NEC

Maintenance Guide (VMware)

NEC Express Server
Express5800 Series

Express5800/R320e-E4
Express5800/R320e-M4
Express5800/R320f-E4
Express5800/R320f-M4
EXP320R, EXP320S

Chapter 1   Maintenance

Chapter 2   Configuring and Upgrading the System

Chapter 3   Useful Features

Manuals

Manuals for this product are provided as booklets (📖) and as electronic manuals (📄) in the EXPRESSBUILDER DVD (💿).

💿 EXPRESSBUILDER

📄 📖 Safety Precautions and Regulatory Notices	
	Describes points of caution to ensure the safe use of this server. **Read these cautions before using this server.**

📄 📖 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	
Chapter 1: Installing OS	Installation of OS and drivers, and precautions for installation
Chapter 2: Installing Bundled Software	Installation of bundled software, such as NEC ESMPRO
Chapter 3: Configuring the Separate Log Server	Configure the log server using other than ftSys Management Appliance

📄 📖 Maintenance Guide	
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

Conventions Used in This Document

Signs and symbols for safety

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

⚠ **WARNING**   Indicates there is a risk of death or serious personal injury

⚠ **CAUTION**   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, **hardware failure, data loss, and other serious malfunctions could occur**.
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 one of the following drives. These drives are 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

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

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EDK/EDKII

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http://www.nec.com/

Safety notes

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

1

Maintenance

NEC Express5800 Series
Express5800/R320e-E4, R320e-M4,
R320f-E4, R320f-M4

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

Express5800/R320e-E4, R320e-M4, R320f-E4, R320f-M4   Maintenance Guide (VMware)

1. 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 safety. 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, NiMH, or Li-ion 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 media from the optical disk drive.

2.   Power off the server (POWER LED is unit).

3.   Unplug the power cord of the server from the power outlet.

4.   Disconnect all the cables from the server.

5.   Remove 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 and cause malfunctions and failures when these are used in such state. 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 top conditions at all times, periodically check and perform maintenance as follows. If abnormalities are found, ask your sales representative, avoiding impossible operation.

2.1   Checking and Applying Updates

Express5800 Series posts update information for BIOS, FW (firmware), 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: http://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

NEC ESMPRO Manager   AlertViewer

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:
- Power on the server and while the server is running.
- Before shutting down the server.

LEDs to be checked:
- LEDs located at front of the server

System POWER LED

System FAULT LED

System FT LED
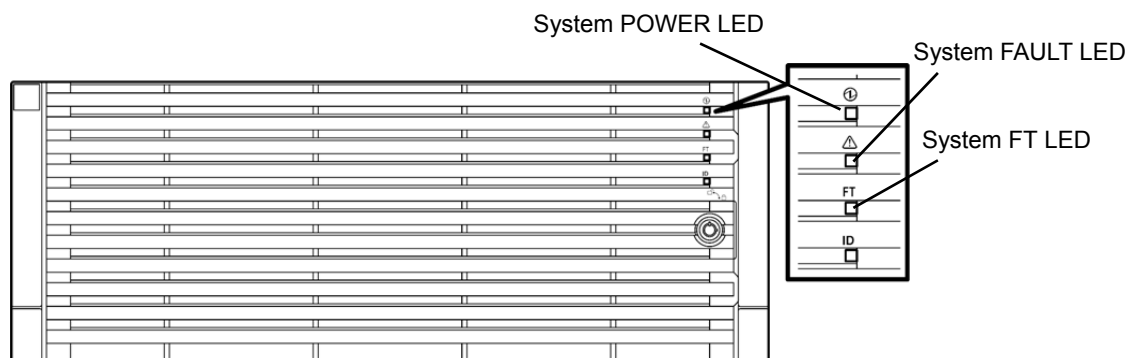
- LEDs on hard disk drives installed in 2.5-inch hard disk drive bay

Slot 0   Slot 1   Slot 2   Slot 3   Slot 4   Slot 5   Slot 6   Slot 7

Slot 0   Slot 1   Slot 2   Slot 3   Slot 4   Slot 5   Slot 6   Slot 7

DISK ACCESS LED
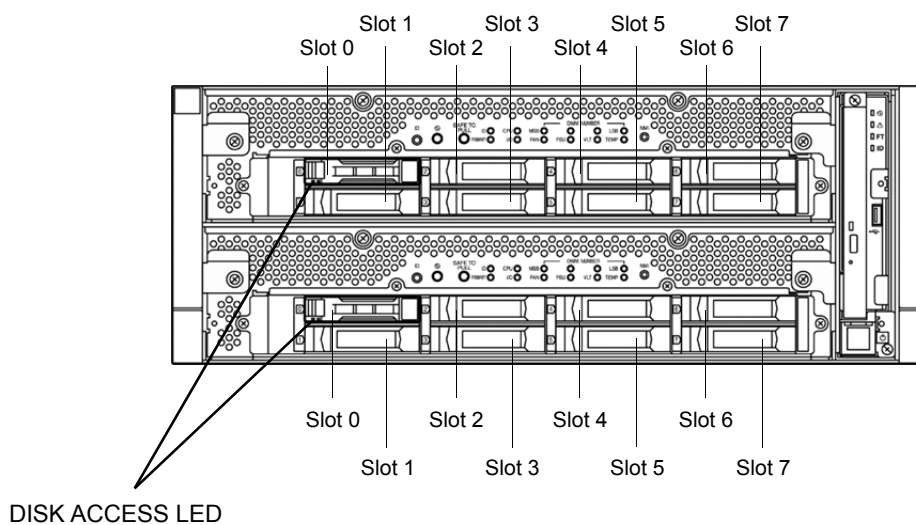
If the indicator shows the server abnormality, contact your salses representative.

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

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

1. Power off the server.

   1. Make sure that the server is powered off.

   2. 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.

   1. Soak a soft cloth in neutral detergent that is diluted with cold or warm water, and squeeze it firmly.

   2. Rub off stains on the server with the cloth prepared in Step 1.

   3. Soak a soft cloth in water, squeeze it firmly and wipe the server with it once again.

   4. 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 of the server with a dry cloth.

2.5.2 Cleaning Tape Drive

A dirty tape drive head causes unsuccessful file backup and damages the tape cartridge. Periodically clean the tape drive with the designated cleaning tape.
For the cleaning interval and method, the estimated usable period and lifetime of the tape cartridge, refer to the instructions attached to the tape drive.

2.5.3 Cleaning the Keyboard and Mouse

Check that the entire system including the server and peripheral devices is powered off (POWER LED is unlit), and then wipe the surface of the keyboard with a dry cloth.

If an optical sensor of the mouse is dusty, it cannot work normally. Wipe the optical sensor with a dry cloth to remove any dirt or dust.

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. Refer to *Chapter 1 (6. Error Messages)*.
3. Refer to *Chapter 1 (8. Troubleshooting)*. If you find a symptom similar to your problem, take the action as instructed.
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/IO 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 ***:nn.n* (for example, 7c: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 - 0/16	1/1 - 1/16
Processors	0/21,0/22	1/21,1/22
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 07:00.0, 07:00.1 vmnic_100600 vmnic_100601	11/6 41:00.0, 41:00.1 vmnic_110600 vmnic_110601
Display controller VGA compatible controller: Matrox® Graphics, Inc. MGA G200e	10/7 2c:00.0	11/7 66:00.0
Serial bus controllers USB controller: Intel Corporation DH82029	10/8 2b:00.0, 2b:00.1	11/8 65:00.0, 65:00.1
Bridge	10/10, 10/11	11/10, 10/11
Network controller Ethernet controller: Intel Corporation Ethernet Controller 10-Gigabit X540-AT2	10/12 9e:00.0, 9e:00.1 vmnic_101200 vmnic_101201	11/12 d8:00.0, d8:00.1 vmnic_111200 vmnic_111201
Internal disk controller Hard disk drive 1-8	10/40 10/40/1 - 10/40/8	11/40 11/40/1 - 11/40/8
2xPCIe	10/70	11/70
Baseboard Management Controller	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/IO 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/IO 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)
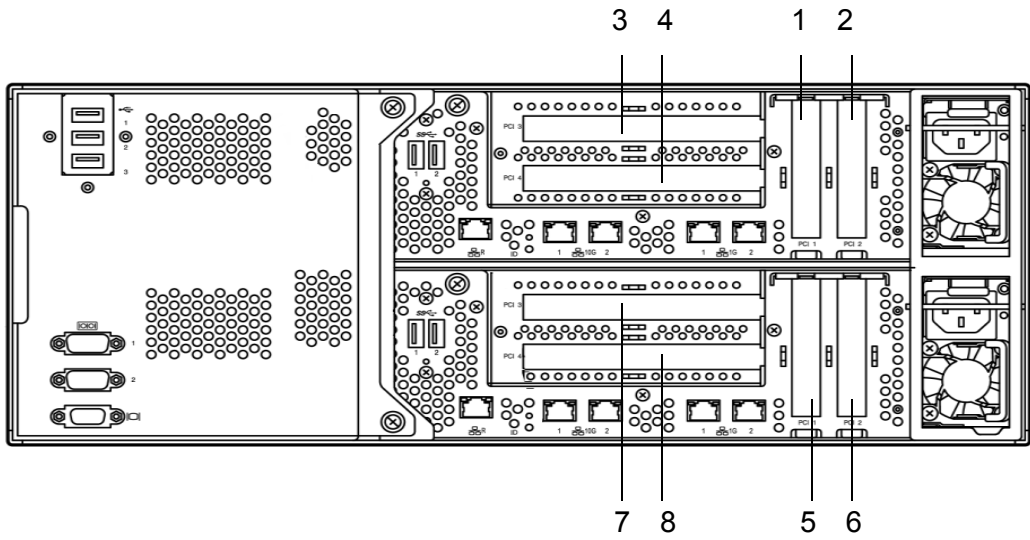
Callout	Device	Device ID
1	I/O module 0 PCI Slot 1	10/1
2	I/O module 0 PCI Slot 2	10/2
3	I/O module 0 PCI Slot 3	10/3
4	I/O module 0 PCI Slot 4	10/4
5	I/O module 1 PCI Slot 1	11/1
6	I/O module 1 PCI Slot 2	11/2
7	I/O module 1 PCI Slot 3	11/3
8	I/O module 1 PCI Slot 4	11/4

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   -     -
...
0/21        Intel(R) Xeon(R) CPU E5-2671 v4 @ 2.30GHz 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   -     -
...
1/21        Intel(R) Xeon(R) CPU E5-2671 v4 @ 2.30GHz 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
0000:09:00.0 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
0000:7d:00.0 Fibre Channel: QLogic Corp. ISP8324-based ONLINE  DUPLEX  -     -
10/4        -                                       MISSING EMPTY   -     -
10/5        Mass Storage Ctlr                       ONLINE  DUPLEX  -     0
0000:1a:00.0 Mass storage controller: LSI Logic / Symb ONLINE  DUPLEX  -     -
10/6        Network Ctlr                            ONLINE  DUPLEX  -     0
0000:07:00.0 Ethernet controller: Intel Corporation I3 ONLINE  DUPLEX  -     -
vmnic_100600 Network Interface                      ONLINE  DUPLEX  -     -
0000:07:00.1 Ethernet controller: Intel Corporation I3 BROKEN  BROKEN  -     -
vmnic_100601 Network Interface                      BROKEN  BROKEN  -     -
10/7        Display Ctlr                            ONLINE  DUPLEX  -     0
0000:2c:00.0VGA compatible controller: Matrox Electro  ONLINE  DUPLEX  -     -
10/8        USB Serial Bus Ctlr                     ONLINE  ONLINE  -     0
0000:2b:00.0USB Controller: Intel Corporation Wellsbu  ONLINE  ONLINE  -     -
0000:2b:00.1USB Controller: Intel Corporation Wellsbu  ONLINE  ONLINE  -     -
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
0000:9e:00.0 Ethernet controller: Intel Corporation Et ONLINE  DUPLEX  -     -
vmnic_101200 Network Interface                      ONLINE  DUPLEX  -     -
0000:9e: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
0000:43:00.0 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:b7:00.0 Fibre Channel: QLogic Corp. ISP8324-based ONLINE  DUPLEX   -     -
11/4          -                                     MISSING EMPTY    -     -
11/5          Mass Storage Ctlr                     ONLINE  DUPLEX   -     0
0000:54:00.0 Mass storage controller: LSI Logic / Symb ONLINE  DUPLEX   -     -
11/6          Network Ctlr                          ONLINE  DUPLEX   -     0
0000:41:00.0 Ethernet controller: Intel Corporation I3 ONLINE  DUPLEX   -     -
vmnic_110600 Network Interface                      ONLINE  DUPLEX   -     -
0000:41:00.1 Ethernet controller: Intel Corporation I3 BROKEN  BROKEN   -     -
vmnic_110601 Network Interface                      BROKEN  BROKEN   -     -
11/7          Display Ctlr                          ONLINE  DUPLEX   -     0
0000:66:00.0 VGA compatible controller: Matrox Electro ONLINE  DUPLEX   -     -
11/8          USB Serial Bus Ctlr                   ONLINE  ONLINE   -     0
0000:65:00.0 USB Controller: Intel Corporation Wellsbu ONLINE  ONLINE   -     -
0000:65:00.1 USB Controller: Intel Corporation Wellsbu ONLINE  ONLINE   -     -
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:d8:00.0 Ethernet controller: Intel Corporation Et ONLINE  DUPLEX   -     -
vmnic_111200 Network Interface                      ONLINE  DUPLEX   -     -
0000:d8:00.1 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/R320f-M4 system, P-Package N8800-219F, 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                 : 243-634944
Artwork Rev            : 0
ECO Level              : 0
Min Partner ECO Level  : 0
Serial #               : DBA2BE460004
Active Compat Node     : false
Logic Revision         : 2800028
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                : HGST:HUC101812CSS200
Firmware Rev          : A920
Serial                : 06G0971H
Device Name           : disk_i
Udev Device Names     : -
Kernel Device Names   : vmhba1:C0:T1:L0
Endurance             : -
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 Controller**

To stop the internal disk controller, use the **ftsmaint** command as well. For example, use the following
command to stop the disk drive 1 of internal disk controller.

```
# /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 controller 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                 : 243-634944
 Firmware Rev           : BIOS Version 9.1:31
 Artwork Rev            : 0
 ECO Level              : 0
 Min Partner ECO Level  : 0
 Serial #               : DBA2BE460004
 Logic Revision         : 2800028
 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/2800_4800_6800/062-03711bmc_b*nn.nnrnn.nnsnn.*

   ***nn*.bin/opt/ft/firmware/bmc/2800_4800_6800**

Tips	See *Chapter 2 (1.1.2 Install NEC ESMPRO 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 30 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      : 04.71/01.03/04.08    Version is indicated in the underlined part.
   ```

   ```
   # /opt/ft/bin/ftsmaint ls 11/120
    Op State          : DUPLEX
    :
    Firmware Rev      : 04.71/01.03/04.08    Version is indicated in the underlined part.
   ```

7. Run the following command to check that Op State of I/O module 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/2800_4800_6800/062-03711bios*n.n.nn***.rom**

   /opt/ft/firmware/bios/2800_4800_6800

   > **Tips** | See *Chapter 2 (1.1.2 Install NEC ESMPRO 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 9.1:31   Version is indicated in the underlined part.


# /opt/ft/bin/ftsmaint ls 1
 Op State        : DUPLEX
   :
 Firmware Rev    : BIOS Version 9.1:31   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/IO module has a processor function part and IO function part.

Tips	Processor function part and IO function exists in the CPU/IO 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.
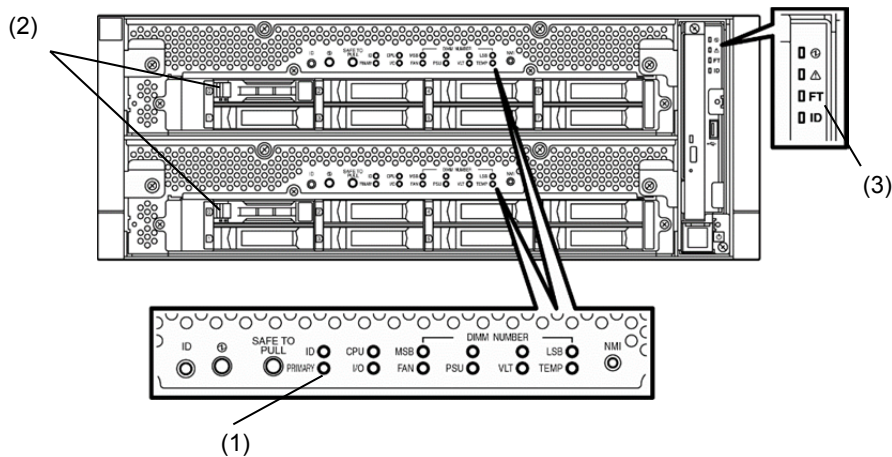
[Indications of the status LED when I/O modules are duplicated]

* 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.
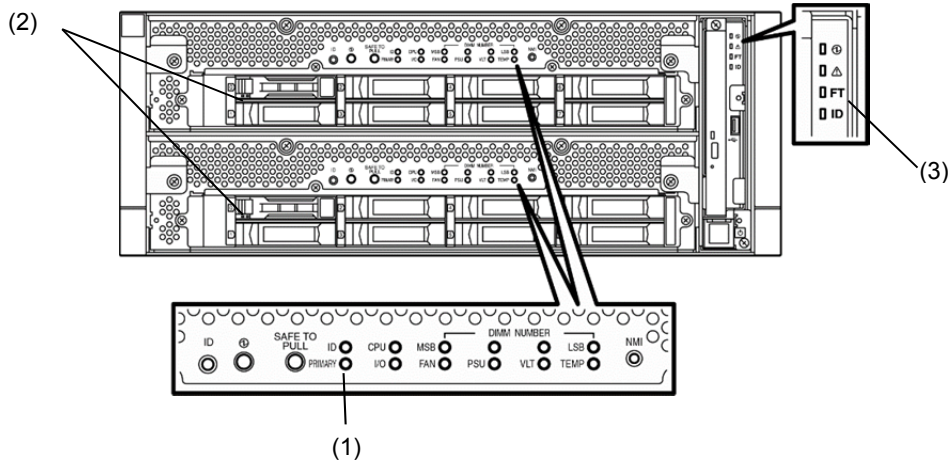
[Indications of status LED when CPU modules are duplicated]

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

If the server enters the abnormal state, the error is posted by various means. This section explains the types of error messages.

- LED indication is unusual.

  → Refer to "*6.1 Error Messages by LED Indication*".

- An error message appeared.

  → Refer to "*6.2 POST Error Message*".

6.1   Error Messages by LED Indication

The LEDs on the front and rear panels of the server and near the handles of hard disk drives inform the user of the various server statuses by the colors and the patterns of going on, going off, and flashing. If trouble seems to have occurred, check the LED indication.

This Maintenance Guide describes actions to be taken for watch error message. However, if replacement of modules is necessary, contact your sales agent.

System POWER LED

System FAULT LED

System FT LED

<With Front Bezel mounted>

DISK Access LED   Module POWER LED

System POWER LED

System FAULT LED

System FT LED

Optical DISK ACCESS LED

EXPRESSSCOPE

<With Front Bezel removed>

Power Unit LED

1GLAN connector

SPEED LED

Management LAN port

Module ID LED

10GLAN connector
(R320e-M4, R320f-M4
only)

LINK/ACT LED

<Rear Panel>
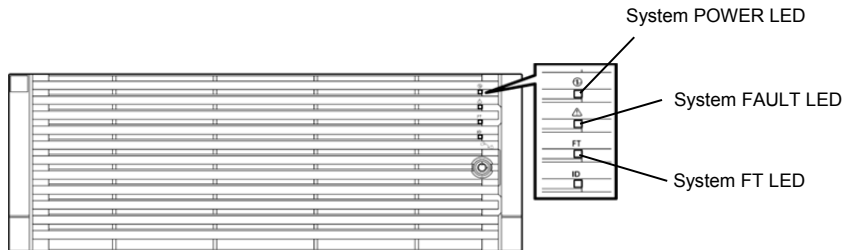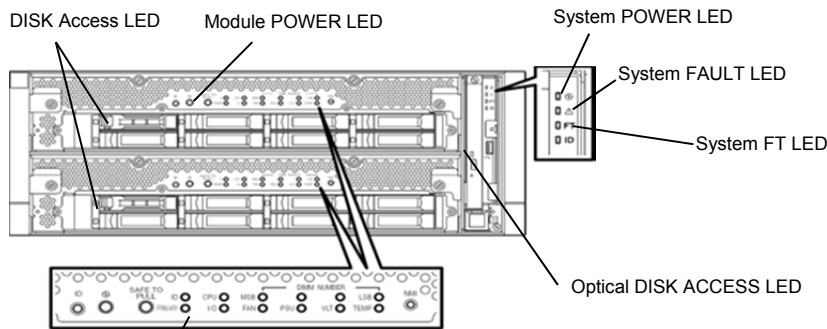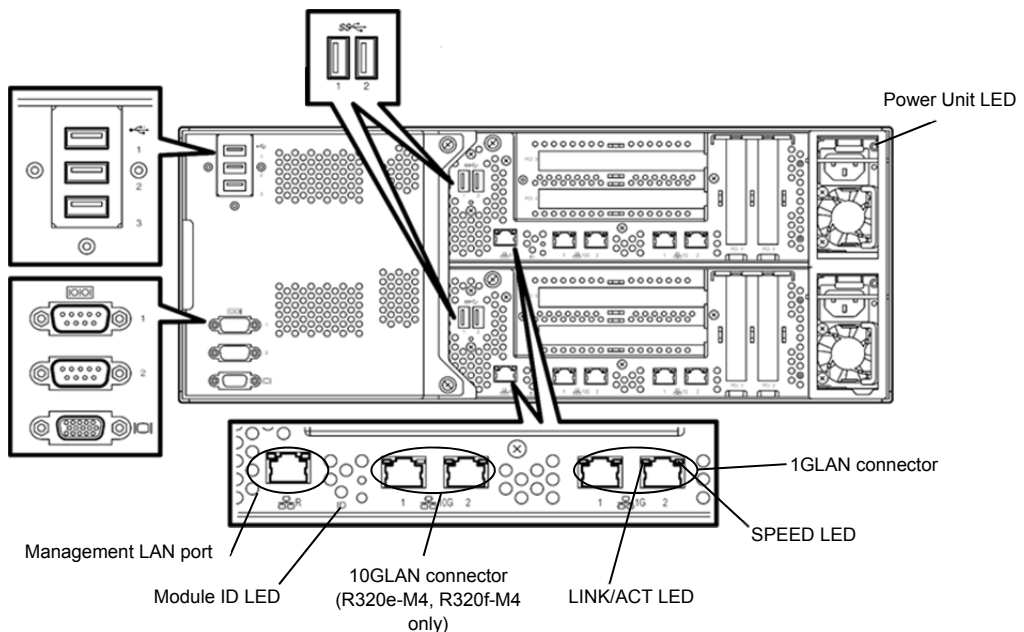
(1) **System POWER LED**

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 status. 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, then contact your service representative.
Blinking (amber)	One of the CPU/IO modules failed. However, the failed CPU/IO module cannot be identified.	Contact your service representative.

(3) **System FT LED**

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

(4) **System ID LED**

LED indication	Description	Action
On (blue)	The UID switch is pressed.	–
Blinking (blue)	The device identification request is issued from remote site.	–
Off	–	–

(5) **Disk Access LED**

DISK LED 2 (amber)

DISK LED 1 (green)
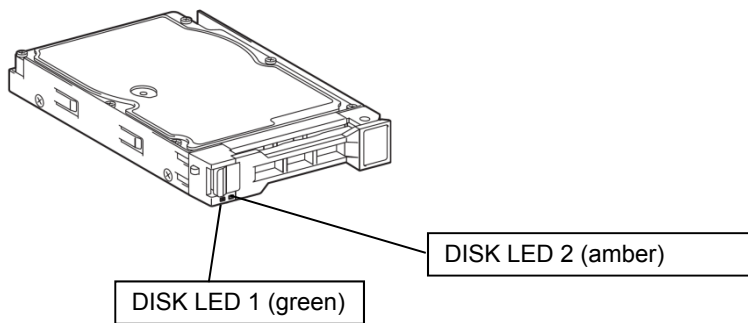
Conditions of DISK LED		Description	Action
DISK LED 1	DISK LED 2		
Off	Off	The disk is in the idle state.	–
Blinking (green)	Off	The disk is being accessed.	–
Off	On (amber)	The disk is failing.	Contact your sales representative.
Off	Blinking (amber)	The mirror of the disk is disconnected.	Perform mirroring.
Blinking in green and amber in turn		The mirror of the disk is being rebuilt or disconnected.	Check whether the mirror of the disk is disconnected.

(6) **Access LED on optical disk drive**

LED indication	Description	Action
Off	The optical disk is not accessed.	–
On	The 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 main unit and hub, and they are connected correctly ("LINK").	–
Blinking (green)	The network port is sending or receiving data (ACT).	–
Off	Disconnected from network.	Check the network status and cable connection.

SPEED LED (Management port)

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

SPEED LED (1G LAN connector)

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

SPEED LED (10G LAN connector)

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

(8) EXPRESSSCOPE

If any module fails, LED on EXPRESSSCOPE relevant to the failed module lights in amber.
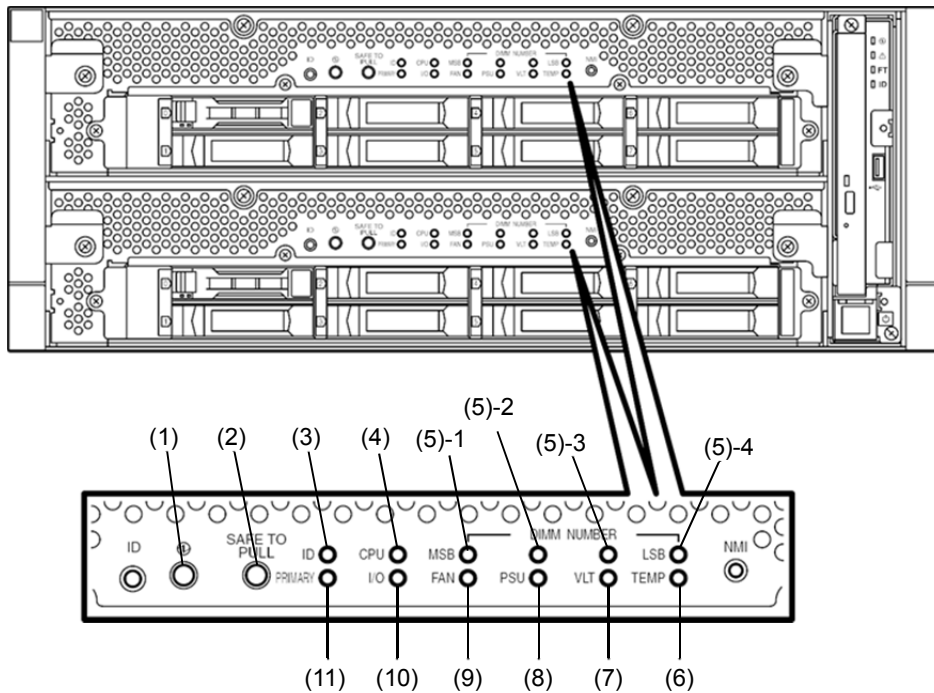
(1) Module POWER LED

LED indication	Description	Action
On (green)	The power of CPU/IO module is ON.	–
Off	The AC power is not supplied to the CPU/IO module. (It may take about 1 minute until standby state (this LED is blinking) after the AC power is supplied.)	–
Blinking (green)	The 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)	The CPU/IO module can be removed.	–
Blinking (green)	The CPU/IO module cannot be removed.	–
Off	The CPU/IO module is in offline state.	–

(3) Module ID (ID LED)

The Module ID LED is used for identifying the device that requires maintenance among devices mounted on the rack.

LED indication	Description	Action
On (green)	The UID switch is pressed.	–
Blinking (green)	The device identification requests was sent from remote site.	–
Off	–	–

(4) CPU (CPU FAULT LED)

The LED lights in amber when the CPU part (CPU module) of CPU/IO modules fails. Contact your service representative.

(5) MEM NUMBER (Memory slot error LED)

The LED lights amber when failure occurs on the memory slot of CPU/IO module.
Memory slots with errors can be identified by lighting status of the (5)-1 to (5)-4 as shown in the table below.

Status of memory slot error LED				Description	Action
(5)-1 (MSB)	(5)-2	(5)-3	(5)-4 (LSB)		
–	–	–	–	Operating normally.	–
–	–	–	○	An error occurred on memory slot 1.	Contact your sales representative.
–	–	○	–	An error occurred on memory slot 2.	Contact your sales representative.
–	–	○	○	An error occurred on memory slot 3.	Contact your sales representative.
–	○	–	–	An error occurred on memory slot 4.	Contact your sales representative.
–	○	–	○	An error occurred on memory slot 5.	Contact your sales representative.
–	○	○	–	An error occurred on memory slot 6.	Contact your sales representative.
–	○	○	○	An error occurred on memory slot 7.	Contact your sales representative.
○	–	–	–	An error occurred on memory slot 8.	Contact your sales representative.
–	–	–	●	An error occurred on memory slot 9.	Contact your sales representative.
–	–	●	–	An error occurred on memory slot 10.	Contact your sales representative.
–	–	●	●	An error occurred on memory slot 11.	Contact your sales representative.
–	●	–	–	An error occurred on memory slot 12.	Contact your sales representative.
–	●	–	●	An error occurred on memory slot 13.	Contact your sales representative.
–	●	●	–	An error occurred on memory slot 14.	Contact your sales representative.
–	●	●	●	An error occurred on memory slot 15.	Contact your sales representative.
●	–	–	–	An error occurred on memory slot 16.	Contact your sales representative.
●	●	●	●	An error occurred on unknown memory slot. Or the memory is unpopulated.	Contact your sales representative.

○:   LED is lit.
●:   LED is blinking.
–:   LED is unlit.

(6) TEMP (Abnormal temperature LED)

The LED lights in amber when temperature in CPU/IO module becomes abnormal. Contact your service representative.

(7) VLT (Power error LED)

The LED lights in amber when electric voltage failure occurs in CPU/IO module. Contact your service representative.

(8) PSU (Power supply unit error LED)

The LED lights in amber when failure occurs on the power supply unit of CPU/IO module. Contact your service representative.

(9) FAN (Fan error LED)

The LED lights in amber when failure occurs on the cooling fan for CPU of CPU/IO module. Contact your service representative.

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

The LED lights in amber when failure occurs on the I/O (I/O module) part of CPU/IO module. Contact your service representative.

(11) PRIMARY (PRIMARY LED)

The LED lights in green when CPU/IO module is primary. This LED may blink in green while the DUMP (NMI) switch is pressed.

(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 power unit does not receive the AC power.	–
Blinking (green)	The power unit receives the AC power.	–
On (green)	The server is powered on.	–
On (amber) Blinking (amber)	The power supply unit fails.	Contact your service representative.

6.2 POST Error Message

When POST detects any error, it displays an error message on the display unit.

```
System Monitoring Check
... Passed
ERROR
8002: Check date and time settings

Press <F1> to resume, <F2> to setup
```

Example of error message
This message indicates that date and time
set on realtime clock is incorrect.
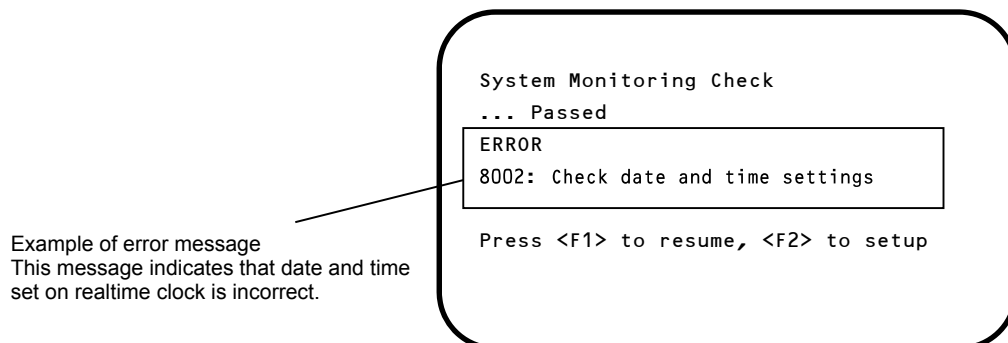
The following table lists error messages and the actions to take in response to them.

Tips	• Write down the displayed messages before contacting your sales representative. • The list only contains messages for the server. For details about error messages of optional devices, and the actions to take, refer to the instructions that come with each product.

(1) **Error messages**

	Error Message	Cause	Solution
8000	System variable is corrupted.	Illegal setup information of BIOS occurred.	Start BIOS Setup Utility (SETUP), and then execute **Load Setup Defaults** and specify the necessary settings. If the same error is detected repeatedly in spite of re-setting, contact your sales representative.
8001	Real time clock error	Real time clock error occurred.	Start SETUP, and then specify the correct date and time. If the same error is detected repeatedly in spite of re-setting, contact your sales representative.
8002	Check date and time settings	Incorrect date and time set on real time clock occurred.	
8006	System configuration data cleared by Jumper.	The setup utility settings were cleared using the jumper.	Follow the steps described in *Chapter 1 (9. Resetting and Clearing the Server)*.
8007	SETUP Menu Password cleared by Jumper.	The setup utility password was cleared using the jumper.	
8800	DXE_NB_ERROR	An error occurred during initialization of chipset.	Contact your sales representative.
8801	DXE_NO_CON_IN	An error occurred 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** → **PCIx 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 occurred.	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	PCI device resource allocation failed.	Check the connection of the optional board.
C010	The error occurred during temperature sensor reading	An error occurred while reading temperature sensor.	Contact your sales representative.
C011	System Temperature out of the range.	A temperature abnormality occurred.	It is possible that a fan has failed or is clogged. Contact your sales representative.

Error Message		Cause	Solution
C061	1st SMBus device Error detected.	An error occurred on 1st SM Bus.	Contact your sales representative.
C062	2nd SMBus device Error detected.	An error occurred on 2nd SM Bus.	
C063	3rd SMBus device Error detected.	An error occurred on 3rd SM Bus.	
C064	4th SMBus device Error detected.	An error occurred on 4th SM Bus.	
C065	5th SMBus device Error detected.	An error occurred on 5th SM Bus.	
C066	6th SMBus device Error detected.	An error occurred on 6th SM Bus.	
C067	7th SMBus device Error detected.	An error occurred on 7th SM Bus.	
C101	BMC Memory Test Failed..	An error occurred on BMC.	Unplug the power cord, wait for at least 30 seconds, then restart the server. If the same error is detected repeatedly, contact your sales representative.
C102	BMC Firmware Code Area CRC check Failed.		
C103	BMC core hardware failure.		
C104	BMC IBF or OBF check failed.	An error occurred while accessing BMC.	
C105	BMC SEL area full.	There is not enough space to store the system event log.	Delete the event logs with following the steps described in Chapter 3 (1.2.4 (3) Event Log Configuration submenu).
C10C	BMC update firmware corrupted.	An illegality occurred while updating BMC firmware.	Unplug the power cord, wait for at least 30 seconds, then restart the server. If the same error is detected repeatedly, contact your sales representative.
C10D	Internal Use Area of BMC FRU corrupted.	An illegality occurred in FRU containing the device information.	
C10E	BMC SDR Repository empty.	An error occurred on BMC SDR.	
C10F	IPMB signal lines do not respond.	Failure of Satellite Management Controller occurred.	
C110	BMC FRU device failure.	An error occurred in FRU that contains device information.	
C111	BMC SDR Repository failure.	Failure occurred in SROM that stores the SDR.	
C112	BMC SEL device failure.	Device failure occurred in BMC SEL.	
C113	BMC RAM test error.	An error occurred in BMC RAM.	
C114	BMC Fatal hardware error.	A hardware error occurred in BMC.	
C115	Management controller not responding	Management controller does not respond.	Update the BMC firmware. If the same error is detected repeatedly, contact your sales representative.
C116	Private I2C bus not responding.	Private I2C bus does not respond.	Unplug the power cord, wait for at least 30 seconds, then restart the server. If the same error is detected repeatedly, contact your sales representative.
C117	BMC internal exception	BMC internal error occurred.	
C118	BMC A/D timeout error.	BMC A/D timeout error occurred.	
C119	SDR repository corrupt.	BMC error or illegal SDR data occurred.	
C11A	SEL corrupt.	BMC error or illegal system event log data occurred.	

Error Message		Cause	Solution
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 occurred 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, then restart the server. At that time, check the jumper switch setting on motherboard. If the same error is detected repeatedly, contact your sales representative.
D483	BP SROM data invalid	An invalid data occurred in system backplane.	Contact your sales representative.
D484	BP SROM data read error	Failed to read data in system backplane.	
D485	MB SROM data invalid	An invalid data occurred in CPU/IO board.	
D486	MB SROM data read error	Failed to read data in CPU/IO board.	

(2) **Error messages on a virtual LCD**

In EXPRESSSCOPE Engine 3 web browser window, you can confirm virtual LCD error messages (for details on the virtual LCD, refer to "*EXPRESSSCOPE Engine 3 User's Guide*").

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

Message displayed on upper LCD line

Message displayed on lower LCD line
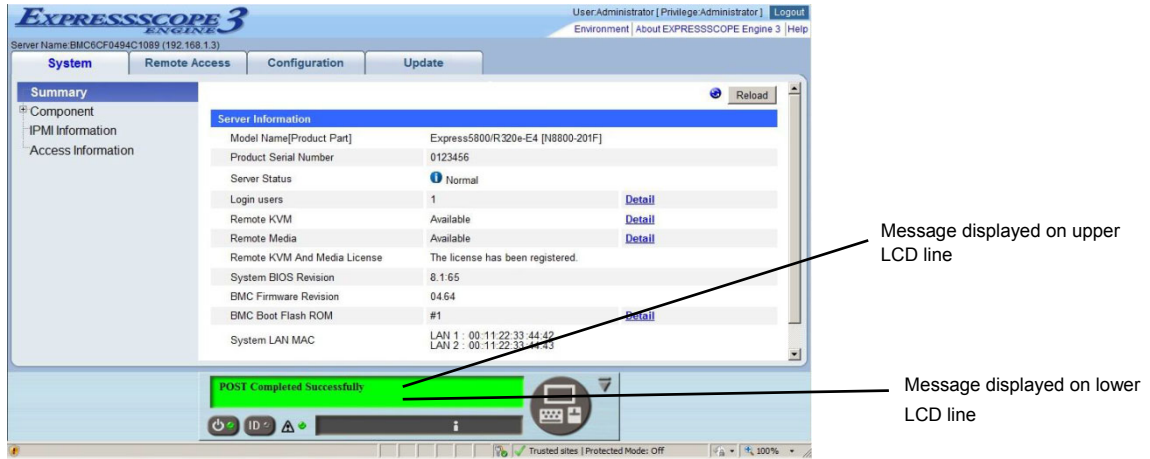
Messages displayed on an upper LCD line

Message on Upper LCD Line	Description	Solution
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	Solution
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 fan has failed or is clogged. Contact your sales representative and request repairs.
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. If this does not resolve the problem, contact your sales representative and request repairs.
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.	
Processor2 Thermal Trip		

Message on Lower LCD Line	Description	Solution
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.	
System Front FAN1 Lower Non-Critical	A fan alarm was detected.	It is possible that a fan has failed or is clogged. Contact your sales representative and request repairs.
System Front FAN2 Lower Non-Critical		
System Front FAN3 Lower Non-Critical		
System Front FAN4 Lower Non-Critical		
System Front FAN5 Lower Non-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 [xxx.xxx.xxx.xxx]:
```

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.)

```
/tmp/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 OS 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>
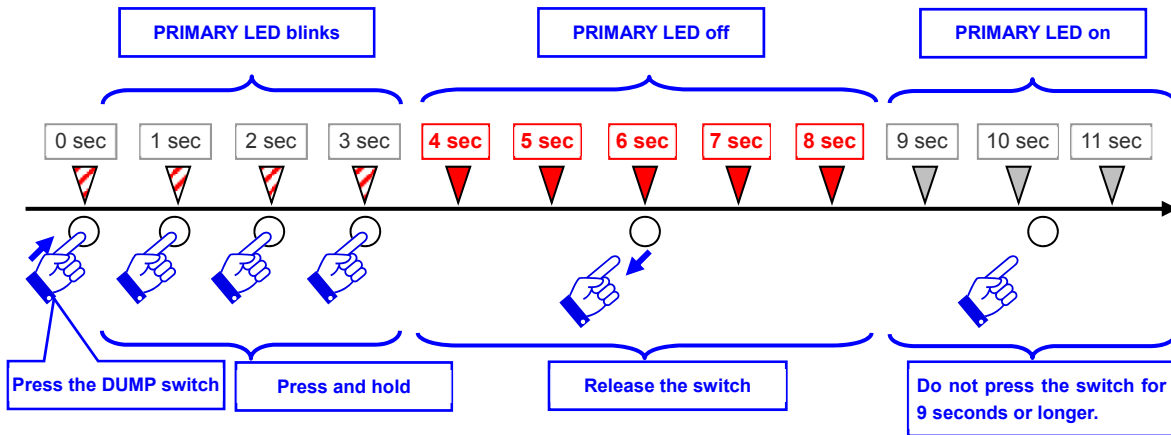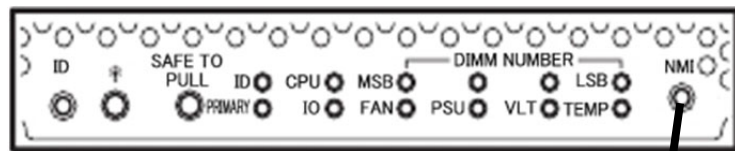
DUMP(NMI) switch

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 operate as intended, check it according to the contents of the following checklist before sending it for repair. If an item in the checklist corresponds with a problem you are experiencing, follow the subsequent check and processing instructions.

- The server does not work normally.
    - → Refer to *"8.1 Problems When Turning on the Server"*.
    - → 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 with Optical Disk Drive and Flash FDD"*.
- Failed to start from EXPRESSBULDER.
    - → Refer to *"8.2 Problems When Starting EXPRESSBUILDER"*.
    - → Refer to *"8.8 Problems When Starting EXPRESSBUILDER on Windows"*.
- Failed to install OS.
    - → Refer to *"8.3 Problems When Installing VMware ESXi and the ft control software"*.
- NEC ESMPRO does not work normally.
    - → Refer to *"8.9 Problems with 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 ESMPRO Manager
    - → Refer to *NEC ESMPRO 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   Problems When Turning on the Server

[?]   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.

→   Check the power cord for broken shield or bent plugs.

→   Make sure the power breaker for the connected power outlet is on.

→   If the power cord is plugged to a UPS, make sure the UPS is powered and it supplies power. See the manual that comes with the UPS for details.
Check the linkage between power supply to the server and the connected UPS using the BIOS SETUP utility of the server.

❑   Did you press the POWER switch?

→   When power cord is connected, the initialization of management controller starts. During initialization, the Module POWER LED is unlit. To power on the server, press the POWER switch after the Module POWER LED is lit green. (It may take about 1 minute until the Module POWER 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.

❑   Wait until the NEC logo appears.

[?]   The screen showing nothing (black screen) appears several times during POST execution.

❑   This sever may switch the screen to the black screen several times during POST execution, but there is not any problem.

[?]   POST fails to complete:

❑   Are the DIMMs installed?

→   Check if DIMMs are installed correctly.

❑   Is the memory size large?

→   The memory check may take a time if the memory size is large. Wait for a while.

❑   Did you perform any keyboard or mouse operation immediately after you started the server?

→   If you perform any keyboard or mouse operation immediately after start-up, POST may accidentally detect a keyboard controller error and stops proceeding. In such a case, restart the server. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the server.

❑   Does the server have appropriate memory boards or PCI card?

→   Operation of the server with unauthorized devices is not guaranteed.

❑   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   Problems When Starting EXPRESSBUILDER

[?]   Unable to start EXPRESSBUILDER

❑   Did you insert EXPRESSBUILDER DVD?

→   Insert the DVD and restart the server.

❑   Are BIOS settings correct?

→   Configure the boot order in BIOS SETUP so that the optical disk drive will be the first to start up.

❑   Did an error message appear at startup?

→ Take an appropriate action described below according to the on-screen 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 the hardware connections.

```
Error [Message ID:Z3003] :

Failed to read a file.
```

Meaning: A file cannot be read from a DVD.

Action: Check if a DVD is scratched.

❑   Is a message popped up?

→   Take an appropriate action according to the on-screen message.

Message	Action
This EXPRESSBUILDER is not for this computer. Insert the EXPRESSBUILDER disc for this computer and click **OK** to restart the computer.	Use EXPRESSBUILDER provided with the server. If the same error occurs, contact your sales representative.
Failed to get the hardware parameters on the motherboard. Check if EXPRESSBUILDER is for this computer, and check if the motherboard is broken. Click **OK** to restart the computer.	Contact your sales representative.
Failed to find a file. Click **OK** to restart the computer.	Media may be defective or the optical disk drive may be faulty. Contact your sales representative.
Failed to open a file. Click **OK** to restart the computer.	
Failed to get the parameters of a file. Click **OK** to restart the computer.	
Failed to read a file.	
Failed to copy a file.	
An undefined error occurred. Click **OK** to restart the computer.	

8.3   Problems When Installing VMware ESXi and the 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 *(1.7 Setting HBA configuration by using QLogic)* in *Installation Guide*.

❑   Have you checked precautions for installation?

→   Refer to *Chapter 1 (1.8 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 Messages by LED Indication)* 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) (1.7 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

[?]   Fail 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?

  - →   Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.

- ❑   Is option board setting correct?

  - →   Usually, no PCI device settings need to be changed. However, depending on the board to be set, special setting may be required. 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 your server?

  - →   Operation of the server with unauthorized devices is not guaranteed.

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

- →   If the amount of memory is large, it takes time to copy the memory in dual mode and the system stops working temporarily during the copying, but it is not system trouble.

[?]   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 guaranteed.

- ❑   Is the Hard Disk Drive properly installed?

  - →   Check the Hard Disk Drive installation status and the cable connections.

[?]   Unable to configure duplexing for Hard Disk Drive:

- →   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 may 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?

→   You can disable the internal network controller using the BIOS setup utility. Check the settings with BIOS setup utility.

❑   Have you completed protocol and services settings?

→   Verity that the network driver for the server network controller has been installed. Also verify that protocol such as TCP/IP or various services have been properly specified.

❑   Is the transfer speed correct?

→   You can change the transfer speed or configure the setting for onboard LAN controller from Host Client. Be sure to specify the same transfer speed and duplex mode as those on connected hub. If you specify "Auto negotiate", make sure that "Auto negotiate" is also specified for the connected hub.

[?]   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 "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   **Problems When Starting EXPRESSBUILDER on Windows**

[?]   **Unable to read the manuals**

❑   Have you installed Adobe Reader to your computer?

→   To read the manuals, install Adobe Reader in your computer.

❑   Does the "Internet explorer has stopped working" error appear?

→   Close the dialog box and continue with the operation. If the same error occurs, double-click the "version.xml" of the root folder on DVD, and then click **Yes** on the dialog box. After that, you can read the manual by clicking the link of manual again.

[?]   **The menu does not appear**

❑   Is the file association correct?

→   Make sure that the ".hta" file extension is associated to "Microsoft HTML application host".

❑   Did you run the menu on this computer?

→   The autorun function of this computer is not available. Run the following file on DVD directly.
`\autorun\dispatcher_x64.exe`

❑   Is the OS in the proper state?

→   The menu does not appear depending on the system registry setting or the timing to set the DVD/CD. In such case, choose **Computer** from Explorer and double-click the icon of the set DVD drive.

[?]   **Some menu items are gray**

❑   Is your system environment correct?

→   Some software requires administrator authority or needs to be operated on the server. Run on the appropriate environment.

8.9   Problems with Bundled Software

[?]   NEC ESMPRO Agent (for Linux)

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

[?]   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)*.

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 Messages by LED Indication)*.

❑   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

❑   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]

❑   CPU Information

→   Check the [CPU] screen under [System] of [Information of server state/constitution] for details of the CPU information.
* You cannot check the correct information on the [CPU] screen under the [ft system] tree,

❑   The detail information of alert

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

8.10   Problems with Optical Disk Drive and Flash FDD

[?]   Unable to access or play optical disks such as CD-ROM/DVD-ROMs

❑   Is the CD-ROM 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 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.

❑   Is the DVD/CD-ROM supported by the server?

→   For a disk such as a CD with copy guard which does not conform to the CD standard, the playback of such a disk with the optical disk drive is not guaranteed.

→   The DVD/CD-ROM for Macintosh is not supported.

[?]   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 the forced eject hole at the front of the tray. Keep pressing slowly until the tray comes out.

Forced eject hole
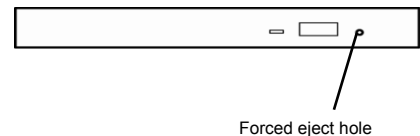
Important	• **Do not use anything that easily breaks such as toothpicks or plastic.**
	• **If you still cannot eject the disk, contact the maintenance service company.**

3. Pull the tray out with your hands.

4. Remove the disk.

5. Push the tray back to its original position.

[?]   Fail 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. Refer to the manual that comes with the OS for formatting.

❑   Is another Flash FDD connected to this server besides this Flash FDD?

→   One Flash FDD can only be connected to a USB connector of this server.

[?]   The Flash FDD doesn't 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 it to this server.

𝟗. Resetting and Clearing the Server

Refer to 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** + **Delete** + **Alt**. This clears all the data in progress in memory, and restarts the server.

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

𝟗.𝟐   Forced Shutdown

Use this function to turn off the power forcibly 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 4 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 function 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 4 seconds or longer.
The server is forcedly powered off.
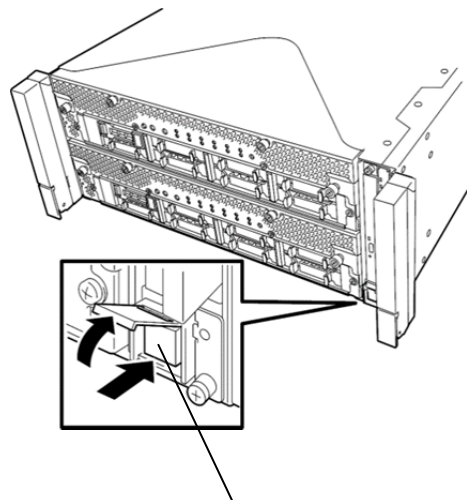
Press this switch for 4 seconds or longer.

9.3   Clearing BIOS Settings (CMOS Memory)

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

You can also clear the password set in the BIOS Setup utility (SETUP) by using the same way.

Tips	When the server works, use the BIOS setup utility (SETUP) to return the settings to the factory defaults.

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 settings. Any change may cause the server to fail or malfunction.**

PASSWORD Clear Jumper
(PASSCLR)

Protect (factory default)

Clear

CMOS Clear Jumper
(CMOSCLR)

Protect (factory default)
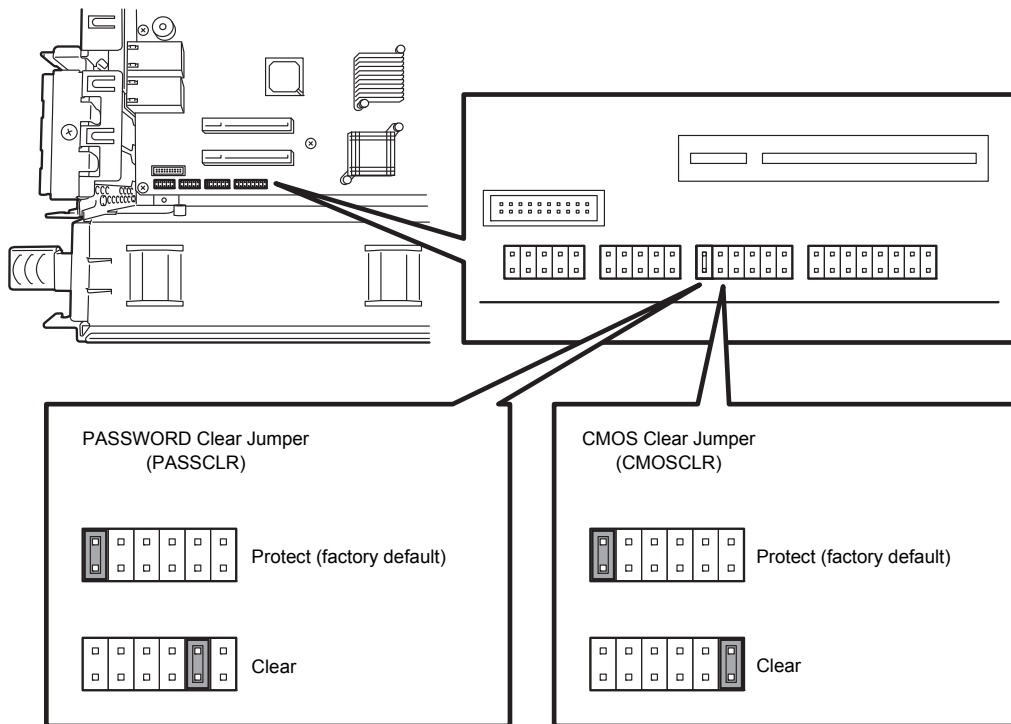
Clear

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 safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *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, refer to *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, refer to *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.

    Refer to *Chapter 2 (5.4 Removing and Installing CPU/IO Module)*.

3. Remove the top cover.

4. Confirm the position of Clear CMOS Jumper.

5. Change jumper switch to "CMOS CLR" position.

6. Assemble the CPU/IO module 0 and install it to the server.

7. Connect AC power cords to CPU/IO modules 0 and 1 at the same time.

8. Confirm that PRIMARY LED of CPU/IO module 0 lights after a while.

    If PRIMARY LED of CPU/IO module 1 lights, disconnect AC power cords from both CPU/IO modules,

    wait for 30 seconds, and connect them at the same time.

9. Check that the Module POWER LEDs on CPU/IO modules 0 and 1 starts blinking, and then press the

    POWER switch to turn on the server.

10. If the following warning message appears, press the POWER switch to power off the server.

    (POST proceeds even when the warning message is displayed.)

    ```
    WARING

    8006: System configuration data cleared by Jumper.
    ```

11. Disconnect AC power cords from CPU/IO modules 0 and 1.

12. Remove CPU/IO module 0, and remove its top cover.

13. Change jumper switch setting to its original position (Protect).

14. Assemble the CPU/IO module 0 and install it to the server.

15. Connect AC power cords to CPU/IO modules 0 and 1 at the same time.

16. Confirm that PRIMARY LED of CPU/IO module 0 lights after a while.

    If PRIMARY LED of CPU/IO module 1 lights, disconnect AC power cords from both CPU/IO modules,

    wait for 30 seconds, and connect them at the same time.

17. Check that the POWER LEDs on CPU/IO modules 0 and 1 starts blinking, and then press the POWER

    switch to turn on the server.

18. When the following message appears, press **F2** to start BIOS SETUP utility.

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

19. BIOS SETUP starts. On [Save & Exit] menu of BIOS 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.

   Refer to *Chapter 2 (5.4 Removing and Installing CPU/IO Module)*.

3. Remove the top cover

4. Confirm the position of Clear Password Jumper.

5. Change jumper switch to "PASS CLR" position.

6. Assemble the CPU/IO module 0, and install it to the server.

7. Connect AC power cords to CPU/IO modules 0 and 1 at the same time.

8. Confirm that PRIMARY LED of CPU/IO module 0 lights after a while.

   If PRIMARY LED of CPU/IO module 1 lights, disconnect AC power cords from both CPU/IO modules,

   wait for 30 seconds, and connect them at the same time.

9. Check that the Module POWER LEDs on CPU/IO modules 0 and 1 starts blinking, and then press the

   POWER switch to turn on the server.

10. If the following warning message appears, press the POWER switch to power off the server.

    (POST proceeds even when the warning message is displayed.)

    ```
    WARING
    8007:SETUP Menu Password cleared by Jumper.
    ```

11. Disconnect AC power cords from CPU/IO modules 0 and 1.

12. Remove CPU/IO module 0, and remove its top cover.

13. Change jumper switch setting to its original position (Protect).

14. Assemble the CPU/IO module 0, and install it to the server.

15. Connect AC power cords to CPU/IO modules 0 and 1.

10. System Diagnostics

The System Diagnostics runs several tests on the server.

10.1   Test Items

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 to the disk on checking hard disk drives.

10.2   Startup and Exit of System Diagnostics

Start up System Diagnostics in the following procedure. (If the server is running, shutdown the system.)

1. Start up EXPRESSBUILDER and select **Tool menu** from Boot menu.

    For information on starting up EXPRESSBUILDER, refer to *Chapter 3 (5. Details of EXPRESSBUILDER)*.

Note	Choose English if Language Selection Menu appears.

2. Select Test and diagnostics.

3. Select **End-User Mode (Basic)** to start System Diagnostics. This process takes about three minutes.

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

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

    Supervisor-Mode is intended for maintenance personnel.

Diagnostics tool title

```
TeDoLi (TEst & Diagnosis On Linux) Ver001.00 (Build020901.1.1m)
                              Test End
  Start 10:06:58   End 10:09:58   Pass 000:03:00   TestTime 000:03:00
  Test End:   NormalEnd       03   AbnormalEnd    00    ForceEnd   00

     <System>
     MEM       Memory                   16 count    NormalEnd
     CACHE    Cache                     49 count    NormalEnd
     <SCSI>
     HDD_02:000   DK32DJ-36W            89 count    NormalEnd




[Enter] Detail Information    [ESC] Return to Enduser Menu
```

Test window title

Test results

Test summary window

Guideline

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.

Guideline

Shows the details of the keys to operate window.

Test summary window

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

When an error is detected by the 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**. Take notes about the error message that has been output to the Detail Information screen and contact the store where you purchased the product or your maintenance service company.

4.   Follow the guideline shown at the bottom of the screen, and press **Esc**.

The **Enduser Menu** below is displayed.

```
TeDoLi (TEst & Diagnosis On Linux) Ver001.00 (Build020901.1.1m)

                    ┌─ Enduser Menu ─┐
                    │ <Test Result>  │
                    │ <Device List>  │
                    │ <Log Info>     │
                    │ <Option>       │
                    │ <Reboot>       │
                    └────────────────┘

Please choose a function by the arrow key and push Enter key.
```

<Test Result>
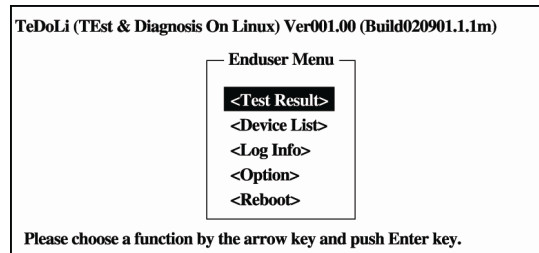
Shows the diagnostics completion screen of the above diagnostics.

<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 select [Save(F)].

<Option>

Optional features can be used from this menu.

<Reboot>

Reboots the server.

5.   Select **Reboot** in **Enduser Menu**.

The server restarts. Remove EXPRESSBUILDER DVD from the drive.

System Diagnostics is now completed.

11. Offline Tools

Offline tools are used for preventive maintenance, failure analysis, and their settings for this product.

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** while the message below is displayed.

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

3.   Keyboard Selection Menu appears after POST completion.

     When you select a keyboard type, the following menu is displayed.

Off-line TOOL MENU
Maintenance Utility BMC Configuration Exit

4.   Select **Maintenance Utility** or **BMC Configuration** to start each tool.

Refer to the next section for more information.

11.2   **Functions of Offline Tools**

Offline Tools offers the following functions.

Note	When you start the offline tools while RDX is connected to the server, disable RDX before starting the offline tools by setting RDX to hibernate mode.

Off-line Maintenance Utility

Off-line Maintenance Utility is started when **Maintenance Utility** is selected. Off-line Maintenance Utility is used for preventive maintenance and failure analysis for this product. When you are unable to start NEC ESMPRO due to a failure, Off-line Maintenance Utility can be used to check the cause of the failure.

Note	The Off-line Maintenance Utility is intended for maintenance personnel. Consult with your service representative if any trouble that requires Off-line Maintenance Utility occurred.

After starting up the Off-line Maintenance Utility, the following features are available to run.

- **–** IPMI Information Viewer
  Displays System Event Log (SEL), Sensor Data Record (SDR), and Field Replaceable Unit (FRU) in IPMI (Intelligent Platform Management Interface) and also back up such information.
  Using this feature, system errors and events can be investigated to locate the parts 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 will be displayed, however, it is not a failure.
	``` WARNING! No Information. The Device is not detected or it is broken. ```

- **–** System Information Viewer
  Displays information on processor (CPU), BIOS.
  Also output the information to a text file.

- **–** System Information Management
  Set the information specific to your server (Product information, Chassis information).

BMC Configuration

- **–** It is used for setups of alert functions by BMC (Baseboard Management Controller) and remote control functions by Management PC.

  Refer to *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)*.

2

NEC Express5800 Series
Express5800/R320e-E4, R320e-M4, R320f-E4, R320f-M4

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 and Replacing 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 7.3

Tips	For detailed information on CentOS, refer to the Web site below. 　http://www.centos.org/
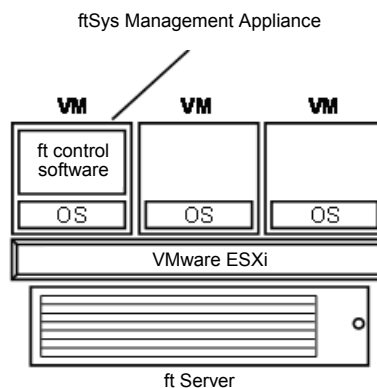
1.2   Steps for Accessing ftSys Management Appliance

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.

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 and device name
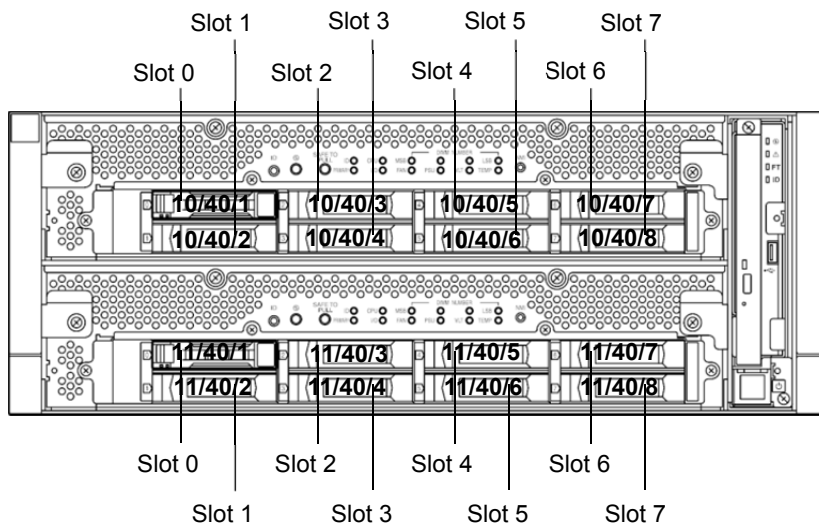
Slots corresponding to the mirroring process

Corresponding slots		
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 "vmhba*n*:C0:T*x*:L0".
The "*n*" of "vmhba*n*" represents the last digit of I/O module (10, 11). "*x*" of "Tx" represents a target number. The target number is obtained by the slot number plus one is set as the target number.

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                : HGST:HUC101812CSS200
Firmware Rev          : A920
Serial #              : 06G094AH
Device Name           : disk_a
Udev Device Names     : -
Kernel Device Names   : vmhba0:C0:T1:L0
Endurance             : -
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 "mpm*n*"("*n*" is 0~7).

The RAID device names assigned to internal hard disk drives
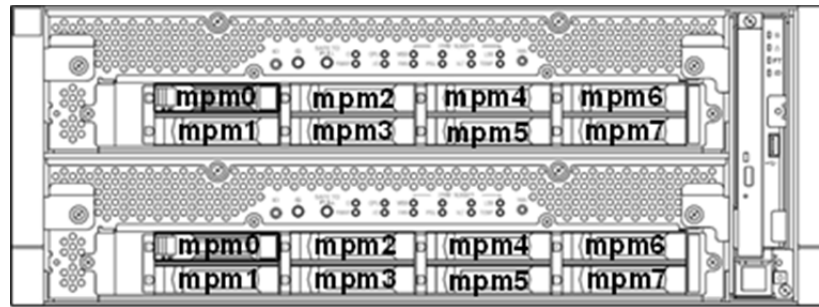
Important	• When the status of each disk becomes "resync" "recovery" "check" or "repair" do not add a disk, insert/remove HDD, power off or restart the system. Wait until the status indication of Raid device disappears and the status of each disks become "in_sync". Check the status of RAID using the "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 <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 <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 <Device name>`

- To add a disk to the RAID configuration
  `esxcli -s <IP address or hostname of ESXi host> storage mpm add -v <Device name> -d <Kernel device name>`

- To add disks (RAID configuration)
  `esxcli -s <IP address or hostname of ESXi host> storage mpm create -v <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)
```

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

   Please wait while the system to recognize the disk.

```
# 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)
```

3. 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.

4. 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/6.5/com.vmware.vsphere.html.host client.doc/GUID-83042A09-281D-4B74-9176-8E882AD23432.html

Important	**If special characters are used for the datastore name, an error may occur unexpectedly. Therefore, do not use special characters for the datastore name. For details, refer to Knowledge Base of VMware.** 【**Knowlede Base of VMware -Troubleshooting issues with VMs or datastore names containing special characters (2046088)** 】 http://kb.vmware.com/kb/2046088

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].
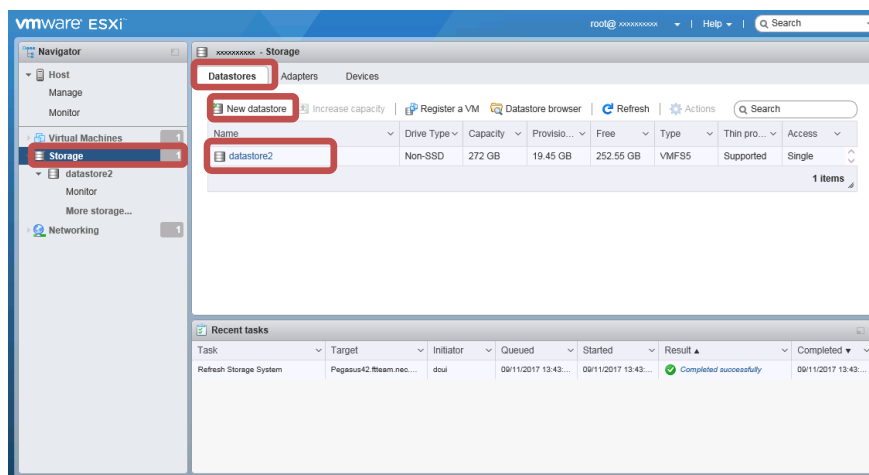
4. The [New Datastore] wizard appears. Select "Create new VMFS datastore" in [Select creation type], and select [Next].
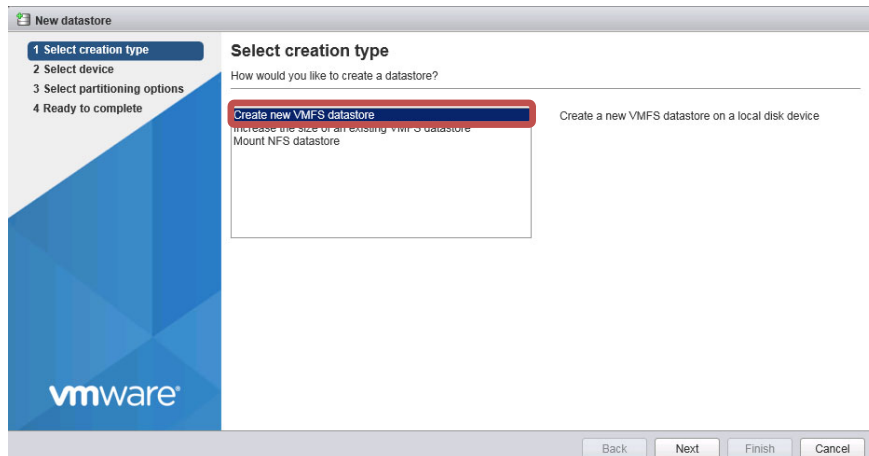
5. Fill in the name column with the datastore name, select the volume for creation of the VMFS datastore, and select [Next].
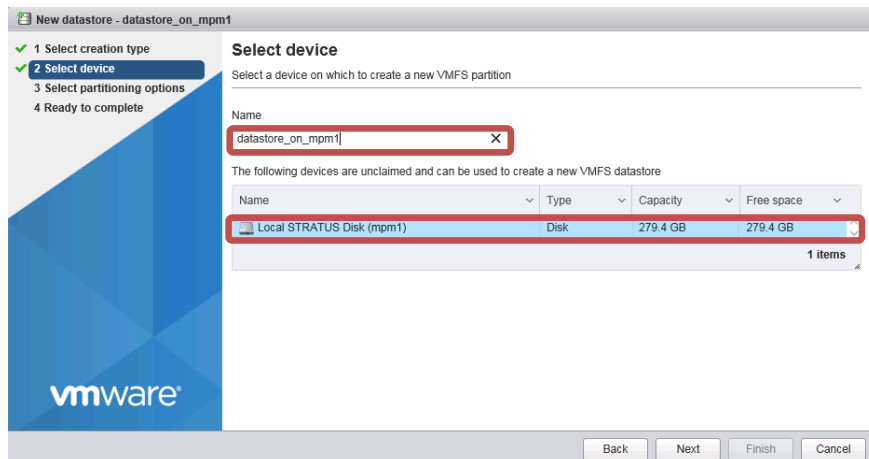
6. Do not change the default value of the partitioning option, and select [Next].
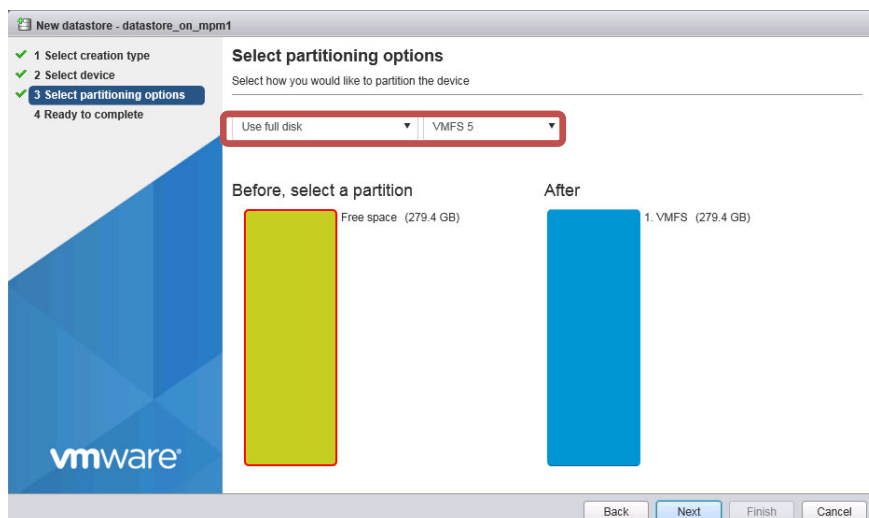
7. Select [Finish] in the setting confirmation.

The VMFS datastore is created according to the following procedure.
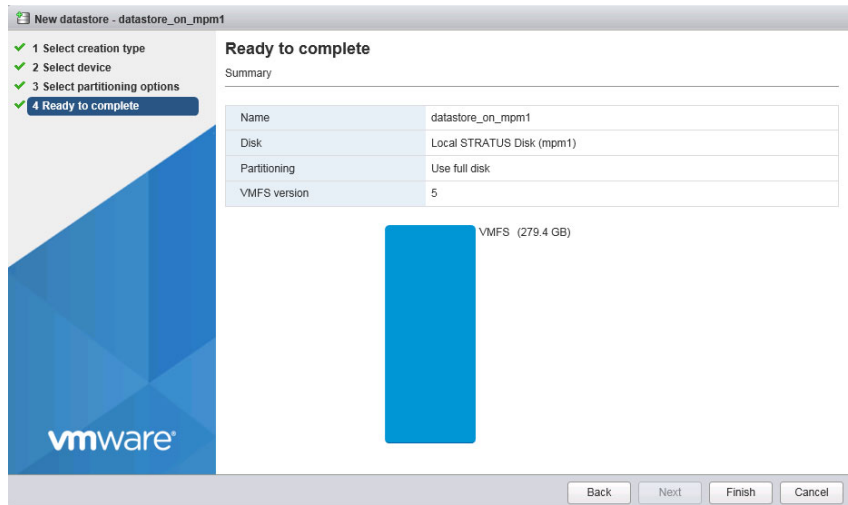
3. Duplex LAN Configuration

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 ESMPRO 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.

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 R320e-M4, R320f-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.
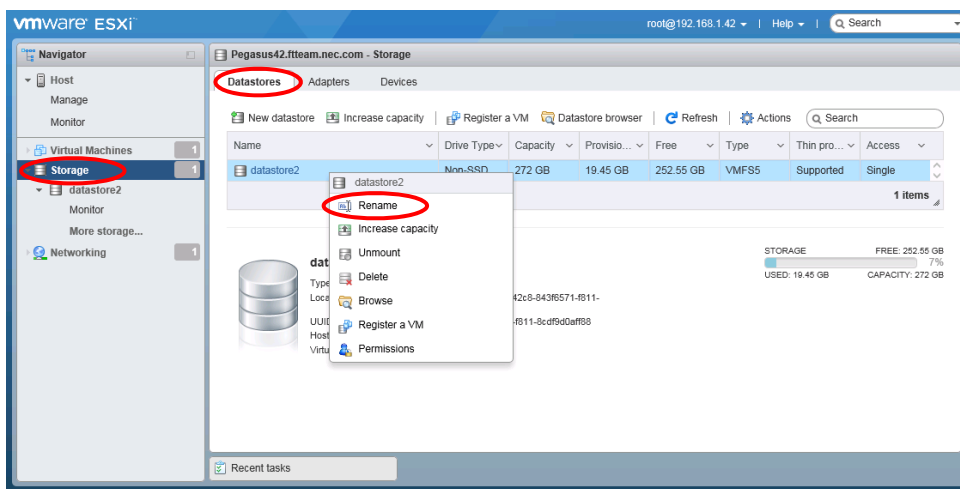
5. Installing and Replacing Optional Devices

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

Important	• **NEC recommends that the installation or replacement be performed by a maintenance engineer (of an NEC-approved maintenance service agency) who is acquainted with this server and has expert knowledge on it.**
	• **If you add or remove an optional device to or from the server or replace it by using a procedure not shown in this chapter, or you install an unspecified part or cable, NEC will take no responsibility for any breakage of the server or its part or any effect resulting from operation of the server. In addition, in this case, you have to pay for the repair even during the period of free-of-charge repair.**

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 safety. Failure to observe the precautions may cause death or serious injury. For details, refer to following pages

- Do not disassemble, repair, or modify the server.
- Do not look into the optical 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, refer to following pages

- 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 **Verification before installing optional devices**

If you add on optional devices onto this server, some devices require specific ft control software version (s).

If the optional device requires specific version number (s), refer to the following procedure before adding the devices.

1. Confirm the version of the required ft server control software from the manuals that come with the optional device to be added to the server. Alternatively, confirm it from the NEC website or contact your sales representative.

2. Verify 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 more information on how to verify the working ft control software version, refer to *Chapter 1 (2.2 Confirmation of the ft control software version)* in *Installation Guide*.

5.1.3 Basics of Installation, Removal, and replacement

Note the following, when installing, removing or replacing devices, to improve the performance of Express5800/ft series.

- With the Express5800/ft series, devices can be replaced during the continuous operation.
  Take extreme care for electric shock and damage to the component due to short-circuit.

- Optional devices cannot be installed 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.

- To remove the CPU/IO module during the continuous operation, disable the intended module (place the module off-line) by using the ftsmaint command.

  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*

- When installing or removing an optional device, make sure that the hardware configurations of both CPU/IO modules are the same.

- When installing or removing an optional device, make sure that the slot and socket positions of both CPU/IO modules are also the same.

- Do not install those devices having different specifications, performance, or features.

- Before removing the set screws from the CPU/IO modules, place the desired module off-line using the ftsmaint command.

5.2   **Optional Devices That Can Be Installed, Removed, or Replaced**

Optional devices that can be installed, removed, or replaced upon failure are as follows:

- 2.5-inch hard disk drive
  The server can contain up to 8 hard disk drives in one CPU/IO module.
  Install and remove hard disk drives in 2.5-inch hard disk drive bay at front of the server.

- DIMM
  Up to 16 DIMMs can be installed for one CPU/IO module.
  After removing the CPU/IO module, install or remove DIMMs in or from DIMM slots on motherboard of the server.

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

- PCI card
  Up to two cards on R320e-E4, R320f-E4 model or four cards on R320e-M4, R320f-M4 model can be installed respectively for one CPU/IO module.
  After removing the CPU/IO module, install or remove PCI card in or from PCI card slot of the server.

5.3 Installation, Removal and Replacement of 2.5-inch Hard Disk Drive

The 2.5-inch hard disk drive bays in front of the server can mount up to 8 hard disk drives with the 2.5 inch width exclusive trays for one CPU/IO module.

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 agent for hard disk drives optimum for your server.

The operation is executed on the created mirror volume with installed hard disk drive pairs such as slot 0 on CPU/IO module 0/1, slot 1 on CPU/IO module 0/1, slot 2 on CPU/IO module 0/1. (The OS is installed on the mirror volumes that consist of the hard disks in the slot 0.)
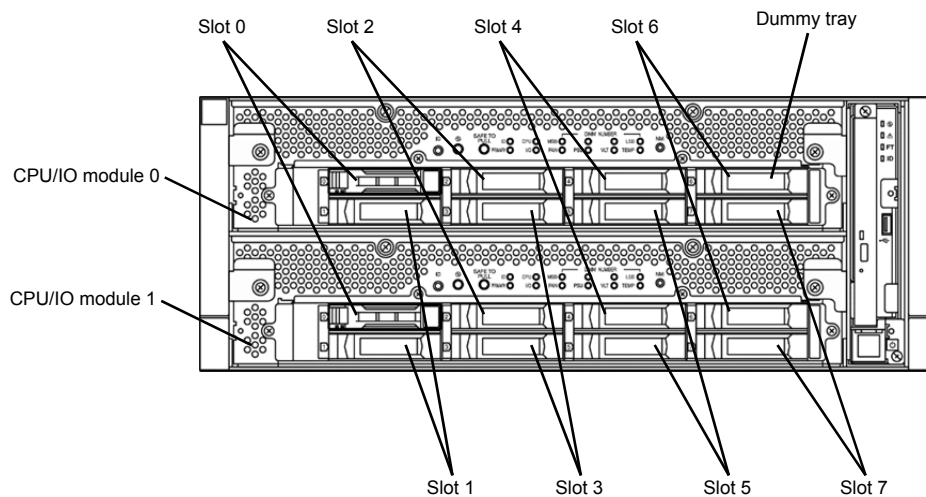
Slots to execute the mirroring process

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 Installation

Follow the procedure 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 0 through slot 7.

Important	• **Refer to 5.1.3 *Basics of Installation, Removal, and replacement* in *this Chapter* and *Chapter 1 (1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices* before starting installing or removing options.**
	• **You must mount two HDDs that form dual disk configuration before starting the OS. Be sure to set the dual disk configuration.**

Tips	A hard disk drive can be added without shutting down the OS. If you do this, you can skip steps 1 and 7 below.

1. Shut down the OS.

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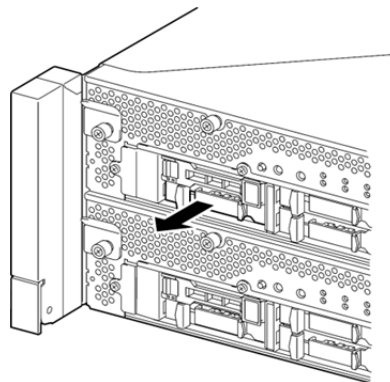
4. Unlock the hard disk drive.
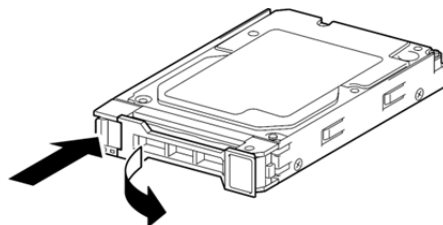
5.   Firmly hold the handle of the hard disk drive to install and insert the drive into the slot.

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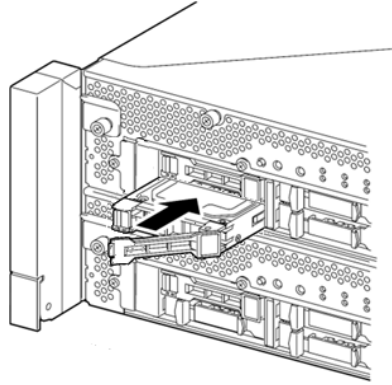
6.   Slowly close the lever. When the lever is locked, you will hear a click sound.

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.
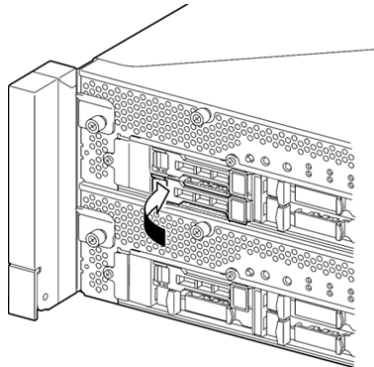
7.   Press the POWER switch to power on.

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 Removal

Follow the procedure below to remove the hard disk drive.

Important	Refer to *5.1.3 Basics of Installation, Removal, and replacement* in *this Chapter* 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 system 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.
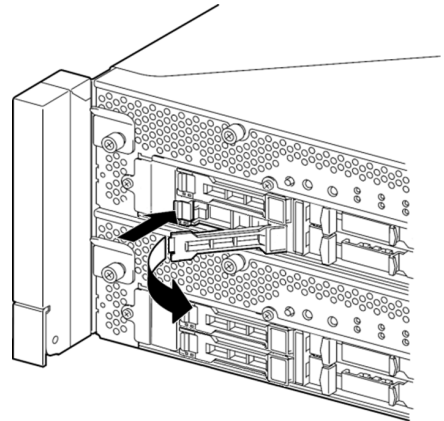
4. Hold the handle and hard disk drive to pull them

    off.
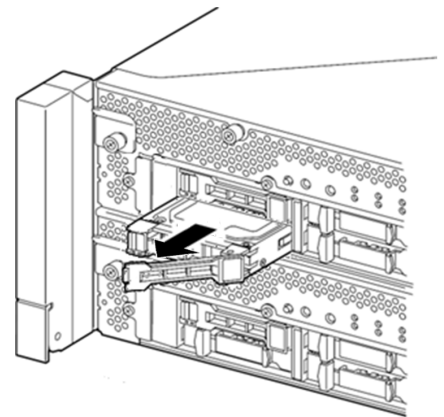
5.   Install the dummy tray in an empty tray.
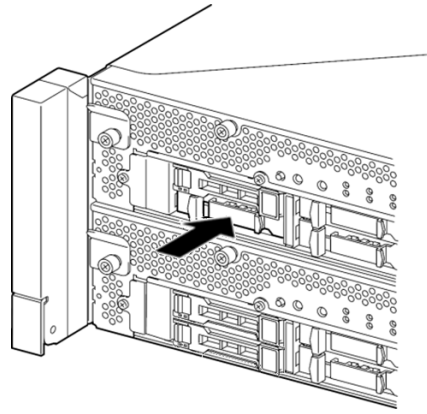
5.3.3   Replacement

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

Important	Refer to *5.1.3 Basics of Installation, Removal*, and replacement in this Chapter and *Chapter 1 (1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices* before starting installing or removing options.

(1) Replacement procedure

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 Removal* in *this Chapter*.

3.   Refer to the steps in *5.3.1 Installation* 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   Removing and Installing CPU/IO Module

To remove, install, or replace optional devices such as CPU (processor), DIMM (memory), and PCI card, you need to remove the CPU/IO module.

Important	• **Refer to** *5.1.3 Basics of Installation, Removal, and replacement* **in** *this Chapter* **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 Messages by LED Indication)* **for details of the Status LED.** • **When replacing both CPU/IO modules, replace one module and wait until dual configuration is established to replace the other module. If you replace the both modules simultaneously, establishing dual CPU/IO module configuration can result in interruption of the whole system.**

5.4.1 **Removal**

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, select [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.
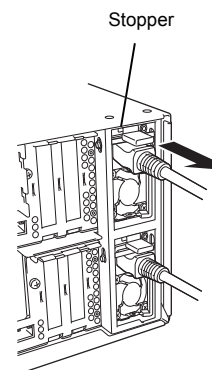
    Stopper

Note	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.

4. 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.
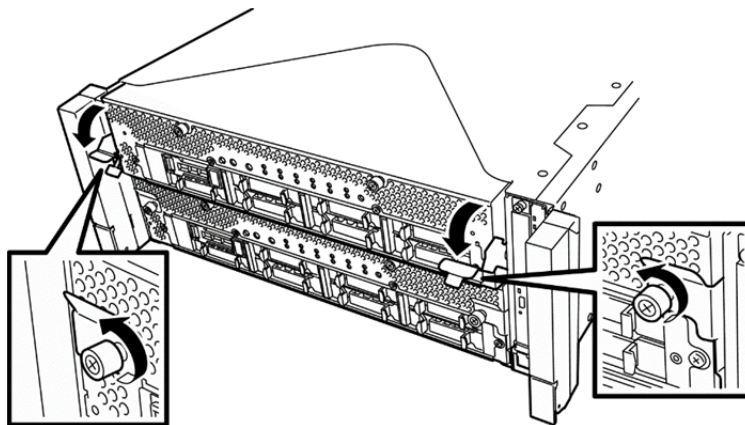
5. Hold the black levers of the CPU/IO module and pull it off.

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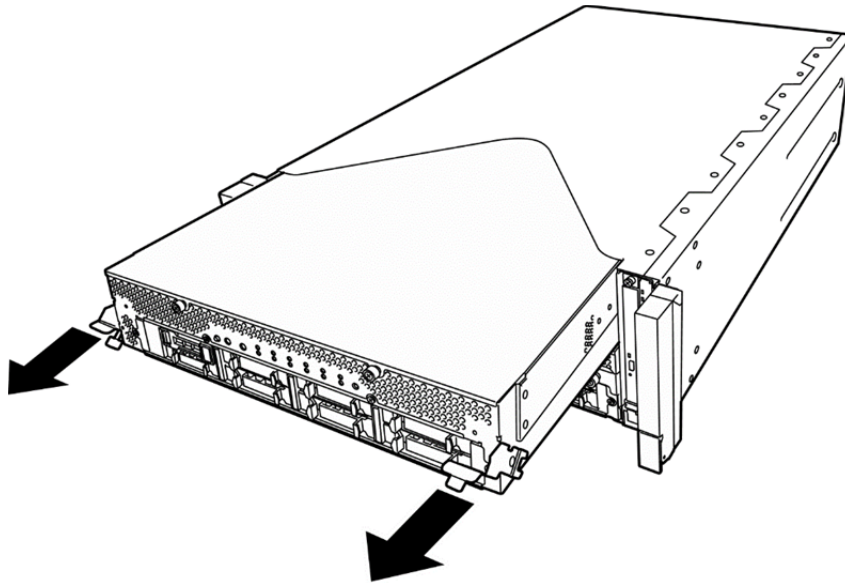
6.   Lower the lock on the side of CPU/IO module to unlock it, and then pull it out.

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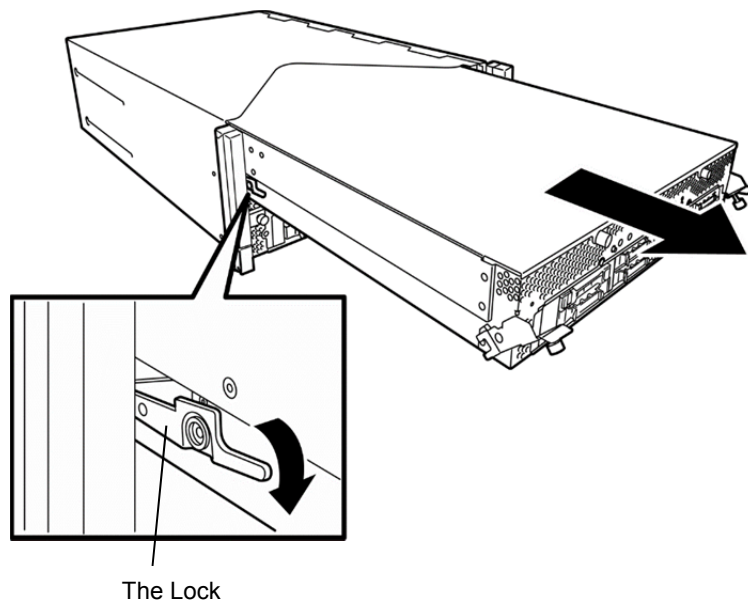
7.   Pull out the CPU/IO module gently and carefully, and place it on a flat and sturdy table.
     Avoid the dusty or humid place.

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 Installation

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

Important	• Refer to **5.1.3** *Basics of Installation, Removal, and replacement* in *this Chapter* 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 it into the rack.

    Hold the CPU/IO module in such a way that its back panel connector faces the back of the rack and

    engage the guides of the module and chassis, and insert it slowly.
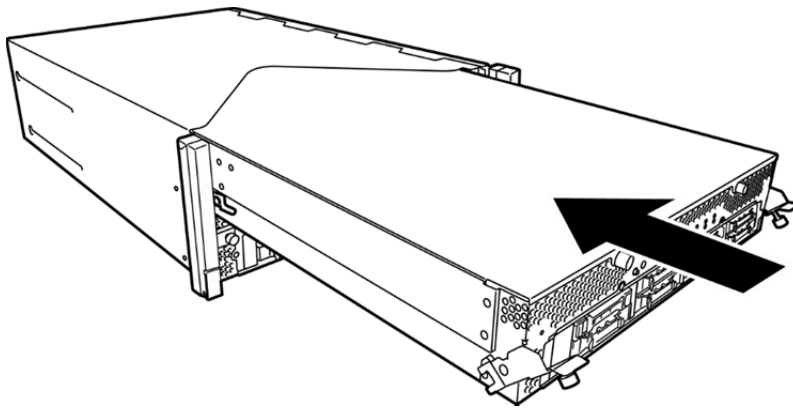
2. Push up the black levers placed on the left and right sides of the front of the CPU/IO module, and

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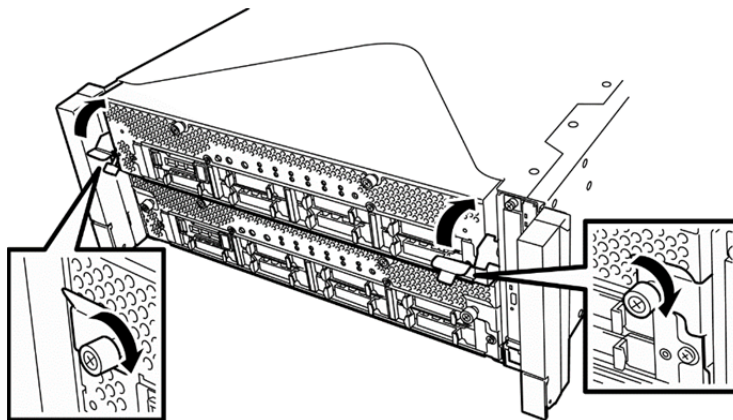
Important	• Secure the handle with the screws. If it is not secured by the screws, the operation of the CPU/IO module will be unstable. • In some system statuses or settings, auto start up or integration does not take place when the module is connected. In such a case, check the status by using the ftsmaint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

3.   Connect the cables for connecting the peripheral devices and network.

4.   Hold the stopper with your hand and insert the cable of the installed module.

5.   The installed CPU/IO module will be automatically started.

5.5   Installing, Removing and Replacing DIMM

The DIMM (Dual Inline Memory Module) is installed to the DIMM slot in the CPU/IO module on the Express5800/ft series.

The motherboard of CPU/IO module has 16 slots for DIMM.

Tips	• Maximum memory capacity is as follows: Up to 512GB (32GB x 16) • 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.** • **Refer to 5.1.3** *Basics of Installation, Removal, and replacement* **in** *this Chapter* **and** *Chapter 1 (1.8 Anti-static Measures)* **in** *Safety Precautions and Regulatory Notices* **before starting installing or removing options.**

DIMM slot 1
DIMM slot 2
DIMM slot 3
DIMM slot 4

DIMM slot 8
DIMM slot 7
DIMM slot 6
DIMM slot 5

DIMM slot 9
DIMM slot 10
DIMM slot 11
DIMM slot 12

DIMM slot 16
DIMM slot 15
DIMM slot 14
DIMM slot 13
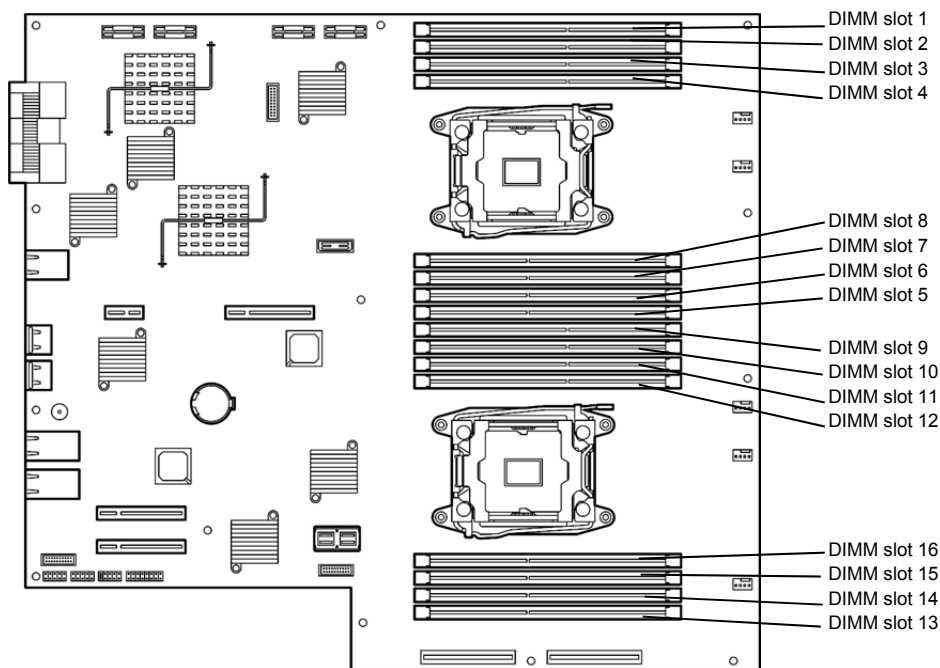
Motherboard of the CPU/IO module

Precautions

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

- DIMM 9 through 16 are available only when the processor #2 is installed.
- To install DIMM, install the product with the same serial number to the same slots of the CPU/IO modules 0 and 1.
- Refer to the following table to install additional DIMM.

Allowable DIMM capacity		Slot number to install DIMM (8GB/16GB/32GB)															
No. of CPUs	Capacity (GB)	1	2	3	4	8	7	6	5	9	10	11	12	16	15	14	13
1	8	8															
	16	8		8													
	24	8		8					8								
	32	8		8			8		8								
	48	8	8	8	8		8		8								
	64	8	8	8	8	8	8	8	8								
	64	16		16			16		16								
	96	16	8	16	8	8	16	8	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	8	8															
	16	8								8							
	24	8		8						8							
	32	8		8						8		8					
	48	8		8					8	8		8					8
	64	8		8			8		8	8		8			8		8
	96	8	8	8	8		8		8	8	8	8	8		8		8
	128	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	128	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
	512	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32

5.5.1 Installation

Follow the procedure below to install the DIMM.

1.   Shut down OS.

The sever turns off automatically.

2.   Disconnect the power cords from the outlets.

3.   Remove the CPU/IO module by referring to *5.4.1 Removal* in *this Chapter*.

4.   Remove three screws (two on the front and one on the rear), and remove the top cover of the CPU/IO module.
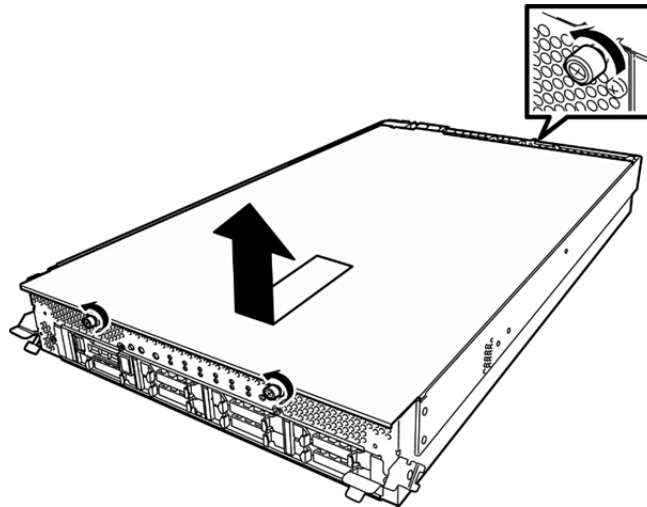
5.   Remove the air duct.

Air duct
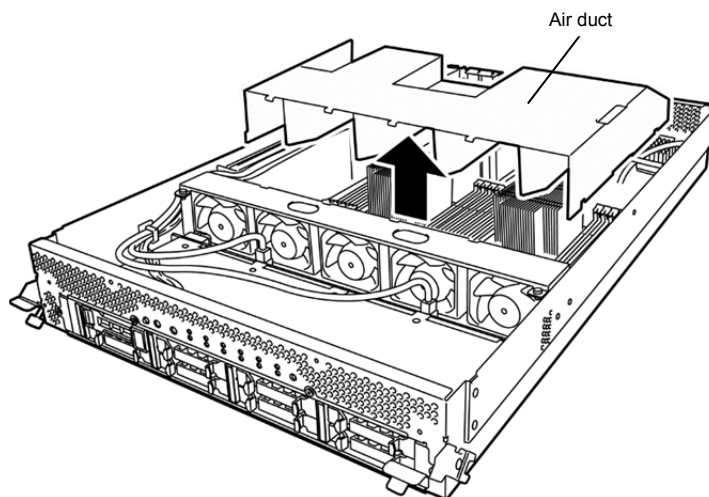
6. Insert a DIMM into the DIMM slot vertically.

    After the DIMM is completely inserted into the slot, the levers are automatically closed.
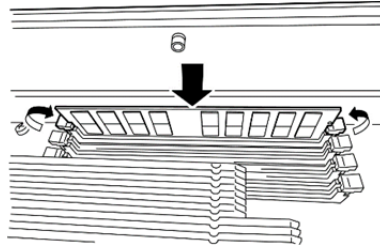
Note	Pay attention to the direction of the DIMM. The terminal of the DIMM has a cutout to prevent incorrect insertion.

7. Insert the air duct.

8. Place the top cover of the CPU/IO module and secure it with three screws.
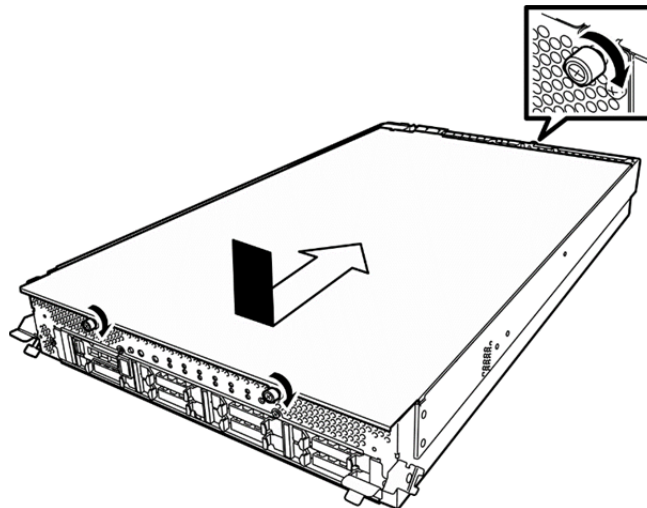
9. Refer to *5.4.2 Installation* in *this Chapter.*

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 Removal

Follow the procedure below to remove the DIMM.

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

1. Shutdown OS.

    The system turns off automatically.

2. Disconnect the power cords from the outlets.

3. Remove the CPU/IO module referring to *5.4.1 Removal* in *this Chapter*.

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.
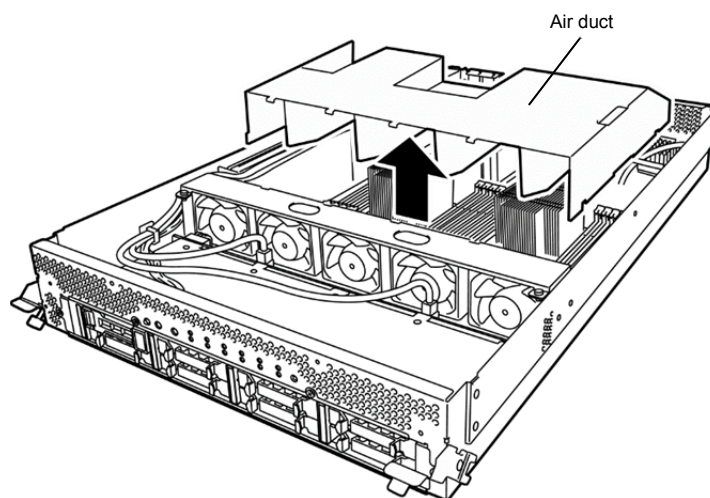
Air duct

6.   Open the levers attached on both sides of the slot of the DIMM to be removed horizontally.

It will be unlocked and the DIMM can be removed.
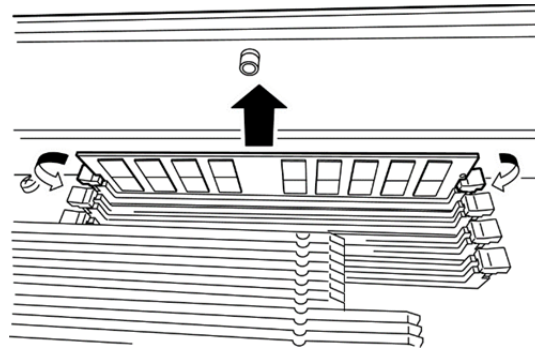
7.   Insert the air duct.

8.   Place the top cover of the CPU/IO module and secure it with three screws.
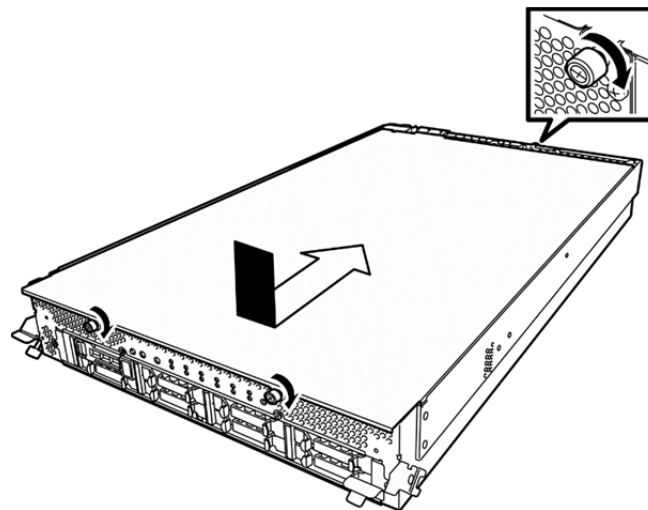
9.   Refer to *5.4.2 Installation* in *this Chapter* and install the CPU/IO module.

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 Replacement

Follow the procedure below to replace a failed DIMM.

1.   If the memory slot error LED lights, check the failed DIMM by referring to *Chapter 1 (6.1 Error Messages by LED Indication)*.

2.   Remove the CPU/IO module by referring to *5.4.1 Removal* in *this Chapter*.

3.   Replace the DIMM.

4.   Refer to *5.4.2 Installation* in *this Chapter* and install the CPU/IO module.

5.   Start up the CPU/IO module using the ftsmaint command.

5.6   Installing, Removing and Replacing Processor (CPU)

In addition to the standard CPU (Intel® Xeon® Processor), you can operate the system by adding one CPU to each CPU/IO module.

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.**
	• **Refer to 5.1.3 *Basics of Installation, Removal, and replacement* in *this Chapter* and *Chapter 1 (1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices* before starting installing or removing options.**

CPU1
(Standard CPU)

CPU2
(Additional CPU)
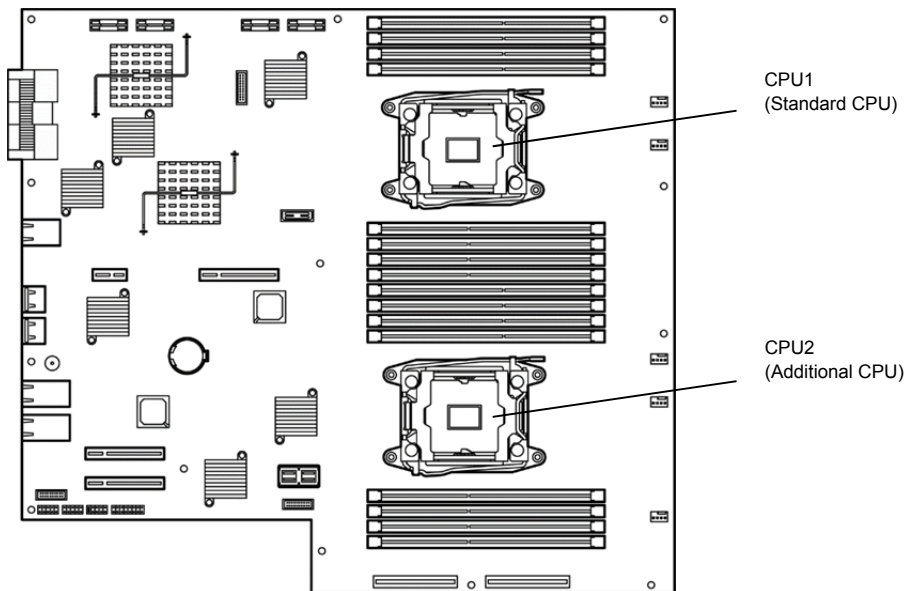
5.6.1 Installation

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

1. Shut down the OS.

    The server is automatically powered off.

2. Disconnect the power cords from the outlets.

3. Remove the CPU/IO module by referring to *5.4.1 Removal* in *this Chapter.*

4. Remove the air duct by referring to *5.5.1 Installation* in *this Chapter*.

5. Verify the location of the CPU socket.

6. Remove the protective cover from the processor (CPU) socket.

Important	Keep the removed protective cover for future use.
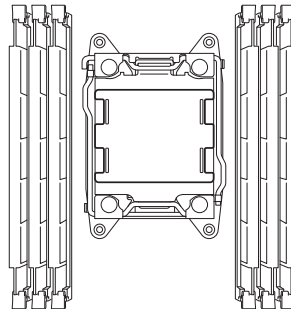
7. Push down the socket lever marked with " ⌐ ① →" once to unlatch it from the hook, then slowly open the lever until it stops.
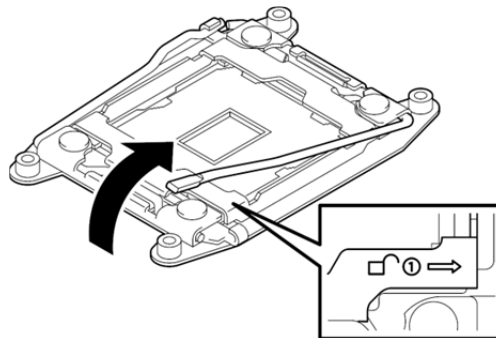
8. Push down the socket lever marked with "← ⌐ ① " once to unlatch it from the hook, then slowly open the lever until it stops.
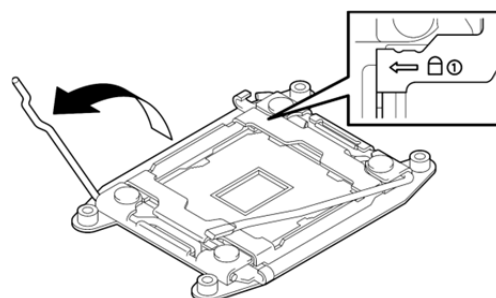
9.   Lift the plate.
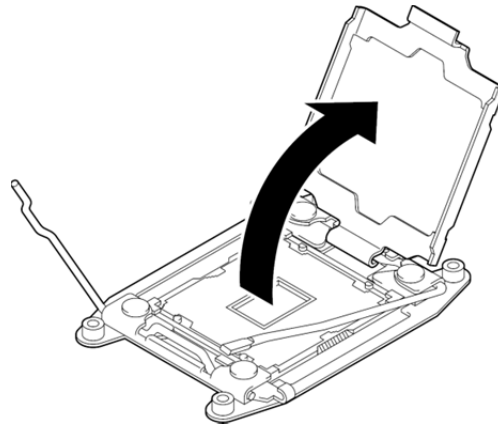
10. Put the processor on the CPU socket slowly and gently.

For easy installation, hold edges of processor with your thumb and index fingers so that the notch is aligned with the key on the CPU socket.

Important	• **Be sure to hold the processor only at the edges.**
	• **Pay attention not to touch the bottom of the processor (pin section).**

Note	• Insert the processor while aligning the notch on the processor with the key on the CPU socket.
	• Bring down the processor straight without tilting or sliding it in the socket.

Pin mark

Notch

Pin mark

Key
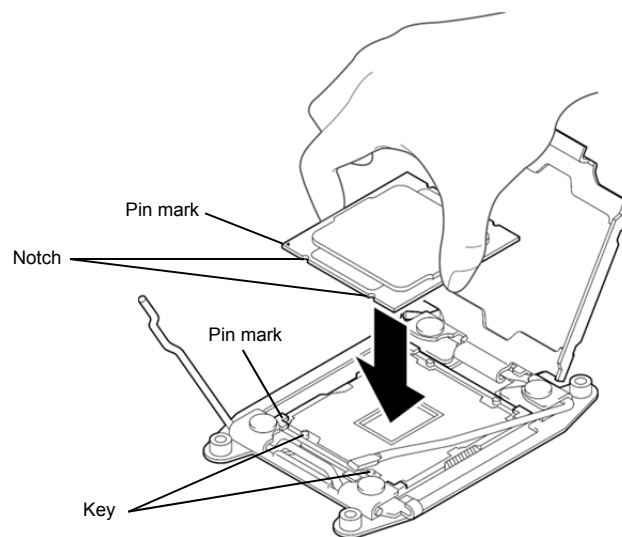
11.   Lightly push the processor to the CPU socket, and close the plate.
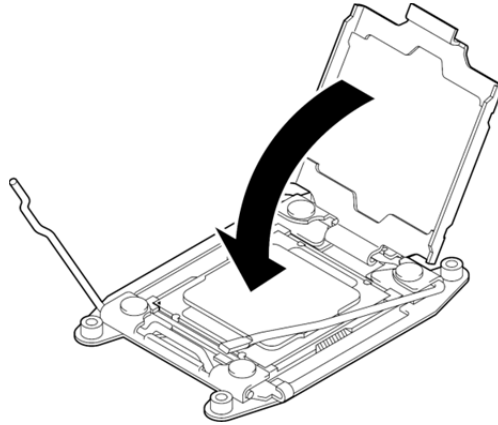
12.   Close the socket lever marked with "← 🔒 ① " to fix it.
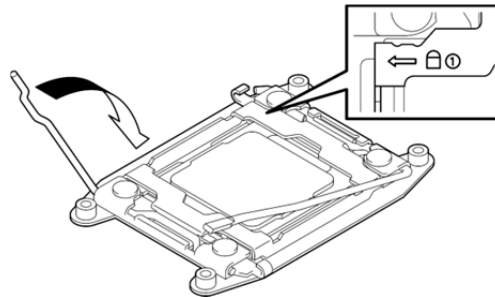
13.   Close the socket lever marked with " 🔓 ① →" to fix it.
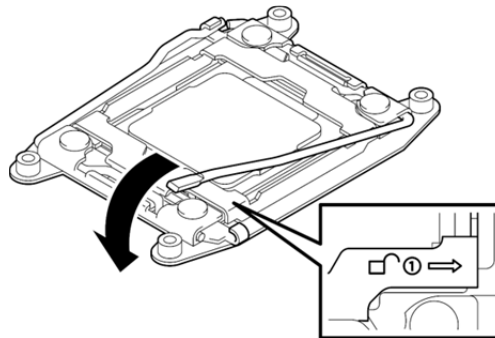
14. Place the heat sink on the CPU.

Important	Do not touch the cooling sheet that is attached on the back of the heat sink with your hand.
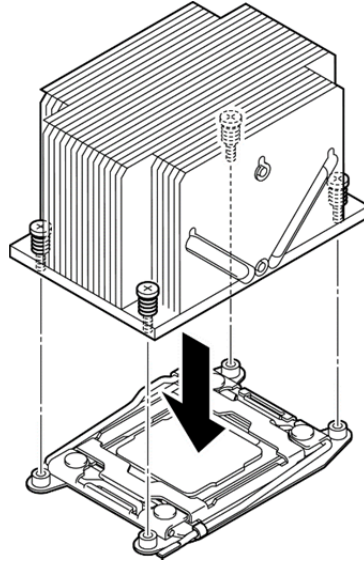
Important	If you install additional CPU, ensure that the fins of the additional CPU's heat sink are in the same direction as those of the standard CPU.

Heat sink of additional CPU

Front of server

Heat sink of standard CPU
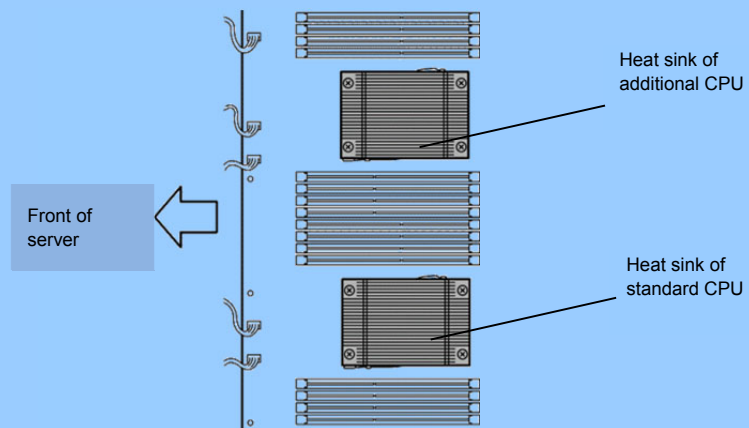
15.   Secure the heat sink with four screws.

> **Important**   **Tentatively secure the screws diagonally with the order as shown in the figure below, check that the heat sink is attached to the CPU socket in parallel, then tighten the screws diagonally.**
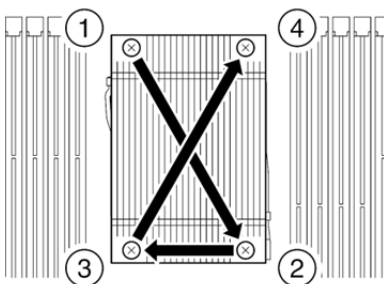
16.   Install the air duct*.*

17.   Refer to *5.4.2 Installation* in this *Chapter* and install the CPU/IO module.

18.   Connect the power cords.

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

20.   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)*.

5.6.2   Removal

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

5.6.3   Replacement

Take the steps below to replace the failed CPU and heat sink.

1.   Identify the failed CPU by ftsmaint command.

2.   Remove the CPU/IO module by referring to *5.4.1 Removal* in *this Chapter.*

3.   Replace the heat sink and CPU by referring to *5.6.1 Installation* in *this Chapter.*.

4.   Refer to *5.4.2 Installation* in *this Chapter* and install the CPU/IO module.

5.   Start the CPU/IO module from the ftsmaint command.

5.7   Installing, Removing and Replacing PCI Card

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

Important	Refer to *5.1.3 Basics of Installation, Removal, and replacement* in *this Chapter* 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 a dual PCI card configuration, install the same type of board (i.e., having the same specifications and performance) to the same slot for each CPU/IO module.
  When a PCI card is installed to one CPU/IO module, another identical PCI card should be installed to the same slot in another group. This rule is applied to the case of removal or replacement.
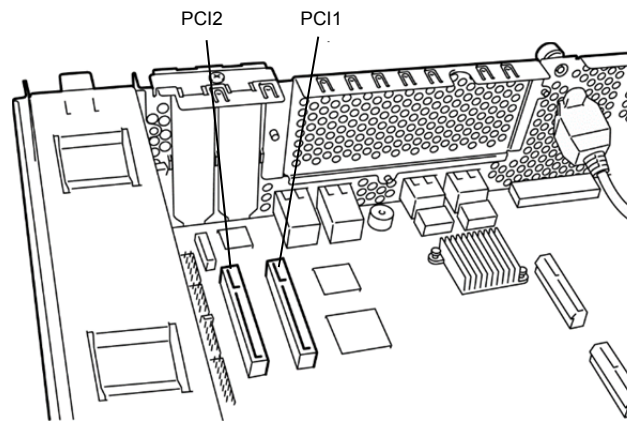
< R320e-E4 model, R320f-E4 model (without riser card) >
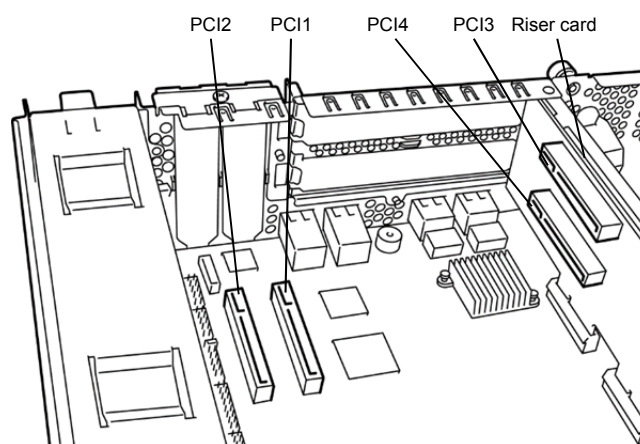
< R320e-M4 model, R320f-M4 model (with riser card) >

List of option PCI cards and installable slots (R320e-E4 model)

N code	Product name	PCI-1	PCI-2	Remarks
		PCI slot performance		
		PCIe 3.0 x4 lane		
		Slot size		
		Low Profile		
		PCI card type		
		x8 slot		
N8804-012	1000BASE-T 2ch board set	○	○	*1 *3
N8804-011	10GBASE-T 1ch board set	○	○	*1 *2 *3
N8803-040/040F	Fibre Channel 1ch board set	○	○	*1

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

*2: Up to one board can be installed for each CPU/IO module and up to two boards can be installed in system.

*3: N8804-012 and N8804-011 can't be loaded at the same time in system.

List of option PCI cards and installable slots (R320e-M4 model)

N-code	Product name	PCI-1	PCI-2	PCI-3	PCI-4	Remarks
		PCI slot performance		PCI slot performance		
		PCIe 3.0 x4 lane		PCIe 3.0 x8 lane		
		Slot size		Slot size		
		Low Profile		Full Height		
		PCI card type				
		x8 slot				
N8804-012	1000BASE-T 2ch board set	–	–	–	–	*1 *3
N8804-011	10GBASE-T 1ch board set	–	–	○	○	*1 *2 *3
N8803-040/040F	Fibre Channel 1ch board set	–	–	○	○	*1 *3

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

*2: Up to one board can be installed for each CPU/IO module and up to two boards can be installed in system.

*3: Installation priority for PCI-3, and PCI-4: N8803-040(040F)>N8804-011>N8804-012

List of option PCI cards and installable slots (R320f-E4 model)

N code	Product name	PCI-1	PCI-2	Remarks
		PCI slot performance		
		PCIe 3.0 x4 lane		
		Slot size		
		Low Profile		
		PCI card type		
		x8 slot		
N8804-012	1000BASE-T 2ch board set	○	○	*1 *3
N8804-011	10GBASE-T 1ch board set	○	○	*1 *2 *3
N8803-040AF	Fibre Channel 1ch board set	○	○	*1

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

*2: Up to one board can be installed for each CPU/IO module and up to two boards can be installed in system.

*3: N8804-012 and N8804-011 can't be loaded at the same time in system.

List of option PCI cards and installable slots (R320f-M4 model)

N-code	Product name	PCI-1	PCI-2	PCI-3	PCI-4	Remarks
		PCI slot performance		PCI slot performance		
		PCIe 3.0 x4 lane		PCIe 3.0 x8 lane		
		Slot size		Slot size		
		Low Profile		Full Height		
		PCI card type				
		x8 slot				
N8804-012	1000BASE-T 2ch board set	–	–	–	–	*1 *3
N8804-011	10GBASE-T 1ch board set	–	–	○	○	*1 *2 *3
N8803-040AF	Fibre Channel 1ch board set	–	–	○	○	*1 *3

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

*2: Up to one board can be installed for each CPU/IO module and up to two boards can be installed in system.

*3: Installation priority for PCI-3, and PCI-4: N8803-040AF>N8804-011>N8804-012

Refer to *System Configuration Guide* for the latest support status.

5.7.2 Installation

Follow the procedure below to install the board to be connected to the PCI card slot.

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

(1) Installing Low Profile PCI Board

1.   Shut down the OS.

     The server is automatically powered off.

2.   Disconnect the power cords from the outlets.

3.   Remove the CPU/IO module by referring to *5.4.1 Removal* in *this Chapter*.

4.   Remove one screw that secures the retention

     latch and open the latch.

PCI retention latch
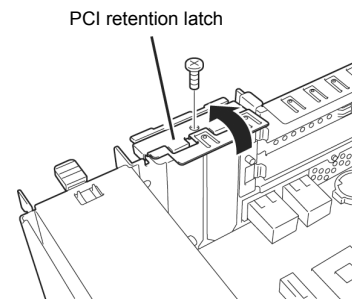
5.   Remove the PCI bracket cover.

Important	Keep and store the removed PCI bracket cover with care.
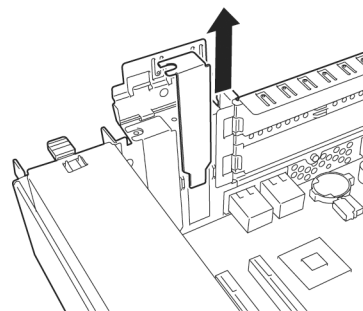
6.   Install a PCI card in a PCI slot.

Important | **When you attempt to install the Fibre channel card to the server, this may fail due to interference by the SFP+ module installed on the Fibre channel card.**

In this case, remove the SFP+ module from the Fibre channel card beforehand, and install the Fibre channel before installing the SFP+ module.
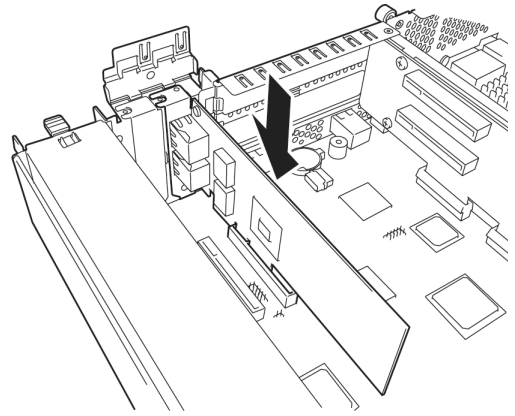
7.   Close the latch and secure with one screw removed in step 4.
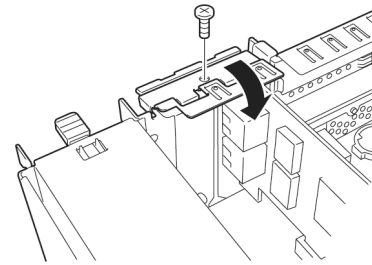
8.   Refer to *5.4.2 Installation* in *this Chapter* and install the CPU/IO module.

9.   Connect the power cords.

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

11. 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 (1) Error messages)*.

12. After the OS has started, proceed to steps in *5.7.5 Setup of Optional PCI Board* in *this Chapter*.

(2) Installing Full Height PCI Board

1.   Shut down the OS.

     The server is automatically powered off.

2.   Disconnect the power cords from the outlets.

3.   Remove the CPU/IO module by referring to *5.4.1 Removal* in *this Chapter*.

4.   Remove one screw that secures the retention

     latch and open the latch.

PCI retention latch
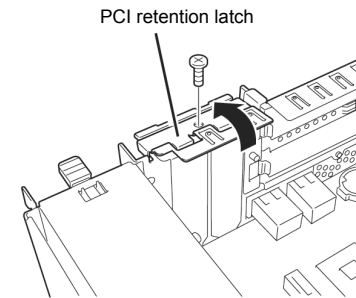
5.   Remove three screws that secure the Riser

     Card, and remove the riser card from the

     motherboard.

PCI Rizer Card
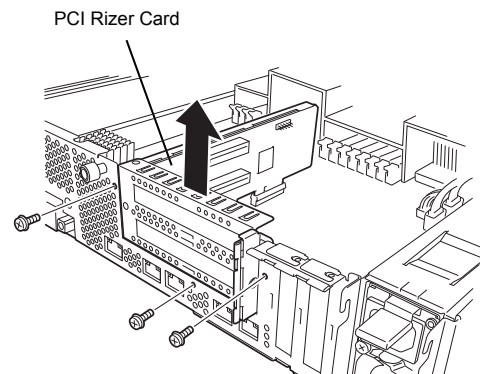
6.   Remove one screw that secures the stopper and

     open the retention latch of the Riser Card.

Retention latch
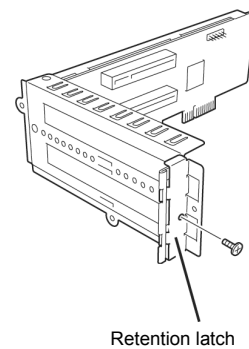
7.   Remove the PCI blank cover.

Important	Keep and store the removed PCI blank cover with care.
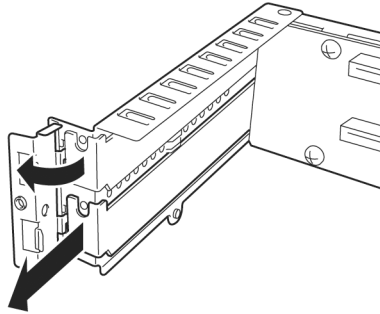
8.   Install a PCI card in a PCI slot.

Important	When you attempt to install the Fibre channel card to the server, this may fail due to interference by the SFP+ module installed on the Fibre channel card. In this case, remove the SFP+ module from the Fibre channel card beforehand, and install the Fibre channel before installing the SFP+ module.
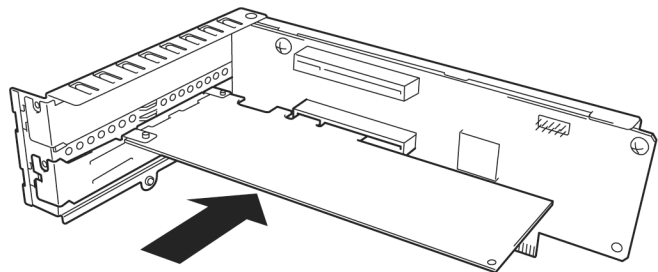
9.   Close the latch and secure with one screw removed in step 6.
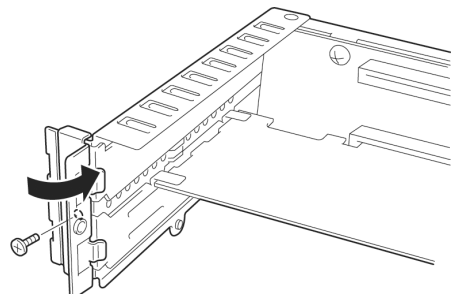
10. Install a Riser Card on the motherboard and
secure it with three screws removed in step 5.
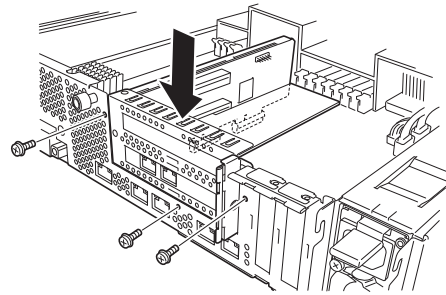
11. Close the latch and secure it with one screw
removed in step 4.
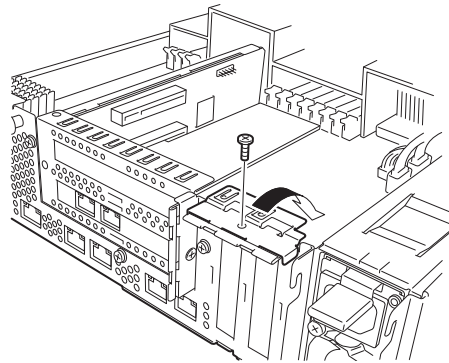
12. Refer to *5.4.2 Installation* in *this Chapter* and install the CPU/IO module.

13. Connect the power cords.

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

15. Verify that POST displays no error message.
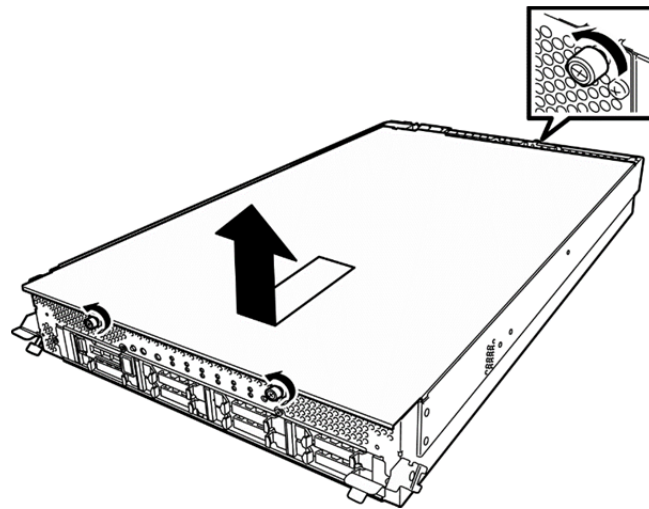If POST displays an error message, write it down and see the POST error message list in *Chapter 1 (6.2 (1) Error messages)*.

16. After the OS has started, proceed to steps in *5.7.5 Setup of Optional PCI Board* in *this Chapter*.

5.7.3 **Removal**

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

5.7.4   Replacement

Follow the procedure below to replace the failed PCI card.

(1) N8804-011 10GBASE-T 1ch board set or N8804-012 1000BASE-T 2ch board set

1.   Identify the failed board by ftsmaint command.

2.   Remove the CPU/IO module by referring to *5.4.1 Removal* in *this Chapter*.

3.   Remove the PCI card.

4.   Replace the board and secure it.

5.   Refer to *5.4.2 Installation* in *this Chapter* 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 recognized correctly by the OS.

(2) N8803-040/040F Fibre Channel 1ch Board set or N8803-040AF Fibre Channel 1ch Board set

1.   Identify the failed board by ftsmaint command.

2.   Remove the CPU/IO module by referring to *5.4.1 Removal* in *this Chapter*.

3.   Configure WWPN of Fibre Channel board to be installed (setting/confirming access control) by using control software such as iStorageManager.

4.   Remove the PCI card.

5.   Replace the board and secure it.

6.   Refer to *5.4.2 Installation* in *this Chapter* and install the CPU/IO module.

7.   Connect the network cable and cables for option devices.

8.   The installed CPU/IO module will start automatically.

9.   Confirm that the PCI card is recognized correctly by the OS.

5.7.5   Setup of Optional PCI Board

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

(1) N8804-012 1000BASE-T 2ch board set

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

  Refer to "*List of option PCI cards and installable slots*" in *5.7.1 Precautions* in *this Chapter*

- Driver installation procedure

  For Express5800/ft series, use two option PCI cards in a pair to make dual configuration.

  You do not need to install drivers for N8804-012 board because they are included in the OS. After installing the boards, refer to *3. Duplex LAN Configuration* in *this Chapter*.

(2) N8804-011 10GBASE-T 1ch board set

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

  Refer to "*List of option PCI cards and installable slots*" in *5.7.1 Precautions* in *this Chapter*.

- Driver installation procedure

  For Express5800/ft series, use two option PCI cards in a pair to make dual configuration.

  You do not need to install drivers for N8804-011 board because they are included in the OS. After installing the boards, refer to *3. Duplex LAN Configuration* in *this Chapter*..

(3) N8803-040/040F Fibre Channel 1ch Board Set or N8803-040AF Fibre Channel 1ch Board Set

- Slots to install optional PCI cards

  Refer to "*List of option PCI cards and installable slots*" in *5.7.1 Precautions* in *this Chapter*.

- Driver installation procedure

  For Express5800/ft series, use two option PCI cards in a pair to make dual configuration.
  You do not need to install drivers for N8803-040/040F board or N8803-040AF board because they are included in the OS.

NEC Express5800 Series
Express5800/R320e-E4, R320e-M4, R320f-E4, R320f-M4

3

Useful Features

This chapter describes useful features for using the server. Refer to this chapter according to your purpose and need.

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, ...`   (* a different message may appear depending on the environment)
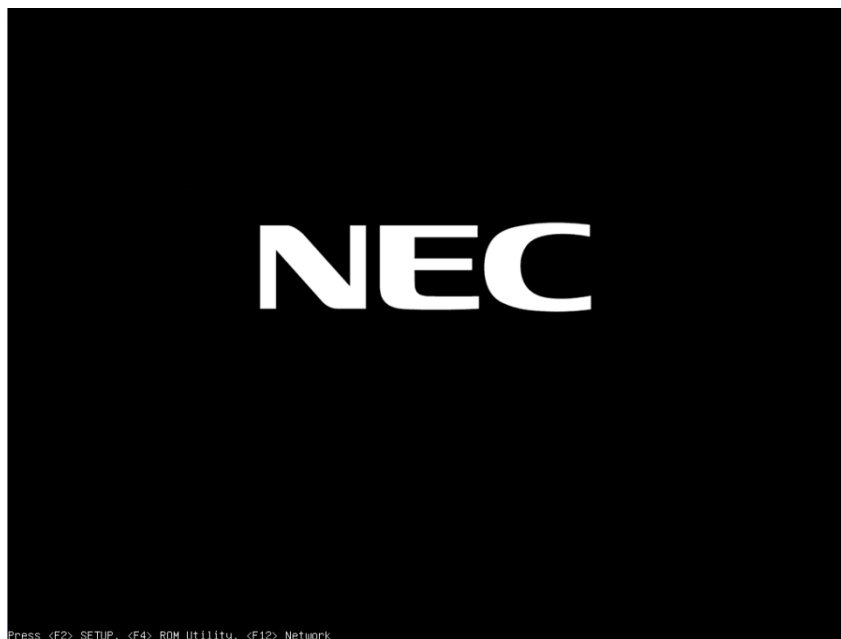
If you press **F2**, SETUP will start after POST, and the Main menu appears.

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

If you start up the SETUP utility, the **Main** menu is displayed first.

```
              Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
       Main  Advanced  Security  Server  Boot  Save & Exit

      BIOS Information                                    Set the Date. Use Tab to
      BIOS Version                    8.0:38              switch between Date elements.
      Build Date                      03/30/2015 16:11:45
      Access Level                    Administrator
      UEFI Spec Version               2.3.1

      Memory Information
      Total Memory                    16384 MB

      System Date                     [Wed 04/22/2015]
      System Time                     [09:51:23]




                                                          F1: General Help
                                                          F4: Save & Exit Setup
                                                          ESC: Exit


              Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

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	–	The version of the UEFI specification supported by the BIOS.
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 **Enter** to display its submenu.

If the Boot Mode is [UEFI]:

```
                Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
         Main  Advanced  Security  Server  Boot  Save & Exit

       ▶ Processor Configuration                        Processor Configuration
       ▶ Memory Configuration                           parameters.
       ▶ PCI Configuration
       ▶ Advanced Chipset Configuration
       ▶ USB Configuration
       ▶ Serial Port Configuration
       ▶ Network Stack Configuration
       ▶ UEFI Driver Configuration



                                                        F1: General Help
                                                        F4: Save & Exit Setup
                                                        ESC: Exit


                Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

If the Boot Mode is [Legacy]:

```
                Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
         Main  Advanced  Security  Server  Boot  Save & Exit

       ▶ Processor Configuration                        Processor Configuration
       ▶ Memory Configuration                           parameters.
       ▶ PCI Configuration
       ▶ Advanced Chipset Configuration
       ▶ USB Configuration
       ▶ Serial Port Configuration
         Network Stack Configuration
       ▶ UEFI Driver Configuration
         ****************************************
         Setup Notice :
          When "Boot Mode" is set to [Legacy],
          "Network Stack Configuration" and
          "UEFI Driver Configuration" cannot be
          configured.
         ****************************************


                                                        F1: General Help
                                                        F4: Save & Exit Setup
                                                        ESC: Exit


                Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

Note   The Network Stack Configuration or UEFI Driver Configuration submenu cannot be selected if the Boot Mode is [Legacy]; They are selectable only if the Boot Mode is [UEFI].

(1) Processor Configuration submenu

From the **Advanced** menu, select **Processor Configuration** and then press **Enter** to display the menu screen shown below. For the menu that has ▶ on the left, move the cursor to it and then press **Enter** to show its submenus.

```
                Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
            Advanced

     ▶ Processor Information
       Hardware Prefetcher              [Enabled]
       Adjacent Cache Line Prefetch     [Enabled]

       Execute Disable Bit             [Enabled]
       VT-x                            [Enabled]
       Active Processor Cores          8
       Hyper-Threading                 [Enabled]





                                               F1: General Help
                                               F4: Save & Exit Setup
                                               ESC: Exit



                Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

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 (maximum number of cores) can be changed only if one processor is installed. It may be set only for the debugging purpose.
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

```
           Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
           Advanced

    Processor 1 CPUID              306f2
    Processor Type                Intel(R) Xeon(R)
                                  processor E5-2630 v3
    Processor Speed               2400 MHz
    Active Cores                  8
    Max Cores                     8
    L2 Cache RAM                  8 x 256 kB
    L3 Cache RAM                  20480 kB
    Microcode Revision            ffff0001
    EMT64                         Supported
    Hyper-Threading               Supported

    Processor 2 CPUID              306f2
    Processor Type                Intel(R) Xeon(R)
                                  processor E5-2630 v3
    Processor Speed               2400 MHz
    Active Cores                  8
    Max Cores                     8
    L2 Cache RAM                  8 x 256 kB
    L3 Cache RAM                  20480 kB                 F1: General Help
    Microcode Revision            ffff0001                 F4: Save & Exit Setup
    EMT64                         Supported                ESC: Exit
    Hyper-Threading               Supported



           Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

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.
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 displayed if the Intel 64 architecture of Processor 1 is supported.
Hyper-Threading	–	[Supported] is displayed if the Hyper-Threading Technology function of Processor 1 is supported.
Processor 2 CPUID	Number Not Installed	ID of Processor 2 is displayed by a numerical value. "Note 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 displayed if the Intel 64 architecture of Processor 2 is supported.
Hyper-Threading	–	[Supported] is displayed if the Hyper-Threading Technology function of Processor 2 is supported.

[   ]: Factory settings

(2) Memory Configuration submenu

From the **Advanced** menu, select **Memory Configuration** and then press **Enter** to display the menu screen shown below. For the menu that has ▶ on the left, move the cursor to it and then press **Enter** to show its submenus.

```
            Aptio Setup Utility – Copyright (C) 2014 American Megatrends, Inc.
      Advanced

  ▶ Memory Information





                                                      F1: General Help
                                                      F4: Save & Exit Setup
                                                      ESC: Exit


            Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```
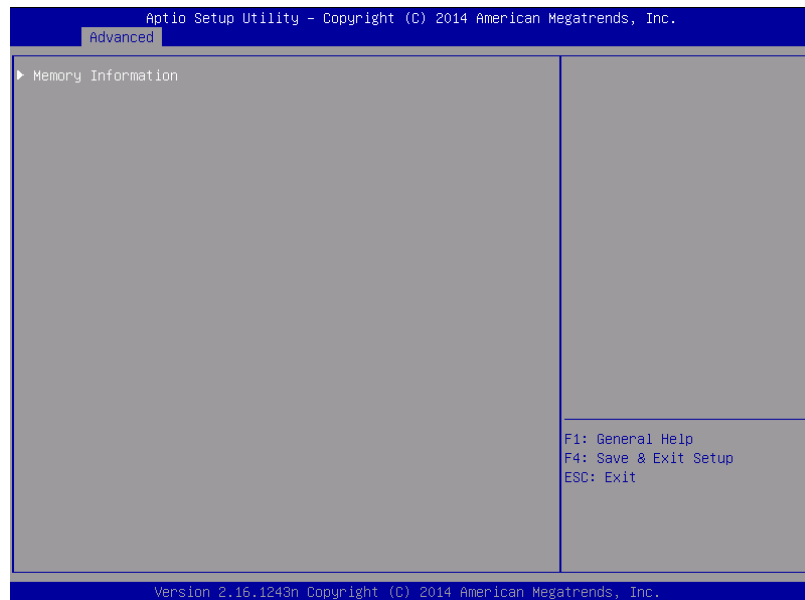
For details about the options, see the table below.

Option	Parameter	Descriptions
Memory Information	–	–

[   ]: Factory settings

(a) Memory Information submenu

```
          Aptio Setup Utility – Copyright (C) 2014 American Megatrends, Inc.
               Advanced

  Total Memory                    16384 MB

  Current Memory Speed            1866 MHz
  CPU1_DIMM1 Status               16384 MB
  CPU1_DIMM2 Status               Not Present
  CPU1_DIMM3 Status               Not Present
  CPU1_DIMM4 Status               Not Present
  CPU1_DIMM5 Status               Not Present
  CPU1_DIMM6 Status               Not Present
  CPU1_DIMM7 Status               Not Present
  CPU1_DIMM8 Status               Not Present

  CPU2_DIMM1 Status               Not Present
  CPU2_DIMM2 Status               Not Present
  CPU2_DIMM3 Status               Not Present
  CPU2_DIMM4 Status               Not Present
  CPU2_DIMM5 Status               Not Present
  CPU2_DIMM6 Status               Not Present
  CPU2_DIMM7 Status               Not Present
  CPU2_DIMM8 Status               Not Present        F1: General Help
                                                     F4: Save & Exit Setup
                                                     ESC: Exit



          Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

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	–	Currently active memory clock.
CPU1_DIMM1-8 Status CPU2_DIMM1-8 Status	Number Not Present	Capacity and status 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 **Enter** to display the menu screen as shown below.

```
              Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
         Advanced

  ▶ PCI Device Controller and Option ROM Settings




                                                          F1: General Help
                                                          F4: Save & Exit Setup
                                                          ESC: Exit



              Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```
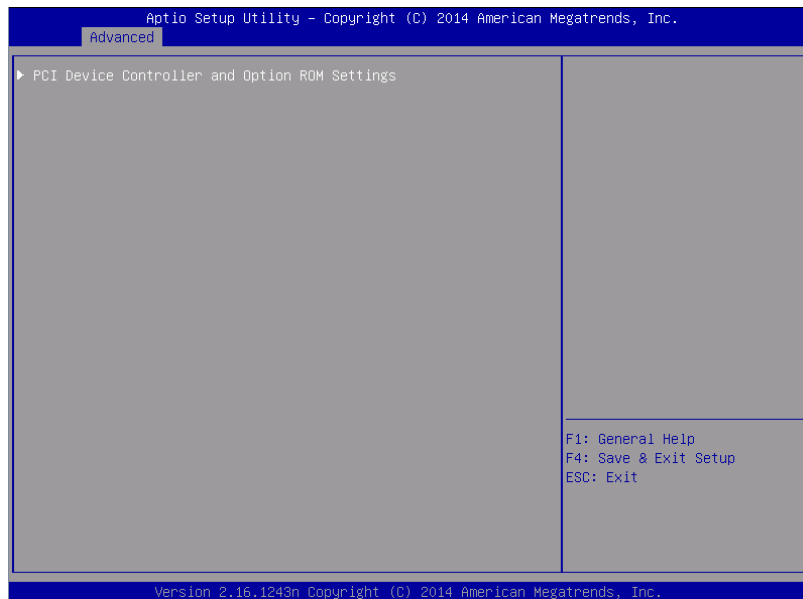
For details about the options, see the table below.

Option	Parameter	Descriptions
PCI Device Controller and Option ROM Settings	—	—

[   ]:   Factory settings

(a) **PCI Device Controller and Option ROM Settings submenu**

```
              Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
              Advanced

       SAS Option ROM Scan            [Enabled]         Selects the Boot Option for
       LAN Boot Mode                  [PXE]             SAS Devices.
       LAN1 Option ROM Scan           [Enabled]
       LAN2 Option ROM Scan           [Enabled]
       LAN3 Option ROM Scan           [Enabled]
       LAN4 Option ROM Scan           [Enabled]

       PCI1 Slot Option ROM           [Disabled]
       PCI2 Slot Option ROM           [Disabled]
       PCI3 Slot Option ROM           [Disabled]
       PCI4 Slot Option ROM           [Disabled]




                                                        F1: General Help
                                                        F4: Save & Exit Setup
                                                        ESC: Exit



              Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

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.
LAN Boot Mode	[PXE] iSCSI	Select the option ROM where the onboard LAN is deployed. This appears only if the Boot Mode is [Legacy].
LANx Option ROM Scan	Disabled [Enabled]	Enable or disable the option ROM SCAN for onboard LAN. R320e-M4, R320f-M4 X:1/2/3/4 R320e-E4, R320f-E4 X:1/2
PCIx Slot Option ROM	[Disabled] Enabled	Enable or disable the option ROM on each PCI slot. R320e-M4, R320f-M4 X:1/2/3/4 R320e-E4, R320f-E4 X:1/2

[   ]: Factory settings

Note   If the hard disk drive in which the OS has been installed is not connected for a LAN board (network boot) or Fibre Channel controller, disable option-ROM deployment of the PCI slot.

(4) Advanced Chipset Configuration submenu

From the **Advanced** menu, select **Advanced Chipset Configuration** and then press **Enter** to display the menu screen as shown below.

```
         Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
        Advanced

                                                           Determines the action of the
      Wake On LAN/PME                    [Enabled]         system when a LAN/PME wake
                                                           up event occurs.














                                                           F1: General Help
                                                           F4: Save & Exit Setup
                                                           ESC: Exit




         Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```
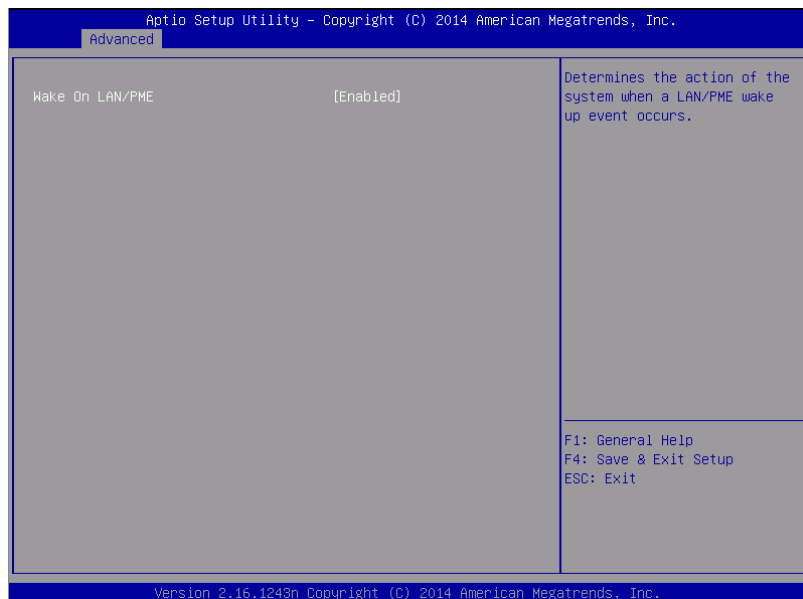
For details about the options, see the table below.

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 **Enter** to display the menu screen shown below.

```
            Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
      Advanced

  Device Reset Timeout            [20 sec]                 Selects USB mass storage
                                                           device Start Unit command
  XHCI Mode                       [Auto]                   timeout.









                                                           F1: General Help
                                                           F4: Save & Exit Setup
                                                           ESC: Exit



            Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

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.
XHCI Mode	Smart Auto Auto Enabled [Disabled]	Set the USB 3.0 controller mode. For [Smart Auto], the USB 3.0 setting is inherited during POST according to the support of OS. For [Auto], USB 3.0 is enabled after the startup of the OS that supports USB 3.0. For [Enabled], USB 3.0 is enabled. For [Disabled], USB 3.0 is disabled. Set the value of [XHCI Mode] to [Auto] for this server according to *Chapter 1 (1.Setup Procedure)* in *Installation Guide (VMware)*.

[   ]: Factory settings

(6) Serial Port Configuration submenu

From the **Advanced** menu, select **Serial Port Configuration** and then press **Enter** to display the menu screen shown below.

```
               Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
      Advanced

      Serial Port A Settings                               Configures serial port A
      Serial Port A                    [Enabled]           using options.
      Serial A Base I/O                [3F8h]              [Disabled]
      Serial A Interrupt               [IRQ 4]              No configuration
                                                           [Enabled]
      Serial Port B Settings                                User configuration
      Serial Port B                    [Enabled]
      Serial B Base I/O                [2F8h]
      Serial B Interrupt               [IRQ 3]

      Console Redirection Settings
      BIOS Redirection Port            [Disabled]




                                                           F1: General Help
                                                           F4: Save & Exit Setup
                                                           ESC: Exit


               Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

From **BIOS Redirection Port**, select **Serial Port A** or **Serial Port B** and then press **Enter** to display the menu screen shown below.

```
               Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
      Advanced

      Serial Port A Settings                               Selects the Serial port to
      Serial Port A                    [Enabled]           use for Console Redirection.
      Serial A Base I/O                [3F8h]              [Disabled] completely
      Serial A Interrupt               [IRQ 4]             disables Console Redirection.

      Serial Port B Settings
      Serial Port B                    [Enabled]
      Serial B Base I/O                [2F8h]
      Serial B Interrupt               [IRQ 3]

      Console Redirection Settings
      BIOS Redirection Port            [Serial Port A]
      Terminal Type                    [VT100+]
      Baud Rate                        [115200]
      Data Bits                        [8]
      Parity                           [None]
      Stop Bits                        [1]
      Flow Control                     [Hardware RTS/CTS]

      Continue C.R. after POST         [Enabled]           F1: General Help
                                                           F4: Save & Exit Setup
                                                           ESC: Exit


               Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```
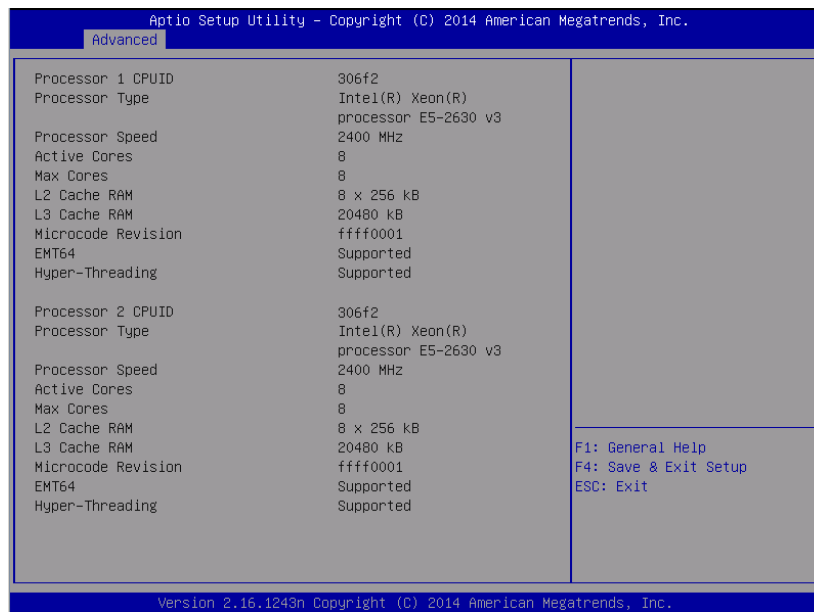
For details about the options, see the table below.

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

Select [Network Stack Configuration] from the Advanced menu, and press Enter to display the following

screen.

```
            Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
        Advanced

    Network Stack                 [Enabled]          Disable/Enable UEFI Network
                                                     Stack.
    PXE Configuration
    Network Mode                  [IPv4]
    Media Detect Count            1

  ▶ iSCSI Configuration




                                                     F1: General Help
                                                     F4: Save & Exit Setup
                                                     ESC: Exit



            Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```
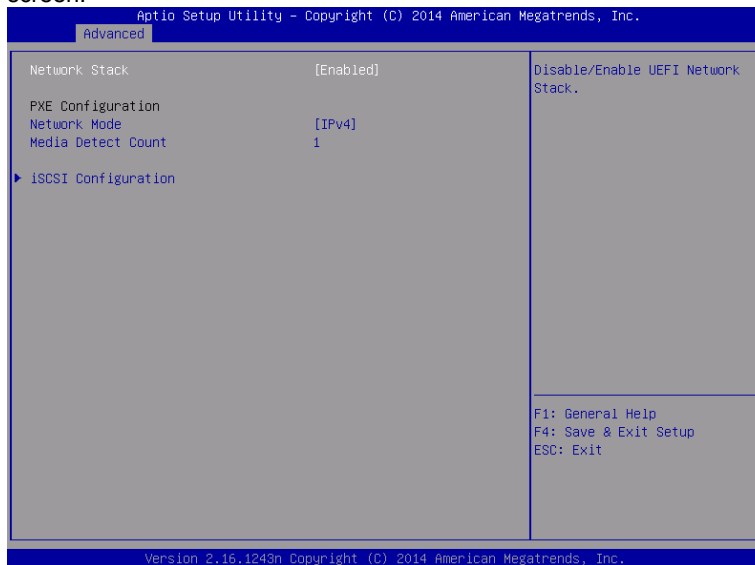
Option	Parameter	Descriptions
Network Stack	Disabled [Enabled]	Enable or disable the UEFI network stack. The following menu items appear if this function was enabled.
PXE Configuration	—	—
Network Mode	Disabled [IPv4] IPv6	Set the PXE network mode.
Media Detect Count	[1]-50	Set the number of media detection retries that are performed during PXE connection.
iSCSI Configuration	—	—

[   ]: Factory settings

(a) iSCSI Configuration submenu

```
                    Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
        Advanced

   iSCSI Initiator Name                              The worldwide unique name of
                                                     iSCSI Initiator. Only IQN
 ▶ Add an Attempt                                    format is accepted.Range is
                                                     from 4 to 223
 ▶ Delete Attempts

 ▶ Change Attempt Order




                                                     F1: General Help
                                                     F4: Save & Exit Setup
                                                     ESC: Exit


                    Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```
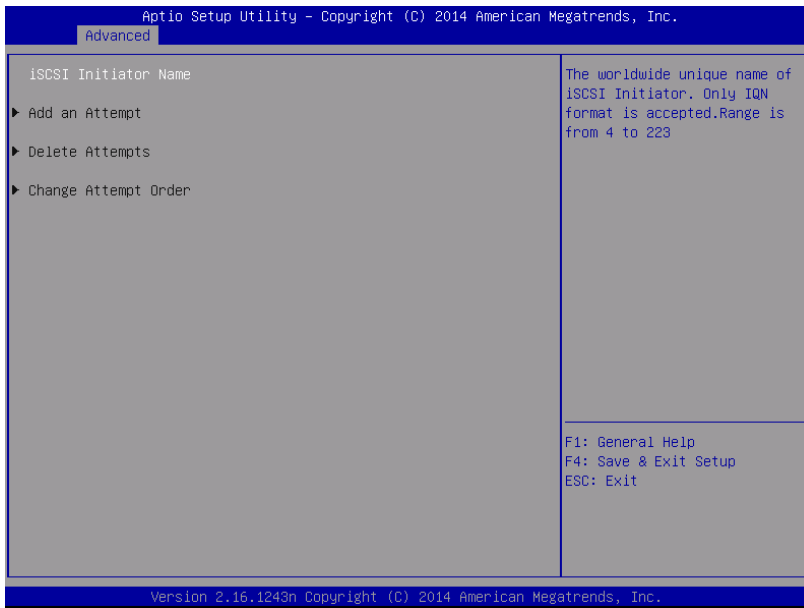
For details of the options, see the following table.

Option	Parameter	Descriptions
iSCSI Initiator Name	4 to 223 alphanumeric characters	Set the iSCSI initiator name In the format of "iSCSI qualified name (IQN)". The following menu items can be selected if the iSCSI initiator name was set.
Add an Attempt	–	–
Attempt [XX]	–	–
Delete Attempts	–	–
Change Attempt Order	–	–

[   ]: Factory settings

①. **Add an Attempt submenu**

```
                 Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
         Advanced

▶ MAC 58:C2:32:0D:85:9C                              PFA: Bus 7 | Dev 0 | Func 0
▶ MAC 58:C2:32:0D:85:9D
▶ MAC 58:C2:32:0D:85:A4
▶ MAC 58:C2:32:0D:85:A5




                                                    F1: General Help
                                                    F4: Save & Exit Setup
                                                    ESC: Exit



                 Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```
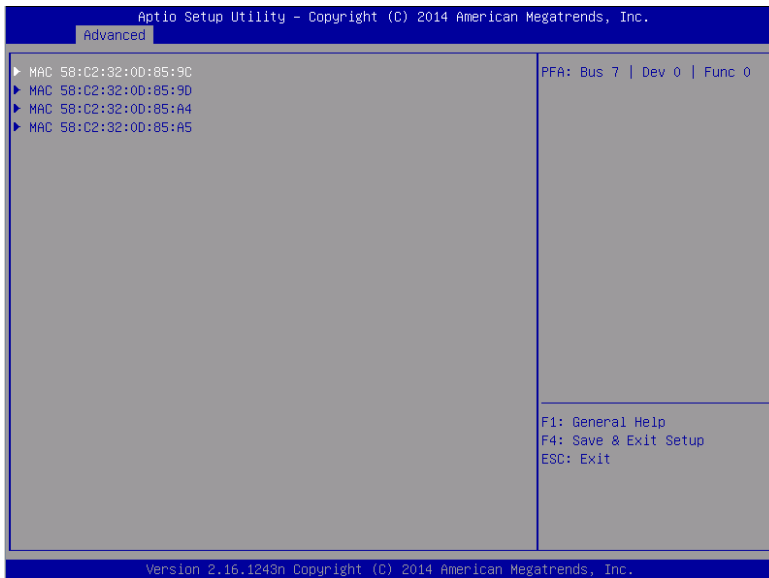
Note	The MAC address appears if the onboard LAN controller or the UEFI driver of each PCI device was loaded.

Option	Parameter	Descriptions
MAC [XX:XX:XX:XX:XX:XX]	–	–

②. MAC [XX:XX:XX:XX:XX:XX] submenu

```
              Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
        Advanced

   iSCSI Attempt Name              1                  ▲ The human name defined for
                                                        this attempt. Maximum length
   iSCSI Mode                      [Disabled]           is upto 96 characters

   Internet Protocol               [IP4]

   Connection Retry Count          5
   Connection Establishing Timeout 16000

   OUI-format ISID                 18C2320D859C
   Configure ISID                  0D859C

   Enable DHCP                     [Enabled]

   Get Target info via DHCP        [Disabled]
   Target Name
   Target IP Address               0.0.0.0
   Target Port                     3260
   Boot LUN                        0
                                                      ┌────────────────────────
   Authentication Type             [CHAP]             F1: General Help
   CHAP Type                       [Mutual]           F4: Save & Exit Setup
   CHAP Name                                          ESC: Exit
   CHAP Secret
   CHAP Status                     [Not Installed]  ▼

              Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

Option	Parameter	Descriptions
iSCSI Attempt Name	Up to 96 alphanumeric characters	Set the iSCSI attempt name.
iSCSI Mode	[Disabled] Enabled Enabled for MPIO	Set the iSCSI mode.
Internet Protocol	[IP4] IP6	Set the iSCSI IP mode.
Connection Retry Count	0-[5]-16	Set the number of retries of iSCSI connection.
Connection Establishing Timeout	100-[16000]-20000	Set the timeout value of iSCSI connection In milliseconds.
OUI-format ISID	(Display only)	OUI-format ISID is displayed.
Configure ISID	6 digits	Set the lower three bytes of OUI-format ISID. For the default, store the MAC address value.
Enable DHCP	[Disabled] Enabled	Enable or disable the DHCP.
Initiator IP Address	IP Address	Set the initiator IP address. This option does not appear if Enable DHCP was enabled or Internet Protocol was set to [IP6].
Initiator Subnet Mask	IP Address	Set the initiator subnet mask. This option does not appear if Enable DHCP was enabled.

Option	Parameter	Descriptions
Gateway	IP Address	Set the gateway. This option does not appear if Enable DHCP was enabled.
Get target info via DHCP	[Disabled] Enabled	Enable or disable acquiring the target information via the DHCP. This option does not appear if Enable DHCP was disabled.
Target Name	4 to 223 alphanumeric characters	Set the target name. Set in the format of "iSCSI qualified name (IQN)". This option does not appear if Get Target info via DHCP was enabled.
Target IP Address	IP Address	Set the target IP address. This option does not appear if Get Target info via DHCP was enabled.
Target Port	0-65535	Set the target port. This option does not appear if Get Target info via DHCP was enabled.
Boot LUN	Up to 20 alphanumeric characters	Set LUN. This option does not appear if Get Target info via DHCP was enabled.
Authentication Type	CHAP [None]	Set the authentication type.
CHAP Type	One way [Mutual]	Set the CHAP type. This option appears if Authentication Type was set to [CHAP].
CHAP Name	Up to 126 alphanumeric characters	Set the CHAP name. This option appears if Authentication Type was set to [CHAP].
CHAP Secret	12 to 16 alphanumeric characters	Set the CHAP secret. This option appears if Authentication Type was set to [CHAP].
CHAP Status	(Display only)	The CHAP secret setting is displayed. This option appears if Authentication Type was set to [CHAP].
Reverse CHAP Name	Up to 126 alphanumeric characters	Set the reverse CHAP name. This option appears if Authentication Type was set to [CHAP] and CHAP Type was set to [Mutual].
Reverse CHAP Secret	12 to 16 alphanumeric characters	Set the reverse CHAP secret. This option appears if Authentication Type was set to [CHAP] and CHAP Type was set to [Mutual].
Reverse CHAP Status	(Display only)	The reverse CHAP secret setting is displayed. This option appears if Authentication Type was set to [CHAP] and CHAP Type was set to [Mutual].
Save Changes	–	Save the changes.
Back to Previous Page	–	Return to the iSCSI Configuration submenu.

[   ]: Factory settings

③. **Attempt[XX] submenu**

The same options as the MAC [XX:XX:XX:XX:XX:XX] submenu are displayed or set.
See the MAC [XX:XX:XX:XX:XX:XX] submenu.

④. **Delete Attempts submenu**

```
              Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
       Advanced

   Attempt 1                          [Disabled]            MAC: 58:C2:32:0D:85:9C, PFA:
                                                            Bus 7 | Dev 0 | Func 0,
   Commit Changes and Exit                                  iSCSI mode: Enabled, IP
   Discard Changes and Exit                                 version: IP4




                                                            F1: General Help
                                                            F4: Save & Exit Setup
                                                            ESC: Exit


              Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```
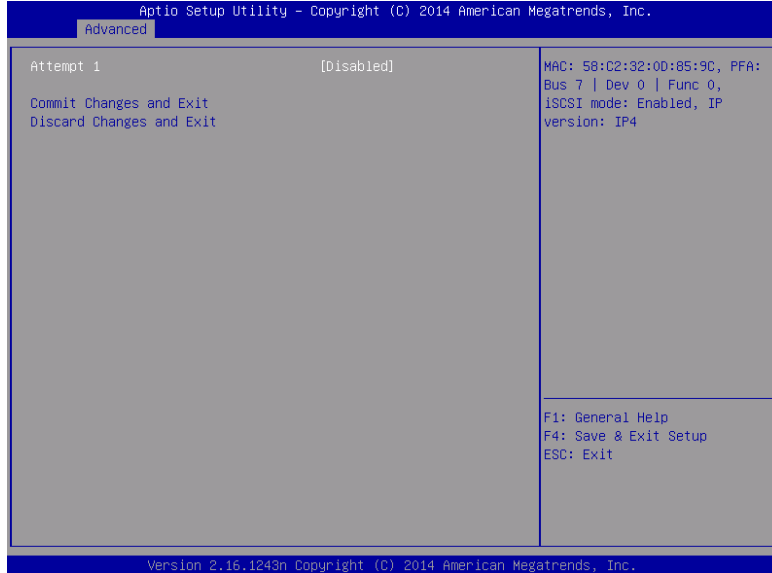
Option	Parameter	Descriptions
Attempt [XX]	[Disabled] Enabled	Enable the iSCSI attempt to be deleted.
Commit Changes and Exit	–	Save the changes, and then return to the iSCSI Configuration submenu.
Discard Changes and Exit	–	Without save the changes, return to the iSCSI Configuration submenu.

[   ]: Factory settings

⑤. **Change Attempt Order submenu**

```
                Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
        Advanced

  Change Attempt Order              [Attempt 1]          Change the order of Attempts
                                                         using +/- keys. Use arrow
  Commit Changes and Exit                                keys to select the attempt
  Discard Changes and Exit                               then press +/- to move the
                                                         attempt up/down in the
                                                         attempt order list.




                                                         F1: General Help
                                                         F4: Save & Exit Setup
                                                         ESC: Exit



                Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

Option	Parameter	Descriptions
Change Attempt Order	Attempt [XX] Attempt [XX]	Set the iSCSI attempt priority. Display the pop-up window by pressing Enter. Then, use + or - key to change the priority.
Commit Changes and Exit	–	Save the changes, and then return to the iSCSI Configuration submenu.
Discard Changes and Exit	–	Without save the changes, return to the iSCSI Configuration submenu.

[　　]: Factory settings

(8) UEFI Driver Configuration submenu

Select [UEFI Driver Configuration] from the Advanced menu, and press Enter to display the following screen.


```
                    Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
             Advanced

 ▶ Intel(R) I350 Gigabit Network Connection - 8C:DF:9D:91:A3:18    Configure Gigabit Ethernet
 ▶ VLAN Configuration (MAC:8CDF9D91A318)                           device parameters
 ▶ Intel(R) I350 Gigabit Network Connection - 8C:DF:9D:91:A3:19
 ▶ VLAN Configuration (MAC:8CDF9D91A319)
 ▶ LSI SAS3 MPT Controller SAS3008, (PCISubDeviceId: 0x804E,
   PCIBus: 0x1A, PCIDevice: 0x0, PCIFunc: 0x0, PCISlot: 0x9)
 ▶ Intel(R) Ethernet Controller 10 Gigabit X540-AT2 -
   8C:DF:9D:91:A3:20
 ▶ VLAN Configuration (MAC:8CDF9D91A320)
 ▶ Intel(R) Ethernet Controller 10 Gigabit X540-AT2 -
   8C:DF:9D:91:A3:21
 ▶ VLAN Configuration (MAC:8CDF9D91A321)

 ▶ Driver Health

                                                                  F1: General Help
                                                                  F4: Save & Exit Setup
                                                                  ESC: Exit

                    Version 2.17.1249n Copyright (C) 2016 American Megatrends, Inc.
```

Option	Parameter	Descriptions
(UEFI Driver Name)	ー	The MAC address appears if the onboard LAN controller or the UEFI driver of each PCI device was loaded. This submenu varies depending on the UEFI driver.
VLAN Configuration (MAC:XXXXXXXXXXXX)	ー	This option is indicated only by R320f-M4 and R320f-E4.
Driver Health	ー	ー

[   ]: Factory settings

(a) VLAN Configuration (MAC:XXXXXXXXXXXX) submenu

```
              Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
        Advanced

  ▶ Intel(R) PRO/1000 6.4.13 PCI-E     Healthy        Provides Health Status for
  ▶ Intel(R) 10GbE Driver 4.5.19 x64    Healthy        the Drivers/Controllers
  ▶ Intel(R) PRO/1000 6.4.13 PCI-E     Healthy
  ▶ QLogic Fibre Channel Driver     Healthy
  ▶ Intel(R) 10GbE Driver 4.5.19 x64    Healthy




                                                        F1: General Help
                                                        F4: Save & Exit Setup
                                                        ESC: Exit



              Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

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
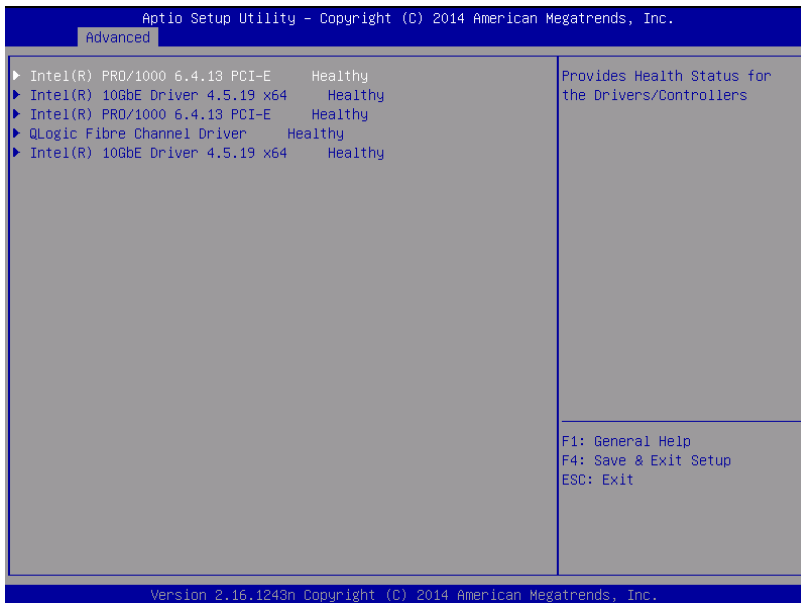
```
            Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
          Advanced

▶ Intel(R) PRO/1000 6.4.13 PCI-E     Healthy        Provides Health Status for
▶ Intel(R) 10GbE Driver 4.5.19 x64     Healthy      the Drivers/Controllers
▶ Intel(R) PRO/1000 6.4.13 PCI-E     Healthy
▶ QLogic Fibre Channel Driver     Healthy
▶ Intel(R) 10GbE Driver 4.5.19 x64     Healthy






                                                   F1: General Help
                                                   F4: Save & Exit Setup
                                                   ESC: Exit



            Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

For details of the options, see the following table.

Option	Parameter	Descriptions
(UEFI Driver Name)	–	The state of UEFI Driver Health is displayed. This option appears if the onboard LAN controller or the UEFI driver of each PCI device was loaded if this driver corresponds to the Driver Health.

[   ]: 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 **Enter** to show its submenus. Then configure the settings.

```
              Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
        Main  Advanced  Security  Server  Boot  Save & Exit

    Password Configuration                                    Set the Administrator
    Administrator Password                                    Password for system setup.
    User Password

    Security Configuration
    Password On Boot                     [Disabled]
    Disable USB Ports                    [None]








                                                              F1: General Help
                                                              F4: Save & Exit Setup
                                                              ESC: Exit




              Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

Select **Administrator Password** or **User Password**, and then press **Enter** to display the screen where you can register/change the password.

Tips	(1) User Password cannot be set without setting Administrator Password
	(2) Do not set any password before installing OS.
	(3) 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), refer to *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 **Enter** 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 **Enter** 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 **Enter** to show its submenus.

```
                Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
          Main  Advanced  Security  Server  Boot  Save & Exit

       ▶ System Management
       ▶ Power Control Configuration
       ▶ Event Log Configuration

         FRB-2 Timer                      [Enabled]
         PCI Enumeration Monitoring       [Enabled]
         PCI Enumeration Monitoring Timeout   180
         Option ROM Scan Monitoring       [Enabled]
         Option ROM Scan Monitoring Timeout   300
         OS Boot Monitoring               [Enabled]
         OS Boot Monitoring Timeout       600
         POST Pause Monitoring            [Enabled]
         POST Pause Monitoring Timeout    180
         Thermal Sensor                   [Enabled]
         POST Error Pause                 [Disabled]
         Display BMC IP address in POST   [Enabled]
         Legacy memory copy               [Disabled]




                                                    F1: General Help
                                                    F4: Save & Exit Setup
                                                    ESC: Exit



                Version 2.17.1249n Copyright (C) 2016 American Megatrends, Inc.
```

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 **Enter** 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. If the ESMPRO/ServerAgent is not installed on OS, disable this feature.
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 (Unit: seconds).
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	Set whether to stop POST temporarily at the end of POST when an error occurs during execution of POST.
Display BMC IP address in POST	Disabled [Enabled]	Enable or disable the feature to display BMC IP address during POST. (This option is indicated only by R320f-M4 and R320f-E4.)
Legacy memory copy	Disabled Enabled	Specify the memory copying method to other module. Don't change this option when there are no directions. (The factory setting differs depending on the environment you are using. Also, this option may not be displayed.) - When R320e-M4, R320e-E4 model Factory settings is [Enabled]. This option is different in setting depending on ESXi Version. 1) If ESXi Version is ESXi6.0 Don't change the setting. 2) If ESXi Version is ESXi6.5 or more Change to [Disabled] setting. Confirm the BIOS version. If BIOS version is not 8.1:71 or more, update to most new version. Then change to setting. See *Chapter 1 Installing OS in Installation Guide*, and change the setting. - When R320f-M4, R320f-E4 model Factory settings is [Disabled]. Don't change the setting.

[   ]: Factory settings

(1) System Management submenu

From the **Server** menu, move the cursor to **System Management** and then press **Enter** to show its submenus.
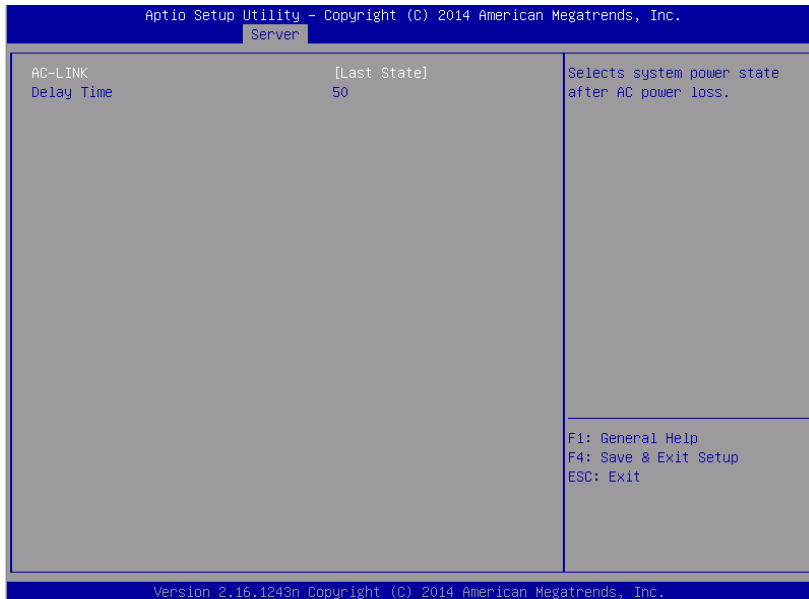
```
                Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
                                    Server

        BIOS Version                    8.0:38
        UEFI Spec Version               2.3.1

        Board Part Number               243-634944
        Board Serial Number             000000000000
        System Part Number              N8800-209E
        System Serial Number            88888888
        Chassis Part Number             243-427840-501
        Chassis Serial Number           01
        BMC Device ID                   42
        BMC Device Revision             01
        BMC Firmware Revision           04.31
        SDR Revision                    04.05
        ASIC Revision                   0002800028
        SMM Revision                    20
        System MAC Address              58-C2-32-0D-85-9C



                                                            F1: General Help
                                                            F4: Save & Exit Setup
                                                            ESC: Exit




                  Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

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 version of the UEFI specification supported by the BIOS.
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

Select [Power Control Configuration] from the Server menu, and press Enter to display the following screen.

```
                Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
                           Server

 AC-LINK                          [Last State]        Selects system power state
 Delay Time                       50                   after AC power loss.












                                                       F1: General Help
                                                       F4: Save & Exit Setup
                                                       ESC: Exit



                Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

For details of the options, see the following table.

Option	Parameter	Descriptions
AC-LINK	Stay Off [Last State] Power On	Set the AC-LINK function. Set the server power state that results when the AC power is supplied again after being turned off once (see the table below). If Power On or Last State is set, the server starts after the CPU/IO modules of both systems are installed (up to 180 seconds) in addition to the delay time of Power On Delay Time.
Delay Time	[50]-600	Set the DC-ON delay time in seconds if the AC-LINK setting is Power On or Last State. When setting up Power On, set at 70 seconds or more.

The following table summarizes the AC-LINK settings and how the DC power behaves when the AC power is supplied again after being turned off.

State exhibited before the AC power is turned off	AC-LINK setting		
	Stay Off	Last State	Power On
In operation (DC power is on.)	Off	On [*1]	On
Stopped (DC power is also off.)	Off	Off	On
Forced 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 This is to press and hold down the POWER switch for 4 seconds or more. The power is forcibly turned
   off.

Tips	If an uninterruptible power supply (UPS) is used for automatic operation, set the AC-LINK to [Power On].

(3) Event Log Configuration submenu

From the **Server** menu, move the cursor to **Event Log Configuration** and then press **Enter** to show its submenu.
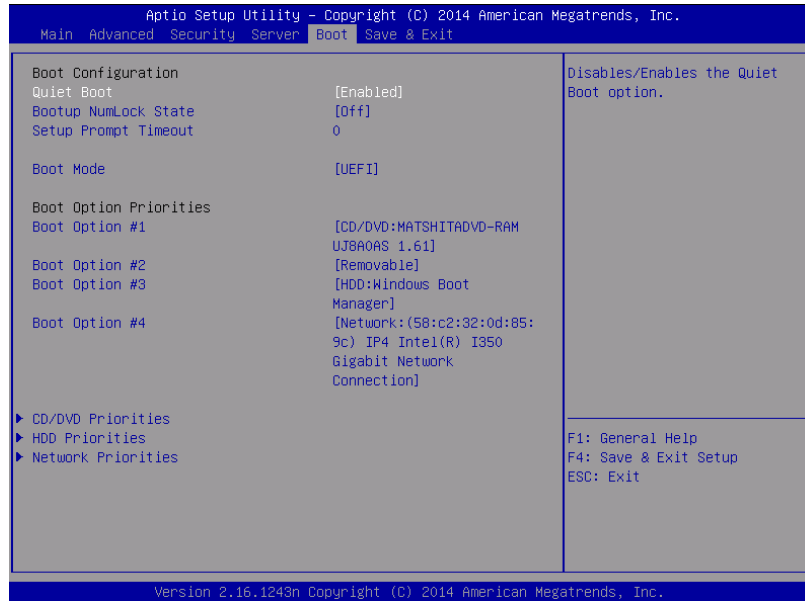
```
                Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
                                    Server

    ▶ Clear Online Event Logs                        The online system event log
    ▶ Clear Offline Event Logs                       will be cleared if you
                                                     select "YES".












                                                     F1: General Help
                                                     F4: Save & Exit Setup
                                                     ESC: Exit




                Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```
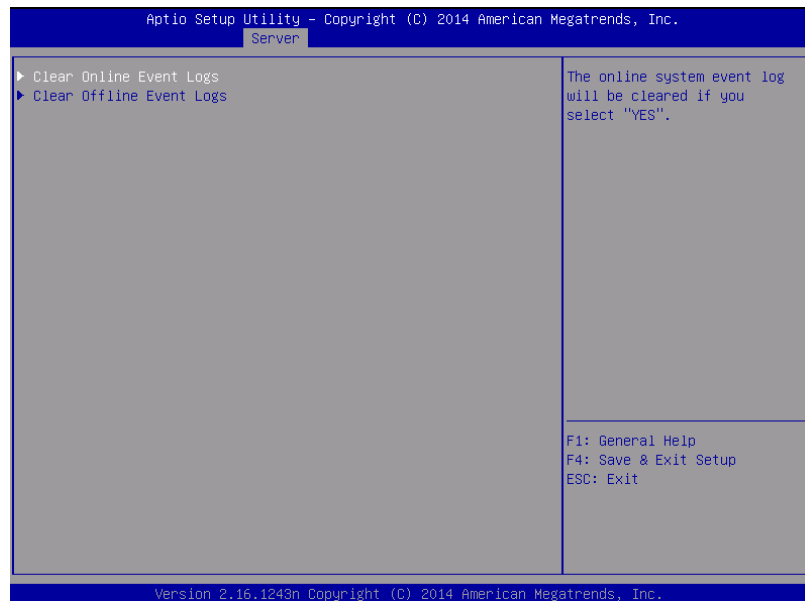
For details about the options, see the table below.

Option	Parameter	Descriptions
Clear Online Event Logs	–	Press **Enter** then select Yes to clear event logs of active module.
Clear Offline Event Logs	–	Press **Enter** 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.

```
                    Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
           Main  Advanced  Security  Server  Boot  Save & Exit

         Boot Configuration                                        Disables/Enables the Quiet
         Quiet Boot                        [Enabled]               Boot option.
         Bootup NumLock State              [Off]
         Setup Prompt Timeout              0

         Boot Mode                         [UEFI]

         Boot Option Priorities
         Boot Option #1                    [CD/DVD:MATSHITADVD-RAM
                                           UJ8A0AS 1.61]
         Boot Option #2                    [Removable]
         Boot Option #3                    [HDD:Windows Boot
                                           Manager]
         Boot Option #4                    [Network:(58:c2:32:0d:85:
                                           9c) IP4 Intel(R) I350
                                           Gigabit Network
                                           Connection]

       ▶ CD/DVD Priorities
       ▶ HDD Priorities                                            F1: General Help
       ▶ Network Priorities                                        F4: Save & Exit Setup
                                                                   ESC: Exit



                    Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

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 logo during POST. When this option is set to **Disabled**, the results of POST execution are displayed instead of the 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] - 65535	Set a value from 0 to 65535 seconds that specifies the F2 key input wait time required to start SETUP.
Boot Mode	[Legacy] UEFI	Set the boot mode. If [Load Setup Defaults] in the Save & Exit mode was executed, this option is set to [UEFI]. For this server, set this option to [Legacy].
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

Changing the boot order

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 arrow keys ↑/↓ and +/−.
     Move the cursor to a device using the arrow keys ↑/↓, and change the priority using the arrow keys +/−.

Boot order rules

(1) If a bootable device is newly connected, the priority lowest in its BBS Priorities is assigned to that device.

(2) If a bootable device is disconnected from the server, the relevant device is removed from BBS Priorities.

(3) When Load Setup Defaults is executed on Save & Exit menu, the Boot Option and BBS Priorities are changed as follows.

   a) Boot Option Priorities

       1. Boot Option #1: CD/DVD Drive

       2. Boot Option #2: Removable Device

       3. Boot Option #3: Hard Disk Drive

       4. Boot Option #4: Network Device

   b) Priority of Priorities for each device type

       •   The priorities of the non-USB devices, including the SATA device and RAID, become higher, and the USB devices are registered subsequent to the non-USB devices.

   c) Devices that can be started

       •   If these devices have been Disabled, the setting is reset and re-registered for Priorities of each device type.

1.2.6   Save & Exit

If you move the cursor to **Save & Exit**, the **Save & Exit** menu appears.

```
            Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.
      Main  Advanced  Security  Server  Boot  Save & Exit

 Save & Exit Options                                Exit system setup after
 Save Changes and Exit                              saving the changes.
 Discard Changes and Exit
 Save Changes and Power Off
 Discard Changes and Power Off
 Load Setup Defaults




                                                    F1: General Help
                                                    F4: Save & Exit Setup
                                                    ESC: Exit



            Version 2.16.1243n Copyright (C) 2014 American Megatrends, Inc.
```

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 setting at startup of SETUP utility is retained.

After the SETUP utility closes, the system automatically reboots.

(c) Save Changes and Power Off

The utility closes after the changes are saved in NVRAM.

After closing, the server automatically turns off the power.

(d) Discard Changes and Power Off

The utility closes without saving the changes in NVRAM. The initial BIOS settings being set when the utility starts are inherited. After closing, the server automatically turns off the power.

(e) Load Setup Defaults

This option resets all the values 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. The values in the iSCSI Configuration or UEFI Driver Configuration submenus do not return to the default settings.

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**.
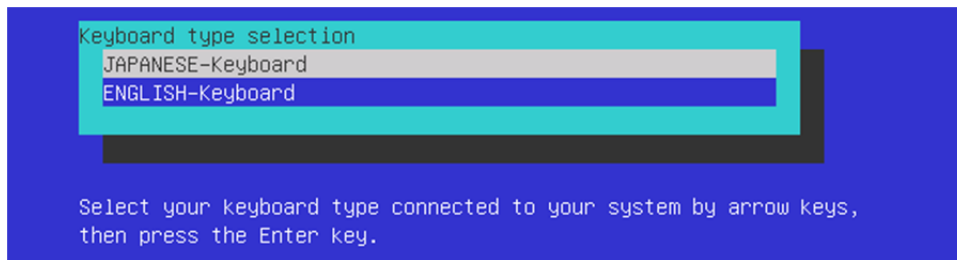
Keyboard type selection

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**.
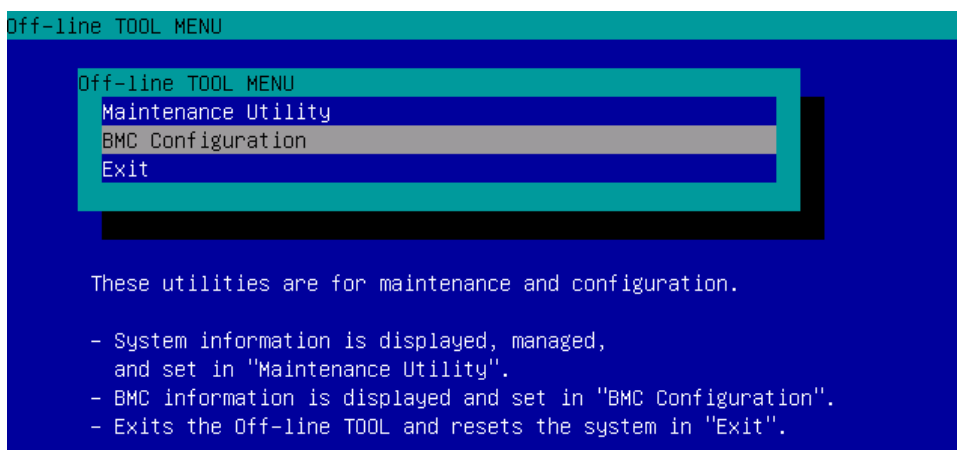
Off-line TOOL MENU

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.
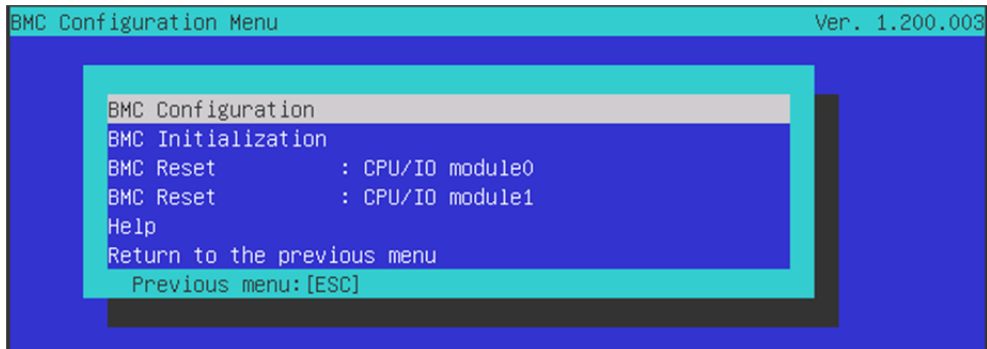
Main Menu

The features are described below.

(a) BMC Configuration

You can set configuration information to BMC.
If you select **OK** after you change the values, the set values are applied to BMC.
See *(2.4 Setting BMC Configuration)* for details.

(b) BMC Initialization

You can restore the BMC Configuration information to the default value (except for some items).
Executing this item initializes both CPU/IO modules 0 and 1.
See *(2.5 BMC Initialization)* for details.

(c) BMC Reset: CPU/IO module X

You can reset BMC of CPU/IO module X (X = 0 or 1) without changing any settings.
See *(2.6 BMC Reset)* for details.

(d) Help

You can open BMC Configuration help window.

(e) Return to the previous menu

You can exit BMC Configuration, and return to **Offline Tools** menu.

2.4   **Setting BMC Configuration**

The Main Menu appears when you select **BMC Configuration** on Offline Tool menu.
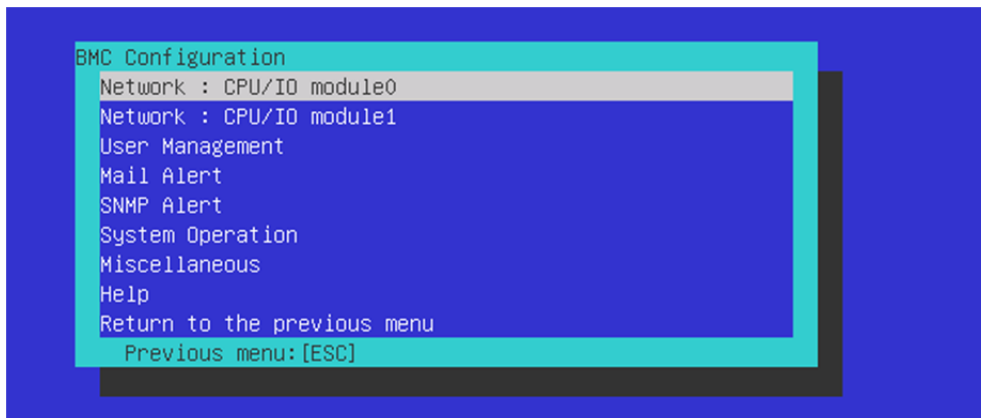
BMC Configuration menu

The features are described below.

(a) Network : CPU/IO module X

You can view 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.
See *(2.4.1 Network)* for details.

(b) User Management

You can manage users who use BMC.
See *(2.4.2 User Management)* for details.

(c) Mail Alert

You can view E-mail alert issued from BMC and change parameter setting.
See *(2.4.3 Mail Alert)* for details.

(d) SNMP Alert

You can view SNMP alert issued from BMC and change parameter setting.
See *(2.4.4 SNMP Alert)* for details.

(e) System Operation

You can set parameters for remote KVM console and remote media.
See *(2.4.5 System Operation)* for details.

(f) Miscellaneous

You can set various features of BMC.
See *(2.4.6 Miscellaneous)* for details.

(g) Help

You can open BMC Configuration help window.

(h) Return to the previous menu

You can exit 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 : CPU/IO module0
 IPv4 Property
 IPv6 Property
 Access Limitation
 Service
 Help
 Return to the previous menu
   Previous menu:[ESC]
```
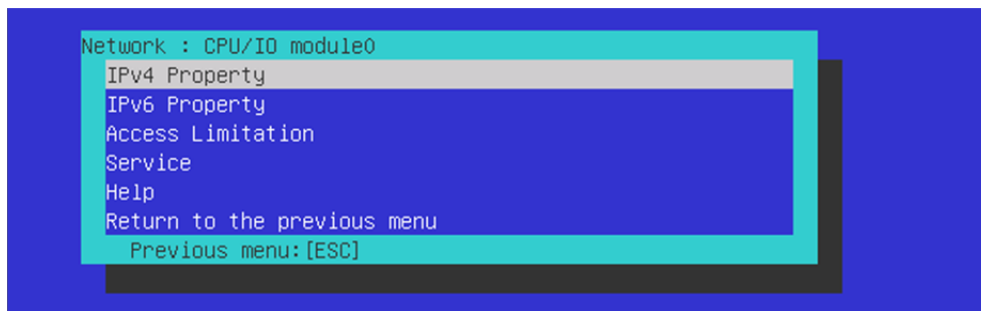
Network menu

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.[1]
	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. If you set this item, it is necessary for applying configuration information that the gateway is connected on network. [2] [3]	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 Address Assignment Mode. *7 *9	::
Static Address	Specify IPv6 address when Static is specified for Address Assignment Mode. *7 *10	0::0
Prefix Length	Specify the prefix length when Static is specified for Address Assignment Mode. *2 *7	64
Gateway Address	Specify the gateway address when Static is specified for Address Assignment Mode. *2 *7	0:00
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. *11 *12	Blank
Service		
HTTP	Enable or disable HTTP service. *13	Enable
HTTP Port Number	Specify the HTTP port number. *14	80
HTTPS	Enable or disable HTTPS service. *13	Enable
HTTPS Port Number	Specify the HTTPS port number. *14	443
SSH	Enable or disable SSH service.	Enable
SSH Port Number	Specify the SSH port number. *14	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:   When you need to know the Link Local Address, first set IPv6 to "Enable", redisplay this screen. Then Link Local Address configured automatically appear, be sure to use this address.

*9:   Displayed only when "Dynamic" is specified for Address Assignment Mode.

*10: Cannot set the Static Address whose start is "fe8".

*11: Can be specified when Access Limitation Type is "Allowed Address" or "Deny Address". The length must not exceed 255 characters.

12: The range of IP address 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)

*13: If HTTP is set to "Enable", HTTPS is changed to "Enable" automatically. You are not allowed to set "Enable" to HTTP only.
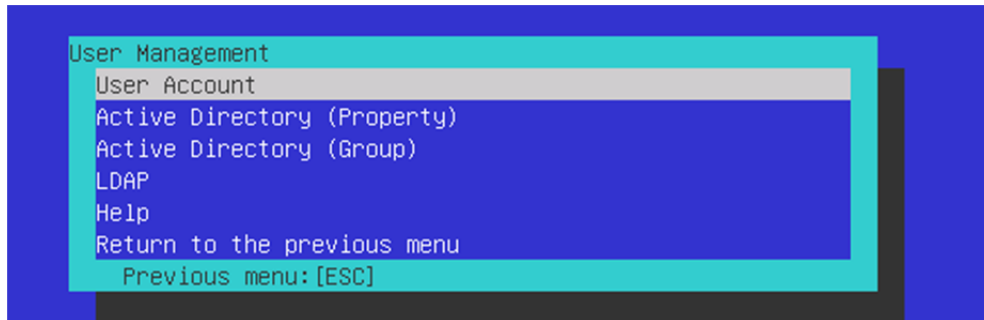
*14: Port number can be specified only when the relevant port is set to "Enable". The port number must be unique.

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
  User Account
  Active Directory (Property)
  Active Directory (Group)
  LDAP
  Help
  Return to the previous menu
     Previous menu:[ESC]
```

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
User Domain Name	Specify the user domain name. [5] [6]	Blank
Timeout	Specify timeout period for connection with Domain Controller. [5]	120
Domain Controller Server1	Enable or disable Domain Controller Server 1. [5] [7]	Enable
Server Address1	Specify IP address of Domain Controller Server 1. [5] [8]	Blank
Domain Controller Server2	Enable or disable Domain Controller Server 2. [5] [7]	Disable
Server Address2	Specify IP address of Domain Controller Server 2. [5] [8]	Blank
Domain Controller Server1	Enable or disable Domain Controller Server 3. [5] [7]	Disable
Server Address3	Specify IP address of Domain Controller Server 3. [5] [8]	Blank
Active Directory (Group)		
Group Name	Specify group name. [5] [6]	Blank
Group Domain	Specify group domain. [6]	Blank

Privilege	Specify privilege of group. [4]
	
	    Administrator
	
	    Operator
	
	    User
		Administrator

Item	Description	Default Value
LDAP		
LDAP Authentication	Enable or disable LDAP authentication.	Enable
IP Address	Specify the IP address. *9	0.0.0.0
Port Number	Specify the LDAP port number. *9	636
Search Base	Specify the search base used in LDAP authentication. *9 *10	Blank
Bind Domain Name	Specify the bind domain used in LDAP authentication. *9 *10	Blank
Bind Password	Specify the bind password used in LDAP authentication. *9 *11	Blank

*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 not 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 255 characters including alphanumeric, hyphen, underscore, and period can be used.

*7:   If Active Directory authentication is set to "Enable", at least one domain controller server must be enabled.

*8:   Can be specified only when domain controller server is set to "Enable".

*9:   Can be specified only when LDAP authentication is set to "Enable".

*10: Characters in the range between 4 and 62 including alphanumeric, hyphen, underscore, period, comma, and equal sign can be used.

*11: 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
  Mail Alert
  SMTP Server
  Alert Level
  Alert Test
  Help
  Return to the previous menu
    Previous menu:[ESC]
```
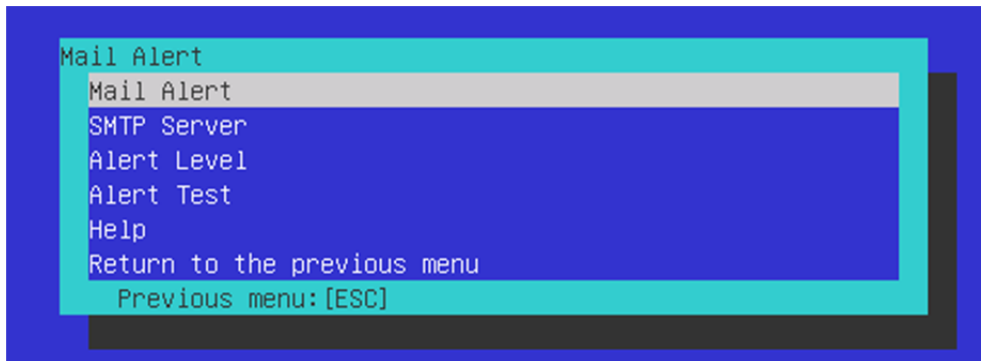
Mail Alert menu

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
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

Item	Description	Default Value
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.	
	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 addresses should be enabled.

*2:   Can be specified only when To:address 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 method 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 not be available 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 Reciever1	Enable or disable primary receiver. [*4]	Enable
IP Address1	Specify the IP Address of primary receiver. [*5]	0.0.0.0
Alert Reciever2	Enable or disable secondary receiver. [*4]	Disable
IP Address2	Specify the IP Address of secondary receiver. [*5]	0.0.0.0
Alert Reciever3	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.	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.	
	Separate Setting : You can arbitrarily select the event to alert in each sensor type.	
Alert Test	Execute a test by SNMP alert. [*6]	–

*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: 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.
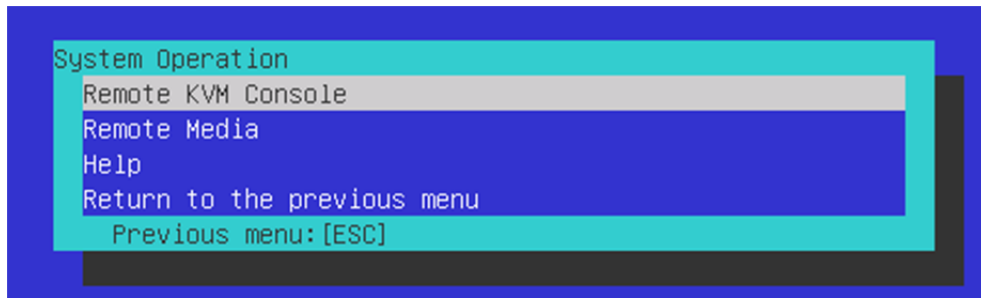
System Operation menu

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	Relative
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]
	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. [*2]
		Stop logging 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	Enable or disable Redirection feature. [*5] [*7]	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 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 log of OS by ft control software, so back up the 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.
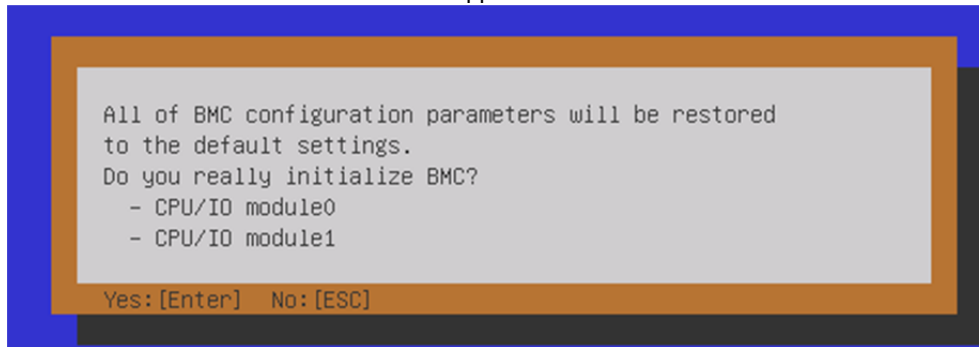
*7: If Redirection is set to "Enable", Console Redirection Configuration port in BIOS is set to "Serial Port B" at next boot.

Note	If you do not use remote management feature by NEC ESMPRO, set to "Disable" for ESMPRO Management in Management Software. In this case, setting 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]
```
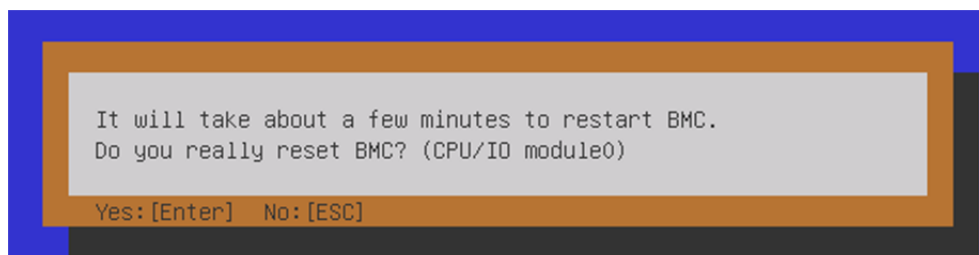
Confirmation message (BMC Initialization)

<**ESC**> key: Aborts 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 one minute to restart BMC.

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: Aborts processing and returns to Main menu.

<**Enter**> key: Resets BMC of CPU/IO module X (X = 0 or 1). It takes about one minute to restart BMC.

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 turn off the DC power to 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.   Start the BIOS Setup Utility according to *1.1 Starting SETUP* in *1. System BIOS* in *this Chapter*.

3.   If [Boot mode] in the [Boot] menu is [UEFI], change the setting to [Legacy].

4.   Select [Save Changes and Exit] in the [Save & Exit] menu, and restart the server.

5.   After the following messages appear during POST, press the **C** key while holding down **Ctrl.**

```
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 Utility...
```

6.   After a while, the SAS Configuration utility starts and the "Adapter List" menu is displayed.
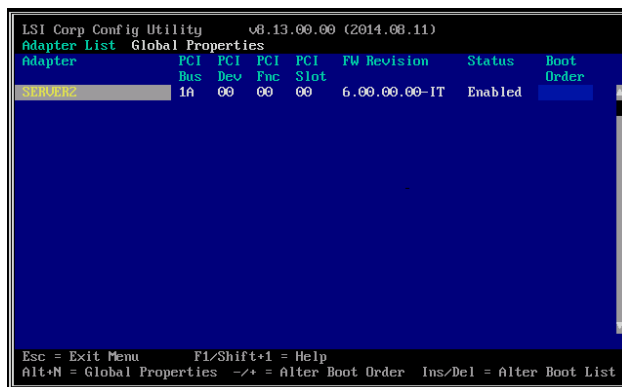
3.2   Quitting the SAS Configuration Utility

Take procedures below to quit the SAS Configuration utility.

1.   Press and hold down ESC until the following menu is displayed.

```
 Are you sure you want to exit ?
   Cancel Exit
   Save changes and reboot.
   Discard changes and reboot.
   Exit the Configuration Utility and Reboot
```

2.   From the menu, select either "Discard changes and reboot" or "Exit the Configuration Utility and Reboot", and press Enter.

Tips	Do not use the SAS Configuration utility to change the setting. If you mistakenly changed the setting, you should select [Discard changes and reboot] before closing the utility.

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 turn off the DC power to 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 **Enter** on the "Adapter List" menu.

After the "Adapter Properties" menu appears, select [SAS Topology] and press **Enter**.

2.   After the "SAS Topology" menu appears, select [Direct Attach Devices] and press **Enter.**

3.   After a while, the screen displays the hard disk drive installed in the primary CPU/IO module. Select the desired hard disk drive to be physically formatted. Then, press the D key while holding down **Alt**.

```
LSI Corp Config Utility      v8.13.00.00 (2014.08.11)
SAS Topology -- SAS3008
                         Device Identifier           Device
SERVER2(1A:00)                                        Info
 L Controller            Direct Attach Devices        Controller
   L Slot  0             SEAGATE ST300MP0065    N402   SAS






Esc = Exit   F1/Shift+1 = Help
Alt+D = Device Properties    Alt+M = More Keys
```
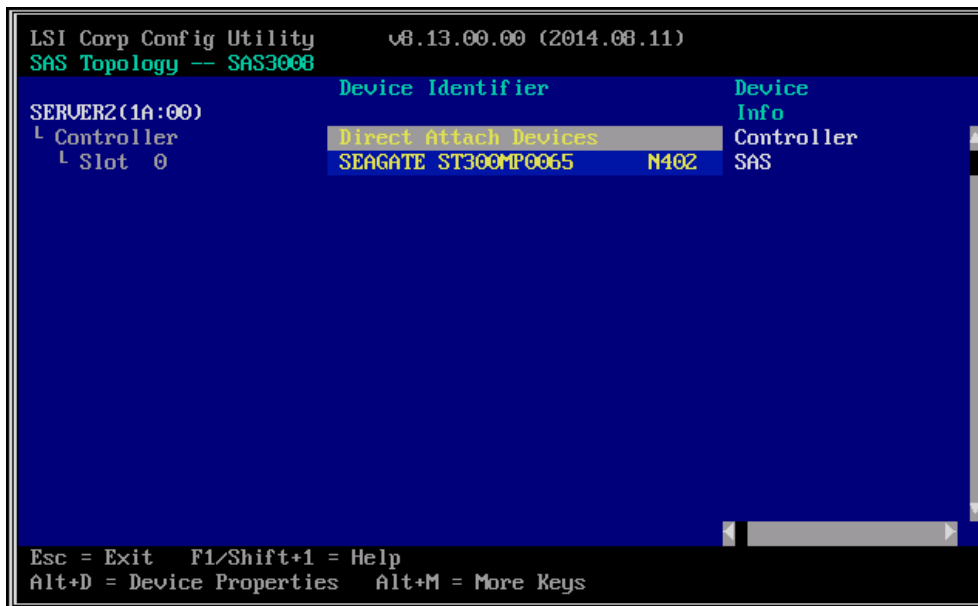
4.   The "Device Properties" menu is displayed. Select [Format] and press **Enter**.

```
LSI Corp Config Utility      v8.13.00.00 (2014.08.11)
Device Properties -- SAS3008

       Device Identifier     SEAGATE ST300MP0065     N402
       Scan Order            9
       Phy Number            3
       Slot Number           0
       RAID Member           No
       Device Information    SAS
       Neg Link Speed        12.0 Gbps
       Disk Capacity         279.3 GiB
       SAS Address           5000C500:76C51101
       Serial Number         S7K00HNJ0000S439LW6L

       Format

       Verify


Esc = Exit   F1/Shift+1 = Help
Alt+N = Next Device    Alt+P = Previous Device    Enter = Select Item
```

5. After a while, the "Device Properties" menu is displayed. Press the **F** key to start the formatting process.

```
LSI Corp Config Utility      v8.13.00.00 (2014.08.11)
Device Format -- SAS3008

     Device Identifier      SEAGATE ST300MP0065      N402
     SAS Address            5000C500:76C51101
     Serial Number          S7K00HNJ0000S439LW6L

     WARNING!
     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. Once the following message appears, the formatting process is complete.
    Press any key to display the "Device Properties" menu.

```
LSI Corp Config Utility      v8.13.00.00 (2014.08.11)
Device Format -- SAS3008

     Device Identifier      SEAGATE ST9146853SS      N002
     SAS Address            5000C500:42AAF739
     Serial Number          6XM01HH70000S128NFFA

     Status:                Complete!

     Format completed successfully.
     Press any key
```

7. After formatting, close the utility according to *3.2 Quitting the SAS Configuration Utility* in *this Chapter*.

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

  Refer to *Chapter 1 (11. Offline Tools)*.

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 disconnect it.

⚠ **CAUTION**
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.

The write protection of Flash FDD is the status before connecting it to this server. If you want to change the write protection status, remove Flash FDD from the server, change the write protection switch, and then connect it again.

Note	Be careful not to accidentally flip the write protection switch while connecting Flash FDD to or removing it from the server.

4.1   Notes on Using Flash FDD

Flash FDD is only intended as a temporary means of recording a driver software, so do not use it to back up data.

4.1.1 Compensation for recorded data

NEC will not pay compensation for data recorded on Flash FDD if the data is lost.

4.1.2 Handling Flash FDD

- Flash FDD is consumables.
  If Flash FDD causes an error, use a new Flash FDD.
- Do not turn off the server while the access LED of Flash FDD is blinking.
  Turning off the server at this time can cause a failure or data corruption.
- Flash FDD cannot be connected via USB hub.
  Directly connect Flash FDD to USB connector of the server.
- Before handling Flash FDD, discharge static electricity from your body by touching a nearby metal object (such as a doorknob or aluminum frame).
- Do not disassemble Flash FDD.
- Do not apply a strong force to Flash FDD.
- Do not place Flash FDD in an area directly exposed to sunlight or near a heater.
- Do not handle Flash FDD while eating, drinking, or smoking. Also, avoid contact with thinner, alcohol, or other corrosive substances.
- Carefully connect Flash FDD to the server.
- Do not move the server while Flash FDD is connected to USB connector.
- Remove Flash FDD from the server after use.

4.1.3 Use with EXPRESSBUILDER

- Connect Flash FDD after Home Menu of EXPRESSBUILDER appears.
- Before you exit EXPRESSBUILDER, remove Flash FDD from the server.

5. Details of EXPRESSBUILDER

EXPRESSBUILDER helps you to install operating system and maintain the server. EXPRESSBUILDER also provides bundled software and documents.

5.1 Starting EXPRESSBUILDER

Use the accompanying DVD labeled "EXPRESSBUILDER", as shown below:

(1)   Insert the DVD into the server, and then restart the server by pressing <**Ctrl**> + <**Alt**> + <**Delete**> keys.
Boot Selection Menu shown in *Chapter 3 (5.2 Menu 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 Menu of EXPRESSBUILDER - (4) Autorun Menu)* will appear.
If the autorun menu is disabled, launch the menu by running `\autorun\dispatcher_x64.exe`.

5.2 Menu of EXPRESSBUILDER

EXPRESSBUILDER is operated by using onscreen menus.

(1) Boot Selection Menu
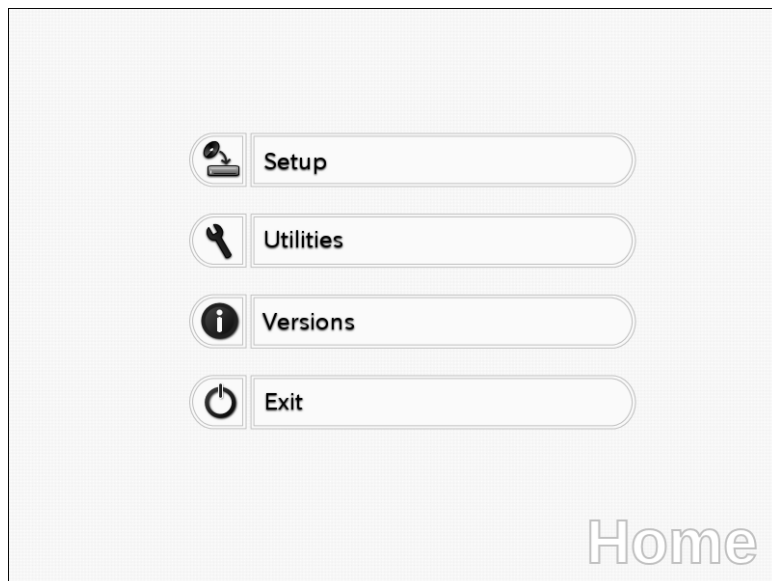
When EXPRESSBUILDER starts, the following menu will appear.
Use the upper and lower arrow keys to move the cursor, and then press <**Enter**> key to choose it.

Boot selection
OS installation *** default ***
Tool menu

Home Menu shown in *(2) Home Menu* will appear when choosing **OS installation** or no key is pressed**.**

Tool Menu shown in *(3) Tool Menu* will appear when choosing **Tool menu**.

(2) Home Menu

Operate Home Menu using the mouse or keyboard (**<Tab>** or **<Enter>** key).

The following functions are included.

a) Setup

Do not select this item because the item is not supported for this server.

b) Utilities

Starts a utility provided by EXPRESSBUILDER.

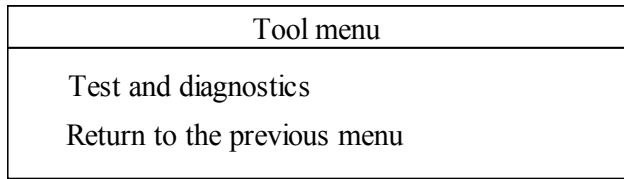See *Chapter 3 (5.3 Utilities Provided by EXPRESSBUILDER)* for details.

c) Versions

Displays software versions, driver versions, and EXPRESSBUILDER version.

d) Exit

Closes EXPRESSBUILDER and then shut down or restart the server.

(3) Tool Menu

Tool menu
Test and diagnostics
Return to the previous 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 about system diagnostics, see *Chapter 1 (10. System Diagnostics)*.

(4) Autorun Menu
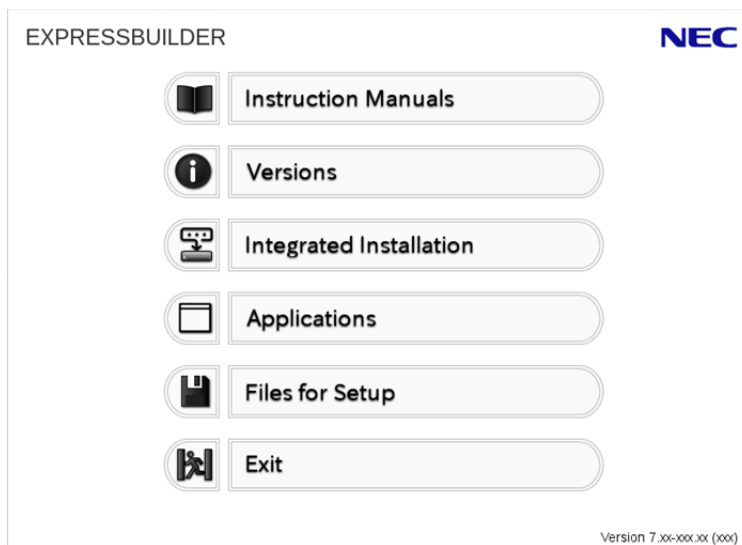
Use Autorun menu to read documents or install bundled software. Adobe Reader is needed to view or print manuals of PDF format.

Integrated Installation

You can easily install Starter Pack or NEC ESMPRO using this feature. Log on the Windows with the built-in Administrator to use this feature.

5.3 Utilities Provided by EXPRESSBUILDER

The following utilities can be started when choosing **Utilities** from Home Menu.

File execution

Directly runs an external utility on removable media. **Use this feature only for utilities provided by NEC.**

Note	The operation of external utilities provided by companies other than NEC is not supported.

6. EXPRESSSCOPE Engine 3

EXPRESSSCOPE Engine 3 enables various functions by using a system management LSI called BMC (Baseboard Management Controller).

EXPRESSSCOPE Engine 3 monitors statuses inside the server such as that of power supplies, fans, temperature, and voltage. Connecting the management LAN connector (refer to Chapter 1 (4.3 Rear View) in User's Guide) to your network enables you to do the following from a remote site via a Web browser and SSH client;

- Managing the server
- Operating KVM (keyboard, video, and mouse) 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 functions, 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. Refer to *Chapter 3 (2. BMC Configuration)* for details.

Note	EXPRESSSCOPE Engine 3 is mounted in both CPU/IO modules 0 and 1 of the server; the respective settings need to be set for both modules. In addition, set different IP addresses for CPU/IO modules 0 and 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.

Refer to "*NEC ESMPRO Manager Installation Guide*" or online help of NEC ESMPRO for details.

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 Knowlede 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]

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.
Express Report Service	Software that can report the server failure to the contact center by E-mail or modem. This software is installed with NEC ESMPRO Agent to the server.
Express Report Service (HTTPS)	Software that can report the server failure to the contact center by HTTPS.
ExpressUpdate	A feature for updating BIOS, firmware, driver, or software of the server. This feature is available when NEC ESMPRO Manager cooperates with EXPRESSSCOPE ENGINE 3 and ExpressUpdate Agent.
ExpressUpdate Agent	Software for performing ExpressUpdate. This is installed to the server.
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 Agent Extension	Software for performing the scheduled operations. This works with NEC ESMPRO Manager.
NEC ESMPRO Manager	Software for managing a number of servers on network.
OEM driver	A Windows driver for the mass storage device.
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".
Product Info Collection Utility	Software for collecting several hardware/software statuses or event logs. You can easily collect the data for the server maintenance by using this software.
Starter Pack	Software package for the server. This software includes the customized drivers for Windows. This must be installed before using Windows on the server.
Windows OS parameter file	A file that saved settings for installing Windows. You can install with the saved settings in this file when setting Windows with EXPRESSBUILDER.

Revision Record

Revision (Document Number)	Date Issued	Description
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30.103.02-104.01	December 2017	Added the description about Express5800/R320f-E4, R320f-M4, and VMware ESXi 6.5

NEC Express Server

Express5800/R320e-E4, R320e-M4,
R320f-E4, R320f-M4
Maintenance Guide (VMware)

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