

**ASUS<sup>®</sup>**

**RS720Q-E6 / RS12**

**RS724Q-E6 / RS12**

*2U Rackmount Server*

*User Guide*



E6465

First Edition V1

March 2011

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# Notices

## Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



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**WARNING!** The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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## Canadian Department of Communications Statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This Class A digital apparatus complies with Canadian ICES-003.

## REACH Information

Complying with the REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulatory framework, we publish the chemical substances in our products at ASUS REACH website at <http://csr.asus.com/english/REACH.htm>.

# Safety information

## Electrical Safety

- Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.
- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing any additional devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your dealer.

## Operation Safety

- Any mechanical operation on this server must be conducted by certified or experienced engineers.
- Before operating the server, carefully read all the manuals included with the server package.
- Before using the server, ensure all cables are correctly connected and the power cables are not damaged. If any damage is detected, contact your dealer as soon as possible.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Place the server on a stable surface.



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This product is equipped with a three-wire power cable and plug for the user's safety. Use the power cable with a properly grounded electrical outlet to avoid electrical shock.

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### Lithium-Ion Battery Warning

**CAUTION!** Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

### CD-ROM Drive Safety Warning

**CLASS 1 LASER PRODUCT**

### Heavy System

**CAUTION!** This server system is heavy. Ask for assistance when moving or carrying the system.





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**DO NOT** throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

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**DO NOT** throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

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## About this guide

### Audience

This user guide is intended for system integrators, and experienced users with at least basic knowledge of configuring a server.

### Contents

This guide contains the following parts:

**1. Chapter 1: Product Introduction**

This chapter describes the general features of the server, including sections on front panel and rear panel specifications.

**2. Chapter 2: Hardware setup**

This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

**3. Chapter 3: Installation options**

This chapter describes how to install optional components into the barebone server.

**4. Chapter 4: Motherboard information**

This chapter gives information about the motherboard that comes with the server. This chapter includes the motherboard layout, jumper settings, and connector locations.

**5. Chapter 5: BIOS setup**

This chapter tells how to change system settings through the BIOS Setup menus and describes the BIOS parameters.

**6. Chapter 6: RAID configuration**

This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

**7. Chapter 7: Driver installation**

This chapter provides instructions for installing the necessary drivers for different system components.

## Conventions

To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual.



**DANGER/WARNING:** Information to prevent injury to yourself when trying to complete a task.



**CAUTION:** Information to prevent damage to the components when trying to complete a task.



**IMPORTANT:** Instructions that you **MUST** follow to complete a task.



**NOTE:** Tips and additional information to help you complete a task.

## Typography

### **Bold text**

Indicates a menu or an item to select.

### *Italics*

Used to emphasize a word or a phrase.

### <Key>

Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.

Example: <Enter> means that you must press the Enter or Return key.

### <Key1+Key2+Key3>

If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).

Example: <Ctrl+Alt+Del>

### **Command**

Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets.

Example: At the DOS prompt, type the command line: **format A:/S**

## References

Refer to the following sources for additional information, and for product and software updates.

### 1. **ASUS Server Web-based Management (ASWM) user guide**

This manual tells how to set up and use the proprietary ASUS server management utility.

### 2. **ASUS websites**

The ASUS websites worldwide provide updated information for all ASUS hardware and software products. Refer to the ASUS contact information.

# Chapter 1

This chapter describes the general features of the chassis kit. It includes sections on front panel and rear panel specifications.

# Product introduction

## 1.1 System package contents

Check your system package for the following items.

Model Name	RS720Q-E6/RS12, RS724Q-E6/RS12
Chassis	ASUS R21A 2U Rackmount Chassis
Motherboard	4 x ASUS Z8NH-D12 Server Board (RS720Q-E6/RS12) 4 x ASUS Z8PH-D12 SE/QDR Server Board (RS724Q-E6/RS12)
Component	1 x 1600W Power Supply 12 x Hot-Swap 3.5" HDD Trays (varies by territories) 4 x PCIe Riser Card (RE16R-R12B) 2 x Front I/O Board (FPB-R21A) 2 x Power Supply Power Distribution Board (PDB-R21A) 1 x Power Connection Board (PSB-R21A) 1 x Backplane Board (BP12LX-R21A) 2 x Midplane Board (MP8LX-R21-S) 4 x System Fans (80 x 38mm)
Accessories	1 x RS72xQ-E6/RS12 User's Guide 1 x ASWM 2.0 User's Guide 1 x RS72xQ-E6/RS12 Support CD (including ASWM*) 1 x Mellanox driver disc (RS724Q-E6/RS12 only**) 1 x Bag of Screws 2 x AC Power Cables 1 x Friction Rail Kit
Optional Items	8 x CPU Heatsinks (varies by territories) ASMB4-iKVM Remote management card PIKE Riser Card (RE16R-R12B-PIKE)

\* ASUS System Web-based Management

\*\* The Mellanox driver is included in the motherboard support DVD or in an individual driver disc, depending on the shipping sequence. This is subjected to change without notice.



If any of the above items is damaged or missing, contact your retailer.

## 1.2 Serial number label

Before requesting support from the ASUS Technical Support team, you must take note of the product's serial number containing 14 characters such as xxS0xxxxxxxxxx. See the figure below.

With the correct serial number of the product, ASUS Technical Support team members can then offer a quicker and satisfying solution to your problems.



## 1.3 System specifications

The ASUS RS720Q-E6/RS12 is a 2U barebone server system featuring the ASUS Z8NH-D12 server boards. The ASUS RS724Q-E6/RS12 is a 2U barebone server system featuring the ASUS Z8PH-D12 SE/QDR server boards. The servers support Intel® LGA1366 Xeon® series processors, plus other latest technologies through the chipsets onboard.

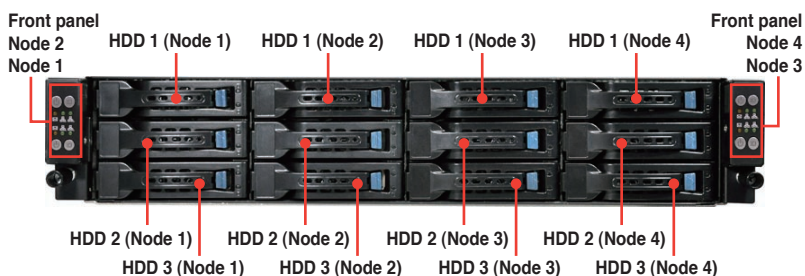
Model Name		RS720Q-E6/RS12	RS724Q-E6/RS12
Processor / System Bus		2 x Socket LGA1366 per Node	
		Six/Quad-Core Intel® Xeon® X5600 Series (95W) Quad-Core Intel® Xeon® X5500 Series (95W) Quad-Core Intel® Xeon® E5500/E5600 Series (80W) Quad-Core Intel® Xeon® L5500/L5600 Series (60W/40W)	
Core Logic		QPI 4.8 / 5.86 / 6.4 GT/s	
ASUS Features		Smart Fan	✓
		ASWM2.0	✓
Memory		Total Slots	12 DIMMs per Node (3-channel per CPU, 6 DIMMs per CPU)
		Capacity	Maximum up to 96GB (RDIMM) per Node Maximum up to 48GB (UDIMM) per Node
		Memory Type	DDR3 1333 / 1066 Reg DIMM / Unbuffered DIMM with ECC
		Memory Size	1GB, 2GB, 4GB and 8GB (RDIMM) 1GB, 2GB and 4GB (UDIMM)
Expansion Slots		Total PCI/PCI-X/PCI-E Slots	1 per Node
		Slot Type and Additional Slot	1 x PCI-E 2.0 x16 slot (x16 link) (Low profile / HL) per Node or 1 x PIKE Riser Card Slot for Storage Enhancement (Optional)
Storage		SATA Controller	<b>Intel® ICH10R:</b> 4 x SATA2 300MB/s ports - Intel Matrix Storage (for Windows) supporting SW RAID 0, 1 & 5 - LSI MegaRAID (for Linux / Windows) supporting SW RAID 0 & 1
		SAS Controller	<b>Optional: (PIKE Riser Card is necessary)</b> - ASUS PIKE 1068E 8-port SAS RAID card - ASUS PIKE 2008 8-port SAS2 6G RAID card - ASUS PIKE 2008/IMR 8-port SAS2 6G RAID card - ASUS PIKE 2108 8-port SAS2 6G HW RAID card
HDD Bays		I = internal A or S will be hot-swappable	3 x Hot-swap 3.5" HDD Bays per Node (Total 12 x 3.5" HDD in 2U)
Networking		LAN	2 x Intel® 82574L + 1 x Mgmt LAN per Node
			2 x Intel® 82574L + 1 x Mgmt LAN per Node  1 x Single Port Mellanox ConnectX2 QDR InfiniteBand with QSFP interface per Node

(continued on the next page)

Model Name		RS720Q-E6/RS12	RS724Q-E6/RS12
Graphic	VGA	Aspeed AST2050 8MB	
Onboard I/O		Per Node: <ul style="list-style-type: none"> <li>- 1 x External Serial Port</li> <li>- 3 x RJ-45 ports (1 for ASMB4-iKVM)</li> <li>- 2 x USB 2.0 ports</li> <li>- 1 x VGA port</li> <li>- 1 x Internal A Type USB Port</li> </ul>	Per Node: <ul style="list-style-type: none"> <li>- 1 x External Serial Port</li> <li>- 3 x RJ-45 ports (1 for ASMB4-iKVM)</li> <li>- 2 x USB 2.0 ports</li> <li>- 1 x VGA port</li> <li>- 1 x Internal A Type USB Port</li> <li>- 1 x QSFP Port for Infiniband QDR</li> </ul>
		Windows <sup>®</sup> Server 2008 Enterprise 32 / 64-bit Windows <sup>®</sup> Server 2003 R2 Enterprise 32 / 64-bit RedHat <sup>®</sup> Enterprise Linux AS5.0 32 / 64-bit SuSE <sup>®</sup> Linux Enterprise Server 10 32 / 64-bit (Subject to change without any notice)	
Anti-virus Software		Optional anti-virus CD Pack	
Management Solution	Out of Band Remote Hardware	Optional ASMB4-iKVM for KVM-over-IP support	
	Software	ASUS ASWM 2.0 <sup>®</sup>	
Dimension (HH x WW x DD)		750mm x 444mm x 87mm (2U)	
Net Weight Kg (CPU, DRAM & HDD not included)		25 Kg	
Power Supply		1+1 Redundant 1600W (80+ Platinum) Power Supply	
Power Rating		Input: 1000W: 100–120Vac, 12–10A, 50–60Hz, Class 1 1200W: 120–140Vac, 12–10A, 50–60Hz, Class 1 1620W: 180–240Vac, 10.5–8A, 50–60Hz, Class 1	
Environment		Operation temperature: 10°C–35°C Non operation temperature: -40°C–70°C Non operation humidity: 20%–90% ( Non-condensing)	

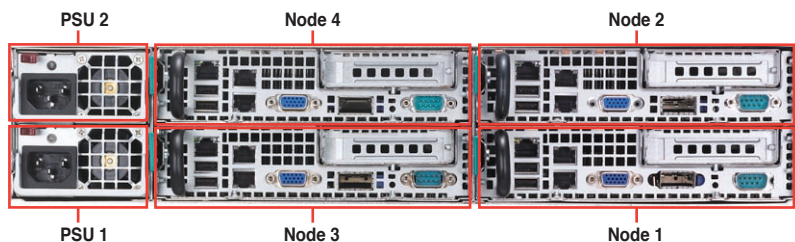
\*Specifications are subject to change without notice.

## 1.4 Front panel features



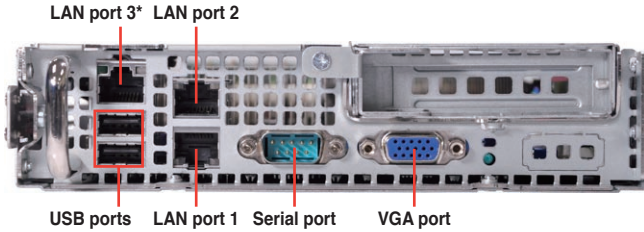
Refer to section 1.7.1 **Front panel LEDs** for the LED descriptions.

## 1.5 Rear panel features



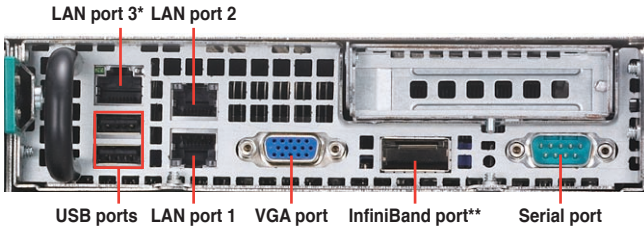
When installing only two nodes, install the nodes to node slot number 1 and 3 or number 2 and 4.

## RS720Q-E6/RS12



\* This port is for ASUS ASMB4-iKVM controller card only.

## RS724Q-E6/RS12

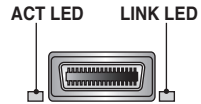


\* This port is for ASUS ASMB4-iKVM controller card only.

\*\* This port allows connection with a QSFP cable to an InfiniBand switch.

## Infiniband (MQSFP1) indications

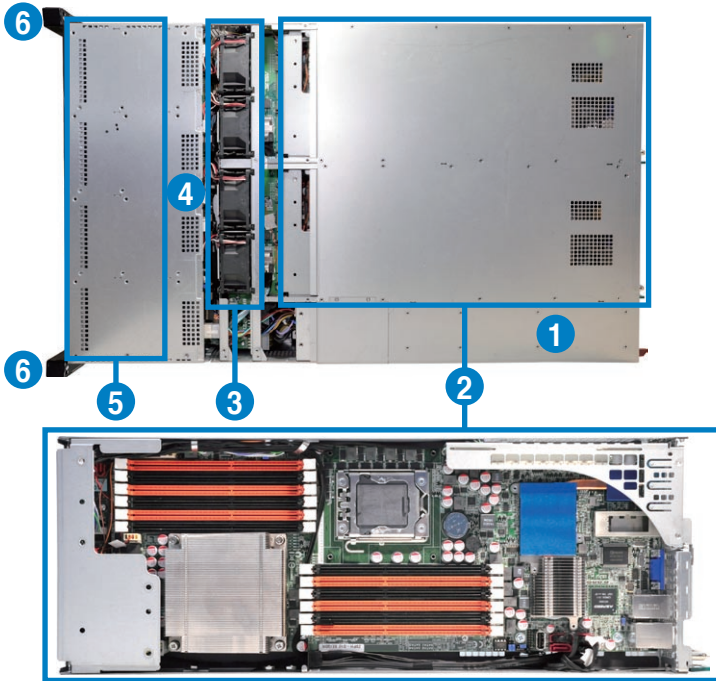
Activity LED	Link LED	Description
Off	Off	No device
Orange	Green	Device plugged in; Ready
Orange Blinking	Green	Device plugged in; Data transmitting





## 1.6 Internal features

The barebone server includes the basic components as shown.



1. Redundant power supply and power fan
2. ASUS Z8NH-D12 Server Boards (RS720Q-E6/RS12); Z8PH-D12 SE/QDR Server Boards (RS724Q-E6/RS12)
3. System fans
4. SATA/SAS backplane (hidden)
5. Hot-swap HDD trays (SAS and SATA)
6. Front LED Boards



Turn off the system power and detach the power supply before removing or replacing any system component.

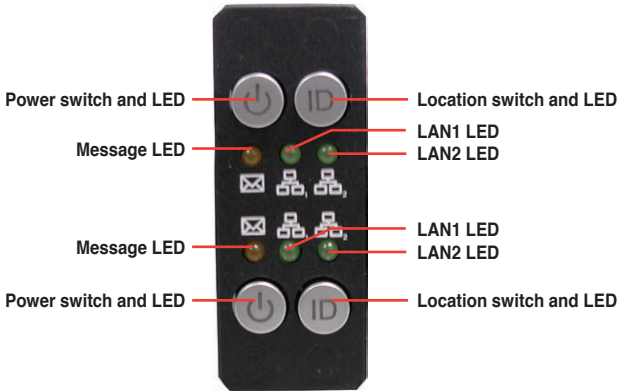


The barebone server does not include a floppy disk drive. Connect a USB floppy disk drive to any of the USB ports on the front or rear panel if you need to use a floppy disk.

**\*WARNING**  
**HAZARDOUS MOVING PARTS**  
**KEEP FINGERS AND OTHER BODY PARTS AWAY**

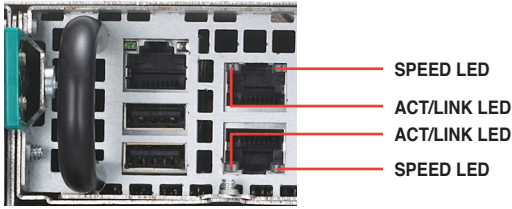
# 1.7 LED information

## 1.7.1 Front panel LEDs



LED	Icon	Display status	Description
Power LED		ON	System power ON
Message LED		OFF	System is normal; no incoming event
		ON	1. Without ASMB4-iKVM installed: CPU over-heated 2. With ASMB4-iKVM installed: a hardware monitor event is indicated
Location LED	ID	OFF	Normal status
		ON	Location switch is pressed (Press the location switch again to turn off)
LAN LEDs	 	OFF	No LAN connection
		Blinking	LAN is transmitting or receiving data
		ON	LAN connection is present

## 1.7.2 LAN (RJ-45) LEDs



ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
GREEN	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection

## 1.7.3 HDD status LED



SATAII/SAS HDD LED Description		
HDD Activity LED (Green)	OFF	HDD not present
	ON	HDD present, no activity
	Blinking	1. Read/write data from/into the SATAII/SAS HDD 2. Locating (blinking with the HDD status LED)
HDD Status LED (Red)	OFF	HDD not present
	ON	HDD has failed and should be swapped immediately
	Blinking	1. RAID rebuilding 2. Locating (blinking with the HDD activity LED)



# Chapter 2

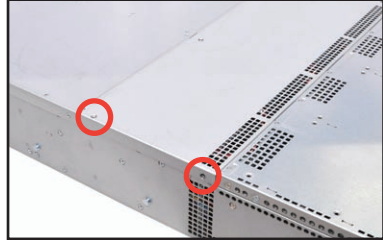
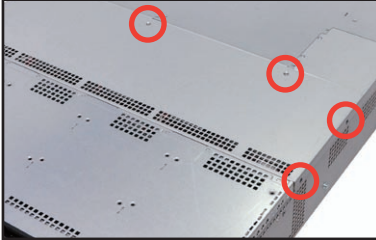
This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

# Hardware setup

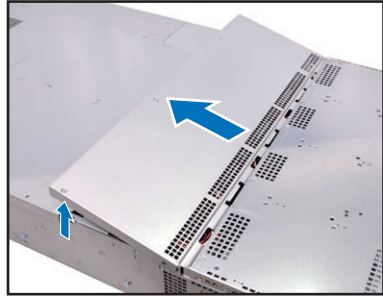
## 2.1 Chassis cover

### Removing the top cover

1. Loosen the six screws on the top and the two sides of the top cover, as shown in the following figures.



2. Lift the rear end of the top cover, and follow the direction of the arrow in the right figure to slide the cover toward the rear panel until it is disengaged from the chassis.

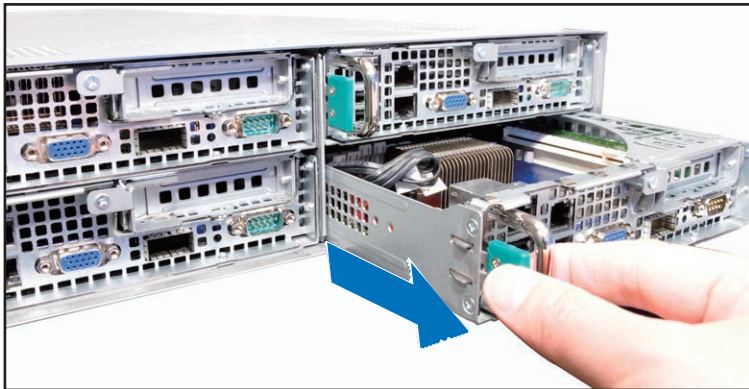


## Removing the server node

1. Hold the server node lever and press the node latch.



2. Firmly pull the server node out of the server chassis.



When installing only two nodes, install the nodes to node slot number 1 and 3 or number 2 and 4. Refer to section **1.5 Rear panel features** for details.

## 2.2 Central Processing Unit (CPU)

The motherboard comes with two surface mount LGA1366 sockets designed for the Intel® Xeon® processor.

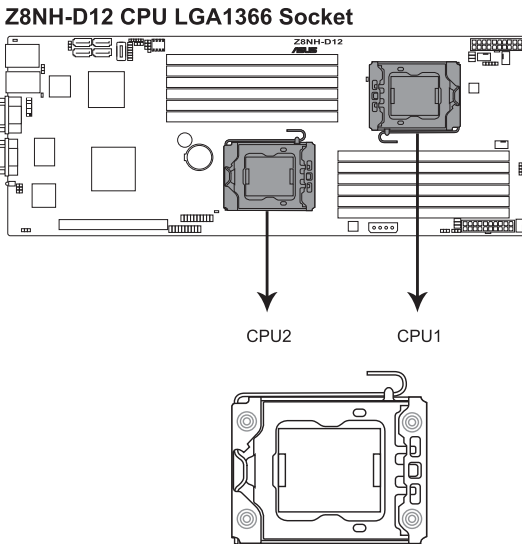


- Your boxed Intel® Xeon® LGA1366 processor package should come with installation instructions for the CPU and heatsink. If the instructions in this section do not match the CPU documentation, follow the latter.
- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.
- Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1366 socket.
- The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

### 2.2.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.



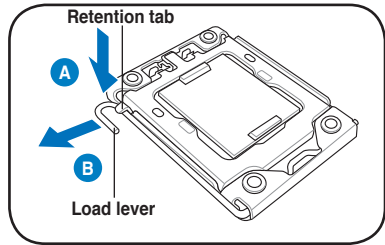
Before installing the CPU, ensure that the socket box is facing towards you and the load lever is on your left.



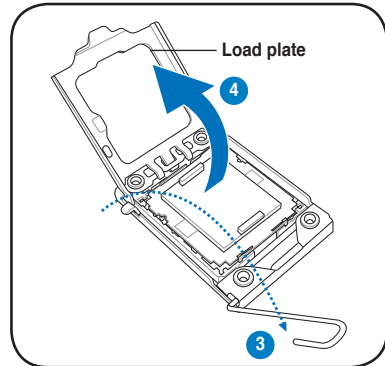
2. Press the load lever with your thumb (A), then move it to the left (B) until it is released from the retention tab.



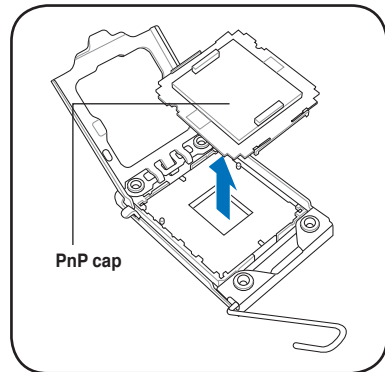
To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.



3. Lift the load lever in the direction of the arrow to a 135° angle.
4. Lift the load plate with your thumb and forefinger to a 100° angle.



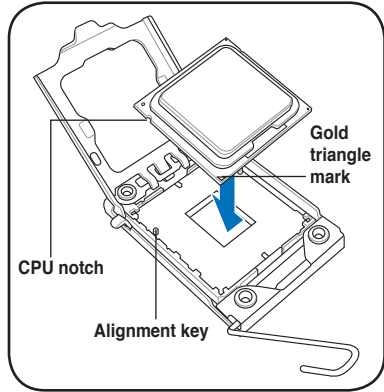
5. Remove the PnP cap from the CPU socket.



6. Position the CPU over the socket, ensuring that the gold triangle is on the bottom-left corner of the socket, and then fit the socket alignment key into the CPU notch.



The CPU fits in only one correct orientation. **DO NOT** force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!



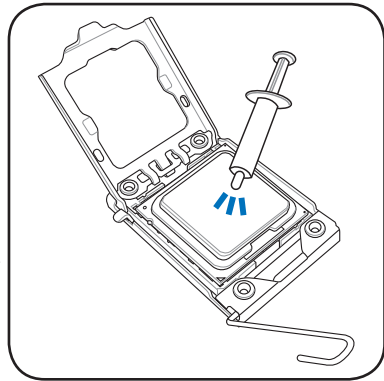
7. Apply some Thermal Interface Material to the exposed area of the CPU that the heatsink will be in contact with, ensuring that it is spread in an even thin layer.



Some heatsinks come with pre-applied thermal paste. If so, skip this step.

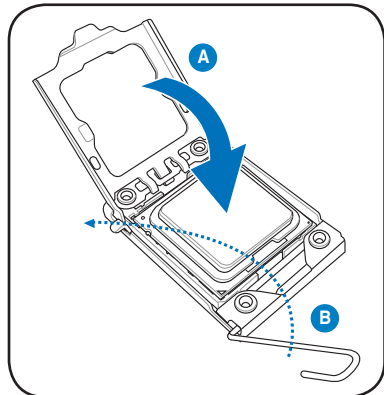


**DO NOT** eat the thermal Interface Material. If it gets into your eyes or touches your skin, ensure that you wash it off immediately and seek professional medical help.



To prevent contaminating the paste, **DO NOT** spread the paste with your finger directly.

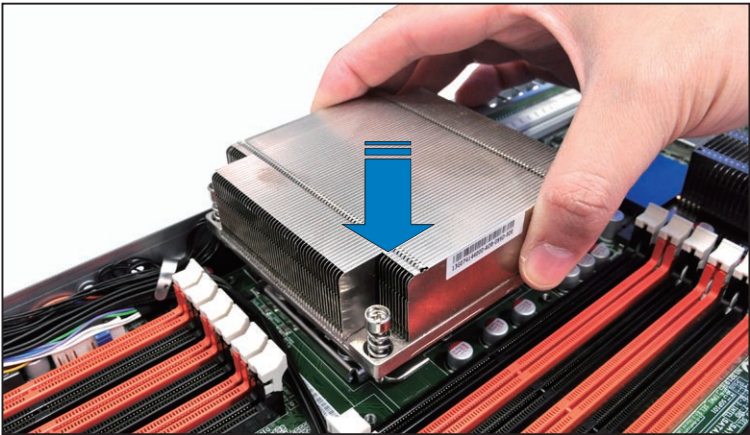
8. Close the load plate (A), and then push the load lever (B) until it snaps into the retention tab.



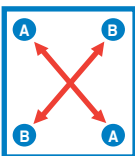
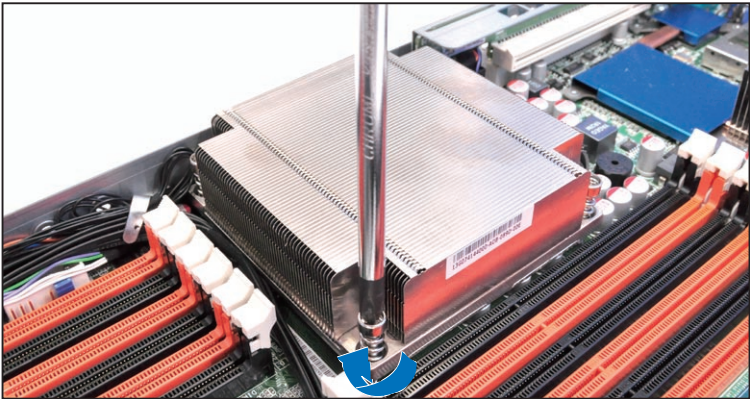
## 2.2.2 Installing the CPU heatsink and airduct

To install the CPU heatsink:

1. Place the heatsink on top of the installed CPU, ensuring that the four fasteners match the holes on the motherboard.



2. Twist each of the four screws with a Philips (cross) screwdriver just enough to attach the heatsink to the motherboard. When the four screws are attached, tighten them one by one to completely secure the heatsink.



Tighten the four heatsink screws in a diagonal sequence.

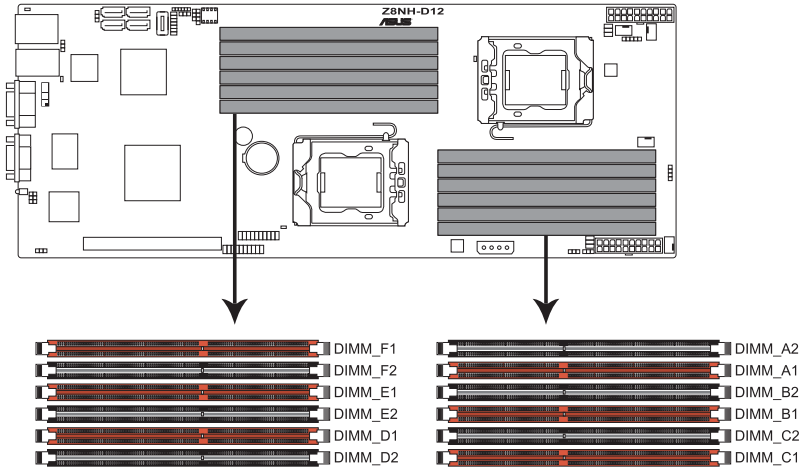
## 2.3 System memory

### 2.3.1 Overview

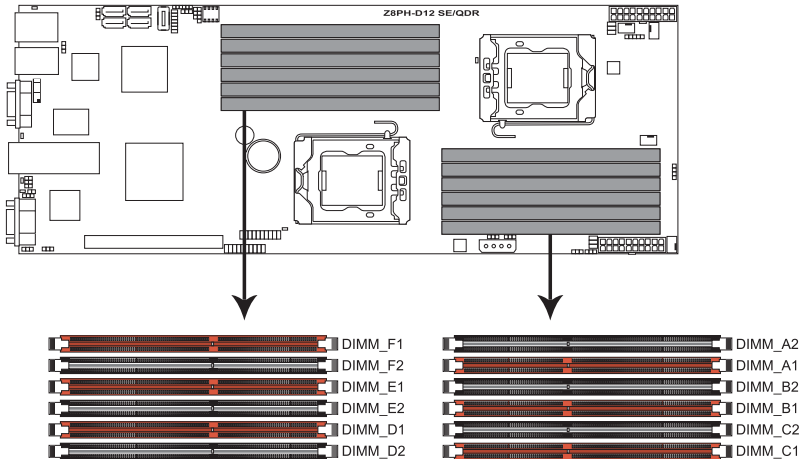
The motherboard comes with twelve (12) Double Data Rate 3 (DDR3) Dual Inline Memory Modules (DIMM) sockets.

The figure illustrates the location of the DDR3 DIMM sockets:

#### Z8NH-D12 240-pin DDR3 DIMM sockets



#### Z8PH-D12 SE/QDR 240-pin DDR3 DIMM sockets



## 2.3.2 Memory Configurations

You may install 1 GB, 2 GB, 4 GB, or 8GB registered / unbuffered ECC DDR3 DIMMs into the DIMM sockets using the memory configurations in this section.



- Always install DIMMs with the same CAS latency. For optimum compatibility, we recommend that you obtain memory modules from the same vendor. Refer to the Qualified Vendors List on the ASUS web site.
- You may install varying memory sizes in Channel A, Channel B and Channel C. The system maps the total size of the lower-sized channel for the dual-channel or triple-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.
- Due to the memory address limitation on 32-bit Windows OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you do any of the following:
  - Use a maximum of 3GB system memory if you are using a 32-bit Windows OS.
  - Install a 64-bit Windows OS when you want to install 4GB or more on the motherboard.
 For more details, refer to the Microsoft® support site at <http://support.microsoft.com/kb/929605/en-us>.
- This motherboard does not support DIMMs made up of 512 Mb (64MB) chips or less (Memory chip capacity counts in Megabit, 8 Megabit/Mb = 1 Megabyte/MB).

### Memory population table

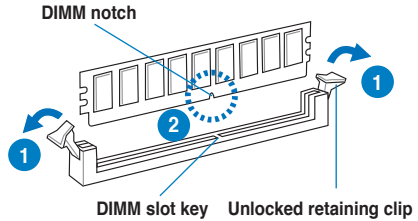
CPU 1 Configuration						
	DIMM_A2	DIMM_A1	DIMM_B2	DIMM_B1	DIMM_C2	DIMM_C1
1 DIMMs	--	●	--	--	--	--
2 DIMMs	--	●	--	●	--	--
3 DIMMs	--	●	--	●	--	●
4 DIMMs	●	●	--	●	--	●
6 DIMMs	●	●	●	●	●	●
CPU 2 Configuration						
	DIMM_D2	DIMM_D1	DIMM_E2	DIMM_E1	DIMM_F2	DIMM_F1
1 DIMMs	--	●	--	--	--	--
2 DIMMs	--	●	--	●	--	--
3 DIMMs	--	●	--	●	--	●
4 DIMMs	●	●	--	●	--	●
6 DIMMs	●	●	●	●	●	●

### 2.3.3 Installing a DIMM



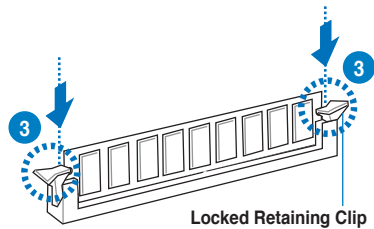
Ensure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the DIMM slot key on the socket.



A DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket in the wrong direction to avoid damaging the DIMM.

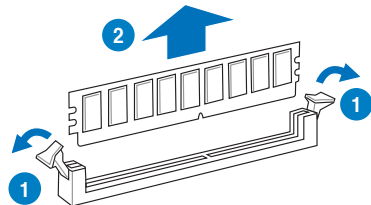
3. Hold the DIMM by both of its ends, then insert the DIMM vertically into the socket. Apply force to both ends of the DIMM simultaneously until the retaining clips snap back into place, and the DIMM cannot be pushed in any further to ensure proper sitting of the DIMM.



Always insert the DIMM into the socket VERTICALLY to prevent DIMM notch damage.

### 2.3.4 Removing a DIMM

1. Simultaneously press the retaining clips outward to unlock the DIMM.
2. Remove the DIMM from the socket.



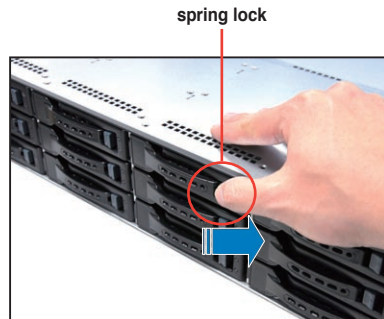
Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

## 2.4 Hard disk drives

The system supports three hot-swap SATAII/SAS hard disk drives per node (available only when an optional ASUS PIKE SAS RAID card is installed) or three hot-swap SATAII hard disk drives per node. The hard disk drive installed on the drive tray connects to the motherboard SATAII/SAS ports via the SATAII/SAS backplane.

To install a hot-swap SATAII/SAS HDD

1. Release a drive tray by pushing the spring lock to the right, then pulling the tray lever outward. The drive tray ejects slightly after you pull out the lever.



2. Firmly hold the tray lever and pull the drive tray out of the bay.



3. Take note of the drive tray holes. Each side has three holes to fit different types of hard disk drives. Use two screws on each side to secure the hard disk drive.



4. Place a SATAII/SAS hard disk drive on the tray, then secure it with four screws.



- Carefully insert the drive tray and push it all the way to the depth of the bay until just a small fraction of the tray edge protrudes.



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When installed, the SATAII/SAS connector on the drive connects to the SATAII/SAS interface on the backplane.

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- Push the tray lever until it clicks, and secures the drive tray in place. The drive tray is correctly placed when its front edge aligns with the bay edge.
- Repeat steps 1 to 6 if you wish to install other SATAII/SAS drive(s).





## 2.5 Expansion slot

### 2.5.1 Installing an expansion card to the riser card bracket

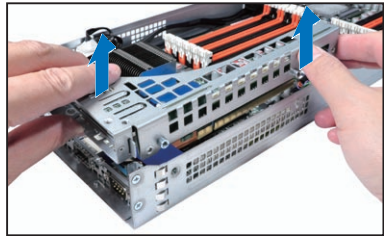
The barebone server comes with a riser card bracket. You need to remove the bracket if you want to install PCI Express x16 expansion cards.

To install a PCI Express x16 card

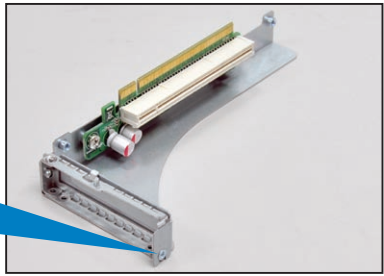
1. Remove the three screws on the riser card bracket, as shown in the right figure.



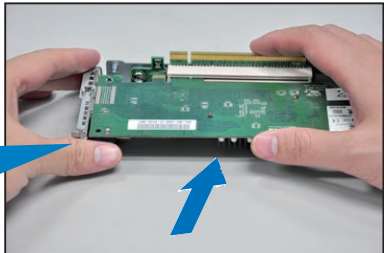
2. Firmly hold the riser card bracket, and then pull it up to detach it from the PCI Express x16 slot on the motherboard.



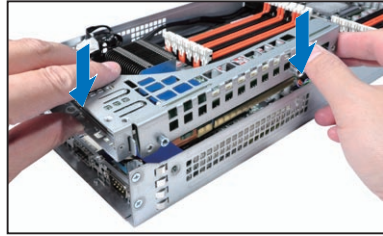
3. Place the riser card bracket on a flat and stable surface, and then remove the screw from the slot bay.



4. Install a PCI Express x16 card to the bracket as shown, and then secure the card with a screw.



5. Press the riser card bracket until the golden connectors completely fit the slot and the bracket aligns with the rear panel.
6. Connect the cable(s) to the card, if applicable.



## 2.5.2 Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 5 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the following tables.
3. Install the software drivers for the expansion card.

### Standard Interrupt assignments

IRQ	Priority	Standard function
0	1	System Timer
1	2	Keyboard Controller
2	-	Programmable Interrupt
4*	12	Communications Port (COM1)
5*	13	--
6	14	Floppy Disk Controller
7*	15	--
8	3	System CMOS/Real Time Clock
9*	4	ACPI Mode when used
10*	5	IRQ Holder for PCI Steering
11*	6	IRQ Holder for PCI Steering
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

\* These IRQs are usually available for ISA or PCI devices.

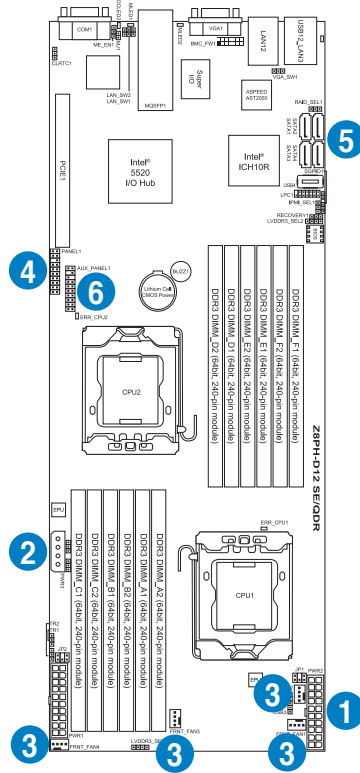
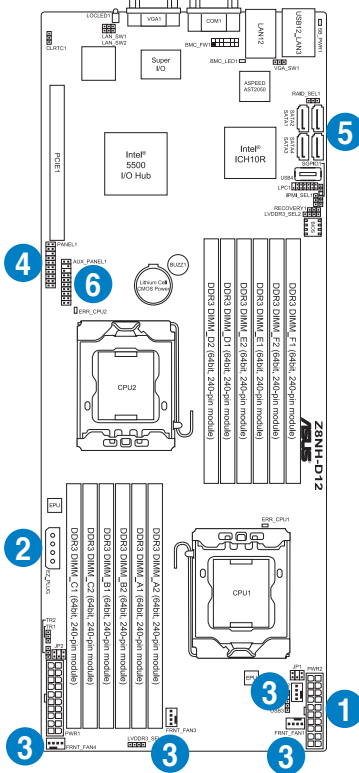
## 2.6 Cable connections



- The bundled system cables are pre-connected before shipment. You do not need to disconnect these cables unless you will remove pre-installed components to install additional devices.
- Refer to Chapter 4 for detailed information on the connectors.

### RS720Q-E6/RS12 (Z8NH-D12)

### RS724Q-E6/RS12 (Z8PH-D12 SE/QDR)



### Pre-connected system cables

1. 20-pin proprietary power connector (from power supply to motherboard)
2. 4-pin proprietary power connector (from power supply to motherboard)
3. System fan connectors (from motherboard FRNT\_FAN1, FRNT\_FAN2, FRNT\_FAN3 and FRNT\_FAN4 to system fans)
4. Panel connector (from motherboard to front I/O board)
5. SATA connectors (from motherboard to SATAII/SAS backplane board)
6. Auxiliary panel connector (from motherboard to front I/O board)

## 2.7 Removable/optional components

You may need to remove previously installed system components when installing or removing system devices. Or you may need to install the optional components into the system. This section tells how to remove/install the following components:

1. System fans
2. Redundant power supply module (optional)
3. ASUS PIKE RAID card (optional)
4. ASUS ASMB4-iKVM (optional)



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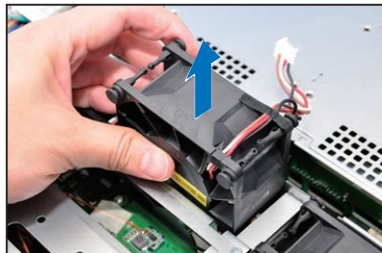
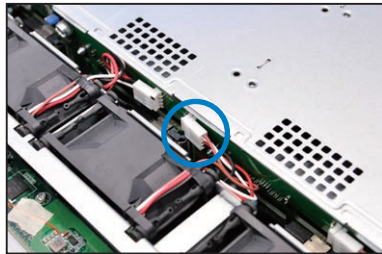
Ensure that the system is turned off before removing any components.

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### 2.7.1 System fans

To uninstall the system fans

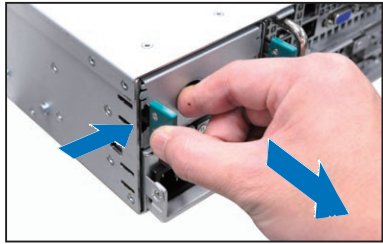
1. Disconnect the system fan cable from the fan connector on the HDD backplane.
2. Lift the fan, and then set aside.
3. Repeat step 1 to 2 to uninstall the other system fans.



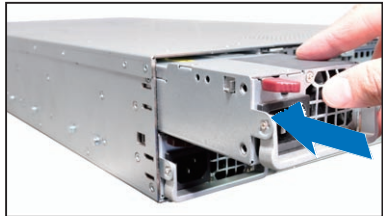
## 2.7.2 Redundant power supply module

To install a second redundant power supply module

1. Press and hold the latch on the dummy cover and pull out the cover from the server chassis.

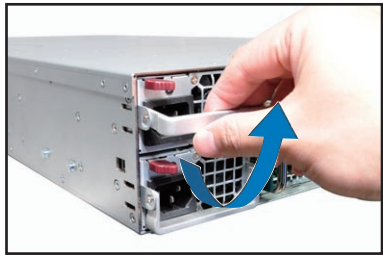


2. Take out the second redundant power supply module from its package. Firmly push the power supply module into the chassis until the latch locks to the server chassis.

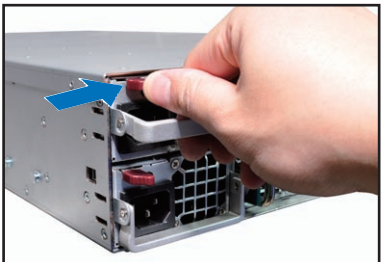


To replace a failed redundant power supply module

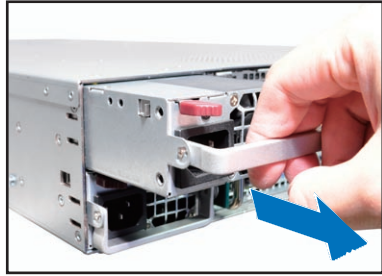
1. Lift up the power supply module lever.



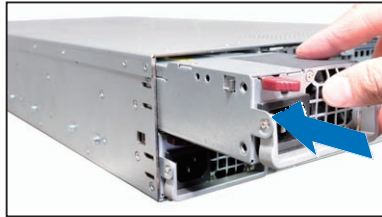
2. Hold the power supply module lever and press the PSU latch.



3. Firmly pull the power supply module out of the system chassis.



4. Firmly push the new power supply module into the chassis until the latch locks to the server chassis.



- If you install two or more nodes, please install both the power supply modules.
- The system automatically combines the two power supply modules as a single one. The combined output power varies with input voltages. Refer to the table below for details.

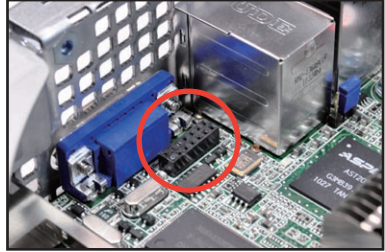
Input Voltage	Max. Output Power (Watt) per PSU
100–120Vac, 12–10A, 50–60Hz	1000W
120–140Vac, 12–10A, 50–60Hz	1200W
180–240Vac, 10.5–8A, 50–60Hz	1620W

- To enable the hot-swap feature (redundant mode), keep the total power consumption of the installed nodes under the maximum output power of an individual power supply module.
- For steady power input, use only the power cables that come with the server system package.

### 2.7.3 Installing ASMB4 series management board (optional)

Follow the steps below to install an optional ASMB4 series management board on your motherboard.

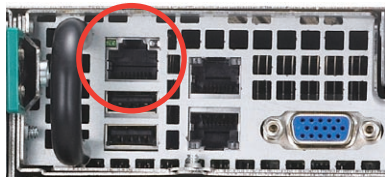
1. Locate the BMC\_FW1 header on the motherboard.



2. Orient and press the ASMB4 management card in place.



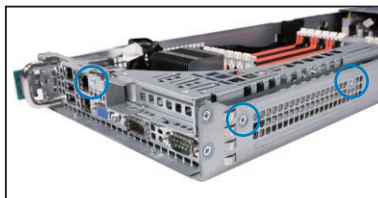
3. Insert the LAN cable plug to the LAN3 port for server management.



## 2.7.4 Installing ASUS PIKE Riser Card (optional)

Follow the steps below to install the optional ASUS PIKE SAS RAID card to the ASUS PIKE riser card.

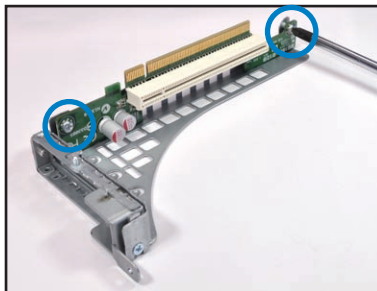
1. Remove the three screws on the riser card bracket, as shown in the right figure.



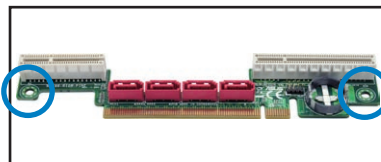
2. Firmly hold the riser card bracket, and then pull it up to detach it from the PCI Express x16 slot on the motherboard.



3. Locate the two screws on the riser card bracket, then remove the screws from the bracket.

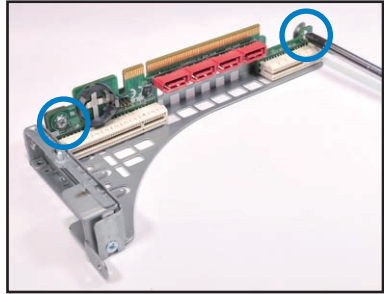


4. Locate the two screw holes on the PIKE riser card.

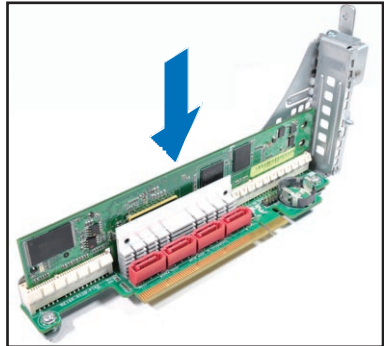




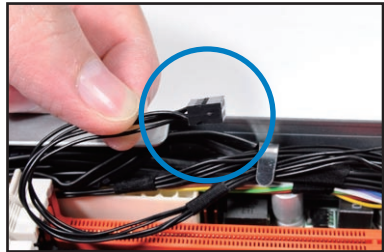
5. Secure the PIKE riser card to the riser card bracket with two screws.



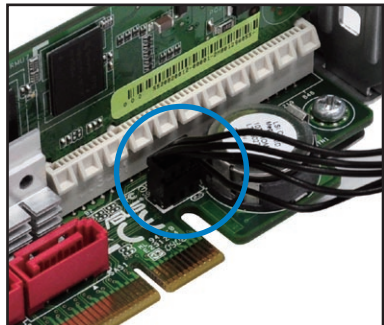
6. Align and insert the golden fingers of the PIKE SAS RAID card into the card slot on the PIKE riser card. Ensure the card is completely seated on the slot.



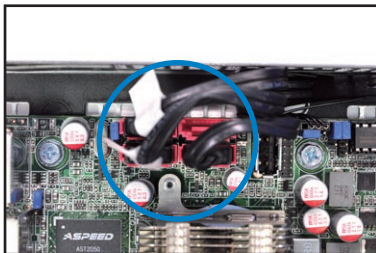
7. Locate the SGPIO connector on the side of the server chassis.



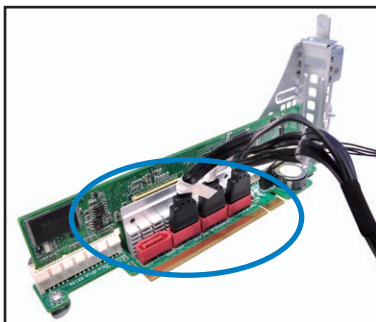
8. Connect the SGPIO cable to the SGPIO connector on the PIKE Riser card.



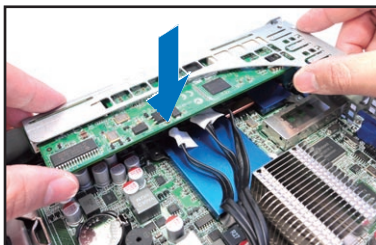
9. Remove the SATA/SAS cables from the onboard SATA1–3 connectors.



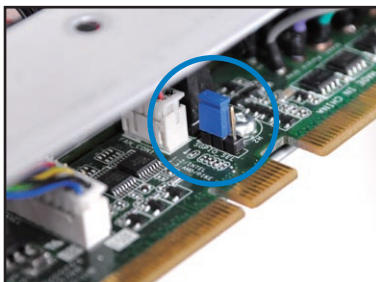
10. Connect the SATA/SAS cables to the SAS1–3 connectors on the PIKE riser card.



11. Align the riser card bracket to the PCI Express x16 slot on the motherboard.
12. Press the riser card bracket until the golden fingers completely fit the slot and the bracket aligns with the rear panel.



13. Move the **SGPIO\_SEL** jumper in front of the server node from pin 1–2 to pin 2–3.



# Chapter 3

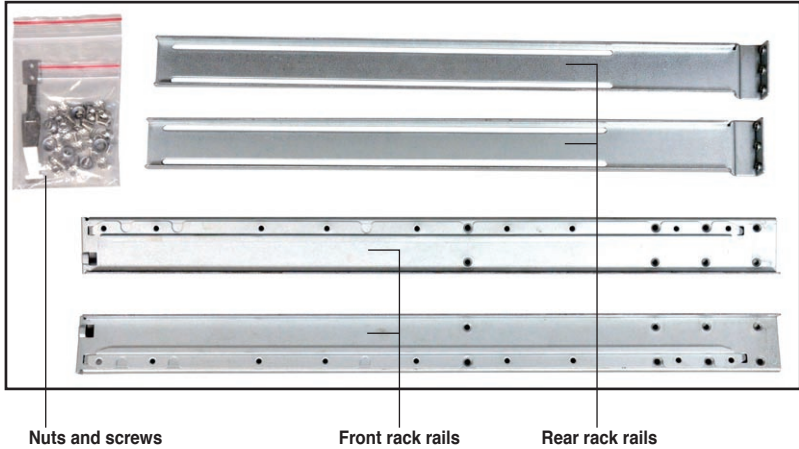
This chapter describes how to install the optional components and devices into the barebone server.

# Installation options

### 3.1 Installing friction rail kit items

Your friction rail kit package contains:

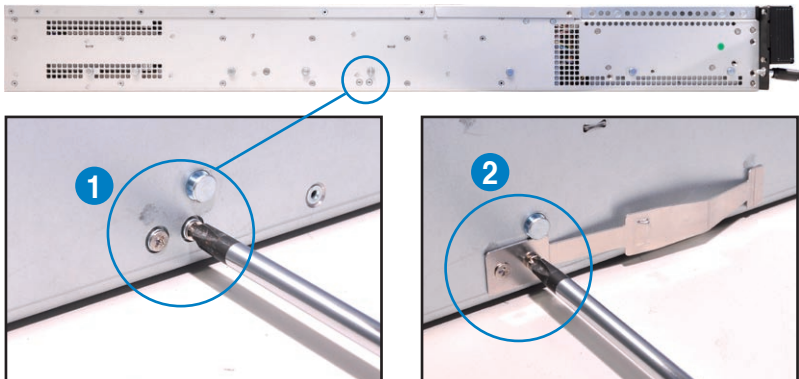
- Two pairs of rack rails (for the rack)
- Nut-and-bolt type screws and one pair of server latches



#### 3.1.1 Attaching the fixing latches to the server

Refer to the figures below for the locations to attach the two fixing latches to the two sides of the server with four screws.

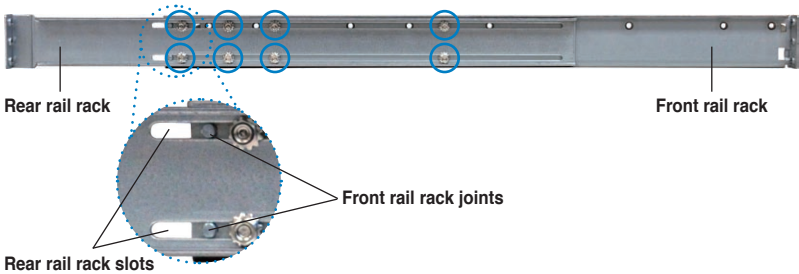
1. Remove the two screws on the side of the server chassis.
2. Secure the fixing latch with the two screws you removed in step 1.
3. Repeat step 1 to 2 to secure another fixing latch to the other side of the server.



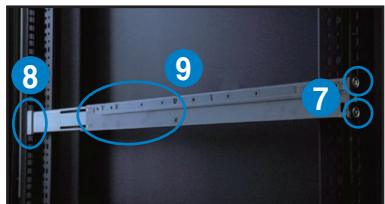
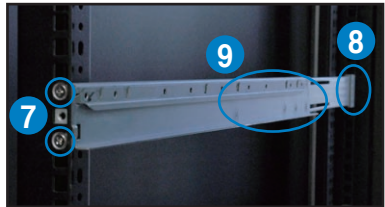
### 3.1.2 Attaching the rack rails

To attach the rack rails

1. Place the two front rail rack joints into the rear rail rack slots, as shown in the following figure.
2. Attach the front and rear rail racks with eight screws and nuts, as shown in the following figure. Do not secure the screws too tight so that you can still adjust the length of the rack rails to meet the depth of the server rack.



3. Select two units of space (2U) on the rack where you want to install the barebone server.
4. Measure the depth of the rack to determine the length of the rack rails.
5. Adjust the rack rail to ensure that it fits the rack.
6. Position the rack rail to the 2U space on the rack. Ensure that the front end of the rack rail goes to the front of the rack space.
7. Secure the front end of the rail with two rack screws, as shown in the right figure.
8. Secure the rear end of the rail with two rack screws, as shown in the right figure.
9. Fasten the eight screw you secure in step 2, as shown in the right figure.
10. Repeat steps 6 to 9 to assemble and attach the rack rail on the other side.



### 3.1.3 Mounting the server to the rack

To mount the server to the rack

1. Place the server on the rack rails, and then push the server all the way to the depth of the rack.



2. Tighten the two rack screws to secure the server in place.

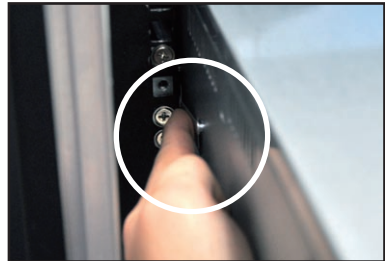


To uninstall the server from the rack

1. Loosen the rack screws that secured the server to the rack.
2. Pull the server from the rack.



Remember to press the latches on both sides to release the server from the rack.



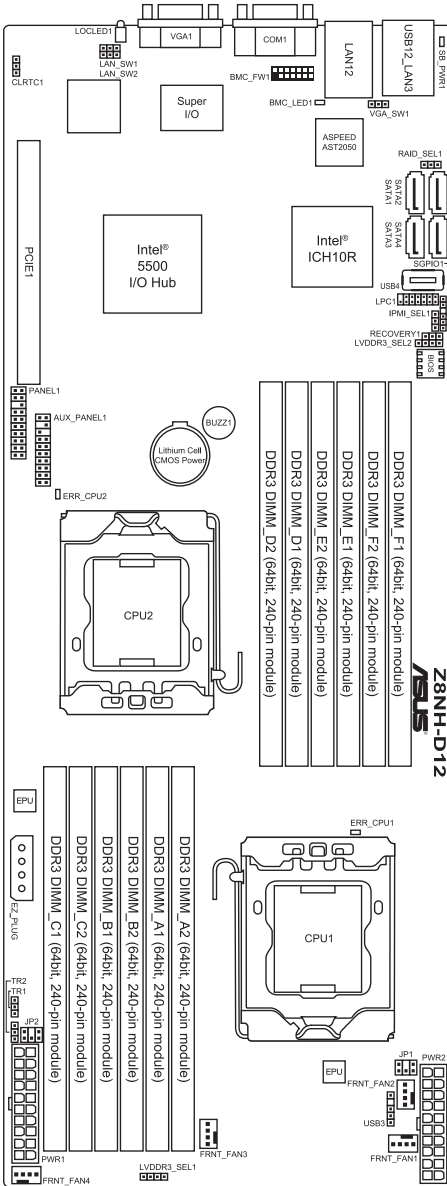
# Chapter 4

This chapter includes the motherboard layout, and brief descriptions of the jumpers and internal connectors.

# Motherboard info

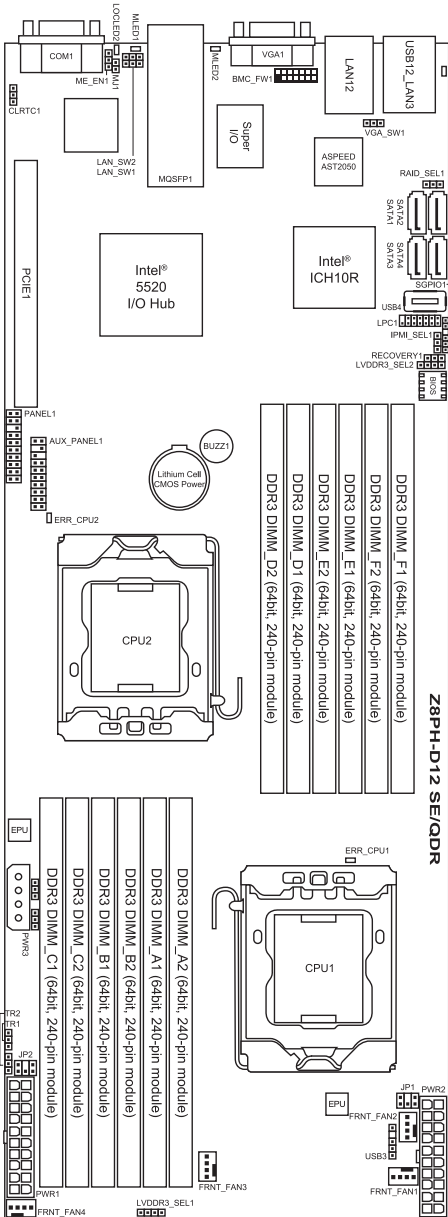
# 4.1 Motherboard layouts

## Z8NH-D12 (For RS720Q-E6/RS12)





# Z8PH-D12 SE/QDR (For RS724Q-E6/RS12)



## Layout contents

Jumpers		Page
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6.	Force BIOS recovery setting (3-pin RECOVERY1)	4-10

Internal connectors		Page
1.	Serial ATA connectors (7-pin SATA1, SATA2, SATA 3, SATA4)	4-11
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3.	Front fan connectors (4-pin FRNT_FAN1, FRNT_FAN2, FRNT_FAN3, FRNT_FAN4)	4-13
4.	LPC debug card connector (14-1 pin LPC1)	4-14
5.	Serial General Purpose Input/Output connector (6-1 pin SGPIO1)	4-14
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7.	Power Supply SMBus connectors (6-1 pin JP1, JP2)	4-15
8.	Proprietary power connectors (20-pin PWR1, 20-pin PWR2, 4-pin PWR3)	4-16
9.	System panel connector (20-pin PANEL1)	4-17
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Internal LEDs		Page
1.	Standby power LED	4-19
2.	CPU warning LED (ERR_CPU1, ERR_CPU2)	4-19

## 4.2 Jumpers

### 1. Clear RTC RAM (CLRRTC1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 1–2 (default) to pins 2–3. Keep the cap on pins 2–3 for about 5–10 seconds, then move the cap back to pins 1–2.
3. Plug the power cord and turn ON the computer.
4. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

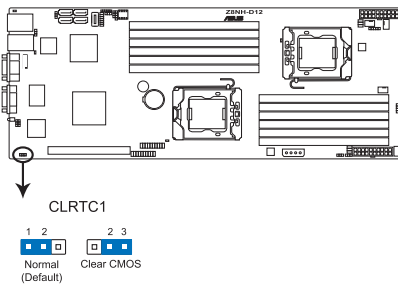


Except when clearing the RTC RAM, never remove the cap on CLRRTC1 jumper default position. Removing the cap will cause system boot failure!

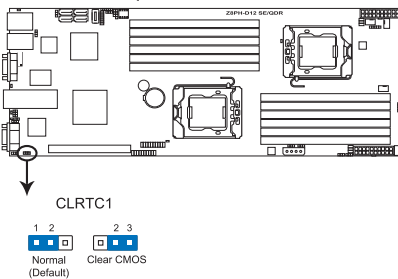


If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.

#### Z8NH-D12 Clear RTC RAM



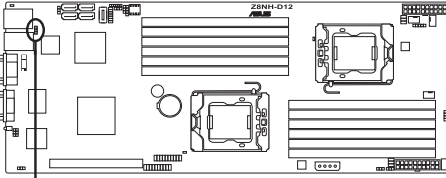
#### Z8PH-D12 SE/QDR Clear RTC RAM



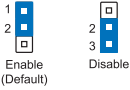
## 2. VGA controller setting (3-pin VGA\_SW1)

This jumper allows you to enable or disable the onboard VGA controller. Set to pins 1–2 to activate the VGA feature.

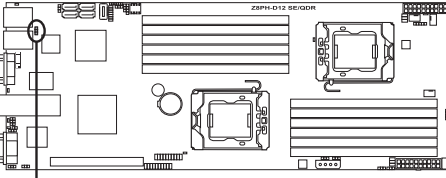
### Z8NH-D12 VGA setting



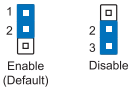
VGA\_SW1



### Z8PH-D12 SE/QDR VGA setting



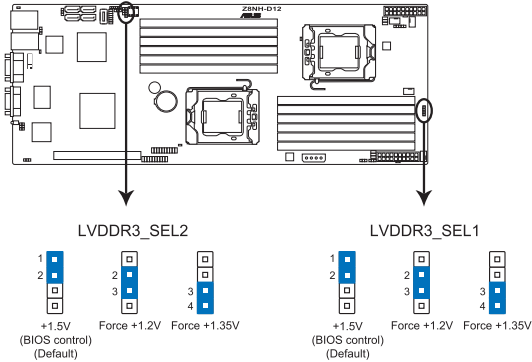
VGA\_SW1



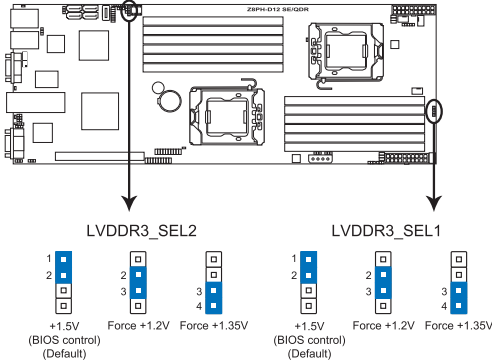
### 3. DDR3 voltage control setting (4-pin LVDDR3\_SEL1; LVDDR3\_SEL2)

These jumpers allow you to adjust the DIMM voltage. Set to pins 1–2 to select 1.5V BIOS control, pins 2–3 to select 1.2V Force or 3–4 to select 1.35V Force.

#### Z8NH-D12 LVDDR3 setting



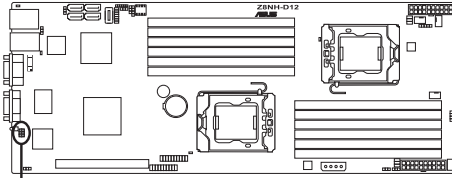
#### Z8PH-D12 SE/QDR LVDDR3 setting



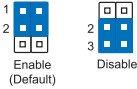
#### 4. LAN controller setting (3-pin LAN\_SW1, LAN\_SW2)

These jumpers allow you to enable or disable the onboard Intel® Intel 82574L Gigabit LAN controllers. Set to pins 1–2 to activate the Gigabit LAN feature.

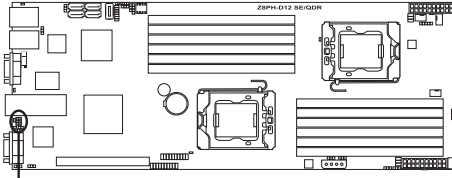
##### Z8NH-D12 LAN setting



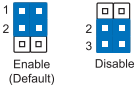
LAN\_SW1  
LAN\_SW2



##### Z8PH-D12 SE/QDR LAN setting



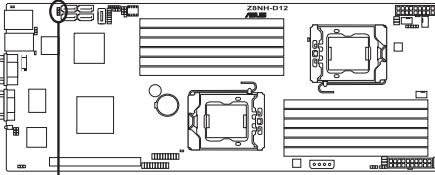
LAN\_SW1  
LAN\_SW2



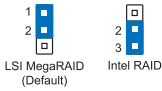
## 5. Intel® ICH10R SATA port S/W RAID setting (3-pin RAID\_SEL1)

This jumper allows you to select the Serial ATA RAID configuration utility to use when you create disk arrays. Place the jumper caps on pins 1–2 if you want to use the LSI MegaRAID software RAID Configuration Utility (default); otherwise, place the jumper caps on pins 2–3 to use the Intel® Matrix Storage Manager (IMSM).

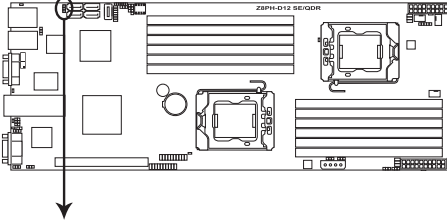
### Z8NH-D12 RAID setting



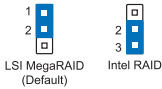
#### RAID\_SEL1



### Z8PH-D12 SE/QDR RAID setting



#### RAID\_SEL1



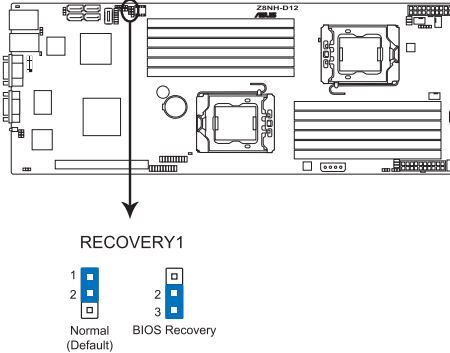
## 6. Force BIOS recovery setting (3-pin RECOVERY1)

This jumper allows you to quickly update or recover the BIOS settings when it becomes corrupted.

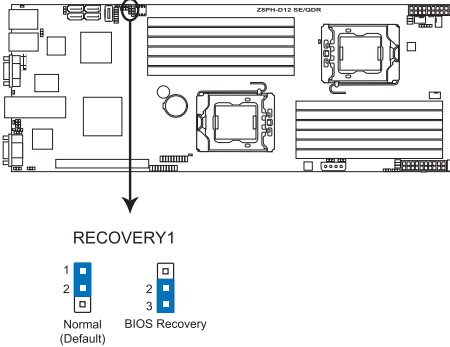
To update the BIOS:

1. Prepare a USB flash disk that contains the original or latest BIOS for the motherboard (XXXXXX.ROM) and the AFUDOS.EXE utility.
2. Set the jumper to pins 2–3.
3. Insert the USB flash and turn on the system to update the BIOS.
4. Shut down the system.
5. Set the jumper back to pins 1–2.
6. Turn on the system.

### Z8NH-D12 BIOS recovery setting



### Z8PH-D12 SE/QDR BIOS recovery setting





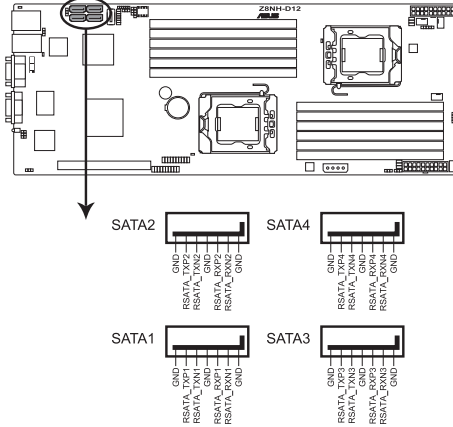
## 4.3 Internal connectors

### 1. Serial ATA connectors (7-pin SATA1, SATA2, SATA3, SATA4)

Supported by the Intel® ICH10R chipset, these connectors are for the Serial ATA signal cables for Serial ATA hard disk drives that allows up to 3Gb/s of data transfer rate.

If you installed Serial ATA hard disk drives, you can create a RAID 0, RAID 1, or RAID 5 configuration.

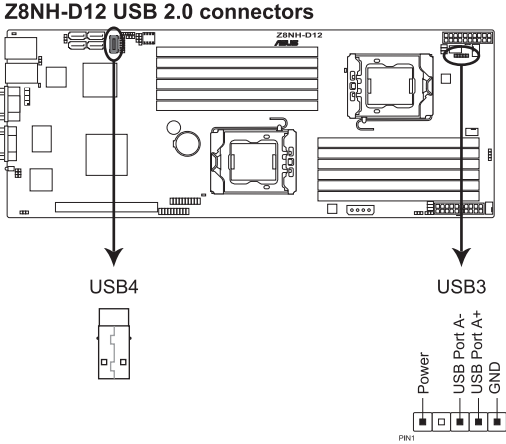
#### Z8NH-D12 SATA connectors



The actual data transfer rate depends on the speed of Serial ATA hard disks installed.

**2. USB connector (5-1 pin USB3; A-Type USB4)**

These connectors are for USB 2.0 ports. Connect the USB module cables to connectors USB3, then install the modules to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.



### 3. Front fan connectors

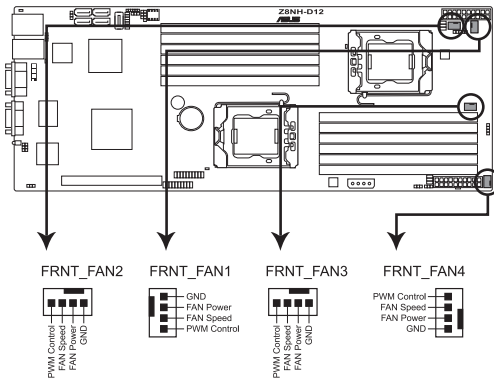
#### (4-pin FRNT\_FAN1, FRNT\_FAN2, FRNT\_FAN3, FRNT\_FAN4)

The fan connectors support cooling fans of 350 mA–740 mA (8.88 W max.) or a total of 3.15 A–6.66 A (53.28 W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.



- DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components.
- These are not jumpers! DO NOT place jumper caps on the fan connectors!
- All fans feature the ASUS Smart Fan technology.

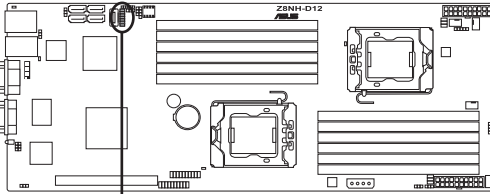
#### Z8NH-D12 FAN connectors



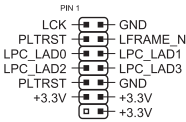
**4. LPC debug card connector (14-1 pin LPC1)**

This is a low pin count interface used to plug in the LPC debug card.

**Z8NH-D12 LPC connector**



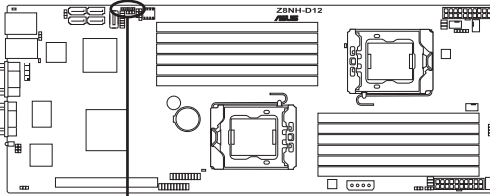
**LPC1**



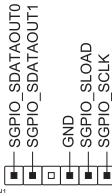
**5. Serial General Purpose Input/Output connector (6-1 pin SGPIO1)**

This connector is used for the SGPIO peripherals for the LSI MegaRAID and Intel Matrix RAID SATA LED.

**Z8NH-D12 SGPIO connector**



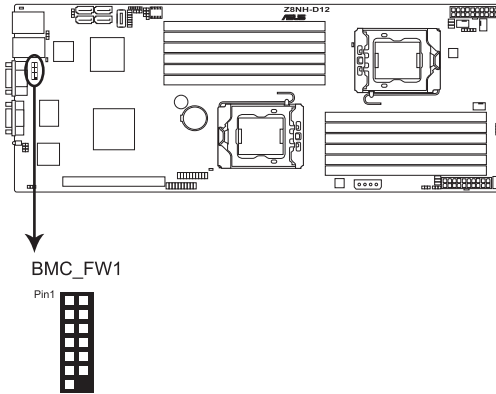
**SGPIO1**



## 6. BMC header (BMC\_FW1)

The BMC connector on the motherboard supports an ASUS® Server Management Board 4 Series (ASMB4).

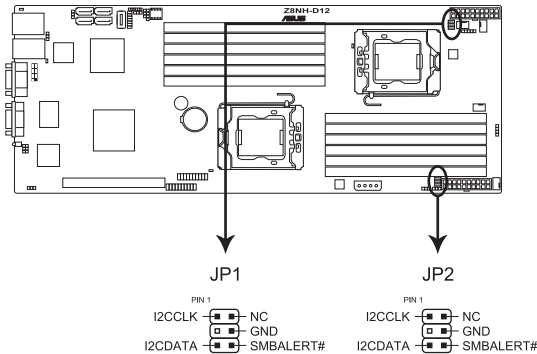
### Z8NH-D12 BMC connector



## 7. Power Supply SMBus connectors (6-1 pin JP1, JP2)

These connectors allow you to connect SMBus (System Management Bus) to the power supply unit to read PSU information. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.

### Z8NH-D12 JP connector



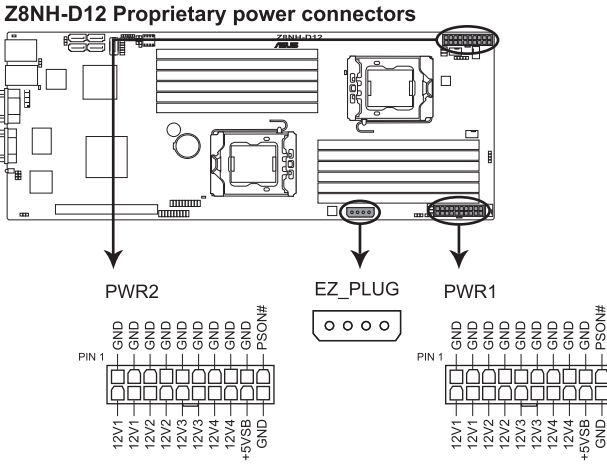
## 8. Proprietary power connectors (20-pin PWR1, 20-pin PWR2, 4-pin PWR3)

These connectors are for Proprietary power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Orient the connectors and push down firmly until they completely fit.

The 4-pin EZ\_PLUG is designed for hard disk drives power supply. **DO NOT** connect other 4-pin power connectors of the power supply unit (PSU) to this connector.



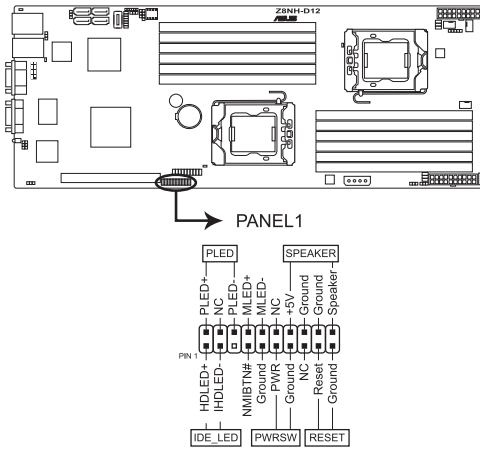
- Connect either one of the 20-pin power connectors to boot up the system.
- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- **USE THE PROPRIETARY POWER SUPPLY ONLY** and ensure that your PSU can provide at least the minimum power required by your system.



## 9. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.

### Z8NH-D12 System panel connector



#### 1. System power LED (3-pin PLED)

This 3-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

#### 2. Message LED (2-pin MLED)

This 2-pin connector is for the message LED cable that connects to the front message LED. The message LED is controlled by Hardware monitor to indicate an abnormal event occurrence.

#### 3. System warning speaker (4-pin SPEAKER)

This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

#### 4. Hard disk drive activity LED (2-pin HDDLED)

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

#### 5. Proprietary power button/soft-off button (2-pin PWRSW)

This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

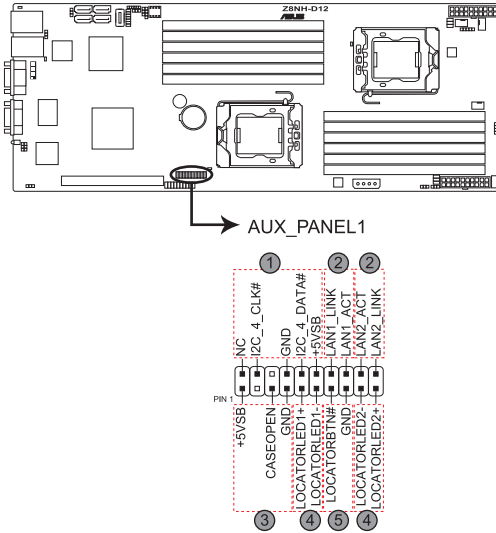
#### 6. Reset button (2-pin RESET)

This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

## 10. Auxiliary panel connector (20-pin AUX\_PANEL1)

This connector is for additional front panel features including front panel SMB, locator LED and switch, chassis intrusion, and LAN LEDs.

### Z8NH-D12 Auxiliary panel connector



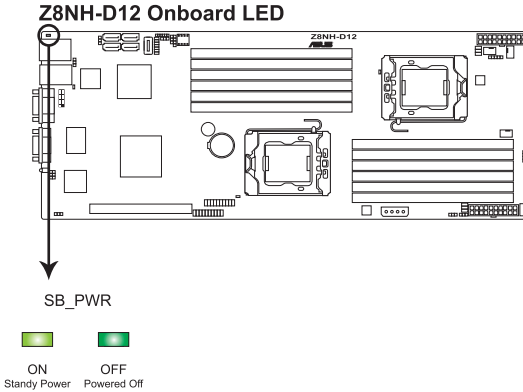
- 1. Front panel SMB (6-1 pin FPSMB)**  
These leads connect the front panel SMBus cable.
- 2. LAN activity LED (2-pin LAN1\_LED, LAN2\_LED)**  
These leads are for Gigabit LAN activity LEDs on the front panel.
- 3. Chassis intrusion (4-1 pin CHASSIS)**  
These leads are for the intrusion detection feature for chassis with intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to these leads to record a chassis intrusion event. The default setting is short CASEOPEN and GND pin by jumper cap to disable the function.
- 4. Locator LED (2-pin LOCATORLED1 and 2-pin LOCATORLED2)**  
These leads are for the locator LED1 and LED2 on the front panel. Connect the Locator LED cables to these 2-pin connector. The LEDs will light up when the Locator button is pressed.
- 5. Locator Button/Switch (2-pin LOCATORBTN)**  
These leads are for the locator button on the front panel. This button queries the state of the system locator.



## 4.4 Internal LEDs

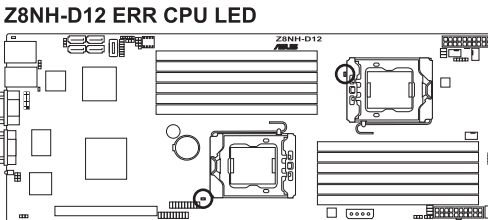
### 1. Standby Power LED

The motherboard comes with a standby power LED. The green LED lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.



### 2. CPU warning LED (ERR\_CPU1, ERR\_CPU2)

The CPU warning LEDs light up to indicate that an impending failure of the corresponding CPU.





# Chapter 5

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

# BIOS setup

# 5.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup:

1. **AFUDOS utility** (Updates the BIOS in DOS mode using a bootable USB flash drive.)
2. **ASUS CrashFree BIOS 3** (To recover the BIOS using a USB flash drive when the BIOS file fails or gets corrupted.)

Refer to the corresponding sections for details on these utilities.



Save a copy of the original motherboard BIOS file to a bootable USB flash drive in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the AFUDOS utility.

## 5.1.1 AFUDOS utility

The AFUDOS utility allows you to update the BIOS file in DOS environment using a bootable USB flash drive with the updated BIOS file. This utility also allows you to copy the current BIOS file that you can use as backup when the BIOS fails or gets corrupted during the updating process.

### Copying the current BIOS

To copy the current BIOS file using the AFUDOS utility:



- Ensure that the USB flash drive is not write-protected and has at least 2048 KB free space to save the file.
- The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be the same as shown.

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable USB flash drive.
2. Boot the system in DOS mode, and then at the prompt type:

```
afudos /o[filename]
```

where the [filename] is any user-assigned filename not more than eight alphanumeric characters for the main filename and three alphanumeric characters for the extension name.

```
A:\>afudos /oOLDBIOS1.rom
```

Main filename                      Extension name

3. Press <Enter>. The utility copies the current BIOS file to the USB flash drive.

```
A:\>afudos /oOLDBIOS1.rom
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
Reading flash ..... done
Write to file..... ok
A:\>
```

The utility returns to the DOS prompt after copying the current BIOS file.

## Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

1. Visit the ASUS website ([www.asus.com](http://www.asus.com)) and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable USB flash drive.



Write the BIOS filename on a piece of paper. You need to type the exact BIOS filename at the DOS prompt.

2. Copy the AFUDOS utility (`afudos.exe`) from the motherboard support CD to the bootable USB flash drive.
3. Boot the system in DOS mode, and then at the prompt type:

```
afudos /i [filename]
```

where [filename] is the latest or the original BIOS file on the bootable USB flash drive, and then press <Enter>.

```
A:\>afudos /iz8NHD12.ROM
```

The utility verifies the file, and then starts updating the BIOS file.

```
A:\>afudos /iz8NHD12.ROM
AMI Firmware Update Utility - Version 1.19 (ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

WARNING!! Do not turn off power during flash BIOS
Reading file ..... done
Reading flash ..... done

Advance Check .....
Erasing flash ..... done
Writing flash ..... 0x0008CC00 (9%)
```



DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

```
A:\>afudos /iz8NHD12.ROM
AMI Firmware Update Utility - Version 1.19 (ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

WARNING!! Do not turn off power during flash BIOS
Reading file ..... done
Reading flash ..... done

Advance Check .....
Erasing flash ..... done
Writing flash ..... done
Verifying flash .... done

Please restart your computer

A:\>
```

### 5.1.2 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using a USB flash drive that contains the updated BIOS file.



---

Prepare a USB flash drive containing the updated motherboard BIOS before using this utility.

---

To recover the BIOS using ASUS CrashFree BIOS 3

1. Insert the USB flash disk that contains the BIOS file to the USB port.
2. Turn on the system.
3. The utility will automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.
4. Restart the system after the utility completes the updating process.



---

DO NOT shut down or reset the system while recovering the BIOS! Doing so would cause system boot failure!

---



---

The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website ([www.asus.com](http://www.asus.com)) to download the latest BIOS file.

---

## 5.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section **5.1 Managing and updating your BIOS**.

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to “Run Setup.” This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware chip.

The firmware chip on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

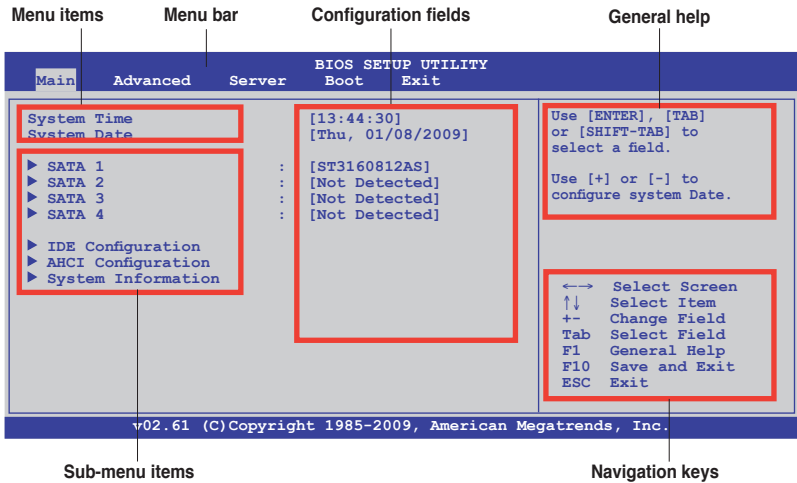
If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.



- 
- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit Menu. See section **5.7 Exit Menu**.
  - The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
  - Visit the ASUS website ([www.asus.com](http://www.asus.com)) to download the latest BIOS file for this motherboard.
-

## 5.2.1 BIOS menu screen



## 5.2.2 Menu bar

The menu bar on top of the screen has the following main items:

- Main** For changing the basic system configuration
- Advanced** For changing the advanced system settings
- Server** For changing the advanced server settings
- Boot** For changing the system boot configuration
- Exit** For selecting the exit options and loading default settings

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

## 5.2.3 Navigation keys

At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.



Some of the navigation keys differ from one screen to another.



## 5.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting Main shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.

## 5.2.5 Sub-menu items

A solid triangle before each item on any menu screen means that the item has a sub-menu. To display the sub-menu, select the item and press <Enter>.

## 5.2.6 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to 5.2.7 Pop-up window.

## 5.2.7 Pop-up window

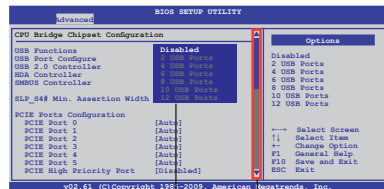
Select a menu item then press <Enter> to display a pop-up window with the configuration options for that item.

## 5.2.8 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> /<Page Down> keys to display the other items on the screen.

## 5.2.9 General help

At the top right corner of the menu screen is a brief description of the selected item.



Scroll bar  
Pop-up window

## 5.3 Main menu

When you enter the BIOS Setup program, the Main menu screen appears, giving you an overview of the basic system information.



Refer to section 5.2.1 BIOS menu screen for information on the menu screen items and how to navigate through them.

BIOS SETUP UTILITY		
Main	Advanced	Server
System Time	[13:44:30]	
System Date	[Thu, 01/08/2009]	
▶ SATA 1	: [ST3160812AS]	
▶ SATA 2	: [Not Detected]	
▶ SATA 3	: [Not Detected]	
▶ SATA 4	: [Not Detected]	
▶ IDE Configuration		
▶ AHCI Configuration		
▶ System Information		

Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.

Use [+] or [-] to configure system Date.

←→ Select Screen  
↑↓ Select Item  
+→ Change Field  
Tab Select Field  
F1 General Help  
F10 Save and Exit  
ESC Exit

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### 5.3.1 System Time [xx:xx:xx]

Allows you to set the system time.

### 5.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

### 5.3.3 SATA1-4

The BIOS automatically detects the connected IDE devices. There is a separate sub-menu for each IDE device. Select a device item, then press <Enter> to display the IDE device information.

BIOS SETUP UTILITY		
Main	Advanced	Server
<b>SATA 1</b>		
Device	:Hard Disk	
Vendor	:ST3160812AS	
Size	:160.0GB	
LBA Mode	:Supported	
Block Mode	:16Sectors	
PIO Mode	:4	
Async DMA	:MultiWord DMA-2	
Ultra DMA	:Ultra DMA-6	
S.M.A.R.T.	:Supported	
Type	[Auto]	
LBA/Large Mode	[Auto]	
Block(Multi-Sector Transfer)M	[Auto]	
PIO Mode	[Auto]	
DMA Mode	[Auto]	
SMART Monitoring	[Auto]	
32Bit Data Transfer	[Enabled]	

Disabled: Disables LBA Mode.  
Auto: Enables LBA Mode if the device supports it and the device is not already formatted with LBA Mode disabled.

←→ Select Screen  
↑↓ Select Item  
+→ Change Option  
F1 General Help  
F10 Save and Exit  
ESC Exit

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The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and S.M.A.R.T. monitoring). These values are not user-configurable. These items show N/A if no IDE device is installed in the system.

### **Type [Auto]**

Selects the type of IDE drive. Setting to [Auto] allows automatic selection of the appropriate IDE device type. Select [CDROM] if you are specifically configuring a CD-ROM drive. Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.

Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

### **LBA/Large Mode [Auto]**

Enables or disables the LBA mode. Setting to [Auto] enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled.

Configuration options: [Disabled] [Auto]

### **Block (Multi-Sector Transfer) M [Auto]**

Enables or disables data multi-sectors transfers. When set to [Auto], the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time.

Configuration options: [Disabled] [Auto]

### **PIO Mode [Auto]**

Allows you to select the data transfer mode.

Configuration options: [Auto] [0] [1] [2] [3] [4]

### **DMA Mode [Auto]**

Sets the DMA mode.

Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5] [UDMA6]

### **SMART Monitoring [Auto]**

Sets the Smart Monitoring, Analysis, and Reporting Technology.

Configuration options: [Auto] [Disabled] [Enabled]

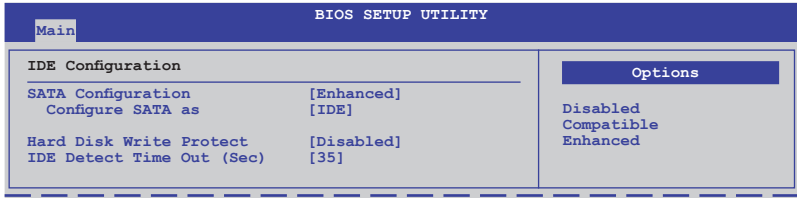
### **32Bit Data Transfer [Enabled]**

Enables or disables 32-bit data transfer.

Configuration options: [Disabled] [Enabled]

### 5.3.4 IDE Configuration

The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press <Enter> if you wish to configure the item.



#### SATA Configuration [Enhanced]

Configuration options: [Disabled] [Compatible] [Enhanced]

##### Configure SATA as [IDE]

Sets the configuration for the Serial ATA connectors supported by the Southbridge chip. Configuration options: [IDE] [RAID] [AHCI]



- If you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices, keep the default setting [IDE].
- If you want the Serial ATA hard disk drives to use the Advanced Host Controller Interface (AHCI), set this item to [AHCI]. The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.
- If you want to use LSI® MegaRAID or the Intel® Matrix Storage Technology configuration from the Serial ATA hard disk drives, set this item to [RAID].

#### Hard Disk Write Protect [Disabled]

Disables or enables device write protection. This will be effective only if the device is accessed through BIOS.

Configuration option: [Disabled] [Enabled]

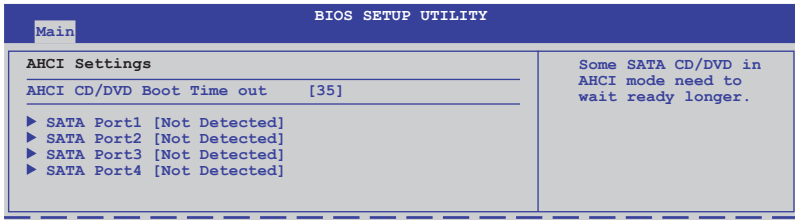
#### IDE Detect Time Out (Sec) [35]

Selects the time out value for detecting ATA/ATAPI devices.

Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

### 5.3.5 AHCI Configuration

This menu is the section for AHCI configuration.



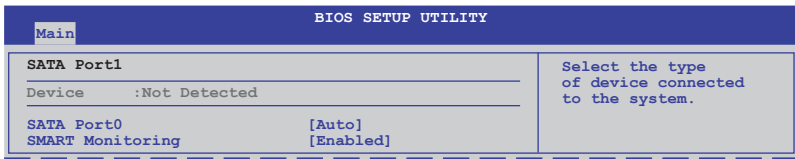
#### AHCI CD/DVD Boot Time out [35]

Selects the boot time out value for SATA CD/DVD devices in AHCI mode.

Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

#### SATA Port1–4 [XXXX]

Displays the status of auto-detection of SATA devices.



#### SATA Port0 [Auto]

Allows you to select the type of device connected to the system.

Configuration options: [Auto] [Not Installed]

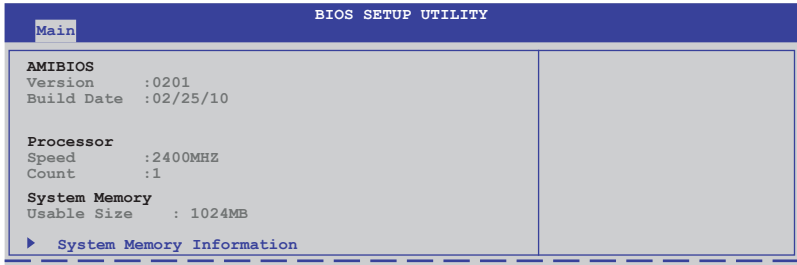
#### SMART Monitoring [Enabled]

Allows you to set the Self-Monitoring, Analysis and Reporting Technology.

Configuration options: [Disabled] [Enabled]

### 5.3.6 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu.



#### AMIBIOS

Displays the auto-detected BIOS information.

#### Processor

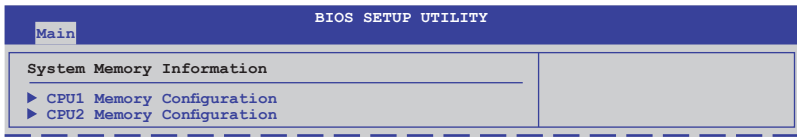
Displays the auto-detected CPU specification.

#### System Memory

Displays the auto-detected system memory.

#### System Memory Information

Displays system memory information.



#### *CPU1/2 Memory Configuration*

Allows you to check information of installed memory (6 DIMMs per CPU).

## 5.4 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.



Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

```
BIOS SETUP UTILITY
Main  Advanced  Server  Boot  Exit
└─▶ CPU Configuration          Configure CPU.
└─▶ Chipset Configuration
└─▶ Legacy Device Configuration
└─▶ USB Configuration
└─▶ PCI/PnP Configuration
└─▶ Power On Configuration
└─▶ Event Log Configuration
└─▶ Hardware Monitor
└─▶ I/O Virtualization
└─▶ PCI Express Configuration
└─▶ ACPI Configuration

←→ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1  General Help
F10 Save and Exit
ESC Exit

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```

### 5.4.1 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects. Some items may not appear if your CPU does not support the related functions.

```
BIOS SETUP UTILITY
Advanced
Configure advanced CPU settings
Module Version:01.08
Manufacturer: Intel
Brand String: Intel(R) Xeon(R) CPU L5640 @ 2.27GHz
Frequency : 2.26GHz
BCLK Speed : 133MHz
Cache L1 : 384 KB
Cache L2 : 1536 KB
Cache L3 : 12288 KB
Ratio Status: Unlocked (Min:12, Max:17)
Ratio Actual Value : 17

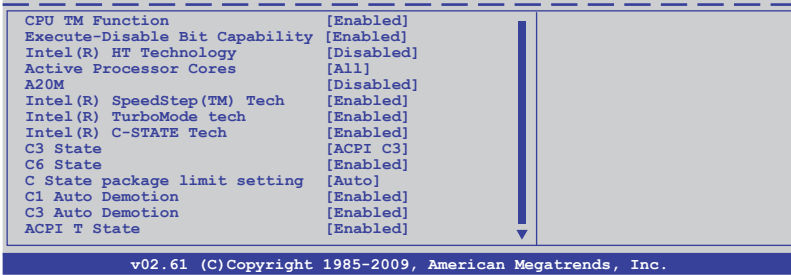
Ratio CMOS Setting: [17]
C1E Support [Enabled]
Hardware Prefetcher [Enabled]
Adjacent Cache Line Prefetch [Enabled]
MPS and ACPI MADT ordering [Modern ordering]
Max CPUID Value Limit [Disabled]
Intel(R) Virtualization Tech [Enabled]

Sets the ratio between CPU Core Clock and the FSB Frequency.
Note: If an invalid ratio is set in CMOS then actual and setpoint values may differ.

←→ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1  General Help
F10 Save and Exit
ESC Exit

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```

Scroll down for more items.



### Ratio CMOS Setting [Auto]

Allows you to adjust the ratio between CPU Core Clock and BCLK Frequency.  
Use the <+> and <-> keys to adjust the value.

Configuration options: [12.0] [13.0] [14.0] [15.0] [16.0] [17.0]

### **C1E Support [Enabled]**

Allows you to enable or disable Enhanced Halt State support.  
Configuration options: [Disabled] [Enabled]

### **Hardware Prefetcher [Enabled]**

Allows you to enable or disable the Hardware Prefetcher function.  
Configuration options: [Disabled] [Enabled]

### **Adjacent Cache Line Prefetch [Enabled]**

Allows you to enable or disable the Adjacent Cache Line Prefetch function.  
Configuration options: [Disabled] [Enabled]

### **MPS and ACPI MADT ordering [Modern ordering]**

Allows you to select the ordering according to the operating system you install.  
Select [Modern ordering] for Windows XP or later OS versions and [Legacy ordering] for Windows 2000 or earlier OS version.  
Configuration options: [Modern ordering] [Legacy ordering]

### **Max CPUID Value Limit [Disabled]**

Setting this item to [Enabled] allows legacy operating systems to boot even without support for CPUs with extended CPUID functions.  
Configuration options: [Disabled] [Enabled]



### **Intel(R) Virtualization Tech [Enabled]**

The Intel® Virtualization Technology allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems. Configuration options: [Disabled] [Enabled]

### **CPU TM Function [Enabled]**

This function enables the overheated CPU to throttle the clock speed to cool down. Configuration options: [Disabled] [Enabled]

### **Execute-Disable Bit Capability [Enabled]**

Allows you to enable or disable the No-Execution Page Protection Technology. Setting this item to [Disabled] forces the XD feature flag to always return to zero (0). Configuration options: [Disabled] [Enabled]

### **Intel(R) HT Technology [Enabled]**

Allows you to enable or disable the Intel Hyper-Threading Technology function. When disabled, only one thread per activated core is enabled. Configuration options: [Enabled] [Disabled]

### **Active Processor Cores [All]**

Allows you to choose the number of CPU cores to activate in each processor package. Configuration options: [All] [1] [2]

### **A20M [Disabled]**

Legacy OSES and APs may need A20M enabled. Configuration options: [Disabled] [Enabled]

### **Intel(R) SpeedStep (TM) Tech [Enabled]**

When set to [Disabled], the CPU runs at its default speed. When set to [Enabled], the CPU speed is controlled by the operating system. Configuration options: [Disabled] [Enabled]

### **Intel(R) TurboMode tech [Enabled]**

The turbo mode allows the processor cores to run faster than the marked frequency in specific condition. Configuration options: [Disabled] [Enabled]

### **Intel(R) C-STATE Tech [Enabled]**

The Intel® C-State Technology allows the CPU to save more power under idle mode. Enable this item only when you install a C-State Technology-supported CPU. Configuration options: [Disabled] [Enabled]



---

The following items appear only when you set the **Intel(R) C-STATE Tech** item to [Enabled].

---

### **C3 State [ACPI C3]**

Allows you to select Nehalem C state action.

Configuraiton options: [Disabled] [ACPI C2] [ACPI C3]

### **C6 State [Enabled]**

Allows you to select Nehalem C state action.

Configuraiton options: [Disabled] [Enabled]

### **C State package limit setting [Auto]**

We recommend that you set this item to [Auto] for BIOS to automatically detect the C-State mode supported by your CPU.

Configuration options: [Auto] [C1] [C3] [C6]

### **C3 Auto Demotion [Enabled]**

When this item is enabled, the CPU will conditionally demote C6 requests to C3 based on the uncore auto-demote information.

Configuration options: [Disabled] [Enabled]

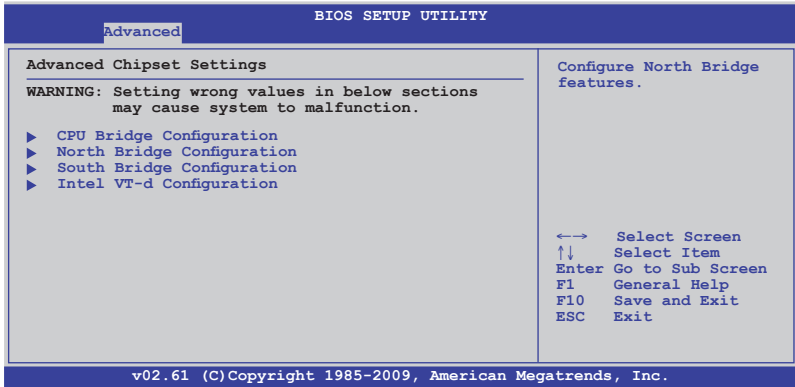
### **ACPI T State [Enabled]**

Enables or disables processor throttling report in ACPI.

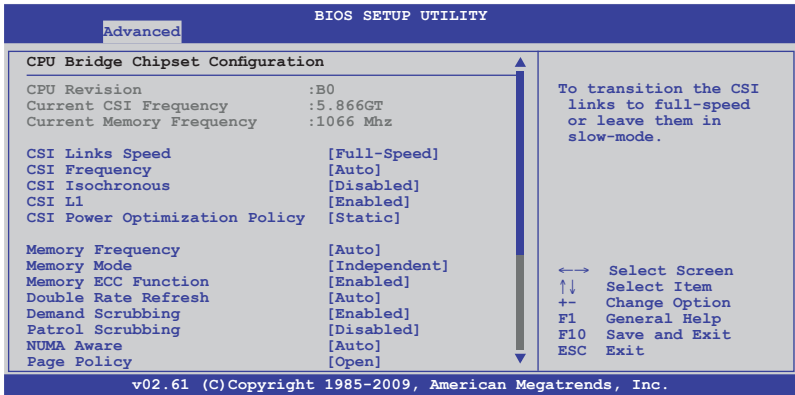
Configuration options: [Disabled] [Enabled]

## 5.4.2 Chipset Configuration

The Chipset configuration menu allows you to change advanced chipset settings. Select an item then press <Enter> to display the sub-menu.



### CPU Bridge Chipset Configuration



Scroll down for more items.



### **CSI Links Speed [Full-Speed]**

Allows you to set the speed of CSI Links.

Configuration options: [Slow-Mode] [Full-Speed]

### **CSI Frequency [Auto]**

Allows you to set the CSI frequency.

Configuration options: [Auto] [4.800GT] [5.866GT] [6.400GT]

### **CSI Isochronous [Disabled]**

Configuration options: [Disabled] [Enabled]

### **CSI L1 [Disabled]**

Configuration options: [Disabled] [Enabled]

### **CSI Power Optimization Policy [Static]**

Configuration options: [Adaptive] [Static] [Bypass]

### **Memory Frequency [Auto]**

You may allow the system to detect DDR3 memory frequency via SPD or designate a specific frequency.

Configuration options: [Auto] [Force DDR-800] [Force DDR-1066]  
[Force DDR-1333]

### **Memory Mode [Independent]**

Allows you to set Memory channel mode.

Configuration options: [Independent] [Channel Mirroring] [Lockstep]

### **Memory ECC Function [Enabled]**

Allows you to enable or disable Memory ECC function.

Configuration options: [Disabled] [Enabled]

### **Double Rate Refresh [Auto]**

Configuration options: [Disabled] [Auto]

### **Demand Scrubbing [Enabled]**

Enables or disables the ECC demand scrub.

Configuration options: [Disabled] [Enabled]

### **Patrol Scrubbing [Disabled]**

Enables or disables the ECC patrol scrub.

Configuration options: [Disabled] [Enabled]

## NUMA Aware [Auto]

Configuration options: [Disabled] [Enabled]

## Page Poilcy [Open]

Configuration options: [Closed] [Open]

## Adaptive Page [Disabled]

Configuration options: [Disabled] [Enabled]

## Data Scramble [Enabled]

Configuration options: [Disabled] [Enabled]

## Split Below 4 GB [Disabled]

Configuration options: [Disabled] [Auto]

## Channel Interleaving [6:1]

Allows you to set the channel interleaving setting.

Configuration options: [1:1] [2:1] [4:1] [6:1]

## Rank Interleaving [4:1]

Allows you to set the rank interleaving setting.

Configuration options: [1:1] [2:1] [4:1]

## Memory Thermal Throttling [Disabled]

[CLTT] is for closed loop thermal throttling and [OLTT] for open loop thermal throttling. Configuration options: [CLTT] [OLTT] [Disabled] [Auto]

## Force VDD 1.5V [Disabled]

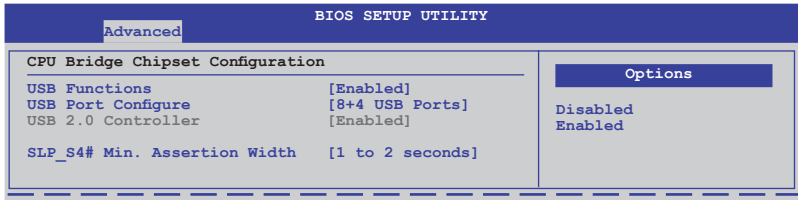
Configuration options: [Disabled] [Enabled]

## North Bridge Configuration

The North Bridge Configuration menu shows the auto-detected Northbridge values.

BIOS SETUP UTILITY	
Advanced	
NorthBridge Chipset Configuration	
NB Revision	:C2
Current CSI Frequency	:5.866GT

# South Bridge Chipset Configuration



## USB Functions [Enabled]

Allows you to configure the amount of USB ports to be enabled.  
Configuration options: [Disabled] [Enabled]

## USB Port Configure [8+4 USB Ports]

This item disappears when you set the **USB Functions** item to [Disabled].  
Configuration options: [6+6 USB Ports] [8+4 USB Ports]

## USB 2.0 Controller [Enabled]

Allows you to enable or disable the USB 2.0 controller.  
Configuration options: [Enabled] [Disabled]

## SLP\_S4# Min. Assertion Width [1 to 2 seconds]

Configuration options: [4 to 5 seconds] [3 to 4 seconds] [2 to 3 seconds]  
[1 to 2 seconds]

## Intel VT-d Configuration

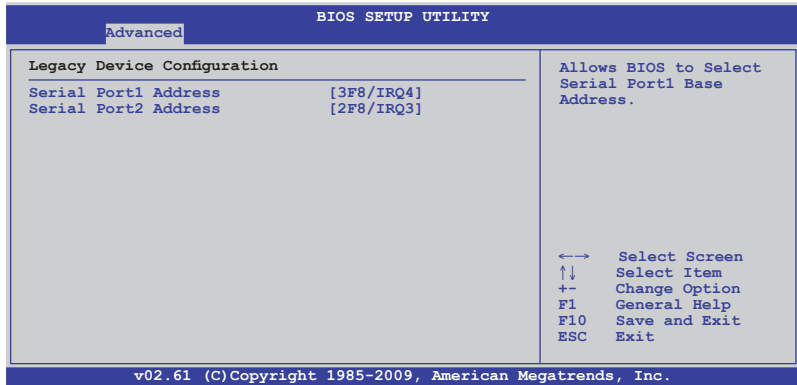


### Intel VT-d [Disabled]

Allows you to enable or disable the Intel Virtualization Technology for Directed I/O.

Configuration options: [Disabled] [Enabled]

## 5.4.3 Legacy Device Configuration



### **Serial Port1 Address [3F8/IRQ4]**

Allows you to select the Serial Port1 base address.

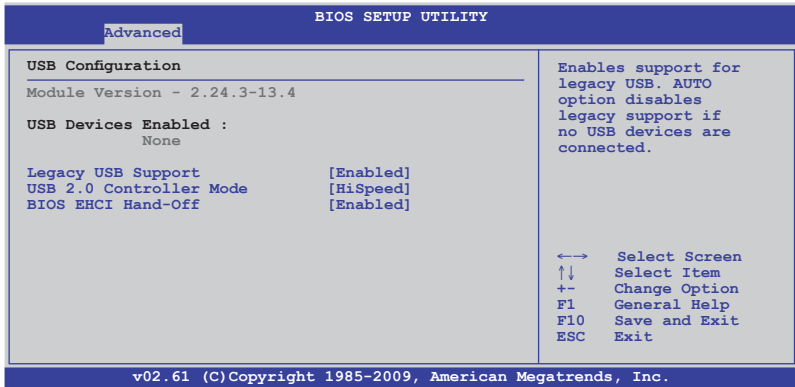
Configuration options: [Disabled] [3F8/IRQ4] [3E8/IRQ4] [2E8/IRQ3]

### **Serial Port2 Address [2F8/IRQ3]**

Allows you to select the Serial Port2 base address.

Configuration options: [Disabled] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

## 5.4.4 USB Configuration



### Legacy USB Support [Enabled]

Allows you to enable or disable support for legacy USB devices. Setting to [Auto] allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled. Configuration options: [Disabled] [Enabled] [Auto]



The following item appears only when you set **Legacy USB Support** to [Enabled].

### USB 2.0 Controller Mode [HiSpeed]

Allows you to set the USB 2.0 controller to HiSpeed (480Mbps) or FullSpeed (12Mbps). Configuration options: [FullSpeed] [HiSpeed]

### BIOS EHCI Hand-Off [Enabled]

Enables or disables the BIOS EHCI hand-off support. Configuration options: [Disabled] [Enabled]

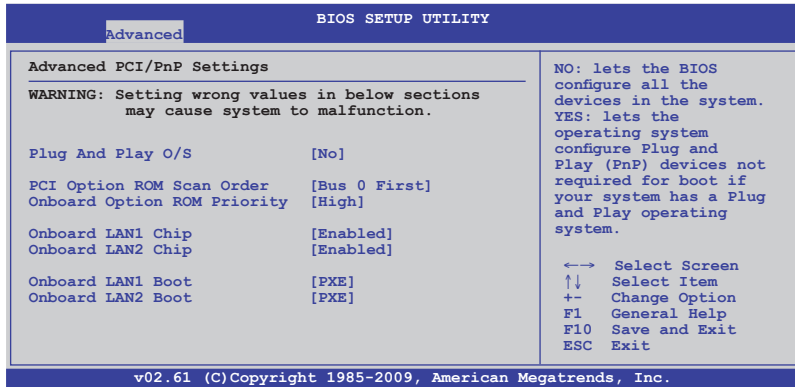


## 5.4.5 PCIPnP Configuration

The PCIPnP Configuration menu items allow you to change the advanced settings for PCI/PnP devices.



Take caution when changing the settings of the PCI/PnP Configuration menu items. Incorrect field values can cause the system to malfunction.



### Plug And Play O/S [No]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot.

Configuration options: [No] [Yes]

### PCI Option ROM Scan Order [Bus 0 First]

Allows you to select the PCI option ROM scanning order. The scanning of the option ROM will start from the lowest bus, device, function number if you set this item to [Bus 0 First]; the scanning starts from the highest bus, device, function number if you set this item to [Bus N First].

Configuration options: [Bus 0 First] [Bus N First]

### Onboard Option ROM Priority [High]

Allows you to select the onboard option ROM priority.

Configuration options: [Normal] [High]

### Onboard LAN1/2 Chip [Enabled]

Allows you to enable or disable the onboard LAN1/2 chip.

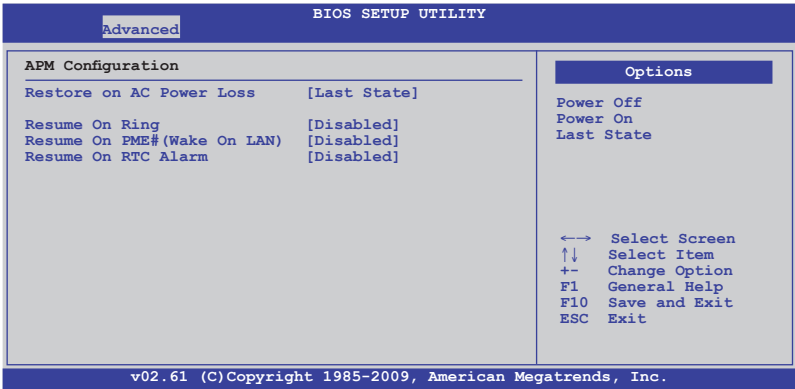
Configuration: [Disabled] [Enabled]

### Onboard LAN1/2 Boot [PXE]

Allows you to configure the onboard LAN1/2 boot mode.

Configuration: [Disabled] [PXE] [iSCSI]

## 5.4.6 Power On configuration



### Restore on AC Power Loss [Last State]

When set to [Power Off], the system goes into off state after an AC power loss. When set to [Power On], the system will reboot after an AC power loss. When set to [Last State], the system goes into either off or on state, whatever the system state was before the AC power loss.

Configuration options: [Power Off] [Power On] [Last State]

### Resume On Ring [Disabled]

When set to [Enabled], the system enables RI to generate a wake event while the computer is in Soft-off mode. Configuration options: [Disabled] [Enabled]

### Resume On PME#(Wake On LAN) [Disabled]

When set to [Enabled], the system enables PME to generate a wake event while the computer is in Soft-off mode. Configuration options: [Disabled] [Enabled]

### Resume On RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake-up event.

Configuration options: [Disabled] [Enabled]



The following items appear only when the **Resume On RTC Alarm** item is set to [Enabled].

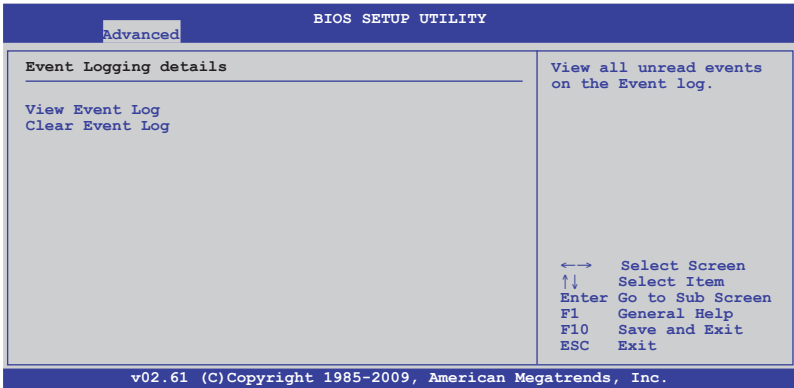
#### RTC Alarm Date [15]

To set the alarm date, highlight this item and press the <+> or <-> key to make the selection.

#### System Time [12:30:30]

Use the <ENTER>, <TAB> or <SHIFT-TAB> key to select a field. Use the <+> or <-> key to configure alarm time.

## 5.4.7 Event Log Configuration



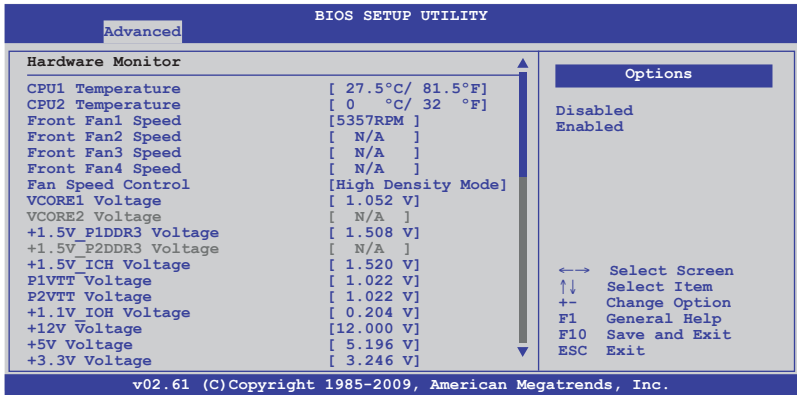
### View Event Log

Press <Enter> to read all the unread event log.

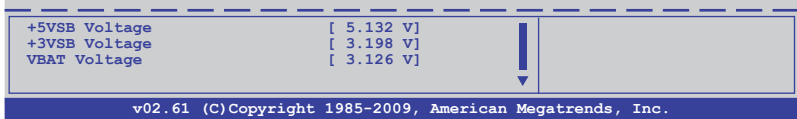
### Clear Event Log

Press <Enter> to clear all events on the event log.

## 5.4.8 Hardware Monitor



Scroll down for more items.



### CPU1/2 Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the CPU temperatures. Select [Ignored] if you do not wish to display the detected temperatures.

### Front Fan1–4 Speed [xxxxRPM] or [Ignored] / [N/A]

The onboard hardware monitor automatically detects and displays the speed of CPU fans, front fans, and rear fans in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows [N/A].

### Fan Speed Control [High Density Mode]

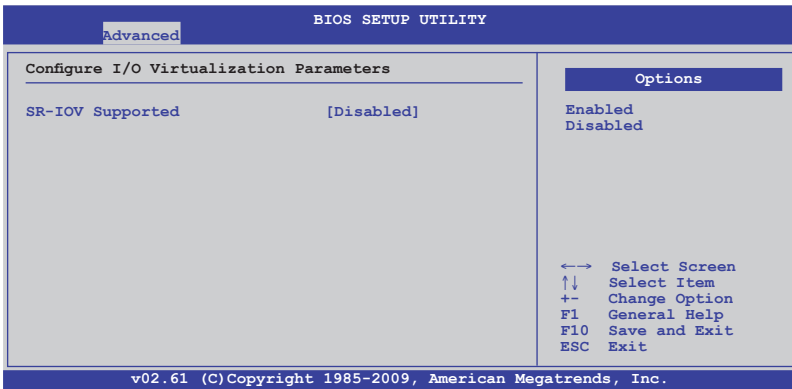
Allows you to configure the ASUS Smart Fan feature that smartly adjusts the fan speeds for more efficient system operation.

Configuration options: [Full Speed Mode] [Whisper Mode] [Generic Mode] [High Density Mode]

### VCORE1/2 Voltage, +1.5V\_P1/2DDR3 Voltage, +1.5V\_ICH Voltage, P1/2VTT Voltage, +1.1V\_IOH Voltage, +12V Voltage, +5V Voltage, +3.3V Voltage, +5VSB Voltage, +3VSB Voltage, VBAT Voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. Select [Ignored] if you do not want to detect this item.

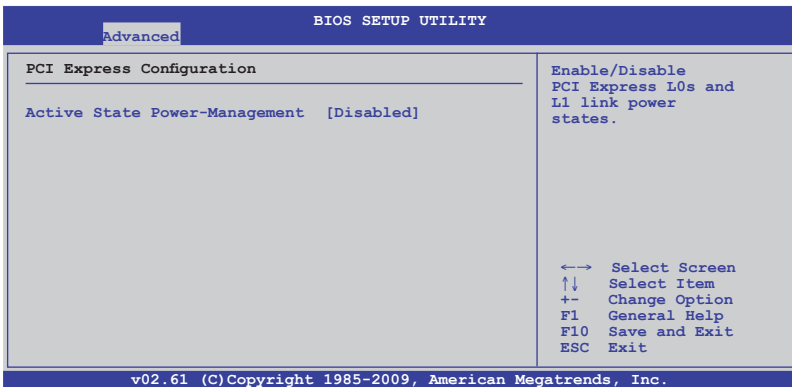
## 5.4.9 I/O Virtualization



### SR-IOV Supported [Disabled]

Configuration options: [Disabled] [Enabled]

## 5.4.10 PCI Express Configuration

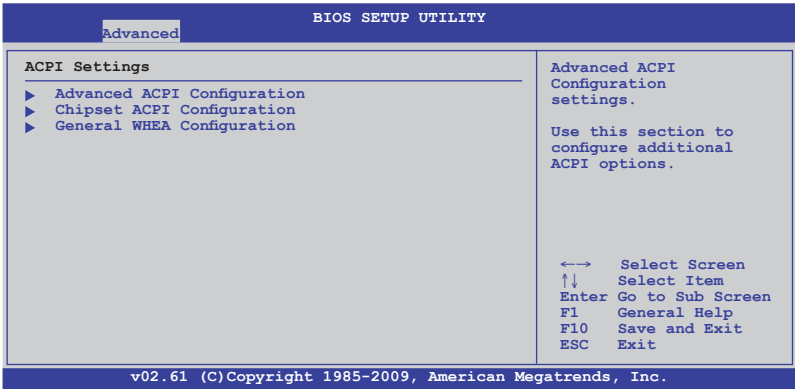


### Active State Power-Management [Disabled]

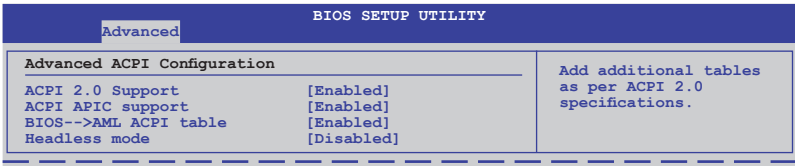
Enables or disables the PCI Express L0s and L1 link power states.

Configuration options: [Disabled] [Enabled]

## 5.4.11 ACPI Configuration



### Advanced ACPI Configuration



#### ACPI 2.0 Support [Enabled]

Specifies the Advanced Configuration and Power Interface (ACPI) version supported.

Configuration options: [Disabled] [Enabled]

#### ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list.

Configuration options: [Disabled] [Enabled]

#### BIOS-->AML ACPI table [Enabled]

Allows you to include the BIOS-->AML exchange table pointer to (X)RSDT pointer list.

Configuration options: [Disabled] [Enabled]

#### Headless mode [Disabled]

Allows you to enable or disable the Headless operation mode through ACPI.

Configuration options: [Disabled] [Enabled]

## Chipset ACPI Configuration

Advanced		BIOS SETUP UTILITY	
South Bridge ACPI Configuration		Options	
APIC ACPI SCI IRQ	[Disabled]	Enabled	Disabled
High Performance Event Timer	[Enabled]		
HPET Memory Address	[FED0000h]		

### APIC ACPI SCI IRQ [Disabled]

Allows you to enable or disable the APIC ACPI SCI IRQ feature.

Configuration options: [Disabled] [Enabled]

### High Performance Event Timer [Enabled]

Allows you to enable or disable the High Performance Event Timer feature.

Configuration options: [Disabled] [Enabled]

### HPET Memory Address [FED0000h]

Allows you to select the HPET Memory address.

Configuration options: [FED0000h] [FED01000h] [FED02000h] [FED03000h]

## General WHEA Configuration

Advanced		BIOS SETUP UTILITY	
General WHEA Configuration		Enable or disable Windows Hardware Error Architecture.	
WHEA Support	[Enabled]		

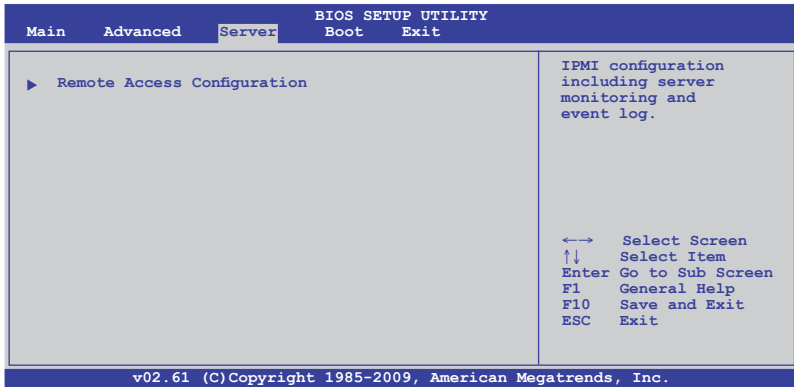
### WHEA Support [Enabled]

Allows you to enable or disable the Windows Hardware Error Architecture (WHEA) support.

Configuration options: [Disabled] [Enabled]

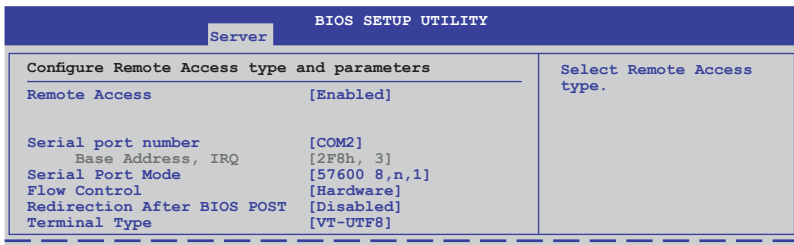
## 5.5 Server menu

The Server menu items allow you to customize the server features.



### Remote Access Configuration

The items in this menu allows you to configure the Remote Access features. Select an item then press <Enter> to display the configuration options.



#### Remote Access [Enabled]

Enables or disables the remote access feature.

Configuration options: [Disabled] [Enabled]



The following items appear only when **Remote Access** is set to [Enabled].

#### Serial port number [COM2]

Selects the serial port for console redirection.

Configuration options: [COM1] [COM2]

#### **Base Address. IRQ [2F8h, 3]**

This item is not user-configurable and changes with the configuration of **Serial port number**.



Serial Port Mode [57600 8,n,1]

Sets the Serial port mode.

Configuration options: [115200 8,n,1] [57600 8,n,1] [38400 8,n,1] [19200 8,n,1] [09600 8,n,1]

Flow Control [Hardware]

Allows you to select the flow control for console redirection.

Configuration options: [None] [Hardware] [Software]

Redirection After BIOS POST [Disabled]

Sets the redirection mode after the BIOS Power-On Self-Test (POST). Some operating system may not work when set to [Always].

Configuration options: [Disabled] [Boot Loader] [Always]

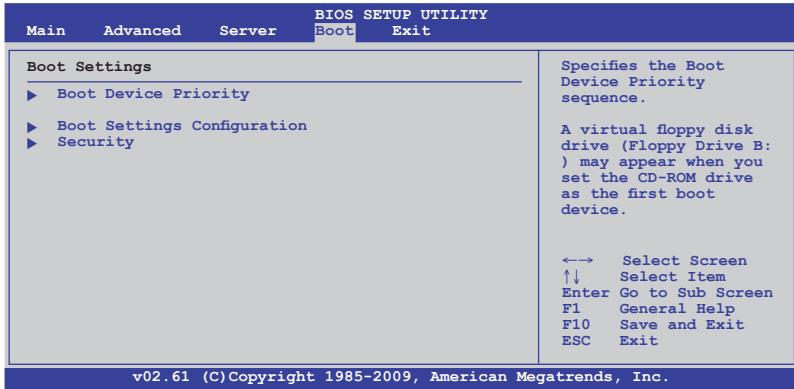
Terminal Type [VT-UTF8]

Allows you to select the target terminal type.

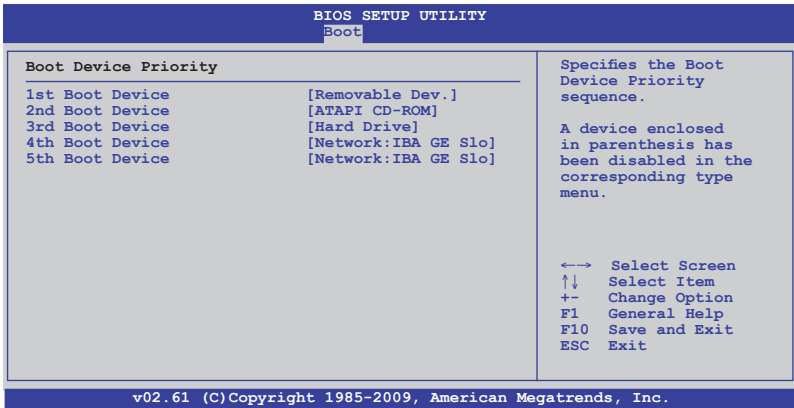
Configuration options: [ANSI] [VT100] [VT-UTF8]

## 5.6 Boot menu

The Boot menu items allow you to change the system boot options. Select an item then press <Enter> to display the sub-menu.



### 5.6.1 Boot Device Priority



#### 1st ~ xxth Boot Device [XXXXXXX]

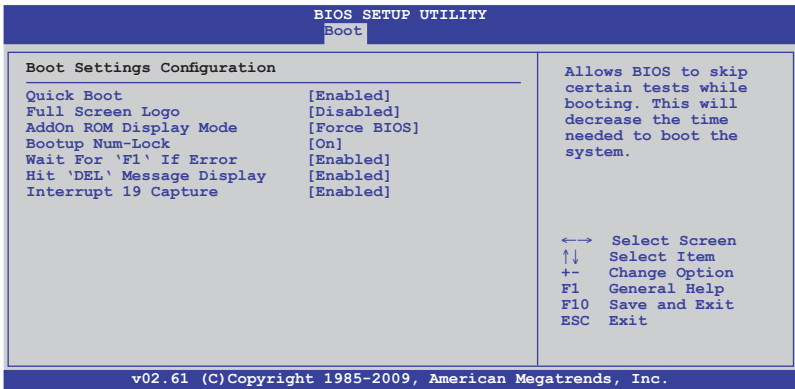
These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

Configuration options: [xxxxx Drive] [Disabled]

### 5.6.2 Hard Disk Drives; CDROM Drives

These two items appear only when you install more than two hard disk drives or optical drives to your system. These items allow you to specify the boot priority sequence of the hard disk drives or the optical drives.

## 5.6.3 Boot Settings Configuration



### Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.

Configuration options: [Disabled] [Enabled]

### Full Screen Logo [Disabled]

Allows you to enable or disable the full screen logo display feature.

Configuration options: [Disabled] [Enabled]



Set this item to [Enabled] to use the ASUS MyLogo2™ feature.

### AddOn ROM Display Mode [Force BIOS]

Allows you to set the display mode for Options ROM.

Configuration options: [Force BIOS] [Keep Current]

### Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.

Configuration options: [Off] [On]

### Wait For 'F1' If Error [Enabled]

When set to [Enabled], the system waits for the <F1> key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]

### Hit 'DEL' Message Display [Enabled]

When set to [Enabled], the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

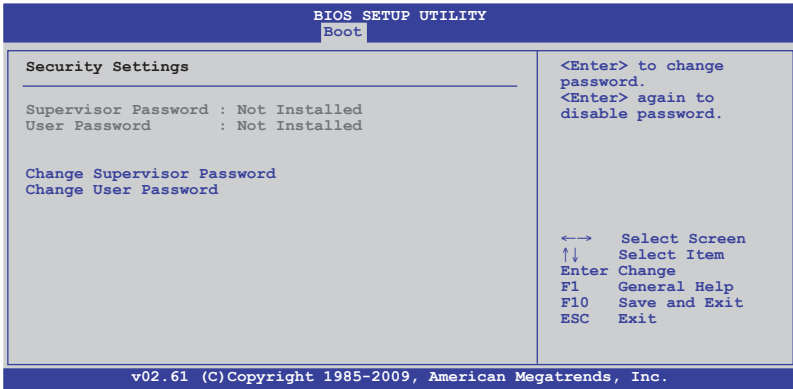
### Interrupt 19 Capture [Enabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19.

Configuration options: [Disabled] [Enabled]

## 5.6.4 Security

The Security menu items allow you to change the system security settings. Select an item then press <Enter> to display the configuration options.



### Change Supervisor Password

Select this item to set or change the supervisor password. The **Supervisor Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a Supervisor Password:

1. Select the **Change Supervisor Password** item and press <Enter>.
2. From the password box, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message "Password Installed" appears after you successfully set your password.

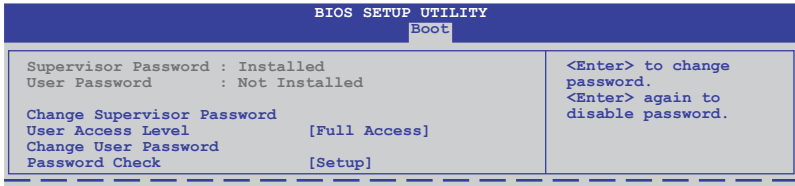
To change the supervisor password, follow the same steps as in setting a user password.

To clear the supervisor password, select the **Change Supervisor Password** then press <Enter>. The message "Password Uninstalled" appears.



If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section **4.2 Jumpers** for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.



### User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

**No Access** prevents user access to the Setup utility.

**View Only** allows access but does not allow change to any field.

**Limited** allows changes only to selected fields, such as Date and Time.

**Full Access** allows viewing and changing all the fields in the Setup utility.

### Change User Password

Select this item to set or change the user password. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows Installed.

To set a User Password:

1. Select the **Change User Password** item and press <Enter>.
2. On the password box that appears, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message "Password Installed" appears after you set your password successfully.

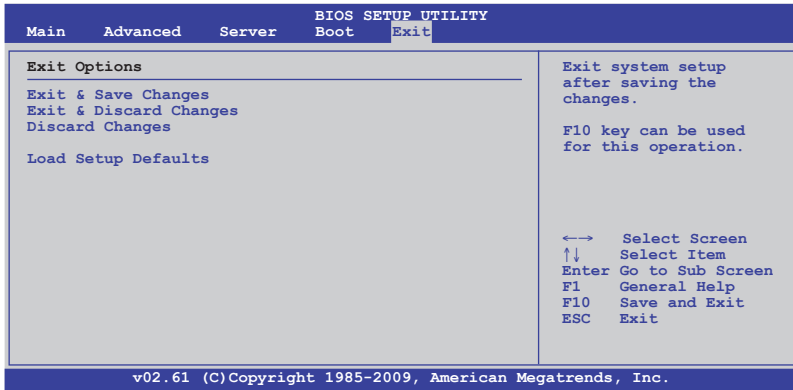
To change the user password, follow the same steps as in setting a user password.

### Password Check [Setup]

When set to [Setup], BIOS checks for user password when accessing the Setup utility. When set to [Always], BIOS checks for user password both when accessing Setup and booting the system. Configuration options: [Setup] [Always]

## 5.7 Exit menu

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

### Exit & Save Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select **YES** to save changes and exit.



If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Press <Enter> to save the changes while exiting.

### Exit & Discard Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than System Date, System Time, and Password, the BIOS asks for a confirmation before exiting.

### Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select **YES** to discard any changes and load the previously saved values.

### Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **YES** to load default values. Select **Exit & Save Changes** or make other changes before saving the values to the non-volatile RAM.

# Chapter 6

This chapter provides instructions for setting up, creating and configuring RAID sets using the available utilities.

# RAID configuration

## 6.1 Setting up RAID

The motherboard comes with the Intel® ICH10R southbridge controller that supports the following SATA RAID solutions:

- **LSI MegaRAID software RAID Configuration Utility** (default) with RAID 0 and RAID 1 support (for both Linux and Windows OS).
- **Intel Matrix Storage Manager** with RAID 0, RAID 1, and RAID 5 support (for Windows OS only).

### 6.1.1 RAID definitions

**RAID 0** (*Data striping*) optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

**RAID 1** (*Data mirroring*) copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

**RAID 5** stripes both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.

### 6.1.2 Installing hard disk drives

The motherboard supports SATA hard disk drives for RAID set configuration. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

See section **2.4 Hard disk drives** for SATA hard disk drive installation.



### 6.1.3 RAID controller selection

You can choose either the LSI Software RAID Configuration Utility or the Intel Matrix Storage Manager as the default utility to create RAID set(s). See **5. Intel ICH10R SATA port S/W RAID setting** on page 4-9 for details.

### 6.1.4 Setting the RAID item in BIOS

You must enable the RAID function in the BIOS Setup before creating RAID set(s) using SATA HDDs. To do this:

1. Enter the BIOS Setup during POST.
2. Go to the **Main** menu > **IDE Configuration**, and then press <Enter>.
3. Set the **Configure SATA as** item to [RAID].
4. Save your changes, and then exit the BIOS Setup.



---

Refer to Chapter 5 for details on entering and navigating through the BIOS Setup.

---

## 6.2 LSI Software RAID Configuration Utility

The LSI MegaRAID software RAID configuration utility allows you to create RAID 0 or RAID 1 set from SATA hard disk drives connected to the SATA connectors supported by the motherboard southbridge chip.

To enter the LSI MegaRAID software RAID configuration utility

1. Turn on the system after installing all the SATA hard disk drives.
2. During POST, the LSI MegaRAID software RAID configuration utility automatically detects the installed SATA hard disk drives and displays any existing RAID set(s). Press <Ctrl> + <M> to enter the utility.

```
LSI MegaRAID Software RAID BIOS Version A.08 09161344R
LSI SATA RAID Found at PCI Bus No: Dev No:1F
Device present at Port 0      ST3160812AS      152114MB
Device present at Port 1      ST3160812AS      152114MB
Device present at Port 2      ST3160812AS      152114MB
Press Ctrl-M or Enter to run LSI Software RAID Setup Utility.
```



- The LSI MegaRAID software RAID configuration utility automatically configures to RAID 1 when the SATA to RAID Mode is enabled.
- The RAID setup screens shown in this section are for reference only and may not exactly match the items on your screen due to the controller version difference.
- When you create RAID sets with the LSI MegaRAID software RAID configuration utility, the boot priority of the SATA optical drive has to be manually adjusted. Otherwise, the system will not boot from the connected SATA ODD.

3. The utility main window appears. Use the arrow keys to select an option from the **Management Menu** and then press <Enter>. Refer to the Management Menu descriptions on the next page.

At the bottom of the screen is the legend box. The keys on the legend box allow you to navigate through the setup menu options or execute commands. The keys on the legend box vary according to the menu level.

```
LSI Software RAID Configuration Utility Ver A.60 Jul 30, 2008
BIOS Version A.08.09161344R

Management Menu
Configure
Initialize
Objects
Rebuild
Check Consistency

Configure VD(s)

Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```

Menu	Description
<b>Configure</b>	Allows you to create RAID 0 or RAID 1 set using the Easy Configuration or the New Configuration command. This menu also allows you to view, add, or clear RAID configurations or select the boot drive
<b>Initialize</b>	Allows you to initialize the virtual drives of a created RAID set
<b>Objects</b>	Allows you to initialize virtual drives or change the virtual drive parameters
<b>Rebuild</b>	Allows you to rebuild failed drives
<b>Check Consistency</b>	Allows you to check the data consistency of the virtual drives of a created RAID set

## 6.2.1 Creating a RAID set

The LSI Software RAID Configuration Utility allows you to create a RAID 0 or RAID 1 set using two types of configurations: **Easy** and **New**.

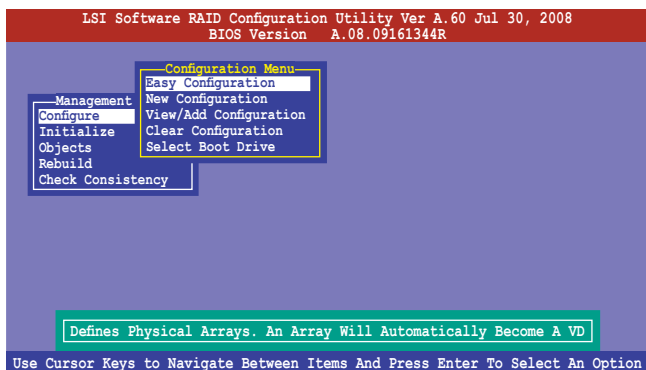
In **Easy Configuration**, the virtual drive parameters are set automatically.

In **New Configuration**, you manually set the virtual drive parameters.

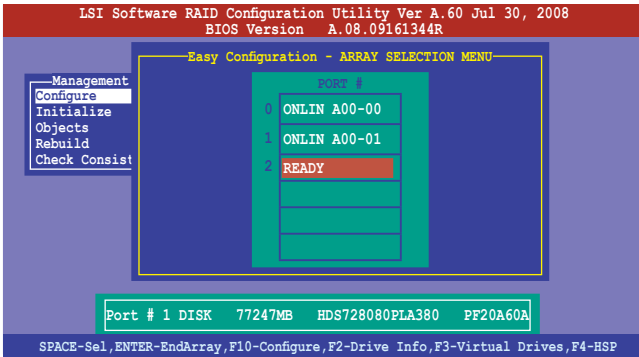
### Using Easy Configuration

To create a RAID set using the **Easy Configuration** option

1. From the **Management Menu**, select **Configure > Easy Configuration**, and then press <Enter>.

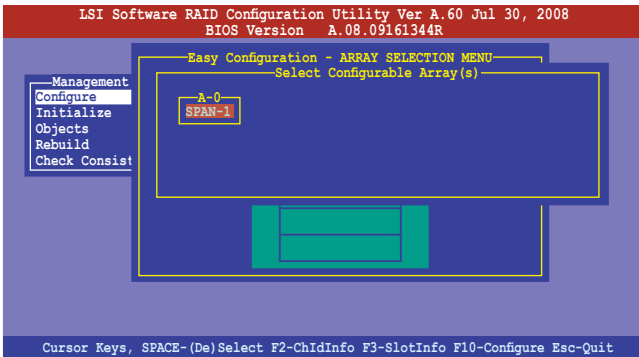


- The **ARRAY SELECTION MENU** displays the available drives connected to the SATA ports. Use the up/down arrow key to select the drives you want to include in the RAID set, and then press <Space>. When selected, the drive indicator changes from **READY** to **ONLIN A[X]-[Y]**, where X is the array number, and Y is the drive number.

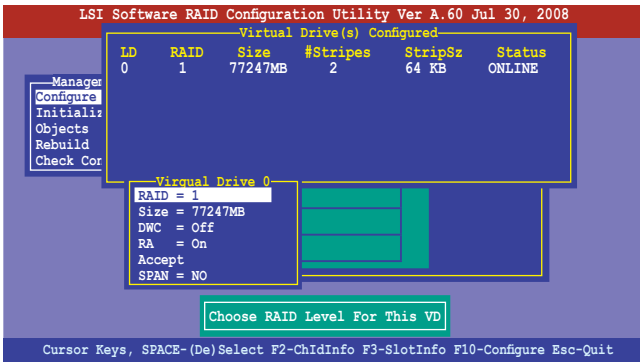


- The information of the selected hard disk drive displays at the bottom of the screen.
- You need at least two identical hard disk drives when creating a RAID 1 set.

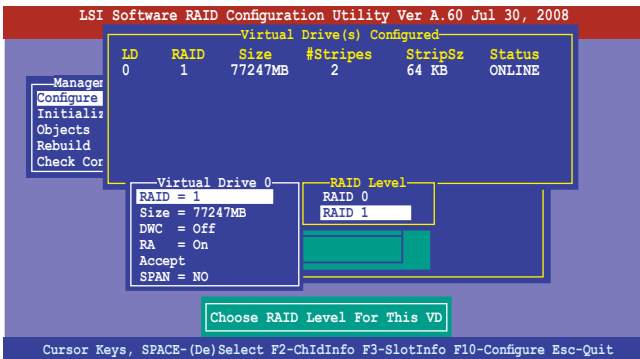
- Select all the drives required for the RAID set, and then press <F10> to configure array setting.
- Press <Space> to select the configurable array.



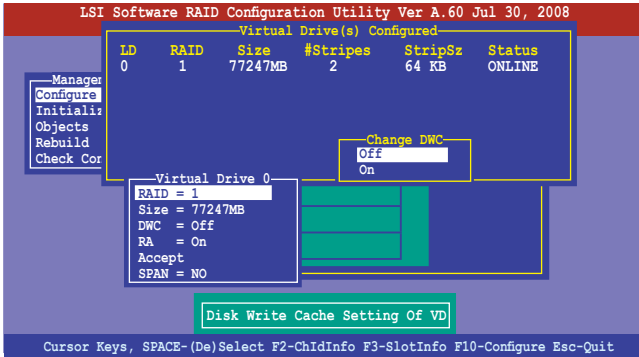
- Press <F10> again, the virtual drive information appears including a **Virtual Drive** menu that allows you to change the virtual drive parameters.



- Select **RAID** from the **Virtual Drive** sub-menu, and then press <Enter>.
- Select the **RAID** level from the menu, and then press <Enter>.



8. When creating a **RAID 1** set, select **DWC** from the **Virtual Drive** menu, and then press <Enter>.
- When creating a **RAID 0** set, proceed to step 10.
9. Select **On** to enable the **Disk Write Cache** setting, and then press <Enter>.

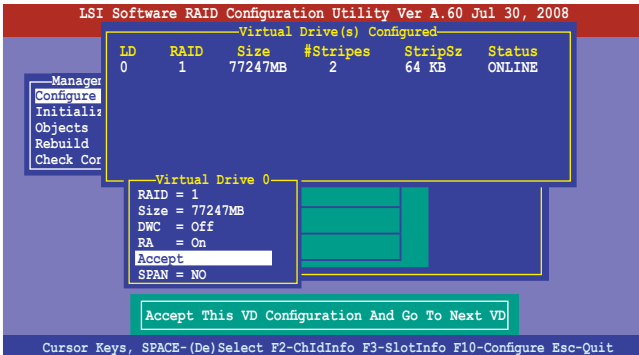



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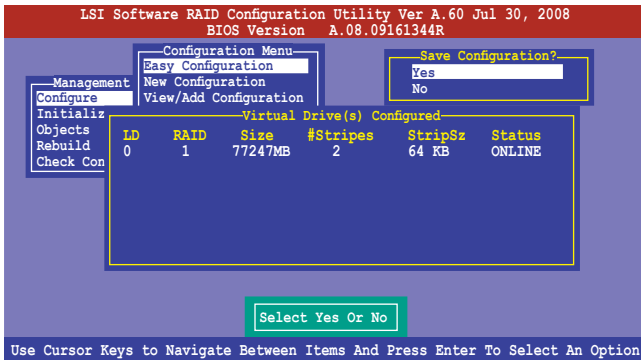
Enabling DWC can improve the performance, but with the risk of data loss.

---

10. When finished setting the selected virtual drive configuration, select **Accept** from the menu, and then press <Enter>.



11. Follow step 2 to 10 to configure additional virtual drives.
12. Press <Esc> to finish RAID configuration. When prompted to save configuration, select **Yes** from the menu, and then press <Enter>.



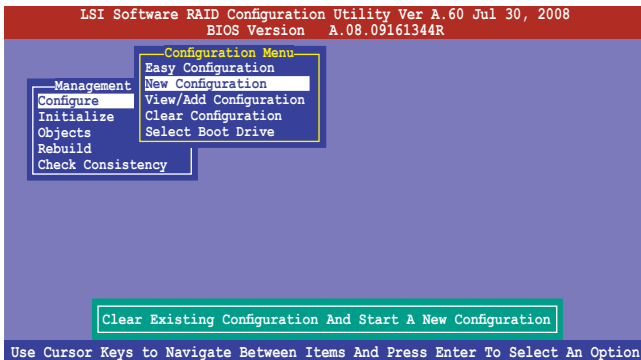
## Using New Configuration



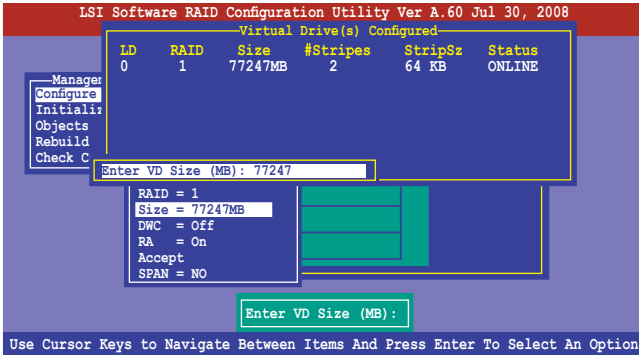
When a RAID set already exists, using the **New Configuration** command erases the existing RAID configuration data. If you do not want to delete the existing RAID set, use the **View/Add Configuration** command to view or create another RAID configuration.

To create a RAID set using the **New Configuration** option

1. From the **Management Menu**, select **Configure > New Configuration**, and then press <Enter>.



2. Follow step 2 to 7 of the previous section: **Using Easy Configuration**.
3. Select **Size** from the **Virtual Drive** menu, and then press <Enter>.
4. Key-in the desired virtual drive size, and then press <Enter>.



5. Follow step 8 to 12 of the previous section: **Using Easy Configuration** to create the RAID set.



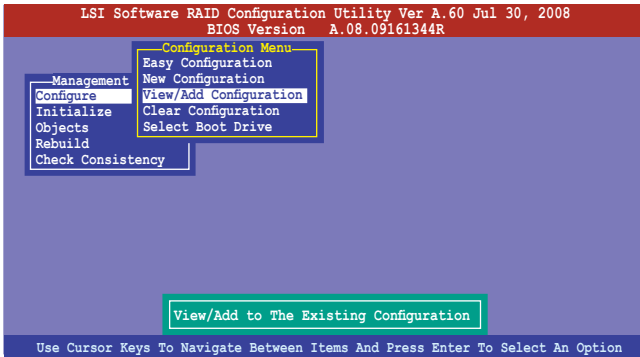
## 6.2.2 Adding or viewing a RAID configuration

You can add a new RAID configuration or view an existing configuration using the **View/Add Configuration** command.

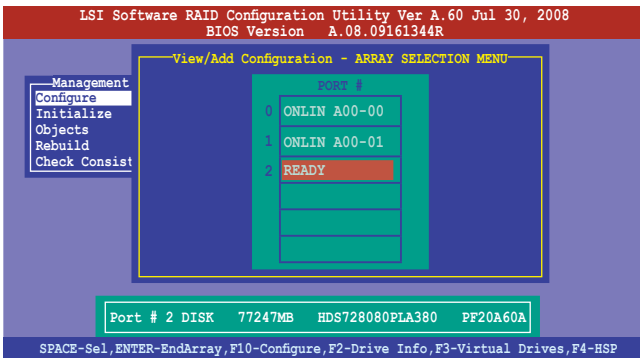
### Adding a new RAID configuration

To add a new RAID configuration:

1. From the **Management Menu**, select **Configure > View/Add Configuration**, and then press <Enter>.



2. The **ARRAY SELECTION MENU** displays the available drives connected to the SATA ports. Select the drive(s) you want to include in the RAID set, then press <Space>. When selected, the drive indicator changes from **READY** to **ONLIN A[X]-[Y]**, where X is the array number, and Y is the drive number.



The information of the selected hard disk drive displays at the bottom of the screen.

3. Follow step 3 to 12 of section **6.2.1 Creating a RAID set: Using Easy Configuration** to add a new RAID set.

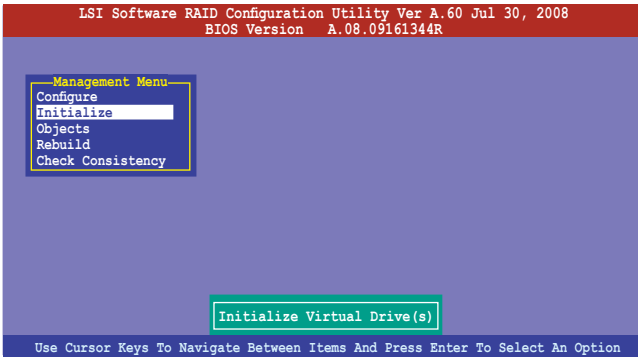
### 6.2.3 Initializing the virtual drives

After creating the RAID set(s), you must initialize the virtual drives. You may initialize the virtual drives of a RAID set(s) using the **Initialize** or **Objects** command on the **Management Menu**.

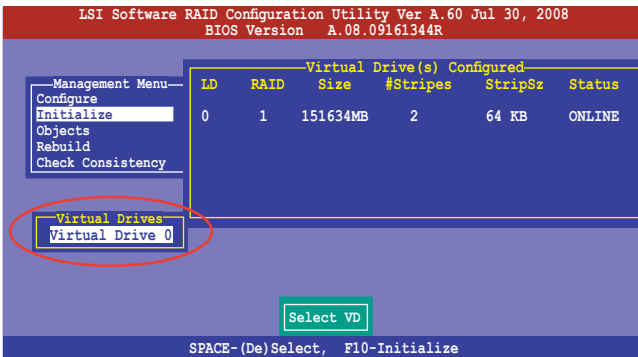
#### Using the Initialize command

To initialize the virtual drive using the Initialize command

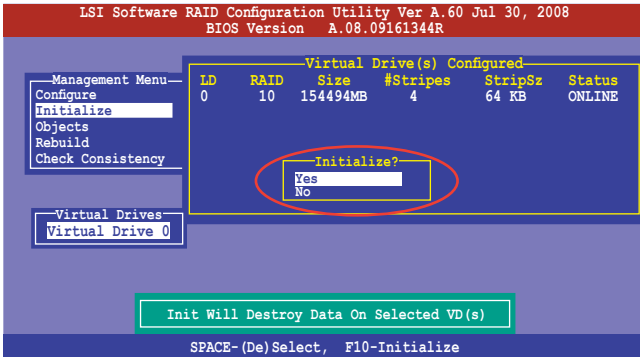
1. From the **Management Menu**, select **Initialize**, and then press <Enter>.



2. The screen displays the available RAID set(s) and prompts you to select the virtual drive to initialize. Use the arrow keys to select the virtual drive from the **Virtual Drive** selection, and then press <Space>.

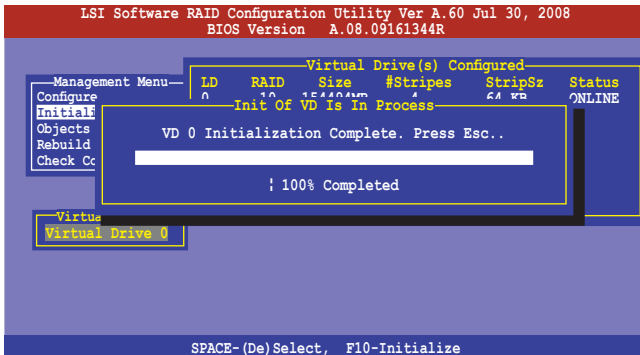


3. Press <F10> to start initialization. When prompted, select **Yes** from the **Initialize?** dialog box, and then press <Enter>.



Initializing a virtual drive erases all data on the drive.

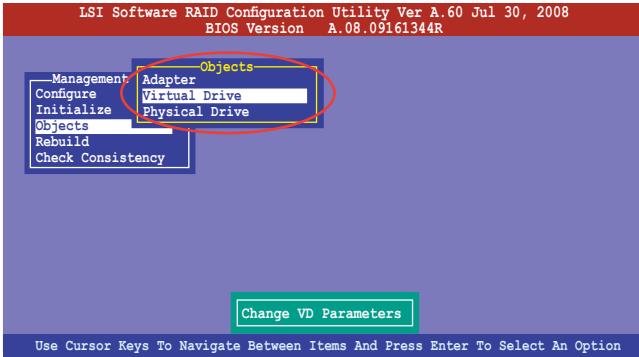
4. A progress bar appears on screen. If desired, press <Esc> to abort initialization. When initialization is completed, press <Esc>.



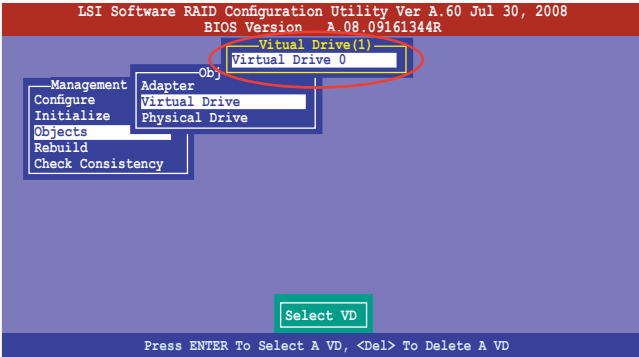
## Using the Objects command

To initialize the virtual drives using the **Objects** command

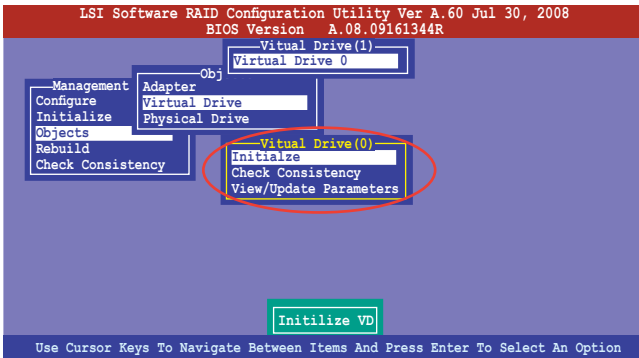
1. From the **Management Menu**, select **Objects > Virtual Drive**, and then press <Enter>.



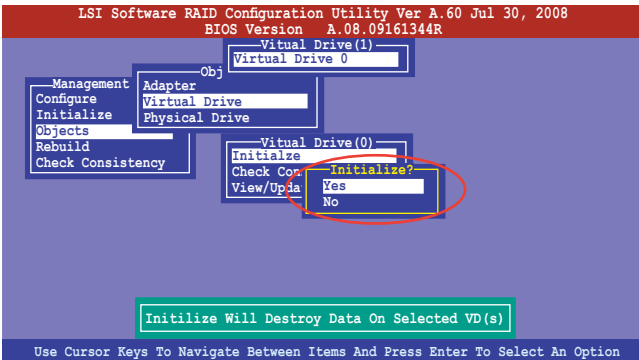
2. Select the virtual drive to initialize from the **Virtual Drives** sub-menu, and then press <Enter>.



3. Select **Initialize** from the pop-up menu, and then press <Enter> to start initialization.



4. When prompted, press the <Space> to select **Yes** from the **Initialize?** dialog box, and then press <Enter>.



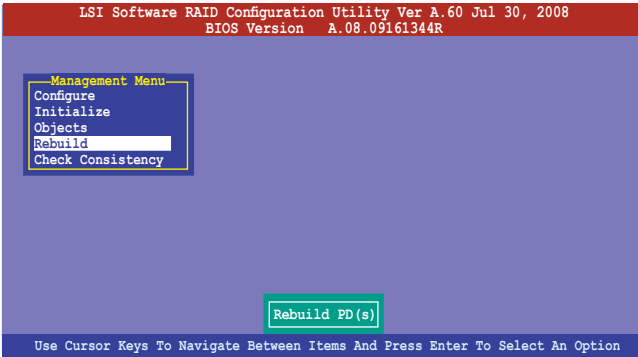
5. A progress bar appears on screen. If desired, press <Esc> to abort initialization. When initialization is completed, press <Esc>.

## 6.2.4 Rebuilding failed drives

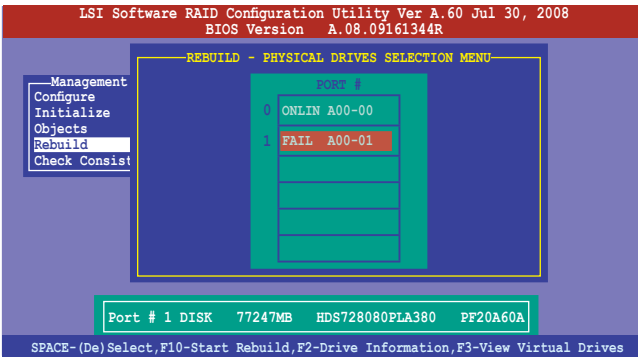
You can manually rebuild failed hard disk drives using the **Rebuild** command in the **Management Menu**.

To rebuild a failed hard disk drive

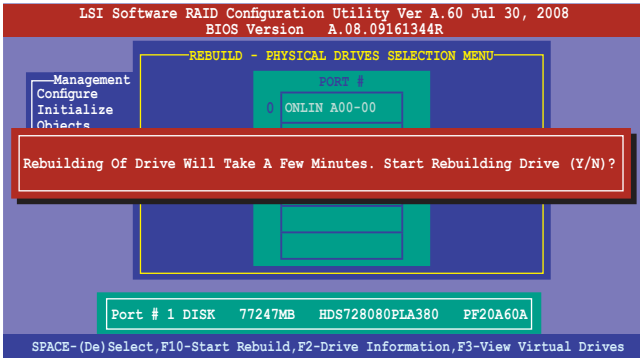
1. From the **Management Menu**, select **Rebuild**, and then press <Enter>.



2. The **PHYSICAL DRIVES SELECTION MENU** displays the available drives connected to the SATA ports. Select the drive you want to rebuild, and then press <Space>.



3. After selecting the drive to rebuild, press <F10>. When prompted, press <Y> to rebuild the drive.



4. When rebuild is complete, press any key to continue.

## 6.2.5 Checking the drives for data consistency

You can check and verify the accuracy of data redundancy in the selected virtual drive. The utility can automatically detect and/or detect and correct any differences in data redundancy depending on the selected option in the **Objects > Adapter** menu.

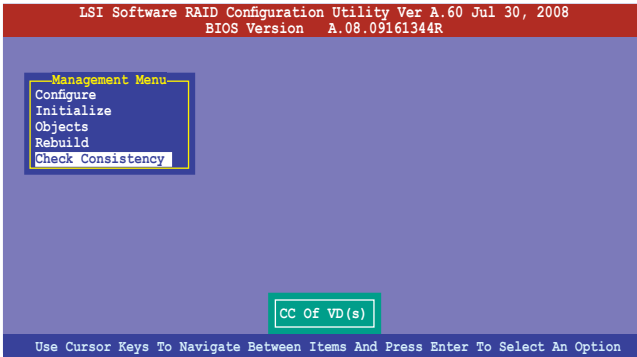


The **Check Consistency** command is available only for virtual drives included in a RAID 1 set.

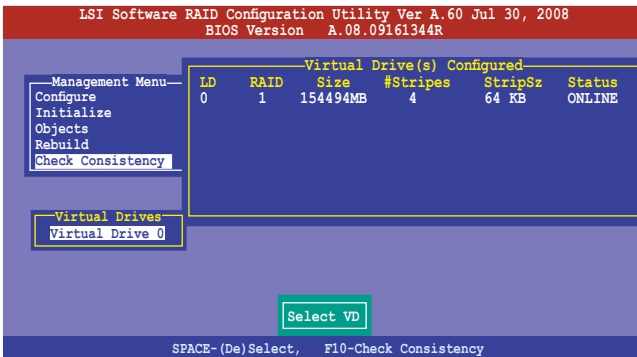
### Using the Check Consistency Command

To check data consistency using the **Check Consistency** command

1. From the **Management Menu**, select **Check Consistency**, and then press <Enter>.

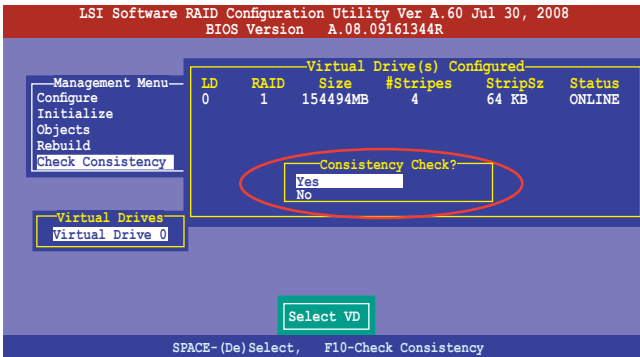


2. The screen displays the available RAID set(s) and prompts you to select the virtual drive to check. Press <Space> to select the virtual drive from the **Virtual Drive** sub-menu, and then press <F10>.

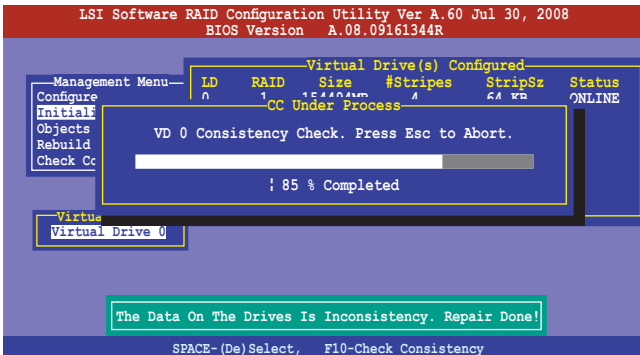




3. When prompted, use the arrow keys to select **Yes** from the **Consistency Check?** dialog box, and then press <Enter>.



A progress bar appears on screen.



4. While checking the disk consistency, press <Esc> to display the following options.
- **Stop** - Stops the consistency check. The utility stores the percentage of disk checked, and when you restart checking, it continues from the last percentage completed rather than from zero percent.
  - **Continue** - Continues the consistency check.
  - **Abort** - Aborts the consistency check. When you restart checking, it continues from zero percent.
5. When checking is complete, press any key to continue.

## Using the Objects command

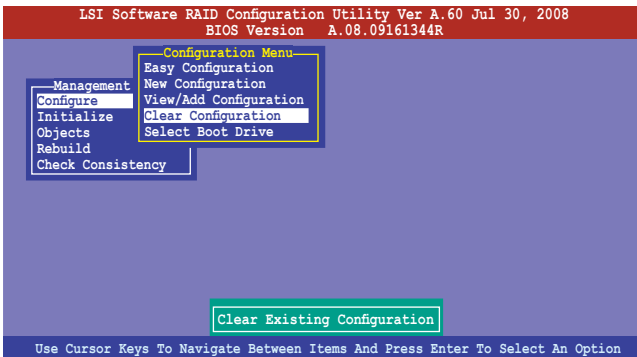
To check data consistency using the **Objects** command

1. From the **Management Menu**, select **Objects**, and then select **Virtual Drive** from the sub-menu.
2. Use the arrow keys to select the virtual drive you want to check, and then press <Enter>.
3. Select **Check Consistency** from the pop-up menu, and then press <Enter>.
4. When prompted, use the arrow keys to select **Yes** from the dialog box to check the drive.
5. When checking is complete, press any key to continue.

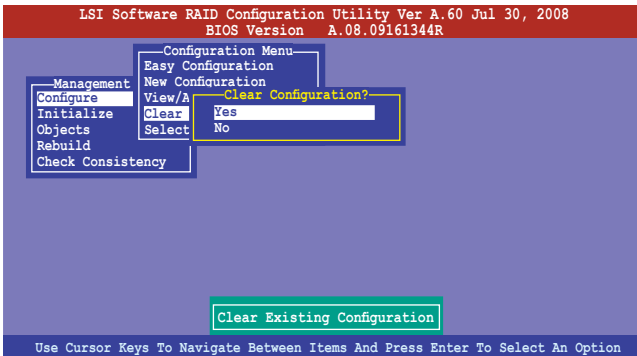
## 6.2.6 Deleting a RAID configuration

To delete a RAID configuration

1. From the **Management Menu**, select **Configure > Clear Configuration**, and then press <Enter>.



2. When prompted, use the arrow keys to select **Yes** from the **Clear Configuration?** dialog box, and then press <Enter>.



The utility clears all the current array(s).

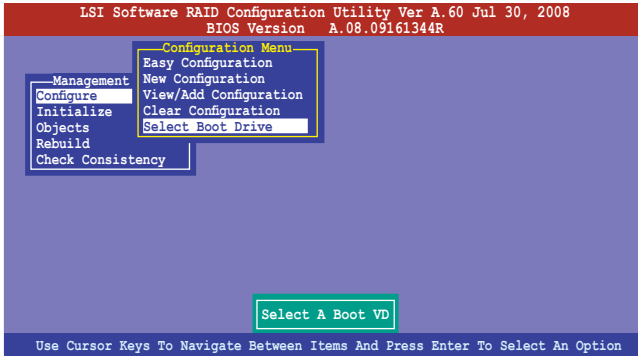
3. Press any key to continue.

## 6.2.7 Selecting the boot drive from a RAID set

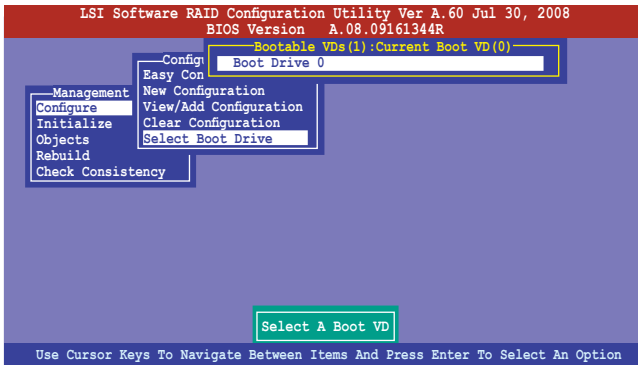
You must have created a new RAID configuration before you can select the boot drive from a RAID set. See section 6.2.1 **Creating a RAID set: Using New Configuration** for details.

To select the boot drive from a RAID set

1. From the **Management Menu**, select **Configure > Select Boot Drive**, and then press <Enter>.



2. When prompted, use the arrow keys to select the bootable virtual drive from the list, then press <Enter>.



3. The virtual drive is selected as boot drive. Press any key to continue.

## 6.2.8 Enabling WriteCache

You may manually enable the RAID controller's WriteCache option after creating a RAID set to improve the data transmission performance.



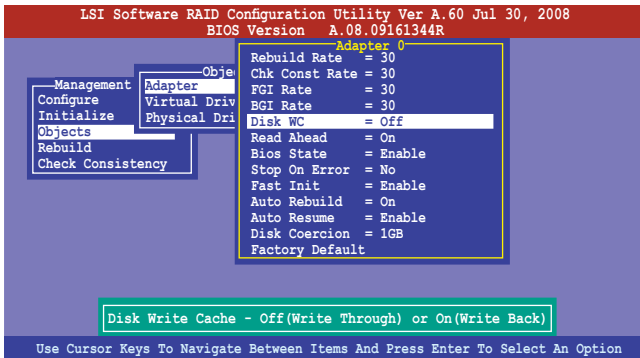
When you enable WriteCache, you may lose data when a power interruption occurs while transmitting or exchanging data among the drives.



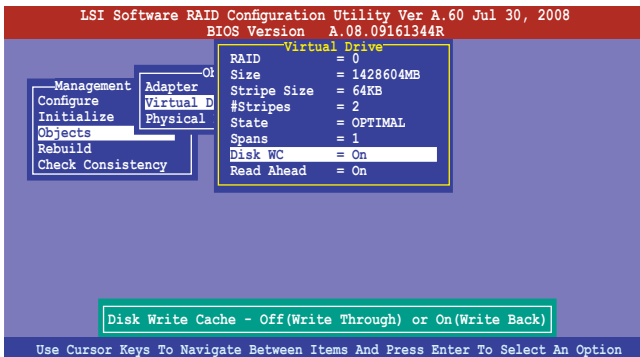
The WriteCache function is recommended for RAID 1 set.

To enable WriteCache

1. From the **Management Menu**, select **Objects > Adapter**, and then press <Enter> to display the adapter properties.
2. Select **Disk WC**, and then press <Enter> to turn on the option.



3. From the **Management Menu**, select **Objects > Virtual Drive**, and then press <Enter> to display the adapter properties.
4. Select **Disk WC**, and then press <Enter> to turn on the option.



5. When finished, press any key to continue.

## 6.3 Intel® Matrix Storage Manager Option ROM Utility

The Intel® Matrix Storage Manager Option ROM utility allows you to create RAID 0, RAID 1, or RAID 5 set from Serial ATA hard disk drives that are connected to the Serial ATA connectors supported by the Southbridge.

To enter the Intel® Matrix Storage Manager option ROM utility:

1. Install all the Serial ATA hard disk drives.
2. Turn on the system.
3. During POST, press <Ctrl+I> to display the utility main menu.

```
Intel(R) Matrix Storage Manager option ROM v8.5.0.1030 ICH10R/DO wRAID5
Copyright(C) 2003-08 Intel Corporation. All Rights Reserved.

[ MAIN MENU ]
1. Create RAID Volume          3. Reset Disks to Non-RAID
2. Delete RAID Volume        4. Recovery Volume Options
5. Exit

[ DISK/VOLUME INFORMATION ]

RAID Volumes:                * = Data is Encrypted
None defined.

Physical Disks:
Port Drive Model      Serial #           Size      Type/Status(Vol ID)
0  ST3160812AS        9LS0H7A4          149.0GB  Non-RAID Disk
1  ST3160812AS        9LS0F4HL          149.0GB  Non-RAID Disk
2  ST3160812AS        3LS0JYL8          149.0GB  Non-RAID Disk

[↑↓]-Select      [ESC]-Exit      [ENTER]-Select Menu
```

The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.



The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.

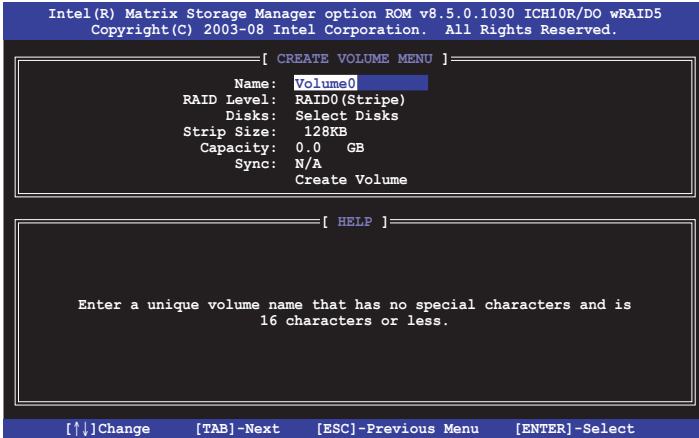


The utility supports maximum four hard disk drives for RAID configuration.

### 6.3.1 Creating a RAID set

To create a RAID set

1. From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears.



2. Enter a name for the RAID set and press <Enter>.
3. When the **RAID Level** item is selected, press the up/down arrow key to select a RAID level to create, and then press <Enter>.
4. When the **Disks** item is selected, press <Enter> to select the hard disk drives you want to include in the RAID set. The **SELECT DISKS** screen appears.



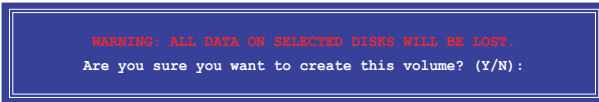
5. Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection.

- Use the up/down arrow key to select the stripe size for the RAID array (for RAID 0 and 5 only), and then press <Enter>. The available stripe size values range from 4 KB to 128 KB. The following are typical values:  
RAID 0: 128KB  
RAID 5: 64KB



We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

- When the **Capacity** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.
- When the **Create Volume** item is selected, press <Enter>. The following warning message appears.

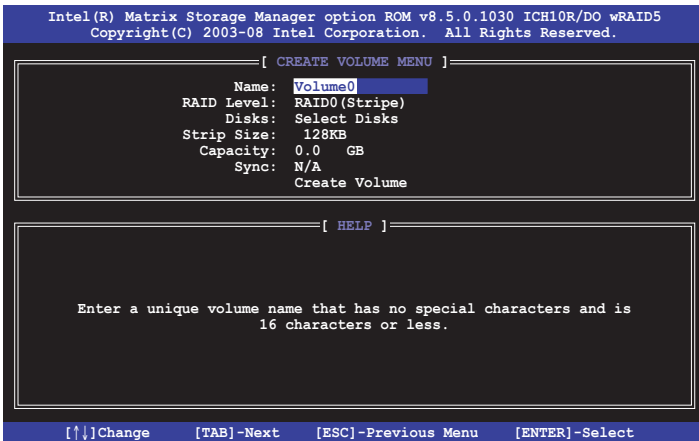


- Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the **CREATE VOLUME** menu.

### 6.3.2 Creating a Recovery set

To create a recovery set

- From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears.





2. Enter a name for the recovery set and press <Enter>.
3. When the **RAID Level** item is selected, press the up/down arrow key to select **Recovery**, and then press <Enter>.
4. When the **Disks** item is selected, press <Enter> to select the hard disk drives you want to include in the recovery set. The **SELECT DISKS** screen appears.



5. Use the up/down arrow key to select a drive, press <TAB> to select a Master disk, and then press <SPACE> to select a Recovery disk. A small triangle marks the selected drive. Press <Enter> after completing your selection.
6. When the **Sync** item is selected, use the up/down arrow key to select a sync option that you want and press <Enter>.
7. When the **Create Volume** item is selected, press <Enter>. The following warning message appears.



8. Press <Y> to create the recovery set and return to the main menu, or <N> to go back to the **CREATE VOLUME** menu.



If a recovery set is created, you cannot add more RAID sets even when you have more non-RAID disks installed in your system.

### 6.3.3 Deleting a RAID set



Take caution when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set

1. From the utility main menu, select **2. Delete RAID Volume** and press <Enter>. The following screen appears.

```
Intel(R) Matrix Storage Manager option ROM v8.5.0.1030 ICH10R/DO wRAID5
Copyright(C) 2003-08 Intel Corporation. All Rights Reserved.

[ DELETE VOLUME MENU ]

Name      Level      Drives      Capacity    Status      Bootable
Volume0   RAID0(Stripe)  2           298.0GB     Normal      Yes

[ HELP ]

Deleting a volume will reset the disks to non-RAID.

WARNING: ALL DISK DATA WILL BE DELETED.
(This does not apply to Recovery volumes)

[↑↓]-Select      [ESC]-Previous Menu      [DEL]-Delete Volume
```

2. Use the up/down arrow key to select the RAID set you want to delete, and then press <Del>. The following warning message appears.

```
[ DELETE VOLUME VERIFICATION ]

ALL DATA IN THE VOLUME WILL BE LOST!
(This does not apply to Recovery volumes)

Are you sure you want to delete volume "Volume0"? (Y/N) :
```

3. Press <Y> to delete the RAID set and return to the utility main menu, or press <N> to return to the **DELETE VOLUME** menu.

## 6.3.4 Resetting disks to Non-RAID



Take caution before you reset a RAID volume hard disk drive to non-RAID. Resetting a RAID volume hard disk drive deletes all internal RAID structure on the drive.

To reset a RAID set hard disk drive

1. From the utility main menu, select **3. Reset Disks to Non-RAID** and press <Enter>. The following screen appears.

```
[ RESET RAID DATA ]

Resetting RAID disk will remove its RAID structures
and revert it to a non-RAID disk.

WARNING: Resetting a disk causes all data on the disk to be lost.
(This does not apply to Recovery volumes)

Port Drive Model      Serial #      Size      Status
0  ST3160812AS        9LS0HJAM    149.0GB  Member Disk
1  ST3160812AS        9LS0F4HL    149.0GB  Member Disk

Select the disks that should be reset.

[↑,↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete
```

2. Use the up/down arrow key to select the RAID set drive(s) you want to reset, and then press <Space> to select.
3. Press <Enter> to reset the RAID set drive(s). A confirmation message appears.
4. Press <Y> to reset the drive(s) or press <N> to return to the utility main menu.

## 6.3.5 Recovery Volume Options

If you have created a recovery set, you can configure more recovery set options following the descriptions in the section.



See section 6.3.2 **Creating a Recovery set** to create a recovery set before continue.

To configure a recovery set

1. From the utility main menu, select **4. Recovery Volume Options** and press <Enter>. The following screen appears.

```
Intel(R) Matrix Storage Manager option ROM v8.5.0.1030 ICH10R/DO wRAID5
Copyright(C) 2003-08 Intel Corporation. All Rights Reserved.

[ RECOVERY VOLUME OPTIONS ]

1. Enable Only Recovery Disk
2. Enable Only Master Disk

[ HELP ]

Enable Only Recovery Disk - enables recovery disk if available and
disables master disk.
Enable Only Master Disk - enables master disk if available and
disables recovery disk.
Actions will result in change from Continuous Update mode to On-Request.

[↑↓]-Select [ESC]-Previous Menu [ENTER]-Select
```

2. Use the up/down arrow key to select the option you want, and then press <ENTER>. The **SELECT RECOVERY VOLUME** screen appears.

```
[ SELECT RECOVERY VOLUME ]

Name      Level          Capacity  Status   Bootable
Volume0   Recovery(Cont.) 149.0GB  Normal   Yes

Select a Recovery volume to do the operation.

[↑↓]-Up/Down [SPACE]-Selects [ENTER]-Done
```

3. Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection and return to the utility main menu.

### 6.3.6 Exiting the Intel® Matrix Storage Manager

To exit the utility

1. From the utility main menu, select **5. Exit**, and then press <Enter>. The following warning message appears.



2. Press <Y> to exit or press <N> to return to the utility main menu.

### 6.3.7 Rebuilding the RAID



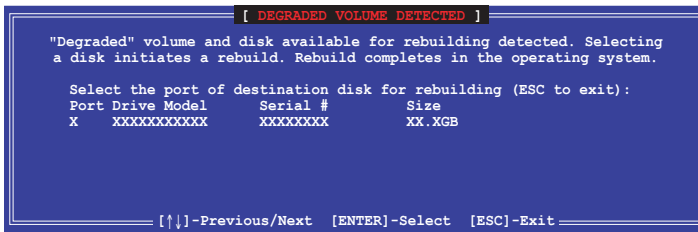
This option is only for the RAID 1 set.

#### Rebuilding the RAID with other non-RAID disk

If any of the SATA hard disk drives included in the RAID 1 array failed, the system displays the status of the RAID volume as “**Degraded**” during POST. You can rebuild the RAID array with other installed non-RAID disks.

To rebuild the RAID with other non-RAID disk:

1. At the prompt, press <Ctrl> + <I> to enter the Intel Matrix Storage Manager option ROM utility.
2. If there is a non-RAID SATA Hard Disk available, the utility will prompt to rebuild the RAID. Press <Enter>, and then use up/down arrow keys to select the destination disk or press <ESC> to exit.



Select a destination disk with the same size as the original hard disk.

- The utility immediately starts rebuilding after the disk is selected. The status of the degraded RAID volume is changed to **“Rebuild”**.

```

Intel(R) Matrix Storage Manager option ROM v8.5.0.1030 ICH10R/DO wRAID5
Copyright(c) 2003-08 Intel Corporation. All Rights Reserved.

----- [ MAIN MENU ] -----
1. Create RAID Volume          3. Reset Disks to Non-RAID
2. Delete RAID Volume         4. Recovery Volume Options
5. Exit

----- [ DISK/VOLUME INFORMATION ] -----

RAID Volumes:
ID  Name      Level      Strip  Size  * = Data is Encrypted
0   Volume0  RAID1(Mirror)  N/A   149.0GB  Status  Bootable
                                Rebuild  Yes

Physical Disks:
Port Drive Model      Serial #      Size  Type/Status(Vol ID)
1    ST3160812AS    9LS0F4HL     149.0GB  Member Disk(0)
2    ST3160812AS    3LS0JYL8     149.0GB  Member Disk(0)

Volumes with "Rebuild" status will be rebuilt within the operating system.

[↑↓]-Select      [ESC]-Exit      [ENTER]-Select Menu

```

- Exit Intel Matrix Storage Manager and reboot the system.
- Select **Start > Programs > Intel Matrix Storage > Intel Matrix Storage Console** or click the **Intel Matrix Storage Manager** tray icon to load the Intel Matrix Storage Manager utility.
- From the **View** menu, select **Advanced Mode** to display the details of the Intel Matrix Storage Console.
- From the **Volumes view** option, select **RAID volume** to view the rebuilding status. When finished, the status is changed to **“Normal”**.

### Rebuilding the RAID with a new hard disk

If any of the SATA hard disk drives included in the RAID array failed, the system displays the status of the RAID volume as **“Degraded”** during POST. You may replace the disk drive and rebuild the RAID array.

To rebuild the RAID with a new hard disk:

- Remove the failed SATA hard disk and install a new SATA hard disk of the same specification into the same SATA Port.




---

Select a destination disk with the same size as the original hard disk.

---

- Reboot the system and then follow the steps in section **Rebuilding the RAID with other non-RAID disk** on page 6-31.

### 6.3.8 Setting the Boot array in the BIOS Setup Utility

You can set the boot priority sequence in the BIOS for your RAID arrays when creating multi-RAID using the Intel® Matrix Storage Manager.

To set the boot array in the BIOS:



---

Set at least one of the arrays bootable to boot from the hard disk.

---

1. Reboot the system and press <Del> to enter the BIOS setup utility during POST.
2. Go to the **Boot** menu and select the option **Boot Device Priority**.
3. Use up/down arrow keys to select the boot priority and press <Enter>. See section **5.6.1 Boot Device Priority** for details.
4. From the **Exit** menu, select **Exit & Save Changes**, then press <Enter>.
5. When the confirmation window appears, select **OK**, then press <Enter>.





# Chapter 7

This chapter provides instructions for installing the necessary drivers for different system components.

# Driver installation

# 7.1 RAID driver installation

After creating the RAID sets for your server system, you are now ready to install an operating system to the independent hard disk drive or bootable array. This part provides instructions on how to install the RAID controller drivers during OS installation.

## 7.1.1 Creating a RAID driver disk



The system does not include a floppy drive. You have to use a USB floppy drive when creating a SATA RAID driver disk.

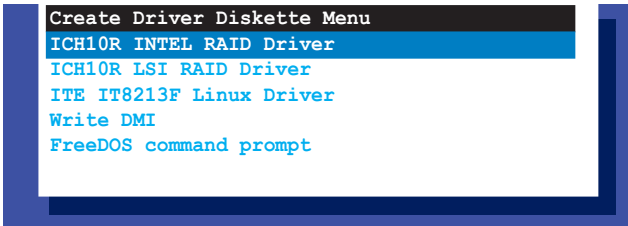


If you have created RAID sets with the LSI Software RAID configuration utility, the boot priority of the SATA optical disk drive has to be manually adjusted. Otherwise, the system will not boot from the connected SATA ODD.

A floppy disk with the RAID driver is required when installing Windows® or Red Hat® Enterprise operating system on a hard disk drive that is included in a RAID set. You can create a RAID driver disk in DOS (using the Makedisk application in the support DVD).

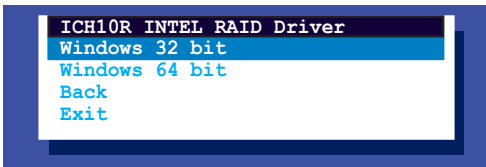
To create a RAID driver disk in DOS environment

1. Place the motherboard support DVD in the optical drive.
2. Restart the computer, and then enter the BIOS Setup.
3. Select the optical drive as the first boot priority to boot from the support DVD. Save your changes, and then exit the BIOS Setup.
4. Restart the computer. The Makedisk menu appears.

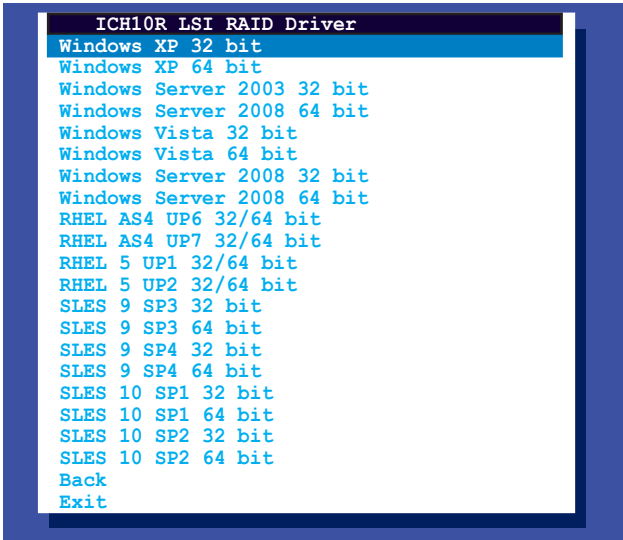


5. Use the arrow keys to select the type of RAID driver disk you want to create and press <Enter> to enter the sub-menu.

### ICH10R INTEL RAID Driver



## ICH10R LSI RAID Driver



6. Locate the RAID driver and place a blank, high-density floppy disk to the floppy disk drive.
7. Press <Enter>.
8. Follow screen instructions to create the driver disk.

To create a RAID driver disk in Windows® environment

1. Start Windows®.
2. Place the motherboard support DVD into the optical drive.
3. Go to the **Make Disk** menu, and then select the type of RAID driver disk you want to create.
4. Insert a floppy disk into the floppy disk drive.
5. Follow succeeding screen instructions to complete the process.



---

Write-protect the floppy disk to avoid computer virus infection.

---

To create a RAID driver disk in Red Hat® Enterprise Linux server environment

1. Insert a blank formatted high-density floppy disk to the USB floppy disk drive.
2. Type `dd if=XXX.img of=/dev/fd0` to decompress the file into the floppy disk from the following path in the support DVD:

For LSI MegaRAID Driver

**\Drivers\ICH10R LSI RAID\Driver\makedisk\Linux**

3. Eject the floppy disk.

## 7.1.2 Installing the RAID controller driver

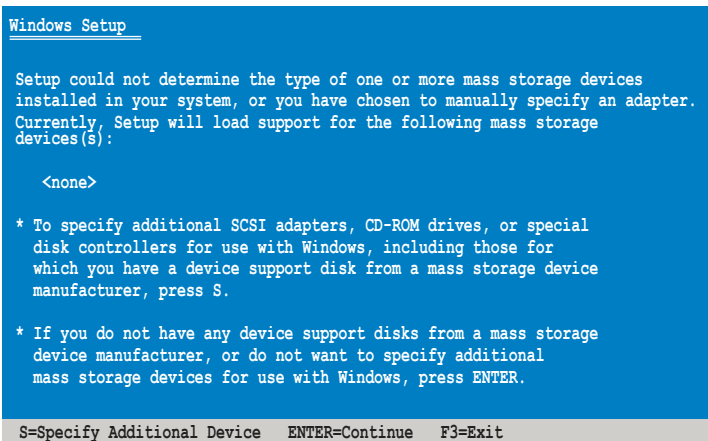
### During Windows® Server 2003 / XP OS installation

To install the RAID controller driver when installing Windows® Server 2003 / XP OS

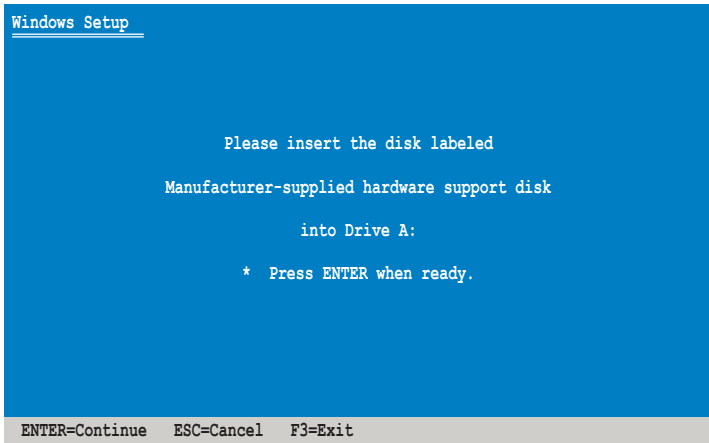
1. Boot the computer using the Windows® Server 2003 / XP installation disc. The Windows® Setup starts.
2. Press <F6> when the message “Press F6 if you need to install a third party SCSI or RAID driver...” appears at the bottom of the screen.



3. The next screen appears. Press <S> to specify an additional device.



4. Insert the RAID driver disk you created earlier to the floppy disk drive, then press <Enter>.

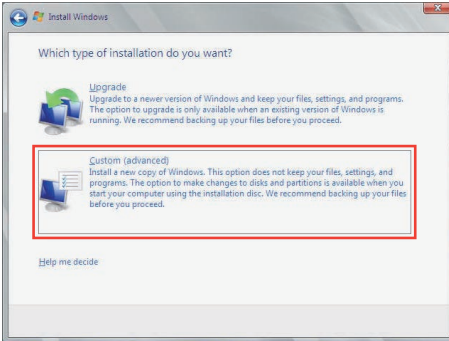


5. Select the RAID controller driver you need from the list, and then press <Enter>.
6. The Windows® Setup loads the RAID controller drivers from the RAID driver disk. When the next screen appears, press <Enter> to continue installation.
7. Setup then proceeds with the OS installation. Follow screen instructions to continue.

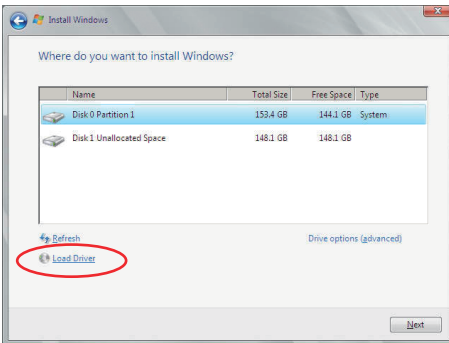
## During Windows® Server 2008 OS installation

To install the RAID controller driver when installing Windows® Server 2008 OS

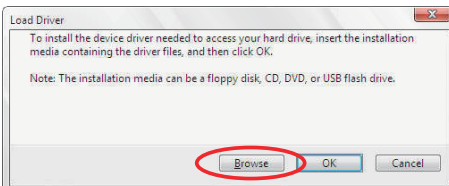
1. Boot the computer using the Windows® Server 2008 OS installation disc. Follow the screen instructions to start installing Windows Server 2008.
2. When prompted to choose a type of installation, click **Custom (advanced)**.



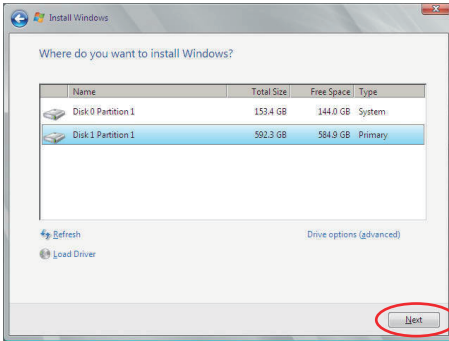
3. Click **Load Driver**.



4. A message appears, reminding you to insert the installation media containing the driver of the RAID controller driver. If you have only one optical drive installed in your system, eject the Windows OS installation disc and replace with the motherboard Support DVD into the optical drive. Click **Browse** to continue.



5. Locate the driver in the corresponding folder of the Support DVD, and then click **OK** to continue.
6. Select the RAID controller driver you need from the list and click **Next**.
7. When the system finishes loading the RAID driver, replace the motherboard Support DVD with the Windows Server installation disc. Select the drive to install Windows and click **Next**.



8. Setup then proceeds with the OS installation. Follow screen instructions to continue.



## Red Hat® Enterprise Linux OS 5.0

To install the RAID controller driver when installing Red Hat® Enterprise OS:

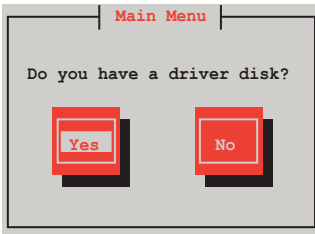
1. Boot the system from the Red Hat® OS installation CD.
2. At the `boot:`, type `linux dd noprobe=ata1 noprobe=ata2...`, then press `<Enter>`.



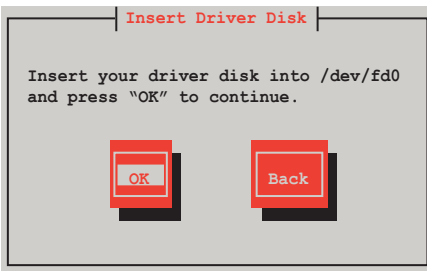
The number of `ata` varies with the hard disk drive number you have when building a RAID set. For example, if you want to build a RAID set with 3 hard disk drives, type command line: `linux dd noprobe=ata1 noprobe=ata2 noprobe=ata3`.

```
- To install or upgrade in graphical mode, press the <ENTER> key.
- To install or upgrade in text mode, type: linux text <ENTER>.
- Use the function keys listed below for more information.
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]
boot: linux dd noprobe=ata1 noprobe=ata2
```

4. Select **Yes** using the `<Tab>` key when asked if you have the driver disk, then press `<Enter>`.

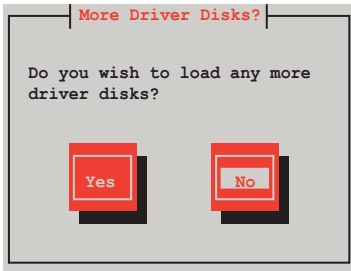


5. Insert the Red Hat® Enterprise RAID driver disk to the USB floppy disk drive, select **OK**, then press `<Enter>`.



The drivers for the RAID card are installed to the system.

- When asked if you will load additional RAID controller drivers, select **No**, then press <Enter>.



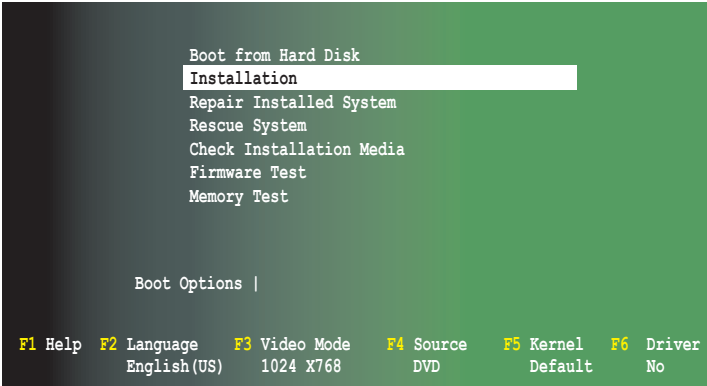
- Follow the onscreen instructions to finish the OS installation.
- When the installation is completed, DO NOT click **Reboot**. Press <Ctrl> + <Alt> + <F2> to switch to the command-line interface from graphic user interface.
- Type the following commands when using a Legacy floppy.

```
mkdir /mnt/driver
mount /dev/fd0 /mnt/driver
cd /mnt/driver
sh replace_ahci.sh
reboot
```

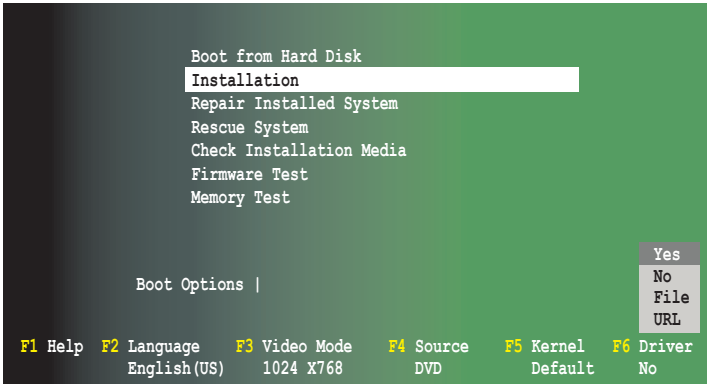
## SUSE Linux 11 OS

To install the RAID controller driver when installing SUSE Linux Enterprise Server OS:

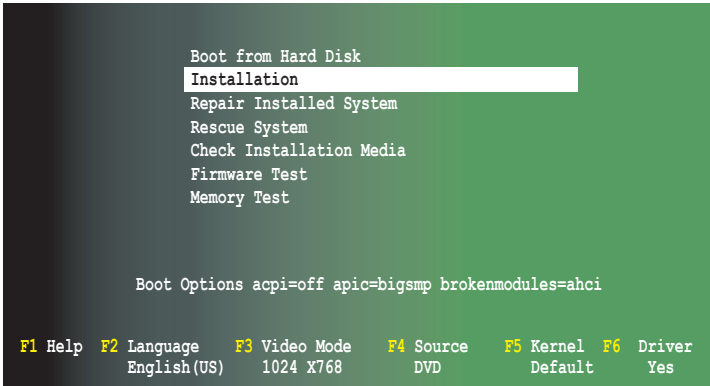
1. Boot the system from the SUSE OS installation CD.
2. Use the arrow keys to select **Installation** from the **Boot Options** menu.



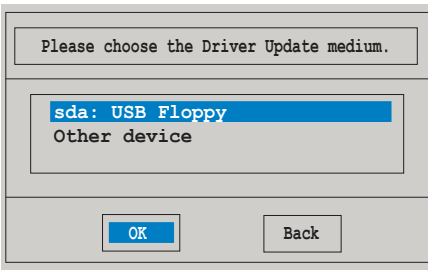
3. Press <F6>, then select **Yes** from the menu. Press <Enter>.



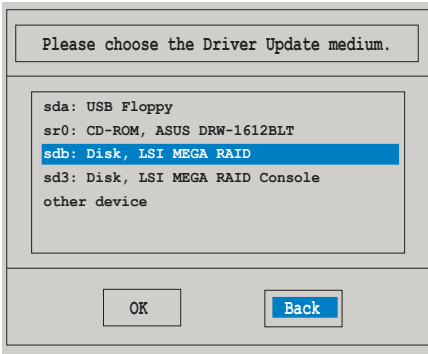
4. Insert the RAID driver disk to the floppy disk drive. Type the command **acpi=off apic=bigsmc brokenmodules=ahci** in **Boot Options** field, and press <Enter>.



5. When below screen appears, select the USB floppy disk drive (sda) as the driver update medium. Select **OK**, then press <Enter>.



6. The drivers for the RAID controller are installed to the system as shown below.



7. Select **Back** and follow the onscreen instructions to finish the installation.

## 7.2 Intel® chipset device installation

This section provides instructions on how to install the Plug and Play components for the Intel® chipset on the system.

You need to manually install the Intel® chipset software on a Windows Server operating system. To install the Intel® chipset device software:

1. Restart the computer, then log on with **Administrator** privileges.
2. Insert the motherboard/system support DVD to the optical drive. The support DVD automatically displays the **Drivers** menu if Autorun is enabled in your computer.
3. Click the item **Intel Chipset Device Software** from the menu.



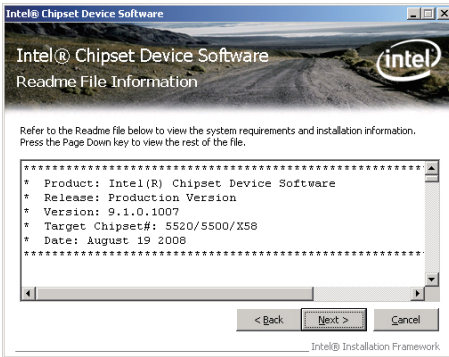
4. The **Intel(R) Chipset Device Software** window appears. Click **Next** to start installation.



5. Select **Yes** to accept the terms of the **License Agreement** and continue the process.



6. Read the **Readme File Information** and press **Next** to continue the installation.



7. After completing the installation, click **Finish** to complete the setup process.



## 7.3 LAN driver installation

This section provides instructions on how to install the Intel® Gigabit LAN controller drivers on a Windows® Server OS.

To install the LAN controller drivers

1. Restart the computer, and then log on with Administrator privileges.
2. Insert the motherboard/system support DVD to the optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer.

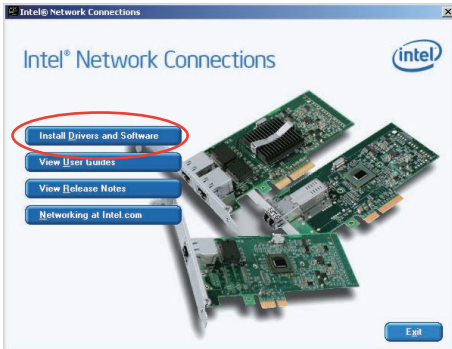


- Windows® automatically detects the LAN controllers and displays a New Hardware Found window. Click **Cancel** to close this window.
- If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

3. Click the **Intel Network Connections Software** to begin installation.



4. Click **Install Drivers and Software** option to begin installation.

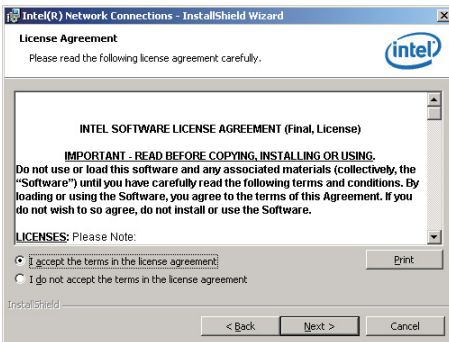




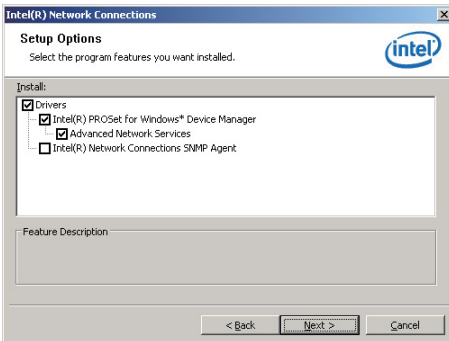
5. Click **Next** when the **Intel(R) Network Connections–InstallShield Wizard** window appears.



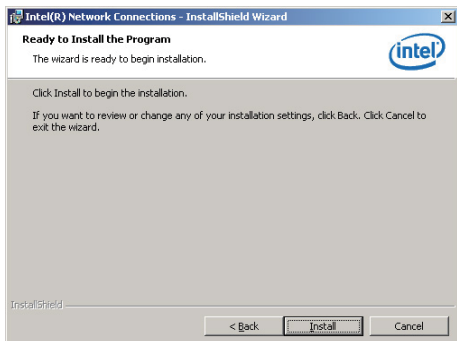
6. Toggle **I accept the terms in the license agreement** and click **Next** to continue.



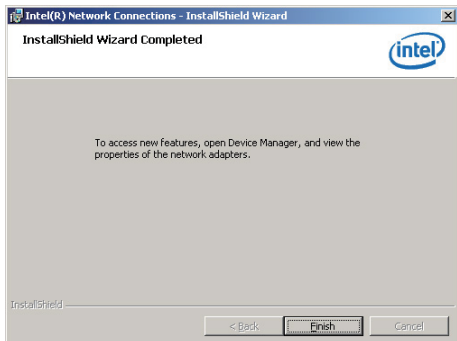
7. Click the **Intel(R) PROSet for Windows Device Manager** box, and then click **Next** to start the installation.



8. Follow the screen instructions to complete installation.



9. When finished, press **Finish** to continue.



## 7.4 VGA driver installation

This section provides the instructions on how to install the ASPEED Video Graphics Adapter (VGA) driver.

You need to manually install the ASPEED VGA driver on a Windows® operating system.

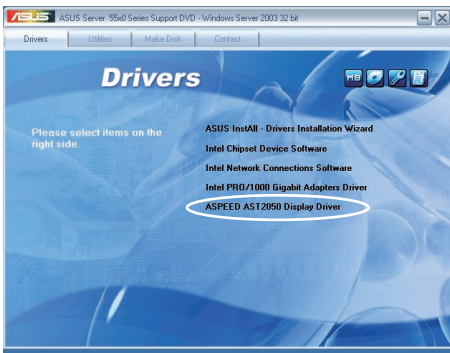
To install the ASPEED VGA driver:

1. Restart the computer, and then log on with **Administrator** privileges.
2. Insert the motherboard/system support DVD to the optical drive. The support DVD automatically displays the **Drivers** menu if Autorun is enabled in your computer.

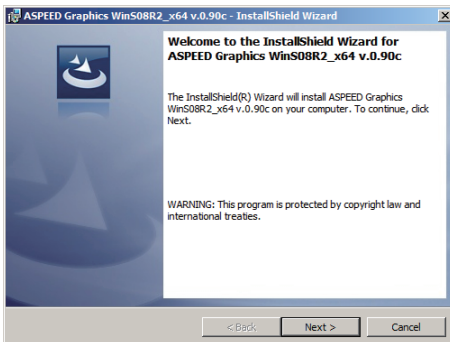


If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file **ASSETUP.EXE** from the **BIN** folder. Double-click the **ASSETUP.EXE** to run the support DVD.

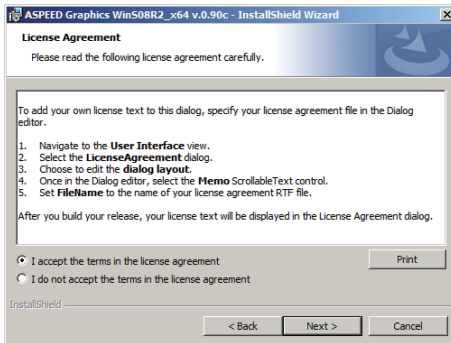
3. Click the **ASPEED AST2050 Display Driver** to begin installation.



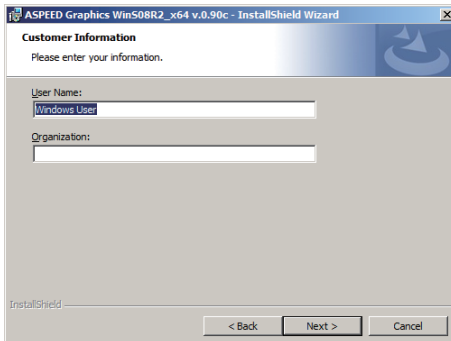
4. Click **Next** to start the installation.



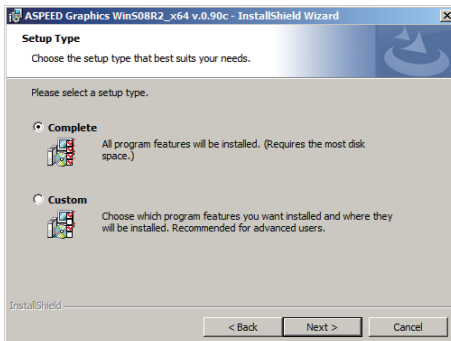
5. Toggle **I accept the terms in the license agreement** and click **Next** to continue.



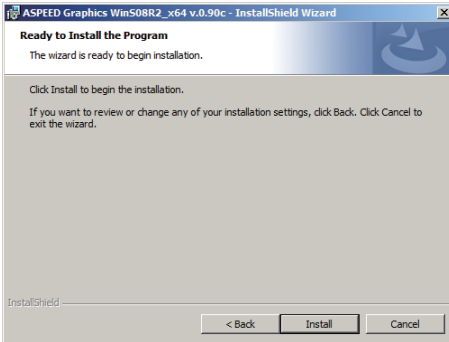
6. Enter the user information and click **Next** to continue.



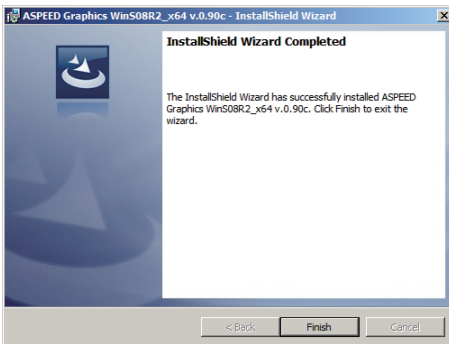
7. Select a setup type and click **Next** to continue.



8. Click **Install** to start driver installation.



9. When the installation completes, click **Finish** to restart your computer before using the program.



## 7.5 Mellanox ConnectX QDR PCI Gen2 Channel Adapter driver installation (For RS724Q-E6/RS12 only)

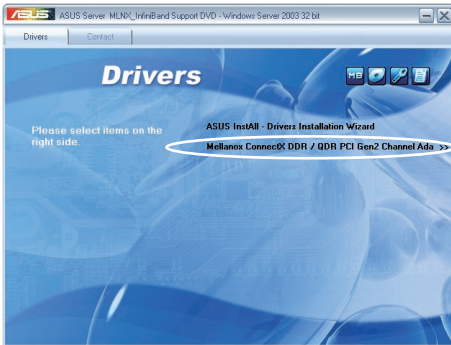
This section provides instructions on how to install the Mellanox driver.

### 7.5.1 Windows operating system

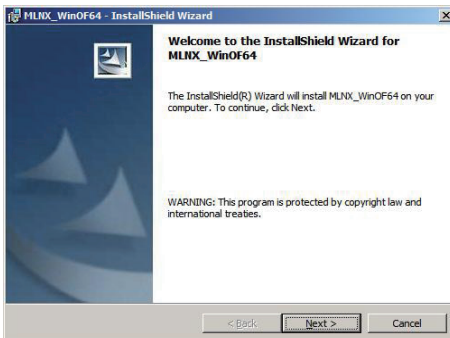
You need to manually install the Mellanox driver on a Windows® operating system.

To install the Mellanox driver

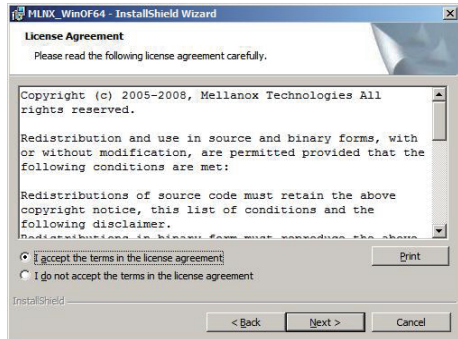
1. Restart the computer, then log on with Administrator privileges.
2. Insert the motherboard/system support DVD to the optical drive. The support DVD automatically displays the Drivers menu if Autorun is enabled in your computer.
3. Click **Mellanox ConnectX QDR PCI Gen2 Channel Adapter Driver**.



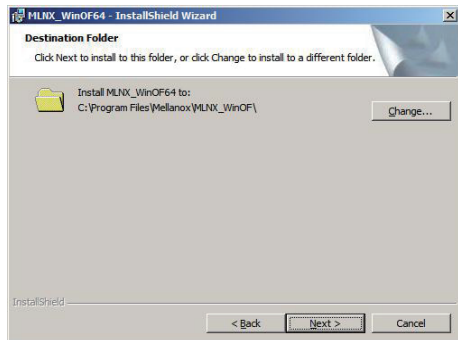
4. Click **Next** to start installing the driver.



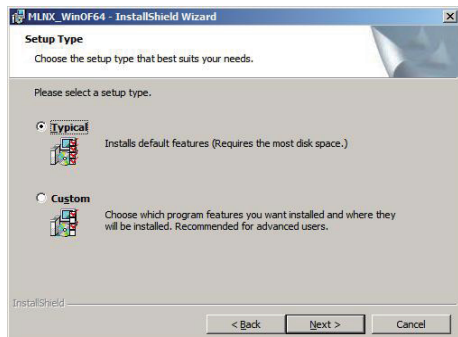
5. Click **I accept the terms in the license agreement** and click **Next** to continue.



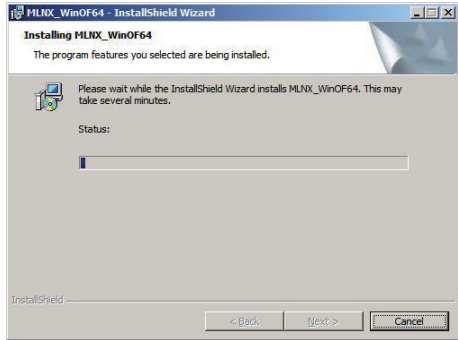
6. Click **Change** to select your desired destination folder and click **Next** to continue.



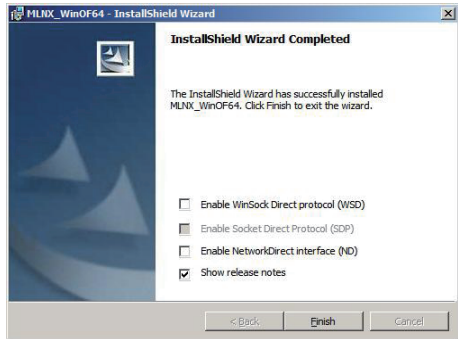
7. Select a setup type and click **Next** to continue.



8. The driver features you selected are being installed.



9. Click your preferred options and click **Finish** to exit the wizard.





## 7.5.2 Red Hat® Enterprise Linux OS

You need to manually mount the Mellanox driver on a Red Hat® Enterprise Linux OS.



For users using SUSE Linux Enterprise Server OS, follow the general instructions in this section to mount the Mellanox driver on your system.

To mount the Mellanox driver

1. Login to the system as root.
2. Create a folder on the desktop and copy the latest Mellanox driver to the folder.



You can name the folder as you like.

```
root@localhost:~  
[root@localhost ~]# cd /  
[root@localhost /]# mkdir xxx  
[root@localhost /]#
```

3. Type the command line and mount the driver to the system.



The driver version and the OS label may vary. Ensure that the command line matches your driver version and operating system.

```
root@localhost:~  
[root@localhost ~]# cd /  
[root@localhost /]# mkdir xxx  
[root@localhost /]# mount -o ro,loop /tmp/MLNX_OFED_LINUX-1.4-rhel5.3.iso /xxx  
[root@localhost /]#
```

4. Type the command line and install the driver.

```
root@localhost:~  
[root@localhost ~]# cd /  
[root@localhost /]# mkdir xxx  
[root@localhost /]# mount -o ro,loop /tmp/MLNX_OFED_LINUX-1.4-rhel5.3.iso /xxx  
[root@localhost /]# cd /xxx  
[root@localhost xxx]# ls  
docs firmware i686 ia64 mlnxofedinstall ppc64 src uninstall.sh x86_64  
[root@localhost xxx]# ./mlnxofedinstall
```

5. All other Mellanox, OEM, OFED, or distribution IB packages will be removed. Press <Y> to continue.

```

root@localhost:xxx
File Edit View Terminal Tabs Help
[root@localhost ~]# cd /
[root@localhost ~]# mkdir xxx
[root@localhost ~]# mount -o ro,loop /tmp/MLNX_OFED_LINUX-1.4-rhel5.3.iso /xxx
[root@localhost ~]# cd /xxx
[root@localhost xxx]# ls
docs  firmware  i686  ia64  mlnxfedinstall  ppc64  src  uninstall.sh  x86_64
[root@localhost xxx]# ./mlnxfedinstall
This program will install the MLNX_OFED_LINUX package on your machine.
Note that all other Mellanox, OEM, OFED, or Distribution IB packages will be removed.
Do you want to continue?[y/N]:

```

6. The system starts uninstalling the previous version of OFED.

```

root@localhost:xxx
File Edit View Terminal Tabs Help
[root@localhost ~]# cd /
[root@localhost ~]# mkdir xxx
[root@localhost ~]# mount -o ro,loop /tmp/MLNX_OFED_LINUX-1.4-rhel5.3.iso /xxx
[root@localhost ~]# cd /xxx
[root@localhost xxx]# ls
docs  firmware  i686  ia64  mlnxfedinstall  ppc64  src  uninstall.sh  x86_64
[root@localhost xxx]# ./mlnxfedinstall
This program will install the MLNX_OFED_LINUX package on your machine.
Note that all other Mellanox, OEM, OFED, or Distribution IB packages will be removed.
Do you want to continue?[y/N]:y
Uninstalling the previous version of OFED

```

7. When the installation finishes, reboot your system to complete the installation.

```

root@localhost:xxx
File Edit View Terminal Tabs Help
65:libibmad-static [#####] [ 88%]
66:libibmad-static [#####] [ 89%]
67:librdmac-devel [#####] [ 91%]
68:librdmac-devel [#####] [ 92%]
69:libsdp-devel [#####] [ 93%]
70:libsdp-devel [#####] [ 95%]
71:opensn-devel [#####] [ 96%]
72:opensn-devel [#####] [ 97%]
73:opensn-static [#####] [ 99%]
74:opensn-static [#####] [100%]
Device (15b3:6732):
  0a:00:0 InfiniBand: Mellanox Technologies MT26418 [ConnectX IB DDR, PCIe
  2.0 5GT/s] (rev a0)
  Link Width: 8x
  Link Speed: 56Gb/s

Installation finished successfully.

The firmware version 2.6.0 is up to date.
Note: To force firmware update use '--force-fw-update' flag.
warning: /etc/infiniband/openib.conf saved as /etc/infiniband/openib.conf.rpmse
[root@localhost xxx]#

```



If your system has the latest firmware, no firmware update will occur. To force firmware update, type **--force-fw-update**.

## 7.6 Management applications and utilities installation

The support DVD that came with the motherboard package contains the drivers, management applications, and utilities that you can install to avail all motherboard features.



The contents of the support DVD are subject to change at any time without notice. Visit the ASUS website ([www.asus.com](http://www.asus.com)) for updates.

### 7.6.1 Running the support DVD

Place the support DVD to the optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer.



If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

### 7.6.2 Drivers menu

The Drivers menu shows the available device drivers if the system detects installed devices. Install the necessary drivers to activate the devices.



The screen display and driver options vary under different operating system versions.



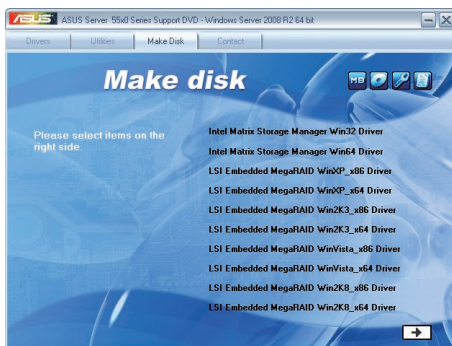
## 7.6.3 Utilities menu

The Utilities menu displays the software applications and utilities that the motherboard supports. Click an item to install.



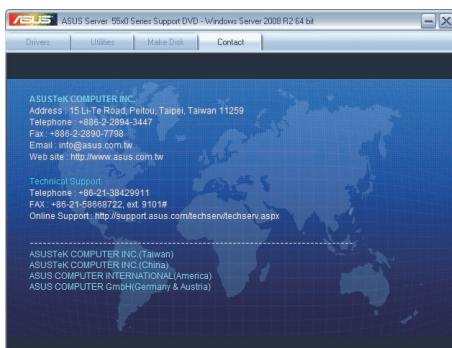
## 7.6.4 Make disk menu

The Make disk menu contains items to create the Intel ICH10R and LSI MegaRAID driver disks.



## 7.6.5 Contact information

Click the Contact tab to display the ASUS contact information. You can also find this information on the inside front cover of this user guide.



# ASUS contact information

## ASUSTeK COMPUTER INC.

Address 15 Li-Te Road, Peitou, Taipei, Taiwan 11259  
Telephone +886-2-2894-3447  
Fax +886-2-2890-7798  
E-mail [info@asus.com.tw](mailto:info@asus.com.tw)  
Web site <http://www.asus.com.tw>

### *Technical Support*

Telephone +86-21-38429911  
Fax +86-21-58668722 ext: 9101  
Online Support <http://support.asus.com/techserv/techserv.aspx>

## ASUSTeK COMPUTER INC. (Taiwan)

Address 15 Li-Te Road, Peitou, Taipei, Taiwan 11259  
Telephone +886-2-2894-3447  
Fax +886-2-2890-7798  
E-mail [info@asus.com.tw](mailto:info@asus.com.tw)  
Web site <http://www.asus.com.tw>

### *Technical Support*

Telephone +886-2-2894-3447 (0800-093-456)  
Online Support <http://support.asus.com/techserv/techserv.aspx>

## ASUSTeK COMPUTER INC. (China)

Address No.508, Chundong Road, Xinzhuang Industrial Zone,  
Minhang District, Shanghai, China.  
Telephone +86-21-5442-1616  
Fax +86-21-5442-0099  
Web site <http://www.asus.com.cn>

### *Technical Support*

Telephone +86-21-3407-4610 (800-820-6655)  
Online Support <http://support.asus.com/techserv/techserv.aspx>

## **ASUS contact information**

### **ASUS COMPUTER INTERNATIONAL (America)**

Address 800 Corporate Way, Fremont, CA 94539, USA  
Fax +1-510-608-4555  
Web site <http://usa.asus.com>

#### *Technical Support*

Support fax +1-812-284-0883  
General support +1-812-282-2787  
Online support <http://support.asus.com/techserv/techserv.aspx>

### **ASUS COMPUTER GmbH (Germany and Austria)**

Address Harkort Str. 21-23, D-40880 Ratingen, Germany  
Fax +49-2102-959911  
Web site <http://www.asus.de>  
Online contact <http://www.asus.de/sales>

#### *Technical Support*

Telephone +49-1805-010923\*  
Support Fax +49-2102-959911  
Online support <http://support.asus.com/techserv/techserv.aspx>

\* EUR 0.14/minute from a German fixed landline; EUR 0.42/minute from a mobile phone.