

Maintenance Guide (VMware)

NEC Express Server
Express5800 Series

Express5800/R320g-E4
Express5800/R320g-M4
EXP320T, EXP320V

Chapter 1 Maintenance

Chapter 2 Configuring and Upgrading the System

Chapter 3 Useful Features

Manuals

Attached as a book

Safety Precautions and Regulatory Notices

Describes points of caution to ensure the safe use of this server.
Read these cautions before using this server.

Included in EXPRESSBUILDER as an electric manual

User's Guide

Chapter 1: General Description	Overviews, names, and functions of the server components
Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and suitable location for this server
Chapter 3: Setup	System BIOS configurations and summary of EXPRESSBUILDER
Chapter 4: Appendix	Specifications

Installation Guide (VMware)

Chapter 1: Installing Operating System	Installation of OS and drivers, and precautions for installation
Chapter 2: Installing Bundled Software	Installation of NEC ESMPRO, BMC Configuration, and other bundled software
Chapter 3: Configuring the Separate Log Server	Procedure used to set up as the log server, a server that is separate from the ftSys Management Appliance.

Maintenance Guide (VMware)

Chapter 1: Maintenance	Server maintenance, error messages, and troubleshooting
Chapter 2: Configuring and Upgrading the System	Changing hardware configuration, installing additional devices and setting up management tools
Chapter 3: Useful Features	The detail of system BIOS settings, SAS Configuration Utility, and EXPRESSBUILDER

Other manuals

The detail of NEC ESMPRO, BMC Configuration, and other features.

Contents

Manuals	2
Contents	3
Conventions Used in This Document	7
Signs and symbols for safety	7
Notations used in the text.....	8
Optical disk drive.....	8
Hard disk drive	8
Removable media	8
Abbreviations of Operating Systems (VMware)	9
POST	9
BMC	9
Trademarks	10
License Notification	11
Warnings and Additions to This Product and Document.....	14
Latest editions.....	14
Safety notes	14
Chapter 1 Maintenance	15
1. Relocation and Storage	17
2. Daily Maintenance	19
2.1 Checking and Applying Updates	19
2.2 Checking Alerts	19
2.3 Checking STATUS LED	20
2.4 Making Backup Copies	21
2.5 Cleaning.....	21
2.5.1 Cleaning the server	22
2.5.2 Cleaning the Keyboard and Mouse	22
3. User Support.....	23
3.1 Maintenance Services.....	23
3.2 Before Asking for Repair	23
4. Maintenance of Express5800/ft series.....	24
4.1 ftsmaint Command.....	24
4.1.1 Component information	24
4.1.2 Start/stop the component	24
4.1.3 MTBF clear.....	25
4.1.4 Diagnostics.....	25
4.1.5 BMC firmware update.....	25
4.1.6 BIOS update.....	25
4.2 Device Path Enumeration	26
4.3 ftsmaint Examples.....	29
4.3.1 Displaying System Status.....	29
4.3.2 Displaying the Status of a Single System Component	31
4.3.3 Bringing System Components Down and Up	32
4.3.4 Stopping and Starting the Internal Disk Enclosure	33
4.3.5 Diagnostics.....	33
4.3.6 Updating BMC firmware	34
4.3.7 Updating BIOS	36

4.4 Disabling Auto Reinstallation of CPU Module	38
4.4.1 Disabling auto reinstallation of CPU module	38
4.4.2 Scheduling for auto reinstallation of CPU module	39
5. Checking the Duplicating Operation of Modules	40
5.1 Evaluate Start and Stop of I/O Modules	40
5.2 Evaluate Start and Stop of CPU Modules	43
6. Error Messages	45
6.1 Error Indication by LED	45
6.2 POST Error Message	52
7. Collecting Failure Information	59
7.1 Collection of Collect Logs	59
7.2 Collection of System Information	60
7.3 Collecting Memory Dump	61
8. Troubleshooting	63
8.1 Problem of Powering on	64
8.2 Problem of EXPRESSBUILDER	65
8.3 Problems When Installing VMware ESXi and ft control software	66
8.4 Problems When starting ESXi	67
8.5 Problems When Occurring Failures	68
8.6 Problems with Internal Devices and Other Hardware	68
8.7 Problems with System Operation	70
8.8 Problem of EXPRESSBUILDER on Windows	71
8.9 Problem of Bundled Software	72
8.10 Problem of Optical Disk Drive and Flash FDD	75
9. Resetting and Clearing the Server	76
9.1 Software Reset	76
9.2 Forced Shutdown	76
9.3 Clearing BIOS Settings (CMOS Memory)	77
10. System Diagnostics	81
10.1 Tests	81
10.2 Usage of System Diagnostics	81
11. Offline Tools	85
11.1 Starting Offline Tools	85
11.2 Features of Offline Tools	86
12. Precautions for Operation	87
Chapter 2 Configuring and Upgrading the System	88
1. ftSys Management Appliance	89
1.1 Overview	89
1.2 Steps for Accessing ftSys Management Appliance	90
1.3 Precautions for Using ftSys Management Appliance	90
2. Hard Disk Drive Operations	92
2.1 Operable disk configuration	92
2.2 esxcli Command Syntax	95
2.3 Confirm Hard Disk Drives status	96
2.4 Replacing a hard disk drive	97
2.4.1 Identifying a failing disk	97
2.4.2 Restoring the redundant configuration manually	98
2.4.3 Reducing resync time	100
2.5 Adding Hard Disk Drives	101
2.5.1 Inserting Additional Hard Disk Drives	101
2.5.2 Configuring a RAID Device	101
2.5.3 Creating and Mounting a Filesystem	103

3. Duplex LAN Configuration	106
3.1 Functional Overview	106
3.2 Operable Network Configuration	106
4. Miscellaneous Configuration	108
4.1 Changing Datastore Name	108
5. Installing Optional Devices	109
5.1 Precautions	109
5.1.1 Safety precautions	109
5.1.2 Before adding optional devices	110
5.1.3 Precautions for installing/removing or replacing optional devices	110
5.2 Available Optional Devices	111
5.3 2.5-inch Hard Disk Drive	112
5.3.1 Installing 2.5-inch Hard Disk Drive	113
5.3.2 Removing 2.5-inch Hard Disk Drive	115
5.3.3 Replacing 2.5-inch Hard Disk Drive	116
5.4 CPU/IO Module	117
5.4.1 Removing CPU/IO Module	118
5.4.2 Installing CPU/IO Module	121
5.5 DIMM	122
5.5.1 Installing DIMM	124
5.5.2 Removing DIMM	126
5.5.3 Replacing DIMM	127
5.6 CPU (Processor)	128
5.6.1 Installing CPU	129
5.6.2 Removing CPU	131
5.6.3 Replacing CPU	131
5.7 PCI Card	132
5.7.1 Precautions	132
5.7.2 Installing PCI Card	134
5.7.3 Removing PCI Card	138
5.7.4 Replacing PCI Card	138
5.7.5 Setup of Optional PCI Card	139
Chapter 3 Useful Features	140
1. System BIOS	141
1.1 Starting SETUP	141
1.2 Parameter Descriptions	141
1.2.1 Main	142
1.2.2 Advanced	143
1.2.3 Security	163
1.2.4 Server	165
1.2.5 Boot	171
1.2.6 Save & Exit	173
2. BMC Configuration	174
2.1 Overview	174
2.1.1 Offline Tools	174
2.2 Activating BMC Configuration	175
2.3 Main Menu of BMC Configuration	176
2.4 Setting BMC Configuration	177
2.4.1 Network	178
2.4.2 User Management	181
2.4.3 Mail Alert	183
2.4.4 SNMP Alert	185
2.4.5 System Operation	186
2.4.6 Miscellaneous	187
2.5 BMC Initialization	188
2.6 BMC Reset	188
3. SAS Configuration Utility	189
3.1 Starting the SAS Configuration Utility	189

3.2 Quitting the SAS Configuration Utility	190
3.3 Physical Formatting of the Hard Disk Drive	190
4. Flash FDD.....	193
4.1 Notes on Using Flash FDD	193
4.1.1 Compensation for recorded data	193
4.1.2 Handling Flash FDD	193
4.1.3 Use with EXPRESSBUILDER	193
5. Details of EXPRESSBUILDER	194
5.1 Starting EXPRESSBUILDER	194
5.2 Menus of EXPRESSBUILDER.....	194
5.3 Utility in EXPRESSBUILDER.....	196
6. EXPRESSSCOPE Engine 3	197
7. NEC ESMPRO.....	198
7.1 NEC ESMPRO Agent.....	198
7.2 NEC ESMPRO Manager.....	198
7.2.1 Monitoring the ESXi status of the ft server (ESXi 6.5 or later).....	198
Glossary	200
Revision Record	201

Conventions Used in This Document

Signs and symbols for safety

WARNING and CAUTION are used in this guide as following meaning.



Indicates there is a risk of death or serious personal injury



Indicates there is a risk of burns, other personal injury, or property damage

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	Attention	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type.	(Example) (Electric shock risk)
	Prohibited Action	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example) (Do not disassemble)
	Mandatory Action	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example) (Disconnect a plug)

(Example in this guide)

Symbol to draw attention

Description of a warning

Term indicating a degree of danger

WARNING

Use only the specified outlet

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

Notations used in the text

In addition to safety-related symbols urging caution, three other types of notations are used in this document. These notations have the following meanings.

Important	Indicates critical items that must be followed when handling hardware or operating software. If the procedures described are not followed, <u>hardware failure, data loss, and other serious malfunctions could occur.</u>
Note	Indicates items that must be confirmed when handling hardware or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drive

This server is equipped with the following drive. This drive is referred to as *optical disk drive* in this document.

- DVD Super MULTI drive

Hard disk drive

Unless otherwise stated, *hard disk drive* described in this document refers to both of the following.

- Hard disk drive (HDD)
- Solid state drive (SSD)

Removable media

Unless otherwise stated, *removable media* described in this document refers to both of the following.

- USB flash drive
- Flash FDD

Abbreviations of Operating Systems (VMware)

VMware are referred to as follows.

Notations in this document	Official names of OS
VMware ESXi or ESXi	VMware ESXi 6.7 Update1

POST

POST described in this document refers to the following.

- Power On Self-Test

BMC

BMC described in this document refers to the following.

- Baseboard Management Controller

Trademarks

EXPRESSSCOPE is a registered trademark of NEC Corporation

Microsoft, Windows, and Windows Server are registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.

Intel, and Xeon are registered trademarks of Intel Corporation of the United States.

Linux is a trademark or registered trademark of Linus Torvalds in Japan and other countries.

Adobe, the Adobe logo, and Acrobat are trademarks of Adobe Systems Incorporated.

PCI Express is a trademark of Peripheral Component Interconnect Special Interest Group.

VMware products are covered by one or more patents listed at <http://www.vmware.com/go/patents>.

VMware is a registered trademark or trademark of VMware, Inc in the United States and/or other jurisdictions.

All other product, brand, or trade names used in this publication are the trademarks or registered trademarks of their respective trademark owners.

License Notification

Open source software of following license is included in the part of this product (system BIOS).

- EDK/EDKII
- OpenSSL
- AMI CRYPTO LIBRARY USING WPA SUPPLICANT

Open source software of following license is included in the part of this product (Off-line Tools).

- EDK/EDKII

EDK/EDKII

BSD License from Intel

Copyright (c) 2012, Intel Corporation

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

OpenSSL

OpenSSL License

Copyright (c) 1998-2011 The OpenSSL Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment:
"This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit.
(<http://www.openssl.org/>)"
4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.
5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.
6. Redistributions of any form whatsoever must retain the following acknowledgment:
"This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit
(<http://www.openssl.org/>)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT ``AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).

This product includes software written by Tim Hudson (tjh@cryptsoft.com).

AMI CRYPTO LIBRARY USING WPA SUPPLICANT

WPA Supplicant

Copyright (c) 2003-2016, Jouni Malinen <j@w1.fi> and contributors
All Rights Reserved.

This program is licensed under the BSD license (the one with advertisement clause removed).
If you are submitting changes to the project, please see CONTRIBUTIONS file for more instructions.

License

This software may be distributed, used, and modified under the terms of
BSD license:

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name(s) of the above-listed copyright holder(s) nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Warnings and Additions to This Product and Document

1. **Unauthorized reproduction of the contents of this document, in part or in its entirety, is prohibited.**
2. **This document is subject to change at any time without notice.**
3. **Do not make copies or alter the document content without permission from NEC Corporation.**
4. **If you have any concerns, or discover errors or omissions in this document, contact your sales representative.**
5. **Regardless of article 4, NEC Corporation assumes no responsibility for effects resulting from your operations.**
6. **The sample values used in this document are not the actual values.**

Keep this document for future use.

Latest editions

This document was created based on the information available at the time of its creation. The screen images, messages and procedures are subject to change without notice. Substitute as appropriate when content has been modified.

The most recent version of the guide, as well as other related documents, is also available for download from the following website.

<https://www.nec.com/>

Safety notes

To use this server safely, read thoroughly *Safety Precautions and Regulatory Notices* that comes with your server.

NEC Express5800 Series Express5800/R320g-E4, R320g-M4

1

Maintenance

This chapter explains maintenance of server, and what actions are to be taken in case of trouble when operating this server.

1. Relocation and Storage

Describes how to relocate and store this server.

2. Daily Maintenance

Describes what you must confirm for daily use, how to manage files, and how to clean the server.

3. User Support

Describes various services on this product.

4. Maintenance of Express5800/ft series

Describes how to start, stop, diagnose each components of ft server, and how to update firmware.

5. Checking the Duplicating Operation of Modules

Describes how to check if the system runs properly after system installation or reinstallation.

6. Error Messages

Describes error messages and actions to be taken at occurrence of an error.

7. Collecting Failure Information

Describes how to collect information about the location where a failure occurred and its cause when the server malfunctions. Refer to this section in case of a failure.

8. Troubleshooting

Describes how to identify the causes of problems and what actions are to be taken to address them. Refer to this section when you suspect a failure.

9. Resetting and Clearing the Server

Describes how to reset or clear the server. Refer to this section when the server is not working or when you want to restore BIOS settings to the factory settings.

10. System Diagnostics

Describes the system diagnostics of this server.

11. Offline Tools


Describes tools for preventive maintenance of this product.

12. Precautions for Operation

I. Relocation and Storage

Follow the steps below if you want to relocate or store this server.


⚠ WARNING



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, see *Safety Precautions and Regulatory Notices*.

- Do not disassemble, repair, or alter the server.
- Do not remove the lithium battery.
- Disconnect the power plug before installing or removing the server.

⚠ CAUTION



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see *Safety Precautions and Regulatory Notices*.

- Make sure to complete installation.
- Do not get your fingers caught.
- Be careful of handling internal components that may be at high temperatures.

Note

- If the server needs to be relocated/stored due to a change in the floor layout to a great extent, contact your service representative.
- If the server has hard disk drives, move the server while being careful not to damage the drive.
- When storing the server, monitor the environmental conditions of the storage area (temperature: –10°C to 55°C, humidity: 20% to 80%). (No dew condensation is permitted)

Tips

Make backup copies of important data stored in the hard disk drive.

1. Remove the disc from the optical disk drive.
2. Power off the server (POWER LED goes off).
3. Unplug the power cord of the server from the power outlet.
4. Disconnect all the cables from the server.
5. Remove both of installed CPU/IO modules and 4U frame.
6. Carry the removed CPU/IO modules and 4U frame separately.
7. Pack the server securely to protect from damage, shock, and vibration.

Important If this server and internal optional devices are suddenly moved from a cold place to a warm place, condensation will occur. Wait for a sufficient period of time before using the server and other components in the operating environment.

Note Check and adjust the system clock before operating after relocating or storing the server.

2. Daily Maintenance

To use this server under good conditions at all times, periodically check and maintain as follows. If failures are found, ask your sales representative, avoiding impossible operation.

2.1 Checking and Applying Updates

Express5800 Series posts update information for BIOS, firmware (FW), driver, and others of the server and peripheral devices on our website. We recommend that the latest update always be applied for stable system.

NEC corporate site: <https://www.nec.com/>

[Support & Downloads]

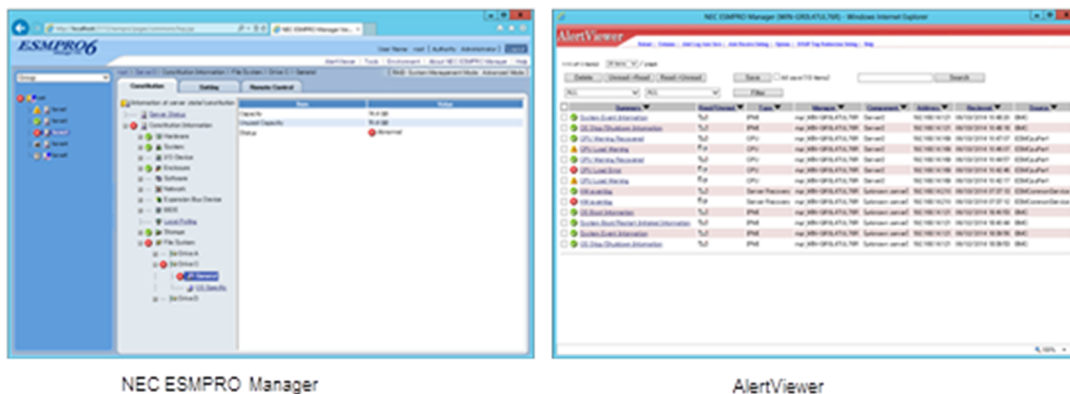
Tips

- Download and apply the latest update yourself.
- NEC recommends that you back up data for a rainy day before applying the latest update.

2.2 Checking Alerts

Use NEC ESMPRO Manager (for Windows) to constantly verify that no abnormalities are detected on the monitored server and that no alerts have been issued.

Example image of NEC ESMPRO Manager



2.3 Checking STATUS LED

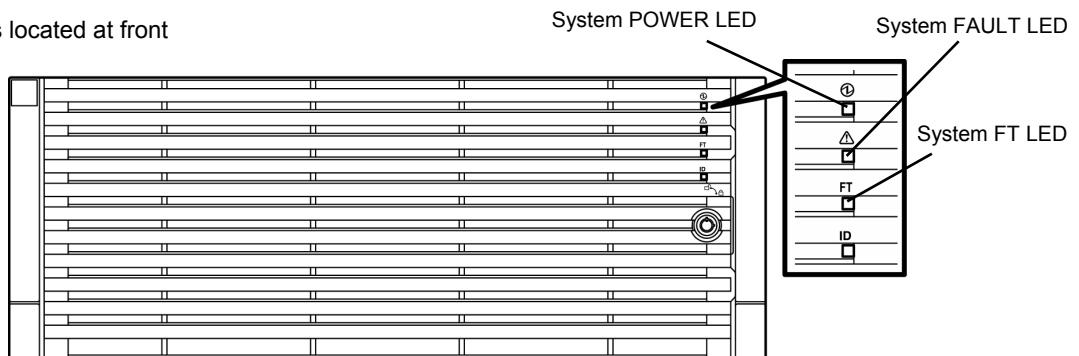
Check LEDs located at front of the server for any abnormalities after the server is powered on or before shutting down the server and the server is powered off. Check LEDs for any abnormalities also while the server is running.

Check LED indication when:

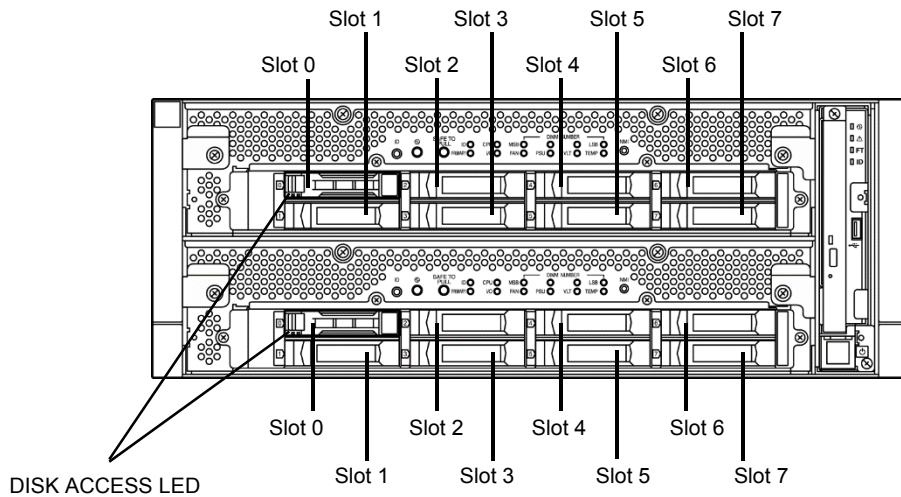
- Just after turning on the power of the server
- While the server is running.
- Before shutting down the server.

LEDs to be checked:

- LEDs located at front



- LEDs on hard disk drives



If the indicator shows the server abnormality, contact your sales representative.

For the functions and descriptions of the LED, see *Chapter 1 (6.1 Error Indication by LED)*.


2.4 Making Backup Copies






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

When you have changed the hardware configuration or BIOS configuration, make a backup copy of the system information according to *Chapter 1 (1.13 Backing Up System Information)* in *Installation Guide*.

2.5 Cleaning

Regularly clean the server to keep it in good condition.

 **WARNING**



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, see *Safety precautions and Regulatory Notices*.

- Do not disassemble, repair, or alter the server.
- Disconnect the power plug before cleaning the server.

2.5.1 Cleaning the server

For daily cleaning, wipe the external surfaces of the server with a dry soft cloth. Follow the procedure below if stains remain on the surfaces:

- Important**
- Do not use thinner, benzene, and other volatile solvents to clean the server.
 - The power sockets, cables, connectors on the rear panel of server, and the inside of the server must be kept dry.

1. Power off the server.
 - Make sure that the server is powered off.
 - Unplug the power cord of the server from a power outlet.
2. Clean the power plug.

Wipe off dust from the power cord plug with a dry cloth.
3. Clean the server.
 - Soak a soft cloth in neutral detergent that is diluted with cold or warm water, and squeeze it firmly.
 - Rub off stains on the server with the cloth prepared in Step 1.
 - Soak a soft cloth in water, squeeze it firmly and wipe the server with it once again.
 - Wipe the server with a dry cloth.
4. Clean the rear panel of the server.

Wipe off dust from the fan exhaust opening on the rear with a dry cloth.

2.5.2 Cleaning the Keyboard and Mouse

Wipe the surface of the keyboard with a dry cloth after confirming that whole the system including this server and peripheral devices are turned off (POWER LED is not lit).

Mouse will not work correctly if the optical sensor is stained. Wipe the optical sensor with a dry cloth.

3. User Support

Before getting after-sales service, check the contents of the warranty and service.

3.1 Maintenance Services

Service representatives from NEC subsidiary companies or companies authorized by NEC provide maintenance services. For the services, contact your sales representative.

3.2 Before Asking for Repair

If you think that a failure occurred, follow the steps below:

1. Check if the power cord and cables to other products are properly connected.
2. Check LED indications and alarm messages on display unit. See *Chapter 1 (6. Error Messages)*.
3. See *Chapter 1 (8. Troubleshooting)*. If you find a symptom similar to your problem, take the action as instructed. The LED indications and the display on the screen at the failure will be useful information for the repair.
4. Confirm that the required software has been properly installed.
5. Scan for viruses using a commercial Antivirus Software.

If the problem persists after taking the measures above, contact your sales representative. Take notes on LED indications and the display on the screen at the failure, which will be useful information for the repair.

4. Maintenance of Express5800/ft series

For Express5800/ft server maintenance tasks, use the `/opt/ft/bin/ftsmaint` command on console of ftSys Management Appliance. For information about using the `ftsmaint` command and using device path enumeration to manage specific devices in your system, see the following sections:

- 4.1 *ftsmaint* Command
- 4.2 Device Path Enumeration
- 4.3 *ftsmaint* Examples

4.1 *ftsmaint* Command

4.1.1 Component information

`ftsmaint ls path`

This command displays the status of the hardware specified by the enumerated path. Specifying a path displays a detailed status of the hardware at that path.

Omitting the *path* argument displays a less-detailed table of all fault-tolerant devices on the system. Refer to *Chapter 1 (4.2 Device Path Enumeration)* for more information.

Output from `ftsmaint ls path` reflects what the management software reports about the state of a given component. Because of system latency, this may not reflect the immediate state of the device.

To verify the actual state of the device, check the state of its LED.

Note

Running this command may fail if the necessary process does not run immediately after the system startup. In this case, wait for a while (several minutes or so), and try again.

4.1.2 Start/stop the component

`ftsmaint bringDown path`

This command removes from service the CPU module, I/O module, or internal disk specified by *path*. No other devices are supported. When you bring down a device, the effect on the system is the same as physically removing it.

Important

When manually bringing down a component, it is possible that a whole CPU/I/O module will be taken out of service. Be careful to bring down a component only when the system is fully duplexed.

Note

This command is valid only for CPU module, I/O module, and internal hard disk drives.

ftsmaint bringUp path

This command brings into service the CPU module, I/O module, or internal disk specified by *path*. No other devices are supported.

Tips

Running the `ftsmaint bringUp` command on a CPU module degrades system performance and halts network communications for up to a minute.

Note

This command is valid only for CPU module, I/O module, and internal hard disk drives.

4.1.3 MTBF clear

ftsmaint clearMtbF path

This command clears the MTBF value of the CPU module, I/O module, or I/O module slot specified by *path*.

Important

Do not use this feature to retain a faulty or degraded device in service.

4.1.4 Diagnostics

ftsmaint runDiag path

This command starts diagnostics on the CPU module or I/O module specified by *path*.

4.1.5 BMC firmware update

ftsmaint burnBmcs fw_file

This command updates the BMC firmware using BMC firmware file specified by *fw_file* argument.

Important

- Shutdown the guest OS except for ftSys Management Appliance.
- Make sure that I/O modules and BMC are duplicated before starting update of BMC firmware.
- Do not operate the machine and power supply unit while the firmware is updated. The firmware is destroyed and modules may need to be replaced.

4.1.6 BIOS update

ftsmaint burnProm fw_file path

This command updates BIOS of CPU module specified by *path* argument using the BIOS firmware file specified by *fw_file* argument.

Important

- Shutdown the guest OS except for ftSys Management Appliance.
- Make sure that CPU modules are duplicated before starting update of BIOS.
- Do not operate the machine and power supply unit while the firmware is updated. The firmware is destroyed and modules may need to be replaced.

4.2 Device Path Enumeration

Some subsystems and components of the server system are addressable by device path IDs. Device path IDs uniquely identify the devices in the server system.

Table 1 lists the device path IDs for devices in the server system. In Table 1, IDs in the format ****:.n.n** (for example, 28:00.0) indicate PCI bus, slot, and function.

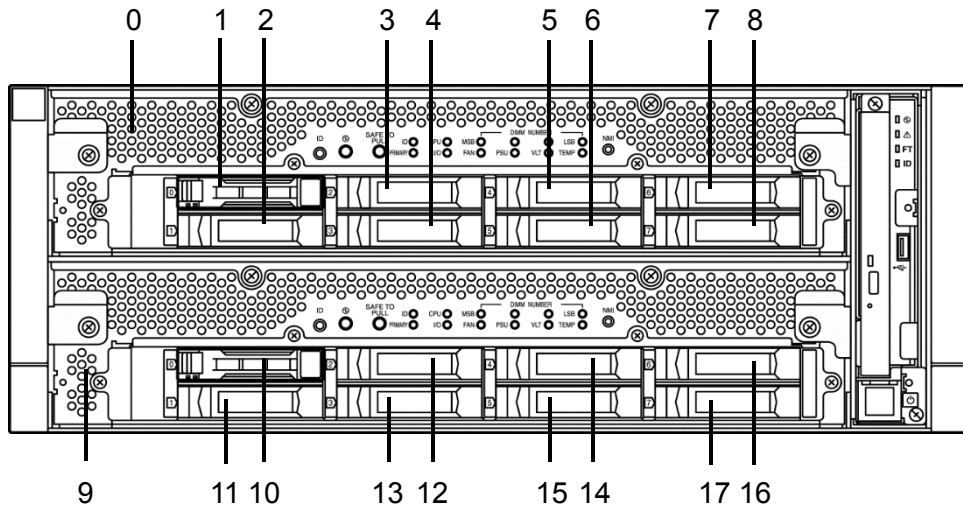
These numbers may change as a result of normal system events. Therefore, devices in your system may appear with different IDs in command output from `ftsmaint` and other commands. The values for such devices are provided here as representative sample data only.

Table 1. Device Paths of the Server Devices

Device	Path	
	CPU/IO Module 0	CPU/IO Module 1
CPU Module	0	1
DIMMs (addressed by slot)	0/1 - 0/20	1/1 - 1/20
Processors	0/41,0/42	1/41,1/42
Temperature #n sensor	0/130	1/130
Fan #n sensors	0/140 - 0/144	1/140 - 1/144
I/O Module	10	11
PCI Slot devices (in slots on motherboards)	10/1,10/2	11/1,11/2
PCI Slot devices (in optional high-profile PCIe slots)	10/3,10/4	11/3,11/4
Internal Disk controller	10/5	11/5
Network controller Ethernet controller: Intel® Corporation I350 Gigabit network connection Network interface	10/6 28:00.0, 28:00.1 vmnic_100600 vmnic_100601	11/6 62:00.0, 62:00.1 vmnic_110600 vmnic_110601
Display controller VGA compatible controller: Matrox® Graphics, Inc. MGA G200e	10/7 2e:00.0	11/7 68:00.0
Bridge	10/10, 10/11	11/10, 10/11
Network controller Ethernet controller: Intel Corporation Ethernet Controller 10-Gigabit X550-BT2	10/12 9f:00.0, 9f:00.1 vmnic_101200 vmnic_101201	11/12 d1:00.0, d1:00.1 vmnic_111200 vmnic_111201
Internal disk enclosure Hard disk drive 1-8	10/40 10/40/1 - 10/40/8	11/40 11/40/1 - 11/40/8
PCI riser card 2xPCIe	10/70	11/70
Baseboard Management Controller(BMC)	10/120	11/120

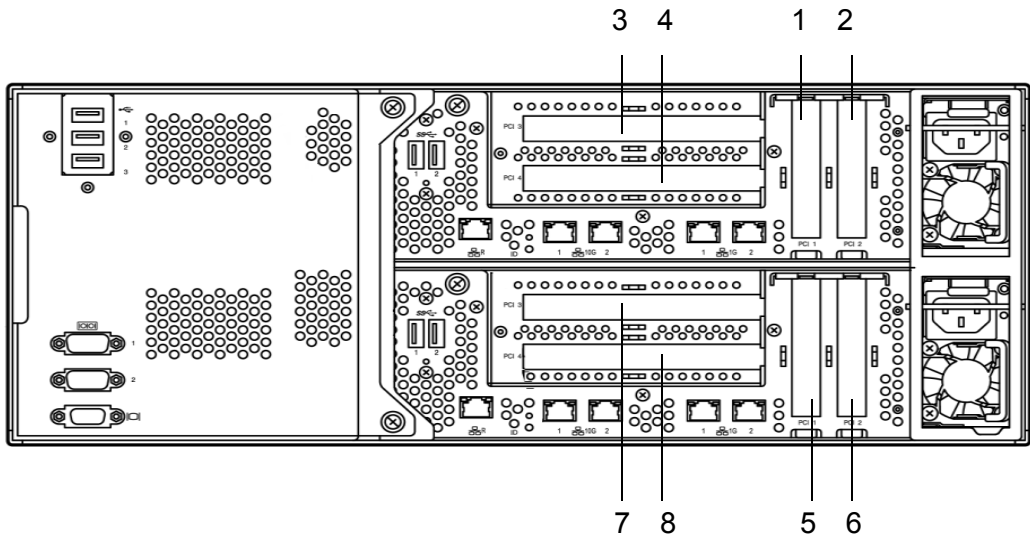
Figure 1 and Figure 2 show the locations of the major enumerated devices.

Figure 1. Locations of Major Enumerated Devices (Front View)



Callout	Device	Device ID	Physical Label
0	CPU/I/O Module 0 (CPU-0, I/O-10)	0	
1	Internal hard disk drive 1	10/40/1	0
2	Internal hard disk drive 2	10/40/2	1
3	Internal hard disk drive 3	10/40/3	2
4	Internal hard disk drive 4	10/40/4	3
5	Internal hard disk drive 5	10/40/5	4
6	Internal hard disk drive 6	10/40/6	5
7	Internal hard disk drive 7	10/40/7	6
8	Internal hard disk drive 8	10/40/8	7
9	CPU/I/O Module 1 (CPU-1, I/O-11)	1	
10	Internal hard disk drive 1	11/40/1	0
11	Internal hard disk drive 2	11/40/2	1
12	Internal hard disk drive 3	11/40/3	2
13	Internal hard disk drive 4	11/40/4	3
14	Internal hard disk drive 5	11/40/5	4
15	Internal hard disk drive 6	11/40/6	5
16	Internal hard disk drive 7	11/40/7	6
17	Internal hard disk drive 8	11/40/8	7

Figure 2. Locations of Major Enumerated Devices (Rear View)



Callout	Device	Device ID
1	I/O module 0 PCI Slot 1	10/1
2	I/O module 0 PCI Slot 2	10/2
3	I/O module 0 PCI Slot 3	10/3
4	I/O module 0 PCI Slot 4	10/4
5	I/O module 1 PCI Slot 1	11/1
6	I/O module 1 PCI Slot 2	11/2
7	I/O module 1 PCI Slot 3	11/3
8	I/O module 1 PCI Slot 4	11/4

4.3 ftsmaint Examples

The following sections provide examples of how to use the ftsmaint command.

4.3.1 Displaying System Status

To display the status of the fault-tolerant devices and subsystems in your server system, use the following command:

```
# /opt/ft/bin/ftsmaint ls
```

Example 1 shows typical output for this command.

Example 1. Displaying System Status with the ftsmaint Command

H/W Path	Description	State	OPState	FRev	Fct
0	Combined CPU/IO	ONLINE	DUPLEX	*	0
0/1	DIMM	ONLINE	ONLINE	-	-
0/1/130	DIMM 1 Temp#0 Sensor	-	NORMAL	-	-
0/2	DIMM	MISSING	EMPTY	-	-
...					
0/41	Intel(R) Xeon(R) Gold 6127M CPU @ 2.20GHz	ONLINE	ONLINE	-	-
...					
0/130	Baseboard Temp#0 Sensor	-	NORMAL	-	-
0/140	Baseboard Fan0#0 Sensor	-	NORMAL	-	-
...					
1	Combined CPU/IO	ONLINE	DUPLEX	*	0
1/1	DIMM	ONLINE	ONLINE	-	-
1/1/130	DIMM 1 Temp#1 Sensor	-	NORMAL	-	-
1/2	DIMM	MISSING	EMPTY	-	-
...					
1/41	Intel(R) Xeon(R) Gold 6127M CPU @ 2.20GHz	ONLINE	ONLINE	-	-
...					
1/130	Baseboard Temp#1 Sensor	-	NORMAL	-	-
1/140	Baseboard Fan0#1 Sensor	-	NORMAL	-	-
1/141	Baseboard Fan1#1 Sensor	-	NORMAL	-	-
...					
10	Combined CPU/IO	ONLINE	DUPLEX	-	0
10/1	Network Ctlr	ONLINE	DUPLEX	-	0
0000:08:00.0	Ethernet controller: Intel Corporation Et	ONLINE	DUPLEX	-	-
vmnic_100100	Network Interface	ONLINE	DUPLEX	-	-
10/2	-	MISSING	EMPTY	-	-
10/3	Fibre Channel Serial Bus Ctlr	ONLINE	DUPLEX	-	0
0000:7e:00.0	Fibre Channel: QLogic Corp. ISP8324-based	ONLINE	DUPLEX	-	-
10/4	-	MISSING	EMPTY	-	-
10/5	Mass Storage Ctlr	ONLINE	DUPLEX	-	0
0000:2a:00.0	Mass storage controller: LSI Logic / Symb	ONLINE	DUPLEX	-	-
10/6	Network Ctlr	ONLINE	DUPLEX	-	0
0000:28:00.0	Ethernet controller: Intel Corporation I3	ONLINE	DUPLEX	-	-
vmnic_100600	Network Interface	ONLINE	DUPLEX	-	-
0000:28:00.1	Ethernet controller: Intel Corporation I3	BROKEN	BROKEN	-	-
vmnic_100601	Network Interface	BROKEN	BROKEN	-	-
10/7	Display Ctlr	ONLINE	DUPLEX	-	0
0000:2e:00.0	VGA compatible controller: Matrox Electro	ONLINE	DUPLEX	-	-
10/10	PCI to PCI Bridge	ONLINE	ONLINE	-	0
10/11	PCI to PCI Bridge	ONLINE	ONLINE	-	0
10/12	Network Ctlr	ONLINE	DUPLEX	-	0
0000:9f:00.0	Ethernet controller: Intel Corporation Et	ONLINE	DUPLEX	-	-
vmnic_101200	Network Interface	ONLINE	DUPLEX	-	-
0000:9f:00.1	Ethernet controller: Intel Corporation Et	BROKEN	BROKEN	-	-
vmnic_101201	Network Interface	BROKEN	BROKEN	-	-
10/40	Internal Disk Enclosure	-	-	-	-
10/40/1	Disk Drive	ONLINE	DUPLEX	A920	0
10/40/5	Disk Drive	ONLINE	DUPLEX	A920	0

10/40/6	Disk Drive	ONLINE	DUPLEX	A920	0
10/70	2x PCI-E2(X8) Riser Card	-	-	-	-
10/120	Baseboard Management Ctlr	ONLINE	DUPLEX	*	-
10/130	BB Rear Temp#0 Sensor	-	NORMAL	-	-
11	Combined CPU/IO	ONLINE	DUPLEX	-	0
11/1	Network Ctlr	ONLINE	DUPLEX	-	0
0000:42:00.0	Ethernet controller: Intel Corporation Et	ONLINE	DUPLEX	-	-
vmnic_110100	Network Interface	ONLINE	DUPLEX	-	-
11/2	-	MISSING	EMPTY	-	-
11/3	Fibre Channel Serial Bus Ctlr	ONLINE	DUPLEX	-	0
0000:b0:00.0	Fibre Channel: QLogic Corp. ISP8324-based	ONLINE	DUPLEX	-	-
11/4	-	MISSING	EMPTY	-	-
11/5	Mass Storage Ctlr	ONLINE	DUPLEX	-	0
0000:64:00.0	Mass storage controller: LSI Logic / Symb	ONLINE	DUPLEX	-	-
11/6	Network Ctlr	ONLINE	DUPLEX	-	0
0000:62:00.0	Ethernet controller: Intel Corporation I3	ONLINE	DUPLEX	-	-
vmnic_110600	Network Interface	ONLINE	DUPLEX	-	-
0000:62:00.1	Ethernet controller: Intel Corporation I3	BROKEN	BROKEN	-	-
vmnic_110601	Network Interface	BROKEN	BROKEN	-	-
11/7	Display Ctlr	ONLINE	DUPLEX	-	0
0000:68:00.0	VGA compatible controller: Matrox Electro	ONLINE	DUPLEX	-	-
11/10	PCI to PCI Bridge	ONLINE	ONLINE	-	0
11/11	PCI to PCI Bridge	ONLINE	ONLINE	-	0
11/12	Network Ctlr	ONLINE	DUPLEX	-	0
0000:d1:00.0	Ethernet controller: Intel Corporation Et	ONLINE	DUPLEX	-	-
vmnic_111200	Network Interface	ONLINE	DUPLEX	-	-
0000:d1:00.1	Ethernet controller: Intel Corporation Et	BROKEN	BROKEN	-	-
vmnic_111201	Network Interface	BROKEN	BROKEN	-	-
11/40	Internal Disk Enclosure	-	-	-	-
11/40/1	Disk Drive	ONLINE	DUPLEX	A920	0
11/40/5	Disk Drive	ONLINE	DUPLEX	A920	0
11/40/6	Disk Drive	ONLINE	DUPLEX	A920	0
11/70	2x PCI-E2(X8) Riser Card	-	-	-	-
11/120	Baseboard Management Ctlr	ONLINE	DUPLEX	*	-
11/130	BB Rear Temp#1 Sensor	-	NORMAL	-	-

IO Enclosure 10 is the Active Compatibility Node.

This is an Express5800/R320g-M4 system, P-Package N8800-250F, Serial# 0000000000.

* Use lsLong to see this value.

4.3.2 Displaying the Status of a Single System Component

Before you remove a component that is duplexed for fault tolerance, verify that it is not in a simplex state. To verify the state of a component, type a command in the following format:

```
# /opt/ft/bin/ftsmaint ls path
```

For *path*, specify the correct device ID for the component, as listed in Table 1.

The value of Op State shows the state of device. DUPLEX is shown if the system is duplicated, and SIMPLEX is shown if the system is not duplicated.

The following examples demonstrate some common commands and the resulting output.

In Example 2, the I/O module 1 is listed as having a State of ONLINE and an OP State of DUPLEX. The value of SECONDARY for Reason indicates that it is operating as the backup I/O element.

Example 2. Viewing the State of the Bottom I/O module 1

```
# /opt/ft/bin/ftsmaint ls 11
H/W Path           : 11
Description        : Combined CPU/IO
State              : ONLINE
Op State           : DUPLEX
Reason             : SECONDARY
Modelx             : GXA-016200
Artwork Rev       : 0
ECO Level          : 0
Min Partner ECO Level : 0
Serial #           : 2BJ080004
Active Compat Node : true
Logic Revision     : 1900019
MTBF Policy        : useThreshold
MTBF fault class:  uncorrectable
Fault Count:       0
Last Timestamp:    -
Replace Threshold: 0
Evict Threshold:   21600
Value:             0
Minimum Count:     4
```

In Example 3, the internal hard disk drive in the I/O module 1 is listed as having a State of ONLINE and an Op State of DUPLEX.

Example 3. Viewing the State of Hard Disk Drive 11/40/1

```
# ftsmaint ls 11/40/1
H/W Path           : 11/40/1
Description        : Disk Drive
State              : ONLINE
Op State           : DUPLEX
Reason             : NONE
Modelx             : TOSHIBA:KPM51MUG400G
CapacityGB         : 372.53
Firmware Rev       : 0107
Serial             : 78B0A009TAVR
Device Name        : disk_i
Udev Device Names  : -
Kernel Device Names : vmhbal:C0:T1:L0
Endurance          : 100% (warning 10%, critical 5%)
MTBF Policy        : useThreshold
MTBF fault class:  critical      noncritical      removal
Fault Count:       0              0                0
Last Timestamp:    -              -                -
Replace Threshold: 0              0                0
Evict Threshold:   2147483647      604800           86400
Value:             0              0                0
Minimum Count:     1              4                2

MTBF fault class:  aborts
Fault Count:       0
Last Timestamp:    -
Replace Threshold: 0
Evict Threshold:   86400
Value:             0
Minimum Count:     2
```

4.3.3 Bringing System Components Down and Up

You can use the `ftsmaint` command to bring down and restart fault-tolerant components. After bringing up a component, the system synchronizes and duplexes the corresponding component automatically.

When you use the `bringDown` command, the I/O module 1 stops.

```
# /opt/ft/bin/ftsmaint bringDown 11
Completed bringDown on the device at path 11.
```

When you use the `bringUp` command, the I/O module 1 starts. The system automatically synchronizes I/O module 1 with I/O module 0. The RAID array drives are updated and become mirrored, and the system should resume duplex operation.

```
# /opt/ft/bin/ftsmaint bringUp 11
Completed bringUp on the device at path 11.
```

4.3.4 Stopping and Starting the Internal Disk Enclosure

To stop the hard disk drive, use the **ftsmaint** command as well. For example, use the following command to stop the hard disk drive 1 of CPU module 1.

```
# /opt/ft/bin/ftsmaint bringDown 11/40/1
Completed bringDown on the device at path 11/40/1.
```

Typing the following command starts the internal disk enclosure again.

```
# /opt/ft/bin/ftsmaint bringUp 11/40/1
Completed bringUp on the device at path 11/40/1.
```

4.3.5 Diagnostics

To start diagnostics on the CPU module and I/O module, use the following command.

```
# /opt/ft/bin/ftsmaint runDiag path
```

Before starting diagnostics, you need to bring down the module to be diagnosed. For example, use the following commands to start diagnostics on CPU module 1.

```
# /opt/ft/bin/ftsmaint bringDown 1
Completed bringDown on the device at path 1.
# /opt/ft/bin/ftsmaint runDiag 1
Completed diagnostics on the device at path 1.
```

Check the Op State shows "DIAGNOSTICS_PASSED" by the following command.

```
# /opt/ft/bin/ftsmaint ls 1
H/W Path           : 1
Description        : Combined CPU/IO
State              : UNKNOWN
Op State           : DIAGNOSTICS_PASSED
Reason             : NONE
Modelx             : GXA-016200
Firmware Rev       : BIOS Version 1.0:27
Artwork Rev        : 0
ECO Level          : 0
Min Partner ECO Level : 0
Serial #           : 2BJ080004
Logic Revision      : 1900019
MTBF Policy        : useThreshold
MTBF fault class:  correctable      uncorrectable      microsync
Fault Count:       0                0                  0
Last Timestamp:    -                -                  -
Replace Threshold: 0                0                  1728
Evict Threshold:   1800             21600              0
Value:             0                0                  0
Minimum Count:     8                4                  50
```

Note

Upon completion of diagnostics, run bringUp command to start the relevant module.

4.3.6 Updating BMC firmware

Use the following command to update the BMC firmware.

```
# /opt/ft/bin/ftsmaint burnBmcs fw_file
```

Important Shutdown the guest OS except for ftSys Management Appliance.

1. Login to ftSys Management Appliance as a root user.
2. Use the SCP command or Host Client to store the BMC firmware file in the desired directory of ftSys Management Appliance.

In the example below, ft control software Install DVD is mounted and BMC firmware file is copied to ftSys Management Appliance.

```
# cp /mnt/cdrom/firmware/bmc/R310g-E4_R320g-E4_R320g-M4/351-01569bmc_bnn.
nrrnn.nnsnn.nn.bin /opt/ft/firmware/bmc/R310g-E4_R320g-E4_R320g-M4
```

Tips See *Chapter 2 (1.1.2 Install NEC ESM PRO Agent)* in *Installation Guide* for how to mount/unmount ft control software Install DVD.

3. Run the following command to check the State shows "ONLINE" and Op State shows "DUPLEX" for I/O modules 0 and 1.

```
# /opt/ft/bin/ftsmaint ls 10
H/W Path      : 10
...
State         : ONLINE
Op State      : DUPLEX
...
```

```
# /opt/ft/bin/ftsmaint ls 11
H/W Path      : 11
...
State         : ONLINE
Op State      : DUPLEX
...
```

4. Run the following command to check the State shows "ONLINE" and Op State shows "DUPLEX" for BMCs of I/O modules 0 and 1.

```
# /opt/ft/bin/ftsmaint ls 10/120
H/W Path      : 10/120
...
State         : ONLINE
Op State      : DUPLEX
.....
```

```
# /opt/ft/bin/ftsmaint ls 11/120
H/W Path      : 11/120
...
State         : ONLINE
Op State      : DUPLEX
.....
```

5. Run the following command to update BMC firmware. For *bmc_file*, specify the file path you have copied in Step 2.

It takes approximately 40 minutes until update completes.

```
# /opt/ft/bin/ftsmaint burnBmcs bmc_file
```

When the following messages are displayed, update completes.

```
Updated firmware on the device at path 11/120.
```

```
Updated firmware on the device at path 10/120.
```

Important

Do not operate the machine and power supply unit while the firmware is updated. The firmware is destroyed and modules may need to be replaced.

6. Run the following command to check that Op State of BMC shows "DUPLEX" and Firmware Rev shows the new BMC version.

```
# /opt/ft/bin/ftsmaint ls 10/120
```

```
Op State      : DUPLEX
```

```
:
```

```
Firmware Rev  : 05.37/01.52/05.04 Version is indicated in the underlined part.
```

```
# /opt/ft/bin/ftsmaint ls 11/120
```

```
Op State      : DUPLEX
```

```
:
```

```
Firmware Rev  : 05.37/01.52/05.04 Version is indicated in the underlined part.
```

7. Run the following command to check that Op State of I/O module shows "DUPLEX". After updating completes in Step 5, it takes about 5 minutes until shows "DUPLEX".

```
# /opt/ft/bin/ftsmaint ls 10
```

```
:
```

```
Op State      : DUPLEX
```

```
# /opt/ft/bin/ftsmaint ls 11
```

```
:
```

```
Op State      : DUPLEX
```

8. Unmount ft control software Install DVD, if mounted. Then, disconnect the DVD drive.

4.3.7 Updating BIOS

Use the following command to update the BIOS.

```
# /opt/ft/bin/ftsmaint burnProm fw_file path
```

Important Shutdown the guest OS except for ftSys Management Appliance.

1. Login to ftSys Management Appliance as a root user.
2. Use the SCP command or Host Client to store the BIOS file in the desired directory of ftSys Management Appliance.

In the example below, ft control software Install DVD is mounted and BIOS file is copied to ftSys Management Appliance.

```
# cp /mnt/cdrom/firmware/bios/R310g-E4_R320g-E4_R320g-M4/351-01568biosn.n.nn.rom /opt/ft/firmware/bios/R310g-E4_R320g-E4_R320g-M4
```

Tips See *Chapter 2 (1.1.2 Install NEC ESM PRO Agent)* in *Installation Guide* for how to mount/unmount ft control software Install DVD.

3. Run the following command to check the State shows "ONLINE" and Op State shows "DUPLEX" for CPU modules 0 and 1.

```
# /opt/ft/bin/ftsmaint ls 0
H/W Path      : 0
...
State         : ONLINE
Op State      : DUPLEX
...
```

```
# /opt/ft/bin/ftsmaint ls 1
H/W Path      : 1
...
State         : ONLINE
Op State      : DUPLEX
...
```

4. Run the following command to update the BIOS of CPU modules 0 and 1.

- (1) Stop the CPU module 0.

```
# /opt/ft/bin/ftsmaint bringDown 0
Completed bringDown on the device at path 0.
```

- (2) Update the BIOS of CPU module 0. For *bios_file*, specify the file path you have copied in Step 2.

```
# /opt/ft/bin/ftsmaint burnProm bios_file 0
Updated firmware on the device at path 0.
```

- (3) Start the CPU module 0, and stop the CPU module 1.

```
# /opt/ft/bin/ftsmaint jumpSwitch 0
Transferred processing to the device at path 0.
```


- (4) Diagnosis is performed when CPU module 1 is started. The new BIOS is applied to CPU module 1 from CPU module 0 automatically, and duplication process is performed.

```
# /opt/ft/bin/ftsmaint bringUp 1
```

Completed bringUp on the device at path 1.

Important

Do not operate the machine and power supply unit while the firmware is updated. The firmware is destroyed and modules may need to be replaced.

5. Run the following command to check that Op State of CPU module shows "DUPLEX" and Firmware Rev shows the new BIOS version.

```
# /opt/ft/bin/ftsmaint ls 0
```

```
Op State      : DUPLEX
```

```
:
```

```
Firmware Rev  : BIOS Version 1.0:27 Version is indicated in the underlined part.
```

```
# /opt/ft/bin/ftsmaint ls 1
```

```
Op State      : DUPLEX
```

```
:
```

```
Firmware Rev  : BIOS Version 1.0:27 Version is indicated in the underlined part.
```

6. Unmount ft control software Install DVD, if mounted. Then, disconnect the DVD drive.

4.4 Disabling Auto Reinstallation of CPU Module

If the failure is corrected and the CPU module is restarted, the Auto Reinstallation of CPU Module feature reconfigures the system and automatically brings up the module relevant to that failure.

Auto Reinstallation of CPU Module feature is enabled by default. It works when ft server is started, recovered from system fault, or recovered from pseudo fault.

This feature may be disabled because it may take time to automatically reinstall the CPU module depending on system configuration. Take the steps below to disable this feature.

You can shift the timing of no communication that occurs during the installation process of CPU module by disabling the auto reinstallation of CPU module and manually enabling the installation of the CPU module.

Important	You need to perform this configuration as a root user.
Note	This configuration just shifts the timing of the no-communication and does not control the no-communication status. Furthermore, this configuration does not prevent timeout error due to no communication from occurring.
Tips	Even if auto reinstallation of CPU is disabled, it is enabled and the installation process occurs when the system is starting up by a reboot.

4.4.1 Disabling auto reinstallation of CPU module

Run the following command to disable auto reinstallation of CPU module.

```
# /opt/ft/bin/ftsmaint bringupPolicy defer
Successfully deferred cpuBringupPolicy
```

If auto reinstallation of CPU module is disabled, run the *ftsmaint bringup* command to install the CPU module manually, or restart the system.

Run the following command to enable auto reinstallation of CPU module.

```
# /opt/ft/bin/ftsmaint bringupPolicy enable
Successfully enabled cpuBringupPolicy
```

Run the following command to confirm the current setting.

```
# /opt/ft/bin/ftsmaint bringupPolicy list
CPU bringup policy is enabled
```

4.4.2 Scheduling for auto reinstallation of CPU module

You can also limit the time to perform auto reinstallation of CPU by combination with cron daemon.

1. Add configuration to `/etc/crontab`

Example: Disable auto reinstallation of CPU module from 6:00 to 18:15 everyday.

Add the following lines to `/etc/crontab`.

```
# Defer CPU bringup at 6:00 every day
# Enable CPU bringup at 18:15 every day
0 6 * * * root /opt/ft/bin/ftsmaint bringupPolicy defer
15 18 * * * root /opt/ft/bin/ftsmaint bringupPolicy enable
```

2. Reflect the configuration file of cron daemon.

```
# crontab -u root /etc/crontab
```

5. Checking the Duplicating Operation of Modules

This section describes how to check if the system runs properly after system installation or reinstallation.

CPU/I/O module has a processor function part and IO function part.

Tips

Processor function part and IO function exists in the CPU/I/O module, which monitor and control for each part. In this section, the processor function part is referred to as CPU module and IO function part I/O module.

5.1 Evaluate Start and Stop of I/O Modules

This section describes how to confirm the continuous system operation by failover after stopping the primary I/O module.

1. Check which is the primary I/O module.

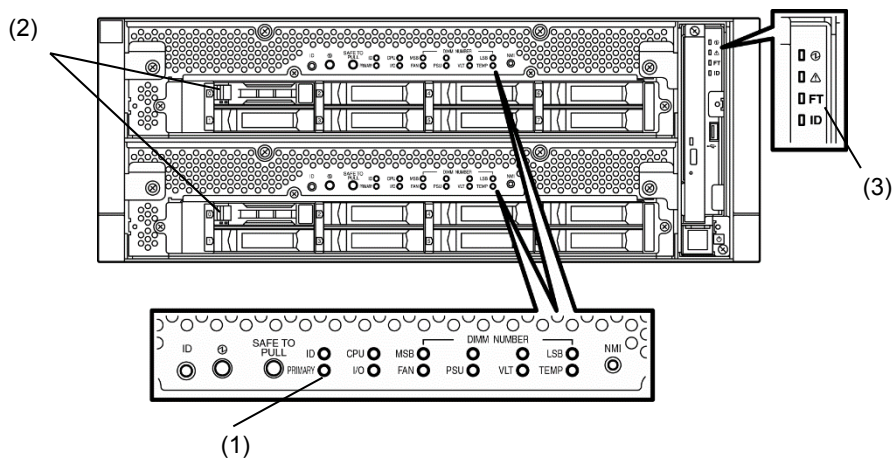
Tips

The I/O module with the PRIMARY LED lit is the primary module.

2. Check whether the I/O modules are duplicated.

Tips

To check if the I/O modules are duplicated, see the System FT LED.



[Indications of the status LED when I/O modules are duplicated]

* When I/O module 0 is defined as primary module

LED		I/O module 0	I/O module 1
(1)	PRIMARY LED	Green	–
(2)	DISK ACCESS LED	Green(Blinking)	Green (Blinking)
LED		System	
(3)	System FT LED	Green	

*Each number in the table corresponds to the numbers in the above figure.

DISK ACCESS LED (2) is lit when there is access to the hard disk drive.

3. Stop the operation of the primary I/O module using the ftsmaint Command.

If the I/O Module 0 is primary, run the following command.

```
# cd /opt/ft/bin
# ./ftsmaint bringdown 10 (*)
```

* Specify the device path ID of the primary I/O module.

When you stop the operation of the primary I/O module, failover occurs and the secondary I/O module becomes the primary module.

The status LED of I/O module changes as shown below:

[Indications of status LED]

LED		I/O module 0	I/O module 1
(1)	PRIMARY LED	–	Green
(2)	DISK ACCESS LED	–	Amber or Green blinking (Green when accessing to HDD)
LED		System	
(3)	System FT LED	–	

4. Start the I/O module stopped in step 3.
Run the following command to start the stopped I/O module 0.

```
# cd /opt/ft/bin
# ./ftsmaint bringup 10
```

When the I/O module is started, diagnosis of I/O module, and duplication of I/O module are performed.

The status LED of I/O module changes as shown below:

[Indications of status LED]

Immediately after the I/O module startup until the completion of diagnosis:

LED		I/O module 0	I/O module 1
(1)	PRIMARY LED	–	Green
(2)	DISK ACCESS LED	–	Amber or Green blinking (Green when accessing to HDD)
LED		System	
(3)	System FT LED	–	



When duplication of disks is started after the completion of diagnosis of I/O module:

LED		I/O module 0	I/O module 1
(1)	PRIMARY LED	–	Green
(2)	DISK ACCESS LED	Amber or Green blinking (Green when accessing to HDD)	Amber or Green blinking (Green when accessing to HDD)
LED		System	
(3)	System FT LED	–	



After the completion of disk duplication and when the I/O modules are duplicated:

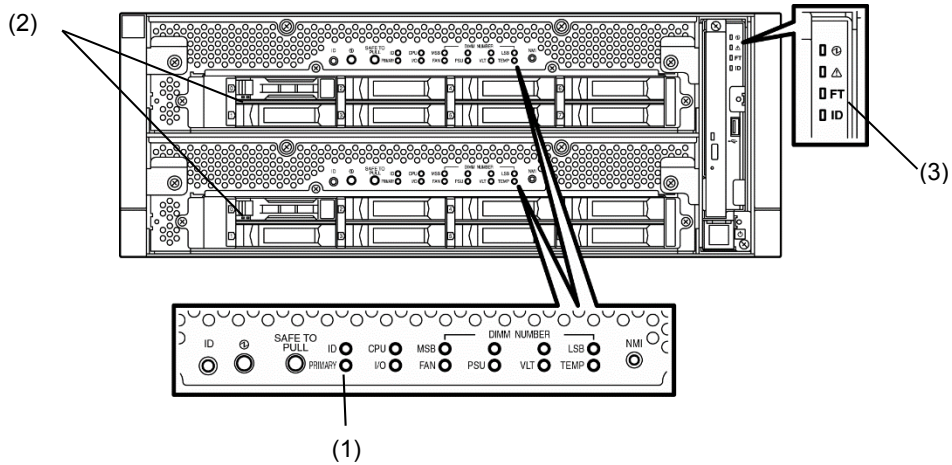
LED		I/O module 0	I/O module 1
(1)	PRIMARY LED	–	Green
(2)	DISK ACCESS LED	Green (Blinking) (Green when accessing to HDD)	Green (Blinking) (Green when accessing to HDD)
LED		System	
(3)	System FT LED	Green	

5.2 Evaluate Start and Stop of CPU Modules

This section describes how to confirm the continuous system operation after stopping one of the CPU modules.

1. Confirm that the CPU modules are duplicated.

To check if the CPU modules are duplicated, see the status LEDs of the CPU modules.



[Indications of status LED when CPU modules are duplicated]

LED	System
(3) System FT LED	Green

2. Use the `ftsmaint` command to stop the operation of the CPU module to be removed.

To stop the CPU Module 0, run the following command.

```
# cd /opt/ft/bin
# ./ftsmaint bringdown 0
```

When the CPU module is stopped, the status LED changes as follows. This indicates that one CPU module is operating now.

[Indications of status LED]

LED	System
(3) System FT LED	—

3. Start the stopped CPU module.

Run the following command to start the operation of the CPU module stopped in step 2.

```
# cd /opt/ft/bin  
# ./ftsmaint bringup 0
```

When the CPU module is started, **Hardware diagnosis**, **Memory Synchronization (Memory Copy)**, and then the **Duplication Completion** are performed.

Note that the system is paused temporarily for copying memory during memory synchronization.

[Indications of status LED after completion of duplication]

	LED	System
(3)	System FT LED	Green

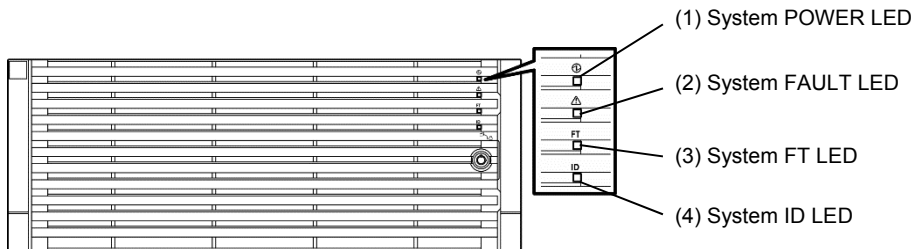
6. Error Messages

Take an action below if the server is faulty.

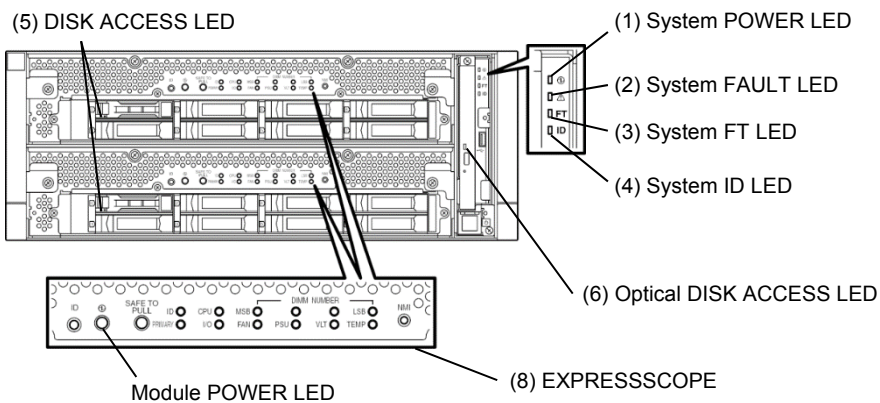
- If LED indicates an error state, see 6.1 Error Indication by LED.
- If an error message appears, see 6.2 POST Error Message.

6.1 Error Indication by LED

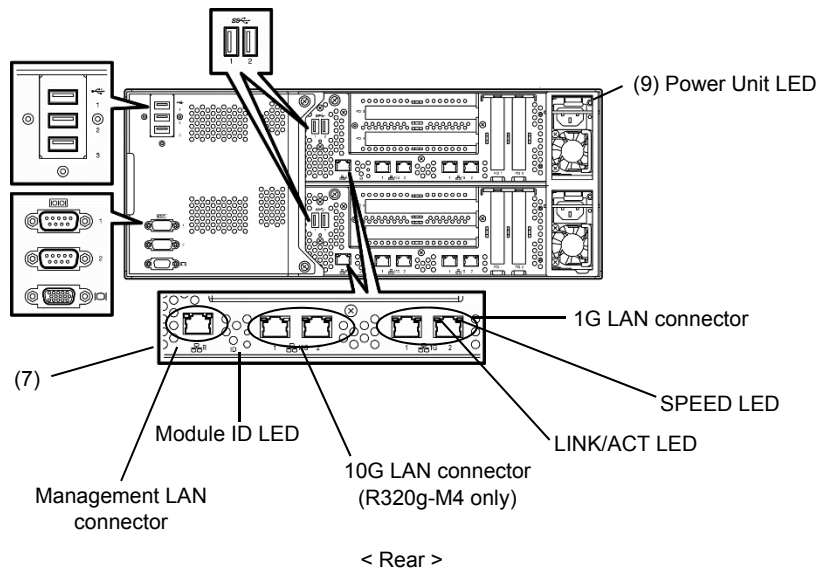
LEDs on the front and rear panels of the server and near the handles of hard disk drives notify the various server statuses, with lighting, blinking, and lighting-out patterns or colors. If trouble seems to have occurred, check the LED indication. States of LEDs, their meanings, and how to approach the situation are described below, but when you need to replace the module, be sure to contact your sales representative.



< Front (With Bezel) >



< Front (Without Bezel)>



(1) System POWER LED

LED indication	Description	Action
On (green)	Either or both of CPU/IO modules are powered on.	–
Off	Both of CPU/IO modules are powered off.	–

(2) System FAULT LED

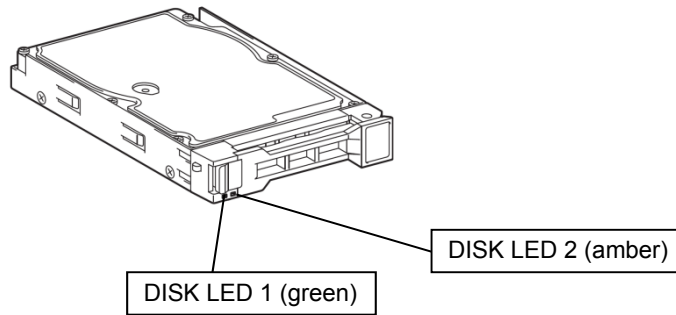
LED indication	Description	Action
Off	Both of CPU/IO modules are offline or normal.	System FAULT LED does NOT notify of disk statuses. Check it according to (5) DISK ACCESS LED indication.
On (amber)	One of the CPU/IO modules failed.	Take a note of LED indications on EXPRESSSCOPE, and then contact your sales representative.
Blinking (amber)	One of the CPU/IO modules failed. Failed CPU/IO module cannot be identified.	Contact your sales representative.

(3) System FT LED

LED indication	Description	Action
On (green)	System is operating under duplex condition.	–
Off	System is not duplexed.	–

(4) System ID LED

LED indication	Description	Action
On (blue)	UID switch is pressed.	–
Blinking (blue)	The server is receiving an identification request sent by remote.	–
Off	–	–

(5) DISK ACCESS LED

Status of DISK LED 1 and 2		Description	Action
DISK LED 1	DISK LED 2		
Off	Off	Disk is in the idle state.	–
Blinking (green)	Off	Disk is being accessed.	–
Off	On (amber)	Disk is faulty.	Contact your sales representative.
Off	Blinking (amber)	Disks are not mirroring.	Perform mirroring.
Blinking in green and amber alternately		Rebuilding is in progress or disks are not mirroring.	Confirm that the disk mirroring is complete.

(6) Optical DISK ACCESS LED

LED indication	Description	Action
Off	Optical disk is not accessed.	–
On	Optical disk is being accessed.	–

(7) LEDs on Management LAN connector and LAN connectors**LINK/ACT LED**

LED indication	Description	Action
On (green)	Power is supplied to the server and hub, and they are connected correctly (LINK state).	–
Blinking (green)	The port is sending or receiving data (ACT state).	–
Off	Disconnected from network.	Check the condition and connection of network cables.

SPEED LED (Management LAN connector)

LED indication	Description	Action
On (green)	Port is operating on 100BASE-TX.	–
Off	Port is operating on 10BASE-T.	–

SPEED LED (1G LAN connector)

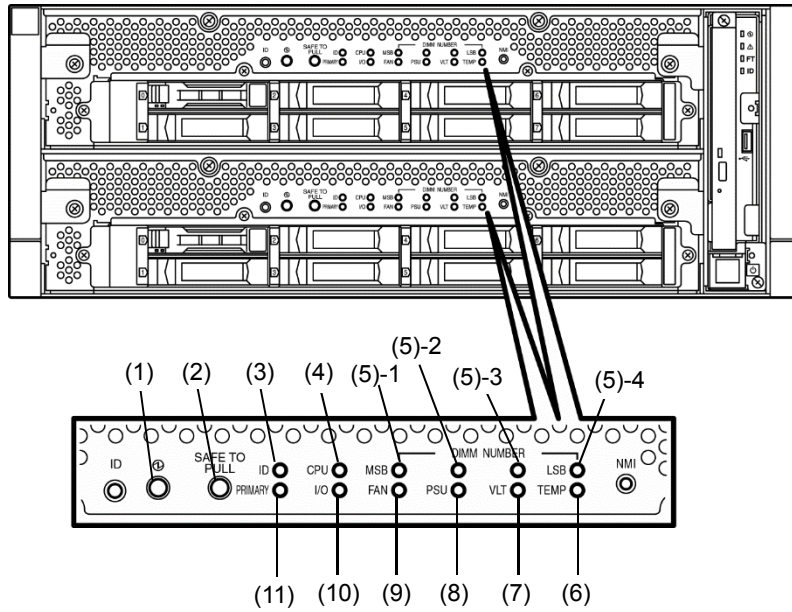
LED indication	Description	Action
On (amber)	Port is operating on 1000BASE-T.	–
On (green)	Port is operating on 100BASE-TX.	–

SPEED LED (10G LAN connector)

LED indication	Description	Action
On (amber)	Port is operating on 1000BASE-T.	–
On (green)	Port is operating on 10GBASE-T.	–
Off	Port is operating on 100BASE-TX.	–

(8) EXPRESSSCOPE

Corresponding LED lights amber if modules have failures.



(1) Module POWER LED

LED indication	Description	Action
On (green)	The power of CPU/IO module is ON.	–
Off	AC power is not supplied to CPU/IO module. The server becomes the standby state (blinking in green) in about 90 seconds after AC power is supplied.	–
Blinking (green)	CPU/IO module is in standby state.	–

(2) SAFE TO PULL (SAFE TO PULL LED)

This LED indicates the possibility to remove CPU/IO module safely.

LED indication	Description	Action
On (green)	CPU/IO module can be removed.	–
Blinking (green)	CPU/IO module cannot be removed.	–
Off	CPU/IO module is in offline state.	–

(3) Module ID (ID LED)

Module ID LED is used for identifying the server that requires maintenance among servers mounted on a rack.

LED indication	Description	Action
On (green)	UID switch is pressed.	–
Blinking (green)	The server is receiving an identification request sent by remote.	–
Off	–	–

(4) CPU (CPU FAULT LED)

The LED lights amber when the CPU part of CPU/IO modules fails.

(5) MEM NUMBER (Memory slot error LED)

The LED lights amber when failure occurs on the memory slot 0 of CPU/IO module.

Memory slots with errors can be identified by illumination status of the following (5)-1 to (5)-4.

Status of memory slot error LED				Description	Action
(5)-1 (MSB)	(5)-2	(5)-3	(5)-4 (LSB)		
–	–	–	–	Operating normally	–
–	–	–	○	Error at memory slot 1	Contact your sales representative.
–	–	○	–	Error at memory slot 2	
–	–	○	○	Error at memory slot 3	
–	○	–	–	Error at memory slot 4	
–	○	–	○	Error at memory slot 5	
–	○	○	–	Error at memory slot 6	
–	○	○	○	Error at memory slot 7	
○	–	–	–	Error at memory slot 8	
–	–	–	●	Error at memory slot 9	
–	–	●	–	Error at memory slot 10	
–	–	●	●	Error at memory slot 11	
–	●	–	–	Error at memory slot 12	
–	●	–	●	Error at memory slot 13	
–	●	●	–	Error at memory slot 14	
–	●	●	●	Error at memory slot 15	
●	–	–	–	Error at memory slot 16	
●	–	–	●	Error at memory slot 17	
●	–	●	–	Error at memory slot 18	
●	–	●	●	Error at memory slot 19	
●	●	–	–	Error at memory slot 20	
●	●	●	●	Error at unknown memory slot, or memory is not installed.	

- : LED is lit.
- : LED is blinking.
- : LED is unlit.

(6) TEMP (Abnormal temperature LED)

Amber: Temperature in CPU/IO module becomes abnormal.

(7) VLT (Power error LED)

Amber: Electric voltage failure occurs in CPU/IO module.

(8) PSU(Power supply unit error LED)

Amber: Failure occurs on the power supply unit of CPU/IO module.

(9) FAN (Fan error LED)

Amber: Failure occurs on the cooling fan for CPU of CPU/IO module.

(10) I/O (I/O FAULT LED)

Amber: Failure occurs on the I/O (PCI) part of CPU/IO module.

(11) PRIMARY (Primary LED)

Green: CPU/IO module is primary. Pressing DUMP (NMI) switch may blink LED in green.

(9) Power Unit LED

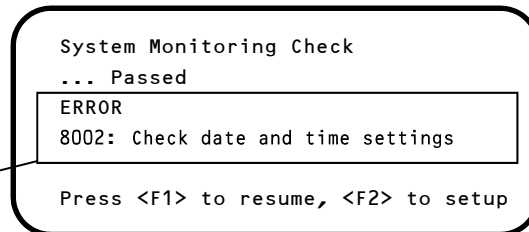
Power Unit LED is located at power supply unit at the rear of the server.

LED indication	Description	Action
Off	The server is not receiving AC power.	
Blinking (green)	The server is receiving AC power.	–
On (green)	The server is powered on.	–
On (amber) Blinking (amber)	The power supply unit fails.	Contact your sales representative.

6.2 POST Error Message

If POST detects an error, an error message appears on the display.

Example:
This message indicates that date and time set on realtime clock is incorrect.



The next table lists error messages and the actions to take in response to them.

If the same error appears even if the action is performed, contact your sales representative.

Tips

- Write down the displayed messages before contacting your sales representative.
- The list only contains messages for the server, not including for option device.

(1) Error messages

Error Message		Description	Action
8000	System variable is corrupted.	Illegal setup information of BIOS was detected.	Start BIOS Setup Utility (SETUP), and then select Load Setup Defaults and specify the necessary settings.
8001	Real time clock error	Real time clock error was detected.	Start SETUP, and then specify the correct date and time.
8002	Check date and time settings	Incorrect date and time set on real time clock was detected.	
8006	System configuration data cleared by Jumper.	The setup utility settings were cleared using the jumper.	Follow the steps described in <i>Chapter 1 (9. Resetting and Clearing the Server)</i> .
8007	SETUP Menu Password cleared by Jumper.	The setup utility password was cleared using the jumper.	
8800	DXE_NB_ERROR	An error was detected during initialization of chipset.	Contact your sales representative.
8801	DXE_NO_CON_IN	An error was detected during initialization of console.	
8802	DXE_NO_CON_OUT		
8803	PEI_DXE_CORE_NOT_FOUND	A flash ROM is corrupt.	
8804	PEI_DXEIPL_NOT_FOUND		
8805	DXE_ARCH_PROTOCOL_NOT_AVAILABLE		
8806	PEI_RESET_NOT_AVAILABLE	The system was not reset correctly.	
8807	DXE_RESET_NOT_AVAILABLE		
8808	DXE_FLASH_UPDATE_FAILED	The Flash ROM was not written to correctly.	
B000	Expansion ROM not initialized	Failed to expand option ROM.	Disable expansion of option ROM of the board that is not used for OS boot.
B001	Expansion ROM not initialized - PCI Slot 1	Option ROM expansion in PCI slot 1 failed.	Disable expansion of option ROM of the option board that is not used for OS boot. Start SETUP, and select Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → PCI Slot Option ROM → Disabled . (x: PCI slot number)
B002	Expansion ROM not initialized - PCI Slot 2	Option ROM expansion in PCI slot 2 failed.	
B003	Expansion ROM not initialized - PCI Slot 3	Option ROM expansion in PCI slot 3 failed.	
B004	Expansion ROM not initialized - PCI Slot 4	Option ROM expansion in PCI slot 4 failed.	
B022	Serial Port Configuration Overlapped.	Overlapping serial port configuration was detected.	Start SETUP, select Advanced → Serial Port Configuration , and specify the setting again in a way that the values of Base I/O or Interrupt in Serial Port A and Serial Port B will not be the same.
B800	DXE_PCI_BUS_OUT_OF_RESOURCES	Resources to be allocated to PCI expansion card was insufficient	Check the option board connection.
C010	The error occurred during temperature sensor reading	An error was detected while reading temperature sensor.	Contact your sales representative.
C011	System Temperature out of the range.	A temperature abnormality was detected.	It is possible that a cooling fan has failed or is clogged. Contact your sales representative.

Error Message		Description	Action
C061	1st SMBus device Error detected.	An error was detected on 1st SM Bus.	Contact your sales representative.
C062	2nd SMBus device Error detected.	An error was detected on 2nd SM Bus.	
C063	3rd SMBus device Error detected.	An error was detected on 3rd SM Bus.	
C064	4th SMBus device Error detected.	An error was detected on 4th SM Bus.	
C065	5th SMBus device Error detected.	An error was detected on 5th SM Bus.	
C066	6th SMBus device Error detected.	An error was detected on 6th SM Bus.	
C067	7th SMBus device Error detected.	An error was detected on 7th SM Bus.	
C101	BMC Memory Test Failed..	An error was detected on BMC.	Unplug the power cord, wait for at least 30 seconds, then restart the server.
C102	BMC Firmware Code Area CRC check Failed.		
C103	BMC core hardware failure.		
C104	BMC IBF or OBF check failed.	An error was detected while accessing BMC.	
C105	BMC SEL area full.	There is not enough space to store the system event log.	Start up Offline Tools (<i>Chapter 1, 11. Offline Tools</i>) and delete the event logs.
C10C	BMC update firmware corrupted.	An illegality was detected while updating BMC firmware.	Unplug the power cord, wait for at least 30 seconds, and then restart the server.
C10D	Internal Use Area of BMC FRU corrupted.	An illegality was detected in FRU containing the device information.	
C10E	BMC SDR Repository empty.	An error was detected on BMC SDR.	
C10F	IPMB signal lines do not respond.	Failure of Satellite Management Controller was detected.	
C110	BMC FRU device failure.	An error was detected in FRU that contains device information.	
C111	BMC SDR Repository failure.	Failure was detected in SROM that stores the SDR.	
C112	BMC SEL device failure.	Device failure was detected in BMC SEL.	
C113	BMC RAM test error.	An error was detected in BMC RAM.	
C114	BMC Fatal hardware error.	A hardware error was detected in BMC.	
C115	Management controller not responding	Management controller does not respond.	
C116	Private I2C bus not responding.	Private I2C bus does not respond.	Unplug the power cord, wait for at least 30 seconds, and then restart the server.
C117	BMC internal exception	BMC internal error was detected.	
C118	BMC A/D timeout error.	BMC A/D timeout error was detected.	
C119	SDR repository corrupt.	BMC error or illegal SDR data was detected.	
C11A	SEL corrupt.	BMC error or illegal system event log data was detected.	

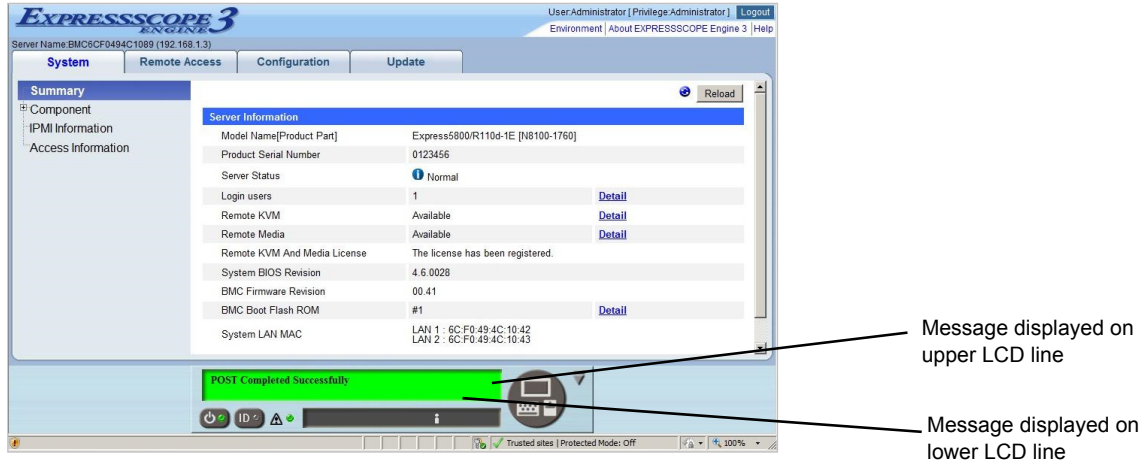
Error Message		Description	Action
C11B	BMC Mezzanine card is not found.	BMC Mezzanine card is not installed.	Contact your sales representative.
C11C	BMC Mezzanine partition is invalid.	A format error was detected in BMC Mezzanine card.	
C11D	BMC is in Forced Boot Mode.	Detected that BMC is in Forced Boot Mode.	Unplug the power cord, wait for at least 30 seconds, and then restart the server. At that time, check the jumper switch setting on motherboard.
D483	BP SR0M data invalid	An invalid data was detected in system backplane.	Contact your sales representative.
D484	BP SR0M data read error	Failed to read data in system backplane.	
D485	MB SR0M data invalid	An invalid data was detected in CPU/IO board.	
D486	MB SR0M data read error	Failed to read data in CPU/IO board.	

(2) Error messages on a virtual LCD

You can confirm the error messages by using EXPRESSSCOPE Engine 3 web browser window. For details, see “EXPRESSSCOPE Engine 3 User’s Guide (for ft series)”.

The table below shows the error messages displayed on upper and lower lines, cause, and action.

If the same error appears even if the action is performed, contact your sales representative.



Messages displayed on an upper LCD line

Message on Upper LCD Line	Description	Action
XXXX BIOSXXXX	Displayed while POST is running.	This is not an error.
POST Completed Successfully	Displayed when POST completes normally.	This is not an error.
POST ERROR XXXX	Error XXXX was detected during POST.	Check the message displayed on LCD, and take an appropriate action.
System Simplex	The system is operating in simplex mode.	This is not an error.
System Duplex	CPU/IO module is operating in duplex mode.	This is not an error.
CPU Broken	A CPU failure was detected.	Contact your sales representative.
IO Broken	An I/O unit failure was detected.	Contact your sales representative.

Messages displayed on a lower LCD line

Message on Lower LCD Line	Description	Action
VBAT Lower Non-Critical	A voltage abnormality was detected.	Contact your sales representative.
VBAT Upper Non-Critical		
VBAT Lower Critical		
VBAT Upper Critical		
Baseboard Temperature1 Lower Non-Critical	A temperature abnormality was detected.	It is possible that a cooling fan has failed or is clogged. Contact your sales representative.
Baseboard Temperature1 Upper Non-Critical		
Baseboard Temperature1 Lower Critical		
Baseboard Temperature1 Upper Critical		
Baseboard Temperature2 Lower Non-Critical		
Baseboard Temperature2 Upper Non-Critical		
Baseboard Temperature2 Lower Critical		
Baseboard Temperature2 Upper Critical		
CPU1_DIMM Area Temperature Lower Non-Critical		
CPU1_DIMM Area Temperature Upper Non-Critical		
CPU1_DIMM Area Temperature Lower Critical		
CPU1_DIMM Area Temperature Upper Critical		
CPU2_DIMM Area Temperature Lower Non-Critical		
CPU2_DIMM Area Temperature Upper Non-Critical		
CPU2_DIMM Area Temperature Lower Critical		
CPU2_DIMM Area Temperature Upper Critical		
Processor1 Thermal Control Upper Non-Critical		
Processor1 Thermal Control Upper Critical		
Processor2 Thermal Control Upper Non-Critical		
Processor2 Thermal Control Upper Critical		
DUMP Request !	The dump button was pressed.	Wait until collecting the memory dump data has finished.
Power Supply1 Failure detected	A power supply unit abnormality occurred.	Make sure that the power cord is plugged in.
Processor Missing	No CPU is installed.	Contact your sales representative.
Processor1 Thermal Trip	The power was forcibly turned off due to a CPU temperature abnormality.	Contact your sales representative.
Processor2 Thermal Trip		
Sensor Failure Detected.	Abnormality in a sensor was detected.	Contact your sales representative.
SMI timeout	A timeout occurred while servicing system management interrupts.	
IPMI Watchdog timer timeout (Power off)	A watchdog timer timeout occurred.	

Message on Lower LCD Line	Description	Action
System FAN0 Lower Non-Critical	A fan alarm was detected.	It is possible that a cooling fan has failed or is clogged. Contact your sales representative.
System FAN0 Lower Critical		
System FAN1 Lower Non-Critical		
System FAN1 Lower Critical		
System FAN2 Lower Non-Critical		
System FAN2 Lower Critical		
System FAN3 Lower Non-Critical		
System FAN3 Lower Critical		
System FAN4 Lower Non-Critical		
System FAN4 Lower Critical		

7. Collecting Failure Information

If the server fails, you can collect failure information by using the following method.

The failure information is to be collected only at the request of your sales representative.

Important

When the system restarts after a failure has occurred, a message may appear indicating virtual memory shortage. Ignore this message and proceed with starting the system. Restarting the system may result in an inability to properly dump the data.

7.1 Collection of Collect Logs

When you collect NEC ESMPRO Agent collect logs, log in to the log server on which NEC ESMPRO Agent is installed as the root user and run the following command.

```
# cd /opt/nec/esmpro_sa/tools/  
# ./collectsa.sh
```

The collected data is created in the following file.

```
/opt/nec/esmpro_sa/tools/collectsa.tgz
```

Note

It may take certain period of time to create collectsa.tgz file.

7.2 Collection of System Information

The ESX system information is recorded in syslog, etc. When you collect system information in the server, log in to ftSys Management Appliance as a root user and run the following command.

```
# /opt/ft/sbin/buggrabber.pl
```

The following message is displayed.

If the IP address or the host name of the ESXi host enclosed with brackets ([]) is correct, press the <Enter> key.

```
Enter Name or IP address of the host ftServer
```

The following message is displayed.

If the root user name of the ESXi host enclosed with brackets ([]) is correct, press the <Enter> key.

```
Enter Administrative user for xxx.xxx.xxx.xxx [xxx]:
```

If the following message appears, enter the root password for ESXi host.

```
Enter Administrative password for xxx.xxx.xxx.xxx []:
```

The collected data is created in the following directory. (YYYYMMDD denotes created date.)

```
/home/BugPool/Bug_YYYYMMDD.tar
```

Note

It may take certain period of time to create Bug_YYYYMMDD.tar file.

Tips

If the information shown in the brackets is not correct, set the correct data on the system by executing the configure-appliance command, and then execute the buggrabber command again.

For details of the configure-appliance command, see the following section in *Installation Guide*.

Chapter 1, Installing Operating System 2.3.1 If the network settings of the ESXi host or root user password has been changed

7.3 Collecting Memory Dump

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

The dumps for the ESXi host are saved to the following files under `/var/core`.

- `vmkernel-zdump-MMDDYY.HH:mm.n`
- `vmkernel-dumpinfo-MMDDYY.HH.mm.txt`
- `vmkernel-ring-MMDDYY.HH.mm`

* MMDDYY denotes the created date, and HH:mm.n denotes the created time.

* It may take certain time to create dump data file.

* Names of the dump files may differ from the ones as above depending on the server state at which dump data were collected (for example, 'vmkernel-zdump.1').

Consult with your sales representative before dumping the memory. Dumping the memory while the server is in operating normally may affect the system operation.

Important

- A message indicating insufficient virtual memory may appear when restarting the system due to an error. Ignore this message and proceed. Restarting the system may result in an inability to properly dump the data.
- If a physical processor of CPU #0 is allowed to be used for the virtual machine, memory dump may not be collected even when pressing the DUMP switch. To operate the machine assuming to collect memory dump, set the value other than "0" for the property of "Scheduling Affinity" of the virtual machine.

Use the DUMP (NMI) switch to collect the memory dump in case of a failure.

The procedure for use of the DUMP (NMI) switch is described below.

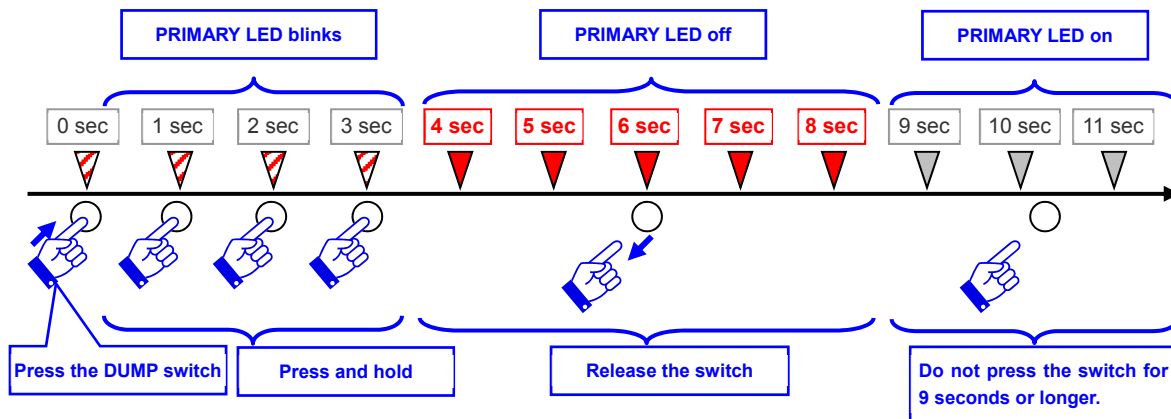
Important

If you perform these steps, the system is made offline automatically, and is rebooted. Note that the system is not ready for use for that period.

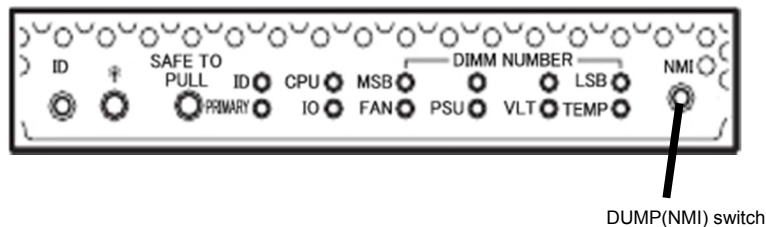
Hold and press the DUMP switch on the primary CPU/IO module for 4 to 8 seconds.

The PRIMARY LED blinks when pressing the DUMP switch. Release your finger when the LED goes off. Press the DUMP switch by inserting the pointed tool such as ballpoint pen into the switch hole.

<How to press the DUMP switch>



<Location of the DUMP switch>



Important

- Pressing the DUMP switch excessively shorter or longer will fail to collect memory dump.
- Do not use anything that easily breaks such as pencil, toothpicks, or plastic.

The memory dump is stored when DUMP switch is pressed. (Memory dump may not be collected at CPU stall.)

Tips

The dump files cannot be deleted automatically. Check the /var/core directory size periodically in order not to run out of the capacity. The size of a dump file is approximately 100 MB.

After executing memory dump using the DUMP switch, the server may fail to restart. In such a case, forcibly reset the server according to *Chapter 1 (9.2 Forced Shutdown)*.

8. Troubleshooting

If this system does not work normally, check it according to the following checklist.

- The server does not work normally.
 - Refer to "8.1 Problem of Powering on".
 - Refer to "8.4 Problems When starting ESXi".
 - Refer to "8.5 Problems When Occurring Failures".
 - Refer to "8.6 Problems with Internal Devices and Other Hardware".
 - Refer to "8.7 Problems with System Operation".
 - Refer to "8.10 Problems of Optical Disk Drive and Flash FDD".
- Failed to start from EXPRESSBUILDER.
 - Refer to "8.2 Problem of EXPRESSBUILDER".
 - Refer to "8.8 Problem of EXPRESSBUILDER on Windows".
- Failed to install OS.
 - Refer to "8.3 Problems When Installing VMware ESXi and ft control software".
- NEC ESM PRO does not work normally.
 - Refer to "8.9 Problem of Bundled Software".
 - Refer to *User's Guide* stored in ft control software Install DVD.

If the server still does not work normally, refer to the following topics in this chapter before suspecting failure.

- Error message
 - Refer to "6. Error Messages".
- NEC ESM PRO Manager
 - Refer to *NEC ESM PRO Manager Installation Guide* stored in EXPRESSBUILDER.
- Collect failure information
 - Refer to "7. Collecting Failure Information".

If the trouble persists, contact your service representative.

8.1 Problem of Powering on

[?] Fail to power on the server:

- Is the server properly supplied with power?
 - Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the server.
 - Make sure to use the power cord provided with the server. Check the power cord for broken shield or bent plugs.
 - Make sure the circuit breaker for the connected power outlet is on.
 - If the power cord is plugged to a UPS, make sure the UPS is powered and it supplies power. Refer to the manual that comes with the UPS for details.
In addition, be sure to check the power interlock function with the UPS by using BIOS Setup Utility.
- Did you press the POWER switch?
 - To power on the server, press the POWER switch after the module POWER LED is lit green. It takes about 90 seconds until the module LED blinks in green after connecting the power cord.
- Did you install the CPU/IO module properly?
 - Check if the CPU/IO module is properly installed in the server. Secure the CPU/IO module with screw located on the module removable handle.

[?] The screen does not turn on:

- Sometimes takes tens of seconds until a screen is indicated. Wait for some time.

[?] The screen is sometimes changed to the black screen during POST process:

- Ignore the black screen and wait until POST ends.

[?] POST fails to complete:

- Are the DIMMs installed properly?
 - Check if DIMMs are properly installed.
- Is the memory size large?
 - Wait for some time until the memory check ends. The time for checking the memory is increased in proportion to the memory size.
- Did you perform any keyboard or mouse operation immediately after you started the server?
 - Restart the server and do not perform any keyboard or mouse operation until the BIOS startup message appears.
- Are memory and PCI card supported for use with this server?
 - Operation of the server with unauthorized devices is not supported.
- Did you install the CPU/IO module properly?
 - Check if the CPU/IO module is properly installed in the server. Secure the CPU/IO module with screw located on the module removable handle.

8.2 Problem of EXPRESSBUILDER

[?] Unable to start EXPRESSBUILDER:

- ❑ Did you insert the EXPRESSBUILDER DVD before starting the server?
 - Insert the EXPRESSBUILDER DVD, and then restart the server.
- ❑ Are BIOS settings correct?
 - In **Boot** menu of the BIOS setup utility, configure the boot order so that the optical disk drive will be the first to start up.
- ❑ Is an error message displayed?
 - Take an appropriate action according to the message.

```
Error [Message ID:Z3002] :
Failed to detect a DVD drive or a flash drive.
```

Meaning: A DVD drive or a built-in flash drive cannot be detected.

Action: Check if hardware is properly connected.

```
Error [Message ID:Z3003] :
Failed to read a file.
```

Meaning: A file cannot be read from a DVD.

Action: Check if the DVD is damaged.

- ❑ Is a message popped up?
 - Take an appropriate action according to the table below.

Message	Action
EXPRESSBUILDER does not support this computer. Insert EXPRESSBUILDER disc for the computer and click OK to restart the computer.	Run the correct version of EXPRESSBUILDER.
Failed to get the hardware parameters on the motherboard. Check if EXPRESSBUILDER is for this computer or if the motherboard has failed.	Contact your sales representative.
Failed to find a file.	EXPRESSBUILDER disc has stains or cracks or the optical disk drive is faulty. Contact your sales representative.
Failed to open a file.	
Failed to get the parameters of a file.	
Failed to save a file.	
Failed to copy a file.	Contact your sales representative.
An undefined error occurred.	

8.3 Problems When Installing VMware ESXi and ft control software

[?] Unable to install VMware ESXi

- ❑ Is the Hard Disk Drive properly installed?
 - Make sure that the Hard Disk Drive is installed securely and that cables are properly connected.
- ❑ Have you configured Boot Mode and QLogic BIOS?
 - The settings are different from the default values. Refer to *Chapter 1 (1.3 Enabling Internal Hard Disk Drive) or (1.4 Enabling Fiber Channel card) and (1.6 Setting HBA configuration by using QLogic) in Installation Guide.*
- ❑ Have you checked precautions for installation?
 - Refer to *Chapter 1 (1.7 Installing VMware ESXi) in Installation Guide.*

[?] ft control software UPDATE Disk is not included.

- ft control software UPDATE disk is used to update ft control software; it may not be shipped with the equipment.

[?] OS can be operated after a setup but each module or PCI board is not duplicated. (System FT LED on the CPU/IO module does not light on green).

- ❑ Did you abort the installation during a setup such as by closing a window of the programs that are running?
 - Installation will be aborted if you finish the programs that are running. Although the operation on OS will be feasible, modules or PCI boards will not be duplicated properly if you abort the installation. In this case, you need to reinstall OS according to *Chapter 1 (1. Setup Procedure) in Installation Guide.*

[?] DISK ACCESS LED blinks in amber.

- ❑ Did you properly setup the duplex of HDDs?
 - DISK ACCESS LED lights in amber, if a setup for duplex is not performed. Refer to *Chapter 1 (6.1 Error Indication by LED) for details about the indication status of LED.* Refer to *Chapter 2 (2. Hard Disk Drive Operations), and set up the duplex of HDDs.*

[?] The ft control software does not work even after VMware ESXi has been updated.

- ❑ Do not update VMware ESXi independently. Also, do not apply any patch data that is not described in *Installation Guide or Update Procedure.*
 - When updating VMware ESXi, the relevant ft control software is required. Follow instructions in *Update Procedure* of ft control software. If VMware ESXi is updated independently, ft control software will not work properly. In this case, you need to re-install ft control software according to *Chapter 1 (1. Setup Procedure) in Installation Guide.*

8.4 Problems When starting ESXi

[?] Unable to start ESXi:

- ❑ Are Hard Disk Drives properly installed?
 - Install Hard Disk Drives properly.
- ❑ Have you changed the BIOS setting?
 - The set values are different from the default values. Refer to *Chapter 1 (1.3 Enabling Internal Hard Disk Drive)* or *Chapter 1 (1.4 Enabling Fiber Channel card)* (1.6 Setting HBA configuration by using QLogic) in *Installation Guide* for details to make correct settings.
- ❑ Is the internal SAS cable connected to Hard Disk Drive correctly?
 - Connect the SAS cable properly.
If the SAS cable is not recognized as connected although the above action has been taken, the Hard Disk Drive may be faulty. Contact your sales representative.
- ❑ Is the EXPRESSBUILDER DVD inserted?
 - Eject the EXPRESSBUILDER DVD and reboot.
- ❑ Is a Flash FDD connected to the server?
 - Take out the Flash FDD and restart the server.

[?] Machine repeats rebooting at startup:

- ❑ Is the value of [OS Boot Monitoring Timeout] in the BIOS setting appropriate?
 - Change the value of [OS Boot Monitoring Timeout] to suit your environment. Refer to *Chapter 3 (1. System BIOS)* for details.

[?] Wake On LAN does not function:

- ❑ Is the AC power supplied to both CPU/IO modules?
 - If the AC power supplied to only one of the CPU/IO module, Wake On LAN may become unavailable. Supply the AC power to both of CPU/IO modules.
- ❑ Is Hub/Client fixed as 1000M?
 - Check the following configurations:
 - Set the Hub as "Auto-Negotiation".
 - Set the Client as "Auto-negotiate best speed".

Important For both Hub/Client, you cannot use Wake On LAN feature from standby state with the 1000M fixed configuration.

- ❑ Do you send Magic Packet to only one of the duplexed LAN?
 - If you use Wake On LAN under duplexed LAN, you need to send Magic Packets to all of the duplexed LAN pair(s).
- ❑ Did you send Magic Packet to 10G LAN connector?
 - Wake On LAN feature is not supported for the 10G LAN connector.

[?] Fail to duplex CPUs:

- Check if the memory configuration is correct.
- Check if CPUs or memory (DIMM) recommended by NEC are used.

8.5 Problems When Occurring Failures

[?] Memory dump (debug information) cannot be collected when a failure occurs:

- ❑ Do you press the DUMP switch correctly?
 - Hold down the DUMP switch for 4 to 8 seconds if you would like to collect memory dump by pressing the switch. If you press DUMP switch shorter than 4 seconds or longer than 8 seconds, you will not be able to collect memory dump.
- ❑ Check if you are not using a physical processor of CPU #0 for the virtual machine.
 - If a physical processor of CPU #0 is allowed to be used for the virtual machine, memory dump may not be collected even when pressing the DUMP switch. To operate the machine assuming to collect memory dump, set the value other than "0" for the property of "Scheduling Affinity" of the virtual machine.
 - * Setting procedure for "Scheduling Affinity"

Select the target virtual machine from Host Client, and select "Edit Settings" from the menu displayed by right-clicking. Select "CPU" from "Virtual Hardware" on the displayed Edit Settings screen to change "Scheduling Affinity".

8.6 Problems with Internal Devices and Other Hardware

[?] Failed to access the internal or external devices (or such devices fail to operate):

- ❑ Are cables properly connected?
 - Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.
- ❑ Is the power-on order correct?
 - When the server has any external devices connected, power on the external devices first, then the server.
- ❑ Did you install drivers for connected optional devices?
 - Depending on the connected optional device, specific device driver is required. Refer to the manual that comes with the device to install its driver.
 - * Do not connect an unsupported external device, or install a driver for the unsupported external device.
- ❑ Is option board setting correct?
 - Usually you do not need to change the settings for PCI devices, but there are some boards that require specific settings. Refer to the manual that comes with the board for details to make correct settings.

[?] The keyboard or mouse does not work:

- ❑ Is the cable properly connected?
 - Make sure that the cable is connected to the connector on the front or rear of the server.
- ❑ Are the keyboard and mouse are compliant with the ft server?
 - Operation of the server with unauthorized devices is not supported.

[?] Screen freezes, keyboard and mouse are disabled:

- If the amount of memory is increased, system starting, CPU/IO module duplexing, or memory copying takes time and the system stops working temporarily. This is not malfunction.

[?] Unable to access the hard disk drive

- Is the hard disk drive supported by the server?
 - Operation of any device that is not authorized by NEC is not supported.
- Is the hard disk drive properly installed?
 - Check the hard disk drive installation status and the cable connections.

[?] Unable to duplex disks:

- Unless you perform mirroring (including reconfiguration after failed disks are replaced) in correct order of *Chapter 2 (2. Hard Disk Drive Operations)*, the mirror may not be (re)configured. Check if the steps were correct.

[?] DISK ACCESS LEDs on the disks are off:

- The LEDs seem to be off when an excessive amount of access causes the frequent blinking. Check if the LEDs are blinking green when the access is reduced.

8.7 Problems with System Operation

[?] The server is not found on the network:

- ❑ Is the cable connected properly?
 - Securely connect the proper cable to the network port on the rear of the server. Additionally, make sure that the cable conforms to the network interface standards.
- ❑ Are BIOS settings correct?
 - Check the settings with BIOS Setup Utility.
- ❑ Have you completed protocol and services settings?
 - Confirm that the network driver has been installed and the network protocol and services have been properly set up.
- ❑ Is the transfer speed correct?
 - Be sure to specify the same transfer speed and duplex mode as those on connected hub. If you specify "Auto-Negotiation", make sure that "Auto-Negotiation" is also specified for the connected hub.
- ❑ Is the transfer speed of 10G LAN port "100Mbps"?
 - If you specify 100Mbps, set the NIC speed setting of this server to auto negotiation, and set the hub speed to 100Mbps and duplex mode to auto.

[?] A CPU/IO module cannot be integrated:

- When a component fails and is reintegrated, the following message may be recorded to the system log and the process is stopped. Such event indicates that the component's MTBF is below the threshold and it is judged that repair is necessary. Thus the reintegration process cannot be completed. Generally replacement of the component will be required, so contact your sales representative. If reintegrating the component without repair is required for some reason, consult your sales agent. It is possible to perform reintegration forcefully.

```
EVLOG: ERROR - x is now STATE_BROKEN / REASON_BELOW_MTBF
```

(x is a device number)

[?] Screen under changing (distorted display) can be seen when screen resolution is changed:

- If screen resolution is changed while the entire system is under high load, screen under changing (distorted display) may be seen. This is because screen update is taking time to complete due to high load in the system. This is not because an error is occurring. The screen will return to normal if you wait awhile.

[?] While setting up a cluster configuration using VMware with EVC enabled, some EVC modes cannot be set

- The following EVC modes are not available for the ft server because the use of some functions of Intel® Xeon® processor are limited in order to implement the synchronization of processors.

- Intel "Skylake" Generation
- Intel "Broadwell" Generation
- Intel "Haswell" Generation
- Intel "Ivy Bridge" Generation
- Intel "Sandy Bridge" Generation

When enabling EVC for the cluster configuration in the environment such as this server, use the EVC mode with the setting of Intel "Westmere" Generation or below.

8.8 Problem of EXPRESSBUILDER on Windows

[?] Unable to read manuals:

- Have you installed Adobe Reader to your computer?
 - To read the manuals, install Adobe Reader in your computer.
- Is the error "Internet Explorer has stopped working" displayed?
 - Close the dialog box, and continue operation. If the same error occurs, double click "version.xml" in root of DVD, and then select **Yes** in the dialog box. After that, click the link in the manual to open the file.

[?] Autorun menu does not appear:

- If the menu does not start automatically, run the following file by Explorer.
 - \autorun\dispatcher.exe (on 32 bit edition)
 - \autorun\dispatcher_x64.exe (on 64 bit edition)

[?] The menu item of Integrated Installation is gray:

- Is your system environment suitable?
 - To run **Integrated Installation**, log on to the Windows on the server with an account of administrator.

[?] The menu is displayed with a wrong language

- Is your system environment suitable?
 - Confirm the settings of **Regional and Language Options**. Specify the language settings of each tab to **English (US)**.

8.9 Problem of Bundled Software

[?] Device ID in Alert Report

- Some Express5800/ft series reports use unique device IDs which correspond to the devices listed in *Chapter 1 (4.2 Device Path Enumeration)*.

[?] NEC ESMPRO Agent (for Linux)

- For details of NEC ESMPRO Agent, refer to *User's Guide* stored in ft control software Install DVD.

Supplementary explanation for NEC ESMPRO Agent

❑ Notice on Operation of NEC ESMPRO Agent

- It may become unable to send report after recovering from hardware failure.
<Workaround>
Perform the following operation after recovered from hardware failure. After replacing the hardware, confirm that System FT LED is lit green (duplex mode), log in as a root user, and run the following command.

```
# /opt/nec/esmpro_sa/bin/ESMRestart
```

* For the location of System FT LED, refer to *Chapter 1 (6.1 Error Indication by LED)*.

❑ About rpcbind

- NEC ESMPRO Agent uses rpcbind function. If rpcbind stops or NEC ESMPRO Agent reboots while NEC ESMPRO Agent is operating, NEC ESMPRO Agent does not work appropriately. Run the following command and reboot NEC ESMPRO Agent

```
# /opt/nec/esmpro_sa/bin/ESMRestart
```

❑ ntagent Memory Usage

- When [Information of server state/constitution] appears, the memory usage of ntagent increases about 10KB per hour. Do not always display [Information of server state/constitution], but display it only when failure occurs. When memory usage is enlarged, run the following command and reboot NEC ESMPRO Agent.

```
# /opt/nec/esmpro_sa/bin/ESMRestart
```

❑ Network (LAN) Monitoring Report

- The network (LAN) monitoring function defines the line status depending on the number of transmission packets and the number of packet errors within a certain period. Thus, the LAN monitoring function may report a line fault or high line load only in a temporary high line impedance state. If a normal state recovery is reported immediately, temporal high line impedance may have occurred thus there is not any problem.

❑ Network (LAN)Monitoring Threshold

- Because the Express5800/ft series detects hardware faults on the network in the driver level, NEC ESMPRO Agent does not monitor line faults.

❑ Change of SNMP Community

- If the security setting of the SNMP Service of a system, where NEC ESMPRO Agent is installed, is changed from the default "public" to a community name, change the community settings of NEC ESMPRO Agent, too.
 1. Log in as a root user.
 2. Move to the directory where the control panel of NEC ESMPRO Agent is stored.
cd/opt/nec/esmpro_sa/bin
 3. Start the control panel.
./ESMagntconf
The Control Panel window appears.

4. Click [General].
The [General Properties] window appears.
 5. Select a SNMP community name used when you retrieve local machine information in the [SNMP Community] box. (Select by "↑" key or "↓" key.)
 6. Click [OK] to quit.
- ❑ The Detail Information of Alert
 - Detail information of some alert displayed on the alert viewer may be displayed as "Unknown."
 - ❑ File System Monitoring Function
 - vmfs area is not monitored.
 - ❑ Change Settings of File System Monitoring Function
 - New settings in thresholds of monitoring interval and free space monitoring are not reflected immediately after they are changed. They are reflected at the next monitoring interval of monitoring service.
 - ❑ CPU Load Ratio of snmpd Service
 - While monitoring the server from NEC ESMPRO Manager, the CPU load ratio of snmpd Service on NEC ESMPRO Agent side may increase at every monitoring interval (default: 1 minute). NEC ESMPRO Manager and NEC ESMPRO Agent exchange information through snmpd Service. If the server status monitoring by NEC ESMPRO Manager is on (default: ON), NEC ESMPRO Manager regularly issues a request to NEC ESMPRO Agent to get the current status of the server. In response, NEC ESMPRO Agent checks the status of the server. As a result, the CPU load ratio of snmpd Service increases temporarily.
If you have trouble of terminating a movie player application, turn off the server status monitoring by NEC ESMPRO Manager or extend the monitoring interval.
 - ❑ Hang of snmpd Service
 - Snmpd Service has a module called "SNMP Extended Agent." This module may be registered when you install some software that uses snmpd Service.
If you start snmpd Service, SNMP Extended Agent is also loaded at the initialization. However, if the initialization is not completed within a specified period, snmpd Service will hang. It may take time to complete the initialization due to temporary high load on the system. In this case, wait for the system load become low enough before restarting snmpd Service.

[?] NEC ESMPRO Manager

- For details of NEC ESMPRO Manager, refer to "*NEC ESMPRO Manager Installation Guide*" in EXPRESSBUILDER or its help.

Supplementary explanation about [Information of server state/constitution] of NEC ESMPRO Manager

- ❑ CPU Information
 - The CPU information can be viewed by selecting **System – CPU** in the **Information of server state/constitution** screen.
- ❑ Change of hardware configuration
 - If Information of server state/constitution tree is not be displayed correctly when you dynamically change the configuration of the CPU or PCI module (I/O module), wait for at least five minutes, and then open Information of server state/constitution again.
- ❑ Display immediately after system startup
 - If you open [Information of server state/constitution] immediately after the system starts up, the tree or the state may not be displayed correctly due to high load of the system. In about 20 minutes after the system startup, open [Information of server state/constitution] again.

❑ Display of an Unmounted Sensor

→ An unmounted sensor is indicated as "Unknown" on [Information of server state/constitution].

Ex: [Information of server state/constitution] - [Enclosure] - [Temperature]

Temperature information	
Location:	DIMM2 Temp#0
Temperature:	Unknown
Threshold:	Disabled
Status:	Unknown

❑ Pop-up "Constitution Information has changed." is displayed.

→ If you are seeing [Information of server state/constitution], pop-up is displayed when hardware constitution on the monitored server is changed (such as attaching or removing CPU module or PCI module (I/O module)). The information on the screen is updated afterwards.

❑ System Environment Monitoring

→ The monitoring of temperature, fan and voltage under [Enclosure] in [Information of server state/constitution] is set to enable and cannot be changed to disable by default. "Monitoring" is displayed on the following screen if NEC ESMPRO Manager is used for monitoring.

[Information of server state/constitution] - [Enclosure] - [Temperature]

[Information of server state/constitution] - [Enclosure] - [Fan]

[Information of server state/constitution] - [Enclosure] - [Voltage]

❑ The detail information of alert

→ Detail information of some alert displayed on the AlertViewer may be displayed as "Unknown".

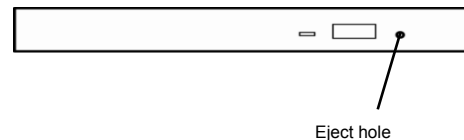
8.10 Problem of Optical Disk Drive and Flash FDD

[?] Unable to access or play a CD-ROM/DVD-ROM:

- Is the CD/DVD properly set in the optical disk drive tray?
 - There is a holder in the tray to secure the disk. Make sure that the disk is securely placed in the holder.
- Is the CD/DVD supported by the server?
 - CD with copy guard feature is not supported.
 - CD/DVD for Macintosh is not supported.
- Is the ft control software installed?
 - The DVD drive of the server is available only when ESXi OS is installed for the first time. If you want to use DVD with the guest OS, connect the DVD drive of the machine on which Host Client is running to guest OS.

[?] Unable to eject a disk using the eject button:

- Eject the disk in the following procedure.
 1. Press the POWER switch to turn off the server (System POWER LED is off).
 2. Use a 100 mm long metal pin that is 1.2 mm in diameter (or uncoil a thick paper clip) and insert it into Eject Hole at the front of the tray. Keep pressing slowly until the tray comes out.



Important

- Do not use toothpicks, plastic pin, and other fragile pins.
- If you still cannot eject the disk, contact your sales representative.

3. Pull the tray out with your hands.
4. Remove the disk.
5. Push the tray back to its original position.

[?] Failed to access (read or write) to the Flash FDD:

- Is the Flash FDD write-protected?
 - Place the write-protect switch on the Flash FDD to the "Write-enabled" Position.
- Is the Flash FDD formatted?
 - Use a formatted Flash FDD.
- Are multiple Flash FDDs set?
 - One Flash FDD can only be connected to a USB connector of this server.

[?] The Flash FDD does not operate normally after failover:

- Reconnect Flash FDD once after removing.
 - When the server process failover with the Flash FDD connected, the Flash FDD is not normally recognized. In that case, once remove the Flash FDD, and reconnect to this server.

9. Resetting and Clearing the Server

See this section if the server does not work or if you want to set BIOS settings back to the factory settings.

9.1 Software Reset

If the server halts before starting the OS, press <Ctrl> + <Alt> + <Delete> keys. Resetting the server clears all the data in memory and restarts the server.

Note

Make sure that no processing is in progress when resetting the server.

9.2 Forced Shutdown

Use this feature when an OS command does not shut down the server, POWER Switch does not turn off the server, or software reset does not work.

Continue to hold POWER Switch of the server for at least four seconds. The power is forcibly turned off.

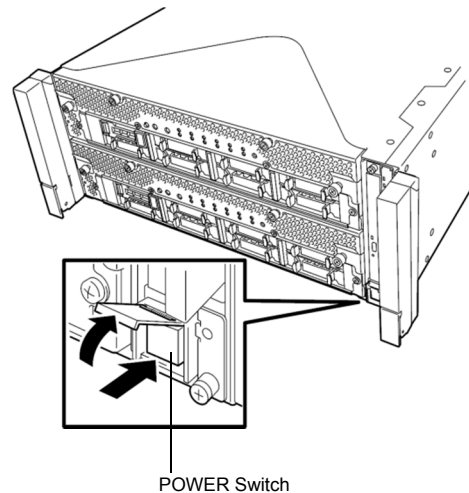
To turn on the power back again, wait at least 30 seconds after turning off the power.

Note

If the remote power-on feature is used, cycle the power once to load the OS after the power has been forcibly turned off, and then turn off the power again by shutting down the OS.

Press the POWER switch for at least four seconds.

The server is forcibly powered off.



9.3 Clearing BIOS Settings (CMOS Memory)

To set the BIOS settings back to the factory settings (clearing CMOS memory), use the jumper switch.

You can also clear the password of BIOS Setup Utility (SETUP) by using the jumper switch.

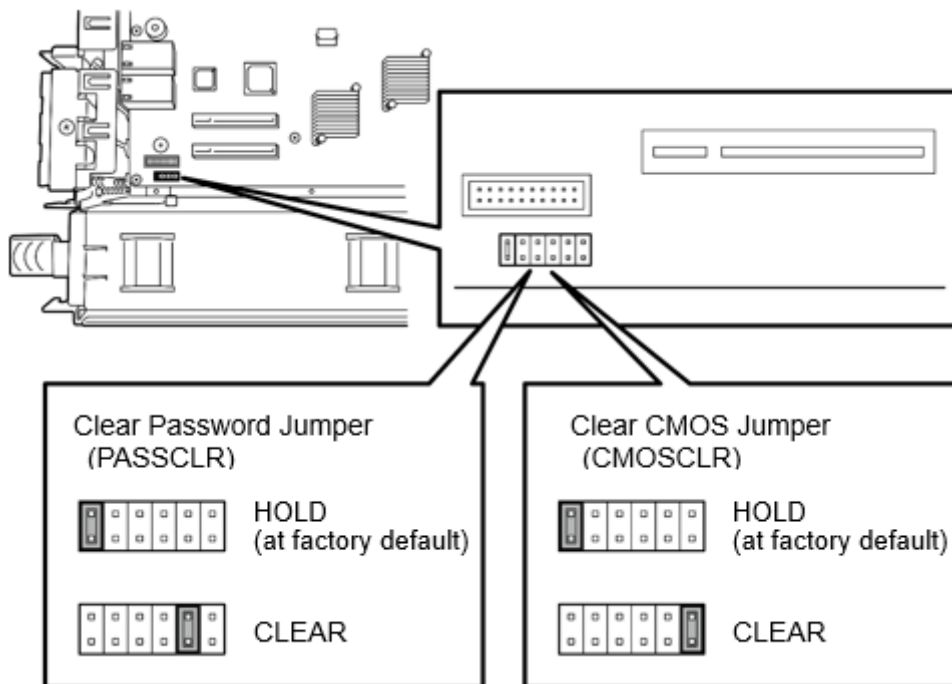
Tips

Usually, select **Load Setup Defaults** in BIOS Setup Utility (SETUP) to return the settings to the factory settings.

To clear the password or the CMOS memory, use the corresponding jumper switch illustrated in the figure below.


Important

Do not change any other jumper switch. Any change will cause the server to fail or malfunction.



The following instructions show how to clear the CMOS memory and the password.


⚠ WARNING



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, see *Safety Precautions and Regulatory Notices*.

- Do not disassemble, repair, or alter the server.
- Do not remove lithium batteries.
- Disconnect the power plug before installing or removing the server.

⚠ CAUTION



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see *Safety Precautions and Regulatory Notices*.

- Make sure to complete installation.
- Do not get your fingers caught.
- Avoid installing under extreme temperature conditions.

Important Take anti-static measures before operating the server. For detailed information on static electricity, see *Chapter 1(1.8 Anti-static Measures) in Safety Precautions and Regulatory Notices*.

Clearing CMOS memory

1. Disconnect AC power cords from CPU/IO modules 0 and 1.
2. Remove CPU/IO module 0, and remove its top cover.
See *Chapter 2 (5.4 CPU/IO Module)*.
3. Confirm the position of Clear CMOS Jumper.
4. Change jumper switch to "CMOS CLR" position.
5. Assemble the CPU/IO module 0.
6. Connect AC power cords to CPU/IO modules 0 and 1 at the same time.
7. Confirm that PRIMARY LED of CPU/IO module 0 goes on after a while.
If PRIMARY LED of CPU/IO module 1 is lit, disconnect AC power cords from both CPU/IO modules, wait for 30 seconds, and connect them at the same time.
8. When the POWER LEDs on CPU/IO modules 0 and 1 starts blinking, press the POWER switch to turn on the server.
9. If the following warning message appears, press the POWER switch to power off the server.
(POST proceeds even when the warning message is displayed.)
WARNING
8006: System configuration data cleared by Jumper.
10. Disconnect AC power cords from CPU/IO modules 0 and 1.
11. Remove CPU/IO module 0, and remove its top cover.
12. Change jumper switch setting to its original position (Protect).
13. Assemble the CPU/IO module 0.
14. Connect AC power cords to CPU/IO modules 0 and 1 at the same time.
15. Confirm that PRIMARY LED of CPU/IO module 0 goes on after a while.
If PRIMARY LED of CPU/IO module 1 is lit, disconnect AC power cords from both CPU/IO modules, wait for 30 seconds, and connect them at the same time.
16. When the POWER LEDs on CPU/IO modules 0 and 1 starts blinking, press the POWER switch to turn on the server.
17. When the following message appears, press <F2> key to start BIOS SETUP Utility.
Press <F2> SETUP, <F4> ROM Utility, <F12> Network
18. On **Save & Exit** menu of SETUP, select **Load Setup Defaults**, and then **Save Changes and Exit**.

Clearing a password

1. Disconnect AC power cords from CPU/IO modules 0 and 1.
2. Remove CPU/IO module 0, and remove its top cover.
See *Chapter 2 (5.4 CPU/IO Module)*.
3. Confirm the position of Clear Password Jumper.
4. Change jumper switch to "PASS CLR" position.
5. Assemble the CPU/IO module 0.
6. Connect AC power cords to CPU/IO modules 0 and 1 at the same time.
7. Confirm that PRIMARY LED of CPU/IO module 0 goes on after a while.
If PRIMARY LED of CPU/IO module 1 is lit, disconnect AC power cords from both CPU/IO modules, wait for 30 seconds, and connect them at the same time.
8. When the POWER LEDs on CPU/IO modules 0 and 1 starts blinking, press the POWER switch to turn on the server.
9. If the following warning message appears, press the POWER switch to power off the server.
(POST proceeds even when the warning message is displayed.)
WARNING
8007:SETUP Menu Password cLeared by Jumper.
10. Disconnect AC power cords from CPU/IO modules 0 and 1.
11. Remove CPU/IO module 0, and remove its top cover.
12. Change jumper switch setting to its original position (Protect).
13. Assemble the CPU/IO module 0.
14. Connect AC power cords to CPU/IO modules 0 and 1.

10. System Diagnostics

System Diagnostics runs several tests on the server.

From the **Tool menu** of EXPRESSBUILDER, select **Test and diagnostics** to diagnose the system.

10.1 Tests

The following items are tested in System Diagnostics.

- Memory
- CPU cache memory
- Hard disk drive

Important To avoid affecting a network and storage system, disconnect a LAN cable, Fibre Channel, NEC Storage, and other external storage before running System Diagnostics.

Tips No data is written on the disk when checking the hard disk drives.

10.2 Usage of System Diagnostics

After turning off the server or restarting the server, run System Diagnostics in the following procedure.

1. System Diagnostics is done by using, EXPRESSBUILDER, which is attached to main machine.

If it is not necessary to diagnose hard disk drives for System Diagnostics, remove all the hard disk drives installed to main machine.

If it is necessary to diagnose a hard disk drive, install the hard disk drive to primary CPU/IO module only. Remove a hard disk drive of secondary CPU/IO module from main machine.

Important If EXPRESSBUILDER is to be started on main machine, remove hard disk drives from both primary and secondary CPU/IO modules. Or, install a hard disk drive to primary CPU/IO module only. Do not start EXPRESSBUILDER while hard disk drives are installed to both primary and secondary CPU/IO modules.

Note

- For primary CPU/IO module, check the PRIMARY lamp on the front side of CPU/IO module (Refer to *Chapter 1 (6.1 Error Indication by LED)*).
- Since removed hard disk drives go back to the original locations after System Diagnostics are completed, make a note which one goes where beforehand.

- After making sure that periphery cables (except power cable) are removed, run EXPRESSBUILDER and choose **Tool menu** from Boot Selection Menu.

For more information, see *Chapter 3 (5. Details of EXPRESSBUILDER)*.

Note Choose **English** if **Language selection menu** appears.

- Choose **Test and diagnostics**. Shows the following three menus.

- End-User Mode (Basic)

Run basic System Diagnostics.

When this menu selected, the process start automatically. Then it takes about three minutes.

When the diagnostics is completed, the screen display changes as shown below.

- End-User Mode (Professional)

Run detail System Diagnostics.

When this menu selected, shows the screen of Device List(End-User Pro).

See *eupro Ug_en.pdf* in the \isolinux\diag folder of EXPRESSBUILDER for the **End-User Mode (Professional)** feature.

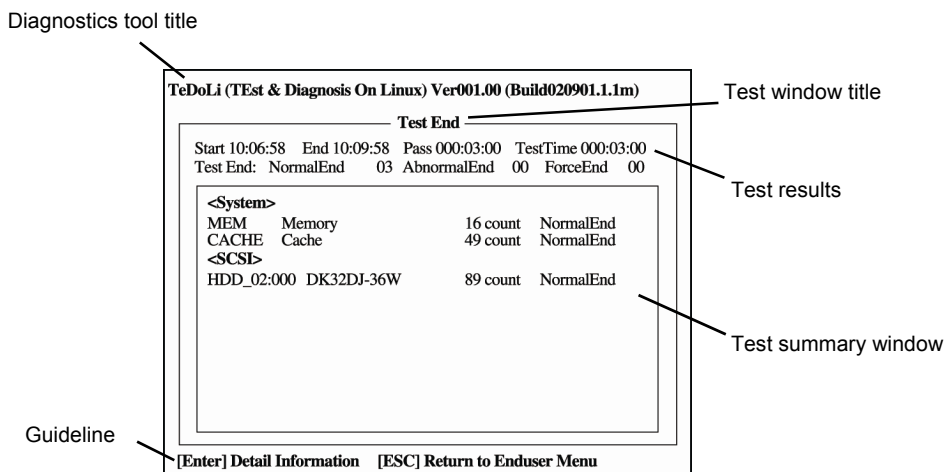
After System Diagnostics are completed, perform Step 6 of this procedure.

- Supervisor-Mode

This menu is intended for maintenance personnel.

Do not run this menu.

End-User Mode (Basic) (After the System Diagnostics)



Diagnostics tool title

Shows the name and version of the diagnostic tool.

Test window title

Shows the progress of the diagnostics. "Test End" is displayed when the diagnostics completes.

Test results

Shows the start, end, and elapsed time and completion status of the diagnostics.

Test summary window

Shows the results of each test. Move the cursor and press <Enter> key on the cursor line to display the details of the test.

If an error is detected by System Diagnostics, the relevant test result in the Test summary window is highlighted in red, and "Abnormal End" is displayed in the result on the right side.

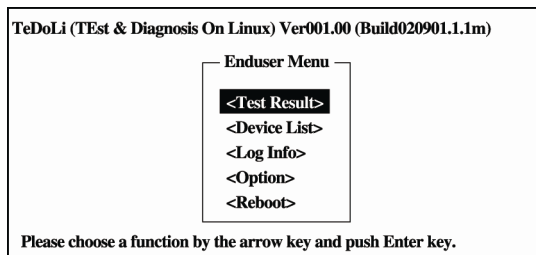
Move the cursor to the test that detected the error, and press <Enter > key. Take notes about the error message that has been output to the Detail Information screen and contact your sales representative.

Guideline

Shows the details of the keys to operate window.

- Follow the guideline shown at the bottom of the screen, and press <Esc> key.

Enduser Menu below is displayed.

**<Test Result>**

Shows the diagnostics completion screen of the above diagnostics.

<Device List>

Shows a list of connected devices.

<Log Info>

Shows the log information of the diagnostics.

To save it, connect FAT formatted removable media, and then choose Save(F).

<Option>

Optional features can be used from this menu.

<Reboot>

Restarts the server.

- Choose **Reboot** in **Enduser Menu** of step 4.
- Since the main machine restarts, press the power switch to stop the main machine.
(Refer to "Chapter 1 (4.2 Front View (Without Front Bezel)) Power switch" of "User's Guide.")
- That would complete System Diagnostics from primary CPU/IO module.

Put back all the hard disk drives that are removed on Step 1 to original locations.

If Sytem Diagnostics is to be continued for hard disk drive of secondary CPU/IO module, change the present secondary CPU/IO module into primary CPU/IO module temporarily.

After switching them, remove all the hard disk drives of secondary CPU/IO module, which used to be primary.

Use this primary CPU/IO module, which used to be secondary, and perform the same System Diagnostics starting from Step 2.

Note

- Check the PRIMARY lamp on the front side of CPU/IO module to know whether it is primary or not (Refer to *Chapter 1 (6.1 Error Indication by LED)*). If PRIMARY lamp is not lightened up, it is secondary CPU/IO module at present.
- If you want to change secondary CPU/IO module into primary CPU/IO module while the power is not turned on, remove the power cables connected to both CPU/IO modules. After 30 seconds elapse, connect the power cable to primary CPU/IO module that you desire. After waiting for enough time (15 seconds or more), connect the power cable to the other CPU/IO module.

After Sytem Diagnostics are completed, put back all the hard disk drives, which are removed, to original locations. And make sure to switch back the primary and secondary CPU/IO modules as they were before.

8. That would complete System Diagnostics. After reconnecting removed periphery cables, start the sytem.

Remove EXPRESSBUILDER DVD from the drive.

Important

Do not start EXPRESSBUILDER while hard disk drives are installed to both primary and secondary CPU/IO modules.

***11.* Offline Tools**

Offline tools are used for maintenance, failure analysis, and the settings of the server.

***11.1* Starting Offline Tools**

Start up the offline tools at the following steps.

1. Turn on the peripheral devices and then the server.
2. Press <F4> key while the message below is displayed.

Press <F2> SETUP, <F4> ROM Utility, <F12> Network

3. Keyboard Selection Menu appears after POST completion.
The following menu is displayed, after choosing a keyboard type.

Off-line TOOL MENU
Maintenance Utility
BMC Configuration
Exit

4. Choose **Maintenance Utility** or **BMC Configuration** to start each tool.
See the next section for more information.

11.2 Features of Offline Tools

Offline Tools has the following features.

Off-line Maintenance Utility

Off-line Maintenance Utility is started when **Maintenance Utility** is chosen. Off-line Maintenance Utility is used for preventive maintenance and failure analysis for the server. If you are unable to start NEC ESM PRO due to a failure, Off-line Maintenance Utility can be used to check the cause of the failure.

Note

Off-line Maintenance Utility is intended for maintenance personnel. Consult with your sales representative if a trouble that requires Off-line Maintenance Utility occurs.

Off-line Maintenance Utility has the following features.

– IPMI Information Viewer

Displays System Event Log (SEL), Sensor Data Record (SDR), and Field Replaceable Unit (FRU) in Intelligent Platform Management Interface (IPMI) and also back up such logs.

Using this feature, system errors and events can be investigated to locate the component to be replaced. You can also clear the SEL area, and specify the operation when the SEL area becomes full.

Tips

DIMM information (DIMMx FRU#y) displayed when you select **Display Most Recent IPMI Data → Field Replaceable Unit (FRU) List** is the one for CPU/IO module on primary side.

For the CPU/IO module on opposite side, the following message is displayed. Ignore the message because this is not a failure.

```
WARNING!
No Information.
The Device is not detected or it is broken.
```

– System Information Viewer

Displays and saves information on processor (CPU) or BIOS.

– System Information Management

Specifies Product data and other System data.

BMC Configuration

- Uses this utility to specify the alert notification feature by Baseboard Management Controller (BMC) and use the remote management feature by "PC for Management". See *Chapter 3 (2. BMC Configuration)* for more information.

***12.* Precautions for Operation**

If a shutdown request is sent to the ESXi host while the CPU module is reinstalled after the server boot or a synchronization failure, the server may not be shut down successfully. Wait until CPU module has been reinstalled before making a shutdown request. If the shutdown fails in the case as mentioned above, restart the server forcibly by pressing the DUMP(NMI) switch. For details on how to use the DUMP(NMI) switch, see *Chapter 1 (7.3 Collecting Memory Dump)*.

Configuring and Upgrading the System

This chapter describes procedure for change configuration and installing internal option devices.

1. ftSys Management Appliance

Describes the specifications of ftSys Management Appliance (virtual machine).

2. Hard Disk Drive Operations

Describes how to duplex hard disk drives and how to replace the failed hard disk drives.

3. Duplex LAN Configuration

Describes how to configure duplex LAN.

4. Miscellaneous Configuration

5. Installing Optional Devices

Describes procedure for installing, replacing, or removing internal option devices.

1. ftSys Management Appliance

1.1 Overview

The ftSys Management Appliance is a CentOS-based virtual machine hosted by the VMware ESXi hypervisor on your ftServer system. ft control software runs on ftSys Management Appliance. ft control software monitors/manages the state of the ESXi host system at all times and provides commands to change the system settings and access the system information.

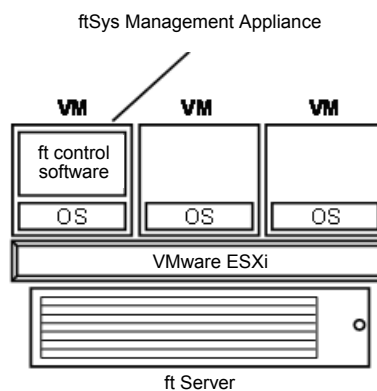
The specifications of ftSys Management Appliance (virtual machine) are as follows.

CPU	1vCPU
Memory	2048MB
Disk	16GB
Network	1port
Guest OS	CentOS 7.6

Tips

For detailed information on CentOS, refer to the Web site below.

<http://www.centos.org/>



1.2 Steps for Accessing ftSys Management Appliance

Access the ft management appliance by using Host Client installed on the management PC. Right-click the ft management appliance of the Navigator of Host Client and select [Console] and [Launch remote console]. You can select this item by clicking the “Console” tab displayed on the left-hand pane or from the “Actions” tab.

All the administrative commands that are described in this document are supposed to run on ftSys Management Appliance.

For Host Client, refer to the “Installation Guide” of this series.

1.3 Precautions for Using ftSys Management Appliance

To enable the ft server to operate continuously, it is necessary to operate the ft Management Appliance continuously. If the ft Management Appliance is shut down for any other product than maintenance, the redundancy of the ft server may be lost. Specifically, note the following precautions when operating the ft Management Appliance.

- Do not migrate or delete the ftSys Management Appliance. To ensure continuous uptime, the appliance must be present and running on your ftServer system at all times.
- Do not restart or shutdown the ftSys Management Appliance, unless instructed to do so for updates or troubleshooting purposes. The appliance is also configured to start and shut down automatically with your ESXi host. Do not change this configuration.
- Deploy only one ftSys Management Appliance per system, and configure it to manage only the ESXi host on which it is installed.
- Deploy the ftSys Management Appliance only in the VMFS volume located on the boot disk for your system, whether the boot disk is an internal disk or external storage volume. Check that the boot disk can be accessed only from the supported ft server.
- For configuration changes below, running appropriate commands is required. For details, refer to *Chapter 1 (2.3 Precautions for Changing the Configuration after Setup) of Installation Guide*.
 - To change the IP address or hostname of ESXi host, root user password
 - To change the IP address or host name of log server
 - To change the firewall rules for ftSys Management Appliance
- Please ensure that the appliance remains on the same network as the ESXi host, and that the appliance and host can still communicate with each other.
- Do not enable SELinux in the ftSys Management Appliance.
- As long as there are no directions from maintenance personnel, ft peculiar service on ftSys Management Appliance or an ESXi host is not stopped, or a starting setup is not changed.

- Use only the root user to run administrative commands in the appliance. Avoid creating additional administrative users in the appliance. The default root password is "ftServer" and changing the password is recommended from the security viewpoint.
- To avoid directly logging in to ftSys Management Appliance with the root user from security viewpoint, log in to ftSys Management Appliance with the ftadmin user, and then, gain root privileges by the `su` command before running the administrative commands. The default ftadmin password is "ftadmin" and changing the password is recommended as well as that of the root user.
- Avoid deploying your own scripts and third-party agents in the ftSys Management Appliance.
- Avoid manually updating the CentOS software or manually adding and removing RPM software packages in the ftSys Management Appliance.
- ftSys Management Appliance is monitored by the ESXi host, and even if it stops, it is automatically restarted.
- The duplicated state continues even when ftSys Management Appliance stops. However, when a module is isolated and duplication ends while ftSys Management Appliance is stopped, the module is not embedded again while ftSys Management Appliance is stopped.
- When your ft Server is included in the VMware vSphere HA cluster, set "VM restart priority" of ftSys Management Appliance to other than "disable". When it is set to "disable", the ft Server may not be duplicated properly.
- Before you transfer an ESXi host from the normal mode to the maintenance mode, shut down ftSys Management Appliance manually.
Then transfer the ESXi host to the maintenance mode quickly because ftSys Management Appliance will restart automatically several tens of minutes after shutting down,
After you transfer the ESXi host from the maintenance mode to the normal mode, power on ftSys Management Appliance manually.

2. Hard Disk Drive Operations

NEC Express5800/ft series duplicates the hard disk drive to secure data integrity by Software-RAID.

Important

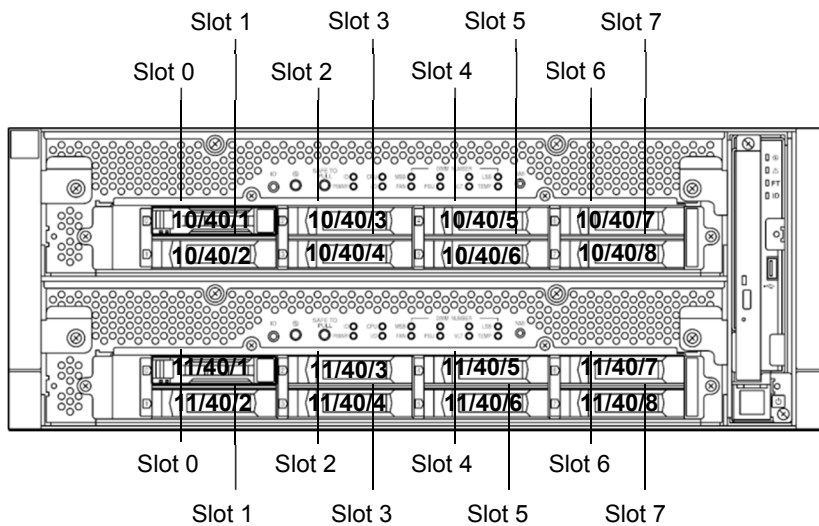
- It is recommended to create only a system partition on the disk specified at installation of VMware ESXi.
- When you have created the VMFS data store area on the disk with specified at installation of VMware ESXi, note that all area of the disk is cleared at the time of the reinstallation of the VMware ESXi.

2.1 Operable disk configuration

Duplication must be configured for all the internal hard disk drives in NEC Express5800/ft series.

The hard disk drives redundancy is configured by Software RAID with the internal disks of corresponding slots.

The internal hard disk drive path



Slots corresponding to the mirroring process

Corresponding slots	
CPU/IO module #0	CPU/IO module #1
Slot 0 (10/40/1)	↔ Slot 0 (11/40/1)
Slot 1 (10/40/2)	↔ Slot 1 (11/40/2)
Slot 2 (10/40/3)	↔ Slot 2 (11/40/3)
Slot 3 (10/40/4)	↔ Slot 3 (11/40/4)
Slot 4 (10/40/5)	↔ Slot 4 (11/40/5)
Slot 5 (10/40/6)	↔ Slot 5 (11/40/6)
Slot 6 (10/40/7)	↔ Slot 6 (11/40/7)
Slot 7 (10/40/8)	↔ Slot 7 (11/40/8)

To operate the internal hard disk drive, use the kernel device names. The kernel device name is decided by being detected by system when the hard disk drive is inserted or system is booted. The kernel device name is displayed as "vmhban:C0:Tx:L0".

The "n" of "vmhban" represents the last digit of I/O module (10, 11). "x" of "Tx" represents a target number larger than 0, and it is assigned by detection order. A target number in I/O module (10) may be different from one in I/O module (11), but that doesn't matter.

You can confirm the kernel device name corresponding to the slot by using "/opt/ft/bin/ftsmaint" command.

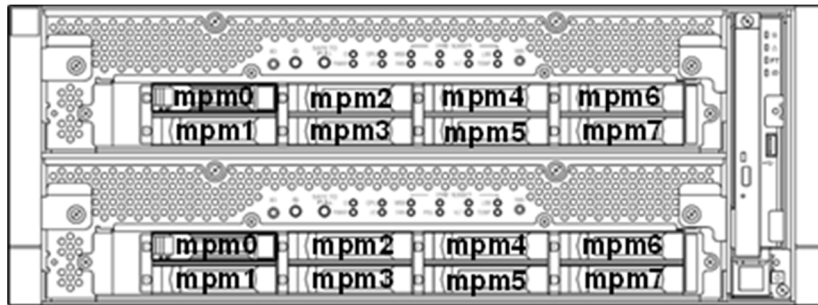
If you need to confirm the kernel device name of internal hard disk drive installed in the slot0 of I/O module 0 (10), run the following command. In the following example, the kernel device name is vmhba0:C0:T1:L0.

```
# /opt/ft/bin/ftsmaint ls 10/40/1
H/W Path           : 10/40/1
Description        : Disk Drive
State              : ONLINE
Op State           : DUPLEX
Reason             : NONE
Modelx             : TOSHIBA:KPM51MUG400G
CapacityGB         : 372.53
Firmware Rev       : 0107
Serial #           : 78B0A009TAVR
Device Name        : disk_a
Udev Device Names  : -
Kernel Device Names : vmhba0:C0:T1:L0
Endurance          : 100% (warning 10%, critical 5%)
MTBF Policy        : useThreshold
MTBF fault class:  critical      noncritical      removal
Fault Count:       0              0              0
Last Timestamp:    -              -              -
Replace Threshold: 0              0              0
Evict Threshold:   2147483647      604800         86400
Value:             0              0              0
Minimum Count:     1              4              2

MTBF fault class:  aborts
Fault Count:       0
Last Timestamp:    -
Replace Threshold: 0
Evict Threshold:   86400
Value:             0
Minimum Count:     2
```

To configure the redundant configuration, use "esxcli storage mpm" command. On this occasion, the RAID device name is expressed as "mpmn" ("n" is 0~7).

The RAID device names assigned to internal hard disk drives

**Important**

- When the status of each disk becomes "resync" "recovery" "check" or "repair" do not add a disk, insert/remove HDD, power off or restart the system. Wait until the status indication of Raid device disappears and the status of each disks become "in_sync". Check the status of RAID using the "esxcli storage mpm" command, which is described later in this document.
- Use only the hard disk drives specified by NEC. There is a risk of hard disk as well as the entire device breakdown when you install a third-party hard disk drive. Purchase two, paired hard disk drive of the same model to configure the hard drive redundancy. For information on which HDD suits this device the best, ask your sales agent.

2.2 esxcli Command Syntax

The `esxcli` command syntax used in this document is as follows.

- To check the state of the disk
`esxcli -s <IP address or hostname of ESXi host> storage mpm list`
- To isolate a disk from the RAID configuration
`esxcli -s <IP address or hostname of ESXi host> storage mpm fail -v <RAID Device name> -d <Kernel device name>`
- To remove a disk from the RAID configuration
`esxcli -s <IP address or hostname of ESXi host> storage mpm remove -v <RAID Device name> -d <Kernel device name>`
- To stop a disk from the RAID configuration
`esxcli -s <IP address or hostname of ESXi host> storage mpm stop -v <RAID Device name>`
- To add a disk to the RAID configuration
`esxcli -s <IP address or hostname of ESXi host> storage mpm add -v <RAID Device name> -d <Kernel device name>`
- To add disks (RAID configuration)
`esxcli -s <IP address or hostname of ESXi host> storage mpm create -v <RAID Device name> --disk1=<Kernel device name> --disk2=<Kernel device name>`

Tips

In some cases, the following error message may be displayed as the result of the `esxcli` command.

```
# esxcli -s ftESXi storage mpm list
Enter username: root
Connect to ftESXi failed. Server SHA-1 thumbprint:
48:01:F6:82:E1:92:F7:35:BE:C4:37:E3:9C:89:58:E6:03:9B:FE:95 (not
trusted).
```

If the above error message is output, execute the `esxcli` command with '--thumbprint' option. Specify the thumbprint shown in the error message for the '--thumbprint' option.

```
# esxcli
--
thumbprint=48:01:F6:82:E1:92:F7:35:BE:C4:37:E3:9C:89:58:E6:03:9B:FE:95 -s ftESXi storage mpm list
```

For details of the `esxcli` command, see the documents from VMware.

2.3 Confirm Hard Disk Drives status

To confirm the hard disk drive status, use `esxcli storage mpm list` command.

The following display is an example when `esxcli storage mpm list` command is run.

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm list
Info
-----
mpm0 : 292968640 blocks (286102 MB) [2/2]
  \_ vmhba0:C0:T1:L0 (10/40/1)      [ in_sync ]
  \_ vmhba1:C0:T1:L0 (11/40/1)      [ in_sync ]
```

Note

The kernel device name is defined at the time when disk is detected. Accordingly, it is subject to be changed if the hard disk drive is relocated or the system is rebooted. You need to confirm the current disk status by running the `esxcli storage mpm list` command every time you perform disk operation.

2.4 Replacing a hard disk drive

To replace a failing hard disk drive, follow the steps below. Replace a hard disk drive when the CPU/IO module 0 and 1 are powered on.

2.4.1 Identifying a failing disk

This section provides information on how to identify a failing hard disk drive.

Important This must be operated by root user.

1. Run `esxcli -s <IP address or hostname of ESXi host> storage mpm list`.
2. Check the failed disk form the displayed info.

The following example shows that a failure occurs in the built-in hard disk drive inserted into slot 0 of I/O module 1, and the status is [faulty]. The hard disk drive may be separated from the RAID configuration depending on the failure condition, and may become the Unused status.

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm list
Info
-----
mpm0 : 292968640 blocks (286102 MB) [2/2]
  \_ vmhba0:C0:T1:L0 (10/40/1)      [ in_sync ]
  \_ vmhba1:C0:T1:L0 (11/40/1)      [ faulty ]
```

When you confirm the slot0 of I/O Module1 by `/opt/ft/bin/ftsmaint ls` command, it is displayed as follows.

```
# cd /opt/ft/bin/
# ./ftsmaint ls 11/40/1
H/W Path      : 11/40/1
Description   : Disk Drive
State         : BROKEN
Op State      : SHOT
Reason        : NONE
. . .        . . . .
. . .        . . . .
```

2.4.2 Restoring the redundant configuration manually

This section provides information on how to replace a failing internal hard disk drive and restore duplication.

Important

- This must be operated by root user.
- While the replaced hard disk drive is restoring to the RAID configuration, do not stop/restart the system when the reconfigured each RAID device is in RECOVERY. Wait until the status indication of them disappears and the status of each disks become "in_sync". (It comes to take time depending on disk space.)

1. To isolate the failing hard disk drive from redundant configuration, run the `esxcli storage mpm fail` and `esxcli storage mpm remove` commands with device name and kernel device name specified.

Note

The `remove` command will fail if hard disk drive status is other than [faulty]. You should change disk status by running `fail` command in advance. Run the `remove` command without intermission because the disk status returns to [in_sync] in a short time after running the `fail` command.

The following is an example of command prompt for the procedure from isolating the internal hard disk stored in the slot 0 of I/O Module 1.

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm list
Info
-----
mpm0 : 292968640 blocks (286102MB) [2/2]
 \_ vmhba0:C0:T1:L0 (10/40/1)      [ in_sync ]
 \_ vmhba1:C0:T1:L0 (11/40/1)      [ faulty ]

# esxcli -s xxx.xxx.xxx.xxx storage mpm fail -v mpm0 -d vmhba1:C0:T1:L0

# esxcli -s xxx.xxx.xxx.xxx storage mpm remove -v mpm0 -d vmhba1:C0:T1:L0

# esxcli -s xxx.xxx.xxx.xxx storage mpm list
Info
-----
mpm0 : 292968640 blocks (286102MB) [1/2]
 \_ vmhba0:C0:T1:L0 (10/40/1)      [ in_sync ]

Unused disks:
- vmhba1:C0:T1:L0 (11/40/1)
```

- Remove the isolated hard disk drive from the system, and then, insert a new disk.

Run the "list" command, Check that the hard disk drive inserted in [Unused disks:] is indicated.

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm list
Info
-----
mpm0 : 292968640 blocks (286102MB) [1/2]
 \_ vmhba0:C0:T1:L0 (10/40/1)      [ in_sync ]

:
:
:

# esxcli -s xxx.xxx.xxx.xxx storage mpm list
Info
-----
mpm0 : 292968640 blocks (286102MB) [1/2]
 \_ vmhba0:C0:T1:L0 (10/40/1)      [ in_sync ]

Unused disks:
- vmhba1:C0:T1:L0 (11/40/1)
```

- To restore the redundant configuration, run the "esxcli storage mpm add" command with RAID device name and kernel device name corresponding to the hard disk drive specified.

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm add -v mpm0 -d vmhba1:C0:T1:L0
```

Note

Synchronization may start automatically when a new hard disk drive is inserted. In this case, restoration by running add command is not necessary.

- Confirm that resync is started.

In the example below, it is shown that the progress ratio of synchronization is 51.6%, and 32.8 minutes is required to complete synchronization. When the progress is no longer displayed and both kernel devices show [in_sync], the synchronization is completed.

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm list
Info
-----
mpm0 : 292968640 blocks (286102 MB) [2/2]
 |   recover=51.6% (73879680/292968640) finish=32.8min (35088K/s)
 \_ vmhba0:C0:T1:L0 (10/40/1)      [ in_sync ]
 \_ vmhba1:C0:T1:L0 (11/40/1)      [ syncing ]

# esxcli -s xxx.xxx.xxx.xxx storage mpm list
Info
-----
mpm0 : 292968640 blocks (286102 MB) [2/2]
 \_ vmhba0:C0:T1:L0 (10/40/1)      [ in_sync ]
 \_ vmhba1:C0:T1:L0 (11/40/1)      [ in_sync ]
```

2.4.3 Reducing resync time

If resynchronization of the hard disk drive requires much time, you can reduce the resync time to change the minimum/maximum resync speed to 0 KB/sec.

Tips

By specifying 0 (zero) for the minimum/maximum synchronization speed, the synchronization speed will not be limited and the synchronization will work with the best effort.

Note

The minimum/maximum resync speed affects system performance. If it is changed, the system performance may become lower, therefore care must be taken in changing configuration.

Run the following command to confirm the current speed.

The example below shows the default setting (minimum resync speed: 1,000 KB/sec, maximum resync speed: 0 KB/sec).

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm speedLimit
Volume  Minimum  Maximum
-----  -
volume   1000      0
```

Run the following command to specify the minimum/maximum resync speed to 0 KB/sec for all hard disk drives.

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm speedLimit --min=0 --max=0
Volume  Minimum  Maximum
-----  -
volume     0        0
```

To confirm or specify the minimum/maximum resync speed for individual hard disk drive, run the command with "-v <Device name>". The example below shows that the command is run for device name mpm1.

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm speedLimit -v mpm1 --min=0
--max=0
Volume  Minimum  Maximum
-----  -
volume     0        0
```

Note

The minimum/maximum resync speed is reverted when the ESXi host is rebooted. To use the setting persistently, let this command be run every time when the ESXi host is started.

Describe the following line in "/etc/rc.local.d/local.sh" file of ESXi host.

```
esxcli storage mpm speedLimit --min=0 --max=0
```

Describe the above command in the line above "exit 0".

Refer to the Knowledge Base of VMware for how to describe the /etc/rc.local.d/local.sh file.
<VMware, Knowledge Base - Modifying the rc.local or local.sh file in ESX/ESXi to run commands while booting (2043564)>

<https://kb.vmware.com/kb/2043564>

2.5 Adding Hard Disk Drives

To add hard disk drives, follow the steps below. The hard disk drives should be added with the power of the CPU/IO module 0 and 1 turned on.

2.5.1 Inserting Additional Hard Disk Drives

Insert additional hard disk drives into empty slots in the order of the slot number from lowest to highest. Note that two disks should be inserted into the correct locations to become a pair of slots that supports the mirroring process.

Note Use a new hard disk drive to be added with the physical format completed in advance. The specifications of the two drives must be the same. To add more than one hard disk drive, install (insert) one by one.

2.5.2 Configuring a RAID Device

This section describes how to configure a new RAID device on the added disks.

Important These operations must be performed by the root user.

Note If the target disk drive has a data contained in it, the existing data will be erased by configuring RAID system. Make sure that the target disk drive does not contain any necessary data.

1. Run `esxcli -s <IP address or hostname of ESXi host> storage mpm list`.
2. Check the added disks in the information displayed.

The following is an example that two disks are inserted into a pair of slots for the slot 1.

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm list
Info
-----
mpm0 : 292968640 blocks (286102MB) [2/2]
 \_ vmhba0:C0:T1:L0 (10/40/1)      [ in_sync ]
 \_ vmhba1:C0:T1:L0 (11/40/1)      [ in_sync ]

Unused disks:
- vmhba0:C0:T2:L0 (10/40/2)
- vmhba1:C0:T2:L0 (11/40/2)
```

3. Configure a RAID device for a pair of the added disks (unused disks). Specify the RAID device name and kernel device name that represents the relevant disk in "esxcli storage mpm create". When the progress is no longer displayed and both kernel devices show [in_sync], the synchronization is completed.

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm create -v mpm1 --
disk1=vmhba0:C0:T2:L0 --disk2=vmhba1:C0:T2:L0

<<<Make sure that the RAID device is configured
successfully.>>>
# esxcli -s xxx.xxx.xxx.xxx storage mpm list
Info
-----
mpm0 : 292968640 blocks (286102 MB) [2/2]
 \_ vmhba0:C0:T1:L0 (10/40/1)      [ in_sync ]
 \_ vmhba1:C0:T1:L0 (11/40/1)      [ in_sync ]

mpm1 : 292968640 blocks (286102 MB) [2/2]
 \_ vmhba0:C0:T2:L0 (10/40/2)      [ in_sync ]
 \_ vmhba1:C0:T2:L0 (11/40/2)      [ in_sync ]
```

2.5.3 Creating and Mounting a Filesystem

Create a file system (VMFS data store) to a RAID device you have built.

Important

In vSphere version 6.5 or after, support for vSphere Client has been discontinued. To set VMware ESXi, use an item (VMware Host Client, etc.) other than vSphere Client. VMware Host Client uses the Web browser. Therefore, the requirements of the Web browser must be met. For details, refer to the following Website.
<https://docs.vmware.com/en/VMware-vSphere/6.7/com.vmware.vsphere.html.hostclient.doc/GUID-83042A09-281D-4B74-9176-8E882AD23432.html>

Note

When configuring RAID device using `esxcli storage mpm create` command, some data remains unerased, and the existing VMFS datastore may be displayed on datastore list. In this case, erase the existing datastore, then create a new datastore.

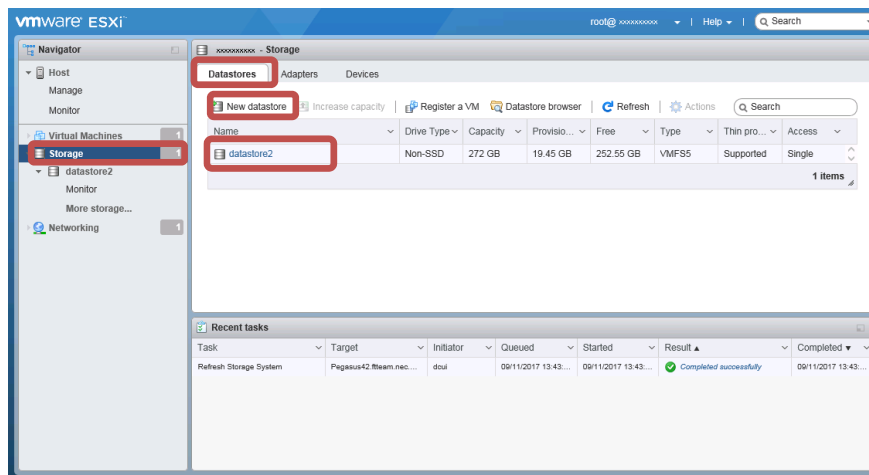
An example of Host Client is shown below.

1. Input the URL in the Web browser, connect to the ESXi host, and log in.

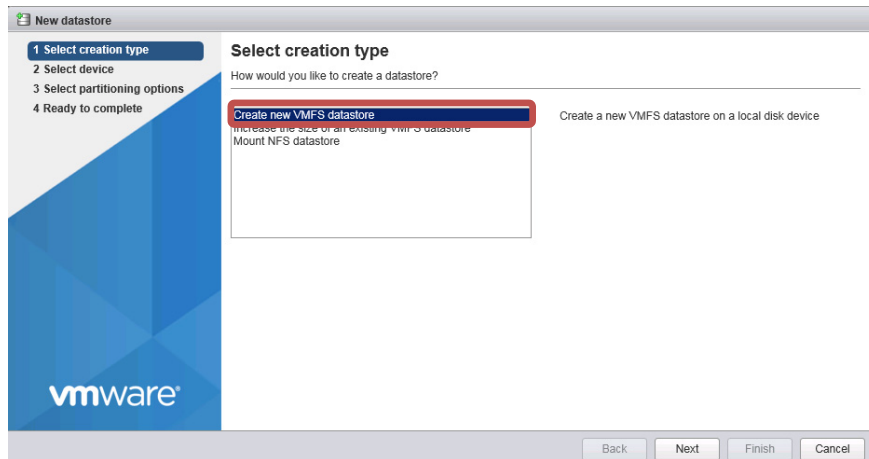
`https://<ESXi host name or IP address>/ui`

2. Select [Storage] of Navigator, and select the [Datastores] tab.

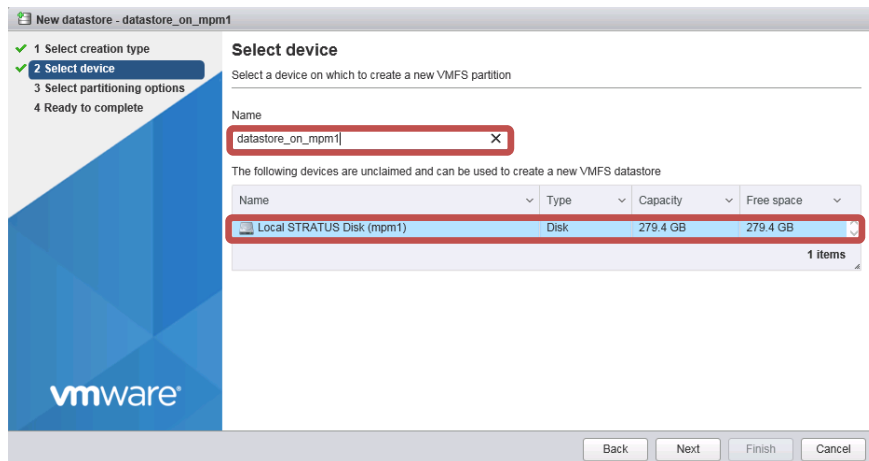
3. Select [New Datastore].



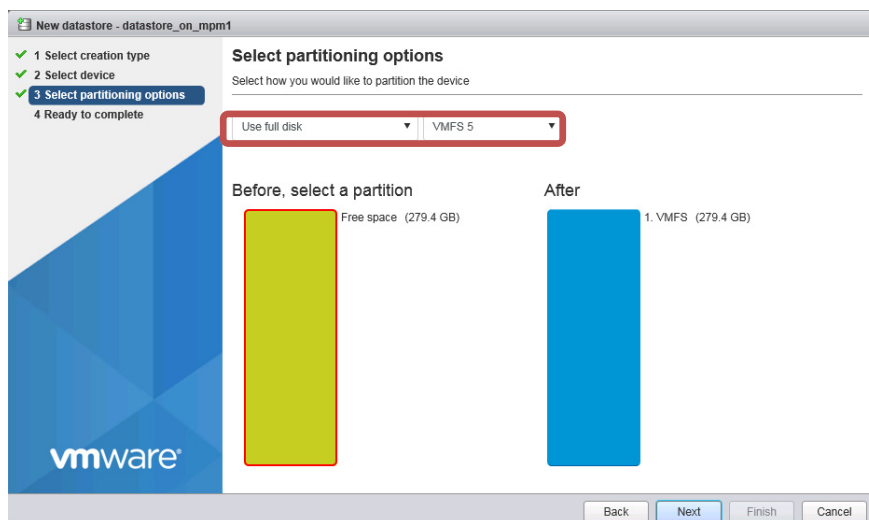
- The [New Datastore] wizard appears. Select “Create new VMFS datastore” in [Select creation type], and select [Next].



- Fill in the name column with the datastore name, select the volume for creation of the VMFS datastore, and select [Next].

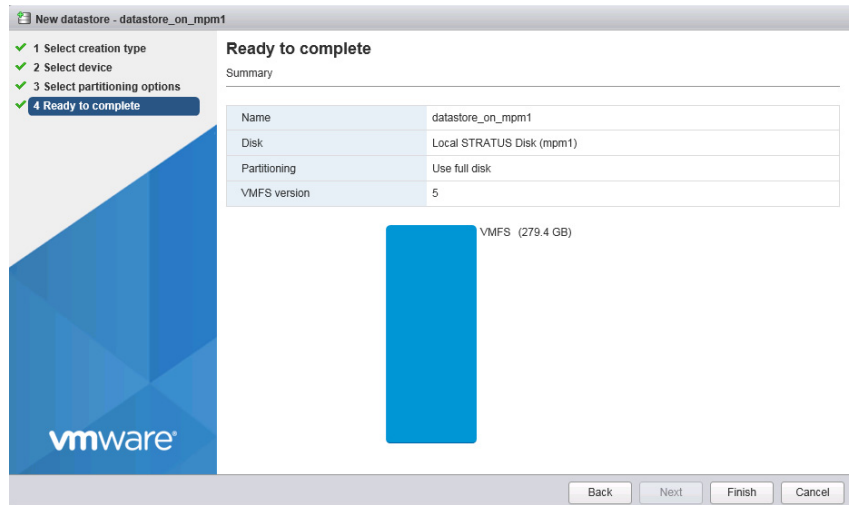


- Do not change the default value of the partitioning option, and select [Next].



7. Select [Finish] in the setting confirmation.

The VMFS datastore is created according to the following procedure.



3. Duplex LAN Configuration

The operable network configuration is described here.

3.1 Functional Overview

Duplicating a LAN is achieved by binding multiple adapters to the same virtual switch (NIC teaming). If an uplink adapter fails, it switches to another adapter to continue the operation.

3.2 Operable Network Configuration

For NEC Express5800/ft series, network interface names are based on the naming convention as described in the table below. Network duplication is achieved by pairing network interfaces of PCI slots in CPU/IO module 0 and network interfaces in the same PCI slots in CPU/IO module 1 (i.e. Two network interfaces are bound to a switch).

When installing VMware ESXi, the standard switch (vSwitch0) is created in the port #1 (vmnic_100600, vmnic_110600) of On Board (1 Gigabit) of CPU/IO modules 0 and 1, and network duplication is achieved.

You can configure the setting of and check the network interfaces from Host Client.

For more specific setting method, see VMware vSphere document.

When you add network adapters to an existing vSwitch, the adapters may not be added in the Active Adapters category.

Ensure that all of the adapters appear in the Active Adapters category.

When you view network adapters (by selecting [Configure Management Network] -> [Network Adapters]) on an ESXi host of this server, [N/A] is displayed for [Hardware Label]. The value other than [N/A] (for example, [Chassis Slot XX; function X]) may be displayed depending on your environment, but it does not affect the operation.

The network may be disconnected for up to about one minute when failover occurs on CPU/IO module due to hardware failure.

It is necessary to be used after carefully examining the setting of application and client.

When I/O modules 0 (10) and 1 (11) were duplexed after startup of ESXi host, an alert is issued to NEC ESM PRO Manager.

[Message: The device is now in a DUPLEX state.]

After this alert is issued, the following alert may be issued for the device such as network adapter of which status is changed to SIMPLEX.

[Message: The device is now in a SIMPLEX state.]

However, it is not the problem if an alert that notifies of completion of duplication is issued immediately after this alert message.

Do not use "Route based on IP hash" for NIC load balancing when connecting 100Mbps.

If you use "Route based on IP hash" and connect with 100M bps, network traffic may be disconnect when the module degraded.

PCI slot and network interface name

PCI slot	Port	CPU/IO module 0	CPU/IO module 1
On Board (1 Gigabit)	#1	vmnic_100600	vmnic_110600
	#2	vmnic_100601	vmnic_110601
On Board (10 Gigabit) (*)	#1	vmnic_101200	vmnic_111200
	#2	vmnic_101201	vmnic_111201
PCI-e slot 1	#1	vmnic_100100	vmnic_110100
	#2	vmnic_100101	vmnic_110101
PCI-e slot 2	#1	vmnic_100200	vmnic_110200
	#2	vmnic_100201	vmnic_110201
PCI-e slot 3 (*)	#1	vmnic_100300	vmnic_110300
	#2	vmnic_100301	vmnic_110301
PCI-e slot 4 (*)	#1	vmnic_100400	vmnic_110400
	#2	vmnic_100401	vmnic_110401

* For R320g-M4 model only

4. Miscellaneous Configuration

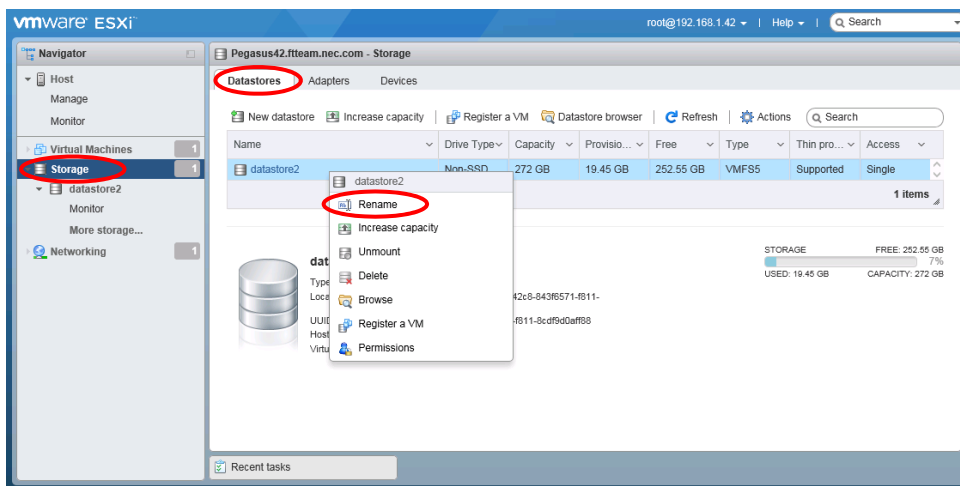
4.1 Changing Datastore Name

If the ft Management Appliance is installed in internal disk, the storage name of internal disk (datastore1) is changed to datastore2.

You can change the datastore name as needed.

Select [Storage] from Navigator of Host Client, select the related datastore on the [Datastores] tab, select [Rename] from the menu displayed by right-clicking, and change the name.

Refer to the VMware vSphere document for detailed information.



5. Installing Optional Devices

This section describes procedures to add/remove optional devices and replace failed components.


Important







- NEC recommends that the procedures should be performed by maintenance personnel who belong to a maintenance service company certified by NEC.
- Use only the devices and cables specified by NEC. You will be charged to repair damages, malfunctions, and failures caused by the use of any devices or cables not specified for use with this server even within the warranty period.

5.1 Precautions

5.1.1 Safety precautions


Observe the following notes to install/remove or replace optional devices safely and properly.





 **WARNING**

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, see *Safety Precautions and Regulatory Notices*.

- Do not disassemble, repair, or modify the server.
- Do not look into the optical disc drive.
- Do not remove the lithium battery

 **CAUTION**

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see *Safety Precautions and Regulatory Notices*.

- Do not install CPU/IO module with its cover removed.
- Make sure to complete component installation.
- Do not pinch your finger(s).
- Pay attention to hot components.

5.1.2 Before adding optional devices

If you add on optional devices onto this server, some devices require specific the ft server software version.

Follow the steps below to check the version of the software.

1. Confirm the required ft server control software's version, check the NEC website, or contact your sales representative.
2. Confirm the version of the ft control software on your system.
3. After confirming that the version of ft control software is appropriate to the optional device, add the device onto the server.

For details, see *Chapter 1 (2.2 Confirmation of the ft control software Version)* in *Installation Guide (VMware)*.

5.1.3 Precautions for installing/removing or replacing optional devices

Note the following, when installing/removing or replacing devices.

Installing/removing

- Optional devices (except HDD) cannot be newly added or removed during continuous operation. After shutting down OS, check that the server is powered off, disconnect all power cords and interface cables from the server before installing or removing the optional devices.
- Make sure to provide the same hardware configuration on both CPU/IO modules.
- Use the slots and sockets in the same position on both groups.
- Do not install those devices having different specifications, performance, or features.

Replacing

- Fault devices can be replaced during the continuous operation. Take care for electric shock and damage to the component due to short-circuit.
- To remove the CPU/IO module during the continuous operation, disable the intended module (place the module off-line) by using the `ftsmaint` command before removing the screws from the CPU/IO modules.

After a new module is installed to the server, enable the module using the `ftsmaint` command.

Tips

The system is defaulted to automatically boot the module, once installed. For details, refer to *Chapter 1 (4.4 Disabling Auto Reinstallation of CPU Module)* in *this manual*

5.2 Available Optional Devices

Optional devices that can be added, removed, or replaced are as follows:

- 2.5-inch hard disk drive
A maximum of 8 units can be installed per CPU/IO module.
Install or remove hard disk drives in 2.5-inch hard disk drive bay at front of the server.

- DIMM
2CPU: A maximum of 20 units can be installed per CPU/IO module.
1CPU: A maximum of 8 units can be installed per CPU/IO module.

After removing the CPU/IO module from the server, install or remove DIMMs in DIMM slots on motherboard of the server.

- CPU (Processor)
In addition to the CPU of standard equipment, one more CPU can be installed per CPU/IO module.
After removing the CPU/IO module from the server, install or remove CPU in CPUs sockets of the server.

- PCI card
Up to two cards can be installed on R320g-E4 model, and up to 4 cards on R320g-M4 model per CPU/IO module. After removing the CPU/IO module, install or remove PCI card in PCI card slot of the server.

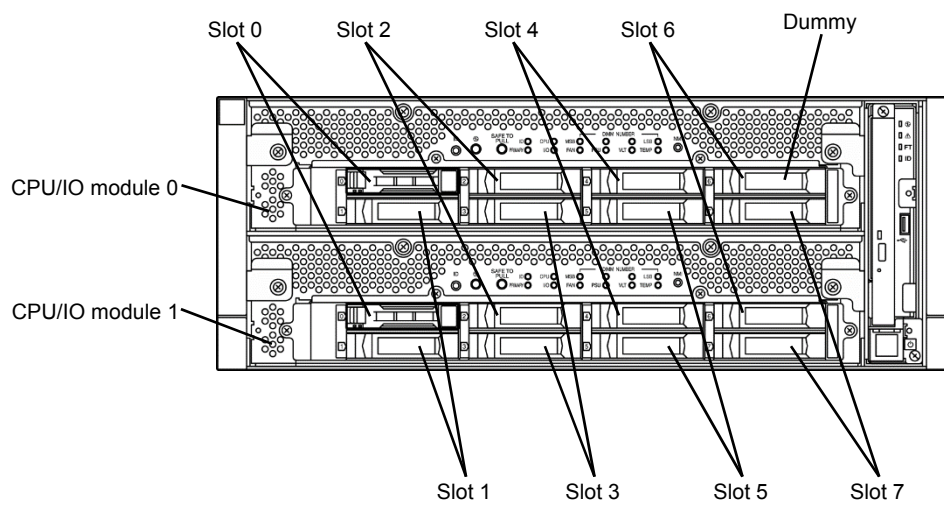
5.3 2.5-inch Hard Disk Drive

Up to 8 hard disk drives mounted on the 2.5-inch width dedicated tray can be installed on the 2.5-inch hard disk drive bay located at the front of the unit.

Important

- Do not use any hard disks that are not authorized by NEC. Installing a third-party hard disk may cause a failure of the server as well as the hard disk.
- Purchase hard disks of the same model in pair. Contact your sales representative for hard disk drives optimum for your server.

The operation is run on the created mirror volume with installed hard disk drive pairs such as slot 0 on CPU/IO module 0/1. The same is true of slot 1 to slot 7. The OS is installed on the mirror volumes that consist of the hard disks in the slot 0.



Slots related to the mirroring process

Empty slots in the 2.5-inch hard disk drive bay contain dummy trays. The dummy trays are inserted to improve the cooling effect in the server. Always insert the dummy trays in the slots with no hard disks drive installed.

5.3.1 Installing 2.5-inch Hard Disk Drive

Follow the steps below to install the hard disk drives. Install the hard disk drives from a smaller slot number to large number on CPU/IO module 0/1, from slot 1 to slot through slot 7.

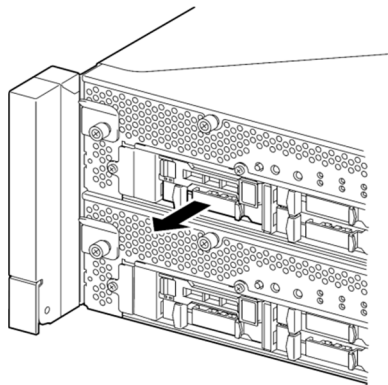
If you installs hard disk drive when the server powered off, the server power on after add the pair hard disk drive. After the server powered on, refer to “2.5 Adding Hard Disk Drives” in this Chapter to set the dual disk configuration.

Important See Chapter 2 (5.1.3 Precautions for installing/removing or replacing optional devices) and Chapter 1(1.8 Anti-static Measures) in Safety Precautions and Regulatory Notices before starting installing or removing options.

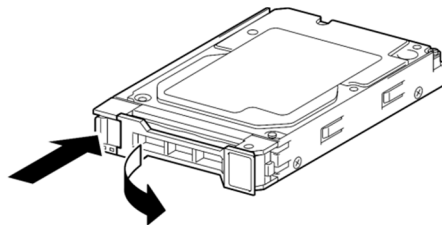
Tips You can install a hard disk drive without shutting down the OS.
In this case, you can skip Step 1 and Step 7.

1. Shut down the OS.
The server turns off automatically.
2. Remove the front bezel.
3. If a dummy tray is inserted in a slot you want to install the hard disk drive, remove the dummy tray.

Important Keep and store the dummy tray for future use.



4. Unlock the hard disk drive.

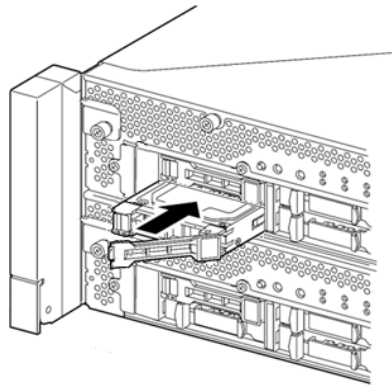


5. Firmly hold the handle of the hard disk drive to install and insert the drive into the slot.

Important If you install the hard disk drive without shutting down the OS, each hard disk drive installs after enough interval (more than 15 seconds).

Note

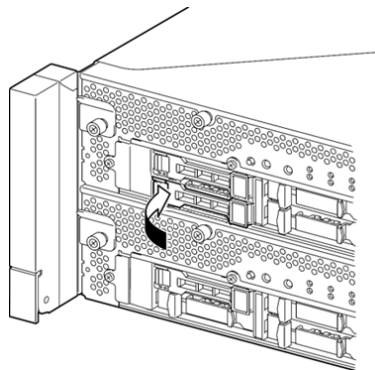
- Insert the hard disk drive until the lever hook touches the server frame.
- Check the direction of the lever. Insert the hard disk drive with the lever unlocked.



6. Slowly close the lever. When the lever is locked, you will hear a click sound.

Important Be careful not to pinch your finger(s) between the lever and tray.

Note Check the hook of the lever is engaged with the frame.



7. Press the POWER switch to power on.

8. Refer to "2.5 Adding Hard Disk Drives" in this Chapter to set the dual disk configuration.

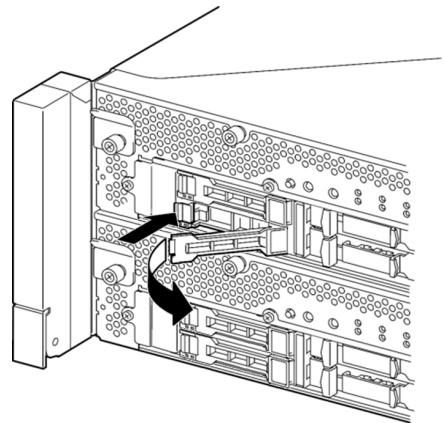
9. Install the front bezel.

5.3.2 Removing 2.5-inch Hard Disk Drive

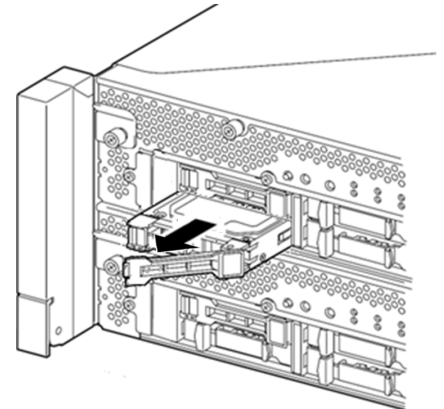
Follow the steps below to remove the hard disk drive.

Important See *Chapter 2 (5.1.3 Precautions for installing/removing or replacing optional devices)* and *Chapter 1(1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices* before starting installing or removing options.

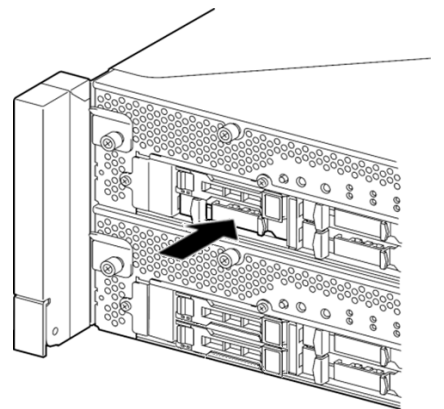
1. Shut down the OS.
The server turns off automatically.
2. Remove the front bezel.
3. Push the lever of the hard disk to unlock the drive, and pull the handle toward you.



4. Hold the handle and hard disk drive to pull them off.



5. Install the dummy tray in an empty tray.



5.3.3 Replacing 2.5-inch Hard Disk Drive

Follow the steps below to remove the failed hard disk drive. The hard disk drive is replaced with a new disk with the server powered on.

Important See *Chapter 2 (5.1.3 Precautions for installing/removing or replacing optional devices)* and *Chapter 1(1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices* before starting installing or removing options.

(1) Replacing the Hard Disk Drive

1. Locate the failed hard disk drive.
When a hard disk drive fails, the DISK ACCESS LED on the hard disk drive's handle lights amber.
2. Remove the failed hard disk drive by referring to "2.4 Replacing a hard disk drive" and "5.3.2 Removing 2.5-inch Hard Disk Drive" in this Chapter.
3. Refer to the steps in "5.3.1 Installing 2.5-inch Hard Disk Drive" in this Chapter to install a new hard disk drive after waiting for 15 seconds or more.

Note

- The hard disk drive to be installed for replaced must have the same specifications as its mirroring hard disk drive.
- Use unsigned hard disk drive for replacement. To use the signed disk, it is necessary to recover the duplex configuration by referring to "2. Hard Disk Drive Operations" in this Chapter after formatting the disk physically.
As to physical format, refer to *Chapter 3 (3. SAS Configuration Utility)*.

4. Restore the redundant configuration.
Refer to "2.4 Replacing a hard disk drive" in this Chapter.

5.4 CPU/IO Module

To replace a CPU (processor), DIMM (memory), and PCI card, remove the CPU/IO module.

Important

- See *Chapter 2 (5.1.3 Precautions for installing/removing or replacing optional devices)* and *Chapter 1(1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices* before starting installing or removing options.
- To install or remove CPU or DIMM, first power off the server before removing the CPU/IO module.
- Removing the CPU/IO module being operating may cause unexpected trouble. Use the `ftsmaint` command to isolate the CPU module and I/O module to be removed so that the CPU/IO module is removed when it is stopped, without fail. Then remove the relevant module after verifying the Status LED on the CPU/IO module. See *Chapter 1 (6.1 Error Indication by LED)* for details of the Status LED.
- When replacing both CPU/IO modules, replace one CPU/IO module and wait until dual configuration is established to replace the other CPU/IO module. If you replace the both CPU/IO modules simultaneously, establishing dual CPU/IO module configuration can result in interruption of the whole system.

5.4.1 Removing CPU/IO Module

Follow the procedure below to remove the CPU/IO module.

1. Stop the CPU/IO module you want to remove.

To stop the CPU/IO module, run the `ftsmaint` command on the console OS.

Refer to *Chapter 1 (4. Maintenance of Express5800/ft series)* for details.

If the CPU/IO module to be removed is CPU/IO module 0, stop the CPU module 0 first as follows.

```
# cd /opt/ft/bin
# ./ftsmaint bringdown 0
```

With the following command, check that the Status of the CPU module is OFFLINE.

```
# ./ftsmaint ls 0
```

Similarly, stop the I/O module 0.

```
# ./ftsmaint bringdown 10
```

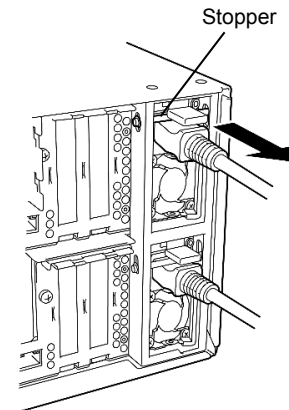
Check that the Status of the I/O module 0 is OFFLINE.

```
# ./ftsmaint ls 10
```

Tips

When removing CPU/IO module 1, run [Bring down] for CPU module 1 and I/O module 1

2. Remove the front bezel
3. Disconnect the power cord of a module to be removed.
The stopper will go down when you disconnect the cable.



Important

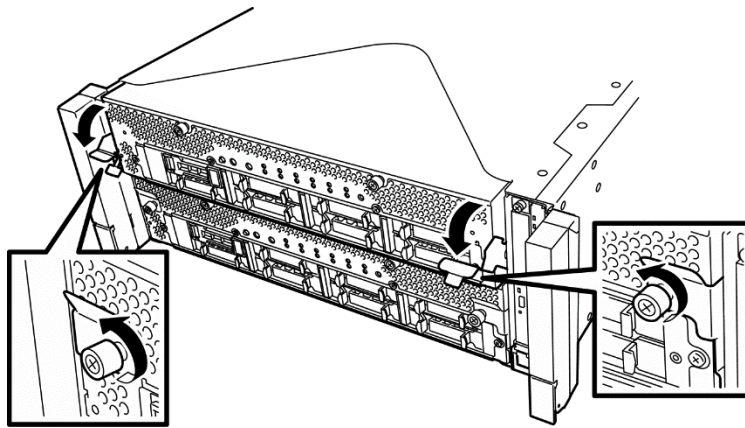
Check whether the stopper goes down after disconnecting the power cord. If you disconnect the cable and the stopper does not go down, you cannot pull out the CPU/IO module in the next step.

In case the stopper does not go down, insert CPU/IO module deeply once again.

- Loosen the screws of black levers placed on the left and right sides of the front of the CPU/IO module to press down the lever.

Important Before you pull out a CPU/IO module, check the rear of the server to make sure cables are disconnected from peripheral devices or network. If any cables are connected, keep a record of where the cables are connected and disconnect all cables from the module you are to pull out.

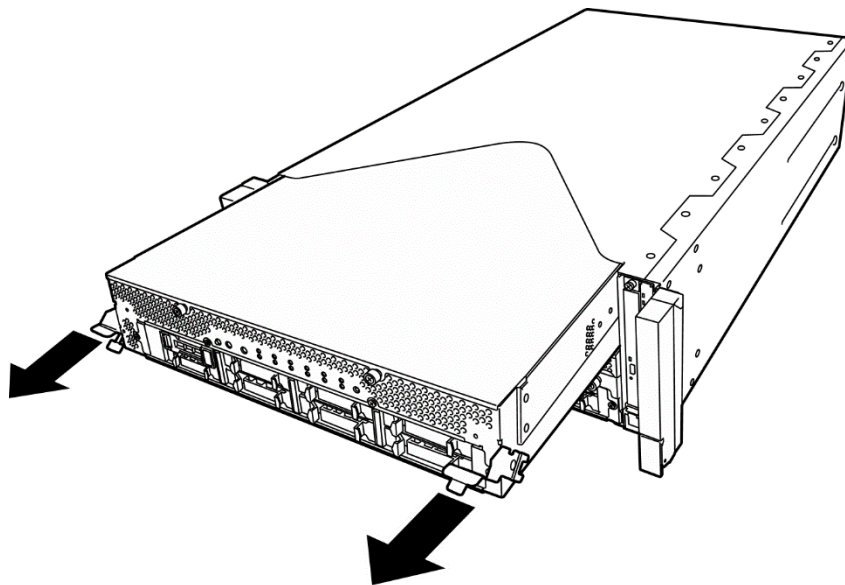
Tips If you cannot disconnect the LAN cable easily, disconnect it while pressing the latch with a slotted screwdriver.



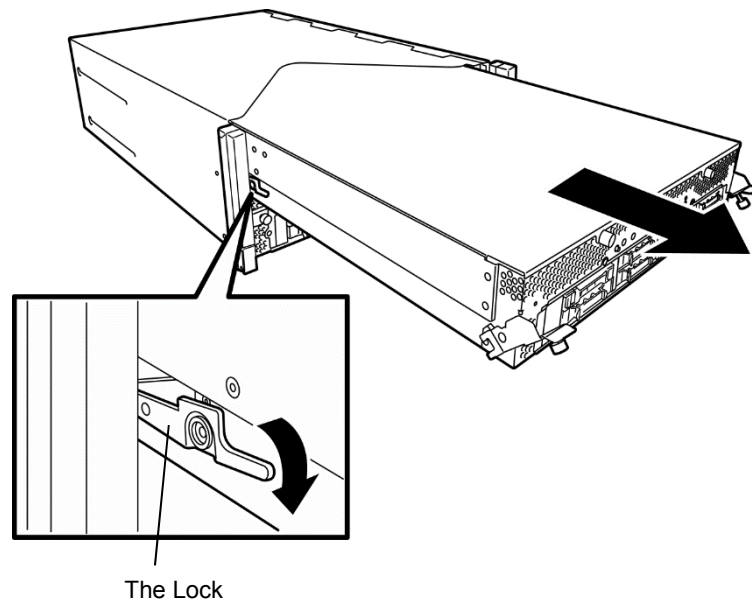
- Hold the black levers of the CPU/IO module and pull it off. Pull it off until it is locked and stopped.

Important

- Do not hold part other than the handle to pull the module.
- Handle the CPU/IO module carefully. Do not drop the module or bump it against parts in the device when you remove it.



6. Lower the lock on the side of CPU/IO module to unlock it, and then pull it out.



7. Pull out the CPU/IO module gently and carefully, and place it on a flat and sturdy table. Avoid the dusty or humid place.

This allows you to access the devices in the CPU/IO module. For more information on how to handle these devices, see the associated sections.

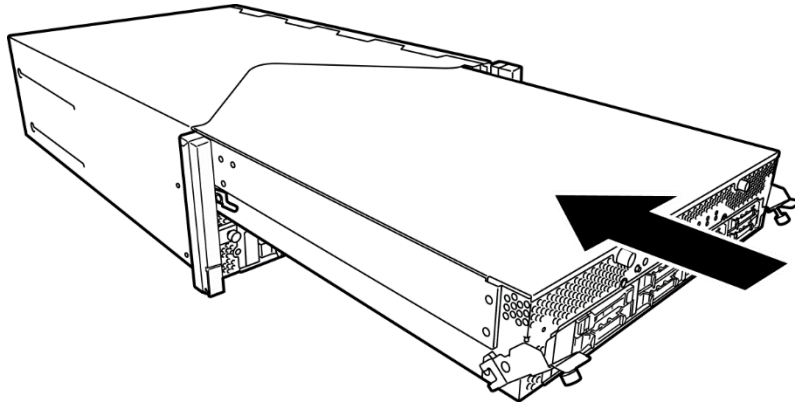
5.4.2 Installing CPU/IO Module

Follow the steps below to install the CPU/IO module:

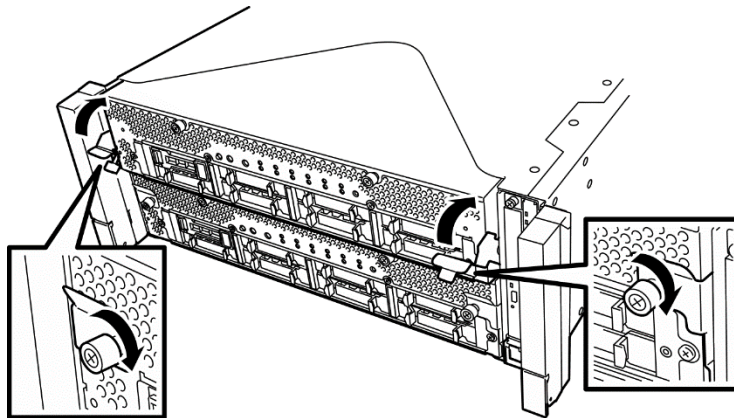
Important

- See *Chapter 2 (5.1.3 Precautions for installing/removing or replacing optional devices)* and *Chapter 1(1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices* before starting installing or removing options.
- Insert the black lever slowly and fasten the screws tightly. Be careful not to cause a shock to the device at this time.

1. Firmly hold the CPU/IO module with both hands and insert the module into the rack. Engage the guides of the module and chassis, and then insert the module slowly.



2. Push up the black levers on the CPU/IO module, and fasten them with screws.



Important

- Secure the lever with the screws. If it is not secured by the screws, the operation of the CPU/IO module will be unstable.
- In some system statuses or settings, auto start up or integration does not take place when the module is connected. In such a case, check the status by using the `ftsmaint` command, and then start up the CPU/IO modules.

3. Connect the cables for peripherals and network.
4. While holding the stopper, insert the power codes of the installed CPU/IO module.
5. The installed CPU/IO module will be automatically started.

5.5 DIMM

Dual inline memory module (DIMM) is installed or removed to the DIMM slot of the CPU/IO module.

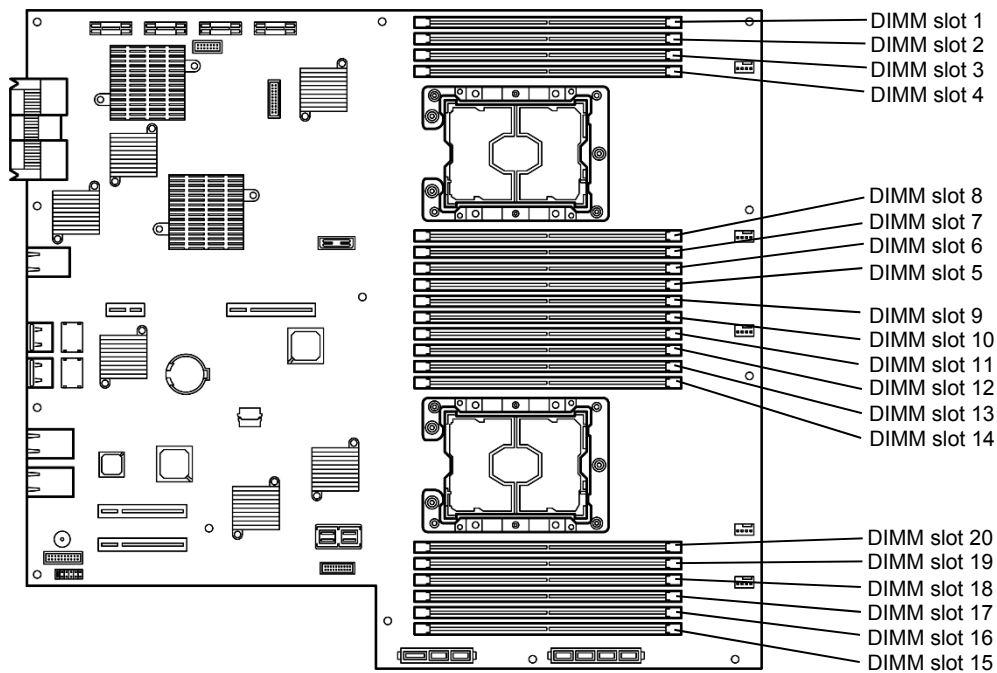
The CPU/IO board of a CPU/IO module has 20 slots for DIMM.

Tips

- Maximum memory capacity depends on server model as follows:
2CPU: Up to 640GB (32GB x 20)
1CPU: Up to 256GB (32GB x 8)
- In the error messages and logs in POST, NEC ESMPRO, or Off-line Maintenance Utility, the DIMM slot may be described as "group". The number next to "group" corresponds to the slot number shown in the figure on the next page.

Important

- **Make sure to use the DIMM authorized by NEC. Installing a third-party DIMM may cause a failure of the DIMM as well as the server. Repair of the server due to failures or damage resulted from installing such a board will be charged.**
- **Before adding or removing DIMMs, power off the server and detach the CPU/IO module.**
- **See Chapter 2 (5.1.3 Precautions for installing/removing or replacing optional devices) and Chapter 1(1.8 Anti-static Measures) in Safety Precautions and Regulatory Notices before starting installing or removing options.**



DIMM slots in the CPU/IO module

Precautions

Note the following to install, remove, or replace DIMM.

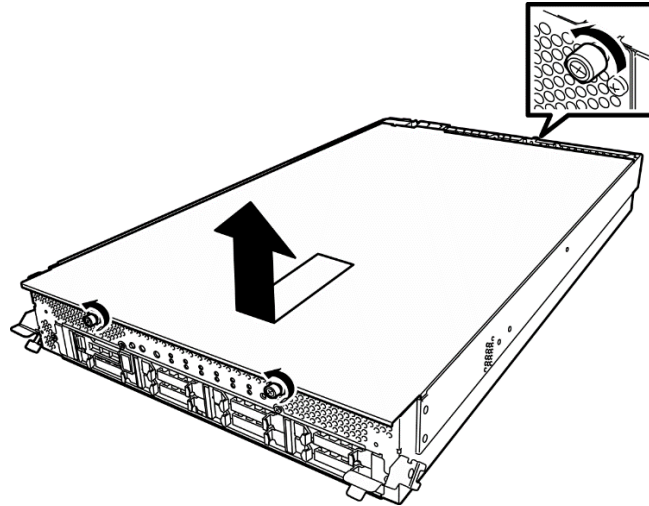
- DIMM 9 through 20 are available only when the CPU2 is installed.
- To install DIMM, install the product of the same model number to the same slots of the CPU/IO modules 0 and 1.
- See the following table to install additional DIMM (16GB, 32GB).

Available DIMM capacity		Slot for installing DIMM																				
No. of CPUs	Capacity (GB)	1	2	3	4	8	7	6	5	9	10	11	12	13	14	20	19	18	17	16	15	
1	16	16																				
	32	16							16													
	48	16		16					16													
	64	16		16				16	16													
	96	16	16	16				16	16	16												
	128	16	16	16	16	16	16	16	16													
	128	32		32				32	32													
	256	32	32	32	32	32	32	32	32													
2	16	16																				
	32	16								16												
	48	16							16	16												
	64	16							16	16												16
	96	16		16					16	16	16											16
	128	16		16				16	16	16	16								16			16
	192	16	16	16				16	16	16	16		16				16	16				16
	256	16	16	16	16	16	16	16	16	16	16	16		16			16		16	16		16
	256	32		32				32	32	32	32		32							32		32
	320	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	512	32	32	32	32	32	32	32	32	32	32	32		32				32		32	32	32
640	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	

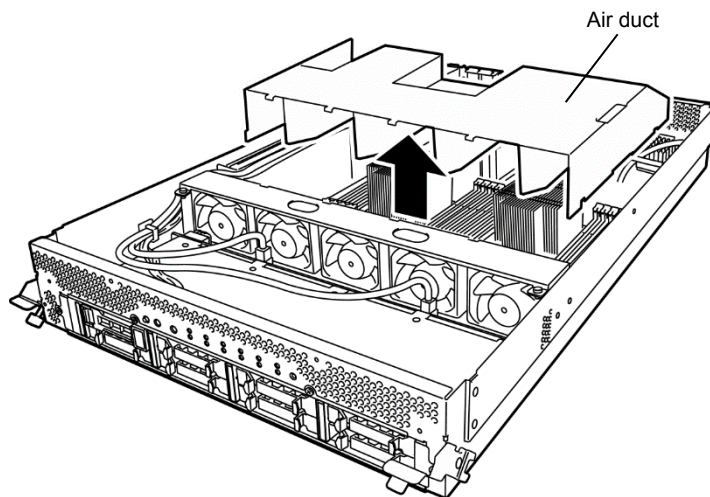
5.5.1 Installing DIMM

Follow the steps below to install the DIMM.

1. Shut down OS.
The server turns off automatically.
2. Disconnect the power cords from the outlets.
3. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
4. Remove three screws (two on the front and one on the rear), and remove the top cover of the CPU/IO module.

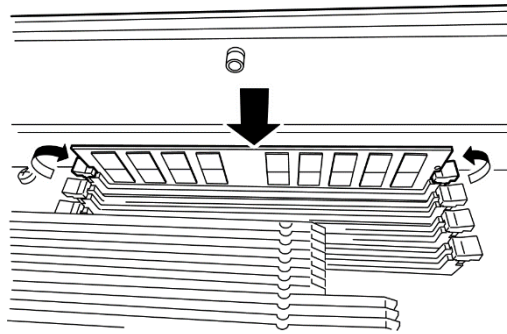


5. Remove the air duct.



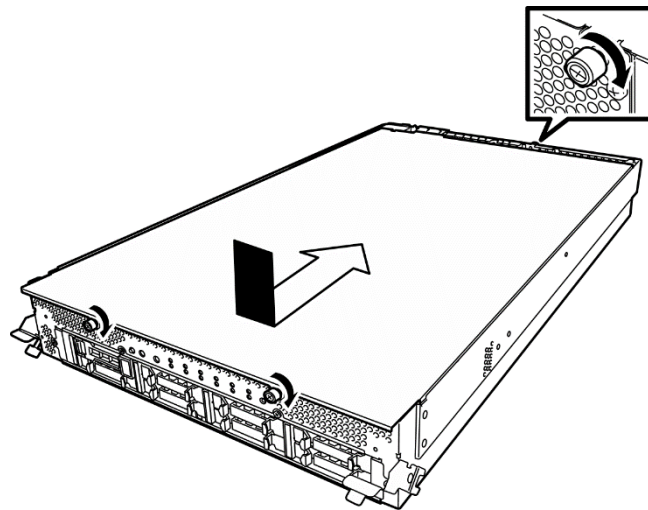
6. Insert a DIMM into the DIMM slot vertically.

After the DIMM is completely inserted into the slot, the levers are automatically closed.

**Note**

Pay attention to the direction of the DIMM.
The terminal of the DIMM has a notch to prevent incorrect insertion.

7. Install the air duct.
8. Place the top cover of the CPU/IO module and secure it with three screws.



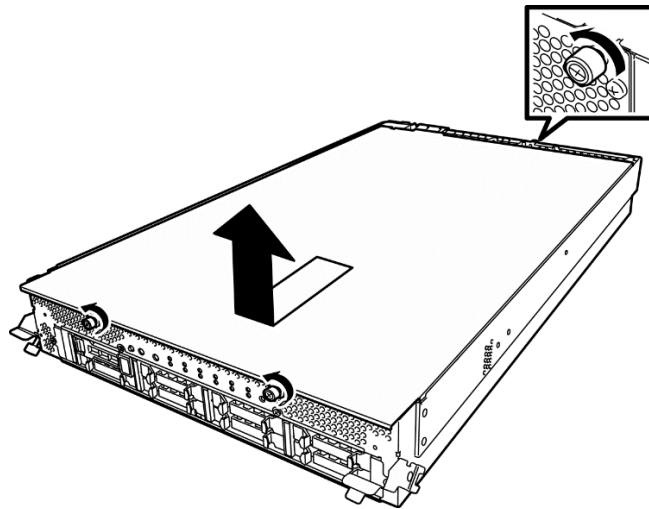
9. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
10. Connect the power cords.
11. Press the POWER switch to power on the server.
12. Verify that POST displays no error message.
If POST displays an error message, write it down and see the POST error message list in *Chapter 1 (6.2 POST Error Message)*.

5.5.2 Removing DIMM

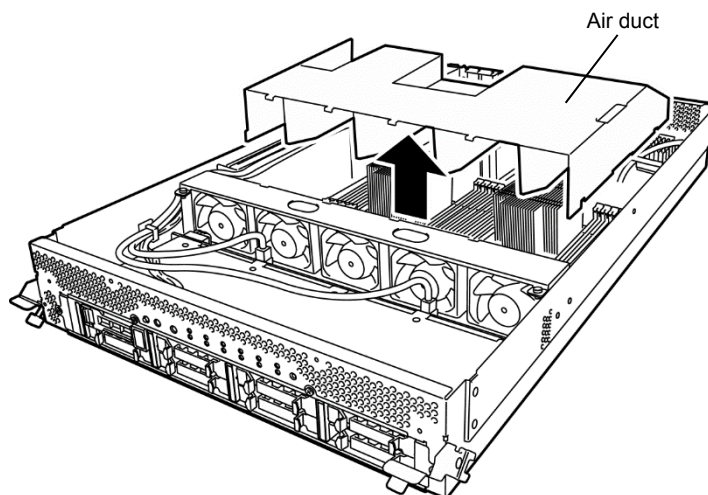
Follow the steps below to remove the DIMM.

Important At least one DIMM is required to operate the server.

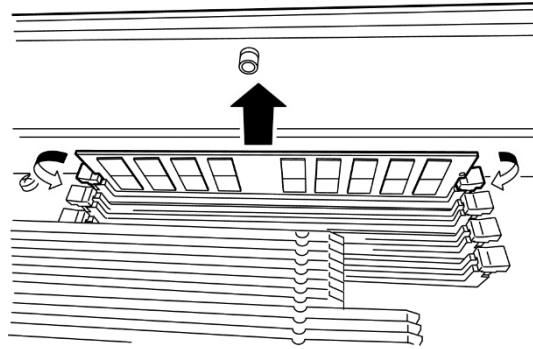
1. Shutdown OS.
The server turns off automatically.
2. Disconnect the power cords from the outlets.
3. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
4. Remove three screws (two on the front and one on the rear), and remove the top cover of the CPU/IO module.



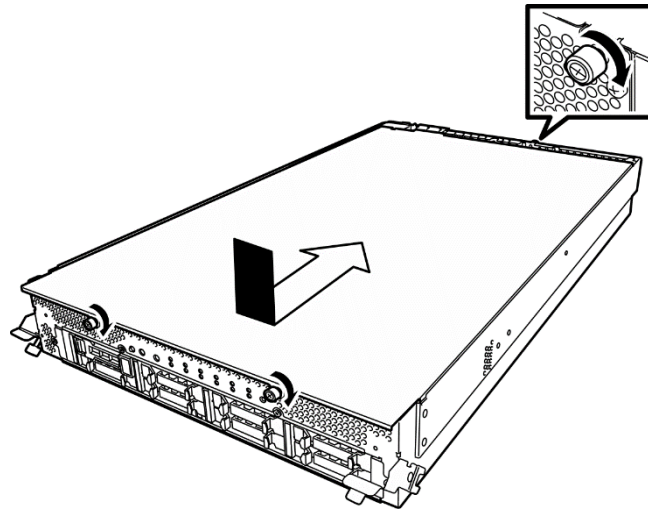
5. Remove the air duct.



6. Press the levers on both sides of the DIMM slot to release the lock, and remove the DIMM.



7. Install the air duct.
8. Place the top cover of the CPU/IO module and secure it with three screws.



9. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
10. Connect the power cords.
11. Press the POWER switch to power on the server.
12. Verify that POST displays no error message.
If POST displays an error message, write it down and see the POST error message list in *Chapter 1 (6.2 POST Error Message)*.

5.5.3 Replacing DIMM

Follow the steps below to replace a failed DIMM.

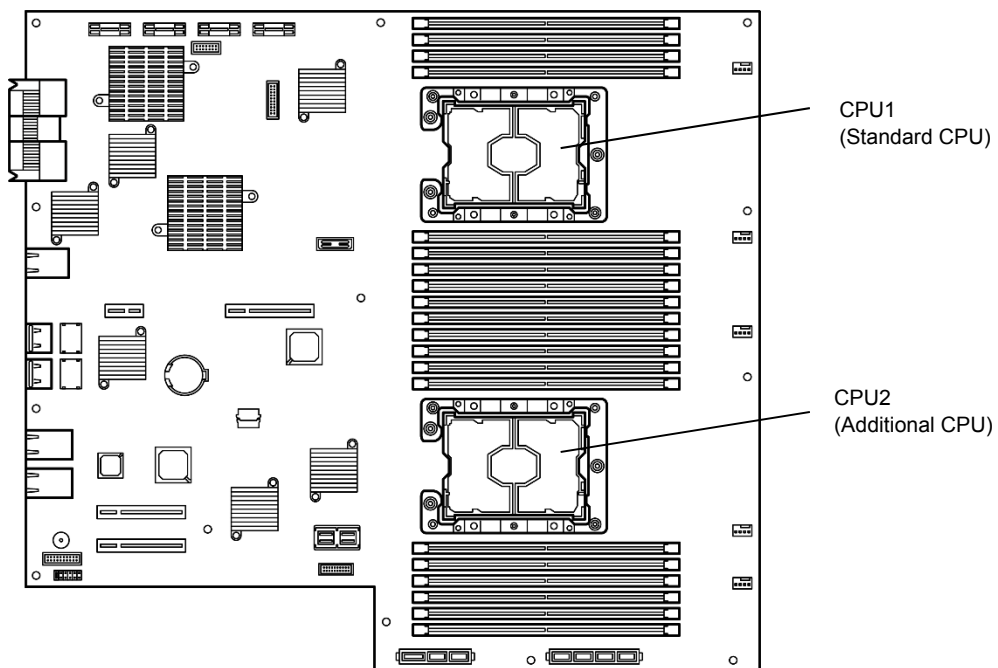
1. Refer to *Chapter 1 (6.1 Error Indication by LED)* to check the faulty DIMM when the memory slot error LED lights up.
2. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
3. Remove the top cover and the air duct according to *Chapter 2 (5.5.1 Installing DIMM)*.
4. Replace the DIMM.
5. Install the air duct and top cover of the CPU/IO module.
6. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
7. Start up the CPU/IO module using the `ftsmaint` command.

5.6 CPU (Processor)

In addition to the Intel Xeon Processor one more CPU can be expanded to each of the CPU/IO modules for operation.

Important

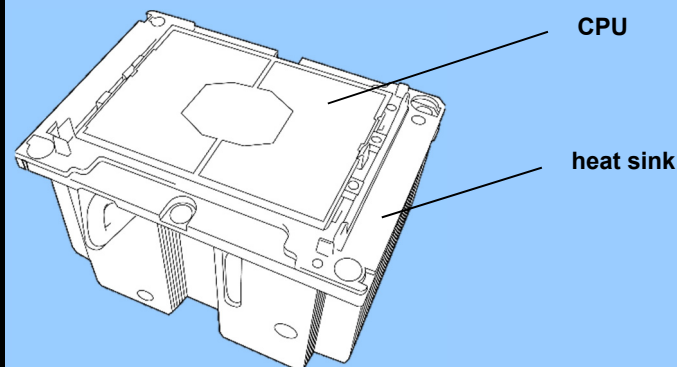
- Make sure to use the CPU specified by NEC. Installing a third-party CPU may cause a failure of the CPU as well as the server. Repairing the server due to failures or damage resulting from these products will be charged even if it is under guarantee.
- Before adding or removing a CPU, power off the server and then remove the CPU/IO module.
- See Chapter 2 (5.1.3 Precautions for installing/removing or replacing optional devices) and Chapter 1(1.8 Anti-static Measures) in Safety Precautions and Regulatory Notices before starting installing or removing options.



CPU slots in the CPU/IO module

Important

CPU has been installed to the heat sink. When installing/removing or replacing, take extra care so that CPU is not removed from the heat sink.

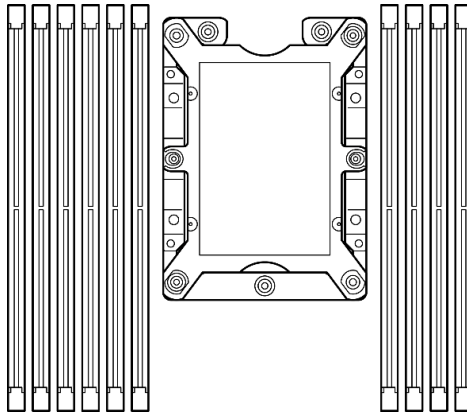


5.6.1 Installing CPU

Follow the steps below to install a CPU and heat sink.

1. Shut down the OS.
The server turns off automatically.
2. Disconnect the power cords from the outlets.
3. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
4. Remove the air duct according to *Chapter 2 (5.5.1 Installing DIMM)*.
5. Locate the CPU socket.
6. Remove the protective cover from the CPU socket.

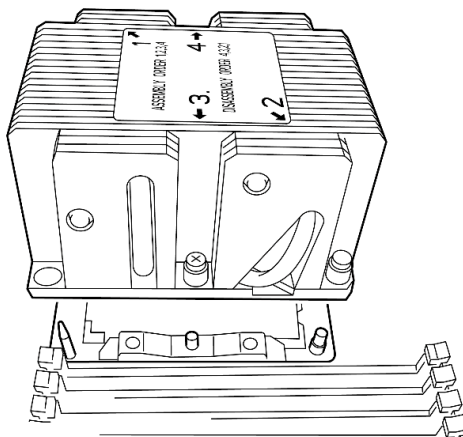
Important Keep and store the removed protective cover for future use.



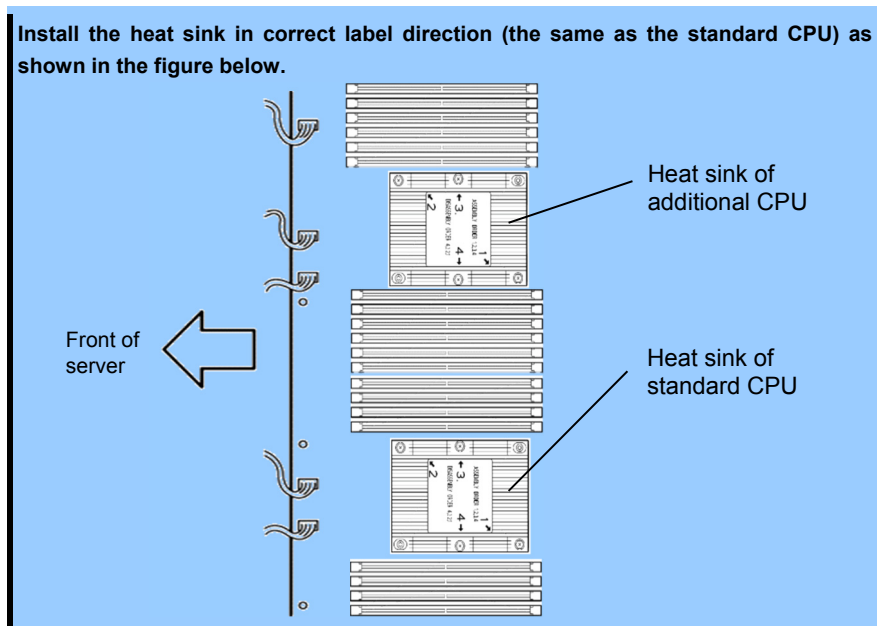
7. Put the heat sink with CPU on the socket gently and carefully.

Important Pay attention not to touch the bottom of the CPU (pin section).

Note Bring down the CPU straight without tilting or sliding it in the socket.

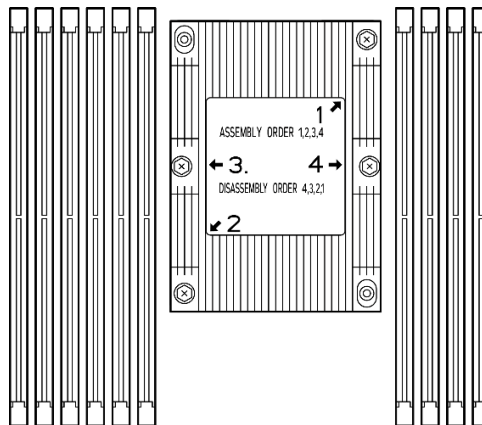


Important Install the heat sink in correct label direction (the same as the standard CPU) as shown in the figure below.



8. Tighten the four screws of heat sink.

Important Tighten the screws as shown below. (Assembly order 1, 2, 3, 4)

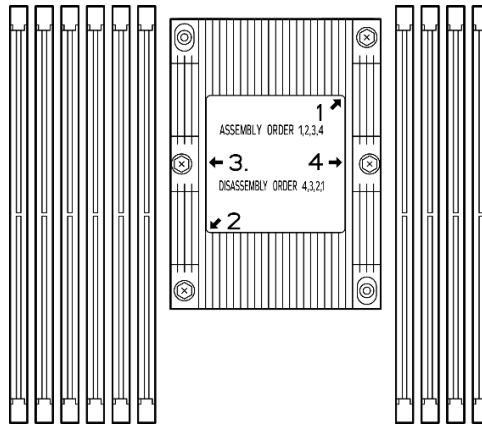


9. Install the air duct and top cover of the CPU/IO module.
10. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
11. Connect the power cords.
12. Press the POWER switch to power on the server.
13. Confirm that POST displays no error message.
If POST displays an error message, write it down and see the POST error message list in *Chapter 1 (6.2 POST Error Messages)*.

5.6.2 Removing CPU

Remove the heat sink and CPU in the reverse procedure of installation.

Important Loosen the screws as shown below. (Disassembly order 4, 3, 2, 1)



5.6.3 Replacing CPU

Follow the steps below to replace the failed CPU.

1. Identify the failed CPU by viewing Event Log.
2. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
3. Install a new heat sink and CPU.
4. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
5. Start the CPU/IO module from the `ftsmaint` command.

5.7 PCI Card

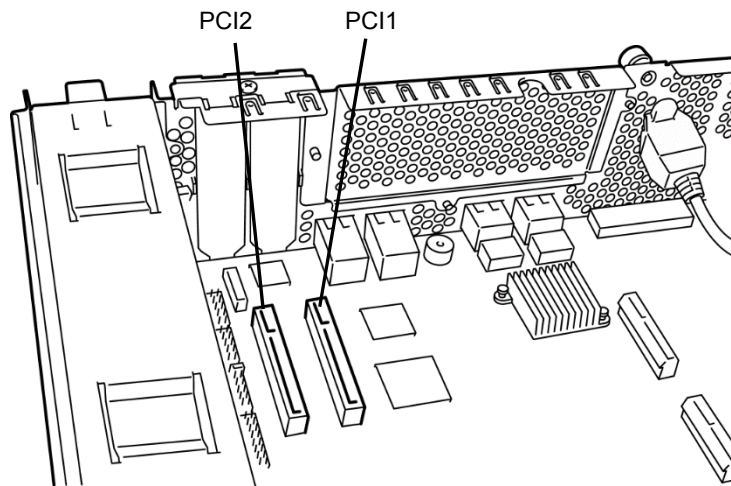
Either two or four PCI cards can be installed to the CPU/IO module.

Important See *Chapter 2 (5.1.3 Precautions for installing/removing or replacing optional devices)* and *Chapter 1(1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices* before starting installing or removing options.

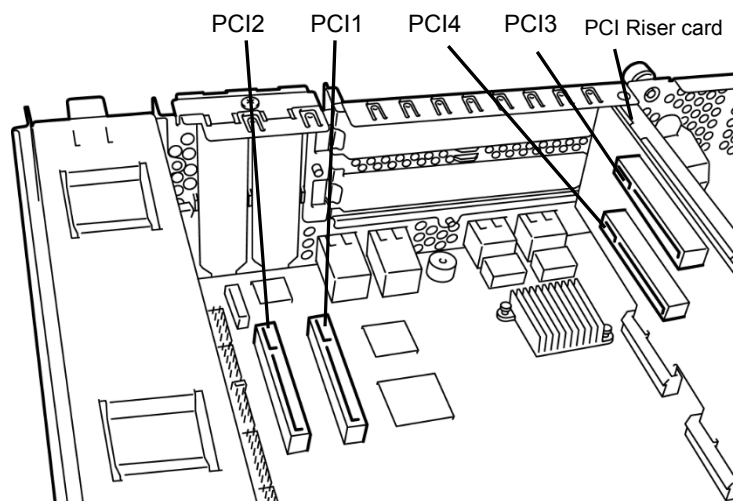
5.7.1 Precautions

Note the following to install/remove or replace PCI card.

- To make duplex PCI cards, install the same type of card (the same specifications and performance) to the same slot of each CPU/IO module.
- When a PCI card is installed to one CPU/IO module, another identical PCI card must be installed to the same slot in another CPU/IO module. This rule is applied to the case of removing/replacing.



R320g-E4 model (without PCI riser card)



R320g-M4 model (with PCI riser card)

Optional PCI cards and installable slots (R320g-E4 model)

Model number	Product name	PCI-1		PCI-2		Remarks
		PCI slot performance		PCIe 3.0 x8 lane		
		Slot size		Low Profile		
		PCI card type		x8 socket		
N8804-012	1000BASE-T 2ch Adapter Kit	✓	✓	✓	✓	*1,*3
N8804-013	10GBASE-T 2ch Adapter Kit	✓	✓	✓	✓	*1, *2,*3
N8803-040AF	Fibre Channel 1ch Adapter Kit	✓	✓	✓	✓	*1

*1: The same card must be mounted into the same slot for each CPU/IO module 0, 1.

*2: Up to one card can be installed for each CPU/IO module.

*3: N8804-012 and N8804-013 can't be loaded at the same time in system.

Optional PCI cards and installable slots (R320g-M4 model)

Model number	Product name	PCI-1		PCI-2		PCI-3		PCI-4		Remarks
		PCI slot performance		PCIe 3.0 x8 lane		PCIe 3.0 x8 lane				
		Slot size		Low Profile		Full Height				
		PCI card type		x8 socket						
N8804-012	1000BASE-T 2ch Adapter Kit	-	-	-	-	-	-	-	-	*1, *3
N8804-013	10GBASE-T 2ch Adapter Kit	-	-	✓	✓	✓	✓	✓	✓	*1,*2, *3
N8803-040AF	Fibre Channel 1ch Adapter Kit	-	-	✓	✓	✓	✓	✓	✓	*1, *3

*1: The same card must be mounted into the same slot for each CPU/IO module 0, 1.

*2: Up to one card can be installed for each CPU/IO module.

*3: Priority of installation to PCI-3, PCI-4 is N8803-040AF>N8804-013>N8804-012.

See *System Configuration Guide* for the latest information on support.

5.7.2 Installing PCI Card

Follow the steps below to install the PCI card.

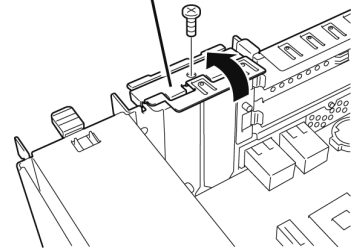
Note

To install the PCI card, make sure the shape of the card connector matches with the shape of the PCI card slot connector.

(1) Installing a low profile PCI card

1. Shut down the OS.
The server turns off automatically.
2. Disconnect the power cords from the outlets.
3. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
4. Remove one screw that secures the PCI retention latch, and then open the latch.

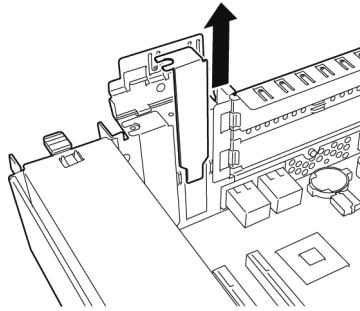
PCI retention latch



5. Remove the blank cover.

Important

Keep the removed blank cover for future use.

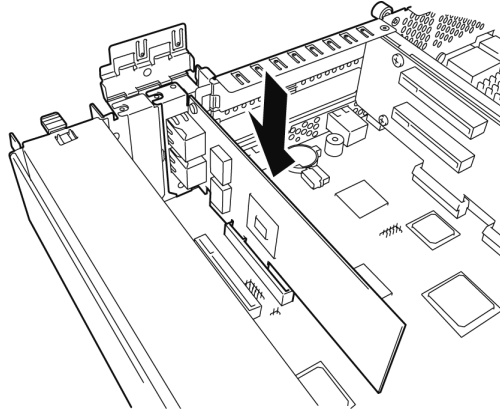


6. Install a PCI card in a PCI slot.

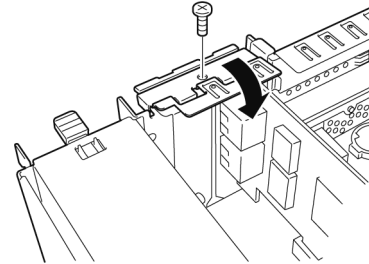
Important

When installing Fibre channel card on the server, the SFP+ module mounted on the Fibre channel card may interfere with the installation.

In this case, remove the SFP+ module from the Fibre channel card in advance, install the Fibre channel card and then mount the SFP+ module.



7. Close the latch, and then secure it with one screw.

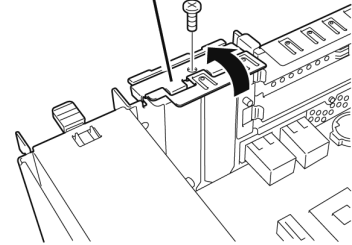


8. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
9. Connect the power cords.
10. Press the POWER switch to power on the server.
11. Confirm that POST displays no error message.
If POST displays an error message, write it down and see the POST error message list in *Chapter 1 (6.2 (1) Error Messages)*.
12. After the OS has started, proceed to steps in *Chapter 2 (5.7.5 Setup of Optional PCI Card)*.

(2) Installing a full height PCI card

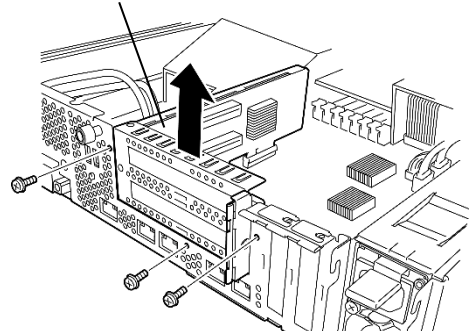
1. Shut down the OS.
The server turns off automatically.
2. Disconnect the power cords from the outlets.
3. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
4. Remove one screw that secures the PCI retention latch, and then open the latch.

PCI retention latch

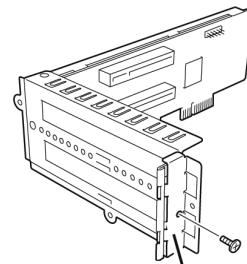


5. Remove three screws that secure the PCI riser card, and remove the PCI riser card from the motherboard.

PCI riser card



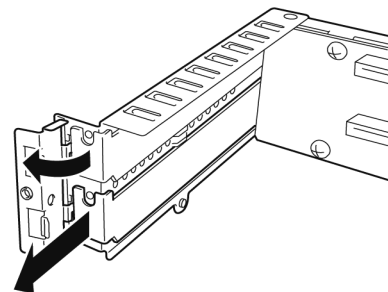
6. Remove one screw that secures the PCI retention latch of PCI riser card, and then open the latch.



PCI retention latch

7. Remove the blank cover.

Important Keep the removed blank cover for future use.

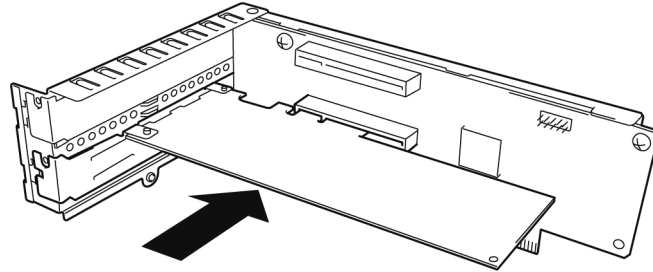


8. Install a PCI card in a PCI slot of PCI riser card.

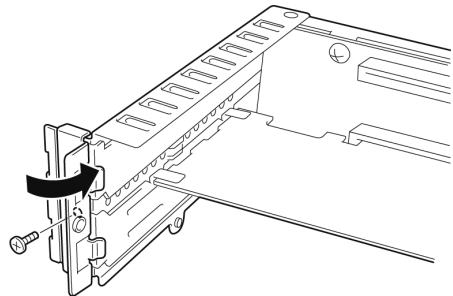
Important

When installing Fibre channel card on the server, the SFP+ module mounted on the Fibre channel card may interfere with the installation.

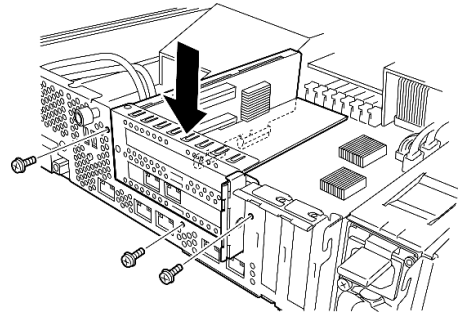
In this case, remove the SFP+ module from the Fibre channel card in advance, install the Fibre channel card and then mount the SFP+ module.



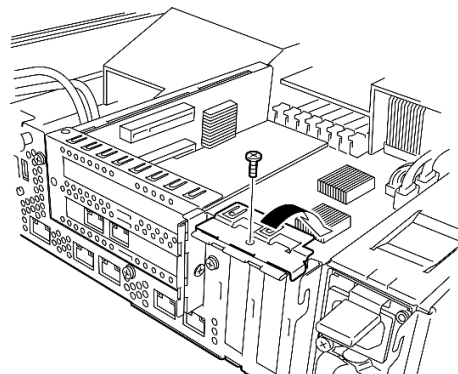
9. Close the latch and secure it with one screw.



10. Install PCI riser card on the motherboard and secure it with three screws.



11. Close the latch and secure it with one screw.



12. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.

13. Connect the power cords.

14. Press the POWER switch to power on the server.

15. Confirm that POST displays no error message.

If POST displays an error message, write it down and see the POST error message list in *Chapter 1 (6.2 (1) Error Message)*.

16. After the OS has started, proceed to steps in *Chapter 2 (5.7.5 Setup of Optional PCI Card)*.

5.7.3 Removing PCI Card

To remove PCI card, follow the reverse procedure of the installation, and then install the blank cover.

5.7.4 Replacing PCI Card

Follow the steps below to replace the failed PCI card.

(1) N8804-012 1000BASE-T 2ch Adapter Kit and N8804-013 10GBASE-T 2ch Adapter Kit

1. Identify the failed card by `ftsmaint` command.
2. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
3. Remove the PCI card.
4. Replace the card and secure it.
5. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
6. Connect the network cable and cables for option devices.
7. The installed CPU/IO module will start automatically
8. Confirm that the PCI card is correctly recognized by POST and OS.

(2) N8803-040AF Fibre Channel 1ch Adapter Kit

1. Identify the failed card by `ftsmaint` command.
2. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
3. Configure WWPN of Fibre Channel card to be installed (setting/confirming access control) by using control software such as NEC Storage Manager.
4. Remove the PCI card.
5. Replace the card and secure it.
6. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
7. Connect the network cable and cables for optional devices.
The installed CPU/IO module will start automatically.
8. Confirm that the PCI card is correctly recognized by POST and OS.

5.7.5 Setup of Optional PCI Card

Important To enable the fault-tolerant feature of the optional device, the identical PCI cards must be installed to the slots with the same number in CPU/IO module 0 and CPU/IO module 1.
For the supported connecting devices, contact your sales agent.

(1) N8804-012 1000BASE-T 2ch Adapter Kit and N8804-013 10GBASE-T 2ch Adapter Kit

Important For LAN cable's connector, use a RJ-45 connector which is compliant with IEC8877 standard. If any other connector is used, it may not be removed easily.

- Slots to install optional PCI cards
See "*List of option PCI cards and installable slots*" in Chapter 2 (5.7.1 Precautions).
- Driver installation procedure
Install N8804-012 1000BASE-T 2ch Adapter Kit or N8804-013 10GBASE-T 2ch Adapter Kit, and restart the server. After starting the server, the driver will be installed automatically.
- Configure duplex LAN
See Chapter 2 (3. Duplex LAN Configuration).
- Configure network

(2) N8803-040AF Fibre Channel 1ch Adapter Kit

- Slots to install optional PCI cards
See "*List of option PCI cards and installable slots*" in Chapter 2 (5.7.1 Precautions).
- Driver installation procedure
Install N8803-040AF Fibre Channel 1ch Adapter Kit and start the system. After starting the system, the driver will be installed automatically.

NEC Express5800 Series Express5800/R320g-E4, R320g-M4

3

Useful Features

This chapter describes useful features for using the server.

1. System BIOS

Describes how to set the System BIOS settings and parameters.

2. BMC Configuration

Describes the BMC Configuration Utility in Off-line Tool of the server.

3. SAS Configuration Utility

Describes the SAS Configuration Utility of the server.

4. Flash FDD

Describes the Flash FDD.

5. Details of EXPRESSBUILDER

Describes the EXPRESSBUILDER attached to the server.

6. EXPRESSSCOPE Engine 3

Describes EXPRESSSCOPE Engine 3.

7. NEC ESMPRO

Describes NEC ESMPRO Agent and NEC ESMPRO Manager, applications to manage and monitor the server.

1. System BIOS

You can check and change the parameters using the BIOS Setup utility (SETUP).

1.1 Starting SETUP

Turn on the server and proceed with POST.

After a while, the following message appears at the bottom left of the screen.

Press <F2> SETUP, ... (* this message depends on the hardware environment)



SETUP will start after POST when <F2> key is pressed.

1.2 Parameter Descriptions

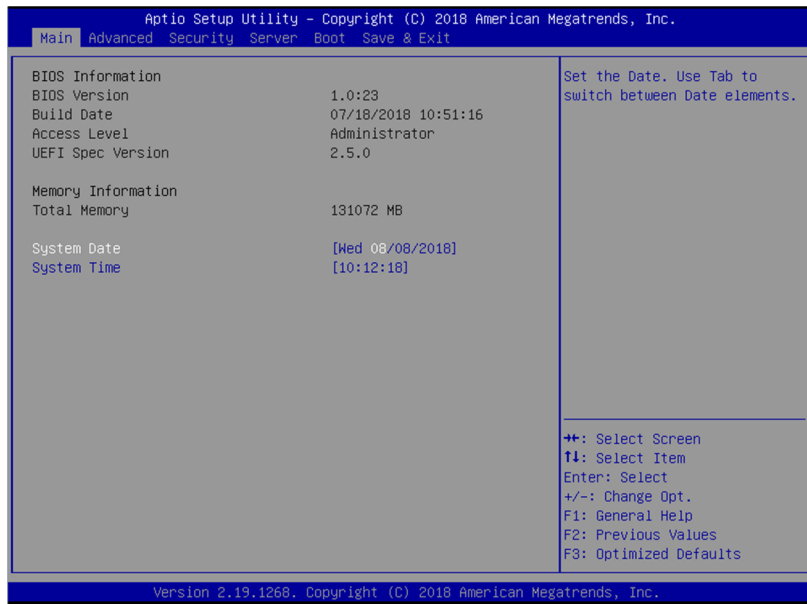
The SETUP utility has the following six major menus.

- Main
- Advanced
- Security
- Server
- Boot
- Save & Exit

These menus have submenus for relevant items. Selecting submenus allows you to configure further detailed parameters.

1.2.1 Main

The **Main** menu is displayed first when starting SETUP.



For details about the options, see the table below.

Option	Parameter	Descriptions
BIOS Information	–	–
BIOS Version	–	The BIOS version is displayed (display only).
Build Date	MM/DD/YYYY	The BIOS build date is displayed (display only).
Access Level	[Administrator] User	The current access level (Administrator or User) is displayed (display only). If no password is set, Administrator is displayed.
UEFI Spec Version	–	Shows the UEFI Spec version that BIOS supports.
Memory Information	–	–
Total Memory	–	The total capacity of installed memory is displayed (display only).
System Date	WWW MM/DD/YYYY	Set the system date.
System Time	HH:MM:SS	Set the system time

[]: Factory settings

Tips

Be sure to confirm that the date and time in the BIOS parameters are correctly configured.

Check the system clock monthly. Additionally, if you implement the server in a system that requires highly accurate time, use of a time server (an NTP server) is recommended.

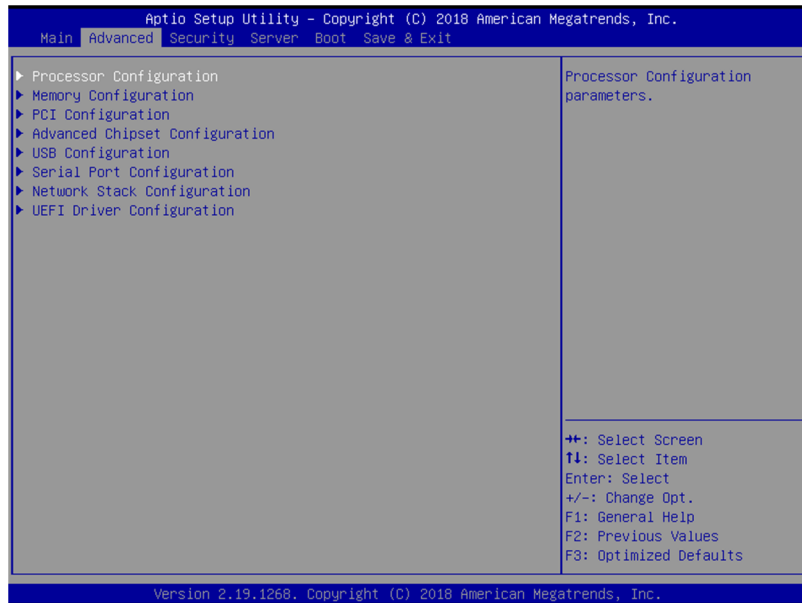
If the system time becomes considerably slow or fast over time even though you regularly adjust it, contact the dealer where you purchased the server or the maintenance service company for maintenance.

1.2.2 Advanced

If you move the cursor to **Advanced**, the **Advanced** menu appears.

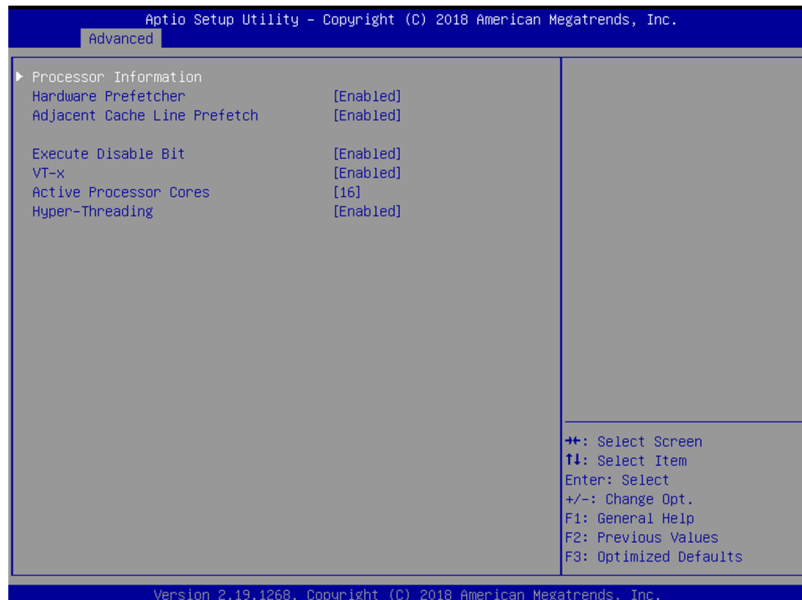
For the menus that show a “▶” to their left, select a menu and press the <Enter> key to display its submenu.

When Boot Mode is UEFI



(1) Processor Configuration submenu

From the **Advanced** menu, select **Processor Configuration** and then press the <Enter> key to display the menu screen shown below. For the menu that has ▶ on the left, move the cursor to it and then press the <Enter> key to show its submenus.

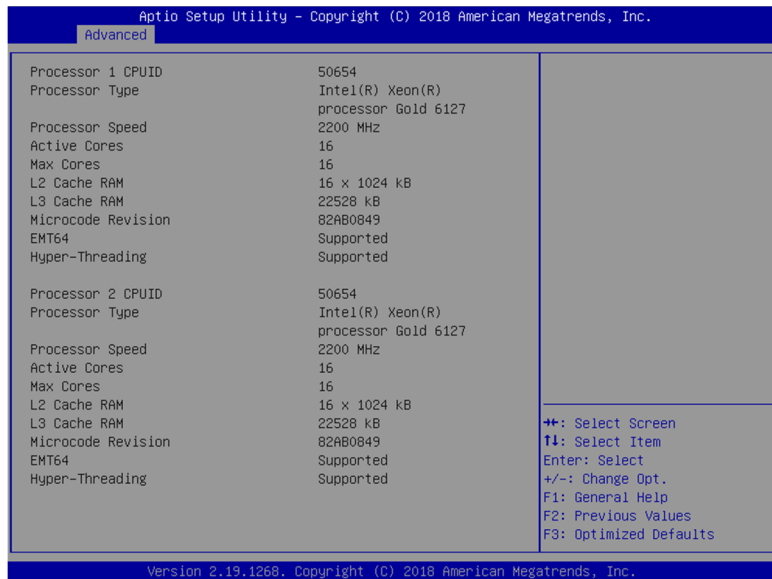


For details about the options, see the table below.

Option	Parameter	Descriptions
Processor Information	–	–
Hardware Prefetcher	Disabled [Enabled]	Enable or disable hardware prefetcher.
Adjacent Cache Line Prefetch	Disabled [Enabled]	Enable or disable optimized access from memory to cache.
Execute Disabled Bit	Disabled [Enabled]	Enable or disable Execute Disable Bit feature. This option is displayed only when the installed processor supports this feature.
VT-x	Disabled [Enabled]	Enable or disable Intel Virtualization Technology (feature to virtualize processor).
Active Processor Cores	1-[x]	Specify the number of cores to enable in each processor package. The number of cores that can be specified depends on the processor installed. X denotes the maximum number of cores. The setting can be changed only when 1 processor is mounted. Do not set up except for debugging.
Hyper-Threading	Disabled [Enabled]	Enable or disable the feature to execute two threads with only one core. This option is displayed only when the installed processor supports this feature.

[]: Factory settings

(a) Processor Information submenu



For details about the options, see the table below (display only).

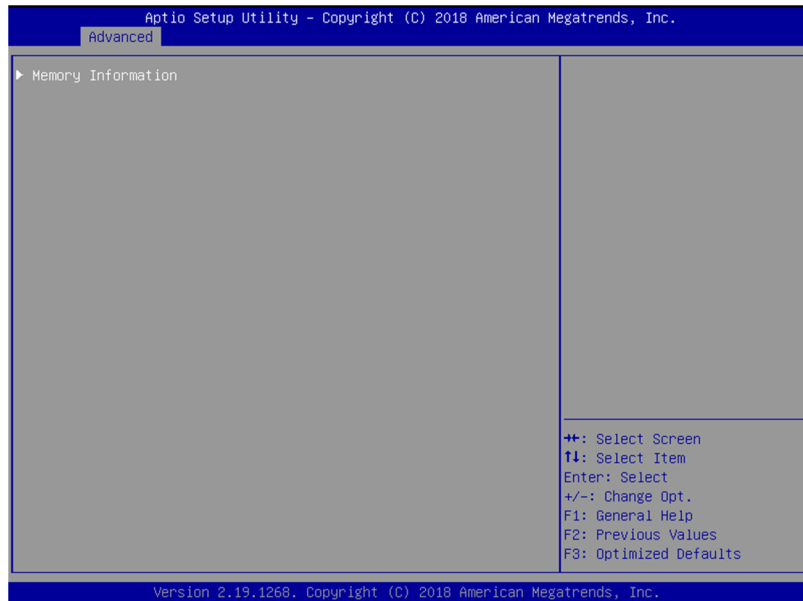
Option	Parameter	Descriptions
Processor 1 CPUID	Number	ID of Processor 1 is displayed by a numerical value.
Processor Type	–	Type of Processor 1 is displayed.
Processor Speed	–	Clock speed of Processor 1 is displayed.
Active Cores	–	The number of active cores in Processor 1 is displayed.

Option	Parameter	Descriptions
Max Cores	–	The maximum number of cores in Processor 1 is displayed.
L2 Cache RAM	–	The secondary cache size of Processor 1 is displayed.
L3 Cache RAM	–	The tertiary cache size of Processor 1 is displayed.
Microcode Revision	–	The revision of the microcode applied to Processor 1 is displayed.
EMT64	–	"Supported" is shown when the processor 1 supports Intel 64 architecture.
Hyper-Threading	–	"Supported" is shown when the processor 1 supports Hyper-Threading Technology.
Processor 2 CPUID	Number Not Installed	ID of Processor 2 is displayed by a numerical value. Not Installed indicates that no processor is installed in processor socket 2.
Processor Type	–	Type of Processor 2 is displayed.
Processor Speed	–	Clock speed of Processor 2 is displayed.
Active Cores	–	The number of active cores in Processor 2 is displayed.
Max Cores	–	The maximum number of cores in Processor 2 is displayed.
L2 Cache RAM	–	The secondary cache size of Processor 2 is displayed.
L3 Cache RAM	–	The tertiary cache size of Processor 2 is displayed.
Microcode Revision	–	The revision of the microcode applied to Processor 2 is displayed.
EMT64	–	"Supported" is shown when the processor 2 supports Intel 64 architecture.
Hyper-Threading	–	"Supported" is shown when the processor 2 supports Hyper-Threading Technology.

[]: Factory settings

(2) Memory Configuration submenu

From the **Advanced** menu, select **Memory Configuration** and then press the <Enter> key to display the menu screen shown below. For the menu that has ► on the left, move the cursor to it and then press the <Enter> key to show its submenus.

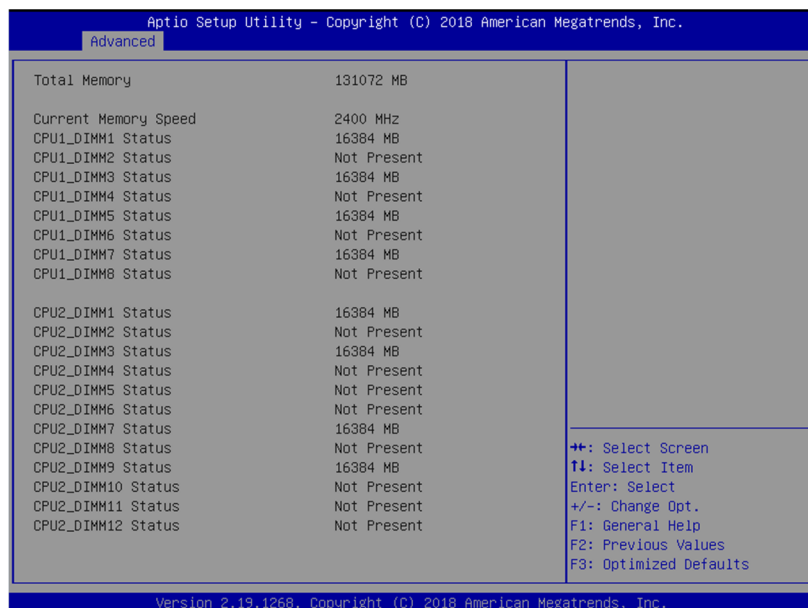


For details about the options, see the table below.

Option	Parameter	Descriptions
Memory Information	–	–

[]: Factory settings

(a) Memory Information submenu



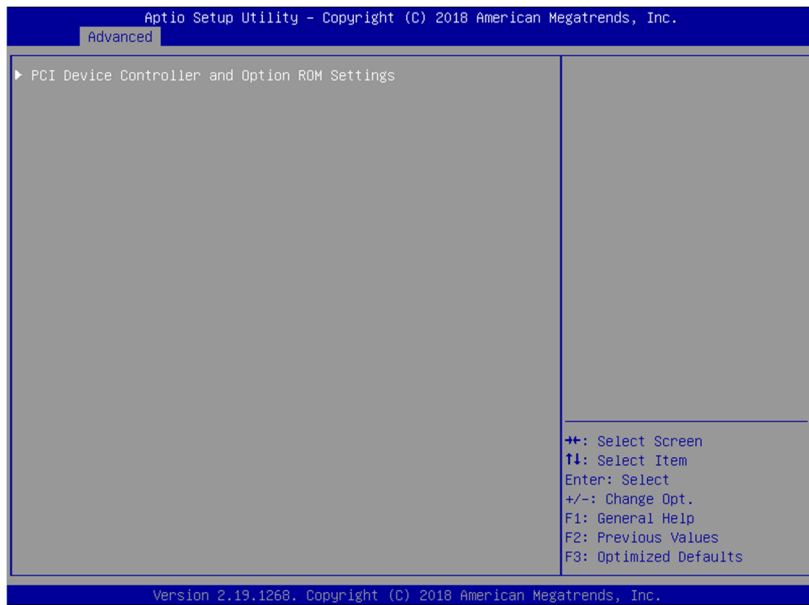
For details about the options, see the table below (display only).

Option	Parameter	Descriptions
Total Memory	–	The physical capacity of installed memory is displayed.
Current Memory Speed	–	Current running memory clock
CPU1_DIMM1-8 Status CPU2_DIMM1-12 Status	Number Not Present	Capacity and state of each DIMM is displayed. Number: indicates memory capacity and DIMM is working normally. Not Present: Indicates no DIMM is installed.

[]: Factory settings

(3) PCI Configuration submenu

From the **Advanced** menu, select **PCI Configuration** and then press the <Enter> key to display the menu screen as shown below.

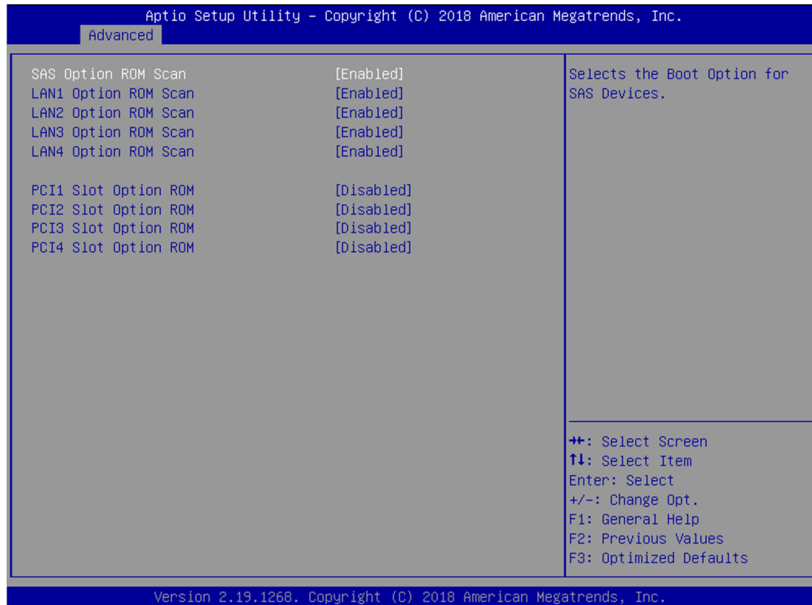


For details about the options, see the table below.

Option	Parameter	Descriptions
PCI Device Controller and Option ROM Settings	–	–

[]: Factory settings

(a) PCI Device Controller and Option ROM Settings submenu



For details about the options, see the table below.

Option	Parameter	Descriptions
SAS Option ROM Scan	Disabled [Enabled]	Enable or disable the option ROM SCAN for onboard SAS.
LANx Option ROM Scan	Disabled [Enabled]	Enable or disable the option ROM SCAN for onboard LAN. R320g-M4 x:1/2/3/4 R320g-E4 x:1/2
PCIx Slot Option ROM	[Disabled] Enabled	Enable or disable the option ROM on each PCI slot. R320g-M4 x:1/2/3/4 R320g-E4 x:1/2

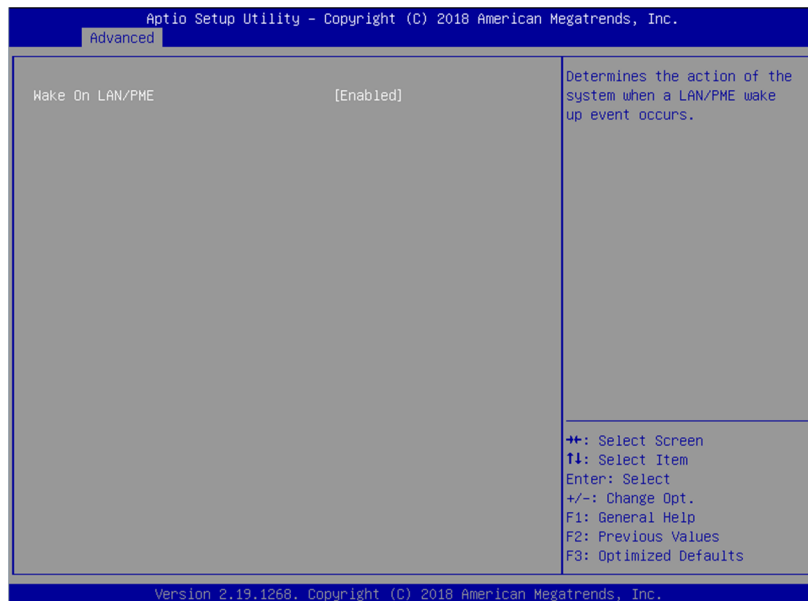
[]: Factory settings

Note

For LAN card (network boot) or Fibre Channel controller, if no Hard Disk Drive on which an OS is installed is connected, set the option ROM for that slot to **Disabled**.

(4) Advanced Chipset Configuration submenu

From the **Advanced** menu, select **Advanced Chipset Configuration** and then press the <Enter> key to display the menu screen as shown below.



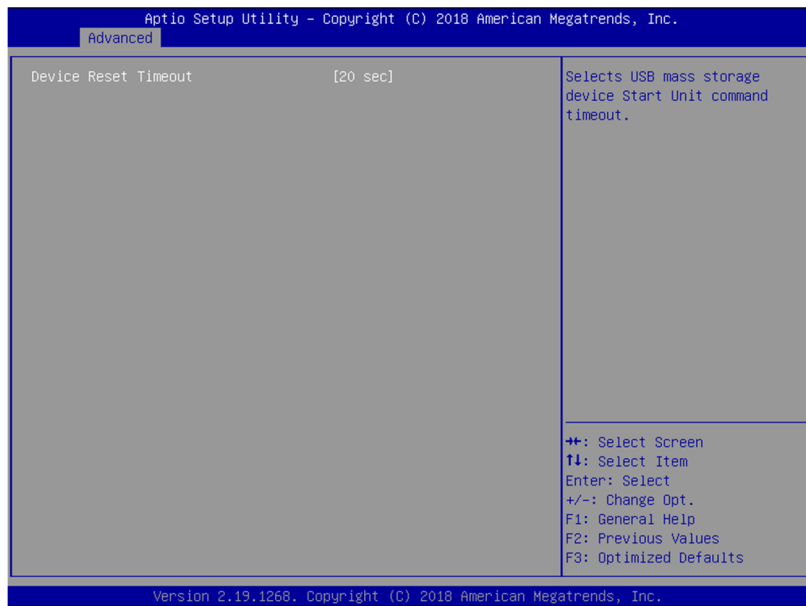
For details about the options, see the table below.

Option	Parameter	Descriptions
Wake On LAN/PME	Disabled [Enabled]	Enable or disable the feature that remotely powers on the server through a network.

[]: Factory settings

(5) USB Configuration submenu

From the **Advanced** menu, select **USB Configuration** and then press the <Enter> key to display the menu screen shown below.



For details about the options, see the table below.

Option	Parameter	Descriptions
Device Reset Timeout	10 sec [20 sec] 30 sec 40 sec	Specify the timeout period when Start Unit command is issued to USB Mass Storage Device.

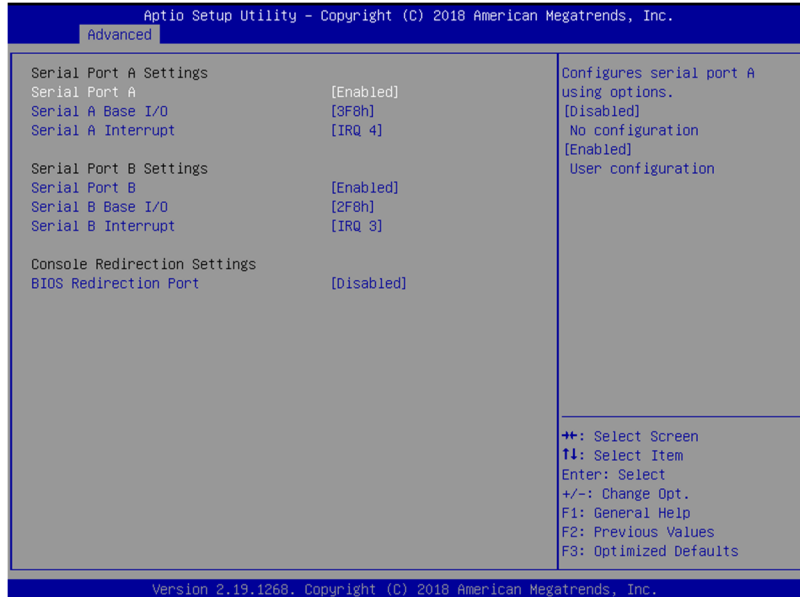
[]: Factory settings

(6) Serial Port Configuration submenu

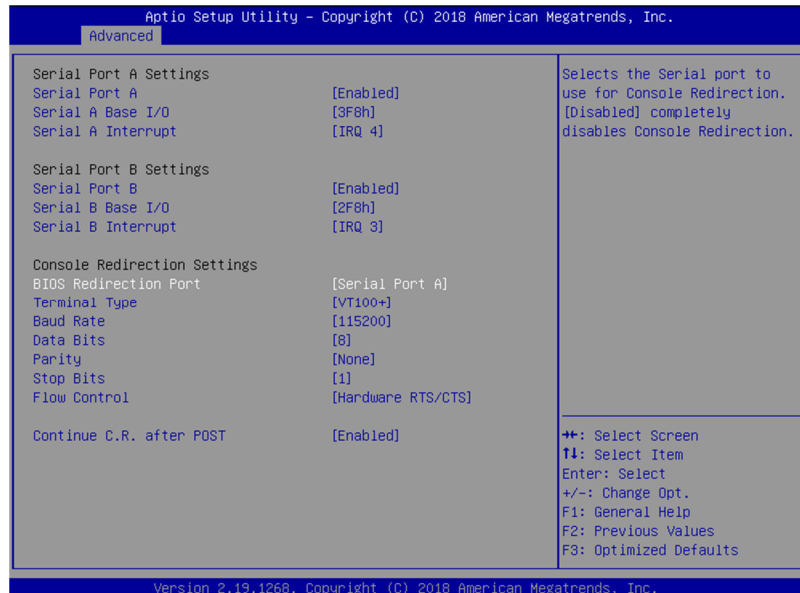
From the **Advanced** menu, select **Serial Port Configuration** and then press the <Enter> key to display the menu screen shown below.

Note

The serial port connectors are reserved for maintenance.
Don't change the settings of serial port.



From **BIOS Redirection Port**, select **Serial Port A** or **Serial Port B** and then press the <Enter> key to display the menu screen shown below.



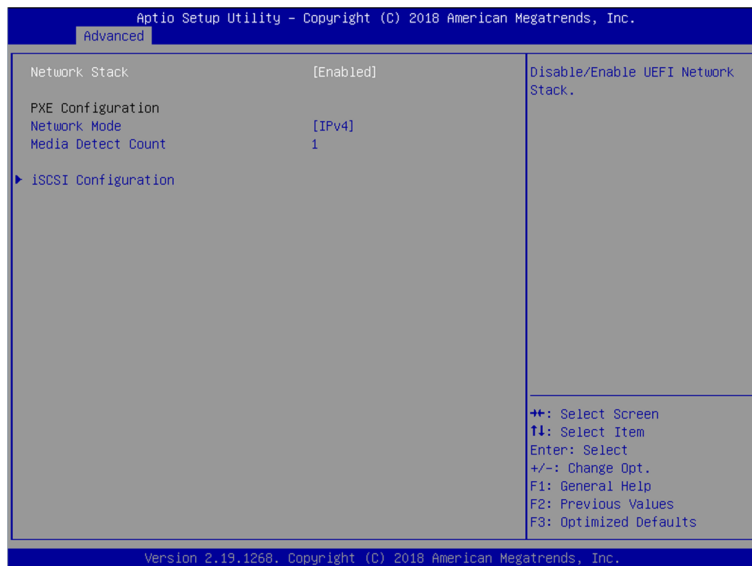
For details about the options, see the table below.

Option	Parameter	Descriptions
Serial Port A Settings	–	–
Serial Port A	Disabled [Enabled]	Enable or disable serial Port A.
Serial A Base I/O	[3F8h] 2F8h 3E8h 2E8h	Specify the base I/O address for serial port A.
Serial A Interrupt	IRQ 3 [IRQ 4]	Specify the interrupt for serial port A.
Serial Port B Settings	–	–
Serial Port B	Disabled [Enabled]	Enable or disable serial Port B.
Serial B Base I/O	3F8h [2F8h] 3E8h 2E8h	Specify the base I/O address for serial port B.
Serial B Interrupt	[IRQ 3] IRQ 4	Specify the interrupt for serial port B.
Console Redirection Settings	–	–
BIOS Redirection Port	[Disabled] Serial Port A Serial Port B	Enable or disable the console redirection feature for the specified serial port. Specifying Serial Port A or Serial Port B allows direct connection via terminal unit such as NEC ESMPRO Manager, and options for connection shown below are displayed.
Terminal Type	[VT100+] VT-UTF8 PC-ANSI	Select the terminal type.
Baud Rate	9600 19200 57600 [115200]	Specify baud rate.
Data Bits	7 [8]	Specify data bit width.
Parity	[None] Even Odd	Specify parity type.
Stop Bits	[1] 2	Specify stop bits.
Flow Control	None [Hardware RTS/CTS]	Specify the flow control method.
Continue C.R. after POST	Disabled [Enabled]	Select whether the console redirection is continued after completion of POST or not.

[]: Factory settings

(7) Network Stack Configuration submenu

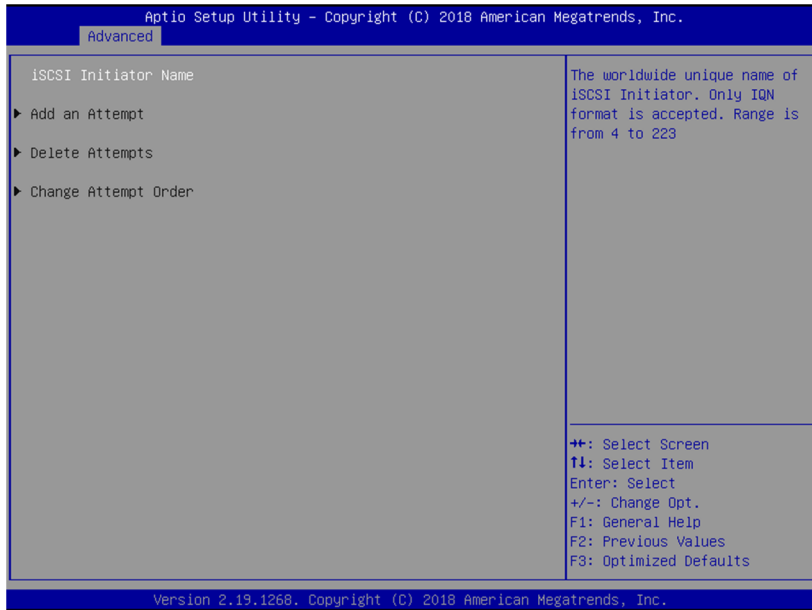
From the **Advanced** menu, select **Network Stack Configuration** and then press the <Enter> key to display the menu screen shown below.



Option	Parameter	Descriptions
Network Stack	Disabled [Enabled]	Specify enabled/disabled of the UEFI network stack. When enabling this function, the subsequent menu options appears.
PXE Configuration	—	—
Network Mode	Disabled [IPv4] IPv6	Specify the PXE network mode.
Media Detect Count	[1]-50	Specify the number of retries to detect media at the PXE connection.
iSCSI Configuration	—	—

[]: Factory settings

(a) iSCSI Configuration submenu



For details about the options, see the table below.

Option	Parameter	Descriptions
iSCSI Initiator Name	4 to 223 alphanumeric characters	Specify an initiator name of iSCSI. The initiator name must be iSCSI qualifier (IQN) format. When enabling this function, the subsequent menu options appear.
Add an Attempt	—	—
Attempt [XX]	—	—
Delete Attempts	—	—
Change Attempt Order	—	—

[]: Factory settings

i. Add an Attempt submenu

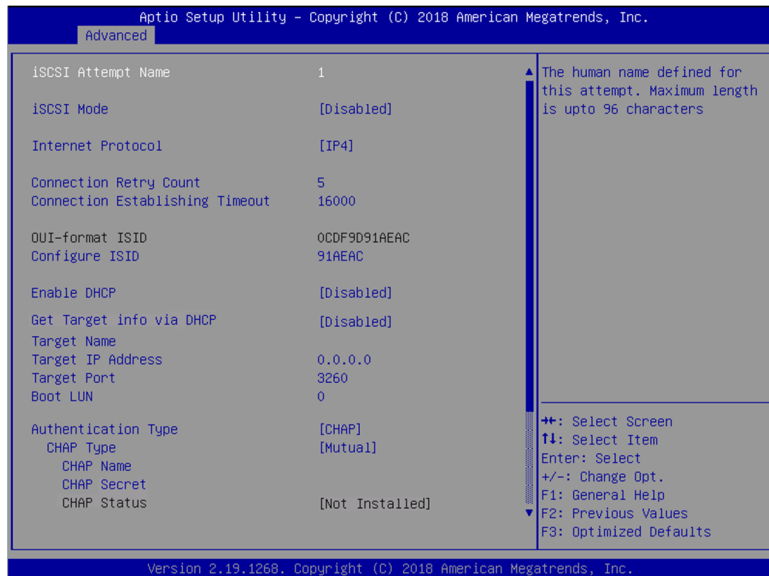


Note

When an on-board LAN controller or a UEFI driver of each PCI device is loaded, a MAC address is displayed.

Option	Parameter	Descriptions
MAC [XX:XX:XX:XX:XX:XX]	—	—

ii. MAC [XX:XX:XX:XX:XX:XX] submenu



Option	Parameter	Descriptions
iSCSI Attempt Name	Up to 96 alphanumeric characters	Specify of an iSCSI attempt name.
iSCSI Mode	[Disabled] Enabled Enabled for MPIO	Specify the iSCSI mode
Internet Protocol	[IP4] IP6	Specify the IP mode of iSCSI.
Connection Retry Count	0-[5]-16	Specify the number of iSCSI connection retries.
Connection Establishing Timeout	100-[16000]-20000	Specify a timeout value of iSCSI connection (msec.).
OUI-format ISID	For display only	Displays the OUI-format ISID.
Configure ISID	6 numerals	Specify the lower 3 bytes of OUI-format ISID. MAC address value is stored as a default value.
Enable DHCP	[Disabled] Enabled	Enable or disable DHCP.
Initiator IP Address	IP Address	Specify an IP address of the initiator. When Enable DHCP is enabled or Internet Protocol is IP6 , this option does not appear.
Initiator Subnet Mask	IP Address	Specify a subnet mask of the initiator. When Enable DHCP is enabled, this option does not appear.
Gateway	IP Address	Specify the gateway. When Enable DHCP is enabled, this option does not appear.
Get target info via DHCP	[Disabled] Enabled	Enable or disable the function acquiring target information via DHCP. When Enable DHCP is disabled, this option does not appear.
Target Name	4 to 223 alphanumeric characters	Specify a target name in the iSCSI qualifier (IQN) format. When Get Target info via DHCP is enabled, this option does not appear.
Target IP Address	IP Address	Specify a target IP address. When Get Target info via DHCP is enabled, this option does not appear.

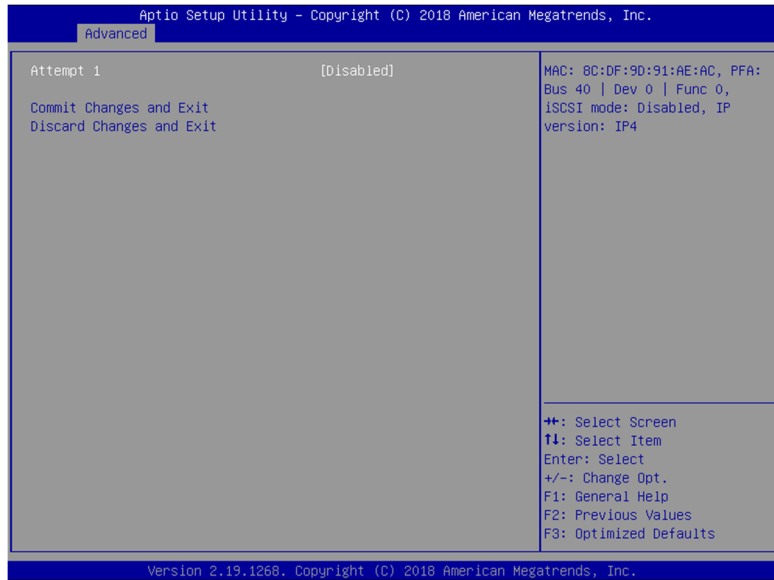
Option	Parameter	Descriptions
Target Port	0-65535	Specify a target port. When Get Target info via DHCP is enabled, this option does not appear.
Boot LUN	Up to 20 alphanumeric characters	Specify LUN. When Get Target info via DHCP is enabled, this option does not appear.
Authentication Type	CHAP [None]	Specify Authentication Type .
CHAP Type	One way [Mutual]	Specify a CHAP type. When Authentication Type is CHAP , this option appears.
CHAP Name	Up to 126 alphanumeric characters	Specify a CHAP name. When Authentication Type is CHAP , this option appears.
CHAP Secret	12 to 16 alphanumeric characters	Specify a CHAP secret. When Authentication Type is CHAP , this option appears.
CHAP Status	For display only	Specify the CHAP secret setting state. When Authentication Type is CHAP , this option appears.
Reverse CHAP Name	Up to 126 alphanumeric characters	Specify a reverse CHAP name. Authentication Type is CHAP and when CHAP Type is Mutual , this option appears.
Reverse CHAP Secret	12 to 16 alphanumeric characters	Specify the reverse CHAP secret. When Authentication Type is CHAP and when CHAP Type is Mutual , this option appears.
Reverse CHAP Status	For display only	Specify the reverse CHAP secret setting state. When Authentication Type is CHAP and when CHAP Type is Mutual , this option appears.
Save Changes	—	Save changes you made.
Back to Previous Page	—	Return to the iSCSI Configuration submenu.

[]: Factory settings

iii. Attempt[XX] submenu

Display or specify the same options as MAC [XX:XX:XX:XX:XX:XX] submenu.
See MAC [XX:XX:XX:XX:XX:XX] submenu.

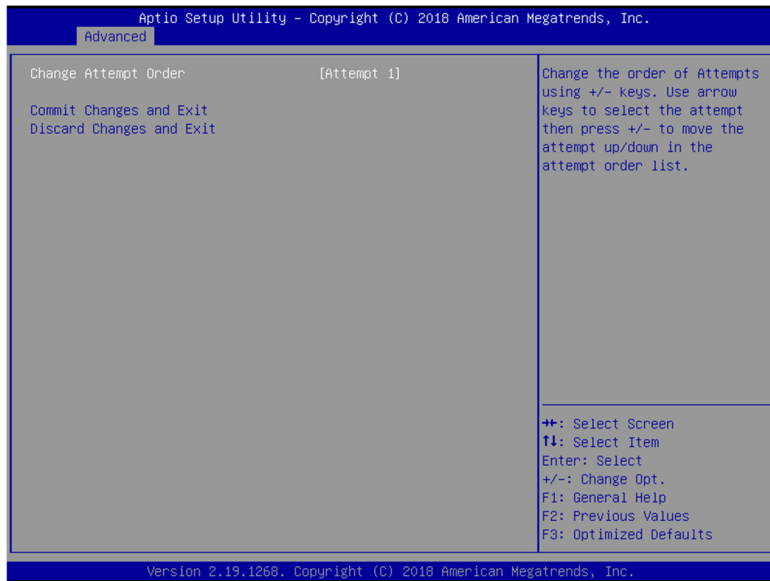
iv. Delete Attempts submenu



Option	Parameter	Descriptions
Attempt [XX]	[Disabled] Enabled	Specify Enabled to the iSCSI attempt you delete.
Commit Changes and Exit	—	Save changes and return to the iSCSI Configuration submenu.
Discard Changes and Exit	—	Return to the iSCSI Configuration submenu without saving changes.

[]: Factory settings

v. Change Attempt Order submenu

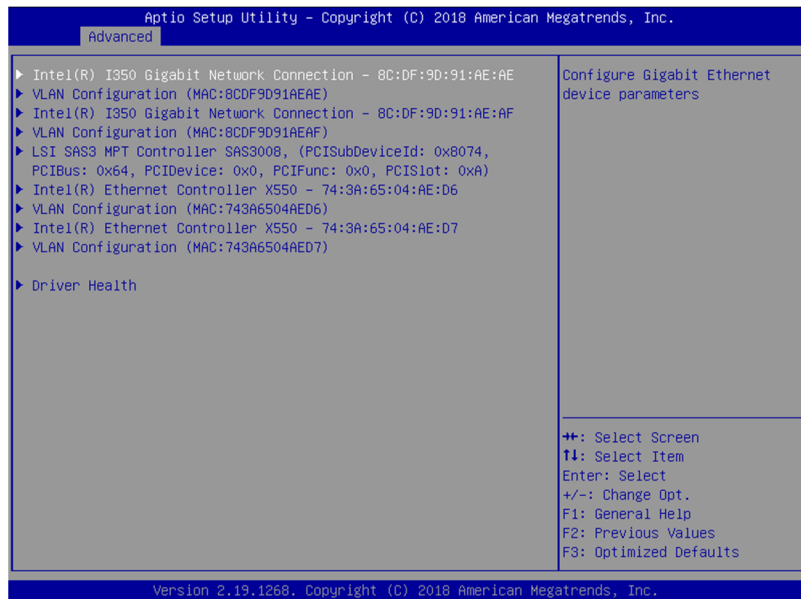


Option	Parameter	Descriptions
Change Attempt Order	Attempt [XX] Attempt [XX]	Specify priority of iSCSI attempts. Press <Enter> key to display a pop-up screen. Using <+>/<-> keys, change the priority.
Commit Changes and Exit	—	Save changes and return to the iSCSI Configuration submenu.
Discard Changes and Exit	—	Return to the iSCSI Configuration submenu without saving changes.

[]: Factory settings

(8) UEFI Driver Configuration submenu

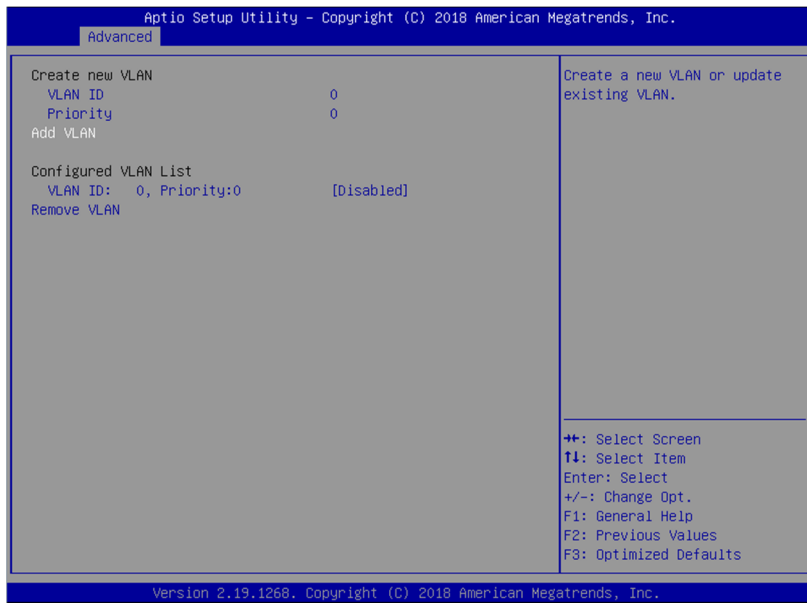
From the **Advanced** menu, select **UEFI Driver Configuration** and then press the <Enter> key to display the menu screen shown below.



Option	Parameter	Descriptions
(UEFI Driver Name)	—	When a UEFI driver of an on-board LAN controller or each PCI device is loaded, a MAC address is displayed. This submenu differs depending on UEFI drivers.
VLAN Configuration (MAC:XXXXXXXXXXXX)	—	—
Driver Health	—	—

[]: Factory settings

(a) VLAN Configuration (MAC:XXXXXXXXXX) submenu

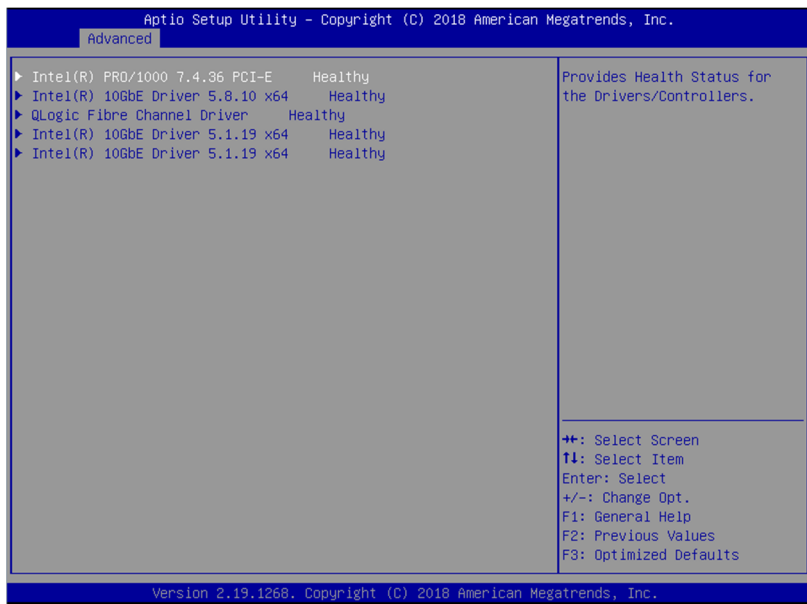


Option	Parameter	Descriptions
Create new VLAN	—	—
VLAN ID	[0]-4094	Specify VLAN ID.
Priority	[0]-7	Specify VLAN Priority.
Add VLAN	—	Add VLAN.
Configured VLAN List	—	—
VLAN ID: [x], Priority:[x]	[Disabled] Enabled	Set VLAN to be deleted to [Enabled].
Remove VLAN	—	Delete the specified VLAN.

[]:Factory settings

Important This is set for the CPU/IO module of the primary side. When you configure the CPU/IO module of the secondary side, first power off the server, plug out and plug in the AC power cord of the primary side. Then start the server and set this.

(b) Driver Health submenu



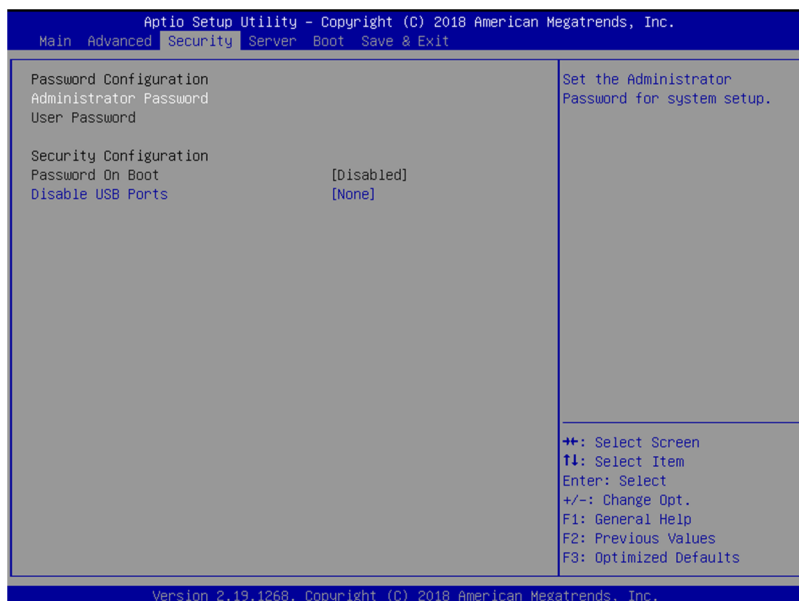
For details about the options, see the table below.

Option	Parameter	Descriptions
(UEFI Driver Name)	—	Displays the UEFI Driver Health state. This option appears when a UEFI driver of an on-board LAN controller or each PCI device is loaded and it supports Driver Health function.

[]: Factory settings

1.2.3 Security

If you move the cursor to **Security**, the **Security** menu appears. For the menu that has ► on the left, move the cursor to it and then press the <Enter> key to show its submenus. Then configure the settings.



Select **Administrator Password** or **User Password**, and then press the <Enter> key to display the screen where you can register/change the password.

Tips

- User Password cannot be set without setting Administrator Password
- Do not set any password before installing OS.
- If you have forgotten any password, contact the store where you purchased the product or your maintenance service company. If you clear the password set in the BIOS Setup utility (SETUP), see *Chapter 1 (9. Resetting and Clearing the Server)*.

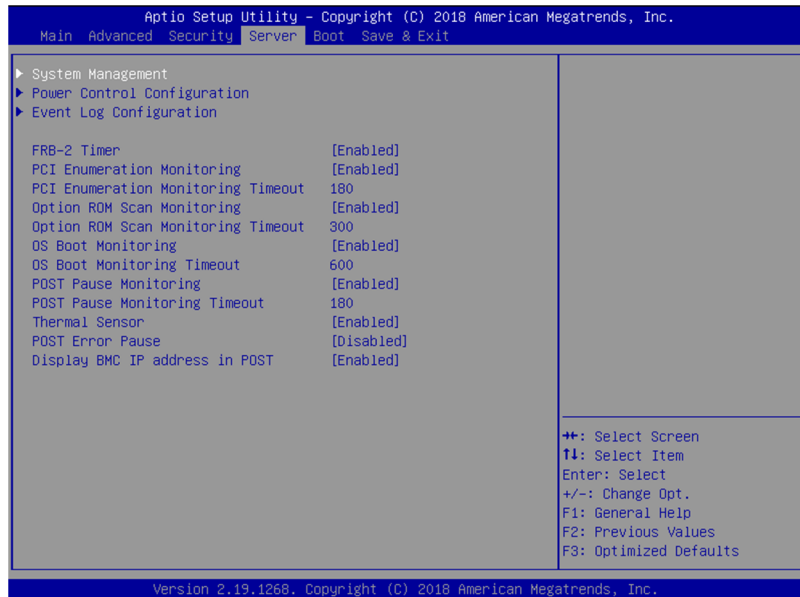
For details about the options, see the table below.

Option	Parameter	Descriptions
Password Configuration	–	–
Administrator Password	Up to 20 alphanumeric characters	When the <Enter> key is pressed, the password entry screen to set administrative right is displayed. This password can be used to access all SETUP menus. Password can be set only when SETUP is started by administrative right. If no password is set, SETUP starts with administrative right.
User Password	Up to 20 alphanumeric characters	When the <Enter> key is pressed, the password entry screen to set user right is displayed. With this password, access to SETUP menus is limited. The user password can be set when SETUP is started by administrative right or user right.
Security Configuration	–	–
Password On Boot	[Disabled] Enabled	Enable or disable the feature that requires a password entry on boot. This option can be selected when Administrator Password is set.
Disable USB Ports	[None] Front Rear Front + Rear	Select a USB port to be disabled.

[]: Factory settings

1.2.4 Server

If you move the cursor to **Server**, the **Server** menu screen appears. For the menu that has ► on the left, move the cursor to it and then press the <Enter> key to show its submenus.



The **Server** menu screen shows the options you can configure and their features. For the menu **System Management**, move the cursor to it and then press the <Enter> key to show its submenus.

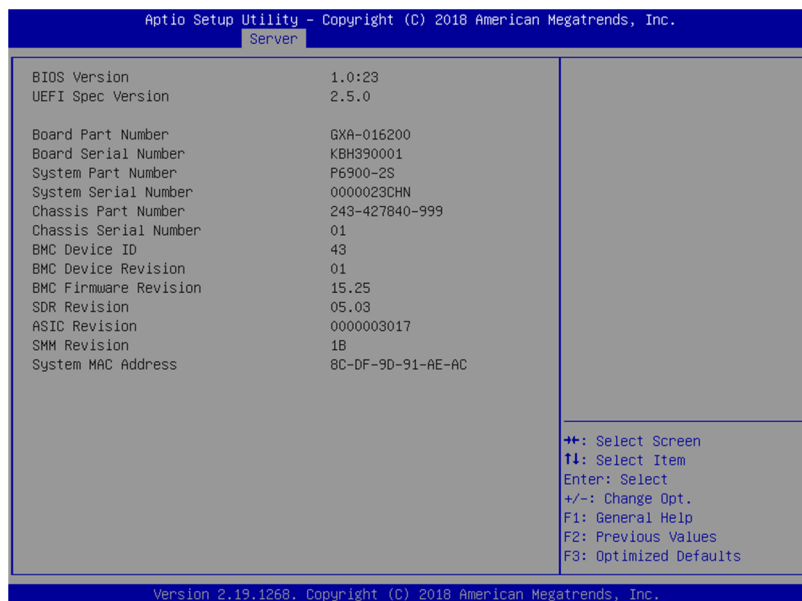
Option	Parameter	Descriptions
System Management	–	–
Power Control Configuration	–	–
Event Log Configuration	–	–
FRB-2 Timer	Disabled [Enabled]	Enable or disable FRB-2 timer.
PCI Enumeration Monitoring	Disabled [Enabled]	Enable or disable the feature to monitor PCI device scan.
PCI Enumeration Monitoring Timeout	60-[180]-1200	Specify the timeout period for PCI device scan (Unit: second).
Option ROM Scan Monitoring	Disabled [Enabled]	Enable or disable the feature to monitor option ROM scan.
Option ROM Scan Monitoring Timeout	60-[300]-1200	Specify the timeout period for option ROM scan (Unit: second).
OS Boot Monitoring	Disabled [Enabled]	Enable or disable the feature to monitor OS boot-up. Disable this function only when you perform the installation according to "Chapter 1 Installing the OS". Enable this function again after you complete the installation.
OS Boot Monitoring Timeout	60-[600]-1200	Specify the timeout period for OS boot-up (Unit: second).
POST Pause Monitoring	Disabled [Enabled]	Enable or disable the feature to monitor POST while the boot-up is suppressed.
POST Pause Monitoring Timeout	60-[180]-1200	Specify the timeout period for monitoring POST while the boot-up is suppressed (Unit: second).

Option	Parameter	Descriptions
Thermal Sensor	Disabled [Enabled]	Enable or disable the feature to monitor the thermal sensor.
POST Error Pause	[Disabled] Enabled	Enable or disable the feature to suppress OS booting when POST detects an error.
Display BMC IP address in POST	Disabled [Enabled]	Enable or disable the feature to display BMC IP address during POST.

[]: Factory settings

(1) System Management submenu

From the **Server** menu, move the cursor to **System Management** and then press the <Enter> key to show its submenus.

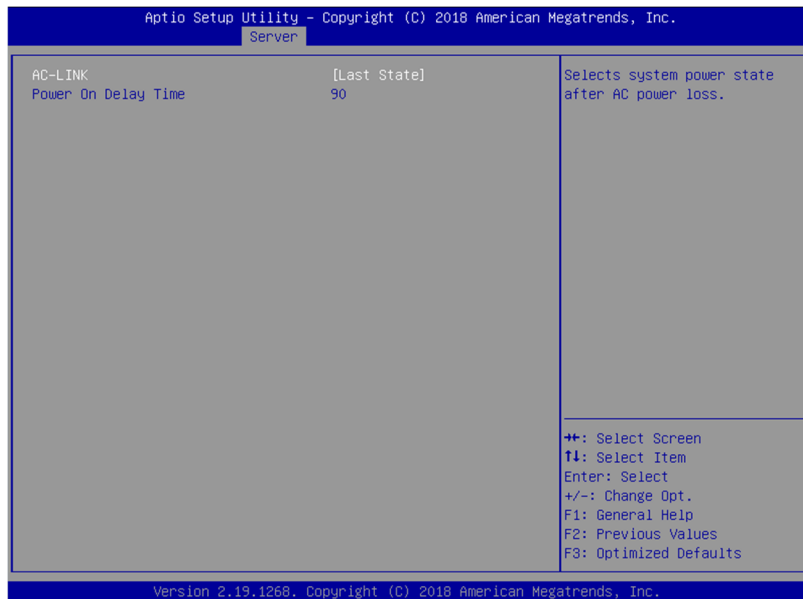


For details about the options, see the table below (display only).

Option	Parameter	Descriptions
BIOS Version	–	The current BIOS version is displayed.
UEFI Spec Version	–	The UEFI specification version supported by BIOS is displayed.
Board Part Number	–	The part number of motherboard is displayed.
Board Serial Number	–	The serial number of motherboard is displayed.
System Part Number	–	The part number of the system is displayed.
System Serial Number	–	The serial number of the system is displayed.
Chassis Part Number	–	The part number of chassis is displayed.
Chassis Serial Number	–	The serial number of chassis is displayed.
BMC Device ID	–	The device ID of BMC is displayed.
BMC Device Revision	–	The revision of BMC is displayed.
BMC Firmware Revision	–	The firmware revision of BMC is displayed.
SDR Revision	–	The revision of Sensor Data Record is displayed.
ASIC Revision	–	The firmware revision of Fault-tolerant chipset is displayed.
SMM Revision	–	The firmware revision of System Management is displayed.
System MAC Address	–	The system MAC address is displayed.

(2) Power Control Configuration submenu

From the **Server** menu, move the cursor to **Power Control Configuration** and then press the <Enter> key to show its submenus.



For details about the options, see the table below.

Option	Parameter	Descriptions
AC-LINK	Stay Off [Last State] Power On	Specify the AC-LINK function that sets up the power supply state of this server when AC power is off and then supplied (see the table below). When setting up Power On and Last State , the server activates until CPU/IO modules are implemented in both systems in max. 180 seconds in addition to delay time of the Power On Delay Time .
Power On Delay Time	[90]-600	When the AC-LINK setting is Power On or Last State , specify DC-ON delay time (sec.) When setting up Power On , set at 90 seconds or more.

[90]: Factory settings

The AC-LINK settings and DC power operations when AC power was off and then is supplied are as follows.

State before AC power off	AC-LINK settings		
	Stay Off	Last State	Power On
Running (DC power On)	Off	On *1	On
Stopping (DC power Off)	Off	Off	On
Forcible power Off *2	Off	Off	On

*1 When the setting is Last State and State before AC power Off is "Running (DC power On)", there are following restrictions.

- When timing of AC power off can be controlled before an OS boot, do AC power off the CPU/IO module of the secondary side first.

At this time, there is the timing of DC power Off. During this timing, if another CPU/IO module do AC power off, last state of "State before AC power Off" becomes "Stopping (DC power Off)". This is specification for ft server.

When the power supply of both module is same and the timing of AC power off is the same time, these restrictions isn't relevant.

*2 Press POWER switch for 4 seconds or more to forcibly turn off the power supply.

Tips

Set up **Power On** in **AC-LINK** for automatic operation using an uninterruptible power supply (UPS).

(3) Event Log Configuration submenu

From the **Server** menu, move the cursor to **Event Log Configuration** and then press the <Enter> key to show its submenu.

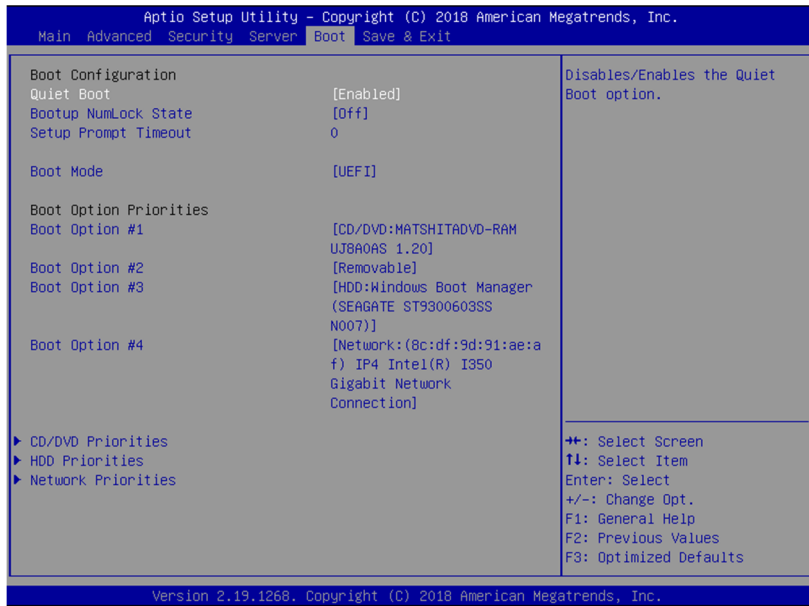


For details about the options, see the table below.

Option	Parameter	Descriptions
Clear Online Event Logs	–	Press the <Enter> key then select Yes to clear event logs of active module.
Clear Offline Event Logs	–	Press the <Enter> key then select Yes to clear event logs of standby module.

1.2.5 Boot

If you move the cursor to **Boot**, the **Boot** menu where you can configure the boot order appears.



For details about the options, see the table below.

Option	Parameter	Descriptions
Boot Configuration	–	–
Quiet Boot	Disabled [Enabled]	Enable or disable the feature to display the NEC logo during POST. When this option is set to Disabled , the results of POST execution are displayed instead of the NEC logo. If BIOS Redirection Port is enabled, this option is shown as Unavailable and inaccessible (run with Disabled state automatically)
Bootup NumLock State	On [Off]	Enable or disable NumLock feature of keyboard.
Setup Prompt Timeout	[0] to 65535	Specify the time 0 to 65535 seconds until the <F2> is pressed to launch SETUP.
Boot Mode	Legacy [UEFI]	Specify the boot mode. Before physical formatting of hard disk drive, set this option to "Legacy" After the physical formatting is complete, return the mode from Legacy to UEFI .
Boot Option Priorities	–	–
Boot Option #1	–	These items display the priority of boot devices.
Boot Option #2	–	
Boot Option #3	–	
Boot Option #4	–	
CD/DVD Priorities	–	Specify the boot priority for each device type.
HDD Priorities	–	
Network Priorities	–	

[]: Factory settings

How to change the boot priority

1. When BIOS detects a bootable device, information on the device is displayed in the designated area.
2. The boot priority (from first to fourth) of the registered boot devices can be changed using the <↑>/<↓> and <+>/<-> keys.
Move the cursor to a device using the <↑>/<↓> keys, and change the priority using the <+>/<-> keys.

Rules on boot priority

1. If a bootable device is newly connected, the device is registered as the device with the lowest priority in Priorities of that device type.
2. If a bootable device is disconnected from the server, the relevant device is removed from **Priorities** of that device type.
3. When **Load Setup Defaults** is executed on **Save & Exit** menu, the **Boot Option** and **Priorities** of that device type are changed as follows.

a) Boot Option Priorities

1. Boot Option #1: CD/DVD
2. Boot Option #2: Removable
3. Boot Option #3: HDD
4. Boot Option #4: Network

b) The priority of bootable devices in Priorities of that device type is determined as follows:

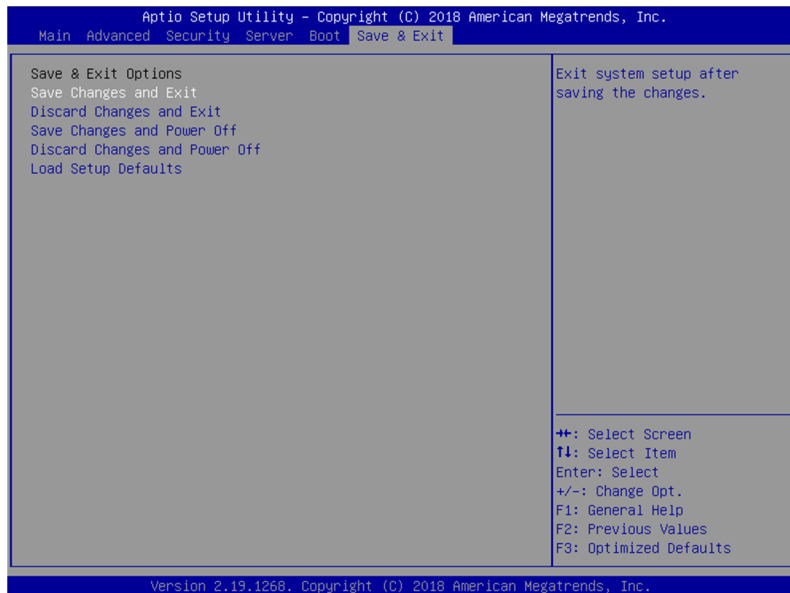
Devices other than USB device is given higher priority and USB device is given priority next to non-USB devices.

c) Bootable device

If a bootable device has been set to **Disabled**, cancel the Disabled status, and register the device in **Priorities** of that device type.

1.2.6 Save & Exit

If you move the cursor to **Save & Exit**, the **Save & Exit** menu appears.



The options of this menu are described below.

(a) Save Changes and Exit

The SETUP utility closes with all the changes saved in NVRAM (Non-volatile memory). After the SETUP utility closes, the system automatically reboots.

(b) Discard Changes and Exit

The SETUP utility closes without saving the changes in NVRAM. The settings at startup of SETUP utility are retained.

After the SETUP utility closes, the system automatically reboots.

(c) Save Changes and Power Off

Changes are saved in NVRAM and the SETUP utility closes. After finishing, this server automatically turns off the power supply.

(d) Discard Changes and Power Off

The SETUP utility closes without saving the changes in NVRAM. The settings at startup of SETUP utility are retained.

After finishing, this server automatically turns off the power supply.

(e) Load Setup Defaults

This option resets all values in the SETUP utility to the default settings.

Note

- The factory-set value may differ from the default value depending on your server model. Reconfigure each item according to your environment by referring to the list of settings in this section.
- Values of iSCSI Configuration submenu and UEFI Driver Configuration submenu do not return to default values.

2. BMC Configuration

BMC Configuration utility allows you to view or change system parameters.

2.1 Overview

2.1.1 Offline Tools

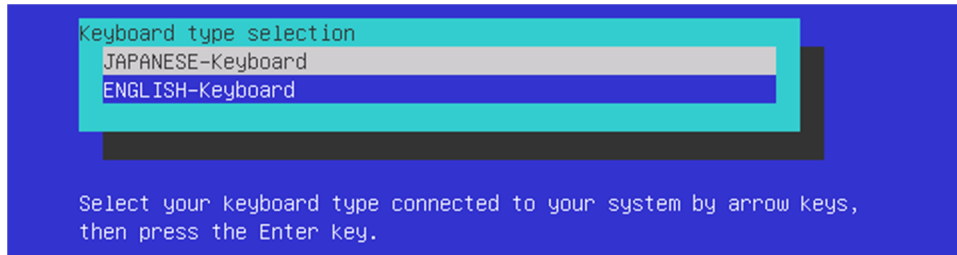
The server has the following offline tools:

- Maintenance Utility
Use this tool when maintaining the server.
- BMC Configuration
Use this tool when setting system configuration information to BMC.

This section describes the features of BMC Configuration.

2.2 Activating BMC Configuration

1. Press <F4> key at POST to display Keyboard type selection.



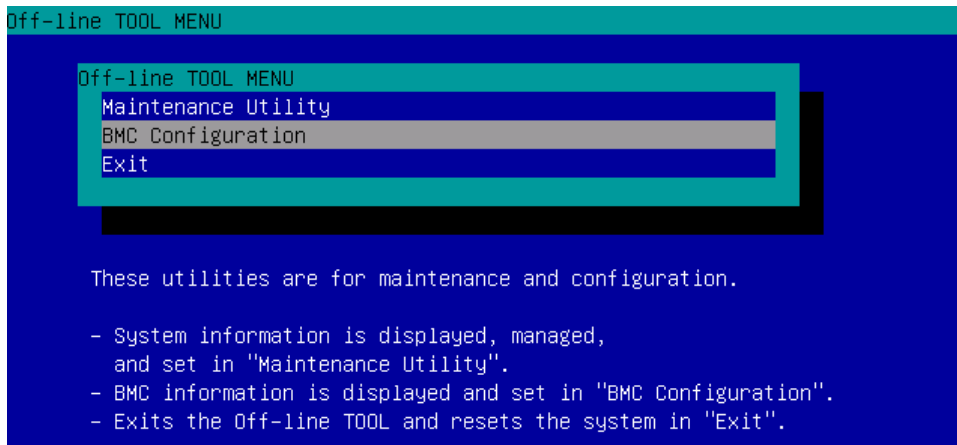
Keyboard type selection

Important If you select "JAPANESE - Keyboard" and use a Japanese keyboard, you can't input the following key.

<¥>, <|>, <|>, <_> and <-> key, <*> and <+> key of numeric keypad

If you press <Shift> + <^> key, you can input underscore (_).

2. Select of the keyboard type connected with this server to display Off-line TOOL MENU.

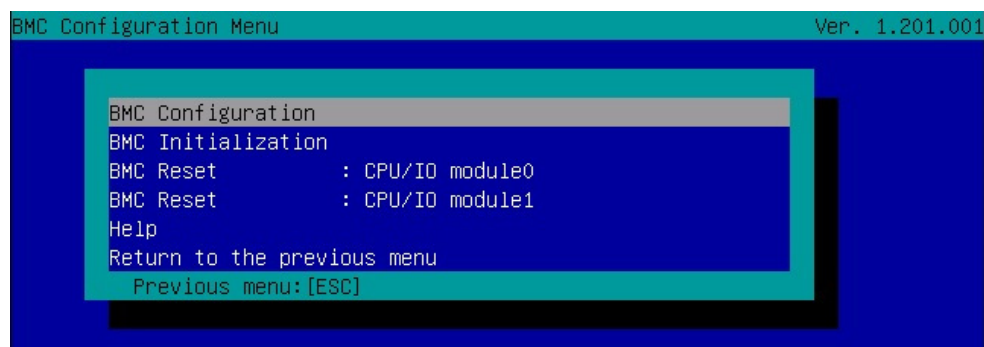


Off-line TOOL MENU

3. Select **BMC Configuration** from the menu to activate the BMC Configuration.

2.3 Main Menu of BMC Configuration

The Main Menu appears when you select **BMC Configuration** on **Offline Tools** menu.



Main Menu

The features are described below.

(a) BMC Configuration

Sets configuration information to BMC.

If you select **OK** after you change the values, the set values are applied to BMC.

For details, see (2.4 *Setting BMC Configuration*).

(b) BMC Initialization

Restores the BMC Configuration information to the default value (except for some items).

Executing this item initializes both CPU/IO modules 0 and 1.

For details, see (2.5 *BMC Initialization*).

(c) BMC Reset: CPU/IO module X

Resets BMC of CPU/IO module X (X = 0 or 1) without changing any settings.

For details, see (2.6 *BMC Reset*).

(d) Help

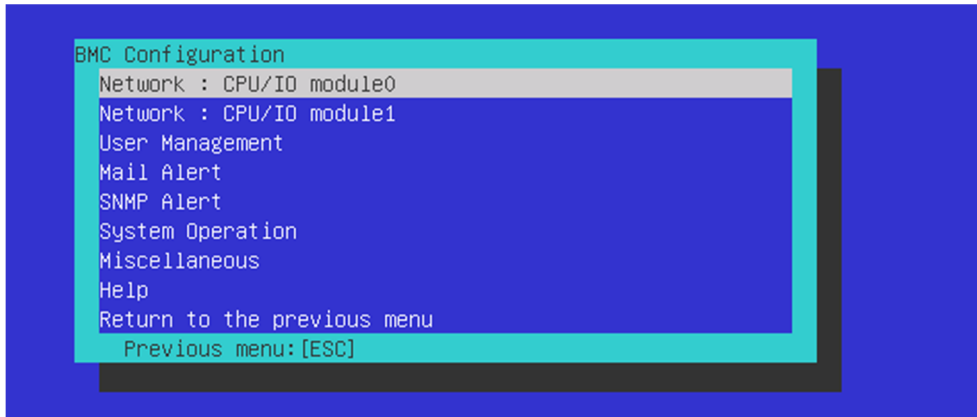
Opens BMC Configuration help window.

(e) Return to the previous menu

Exits BMC Configuration, and return to **Offline Tools** menu.

2.4 Setting BMC Configuration

The Main Menu appears when you select **BMC Configuration** on **Offline Tools** menu.



BMC Configuration menu

The features are described below.

(a) Network: CPU/IO module X

Views network environment and services of BMC LAN of CPU/IO module X (X = 0 or 1) and change parameter setting. Only the module that is installed appears on this menu.

For details, see (2.4.1 Network).

(b) User Management

Manages users who use BMC.

For details, see (2.4.2 User Management).

(c) Mail Alert

Views E-mail alert issued from BMC and change parameter setting.

For details, see (2.4.3 Mail Alert).

(d) SNMP Alert

Views SNMP alert issued from BMC and change parameter setting.

For details, see (2.4.4 SNMP Alert).

(e) System Operation

Sets parameters for remote KVM console and remote media.

For details, see (2.4.5 System Operation).

(f) Miscellaneous

Sets various features of BMC.

For details, see (2.4.6 Miscellaneous).

(g) Help

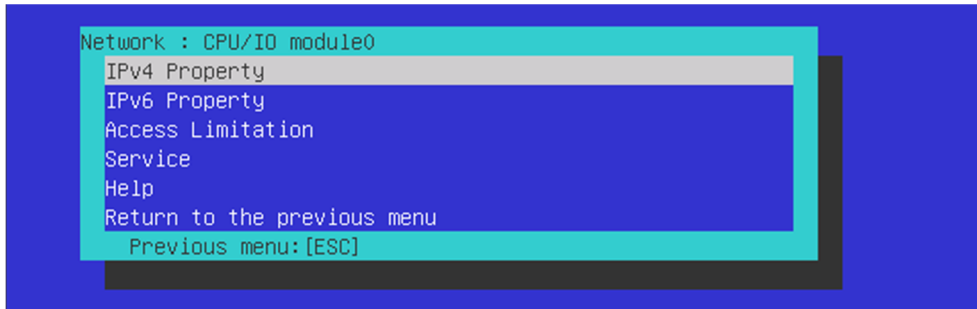
Opens BMC Configuration help window.

(h) Return to the previous menu

Exits BMC Configuration, and return to **Offline Tools** menu.

2.4.1 Network

The **Network** menu appears when you select **Network: CPU/IO moduleX** on **BMC Configuration** menu.



Network menu

The table below shows details of parameters and their default value.

Item	Description	Default Value
IPv4 Property		
Management LAN	Specify and display LAN port to communicate with BMC. Management LAN : LAN port for BMC exclusive use. Shared BMC LAN : LAN port of System (OS) is shared and used. This item cannot be chosen for this server.	Management LAN
Connection Type	Specify and display the connection type of BMC LAN. Auto Negotiation : Connecting by suitable setting. 100Mbps Full Duplex : Connecting by Full Duplex at speed of 100 Mbps. 100Mbps Half Duplex : Connecting by Half Duplex at speed of 100 Mbps. 10Mbps Full Duplex : Connecting by Full Duplex at speed of 10 Mbps. 10Mbps Half Duplex : Connecting by Half Duplex at speed of 10 Mbps.	Auto Negotiation
BMC MAC Address	MAC Address of BMC is displayed.	—
DHCP	Determine whether to dynamically obtain an IP address from a DHCP server. If the item is set to Enable and applied, BMC set the value IP Address , Subnet Mask and Default Gateway obtained from DHCP server. ²	Disable
IP Address	Specify the BMC LAN IP address. ³	192.168.1.1
Subnet Mask	Specify the Subnet Mask of BMC LAN. ^{1 2 3}	255.255.255.0
Default Gateway	Specify the Default Gateway IP address of the BMC LAN. ^{2 3} If you set this item, it is necessary for applying configuration information that the gateway is connected on network.	0.0.0.0
Dynamic DNS	Determine whether to enable/disable of Dynamic DNS. ⁴	Disable
DNS Server	Specify the DNS Server.	0.0.0.0
Host Name	Specify the Host Name. ⁵	Blank
Domain Name	Specify the Domain Name. ⁶	Blank

Item	Description	Default Value
IPv6 Property		
IPv6	Enable or disable IPv6. *2	Disable
Address Assignment Mode	Specify the mode to assign IPv6 address (Static or Dynamic). *2 *7	Dynamic
Link Local Address	Display link local address. *7 *8	—
Global Address	Display IPv6 address when Dynamic is specified for assignment mode. *7 *8	—
Static Address	Specify IPv6 address when Static is specified for assignment mode. *7 Setting ":::" or "0::0" as Static Address, and when redisplaying this screen, this item is set as 0.	0::0
Prefix Length	Specify the prefix length when Static is specified for assignment mode. *2 *7 Setting this address different as prefix of Static Address, and when redisplaying this screen, this item is set as ":::".	64
Gateway Address	Specify the gateway address when Static is specified for assignment mode. *2 *7	0::0
DNS Server Address	Specify the DNS Server. *7	0::0
Access Limitation		
Limitation Type	Select the Access Limitation Type. Allow All : Access to BMC is not limited. Allow Address : Specify the IP Address that is allowed to access BMC. Deny Address : Specify the IP Address that denies accessing BMC.	Allow All
IP Address	Specify the IP Address to allow or deny to access with BMC. *9 *10	Blank
Service		
HTTP	Enable or disable HTTP service. *11	Enable
HTTP Port Number	Specify the HTTP port number. *12	80
HTTPS	Enable or disable HTTPS service. *11	Enable
HTTPS Port Number	Specify the HTTPS port number. *12	443
SSH	Enable or disable SSH service.	Enable
SSH Port Number	Specify the SSH port number. *12	22

- *1: If an illegal value is specified for subnet mask, an error message is displayed and setting is disabled.
- *2: It should be same settings for CPU/IO module 0 and CPU/IO module 1. When the settings is different, the settings of primary module is preferentially. In addition, this rule is applied to the BMC Configuration for Windows.
- *3: Can be changed only when DHCP is set to "Disable".
- *4: Can be changed only when DHCP is set to "Enable".
- *5: Host Name should be within 63 characters.
Acceptable characters are: alphanumeric, hyphen (-), underscore (_), and period (.).
- *6: Host Name and Domain Name should be within total of 255 characters.
Acceptable characters are: alphanumeric, hyphen (-), underscore (_), and period (.).
- *7: Can be specified only when IPv6 is set to "Enable".
- *8: Displayed only when "Dynamic" is specified for Address Assignment Mode.
- *9: Can be specified when Access Limitation Type is "Allowed Address" or "Deny Address". The length must not exceed 255 characters.
- *10: The range of IP addresses to "Allow" or "Deny" access is delimited by ", (Comma)". With regard to the setting of "Deny" access, "*" (Asterisk) can be described as a wild-card. (ex: 192.168.1.*,192.168.2.1,192.168.2.254)
- *11: If HTTP is set to "Enable", HTTPS is changed to "Enable" automatically. You are not allowed to set "Enable" to HTTP only.

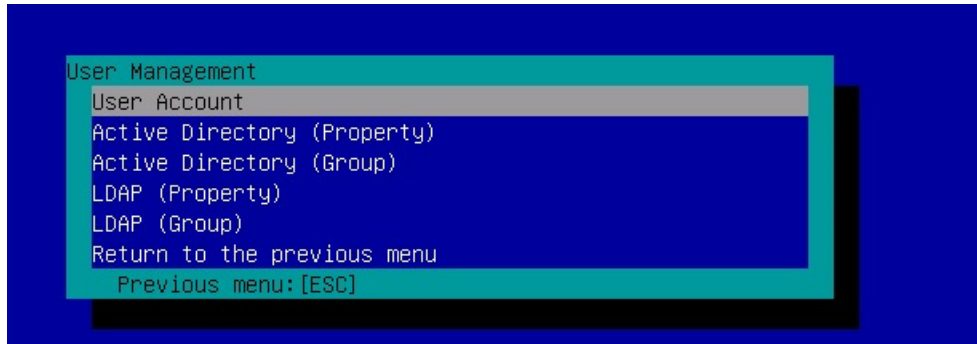
*12: Port number can be specified only when the relevant port is set to "Enable". The port number must be unique.

Tips

If you use Japanese keyboard and select "JAPANESE - Keyboard" at the chapter "2.2 Activating BMC Configuration", you can input underscore(_) by pressing <Shift> + <^> key.

2.4.2 User Management

The **User Management** menu appears when you select **User Management** on **BMC Configuration** menu.



User Management menu

The table below shows details of parameters and their default value.

Item	Description	Default Value
User Account		
User	Enable or disable the user. ^{*1}	Enable
User Name	Specify user name. ^{*2}	Blank
Password	Specify password. ^{*3}	Blank
Confirm Password	Specify the same character string used for "Password". ^{*3}	Blank
Privilege	Specify the privilege of the user. ^{*4} Administrator Operator User	Administrator
Active Directory (Property)		
Active Directory Authentication	Enable or disable Active Directory authentication.	Disable
Authentication User	Specify the authentication user of Active Directory. ^{*5 *6}	Blank
Authentication Password	Set the authentication password for Active Directory. ^{*5 *7}	Blank
User Domain Name	Specify the user domain name. ^{*5 *8}	Blank
Timeout	Specify timeout period for connection with Domain Controller. ^{*5}	120
Domain Controller Server1	Enable or disable Domain Controller 1. ^{*5 *9}	Enable
Server Address1	Specify IP address of Domain Controller 1. ^{*5 *10}	Blank
Domain Controller Server2	Enable or disable Domain Controller 2. ^{*5 *9}	Disable
Server Address2	Specify IP address of Domain Controller 2. ^{*5 *10}	Blank
Domain Controller Server3	Enable or disable Domain Controller 3. ^{*5 *9}	Disable
Server Address3	Specify IP address of Domain Controller 3. ^{*5 *10}	Blank
Active Directory (Group) ^{*5}		
Group Name	Specify group name. ^{*8}	Blank
Group Domain	Specify group domain. ^{*8}	Blank
Privilege	Specify privilege of group. ^{*4} Administrator Operator User	Administrator

Item	Description	Default Value
LDAP (Property)		
LDAP Authentication	Enable or disable LDAP authentication.	Enable
IP Address	Specify the IP address. ^{*11}	0.0.0.0
Port Number	Specify the LDAP port number. ^{*11}	636
Search Base	Specify the search base used in LDAP authentication. ^{*11 *12}	Blank
Bind Domain Name	Specify the bind domain used in LDAP authentication. ^{*11 *12}	Blank
Bind Password	Specify the bind password used in LDAP authentication. ^{*11 *13}	Blank
LDAP (Group) ^{*11}		
Group Name	Specify the LDAP group name. ^{*8}	Blank
Group Search Base	Specify the search base of LDAP group. ^{*12}	Blank
Privilege	Specify privilege of LDAP group. ^{*4} Administrator Operator User	Administrator

*1: Can be specified if a user exists.

*2: Up to 15 characters including alphanumeric, hyphen (-), and underscore (_) can be used. Note, however, User Name must start with hyphen (-). In addition, "root", "null", "MWA", "AccessByEM-Poem", and names which are already assigned for other number are not allowed.

*3: Up to 19 ASCII characters excluding " " (blank), " (quotation), & (ampersand), ? (question mark), = (equal sign), #, and \, can be used.

*4: Privileges are defined as follows:

Administrator: User who has administrator right. All operations are allowed.

Operator: User who can operate the machine. Session management, license registration, remote KVM/media, configuration, and update are not allowed.

User: General user. Viewing IPMI information only is allowed.

*5: Can be specified only when Active Directory authentication is set to "Enable".

6: Up to 64 ASCII characters can be used excluding " " (blank), ",", ";", ":", "|", "=", "+", "", "?", "<", ">", "@", "!", " ", "\"", "\\", "[", and "]".

*7: ASCII characters in the range between 6 and 127 can be used excluding blank.

*8: Up to 255 characters including alphanumeric, hyphen, underscore, and period can be used.

*9: If Active Directory authentication is set to "Enable", at least one domain controller server must be enabled.

*10: Can be specified only when domain controller server is set to "Enable".

*11: Can be specified only when LDAP authentication is set to "Enable".

*12: Characters in the range between 4 and 62 including alphanumeric, hyphen, underscore, period, comma, and equal sign can be used.

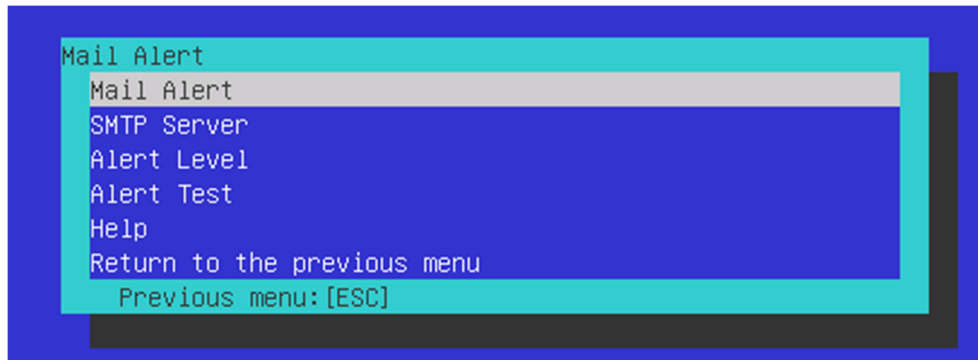
*13: Alphanumeric characters in the range between 4 and 31 excluding " , #, and \ can be used.

Tips

If you use Japanese keyboard and select "JAPANESE - Keyboard" at the chapter "2.2 Activating BMC Configuration", you can input underscore(_) by pressing <Shift> + <^> key.

2.4.3 Mail Alert

The **Mail Alert** menu appears when you select **Mail Alert** on **BMC Configuration** menu.



Mail Alert menu

The table below shows details of parameters and their default value.

Item	Description	Default Value
Mail Alert		
SMTP Alert	Enable or disable Mail Alert.	Disable
Response of SMTP Server	Specify the timeout period until when the connection to SMTP server succeed by E-mail transmission.	30
To:1	Select Enable/Disable of To:1. ^{*1}	Enable
To:1 E-Mail Address	Specify the mail address of To:1. ^{*2 *3}	Blank
To:2	Select Enable/Disable of To:2. ^{*1}	Disable
To:2 E-Mail Address	Specify the mail address of To:2. ^{*2 *3}	Blank
To:3	Select Enable/Disable of To:3. ^{*1}	Disable
To:3 E-Mail Address	Specify the mail address of To:3. ^{*2 *3}	Blank
From:	Specify the mail address of From. ^{*3}	Blank
Reply-To:	Specify the mail address of Reply-To. ^{*3}	Blank
Subject:	Specify the Subject. ^{*4}	Blank
Subject Option	Enable or disable the feature to add Subject Option.	Disable
X-Priority/Date Format	Enable or disable the feature to add X-Priority, and select date format.	Enable / MM/DD/YYYY
SMTP Server		
SMTP Server	Specify the SMTP Server. ^{*5}	0.0.0.0
SMTP Port Number	Specify the SMTP port number.	25
SMTP Authentication	Select Enable/Disable of SMTP Authentication.	Disable
CRAM-MD5	Select Enable/Disable of CRAM-MD5. ^{*6 *7}	Enable
LOGIN	Select Enable/Disable of LOGIN authentication. ^{*6 *7}	Enable
PLAIN	Select Enable/Disable of PLAIN authentication. ^{*6 *7}	Enable
User Name	Specify the SMTP User Name. ^{*6 *8}	Blank
Password	Specify the SMTP User Password. ^{*6 *9}	Blank
Alert Level		
Alert Level	Specify the kind of event to alert. ^{*10}	Error, Warning
	Error : When "Error" is detected in each sensor type, the alert is sent to the checked address.	
	Error, Warning : When "Error" or "Warning" is detected in each sensor type, the alert is sent to the checked address.	
	Error, Warning, Information : When "Error", "Warning" or "Information" is detected in each sensor type, the alert is sent to the checked address.	

Item	Description	Default Value
	Separate Setting : You can arbitrarily select the event and the address (To:X) to alert in each sensor type.	
Alert Test	Execute test by sending an alert by setup content and mail. *11	—

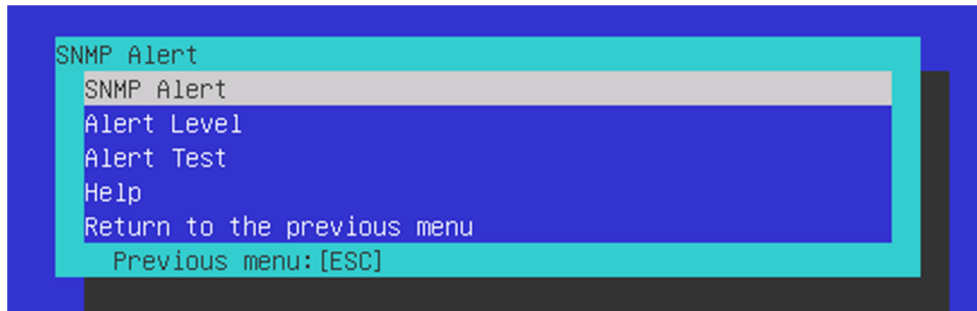
- *1: When Mail Alert is enabled, at least one address should be enabled.
- *2: Can be specified only when To: X is set to "Enable".
- *3: Up to 255 characters including alphanumeric, hyphen, underscore, period, and @ (at mark) can be used.
- *4: Up to 63 alphanumeric characters excluding +, ", ?, =, <, >, #, and \ can be used.
- *5: Up to 255 alphanumeric characters, hyphen, underscore, and period can be used for full domain name or IP address.
- *6: Can be specified only when SMTP Authentication is set to "Enable".
- *7: When SMTP Authentication is set to "Enable", at least one of the authentic methods should be enabled.
- *8: Up to 64 alphanumeric characters excluding " " blank, ", ?, =, <, >, #, and \, can be used.
- *9: Up to 20 alphanumeric characters excluding " " blank, ", ?, =, <, >, #, and \, can be used.
- *10 Can be specified only when SMTP Alert is set to "Enable".
- *11: Be sure to perform Alert Test after all the parameters are configured appropriately. Alert feature may fail depending on configuration made for network or alert receiver.

Tips

If you use Japanese keyboard and select "JAPANESE - Keyboard" at the chapter "2.2 Activating BMC Configuration", you can input underscore(_) by pressing <Shift> + <^> key.

2.4.4 SNMP Alert

The **SNMP Alert** menu appears when you select **SNMP Alert** on **BMC Configuration** menu.



SNMP Alert menu

The table below shows details of parameters and their default value.

Item	Description	Default Value
SNMP Alert		
SNMP Alert	Enable or disable SNMP Alert. ^{*1}	Disable
Computer Name	Specify the Computer Name. ^{*2}	Blank
Community Name	Specify the Community Name. ^{*2}	Public
Alert Process	Select One Alert Receiver or All Alert Receiver for Alert Process.	One Alert Receiver
Alert Acknowledge	Enable or disable Alert Acknowledge.	Enable
Alert Retry Count	Specify the count of Alert retry. ^{*3}	3
Alert Timeout	Specify the timeout period (in seconds) for alert. ^{*3}	6
Alert Receiver1	Enable or disable primary receiver. ^{*4}	Enable
IP Address1	Specify the IP Address of primary receiver. ^{*5}	0.0.0.0
Alert Receiver2	Enable or disable secondary receiver. ^{*4}	Disable
IP Address2	Specify the IP Address of secondary receiver. ^{*5}	0.0.0.0
Alert Receiver3	Enable or disable tertiary receiver. ^{*4}	Disable
IP Address3	Specify the IP Address of tertiary receiver. ^{*5}	0.0.0.0
Alert Level		
Alert Level	Specify the kind of event to alert. ^{*6} Error : When "Error" is detected in each sensor type, the alert is sent to the checked address. Error, Warning : When "Error" or "Warning" is detected in each sensor type, the alert is sent to the checked address. Error, Warning, Information : When "Error", "Warning" or "Information" is detected in each sensor type, the alert is sent to the checked address. Separate Setting : You can arbitrarily select the event to alert in each sensor type.	Error, Warning
Alert Test	Execute an SNMP alert test using current settings. ^{*7}	—

*1: When PEF (Platform Event Filter) is set to "Disable" in Miscellaneous menu, SNMP alert is disabled.

*2: Up to 16 alphanumeric characters are accepted.

*3: Can be specified only when Alert Acknowledge is set to "Enable".

*4: When SNMP Alert is enabled, at least one alert receiver should be enabled.

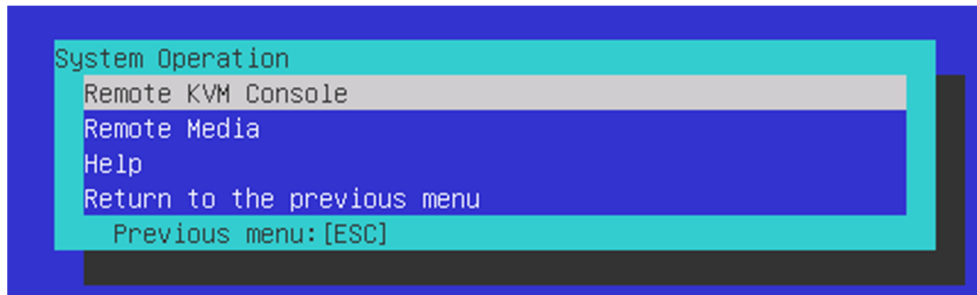
*5: Can be specified only when each Alert Receiver is set to "Enable".

*6: Can be specified only when SNMP Alert is set to "Enable".

*7: Be sure to perform Alert Test after all the parameters are configured appropriately. Alert feature may fail depending on configuration made for network or alert receiver.

2.4.5 System Operation

The **System Operation** menu appears when you select **System Operation** on **BMC Configuration** menu.



System Operation menu

The table below shows details of parameters and their default value.

Item	Description	Default Value
Remote KVM Console		
Encryption	Enable or disable encryption.	Enable
Port Number (No Encryption)	Specify the port number when encryption is disabled. *1	7578
Port Number (Encryption)	Specify the port number when encryption is enabled *1	7582
Mouse Cursor Mode	Specify display mode of mouse cursor. Single Dual	Dual
Mouse Coordinate Mode	Select a mode to indicate coordinate when moving mouse cursor. Relative Absolute	Abdolute
Keyboard Language	Select a keyboard language. Japanese (JP) English (US) French (FR) German (DE)	English(US)
Remote Media		
Encryption	Enable or disable encryption.	Enable
Remote CD/DVD (No Encryption)	Specify the port number of remote CD/DVD port when encryption is disabled. *1	5120
Remote USB Memory (No Encryption)	Display the port number of remote USB memory when encryption is disabled. (Remote CD/DVD port number + 2)	—
Remote FD (No Encryption)	Display the port number of remote FD when encryption is disabled. (Remote CD/DVD port number + 3)	—
Remote CD/DVD (Encryption)	Specify the port number of remote CD/DVD port when encryption is enabled. *1	5124
Remote USB Memory (Encryption)	Display the port number of remote USB memory when encryption is enabled. (Remote CD/DVD port number + 2)	—
Remote FD (Encryption)	Display the port number of remote FD when encryption is enabled. (Remote CD/DVD port number + 3)	—

*1: Port numbers must be the unique one.

2.4.6 Miscellaneous

The Miscellaneous menu appears when you select **Miscellaneous** on BMC Configuration menu.

Item	Description	Default Value
Miscellaneous		
Behavior when SEL repository is full	Specify the behavior when SEL repository is full. ^{*1} ^{*2} Stop logging SEL : SEL is not recorded any more. Clear all SEL : Delete all SEL and record SEL newly. Overwrite oldest SEL : Old SEL is overwritten with new SEL.	Overwrite oldest SEL
Platform Event Filter	Enable or disable Platform Event Filter. ^{*3}	Enable
Management Software	Setting for remote management	—
ESMPRO Management	Enable or disable NEC ESMPRO Management. ^{*4}	Current set value
Authentication Key	Specify the Authentication Key. ^{*5} ^{*6}	Guest
Redirection	Set to "Disable".	Enable

*1: When this item is changed to/from "Overwrite oldest SEL", all log records in the SEL Repository are cleared.

*2: However, even if you specify this setting, in the case that the Windows OS is started and ft control software detects SEL area is filled fully, all SEL are deleted and new SEL is recorded again.
 In addition, the contents of SEL is recorded to event log of Windows OS by ft control software, so back up event log as needed according to your operation form.

*3: Disabling Platform Event Filter also disables SNMP alert.

*4: When BMC can be managed directly from NEC ESMPRO Manager (Ver.5.4 or later), this item must be set to "Enable". If it is set to "Enable", Authentication Key is required.

*5: Can be specified only when ESMPRO Management is set to "Enable".

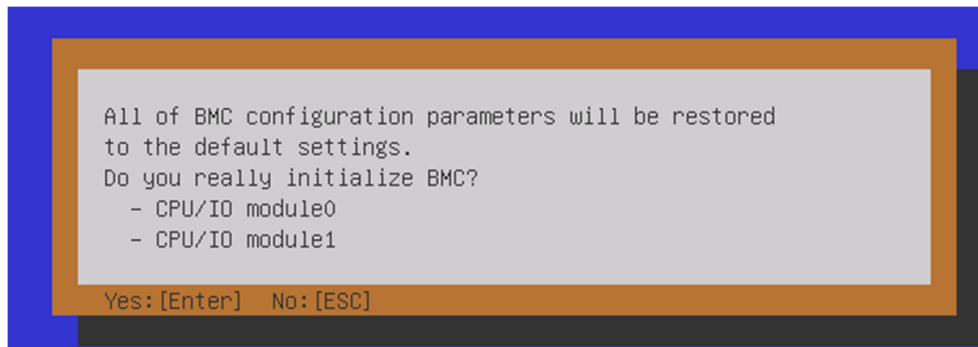
*6: This Authentication key is used when NEC ESMPRO Manager (Ver.5.4 or later) manages the target server. Up to 16 alphanumeric characters are accepted.

Note

If you do not use remote management feature by NEC ESMPRO, set to "Disable" for ESMPRO Management in Management Software. In this case, settings for relevant items are hidden and unnecessary.

2.5 BMC Initialization

If you select **BMC Initialization** on **Main** menu, the confirmation message as show below appears. Only the CPU/IO module installed in the server appears on this menu.



```

All of BMC configuration parameters will be restored
to the default settings.
Do you really initialize BMC?
- CPU/IO module0
- CPU/IO module1

Yes: [Enter]  No: [ESC]

```

Confirmation message (BMC Initialization)

<ESC> key: Stops processing and returns to **Main** menu.

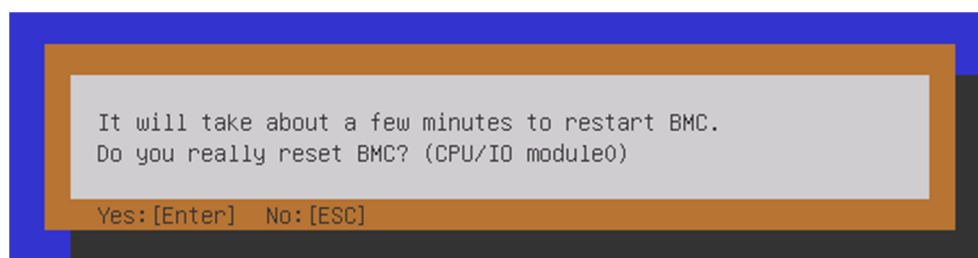
<Enter> key: Initializes BMC configuration settings and restores the default value except for some items. After initialization, it takes about 3 minutes to restart BMC.

Note

Do not shutdown the system, reboot the system, or perform any switch operation while BMC is being initialized (for approximately 3 minutes).

2.6 BMC Reset

If you select **BMC Reset : CPU/IO module X** on **Main** menu, the confirmation message as show below appears. Only the CPU/IO module installed in the server appears on this menu.



```

It will take about a few minutes to restart BMC.
Do you really reset BMC? (CPU/IO module0)

Yes: [Enter]  No: [ESC]

```

Confirmation message (BMC Reset)

<ESC> key: Stops processing and returns to Main menu.

<Enter> key: Resets BMC of CPU/IO module X (X = 0 or 1). It takes about 90 seconds to restart BMC.

Note

Do not shutdown the system, reboot the system, or perform any switch operation while BMC is being reset (for approximately 90 seconds).

3. SAS Configuration Utility

SAS Configuration utility makes settings of the built-in SAS controller. You can start it up by simple key operation during POST execution.

Important

- Because the server is installed with the latest version of the utility, your screen display may be different from the one described in this guide. For information on options different from those described in this guide, refer to the online help or ask your service agent.
- This utility is set for the CPU/IO module of the primary side. When you configure the CPU/IO module of the secondary side, first power off the server, plug out and plug in the AC power cord of the primary side. Then start the server.
- The SAS Configuration Utility is used for physical formatting. Do not change the settings on each utility menu, as doing so causes failure and malfunction of this server.

3.1 Starting the SAS Configuration Utility

Take the following procedures to start the SAS Configuration utility.

1. Power on the server.
2. Run the BIOS setup menu (see *Chapter 3 (1.1 Starting SETUP)*).
3. Choose **Legacy** from **Boot mode** in **Boot** menu.
4. Choose **Save Changes and Exit** in **Save & Exit** menu and then reboot.
5. The following messages appear in the POST and then keep pressing the <Ctrl> key and press the <C> key.

```
LSI Corporation MPT SAS3 BIOS
MPT3BIOS-x.xx.xx.xx (xxxx.xx.xx)
Copyright 2000-20xx LSI Corporation.

Press Ctrl-C to start LSI Corp Configuration
```

6. The SAS Configuration utility starts up with the **Adapter List** menu displayed.

The screenshot shows the Avago Technologies Config Utility interface. At the top, it displays 'Avago Technologies Config Utility' and the version 'v8.37.00.00 (2018.04.04)'. Below this, there are two menu options: 'Adapter List' (highlighted in green) and 'Global Properties'. The 'Adapter List' menu is expanded to show a table of SAS adapters. The table has columns for 'Adapter', 'PCI Bus', 'PCI Dev', 'PCI Fnc', 'PCI Slot', 'FW Revision', 'Status', and 'Boot Order'. One adapter is listed: 'SERUER2' with values '2A', '00', '00', '00', '16.00.00.00-IT', 'Enabled', and '0'. At the bottom of the screen, there are instructions: 'Esc = Exit Menu', 'F1/Shift+1 = Help', 'Alt+N = Global Properties', '-/+ = Alter Boot Order', and 'Ins/Del = Alter Boot List'.

Adapter	PCI Bus	PCI Dev	PCI Fnc	PCI Slot	FW Revision	Status	Boot Order
SERUER2	2A	00	00	00	16.00.00.00-IT	Enabled	0

3.2 Quitting the SAS Configuration Utility

Take procedures below to quit the SAS Configuration utility.

1. Keep pressing the <Esc> key until the menu shown below appears.
2. Select **Discard changes and reboot** or **Exit the Configuration Utility and Reboot** from the menu, and press the <Enter> key.

```
Are you sure you want to exit ?
Cancel Exit
Save changes and reboot.
Discard changes and reboot.
Exit the Configuration Utility and Reboot
```

Tips

Do not change the settings on the SAS Configuration. If you changed the settings, select **Discard changes and reboot** to finish the utility.

3. Run the BIOS setup menu after the rebooted (see *Chapter 3 (1.1 Starting SETUP)*).
4. Select **UEFI** from **Boot mode** from **Boot** menu.
5. Select **Save Changes and Exit** from **Save & Exit** menu, save the settings and then reboot.

3.3 Physical Formatting of the Hard Disk Drive

Important

This utility is set for the CPU/IO module of the primary side. When you configure the CPU/IO module of the secondary side, first power off the server, plug out and plug in the AC power cord of the primary side. Then start the server.

The following describes how to execute physical formatting of hard disk drive.

1. Press the <Enter> key on the **Adapter List** menu.

Adapter Properties menu appears. Select **SAS Topology** and press the <Enter> key.

```
Avago Technologies Config Utility      v3.37.00.00 (2018.04.04)
Adapter Properties -- SAS3008

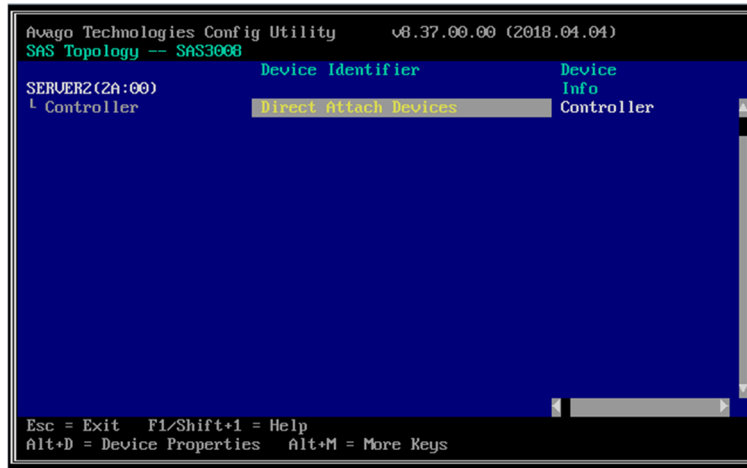
Adapter          SERUER2
PCI Slot         00
PCI Address(Bus/Dev) 2A:00
MPT Firmware Revision 16.00.00.00-IT
SAS Address      50030130:F2C05000
NVDATA Version   0E.01.B6.06
Status           Enabled
Boot Order       0
Boot Support     [Enabled BIOS & OS]

[SAS Topology]
[Advanced Adapter Properties]

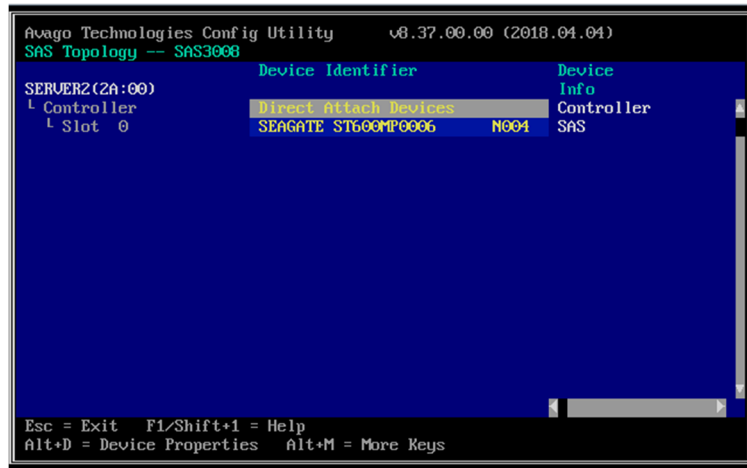
Esc = Exit Menu      F1/Shift+1 = Help
Enter = Select Item  -/+Enter = Change Item
```

2. Select **SAS Topology** and press the <Enter> key.

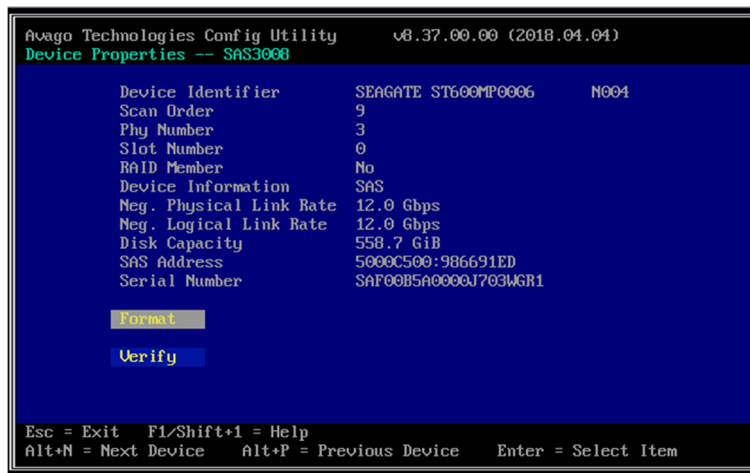
SAS Topology menu appears. Select **Direct Attach Device** and press the <Enter> key.



3. Hard disk drives that are installed on the primary CPU/IO module appear after a while. Select the hard disk drive to execute physical formatting, keep pressing the <Alt> key and press the <Enter> key.



4. **Device Properties** menu appears after a while. Select the **Format** and press the <Enter> key.



5. **Device Format** menu appears after a while. Press the <F> key to start formatting.

```

Avago Technologies Config Utility      v8.37.00.00 (2018.04.04)
Device Format -- SAS3008

Device Identifier      SEAGATE ST600MP0006      N004
SAS Address           5000C500:986691ED
Serial Number         SAF00B5A0000J703WGR1

WARNING: Format will change the current sector size
to its native sector size!
Format will permanently erase all data on this device!
Format may take hours to complete and cannot be stopped.
Press the 'F' key to begin format or any other key to exit.

Elapsed Time:         00:00:00

Percent
Complete      0%                               100%
  
```

6. After the completion of formatting, the following message appears.

Press any key to display the **Device Properties** menu.

```

Avago Technologies Config Utility      v8.37.00.00 (2018.04.04)
Device Format -- SAS3008

Device Identifier      SEAGATE ST600MP0006      N004
SAS Address           5000C500:986691ED
Serial Number         SAF00B5A0000J703WGR1

Status:               Complete!

Format completed successfully.
Press any key
  
```

7. After the completion of formatting, finish this utility (see *Chapter 3 (3.2 Quitting the SAS Configuration Utility)*).

Press any key to display the **Device Properties** menu.



4. Flash FDD

Flash FDD is a device that is compatible with a floppy disk drive.

Flash FDD is used when:

- Collecting the hardware logs (IPMI log)
See *Chapter 1 (11. Offline Tools)*.
- Backup/Restore of System information

Only one Flash FDD can be connected to a USB connector of this server. If another USB or floppy disk drive is connected to this server, be sure to remove it.

 CAUTION	
	<p>Be extremely careful not to lose Flash FDD or have it stolen. If Flash FDD is lost, stolen, misappropriated, or fraudulently obtained, there is a risk of leaking confidential information to a third party. NEC assumes no responsibility for damages caused by leaking confidential information in this way.</p>

If you want to change the write protection, remove Flash FDD from the server, change the write protection switch, and then connect it again.

4.1 Notes on Using Flash FDD

Do not use Flash FDD to back up data. Flash FDD can be used for collecting the hardware logs (IMPI log) or backup/restore of System information only.

4.1.1 Compensation for recorded data

NEC does not pay compensation for data recorded on Flash FDD even if the data is lost.

4.1.2 Handling Flash FDD

- Flash FDDs are consumables. If Flash FDD causes an error, replace with a new Flash FDD.
- Do not turn off the server while the access LED of Flash FDD is blinking.
- Flash FDD cannot be connected to a USB hub. Directly connect Flash FDD to the server.
- Before handling Flash FDD, discharge static electricity from your body by touching a doorknob or aluminum frame, and other metal objects.
- Remove Flash FDD from the server when not in use.

4.1.3 Use with EXPRESSBUILDER

- Connect Flash FDD after Home Menu of EXPRESSBUILDER appears.
- Remove Flash FDD from the server before closing EXPRESSBUILDER.

5. Details of EXPRESSBUILDER

EXPRESSBUILDER helps you to maintain the server. EXPRESSBUILDER also provides bundled software and instruction manuals.

5.1 Starting EXPRESSBUILDER

You can start EXPRESSBUILDER by using the EXPRESSBUILDER DVD as follows:

- (1) Insert the DVD into the server, and then restart.

Boot Selection Menu shown in *Chapter 3 (5.2 Menus of EXPRESSBUILDER) - (1) Boot Selection Menu* will appear.

- (2) Insert the DVD into a computer running Windows.

Autorun Menu shown in *Chapter 3 (5.2 Menus of EXPRESSBUILDER) - (4) Autorun Menu* will appear.

If the menu does not appear, run the following file on DVD.

```
\autorun\dispatcher_x64.exe.
```

5.2 Menus of EXPRESSBUILDER

You can operate EXPRESSBUILDER by using onscreen menus.

(1) Boot Selection Menu

When the server starts from EXPRESSBUILDER, the following menu appears.

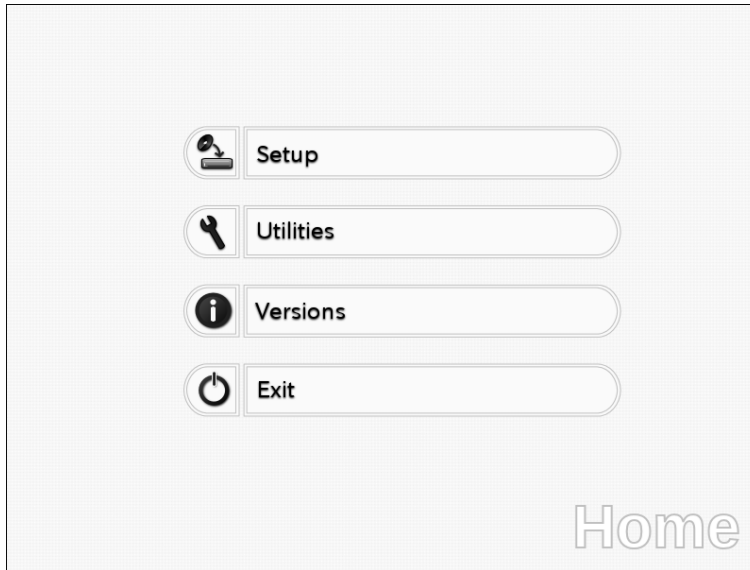
Choose an item by using arrow keys and <Enter> key.

Boot selection
OS installation *** default ***
Tool menu

When **OS installation** is chosen or no key is pressed, Home Menu shown in *(2) Home Menu* will appear.

When **Tool menu** is chosen, Tool Menu shown in *(3) Tool Menu* will appear.

(2) Home Menu



Operate Home Menu using the mouse or keyboard (Tab and Enter keys).

Home Menu includes the following items:

a) Setup

Do not select this item because the item is not supported for this server.

b) Utilities

Starts a utility in EXPRESSBUILDER.

For details, see *Chapter 3 (5.3 Utility in EXPRESSBUILDER)*.

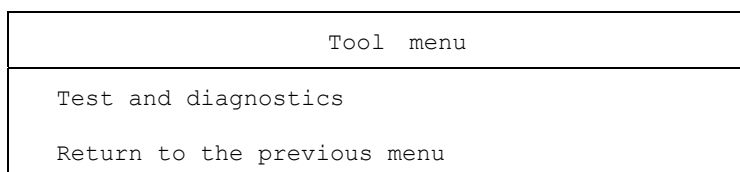
c) Versions

Shows the versions of software and drivers in EXPRESSBUILDER.

d) Exit

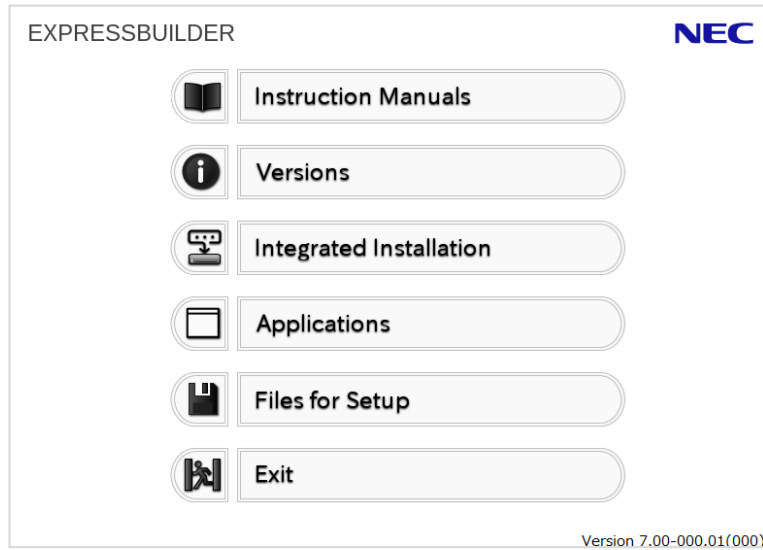
Closes EXPRESSBUILDER, and then shut down or restart the server.

(3) Tool Menu



Choose **Test and diagnostics** to run System Diagnostics, which is used to analyze and diagnose the server and check the cable connection. For details, see *Chapter 1 (10. System Diagnostics)*.

(4) Autorun Menu



Use Autorun menu to read documents or install bundled software. Adobe Reader is needed to view or print manuals of PDF format.

Integrated Installation

You can easily install NEC ESMPRO using this feature. Log on the Windows with the built-in Administrator to use this feature.

5.3 Utility in EXPRESSBUILDER

You can run the following utility when choosing **Utilities** from Home Menu.

File Execution

Directly runs an external utility on removable media. Use this feature for utilities provided by NEC.

Note

Do not run the file provided by a third party.

6. EXPRESSSCOPE Engine 3

EXPRESSSCOPE Engine 3 enables various features by using Baseboard Management Controller (BMC).

EXPRESSSCOPE Engine 3 monitors the status of power supplies, cooling fans, temperature, voltage, and other statuses inside the server. Connecting the management LAN connector (see *Chapter 1 (4.3 Rear View)* in *User's Guide*) to your network enables you to do the following from a remote site through a web browser and SSH client:

- Managing the server
- Operating keyboard, video, and mouse (KVM) from a remote console
- Accessing a CD-ROM, DVD ROM, floppy disk, ISO image, or USB flash drive in a remote console (*)

* To actualize these features, virtual USB mass storage (Remote FD, Remote CD/DVD, Remote USB Memory, or Virtual Flash) is always connected as USB mass storage.

Tips

To reset BMC, use the Off-line Tool of the server.
For details, see *Chapter 3 (2. BMC Configuration)*.

Note

EXPRESSSCOPE Engine 3 is implemented on both CPU/IO modules (module 0 and 1) and configuration is required on both modules. Set different IP addresses for CPU/IO module 0 and CPU/IO module 1.

7. NEC ESMPRO

7.1 NEC ESMPRO Agent

For details of NEC ESMPRO Agent, refer to *User's Guide* in ft control software Install DVD.

7.2 NEC ESMPRO Manager

NEC ESMPRO Manager remotely controls and monitors the server hardware.

To use these features, install the bundled software such as NEC ESMPRO Agent on the server.

See "*NEC ESMPRO Manager Installation Guide*" or online help of NEC ESMPRO for details.

Note When you change the BMC network settings by using NEC ESMPRO Manager, it may take time to complete the setting.

7.2.1 Monitoring the ESXi status of the ft server (ESXi 6.5 or later)

To monitor the status of the ft server (ESXi 6.5 or later) from NEC ESMPRO Manager, enable the WS-MAN service of ESXi prior to component registration of the ESXi of the ft server to NEC ESMPRO Manager.

Note The WS-MAN service is disabled by default in the ft server ESXi 6.5 or later. Therefore, the ESXi status cannot be monitored from NEC ESMPRO Manager by default.

Enable the WS-MAN service of ESXi according to the following procedure.

1. Describe the following contents in the `/etc/rc.local.d/local.sh` file of the ESXi host.

```
# cat /etc/rc.local.d/local.sh
:
esxcli system wbem set --ws-man true
/etc/init.d/wsman restart
/etc/init.d/sfcbd-watchdog restart
:
exit 0
```

Note For details of how to describe in the `/etc/rc.local.d/local.sh` file, refer to Knowledge Base of VMware.

[VMware Knowledge Base -Modifying the rc.local or local.sh file in ESX/ESXi to execute commands while booting (2043564)]

<https://kb.vmware.com/kb/2043564>

2. Restart the ft server.
3. Configure the WS-MAN on the NEC ESMPRO Manager side.

Note

For detailed setting on the NEC ESMPRO Manager side, refer to “*NEC ESMPRO Manager Setup Guide*”.

[NEC ESMPRO Manager Ver. x.xx (Windows)]

<http://www.58support.nec.co.jp/global/download/>

→ [ESMPRO]TAB

→ NEC ESMPRO Manager Ver. 6 Setup Guide [PDF]

You register component of BMC with the ESXi host of this server on NEC ESMPROManager. After that do component registration of ftSys Management Appliance.

Glossary

Term	Description
BIOS Setup Utility (SETUP)	Software for setting BIOS. You can run this software by pressing <F2> key during POST.
BMC	Baseboard Management Controller (BMC) is a built-in controller that supports the IPMI version 2.0 protocol. BMC can manage the server hardware.
BMC Configuration Utility	Software for setting BIOS or BMC. You can use as Windows application or run this software when pressing <F4> key during POST.
CPU module	A CPU subsystem logically configured in a CPU/IO module. It includes CPUs and memory.
CPU/IO module	A module that includes CPUs (processors), memory, PCI boards, a cooling fan, hard disk drives and power supply units.
DUMP Switch	A switch that is used for collecting the memory dump if an error occurs. You can specify the destination of the dump by using the OS function.
EXPRESSBUILDER	Standard software for setting up the server easily. This also includes several useful applications and instruction manuals.
EXPRESSSCOPE ENGINE 3	A name of BMC for NEC Express5800 series.
Flash FDD	An optional USB device that can use as a floppy disk drive.
I/O module	An I/O subsystem logically configured in a CPU/IO module. It includes hard disk drives, PCI cards, BMC and 1G/10G LAN.
NEC ESMPRO	Standard software for the server management. This consists of several applications for managing or monitoring.
NEC ESMPRO Agent	Software for monitoring the server. This works with NEC ESMPRO Manager and resides as the OS service.
NEC ESMPRO Manager	Software for managing a number of servers on network.
OS standard installer	An installer that stored in Windows installation disc. Use this installer if you want to install the OS manually.
Offline tools	Software that can confirm or change IPMI data such as SEL, SDR, or FRU. You can start Offline tools when pressing <F4> key during POST.
PC for Management	A computer for managing the server on network. A general Windows/Linux computer can be used as "PC for Management".

Revision Record

Document Number	Date Issued	Description
30.104.02-104.01	July 2019	Newly created

NEC Express Server

Express5800/R320g-E4, R320g-M4
Maintenance Guide (VMware)

July 2019

NEC Corporation
7-1 Shiba 5-Chome, Minato-Ku
Tokyo 108-8001, Japan

© NEC Corporation 2019

The contents of this manual may not be copied or altered without the prior written permission of NEC Corporation.