

NEC Express Server
Express5800 Series

Express5800/R320c-E4

Model Number: N8800-173F, EXP320P

Express5800/R320c-M4

Model Number: N8800-174F, EXP320Q




Maintenance Guide (Linux)








Chapter 1 Maintenance

Chapter 2 Configuring and Upgrading the System

Chapter 3 Useful Features

Documents for This Product

Documents for this product are provided as booklets () and as electronic manuals () in the EXPRESSBUILDER DVD ()

	User's Guide	
	Chapter 1: General Description	Overviews, names, and functions of the server components
	Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and suitable location for this server
	Chapter 3: Setup	System BIOS configurations and summary of EXPRESSBUILDER
	Chapter 4: Appendix	Specifications
	Installation Guide (Linux)	
	Chapter 1: Installing Operating System	Installation of OS and drivers, and precautions for installation
	Chapter 2: Installing Bundled Software	Installation of bundled software, such as NEC ESMPRO
	Maintenance Guide (Linux)	
	Chapter 1: Maintenance	Server maintenance and troubleshooting
	Chapter 2: Configuring and Upgrading the System	The setup of hardware and management tools
	Chapter 3: Useful Features	Useful features and the detail of system BIOS settings, SAS Configuration Utility, and EXPRESSBUILDER
	Other documents	
	The detail of NEC ESMPRO and other features.	

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Notations Used in This Document

Notations used in the text

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

Important	Indicates critical items that must be followed when handling the hardware or operating software. If the procedures described are not followed, <u>hardware failure, data loss, or other serious malfunctions could occur.</u>
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 drive

This server is equipped with one of the following drives. These drives are referred to as *optical disk drive* in this document.

- DVD-ROM drive
- DVD Super MULTI drive

Removable media

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

- USB flash drive
- Flash FDD

Abbreviations of Operating Systems (Linux)

Linux Operating Systems are referred to as follows.

See <i>Chapter 1 (1.1 Supported Linux OS) in Installation Guide (Linux)</i> for detailed information.

Notations in this document	Official names of Linux
Red Hat Enterprise Linux 6 Server	Red Hat Enterprise Linux 6 (x86_64)

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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Russian	<p style="text-align: center;">Декларация о Соответствии</p> <p style="text-align: center;">Требованиям Технического Регламента об Ограничении Использования некоторых Вредных Веществ в электрическом и электронном оборудовании (утверждённого Постановлением №1057 Кабинета Министров Украины)</p> <p>Изделие соответствует требованиям Технического Регламента об Ограничении Использования некоторых Вредных Веществ в электрическом и электронном оборудовании (ТР ОИВВ).</p> <p>Содержание вредных веществ в случаях, не предусмотренных Дополнением №2 ТР ОИВВ:</p> <ol style="list-style-type: none"> 1. свинец (Pb) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 2. кадмий (Cd) – не превышает 0,01 % веса вещества или в концентрации до 100 миллионных частей; 3. ртуть (Hg) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 4. шестивалентный хром (Cr⁶⁺) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 5. полибромбифенолы (PBB) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 6. полибромдифеноловые эфиры (PBDE) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей.
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India

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

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

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

1

Maintenance

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

1. 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 the Server

Describes how to start, stop, diagnose each components of the 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 recovery of the HDD duplex configuration and starting fsck when boot up.

10. Resetting the Server and Clearing BIOS Settings

Describes how to reset the server and clear the BIOS settings. 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

Describes the system diagnostics of this server.

12. Offline Tools

Describes tools for preventive maintenance of this product.

***I.* Transfer, Relocation, and Disposal**

***I.I* 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 "Trash" or execute the "format" command. 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.



廢電池請回收


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 safely. 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 goes off).
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.

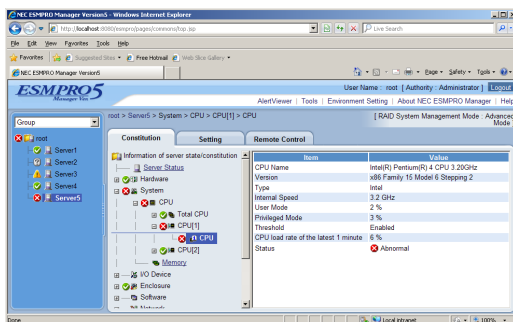
NEC corporate site: <http://www.nec.com/>

[Support & Downloads]

2.2 Checking Alerts

Use NEC ESMPRO Manager 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

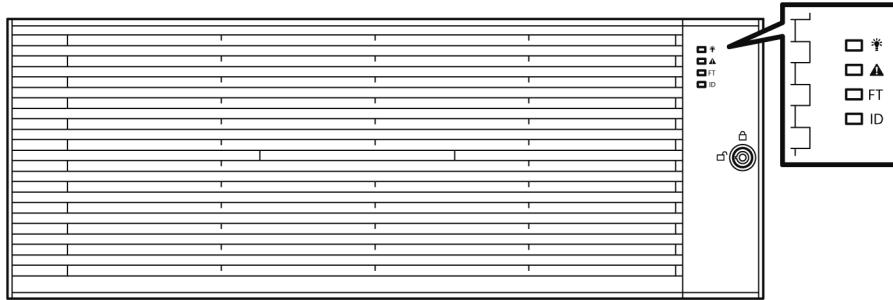
2.3 Checking STATUS LED

Check LED indication when:

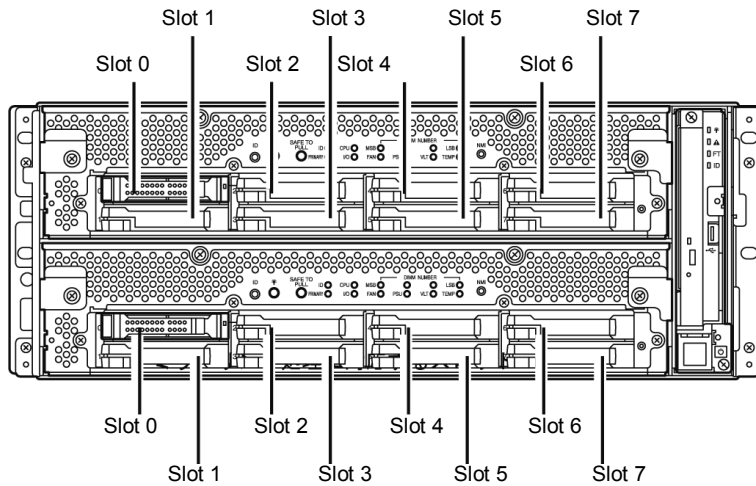
- Power on the server and while the server is running.
- Before shutting down the server.

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 sales representative.

For the functions and descriptions of the LED, see *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 (2.9 Backing Up System Information)* in *Installation Guide*.

2.5 Cleaning

Regularly clean the server to keep it in good condition.

 WARNING	
    	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to <i>Safety precautions in Precautions for Use</i> in "User's Guide".</p> <ul style="list-style-type: none">• Do not disassemble, repair, or alter the server.• Disconnect the power plug before cleaning the server.

2.5.1 Cleaning the server

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

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

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

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

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

2.5.2 Cleaning Tape Drive

A dirty tape drive head causes unsuccessful file backup and damages the tape cartridge. Periodically clean the tape drive with the designated cleaning tape.

For the cleaning interval and method, the estimated usable period and lifetime of the tape cartridge, refer to the instructions attached to the tape drive.

2.5.3 Cleaning the Keyboard and Mouse

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 keyboard and mouse from the USB port.
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. See *Chapter 1 (6. Error Messages)*.
3. See *Chapter 1 (8. Troubleshooting)*. If you find a symptom similar to your problem, take the action as instructed.
4. Confirm that the required software has been properly installed.
5. Scan for viruses using a commercial Antivirus Software.

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

4. Maintenance of the Server

This server can be maintained in two ways.

- To use NEC ESMPRO Manager for remote maintenance
- To use ft Server Utility on this server for local maintenance.

Tips

To start ft Server Utility, select menus as follows:

```
# /opt/nec/esmpro_sa/bin/ESMftcutil
```

The table below lists the availability of maintenance features common to all components.

Maintenance features \ Component	Component				
	General	CPU module	PCI module	SCSI enclosure	Firmware under BMC
Start	–	Remote / Local	Remote / Local	–	–
Stop	–	Remote / Local	Remote / Local	–	–
View MTBF information	–	Remote / Local	Remote / Local	–	–
MTBF clear	–	Remote / Local	Remote / Local	–	–
Diagnosis	–	–	–	–	–
Dump collection	–	–	–	–	–
Board switch	–	Remote / Local	–	–	–
BIOS Update	–	Remote / Local	–	–	–
F/W update	–	–	–	–	Local
Quick dump	–	–	–	–	–
Auto firmware update	–	–	–	–	–
Auto module start	–	–	–	–	–

Remote: Executable from remote management PC by using NEC ESMPRO Manager

Local: Executable on local server by using ft Server Utility

–: Not supported

Tips

The server does not support maintenance feature for the components listed below.

- Internal devices
 - SCSI adapter under PCI module
 - Ethernet board under PCI module
 - Network port of Ethernet board under PCI module
 - SCSI enclosure and SCSI slots under the enclosure
- Optional devices

Important

- **Consult with your maintenance personnel to use the maintenance features.**
- **Perform the following steps before replacing component.**
 1. Clear MTBF information of relevant component.
 2. Stop the relevant CPU module and PCI module.

4.1 Start and Stop of Components

This section describes how to start or stop components.

Important Use this feature to stop the relevant CPU module and PCI module before replacing component.

If a component fails or needs to be replaced, the server allows you to forcibly stop the component. The stopped component can also be restarted.

4.1.1 Available status

The table below shows the potential cases in which the dump is acquired.

Component	State of component	
	Start	Stop
CPU module	<ul style="list-style-type: none"> • Power supply stop • Broken • Forced stop • Firmware Update Complete • Diagnostics Passed 	<ul style="list-style-type: none"> • Duplex
PCI module	<ul style="list-style-type: none"> • Power supply stop • Broken • Forced stop • Firmware Update Complete • Diagnostics Passed 	<ul style="list-style-type: none"> • Duplex

Tips You can view the state of component by NEC ESMPRO Manager or ft Server Utility.

4.1.2 Procedure in NEC ESMPRO Manager

Perform the procedure below to start component.

1. Select **General** screen of the target component under the **ft System** tree in **Information of server state/constitution**.
2. Check that the current status of the target component is available. The status is shown on Status Information display of **General** screen.
3. Select **Maintenance** screen and click the **Execute** button of **Bring Up** operation.

Tips

- The target component starts after a while.
- The start result can be verified by "State" in the **General** screen of target component. The result of the start operation is reported by the server as an alert.

Perform the procedure below to stop the component.

1. Select **General** screen of the target component under the **ft System** tree in **Information of server state/constitution**.
2. Check that the current status of the target component is available. The status is shown on Status Information display of **General** screen.
3. Select **Maintenance** screen and click the **Execute** button of **Bring Down** operation.

Tips

- The target component stops after a while.
- The stop result can be verified by "State" in the **General** screen of target component. The result of the stop operation is reported by the server as an alert.

Sample screen of NEC ESMPRO Manager

The screenshot shows the NEC ESMPRO Manager web interface. The browser address bar indicates the URL is `http://localhost:9080/esmpro/pages/commons/top.jsp`. The user is logged in as 'root' with 'Administrator' authority. The navigation tree on the left shows the path: `root > Server > Constitution Information > ft System > CPU Module > CPU Module`. The main content area is divided into three tabs: **Constitution**, **Setting**, and **Remote Control**. The **Constitution** tab is active, showing a tree view of the system hierarchy. The right-hand panel displays the following information:

Item	Value	
MTBF Information		
Type	Use Threshold	
Threshold	-	
Current	-	
Faults	0	
Time of last fault	-	
Diagnostics Information		
Time of last run	01/26/2012 10:43:29 (+09:00)	
Result		
Message[1]	-	
Test Number[1]	-	
Operation		
Operation	Description	Execute
Bring Up	Bring up the CPU Module.	Execute
Bring Down	Bring down the CPU Module.	Execute
Dump	Perform dump.	Execute
MTBF Clear	Clear the MTBF information.	Execute
Diagnostics	Run diagnostics of the CPU Module.	Execute

Maintenance screen of CPU Module

4.1.3 Procedure in ft Server Utility

Use ft Server Utility menu and select the relevant component.

Perform the procedure below to start component.

1. Select the target component.
2. Check **Current state** of the target component by selecting **Refresh**.
3. Select **Start** button of the target component.

Tips

- The target component starts after a while.
- The start result can be verified by "**State**" of target component. Note that state display is not refreshed automatically, you need to select **Refresh** to check **Current state**.

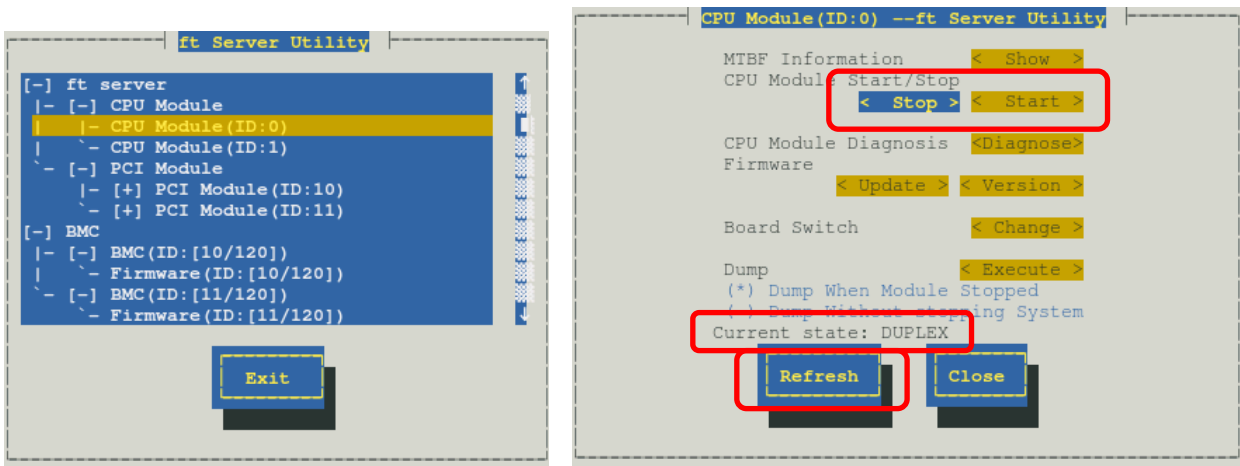
Perform the procedure below to stop the component.

1. Select the target component.
2. Check **Current state** of the target component by selecting **Refresh**.
3. Select **Stop** button of the target component.

Tips

- The target component stops after a while.
- The stop result can be verified by "**State**" of target component. Note that state display is not refreshed automatically, you need to select **Refresh** to check **Current state**.

Sample screen of ft Server Utility



CPU module

4.2 Check and Clear of MTBF Information

The MTBF information of a component can be viewed or cleared (initialized).

Important Stop the relevant CPU module and PCI module before replacing components.

The server manages the MTBF (mean time between failure) of each component. If a fault occurs in a component, the server calculates the MTBF of the component again. If the calculated value is lower than the pre-defined threshold, the server disables the component to be used.

A disabled component with the MTBF lower than the threshold can be forcibly enabled by clearing the MTBF.

Important Before clearing MTBF and forcedly enable the component, contact your maintenance personnel for the forced use of such a component.

4.2.1 Available status

The table below shows the potential cases in which the MTBF information can be cleared.

Component	Status of component
CPU module	<ul style="list-style-type: none"> • Broken • MTBF is lower than the threshold.
PCI module	<ul style="list-style-type: none"> • Broken • MTBF is lower than the threshold.

Tips The status of component can be verified on screen of NEC ESMPRO Manager or ft Server Utility.

4.2.2 Procedure in NEC ESMPRO Manager

Perform the procedure below to clear (initialize) MTBF information of component.

1. Select **General** screen of the target component under the **ft System** tree in **Information of server state/constitution**.
2. Check that the current status of the target component is available. The status is shown on Status Information display of **General** screen.
3. Select **Maintenance** screen and click the **Execute** button of **MTBF Clear** operation.

Tips

The MTBF clearing result can be verified by "Status Information" in **General** on the target component screen. The result of the MTBF clearing operation is reported by the server as an alert.

4. Start the target component.

Sample screen of NEC ESMPRO Manager

The screenshot shows the NEC ESMPRO Manager web interface. The browser address bar indicates the URL is `http://localhost:8080/esmpro/pages/commons/top.jsp`. The user is logged in as 'root' with 'Administrator' authority. The navigation tree on the left shows the path: `root > Server > Constitution Information > ft System > CPU Module > CPU Module (D:1) > Maintenance`. The main content area has three tabs: 'Constitution', 'Setting', and 'Remote Control'. The 'Constitution' tab is active, showing a tree view of the server's constitution. The 'CPU Module' is selected, and the 'Maintenance' sub-tab is active. The right-hand panel displays the following information:

Item	Value	
MTBF Information		
Type	Use Threshold	
Threshold	-	
Current	-	
Faults	0	
Time of last fault	-	
Diagnostics Information		
Time of last run	01/26/2012 10:43:29 (+09:00)	
Result		
Message[1]	-	
Test Number[1]	-	
Operation		
Operation	Description	Execute
Bring Up	Bring up the CPU Module.	Execute
Bring Down	Bring down the CPU Module.	Execute
Dump	Perform dump.	Execute
MTBF Clear	Clear the MTBF information.	Execute
Diagnostics	Run diagnostics of the CPU Module.	Execute

Maintenance screen of CPU Module

4.2.3 Procedure in ft Server Utility

Use ft Server Utility menu and select the relevant component.

Perform the procedure below to clear MTBF information of component.

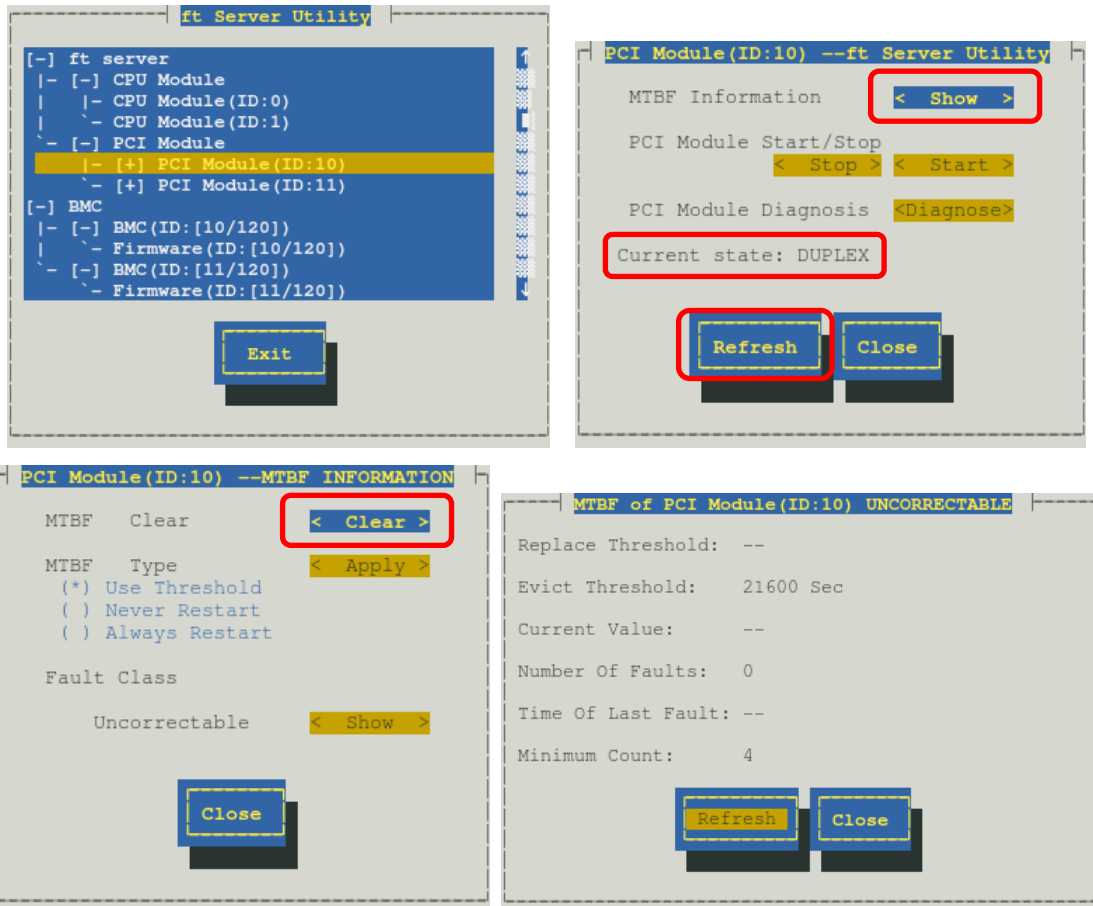
1. Select the target component.
2. Check **Current state** of the target component by selecting **Refresh**.
3. Select **Show** on **MTBF INFORMATION** of the target component.
4. Select **Clear** button in **MTBF Clear** of the target component.

Tips

If the **Number of Faults** in MTBF information on the screen of target component becomes zero, MTBF information is cleared.

5. Start the component.

Sample screen of ft Server Utility



PCI Module

4.3 Diagnostics

The current version of utility does not support this feature.

4.4 Dump Collection

The current version of utility does not support this feature.

4.5 BIOS Update

The BIOS of CPU module can be updated.

4.5.1 Available status

The BIOS of CPU module can be updated with CPU module in offline state (system is continuously running, but the target CPU module is in halt state).

The table below shows the potential cases in which the BIOS update can be performed.

Component	Status of component
CPU module	• Offline

Tips

The status of component can be verified on screen of NEC ESMPRO Manager or ft Server Utility.

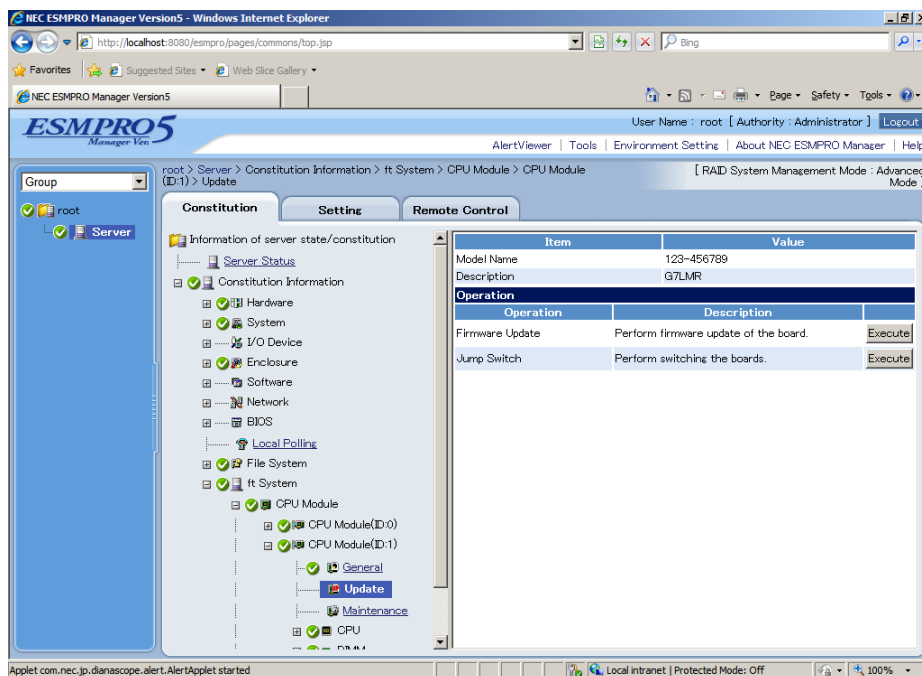
4.5.2 Procedure in NEC ESMPRO Manager

Take the steps below to update BIOS of CPU module.

Important To update BIOS of CPU module, a BIOS image file for updating needs to be stored on the server.

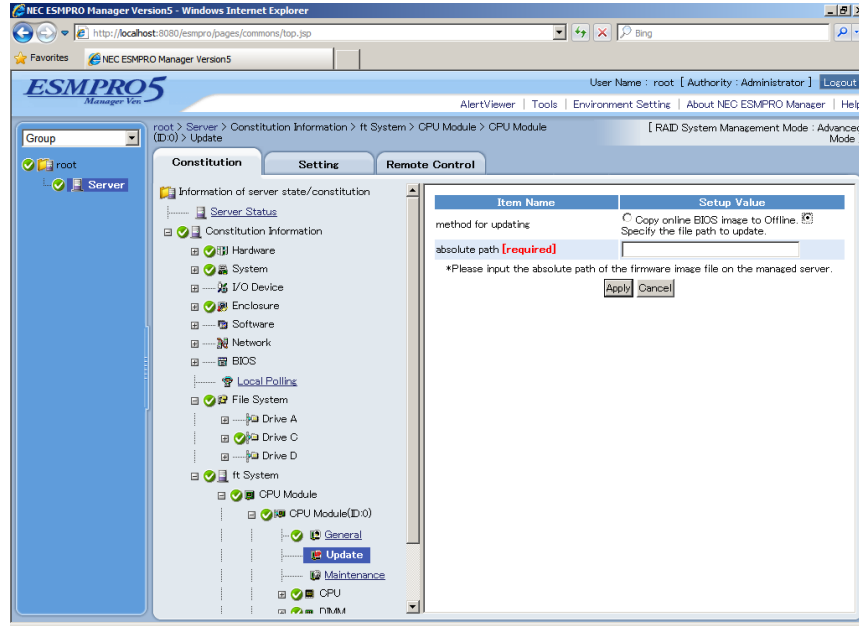
1. Save the BIOS image file for update in the following folder in the server.
/etc/opt/ft/BIOS.ROM
2. Select **General** screen of the target CPU under the **ft System** tree in **Information of server state/constitution**.
3. Check that the current status of the target component is available. The status is shown on Status Information display of **General** screen.
4. Select **Update** screen and click the **Execute** button of **Firmware Update**.

Sample screen of NEC ESMPRO Manager



Update screen of CPU Module

5. Select **Specify the file path to update**, enter the path for BIOS image file you have recorded in Step 1 into **absolute path** box, and click **Apply**.

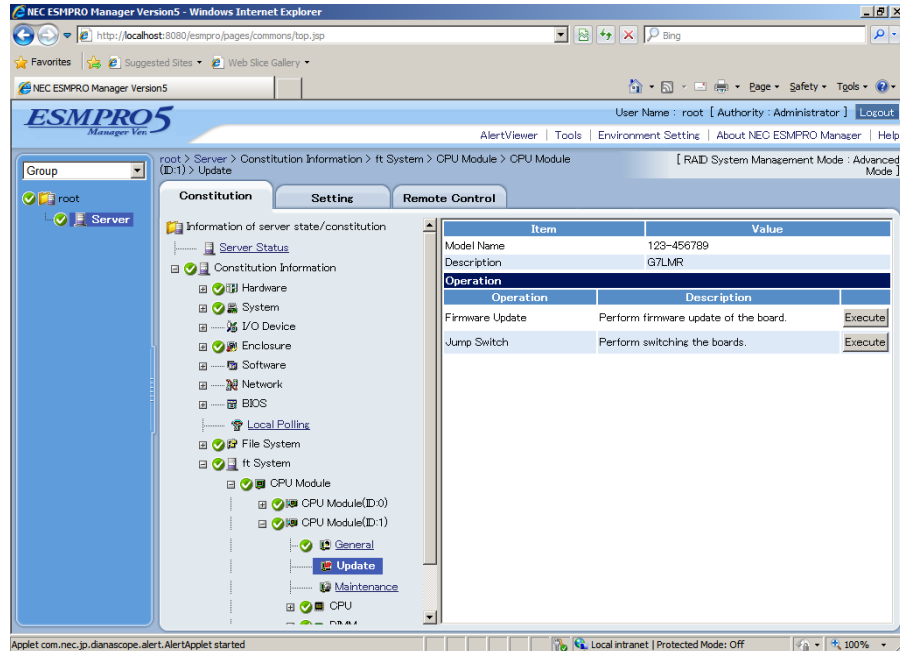


6. When you click **OK** on confirmation dialog box, firmware update starts.

Tips

The update result can be verified by **Status Information of General** of target component ("Firmware update completed" is displayed). In addition, the result of the update is reported by the server as an alert.

7. When BIOS update completes, open **Update** screen, and click **Execute** button on **Jump Switch**.



8. When you click **OK** on confirmation dialog box, the CPU module of which BIOS has been updated starts, and the other CPU module stops.
9. Start the CPU module that has stopped. The firmware is updated automatically.

4.5.3 Procedure in ft Server Utility

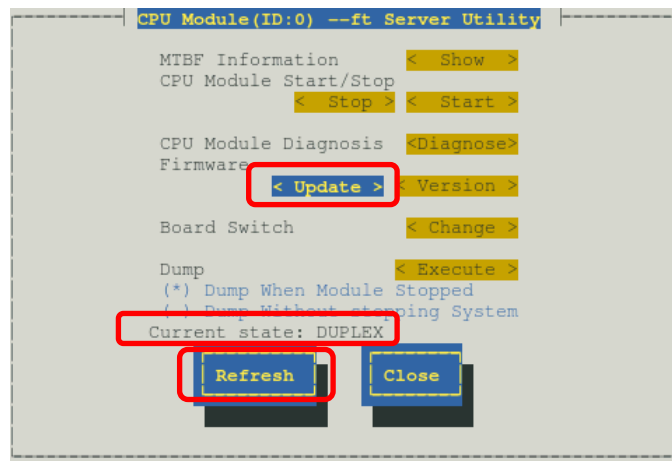
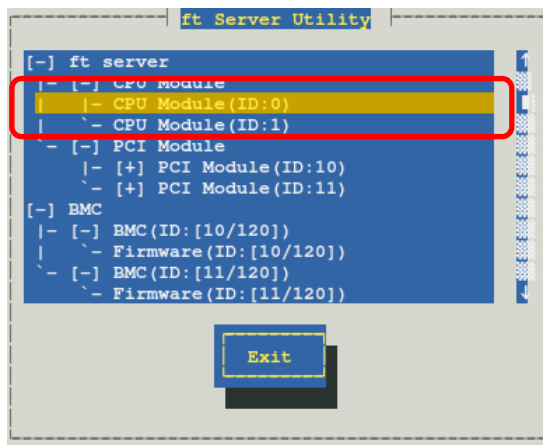
Use ft Server Utility menu and select the relevant component.

Take the steps below to update BIOS of CPU module.

Important To update BIOS of CPU module, a BIOS image file for updating needs to be stored on the server.

1. Save the BIOS image file for update in the /etc/opt/ft/BIOS.ROM directory in the server.
2. Select either one CPU module.
3. Check **Current state** of the target CPU module by selecting **Refresh**.
If the target CPU module is operating, stop it.
4. Select **Update** on **Firmware** of CPU module screen.

Sample screen of ft Server Utility



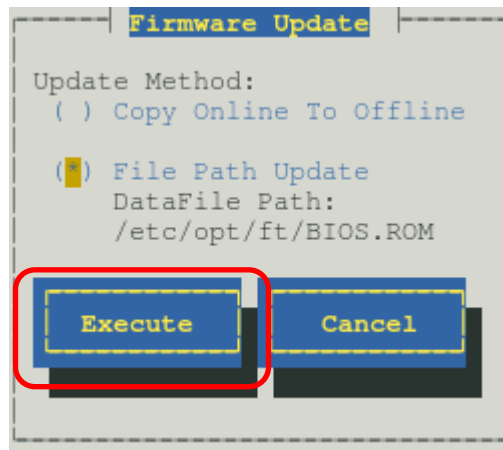
CPU module

5. Select **File Path Update**, and select **Execute**.

The firmware update starts.

Tips

- You must use the file path (/etc/opt/ft/BIOS.ROM) recorded in Step 1.
- The update result can be verified by "**State**" of target component.
Note that state display is not refreshed automatically, you need to select **Refresh** to check **Current state**.



6. Verify the firmware update status.

It takes about 5 to 10 minutes until the firmware update completes from start of update.

When firmware update completes, verify the firmware revision shows the one you expected.

Tips

- Pressing the **Refresh** button refreshes the display of ft Server Utility.
Display changes according to progress of update process.
During update → "FIRMWARE_UPDATE"
When firmware update completes → "FIRMWARE_UPDATE_COMPLETE"
- No state changes when the firmware is not correctly updated. Confirm whether the update file on the server is correctly stored in "/etc/opt/ft/BIOS.ROM".

7. When BIOS update completes, select **Change**.

The CPU module of which BIOS has been updated starts, and the other CPU module stops.

8. Start the other module in halt state.

Starting the module causes the firmware to be updated automatically.

4.6 BMC Firmware Update

The BMC firmware can be updated.

Important Consult with your maintenance personnel before updating BMC firmware.

Tips This server has BMC on each of PCI modules 0 and 1. With the procedure described below, both BMCs are automatically updated.

4.6.1 Available status

BMC firmware update can be performed only on the secondary PCI module.
If the target module is primary, change it to secondary.

The table below shows the potential cases in which the BMC firmware can be updated.

Component	Status of component
Firmware under BMC	• Duplex

Tips The status of component can be verified on screen of ft Server Utility.

4.6.2 Procedure in ft Server Utility

Take the steps below to update BMC firmware.

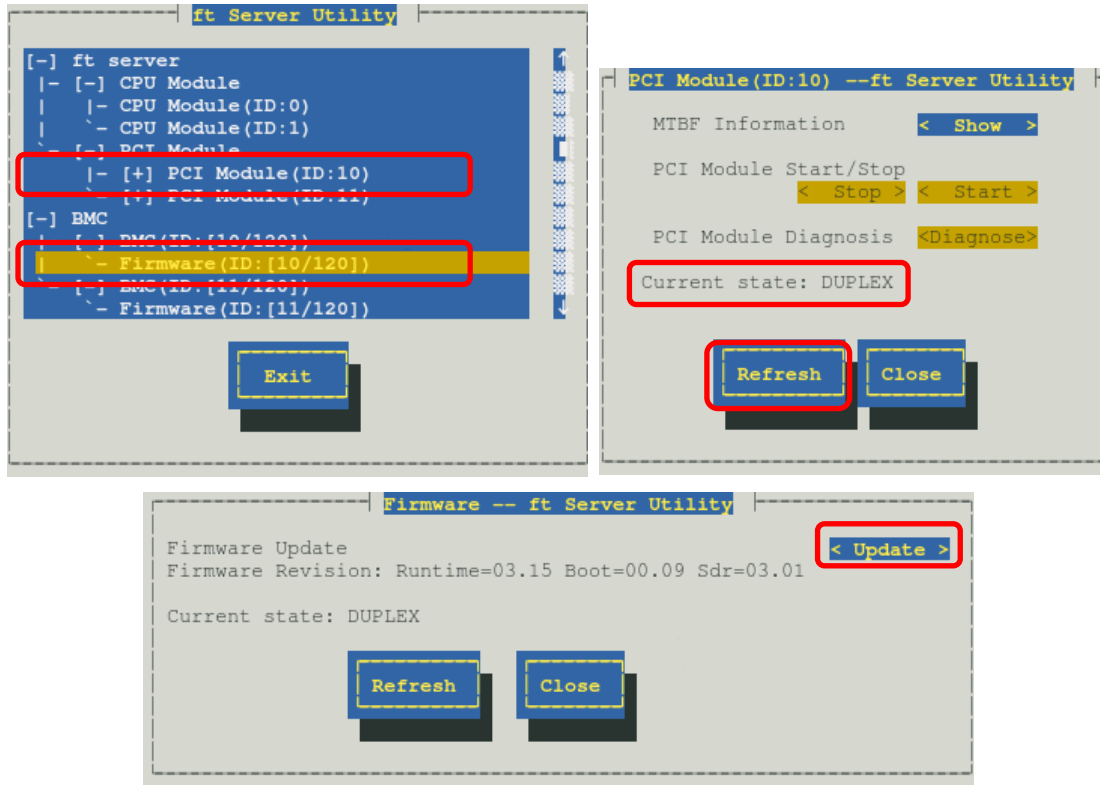
1. Save the image data of the BMC update firmware in a desired directory of the server. Write down the path to the directory in which the image data is saved.

Important To update BMC firmware, a firmware image file for updating needs to be stored on the server.

2. Select the secondary PCI module.
3. Check **Current state** of the target component by selecting **Refresh**.
4. Select a firmware #n under the target BMC #n in the [BMC] tree.
BMC #0 is BMC of the PCI module (ID:10), BMC #1 is BMC of the PCI module (ID:11).
5. Select **Update** of firmware update.
When update starts, the following message is output to syslog.
kernel: EVLOG: INFORMATION - BMC nn/120, firmware burn starting.

Tips The color of the screen may be different due to newt package used for screen display. However, the initial position is **Update** on firmware screen.

Sample screen of ft Server Utility



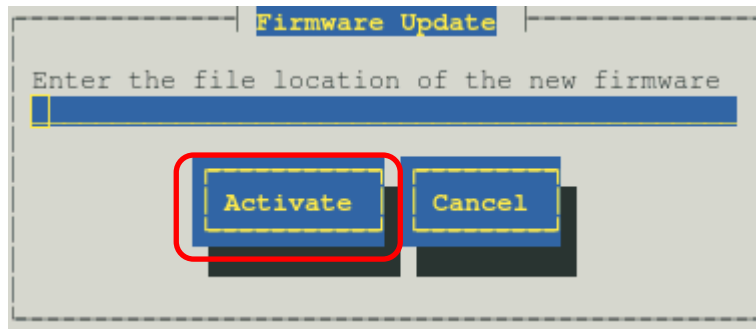
BMC

6. Enter the file path you have written down in Step 1 in **Enter the file location of the new firmware** text box, and select **Activate**.

BMC firmware update starts.

When update is completed, the following message is output on syslog.

kernel: EVLOG: INFORMATION - BMC nn/120, firmware burn succeeded.



Tips

When the following error message is displayed, check the file location of the new firmware.

- The length of the file name must be between 1 and 255 characters.
- Update file does not exist.

7. If the BMC firmware update of one PCI module is completed, select another PCI module, **stop** and **start**.
8. When it is necessary to replace it to return primary and the secondary of PCI module to an original state, **stop** PCI module of the primary side and **start**.

5. Checking the Duplicating Operation of Modules

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

Tips

CPU/IO module has a processor function part and IO function part. Each part is monitored and managed by the module. 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.

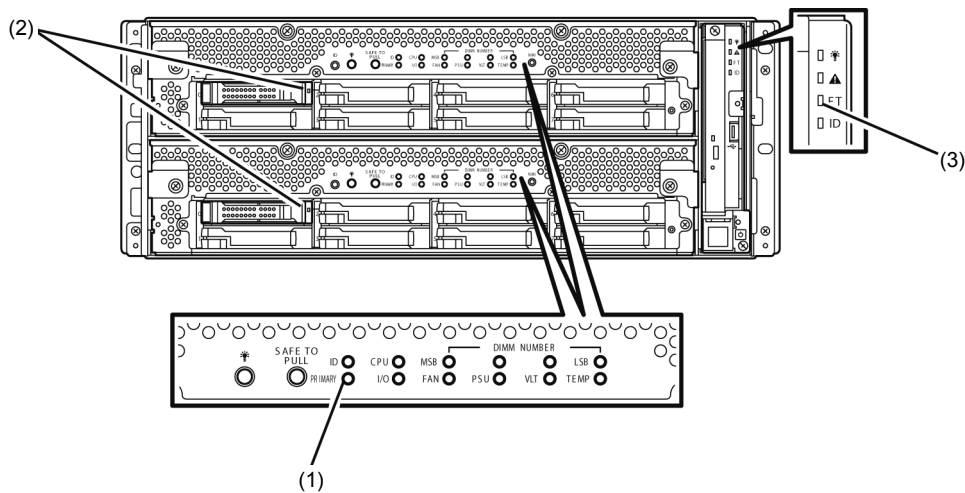
Tips

The PCI module with the PRIMARY LED illuminated is the primary module.

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

Tips

To check if the CPU/IO modules are duplicated, see the System FT LED.



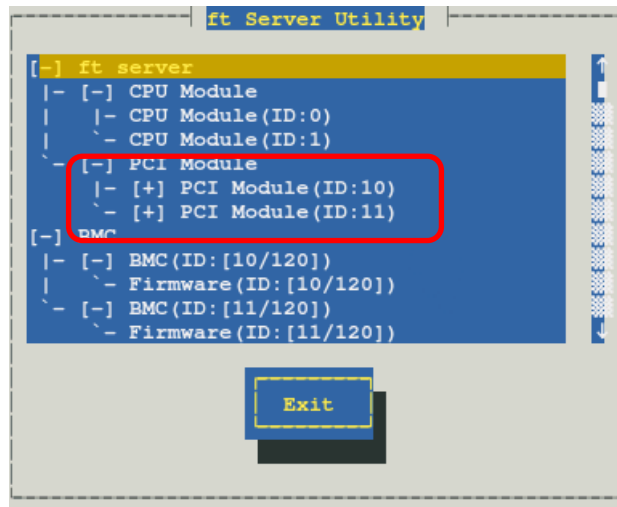
Indications of the status LEDs when CPU/IO modules are duplicated

LED		Primary	Secondary
1	PRIMARY LED	On (Green)	-
2	DISK ACCESS LED	Blinking (Green)	Blinking (Green)
LED		System	
3	System FT LED	On (Green)	

* The numbers in table above correspond to those shown in figure above.
DISK ACCESS LED (2) lights only when hard disk drive is accessed.

3. Start ft Server Utility.

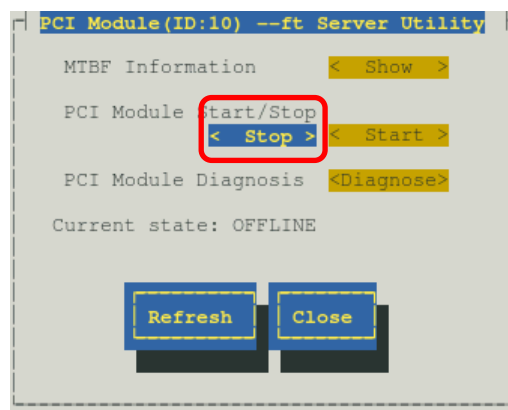
/opt/nec/esmpro_sa/bin/ESMftcutil



4. Select **PCI Module** and then the primary PCI module (*) from the **ft server** tree.

- Select **PCI module (ID:10)** when CPU/IO module 0 is primary module.
- Select **PCI module (ID:11)** when CPU/IO module 1 is a primary module.

5. Select **Stop** of **Start/Stop**



Tips

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

When the primary PCI module is stopped, the screen temporarily blacks out and then displayed again, and the status changes as follows. This indicates that PCI module is failed over.

Indications of status LEDs

LED		Secondary*	Primary*
1	PRIMARY LED	–	On (Green)
2	DISK ACCESS LED	–	Blinking amber or green (Lights green when accessing the disk drive)
LED		System	
3	System FT LED	–	

* The primary and secondary modules after failover

6. Restart the stopped PCI module.

Select **Start** of **Start/Stop** to the PCI module which has been stopped, and the PCI module will be started.

Tips

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

The PCI modules' status LEDs changes as shown below:

Indications of the status LEDs

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

LED		Secondary	Primary
1	PRIMARY LED	–	On (Green)
2	DISK ACCESS LED	–	Blinking amber or green (Lights green when accessing the disk drive)
LED		System	
3	System FT LED	–	



When duplication of disks is started after the completion of PCI module diagnosis:

* The status of LEDs varies depending on the method of disk duplication.

LED		Secondary	Primary
1	PRIMARY LED	–	On (Green)
2	DISK ACCESS LED	Blinking amber or green (Lights green when accessing the disk drive)	Blinking amber or green (Lights green when accessing the disk drive)
LED		System	
3	System FT LED	–	



After the completion of mirror volume duplication and when the PCI modules are duplicated:

LED		Secondary	Primary
1	PRIMARY LED	–	On (Green)
2	DISK ACCESS LED	Blinking (Green) (Lights green when accessing the disk drive)	Blinking (Green) (Lights green when accessing the disk drive)
LED		System	
3	System FT LED	On (Green)	

Important After duplication is completed, the FT LED lights in green. Do not perform the evaluation of start and stop unless the above process is completed.

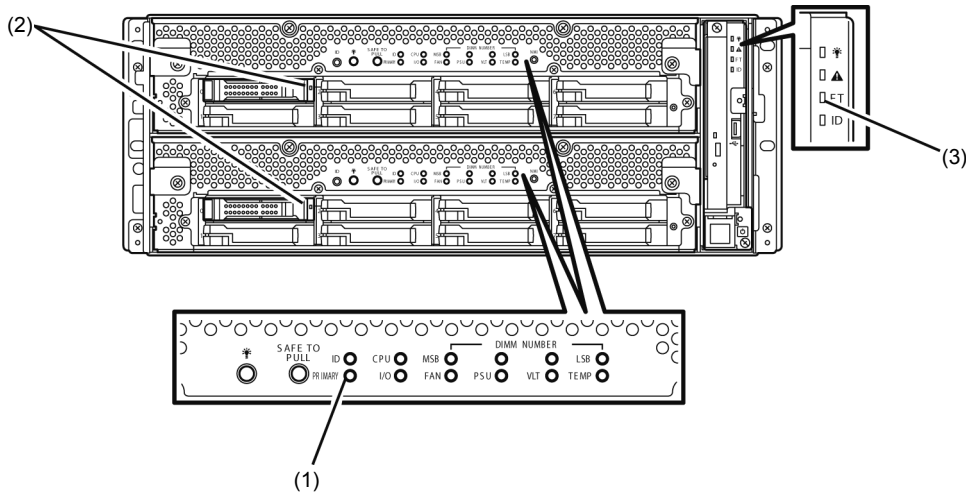
5.2 Confirm Start and Stop of CPU Modules

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.

Tips

To check if the CPU modules are duplicated, see the System FT LED.

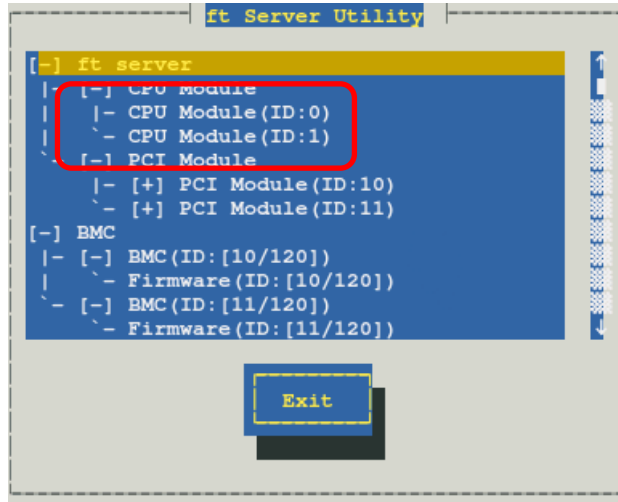


Indications of status LEDs when CPU modules are duplicated

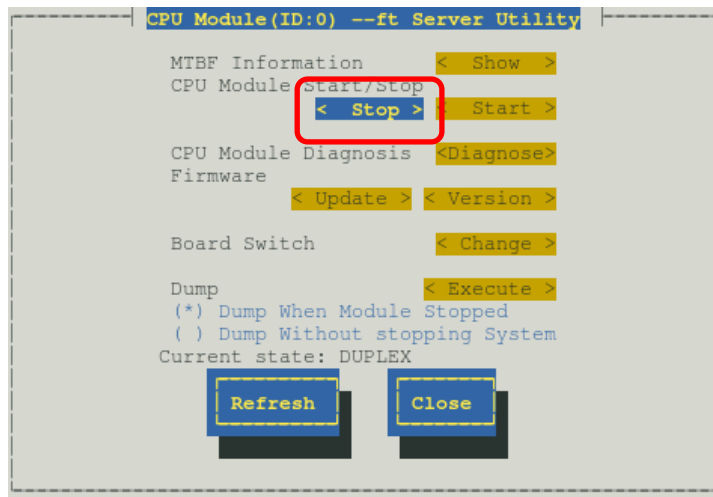
LED		CPU/IO module 0 (Operating)	CPU/IO module 1 (Operating)
1	PRIMARY LED	On (Green)	—
2	DISK ACCESS LED	Blinking (Green) (Lights green when accessing to HDD)	Blinking (Green) (Lights green when accessing to HDD)
		System	
3	System FT LED	On (Green)	

* The numbers in table above correspond to those shown in figure above.
DISK ACCESS LED (2) lights only when hard disk drive is accessed.

2. Start ft Server Utility.
/opt/nec/esmpro_sa/bin/ESMftcutil



3. Select **CPU Module** then the CPU module to stop (*) from the **ft server** tree.
 - Select **CPU module (ID:0)** to stop CPU/IO module 0.
 - Select **CPU module (ID:1)** to stop CPU/IO module 1.
4. Select **Stop** of **Start/Stop**.



When you stop the operation of a CPU module, the indications of the status LEDs change as follows. Below denotes that the only one CPU module is operating.

Indications of status LEDs

LED		CPU/IO module 0 (Stopped)*	CPU/IO module 1 (Operating)
1	PRIMARY LED	On (Green)	-
2	DISK ACCESS LED	Blinking (Green) (Lights green when accessing the disk drive)	Blinking (Green) (Lights green when accessing the disk drive)
LED		System	
3	System FT LED	-	

* As an example, the indications of when CPU/IO module 0 is stopped are shown.

5. Start the CPU module stopped.
Select the stopped CPU module and select **Start** of **Start/Stop**.

Tips

When the CPU module is started, **Hardware diagnosis** and then **synchronization of memory (memory copy)** are performed, and the duplication process is completed. Note that the system is paused temporarily for copying memory during memory synchronization.

Indications of status LEDs after completion of duplication

LED		CPU/IO module 0 (Operating)	CPU/IO module 1 (Operating)
1	PRIMARY LED	On (Green)	–
2	DISK ACCESS LED	Blinking (Green) (Lights green when accessing the disk drive)	Blinking (Green) (Lights green when accessing the disk drive)
LED		System	
3	System FT LED	On (Green)	

Important

After duplication is completed, the System FT LED lights in green. Do not perform the evaluation of start and stop unless the above process is completed.

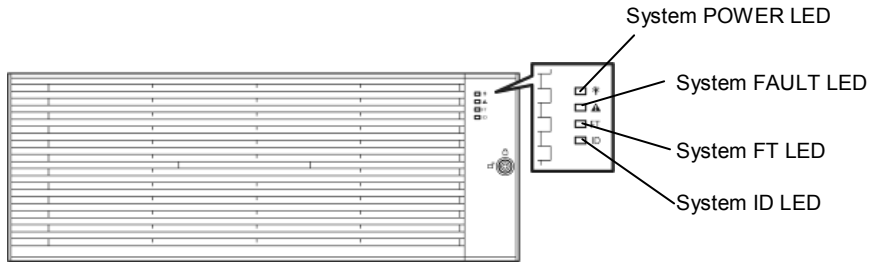
6. Error Messages

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

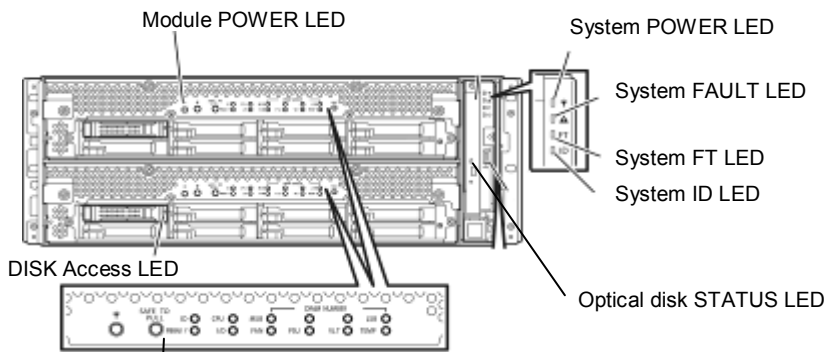
- LED indication is unusual.
→ See "*6.1 Error Messages by LED Indication*".
- An error message appeared.
→ See "*6.2 POST Error Message*".

6.1 Error Messages by LED Indication

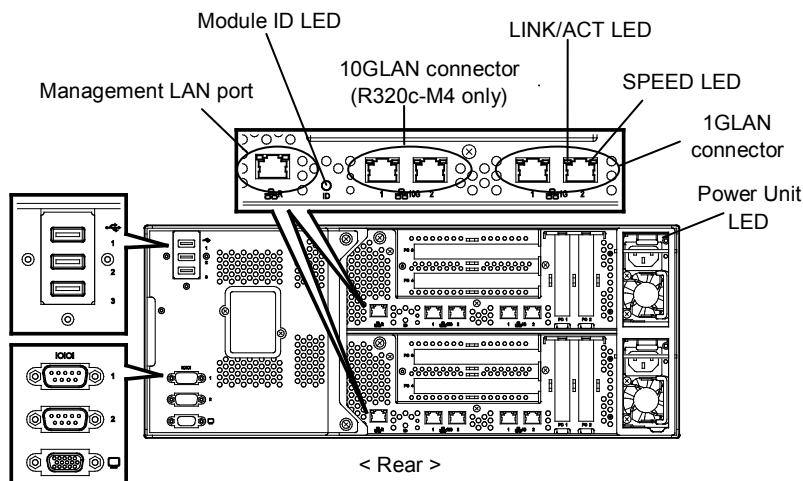
LEDs on the front and rear panels of the server and near the handles of hard disk drives notify the various server statuses. If trouble seems to have occurred, check the LED indication. If replacement of modules is necessary, contact your sales agent.



< Front (With Bezel) >



< Front (Without Bezel) >



< Rear >

(1) System POWER LED

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

(2) System FAULT LED

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

(3) System FT LED

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

(4) System ID LED

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

(5) Disk Access LED

LED indication	Description	Action
Off	Disk is in the idle state.	–
Green	Disk is being accessed. (The LED lights when Disk is accessed.)	–
Amber	Disk is faulty.	Contact your sales representative.
Blinking (amber)	The mirror of the disk is disconnected.	Perform mirroring.
Blinking in green and amber in turn	The mirror of the disk is being rebuilt or disconnected.	Check whether the mirror of the disks is disconnected.

(6) Access LED on optical disk drive

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

(7) LEDs on management port and LAN connectors**LINK/ACT LED**

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

SPEED LED (Management port)

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

SPEED LED (1G LAN connector)

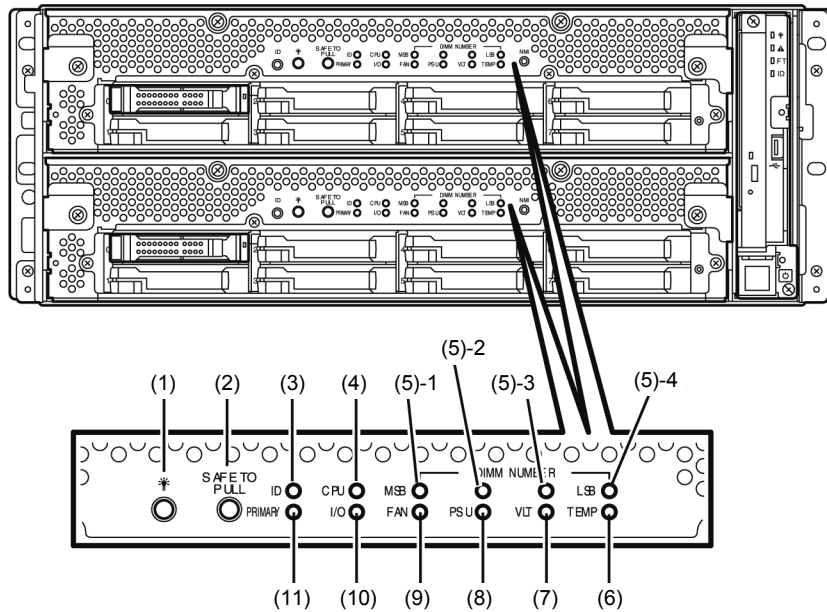
LED indication	Description	Action
On (amber)	Port is operating on 1000BASE-T.	–
On (green)	Port is operating on 100BASE-TX.	–
Off	Port is operating on 10BASE-T.	–

SPEED LED (10G LAN connector)

LED indication	Description	Action
On (amber)	Port is operating on 1000BASE-T.	–
On (green)	Port is operating on 10000BASE-TX.	–
Off	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)	CPU/IO module is in standby state.	–

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

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

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

(3) Module ID (ID LED)

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

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

(4) CPU (CPU FAULT LED)

The LED lights amber when the CPU part of CPU/IO modules fails. Contact your sales representative.

(5) MEM NUMBER (Memory slot error LED)

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

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

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

○: LED is lit.

●: LED is blinking.

–: LED is unlit.

(6) TEMP (Abnormal temperature LED)

Amber: Temperature in CPU/IO module becomes abnormal. Contact your sales representative.

(7) VLT (Power error LED)

Amber: Electric voltage failure occurs in CPU/IO module. Contact your sales representative.

(8) PSU(Power supply unit error LED)

Amber: Failure occurs on the power supply unit of CPU/IO module. Contact your sales representative.

(9) FAN (Fan error LED)

Amber: Failure occurs on the cooling fans for CPU and power supply unit of CPU/IO module. Contact your sales representative.

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

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

(11) PRIMARY (Primary LED)

Green: CPU/IO module is primary.

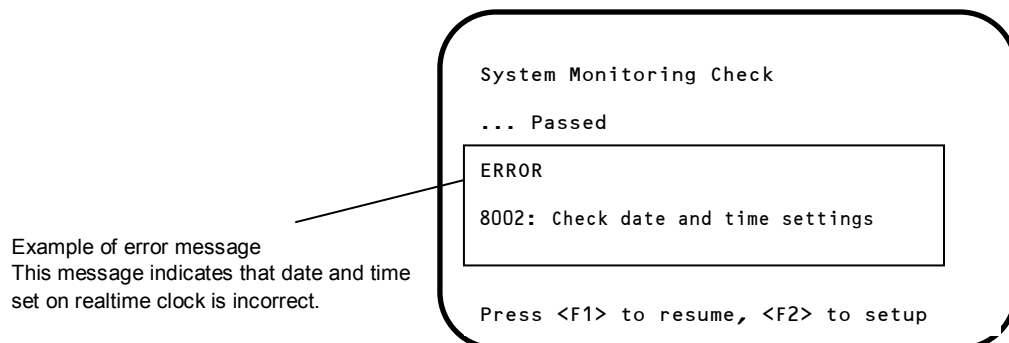
(9) Power Unit LED

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

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

6.2 POST Error Message

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



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

Tips

- Write down the displayed messages or 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 <i>Chapter 1 (10. Resetting and Clearing the Server)</i> .
8007	SETUP Menu Password cleared by Jumper.	The setup utility password was cleared using the jumper.	
8800	DXE_NB_ERROR	An error was detected during initialization of chipset.	Contact your sales representative.
8801	DXE_NO_CON_IN	An error was detected during initialization of console.	
8802	DXE_NO_CON_OUT		
8803	PEI_DXE_CORE_NOT_FOUND	A flash ROM is corrupt.	
8804	PEI_DXEIPL_NOT_FOUND		
8805	DXE_ARCH_PROTOCOL_NOT_AVAILABLE		
8806	PEI_RESET_NOT_AVAILABLE	The system was not reset correctly.	
8807	DXE_RESET_NOT_AVAILABLE		
8808	DXE_FLASH_UPDATE_FAILED	The Flash ROM was not written to correctly.	
B000	Expansion ROM not initialized	Failed to expand option ROM.	
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.

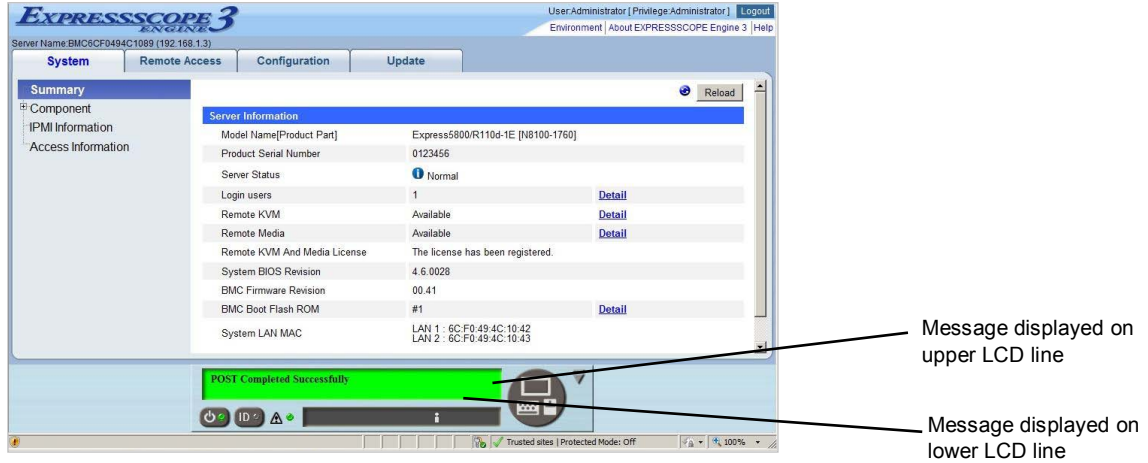
Error Message		Cause	Solution
C061	1st SMBus device Error detected.	An error was detected on 1st SM Bus.	Contact your sales representative.
C062	2nd SMBus device Error detected.	An error was detected on 2nd SM Bus.	
C063	3rd SMBus device Error detected.	An error was detected on 3rd SM Bus.	
C064	4th 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.	Start up Offline Tools (<i>Chapter 1, 12. Offline Tools</i>) and delete the event logs.
C10C	BMC update firmware corrupted.	An illegality was detected while updating BMC firmware.	Unplug the power cord, wait for at least 30 seconds, 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.	
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.



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/I/O module is operating in duplex mode.	This is not an error.
Split mode	CPU/I/O 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.
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.
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.
Processor2 Thermal Trip		

Message on Lower LCD Line	Description	Solution
Sensor Failure Detected.	Abnormality in a sensor was detected.	Contact your sales representative.
SMI timeout	A timeout occurred while servicing system management interrupts.	
IPMI Watchdog timer timeout (Power off)	A watchdog timer timeout occurred.	
System Front FAN1 Lower Non-Critical	A fan alarm was detected.	It is possible that a fan has failed or is clogged. Contact your sales representative.
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 at this time may result in an inability to properly collect information.

7.1 Collecting Failure Information Occurred on Server

Important If you collect system information with the following command, verify that the partition of target disk has enough free space.
This must be operated as a root user.

When you collect system information in the server, run the following command:

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

The collected data will be stored in the following created directory.

```
/home/BugPool/
```

Tips If you change the destination to save, add the following option to the above command and run.
`--bugpool=<relative or absolute path to the destination>`

7.2 Information Collection Tool actlog

actlog is useful for troubleshooting problems when an error occurred on your system. It collects various system information (such as system resource and process resource data) continuously, and trace the change of system configuration file.

For the features of actlog and how to install it, refer to "actlog Release Note" in EXPRESSBUILDER.

EXPRESSBUILDER DVD: 001/lnx/pp/actlog/release_note.*

Tips

actlog contains useful tools (e.g., chkenv-server command that allows easy installation of information collection tool and checking of setting conditions). For more information, refer to "actlog Release Note".

7.3 Collecting Memory Dump

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

Important

Do not change settings for dump collection in kdump.conf file that are configured automatically at installation of ft Server Control Software. If you change the settings, collecting memory dump is not guaranteed.

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

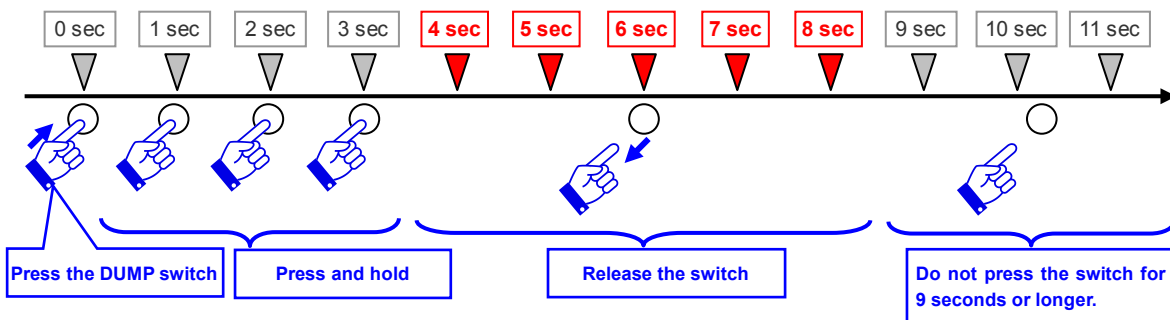
Important

Restarting the system after error has occurred may display a message indicating insufficient virtual memory. Ignore this message and proceed. Restarting the system at this time may result in dumping improper data.

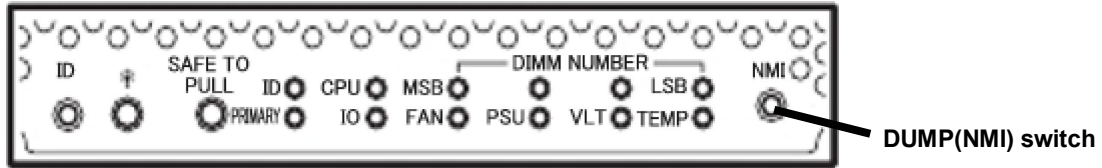
If a failure occurs and you want to collect memory dump, press the DUMP switch on CPU/IO module of primary side for 4 to 8 seconds.

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

<How to press the DUMP switch>



<Location of the DUMP switch>



Important

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

If you press the DUMP switch, system restarts automatically and returns to duplexed state. Wait until the memory dump finishes completely. The memory dump is stored in `/var/crash/` directory. Memory dump is not collected depending on CPU status (e.g. CPU stall).

Tips

Memory dump process of the server may continue until the system returns to duplexed state even after the restart. Wait for a while until duplication completes.

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)*.

B. Troubleshooting

If this system does not work correctly, 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.
 - See "8.1 Problem of Powering on".
 - See "8.4 Problem of Starting OS".
 - See "8.5 Problem of Internal Devices and Other Hardware".
 - See "8.6 Problem of OS Operation".
 - See "8.9 Problem of Optical Disk Drive and Flash FDD".
- Failed to start from EXPRESSBUILDER.
 - See "8.2 Problem of Starting EXPRESSBUILDER".
 - See "8.7 Problem of Starting EXPRESSBUILDER on Windows".
- Failed to install OS.
 - See "8.3 Problem of Installing OS".
- NEC ESMPRO does not work normally.
 - See "8.8 Problem of Bundled Software".
 - Refer to *NEC ESMPRO Agent Installation Guide (Linux)* stored in ft Server Control Software Install CD.
- Failed to setup OS.
 - See "8.3 Problem of Installing OS".

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

- Error message
 - See "6. Error Messages".
- NEC ESMPRO Manager
 - Refer to *NEC ESMPRO Manager Installation Guide* stored in EXPRESSBUILDER.
- Collect failure information
 - See "7. Collecting Failure Information".
- Recovery of system
 - See "9. System Recovery".

If the trouble persists, contact your service representative.

***8.1* Problem of Powering on to POST completion**

[?] Fail to power on the server:

- Is the server properly supplied with power?
 - Make sure the power breaker for the connected power outlet is on.
- 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.
 - If the power cord is plugged to a UPS, make sure the UPS is powered on and it supplies power. Refer to 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 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 handle.

8.2 Problem of Starting EXPRESSBUILDER

[?] Unable to start EXPRESSBUILDER:

- ❑ Did you insert EXPRESSBUILDER DVD and restart the server while POST is running?
 - An error message will appear or OS will start unless EXPRESSBUILDER DVD is inserted before the end of POST.
- ❑ Are BIOS settings correct?
 - Configure the boot order so that the optical disk drive will be the first to start up.
<Menu to check: **Boot**>
- ❑ Is a message displayed when starting EXPRESSBUILDER with text base?
 - Take an appropriate action according to the on-screen message.

Error [Message ID:Z3002] :
Description: Failed to detect a DVD drive or a flash drive.
Action: Check if hardware is connected properly.

Error [Message ID:Z3003] :
Description: Failed to read a file.
Action: Check if DVD is damaged.

- ❑ Is a message such as the following displayed after graphic display?
 - Take an appropriate action according to the table below.

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

B.3 Problem of 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.

[?] Unable to install OS correctly:

- Have you checked precautions for installation?

→ Refer to "*Installation Guide (Linux)*".

[?] Rebooted during the setup:

→ Refer to *Chapter 1 (2.1.2 Disabling OS Boot Monitoring Feature)* in *Installation Guide (Linux)*, and set the parameter of this server's OS Boot Monitoring feature to correct value.

[?] ft Server Control Software UPDATE Disk is not included:

→ ft Server Control Software UPDATE disk is used to update ft Server Control Software; it may not be shipped with the equipment.

[?] During setting up, Error or Warning logs are recorded in syslog:

→ During installing Operating System and ft Server Control Software, due to a temporary state of the system under installation, Error or Warning logs are recorded in syslog.Log. When setup is completed as a procedure of *Installation Guide*, and the system is duplicated, the system operation is normal.

8.4 Problem of Starting OS

[?] Unable to start OS:

- ❑ Are Hard Disk Drives properly installed?
 - Install Hard Disk Drives properly.
- ❑ Is SAS cable connected correctly?
 - Connect the SAS cable properly.
If the Hard Disk Drive 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.

[?] The server repeats rebooting at startup:

- ❑ Is the value of **OS Boot Monitoring Timeout** in the BIOS setting appropriate?
 - Change the value of **OS Boot Monitoring Timeout** to suit your environment. See *Chapter 3 (1. System BIOS)* for details.
 - * It is recommended to change the value for **OS Boot Monitoring Timeout** to the one appropriate to your system configuration if your system has large amount of memory installed or has large capacity disk installed.
- ❑ Is the system changed to maintenance mode during bootup?
 - The following message appears on screen.
Give root password for maintenance (or type Control-D to continue):
- ❑ Did daemons or the driver start properly at startup or occurrence of trouble?

[?] Wake On LAN feature does not work:

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

Important

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

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

[?] Fail to duplex CPUs:

- Check the memory configuration is correct.
- Check third-party CPUs or memory (DIMM) are not used.

[?] The following message appears at OS startup:

- The following message appears at every time the OS start. However, it does not affect the system operation.

i8042.c: Can't read CTR while initializing i8042.

I8042: probe of i8042 failed with error -5

ACPI Error: Could not enable RealTimeClock event (20090903/evxfevnt-193)

ACPI Warning: Could not enable fixed event 4 (20090903/evxface-146)

x2apic not enabled, IRQ remapping init failed

8.5 Problem of 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, PCI device settings need not 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 USB connector on the front or rear of the server.
- Are the keyboard and mouse are compliant with this server?
 - Operation of the server with unauthorized devices is not guaranteed.

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

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

[?] Unable to access the Hard Disk Drive

- Is the Hard Disk Drive supported by the server?
 - Operation of any device that is not authorized by NEC is not guaranteed.
- Is the Hard Disk Drive properly installed?
 - Check the Hard Disk Drive installation status and the cable connections.

[?] Unable to configure dual disks:

- Unless you perform mirroring (including reconfiguration after failed disks are replaced) in correct order, 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.

8.6 Problem of OS Operation

[?] OS operation is unstable:

- Did you access to directory or file under /dev, /proc or /sys?

→ The server frequently saves and updates information related to system operation and management in the following directories. Because accessing any of these directories by a command or other means may impact fault tolerant features and make behavior of the system unstable, do not access them.

```
/dev/mem
/proc/kcore
/proc/bus
/proc/ft
/proc/ide
/sys
```

[?] 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.

- Is the transfer speed correct?

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

- Is the transfer speed of 10G LAN port '100Mbps'?

→ If you specify 100Mbps, make sure that Auto-Negotiation is specified for the connected hub. Other than Auto-Negotiation is not supported by 10G LAN port.

[?] 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 component 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 reintegrating the component without repair is required for some reason, consult your sales agent. It is possible to perform reintegration forcefully.

```
ERROR - x is now STATE_BROKEN / REASON_BELLOW_MTBF
(x denotes device number.)
```

[?] Fibre Channel board set (N8803-038) related log is recorded in the System log:

→ Although the following log may be recorded in the system log after changing IO modules, there is no problem on operation.

```
kernel: qla2xxx [XXXX:XX:XX.X]-XXXX:XX: **** Failed mbx[0]=4006, mb[1]=XXX, mb[2]=X, mb[3]=X, cmd=6a ****.
```

(x denotes device number.)

8.7 Problem of Starting EXPRESSBUILDER on Windows

[?] Cannot read documents:

- Do you have Adobe Reader installed correctly in your system?
 - To read documents, Adobe Reader needs to be installed in your computer.
- Is your browser Internet Explorer?
 - Internet Explorer sometimes displays the Information bar to enforce security. Click the Information bar to display the documents.
 - The screen of Internet Explorer may not proceed with the message "Connecting..." displayed. In this case, click "Documents" again, or quit Internet Explorer once, and try again.

[?] The menu does not appear:

- The Autorun feature is disabled on this server by the shipping default.
When you start menu, run `\autorun\dispatcher_x64.exe` after setting EXPRESSBUILDER DVD.

[?] Some menu items are grayed out:

- Is your system environment correct?
 - Some software requires administrator privilege or needs to be operated on the server. Run on the appropriate environment.

B.B Problem of Bundled Software

[?] NEC ESMPRO Agent (Linux):

→ For details of NEC ESMPRO Agent (Linux), see "NEC ESMPRO Agent User's Guide (Linux)" in ft Server Control Software Install CD.

Supplementary explanation for NEC ESMPRO Agent (Linux)

□ Device ID in Alert Report

→ Some server alerts use unique device IDs which correspond to the devices listed in the table below as the device identification information.

Device name	Device ID
CPU module 0	0
DIMM slot 1 on CPU module 0	0/1
DIMM slot 2 on CPU module 0	0/2
DIMM slot 3 on CPU module 0	0/3
DIMM slot 4 on CPU module 0	0/4
DIMM slot 5 on CPU module 0	0/5
DIMM slot 6 on CPU module 0	0/6
DIMM slot 7 on CPU module 0	0/7
DIMM slot 8 on CPU module 0	0/8
DIMM slot 9 on CPU module 0	0/9
DIMM slot 10 on CPU module 0	0/10
DIMM slot 11 on CPU module 0	0/11
DIMM slot 12 on CPU module 0	0/12
DIMM slot 13 on CPU module 0	0/13
DIMM slot 14 on CPU module 0	0/14
DIMM slot 15 on CPU module 0	0/15
DIMM slot 16 on CPU module 0	0/16
CPU1 on CPU module 0	0/21
CPU2 on CPU module 0	0/22
CPU module 1	1
DIMM slot 1 on CPU module 1	1/1
DIMM slot 2 on CPU module 1	1/2
DIMM slot 3 on CPU module 1	1/3
DIMM slot 4 on CPU module 1	1/4
DIMM slot 5 on CPU module 1	1/5
DIMM slot 6 on CPU module 1	1/6
DIMM slot 7 on CPU module 1	1/7
DIMM slot 8 on CPU module 1	1/8
DIMM slot 9 on CPU module 1	1/9
DIMM slot 10 on CPU module 1	1/10
DIMM slot 11 on CPU module 1	1/11
DIMM slot 12 on CPU module 1	1/12
DIMM slot 13 on CPU module 1	1/13
DIMM slot 14 on CPU module 1	1/14
DIMM slot 15 on CPU module 1	1/15
DIMM slot 16 on CPU module 1	1/16

Device name	Device ID
CPU1 on CPU module 1	1/21
CPU2 on CPU module 1	1/22
PCI module 0	10
PCI slot 1 on PCI module 0	10/1
PCI slot 2 on PCI module 0	10/2
PCI slot 3 on PCI module 0	10/3
PCI slot 4 on PCI module 0	10/4
SCSI adaptor on PCI module 0	10/5
Ethernet board 1 on PCI module 0	10/6
Ethernet board 2 on PCI module 0	10/12
PCI module 1	11
PCI slot 1 on PCI module 1	11/1
PCI slot 2 on PCI module 1	11/2
PCI slot 3 on PCI module 1	11/3
PCI slot 4 on PCI module 1	11/4
SCSI adaptor on PCI module 1	11/5
Ethernet board 1 on PCI module 1	11/6
Ethernet board 2 on PCI module 1	11/12
SCSI enclosure 0	10/40
SCSI slot 1 on SCSI enclosure 0	10/40/1
SCSI slot 2 on SCSI enclosure 0	10/40/2
SCSI slot 3 on SCSI enclosure 0	10/40/3
SCSI slot 4 on SCSI enclosure 0	10/40/4
SCSI slot 5 on SCSI enclosure 0	10/40/5
SCSI slot 6 on SCSI enclosure 0	10/40/6
SCSI slot 7 on SCSI enclosure 0	10/40/7
SCSI slot 8 on SCSI enclosure 0	10/40/8
SCSI enclosure 1	11/40
SCSI slot 1 on SCSI enclosure 1	11/40/1
SCSI slot 2 on SCSI enclosure 1	11/40/2
SCSI slot 3 on SCSI enclosure 1	11/40/3
SCSI slot 4 on SCSI enclosure 1	11/40/4
SCSI slot 5 on SCSI enclosure 1	11/40/5
SCSI slot 6 on SCSI enclosure 1	11/40/6
SCSI slot 7 on SCSI enclosure 1	11/40/7
SCSI slot 8 on SCSI enclosure 1	11/40/8

* "SCSI" includes SAS.

* For R320c-E4, PCI slots 3, PCI slot 4, and Ethernet board 2 do not exist on the PCI module.

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

→ At the time when a temperature or voltage error occurs on CPU/IO module, necessary actions will differ depending on their status as shown below. You can check the status of each module from the **Information of server state/constitution** of NEC ESMPRO Manager or ft Server Utility.

Status	Operation
Duplex	Stop the failed CPU/IO module.
Other than Duplex, Empty	Shutdown 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 synchronizing. Temperature or voltage error occurring during disk mirroring will result in the system to shutdown.

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

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

- ❑ The display of ft Server Utility is incorrect:

→ If you open ft Server Utility immediately after the system starts up, the tree under the CPU module, PCI module, and/or SCSI enclosure may not be displayed correctly because the data construction has not been completed. Wait for a while, and start ft Server Utility again.

- ❑ 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. You can check the status of each module from the **Information of server state/constitution** of NEC ESMPRO Manager or ft Server Utility.

Status	Operation
Duplex	Stop the failed CPU/PCI module (CPU/IO module).
Simplex	Shutdown 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 (I/O 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 shutdown.

- ❑ The status of network port is displayed as an error:

→ For the network ports, connect the unused port of both PCI modules (IO modules) with a cross cable.

- ❑ Alert notification of monitored events

→ In SNMP alert, the message text length is limited to 511 bytes. If the message text exceeds 512 bytes is sent, you need to verify the full length message on Event Viewer of sender machine. To display the message text exceeding 512 bytes on Alert Viewer, use TCP/IP In-Band.

[?] NEC ESMPRO Manager:

→ For details of NEC ESMPRO Manager, see "*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.
 - * Selecting **CPU** in the **ft System** tree may fail to confirm the correct information.
- ❑ Change of hardware configuration
 - If you dynamically change the configuration of the CPU or PCI module (IO module), **Information of server state/constitution** tree 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.
- ❑ 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. When Starting or Stopping of module completes, the status will be displayed correctly.
- ❑ Display of an Unmounted Sensor
 - An unmounted sensor is indicated as "Unknown" on **Information of server state/constitution**.

Ex: **Information of server state/constitution - Enclosure - Temperature**

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

- ❑ Pop-up "Constitution Information has changed." is displayed.
 - If you are seeing **Information of server state/constitution**, pop-up is displayed when hardware constitution on the monitored server is changed (such as attaching or removing CPU module or PCI module). The information on the screen is updated afterwards.
- ❑ System Environment Monitoring
 - Monitoring of temperature, fan and voltage under **Enclosure** in **Information of server state/constitution** is set to enable by default and cannot be changed to disable.
Information of server state/constitution - Enclosure - Temperature
Information of server state/constitution - Enclosure - Fan
Information of server state/constitution - Enclosure - Voltage
- ❑ 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.
- ❑ Display of chipset type of CPU module:
 - If **Ivy Bridge** is installed, the chipset type is not correctly displayed.

8.9 Problem of 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.

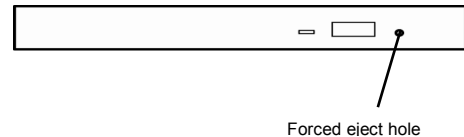
[?] Unable to access or play DVD/CD-ROMs:

- ❑ 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.



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 to this server.

9. System Recovery

If a failure occurs on hard disk drive, recover the duplex configuration according to *Chapter 2 (1. Disk Operations)*.

Note

- If Hard Disk Drive cannot be recognized, you cannot recover the system.
- This must be operated as a root user.

If fsck starts at bootup and halts on the way, try to run fsck to each md device.

```
# fsck -y /dev/md*  
*:md number
```

10. Resetting the Server and Clearing BIOS Settings

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 Soft Reset

If the server halts before starting the OS, press <Ctrl> + <Delete> + <Alt> keys. 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

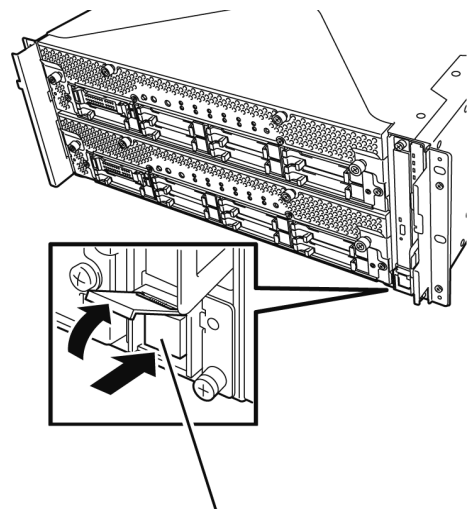
Use this function when an OS command does not shut down the server, POWER Switch does not turn off the server, or software reset does not work.

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.

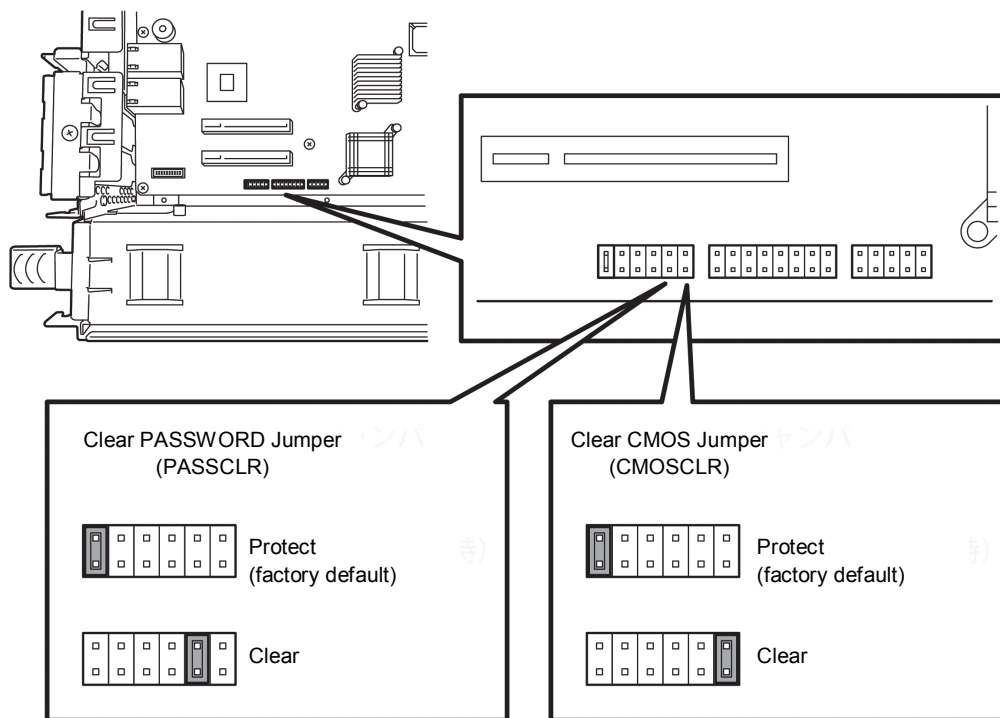
Tips

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.



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


⚠ WARNING



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, 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, see *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.
See *Chapter 2 (5.4 CPU/IO Module)*.
3. Confirm the position of Clear CMOS Jumper.
4. Change jumper switch to "CMOS CLR" position.
5. Assemble the CPU/IO module 0.
6. Connect AC power cords to CPU/IO modules 0 and 1 at the same time.
7. Confirm that PRIMARY LED of CPU/IO module 0 goes on after a while.
If PRIMARY LED of CPU/IO module 1 is lit, disconnect AC power cords from both CPU/IO modules, wait for 30 seconds, and connect them at the same time.
8. When the POWER LEDs on CPU/IO modules 0 and 1 starts blinking, press the POWER switch to turn on the server.
9. If the following warning message appears, press the POWER switch to power off the server.
(POST proceeds even when the warning message is displayed.)
WARNING
8006: System configuration data cleared by Jumper.
10. Disconnect AC power cords from CPU/IO modules 0 and 1.
11. Remove CPU/IO module 0, and remove its top cover.
12. Change jumper switch setting to its original position (Protect).
13. Assemble the CPU/IO module 0.
14. Connect AC power cords to CPU/IO modules 0 and 1 at the same time.
15. Confirm that PRIMARY LED of CPU/IO module 0 goes on after a while.
If PRIMARY LED of CPU/IO module 1 is lit, disconnect AC power cords from both CPU/IO modules, wait for 30 seconds, and connect them at the same time.
16. When the POWER LEDs on CPU/IO modules 0 and 1 starts blinking, press the POWER switch to turn on the server.
17. When the following message appears, press the <F2> key 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.
See *Chapter 2 (5.4 CPU/IO Module)*.
3. Confirm the position of Clear Password Jumper.
4. Change jumper switch to "PASS CLR" position.
5. Assemble the CPU/IO module 0.
6. Connect AC power cords to CPU/IO modules 0 and 1 at the same time.
7. Confirm that PRIMARY LED of CPU/IO module 0 goes on after a while.
If PRIMARY LED of CPU/IO module 1 is lit, disconnect AC power cords from both CPU/IO modules, wait for 30 seconds, and connect them at the same time.
8. When the POWER LEDs on CPU/IO modules 0 and 1 starts blinking, press the POWER switch to turn on the server.
9. If the following warning message appears, press the POWER switch to power off the server.
(POST proceeds even when the warning message is displayed.)
WARNING
8007:SETUP Menu Password cLeared by Jumper.
10. Disconnect AC power cords from CPU/IO modules 0 and 1.
11. Remove CPU/IO module 0, and remove its top cover.
12. Change jumper switch setting to its original position (Protect).
13. Assemble the CPU/IO module 0.
14. Connect AC power cords to CPU/IO modules 0 and 1.

11. System Diagnostics

The System Diagnostics runs several tests on the server to check if the server works normally.

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 and external I/O devices (e.g., Fibre Channel and iStorage). Executing the system diagnostics with them connected may affect the network or the system that is running.

Tips

On checking hard disk drives, no data is written to the disk.

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

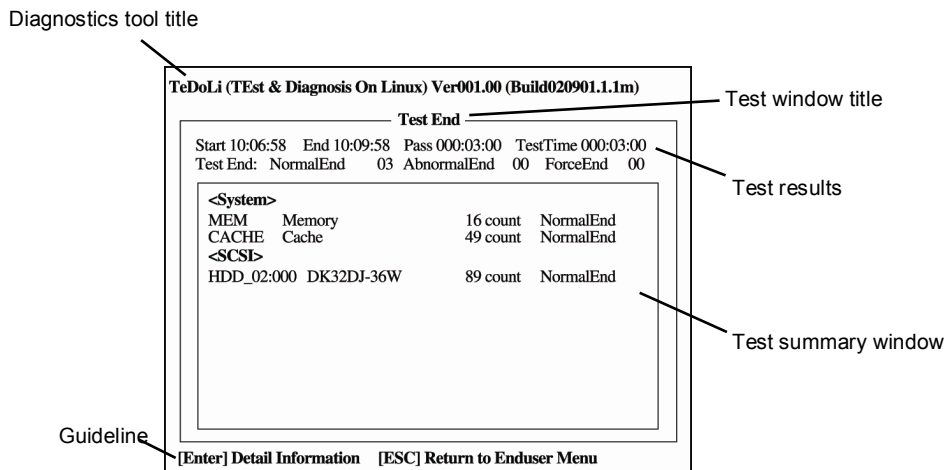
Note

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

2. Select **Test and diagnostics**.
3. Select **End-User Mode (Basic)** to start System Diagnostics. This process takes about three minutes. When the diagnostics is completed, the screen display changes as shown below.

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

Supervisor-Mode is intended for maintenance personnel.

**Diagnosics 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.

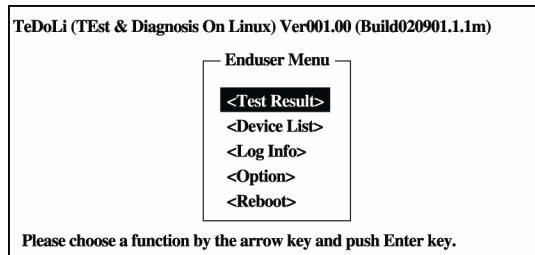
Test summary window

Shows the results of each test. Move the cursor and press <Enter> key 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> key. Take notes about the error message that has been output to the Detail Information screen and contact the store where you purchased the product or your maintenance service company.

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

5. 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 maintenance, failure analysis, and the settings of the server.

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> key while the message below is displayed.

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

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

Off-line TOOL MENU
Maintenance Utility
BMC Configuration
Exit

4. Choose **Maintenance Utility** or **BMC Configuration** to start each tool.
See the next section "12.2 Features of Offline Tools" for more information.

12.2 Features of Offline Tools

The offline Tools offer the following features.

Note

Disable RDX by setting RDX to hibernate mode before starting the offline tools.

Off-line Maintenance Utility

The Off-line Maintenance Utility is started when Maintenance Utility is selected. The 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, the Off-line Maintenance Utility can be used to check the cause of the failure.

Note

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

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

- IPMI Information Viewer
Displays System Event Log (SEL), Sensor Data Record (SDR), and Field Replaceable Unit (FRU) in Intelligent Platform Management Interface(IPMI) and also back up such logs.
Using this feature, system errors and events can be investigated to locate the component to be replaced. You can also clear the SEL area, and specify the operation when the SEL area becomes full.

Tips

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

For the CPU/IO module on opposite side, the following message 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 Baseboard Management Controller (BMC) and remote control functions by PC for Management.
See *Chapter 3 (2. BMC Configuration)* for more information.

Configuring and Upgrading the System

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

1. Disk Operations

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

2. Duplex LAN Configuration

Describes how to configure duplex LAN.

3. Configuring Video Mode

Describes how to change video mode settings.

4. Service Programs

Describes service programs used for the server.

5. Installing Optional Devices

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

1. Disk Operations

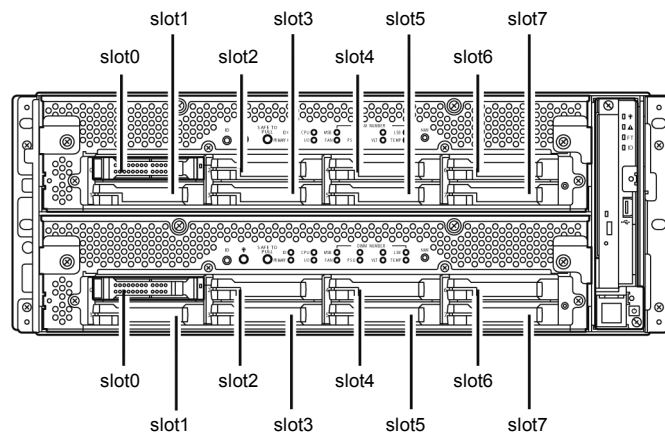
This server duplexes disks to secure data by using software. This section describes operations such as configuration of dual settings to disks and replacement of disks.

Important

- It is recommended to create only system partitions on the hard disk drive containing the OS.
- When you create a partition other than system partitions on the disk containing the OS, note the following:
If you reinstall the OS, the entire area of disk will be cleared. If there is any data partition other than the system partition, the data must be backed up before reinstalling the OS.
- If you remove the hard disk drive from the system and then insert it, wait a 30 seconds or more after remove it.

1.1 Available Disk Configuration

RAID must be configured for all the internal hard disk drives in this server. As shown in the table below, the internal hard disk drive redundancy is configured by software RAID with the internal hard disk drives of corresponding slots.



Slots corresponding to the mirroring process

Corresponding slots
CPU/IO module 0 slot 0 ↔ CPU/IO module 1 slot 0
CPU/IO module 0 slot 1 ↔ CPU/IO module 1 slot 1
CPU/IO module 0 slot 2 ↔ CPU/IO module 1 slot 2
CPU/IO module 0 slot 3 ↔ CPU/IO module 1 slot 3
CPU/IO module 0 slot 4 ↔ CPU/IO module 1 slot 4
CPU/IO module 0 slot 5 ↔ CPU/IO module 1 slot 5
CPU/IO module 0 slot 6 ↔ CPU/IO module 1 slot 6
CPU/IO module 0 slot 7 ↔ CPU/IO module 1 slot 7

Important

- While the status of each RAID device is RESYNC, RECOVERY, CHECK or REPAIR, do not insert/remove hard disk drive, power off or restart the system. Wait until the status turns to DUPLEX. Check the status of RAID device using the `ftdiskadm` command. See the Installation Guide for details.
- Use only the hard disk drives specified by NEC. There is a risk of hard disk drive as well as the server failure when you install a third-party hard disk drive. Use two, paired hard disk drives of the same model to configure the hard disk drive redundancy. Ask your sales representative for the hard disk drive appropriate to this server.

The operation such as mounting for a partition of internal hard disk drives must be performed for the RAID device (md) that is configured by Software RAID but not for partition.

For the `ftdiskadm` command described later in this document, slot numbers of internal hard disk drives are allocated as follows;

Slot number of hardware	Slot number used in <code>ftdiskadm</code>
Slot 0 (CPU/IO module 0)	Slot 1
Slot 1 (CPU/IO module 0)	Slot 2
Slot 2 (CPU/IO module 0)	Slot 3
Slot 3 (CPU/IO module 0)	Slot 4
Slot 4 (CPU/IO module 0)	Slot 5
Slot 5 (CPU/IO module 0)	Slot 6
Slot 6 (CPU/IO module 0)	Slot 7
Slot 7 (CPU/IO module 0)	Slot 8
Slot 0 (CPU/IO module 1)	Slot 9
Slot 1 (CPU/IO module 1)	Slot 10
Slot 2 (CPU/IO module 1)	Slot 11
Slot 3 (CPU/IO module 1)	Slot 12
Slot 4 (CPU/IO module 1)	Slot 13
Slot 5 (CPU/IO module 1)	Slot 14
Slot 6 (CPU/IO module 1)	Slot 15
Slot 7 (CPU/IO module 1)	Slot 16

1.2 Replacing Failed Hard Disk Drives

The following describes how to locate and replace the failed hard disk drive. Replace a hard disk drive while the CPU/IO module 0 and 1 are powered on.

1.2.1 How to Locate Failed Disks

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

Important This must be operated by root user.

1. In the `ftdiskadm` command, select and execute [1 List RAID Arrays].
The information on each RAID device (md) is displayed.
2. Identify the failed disk from the displayed information.
If "F" is added to Member column, it indicates that an error occurred on the partition of that hard disk drive.
The number enclosed with brackets indicates a slot number telling you which partitions of the hard disk drive is having a problem.

The following is an example when a failure occurred on the internal hard disk drive in the slot 9 (Slot 0 of CPU/IO module 1).

```
# ftdiskadm

Command action
 1 List RAID Arrays
 2 List Internal Disks
 3 Make Mirroring Arrays (RAID1)
 4 Repair Mirroring Arrays (RAID1)
 5 Delete Mirroring Arrays (RAID1)
 6 Remove Disk Partitions (RAID1)
 7 Make Striping Array (RAID1+0)
 8 Delete Striping Array (RAID1+0)
 c Configurations
 q Quit

Command: 1

[List RAID Arrays]

Name Partition (Label) Status Member
-----
< Mirroring Array (RAID1) >
md0 /boot (-) DUPLEX (1)sda1 (9)sdi1
md1 /var/crash (-) DUPLEX (1)sda2 (9)sdi2
md2 swap (-) SIMPLEX (1)sda3 F(9)sdi3
md3 / (-) DUPLEX (1)sda5 (9)sdi5
```

1.2.2 Restoring the redundant configuration

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

Important

- This must be operated by root user.
- While the replaced disk is restoring to the redundant configuration, do not stop/restart the system when the reconfigured RAID device is in RECOVERY state. Wait until their status turns to DUPLEX. Note that the wait time becomes long in proportion to the capacity of the hard disk drive.

1. Select [6 Remove Disk Partitions (RAID1)] in `ftdiskadm`, specify the slot number you want to isolate from RAID configuration for replacement.
2. Remove the hard disk drive from the system, and then, insert a new disk.
3. Wait approximately five minutes until the system automatically performs resynchronization.
4. If the system does not perform resynchronization automatically in Step 3, recover RAID configuration manually by selecting [4 Repair Mirroring Arrays (RAID1)] in `ftdiskadm`.

The following is an example of the procedure from isolating the hard disk drive in slot 9 (Slot 0 of CPU/IO module 1) through restoring redundancy.

```
# ftdiskadm

Command action
 1 List RAID Arrays
 2 List Internal Disks
 3 Make Mirroring Arrays (RAID1)
 4 Repair Mirroring Arrays (RAID1)
 5 Delete Mirroring Arrays (RAID1)
 6 Remove Disk Partitions (RAID1)
 7 Make Striping Array (RAID1+0)
 8 Delete Striping Array (RAID1+0)
 c Configurations
 q Quit

Command: 6 ----- (*1)

[Remove Disk Partitions (RAID1)]
* Which SCSI SLOT? [1-16] 9

mdadm : hot removed /dev/sdi5
mdadm : hot removed /dev/sdi3
mdadm : hot removed /dev/sdi2
mdadm : hot removed /dev/sdi1
```

*1 Isolate the hard disk drive specified by slot number from the redundant configuration.


```

Command action
 1 List RAID Arrays
 2 List Internal Disks
 3 Make Mirroring Arrays (RAID1)
 4 Repair Mirroring Arrays (RAID1)
 5 Delete Mirroring Arrays (RAID1)
 6 Remove Disk Partitions (RAID1)
 7 Make Striping Array (RAID1+0)
 8 Delete Striping Array (RAID1+0)
 c Configurations
 q Quit

Command: 1 ----- (*1)

[List RAID Arrays]

Name Partition (Label) Status Member
=====
< Mirroring Array (RAID1) >
md0 /boot (-) SIMPLEX (1)sda1
md1 /var/crash (-) SIMPLEX (1)sda2
md2 swap (-) SIMPLEX (1)sda3
md3 / (-) SIMPLEX (1)sda5

----- (*2)

Command action
 1 List RAID Arrays
 2 List Internal Disks
 3 Make Mirroring Arrays (RAID1)
 4 Repair Mirroring Arrays (RAID1)
 5 Delete Mirroring Arrays (RAID1)
 6 Remove Disk Partitions (RAID1)
 7 Make Striping Array (RAID1+0)
 8 Delete Striping Array (RAID1+0)
 c Configurations
 q Quit

```

*1 Make sure the specified hard disk drive is removed from RAID.

*2 After making sure that the specified disk is properly isolated from redundant configuration (partition of the disk specified as a member is not displayed), replace the disk.

After inserting a new disk, wait approximately 5 minutes until the system starts resynchronization. If the system does not perform resynchronization automatically, recover RAID manually

```

Command: 2 ----- (*1)

[List Internal Disk]

Slot  Name [use]      Information (/Vendor/Model/Serial)      Path
=====
  1   sda(sdq) [4]    AAA/BBB/CCC                             h0c0t0l0
  2   -
  3   -
  4   -
  5   -
  6   -
  7   -
  8   -
  9   sdi(sdr) [4]    AAA/BBB/DDD                             h1c0t0l0
 10   -
 11   -
 12   -
 13   -
 14   -
 15   -
 16   -

Command action
  1 List RAID Arrays
  2 List Internal Disks
  3 Make Mirroring Arrays (RAID1)
  4 Repair Mirroring Arrays (RAID1)
  5 Delete Mirroring Arrays (RAID1)
  6 Remove Disk Partitions (RAID1)
  7 Make Striping Array (RAID1+0)
  8 Delete Striping Array (RAID1+0)
  c Configurations
  q Quit

Command: 4 ----- (*2)

[Repair Mirroring Arrays (RAID1)]
* Which SCSI SLOT? [1-16] 9

Command action
  1 List RAID Arrays
  2 List Internal Disks
  3 Make Mirroring Arrays (RAID1)
  4 Repair Mirroring Arrays (RAID1)
  5 Delete Mirroring Arrays (RAID1)
  6 Remove Disk Partitions (RAID1)
  7 Make Striping Array (RAID1+0)
  8 Delete Striping Array (RAID1+0)
  c Configurations
  q Quit

```

*1 Make sure that the new disk is recognized by the system.

*2 Run this command to restore the redundant configuration manually if the system does not start automatic resynchronization.

```

Command: 1 ----- (*3)

[List RAID Arrays]

Name Partition (Label) Status Member
=====
< Mirroring Array (RAID1) >
md0 /boot (-) RECOVERY(73.2%) (1)sda1 R(9)sdi1
md1 /var/crash (-) RESYNC (1)sda2 R(9)sdi2
md2 swap (-) RESYNC (1)sda3 R(9)sdi3
md3 / (-) RESYNC (1)sda5 R(9)sdi5

----- (*4)

Command action
 1 List RAID Arrays
 2 List Internal Disks
 3 Make Mirroring Arrays (RAID1)
 4 Repair Mirroring Arrays (RAID1)
 5 Delete Mirroring Arrays (RAID1)
 6 Remove Disk Partitions (RAID1)
 7 Make Striping Array (RAID1+0)
 8 Delete Striping Array (RAID1+0)
 c Configurations
 q Quit

Command: 1 ----- (*5)

[List RAID Arrays]

Name Partition (Label) Status Member
=====
< Mirroring Array (RAID1) >
md0 /boot (-) DUPLEX (1)sda1 (9)sdi1
md1 /var/crash (-) DUPLEX (1)sda2 (9)sdi2
md2 swap (-) DUPLEX (1)sda3 (9)sdi3
md3 / (-) DUPLEX (1)sda5 (9)sdi5

```

*3 Check if the resynchronization process is started.

*4 Perform restoration (RECOVERY) to each RAID devices (md). After a while, check the Status with the command listed below. "RESYNC" shows it is waiting to be restored. "R" on the left side of the Member indicates the disk partition is either waiting to be restored or is in the process of restoring.)

*5 When each RAID device Status is DUPLEX, the RAID configuration is restored normally. This ends the disk replacement procedure.

2. Duplex LAN Configuration

The server builds duplex LAN configuration by using onboard and additional LAN adapters.

2.1 Overview

For duplicating LAN, the mode for bonding is used.

The default setting of bonding is active-backup(mode=1).

2.2 Rules of Duplex Configuration on This Server

For this server, 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.

PCI slot and network interface name

PCI slot	Port	CPU/IO module 0	CPU/IO module 1
1G LAN connector	#1	eth100600 (1)	eth110600 (1)
	#2	eth100601 (2)	eth110601 (2)
10G LAN connector *	#1	eth101200 (3)	eth111200 (3)
	#2	eth101201 (4)	eth111201 (4)
PCI slot 1	#1	eth100100 (5)	eth110100 (5)
	#2	eth100101 (6)	eth110101 (6)
PCI slot 2	#1	eth100200 (7)	eth110200 (7)
	#2	eth100201 (8)	eth110201 (8)
PCI slot 3 *	#1	eth100300 (9)	eth110300 (9)
	#2	eth100301 (10)	eth110301 (10)
PCI slot 4 *	#1	eth100400 (11)	eth110400 (11)
	#2	eth100401 (12)	eth110401 (12)

* R320c-E4 model does not have 10G LAN connector, PCI slot 3, and PCI slot 4.

Tips

The number enclosed with brackets in the CPU/IO module column is slot numbers allocated by vndctl command described later. The slot numbers are allocated one-to-one to each interface pair.

2.3 Cautions on Network Configuration

Do not configure network settings with the system-config-network command that comes with the OS.

There is an issue of the bonding interface network's configuration not updated properly; there is also a known issue of /etc/hosts file being edited illegally.

If you implement configurations on IP address, subnet mask or default gateway on the bonding interface, you must use the vndctl command described later. For other network configuration items, manually configure them by referring to such an online manual page of the man command.

2.4 Dual Configuration Setup

The following describes the procedure to set dual LAN configuration. The following example is used.

<configuration detail>

Slot number: 5

Network interface name (CPU/IO module 0) : eth100100

Network interface name (CPU/IO module 1) : eth110100

IP address: 192.168.0.101

Subnet mask: 255.255.255.0

Default gateway: 192.168.0.1

Important

- You must perform this operation as a root user.
- Stop the running interface with the following command before the setup, then go to Step 2.
vndctl down <slot number>

1. Run the following command to construct the network interfaces (eth100100 and eth110100) corresponding to slot 5 as the bonding interface.

```
# vndctl add 5
```

2. Run the following command to configure the network settings (the parts with * are to be specified by a user) on the bonding interface that has been constructed. For default gateway, you can omit the process by pressing the <ENTER> key without specifying anything.

```
# vndctl config 5
[Virtual Network Setting]
*Boot Protocol? [none/dhcp/bootp] none
*IP address? 192.168.0.101
*Netmask? 255.255.255.0
*Default gateway (IP)? 192.168.0.1

*Are you sure to set it? [y/n] y

DEVICE=bond2
ONBOOT=yes
BOOTPROTO=none
IPADDR=192.168.0.101
NETMASK=255.255.255.0
GATEWAY=192.168.0.1
BONDING_OPTS="miimon=100 mode=1"
```

3. Run the following command to activate the bonding interface that has been constructed.

```
# vndctl up 5
```

4. Run the following command to check the status of the bonding interface that has been constructed.

```
# vndctl status

--Virtual Network Status--
BondingDevice Slot Status InetAddress RXErrors TXErrors Collisions
bond0          1  ONLINE -                0         0         0
bond1          2  ONLINE -                0         0         0
bond2          5  ONLINE 192.168.0.101    0         0         0
bond3          -  OFFLINE -                0         0         0
bond4          -  OFFLINE -                0         0         0
bond5          -  OFFLINE -                0         0         0
bond6          -  OFFLINE -                0         0         0
bond7          -  OFFLINE -                0         0         0
bond8          -  OFFLINE -                0         0         0
bond9          -  OFFLINE -                0         0         0
bond10         -  OFFLINE -                0         0         0
bond11         -  OFFLINE -                0         0         0

Slot          RealDevice Status          Interface LinkState LinkSpeed
1    top      eth100600 DUPLEX          UP        LINK      1000Mb/s FD
     bottom  eth100600 DUPLEX          UP        LINK      1000Mb/s FD
2    top      eth100601 DUPLEX          UP        LINK      1000Mb/s FD
     bottom  eth110601 DUPLEX          UP        LINK      1000Mb/s FD
5    top      eth100100 DUPLEX          UP        LINK      1000Mb/s FD
     bottom  eth110100 DUPLEX          UP        LINK      1000Mb/s FD
```

When bond2 (bond 0 and bond 1 are configured by default.) is configured for the slot 5 and as shown above, and the status of each network interface (eth100100, eth110100) is DUPLEX, duplication is successfully completed.

2.5 Deleting dual LAN configuration

Follow the steps below to delete the dual LAN configuration.

1. Run the following command to stop the bonding interfaces corresponding to the slot number <slot>.

```
# vndctl down <slot>
```

2. Run the following command to delete the bonding interfaces corresponding to the slot number <slot>.

```
# vndctl del <slot>
```

2.6 Using Shared Directory with Samba

Add `directio` option to mount command when you use the share of Windows or Samba of Unix OS.

<Example of mount command >

```
# mount -t cifs //<machine name>/<share name> -o username=<user name>,directio <mount point>
```


3. Configuring Video Mode

You cannot use `xrandr` to change the resolution because the `xrandr` function is not supported. You cannot change the resolution and the number of colors from application menu due to hardware specification. Take the steps below to change resolution and number of colors.

1. Login with the user having root privilege, and open `/etc/X11/xorg.conf`.

Important `xorg.conf` is a very important file for the X Window System. It is recommended to make a backup file because corrupting `xorg.conf` can result in failure to start up the X Window System in the worst case. When you make a backup file, use a different file name for the backup since the file name `/etc/X11/xorg.conf.backup` is used by the system.

2. Modify the following configuration in `xorg.conf`.

In the figure below, the resolution is set to 1024x768, refresh rate is set to 70Hz, and the number of colors is set to 16bpp.

<Changing the numbers of colors>

Change the value indicated by (1) to the number of colors you want (8bpp, 16bpp, or 24bpp).

<Modify the resolution>

Select a combination of resolution and refresh rate among the list shown by (3), enter the value in Modes shown by (2).

```
Section "Screen"
    Identifier "Screen0"
    Device "Videocard0"
    Monitor "Monitor0"
    DefaultDepth 16
    SubSection "Display"
        Viewport 0 0
        Depth 16
        # Choose one 16 bpp video mode from the list below
        Modes "1024x768 @ 70Hz"
        # Modes "1024x768 @ 75Hz" "1024x768 @ 85Hz" "1024x768 @ 70Hz" "1024x768 @ 60Hz"
        "800x600 @ 85Hz" "800x600 @ 75Hz" "800x600 @ 72Hz" "800x600 @ 60Hz" "1280x1024 @ 85Hz"
        "1280x1024 @ 75Hz" "1280x1024 @ 72Hz" "1280x1024 @ 60Hz" "1600x1200 @ 70Hz" "1600x1200 @ 60Hz"
        "640x480 @ 60Hz" "1280x1024 @ 70Hz" "1440x900 @ 60Hz" "1440x900 @ 75Hz" "1366x768 @ 60Hz"
    EndSubSection
    SubSection "Display"
        Viewport 0 0
        Depth 24
        # Choose one 24 bpp video mode from the list below
        Modes "1024x768 @ 75Hz"
        # Modes "1024x768 @ 75Hz" "1024x768 @ 85Hz" "1024x768 @ 70Hz" "1024x768 @ 60Hz"
        "800x600 @ 85Hz" "800x600 @ 75Hz" "800x600 @ 72Hz" "800x600 @ 60Hz" "1280x1024 @ 85Hz"
        "1280x1024 @ 75Hz" "1280x1024 @ 72Hz" "1280x1024 @ 60Hz" "1280x1024 @ 70Hz" "1600x1200 @ 60Hz"
        "1440x900 @ 60Hz"
    EndSubSection
    SubSection "Display"
        Viewport 0 0
        Depth 8
        # Choose one 8 bpp video mode from the list below
        Modes "1024x768 @ 60Hz"
        # Modes "1024x768 @ 60Hz" "800x600 @ 60Hz" "640x480 @ 60Hz" "1280x1024 @ 60Hz"
    EndSubSection
EndSection
```

3. If the X Window System is started, select Logout from the system menu to quit X Window System.
4. The mode is switched to the console mode (CUI), start up the X Window System by entering `"startx"`.

4. Service Programs

This server provides the following service programs in addition to the dedicated drivers.

Service program name
kdump
ft-dump_helper
ft-firstboot
ft-retrieveChipsetDumps
network
snmpd
rpcbind
ESMntserver
ESMamvmain
ESMftreport
ESMcmn
ESMfilesys
ESMIS
ESMps
ntagent

Important The programs listed in "Service program name" are necessary for the server operation. Do not stop these services.

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 safely. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- Do not disassemble, repair, or modify the server.
- Do not look into the optical disk 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 Server Control Software version (s).

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

1. Confirm the required ft Server 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 Server Control Software on your system.
3. After confirming that the version of ft Server Control Software is appropriate to the optional device, add the device onto the server.

For more information on how to verify the working ft Server Control Software version, refer to *Chapter 1 (2.11 Checking the ft Server 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 this server.

- With this server, optional 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 either of the following methods:
 - ft server utility of the NEC ESMPRO Agent
 - NEC ESMPRO Manager from the management PC on the network

After a new module is installed to the server, enable the module using the ft server utility or the NEC ESMPRO Manager.

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 (except SAS board).
- 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 ft server utility or the NEC ESMPRO Manager.

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 x 16-GB DIMMs) can be installed.
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 in addition to standard CPU.
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.

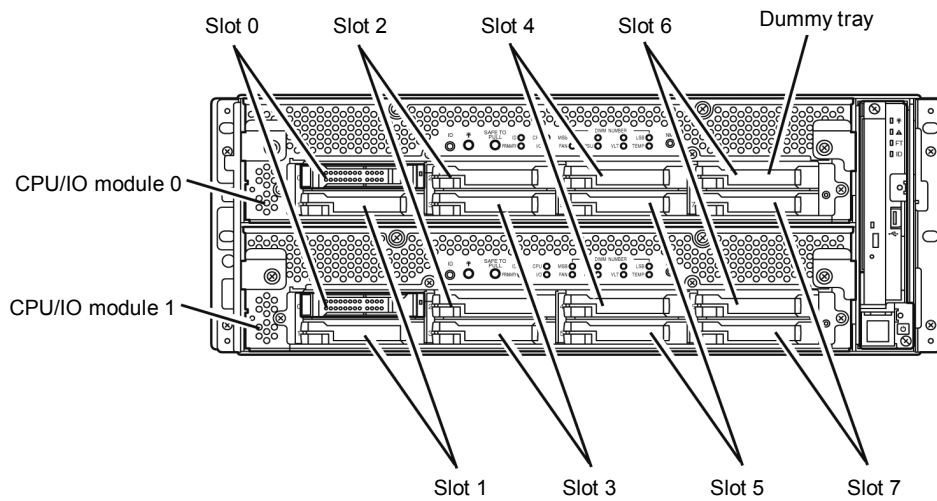
5.3 2.5-inch Hard Disk Drive

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 larger number on CPU/IO module 0/1, from slot 0 to slot through slot 7.

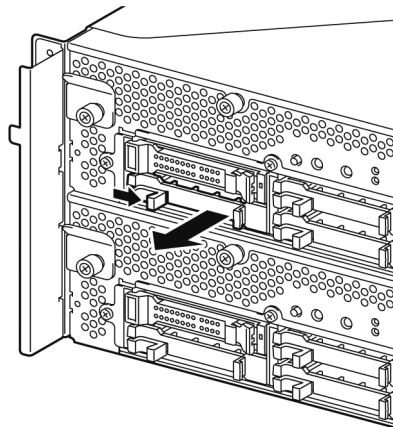
- Important**
- See Chapter 2 (5.1.2 Anti-static measures) and Chapter 2 (5.1.4 Preparing your system for upgrade) before starting installing or removing options.
 - You must mount two HDDs that form dual disk configuration before starting the OS.

Tips

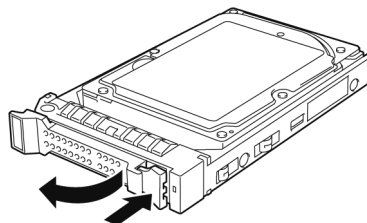
You can install a hard disk drive without shutting down the OS.
In this case, you can skip Step 1 "Shutdown the OS" and Step 8 "Press the POWER switch to power on".

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.



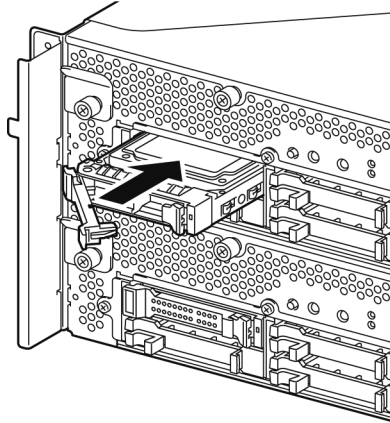
5. Unlock the hard disk drive.



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.



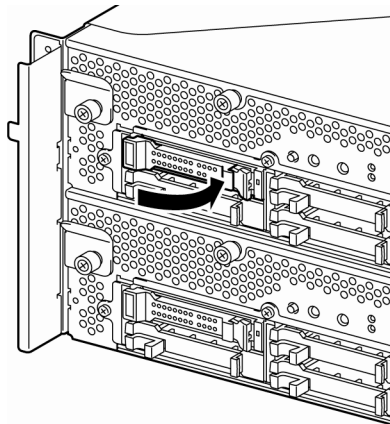
7. Slowly close the lever. When the lever is locked, you will hear a click sound.

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.

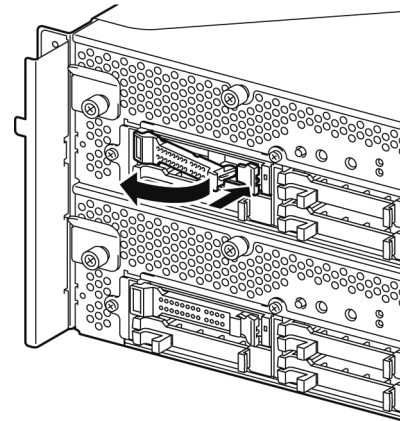
10. See *Chapter 2 (1. Disk Operations)* to set the dual disk configuration.

5.3.2 Removing 2.5-inch Hard Disk Drive

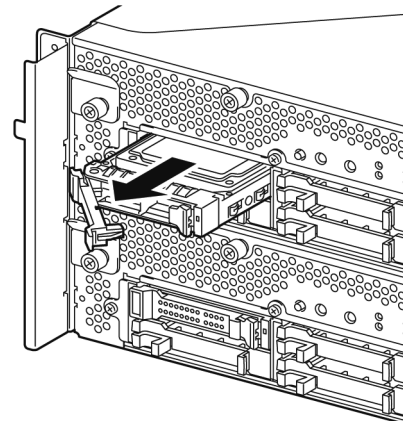
Follow the procedure below to remove the hard disk drive.

Important See *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 while the server is continuously running.

- Important**
- See *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.

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 according to *Chapter 2 (1.2 Replacing Failed Hard Disk Drives)* and *(5.3.2 Removing 2.5-inch Hard Disk Drive)*.
3. Follow 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 replacement 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 restore the duplex configuration according to *Chapter 2 (1. Disk Operations)* after formatting the disk physically.
As to physical format, see *Chapter 3 (3.3 Physical Formatting of the Hard Disk Drive)*.

4. Restore the redundant configuration.
See *Chapter 2 (1.2 Replacing Failed Hard Disk Drives)*.

5.4 CPU/IO Module

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

Important

- See *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., ft server utility or NEC ESMPRO Manager) 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 this end, use the ft server utility of the NEC ESMPRO Agent installed to your server or the **Information of server state/constitution** of the NEC ESMPRO Manager.

For the detailed procedure, see *Chapter 1 (4. Maintenance of the Server)*.

NEC ESMPRO Manager

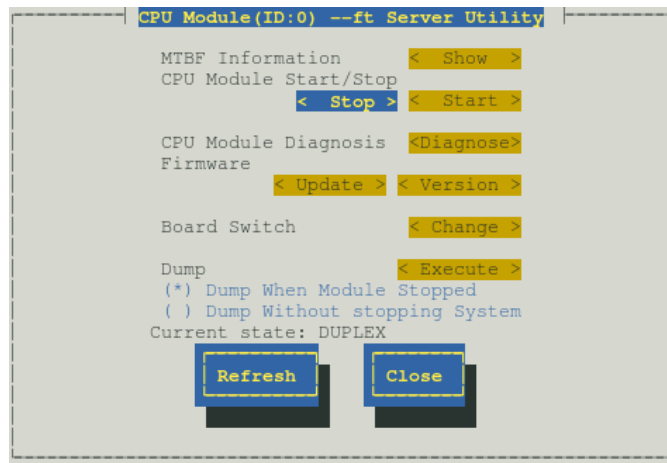
Select **ft System - CPU Module - CPU Module (to be removed) - Maintenance - Bring Up/Bring Down - Bring Down**.

The screenshot shows the NEC ESMPRO Manager web interface in a browser window. The breadcrumb navigation path is: root > Server > Constitution Information > ft System > CPU Module > CPU Module (D-1) > Maintenance. The left sidebar shows a tree view of the system hierarchy, with 'CPU Module (D-1)' selected. The main content area is divided into three tabs: 'Constitution', 'Setting', and 'Remote Control'. The 'Constitution' tab is active, displaying 'Information of server state/constitution'. On the right, there are three tables: 'MTBF Information', 'Diagnostics Information', and 'Operation'.

Item	Value	
MTBF Information		
Type	Use Threshold	
Threshold	-	
Current	-	
Faults	0	
Time of last fault	-	
Diagnostics Information		
Time of last run	01/26/2012 10:43:29 (+09:00)	
Result		
Message[1]	-	
Test Number[1]	-	
Operation		
Operation	Description	
Bring Up	Bring up the CPU Module.	Execute
Bring Down	Bring down the CPU Module.	Execute
Dump	Perform dump.	Execute
MTBF Clear	Clear the MTBF information.	Execute
Diagnostics	Run diagnostics of the CPU Module.	Execute

ft server utility

Select **ftServer - CPU Module - CPU Module (to be removed) - CPU Module Start/Stop – Stop**.

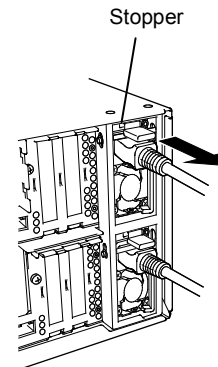


Repeat the steps above for the PCI module and confirm that the status of the CPU/IO module and the IO module (PCI module) are "**Removed**".

Tips

When removing CPU/IO module 0, select **Stop** for CPU module (ID:0) and PCI module (ID:10)

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.

**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.

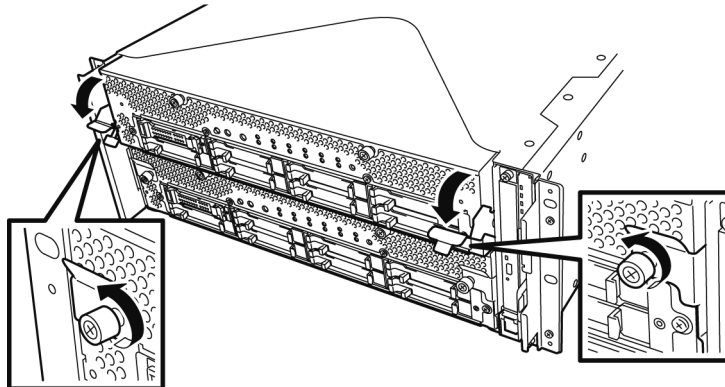
- Loosen the screws securing the CPU/IO module handle to press down the handle.

Important Before you pull out a CPU/IO module, check the rear of the server to make sure cables for peripheral equipment or network are disconnected.

If any cables are connected, keep a record of where the cables are connected and disconnect all cables from the module you are going to remove.

Tips

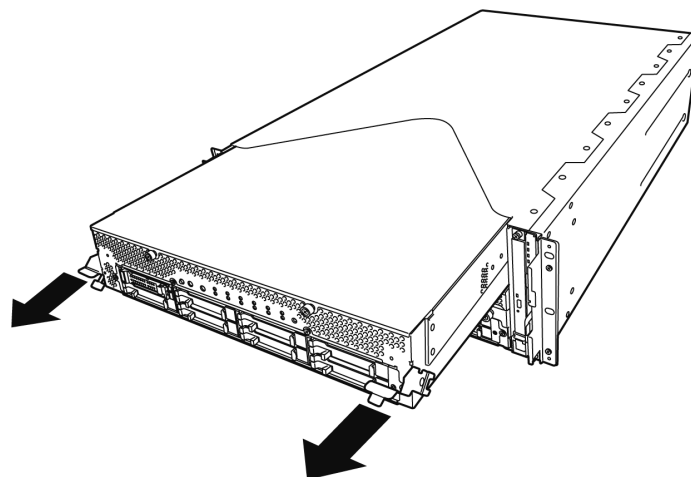
If you cannot disconnect the LAN cable easily, disconnect while pressing the latch with a slotted screwdriver.



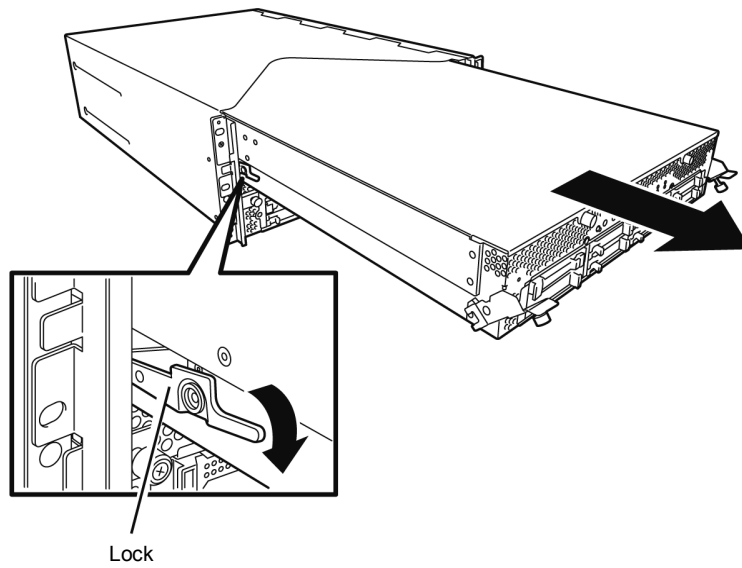
- Hold the black levers of the CPU/IO module and pull it off. Pull it off until it is locked and stopped.

Important

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



6. 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.



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.

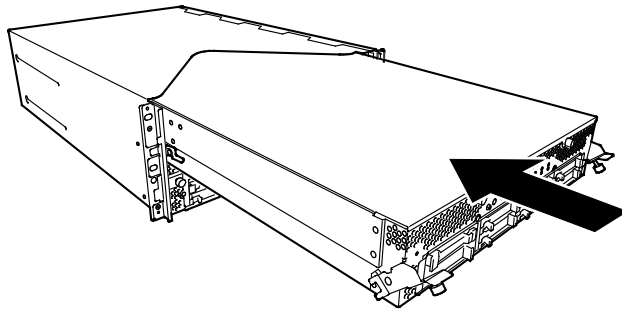
5.4.2 Installing CPU/IO Module

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

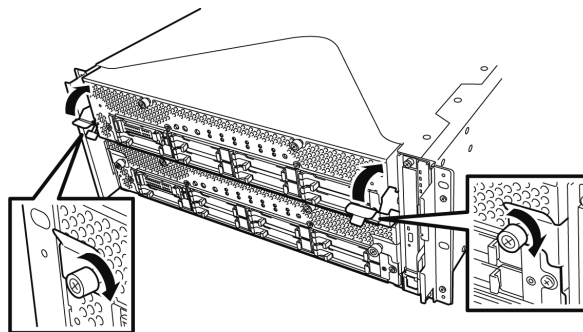
Important

- See *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 ft server utility or "Information of server state/constitution" of NEC ESMPRO Manager, 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 on motherboard in the CPU/IO module of the server.

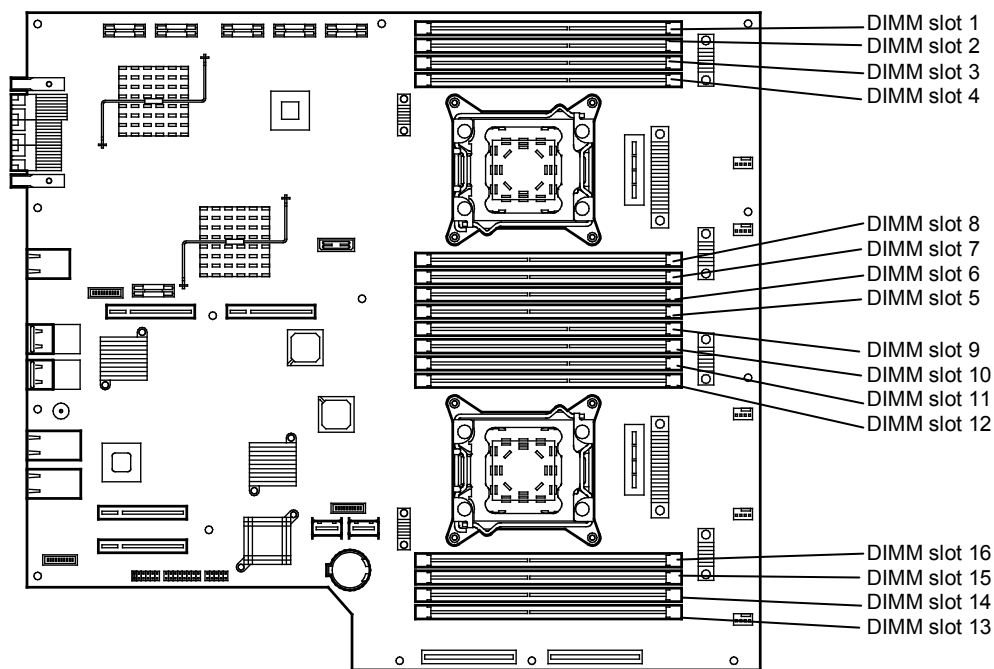
The motherboard of CPU/IO module has 16 sockets for DIMM.

Tips

- Maximum memory capacity depends on server model as follows:
Up to 256GB (16GB x 16)
- In the error messages and logs in POST, NEC ESM/PRO, or Off-line Maintenance Utility, 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.**
- **See 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.**



CPU/IO board in the CPU/IO module

Precautions

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

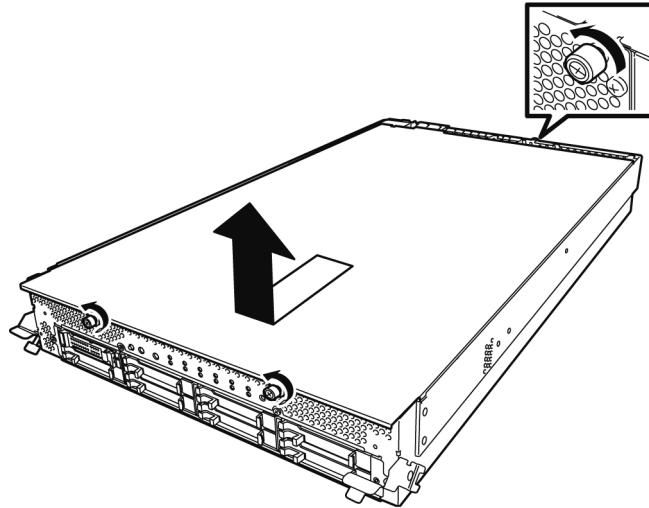
- DIMM 9 through 16 are available only when the processor #2 is installed.
- To install DIMM, install the product with the same model number to the same slots of the CPU/IO modules 0 and 1.
- See the following table to install additional DIMM.

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	

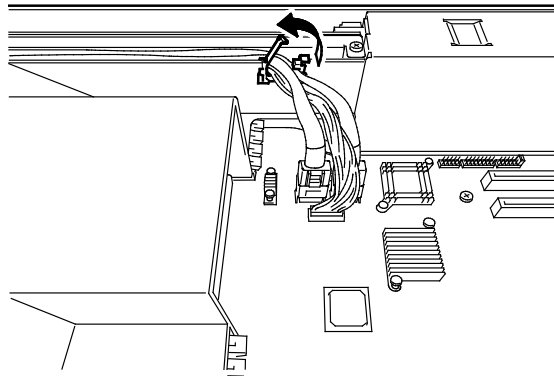
5.5.1 Installing DIMM

Follow the procedure below to install the DIMM.

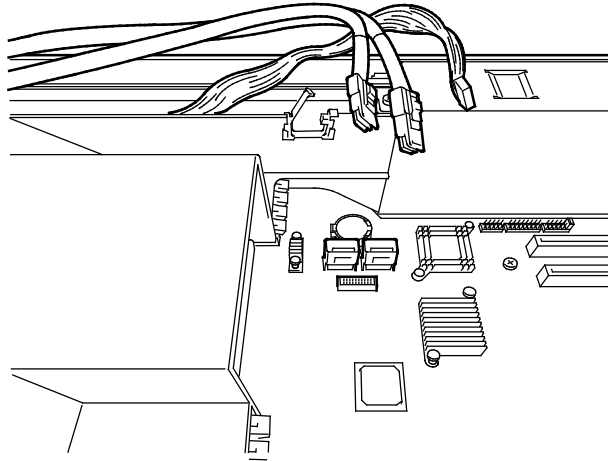
1. Shut down OS.
The server turns off automatically.
2. Disconnect the power cords from the outlets.
3. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
4. Remove three screws (two on the front and one on the rear), and remove the top cover of the CPU/IO module.



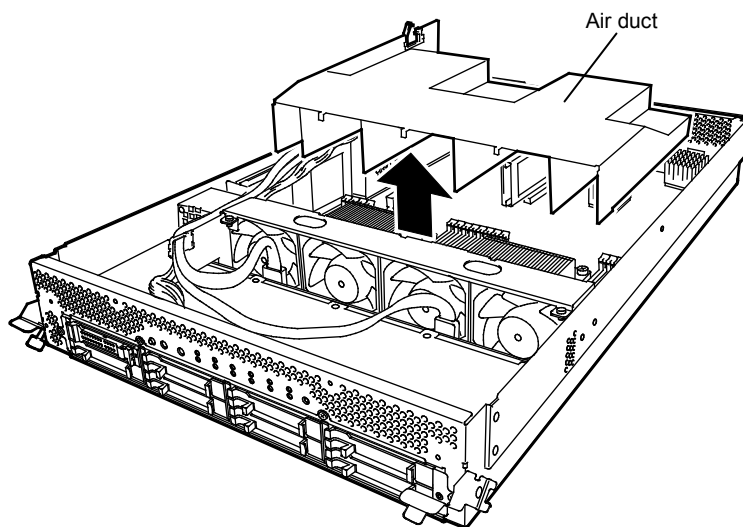
5. Open the cable clamp of air duct.



6. Disconnect cables.

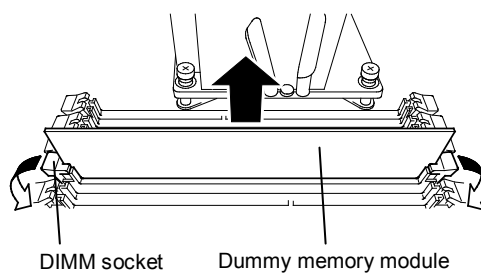


7. Remove the air duct.



8. Locate the socket you are mounting the DIMM.

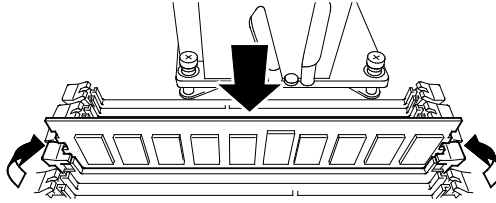
9. Remove the dummy memory module by opening the levers on both sides of the DIMM slot.



Important Keep and store the removed dummy memory module with care.

10. Insert a DIMM into the DIMM socket vertically.

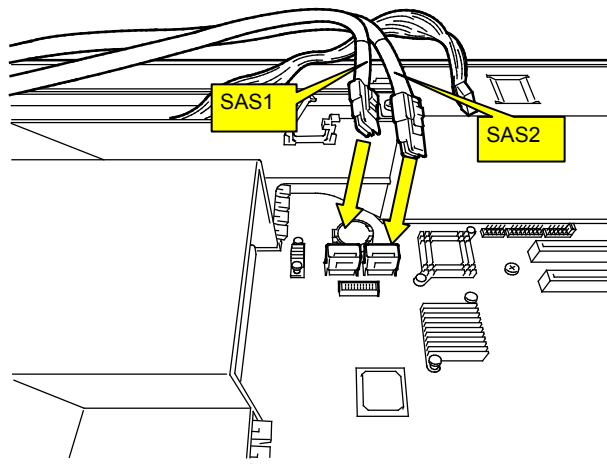
After the DIMM is completely inserted into the socket, the levers are automatically closed.



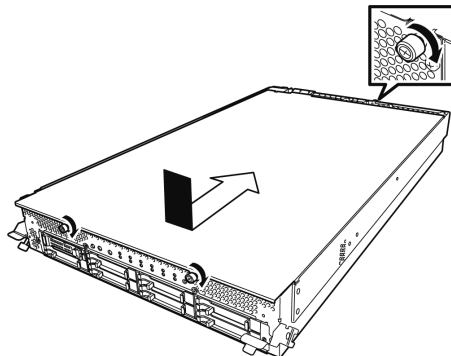
Note

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.



12. Place the top cover of the CPU/IO module and secure it with three screws.



13. See *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.

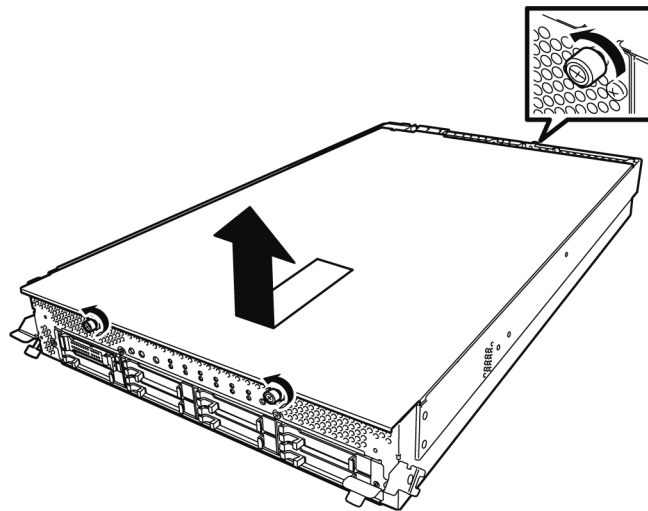
If POST displays an error message, write it down and see the POST error message list in *Chapter 1 (6.2 POST Error Message)*.

5.5.2 Removing DIMM

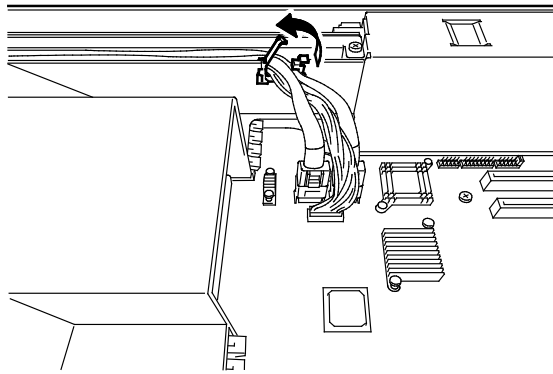
Follow the procedure below to remove the DIMM.

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

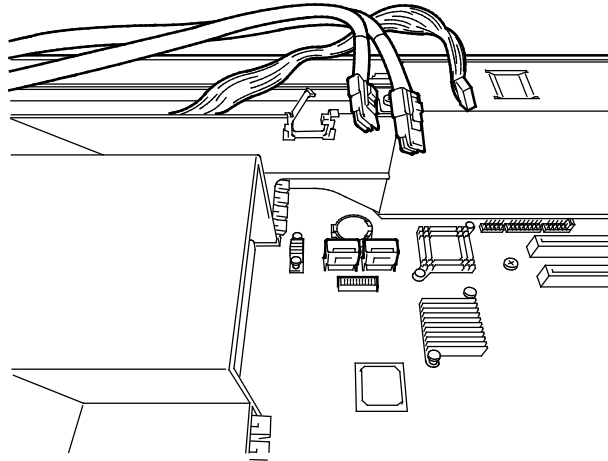
1. Shutdown OS.
The system turns off automatically.
2. Disconnect the power cords from the outlets.
3. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
4. Remove three screws (two on the front and one on the rear), and remove the top cover of the CPU/IO module.



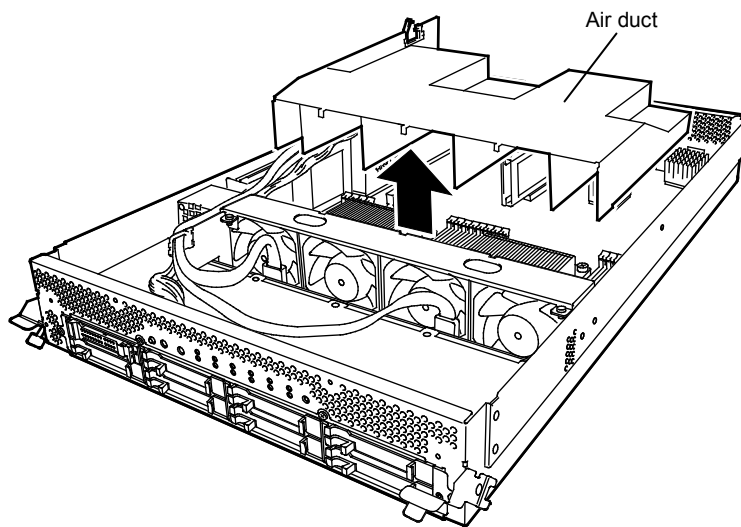
5. Open the cable clamp of air duct.



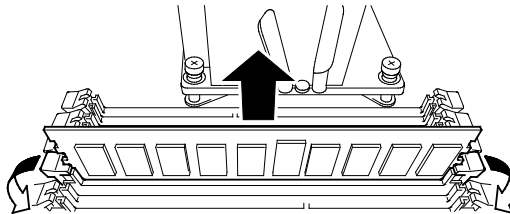
6. Disconnect cables.



7. Remove the air duct.

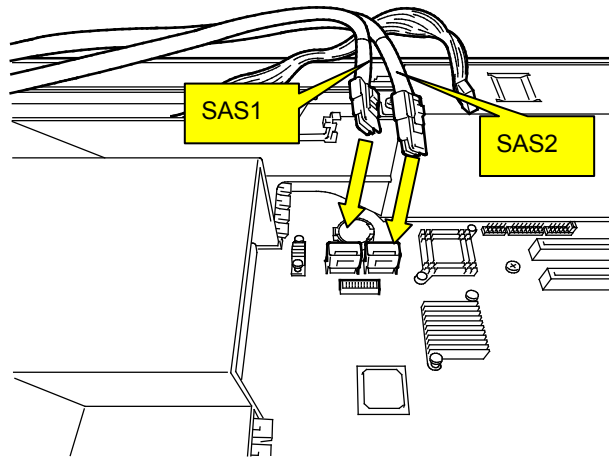


8. Open the levers attached on both sides of the socket of the DIMM to be removed. It will be unlocked and the DIMM can be removed.

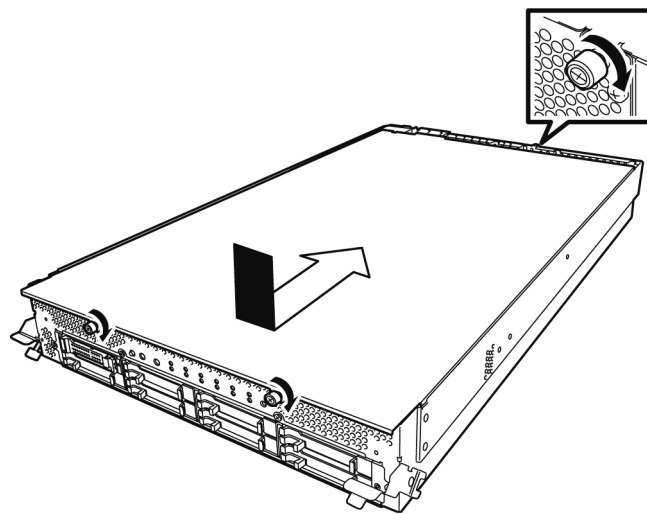


9. Attach the dummy memory module.

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. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
13. Connect the power cords.
14. Press the POWER switch to power on the server.
15. 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.

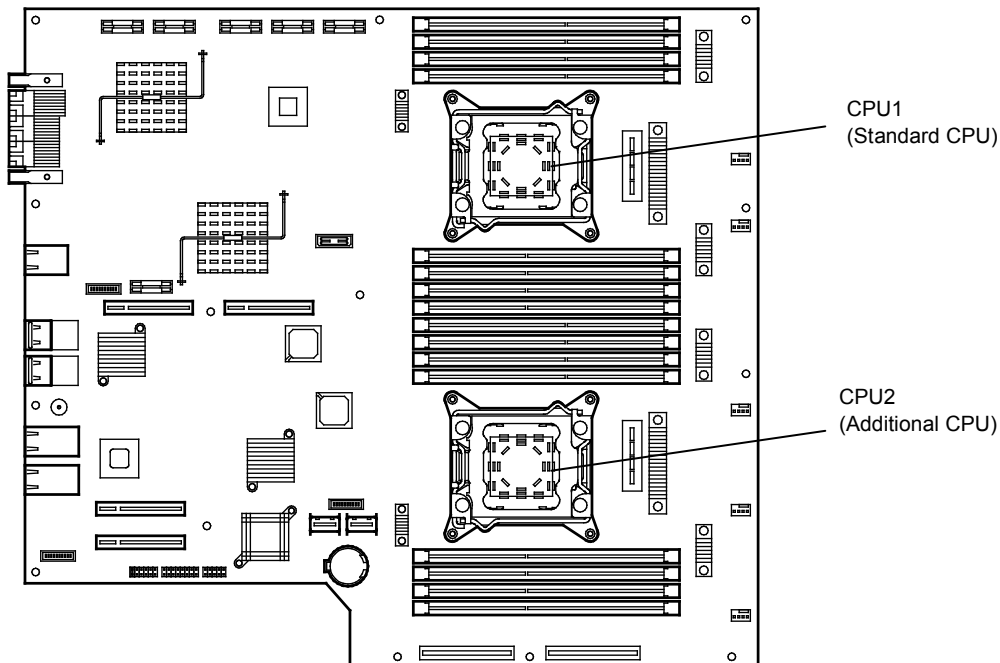
1. Identify the failed DIMM by viewing the memory slot error LED.
2. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
3. Replace the DIMM.
4. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
5. Start up the CPU/IO module using NEC ESMPRO Manager or ft server utility.

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.
- See 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.

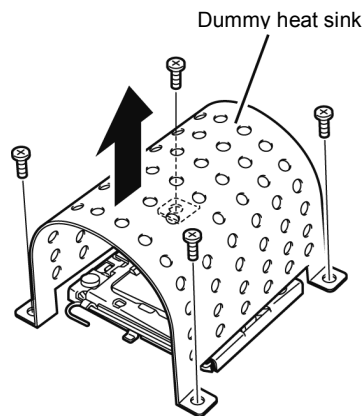


5.6.1 Installing CPU

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

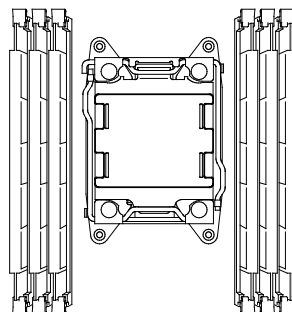
1. Shut down the OS.
The server is automatically powered off.
2. Disconnect the power cords from the outlets.
3. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
4. Remove the air duct according to *Chapter 2 (5.5.2 Removing DIMM)*.
5. Verify the location of the CPU socket.
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.

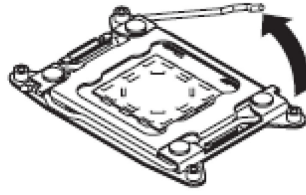


7. Remove the protective cover from processor (CPU) socket.

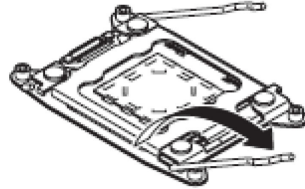
Important Keep and store the removed protective cover with care.



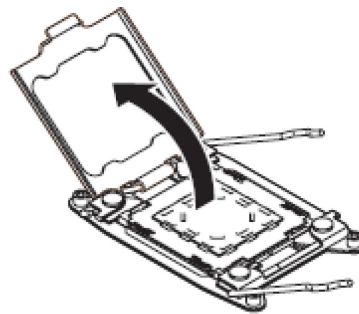
8. Push down the lever marked with "⇨ ① →" to unlatch from the hook, and open the lever until it stops.



9. Push down the lever marked with "← ① ⇩" to unlatch from the hook, and open the lever until it stops.



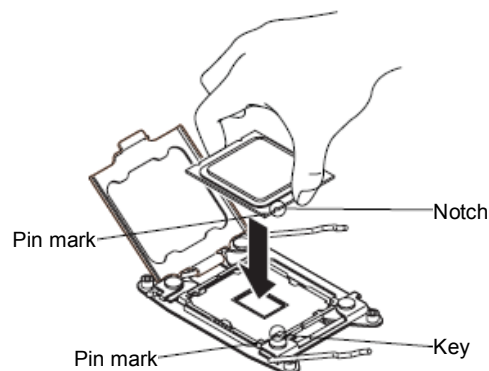
10. Lift the plate.



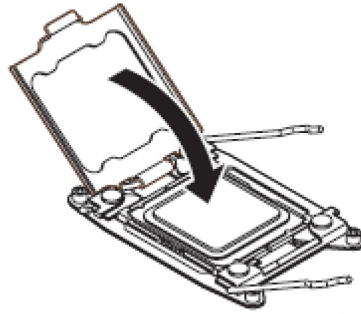
11. Place the CPU on the socket gently and carefully.
For easy installation, hold edges of CPU with your thumb and index fingers so that the notch is aligned with the key on the CPU socket.

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

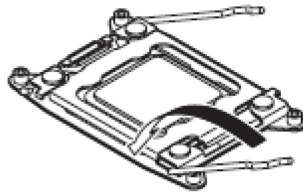
- Note**
- Insert the CPU while aligning the notch on the processor with the key on the CPU socket.
 - Bring down the CPU straight without tilting or sliding it in the socket.



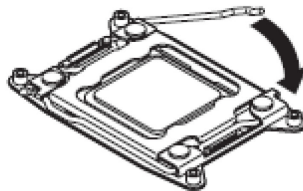
12. After pressing the CPU softly against the socket, and close the plate.



13. Fix the CPU by pushing down the lever marked with "← ①" "

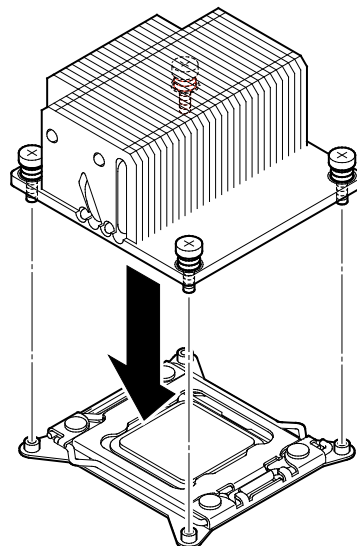


14. Fix the CPU by pushing down the lever marked with "⇨ ① →" "

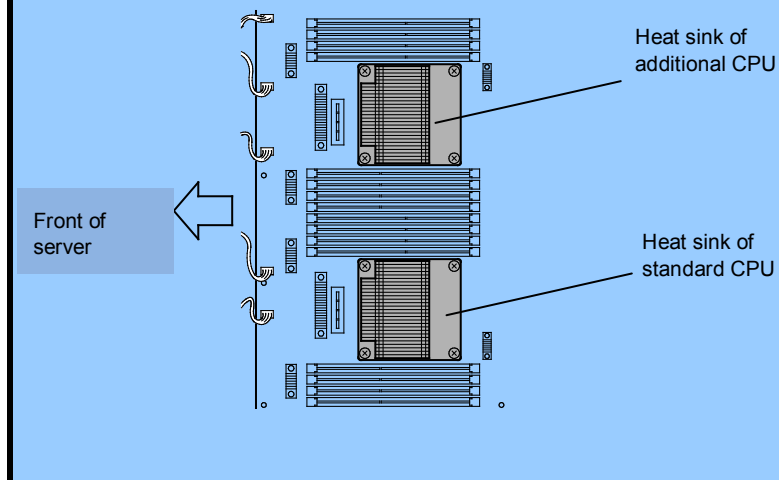


15. Place the heat sink on the CPU.

Important Do not touch the cooling sheet that is attached on the back of the heat sink with your hand.

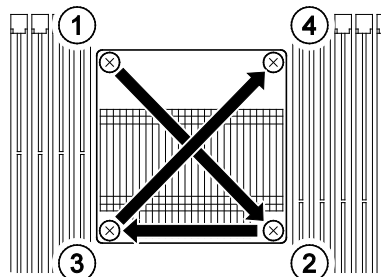


Important If you install additional CPU, ensure that the fins of the additional CPU's heat sink are in the same direction as those of the standard CPU.



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 according to *Chapter 2 (5.5.1 Installing DIMM)*.

18. See *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 Messages)*.

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 viewing Event Log.
2. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
3. Install the new heat sink and CPU.
4. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
5. Start the CPU/IO module from NEC ESMPRO Manager or ft server utility.

5.7 PCI Card

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

Important

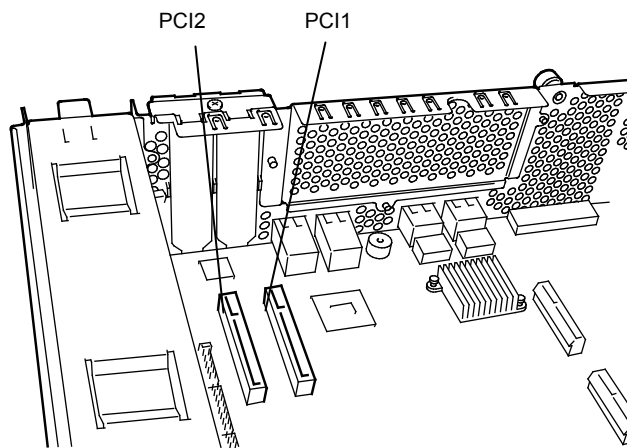
The PCI card is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the PCI card. Do not touch the PCI card terminals or onboard parts by a bare hand or place the PCI card directly on the desk.

See *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.

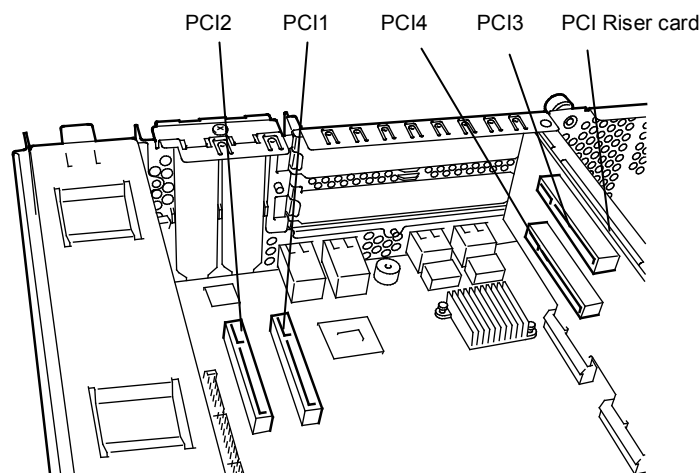
5.7.1 Precautions

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 PCI card of same type should be installed to the same slot in another group. This rule is applied to the case of removal.



R320c-E4 model (without PCI riser card)



R320c-M4 model model (with PCI 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
N8803-039	SAS board	○	○	*2

*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	PCIe 2.0 x4 lane	PCIe 2.0 x8 lane		
		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
N8803-039	SAS board	○	○	○	○	*2

*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 Card

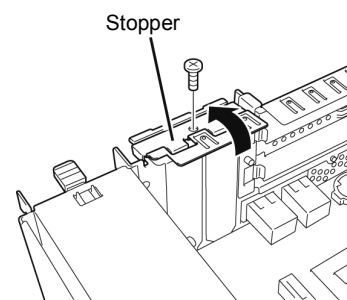
Follow the procedure below to install the board to be connected to the PCI card slot.

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 Card

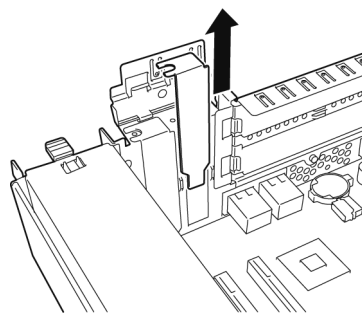
1. Shut down the OS.
2. The server is automatically powered off.
3. Disconnect the power cords from the outlets.
4. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
5. Remove one screw that secures the stopper and remove the stopper.



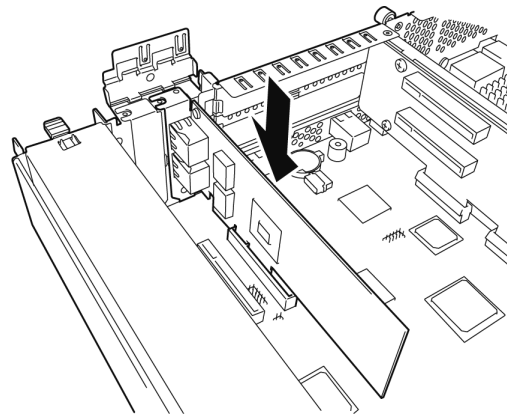
6. Verify the location of the CPU socket.
7. Remove the PCI bracket cover.

Important

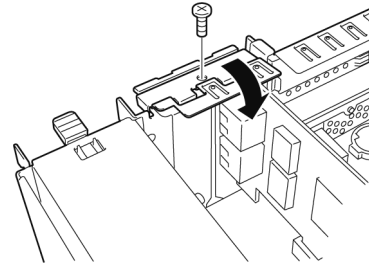
Keep and store the removed PCI bracket cover with care.



8. Install a PCI card in a PCI slot.



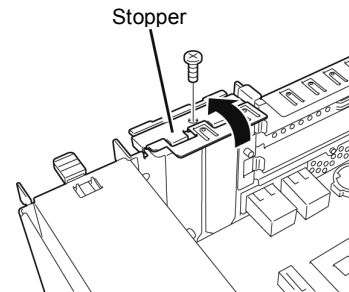
9. Install the stopper and secure it with one screw.



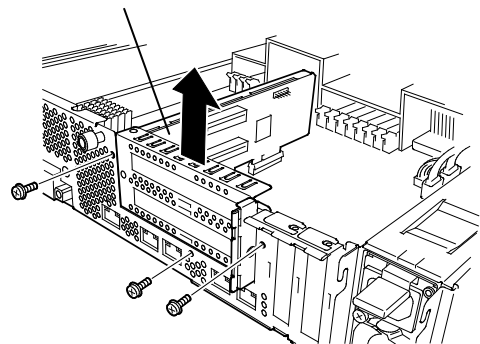
10. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
11. Connect the power cords.
12. Press the POWER switch to power on the server.
13. Verify that POST displays no error message.
If POST displays an error message, write it down and see the POST error message list in *Chapter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

(2) Installing Full Height PCI Card

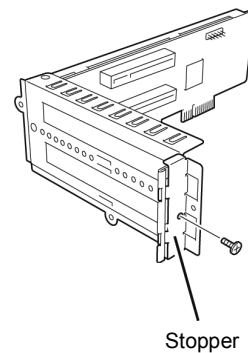
1. Shut down the OS.
The server is automatically powered off.
2. Disconnect the power cords from the outlets.
3. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
4. Remove one screw that secures the stopper and remove the stopper.



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

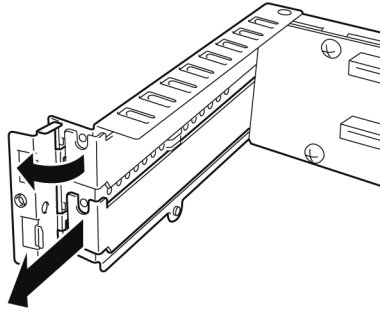


6. Remove one screw that secures the stopper and remove the stopper from the PCI riser Card.
7. Verify the location of the PCI slot.

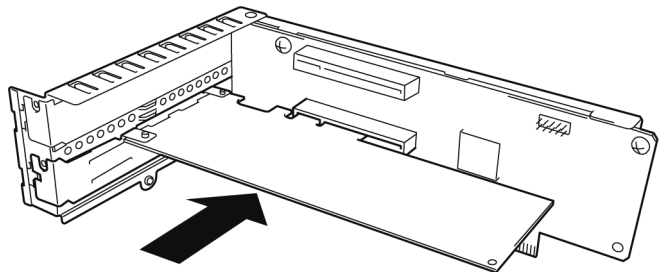


8. Remove the PCI bracket cover.

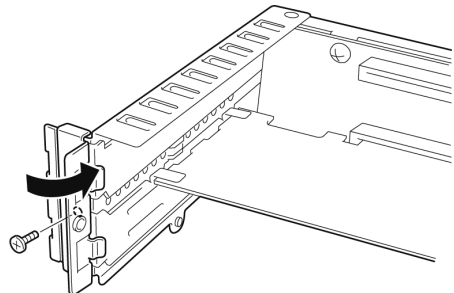
Important Keep and store the removed PCI bracket cover with care.



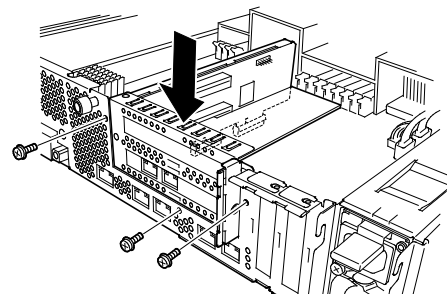
9. Install a PCI card in a PCI slot.



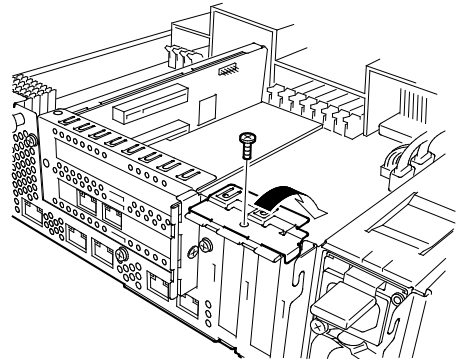
10. Install the stopper and secure it with one screw.



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



12. Install the stopper and secure it with one screw.



13. See *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)*.

5.7.3 Removing PCI Card

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

5.7.4 Replacing PCI Card

Follow the procedure below to replace the failed PCI card.

(1) N8803-039 SAS board

1. Identify the failed board by viewing syslog.
2. Remove the CPU/IO module according 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. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
6. Confirm that the PCI card is correctly recognized by POST and OS.

(2) N8803-038 Fibre Channel board set

1. Identify the failed board by viewing syslog.
2. Remove the CPU/IO module according 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. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
7. Confirm that the PCI card is correctly recognized by POST and OS.
8. Configure multi path according to *Chapter 2 (5.7.5 (2) N8803-038 Fibre Channel Board Set)*.

(3) 1000BASE-T board set (N8804-009), 10GBase-T 1ch board set (N8804-011)

1. Identify the failed board by viewing syslog.
2. Remove the duplex LAN according to *Chapter 2 (2.5 Deleting dual LAN configuration)*.
3. Remove the CPU/IO module according to *Chapter 2 (5.4.1 Removing CPU/IO Module)*.
4. Remove the PCI bracket, then remove the PCI card.
5. Replace the PCI card and secure it.
6. See *Chapter 2 (5.4.2 Installing CPU/IO Module)* and install the CPU/IO module.
7. Confirm that the PCI card is correctly recognized by POST and OS.
8. Create a team according to *Chapter 2 (2.4 Dual Configuration Setup)*.

5.7.5 Setup of Optional PCI Card

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

(1) N8804-009 1000BASE-T 2ch board set, N8804-011 10GBASE-T 1ch board set

Important To use this board, use a LAN cable having RJ-45 connector which is compliant with IEC8877 standard. If any other connector is used, it may not be removed easily.

- Slots to install optional PCI cards
See "*List of option PCI cards and installable slots*" in Chapter 2 (5.7.1 Precautions).
- Driver installation procedure
Install N8804-009 1000BASE-T 2ch board set or N8804-011 10GBASE-T 1ch board set, and restart the system.
After starting the system, the driver will be installed automatically.
- Configure duplex LAN
See Chapter 2 (2. Duplex LAN Configuration).

(2) N8803-038 Fibre Channel Board Set

- Slots to install optional PCI cards
See "*List of option PCI cards and installable slots*" in Chapter 2 (5.7.1 Precautions).
- Driver installation procedure
Install N8803-038 Fibre Channel board and start the system.
After starting the system, the driver will be installed automatically.

Important

- StoragePathSavior is necessary to connect NEC iStorage using N8803-038 Fiber Channel boards.
- Mount N8803-038 Fibre Channel boards after completing the OS installation. They are used in a pair. Mount each controller on the slot of the same position of each PCI module.

- Configuring multi path

Important This operation must be executed by only root user.

1. Run the following command to create multi path device.

```
# multipath
```

When this command is executed, dm device of dm-X (X denotes number) and dm-mp device (symbolic link to dm device) of mapper/mpathN and mappae/mpathNpM (N is an alphabetic character and M is natural number except 1) are created under /dev.

Then sd device of FibreChannel is virtualized as a dm-mp device by each path.

The dm device uses dm-mp device since it has no distinction between entire device and the partition. mpathN is Nth LUN, mpathNpM is Mth partition in mpathN.

2. Run the following command to start path watch daemon (multipathd).

```
# chkconfig multipathd on
```

```
# /etc/init.d/multipathd start
```

3. Run the following command to check the path condition.

```
# multipath -ll
```

The path condition of each dm-mp device can be displayed.

- Changing environment in running system
 - Change partition
Run fdisk command to virtualized /dev/mapper/mpathN (N is an alphabet). OS must be rebooted to reflect the change to the system.
 - Add, modify, remove LUN
OS must be rebooted to reflect the change to the system.

(3) N8803-039 SAS Board

- Slots to install optional PCI cards
See "*List of option PCI cards and installable slots*" in Chapter 2 (5.7.1 Precautions).
- Driver installation procedure
Install N8803-037 SAS board and start the system.
After starting the system, the driver will be installed automatically.

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

3

Useful Features

This chapter describes convenient 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 ESM PRO

Describes NEC ESM PRO Agent and NEC ESM PRO 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> key while expanding option ROM.)

***1.2* Parameter Descriptions**

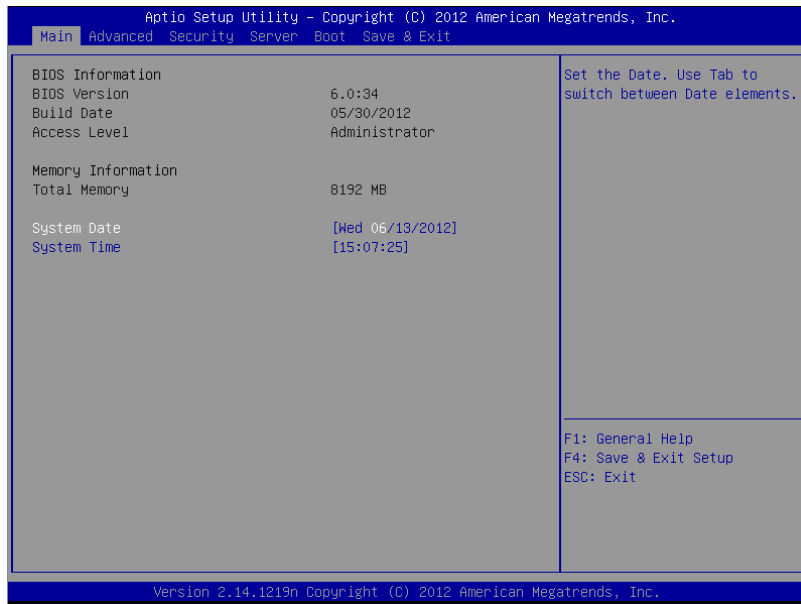
The SETUP utility has the following six major menus.

- 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.



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.

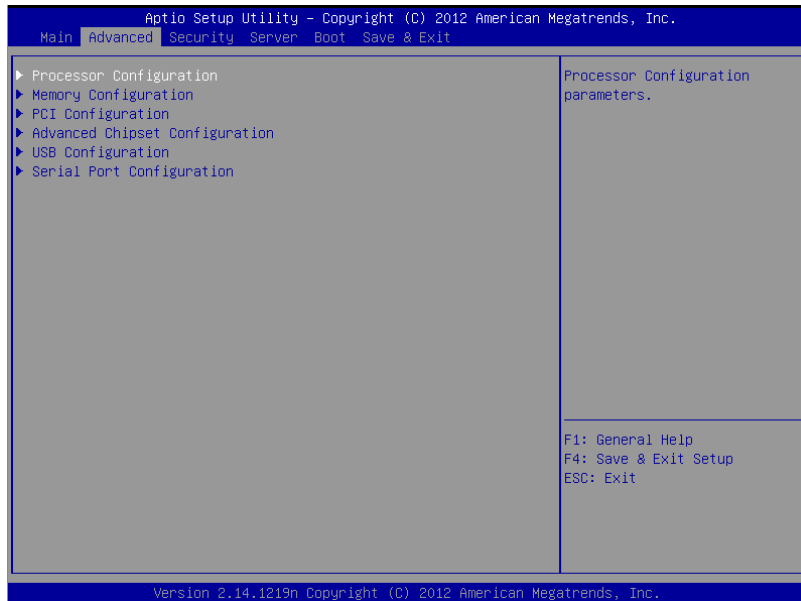
Check the system clock monthly. Additionally, if you implement the server in a system that requires highly accurate time, use of a time server (an NTP server) is recommended.

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

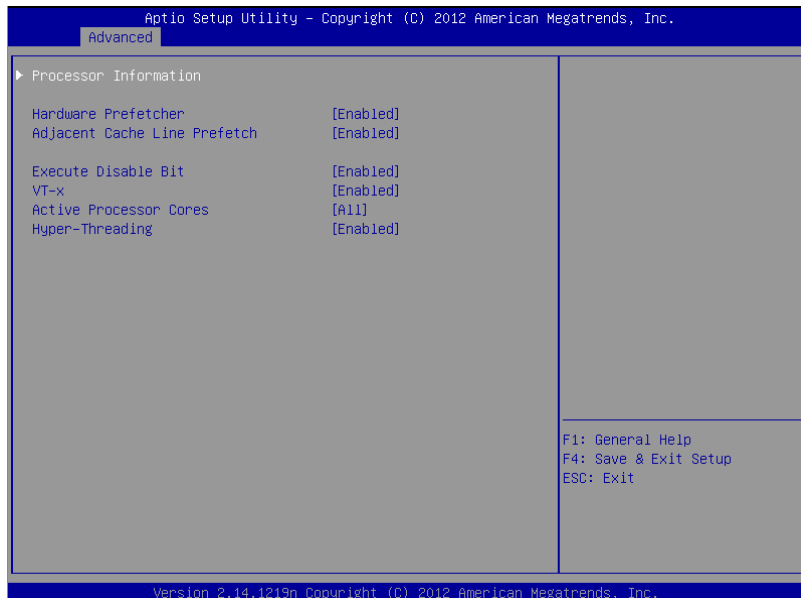
If you move the cursor to **Advanced**, the **Advanced** menu appears.

For the menus that show a "▶" to their left, select a menu and press the <Enter> key to display its submenu.



(1) Processor Configuration submenu

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

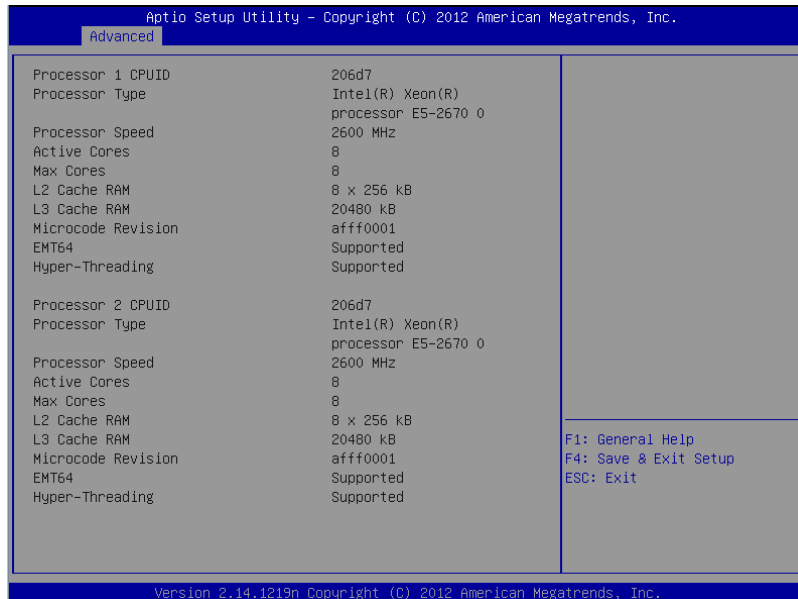


For details about the options, see the table below.

Option	Parameter	Descriptions
Processor Information	–	–
Hardware Prefetcher	Disabled [Enabled]	Enable or disable hardware prefetcher.
Adjacent Cache Line 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



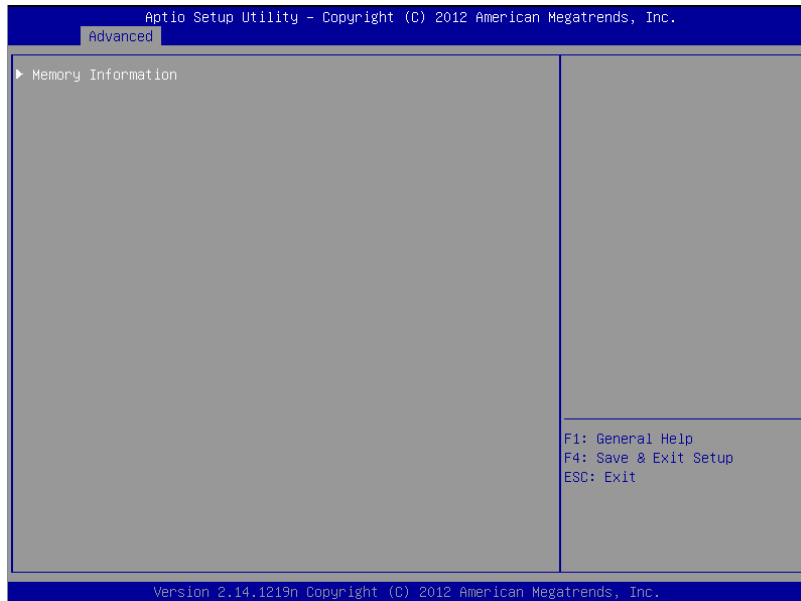
For details about the options, see the table below (display only).

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. Not Installed indicates that no processor is installed in processor socket 2.
Processor Type	–	Type of Processor 2 is displayed.
Processor Speed	–	Clock speed of Processor 2 is displayed.
Active Cores	–	The number of active cores in Processor 2 is displayed.
Max Cores	–	The maximum number of cores in Processor 2 is displayed.
L2 Cache RAM	–	The secondary cache size of Processor 2 is displayed.
L3 Cache RAM	–	The tertiary cache size of Processor 2 is displayed.
Microcode Revision	–	The revision of the microcode applied to Processor 2 is displayed.
EMT64	Supported	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

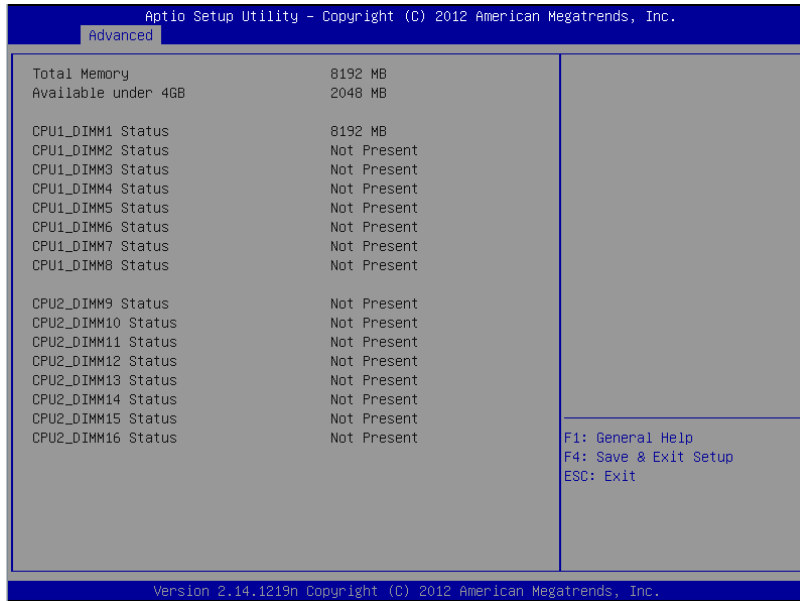
From the **Advanced** menu, select **Memory Configuration** and then press the <Enter> key to display the menu screen shown below. For the menu that has ► on the left, move the cursor to it and then press the <Enter> key to show its submenus.



For details about the options, see the table below.

Option	Parameter	Descriptions
Memory Information	–	–

[]: Factory settings

(a) Memory Information submenu

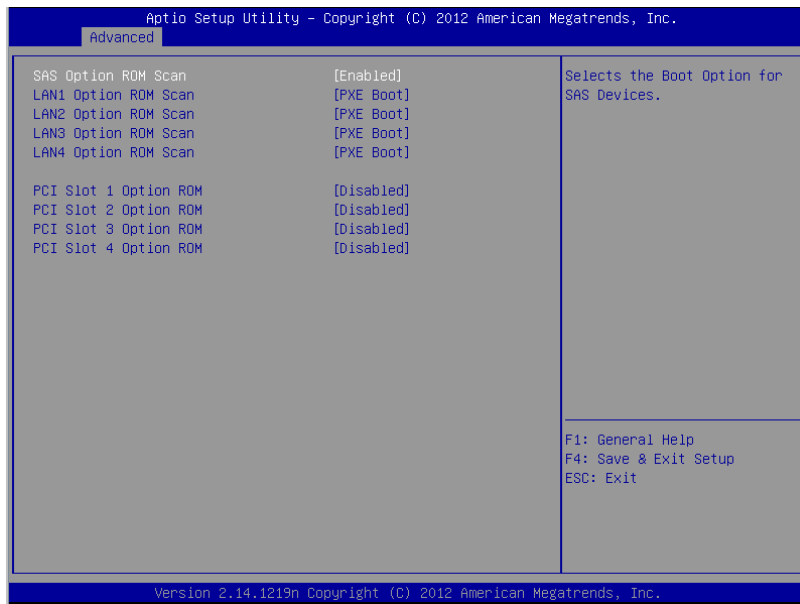
For details about the options, see the table below (display only).

Option	Parameter	Descriptions
Total Memory	–	The physical capacity of installed memory is displayed.
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 the **<Enter>** key to display the menu screen as shown below.



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

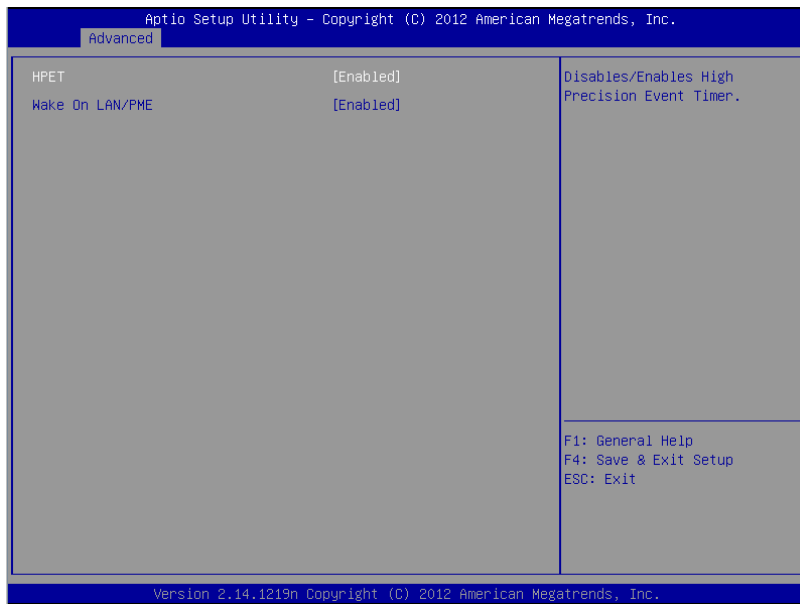
[]: Factory settings

Note

For a RAID Controller, LAN card (network boot), or Fibre Channel controller, if no Hard Disk Drive on which an OS is installed is connected, set the option ROM for that slot to **Disabled**.

(4) Advanced Chipset Configuration submenu

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



For details about the options, see the table below.

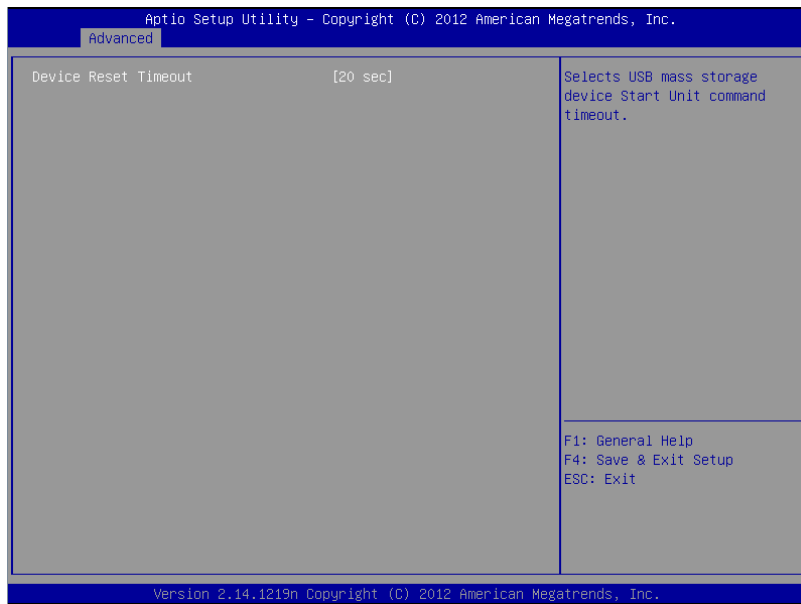
Option	Parameter	Descriptions
HPET	Disabled [Enabled]	Enable or disable the High-Precision Event Timer. This feature may not be supported depending on OS.
Wake On LAN/PME	Disabled [Enabled]	Enable or disable the feature that remotely powers on the server through a network.

[]: 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 the <Enter> key to display the menu screen shown below.



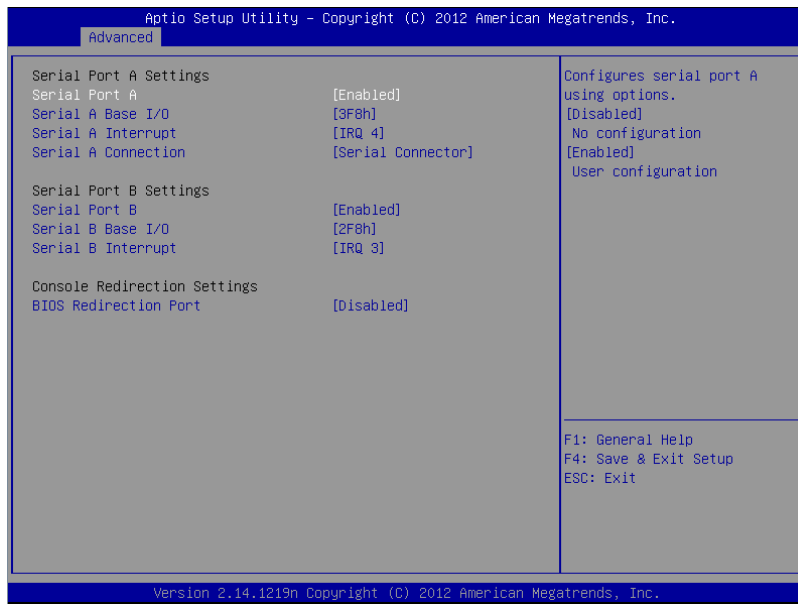
For details about the options, see the table below.

Option	Parameter	Descriptions
Device Reset Timeout	10 sec [20 sec] 30 sec 40 sec	Specify the timeout period when Start Unit command is issued to USB Mass Storage Device.

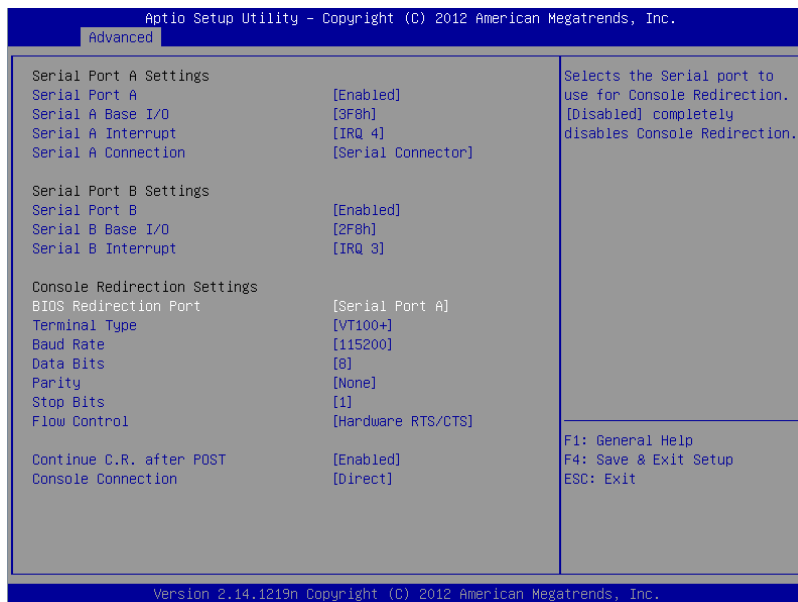
[]: Factory settings

(6) Serial Port Configuration submenu

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



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



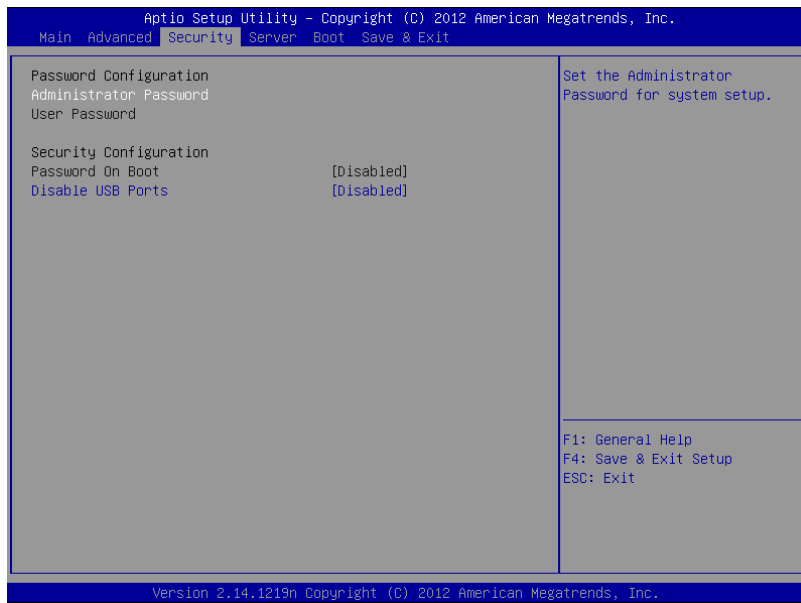
For details about the options, see the table below.

Option	Parameter	Descriptions
Serial Port A Settings	–	–
Serial Port A	Disabled [Enabled]	Enable or disable serial Port A.
Serial A Base I/O	[3F8h] 2F8h 3E8h 2E8h	Specify the base I/O address for serial port A.
Serial A Interrupt	[IRQ 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 the <Enter> key to show its submenus. Then configure the settings.



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

Tips

- User Password cannot be set without setting Administrator Password
- Do not set any password before installing OS.
- If you have forgotten any password, contact the store where you purchased the product or your maintenance service company. If you clear the password set in the BIOS Setup utility (SETUP), see *Chapter 1 (10 Resetting the Server and Clearing BIOS Settings)*.

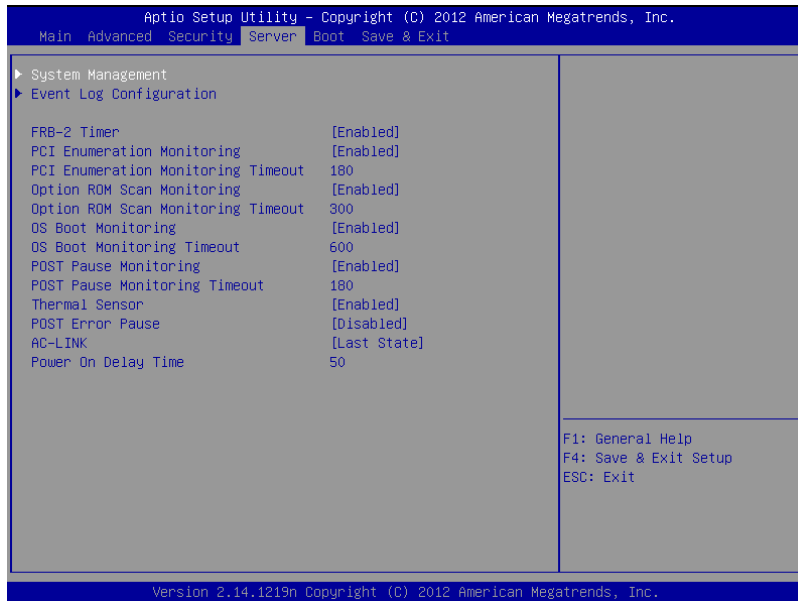
For details about the options, see the table below.

Option	Parameter	Descriptions
Password Configuration	–	–
Administrator Password	Up to 20 alphanumeric characters	When the <Enter> key is pressed, the password entry screen to set administrative right is displayed. This password can be used to access all SETUP menus. Password can be set only when SETUP is started by administrative right. If no password is set, SETUP starts with administrative right.
User Password	Up to 20 alphanumeric characters	When the <Enter> key is pressed, the password entry screen to set user right is displayed. With this password, access to SETUP menus is limited. The user password can be set when SETUP is started by administrative right or user right.
Security Configuration	–	–
Password On Boot	[Disabled] Enabled	Enable or disable the feature that requires a password entry on boot. This option can be selected when Administrator Password is set.
Disable USB Ports	[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 the <Enter> key to show its submenus.



The **Server** menu screen shows the options you can configure and their features. For the menu **System Management**, move the cursor to it and then press the <Enter> key to show its submenus.

Option	Parameter	Descriptions
System Management	–	–
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 [Enabled]	Enable or disable the feature to monitor the thermal sensor.

Option	Parameter	Descriptions
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).

[]: Factory settings

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

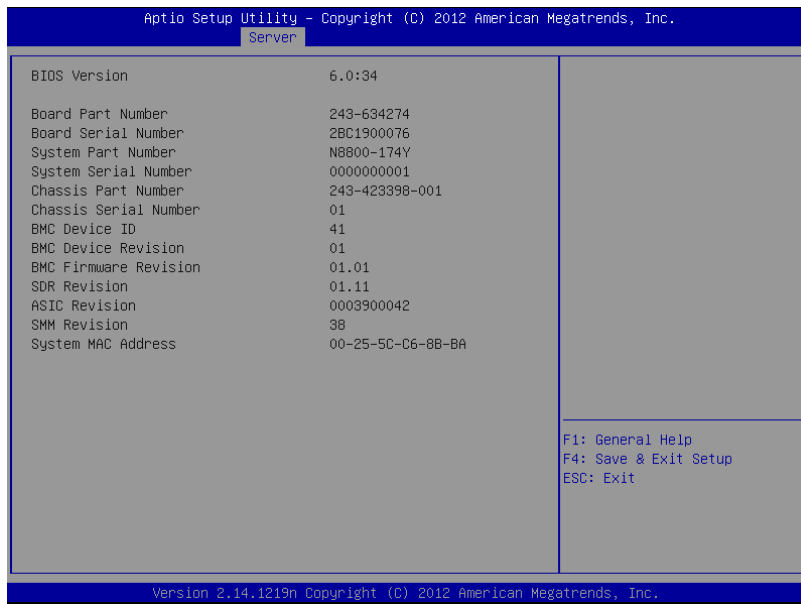
* Continue pressing the POWER switch for at least 4 seconds to forcibly turn off the power.

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 the <Enter> key to show its submenus.

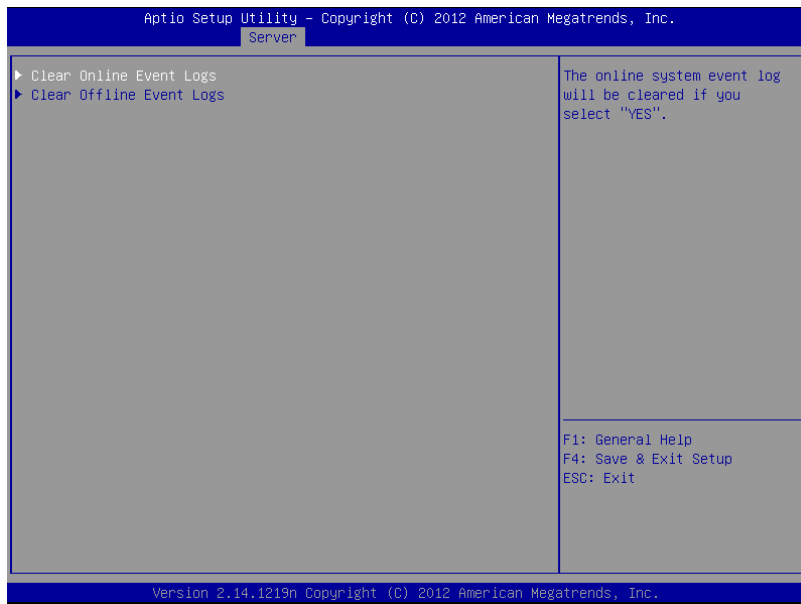


For details about the options, see the table below (display only).

Option	Parameter	Descriptions
BIOS Version	–	The current BIOS version is displayed.
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 the <Enter> key to show its submenu.

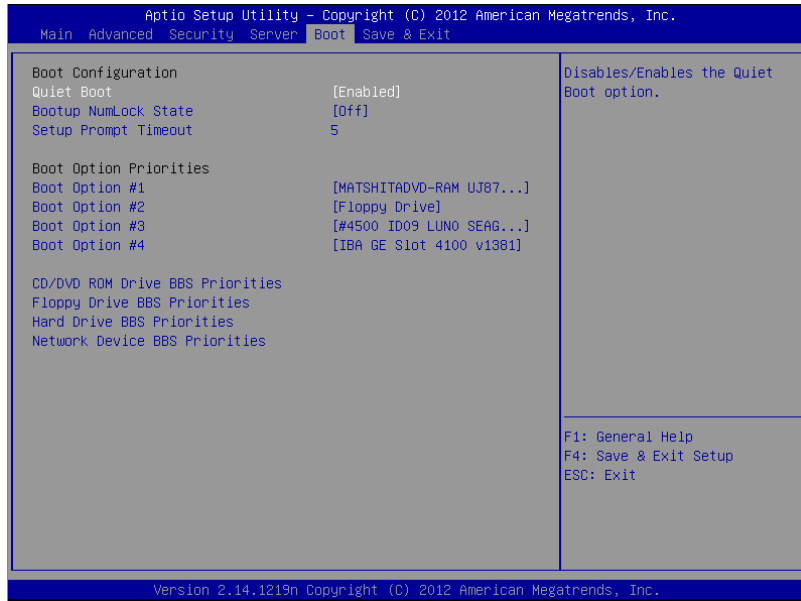


For details about the options, see the table below.

Option	Parameter	Descriptions
Clear Online Event Logs	–	Press the <Enter> key then select Yes to clear event logs of active module.
Clear Offline Event Logs	–	Press the <Enter> key then select Yes to clear event logs of standby module.

1.2.5 Boot

If you move the cursor to **Boot**, the **Boot** menu where you can configure the boot order appears.



For details about the options, see the table below.

Option	Parameter	Descriptions
Boot Configuration	–	–
Quiet Boot	Disabled [Enabled]	Enable or disable the feature to display 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

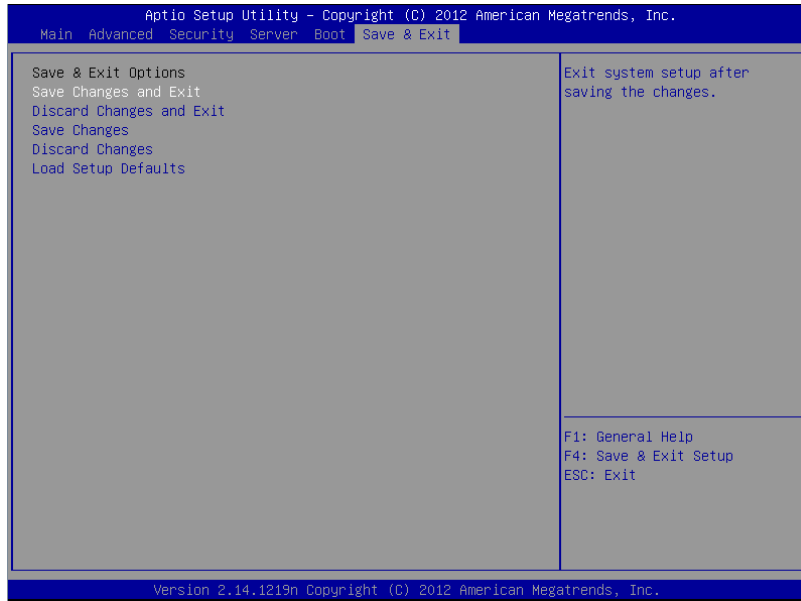
1. When BIOS detects a bootable device, information on the device is displayed in the designated area.
2. The boot priority (from first to fourth) of the registered boot devices can be changed using the <↑>/<↓> and <+>/<-> keys.
Move the cursor to a device using the <↑>/<↓> keys, and change the priority using the <+>/<-> 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.



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.

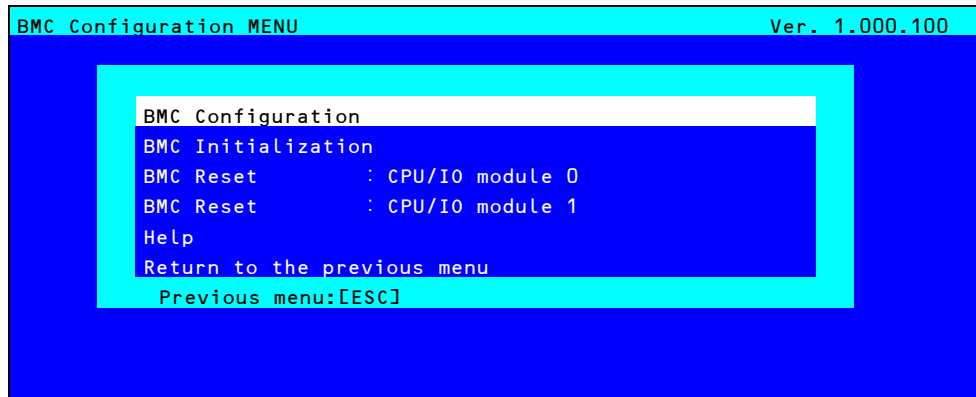
2.1.2 Starting BMC Configuration

When the server starts, press <F4> key 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 Tools** menu.



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.

See (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.

See (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.

See (2.2.4 *Resetting BMC*) for details.

(d) Help

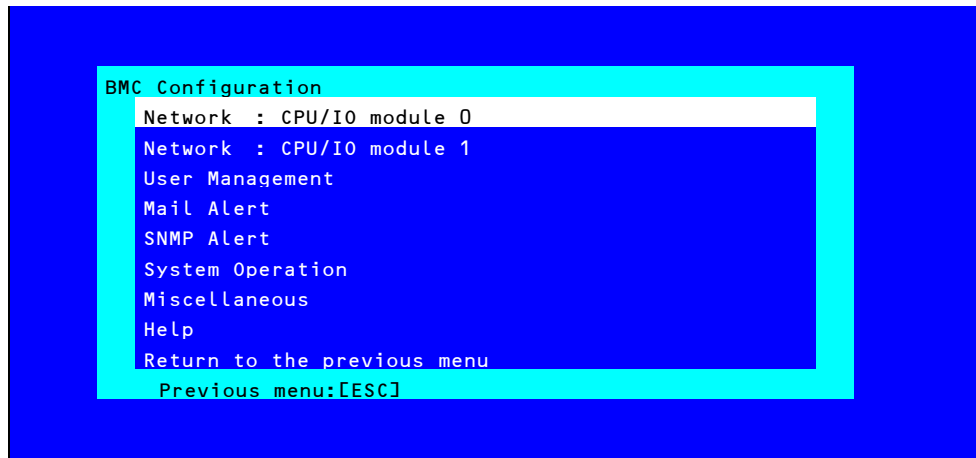
You can open BMC Configuration help window.

(e) Return to the previous menu

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

2.2.2 Setting BMC Configuration

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



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.
See (2.2.2 (a) Network) for details.

(b) User Management

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

(c) Mail Alert

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

(d) SNMP Alert

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

(e) System Operation

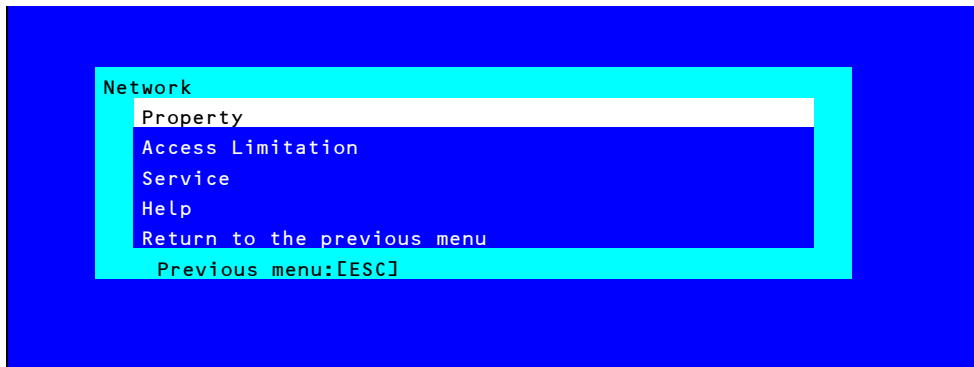
You can set parameters for remote KVM console and remote media.
See ((e) System Operation) for details.

(f) Miscellaneous

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

(a) Network

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

**Network menu**

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

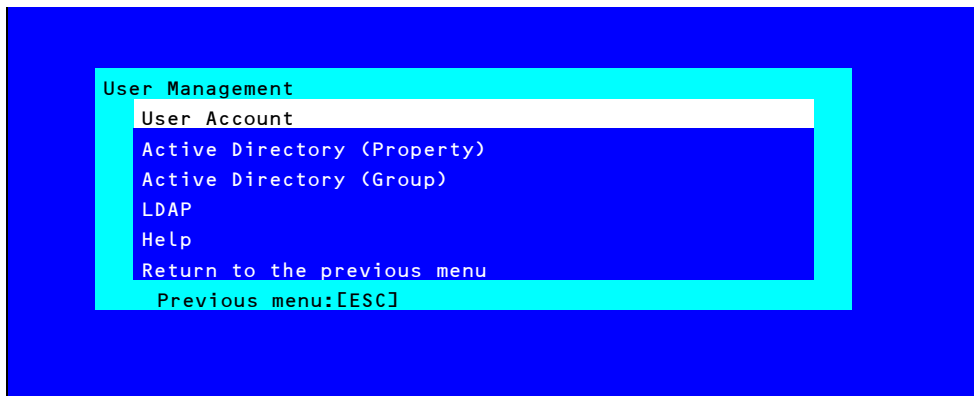
Item	Description	Default Value
Property		
Management LAN	Specify and display LAN port to communicate with BMC Management LAN : LAN port for BMC exclusive use.	Management LAN
Connection Type	Specify and display the connection type of BMC LAN. Auto Negotiation : Connecting by suitable setting. 100Mbps 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. ²	192.168.1.1
Subnet Mask	Specify the Subnet Mask of BMC LAN. ^{1 2}	255.255.255.0
Default Gateway	Specify the Default Gateway IP address of the BMC LAN. ² 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. ³	Disable
DNS Server	Specify the DNS Server.	0.0.0.0
Host Name	Specify the Host Name. ⁴	Blank
Domain Name	Specify the Domain Name. ⁵	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. ^{*6 *7}	Blank
Service		
HTTP	Enable or disable HTTP service. ^{*8}	Enable
HTTP Port Number	Specify the HTTP port number. ^{*9}	80
HTTPS	Enable or disable HTTPS service. ^{*8}	Enable
HTTPS Port Number	Specify the HTTPS port number. ^{*9}	443
SSH	Enable or disable SSH service.	Enable
SSH Port Number	Specify the SSH port number. ^{*9}	22

- *1: If an illegal value is specified for subnet mask, an error message is displayed and setting is disabled.
- *2: Can be changed only when DHCP is set to "Disable".
- *3: Can be changed only when DHCP is set to "Enable".
- *4: Host Name should be within 63 characters.
Acceptable characters are: alphanumeric, hyphen (-), underscore (_), and period (.).
- *5: Host Name and Domain Name should be within total of 255 characters.
Acceptable characters are: alphanumeric, hyphen (-), underscore (_), and period (.).
- *6: 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)
- *7: Can be specified when Access Limitation Type is "Allowed Address" or "Deny Address". The length must not exceed 255 characters.
- *8: If HTTP is set to "Enable", HTTPS is changed to "Enable" automatically. You are not allowed to set "Enable" to HTTP only.
- *9: 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 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 Server3	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 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".

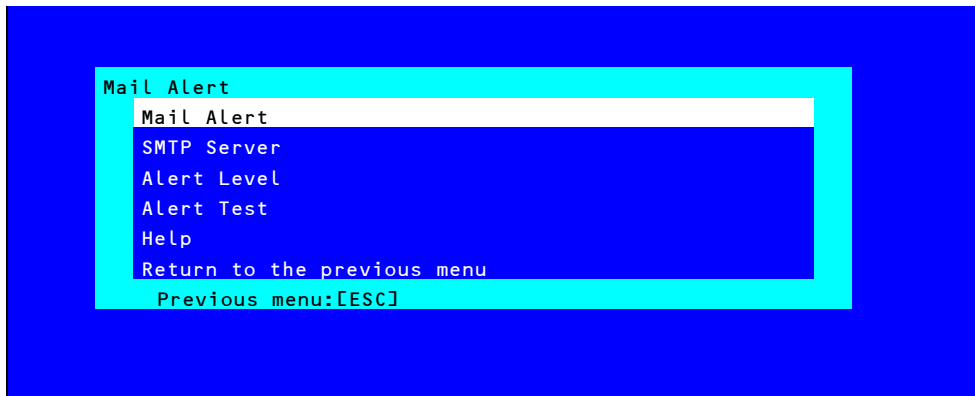
*9: Can be specified only when LDAP authentication is set to "Enable".

*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 menu

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

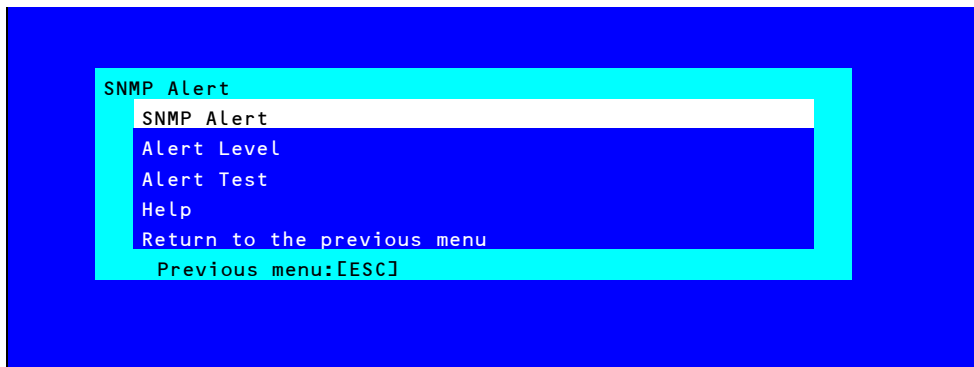
Item	Description	Default Value
Mail Alert		
Mail Alert	Enable or disable Mail Alert.	Disable
Response of SMTP Server	Specify the timeout period until when the connection to SMTP server succeed by E-mail transmission.	30
To:1	Select Enable/Disable of To:1. ^{*1}	Enable
To:1 E-Mail Address	Specify the 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	Specify the kind of event to alert.	Error, Warning
Alert Level	Error : When "Error" is detected in each sensor type, the alert is sent to the checked address.	
Alert Level	Error, Warning : When "Error" or "Warning" is detected in each sensor type, the alert is sent to the checked address.	
Alert Level	Error, Warning, Information : When "Error", "Warning" or "Information" is detected in each sensor type, the alert is sent to the checked address.	
Alert Level	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 menu**

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

Item	Description	Default Value
SNMP Alert		
SNMP Alert	Enable or disable SNMP Alert. ^{*1}	Disable
Computer Name	Specify the Computer Name. ^{*2}	Blank
Community Name	Specify the Community Name. ^{*2}	Public
Alert Process	Select One Alert Receiver or All Alert Receiver for Alert Process.	One Alert Receiver
Alert Acknowledge	Enable or disable Alert Acknowledge.	Enable
Alert Retry Count	Specify the count of Alert retry. ^{*3}	3
Alert Timeout	Specify the timeout period (in seconds) for alert. ^{*3}	6
Alert Receiver1	Enable or disable primary receiver. ^{*4}	Enable
IP Address1	Specify the IP Address of primary receiver. ^{*5}	0.0.0.0
Alert Receiver2	Enable or disable secondary receiver. ^{*4}	Disable
IP Address2	Specify the IP Address of secondary receiver. ^{*5}	0.0.0.0
Alert Receiver3	Enable or disable tertiary receiver. ^{*4}	Disable
IP Address3	Specify the IP Address of tertiary receiver. ^{*5}	0.0.0.0
Alert Level		
Alert Level	Specify the kind of event to alert. Error : When "Error" is detected in each sensor type, the alert is sent to the checked address. Error, Warning : When "Error" or "Warning" is detected in each sensor type, the alert is sent to the checked address. Error, Warning, Information : When "Error", "Warning" or "Information" is detected in each sensor type, the alert is sent to the checked address. Separate Setting : You can arbitrarily select the event to alert in each sensor type.	Error, Warning
Alert Test	Execute 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".

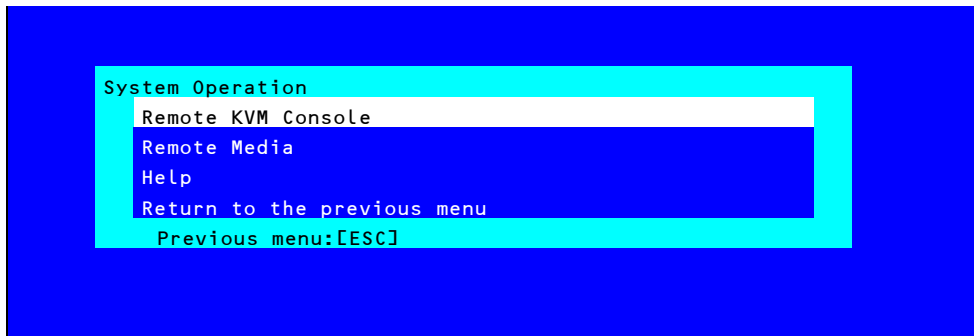
*4: When SNMP Alert is enabled, at least one alert receiver should be enabled.

*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 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 NEC ESMPRO, set to "Disable" for ESMPRO Management in Management Software. In this case, setting for relevant items are hidden and unnecessary.

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 0
- CPU/IO module 1

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

Confirmation message (Initialization)

<ESC> key: Aborts processing and returns to **Main** menu.

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

2.2.4 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> key: Aborts processing and returns to Main menu.

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

3. SAS Configuration Utility

SAS Configuration utility makes settings of the built-in SAS controller. You can start it up by simple key operation during POST execution.

Important

- Because the server is installed with the latest version of the utility, your screen display may be different from the one described in this guide. For information on options different from those described in this guide, refer to the online help or ask your service representative.
- 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.

```
LSI Corp Config Utility v7.23.01.00 (2011.11.17)
Adapter List Global Properties
Adapter PCI PCI PCI PCI FW Revision Status Boot
Bus Dev Fnc Slot Revision Status Order
SERVER 0B 00 00 00 12.00.00-IT Enabled 0

Esc = Exit Menu F1/Shift+1 = Help
Alt+N = Global Properties -/+ = Alter Boot Order Ins/Del = Alter Boot List
```

3.2 Quitting the SAS Configuration Utility

Take procedures below to quit the SAS/ Configuration utility.

1. Keep pressing the <Esc> key until the **Adapter List** menu appears.

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

Select **Discard changes and reboot** from the menu, and press the <Enter> key.

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

Tips

You need not to select any other menu because no change is made on SAS Configuration utility.

3.3 Physical Formatting of the Hard Disk Drive

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

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

1. Press the <Enter> key on the **Adapter List** menu.

Adapter Properties menu appears after a short while.

```

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

Adapter                SERVER
PCI Slot               00
PCI Address(Bus/Dev)   0B:00
MPT Firmware Revision 12.00.00.00-IT
SAS Address            50030130:F1B25400
NVDATA Version        0C.00.CC.01
Status                Enabled
Boot Order             0
Boot Support           [Enabled BIOS & OS]

SAS Topology
Advanced Adapter Properties

Esc = Exit Menu      F1/Shift+1 = Help
Enter = Select Item  --/+Enter = Change Item
  
```

2. Select **SAS Topology** and press the <Enter> key.

SAS Topology menu appears after a while.

```

LSI Corp Config Utility      v7.23.01.00 (2011.11.17)
SAS Topology -- SAS2008

SERVER(0B:00)
├ Controller
│   └ Direct Attach Devices
└ Info
    └ Controller
  
```

3. Select **Direct Attach Device** and press the <Enter> key.

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

```

LSI Corp Config Utility      v7.23.01.00 (2011.11.17)
SAS Topology -- SAS2008

SERVER(0B:00)
├ Controller
│   └ Slot 0
│       └ SEAGATE ST9146853SS    N00Z    SAS
└ Info
    └ Controller
  
```

- Select the hard disk drive to execute physical formatting and press the <D> key while pressing the <Alt> key.

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    N00Z
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
  
```

- Select **Format** and press the <Enter> key.

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    N00Z
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.
  
```

- Press the <F> key 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    N00Z
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.
See *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	
	<p>Be extremely careful not to lose Flash FDD or have it stolen. If Flash FDD is lost, stolen, misappropriated, or fraudulently obtained, there is a risk of leaking confidential information to a third party. NEC assumes no responsibility for damages caused by leaking confidential information in this way.</p>

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

Note

Pay attention not to move the write-protect switch when installing or removing Flash FDD.

4.1 Notes on Using Flash FDD

Do not use Flash FDD to back up data. Flash FDD can be used to save temporary data.

4.1.1 Compensation for recorded data

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

4.1.2 Handling Flash FDD

- Flash FDDs are consumables.
If Flash FDD causes an error, replace with a new Flash FDD.
- Do not turn off the server while the access LED of Flash FDD is blinking.
Doing so may cause failure of the device and damage to the data.
- Flash FDD cannot be connected to a USB hub.
Directly connect Flash FDD to the server.
- Before handling Flash FDD, discharge static electricity from your body by touching a 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.
- Be careful when connecting the Flash FDD to the server.
- Do not relocate the server with Flash FDD connected to USB connector.
- Remove Flash FDD from the server when not in use.

4.1.3 Use with EXPRESSBUILDER

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

4.1.4 Notes on using Flash FDD on Linux OS

Do not access the Flash FDD by specifying sd device name if integration or separation occurred in one of the modules.

Device name may be changed due to integration or separation occurred on one of the modules. Specifying sd device name might destroy the partition information or other information on another disk.

Note

It is a feature of this server that the device names of the device files change due to integration or separation of one of the modules.

5. Details of EXPRESSBUILDER

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

5.1 Starting EXPRESSBUILDER

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

Tips

Remove other removable media before starting EXPRESSBUILDER.

Insert the DVD into the server, and then restart the system. (Cycle the power of server, or press <Ctrl> + <Alt> + <Delete> keys.)

Boot Selection Menu shown in *Chapter 2 (5.2 Menus of EXPRESSBUILDER - (1) Boot Selection Menu)* appears.

5.2 Menus of EXPRESSBUILDER

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> key to choose it.

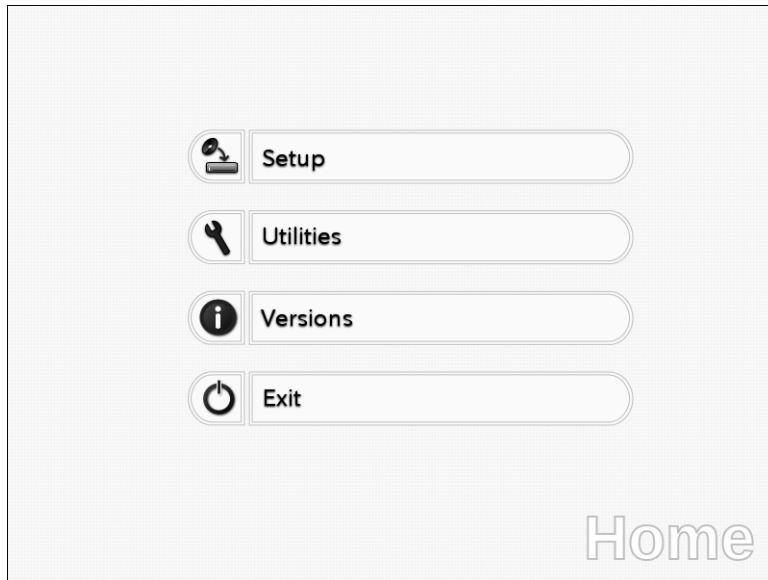
OS installation is chosen if no key is pressed.

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

Do not select **OS installation** because this menu is unavailable on Linux model.

When you select **Tool menu**, Tool Menu shown in *(3) Tool Menu* appears.

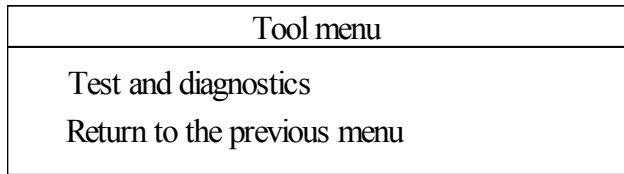
(2) Home Menu



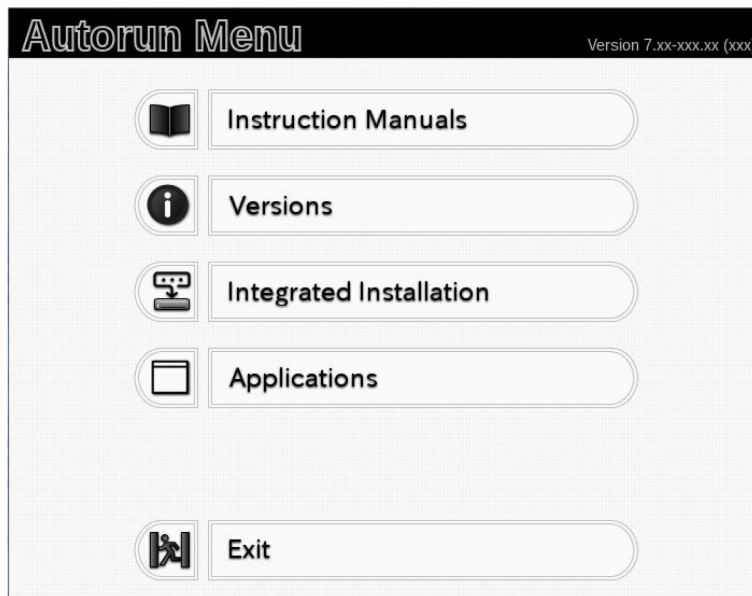
Operate Home Menu using the mouse or keyboard.

The following menus are included.

- a) **Setup**
Do not select this menu because it is unavailable on Linux model.
- b) **Utilities**
Starts a utility provided by EXPRESSBUILDER.
See *Chapter 3 (5.3 Utilities Provided by EXPRESSBUILDER)* for details.
- c) **Versions**
Displays software and driver versions in EXPRESSBUILDER.
- d) **Exit**
Select this menu to close EXPRESSBUILDER.

(3) Tool Menu

Choose **Test and diagnostics** to run System Diagnostics, which is used to analyze and diagnose the server and check the cable connection. For details about system diagnostics, see *Chapter 1 (11. System Diagnostics)*.

(4) Autorun Menu

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

Integrated Installation

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

5.3 Utilities Provided by EXPRESSBUILDER

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

File execution

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

Note

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

6. EXPRESSSCOPE Engine 3

EXPRESSSCOPE Engine 3 enables various features by using Baseboard Management Controller (BMC), which is the system management LSI.

EXPRESSSCOPE Engine 3 monitors statuses inside the server such as that of power supplies, cooling fans, temperature, and voltage. Connecting the management LAN port to your network enables you to do the following from a remote site through a web browser and SSH client;

- Managing the server
- Operating keyboard, video, and mouse (KVM) from a remote console (*)
- Accessing a CD-ROM, DVD ROM, floppy disk, ISO image, or USB flash drive in a remote console (*)

* To actualize these features, virtual USB mass storage (Remote FD, Remote CD/DVD, Remote USB Memory, or Virtual Flash) is always connected as USB mass storage.

Tips

To reset BMC, use the Off-line Tool of the server.
See *Chapter 3 (2. BMC Configuration)* for details.

7. NEC ESMPRO

7.1 NEC ESMPRO Agent (Linux)

For details of NEC ESMPRO Agent (Linux), see "*NEC ESMPRO Agent User's Guide (Linux)*" stored in ft Server Control Software Install CD.

7.2 NEC ESMPRO Manager

NEC ESMPRO Manager remotely controls and monitors the server hardware.

To use these features, install the bundled software such as NEC ESMPRO Agent on the server.

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