Express5800

NEC

NEC Express Server
Express5800 Series

Express5800/R320c-E4
Model Number: N8800-173F, EXP320P

Express5800/R320c-M4
Model Number: N8800-174F, EXP320Q

Maintenance Guide (VMware)

Chapter 1   Maintenance

Chapter 2   Configuring and Upgrading the System

Chapter 3   Useful Features

Documents Provided with This Product

Documents for this product are provided as accompanying booklets (📖) and as electronic manuals (🖹) stored within EXPRESSBUILDER DVD (💿).

📖	Precautions for Use	Describes points of caution to ensure the safe use of this server. **Read these cautions before using this server.**
📖	Getting Started	Describes how to use this server, from unpacking to operations. Refer to this guide as you begin for an overview of this server.

💿 EXPRESSBUILDER

📄 User's Guide

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

📄 Installation Guide

Chapter 1: Installing OS	Installation of OS and drivers, and important information for installation
Chapter 2: Installing Bundled Software	Installation of bundled software, such as NEC ESMPRO

📄 Maintenance Guide

Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2 Configuring and Upgrading the System	Configure hardware and setup management tool associated with hardware
Chapter 3: Useful Features	Useful features and the detail of system BIOS settings, SAS Configuration Utility, and EXPRESSBUILDER

📄 Other documents

Provides the detail of NEC ESMPRO and the other features.

Contents

Notations Used in This Document

Notations used in the text

In addition to safety-related symbols urging caution, 3 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 the 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 the hardware or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drives

This server is equipped with one of the following drives, depending on the order at the time of purchase. These drives are referred to as *optical disk drives* in this document.

- **DVD-ROM drive**
- **DVD Super MULTI drive**

Hard disk drives

Unless otherwise stated, hard disk drive (HDD) described in this document refers to the following.

- **Hard disk drives (HDD)**

Removable media

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

- **USB memory**
- **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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Registration NO.	: KCC-REM-NEC-EXP320Q
Basic Model Number	: EXP320Q
Trade Name or Registrant: NEC CORPORATION	:
Equipment Name	: FT Server
Manufacturer	: NEC CORPORATION

Turkish RoHS information relevant for Turkish market

EEE Yönetmeliğine Uygundur.

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http://www.nec.com/

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NEC Express5800 Series
Express5800/R320c-E4, R320c-M4

Maintenance

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

1. Transfer, Relocation, and Disposal

Describes how to transfer this server to a third party. Also describes how to dispose, move 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. System Recovery

Describes the system recovery setup. Refer to this section when ft control software or Guest OS is corrupt.

10. 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.

11. System Diagnostics   **11**

Describes the system diagnostics of this server.

12. Offline Tools

Describes tools for preventive maintenance of this product.

1. Transfer, Relocation, and Disposal

1.1 Transfer to a Third Party

Observe the following precautions when you transfer (or sell) the server or software provided with the server to a third party.

- **Server**

  When transferring (or selling) the server to a third party, be sure to provide the server's instruction manuals (including electronic manuals) to the third party.

- **Data on the hard disk drive**

  Be sure to erase the data stored in HDD to prevent the leakage of sensitive data (such as customer information or company management information) to any third parties. It is the user's responsibility to erase the data.

  > **Important**   **NEC assumes no liability for data leakage should the product be transferred to a third party without erasing the data.**

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

- **Bundled software**

  Observe the following precautions when transferring (selling) the bundled software to a third party.
  - Transfer them with the server.
  - All provided media and documents must be transferred and no backup copies must be retained.
  - Transfer requirements listed in "Software License Agreement" that comes with each software application must be satisfied.
  - Software on client PC must be uninstalled before transferring.

1.2 Disposal of the Server and Consumables

- Dispose of the server, hard disk drives, option board, and battery according to laws and regulations of the central and/or local government. Also dispose of the power cord attached to this product together with the server to prevent diversion to other products.

Note	• For disposal (or replacement) of the battery on the mother board of the server, consult with your sales representative. • It is the user's responsibility to completely erase all data stored on storage devices such as hard disk drives, backup data cartridges, or any other media (such as CD-R/CD-RW) so that the data cannot be restored by a third party.

- Some components including fans, batteries, and the optical disk drive work for a limited period of time and require replacement. For stable operation of the server, NEC recommends you regularly replace these components. Contact your sales representative for information on replacement or the lifetime of components.

1.3 Regarding the Transportation of This Server

This server and/or some of the associated optional devices uses lithium metal batteries or lithium ion batteries. Regulations for air/ocean transportation apply when transporting lithium batteries. Conform to the regulations if you want to transport this server or optional devices by air or ship.

1.4 Relocation and Storage

Follow the steps below when you move 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, refer to *Safety precautions* in *Precautions for Use* in "*User's Guide*".

- **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, refer to *Safety precautions* in *Precautions for Use* in "*User's Guide*".

- **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. • If the system clock time is significantly delayed or advanced over time in spite of adjustment, contact your sales representative.

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
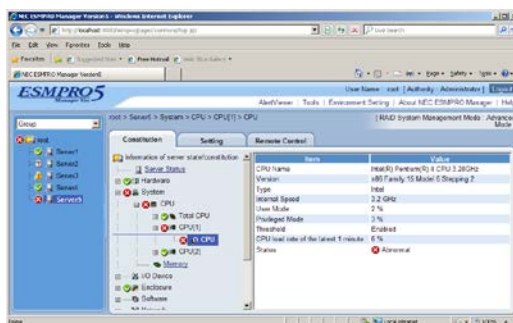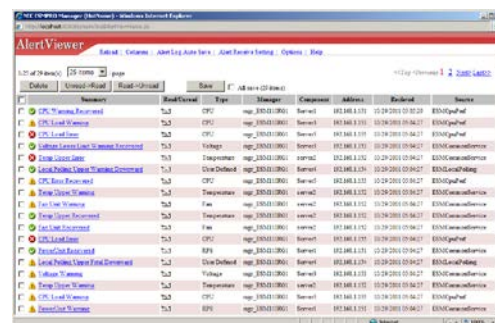
NEC ESMPRO Manager   AlertViewer

2.3 Checking STATUS LED

Check 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
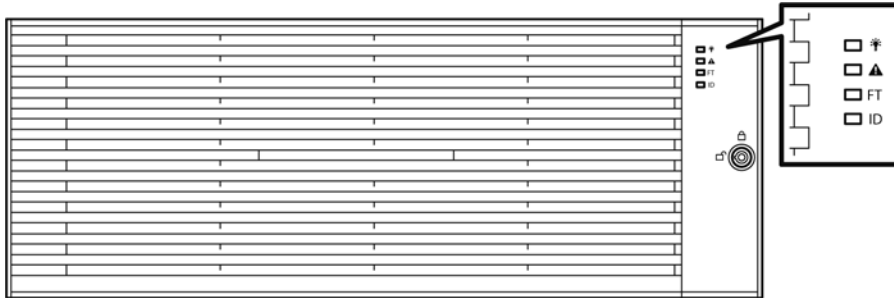
LEDs on hard disk drives installed in 2.5-inch hard disk drive bay
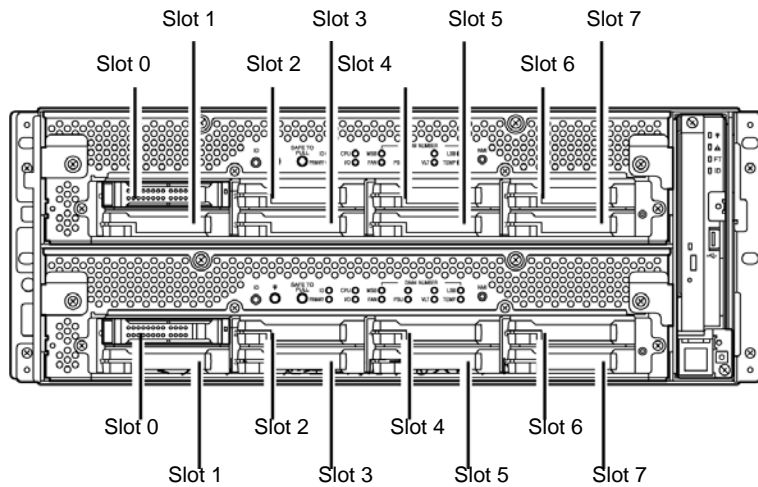
If the indicator shows the server abnormality, contact your salses representative.

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* (*1.13 Backing Up System Information*) in *Installation Guide.*

2.5 Cleaning

Regularly clean the server to keep it in good condition.

⚠ WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* **in** *Precautions for Use* **in "***User's Guide***".**

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

2.5.1 Cleaning the Express5800/ft series

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**

A keyboard and a mouse use USB interface. Therefore it is not necessary to power off the server when connecting or disconnecting them.

1. Disconnect the mouse from the USB port of the keyboard.

2. Wipe the surface of the keyboard and mouse with a dry cloth

3. Wipe the sensor with a dry cloth to remove any dirt or dust.

2.5.4 **Cleaning Optical Disk**

A dusty optical disk or dust-accumulated tray causes the device to fail to read data correctly.

Follow the procedure below to clean the tray and optical disk regularly:

1.   Make sure that the server is powered on (POWER LED is lit).

2.   Press the Eject button on the front of the optical disk drive.

     The tray comes out.

3.   Hold the optical disk lightly and take it out from the tray.

Important	Do not touch the signal side of the optical disk with your hand.

4.   Wipe the tray with a dry soft cloth.

Important	Do not wipe the lens of the optical disk drive. Doing so may damage the lens and may cause a malfunction of the drive.

5.   Gently push the tray to close the tray.

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

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

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.

$\mathcal{4}.$ 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:

> *ftsmaint Command*
> *Device Path Enumeration*
> *ftsmaint Examples*

$\mathcal{4}.1$ ftsmaint Command

$\mathcal{4}.1.1$ 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 ftSSS 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 opstate 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.

$\mathcal{4}.1.2$ Start/stop the component

- **ftsmaint bringDown *path***

This command removes from service the CPU module, PCI 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 disk drives.

- **ftsmaint bringUp *path***

This command brings into service the CPU module, PCI 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 disk drives.

4.1.3 MTBF clear

- **ftsmaint clearMtbf** *path*

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

Important	**Do not use this feature to retain a faulty or degraded device in service. It may be useful if the MTBF for a device has been degraded by testing or a configuration error.**

4.1.4 Diagnostics

- **ftsmaint runDiag** *path*

This command starts diagnostics on the CPU module or PCI module specified by *path*.

4.1.5 Dump collection

- **ftsmaint dump** *path*

This command generates a dump of the CPU module specified in the *path* argument.

The dumps for the ESXi host are saved in /var/core/vmkernel-zdump-MMDDYY.HH:mm.n.

- * MMDDYY denotes the created date, and HH:mm.n denotes the created time.
- * It may take certain time to create dump data file.

Important	**If you run this command, the specified CPU module is made offline automatically, and duplication of system is canceled. (The specified CPU is made online automatically upon completion of command.)**
Note	The system must be duplexed before running this command.
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.

4.2 **Device Path Enumeration**

Some subsystems and components of the NEC Express5800/ft series system are addressable by device path IDs. Device path IDs uniquely identify the devices in an NEC Express5800/ft series system.

Table 1 lists the device path IDs for devices in an NEC Express5800/ft series system. In Table 1, IDs in the format ***:nn.n* (for example, 0b: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 NEC Express5800/ft series Devices

Device	Path	
	CPU Module 0	**CPU 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
	PCI Module 0	**PCI Module 1**
PCI 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 82576 Gigabit network connection Network interface	10/6 07:00.0, 07:00.1 vmnic100600 vmnic100601	11/6 41:00.0, 41:00.1 vmnic110600 vmnic110601
Display controller VGA compatible controller: Matrox® Graphics, Inc. MGA G200e	10/7 0a:00.0	11/7 44:00.0
Serial bus controllers USB controller: Intel Corporation 82801JI	10/8 2c:00.0, 2c:00.1	11/8 66:00.0, 66:00.1
Bridge	10/10, 10/11	11/10, 10/11
Network controller Ethernet controller: Intel Corporation Ethernet Controller 10-Gigabit X540-AT2	10/12 7d:00.0, 7d:00.1 vmnic101200, vmnic101201	11/12 b7:00.0, b7:00.1 vmnic111200, vmnic111201
Storage enclosure Internal 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)
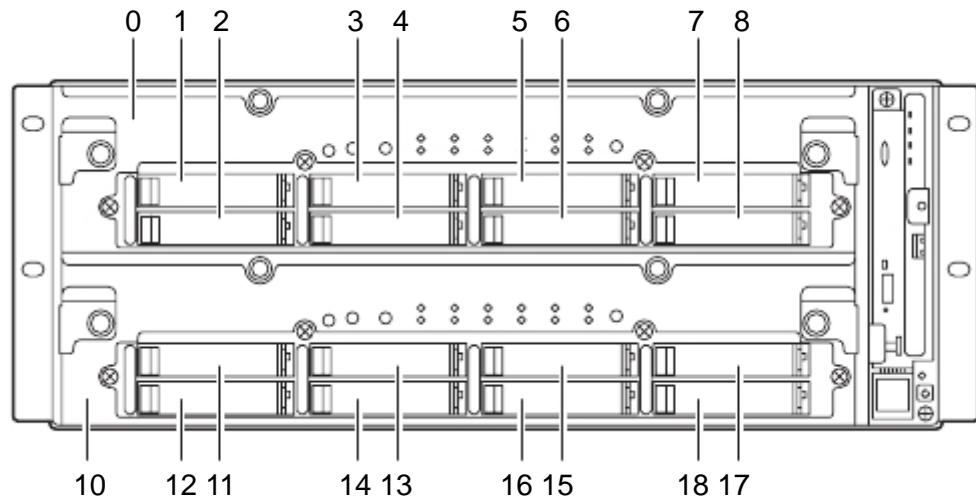
Callout	Device	Device ID	Physical Label
0	CPU/IO Module 0 (CPU-0, I/O-10)	0	
1	Internal disk drive 1	10/40/1	0
2	Internal disk drive 2	10/40/2	1
3	Internal disk drive 3	10/40/3	2
4	Internal disk drive 4	10/40/4	3
5	Internal disk drive 5	10/40/5	4
6	Internal disk drive 6	10/40/6	5
7	Internal disk drive 7	10/40/7	6
8	Internal disk drive 8	10/40/8	7
10	CPU/IO Module 1 (CPU-1, I/O-11)	1	
11	Internal disk drive 1	11/40/1	0
12	Internal disk drive 2	11/40/2	1
13	Internal disk drive 3	11/40/3	2
14	Internal disk drive 4	11/40/4	3
15	Internal disk drive 5	11/40/5	4
16	Internal disk drive 6	11/40/6	5
17	Internal disk drive 7	11/40/7	6
18	Internal disk drive 8	11/40/8	7

Figure 2. Locations of Major Enumerated Devices (Rear View)
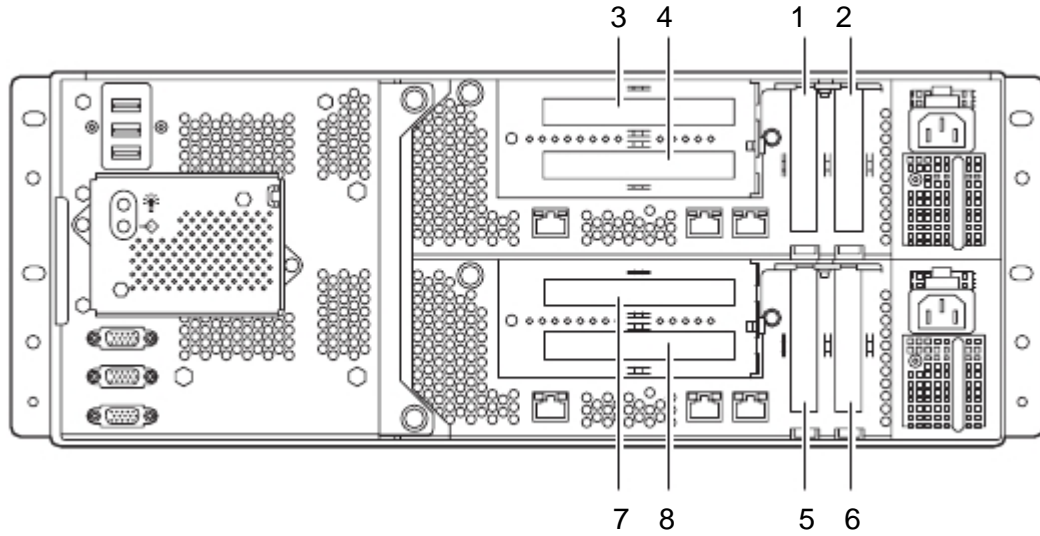
Callout	Device	Device ID
1	PCI module 0 PCI Slot 1	10/1
2	PCI module 0 PCI Slot 2	10/2
3	PCI module 0 PCI Slot 3	10/3
4	PCI module 0 PCI Slot 4	10/4
5	PCI module 1 PCI Slot 1	11/1
6	PCI module 1 PCI Slot 2	11/2
7	PCI module 1 PCI Slot 3	11/3
8	PCI module 1 PCI Slot 4	11/4

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 NEC Express5800/ft series system, issue the following command:

```
# 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   *     3
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 E5-2670 0 @ 2.60GHz       ONLINE   ONLINE   -     -
...
0/130       Baseboard Temp#0 Sensor                        -        NORMAL   -     -
0/140       Baseboard Fan1#0 Sensor                        -        NORMAL   -     -
0/141       Baseboard Fan2#0 Sensor                        -        NORMAL   -     -
...
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 E5-2670 0 @ 2.60GHz       ONLINE   ONLINE   -     -
...
1/130       Baseboard Temp#1 Sensor                        -        NORMAL   -     -
1/140       Baseboard Fan1#1 Sensor                        -        NORMAL   -     -
1/141       Baseboard Fan2#1 Sensor                        -        NORMAL   -     -
...
10          Combined CPU/IO                                ONLINE   DUPLEX   -     2
10/1        Network Ctlr                                   ONLINE   ONLINE   -     0
0c:00.0     Ethernet controller: Intel Corporation 82      BROKEN   BROKEN   -     -
vmnic100100 Network Interface                              BROKEN   BROKEN   -     -
0c:00.1     Ethernet controller: Intel Corporation 82      BROKEN   BROKEN   -     -
vmnic100101 Network Interface                              BROKEN   BROKEN   -     -
10/2        -                                              MISSING  EMPTY    -     -
10/3        -                                              MISSING  EMPTY    -     -
10/4        -                                              MISSING  EMPTY    -     -
10/5        Mass Storage Ctlr                              ONLINE   DUPLEX   -     0
0b:00.0     Serial Attached SCSI controller: LSI Logi      ONLINE   DUPLEX   -     -
10/6        Network Ctlr                                   ONLINE   ONLINE   -     0
07:00.0     Ethernet controller: Intel Corporation 82      ONLINE   ONLINE   -     -
vmnic100600 Network Interface                              ONLINE   ONLINE   -     -
07:00.1     Ethernet controller: Intel Corporation 82      BROKEN   BROKEN   -     -
vmnic100601 Network Interface                              BROKEN   BROKEN   -     -
10/7        Display Ctlr                                   ONLINE   DUPLEX   -     0
0a:00.0     VGA compatible controller: Matrox Graphic      ONLINE   DUPLEX   -     -
10/8        USB Serial Bus Ctlr                            ONLINE   ONLINE   -     0
2c:00.0     USB Controller: Intel Corporation Patsbur      ONLINE   ONLINE   -     -
2c:00.1     USB Controller: Intel Corporation Patsbur      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   ONLINE   -     0
7d:00.0     Ethernet controller: Intel Corporation Et      BROKEN   BROKEN   -     -
vmnic101200 Network Interface                              BROKEN   BROKEN   -     -
7d:00.1     Ethernet controller: Intel Corporation Et      BROKEN   BROKEN   -     -
vmnic101201 Network Interface                              BROKEN   BROKEN   -     -
```

```
10/40       Internal Disk Enclosure               -        -        -    -
10/40/1     Disk Drive                            ONLINE   DUPLEX   N007 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   SIMPLEX  -    0
11/1        Network Ctlr                          ONLINE   ONLINE   -    0
46:00.0     Ethernet controller: Intel Corporation 82  BROKEN  BROKEN  -  -
vmnic110100 Network Interface                     BROKEN   BROKEN   -    -
46:00.1     Ethernet controller: Intel Corporation 82  BROKEN  BROKEN  -  -
vmnic110101 Network Interface                     BROKEN   BROKEN   -    -
11/2        -                                     MISSING  EMPTY    -    -
11/3        -                                     MISSING  EMPTY    -    -
11/4        -                                     MISSING  EMPTY    -    -
11/5        Mass Storage Ctlr                     ONLINE   DUPLEX   -    0
45:00.0     Serial Attached SCSI controller: LSI Logi  ONLINE  DUPLEX  -  -
11/6        Network Ctlr                          ONLINE   SIMPLEX  -    0
41:00.0     Ethernet controller: Intel Corporation 82  ONLINE  SIMPLEX  -  -
vmnic110600 Network Interface                     ONLINE   SIMPLEX  -    -
41:00.1     Ethernet controller: Intel Corporation 82  BROKEN  BROKEN  -  -
vmnic110601 Network Interface                     BROKEN   BROKEN   -    -
11/7        Display Ctlr                          ONLINE   DUPLEX   -    0
44:00.0     VGA compatible controller: Matrox Graphic  ONLINE  DUPLEX  -  -
11/8        USB Serial Bus Ctlr                   ONLINE   ONLINE   -    0
66:00.0     USB Controller: Intel Corporation Patsbur  ONLINE  ONLINE  -  -
66:00.1     USB Controller: Intel Corporation Patsbur  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   ONLINE   -    0
b7:00.0     Ethernet controller: Intel Corporation Et  BROKEN  BROKEN  -  -
vmnic111200 Network Interface                     BROKEN   BROKEN   -    -
b7:00.1     Ethernet controller: Intel Corporation Et  BROKEN  BROKEN  -  -
vmnic111201 Network Interface                     BROKEN   BROKEN   -    -
11/40       Internal Disk Enclosure               -        -        -    -
11/40/1     Disk Drive                            ONLINE   DUPLEX   N007 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 11 is the Active Compatibility Node.

This is an Express5800/R320c-M4 system, P-Package N8800-174Y, Serial# 3300387.

* 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:

```
# ftsmaint ls path
```

For *path*, specify the correct value for the component, as listed in Table 1.
The value of Op State specifies whether the device is in a simplex state: the value is generally either DUPLEX or SIMPLEX.
The following examples demonstrate some common commands and the resulting output.

In Example 2, the PCI 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 PCI module

```
# ftsmaint ls 11
H/W Path               : 11
Description            : Combined CPU/IO
State                  : ONLINE
Op State               : DUPLEX
Reason                 : SECONDARY
Modelx                 : 243-634274
Artwork Rev            : 1
ECO Level              : 1
Min Partner ECO Level  : 0
Serial #               : CBR2BD100008
Active Compat Node     : false
Logic Revision         : 3900042
MTBF Policy            : useThreshold
MTBF fault class:   uncorrectable
Fault Count:        0
Last Timestamp:     -
Replace Threshold:  0
Evict Threshold:    21600
Value:              0
```

In Example 3, the disk in the PCI module 1 is listed as having a State of ONLINE and an Op State of DUPLEX.

Example 3. Viewing the State of Disk 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                 : SEAGATE:ST9146853SS
Firmware Rev           : N007
Serial #               : 6XM01HHS0000S128SF7L
Device Name            : disk_i
Udev Device Names      : -
Kernel Device Names    : vmhba110500:C0:T0: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 attempts to synchronize and duplex the corresponding component automatically.

For example, the first command below brings down the PCI module 1; the second command brings it back up and, if possible, automatically resynchronizes the PCI module 0 with the PCI module 1:

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

When you issue the bringUp command, the system should automatically synchronize, the RAID array drives should update and become mirrored, and the system should resume duplex operation.

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 module, issue the following command.

```
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 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                 : 243-634274
 Firmware Rev           : BIOS Version 6.2:52
 Artwork Rev            : 1
 ECO Level              : 1
 Min Partner ECO Level  : 0
 Serial #               : CBR2BD100008
 Logic Revision         : 3900042
 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 **Dump collection**

If you want to collect the dump during system boot, use the following command. The following command example generates a dump of the CPU module 0. The system must be running in duplex mode for you to use this method.

```
# /opt/ft/bin/ftsmaint dump 0
    Generated dump of the device at path 0.
```

In the result, the dump for the ESXi host is saved in /var/core/vmkernel-zdump-MMDDYY.HH:mm.n on the ESXi host.

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 auitomatically 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 no communication timeout 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.

– When CPU/IO module 0 is the primary: Path of CPU module to be installed is 1.
```
# /opt/ft/bin/ftsmaint bringup 1
  Completed bringUp on the device at path 1.
```

– When CPU/IO module 1 is the primary: Path of CPU module to be installed is 0.
```
# /opt/ft/bin/ftsmaint bringup 0
  Completed bringUp on the device at path 0.
```

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 PCI module.

5.1   Evaluate Startup and Stop of PCI Modules

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

1. Check which is the primary CPU/IO module.

   The CPU/IO module with the PRIMARY LED lit is the primary module.

2. Check whether the CPU/IO modules are duplicated.

   To check if the CPU/IO modules are duplicated, see the System FT LED.
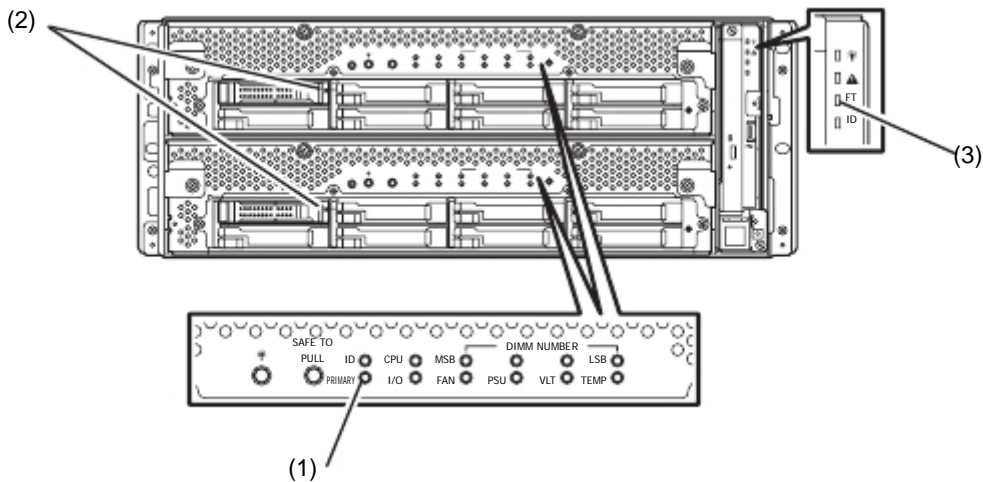
[Indications of the status LED when PCI modules are duplicated]

	LED	Primary	Secondary
(1)	PRIMARY LED	Green	—
(2)	DISK ACCESS LED	Green	Green

	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 PCI module using the ftsmaint Command.

If the PCI Module 0 is primary, run the following command.

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

*As for the primary PCI Module (*), if the PCI Module 0 is primary select [PCI Module (ID:10)]. If the PCI module 1 is primary, select [PCI Module (ID:11)].

When you stop the operation of the primary PCI module, failover occurs and the secondary PCI module becomes the primary module.

The PCI module's'status LED changes as shown below:

[Indications of status LED]

	LED	Secondary*	Primary*
(1)	PRIMARY LED	―	Green
(2)	DISK ACCESS LED	―	Amber or Green blinking (Green when accessing to HDD)

	LED	System
(3)	System FT LED	―

*indicating primary or secondary after failover.

4. Restart the PCI module.
   If the PCI Module 0 was stopped in the step 3, run the following command and the PCI module will be started.

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

Once the PCI module is started, PCI module diagnosis, mirror volume duplication and PCI module duplication are performed.

The PCI module's status LED changes as shown below:

[Indications of status LED]

Immediately after the PCI module startup until the completion of diagnosis:

	LED	Secondary*	Primary*
(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 PCI module diagnosis:

	LED	Secondary*	Primary*
(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 PCI modules are duplicated:

	LED	Secondary*	Primary*
(1)	PRIMARY LED	—	Green
(2)	DISK ACCESS LED	Green	Green

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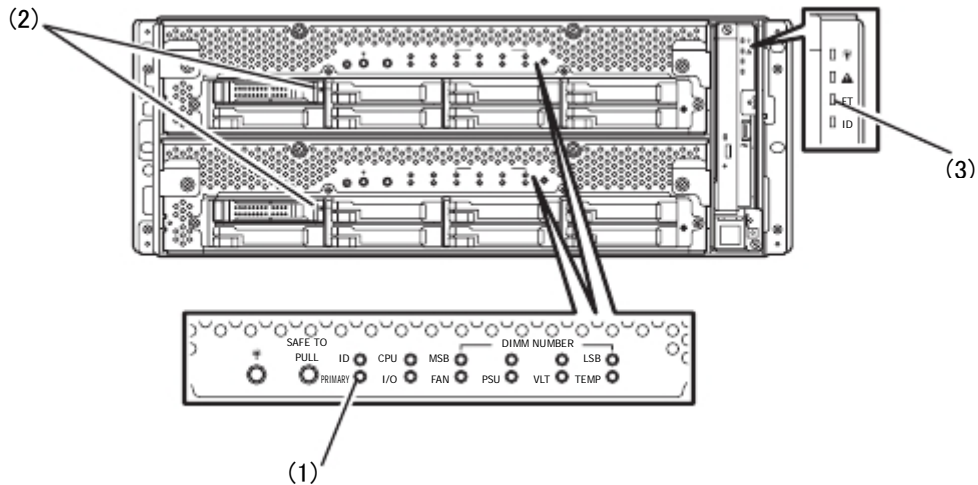
[Indications of status LED when CPU modules are duplicated]

LED		CPU/IO module 0 (Operating)	CPU/IO module 1 (Operating)
(1)	PRIMARY LED	Green	—
(2)	DISK ACCESS LED	Green	Green

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 when CPU module is stopped]

	LED	CPU/IO module 0 (Stopped) *	CPU/IO module 1 (Operating)
(1)	PRIMARY LED	Green	—
(2)	DISK ACCESS LED	Green	Green
	LED	System	
(3)	System FT LED	—	

*Here, an example where CPU module 0 is stopped is shown.

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
```

Once the CPU module is started, hardware diagnosis and then the duplication process are performed. Note that the system is paused temporarily for copying memory during memory synchronization.

[Indications of status LED after completion of duplication]

	LED	CPU/IO module 0 (Operating)	CPU/IO module 1 (Operating)
(1)	PRIMARY LED	Green	—
(2)	DISK ACCESS LED	Green	Green
	LED	System	
(3)	System FT LED	Green	

6. **Error Messages**

If the Express5800/ft series 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 Express5800/ft series 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.
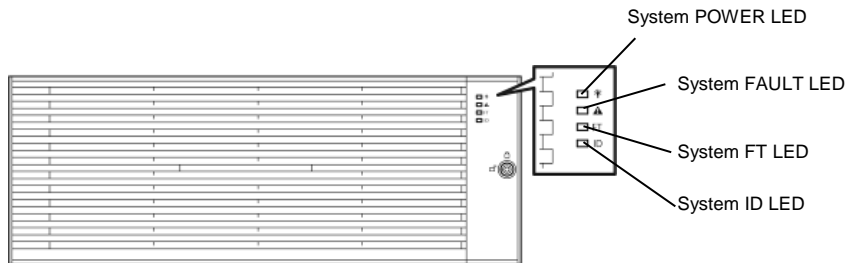
< With Front Bezel mounted >
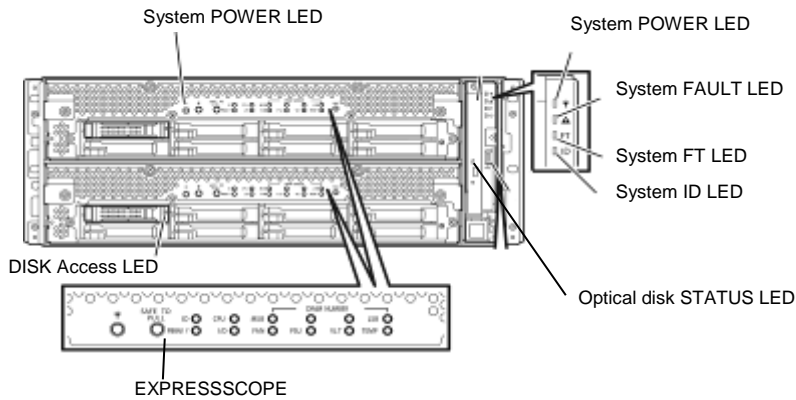
< Front Panel >
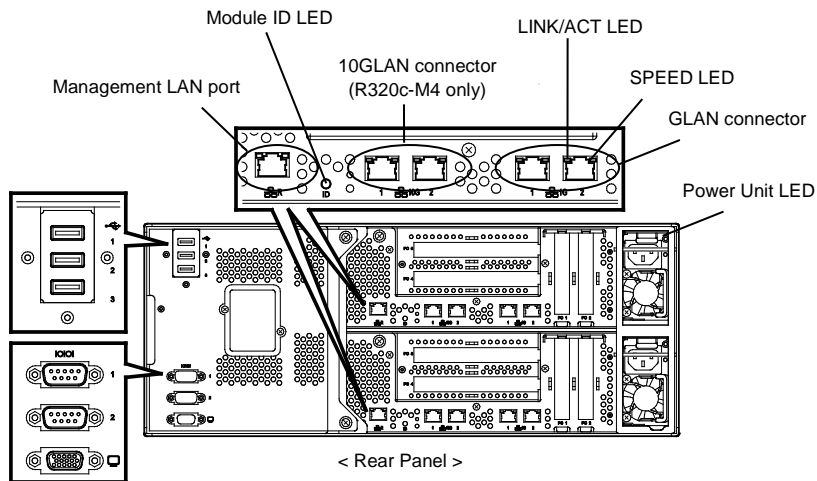
< Rear Panel >

(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
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.	–

(5) Disk Access LED

LED indication	Description	Action
Off	The disk is in the idle state.	–
Green	The disk is being accessed.	–
Amber	Disk failure	Contact your sales representative.
Blinking (amber)	The mirror of the disk is disconnected.	Perform mirroring.
Blinking in green and amber in turn	The hard disk drive configuration (rebuild) is in progress.	Wait for a while; the LED blinks in green after rebuild finishes. If the rebuild fails, the LED lights in amber.

(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) LAN Connector LEDs on management port 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.	When the LED does not light during "LINK", check the condition and connection of network cables. If there is nothing wrong with the cables, a defect is suspected in the network (LAN) controller. Contact your sales representative.

Speed LED (Management port)

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

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 1000BASE-TX.	–
Off	The port is operating on 100BASE-T.	–

(8) EXPRESSSCOPE

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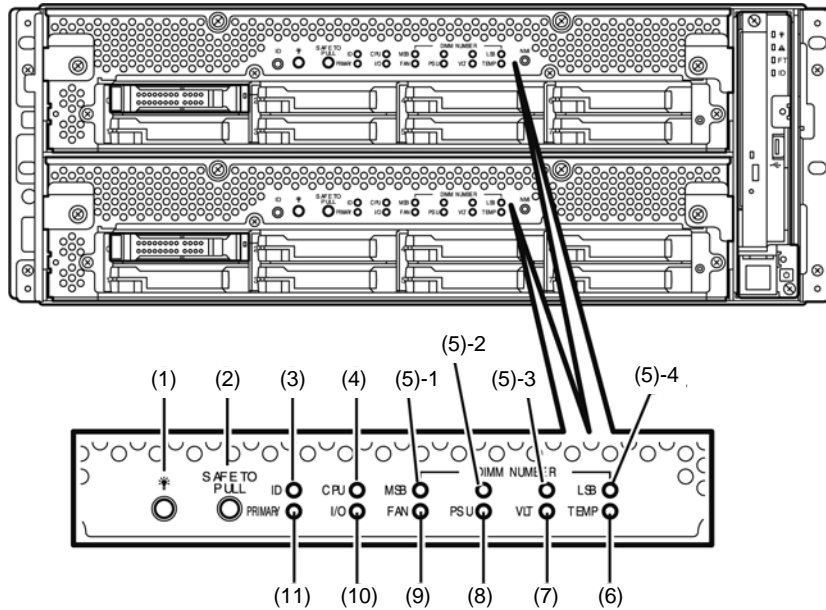
(1) Module POWER LED

LED indication	Description	Action
On (green)	The power of CPU/IO module is ON.	–
Off	The power is not supplied to CPU/IO module.	–
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 off line 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)	When received device identification requests from remote site.	–

(4) CPU (CPU FAULT LED)

The LED lights in amber when the CPU part 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 0 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.	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 and power supply unit 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 (PCI) part of CPU/IO module. Contact your service representative.

(11) PRIMARY (Primary LED)

The LED lights in green when CPU/IO module is primary.

(12) Power Unit LED

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

LED indication	Description	Action
Blinking (green)	The power cord is connected to AC inlet and 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.
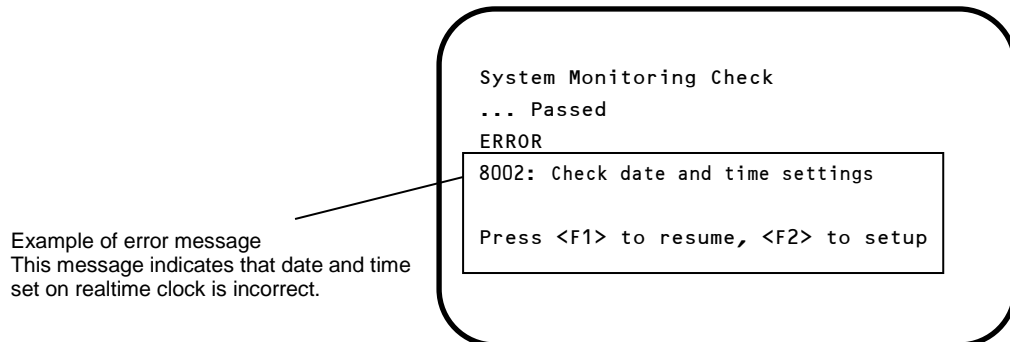
The following table lists error messages and the actions to take in response to them.

Tips	• Write down the displayed messages and beep patterns before contacting your sales representative. Alarm messages are useful information for maintenance. • 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 was detected.	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 was detected.	Start SETUP, and then specify the correct date and time.
8002	Check date and time settings	Incorrect date and time set on real time clock was detected.	If the same error is detected repeatedly in spite of re-setting, contact your sales representative.
8006	System configuration data cleared by Jumper.	The setup utility settings were cleared using the jumper.	Follow the steps described in *Chapter 1 (10. 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 was detected during initialization of chipset.	Contact your sales representative.
8801	DXE_NO_CON_IN	An error was detected during initialization of console.	
8802	DXE_NO_CON_OUT		
8803	PEI_DXE_CORE_NOT_FOUND	A flash ROM is corrupt.	
8804	PEI_DXEIPL_NOT_FOUND		
8805	DXE_ARCH_PROTOCOL_NOT_A VAILABLE		
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** → **PCIxx Slot Option ROM** → **Disabled**. (xx: PCI slot number)
B002	Expansion ROM not initialized - PCI Slot 2	Option ROM expansion in PCI slot 2 failed.	
B003	Expansion ROM not initialized - PCI Slot 3	Option ROM expansion in PCI slot 3 failed.	
B004	Expansion ROM not initialized - PCI Slot 4	Option ROM expansion in PCI slot 4 failed.	
B022	Serial Port Configuration Overlapped.	Overlapping serial port configuration was detected.	Start SETUP, select **Advanced** → **Serial Port Configuration**, and specify the setting again in a way that the values of Base I/O or Interrupt in **Serial Port A** and **Serial Port B** will not be the same.
C010	The error occurred during temperature sensor reading	An error was detected while reading temperature sensor.	Contact your sales representative.
C011	System Temperature out of the range.	A temperature abnormality was detected.	It is possible that a fan has failed or is clogged. Contact your sales representative.

Error Message		Cause	Solution
C061	1st SMBus device Error detected.	An error was detected on 1st SM Bus.	Contact your sales representative.
C062	2nd SMBus device Error detected.	An error was detected on 2nd SM Bus.	
C063	3rd SMBus device Error detected.	An error was detected on 3rd SM Bus.	
C064	4th SMBus device Error detected.	An error was detected on 4th SM Bus.	
C065	5th SMBus device Error detected.	An error was detected on 5th SM Bus.	
C066	6th SMBus device Error detected.	An error was detected on 6th SM Bus.	
C067	7th SMBus device Error detected.	An error was detected on 7th SM Bus.	
C101	BMC Memory Test Failed..	An error was detected on BMC.	Unplug the power cord, wait for at least 30 seconds, then restart the server. 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 was detected while accessing BMC.	
C105	BMC SEL area full.	There is not enough space to store the system event log.	Run the Off-line Tool and delete the event logs.
C10C	BMC update firmware corrupted.	An illegality was detected while updating BMC firmware.	Unplug the power cord, wait for at least 30 seconds, 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 was detected in FRU containing the device information.	
C10E	BMC SDR Repository empty.	An error was detected on BMC SDR.	
C10F	IPMB signal lines do not respond.	Failure of Satellite Management Controller was detected.	
C110	BMC FRU device failure.	An error was detected in FRU that contains device information.	
C111	BMC SDR Repository failure.	Failure was detected in SROM that stores the SDR.	
C112	BMC SEL device failure.	Device failure was detected in BMC SEL.	
C113	BMC RAM test error.	An error was detected in BMC RAM.	
C114	BMC Fatal hardware error.	A hardware error was detected in BMC.	
C115	Management controller not responding	Management controller does not respond.	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 was detected.	
C118	BMC A/D timeout error.	BMC A/D timeout error was detected.	
C119	SDR repository corrupt.	BMC error or illegal SDR data was detected.	
C11A	SEL corrupt.	BMC error or illegal system event log data was detected.	

Error Message		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 was detected in BMC Mezzanine card.	
C11D	BMC is in Forced Boot Mode.	Detected that BMC is in Forced Boot Mode.	Unplug the power cord, wait for at least 30 seconds, 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 was detected 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 was detected 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.
Split mode	CPU/IO module is operating in split 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

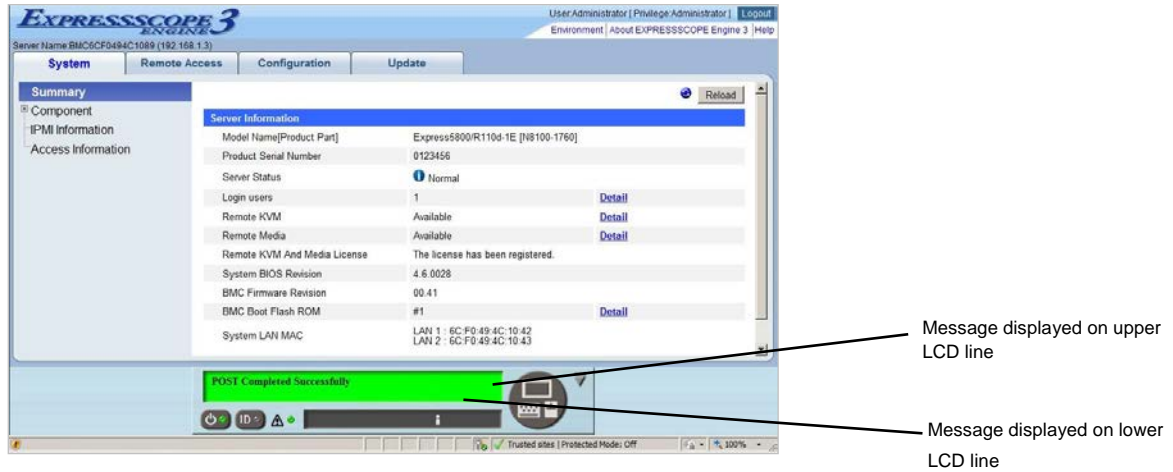| Message on Lower LCD Line	Description	Solution
VBAT Lower Non-Critical	A voltage abnormality was detected.	Contact your sales representative.
VBAT Upper Non-Critical		
VBAT Lower Critical		
VBAT Upper Critical		
Baseboard Temperature1 Lower Non-Critical	A temperature abnormality was detected.	It is 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 and request CPU or motherboard replacement.
Processor1 Thermal Trip	The power was forcibly turned off due to a CPU temperature abnormality.	Contact your sales representative.

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

NEC Express5800/ft series, log in to ftSys Management Appliance as a root user and run the following command.

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

If the following message appears, enter the host name or IP address of ESXi host.

```
Enter Name or IP address of the host ftServer [xxx.xxx.xxx.xxx]:
```

If the following message appears, enter the root user name of ESXi host.

```
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. |

7.3 Collecting Memory Dump

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

Dump data of ESXi host is stored in /var/core/vmkernel-zdump-MMDDYY.HH:mm.n on ESXi host.

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

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

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.**

If a failure occurs and you want to collect memory dump, perform either of the following:

• Press the DUMP switch.

• Run the ftsmaint dump command.

For details of ftsmaint dump command, see *Chapter 1 (4.1.5 Dump collection)*.

Take the steps below to use the DUMP (NMI) switch.

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.
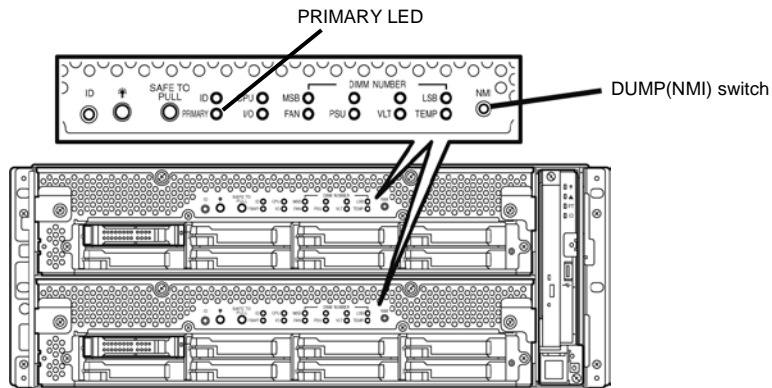
Note	Confirm the PRIMARY LED on front panel. Identify the primary CPU/IO module of which PRIMARY LED is lit.

Important	**Pressing the DUMP switch excessively shorter or longer will fail to collect memory dump.**

Press the DUMP switch by inserting the pointed tool such as ballpoint pen into the switch hole.

Important	**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 (10.2 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 Upon Power On to the End of POST"*.
    - → Refer to *"8.4 When OS is Started"*.
    - → Refer to *"8.5 When Failure Occurs"*.
    - → Refer to *"8.6 Problems with Internal Devices and Other Hardware"*.
    - → Refer to *"8.7 When OS is in Operation"*.
    - → Refer to *"8.10 Problems with Optical Disk Drive and Flash FDD"*.
- Failed to start from EXPRESSBULDER.
    - → Refer to *"8.2 Problems with NEC EXPRESSBUILDER"*.
    - → Refer to *"8.8 When EXPRESSBUILDER is Started on Windows"*.
- Failed to install OS.
    - → Refer to *"8.3 Upon Installing OS"*.
- 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.
- The server does not work normally after OS has started.
    - → Refer to *"8.4 When OS is Started"*.

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"*.
- System recovery
    - → Refer to *"9. System Recovery"*.

If the trouble persists, contact your service representative.

8.1   Upon Power On to the End of POST

[?]   Fail to power on the server:

❑   Is the server properly supplied with power?

❑   Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the server.

❑   Make sure to use the power cord provided with the server. Check the power cord for broken shield or bent plugs.

→   Make sure the 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.
Power supply to the server may be linked with 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 POWER LED is unlit. To power on the server, press the POWER switch after the POWER LED is lit green.

❑   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.

[?]   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 with NEC EXPRESSBUILDER

[?]   Unable to start EXPRESSBUILDER

❑   Did you insert EXPRESSBUILDER DVD and reboot while POST was being executed?

→   If you fail to insert EXPRESSBUILDER DVD and reboot during POST execution, an error message may appear or the OS may start up. Restart the server.

❑   Is BIOS configuration correct?

→   BIOS SETUP Utility allows you to configure the boot order of the boot devices. Configure the boot order so that the optical disk drive will be the first to start up.
<Menu to check: [Boot]>

❑   Is a message such as the following displayed?

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

Message	Cause	Solution
`This EXPRESSBUILDER version is not designed for this computer. Insert the correct version and click [OK].`	This EXPRESSBUILDER version is not designed for this computer.	Use EXPRESSBUILDER provided with the server. If the same error persists, contact your service representative.
`EXPRESSBUILDER could not get the hardware parameters of this motherboard. This version is not designed for this computer or the motherboard may be broken.`	EXPRESSBUILDER could not find the hardware information on motherboard.	Contact your sales representative.
`The file that EXPRESSBUILDER tried to operate was not found.`	Failed to read a file or folder in EXPRESSBUILDER.	Media may be defective or the optical disk drive may be faulty. Contact your sales representative.
`The file that EXPRESSBUILDER tried to operate was not able to open.`		
`EXPRESSBUILDER can not get the parameters of the definition file.`		
`An undefined error occurred.`	Internal error occurred.	

8.3 Upon Installing OS

[?] Unable to install OS

❑ 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 QLogic BIOS?

→ The settings are different from the default values. Refer to *Chapter 1 (1.4 Enabling FC card)* and *(1.6 Setting HBA configuration by using QLogic)* in *Installation Guide*.

[?] Unable to install VMware

❑ Have you checked precautions for installation?

→ Refer to *Chapter 1 (1.7 Installing VMware ESXi)* in *Installation Guide*.

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

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

[?] OS can be operated after a setup but each module or PCI board is not duplicated. (Status 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 onOS 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 lights 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. Disk 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 When OS is Started

[?]   **Unable to start OS**

❑   Are Hard Disk Drives properly installed?

→   Install Hard Disk Drives properly.

❑   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 CHKDSK executed at machine startup?

→   Run the BIOS SETUP utility at rebooting and change parameters as follows:
   (Change BIOS settings)
   Change [Server] - [OS Boot Monitoring] to [Disabled].

   (For details, Refer to *Chapter 3 (1. System BIOS)*.

   *   After completion of CHKDSK, restart the machine and change the above setting back to [Enabled] and continue the operation.

   CHKDSK is executed in the following conditions:

   (1)   CHKDSK is scheduled to be executed at next system startup

   (2)   Corruption of file system is detected since the previous startup until shutdown

   (3)   Inconsistency (corruption) of file system is detected while mouting at system startup

❑   Is the value of [OS Boot Monitoring] in the BIOS setting appropriate?

→   Change the value of [OS Boot Monitoring] 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-Negotioation".
   – 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).

→   This server uses the Locally Administered Address which you set in LAN teaming as MAC address during OS running. If the server does not wake with MAC address of each CPU/IO modules, you should use the Locally Administered Address.

❑   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 third-party CPUs or memory (DIMM) are used.

8.5 When Failure Occurs

[?]   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 vSphere Client and select "Edit" from CPUinformation on the "Resource Allocation" page. On the displayed property screen, select "Advanced CPU" on the "Resource" page 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 Express5800/ft series?

→ 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 dual disks:**

→ Unless you perform mirroring (including reconfiguration after failed disks are replaced) in correct order of *Chapter 2 (2. Disk 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 When OS is in 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 built-in LAN controller from VI client. However, do not use the "Auto Detect" function. Fix the setting of the transfer rate to the same with that of the connected hub. Also, check if the duplex mode is the same with that of the connected hub.

[?] Power-saving feature does not work:

→ The server does not support power-saving feature specified in [Power Option].

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

→ When a componet fails and is reintegrated, the following message may be recorded to the system event 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 reintegraating the component without repair is required for some reason, consult your sales agent. It is possible to perform reintegration forcefully.

> kernel: 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 occuring. The screen will return to normal if you wait awhile.

[?] Screen does not appear after changing screen size:

→ The screen may not appear if failover occurs on the system when screen size is changed.

[?] Logs which are output in an environment where a Fibre Channel board (N8803-038) was installed:

→ The log below is periodically output in /var/log/vmkernel in an environment where a Fibre Channel board was installed. However, there is no problem.
vmkernel: 0:03:02:42.949 cpu2:4209)VMK_PCI: 739: device 181:00.0
capType 16 capIndex 76

8.8 When EXPRESSBUILDER is Started on Windows

[?]   Cannot read online documents

❑   Do you have Adobe Reader installed correctly in your system?

→   Some documents are supplied in PDF format. To read PDF files, Adobe Reader needs to be installed in your computer.

❑   Is your browser Internet Explorer?

→   Internet Explorer sometimes displays the Information bar to enforce security. If this happens, click the Information bar to display the documents.

[?]   The menu does not appear

❑   Is the shift key pressed?

→   Setting the DVD/CD with the shift key pressed down cancels the Autorun feature.

❑   Is the OS in the proper state?

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

[?]   Some menu items are grayed out

❑   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)*.

❑   File System Monitoring

→ On the file system monitoring of NEC ESMPRO Agent, vmfs areas are not monitored.

❑   About portmap

NEC ESMPRO Agent uses portmap function. If portmap 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

❑   LAN Monitoring Report

→ The 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.

❑   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. Thus, the value set for "Line fault occurrence rate" of a [LAN] tab of [NEC ESMPRO Agent properties] is not used.

❑ Change of SNMP Community

→ If the security setting of the SNMP Service of a system, where the NEC ESMPRO Agent is installed, is changed from the default "public" to a community name, change the community settings of the 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."

❑ 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 the 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.

❑ Shutdown Monitoring

When performing shutdown monitoring, all shutdown processes are to be monitored. If there is an application that performs shutdown without rebooting OS or turning off the power, set the timeout value longer or disable the monitoring function.

❑   Temperature/voltage error occurs on the CPU/PCI modules

→   At the time when a temperature or voltage error occurs on CPU/PCI module (CPU/IO module), necessary actions will differ depending on their status as shown below.

Status	Operation
Duplex	Stop the failed CPU/PCI module (CPU/IO module).
Other than Duplex, Empty	Shut down the system.

Tips	• If the status is "Empty", the module is not mounted. Sensor monitoring is not conducted.
	• If disks are mounted on CPU/IO modules, the status of both modules is "Simplex" while the disks are mirrored. Temperature or voltage error occurring during disk mirroring will result in the system to shut down.

❑   Module status is shown "Fault":

→   PCI modules (IO modules) and modules under the SCSI enclosure have impact on each other. For example, when the "Status" item of a module changes to "fault", it may be caused by other module error. Check the status of the other modules referring to alert message.

❑   Temperature/voltage error occurs on the CPU/PCI modules:

→   At the time when a temperature or voltage error occurs on CPU/PCI module (CPU/IO module), necessary actions will differ depending on their status as shown below.

Status	Operation
Duplex	Stop the failed CPU/PCI module (CPU/IO module).
Simplex	Shut down the system.

→   Remove the disk in the following procedure.

1. If the status is "Empty", the module is not mounted. Sensor monitoring is not conducted.

2. If disks are mounted on PCI modules (IO modules), the status of both modules is "Simplex" while the disks are mirrored. Temperature or voltage error occurring during disk mirroring will result in the system to shut down.

[?]   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

❑ Status Color after Mounting a Hard Disk Drive

→ When creating a new mirror, the status of [SCSI Enclosure] and [SCSI Slot] of [Information of server state/constitution] will continue to change frequently after you mount a hard disk until the mirror is completed. During this process, the status color may turn to abnormal, but when the mirror is created successfully, it will return normal.

❑ CPU Information

→ The CPU information can be viewed by selecting [System] – [CPU] in the [Information of server state/constitution] screen.

→ If you select [CPU Module] – [CPU] in the [ft System] tree, unknown or incorrect information appears in some information items.

❑ Change of hardware configuration

→ If you dynamically change the configuration of the CPU or PCI module (IO module), [ft System] tree in [Information of server state/constitution] may not be displayed correctly. In such a case, wait for about 5 minutes, open [Information of server state/constitution] again.

❑ Display immediately after system startup

→ If you open [Information of server state/constitution] immediately after the system starts up, the tree or the state may not be displayed correctly due to high load of the system. In about 20 minutes after the system startup, open [Information of server state/constitution] again.

❑ Flash FDD information

→ After turning on/off the POWER switch of CPU/IO module, the flash FDD name of [I/O Device] in [Information of server state/constitution] may be different from the name that is recognized by the OS. Check the Flash FDD name on Explorer.
If Flash FDD is added or removed while the system is running, the result is reflected to [I/O Device] in [Information of server state/constitution] at the next system startup.

❑ Display when the PCI module (IO module) is running in the simplex mode.

→ When only the PCI modules (IO modules) is running in the simplex mode (non-duplexed mode), the [Information of server state/constitution] cannot display the status of the [SCSI Enclosure] and [Mirror Disk] correctly. To check if the duplex mode is changed to the simplex mode, check the event log or AlertViewer log, or the status color of the PCI module by the [Information of server state/constitution].

❑ SCSI Status while PCI module is Starting or being Stopped:

→ While the PCI module is starting or being stopped, the status of [SCSI Enclosure], [SCSI Slot], and [Mirror Disk] in [Information of server state/constitution] may become unstable, and incorrect status may be displayed temporarily.

❑ Display of an Unmounted Sensor

→ For R320c-E4/ R320c-M4, 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). The information on the screen is updated afterwards.

❑   System Environment Monitoring

→   On Express5800/R320c-E4 or R320c-M4, 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.
[Information of server state/constitution] - [Enclosure] - [Temperature]
[Information of server state/constitution] - [Enclosure] - [Fan]
[Information of server state/constitution] - [Enclosure] - [Voltage]

❑   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). The information on the screen is updated afterwards.

❑   Information of the keyboard/mouse

→   When plugging or unplugging CPU/IO module, the keyboard information under the [I/O Device] in the [Information of server state/constitution] may be displayed incorrectly. Restart the system.

❑   Status of SCSI Slots and Mirrored Disks at High Load:

→   When the system load is high, the status of SCSI slots and mirror disks may not be obtained, and incorrect status may be displayed temporarily.

❑   USB Device and Window Displaying

→   On [Information of server state/constitution], if mouse, keyboard or display appears because USB is disabled, the details are shown as unknown.

❑   CPU Information

→   In [CPU Information] of [Information of server state/constitution], the external clock is displayed as "Unknown."

❑   Display of Keyboard and Mouse

→   Also in the state that is unconnected with a Keyboard and Mouse, [Information of server state/constitution] displays Keyboard and Mouse.

❑   The detail information of alert is displayed as "Unknown":

→   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-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.

→   After ft control software is installed, an optical disk drive becomes inaccessible. When accessing to an optical disk drive is necessary, follow the procedure below to temporarily allow access to the drive.
   # /opt/ft/sbin/enable-usb-storage
Use of optical disk drive in normal operation is not recommended. Do not operate the server while using the optical disk drive, such as mounting on service console or allocating to guest OS. When an optical disk drive is used during the system operation, the product may not work properly. If an optical disk drive is used, remove the mounted / allocating optical disk drive and reboot the system.

❑   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 (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 or a floppy disk drive connected to this server besides this Flash FDD?

→   One Flash FDD can only be connected to a USB connector of this server.
   If another Flash FDD or a floppy disk drive connected to this server, use it after removing this.

[?]   **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.

[?]   **Icon of drive A is changed to that of removable disk:**

     →   Does not cause any problem.

9. **System Recovery**

For repairing the service console, try fsck.

Important	• **If the sd device cannot be recognized by the service console, the system cannot be repaired.** • **To execute this configuration, log in as a root user.**

IMPORTANT:

```
# fsck -C -pvf /dev/sd*
*:device ID
```

Try the guest OS repairing method according to each OS.

10. 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.

10.1 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

10.2 Forced Shutdown

Use this function 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.
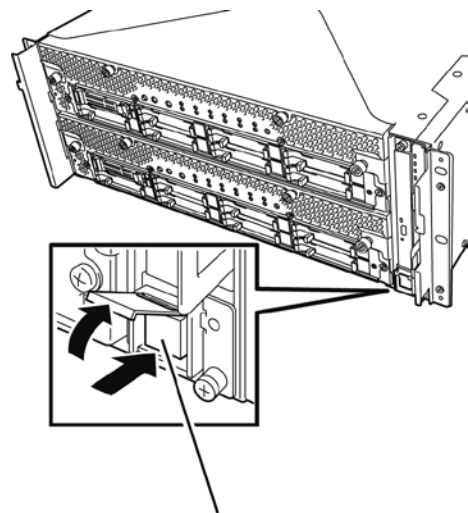
Press this switch for 4 seconds or longer.

10.3 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* in *Precautions for Use* in "*User's Guide*".

- 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* in *Precautions for Use* in "*User's Guide*".

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 2 (5.1.2 Anti-static measures)*.

Clearing CMOS memory

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

2. Remove CPU/IO module 0, and remove its top cover.
   Refer to *Chapter 2 (5.4 CPU/IO Module)*.

3. Confirm the position of Clear CMOS Jumper.

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

5. Assemble the CPU/IO module 0.

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

7. Confirm that PRIMARY LED of CPU/IO module 0 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.

8. When the POWER LEDs on CPU/IO modules 0 and 1 starts blinking, press the POWER switch to turn on the server.

9. If the following warning message appears, press the POWER switch to power off the server.
   (POST proceeds even when the warning message is displayed.)

   ```
   WARING

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

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

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

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

13. Assemble the CPU/IO module 0.

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

15. Confirm that PRIMARY LED of CPU/IO module 0 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.

16. When the POWER LEDs on CPU/IO modules 0 and 1 starts blinking, press the POWER switch to turn on the server.

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

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

18. 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, and remove its top cover.

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

3. Confirm the position of Clear Password Jumper.

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

5. Assemble the CPU/IO module 0.

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

7. Confirm that PRIMARY LED of CPU/IO module 0 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.

8. When the POWER LEDs on CPU/IO modules 0 and 1 starts blinking, press the POWER switch to turn on the server.

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

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

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

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

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

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

13. Assemble the CPU/IO module 0.

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

11. System Diagnostics

The System Diagnostics runs several tests on the server.

11.1 Test Items

The following items are tested in System Diagnostics.

- Memory
- CPU cache memory
- Hard disk drive

Important	**Before executing the System Diagnostics, be sure to disconnect the LAN cable. Executing the System Diagnostics with the LAN cable connected may affect the network.**

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

11.2 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	In case **Language selection menu** appears, select **English**.

2. Select **Test and diagnostics**.

   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.

```
                                      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
```

Diagnostics tool title · 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.

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

The **Enduser Menu** below is displayed.

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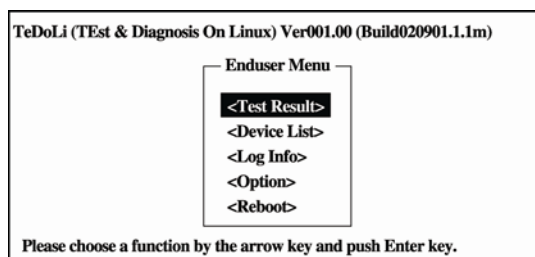
Shows the diagnostics completion screen of the above diagnostics.

<Device List>

Shows a list of connected devices.

<Log Info>

Shows the log information of the diagnostics. Log information can be saved. To save it, connect a FAT

formatted removable media, and then select [Save(F)].

<Option>

Optional features can be used from this menu.

<Reboot>

Reboots the hardware.

4.   Select **Reboot** in **Enduser Menu**.

The server restarts. Remove EXPRESSBUILDER DVD from the drive.

System Diagnostics is now completed.

12. Offline Tools

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

12.1 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.

12.2 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.

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.

2

NEC Express5800 Series
Express5800/R320c-E4, R320c-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. **Disk Operations**

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

3. **Duplex LAN Configuration**

   Describes how to configure duplex LAN.

4. **Miscellaneous Configuration**

5. **Installing Optional Devices**

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

1. ftSys Management Appliance

1.1 Overview

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

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

CPU	1vCPU
Memory	1024MB
Disk	10GB
Network	1port
Guest OS	CentOS 5.7

Tips	For detailed information on CentOS, refer to the Web site below. http://www.centos.org/

ftSys Management Appliance

ft Server
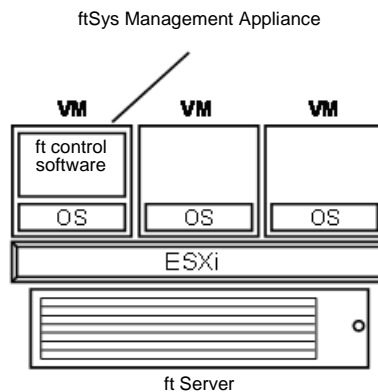
1.2 Steps for Accessing ftSys Management Appliance

Access ftSys Management Appliance by using the vSphere Client installed on the Management PC.
Right-click ftSys Management Appliance in the left pane of the vSphere Client and select [Open Console].
ftSys Management Appliance can also be accessed by clicking the [Console] tab displayed in the right pane
or clicking the [Launch Virtual Machine Console] button on the toolbar.

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

1.3 Precautions for Using ftSys Management Appliance

Your system is not fault tolerant unless the ftSys Management Appliance is properly configured and running
at all times. Use ftSys Management Appliance with careful attention to the instructions provided below.

- 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 network configuration of the ESXi host
  - 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 special directions, 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 account to run administrative commands in the appliance. Only the root account in the appliance is properly configured for administrative access to the ESXi host. 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 account from security viewpoint, log in to ftSys Management Appliance with the ftadmin account, 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 account.

- Avoid deploying your own scripts and third-party agents in the ftSys Management Appliance that may interfere with the continuous uptime of your system.

- 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 embed again while ftSys Management Appliance is stopped.

- When your ft Server is included in the VMware vSphere 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. Disk Operations

NEC Express5800/ft series duplicates disks to secure data integrity by Software-RAID.

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

2.1 Operable disk configuration

RAID must be configured for all the internal disks in NEC Express5800/ft series.

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

The internal disks path and device name
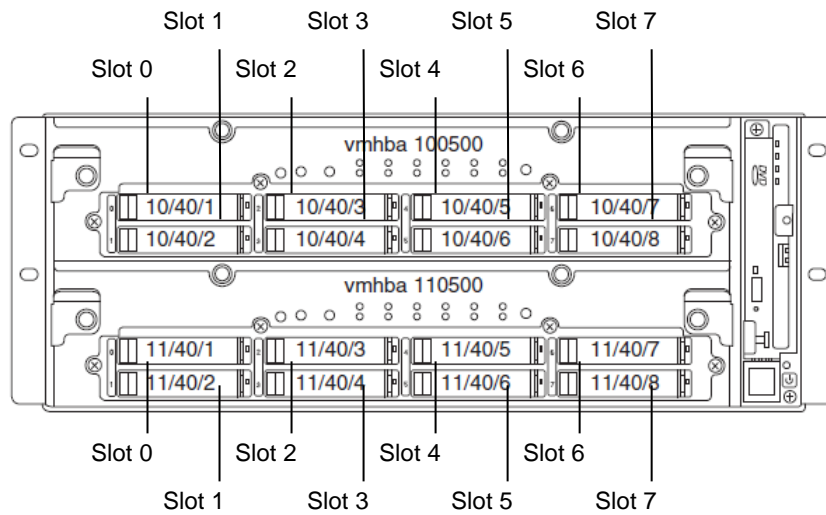
Slots corresponding to the mirroring process

Corresponding slot	
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 disk it need to use the kernel device names. The kernel device name is decided by being detected by system when the disk is inserted or system is booted. The kernel device name is displayed as "vmhba*nn*0500:C0:T*x*.L0".

The "*nn*" of "vmhba*nn*0500:C0:T*x*.L0" displays PCI Modules (10,11),and "*x*" that number more than 0 are assigned by detection order displays 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 disk installed in the slot0 of I/O module 0 (10), run the following command. In the following example, the kernel device name is vmhba100500:C0:T0: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                : SEAGATE:ST9146853SS
Firmware Rev          : N007
Serial #              : 6XM02H250000B117KSV2
Device Name           : disk_a
Udev Device Names     : -
Kernel Device Names   : vmhba100500:C0:T0: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
```

Configuring the redundant configuration, it is necessary to 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 disks

dco001h
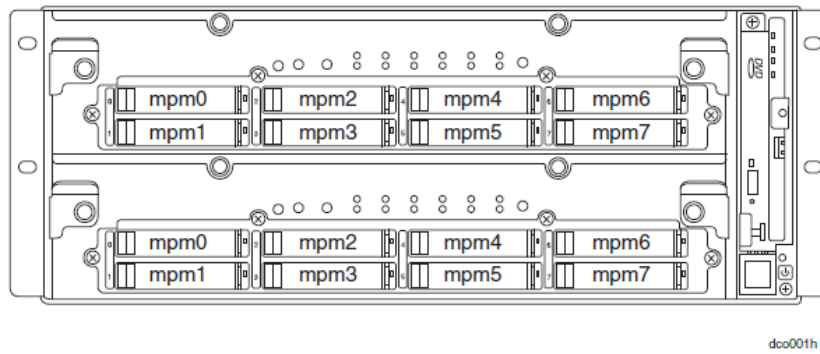
Important	•	When the status of each disk becomes "resync" "recovery" "check" or "repair" do not add a disk, insert/remove HDD, power off or restart the system. Wait until the status indication of Raid device disappears and the status of each disks become "in_sync". Check the status of RAID using the "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 *\<ESXi host IP address\>* storage mpm list

- To isolate a disk from the RAID configuration
  esxcli -s *\<ESXi host IP address\>* storage mpm fail –v *\<Device name\>* -d *\<Kernel device name\>*

- To remove a disk from the RAID configuration
  esxcli -s *\<ESXi host IP address\>* storage mpm remove –v *\<Device name\>* -d *\<Kernel device name\>*

- To add a disk to the RAID configuration
  esxcli -s *\<ESXi host IP address\>* storage mpm add –v *\<Device name\>* -d *\<Kernel device name\>*

- To add disks (RAID configuration)
  esxcli -s *\<ESXi host IP address\>* storage mpm create –v *\<Device name\>* --disk1= *\<Kernel device name\>* --disk2=*\<Kernel device name\>*

2.3 Confirm Hard Disk Drives status

To confirm the disk 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 : 143066368 blocks (139713 MB) [2/2]
 \_ vmhba100500:C0:T0:L0 (10/40/1)        [ in_sync ]
 \_ vmhba110500:C0:T0: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 disk 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, follow the steps below. Replace a hard disk when the CPU/IO module 0 and 1 are powered on.

2.4.1 Determining a failing disk

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

Important	This must be operated by root user.

1. Run esxcli -s <*ESXi host IP address*> storage mpm list.

2. Check the failed disk form the displayed info.

   The following is an example when a failure occurred on the internal disk stored in the slot 0 of PCI module 1.

   ```
   # esxcli –s xxx.xxx.xxx.xxx storage mpm list
   Info
   -------------------------------------------------------
   mpm0 : 143066368 blocks (139713 MB) [2/2]
    \_ vmhba100500:C0:T0:L0 (10/40/1)        [ in_sync ]
    \_ vmhba110500:C0:T0:L0 (11/40/1)        [ faulty ]
   ```

   When you confirm the slot0 of PCI 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 disk and restore duplication.

> **Important**
> - **This must be operated by root user.**
>
> - **While the replaced disk 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 disk 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 disk 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 disk stored in the slot 0 of PCI Module 1.

```
# esxcli –s xxx.xxx.xxx.xxx storage mpm list
Info
------------------------------------------------------
mpm0 : 143066368 blocks (139713 MB) [2/2]
 \_ vmhba100500:C0:T0:L0 (10/40/1)        [ in_sync ]
 \_ vmhba110500:C0:T0:L0 (11/40/1)        [ faulty ]

# esxcli –s xxx.xxx.xxx.xxx storage mpm fail –v mpm0 –d vmhba110500:C0:T0:L0

# esxcli –s xxx.xxx.xxx.xxx storage mpm remove -v mpm0 –d vmhba110500:C0:T0:L0

# esxcli –s xxx.xxx.xxx.xxx storage mpm list
Info
------------------------------------------------------
mpm0 : 143066368 blocks (139713 MB) [1/2]
 \_ vmhba100500:C0:T0:L0 (10/40/1)        [ in_sync ]

Unused disks:
– vmhba110500:C0:T0:L0 (11/40/1)
```

2. Remove the disk 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 : 143066368 blocks (139713 MB) [1/2]
 \_ vmhba100500:C0:T0:L0 (10/40/1)        [ in_sync ]


  :
  :
  :

# esxcli –s xxx.xxx.xxx.xxx storage mpm list
Info
------------------------------------------------------
mpm0 : 143066368 blocks (139713 MB) [1/2]
 \_ vmhba100500:C0:T0:L0 (10/40/1)        [ in_sync ]

Unused disks:
– vmhba110500:C0:T0: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 specified.

```
# esxcli –s xxx.xxx.xxx.xxx storage mpm add -v mpm0 –d vmhba110500:C0:T0:L0
```

| **Note** | Synchronization may start automatically when a new disk 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 : 143066368 blocks (139713 MB) [2/2]
 |    recover=51.6% (73879680/143066368) finish=32.8min (35088K/s)
 \_ vmhba100500:C0:T0:L0 (10/40/1)        [ in_sync ]
 \_ vmhba110500:C0:T0:L0 (11/40/1)        [ syncing ]

# esxcli –s xxx.xxx.xxx.xxx storage mpm list
Info
------------------------------------------------------
mpm0 : 143066368 blocks (139713 MB) [2/2]
 \_ vmhba100500:C0:T0:L0 (10/40/1)        [ in_sync ]
 \_ vmhba110500:C0:T0:L0 (11/40/1)        [ in_sync ]
```

2.4.3 **Reducing resync time**

You can reduce the resync time to change the minimum resync speed from 1,000 KB/sec (default) to 200,000 KB/sec.

Note	The minimum resync speed affects system performance. If it is increased, the system performance becomes 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: 200,000 KB/sec).

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm speedLimit
Volume  Minimum  Maximum
------  -------  -------
volume    1000   200000
```

Run the following command to specify the minimum resync speed to 200,000 KB/sec for all disks.

```
# esxcli -s xxx.xxx.xxx.xxx storage mpm speedLimit --min=200000 --max=200000
Volume  Minimum  Maximum
------  -------  -------
volume  200000   200000
```

To confirm or specify the minimum resync speed for individual disk, 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=200000
--max=200000
Volume  Minimum  Maximum
------  -------  -------
volume  200000   200000
```

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=200000 --max=200000` Refer to the Knowlede Base of VMware for how to describe the /etc/rc.local.d/local.sh file. <VMware, Knowlede Base -Modifying the rc.local or local.sh file in ESX/ESXi to run commands while booting (2043564)> http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=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 Disk Drives

Insert additional 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.

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 <*ESXi host IP address*> 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 : 143066368 blocks (139713 MB) [2/2]
 \_ vmhba100500:C0:T0:L0 (10/40/1)        [ in_sync ]
 \_ vmhba110500:C0:T0:L0 (11/40/1)        [ in_sync ]

Unused disks:
- vmhba100500:C0:T1:L0 (10/40/2)
- vmhba110500:C0:T1: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=vmhba100500:C0:T1:L0 --disk2=vmhba110500:C0:T1:L0

<<<Make sure that the RAID device is configured
successfully.>>>
# esxcli –s xxx.xxx.xxx.xxx storage mpm list
Info
--------------------------------------------------------
mpm0 : 143066368 blocks (139713 MB) [2/2]
 \_ vmhba100500:C0:T0:L0 (10/40/1)        [ in_sync ]
 \_ vmhba110500:C0:T0:L0 (11/40/1)        [ in_sync ]

mpm1 : 878906176 blocks (858306 MB) [2/2]
 \_ vmhba100500:C0:T1:L0 (10/40/2)        [ in_sync ]
 \_ vmhba110500:C0:T1: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.

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.

1. Open vSphere Client and log in to the ESXi host.

2. Select the **Configuration** tab for the ESXi host.

3. Select **Storage** in the **Hardware** box.

4. Select **Add Storage**.
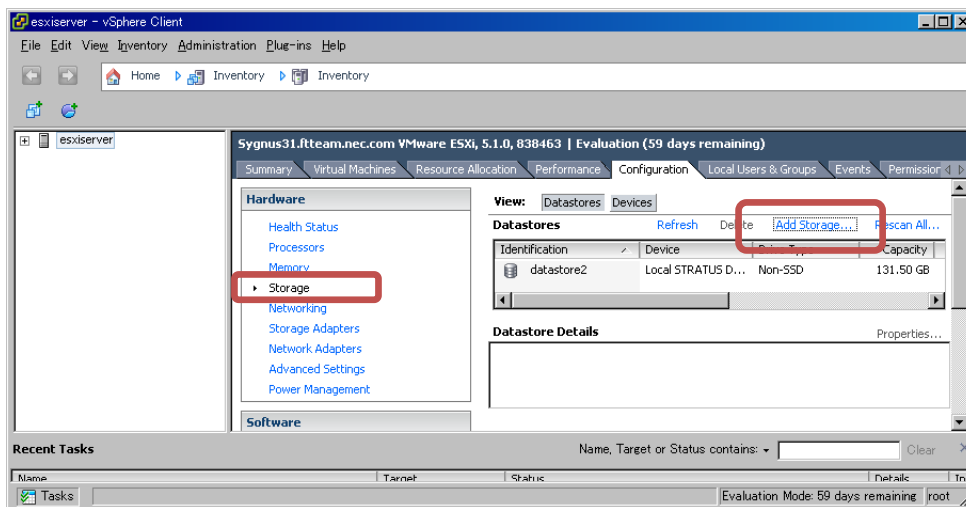
5. The Add Storage wizard appears. Select **Disk/LUN** in **Storage Type** and click **Next**.
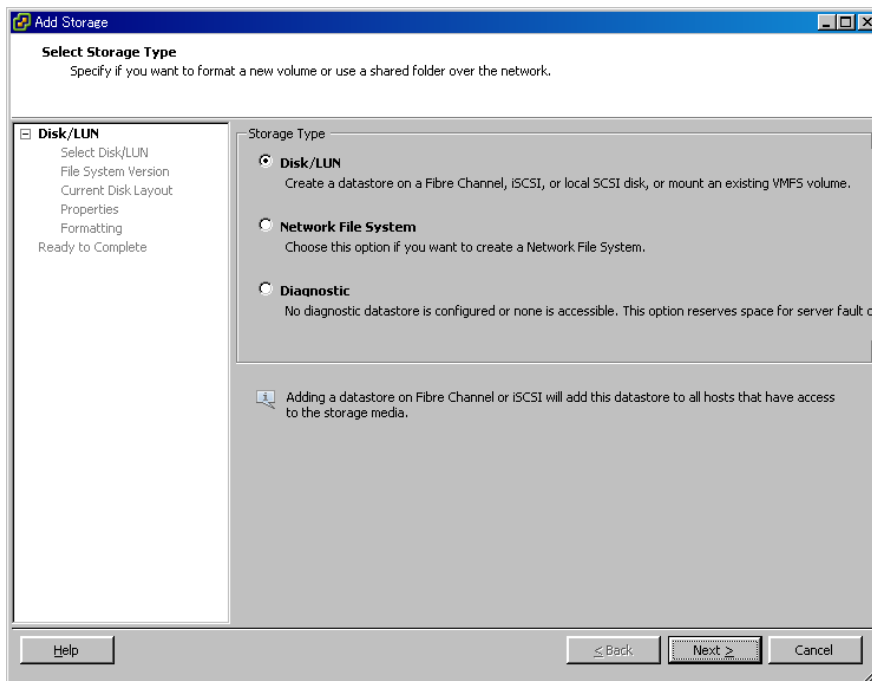
6. Select a volume on which to create the VMFS datastore and click **Next**.
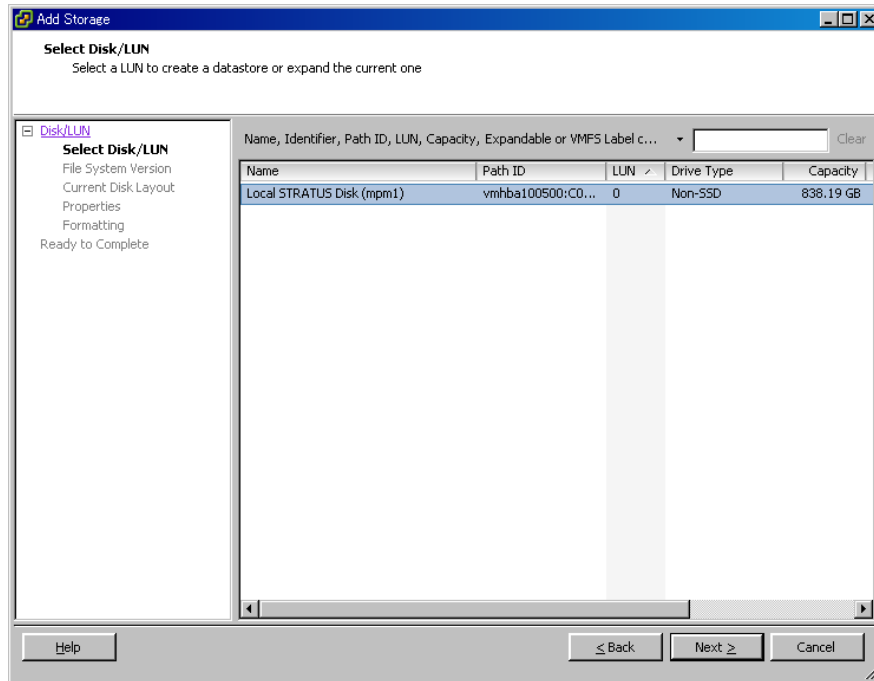
7. Select the version of file system, and click **Next**.
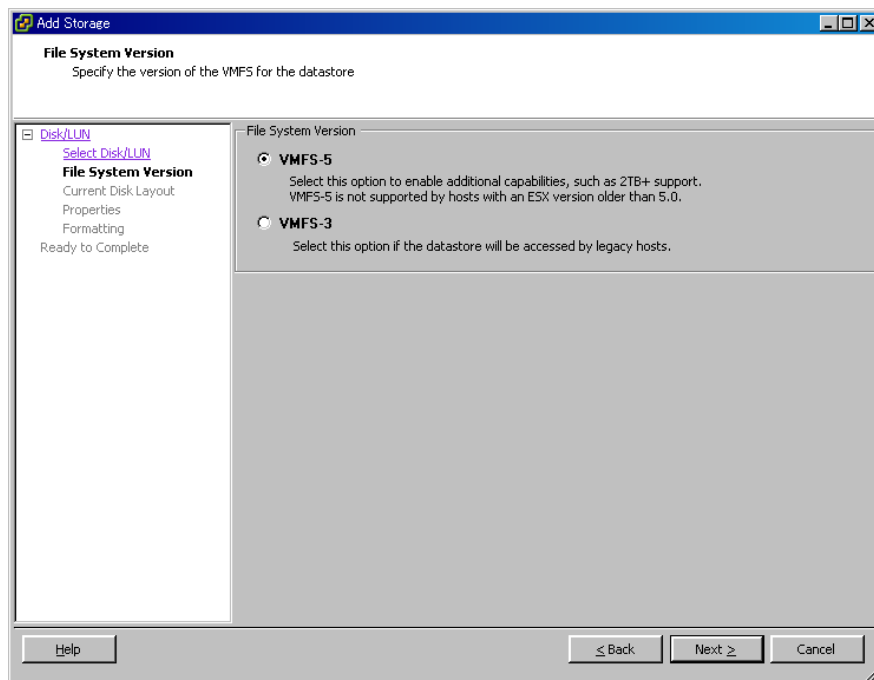
8. Confirm the current disk layout, and click **Next**.
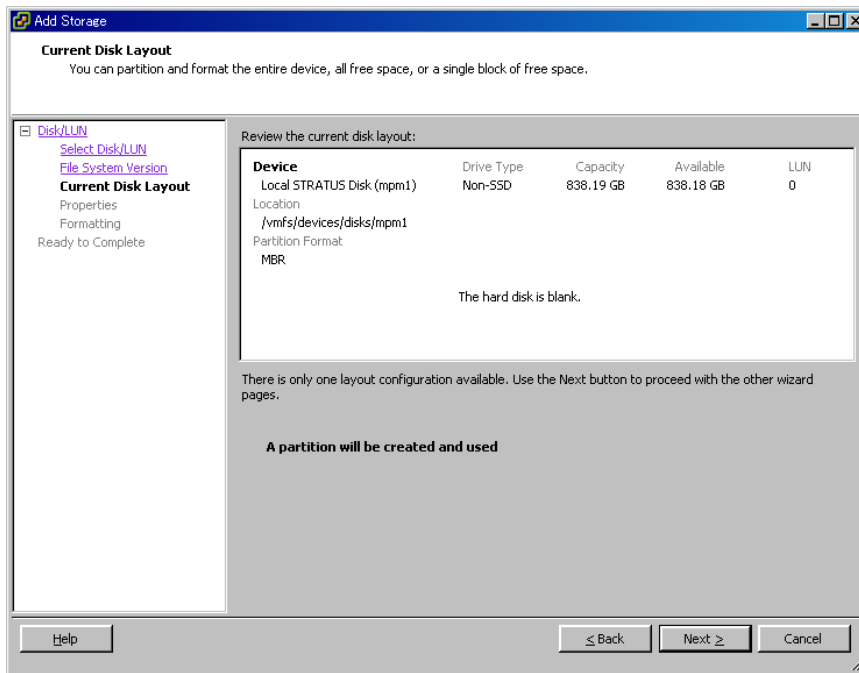
9. Enter the datastore name, and click **Next**.
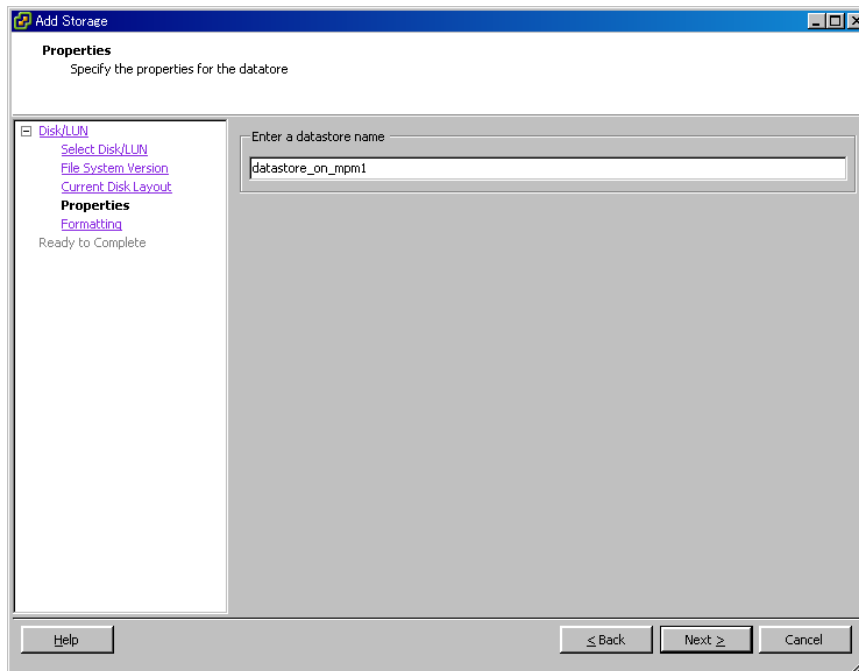
10. Specify the capacity for the area to be used, and click **Next**. By default, the maximum available space in storage device is used.
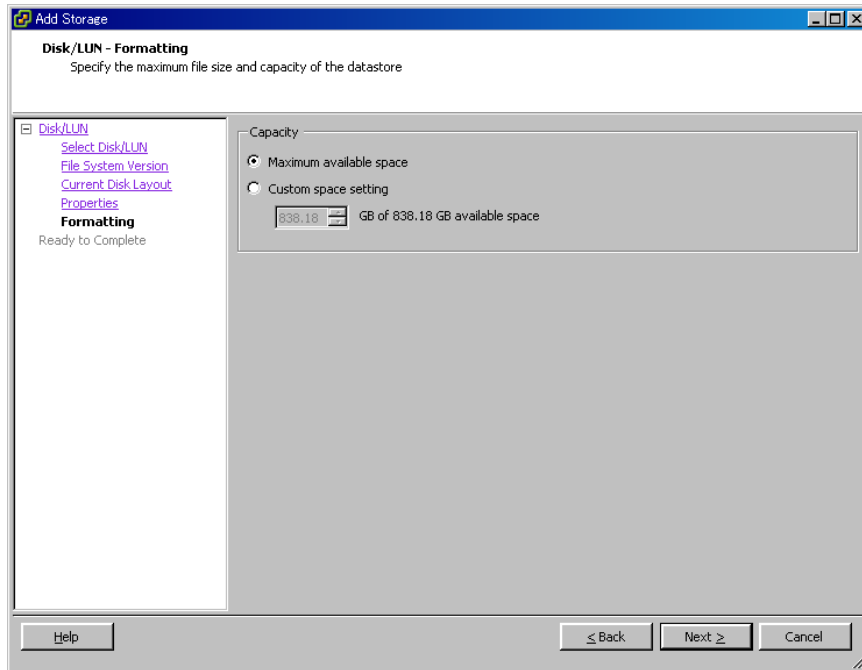
11. Click **Finish**.

Now the VMFS datastore is created.
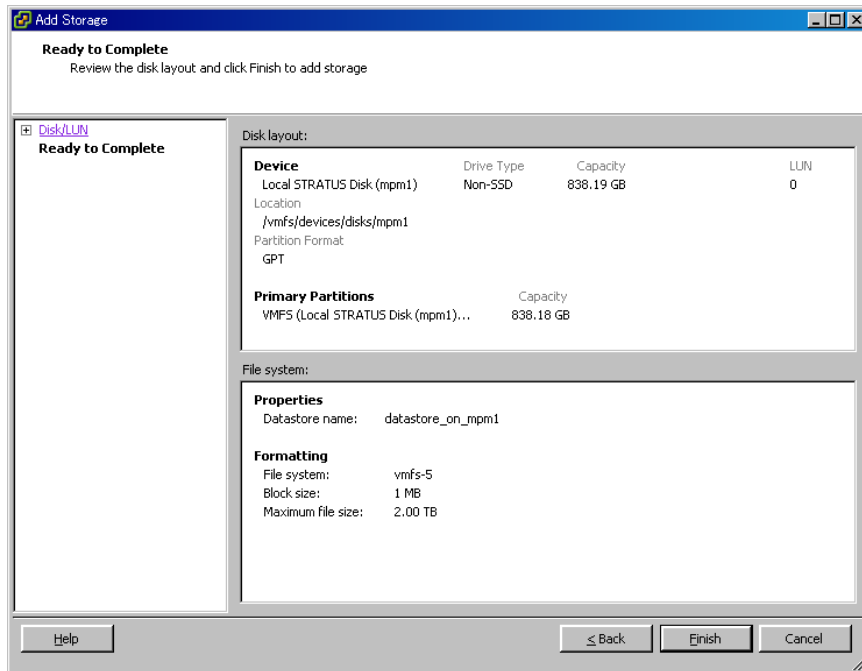
3. Duplex LAN Configuration

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).

In normal installation, the standard switch (vSwitch0) is set to vmnic100600 and vmnic110600 of Port #1 on On Board (1 Gigabit), and network duplication is achieved.

You can configure the setting of and check the network interfaces from Vsphere client.

For more specific setting method, see VMware Vsphere document "*ESXI Configuration Guide*".
The network is disconnected for up to about one minute when network failure occurs.

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

PCI slot and network interface name

PCI slot	Port	CPU/IO module 0	CPU/IO module 1
On Board (1 Gigabit)	#1	vmnic100600	vmnic110600
	#2	vmnic100601	vmnic110601
On Board (10 Gigabit) (*)	#1	vmnic101200	vmnic111200
	#2	vmnic101201	vmnic111201
PCI-e slot 1	#1	vmnic100100	vmnic110100
	#2	vmnic100101	vmnic110101
PCI-e slot 2	#1	vmnic100200	vmnic110200
	#2	vmnic100201	vmnic110201
PCI-e slot 3 (*)	#1	vmnic100300	vmnic110300
	#2	vmnic100301	vmnic110301
PCI-e slot 4 (*)	#1	vmnic100400	vmnic110400
	#2	vmnic100401	vmnic110401

* For R320c-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 the relevant datastore in [Summary] tab of VMware vSphere, and select [Rename] from right-click menu.

Refer to the VMware vSphere document for detailed information.
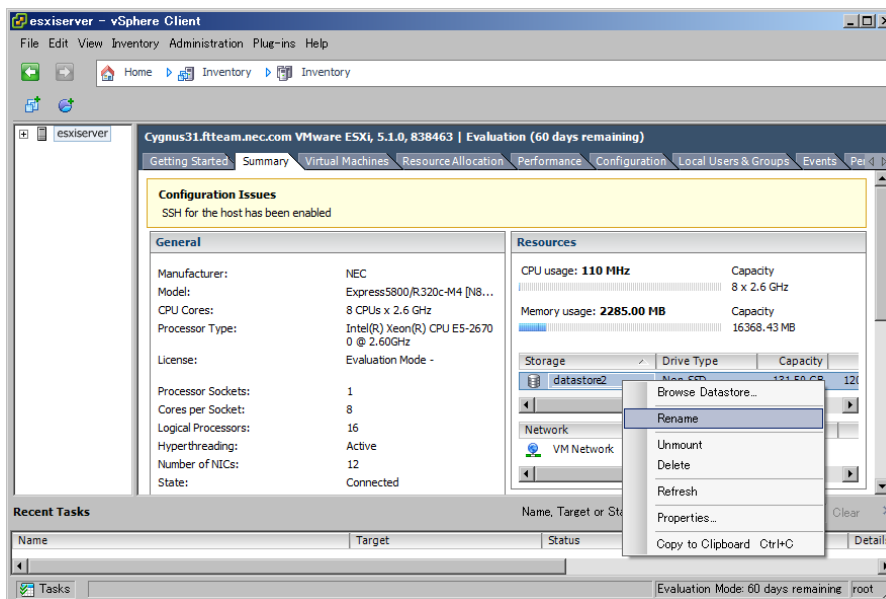
5. Installing Optional Devices

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

Important	• **Optional devices described in this chapter may be installed or removed by the user. However, NEC does not assume any liability for damage to optional devices or the server or malfunctions of the server resulted from installation by the user.** • **Use only the devices and cables specified by NEC. You will be charged to repair damages, malfunctions, and failures caused by the use of any devices or cables not specified for use with this server even within the warranty period.**

5.1 Before Starting Work

5.1.1 Safety precautions

Observe the following notes to install or remove 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 *Safety precautions* in *Precautions for Use* in *User's Guide*.

- Do not disassemble, repair, or modify the server.
- Do not look into the DVD-ROM drive.
- Do not remove the lithium battery, NiMH battery, or Li-ion 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 *Safety precautions* in *Precautions for Use* in *User's Guide.*

- 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 **Anti-static measures**

The server contains electronic components sensitive to static electricity. Avoid failures caused by static electricity when installing or removing any optional devices.

- **Wear wrist straps (arm belts or anti-static gloves).**
  Wear wrist straps on your wrists. If no wrist strap is available, touch an unpainted metal part of the cabinet before touching a component to discharge static electricity from your body.

  Touch the metal part regularly when working with components to discharge static electricity.

- **Select a suitable workspace.**
  Work with the server on the anti-static or concrete floor.

  When you work with the server on a carpet where static electricity is likely to be generated, make sure take anti-static measures beforehand.

- **Use a worktable.**
  Place the server on an anti-static mat to work with it.

- **Clothes**
  Do not wear a wool or synthetic cloth to work with the server.

  Wear anti-static shoes to work with the server.

  Take off any metal accessories you wear (ring, bracelet, or wristwatch) before working with the server.

- **Handling of components**
  Keep any component in an anti-static bag until you actually install it to the server.

  Hold a component by its edge to avoid touching any terminals or parts.

  To store or carry any component, place it in an anti-static bag.

5.1.3 **Pre-upgrade verification**

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 required ft control software's version, Refer to the *User's Guide* provided with the device, check 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*.

5.1.4 **Preparing your system for upgrade**

Note the following, when installing 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.

- Make sure to provide the same hardware configuration on both CPU/IO modules

- Use the same slots and sockets on both groups.

- 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 Available Option Devices

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

- 2.5-inch hard disk drive
  The server can contain up to 16 hard disk drives.
  Install hard disk drives in 2.5-inch hard disk drive bay at front of the server.

- DIMM
  Up to 256 GB (16 16-GB DIMMs) can be installed on R320c-E4 model, or   R320c-M4 model.
  After removing the CPU/IO module, install DIMMs in DIMM sockets on motherboard of the server.

- Processor (CPU)
  Up to two CPUs can be installed.
  After removing the CPU/IO module, install CPU in CPUs sockets of the server.

- PCI card
  Up to two cards can be installed on R320c-E4 model, or up to 4 cards on R320c-M4 model.
  After removing the CPU/IO module, install PCI card in PCI card slot of the server.

5.3 2.5-inch Hard Disk Drive

The 2.5-inch hard disk drive bays in front of the server can mount up to 16 hard disk drives with the 2.5 inch width exclusive trays.

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.)
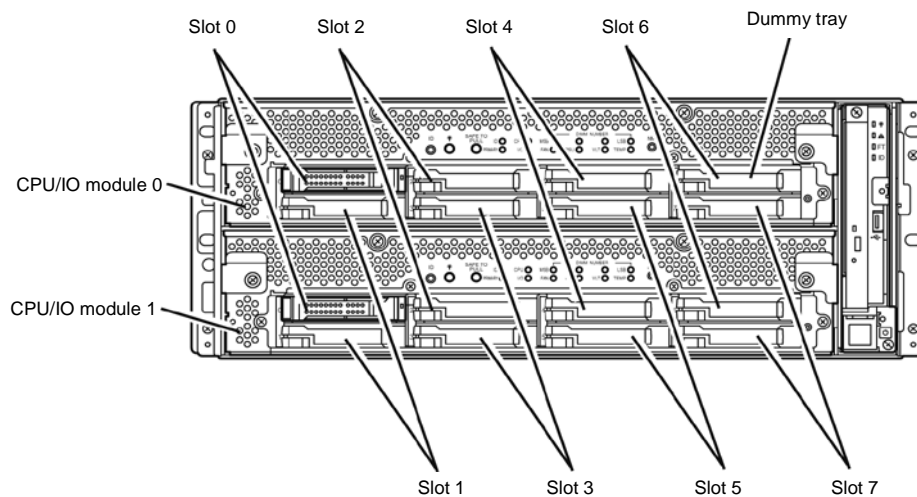
Slots to execute the mirroring process

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 Installing 2.5-inch Hard Disk Drive

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 to slot through slot 7.

Important	• Refer to *Chapter 2 (5.1.2 Anti-static measures)* and *Chapter 2 (5.1.4 Preparing your system for upgrade)* before starting installing or removing options. • You must mount two HDDs that form dual disk configuration before starting the OS.

1. Shut down the OS.

   The system turns off automatically.

2. Remove the front bezel.

3. Identify the slot to which you want to install a hard disk drive.

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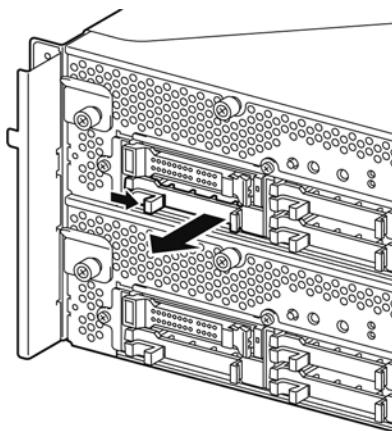
5. Unlock the hard disk drive.
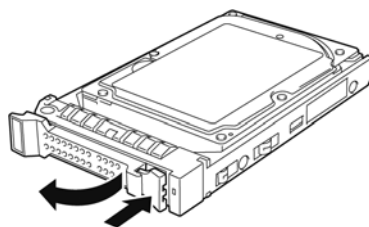
6.   Firmly hold the handle of the hard disk drive to install and insert the drive into the slot.

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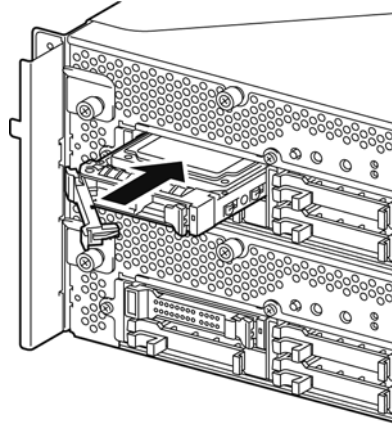
7.   Slowly close the lever. When the lever is locked, you will hear a click sound.

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.
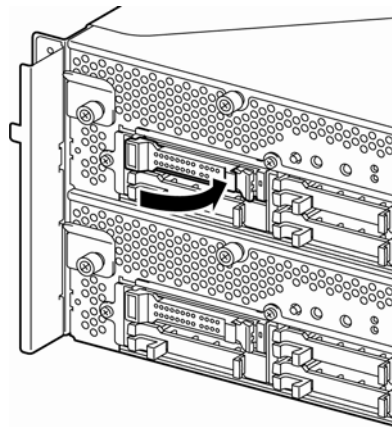
8.   Press the POWER switch to power on.

9.   Install the front bezel.

10.   Refer to *Chapter 2 (2.5 Adding Hard Disk Drives)* to set the dual disk configuration.

5.3.2 **Removing 2.5-inch Hard Disk Drive**

Follow the procedure below to remove the hard disk drive.

Important	Refer to *Chapter 2 (5.1.2 Anti-static measures)* and *Chapter 2 (5.1.4 Preparing your system for upgrade)* 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
    according to procedures described in *Chapter 2
    (5.3.1 Installing 2.5-inch Hard Disk Drive)*.
    Ensure to install the dummy slot in the empty slot
    to improve the cooling effect within the server.
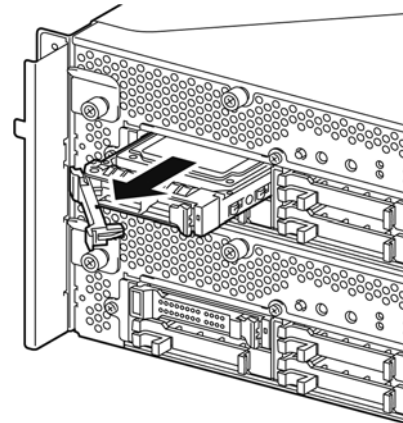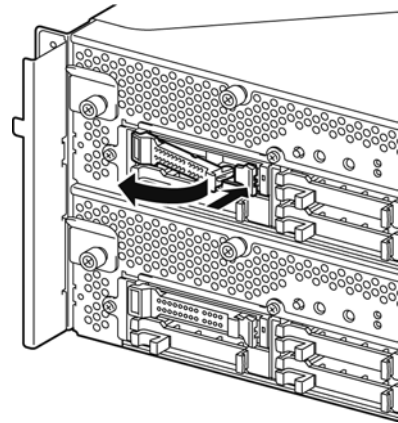
5.3.3 **Replacing 2.5-inch Hard Disk Drive**

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 *Chapter 2 (5.1.2 Anti-static measures)* and *Chapter 2 (5.1.4 Preparing your system for upgrade)* before starting installing or removing options.** • **You can replace a hard disk drive during continuous operation.**

(1) Replacing the Hard Disk Drive

1. Locate the failed hard disk drive.

   When a hard disk drive fails, the DISK ACCESS LED on the hard disk drive's handle lights amber.

2. Remove the failed hard disk referring to *Chapter 2 (2.4 Replacing a hard disk drive)* and *Chapter 2 (5.3.2 Removing 2.5-inch Hard Disk Drive)*.

3. Refer to the steps in *Chapter 2 (5.3.1 Installing 2.5-inch Hard Disk Drive)* to install a new hard disk drive.

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 *Chapter 2 (2. Disk Operations)* after formatting the disk physically. As to physical format, refer to *Chapter 3 (3. SAS Configuration Utility)*.

4. Restore the redundant configuration.

   Refer to *Chapter 2 (2.4 Replacing a hard disk drive)*.

5.4 CPU/IO Module

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

| Important	• **Refer to** *Chapter 2 (5.1.2 Anti-static measures)* **and** *Chapter 2 (5.1.4 Preparing your system for upgrade)* **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 module being operating may cause unexpected trouble. Use the management software (e.g., the ftsmaint command) to isolate the module to be removed so that the 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 Removing CPU/IO Module

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

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

    To stop the server, 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 PCI module 0.

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

    Check that the Status of the PCI module is OFFLINE.

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

Tips	When removing CPU/IO module 1, select [Bring Down] for CPU module (ID:1) and PCI module (ID:11)

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.
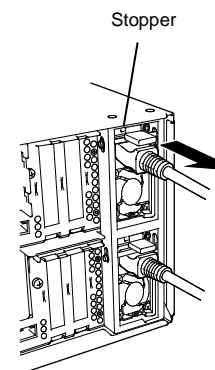
    Stopper

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 securing the CPU/IO module handle to press down the handle.

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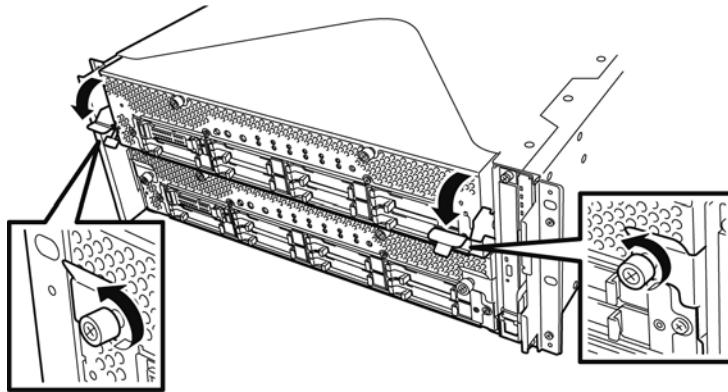
5. Hold the black levers of the CPU/IO module and pull it off.

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.
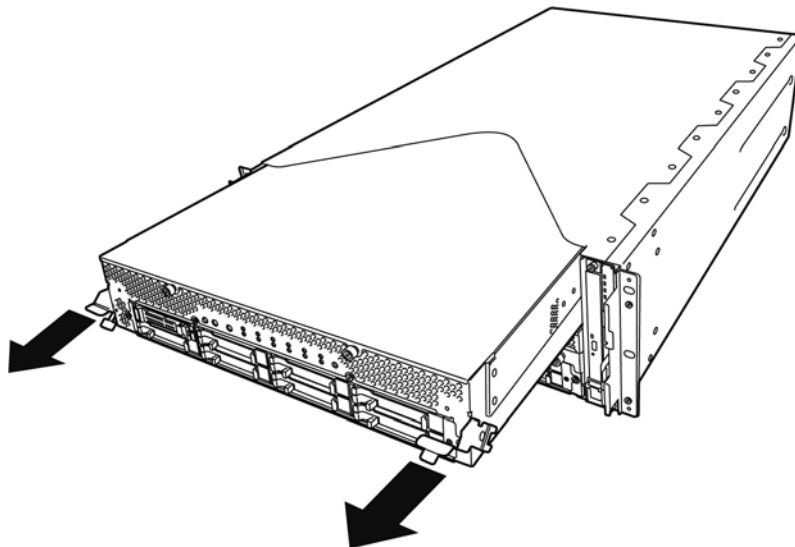
6. The CPU/IO module is locked on the way and cannot be pulled out. Lower the lock on the side of CPU/IO module to unlock it, and then pull it out.

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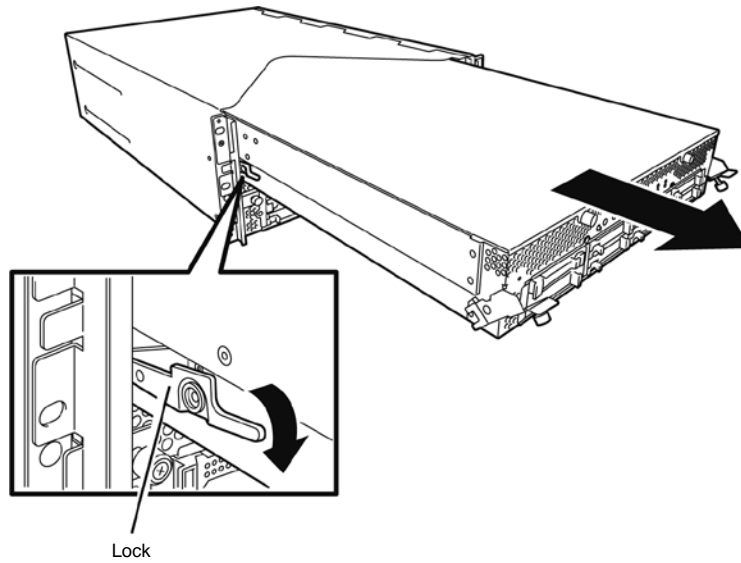
7. Pull out the CPU/IO module gently and carefully, and place it on a flat and sturdy table.
   Avoid the dusty or humid place.

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 Installing CPU/IO Module

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

Important	• **Refer to *Chapter 2 (5.1.2 Anti-static measures)* and *Chapter 2 (5.1.4 Preparing your system for upgrade)* 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.
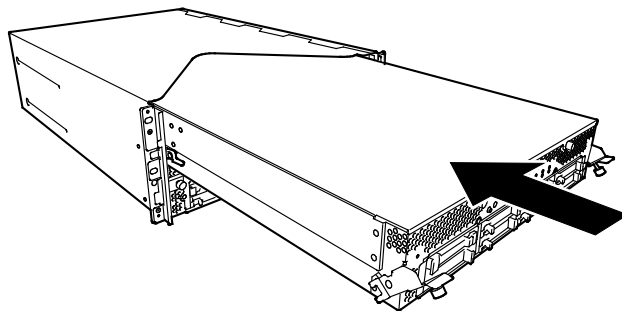
2. Push up the black levers placed on the left and right sides of the front of the CPU/IO module, and fasten them with screws.
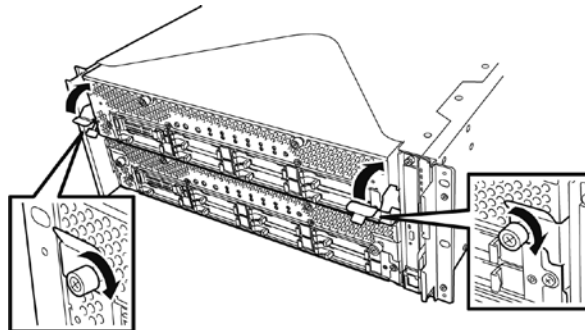
Important	• **Secure the handle with the screws. If it is not secured by the screws, the operation of the CPU/IO module will be unstable.** • **In some system statuses or settings, auto start up or integration does not take place when the module is connected. In such a case, check the status by using 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 DIMM

The DIMM (dual inline memory module) is installed to the DIMM socket in the CPU/IO module on the Express5800/ft series.

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

Tips	• Maximum memory capacity is as follows: – R320c-M4 model, R320c-E4 model: Up to 256GB (16GB x 16) • In the error messages and logs in POST or ftsmaint command of NEC ESMPRO, the DIMM connector may be described as "group". The number next to "group" corresponds to the slot number shown in the figure on the next page.

Important	• **The DIMM is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the DIMM. Do not touch the DIMM terminals or onboard parts with a bare hand or place the DIMM directly on the desk.** • **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** *Chapter 2 (5.1.2 Anti-static measures)* **and** *Chapter 2 (5.1.4 Preparing your system for upgrade)* **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
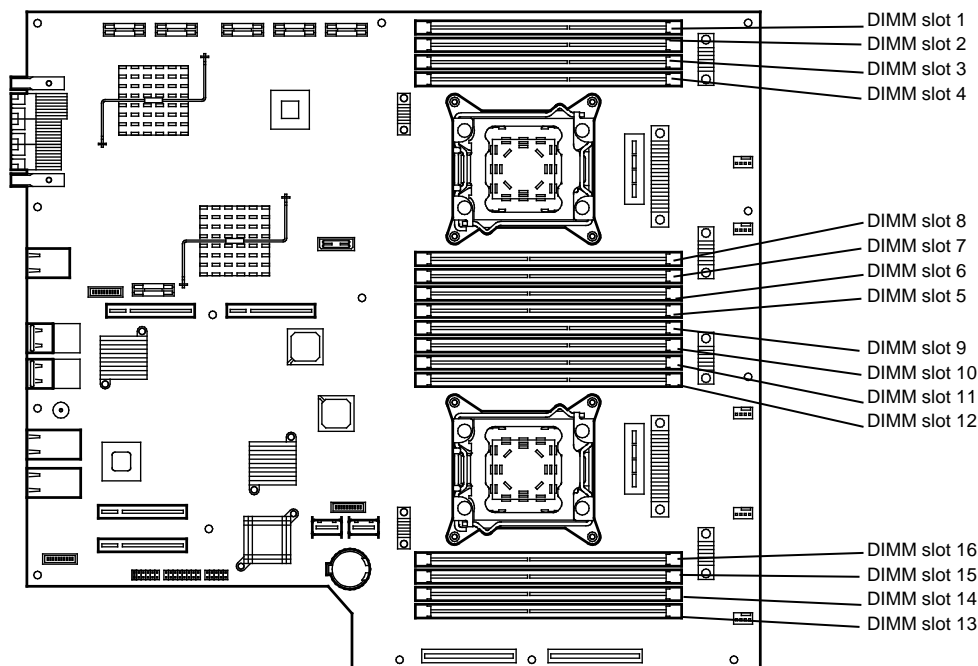
Motherboard of the CPU/IO module

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															
No. of CPUs	Capacity (GB)	1	2	3	4	8	7	6	5	9	10	11	12	16	15	14	13
1	4	4															
	8	4		4													
	12	4		4					4								
	16	4		4			4		4								
	20	4	4	4			4		4								
	24	4	4	4	4		4		4								
	28	4	4	4	4		4	4	4								
	32	4	4	4	4	4	4	4	4								
	32	8		8			8		8								
	48	8	4	8	4	4	8	4	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								
2	4	4															
	8	4								4							
	12	4		4						4							
	16	4		4						4		4					
	24	4		4					4	4		4					4
	32	4		4			4		4	4		4			4		4
	40	4	4	4			4		4	4	4	4			4		4
	48	4	4	4			4	4	4	4	4	4			4	4	4
	56	4	4	4	4		4	4	4	4	4	4	4		4	4	4
	64	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	64	8		8			8		8	8		8			8		8
	96	8	4	8	4	4	8	4	8	8	4	8	4	4	8	4	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
	192*	16	8	16	8	8	16	8	16	16	8	16	8	8	16	8	16
	256*	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16

5.5.1 **Installing DIMM**

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 referring to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.

4. Remove three screws (two on the front and one on the rear), and remove the top cover of the
    CPU/IO module.
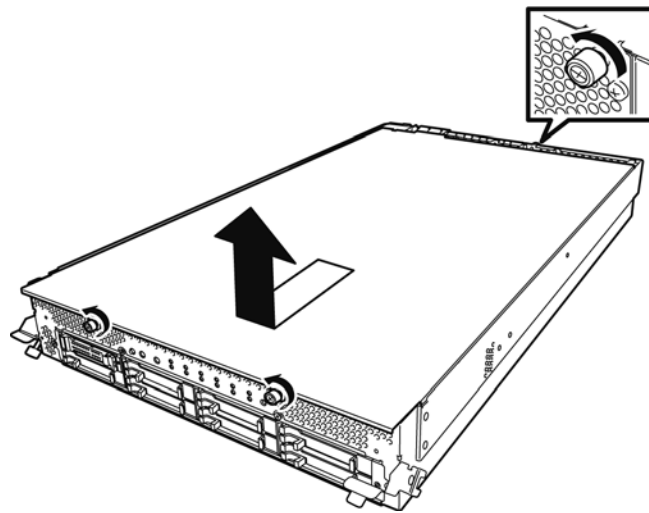
5. Open the cable clamp of air duct.
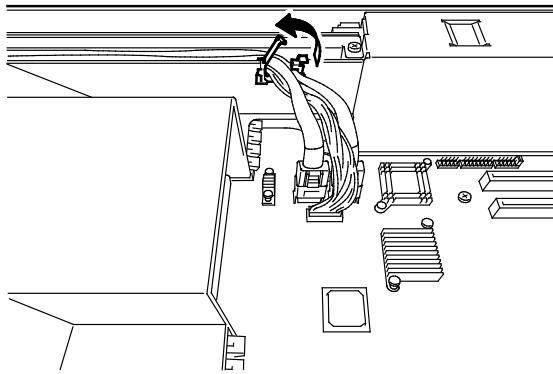
6.   Disconnect cables.
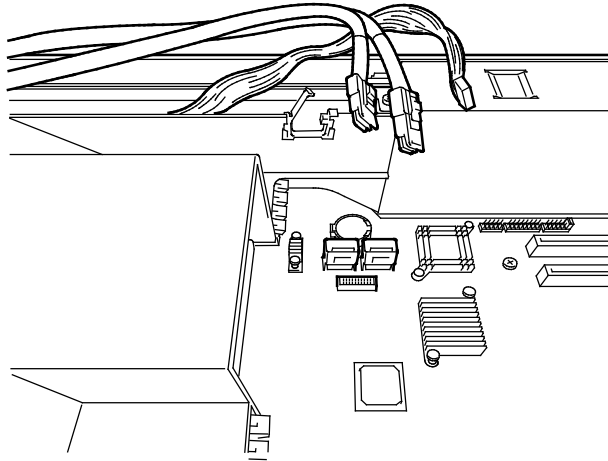
7.   Remove the air duct.

Air duct
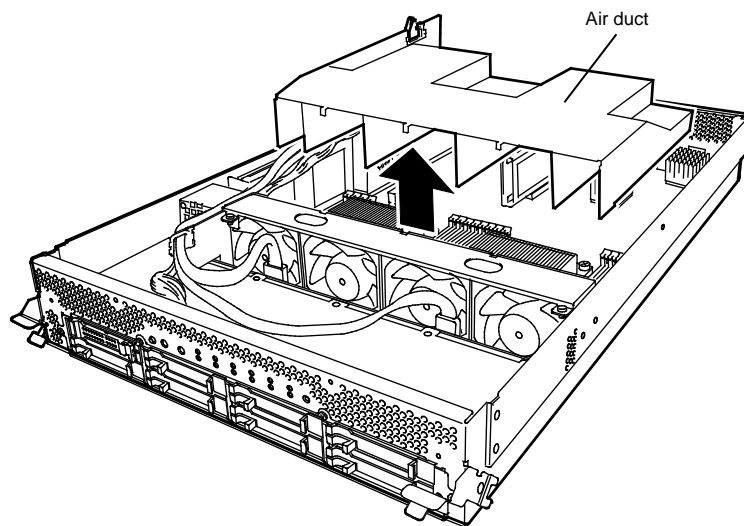
8.   Locate the socket you are mounting the DIMM.

9. Remove the dummy memory module by opening the levers on both sides of the DIMM slot.

DIMM socket   Dummy memory module
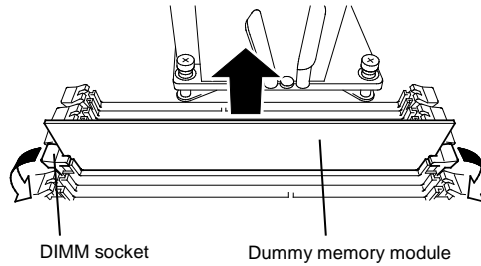
Important	**Keep and store the removed dummy memory module with care.**

10. Insert a DIMM into the DIMM socket vertically.

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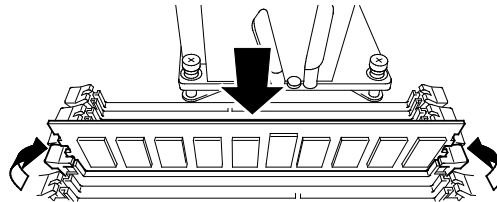
Note	Pay attention to the direction of the DIMM. The terminal of the DIMM has a cutout to prevent incorrect insertion.

11. Attach the air duct, cable, and cable clamp.

SAS1

SAS2
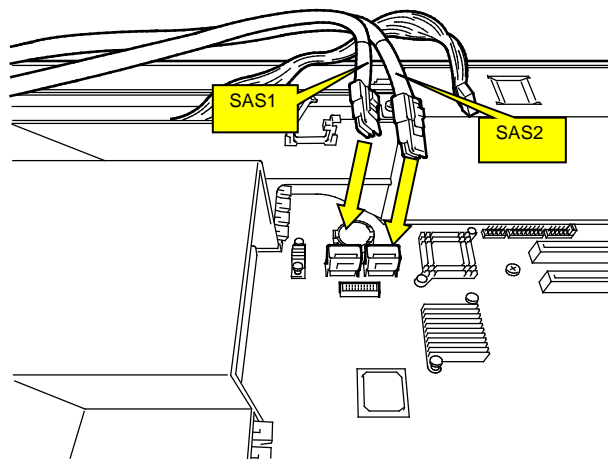
12. Place the top cover of the CPU/IO module and secure it with three screws.
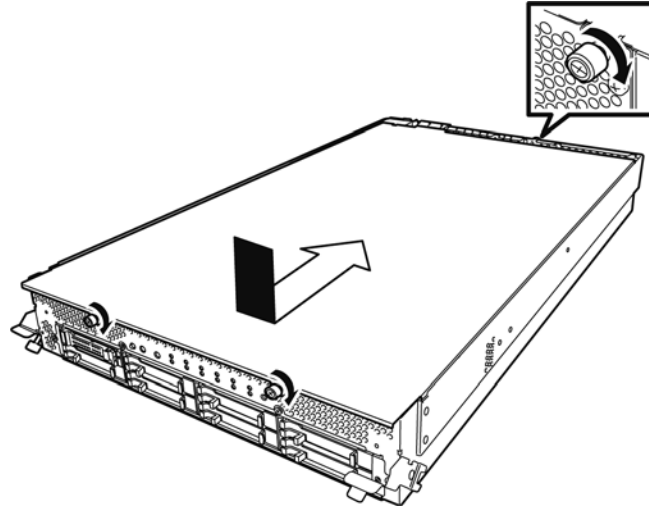
13. Refer to *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.

14. Connect the power cords.

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

16. Verify that POST displays no error message.

     If POST displays an error message, write it down and see the POST error message list in *Chapter 1*

     (6.2 POST Error Message).

5.5.2 Removing DIMM

Follow the 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 *Chapter 2 (5.4.1 Removing CPU/IO Module)*.

4. Remove three screws (two on the front and one on the rear), and remove the top cover of the

    CPU/IO module.
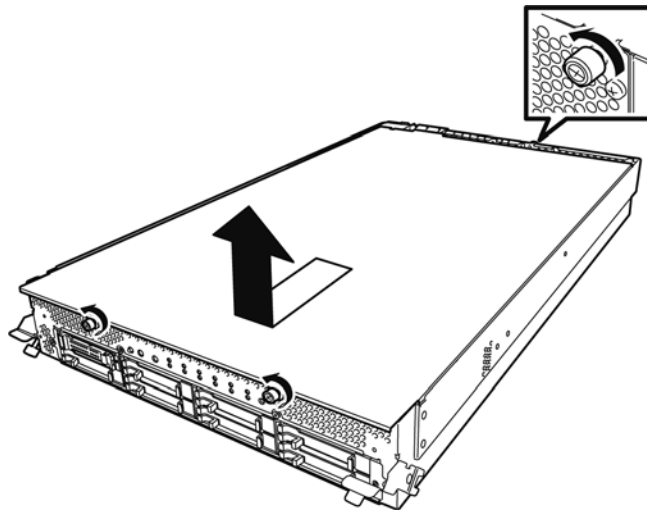
5. Open the cable clamp of air duct.
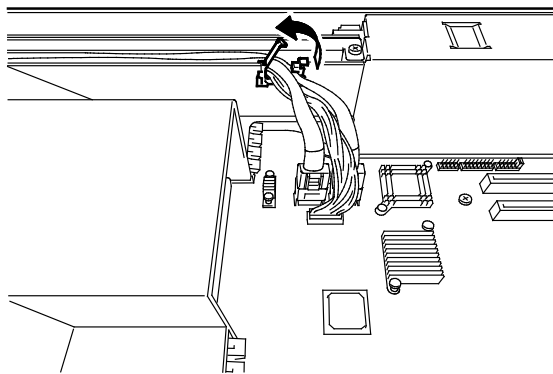
6.   Disconnect cables.
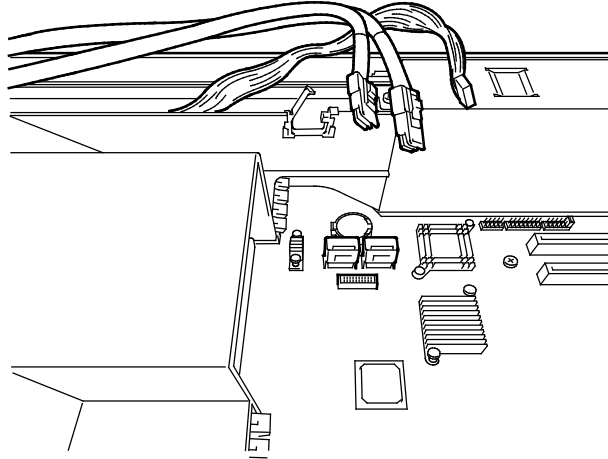
7.   Remove the air duct.
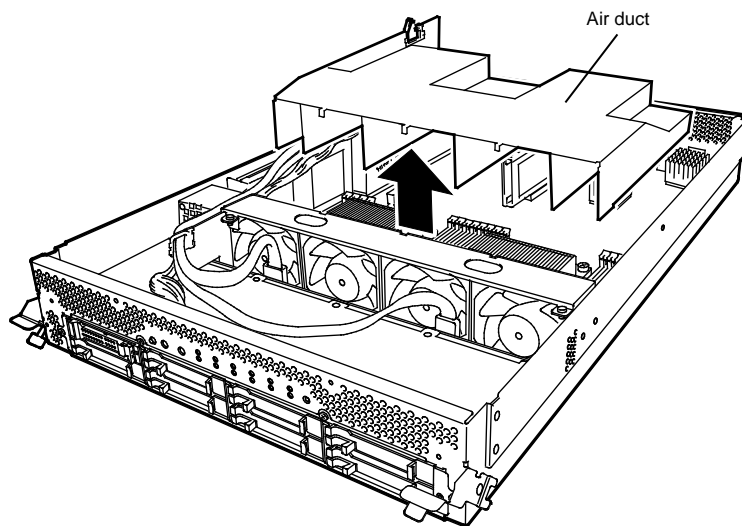
Air duct

8.   Open the levers attached on both sides of the socket of the DIMM to be removed.

It will be unlocked and the DIMM can be removed.
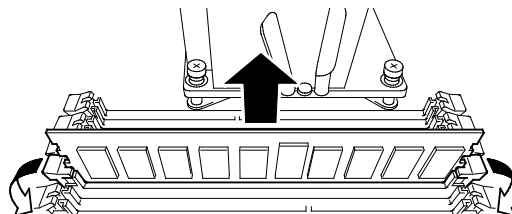
9. Attach the dummy memory module.

10. Attach the air duct, cable, and cable clamp.

11. Place the top cover of the CPU/IO module and secure it with three screws.
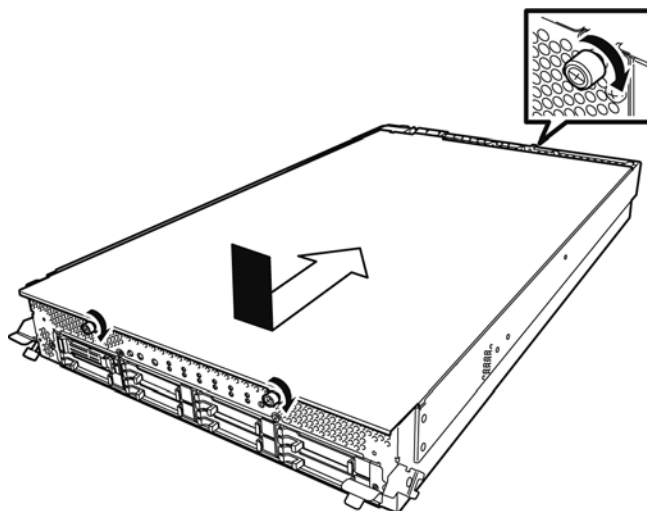
12. Refer to *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.

13. Connect the power cords.

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

15. Verify that POST displays no error message.

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

5.5.3 Replacing DIMM

Follow the procedure below to replace a failed DIMM.

1. Identify the failed DIMM by viewing the memory slot error LED.

2. Remove the CPU/IO module referring to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.

3. Replace the DIMM.

4. Refer to *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.

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

5.6 Processor (CPU)

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

Important	• The CPU is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the CPU. Do not touch the CPU terminals or onboard parts with a bare hand or place the CPU directly on a desk.
	• 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 *Chapter 2 (5.1.2 Anti-static measures)* and *Chapter 2 (5.1.4 Preparing your system for upgrade)* before starting installing or removing options.

CPU1
(Standard CPU)

CPU2
(Additional CPU)
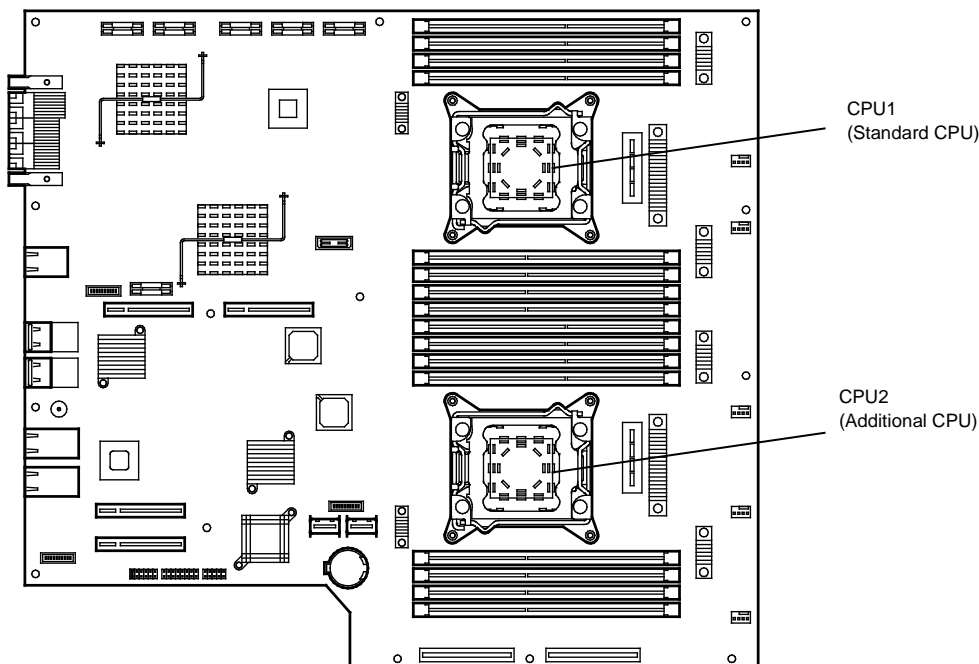
5.6.1 Installing CPU

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 referring to *Chapter 2 (5.4.1 Removing CPU/IO Module).*

4. Remove the air duct refferring to *Chapter 2 (5.5.2 Removing DIMM).*

5. Verify the location of the CPU socket.

6. Remove four screws that secure the dummy heat sink. Remove the dummy heat sink.

Important	Keep and store the removed dummy heat sink and four screws with care.

Dummy heat sink
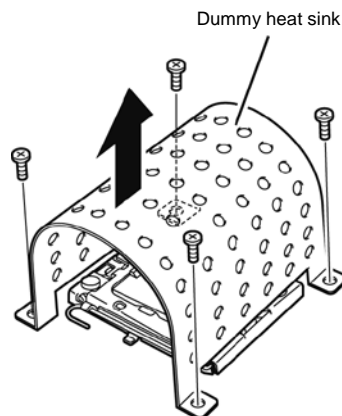
7. Remove the protective cover from the processor (CPU) socket.

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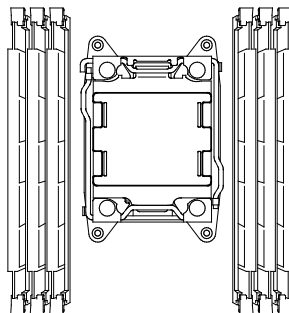
8. Push down the socket lever marked with " ⌐ ① →" once to unlatch it from the hook, then slowly open the lever until it stops.
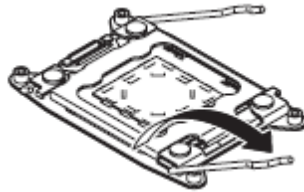
10. Lift the plate.
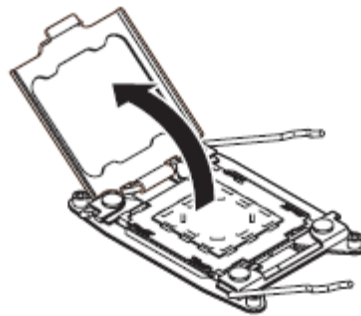
11. Put the processor on the CPU socket slowly and gently.

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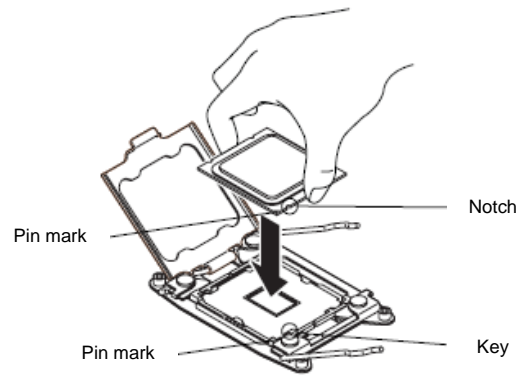
12. Lightly push the processor to the CPU socket, and close the plate.
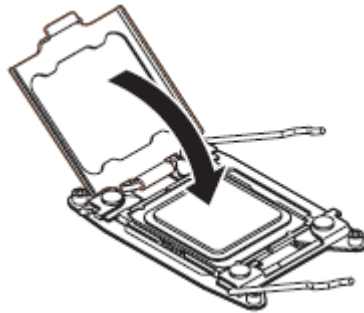
13. Close the socket lever marked with "← 🔒 ① " to fix it.
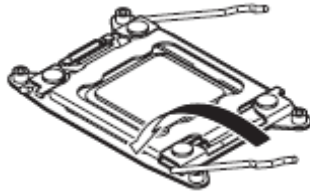
14. Close the socket lever marked with " 🔓 ① →" to fix it.
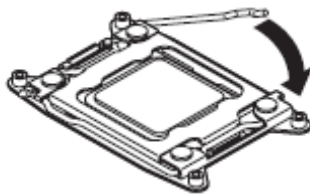
15.   Place the heat sink on the CPU.

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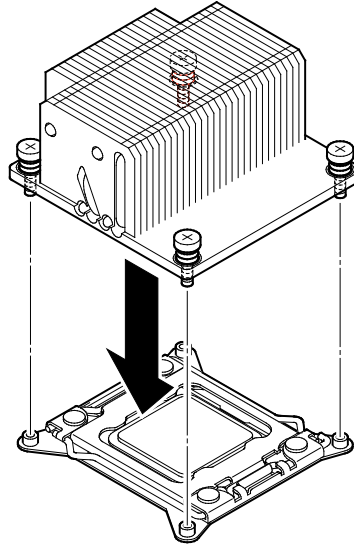
Important	If you install additional CPU, ensure that the fins of the additional CPU's heat sink are in the same direction as those of the standard CPU.

Heat sink of additional CPU

Front of server

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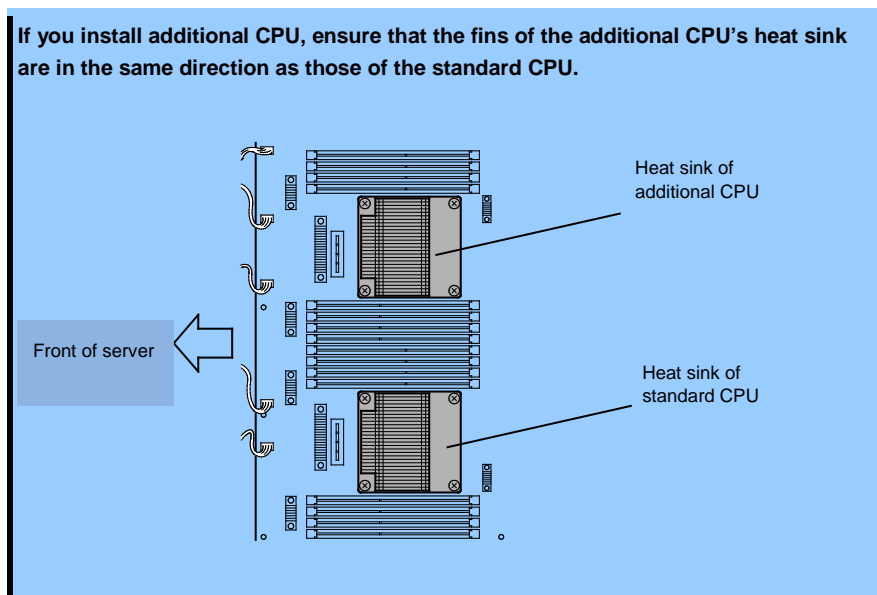
16.   Secure the heat sink with four screws.

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.
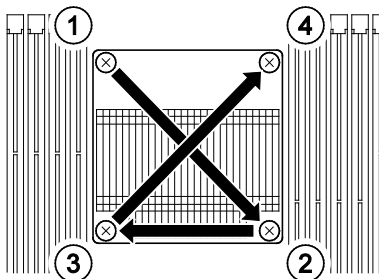
17.   Install the air duct referring to *Chapter 2 (5.5.1 Installing DIMM)*.

18.   Refer to *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.

19.   Connect the power cords.

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

21.   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 Removing CPU

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

5.6.3 **Replacing CPU**

Take the steps below to replace the failed CPU.

1.   Identify the failed CPU by ftsmaint command.

2.   Remove the CPU/IO module referring to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.

3.   Install the new heat sink and CPU.

4.   Refer to *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.

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

5.7 PCI Card

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

Important	The PCI card is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the PCI card. Do not touch the PCI card terminals or onboard parts by a bare hand or place the PCI card directly on the desk. Refer to *Chapter 2 (5.1.2 Anti-static measures)* and *Chapter 2 (5.1.4 Preparing your system for upgrade)* before starting installing or removing options.

5.7.1 Precautions

Note the following to install 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 group.
  When a PCI card is installed to one group, another identical PCI card should be installed to the same slot in another group. This rule is applied to the case of removal.
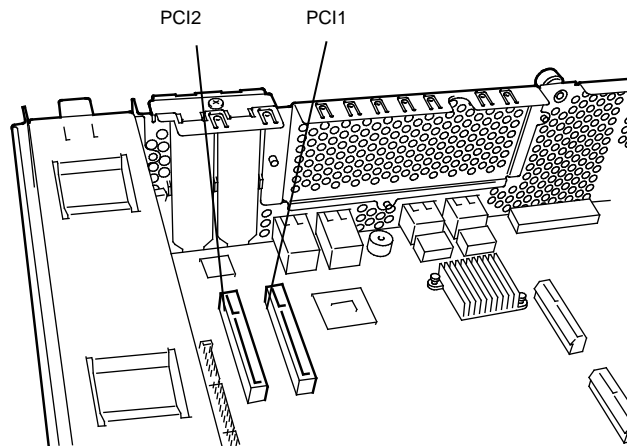
< R320c-E4 model (without riser card) >
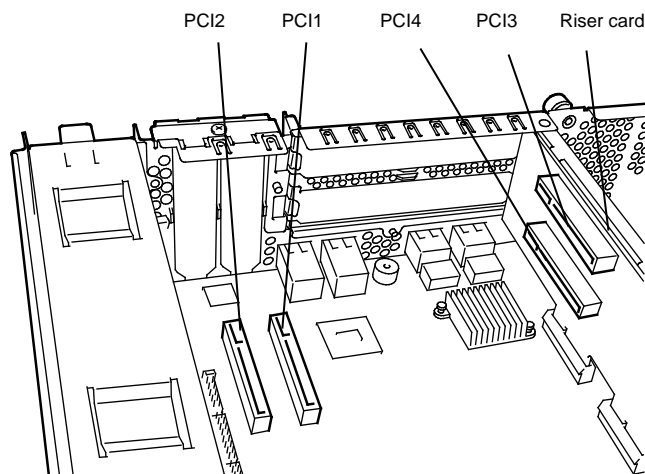
< R320c-M4 model (with riser card) >

List of option PCI cards and installable slots (R320c-E4 model)

N code	Product name	PCI-1	PCI-2	Remarks
		PCI slot performance		
		PCIe 2.0 x4 lane		
		Slot size		
		Low Profile		
		PCI card type		
		x8 socket		
N8804-009	1000BASE-T 2ch board set	○	○	*1
N8804-011	10GBASE-T 1ch board set	○	○	*1 *2
N8803-038	Fibre Channel 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 card can be installed for each CPU/IO module and up to two boards can be installed for each device.

List of option PCI cards and installable slots (R320c-M4 model)

N-code	Product name	PCI-1	PCI-2	PCI-3	PCI-4	Remarks
		PCI slot performance		PCI slot performance		
		PCIe 2.0 x4 lane		PCIe 2.0 x8 lane		
		Slot size		Slot size		
		Low Profile		Full Height		
		PCI card type				
		x8 socket				
N8804-009	1000BASE-T 2ch board set	○	○	○	○	*1
N8804-011	10GBASE-T 1ch board set	–	–	○	○	*1 *2
N8803-038	Fibre Channel board set	–	–	○	○	*1

*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 for each device.

5.7.2 Installing PCI Board

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 referring to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.

4. Remove one screw that secures the stopper and

    remove the stopper.
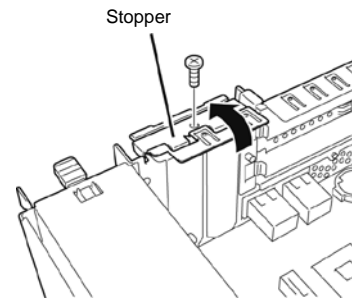
Stopper

5. Verify the location of the CPU socket.

6. Remove the PCI bracket cover.

Important	Keep and store the removed PCI bracket cover with care.
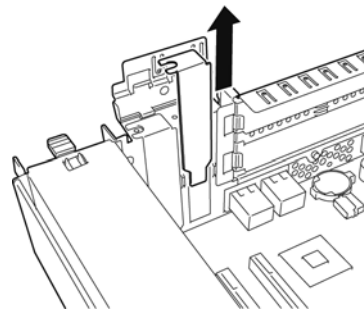
7.   Install a PCI card in a PCI slot.
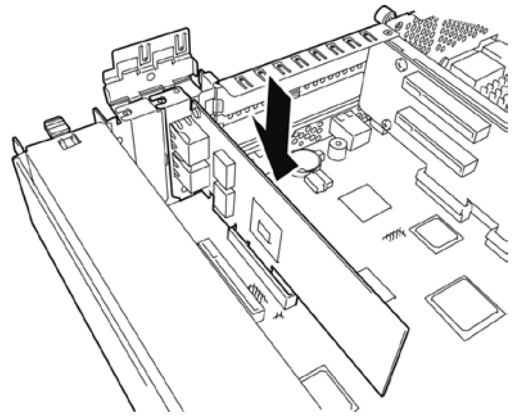
8.   Install the stopper and secure with one screw.
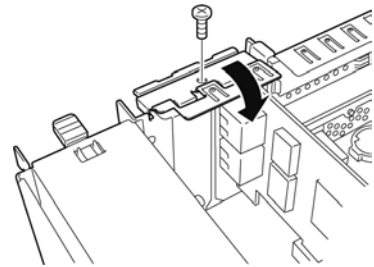
9.   Refer to *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.

10.   Connect the power cords.

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

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

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

(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 referring to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.

4. Remove one screw that secures the stopper and remove the stopper.
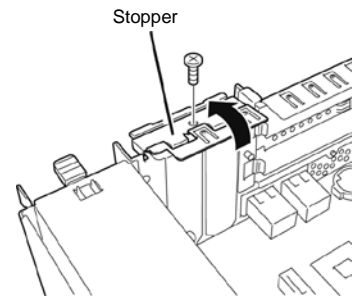
5. Remove three screws that secure the Riser Card, and remove the riser card from the motherboard.
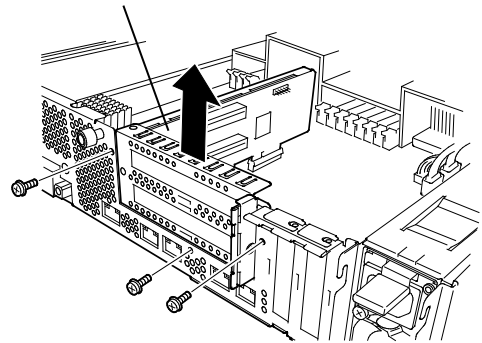
6. Remove one screw that secures the stopper and remove the stopper from the Riser Card.

7. Verify the location of the PCI slot.
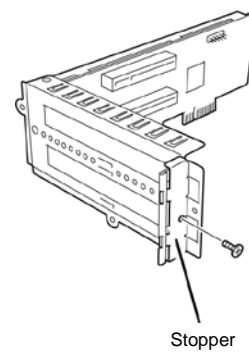
8.   Remove the PCI bracket cover.

Important	**Keep and store the removed PCI bracket cover with care.**
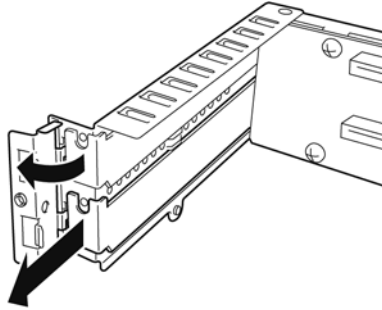
9.   Install a PCI card in a PCI slot.
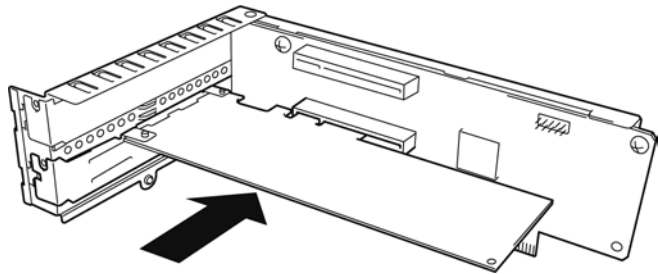
10. Install the stopper and secure with one screw.
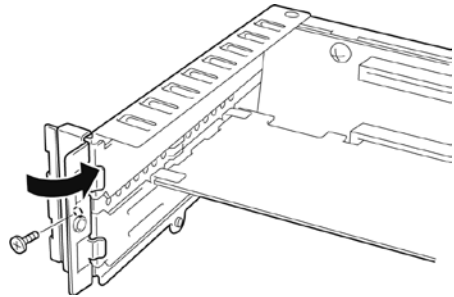
11. Install a Riser Card on the motherboard and secure it with three screws.
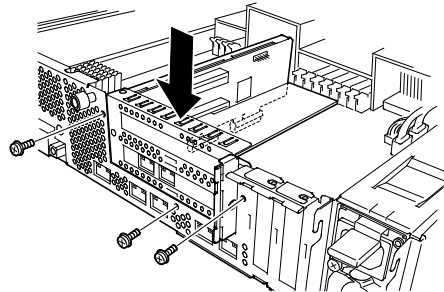
12. Install the stopper and secure it with one screw.
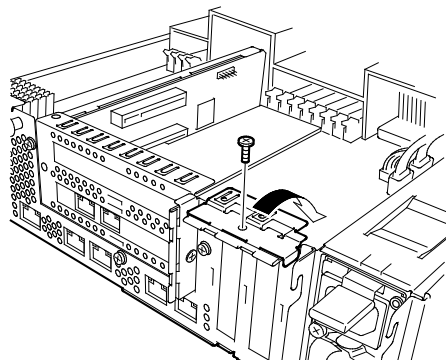
13. Refer to *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.

14. Connect the power cords.

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

16. 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)*.

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

5.7.3 Removing PCI Board

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

5.7.4 **Replacing PCI Board**

Follow the procedure below to replace the failed PCI card.

(1) <Other than N8803-038 Fibre Channel Board Set>

1.   Identify the failed board by ftsmaint command.

2.   Remove the CPU/IO module referring to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.

3.   Remove the PCI bracket, then remove the PCI card.

4.   Replace the board and secure it.

5.   Refer to *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.

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

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

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

(2) N8803-038 Fibre Channel Board set

1.   Identify the failed board by ftsmaint command.

2.   Remove the CPU/IO module referring to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.

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 bracket, then remove the PCI card.

5.   Replace the board and secure it.

6.   Refer to *Chapter 2 (5.4.2 Installing CPU/IO Module)* 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. For the supported connecting devices, contact your sales agent.

(1) N8804-009 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 *Chapter 2 (5.7.1 Precautions).*

- 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 N8804-009 board because they are included in the OS. After installing the boards, refer to *Chapter 2 (3. Duplex LAN Configuration).*

(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 *Chapter 2 (5.7.1 Precautions).*

- 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 *Chapter 2 (3. Duplex LAN Configuration).*

(3) N8803-038 Fibre Channel Board Set

- Slots to install optional PCI cards

  Refer to "*List of option PCI cards and installable slots*" in *Chapter 2 (5.7.1 Precautions).*

- Driver installation procedure
  You do not need to install drivers for N8804-009 board because they are included in the OS.

NEC Express5800 Series
Express5800/R320c-E4, R320c-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. (You can also start SETUP by pressing **F2** while expanding option ROM.)

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) 2012 American Megatrends, Inc.
     Main  Advanced  Security  Server  Boot  Save & Exit

    BIOS Information                                   Set the Date. Use Tab to
    BIOS Version                  6.0:34               switch between Date elements.
    Build Date                    05/30/2012
    Access Level                  Administrator

    Memory Information
    Total Memory                  8192 MB

    System Date                   [Wed 06/13/2012]
    System Time                   [15:07:25]




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


           Version 2.14.1219n Copyright (C) 2012 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.
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.

```
              Aptio Setup Utility - Copyright (C) 2012 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




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




              Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.
```

(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) 2012 American Megatrends, Inc.
          Advanced
   ▶ Processor Information

      Hardware Prefetcher              [Enabled]
      Adjacent Cache Line Prefetch     [Enabled]

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








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

              Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.
```
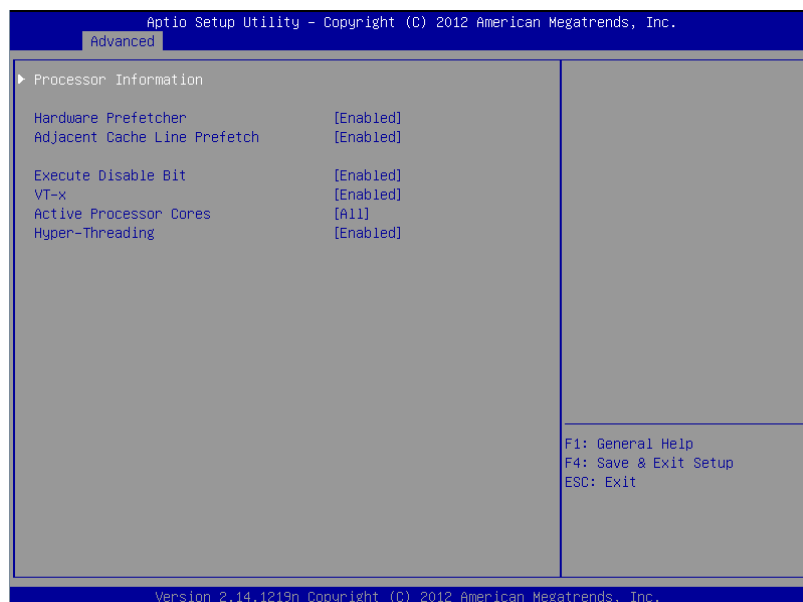
For details about the options, see the table below.

Option	Parameter	Descriptions
Processor Information	−	−
Hardware Prefetcher	Disabled [Enabled]	Enable or disable hardware prefetcher.
Adjacent Cache Line Prefech	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	[All] 1-8	Specify the number of cores to enable in each processor package. The number of cores that can be specified depends on the processor installed.
Hyper-Threading	Disabled [Enabled]	Enable or disable the feature to execute two threads with only one core. This option is displayed only when the installed processor supports this feature.

[   ]: Factory settings

(a) Processor Information submenu
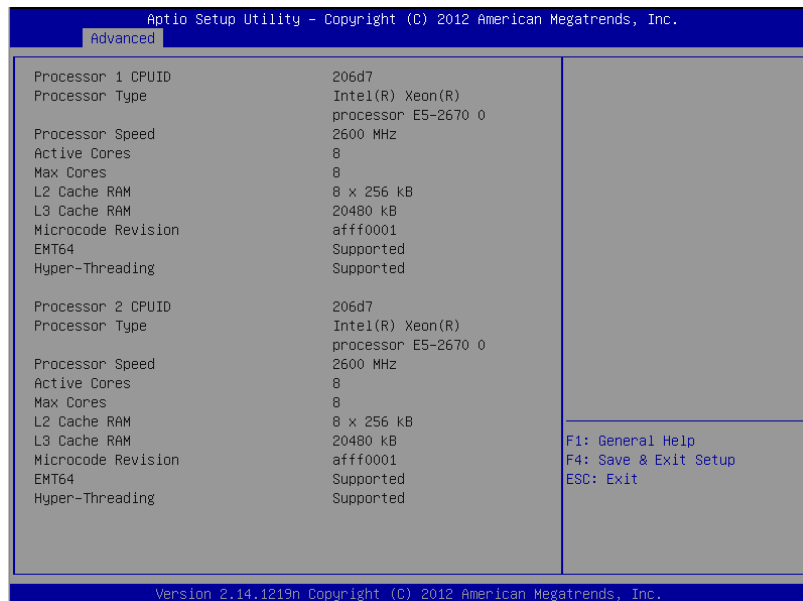
For details about the options, see the table below (display only).

Option	Parameter	Descriptions
Processor 1 CPUID	Number	ID of Processor 1 is displayed by a numerical value.
Processor Type	–	Type of Processor 1 is displayed.
Processor Speed	–	Clock speed of Processor 1 is displayed.
Active Cores	–	The number of active cores in Processor 1 is displayed.
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 Not Supported	Whether the Intel 64 architecture is supported on Processor 1 or not is displayed.
Hyper-Threading	Supported Not Supported	Whether the Hyper-Threading Technology is supported or not on Processor 1 is displayed.
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	Whether the Intel 64 architecture is supported on Processor 2 or not is displayed.
Hyper-Threading	Supported	Whether the Hyper-Threading Technology is supported or not on Processor 2 is displayed.

[   ]: 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) 2012 American Megatrends, Inc.
        Advanced

 ▶ Memory Information




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


            Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.
```
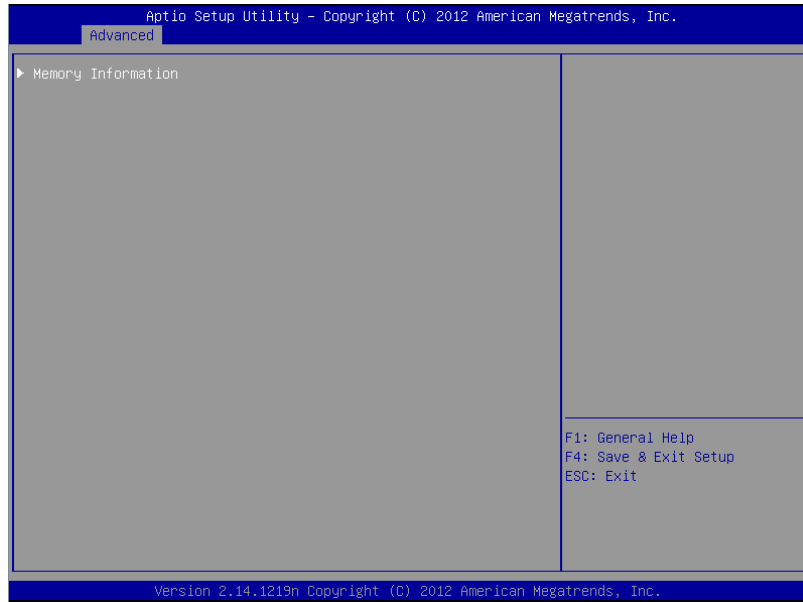
For details about the options, see the table below.

Option	Parameter	Descriptions
Memory Information	–	–

[   ]: Factory settings

(a) Memory Information submenu

```
               Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
             Advanced

    Total Memory                    8192 MB
    Available under 4GB             2048 MB

    CPU1_DIMM1 Status               8192 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_DIMM9 Status               Not Present
    CPU2_DIMM10 Status              Not Present
    CPU2_DIMM11 Status              Not Present
    CPU2_DIMM12 Status              Not Present
    CPU2_DIMM13 Status              Not Present
    CPU2_DIMM14 Status              Not Present
    CPU2_DIMM15 Status              Not Present
    CPU2_DIMM16 Status              Not Present       F1: General Help
                                                      F4: Save & Exit Setup
                                                      ESC: Exit




               Version 2.14.1219n Copyright (C) 2012 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.
Available under 4GB	–	Memory capacity available in an area under 4 GB is displayed.
CPU1_DIMM1-8 Status CPU2_DIMM9-16 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) 2012 American Megatrends, Inc.
          Advanced

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

  PCI Slot 1 Option ROM                  [Disabled]
  PCI Slot 2 Option ROM                  [Disabled]
  PCI Slot 3 Option ROM                  [Disabled]
  PCI Slot 4 Option ROM                  [Disabled]




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



                    Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.
```
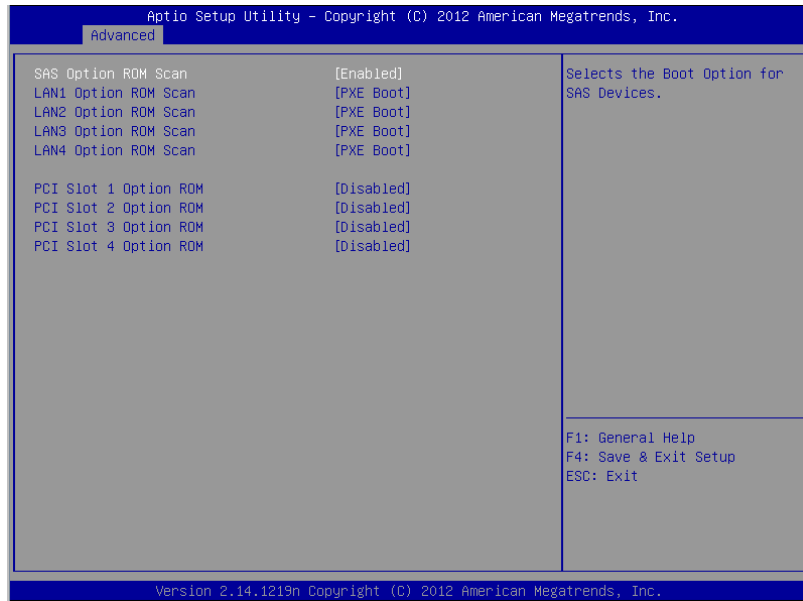
For details about the options, see the table below.

Option	Parameter	Descriptions
SAS Option ROM Scan	Disabled [Enabled]	Enable or disable the option ROM SCAN for onboard SAS.
LANX Option ROM Scan	Disabled [PXE Boot] iSCSI Boot	Enable or disable the option ROM SCAN for onboard LAN. R320c-M4 X:1/2/3/4 R320c-E4 X:1/2
PCI Slot X Option ROM	[Disabled] Enabled	Enable or disable the option ROM on each PCI slot. R320c-M4 X:1/2/3/4 R320c-E4 X:1/2

[   ]: Factory settings

Note   If you use Fibre Channel controller and not boot with it, you must disable Option ROM for its 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) 2012 American Megatrends, Inc.
          Advanced

  HPET                                [Enabled]          Disables/Enables High
                                                         Precision Event Timer.
  Wake On LAN/PME                     [Enabled]




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


                Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.
```
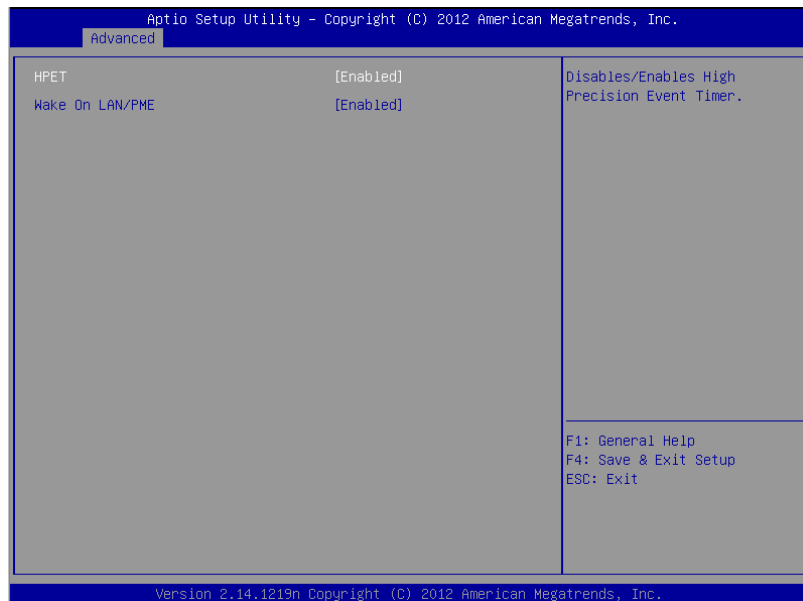
For details about the options, see the table below.

Option	Parameter	Descriptions
HPET	Disabled [Enabled]	Enable or disable the High-Precision Event Timer. This option may not be supported depending on OS.
Wake On LAN/PME	Disabled [Enabled]	Enable or disable the feature that remotely powers on the server through a network.

[   ]: Factory settings

Important   **The menu for VT-d and I/OAT may be displayed depending on your server model. However, do not change settings.**
VT-d must be Disabled, and I/OAT must be Enabled.

(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) 2012 American Megatrends, Inc.
       Advanced

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




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



            Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.
```
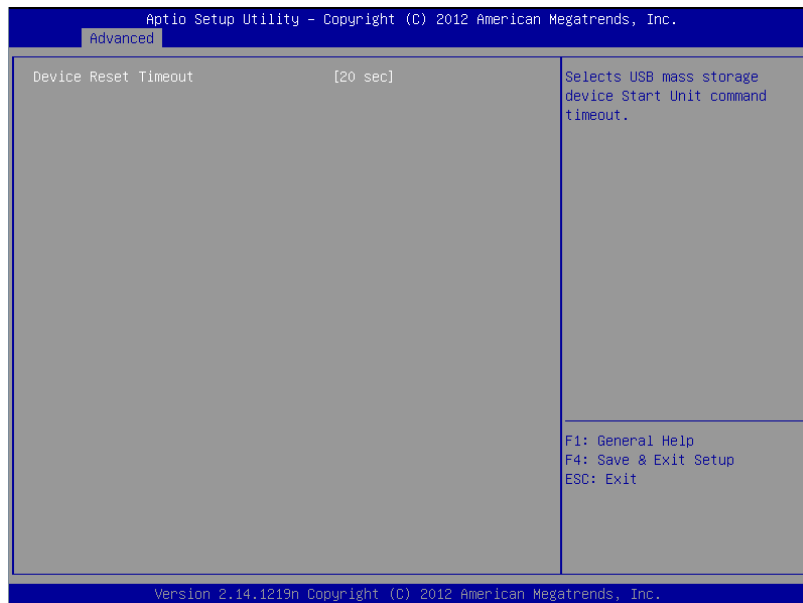
For details about the options, see the table below.

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.

[   ]: 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) 2012 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
    Serial A Connection              [Serial Connector]   [Enabled]
                                                           User configuration
    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            [Disabled]




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



              Version 2.14.1219n Copyright (C) 2012 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) 2012 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 A Connection              [Serial Connector]

    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]

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



              Version 2.14.1219n Copyright (C) 2012 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 4] IRQ 3	Specify the interrupt for serial port A.
Serial A Connection	[Serial Connector] Internal Modem	Specify the connection destination for serial port A, Serial connector or Internal modem.
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 4 [IRQ 3]	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.
Console Connection	[Direct] Via modem	Specify the connector to be used for console.

[   ]: 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) 2012 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                    [Disabled]







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



          Version 2.14.1219n Copyright (C) 2012 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	• User Password cannot be set without setting Administrator Password
	• Do not set any password before installing OS.
	• If you have forgotten any password, contact the store where you purchased the product or your maintenance service company. If you clear the password set in the BIOS Setup utility (SETUP), refer to *Chapter 1 (10 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	[Disabled] 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) 2012 American Megatrends, Inc.
      Main  Advanced  Security  Server  Boot  Save & Exit

   ▶ System Management
   ▶ 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]
     AC-LINK                             [Last State]
     Power On Delay Time                 50


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



              Version 2.14.1219n Copyright (C) 2012 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	–	–
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 NEC ESMPRO Agent 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.
POST Pause Monitoring Timeout	60-[180]-1200	Specify the timeout period for monitoring POST while the boot-up is suppressed (Unit: second).
Thermal Sensor	Disabled	Enable or disable the feature to monitor the thermal sensor.

Option	Parameter	Descriptions
	[Enabled]	
POST Error Pause	[Disabled] Enabled	Enable or disable the feature to suppress OS booting when POST detects an error.
AC-LINK	Stay Off [Last State] Power On	Specify AC link feature. Specify how the DC power state should be when the AC power is supplied again after loss of power. (See the table below) If **Power On** or **Last State** is selected, the system starts after the time specified for **Power On Delay Time** has elapsed and CPU/IO modules of both systems are installed (180 seconds at longest).
Power On Delay Time	[50]-600	Specify the DC power-on delay time when **Power On** or **Last State** is selected for AC-LINK (Unit: second).

The table below shows the operation of DC power when the AC power is turned off once and then back on, in accordance with the **AC LINK** setting.

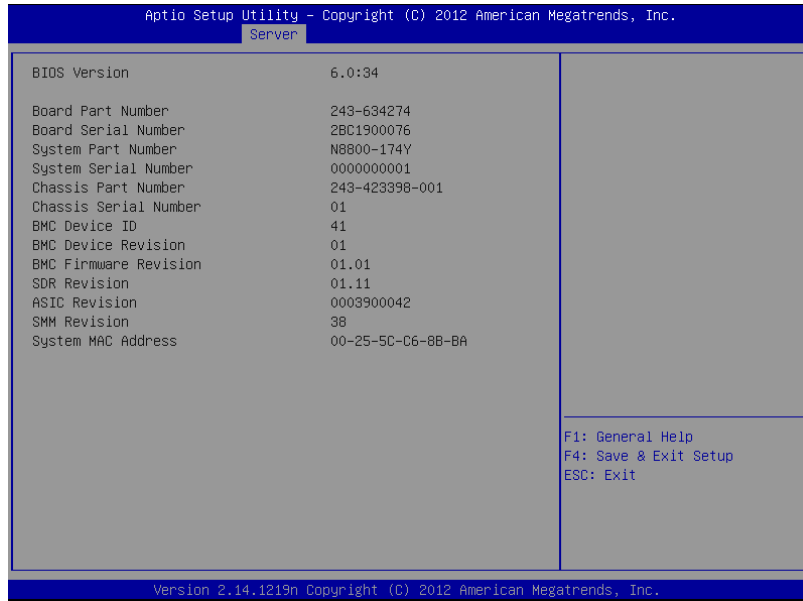| System status before AC power was turned off	AC LINK setting		
	Stay Off	Last State	Power On
Operating (DC power is ON)	Off	On	On
Abort (DC power is also OFF)	Off	Off	On
Forced shutdown*	Off	Off	On

* Continue pressing the POWER switch for at least 4 seconds to forcibly turn off the power.

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

(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) 2012 American Megatrends, Inc.
                          Server

    BIOS Version                      6.0:34

    Board Part Number                 243-634274
    Board Serial Number               2BC1900076
    System Part Number                N8800-174Y
    System Serial Number              0000000001
    Chassis Part Number               243-423398-001
    Chassis Serial Number             01
    BMC Device ID                     41
    BMC Device Revision               01
    BMC Firmware Revision             01.01
    SDR Revision                      01.11
    ASIC Revision                     0003900042
    SMM Revision                      38
    System MAC Address                00-25-5C-C6-8B-BA




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




            Version 2.14.1219n Copyright (C) 2012 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.
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) 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) 2012 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 2.14.1219n Copyright (C) 2012 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) 2012 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              5

        Boot Option Priorities
        Boot Option #1                    [MATSHITADVD-RAM UJ87...]
        Boot Option #2                    [Floppy Drive]
        Boot Option #3                    [#4500 ID09 LUN0 SEAG...]
        Boot Option #4                    [IBA GE Slot 4100 v1381]

        CD/DVD ROM Drive BBS Priorities
        Floppy Drive BBS Priorities
        Hard Drive BBS Priorities
        Network Device BBS Priorities


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



              Version 2.14.1219n Copyright (C) 2012 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	Number	Specify the time until the **F2** is pressed to launch SETUP.
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 ROM Drive BBS Priorities	–	Specify the boot priority for each BBS (BIOS Boot Specification).
Floppy Drive BBS Priorities	–	
Hard Drive BBS Priorities	–	
Network Drive BBS Priorities	–	

[   ]: Factory settings

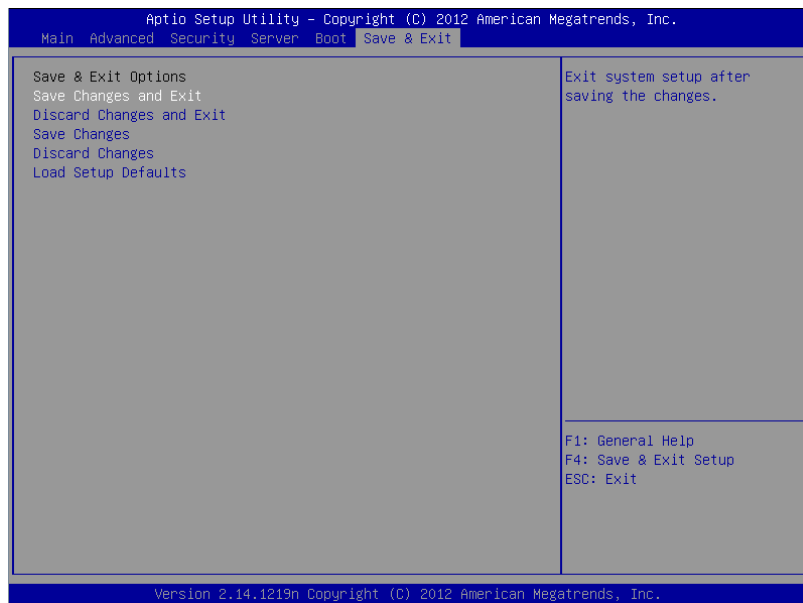1. When BIOS detects a bootable device, information on the device is displayed in the designated area.

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 +/−.

Tips	• If a bootable device is newly connected, the priority lowest in its BBS Priorities is assigned to that device. • If a bootable device is disconnected from the server, the relevant device is removed from BBS Priorities. • When **Load Setup Defaults** is executed on **Save & Exit** menu, the **Boot Option** and **BBS Priorities** are changed as follows. ➢ Boot Option Priorities ◇ Boot Option #1: CD/DVD ROM Drive ◇ Boot Option #2: Floppy Drive ◇ Boot Option #3: Hard Drive ◇ Boot Option #4: Network Device

1.2.6 Save & Exit

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

```
              Aptio Setup Utility - Copyright (C) 2012 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
     Discard Changes
     Load Setup Defaults




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



              Version 2.14.1219n Copyright (C) 2012 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

Changes are saved in NVRAM.

(d) Discard Changes

The changes are discarded and the settings are reset to the one at startup of SETUP utility.

(e) Load Setup Defaults

This option resets all values in the SETUP utility to the default settings.

Note	The factory-set value may differ from the default value depending on your server model. Reconfigure each item according to your environment by referring to the list of settings in this section.

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:

- Off-line 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.

2.1.2 Starting BMC Configuration

When the server starts, press **F4** to display Offline Tools menu, and select **BMC Configuration** on the menu. The BMC Configuration starts.

2.2   Features of BMC Configuration

2.2.1 Main Menu

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

```
BMC Configuration MENU                              Ver. 1.000.100


        BMC Configuration
        BMC Initialization
        BMC Reset        : CPU/IO module O
        BMC Reset        : CPU/IO module 1
        Help
        Return to the previous menu
          Previous menu:[ESC]


```
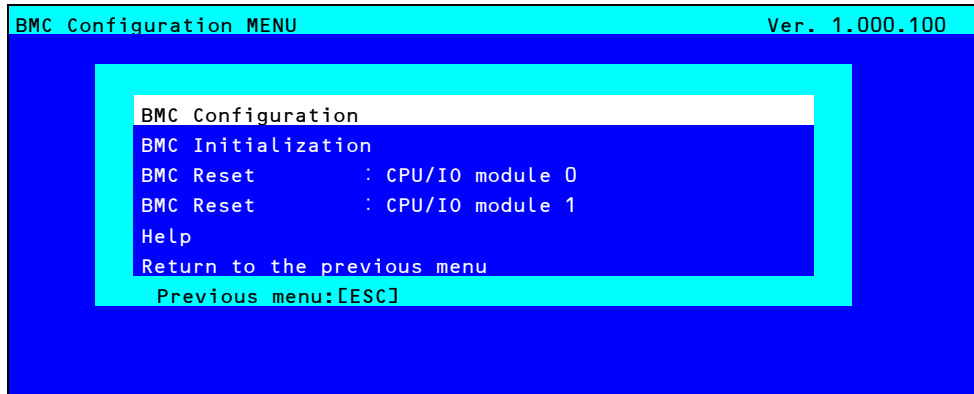
Main Menu

(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.
Refer to *Chapter 3 (2.2.2 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.
Refer to *Chapter 3 (2.2.3 Initializing BMC)* 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.
Refer to *Chapter 3 (2.2.4 Resetting BMC)* 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 Tool menu.

2.2.2 **Setting BMC Configuration**

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

```
BMC Configuration
   Network  : CPU/IO module O
   Network  : CPU/IO module 1
   User Management
   Mail Alert
   SNMP Alert
   System Operation
   Miscellaneous
   Help
   Return to the previous menu
    Previous menu:[ESC]
```
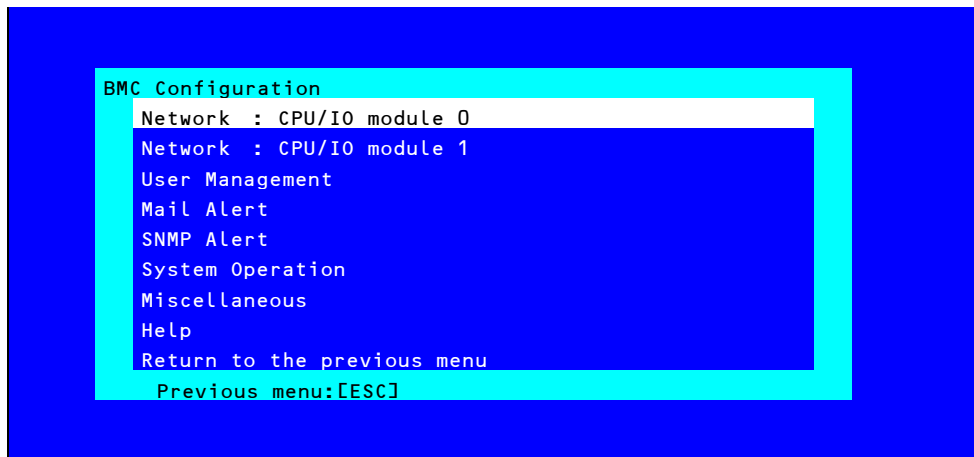
BMC Configuration menu

(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.
Refer to *Chapter 3 (2.2.2 (a) Network)* for details.

(b) User Management

You can manage users who use BMC.
Refer to *Chapter 3 ((b) User Management)* for details.

(c) Mail Alert

You can view E-mail alert issued from BMC and change parameter setting.
Refer to *Chapter 3 ((c) Mail Alert)* for details.

(d) SNMP Alert

You can view SNMP alert issued from BMC and change parameter setting.
Refer to *Chapter 3 ((d) SNMP Alert)* for details.

(e) System Operation

You can set parameters for remote KVM console and remote media.
Refer to *Chapter 3 ((e) System Operation)* for details.

(f) Miscellaneous

You can set various features of BMC.
Refer to *Chapter 3 ((f) Miscellaneous)* for details.

(a) Network

The Network menu appears when you select **Network** on BMC Configuration menu.

```
Network
    Property
    Access Limitation
    Service
    Help
    Return to the previous menu
      Previous menu:[ESC]
```
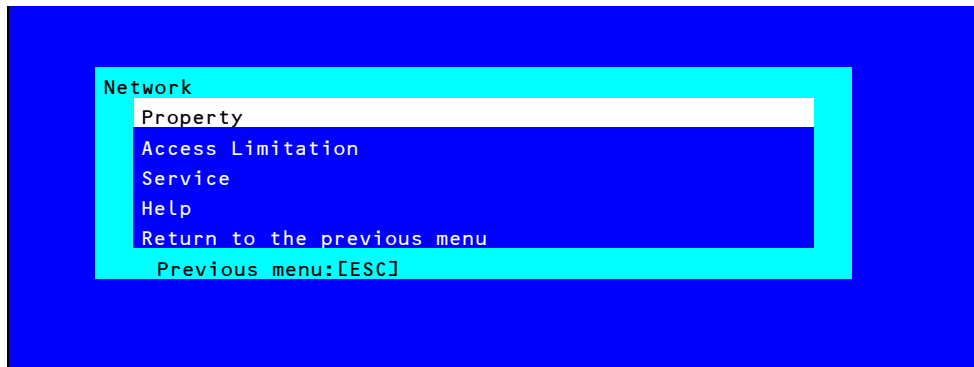
Network menu

The table below shows details of parameters and their default value.

Item	Description	Default Value
Property		
Management LAN	Specify and display LAN port to communicate with BMC. [*1] [*2] Management LAN : LAN port for BMC exclusive use. Shared BMC LAN : LAN port of System (OS) is shared and used.	Management LAN

Connection Type	Specify and display the connection type of BMC LAN.[*1]
	 Auto Negotiation
	   : Connecting by suitable setting.
	 100Mbps Full
	   : Connecting by Full Duplex at speed of 100 Mbps.
	 100Mbps Half
	   : Connecting by Half Duplex at speed of 100 Mbps.
	 10Mbps Full
	   : Connecting by Full Duplex at speed of 10 Mbps.
	 10Mbps Half
	   : 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.	Disable
IP Address	Specify the BMC LAN IP address. [*4]	192.168.1.1
Subnet Mask	Specify the Subnet Mask of BMC LAN. [*3] [*4]	255.255.255.0
Default Gateway	Specify the Default Gateway IP address of the BMC LAN. [*4] If you set this item, it is necessary for applying configuration information that the gateway is connected on network.	0.0.0.0
Dynamic DNS	Determine whether to enable/disable of Dynamic DNS. [*5]	Disable
DNS Server	Specify the DNS Server.	0.0.0.0
Host Name	Specify the Host Name. [*6]	Blank
Domain Name	Specify the Domain Name. [*7]	Blank

Item	Description	Default Value
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 deny to access BMC.
		Allow All

IP Address	Specify the IP Address to allow or deny to access with BMC. [*8] [*9]	Blank
Service		
HTTP	Enable or disable HTTP service. [*10]	Enable
HTTP Port Number	Specify the HTTP port number. [*11]	80
HTTPS	Enable or disable HTTPS service. [*10]	Enable
HTTPS Port Number	Specify the HTTPS port number. [*11]	443
SSH	Enable or disable SSH service.	Enable
SSH Port Number	Specify the SSH port number. [*11]	22

*1: You can change this parameter only if your allows it.

*2: After you change parameter value, resetting of BMC may be required depending on the server. When set to "Shared BMC LAN", the management LAN port is disabled. When set to "Shared BMC LAN", the system (OS) LAN port also transmits or receives data. Thus, the network performance may be reduced due to load of system LAN (or BMC LAN).

*3: If an illegal value is specified for subnet mask, an error message is displayed and setting is disabled.

*4: Can be changed only when DHCP is set to "Disable".

*5: Can be changed only when DHCP is set to "Enable".

*6: Host Name should be within 63 characters.
Acceptable characters are: alphanumeric, hyphen (-), underscore (_), and period (.).

*7: Host Name and Domain Name should be within total of 255 characters.
Acceptable characters are: alphanumeric, hyphen (-), underscore (_), and period (.).

8: 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)

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

*10: If HTTP is set to "Enable", HTTPS is changed to "Enable" automatically. You are not allowed to set "Enable" to HTTP only.

*11: Port number can be specified only when the relevant port is set to "Enable". The port number must be unique.

(b) 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]
```
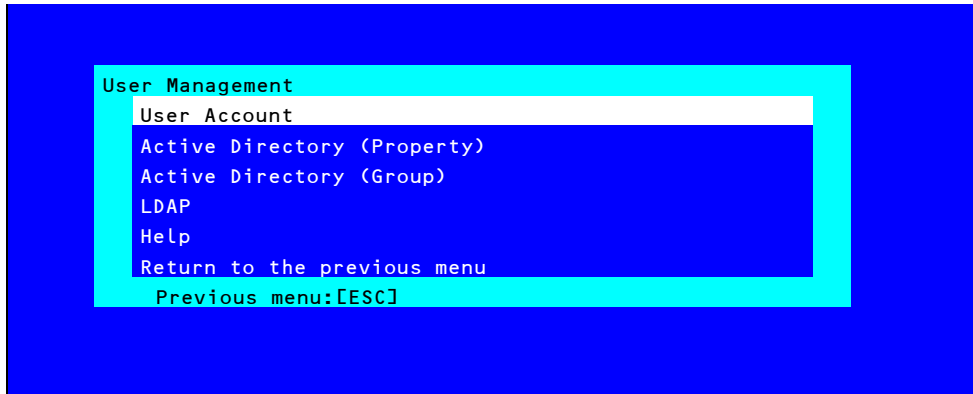
User Management menu

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 1. [*5] [*7]	Enable
Server Address1	Specify IP address of Domain Controller 1. [*5] [*8]	Blank
Domain Controller Server2	Enable or disable Domain Controller 2. [*5] [*7]	Disable
Server Address2	Specify IP address of Domain Controller 2. [*5] [*8]	Blank
Domain Controller Server1	Enable or disable Domain Controller 3. [*5] [*7]	Disable
Server Address3	Specify IP address of Domain Controller 3. [*5] [*8]	Blank
Active Directory (Group)		
Group Name	Specify group name. [*8]	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.	Disable
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 start 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.

(c) 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]
```
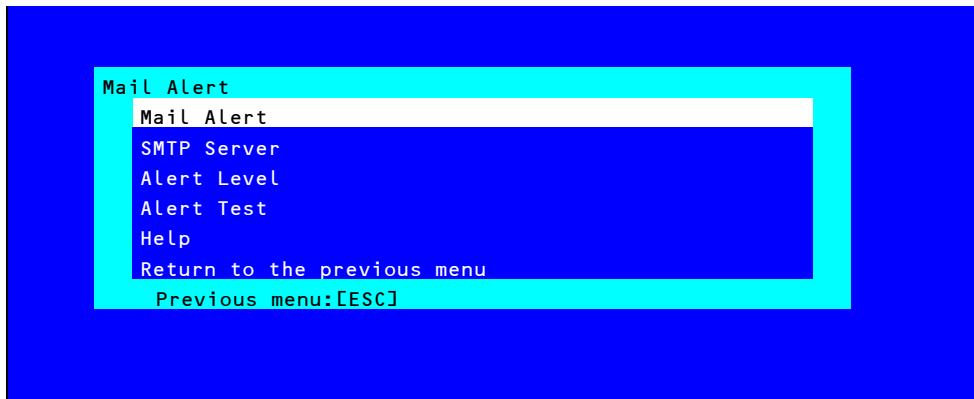
Mail Alert menu

The table below shows details of parameters and their default value.

Item	Description	Default Value
Mail Alert		
Mail 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.	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 mail. [10]	—

*1:   When Mail Alert is enabled, at least one addresses should be enabled.

*2:   Can be specified only when To:X is set to "Enable".

*3:   Up to 255 characters including alphanumeric, hyphen, underscore, period, and @ (at mark) can be used.

*4:   Up to 63 alphanumeric characters excluding +, ", ?, =, <, >, #, and \ can be used.

*5:   Up to 255 alphanumeric characters, hyphen, 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 19 alphanumeric characters excluding " " blank, ",?, =, <, >, #, and \, can be used.

*10: 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.

(d) SNMP Alert

The SNMP Alert menu appears when you select **SNMP Alert** on BMC Configuration menu.

```
SNMP Alert
  SNMP Alert
  Alert Level
  Alert Test
  Help
  Return to the previous menu
   Previous menu:[ESC]
```

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.

(e) System Operation

The System Operation menu appears when you select **System Operation** on BMC Configuration menu.

```
System Operation
   Remote KVM Console
   Remote Media
   Help
   Return to the previous menu
    Previous menu:[ESC]
```
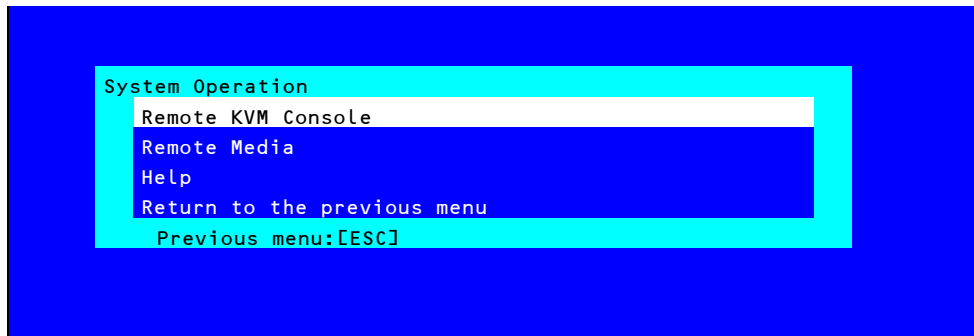
System Operation menu

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.

(f) 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.	Stop logging SEL
Platform Event Filter	Enable or disable Platform Event Filter. [*2]	Enable
Management Software	Setting for remote management	—
ESMPRO Management	Enable or disable NEC ESMPRO Management. [*3]	Current set value
Authentication Key	Specify the Authentication Key. [*4] [*5]	Guest
Redirection	Enable or disable Redirection feature. [*4] [*6]	Enable

*1: When this item is changed to/from "Overwrite oldest SEL", all log records in the SEL Repository are cleared.

*2: Disabling Platform Event Filter also disables SNMP alert.

*3: 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.

*4: Can be specified only when ESMPRO Management is set to "Enable".

*5: 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.

*6: 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 ESMPRO, set to "Disable" for ESMPRO Management in Management Software. In this case, setting for relevant items are hidden and unnecessary.
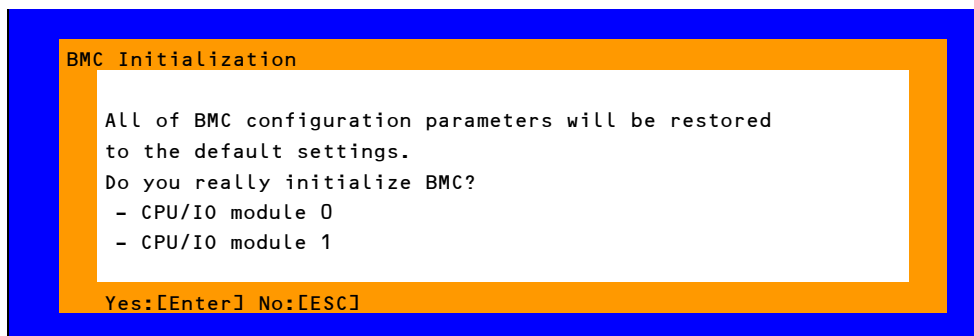
Note   If you set 100 or greater to **Power On Delay Time** on the **Server** menu of the BIOS SETUP utility, and make the Miscellaneous setting, an error may occur.
In this case, set 99 or less to **Power On Delay Time** temporarily, and then make the Miscellaneous setting. After that, set **Power On Delay Time** again as needed.

2.2.3 Initializing BMC

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.

```
BMC Initialization

   All of BMC configuration parameters will be restored
   to the default settings.
   Do you really initialize BMC?
    - CPU/IO module O
    - CPU/IO module 1


   Yes:[Enter] No:[ESC]
```
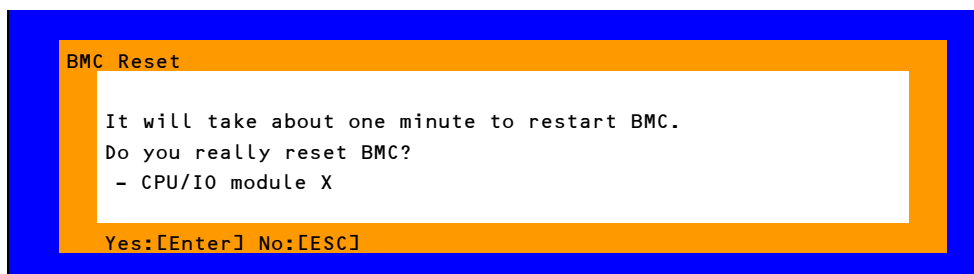
Confirmation message (Initialization)

ESC: Aborts processing and returns to Main menu.

Enter: Initializes BMC configuration settings and restores the default value except for some items.
                After initialization, it takes about one minute to restart BMC.

2.2.4 Resetting BMC

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.

```
BMC Reset

   It will take about one minute to restart BMC.
   Do you really reset BMC?
    - CPU/IO module X


   Yes:[Enter] No:[ESC]
```

Confirmation message (BMC Reset)

ESC: Aborts processing and returns to Main menu.

Enter: 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 power off the server, plug out and plug in the AC power cord of the primary side. Then start the server.** • **The SAS Configuration Utility is used for physical formatting. Do not change the settings on each utility menu, as doing so causes failure and malfunction of this server.**

𝟛.𝟙 Starting the SAS Configuration utility

Take the following procedures to start the SAS/ Configuration utility.

1. Power on the server.

    The following message appears on the screen during POST execution.

    ```
    LSI Corporation MPT SAS2 BIOS

    MPT2BIOS-x.xx.xx.xx (xxxx.xx.xx)

    Copyright 2000-20xx LSI Corporation.


    Press Ctrl-C to start LSI Corp Configuration Utility...
    ```

2. Press and hold down the **Ctrl** key and press the **C** key.

    The SAS Configuration utility starts up with the "Adapter List" menu displayed.

3.2 Quitting the SAS Configuration utility

Take procedures below to quit the SAS/ Configuration utility.

1. Keep pressing **ESC** until the "Adapter List" menu appears.

   A message appears to prompt whether you want to quit the utility.

   Select an item you want to perform and press **Enter**.

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

   Tips The changes made on SAS Configuration Utility will be effective after the reboot of the server.

𝟑.𝟑 **Physical Formatting of the Hard Disk Drive**

Important **This utility is set for the CPU/IO module of the primary side. When you configure the CPU/IO module of the secondary side, first power off the server, plug out and plug in the AC power cord of the primary side. Then start the server.**

The following describes how to execute physical formatting of hard disk drive.

1. Press **Enter** on the "Adapter List" menu.

    "Adapter Properties" menu appears after a short while.

2. Select "SAS Topology" and press **Enter**.

    "SAS Topology" menu appears after a while.

3. Select "Direct Attach Device" and press **Enter**.

    Hard disk drives that are installed on the primary CPU/IO module appear after a while.

4. Select the hard disk drive to execute physical formatting and press **D** while pressing **Alt**.

    "Device Properties" menu appears after a while.

```
LSI Corp Config Utility      v7.23.01.00 (2011.11.17)
Device Properties -- SAS2008

         Device Identifier    SEAGATE ST9146853SS    N002
         Scan Order           9
         Phy Number           0
         Slot Number          0
         RAID Member          No
         Device Information   SAS
         Disk Capacity (GB)   136
         SAS Address          5000C500:42AAF739
         Serial Number        6XM01HH70000S128NFFA

         Format

         Verify
```

5. Select "Format" and press **Enter**.

    "Device Format" menu appears after a while.

```
LSI Corp Config Utility      v7.23.01.00 (2011.11.17)
Device Format -- SAS2008

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

         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.
```

6. Press **F** to start formatting.

    After the completion of formatting, the following message appears.

```
LSI Corp Config Utility      v7.23.01.00 (2011.11.17)
Device Format -- SAS2008

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

         Status:              Complete!

         Format completed successfully.
         Press any key
```

Press any key to display "Device Properties" menu.

4. Flash FDD

Flash FDD is a device that is compatible with a floppy disk drive.

Flash FDD is used when:

- Collecting the hardware logs

    Refer to *Chapter 1 (12. 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 Top Menu of EXPRESSBUILDER appears.
- Before you exit EXPRESSBUILDER, remove Flash FDD from the server.
- Click [Remove] in the lower right corner of the menu to disable Flash FDD, and then remove it.
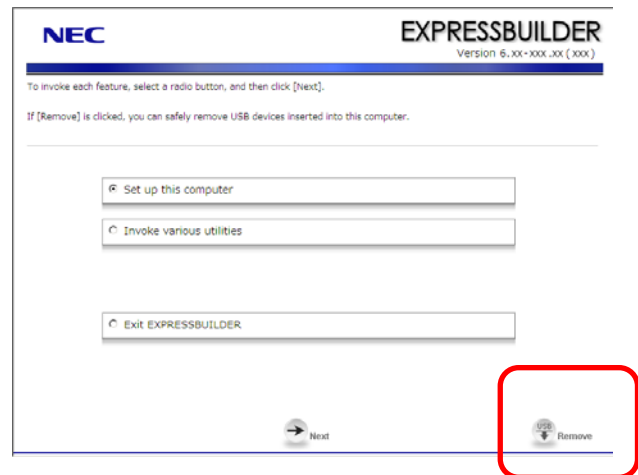
5. **Details of EXPRESSBUILDER**

EXPRESSBUILDER helps you to install operating system and check the connection status of server.

EXPRESSBUILDER also provides bundled software and documents.

5.1 **Starting EXPRESSBUILDER**

EXPRESSBUILDER is stored in DVD provided with the server, and can be run in the following two ways.

- Insert the DVD to the optical disk drive of the server, and then reboot by turning off and on the server or by pressing **Ctrl** + **Alt** + **Delete**.

  Boot Selection Menu shown in *Chapter 3 (5.2   Menu) - (1) Boot Selection Menu)* appears.

> **Tips** Remove other removable media before starting EXPRESSBUILDER.

- Insert the DVD into a computer on which Windows is running.

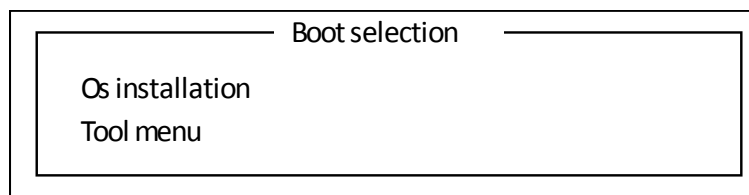 Autorun Menu shown in *Chapter 3 (5.2   Menu) - (3) Autorun Menu* appears.

5.2 **Menu**

EXPRESSBUILDER is operated by using onscreen menus.

(1) **Boot Selection Menu**

When EXPRESSBUILDER starts from DVD, the following menu appears.

Use the upper and lower arrow keys to move the cursor, and then press **Enter** to select it.

```
┌──────────────── Boot selection ────────────────┐
│                                                 │
│    Os installation                              │
│    Tool menu                                    │
│                                                 │
│                                                 │
└─────────────────────────────────────────────────┘
```

If you select **Tool menu**, Tool Menu shown in *(2) Tool Menu* appears after selecting display language type.

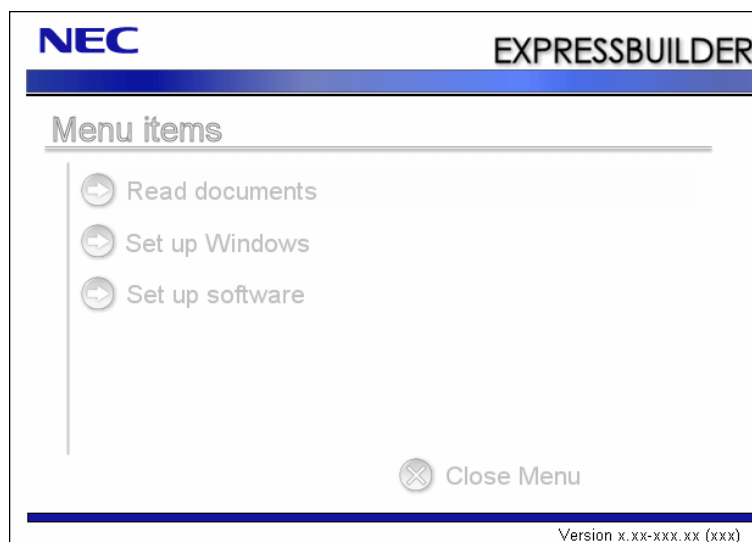> **Important** **Do NOT select [OS installation] when VMware is installed.**

(2) Tool Menu

TOOL MENU
Test and diagnostics   Return to previous menu

The system diagnostics, which is used to analyze and diagnose the server and check the connection, can be started from Tool Menu. For details about system diagnostics, refer to *Chapter 1 (11. System Diagnostics)*.

(3) Autorun Menu

The Autorun menu is used to read documents and to install bundled software. Adobe Reader is needed to view or print documents because all documents are provided as PDF files.

If Autorun Menu does not launch, eject the DVD and then insert it again. Autorun Menu can be re-displayed by selecting **Computer (**or **My Computer** on Windows XP**)** from Windows Explorer and then double-clicking the drive icon of EXPRESSBUILDER DVD.

❻. 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 port 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.

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.