

# Hitachi Compute Rack 210H/220H BIOS Guide

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# Preface

This document provides system BIOS and RAID BIOS setup information of the *Compute Rack 210H/220H* (CR 210H/CR 220H).

This preface includes the following information:

- ☐ [Intended Audience](#)
- ☐ [Release Notes](#)
- ☐ [Document Conventions](#)
- ☐ [Getting Help](#)
- ☐ [Comments](#)

**Notice:** The use of the Compute Rack is governed by the terms of your agreements with Hitachi.

## Intended Audience

This document is intended for personnel involved in planning, managing, and performing the tasks to prepare your site and to perform installation for the Compute Rack installation and to install the same.

This document assumes the following:

- The reader has a background in hardware installation of computer systems.
- The reader is familiar with the location where the Compute Rack will be installed, including knowledge of physical characteristics, power systems and specifications, and environmental specifications.

## Release Notes

Release notes contain requirements and more recent product information that may not be fully described in this manual. Be sure to review the release notes before installation.





## Document Conventions

The term “Compute Rack” refers to all the models of the Compute Rack, unless otherwise noted.

This document uses the following typographic conventions:

Convention	Description
<b>Bold</b>	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click <b>OK</b> .
<i>Italic</i>	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: <i>copy source-file target-file</i> <b>Note:</b> Angled brackets (< >) are also used to indicate variables.
screen/code	Indicates text that is displayed on screen or entered by the user. Example: # pairdisplay -g oradb
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: # pairdisplay -g <group> <b>Note:</b> Italic font is also used to indicate variables.
[ ] square brackets	Indicates optional values. Example: [ a   b ] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a   b } indicates that you must choose either a or b.
vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [ a   b ] indicates that you can choose a, b, or nothing. { a   b } indicates that you must choose either a or b.
<u>underline</u>	Indicates the default value. Example: [ <u>a</u>   b ]

This document uses the following symbols to emphasize certain information.

Symbol	Label	Description
	WARNING	This indicates the presence of a potential risk that might cause death or severe injury.
	CAUTION	This indicates the presence of a potential risk that might cause relatively mild or moderate injury.
<b>NOTICE</b>	NOTICE	This indicates the presence of a potential risk that might cause severe damage to the equipment and/or damage to surrounding properties.
	Note	This indicates notes not directly related to injury or severe damage to equipment.
	Tip	This indicates advice on how to make the best use of the equipment.

## Getting Help

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## Comments

Please send us your comments on this document: [doc.comments@hds.com](mailto:doc.comments@hds.com). Include the document title, number, and revision, and refer to specific sections and paragraphs whenever possible. All comments become the property of Hitachi Data Systems. ***Thank you!***



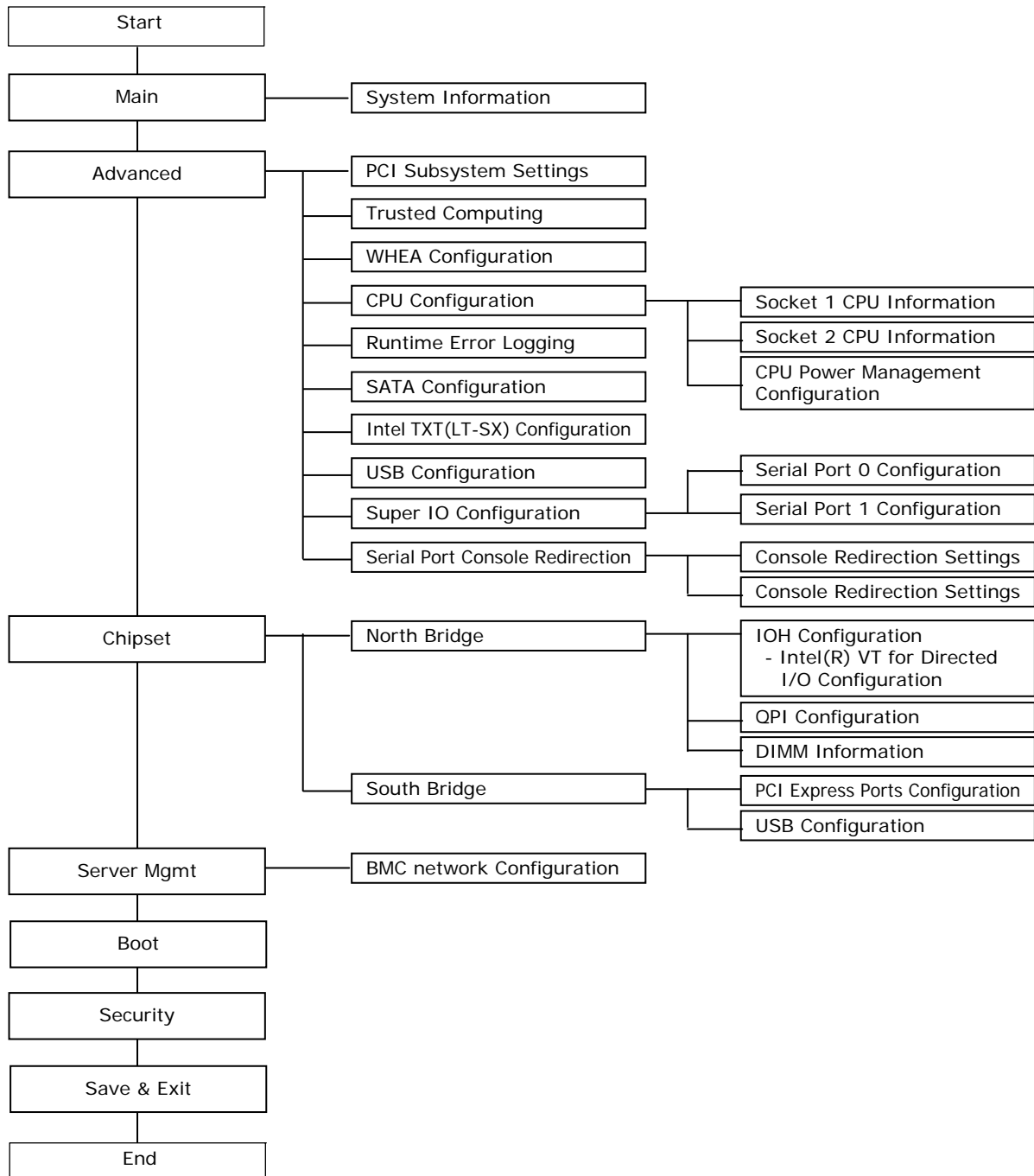
# System BIOS

This chapter describes system BIOS setup menu items.

- [Configuration of system BIOS setup menu](#)
- [Starting system BIOS setup menu](#)
- [Key functions for system BIOS setup menu](#)
- [System BIOS setup menu window](#)
- [System BIOS setup menu items](#)
- [Exiting system BIOS setup menu](#)

# Configuration of system BIOS setup menu

This section describes the system BIOS setup menu items. See the following chart.

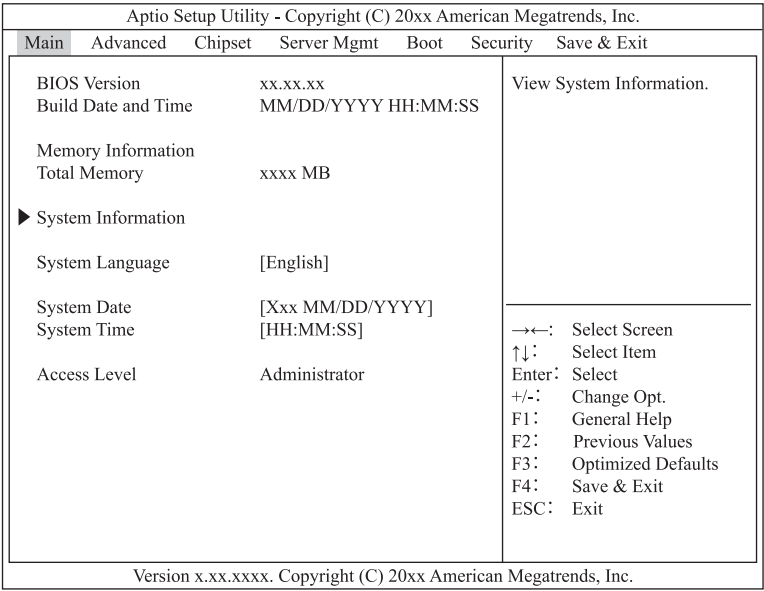


**Figure 1-1 System BIOS setup menu**


# Starting system BIOS setup menu

1. Power on the system.
2. When **Press <DEL> to enter SETUP** is displayed in the top of the window during the system unit boot, press **DELETE** key.

**Entering SETUP...** is displayed. Shortly after the Power on self test (POST) of the RAID BIOS and the extension board BIOS installed in the system is finished, the system BIOS setup menu starts up and the **Aptio Setup Utility** will be displayed.



**Figure 1-2: System BIOS setup menu starting window**



- When the OS has started before pressing the key, shut down the OS and restart the system unit. See the documents attached to your OS for shutting down.
- Depending on the capacity of the memory boards in the system unit, you may need to wait a couple minutes the system BIOS setup menu will start.

## Key functions for system BIOS setup menu

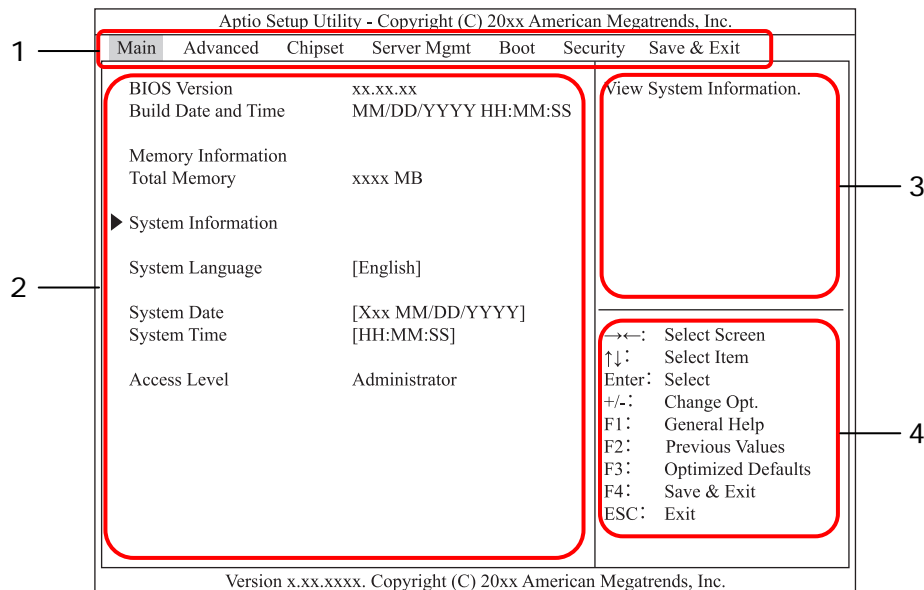
The following table describes key functions in the system BIOS setup menu.

**Table 1-1: Key functions**

Keys	Description
[↑], [↓]	Moves the cursor up and down in the menu.
[←], [→]	Move the cursor left and right in the menu bar to select the setup menu.
[Enter]	<ul style="list-style-type: none"><li>▪ Displays the submenu.</li><li>▪ Performs the command.</li></ul>
[Esc]	<ul style="list-style-type: none"><li>▪ Exits the submenu.</li><li>▪ Exits the system BIOS setup menu.</li></ul>
[F1]	Display the help screen for the keys.
[F2]	Load the last saved settings.
[F3]	Load the default settings.
[F4]	Save the settings and exit the system BIOS setup menu.
[+], [-]	Increases or decreases the setting value.

# System BIOS setup menu window

The following describes the outline of **Aptio Setup Utility** window.



**Figure 1-3: System BIOS setup menu window components**

## 1. Menu bar

Select the setup menu (Main, Advanced, Chipset, Server Mgmt, Boot, Security, and Save&Exit).

## 2. Menu items

Set values for each setup item. Place the cursor at a setup item with "►" and press **Enter** key to display its submenu.

## 3. Help

Automatically displays the help information on the selected setup item.

## 4. Key guidance

Indicate the key functions.

# System BIOS setup menu items

## Main

Move the cursor in the menu bar to select the **Main** menu.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.		
Main	Advanced	Chipset
Server Mgmt		
Boot		
Security		
Save & Exit		
BIOS Version                   xx.x.xx		
Build Date and Time       MM/DD/YYYY HH:MM:SS		
Memory Information		
Total Memory               xxxx MB		
► System Information		
System Language           [English]		
System Date               [Xxx MM/DD/YYYY]		
System Time               [HH:MM:SS]		
Access Level               Administrator		
→←: Select Screen		
↑↓: Select Item		
Enter: Select		
+/-: Change Opt.		
F1: General Help		
F2: Previous Values		
F3: Optimized Defaults		
F4: Save & Exit		
ESC: Exit		
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.		

Figure 1-4: Main menu

The following table shows description of menu items.

**Table 1-2: Main menu items**

Menu items	Selection <sup>1</sup>	Description
BIOS Version	-	Displays the system BIOS version.
Build Date and Time	-	Displays the build data and time of the system BIOS.
Memory Information		
Total Memory	-	Displays the total installed memory size.
System Information	-	Displays the <b>System Information</b> submenu. See <a href="#">System Information</a> for the details.
System Language	▪ [English]	Specify the language used for the system BIOS setup menu.
System Date <sup>2</sup>	-	Sets the local date of the system. Sets the date as MM/DD/YYYY.
System Time <sup>2</sup>	-	Sets the local time of the system. Sets the time as HH:MM:SS in the form of 24 hours.
Access Level	-	Displays the user who is logging on to the system BIOS setup menu
<b>Notes:</b> 1 A value in square brackets, [ ], shows the default. 2 Use <b>TAB</b> , <b>SHIFT + TAB</b> , or <b>Enter</b> key to move the cursor inside <b>System Time</b> and <b>System Date</b> settings.		

## System Information

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.		
<b>Main</b>		
BMC Version	xx.xx	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
SDR Version	xxxxxxxx	
ME Version	x.x.x.xx	
System Product Name	HA8000/xxxxxxxx	
System Version	xxxxxxxx	
System Serial Number	xxxxxxx xxxxxxxx	
Board Product Name	xxxxxx	
LAN1 MAC Address	xx-xx-xx-xx-xx-xx	
LAN2 MAC Address	xx-xx-xx-xx-xx-xx	
BMC MAC Address	xx-xx-xx-xx-xx-xx	
Remote KVM	xxxxxxxxxxxx	
HA Monitor	xxxxxxxxxxxx	
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.		

**Figure 1-5: System Information submenu**

The following table shows description of menu items.

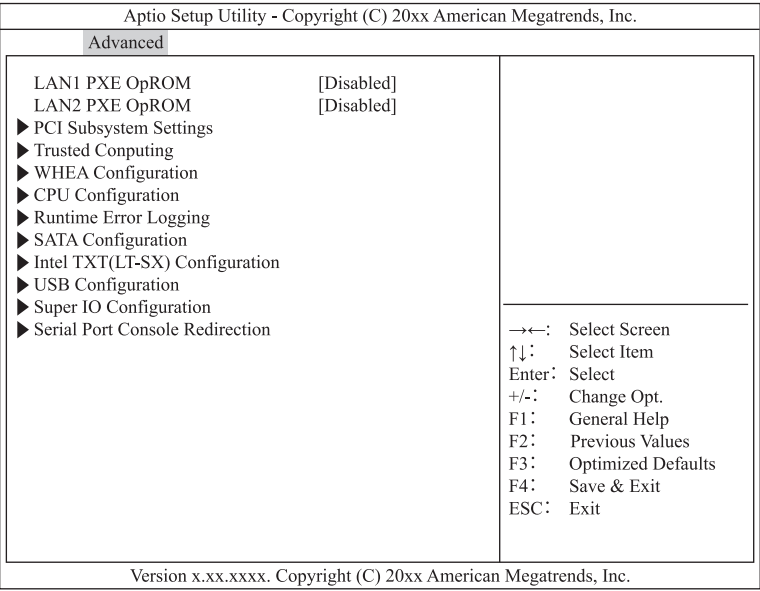
**Table 1-3: System Information menu items**

Menu items	Description
BMC Version	Displays the BMC version.
SDR Version	Displays the SDR version.
ME Version	Displays the ME version.
System Product Name	Displays the product name the system unit.
System Version	Displays the system unit version
System Serial Number	Displays the serial number of the system unit.
Board Product Name	Displays the motherboard name of the system unit.
LAN1 MAC Address	Displays the LAN1 MAC address.
LAN2 MAC Address	Displays the LAN2 MAC address.
BMC MAC Address	Displays the BMC LAN MAC address.
Remote KVM	Displays the status of Remote KVM.
HA Monitor	Displays the status of HA Monitor.



# Advanced

Move the cursor in the menu bar to select the **Advanced** menu.



**Figure 1-6: Advanced menu**

The following table shows description of menu items.

**Table 1-4: Advanced menu items**

Menu items	Selection*	Description
LAN1 PXE OpROM	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets a PXE boot from the onboard LAN1 controller
LAN2 PXE OpROM	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets a PXE boot from the onboard LAN2 controller
PCI Subsystem Settings	-	Displays the <b>PCI Subsystem Settings</b> submenu. See <a href="#">PCI Subsystem Settings</a> for the details.
Trusted Computing	-	Displays the <b>Trusted Computing</b> submenu. See <a href="#">Trusted Computing</a> for the details.
WHEA Configuration	-	Displays the <b>WHEA Configuration</b> submenu. See <a href="#">WHEA Configuration</a> for the details.
CPU Configuration	-	Displays the <b>CPU Configuration</b> submenu. See <a href="#">CPU Configuration</a> for the details.
Runtime Error Logging	-	Displays the <b>Runtime Error Logging</b> submenu. See <a href="#">Runtime Error Logging</a> for the details.
SATA Configuration	-	Displays the <b>SATA Configuration</b> submenu. See <a href="#">SATA Configuration</a> for the details.
Intel TXT(LT-SX) Configuration	-	Displays the <b>Intel TXT(LT-SX) Configuration</b> submenu. See <a href="#">Intel TXT(LT-SX) Configuration</a> for the details.
USB Configuration	-	Displays the <b>USB Configuration</b> submenu. See <a href="#">USB Configuration</a> for the details.
Super IO Configuration	-	Displays the <b>Super IO Configuration</b> submenu. See <a href="#">Super IO Configuration</a> for the details.
Serial Port Console Redirection		Displays the <b>Serial Port Console Redirection</b> submenu. See <a href="#">Serial Port Console Redirection</a> for the details.
* A value in square brackets, [ ], shows the default.		

## PCI Subsystem Settings

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.		
Advanced		
PCI ROM Priority	[Legacy ROM]	
No Snoop	[Enabled]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.		

**Figure 1-7: PCI Subsystem Settings submenu**

The following table shows description of menu items.

**Table 1-5: PCI Subsystem Settings submenu items**

Menu items	Selection*	Description
PCI ROM Priority	<ul style="list-style-type: none"><li>[Legacy ROM]</li><li>EFI Compatible ROM</li></ul>	Sets the priority of the ROM on the PCI card.
No Snoop	<ul style="list-style-type: none"><li>Disabled</li><li>[Enabled]</li></ul>	Sets a snoop function.
* A value in square brackets, [ ], shows the default.		

## Trusted Computing

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.	
Advanced	
Configuration	
TPM SUPPORT	[Disable]
TPM State	[Disabled]
Current Status information	
TPM Enabled Status:	[Disabled]
TPM Active Status:	[Deactivated]
TPM Owner Status:	[Unowned]
→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.	

**Figure 1-8: Trusted Computing submenu**

The following table shows description of menu items.

**Table 1-6: Trusted Computing submenu items**

Menu items	Selection <sup>1</sup>	Description
Configuration		
TPM SUPPORT	<ul style="list-style-type: none"> <li>▪ [Disable]</li> <li>▪ Enable</li> </ul>	Sets the Trusted Platform Module (TPM) to enable.
TPM State <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets the TPM to use.
Pending operation <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ [None]</li> <li>▪ Enable Take Ownership</li> <li>▪ Disable Take Ownership</li> <li>▪ TPM Clear</li> </ul>	Sets the TPM to clear operation.
Current Status Information		
NO Security Device Found <sup>3</sup>	-	The TPM is not installed in the system unit.
SUPPORT TURNED OFF <sup>4</sup>	-	The TPM is disabled.
TPM Enabled Status <sup>2</sup>	-	Displays an operation status of the TPM.
TPM Active Status <sup>2</sup>	-	Displays an active status of the TPM.
TPM Owner Status <sup>2</sup>	-	Displays an owner status of the TPM.
<b>Notes:</b> <ol style="list-style-type: none"> <li>1 A value in square brackets, [ ], shows the default.</li> <li>2 This item is displayed when the TPM board (EQ7000-Y/EQ7000-R) is installed to the system unit and <b>TPM SUPPORT</b> is set <b>Enable</b>.</li> <li>3 This item is displayed when the TPM board (EQ7000-Y/EQ7000-R) is not installed in the system unit.</li> <li>4 This item is displayed when the TPM board (EQ7000-Y/EQ7000-R) is installed in the system unit and <b>TPM SUPPORT</b> is set <b>Disabled</b>.</li> </ol>		

## TPM SUPPORT setting

If you use Windows BitLocker function, perform the following procedures.

1. Change the setting of **TPM SUPPORT** to **Enable**.
2. Save settings and exit the system BIOS setup menu.  
See [Exiting system BIOS setup menu](#) on page 1-56.
3. Restart the system unit, and then start the system BIOS setup menu.  
See [Starting system BIOS setup menu](#) on page 1-3.
4. Change the setting of **TPM State** to **Enabled**.
5. Save settings and exit the system BIOS setup menu.
6. Restart the system unit, and then start the system BIOS setup menu.
7. Confirm the displaying of **TPM Enabled Status** and **TPM Active Status** is **Enabled** and **Active**.

Otherwise, leave the setting for **TPM SUPPORT** as **disable** (default).

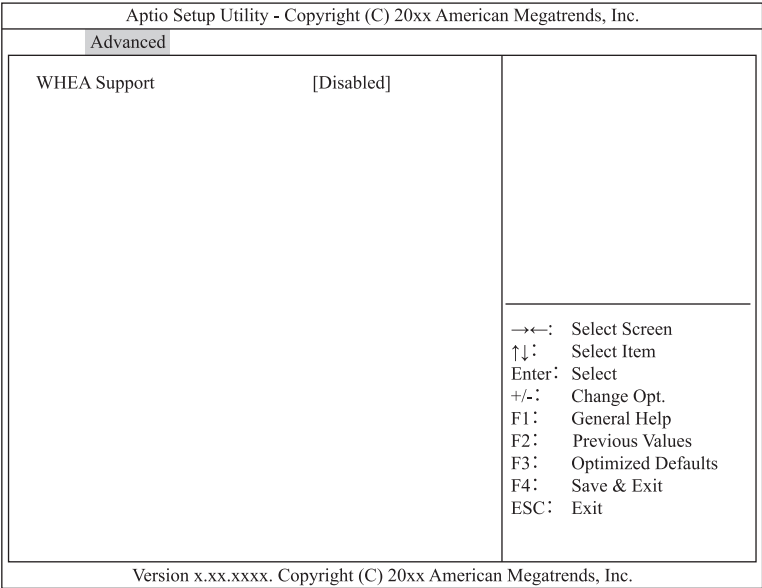


When the system unit is restarted while **TPM SUPPORT** is enabled, **TPM State** may be enabled after starting the setup menu in the first time. In this case, also you should save the setting of setup menu.

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## WHEA Configuration

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-9: WHEA Configuration submenu**

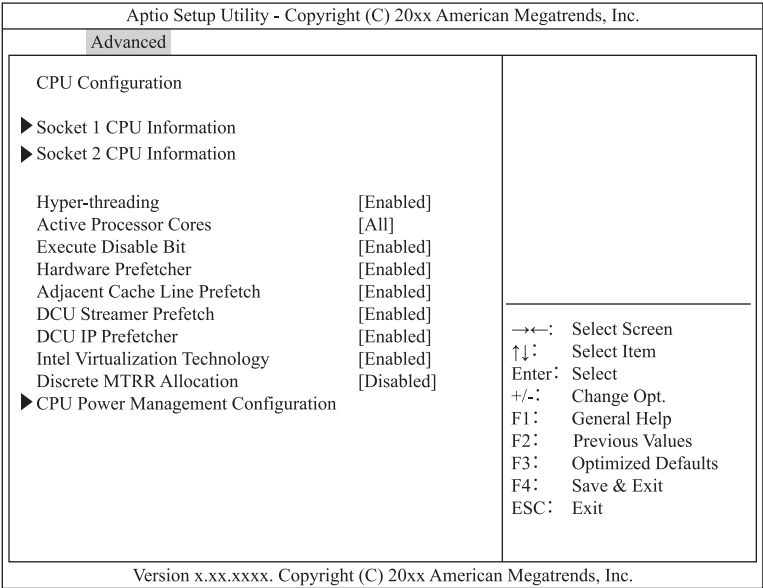
The following table shows description of menu items.

**Table 1-7: WHEA Configuration submenu items**

Menu items	Selection*	Description
WHEA Support	<ul style="list-style-type: none"><li>▪ [Disabled]</li><li>▪ Enabled</li></ul>	Sets the Windows Hardware Error Architecture (WHEA) to enable.
* A value in square brackets, [ ], shows the default.		

# CPU Configuration

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-10: CPU Configuration submenu**



- Do not enable the settings of **Discrete MTRR Allocation**. If you change the settings, system BIOS may not start up.
- If you change the setting of **Intel Virtualization Technology**, save the setting and turn off the power of the system unit to allow the new setting to take effect.



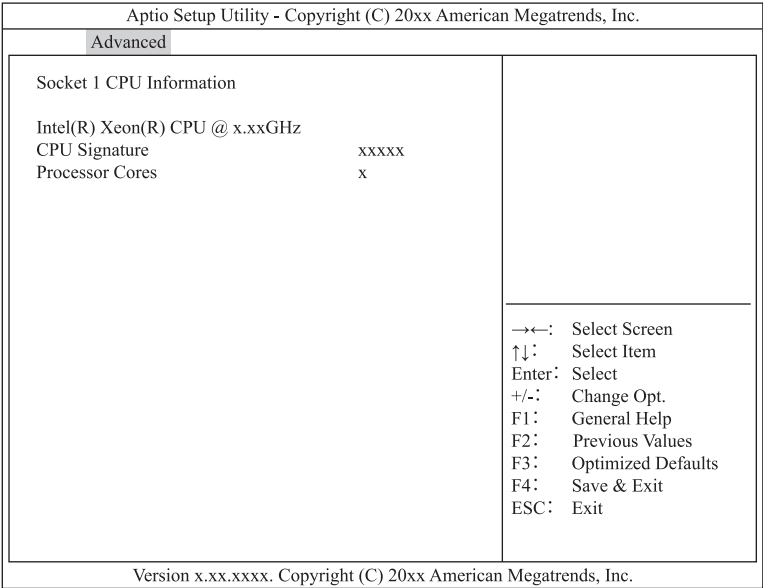
The following table shows description of menu items.

**Table 1-8: CPU Configuration submenu items**

Menu items	Selection <sup>1</sup>	Description
CPU Configuration		
Socket 1 CPU Information	-	Displays the <b>Socket 1/2 CPU Information</b> submenu.
Socket 2 CPU Information <sup>2 3</sup>	-	See <a href="#">Socket 1 CPU Information</a> for the details.
Hyper-threading <sup>4</sup>	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets CPU Hyper Threading.
Active Processor Cores	<ul style="list-style-type: none"> <li>▪ [All]</li> <li>▪ 1, 2, 4, 6</li> </ul>	Sets the number of running cores in the CPU package.
Execute Disable Bit	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	With "Disable", the response is always "0" for XD feature flag.
Hardware Prefetcher	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets CPU Data Prefetch.
Adjacent Cache Line Prefetch	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets CPU cache Prefetch.
DCU Streamer Prefetcher	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets DCU Streamer Prefetch function.
DCU IP Prefetcher	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets DCU IP Prefetch function.
Intel Virtualization Technology	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets Vanderpool Technology, which is Intel's new virtualization technology.
Discrete MTRR Allocation	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets discrete caching.
CPU Power Management Configuration	-	Displays the <b>CPU Power Management Configuration</b> submenu. See <a href="#">CPU Power Management Configuration</a> for the details.
<b>Notes:</b> <ol style="list-style-type: none"> <li>1 A value in square brackets, [ ], shows the default.</li> <li>2 This submenu items are same as the <b>Socket 1 CPU Information</b> submenu.</li> <li>3 This item is displayed <b>Socket 2 Not Present</b> when the processor is not installed to the CPU socket 2.</li> <li>4 This item is not displayed when the CPU installed in the system unit is not supporting the Hyper Threading function.</li> </ol>		

## Socket 1 CPU Information

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-11: Socket 1 CPU Information submenu**

The following table shows description of menu items.

**Table 1-9: Socket 1 CPU Information submenu items**

Menu items	Description
Socket 1 CPU Information	
Intel(R) Xeon® CPU @ x.xxGHz	Displays the type of CPU.
CPU Signature	Displays the stepping of CPU.
Processor Core	Displays the number of cores in the CPU package.

## CPU Power Management Configuration

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.	
Advanced	
CPU Power Management Configuration	
Power Technology	[Custom]
EIST	[Enabled]
Turbo Mode	[Enabled]
P-STATE Coordination	[HW_ALL]
CPU C3 Report	[Disabled]
CPU C6 report	[Enabled]
CPU C7 report	[Disabled]
Package C State limit	[C2]
Energy Performance	[Balanced Performance]
Frequency Floor Override	[Disabled]
<div>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</div>	
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.	

**Figure 1-12: CPU Power Management Configuration submenu**



Do not enable the settings of **Frequency Floor Override**. If you change the settings, the CPU power management may be adversely affected.

The following table shows description of menu items.

**Table 1-10: CPU Power Management Configuration submenu items**

Menu items	Selection <sup>1</sup>	Description
CPU Power Management Configuration		
Power Technology	<ul style="list-style-type: none"> <li>Disabled</li> <li>Energy Efficient</li> <li>[Custom]</li> </ul>	Sets CPU power technology function.
EIST <sup>2</sup>	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets CPU EIST, which makes effect after the reboot.
Turbo Mode <sup>3 4</sup>	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets CPU Turbo Mode, which makes effect after the reboot.
P-STATE Coordination <sup>3</sup>	<ul style="list-style-type: none"> <li>[HW_ALL]</li> <li>SW_ALL</li> <li>SW_ANY</li> </ul>	Sets the ACPI P-State coordination. <b>HW_ALL</b> : Processor hardware is responsible. <b>SW_ALL</b> : OS Power Manager is responsible (all of logical processor). <b>SW_ANY</b> : OS Power Manager is responsible (any of logical processor).
CPU C3 Report <sup>2</sup>	<ul style="list-style-type: none"> <li>[Disabled]</li> <li>ACPI C-2</li> <li>ACPI C-3</li> </ul>	Sets CPU C2 or C3 Power States, which makes effect after the reboot.
CPU C6 report <sup>2</sup>	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets CPU C6 Power States, which makes effect after the reboot.
CPU C7 report <sup>2</sup>	<ul style="list-style-type: none"> <li>[Disabled]</li> <li>Enabled</li> </ul>	Sets CPU C6 Power States, which makes effect after the reboot.
Package C State limit <sup>2</sup>	<ul style="list-style-type: none"> <li>C0</li> <li>[C2]</li> <li>C6</li> <li>C7</li> <li>No limit</li> </ul>	Sets state for the C-State package limit.
Energy Performance	<ul style="list-style-type: none"> <li>Performance</li> <li>[Balanced Performance]</li> <li>Blanced Energy</li> <li>Energy Efficient</li> </ul>	Sets the policy of power consumption.
Frequency Floor Override	<ul style="list-style-type: none"> <li>[Disabled]</li> <li>Enabled</li> </ul>	Sets the ACPI P-State limit.
<b>Notes:</b> <ol style="list-style-type: none"> <li>1 A value in square brackets, [ ], shows the default.</li> <li>2 This item is displayed when <b>Power Technology</b> is set <b>Custom</b>.</li> <li>3 This item is displayed when <b>Power Technology</b> is set <b>Custom</b> and <b>EIST</b> is set <b>Enabled</b>.</li> <li>4 This item is not displayed when the CPU installed in the system unit is not supporting the Turbo Mode function.</li> </ol>		

## Runtime Error Logging

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.	
Advanced	
Runtime Error Logging Support	[Enabled]
PCI Error Logging Support	[Enabled]
<div>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</div>	
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.	

**Figure 1-13: Runtime Error Logging submenu**



Do not disable the settings of **Runtime Error Logging Support** and **PCI Error Logging Support**. If you change the settings, system BIOS will not report error information.

The following table shows description of menu items.

**Table 1-11: Runtime Error Logging submenu items**

Menu items	Selection <sup>1</sup>	Description
Runtime Error Logging Support	<ul style="list-style-type: none"><li>Disabled</li><li>[Enabled]</li></ul>	Sets runtime error logging function.
PCI Error Logging Support <sup>2</sup>	<ul style="list-style-type: none"><li>Disabled</li><li>[Enabled]</li></ul>	Sets PCI error logging function.
<b>Notes:</b>  1 A value in square brackets, [ ], shows the default. 2 This item is displayed when <b>Runtime Error Logging Support</b> is set <b>Enabled</b> .		

## SATA Configuration

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.	
Advanced	
SATA Configuration	
SATA Port0	Not Present
SATA Port1	Not Present
SATA Port2	Not Present
SATA Port3	Not Present
SATA Port4	xxxxxxx
SATA Port5	Not Present
SATA Mode	[AHCI Mode]
<div>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</div>	
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.	

**Figure 1-14: SATA Configuration submenu**

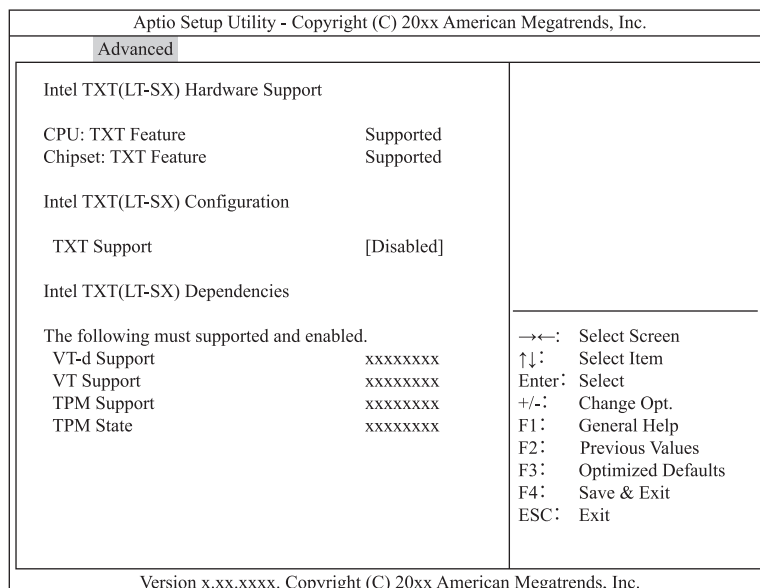
The following table shows description of menu items.

**Table 1-12: SATA Configuration submenu items**

Menu items	Selection <sup>1</sup>	Description
SATA Configuration		
SATA Port0	-	Displays the device information of connected to SATA port. SATA Port4 will display installed DVD-ROM drive.
SATA Port1		
SATA Port2		
SATA Port3		
SATA Port4		
SATA Port5		
SATA Mode	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ IDE Mode</li> <li>▪ [AHCI Mode]</li> </ul>	Sets SATA mode.
Serial-ATA Controller0 <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ Enhanced</li> <li>▪ [Compatible]</li> </ul>	Sets SATA controller0 to enable.
Serial-ATA Controller1 <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets SATA controller1 to enable.
<b>Notes:</b> 1 A value in square brackets, [ ], shows the default. 2 This item is displayed when <b>SATA Mode</b> is set <b>IDE Mode</b> .		

## Intel TXT(LT-SX) Configuration

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-15: Intel TXT(LT-SX) Configuration submenu**

The following table shows description of menu items.

**Table 1-13: Intel TXT(LT-SX) Configuration submenu items**

Menu items	Selection <sup>1</sup>	Description
Intel TXT(LT-SX)Hardware Support		
CPU: TXT Feature	-	Displays the TXT support status of CPU.
Chipset: TXT Feature	-	Displays the TXT support status of Chipset.
Intel TXT(LT-SX) Configuration		
TXT Support <sup>2</sup>	<ul style="list-style-type: none"> <li>[Disabled]</li> <li>Enabled</li> </ul>	Sets the TXT function to enable.
Intel TXT(LT-SX) Dependencies		
VT-d Support	-	Displays the VT-d function status.
VT Support	-	Displays the VT function status.
TPM Support	-	Displays the TPM enable status.
TPM State	-	Displays the TPM use status.
<b>Notes:</b> <ul style="list-style-type: none"> <li>1 A value in square brackets, [ ], shows the default.</li> <li>2 This setting can be changed when <b>VT-d Support</b>, <b>VT Support</b>, <b>TPM SUPPORT</b>, and <b>TPM State</b> are <b>Enabled</b>.</li> </ul>		



# USB Configuration

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.	
Advanced	
USB Configuration	
USB Devices: x Drives, x Keyboards, x Mice, x Hubs	
Legacy USB Support	[Enabled]
EHCI Hand-off	[Disabled]
Port 60/64 Emulation	[Enabled]
USB hardware delays and time-outs:	
USB transfer time-out	[20 sec]
Device reset time-out	[20 sec]
Device power-up delay	[Auto]
Mass Storage Devices:	
xxxxxxxxxxxxxx	[Auto]
→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.	

Figure 1-16: USB Configuration submenu

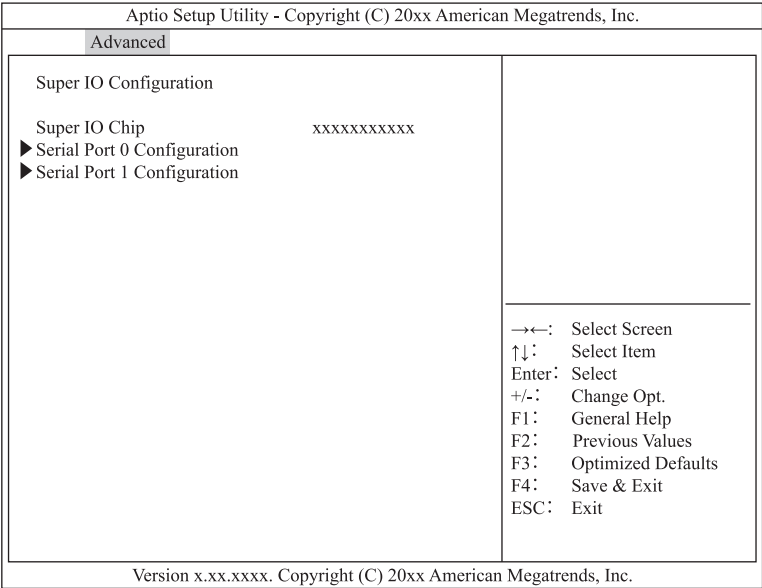
The following table shows description of menu items.

**Table 1-14: USB Configuration submenu items**

Menu items	Selection <sup>1</sup>	Description
USB Configuration		
USB Device	-	Displays the detected USB devices.
Legacy USB Support	<ul style="list-style-type: none"> <li>▪ [Enabled]</li> <li>▪ Disabled</li> <li>▪ Auto</li> </ul>	Sets USB devices to use in legacy mode.
EHCI Hand-off	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets USB legacy mode to disabled.
Port 60/64 Emulation	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets PS/2 keyboard/mouse emulation.
USB hardware delays and time-outs:		
USB transfer time-out	<ul style="list-style-type: none"> <li>▪ 1 sec</li> <li>▪ 5 sec</li> <li>▪ 10 sec</li> <li>▪ [20 sec]</li> </ul>	Sets USB transfer time-out.
Device reset time-out	<ul style="list-style-type: none"> <li>▪ 10 sec</li> <li>▪ [20 sec]</li> <li>▪ 30 sec</li> <li>▪ 40 sec</li> </ul>	Sets USB device reset time-out.
Device power-up delay	<ul style="list-style-type: none"> <li>▪ [Auto]</li> <li>▪ Manual</li> </ul>	Sets delay of USB device powering-up.
Device power-up delay in seconds <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ [5]</li> <li>▪ 1-40</li> </ul>	Sets delay time of USB device powering-up.
Mass Storage Devices: <sup>3</sup>		
xxxxxxxxxxxxxxxx <sup>3</sup>	<ul style="list-style-type: none"> <li>▪ [Auto]</li> <li>▪ Floppy</li> <li>▪ Forced FDD</li> <li>▪ Hard Disk</li> <li>▪ CD-ROM</li> </ul>	Sets the emulation mode of a USB mass storage device.
<b>Notes:</b> 1 A value in square brackets, [ ], shows the default. 2 This item is displayed when <b>Device power-up delay</b> is set <b>Manual</b> , but not supported. 3 This item is displayed when a USB mass storage device is connected to the system unit.		

## Super IO Configuration

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-17: Super IO Configuration submenu**

The following table shows description of menu items.

**Table 1-15: Super IO Configuration submenu items**

Menu items	Description
Super IO Configuration	
Super IO Chip	Displays the super I/O device..
Serial Port 0 Configuration	Displays the <b>Serial Port 0/1 Configuration</b> submenu. See <a href="#">Serial Port 0 Configuration</a> for the details.
Serial Port 1 Configuration*	
* This submenu items are same as the Serial Port 0 Configuration submenu.	

## Serial Port 0 Configuration

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.	
Advanced	
Serial Port 0 Configuration	
Serial Port	[Enabled]
Device Settings	IO=3F8h; IRQ=4;
Change Settings	[Auto]
→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.	

**Figure 1-18: Serial Port 0 Configuration submenu**

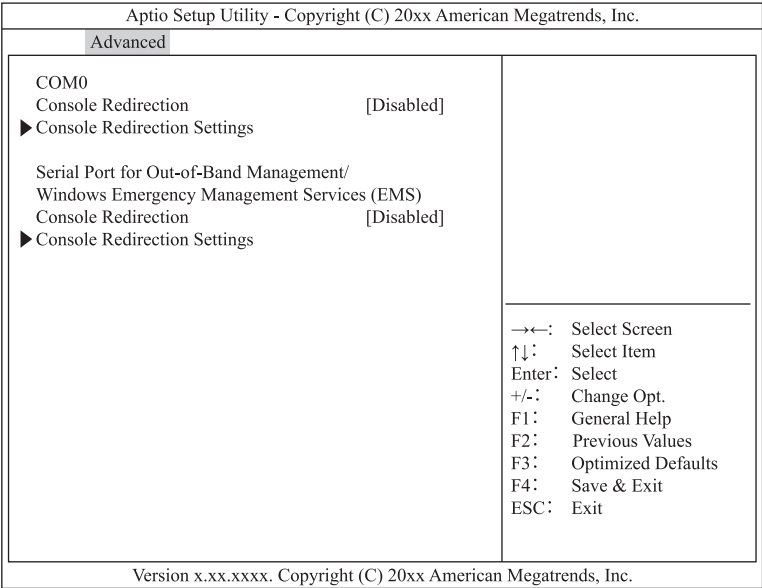
The following table shows description of menu items.

**Table 1-16: Serial Port 0 Configuration submenu items**

Menu items	Selection <sup>1</sup>	Description
Serial Port 0 Configuration		
Serial Port <sup>2</sup>	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets serial port 0 to enable.
Device Settings <sup>3</sup>	-	Displays serial port 0 setting.
Change Settings <sup>3</sup>	<ul style="list-style-type: none"> <li>[Auto]</li> <li>IO=3F8h; IRQ=4;</li> <li>IO=3F8h; IRQ=3,4,5,6,7,10,11,12;</li> <li>IO=2F8h; IRQ=3,4,5,6,7,10,11,12;</li> <li>IO=3E8h; IRQ=3,4,5,6,7,10,11,12;</li> <li>IO=2E8h; IRQ=3,4,5,6,7,10,11,12;</li> </ul>	Sets I/O and IRQ to serial port 0.
<b>Notes:</b> <ol style="list-style-type: none"> <li>1 A value in square brackets, [ ], shows the default.</li> <li>2 This item is set as <b>Disabled</b> in the <b>Serial Port 1 Configuration</b> submenu.</li> <li>3 This item is displayed when <b>Serial Port</b> is set <b>Enabled</b>.</li> </ol>		

# Serial Port Console Redirection

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-19: Serial Port Console Redirection submenu**



Do not enable the settings of **Serial Port Console Redirection** items. This function is not supported by Hitachi Compute Rack System.

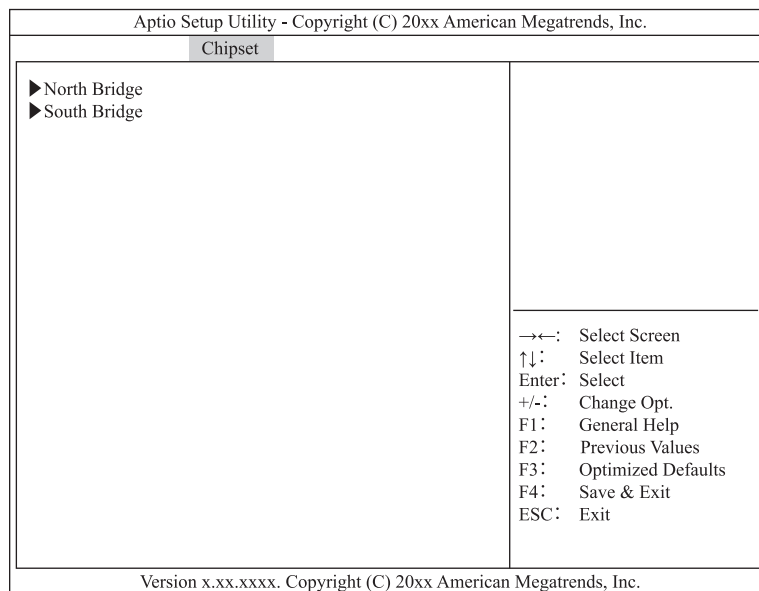
The following table shows description of menu items.

**Table 1-17: Serial Port Console Redirection submenu items**

Menu items	Selection*	Description
COM0		
Console Redirection	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets console redirection function to enable.
Console Redirection Settings	-	Displays the Console Redirection Settings submenu.  This submenu can not change settings because <b>Console Redirection</b> is <b>Disabled</b> .
Serial Port for Out-Band Management/Windows Emergency Management Services (EMS)		
Console Redirection	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets console redirection function to enable.
Console Redirection Settings	-	Displays the Console Redirection Settings submenu.  This submenu can not change settings because <b>Console Redirection</b> is <b>Disabled</b> .
* A value in square brackets, [ ], shows the default.		

## Chipset

Move the cursor in the menu bar to select the **Chipset** menu.



**Figure 1-20: Chipset menu**

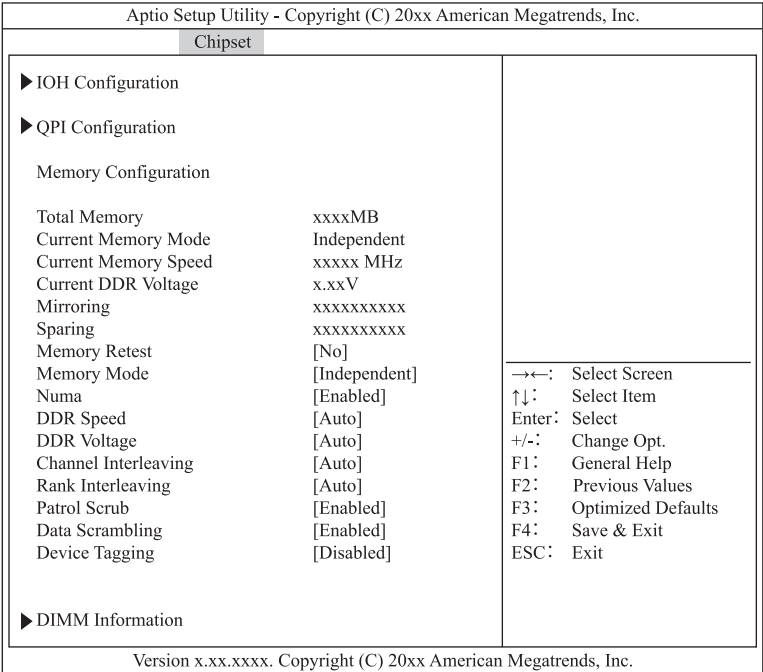
The following table shows description of menu items in the left pane of window.

**Table 1-18: Chipset menu items**

Menu items	Description
North Bridge	Displays the <b>North Bridge</b> submenu. See <a href="#">North Bridge</a> for the details.
South Bridge	Displays the <b>South Bridge</b> submenu. See <a href="#">South Bridge</a> for the details.

# North Bridge

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-21: North Bridge submenu**



- If you change the setting of **NUMA**, save the setting and turn off the power of the system unit to allow the new setting to take effect.
- Do not change the settings of **DDR Speed**. If you change the settings, the system unit may not operate properly.
- Do not change the settings of **Channel Interleaving** and **Rank Interleaving**. If you change the settings, memory performance may be degraded.



The following table shows description of menu items.

**Table 1-19: North Bridge submenu items**

Menu items	Selection <sup>1</sup>	Description
IOH Configuration	-	Displays the <b>IOH Configuration</b> submenu. See <a href="#">IOH Configuration</a> for the details.
QPI Configuration	-	Displays the <b>QPI Configuration</b> submenu. See <a href="#">QPI Configuration</a> for the details.
Memory Configuration		
Total Memory <sup>2</sup>	-	Displays the total memory size.
Current Memory Mode	-	Displays the current memory mode.
Current Memory Speed	-	Displays current memory speed.
Current DDR Voltage	-	Displays current voltage of DIMM.
Mirroring	-	Displays whether mirror mode is possible on the installed memory configuration.
Sparing	-	Displays whether spare mode is possible on the installed memory configuration.
Memory Retest	<ul style="list-style-type: none"> <li>▪ No</li> <li>▪ [Yes]</li> </ul>	Sets the memory information to clear. If you want to clear the error information of disabled memory and clear the disabled state, set <b>Yes</b> after you replace the DIMM.
Memory Mode	<ul style="list-style-type: none"> <li>▪ [Independent]</li> <li>▪ Mirroring</li> <li>▪ Lock Step</li> <li>▪ Sparing</li> </ul>	Selects the memory operating mode.
Numa <sup>3</sup>	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets Non-Uniform Memory Access (NUMA) to enable.
DDR Speed	<ul style="list-style-type: none"> <li>▪ [Auto]</li> <li>▪ Force DDR3 800</li> <li>▪ Force DDR3 1066</li> <li>▪ Force DDR3 1333</li> <li>▪ Force DDR3 1600</li> </ul>	Sets clock speed of DDR.
DDR Voltage	<ul style="list-style-type: none"> <li>▪ [Auto]</li> <li>▪ 1.5V</li> </ul>	Sets voltage of DIMM.
Channel Interleaving	<ul style="list-style-type: none"> <li>▪ [Auto]</li> <li>▪ 1-way</li> <li>▪ 2-way</li> <li>▪ 3-way</li> <li>▪ 4-way</li> </ul>	Sets the memory channel interleaving.
Rank Interleaving	<ul style="list-style-type: none"> <li>▪ [Auto]</li> <li>▪ 1-way</li> <li>▪ 2-way</li> <li>▪ 4-way</li> <li>▪ 8-way</li> </ul>	Sets the rank of memory interleaving.

Menu items	Selection <sup>1</sup>	Description
Patrol Scrub	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets the patrol scrubbing which proactively searches the memory to repair correctable errors.
Data Scrambling	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets the memory data scrambling.
Device Tagging	<ul style="list-style-type: none"> <li>[Disabled]</li> <li>Enabled</li> </ul>	Set the device tagging on DIMM.
DIMM Information	-	Displays the <b>DIMM Information</b> submenu. See <a href="#">DIMM Information</a> for the details.
<b>Notes:</b> <ol style="list-style-type: none"> <li>1 A value in square brackets, [ ], shows the default.</li> <li>2 If <b>Memory Mode</b> is set <b>Mirroring</b>, half of the installed memory is used for mirroring. The capacity displayed in <b>Total Memory</b> is half of the installed memory size. If <b>Memory Mode</b> is set <b>Sparing</b>, for each channel, one rank from the installed DIMMs are used as spare memory. Depending on whether the installed DIMMs are single-rank or dual-rank, the capacity displayed in <b>Total Memory</b> is different. The capacity displayed <b>Total Memory</b> is as follows: <ul style="list-style-type: none"> <li>- If single-rank DIMMs are installed: 1/2 (2DIMM per channel) or 2/3 (3DIMM per Channel) of the installed memory size.</li> <li>- If dual-rank DIMMs are installed: 3/4 (2DIMM per Channel) or 5/6 (3DIMM per Channel) of the installed memory size.</li> </ul> </li> <li>3 This item is displayed when installing two CPUs in the system unit.</li> </ol>		

## Memory Mode

In order to enable memory redundancy, you can set the memory mirroring function, the lock step function or the online spare memory function.

- If you use memory mirroring, set **Mirroring**.
- If you use memory lock step, set **Lock Step**.
- If you use online spare memory, set **Sparing**.

When you use memory mirroring, memory lock step, or online spare memory, you need to understand the restrictions on the configuration of memory boards. See *Hitachi Compute Rack 210H User's Guide* or *Hitachi Compute Rack 220H User's Guide*.

## DDR Voltage

The memory 1600 RDIMM should satisfy the following conditions to perform as high as 1600 MHz when the memory 1600 RDIMM is mounted in the system unit.

- Changed from Auto to 1.5V for the configuration of DDR Voltage.
- Xeon processor E5-2670 or E5-2690 should be mounted, and the number of mounted DIMM should be 1DPC\* or 2DPC\*.

\* DPC (DIMM per channel) is the number of DIMM per channel.

- 1DPC: Less than or equal to 1 DIMM is mounted in each channel.
- 2DPC: 2 DIMMs are mounted in even one of channels.
- 3DPC: 3 DIMMs are mounted in even one of channels.

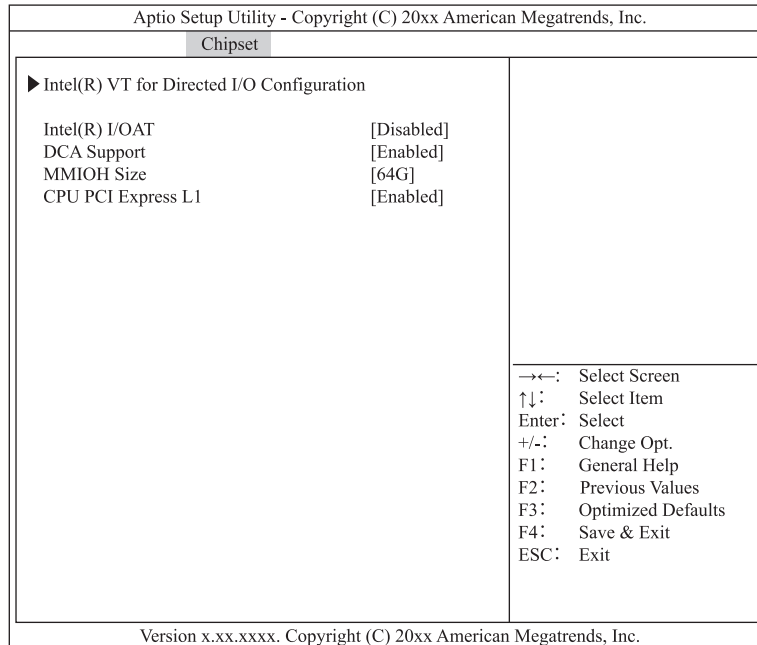
## Device Tagging

You can use device tagging, where redundancy is enabled at the DRAM chip level so that the system unit can avoid system down and can continue operation even when one DRAM chip on the DIMM fails.

Device tagging is not operated when you set **Memory Mode** to **Mirroring**, **Lock Step**, or **Sparing**. If you use device tagging, set **Memory Mode** to **Independent**.

## IOH Configuration

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-22: IOH Configuration submenu**

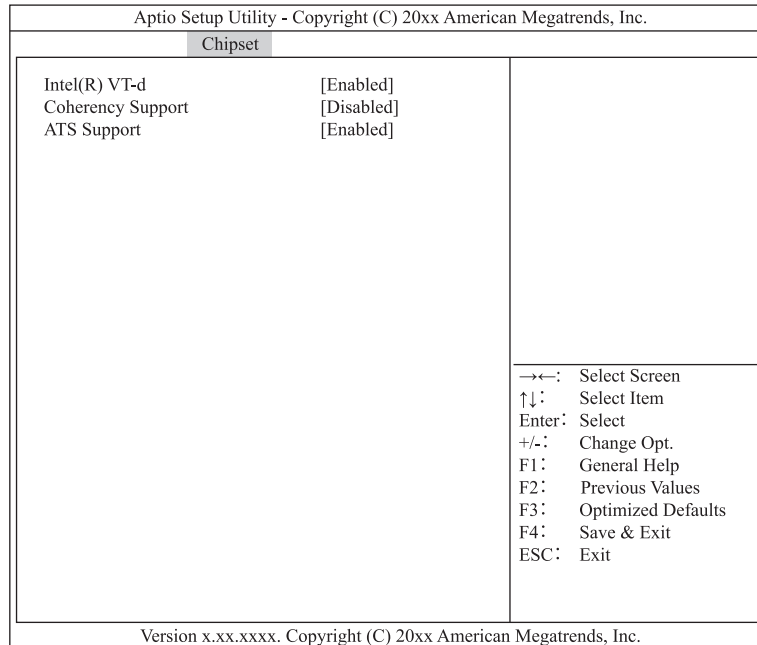
The following table shows description of menu items.

**Table 1-20: IOH Configuration submenu items**

Menu items	Selection*	Description
Intel(R) VT for Directed I/O Configuration	-	Displays the <b>Intel(R) VT for Directed I/O Configuration</b> submenu. See <a href="#">Intel(R) VT for Directed I/O Configuration</a> for the details.
Intel(R) I/OAT	<ul style="list-style-type: none"> <li>[Disabled]</li> <li>Enabled</li> </ul>	Sets Intel I/O Acceleration Technology to enable.
DCA Support	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets QPI DCA to enable..
MMIOH Size	<ul style="list-style-type: none"> <li>[64G]</li> <li>1G, 2G, 4G, 8G, 16G, 32G, 128G</li> </ul>	Sets the size of the memory-mapped I/O above 4GB address.
CPU PCI Express L1	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets the power saving function (L1) by the CPU.
* A value in square brackets, [ ], shows the default.		

## Intel(R) VT for Directed I/O Configuration

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-23: Intel(R) VT for Directed I/O Configuration submenu**

The following table shows description of menu items.

**Table 1-21: Intel(R) VT for Directed I/O Configuration submenu items**

Menu items	Selection <sup>1</sup>	Description
Intel(R) VT-d	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets Intel VT-d to enable.
Coherency Support <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets coherency mode.
ATS Support <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets the address translation service (ATS) to enable.
<b>Notes:</b> <ul style="list-style-type: none"> <li>1 A value in square brackets, [ ], shows the default.</li> <li>2 This item is displayed when <b>Intel(R) VT-d</b> is set <b>Enabled</b>.</li> </ul>		

## QPI Configuration

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.	
Chipset	
Current QPI Link Speed	xxxx
Current QPI Link Freq	x.xGT/s
Isoc	[Enabled]
QPI Link Speed Mode	[Fast]
QPI Link Frequency Select	[Auto]
QPI Link0p	[Disabled]
QPI Link1	[Disabled]
Alernate RTID	[Disabled]

→←:	Select Screen
↑↓:	Select Item
Enter:	Select
+/-:	Change Opt.
F1:	General Help
F2:	Previous Values
F3:	Optimized Defaults
F4:	Save & Exit
ESC:	Exit

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**Figure 1-24: QPI Configuration submenu**

The following table shows description of menu items.

**Table 1-22: QPI Configuration submenu items**

Menu items	Selection <sup>1</sup>	Description
Current QPI Link Speed	-	Displays current QPI link mode.
Current QPI Link Freq <sup>2</sup>	-	Displays current QPI link speed.
Isoc	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets QPI isochronous.
QPI Link Speed Mode	<ul style="list-style-type: none"> <li>▪ [Fast]</li> <li>▪ Slow</li> </ul>	Sets QPI link mode.
QPI Link Frequency Select	<ul style="list-style-type: none"> <li>▪ [Auto]</li> <li>▪ 6.4 GT/s</li> <li>▪ 7.2 GT/s</li> <li>▪ 8.0 GT/s</li> </ul>	Sets QPI link speed.
QPI LinkOp	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets QPI power saving mode (L0p) to enable.
QPI Link1	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets QPI power saving mode (L1) to enable.
Alternate RTID	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets the transaction ID to enable.
<b>Notes:</b> 1 A value in square brackets, [ ], shows the default. 2 This item is displayed <b>Unknown</b> when installing one CPU in the system unit.		

## DIMM Information

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.		
Chipset		
CPU 1 DIMM Information		
CPU1_DIMM3 (Ch 2 Dimm 0)	xxxxxxxxxx	
CPU1_DIMM7 (Ch 2 Dimm 1)	xxxxxxxxxx	
CPU1_DIMM11 (Ch 2 Dimm 2)	xxxxxxxxxx	
CPU1_DIMM4 (Ch 3 Dimm 0)	xxxxxxxxxx	
CPU1_DIMM8 (Ch 3 Dimm 1)	xxxxxxxxxx	
CPU1_DIMM12 (Ch 3 Dimm 2)	xxxxxxxxxx	
CPU1_DIMM10 (Ch 1 Dimm 2)	xxxxxxxxxx	
CPU1_DIMM6 (Ch 1 Dimm 1)	xxxxxxxxxx	
CPU1_DIMM2 (Ch 1 Dimm 0)	xxxxxxxxxx	
CPU1_DIMM9 (Ch 0 Dimm 2)	xxxxxxxxxx	
CPU1_DIMM5 (Ch 0 Dimm 1)	xxxxxxxxxx	
CPU1_DIMM1 (Ch 0 Dimm 0)	xxxxxxxxxx	
CPU 2 DIMM Information		
CPU2_DIMM3 (Ch 2 Dimm 0)	xxxxxxxxxx	
CPU2_DIMM7 (Ch 2 Dimm 1)	xxxxxxxxxx	
CPU2_DIMM11 (Ch 2 Dimm 2)	xxxxxxxxxx	
CPU2_DIMM4 (Ch 3 Dimm 0)	xxxxxxxxxx	
CPU2_DIMM8 (Ch 3 Dimm 1)	xxxxxxxxxx	
CPU2_DIMM12 (Ch 3 Dimm 2)	xxxxxxxxxx	
CPU2_DIMM10 (Ch 1 Dimm 2)	xxxxxxxxxx	
CPU2_DIMM6 (Ch 1 Dimm 1)	xxxxxxxxxx	
CPU2_DIMM2 (Ch 1 Dimm 0)	xxxxxxxxxx	
CPU2_DIMM9 (Ch 0 Dimm 2)	xxxxxxxxxx	
CPU2_DIMM5 (Ch 0 Dimm 1)	xxxxxxxxxx	
CPU2_DIMM1 (Ch 0 Dimm 0)	xxxxxxxxxx	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.		

**Figure 1-25: DIMM Information submenu**



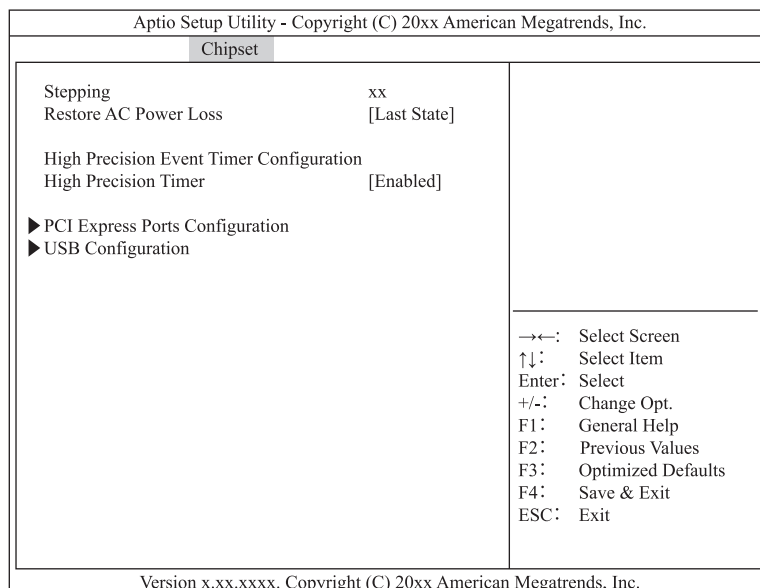
The following table shows description of menu items.

**Table 1-23: DIMM Information submenu items**

Menu items	Description
CPU 1 DIMM Information	
CPU1_DIMM3 (Ch 2 Dimm0) CPU1_DIMM7 (Ch 2 Dimm0) CPU1_DIMM11 (Ch 2 Dimm2) CPU1_DIMM4 (Ch 3 Dimm0) CPU1_DIMM8 (Ch 3 Dimm1) CPU1_DIMM12 (Ch 3 Dimm2) CPU1_DIMM10 (Ch 1 Dimm2) CPU1_DIMM6 (Ch 1 Dimm1) CPU1_DIMM2 (Ch 1 Dimm0) CPU1_DIMM9 (Ch 0 Dimm2) CPU1_DIMM5 (Ch 0 Dimm1) CPU1_DIMM1 (Ch 0 Dimm0)	Displays the DIMM information which is installed in DIMM slots for CPU1.  Memory size "xxxx <b>MB</b> " : DIMM is available* <b>Not Present</b> : DIMM is not installed in the DIMM slot <b>Disabled</b> : DIMM is disabled cause error.
CPU 2 DIMM Information	
CPU2_DIMM3 (Ch 2 Dimm0) CPU2_DIMM7 (Ch 2 Dimm0) CPU2_DIMM11 (Ch 2 Dimm2) CPU2_DIMM4 (Ch 3 Dimm0) CPU2_DIMM8 (Ch 3 Dimm1) CPU2_DIMM12 (Ch 3 Dimm2) CPU2_DIMM10 (Ch 1 Dimm2) CPU2_DIMM6 (Ch 1 Dimm1) CPU2_DIMM2 (Ch 1 Dimm0) CPU2_DIMM9 (Ch 0 Dimm2) CPU2_DIMM5 (Ch 0 Dimm1) CPU2_DIMM1 (Ch 0 Dimm0)	Displays the DIMM information which installed in DIMM slots for CPU2.  Memory size "xxxx <b>MB</b> " : DIMM is available* <b>Not Present</b> : DIMM is not installed in the DIMM slot <b>Disabled</b> : DIMM is disabled cause error.
* This item displays <b>0 MB</b> when DIMM is set to redundancy for memory mirroring function, lock step function or online spare memory function.	

## South Bridge

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-26: South Bridge submenu**

The following table shows description of menu items.

**Table 1-24: South Bridge submenu items**

Menu items	Selection*	Description
Stepping	-	Displays the stepping of the chipset.
Restore AC Power Loss	<ul style="list-style-type: none"> <li>Power Off</li> <li>Power On</li> <li>[Last State]</li> </ul>	Selects a status after restore AC power loss.
High Precision Event Timer Configuration		
High Precision Timer	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets the high precision event timer.
PCI Express Ports Configuration	-	Displays the <b>PCI Express Ports Configuration</b> submenu. See <a href="#">PCI Express Ports Configuration</a> for the details.
USB Configuration	-	Displays the <b>USB Configuration</b> submenu. See <a href="#">USB Configuration</a> for the details.
* A value in square brackets, [ ], shows the default.		

## PCI Express Ports Configuration

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.	
Chipset	
PCI Express Ports Configuration	
Onboard VGA	[Enabled]
PCH PCI Express L1	[Enabled]
DMI Vc1 Control	[Enabled]
DMI Vcp Control	[Enabled]
DMI Vcm Control	[Enabled]
→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.	

**Figure 1-27: PCI Express Ports Configuration submenu**



Do not disable the settings of **Onboard VGA**. If you change this, the video signals are not output from the system unit.

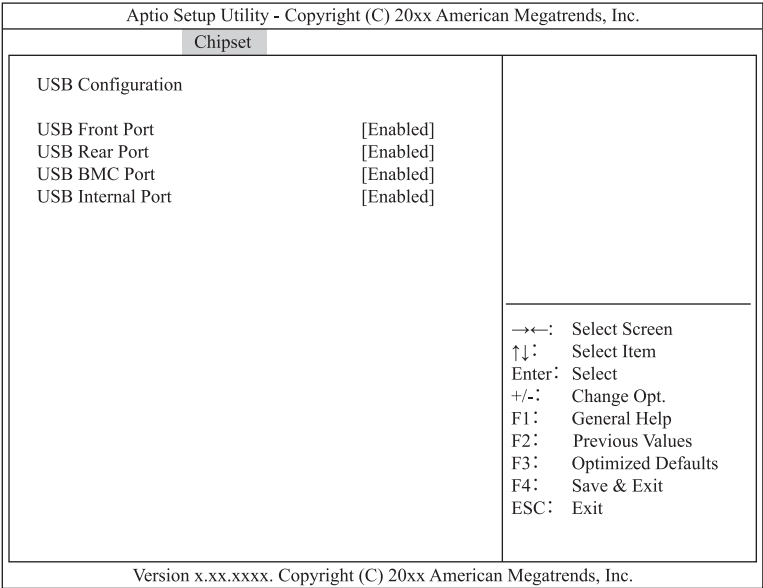
The following table shows description of menu items.

**Table 1-25: PCI Express Ports Configuration submenu items**

Menu items	Selection*	Description
PCI Express Ports Configuration		
Onboard VGA	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets the onboard VGA.
PCH PCI Express L1	<ul style="list-style-type: none"> <li>[Enabled]</li> <li>Disabled</li> </ul>	Sets power saving function (L1) by the PCH.
DMI Vc1 Control	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets virtual channel (Vc1) on the DMI bus to enable.
DMI Vcp Control	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets virtual channel (Vcp) on the DMI bus to enable.
DMI Vcm Control	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets virtual channel (Vcm) on the DMI bus to enable.
* A value in square brackets, [ ], shows the default.		

## USB Configuration

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-28: USB Configuration submenu**



Do not disable the all settings of **USB Configuration**. If you change these, you cannot use a keyboard connected to the system unit.

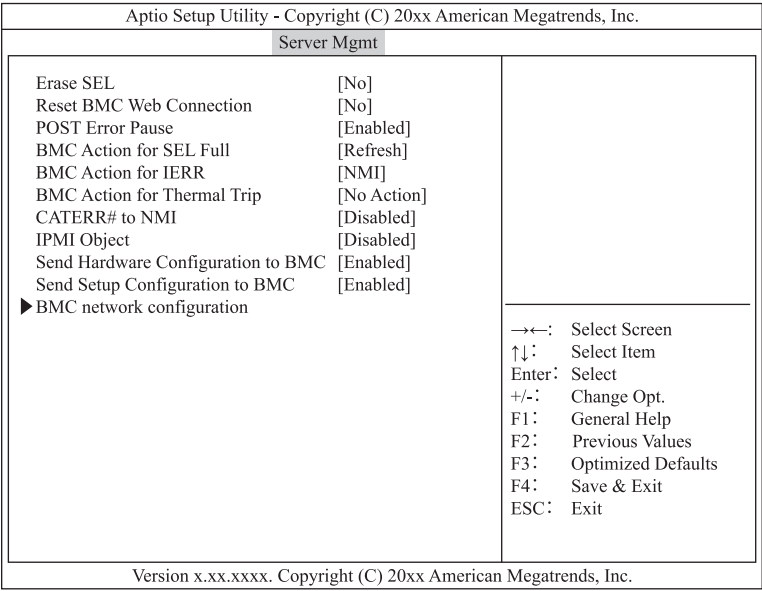
The following table shows description of menu items.

**Table 1-26: USB Configuration submenu items**

Menu items	Selection*	Description
USB Configuration		
USB Front Port	<ul style="list-style-type: none"><li>Disabled</li><li>[Enabled]</li></ul>	Sets the front USB port to enable.
USB Rear Port	<ul style="list-style-type: none"><li>Disabled</li><li>[Enabled]</li></ul>	Sets the rear USB port to enable.
USB BMC Port	<ul style="list-style-type: none"><li>Disabled</li><li>[Enabled]</li></ul>	Sets the BMC USB port to enable.
USB Internal Port	<ul style="list-style-type: none"><li>Disabled</li><li>[Enabled]</li></ul>	Sets the internal USB port to enable.
* A value in square brackets, [ ], shows the default.		

# ServerMgmt

Move the cursor in the menu bar to select the **ServerMgmt** menu.



**Figure 1-29: ServerMgmt menu**

The following table shows description of menu items.

**Table 1-27: ServerMgmt menu items**

Menu items	Selection*	Description
Erase SEL	<ul style="list-style-type: none"> <li>▪ [No]</li> <li>▪ Yes, On next reset</li> </ul>	Sets to clear the event log data.
Reset BMC Web Connection	<ul style="list-style-type: none"> <li>▪ [No]</li> <li>▪ Yes, On next reset</li> </ul>	Sets to clear the BMC network settings.
POST Error Pause	<ul style="list-style-type: none"> <li>▪ [Enabled]</li> <li>▪ Disabled</li> </ul>	Set to pause when errors occur during Power On Self Test (POST).
BMC Action for SEL Full	<ul style="list-style-type: none"> <li>▪ Keep</li> <li>▪ [Refresh]</li> </ul>	Selects an action when the event log data has maxed out.
BMC Action for IERR	<ul style="list-style-type: none"> <li>▪ [NMI]</li> <li>▪ Hard Reset</li> <li>▪ No Action</li> <li>▪ Power Cycle</li> </ul>	Selects a BMC action when CPU error occurs.
BMC Action for Thermal Trip	<ul style="list-style-type: none"> <li>▪ [No Action]</li> <li>▪ Power On</li> </ul>	Selects a BMC action when thermal trip occurs.
CATERR# to NMI	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets a NMI when detected a CATERR.
IPMI Object	<ul style="list-style-type: none"> <li>▪ [Disabled]</li> <li>▪ Enabled</li> </ul>	Sets the IPMI to enable.
Send Hardware Configuration to BMC	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets to sending hardware configuration data to BMC.
Send Setup Configuration to BMC	<ul style="list-style-type: none"> <li>▪ Disabled</li> <li>▪ [Enabled]</li> </ul>	Sets to sending setup configuration data to BMC.
BMC network configuration	-	Displays the <b>BMC network configuration</b> submenu. See <a href="#">BMC network configuration</a> for the details.
* A value in square brackets, [ ], shows the default.		

## BMC network configuration

Place the cursor on an item to display or set, and press **Enter**.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.	
Server Mgmt	
BMC network configuration	
Enabled DHCP	[Enabled]
IP address	xxx.xxx.xxx.xxx
Subnet mask	xxx.xxx.xxx.xxx
GateWay	xxx.xxx.xxx.xxx
Save Changes	[No]
→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.	

**Figure 1-30: BMC network configuration submenu**

The following table shows description of menu items.

**Table 1-28: BMC network configuration submenu items**

Menu items	Selection <sup>1</sup>	Description
BMC network configuration		
Enabled DHCP	<ul style="list-style-type: none"> <li>Disabled</li> <li>[Enabled]</li> </ul>	Sets to enable DHCP for BMC network.
IP address <sup>2</sup>	<ul style="list-style-type: none"> <li>[xxx.xxx.xxx.xxx]</li> </ul>	Sets the IP address to BMC network.
Subnet mask <sup>2</sup>	<ul style="list-style-type: none"> <li>[xxx.xxx.xxx.xxx]</li> </ul>	Sets the subnet mask to BMC network.
GateWay <sup>2</sup>	<ul style="list-style-type: none"> <li>[xxx.xxx.xxx.xxx]</li> </ul>	Sets the gateway to BMC network.
Save Changes	<ul style="list-style-type: none"> <li>[No]</li> <li>Yes, On next reset</li> </ul>	Save change settings of BMC network, which makes effect after the reboot.
<b>Notes:</b> <ul style="list-style-type: none"> <li>1 A value in square brackets, [ ], shows the default.</li> <li>2 This item setting is detected automatically when <b>Enabled DHCP</b> is <b>Enabled</b>.</li> </ul>		



When the BMC network setting is changed and saved, the reflecting time may take time for several tens of seconds until the setting is reflected to the BMC. The BMC network can not be connected in this time. The old value before setting may be displayed when confirming the BMC network setting with the system BIOS setup menu.

In this case, restart the system unit again. Check the BMC network setting and configuration if BMC network can not be connected after restarting.



- Setup for the BMC network settings is necessary when the remote management function is used. See *Hitachi Compute Rack 210H/220H Remote Management User's Guide*.
  - The DHCP address has lease period. We recommend that only using DHCP when setting up the system unit. Set disabled DHCP after setting up the system unit, and then changes a static IP address.
-



# Boot

Move the cursor in the menu bar to select the **Boot** menu.

Aptio Setup Utility - Copyright (C) 20xx American Megatrends, Inc.		
Main	Advanced	Chipset
Server Mgmt	Boot	Security
Save & Exit		
Boot Configuration		
Setup Prompt Timeout	1	
Boot Numlock State	[On]	
Quiet Boot	[Disabled]	
Boot Option Priorities Clear	[No]	
Boot Option Priorities		
Boot Option #1	[P4: xxxxxx ...]	
Boot Option #2	[xxxxxxxxxxxxxxxxxxxxx ...]	
Boot Option #3	[Built-in EFI Shell]	
CD/DVD ROM Drive BBS Priorities		
Hard Drive BBS Priorities		
Network Device BBS Priorities		
Floppy Drive BBS Priorities		
		→←: Select Screen
		↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version x.xx.xxxx. Copyright (C) 20xx American Megatrends, Inc.		

Figure 1-31: Boot menu

The following table shows description of menu items.

**Table 1-29: Boot menu items**

Menu items	Selection <sup>1</sup>	Description
Boot Configuration		
Setup Prompt Timeout	<ul style="list-style-type: none"> <li>[1]</li> <li>1-65535</li> </ul>	Sets the display time of the setup prompts during Power On Self Test (POST). This item setting must be 1 to 10.
Bootup NumLock State	<ul style="list-style-type: none"> <li>[On]</li> <li>Off</li> </ul>	Sets the numlock state at boot up.
Quiet Boot	<ul style="list-style-type: none"> <li>[Disabled]</li> <li>Enabled</li> </ul>	Sets whether to suppress messages during boot up.
Boot Option Priorities Clear	<ul style="list-style-type: none"> <li>[No]</li> <li>Yes</li> </ul>	Sets to clear the boot device priority settings.
Boot Option Priorities <sup>2</sup>		
Boot Option #1	<ul style="list-style-type: none"> <li>[P4: xxxxxxxx ...]</li> </ul>	Sets priorities of the boot devices.
Boot Option #2	<ul style="list-style-type: none"> <li>[(Bus xx Dev xx) PCI ...]</li> </ul>	
Boot Option #3	<ul style="list-style-type: none"> <li>[Built-in EFI Shell]</li> </ul>	
CD/DVD ROM Drive BBS Priorities <sup>3</sup>	-	Displays the CD/DVD ROM Drive BBS Priorities submenu. See <a href="#">CD/DVD ROM Drive BBS Priorities</a> for the details.
Hard Drive BBS Priorities <sup>3</sup>	-	Displays the Hard Drive BBS Priorities submenu. See <a href="#">Hard Drive BBS Priorities</a> for the details.
Network Device BBS Priorities <sup>4</sup>	-	Displays the Network Device BBS Priorities submenu.
Floppy Drive BBS Priorities <sup>3 5</sup>	-	Displays the Floppy Drive BBS Priorities submenu.
<b>Notes:</b> <ol style="list-style-type: none"> <li>1 A value in square brackets, [ ], shows the default.</li> <li>2 If you set <b>Advanced&gt;LAN1 PXE OpROM</b> or <b>LAN2 PXE OpROM</b>, PXE boot is enabled. <b>BRCM MBA Slot 0x0X ...</b> item is displayed in the <b>Boot Option Priorities</b> when PXE boot is enabled.</li> <li>3 These items' display order is changed by configuration of the system unit.</li> <li>4 This item is displayed when you set <b>Advanced&gt;LAN1 PXE OpROM</b> or <b>LAN2 PXE OpROM</b>, PXE boot is enabled.</li> <li>5 This item is displayed when you connect an external floppy disk drive to the system unit.</li> </ol>		

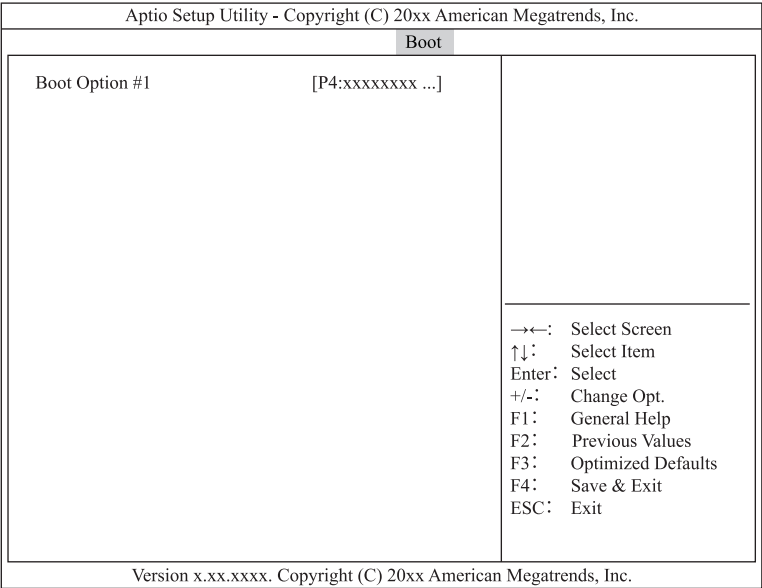
## Boot from Remote Console virtual device

When the Remote Console is enabled, the remote CD-ROM drive is displayed as **HITACHI Remote CD/DVD x.xx** in the **Network Device BBS Priorities** submenu and the remote floppy disk drive is displayed as **HITACHI Remote FD x.xx** in the **Floppy Drive BBS Priorities** submenu.

If you want to boot from the remote CD-ROM drive or the remote floppy drive on the Remote Console, change the priority for the **HITACHI Remote CD/DVD x.xx** or **HITACHI Remote FD x.xx** accordingly.

# CD/DVD ROM Drive BBS Priorities

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-32: CD/DVD ROM Drive BBS Priorities submenu**

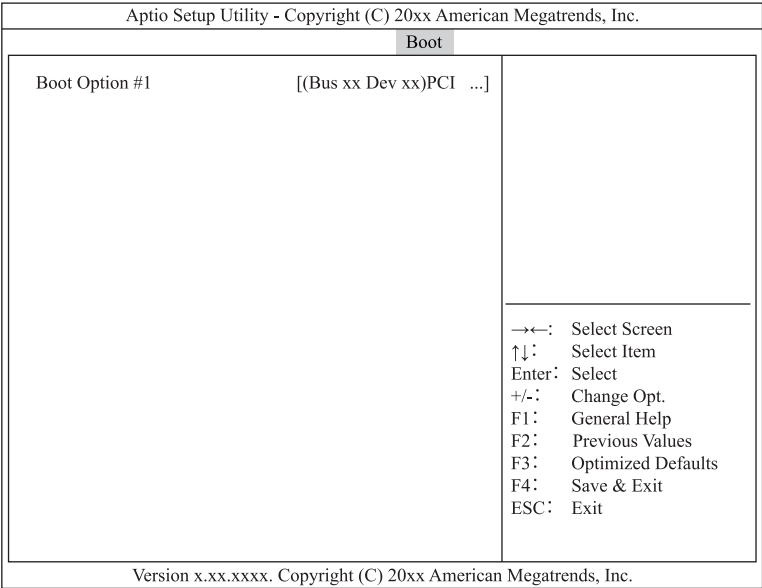
The following table shows description of menu items.

**Table 1-30: CD/DVD ROM Drive BBS Priorities submenu items**

Menu items	Selection*	Description
Boot Option #1	<ul style="list-style-type: none"> <li>[P4:xxxxxxx ...]</li> <li>Disabled</li> </ul>	Sets to enable the CD-ROM or DVD-ROM drive for boot up.
* A value in square brackets, [ ], shows the default.		

# Hard Drive BBS Priorities

Place the cursor on an item to display or set, and press **Enter**.



**Figure 1-33: Hard Drive BBS Priorities submenu**

The following table shows description of menu items.

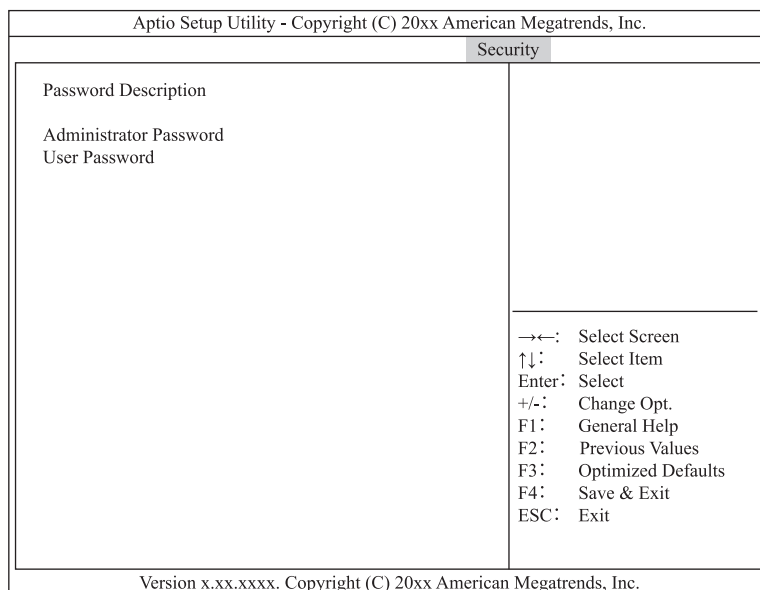
**Table 1-31: Hard Drive BBS Priorities submenu items**

Menu items	Selection*	Description
Boot Option #1	<ul style="list-style-type: none"><li>▪ [(Bus xx Dev xx)PCI RAID Adapter]</li><li>▪ Disabled</li></ul>	Sets to enable the HDD for boot up.
* A value in square brackets, [ ], shows the default.		

## Security

Move the cursor in the menu bar to select the **Security** menu.

This system does not support password setting in the **Security** menu. If you enter a password and then you forget the password, the system unit can no longer be used and must be repaired.



**Figure 1-34: Security menu**

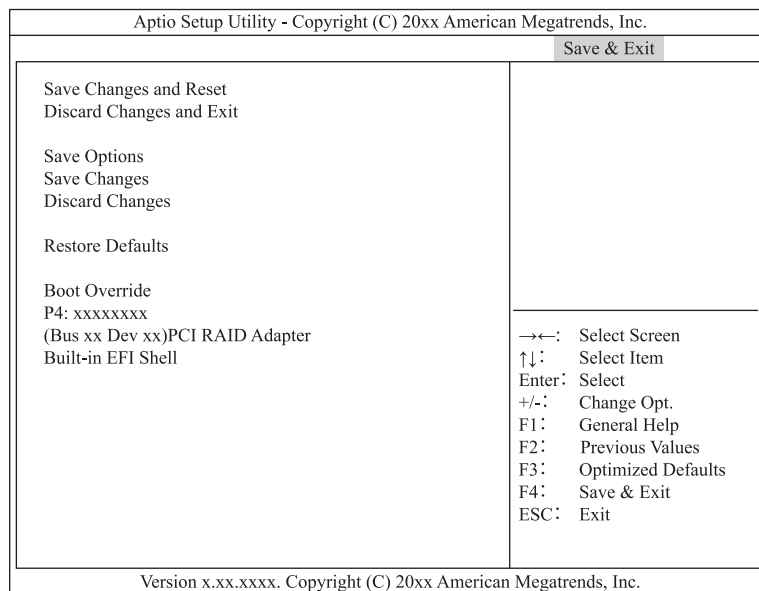
The following table shows description of menu items.

**Table 1-32: Security menu items**

Menu items	Selection	Description
Password Description		
Administrator Password	-	Sets an administrator password.
User Password	-	Sets a user password.

## Save & Exit

Move the cursor in the menu bar to select the **Save & Exit** menu.



**Figure 1-35: Save & Exit menu**

The following table shows description of menu items.

**Table 1-33: Save & Exit menu items**

Menu items	Selection	Description
Save Changes and Reset	-	Save the settings and reset the system BIOS.
Discard Changes and Exit	-	Exit the system BIOS setup menu without saving the settings.
Save Options		
Save Changes	-	Save the settings.
Discard Changes	-	Load previous settings.
Restore Defaults	-	Load optimized default settings.
Boot Override		
P4: xxxxxxxx	-	Selects the device to boot from.
(Bus xx Dev xx)PCI RAID Adapter	-	
Built-in EFI Shell	-	

## Exiting system BIOS setup menu

1. Press **F4** key.

A confirmation message to save the settings is displayed.

Save & reset	
Save configuration and reset?	
<input checked="" type="button" value="Yes"/>	<input type="button" value="No"/>

**Figure 1-36: Save & reset window**

2. Select **Yes** by moving cursor, and then press **Enter** key.

The settings in the system BIOS setup menu are saved. The system unit will be restarted.

If you want to go back to the menu, select **No** and press **ENTER** key.



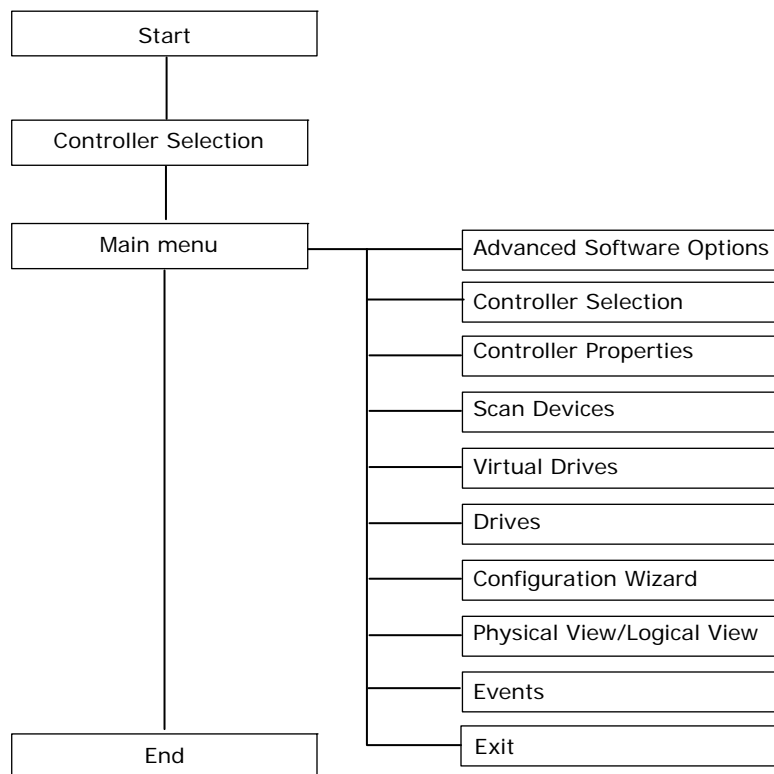
# MegaRAID WebBIOS

This chapter describes the functionality of MegaRAID WebBIOS.

- ❑ [Configuration of MegaRAID WebBIOS](#)
- ❑ [Disk array utility for the system](#)
- ❑ [Type of RAID controllers](#)
- ❑ [Starting MegaRAID WebBIOS](#)
- ❑ [Operation for MegaRAID WebBIOS](#)
- ❑ [Window configuration of MegaRAID WebBIOS](#)
- ❑ [MegaRAID WebBIOS menu items](#)
- ❑ [Building and editing virtual drives](#)
- ❑ [Disk with foreign configuration](#)
- ❑ [Exiting MegaRAID WebBIOS](#)
- ❑ [Status](#)

## Configuration of MegaRAID WebBIOS

This section describes the MegaRAID WebBIOS configuration. See the following chart.



**Figure 2-1: MegaRAID WebBIOS configuration**

## Disk array utility for the system

The system equipment can set a disk array using the utility "MegaRAID WebBIOS".

Under normal operation, you do not need to change the settings.

Setting is required only if you need to change the system configuration, for example, when you have changed disks.

Operate MegaRAID WebBIOS in accordance with descriptions in this manual. Otherwise, it may not work properly. Do not execute the operation other than described in this manual.



Connect a mouse to the system unit before starting MegaRAID WebBIOS.

---

## Type of RAID controllers

Two types of RAID controller are installed to system units. Those Two types differ in whether the controller is with or without a cache backup module.

In the MegaRAID WebBIOS menus, the controller types are displayed below:

- RAID controller with cache backup module: **LSI MegaRAID SAS 9266-8i**
- RAID controller without cache backup module: **LSI MegaRAID SAS 9267-8i**

Note that in the following description, some setup items and setup steps may differ depending on the type of the RAID controller.

## Starting MegaRAID WebBIOS

1. Power on the system unit.
2. When the following window is displayed, press **Ctrl** + **H** keys.

The MegaRAID WebBIOS is started.

```
LSI MegaRAID SAS-MFI BIOS
Version xx.xx.xx (Build xxxxxx xx, 20xx)
Copyright(c) 20xx LSI Corporation
HA -x (Bus xx Dev xx) MegaRAID SAS xxxxxxxxx
FW package: xx.xx.xx.-xxxx

x Virtual Drive(s) found on the host adapter.

x Virtual Drive(s) handled by BIOS
Press <Ctrl><H> for WebBIOS
```

The following windows will displayed when installed the RAID controller with cache backup module. Press any key to continue.

```
Your VDs that configured for write-back are temporality running in
write-through mode. This is caused by the battery being charged, missing
or bad. Please allow the battery to charge for 24 hours before evaluating
the battery for replacement.

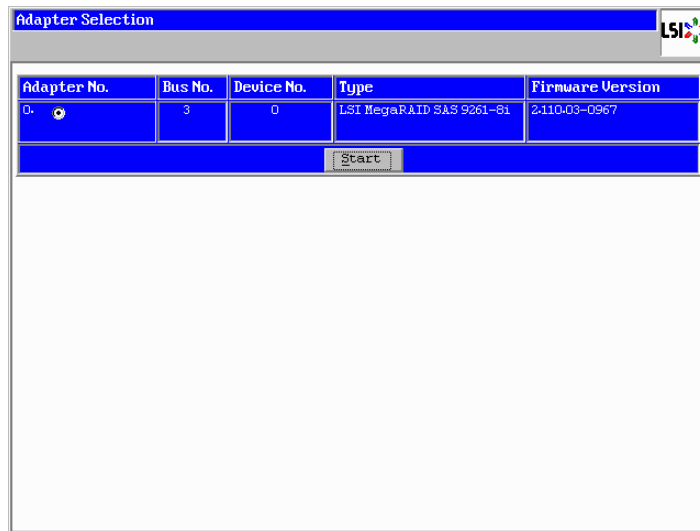
The following VDs are affected: X
Press any key to continue.
```



When the OS has started before pressing the key, shut down the OS and restart the system unit. See the documents attached to your OS for shutting down.

---

3. The MegaRAID WebBIOS is started and **Adapter Selection** is displayed.



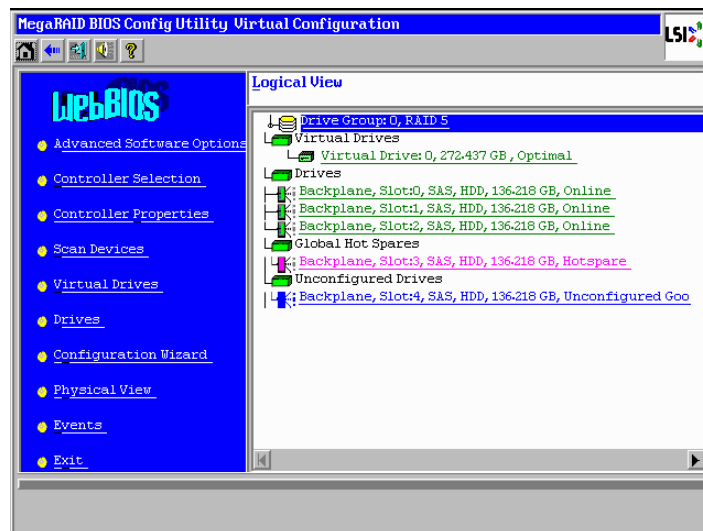
4. Press **Ctrl** key at the left side of the keyboard once.



If **Ctrl** key at the left side of the keyboard is not pressed, your keyboard and mouse may not operate properly. If the keyboard or mouse is not available when you operate MegaRAID WebBIOS, press **Ctrl** key at the left side of the keyboard once.

5. Press **Enter** key once.

The main menu is displayed.

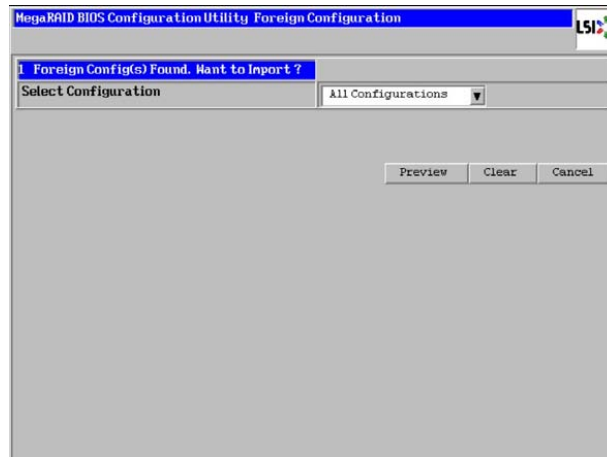




If you do not press **Enter** key, the mouse will not work properly.



If a disk is different from the disk array configuration recorded in the RAID controller, the following window is displayed. See [Disk with foreign configuration](#) when the following window is displayed.



## Operation for MegaRAID WebBIOS

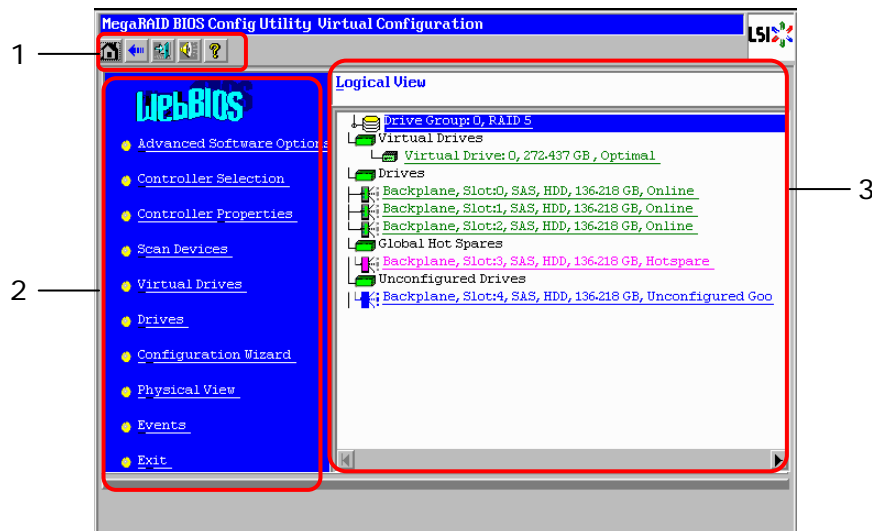
For MegaRAID WebBIOS, you can set individual items by using the following keys and mouse. Connect a mouse to the remote console before starting MegaRAID WebBIOS.

**Table 2-1: Keys and mouse**

Key/mouse	Operation
Mouse	Moves the cursor.
Mouse – left button	<ul style="list-style-type: none"><li>▪ Selects an item that the mouse cursor is placed on.</li><li>▪ Moves the cursor to an item to which the mouse cursor points.</li><li>▪ Selects a disk array or physical disk.</li></ul>
[0] to [9]	Enters numerical values.
[Ctrl]	Selects multiple disk arrays or disks.
[Delete], [Back Space]	Deletes an entered value.

## Window configuration of MegaRAID WebBIOS






The window configuration of MegaRAID WebBIOS is shown below.



**Figure 2-2: MegaRAID WebBIOS window components**

## 1. Menu icon

**Table 2-3: Menu icons**

Icon at the upper left on the window	Operation of icon
	Return to the main menu.
	Return to the previous window.
	Finish the utility.
	Temporarily stop ringing the buzzer on the disk array controller board. *
	Display the version of MegaRAID Web BIOS.
*This function is not supported.	

## 2. Menu items

Menu items for MegaRAID WebBIOS are displayed. Click each item to go to the respective menu window.

## 3. Logical View/Physical View

Virtual drives or drives connected to the RAID controller are displayed.



- Click a drive from drives displayed in **Logical View** or **Physical View**, and the same window is displayed as one when you select **Drives > Properties** from the menu.
  - Select a virtual drive from drives displayed in **Logical View**, and the same window is displayed as the one when you click **Virtual Drives > Properties** from the menu.
  - If not all capacity of the Drive Group is not used, **Total Free Capacity** is displayed. When **Total Free Capacity** is displayed, you can add an additional virtual drive to the Drive Group. Note that the RAID level of the new virtual drive has to be the same as the RAID level of the virtual drives already constructed in the Drive Group.
-



## MegaRAID WebBIOS menu items

This section describes the setting items and values for MegaRAID WebBIOS.

- In the table, the underlined values are default values. Those values in squared brackets, [ ], are recommended values.

Example:

[Enabled] / Disabled: "Enabled" is the default and also recommended value.

[Enabled] / Disabled: "Disabled" is the default value; and "Enabled" is the recommended value, which requires the change.

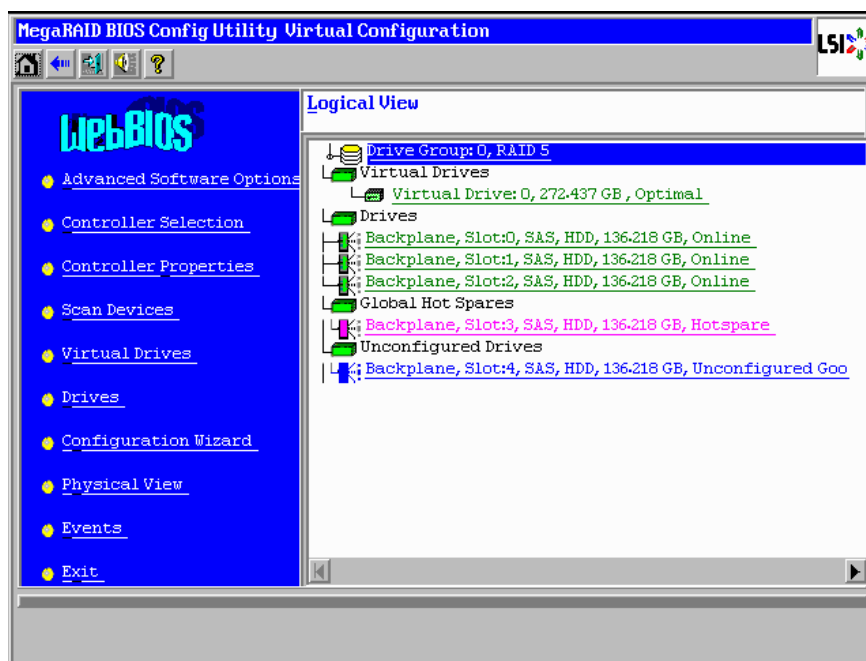


Unless otherwise specified, use the recommended values for all setting items. If you set non-recommended values, the equipment would not be supported and might not operate properly.

---

## Main menu

Start MegaRAID WebBIOS, and the following main menu is displayed.



The following table shows description of menu items in the left side of window.

**Table 2-4: Main menu items**

Menu items	Description
Advanced Software Options	Sets expansion functions
Controller Selection*	Returns to the Controller Selection window
Controller Properties	Displays and sets the hardware information on the disk array controller board
Scan Devices	Scans the installed devices
Virtual Drives	Displays and sets the virtual drive (logical drive) information
Drives	Displays and sets the drive (physical drive) information
Configuration Wizard	Configures or formats disk arrays
Physical View / Logical View	Switches display modes
Events	Displays events
Exit	Exit the MegaRAID WebBIOS
*This menu is displayed as <b>Adapter Selection</b> on the Controller Selection window.	



Do not use **Advanced Software Options** and **Events** because they are not supported.

## Controller properties: menu for setting the RAID controller board

You can review the hardware information about the RAID controller board.

### Controller Information menu 1

Click **Controller Properties** from the main menu. The following **Controller Information 1** window is displayed.



The following table shows description of menu items in the window.

**Table 2-5: Controller properties menu 1 items**

Menu items	Description
Serial Number	Serial number
SubVendorID	Sub-vendor ID
SubDeviceID	Sub-device ID
HostInterface	Host interface
Firmware Version	Firmware version
FW Package Version	Firmware package version
Firmware Time	Current time that firmware recognizes
WebBIOS Version	MegaRAID WebBIOS version
Drive Count	Number of installed physical devices
Unconfig Good SpinDown	SpinDown setting mode for unused drives
FRU	Board names for maintenance
Drive Security Capable	Physical drive security capability: Yes or No
PortCount	Number of installed ports

Menu items	Description
NVRAM Size	Size of installed NVRAM
Memory Size	Size of installed memory
Min Strip Size	Minimum strip size
Max Strip Size	Maximum strip size
Virtual Drive Count	Existing number of array configurations (logical devices)
Hot Spare Spin Down	Disk spin-down mode set to hot spare.
Chip Temperature(Celsius)	Chip on the RAID controller temperature.



You can not change the settings for those items displayed above.

---

## Controller Information menu 2

Click **Next** in the **Controller Information menu 1** window. The following window is displayed.



The following table shows description of menu items in the window.

**Table 2-6: Controller properties menu 2 items**

Menu items	Description
Global Hotspare for Emergency	Different type of drive using Hotspare
Emergency for SMARTer	Different type of drive using SMART copyback
SSD Disk Cache Setting	Setting the SSD disk cache
Unconfig Good for Emergency	Different type of drive using drive rebuilding
Shield State Supported	Physical drives diagnose function
Metadata Size	Size of metadata



You can not change the settings for those items displayed above.

## Controller properties submenu 1

Click **Next** in the **Controller Information menu 2** window. The following window is displayed.



The following table shows description of menu items in the window.

**Table 2-7: Controller properties submenu 1 items**

Menu items	Description	Setting/display value
Battery Backup <sup>1</sup>	Status of cache backup module installation	None / Present
Set Factory Defaults <sup>2</sup>	Returning all the settings to their defaults values	Unchangeable
Cluster Mode <sup>3</sup>	Setting the cluster mode	[Disabled]
Rebuild Rate <sup>4</sup>	Priority of rebuilding	0 to 100 / [30]
BGI Rate <sup>4</sup>	Priority of background initializing	0 to 100 / [30]
CC Rate <sup>3</sup>	Priority of consistency check	0 to 100 / [30]
Reconstruction Rate <sup>4</sup>	Priority of capacity expansion	0 to 100 / [30]
NCQ <sup>3</sup>	Enabling or disabling the NCQ command	[Enabled] / Disabled
Coercion Mode <sup>5</sup>	Setting the capacity control for the physical disk used for disk array building	[None (using the entire capacity)] / 128MB-way (using a capacity as a multiple of 128MB) / 1GB-way (using a capacity as a multiple of 1GB)
S.M.A.R.T Polling <sup>4</sup>	Setting the interval of S.M.A.R.T. reporting	0 to 65535 / 300 / [600]
Alarm Control	Sounding the buzzer on the controller in the event of failure at a connected device	[Disabled] / Enabled / Silence

Menu items	Description	Setting/display value
Patrol Read Rate <sup>4</sup>	Priority of patrol reading	<u>0</u> to 100 / [30]
Cache Flush Interval <sup>3</sup>	Flush timing for write-cache data	1 to 255 / [ <u>4</u> ]
Spinup Drive Count <sup>4</sup>	Number of disk motors to start at system startup	<u>0</u> to 8 / [1]
Spinup Delay <sup>4</sup>	Timing for disk motors to start at system startup	<u>0</u> to xxx / [6]
<b>Notes:</b> 1 "Present" value is displayed when installed the RAID controller with cache backup module. 2 Do not use "Set Factory Defaults." This setting must be changed to the recommended values. 3 Always use the "Default" setting. 4 Always use the recommended values. 5 This can be changed only when no virtual drive have been set at all.		

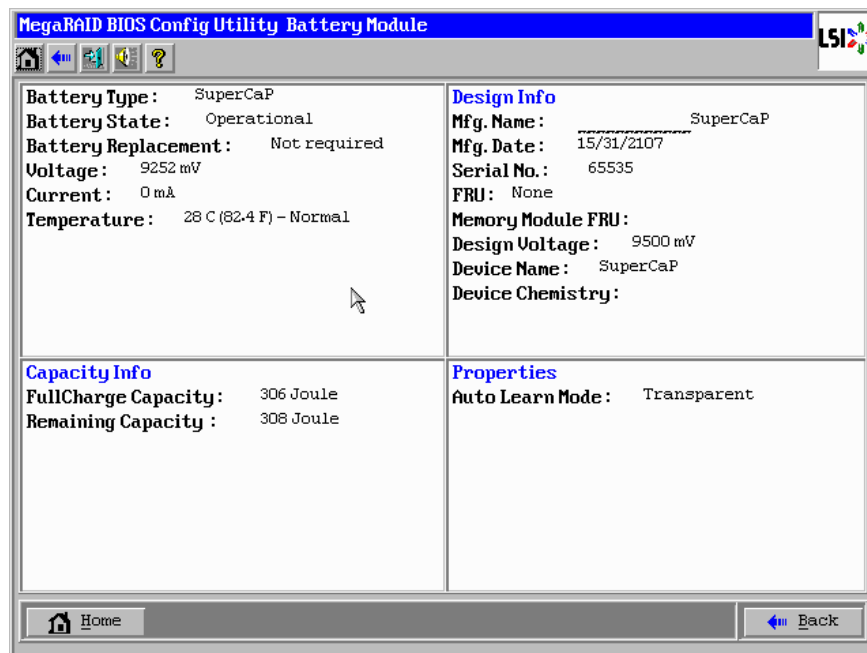


Place the mouse cursor on a setting item and left-click the mouse to change the setting values. Or, left-click the mouse to move the cursor and enter a value from the keyboard. Click **Submit** after the setting.

## Battery Module submenu

Click **Present** in the **Properties: Controller properties submenu 1 > Battery Backup**. The following window is displayed.

This window is displayed when installed the RAID controller with cache backup module.



The following table shows description of menu items in the window.

**Table 2-8: Battery Module submenu items**

Menu items	Description
Battery Type	Cache backup module type
Battery State	Cache backup module status
Battery Replacement	To need replacement the cache backup module
Voltage	Voltage of the cache backup module
Current	Current from the cache backup module
Temperature	The cache backup module temperature
FullCharge Capacity	Full charge capacity of the cache backup module
Remaining Capacity	Remaining charge capacity of the cache backup module
Mfg Name	Product name
Mfg Date	Manufacturing date
Serial No.	Serial number
FRU	Cache backup module names for maintenance
Memory Module FRU	Memory module names for maintenance
Design Voltage	Design voltage of the cache backup module



Menu items	Description
Device Name	Device name of the cache backup module
Device Chemistry	Component of the cache backup module
Auto Learn Mode	Auto diagnostic mode

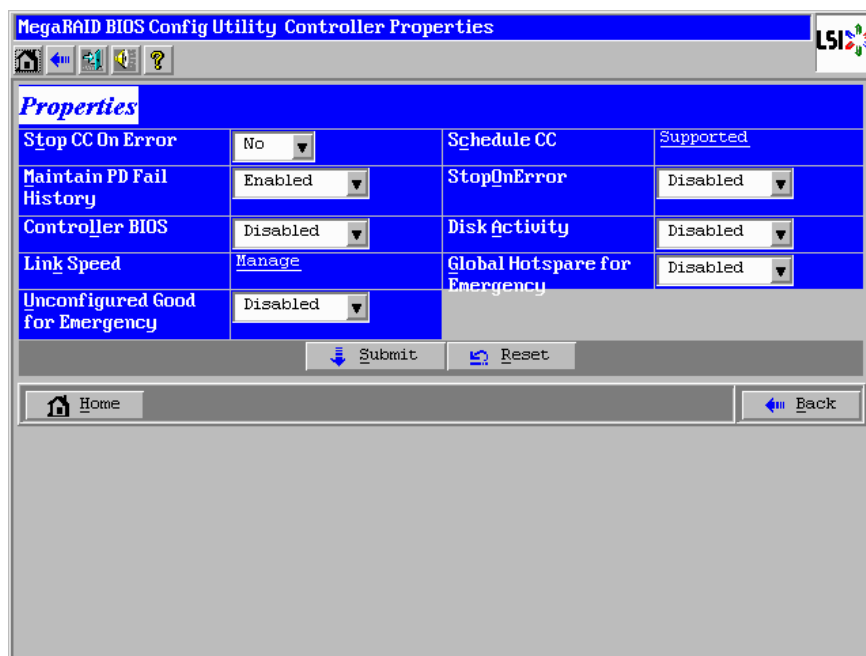


You can not change the settings for those items displayed above.

---

## Controller properties submenu 2

Click **Next** in the **Properties: Controller properties submenu 1** window. The following window is displayed.



The following table shows description of menu items in the window.

**Table 2-9: Controller properties submenu 2 items**

Menu items	Description	Setting/display value
Stop CC On Error	Sets an operation when an error is detected at the consistency check	[No] / Yes
Maintain PD Fail History <sup>1</sup>	Sets whether or not a failed disk can be used	[Enabled (Registers failed disk information.)] / Disabled (Not register failed disk information.)
Controller BIOS <sup>1</sup>	Enables the RAID controller BIOS	[Enabled] / Disabled
Link Speed <sup>2</sup>	Sets link speed of SAS interface	When [Manage] is clicked, the window moves to <a href="#">Manage Link Speed submenu</a> .
Unconfigured Good for Emergency <sup>1</sup>	Different type of drive using drive rebuilding	[Disabled] / Enabled
Schedule CC	Sets a consistency check schedule	When [Supported] is clicked, the window moves to <a href="#">Schedule CC Page submenu</a> .
StopOnError <sup>1</sup>	Sets whether or not boot the OS if a failure is detected at the system boot	[Disable] / Enabled
Disk Activity <sup>1</sup>	Sets switching disk LEDs	[Disabled] / Enabled

Menu items	Description	Setting/display value
Global Hotspare for Emergency <sup>1</sup>	Different type of drive using Hotspare	[ <u>Disabled</u> ] / Enabled
<b>Notes:</b> 1 Use this item with the default setting. 2 This item is displayed when installed the RAID controller with cache backup module. Do not set this item because it is not supported.		

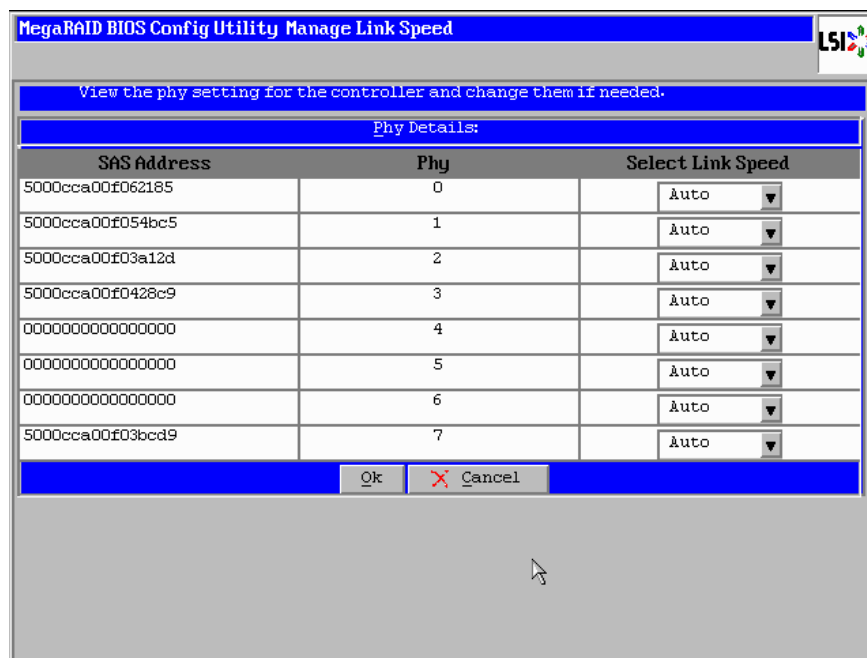


Place the mouse cursor on a setting item and left-click the mouse to change the setting values. Or, left-click the mouse to move the cursor and enter a value from the keyboard. Click **Submit** after the setting.

---

## Manage Link Speed submenu

Click **Manage** in the **Properties: Controller properties submenu 2 > Link Speed**. The following window is displayed.



Do not change the items in **Manage Link Speed submenu** settings because they are not supported. Use these items with the default settings.

**Table 2-10: Controller properties submenu 2 items**

Menu items	Description	Setting/display value
Select Link Speed	Sets the link speed to physical drives	[Auto] / 1.5Gbps / 3Gbps / 6Gbps

## Schedule CC page submenu

Click **Supported** in the **Properties: Controller properties submenu 2 > Schedule CC**. The following window is displayed.

The screenshot shows the 'MegaRAID BIOS Config Utility Schedule CC Page'. The main area is titled 'Schedule Consistency Check'. It features four input fields: 'CC Frequency' set to 'Disable', 'CC Start (mm/dd/yyyy)' set to '01/01/2000', 'CC Start Time' set to '12:00 AM', and 'CC Mode' set to 'Sequential'. Below these is a section 'Select VDs to Exclude CC' with a list box containing 'VDO: RAID5: 136.218 GB: Optimal'. At the bottom of the main area are 'Submit' and 'Reset' buttons. The footer contains a 'Home' button and a 'Back' button.

The following table shows description of menu items in the window.

**Table 2-11: Schedule CC page menu items**

Menu items	Description	Setting/display value
CC Frequency	Sets the CC schedule function: Enable or Disable	[Disable] / Continuous / Hourly / Dairy / <u>Weekly</u> / Monthly
CC Start Time	Sets on what time the consistency check starts	12:00 AM. to 11:00 PM. / [The nearest to the present time]
Select VDs to Exclude CC	Specifies a disk array on which the consistency check is excluded	Choose any array configuration.
CC Start (mm/dd/yyyy)	Sets on what date the consistency check starts	Choose any date.
CC Mode	Sets if the consistency check is executed on multiple disk arrays	[Sequential] / <u>Concurrent</u>

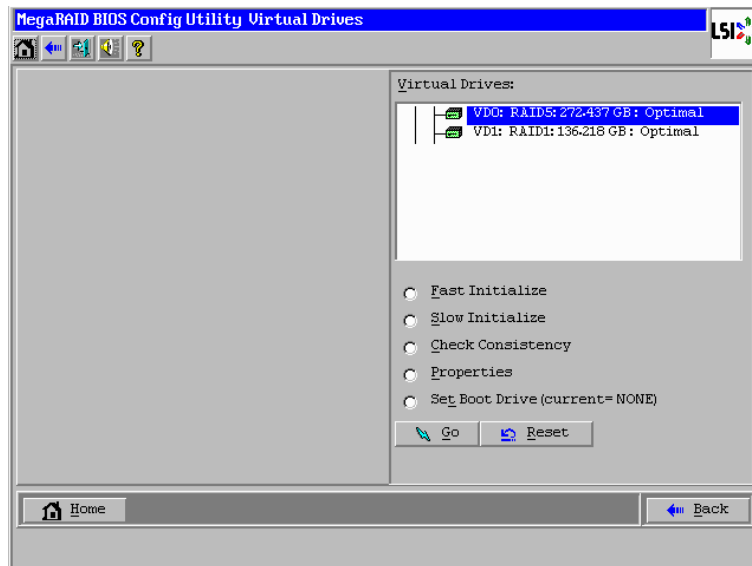
## Virtual drives: viewing and setting disk array information

You can display and change the information on the virtual drive (logical drive) that is already set.

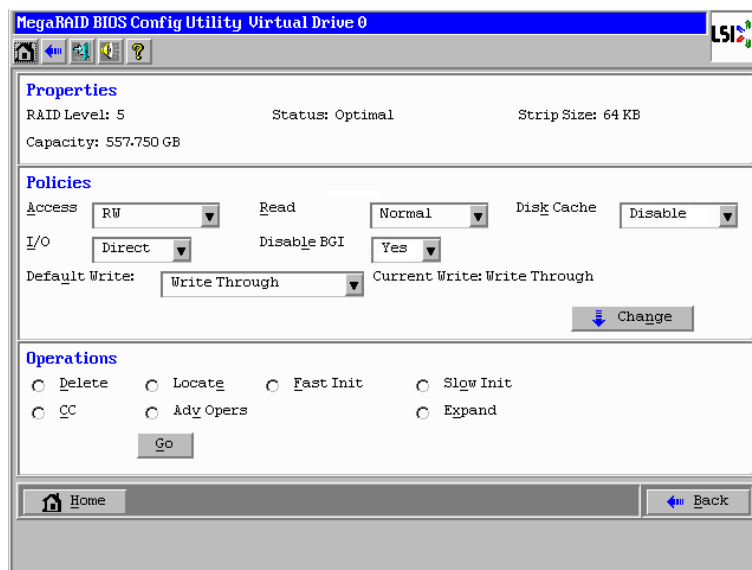
The virtual drive is a drive recognized by the OS as a logical entity on the disk array that is constructed of a group of physical drives.

You can construct multiple virtual drives on the same disk array.

Click **Virtual Drives** in the main menu. The following window will be displayed.



Click a virtual drive for viewing information and changing the setting from the list on the upper right pane. Check **Properties** > **Go**. The **Virtual Drive** window will be displayed.



The following table shows description of menu items in the window.

**NOTICE** You need connect the AC cables of the system unit to a UPS, when you use the RAID controller without cache backup module and set **Default Write** to **Always Write Back**. Otherwise, the data corruption may result when blackout or momentary loss of power occurs.



If multiple virtual drives reside on the same Drive Group, keep the same setting for all the virtual drives.

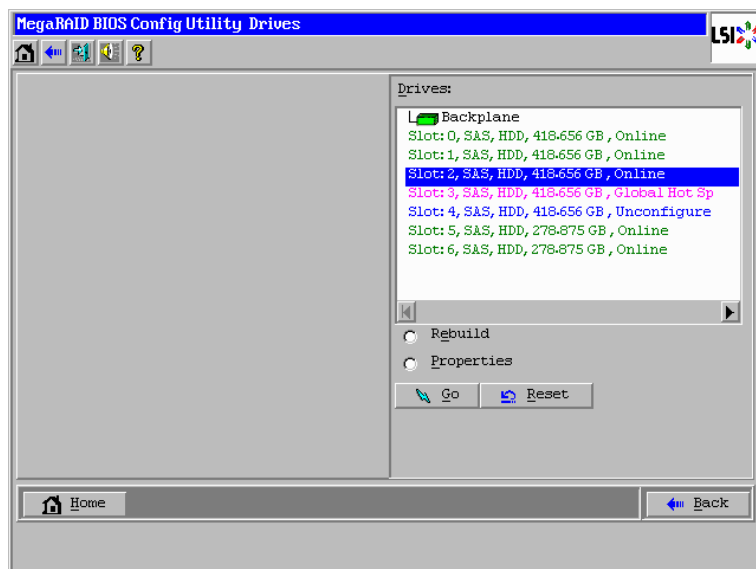
**Table 2-12: Virtual Drive menu items**

Menu items	Description	Setting/display value
Properties		
RAID Level	RAID level	-
Status	Status of the virtual drive	-
Strip Size	Strip size of the virtual drive	-
Capacity	Size of the virtual drive	-
Parity Size <sup>1</sup>	Parity size of the virtual drive	
Policies		
Access	Access mode	[RW (reading and writing)] / Read Only (reading only) / Blocked (access denied)
Read	Read policy	[Normal (no read ahead)] / Ahead (always read ahead)
Disk Cache	Setting the cache installed in a physical disk	[Disable (cache: not used)] / [Enable (cache: used)] / <u>No Change</u> (based on the disk setting)
I/O	Setting the read-cache operation	[Direct (cache: not used)] / Cached (cache: used)
Disable BGI	Setting the background initialization	<u>No</u> (background initializing valid) / [Yes (background initializing invalid)]
Default Write <sup>2</sup>	Setting the write cache of the disk array	<ul style="list-style-type: none"> <li>RAID controller with cache backup module: Write Through / Always Write Back / <u>Write Back With BBU</u></li> <li>RAID controller without cache backup module: <u>Write Through</u> / [Always Write Back] / Write Back With BBU</li> </ul>
<b>Notes:</b> 1 This item is displayed when the virtual drive is RAID5 or 6. 2 If you use the RAID controller without cache backup module, use this item with the default setting when installing an OS. Even if the system unit is connected to a UPS, the install may not finish normally.		

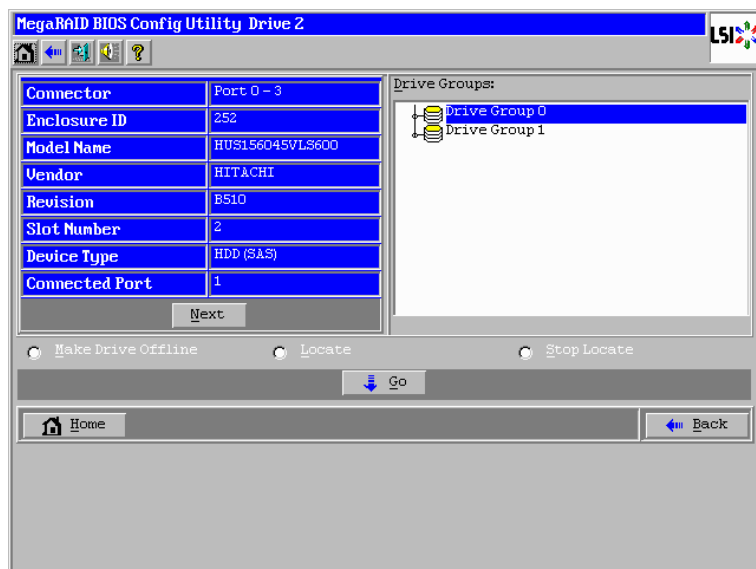
## Drives: viewing physical disk information

You can display the information on the physical drive connected to the RAID controller.

Click **Drives** in the main menu. The following window is displayed.

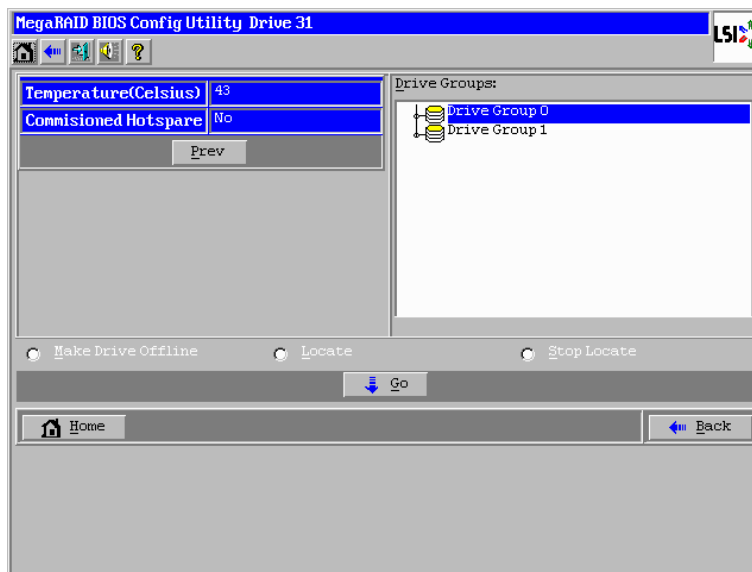
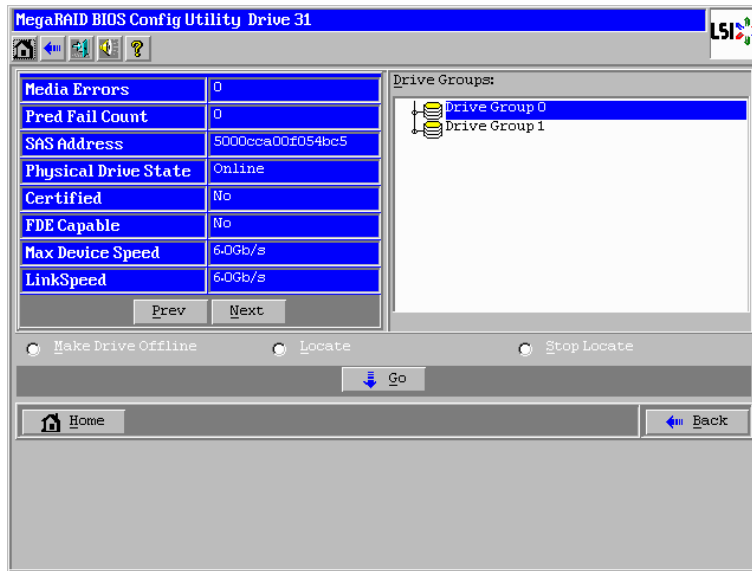


Click a drive to review information from the list on the upper right pane. Check **Properties** > **Go**. The following window is displayed.





Click **Next** on the upper left pane, the following windows are displayed in order.



The following table shows description of menu items in the left side of those windows.

**Table 2-13: Drives menu items**

Menu items	Description
Connector	Connector of the connected disk array controller board
Enclosure ID	ID number of the connected enclosure device
Mode name	Disk mode name
Vendor	Vendor name
Revision	Firmware version
Slot Number	Number of the slot installed
Device Type	Device type
Connected Port	Port number of the connected disk array controller board
Media Errors	Number of detected media errors
Pred Fail Count	Number of reported S.M.R.T warnings
SAS Address	SAS address
Physical Drive State	Status
Certified	Certification
FDE Capable	With or without encryption function
Max Device Speed	Maximum speed at which a physical disk can operate
Link Speed	Link speed of an interface
Temperature (Celsius)	Disk temperature
Commisioned Hotspare	Enabled/disabled protection by hotspare



- Items in the table above can not be changed.
  - **Media Errors** and **Pred Fail Count** are cleared when the system unit is powered off.
-

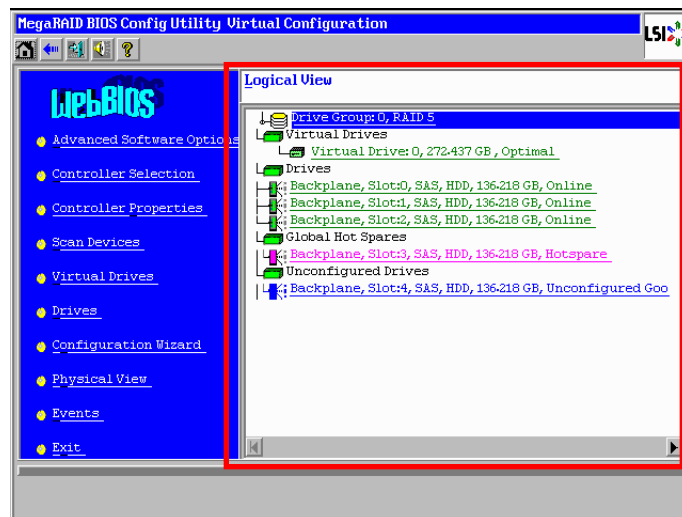
## Switching the display mode

This section describes switching disk array display modes in the main menu.

There are two types of display mode: **Logical View** and **Physical View**.

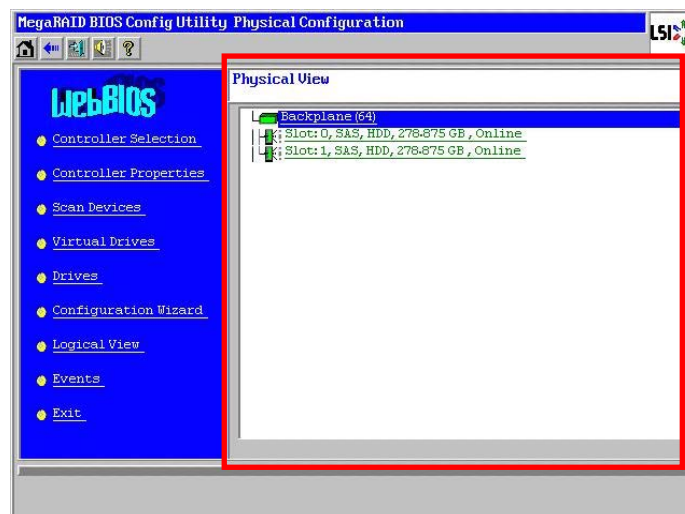
The **Logical View** mode displays a list of disk array configurations that are already set.

The **Physical View** mode displays a list of physical disks comprising a disk array configuration.



**Logical View mode:**

- Virtual drives (Logical drives)
- Drives (physical drives)
- Hot spares



**Physical View mode:**

- Drives (physical drives)



The **Logical View** mode is applied when the MegaRAID WebBIOS is started.

To switch to the physical view mode, click **Physical View** in the **Logical View** mode of the main menu.

To switch to the logical view mode, click **Logical View** in the **Physical View** mode of the main menu.

## Building and editing virtual drives

This section describes the procedure for building virtual drives.

The building of disk arrays should be entirely performed with **Configuration Wizard**.

---

**NOTICE** **Do not change** the configuration of the virtual drives during system operations. If you change the configuration, all data will be lost from those physical drives due to change in the virtual drive.

---



Set each item to the recommended value unless otherwise specific directions are given. Otherwise, the system may not properly operate. We have no responsibility for the malfunction due to the setting except our recommended values.



The maximum number of the virtual drives you can construct per RAID controller is 64.

The maximum number of the virtual drives you can construct on one Drive Group is 16.

---

## Building virtual drive

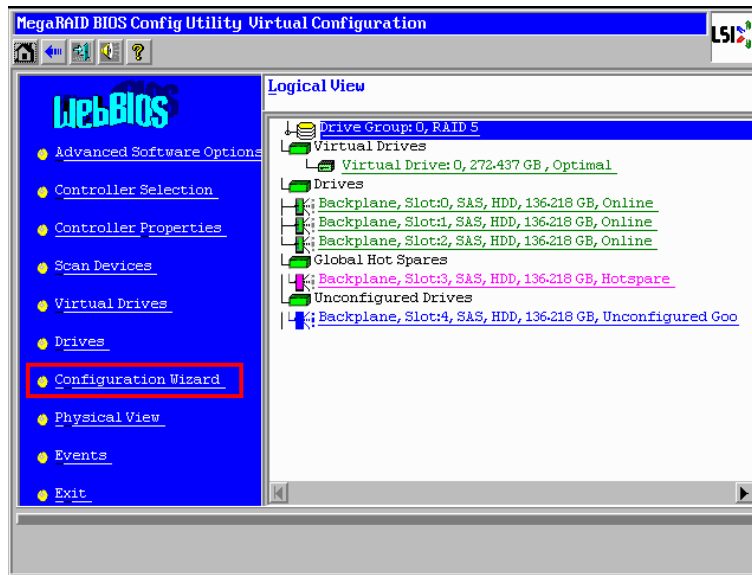
This section describes the procedure for building new virtual drive.

When you build a virtual drive, create a group of physical drives first and then configure the virtual drive (logical drive).

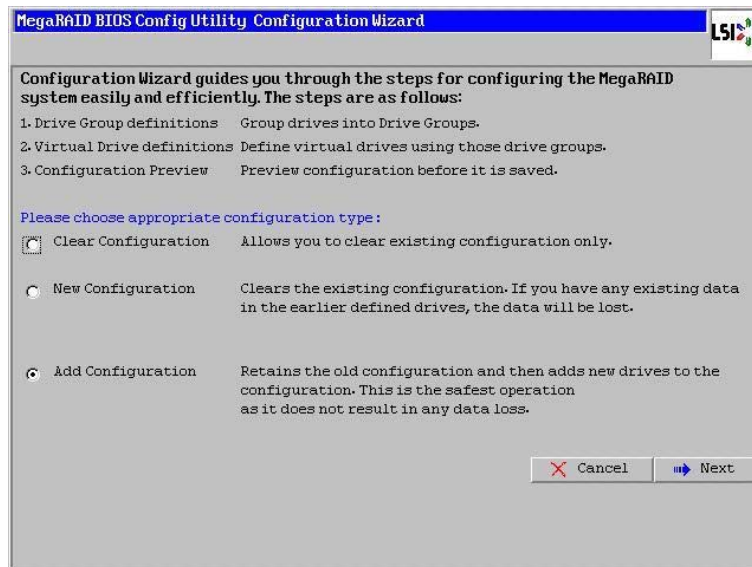
## Building virtual drive for RAID 0, 1, 5, and 6

Here is a procedure for building virtual drive for RAID 0, 1, 5, and 6.

1. Click **Configuration Wizard** in the main menu.



2. The following window is displayed.  
Click **New Configuration** or **Add Configuration** box, and then click **Next**.



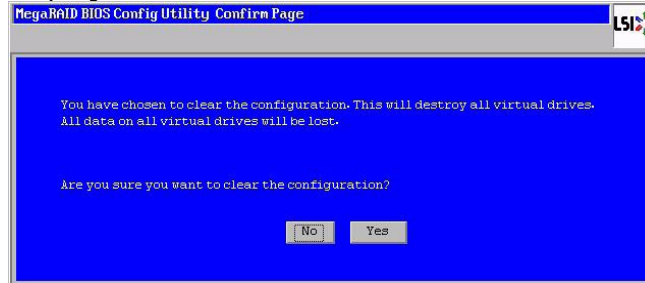
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**NOTICE** If you select **New Configuration**, all data in the disks is lost.  
Backup your required data before selecting **New Configuration**.

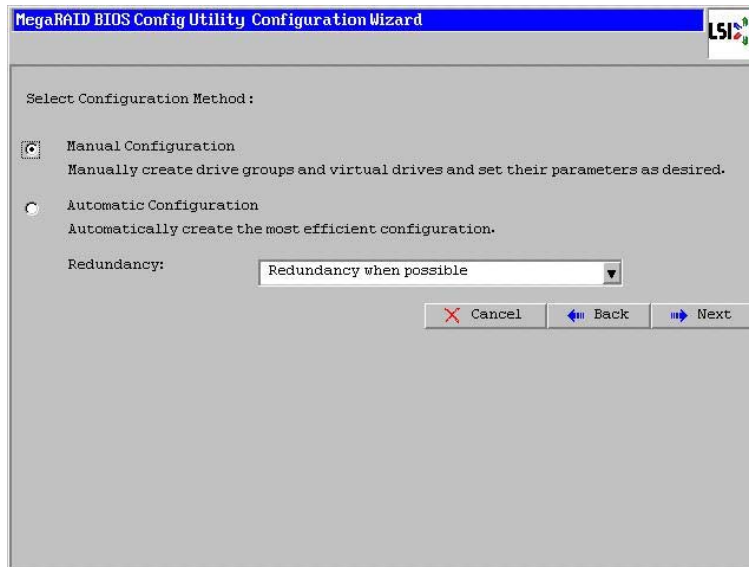
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- The existing disk arrays remain as is, when you select **Add Configuration**. **Add Configuration** should be selected when you want to keep the data in existing disk arrays, and to build disk arrays using additional disks.
- If you click **New Configuration**, you lose the data in the existing disk arrays. This should be selected when you discard the data in the existing disk array and build a new one.
- If you click **New Configuration**, the following window is displayed first. Click **Yes** to build new disk array.



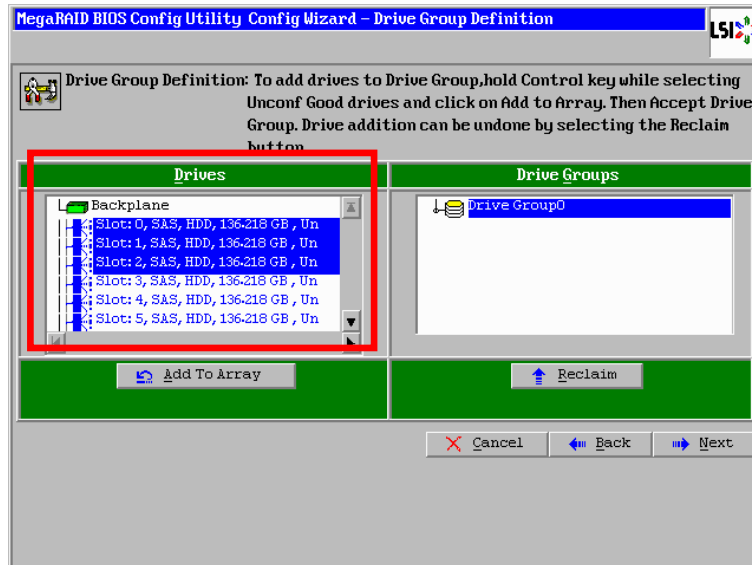
3. The following window is displayed. Click **Manual Configuration** > **Next**.



4. The following window is displayed.

Click physical drives in **Drives** pane for building virtual drive.

If you add a virtual drive to the already existing Drive Group, select nothing and go to the step 7.



The number of drives required varies depending on the RAID level to be set. The following table summarizes the number of drives required.

**Table 2-14: Number of drives required**

RAID level	Number of drives required
RAID 0 (including JBOD)	One or more
RAID 1	Two
RAID 5	Three or more
RAID 6	Four or more

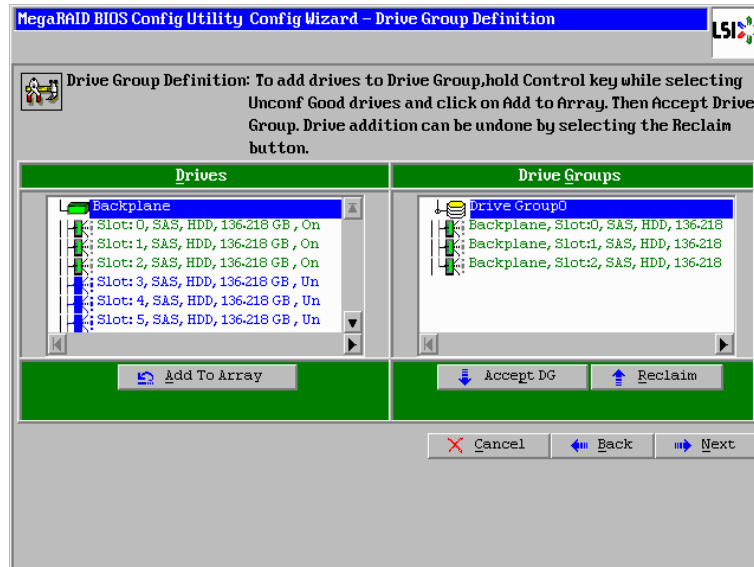


RAID 6 with three physical drives and RAID 1 with three or more physical drives are not supported. If you configure those settings, the virtual drive may not operate properly.



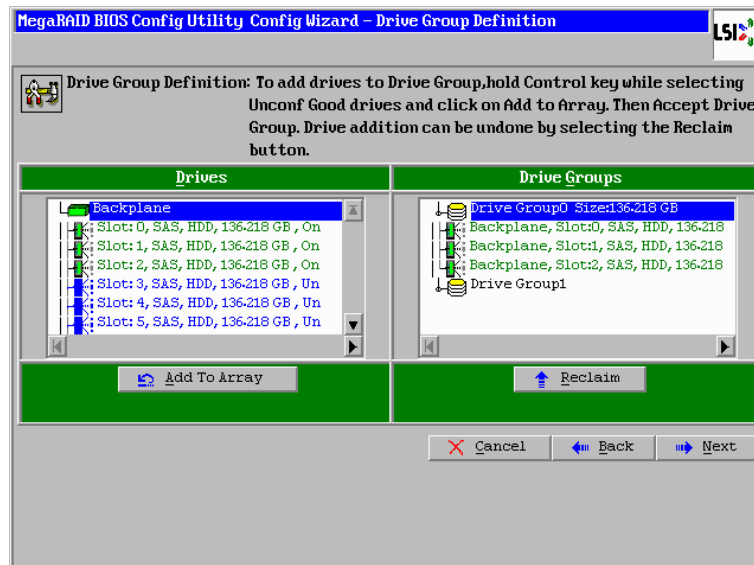
- You can select only a drive which status is "Unconfigured Good" (unused).
- To select multiple drives, click the drives while pressing **Ctrl** key.

5. After selecting all physical drives to build a virtual drive, click **Add To Array**. Status of those selected drives is **Online** that is displayed in the **Drive Groups** pane.



To release a physical drive from [Online], select the drive and click **Reclaim**.

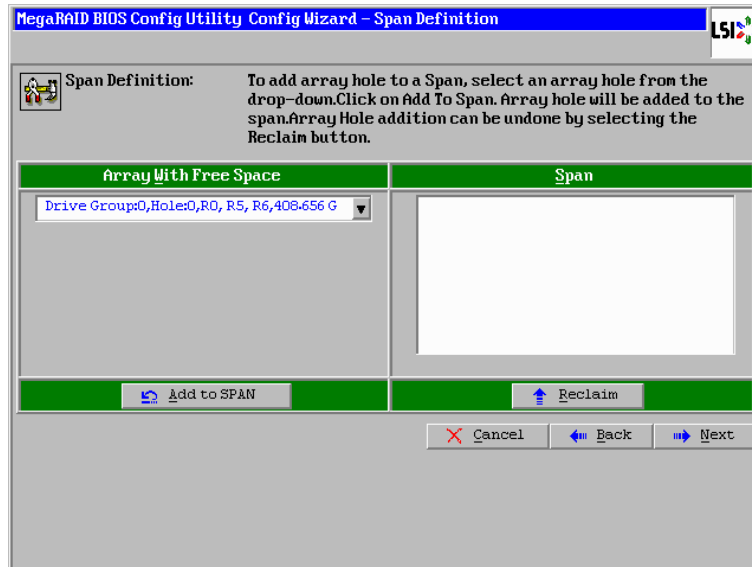
6. Click **Accept DG**.
7. The following window is displayed. Click **Next**.





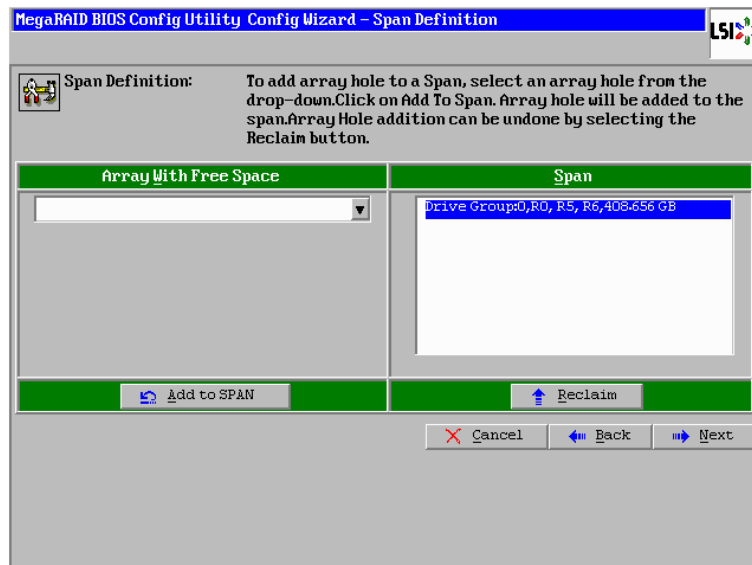
8. The following window is displayed.

Select the currently building "Drive Group" from the pull down menu in the **Array With Free Space** pane.



9. Click **Add to SPAN**.

10. The following window is displayed. Click **Next**.



11. The following window is displayed.

Specify the RAID level, strip size, read policy, write policy, and virtual drive size as shown in the table below:

MegaRAID BIOS Config Utility Config Wizard - Virtual Drive Definition

RAID Level: RAID 6

Strip Size: 64 KB

Access Policy: RW

Read Policy: Normal

Write Policy: Write Through

IO Policy: Direct

Drive Cache: Unchanged

Disable BGI: No

Select Size: GB

Update Size

Accept Reclaim

Cancel Back Next

Virtual Drives

Next LD, Possible RAID Levels

R0:408.656 GB R5:272.437 GB R6:136.218 GB

Set each item in the following value to the recommended value, unless otherwise specified.

**NOTICE** You need connect the AC cables of the system unit to a UPS, when you use the RAID controller without cache backup module and set **Write Policy** to **Always Write Back**. Otherwise, the data corruption may result when blackout or momentary loss of power occurs.

**Table 2-15: Specify the RAID level, strip size, and policies**

Menu items	Description	Setting/display value
RAID Level <sup>1</sup>	RAID Level	Specify any level.
Strip Size	Strip size	8KB / 16KB / 32KB / <u>[64KB]</u> / 128KB / 256KB / 512KB / 1MB
Access Policy	Access policy	<u>[RW (reading and writing)]</u> / Read Only (reading only) / Blocked (access denied)
Read Policy	Read policy	<u>[Normal (no read ahead)]</u> / Ahead (always read ahead)
Write Policy <sup>2</sup>	Write policy	<ul style="list-style-type: none"> <li>RAID controller with cache backup module: Write Through / Always Write Back / <u>[Write Back With BBU]</u></li> <li>RAID controller without cache backup module: <u>[Write Through]</u> / [Always Write Back] / Write Back With BBU</li> </ul>
IO Policy	Read-cache operation	<u>[Direct (cache: not used)]</u> / Cached (cache: used)
Disk Cache <sup>3</sup>	Setting the disk cache	[Disable (cache: not used)] / Enable (cache: used) / <u>No change (depending on the disk setting)</u>
Disable BGI <sup>3</sup>	Setting the background initialization	<u>No (background initializing valid)</u> / [Yes (background initializing invalid)]
Select Size <sup>4</sup>	Size of a disk array	Entering the maximum capacity value. (minimum allowable value: 64 KB)
<b>Notes:</b> <ol style="list-style-type: none"> <li>1 If you add a virtual drive to the already existing Drive Group, you can not change the RAID level.</li> <li>2 If you use the RAID controller without cache backup module, use this item with the default setting when installing an OS. Even if the system unit is connected to a UPS, the install may not finish normally.</li> <li>3 Change from the default value to the recommended value.</li> <li>4 When you configure "Select Size", check the maximum allowable capacity displayed under [Next LD, Possible RAID Levels] at the right of the window. And then you specify the value at your discretion within the maximum capacity in accordance with the specified RAID level. When you enter the value, completely delete the value in the box first and then enter the value. When you enter the maximum capacity, enter all the digits precisely including decimal places and make sure you do not skip even zeros.</li> </ol>		



If multiple virtual drives reside on the same Drive Group, keep the same setting for all the virtual drives.

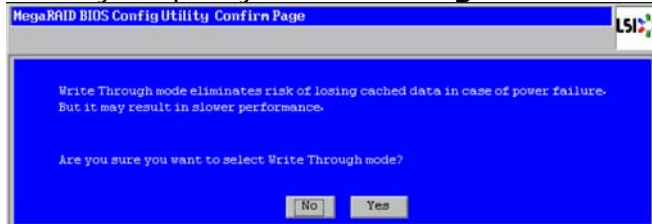


If you specify a larger disk array size than the maximum capacity, **Unacceptable size** is displayed on the window and all the setting items are initialized. You need to reset all items to the correct size.

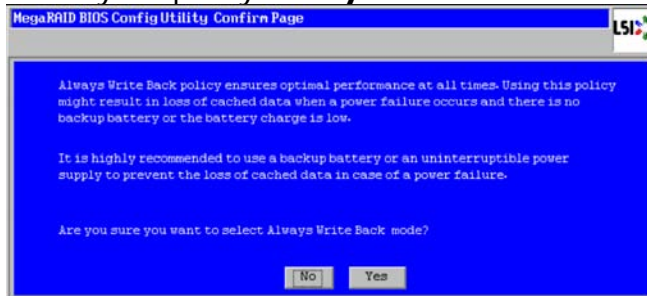
12. Click **Accept**.

13. The following window is displayed. Click **Yes**.

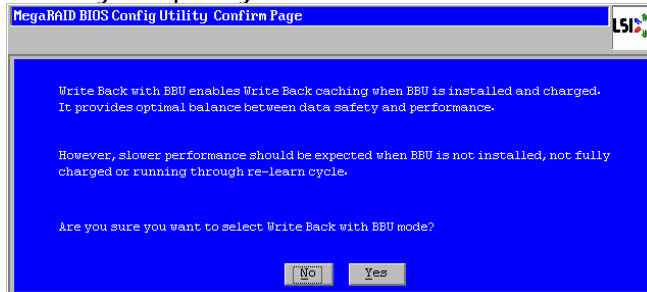
- When you specify **Write Through** to **Write Policy**



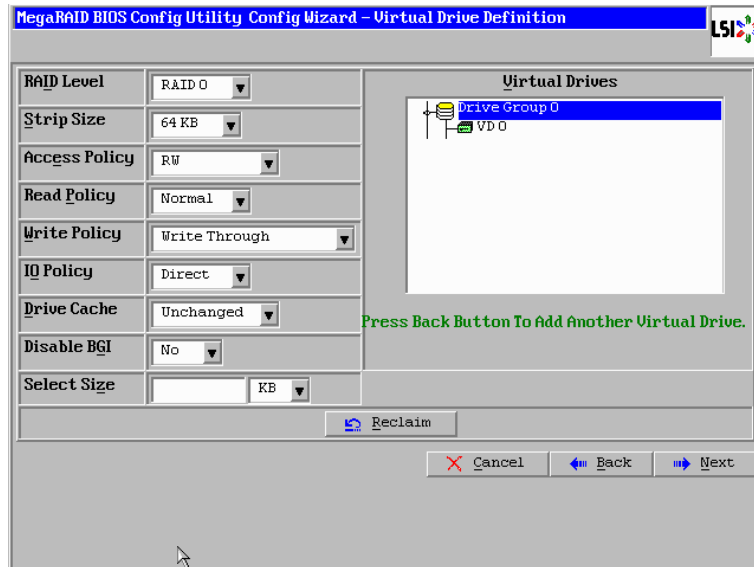
- When you specify **Always Write Back** to **Write Policy**



- When you specify **Write Back With BBU** to **Write Policy**



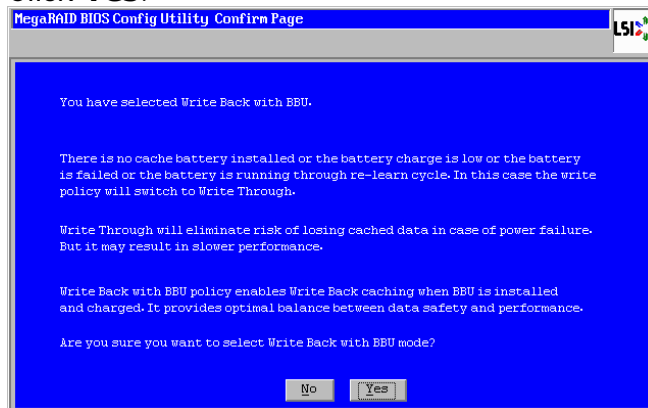
14. The following window is displayed. Click **Next**.



The screenshot shows the 'MegaRAID BIOS Config Utility Config Wizard - Virtual Drive Definition' window. On the left, there are several configuration options: RAID Level (RAID 0), Strip Size (64 KB), Access Policy (RW), Read Policy (Normal), Write Policy (Write Through), IO Policy (Direct), Drive Cache (Unchanged), Disable BGI (No), and Select Size (with a text box and a KB dropdown). On the right, under 'Virtual Drives', there is a tree view showing 'Drive Group 0' and 'VD 0'. Below this, a green text prompt says 'Press Back Button To Add Another Virtual Drive.' At the bottom, there are buttons for 'Reclaim', 'Cancel', 'Back', and 'Next'.

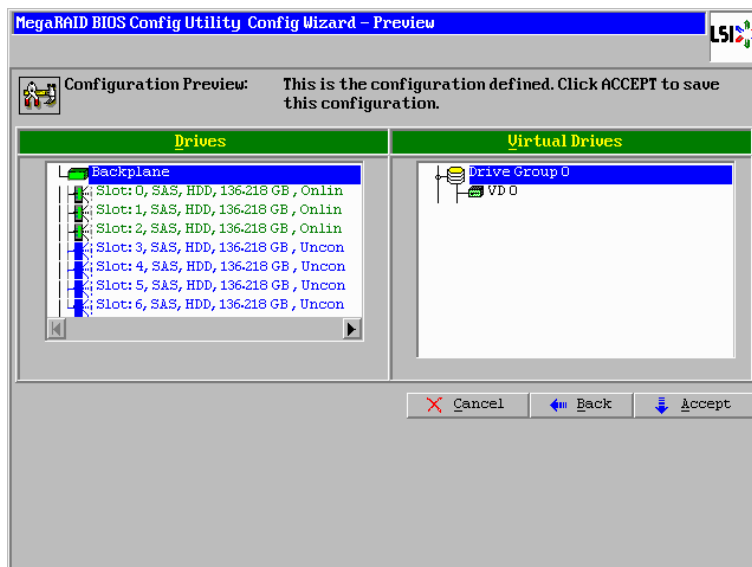


The following window is displayed before above window is displayed When you specify **Write Back With BBU** to **Write Policy**. Click **Yes**.



The screenshot shows the 'MegaRAID BIOS Config Utility Confirm Page' window. It has a blue background and contains the following text: 'You have selected Write Back with BBU.' followed by a paragraph: 'There is no cache battery installed or the battery charge is low or the battery is failed or the battery is running through re-learn cycle. In this case the write policy will switch to Write Through.' Then another paragraph: 'Write Through will eliminate risk of losing cached data in case of power failure. But it may result in slower performance.' Then a third paragraph: 'Write Back with BBU policy enables Write Back caching when BBU is installed and charged. It provides optimal balance between data safety and performance.' Finally, it asks 'Are you sure you want to select Write Back with BBU mode?' with 'No' and 'Yes' buttons at the bottom.

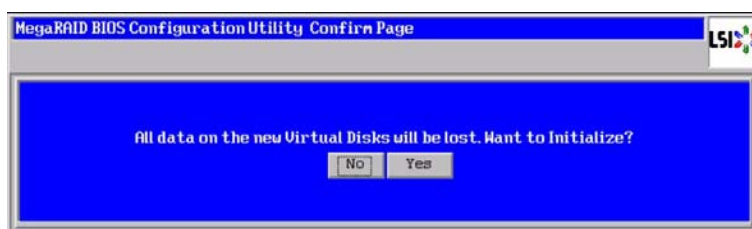
15. The following window is displayed.  
Confirm the settings, and then click **Accept**.  
If the settings are wrong, click **Back** and return to the step 11.



16. The following window is displayed. Click **Yes**.



17. The following window is displayed. Click **No**.



The window returns to the main menu.

18. Initialize the created virtual drive.  
See [Initializing virtual drive](#) on page 2-49.

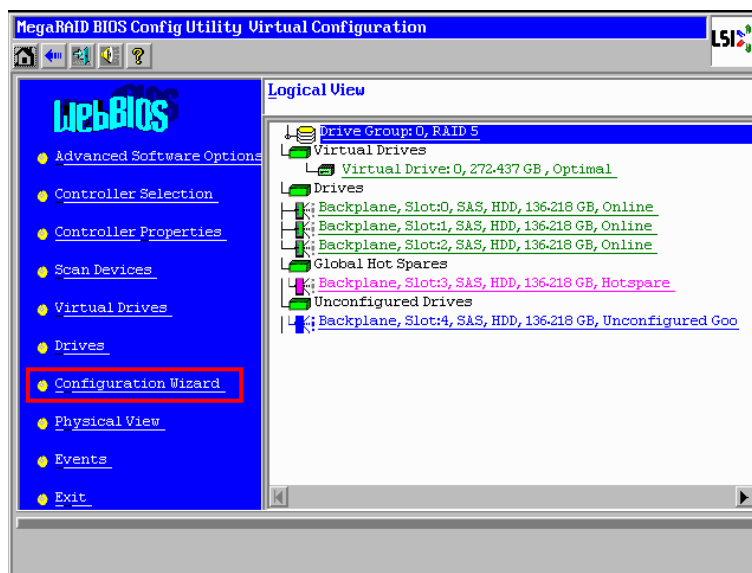
## Building virtual drive for RAID 10

Here is a procedure for building virtual drive for RAID 10.  
The following table shows the number of required physical drives.

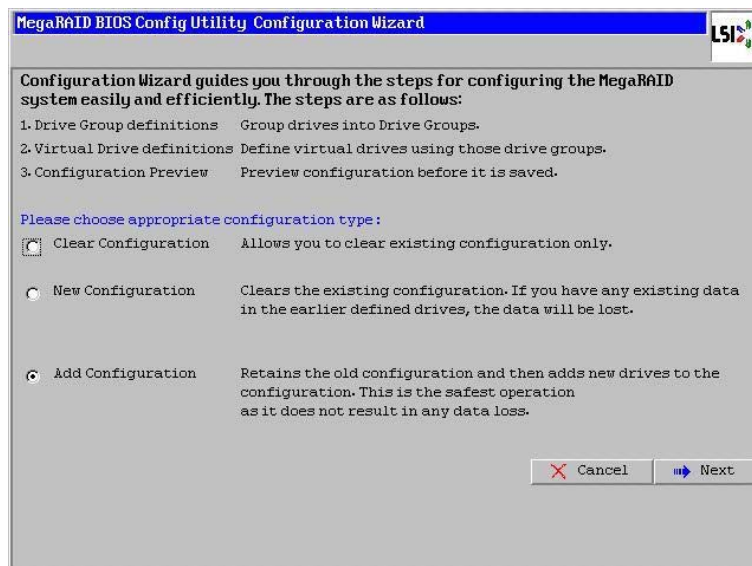
**Table 2-16: Number of disks required**

RAID level	Number of drives required
RAID 10	Four, six, or eight

1. Click **Configuration Wizard** in the main menu.



2. The following window is displayed.  
Click **New Configuration** or **Add Configuration** box, and then click **Next**.



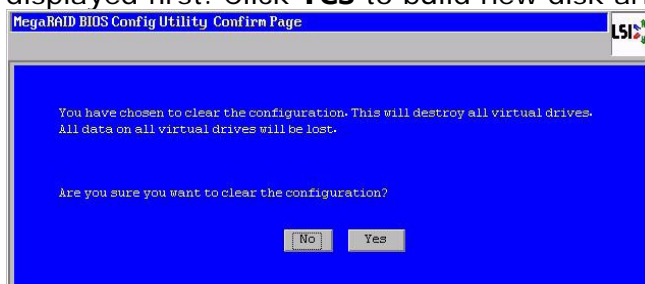
---

**NOTICE** If you select **New Configuration**, all data in the disks is lost. Backup your required data before selecting **New Configuration**.

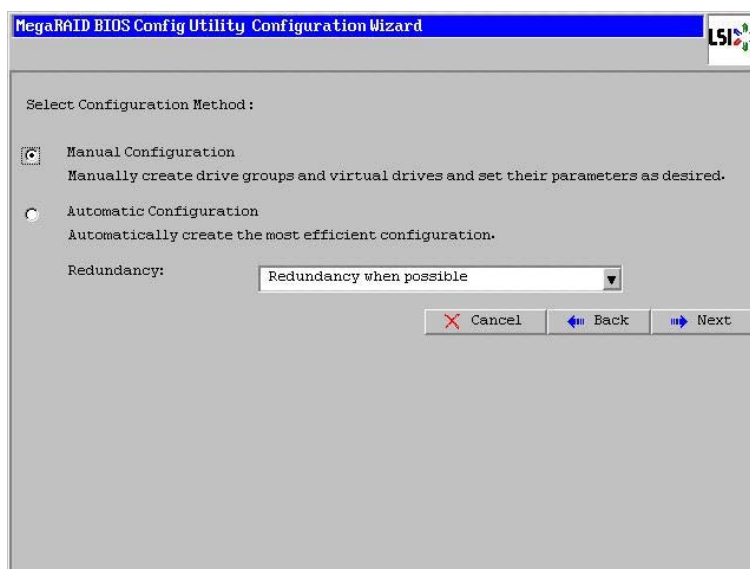
---



- The existing disk arrays remain as is, when you select **Add Configuration**. **Add Configuration** should be selected when you want to keep the data in existing disk arrays, and to build disk arrays using additional disks.
- If you click **New Configuration**, you lose the data in the existing disk arrays. This should be selected when you discard the data in the existing disk array and build a new one.
- If you click **New Configuration**, the following window is displayed first. Click **Yes** to build new disk array.

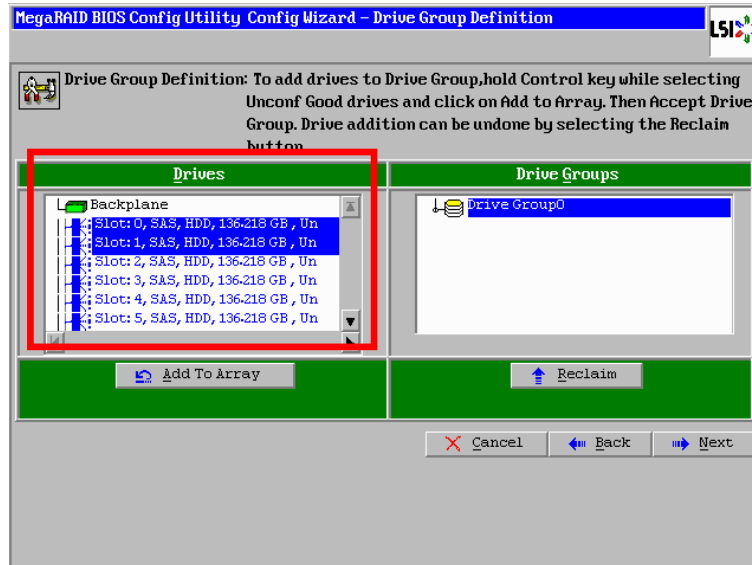


- 
3. The following window is displayed. Click **Manual Configuration** > **Next**.





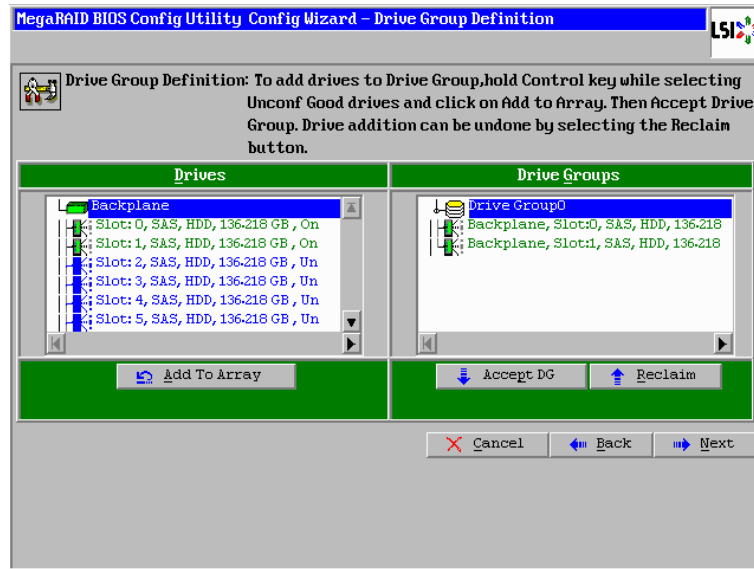
4. The following window is displayed.  
Click a physical drive in **Drives** pane for building virtual drive.  
If you build a new virtual drive, select two physical drives.  
If you add a virtual drive to the already existing Drive Group, select nothing  
and go to the step 7.



- You can select only a drive which status is "Unconfigured Good" (unused).
- To select multiple drives, click the drives while pressing **Ctrl** key.

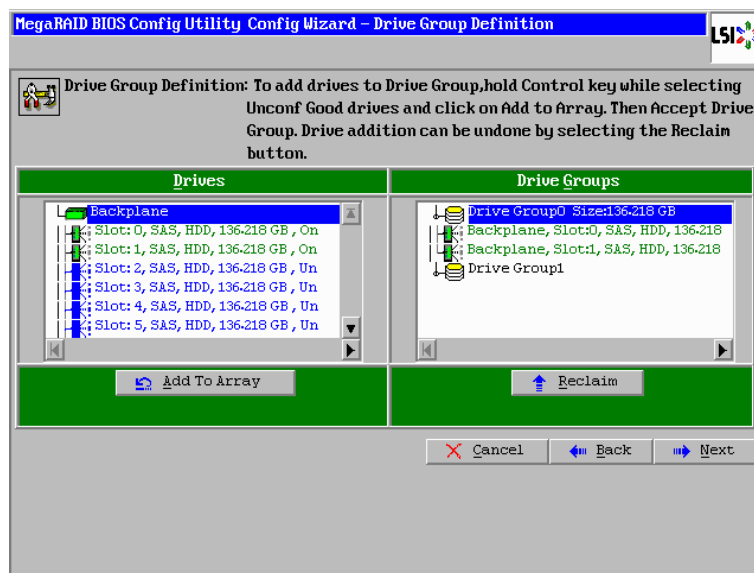
5. After selecting two physical drives to build a virtual drive, click **Add To Array**.

Status of those selected disks is **Online** that is displayed in the **Drive Groups** pane.

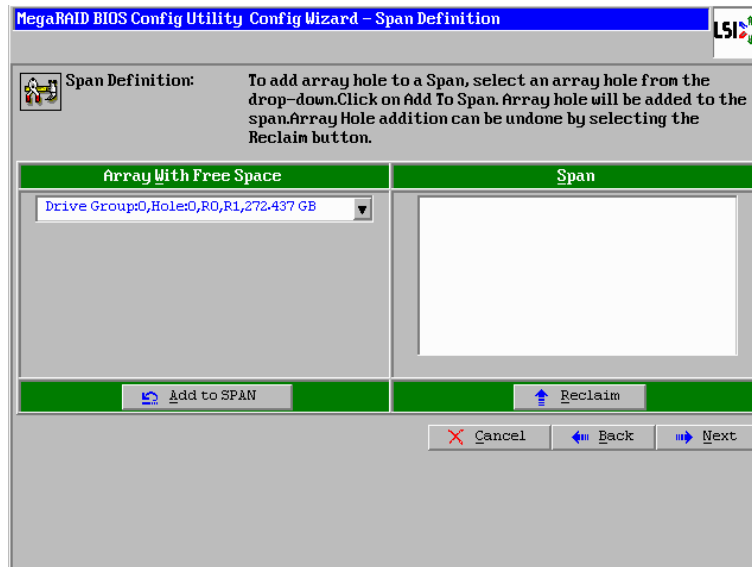


To release a physical drive from [Online], select the drive and click **Reclaim**.

6. Click **Accept DG**.
7. The following window is displayed.  
If you build a new virtual drive, repeat the steps 4, 5, and 6 until you select all the physical drives used for RAID 10. And then, click **Next**.  
If you add a virtual drive to the already existing Drive Group, click **Next**.



8. The following window is displayed.
- If you build a new virtual drive, select all the Drive Group added in the step 7 from the pull down menu in the **Array With Free Space** pane.
- If you add a virtual drive to the already existing Drive Group, select that from the pull down menu in the **Array With Free Space** pane.

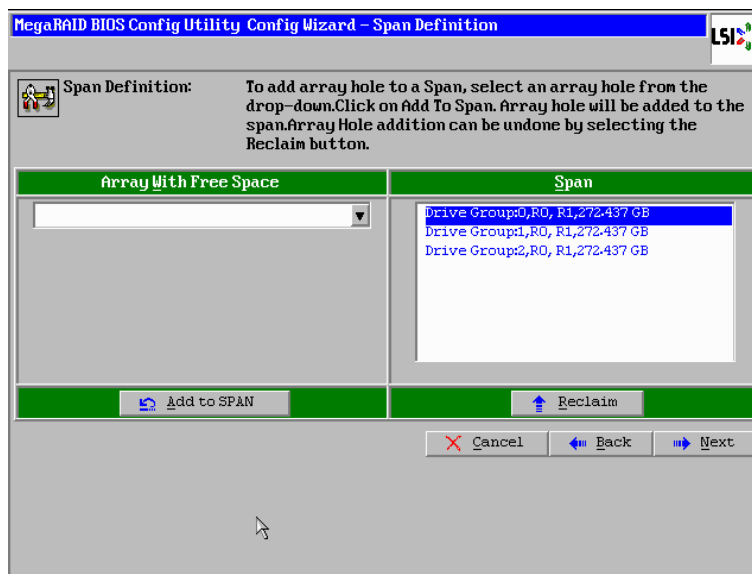


9. Click **Add to SPAN**.



If you add a virtual drive to the already existing Drive Group, select either one of the Drive Group and then click **Add to SPAN**. Then all the currently building Drive Groups are selected.

10. The following window is displayed. Click **Next**.



11. The following window is displayed.

While all the displayed virtual drives are selected, specify the RAID level, strip size, read policy, write policy, and virtual drive size as shown in the table below:

The screenshot shows the 'MegaRAID BIOS Config Utility Config Wizard - Virtual Drive Definition' window. On the left, there is a list of configuration options with dropdown menus: RAID Level (RAID 10), Strip Size (64 KB), Access Policy (RW), Read Policy (Normal), Write Policy (Write Through), IO Policy (Direct), Drive Cache (Unchanged), Disable BGI (No), and Select Size (GB). On the right, under 'Virtual Drives', it shows 'Next LD, Possible RAID Levels' with two entries: R00:817.312 GB and R10:408.656 GB. At the bottom, there are buttons for 'Accept', 'Reclaim', 'Cancel', 'Back', and 'Next'.

Set each item in the following value to the recommended value, unless otherwise specified.

---

**NOTICE** You need connect the AC cables of the system unit to a UPS, when you use the RAID controller without cache backup module and set **Write Policy** to **Always Write Back**. Otherwise, the data corruption may result when blackout or momentary loss of power occurs.

---

**Table 2-17: Specify the RAID level, strip size, and policies**

Menu items	Description	Setting/display value
RAID Level	RAID Level	[RAID 10]
Strip Size	Strip size	8KB / 16KB / 32KB / <u>[64KB]</u> / 128KB / 256KB / 512KB / 1MB
Access Policy	Access policy	<u>[RW (reading and writing)]</u> / Read Only (reading only) / Blocked (access denied)
Read Policy	Read policy	<u>[Normal (no read ahead)]</u> / Ahead (always read ahead)
Write Policy <sup>1</sup>	Write policy	<ul style="list-style-type: none"> <li>RAID controller with cache backup module: Write Through / Always Write Back / <u>[Write Back With BBU]</u></li> <li>RAID controller without cache backup module: <u>[Write Through]</u> / [Always Write Back] / Write Back With BBU</li> </ul>
IO Policy	Read-cache operation	<u>[Direct (cache: not used)]</u> / Cached (cache: used)
Disk Cache <sup>2</sup>	Setting the disk cache	[Disable (cache: not used)] / Enable (cache: used) / <u>No change (depending on the disk setting)</u>
Disable BGI <sup>2</sup>	Setting the background initialization	<u>No (background initializing valid)</u> / [Yes (background initializing invalid)]
Select Size <sup>3</sup>	Size of a disk array	Entering the maximum capacity value. (minimum allowable value: 64 KB)
<b>Notes:</b> <ol style="list-style-type: none"> <li>If you use the RAID controller without cache backup module, use this item with the default setting when installing an OS. Even if the system unit is connected to a UPS, the install may not finish normally.</li> <li>Change from the default value to the recommended value.</li> <li>When you configure "Select Size", check the maximum allowable capacity displayed under [Next LD, Possible RAID Levels] at the right of the window. And then you specify the value at your discretion within the maximum capacity in accordance with the specified RAID level. When you enter the value, completely delete the value in the box first and then enter the value. When you enter the maximum capacity, enter all the digits precisely including decimal places and make sure you do not skip even zeros.</li> </ol>		



If multiple virtual drives reside on the same Drive Group, keep the same setting for all the virtual drives.

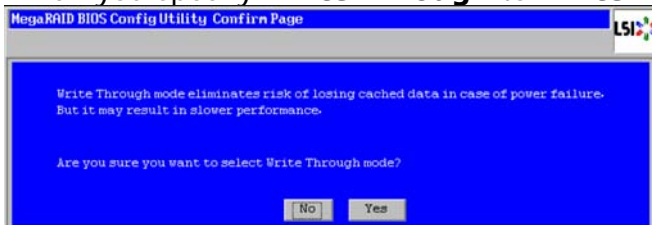


If you specify a larger disk array size than the maximum capacity, **Unacceptable size** is displayed on the window and all the setting items are initialized. You need to reset all items to the correct size.

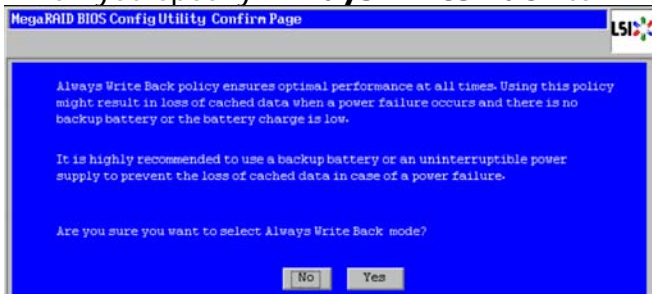
12. Click **Accept**.

13. The following window is displayed. Click **Yes**.

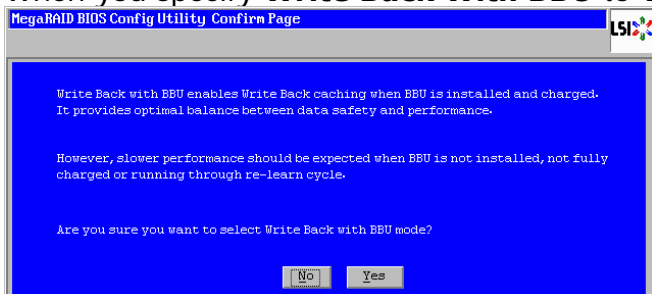
- When you specify **Write Through** to **Write Policy**



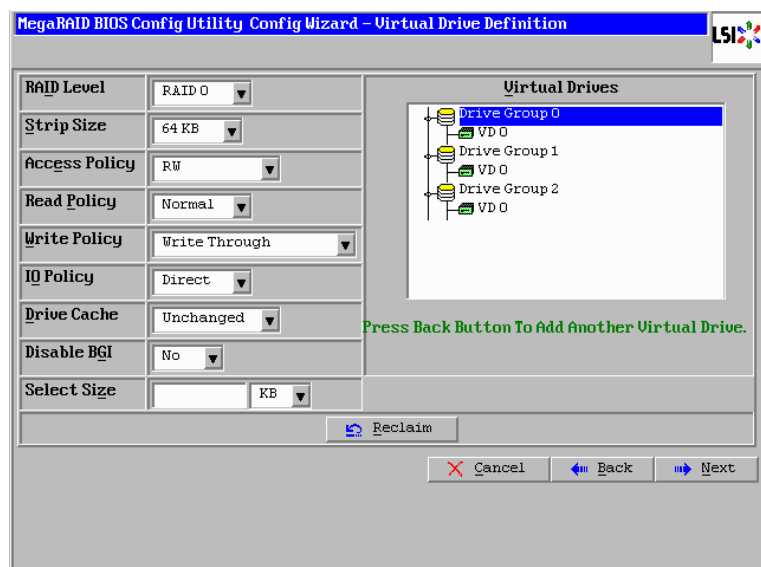
- When you specify **Always Write Back** to **Write Policy**



- When you specify **Write Back With BBU** to **Write Policy**

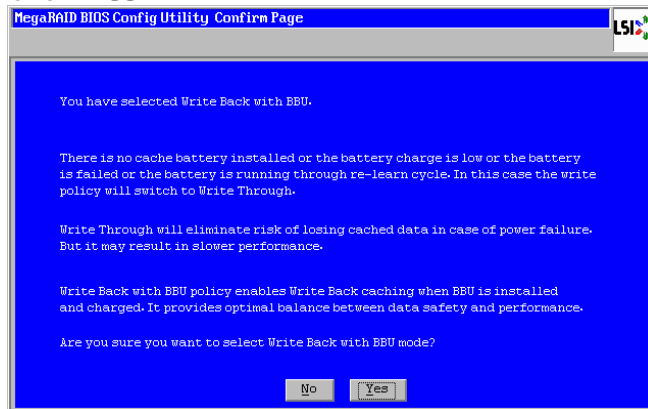


14. The following window is displayed. Click **Next**.



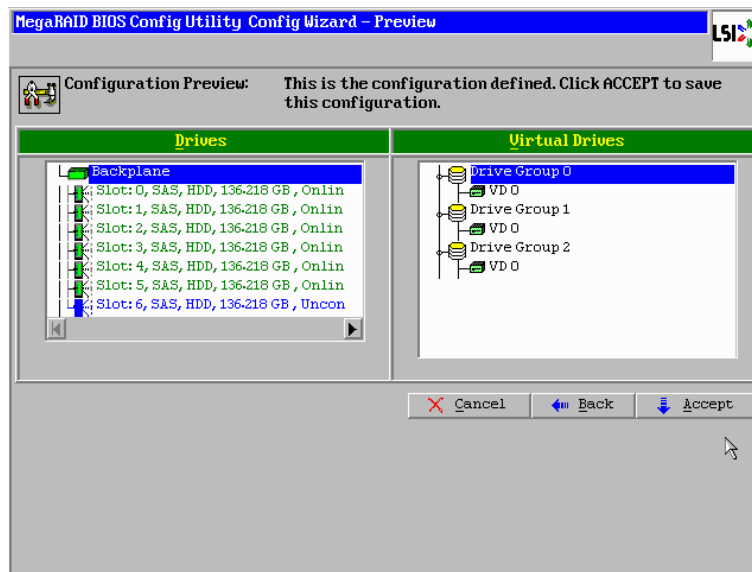


The following window is displayed before above window is displayed when you specify **Write Back With BBU** to **Write Policy**. Click **Yes**.

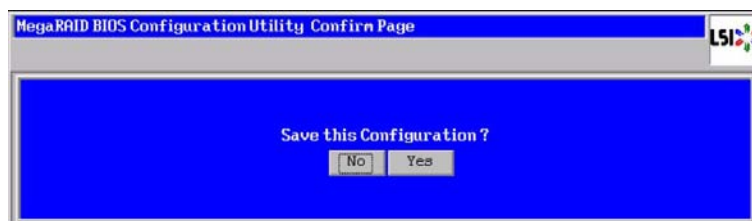


15. The following window is displayed.  
Confirm the settings, and then click **Accept**.

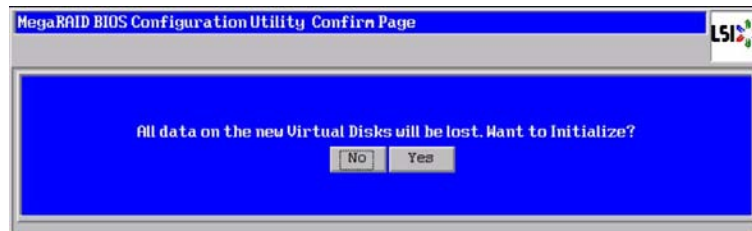
If the settings are wrong, click **Back** and return to the step 11.



16. The following window is displayed. Click **Yes**.



17. The following window is displayed. Click **No**.



The window returns to the main menu.

18. Initialize the created virtual drive.

See [Initializing virtual drive](#) on page 2-49.



## Initializing virtual drive

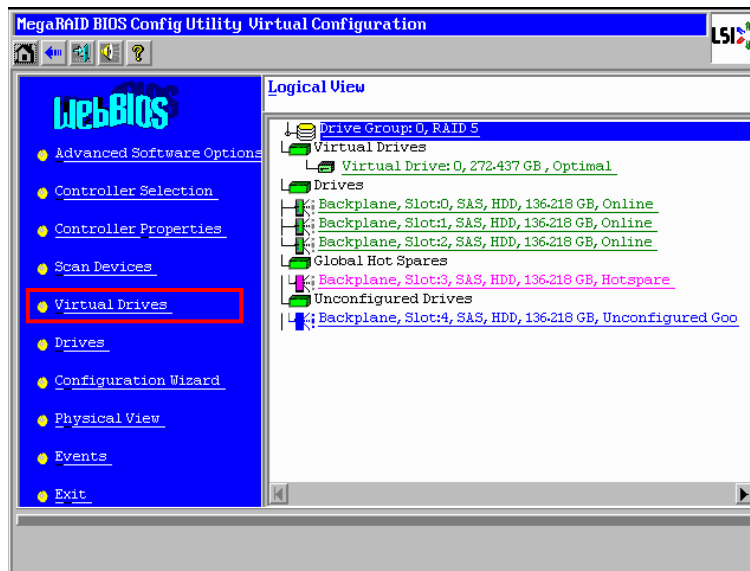
This section describes the procedure for initializing virtual drive.

**NOTICE** When a virtual drive is initialized, all data in those physical drives including the virtual drive information is lost. Backup your required data before initializing a virtual drive.

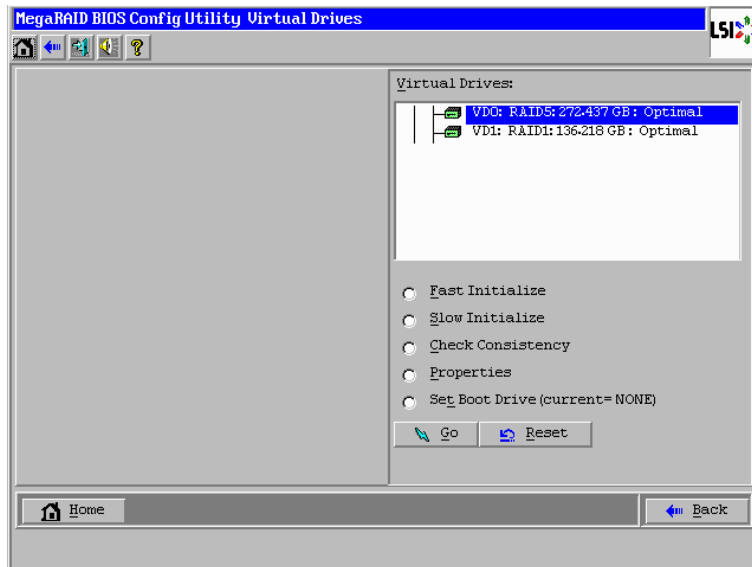


Do not perform initialization when consistency check is under operating for other virtual drive on the same Drive Group. Otherwise, consistency check and initialization may not operate properly.

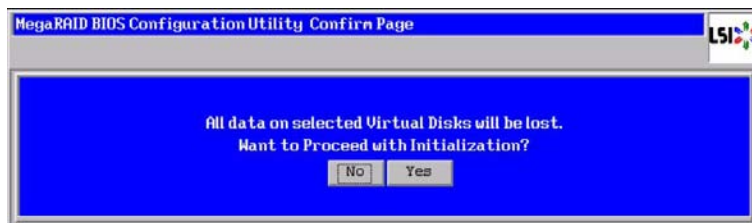
1. Click **Virtual Drives** in the main menu.



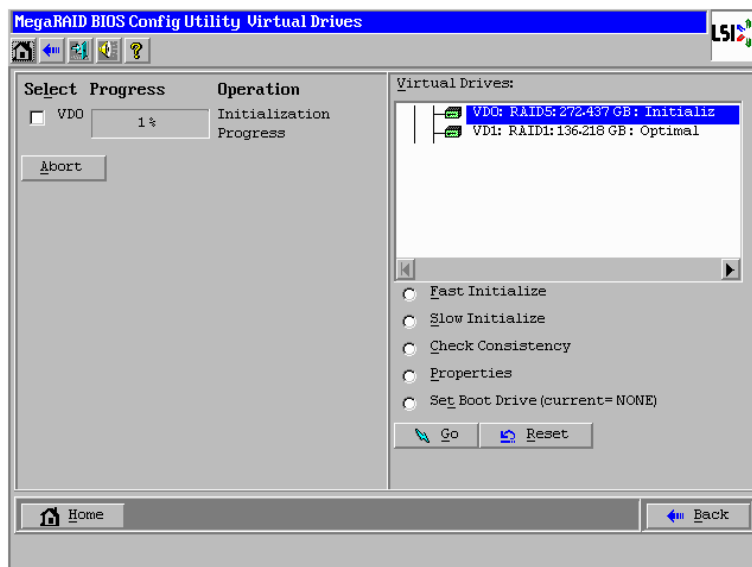
2. The following window is displayed.  
In the list of virtual drives displayed in the upper right pane, click a virtual drive configuration to be initialized.



3. Click **Slow Initialize** > **Go**.  
4. The following window is displayed. Click **Yes**.



5. The following **progress of initialization** in the left pane is displayed.



6. Wait until the processing is completed to 100%.

A guideline of initialization time is shown in the following table.

**Table 2-18: Guideline of initialization**

Single drive capacity	Initialization time
146 GB (SAS / 2.5 inch type HDD)	Approximately 16 minutes
300 GB (SAS / 2.5 inch type HDD)	Approximately 40 minutes
450 GB (SAS / 2.5 inch type HDD)	Approximately 60 minutes
600 GB (SAS / 2.5 inch type HDD)	Approximately 80 minutes
900 GB (SAS / 2.5 inch type HDD)	Approximately 120 minutes
1.2 TB (SATA2 / 2.5 inch type HDD)	Approximately 160 minutes
500 GB (SATA2 / 2.5 inch type HDD)	Approximately 670 minutes
1 TB (SATA2 / 2.5 inch type HDD)	Approximately 1340 minutes
100 GB (SATA2 / 2.5 inch type SSD)	Approximately 10 minutes
200 GB (SATA2 / 2.5 inch type SSD)	Approximately 20 minutes



The initialization time varies depending on the physical drive capacity regardless of the RAID level or virtual drive capacity.

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7. When initialization is completed to 100%, click **Home** to return to the main menu.

## Deleting disk arrays

This section describes the procedure for deleting virtual drive.

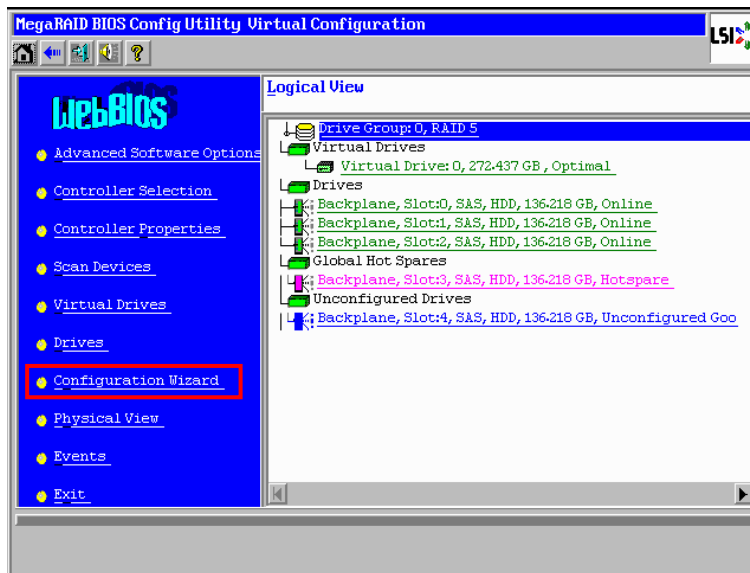
---

**NOTICE** When a virtual drive is deleted, all data in those physical drives including the virtual drive information is lost. Backup your required data before deleting a virtual drive.

---

### Deleting all virtual drives simultaneously

1. Click **Configuration Wizard** in the main menu.



2. The following window is displayed. Click **Clear Configuration > Next**.



3. The following window is displayed. Click **Yes**.



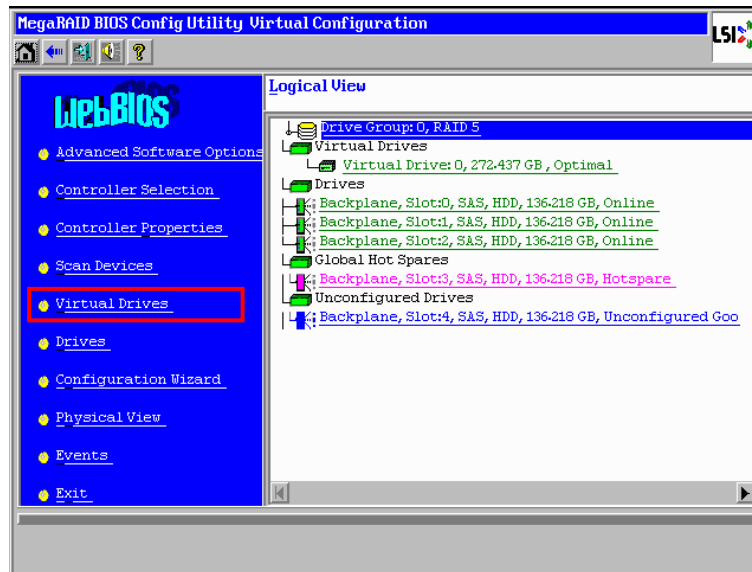
## Deleting virtual drive selectively



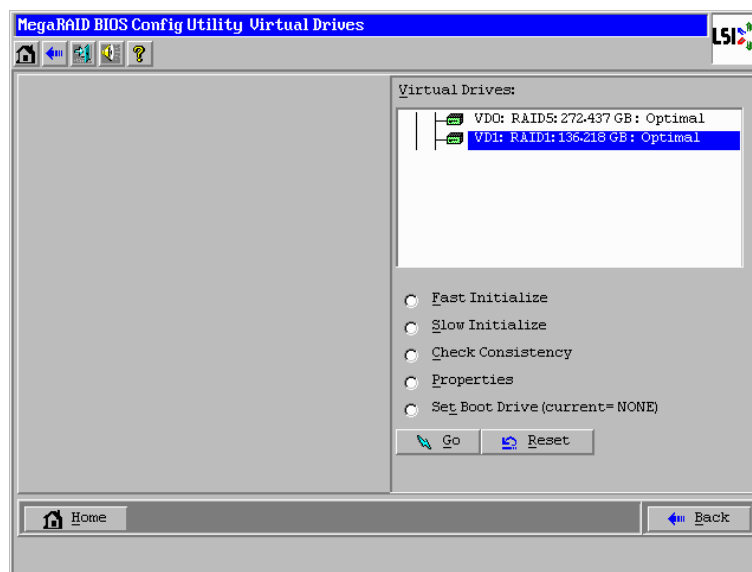
When you delete a virtual drive on the Drive Group, deleting the last build virtual drive is supported only.

If you want to delete an older virtual drive, delete virtual drives in the reverse order starting at the last build virtual drive and ending at the virtual drive you want to delete.

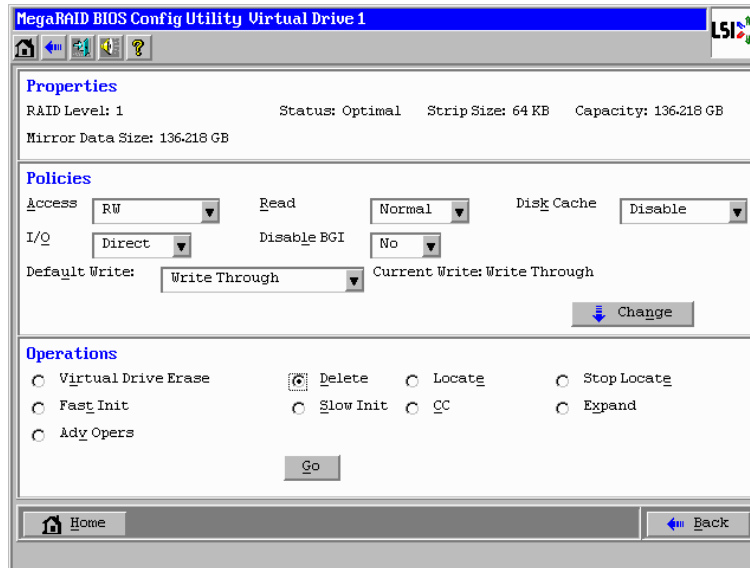
1. Click **Virtual Drives** in the main menu.



2. The following window is displayed.  
From the list displayed in the upper right pane, click a virtual drive to be deleted. Then click **Properties** > **Go**.

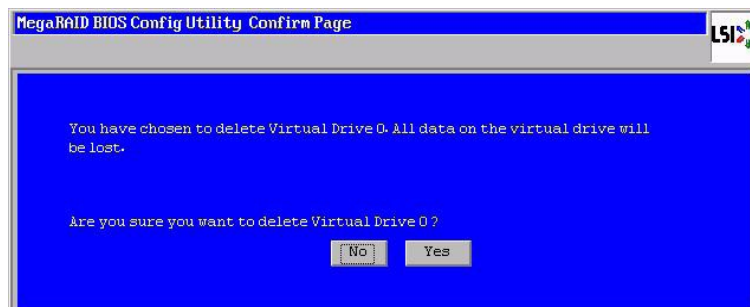


3. The following window is displayed.  
Click **Delete** > **Go** in the Operations pane.



The screenshot shows the 'MegaRAID BIOS Config Utility Virtual Drive 1' window. It has a blue title bar with the LSI logo. Below the title bar is a navigation bar with icons for Home, Back, Forward, and Help. The main content area is divided into three sections: 'Properties', 'Policies', and 'Operations'. The 'Properties' section shows RAID Level: 1, Status: Optimal, Strip Size: 64 KB, Capacity: 136.218 GB, and Mirror Data Size: 136.218 GB. The 'Policies' section has dropdown menus for Access (RW), Read (Normal), Disk Cache (Disable), I/O (Direct), Disable BGI (No), Default Write (Write Through), and Current Write (Write Through). There is a 'Change' button with a downward arrow. The 'Operations' section has radio buttons for Virtual Drive Erase (selected), Fast Init, Adv Opers, Delete (selected), Slow Init, CC, Locate, Stop Locate, and Expand. There is a 'Go' button. At the bottom, there are 'Home' and 'Back' buttons.

4. The following window is displayed. Click **Yes**.



The screenshot shows the 'MegaRAID BIOS Config Utility Confirm Page' window. It has a blue title bar with the LSI logo. The main content area has a blue background with white text. The text reads: 'You have chosen to delete Virtual Drive 0. All data on the virtual drive will be lost.' followed by 'Are you sure you want to delete Virtual Drive 0?'. At the bottom, there are 'No' and 'Yes' buttons.

## Checking disk arrays for consistency

This section describes how to check the consistency of disk arrays.

Consistency check can be done from MegaRAID Storage Manager. See *MegaRAID Storage Manage Instruction Manual*, contained in the "DriverKit & Manual" CD-ROM for how to check the consistency from the MegaRAID Storage Manager.

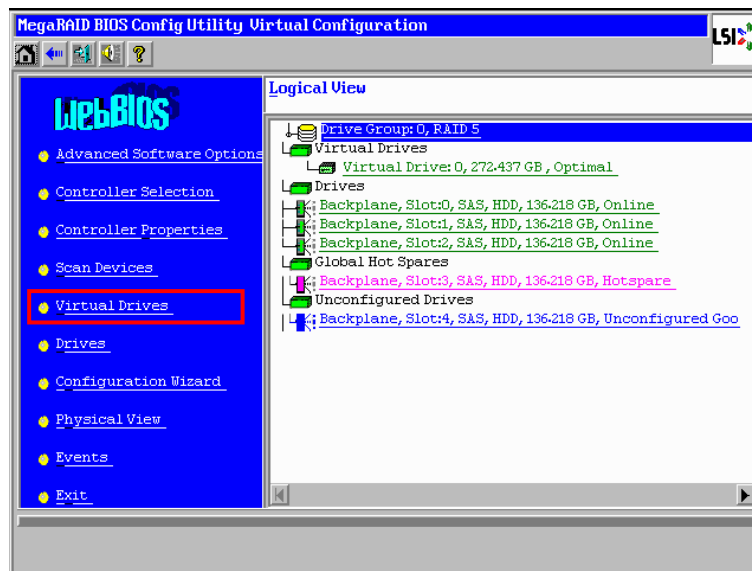


Do not perform consistency check when initialization is under operating for other virtual drive on the same Drive Group. Otherwise, initialization and consistency check may not operate properly.



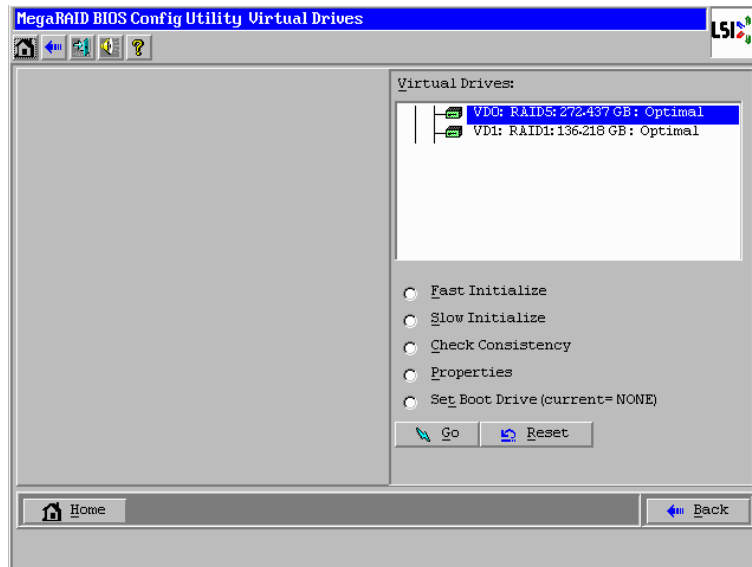
You can perform consistency check only for RAID 1, 5, 6, and 10.

1. Click **Virtual Drives** in the main menu.

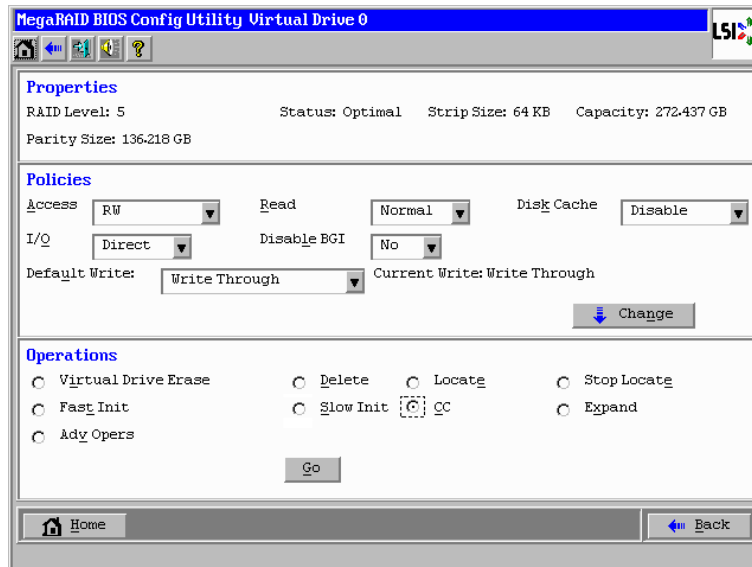




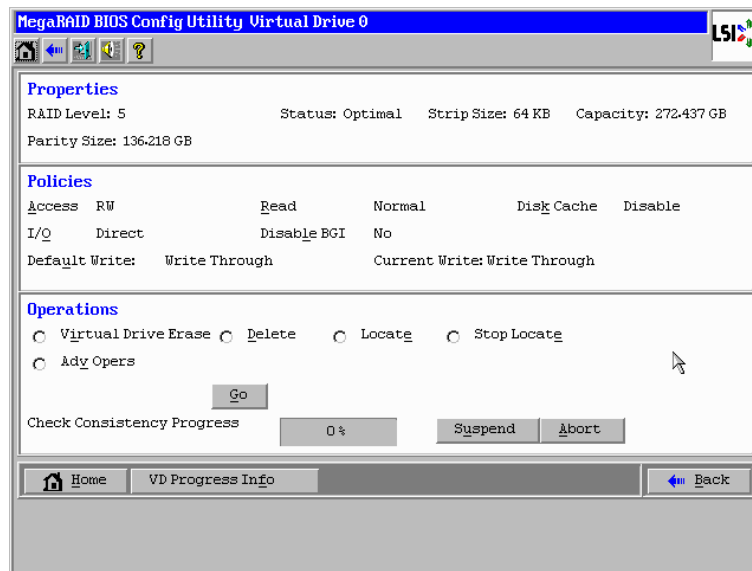
2. The following window is displayed.  
From the list displayed in the upper right pane, click a virtual drive to be checked the consistency, and then check **Properties** > **Go**.



3. The following window is displayed. Click **CC** > **Go**.



- The progress of consistency check is displayed in the following **Operations** pane.



- Wait until the processing is completed to 100%.
- When the consistency check is completed to 100%, click **Home** to return to the main menu.

## Changing the order of booting virtual drives

Do not change the settings of this menu items. This function is not supported by Hitachi Compute Rack System. Use defaults setting for all the items.

## Making hot spares

This section describes a procedure of making a hot spare (reserve drive).

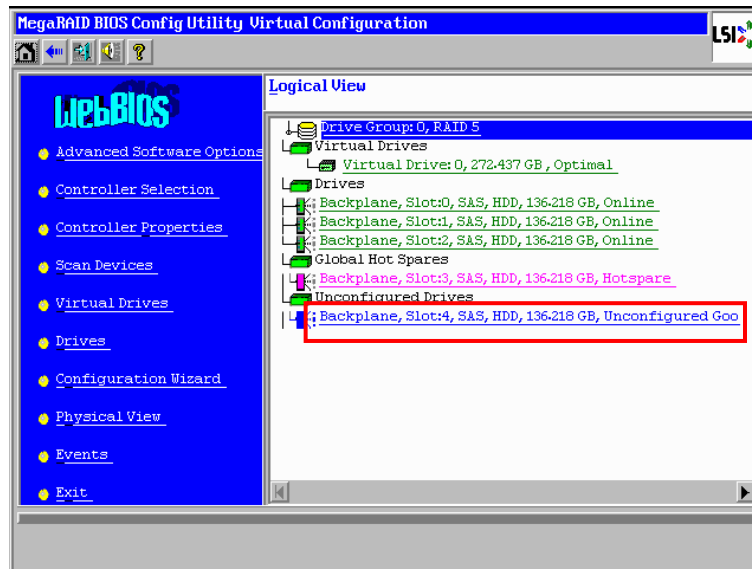
Two types of hot spare are available: "global hot spares" can be used for all virtual drives and "dedicated hot spares (local spares)" are dedicated to the specific virtual drive.

Choose the type as required.



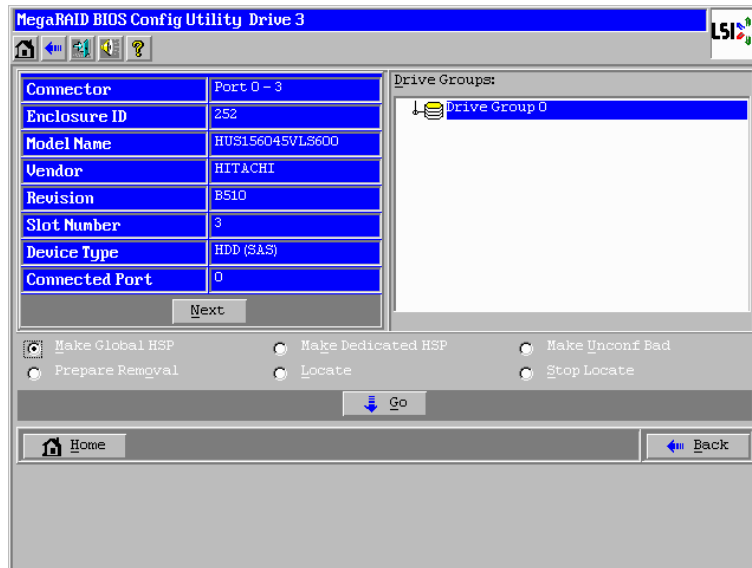
- Before you make a hot spares, you need to build a virtual drive with redundancy (RAID 1, 5, 6, 10).
- For the disk array configured with HDDs, install HDD as reserve drive; for the disk array configured with SSDs, install SSD as reserve drive. Other type of disk array cannot be configured as reserve drive.

1. Click the physical drive you want to use as a hot spare from the list in the **Logical View** / **Physical View** in the main menu.

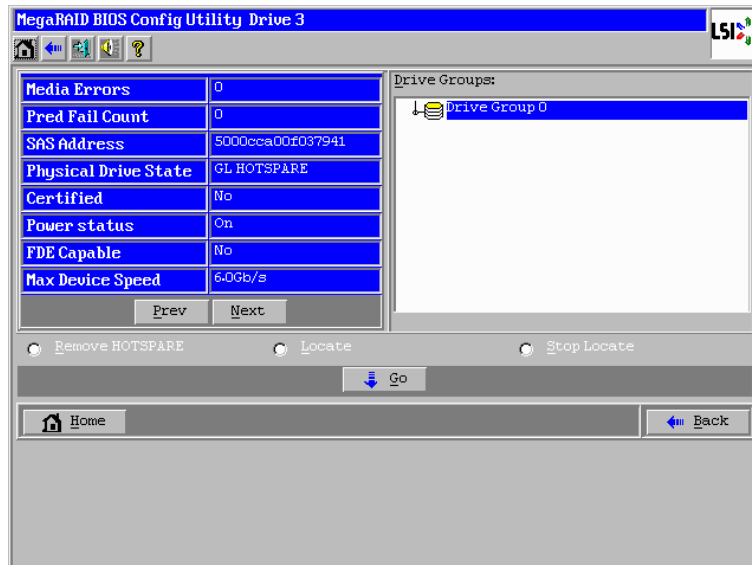


You can select only a drive which status is "Unconfigured Good" (unused).

- The following window is displayed.  
If you set the drive as "global hot spare", check **Make Global HSP**.  
If you set the drive as "dedicated hot spare", click the logical drive to be protected in the upper right pane, and then check **Dedicated HSP**.



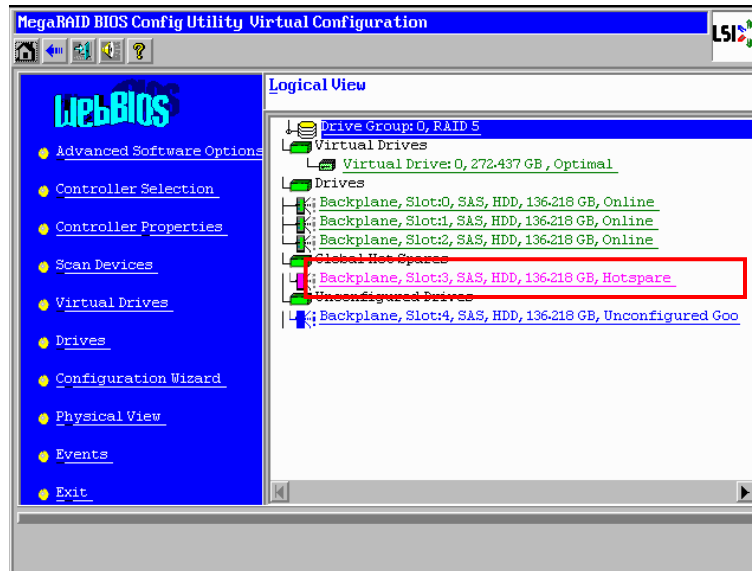
- Check **Make Global HSP** or **Make Dedicated HSP**, and then click **Go**.  
The drive is set as hot spare.



## Removing hot spares

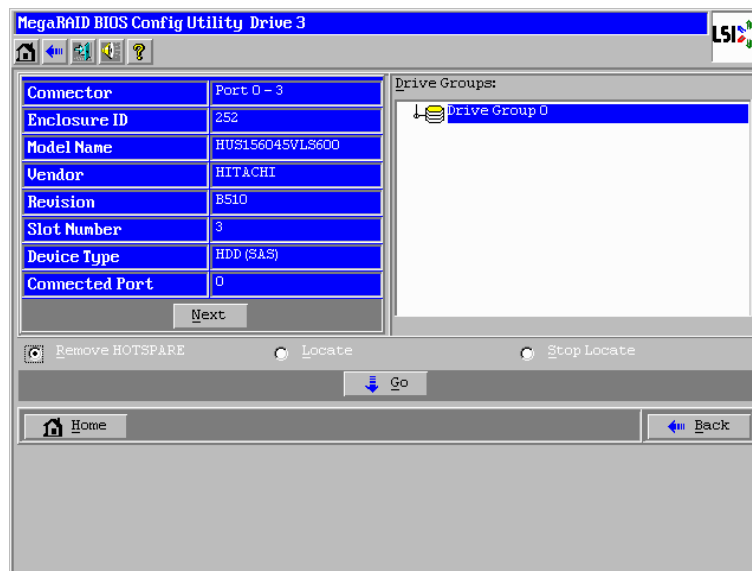
This section describes a procedure of remove a hot spare.

1. Click the physical drive used as a hot spare from the list in the **Logical View** / **Physical View** in the main menu.



2. The following window is displayed.  
Check **Remove HOTSPARE**, and then click **Go**.

The hot spare is removed.



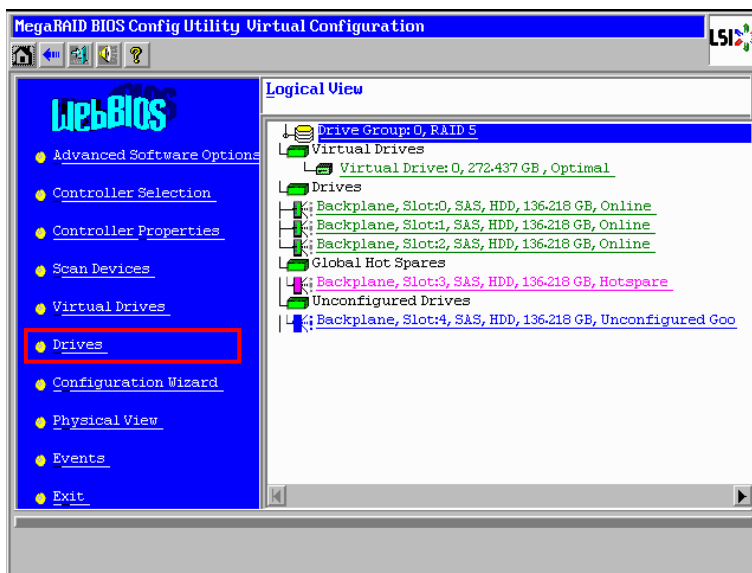
## Rebuilding virtual drives

This section describes a procedure of rebuilding virtual drive in case of trouble that has occurred on a physical disk in the redundant disk array configuration.

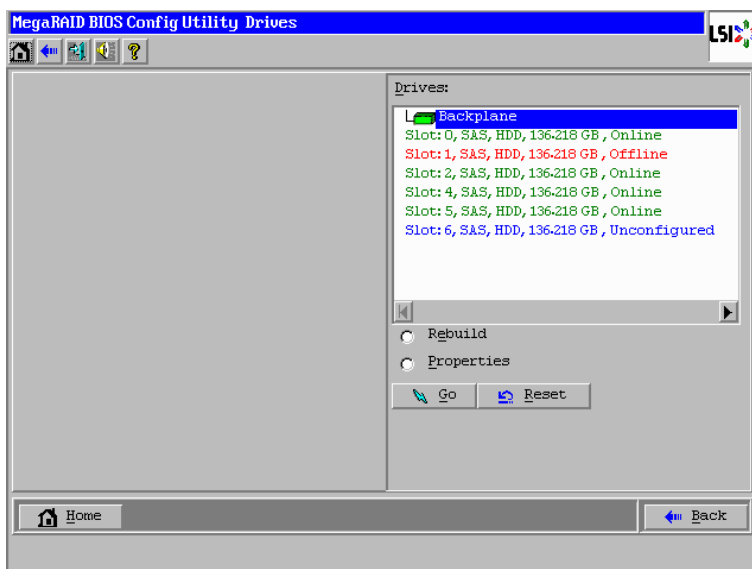
Usually, rebuilding will work automatically after you replace the failed disk in hot-plug. Also, if you set up hot spares, rebuilding will work automatically.

The following is a procedure of manual rebuilding in case that rebuilding doesn't work automatically by some reason.

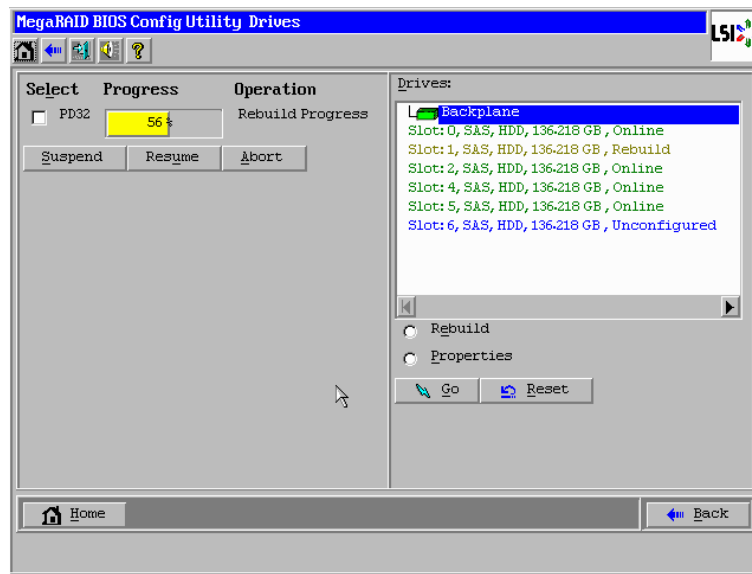
1. Click **Drives** in the main menu.



2. The following window is displayed.  
Click a disk status is **Offline**, and then click **Rebuild** > **Go**.



- The progress of rebuilding is displayed in the left pane of the following window.



- Wait until the processing is completed to 100%.  
A guideline of rebuilding time is shown in the following table.

**Table 2-19: Guideline of rebuilding time**

RAID level	Capacity of a virtual drive	Rebuilding time
RAID 1	146 GB (SAS 146 GB / 2.5 inch type HDD × 2)	Approximately 16 minutes
	500 GB (SATA2 500 GB / 2.5 inch type HDD × 2)	Approximately 60 minutes
	100 GB (SATA2 100 GB / 2.5 inch type SSD × 2)	Approximately 10 minutes
RAID 5	292 GB (SAS 146 GB / 2.5 inch type HDD × 3)	Approximately 16 minutes
	1 TB (SATA2 500 GB / 2.5 inch type HDD × 3)	Approximately 60 minutes
	200 GB (SATA2 100 GB / 2.5 inch type SSD × 3)	Approximately 10 minutes
RAID 6	292 GB (SAS 146 GB / 2.5 inch type HDD × 4)	Approximately 16 minutes
	1 TB (SATA2 500 GB / 2.5 inch type HDD × 4)	Approximately 60 minutes
	200 GB (SATA2 100 GB / 2.5 inch type SSD × 4)	Approximately 10 minutes
RAID 10	292 GB (SAS 146 GB / 2.5 inch type HDD × 4)	Approximately 16 minutes
	1 TB (SATA2 500 GB / 2.5 inch type HDD × 4)	Approximately 50 minutes
	200 GB (SATA2 100 GB / 2.5 inch type SSD × 4)	Approximately 10 minutes



The rebuild time is proportional to the capacity of the physical drives.

- When rebuilding is completed to 100%, click **Home** to return to the main menu.



## Adding capacity to virtual drives

This section describes a procedure of adding capacity to a virtual drive in the disk array such as RAID level 0, 5, and 6 configurations.

Adding capacity can be done from MegaRAID Storage Manager. See *MegaRAID Storage Manage Instruction Manual*, contained in the "DriverKit & Manual" CD-ROM.

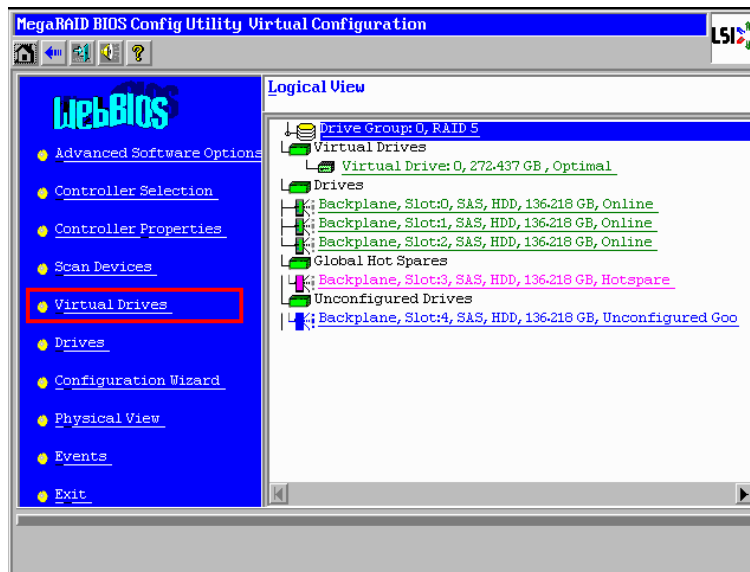


- You cannot cancel adding capacity to a virtual drive in the middle.
- If multiple virtual drives reside on the same Drive Group or if all the capacity of the Drive Group has not been used up, capacity expansion is not supported.

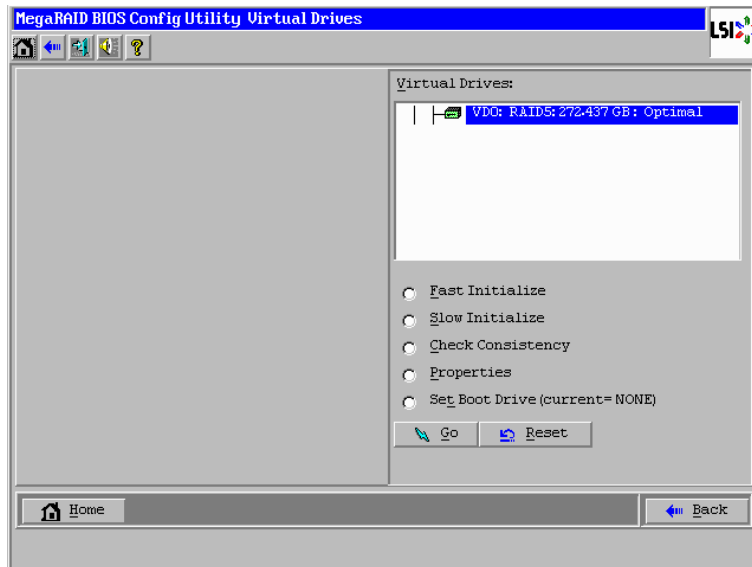


In order to add capacity, you need to have physical drives with "Unconfigured Good" status.

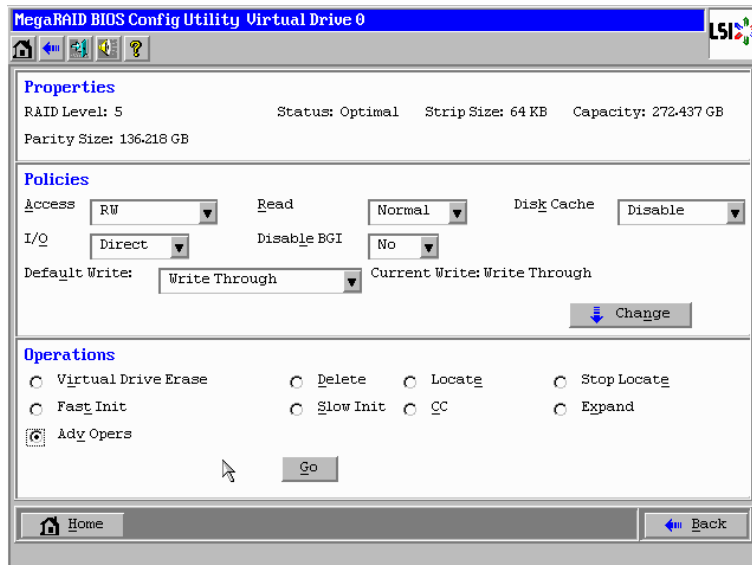
1. Click **Virtual Drives** in the main menu.



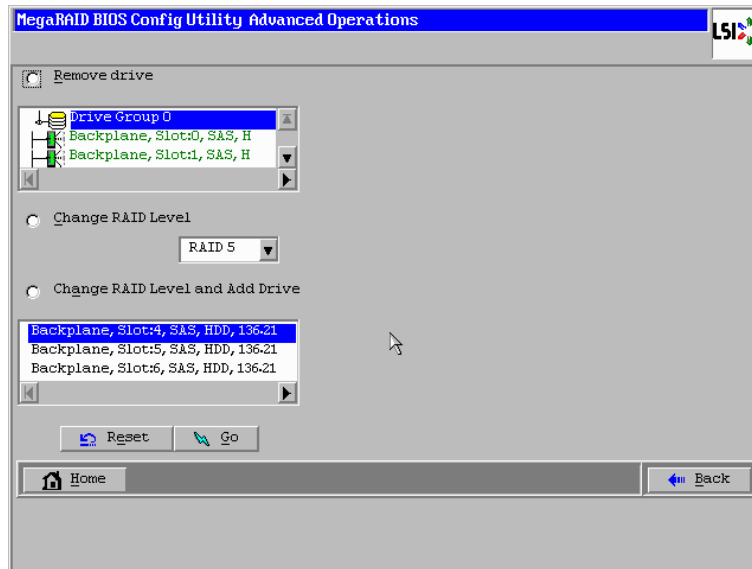
2. The following window is displayed.  
From the list displayed in the upper right pane, click a virtual drive to add capacity, and then check **Properties** > **Go**.



3. The following window is displayed. Click **Adv Opers** > **Go**.

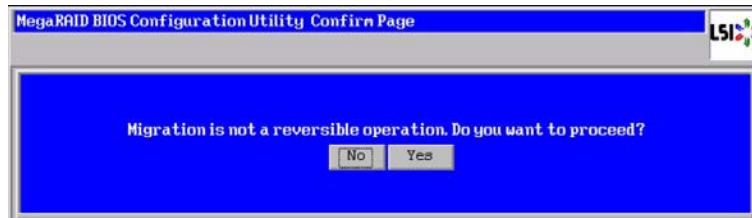


4. The following window is displayed.  
Check **Change RAID Level and Add Drive**, select the physical drives used for adding capacity from the list below, and then click **Go**.

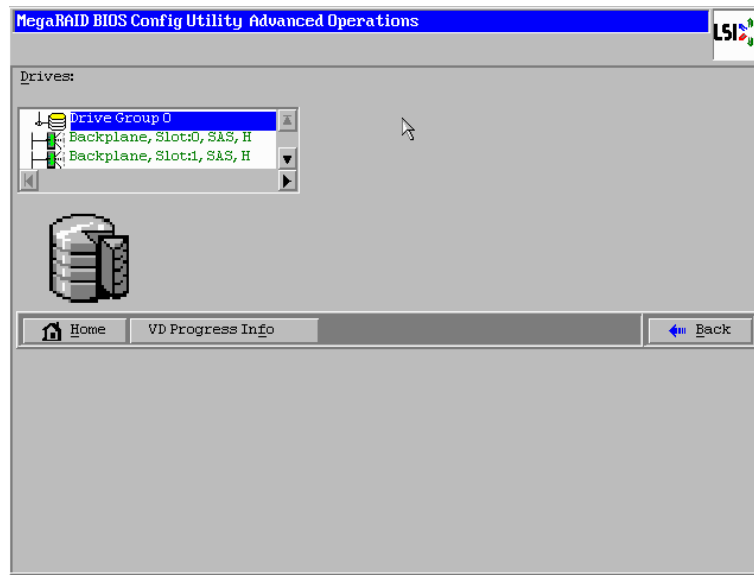


To select multiple drives, click the drives while pressing **Ctrl** key.

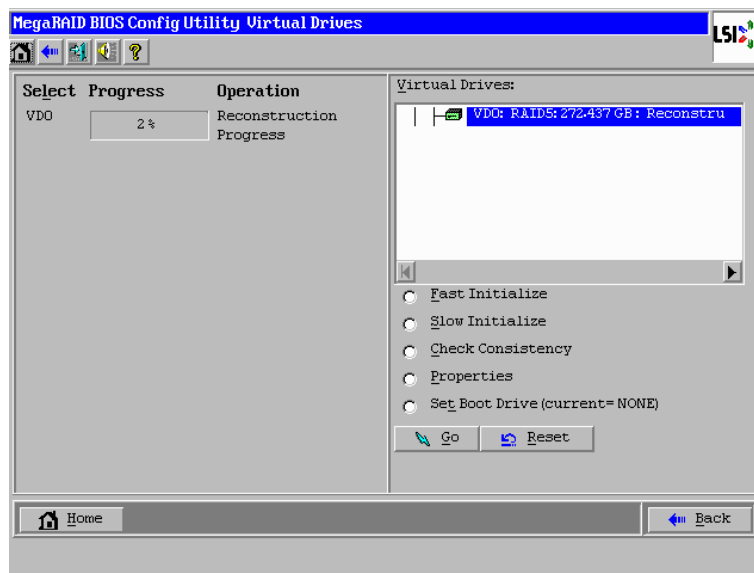
5. The following window is displayed. Click **Yes**.



6. The following window is displayed. Click **VD Progress Info**.



7. The progress of adding capacity is displayed in the left pane of the following window.



8. Wait until the processing is completed to 100%.

A guideline of adding capacity time is shown in the following table.

**Table 2-20: Guideline of adding capacity time**

RAID level	Adding capacity to a virtual drive	Adding time
RAID 0	438 GB (SAS 146 GB / 2.5 inch type HDD × 3)	Approximately 100 minutes
	1.5 TB (SATA2 500 GB / 2.5 inch type HDD × 3)	Approximately 610 minutes
	300 GB (SATA2 100 GB / 2.5 inch type SSD × 3)	Approximately 60 minutes
RAID 5	292 GB (SAS 146 GB / 2.5 inch type HDD × 3)	Approximately 80 minutes
	1 TB (SATA2 500 GB / 2.5 inch type HDD × 3)	Approximately 480 minutes
	200 GB (SATA2 100 GB / 2.5 inch type SSD × 3)	Approximately 45 minutes
RAID 6	292 GB (SAS 146 GB / 2.5 inch type HDD × 4)	Approximately 80 minutes
	1 TB (SATA2 500 GB / 2.5 inch type HDD × 4)	Approximately 580 minutes
	200 GB (SATA2 100 GB / 2.5 inch type SSD × 4)	Approximately 45 minutes



The adding capacity time is proportional to the capacity of the virtual drives.

9. When adding capacity is completed to 100%, click **Home** to return to the main menu.

## Changing the write policy

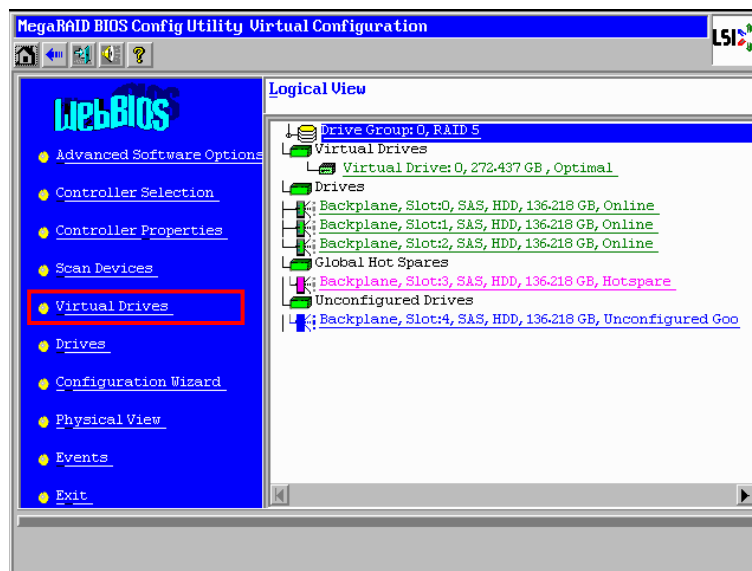
This section describes a procedure of changing the write policy of a virtual drive. You can expect better write performance if you enable the write cache of the virtual drive.

**NOTICE** You need connect the AC cables of the system unit to a UPS, when you use the RAID controller without cache backup module and set **Write Policy** to **Always Write Back**. Otherwise, the data corruption may result when blackout or momentary loss of power occurs.

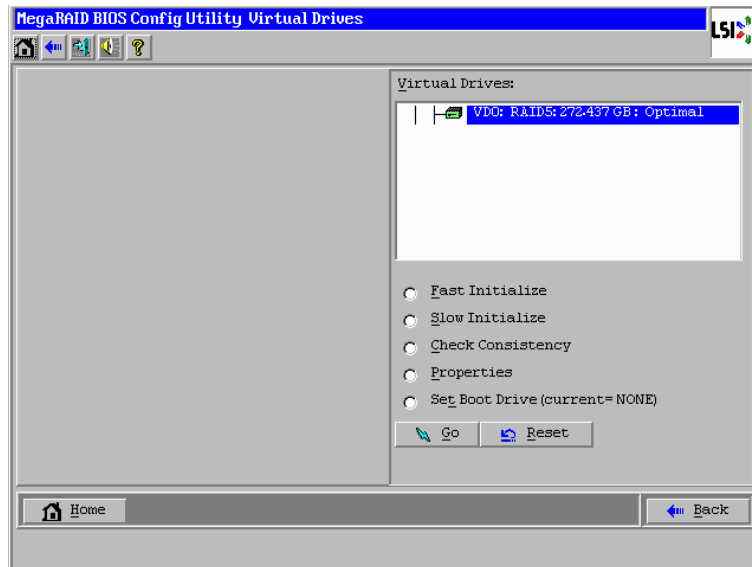


- If you use the RAID controller without cache backup module, use **Write Through** setting when installing an OS. Even if the system unit is connected to a UPS, the install may not finish normally.
- If you use the RAID controller with cache backup module, use only **Write Back With BBU** setting. Otherwise, write performance may be compromised.
- If multiple virtual drives reside on the same Drive Group, keep the same setting for all the virtual drives.

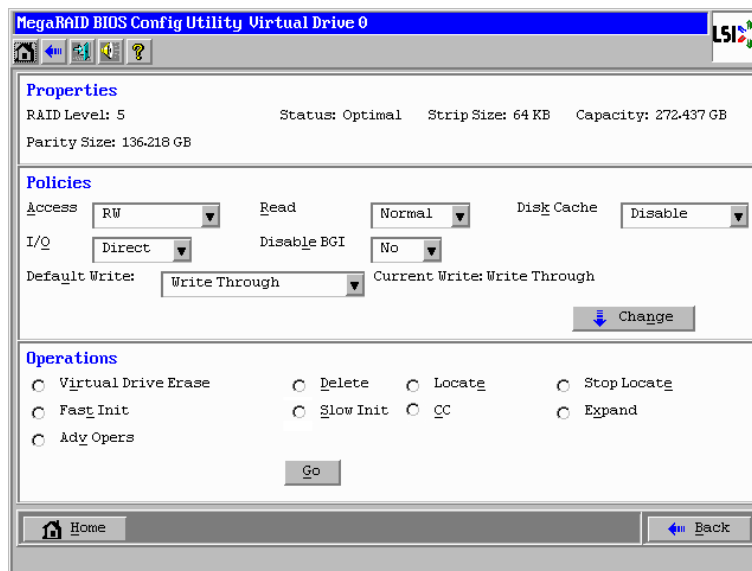
1. Click **Virtual Drives** in the main menu.



- The following window is displayed.  
From the list displayed in the upper right pane, click a virtual drive to change write policy, and then check **Properties** > **Go**.



- The following window is displayed.  
Select the write policy from **Default Write** displayed in the **Policies** pane.

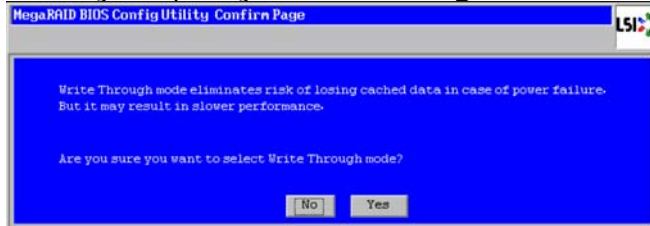


The setting is shown in the following table.

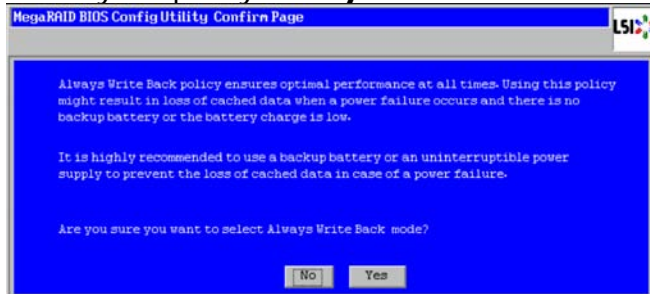
**Table 2-20: Default Write settings**

Setting	Description
Always Write Back	Write cache is enabled.
Write Through	Write cache is disabled.
Write Back With BBU	Write cache is enabled only when a cache backup module is connected to the RAID controller.

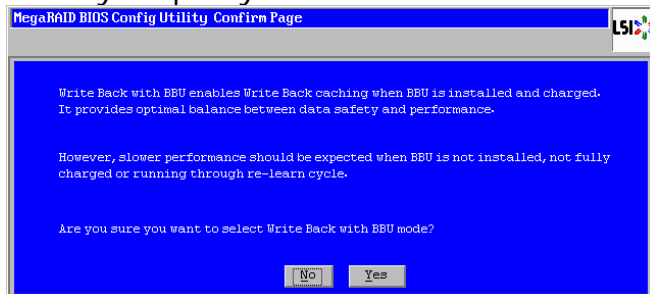
4. Click **Change**.
5. The following window is displayed. Click **Yes**.
  - When you specify **Write Through** to **Default Write**



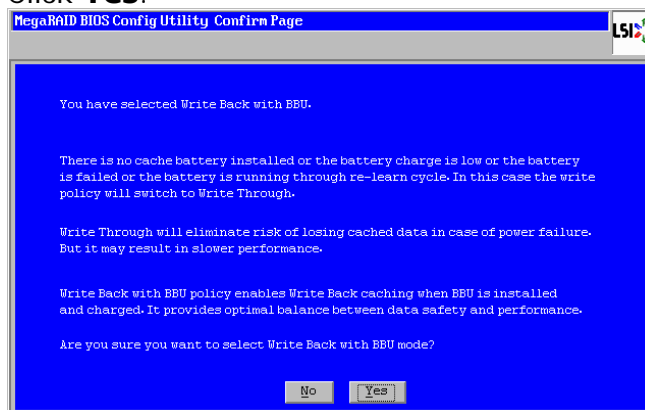
- When you specify **Always Write Back** to **Default Write**



- When you specify **Write Back With BBU** to **Default Write**



The following window is displayed after above window is displayed when you specify **Write Back With BBU** to **Default Write**. Click **Yes**.





6. Click **Home** to return to the main menu.



You need to configure the write policy for each of the virtual drives.  
If one or more virtual drives are build, configure the write policy for all of the virtual drives.

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## Disk with foreign configuration

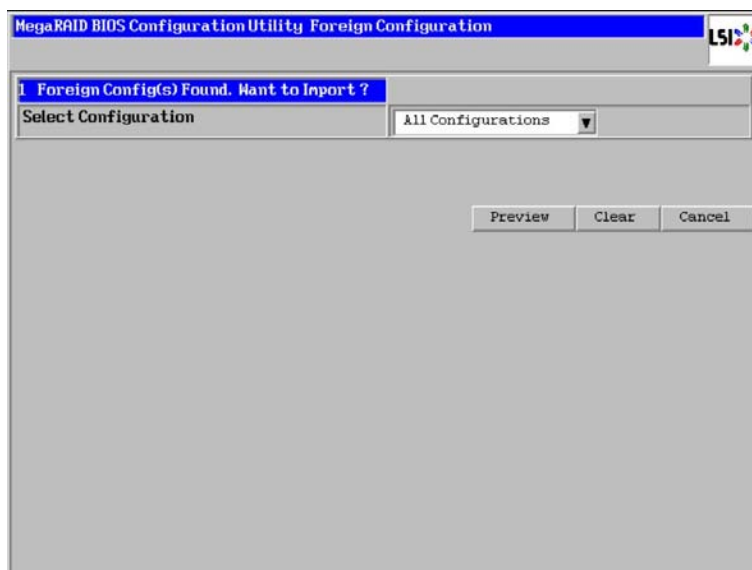
This section describes how to deal with a disk with a different configuration detected by the RAID controller configuration.

Difference in configuration between disks may be caused by the following conditions.

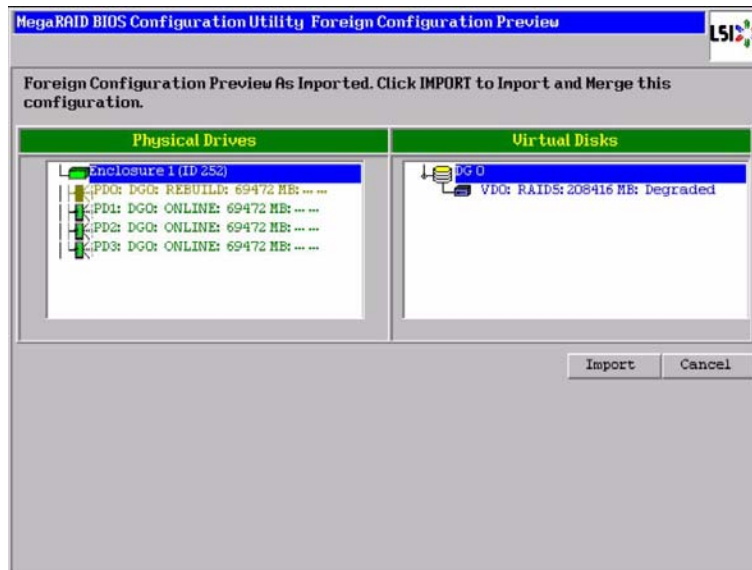
**Table2-22: Conditions to generate foreign configuration**

Conditions to generate foreign configuration
A disk failed and could not be recognized. Then the disk has been restored to be recognized.

1. If the following window is displayed when starting the MegaRAID WebBIOS, click **Preview**.



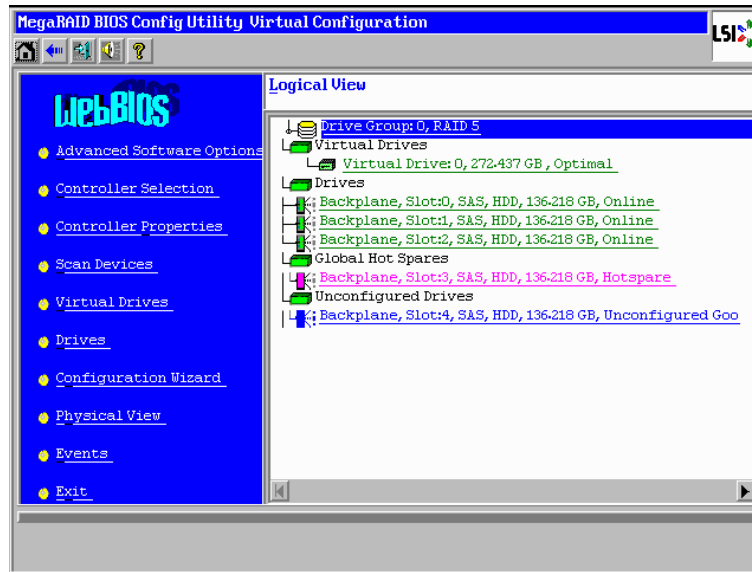
2. If the displayed configuration is correct, click **Import**.  
If the displayed configuration is incorrect, click **Cancel** to return the windows on the step 1, and then click **Clear**.



When you click **Clear**, **Previous foreign configuration will be lost. Do you want to proceed?** is displayed. Then click **Yes**.  
The previous foreign configuration is eliminated.

## Exiting MegaRAID WebBIOS

1. Return to the main menu.



2. From the main menu, click **Exit**.

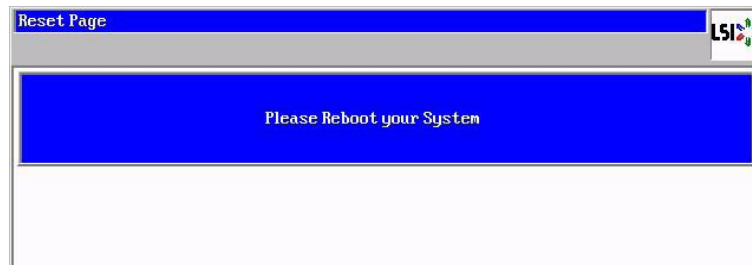
The **Exit Confirmation** window is displayed.



3. Click **Yes**.

Clicking **No** returns window to the main menu.

4. In response to the following message, powers off the system unit or restart the system unit by pressing **Ctrl + Alt + Delete** keys.



## Status

This section describes statuses of virtual drives / physical drives displayed in MegaRAID WebBIOS.

### Status of the virtual drive

Here is a list of statuses for disk arrays.

**Table 2-23: Statuses for disk arrays**

Status	Description
Optimal	Normal. The virtual drive is operable.
Partially Degraded	One physical drive fails in a RAID 6 virtual drive.
Degraded	One physical drive fails in a RAID 1, 5, or 10 virtual drive.
Offline	The virtual drive is inoperable because of either failures in multiple drive s in a redundant disk array or a failure in a drive in a non-redundant disk array.

### Status of the physical drive

**Table 2-24: Status of the disk**

Status	Description
Online	Normal.
Offline/Failed	A fault has occurred. The physical drive is separated from the disk array due to a failure.
Rebuild	Rebuilding is underway.
Global Hot Spare	The physical drive is set as a global hot spare.
Dedicated Hot Spare	The physical drive is set as a dedicated hot spare.
Unconfigured Good	This is not used for a disk array.
Unconfigured Bad	A fault has occurred. The unrecognizable disk is restored to recognizable.
Missing	A fault has occurred. A "normal" disk has been removed.





## **Hitachi Data Systems**

### **Corporate Headquarters**

2845 Lafayette Street  
Santa Clara, California 95050-2639  
U.S.A.  
[www.hds.com](http://www.hds.com)

### **Regional Contact Information**

#### **Americas**

+1 408 970 1000  
[info@hds.com](mailto:info@hds.com)

#### **Europe, Middle East, and Africa**

+44 (0) 1753 618000  
[info.emea@hds.com](mailto:info.emea@hds.com)

#### **Asia Pacific**

+852 3189 7900  
[hds.marketing.apac@hds.com](mailto:hds.marketing.apac@hds.com)

