

Areas Covered

Before Reading This Manual

This section explains the notes for your safety and conventions used in this manual.

Chapter 1 Overview

This chapter explains component names and basic operations of this server, as well as an overview of the software provided with this server. In addition, the workflow, from placing the server to starting the operation, is also described.

Chapter 2 Checking before OS Installation

This chapter explains the preparation on the server and cautions necessary before OS installation. Please read this chapter before starting installation.

Chapter 3 OS Installation

This chapter explains how to install the OS in the server.

Chapter 4 Operations after OS Installation

This chapter explains the operations to be performed after OS installation. Be sure to perform those operations before operating the server.

Chapter 5 High Reliability Tools

For stable PRIMERGY server operations, we recommend that high reliability tools be installed.

This chapter explains the installation and necessary settings of high reliability tools.

Chapter 6 Installing Internal Options

This chapter explains how to install internal options.

Chapter 7 Configuring Hardware and Utilities

This chapter explains how to make the environment settings necessary to operate the server and how to use each utility.

Chapter 8 Operation and Maintenance

This chapter explains the operations necessary after starting to use this server as well as daily care and maintenance.

Appendix

This appendix explains the specifications for the server and for its internal options. It also covers how to recycle the products.

Before Reading This Manual

For Your Safety...

This manual contains important information, required to operate the server safely. Thoroughly review the information in this manual before using the server. Especially note the points under "Safety Precautions", and only operate the server with a complete understanding of the material provided. This manual and "Safety Precautions" should be kept in an easy-to-access location for quick reference when using this server.

Safety of Laser

This product contains Class 1 laser product, which is compatible with U.S. FDA 21 CFR, Subchapter J and International Standard IEC 60825-1. Do not look at the light source of laser beam directly. Doing so may lead to visual damage.

Data Backup

To protect data stored in this device (including basic software (OS) and application software), perform backup and other necessary operations. Note that data protection is not guaranteed when repairs are performed. It is the customer's responsibility to maintain backup copies in advance.

In case of data loss, Fujitsu assumes no liability for data maintenance or restoration and damages that occur as a result of the data loss for any reason, except for items covered under warranty.

High Safety

The Products are designed, developed and manufactured as contemplated or general use, including without limitation, general office use, personal use, household use, and ordinary industrial use, but are not designed, developed and manufactured as contemplated for use accompanying fatal risks or dangers that, unless extremely high safety is secured, could lead directly to death, personal injury, severe physical damage, or other loss (hereinafter "High Safety Required Use"), including without limitation, nuclear reaction control in nuclear facility, aircraft flight control, air traffic control, mass transport control, medical life support system, missile launch control in weapon system. You shall not use this Product without securing the sufficient safety required for the High Safety Required Use. If you wish to use this Product for High Safety Required Use, please consult with our sales representatives in charge before such use.

Problems may occur with this device in the event of an instantaneous voltage drop of the power supply due to lightning, etc. To prevent an instantaneous voltage drop of the power supply, we recommend that you use an uninterruptible power supply system.

■ SATA hard disk (SATA model)

The SATA hard disk that is installed in the SATA model is designed to be used about eight hours per day for five years with small scale and comparatively low access frequency.

Refrain from using for mission-critical tasks in which continuous 24/7/365 operation is necessary, or database in which the access is frequently repeated, and high reliability is required.

To prevent the loss of important data, regular data backup is recommended.

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Remarks

■ Warning descriptions

Various symbols are used throughout this manual. These are used to emphasize important points for your safety and that of others. The following are the symbols and their meanings. Fully understand these symbols when reading this manual.



 WARNING	Failure to observe this warning may cause serious injury or death, and/or destroy the system.
 CAUTION	Failure to observe this warning may lead to injury, destruction of the system, or loss of data.

The following symbols are used to indicate the type of warning or caution being described.

	A triangle mark emphasizes the urgency of the WARNING and CAUTION. Details are described next to the triangle.
	A barred circle (⊘) warns against certain actions (Do Not). Details are described next to the circle.
	A black circle indicates actions that must be taken. Details are described next to the black circle.

■ Symbols

Symbols used in this manual have the following meanings.

 IMPORTANT	These sections explain prohibited actions and points to note when using this device. Make sure to read these sections.
 POINT	These sections explain information needed to operate the hardware and software properly. Make sure to read these sections.
→	This mark indicates reference pages or manuals.

■ Key descriptions / Operations

Keys are represented throughout this manual in the following manner.

E.g.: [Ctrl] key, [Enter] key, [→] key, etc.

The following indicate pressing several keys at once:

E.g.: [Ctrl] + [F3] key, [Shift] + [↑] key, etc.

■ DVD-ROM drive description

In this manual, DVD-ROM drive is described as CD/DVD drive.

■ Entering commands (Keys)

Command entries are displayed in the following way.

```
diskcopy a: a:
          ↑ ↑
```

- At each blank in a command line (as pointed out above), press the [Space] key once.
- When using Windows, commands are not case sensitive.
- CD/DVD drive names are shown as [CD/DVD drive]. Enter your drive name according to your environment.

```
[CD/DVD drive]:\setup.exe
```

■ Screen shots and figures

Screen shots and figures are used as visual aids throughout this manual. Windows, screens, and file names may vary depending on the OS, software, or configuration of the server used. Figures in this manual may not show cables that are actually connected for convenience of explanation.

■ Consecutive operations

Consecutive operations are described by connecting them with "-".

Example: Procedure of clicking the [Start] button, pointing to [All programs], and clicking [Accessories]

↓

Click [Start] – [All programs] – [Accessories].

■ Server types

Server types are described as follows.

table: Server Types

Type	Expression and abbreviation
Servers without an internal hard disk	Diskless Type

■ Abbreviations

The following expressions and abbreviations are used throughout this manual.

table: Abbreviations of Product Names

Product name	Expressions and abbreviation		
PRIMERGY RX100 S5 (SAS model)	SAS model	This server or the server	
PRIMERGY RX100 S5 (SATA model)	SATA model		
Microsoft® Windows Server® 2003, Standard Edition	Windows Server 2003		
Microsoft® Windows Server® 2003 R2, Standard Edition	Windows Server 2003 R2	Windows	
Microsoft® Windows Server® 2003, Standard x64 Edition	Windows Server 2003 x64* ¹		
Microsoft® Windows Server® 2003 R2, Standard x64 Edition	Windows Server 2003 R2 x64		
Microsoft® Windows® Preinstallation Environment	Windows PE		
Microsoft® Windows Vista® Business	Windows Vista		
Microsoft® Windows® XP Professional	Windows XP Professional		
Microsoft® Windows® 2000 Professional	Windows 2000 Professional		
Microsoft® Windows Server® 2003 Service Pack 1	Service Pack		
Microsoft® Windows Server® 2003 x64 Service Pack			
Red Hat Enterprise Linux ES (v.4 for x86)	Linux		
Red Hat Enterprise Linux ES (v.4 for EM64T)			
Red Hat Enterprise Linux 5 (for x86)			
Red Hat Enterprise Linux 5 (for Intel64)			

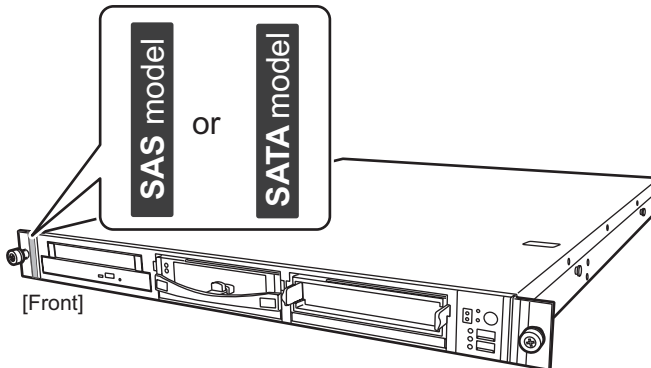
*1: Unless otherwise noted, Windows Server 2003 can also mean Windows Server 2003 x64.

■ PRIMERGY RX100 S5 model description

This server contains a SAS model and SATA model. In this manual, the parts without notes are described as common contents.

Each model is designated either as a [SAS model] or [SATA model]. Check your model before reading this manual.

The model description label is located in the following location of the server.



■ Software manuals

Software Manual contains other reference information and cautions for ServerStart not described in this manual. Please read it before using ServerStart.

Software Manual is contained as a "README.TXT" file in the root directory on the PRIMERGY Startup Disc. Use a text editor to read it.

■ Latest information about software provided with this server

For the latest information regarding ServerStart, ServerView and other software provided with this server, refer to the Fujitsu PRIMERGY website (<http://primergy.fujitsu.com>).

Warning and Caution Labels

Warning and caution labels are found on the server.

Do not remove or stain these labels.

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Chapter 1

Overview

1

This chapter explains component names and basic operations of this server, as well as an overview of the software provided with this server. In addition, the workflow, from placing the server to starting the operation, is also described.

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1.1 RX100 S5

This server has the following features.

■ High reliability

● Disk array system configuration

Since an onboard SAS controller is installed in SAS models and an onboard software RAID is installed in SATA models, an array can be configured.

● Redundant function

By configuring the disk array system (other than RAID0), a failed hard disk unit can be replaced or repaired without turning off the server and peripheral devices (hot pluggable).

● Hardware and software designed for data security

The locks on the rack and security (password) setting in the BIOS Setup Utility protect hardware and data assets in the server against theft, ensuring data security with high reliability.

● Proactive fan function

When a fan fails or the ambient temperature rises, the system fan speed is increased automatically to avoid increase in temperature in the server, ensuring stable server operation.

● Remote management control function

This server has a function of the onboard remote service board. By using the Remote Management Control function, you can use the Web interface to power on/off or reset the server (remote control function) and to monitor the server. For details, refer to "Appendix D Remote Management Controller" (→p.212).

● High reliability tools

There are various high reliability tools available, such as [ServerView], which observes the server state and offers stable system operation. For information about high reliability tools, refer to "1.2.2 High Reliability Tools" (→p.19).

■ High-speed processing

● Quad-Core Intel® Xeon® processors/Dual-Core Intel® Xeon® processors/Intel® Core™ 2 Duo processors/Intel® Celeron® processors

The server has one Quad-Core Intel® Xeon® processors, Dual-Core Intel® Xeon® processors, Intel® Core™ 2 Duo processors, or Intel® Celeron® processors for high-speed data processing.

The quad core processor physically fulfills the same function as 4 CPUs, and the dual core processor physically fulfills the same function as 2 CPUs.

- **PCI-Express**

The server uses PCI-Express (x8) buses, which provide high-speed data transferring.

- **Compact design and scalability**

- **Space saving 1U design**

This server is slim, with a thickness of 1U. The server, display device, keyboard, and external SCSI device fit in a 19-inch rack, which saves the installation space.

- **Maximum memory capacity of 8GB**

In addition to the preinstalled 512MB memory, the memory is expandable to 8GB.

- **Hard disk bay**

Up to two internal hard disk units can be installed in the 3.5-inch storage bays.

- **Internal DVD-ROM unit**

One optional internal DVD-ROM unit can be installed.

- **Two PCI slots**

The server has two PCI slots (PCI-Express).

1.2 Supplied Software

The following software is supplied together with the server. ServerStart supports setting up the system and high reliability tools prevent troubles while server system is running.

1.2.1 Setup Support Tool - ServerStart

ServerStart is an initial setup support tool for PRIMERGY. It offers simple procedures for setup and proper installation for recommended drivers.

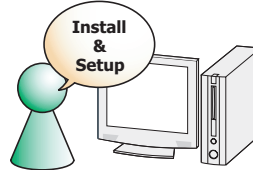
■ Setting up with ServerStart

When performing the OS installation with ServerStart, drivers which are corresponding to the automatically recognized expansion cards will be installed. In addition, high reliability tools and array controller management tools are automatically installed. It prevents the related errors. It is recommended to perform the OS installation with using ServerStart.

Not using ServerStart

- Complicated hardware settings such as RAID configuration
- User definition, access policies and network settings
- Manual settings for each item
resulting in leading mistakes and taking time for server installation.

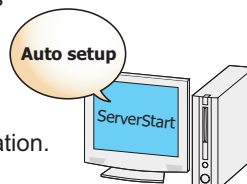
Example:
IP address settings, creation of user,
registration of computer name, and etc.



Using ServerStart

- Automatic RAID configuration
- Automatic installation of recommended drivers
- Automatic installation of high reliability tools are available.

Example:
Automated operations such as OS installation.



POINT

- ▶ Some operations such as a license window and media replacements are required.
- ▶ High reliability tools are software with comprehensive strength for stable system operation of the server management.

■ Merit with ServerStart Setup

● Network configuration

ServerStart can configure a network on server installation. For details on available network patterns, refer to "Using ServerStart to Configure the Network".

● Automatic driver installation

This function installs the recommended drivers for such as automatically recognized expansion cards on the server installation. It is preventative for mismatch driver installations, such as previous version or incompatible drivers.

● Automatic RAID configuration

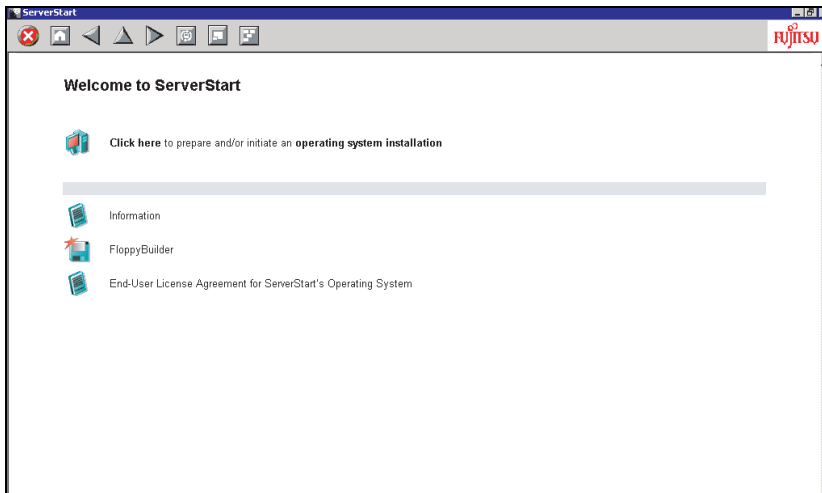
Without RAID utility, disk array can be configured by specifying a RAID type and number of hard disk unit.

■ Intuitive user interface

The intuitive user interface allows you to easily set the necessary information.

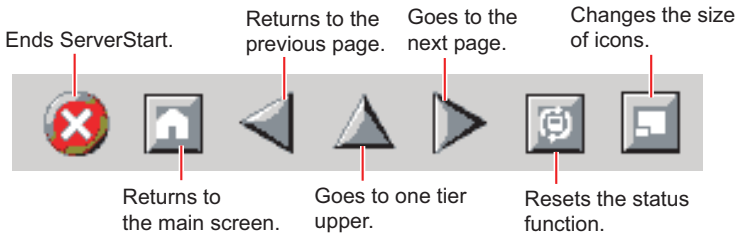
● Main window

When ServerStart starts up, the following window appears. The window and tool bar differ, depending on the mode.



● **Tool bar**

For the expert mode

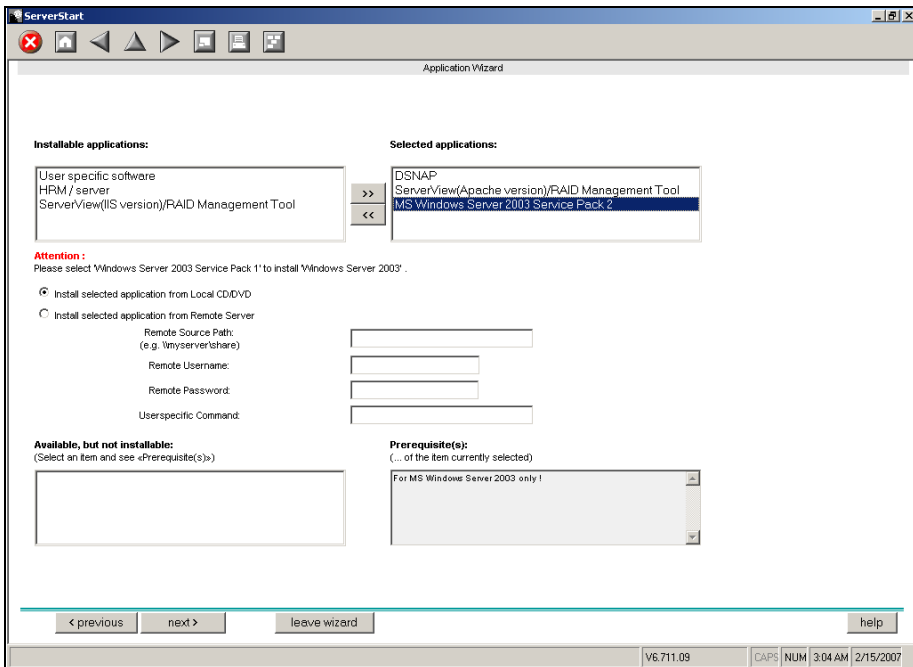


- ▶ While the wizard is running, do not click the ◀ ▶ icon to move to the previous or next window or to upper tree level. To move to a different window, click the [Previous], [Up], or [Next] button at the bottom of the wizard window.

● **Wizard window**

Clicking a wizard displays a wizard window.

Set each item in the wizard window. To move to a step in the next wizard window, click the operation button at the bottom of the window. Clicking [help] displays an explanation for setting the item.



1.2.2 High Reliability Tools

High reliability tools provide comprehensive supports for stable system operations of the server. The following tools have individual management function through normal operations to restoration from errors:

- Server monitoring tools
- System diagnosis support tool
- LAN driver advanced setup tools

■ Server monitoring tools

The server monitoring tools monitor the hardware status and notify the event of an error when irregular status occurs.

● Early detection of a server failure [ServerView]

ServerView monitors the server status to protect important server resources. The server hardware keeps under observation all the time and a potential irregular status will be notified in timely manner when it is detected. A corrective action can be taken in early stage and eliminate the system error before growing a serious matter.



- ▶ For notes of security for ServerView, refer to "● Security" in Section "1.1.7 Note", ServerView User's Guide.

● Maintenance support tool [HRM/server]

HRM/server performs the server maintenance operation promptly and surely to retain stable system operation.

● Early detection of a disk problem [RAID Management Tool]

RAID Management Tool monitors a configured disk array performance. When an event occurs, it leaves an event log in the event viewer's application logs. At the same time, a pop-up window indicates a hard disk failure, rebuild status, etc.

■ System diagnosis support tools

The system diagnosis support tools boost device management in order to perform stable server operation.

● Early solution to problems [DSNAP]

DSNAP is a command line utility for collectively acquiring failure analysis information. Command line operation makes easy to set the configuration information of the system file and major registries, and collect the event log. When a problem occurs in your Windows Server 2003 system, DSNAP is used for a support engineer to understand your system software configuration and settings correctly and to promote research smoothly. Provide this with memory dump to your support engineer.

■ LAN driver advanced setup tools

These tools set details on the LAN, including the use of teaming (load balance) function and VLAN configuration.

● Broadcom Advanced Control Suite (BACS)

BACS is a tool for setting details on the onboard LAN in case such as configuring a VLAN with onboard LAN.

● Intel® PROSet

Intel® PROSet is a tool for setting details on the LAN card in case such as using teaming function between LAN cards or onboard LAN and LAN card, and configuring a VLAN with LAN card.

1.2.3 Installing High Reliability Tools

Collective installation all high reliability tools, provided with PRIMERGY, may be made by specifying them in "Application Wizard".

The following high reliability tools are installed with ServerStart.

table: High reliability tools installation

High reliability tool	ServerStart installation	
	Quick Installation mode	Expert mode
RAID Management Tool / ServerView (for Apache)	I	S
RAID Management Tool / ServerView (for IIS)	M	N
HRM/server	I	N
DSNAP	I	S
Broadcom Advanced Control Suite (BACS)	I	I
Intel® PROSet	I	I

- I: Installed automatically
- N: Installed if selected (Not selected by default)
- S: Installed if selected (Selected by default)
- M: Install manually.

IMPORTANT

- ▶ ServerStart Batch installation does not support Linux.
- ▶ ServerView requires some settings after installation, even when high reliability tools have been installed automatically with ServerStart. Refer to "Chapter 5 High Reliability Tools" (→p.109).

POINT

- ▶ When using ServerStart to install the OS, RAID Management Tool and ServerView are installed together. These cannot be selected individually.
- ▶ To use all functions of ServerView, "Java2 Runtime Environment Standard Edition" and "Web server" are required. When using ServerStart to install the OS, "Java2 Runtime Environment Standard Edition" is installed automatically. For Web server, you can use either of the followings by selecting a menu.

- ServerView (for Apache)
Install ServerView Web-Server (Web server for ServerView, Apache for Win32 base) and install ServerView configuring to use this Web server.
- ServerView (for IIS)

Install Microsoft Internet Information Server (IIS) supplied with Windows separately. ServerView is installed with the setting to operate using IIS installed on the system.

When IIS is not found in the system, ServerView Web-Server is installed even if "ServerView (for IIS)" is selected. ServerView (for Apache) is selected by default. To install ServerView (for IIS), select "RAID Management Tool / ServerView (for IIS)". If "RAID Management Tool / ServerView (for IIS)" is selected, ServerView (for Apache) is not installed.

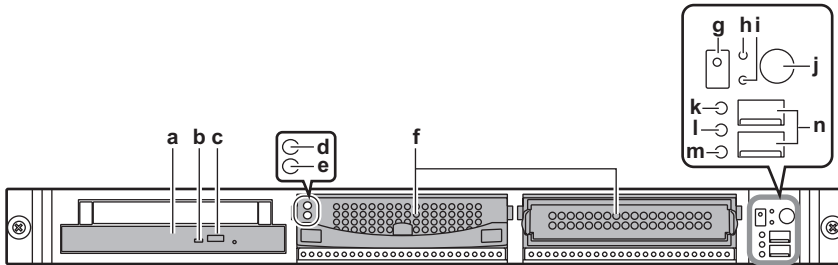
It is not possible to release both of ServerView (for IIS) and ServerView (for Apache). ServerView (for IIS) may not be installed in the quick installation mode.

- ▶ Intel® PROSet will be installed only when an optional LAN card is installed properly and the driver is applied correctly.
- ▶ If the OS is installed on other than drive C using ServerStart, Intel® PROSet will not be installed. In this case, install Intel® PROSet manually. For details, refer to "4.7.1 Intel® PROSet Installation" (→p.104).

1.3 Component Names and Functions

This section explains the component names and functions of the server.

1.3.1 Server (Front View)






- a** CD/DVD drive (Optional)
Insert CD/DVD.
- b** CD/DVD access LED
Lights when reading data from CD/DVD.
- c** CD/DVD eject button
Push the button when inserting or ejecting CD/DVD.
Do not push this button when the CD/DVD access LED is on.
- d** Hard disk access LED ()
This LED lights up green when data is being written to or read from the hard disk.
- e** Hard disk failure LED ()

table: Hard disk status

LED status	Hard disk status
Off	Normal mode or hot sparing
Amber	Hard disk failure
Blinks in amber	Initializing or rebuilding


- f** 3.5-inch storage bay
Install the internal hard disk unit into the server unit. Up to two internal hard disk units can be installed in the server.
- g** System identification LED button/System identification LED ()
This LED is for maintenance. When pressing this button, the front and rear system identification LEDs are lit blue so that the locations of devices being maintained can be determined.
Also, this LED can be lit by using [system identification LED display] button on the ServerView.

h Reset switch ()


Pressing this switch resets and restarts the system.




- ▶ Do not reset the system when the hard disk access LED is turned on. Data in the hard disk may be damaged.

i Maintenance switch ()

This switch is used only by maintenance personnel. Do not touch this.


j Power switch ()

- ▶ Do not turn the server off when the hard disk access LED is turned on. Data in the hard disk may be damaged.

k Front maintenance LED ()

This LED lights or blinks yellow when abnormality is detected in parts in the server.

If this LED lights or blinks, contact an office listed in the "Contact Information" of the "Start Guide".

l Hard disk access LED ()


This LED lights green when data is being written to or read from the hard disk.

m Power LED ()

This LED lights green when the server's power is turned on.

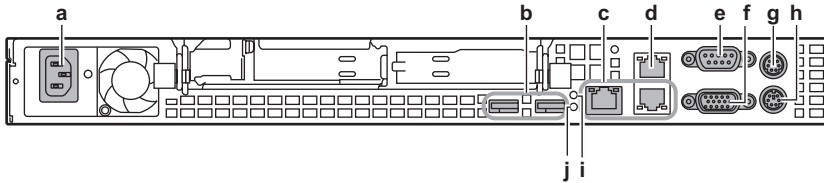
This LED lights amber when the server's power is turned off (standby mode).

This LED does not light when the power cable is unplugged.

n USB connector ()


Connects peripheral equipment conforming to the USB standard (2.0 or 1.1)

1.3.2 Server (Rear View)





a Inlet

The AC power cables are plugged in.

b USB connector ()

Connects peripheral equipment conforming to the USB standard (2.0 or 1.1).

c LAN port 1/2 ( )

An Unshielded Twisted Pair (UTP) cable is plugged in. For 1000Mbps connection, a cable conforming to category 5 enhanced is required.

The meanings of the two LEDs are shown in the table below.


table: LAN connection status

LED location	LED status	Connection status
Left	Green	Link is being established.
	Off	Link is not established.
Right	Amber	Connection is established at 1000Mbps.
	Green	Connection is established at 100Mbps.
	Off	Connection is established at 10Mbps.

d Service LAN port ()

This LAN port is used exclusively for the remote management controller.


By connecting a LAN cable, the remote management controller function can be used with Web interface. When using Remote Management Controller, refer to "Appendix D Remote Management Controller" (→p.212).

e Serial port (9-pin) ()

Cables of peripheral equipment conforming to the RS-232C standard such as modems are plugged in.

f Display connector (15-pin) ()


A display cable is plugged in.

g Mouse connector (6-pin) ()

A mouse is plugged in.

h Keyboard connector (6-pin) ()

A keyboard is plugged in.

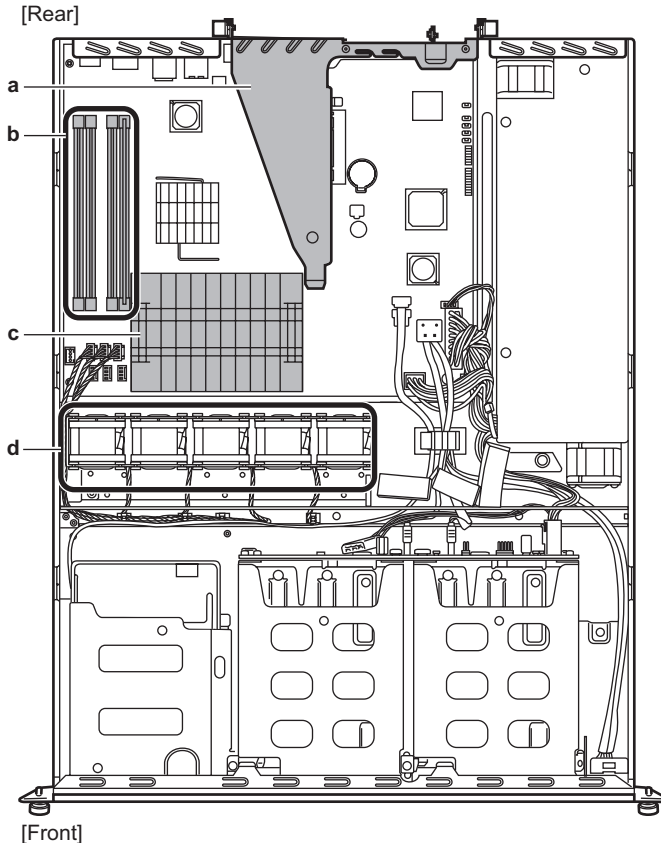
i Rear maintenance LED ()

When an error is detected in a server component, this LED lights or blinks amber. When this LED lights or blinks, contact an office listed in the "Contact Information" of the "Start Guide".

j System identification LED (ID)

This LED is for maintenance. When pressing the system identification LED button on the front, the front and rear system identification LEDs are lit blue so that the locations of devices being maintained can be determined. Also, this LED can be lit by using [system identification LED display] button on the ServerView.

1.3.3 Server (Inside)

**a Card fix frame**

Install various expansion cards that enhance the function of this server.
PCI bus expansion cards can be installed.

b Memory slot

Install memory modules.

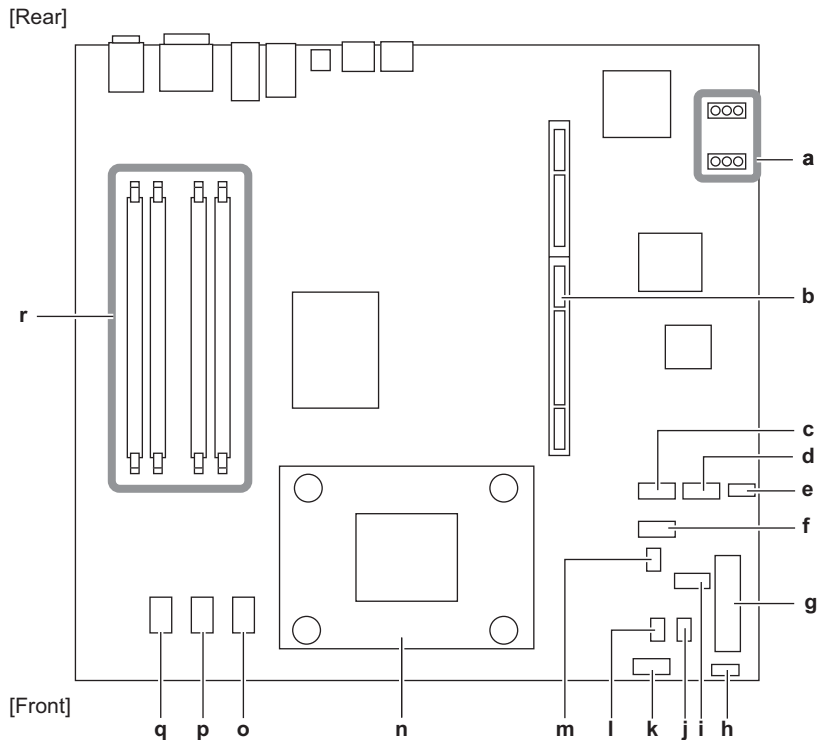
c CPU

One CPU is installed by default.

d System fan

Contact an office listed in the "Contact Information" of the "Start Guide" for the system fan replacement.

1.3.4 Baseboard



a Jumper pins

For the jumper pins settings, refer to "7.1 Jumper Pins Settings" (→p.142).

b Connector for the card fix frame

Attach the fix frame of the expansion board.

c SATA1 connector (for SATA model only)

For SATA model, the SATA cable of the internal hard disk unit (Bay 1) is plugged in.

d SATA2 connector (for SATA model only)

For SATA model, the SATA cable of the internal hard disk unit (Bay 2) is plugged in.

e PSU I2C connector

f SATA5 connector

The SATA cable of the optional internal DVD-ROM unit is plugged in.

g Power connector

The power supply unit cable is plugged in.

h Front panel connector

The front panel cable is plugged in.

i SAS connector (for SAS model only)

For SAS model, the SAS cable of the internal hard disk unit is plugged in.

j Fan 5 connector

A system fan 5 cable is plugged in.

- k** 12V power connector
A power supply unit cable is plugged in.
- l** Fan 4 connector
A system fan 4 cable is plugged in.
- m** LED connector
A hard disk LED cable is plugged in.
- n** CPU socket
- o** Fan 3 connector
A system fan 3 cable is plugged in.
- p** Fan 2 connector
A system fan 2 cable is plugged in.
- q** Fan 1 connector
A system fan 1 cable is plugged in.
- r** Memory slot
Install memory modules.

1.4 Standard Operations

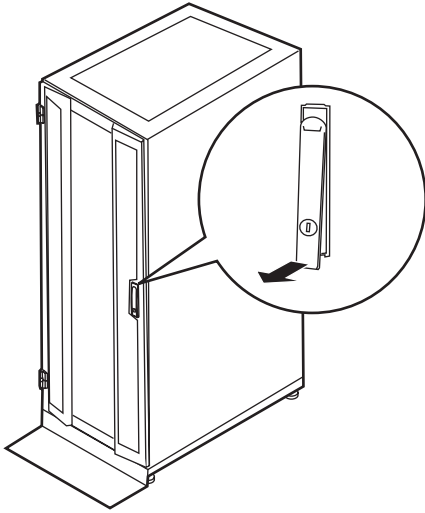
This section explains standard server operations, including how to turn the server on/off and how to insert/eject a CD/DVD.

1.4.1 Opening the Rack Door

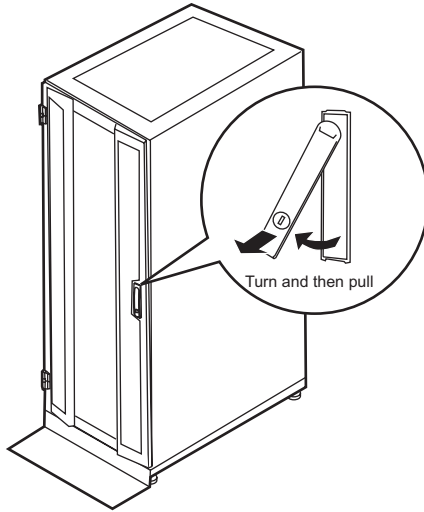
This section explains how to open the front and rear doors of the 40U standard rack. For other racks, refer to each rack manual.

■ Opening the front door

- 1** Turn the rack key to unlock and pull the rack handle up.
→"8.4.1 Hardware Security" (p.185)

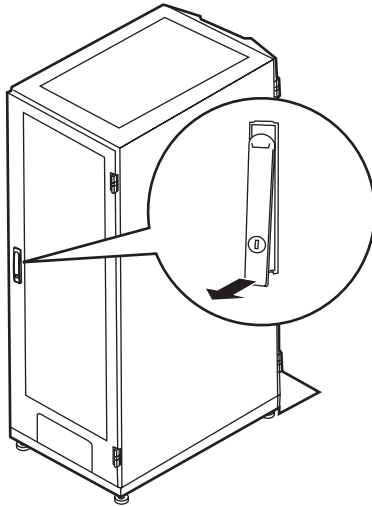


- 2** Turn the handle in the direction of the arrow and pull it forward.

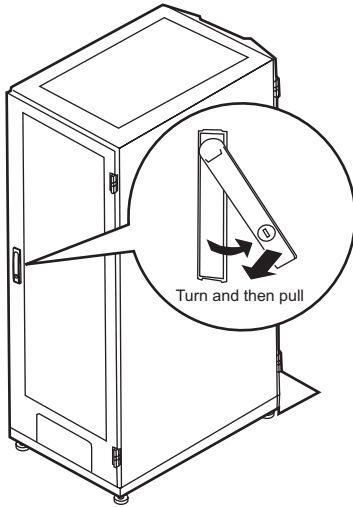


■ Opening the rear door

- 1** Turn the rack key to unlock and pull the rack handle up.



- 2 Turn the handle in the direction of the arrow and pull it forward.



POINT

- ▶ Unless you are inserting/removing media or turning the power on/off, keep the rack door closed. Doing so blocks electric waves from cell phones, etc.
- ▶ Do not lose the keys. If the key is lost, contact an office listed in the "Contact Information" of the "Start Guide".

1.4.2 Turning On the Server

CAUTION



- Do not move, strike, or shake the server when it is turned on. This can damage the hard disk in the server and cause data loss.



- Turn the server on when the temperature is in its operating environment range (10-35°C). For details on the operating environment, refer to "Start Guide" and "Safety Precautions".

When operating the device outside of this operating environment, the server may operate improperly, damage data etc.

Furthermore, Fujitsu cannot be held responsible for any related damage, malfunction, or loss of data, etc.

- Be sure to wait for 10 seconds or more after shutdown before turning the server on.



- The fans rotate at high speed immediately after the server is turned on, but this is not defective. When the temperature is in the server's operating environment range (10-35°C), they start to rotate at normal speed later.

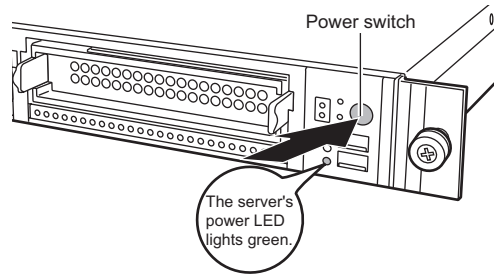
- 1 Open the rack door.
→"1.4.1 Opening the Rack Door" (p.28)

- 2 Make sure that the CD/DVD drive is empty.

3 Turn on the display and peripheral devices.

4 Press the power switch on the front of the server.

The server's power LED lights green. When the power is turned on, the server performs Power On Self Tests (POST). If any abnormalities are detected by POST, error messages are displayed.
→"8.2.2 Error Messages" (p.173)



IMPORTANT

- ▶ Wait 10 seconds or more to press the power switch after connecting the power cable.

POINT

- ▶ The time to turn on the server can be set with the ASR setting (on the [Power On/Off] tab) using ServerView. For details, refer to "3.4 Serious Error Handling (ASR)" in "ServerView User's Guide".
- ▶ If you press the [F12] key right after the POST memory count, the Boot Menu is displayed, where you can change the boot disk (→"■ How to start the BIOS Setup Utility" (p.143)).

1.4.3 Turning Off the Server



WARNING



- In the event of smoke or sparks, immediately unplug the electric cord. Failure to do so may lead to a fire or electric shock.



CAUTION



- When turning off the server, be sure to follow the procedures described in this section. Data can be lost if these procedures are not followed correctly.

1 Make sure that the CD/DVD drive is empty.

2 Shut down the OS.

In the following cases, the server is turned off after the OS is shut down.

- Windows OS
- When ServerView is installed

POINT

- ▶ In other cases, press the power switch of the server after shutting down the OS and making sure that the hard disk access LED is off. The power LED lights amber.

3 Turn off the display and peripheral devices.



- Be sure to wait for 10 seconds or more after shutdown before turning the server on.

POINT

- ▶ The time to turn off the server can be set with the ASR setting (on the [Power On/Off] tab) using ServerView. For details, refer to "3.4 Serious Error Handling (ASR)" in "ServerView User's Guide".

■ Cautions for turning the power on/off (for Windows Server 2003)

For the power switch of this server, you can specify the following operation modes depending on the OS settings (normally, "Shutdown" is specified).

"Do Nothing", "Prompt Input", "Standby", "Hibernation", or "Shutdown"

On this server, functions corresponding to "Standby" and "Hibernation" are supported as BIOS and hardware functions. However, some drivers and software installed in the server do not support these functions. For this reason, functions corresponding to "Standby" and "Hibernation" are unavailable on this server.

When the operating mode is set to "Standby" or "Hibernation", the system may operate improperly or hard disk data may be corrupted.

For details about operating mode settings, refer to the manual supplied with the OS.

1.4.4 Inserting and Ejecting a CD/DVD

The optional DVD-ROM unit can be installed in this server.

This section explains how to insert and eject a CD/DVD.



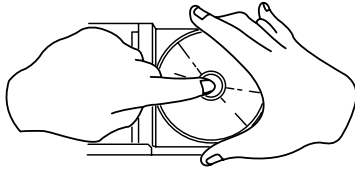
- Do not look at the light source of the CD/DVD drive laser beam directly. Doing so may lead to visual damage.

■ Cautions when handling drives

- High humidity and airborne dust levels are to be avoided. Electric shocks and/or server failures may be caused by liquids such as water, or metallic items, such as paper clips, entering a drive.
- Shocks and vibrations are also to be avoided.
- Do not insert any objects other than the specified CDs/DVDs.
- Do not pull on, press hard, or otherwise handle the CD/DVD tray roughly.
- Do not disassemble the CD/DVD drive.
- Before use, clean the CD/DVD tray using a soft, dry cloth.
- As a precaution, remove discs from the CD/DVD drive when the drive is not to be used for a long time. Keep the CD/DVD tray closed to prevent foreign matter, such as dust, from entering the CD/DVD drive.

■ Cautions when handling media

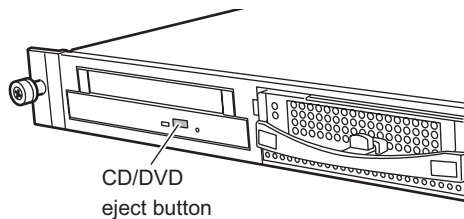
- When removing a disc from its case, press the central disc holder to release the disc as shown in the figure below, then just lift the disc up.



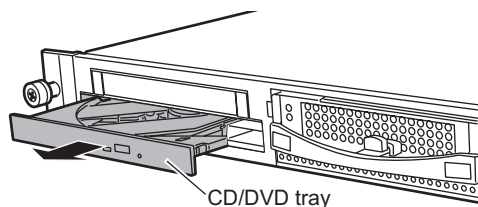
- Hold CDs/DVDs by their edges to avoid contact with the disc surface.
- Do not contaminate the CD/DVD surface with fingerprints, oil, dust, etc. If dirty, clean with a soft, dry cloth, wiping from the center to the edge. Do not use benzene, thinners, water, record sprays, antistatic agents, or silicone-impregnated cloth.
- Be careful not to damage the CD/DVD surface.
- Keep the CDs/DVDs away from heat sources.
- Do not bend or place heavy objects on CDs/DVDs.
- Do not write with ballpoint pen or pencil on the label (printed) side.
- Do not attach stickers or similar to the label side. Doing so may cause rotational eccentricity and abnormal vibrations.
- When a CD/DVD is moved from a cold place to a warm place, condensation build-up on the CD/DVD surface can cause the data read errors. In this case, let the CD/DVD dry naturally after wiping it with a soft, dry cloth. Do not use a hair dryer, etc.
- To avoid dust, damage, and deformation, keep the CD/DVD in its case whenever it is not in use.
- Do not store CDs/DVDs at high temperatures. Areas exposed to prolonged direct sunlight or near heating appliances are to be avoided.

■ Inserting the CD/DVD

- 1** Make sure the server is turned on and press the CD/DVD eject button.
The CD/DVD tray comes out a little.

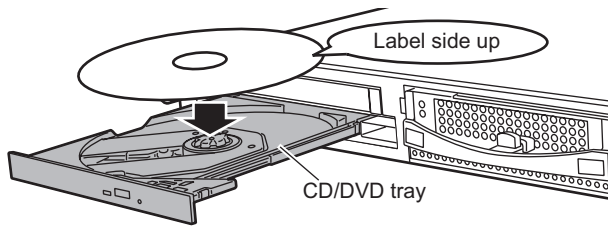


- 2** Pull the CD/DVD tray out.



3 Place the CD/DVD at the center of the tray.

While supporting the CD/DVD tray, push the tray until it clicks into position.



IMPORTANT

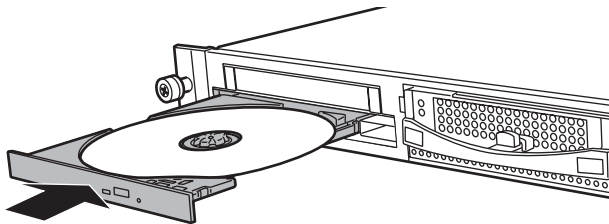
- ▶ If the CD/DVD is placed improperly when the tray is pushed into the unit, the CD/DVD or the drive may be damaged.
- ▶ Be careful not to touch the lens of the CD/DVD drive.

POINT

- ▶ When inserting CD/DVD, the CD/DVD access LED is turned on. After checking that the LED is turned off, proceed with the next procedure.

4 Move the tray back.

Push the tray gently until it clicks into position.

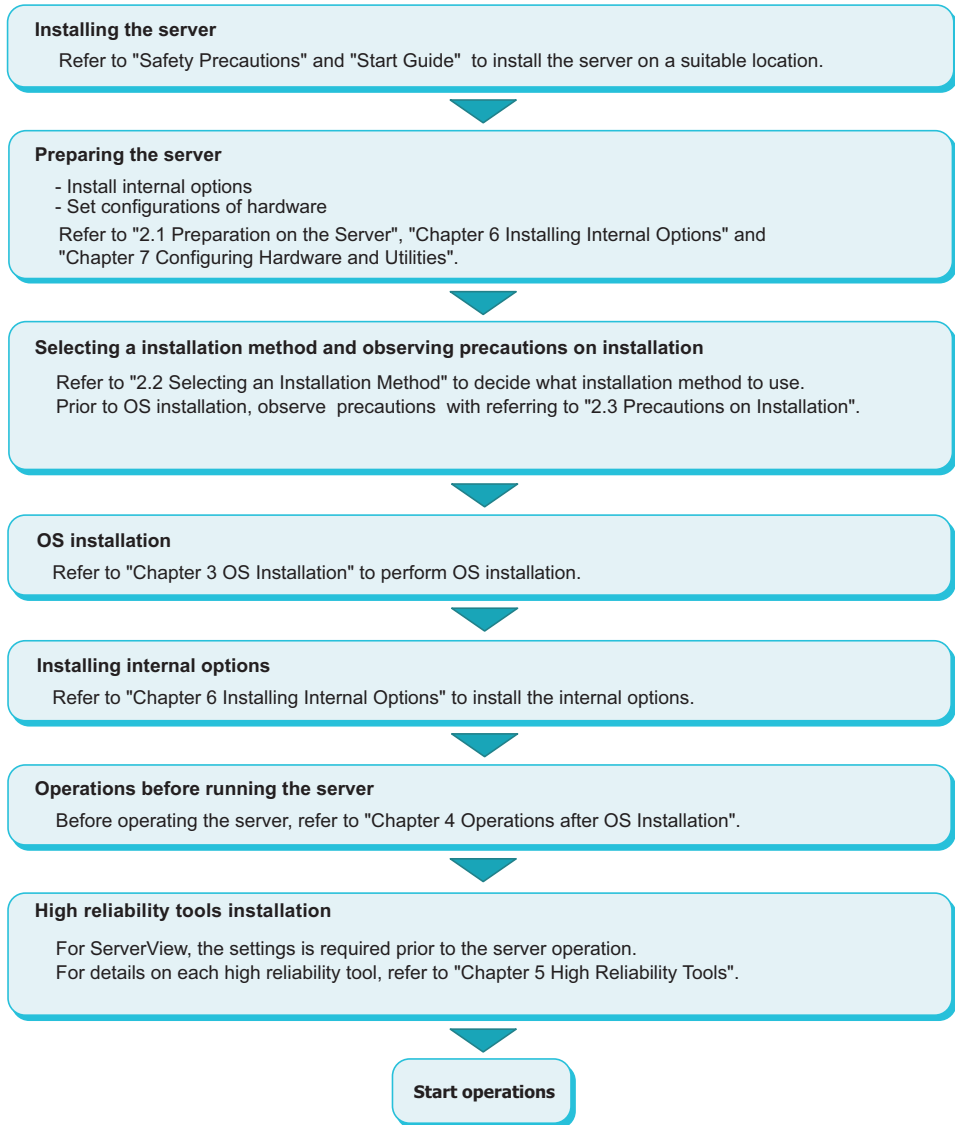


■ Ejecting the CD/DVD

To eject the CD/DVD, press the CD/DVD eject button in the same way as steps 1 to 2 in "■ Inserting the CD/DVD" (→p.33).

1.5 Workflow

Use the following workflow from server installation to start of operation.



Chapter 2

Checking before OS Installation

2

This chapter explains the preparation on the server and cautions necessary before OS installation. Please read this chapter before starting installation.

2.1	Preparation on the Server	38
2.2	Selecting an Installation Method	42
2.3	Precautions on Installation	43

2.1 Preparation on the Server

Before starting installation, install internal options in the server and perform necessary hardware settings.

2.1.1 Installing Internal Options

Internal options are classified into those that must be installed before the OS installation and those that must be installed after the OS installation. For installation procedures, refer to "Chapter 6 Installing Internal Options" (→p.117).

● Options that must be installed before the OS installation

- Memory modules
- Expansion cards
- USB Floppy disk drive



- ▶ For installation, use the ServerStart floppy disk or driver disk. Connect the USB floppy disk drive beforehand.

● Options that must be installed after the OS installation

- Optional SCSI devices
- Non-system internal hard disk drives



- ▶ If an internal option device that must be installed after the OS installation has been already installed, remove it and then reinstall it after the OS installation.

■ Installing optional external devices

When installing external optional SCSI devices and/or USB connection devices (except floppy disk drive), turn off their power or unplug their connection cables from the server during the OS installation. Connect them after the OS installation.

■ Cautions for installing an expansion card

When using an expansion card, read the notes on the expansion card.

■ Cautions for installing memory modules

For this server, the maximum installable memory capacity varies depending on the OS. Furthermore, since the server uses part of the memory as PCI resources, the maximum available capacity is limited. The following shows the maximum installable capacity and the maximum available capacity.

table: Maximum Installable Capacity and Maximum Available Capacity

OS	Installed memory capacity	Available memory capacity
Windows Server 2003 Windows Server 2003 R2	Up to 2.0GB	Same as the installed memory capacity
	2.0GB to 4.0GB	Depends on the [NX Memory Protection] setting in the [Advanced Processor Options] submenu under the Advanced menu of the BIOS Setup Utility. <ul style="list-style-type: none"> • Disabled: 2.0GB • Enabled: Same as the installed memory capacity *1
Windows Server 2003 x64	Installed memory capacity	Same as the installed memory capacity
Linux	Installed memory capacity	Same as the installed memory capacity

*1: Adding the /PAE option to the Boot.ini file also makes the installed memory capacity the available memory capacity. Also, refer to the Microsoft website for information about specifying the /PAE option in the Boot.ini file.

■ LAN cable

Be sure to connect the LAN cable when the server is not connected to the Internet.



- ▶ Connecting to the Internet during setup can cause security problems. Do not connect to the Internet until the setup completes.

If the OS is installed or applications are automatically installed without connecting the LAN cable to the LAN card, an error may be recorded in the event viewer after setup completes.

Connect the LAN cable to the LAN card after Service Pack 2 is applied in the following situations:

- When installing Intel® PROSet
 - When an optional LAN card is installed and OS is installed by using ServerStart, or high reliability tools are installed by batch installation tool "PowerUp Gear", Intel® PROSet is automatically installed.
- When a 10Mbps half-duplex connection is used

2.1.2 Hardware Settings

Before starting installation, set necessary hardware settings, such as the BIOS Setup Utility.

■ BIOS Setup Utility

The BIOS Setup Utility must be used in the following cases. For details on how to use the BIOS Setup Utility, refer to "7.2 BIOS Setup Utility" (→p.143).

● Changing the boot drive

To change the boot drive, start up the BIOS Setup Utility, select [Boot Option], and set the boot drive. →"7.2.18 Boot Menu" (p.164)



- ▶ When booting the system from the USB floppy disk drive, check that the USB floppy disk drive is included in the [Boot priority order] under the "7.2.18 Boot Menu" (→p.164) of the BIOS Setup Utility.

● Performing remote installation

Before performing remote installation of ServerStart, use the following procedures to enable network startup (PXE). In addition, check the MAC address.

1 Take the following steps in the BIOS Setup Utility.

1. Start the BIOS Setup Utility.
→"7.2.1 Starting and Exiting the BIOS Setup Utility" (p.143)
2. Select the [Peripheral Configuration] submenu in the Advanced menu and press the [Enter] key.
3. Set [LAN 1 OproM] or [LAN 2 OproM] to [PXE].
4. Press the [Esc] key and select [Save Changes & Exit] in the [Exit] menu to exit the BIOS Setup Utility.
5. Start the BIOS Setup Utility again.
6. Select the Boot menu.
7. Change the [Boot Sequence] setting as shown below.

```
1 PCIBEV :BootM anage PXE, S bt ****
2 CD-ROM Device
3 HDD Device
```

8. Exit the BIOS Setup Utility and turn off the server.

2 Check the MAC address.

Start up the server from the network.

The MAC address is displayed as shown below.

```
CLIENT MAC ADDR : ** ** ** ** ** ** ****
```

The MAC address is required for remote installation. Write it down.

POINT

- ▶ You can turn the power on and off from a client (via a LAN) by utilizing the Wakeup On LAN (WOL) function. Refer to "4.5.4 Turning the Power On via a LAN" (→p.91).

2.2 Selecting an Installation Method

When install the OS with ServerStart, there are multiple installation methods. Prior to OS installation, refer to the following to decide on the method.

2.2.1 Supported OS

POINT

- ▶ ServerStart does not support OS installation of Linux.
- ▶ Any of unsupported OS cannot be installed.

The following OS can be installed with using ServerStart.

- Microsoft® Windows Server® 2003, Standard Edition
- Microsoft® Windows Server® 2003, Standard x64 Edition
- Microsoft® Windows Server® 2003 R2, Standard Edition
- Microsoft® Windows Server® 2003 R2, Standard x64 Edition

2.2.2 Installation Modes of ServerStart

■ Quick installation mode

This mode completes the OS installation by executing plain settings. Select this mode when you want to install the OS quickly and simply. To install while maintaining the established RAID environment, the quick installation mode must be selected to install the OS.

Select [Logical Disk0] in the [Select the Boot Controller and Boot Disk] window and install the OS.

■ Expert mode

In this mode, start up Disk Manager and format the partition where your OS is installed prior to installation of the OS. Select the expert mode only when installing the OS while maintaining the existing partitions. Also, when using ServerStart while maintaining the existing partitions, start up Disk Manager, format an installation partition and install the OS.

2.3 Precautions on Installation

Observe all the following notes before starting OS installation.

2.3.1 Installation Partition Size

The installation partition sizes are stated as below when using ServerStart to install your OS.

- Maximum size: 2TB
- Minimum size: 2200MB

● Notes

- When setting the OS and BOOT partitions on different partitions, specify the partition size directly.
- In either of the following cases, specify a partition size 2TB or less.
 - When the same partition is specified as the OS and BOOT partitions
 - When different partitions are specified as the OS and BOOT partitions
- The OS cannot be installed on a partition larger than 2TB.

POINT

- ▶ The BOOT partition is a partition for booting. Minimum information that is necessary for booting such as "ntldr" is set.
The OS partition is a partition for installing the OS.

2.3.2 Notes on Configuring RAID

Observe the notes described as follows prior to configuring RAID.

■ Hard disk unit

- Only internal hard disk units can be used. Up to two internal hard disk units can be installed in the server. However, the number of available hard disk units that can be installed varies depending on the RAID level. For details, refer to Array Controller Document & Tool CD.
- Be sure to use hard disk units of the same model with the same capacity.

■ Array configuration

Array controllers to be used vary depending on model of the server. For RAID configuration of each model, refer to applicable manuals.

● When using an onboard SAS Ctrl (Integrated Mirroring SAS) (SAS model only)

Configure RAID with an internal hard disk which is connected to a SAS connector on the baseboard. The array controller to be employed is "Integrated Mirroring SAS" and available RAID level is "RAID1" only. For details, refer to "Integrated Mirroring SAS Users Guide" in Array Controller Document & Tool CD.

● When using an onboard software RAID (SATA model only)

Configure RAID with an internal hard disk which is connected to a SATA connector on the baseboard. The array controller to be employed is "Embedded MegaRAID SATA" and available RAID level is "RAID 0" and "RAID 1". For details, refer to "Embedded MegaRAID SATA Users Guide" in Array Controller Document & Tool CD.

POINT

- ▶ Only one array controller is available with connecting to the internal hard disk. Multiple array controllers cannot be used.

■ Notes

- When RAID-configured hard disk unit is used
Hard disk units that have been used before may have unwanted partition information or array configuration information, which may cause unexpected problems. If you connect any hard disk units with usage history to this server, format them at low level on another system before connecting them to the server. For information on how to format the hard disk, refer to the manual supplied with the system to be used.
- Number of hard disk units
If the number of actually installed units is less than that the setting for the number of units (plus one, when hot spare is specified), installation using ServerStart is aborted because of an error.
When the number of actually installed hard disk units is larger than configured, the disk units are set up according to the setting. Extra units will be configured as standby disk units.

2.3.3 Cautions for Using ServerStart

Observe the cautions described below when the OS installation is performed with ServerStart.

■ Operating ServerStart

Mainly, a mouse is used for ServerStart operations. In some cases, operation with the [Tab] key or cursor are not available. Be sure to use a mouse while operating ServerStart.

■ Configuration file (SerStartBatch.ini)

A configuration file stores the server setup and client information configured in ServerStart. To create a configuration file, use the ServerStart floppy disk supplied with this server. Store only one file on each floppy disk. Do not set the ServerStart floppy disk to the write-protected state. You can use any name for the configuration file. However, the file must be installed in the server as "SerStartBatch.ini". When installing the configuration file, make sure to save it as "SerStartBatch.ini" on the ServerStart floppy disk. Start up ServerStart, insert the ServerStart floppy disk containing "SerStartBatch.ini", and click [Start] to install the server

■ Ejecting PRIMERGY Startup Disc

Do not eject PRIMERGY Startup Disc while ServerStart is running. If the PRIMERGY Startup Disc is ejected and inserted again, ServerStart starts up in multiple windows, and settings you have made may be lost.

■ Exiting ServerStart

After operation in the expert mode, exiting ServerStart restarts the system. Remove discs from the floppy disk and CD/DVD drives and click [OK]. When the display on the screen disappears, turn off the system.

■ License for use of system for ServerStart

"License for Use of System for ServerStart" linked from the ServerStart startup window is a license for use of Windows PE contained in ServerStart of the PRIMERGY Startup Disc. Windows PE for starting up ServerStart can be only used for installing Windows Server 2003 R2 and Windows Server 2003, provided under a separate legal license.

■ Display of onboard LAN

Display of an onboard LAN on your OS is as below when OS installation performs with ServerStart.

table: Display of Onboard LAN

LAN Port	Property on My Network	LAN Device Name
Onboard LAN	Local Area Connection	BroadcomNetXtreme Gigabit Ethernet
Onboard LAN	Local Area Connection 2	BroadcomNetXtreme Gigabit Ethernet #2

■ Adapter numbers

For ServerStart, onboard multiple LAN adapters (network adapter) may be configured on OS installation wizard.

To configure multiple LAN cards, select the adapter numbers in order of Adapter 1 and Adapter 2, and enter settings for each adapter. Note that the order of adapter numbers is not necessarily the same as the order of slots for the installed LAN adapters. This means that the setting for Adapter 1 is not always applied to the onboard LAN. After installing the OS, check the LAN adapters to make sure that they are configured as intended.

■ Setting up the printer

ServerStart does not support setup of printers. Perform installation after setup is completed.

2.3.4 Automatic Driver Installation with ServerStart

ServerStart supports automatic driver installation for the following expansion cards.

table: Automatic Driver Installation of Expansion Cards

Name	Product ID	Bus
Onboard FDD/IDE/SATA	-	-
Onboard SATA	-	-
Onboard LAN	-	PCI-E
Onboard VGA	-	PCI
Onboard Software RAID	-	-
Onboard SAS Ctrl	-	-
Eth. Ctrl 2x1Gbit PCI-E 1000-BASE-T lp	PG-2861L	PCI-E
Eth. Ctrl 1x1Gbit PCI-E 1000-BASE-T lp	PG-289L	PCI-E
Eth. Ctrl 1x1Gbit PCI-E 1000BASE-SX lp	PG-288L	PCI-E
SCSI Ctrl U320 lp	PG-2281L	PCI-E

Chapter 3

OS Installation

3

This chapter explains how to install the OS in the server using ServerStart.

3.1 Quick Installation Mode	48
3.2 Expert Mode	54

3.1 Quick Installation Mode

In this quick installation mode, the OS is installed after configuring minimum required settings. To install the OS quickly and easily, use the quick installation mode.



- ▶ Confirm that the USB floppy disk drive is connected before turning on the server power.
- ▶ In quick installation mode, Service Pack 2 is installed automatically (even if the CD with Service Pack 1 applied is specified, Service Pack 2 is installed).

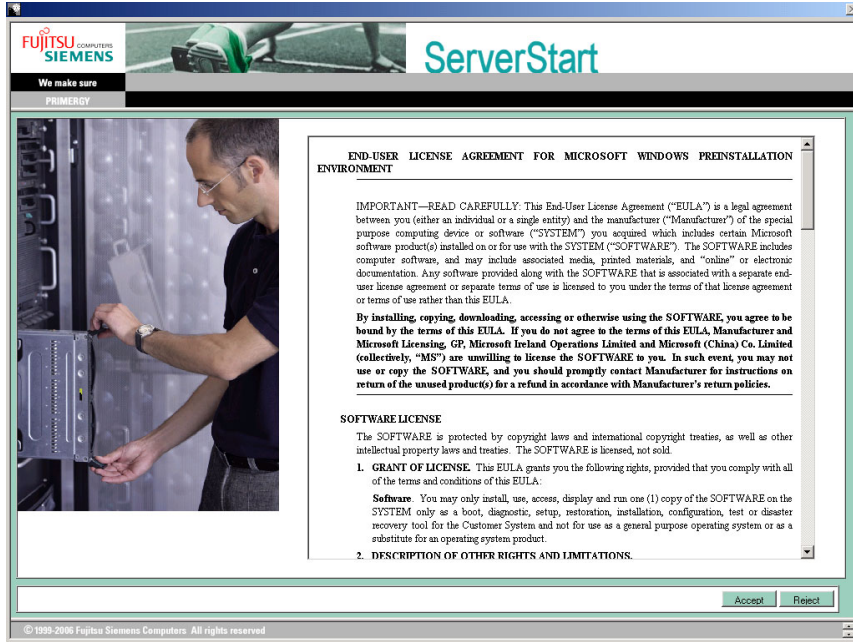
- 1 Turn on the server and insert PRIMERGY Startup Disc immediately. ServerStart starts up. The select-media window for the configuration file appears.

- 2 Insert the ServerStart floppy disk supplied with the server. Make sure that "on local drive (floppy/USB stick)" and "A:" are selected and click [Continue].



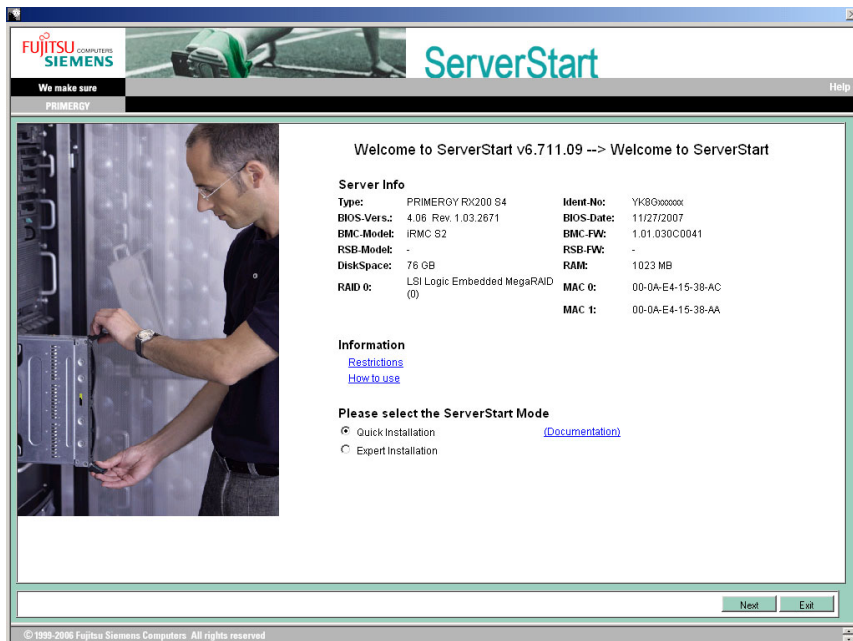
- ▶ Set the ServerStart floppy disk in the write-enabled state.

The [Initialization of ServerStart core running] window appears and the ServerStart initialization process starts. Depending on hardware configuration, this process may take a few minutes. After completion, the license agreement window appears.



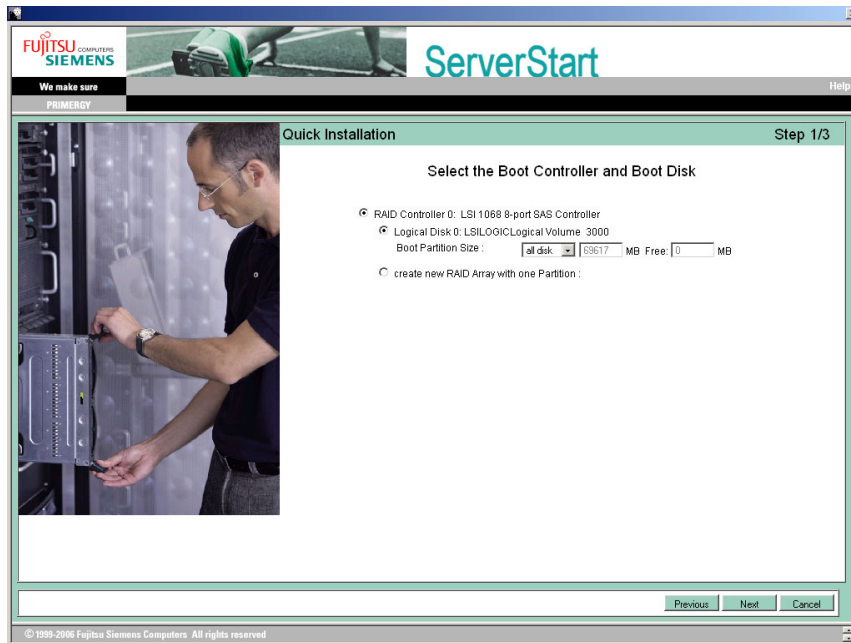
3 Click [Accept].

The [Welcome to ServerStart] window appears.



4 Select "Quick Installation" and click [Next].

The [Select the Boot Controller and Boot Disk] window appears.



5 Set configuration of the RAID and disks and click [Next].

To install the OS while maintaining the established RAID environment

Select [Logical Disk 0] and specify partition size to be created.

One partition can be created. Select [Logical Disk 0] even if the RAID is not required to be created.

To configure RAID

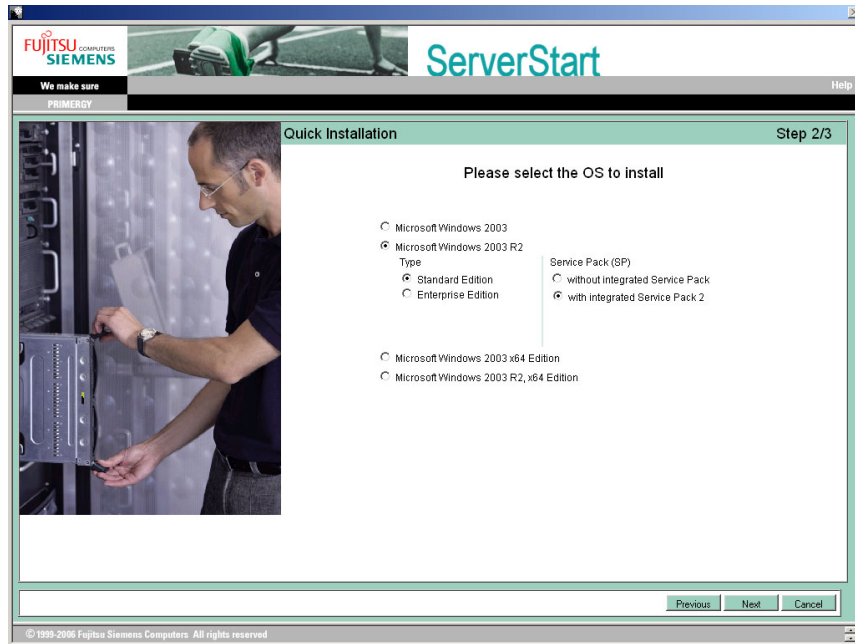
Select [create new RAID array with one partition] and specify the RAID level to be configured and the size of the partition.

All existing RAID will be deleted. Also, only one partition can be created.

POINT

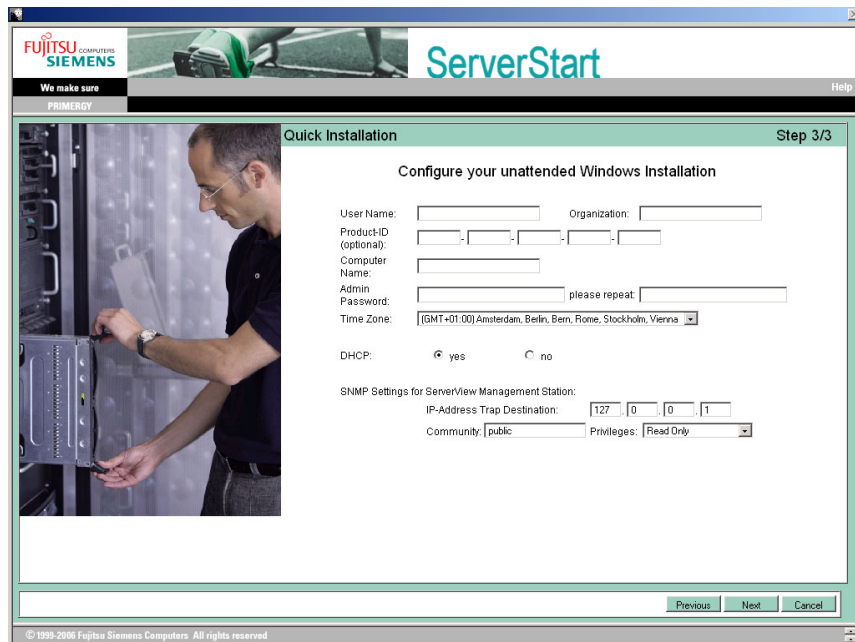
- ▶ When [Auto] is selected, the RAID is configured with the following levels, depending on the number of the installed disk units.
 - When two hard disk units are installed: RAID1
 - When three hard disk units are installed: RAID5
 - When more than three hard disk units are installed: RAID5 with hot spare function
- ▶ The configurations of the created partitions are as follows.
 - Volume label: system
 - File system: NTFS
 - Partition configuration: Boot/OS

The [Please select the OS to install] window appears.



6 Select the OS to be installed and click [Next].

The [Configure your unattended Windows Installation] window appears.



7 Set the items and click [Next].

The [Summary] window appears.

8 Confirm the settings and click [Start Installation].

9 Click [Start now].

Installation starts.

1. If a message prompts you to insert Array Controller Document & Tool CD, insert the CD/DVD and click [OK].
2. If a message prompts you to insert Service Pack CD-ROM, Insert the CD-ROM and click [OK].
3. For Window Server 2003 x64, a message prompts you to insert Startup Disk Win64 and reboot the system. Insert the CD/DVD.

 **POINT**

- ▶ When installing an OS with ServicePack2 already applied, click [Cancel]. Skip to the next step without inserting Service Pack CD-ROM.

10 When a message prompts you to insert the OS CD/DVD, insert the CD/DVD and click [OK].

For Windows Server 2003 / Windows Server 2003 x64

1. Insert the OS CD/DVD (Installation disc).
After files are copied, a message prompts you to eject the CD/DVD and floppy disk.

For Windows Server 2003 R2 / Windows Server 2003 R2 x64

1. Insert the OS CD/DVD (Installation disc) Disc 1.
After files are copied, a message prompts you to insert the Disc 2.
2. Insert the OS CD/DVD (Installation disc) Disc 2.
After files are copied, a message prompts you to eject the CD/DVD and floppy disk.

11 Eject the CD/DVD and floppy disk and click [OK].

The system is restarted.

The system continues the installation operation after restart.

Setup of OS GUI and installation of LAN utility, Service Pack, and Active Directory are performed automatically.

12 When a confirmation message to restart appears, click [Restart].

The system restarts and installs high reliability tools.

 **POINT**

- ▶ Thus the Command Prompt windows may appear and disappear during installation of ServerView, the installation process is properly proceeding.

13 Press the [Enter] key when a message notifies completion of installation.

14 Restart the system.

Click [Start] – [Shutdown]. Select [Restart] and click [OK].

The system restarts.

15 Perform the settings for the RAID management tool (ServerView RAID).

For the setting procedures, refer to the manuals in Array Controller Document & Tool CD.

- Settings of an array administrator account
The Windows user account is required when using ServerView RAID. Create a group named "raid-adm", and an account with any name for an array administrator within the group "raid-adm".
- Configuration of HDD Check Scheduler
Modify the settings of HDD Check Scheduler if necessary when using an Onboard Software RAID (Embedded MegaRAID SATA). It has been set at 12 o'clock everyday as a default setting.

The server setup and OS installation have been completed.

Refer to "Chapter 4 Operations after OS Installation" (→p.69) and perform necessary procedures before starting server operations.

3.2 Expert Mode

In the expert mode, start up Disk Manager, format the installation partition, and install the OS. Use this mode only when you want to perform installation while maintaining the existing partitions.



- ▶ Confirm that the USB floppy disk drive is connected before turning on the server power.

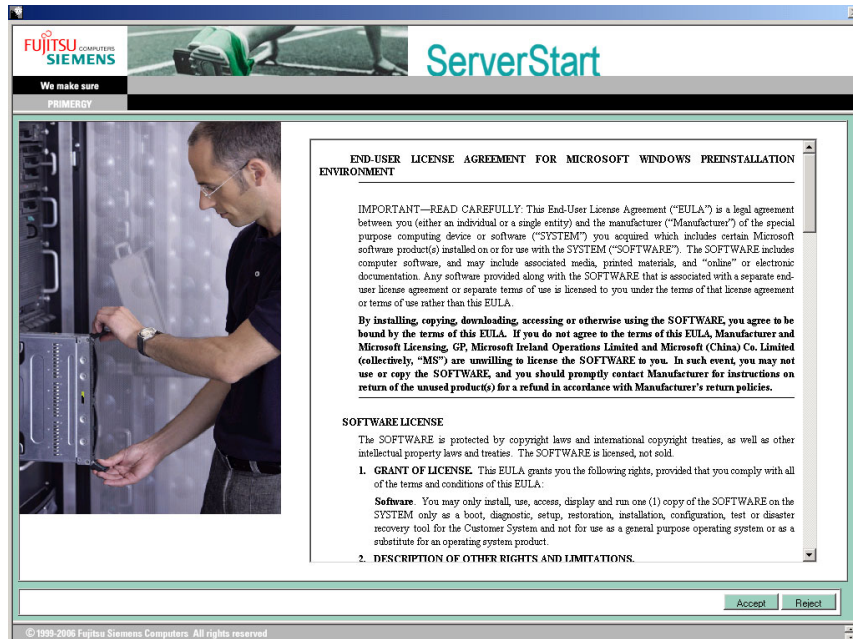
3.2.1 Starting Up the Expert Mode

Start up the expert mode.

- 1 Turn on the server and insert PRIMERGY Startup Disc immediately. ServerStart starts up. The select-media window for the configuration file appears.

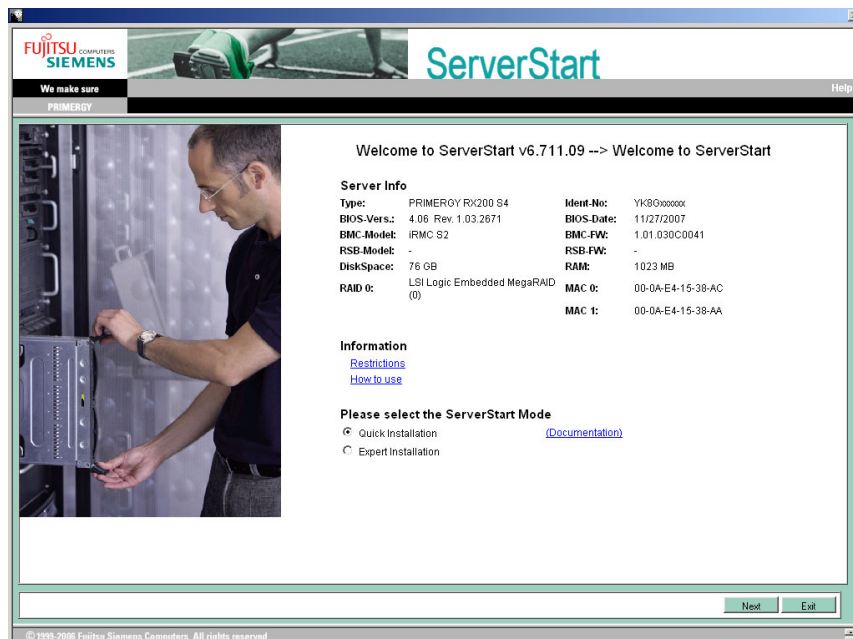
- 2** Set the ServerStart floppy disk, provided with the server, and ensure that "Removable media" and "A:" are selected. Click [Create].

The [Initialization of ServerStart core running] window appears and the ServerStart initialization process starts. Depending on hardware configuration, this process may take a few minutes. After completion, the license agreement window appears.

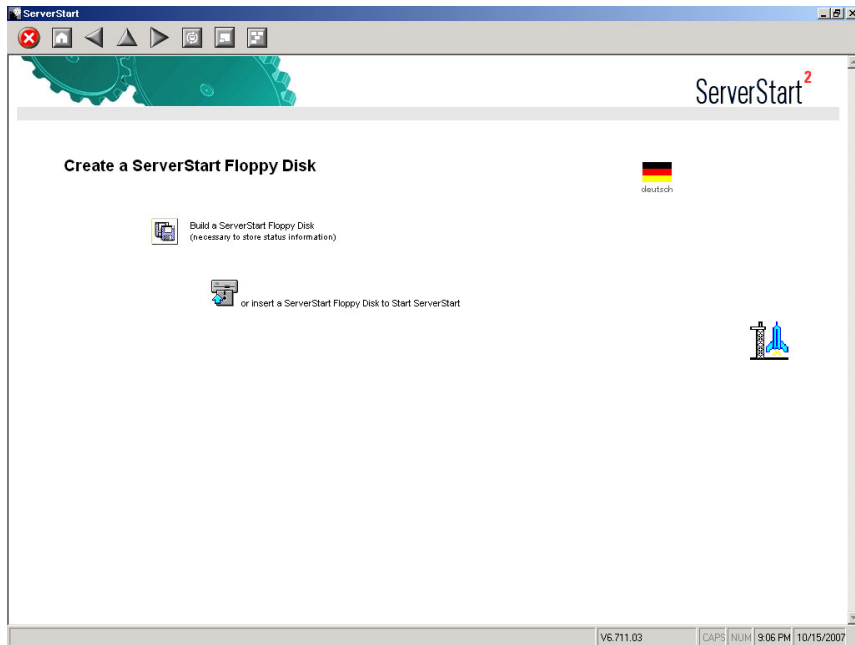


- 3** Click [Accept].

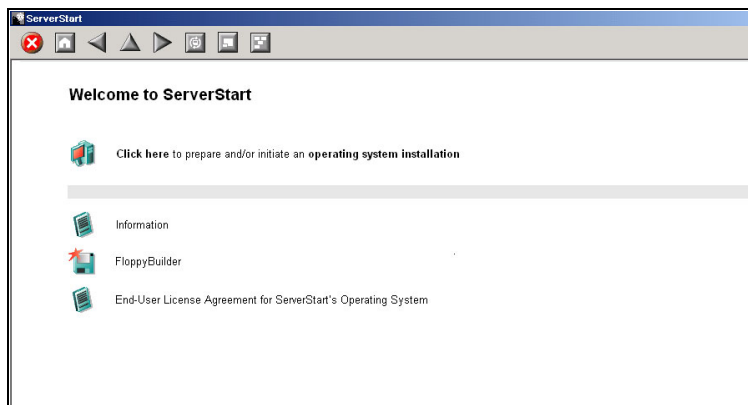
The [Welcome to ServerStart] window appears.



- 4 Select [Expert Installation] and click [Next].
The [Create a ServerStart Floppy Disk] window appears.



- 5 Click [Build a ServerStart Floppy Disk].
Creation of a ServerStart floppy disk starts. When the creation is completed, the "Floppy disk has been created." message appears.
- 6 Click [OK].
The [Please Select your Keyboard] window appears.
- 7 Select your keyboard language from the drop-down list and click [OK].
The subsequent start procedure may take several minutes.
The [Welcome to ServerStart] window appears.



- 8** Click [Click here to prepare and/or initiate an operating system installation].
The [Select the operating system to be installed] window appears.
Click [Special Hints on Operating System Installation] and observe them carefully. Important information such as limitations on configuration of hard disk units is described.
- 9** Click [MS Windows Operating Systems].
The [Microsoft Windows Operating System Installation] window appears.
- 10** Click [Install MS Windows Server 2003 or MS Small Business Server (SBS) 2003].
The [Installation of MS Windows Server 2003] window appears.
- 11** Click [Install MS (OS) interactively (expertise required)].
The expert mode starts.



Start up the configuration tools to set items. Exiting a tool returns to the display to the expert mode window.



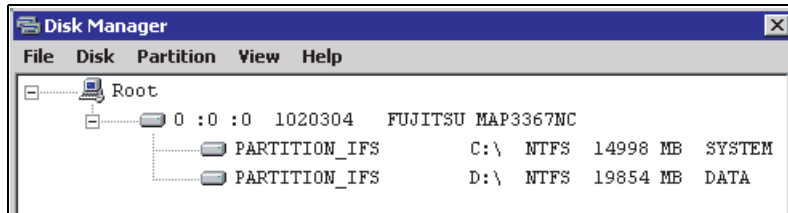
- ▶ Make sure to open the menu of each wizard and confirm the settings.

3.2.2 Disk Manager

Start up Disk Manager and format the installation partition.

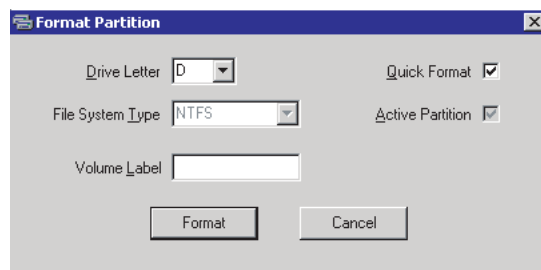
- 1 Click [Use Disk Manager to partition and format your disk drives].

Disk Manager starts up.



- 2 Format the OS installation partition. Select the OS installation partition and click the [Partition] menu – [Format].

The [Format Partition] window appears.



- ▶ Be sure to set the active partition on drive C.

- 3 Set items and click [Format].
The partition is formatted.
- 4 When the formatting is completed, click the [File] menu – [Exit].
Disk Manager closes and the display returns to the expert mode window.

3.2.3 OS Installation Wizard

Set computer information, user information, and the network protocol.

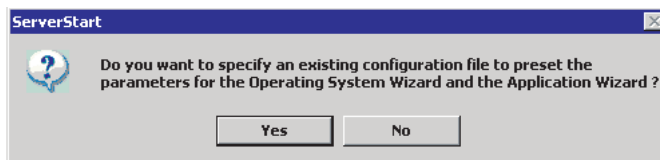
ServerStart can configure multiple network patterns. When configuring a domain controller, refer to "Using ServerStart to Configure the Network".

POINT

- ▶ The setup windows vary depending on the OS to be installed. For example, operation on Server 2003 R2 is given below. Server 2003 R2 is corresponding to your OS to be installed.

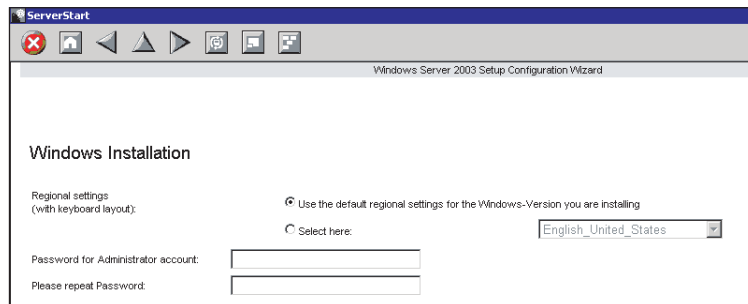
1 Click [Installation Wizard for MS Windows Server 2003].

A message prompts you to specify the configuration file.



2 Click [No].

The [Windows Installation] window appears.

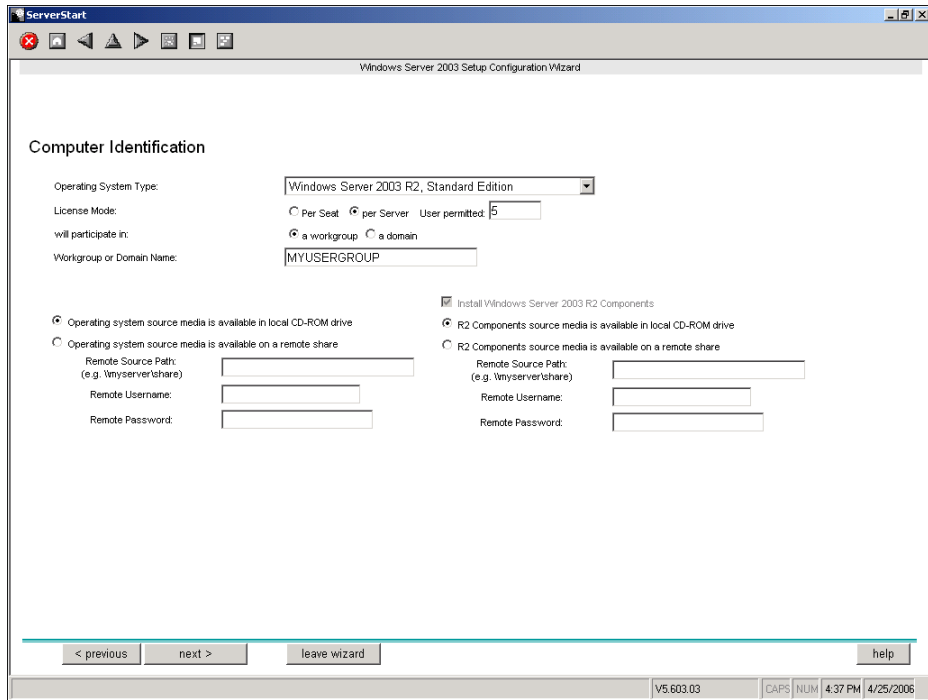


3 Enter the password in [Password for Administrator account] and [Please repeat Password] and click [Next].

POINT

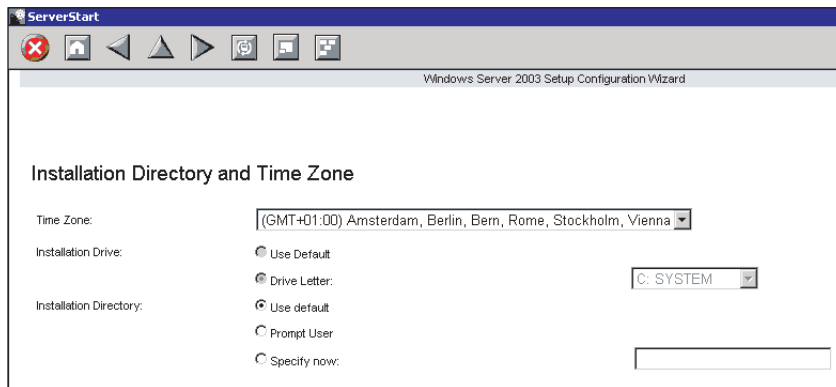
- ▶ If the passwords of [Password for Administrator account] and [Please repeat Password] are not identical, an error message occurs. Enter the password correctly.

The [Computer Identification] window appears.

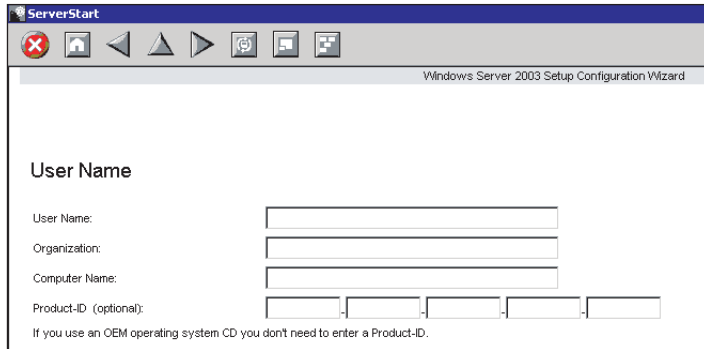


4 Set items and click [Next].

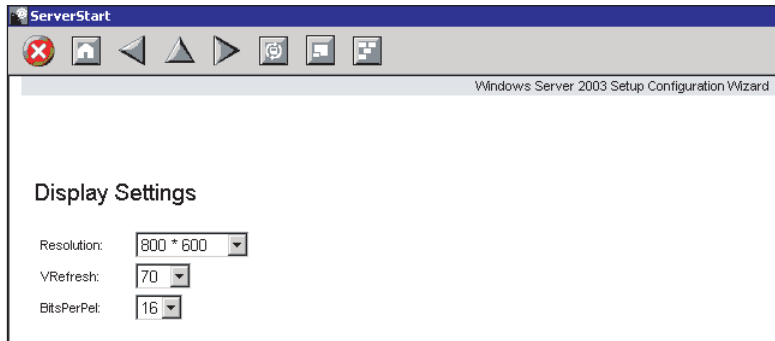
The [Installation Directory and Time Zone] window appears.



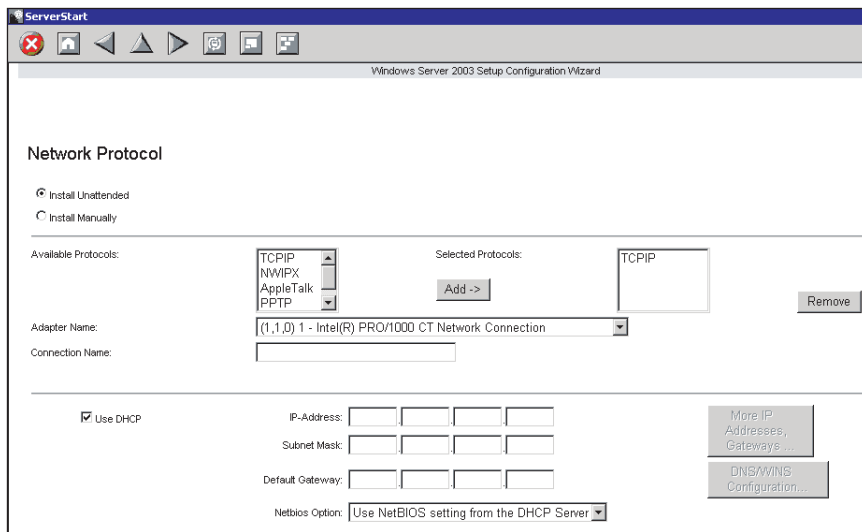
- Set items and click [Next].
The [User Name] window appears.



- Set items and click [Next].
The [Display Settings] window appears.

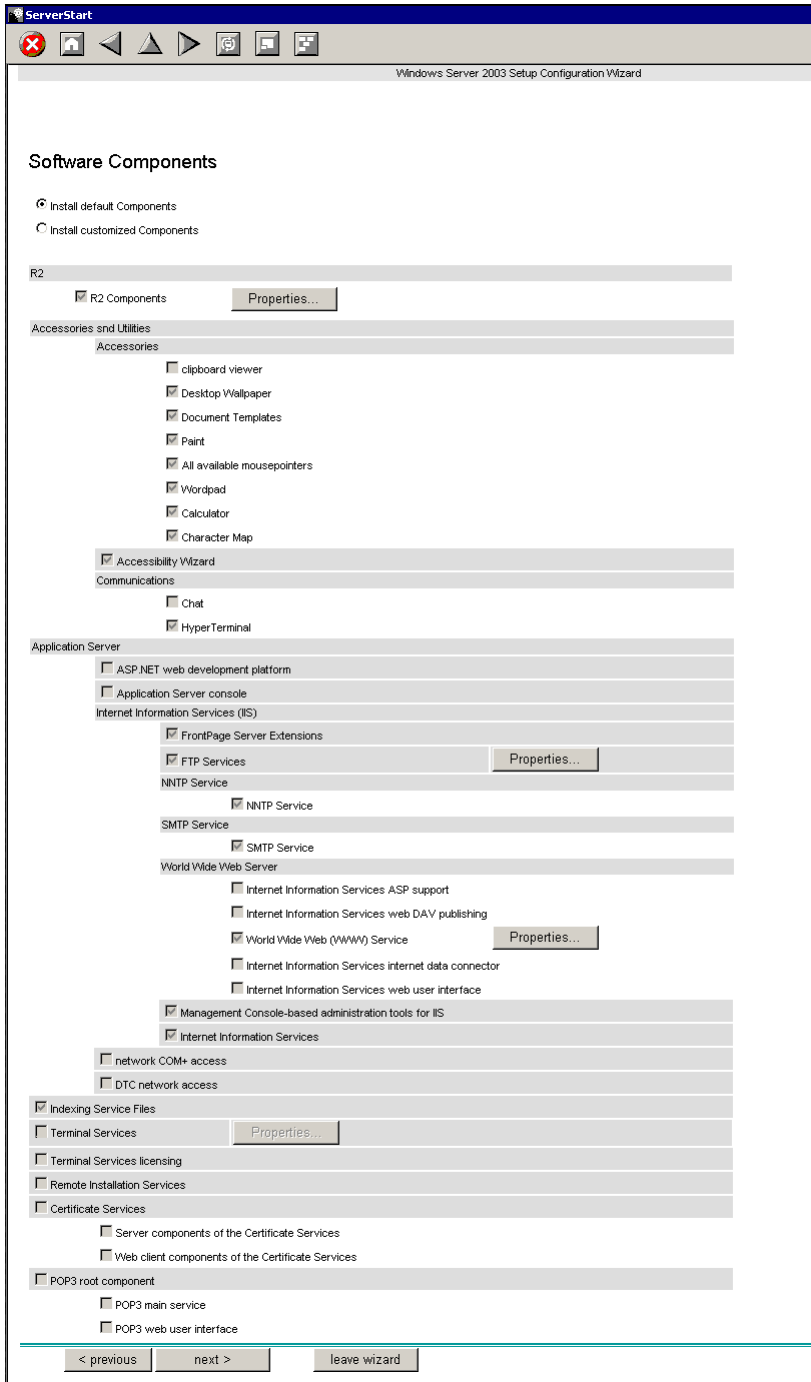


- Set items and click [Next].
The [Network Protocol] window appears.



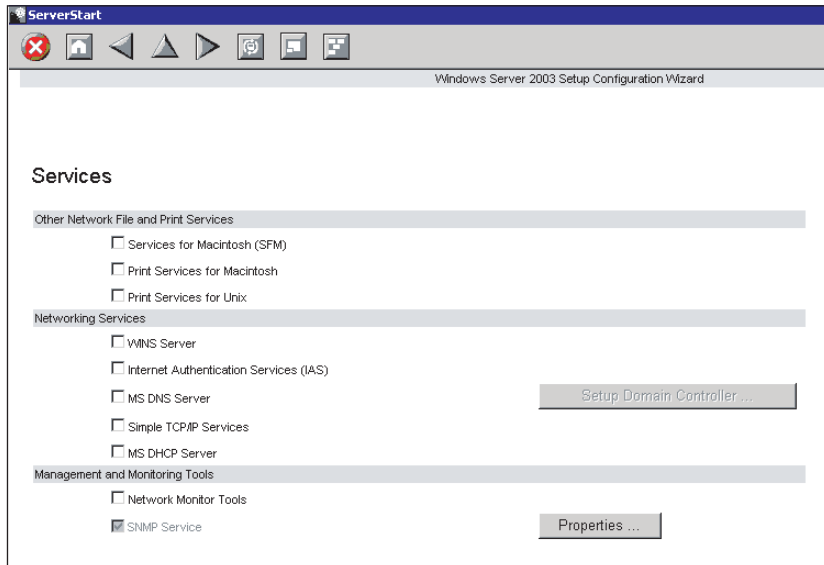
8 Set items and click [Next].

The [Software Components] window appears.



- ▶ If Windows Server 2003 R2 is selected at the Computer Identification, R2 components are always copied to the hard disk. To install the components, click [Properties] and check the box of the components to be installed.

- 9** Set items and click [Next].
The [Services] window appears.



POINT

- ▶ Simple Network Management Protocol is always installed. Click [Properties] to change the settings.

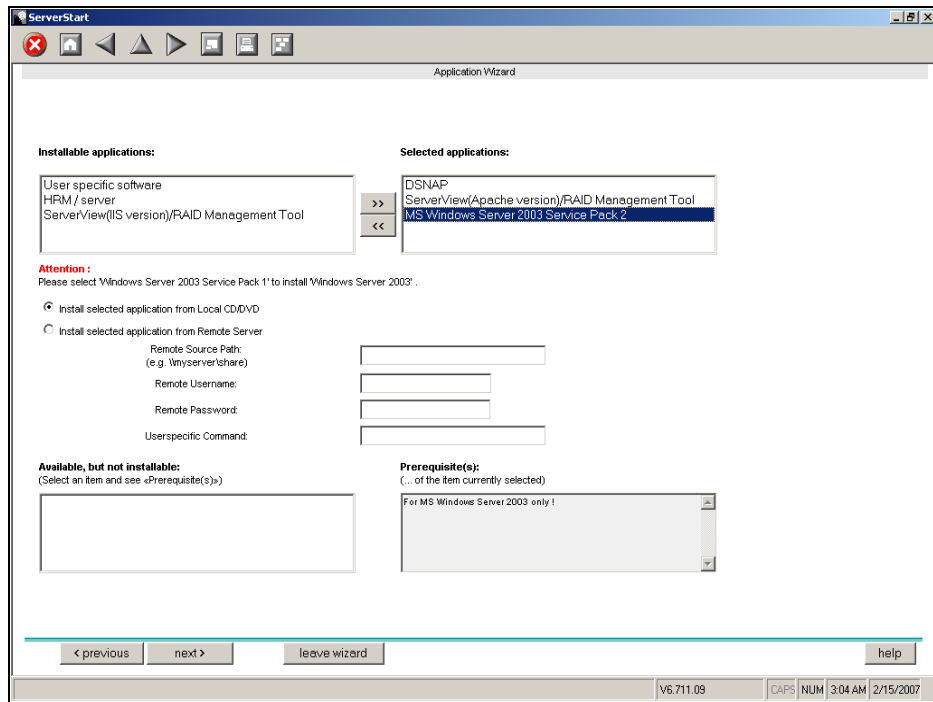
- 10** Set items and click [leave wizard].
The display returns to the expert mode window.

3.2.4 Application Wizard

Set configurations for installation of supplied applications such as high reliability tools. Open those windows and confirm the settings carefully.

1 Click [Application Wizard: Select additional software components].

The application wizard appears.



2 From the list in [Installable applications], select application software to be installed and click [>>].

Set all applications to be installed on the [Selected applications] list.

POINT

- ▶ Although the selection can be released in the expert mode, it may take a long time to restore the system when errors occur without the management tools. Be sure to install these tools.
 - DSNAP
 - Broadcom Advanced Control Suite
 - RAID Management Tool
 - ServerView (Apache)
 - ServerView (IIS)
- ▶ Only Service Pack 2 is available to perform automatic installation with ServerStart.

3 Click [leave wizard].

The application wizard closes.

3.2.5 Starting OS Installation

Install the OS to the server.



Notes on the Installation

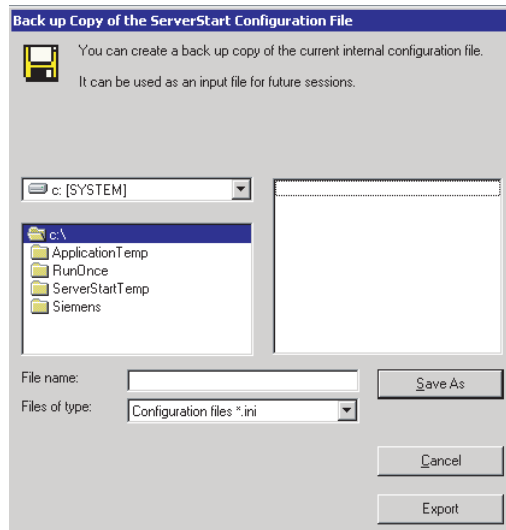
- ▶ When the installation partition is not empty, a confirmation message appears. Unless otherwise considered as problem, click [OK] to continue the installation procedure.
- ▶ If an incorrect setting (such as the CD key) is found during installation, an error window will appear. Enter the correct values in the window to continue the installation procedure. However, corrections made here are not reflected on the configuration file.

1 Click [Click here, to Start the Installation of (OS)].

A confirmation window asking whether you want to save the current settings appears.

2 Click [Yes].

The following window appears.



3 Enter the file name and click [Save As].

Installation starts automatically.

1. If a message prompts you to insert Array Controller Document & Tool CD, insert the CD-ROM and click [OK].
2. If a message prompts you to insert the Service Pack CD-ROM, insert the CD-ROM and click [OK].
3. For Window Server 2003 x64, a message prompts you to insert Startup Disk Win64 and reboot the system. Insert the CD/DVD.

- 4** When a message prompts you to insert the OS CD/DVD, insert the CD/DVD and click [OK].

For Windows Server 2003 / Windows Server 2003 x64

1. Insert the OS CD/DVD (Installation disc).

The license agreement window appears.

2. Click [I agree].

After files are copied, a message prompts you to eject the CD/DVD and floppy disk.

For Windows Server 2003 R2 / Windows Server 2003 R2 x64

1. Insert the OS CD/DVD (Installation disc) Disc 1.

The license agreement window appears.

2. Click [I agree].

After files are copied, a message prompts you to insert the Disc 2.

3. Insert the Disc 2 of OS CD/DVD (Installation disc).

After files are copied, a message prompts you to eject the CD/DVD and floppy disk.

- 5** Eject the CD/DVD and floppy disk and click [OK].

The system is restarted. The system continues the installation operation after restart.

Setup of OS GUI and installation of LAN utility, Service Pack, and Active Directory are performed automatically.

 **POINT**

- ▶ When SATA hard disk has been installed, the message appears that SATA HDD is detected. Click [OK] and proceed to the operation.

- 6** When a confirmation message to restart appears, click [Restart].

The system restarts and installs high reliability tools.

 **POINT**

- ▶ Thus the Command Prompt windows may appear and disappear during installation of ServerView, the installation process is properly proceeding.

- 7** Press the [Enter] key when a message notifies completion of installation.

- 8** Restart the system.

Click [Start] – [Shutdown]. Select [Restart] and click [OK].

The system restarts.

- 9** Perform the settings for the RAID management tool (ServerView RAID).

For the setting procedures, refer to the manuals in Array Controller Document & Tool CD.

- Settings of an array administrator account

The Windows user account is required when using ServerView RAID. Create a group named "raid-adm", and an account with any name for an array administrator within the group "raid-adm".

- Configuration of HDD Check Scheduler

Modify the settings of HDD Check Scheduler if necessary when using an Onboard Software RAID (Embedded MegaRAID SATA). It has been set at 12 o'clock everyday as a default setting.

The server setup and OS installation have been completed. Refer to "Chapter 4 Operations after OS Installation" (→p.69) and perform necessary procedures before starting server operations.

4

Chapter 4

Operations after OS Installation

This chapter explains the operations to be performed after OS installation. Be sure to perform these operations before operating the server.

4.1	Memory Dump/Paging File Setting	70
4.2	Creating a Disk for System Recovery	76
4.3	Storing the System Configuration Information	78
4.4	Creating Maintenance Tools and Driver Disks	81
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4.7	LAN Driver Advanced Setup [Intel® PROSet]	104

4.1 Memory Dump/Paging File Setting

Before starting operating this server, configure the setting for obtaining memory dump.

● Memory dump

Debugging information, when memory dump has been set, will be automatically saved in case that a STOP error (fatal system error) occurs in the system. Error causes may be apparent by analyzing the saved memory dump.

When a large-capacity memory is installed, care shall be exercised to configure the settings of the memory dump file. The settings for obtaining memory dump should be configured after installing the files to be used for operations (OS, applications, etc.).

4.1.1 How to Obtain Memory Dump

Check the following settings before starting configuration to obtain memory dump.

■ Checking hard disk free space

To obtain memory dump, sufficient hard disk capacity is required for creating paging files and memory dump files. The obtainable dump types and required hard disk capacity are as follows:

● Complete memory (full) dump (recommended)

When the system unexpectedly stops, contents of the whole system memory are recorded. The file is stored in the directory displayed in the [Dump file] box.

- Paging file: Installed physical memory + 11MB (Recommended: Installed physical memory × 1.5)
- Memory dump file: Equivalent to installed physical memory



- ▶ Complete memory dump cannot be used on the computer in which the 2GB or larger memory is installed.

● Kernel memory dump

Information of only kernel memory space is recorded. The file is stored in the directory displayed in the [Dump file] box. Capacity required for kernel memory dump is as follows:

- Paging file: Depending on installed physical memory amount
 - For memory of 256 to 1,373MB - Installed physical memory × 1.5
 - For memory of 1,374MB or more - 32-bit system: 2GB + 16MB, 64-bit system: Installed physical memory + 128MB
- Memory dump file: Depending on the kernel-mode address space being used during STOP

● Small memory dump

Minimum information to identify a problem is recorded. When this option is selected, a new file is created each time the system unexpectedly stops.

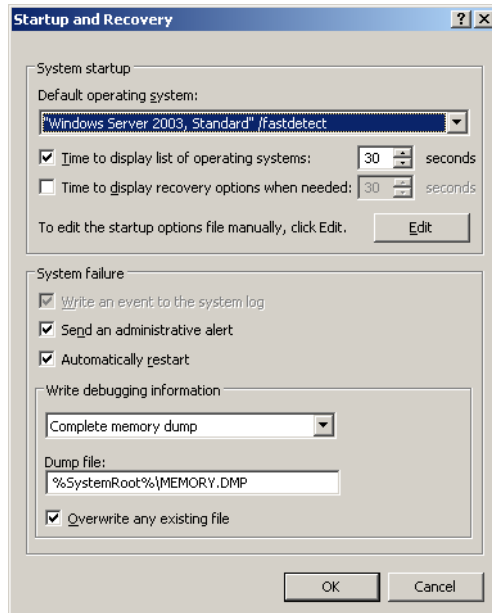
Those file histories are stored in the directory displayed in [Small dump directory].

- Paging file: Minimum 2MB
- Memory dump file: 64KB or 128KB

■ Memory dump file setting

Set up the memory dump file according to the following procedures:

- 1** Log on to the server with the administrator account.
- 2** Check free space of the drive where the memory dump file is to be stored.
Check the required free space according to "■ Checking hard disk free space" (→p.70).
If the drive has insufficient free space, refer to "■ Cannot collect the memory dump" (→p.182).
- 3** Click [Start] – [Control Panel] – [System].
The [System Properties] window appears.
- 4** Click the [Advanced] tab and click [Settings] in [Startup and Recovery].
The [Startup and Recovery] window appears.



5 Set as follows:

1. In the [Write debugging information] section, select the memory dump file type.
 - Complete memory dump (Recommended)
The whole system memory information is recorded to the memory dump file.
 - Kernel memory dump
Only kernel memory is recorded to the memory dump file.
 - Small memory dump (64KB)
Minimum information is recorded to the memory dump file.
Each time a fatal error occurs, a new file is created in the directory specified in [Small dump directory].
2. In [Dump file] or [Small dump directory], specify the directory to save the memory dump file, with its full path.
For kernel memory dump or complete memory dump, when check the box of the [Overwrite any existing file], debugging information is overwritten to the specified file every time.

6 Click [OK] to close the [Startup and Recovery] window.

7 Click [OK] to close the [System Properties] window.

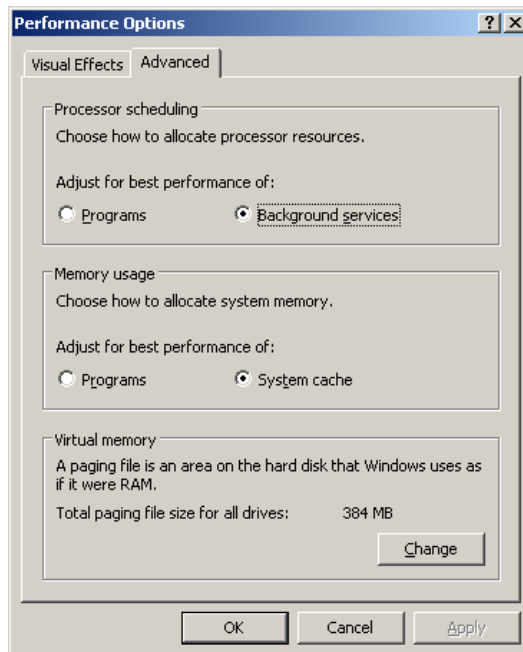
8 Restart the system.

The setting is enabled after the system restarts.

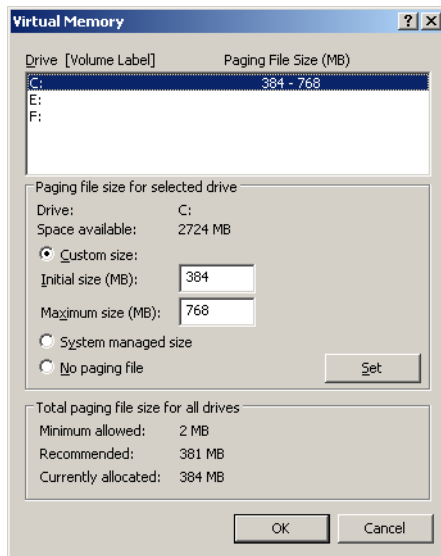
■ Paging file setting

Set up the paging file according to the following procedures:

- 1** Log on to the server with the administrator account.
- 2** Check free space of the drive where the system has been installed.
Check the required free space according to "■ Checking hard disk free space" (→p.70).
If the drive has insufficient free space, refer to "■ Cannot collect the memory dump" (→p.182).
- 3** Click [Start] – [Control Panel] – [System].
The [System Properties] window appears.
- 4** Click the [Advanced] tab and click [Settings] in [Performance].
The [Performance Options] window appears.
- 5** Click the [Advanced] tab.



- 6** Click [Change] of the [Virtual memory].
The [Virtual Memory] window appears.



- 7** Select the drive where the paging file is to be created.
In [Drive], select the drive where the system is installed.
The selected drive is displayed in [Drive] in [Paging file size for selected drive].
- 8** Select [Custom size] and enter a value in [Initial size].
The value depends on the type of the set dump file.
Set a value larger than the value shown in [Recommended] in [Total paging file size for all drives].

IMPORTANT

- ▶ When a smaller value is specified for the paging file size, performance may be affected. For maximum system efficiency, be sure to set [Initial size] with a value larger than the [Recommended] size described in [Total paging file size for all drives]. The recommended size is total memory installed in the system x 1.5. However, if a program occupies a large part of memory is regularly used, set a larger size as required.

- 9** Enter a value in [Maximum size].
Set a value larger than the [Initial size].
- 10** Save the settings.
Click [Set] in the [Paging file size for selected drive] section.
The settings are saved, and the value specified is displayed in [Paging File Size] of [Drive].
- 11** Click [OK] to close the [Virtual Memory] window.
- 12** Click [OK] to close the [Performance Options] window.
- 13** Click [OK] to close the [System Properties] window.

14 Restart the system.

The setting is enabled after the system is restarted.

■ Rebooting after OS dump setting

Rebooting may not be executed when the server fails even if rebooting has been set after obtaining dumping.

Immediate provision may be required when the server fails. However, configure the settings of rebooting with the Watchdog, when continuous operation is required. For details and configuration procedures for the software, the Watchdog, refer to "3.4 Serious Error Handling (ASR)" in "ServerView User's Guide".

4.2 Creating a Disk for System Recovery

If the installation of the OS was performed manually, create a system recovery disk.

POINT

- ▶ If the system file, system configuration or environment setting change at startup, etc., is damaged, such data can be reconstructed using the recovery information stored in the created system recovery disk.
- ▶ To create a recovery disk, prepare an unused formatted floppy disk.

4.2.1 Creating the Automated System Recovery (ASR) Set

After setting up Windows Server 2003, create a system recovery set. An unused formatted floppy disk and a media are required to store back up files.

IMPORTANT

- ▶ Confirm that the USB floppy disk drive is connected before turning on the server power.
- 1** Click [Start] – [All Programs] – [Accessories] – [System Tool] – [Backup].
The [Backup or Recovery Wizard] window appears.
 - 2** Click [Next].
The [Backup or Recovery] window appears.
 - 3** Select [Create a backup of files and settings], and then click [Next].
The [Items to Create Backups] window appears
 - 4** Select [All the information in this computer], and then click [Next].
The [Backup Type, Destination and Name of the Backup File] window appears.
 - 5** Enter a name and a destination of the backup file, and then click [Next].
The [Backup or Recovery Wizard Complete] window appears.
 - 6** Click [Finish].
Backup process starts.
 - 7** If a message prompts you to insert a floppy disk, insert the floppy disk and click [OK].
Automated system recovery disk is created.

- 8** When the process is completed, a message appears. Eject the floppy disk according to the message and put a label on it.
Label Example: "Windows Automated System Recovery Disk: Backup.bkf, Created at 12:00 04/01/2008"
- 9** Click [OK] to exit [Backup Utility].
- 10** Click [Close] to close the [Backup Progress] window.
An automated system recovery set has been created.
Store the automated system recovery set just created for sure.

4.3 Storing the System Configuration Information

Before starting operations and when changing the system configuration information, store the configuration information. By storing this information, the system can be recovered with the stored information in case of a system failure (such as when the baseboard fails). Use Server Management Tools for storing and recovering the system configuration information.



- ▶ Since the system configuration information is significant in maintaining the server, be sure to store the configuration information after the following operations:
 - When the information is changed with the BIOS Setup Utility
 - When the hardware configuration of this server is changed (e.g. memory, hard disk unit, baseboard or expansion card is added/removed or changed)
 - When the Remote Management Controller information is changed
- ▶ As the stored system configuration information will be used for maintenance operation.

■ Cautions

- Confirm that the USB floppy disk drive is connected before turning on the server power.
- When the USB floppy disk drive is connected, the device name is in the "Excluded from boot order" field of "7.2.18 Boot Menu" (→p.164) and the device cannot be booted via the USB floppy disk drive. When booting via USB floppy disk drive is required, set it again to move the device name to the "Boot priority order" field.
- "Server Management Tools" disk is exclusively for this server. Do not use it on other systems. Otherwise, the systems may be damaged.
- Only the information that is configured with the BIOS Setup Utility and the configuration information of the Remote Management Controller can be stored/recovered. However, a user account for the Remote Management Controller and the license information of the Remote Management Controller Upgrade Kit cannot be stored.
- Make sure to perform this operation only when the server is started with the "Server Management Tools" disk. Do not run Server Management Tools on the server started from the hard disk or by the other floppy disk. Otherwise, the system may be damaged.
- Do not eject a floppy disk while the floppy disk access LED is on. Such an action may lead not only to corruption of the floppy disk data but also an unstable state of the system.
- If an error message appears while running Server Management Tools, respond to the message according to "■ Server management tools error messages" (→p.177).

4.3.1 Storing the BIOS Information and the Remote Management Controller Information

Store the BIOS information and the Remote Management Controller information according to the following procedures.



- ▶ Confirm that the USB floppy disk drive is connected before turning on the server power.
- ▶ Before starting the operation, if the "OS Boot Monitoring" function of ServerView is enabled, disable it (it is disabled by default). If you start up the system while the "OS Boot Monitoring" function remains effective, the operation of the server may become unpredictable at such times as an abrupt power interruption or restart.

If it is necessary to operate the server with the "OS Boot Monitoring" function enabled, enable the function after storing the BIOS/Remote Management Controller information. For details of ServerView, refer to "ServerView User's Guide".

- 1** Insert the "Server Management Tools" disk into the floppy disk drive and turn on the server.

The window for selecting a keyboard appears.

```
Please select:
 1 = JP Keyboard
 2 = US Keyboard
Your selection
```

- 2** Select a keyboard.

Select [1] for Japanese keyboard or select [2] for English keyboard. Japanese keyboard is selected by default.

- 3** When the DOS Prompt window appears, enter the following command and press the [Enter] key.

```
A:\SMT>bbssave.bat
```

- 4** If the BIOS information or the Remote Management Controller information is stored successfully, the following message appears.

```
Success !
```

- 5** Confirm that the stored information files are created.

Enter the following command to display the stored information files which are created.

```
A:\SMT>dir
```

The BIOS information has been stored. The server can now be turned off safely.

4.3.2 Recovering the BIOS / Remote Management Information

If the information configured with the BIOS Setup Utility was deleted due to a drain of the built-in server battery, etc., restore the BIOS information according to the following procedures.

IMPORTANT

- ▶ Confirm that the USB floppy disk drive is connected before turning on the server power.
- ▶ Do not turn off the server while a program is running.
- ▶ Before starting up the system, check that the "OS Boot Monitoring" function of ServerView is disabled (it is disabled by default).

If you start up the system while the "OS Boot Monitoring" function remains effective, the operation of the server may become unpredictable at such times as an abrupt power interruption or restart. If the server is operated with the "OS Boot Monitoring" function enabled, enable the function again before resuming operation. For details of ServerView, refer to "ServerView User's Guide".

- 1** Insert the "Server Management Tools" disk into the floppy disk drive and turn on the server.

The window for selecting a keyboard appears.

```
Please select:
 1 = JP Keyboard
 2 = US Keyboard
Your selection
```

- 2** Select a keyboard.

Select [1] for Japanese keyboard or select [2] for English keyboard. Japanese keyboard is selected by default.

- 3** When the DOS Prompt window appears, confirm that the BIOS stored information files are in the floppy disk.

Enter the following command to confirm that the stored information files are in the floppy disk.

```
A:\SMT>dir
```

- 4** Enter the following command and press the [Enter] key.

```
A:\SMT>biosrestbat
```

- 5** If the BIOS information is restored correctly, the following message appears.

```
Success !
```

- 6** The BIOS information will be enabled after the next system restart. Restart the server.

Perform Step 1 to display the DOS Prompt window. The restoration procedure has been completed. The server can now be turned off safely.

4.4 Creating Maintenance Tools and Driver Disks

This section explains how to create the server maintenance tools and driver disks with FloppyBuilder function of ServerStart.

With FloppyBuilder function of ServerStart, you can create the following tools:

- "Server Management Tools" disk
- DOS Diskette

FloppyBuilder can be used under environments such as:

- The ServerStart system started on a client computer (recommended)
- The ServerStart system started from PRIMERGY Startup Disc on the server

IMPORTANT

- ▶ Confirm that the USB floppy disk drive is connected before turning on the server power.

POINT

- ▶ When creating the tools on a client computer, it is necessary to install ServerStart on the client computer beforehand.
If ServerStart of a different version is installed on the computer, make sure to uninstall the ServerStart. Then perform installation again.
For details on how to uninstall ServerStart, refer to "■ Uninstalling ServerStart" (→p.83).

4.4.1 Installing ServerStart

Install ServerStart on a client computer when creating a drive disk using FloppyBuilder function.

● System requirements for client computers

Client computers must satisfy the following requirements.

Hardware	Personal computers operated with Windows Vista, Windows XP Professional, or Windows 2000 Professional (A DVD drive and minimum 10MB free disk space are required.)
Software	Microsoft® Internet Explorer 5.5 or later

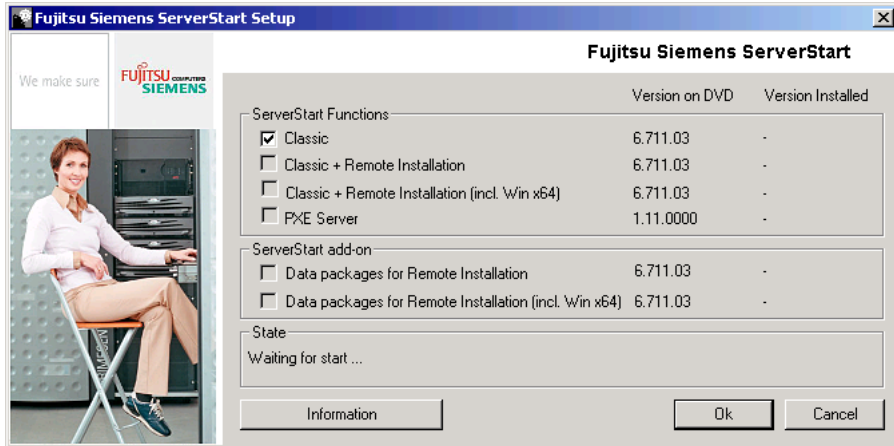
POINT

Using ServerStart on the server

- ▶ ServerStart can be installed in the server, Windows Server 2003 employed. Install ServerStart in accordance with this chapter.
Note that ServerStart is not available to the server where Windows Server 2003 x64 is installed.

1 Insert the PRIMERGY Startup Disc into the client computer.
The [PRIMERGY Startup Disc] window appears.

2 Click [ServerStart V6.711].
[Fujitsu Siemens ServerStart] window appears.



POINT

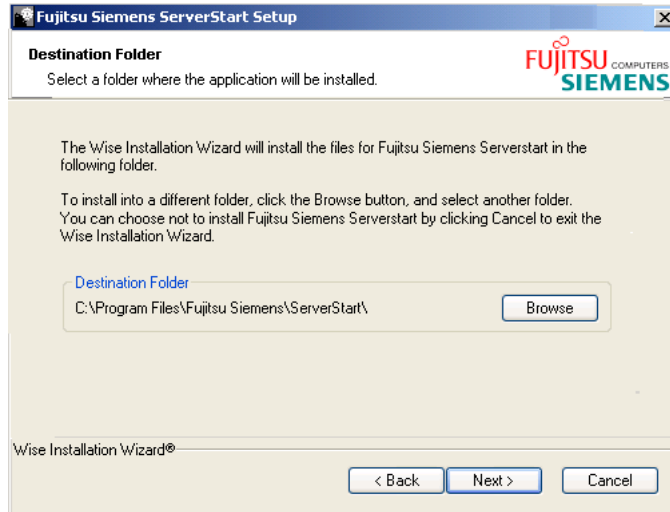
- ▶ The message "Do you want to run or save this file?" may appear depending the OS in use. Follow as below.
 1. Click [Run].
A message appears that "The publisher could not be verified. Are you sure you want to run this software?"
 2. Click [Run].
Execute "SeStSetup.exe" in the disk when [Fujitsu ServerStart Setup] window is not displayed.

3 Check the checkbox of [Classic] only and click [OK].
The Setup window appears.

4 Click [Next].
The [License Agreement] window appears.

5 Select [I accept the license agreement] and click [Next].
The [User Information] window appears.

- 6** Enter the user information of the software and click [Next].
The [Destination Folder] window appears.



- 7** Specify the installation folder and click [Next]. To change the installation folder, click [Browse] and select the folder.

The [Ready to Install the Application] window appears.

- 8** Click [Next].

Installation is executed.

POINT

- ▶ If a message prompts you to restart the system before or after installation, eject the disc and restart the system according to the message. When the system restarts, insert PRIMERGY Startup Disc and start installation again.
If the "This program does not respond." message appears during restart operation, click [Exit] to continue the restart operation.

When the installation is completed, the completion window appears.

- 9** Click [Exit].

ServerStart has been installed to the client computer.

■ Uninstalling ServerStart

Uninstall ServerStart on the client computer according to the following procedure when necessary.

- 1** Click [Start] – [All Programs] – [Fujitsu Siemens ServerStart] – [Uninstall ServerStart].

- 2** Click [OK].

When the uninstallation is executed successfully, ServerStart is deleted.

4.4.2 Startup Method for FloppyBuilder

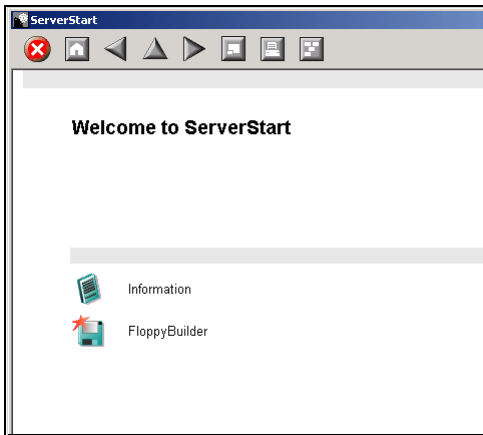
Start up ServerStart and FloppyBuilder. Startup methods vary depending on the cases of creating on a client server, or the server.

- **For creation on a client computer**

- 1** Set the PRIMERGY Startup Disc to the client computer.
Once "PRIMERGY Startup Disc" window appears, exit the window.

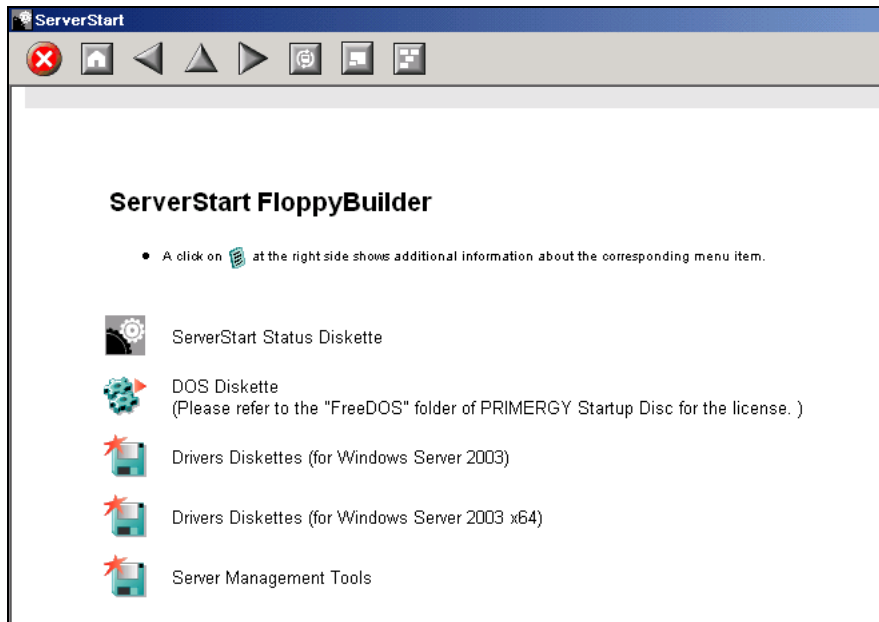
- 2** Click [Start] – [All Programs] – [Fujitsu Siemens ServerStart] – [ServerStart (Start from DVD)].

ServerStart starts up and the [Welcome to ServerStart] window appears.



3 Click [FloppyBuilder].

The [ServerStart FloppyBuilder] window appears.



- **For creation on the server**

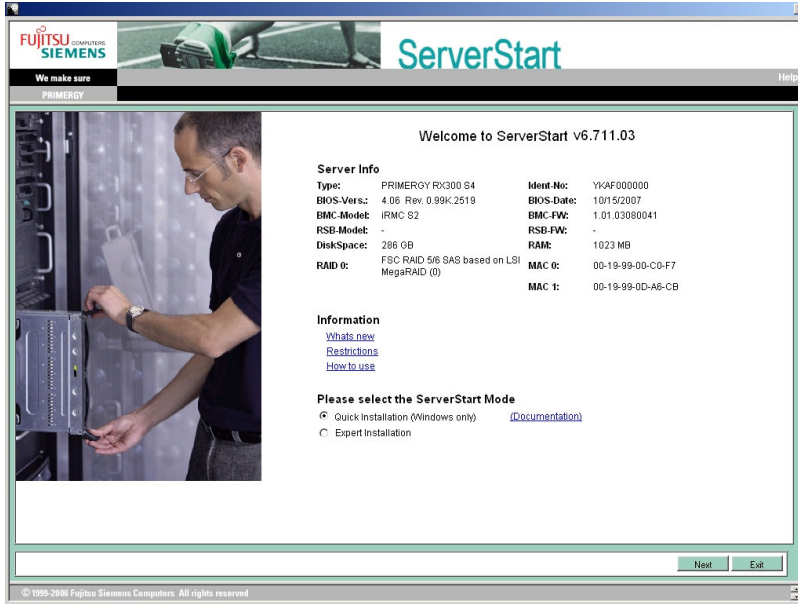
1 Turn on the power of the server and set PRIMERGY Startup Disc. ServerStart starts up and select media window for the configuration file appears.

2 Select [RAM Disk] and click [Next].

The [Initialization of ServerStart core running] window appears and the initialization operation launches. In some cases, initialization operation may take a few minutes, depending on hardware configuration. After completion, the license agreement window appears.

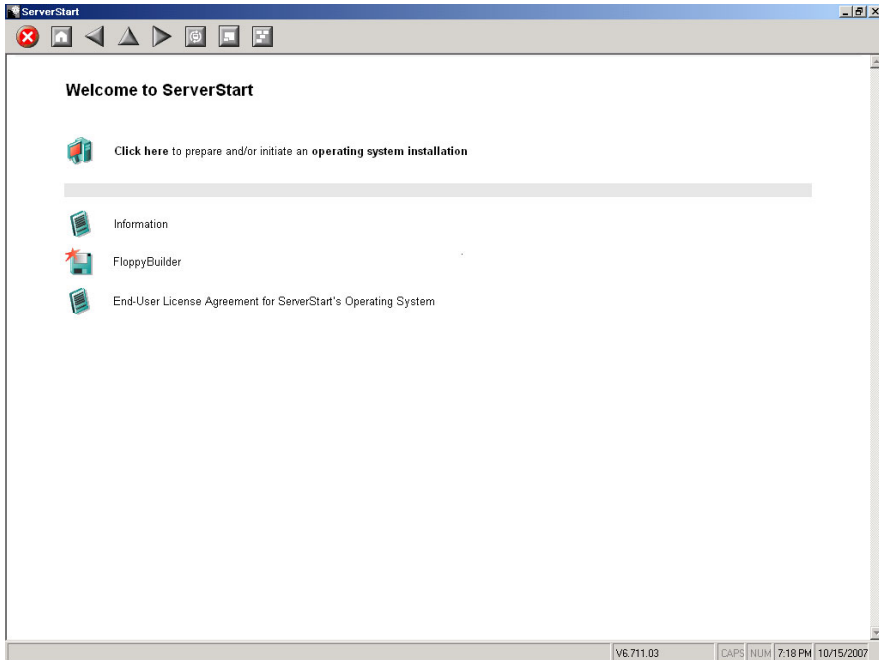
3 Click [Accept].

The [Welcome to ServerStart] window appears.



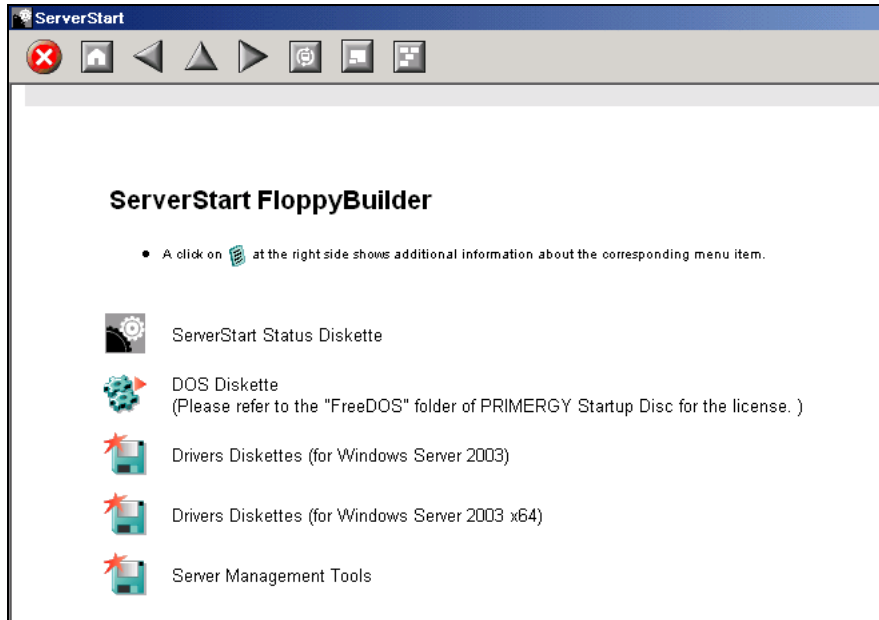
4 Select [Expert Installation] and click [Next].

The [Welcome to ServerStart] window appears.



5 Click [FloppyBuilder].

The [ServerStart FloppyBuilder] window appears.



4.4.3 Creating "Server Management Tools" Disk

Start up ServerStart and confirm that the FloppyBuilder window is displayed.

- 1** Click [Server Management Tools].
- 2** Click the tool to be created.
Insert the prepared floppy disk by following the message.
- 3** Perform the subsequent operations according to the messages on the window.
The floppy disk will be formatted automatically and file copying will start.
The respective tools will be created automatically. When a message appears indicating that the disk is created, click [OK] and eject the disk.
- 4** Fill the following items on the label of the floppy disk.
 - The model of the server
 - Version and Level of the Server Management Tools
 - Date of the floppy disk created

4.4.4 Creating Driver Disks

Obtain floppy disks as many as the drivers to be created before taking the procedures below.

Start up ServerStart and confirm that the FloppyBuilder window is displayed.

- 1** Click [Drivers Diskettes (for Windows Server 2003 / R2)] or [Drivers Diskettes (for Windows Server 2003x64 / R2 x64)], according to the installed OS.
The [FloppyBuilder Driver Disk] window appears.
- 2** Click the type of the driver to be created.
- 3** Click the driver disk to be created.
Follow the message and insert a floppy disk.
- 4** Perform the subsequent operations according to the messages on the windows.
The floppy disk will be formatted automatically and file copying will start.
The driver disk is automatically created. When a message appears indicating that creating the disk is completed, click [OK] and eject the floppy disk.

4.4.5 Creating a DOS Diskette

For DOS data stored into the floppy disk, refer to the file in the following folder of the PRIMERGY Startup Disc.

[CD/DVD drive]:\FreeDOS

To create a DOS diskette, prepare an unused floppy disk.

Start up ServerStart and confirm that the FloppyBuilder window is displayed.

- 1** Start up ServerStart and Click [FloppyBuilder].
- 2** Click [DOS Diskette].
- 3** Perform the subsequent operations according to the messages on the window.
The floppy disk will be formatted automatically and file copying will start.
The DOS diskette will be created automatically. When a message appears indicating that the disk is created, click [OK] and eject the disk.

4.5 Notes before Operating the Server

This section explains the settings required before starting to operate the server. For details on the settings, refer to the following URL.

<http://www.microsoft.com/technet/prodtechnol/exchange/2003/Library/default.mspx>

POINT

- ▶ For the settings of the installed application software supplied with the server, refer to the manuals of each of them.

IMPORTANT

- ▶ For notes on the ServerView security, refer to "●Security" in "1.1.7 Note" in the "ServerView User's Guide".

4.5.1 Auto-run Function from CD/DVD Drives

Perform the following procedures to change the settings of the auto-run function from the CD/DVD drives after server installation:

- 1** Make the registry editable, and change the value of AutoRun of the following registry key:
 HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\CDRom
 Set the value of AutoRun to "1" to enable auto-run, or to "0" to disable auto-run.
- 2** Restart the system.
 The setting is enabled after the system restarts.

4.5.2 Drive Letter Assignment in the Expert Mode

In the expert mode, assignment of a drive letter to a particular partition arbitrarily is not available. Drive letters specified on Disk Manager in the expert mode will be sequentially assigned from the first partition with "C, D, E..." when installation is completed, and an unused drive letter will be assigned to the CD/DVD drive. When change the drive letter, perform the following procedures after installation.

IMPORTANT

- ▶ The drive letters for the system and boot drive is not changeable.

- 1** Click [Start] – [Administrative Tools] – [Computer Management].
- 2** Click [Disk Management].

- 3** Right-click the partition to change the letter and click [Change Drive Letter and Path].
The [Change Drive Letter and Path] window appears.
- 4** Click [Edit].
The [Change Drive Letter or Path] window appears.
- 5** Change the drive letter.

4.5.3 Notes on Advanced Uninterruptible Power Supply (UPS)

Note the following cautions when using an advanced uninterruptible power supply (referred to as UPS herein).

■ UPS shutdown time setting

Set a sufficient time interval of UPS power-off time (time from the shutdown command to the actual power-off). If the interval is not adequate, the power will cut off before system shutdown. It may cause data collapse. For details, refer to the manuals of UPS and the UPS management software.

■ Power supply control by UPS

Change the BIOS settings to turn on the server automatically at power recovery or during scheduled operation using the UPS management software (PowerChute Network Shutdown and PowerChute Business Edition).

- 1** Start the BIOS Setup Utility.
→"7.2.1 Starting and Exiting the BIOS Setup Utility" (p.143)
- 2** Select the Power menu, and set [Power Failure Recovery] to [Always On].
- 3** Save the changes and exit the BIOS Setup Utility.

4.5.4 Turning the Power On via a LAN

You can turn the power on the server from a client (via a LAN) by utilizing the Wakeup on LAN (WOL) function.

IMPORTANT

- ▶ Be sure to install ServerView to control the power supply via a LAN.

POINT

- ▶ When the power cable is disconnected from the server or the server is powered off due to power interruption, restart the server. Unless otherwise, the WOL function will be disabled.
- ▶ Only the onboard LAN is available to correspond to the WOL function for this server. To control power supply via a LAN, connect the onboard LAN and set the onboard LAN adapter bind to "1" for sure.

■ BIOS Setup Utility setting

When perform power management via a LAN, set [Enabled] in the [LAN] item of the "7.2.11 Power Menu" (→p.157) in the BIOS Setup Utility. The [Enabled] in the [LAN] has been set as the initial setting.

4.5.5 Other Notes on Operation

■ Unnecessary files

After OS installation is completed, folders named Runonce and Runonce 2 may be left in the drive where the OS has been installed. Delete these folders since those are not necessary for the system operation.

■ Automated system operation

When perform automated system operation, enhancement of the safety operation with this server against unexpected accidents is necessary, employing such measures as introducing disaster-prevention provisions and stationing responsible for disaster prevention (such as a security guard or janitor) in the building.

■ Unintentional power-off prevention

It is recommended to employ a dedicated power supply device (such as a power distribution board) to prevent accidental power shut-offs.

4.6 LAN Driver Advanced Setup [BACS]

BACS is an integrated GUI application consisting of programs such as Broadcom Advanced Server Program (BASP) that provides load balancing features, etc., by teaming up multiple adapters.

BACS is used in the following situations:

- When using the teaming (load balance) function between onboard LANs.
- When setting up a VLAN using the onboard LAN
- When performing advanced setup of the onboard LAN

POINT

Use of Intel® PROSet

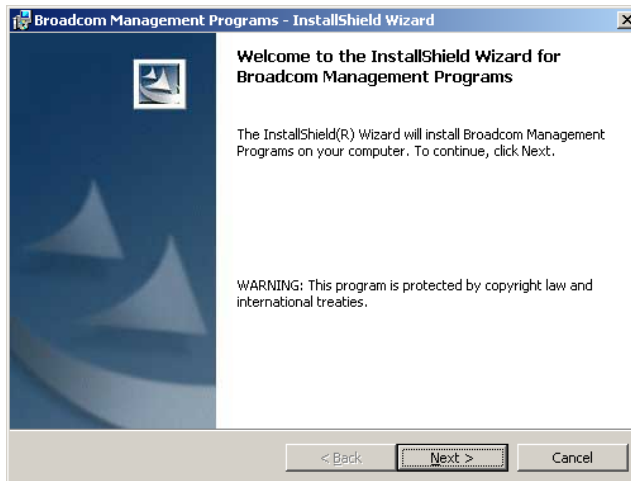
- ▶ Use Intel® PROSet (→p.104) to perform the following advanced setup of a LAN card:
 - When performing the teaming function between a LAN card and the onboard LAN
 - When performing the teaming function between LAN cards
 - When setting up a VLAN using a LAN card
 - When performing advanced setup of a LAN card

4.6.1 BACS Installation

If [Broadcom Control Suite 2] is not displayed in the [Control Panel], install BACS according to the following installation procedures:

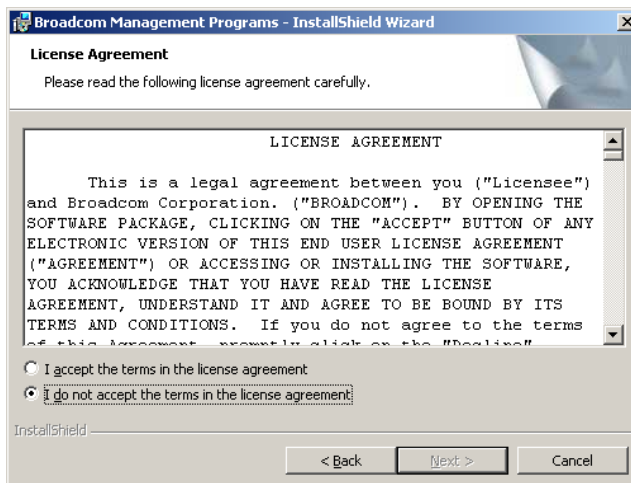
■ For Windows Server 2003 x64

- 1 Execute the following EXE contained in the PRIMERGY Startup Disc.
[CD/DVD drive]:\PROGRAMS\General\Broadcom\MgmtAppsx64\setup.exe
The installer starts up.

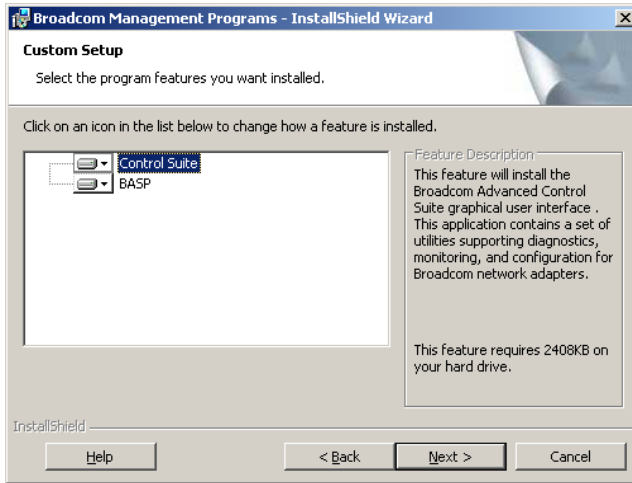


- 2 Click [Next].

License agreement window appears.



- 3 Click [I accept the terms in the license agreement] and click [Next]. Custom Setup window appears.



- 4 Click [Next]. After this, proceed with the installation by following the window instructions.

■ For Windows Server 2003

POINT

- ▶ If the OS is installed using ServerStart, "BACS" is already installed with the driver.

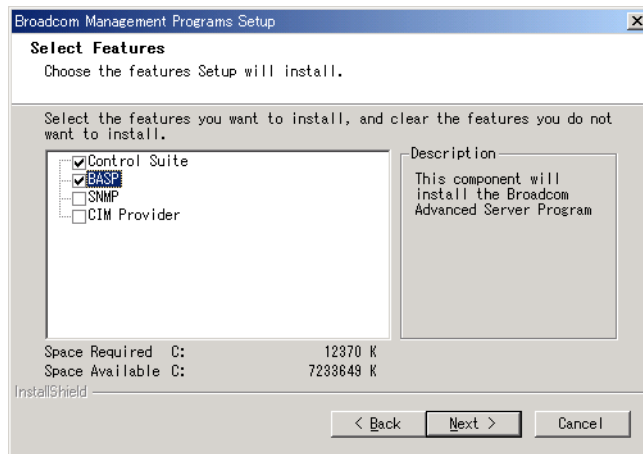
1 Execute the following EXE contained in the PRIMERGY Startup Disc.

[CD/DVD drive]:\PROGRAMS\General\Broadcom\MgmtApps\setup.exe

The installer starts up.

2 Proceed with the installation by following the window instructions.

When the window below appears during the installation procedure, check [BASP] and click [Next].



4.6.2 Load Balance

■ Teaming types

Teaming has the following types.

● Smart Load Balancing™ and Failover or SLB (Auto-Fallback Disable)

Each port can be set for Load Balance Member or Standby Member. Normally, Load Balance Member transmits and receives data and Standby Member is a standby port. Since Load Balance Member has Standby Member functions, all ports can be set for Load Balance Member.

Switch settings are not necessary in this mode. However, all Load Balance Members must be connected to the same switch.

● Generic Trunking (FEC/GEC)/802.3ad-Draft Static

A team can be connected to a Cisco FEC/GEC compliant switch or a switch that supports IEEE802.3ad-Draft Static. In this mode, all team members become Load Balance Member.

■ Notes

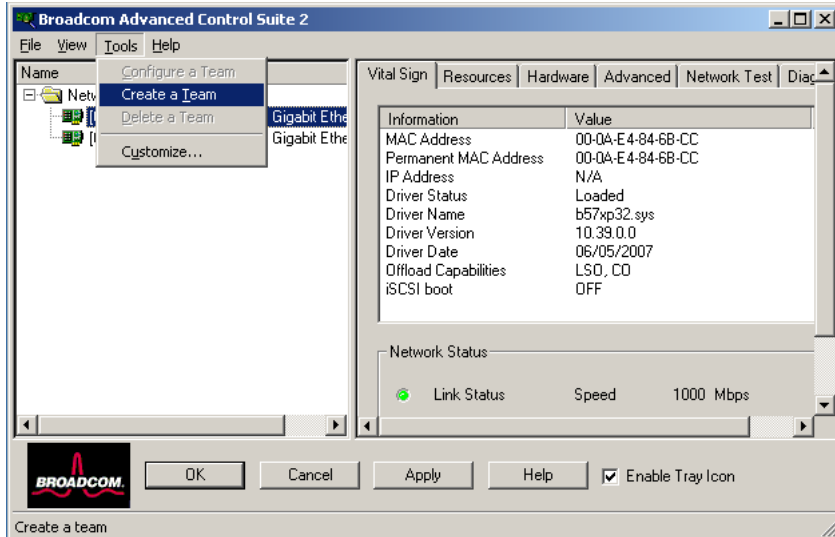
- Once a Windows Server 2003 Team is created, virtual adapters (BASP Virtual Adapter) will be created in the [Device Manager] and [Network and Dial-up Connections] of the system. Do not disable or delete a virtual adapter from the [Device Manager] or [Network and Dial-up Connections]. When deleting a virtual adapter, make sure to use BACS.
- When using teaming, only use IP protocols.
- When using teaming, Windows Load Balancing Server (WLBS) and Network Load Balancing (NLB) cannot be used.
- When an onboard LAN is used with RemoteControlService, the onboard LAN cannot be incorporated into a team. If the onboard LAN where remote control is set by RemoteControlService is incorporated into a team, remote control of RemoteControlService is not performed correctly. For remote control by RemoteControlService, refer to "ServerView User's Guide".

IMPORTANT

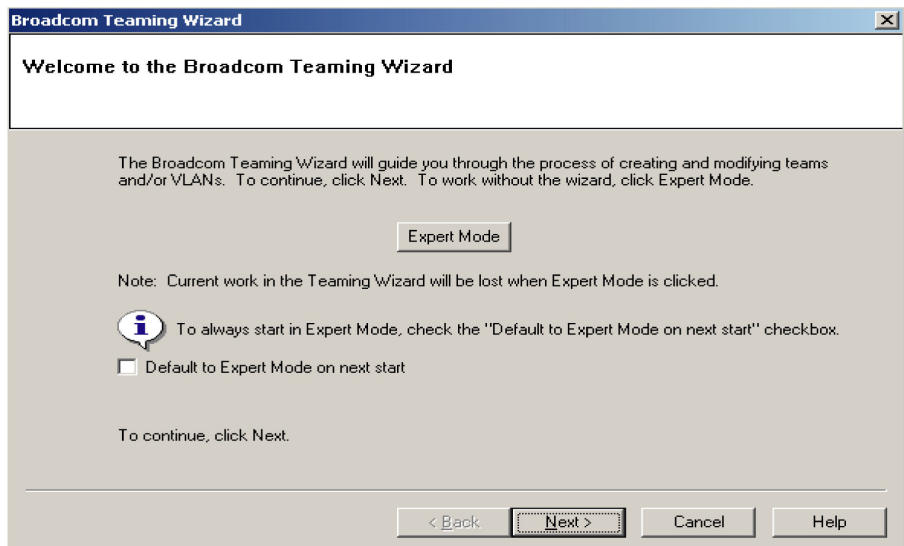
- ▶ Only a link down error between an onboard LAN and the switch it connects with, and the equivalent errors lead to switching of the route. Therefore, if only the switch or onboard LAN is partially damaged and the route being used is normal at the link level, the route will not be switched in the team, and the communication using team may become an error.

■ Load balance setup procedure

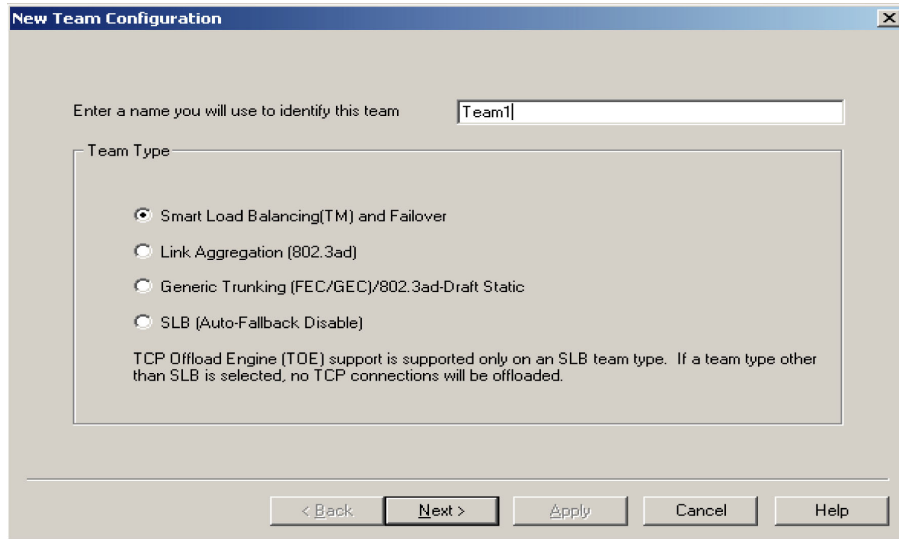
- 1 Click [Start] – [Control Panel] – [Broadcom Control Suite 2] to start BACS.
- 2 Click [Create a Team] in the [Tools] menu.



- 3 Click [Expert Mode] in the [Welcome to the Broadcom Teaming Wizard] window.

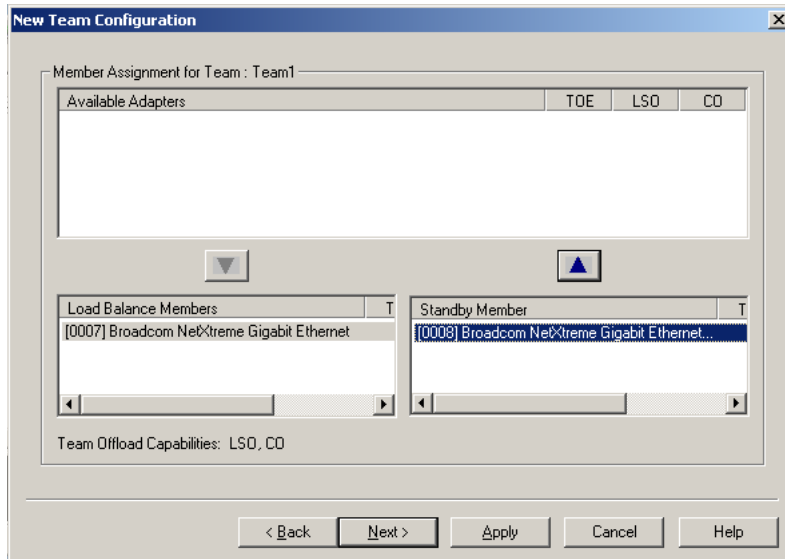


- Specify a team name and select [Team Type] in the [New Team Configuration] window.



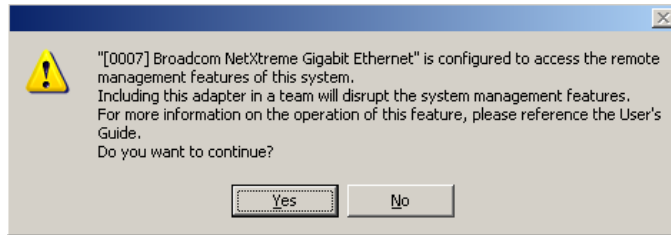
- Do not select [Link Aggregation(802.3ad)] for the [Team Type].

- Select an adapter to be added to the created team from [Available Adapters], click the [▼] and [▲] buttons, and move the adapter to [Load Balance Members] or [Standby Member].



POINT

- ▶ When incorporating the onboard LAN into a team, the following message may appear. When the onboard LAN is not being used for RemoteControlService, click [Yes] to proceed the procedure.



6 Click [Apply] to apply the settings.

A window showing that the network is temporarily disconnected is displayed, click [Yes].

When continuing to VLAN settings, go to "4.6.3 VLAN" (→p.99).

4.6.3 VLAN

■ Notes

When using a VLAN, note the following points.

- Up to four VLANs whose "NetBIOS over TCP/IP" is enabled in the whole system.
- Only ten or less VLANs can be set to a LAN port.
- When adding or deleting a VLAN, always use "Intel(R) PROSet". Do not disable or delete a VLAN from the [Device Manager] or [Network and Dial-up Connections].
- On a VLAN, only use IP protocols.



When LLC and the LNDFC protocols are installed by the Fujitsu communication control service, these protocols are bound (connected) unconditionally. Therefore, release the bind of VLAN and these protocols in the system where these protocols and VLAN are installed at the same time.

■ VLAN setting procedure

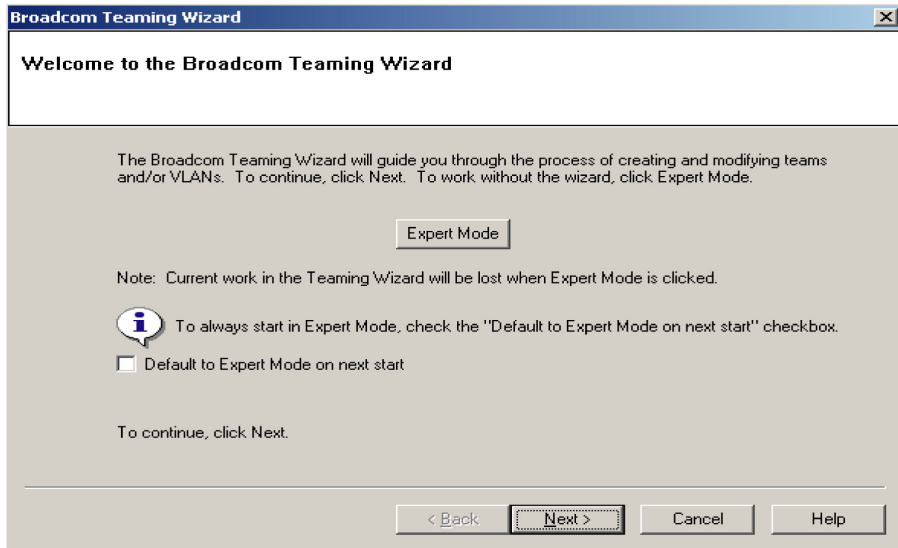
1 Click [Start] – [Control Panel] – [Broadcom Control Suite 2] to start BACS.

2 Right-click a LAN adapter or the Team name of a Teamed Up adapter, and click [Create a VLAN] or [Add VLAN] from the displayed menu.

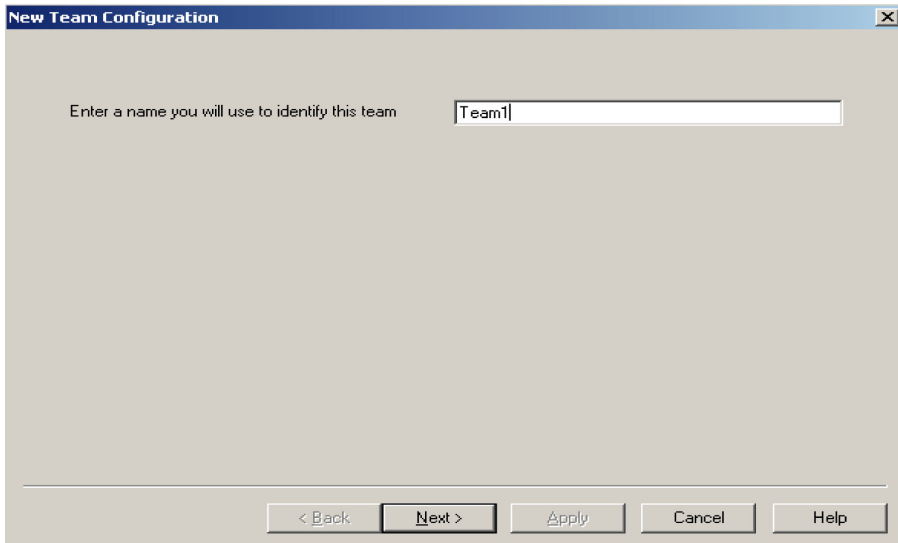
POINT

- ▶ A LAN adapter is displayed with a  mark.
- ▶ The Team name of a Teamed Up adapter is displayed with a  mark.

- 3 Click [Expert Mode] in the [Welcome to the Broadcom Teaming Wizard] window.



- 4 Specify a team name in the [New Team Configuration] window.



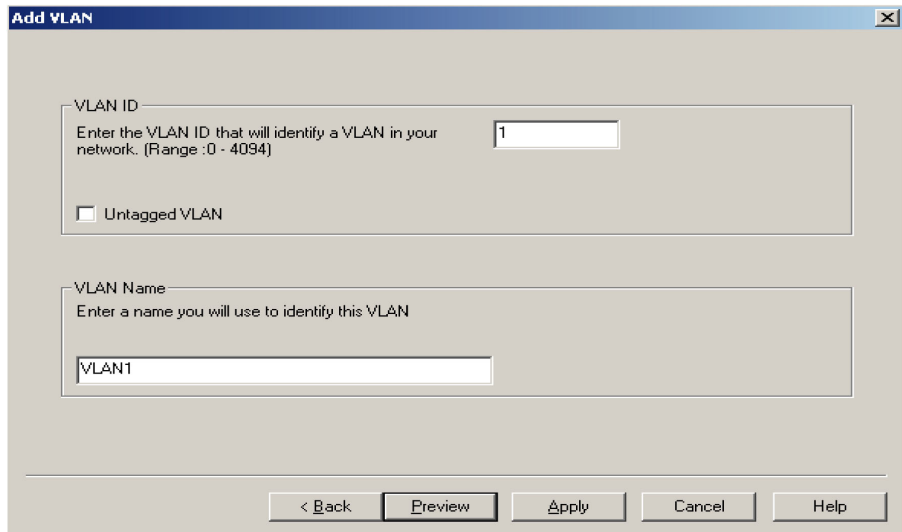
POINT

- ▶ If you selected [Add VLAN] in step 2, this window is not displayed.

5 Specify [VLAN ID] and [VLAN Name] in the [Add VLAN] window.

The [VLAN ID] should be identical to the switch setting.

The [VLAN Name] is not necessary to be identical to the switch setting.

**POINT**

- ▶ A "VLAN ID" or "VLAN Name" that has already been used cannot be used. Enter another setting.

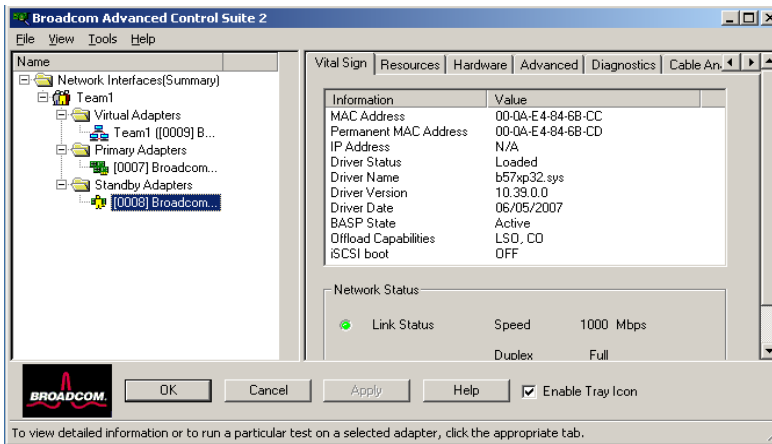
6 Click [Apply] to apply the settings.

After the network is temporarily disconnected, a window is displayed. Click [Yes].

4.6.4 Cautions on Using the Teaming (SLB (Auto-Fallback Disable)) Function



When a primary adapter recovers from a failure during standby operation, auto-fallback is not performed for the primary adapter. Communication is continued with the standby adapter. To return to communication using the primary adapter, perform the following operation.

- 1 Click [Start] – [Control Panel] – [Broadcom Control Suite 2] to start BACS.
- 2 Check that communication is performed with the [Standby Adapters] on the Teamed Up adapter tree.

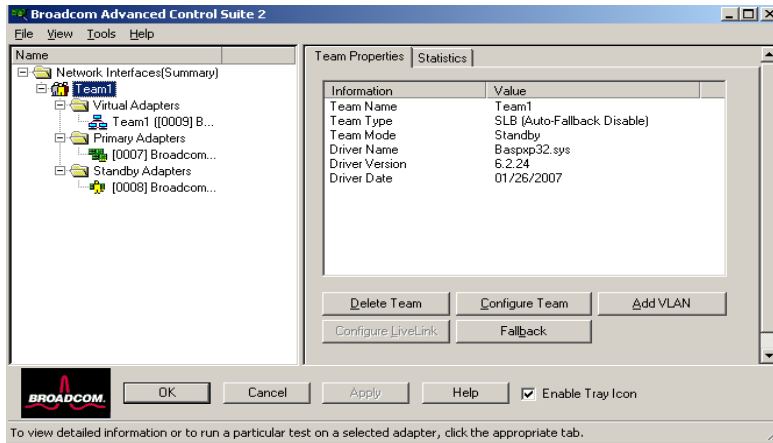



The currently communicating adapter is displayed with a  mark.

- 3 Check that the [Primary Adapters] is running properly on the Teamed Up adapter tree.

The primary adapter that is running properly is displayed with a  mark. If the primary adapter is not running properly, a  mark is displayed.

- 4 Select the Team name of the Teamed Up adapter, and click [Fallback] from the [Team Properties] tab in the right pane of the window.



Check that the  mark moved from the standby adapter to the primary adapter and communication is maintained.

4.7 LAN Driver Advanced Setup [Intel® PROSet]

"Intel® PROSet" is a tool for configuring details on the LAN driver. It is used in the following cases.

- When performing the teaming function between a LAN card and the onboard LAN
- When using the Teaming function between LAN cards
- When setting up a VLAN using a LAN card
- When performing advanced setup of a LAN card

POINT

Use of BACS

- ▶ Use BACS (→p.92) to perform the following advanced setup of the onboard LAN:
 - When using the teaming (load balance) function between onboard LANs.
 - When setting up a VLAN using the onboard LAN
 - When performing advanced setup of an onboard LAN

4.7.1 Intel® PROSet Installation

If tabs, such as [Link], [Teaming] and [VLAN], are not displayed in the LAN adapters properties that can be selected from the [Device Manager], install Intel® PROSet according to the following installation procedures:

1 Execute the following file contained in the PRIMERGY Startup Disc.

For Windows Server 2003 x64

[CD/DVD drive]:\Drivers\LAN\Intel\APPS\PROSETDX\Winx64\DxSetup.EXE

For Windows Server 2003

[CD/DVD drive]:\Drivers\LAN\Intel\APPS\PROSETDX\Win32\DxSetup.EXE

- 2** Click [Next].
- 3** Select [Accept] and click [Next].
- 4** Select [Driver and Intel® PROSet/Advanced Network Service] and click [Next].
- 5** Click [Install].
- 6** Click [Finish].

4.7.2 Cautions for PG-2861x/288x/289x PCI-ex LAN Driver V11.2

■ Event log

When teaming is configured, multiple identical logs from the same source that start with the following log may be stored in the system log file of the event viewer at system start-up.

Source	iANSMiniport
ID	11
Type	Warning
Description	The following adapter link is not connected: (adapter name) * (adapter name) varies depending on the OS or hardware configuration.

Since such event logs will be stored even if the Teaming function is operated normally, ignore them.

4.7.3 Teaming Function

■ Teaming types

Teaming has the following types.

● Adapter Fault Tolerance (AFT)

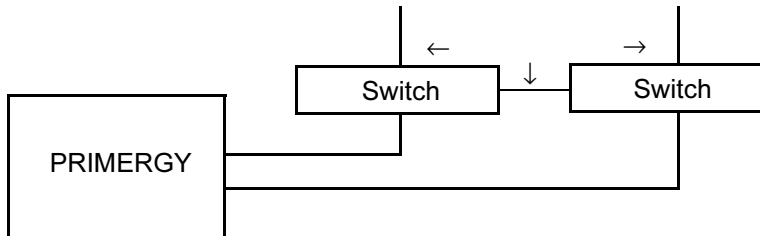
Adapter Fault Tolerance (AFT) is a technology to make the link between the server and switches redundant by using multiple LAN ports. When a failure occurs in the link being used (Primary Link), the communication continues by switching the process to the standby link (Secondary Link) without interrupting. For AFT, all ports in the team must be connected to the same switch.

● Adaptive Load Balancing (ALB)

Adaptive Load Balancing (ALB) is a technology that distributes the sending and receiving data to multiple LAN ports to improve the performance in addition to redundancy function of AFT (When "Receive Load Balancing (RLB)" in Advanced setting is set to "Disabled", the reception is done only in the Primary Link). For ALB, all ports in the team must be connected to the same switch as well as AFT.

● Switch Fault Tolerance (SFT)

Switch Fault Tolerance (SFT) is a redundancy function equal in configuration to AFT when LAN ports are connected to a separate switch. SFT switches the link to be used between LAN ports and switches that are connected to the LAN ports when a failure occurs. However, a failure in links outside of the switches (←, ↓, and → in the figure below) cannot be detected.



● Static link aggregation

Select this mode when connecting a team to a Cisco FEC/GEC compliant switch or a switch that supports IEEE802.3ad-Draft Static. Switch settings are also necessary. All ports in the team must be connected to the same switch.

■ Notes

When using the Teaming function, note the following points.

- For AFT/ALB/Static link type, up to four LAN ports can be incorporated into one team and two ports for a SFT type team.
- Once a Team is created, virtual adapters (Team:(Team Name)) will be created in the [Device Manager] and [Network and Dial-up Connections] of the system. Do not disable or delete this virtual adapter from the [Device Manager] or [Network and Dial-up Connections]. When deleting a virtual adapter, make sure to use "Intel® PROSet".
- When the Teaming function is being used, only the following protocols can be used:
 - For AFT/SFT/Static link type: IP, NetBEUI, IPX (NCP), IPX (NetBIOS)
 - For ALB type: IP, IPX (NCP)
- When the Teaming function is being used, Windows Load Balancing Service (WLBS) and Network Load Balancing (NLB) cannot be used.
- If Static link type is selected, only the switch for link aggregation can be used.
- When adding/deleting a Static link type member, perform such operation in a linked down state.
- When configuring a Team between a Broadcom onboard LAN and an Intel LAN card by using Intel® PROSet, pay attention to the followings:
 - Set the Intel LAN card to primary. For settings, click [Settings] tab – [Modify], select the LAN card, and then click [Primary Settings].
 - VLAN cannot be configured on a Team.



- ▶ Only a link down error between a LAN card (onboard LAN) and the switch it connects with, and the equivalent errors lead to switching of the route. Therefore, if only the switch or LAN card (onboard LAN) is partially damaged and the route being used is normal at the link level, the route will not be switched in the team, but the communication using team may become an error.

■ Teaming configuration procedure

- 1** Click [Start] – [Administrative Tools] – [Computer Management] to start Intel® PROSet.
- 2** Click [Network adapters] under [Device Manager] and double-click a LAN adapter to be incorporated in a team.
- 3** Click the [Teaming] tab, select [Team with other adapters] and click [New Team].
- 4** Enter a team name and click [Next].
- 5** Check the LAN adapter to be incorporated in the Team and click [Next].



- ▶ When the onboard LAN is used for performing remote operations using RemoteControlService, do not check the onboard LAN box (do not incorporate the onboard LAN into a Team).

- 6** Select a Teaming type with which a Team will be created.
Select the following depending on the Teaming type:
 - AFT type: "Adapter fault tolerance"
 - ALB type: "Adaptive load balancing"
 - SFT type: "Switch fault tolerance"
 - Static link type: "Static link aggregation"
- 7** Click [Finish].
- 8** Click [OK] to close the property window for created Teaming adapter.
- 9** Click [OK] to close the property window for the LAN adapter.
When the Teaming setting is complete, the following virtual adapter will be created.
 - "Team: (Team Name)"
 Upper protocols will be bound with the main virtual adapter.
They cannot be bound with the LAN card included in a Team.
The IP address can be set in the main virtual adapter.

4.7.4 VLAN

■ Notes

When using a VLAN, note the following points.

- Up to four VLANs whose "NetBIOS over TCP/IP" is enabled in the whole system.
- Only ten or less VLANs can be set to a LAN port.
- When adding or deleting a VLAN, always use "Intel(R) PROSet". Do not disable or delete a VLAN from the [Device Manager] or [Network and Dial-up Connections].
- On a VLAN, only use IP protocols.

When LLC and the LNDFC protocols are installed by the Fujitsu communication control service, these protocols are bound (connected) unconditionally. Therefore, release the bind of VLAN and these protocols in the system where these protocols and VLAN are installed at the same time.

■ VLAN configuration procedure

- 1** Click [Start] – [Administrative Tools] – [Computer Management] to start Intel® PROSet.
- 2** Click [Network adapters] under [Device Manager] and double-click a LAN card to setup a VLAN.
- 3** Click the [VLANs] tab, and click [New...].
- 4** Specify [VLAN ID] and [VLAN Name]. Then click [OK].
The [VLAN ID] should be identical to the switch setting. 1 to 4094 can be specified.
Any name can be specified as the [VLAN Name].
- 5** Click [OK] to close the property window for the LAN adapter.

When setup of the VLAN is complete, the following virtual adapter will be created.

- "(LAN Adapter Name)-VLAN:(VLAN Name)"
Upper protocols will be bound with the main virtual adapter. They cannot be bound with the LAN card configuring a VLAN. The IP address should be specified in the main virtual adapter.

Chapter 5

High Reliability Tools

5

For stable PRIMERGY server operations, we recommend that high reliability tools be installed. This chapter explains the installation and necessary settings of high reliability tools.

5.1	RAID Management Tool	110
5.2	Server Monitoring Tool [ServerView]	111
5.3	Maintenance Support Tool [HRM/server]	114
5.4	Solving Problems Early [DSNAP]	115

5.1 RAID Management Tool

RAID Management Tool performs configuration, initialization and monitoring of the hard disk array. For details, refer to the manual in the Array Controller Document & Tool CD.

POINT

- ▶ When the OS has been installed using ServerStart, RAID Management Tool has been also installed together with the OS as well as other high reliability tools.

■ Before starting operation

Set an array administrator account for the RAID management tool (ServerView RAID).
For details, refer to the manual in the Array Controller Document & Tool CD.

● Configuration of array administrator account

Set an array administrator account for the RAID management tool (ServerView RAID).
A Windows user account is required when using ServerView RAID.
Create a group named "raid-adm", and an account with any name for an array administrator within the group, "raid-adm".

● Configuration of HDD check scheduler

Modify the settings of HDD Check Scheduler if necessary when using an Onboard Software RAID (Embedded MegaRAID SATA). It has been set at 12 o'clock everyday as a default setting.

5.2 Server Monitoring Tool [ServerView]

ServerView constantly monitors the hardware status of each server in the network and, at the same time, provides a console which enables to recognize the status of all the servers promptly. ServerView keeps the server hardware under monitoring all the time. An error that could cause trouble, if detected, will be notified in real-time. This function helps to remove a system error at earlier stage and avoid troubles.



- ▶ For notes on ServerView security, refer to "●Security" in "1.1.7 Note" in the "ServerView User's Guide".

■ Importance of monitoring the server with ServerView

For safe operation of PRIMERGY, perform monitoring of the server using ServerView for sure. Even if the server is operating with a redundancy configuration, overlooking or neglecting errors could result in a system stop or data loss. As soon as one constituent part of the redundancy configuration fails, the corresponding countermeasures must be taken. For that reason, monitoring the server with ServerView is necessary.

If ServerView is not installed, the following serious problems may occur.

● RAID error monitoring

ServerView notifies users of the RAID errors. In an environment where ServerView is not in use, any errors will be notified. Leaving the RAID error unsolved may lead to a system stop caused by multiple hard disk unit malfunctions.

● Memory monitoring

ServerView monitors the memory. In an environment where ServerView is not in use, a memory single-bit error cannot be detected during operation. The server must restart as those errors are detected with using the BIOS Setup Utility or Server Management Tools. Leaving this error unsolved may develop to multiple-bit errors and cause a system stop.

● Fan monitoring

ServerView monitors the fan function. In an environment where ServerView is not in use, fan malfunction (failure/stop) cannot be detected during operation. The server must restart as those errors are detected with using the BIOS Setup Utility or Server Management Tools. Leaving the malfunction unsolved may lead to overheating inside the server and a system stop.

● Temperature monitoring

ServerView monitors the temperature. In an environment where ServerView is not in use, the increasing temperature inside the server, caused by such as the fan malfunction described above, cannot be detected to prevent a system failure. The server must restart as those errors are detected by using the BIOS Setup Utility or Server Management Tools.

- **Voltage monitoring**

ServerView monitors the voltage. In an environment where ServerView is not in use, voltage surge cannot be detected during operation. The server must restart as those errors are detected by using the BIOS Setup Utility or Server Management Tools. Voltage surges may result in malfunction or data loss.

- **Power supply monitoring**

ServerView monitors the power supply. In an environment where ServerView is not in use, power supply irregularities cannot be detected during operation. The server must restart as those errors are detected by using the BIOS Setup Utility or Server Management Tools. System stops due to power supply failures cannot be prevented.

5.2.1 Installing ServerView

- **When installed using ServerStart**

When the OS has been installed using ServerStart, ServerView has been also installed together with the OS as well as other high reliability tools.

- **When installed manually (Linux)**

ServerView cannot be installed using ServerStart. To install ServerView manually on a Linux system, refer to "Chapter 2 Installation" in "ServerView User's Guide".



- ▶ Be sure to install SNMP service before installing ServerView.

- **When an error screen appears after ServerView installation (Windows Server 2003 only)**

If Windows Server 2003 Service Pack 1 is applied, the following message may appear on restarting immediately after installing/uninstalling ServerView.

```
In order to protect the computer, this program is terminated by
Windows.
Name:SNMP Service
```

This message does not imply an error. Click [Close Message] to close the message.

5.2.2 Setting Required after Installation

Perform necessary operations after ServerView installation referring to "2.4 Setting after Installation" in "ServerView User's Guide".

■ Boot monitoring setting

It is recommended to enable the "Boot Monitoring" function after ServerView is installed. For setting procedures and explanation on the function, refer to "[Restart Settings] Tab" of "3.4 Serious Error Handling (ASR)" in "ServerView User's Guide".

5.3 Maintenance Support Tool [HRM/server]

HRM/server supports quick and proper maintenance operation to achieve high server operation stability.

5.3.1 Installing HRM/server

- **When installed using ServerStart**

When the OS has been installed using ServerStart, HRM/server has been also installed together with the OS as well as other high reliability tools.

- **When installed manually (Linux)**

HRM/server cannot be installed using ServerStart.

To install HRM/server manually into a Linux system, refer to "HRM/server for PRIMERGY (Windows/Linux)" at the following location of the PRIMERGY Startup Disc.

[CD/DVD drive]:\PROGRAMS\Japanese2\HRM\iasv_hrm_install.pdf



- ▶ It is necessary to install ServerView to use HRM/server.

5.3.2 How to use

For system requirements for HRM/server or usage information, refer to "HRM/server for PRIMERGY (Windows/Linux)" at the following location of PRIMERGY Startup Disc.

[CD/DVD drive]:\PROGRAMS\Japanese2\HRM\iasv_hrm_install.pdf

5.4 Solving Problems Early [DSNAP]

DSNAP is a tool for collectively acquiring failure investigation information such as server environment information.

POINT

- ▶ When the OS has been installed using ServerStart, DSNAP has been also installed together with the OS as well as other high reliability tools.

5.4.1 Installing DSNAP

- **For Windows Server 2003 x64**

Copy the following file stored in the PRIMERGY Startup Disc on the hard disk in the server.
[CD/DVD drive]:\PROGRAMS\Japanese\DSNAPx64\DSNAPx64.EXE

- **For Windows Server 2003**

When installing DSNAP separately, copy the following file stored in the PRIMERGY Startup Disc on the hard disk in the server.

[CD/DVD drive]:\PROGRAMS\Japanese\DSNAP\DSNAP.EXE

5.4.2 How to Use

- **For Windows Server 2003 x64**

Refer to the following file stored in the PRIMERGY Startup Disc. Use such a text editor to open it.
[CD/DVD drive]:\PROGRAMS\Japanese\DSNAPx64\README.TXT

- **For Windows Server 2003**

Refer to the following file stored in the PRIMERGY Startup Disc. Use such a text editor to open it.
[CD/DVD drive]:\PROGRAMS\Japanese\DSNAP\README.TXT

Chapter 6

6

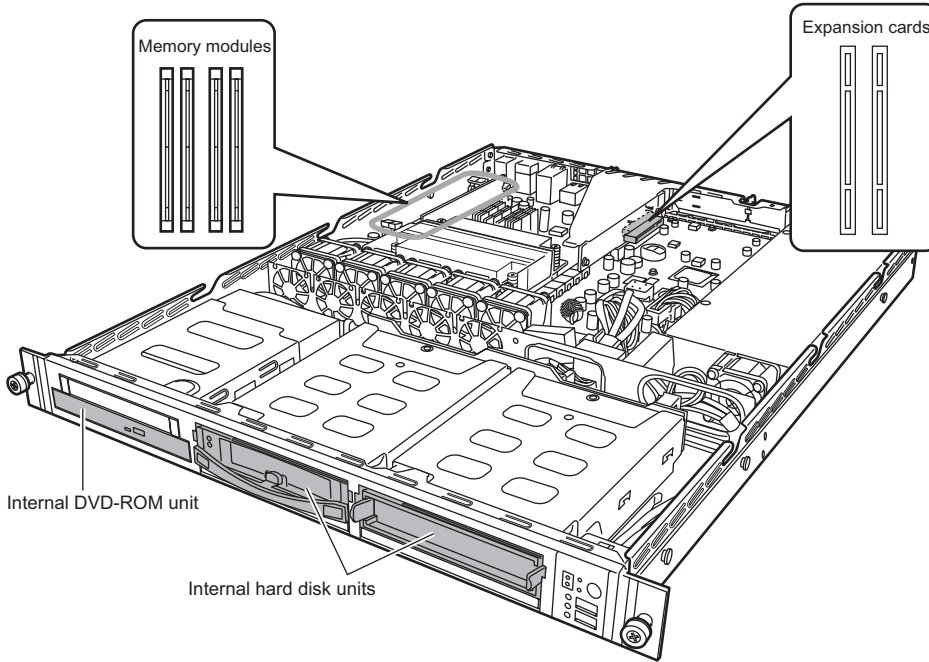
Installing Internal Options

This chapter explains how to install internal options.

6.1	Before Installing Internal Options	118
6.2	Attaching/Removing the Top Cover	120
6.3	Installing Memory Modules	122
6.4	Installing Expansion Cards	126
6.5	Installing an Internal DVD-ROM Unit	132
6.6	Installing Internal Hard Disk Units	136
6.7	Connection of Optional Devices	140

6.1 Before Installing Internal Options

The following types of internal options can be installed on this server.



POINT

- ▶ When re-installing internal options, make sure to use the removed screws for the same device at the same location where it was last installed. Failure to do so may damage the device.
- ▶ The types of installable options described in this manual are subject to change without notice.
- ▶ There is an air duct on the CPU heat sink.
Do not remove the air duct, which is for regulating the flow of air inside of the server.
- ▶ For stable use of the server, use the devices described in the system configuration figure when adding optional devices (internal/external options and USB devices etc.). Fujitsu does not warrant operation of the server when using unauthorized third party optional devices.

**WARNING**

Electric Shock

- Before installing/removing internal options to/from the server, turn off the server, all peripheral devices, and any other connected devices. Also unplug all power cables from the server. Failure to do so may cause electric shock. (→"1.4.3 Turning Off the Server" (p.31))
- Do not disassemble the PSU. Doing so may cause electric shock.



Do not

- Do not install unauthorized third party internal options. Doing so may cause a device failure, fire, or electric shock.
- Do not damage or modify internal cables or devices. Doing so may cause a device failure, fire, or electric shock.

**CAUTION**

- Devices inside the server remain hot after shutdown. Wait for a while after shutdown before installing or removing internal options.
- The circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Before handling them, first touch a metal part of the server to discharge static electricity from your body.
- Do not touch the circuitry on boards or soldered parts. Hold the metallic areas or the edges of the circuit boards.
- If devices are installed or disassembled using methods other than those outlined in this chapter, the warranty will be invalidated.

6.2 Attaching/Removing the Top Cover

This section explains how to attach/remove the top cover.



WARNING



Electric Shock

- Before attaching or removing each cover, turn off the server and all peripheral devices. Also unplug all power cables from the server. Failure to do so may cause electric shock (→"1.4.3 Turning Off the Server" (p.31)).

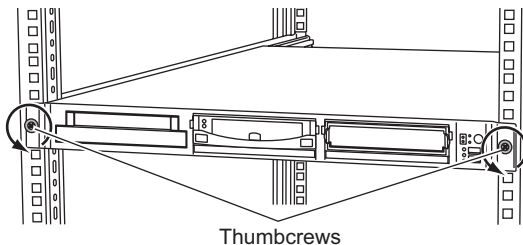


- Use stabilizers to prevent the rack from tipping when installing the rack. Pulling the server out of the rack without installing stabilizers may cause the rack to tip over.

6.2.1 How to Remove/Attach the Top Cover

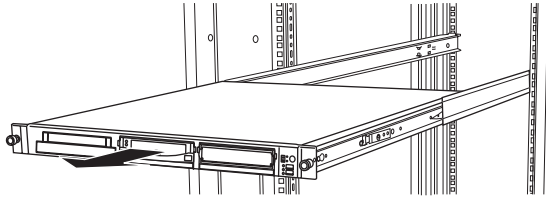
■ How to remove the top cover

- 1** Open the rack door.
→"1.4.1 Opening the Rack Door" (p.28)
- 2** Turn off the server and peripheral devices and remove all cables (SCSI and LAN cables etc.) from the server.
→"1.4.3 Turning Off the Server" (p.31)
- 3** Loosen the two thumbcrews on the front of the server.



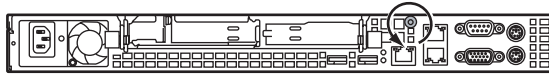
4 Pull the server out until it is locked.

Pull the server forward until it stops.



- Be careful not to pinch your fingers or clothes when pulling the server out or pushing it back. There is a risk of injury.

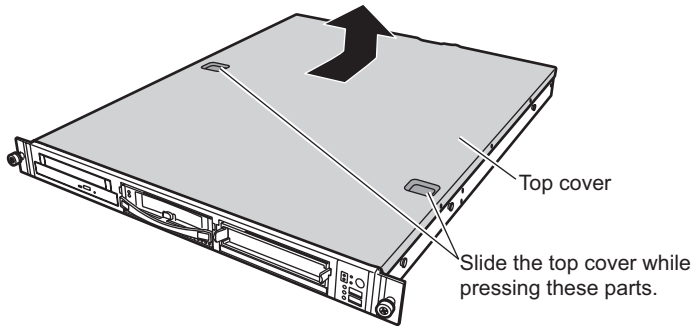
5 Loosen the thumbcrew on the rear of the server.



[Rear side of the server]

6 Slide the top cover slowly to the rear and lift it to remove from the server.

Slide it while pressing the dents.



■ How to attach the top cover



- Before attaching the top cover, make sure no unnecessary parts or tools are left inside the server.
- When turning on the server, make sure the top cover is closed.

To attach the top cover, reverse the removing procedure.

POINT

- ▶ When sliding the server backward, press the locks on both of the rails to unlock.

6.3 Installing Memory Modules

Additional memory modules will help increase the amount of data that can be read at a time and improve the server processing capability.



WARNING



Electric Shock

- Before installing or removing memory modules, turn off the server and all peripheral devices. Also unplug all power cables from the server. Failure to do so may cause electric shock (→"1.4.3 Turning Off the Server" (p.31)).
- Do not install unauthorized third party memory modules. Doing so may cause electric shock, a fire, or failures.



- Wait for a sufficient period of time after server shutdown before installing or removing memory modules. Failure to do so may cause burns.



CAUTION



injury

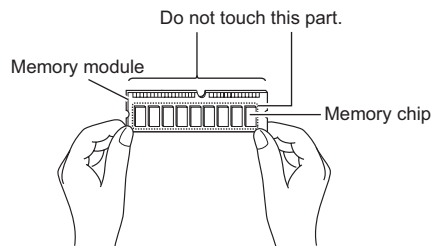
- When installing or removing memory modules, make sure to remove the screws at the specified points only. Failure to do so may cause injury. It may also cause failures.



- Touch only the specified part of the printed circuit board. Failure to do so may cause injury. It may also cause failures.



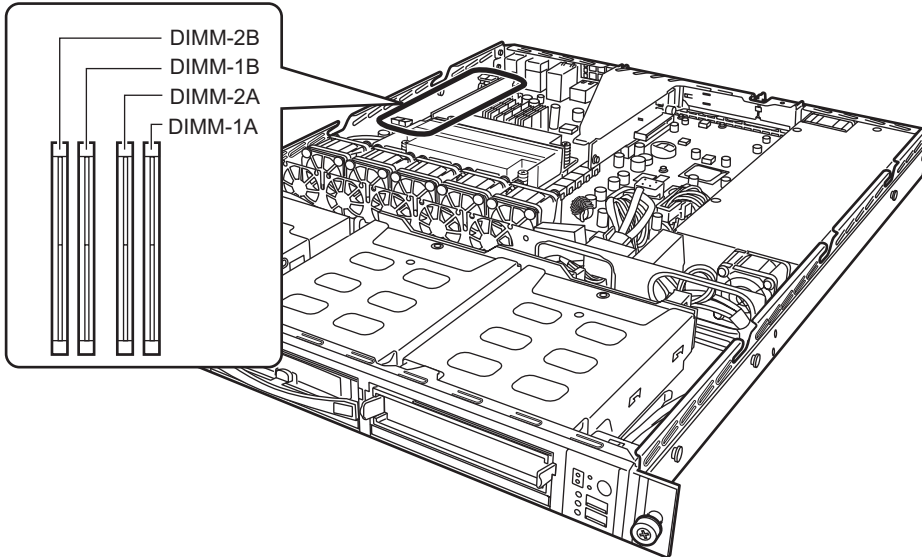
- A memory module consists of parts that are very vulnerable to damage by static electricity, and can easily be damaged by static electricity in the human body. Before handling memory modules, first touch a metal part of the server to discharge static electricity.
- Do not insert and remove memory modules repeatedly. Doing so may cause failures.
- Hold the edges of the memory module, as shown in the figure below. Do not touch the gold lined parts (terminals) and memory chip.



6.3.1 Installation Location of Memory Modules

Install memory modules in the memory slots on the baseboard.

The memory modules installed in this server are composed of one Dual In-Line Memory Module (DIMM), add memory modules one by one.



■ Installation order

Install the memory modules in ascending order of memory capacity from DIMM-1A → 1B → 2A → 2B.

6.3.2 Installable Memory Modules

The following types of memory modules can be installed on this server.

table: List of Installable Memory Modules

Product name	Product ID	Remarks
Memory Module -512MB	PG-RM51BH	512MB (512MB-DIMM:1)
Memory Module -1GB	PG-RM1BH	1GB (1GB-DIMM:1)
Memory Module -2GB	PG-RM2BH	2GB (2GB-DIMM:1)

POINT

Package

- ▶ Before installing memory modules, refer to "Appendix B.1 Memory" (→p.202) to check the packaged contents.

6.3.3 How to Install or Remove Memory Modules



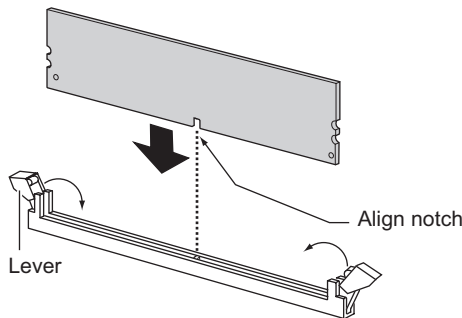
- After the server shutdown, memory modules remain very hot. Wait for a sufficient period of time after the server shutdown before removing memory modules. Failure to do so may cause burns.

- 1** Turn off the power, and remove the top cover.
→ "6.2 Attaching/Removing the Top Cover" (p.120)
- 2** Touch a metal part of the server to discharge static electricity.
- 3** Install or remove memory modules.

When installing memory modules

Keep the levers on both sides of the slot where the memory module is to be installed open, and insert the memory module vertically in the memory slot while lining up the notch.

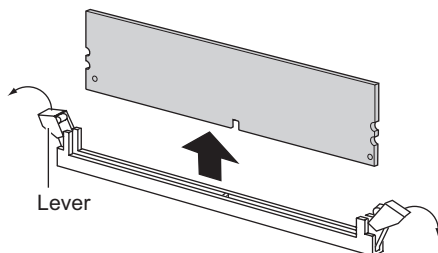
When the memory module is properly installed, the levers on both sides of the slot are pulled back. At this time, confirm that the memory module is secured. If the levers are not pulled back completely, make sure the levers are pushed inwards.



- If the memory module has not been correctly inserted, it may cause a fire. Insert the memory module with attention to its direction.

When removing memory modules

Pull the levers on both sides and remove the memory module.



- If you pull the hook strongly outwards, the memory module pops up. Doing so may cause a device failure.

4 Attach the top cover.

→"6.2.1 How to Remove/Attach the Top Cover" (p.120)

6.3.4 Defective Memory Disconnection Function

This server is equipped with the defective memory (RAM module) disconnection function.

This function disconnects the memory (one DIMM) judged to be defective (causing an error) during the Power On Self Test (POST) and start the server. When POST is executed, if the memory capacity is discovered to be smaller than the capacity of the memory installed, a memory module may be defective.

You can check the slot where the defective memory module is located during POST or from the system event log.

If a defective memory module is discovered, replace it, and then restart the server.

■ How to replace the defective memory module

1 Refer to the system event log, and check the slot location of the defective memory module.

→"8.3 System Event Log" (p.184)

2 Replace the defective memory module with a new memory module according to "6.3.3 How to Install or Remove Memory Modules" (→p.124).

3 Start the BIOS Setup Utility.

→"7.2.1 Starting and Exiting the BIOS Setup Utility" (p.143)

4 Select [Memory Status] submenu in the Server menu and check that the item corresponding to the replaced memory module is set to [Enabled].

If it is set to [Failed], change the memory status to [Enabled].

→"7.2.14 Memory Status Submenu" (p.160)

POINT

- ▶ When the item corresponding to the replaced memory module is not set to [Enabled], the server will start with the new memory module still marked as defective and always disconnected. By changing the setting to [Enabled], the defective memory status is released at the next start of the server, and a new memory becomes available.

5 Cancel the defective memory error status.

For the operation procedure, refer to the Server View User's Guide.

6.4 Installing Expansion Cards

This section contains notes concerning types of expansion cards, various specific expansion cards, and how to install them.



WARNING



Electric Shock

- Before installing an expansion card, turn off the server and all peripheral devices, and unplug the power cables from the outlet. Failure to do so may cause electric shock ("1.4.3 Turning Off the Server" (→p.31)).



CAUTION



- The circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Before handling them, first touch a metal part of the server to discharge static electricity.
- Do not touch the circuitry on boards or soldered parts. Hold the metallic areas or the edges of the circuit boards.
- Expansion cards are susceptible to static electricity. Place them on conductive pads or keep them in their packaging as long as they are not necessary.

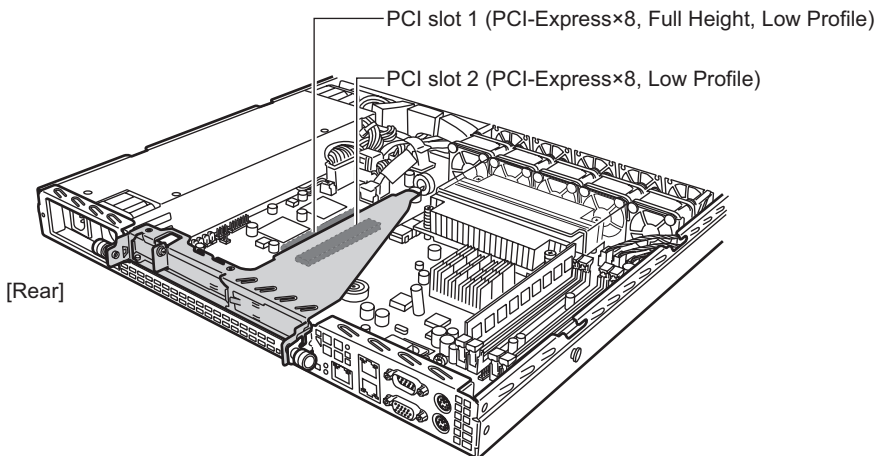


6.4.1 Installation Location of Expansion Cards

The server has two PCI slots. Up to two Expansion cards can be installed.

PCI Slot is compliant to PCI local bus specifications (Version 2.2).

The figure below shows the slot locations and specifications.



6.4.2 Installable Expansion Cards and Notes

This section explains expansion cards that can be installed and notes on the installation.

■ Installable expansion cards

Up to two following expansion cards can be installed in the server depending on the hard disk model.

● SAS model

table: Installable Expansion Cards (SAS model)

Installable expansion card (product ID)	Number of cards		Remarks
SCSI Ctrl U320 lp (PG-2281L)	1	2	Ultra320SCSI, Low Profile, for SCSI option
Eth. Ctrl 2x1Gbit PCI-E 1000-BASE-T lp (PG-2861L)	1		1000BASE-T, Low Profile, Dual Port
Eth. Ctrl 1x1Gbit PCI-E 1000-BASE-T lp (PG-289L)	1		1000BASE-T, Low Profile
Eth. Ctrl 1x1Gbit PCI-E 1000BASE-SX lp (PG-288L)	1		1000BASE-SX, PCI-Express x4

● SATA model

table: Installable Expansion Cards (SATA model)

Installable expansion card (product ID)	Number of cards		Remarks
SCSI Ctrl U320 lp (PG-2281L)	1	2	Ultra320SCSI, Low Profile, for SCSI option
Eth. Ctrl 2x1Gbit PCI-E 1000-BASE-T lp (PG-2861L)	1		1000BASE-T, Low Profile, Dual Port
Eth. Ctrl 1x1Gbit PCI-E 1000-BASE-T lp (PG-289L)	1		1000BASE-T, Low Profile
Eth. Ctrl 1x1Gbit PCI-E 1000BASE-SX lp (PG-288L)	1		1000BASE-SX, PCI-Express x4

■ Installation location and order of expansion cards

Install each expansion card in the PCI slots in the number order described in the following table. Also, install them according to the installation order, then install a driver.



- ▶ Expansion cards will not operate normally unless installed in the specified locations.

● SAS model

table: Installation Location/Order of Expansion Cards (SAS Model)

Installable expansion card (product ID)	PCI slot		Installation order
	1	2	
SCSI Ctrl U320 lp (PG-2281L)	2	1	1
Eth. Ctrl 2x1Gbit PCI-E 1000-BASE-T lp (PG-2861L)	2	1	2
Eth. Ctrl 1x1Gbit PCI-E 1000-BASE-T lp (PG-289L)	2	1	3
Eth. Ctrl 1x1Gbit PCI-E 1000BASE-SX lp (PG-288L)	2	1	4

● SATA model



- ▶ Expansion cards will not operate normally unless installed in the specified locations.

table: Installation Location/Order of Expansion Cards (SATA Model)

Installable expansion card (product ID)	PCI slot		Installation order
	1	2	
SCSI Ctrl U320 lp (PG-2281L)	2	1	1
Eth. Ctrl 2x1Gbit PCI-E 1000-BASE-T lp (PG-2861L)	2	1	2
Eth. Ctrl 1x1Gbit PCI-E 1000-BASE-T lp (PG-289L)	2	1	3
Eth. Ctrl 1x1Gbit PCI-E 1000BASE-SX lp (PG-288L)	2	1	4

■ Notes on installing expansion cards

● Notes on individual cards

For information about specific expansion cards, see the expansion card manual and check the notes supplied with the server. Also, check the following for various expansion cards.

● Installing/Removing SCSI Ctrl U320 Ip (PG-2281L)

Configuration information on the device changes by installing the SCSI Ctrl U320 Ip (PG-2281L) in the server because the bridge circuit is installed in the inside of the card.

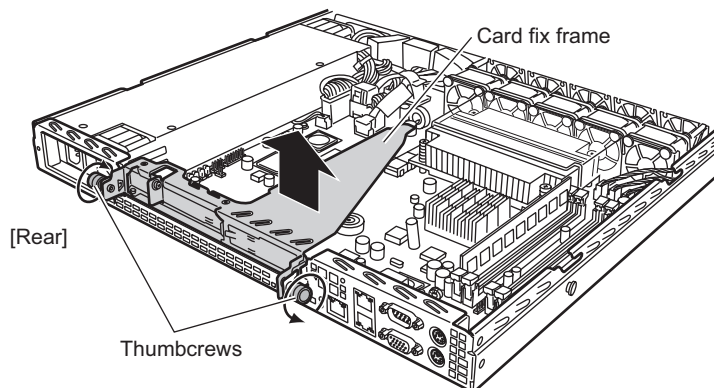
Therefore, when adding/removing the SCSI Ctrl U320 (PG-2281L) after OS installation, the following phenomenon may occur. Deal with it according to each item below.

- The onboard LAN controller might be recognized by the OS as a new device.
Perform the onboard LAN settings (IP address etc.) and set software that uses the onboard LAN again after adding/removing the card.
- The monitoring software (ServerView RAID) of the disk array controller logs the deletion of a hard disk or logical drive (ServerView RAID event ID=10476, 10477, 10526).
Check the hard disk status in ServerView RAID, and ignore the logs if there is no hard disk failure.

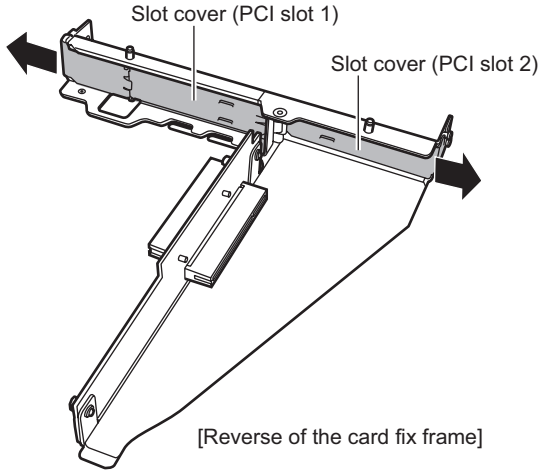
6.4.3 How to Install Expansion Cards

This section explains how to install an expansion card.

- 1** Turn off the server and remove the top cover.
→"6.2 Attaching/Removing the Top Cover" (p.120)
- 2** Touch a metal part of the server to discharge static electricity.
- 3** Loosen the thumbscrews on the rear of the server, and remove the card fix frame.

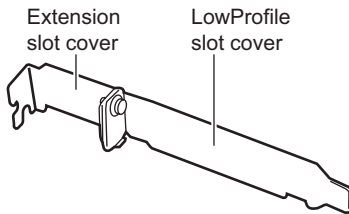


- 4 Remove the slot cover for the slot where the expansion card will be installed from the card fix frame.



POINT

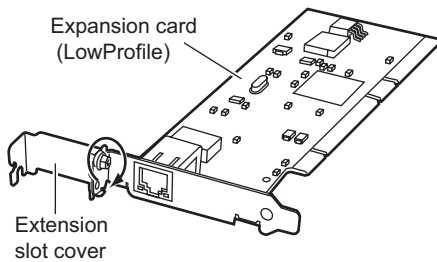
- ▶ The slot cover for PCI slot 1 is composed of a low-profile slot cover and an extension slot cover.



- ▶ Keep the removed slot cover for later use.

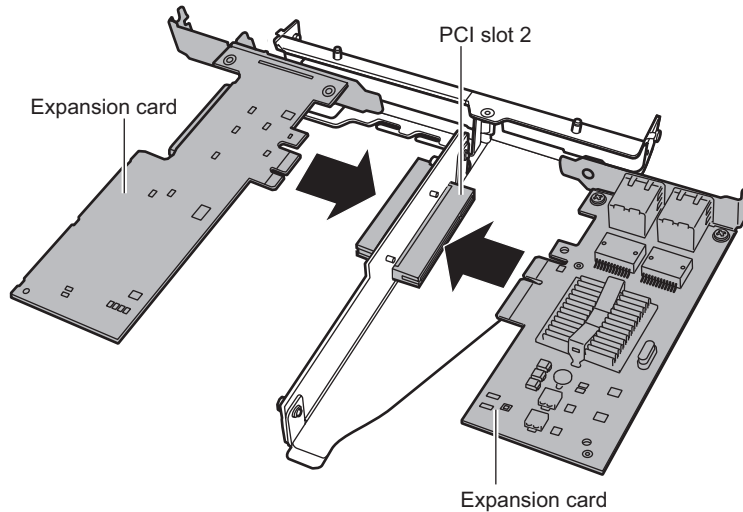
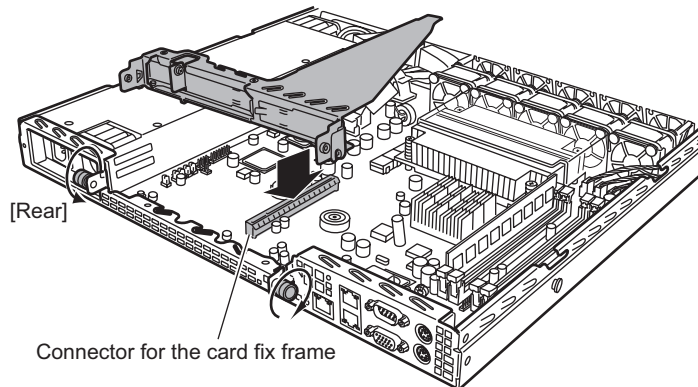
- 5 When installing a low-profile card in PCI slot 1, attach the extension slot cover to the card.

Use the screws attached to the extension slot cover.



6 Install the expansion card in the card fix frame.

When installing two cards in PCI slots 1 and 2, first install a card in PCI slot 2.

**7** Securely install the card fix frame to the connector, and tighten the thumbcrews.**8** Attach the top cover and return the server back to its original position.

→ "6.2 Attaching/Removing the Top Cover" (p.120)

9 Set and check the system resource information.

Check that the [PCI IRQ Line n (n is 1 to 8)] is [Auto Select] in the PCI Configuration submenu under the Advanced menu.

→ "7.2.8 PCI Configuration Submenu" (p.153)

■ How to remove an expansion card

To remove expansion cards, simply reverse the installation procedures.

6.5 Installing an Internal DVD-ROM Unit

This section explains how to install a internal DVD-ROM unit (optional).
For the procedure for handling a CD/DVD, refer to "1.4.4 Inserting and Ejecting a CD/DVD" (→p.32).



WARNING



Electric Shock

- Before installing or removing an internal DVD-ROM unit, turn off the server and all peripheral devices, and unplug all power cables from the server. Failure to do so may cause electric shock (→"1.4.3 Turning Off the Server" (p.31)).



Vision Damage

- Do not look at the light source of the CD/DVD drive laser beam directly. Doing so may lead to visual damage.



CAUTION



- When installing a DVD-ROM, hold it by the side. Applying force to the top may cause failures.



- The circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Before handling them, first touch a metal part of the server to discharge static electricity.
- Do not touch the circuitry on boards or soldered parts. Hold the metallic areas or the edges of the circuit boards.

6.5.1 Installable DVD-ROM Units

The following DVD-ROM unit can be installed in this server.

table: Installable DVD-ROM unit

Product name	Product ID	Remarks
DVD-ROM SATA	PG-DV106	SATA

POINT

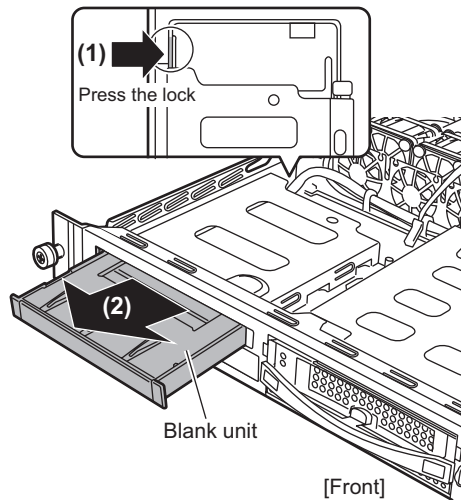
Package

- ▶ Before installing an internal DVD-ROM unit, see "Appendix B.2 Internal DVD-ROM Units" (→p.203). Before installing an internal DVD-ROM unit, see the package list provided with the internal DVD-ROM unit.

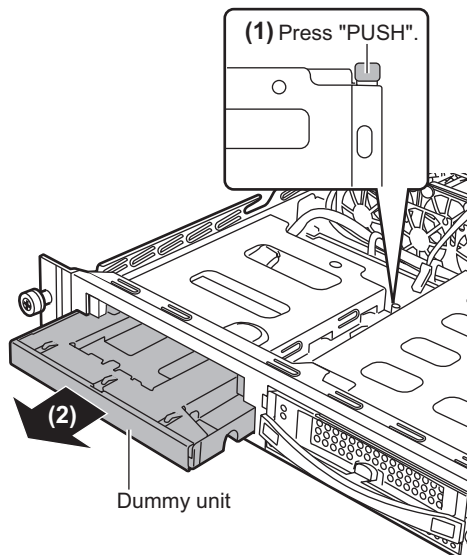
6.5.2 How to Install an Internal DVD-ROM Unit

This section explains how to install an internal DVD-ROM unit.

- 1** Turn off the power, and remove the top cover.
→"6.2 Attaching/Removing the Top Cover" (p.120)
- 2** Touch a metal part of the server to discharge static electricity from your body.
- 3** Remove the blank unit from the upper side of the CD/DVD drive bay.
Press the lock of the blank unit to release it (1), push it forward and out (2).



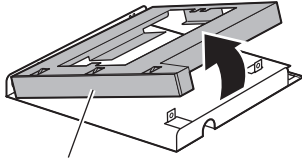
- 4** Press the tab labeled "PUSH" at the back of the CD/DVD drive bay (1), and remove the dummy unit (2).



POINT

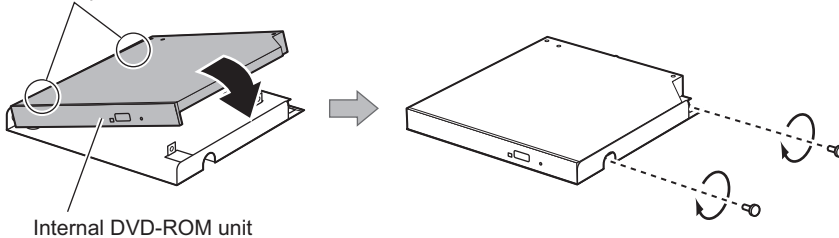
▶ To remove an existing internal DVD-ROM unit, use the same procedure.

- 5** Lift up the dummy unit and remove it from the CD/DVD drive chassis.



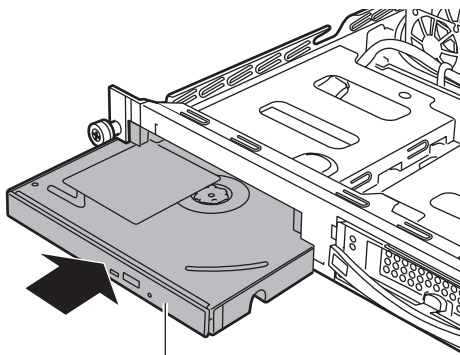
Dummy unit

- 6** Attach the internal DVD-ROM unit to the CD/DVD drive chassis.
Fit in the protrusions at the left side of the internal DVD-ROM unit, and screw on the right side.
Fit in the protrusions.



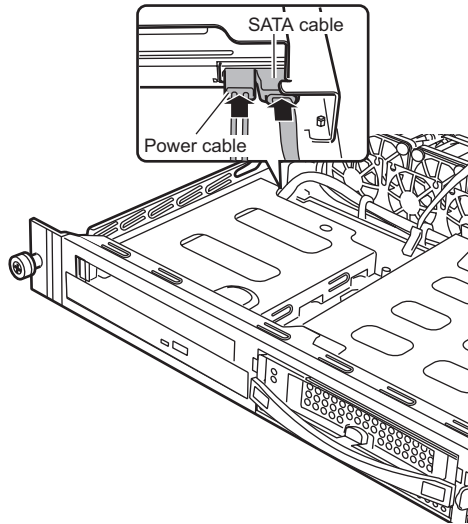
Internal DVD-ROM unit

- 7** Insert the internal DVD-ROM unit into the CD/DVD drive bay.
Insert the internal DVD-ROM unit while holding its sides.



Internal DVD-ROM unit

- 8** Connect the SAS cable and the power cable inside of the server to the rear of the internal DVD-ROM unit.



- 9** Push the blank unit back to the initial position.
Push it until it is all the way seated. It locks with a click.
- 10** Attach the top cover and push the server back to the rack.
→"6.2 Attaching/Removing the Top Cover" (p.120)

■ How to remove the DVD-ROM unit

To remove the internal DVD-ROM unit, simply reverse the installation procedure.

6.6 Installing Internal Hard Disk Units

This section explains how to install internal hard disk units.



- The circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Before handling them, first touch a metal part on the server to discharge static electricity from your body.
- Do not touch the circuitry on boards or soldered parts. Hold the metallic areas or the edges of the circuit boards.
- Before removing this product, turn the power off and wait for about 30 seconds until the disk stops spinning completely.



- When the hard disk unit is starting up, you may hear a resonant noise for a while, but this does not mean a failure.
- Depending on the OS, you can configure the write cache settings for the hard disk drives. However, disable the write cache for use in this server. If the power failure should occur while the write cache is enabled, cached data may be lost.
- Rough handling of hard disk units can damage the stored data. To cope with any unexpected problems, always back up important data. When backing up data to another hard disk drive, you should make backups on a file or partition basis.
- Use the unit in a dry place with low dust levels.
- Be careful not to hit the hard disk unit or bring it into contact with metallic objects.



- Do not use and store the unit in a shock and vibration environment.
- Keep the unit away from direct sunlight and from radiators or other heat sources.
- Do not use or store the unit in extremely hot or cold locations, or locations with extreme temperature changes.
- Never attempt to disassemble the hard disk unit.

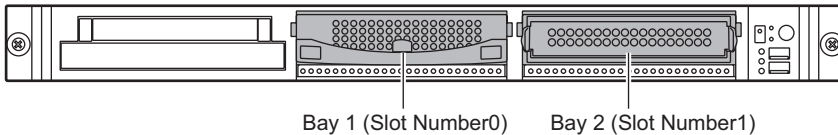
6.6.1 Installation Locations of Internal Hard Disk Units

■ Installation order of internal hard disk units

Install internal hard disk units in the 3.5-inch storage bays.

Bay numbers are as follows.

Install the internal hard disk units in the order of Bay 1 and Bay 2.



The slot number that is displayed in the RAID management software etc. is described in the location where the hard disk is installed.

6.6.2 Installable Internal Hard Disk Units and Notes

■ Installable internal hard disk units

The following internal hard disk units can be installed on this server.

● For SAS model

table: List of Installable Internal Hard Disk Units (SAS Model)

Product name	Product ID	Overview
HDD SAS 15k 73GB hot plug 3.5inch	PG-HDB75A	73.4GB, 15,000rpm, SAS 3.5-inch, hot plug support
HDD SAS 15k 147GB hot plug 3.5inch	PG-HDB45A	146.8GB, 15,000rpm, SAS 3.5-inch, hot plug support
HDD SAS 15k 300GB hot plug 3.5inch	PG-HDB35A	300GB, 15,000rpm, SAS 3.5-inch, hot plug support

● For SATA model

table: List of Installable Internal Hard Disk Units (SATA Model)

Product name	Product ID	Overview
HDD SATA 7.2k 80GB hot plug 3.5inch	PG-HDF87B	80GB, 7,200rpm, SATA 3.5-inch, hot plug support
HDD SATA 7.2k 160GB hot plug 3.5inch	PG-HDF67B	160GB, 7,200rpm, SATA3.5-inch, hot plug support
HDD SATA 7.2k 500GB hot plug 3.5inch	PG-HDF57B	500GB, 7,200rpm, SATA 3.5-inch, hot plug support

POINT

Package

- ▶ Before installing the internal hard disk unit, see "Appendix B.3 Internal Hard Disk Units" (→p.204) to check the packaged contents.

■ Notes on configuring array

Install internal hard disk units with the same model number on bay1 and bay2.

■ Replacing defective internal hard disk units (for array configuration only)

When an array system is configured, if one hard disk unit fails, you can replace it and perform recovery functions without turning off the power of the server and peripheral devices (hot swap/hot plug support). For details, refer to the manual on the "Array Controller Documents & Tools CD".

6.6.3 How to Install Internal Hard Disk Units

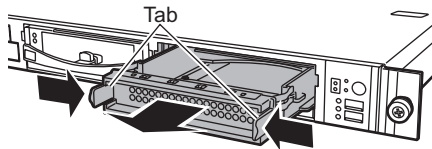
- 1** Turn off the server and all peripheral devices, and unplug all power cables from the server.

→ "1.4.3 Turning Off the Server" (p.31)

- 2** Touch a metal part of the server to discharge static electricity from your body.

- 3** Remove the dummy unit from the bay where an internal hard disk unit will be installed.

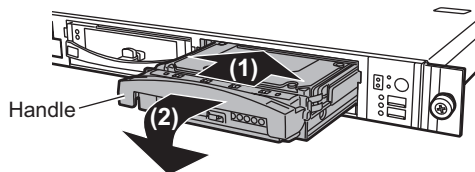
Dummy units are installed in bays where no internal hard disk units are installed. Pressing the tabs on both sides of the dummy unit inward, pull the unit out towards you slowly.



POINT

- ▶ Keep the removed dummy units for later use.

- 4** Install the internal hard disk unit in the server.
 1. Insert the internal hard disk unit into the bottom of the bay with its handle lifted.
 2. Press down the handle of the internal hard disk unit until it clicks.



■ How to remove internal hard disk units

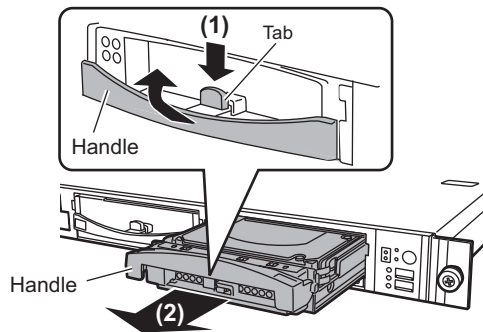
- 1** Turn off the server and all peripheral devices, and unplug all power cables from the server.

→"1.4.3 Turning Off the Server" (p.31)

- 2** Touch a metal part of the server to discharge static electricity from your body.

- 3** Remove the internal hard disk unit.

Pressing the tab at the front of the internal hard disk unit, hold up the handle (1), and pull out the unit towards you (2). Pull out the internal hard disk unit with both hands.



- 4** Install a new internal hard disk unit or a dummy unit.

→"6.6.1 Installation Locations of Internal Hard Disk Units" (p.137)

6.7 Connection of Optional Devices

This section explains the connection of optional devices.

6.7.1 Connecting an External SCSI Option

■ Connectable external SCSI options

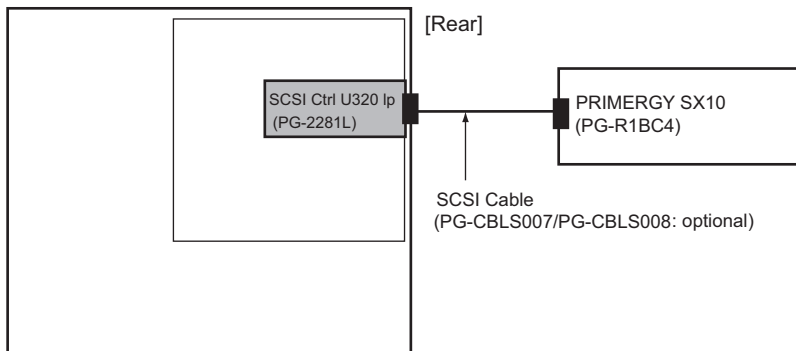
The following external SCSI option can be connected to this server.

table: List of Connectable External SCSI Option

Product name	Product ID
PRIMERGY SX10	PG-R1BC4

■ Connecting a backup cabinet

Only one backup cabinet can be connected as shown below.



■ Notes on external SCSI options

● SCSI-ID setting

Note that the settings of each device do not overlap.

● SCSI cable

Select appropriate SCSI cables to connect the external SCSI option as usage.

table: List of SCSI Cables

Connector types	Length	Product ID	Remarks
VHDCI 68-pin. Half pitch 68-pin	1.8m	PG-CBLS007	Optional
VHDCI 68-pin. Half pitch 68-pin	5m	PG-CBLS008	Optional

Chapter 7

Configuring Hardware and Utilities

7

This chapter explains how to make the environment settings necessary to operate the server and how to use each utility.

7.1 Jumper Pins Settings	142
7.2 BIOS Setup Utility	143

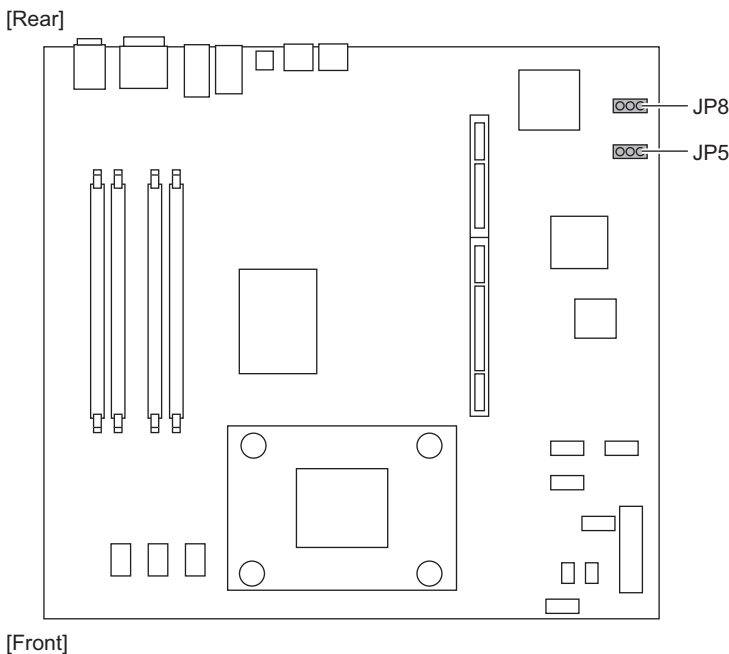
7.1 Jumper Pins Settings

This section explains the jumper pins settings.

7.1.1 Jumper Pins Location and Settings

■ Jumper pins location

The jumper pins of the server is located on the baseboard as shown below.



■ Jumper pin settings

The following settings are available according to the jumper pin location.

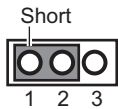


table: Jumper Pin Settings

Jumper	Function	Settings	Description
JP5	Password Skip	<ul style="list-style-type: none"> 1-2 (Disable, default) 2-3 (Enable) 	When setting this item to "Enabled" and the password is specified, the BIOS Setup Utility is started without password authentication.
JP8	BIOS Recovery	<ul style="list-style-type: none"> 1-2 (Disable, default) 2-3 (Enable) 	When setting this item to "Enabled", starts with the saved BIOS information.

7.2 BIOS Setup Utility

This section explains how to make settings in the BIOS Setup Utility, and the items of each setting.

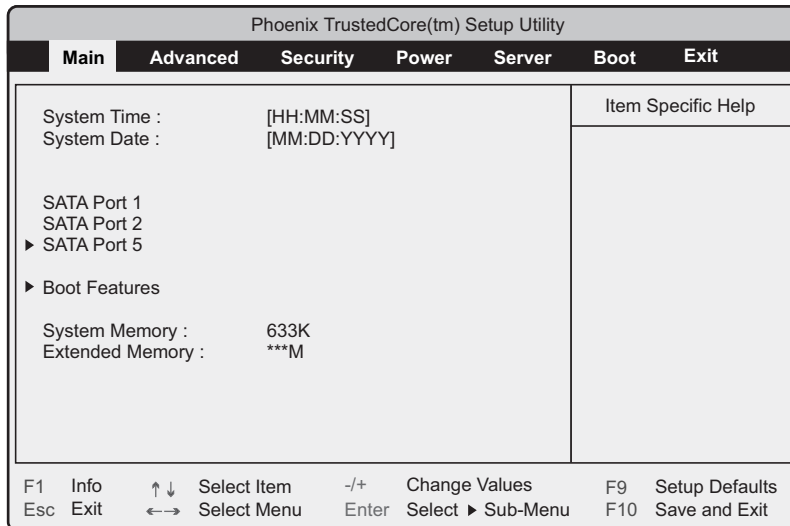
7.2.1 Starting and Exiting the BIOS Setup Utility

This section explains how to start and exit the BIOS Setup Utility.

■ How to start the BIOS Setup Utility

- 1 Turn on the server.
- 2 Press the [F2] key while the message "<F2> BIOS Setup / <F12> Boot Menu" appears on the screen during the POST phase.

The Main menu screen appears after the POST completes.



POINT

When the Main menu is not displayed

- ▶ When the [Main] menu is not displayed because the [F2] key is pressed at wrong timing, press the [Ctrl] + [Alt] + [Delete] keys at the same time to reset, restart the system, and then start the BIOS Setup Utility.

POINT

- ▶ If you press the [F12] key while the message "<F2> BIOS Setup / <F12> Boot Menu" is displayed on the screen, the Boot menu screen will appear after the POST completes.
→"7.2.18 Boot Menu" (p.164)

● Key operations in the BIOS Setup Utility

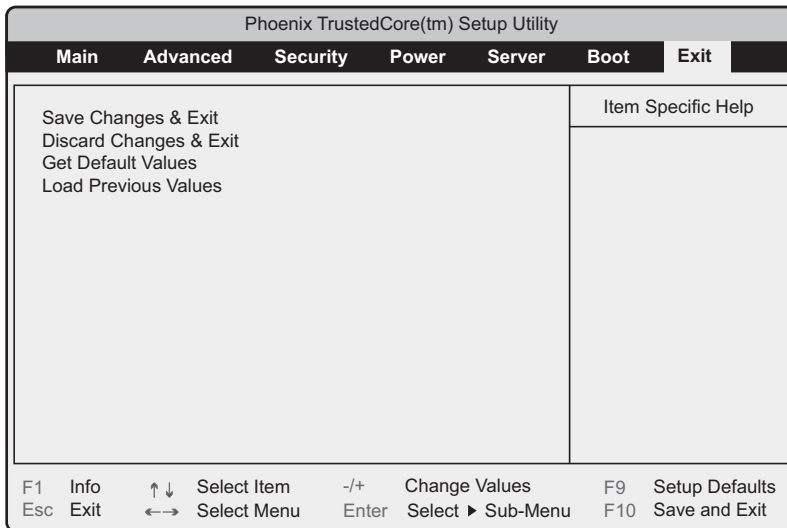
The roles of the keys used for BIOS Setup Utility settings are as follows:

table: List of key operations on the BIOS Setup Utility Screen

Key	Description
[F1]	Displays the system information. Press the [Esc] key to close it.
[Esc]	Ends a submenu and returns to the previous menu. Or displays the Exit menu.
[↑] [↓]	Scrolls through the menu option list.
[←] [→]	Switches between menus.
[+] [-]	Changes the value of an item.
[Enter]	Selects an item. For items where ► is displayed, a submenu appears.
[F9]	Resets each item to the default value. However, all items of the [LAN Settings] in the "7.2.17 IPMI Submenu" (→p.162) are not reset.
[F10]	Saves the value of each item and exits the BIOS Setup Utility.

■ How to exit the BIOS Setup Utility

- 1 Use the [←] [→] keys to display the Exit menu.



- 2 Use the [↑] [↓] keys to select the exit mode.

When saving configuration changes before exiting

Move the cursor to [Save Changes & Exit] and press the [Enter] key.

The message "Save configuration changes and exit now?" is displayed.

When exiting without saving configuration changes

Move the cursor to [Discard Changes & Exit] and press the [Enter] key.

When the configuration has been changed, the message "Configuration has not been saved! Save before exiting?" is displayed.

- 3** Use the [←] [→] keys to move the cursor to [Yes] or [No], and press the [Enter] key.

If you selected [Save Changes & Exit] in the Exit menu:

- Select [Yes] to exit.
After saving the changed settings, the BIOS Setup Utility closes and the server restarts.
- Select [No] not to exit.
The display returns to the BIOS Setup Utility window.

If you selected [Discard Changes & Exit] in the Exit menu:

- Select [Yes] to save changes before exit.
The BIOS Setup Utility closes and the server restarts.
- Select [No] when not saving the settings.
The BIOS Setup Utility closes and the OS starts.

7.2.2 Main Menu

The Main menu is displayed initially when you start the BIOS Setup Utility.

Settings for the time and date and for the drives are configured on the Main menu.

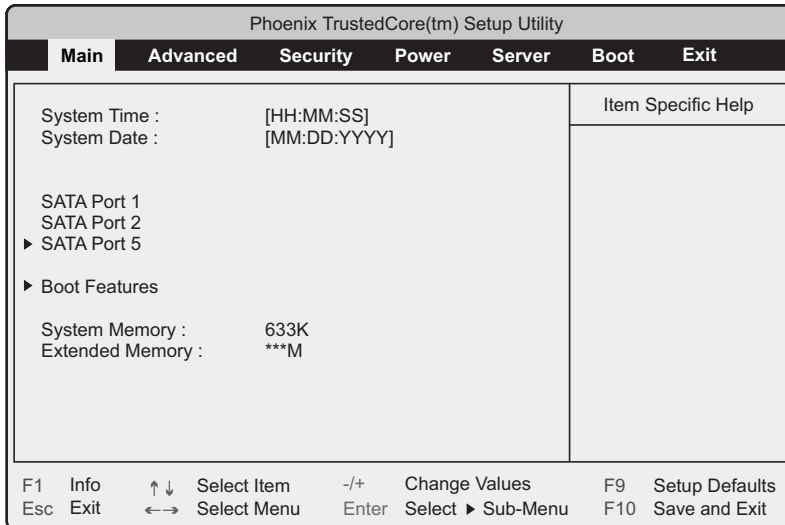


table: Items on the Main Menu

Item	Setting	Description
System Time	Present time	Sets the system time in "hh:mm:ss" format. Enter the hours in the 24-hour clock format. For example, 6:30:00 P.M. is set as "18", "30", and "00". When a higher system time accuracy is required, apply a network-based time setting service (such as NTP) to the system configuration.
System Date	Present date	Sets the system date in "mm/dd/yyyy" format. For example, September 20, 2008 is set as "09", "20", and "2008".
SATA Port 1	When the [Enter] key is pressed, the SATA Port submenu screen appears, and device capacity, LBA Mode, DMA transfer mode, Firmware version, etc. are displayed.	
SATA Port 2		
SATA Port 5		
Boot Features	Sets system startup options. Press the [Enter] key to display the "7.2.3 Boot Features Submenu" (→p.147) window.	
System Memory	Displays the available base memory size less than 1MB.	
Extended Memory	Displays the memory size more than 1MB.	

7.2.3 Boot Features Submenu

Use this submenu to set system startup options.

Phoenix TrustedCore(tm) Setup Utility		
Main		
Boot Features	Item Specific Help	
POST Errors :	[Enabled]	
Keyboard Check :	[Enabled]	
Fast Boot :	[Disabled]	
POST Diagnostic Screen :	[Enabled]	
Boot Menu :	[Enabled]	
NumLock :	[Auto]	

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

table: Items on the Boot Features Submenu

Item	Setting	Description
POST Errors	Enabled (Unchangeable)	Sets whether or not to stop the boot process and shut down the system in case a Power On Self Test (POST) error is detected.
Keyboard Check	<ul style="list-style-type: none"> • Disabled • Enabled (Initial value) 	Sets whether or not to have POST perform a keyboard connection confirmation.
Fast Boot	Disabled (Unchangeable)	Sets whether or not to reduce the scope of POST and thereby speed up system startup.
POST Diagnostic Screen	Enabled (Unchangeable)	Sets whether or not to display the POST diagnostic window.
Boot Menu	Enabled (Unchangeable)	Sets whether or not to display the boot drive selection window after POST.
NumLock	Auto (Unchangeable)	The state of the NumLock at startup.

7.2.4 Advanced Menu

The Advanced menu sets the peripheral device and PCI device options.

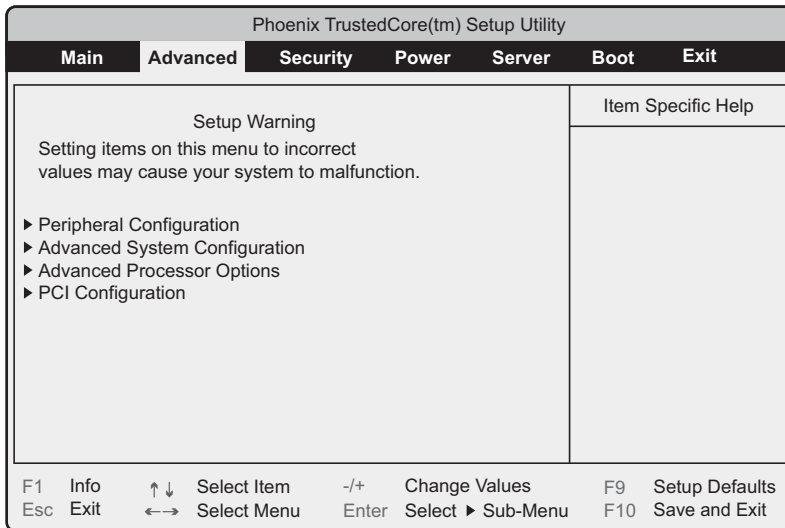


table: Items on the Advanced Menu

Item	Description
Peripheral Configuration	Configures the serial port, USB, onboard LAN, etc. Press the [Enter] key to display the "7.2.5 Peripheral Configuration Submenu" (→p.149) window.
Advanced System Configuration	Configures additional settings. Press the [Enter] key to display the "7.2.6 Advanced System Configuration Submenu" (→p.151) window.
Advanced Processor Options	Configures the processor. Press the [Enter] key to display the "7.2.7 Advanced Processor Options Submenu" (→p.152) window.
PCI Configuration	Configures the PCI device. Press the [Enter] key to display the "7.2.8 PCI Configuration Submenu" (→p.153) window.

7.2.5 Peripheral Configuration Submenu

Use this submenu to configure the serial port, parallel port, etc.

Phoenix TrustedCore(tm) Setup Utility		
Advanced		
Peripheral Configuration		Item Specific Help
Serial 1 :	[Auto]	
Serial Multiplexer :	[System]	
USB Front :	[Enabled]	
USB Rear :	[Enabled]	
USB Devices :	[All]	
LAN Controller :	[LAN1 &2]	
LAN 1 Oprom :	[Disabled]	
LAN 2 Oprom :	[Disabled]	
SAS Controller	[Enabled]	
SAS Option ROM Scan	[Enabled]	

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

table: Items on the Peripheral Configuration Submenu

Item	Setting	Description
Serial 1	<ul style="list-style-type: none"> • Disabled • Enabled • Auto (Initial value) • OS Controlled 	Sets whether to enable or disable the serial port. Set this to "Disabled" when used as a server management port. When "Enabled" is set, [Serial 1 Address] is displayed. Note: ▶ When [Serial Multiplexer] is changed to [iRMC], set this item to "Disabled".
Serial 1 Address	<ul style="list-style-type: none"> • 3F8/IRQ4 (Unchangeable) 	Sets the interrupt of serial port or I/O address. Appears when "Enabled" is selected for [Serial 1].
Serial Multiplexer	<ul style="list-style-type: none"> • System (Initial value) • iRMC 	Switches the function of serial port. <ul style="list-style-type: none"> • System Uses this port as a serial port. (Setting at the time of UPS connection) • iRMC Uses this port as a server management port. In this case, set [Serial 1] to "Disabled".
USB Front	<ul style="list-style-type: none"> • Disabled • Enabled (Initial value) 	Sets whether or not to use the USB port on the front.
USB Rear	<ul style="list-style-type: none"> • Disabled • Enabled (Initial value) 	Sets whether or not to use the USB port on the rear. Sets whether or not to enable the USB 2.0 controller.
USB Devices	All (Unchangeable)	Sets whether or not to make the USB devices usable.
LAN Controller	<ul style="list-style-type: none"> • Disabled • LAN1 • LAN1 &2 (Initial value) 	Sets whether or not to enable the onboard LAN controller.

table: Items on the Peripheral Configuration Submenu

Item	Setting	Description
LAN 1 Oprom	<ul style="list-style-type: none"> • Disabled (Initial value) • PXE • iSCSI (not supported) 	<p>Sets to perform a network boot or not.</p> <p>This function allows booting the server via the network. It is used for remote installation of the OS, etc.</p> <p>This item can be set only when [LAN Controller] setting is "LAN 1" or "LAN 1 & 2".</p>
LAN 2 Oprom	<ul style="list-style-type: none"> • Disabled (Initial value) • PXE • iSCSI (not supported) 	<p>Sets to perform a network boot or not.</p> <p>This function allows booting the server via the network. It is used for remote installation of the OS, etc.</p> <p>This item can be set only when [LAN Controller] setting is "LAN 1 & 2".</p>
SAS Controller	<ul style="list-style-type: none"> • Disabled • Enabled (Initial value) 	<p>Sets whether or not to enable the onboard SAS controller.</p> <p>This item can be set only for SAS models.</p>
SAS Option ROM Scan	<ul style="list-style-type: none"> • Disabled • Enabled (Initial value) 	<p>Sets whether or not to initialize the extended ROM in the onboard SAS controller.</p> <p>This item can be set only for SAS models.</p>

7.2.6 Advanced System Configuration Submenu

Use this submenu to configure the onboard system.

Phoenix TrustedCore(tm) Setup Utility		
Advanced		
Advanced System Configuration		Item Specific Help
Onboard Video:	[Enabled]	
High Precision Event Timer:	[Disabled]	
SMART Device Monitoring:	[Enabled]	
SATA RAID Enable:	[Enabled]	
SATA AHCI Enable:	[Disabled]	
F1 Info	↑↓ Select Item	-/+ Change Values
Esc Exit	←→ Select Menu	Enter Select ▶ Sub-Menu
		F9 Setup Defaults
		F10 Save and Exit

table: Items on the Advanced System Configuration Submenu

Item	Setting	Description
Onboard Video	Enabled (Unchangeable)	Sets whether or not to enable the display function on the baseboard.
High Precision Event Timer	<ul style="list-style-type: none"> Disabled (Initial value) Enabled 	Sets whether or not to use the high precision timer of the chipset.
SMART Device Monitoring	Enabled (Unchangeable)	Sets whether or not to monitor the SMART device.
SATA RAID Enable	<ul style="list-style-type: none"> Disabled^{*1} Enabled 	Sets whether or not to enable the SATA RAID function.
SATA AHCI Enable	Disabled (Unchangeable)	Sets whether or not to enable the AHCI mode. This item can be set when [SATA RAID Enable] is "Disabled". When [SATA RAID Enable] is "Enabled", "Enabled" is displayed.

*1: This item can be set only for SATA models.

Initial value is set to "Enabled" when purchasing the array type of the SATA model.
For the SATA models whose array is not configured, "Disabled" is set.

7.2.7 Advanced Processor Options Submenu

Use this submenu to configure the processor.

Phoenix TrustedCore(tm) Setup Utility		
Advanced		
Advanced Processor Options	Item Specific Help	
CPU Mismatch Detection :	[Enabled]	
CPU Halt Mode :	[Enhanced]	
CPU Thermal Management :	[Enhanced]	
NX Memory Protection :	[Disabled]	
Adjacent Cache Line Prefetch :	[Enabled]	
Hardware Prefetch :	[Enabled]	
Limit CPUID Functions :	[Disabled]	
CPU MC Status Clear :	[Next Boot]	
F1 Info	↑↓ Select Item	-/+ Change Values
Esc Exit	←→ Select Menu	Enter Select ▶ Sub-Menu
		F9 Setup Defaults
		F10 Save and Exit

table: Items on the Advanced Processor Options Submenu

Item	Setting	Description
CPU Mismatch Detection	Enabled (Unchangeable)	Sets whether or not to enable checking the CPU type and frequency.
Enhanced SpeedStep	<ul style="list-style-type: none"> • Disabled (Initial value) • Enabled 	Sets whether or not to enable the power saving function. This item is not displayed when Celeron Processor 430 is installed.
CPU Halt Mode	Enhanced (Unchangeable)	Sets whether or not to enable the power saving function.
Enhanced Idle Power State	Disabled (Unchangeable)	Sets the CPU internal setting. This item is not displayed when Xeon Processor X3220 or Celeron Processor 430 is installed.
CPU Thermal Management	Enhanced (Unchangeable)	Sets the CPU internal setting.
Virtualization Technology	<ul style="list-style-type: none"> • Disabled (Initial value) • Enabled 	Sets whether or not to enable Virtualization Technology. This item is not displayed when Core2 Duo Processor E4600 or Celeron Processor 430 is installed.
NX Memory Protection	<ul style="list-style-type: none"> • Disabled (Initial value) • Enabled 	Sets whether or not to enable "execute disable bit function" of processor.
Adjacent Cache Line Prefetch	Enabled (Unchangeable)	Sets whether or not to enable the adjacent cache line prefetch.
Hardware Prefetch	Enabled (Unchangeable)	Sets whether or not to enable the CPU prefetch.

table: Items on the Advanced Processor Options Submenu

Item	Setting	Description
Core Multi-Processing	Enabled (Unchangeable)	Sets whether or not to enable the CPU multi core function. This item is not displayed when Celeron Processor 430 is installed.
Limit CPUID Functions	Disabled (Unchangeable)	Sets whether or not to limit CPUID expanded function or not. If the OS does not support expanded function, the system may not start.
CPU MC Status Clear	Next Boot (Unchangeable)	Sets the CPU Machine Check status.

7.2.8 PCI Configuration Submenu

Use this submenu to configure the PCI device.

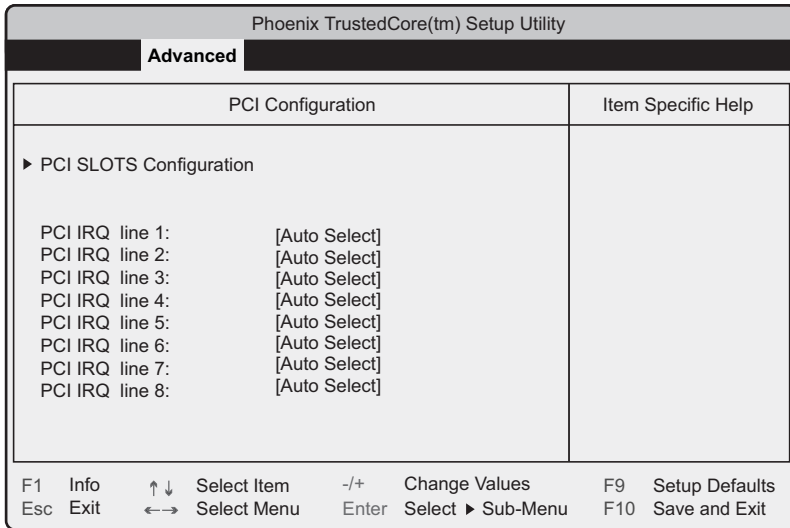


table: Items on the PCI Configuration Submenu

Item	Setting	Description			
PCI SLOTS Configuration	Configures the PCI slots. Press the [Enter] key to display the [PCI SLOTS Configuration] submenu window.				
<table border="1"> <thead> <tr> <th colspan="2">PCI Slot 1 Configuration</th> </tr> </thead> <tbody> <tr> <td>Option ROM SCAN</td> <td> <ul style="list-style-type: none"> Enabled (Initial value) Disabled </td> </tr> </tbody> </table>	PCI Slot 1 Configuration		Option ROM SCAN	<ul style="list-style-type: none"> Enabled (Initial value) Disabled 	Sets whether or not to initialize the extended ROM in each PCI slot.
PCI Slot 1 Configuration					
Option ROM SCAN	<ul style="list-style-type: none"> Enabled (Initial value) Disabled 				
<table border="1"> <thead> <tr> <th colspan="2">PCI Slot 2 Configuration</th> </tr> </thead> <tbody> <tr> <td>Option ROM SCAN</td> <td> <ul style="list-style-type: none"> Enabled (Initial value) Disabled </td> </tr> </tbody> </table>	PCI Slot 2 Configuration		Option ROM SCAN	<ul style="list-style-type: none"> Enabled (Initial value) Disabled 	
PCI Slot 2 Configuration					
Option ROM SCAN	<ul style="list-style-type: none"> Enabled (Initial value) Disabled 				
PCI IRQ Line 1 to 8	Auto Select (Unchangeable)	Sets PCI IRQ.			

7.2.9 Security Menu

The Security menu sets the security options.

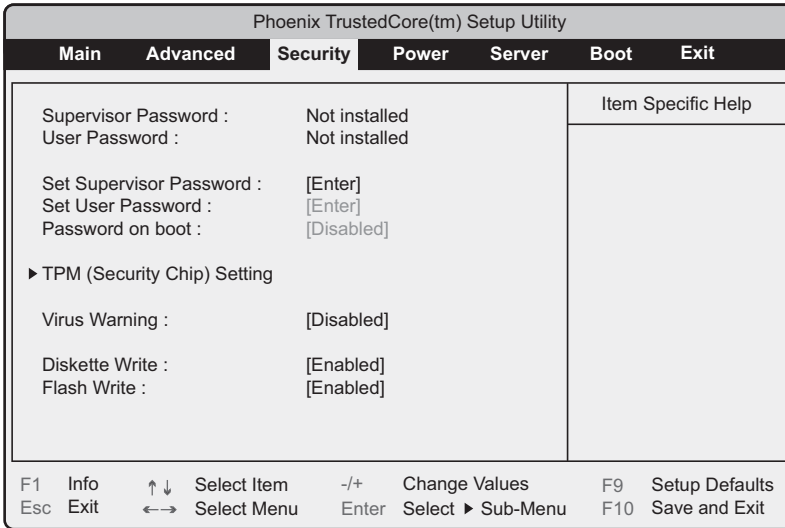


table: Items on the Security Menu

Item	Setting	Description
Supervisor Password		Displays whether or not the password (supervisor password) required for the setup is set. <ul style="list-style-type: none"> • Not Installed: The password is not set. • Installed: The password is set.
User Password		Displays whether or not the password (user password) required for using the server is set. <ul style="list-style-type: none"> • Not Installed: The password is not set. • Installed: The password is set.
Set Supervisor Password		Sets the supervisor password that is used for BIOS Setup security. Setting a supervisor password makes it necessary to enter the password in order to start the BIOS Setup Utility. Press the [Enter] key to display the password entry screen. Enter the supervisor password. For details, refer to "8.4.2 Security against Unauthorized Use" (→p.186).
Setup Password Lock	<ul style="list-style-type: none"> • Standard (Initial value) • Extended 	Sets the range of protection by the supervisor password. Supervisor Password must already be set.
Set User Password		Sets a user password. Setting a user password makes it necessary to enter the password in order to access this server. Supervisor Password must be specified. Press the [Enter] key to display the password entry screen. Enter the user password. For more details, refer to "8.4.2 Security against Unauthorized Use" (→p.186).

table: Items on the Security Menu

Item	Setting	Description
User Password Mode	<ul style="list-style-type: none"> • Standard (Initial value) • Keyboard 	<p>Sets automatic password entering for system start-up. This item is displayed when a Supervisor Password or User Password is set.</p> <ul style="list-style-type: none"> • Standard The password entry screen is displayed when the system is started. The system can be unlocked by entering the password. • Keyboard A password is not required. Keyboard and mouse are locked to prevent the operation. The system can be unlocked by entering the password on the keyboard and pressing the [Enter] key.
TPM (Security Chip) Setting	Sets TPM (Security Chip). Press the [Enter] key to display "7.2.10 TPM (Security Chip) Setting Submenu" (→p.156).	
Password on boot	<ul style="list-style-type: none"> • Disabled (Initial value) • Enabled 	<p>Sets whether or not to skip entering the password when the system is started.</p> <p>This item can be set only when a Supervisor Password is set.</p>
System Password Lock	<ul style="list-style-type: none"> • Standard (Initial value) • WOL SKIP 	<p>Sets whether or not to skip entering the password when the server is started up with Wakeup on LAN. This item is displayed when a Supervisor Password is set.</p>
Virus Warning	Disabled (Unchangeable)	<p>Sets whether or not to check if the boot sector of the hard disk drive has been changed since the previous system startup. If the boot sector is changed without a clear reason, it is necessary to scan the system for computer viruses with a virus detection program.</p>
Diskette Write	<ul style="list-style-type: none"> • Disabled • Enabled (Initial value) 	<p>Sets whether or not to allow writing on the floppy disk.</p>
Flash Write	<ul style="list-style-type: none"> • Disabled • Enabled (Initial value) 	<p>Sets whether or not to allow writing on the BIOS Flash ROM.</p>

7.2.10 TPM (Security Chip) Setting Submenu

Use this submenu to set the security options.

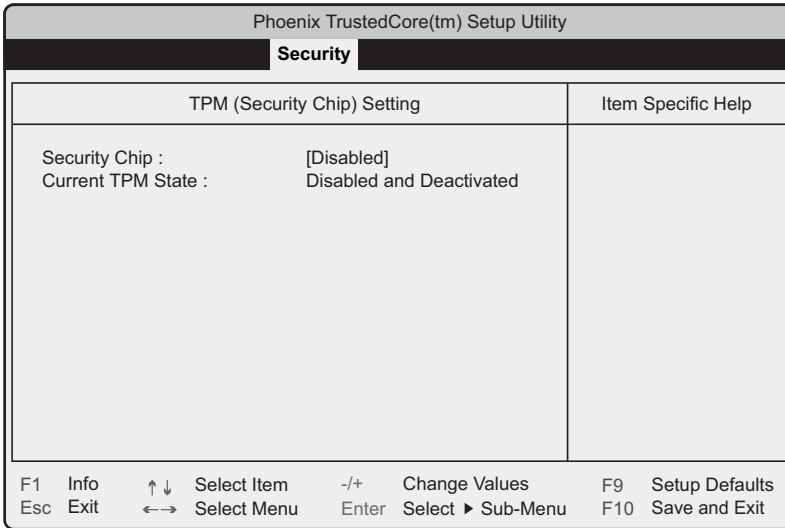


table: Items on the TPM (Security Chip) Setting Submenu

Item	Setting	Description
Security Chip	<ul style="list-style-type: none"> • Disabled (Unchangeable) • Enabled 	Switches the Trusted Platform Module on and off.
Current TPM State	Displays the status of the Trusted Platform Module.	
Change TPM State *1	<ul style="list-style-type: none"> • No Change (Unchangeable) • Enable&Activate • Disable&Deactivate • Clear 	Enables you to modify the status of the Trusted Platform Module using the BIOS.

*1: This item can be set when [Security Chip] is Enabled.

7.2.11 Power Menu

Use this submenu to configure power On/Off settings.

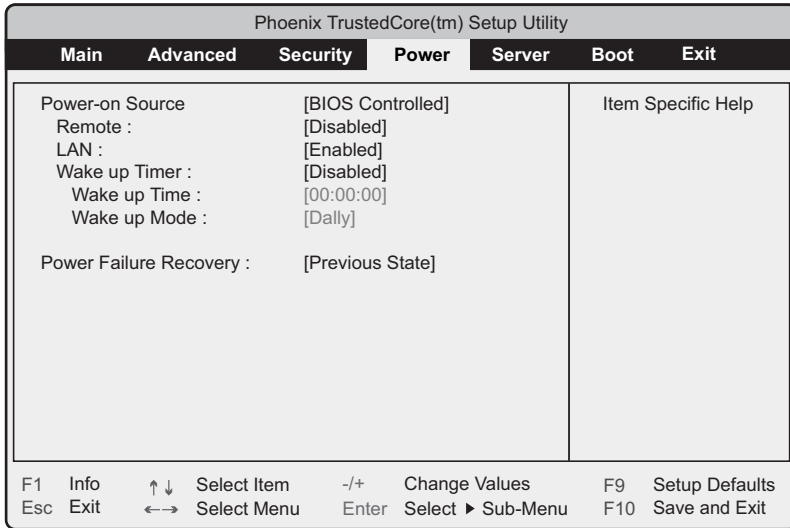


table: Items on the Power Menu

Item	Setting	Description
Power On Source	BIOS Controlled (Unchangeable)	Configures the power on setting.
Remote	Disabled (Unchangeable)	Sets if the power is turned on when the modem (connected to the serial port) receives a ring signal.
LAN	<ul style="list-style-type: none"> Disabled Enabled (Initial value) 	Sets whether or not to enable the power to be turned on via LAN.
Wake Up Timer	Disabled (Unchangeable)	Sets if the power is turned on at a certain time or after a certain time has passed. A separate program is necessary for setting startup time. Sets the following items if [Wake Up Timer] is set to "Enabled".
Wake Up Time	[00:00:00]	Sets the startup time when using [Wake Up Timer].
Wake Up Mode	Daily (Unchangeable)	Sets the startup mode when using [Wake Up Timer].
Wake Up Day	1 (Unchangeable)	This item can be set when [Wake Up Mode] is set to "Monthly".
Power Failure Recovery	<ul style="list-style-type: none"> Always On Always Off Previous State (Initial value) 	Sets to turn the power on or off after a temporary main power outage due to power interruption, etc. Note: ▶ For UPS scheduled operation, set to "Always On". Otherwise, the power may not be turned on at the specified time.

7.2.12 Server Menu

The Server menu sets the server options.

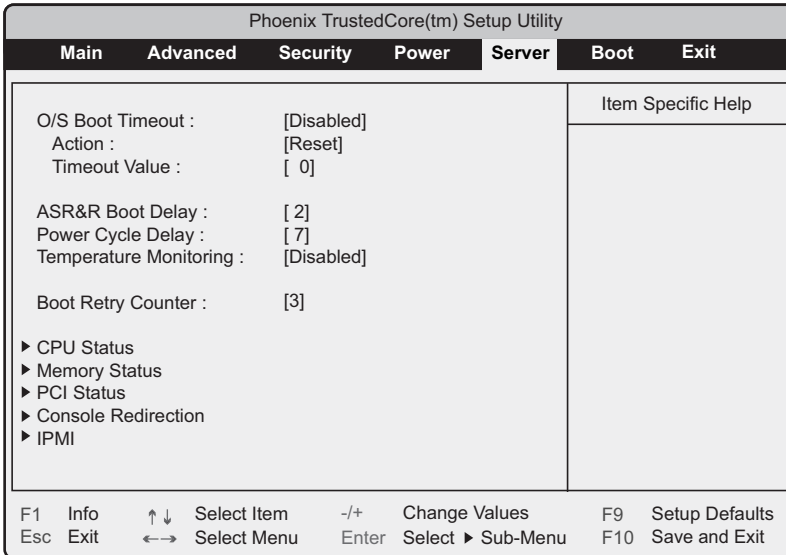


table: Items on the Server Menu

Item	Setting	Description
O/S Boot Time out	<ul style="list-style-type: none"> • Disabled (Initial value) • Enabled 	<p>Sets whether to enable or disable the [OS Boot Monitoring] function when ServerView is installed in the OS. When this function is enabled, the system automatically restarts if the startup of the OS is halted for some reason.</p> <p>The [OS Boot Monitoring] function can also be enabled or disabled from ServerView.</p> <p>Note:</p> <ul style="list-style-type: none"> ▶ If ServerView is not installed on the OS, be sure to set this item to "Disabled". When this function is enabled, the server may not operate as intended. For example, the power may automatically turn off, or the server may restart. ▶ If ServerView is installed in the OS, be sure to disable the [OS Boot Monitoring] function when starting up the system by inserting the PRIMERGY Startup Disc or DOS floppy diskette. If the system is started with this function enabled, the server may automatically turn off or restart improperly. ▶ When setting this function, see the "ServerView User's Guide" to fully learn about its specifications, in order to use it properly with the correct settings.

table: Items on the Server Menu

Item	Setting	Description
Action	<ul style="list-style-type: none"> Continue Reset (Initial value) Power Cycle 	Sets the operation when the OS does not boot successfully within the time set with the [Timeout Value] setting.
Timeout Value	<ul style="list-style-type: none"> 0 (Initial value) 1 to 100 	Sets the timeout period in minutes.
ASR&R Boot Delay	2 (Unchangeable)	Sets the standby time for startup after shutdown due to trouble (such as overheating) in minutes. The system restarts after the set standby time.
Power Cycle Delay	7 (Unchangeable)	Sets the time until the server is turned on after it is turned off.
Temperature Monitoring	Disabled (Unchangeable)	Sets if the server can be turned on when the temperature is not in its operating environment range (10 to 35°C).
Boot Retry Counter	<ul style="list-style-type: none"> 3 (Initial value) 0 to 7 	Sets the maximum number of retries to boot the operating system within the range of 0 to 7.
CPU Status	Sets whether or not to allow the use of the installed CPU. →"7.2.13 CPU Status Submenu" (p.159)	
Memory Status	Sets whether or not to allow the use of the installed memory slots. →"7.2.14 Memory Status Submenu" (p.160)	
PCI Status	Sets whether or not to allow the use of the installed PCI slot. →"7.2.15 PCI Status Submenu" (p.160)	
Console Redirection	Configures detailed settings for console redirection. →"7.2.16 Console Redirection Submenu" (p.161)	
IPMI	Configures detailed settings for IPMI. →"7.2.17 IPMI Submenu" (p.162)	

7.2.13 CPU Status Submenu

Use this submenu to set whether or not to allow the use of the installed CPU.

table: Items on the CPU Status Menu

Item	Setting	Description
CPU Status	Enabled (Unchangeable)	Sets whether or not to allow the use of the CPUs installed in CPU sockets.

7.2.14 Memory Status Submenu

Use this submenu to set whether or not to allow the use of the installed memory modules.

table: Items on the Memory Status Menu

Item	Setting	Description
DIMM-1A	Enabled (Unchangeable)	Sets whether or not to enable the use of the memory modules in memory slot 1A to 2B. If "Disabled" or "Failed" is displayed, the setting can be changed to "Enabled". When the setting value is returned to the initial value with the [F9] key, all memory slots are changed to "enabled". However, the memory slots that are not implemented at next reboot are changed to "Empty".
DIMM-2A	Empty (Unchangeable)	
DIMM-1B		
DIMM-2B		

7.2.15 PCI Status Submenu

Use this submenu to set whether or not to allow the use of the installed PCI slot.

table: Items on the PCI Status Submenu

Item	Setting	Description
Slot 1	Empty (Unchangeable)	Sets whether or not to enable the use of the PCI cards in PCI slots 1 and 2. If "Failed" is displayed, the setting can be changed to "Enabled". When the setting value is returned to the initial value with the [F9] key, all PCI slots are changed to "enabled". However, the PCI slots that are not implemented at next reboot are changed to "Empty".
Slot 2		

7.2.16 Console Redirection Submenu

Use this submenu to configure detailed settings for console redirection.

table: Items on the Console Redirection Submenu

Item	Setting	Description
Console Redirection	<ul style="list-style-type: none"> • Disabled (Initial value) • On-board COM A 	<p>Sets whether to enable or disable console redirection.</p> <p>When "On-board COM A" is set, the following items are displayed. Set each item.</p>
Baud Rate	<ul style="list-style-type: none"> • 300 • 1200 • 2400 • 9600 (Initial value) • 19.2K • 38.4K • 57.6K • 115.2K 	Sets the baud rate to be used for console redirection.
Console Type	<ul style="list-style-type: none"> • VT100 • VT100,8bit • PC-ANSI,7bit • PC-ANSI • VT100+ (Initial value) • VT-UTF8 	Sets the console type for console redirection.
Flow Control	<ul style="list-style-type: none"> • None • XON/XOFF • CTS/RTS (Initial value) 	Sets the flow control for console redirection.
Continue C.R. after POST	<ul style="list-style-type: none"> • Off • On (Initial value) 	Sets the range of use for console redirection.

7.2.17 IPMI Submenu

Use this submenu to configure IPMI.

Phoenix TrustedCore(tm) Setup Utility	
Server	
IPMI	Item Specific Help
SM Error Halt : [Enabled] iRMC Time Sync : [Enabled] Clear System Event Log : [Disabled] Event Log Full Mode : [Overwrite]	
Date Format to show [MM DD YYYY] Date Separator [/]	
▶ System Event Log ▶ System Event Log (list mode) ▶ Realtime Sensor Data ▶ LAN Settings ▶ IPMI Status	
F1 Info ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit	

table: Items on the IPMI Submenu

Item	Setting	Description
SM Error Halt	<ul style="list-style-type: none"> Disabled Enabled (Initial value) 	Sets the procedure for dealing with an error in the fan or temperature sensor.
iRMC Time Sync	Enabled (Unchangeable)	Synchronizes the internal clock of the integrated Remote Management (iRMC) with the system time.
Clear System Event Log	Disabled (Initial value)	Sets whether or not to clear the event log.
Event Log Full Mode	Overwrite (Unchangeable)	Sets whether or not to overwrite the event log when space available for it becomes full.
Date Format to show	[MM DD YYYY] (Unchangeable)	Sets how to display the date format when referring to the system event logs.
Date Separator	[/] (Unchangeable)	Sets how to display the date separator when referring to the system event logs.
System Event Log	Displays the system event logs. Press the [Enter] key to display the system event log window. Display previous and subsequent entries by using the [+] or [-] key.	
System Event Log (list mode)	Refer to the system event logs. Press the [Enter] key to display the system event log window. A list of the system event logs is displayed.	
Realtime Sensor Data	Checks the sensor information. Press the [Enter] key to display the Realtime Sensor Data window.	

table: Items on the IPMI Submenu

Item	Setting	Description
LAN Settings		Configures the LAN settings of the Remote Management Controller port. This setting is required when performing the remote operation using RemoteControlService. Press the [Enter] key to display the LAN Settings window.
Service LAN	Enabled (Unchangeable)	Sets whether or not to enable the Remote Management Controller port.
Service LAN Port	Service (Unchangeable)	Sets whether or not to use the LAN port as Service LAN port.
DHCP	<ul style="list-style-type: none"> • Disabled (Initial value) • Enabled 	Sets whether or not to obtain LAN IP address of the Remote Management Controller port from the DHCP server. The IP address cannot be set when this item is set to "Enabled".
Local IP Address	[000.000.000.001]	Enter an IP address, subnet mask, and default gateway for the Remote Management Controller port.
Subnet Mask	[000.000.000.000]	
Gateway Address	[000.000.000.000]	
IPMI Status		Displays IPMI information. Press the [Enter] key to display the IPMI Status window.

7.2.18 Boot Menu

Use this submenu to set the priority order of the OS boot.

The CD device name and HDD device name that are displayed in the window vary depending on the installed devices.

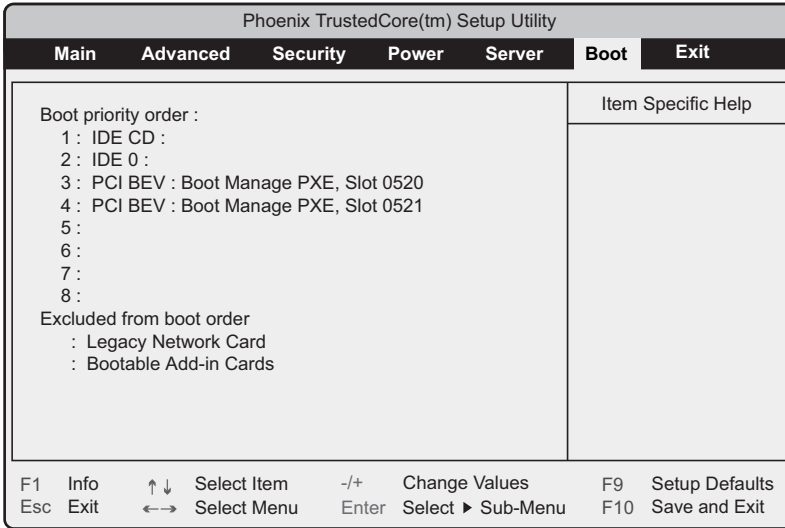
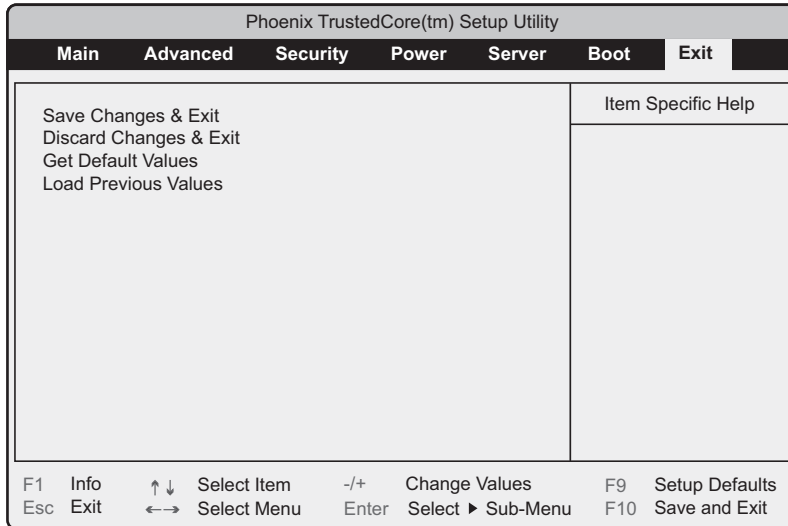


table: Items on the Boot Menu

Item	Description
Boot priority order	Boot device list. Boots in the list order. Also, the priority order that is selected can be changed by using the [+] or [-] key one by one.
Excluded from boot order	The list of the devices that are excluded from the boot device list. The system cannot be booted via the device on the list. When booting the system from a device on the list, press the [X] key selecting the device to be booted, and add the device to the Boot Priority Order list.

7.2.19 Exit Menu

This menu exits the BIOS Setup Utility.



Select the option for handling BIOS settings when exiting the utility.

table: Items on the Exit Menu

Item	Description
Save Changes & Exit	Saves the current settings and exits the BIOS Setup Utility. The server restarts after exiting.
Discard Changes & Exit	Exits the BIOS Setup Utility without saving the current settings. The previously saved settings remain valid.
Get Default Values	Returns to the server's default values for all items. However, [Local IP Address], [Subnet Mask], and [Gateway Address] of the [LAN Settings] in the "7.2.17 IPMI Submenu" (→p.162) are not reset.
Load Previous Values	Sets all items to the values before the last changes by reading from CMOS. Current setting values are discarded. However, all of the [LAN Settings] items in the "7.2.17 IPMI Submenu" (→p.162) are not reset.



- ▶ When selecting [Get Default Values] and returning the setting values to default, pay attention to the following.
 - Move the USB floppy disk drive to the [Excluded from boot order] field in "7.2.18 Boot Menu" (→p.164). When booting via USB floppy disk drive is required, set it again to the original position of the [Boot priority order].
 - For the SAS model, check that the setting values of [SATA RAID Enable] and [SATA AHCIEnable] are set to [Disabled] in "7.2.6 Advanced System Configuration Submenu" (→p.151) under the Advanced menu. When the items are set to [Enabled], the system may not be booted.

Chapter 8

Operation and Maintenance

8

This chapter explains the operations necessary after starting to use this server as well as daily care and maintenance.

8.1	Daily Maintenance	168
8.2	Troubleshooting	170
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8.1 Daily Maintenance

This section explains how to check the status of the operating server, as well as how to perform daily maintenance.

● Information for PRIMERGY

For the latest information on PRIMERGY, update modules, drivers and the software, refer to the Fujitsu PRIMERGY website.

<http://www.fujitsu.com/global/services/computing/server/ia/driver/>

Regarding BIOS and firmware, contact to Fujitsu Support Office. Refer to the following website.

http://www.fujitsu.com/global/contact/computing/PRMRGY_index.html

8.1.1 Checking the Server Condition

Use the status LED or server monitoring tool to check the server status.

■ Checking each LED

This server is equipped with LEDs that display various hardware conditions.

Check the server status via each LED after starting the server. For positions and functions of each status LED, refer to "1.3 Component Names and Functions" (→p.22).

■ Server monitoring tool (ServerView)

ServerView is software to monitor that the server hardware is in a normal state to protect important server resources. When using ServerView, the server hardware is monitored all the time. If an error that could cause trouble is detected, the administrator is notified in real-time for early detection. This allows quicker response to system errors and prevents the error from becoming a serious problem.

For an overview and installation of ServerView and other high reliability tools, refer to "1.2.2 High Reliability Tools" (→p.19) and "Chapter 5 High Reliability Tools" (→p.109).

8.1.2 Cleaning

Clean the server and optional devices periodically to prevent failures.



WARNING



- Before cleaning, turn off the server and unplug the power cables from the outlets. Also power off peripherals and disconnect them from the server. Failure to do so may cause electric shock (→"1.4.3 Turning Off the Server" (p.31)).



- Do not use any flammable aerosol cleaners. Doing so may damage the server as well as cause fire.

■ Cleaning the server

Wipe with a soft, dry cloth. For stains that do not come off with a dry cloth, wipe with a cloth lightly dampened with a mild detergent. Once the stain has been removed, wipe off any remaining detergent with a cloth dampened with water. When wiping the server, be sure that no moisture enters the server. Do not use solvents. Use a mild detergent only. Otherwise, the server may be damaged. Use a vacuum cleaner periodically to prevent dust buildup in ventilation holes.

POINT

- ▶ In dusty environments, dust accumulates up on the front and rear panels of the server over short periods. Install the server in a different location to avoid failures.

■ Cleaning the server interior

In dusty environments, dust accumulates on the server. Dust deposits may cause a server failure, fire, or electric shock. To keep the server in good condition, use a vacuum cleaner periodically to remove dust deposits.

POINT

Cleaning components

- ▶ CPUs: Dust deposits must be removed because they will impair the cooling performance.
- ▶ Fans: Remove dust from and around the fans.
- ▶ Memory/expansion cards: Remove dust between memory modules and between expansion cards. Remove dust from the connector before adding a memory module or an expansion card.
- ▶ Internal hard disk units/Internal DVD-ROM unit: Remove dust deposits from units and devices. Tape devices are particularly susceptible to dust and may cause failures. Install them in a clean environment.



WARNING



Electric Shock • Do not disassemble the PSU when cleaning the server interior. Doing so may cause failures or electric shock.

IMPORTANT

- ▶ Be careful when removing components such as CPUs, memory modules, or hard disk units. Be sure to install parts and cables in the original position.
- ▶ Leaving brushed off or blown off dust in the server can cause a failure. Be sure to remove it completely.

■ Optional devices

For cleaning optional devices, refer to the manual for each device.

8.2 Troubleshooting

This section explains the resolutions when the server is not running properly or when error messages are displayed.

For each situation, refer to the following.

- Hardware problems.
→"8.2.1 Hardware Troubleshooting" (p.170)
- Error messages.
→"8.2.2 Error Messages" (p.173)
- Software problems.
→"8.2.3 Software Troubleshooting" (p.179)

If the problem is not resolved after performing the following troubleshooting, contact an office listed in the "Contact Information" of the "Start Guide".

When contacting an office listed in the "Contact Information" of the "Start Guide", "8.8.1 Contacting Maintenance Support" (→p.195) and collect the required information.

● Information for PRIMERGY

For the latest information on PRIMERGY, update modules, drivers and the software, refer to the Fujitsu PRIMERGY website.

<http://www.fujitsu.com/global/services/computing/server/ia/driver/>

Regarding BIOS and firmware, contact to Fujitsu Support Office. Refer to the following website.

http://www.fujitsu.com/global/contact/computing/PRMRGY_index.html

8.2.1 Hardware Troubleshooting

This section explains hardware related troubleshooting. If the server does not operate properly, an error message appears in the display, or if a failure is suspected, check the following.

For optional devices, refer to the manual included with the optional device.

■ Server

● The server does not power on, or the power LED on the front of the server does not light up.

Check to see whether the power cable is properly connected to the outlet.

For instructions on connecting the power cable, refer to "Start Guide".

● The access LED does not light up

The server may be damaged. Contact an office listed in the "Contact Information" of "Start Guide".

Before contacting an office listed in the "Contact Information" of "Start Guide", refer to "8.8.1 Contacting Maintenance Support" (→p.195).

- **An error message is displayed.**

Refer to "8.2.2 Error Messages" (→p.173).

- **When an expansion card is added, other expansion cards or onboard devices are not recognized.**

Reinstall the drivers for the expansion cards or onboard devices that are not recognized.

- **A temperature warning is output to the hardware event log and OS event log, or ServerView issues a notification of a temperature warning such as by a popup message.**

The above log is output or the above notification is issued by ServerView when the ambient temperature is within 30°C to 35°C, which is near the upper limit of the temperature boundaries (10°C to 35°C). This is to notify the administrator before the ambient temperature actually exceeds the range of the temperature boundaries.

■ Display

- **The display does not power on.**

Check to see whether the power cable of the display is properly connected to the outlet. For details, refer to "Start Guide" or the manual of the display.

- **The display is distorted at Linux shutdown.**

Although the display might be distorted when the system shuts down in the Linux environment, shutdown is performed normally. The system is not effected.

- **Nothing is displayed on the screen.**

- Check to see whether the display cable is connected properly.
If it is not connected, turn the server off and then connect the cable. For the connection location, refer to "Start Guide".
- Check that the brightness volume and contrast volume of the display are adjusted correctly. If they need to be adjusted, perform the necessary adjustments.
For details, refer to the manual of the display.
- There may be an error in the system area of the memory. Contact an office listed in the "Contact Information" of the "Start Guide".

- **Typing the keyboard does not display any characters, or the mouse cursor does not move.**

Check to see whether the keyboard and mouse are connected properly. If they are not connected or you replace them yourself, turn the server off and then connect the cables to the server. For the connection location, refer to "Start Guide".

● **The screen shakes.**

If a device that produces a strong magnetic field such as a television or speaker is near the display, place them further away from the display.

The display may also shake if a nearby cell-phone receives a call. Do not use a cell-phone near the display.

● **The screen display is distorted.**

If a 3D program is executed on Windows Server 2003, the screen display may become distorted or the 3D program may terminate abnormally. If this occurs, set Color quality in screen properties to anything other than True Color (32 bits).

■ **CD/DVD drive**

● **Cannot read data.**

- Check to see whether the CD/DVD is inserted properly.
If it is not inserted, correctly insert the CD/DVD so that the label is facing up.
- Check to see whether the CD/DVD is not dirty.
If it is dirty, wipe it with a soft, dry cloth.
- Check to see whether the CD/DVD is not scratched or bent.
If scratched or damaged, replace the CD/DVD.

● **The unit does not operate properly.**

Check to see whether the internal cable is connected properly.
If it is not connected, correctly connect the internal cable.

■ **System fan**

The server has five system fans. Contact an office listed in the "Contact Information" of "Start Guide" when a system fan fails.

● **The system fan cable is disconnected.**

Reconnect the fan cable to the connector with the corresponding code number.
→"1.3.4 Baseboard" (p.26)

■ **SCSI devices**
(For connecting an external SCSI optional device using SCSI card)

● **The unit does not operate properly.**

- Check to see whether the internal cable is connected properly.
If it is not connected, correctly connect the cable. For setting procedures, refer to "6.7.1 Connecting an External SCSI Option" (→p.140).
- Check to see whether the jumper pins are set properly. If not, set the jumper pins correctly.
- Check to see whether the SCSI IDs are set properly, and the terminator is connected properly.
If they are not set or connected properly, correct the SCSI ID settings and terminator connection.

8.2.2 Error Messages

This section explains the error messages for this server.

■ POST error messages

This section explains error messages of Power On Self Test: a device check performed during the server startup (POST).

If an error occurs during POST, the following messages are displayed.

table: List of POST error messages

Message	Description
Failure Fixed Disk	The SATA device is abnormal. Check that the SATA hard disk is installed properly. If the message still appears after checking, the hard disk must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Stuck Key	A Keyboard error has occurred. Remove objects, if any, that are pressing against any keys on the keyboard. Check to see whether the keyboard is connected properly. If the message still appears even after the server has been restarted, replace the keyboard. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Keyboard error	
Keyboard controller error	A Keyboard controller error has occurred. Remove objects, if any, that are pressing against any keys on the keyboard. Check to see whether the keyboard is connected properly. If the message still appears, replace the keyboard. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
System RAM Failed at offset: *****h	A memory error has occurred. Turn the server off and check that the memory modules are installed properly. If the message appears even after the server is turned on again, check the error log and replace the memory modules (→"6.3 Installing Memory Modules" (p.122)). If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Shadow Ram Failed at offset: *****h	
Extended RAM Failed at address line: ****h	
Memory type mixing detected.	The installed composition of the memory is wrong. If the message still appears even after proper installation, replace the memory modules (→"6.3 Installing Memory Modules" (p.122)). If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Memory decreased in Size	A memory error has occurred. Accessible memory capacity has become smaller than installed memory capacity due to a memory module error. Check the error log and replace the defective memory module (→"6.3 Installing Memory Modules" (p.122)). If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Non Fujitsu Siemens Memory Module detected - Warranty restricted!	A memory error has occurred. This message appears when using memory module other than Fujitsu products. Check to see that the BIOS Setup Utility settings are correct (→"7.2 BIOS Setup Utility" (p.143)). If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".

table: List of POST error messages

Message	Description
System battery is dead - Replace and run SETUP	A battery error has occurred. Contact an office listed in the "Contact Information" of "Start Guide".
System CMOS checksum bad - Default configuration used	A CMOS setting error has occurred. Correct the current set value with the BIOS Setup Utility or restore the settings at the time of purchase. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
System timer error	A system clock error has occurred. Turn the server off and turn it back on. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Real time clock error	A Real Time Clock (RTC) error has occurred. Enter the correct date and time in the "7.2.2 Main Menu" (→p.146) of the BIOS Setup Utility. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Check date and time settings	A date and time error has occurred. Enter the correct date and time in the "7.2.2 Main Menu" (→p.146) of the BIOS Setup Utility. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Previous boot incomplete - Default configuration used	POST is not completed during previous booting. Be sure to perform the following operation. Failure to do so may result in the OS not starting or the server not operating correctly. <ol style="list-style-type: none"> 1. Start the BIOS Setup Utility. 2. Select [Save Changes & Exit] in the [Exit] menu and press the [Enter] key. The message "Save configuration changes and exit now?" appears. 3. Select [Yes], and press the [Enter] key. The BIOS Setup Utility closes and the server restarts.
CPU had been changed - Run SETUP	CPU has been changed. Check that the CPUs are installed properly. If the message appears even after a correct installation, the CPU or baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
CPU mismatch detected	CPU frequency has been changed. Check that the correct CPUs are installed. If the message appears even after a correct installation, update the BIOS by using the BIOS Update Tool provided with the CPU. If the message still appears, the CPU or baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Available CPUs do not support the same bus frequency- System halted!	
Baseboard Management Controller Error	A BMC error has occurred. Turn the server off and unplug the power cables from the server. Turn the server back on. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
System cache error - Cache disabled	A system cache error has occurred. Turn the server off and turn it back on. If the message still appears, check the error log and replace the CPU if it is at fault. Or the baseboard must be replaced. Contact an office listed in the "Contact Information" of the "Start Guide"
Verify CPU Frequency selection in Setup	The CPU is abnormal. Turn the server off and turn it back on. If the message still appears, check the error log and replace the CPU if it is at fault. Or the baseboard must be replaced. Contact an office listed in the "Contact Information" of the "Start Guide"

table: List of POST error messages

Message	Description
CPU runtime error (IERR#) detected	An installed CPU error has occurred. Check the error log and replace the CPU. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Uncorrectable memory error	A memory error has occurred. Check the error log and replace the defective memory module (→"6.3 Installing Memory Modules" (p.122)). If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Memory configuration has changed - Run SETUP	A memory error has occurred. Memory size has been changed since the previous startup. Check the error log and replace the defective memory module (→"6.3 Installing Memory Modules" (p.122)). If the message still appears, contact an office listed in the "Contact Information" of "Start Guide".
No usable system memory.	A memory error has occurred. No memory is available in the system. Check the error log and replace the defective memory module (→"6.3 Installing Memory Modules" (p.122)). If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide". After the replacement, activate the memory in BIOS setup.
Memory module disabled! This module is no longer available for the operating system.	A memory error has occurred. Turn the server off and check that the memory modules are installed properly. If the message appears even after the server is turned on again, check the error log and replace the memory modules (→"6.3 Installing Memory Modules" (p.122)). If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
No usable CPU	A CPU error has occurred. Contact an office listed in the "Contact Information" of "Start Guide".
Patch for installed CPU not loaded. Please run the bios flash update diskette.	Check that the correct CPU is installed. If the correct CPU is installed and the message still appears, the CPU or baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
CPU disable! CPU is no longer available for the operating system.	A CPU error has occurred. Contact an office listed in the "Contact Information" of "Start Guide".
Invalid System Configuration Data	A system configuration error has occurred. Check that the system configuration is supported. If the message still appears even though the configuration is supported, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Resource Conflict	System resources (IRQs, DMA channels, and I/O port addresses) conflict between an onboard device and an expansion card. Review the system resource settings in the BIOS Setup Utility. If the message still appears, contact an office listed in the "Contact Information" of "Start Guide".
IRQ not configured	The IRQ settings of the onboard device or the expansion card are not set. Check and revise the settings on the BIOS Setup Utility. If the message still appears, replace the expansion card. If the message still appears, contact an office listed in the "Contact Information" of "Start Guide".

table: List of POST error messages

Message	Description
Expansion ROM not initialized	A PCI expansion ROM initialization error has occurred. Check the expansion cards or the devices displayed as initialized on the screen, and replace the failed card. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Allocation error static node #	The onboard device or expansion card cannot be used. Replace the device or expansion card. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
Baseboard Management Controller has detected an error	A baseboard error has occurred. Check the error log and replace the relevant option.
iRMC reports sensor status: CRITICAL temp	A temperature error has occurred. Check the system environment. If the message still appears, check the error log and replace the components in the relevant section. Contact an office listed in the "Contact Information" of "Start Guide".
iRMC reports sensor status: WARNING temp	
iRMC reports sensor status: CRITICAL Voltages	A voltage error has occurred. Turn the server off and unplug the power cable from the outlet. Turn the server back on. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
iRMC reports sensor status: CRITICAL Battery	Voltage of the battery is abnormal. Turn the server off and unplug the power cable from the outlet. Turn the server back on. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
iRMC reports sensor status: WARNING Battery	
iRMC reports sensor status: CRITICAL FAN <i>n</i> SYS	A system fan <i>n</i> error has occurred. Check for hooked objects that hinders system fan rotation. If the message still appears, the system fan or baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
iRMC reports sensor status: CRITICAL FAN <i>n</i> PSU	A PSU fan <i>n</i> error has occurred. Check for hooked objects that hinders PSU fan rotation. If the message still appears, the PSU or baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
PCI system error BUS/DEVICE/FUNCTION <i>nnmh</i>	The PCI or memory module is abnormal. Replace the PCI card. If the message still appears after replacement, the baseboard or CPU must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
iRMC Controller Error	The iRMC controller is abnormal. After checking that there is no trouble in the system event log, turn the server's power off, and turn it on again 10 seconds later. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of "Start Guide".
PCI Express link width degraded	The PCI Express card is abnormal. Check that the PCI Express card is properly installed. If it is properly installed and the message still appears, replace the PCI Express card. Nevertheless, if the message still appears, the baseboard or CPU must be replaced. Contact an office listed in the "Contact Information" of the "Start Guide".

table: List of POST error messages

Message	Description
Operating system not found	The OS used for start up cannot be found. Check that an incorrect floppy disk is not set in the floppy disk drive, the device is properly recognized during POST, and the cables are properly connected. Also, check the setting value in "7.2.18 Boot Menu" (→p.164) in the BIOS Setup Utility. If the message still appears, and there is no trouble, the baseboard must be replaced. Contact an office listed in the "Contact Information" of the "Start Guide".
Server Management Configuration NVRam Bad - defaults loaded!	The contents of NVRam are abnormal. Correct the current settings with the BIOS Setup Utility or turn the settings back to the default. When the correct setting values are avoided by Server Management Tools, restore it. If the message still appears, the baseboard must be replaced. Contact an office listed in the "Contact Information" of the "Start Guide".
System Management Configuration changed	The hardware configuration has changed or it is abnormal. Ignore this message when the message appears after the hardware configuration has changed. Otherwise, check the connection status of the cables, etc. if the connection status is correct and the message still appears, the component must be replaced. Check for the failed part in the system event log and contact an office listed in the "Contact Information" of the "Start Guide".

■ Server management tools error messages

The following error messages may appear while executing Server Management Tools. Perform the corresponding resolution listed in the table. If messages other than the following are displayed, contact an office listed in the "Contact Information" of the "Start Guide".

table: List of Server Management Tools Error Messages

Message	Description
Write protect error writing drive A. Abort, Retry, Fail?	The inserted floppy disk is write-protected. Disable the write-protect, and then press the [R] key.
Not ready writing drive A. Abort, Retry, Fail?	The floppy disk is not inserted into the floppy disk drive. Insert the proper floppy disk ("Server Management Tools" disk), and then press the [R] key.
ERROR:Fail to create data file.	<p>The following are possible causes. Check the floppy disk status again.</p> <ul style="list-style-type: none"> The floppy disk is not inserted into the floppy disk drive. Insert the proper floppy disk, and then retry. The floppy disk is write-protected. Disable the write-protect and retry. The floppy disk contains abnormal contents. Create the "Server Management Tools" disk again. If this occurred while recovering BIOS information, configure the information using the BIOS Setup Utility. Then store the BIOS information.
ERROR:Fail to write 1st CMOS data into data file. nn	
ERROR:Fail to write 2nd CMOS data into data file. nn	
ERROR:Fail to write ESCD data into the data file. nn	
ERROR:Fail to write SEEPROM data into the data file. nn	
ERROR:Fail to open data file.	The file for recovering the BIOS information does not exist on this floppy disk. Insert the floppy disk on which the BIOS information was stored, and then retry.

table: List of Server Management Tools Error Messages

Message	Description	
ERROR:Fail to write 1st CMOS data into system. <i>nn</i>	The following are possible causes. Check the floppy disk status again. <ul style="list-style-type: none"> • The floppy disk is not inserted into the floppy disk drive. Insert the proper floppy disk, and then retry. • A different model or an unsupported version of BIOS information. Insert the proper floppy disk, and then retry. • The floppy disk contains abnormal contents. Create the "Server Management Tools" disk again. If this occurred while recovering BIOS information, configure the information using the BIOS Setup Utility. Then store the BIOS information. 	
ERROR:Fail to write 2nd CMOS data into system file. <i>nn</i>		
ERROR:Fail to write ESCD data into system file. <i>nn</i>		
ERROR:Fail to write SEEPROM data into system. <i>nn</i>		
Other messages	Contact an office listed in the "Contact Information" of the "Start Guide".	

8.2.3 Software Troubleshooting

This section explains software-related troubleshooting. For troubles during OS installation or system operation, refer to the following contents.

■ Trouble at a ServerStart startup

● After a boot from PRIMERGY Startup Disc, nothing is displayed on the screen.

This situation may occur if the hard disk drive still contains the previous information. In that case, this situation may occur even when insert Windows Server 2003 Installation CD-ROM.

In such a situation, physically format the hard disk drive to delete the previous information and start up ServerStart.

For physical formatting for hard disk drive, refer to the manual on Array Controller Document & Tool CD.

■ Error messages during installation

The following error messages may appear during installation using ServerStart. Observe the corrective action against the relevant error.

● "WzDiskAdmin: System Error!, Last Error: The device is not ready." appears

Optional SCSI/SAS devices (e.g., hard disk cabinet, DAT unit) may be connected.

Disconnect the optional SCSI/SAS devices and perform installation again. Connect the optional devices after the installation completes.

● "Operating System not found" appears when the system restarts from the CD/DVD after file copy

The following factor may be possibly root cause.

- The Active flag is selected.

● "Missing Operating System" appears during installation

The installation partition size may be too large. Specify the installation partition size correctly. For details on the installation partition size, refer to "2.3.1 Installation Partition Size" (→p.43).

● "Error 1920. Service (PXE Services) failed to start" appears during preconfigured installation

The system installed with the preconfigured settings (PXE server) may not be connected to the network. Check the LAN cable connection and click [Rerun].

■ Application software which uses tftp client function (tftp.exe) does not operate properly

For the system on which Windows Server 2003 is installed, since the tftp client function (tftp.exe) is not installed by default, and application software which uses the tftp client function (tftp.exe) does not operate properly. To use the tftp client function (tftp.exe), install "tftp.exe" from the OS installation disc according to the following procedures.

- 1** Insert the OS installation disc into the CD/DVD drive.
The OS installation disc must be any of Windows Server 2003 CD that has applied SP1, Windows Server 2003 x64 DVD or Windows Server 2003 R2 Disc 1 CD-ROM.
- 2** Start the Command Prompt and move to the i386 folder of the CD/DVD drive.
- 3** Execute the following command to extract "tftp.exe" in the "%Systemroot%\system32" folder.

```
[CD/DVD drive]:\i386>expand -r:tftp.exe TFTP.EX_%Systemroot%\system32
```
- 4** Confirm that "tftp.exe" exists in the "%Systemroot%\System32" folder.

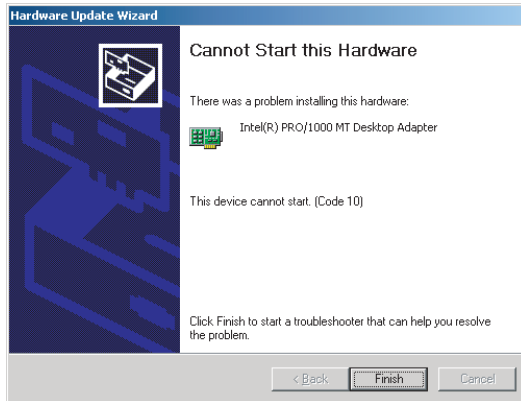
■ Error window appears after installing or uninstalling ServerView (For Windows Server 2003)

For Windows Server 2003 with Service Pack 1 applied, the following message may appear on restarting after installing/uninstalling ServerView. The operation will run properly. Click [Close Message] to close the message.

```
In order to protect the computer, this program is terminated by
Windows. Name: SNMP Service
```

■ Error window appears after LAN driver installation (For Windows Server 2003)

The following window may appear when the installation of the LAN driver to the [Ethernet controller] under [Other devices] starts.



This error results from that the LAN driver for the network adapter recognized immediately after the OS installation is not updated.

Clicking [Finish] in this window displays the [Help and Support Center] window. Click [X] to close this window. The "!" mark is displayed at the LAN device name in Device Manager. The device names are displayed properly when all the LAN drivers are installed and the system is restarted.

■ LAN operation fails or error message appears during LAN driver installation

A conflict may have occurred between system resources including the LAN and other expansion cards. Delete all the LAN drivers and check that conflicts between system resources do not exist. Then, restart the system and reinstall the LAN drivers again.

■ Event log errors after installation

After installation, the following events may be displayed in Event Viewer. Check and perform the corrective action against the relevant event.

table: List of Event Log Errors That May Occur after Installation

ID	Description	Cause and corrective action
62	This computer is a domain PDC at the root of forest. Use the net command "net time /setsntp:<server name>" to configure it for synchronization from an external time source.	Cause: An NTP was selected as a component. Corrective action: ServerStart cannot configure the NTP server due to the absence of items for specifying it. After OS installation, perform the following procedure to specify the time server. <ol style="list-style-type: none"> 1. Start SNTP server operation on another machine. For example, the SNTP server address is <172.22.78.246>. 2. Enter the following at a Command Prompt. net time /setsntp:172.22.78.246 w32tm -s 172.22.78.246

table: List of Event Log Errors That May Occur after Installation

ID	Description	Cause and corrective action
1000	The user or computer name cannot be identified. The return value is "1722".	Cause: The primary DNS server address may be invalid or the server cannot be accessed. Corrective action: Perform the following procedures to correct the DNS address in Internet protocol (TCP/IP) properties. <ol style="list-style-type: none"> 1. Right-click [My Network] and click [Properties]. 2. Right-click [Local Area Connection] and click [Properties]. 3. Click [Internet Protocol (TCP/IP)] and click [Properties]. 4. Enter the correct DNS address in the [Primary DNS server] box.

■ Cannot collect the memory dump

If the memory dump file cannot be created, perform the following procedures.

● Correcting the settings

If the memory dump cannot be collected, check the settings of the paging file and memory dump file. For setting procedures, refer to "4.1 Memory Dump/Paging File Setting" (→p.70).

● Collecting memory dump to other than the system drive

If the memory dump is set to be collected to the system drive (C:\), change the settings so that the memory dump can be saved to a drive other than the system drive. For setting procedures, refer to "4.1 Memory Dump/Paging File Setting" (→p.70). If only the system drive exists, or if there is no free space in any of the drives, perform one of the following:

- Adding a hard disk unit
- Replacing with a higher-capacity hard disk unit

● Reducing the installed memory to collect the memory dump

There must be enough free disk space that matches the size of the installed memory; therefore, reduce the installed memory to a collectable size. Check the memory dump settings when changing the installed memory size.

For setting procedures, refer to "4.1 Memory Dump/Paging File Setting" (→p.70).

● Changing the write type of the debugging information

If the memory dump cannot be collected, select a write type of debugging information within the range of free space of the volume size. If the above does not provide a solution, try increasing the size of the hard disk or adding an additional hard disk unit. For setting procedures, refer to "4.1 Memory Dump/Paging File Setting" (→p.70).

■ Restoring the system

In the event where the system file, system configuration, or environment changes during startup are corrupted, use the repair information stored on the repair disk created at the installation to restore the system. For restoration procedures, refer to "8.6.1 For Windows Server 2003" (→p.192).

■ SNMP service startup fails

If the Simple Network Management Protocol (SNMP) is installed, but has not started, perform the following procedures to start the service.

- 1** Click [Start] – [Computer Management].
- 2** Select [Services] on the [Services and Applications] menu.
- 3** On the details, select [SNMP Service].
- 4** Select [Start] on the [Action] menu.

POINT

- ▶ To have the service automatically start each time the OS starts, double-click [SNMP Service] on the details, and select [Automatic] for the [Startup type] setting of the [SNMP Service Properties] window.

■ Time display in Linux OS environment

● Difference in time between the OS and the hardware clock

Since the software clock on OS is employed but not the hardware clock functioned in the server for time display in Linux environment, time -lag may occur between the OS and the hardware clock.

When time precision is required on OS, it is recommended to use the NTP service to periodically correct the time displayed on the OS.

● Changing the time settings for the OS and hardware clock

In a Linux environment, the time displayed on the OS (the software clock value on the OS) is written to the hardware clock in the server when the OS is shut down.

- Procedure for prohibiting the time on the OS from being written to the hardware clock
When you do not want the time on the OS to be written to the hardware clock at an OS shutdown, comment the following line out in `/etc/rc0.d/S01halt`.

```
runcmd $"Syncing hardware clock to system time" /sbin/hwclock $CLOCKFLAGS
```

↓

```
#runcmd $"Syncing hardware clock to system time" /sbin/hwclock $CLOCKFLAGS
```

- Procedure for reflecting the hardware clock value to the time on the OS
To reflect the hardware clock value to the software clock value on the OS, run the following command.

```
>hwclock --hctosys
```

8.3 System Event Log

This section explains how to refer to and operate system event logs.

8.3.1 How to Refer to Event Logs

ServerView S2 is used for reference of system event logs. A summary of reference procedures is described below. For details such as how to start up ServerView, refer to the "ServerView User's Guide"

- 1** Start up ServerView S2.
- 2** Click the server to be referred from the ServerList.
- 3** Select [Configuration] – [Recovery] on the menu list on the left side.
The list of all the system event logs is displayed.

POINT

- ▶ Web interface of remote management controller may be used for the reference of system event logs.
To use remote management controller, refer to "Appendix D Remote Management Controller" (→p.212).

8.3.2 Deleting the System Event Log

Use the BIOS Setup Utility to delete the system event logs.

- 1** Start up the BIOS Setup Utility.
→"7.2.1 Starting and Exiting the BIOS Setup Utility" (p.143).
- 2** Select the [IPMI] submenu on the [Server] menu.
- 3** Set [Clear System Event Log] item to [Enabled].
- 4** Save the configured value and exit the BIOS Setup Utility.

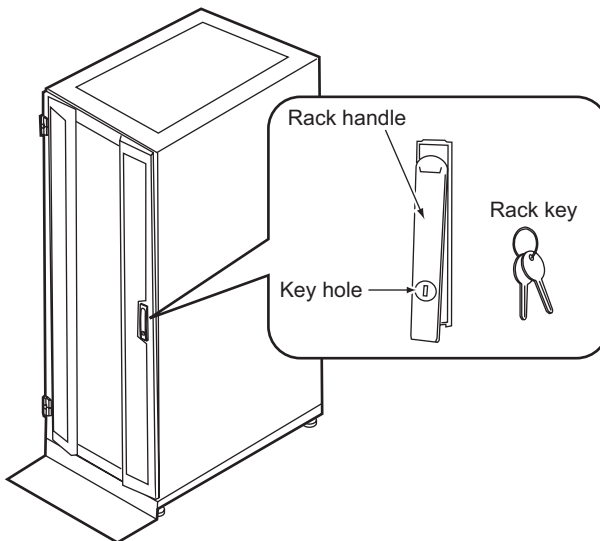
8.4 Security

Security features are provided in order to protect the server hardware and software from theft. Additional security functions, which prevent unauthorized use, provided by the BIOS Setup Utility are also available to help maintain a highly reliable data security system.

8.4.1 Hardware Security

Lock the rack door to protect the hardware in the rack from theft or tampering.

To close the rack door, shut the door and return the rack handle, and turn the rack key.



POINT

- ▶ Do not lose the rack key. If the key is lost, contact an office listed in the "Contact Information" of the "Start Guide".
- ▶ For instructions on opening the rack door, refer to "1.4.1 Opening the Rack Door" (→p.28).
- ▶ The above explanation is based on the 40U standard rack. For details on other rack systems, refer to their respective manuals.

8.4.2 Security against Unauthorized Use

A password can be set to prevent unauthorized use of the server.

When a password is set, the server is accessible only to the users who know the password.

The password is set in the BIOS Setup Utility. For details about the BIOS Setup Utility, refer to "7.2.9 Security Menu" (→p.154).

■ Password types

The following two types of password can be set in this server.

The password types define the privileges of server operations.

● Supervisor password (Administrator password)

This is the password that allows specific persons to access the BIOS setup. Unless the set password is entered, the BIOS setup utility cannot be accessed and the OS cannot be booted.

● User password (User password)

This is the password that allows specific persons to use the server. Unless the set password is entered, part of the BIOS setup utility cannot be accessed and the OS cannot be booted.

■ Setting a password

1 Start the BIOS Setup Utility.

→"7.2.1 Starting and Exiting the BIOS Setup Utility" (p.143)

2 Select [Security] by using the [←] or [→] key from the Main menu.

The [Security] menu appears.

3 By pressing the [↑] or [↓] key, move the cursor to [Set Supervisor Password] or [Set User Password], and press the [Enter] key.

The password entry window appears.

Set Supervisor (User) Password		
Enter New Password	[]
Confirm New Password	[]

4 Enter the password (within six characters) in the [Enter New Password] field.

5 In the [Confirm New Password] field, enter the password you have entered in Step 4 and press the [Enter] key.

[Supervisor Password] or [User Password] on the Security menu shows [Installed].

POINT

- ▶ When only the user or administrator password is set, the same setting items are accessible to both users and administrators.
- ▶ When both passwords are set, users can set dates and user passwords only.

■ Deleting / Changing password

Set Supervisor (User) Password		
Enter Current Password	[]
Enter New Password	[]
Confirm New Password	[]

- 1** Start the BIOS Setup Utility.
→"7.2.1 Starting and Exiting the BIOS Setup Utility" (p.143)
- 2** Select [Security] by using the [←] or [→] key from the Main menu.
The [Security] menu appears.
- 3** By pressing the [↑] or [↓] key, move the cursor to [Set Supervisor Password] or [Set User Password], and press the [Enter] key.
The password entry window appears.
- 4** Enter the current password in the [Enter Current Password] field.
- 5** Enter a new password in the [Enter New Password] field.
To delete the password, enter nothing and perform Step 7.
- 6** In the [Confirm New Password] field, enter the password you have entered in Step 5.
To delete the password, enter nothing and perform Step 7.
- 7** Press the [Enter] key.
When you delete the password, [System Password] or [Setup Password] on the [Security] menu shows [Not installed].

POINT

- ▶ The system shuts down after three invalid password entries. If this happens, power off the server, turn it back on, and then enter the correct password.

8.4.3 Security When Disposing of the Server

■ Notes regarding the deletion of data from the hard disk when disposing of or transferring the server

When disposing of or transferring a server that has been used, the data in the hard disk may be read and used unscrupulously. To prevent confidential or important data from leaking out, the data on the hard disk must be wiped before disposal or transfer.

However, wiping the hard disk is not an easy task. Simply initializing (formatting) the hard disk or deleting the files may give the pretense that the data no longer exists, but in reality the data is simply no longer accessible to the OS, and it is still accessible to malicious individuals that can restore the data. Therefore, if confidential or important data is saved to the hard disk, in addition to the operations mentioned above, it is recommended to use third-party tools or services to wipe the data completely from the disk to prevent its restoration.

When disposing of or transferring the server, it is the customer's responsibility to wipe data contained in the hard disk in order to prevent such important data from leaking.

Also, if software license agreements prohibit unauthorized distribution of software (OS or application software), transferring the server without removing the software may violate the license agreements.

These issues must be taken into consideration.

8.5 Backup

This server utilizes high reliability components and hard disks, however, as a precautionary measure, it is recommended that periodic backups be taken of the data.

8.5.1 Importance of Backups

A backup of data stored on the server is required for data restoration in the event of server trouble resulting in a system failure or accidental data loss due to operational errors.

If the data on the server is backed up, it can be restored from the backup data in the event of data erasure or corruption in hard disk units due to hardware failures or operational errors. If backups are not made, restoration is impossible and your important data will be lost permanently. Be sure to perform periodic backups of the system to protect against any problems there may be.

8.5.2 Backup Devices, Software and Their Operations

Backup operations differ depending on network operating systems, applications, and system operations. Contact an office listed in the "Contact Information" of the "Start Guide" and make backups using the following items.

- Backup device (e.g., DAT72 unit)
- Backup software
(Standard backup software supplied with the OS, e.g., ARCserve, Changer Option)
- Backup operations (schedules)

Use our genuine backup devices and software. Observe the backup medium (tape) storage conditions.

POINT

- ▶ **Mirroring/disk array systems**
To improve system reliability, a mirroring or disk array system using a RAID Ctrl, in addition to periodic backup creation, is recommended.

■ Notes on operating backups

Notes on operating backups are as follows.

For details, refer to the device manuals and Readme.txt included in the device driver.

● Head cleaning

Airborne dust and dust from the magnetic media can collect on the head of the magnetic tape device. To remove this dust, head cleaning must be implemented. Implement head cleaning when the device displays a cleaning request. Particularly DDS devices require periodic head cleaning, otherwise dust can cling to the magnetic head, creating a situation that cannot be cleaned with standard head cleaning methods, and eventually render the device useless.

Also note that the cleaning media has a limit to how many times it can be used. Manage its lifespan.

Using cleaning media that exceeded its lifespan will have no cleaning effect. Note these points especially when performing automatic backups with library devices.

● Managing media lifespans

Media is a consumable product that must be replaced regularly.

Continued use of media exceeding its lifespan can have negative effects on the device (e.g. increase the speed of dust accumulation).

The lifespan of media varies depending on the environment and operation condition of the device, the type of backup software used, and other operation conditions, however, it is recommended that they be replaced sooner than later.

To manage the lifespan, write the use start date on the media.

● Rotating media

Rotate between several media for backups.

When using a single media cartridge repeatedly, backup data can be temporarily lost in the event the backup fails. Or if the hard disk were to fail during a backup, the data will become unrecoverable.

● Avoid leaving media in devices

Because the magnetic recording surface of the device is exposed, media can easily be affected by airborne dust when left inserted for an extended period of time. Insert the media before using it, and remove the media after use, and restore it in its case.

Also note that some tape devices write management information to the tape when ejecting the media. If the power were to go out when the media is still in the device, this writing process will not be performed and the media may become corrupted.

To avoid this, remove the media from the device when turning off the server/device.

● Verifying data after a backup

Some backup software products provide data verification functions after a backup is completed. Such functions will read and verify the data written to the media after a backup is completed. This will increase the usage of the media, thus reducing the number of times it can be used for backups.

Depending on the hardware being used, some devices perform "read after write" operations on data; note the points of this section as necessary.

- **Ejecting media after a backup**

Some backup software products provide functions for ejecting media after a backup is completed. Such functions will rewind the tape after a backup is completed and then eject the media from the drive. Be sure to execute this function for autoloader/library devices. Depending on the structure of some servers, this function may cause the media to eject from an internal device of the server and hit the chassis door. If this is the case, open the door when ejecting, or do not eject the media.

- **Media label types and positions**

When writing information such as the name on media, use the label that came with the media. The area in which a label can be posted on the media of each device varies. Failing to post labels in the designated area can damage the device.

- **Data storage**

When storing data for long periods of time, store the media in a location least affected by temperature, humidity, and magnetic fields.

8.6 Restoring the System

In the unfortunate event where the system file, system configuration, or environment changes during startup are corrupted, use the repair information stored on the recovery disk created at the installation to restore the system.

POINT

- ▶ Create a recovery disk when you have installed an OS or changed the system configuration. Refer to "4.2 Creating a Disk for System Recovery" (→p.76).
- ▶ When a restoration procedure is described in the backup device manual or Readme.txt included in the device driver, refer to the procedure instead of this section.
- ▶ When restoring the system, confirm that the USB floppy disk drive is connected before turning on the server power.

8.6.1 For Windows Server 2003

● Items required

- Windows Server 2003 CD-ROM
- Automated System Recovery floppy disk (created beforehand)
- Backup media (created beforehand)
- Driver disk (for RAID)

For drivers to be used and how to create driver disks, refer to "4.4 Creating Maintenance Tools and Driver Disks" (→p.81).

1 Insert the Windows Server 2003 CD-ROM immediately after the server is turned on.

Check that a floppy disk is not inserted in the floppy disk drive.

2 When an active area is set on the hard disk, the following message is displayed at the bottom of the screen. Press any key while the message is displayed.

```
Press any key to boot from CD ...
```

The Windows Server 2003 setup screen appears.

3 The following message is displayed at the bottom of the screen. Press the [F6] key.

```
Press F6 if you need to install a third party
SCSI or RAID driver...
```

IMPORTANT

- ▶ Because this message is displayed for only a short time after the setup screen (blue screen) is displayed, press the [F6] key immediately after the screen changes blue.

- 4** When a message prompting you to press the [F2] key appears under the screen, press the [F2] key while the message is displayed.

A message prompting you to insert the Automated System Recovery floppy disk (created beforehand) appears.

- 5** Insert the Automated System Recovery floppy disk and follow the window instructions.

- 6** Install the driver.

Install the following driver according to the used array controller.

- When using the onboard SAS Ctrl (Integrated Mirroring SAS):
LSI Logic Fusion-MPT SAS Driver
- When using the onboard software RAID:
LSI Logic Embedded MegaRAID
- An array is not configured:
It is not necessary for a driver to be installed.

For the procedure for installing a driver, refer to the following "OS Installation Manually".

<http://www.fujitsu.com/global/services/computing/server/ia/driver/>

- 7** Follow the window instructions to restore the system.

- When replacing the floppy disk is required, replace it following the instructions.
- When the message that the driver doesn't pass the Windows logo test for verifying interchangeability with Windows is displayed, select "Yes" and continue installing.
- When inserting media is required, insert the backup media (created beforehand) and perform the process according to the message.

POINT

Notes on Automated System Recovery

- ▶ Automated System Recovery does not restore data files.

8.7 Reinstalling the OS

This section explains the procedure for reinstalling the OS.

8.7.1 Checking before OS Reinstallation

■ Removing the optional devices

Remove the following optional devices before reinstallation. Install or connect them after OS installation.

- External optional devices connected via a SCSI card (backup cabinet, etc.)
- Internal hard disk units that do not contain the OS installation folder
- USB optional devices (other than floppy disk devices)

■ Deletion of data from the disk

Reinstallation deletes all disk contents. Save the necessary data and system configuration in a different location.

■ Other notes

Notes on initial installation also apply.

8.7.2 Reinstallation Using ServerStart

When the previous installation was performed in guide or preconfiguration mode, the ServerStart floppy disk used in that installation can be used again. When the reinstallation is performed with the same configuration as that for the previous installation, you do not have to edit the configuration file on the ServerStart floppy disk. You do not have to configure setting on wizards. After ServerStart starts up, click [Start (OS) Installation] to perform installation. Use expert mode when you want to perform reinstallation while maintaining the existing partitions.

8.8 Maintenance Service

This section explains the details of the maintenance service.

If the cause of the failure is uncertain or if the original condition cannot be restored, contact the seller or an office listed in the "Contact Information" of the "Start Guide".

8.8.1 Contacting Maintenance Support

For "Contact Information", refer to "Start Guide". Before contacting maintenance support, check the following.

POINT

- ▶ Fill in the "Configuration Sheet" and "Accident Sheet" of "Configuration Sheets".

● Points to be checked

- Model name and product ID of the server
They are described on the label on the server. For the label location, refer to "Start Guide".
- Hardware configuration (Types and locations of internal options)
- Configuration information (BIOS Setup Utility settings)
- OS
- LAN/WAN system configuration
- Phenomena (what happened when doing what, what was displayed, etc.)
- Date/time of occurrence
- Environmental settings of the server
- LED statuses

Appendix

This appendix explains the specifications for the server and for its internal options.

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A Server Specifications

This section explains the specifications for the server.

A.1 SAS Model

table: Server Specifications (SAS model)

Item		Functions and Specifications
Type		Diskless Type
Product ID		PGUR1051A
Chipset		Intel 3210/ICH9
CPU (frequency/ cache)	Standard	Intel® Celeron® Processor 430 (1.80GHz/512KB)
	Conversion kit	Quad-Core Intel® Xeon® Processor X3220 (2.40GHz/2 × 4MB) Dual-Core Intel® Xeon® Processor E3110 (3.00GHz/6MB) Dual-Core Intel® Xeon® Processor 3065 (2.33GHz/4MB) Intel® Core™ 2 Duo Processor E4600 (2.40GHz/2MB)
	Number of multiplication	1 (Max.1)
Memory	Standard	512MB (DDR2-800, 512MB DIMM × 1)
	Adding size	512MB/1GB/2GB
	Maximum	8GB (4-slot, 2GB DIMM × 4)
PCI slots		PCI-Express (x8) × 2 (exclusive for Low Profile × 1, for Hull High/Low Profile × 1 ^{*1})
Disk array controller		Onboard SAS Ctrl (Integrated Mirroring SAS)
3.5-inch storage bay		2 bays (hot-pluggable)
	Adding size	73.4GB/146.8GB/300GB (15,000rpm, SAS)
	Maximum	600GB (300GB × 2)
CD/DVD drive bay		1 bay (optional)
Floppy disk drive		Optional (USB floppy disk drive) ^{*2}
Onboard controller	Video	iRMC2/ 8MB Video RAM 640 × 480, 800 × 600, 1024 × 768, 1280 × 1024 Display colors: varies depending on the resolution, the OS, etc.
	SAS	SAS LSI 1064E
	LAN	Broadcom BCM 5715 (GbE × 2)
External I/O port	Video	1 (analog RGB DSUB 15 pin)
	Keyboard/Mouse	1 for each (PS/2 mini DIN6 pin)
	USB	4 (USB 2.0, front × 2, rear × 2)
	Serial	1 (DSUB9 pin)
	Parallel	N/A
	LAN	3 (Modular (RJ-45) 8 pin × 2, Service LAN port × 1)
Power supply unit		Standard: 1, Max: 1 (without redundant power supply/hot plug)
	Power/ Connector	100VAC (50/60Hz)/bipolar ground type (conformable to NEMA 5-15)
Fan unit		System fan unit × 5, Power fan unit × 1 (without redundant fans/hot plug)
Internal clock precision		± 2 to 3 minutes/month
Power consumption		Max. 210W/(Max. 756kJ/h)
Dimension (Width × Depth × Height (mm))		429 (482) × 562 (596) × 42 (1U) (): including protrusion
Weight		Max: 12.5kg (including inner rails)
Noise		Max: 45dB

*1: A LowProfile PCI card can be inserted into the standard PCI slot if the extension slot cover is installed.

*2: When a system is configured with multiple computers, at least one floppy disk drive is required.

The specifications for this server are liable to be updated without any notice. Please be forewarned.

■ Supported OS

The following OSes are supported.

- Windows Server 2003, Standard Edition (SP2)
- Windows Server 2003, Standard x64 Edition (SP2)
- Windows Server 2003 R2, Standard Edition (SP2)
- Windows Server 2003 R2, Standard x64 Edition (SP2)
- Red Hat Enterprise Linux ES (v.4 for x86)
- Red Hat Enterprise Linux ES (v.4 for EM64T)
- Red Hat Enterprise Linux 5 (for x86)
- Red Hat Enterprise Linux 5 (for Intel64)

A.2 SATA Model

table: Server Specifications (SATA model)

Item		Functions and Specifications
Type		Diskless Type
Product ID		PGUR1051B
Chipset		Intel 3210/ICH9R [®]
CPU (frequency/ cache)	Standard	Intel [®] Celeron [®] Processor 430 (1.80GHz/512KB)
	Conversion kit	Quad-Core Intel [®] Xeon [®] Processor X3220 (2.40GHz/2 × 4MB) Dual-Core Intel [®] Xeon [®] Processor E3110 (3.00GHz/6MB) Dual-Core Intel [®] Xeon [®] Processor 3065 (2.33GHz/4MB) Intel [®] Core™ 2 Duo Processor E4600 (2.40GHz/2MB)
	Number of multiplication	1 (Max.1)
Memory	Standard	512MB (DDR2-800, 512MB DIMM × 1)
	Adding size	512MB/1GB/2GB
	Maximum	8GB (4-slot, 2GB DIMM × 4)
PCI slots		PCI-Express (x8) × 2 (exclusive for Low Profile × 1, for Hull High/Low Profile × 1 ^{*1})
Disk array controller		Onboard software RAID: Embedded MegaRAID SATA
3.5-inch storage bay		2 bays (hot-pluggable)
	Adding size	80GB/160GB/500GB (7,200rpm, SATA)
	Maximum	1TB (500GB × 2)
CD/DVD drive bay		1 bay (optional)
Floppy disk drive		Optional (USB floppy disk drive) ^{*2}
Onboard controller	Video	iRMC2/ 8MB Video RAM 640 × 480, 800 × 600, 1024 × 768, 1280 × 1024 Display colors: varies depending on the resolution, the OS, etc.
	SATA	Embedded MegaRAID SATA (built into ICH9R)
	LAN	Broadcom BCM 5715 (GbE × 2)
External I/O port	Video	1 (analog RGB DSUB 15 pin)
	Keyboard/Mouse	1 for each (PS/2 mini DIN6 pin)
	USB	4 (USB 2.0, front × 2, rear × 2)
	Serial	1 (DSUB9 pin)
	Parallel	N/A
	LAN	3 (Modular (RJ-45) 8 pin × 2, Service LAN port × 1)
Power supply unit		Standard: 1, Max: 1 (without redundant power supply/hot plug)
	Power/ Connector	100VAC (50/60Hz)/bipolar ground type (conformable to NEMA 5-15)
Fan unit		System fan unit × 5, Power fan unit × 1 (without redundant fans/hot plug)
Internal clock precision		± 2 to 3 minutes/month
Power consumption		Max. 210W/(Max. 756kJ/h)
Dimension (Width × Depth × Height (mm))		429 (482) × 562 (596) × 42 (1U) (): including protrusion
Weight		Max: 12.5kg (including inner rails)
Noise		45dB

*1: A LowProfile PCI card can be inserted into the standard PCI slot if the extension slot cover is installed.

*2: When a system is configured with multiple computers, at least one floppy disk drive is required.

The specifications for this server are liable to be updated without any notice. Please be forewarned.

■ Supported OS

The following OSes are supported.

- Windows Server 2003, Standard Edition (SP2)
- Windows Server 2003, Standard x64 Edition (SP2)
- Windows Server 2003 R2, Standard Edition (SP2)
- Windows Server 2003 R2, Standard x64 Edition (SP2)
- Red Hat Enterprise Linux ES (v.4 for x86)
- Red Hat Enterprise Linux ES (v.4 for EM64T)
- Red Hat Enterprise Linux 5 (for x86)
- Red Hat Enterprise Linux 5 (for Intel64)

B Specifications for Internal Options

This section explains the specifications for internal options for the server. When you have bought an internal option as a standard option, check that the package contents the following items before use. Should it happen that items are missing, contact an office listed in the "Contact Information" of "Start Guide".

B.1 Memory

■ Package

- Memory Module (1)

■ Specifications

table: Memory Specifications

Item	Function and Specifications		
Product name	Memory Module-512MB	Memory Module-1GB	Memory Module-2GB
Product ID	PG-RM51BH	PG-RM1BH	PG-RM2BH
Modules	512MB DIMM × 1	1GB DIMM × 1	2GB DIMM × 1
Capacity	512MB	1GB	2GB
Clock frequency	800MHz (dual edge)		
PIN count	240 PIN		

B.2 Internal DVD-ROM Units

■ Package

- Internal DVD-ROM unit (1)

■ Specifications

table: Internal DVD-ROM Unit Specifications

Item	Function and Specifications
Product name	DVD-ROM SATA
Product ID	PG-DV106
Interface	SATA I
Media	CD-ROM, CD-R/RW, DVD-ROM, DVD-R/RW, DVD+R/RW, DVD-RAM
Standards	CD, DVD
Read system	Optical pickup (laser diode)
Maximum data transfer speed	Max. 3,600KB/sec. (CD-ROM) Max. 10,816KB/sec. (DVD-ROM)
Access time	130msec (CD-ROM) 140msec (DVD-ROM)
Disk loading	Tray loading (manually inserting)
Dimension	128.0 × 129.4 × 12.7mm (W × D × H)
Weight (without media)	approx. 210g

B.3 Internal Hard Disk Units

■ Package

- Hard disk unit (1)

■ Specifications

● SAS hard disk

table: Internal Hard Disk Unit Specifications (SAS)

Item	Function and Specifications		
Product name	HDD SAS 15k 73GB hot plug 3.5inch	HDD SAS 15k 147GB hot plug 3.5inch	HDD SAS 15k 300GB hot plug 3.5inch
Product ID	PG-HDB75A	PG-HDB45A	PG-HDB35A
Interface	SAS (Serial Attached SCSI)		
Storage media	3.5-inch hard disk		
Memory capacity *1	73.4GB	146.8GB	300GB
Maximum data transfer speed	3Gbit/s		
Average latency	2.00ms		
Rpm	15,000rpm		
Dimension (W × D × H) *2	101.6 × 146.0 × 25.4 (mm)		
Weight *2	800g		

*1: The value indicates memory capacity of the formatted hard disk (1GB = 1000³ bytes).

*2: A Hot plug carrier is not included.

● SATA hard disk

table: Internal Hard Disk Unit Specifications (SATA)

Item	Function and Specifications		
Product name	HDD SATA 7.2k 80GB hot plug 3.5inch	HDD SATA 7.2k 160GB hot plug 3.5inch	HDD SATA 7.2k 500GB hot plug 3.5inch
Product ID	PG-HDF87B	PG-HDF67B	PG-HDF57B
Interface	SATA (Serial ATA)		
Storage media	3.5-inch hard disk		
Memory capacity *1	80GB	160GB	500GB
Maximum data transfer speed	3Gbit/s		
Average latency	4.20ms		
Rpm	7,200rpm		
Dimension (W × D × H) *2	101.6 × 147.0 × 26.1 (mm)		
Weight *2	450g		635g

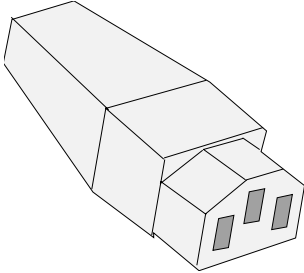
*1: The value indicates memory capacity of the formatted hard disk (1GB = 1000³ bytes).

*2: A Hot plug carrier is not included.

B.4 Power Cord Selection

The power cord for this unit has been packed separately and has been selected according to the country of destination. It must be used to prevent electric shock. Use the following guidelines if it is necessary to replace the original cord set.

The female receptacle of the cord set must meet CEE-22 requirements (see Figure).



■ For the United States and Canada

Use a UL listed and CSA labeled cord set consisting of a three conductor cord with a maximum length of 15 feet.

For units which stand on a desk or table, type SVT or SJT cord sets should be used.

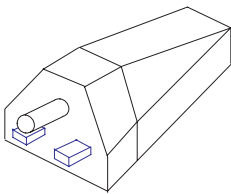
For units which stand on the floor, only SJT type cord sets should be used.

The cord set must be selected according to the current rating for your unit.

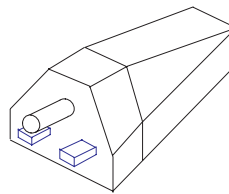
Please consult the table below for the selection criteria for power cords used in the United States and Canada.

table: Selection Criteria for Power Cords Used in the United States and Canada

Cord Type	Size of Conductors in Cord	Maximum Current Rating of Unit
SJT	18 AWG	10 Amps
	16 AWG	12 Amps
	14 AWG	12 Amps
SVT	18 AWG	10 Amps
	17 AWG	12 Amps



- Parallel
For units set at 115 V:
Use a parallel blade, grounding type attachment plug rated 15 A, 125 V.



- Tandem
For units set at 230 V:
Use a tandem blade, grounding type attachment plug rated 15 A, 250 V.

● For units set at 230 V (outside of the United States and Canada):

Use a cord set consisting of a minimum AWG according to the table above and a grounding type attachment plug rated 15 A, 250 V. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed and should be marked HAR.

■ For the United Kingdom

Should the plug on the flexible cord not be of the type for your socket outlets, do not use an adapter but remove the plug from the cord and discard. Carefully prepare the end of the supply cord and fit a suitable plug.



- This appliance must be earthed.

POINT

- ▶ The wires in this mains lead are colored in accordance with the following code:
 - Green and Yellow: Earth
 - Blue: Neutral
 - Brown: Live

As the colors of the wires in the mains lead of this appliance may not correspond with the colored markings identifying the terminals in your plug, proceed as follows:

- The wire which is colored Green and Yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol or colored Green or Green and Yellow.
- The wire which is colored Blue must be connected to the terminal which is marked with the letter N or colored Black.
- The wire which is colored Brown must be connected to the terminal which is marked with the letter L or colored Red.

C Remote Control Function

This server supports the remote control function.

When a personal computer (PC) is connected to the serial port of this server with an RS-232C cross cable, the PC can be used to control (turn on/off and reset) the server power supply.

C.1 Preparation for Using Remote Control Function

To enable the remote control function, perform the following procedure.

- Configuring the BIOS
- Connecting the Server to a PC
- Configuring terminal software communication settings on the PC

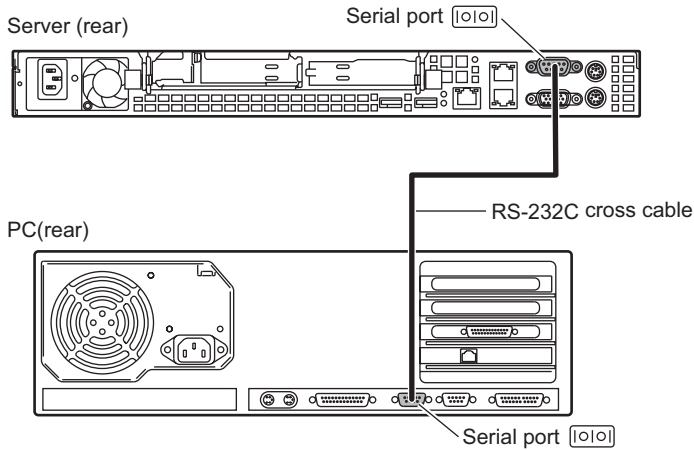
■ Configuring the BIOS

To use the remote control function, or to perform console redirection, perform the following settings using the BIOS Setup Utility.

- 1** Turn on the server. Press the [F2] key during POST to start up the BIOS Setup Utility.
- 2** Select the [Advanced] – [Peripheral Configuration] submenu, and set the following items.
 - Set [Serial1] to [Disabled]
 - Set [Serial Multiplexer] to [iRMC]
- 3** Select the [Exit] – [Saving Changes & Exit] menu to exit the BIOS Setup Utility.

■ Connecting the server to a PC

Connect the server to a PC using an RS-232C cross cable.



■ Configuring the terminal software (PC)

Perform settings for the remote control function using terminal software on the PC.

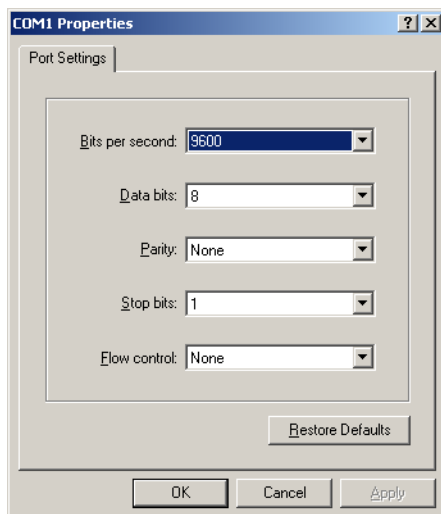
● Port configuration

Configure the port on the PC as follows:

table: Port Settings

Item	Contents
Bits per second	9600
Data bits	8
Parity	Not applied
Stop bits	1
Flow control	Not applied

(Window example)



C.2 Remote Power Supply Control

This section explains how to control the server power supply remotely.

The server power supply can be remote-controlled with the terminal software on the PC.

■ Starting up the Remote Controller

1 Start up the terminal software.

The remote control window appears.

```

*****
* Welcome to PRIMERGY Remote Manager *
* Firmware Revision x.xxA (x.xx) *
* SDRR *.* ID 0203 RX100S5 *
* Firmware built xxx xx xxxx xx:xx:xx *
*****

System Type : PRIMERGY RX100 S5
System ID : xxxxxxxx
System Name : RX100S5-2 (xxx.xxx.xxx.xxx)
System OS : xxxxxxxx
System Status: OK
Power Status : On

Please enter user name :
Please enter pass phrase :

```

Power state is displayed next to "Power Status:".

[table: Meaning of \[Power Status\]](#)

Display	Description
On	The server is powered on.
Off	The server is powered off.

2 When "Please enter user name" appears, enter the user name and press the [Enter] key.

3 When "Please enter pass phrase" appears, enter the password and press the [Enter] key.

Note that the password is case-sensitive. As shown below, the characters you have entered are displayed as asterisks.

```
Please enter pass phrase:*****
```

The remote control main menu appears.

```
*****
* Welcome to PRIMERGY Remote Manager *
* Firmware Revision x.xxA (x.xx)      *
* SDRR *.* ID 0203 RX100S5           *
* Firmware built xxx xx xxxx xx:xx:xx *
*****

System Type   : PRIMERGY RX100 S5
System ID    : xxxxxxxx
System Name   : RX100S5-2 (xxx.xxx.xxx.xxx)
System OS     : xxxxxxxx
System Status: OK
Power Status  : On

Main Menu

(1) System Information...
(2) Power Management...
(3) Enclosure Information...
(4) Service Processor...

(c) Change password
(r) Console Redirection (EMS/SAC)
(s) Start a Command Line shell...

Enter selection or (0) to quit:
```

4 Press the [2] key and select "Power Management".

The Power Management menu appears.

```
*****
* Welcome to PRIMERGY Remote Manager *
* Firmware Revision x.xxA (x.xx)      *
* SDRR *.* ID 0203 RX100S5           *
* Firmware built xxx xx xxxx xx:xx:xx *
*****

System Type   : PRIMERGY RX100 S5
System ID    : xxxxxxxx
System Name   : RX100S5-2 (xxx.xxx.xxx.xxx)
System OS     : xxxxxxxx
System Status: OK
Power Status  : On

Power Management Menu

(1) Immediate Power Off
(2) Immediate Reset
(3) Power Cycle
(*) Power On

(*) Graceful Power Off (Shutdown)
(*) Graceful Reset (Reboot)

Enter selection or (0) to quit:
```

5 Select a menu and press the corresponding number key.

"*" is displayed in the bracket of unavailable menu.

table: Remote Control Menu

Menu name	Key	Operation
Immediate Power Off	[1]	Turns the server off.
Immediate Reset	[2]	Resets the server.
Power Cycle	[3]	Turns the server off and back on again. When Windows is operating, the server restarts after the OS is shut down.
Power On	[4]	Turns the server on.
Graceful Power Off (Shutdown)	[5]	Shuts down the OS and turns the server off. When Windows is operating, the server is turned off after the OS is shut down.
Graceful Reset	[6]	Shuts down the OS and resets the server. When Window is operating, the server is reset after the OS is shut down.
-	[0]	Exits the remote controller.

6 If pressing keys, except the [0] key, perform the following operation.

When "Do you really want reboot (yes/no)?" appears, enter "yes" and press the [Enter] key.

For [3], [5] or [6], the pop-up window "System shutdown due to <software command> in 60 seconds! Press Cancel to abort!" appears when Windows is operating. Select [OK].

D Remote Management Controller

This section explains functions and features of the Remote Management Controller (iRMC2) and the optional Remote Management Controller Upgrade (PG-RMCU2).

D.1 Overview of the Remote Management Controller

This server has the Remote Management Controller (iRMC2) on the baseboard. The Remote Management Controller makes the high-quality, high-reliability remote service board function possible. To use the console redirection function and the remote storage function, the license key of optional Remote Management Controller Upgrade (PG-RMCU2) is necessary. For details of Remote Management Controller Upgrade (PG-RMCU2), refer to "D.4 Remote Management Controller Upgrade (PG-RMCU2)" (→p.215).

■ Features of the Remote Management Controller

- The Remote Management Controller (iRMC2) and LAN are provided on the baseboard. This makes possible to control power supply and reset of the server without depending on the state of the server.
- The video redirection function and the remote storage function can be used by optional Remote Management Controller Upgrade (PG-RMCU2).
- It provides with LAN interface.
- It has the server monitoring function (monitoring server's hang/temperature/voltage).
- It has the server abnormality notification function (it is possible to notify abnormally at the server hang).
- It is possible to display the server status and control power supply/reset of the server by using the Web interface.

IMPORTANT

- ▶ When the baseboard is replaced, the Remote Management Controller may have to be set again. In case of reconfiguration, write down the set values in configuration sheets.

D.2 Preparation for Using Remote Management Controller

To enable the Remote Management Controller, perform the following procedure.

- Configuring the BIOS
- Connecting the Server to a PC

■ Configuring the BIOS

To use the function of the Remote Management Controller, perform the following setting using the BIOS Setup Utility.

- 1** Turn on the server. Press the [F2] key during POST to start up the BIOS Setup Utility.
- 2** Select the [Advanced] menu – [IPMI] – the [LAN Settings] submenu, and set the each item.
For the detailed setting items, refer to "7.2.17 IPMI Submenu" (→p.162).
- 3** From the [Exit] menu, select [Saving Changes & Exit] to exit the BIOS Setup Utility.

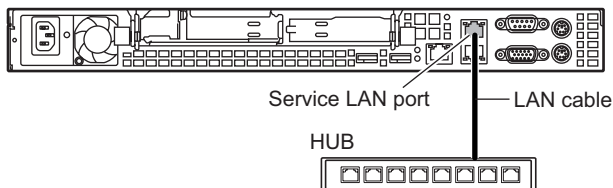


- Save the setting information of set parameters using the Server Management Tools. For details, refer to "4.3 Storing the System Configuration Information" (→p.78).

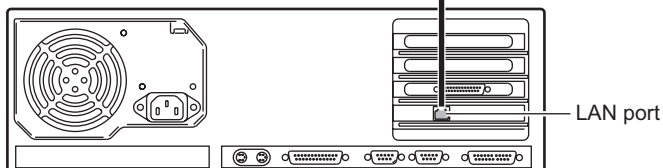
■ Connecting the server to a PC

Connect the server to a PC using a LAN cable.

Server (rear)



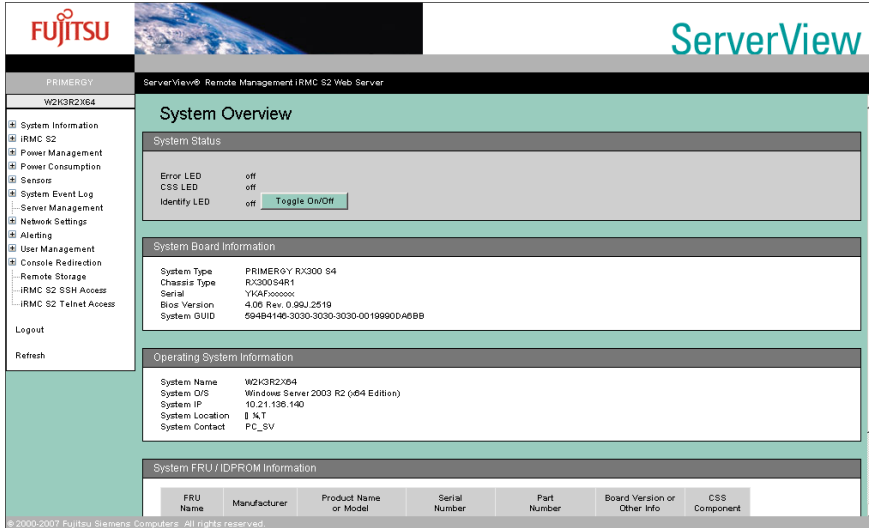
PC (rear)



D.3 Window of the Remote Management Controller

The Remote Management Controller uses the Web interface function.

The following window appears when starting the Remote Management Controller.



The following functions are available.

table: Functions of the Remote Management Controller

Item	Description
System Information	Displays system information.
iRMC S2	Displays the Remote Management Controller information and sets the license key.
Power Management	Turns On/Off or restarts the server power.
Power Consumption	Displays server power information.
Sensors	Displays the status of each sensor (fan, temperature, voltage, power supply).
System Event Log	Displays the system event log.
Server Management	Displays and sets server management information.
Network Settings	Performs network settings.
Alerting	Sends an alert.
User Management	Displays and sets user information.
Console Redirection	Sets redirection in the BIOS Text console and starts Video Redirection.
Video Redirection	Starts Video Redirection.
Remote Storage	Sets Remote Storage Server.
iRMC S2 SSH Access	Sets and starts TEXT redirection using SSH.
iRMC S2 Telnet Access	Sets and starts TEXT redirection using Telnet.
Logout	Logs out from the session of the Remote Management Controller Web interface.

For usage of the Remote Management Controller, refer to "Remote Management Controller User's Guide".

■ Comparison with server management function of ServerView

ServerView, software provided with the server, can manage the server remotely if OS is normally operating. The Remote Management Controller can operate even in the state of the server hang, therefore, it is effective when the server cannot be monitored by ServerView.

D.4 Remote Management Controller Upgrade (PG-RMCU2)

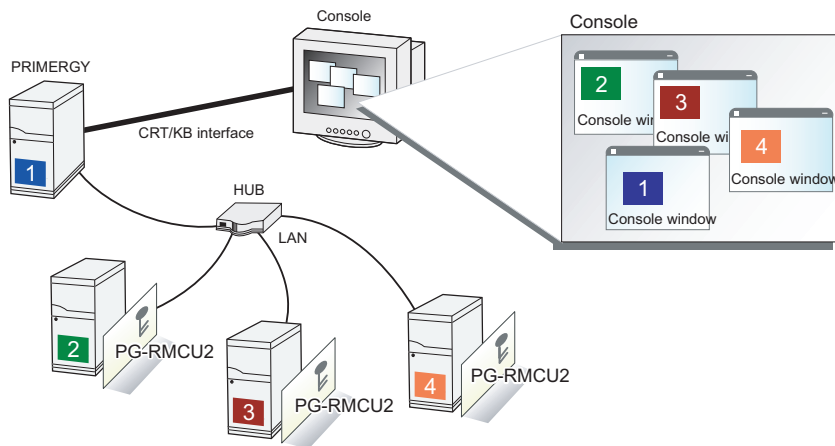
This option is a license key to make Remote Management Controller's video redirection function and remote storage function effective.

table: Specification of Remote Management Controller Upgrade

Item	Specifications
Product name	Remote Management Ctrl Upgrade kit
Product ID	PG-RMCU2
Function	Video redirection function, Remote storage function

● Video redirection function

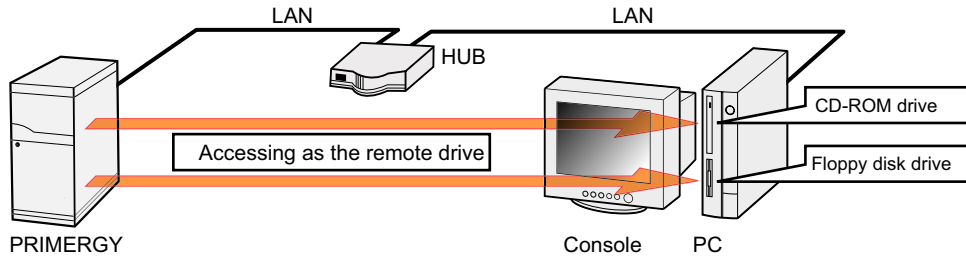
The server can be remotely operated by using video redirection function. Remote operation such as the keyboard and mouse operation, and seeing the contents of the display of the server are possible. By using video redirection function, it makes possible to achieve the function of the KVM switching in the environment where multiple servers are used. The composition of the multiple servers' environment is shown in the figure below.



● Remote storage function

This is a function to recognize the external memory device connected by using the video redirection function as a remote device of the server.

The configuration of the remote storage function is shown in the figure below.



POINT

- ▶ The following devices can be used in the remote storage connection.
 - Internal floppy disk drive
 - Internal DVD-ROM drive
 - USB floppy disk drive

● License key settings

Enter the license key from the Web to make effective the console redirection function and the remote storage function.

For details of the setting method, refer to the manual supplied with PG-RMCU2.

License Key

You do have a valid permanent licence key installed.

Please enter your license key into the area below!

Upload
Clear License

E External Floppy Disk Drive (USB) Notes on Usage

The section explains notes on the usage of USB connected floppy disk drive.

■ Notes on floppy disk drive recognition at server startup

If the floppy disk drive (USB), with a floppy disk inserted, is not connected at server startup, BIOS cannot recognize the floppy disk drive (USB). During OS installation of Windows/Linux, using Windows Automatic System Recovery (ASR), or the Disaster Recovery Option of BrightStor ARCserve Backup, make sure to connect the floppy disk drive (USB) with a floppy disk inserted before server startup.

■ Notes on floppy disk media exchange recognition when installing Windows manually and at system recovery

When performing system recovery using Windows backup data with the following software, also when installing Windows manually, system recovery/installation might not be performed properly. This is caused by the device driver being unreadable due to recognition failure of the floppy disk media replacement.

- BrightStor ARCserve Backup for Windows Disaster Recovery Option
- Windows Server 2003 Automatic System Recovery Function

After pressing the [Enter] key in accordance with the procedures on the screen, if the floppy disk access LED on the floppy disk drive (USB) does not turn on and the floppy disk is not accessed, follow the procedures below.

1 Eject the floppy disk and wait for 2 seconds or longer, then press the [Enter] key several times.

2 Insert the floppy disk and wait for 2 seconds or longer, then press the [Enter] key.

If the floppy disk cannot be accessed, perform the procedures above again.

■ Notes when reading the default values in BIOS Setup Utility

When selecting the [Get Default Values] of the Exit menu in BIOS Setup Utility to return its values to the default values, the USB floppy disk drive is moved to the [Excluded from boot order] field in the "7.2.18 Boot Menu" (→p.164).

When booting via USB floppy disk drive is required, set it again to the original position of the [Boot priority order].

F Recycling

This section explains how to recycle this server.

■ Disposing of the server

When scrapping this server, contact an office listed in the "Contact Information" of "Start Guide". This server must be disposed of as industrial waste.

Furthermore, if the server is disposed of as it is, someone else may gain access to the information contained on the hard disks. It is therefore recommended that all drives be formatted before disposal. However, just formatting or deleting files may not avoid the risk that the data is restored and used for wrongful purposes. If confidential or private information is saved, in order to make it impossible to be restored, it is recommended to use third-party data wiping tools.

■ Disposing of used-up batteries

Used-up batteries must be disposed of as industrial waste and therefore require special processing. Let a licensed industrial waste disposal company take care of disposal.

■ Disposing of liquid crystal displays

Liquid crystal displays must be disposed of as industrial waste and therefore require special processing. Let a licensed industrial waste disposal company take care of disposal.

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PRIMERGY RX100 S5

User's Guide

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