NEC

Maintenance Guide

NEC Express Server
Express5800 Series

Express5800/R110h-1, T110h-S, T110h
EXP335, 335A, 333, 333A, 334, 334A

10.111.01-104.03
August 2018

Manuals

Manuals for this product are provided as booklets (📖) or electronic manuals (📄) in EXPRESSBUILDER.

📖 Safety Precautions and Regulatory Notices	Describes points of caution to ensure the safe use of this server. **Read these cautions before using this server.**
📖 Getting Started	Describes how to use this server, from unpacking to operations. See this guide first and read the outline of this product.

EXPRESSBUILDER

📄 User's Guide

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

📄 Installation Guide (Windows)

Chapter 1: Installing Windows	Installation of Windows and drivers, and precautions for installation
Chapter 2: Installing the Bundled Software	Installation of NEC ESMPRO, Universal RAID Utility, and other bundled software

📄 Maintenance Guide

Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2: Useful Features	The details of system BIOS settings, RAID Configuration Utility, and EXPRESSBUILDER
Chapter 3: Appendix	Error messages and Windows Event Logs

📄 Other manuals

The details of NEC ESMPRO, Universal RAID Utility, and the other features

Contents

Conventions Used in This Document

Signs and symbols for safety

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

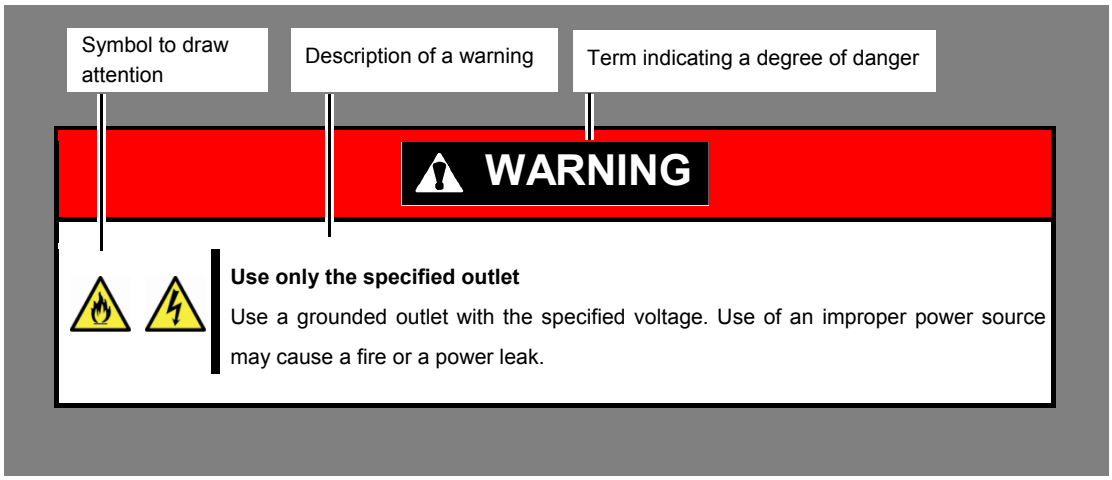
WARNING Indicates there is a risk of death or serious personal injury

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

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

	**Attention**	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type.	(Example) 
	**Prohibited Action**	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example) 
	**Mandatory Action**	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example)  (Disconnect a plug)

(Example in this guide)



Notations used in the text

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

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

Optical disk drive

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

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

Hard disk drive

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

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

Removable media

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

- **USB flash drive**
- **Flash FDD**

Abbreviations of Operating Systems (Windows)

Windows Operating Systems are referred to as follows.

See *Chapter 1 (1.2 Supported Windows OS)* in *Installation Guide (Windows)* for detailed information.

Notations in this document	Official names of Windows
Windows Server 2012 R2	Windows Server 2012 R2 Standard
	Windows Server 2012 R2 Datacenter
	Windows Server 2012 R2 Foundation
Windows Server 2012	Windows Server 2012 Standard
	Windows Server 2012 Datacenter
Windows Server 2008 R2	Windows Server 2008 R2 Standard
	Windows Server 2008 R2 Enterprise

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UEFI NETWORK STACK 2

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This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).
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Keep this document for future reference.

Latest editions

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

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

http://www.nec.com/

Safety notes

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

NEC Express5800 Series
Express5800/ R110h-1, T110h-S, T110h

1 Maintenance

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

1. **Relocation and Storage**
   Describes how to relocate and store the 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. **Failure Information**
   Describes how to collect the failure information. See this section in case of a failure.

5. **Troubleshooting**
   Describes how to troubleshoot the server. See this section if you suspect a failure.

6. **Windows System Recovery**
   Describes Windows recovery setup. See this section if the Windows is corrupt.

7. **Resetting and Clearing the Server**
   Describes how to reset or clear the server. See this section if the server is not working or if you want to restore the BIOS settings to the factory settings.

8. **System Diagnostics**
   Describes the system diagnostics of the server.

9. **Offline Tools**
   Describes tools for preventive maintenance of the server.

I. Relocation and Storage

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

⚠ WARNING

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

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

⚠ CAUTION

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

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

Note

- If the server 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 a disc from the optical disk drive.
2. Power off the server (POWER LED goes off).
3. Unplug the power cord of the server from the power outlet.
4. Disconnect all the cables from the server.
5. Pack the server securely to protect from damage, shock, and vibration.

Important **If the server is suddenly moved from a cold place to a warm place, condensation will occur and cause failures. Wait for a sufficient period of time before using the server and other components.**

Note Adjust the system clock before operating after relocating or storing the server.

2. Daily Maintenance

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

2.1 Checking and Applying Updates

Express5800 Series posts update information for BIOS, firmware (FW), driver, and others of the server and peripheral devices on our website. We recommend you to apply the latest update always.

NEC corporate site: **http://www.nec.com/**

[Support & Downloads]

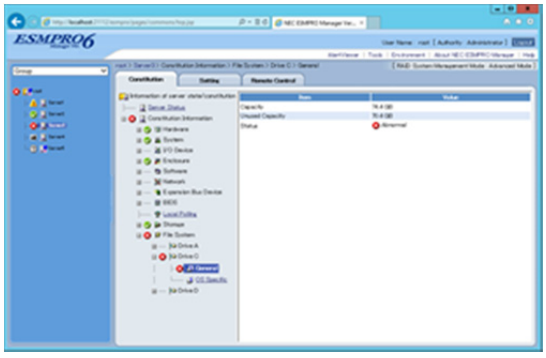
NEC also provides *ExpressUpdate* that helps you to download and install updates that must be applied to BIOS and FW of the server.

Tips NEC recommends that you back up data before applying the latest update.

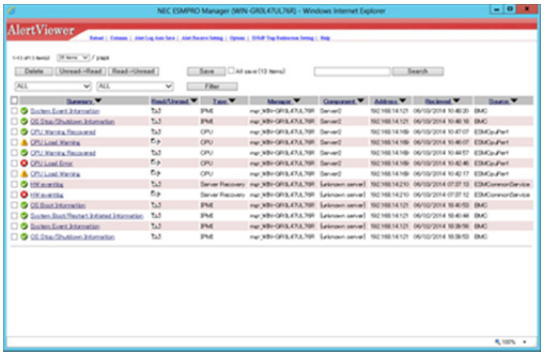
2.2 Checking Alerts

Use NEC ESMPRO Manager (for Windows) to constantly verify that no abnormalities are discovered 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

After powering on the server or before shutting down the system and powering off the server, check STATUS LED on the front of the server. For the functions and descriptions of the LED, see *Chapter 1 (5. Names and Functions of Parts)* in *User's Guide.* If the indicator shows the server abnormality, contact your salses representative.

2.4 Backup

We recommend that you periodically back up the data on HDD.

If a RAID array has been configured on your system, back up the RAID configuration data. We also recommend that you back up it after a rebuilding process required due to HDD failure. See *Chapter 2 (6. Details of EXPRESSBUILDER)* for details.

2.5 Cleaning

Regularly clean the server to keep it in good condition.

WARNING

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

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

2.5.1 Cleaning the server

Wipe the external surfaces of the server with a dry soft cloth. Follow the procedure below if stains remain on the surfaces.

Important

- **Do not use thinner, benzene, and other volatile solvents. Those solvents could damage or tarnish the material.**
- **The power outlet, cables, connectors on the server, and the inside of the server must be kept dry.**

1. Confirm that the power is OFF (POWER LED is OFF).
2. Unplug the power cord of the server from a power outlet.
3. Wipe off dust from the power cord plug with a dry cloth.
4. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
5. Rub off stains on the server with the cloth prepared in step 4.
6. Soak a soft cloth in water, squeeze it firmly, and wipe the server with it once again.
7. Wipe the server with a dry cloth.

2.5.2 Cleaning the 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 manual attached to the tape drive.

2.5.3 Cleaning the keyboard and mouse

Wipe the surface of the keyboard with a dry cloth after confirming that the whole system, including the server and the peripherals, are shut down and the POWER LED is off.

An optical mouse does not work properly if the lens area is not clean. Wipe the sensor with a dry cloth to remove any dirt or dust.

3. User Support

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

3.1 Maintenance Services

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

3.2 Before Asking for Repair

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

1. Check if the power cord and cables to other products are properly connected.
2. See *Chapter 1 (5. Troubleshooting)*. If you find a symptom similar to your problem, take the action as instructed.
3. Confirm that the required software has been properly installed.
4. Scan for viruses using an 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.

For repair within the warranty period, be sure to apply with your warranty.

4. Collecting Failure Information

If the server does not work normally, you can collect failure information by using the following way.

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

Important **Do not reset during dumping memory or restarting the server even if the message of virtual memory shortage appears.**

4.1 Collecting Event Logs

To collect the various event logs of the server, follows the steps below.

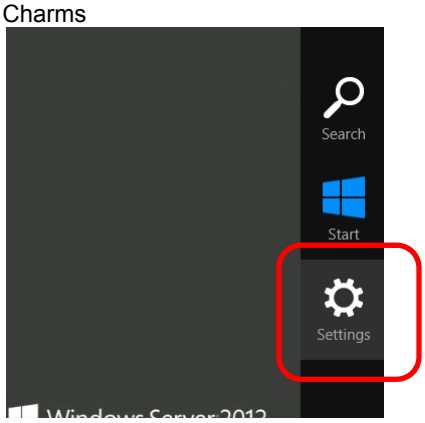
Tips If a STOP error, system error, or stall occurs, restart the system and then follow the steps below.

4.1.1 Windows Server 2012 R2 / Windows Server 2012

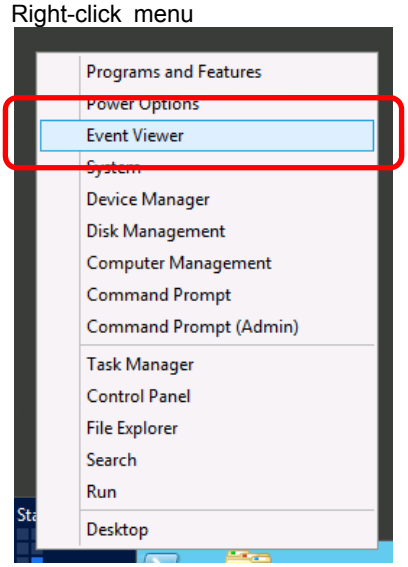
1. Click **Settings** on Charms Bar.

   To go to the step 4, you can directly choose **Event Viewer** by right-clicking on the lower left corner of the screen.

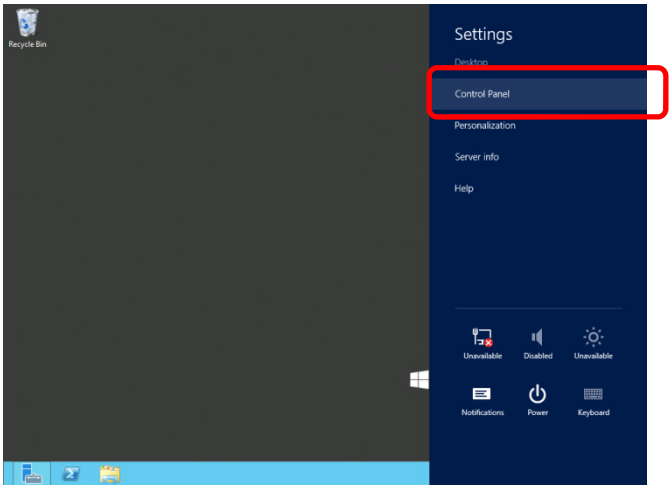
Charms



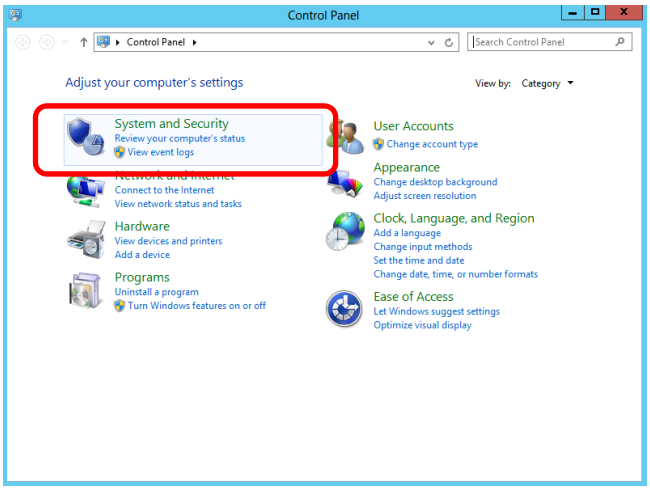
Right-click menu



2. Click **Control Panel** from **Settings**.



3. Click **View event logs** of **System and Security** on **Control Panel**.

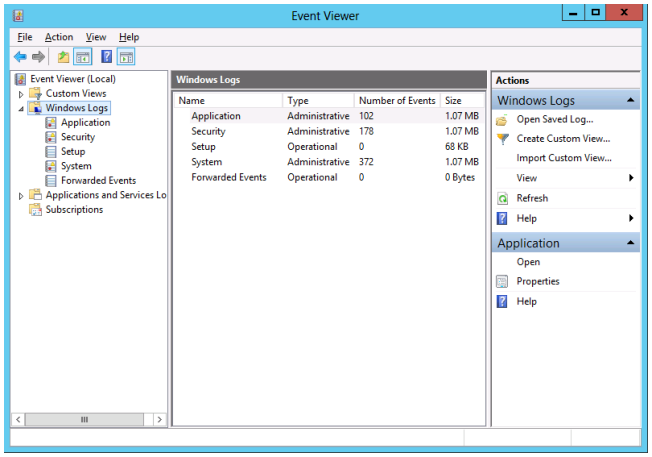


4. Select the type of log in **Windows Logs**.

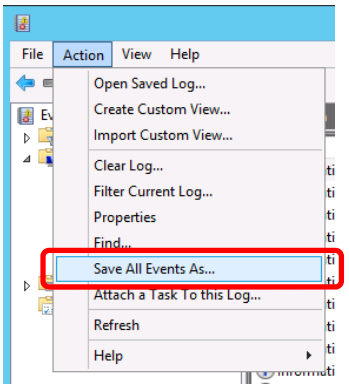
Application records events related to running applications.

Security records events related to security.

System records events that occur in Windows system components.



5. Click **Save All Events As** from **Action** menu.



6. Type the file name of the log file in **File name**.
7. Select the type of the log file you want to save in **Save as type**, and then click **Save**.

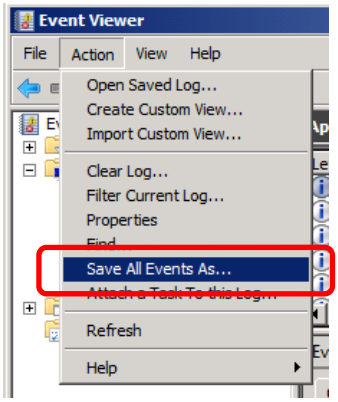
4.1.2 Windows Server 2008 R2

1. Click **Administrative Tool** and then click **Event Viewer** from **Control Panel**.
2. Select the type of log in **Windows Logs**.

   Application records events related to running applications.

   Security records events related to security.

   System records events that occur in Windows system components.
3. Click **Save All Event As** from **Action** menu.



4. Type the file name of the log file in **File name**.
5. Select the type of the log file you want to save in **Save as type**, and then click **Save.**

4.2 Collecting Configuration Information

This section describes how to collect hardware information or configuration.

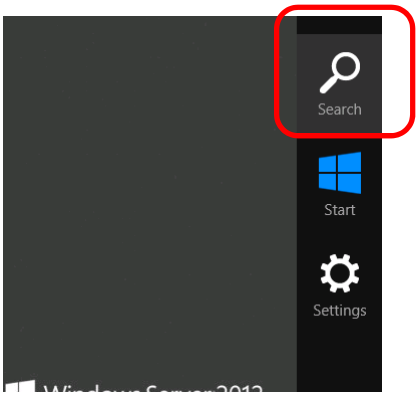
Tips If a STOP error, system error, or stall occurs, restart the system and then follow the procedure below.

4.2.1 Windows Server 2012 R2 / Windows Server 2012

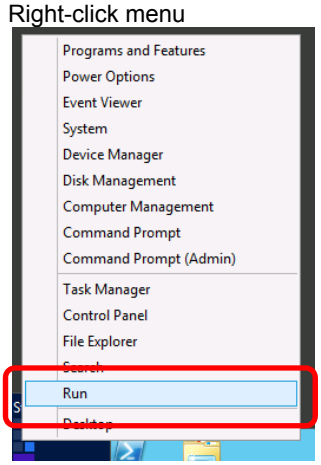
1. Click **Search** on Charms Bar.

   You can directly choose **Run** by right-clicking on the lower left corner of the screen.

Charms

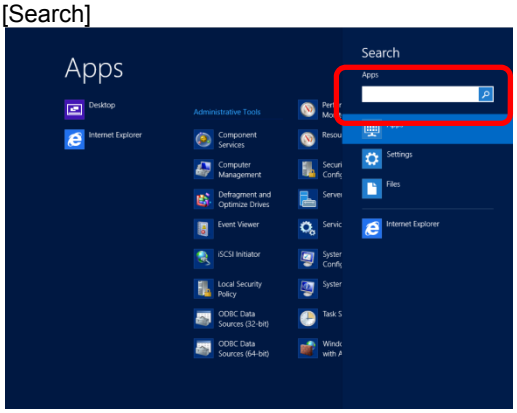


Right-click menu

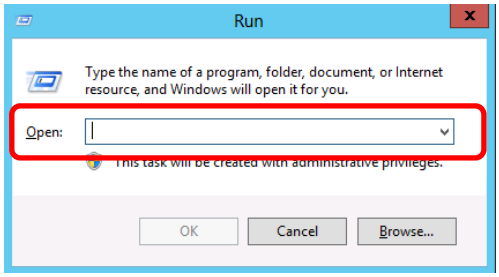


2. Type `msinfo32.exe`, and then press <Enter> key.

[Search]



[Run]



3. System Information starts.
4. Click **Export** from **File** menu.
5. Type a file name to save in **File Name**, and then Click **Save**.

4.2.2 Windows Server 2008 R2

1. Click **Run** from **Start** menu.
2. Type `msinfo32.exe` in **Open**, and then click **OK.**
3. System Information starts.
4. Click **Export** from **Files** menu.
5. Type a file name to save in **File Name**, and then Click **Save.**

4.3 Collecting User-Mode Process Dump

The user-mode process dump is the failure information related to application errors.
For details, see *Chapter 1 (6.2 How to Create a User-Mode Process Dump File)* in "*Installation Guide (Windows)*".

4.4 Collecting Memory Dump

If an error occurs, the dump file will be saved to acquire necessary information. You can specify any location for saving the diagnostic information. For details, see *Chapter 1 (6.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".

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 **Do not reset during dumping memory or restarting the server even if the message of virtual memory shortage appears.**

5. Troubleshooting

If the server does not work normally, check the server according to the following checklist before sending it for repair. If the server still does not work after the action of checklist is performed, write down the error messages displayed on the screen and then contact your sales representative.

5.1 Problem at Powering on

[?] **When the power cable is connected, the POWER LED turns on**

→ POWER LED lights amber during initialization of the server after connecting the power cord. POWER LED turns off when initialization finishes.

[?] **Unable to power on the server**

☐ Is the server properly supplied with power?

→ Check if the power cord connects to the power outlet (or UPS) that meets the power specifications for the server.

→ Use the power cord that comes with the server. Additionally, check the power cord for broken shield or bent plugs.

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

→ If the power cord is plugged to a UPS, make sure the UPS is powered and it outputs power. Refer to the manual that comes with the UPS for details.

Power supply to the server may be linked with UPS using the BIOS Setup utility.

☐ Did you press POWER Switch?

→ Wait until POWER LED is unlit if POWER LED lights amber, and then press the switch on the front of the server to turn on the power.

→ When power cord is connected,the POWER LED lights amber and the initialization of EXPRESSSCOPE Engine 3 (BMC) starts. During initialization, the power switch is not available. Wait until the POWER LED turns off, and press the power switch.

☐ Is Standby Power Save set to **Enabled** in the BIOS setup?

→ When Standby Power Save is enabled, remote power on is not allowed, and you can power on the server only by using POWER Switch on the server. If you change the AC Link setting while Standby Power Save is enabled, you need to press the switch twice to start up the server.

[?] **POST does not complete**

☐ Is memory installed correctly?

→ Check if memory is installed correctly.

☐ Is the memory size large?

→ The memory check may take longer than usual if the installed 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 processing. In such a case, reboot the server. Do not perform any keyboard or mouse operation until the BIOS start-up message appears after you reboot the server.

☐ Are memory and PCI devices supported for use with this server?

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

[?] **The POST error message "B000: Expansion ROM not initialized" is output when an optional card is installed**

☐ Check if expanding the option ROM of a device other than the boot device is enabled.

Start the BIOS setup utility and set expansion of the option ROM of a device other than the boot device to **Disabled**.

Advanced → PCI Configuration → PCI Slot n Option ROM → Enabled

Advanced → PCI Configuration → LAN1 Option ROM Scan → Disabled

5.2 Problem at Starting EXPRESSBUILDER

[?] **Unable to start EXPRESSBUILDER from Internal Flash Memory**

☐ Did you press <F3> key to start EXPRESSBUILDER from Internal Flash Memory during POST?

→ After starting the server, press <F3> key when the following message appears.

```
Press <F2> Setup, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```

☐ Have you inserted a CD/DVD or removable media to the server?

→ Remove a CD/DVD and removable media from the server and try again.

☐ Is the data of Internal Flash Memory broken?

→ Run EXPRESSBUILDER DVD, perform **Update** of **Internal Flash Memory** in Utility menu, and try again.

☐ Is an error message displayed?

→ Take an appropriate action depending on the message.

```
Error [Message ID:Z3001]:
Unable to start EXPRESSBUILDER. Virtual Drive (VD) is incorrect.
```

Action: Go the web site below to find recovery file.
http://www.nec.com/

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

Action: Check if hardware is properly connected.

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

Action: Check if DVD is damaged or not.

☐ Is a message popped up?

→ Take an appropriate action depending on the message.

Message	Action
EXPRESSBUILDER does not support this computer. Insert EXPRESSBUILDER disc for the computer and click **OK** to restart the computer.	Update Internal Flash Memory by using EXPRESSBUILDER DVD that supports this server.
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.	Update Internal Flash Memory by using EXPRESSBUILDER DVD that supports this server.
Failed to open a file.	
Failed to get the parameters of a file.	
Failed to write a file.	
Failed to copy a file.	
An undefined error occurred.	Contact your sales representative.

[?] While running EXPRESSBUILDER, the server reboots after a certain time has elapsed

☐ Is **Boot Monitoring** enabled?

→ **Boot Monitoring** option of BIOS SETUP must be disabled during running EXPRESSBUILDER.

[?] Unable to start EXPRESSBUILDER DVD

☐ Are BIOS settings correct?

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

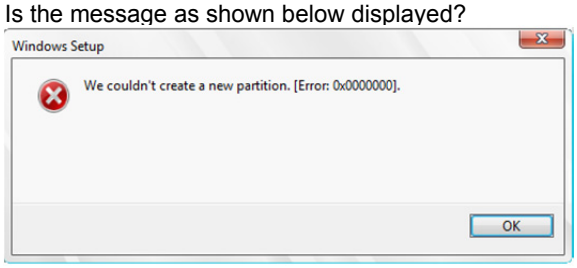
☐ Is a DVD damaged?

→ Prepare a new DVD, create a EXPRESSBUILDER DVD, and try again.

5.3 Problem of Windows Installation

[?] **Unable to create a partition when installing Windows Server 2012 R2 or Windows Server 2012**

☐ Is the message as shown below displayed?



→ Failed to create a partition.

Remove the partition once, then create it again. If data disk is connected, pay strict attention to the partition you are going to remove. For details, refer to the website below:

Windows Server 2012 R2

https://technet.microsoft.com/en-us/library/dn387077.aspx

Windows Server 2012

https://technet.microsoft.com/en-us/library/jj574225.aspx

[?] **The keyboard or mouse does not work when Windows Server 2008 R2 installed**

☐ Did you select **Disabled** for XHCI Hand-off?

→ See Chapter 2 (1. System BIOS) for details.

Advanced → USB Configuration → XHCI Hand-off → Disabled

Select **Enabled** for XHCI Hand-off after Starter Pack installed.

Advanced → USB Configuration → XHCI Hand-off → Enabled

[?] **Unable to install OS**

☐ Is the hard disk drive properly installed?

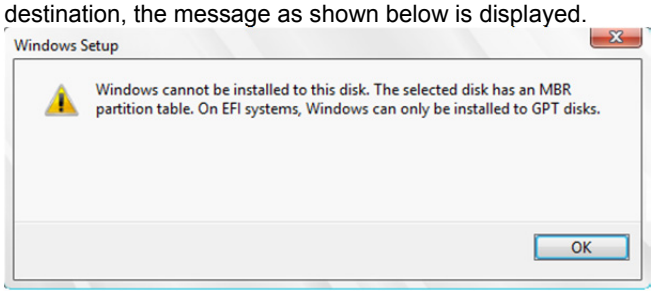
→ Make sure that the hard disk drive is installed securely and that cables are properly connected.

☐ If the hard disk drive of installation destination supported?

→ The supported disk format depends on boot mode as shown below.

Boot mode	Disk format
UEFI	GUID Partition Table (GPT)
Legacy BIOS	Master Boot Record (MBR)

For example, in UEFI environment, if the MBR formatted hard disk drive is specified for installation destination, the message as shown below is displayed.



To change disk format, first erase the disk contents of installation destination, and create the partition again. Before creating a new partition, be sure to backup the necessary data.

☐ Did you configure the RAID controller?

→ For the RAID array, use EXPRESSBUILDER or a RAID Configuration Utility (LSI Software RAID Configuration Utility, Off-line Utility) to properly configure the RAID controller before installing OS.

☐ Did you create a logical drive?

→ For the RAID array, create a logical drive using EXPRESSBUILDER, LSI Software RAID Configuration Utility, Off-line Utility to install OS.

[?] **Unable to install Windows**

☐ Have you checked precautions for installation?

→ For installing OS, see "*Installation Guide (Windows)*".

[?] **A product key was not requested**

☐ Are you installing Windows Server 2008 R2?

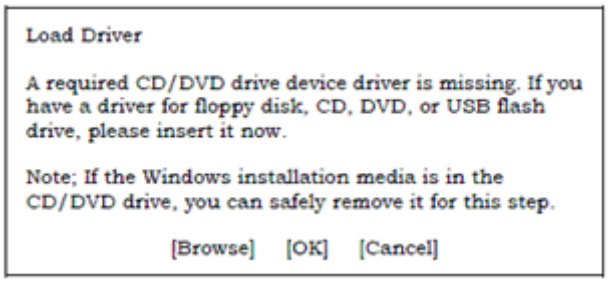
→ If you install using the backup DVD-ROM, entering the product key is not required. If installing using a DVD-ROM other than the backup DVD-ROM, a screen for entering the product key is displayed, during OS installation, and, before the MICROSOFT SOFTWARE LICENSE TERMS dialog box, which displays after OS installation. Follow the on-screen instructions to enter the product key.

[?] **The following devices are indicated as faulty devices in a server core installation of Windows**

- SM Bus Controller
- PCI Simple Communications Controller
- Base System Device
- System Interrupt Controller
- Performance Counters
- PCI Device
- PCI Data Acquisition and Signal Processing Controller
- PCI Memory Controlle
- Not Available
- Universal Serial Bus Controller (only Windows Server 2008 R2)

→ There is no operational problem.

[?] **The following message appears when installing the OS, and you cannot proceed**



→ Windows Server 2008 R2 cannot be installed from USB interfaced optical disk drive. Install from built-in optical disk drive.

[?] **Unable to access the partition which was previously created after reinstalling while several disks are connected**

→ For details, refer to the website below.

http://support.microsoft.com/kb/2497048/ja (Japanese text only)

[?] **When Windows Server 2012 R2/Windows Server 2012 is installed while several R2/Windows Server 2012 is installed while several disks are connected, the system partition and the boot partition (350 MB) are created in another disk**

→ For details, refer to the website below.

http://support.microsoft.com/kb/2530901/ja (Japanese text only)

[?] **When Windows Server 2008 R2 is installed while several disks are connected, the system partition and the boot partition (100 MB) are created in another disk**

→ For details, refer to the website below.

http://support.microsoft.com/kb/2530901/ja (Japanese text only)

[?] **When Starter Pack is installed to Windows Server 2008 R2, the below message is sometimes displayed for a moment upon shutdown**

```
1 program still needs to close:
(Waiting for) Task Host Window
```

→ No problems for system operation.

For details, refer to the website below:

http://support.microsoft.com/kb/975777/en-us

[?] **Windows was installed as "Workgroup" although it is set to "Join the Domain"**

☐ Is the LAN cable properly connected?

→ If the LAN cable is not connected, Windows is installed in workgroup setting. You can change the setting by Control Panel on installed Windows.

[?] **The following features are installed when installing IIS in Windows Server 2008 R2 using EXPRESSBUILDER**

☐ Windows Process Activation Service

- Process Model
- Configuration APIs

☐ Remote Server Administration Tool

- Role Administration Tools
- Web Server (IIS) Tools

→ The features listed above are activated because they are required for the installation of IIS basic features.

[?] **The Telnet Service is not installed**

→ Install the telnet service according to the following procedure.

(1) Adjust the computer name to 14 characters or less.

(2) Click **Run** on **Start** menu.

(3) Type `tlntsvr/service` in the **Open** box, and then click **OK**.

(4) Click **Start** menu, point to **Control Panel,** click **Administrative Tools**, and then click **Services** to confirm whether the Telnet Service is registered.

(5) You can specify the computer name with 15 characters or more after installing the telnet service.

[?] **Unable to run "Create a parameter file for Windows OS"**

→ Associate the file type with Microsoft HTML Application host according to the following procedure.

(1) Select **Run** in **Windows Start** menu.

(2) Type `%windir%\system32\mshta.exe/register`.

[?] **An error message is displayed at the system reboot after installing the graphics accelerator driver**

☐ Is your system environment Server Core of Windows Server 2012 R2?

→ An application error is registered in the event viewer, but this does not affect the system.

5.4 Problem at Starting OS

[?] **Unable to start OS**

☐ Has the BIOS configuration of the RAID controller changed?

→ Set the correct BIOS configuration with a RAID Configuration Utility (LSI Software RAID Configuration Utility, Off-line Utility).

☐ Is the RAID controller detected by POST?

→ Turn on the power after the RAID controller is detected as being connected successfully.

☐ Is the RAID controller inserted firmly straight into the PCI slot?

→ Install the RAID controller properly.

☐ Is the PCI slot able to install the RAID controller?

→ Check the restrictions of PCI slots on the server and then install the RAID controller to the correct slot.

☐ Are hard disk drives properly installed?

→ Install the hard disk drive to the RAID controller properly.

☐ Is SAS cable connected to hard disk drive correctly?

→ Connect the SAS cable properly.

☐ Is the EXPRESSBUILDER DVD inserted?

→ Remove the EXPRESSBUILDER DVD and retry.

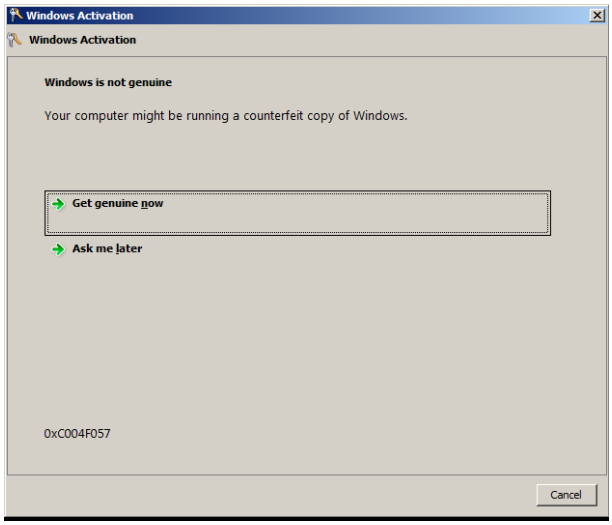
☐ Is a cartridge inserted into built-in RDX (USB)?

→ Either remove the cartridge or change the boot order in BIOS Setup.

☐ Is a disk array unit connected to the PCI card?

→ Change the boot device configuration from HDD Drive BBS Priorities of the BIOS Setup Boot menu.

[?] **The following message appears when logging on Windows Server 2008 R2**



☐ Have you finished license authentication for Windows product?

→ The above message will appear if you use Windows Server 2008 R2 with the unauthenticated license. Select **Get Genuine now** and proceed license authentication.

The above message is an example of request for license authentication. The message displayed on screen may differ from this depending on the license.

5.5 Problem of Windows STOP Error

[?] **Unable to turn the power OFF at the blue screen (STOP error screen)**

→ Continue to press the power switch for at least four seconds to turn off the server.

5.6 Problem of RAID System

[?] **Unable to rebuild hard disk drive**

☐ Is the capacity of the hard disk drive to be rebuilt enough?

→ Use a hard disk drive with the same capacity as that of the faulty hard disk drive.

☐ Is the logical drive RAID0?

→ RAID0 cannot be rebuilt because it has no redundancy. Replace the failed hard disk drive, recreate the configuration information, initialize it, and recover the drive using backup data.

[?] **Unable to rebuild the hard disk drive automatically**

☐ Did you secure sufficient time for replacing the hard disk drive (hot swap)?

→ To make auto-rebuild work, secure at least 90 seconds from when a hard disk drive is removed to when the drive is installed.

☐ Are settings correct?

→ Use the LSI Software RAID Configuration Utility to check the Auto Rebuild settings.

TOPMENU → Objects → Adapter → Auto Rebuild

* The Auto Rebuild settings are not available in Off-line Utility.

[?] **Unable to perform Consistency Check**

☐ Is the logical drive **Critical** or **Degraded**?

→ Replace the failed hard disk drive with new one, and then perform rebuilding.

☐ Is RAID0 configured for the logical drive?

RAID0 has no data redundancy, and therefore, Consistency Check is disabled in the RAID0 configuration.

[?] **A part of physical device information of Universal RAID Utility is not be displayed correctly**

→ If LSI Embedded MegaRAID is used, a part of physical device information of Universal RAID Utility may not be displayed correctly.

[?] **Unable to set Write-Back for Cache Mode**

→ If an extra battery for N8103-176/177/178/179 RAID controller is faulty, not connected, or insufficiently charged, then the Cache Mode is changed to **Write Through** even if you specify **Write Back** (with BBU, not forcefully).

For the description of the Cache Mode, see N8103-176/177/178/179 RAID controller user's guide (*1-8. Write Cache Setting*)

[?] **DISK LED flashes**

☐ DISK LED flashes frequently even while the hard disk drive is not accessed.

→ When Patrol Read is running, the DISK LED flashes even if the hard disk drive is not being accessed. If SATA hard disk drive is used, the DISK LED may stay on.

5.7 Problem of Internal Devices and Other Hardware

[?] **Unable 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?

→ Refer to the manual that comes with the device to install its driver.

☐ Is option board setting correct?

→ Refer to the manual that comes with the board for details to make correct settings.

→ Some devices connected to the serial or parallel port, or USB port may require I/O port address or operation mode settings. Refer to the manual that comes with the device to make correct settings.

[?] **The keyboard or mouse does not work**

☐ Is the cable properly connected?

→ Make sure that the cable is connected to the connector on the front or rear of the server.

☐ Is BIOS configuration correct?

→ Check the BIOS settings by using BIOS Setup Utility.

[?] **Unable to access the hard disk drive**

☐ Is the hard disk drive supported by the server?

→ Operation of any device that is not authorized by NEC is not supported.

☐ Is the hard disk drive properly installed?

→ Check the hard disk drive installation status and the cable connections.

[?] **The numbers assigned to the hard disk drive bays do not match the numbers indicated in the OS**

☐ Is the SATA drive connected in IDE mode?

→ In SATA IDE mode, the drive bays might be detected in a different order from the physical connection, depending on the OS used.

Primary > Secondary

Master > Slave

Group1	Port0 : Primary Master
	Port1 : Secondary Master
	Port2 : Primary Slave
	Port3 : Secondary Slave
Group2	Port4 : Primary Master
	Port5 : Secondary Master

[?] **When N8190-157A/158A/159/160 is used, the names of the Fibre Channel controllers appear with different names on Device Manager**

☐ When N8190-157A/158A/159/160 is used in Windows, a different controller name may be displayed per controller in Device Manager. To display the correct controller name, please perform the following.

Start command prompt and then open the folder under the system drive (drive C), enter the following file, and run the file.

Windows Server 2012 R2:

*C:\Program Files(x86)\EXPRESSBUILDER\repository\011\win\winnt*drivers\01_storage\1_ao_03\friendlyname.exe

Windows Server 2012:

*C:\Program Files(x86)\EXPRESSBUILDER\repository\011\win\winnt*drivers\01_storage\1_ao_02\friendlyname.exe

Windows Server 2008 R2:

*C:\Program Files(x86)\EXPRESSBUILDER\repository\011\win\winnt*drivers\01_storage\1_ao_01\friendlyname.exe

If using EXPRESSBUILDER DVD, run the following file.

Windows Server 2012 R2:

\011\win\winnt\drivers\01_storage\1_ao_03\friendlyname.exe

Windows Server 2012:

\011\win\winnt\drivers\01_storage\1_ao_02\friendlyname.exe

Windows Server 2008 R2:

\011\win\winnt\drivers\01_storage\1_ao_01\friendlyname.exe

[?] **Unable to detect RDX devices and USB devices by System Recovery Options**

☐ Is the USB3.0 driver installed on the system?

→ See Chapter 1(6.Windows System Recovery) to install the USB3.0 driver.

[?] **The keyboard or mouse does not work by System Recovery Options**

☐ Did you select **Disabled** for XHCI Hand-off?

→ See Chapter 2 (1. System BIOS) for details.

Advanced → USB Configuration → XHCI Hand-off → Disabled

Select **Enabled** for XHCI Hand-off after System Recovery Options finished.

Advanced → USB Configuration → XHCI Hand-off → Enabled

5.8 Problem of OS

[?] **Windows is unstable**

☐ Have you installed Starter Pack?

→ Install Starter Pack by following "*Installation Guide (Windows)*".

[?] **Windows is unstable after the system is restored from a backup tool**

→ Install Starter Pack by using EXPRESSBUILDER (see *Chapter 2 Installing the Bundled Software* in "*Installation Guide (Windows)*".

[?] **Unable to fild the server on network**

☐ Is the cable connected properly?

→ Check if the LAN cable is surely connected to the network and the cable is conformed to the network interface protocol.

☐ Are BIOS settings correct?

→ Check the settings with BIOS setup utility.

☐ Have you completed a protocol and services settings?

→ Install the driver for the LAN controller of the server and specify a protocol such as TCP/IP and various services.

☐ Are transfer rate settings correct?

→ Specify the transfer rate and duplex mode to the same as the value specified for netwok hub/switch.

[?] **There are RX dropped packets (if InDiscards) when the system is in operation on Windows**

→ Although there may be RX dropped packets when the LAN is received multicast frames, there is no operational problem.

[?] **LAN adopter port1 name is appeared as "Ethernet" in the system on Windows Server 2012 R2**

→ It is not a problem in operating the system.

5.9 Problem of EXPRESSBUILDER on Windows

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

☐ Have you installed Adobe Reader to your computer?

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

☐ Does the message below appear?

"Internet explorer has stopped working"

→ Close the error dialog box and proceed. If the same error appears, double-click "version.xml" on the root folder of EXPRESSBUILDER DVD, click Yes at the dialog box displayed and click Instruction Manuals on Autorun Menu again.

[?] **Autorun menu does not appear when EXPRESSBUILDER DVD is inserted to the server**

→ Choose **Computer** from Explorer and double-click the icon of the DVD drive that set EXPRESSBUILDER DVD.

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

☐ Is your system environment suitable?

→ To run Integrated Installation, log on to the Windows on the server with an administrative privilege.

[?] **The menu is displayed with a wrong language**

☐ Is your system environment suitable?

→ Confirm the settings of **Regional and Language Options**. Specify the language settings of each tab to **English (US)**.

[?] **Unable to create the repository**

☐ Do four drive letters remain?

→ Free at least four drive letters except A: and B: when creating the repository.
If the drive letters from C: to W: are already assigned, drive letters cannot be assigned to four temporary drives and the repository cannot be created.

[?] **The following message appears after the Update command of EXPRESSBUILDER is run**

```
You need to format the disk in drive I: before you can use it.
Do you want to format it?
```

* The drive letter ("I:") is changed to other drive letter depending on your hardware environment.

→ Click **Cancel** to close the window. If you accidentally format it, you can recover by performing the **Update** command again.

[?] **The following message appears on the right bottom of screen**

```
Device driver software was not successfully installed
```

→ Ignore the message. The message will automatically disappear.

5.10 Problem of Bundled Software

[?] **The installer was displayed by a wrong language or resulted in an error.**

☐ Is your system environment correct?

→ Confirm the settings of **Regional and Language Options**. Set the language settings of each tab to **English (US)**.

[?] **NEC ESMPRO ServerAgentService (for Windows)**

→ For details of NEC ESMPRO ServerAgentService (for Windows), see "NEC ESMPRO ServerAgentService Installation Guide (Windows)" in EXPRESSBUILDER.

[?] **NEC ESMPRO Manager**

→ For details of NEC ESMPRO Manager, see "NEC ESMPRO Manager Installation Guide" in EXPRESSBUILDER or its help.

5.11 Problem of Optical Disk Drive

[?] **Unable to access or play a CD/DVD**

☐ Is the disk properly set in the optical disk drive tray?

→ There is a holder in the tray to secure the disk. Make sure that the disk is securely placed in the holder.

☐ Is the CD/DVD supported by the server?

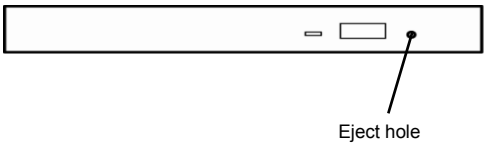
→ For a disk such as a CD with copy guard which does not conform to the CD standard, the playback of such a disk with the optical disk drive is not supported.

→ The CD/DVD for Macintosh is not supported.

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

→ Eject the disk in the following procedure.

1. Press 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 eject hole at the front of the tray. Keep pressing slowly until the tray comes out.



Important
- **Do not use a toothpick, plastic, and other easily breaks.**
- **If you still cannot eject the disk, contact your sales representative.**

3. Pull the tray out with your hands.
4. Remove the disk.
5. Push the tray back.

5.12 Problem at Powering Off

[?] **The power is not turned off**

☐ Is the suppression feature of the power switch enabled?

→ Run BIOS Setup Utility to check the following item is set to **Disabled**. If it is **Enabled**, the power switch is not available.

The menu to be confirmed: **Server → Power Switch Inhibit**

[?] The event is logged when the server is shut down forcibly (pressing power switch for at least four seconds)

→ Ignore this event.

[?] **STATUS LED turns amber after pressing POWER switch for at least four seconds to turn off the server**

→ Unplug the power cord temporarily to turn off the STATUS LED.

[?] **The server does not shift to Standby Power Save mode after enabling the following setting**
[Server]-[Power Control Configuration]-[Standby Power Save]

→ Terminate the POST process to shift to this mode. If the POST process is cancelled, this feature may not take effect when you use the server next time.

5.13 Promlem of Memory Throttling

[?] **The value of memory throttling remains [0%]**

→ This server does not support the memory throttling feature. The information of the memory throttling does not change from [0%] in the EXPRESSSCOPE Engine 3, NEC ESMPRO Manager and Server Configuration Utility

6. Windows System Recovery

Recover the Windows system by using the following instructions if the system does not work normally.

Note

- After recovering the system, be sure to install each driver and Starter Pack. See "*Installation Guide (Windows)*" to install Starter Pack and device drivers.
- If hard disk drives cannot be detected, you cannot recover the Windows system.

6.1 Recovery of Windows Server 2012 R2 / Windows Server 2012

If the Windows does not start normally, you can recover it using the feature of the Windows installation disc. To run this feature, start the installation disc, and then choose **Repair your computer** in **Windows Setup** wizard.
We recommend that this option is performed by the system administrator.

6.2 Recovery of Windows Server 2008 R2

If the Windows does not start normally, you can recover it using the system recovery options.
We recommend that this option is performed by the system administrator. For details, refer to Windows Help.

Important

- **When using an onboard RAID controller (LSI Embedded MegaRAID), you cannot use system recovery options.**
- **Select Disabled for XHCI Hand-off before System Recovery Options started.**
  See *Chapter 2 (1. System BIOS)* for details.
  Advanced → USB Configuration → XHCI Hand-off → Disabled

  Select Enabled for XHCI Hand-off after System Recovery Options finished.
  Advanced → USB Configuration → XHCI Hand-off → Enabled

When using RDX and USB device in **System Recovery Options**, install the USB3.0 driver according to the following procedure.

1. Click **Command Prompt** in **System Recovery Options.**
2. Set the EXPRESSBUILDER DVD in the built-in optical disk drive.
3. To install the USB3.0 driver, type the following at the command prompt and press <Enter>.

   The D: means the optical disk drive in the command below.

   ```
   drvload D:\011\win\winnt\drivers\05_system\1_af_04\drivers\win7\x64\iusb3hub.inf
   drvload D:\011\win\winnt\drivers\05_system\1_af_04\drivers\win7\x64\iusb3xhc.inf
   ```

4. To exit the command prompt, type the following at the command prompt and press <Enter>.

   ```
   exit
   ```

The installation is now complete.

7. Resetting and Clearing the Server

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

7.1 Software Reset

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

Note Make sure that no processing is in progress when you reset the server.

7.2 BMC Reset

Press BMC RESET Switch only if a problem occurs in EXPRESSSCOPE Engine 3 (BMC).

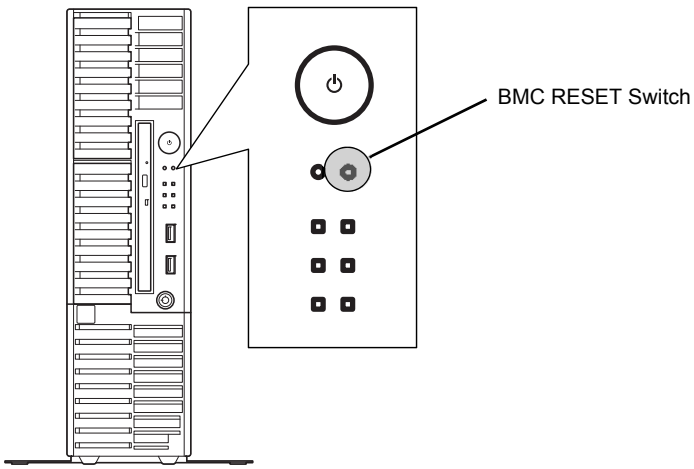
Usually, do not press this switch.

To reset the BMC, press BMC RESET Switch at least five seconds. The remote management feature is not available for about two minutes after the BMC is reset.

Note Do not shut down, restart the server, or perform any switch operation after pressing BMC Reset Switch for at least two minutes.

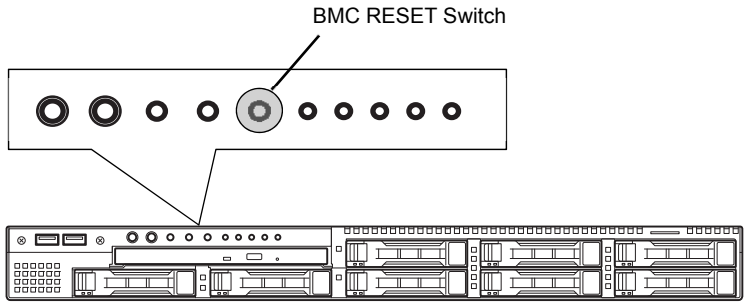
Tips BMC RESET Switch only resets BMC and does not restart the server.

T110h-S

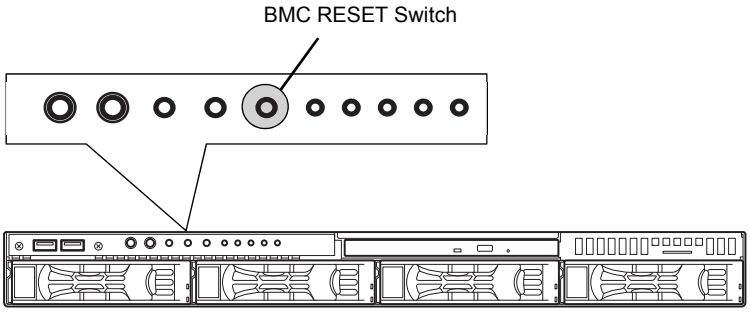


R110h-1

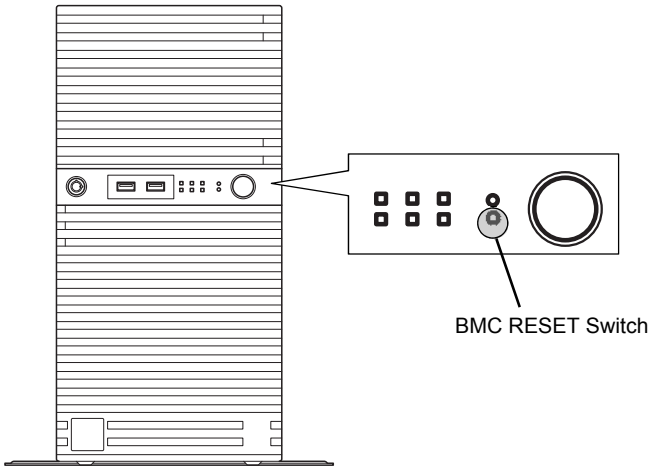
3.5-inch Hard Disk Drive model



2.5-inch Hard Disk Drive model



T110h



7.3 Forced Shutdown

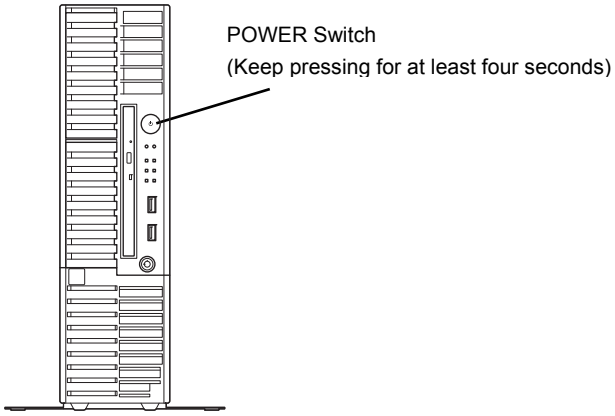
Use this feature if an OS command does not shut down the server, POWER Switch does not turn off the server, or software reset does not work.

Continue to hold POWER Switch of the server for at least four seconds. The power is forcibly turned off.
To turn on the power back again, wait at least 30 seconds after turning off the power.

Note

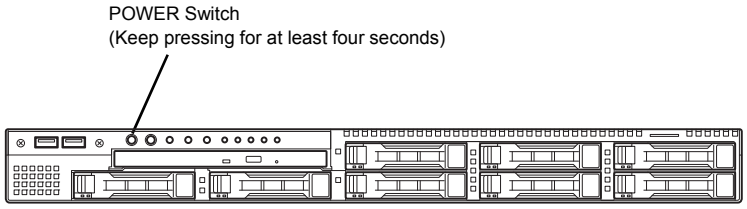
- If the remote power-on feature is used, cycle the power once to load the OS after the power has been forcibly turned off, and then turn off the power again by shutting down the OS.
- When the server is shut down forcibly, an event is logged 12 seconds after the power switch is released. This event indicates that the system detected power supply configuration had been non-redundant and the redundant configuration was restored, and you can ignore this event.
- If STATUS LED turns amber when the server is shut down forcibly, unplug the power cord temporarily to turn off the STATUS LED.

T110h-S

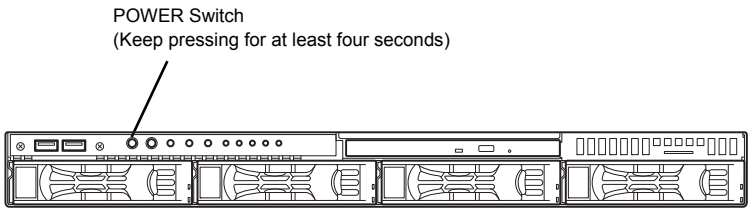


R110h-1

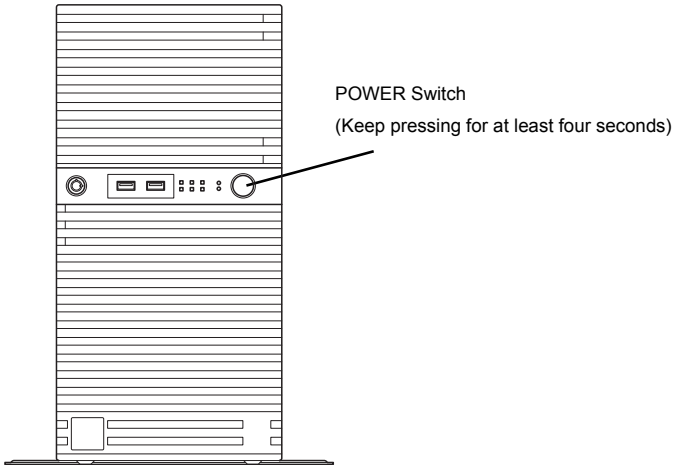
2.5-inch Hard Disk Drive model



3.5-inch Hard Disk Drive model


POWER Switch
(Keep pressing for at least four seconds)

T110h


POWER Switch
(Keep pressing for at least four seconds)

7.4 Clearing BIOS Settings (NVRAM Memory)

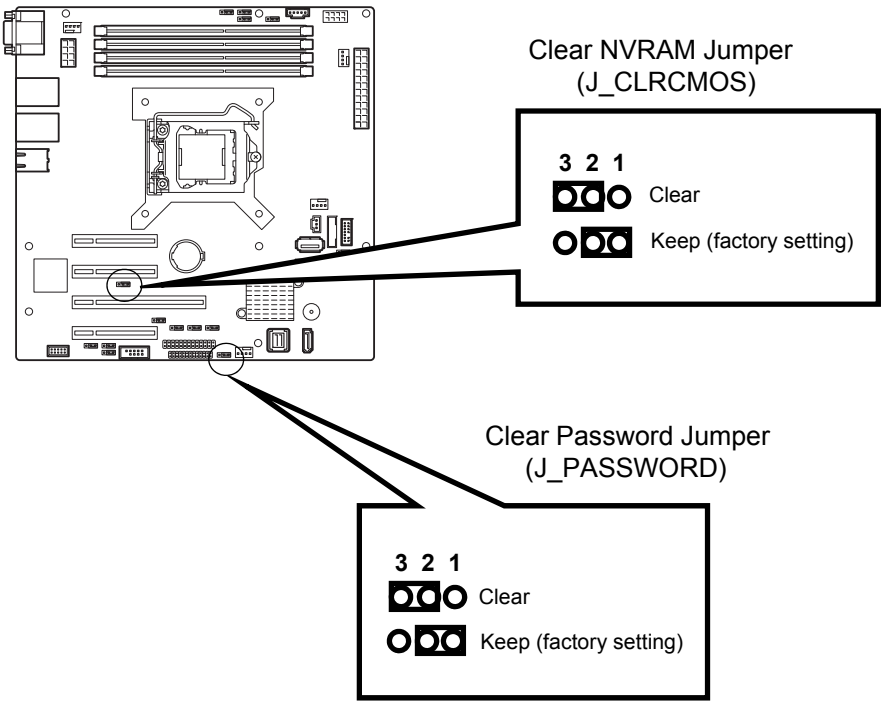
To recover the BIOS settings to the factory settings (clearing NVRAM memory), use the jumper switch.

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

Tips Usually, use BIOS Setup Utility (SETUP) to recover the settings to the factory settings (Load Setup Defaults).

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

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



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

WARNING

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

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

CAUTION

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

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

Important **Take anti-static measures before operating the server. For details, see *Safety Precautions and Regulatory Notices* (*1.8 Anti-static Measures*).**

- **Clearing NVRAM memory**

1. See "*Getting Started*" provided with this server or *Chapter 2 (1. Installing Internal Optional Devices)* in "*User's Guide*" to remove Top Cover.
2. Locate Clear NVRAM Jumper (J_CLRCMOS) by referring the above figure.
3. Change the jumper switch from **Keep** to **Clear**.
4. Wait at least five seconds and then return the jumper to **Keep**.
5. Reassemble the server, and then turn on the server.

   POST will halt with the following error massage.

```
ERROR
8006: System configuration data cleared by Jumper.
Press <F1> to resume, <F2> to Setup
```

6. Press <F2> key to start BIOS Setup Utility, and then run **Load Setup Defaults** from **Save & Exit** menu. The server will restart once before the OS starts.

Tips After this operation, system may restart once before the OS is started.

- **Clearing a password**

  1. See "*Getting Started*" attached to this server or *Chapter 2 (1. Installing Internal Optional Devices)* in "*User's Guide*" to remove Side Cover or Top Cover.
  2. Locate Clear Password Jumper (J_PASSWORD) by referring the above figure.
  3. Change the jumper switch from **Keep** to **Clear**.
  4. Reassemble the server, and then turn on the server.

     POST will halt with the following error message.

     ```
     ERROR
     8007: SETUP Menu Password cleared by Jumper.
     Press <F1> to resume, <F2> to Setup
     ```

  5. Turn off the power and return the jumper switch to **Keep** by the same manner.
  6. Reassemble the server.

8. System Diagnostics

System Diagnostics run several tests on the server.

8.1 Tests

The following items are tested in System Diagnostics.

- Memory
- CPU cache memory
- Hard disk drive

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

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

8.2 Usage of System Diagnostics

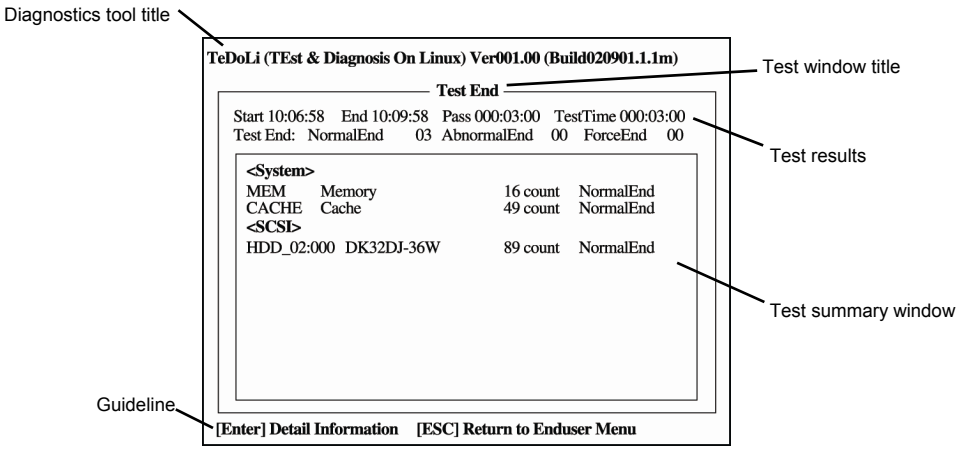
Run System Diagnostics as follows.

1. Run EXPRESSBUILDER and choose **Tool menu** from Boot Selection Menu.
   For details, see *Chapter 2 (6. Details of EXPRESSBUILDER)*.

   Note Choose **English** if Language Selection Menu appears.
   Press <Y> key if "Hit key to continue. [y|Y]" appears in Redirection Mode.

2. Choose **Test and diagnostics**.
3. From Test and diagnostics, choose **End-User Mode (Basic)** to run System Diagnostics. This process takes about three minutes.
   When the diagnostics is completed, the screen changes as shown on the next page.
   See *eupro_ug_en.pdf* in the `\isolinux\diag` folder of EXPRESSBUILDER for the **End-User Mode (Professional)** feature.

   Supervisor-Mode is intended for maintenance personnel.



Diagnostics tool title
The name and version of the diagnostic tool.

Test windows title
The progress of the diagnostics. “Test End” is displayed when the diagnostics completes.

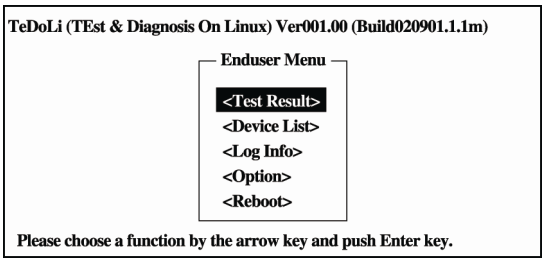
Test result
Shows the start, end, and elapsed time and completion status of the diagnostics.

Guideline
The details of the keys to operate window.

Test summary window
The results of each test. Move the cursor and press <Enter> key on the cursor line to display the details of the test.

If an error is detected by System Diagnostics, the relevant test result in the Test summary window is highlighted in red, and “Abnormal End” appears in the result on the right side.
Move the cursor to the test that detected the error, and press <Enter> key. Take notes about the error message that has been output to the Detail Information screen and contact your sales representative.

4. Follow the guideline shown at the bottom of the screen, and press <Esc> key.
   Enduser Menu below appears.



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

<Device List>
Shows a list of connected devices.

<Log Info>
Shows and saves the log information of the diagnostics.
To save it, connect FAT formatted removable media, and then choose **Save(F)**.

<Option>
Optional features can be used from this menu.

<Reboot>
Restarts the server.

5. Choose **Reboot** in **Enduser Menu**.
   The server will restart.

System Diagnostics is now completed.

9. Offline Tools

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

9.1 Starting Offline Tools

Start up Offline Tools at the following steps.

1. Turn on a display, and other peripheral devices, and then turn on the server.

2. Press <F4> key while the message below appears.
   `Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network.`

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

Off-line TOOL MENU
Maintenance Utility Server Configuration Utility Exit

4. Choose a feature from the menu.
   See *9.2 Features of Offline Tools* for more information.

9.2 Features of Offline Tools

Offline Tools has the following features.

Note Disable RDX by setting RDX to hibernate mode before starting Offline Tools.

- **Off-line Maintenance Utility**

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

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

  Off-line Maintenance Utility has the following features.

  - IPMI Information Viewer

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

    Using this feature, system errors and events can be investigated to locate the parts to be replaced.

    You can also clear the SEL area, and specify the operation when the SEL area becomes full.
  - System Information Viewer

    Displays and saves information on processor (CPU) or BIOS.
  - System Information Management

    Sets the information specific to your server (Product information, Chassis information).

- **Server Configuration Utility**

  Use this utility to specify the alert notification feature by EXPRESSSCOPE Engine 3 and use the remote management feature by "PC for management".

9.3 Console-less Feature

Offline tools can be remotely controlled from "PC for Management" without a keyboard or other consoles.

9.3.1 How to remotely control

Control from a LAN connected PC for Management using the remote KVM of EXPRESSSCOPE engine 3.

For details of the remote KVM, see "*EXPRESSSCOPE Engine 3 User's Guide*" in EXPRESSBUILDER.

Note Connect the LAN cable to the connector on management LAN port.Or, if Shared BMC LAN feature is used, connect the LAN cable to the corresponding LAN connector.

You can also control Offline Tools remotely by using BIOS Console Redirection.

9.3.2 Preparation

Enable the remote management feature of EXPRESSSCOPE Engine 3 in advance to check the hardware error during console-less operation.

See "*EXPRESSSCOPE Engine 3 User's Guide*" or NEC ESMPRO Manager online help.

NEC Express5800 Series
Express5800/R110h-1, T110h-S, T110h

2 Useful Features

This chapter describes useful features for using the server.

1. **System BIOS**
   Describes how to set the BIOS settings.

2. **Server Configuration**
   The server has the following off-line tools.

3. **Flash FDD**
   Describes the Flash FDD.

4. **Power Control Feature**
   Describes the power control feature.

5. **RAID System Configuration**
   Describes the RAID configuration utility installed in the server.

6. **Details of EXPRESSBUILDER**
   Describes the EXPRESSBUILDER attached to the server.

7. **EXPRESSSCOPE Engine 3**
   Describes EXPRESSSCOPE Engine 3.

8. **NEC ESMPRO**
   Describes NEC ESMPRO used to manage and monitor the server.

9. **NEC Product Info Collection Utility**
   Describes the NEC Product Info Collection Utility.

10. **Ezclct Viewer**
    Describes Ezclct Vierwer.

11. **Universal RAID Utility**
    Describes Universal RAID Utility, an application to manage or monitor the RAID Controllers.

12. **Express Report Service / Express Report Service (HTTPS)**
    Describes about Express Report Service / Express Report Service(HTTPS).

13. Express Report Service (MG)

Describes about Express Report Service(MG).

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.

Press <F2> key while the following message is displayed.

```
Press <F2> SETUP, ...
```

1.2 Parameters

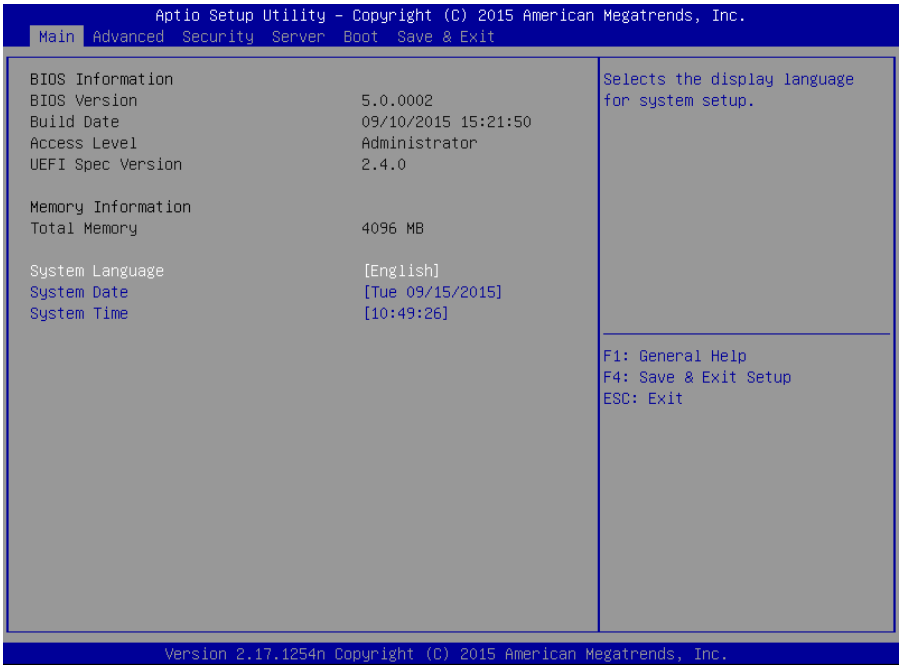
SETUP has the following menus.

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

These menus have several submenus for configuring.

1.2.1 Main

When you start SETUP, the **Main** menu appears first.



The table on the next page shows the items you can configure on the **Main** menu.

Option	Parameter	Description
BIOS Information	–	–
BIOS Version	(display only)	Displays the BIOS version.
Build Date	(display only)	Displays the BIOS build date.
Access Level	(display only)	Displays the access level of the login user, Administrator or User. If no password is specified, **Administrator** is displayed.
UEFI Spec Version	(display only)	Displays the UEFI Specification version.
Memory Information	–	–
Total Memory	(display only)	Displays the basic memory capacity.
System Language	[English] Français Español Deutsch Italiano	Specifies the display language for the BIOS. If you run SETUP with **BIOS Redirection Port** enabled, **English** is automatically selected and you cannot change **System Language**. If **BIOS Redirection Port** is disabled, you can change **System Language**.
System Date	WWW MM/DD/YYYY	Sets the system date.
System Time	HH:MM:SS	Sets the system time

[ ]: Factory settings

Tips

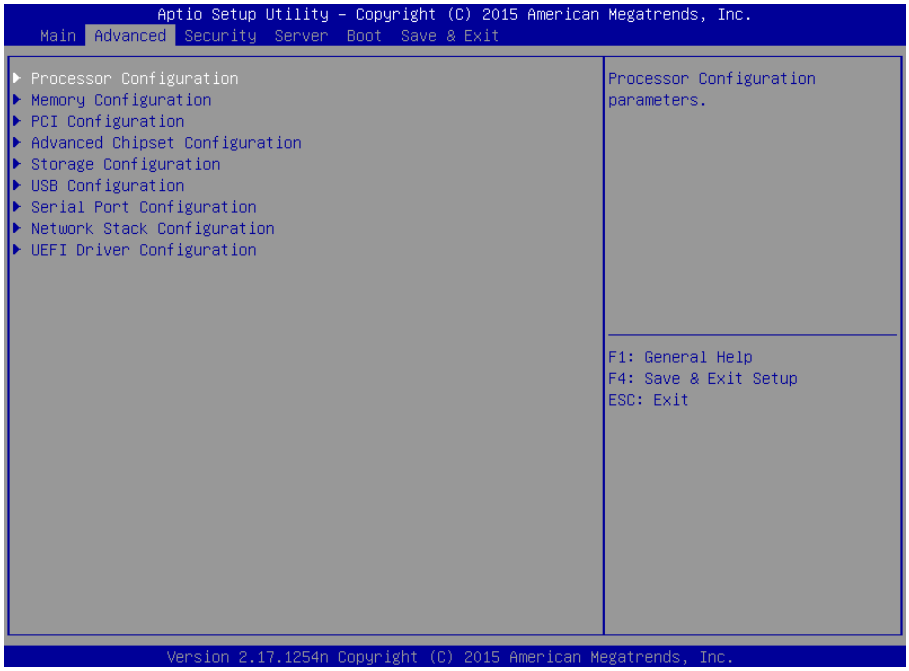
Make sure that the date and time are correct.
Using a time server (NTP server) is recommended.

1.2.2 Advanced

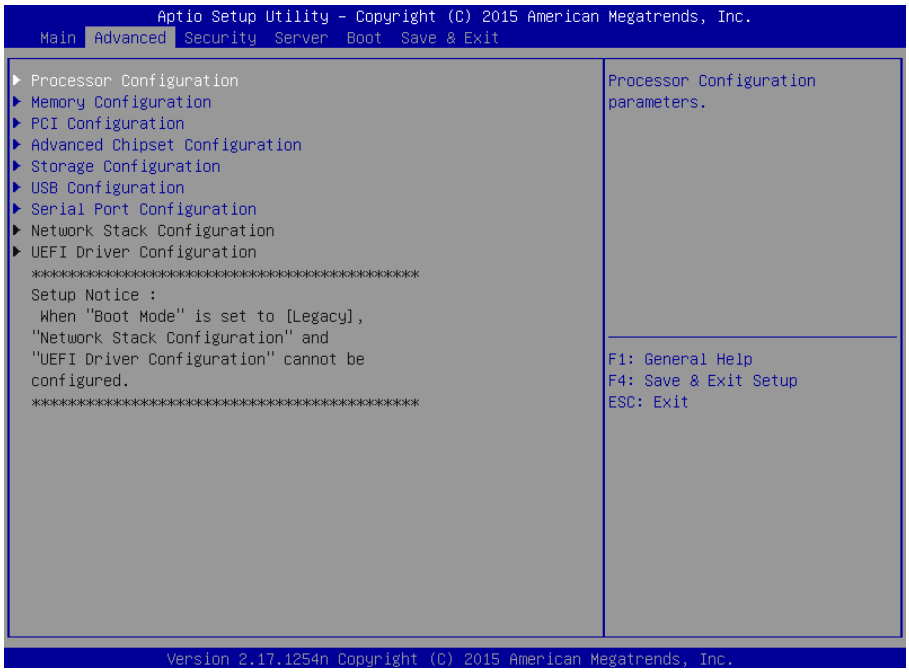
Advanced menu appears when the cursor is moved to **Advanced**.

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

When Boot Mode is UEFI:

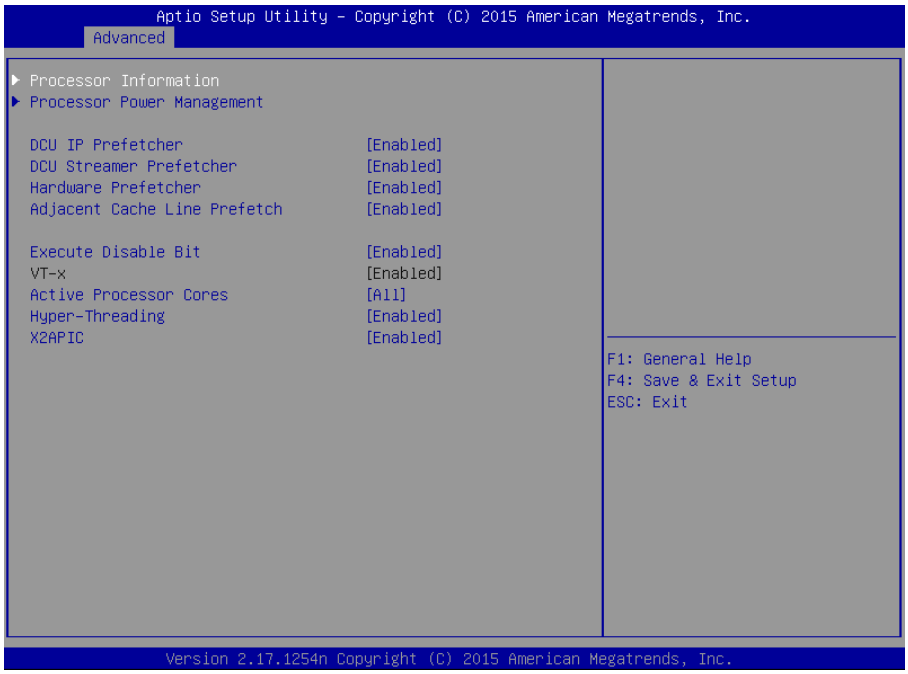


When Boot Mode is Legacy:



(1) Processor Configuration submenu

On **Advanced**, choose **Processor Configuration** and then press <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 <Enter> key to show its submenus.



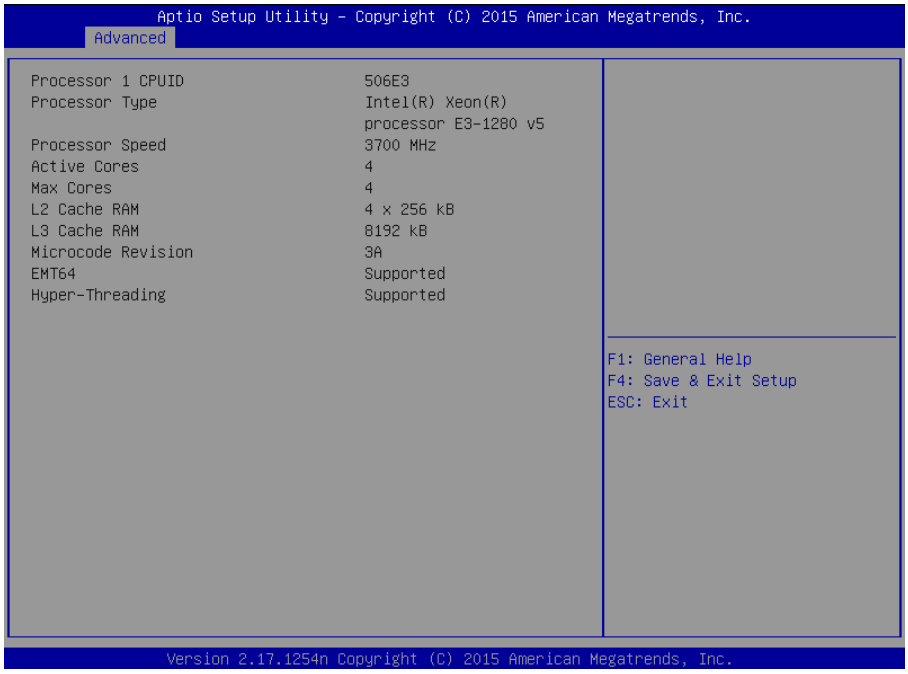
For details about the options, see the table on the next page.

Option	Parameter	Description
Processor Information	–	–
Processor Power Management	–	–
DCU IP Prefetcher	Disabled [Enabled]	Enables or disables the prefetcher of L1 cache.
DCU Streamer Prefetcher	Disabled [Enabled]	Enables or disables the prefetcher of L1 data cache.
Hardware Prefetcher	Disabled [Enabled]	Enables or disables Hardware Prefetcher.
Adjacent Cache Line Prefetch	Disabled [Enabled]	Enables or disables the optimal access from memory to cache.
Execute Disable Bit	Disabled [Enabled]	Enables or disables Execute Disable Bit feature. This option is displayed only when the installed processor supports this featue.
VT-x	Disabled [Enabled]	Enables or disables Intel Virtualization Technology feature.
Active Processor Cores	[All] 1 2 3	Specifies the number of active cores in processor. The selectable number of cores depends on processor installed.
Hyper-Threading	Disabled [Enabled]	Enables or disables the feature to simultaneously execute two threads in a single core. This option is displayed only when the installed processor supports this featue.

Option	Parameter	Description
X2APIC	Disabled [Enabled]	Enable or disable X2APIC feature. This item is selectable when Enabled is selected for VT-x and VT-d. ● The X2APIC feature must be enabled when using an OS shown below: – Windows Server 2012 – Windows Server 2012 R2 ● The X2APIC feature must be disabled when using an OS shown below: – Windows Server 2008 R2 – VMware ESXi 5 – VMware ESXi 6 See *Chapter 1 Installing Windows* in *Installation Guide*, and determine whether this feature is enabled or disabled according to description in "*Before Starting Setup*" appropriate to your OS.

[ ]: Factory settings

(a) Processor Information submenu

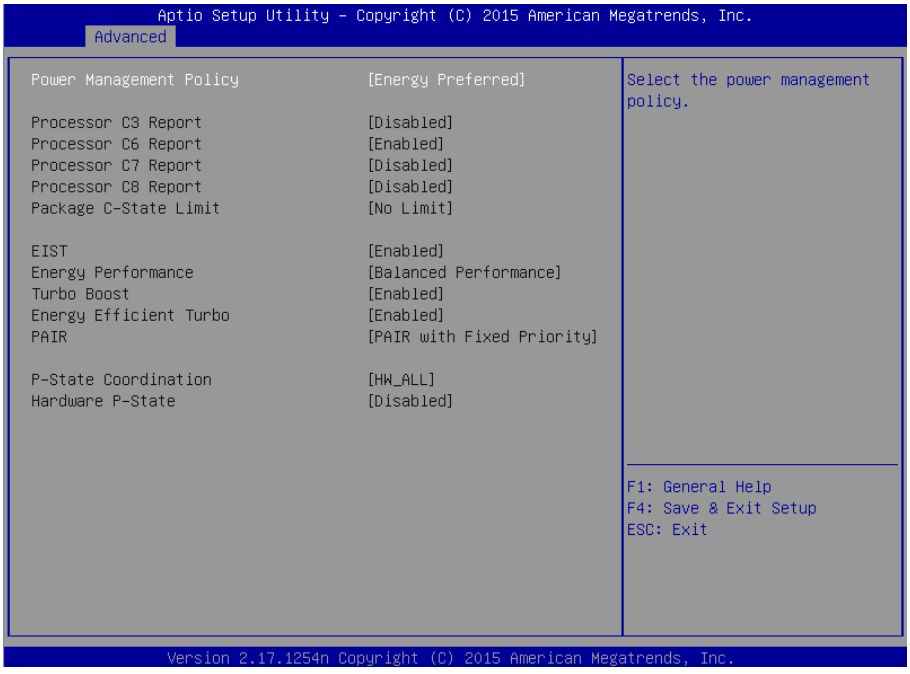


For details about the options, see the table on the next page.

Option	Parameter	Description
Processor 1 CPUID	(display only)	Displays the ID of Processor 1. **Error** indicates an error was detected during POST.
Processor Type	(display only)	Displays the type of Processor 1.
Processor Speed	(display only)	Displays the clock speed of Processor 1.
Active Cores	(display only)	Displays the number of active cores in Processor 1.
Max Cores	(display only)	Displays the maximum number of cores in Processor 1.
L2 Cache RAM	(display only)	Displays the secondary cache size of processor 1.
L3 Cache RAM	(display only)	Displays the tertiary cache size of processor 1.
Microcode Revision	(display only)	Displays the revision of the microcode applied to processor 1.
EMT64	(display only)	Displays **Supported** when processor 1 supports Intel 64 architecture.
Hyper-Threading	(display only)	Displays **Supported** when processor 1 supports Hyper-Threading Technology feature.

[ ]: Factory setting

(b) Processor Power Management submenu



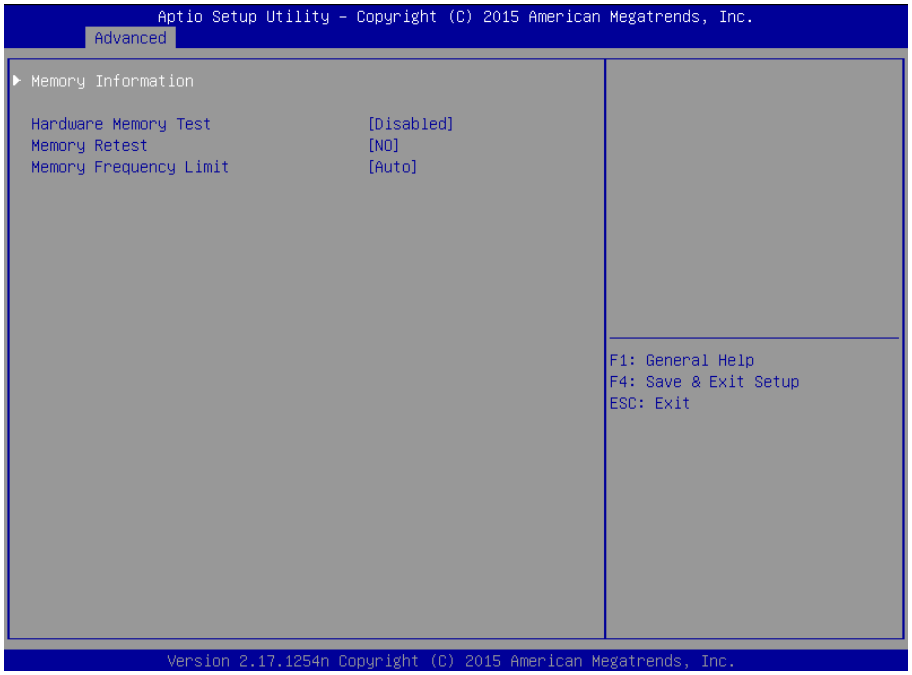
For details about the options, see the table on the next page.

Option	Parameter	Description
Power Management Policy	Performance Preferred [Energy Preferred] Custom	Specify the Power Management Policy. Set the following related menu items en bloc according to this setting. You can select the following related menu items by changing this setting to [Custom]
Processor C3 Report	[Disabled] Enabled	Enables or disables the feature to report C3 state of processor to OS.
Processor C6 Report	Disabled [Enabled]	Enables or disables the feature to report C6 state of processor to OS.
Processor C7 Report	[Disabled] Enabled	Enablesor disables the feature to report C7 state of processor to OS.
Processor C8 Report	[Disabled] Enabled	Enablesor disables the feature to report C8 state of processor to OS. When enabling this option, also enable any of the Processor C3/C6/C7 Report options.
Package C-State Limit	C0 C2 C6(Retention) [No Limit]	Specifies the upper limit for Package C State of processor.
EIST	Disabled [Enabled]	Enables or disables Enhanced Intel SpeedStep(R) Technology feature. This option is displayed only when the installed processor supports this featue.
Energy Performance	Performance [Balanced Performance] Balanced Energy Energy Efficient	Specifies whether the performance is preferred or energy-saving is preferred while processor is running. This option is displayed only when [EIST] is set to "Enabled".
Turbo Boost	Disabled [Enabled]	Enables or disables Intel Turbo Boost Technology. This option is displayed only when the installed processor supports this feature.
Energy Efficient Turbo	Disabled [Enabled]	Enable or disable Energy Efficient Turbo feature. This option is displayed when [EIST] is set to "Enabled" and Turbo Boost is set to "Enabled". This option is displayed only when the installed processor supports this feature.
PAIR	Disabled [Enabled]	Enables or disables the Power Aware Interrupt Routing feature.
P-State Coordination	[HW_ALL] SW_ALL SW_ANY	Specifies the type of P-State Coordination.
Hardware P-State	[Disabled] Enabled	Enables or disables the Hardware P-State feature of a processor. You do not need to change this option for the OS that does not support this feature.

[ ]: Factory settings

(2) Memory Configuration submenu

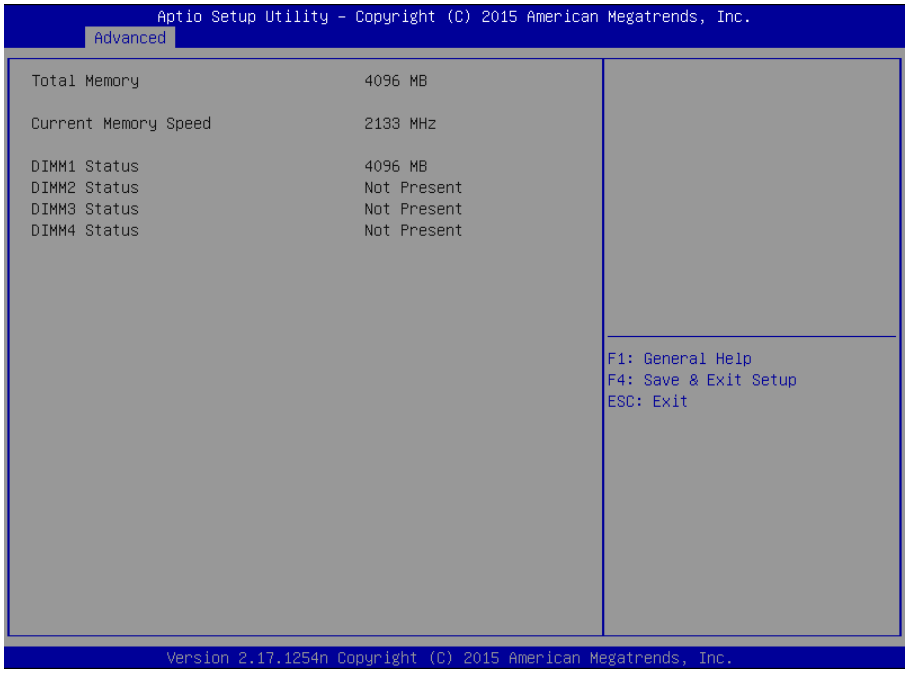
On **Advanced**, choose **Memory Configuration** and then press <Enter> key to display the menu screen shown below. For the menu that has ▶ on the left, move the cursor to it and then press <Enter> key to show its submenus.



Option	Parameter	Description
Memory Information	–	–
Hardware Memory Test	[Disabled] Enabled	Specifies whether to perform a memory test. **Enabled :** if an error is detected during the test, the applicable memory resource will be disabled.
Memory Retest	[No] Yes	**Yes :** the memory error is cleared and all DIMMs are tested on the next POST process. This option is automatically changed to **No** after starting the server.
Memory Frequency Limit	[Auto] 1333 MHz 1600 MHz 1866 MHz 2133 MHz	Specifies the upper limit of the memory frequency. The frequency may be lower than the specified value depending on the memory configuration.

[ ]: Factory setting

(a) Memory Information submenu

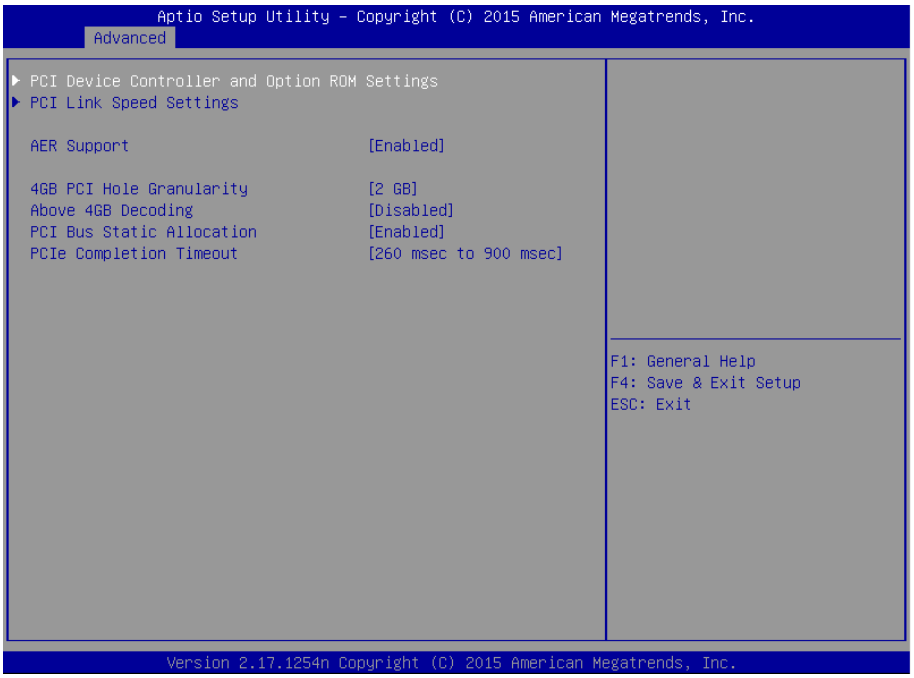


Option	Parameter	Description
Total Memory	(display only)	Displays the basic memory capacity.
Current Memory Speed	(display only)	Displays the current memory operating frequency.
DIMM1 Status **DIMM2 Status** **DIMM3 Status** **DIMM4 Status**	(display only)	Displays the current memory status. The number displayed here corresponds to a DIMM slot number. The number indicates the amount of memory as well as means that memory is normal. The list below shows the meanings of the other states. Disabled: The memory has failed Not Present: No memory is installed Error: Forced memory startup

[ ]: Factory setting

(3) PCI Configuration submenu

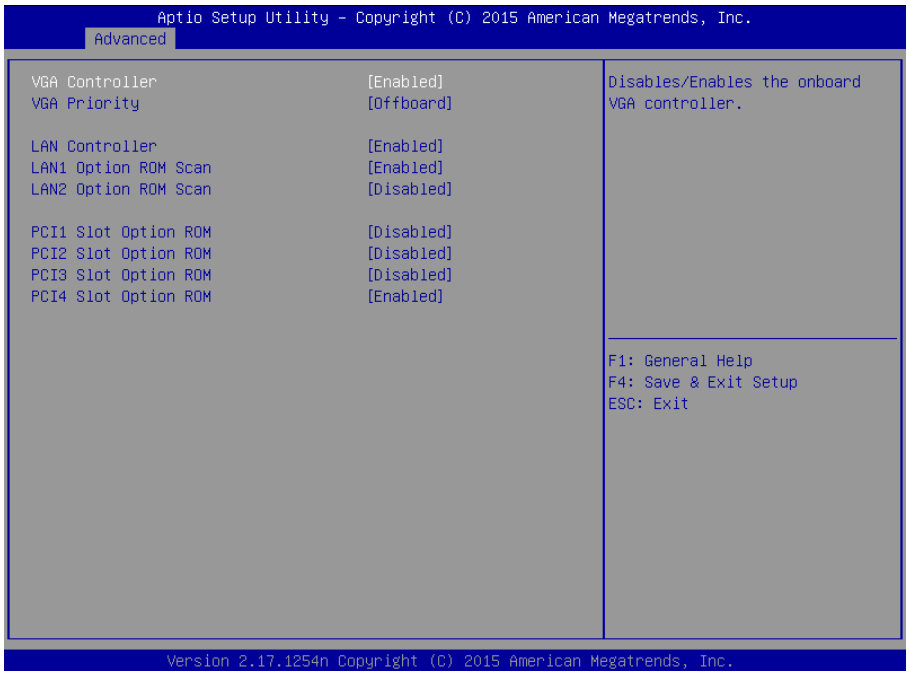
On **Advanced**, choose **PCI Configuration** and then press <Enter> key to display the menu screen as shown below.



Option	Parameter	Description
PCI Device Controller and Option ROM Settings	–	–
PCI Link Speed Settings	–	–
4GB PCI Hole Granularity	3 GB 2 GB 1 GB	Specifies the size of the address space for the PCI device.
Above 4GB Decoding	[Disabled] Enabled	Enable or disable the function that maps the memory to an address space that is more than 4GB for 64 bit PCIe device. This option is not displayed when SATA Mode is set to “RAID Mode”.
PCI Bus Static Allocation	Disabled [Enabled]	Enables or disables static allocation of PCI bus numbers.
PCIe Completion Timeout	50 µsec to 10 msec 16 msec to 55 msec 65 msec to 210 msec [260 msec to 900 msec] 1 sec to 3.5 sec 4 sec to 13 sec 17 sec to 64 sec	Specify completion timeout time for PCIe devices.

[ ]: Factory setting

(a) PCI Device Controller and Option ROM Settings

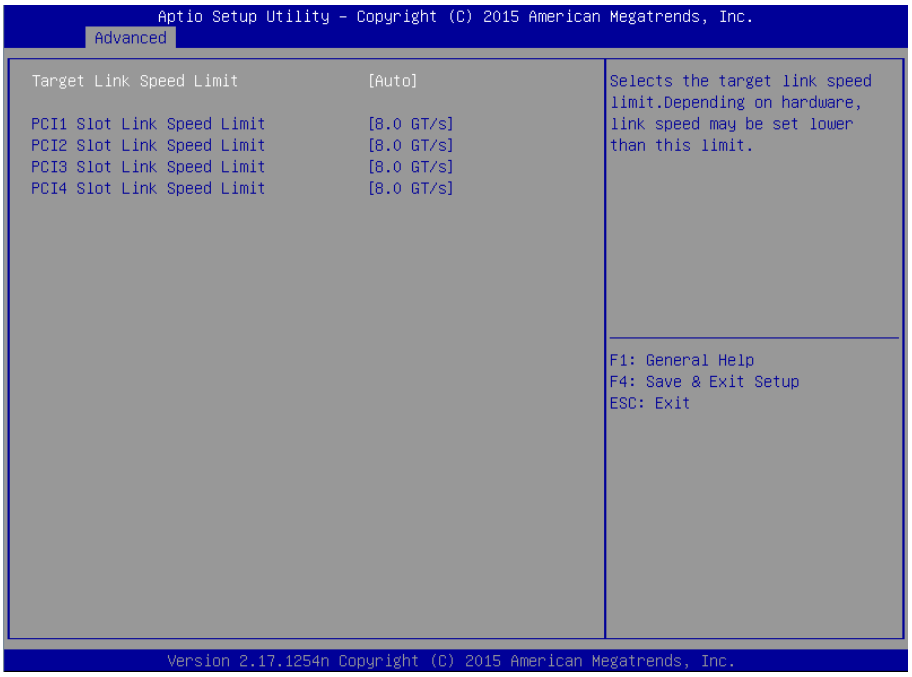


Option	Parameter	Description
VGA Controller	Disabled [Enabled]	Enables or disables the onboard VGA controller.
VGA Priority	[Offboard] Onboard	Specifies the priority to expand ROM of the VGA controller. This option is fixed to "Enabled" if **Shared LAN** is set to "Enabled" for off-line tools.
LAN Controller	Disabled [Enabled]	Enables or disables the on-board LAN controller.
LAN1 Option ROM Scan	Disabled [Enabled]	Enables or disables the option ROM SCAN for on-board LAN 1.
LAN2 Option ROM Scan	[Disabled] Enabled	Enables or disables the option ROM SCAN for on-board LAN 2.
PCI1 Slot Option ROM **PCI2 Slot Option ROM** **PCI3 Slot Option ROM** **PCI4 Slot Option ROM** (Express5800/T110h, T110h-S)	[Disabled] Enabled	Enables or disables the option ROM on each PCI board. Only PCI4 Slot Option ROM is set to [Enabled] as factory settings
PCI1A Slot Option ROM **PCI1B Slot Option ROM** **PCI1C Slot Option ROM** (Express5800/ R110h-1)	[Disabled] Enabled	Enables or disables the option ROM on each PCI board. Only PCI1A Slot Option ROM is set to [Enabled] as factory settings

[ ]: Factory setting

Note For a LAN adapter (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**.

(b) PCI Link Speed Settings submenu

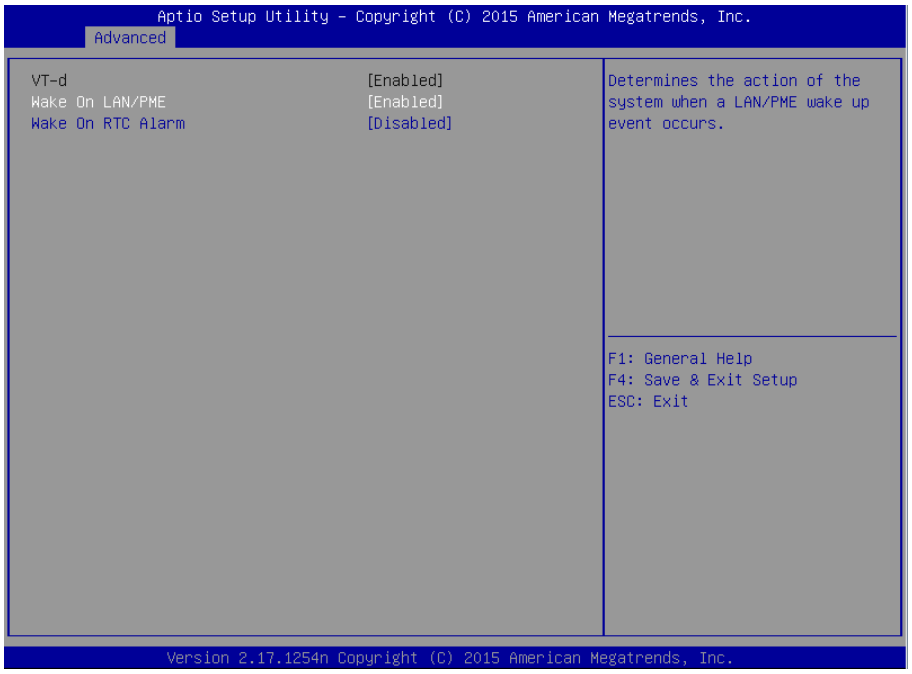


Option	Parameter	Description
Target Link Speed Limit	[Auto] 2.5 GT/s 5.0 GT/s	Specifies the upper limit of the link speed for the onboard PCI devices and PCI devices connected to the PCI slots
PCI1 Slot Link Speed Limit **PCI2 Slot Link Speed Limit** **PCI3 Slot Link Speed Limit** **PCI4 Slot Link Speed Limit** (Express5800/T110h, T110h-S)	2.5 GT/s 5.0 GT/s [8.0 GT/s]	Specifies the upper limit of the link speed for the PCI slots in the range specified in Target Link Speed Limit
PCI1A Slot Link Speed Limit **PCI1B Slot Link Speed Limit** **PCI1C Slot Link Speed Limit** (Express5800/R110h)	2.5 GT/s 5.0 GT/s [8.0 GT/s]	Specifies the upper limit of the link speed for the PCI slots in the range specified in Target Link Speed Limit

[ ]: Factory settings

(4) Advanced Chipset Configuration submenu

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

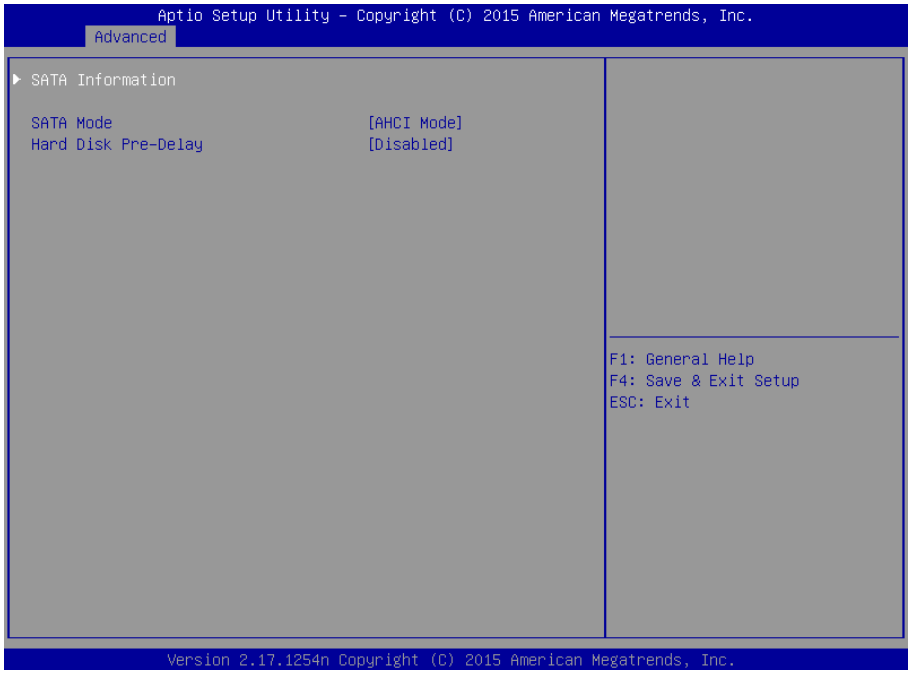


Option	Parameter	Description
VT-d	Disabled [Enabled]	Enables or disables Intel Virtualization Technology for Directed I/O, which is provided by the Intel chipset. This option is displayed only when the installed processor supports this feature.
Wake On LAN/PME	Disabled [Enabled]	Enables or disables the feature that remotely powers on through a network.
Wake On RTC Alarm	[Disabled] Enabled	Enables or disables the feature that remotely powers on using the real time clock.

[ ]: Factory setting

(5) Storage Configuration submenu

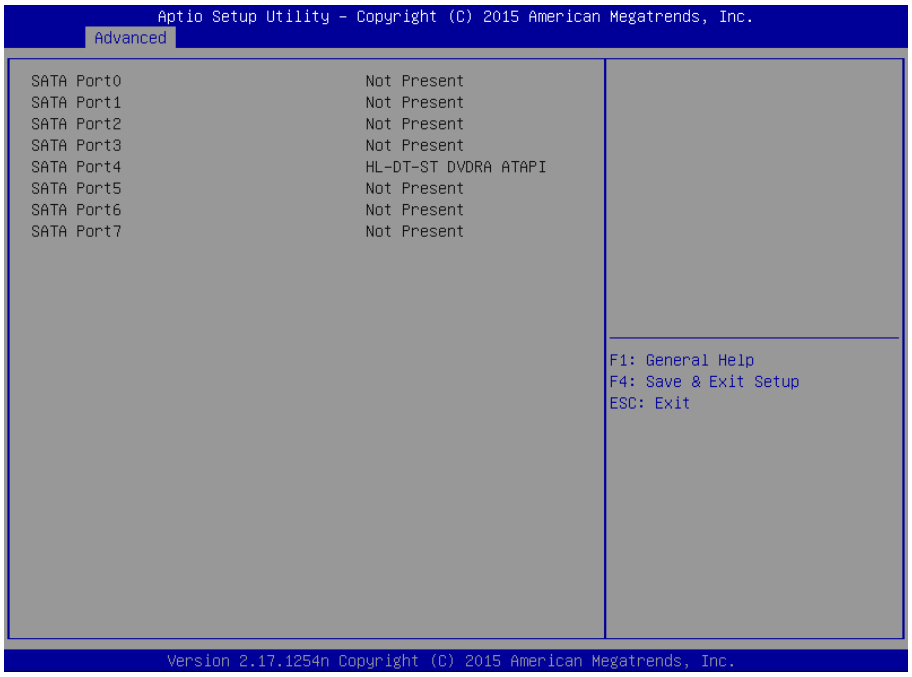
On **Advanced**, choose **Storage Configuration** and then press <Enter> key to display the menu screen shown below. For the menu that has ▶ on the left, move the cursor to it and then press <Enter> key to show its submenus.



Option	Parameter	Description
SATA Information	–	This option is not displayed when SATA Mode is **RAID Mode**.
SATA Mode	Disabled AHCI Mode RAID Mode	Specifies SATA Mode. For the models that show **RAID Mode**, this option is only for display.
Hard Disk Drive Pre-Delay	[Disable] 3 Seconds 6 Seconds 9 Seconds 12 Seconds 15 Seconds 21 Seconds 30 Seconds	Specifies delay time before HDD is accessed during POST.

[ ]: Factory setting

(a) SATA Information submenu

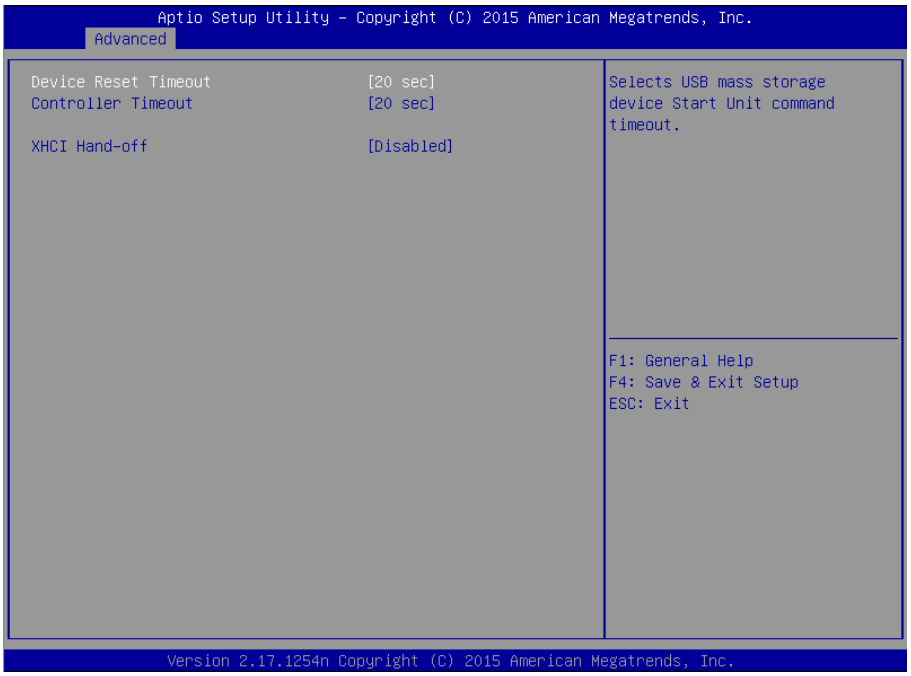


Option	Parameter	Description
SATA Port0	(display only)	Displays the devices connected to each port. **Not Present** means that no device is connected to the port.
SATA Port1		
SATA Port2		
SATA Port3		
SATA Port4		
SATA Port5		
SATA Port6		
SATA Port7		

[ ]: Factory setting

(6) USB Configuration submenu

On **Advanced**, choose **USB Configuration** and then press <Enter> key to display the menu screen shown below.

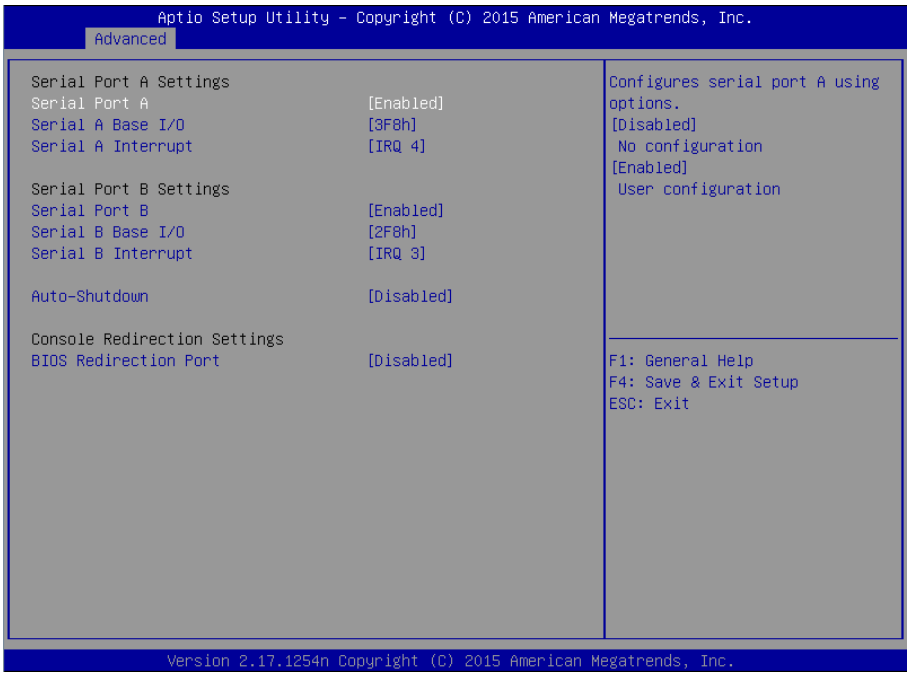


Option	Parameter	Description
Device Reset Timeout	10 sec [20 sec] 30 sec 40 sec	Specifies the time to wait when Start Unit Command is issued to a USB mass storage device.
Controller Timeout	1 sec 5 sec 10 sec [20 sec]	Specifies the time to wait when Control, Bulk, or Interrupt Transfer Command is issued to a USB controller.
XHCI Hand-off	Disabled [Enabled]	Enables or disables the XHCI Hand-off feature.

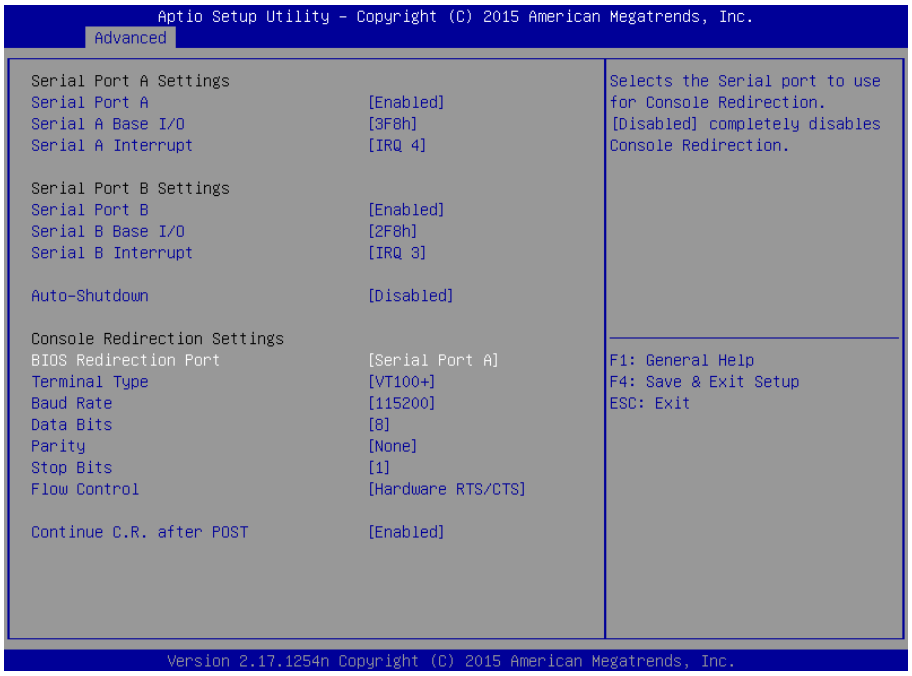
[ ]: Factory setting

(7) Serial Port Configuration submenu

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



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



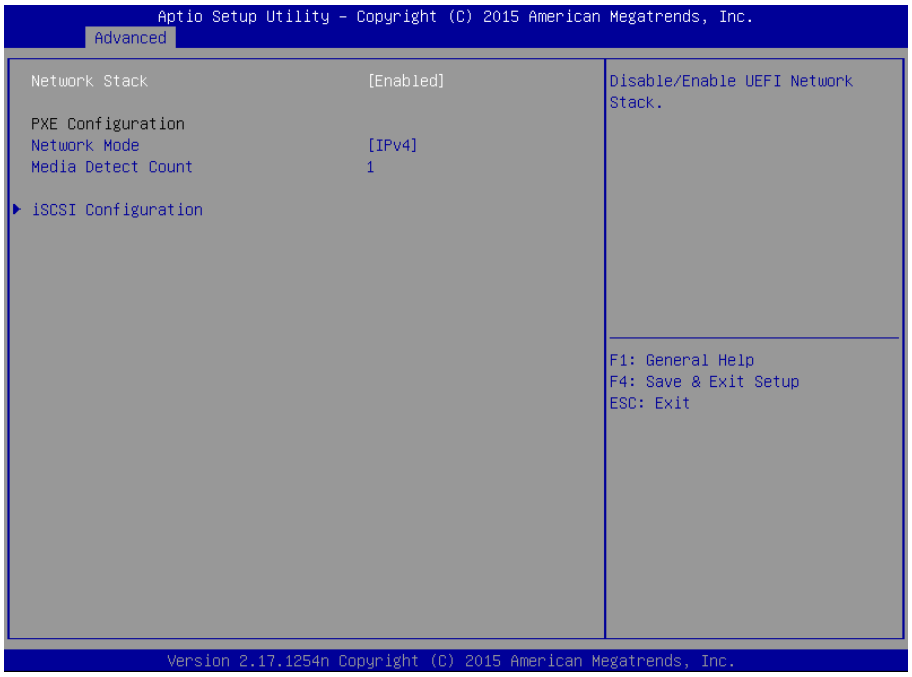
For details about the options, see the table on the next page.

Option	Parameter	Description
Serial Port A Settings	–	–
Serial Port A	Disabled [Enabled]	Enables or disables serial Port A
Serial A Base I/O	[3F8h] 2F8h 3E8h 2E8h	Specifies the base I/O address for serial port A.
Serial A Interrupt	[IRQ 4] IRQ 3	Specifies the interrupt for serial port A
Serial Port B Settings	–	–
Serial Port B	Disabled [Enabled]	Enables or disables serial Port B
Serial B Base I/O	3F8h [2F8h] 3E8h 2E8h	Specifies the base I/O address for serial port B
Serial B Interrupt	IRQ 4 [IRQ 3]	Specifies the interrupt for serial port B
Auto-Shutdown	[Disabled] Enabled	Enable or disable auto shutdown for the serial port. To specify "Enabled", a device that supports this feature must be connected. If the connected device does not support this feature, the serial ports will fail to return from halt state.
Console Redirection Settings	–	–
BIOS Redirection Port	[Disabled] Serial Port A Serial Port B	Enables or disables the console redirection feature for the specified serial port. Specifying **Serial Port A** or **Serial Port B** enables direct connection through terminal unit, and options for connection shown below are displayed.
Terminal Type	[VT100+] VT-UTF8 ANSI	Specifies the terminal type.
Baud Rate	9600 19200 57600 [115200]	Specifies the baud rate.
Data Bits	7 [8]	Specifies the data bit width.
Parity	[None] Even Odd	Specifies the parity type.
Stop Bits	[1] 2	Specifies stop bits.
Flow Control	None [Hardware RTS/CTS]	Specifies the flow control method.
Continue C.R. after POST	Disabled [Enabled]	Enables or disables the feature to continue console redirection after completion of POST.

[ ]: Factory setting

(8) Network Stack Configuration submenu

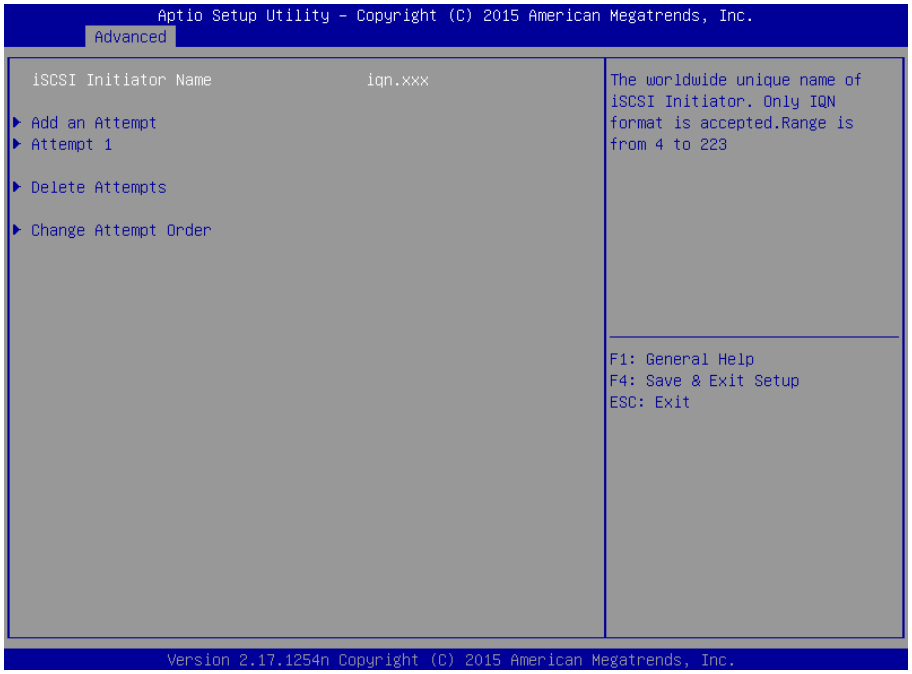
From the **Advanced** menu, select **Network Stack Configuration** and then press the <Enter> key to display the menu screen shown below.



Option	Parameter	Description
Network Stack	Disabled [Enabled]	Enable or disable UEFI Network Stack. If this option is set to "Enabled", the menu items below appear.
PXE Configuration	–	–
Network Mode	Disabled [IPv4] IPv6	Specify the PXE network mode.
Media Detect Count	[1]-50	Specify the number of times trying to detect media at PXE connection.
iSCSI Configuration	–	–

[ ]: Factory setting

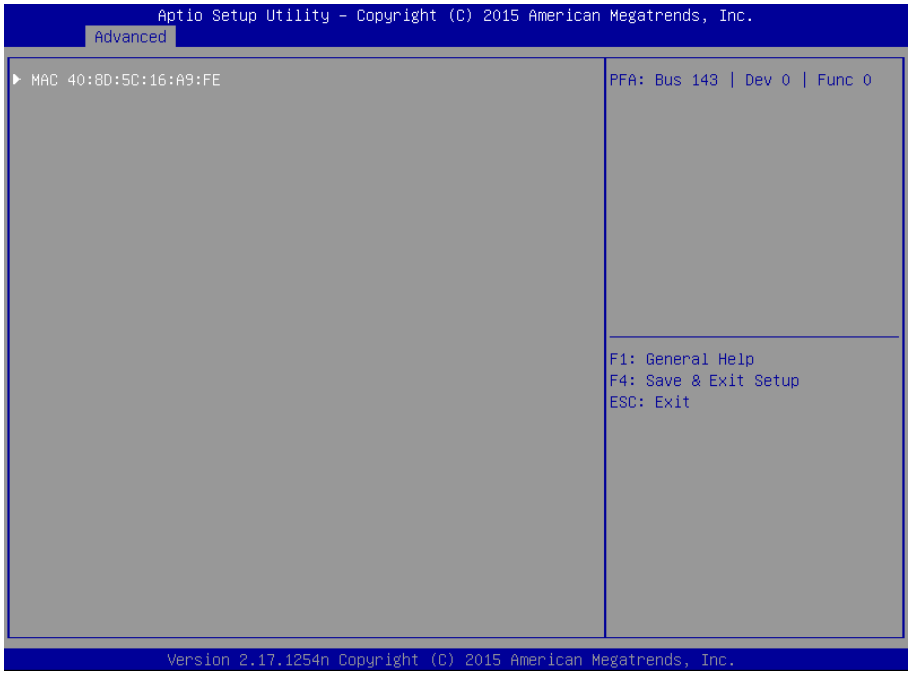
(a) iSCSI Configuration submenu



Option	Parameter	Description
iSCSI Initiator Name	Alphanumeric character between 4 and 223	Specify the name of the iSCSI Initiator. The initiator name must be IQN format (iSCSI Qualifier Name). The menu items below can be selected when "iSCSI Initiator Name" is specified.
Add an Attempt	–	–
Attempt [XX]	–	–
Delete Attempts	–	–
Change Attempt Order	–	–

[ ]: Factory setting

<1> Add an Attempt submenu

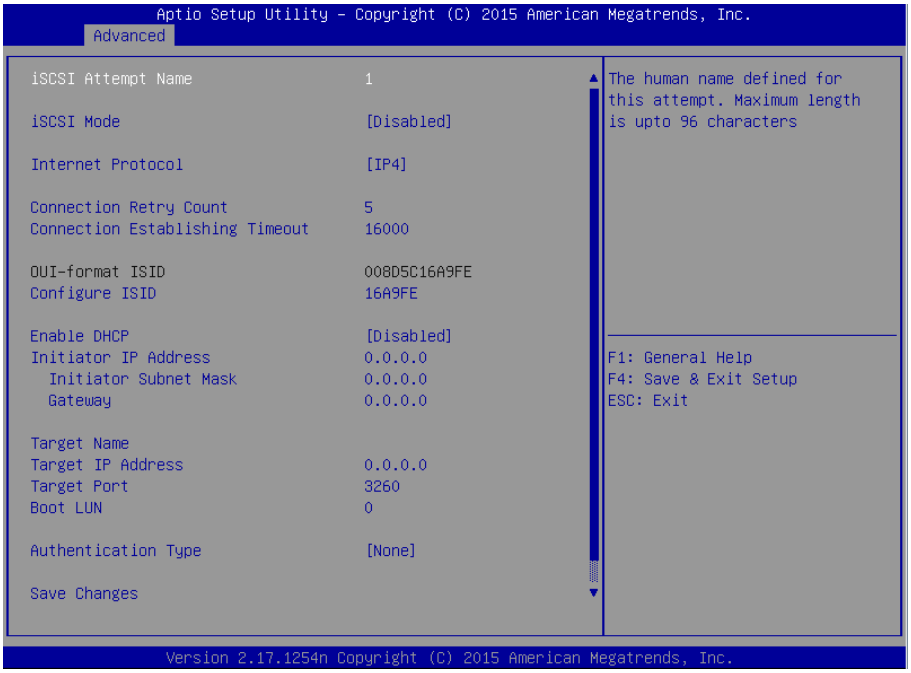


Note A MAC address is displayed when the onboard LAN controller or the UEFI driver for the PCI device is loaded.

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

[ ]: Factory setting

i. MAC [XX:XX:XX:XX:XX:XX] submenu



Option	Parameter	Description
iSCSI Attempt Name	Up to 96 Alphanumeric characters	Specify an attempt name of iSCSI.
iSCSI Mode	[Disabled] Enabled Enabled for MPIO	Specify iSCSI mode.
Internet Protocol	[IP4] IP6	Specify IP mode of iSCSI.
Connection Retry Count	0-[5]-16	Specify the retry count for iSCSI connection.
Connection Establishing Timeout	100-[16000]-20000	Specify the timeout time in msec for iSCSI connection.
OUI-format ISID	(display only)	Displays the OUI-format ISID.
Configure ISID	6-digit numerics	Specify the lower 3 bytes of the OUI-format ISID. The MAC address is stored by default.
Enable DHCP	[Disabled] Enabled	Enable or disable the DHCP server.
Initiator IP Address	IP Address	Specify the IP address of the initiator. This item is not displayed when "Enabled" is selected for **Enable DHCP** or "IP6" is selected for **Internet Protocol**.
Initiator Subnet Mask	IP Address	Specify subnet mask of initiator. This item is not displayed when "Enabled" is selected for **Enable DHCP**.
Gateway	IP Address	Specify a gateway. This item is not displayed when "Enabled" is selected for **Enable DHCP**
Get Target info via DHCP	[Disabled] Enabled	Enable or disable the feature to obtain information of the target device via the DHCP server. This item is not displayed when "Disabled" is selected for **Enable DHCP**.

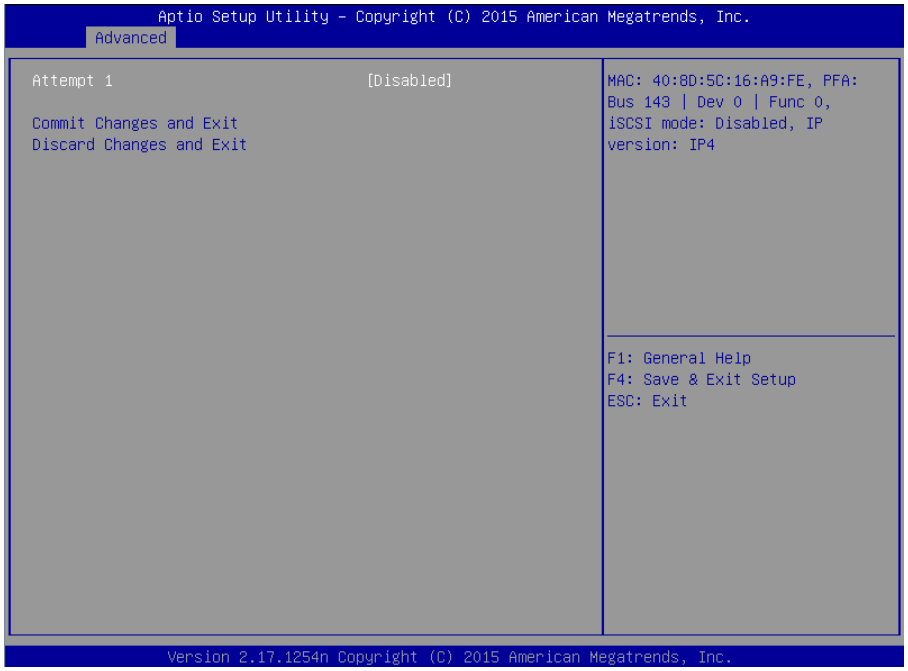
Option	Parameter	Description
Target Name	Alphanumeric characters between 4 and 223	Specify the target name with IQN (iSCSI Qualifier) format. This item is not displayed when "Enabled" is selected for **Get Target info via DHCP**.
Target IP Address	IP Address	Specify the IP address of the target device. This item is not displayed when "Enabled" is selected for **Get Target info via DHCP**.
Target Port	0-65535	Specify the target port. This item is not displayed when "Enabled" is selected for **Get Target info via DHCP**.
Boot LUN	Up to 20 Alphanumeric characters	Specify the LUN. This item is not displayed when "Enabled" is selected for **Get Target info via DHCP**.
Authentication Type	CHAP [None]	Specify the authentication type.
CHAP Type	One Way [Mutual]	Specify the CHAP type. This item is displayed when "CHAP" is selected for **Authentication Type**.
CHAP Name	Up to 126 Alphanumeric characters	Specify the CHAP name. This item is displayed when "CHAP" is selected for **Authentication Type**.
CHAP Secret	Alphanumeric characters between 12 and 16 digits	Specify the CHAP secret. This item is displayed when "CHAP" is selected for **Authentication Type**.
CHAP Status	(display only)	Displays the status of the CHAP secret. This item is displayed when "CHAP" is selected for **Authentication Type**.
Reverse CHAP Name	Up to 126 Alphanumeric characters	Specify the reverse CHAP name. This item is displayed when "CHAP" is selected for **Authentication Type** and "Mutual" is selected for **CHAP Type**.
Reverse CHAP Secret	Alphanumeric characters between 12 and 16 digits	Specify the reverse CHAP secret. This item is displayed when "CHAP" is selected for **Authentication Type** and "Mutual" is selected for **CHAP Type**.
Reverse CHAP Status	(display only)	Displays the status of the reverse CHAP secret. This item is displayed when "CHAP" is selected for **Authentication Type** and "Mutual" is selected for **CHAP Type**.
Save Changes	–	Save the current settings.
Back to Previous Page	–	Return to the iSCSI Configuration submenu.

[ ]: Factory setting

<2> Attempt[XX] submenu

Options and parameters are same as those in MAC [XX:XX:XX:XX:XX:XX] submenu.
See MAC [XX:XX:XX:XX:XX:XX] submenu in <1>Add an Attempt submenu.

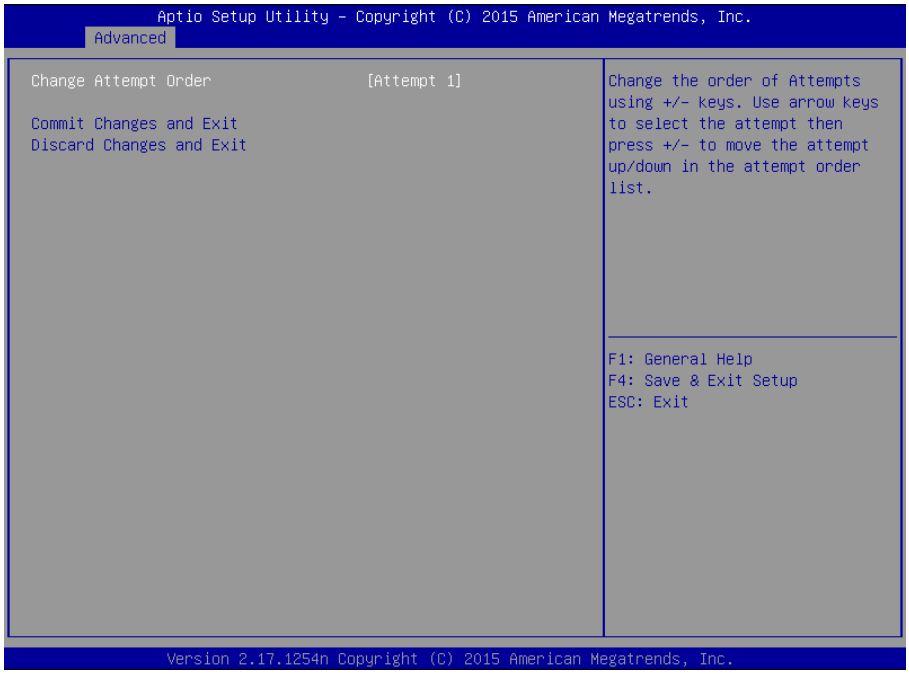
<3> Delete Attempts submenu



Option	Parameter	Description
Attempt [XX]	[Disabled] Enabled	Select "Enabled" for an iSCSI attempt you want to delete.
Commit Changes and Exit	–	Save the current setting and return to the iSCSI Configuration submenu.
Discard Changes and Exit	–	Discard the current setting and return to the iSCSI Configuration submenu.

[ ]: Factory setting

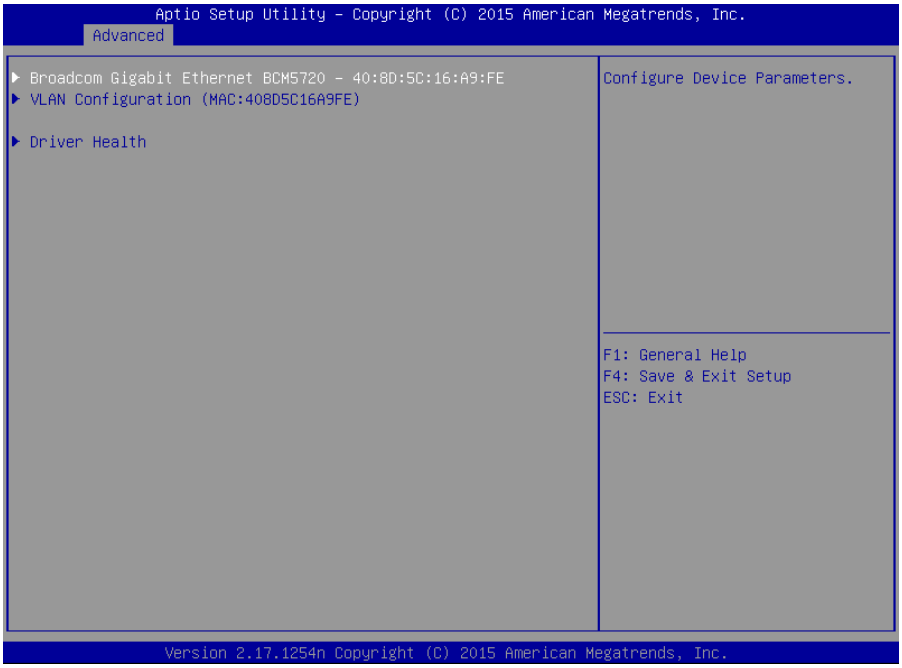
<4> Change Attempt Order submenu



Option	Parameter	Description
Change Attempt Order	–	Specify the priority of iSCSI attempt. Press the <Enter> key to open the pop-up window, and specify the priority by using <+> or <–> key.
Commit Changes and Exit	–	Save the current setting and return to the iSCSI Configuration submenu.
Discard Changes and Exit	–	Discard the current setting and return to the iSCSI Configuration submenu.

[ ]: Factory setting

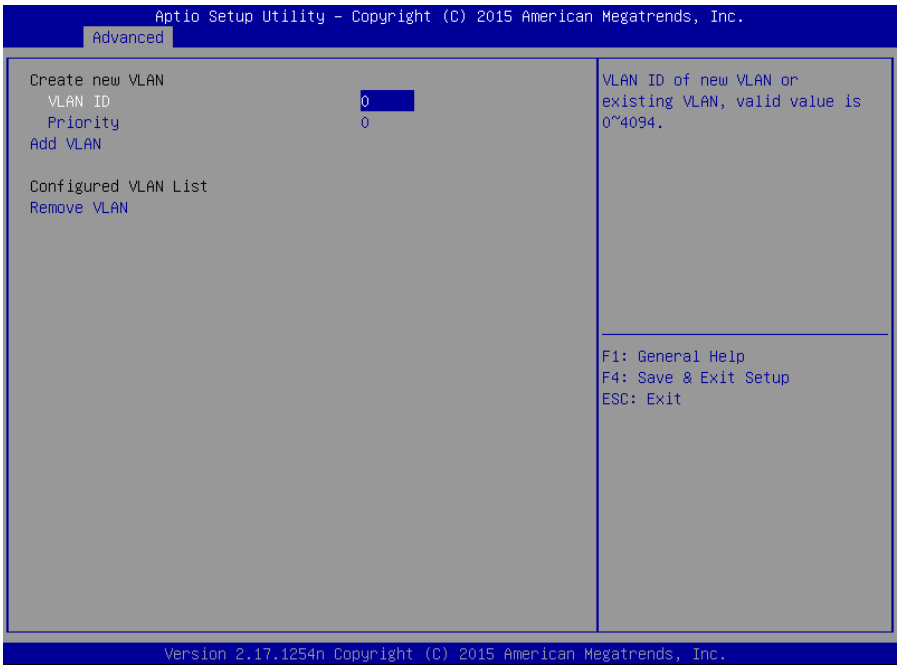
(9) UEFI Driver Configuration submenu



Option	Parameter	Description
(UEFI Driver Name)	–	This item is displayed when the onboard LAN controller or a UEFI driver for a PCI device is loaded. The on-screen menu depends on the specified UEFI driver.
VLAN Configuration (MAC:XXXXXXXXXXXX)	–	–
Driver Health	–	–

[ ]: Factory setting

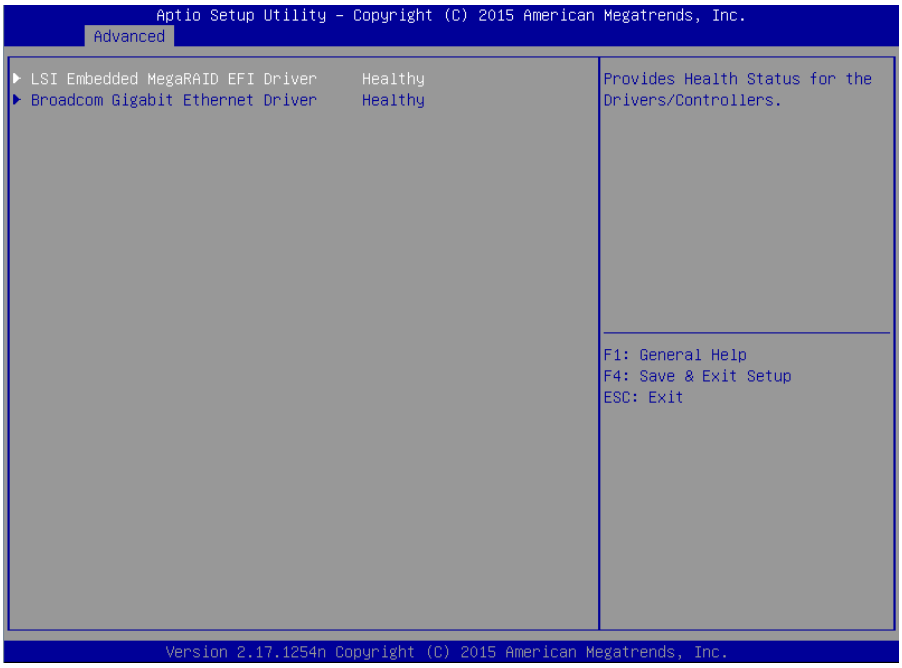
(a) VLAN Configuration (MAC:XXXXXXXXXXXX) submenu



Option	Parameter	Description
Create new VLAN	–	–
VLAN ID	[0]-4094	Specify VLAN ID.
Priority	[0]-7	Specify VLAN Priority.
Add VLAN	–	Add VLAN.
Configured VLAN List	–	–
VLAN ID: [x], Priority:[x]	[Disabled] Enabled	Set VLAN to be deleted to [Enabled].
Remove VLAN	–	Delete the specified VLAN

[ ]: Factory setting

(b) Driver Health submenu

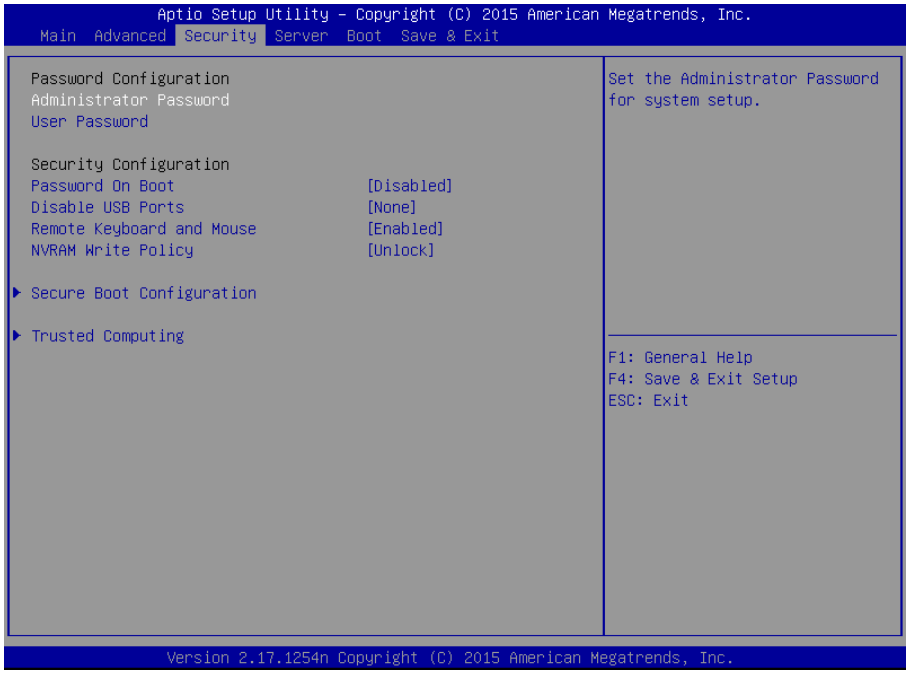


Option	Parameter	Description
(UEFI Driver Name)	(display only)	Displays the status of the UEFI driver. This item is displayed when the onboard LAN controller or a UEFI driver for a PCI device is loaded, and the UEFI driver supports the Driver Health Protocol.

[ ]: Factory setting

1.2.3 Security

Security menu appears when the cursor is moved to **Security**. For the menu that has ▶ on the left, move the cursor to it and then press <Enter> key to show its submenus.



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

Tips

- Set **Administrator Password** before setting **User Password**.
- Do not set any password before installing the OS.
- If you have forgotten the password, see *Chapter 1* (*7. Resetting and Clearing the Server*) to clear password.

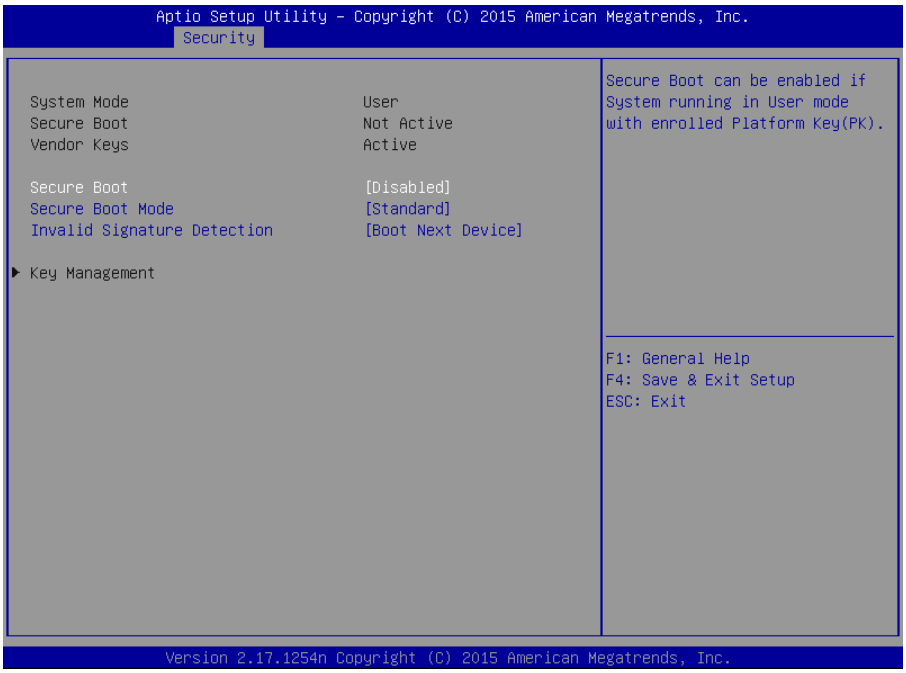
For details about the options, see the table on the next page.

Option	Parameter	Description
Password Configuration	–	–
Administrator Password	Up to 20 alphanumeric characters	Specifies the administrator password. This password can be used to access all SETUP menus. This option can only be specified by logging in with an administrator privilege.
User Password	Up to 20 alphanumeric characters	Specifies the user password. This password can be used to access the limited **SETUP** menus. This option can only be specified by logging in with an administrator privilege.
Security Configuration	–	–
Password On Boot	[Disabled] Enabled	Enables or disables 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 Internal Front + Rear Front + Internal Rear + Internal Front + Rear + Internal	Selects the ports to be disabled. Note that the USB keyboard can be used while POST is running.
Remote Keyboard and Mouse	Disabled [Enabled]	Enables or disables the remote keyboard and mouse supported by BMC.
NVRAM Write Policy	[Unlock] Lock	Set the operation policy to write to the BIOS setting (NVRAM). If "Lock" is specified, writing from the OS to NVRAM is restricted. This function can be selected only when "Secure Boot" is "Disabled".
Secure Boot Configuration	–	This item can be selected only when "Boot Mode" is set to "UEFI".
Trusted Computing	–	This option is displayed only when the optional TPM kit is installed. This option becomes available after Administrator Password is set

[ ]: Factory setting

(1) Secure Boot Configuration submenu

When "Secure Boot" is selected and the <Enter> key is pressed in the Security menu, the following screen is displayed.



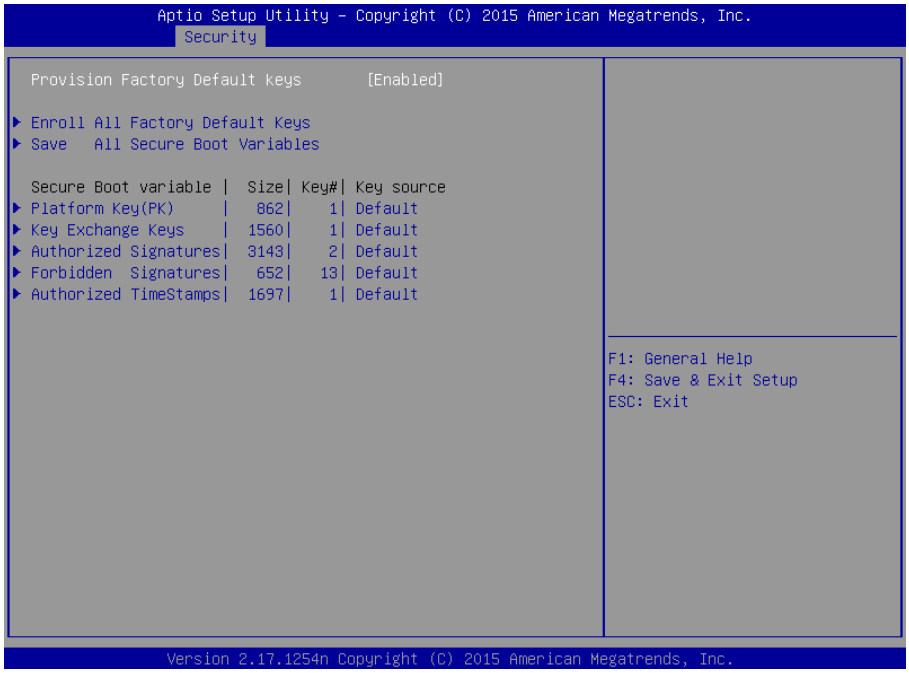
Option	Parameter	Description
System Mode	(display only)	Display the status of registration of Platform Key (PK). It is not registered if the status is [Setup]. It is registered if the status is [User].
Secure Boot	(display only)	The status is [Active] when SETUP is started with the Secure Boot function enabled.
Vendor Keys	(display only)	The status is [Active] when the default key is registered.
Secure Boot	[Disabled] Enabled	Enable or disable the Secure Boot function. This function is enabled when the key is registered.
Secure Boot Mode	[Standard] Custom	Set it to [Custom] to add/delete the key.
Invalid Signature Detection	[Boot Next Device] Halt	Specify the operation when an illegal signature is detected by the Secure Boot function. If "Halt" is specified, a pop-up message is displayed during POST. Select OK to boot the device of the next higher priority.If "Boot Next Device" is specified, the device of the next higheer priority is booted without displaying a message.
Key Management	–	This item can be selected only when "Secure Boot Mode" is set to "Custom".

[ ]: Factory setting

Tips

- We recommend that you set “Administrator Password” to enable “Secure Boot”.
- When “Secure Boot” is enabled, the UEFI driver of the option card needs to be signed by the Microsoft key to have the option card recognized as a bootable device.

(a) Key Management submenu

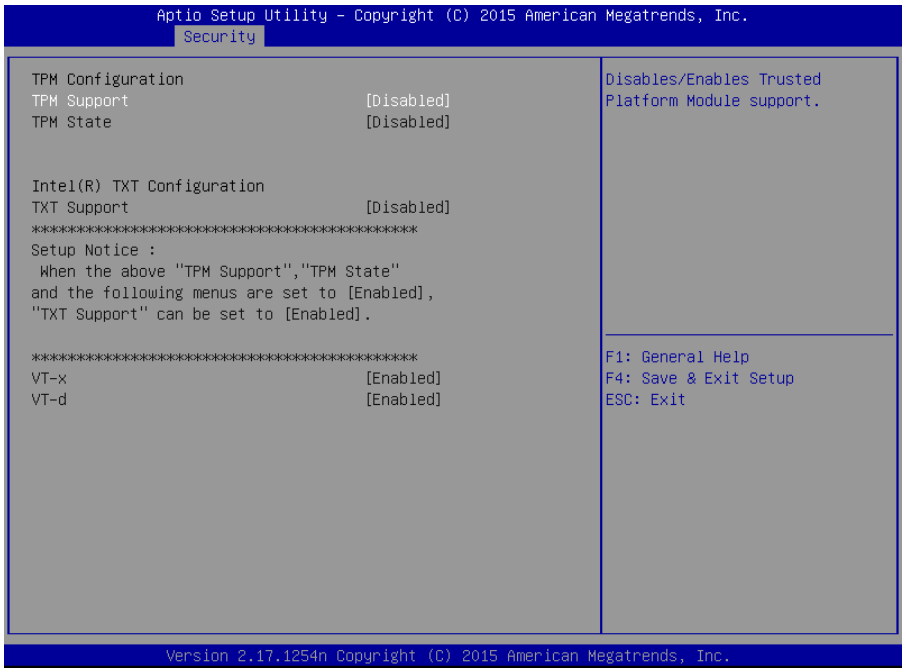


Option	Parameter	Description
Default Key Provision	Disabled [Enabled]	Enable/Disable the function to automatically register the default key if you do not have Platform Key (PK).
Delete All Secure Boot Variables	–	Set “System Mode” to [Setup]. Secure Boot will be disabled. All keys and signature databases (PK, KEK, DB, DBX and DBT) will be deleted. You can execute this section only when you set “Default Key Provision” to [Disabled].
Enroll All Factory Default Keys	–	Set “System Mode” to [User]. Register the default key and signature databases (PK, KEK, DB, DBX and DBT). You can execute this section only when you set “Default Key Provision” to [Enabled].
Save All Secure Boot Variables	–	Save all keys and signature databases (PK, KEK, DB, DBX and DBT) in an external media. You can execute this section only when you have registered PK, KEK, db, dbx and dbt keys.
Secure Boot variable | Size| Key#| Key source	(display only)	Display the status of keys and signature databases (PK, KEK, DB, DBX and DBT).
Platform Key(PK)	–	Display the status of Platform Key (PK). Also register/delete PK.
Key Exchange Keys	–	Display the status of Key Exchange Keys (KEK). Also register/delete KEK.
Authorized Signatures	–	Display the status of Authorized Signatures (DB). Also register/delete DB.
Forbidden Signatures	–	Display the status of Forbidden Signatures (DBX). Also register/delete DBX.
Authorized Timestamps	–	Display the status of Authorized Timestamps (DBT). Also register/delete DBT.

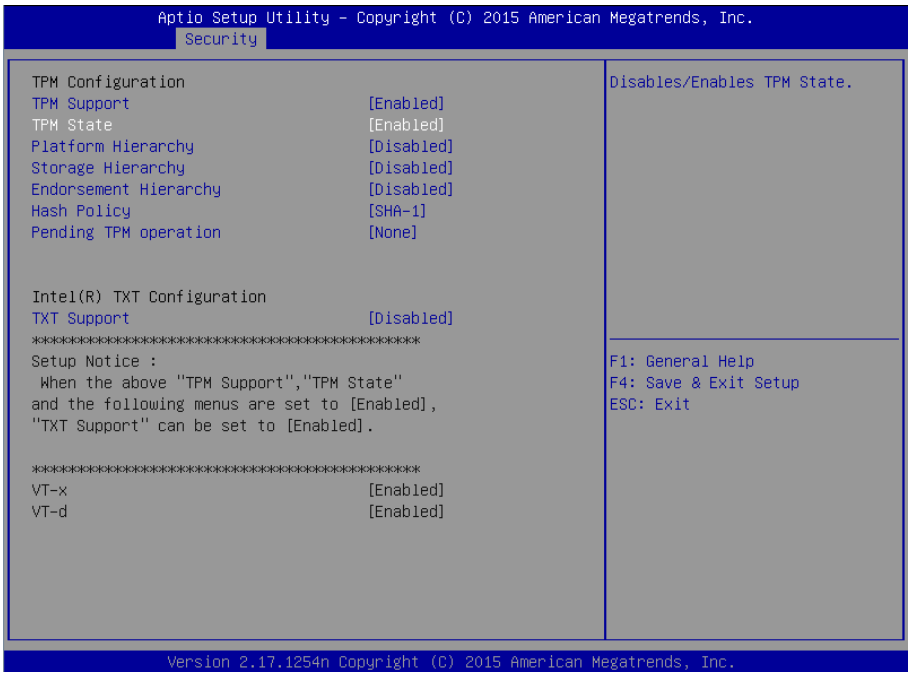
[ ]: Factory setting

(2) Trusted Computing submenu

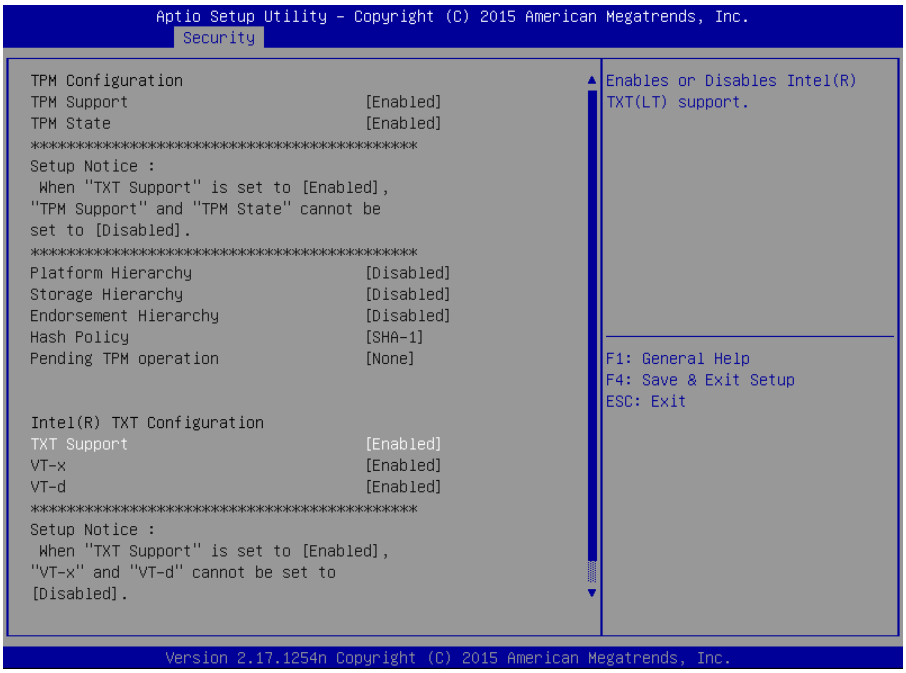
On **Security**, choose **Trusted Computing** and then press <Enter> key to display the menu screen shown below.



If you enable **TPM Support**, enable **TPM State**, the following menu screen appears.



If **TXT Support** is enabled, the following screen is displayed.

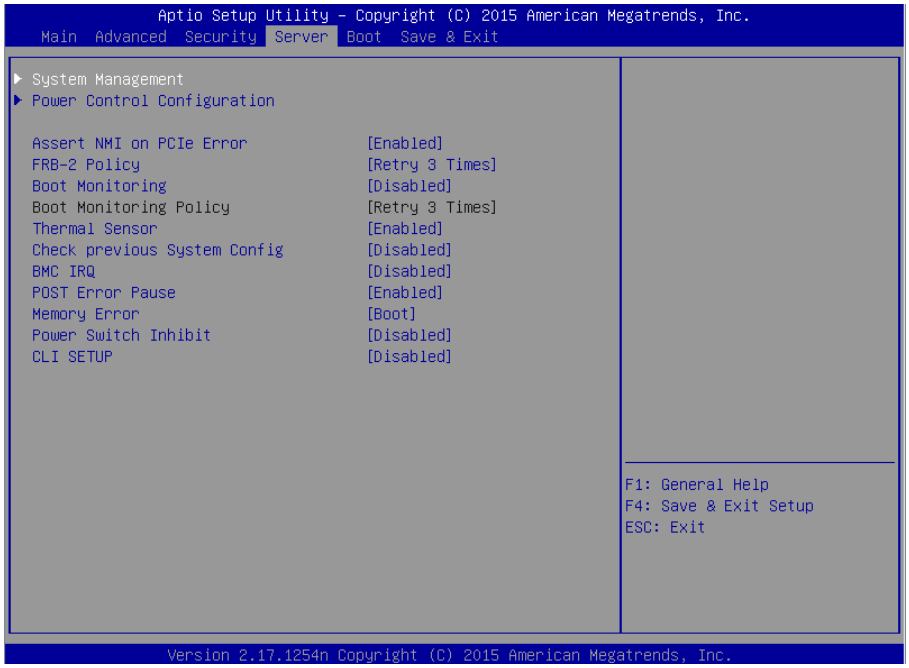


Option	Parameter	Description
TPM Configuration	–	–
TPM Support	[Disabled] Enabled	Enables or disables Trusted Platform Module feature.
TPM State	[Disabled] Enabled	Enables or disables TPM features. This option can be changed when **TPM Support** is enabled.
Pending TPM operation	[None] TPM Clear	Specifies TPM operation. This option can be selected when **TPM State** is set to **Enabled**.
TPM Enabled Status	(display only)	Displays TPM Support Status
TPM Active Status	(display only)	
TPM Owner Status	(display only)	
Platform Hierarchy	Disabled [Enabled]	Enable or disable Platform Hierarchy. This item can be selected if "TPM Support" is "Enabled".
Storage Hierarchy	Disabled [Enabled]	Enable or disable Storage Hierarchy. This item can be selected if "TPM Support" is "Enabled".
Endorsement Hierarchy	Disabled [Enabled]	Enable or disable Endorsement Hierarchy. This item can be selected if "TPM Support" is "Enabled".
Hash Policy	[SHA-1] SHA-2	Specify Hash Policy. This item can be selected if "TPM Support" is "Enabled".
Intel(R) TXT Configuration	–	–
TXT Support	[Disabled] Enabled	Enables or disables the Intel Trusted Execution Technology feature. This option can be selected when **VT-x**, **VT-d**, and **TPM State** are set to **Enabled**.

Option	Parameter	Description
VT-x	Disabled [Enabled]	Enables or disables Intel Virtualization Technology for Directed processor feature.
VT-d	Disabled [Enabled]	Enables or disables Intel Virtualization Technology for Directed I/O feature. This option is displayed only when the installed processor supports this feature.

1.2.4 Server

Server menu appears when the cursor is moved to **Server**. For the menu that has ▶ on the left, move the cursor to it and then press <Enter> key to show its submenus.



On **System Management**, press <Enter> key to show its submenus.

(1/2)

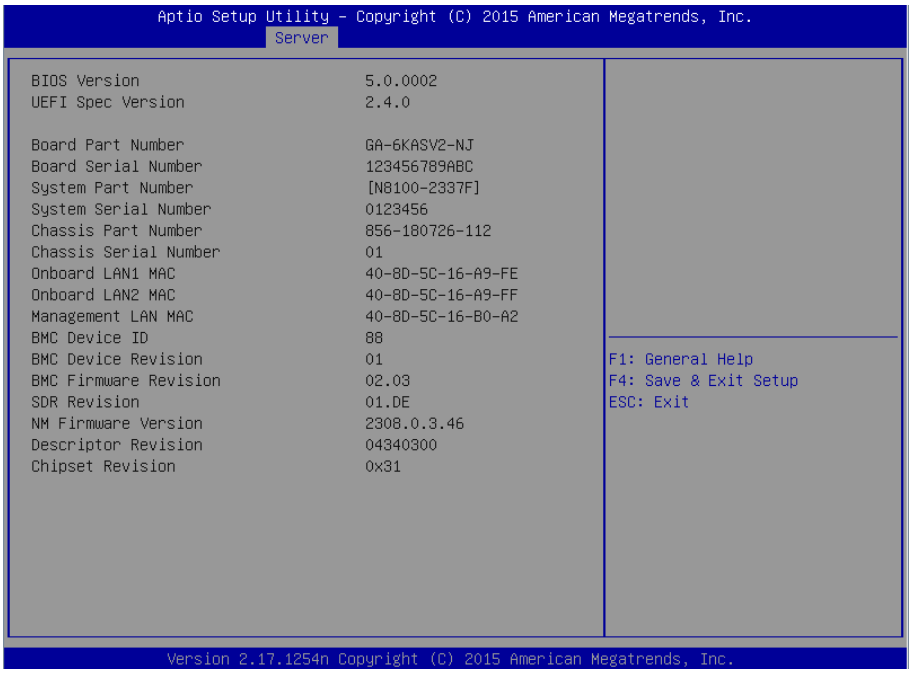
Option	Parameter	Description
System Management	–	–
Power Control Configuraiton	–	–
Assert NMI on PCIe Error	Disabled [Enabled]	Enable or disable NMI assert feature. NMI is asserted when PCIe Uncorrectable error is detected and PCI PERR or SERR is detected.
FRB-2 Policy	[Retry 3 Times] Disable FRB2 Timer Always Reset	Specifies how to operate when FRB level 2 errors occur.
Boot Monitoring	[Disabled] 5-60 minutes	Enables or disables the boot monitoring feature and specifies the timeout setting. To use this feature, install NEC ESMPRO ServerAgentService on Windows. If starting up an OS on which it is not installed, disable this feature.
Boot Monitoring Policy	[Retry 3 times] Always Reset	Specifies the processing to be done when time-out was enforced during boot monitoring. This is configurable only if **Boot Monitoring** has been enabled. **Retry 3 times** resets the server upon the timeout and attempts to boot OS up to three times. **Always Reset** retries booting the OS repeatedly.

(2/2)

Option	Parameter	Description
Thermal Sensor	Disabled [Enabled]	Enables or disables the thermal sensor monitoring. If this option is set to **Enabled** and when abnormal temperature is detected, the system stops at the end of POST.
Check previous System Config	[Disabled] Enabled	If this option is set to **Enabled** and the system configuration differs from the previous boot, the system waits for user's intervention before booting.
BMC IRQ	[Disabled] IRQ 11	Specifies whether to assign an interrupt line to the BMC.
Post Error Pause	Disabled [Enabled]	Specifies whether to stop the POST once at the end of POST if an error occurs during the POST.
Memory Error	Halt [Boot]	Specifies whether to stop operation at the end of POST processing if a memory resource error occurred while executing POST. This option is enabled if **POST Error Pause** in the **Server** menu is enabled. Even if this option is set to **Boot**, operation stops at the end of POST if errors occurred for all resources.
Power Switch Inhibit	[Disabled] Enabled	Enables or disables the power switch inhibit feature.
CLI SETUP	[Disabled] Enabled	Specifies whether to use Command Line Interface (CLI). **Enabled :** SETUP is run by CLI instead of the menu operation. To switch back to the meu operation, set this option to **Disabled** on CLI.

(1) System Management submenu

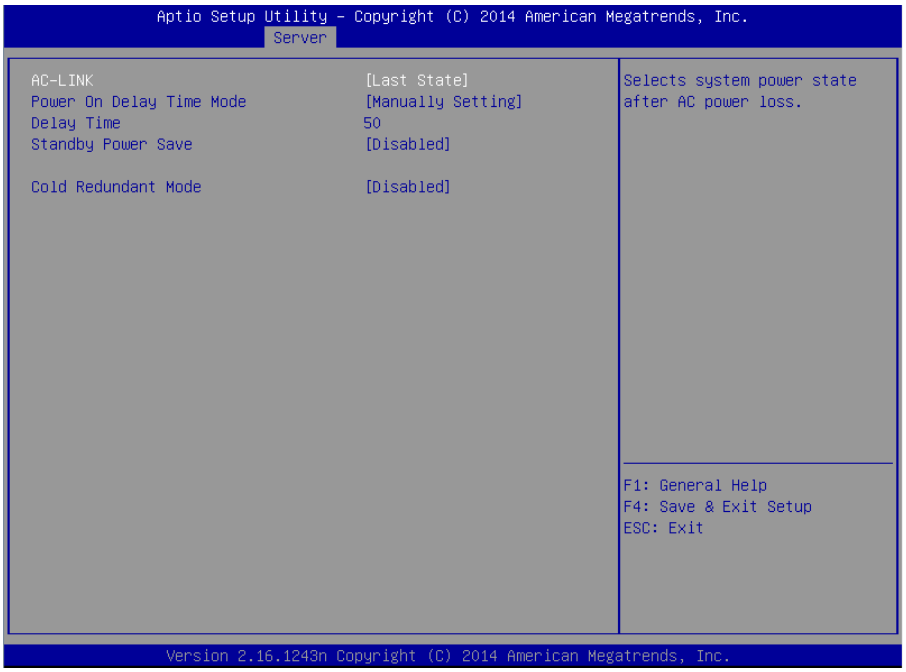
On **Server**, choose **System Management** and then press <Enter> key to show its submenus.



Option	Parameter	Description
BIOS Version	(display only)	Displays the current BIOS version.
UEFI Spec Version	(display only)	Displays the UEFI Specification version.
Board Part Number	(display only)	Displays the part number of the motherboard.
Board Serial Number	(display only)	Displays the serial number of the motherboard.
System Part Number	(display only)	Displays the part number of the system.
System Serial Number	(display only)	Displays the serial number of the system.
Chassis Part Number	(display only)	Displays the part number of the chassis.
Chassis Serial Number	(display only)	Displays the serial number of the chassis.
Onboard LAN1 MAC	(display only)	Displays the MAC address of the onboard LAN port 1.
Onboard LAN2 MAC	(display only)	Displays the MAC address of the onboard LAN port 2.
Management LAN MAC	(display only)	Displays the MAC address of the management LAN port.
BMC Device ID	(display only)	Displays the BMC device ID.
BMC Device Revision	(display only)	Displays the BMC device revision.
BMC Firmware Revision	(display only)	Displays the BMC firmware revision.
SDR Revision	(display only)	Displays the revision of the sensor data record.
NM Firmware Version	(display only)	Displays the firmware version of Intel Node Manager
Descriptor Revision	(display only)	Displays the Descriptor revision.
Chipset Revision	(display only)	Displays the chipset revision.

(2) Power Control Configuration submenu

On **Server**, choose **Power Control Configuration** and then press <Enter> key to show its submenus.



Option	Parameter	Description
AC-LINK	Stay Off [Last State] Power On	Specifies how the power state should be when the AC power is supplied again after the power is lost.See the table below.
Power On Delay Time Mode	[Manually Setting] Random	Selects a method to specify the delay time before powering on DC power. This option is selectable when **Power On** or **Last State** is specified in **AC-LINK**.
Delay Time	[xx]-600	Specifies the waiting time before powering on DC within the range between **"xx"** and 600 seconds. This feature is enabled when **Power On** or **Last State** is specified in the AC LINK setting. **"xx"** indicates the minimum configurable time and is displayed when executing **Load Setup Defaults**. If **Save Changes and Exit** is selected with a value smaller than the minimum value specified, the minimum configurable time is automatically applied.
Standby Power Save	[Disabled] Enabled	Enables or disables the feature that saves the standby power on standby. If this option is enabled, the **AC-LINK** setting is fixed to **Power On** and cannot be changed.
Cold Redundant Mode (Express5800/T110h, T110h-S)	[Disabled] Enabled	Enables or disables cold redundancy. This option is displayed only when using redundant power supply.

The table below shows the operation 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	Off	On	On
Abort (DC power is also Off)	Off	Off	On
Forced shutdown*	Off	On	On

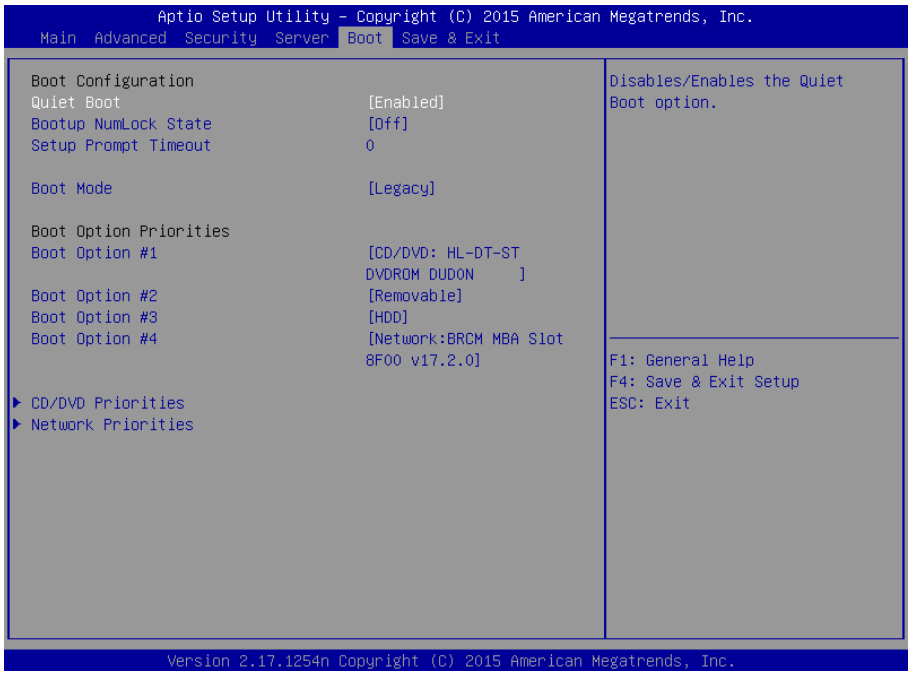
* Continue pressing the POWER switch for at least 4 seconds to forcibly turn off the power.

Tips

- If an uninterruptible power supply (UPS) is used for automatic operation, set the **AC-LINK** to **Power On**.
- **AC-LINK** option becomes valid when next time POST is running.

1.2.5 Boot

Boot menu appears when the cursor is moved to **Boot**.



Option	Parameter	Description
Boot Configuration	–	–
Quiet Boot	Disabled [Enabled]	Specifies whether to display the logo during POST. **Disabled :** the results of POST execution are displayed instead of the NEC logo after the power is turned on. If **BIOS Redirection Port** is enabled, this option is always disabled.
Bootup Numlock State	On [Off]	Enables or disables Numlock.
Setup Prompt Timeout	[0] - 65535	Specifies the time (in seconds) until <F2> is pressed to launch SETUP. The specified value is reflected to waiting time immediately before completion of POST.
Boot Mode	Legacy [UEFI]	Specify the boot mode.This option can be selected when **Secure Boot** is set to Disabled. ● Select "UEFI" for the following OS: – Windows Server 2012 – Windows Server 2012 R2 ● Select "Legacy" for the following OS: – Windows Server 2008 R2 – VMware ESXi 5 – VMware ESXi 6 See *Chapter 1 Installing Windows* in *Installation Guide*, and determine the Boot Mode according to description in *"Before Starting Setup"* appropriate to your OS.
Boot Option Priorities	–	–

Option	Parameter	Description
Boot Option #1	–	These items display the priority of boot devices. If **Boot Mode** is changed, devices are displayed after the system restart.
Boot Option #2	–	
Boot Option #3	–	
Boot Option #4	–	
CD/DVD Priorities	–	Specify the boot priority for each device type.
Removable Priorities	–	
HDD Priorities	–	
Network Priorities	–	

[ ]: Factory setting

How to change the boot priority

1. When BIOS detects a bootable device, it displays device information in the designated area.
2. Move the cursor to a device using the <↑>/<↓> keys, and change the priority (First to Fourth) using the <+>/<–> keys.

Priority of bootable devices

(1) Case when multiple bootable devices are connected

The devices are booted in descending order of the priority set in the Boot option. If the boot has failed, the device that is the next one in the Priorities of the same device type is booted. When the boot of the device that is the lowest in the Priorities of the same device type has failed, a device of the Priorities of the next device type is booted.

For example, if there are 2 Priorities for each device type, the priority of the Boot Option and the Priorities of each device type are as following:

- Priority of boot option and the Priorities of each device type ((1) to (8))

1. Boot Option #1 : CD/DVD
   CD/DVD Priorities Boot Option #1 : CD/DVD device 1…(1)
   CD/DVD Priorities Boot Option #2 : CD/DVD device 2…(2)
2. Boot Option #2 : Removable
   Removable Priorities Boot Option #1 : Removable device 1…(3)
   Removable Priorities Boot Option #2 : Removable device 2…(4)
3. Boot Option #3 : HDD
   HDD Priorities Boot Option #1 : HDD device 1…(5)
   HDD Priorities Boot Option #2 : HDD device 2…(6)
4. Boot Option #4 : Network
   Network Priorities Boot Option #1 : Network device 1…(7)
   Network Priorities Boot Option #2 : Network device 2…(8)

(2) Case when a bootable device is added

If a bootable device is newly connected, the added device is registered as the device that has the lowest priority in the Priorities of each device type.

(3) Case when a bootable device is demounted

If a bootable device is demounted from this machine, the subject device is deleted from the Priorities of each device type.

(4) Case when “Load Setup Defaults” is executed

If "Load Setup Defaults" in the Save & Exit menu is executed, the settings of the Boot Options and the Priorities of each device type are as the following:

a) Priority of Boot Options

1. Boot Option #1 : CD/DVD
2. Boot Option #2 : Removable
3. Boot Option #3 : HDD
4. Boot Option #4 : Network

b) Priority of Each Device Type’s Priorities

- The priority of non-USB devices (SATA device, RAID, etc.) is higher, and USB devices are registered after them.

c) Bootable devices

- For disabled devices, the disabled state is released, and they are registered in the Priorities of each device type again.

(5) Case when Remote Management Advanced License (*1) is registered

If Remote Management Advanced License is registered, remote media are registered as a bootable device. Remote media operate as follows:

- AMI Remote CD/DVD devices are registered as the device of highest priority in "CD/DVD Priorities".
- If "Load Setup Defaults" in the Save & Exit menu is executed, AMI Remote CD/DVD devices are registered as the device of highest priority in "CD/DVD Priorities".

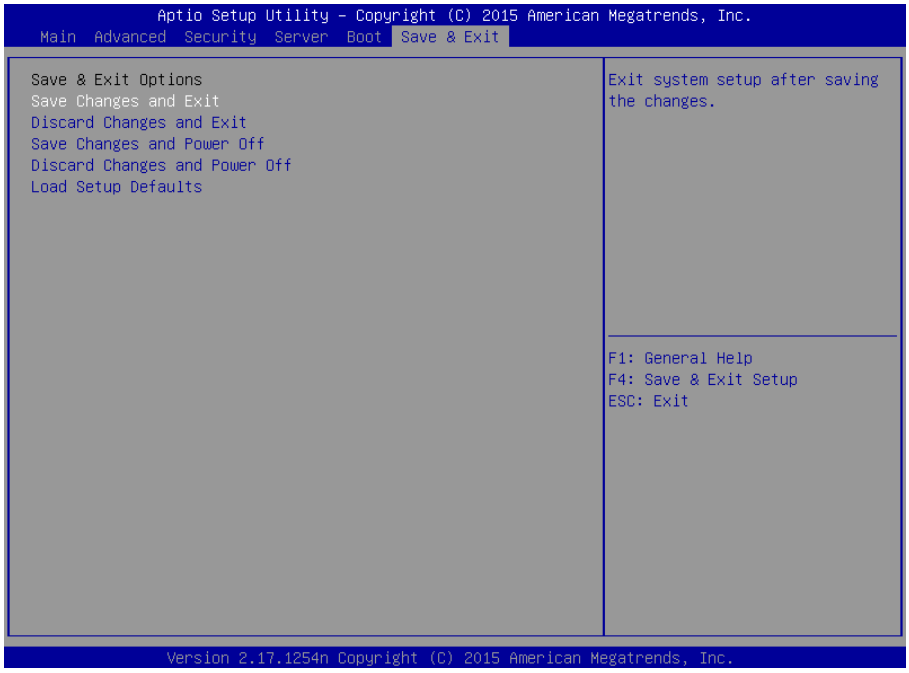
(*) See *EXPRESSSCOPE Engine 3 User's Guide* for details of Remote Management Extended License.

Tips

- If the boot mode is UEFI, the device information that the installation OS has registered is displayed in "HDD Priorities". It may include the model number of the hard disk. “Removable Priorities” may have the partition information storing EFI boot image.
- If the boot mode is UEFI, BIOS registers the device information that is displayed in "HDD Priorities" again when the BIOS settings (NVRAM) are cleared. For that reason, the device information may be different from the one the installation OS registered. However, booting can be done with no problem.
- If **Boot Mode** is set to "Legacy", **HDD Priorities** shows the model number of the hard disk drive.
- Change bootable devices from SETUP instead of the bcdedit command of Windows and efibootmgr command of Linux.

1.2.6 Save & Exit

Save & Exit menu appears when the cursor is moved to **Save & Exit**.



The options of this menu are described below.

(a) Save Changes and Exit

SETUP closes with all the changes saved in Non-volatile RAM (NVRAM). After the SETUP utility closes, the system automatically restarts.

(b) Discard Changes and Exit

SETUP closes without saving the changes and returns to the previous BIOS settings.
The setting at startup of SETUP utility is retained. After the SETUP utility closes, the system automatically restarts.

(c) Save Changes and Power Off

Changes are saved in NVRAM. fter the SETUP utility closes, the power of the server is automatically turned off.

(d) Discard Changes and Power Off

Changes are discarded and the parameters are reset to the previous settings. fter the SETUP utility closes, the power of the server is automatically turned off.

(e) Load Setup Defaults

This option resets all parameters in SETUP to the default settings.

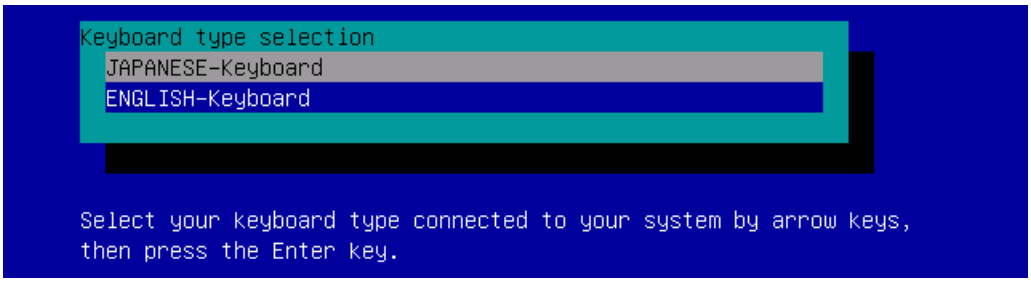
Note

- The factory settings and default settings may differ depending on the model. The settings must be corrected according to your system by referring to the list of settings in this section.
- The values of iSCSI Configuration submenu and UEFI Driver Configuration submenu do not return to the default value.

2. Server Configuration

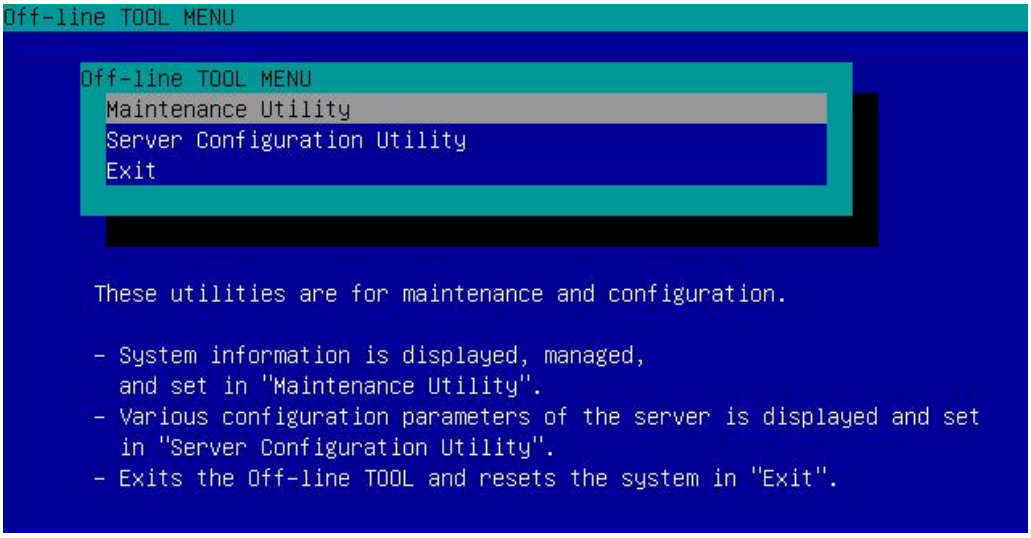
2.1 Starting Server Configuration

1. **Keyboard type selection** appears when you press <F4> key during POST.



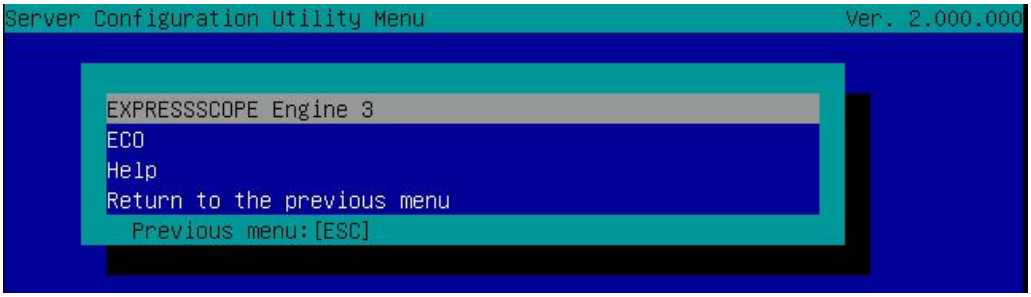
Keyboard type selection menu

2. After you select a keyboard type, **Off-line TOOL MENU** appears.



Off-line TOOL menu

3. Selecting **Server Configuration Utility** in **Off-line TOOL MENU** starts Server Configuration Utility.



(a) EXPRESSSCOPE Engine 3

You can view or set configurations of BMC.

After you set parameters for each item, select **OK** to save the changes.

For details, see *Chapter 2 (2.2 EXPRESSSCOPE Engine 3)*.

(b) ECO

You can view or set information concerning Management Engine (ME).

For details, see *Chapter 2 (2.3.6 ECO)*.

(c) Help

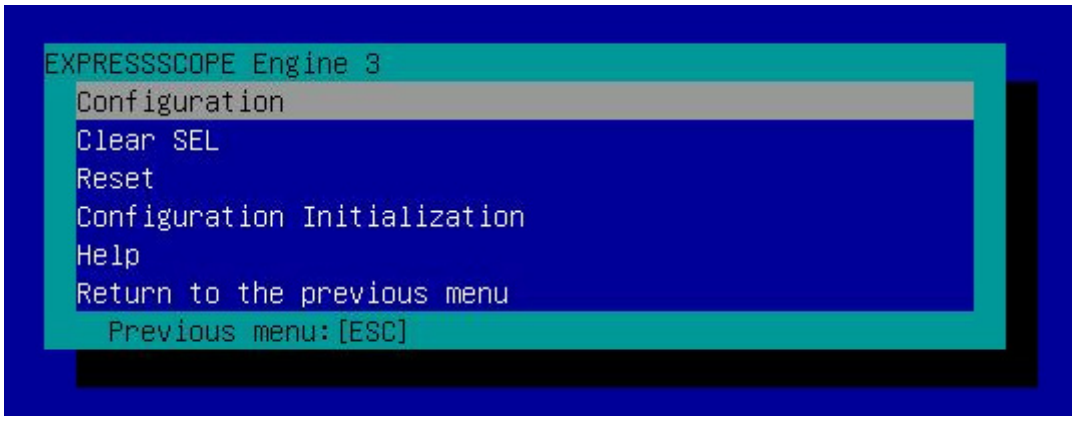
You can open help screen of Server Configuration Utility.

(d) Return to the previous menu

You can exit Server Configuration Utility, and return to Off-line TOOL MENU.

2.2 EXPRESSSCOPE Engine 3

The following menu appears when you select **EXPRESSSCOPE Engine 3** on **Server Configuration Utility**.



EXPRESSSCOPE Engine 3 menu

(a) Configuration

You can set configurations to BMC.

After you set parameters for each item, select **OK** to save the changes.

For details, see *Chapter 2 (2.3.1 Network)*.

(b) Clear SEL

You can clear System Event Log (SEL) of BMC.

For details, see *Chapter 2 (2.4 Clear SEL)*.

(c) Reset

You can reset BMC without changing configurations.

For details, see *Chapter 2 (2.5 Reset)*.

(d) Configuration Initialization

You can initialize BMC configurations to restore the default settings.

For details, see *Chapter 2 (2.6 Initializing Configuration)*.

(e) Help

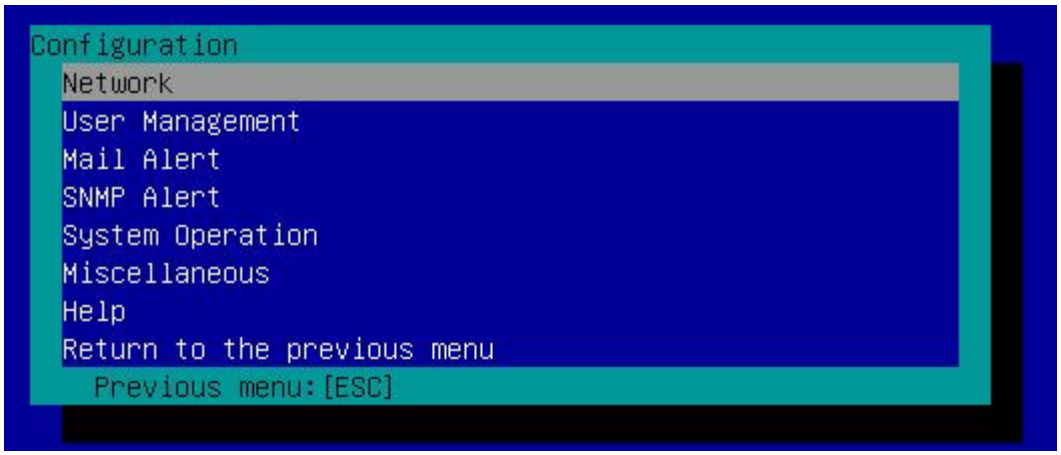
You can open help screen of EXPRESSSCOPE Engine 3.

(f) Return to the previous menu

You can exit EXPRESSSCOPE Engine 3, and return to Server Configuration Utility menu.

2.3 Configuration Menu

The following menu appears when you select **Configuration** on EXPRESSSCOPE Engine 3 menu.



BMC Configuration menu

(a) Network

You can view network environment and services of BMC LAN and change settings.

For details, see *Chapter 2 (2.3.1 Network)*.

(b) User Management

You can manage user accounts to access to BMC.

For details, see *Chapter 2 (2.3.2 User Management)*.

(c) Mail Alert

You can view E-mail alerts issued from BMC and change settings.

For details, see *Chapter 2 (2.3.3 Mail Alert)*.

(d) SNMP Alert

You can view SNMP alerts issued from BMC and change settings.

For details, see *Chapter 2 (2.3.4 SNMP Alert)*.

(e) System Operation

You can set parameters for remote KVM console and remote media.

For details, see *Chapter 2 (2.3.5 System Operation)*.

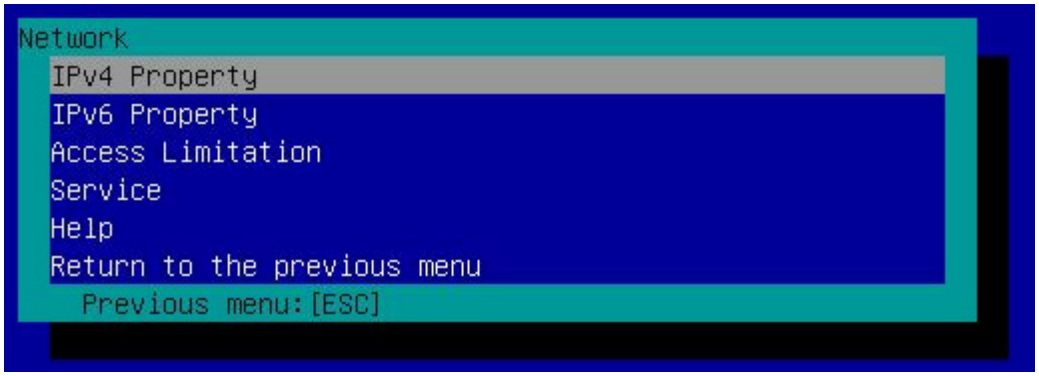
(f) Miscellaneous

You can set various features of BMC.

For details, see *Chapter 2 (2.3.7 Miscellaneous)*.

2.3.1 Network

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



Network menu

(1/2)

Item	Description	Default Value
IPv4 Property		
Management LAN	Specify and display LAN port to communicate with BMC. *1 *2 Management LAN : LAN port for BMC exclusive use. Shared BMC LAN : LAN port of System (OS) is shared and used. NOTE: Before using this feature, make sure and LAN Controller is set to Enabled.	Management LAN
Connection Type	Specify and display the connection type of BMC LAN. *1 Auto Negotiation : Connecting by suitable setting. 100Mbps Full : Connecting by Full Duplex at speed of 100 Mbps. 100Mbps Half : Connecting by Half Duplex at speed of 100 Mbps. 10Mbps Full : Connecting by Full Duplex at speed of 10 Mbps. 10Mbps Half : Connecting by Half Duplex at speed of 10 Mbps.	Auto Negotiation
BMC MAC Address	Display MAC Address of BMC.	–
DHCP	Determine whether to dynamically obtain an IP address from a DHCP server. If this item is set to Enable, BMC set the value obtained from DHCP server on "IP Address", "Subnet Mask" and "Default Gateway".	Disable
IP Address	Specify the BMC LAN IP address. *4	192.168.1.1
Subnet Mask	Specify the Subnet Mask of BMC LAN. *3 *4	255.255.255.0
Default Gateway	Specify the Default Gateway IP address of the BMC LAN. *4 If you set this item, it is necessary for applying configuration information that the gateway is connected on network.	0.0.0.0
Dynamic DNS	Determine whether to enable/disable of Dynamic DNS. *5	Disable
DNS Server	Specify the DNS Server.	0.0.0.0
Host Name	Specify the Host Name. *6	Blank
Domain Name	Specify the Domain Name. *7	Blank

(2/2)

Item	Description	Default Value
IPv6 Property		
IPv6	Enable or disable IPv6.	Disable
Address Assignment Mode	Specify the mode to assign IPv6 address (Static or Dynamic). *12	Dynamic
Link Local Address	Display link local address. *12	–
Global Address	Display IPv6 address when Dynamic is specified for assignment mode. *12 *13	–
Static Address	Specify IPv6 address when Static is specified for assignment mode. *12	0::0
Prefix Length	Specify the prefix length when Static is specified for assignment mode. *12	64
Gateway Address	Specify the gateway address when Static is specified for assignment mode. *12	0::0
Access Limitation		
Limitation Type	Select the Access Limitation Type. Allow All : Access to BMC is not limited. Allow Address : Specify the IP Address that is allowed to access BMC. Deny Address : Specify the IP Address that denies accessing BMC.	Allow All
IP Address	Specify the IP Address (IPv4) to allow or deny accessing BMC. *8 *9	Blank
Service		
HTTPS	Enable or disable HTTPS service. *10	Enable
HTTPS Port Number	Specify the HTTPS port number.*11	443
HTTP	Enable or disable HTTP service. *10	Enable
HTTP Port Number	Specify the HTTP port number. *11	80
SSH	Enable or disable SSH service.	Enable
SSH Port Number	Specify the SSH port number.*11	22

*1: Can be specified if the server supports this feature.

*2: When set to "Shared BMC LAN", the BMC LAN port is disabled. When set to "Shared BMC LAN", the system (OS) LAN port also transmits or receives data. Thus, the network performance may be reduced due to load of system LAN (or BMC LAN).

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

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

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

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

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

8: The range of IP address to "Allow" or "Deny" access is delimited by ",(Comma)". With regard to the setting of “Deny” access, "(Asterisk)" can be described as a wild-card. (ex: 192.168.1.*,192.168.2.1,192.168.2.254)

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

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

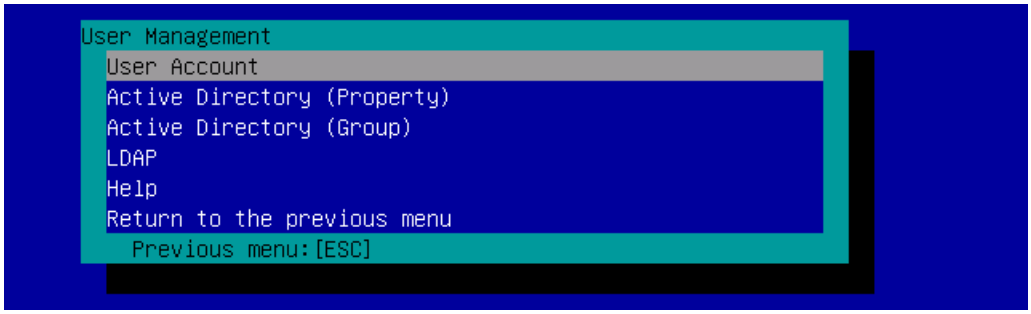
*11: Port number can be specified only when the relevant port is set to "Enable". The port number must be unique.

*12: Can be specified only when IPv6 is set to "Enable".

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

2.3.2 User Management

The following menu appears when you select **User Management** on BMC Configuration menu.



User Management menu

(1/2)

Item	Description	Default Value
User Account		
User	Enable or disable the user. *1	Enable
User Name	Specify user name. *2	Blank
Password	Specify password. *3	Blank
Confirm Password	Specify the same character string used for "Password". *3	Blank
Privilege	Specify the privilege of the user. *4 Administrator Operator User	Administrator
Active Directory (Property)		
Active Directory Authentication	Enable or disable Active Directory authentication.	Disable
User Domain Name	Specify the user domain name. *5 *6	Blank
Timeout	Specify timeout period for connection with Domain Controller. *5	120
Domain Controller Server1	Enable or disable Domain Controller Server 1. *5 *7	Enable
Server Address1	Specify IP address of Domain Controller Server 1. *5 *8	Blank
Domain Controller Server2	Enable or disable Domain Controller Server 2. *5 *7	Disable
Server Address2	Specify IP address of Domain Controller Server 2. *5 *8	Blank
Domain Controller Server3	Enable or disable Domain Controller Server 3. *5 *7	Disable
Server Address3	Specify IP address of Domain Controller Server 3. *5 *8	Blank
Active Directory (Group)		
Group Name	Specify group name of Active Directory.*8	Blank
Group Domain	Specify group domain of Active Directory. *6	Blank
Privilege	Specify privilege of group of Active Directory. *4 Administrator Operator User	Administrator

(2/2)

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	389
	Search Base	Specify the search base used in LDAP authentication. *9 *10	Blank
	Bind Domain Name	Specify the bind domain used in LDAP authentication. 9 *10	Blank
	Bind Password	Specify the bind password used in LDAP authentication. *9*11	Blank

*1: Can be specified if a user exists.

*2: Up to 15 characters including alphanumeric, hyphen (-), and underscore (_) can be used. Note, however, User Name must not start with hyphen (-). In addition, "InternalUseOnly", "null", "MWA", "AccessByEM-Poem", and names which are already assigned for other number are not allowed.

*3: Up to 19 ASCII characters can be used excluding " " (blank), " (quotation), & (ampersand), ? (question mark), = (equal sign), #, and ¥.

*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"

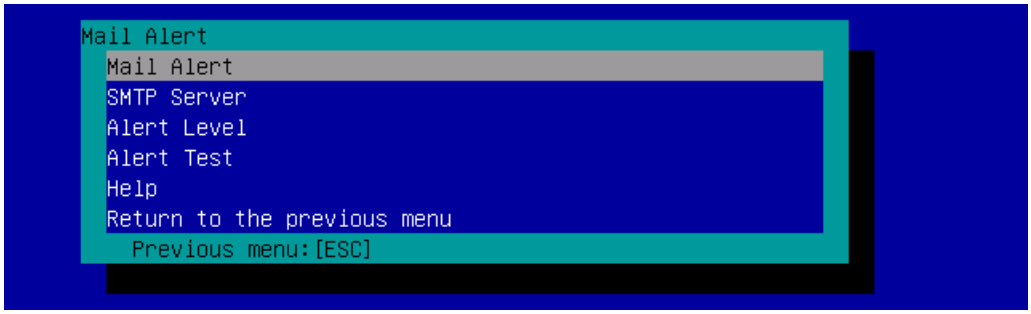
*9: Can be specified only when LDAP authentication is set to "Enable".

*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.

2.3.3 Mail Alert

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



Mail Alert menu

(1/2)

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 Password. *6 *9	Blank

(2/2)

Item	Description	Default Value
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 selected address among To1 to To3. Error, Warning : When "Error" or "Warning" is detected in each sensor type, the alert is sent to the selected address among To1 to To3. Error, Warning, Information : When "Error", "Warning" or "Information" is detected in each sensor type, the alert is sent to the selected address among To1 to To3. Separate Setting : You can arbitrarily select the event and the address (To:X) to alert in each sensor type.	Error, Warning
Alert Test	Execute test by sending an alert by mail. *10	–

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

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

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

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

*5: Up to 255 alphanumeric characters, hyphen, and period can be used for full domain name or IP address.

*6: Can be specified only when SMTP Authentication is set to "Enable".

*7: When SMTP Authentication is set to "Enable", at least one of the authentic methods should be enabled.

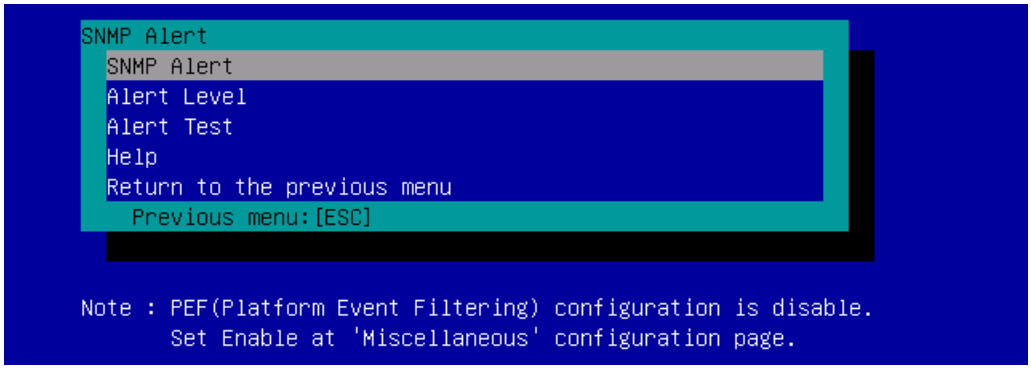
*8: Up to 64 alphanumeric characters can be used excluding " " blank, ",?, =, <, >, #, and ¥.

*9: Up to 19 alphanumeric characters can be used excluding " " blank, ",?, =, <, >, #, and ¥.

*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.

2.3.4 SNMP Alert

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



SNMP Alert menu

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 valid receiver. Error, Warning : When "Error" or "Warning" is detected in each sensor type, the alert is sent to the valid receiver. Error, Warning, Information : When "Error", "Warning" or "Information" is detected in each sensor type, the alert is sent to the valid receiver. Separate Setting : You can arbitrarily select the event to alert in each sensor type.	Error, Warning
Alert Test		Execute an alert test by SNMP. *6	–

*1: When PEF (Platform Event Filter) is set to "Disable" in Miscellaneous menu, SNMP alert is disabled.

*2: Up to 16 alphanumeric characters are accepted.

*3: Can be specified only when Alert Acknowledge is set to "Enable".

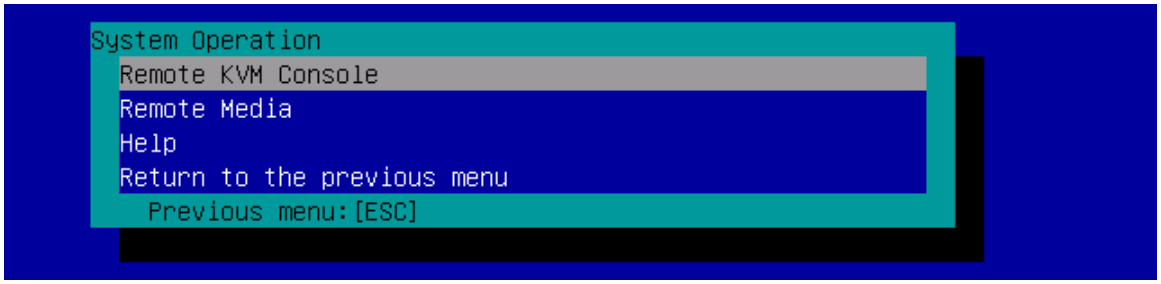
*4: When SNMP Alert is enabled, at least one alert receiver should be enabled.

*5: Can be specified only when each Alert Receiver is set to "Enable".

*6: Be sure to perform Alert Test after all the parameters are configured appropriately. Alert feature may fail depending on configuration made for network or alert receiver.

2.3.5 System Operation

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



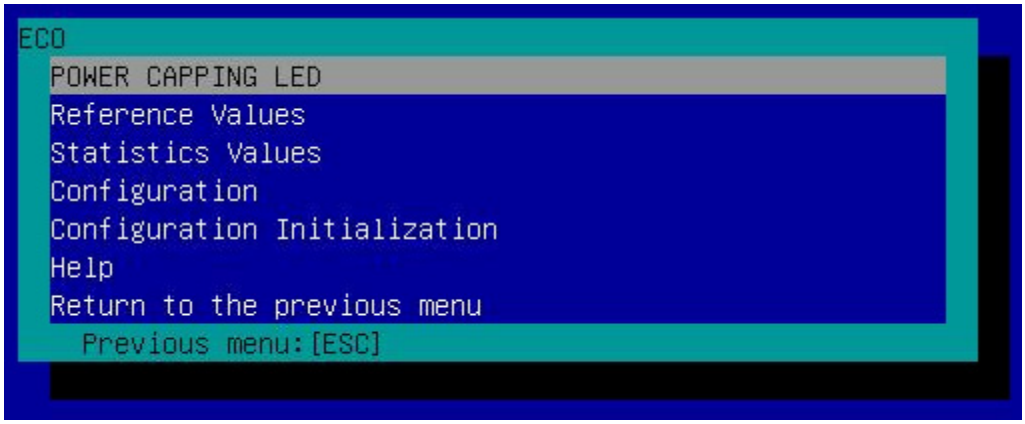
System Operation menu

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	Absolute
Keyboard Language	Select a keyboard language. Japanese(JP) English(US) French(FR) German(DE)	English(US)
Remote Media		
Encryption	Enable or disable encryption.	Enable
Remote CD/DVD (No Encryption)	Specify the port number of remote CD/DVD port when encryption is disabled. *1	5120
Remote USB Memory (No Encryption)	Display the port number of remote USB memory when encryption is disabled. (Remote CD/DVD port number + 2)	–
Remote FD (No Encryption)	Display the port number of remote FD when encryption is disabled. (Remote CD/DVD port number + 3)	–
Remote CD/DVD (Encryption)	Specify the port number of remote CD/DVD port when encryption is enabled. *1	5124
Remote USB Memory (Encryption)	Display the port number of remote USB memory when encryption is enabled. (Remote CD/DVD port number + 2)	–
Remote FD (Encryption)	Display the port number of remote FD when encryption is enabled. (Remote CD/DVD port number + 3)	–

*1: Port numbers must be the unique one.

2.3.6 ECO

The following menu appears when you select **ECO** on Server Configuration Utility menu.



ECO menu

Item		Description	Default Value
POWER CAPPING LED		Shows LED status. Enable : On Working : Blinking Disable : Off Invalid : Unknown	
Reference Values		Displays reference values of power consumption. Maximum Power Consumption : Shows the maximum power consumption. *1 Minimum Power Consumption : Shows the minimum power consumption. *1	
Statistics Values		Shows statistic value for each item. Statistic values for all items can be obtained by selecting "**Reload**". Statistic value of each item can be cleared by selecting "**Reset xxxxx statistics**".	
	Power Consumption	Shows Current / Maximum / Minimum / Average power consumption (Watt)	–
	CPU Throttling	Shows Current / Maximum / Minimum / Average CPU throttling rate (%). *2	–
	Memory Throttling	Shows Current / Maximum / Minimum / Average memory throttling rate (%). *2	–
Configuration			
	Aggressive Mode	Enable or disable Aggressive Mode.	Disable
	Power Threshold(Pa)	Specify power threshold in Aggressive Mode. Allowable range is between AAA and Maximum Power Consumption (Watt). *3 *4	Maximum power consumption
	Correction time limit	When power consumption exceeds the power threshold for Aggressive Mode and unable to recover within the time period specified in this parameter, collects event log, sends an alert, and shuts down the system. Allowable value (in seconds) depends on system. *3	The larger value comparing with 2 and Minimum system value
	Shutdown System	Enable or disable the feature to shut down the system when power consumption exceeds the time specified in Correction time limit. *3	Disable
	Non- Aggressive Mode	Enable or disable Non-Aggressive Mode.	Disable

(2/2)

Item		Description	Default Value
Configuration			
	Power Threshold(Pn)	Specify power threshold in Non-Aggressive Mode. Allowable range is between the Minimum Power Consumption and BBB (Watt). *5 *6	The larger value comparing with Power Threshold(Pa) –10 and Minimum Power Consumption +10
	Correction time limit	When power consumption exceeds the power threshold for Non-Aggressive Mode and unable to recover within the time period specified in this parameter, collects event log and sends an alert. Allowable value (in seconds) depends on system. *5	The larger value comparing with 10 and Minimum system value
	Safe Power Capping *3	Enable or disable Safe Power Capping (Monitoring at unreadable power consumption).	Disable
	Boot Time Configuration *3	Enable or disable Boot Time Configuration.	Disable
	Performance Mode	Select a performance at system boot-up. *7 Performance Optimized : Prefer performance and operation Power Optimized : Optimize power consumption.	Performance Optimized
	Disable CPU Cores	Specify the number of cores to be disabled. Allowable value is between 0 and (Number of maximum cores –1). *7	0

*1: These values are reference purpose only. Each value might be different from the actual value which depends on your system configuration.

*2: Technology that decreases frequency or duty cycle of clock, and suppresses power consumption.

*3: Can be specified only when Aggressive Mode is set to "Enable".

*4: AAA denotes "Minimum Power Consumption" or "Power Threshold (Pn)".

*5: Can be specified only when Non-Aggressive Mode is set to "Enable".

*6: BBB denotes "Maximum Power Consumption" or "Power Threshold (Pa)".

*7: Can be specified only when Boot Time Configuration is set to "Enable".

Note

- The power value may not reach the threshold value. The power control feature saves power consumption by lowering the clock speed of CPU/memory. If the throttling value of CPU/memory reaches 100%, the power value cannot be reduced no longer.
- If the value specified for Power Threshold (Pa) for Aggressive Mode is lower than the power required for system startup and the parameter "Shutdown System" is enabled, the server might not start normally.

2.3.7 Miscellaneous

The following items are available when you select **Miscellaneous** in 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 : Any new SEL is not recorded. Clear all SEL : Erase all SEL and record a new SEL. Overwrite oldest SEL : Old SEL is overwritten with new SEL.	Overwrite oldest SEL
Platform Event Filter	Enable or disable Platform Event Filter. *2	Enable
Management Software	Setting for remote management	–
ESMPRO Management	Enable or disable BMC management by NEC ESMPRO *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".

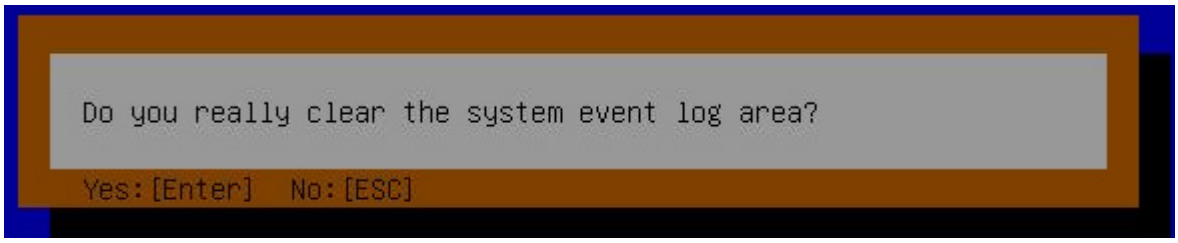
*5: This Authentication key is used when NEC ESMPRO Manager (Ver. 5.4 or later) manages the target server. Up to 16 alphanumeric characters are accepted.

*6: If Redirection is set to "Enable", Console Redirection 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, settings for relevant items are hidden and unnecessary.

2.4 Clear SEL

If you select **Clear SEL** on EXPRESSSCOPE Engine 3 menu, the confirmation message as shown below appears.



Confirmation message (Clear SEL)

<ESC> key: Cancels clearing and returns to BMC Configuration menu.

<Enter> key: Clears SEL.

2.5 Reset

If you select **Reset** on EXPRESSSCOPE Engine 3 menu, the confirmation message as shown below appears.

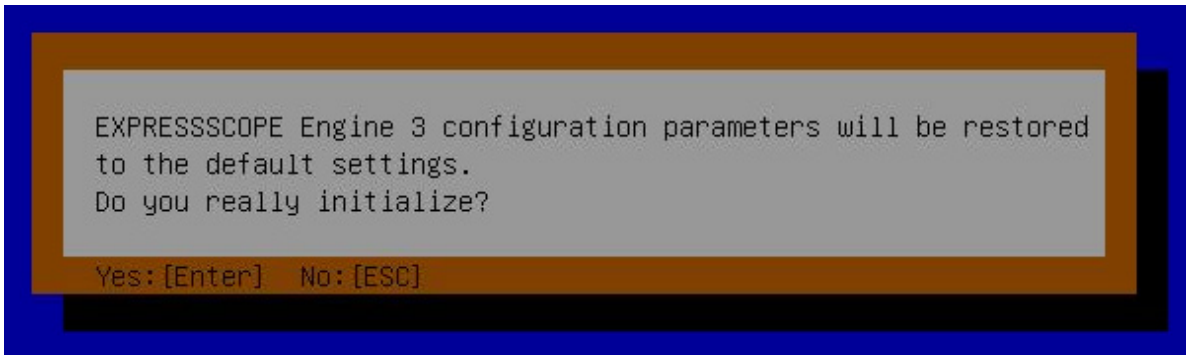
Confirmation message (Reset)

<ESC> key: Cancels resetting and returns to BMC Configuration menu.

<Enter> key: Resets BMC. After resetting, wait for several minutes (approximately three minutes) to re-activate BMC **without operating (shutdown, rebooting, and other switching operations)**.

2.6 Initializing Configuration

If you select **Configuration Initialization** on EXPRESSSCOPE Engine 3 menu, the confirmation message as shown below appears.



Confirmation message (Initialization)

<ESC> key: Cancels initializing and returns to Main menu.

<Enter> key: Initializes BMC configurations and restores the default settings.
After initialization, wait for several minutes (approximately three minutes) to re-activate BMC **without operating (shutdown, rebooting, and other switching operations)**.

3. Flash FDD

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

One Flash FDD can be connected to a USB connector of this server. If another USB or floppy disk drive is connected to the server, remove it before using Flash FDD.

CAUTION

Be extremely careful not to lose the Flash FDD or have it stolen.
If the 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.

If you want to change the write protection, remove Flash FDD from the server and change the write protection switch, and then connect it again.

3.1 Precautions

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

3.1.1 Compensation for recorded data

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

3.1.2 Handling Flash FDD

- **Flash FDDs are consumables. If Flash FDD causes an error, exchange to a new Flash FDD.**
- Do not turn off the server while the access LED of Flash FDD is blinking.
- Flash FDD cannot be connected to a USB hub. Directly connect Flash FDD to the server.
- Before touching Flash FDD, discharge static electricity from your body by touching a doorknob, aluminum frame, and other metal objects.
- Do not disassemble Flash FDD.
- Do not give a shock 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.
- Do not move the server while Flash FDD is connected to the USB connector of this server.
- After using Flash FDD, remove it from this server.

3.1.3 Precautions when using EXPRESSBUILDER

- Connect Flash FDD after Home Menu is displayed.
- When you close EXPRESSBUILDER, remove Flash FDD from the server.

4. Power Control Feature

Power consumption of the server can be controlled through the command line interface of EXPRESSSCOPE Engine 3 (BMC) or by using NEC ESMPRO Manager. This feature curves the upper limit of the power consumption, which allows more servers to be installed in the environment where the power consumption is limited.

For settings information, see "*EXPRESSSCOPE Engine3 User's Guide*" or *NEC ESMPRO Manager online help*.

4.1 Supported OS

The power control feature is available for the following OSs.

- Windows Server 2008 R2 Standard
- Windows Server 2008 R2 Enterprise
- Windows Server 2012 Standard
- Windows Server 2012 Datacenter
- Windows Server 2012 R2 Standard
- Windows Server 2012 R2 Datacenter
- Windows Server 2012 R2 Foundation

5. RAID System Configuration

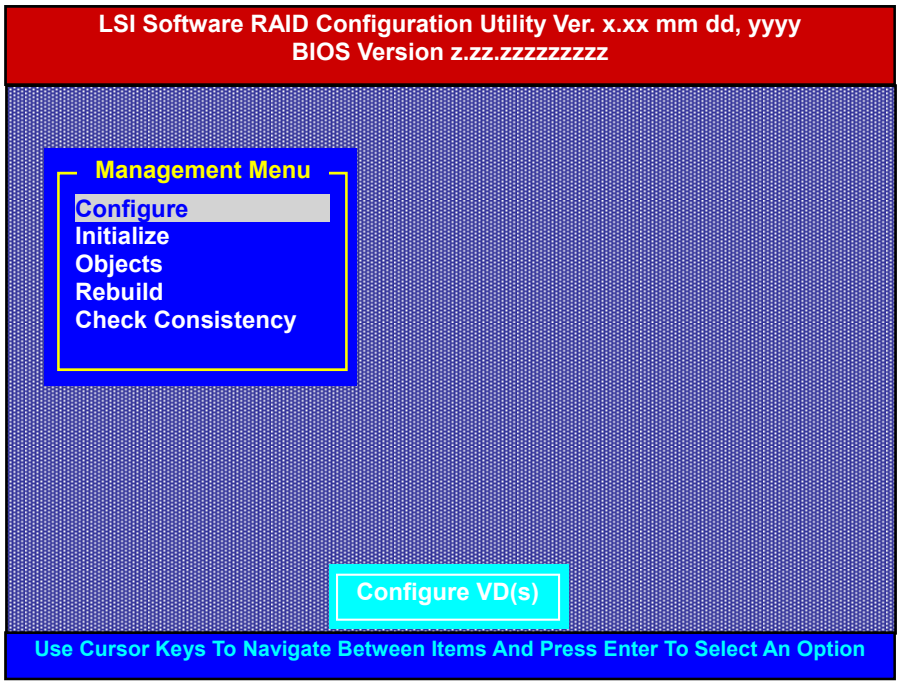
This section describes the LSI Software RAID Configuration Utility and Off-line Utility. The LSI Software RAID Configuration Utility resides in LSI Software RAID and is an OS-independent program.

5.1 Running LSI Software RAID Configuration Utility in the Legacy Mode

On the POST screen after power-on, press the <Ctrl>+<M> key or <Enter> **key** when the following message appears. The LSI Software RAID Configuration Utility starts.

```
Press Ctrl-M or Enter to run LSI Software RAID Configuration Utility
```

Tips If you fail to press <Ctrl>+<M> keys or <Enter> key, or the system proceeds without displaying the following screen, restart the system, and press <Ctrl>+<M> keys on POST screen.



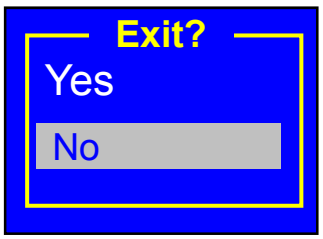
*1: "x" in LSI Software RAID Configuration Utility Verx.xx represents the version of utility.

*2: mm dd, yyy represents created date.

*3: "z" in BIOS Version z.zz.zzzzzzzz represents the version of LSI Software RAID BIOS.

5.1.1 Quitting LSI Software RAID Configuration Utility

To quit the utility, press **the <Esc> key** on the TOP menu of LSI Software RAID Configuration Utility.



Select **Yes**.

When the above message appears, press <Ctrl>+<Alt>+<Del> keys. The server restarts.

5.2 Menu Tree of the Legacy Mode

◇: Selection/execution parameter ●: Setting parameter. ・: Information

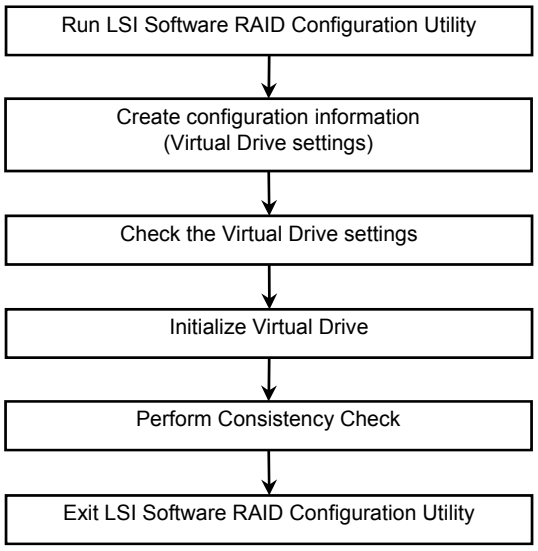
◆: Can be set (modified) after creation of Virtual Drive

Menu	Description
◇Configure	Setting of Configuration
◇Easy Configuration	Setting of Configuration (fixed value used)
◇New Configuration	Create new Configuration
◇View/Add Configuration	Display or add Configuration
◇Clear Configuration	Clear Configuration
◇Select Boot Drive	Select bootable Virtual Drive
◇Initialize	Initialize Virtual Drive
◇Objects	Various settings
◇Adapter	Configure RAID Controller
◇Sel. Adapter	Select an adapter
●Rebuild Rate	30 (Percentage of IO for Rebuild)
●Chk Const Rate	30 (Percentage of IO for Check Consistency)
●FGI Rate	30 (Percentage of IO for Foreground Initialize)
●BGI Rate	30 (Percentage of IO for Background Initialize)
●Disk WC	Off (Use or not use Write Cache of Adapter, unavailable on LSI Software RAID.)
●Read Ahead	On (On/Off Read Ahead)
●Bios State	Enable (Enable or disable LSI Software RAID BIOS)
●Continue on Error	Yes (If LSI Software RAID BIOS detects an error, specify whether the POST halts or not.)
●Fast Init	Enable (Enable or disable Fast Initialize)
●Auto Rebuild	On (Enable or disable Auto Rebuild)
●Auto Resume	Enable (If the system is restarted during Rebuild or Check Consistency, specify whether the task is continued automatically or not.)
●Disk Coercion	1GB (Forcibly pack HDDs of different size)
●Factory Default	Restore the default value

◇Virtual Drive	Operation of Virtual Drive
◇Virtual Drives	Select Virtual Drive (if two or more Virtual Drives exist)
◇Initialize	Initialize Virtual Drive
◇Check Consistency	Check consistency of Virtual Drive
◇View/Update Parameters	Display Virtual Drive information
・RAID	Display RAID level
・SIZE	Display Virtual Drive size
・Stripe SIZE	Display Stripe size
・#Stripes	Display number of physical devices included in Virtual Drive
・State	Display Virtual Drive status
・Spans	Display setting of Virtual Drive
・Disk WC	Display Write Cache Policy of Virtual Drive
・Read Ahead	Display Read Ahead Policy of Virtual Drive
◇Physical Drive	Operation of physical drive
◇Physical Drive Selection Menu	Select a physical drive
◇Make HotSpare	Specify hot-spare disk used for Auto Rebuild
◇Force Online	Forcibly make physical device online
◇Change Drv State	Forcibly make offline if the physical device drive is included in Virtual Drive. Cancel hot-spare if the physical device is specified as hot-spare disk.
◇Device Properties	Display hardware information
・Device Type	Device type
・Media Type	Media type(HDD or SSD)
・Capacity	Capacity
・Product ID	Product ID
・Revision No.	Revision No.
・Link Speed	Transfer rate
◇Rebuild	Execute Rebuild
◇Check Consistency	Check Consistency of Virtual Drive

5.3 Operating Procedures for Configuration Utility in the Legacy Mode

5.3.1 Create/Add Configuration



1. Run LSI Software RAID Configuration Utility.

2. From the TOP menu (Management Menu), select **Configure**, and then **New Configuration**. To add settings to an existing configuration, select **View/add Configuration**.

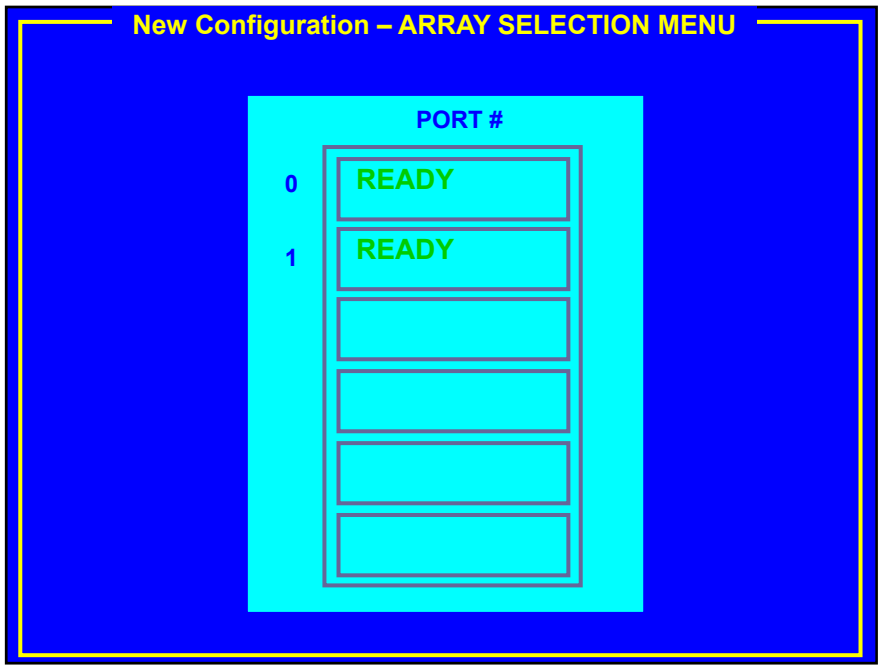
Important

Creating a configuration by using "New Configuration" clears the existing configuration. To add configuration to the existing configuration, select "View/add Configuration".

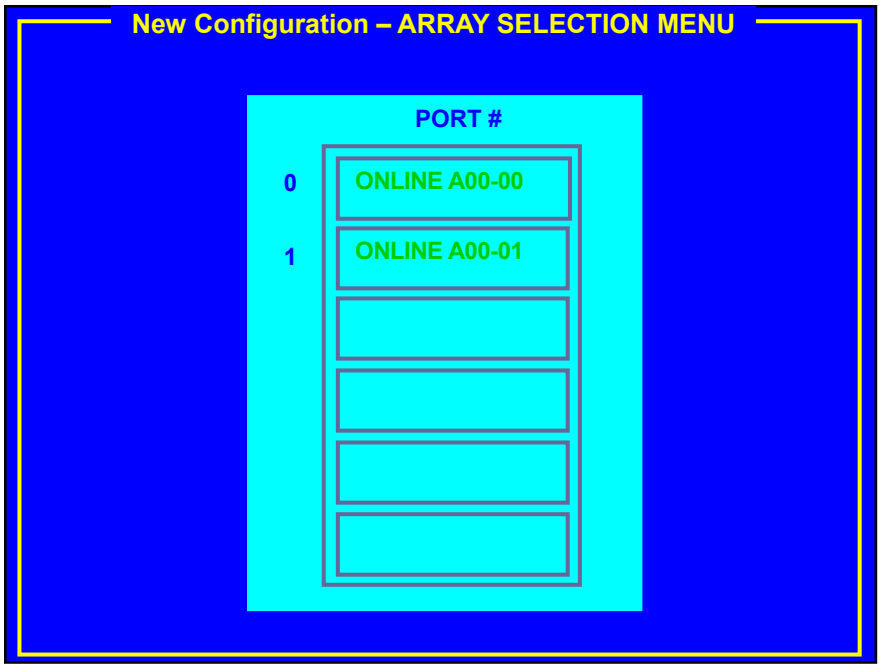
Note

- You cannot specify the Virtual Drive capacity on the **Easy Configuration** menu. Use **New Configuration** or **View/Add Configuration** instead.
- For RAID10, the Virtual Drive is configured with the maximum capacity. You cannot specify the capacity.
- For RAID0, you can skip the step for checking the consistency.

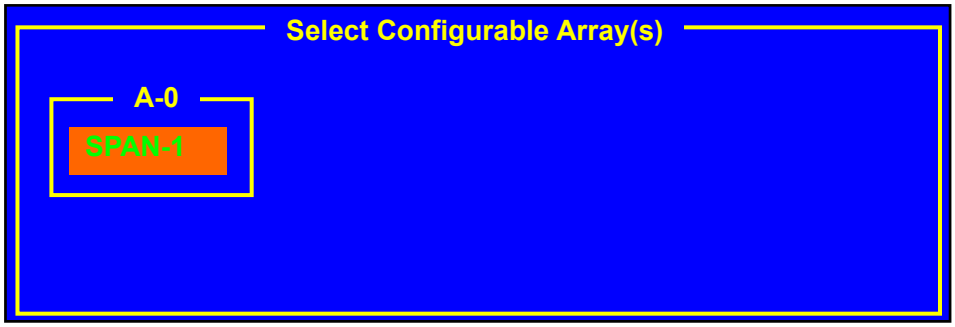
3. When a confirmation message “Proceed?” is displayed, select "Yes".
   The "New Configuration - ARRAY SELECTION MENU" screen appears.



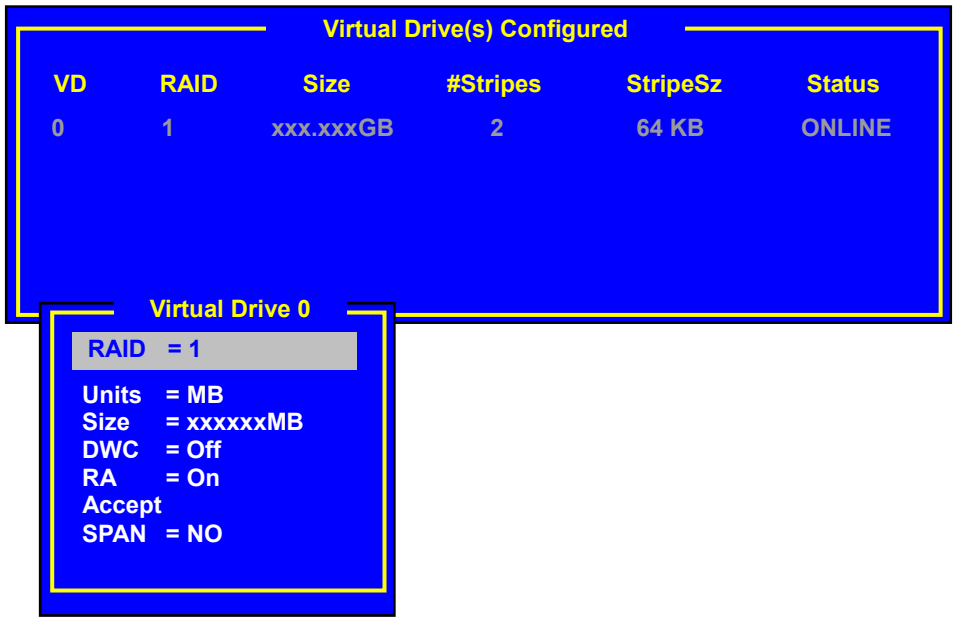
4. Move the cursor onto the physical device to be included in the disk array, and then press the <Space> key. The display for the selected physical device changes from READY to ONLINE.



5. Press the <F10> key to set "Select Configurable Array(s)", and press the <Space> key.SPAN-1 is set.



6. Press the <F10> key to create a virtual drive.
The **Virtual Drives Configure** screen appears. (The figure below shows an example of RAID1 configured with two physical devices. xxx.xxxGB shows capacity.)



7. Select a relevant value for **RAID**, **Units**, **Size**, **DWC**, **RA**, and **Span** by using cursor keys. Press the <Enter> key to fix the selection to determine each value.

(1) **RAID**: Specify the RAID level.

Parameter	Remarks
0	RAID0
1	RAID1
10	RAID10

The selectable RAID level varies depending on the number of physical devices that configure a disk array.

Important **Screen for RAID5 may appear, but this server does not support RAID5.**

(2) **Units**: Specify the unit (MB, GB, or TB) used in "**Size**" field.

(3) **Size**: Specify the size of the virtual drive. Up to eight Virtual Drives can be created per RAID Controller.

(4) **DWC** (Disk Write Cache): Specify the method for writing cached data to the disk.

Parameter	Remarks
Off	Write through
On*	Write back

* Recommended

For this workstation, write back is recommended for good performance. Note, however, that cached data may be lost at an unexpected power failure. Selecting write through degrades performance by approximately 50%.

(5) **RA** (Read Ahead): Specify whether to use read-ahead.

Parameter	Remarks
Off	Does not perform read ahead.
On*	Performs read ahead.

* Recommended

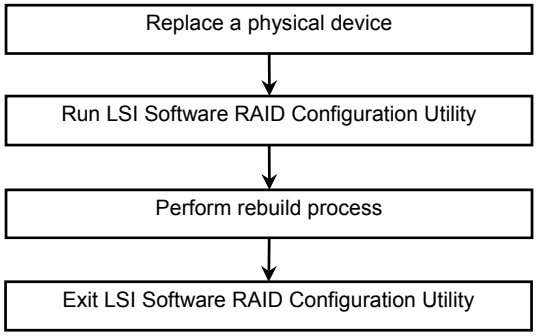
(6) **Span**: Specify Span.

The server does not use this feature.

8. When all settings are completed, select **Accept** and then press the <Enter> key.
9. Press the <Esc> key, and select **Yes** for the confirmation message "Save Configuration?". The configuration is saved.
10. Press **the <Esc> key** to return to the TOP menu screen.
11. On the TOP menu screen, select **Objects**, Virtual Drive, and **View/Update Parameters** to check the specified virtual drive information.
12. Press **the <Esc> key** to return to the TOP menu screen and select **Initialize**.
13. On the **Virtual Drives** screen, move the cursor to the virtual drive to be initialized, and then press **the <Space> key**. The Virtual Drive is selected.
14. Press **the <F10> key**.
15. Select **Yes** to start initialization.
    When the progress bar in the **Init Of VD Is In Progress** screen indicates 100%, initialization is completed. Press **the <Esc> key** to return to the TOP menu screen.
16. For RAID1, check the consistency on the virtual drive that has been initialized.
    See Chapter 2 (5.3.4 Check Consistency) for details.
17. Press **the <Esc> key** to return to the TOP menu and exit from LSI Software RAID Configuration Utility.

5.3.2 Manual Rebuild

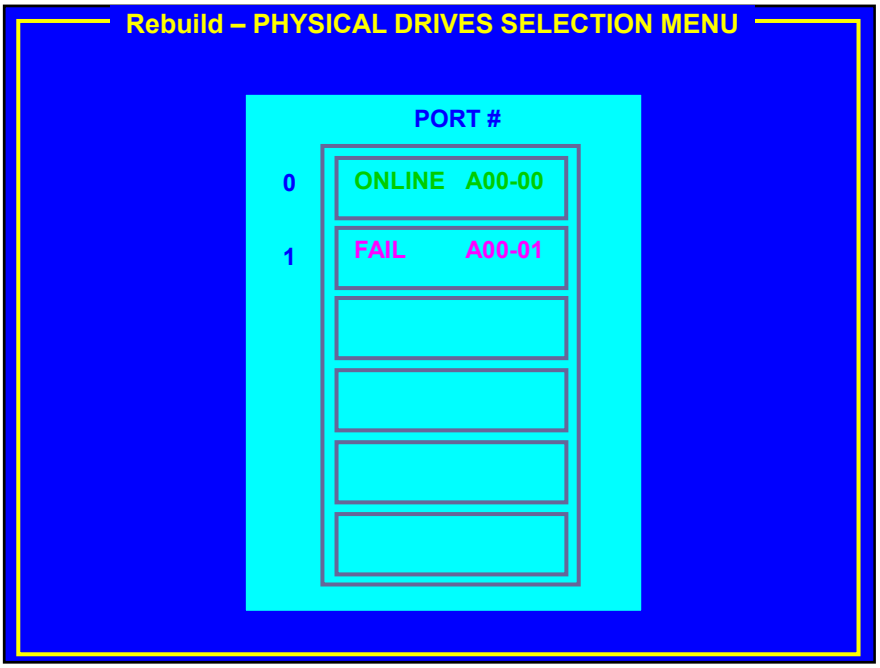
Tips By default, rebuild starts automatically after you replace a physical device.



1. Replace a physical device and turn on the server.

2. Run LSI Software RAID Configuration Utility.

3. From the TOP menu, select **Rebuild**.
   The **Rebuild – PHYSICAL DRIVES SELECTION MENU** screen appears.



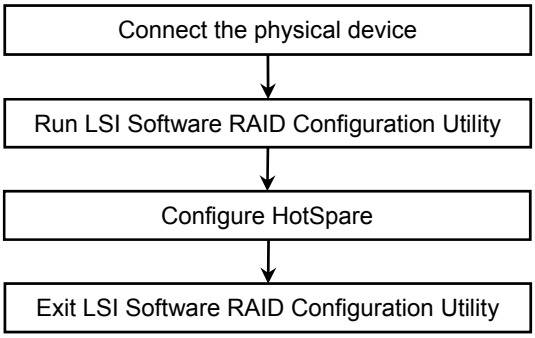
4. Move the cursor onto the physical device displaying "FAIL", and then press the <Space> key to select it. The color of "FAIL" indication for the selected physical device changes to pink.

5. Press the <F10> key.

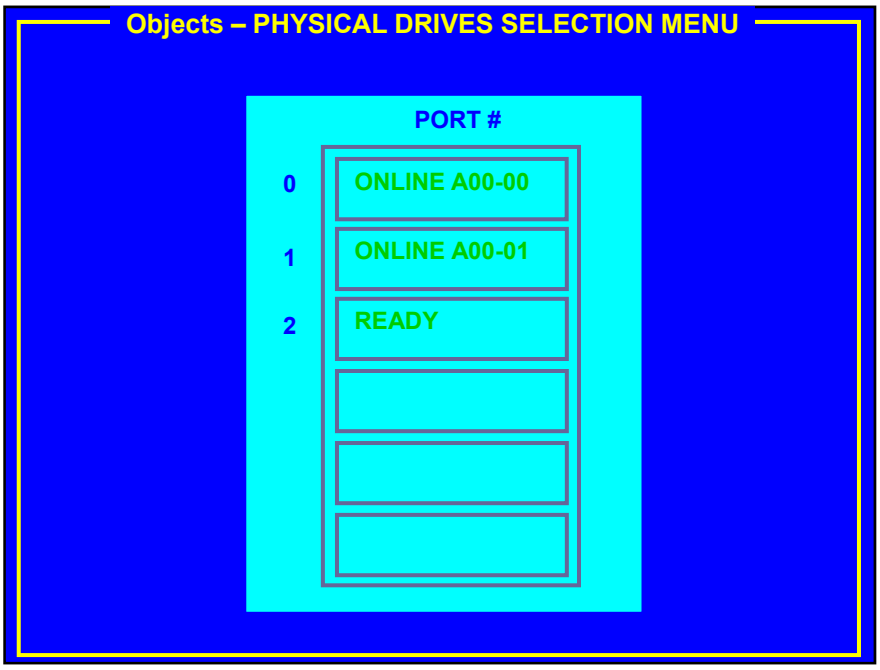
6. Select **Yes** to start the rebuild process.
   When the **Completed** indication in the **REBUILDING** screen indicates 100%, the rebuild process is completed.

7. Press the <Esc> key to return to the TOP menu and exit LSI Software RAID Configuration Utility.

5.3.3 Configure HotSpare

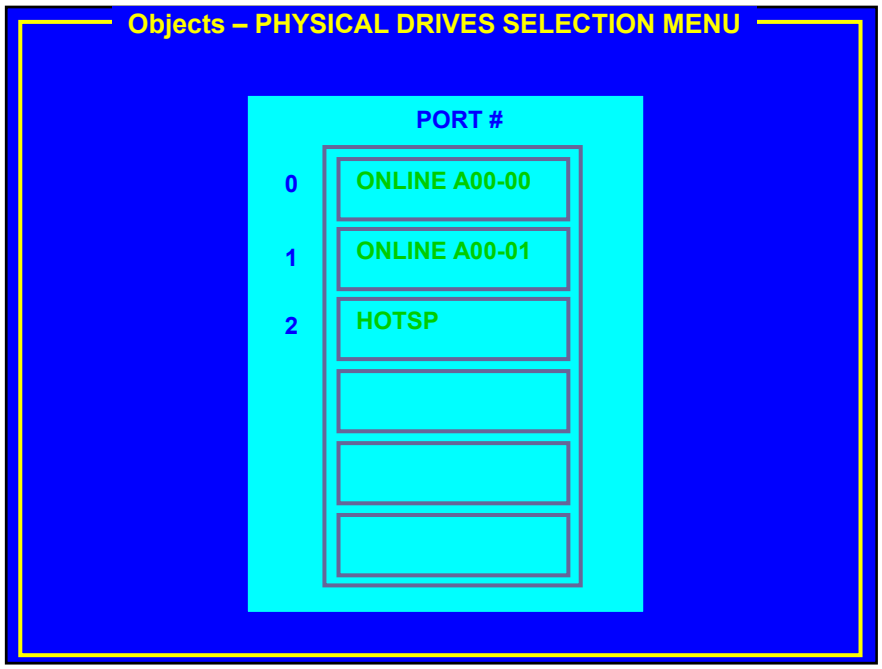


1. Connect a physical device for hot sparing, and then turn on the server.
2. Run LSI Software RAID Configuration Utility.
3. From the TOP menu, select **Objects**, and then **Physical Drive**.
4. The **Objects - PHYSICAL DRIVE SELECTION MENU** screen appears.



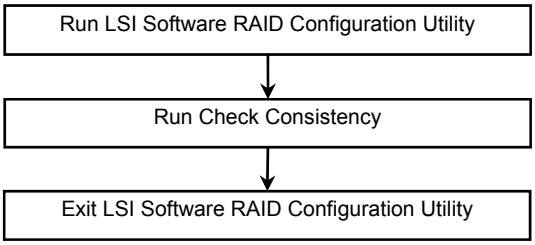
5. Move the cursor onto the physical device to be hot spared, and then press the <Enter> key.
6. Select **Make HotSpare**.
7. When you select **Yes**, the display for the physical device changes to “HOTSP”.

8. Press the <Esc> key to return to the TOP menu screen, and then exit LSI Software RAID Configuration Utility.



Note To cancel the hot spare setting, select **Objects** and then **Physical Drive**, move the cursor onto the physical device to be canceled for hot sparing, press the <Enter> key, and then select **Change Drv State**.

5.3.4 Check Consistency



Important **For RAID0, running Check Consistency is not required.**

1. Run LSI Software RAID Configuration Utility.
2. From the TOP menu, select **Check Consistency**.
3. The **Virtual Drives** screen appears.
4. Move the cursor onto the virtual drive to be checked for consistency, and press the <Space> key.
   The virtual drive is selected.
5. Press the <F10> key.
6. Select **Yes** to start consistency checking.
   When the **Completed** indication on the **CC Under Progress** screen indicates 100%, the consistency check is completed.
7. Press the <Esc> key to return to the TOP menu and exit LSI Software RAID Configuration Utility.

5.3.5 Others

(1) Clear Configuration

Use this feature to clear configuration information. From the TOP menu, select **Configure**, and then **Clear Configuration** to clear all configuration information.

If old configuration information for the physical device remains, configuration may fail. In this case, execute "Clear Configuration".

Note To remove a virtual drive, select **Objects** and then **Virtual Drive**, move the cursor onto the virtual drive to be removed, and then press the <Delete> key. Select **Yes** when the message “Want To Delete A VD?” is displayed

(2) Force Online

Use this feature to forcibly put a physical device in the FAIL status online.

From the TOP menu, select **Objects Physical Drive**, select the target physical device, and then select **Force Online**.

(3) Rebuild Rate

Use this feature to specify the rebuild rate.

From the TOP menu, select **Objects**, **Adapter**, and then **Rebuild Rate**.

The available value is between 0% and 100%. The default value (recommended) is 30%.

(4) Physical device information

Use this feature to display physical device information.

From the TOP menu, select **Objects**, **Physical Drive**, select the target physical device, and then **Drive Properties**.

5.4 Running LSI Software RAID Configuration Utility in the UEFI Mode

Use the BIOS Setup utility (SETUP) to start the LSI Software RAID Configuration Utility.

5.4.1 Running SETUP

Turn on the server and wait for POST proceed.

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

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

Press <CTRL + P> MEBX
```

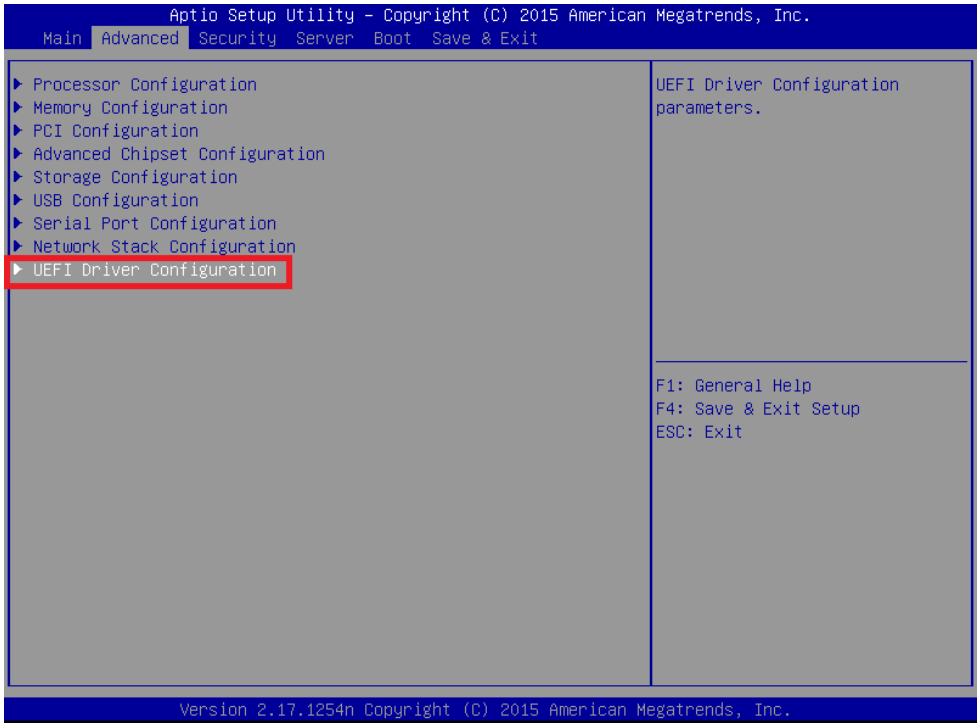
If you press the < F2> key, SETUP starts upon completion of POST, and the Main menu is displayed. (You can also start SETUP by pressing the < F2> key while expanding option ROM.)

Tips If you fail to press <F2> key, or the system proceeds without displaying the following screen, restart the system, and press <F2> keys on POST screen.

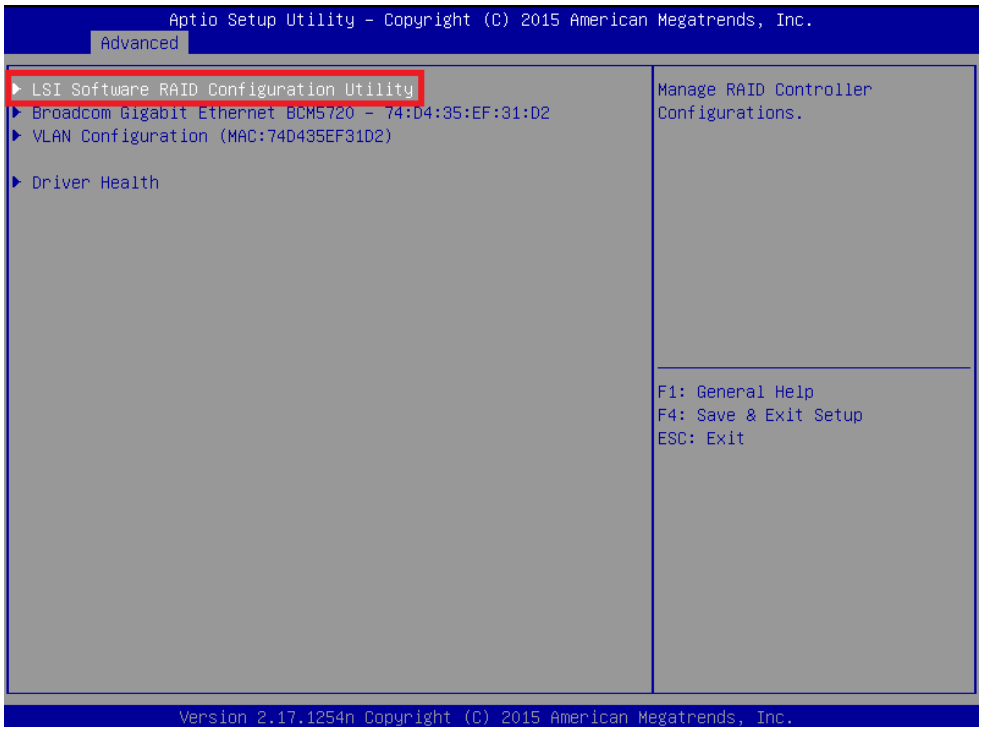
5.4.2 Advanced menu

The **Advanced** menu appears if you move the cursor to the position of **Advanced**.

If you select **UEFI Driver Configuration** and press the <Enter> key, the following submenu appears.

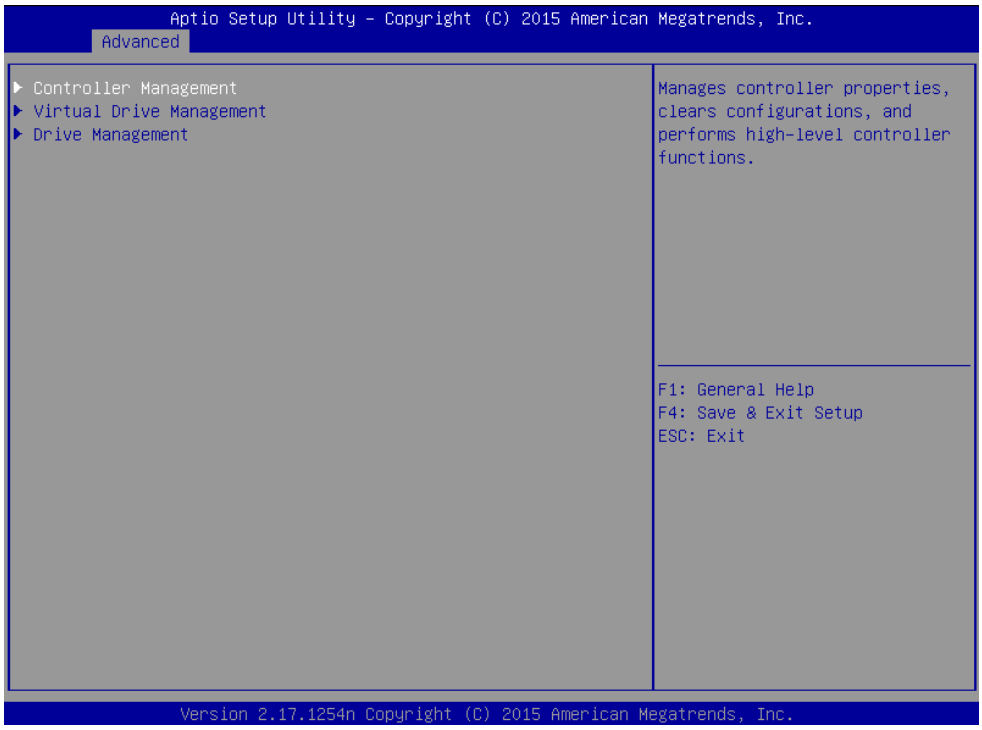


Select **LSI Software RAID Configuration Utility** and press the <Enter> key. The TOP menu of LSI Software RAID Configuration Utility appears.

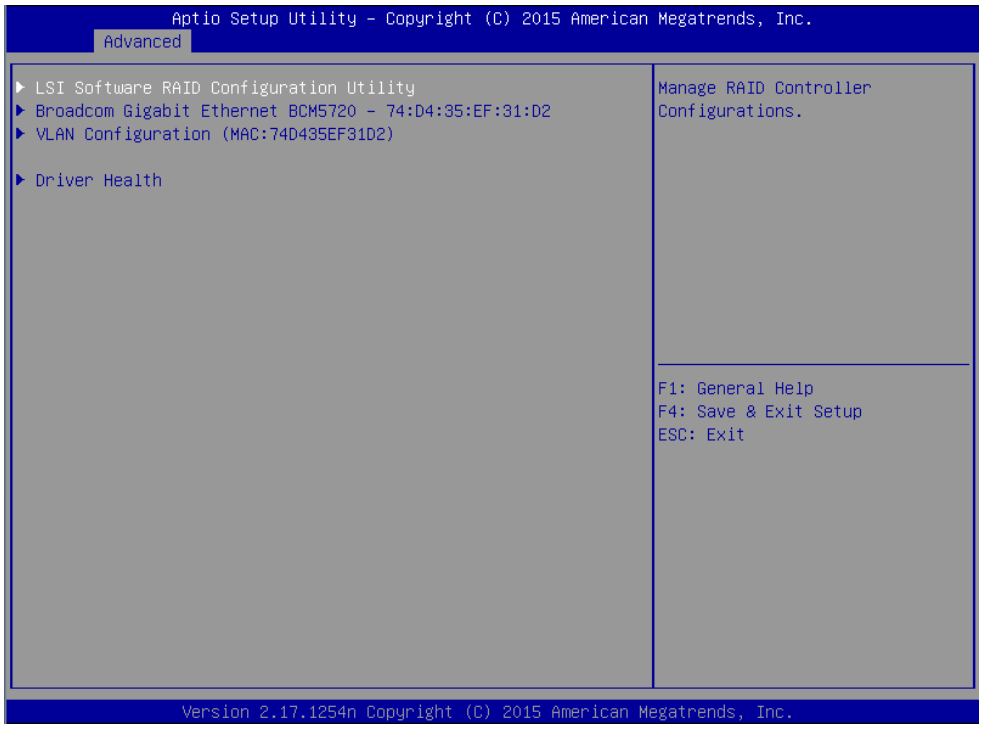


5.4.3 Quitting LSI Software RAID Configuration Utility

To quit the utility, press the <Esc> key on the TOP menu of LSI Software RAID Configuration Utility



When the following screen appears, the LSI Software RAID Configuration Utility is exited.



5.5 Menu Tree of UEFI Mode

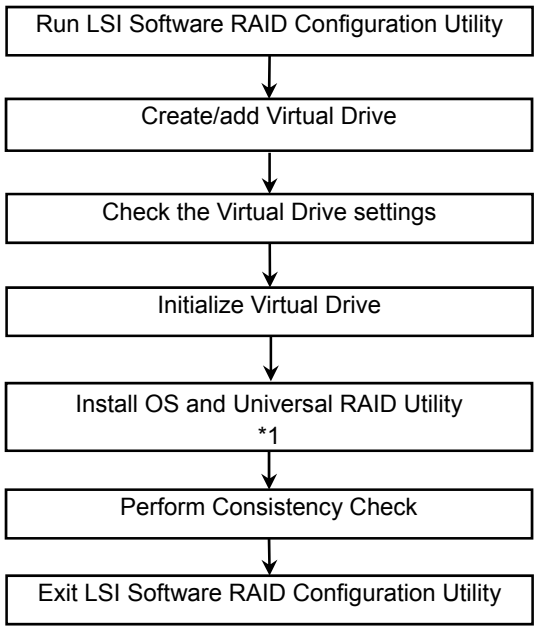
Menu	Value	Descriptions
Controller Management		
> View Controller Information		Display of the RAID controller information
Controller Marketing Name	LSI Embedded MegaRAID	Name of the RAID controller Display may differ due to the restrictions for the number of digit in the display depending on the workstation.
Serial Number	none	Serial number of the RAID controller
PCI ID	Workstation-dependent	PCI ID of the RAID controller
Host Interface	PCI-E	Host interface
Device Port Count	Workstation-dependent	Number of ports
PCI Slot Number	Integrated	PCI slot number of the RAID controller
Drive Count	Workstation-dependent	Number of Physical Drives
Virtual Drive Count		Number of Virtual Drives
Encryption Capable	No	Encryption setting
Minimum Stripe Size	64 KB	Minimum stripe size
Maximum Stripe Size	64 KB	Maximum stripe size
Driver Version		UEFI driver version
UEFI Driver TimeStamp		UEFI driver build version
> Change Controller Properties		Change of the parameter for the RAID controller
Apply Changes		Reflecting the change
Set Factory Defaults		Setting to the default value
Set Boot Device		Setting of the Virtual Drive to start up the OS
Rebuild Rate	30	Ratio of the Rebuild IO (30%)
Background Initialization (BGI) Rate	30	Ratio of the Background Initialize IO (30%)
Consistency Check Rate	30	Ratio of the consistency check IO (30%)
Disk Coercion	1 GB	Forcibly pack Physical Drives of different size
Disk WC	Disable	Cache setting of the Physical Drive The recommended setting is Enable
Read Ahead	Enable	Read Ahead setting
Auto Rebuild	Enable	Automatic Rebuild setting
Auto Resume	Enable	Setting whether or not to reboot the system automatically when it is rebooted during Initialize, Rebuild, or consistency check.
> Clear Configuration		Clearing the RAID Configuration
Virtual Drive Management		
> Create Configuration		Creating the RAID Configuration
Save Configuration		Storing the created configuration
Select RAID Level		Selecting the RAID level
Select Drives From		Selecting the Physical Drive creating the Virtual Drive
Select Drives		Selecting the Physical Drive creating the RAID

Menu	Value	Descriptions
Virtual Drive Name		Virtual Drive name
Virtual Drive Size		Virtual Drive size
Virtual Drive Size Unit		Unit of the Virtual Drive size
Stripe Size	64 KB	Stripe size
Disk WC	Disable	Cache setting of the Physical Drive The recommended setting is Enable
Read Ahead	Enable	Read Ahead setting
Disable Background Initialization	No	Background Initialize setting
> Manage Virtual Drive Properties		
Apply Changes		Reflecting the change
Select Virtual Drive		Virtual Drive selection
Virtual Drive Name		Virtual Drive name
Target ID		Virtual Drive ID
RAID Level		RAID level of the Virtual Drive
Virtual Drive Status	Optimal	Virtual Drive status
Virtual Drive Capacity (MB)		Virtual Drive size
Segment Size	64 KB	Stripe size
Disk WC	Disable	Cache setting of the Physical Drive The recommended setting is Enable.
Read Ahead	Enable	Read Ahead setting
View Associated Drives		Displaying the Physical Drive configuring the Virtual Drive
> Select Virtual Drive Operations		Virtual Drive operation
Select Virtual Drive		Virtual Drive selection
Start Locate	Device-dependent	Lights on (blink) the LED of the slot on which the selected Virtual Drive is mounted.
Stop Locate	Device-dependent	Lights off the LED of the slot on which mounts the selected Virtual Drive is mounted.
Delete Virtual Drive		Virtual Drive deletion
Virtual Drive Operation		Operations of the Virtual Drive
Stop Operation		Stopping the operations being executed in the Virtual Drive.
> View Drive Group Properties		Displays the area used by the members configured in the Virtual Drive.
Drive Management		
> View Drive Properties		Display of the property of the Physical Drive
Select Drive		Physical Drive selection
Drive ID		Physical Drive ID
State	Online	Physical Drive status
Coerced Size (MB)		Other Physical Drive size
Device Type		Physical Drive type
Connected Port		Port number
Media Errors		Media error count
Predicted Fail Count	0	Failure prediction count
Available Size (MB)		Available remained size

Menu	Value	Descriptions
Used Space (MB)		Size in use
Disk Protocol	SATA	Protocol
Negotiated Drive Transfer Speed		Transfer rate
Number of Connections	1	Number of connected Physical Drives
Associated Virtual Drive		The selected Physical Drive is a Virtual Drive of the member
Model Number		Physical Drive model
Revision		Physical Drive revision
> Select Drive Operations		Operations of the Physical Drives
Select Drive		Physical Drive selection
Start Locate	Device-dependent	Lights on (blink) the LED of the slot on which the selected Physical Drive is mounted.
Stop Locate	Device-dependent	Lights off the LED of the slot on which the selected Physical Drive is mounted.
Drive Operation		Operations executed in the Physical Drive
Operation Progress		Progress of the operations being executed in the Physical Drive.
Start Operation		Starting the operations to the Physical Drive
Stop Operation		Cancel of the operations being executed in the Physical Drive.
> View Global Hot Spare Drives	Device-dependent	Display of the Global Hot Spare Drive

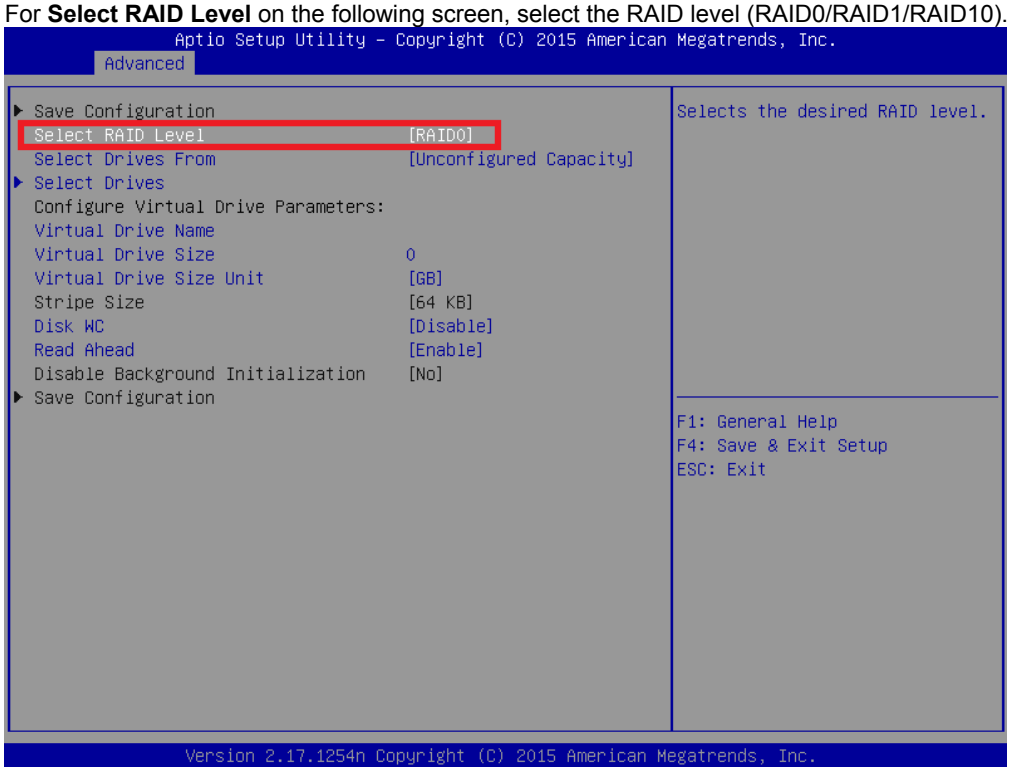
5.6 Operating Procedures for Configuration Utility in UEFI Mode

5.6.1 Create/Add Configuration



*1 This workflow is not required if there is an already-installed Virtual Drive.

1. Run LSI Software RAID Configuration Utility.
2. From the TOP menu screen, select **Virtual Drive Management**, and then **Create Configuration**.
3. For **Select RAID Level** on the following screen, select the RAID level (RAID0/RAID1/RAID10).



4. Create a virtual drive. The procedure for creating a new virtual drive is different from that for adding a virtual drive. Creating a new virtual drive is to create a virtual drive by using a new physical device. Adding a virtual drive is to create an additional virtual drive by using an unused area of the existing Drive Group.

   The procedures to create the virtual drive in each case are following below.

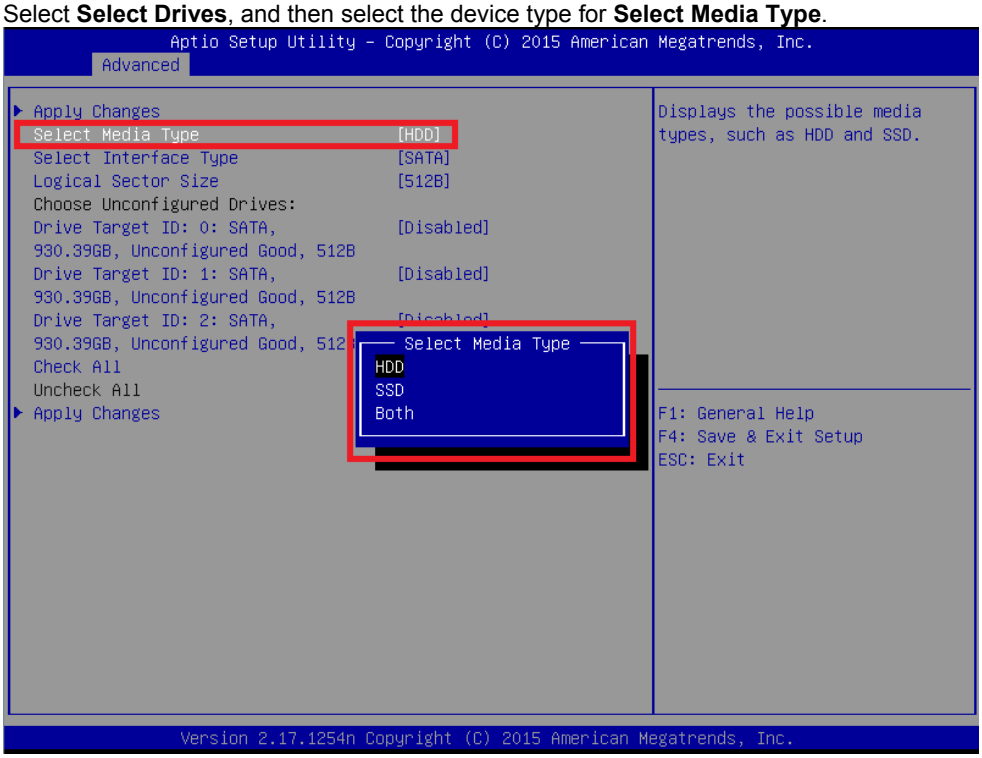
Note

- Up to eight virtual drives can be created.
- For RAID10, only creating a new virtual drive is available.
- For RAID10, the virtual drive is configured with the maximum capacity. You cannot specify the capacity.

4-1. New creation (RAID0/1)

1) On the screen shown in step 3, select “Unconfigured Capacity” of **Select Drives From**.

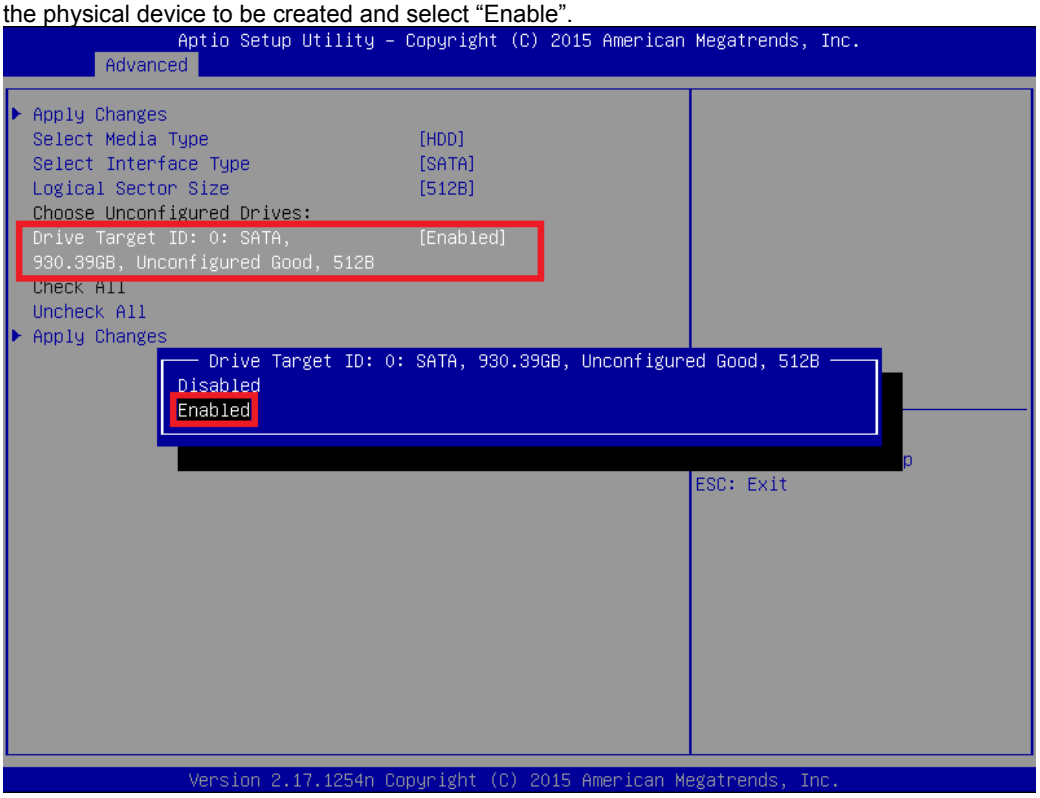
2) Select **Select Drives**, and then select the device type for **Select Media Type**.



Note

- Do not select **Both**. This platform does not support **Both** of Media Type.
- The options for **Select Media Type** vary depending on the connected device.

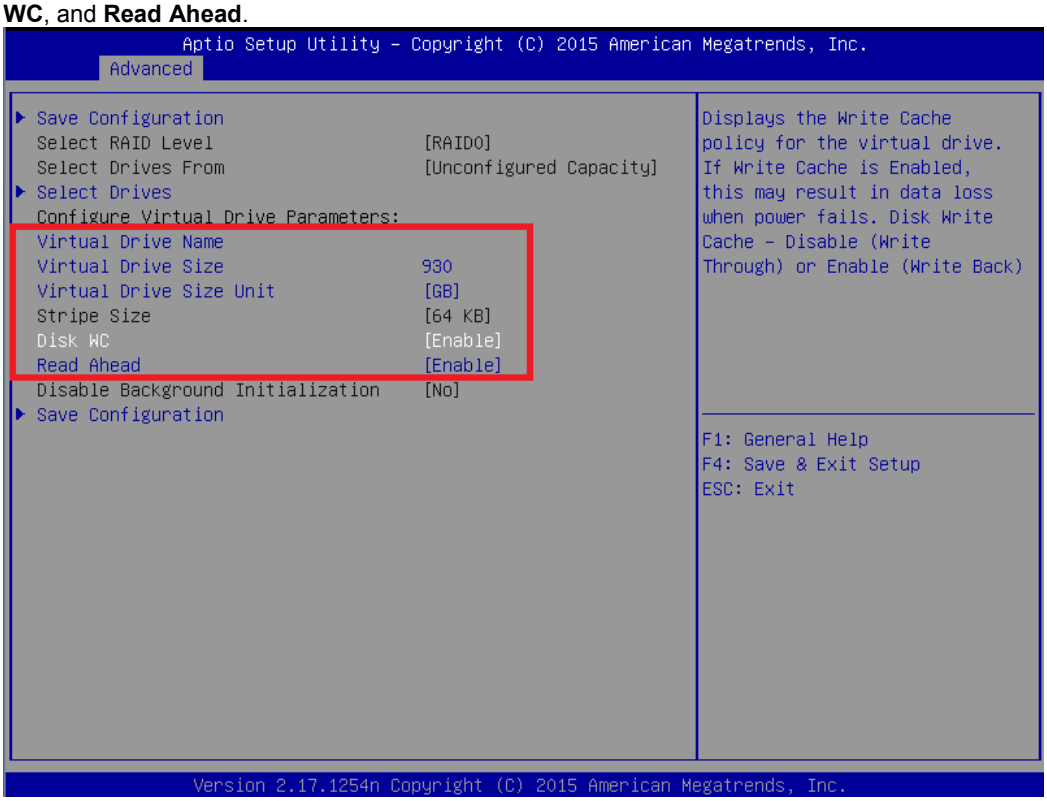
3) When the selected physical device type selected is displayed on the following screen, select the physical device to be created and select “Enable”.



4) Select all of the physical devices to be created, select **Apply Changes,** and then select **OK** on the next screen.

Note You may select either of the upper or lower **Apply Changes** which is provided at two locations.

5) Specify values for **Virtual Drive Name**, **Virtual Drive Size**, **Virtual Drive Size Unit**, **Disk WC**, and **Read Ahead**.



5-1. **Virtual Drive Name**: Specify the name of the virtual drive. (Optional).

5-2. **Virtual Drive Size**: specifies the capacity of the virtual drive.

5-3. **Virtual Drive Size Unit:** Specify the unit (MB/GB/TB) used for **Virtual Drive Size**.

5-4. **Disk WC**: Specify the Disk Write Cache policy.

Parameter	Remarks
Enable*	Write back
Disable	Write through

* Recommended

*For this server, Setting “Enable” is recommended for good performance. Note, however, that cached data may be lost at an unexpected power failure.
Selecting “Disable” degrades performance by approximately 50%, comparing with the “Enable” setting.

5-5. **Read Ahead**: Specify the Read Ahead setting.

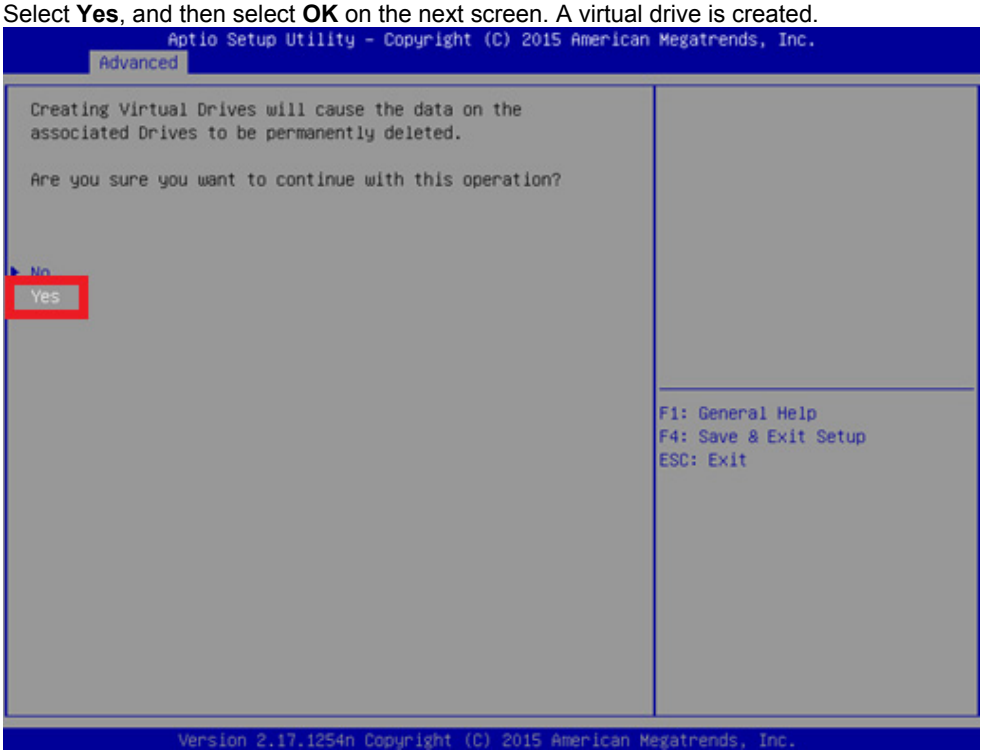
Parameter	Remarks
Disable	Does not perform read ahead.
Enable*	Performs read ahead.

* Recommended

6) When all the settings are completed, select **Save Configuration**.

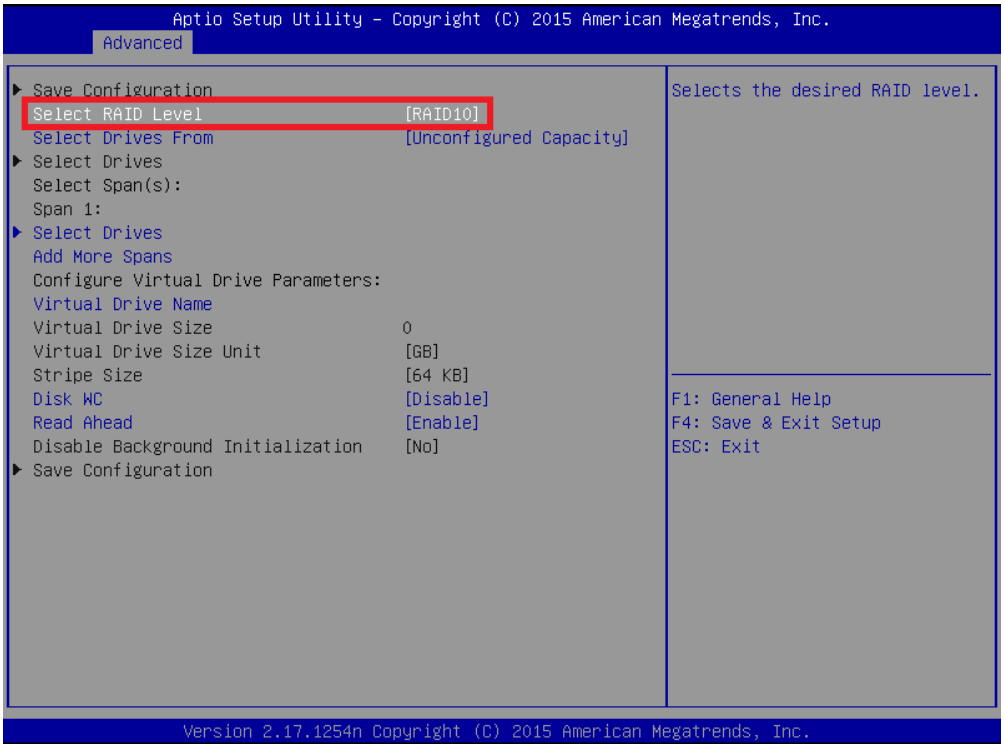
Note You may select either of the upper or lower **Save Configuration** which is provided at two locations.

7) Select **Yes**, and then select **OK** on the next screen. A virtual drive is created.

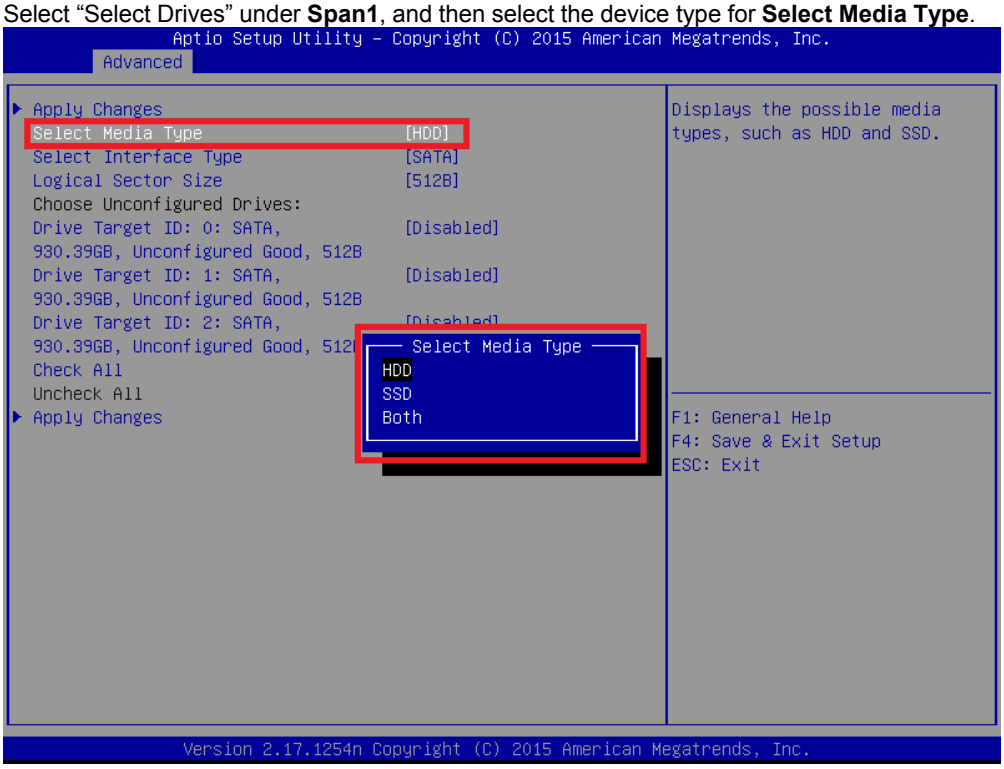


4-2. New creation (RAID10)

Select “RAID10” for **Select RAID Level**.



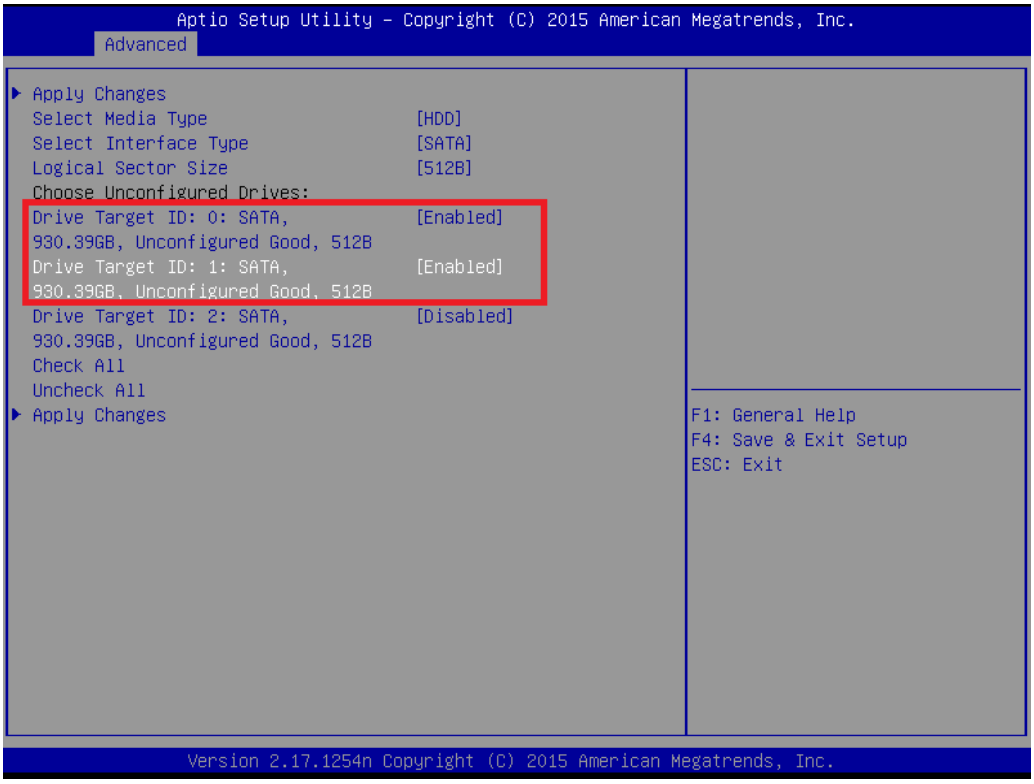
1) Select “Select Drives” under **Span1**, and then select the device type for **Select Media Type**.



Note

- The **Both** option is not available.
- The options for **Select Media Type** vary depending on the connected device.

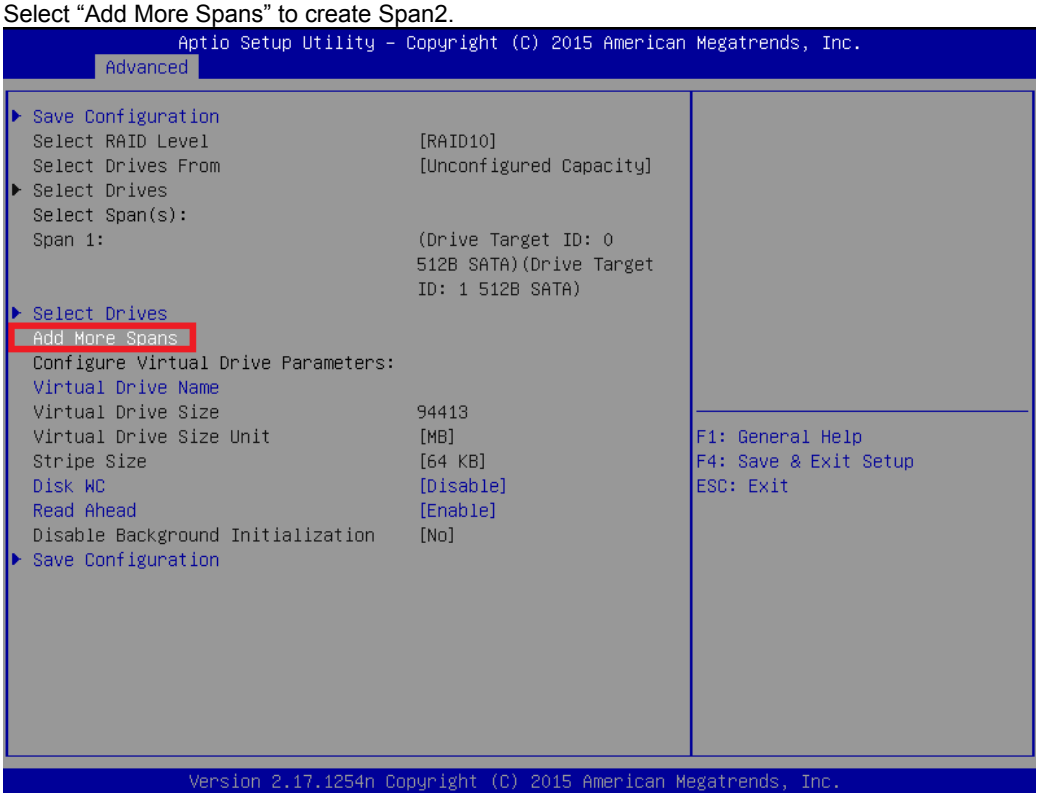
2) When the selected physical device is displayed, select two physical devices to be created, and then select “Enabled”.



3) Select all of the physical devices to be created, select **Apply Changes**, and then select **OK** on the next screen.

Note You may select either of the upper or lower **Apply Changes** which is provided at two locations.

4) Select “Add More Spans” to create Span2.



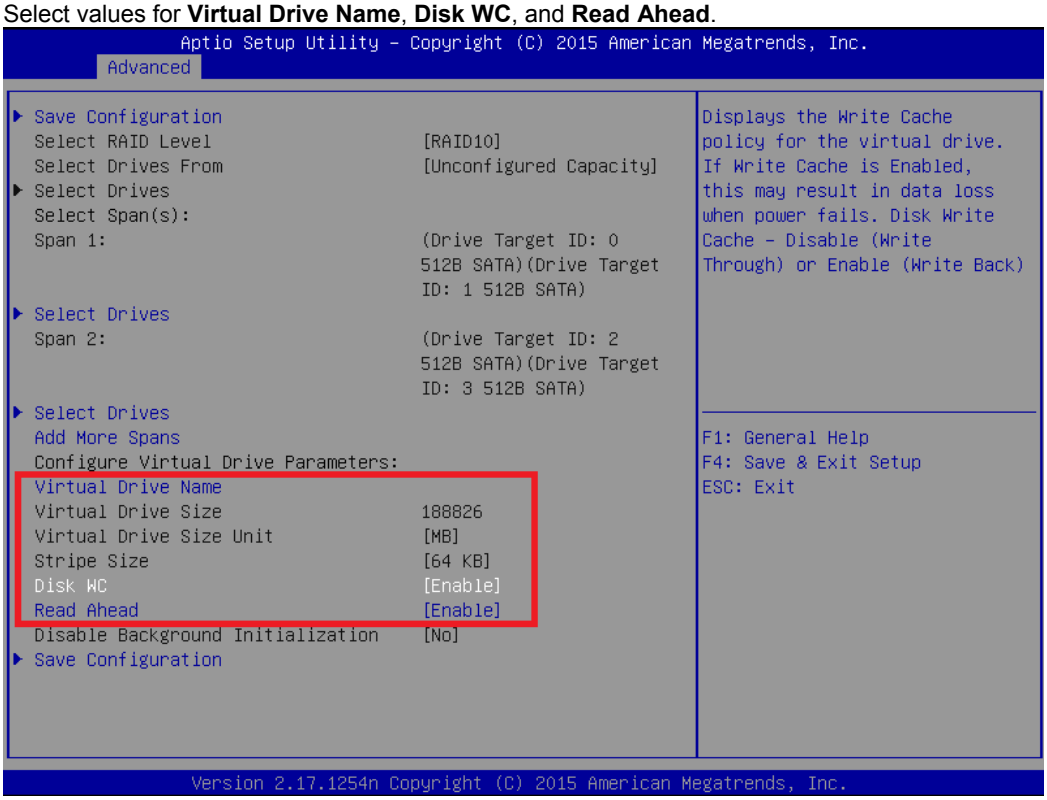
5) Select **Select Drives** under **Span2**, and then select the device type for **Select Media Type**.

6) When the selected physical device is displayed, select two physical devices to be created, and then select “Enabled”.

7) Select all of the physical devices to be created, select **Apply Changes**, and then select **OK** on the next screen.

Note You may select either of the upper or lower **Apply Changes** which is provided at two locations.

8) Select values for **Virtual Drive Name**, **Disk WC**, and **Read Ahead**.



8-1. **Virtual Drive Name**: Specify the name of the virtual drive. (Optional)

8-2. **Disk WC**: Specify the Disk Write Cache policy.

Parameter	Remarks
Enable*	Wright back
Disable	Write through

* Recommended

* For this server, Setting “Enable” is recommended for good performance. Note, however, that cached data may be lost at an unexpected power failure. Selecting “Disable” degrades performance by approximately 50%, comparing with the “Enable” setting.

8-3. **Read Ahead**: Specify the Read Ahead setting.

Parameter	Remarks
Disable	Does not perform read ahead.
Enable*	Performs read ahead.

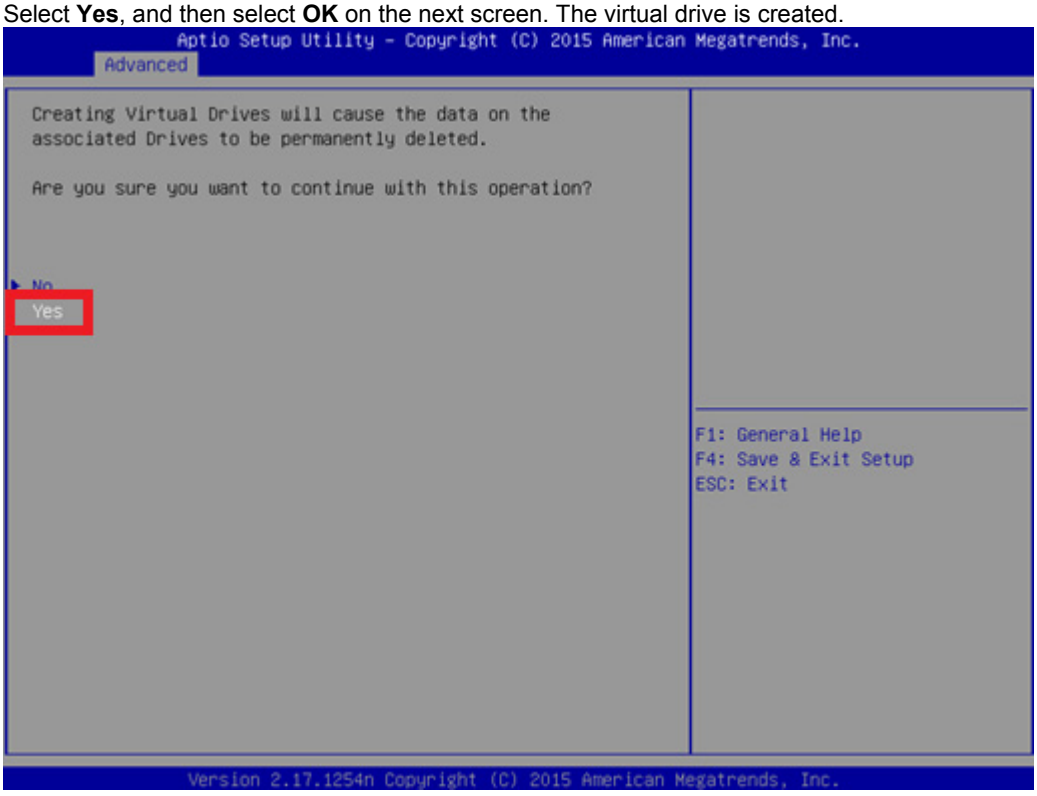
* Recommended

Note For RAID 10, the virtual drive can be created only with the maximum size.

9) When all of the settings are complete, select **Save Configuration**.

Note You may select either of the upper or lower **Save Configuration** which is provided at two locations.

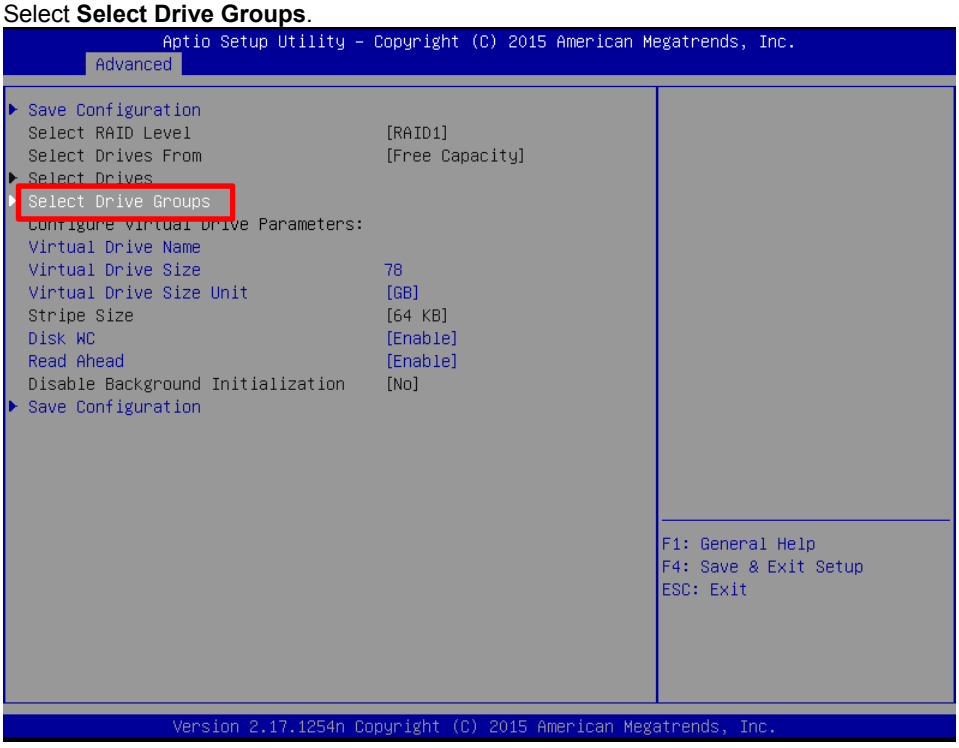
10) Select **Yes**, and then select **OK** on the next screen. The virtual drive is created.



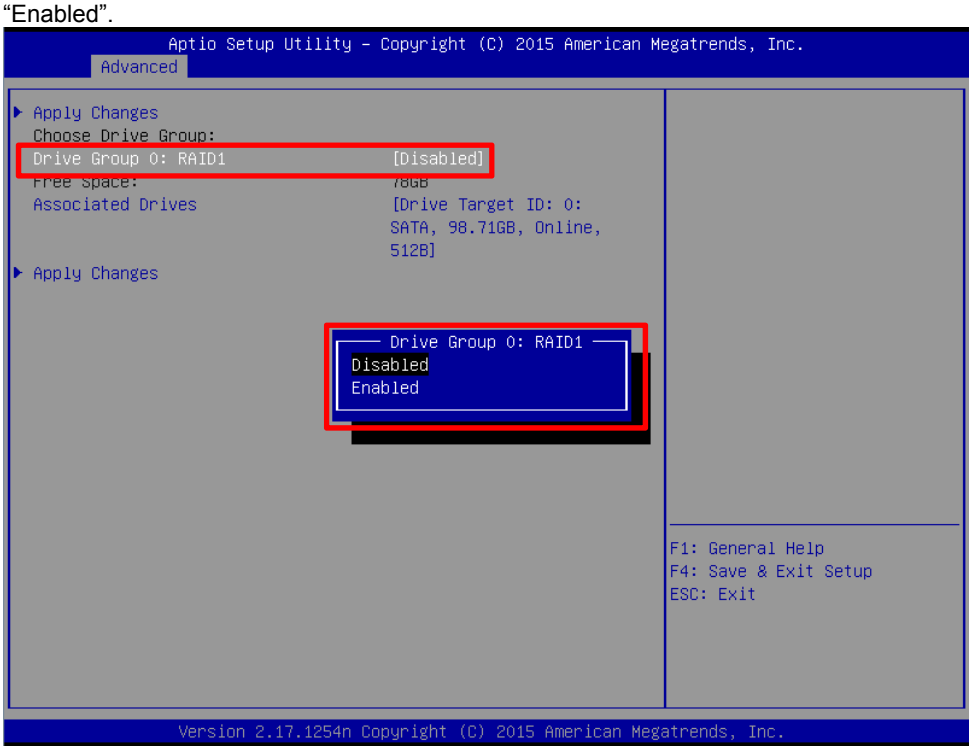
4-3. Additional creation

1) Select “Free Capacity” of **Select Drives From**.

2) Select **Select Drive Groups**.



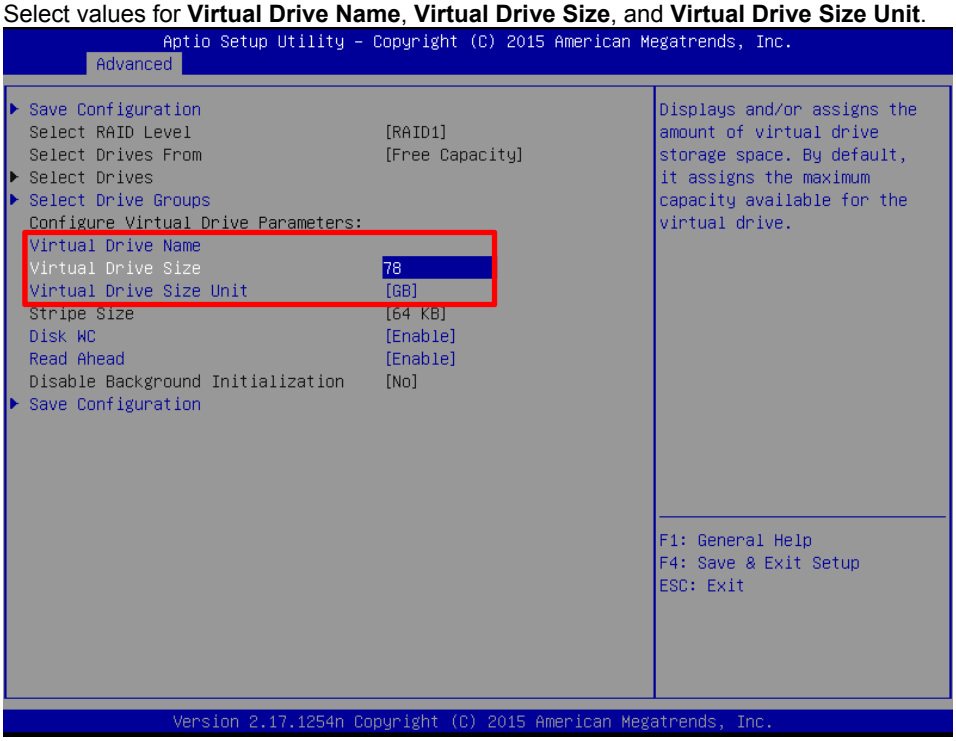
3) Select the Drive Group to be additionally created from **Choose Drive Group**, and set to “Enabled”.



4) Select **Apply Changes**, and then **OK** on the next screen.

Note You may select either of the upper or lower **Apply Changes** which is provided at two locations.

5) Select values for **Virtual Drive Name**, **Virtual Drive Size**, and **Virtual Drive Size Unit**.



5-1. **Virtual Drive Name**: Specify the name of the virtual drive. (Optional).

5-2. **Virtual Drive Size**: Specify the capacity of the virtual drive.

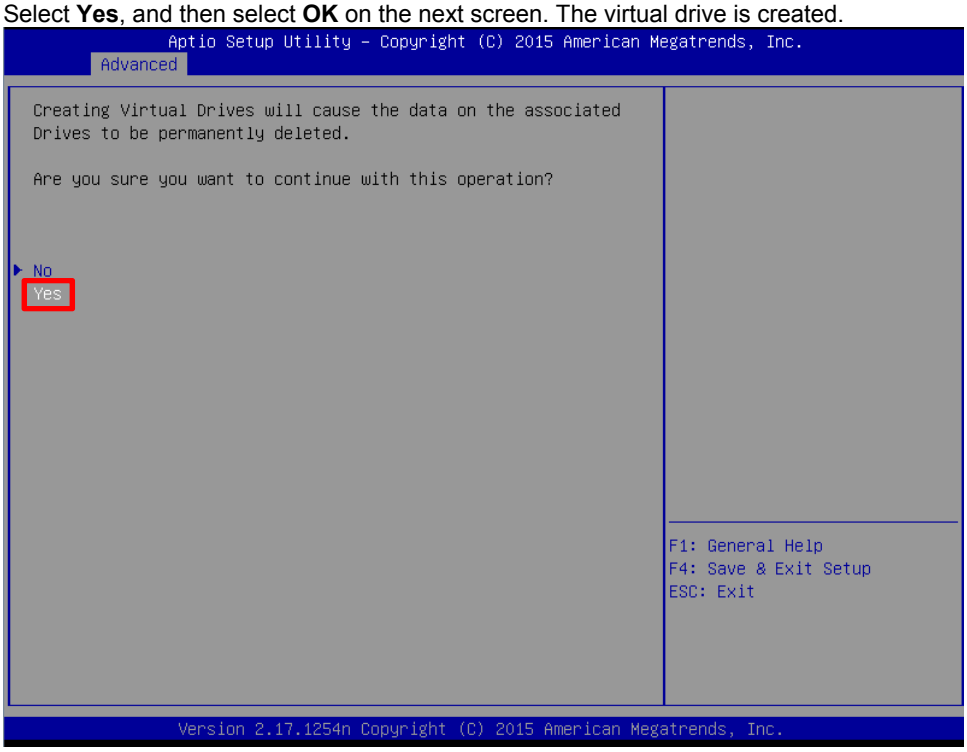
5-3. **Virtual Drive Size Unit**: Specify the unit (MB/GB/TB) used for **Virtual Drive Size**.

Important **The Disk WC and Read Ahead settings reflect the original Drive Group setting. If you change these settings, the original Drive Group setting is also changed.**

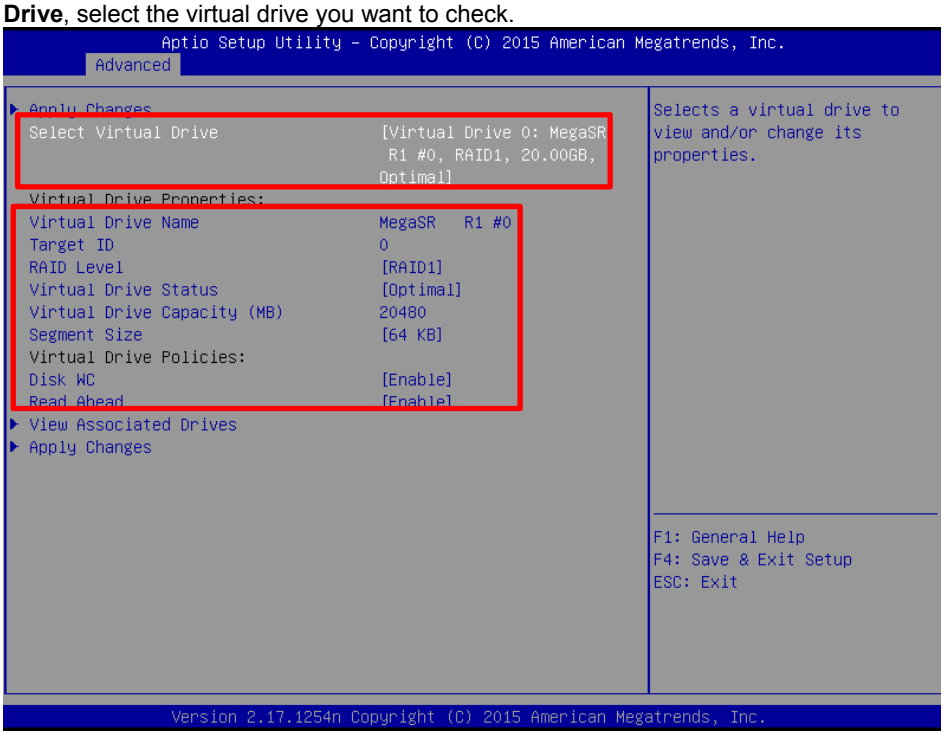
6) When all the settings are completed, select **Save Configuration**.

Note You may select either of the upper or lower **Save Configuration** which is provided at two locations.

7) Select **Yes**, and then select **OK** on the next screen. The virtual drive is created.

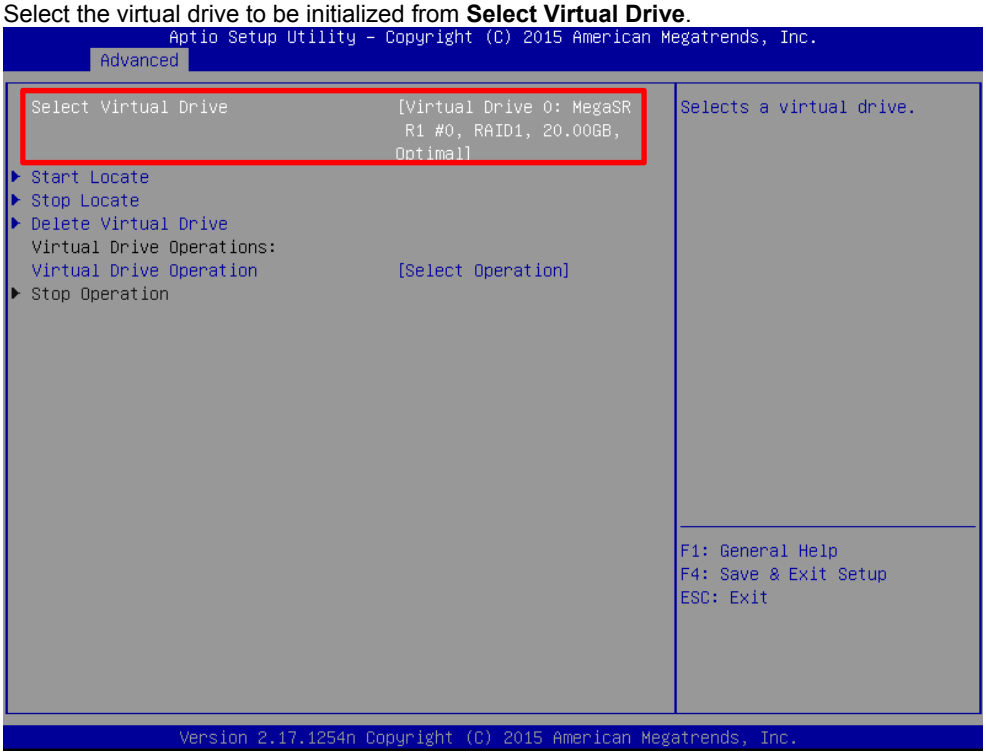


5. Select **Virtual Drive Management** and then **Manage Virtual Drive Properties** and check the virtual drive information on the following screen. When multiple virtual drives are created, for **Select Virtual Drive**, select the virtual drive you want to check.



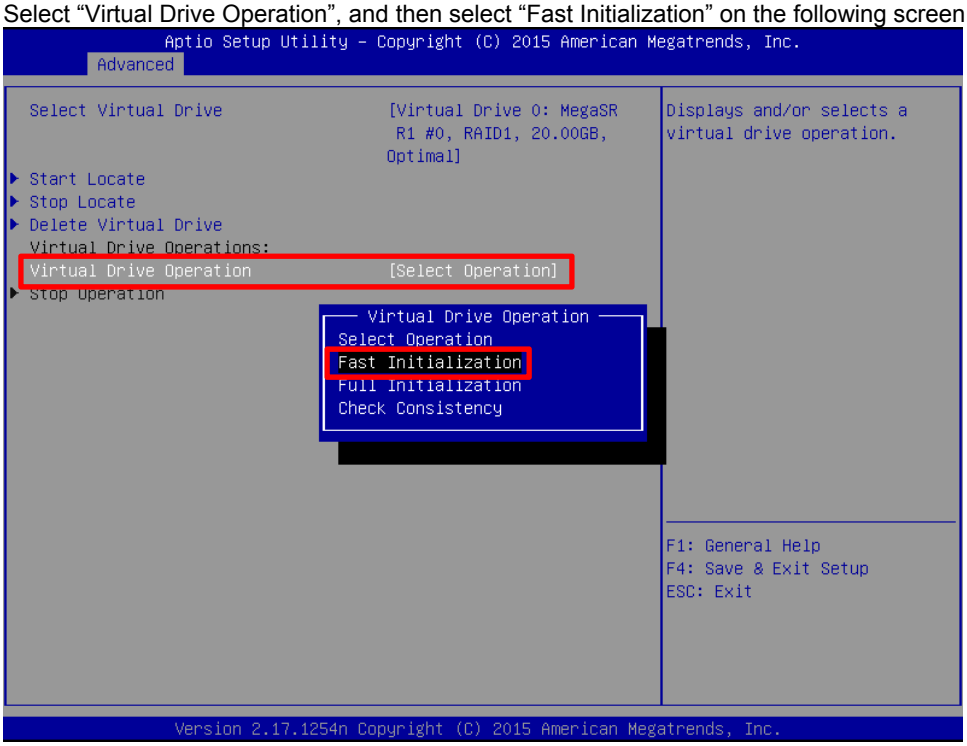
6. Press the <Esc> key to return to the previous screen, and select **Select Virtual Drive Operations**.

7. Select the virtual drive to be initialized from **Select Virtual Drive**.



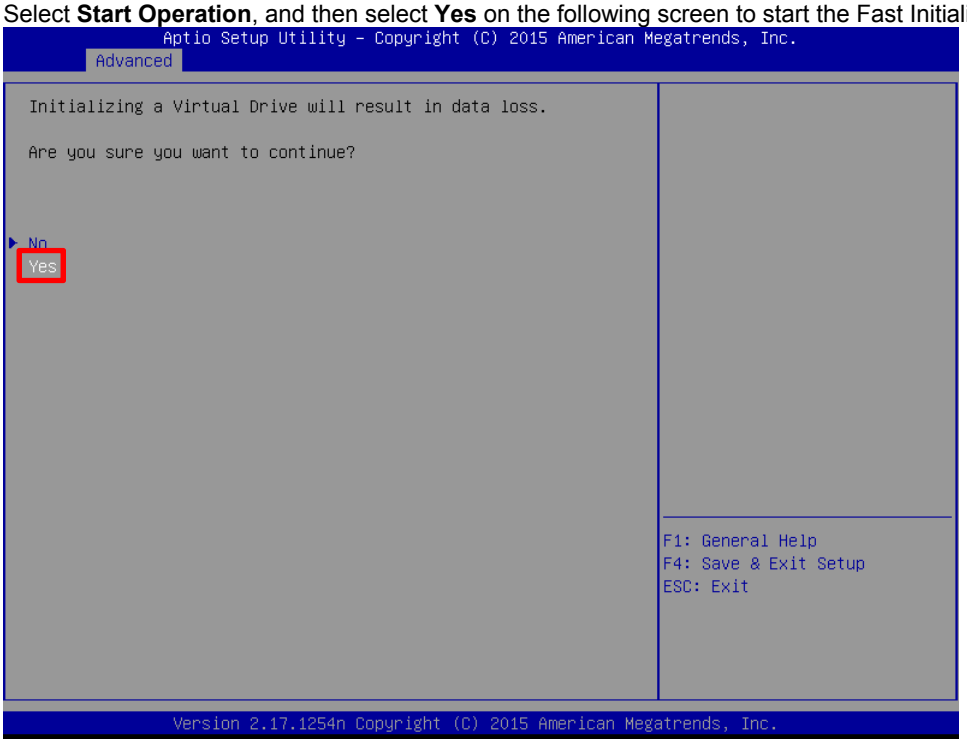
Important **Data is lost after initialization. Take extreme care to select the correct Virtual Drive.**

8. Select “Virtual Drive Operation”, and then select “Fast Initialization” on the following screen.



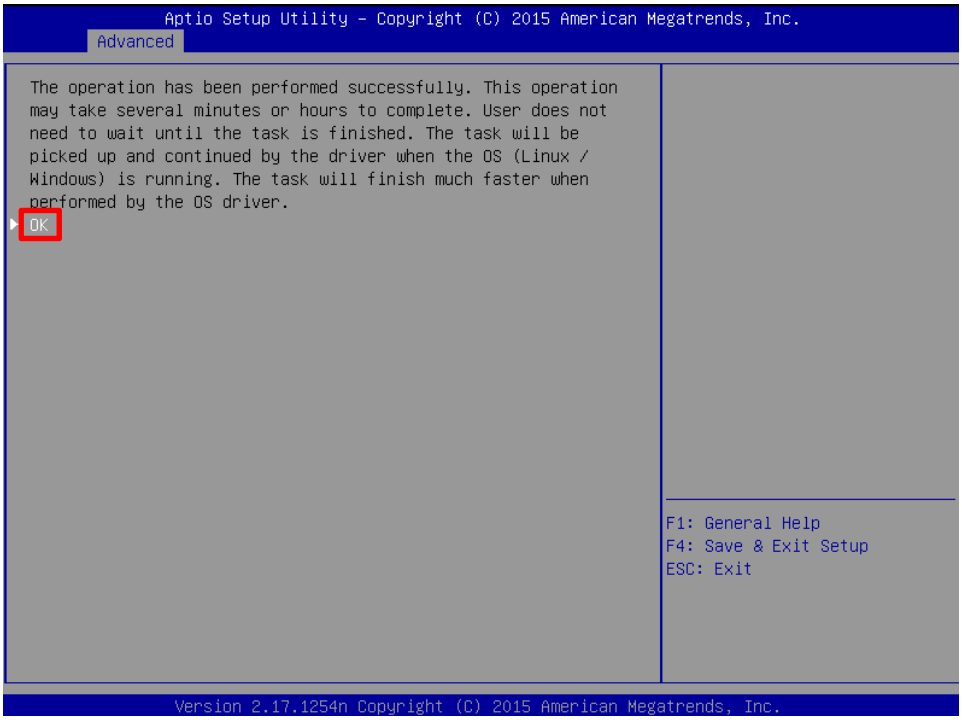
Important **In the UEFI mode, Full Initialization on the LSI Software RAID Configuration Utility takes so long time, so do not select it.**

9. Select **Start Operation**, and then select **Yes** on the following screen to start the Fast Initialization.



Note Fast Initialization completes in a few seconds or several tens of seconds.

10. Select **OK**.



11. Install the OS. You don't need to install the OS if the created virtual drive is not for booting the OS. After the OS is installed, install Universal RAID Utility. For more information about how to install, refer to the User's Guide that comes with this server.

12. For RAID1/RAID10 boot up the OS and run Check Consistency. For more information about how to run Check Consistency, refer to User's Guide for the Universal RAID Utility.

Important

- **In the UEFI mode, the Check consistency on the LSI Software RAID Configuration Utility takes so long time. Run the Check consistency from the Universal RAID Utility on the OS.**
- **Inconsistency may be detected at the first time of the consistency check, but, there is no problem.**

Note

For RAID0, running Check Consistency is not required.

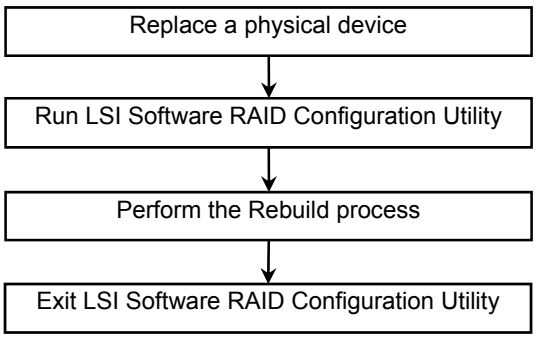
13. Pressing the <Esc> key to return to the TOP menu and exit the utilities.

5.6.2 Manual Rebuild

Tips By default, Rebuild starts automatically after you replace the physical device.

Important **In the UEFI Mode, Rebuild on the LSI Software RAID Configuration Utility takes long time. Run Rebuild from the Universal RAID Utility on the OS.**

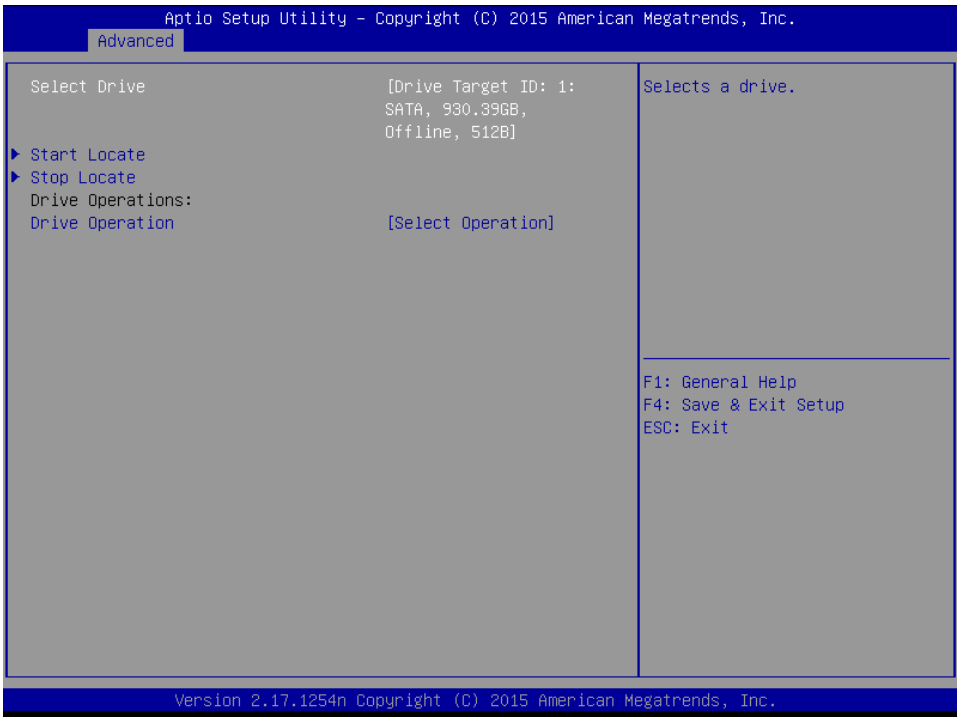
If you need to run Rebuild on the LSI Software RAID Configuration Utility, follow the procedure below.



1. Replace a physical device, and then restart the server.

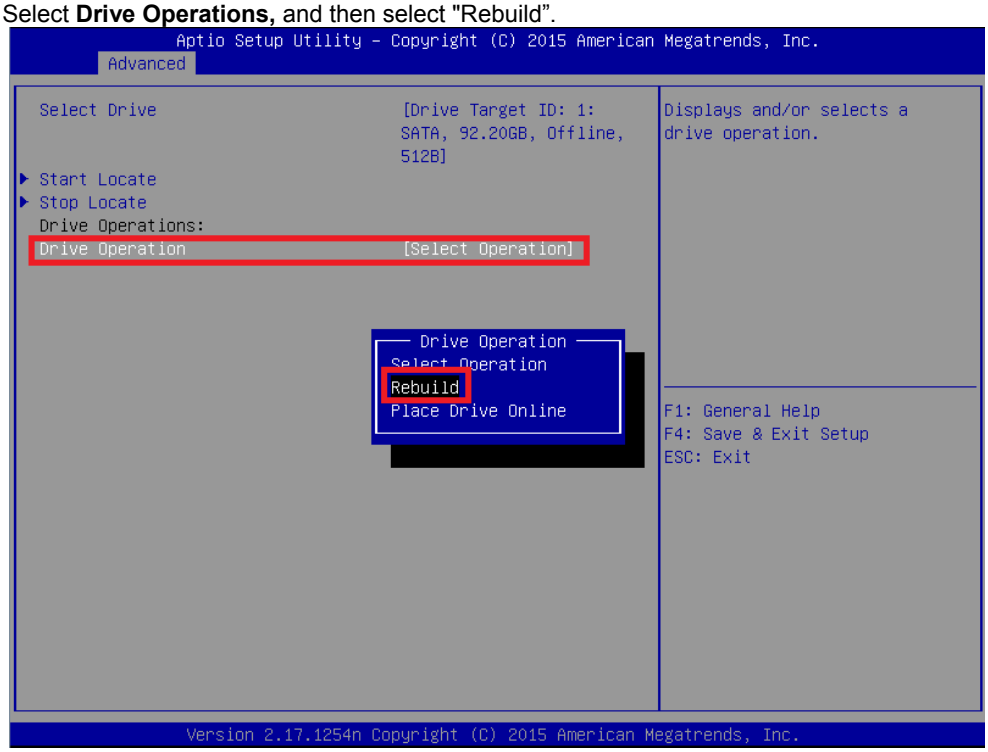
2. Run LSI Software RAID Configuration Utility.

3. From the TOP menu, select **Drive Management**, and then **Select Drive Operations.**
The following screen appears.



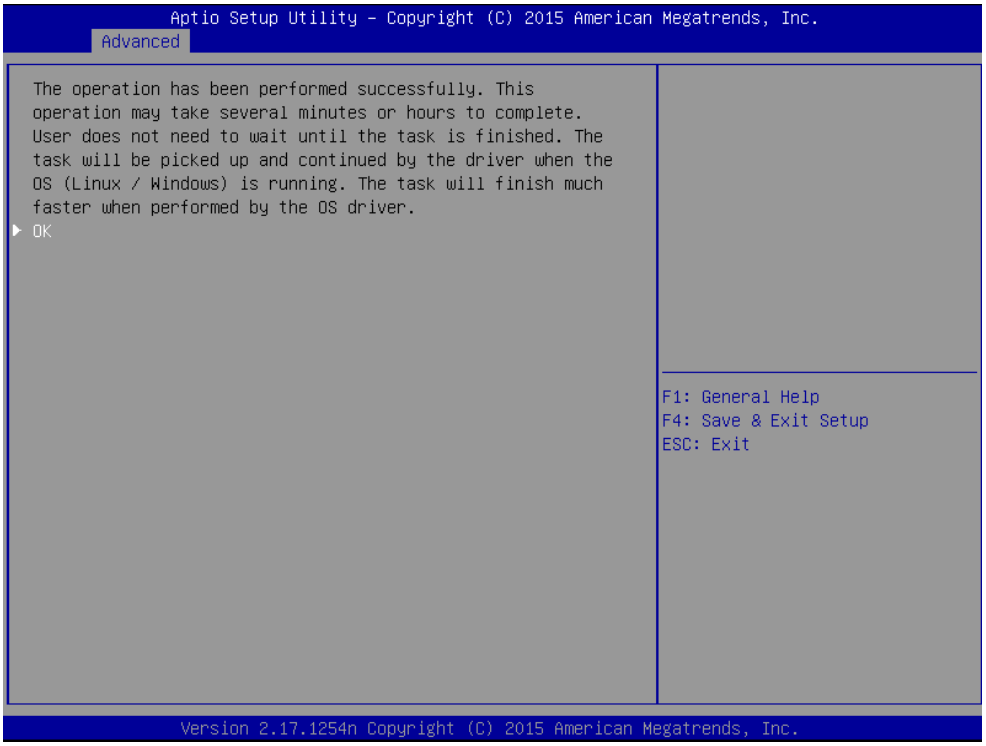
4. Confirm that the target physical device is displayed for **Select Drive**.

5. Select **Drive Operations,** and then select "Rebuild".



6. Select **Start Operation**

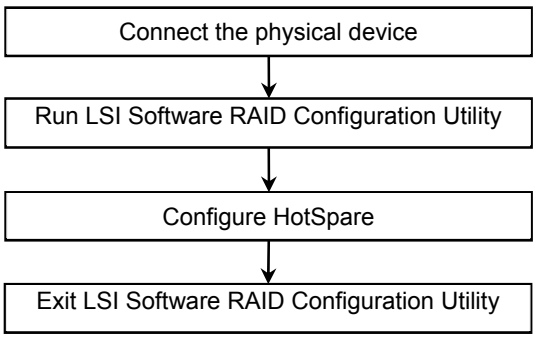
7. Select **OK** to start the rebuild.



Note The status of Operation Progress is not automatically updated. If you want to update the progress status, press the <Esc> key to return previous screen and then select **Select Virtual Drive Operations** again.

8. Exit LSI Software RAID Configuration Utility.

5.6.3 Configure HotSpare

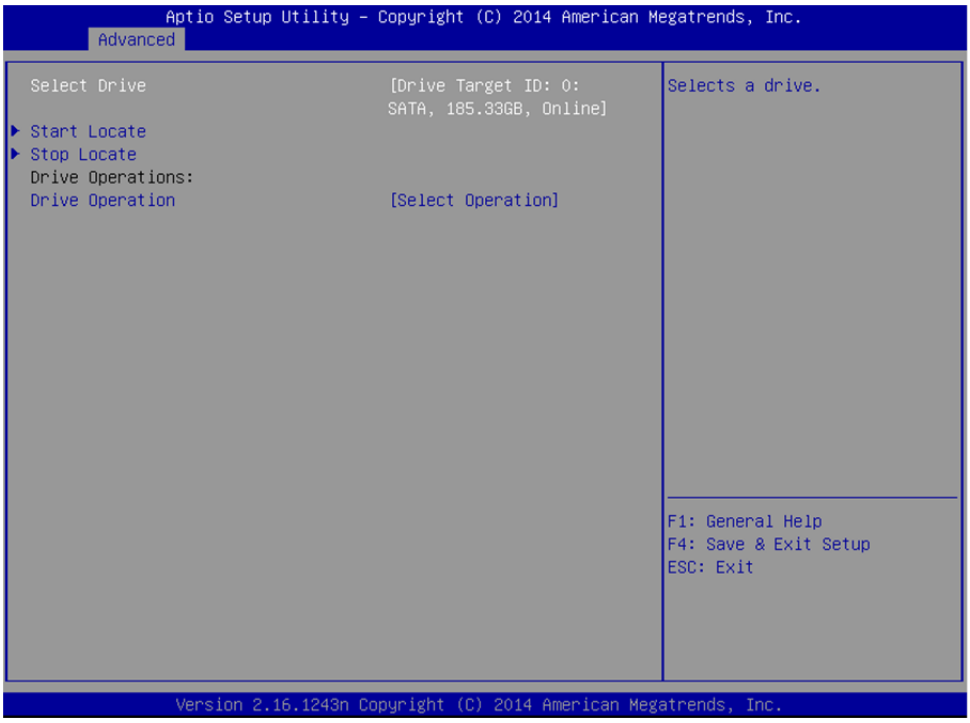


1. Connect a physical device for hot sparing, and then turn on the server.

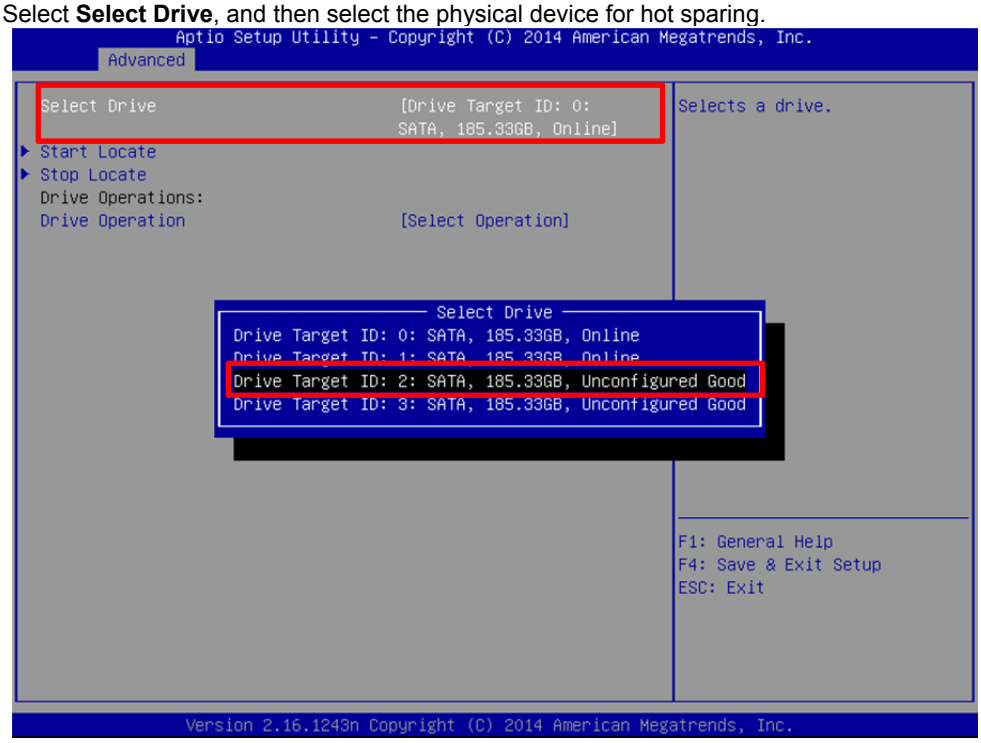
2. Run LSI Software RAID Configuration Utility.

3. On the TOP menu screen, select **Drive Management**.

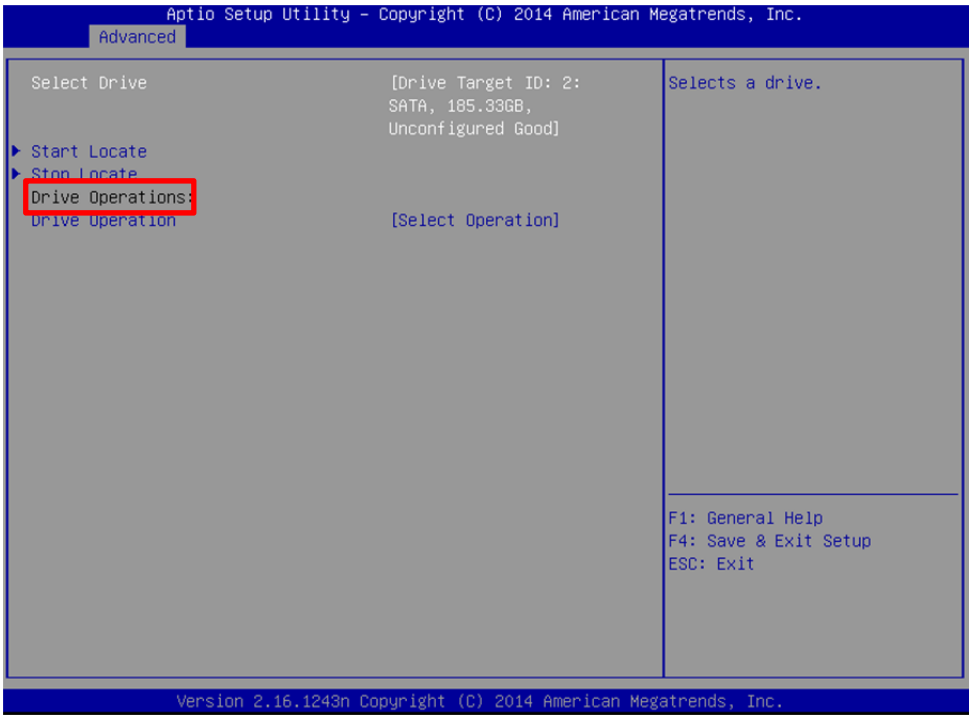
4. The following screen appears.



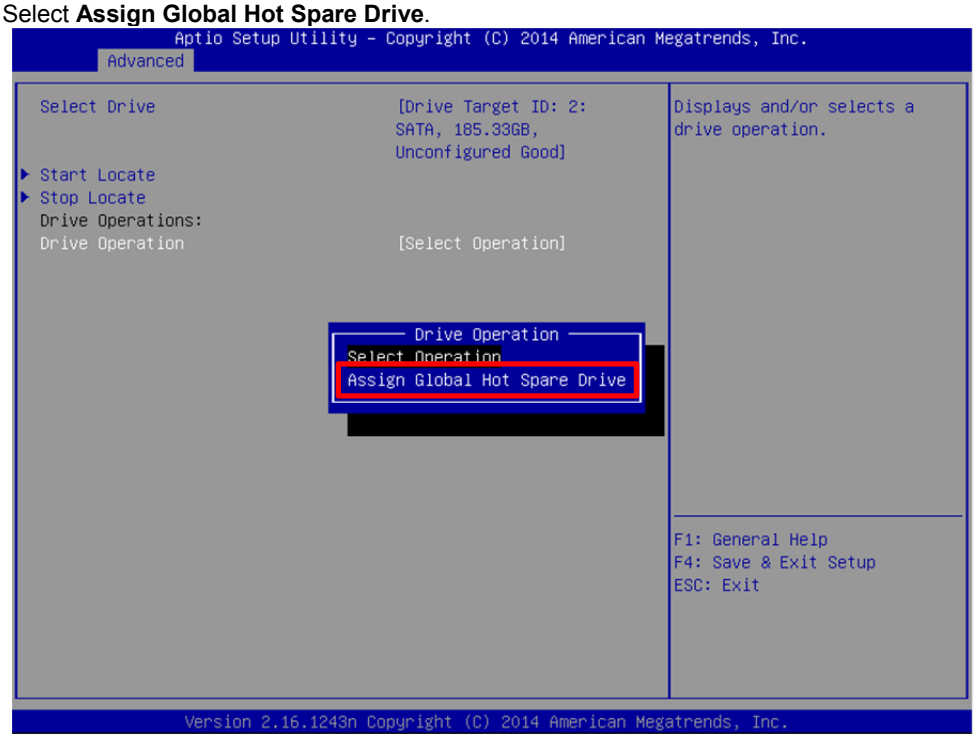
5. Select **Select Drive**, and then select the physical device for hot sparing.



6. Select **Drive Operation**.



7. Select **Assign Global Hot Spare Drive**.



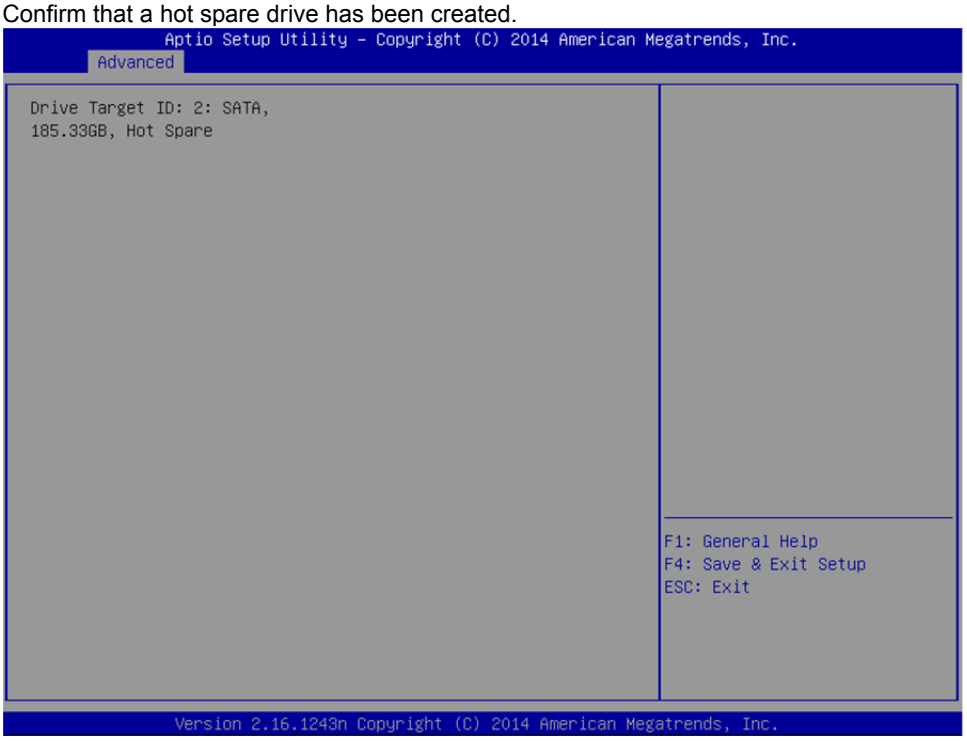
8. Select **Start Operation**, and then select **OK**.

9. Return to the TOP menu screen.

10. Select **Drive Management**.

11. Select **View Global Hot Spare**.

12. Confirm that a hot spare drive has been created.



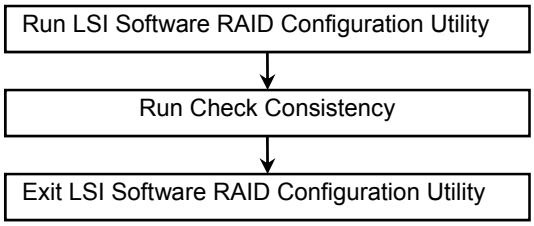
13. Exit LSI Software RAID Configuration Utility.

Note To cancel the HotSpare setting, select **Drive Management**, Select **Drive Operations**, and then select “Unassign Hot Spare Drive”.

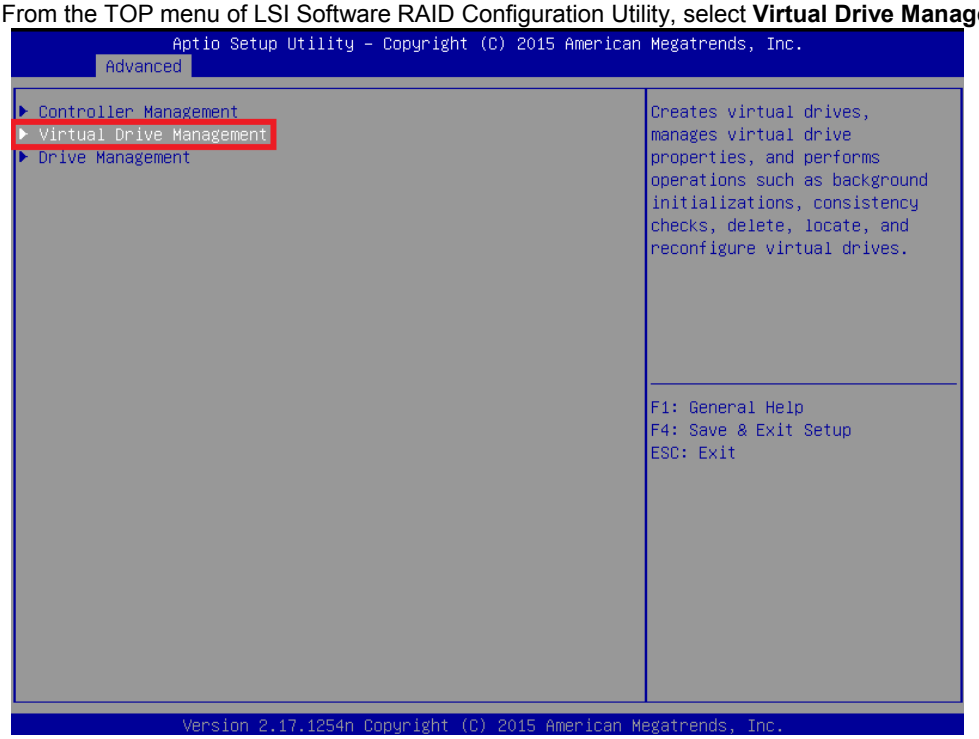
5.6.4 Check Consistency

Important

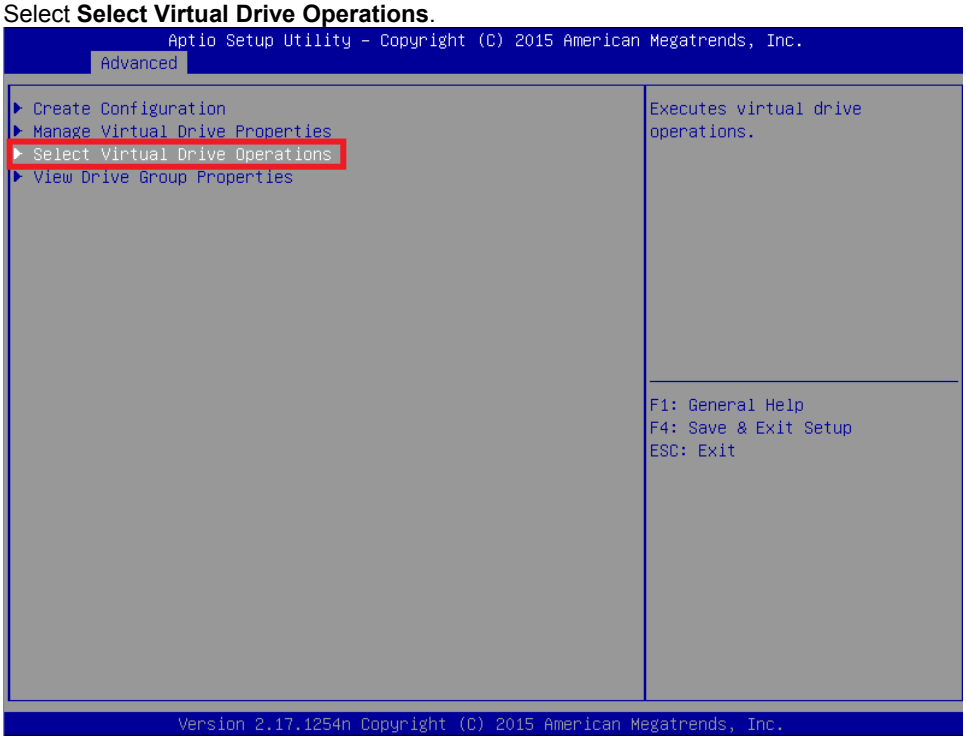
- **In the UEFI Mode, the Check consistency on the LSI Software RAID Configuration Utility takes so long time. Run the Check consistency from the Universal RAID Utility on the OS.**
- **For RAID0, running Check Consistency is not required.**



1. From the TOP menu of LSI Software RAID Configuration Utility, select **Virtual Drive Management**.

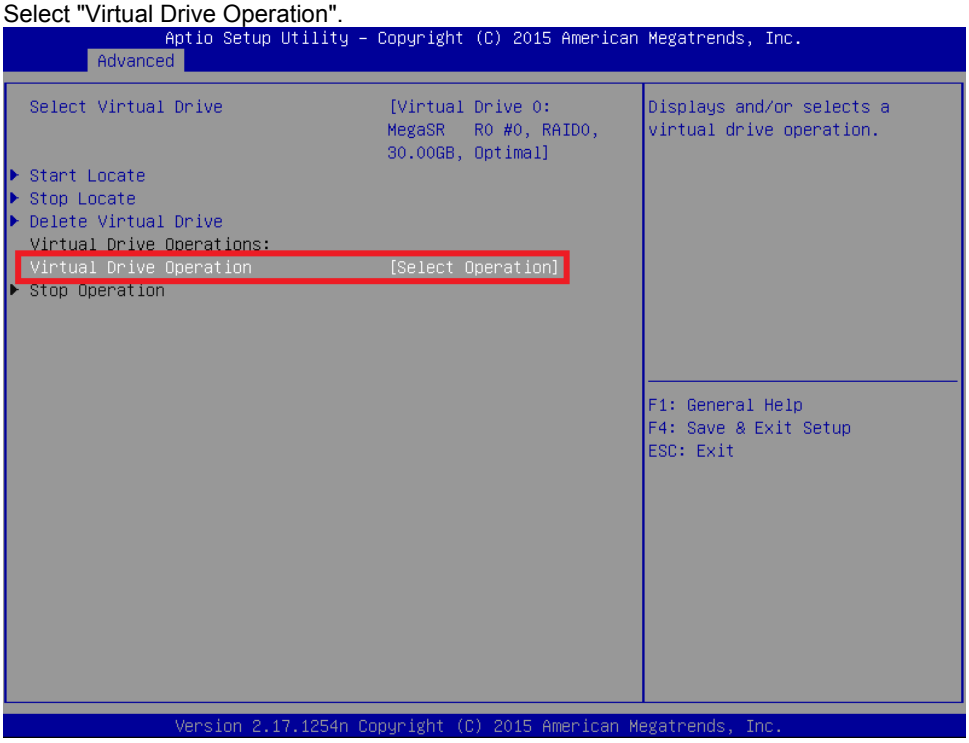


2. Select **Select Virtual Drive Operations**.

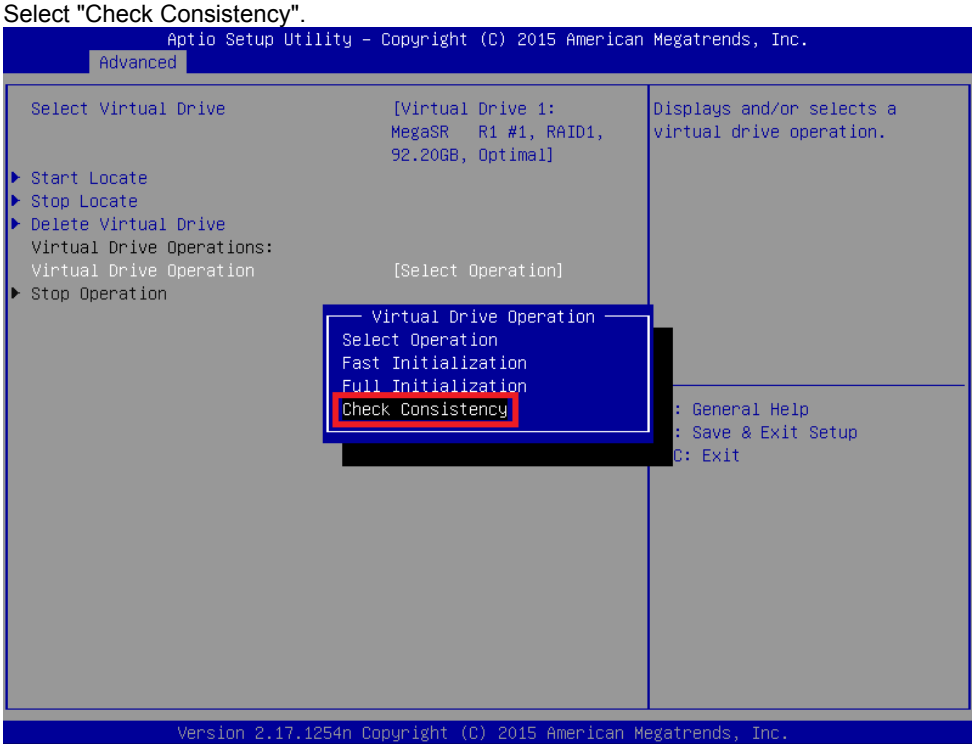


3. Select the target virtual drive for **Select Virtual Drive**,

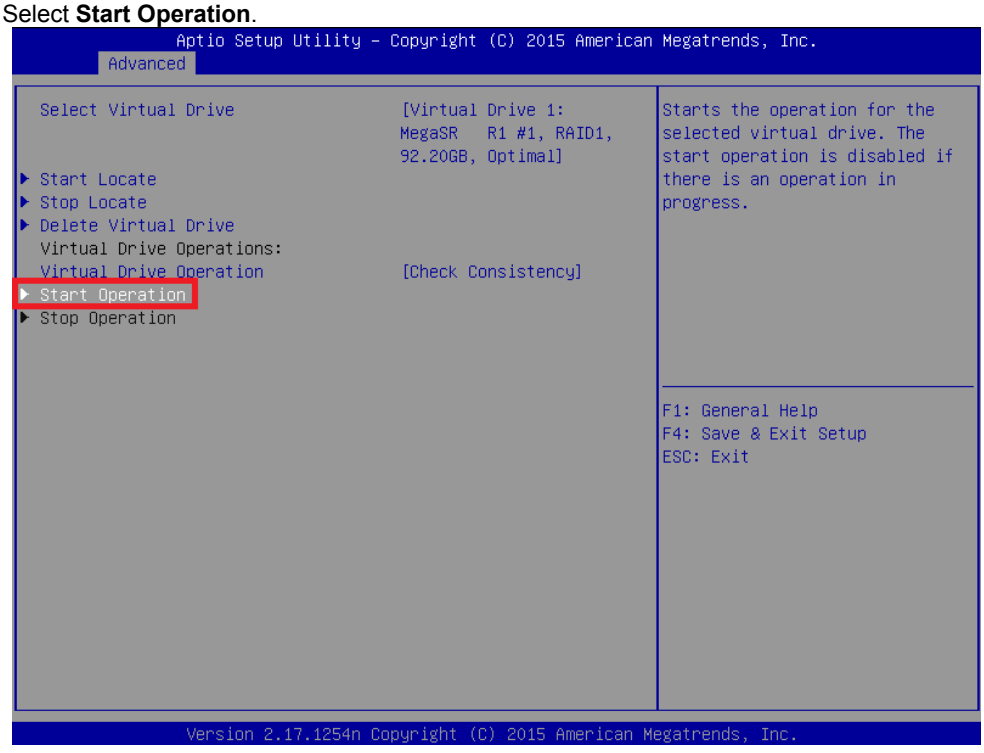
4. Select "Virtual Drive Operation".



5. Select "Check Consistency".

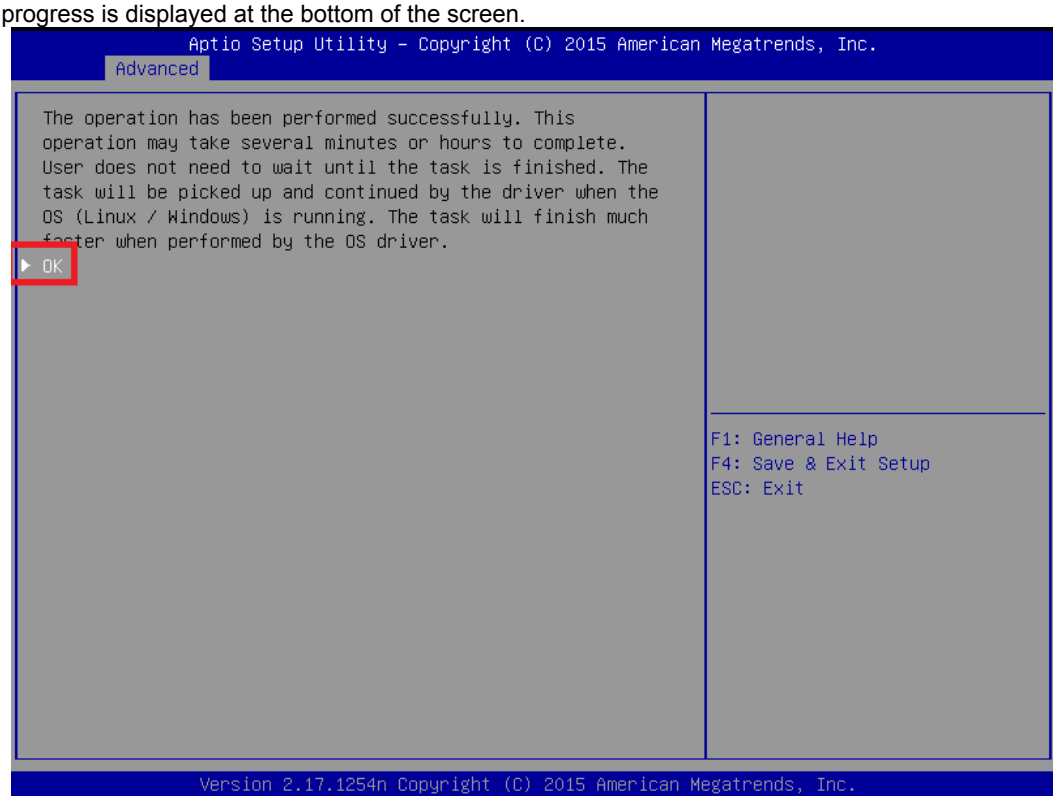


6. Select **Start Operation**.



7. Select **Yes** on the next screen.

8. Select **OK** to run Check consistency. Once Check consistency starts, the indication for **Virtual Drive** Operation changes to **Check Consistency** on the **Select Virtual Drive Operations** screen and the progress is displayed at the bottom of the screen.



Note The status of Operation Progress is not automatically updated. Press the <Esc> key to return to the screen to the upper position once, the progress status is updated when the mode enters **Select Virtual Drive Operations**.

5.6.5 Others

(1) Clear Configuration

Use this feature to clear configuration information. From the TOP menu, **Controller Management** and then **Clear Configuration** to clear all configuration information.

If old configuration information for the physical device remains, configuration may fail. In this case, execute "Clear Configuration".

Note

To remove a virtual drive, select **Virtual Drive Management** and then **Select Virtual Drive Management** and confirm that the virtual drive you want to deleted is displayed for **Select Virtual Drive**. Select **Delete Virtual Drive**. When a confirmation message is displayed, select **Yes**, and then select **OK**.

(2) Place Drive Online

Use this feature to forcibly put a physical device in the FAIL status online.

From the TOP menu, **Drive Management** and then **Select Drive Operations** confirm that the target physical device is displayed for **Select Drive**, select **Drive Operation**, **Place Drive Online**, and then **Start Operation**. When a confirmation message is displayed, select **Yes**, and then select **OK**.

(3) Rebuild Rate

Use this feature to specify the rebuild rate.
From the TOP menu, select **Controller Management**, **Change Controller Properties**, and **Rebuild Rate**.

The available value is between 0% and 100%. The default value (recommended) is 30%.

Select **Apply Changes** and, when a confirmation message is displayed, select **OK**.

(4) Physical device information

Use this feature to display physical device information.

From the TOP menu, select **Drive Management** and then **View Drive Properties**, and then select **Select Drive** to select the physical device you want to check.

5.7 LSI Software RAID Configuration Utility and Universal RAID Utility

Note the following when you use Universal RAID Utility together with LSI Software RAID Configuration Utility.

(1) Terms

LSI Software RAID Configuration Utility and Universal RAID Utility differ in terms. If you use Universal RAID Utility together with LSI Software RAID Configuration Utility, read the terms according to the following list.

Terms of LSI Software RAID Configuration Utility	Terms of Universal RAID Utility	
	RAID Viewer	raidcmd
Adapter	RAID Controller	RAID Controller
Virtual Drive	Logical Drive	Logical Drive
Array	Disk Array	Disk Array
Physical Drive	Physical Device	Physical Device
Drive Group	Disk Array	Disk Array

Tips raidcmd is a command that Universal RAID Utility provides. Refer to *Universal RAID Utility User's Guide* for more information.

(2) Number and ID

The number to manage each component of RAID Controller of Universal RAID Utility is different from LSI Software RAID Configuration Utility. See the table below.

Refer to *Universal RAID Utility User's Guide* for more information.

Item	Management number	
	LSI Software RAID Configuration Utility	Universal RAID Utility
Adapter (RAID Controller)	Number starting from 0	Number starting from 1
Virtual Drive (Logical Drive)	Number starting from 0	Number starting from 1
Array (Disk Array)	Number starting from 0	Number starting from 1
Physical Drive (Physical Device)	Number starting from 0	Assigned based on Enclosure number and slot number
Drive Group (Disk Array)	Number starting from 0	Number starting from 1

(3) Setting of Priority

LSI Software RAID Configuration Utility displays and sets Rebuild Priority and Consistency Check Priority of RAID Controller by percentage. However, Universal RAID Utility uses three levels as High/Middle/Low for them. See the table below for correspondence.

Setting value of LSI Software RAID Configuration Utility and the display level of Universal RAID Utility

Item	Setting value of LSI Software RAID Configuration Utility	Display level of Universal RAID Utility
Rebuild Priority Rebuild Rate (LSI Software RAID Configuration Utility)	15 to 100	High
	8 to 14	Middle
	0 to 7	Low
Consistency Check Priority Chk Const Rate (LSI Software RAID Configuration Utility)	15 to 100	High
	8 to 14	Middle
	0 to 7	Low

Setting level of Universal RAID Utility and the setting value

Item	Setting level of Universal RAID Utility	Setting value
Rebuild Priority Rebuild Rate (LSI Software RAID Configuration Utility)	High	20
	Middle	10
	Low	5
Consistency Check Priority Chk Const Rate (LSI Software RAID Configuration Utility)	High	20
	Middle	10
	Low	5

Tips

- LSI Software RAID Configuration Utility can set FGI Rate (Foreground Initialization priority) and BGI Rate (Background Initialization Priority). But Universal RAID Utility cannot set Background Initialization Priority.
- Initialization Priority cannot be set by Universal RAID Utility in LSI Embedded MegaRAID. To set the initialization priority, use LSI Software RAID Configuration Utility.

6. Details of EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows and maintain the server.

EXPRESSBUILDER also provides bundled software and instruction manuals.

6.1 Starting EXPRESSBUILDER

You can run EXPRESSBUILDER by using the following ways:

Internal Flash Memory:

Remove a CD/DVD and removable media from the server, restart the server and press <F3> key at the following POST message.

```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```

When EXPRESSBUILDER starts from Internal Flash Memory, Boot Selection Menu shown in *Chapter 2 (6.2* Menus of EXPRESSBUILDER*) - (1) Boot Selection Menu* will appear.

Windows Application:

After installing Starter Pack in the server, you can run EXPRESSBUILDER as a Windows application.

Run **NEC EXPRESSBUILDER** from Windows Start Menu or run the shortcut on the desk top.

When EXPRESSBUILDER starts as a Windows application, Autorun Menu shown in *Chapter 2 (6.2 Menus of EXPRESSBUILDER) - (4) Autorun Menu* will appear.

EXPRESSBUILDER DVD:

EXPRESSBUILDER DVD can be downloaded from the following website.

http://www.nec.com/

Use the DVD by the following two ways:

(1) Insert the DVD into the server, and then restart.

Boot Selection Menu shown in *Chapter 2 (6.2 Menus of EXPRESSBUILDER) - (1) Boot Selection Menu* will appear.

(2) Insert the DVD into a computer running Windows.

Autorun Menu shown in *Chapter 2 (6.2 Menus of EXPRESSBUILDER) - (4) Autorun Menu* will appear.

6.2 Menus of EXPRESSBUILDER

You can operate EXPRESSBUILDER using onscreen menus.

(1) Boot Selection Menu

When the server starts from EXPRESSBUILDER, the following menu appears.

Choose an item by using arrow keys and <Enter> key.

```
OS installation   *** default ***

Tool menu (Normal mode)

Tool menu (Redirection mode)
```

Home Menu shown in *(2) Home Menu* appears when you choose **OS installation** or no key is pressed.

Tool Menu shown in *(3)Tool Menu* appears when you choose **Tool menu (Normal mode)**. Usually, choose this mode if you want to run the tool menu.

You can remotely operate EXPRESSBUILDER by using BIOS Console Redirection when choosing **Tool menu (Redirection mode)**. The menu items and the tools are the same as those in normal mode.

Tips Choose the normal mode when using the remote KVM feature.

(2) Home Menu

Operate Home Menu using the mouse or keyboard (Tab and Enter keys).

Home Menu includes the following items.

a) Setup

Configures RAID arrays and installs Windows easily. For details, see *Installation Guide (Windows)*.

If you want to configure RAID arrays without installing Windows, choose **Manual Selection** in the step 1 of Setup.

b) Utilities

Runs utilities in EXPRESSBUILDER.
For details, see *Chapter 2 (6.3 Utilities in EXPRESSBUILDER)*.

c) Versions

Shows the versions of software, drivers, and EXPRESSBUILDER.

d) Exit

Closes EXPRESSBUILDER, and then shut down or restart the server.

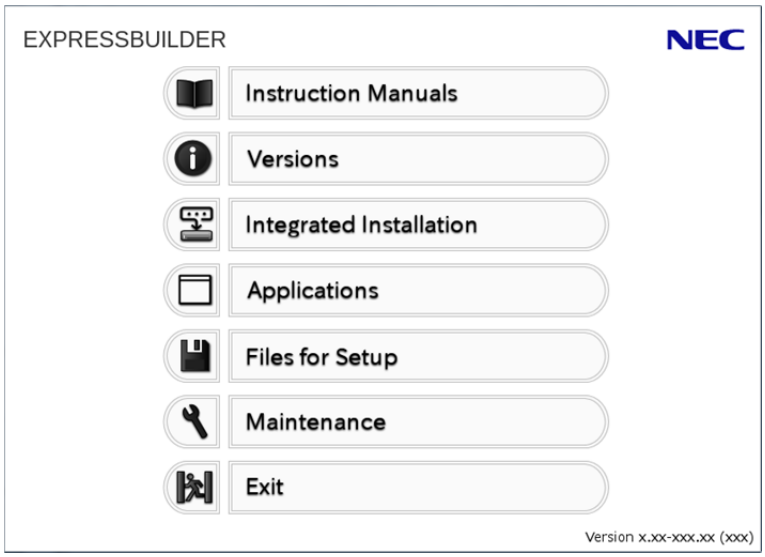
(3) Tool Menu

```
Test and diagnostics

Return to the previous menu
```

Choose **Test and diagnostics** to run System Diagnostics, which is used to analyze and diagnose the server and check the cable connection. For details, see *Chapter 1 (8. System Diagnostics)*.

(4) Autorun Menu



You can use the following features from the menu that starts by using the Windows autorun feature or by using EXPRESSBUILDER as a Windows application.

a) Instruction Manuals

Shows User's Guide, Installation Guide, and other instruction manuals.

b) Versions

Shows the versions of software, drivers, and EXPRESSBUILDER.

c) Integrated Installation

Installs several applications or Starter Pack easily. If the menu is not run on the server or the logon user does not have the administrator privilege, this item is not available.

d) Applications

Installs or runs an application individually.

e) Files for Setup

Creates the file for Windows installation.

f) Maintenance

Updates Internal Flash Memory or copies the application files to removable media.

g) Exit

Closes the menu.

6.3 Utilities in EXPRESSBUILDER

You can run the following utilities when choosing **Utilities** from Home Menu.

(1) RAID Configuration Data

Saves or loads the configuration data on a RAID controller.

(2) File Execution

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

Note Do not run the file provided by a third party.

(3) Internal Flash Memory (only available on DVD)

Manages Internal Flash Memory with the following commands.

a) Initialize

Clears the data on Internal Flash Memory and initializes (formats) it.

All data on Internal Flash Memory is deleted.

b) Update

Copies the data of EXPRESSBUILDER DVD or other media to Internal Flash Memory.

The data is overwritten and **all previous data is cleared**.

Tips The parameter file and RAID configuration data are retained.

(4) Starter Pack installation (only available on Internal Flash Memory)

Installs Starter Pack to the installed Windows. Starter Pack is usually installed from **Setup** of Home Menu or Autorun Menu. Use this feature to manually install Windows without EXPRESSBUILDER DVD.

Tips Starter Pack is automatically installed when Windows is installed by EXPRESSBUILDER.

6.4 EXPRESSBUILDER Command Line Interface

You can operate EXPRESSBUILDER by using Command Line Interface (CLI) on Windows command prompt.

For details, see *EXPRESSBUILDER Command Line Interface User's Guide*.

7. EXPRESSSCOPE Engine 3

EXPRESSSCOPE Engine 3 enables various features by using Baseboard Management Controller (BMC).

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

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

* N8115-04 Remote KVM and Media License are required to activate these features.

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.

8. NEC ESMPRO

8.1 NEC ESMPRO ServerAgentService (for Windows)

For details of NEC ESMPRO ServerAgentService (for Windows), see "*NEC ESMPRO* ServerAgentService *Installation Guide (Windows)*" in EXPRESSBUILDER.

8.2 NEC ESMPRO Manager

NEC ESMPRO Manager can remotely control and monitor the hardware and the RAID system of the server. To use these features, install the bundle software for the server such as NEC ESMPRO ServerAgentService.

For details, see "*NEC ESMPRO Manager Installation Guide*" or online help.

8.3 NEC ESMPRO Agent Extension

NEC ESMPRO Agent Extension enables you to manage the server remotely by this server's BMC connecting with NEC ESMPRO Manager.

For details, see "*NEC ESMPRO Agent Extension Installation Guide*" in EXPRESSBUILDER.

8.4 Server Configuration Utility

This utility enables you to specify configurations to this server's BMC.

For details, see "*Server Configuration Utility User's Guide*" in EXPRESSBUILDER.

8.5 NEC ExpressUpdate Agent

NEC ExpressUpdate Agent enables you to manage and update the versions of the firmware and software installed in this server.

You can install the downloaded packages easily by using NEC ExpressUpdate.

For details, see "*NEC ExpressUpdate Agent Installation Guide*" in EXPRESSBUILDER.

Tips Updates are available for some firmware and software that do not support NEC ExpressUpdate. Refer to the following website to install these packages:
http://www.nec.com/global/prod/express/index.html

9. NEC Product Info Collection Utility

NEC Product Info Collection Utility can collect various logs related to the server all at once. You can collect the server information (Product Info) for maintenance by using this utility.

9.1 Usage

Run the `\stdclct\collect.exe` contained in the installation folder of this utility.

This utility is usually installed to the `C:\ezclct` folder.

The `log` folder is created in the `stdclct` folder and “Product Info” is stored in a compressed (zip) file.

Tips

- Log on to Windows with an account that has an administrator privilege.
- The installation drive requires a free space of at least 2.5 GB.

10. Ezclct Viewer

Ezclct Viewer can display the log files collected by NEC Product Info Collection Utility.

For details, see " Ezclct Viewer *User's Guide*" in EXPRESSBUILDER.

11. Universal RAID Utility

Universal RAID Utility is an application to manage or monitor the following RAID controllers.

- Onboard RAID Controller (LSI Embedded MegaRAID)
- N8103-176 RAID Controller (1GB, RAID 0/1)
- N8103-177 RAID Controller (1GB, RAID 0/1/5/6)
- N8103-178 RAID Controller (2GB, RAID 0/1/5/6)
- N8103-179 RAID Controller (2GB, RAID 0/1/5/6)
- N8103-188 RAID Controller (RAID 0/1)

See "*Installation Guide (Windows)*" for installation.

See "*Universal RAID Utility User's Guide*" in the attached EXPRESSBUILDER for more information.

11.1 Easy Configuration Feature

Easy Configuration cannot be used with LSI Embedded MegaRAID.

11.2 Creating Logical Drive of RAID 6

Four or more physical devices are needed to create a RAID 6 logical drive by using Universal RAID Utility.
If you want to create a RAID 6 logical drive from three physical devices, use LSI Software RAID Configuration Utility or Off-line Utility.

12. Express Report Service / Express Report Service (HTTPS)

For details about Express Report Service / Express Report Service (HTTPS), see "*Express Report Service / Express Report Service (HTTPS) Installation Guide (Windows)*" in EXPRESSBUILDER.

13. Express Report Service (MG)

For details about Express Report Service (MG), see "*Express Report Service (MG) Installation Guide (Windows)"* in EXPRESSBUILDER.

NEC Express5800 Series
Express5800/R110h-1, T110h-S, T110h

3 Appendix

1. **POST Error Message**
   Shows a list of error messages for errors detected by the power on self-test (POST).

2. **List of Windows Event Logs**
   Shows a list of Windows event logs

3. **Accessing Data for Electrical Power, Temperature, and Processor Utilization**
   Describes how to check power consumption in watts, intake temperature, and logical processor utilizations.

4. **Glossary**

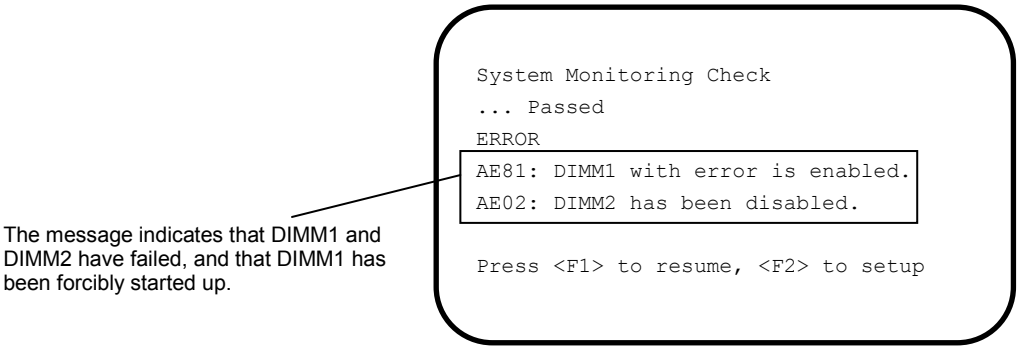
   Describes glossaries of this document.

5. **Revision Record**

   Describes revision history of this document.

I. POST Error Message

If POST detects a problem, an error message is displayed or a beep code sounds.



The next table lists the error messages and the actions to solve the problem. If the error does not change even if the action is performed, contact your sales representative.

Tips Write down the displayed messages and the beep code before contacting your sales representative. The messages are useful information for maintenance.

(1) Error messages

(1/5)

Error Message		Description	Action
8000	System variable is corrupted.	BIOS settings are invalid.	Run BIOS Setup Utility (SETUP), and then select **Load Setup Defaults** and specify the necessary settings.
8002	Check date and time settings	The real-time clock is incorrect.	Run SETUP, and then specify the correct date and time.
8006	System configuration data cleared by Jumper.	The setup utility settings were cleared by the jumper.	See *Chapter 1 (7. Resetting and Clearing the Server).* Start SETUP, and then setup each item again. This error message may appear when lithium battery is removed.
8007	SETUP Menu Password cleared by Jumper.	The setup utility password was cleared by the jumper.	See *Chapter 1 (7. Resetting and Clearing the Server).* Start SETUP, and then set password again.
8020	BIOS update error.	BIOS update failed.	Try again. This is an error logged when BIOS is updated. If the same error occurs again, see the error information described in the release note of BIOS to fix the error.
8021	Recovery jumper is set, but recovery images is not found.	The recovery jumper is set but the BIOS recovery failed.	Contact your sales representative.
8800	DXE_NB_ERROR	An error was detected during initialization of the chipset	
8801	DXE_NO_CON_IN	An error was detected during initialization of the console.	
8802	DXE_NO_CON_OUT		
8803	PEI_DXE_CORE_NOT_FOUND	A flash memory on the motherboard is broken.	
8804	PEI_DXEIPL_NOT_FOUND		
8805	DXE_ARCH_PROTOCOL_NOT_AVAILABLE		
9000	Unsupported CPU detected	An unsupported CPU was detected.	
9E80	Forced to use CPU with error.	A CPU error occurred.	
AB00	Memory not detected	No valid memory is installed.	Check if the memory modules are properly installed.
AE01	DIMM1 has been disabled.	A memory error occurred. DIMM1 has been disabled.	Contact your sales representative.
AE02	DIMM2 has been disabled.	A memory error occurred. DIMM2 has been disabled.	
AE03	DIMM3 has been disabled.	A memory error occurred. DIMM3 has been disabled.	
AE04	DIMM4 has been disabled.	A memory error occurred. DIMM4 has been disabled.	
AE81	DIMM1 with error is enabled.	An error in DIMM1 occurred. The DIMM1 was forcibly enables because all memory is currently disabled.	
AE82	DIMM2 with error is enabled.	An error in DIMM2 occurred. The DIMM2 was forcibly enables because all memory is currently disabled.	
B000	Expansion ROM not initialized	There is no memory for expanding option ROM.	If the PCI board does not connect to a bootable device, disable the **Option ROM Scan** for that board.
B001	Expansion ROM not initialized - PCI Slot 1 (Express5800/T110h, T110h-S)	Option ROM expansion in PCI slot 1 failed.	If the PCI board does not connect to a bootable device, disable the **Option ROM Scan** for that board. Run SETUP, select **Advanced** → **Serial Port Configuration**, and specify the different settings for **Serial Port A** and **Serial Port B**.
B002	Expansion ROM not initialized - PCI Slot 2 (Express5800/T110h, T110h-S)	Option ROM expansion in PCI slot 2 failed.	
B003	Expansion ROM not initialized - PCI Slot 3 (Express5800/T110h, T110h-S)	Option ROM expansion in PCI slot 3 failed.	
B004	Expansion ROM not initialized - PCI Slot 4 (Express5800/T110h, T110h-S)	Option ROM expansion in PCI slot 4 failed.	

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Error Message		Description	Action
B01A	Expansion ROM not initialized - PCI Slot 1A (Express5800/ R110h-1)	Option ROM expansion in PCI slot 1A failed.	
B001	Expansion ROM not initialized - PCI Slot 1B (Express5800/ R110h-1)	Option ROM expansion in PCI slot 1B failed.	
B004	Expansion ROM not initialized - PCI Slot 1C (Express5800/ R110h-1)	Option ROM expansion in PCI slot 1C failed.	
B022	Serial Port Configuration Overlapped.	Overlapping serial port configuration was detected.	Run SETUP, select **Advanced** → **Serial Port Configuration**, and specify the different settings for **Serial Port A** and **Serial Port B**.
B200	Onboard VGA - PCIe Link Failure	A PCIe bus connection failure was detected by the onboard VGA controller.	Contact your sales representative.
B201	Onboard LAN 1 - PCIe Link Failure	A PCIe bus connection failure was detected on the onboard LAN1 port.	
B202	Onboard LAN 2 - PCIe Link Failure	A PCIe bus connection failure was detected on the onboard LAN2 port.	
B211	PCI Slot 1 - PCIe Link Failure (Express5800/T110h, T110h-S)	A PCIe bus connection failure was detected in PCI slot 1.	
B212	PCI Slot 2 - PCIe Link Failure (Express5800/T110h, T110h-S)	A PCIe bus connection failure was detected in PCI slot 2.	
B213	PCI Slot 3 - PCIe Link Failure (Express5800/T110h, T110h-S)	A PCIe bus connection failure was detected in PCI slot 3.	
B214	PCI Slot 4 - PCIe Link Failure (Express5800/T110h, T110h-S)	A PCIe bus connection failure was detected in PCI slot 4.	
B211	PCI Slot 1A - PCIe Link Failure (Express5800/ R110h-1)	A PCIe bus connection failure was detected in PCI slot 1A.	
B212	PCI Slot 1B - PCIe Link Failure (Express5800/ R110h-1)	A PCIe bus connection failure was detected in PCI slot 1B.	
B215	PCI Slot 1C - PCIe Link Failure (Express5800/ R110h-1)	A PCIe bus connection failure was detected in PCI slot 1C.	
B221	Onboard LAN 1 - PCIe Link Width Error	A PCIe bus link width error was detected on the onboard LAN1 port.	
B222	Onboard LAN 2 - PCIe Link Width Error	A PCIe bus link width error was detected on the onboard LAN2 port.	
B231	PCI Slot 1 - PCIe Link Width Error (Express5800/T110h, T110h-S)	A PCIe bus link width error was detected in PCI slot 1.	
B232	PCI Slot 2 - PCIe Link Width Error (Express5800/T110h, T110h-S)	A PCIe bus link width error was detected in PCI slot 2.	
B233	PCI Slot 3 - PCIe Link Width Error (Express5800/T110h, T110h-S)	A PCIe bus link width error was detected in PCI slot 3.	
B234	PCI Slot 4 - PCIe Link Width Error (Express5800/T110h, T110h-S)	A PCIe bus link width error was detected in PCI slot 4.	

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Error Message		Description	Action
B231	PCI Slot 1A - PCIe Link Width Error (Express5800/R110h-1)	A PCIe bus link width error was detected in PCI slot 1A.	Contact your sales representative.
B232	PCI Slot 1B - PCIe Link Width Error (Express5800/R110h-1)	A PCIe bus link width error was detected in PCI slot 1B.	
B235	PCI Slot 1C - PCIe Link Width Error (Express5800/R110h-1)	A PCIe bus link width error was detected in PCI slot 1C.	
B261	Onboard LAN 1 - PCIe Link Speed Error	A PCIe bus link speed error was detected on the onboard LAN1 port.	
B262	Onboard LAN 2 - PCIe Link Speed Error	A PCIe bus link speed error was detected on the onboard LAN2 port.	
B271	PCI Slot 1 - PCIe Link Speed Error (Express5800/T110h, T110h-S)	A PCIe bus link speed error was detected in PCI slot 1.	
B272	PCI Slot 2 - PCIe Link Speed Error (Express5800/T110h, T110h-S)	A PCIe bus link speed error was detected in PCI slot 2.	
B273	PCI Slot 3 - PCIe Link Speed Error (Express5800/T110h, T110h-S)	A PCIe bus link speed error was detected in PCI slot 3.	
B274	PCI Slot 4 - PCIe Link Speed Error (Express5800/T110h, T110h-S)	A PCIe bus link speed error was detected in PCI slot 4.	
B271	PCI Slot 1A - PCIe Link Speed Error (Express5800/R110h-1)	A PCIe bus link speed error was detected in PCI slot 1A.	
B272	PCI Slot 1B - PCIe Link Speed Error (Express5800/R110h-1)	A PCIe bus link speed error was detected in PCI slot 1B.	
B275	PCI Slot 1C - PCIe Link Speed Error (Express5800/R110h-1)	A PCIe bus link speed error was detected in PCI slot 1C.	
C010	The error occurred during temperature sensor reading	An error occurred while reading the temperature sensor.	
C011	System Temperature out of the range.	A temperature abnormality was detected.	A cooling fan has a failure or is clogged by dusts. Contact your sales representative.
C020	The error occurred during voltage sensor reading.	An error occurred while reading the voltage sensor.	Contact your sales representative.
C021	System Voltage out of the range.	A system voltage abnormality was detected.	
C040	SROM data read error	SROM data reading error	
C061	1st SMBus device Error detected.	An error occurred in the 1st SM Bus.	
C062	2nd SMBus device Error detected.	An error occurred in the 2nd SM Bus.	
C063	3rd SMBus device Error detected.	An error occurred in the 3rd SM Bus.	
C064	4th SMBus device Error detected.	An error occurred in the 4th SM Bus.	
C065	5th SMBus device Error detected.	An error occurred in the 5th SM Bus.	
C066	6th SMBus device Error detected.	An error occurred in for the 6th SM Bus.	
C067	7th SMBus device Error detected.	An error occurred in the 7th SM Bus.	
C068	8th SMBus device Error detected.	An error occurred in the 8th SM Bus.	

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Error Message		Description	Action
C103	BMC core hardware failure.	BMC device (chip) error	Turn off the power, disconnect the server from the outlet, wait for at least 30 seconds, and restart the server.
C104	BMC IBF or OBF check failed.	Accessing the BMC address failed.	
C105	BMC SEL area full.	No memory to write the system event log.	Run Offline Tools by pressing <F4> key and delete the event logs.
C10B	BMC operational code corrupted.	BMC device (chip) error	Turn off the power, disconnect the server from the outlet, wait for at least 30 seconds, and restart the server.
C10C	BMC update firmware corrupted.		
C10D	Internal Use Area of BMC FRU corrupted.	Chassis information is incorrect.	
C10E	BMC SDR Repository empty.	BMC device (chip) error	
C10F	IPMB signal lines do not respond.	SMC (Satellite Management Controller) failure	
C110	BMC FRU device failure.	Failure of the SROM for storing chassis information	
C111	BMC SDR Repository failure.	Failure of the SROM for storing sensor data record information	
C112	BMC SEL device failure.	BMC device (chip) failure	
C113	BMC RAM test error.	BMC RAM error	
C114	BMC Fatal hardware error.	BMC error	
C115	Management controller not responding	Management controller does not respond.	Update the BMC firmware.
C116	Private I2C bus not Responding.	Private I2C bus does not respond.	Turn off the power, disconnect the server from the outlet, wait for at least 30 seconds, and restart the server.
C117	BMC internal exception	BMC internal error was detected.	
C118	BMC A/D timeout error.	BMC A/D timeout error was detected.	
C119	SDR repository corrupt.	BMC error or illegal SDR data was detected.	
C11A	SEL corrupt.	BMC error or illegal system event log data was detected.	
C11B	BMC Mezzanine card is not found.	BMC Mezzanine card is not mounted.	Contact your sales representative.
C11C	BMC Mezzanine partition is invalid.	BMC Mezzanine partition is invalid.	
C11D	BMC is in Forced Boot Mode.	The Forced Boot Mode of BMC was detected.	Check the jumper switch on the motherboard. Unplug the power cable, wait for at least 30 seconds, and then restart the server.
C11E	Communication with BMC was failed in previous boot.	Communication with BMC was failed in previous boot.	Turn off the power, disconnect the server from the outlet, wait for at least 30 seconds, and restart the server.
C11F	Backup Data of BMC Mezzanine card has corrupted.	Inconsistency was found on BMC mezzanine card.	Contact your sales representative.
C120	BMC Runtime FW corrupted.	An error occurred on BMC Runtime FW.	Turn off the power, disconnect the server from the outlet, wait for at least 30 seconds, and restart the server.
C121	BMC Force Update FW corrupted.	An error occurred on BMC Force Update FW.	
C122	BMC Configuration area corrupted.	An error occurred on BMC Configuration area.	
C123	BMC eMMC inaccessible.	Failed to access to BMC eMMC.	
C125	BMC eMMC mode error.	BMC eMMC mode error.	
C126	BMC eMMC partition corrupted.	An error occurred on BMC eMMC partition.	
C127	BMC eMMC format corrupted.	A format error occurred on BMC eMMC.	
C128	BMC is in Update Mode.	BMC is in update mode.	
C200	The error occurred during memory configuration check.	The memory information could not be obtained.	Turn off the power and restart the server.

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Error Message		Description	Action
C201	Memory Configuration change is detected.	The memory configuration has changed since the previous startup.	When **Check previous system Config** is enabled in **server** of the BIOS settings, this message appears if the configuration was changed since the previous startup. If this message appears even when no configuration change has been made, contact your sales representative.
C202	The error occurred during CPU configuration check.	The CPU information could not be obtained.	Turn off the power and restart the server.
C203	CPU Configuration change is detected.	The CPU configuration has changed since the previous startup.	When **Check previous system Config** is enabled in **server** of the BIOS settings, this message appears if the configuration was changed since the previous startup. If this message appears even when no configuration change has been made, contact your sales representative
C300	Out-of-band setup configuration failure	Invalid access to BMC Mezzanine card	Contact your sales representative.
C501	Intel(R) Node Manager is in Recovery Mode	The Recovery Mode of Intel Node Manager was detected.	Check the jumper switch on the motherboard. Unplug the power cable, wait for at least 30 seconds, and then restart the server.
C600	Internal Flash is not valid.	Selected Internal Flash Memory as an onetime booting device but unable to enable it.	Turn off the power, disconnect the server from the outlet, wait for at least 30 seconds, and restart the server.
C624	Invalid internal BIOS Configuration Data.	Internal error of BIOS Configuration Data was detected.	
C625	BIOS Configuration Data Send Error.	An internal error was detected during sending BIOS Configuration Data.	
C626	BIOS Configuration Data Read Error.	An internal error was detected during reading BIOS Configuration Data.	
C627	BIOS Configuration Data Write Error.	An internal error was detected during writing BIOS Configuration Data.	
C628	System configuration data cleared by System Boot Options command.	The SETUP setting was cleared by Set System Boot Options of the standard IPMI command.	Run SETUP, and then specify the necessary settings.

(2) Beep code

If POST detects a problem and is unable to display the error message, the beep code sounds instead of displaying the message.

A beep code is a series of short beeps separated by pauses. For example, "1-3-3-1" indicates one beep, a pause, three beeps, a pause, three beeps, a pause, and one beep.

The table below shows the beep code, cause, and action.

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

Beep Code	Description	Action
1-3-3-1	No memory in the server.	Make sure that the DIMMs are correctly installed. If the DIMM is installed correctly, contact your sales representative.
1-5-2-1	No processor in the server.	Make sure that the processor is correctly installed. If the processor is installed correctly, contact your sales representative.
1	An error occurred during the POST processing.	Contact your sales representative.
4	Initializing the BIOS executable module failed.	Contact your sales representative.
5	No graphics controller in the server.	Contact your sales representative.
7	Resetting the system failed.	Contact your sales representative.
8	An error was detected during allocating the PCI resources.	Remove all the PCI boards from the PCI slots, and then restart the server.

(3) Error messages on a virtual LCD

You can confirm the error messages by the EXPRESSSCOPE Engine 3 (BMC) web browser window. For details, see "*EXPRESSSCOPE Engine 3 User's Guide*".

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

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

Message displayed on upper LCD line
Message sent from BIOS

Message displayed on lower LCD line
Message sent from BMC

- **Messages displayed on an upper LCD line**

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BIOS Message on Upper LCD Line	Description	Action
`XX POST Started...`	POST is running. "*XX*" is the POST running code.	This is not an error.
`XX BIOS Rev YYYY`	POST is running. "*XX*" is the POST running code. "*YYYY*" is the system BIOS version.	This is not an error.
`POST Completed Successfully`	POST completes normally.	This is not an error.
`POST ERROR XXXX`	Error XXXX was detected during POST.	Check the error message which appears on-screen, and take the appropriate action for each error.
`No Available Memory in System`	No available memory in the server.	Make sure that the memory is correctly installed.
`Error Pause in POST`	An error occurred during POST.	Check the error message which appears on-screen, and take the appropriate action for each error.
`Entering BIOS SETUP MENU`	Running BIOS SETUP MENU.	This message disappears when SETUP operation is completed.
`Waiting for normal temperature`	A temperature abnormality was detected inside the server.	Lower the room temperature or turn off the power to cool the server to room temperature before starting up the server. If this abnormality continues to occur, check if a cooling fan has failed.
`BIOS Recovery Running`	BIOS recovery is in progress.	Wait until the BIOS recovery process completes.
`BIOS Updater Running`	BIOS update is in progress.	Wait until the BIOS update process completes.

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BIOS Message on Upper LCD Line	Description	Action
System Configuration change is detected	The CPU or memory configuration has changed since the previous startup.	If this message appears even when no configuration change has been made, contact your sales representative
PCI Slot #x Uncorrectable Error (x: 1-4) (Express5800/T110h, T110h-S)	An uncorrectable error occurred in PCI slot #x.	Install the PCI boards correctly.
PCIxx Slot UnCorrectable Error (xx: 1A, 1B, 1C) (Express5800/R110h-1)	An uncorrectable error occurred in PCI slot #xx.	
PCI-Express Uncorrectable Error 1	An uncorrectable device error occurred in PCI Express.	Contact your sales representative.
DIMM #x Correctable Error (x: 1-4)	A correctable memory error occurred in DIMM #x.	The error was corrected. If the same error occurs after restarting, install the DIMM correctly.
DIMM #x Uncorrectable Error (x: 1-4)	An uncorrectable memory error occurred in DIMM #x.	Contact your sales representative.
Memory Reconfigured	A failed DIMM was detected and degraded.	Contact your sales representative.

- **Messages displayed on a lower LCD line**

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BMC Message on Lower LCD Line	Description	Action
Processor Voltage Lower Non-Critical	A voltage abnormality was detected.	Contact your sales representative.
Processor Voltage Upper Non-Critical		
Processor Voltage Lower Critical		
Processor Voltage Upper Critical		
BaseBoard Voltage Lower Non-Critical		
BaseBoard Voltage Upper Non-Critical		
BaseBoard Voltage Lower Critical		
BaseBoard Voltage Upper Critical		
VBAT Lower Non-Critical		
VBAT Upper Non-Critical		
VBAT Lower Critical		
VBAT Upper Critical		
Baseboard Temperature1 Lower Non-Critical	A temperature abnormality was detected.	A cooling fan has a failure or is clogged by dusts. 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		
Ambient Temperature Lower Non-Critical		
Ambient Temperature Upper Non-Critical		
Ambient Temperature Lower Critical		
Ambient Temperature Upper Critical		
DIMM Area Temperature Lower Non-Critical		

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BMC Message on Lower LCD Line	Description	Action
DIMM Area Temperature Upper Non-Critical	A temperature abnormality was detected.	A cooling fan has a failure or is clogged by dusts. Contact your sales representative.
DIMM Area Temperature Lower Critical		
DIMM Area Temperature Upper Critical		
Processor Thermal Control Upper Non-Critical		
Processor Thermal Control Upper Critical		
DUMP Request !	The dump button was pressed.	Wait until collecting the memory dump is complete.
OS shutdown Alm	An OS stop error occurred.	Write down the displayed message, wait until collecting the memory dump is complete, and then contact your sales representative.
Power Supply1 Failure detected	A power supply unit abnormality occurred.	Make sure that the power cord is plugged in.
Power Supply2 Failure detected		
Power Supply1 AC Lost	AC input of a power supply unit was abnormality.	
Power Supply2 AC Lost		
Processor Missing	No CPU is installed.	Contact your sales representative.
Processor Thermal Trip	The power was forcibly turned off due to a CPU temperature abnormality.	
DIMM1 Uncorrectable Error	An unrecoverable error occurred for DIMM1.	
DIMM2 Uncorrectable Error	An unrecoverable error occurred for DIMM2.	
DIMM3 Uncorrectable Error	An unrecoverable error occurred for DIMM3.	
DIMM4 Uncorrectable Error	An uncorrectable error occurred for DIMM4.	
Processor Internal Error	An internal CPU error (IERR) occurred.	
Sensor Failure Detected.	Abnormality in a sensor was detected.	
SMI timeout	A timeout occurred while servicing system management interrupts.	
IPMI Watchdog timer timeout (Power off)	A watchdog timer timeout occurred.	

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BMC Message on Lower LCD Line	Description	Action
Node Manager Firmware Image execution Failed	Abnormality in Node Manager occurred.	Turn off the power, wait for at least 30 seconds, and restart the server.
Node Manager Firmware Flash Erase Error		
Node Manager Firmware Flash Corrupted		
Node Manager Firmware Flash Corrupted		
Node Manager Internal Error		
Node Manager can't communicate BMC		
Node Manager Firmware Image execution Failed		
Node Manager Firmware Flash Erase Error		
Node Manager Firmware Flash Corrupted		
Node Manager Internal Error		
Node Manager can't communicate BMC		
Node Manager Manufacturing Error		
Node Manager Persistent Storage Integrity Error		
Drive 0 Fault	Operation was performed during hard disk drive failure	
Drive 1 Fault		
Drive 2 Fault		
Drive 3 Fault		
Drive 4 Fault		
Drive 5 Fault		
Drive 6 Fault		
Drive 7 Fault		

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BMC Message on Lower LCD Line	Description	Action
System FAN1 Lower Non-Critical	A fan alarm was detected.	A cooling fan has a failure or is clogged by dusts. Contact your sales representative.
System FAN2 Lower Non-Critical		
System FAN3 Lower Non-Critical		
System FAN4 Lower Non-Critical		
System FAN5 Lower Non-Critical		
System FAN6 Lower Non-Critical		
System FAN7 Lower Non-Critical		
System FAN8 Lower Non-Critical		
System FAN9 Lower Non-Critical		
System FAN10 Lower Non-Critical		
System FAN11 Lower Non-Critical		
System FAN12 Lower Non-Critical		

2. List of Windows Event Logs

OS

Event Log

ID	Source	Type	Message (Description)
	Timing when an event is logged		Action

All Windows OS

System Event Log

11	megasas2	Error	The driver detected a controller error on \Device\RaidPort(x).
	When starting system		When the below values are 50 in **Details in the event logs** → **Display**, this event does not affect system operation. <Word style> 0000: 0018000F 00000001 00000000 C004000B 0008: 00000050 00000000 00000000 00000000 0010: 00000000 00000000 00000000 00000000 0018: 00FFFFFF C004000B 00000000 00000000
51	Cdrom	Warning	Error detected on the device \Device\CdRom0 during the paging operation.
	When installing an OS		This event may be registered in the event viewer, but this does not affect system operation.
129	megasas2	Warning	Reset command is issued to device \Device\RaidPort(x). (Any number replaces x)
	While the system is running		This event does not affect system operation If this message is logged because OS has succeeded retry process.
129	Megasr1	Warning	Reset was issued to the device \Device\RaidPort0.
	During consistency check		If this message has been registered as a log, there is no problem since the OS has succeeded in retry. Continue using.

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System Log

2	Microsoft-Windows-Kernel-EventTracing	Error	The session “” could not be started due to the following error: 0xC000000D
	When running an OS for the first time		This event does not affect system operation.
4	b57nd60a	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Starter Pack		This event does not affect system operation.

4	l2nd	Warning	QLogic BCM57810 #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Starter Pack		This event does not affect system operation.
11	Megasas	Error	The driver detected a controller error on *\Device\RaidPort(x)*.
	When applying Starter Pack		This event does not affect system operation if it is logged when applying Starter Pack.
27	ixgbi	Warning	Intel(R) Ethernet Controller X540-AT2 #xx Network link is disconnected.
	When installing an OS		This event does not affect system operation.
27	ixgbt	Warning	Intel(R) Ethernet Controller X540-AT2 #xx Network link is disconnected.
	When starting system and installing Starter Pack		This event does not affect system operation.
46	volmgr	Error	Crash dump was not initialized.
	When installing an OS		Refer to the following website. http://support.microsoft.com/kb/2756313
134	Microsoft-Windows-Time-Service	Warning	The manual peer that is used as the time source in NtpClient could not be set due to DNS resolution error at “time.windows.com,0x9”. Retry after 15 minutes and, after that, retry at double intervals.
	When installing an OS, starting system, applying Starter Pack		If it is not registered after connection with the Internet, there is no problem for system operation.
153	disk	Warning	The I/O operation at the logical block address for disk was retried. • The on-screen indication may differ depending on system environment. • The character string of this event may not be displayed correctly, however, it does not affect the system operation.
	When creating logical drive by Universal RAID Utility		If this event is logged when creating a logical drive by Universal RAID Utility, there is no problem in system operation. The character string of the event will be correctly displayed by applying the Microsoft's update program on the following site: http://support.microsoft.com/kb/2925479
1500	SNMP	Error	The SNMP Service encountered an error while accessing the registry key SYSTEM\CurrentControlSet\Services\SNMP\Parameters\TrapConfiguration.
	When installing an OS		If this event is logged only when SNMP is enabled and does not occur repeatedly, there is no problem with system operation. Go to the following Microsoft website for details. http://support.microsoft.com/kb/2002303/
7023	Service Control Manager	Error	The Network List Service terminated due to the following error. Device not ready.
	When installing an OS		This is logged only when the OS is installed and there is no problem unless the same event logs are continuously logged.

7023	Service Control Manager	Error	The IP Helper service terminated with the following error: The service cannot be started, either because it is disabled or because there are no enabled devices associated with it.
	When installing an OS		If this event is logged only when installing an OS and does not occur repeatedly, there is no problem in system operation.
7030	Service Control Manager	Error	Printer Extensions and Notifications service is marked as interactive service. However, the system is not allowed to use interactive service. Thus, this service might not work correctly.
	When installing an OS		If this event is logged only when installing an OS and does not occur repeatedly, there is no problem in system operation.
10010	Microsoft-Windows-DistributedCOM	Error	The server {xxxxxxxx-xxxx-xxxx-xxxxxxxxxxxx} did not do registration in DCOM within the necessary timeout period.
	When installing an OS		For details, refer to the following website: http://support.microsoft.com/kb/956479/ja (Japanese)
10016	Microsoft-Windows-DistributedCOM	Error	In the settings of application-specific access authorization, access authorization of local activation for COM server applications with CLSID {D63B10C5-BB46-4990-A94F-E40B9D520160} and APPID {9CA88EE3-ACB7-47C8-AFC4-AB702511C276} cannot be granted to the user NT AUTHORITY SYSTEM SID (S-1-5-18) whose address is LocalHost (LRPC is used) running with an SID unable to use application containers (utilization disabled). This security access authorization can be changed using the component service management tool.
	When running an OS for the first time		If this is logged at the first boot of OS and the same event log is not continuously logged, there is no problem.
10149	Microsoft-Windows-WinRM	Warning	The WinRM service is not listening for WS-Management requests.
	When installing an OS		If this event is logged together with ID 7036 "Service Control Manager (Windows Remote Management (WS-Management) service has stopped.), there is no problem in system operation. Also, if WinRM event 10148 (WinRM service is listening WS-Management requests.) is output immediately after this event, there is no problem in system operation.

Application Event Log

1014	Microsoft-Windows-Security-SPP	Error	Failed to obtain end-user license. hr=0x80072EE7
	When installing an OS		If this event is logged only when installing an OS and does not occur repeatedly, there is no problem in system operation.
1015	Microsoft-Windows-Security-SPP	Warning	Detailed information of HRESULT Returned hr=0xC004F022, original hr=0x80049E00
	When installing an OS		If this event is logged only when installing an OS and does not occur repeatedly, there is no problem in system operation.
1058	Microsoft-Windows-Security-SPP	Error	Failed to obtain certificate of purchase from ACPI table. Error code: 0xC004F057
	When installing an OS		This event does not affect system operation.

1534	Microsoft-Windows-User Profiles Service	Warning	Profile notification of event Create for component {2c86c843-77ae-4284-9722-27d65366543c} failed.
	When installing an OS		If this event is logged only when installing an OS and does not occur repeatedly, there is no problem in system operation.
8198	Microsoft-Windows-Security-SPP	Error	License Activation (slui.exe) failed with the following error code: Error code: hr=0xC004F063
	When installing an OS		Unless this event is not logged after license authentication, there is no problem in system operation.
8200	Microsoft-Windows-Security-SPP	Error	Detailed information about failure of license authentication hr=0x80072EE7
	When installing an OS		Unless this event is not logged repeatedly after license authentication, there is no problem in system operation.

Applications and Services Logs

200	Microsoft-Windows-DeviceSetupManager	Warning	A connection to the Windows Update Services could not be established.
	When running the system		If this event is not registered after the Internet connection is established, there is no problem in system operation.
201	Microsoft-Windows-DeviceSetupManager	Warning	A connection to the Windows Metadata and Internet Services (WMIS) could not be established.
	When running the system		If this event is not registered after the Internet connection is established, there is no problem in system operation.
202	Microsoft-Windows-DeviceSetupManager	Warning	The Network List Manager reports no connectivity to the internet.
	When running the system		If this event is not registered after the Internet connection is established, there is no problem in system operation.
215	Microsoft-Windows-AppReadiness	Error	'ART:ResolveStoreCategories' of Administrator failed. Error: 'Class not registered' (0.0469065 sec.)
	When installing an OS		If this event is logged only at the first sign-in after OS installation and does not occur repeatedly, there is no problem in system operation.

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System Log

4	b57nd60a	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Starter Pack		This event does not affect system operation.
4	l2nd	Warning	QLogic BCM57810 #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Starter Pack		This event does not affect system operation.
27	ixgbi	Warning	Intel(R) Ethernet Controller 10 Gigabit X540-AT2 #xx Network link is disconnected.
	When installing an OS		This event does not affect system operation.
27	ixgbt	Warning	Intel(R) Ethernet Controller X540-AT2 #xx Network link is disconnected.
	When starting system and applying Starter Pack		This event does not affect system operation.
153	disk	Warning	The IO operation at the logical block address for disk was retried. * The on-screen message depends on your environment. * Also, though the character string of this event may not be correctly displayed, there is no problem.
	When creating logical drive by Universal RAID Utility		If this event is logged when creating a logical drive by Universal RAID Utility, there is no problem in system operation. Furthermore, the character string of the event is displayed correctly by applying update programs of Microsoft. For details, refer to the following website: http://support.microsoft.com/kb/2925479
7023	Service Control Manager	Error	The Network List Service terminated with the following error: The device is not ready.
	When installing an OS		If this event is logged only when installing an OS and does not occur repeatedly, there is no problem in system operation.
7023	Service Control Manager	Error	The IP Helper service terminated with the following error: The service cannot be started, either because it is disabled or because there are no enabled devices associated with it.
	When installing an OS		If this event is logged only when installing an OS and does not occur repeatedly, there is no problem in system operation.
10010	Microsoft-Windows-DistributedCOM	Error	The server {xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx} did not register with DCOM within the required timeout.
	When installing an OS		Go to the following website for details. http://support.microsoft.com/kb/956479/
10149	Microsoft-Windows-WinRM	Warning	The WinRM service is not listening for WS-Management requests.
	When installing an OS		If this event is logged together with ID 7036 "Service Control Manager (Windows Remote Management (WS-Management) service has stopped.), there is no problem in system operation. Also, if WinRM event 10148 (WinRM service is listening WS-Management requests.) is output immediately after this event, there is no problem in system operation.

Application Event Log

1015	Microsoft-Windows-Security-SPP	Warning	Description: Detailed information of HRESULT Returned hr=0xC004F022, original hr=0x80049E00
	When installing an OS		Unless the application event is registered after license authentication, this event does not affect system operation.
1530	Microsoft-Windows-User Profiles Service	Warning	Windows detected your registry file is still in use by other applications or services. The file will be unloaded now. The applications or services that hold your registry file may not function properly afterwards.
	Upon applying Starter Pack		If there is no such influence cannot sign in Windows, does not affect the system operation.
8198	Microsoft-Windows-Security-SPP	Error	License Activation (slui.exe) failed with the following error code: hr=0x80070057
	When installing an OS, running an OS for the first time		Unless the application event is registered after license authentication, this event does not affect system operation. Go to the following website for details. http://support.microsoft.com/kb/921471/en-us

Applications and Services Logs

104	Microsoft-Windows-DeviceSetupManager	Error	The DSM service failed to start. Result=0x800706B5
	When installing an OS		If this event is logged only when installing an OS and does not occur repeatedly, there is no problem in system operation.
200	Microsoft-Windows-DeviceSetupManager	Warning	A connection to the Windows Update service could not be established.
	When running the system		If it is not registered after the Internet connection is established, there is no problem with system operation.
201	Microsoft-Windows-DeviceSetupManager	Warning	A connection to the Windows Metadata and Internet Services (WMIS) could not be established.
	When running the system		If it is not registered after the Internet connection is established, there is no problem with system operation.
202	Microsoft-Windows-DeviceSetupManager	Warning	The Network List Manager reports no connectivity to the internet.
	When running the system		If it is not registered after the Internet connection is established, there is no problem with system operation.
1001	Microsoft-Windows-Dhcp-Client	Error	Your computer could not assign an address from the network (by the DHCP Server) for the Network Card with network address <*MAC accress*>. The following error occurred: 0x79. Your computer will continue to try and obtain an address on its own from the network address (DHCP) server.
	When installing an OS or applying Starter Pack		If this event does not occur repeatedly, there is no problem with system operation.
12520	Microsoft-Windows-Hyper-V-VMMS	Warning	Auto-generating a self-signed certificate for server authentication.
	When running the system		This event is logged when activating Windows Server 2012 Hyper-V, but this event does not affect system operation.

14100	Microsoft-Windows-Hyper-V-VMMS	Warning	Shut down physical computer. Stopping/saving all virtual machines...
	When running the system		This event is logged when activating Windows Server 2012 Hyper-V, but this event does not affect system operation.
15350	Microsoft-Windows-Hyper-V-VMMS	Error	VID (Virtual Infrastructure Driver) is not running.
	When running the system		This event is logged at shutdown of Windows Server 2012 with Hyper-V enabled. However, this event does not affect system operation.

Windows Server 2008 R2

System Event Log

1	iScsiPrt	Error	Initiator failed to connect to the target. Target IP address and TCP Port number are given in dump data.
	When Windows Server 2008 R2 is operating while iSCSI is recognized		Go to the following website for details. http://support.microsoft.com/kb/976072/en-us
4	b57nd60a	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	When starting system, or applying Starter Pack		This event does not affect system operation.
4	l2nd	Warning	QLogic BCM57810 #xx: The network link is down. Check to make sure the network cable is properly connected.
	When starting system, or applying Starter Pack		This event does not affect system operation.
11	Disk	Error	The driver detected a controller error on Device\Harddisk*X*\DR*X*. **Note**: A different number replaces *X* depending on the connection status of the disk.
	Upon connecting with a USB device, remote media, and/or Virtual Flash USB Device		When the below values are 00 in **Details in the event logs** → **Display**, this event does not affect system operation. <Word style> 0000: 0068030E 00000001 00000000 C004000B 0008: 00000103 00000000 00000000 002D0800 0010: 00000000 00000000 000427B7 00000000 0018: FFFFFFFF 00000006 00000040 00000000 0020: 12060000 10000008 00000000 0000003C 0028: 00000000 86BAA280 00000000 86BDB008 0030: 00000000 00000000 00000000 00000000 0038: 00000000 00000000 00000000 00000000 0040: 00000000 00000000 00000000 00000000 0048: 00000000 00000000 00000000 00000000 0050: 00000000 00000000
11	iANSMiniport	Warning	Adapter link down:Intel(R) ~
	When starting system		This event is logged at system startup if a team is configured with Intel(R) PROSet, however, there is no problem in system operation.
13	iANSMiniport	Warning	Intel(R) ~ has been deactivated from the team.
	When starting system		This event is logged at system startup if a team is configured with Intel(R) PROSet, however, there is no problem in system operation.
16	iANSMiniport	Warning	Team #0: The last adapter has lost link. Network connection has been lost.
	When starting system		This event is logged at system startup if a team is configured with Intel(R) PROSet, however, there is no problem in system operation.
22	iANSMiniport	Warning	Primary Adapter does not sense the following Probes: Intel(R) ~ Possible reason: partitioned Team.
	When starting system		This event is logged at system startup if a team is configured with Intel(R) PROSet, however, there is no problem in system operation.
27	e1rexpress	Warning	Intel(R) Ethernet Server Adapter I340-T2 #xx Network link is disconnected.
	When starting system, or applying Starter Pack		This event does not affect system operation.

134	Microsoft-Windows-Time-Service	Warning	NtpClient was unable to set a manual peer to use as a time source because of DNS resolution error on ' '. NtpClient will try again in 3473457 minutes and double the reattempt interval thereafter.
	When installing an OS		This event does not affect system operation.
1004	IPMIDRV	Warning	The IPMI device driver attempted to communicate with the IPMI BMC device during normal operation. However the communication failed due to a timeout. You can increase the timeouts associated with the IPMI device driver.
	When running the system		The above event log may be recorded. Usually, however, IPMI command retry processing is performed, so there is no operation problem.

Application Event Log

63	Microsoft-Windows-WMI	Warning	A provider, BnxWmiProvider, has been registered in the Windows Management Instrumentation namespace root\brcmbnxns to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.
	Upon applying Starter Pack		This event does not affect system operation.
63	Microsoft-Windows-WMI	Warning	A provider, BnxWmiProvider, has been registered in the Windows Management Instrumentation namespace root\interop to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.
	Upon applying Starter Pack		This event does not affect system operation.
63	Microsoft-Windows-WMI	Warning	A provider, QLGCWmiProvider, has been registered in the Windows Management Instrumentation namespace root\qlgcnxns to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.
	Upon applying Starter Pack		This event does not affect system operation
63	Microsoft-Windows-WMI	Warning	A provider, QLGCWmiProvider, has been registered in the Windows Management Instrumentation namespace root\interop to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.
	Upon applying Starter Pack		This event does not affect system operation
1015	Microsoft-Windows-Security-SPP	Warning	Description: Detailed information of HRESULT Returned hr=0xC004F022, original hr=0x80049E00
	When installing an OS		Unless the application event is registered after license authentication, this event does not affect system operation.

12289	VSS	Error	Unexpected error DeviceIoControl(\\?\storage#volume#_??_mpio#disk&ven_nec&prod_istorage_1000&rev_1000#1&7f6ac24&0&303030303030303031303030303032383030304636#{ GUID}#0000000000007 e00#{ GUID }-00000000000002B8, x00560000,0000000000000000,0,00000000004866D0,4096,[0]). hr = 0x80070013, This media is read-only volume.
	When you import a transportable shadow-copy to another server that has a read-only volume while operating Windows Server 2008 R2:		Go to the following Microsoft website for details: http://support.microsoft.com/kb/2003016/en-us
12289	VSS	Error	Volume shadow copy service error: unexpected error DeviceIoControl (\\?\fdc#generic_floppy_drive#6&6a032c4&0&0 #{ GUID }-00000000000002B0,0x00560000, 0000000000000000,0,00000000001EC0E0,4096,[0]). hr = 0x80070001, function is incorrect.
	When you import a transportable shadow-copy to another server that has a floppy disk drive while operating Windows Server 2008 R2:		Go to the following Microsoft website for details: http://support.microsoft.com/kb/2003968/en-us

Applications and Services Logs

Microsoft-Windows-Kernel-EventTracing/Admin			
2	Microsoft-Windows-Kernel-EventTracing	Error	Session "" failed to start with the following error: 0xC000000D
	When running an OS for the first time		This event does not affect system operation.
3	Microsoft-Windows-Kernel-EventTracing	Error	Session "Microsoft-Windows-Setup" stopped due to the following error: 0xC000000D
	When running an OS for the first time		This event does not affect system operation.
Microsoft-Windows-Dhcp-Client/Admin			
1001	Microsoft-Windows-Dhcp-Client	Error	Your computer could not assign an address from the network (by the DHCP Server) for the Network Card with network address <*MAC accress*>. The following error occurred: 0x79. Your computer will continue to try and obtain an address on its own from the network address (DHCP) server.
	When installing an OS, running an OS for the first time, or applying Starter Pack		If this event is logged when installing an OS, running an OS for the first time, or while applying Starter Pack, it does not affect system operation.

3. Accessing Data for Electric Power, Temperature, and Processor Utilization

This section describes how to access data related to input power consumption in watts, intake temperature, and all logical processor utilizations in the Express Server during usual operation in accordance with ENERGY STAR Program Requirements.

3.1 Windows

The sample program below can be run on Windows Server 2008 and Windows Server 2012.

3.1.1 Power consumption

Run the following commands to access the power consumption readings on Baseboard Management Controller (BMC) by using Intelligent Platform Management Interface (IPMI).

```
Network Function Code: 2Ch (Group Extension)
Command Code: 02h (Get Power Reading)
Request Data: 000001DCh
```

The following is the sample file (named as Power.vbs) created by using Visual Basic Script.

```
' Start Script
Option Explicit

' Prepare for IPMI Driver
Dim osvc, oclass
Dim oinstance, oipmi
set osvc = getobject("winmgmts:root¥wmi")
set oclass = osvc.get("microsoft_ipmi")
for each oinstance in osvc.instancesof("microsoft_ipmi")
         set oipmi = oinstance
next

'Format the IPMI command request
Dim oinparams
set oinparams = oclass.methods_("requestresponse").inparameters
oinparams.networkfunction = &h2C
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h02
oinparams.requestdata = arry(&hdc,&h01,&h00,&h00)
oinparams.requestdatasize = 4


'call the driver
Dim outparams
set outparams = oipmi.execmethod_("requestresponse",oinparams)

WScript.Echo " Completion Code = 0x" & hex(outparams.Completioncode)
If outparams.Completioncode <> 0 Then
   Wscript.Echo " Not supported"
Else
   'WScript.Echo " Data LS Byte    = 0x" & hex(outparams.ResponseData(2))
   'WScript.Echo " Data MS Byte    = 0x" & hex(outparams.ResponseData(3))
   WScript.Echo " Power Consumption = " & outparams.ResponseData(3)*256 + _
                                          outparams.ResponseData(2) & " watts"
End If
' End Script
```

- Command example

```
C:¥VBS> cscript //nologo Power.vbs
```

- Result

```
Completion Code = 0x0
Power Consumption = 76 watts
```

The power consumption is 76 watts.

Tips If the power consumption readings cannot be read on the server depending on the power supply unit, the completion code is `0xC1` or `0xCB`.

3.1.2 Intake air temperature

Run the following commands to search Sensor Data Record (SDR) for the temperature sensor and read intake air temperature data.

- `Get SDR Repository Info`
- `Reserve SDR Repository`
- `Get SDR`
- `Get Sensor Reading`

The following is the sample file (named as Sensor.vbs) created by using Visual Basic Script.

```
'Start Script
Option Explicit

' Prepare for MS IPMI Driver
Dim osvc, oclass
Dim oinstance, oipmi
set osvc = getobject("winmgmts:root¥wmi")
set oclass = osvc.get("microsoft_ipmi")
for each oinstance in osvc.instancesof("microsoft_ipmi")
        set oipmi = oinstance
next

' (Get SDR Repository Info)
Dim oinparams
set oinparams = oclass.methods_("requestresponse").inparameters
' (Get SDR Repository Info)
oinparams.networkfunction = &ha
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h20
oinparams.requestdatasize = 0
' Fire IPMI Command
Dim outparams
Dim i, RecordCount
set outparams = oipmi.execmethod_("requestresponse",oinparams)
RecordCount = outparams.ResponseData(3)*256 + outparams.ResponseData(2)

' (Reserve SDR Repository)
oinparams.networkfunction = &ha
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h22
oinparams.requestdatasize = 0
Dim Reserve_LS, Reserve_MS
set outparams = oipmi.execmethod_("requestresponse",oinparams)
Reserve_LS = outparams.ResponseData(1)
Reserve_MS = outparams.ResponseData(2)

' (Get SDR) for each record
Dim Record_LS,Record_MS, Offset, Length
Dim cnt, sensorNum, sensorType
' First Record
Record_LS = 0
Record_MS = 0
For cnt = 0 to RecordCount-1
   Offset = 0
   Length = 9
   oinparams.networkfunction = &ha
   oinparams.lun = 0
   oinparams.responderaddress = &h20
   oinparams.command = &h23
   oinparams.requestdata = array(Reserve_LS, Reserve_MS, Record_LS, Record_MS, Offset, Length)
   oinparams.requestdatasize = 6
   set outparams = oipmi.execmethod_("requestresponse",oinparams)
   If outparams.Completioncode = 0 Then
      If outparams.ResponseData(6) = 1 Then          ' Full Sensor Record
         call GetSensorType(Reserve_LS, Reserve_MS, Record_LS, Record_MS, sensorType)
         If sensorType = 1 Then                    ' Temperature
            WScript.Echo "========================================="
            call GetIDString(Reserve_LS, Reserve_MS, Record_LS, Record_MS)
            WScript.Echo " Sensor Type = Temperature"
            sensorNum = outparams.ResponseData(10)
            call GetSensor(Reserve_LS, Reserve_MS, Record_LS, Record_MS,sensorNum)
         End If
      End If
```

```
        Record_LS = outparams.ResponseData(1)
        Record_MS = outparams.ResponseData(2)
        If Record_LS = &hff And Record_MS = &hff Then
            exit For
        End If
    End If
Next

Sub GetSensorType(rv_ls, rv_ms, rc_ls, rc_ms, sensorType)
    Dim outtmp
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 12, 2)
    oinparams.requestdatasize = 6
    set outtmp = oipmi.execmethod_("requestresponse",oinparams)
    sensorType = outtmp.ResponseData(3)
End Sub

Sub GetSensor(rv_ls, rv_ms, rc_ls, rc_ms, sensorNum)
    Dim outtmp, units1, units2, sensortype
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 20, 14)
    oinparams.requestdatasize = 6
    set outtmp = oipmi.execmethod_("requestresponse",oinparams)

    units1 = outtmp.ResponseData(3)
    Select Case outtmp.ResponseData(4)
        case 0: units2 = "unspecified"
        case 1: units2 = "degrees C"
        case 6: units2 = "Watts"
        case else: units2 = "Refer to IPMI Specification: Type=0x" _
                            & hex(outtmp.ResponseData(4))
    End Select

    ' (Get Sendor Reading)
    Dim sensorData, rawData, currentValue
    oinparams.networkfunction = &h4
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h2d
    oinparams.requestdata = array(sensorNum)
    oinparams.requestdatasize = 1
    set sensorData = oipmi.execmethod_("requestresponse",oinparams)
    If sensorData.Completioncode <> 0 Then
        'WScript.Echo " Sensor Not Available"
        exit Sub
    End If
    rawData = sensorData.ResponseData(1)
    If units1 and &h40 Then
        If rawData And &h80 Then
            rawData = rawData Xor &hff
        End If
    Elseif units1 and &h80 Then
        call get2complement(rawData, rawData, 8)
    End If
    If (sensorData.ResponseData(2) And &h80) = 0 Or _
       (sensorData.ResponseData(2) And &h40) = 0 Or _
       (sensorData.ResponseData(2) And &h20) Then
        WScript.Echo " Event Status: Unavailable"
    Else
        'WScript.Echo " Event Status: ok"
        Dim M,B,k1,k2
        Dim ret
        M = (outtmp.ResponseData(8) And &hc0) * 4 + outtmp.ResponseData(7)
        B = (outtmp.ResponseData(10) And &hc0) * 4 + outtmp.ResponseData(9)
        call get2complement(M, M, 10)
        call get2complement(B, B, 10)
        call get2complement(outtmp.ResponseData(12) And &h0f, k1, 4)
        call get2complement((outtmp.ResponseData(12) And &hf0)/16, k2, 4)
        currentValue = CDbl (((M * rawData) + (B * (10 ^ k1))) * (10 ^ k2))
        WScript.Echo " Current Value = " & currentValue & " " & units2
    End If
End Sub

Sub get2complement(raw, rv, bit)
    Select Case bit
        case 4:
            If raw And &h8 Then
                rv = 0 - ((&h10 - raw) and &h0f)
            Else
                rv = raw
            End If
        case 8:
            If raw And &h80 Then
```

```
            rv = 0 - ((&h100 - raw) and &h0ff)
         Else
            rv = raw
         End If
      case 10:
         If raw And &h200 Then
            rv = 0 - ((&h400 - raw) and &h3ff)
         Else
            rv = raw
         End If
   End Select
End Sub

Sub GetIDString(rv_ls, rv_ms, rc_ls, rc_ms)
   Dim tmpMessage
   Dim outsdridstringtype
   oinparams.networkfunction = &ha
   oinparams.lun = 0
   oinparams.responderaddress = &h20
   oinparams.command = &h23
   oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 47, 1)
   oinparams.requestdatasize = 6
   set outsdridstringtype = oipmi.execmethod_("requestresponse",oinparams)

   Dim outsdridstring
   Dim idlength, j
   idlength = outsdridstringtype.ResponseData(3) and 31
   oinparams.networkfunction = &ha
   oinparams.lun = 0
   oinparams.responderaddress = &h20
   oinparams.command = &h23
   oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 48, idlength)
   oinparams.requestdatasize = 6
   set outsdridstring = oipmi.execmethod_("requestresponse",oinparams)
   tmpMessage = " ID String = "
   For j = 3 to idlength + 2
      tmpMessage = tmpMessage & Chr(outsdridstring.ResponseData(j))
   Next
   WScript.Echo tmpMessage
End Sub
'End Script
```

- Command example

```
C:¥VBS> cscript //nologo Sensor.vbs
```

- Result

```
==========================================
 ID String = Baseboard Temp4
 Sensor Type = Temperature
 Current Value = 45 degrees C
==========================================
 ID String = Fnt Pnl Temp
 Sensor Type = Temperature
 Current Value = 27 degrees C
==========================================
 ID String = CPU1_DIMM1 Temp
 Sensor Type = Temperature
 Current Value = 35 degrees C
==========================================
 ID String = CPU1_DIMM2 Temp
 Sensor Type = Temperature
 Event Status: Unavailable
==========================================
```

Intake air temperature data is read from the sensor with an ID string that contains any of the following: `Amb`, `Ambient`, or `Front Panel`.

In the case of the sample above, the data is read from a sensor that contains `Fnt Pnl Temp` in its ID, with a resulting intake air temperature of 27°C.

3.1.3 Processor utilization

The utilization rate of all logical processors is given by using the Win32_PerfFormattedData_PerfOS_Processor class that Windows OS provides.

The following is the sample file (named as Proc.vbs) created by using Visual Basic Script. This script outputs the processor utilization rate every 30 seconds.

```
' Start Script
strComputer = "."
Set objWMIService = GetObject("winmgmts:" _
   & "{impersonationLevel=impersonate}!¥¥" & strComputer & "¥root¥cimv2")
set objRefresher = CreateObject("WbemScripting.Swbemrefresher")
Set objProcessor = objRefresher.AddEnum _
   (objWMIService, "Win32_PerfFormattedData_PerfOS_Processor").objectSet
objRefresher.Refresh
Dim first
first = true
Do
  For each intProcessorUse in objProcessor
    If first Then
      If intProcessorUse.Name = "_Total" Then
        first = false
      End If
    else
      Wscript.Echo "Proc" & intProcessorUse.Name & " : " & _
                "PercentProcessorTime=" & _
                intProcessorUse.PercentProcessorTime
    End If
  Next
  Wscript.Sleep 30*1000   'sleep 30 * 1000ms
  objRefresher.Refresh
Loop
' End Script
```

- Command example

```
C:¥VBS> cscript //nologo Proc.vbs
```

- Result

```
Proc0 : PercentProcessorTime=0
Proc1 : PercentProcessorTime=0
Proc2 : PercentProcessorTime=0
Proc3 : PercentProcessorTime=0
Proc4 : PercentProcessorTime=76
Proc5 : PercentProcessorTime=0
Proc6 : PercentProcessorTime=0
Proc7 : PercentProcessorTime=0
Proc_Total : PercentProcessorTime=9
```

`Proc 0` to `Proc 7` show the utilization rate of each processor while `Proc_Total` shows the total processor utilization rate.

4. Glossary

Term	Description
BIOS Setup Utility (SETUP)	Software for setting BIOS. You can run this software by pressing <F2> key during POST.
BMC	Baseboard Management Controller (BMC) is a built-in controller that supports the IPMI version 2.0 protocol. BMC can manage the server hardware.
BMC RESET Switch	A switch for resetting the BMC of the server. This resets the BMC without clearing the BMC settings. Use the switch if the problem on the BMC occurs.
DUMP Switch	A switch that is used for collecting the memory dump if an error occurs. You can specify the destination of the dump by using the Windows function.
EXPRESSBUILDER	Standard software for setting up the server easily. This also includes several useful applications and instruction manuals.
EXPRESSSCOPE ENGINE 3	A name of BMC for NEC Express5800 series.
EXPRESSSCOPE Profile Key	A removable flash memory that stored the settings of BIOS and BMC. If the motherboard of the server is replaced, you can use former settings when moving this flash memory from the former motherboard.
Express Report Service	Software that can report the server failure to the contact center by E-mail or modem. This software is installed with NEC ESMPRO ServerAgentService to the server.
Express Report Service (HTTPS)	Software that can report the server failure to the contact center by HTTPS. This software is installed with NEC ESMPRO ServerAgentService to the server.
Express Report Service (MG)	Software that can report the server failure to the contact center by E-mail, modem or HTTPS without NEC ESMPRO ServerAgentService. This software is installed with NEC ESMPRO Manager to "PC for Management".
ExpressUpdate	A feature for updating BIOS, firmware, driver, or software of the server. This feature is available when NEC ESMPRO Manager cooperates with EXPRESSSCOPE ENGINE 3 and ExpressUpdate Agent.
ExpressUpdate Agent	Software for performing ExpressUpdate. This is installed to the server.
Flash FDD	An optional USB device that can use as a floppy disk drive.
Internal Flash Memory	A built-in flash memory that stored EXPRESSBUILDER as standard. You can start EXPRESSBUILDER from it without DVD when pressing <F3> key during POST.
NEC ESMPRO	Standard software for the server management. This consists of several applications for managing or monitoring.
NEC ESMPRO Agent Extension	Software for performing the scheduled operations. This works with NEC ESMPRO Manager.
NEC ESMPRO Manager	Software for managing multiple servers on network.
NEC ESMPRO ServerAgentService	Software for monitoring the server. This works with NEC ESMPRO Manager. You can choose Service Mode or Non-Service Mode when installing this software. Service Mode resides as the OS service and Non-Service Mode does not use the OS service to reduce memory, CPU power, and other OS resources.
OEM driver	A Windows driver for the mass storage device.
OS standard installer	An installer that stored in Windows installation disc. Use this installer if you want to install the OS manually.
Offline tools	Software that can read or change SEL, SDR, FRU, and other IPMI data. You can start Offline tools when pressing <F4> key during POST.
PC for Management	A computer for managing the server on network. A general Windows/Linux computer can be used as "PC for Management".
Product Info Collection Utility	Software for collecting several hardware/software statuses or event logs. You can easily collect the data for the server maintenance by using this software.
RAID Configuration Utility	Software for configuring RAID arrays. You can run this software during POST.
Server Configuration Utility	Software for setting BIOS or BMC. You can use as Windows application or run this software when pressing <F4> key during POST. This software is the same as BMC Configuration of former models.
Starter Pack	Software package for the server. This software includes the customized drivers for Windows. This must be installed before using Windows on the server.
TPM Kit	An optional product of Trusted Platform Module for the server.
Universal RAID Utility	Software for setting RAID arrays on Windows/Linux. This software is operated on "PC for Management" with NEC ESMPRO Manager.
Windows OS parameter file	A file that saved settings for installing Windows. You can install with the settings in this file when setting Windows with EXPRESSBUILDER.

5. Revision Record

Revision (Document Number)	Date Issued	Description
10.111.01-104.01	January 2016	Newly created
10.111.01-104.02	April 2016	Changed the pathname of driver files
10.111.01-104.03	October 2016	・Windows Server 2008 R2 is now supported for the onboard RAID controller ・Corrected the errors
	August 2018	Clerical Corrections

[MEMO]

NEC Express Server

Express5800/ R110h-1, T110h-S, T110h
Maintenance Guide

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NEC Corporation
7-1 Shiba 5-Chome, Minato-Ku
Tokyo 108-8001, Japan