



RS520-X5 / PS8

2U Rackmount Server

User Guide



E4343

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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.



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.

Canadian Department of Communications Statement

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

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



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.



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.

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.



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.

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.

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 information

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+D>

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	RS520-X5/PS8
Chassis	ASUS R21A 2U Rackmount Chassis
Motherboard	ASUS DSBV-DX/SAS-SYS Server Board
Component	1 x 500W 80+ Single Power Supply 1 x SATAII/SAS HDD Backplane (BP8LX-R20A/C) 8 x hot-swap HDD trays 1 x Front I/O Board (FPB-AR14) 4 x System Fans (80 x 38mm) 1 x Air Duct
Accessories	1 x RS520-X5/PS8 User's Guide 1 x ASWM 2.0 User Guide 1 x RS520-X5/PS8 Support CD (including ASWM*) 1 x Bag of Screws 1 x AC Power Cable
Optional Items	1 x CA eTrust Anti-virus Software CD 1 x Slim-type optical drive 1 x Rackmount Kit

*ASUS System Web-based Management



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 12 characters such as xxxxxxxxxxxx. 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 RS520-X5/PS8 is a server featuring the ASUS DSBV-DX/SAS server board. The server supports Intel® LGA771 Xeon® 5400/5200 series processors with EM64T technology, plus other latest technologies through the chipsets onboard.

Model Name		RS520-X5/PS8
Processor / System Bus		2 x Socket LGA771
		Quad-Core: - Intel® Xeon® E5400 series (TDP: 80W)
		Dual-Core: - Intel® Xeon® E5200 series
		FSB 1333 / 1066 / 667 MHz
Core Logic		Intel® 5000V MCH (Blackford-VS) Intel® 6321ESB (ESB2E)
ASUS Features	Smart Fan	√
	ASWM 2.0	√
Memory	Total Slots	6 (Dual-Channel)
	Capacity	Maximum up to 24GB
	Memory Type	DDR2 667 / 533 Fully-Buffered DIMM
	Memory Size	512MB, 1GB, 2GB and 4GB
Expansion Slots	Total PCI/PCI-X/PCI-E Slots	5
	Slot Type	1 x PCI Express™ x8 slot (x8 link) 1 x PCI Express™ x8 slot (x4 link) 1 x PCI 33 MHz/32-bit/5V slot 1 x PCI-X 133/100 MHz/64bit/3.3V slot 1 x PCI-X 133/100 MHz/64bit/3.3V slot for optional Zero Channel RAID (ZCR) card <i>(colored green)</i>
	SATA Controller	Intel® 6321ESB: 6 x SATA II 300MB/s ports Intel® Matrix Storage (for Windows only) - Supports software RAID 0, 1, 0+1 & 5
	SAS Controller	LSI1068 PCI-X SAS controller: 8 x Serial Attached SCSI (SAS) channels (8 devices) with RAID 0, RAID 1, and RAID 1E configuration Zero-Channel RAID <i>(colored green)</i>
HDD Bays	I = Internal A or S will be hot-swappable	8 x Hot-swap 3.5" SAS/SATA HDD Bays

(continued on the next page)

Networking	LAN	Intel® 82563EB Dual Port PCI-E GbE LAN
Graphic	VGA	XGI Volari Z7 PCI display controller with 32MB of Video memory
Auxiliary Storage FDD / CD / DVD		1 x Slim-type Optical Device Bay Options: No Device / DVD-RW
Onboard I/O		1 x External Serial Port 2 x RJ-45 ports 4 x USB 2.0 ports (Front x 2, Rear x 2) 1 x VGA port 1 x PS/2 keyboard port 1 x PS/2 mouse port
OS Support		Windows® Server 2003 R2 Enterprise 32 / 64-bit RedHat® Enterprise Linux AS5.0 32 / 64-bit SuSE® Linux Enterprise Server 10.0 32 / 64-bit
Anti-virus Software		CA® eTrust™ 7.1 anti-virus software (Optional)
Management Solution		ASUS ASWM 2.0
Dimension (HH x WW x DD)		615mm x 444mm x 87mm
Net Weight		12.5 Kg
Power Supply		500W 80+ Single Power Supply
Environment		Operation temperature: 10°C–35°C / Non operation temperature: -40°C–70°C Non operation humidity: 20%–90% (Non-condensing)

* The total power consumption of the system should be less than 490W.

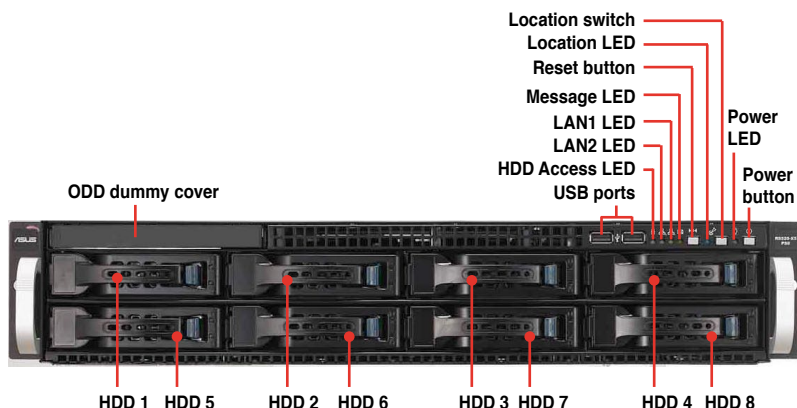
** Specifications are subject to change without notice.

1.4 Front panel features

The barebone server displays a simple yet stylish front panel with easily accessible features. The power and reset buttons, LED indicators, and two USB ports are located on the front panel.



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

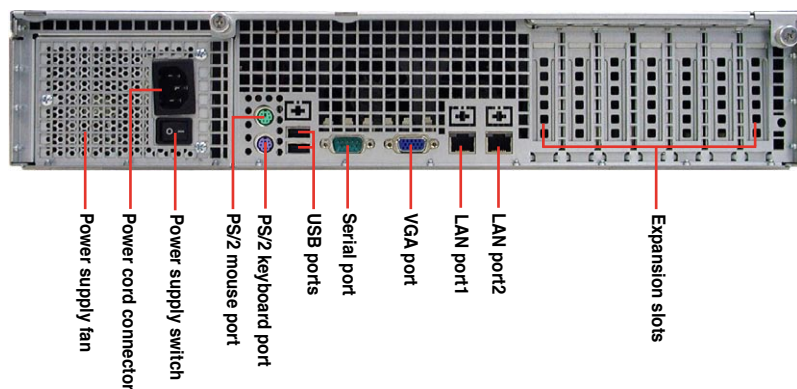


1.5 Rear panel features

The rear panel includes the expansion slots, system power socket, and rear fans. The middle part includes the I/O shield with openings for the rear panel connectors on the motherboard.

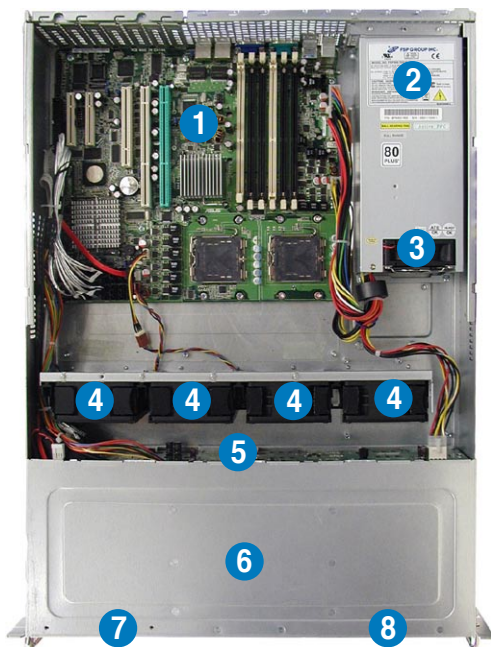


The ports for the PS/2 keyboard, PS/2 mouse, USB, VGA, and Gigabit LAN do not appear on the rear panel if motherboard is not present.



1.6 Internal features

The barebone server includes the basic components as shown.



1. ASUS DSBV-DX/SAS-SYS server board
2. Power supply
3. Power fans
4. System fans*
5. SATA/SAS backplane
6. Hot-swap HDD trays
7. Slim-type optical drive bay
8. Front I/O board (hidden)



- 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.
- Only ASUS CD/DVD-ROMs fit the optical drive bay.

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

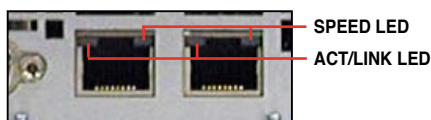
1.7 LED information

1.7.1 Front panel LEDs



LED	Icon	Display status	Description
Power LED		ON	System power ON
HDD Access LED		OFF Blinking	No activity Read/write data into the HDD
Message LED		OFF Blinking	System is normal; no incoming event ASWM indicates a HW monitor event
Location LED		OFF ON	Normal status Location switch is pressed (Press the location switch again to turn off)
LAN LEDs		OFF Blinking ON	No LAN connection LAN is transmitting or receiving data 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

HDD status LED



SATA HDD LED	Description
GREEN	This installed Serial ATA HDD is in good condition
OFF	HDD failure or no HDD is installed

Chapter 2

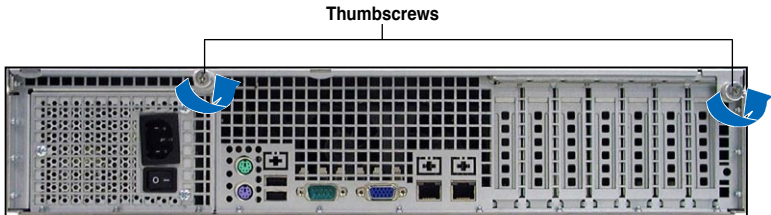
This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

Hardware setup

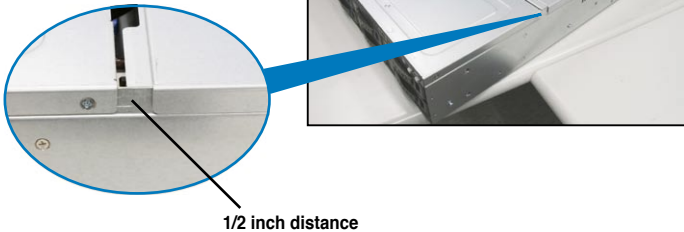
2.1 Chassis cover

Removing the rear cover

1. Loosen the two thumbscrews on the rear panel to release the rear cover from the chassis.



2. Firmly hold the cover and slide it toward the rear panel for about half an inch until it is disengaged from the chassis.



3. Lift the cover from the chassis.

2.2 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA771 socket designed for the Intel® Xeon® Dual/Quad Core processor.

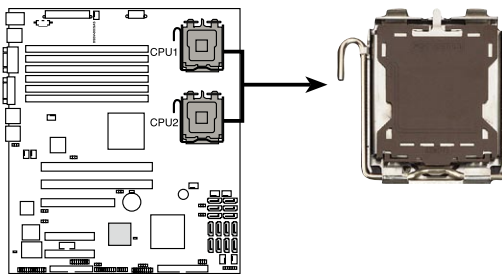


- Your boxed Intel® Xeon® LGA771 processor package should come with installation instructions for the CPU and heatsink. If the instructions in this section do not match the CPU documentation, follow the latter.
- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket 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 LGA771 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.

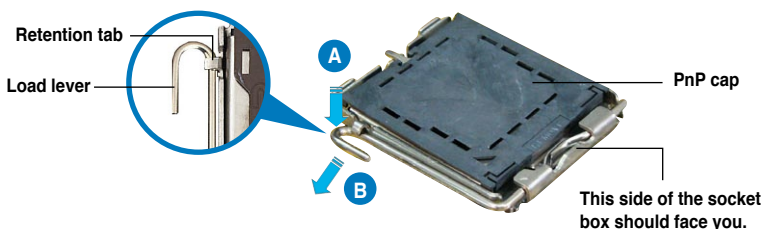


DSBV-DX/SAS CPU LGA771



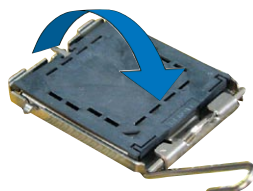
Before installing the CPU, ensure that the socket box is facing towards you and the load lever is on your left.

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

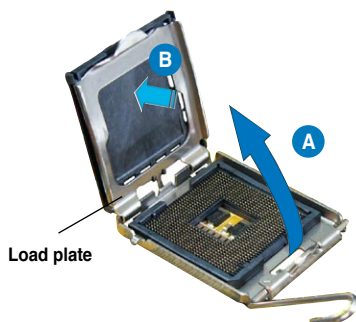


To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

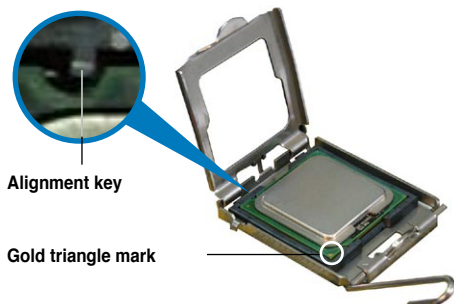
3. Lift the load lever in the direction of the arrow to a 135° angle.



4. Lift the load plate with your thumb and forefinger to a 100° angle (A), then push the PnP cap from the load plate window to remove (B).



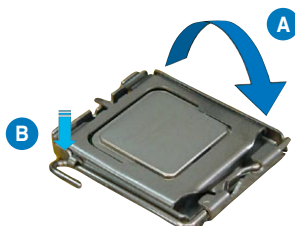
5. Position the CPU over the socket, ensuring that the gold triangle is on the bottom-left corner of the socket. The socket alignment key should fit into the CPU notch.





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!

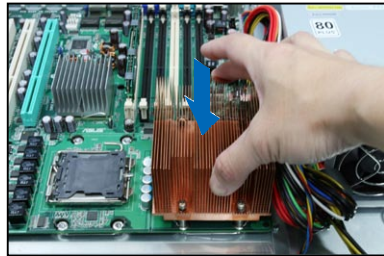
6. Close the load plate (A), then push the load lever (B) until it snaps into the retention tab.



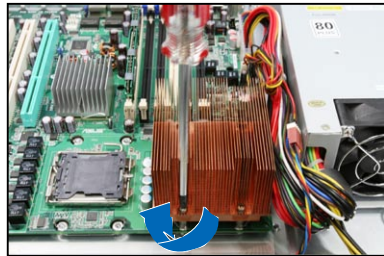
2.2.2 Installing the CPU heatsink

To install the CPU heatsink:

1. Carefully place the heatsink on top of the installed CPU.



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.

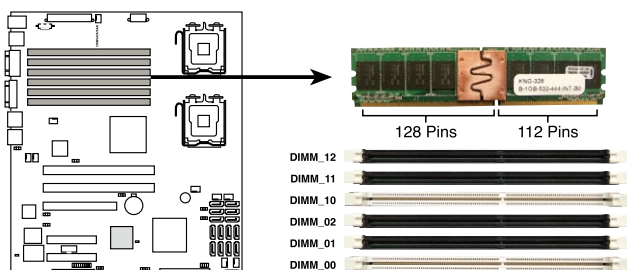


2.3 System memory

2.3.1 Overview

The motherboard comes with six fully-buffered DIMM (FB-DIMM) sockets to support 240-pin FB-DIMM modules. An FB-DIMM module has a different pin-out from DDR2 DIMMs so you cannot install DDR2 DIMMs on an FB-DIMM socket. Note that an FB-DIMM socket has an Advanced Memory Buffer (AMB) chip that allows memory-to-CPU connection at gigabit speed.

The figure illustrates the location of the FB-DIMM sockets:



DSBV-DX/SAS 240-pin DIMM sockets

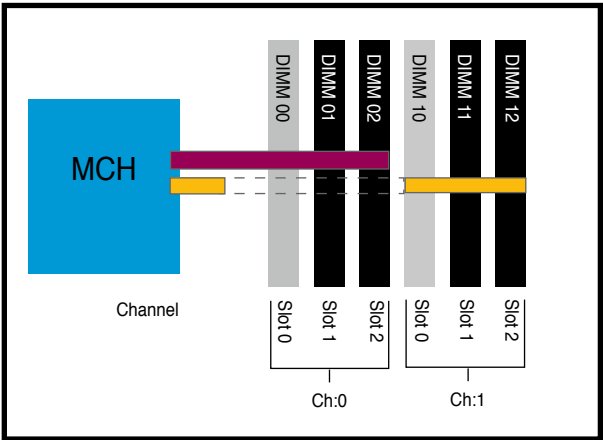
2.3.2 Memory configurations

You may install 256 MB, 512 MB, 1 GB, 2 GB, and 4 GB registered ECC FB-DIMMs into the DIMM sockets.



- 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.
- This motherboard does not support memory modules made up of 128 Mb chips x16 memory modules.
- If you are installing only one memory module, install into the white socket labeled DIMM_00. Installing into any other socket will not work.

Rank population



DIMM installation reference table

No. of DIMMs	Slot/s to use
1	DIMM_00
2	DIMM_00, DIMM_10
4	DIMM_00, DIMM_01, DIMM_10, DIMM_11
6	DIMM_00, DIMM_01, DIMM_02, DIMM_10, DIMM_11, DIMM_12



- DIMMs in pair means two DIMMs with the same configuration.
- For better performance, same configuration DIMMs should be installed on the same slot number for each channel. For example, you may install the same type of DIMMs in DIMM_00, and DIMM_10.

2.3.3 Memory sparing technology

The Intel® 5000V chipset supports the memory sparing technology. Refer to the below sections:

Memory Sparing

At configuration time, a DIMM rank is set aside to replace a defective DIMM rank. When the error rate for a failing DIMM rank reaches a pre-determined threshold, the memory sparing function will issue an interrupt and initiate a spare copy. At the completion of the copy, the failing DIMM rank is disabled and the “spared” DIMM rank will be used in its place. Refer to **5.4.2 Chipset Configuration** and configure the options of **Branch 0 Rank Sparing** to enable the memory sparing functions. And the default BIOS setting is disabled.



- The DIMM rank with the largest size will be assigned as spare rank. Data can only be copied from a smaller sized rank to a larger sized one.
- A DIMM can contain only one or two ranks. To support sparing function, a DIMM channel should contain at least two ranks.
- When sparing function is enabled, the usable memory size will reduce then size of the spare ranks.

The following tables show memory configurations with Memory Sparing function in Branch 0.

One DIMM per channel (Dual ranks)

	Channel 0		Channel 1	
	DIMM_00 (2048MB/2 Ranks)		DIMM_10 (2048MB/2 Ranks)	
	Rank 0 (1024 MB)	Rank 1 (1024 MB)	Rank 0 (1024 MB)	Rank 1 (1024 MB)
Sparing		V		V
Memory space	1024 MB		1024 MB	
Total Memory	2048 MB			

Two DIMM per channel (Dual ranks)

	Channel 0		Channel 1	
	DIMM_00 (1024MB/2 Ranks)		DIMM_10 (1024MB/2 Ranks)	
	Rank 0 (512 MB)	Rank 1 (512 MB)	Rank 0 (512 MB)	Rank 1 (512 MB)
Sparing				
Memory space	512 MB	512 MB	512 MB	512 MB
	DIMM_01 (2048MB/2 Ranks)		DIMM_11 (2048MB/2 Ranks)	
	Rank 0 (1024 MB)	Rank 1 (1024 MB)	Rank 0 (1024 MB)	Rank 1 (1024 MB)
Sparing		V		V
Memory space	1024 MB		1024 MB	
Total Memory	4096 MB			

Three DIMMs per channel (Dual ranks)

	Channel 0		Channel 1	
	DIMM_00 (1024/2 Ranks)		DIMM_10 (1024/2 Ranks)	
	Rank 0 (1024 MB)	Rank 1 (1024 MB)	Rank 0 (1024 MB)	Rank 1 (1024 MB)
Sparing				
Memory space	512 MB	512 MB	512 MB	512 MB
	DIMM_01 (1024MB/2 Ranks)		DIMM_11 (1024MB/2 Ranks)	
	Rank 0 (512 MB)	Rank 1 (512 MB)	Rank 0 (512 MB)	Rank 1 (512 MB)
Sparing				
Memory space	512 MB	512 MB	512 MB	512 MB
	DIMM_02 (2048MB/2 Ranks)		DIMM_12 (2048MB/2 Ranks)	
	Rank 0 (1024 MB)	Rank 1 (1024 MB)	Rank 0 (1024 MB)	Rank 1 (1024 MB)
Sparing		V		V
Memory space	1024 MB		1024 MB	
Total Memory	6144 MB			

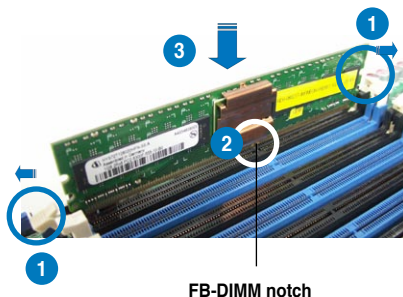
2.3.4 Installing a DIMM



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.

To install a DIMM:

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 break on the socket.
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



- A FB-DIMM is keyed with a notch so that it fits in only one direction. Do not force a DIMM into a socket to avoid damaging the DIMM.
- The FB-DIMM sockets do not support DDR DIMMs. DO NOT install DDR DIMMs to the DDR2 DIMM sockets.

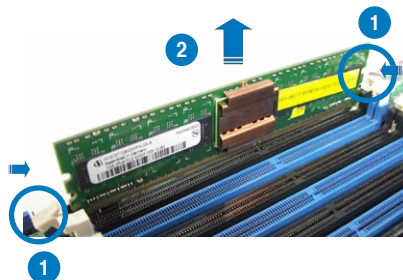
2.3.5 Removing a DIMM

To remove a DIMM:

1. Simultaneously press the retaining clips outward to unlock the DIMM.



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



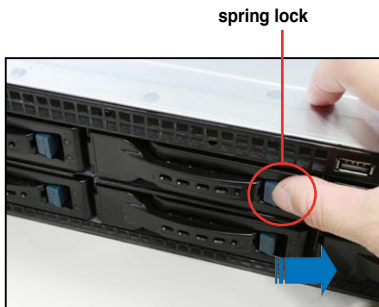
2. Remove the DIMM from the socket.

2.4 Hard disk drives

The system supports eight hot-swap SATAII/SAS hard disk drives. 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.



5. 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.



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

6. 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.
7. Repeat steps 1 to 6 if you wish to install a second SATAII/SAS drive.



8. Refer to section **2.7 SATAII/SAS backplane** cabling for information on the SATAII/SAS backplane cable connections.

2.5 Expansion cards

2.5.1 Installing an expansion card

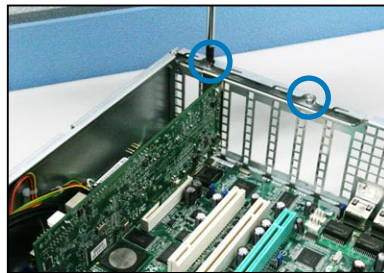
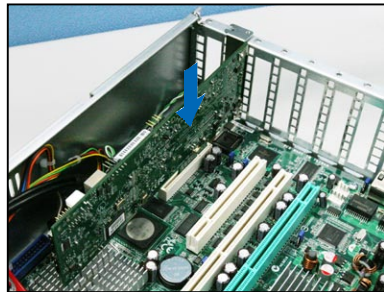
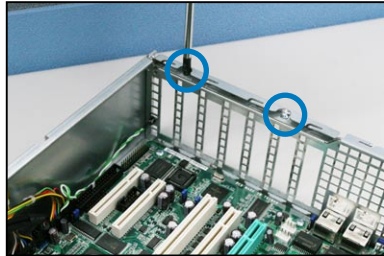
The barebone server comes with two PCI-E expansion slots, allowing you to install half-height expansion cards.



Ensure to unplug the power cord before installing or removing expansion cards. Failure to do so may cause severe damage to the motherboard and other system components!

To install an expansion card:

1. Remove the two screws on the metal bracket lock, and then set it aside.
2. Align the card golden fingers with the slot, and then press firmly until the card is completely seated on the slot.
3. Replace the metal bracket lock, and secure it with two screws.



2.5.2 Configuring an expansion card

After installing the expansion card, configure the 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

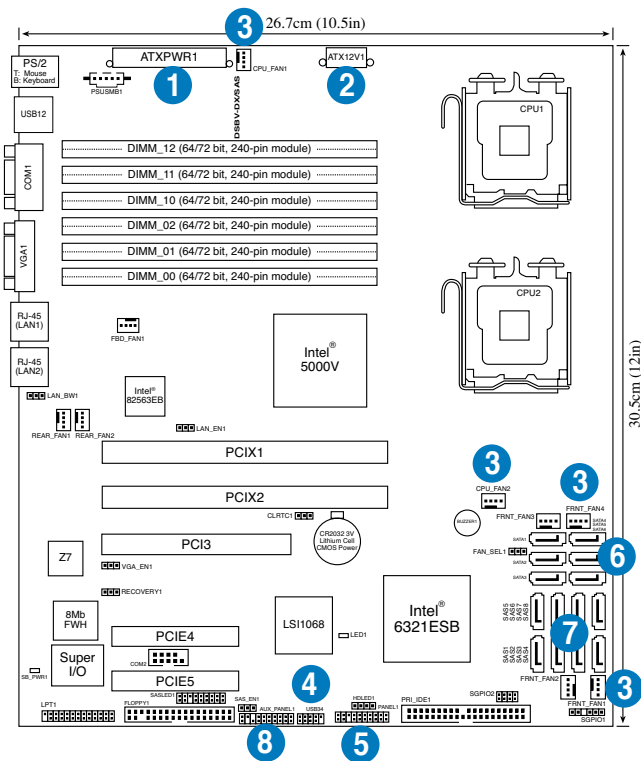
IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	—	Re-direct to IRQ#9
3	11	Communications Port (COM2)*
4	12	Communications Port (COM1)*
5	13	IRQ holder for PCI steering*
6	14	Floppy Disk Controller
7	15	Printer Port (LPT1)*
8	3	System CMOS/Real Time Clock
9	4	IRQ holder for PCI steering*
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.



Pre-connected system cables

1. 24-pin SSI power connector (from power supply to motherboard)
2. 8-pin SSI power connector (from power supply to motherboard)
3. System fan connectors (from motherboard FRNT_FAN4, FRNT_FAN1, CPU_FAN1 and CPU_FAN2 to system fans)
4. USB connector (from motherboard to front I/O board)
5. Panel connector (from motherboard to front I/O board)
6. SATA connectors (from motherboard to slim optical drive)
7. SAS connectors (from motherboard to SATAII/SAS backplane board)
8. Auxiliary panel connector (from motherboard to front I/O board)

2.7 SATAII/SAS backplane cabling

A SATAII/SAS backplane comes pre-installed in the RS520-X5/PS8.

Front side

The front side of the SATAII/SAS backplane faces the front panel when installed. This side includes eight SATAII/SAS connectors for the hot swap drive trays.

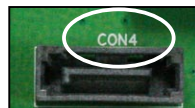
Each SATAII/SAS connector is labeled so you can easily determine their counterpart connectors at the back side of the backplane. Refer to the table for reference.



HDD Device	Front side connector	Back side connector
HDD 1	SAS1	CON1
HDD 2	SAS2	CON2
HDD 3	SAS3	CON3
HDD 4	SAS4	CON4
HDD 5	SAS5	CON5
HDD 6	SAS6	CON6
HDD 7	SAS7	CON7
HDD 8	SAS8	CON8

Back side

The back side of the SATAII/SAS backplane faces the rear panel when installed. This side includes the power connectors and SATAII/SAS interfaces for the motherboard Serial ATA connectors or the SAS card.



2.8 Removable components

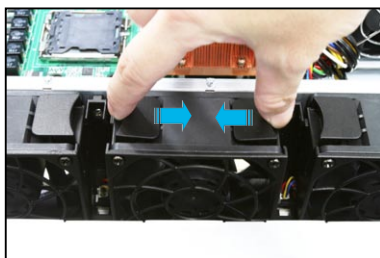
You may need to remove previously installed system components when installing or removing system devices, or when you need to replace defective components. This section tells how to remove the following components:

1. System fans
2. Optical drive

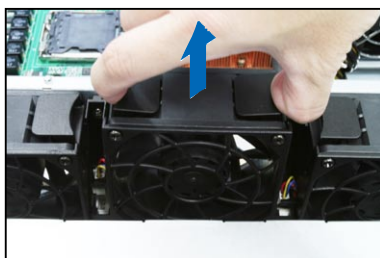
2.8.1 System fans

To uninstall the system fans:

1. Press inward to release the system fan.



2. Lift the fan, then set aside.
3. Repeat step 1 to 2 to uninstall the other system fans.



2.8.2 Optical drive (optional)

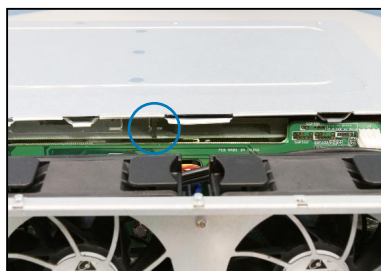
To install the slim optical drive:

1. Remove the dummy cover for the optical drive bay.
2. Insert the slim optical drive into the drive bay.
3. Push the slim optical drive all the way to the depth of the bay until it clicks in place.

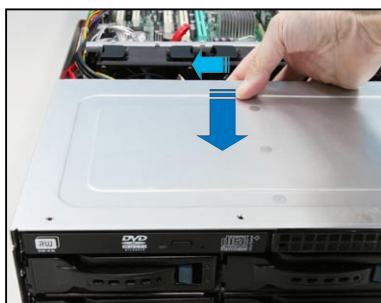


To uninstall the slim optical drive:

1. Locate the optical drive eject latch at the rear side.



2. Press the latch leftward, and push the slim optical drive toward the front panel.



Chapter 3

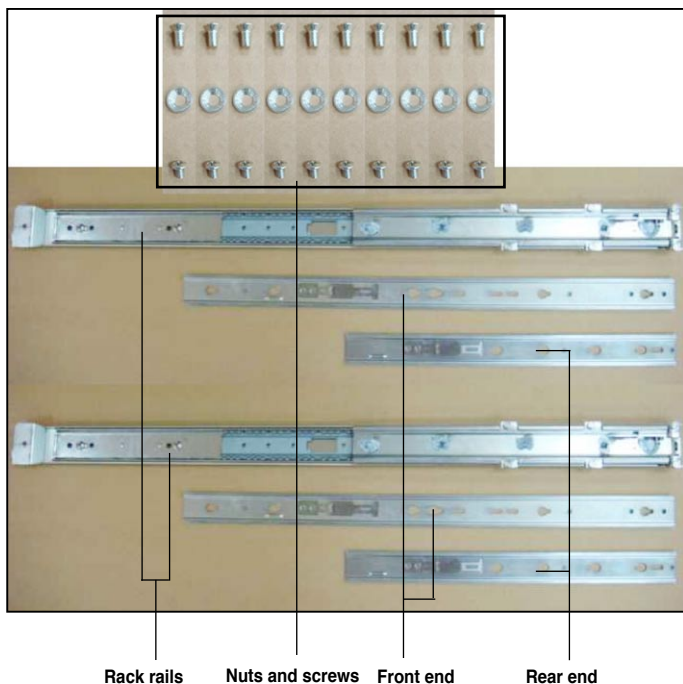
This chapter describes how to install the optional components and devices into the barebone server.

Installation options

3.1 Rackmount rail kit items (optional)

Your rackmount rail kit package contains:

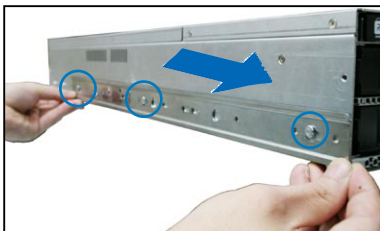
- two pair of server rails (for the server)
- two pairs of rack rails (for the rack)
- Nut-and-bolt type screws



3.2 Attaching the rails to the server

To attach the server rails:

1. Attach the front end of the server rail to the side of the chassis, matching each of the three hooks to the holes on the rail. Then slide the rail toward the front panel until it locks in place.



2. Attach the rear end of the server rail to the side of the chassis, matching each of the two hooks to the holes on the rail. Then slide the rail toward the front panel until it locks in place.



3. Secure the server rail to the side of the chassis with two screws.



4. Repeat steps 1 to 3 to attach the second server rail to the other side of the chassis.

3.3 Attaching the rack rails

To attach the rack rails:

1. Select two units of space (2U) on the rack where you want to install the barebone server.
2. Install the nuts on the holes of the 2U space on the rack front.
3. Install the nuts on the holes of the 2U space on the corresponding rack rear.
4. Measure the depth of the rack to determine the length of the rack rails.
5. Measure the rack rail when assembled 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.
8. Secure the rear end of the rail with two rack screws.
9. Repeat steps 5 to 8 to assemble and attach the second rack rail.



3.4 Rackmounting the server

To mount the server to the rack:

1. Align the server rails with the rack rails, then push the server all the way to the depth of the rack.
2. Drive a screw on the mounting ear to secure the server in place.

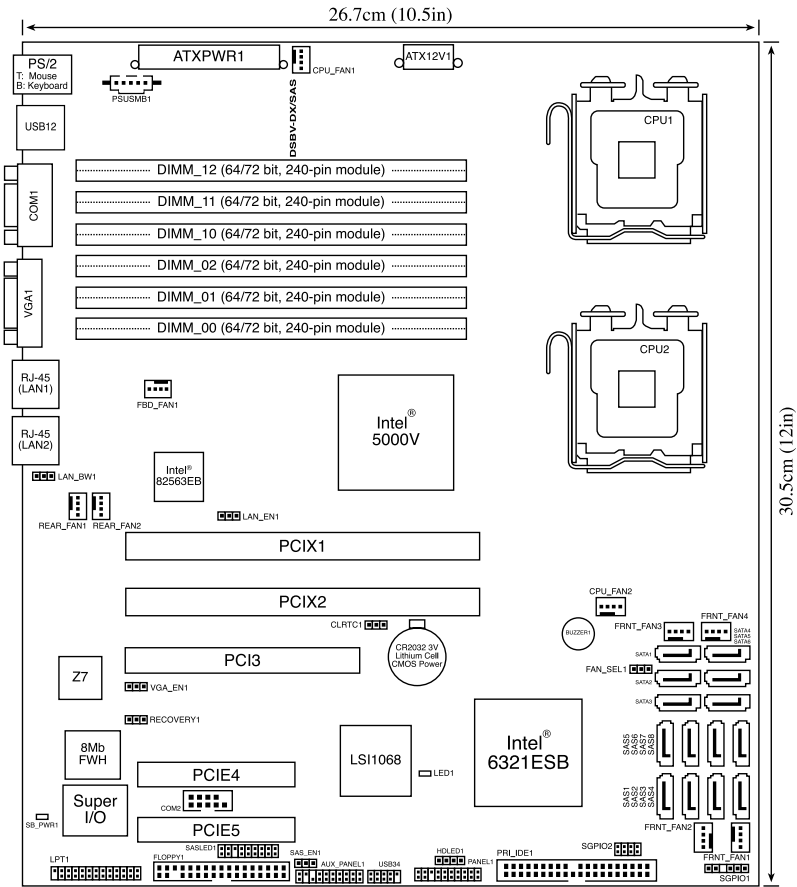


Chapter 4

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

Motherboard info

4.1 Motherboard layouts



Layout contents

Jumpers		Page
1.	Clear RTC RAM (CLRRTC)	4-4
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8.	Serial port connectors (10-1 pin COM2)	4-11
9.	CPU and system fan connectors (4-pin CPU_FAN1/2, REAR_FAN1/2, FRNT_FAN1/2/3/4, FBD_FAN1)	4-12
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14.	System panel connector (20-1 pin PANEL1)	4-15
15.	Auxiliary panel connector (20-pin AUX_PANEL1)	4-16

4.2 Jumpers

1. Clear RTC RAM (CLRTC1)

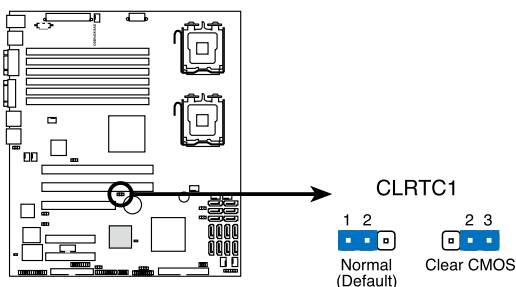
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. 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.
4. Reinstall the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the key during the boot process and enter BIOS setup to re-enter data.



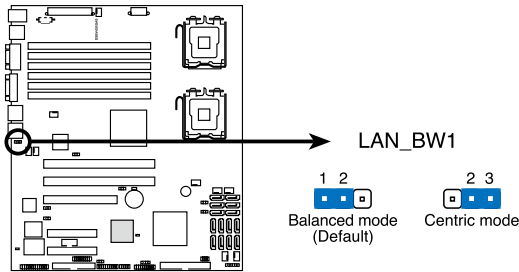
Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



DSBV-DX/SAS Clear RTC RAM

2. LAN bandwidth setting (3-pin LAN_BW1)

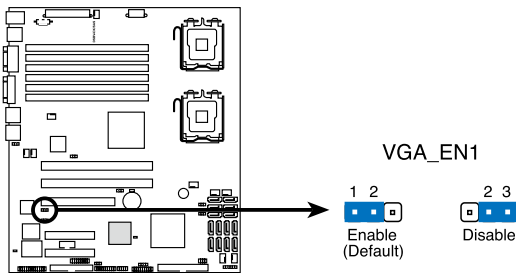
This jumper allows you to set the LAN bandwidth setting for more efficient IP load distribution.



DSBV-DX/SAS LAN bandwidth setting

3. VGA controller setting (3-pin VGA_EN1)

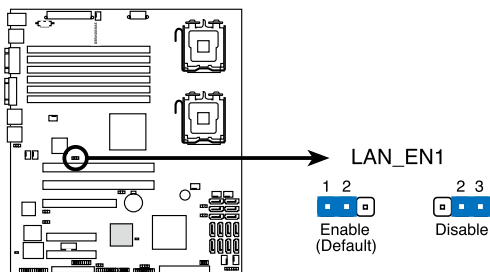
These jumpers allow you to enable or disable the onboard VGA controller. Set to pins 1-2 to activate the VGA feature.



DSBV-DX/SAS VGA setting

4. LAN controller setting (3-pin LAN_EN1)

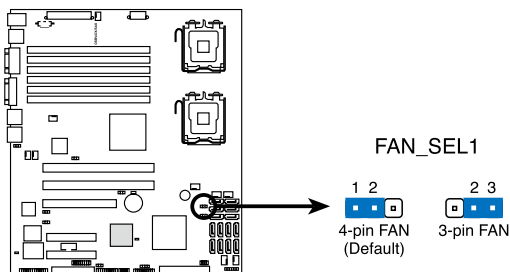
This jumper allows you to enable or disable the onboard Intel® 82563EB Gigabit LAN controller. Set to pins 1-2 to activate the Gigabit LAN feature.



DSBV-DX/SAS LAN_EN1 setting

5. Fan control setting (3-pin FAN_SEL1)

This jumper allows you to switch for fan pin selection Set to pins 1-2 for 4-pin fans or pins 2-3 for 3-pin fans.



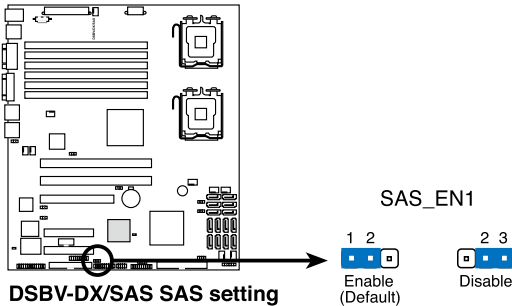
DSBV-DX/SAS Fan setting



- If you use a 4-pin fan but set the jumper to pin 2-3, the fan you installed may not work.
- If you use a 3-pin fan but set the jumper for a 4-pin fan, the fan control will not work and the fan you installed will always run at full speed.

6. Onboard storage setting (3-pin SAS_EN1)

This jumper allows you to enable or disable the onboard LSI1068 SAS controller. Set the jumper to pins 1-2 to enable the SAS function (default).

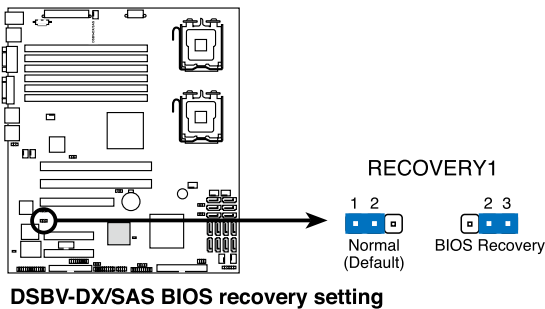


7. Force BIOS recovery setting (3-pin RECOVERY1)

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

To update the BIOS:

1. Prepare a floppy disk that contains the latest BIOS for the motherboard and the Phoenix Phlash16 utility. Ensure you download the correct BIOS for your motherboard model.
2. Set the jumper to pins 2-3.
3. Insert the floppy disk then 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.



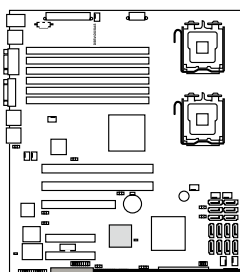
4.3 Internal connectors

1. Floppy disk drive connector (34-1 pin FLOPPY1)

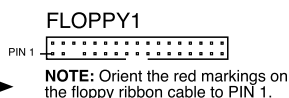
This connector is for the provided floppy disk drive (FDD) signal cable. Insert one end of the cable to this connector, then connect the other end to the signal connector at the back of the floppy disk drive.



Pin 5 on the connector is removed to prevent incorrect cable connection when using a FDD cable with a covered Pin 5.



DSBV-DX/SAS Floppy disk drive connector

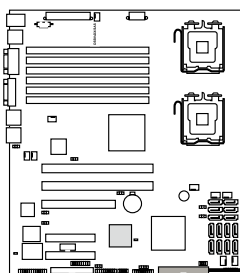


2. IDE connector (40-1 pin PRI_IDE1)

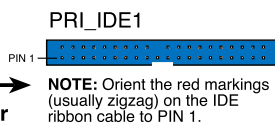
This connector is for an Ultra DMA 100/66 signal cable. The Ultra DMA 100/66 signal cable has three connectors: a blue connector for the primary IDE connector on the motherboard, a black connector for an Ultra DMA 100/66 IDE slave device (optical drive/hard disk drive), and a gray connector for an Ultra DMA 100/66 IDE master device (hard disk drive). If you install two hard disk drives, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings.



- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA 100/66 IDE devices.

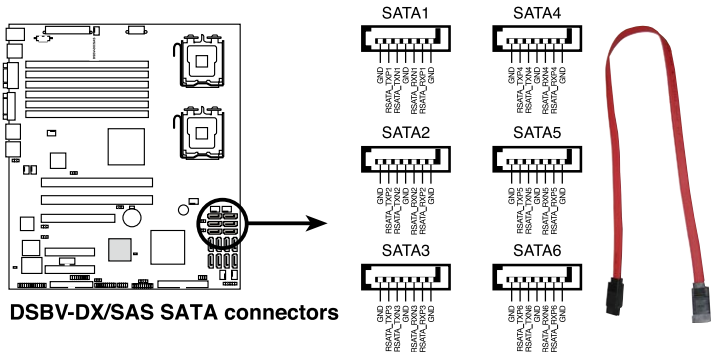


DSBV-DX/SAS IDE connector



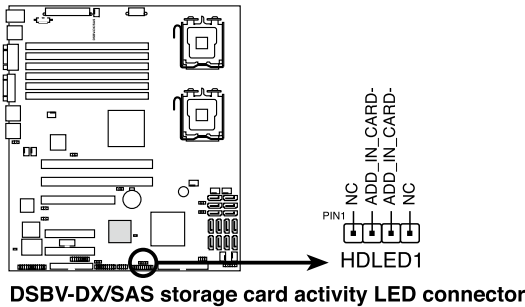
**3. Serial ATA connectors
(7-pin SATA1, SATA2, SATA3, SATA4, SATA5, SATA6)**

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.



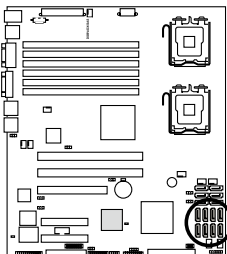
4. Hard disk activity LED connector (4-pin HDLED1)

This connector is used to connect to a hard disk drive active LED connector on the SCSI or RAID card.



5. SAS connectors

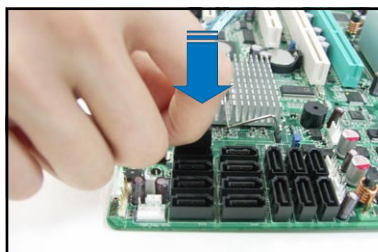
This motherboard comes with eight blue Serial Attached SCSI (SAS) connectors, the next-generation storage technology that supports both Serial Attached SCSI and Serial ATA (SATA). Each connector supports one device.



DSBV-DX/SAS SAS connectors

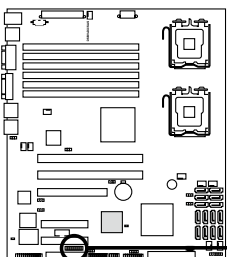
To connect the SAS cable:

Plug in the SAS cable to the SAS1-8 connector until the cable snaps in place.



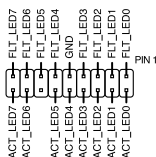
6. SAS LSI1068 ports LED connector (18-1 pin SASLED1)

This connector is for the front panel LED port indicator that shows the SAS HDD status.



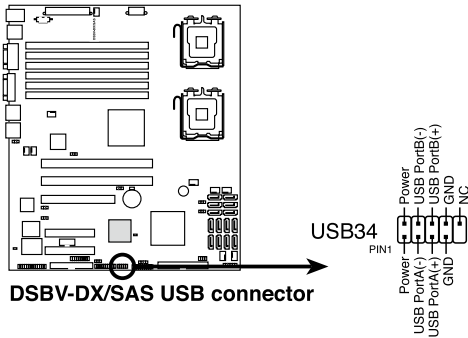
DSBV-DX/SAS SAS LED connector

SASLED1



7. USB connector (10-1 pin USB34)

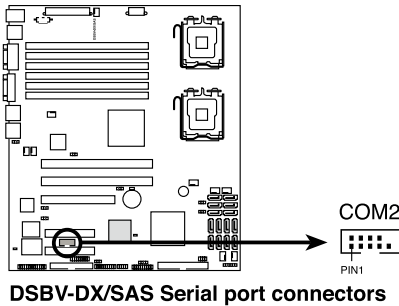
This connector is for USB 2.0 ports. Connect the USB module cable to this connector, then install the module to a slot opening at the back of the system chassis. This USB connector complies with USB 2.0 specification that supports up to 480 Mbps connection speed.



The USB port module is purchased separately.

8. Serial port connector (10-1 pin COM2)

This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



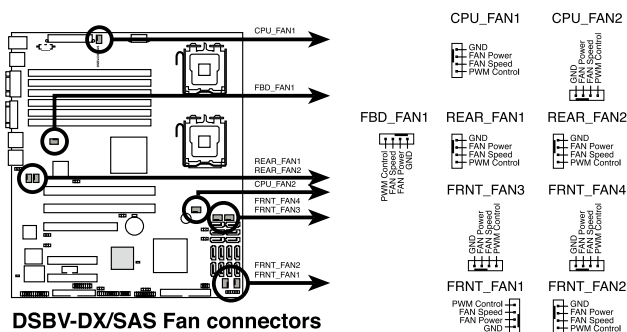
The serial port module is purchased separately.

9. CPU and system fan connectors (4-pin CPU_FAN1/2, REAR_FAN1/2, FRNT_FAN1/2/3/4, FBD_FAN1)

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.

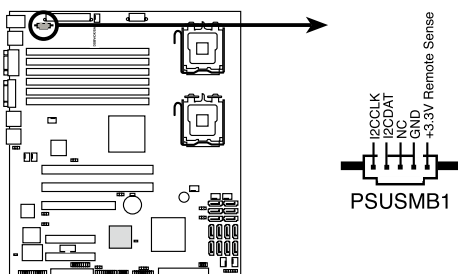


DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!



10. Power supply SMBus connector (5-pin PSUSMB1)

This connector is for the power supply SMB cable, if your power supply supports the SMBus function.

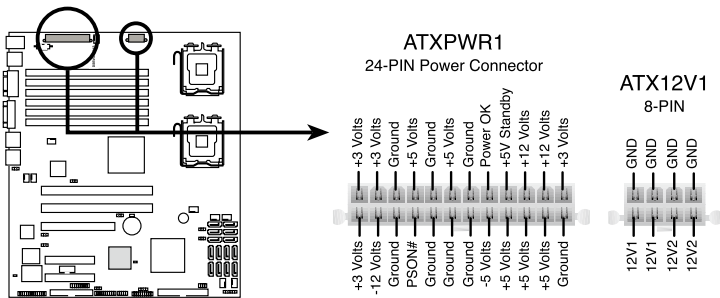


11. SSI power connectors (24-pin ATXPWR1, 8-pin ATX12V1)

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



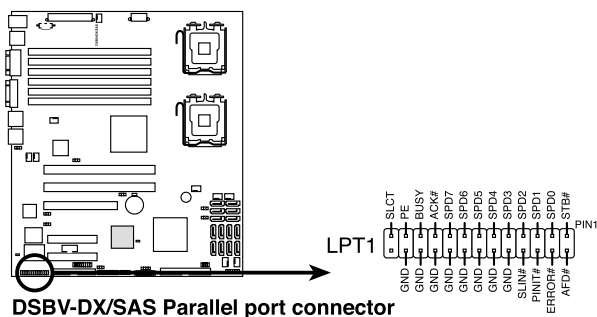
- For a fully configured system, we recommend that you use an SSI 12 V-compliant power supply unit (PSU) for LGA771-socket Intel® Xeon Dual Core processors (Bensley platform).
- DO NOT forget to connect the 24+8-pin power plugs; otherwise, the system will not boot up.
- Use of a PSU with a higher power 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.
- You must install a PSU with a higher power rating if you intend to install additional devices.



DSBV-DX/SAS ATX power connectors

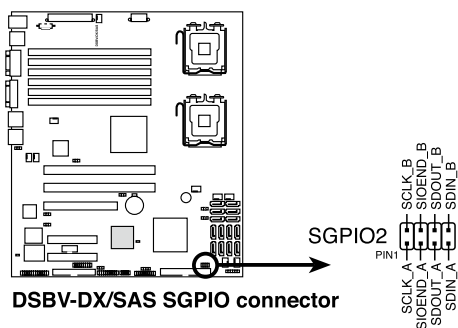
12. Parallel port connector (26-pin LPT1)

This connector is for a parallel port. Connect the parallel port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



13. Serial General Purpose Input/Output connector (2x4 pin SGPIO2)

This connector is used for the SGPIO peripherals for the LSI Logic MPT utility.

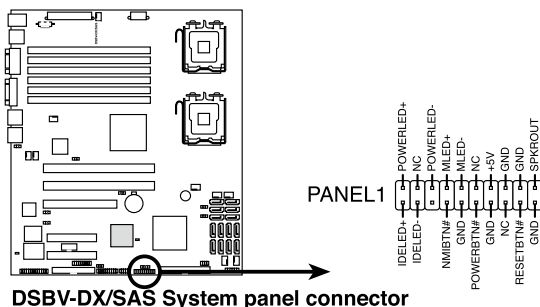


14. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.



The system panel connector is color-coded for easy connection.



1. System power LED (Green 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 (Brown 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 (Orange 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 (Red 2-pin IDE_LED)

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. ATX power button/soft-off button (Green 2-pin PWRSW)

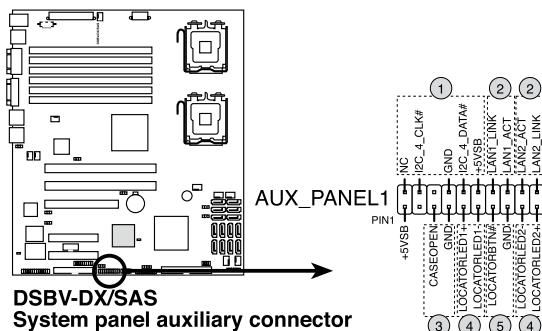
This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

6. Reset button (Blue 2-pin RESET)

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

15. 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.



- 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.

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. **Phoenix Phlash16 BIOS Flash Utility** (Updates the BIOS in DOS mode using a bootable floppy disk.)
2. **ASUS CrashFree BIOS 2** (To recover the BIOS using a bootable floppy disk 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 floppy disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or Phoenix Phlash16 BIOS utilities. Refer to page 5-3 for details.
- Set the **Floppy A** item in Main menu to [Disabled] when using a USB floppy disk drive.

5.1.1 Creating a bootable floppy disk

1. Do either one of the following to create a bootable floppy disk.

DOS environment

- a. Insert a 1.44MB floppy disk into the drive.
- b. At the DOS prompt, type **format A: /S** then press <Enter>.

Windows® XP environment

- a. Insert a 1.44 MB floppy disk to the floppy disk drive.
- b. Click **Start** from the Windows® desktop, then select **My Computer**.
- c. Select the **3 ½ Floppy Drive** icon.
- d. Right click **File** from the menu, then select **Format. A Format 3½ Floppy Disk** window appears.
- e. Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.

5.1.2 Updating the BIOS using the Phoenix Phlash16 Utility

The Basic Input/Output System (BIOS) can be updated using the Phoenix Phlash16 Utility. Follow these instructions to update the BIOS using this utility.

1. Download the latest BIOS file from the ASUS web site. Rename the file to **BIOS.WPH**. Save the file to a floppy disk.



Ensure you copy the correct BIOS file for the specific model of your motherboard. Save only the updated BIOS file in the floppy disk to avoid loading the wrong BIOS file.

2. Copy the **Phoenix Phlash16** (plash16.exe) utility from the Software folder of the support CD to the floppy disk with the latest BIOS file.
3. Boot the system in DOS mode using the bootable floppy disk you created earlier.
4. When the **A:>** appears, replace the bootable floppy disk with the floppy disk containing the new BIOS file and the Phoenix Phlash16 Utility.
5. At the prompt, type the following command string:
plash16 /x BIOS.WPH
6. The Phoenix Phlash16 Utility automatically updates the BIOS.



DO NOT turn off or reset the system during the flashing process!

7. Restart the system after the utility completes the updating process. Ensure you remove the floppy disk from the drive

5.1.3 ASUS CrashFree BIOS 2 utility

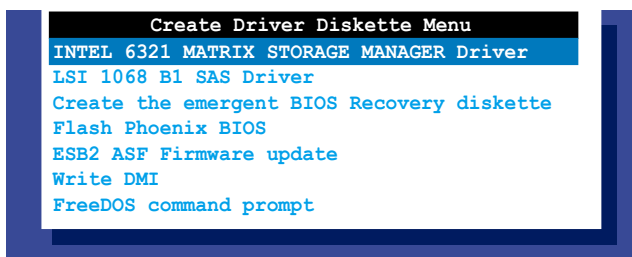
The ASUS CrashFree BIOS 2 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using a floppy disk.



Prepare a blank floppy disk before using this utility.

Recovering the BIOS from a floppy disk

- A. Prepare the recovery diskette:
 1. Insert a floppy disk to the floppy disk drive, then boot from the support CD. The screen will show several options.
 2. Select the item “Create the emergent BIOS Recovery diskette”.



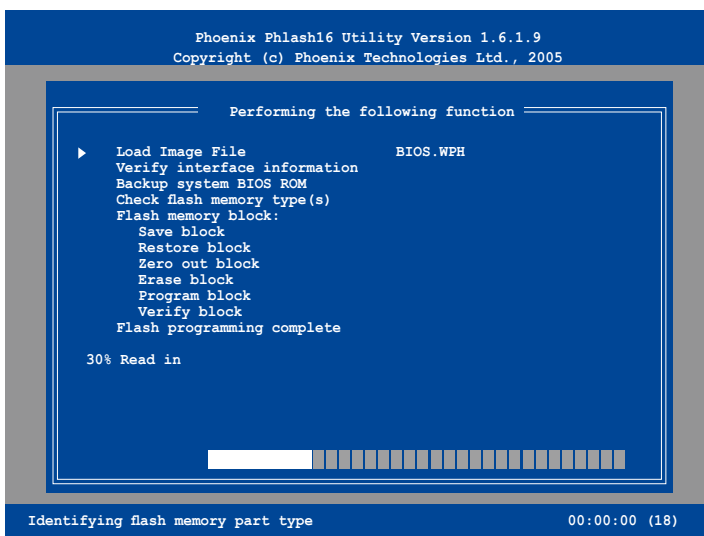
- B. To recover the BIOS from a floppy disk:
 1. When BIOS corrupted, put this disk in the floppy disk drive, then turn on the machine to boot from the floppy disk.
 2. The utility displays the following message and automatically checks the floppy for the recovery information.

RN50 DDR1 A21 BIOS

3. When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

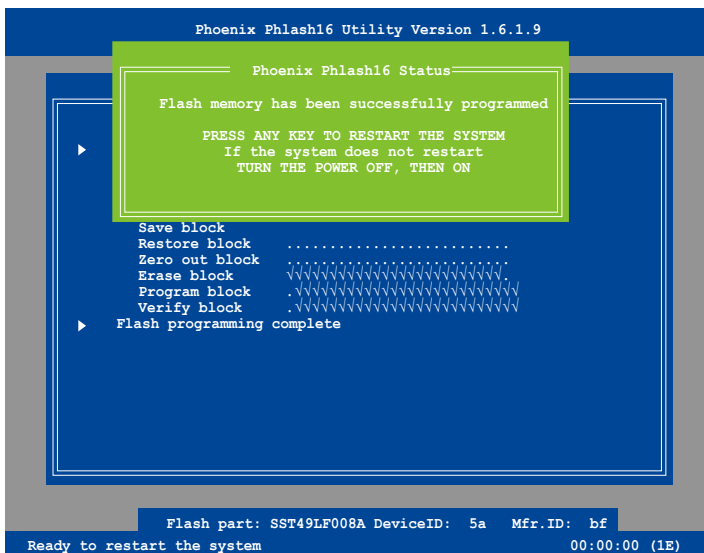


Before you recover the BIOS setting, refer to **4.2 Jumpers, Force BIOS recovery setting** for more information.



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

4. When the utility completes the updating process, a message appears, informing you that the flash memory has been programmed successfully.



5. Press the power button for more than four seconds to turn off the system.



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

5.2 BIOS setup program

This motherboard supports a programmable Low-Pin Count (LPC) 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 LPC chip.

The LPC 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 during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

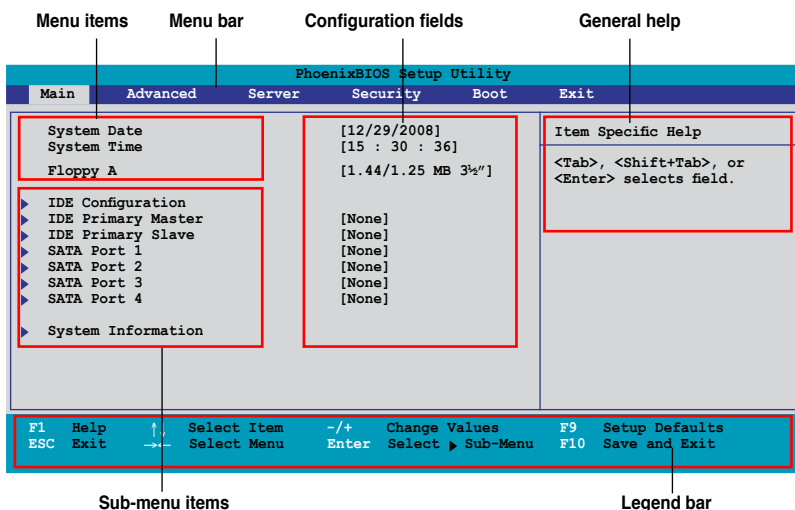
If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

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 **5.8 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) 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
Security	For changing the security 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 Legend bar

At the bottom of the Setup screen is a legend bar. The keys in the legend bar allow you to navigate through the various setup menus. The following table lists the keys found in the legend bar with their corresponding functions.

Navigation Key	Function
<F1>	Displays the General Help screen
<F9>	Loads setup default values
<Esc>	Exits the BIOS setup or returns to the main menu from a sub-menu
Left or Right arrow	Selects the menu item to the left or right
Up or Down arrow	Moves the highlight up or down between fields
Page Down or – (minus)	Scrolls backward through the values for the highlighted field
Page Up or + (plus)	Scrolls forward through the values for the highlighted field
<Enter>	Brings up a selection menu for the highlighted field
<F10>	Saves changes and exit

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>.

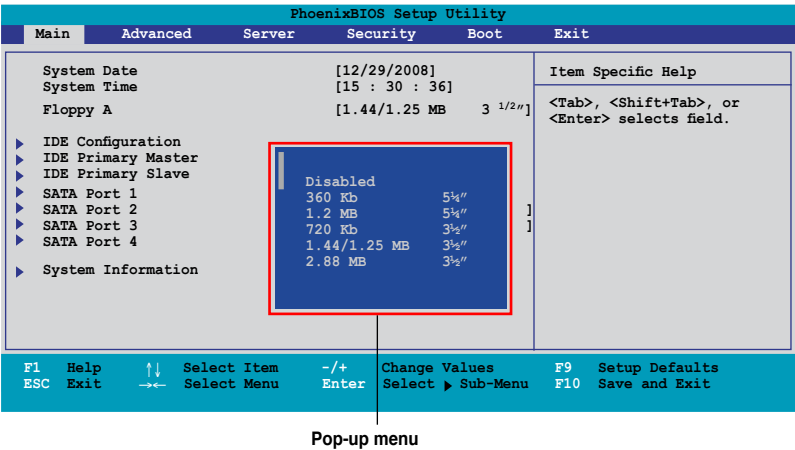
5.2.6 Configuration fields

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 General help

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

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.

PhoenixBIOS Setup Utility					
Main	Advanced	Server	Security	Boot	Exit
System Date			[12/29/2008]		Item Specific Help <Tab>, <Shift-Tab>, or <Enter> selects field.
System Time			[15 : 30 : 36]		
Floppy A			[1.44/1.25 MB 3¼"]		
▶ IDE Configuration					
▶ IDE Primary Master			[None]		
▶ IDE Primary Slave			[None]		
▶ SATA Port 1			[None]		
▶ SATA Port 2			[None]		
▶ SATA Port 3			[None]		
▶ SATA Port 4			[None]		
▶ System Information					
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults		
ESC Exit	→← Select Menu	Enter Select ▶ Sub-Menu	F10 Save and Exit		

5.3.1 System Date [xx/xx/xxxx]

Allows you to set the system date.

5.3.2 System Time [xx:xx:xx]

Allows you to set the system time.

5.3.3 Floppy A [1.44/1.25 MB, 3 1/2"]

Sets the type of floppy drive installed.

Configuration options: [Disabled] [360 Kb 5 1/4"] [1.2 MB 5 1/4"] [720 Kb 3 1/2"] [1.44/1.25 MB 3 1/2"] [2.88 MB 3 1/2"]



Set the **Floppy A** item to [Disabled] when using a USB floppy disk drive.

5.3.4 IDE Configuration

PhoenixBIOS Setup Utility					
Main					
IDE Configuration					Item Specific Help
Fixed disk boot sector: [Normal]					Write protects boot sector on hard disk to protect against viruses.
▶ S-ATA Configuration					
F1	Help	↑↓	Select Item	-/+	Change Values
ESC	Exit	→←	Select Menu	Enter	Select ▶ Sub-Menu
F9	Setup Defaults			F10	Save and Exit

Fixed disk boot sector [Normal]

Setting this item to [Write Protect] prevents write access to the boot sector on the hard disk to protect against viruses. The default setting [Normal] allows write access. Configuration options: [Normal] [Write Protect]

S-ATA Configuration

PhoenixBIOS Setup Utility					
Main					
S-ATA Configuration				Item Specific Help	
Parallel ATA:				[Enabled]	Enable the PATA
Serial ATA:				[Enabled]	
SATA Controller Mode Option:				[Enhanced]	
SATA RAID Enable				[Disabled]	
SATA AHCI Enable				[Disabled]	
F1	Help	↑↓	Select Item	-/+	Change Values
ESC	Exit	→←	Select Menu	Enter	Select ▶ Sub-Menu
F9	Setup Defaults			F10	Save and Exit

Parallel ATA [Enabled]

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

Serial ATA [Enabled]

Allows you to enable or disable the Serial ATA function.

Configuration options: [Disabled] [Enabled]

Native Mode Operation [Auto]

Allows you to choose the native mode for ATA.

Configuration options: [Auto] [Serial ATA]



The above item appears only when the **SATA Controller Mode Option** is set to [Compatible]

SATA Controller Mode Option [Enhanced]

Allows selection of the Serial ATA operation mode depending on the operating system (OS) that you installed. When you set this item to Enhanced Mode, Serial ATA and Parallel ATA devices are auto-detected and placed in native IDE mode. Set to Enhanced Mode if you are using native OS, such as Windows® 2000/XP. When you set this item to Compatible Mode, Serial ATA and Parallel ATA devices are auto-detected and placed in legacy mode. Set this item to [Compatible] if you are using legacy OS, e.g. Windows ME/98/NT, MS-DOS. Configuration options: [Compatible] [Enhanced]



When you set the **SATA Controller Mode Option** item to [Enhanced] or [Compatible] and disable ACHI/RAID mode, Intel 6321ESB can only support maximum four hard disk drives. If you set the **SATA Controller Mode Option** item to [Enhanced] and enable ACHI or RAID, the chipset can support up to six hard disk drives.



The following items appear only if you set the **SATA Controller Mode Option** item to [Enhanced].

SATA RAID Enable [Disabled]

Allows you to enable or disable the Serial ATA RAID function.

Configuration options: [Disabled] [Enabled]

SATA AHCI Enable [Disabled]

Allows you to enable or disable the Serial ATA AHCI function.

Configuration options: [Disabled] [Enabled]



-
- **SATA AHCI Enable** item appears only when **SATA RAID Enable** is set to [Disabled]
 - Due to the driver limitation, you will not find any SATA driver if you install Fedora core 4.
-

5.3.5 IDE Primary Master/Slave; SATA Port1—4

PhoenixBIOS Setup Utility		
Main		
IDE Primary Master [None]		Item Specific Help
Type:	[Auto]	Auto = Autotyping. None = Disabling drive. ATAPI Removable = ATAPI media (e.g., LS120, USB Floppy, USB Zip). CD-ROM = CD-ROM drive. IDE Removable = IDE removable media (e.g., IDE Zip drive). Other ATAPI = Other ATAPI media. User = You simply the hard disk drive type.
Multi-Sector Transfers:	[16 Sectors]	
LBA Mode Control:	[Enabled]	
32-Bit I/O:	[Disabled]	
Transfer Mode:	[FPIO 4 / DMA 2]	
Ultra DMA Mode:	[Mode 5]	
F1 Help	↑↓ Select Item	-/+ Change Values
ESC Exit	→← Select Menu	Enter Select ▶ Sub-Menu
F9 Setup Defaults	F10 Save and Exit	

Type: [Auto]

Selects the type of IDE drive. Setting to Auto allows automatic selection of the appropriate IDE device type. Select [CD-ROM] if you are specifically configuring a CD-ROM drive. Select [ATAPI Removable] if your device is either a ZIP, LS-120, or MO drive. Select [User] to manually enter the parameters of the device.

Configuration options: [Auto] [User] [Other ATAPI] [IDE Removable] [CD-ROM] [ATAPI Removable] [None]



- Except for 32-Bit I/O item, the following items become user-configurable when the **Type** item is not set to [Auto].
- Suggest you to keep the default setting of this item [Auto].
- For items that have no sub-menu, you have to use -/+ for values changing.

Multi-Sector Transfers: [Disabled]

Enables or disables data multi-sectors transfers. When set to 2~16 Sectors, 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] [2 Sectors] [4 Sectors] [8 Sectors] [16 Sectors]

LBA Mode Control: [Disabled]

Enables or disables the LBA mode. Setting to Enabled 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] [Enabled]

32-Bit I/O: [Disabled]

Enables or disables 32-bit data transfer.

Configuration options: [Disabled] [Enabled]

Transfer Mode: [Standard]

Allows you to select the method for the data transferring if the hard disk supports this feature.

Configuration options: [Standard] [Fast PIO 1] [Fast PIO 2] [Fast PIO 3] [Fast PIO 4] [FPIO 3 / DMA 1] [FPIO 4 / DMA2]

Ultra DMA Mode: [Disabled]

When this item is set to [Mode 0-5], the UDMA capability allows improved transfer speeds and data integrity for supported IDE devices.

Configuration options: [Disabled] [Mode 0] [Mode 1] [Mode 2] [Mode 3] [Mode 4] [Mode 5]

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.

PhoenixBIOS Setup Utility		
Main		
System Information		Item Specific Help
Model Name	DSBV-DX/SAS	The detail information for CPUs
Model ID	8051A0	
ASUS-BIOS		
Version	1009	
Date	09/05/2008	
▶ Processor Information		
▶ System Memory Information		
F1 Help	↑↓ Select Item	~/+ Change Values
ESC Exit	→← Select Menu	Enter Select ▶ Sub-Menu
F9 Setup Defaults		F10 Save and Exit



The items in this menu are non-user configurable.

Model Name/Model ID

Displays the ASUS internal model information.

Version

Displays the BIOS revision.

Date

Displays the BIOS build date.

Processor Information

Displays the auto-detected CPU specification.

PhoenixBIOS Setup Utility			
Main			
Processor Information		Item Specific Help	
*** CPU1 : Brand Intel(R) Xeon(TM) CPU 2.83GHz Speed 2.80 GHz Ratio Actual 17 Max 17 Cache L1/32 KB L2/4096 KB ID/uCode 0F64h/02h		All items on this menu cannot be modified in user mode. If any items require changes, please consult your system Supervisor.	
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults
ESC Exit	→← Select Menu	Enter Select ► Sub-Menu	F10 Save and Exit

System Memory Information

Displays the auto-detected system memory information.

PhoenixBIOS Setup Utility			
Main			
System Memory Information		Item Specific Help	
Speed : DDR2 533 Total Memory: 1024MB DIMM 00-- 512MB, AMB Temperature: 98 DIMM 01-- 512MB, AMB Temperature: 70 DIMM 10-- None DIMM 11-- None DIMM 20-- None DIMM 21-- None DIMM 30-- None DIMM 31-- None		All items on this menu cannot be modified in user mode. If any items require changes, please consult your system Supervisor.	
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults
ESC Exit	→← Select Menu	Enter Select ► Sub-Menu	F10 Save and Exit

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.

PhoenixBIOS Setup Utility					
Main	Advanced	Server	Security	Boot	Exit
<div>WARNING: Setting wrong value in below sections may cause system to malfunction.</div> <div><div>▶ Advanced Processor Options</div><div>▶ Chipset Configuration</div><div>▶ PCI Configuration</div><div>▶ ICH USB Control Sub-Menu</div><div>▶ Peripheral Devices Configuration</div><div>▶ ACPI Configuration</div><div>▶ Power On Configuration</div><div>▶ Hardware Monitor</div></div>				<div>Item Specific Help</div> <div>Options for CPU</div>	
F1 Help	↑↓	Select Item	~/+ Change Values	F9 Setup Defaults	
ESC Exit	→←	Select Menu	Enter Select ▶ Sub-Menu	F10 Save and Exit	

5.4.1 Advanced Processor Options

If you install a 5000 series CPU, the BIOS screen appears as the following.

PhoenixBIOS Setup Utility					
Advanced					
Advanced Processor Options				Item Specific Help	
Multiprocessor Specification		[1.4]		Configures the MP Specification revision level. Some operating systems will require 1.1 for compatibility reasons.	
Frequency Ratio		[Default]			
Hyperthreading:		[Enabled]			
Intel (R) Virtualization Technology		[Enabled]			
Machine Checking		[Enabled]			
Fast String operations		[Enabled]			
Compatible FPU Code		[Disabled]			
Split Lock operations		[Enabled]			
C1 Enhanced Mode		[Enabled]			
No Execute Mode Mem Protection		[Enabled]			
Adjacent Cache Line Prefetch		[Enabled]			
Set Max Ext CPUID = 3		[Disabled]			
Echo TPR		[Disabled]			
F1 Help	↑↓	Select Item	~/+ Change Values	F9 Setup Defaults	
ESC Exit	→←	Select Menu	Enter Select ▶ Sub-Menu	F10 Save and Exit	

Scroll down to display the following items:

Advanced Processor Options				Item Specific Help	
Discrete MTRR Allocation		[Disabled]			
Intel EIST support:		[Disabled]			
F1:Help	↑↓	: Select Item	~/+: Change Value	F5: Setup Defaults	
ESC: Exit	→←	: Select Menu	Enter: Select SubMenu	F10: Save and Exit	

Multiprocessor Specification [1.4]

Allows you to configure the MP Specification revision level.

Configuration options: [1.1] [1.4]

Frequency Ratio [Default]

Allows you to select the processor frequency ratio.

Configuration options: [Default] [X 12] [X 13] [X 14] [X 15] [X 16] [X 17]



The configuration options of **Frequency Ratio** may vary according to your CPU.

Hyperthreading [Enabled]

Allows you to enable or disable the Intel® Hyper-Threading Technology feature.

Configuration options: [Disabled] [Enabled]

Intel(R) Virtualization Technology [Enabled]

Configuration options: [Disabled] [Enabled]

***Machine Checking [Enabled]**

Configuration options: [Disabled] [Enabled]

***Fast String operations [Enabled]**

Configuration options: [Disabled] [Enabled]

***Compatible FPU Code [Disabled]**

Configuration options: [Disabled] [Enabled]

***Split Lock operations [Enhanced]**

Configuration options: [Enabled] [Disabled]

C1 Enhanced Mode [Enabled]

Allows you to enable or disable C1E mode. In C1E mode, the CPU power consumption is lower when idle. Configuration options: [Disabled] [Enabled]

No Execute Mode Mem Protection [Enabled]

Configuration options: [Enabled] [Disabled]

Adjacent Cache Line Prefetch [Enabled]

Configuration options: [Enabled] [Disabled]

Set Max Ext CPUID = 3 [Disabled]

Enable this item to boot legacy operating systems that cannot support CPUs with extended CPUID functions. Configuration options: [Disabled] [Enabled]

Echo TPR [Disabled]

Configuration options: [Enabled] [Disabled]

Discrete MTRR Allocation [Disabled]

Configuration options: [Disabled] [Enabled]

Intel EIST support [Disabled]

Enables or disables EIST support. When enabled, this item allows the CPU P state to dynamically change based on system loading.

Configuration options: [Disabled] [Enabled]



- The appearance of the **Intel EIST support** item depends on the CPU SKU.
- Items above with * mark are for technical personnel to debug only.

If you install a 5200/5400 series CPU, the BIOS screen appears as the following.

PhoenixBIOS Setup Utility			
Advanced			
Advanced Processor Options		Item Specific Help	
Multiprocessor Specification	[1.4]	Configures the MP Specification revision level. Some operating systems will require 1.1 for compatibility reasons.	
Numbers of Stop Grant	[Per Core]		
Intel(R) Virtualization Technology	[Enabled]		
Machine Checking	[Enabled]		
Fast String Operations	[Enabled]		
Compatible FPU Code	[Disabled]		
Split Lock operations	[Enabled]		
Thermal Management 2	[Enabled]		
C1 Enhanced Mode	[Enabled]		
No Execute Mode Mem Protection	[Enabled]		
Adjacent Cache Line Prefetch	[Enabled]		
Set Max Ext CPUID = 3	[Disabled]		
Echo TPR	[Disabled]		
F1: Help	↑↓ : Select Item	-/+ : Change Value	F5: Setup Defaults
ESC: Exit	→← : Select Menu	Enter: Select SubMenu	F10: Save and Exit

Scroll down to display the following items:

Advanced Processor Options		Item Specific Help	
Discrete MTRR Allocation	[Disabled]		
Intel EIST support:	[Disabled]		
F1: Help	↑↓ : Select Item	-/+ : Change Value	F5: Setup Defaults
ESC: Exit	→← : Select Menu	Enter: Select SubMenu	F10: Save and Exit

Multiprocessor Specification [1.4]

Allows you to configure the MP Specification revision level.

Configuration options: [1.1] [1.4]

Numbers of Stop Grant [Per Core]

Configuration options: [Per Core] [Single]

Intel(R) Virtualization Technology [Enabled]

Configuration options: [Disabled] [Enabled]

***Machine Checking [Enabled]**

Configuration options: [Disabled] [Enabled]

***Fast String operations [Enabled]**

Configuration options: [Disabled] [Enabled]

***Compatible FPU Code [Disabled]**

Configuration options: [Disabled] [Enabled]

***Split Lock operations [Enabled]**

Configuration options: [Disabled] [Enabled]

Thermal Management 2 [Enabled]

Configuration options: [Disabled] [Enabled]

C1 Enhanced Mode [Enabled]

Allows you to enable or disable C1E mode. In C1E mode, the CPU power consumption is lower when idle. Configuration options: [Disabled] [Enabled]

No Execute Mode Mem Protection [Enabled]

Configuration options: [Enabled] [Disabled]

Adjacent Cache Line Prefetch [Enabled]

Configuration options: [Enabled] [Disabled]

Set Max Ext CPUID = 3 [Disabled]

Enable this item to boot legacy operating systems that cannot support CPUs with extended CPUID functions. Configuration options: [Disabled] [Enabled]

Echo TPR [Disabled]

Configuration options: [Disabled] [Enabled]

Discrete MTRR Allocation [Disabled]

Enable this item for better graphics performance when used with Linux and 4 GB or more memory. Configuration options: [Disabled] [Enabled]

Intel EIST support [Disabled]

Enables or disables EIST support. When enabled, this item allows the CPU P state to dynamically change based on system loading.

Configuration options: [Disabled] [Enabled]



- The appearance of the **Intel EIST** support item depends on the CPU SKU.
- Items above with * mark are for technical personnel to debug only.

5.4.2 Chipset Configuration

This menu shows the chipset configuration settings. Select an item then press <Enter> to display a pop-up menu with the configuration options.

PhoenixBIOS Setup Utility			
Advanced			
Chipset Configuration			Item Specific Help
Crystal Beach Configure Enable		[Enabled]	Enable Configuration/ Memory mapped accesses to the Crystal Beach Configuration space located in Device 8, Fn 0, and Fn 1.
SERR signal condition		[None]	
Demand Scrub Enable		[Enabled]	
Patrol Scrub Enable		[Enabled]	
4GB PCI Hole Granularity		[256 MB]	
Memory Branch Mode		[Interleave]	
Branch 0 Rank Interleave		[4:1]	
Branch 0 Rank Sparing		[Disabled]	
Enhanced x8 Detection		[Enabled]	
Force ITK Config Clocking		[Disabled]	
FBDIMM(s) Thermal Throttling		[Closed Loop]	
Open Loop Type		[User Define]	
Environment Temperature		[25 °C]	
F1 Help	↑↓ Select Item	~/+ Change Values	F9 Setup Defaults
ESC Exit	→← Select Menu	Enter Select ▶ Sub-Menu	F10 Save and Exit

Scroll down to display the following items:

Chipset Configuration		Item Specific Help	
Temperature Rise	[25 °C]		
FBDIMM(s) Air Flow	[2.0]		
F1: Help	↑↓ : Select Item	-/+ : Change Value	F5: Setup Defaults
ESC: Exit	→← : Select Menu	Enter: Select SubMenu	F10: Save and Exit

Crystal Beach Configure Enable [Enabled]

Allows you to enable or disable the Configuration/Memory mapped accesses to the Crystal Beach Configuration space located in Device 8, Fn 0, and Fn 1. Configuration options: [Disabled] [Enabled]

SERR signal condition [None]

Allows you to select the ECC error that the SERR# asserts. Configuration options: [None] [Single bit] [Multiple bit] [Both]

Demand Scrub Enable [Enabled]

Enables or disables the Demand Scrubbing. Configuration options: [Disabled] [Enabled]

Patrol Scrub Enable [Enabled]

Enables or disables the Patrol Scrubbing. Configuration options: [Disabled] [Enabled]

4GB PCI Hole Granularity [256 MB]

Allows you to select the granularity of the PCI hole for PCI resource. Configuration options: [256 MB] [512 MB] [1.0 GB]

Memory Branch Mode [Interleave]

Allows you to select the memory branch mode.

Configuration options: [Sequential] [Interleave] [Single channel 0]

Branch 0 Rank Interleave [4:1]

Allows you to select the Branch 0 Rank Interleave. This item does not appear when the **Memory Branch Mode** is set to [Sequential].

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

Branch 0 Rank Sparing [Disabled]

Allows you to enable or disable the Branch 0 rank/DIMM Sparing feature. This item does not appear when the **Memory Branch Mode** is set to [Sequential].

Configuration options: [Disabled] [Enabled]

Enhanced x8 Detection [Enabled]

Allows you to enable or disable the enhanced x8 DRAM UC error detection.

Configuration options: [Disabled] [Enabled]

Force ITK Config Clocking [Disabled]

Allows you to enable or disable the FBD configuration for ITK test suite.

Configuration options: [Disabled] [Enabled]

FBDIMM(s) Thermal Throttling [Closed Loop]

Allows you to disable or set the thermal throttling control.

Configuration options: [Open Loop] [Closed Loop] [ASUS MemCool FAN] [Disabled]



Set this item to [ASUS MemCool FAN] for a better fan management.

Open Loop Type [User Define]

Allows you to select the Open Loop Type.

Configuration options: [Best Performance] [Best Acoustic] [User Define]



The following items only appear when you set the **Open Loop Type** to [User Define].

Environment Temperature [25 °C]

Allows you to select the Environment Temperature value.

Configuration options: [20 °C]~[40 °C]

Temperature Rise [25 °C]

Allows you to select the Temperature Rise value.

Configuration options: [10 °C]~[30 °C]

FBDIMM(s) Air Flow [2.0]

Allows you to select the Air Flow value.

Configuration options: [1.0] [1.5]~[4.5] [5.0]

5.4.3 PCI Configuration

This menu shows the PCI configuration settings. Select an item then press <Enter> to display the configuration options.

PhoenixBIOS Setup Utility		
Advanced		
PCI Configuration		Item Specific Help
Reset Configuration Data:	[No]	Select 'Yes' if you want to clear the Extended System Configuration Data (ESCD) area.
Plug & Play OS	[No]	
Palette Snooping	[Disabled]	
▶ PCIEX1 Slot		
▶ PCIEX2 Slot		
▶ PCI3 Slot		
▶ PCIE4 Slot		
▶ PCIE5 Slot		
F1 Help	↑↓ Select Item	~/+ Change Values
ESC Exit	→← Select Menu	Enter Select ▶ Sub-Menu
F9 Setup Defaults		F10 Save and Exit

Reset Configuration Data [No]

This item allows you to clear the Extended System Configuration Data (ESCD) area. Configuration options: [No] [Yes]

Plug & 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]

Palette Snooping [Disabled]

When set to [Enabled], the palette snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Configuration options: [Disabled] [Enabled]

PCI1-2 Slot; PCI3 Slot; PCIE4-5 Slot

Allows you to configure the specific PCI devices.

PhoenixBIOS Setup Utility		
Advanced		
PCI1 Slot		Item Specific Help
Option ROM Scan:	[Enabled]	Initialize device expansion ROM

Option ROM Scan [Enabled]

Allows you to enable or disable the device expansion ROM.

Configuration options: [Enabled] [Disabled]

5.4.4 ICH USB Control Sub-Menu

The items in this menu allow you to display the USB configuration settings. Select an item then press <Enter> to display the configuration options.

PhoenixBIOS Setup Utility		
Advanced		
ICH USB Control Sub-Menu		Item Specific Help
USB Function	[Enabled]	Enable USB host controller.
USB 2.0 Controller	[Enabled]	
Legacy USB Support:	[Enabled]	
F1 Help	↑↓ Select Item	-/+ Change Values
ESC Exit	→← Select Menu	Enter Select ► Sub-Menu
		F9 Setup Defaults
		F10 Save and Exit

USB Function [Enabled]

Allows you to enable the USB host controller.

Configuration options: [Disabled] [Enabled]



The following items appear only if you enable the **USB Function** item.

USB 2.0 Controller [Enabled]

Allows you to enable or disable the USB 2.0 controller. Setting this item to [Enabled] allows the built-in high speed USB support in the BIOS to turn on automatically when you install high speed USB devices.

Configuration options: [Disabled] [Enabled]

Legacy USB Support [Enabled]

Allows you to enable or disable support for USB devices on legacy operating systems (OS). Setting to [Enabled] 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]

5.4.5 Peripheral Devices Configuration

This menu shows the peripheral devices configuration settings. Select an item then press <Enter> to display the configuration options.

PhoenixBIOS Setup Utility		
Advanced		
Peripheral Devices Configuration		Item Specific Help
COM1 port:	[Enabled]	Configure COM1 port using options:
Base I/O address:	[3F8]	
Interrupt:	[IRQ 4]	
COM2 port:	[Enabled]	[Disabled]
Mode:	[Normal]	No configuration
Base I/O address:	[2F8]	[Enabled] User configuration
Interrupt:	[IRQ 3]	
Parallel port:	[Enabled]	[Auto] BIOS or OS chooses configuration
Base I/O address:	[378]	
Interrupt:	[IRQ 7]	
Mode:	[ECP]	(OS Controlled) Displayed when controlled bt OS
DMA channel	[DMA 3]	
Floppy disk controller	[Enabled]	
F1 Help	↑↓ Select Item	~/+ Change Values
ESC Exit	→← Select Menu	Enter Select ► Sub-Menu
F9 Setup Defaults		F10 Save and Exit

COM1 port [Enabled]

Allows you to configure COM1 port.

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

Base I/O address [3F8]

Allows you to select the base I/O address for COM1 port.

Configuration options: [3F8] [2F8] [3E8] [2E8]

Interrupt [IRQ 4]

Allows you to set the interrupt for COM1 port.

Configuration options: [IRQ 3] [IRQ 4]

COM2 port [Enabled]

Allows you to configure COM2 port.

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

Mode [Normal]

Allows you to set the mode for COM2 port.

Configuration options: [Normal] [IR] [ASK-IR]

Base I/O address [2F8]

Allows you to select the base I/O address for COM2 port.

Configuration options: [3F8] [2F8] [3E8] [2E8]

Interrupt [IRQ 3]

Allows you to set the interrupt for COM2 port.

Configuration options: [IRQ 3] [IRQ 4]

Parallel port [Enabled]

Allows you to configure the parallel port.

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

Base I/O address [378]

Allows you to select the base I/O address for the parallel port.

Configuration options: [378] [278] [3BC]

Interrupt [IRQ 7]

Allows you to set the interrupt for the parallel port.

Configuration options: [IRQ 5] [IRQ 7]

Mode [ECP]

Allows you to set the mode for the parallel port.

Configuration options: [Output only] [Bi-directional] [EPP] [ECP]

DMA channel [DMA 3]

Allows you to set the DMA channel for the parallel port.

Configuration options: [DMA 1] [DMA 3]

Floppy disk controller [Enabled]

Allows you to configure the floppy disk controller.

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

5.4.6 ACPI Configuration

This menu shows the Advanced Configuration and Power Interface (ACPI) configuration settings. Select an item then press <Enter> to display the configuration options.

PhoenixBIOS Setup Utility		
Advanced		
ACPI Configuration		Item Specific Help
ACPI Version Features	[ACPI v1.0]	Enable RSDP pointers to 64-bit Fixed System Description Tables.
Headless Mode	[Disabled]	
ACPI EMS Support	[Disabled]	
F1 Help	↑↓ Select Item	-/+ Change Values
ESC Exit	→← Select Menu	Enter Select ▶ Sub-Menu
		F9 Setup Defaults
		F10 Save and Exit

ACPI Version Features [ACPI v1.0]

Allows you to enable RSDP pointers to 64-bit fixed system description tables.
Configuration options: [ACPI v1.0] [ACPI v2.0] [ACPI v3.0]

Headless Mode [Disabled]

Allows you to enable or disable the headless operation mode through ACPI.
Configuration options: [Disabled] [Enabled]

ACPI EMS Support [Disabled]

Allows you to enable or disable the ACPI EMS support.
Configuration options: [Disabled] [Enabled]

5.4.7 Power On Configuration

This menu shows the power configuration settings. Select an item then press <Enter> to display the configuration options.

PhoenixBIOS Setup Utility			
Advanced			
Power On Configuration		Item Specific Help	
Restore on AC Power Loss	[Last State]	Configures the system state after recovering from power failure.	
Power On By PME#	[Disabled]		
Power On By RTC Alarm	[Disabled]		
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults
ESC Exit	→← Select Menu	Enter Select ► Sub-Menu	F10 Save and Exit

Restore on AC Power Loss [Last State]

When set to [Power Off], the system goes into “off state” after an AC power interruption. When set to [Power On], the system turns on automatically after a power interruption. When set to [Last State], the system goes into whatever was the system state (on or off) before the power interruption.

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

Power On By PME# [Disabled]

Allows you to enable or disable the PME and onboard LAN to generate a wake-up event. Configuration options: [Disabled] [Enabled]

Power On By 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 if you enable the **Power On By RTC Alarm** item.

RTC Alarm Date [0]

To set the date of alarm, highlight this item and press <Enter> to display a date chart. Press <+> or <-> to change scroll through the options, then press <Enter> when done. The default setting [0] is equivalent to everyday alarm.

Configuration options: [0] [1] ~ [31]

RTC Alarm Date [00 : 00 : 00]

To set the time of alarm:

1. Press <+> or <-> to set the desired value.
2. Use the left/right arrow key or press <Tab> to move to the next field.
3. Press <Enter> when done.

5.4.8 Hardware Monitor

This menu shows the hardware monitor configuration settings. Select an item then press <Enter> to display the configuration options.



The following screens appear when you install Intel® 5000 series CPU.

PhoenixBIOS Setup Utility		
Advanced		
Hardware Monitor		Item Specific Help
CPU1 Domain 0 Temperature	39°C/102°F	To select the fan speed control model.
CPU1 Domain 1 Temperature	29°C/84°F	
CPU2 Domain 0 Temperature	N/A	
CPU2 Domain 1 Temperature	N/A	
SYSTEM1 Temperature	39°C/102°F	
SYSTEM2 Temperature	29°C/84°F	
CPU_FAN1 Speed	3417 RPM	
CPU_FAN2 Speed	N/A	
FRN_FAN1 Speed	N/A	
FRN_FAN2 Speed	N/A	
FRN_FAN3 Speed	N/A	
FRN_FAN4 Speed	N/A	
REAR_FAN1 Speed	N/A	
REAR_FAN2 Speed	N/A	
Smart Fan Control	[Smart Fan II]	

F1	Help	↑↓	Select Item	-/+	Change Values	F9	Setup Defaults
ESC	Exit	→←	Select Menu	Enter	Select ▶ Sub-Menu	F10	Save and Exit

Scroll down to display more items:

PhoenixBIOS Setup Utility		
Advanced		
Hardware Monitor		Item Specific Help
CPU1 Domain 0 Target Temperature	[76 °C]	Full fan speed will be started when the temperature reaches the selected target value.
CPU1 Domain 1 Target Temperature	[76 °C]	
CPU2 Domain 0 Target Temperature	[76 °C]	
CPU2 Domain 1 Target Temperature	[76 °C]	
SYSTEM1 Target Temperature	[70 °C]	
SYSTEM2 Target Temperature	[7 0 ° C]	
FBD FAN1 Speed	N/A	
VCORE0 Voltage	N/A	
VCORE1 Voltage	1.24 V	
VTT	1.22 V	
+1.5V	1.48 V	
+1.8V	1.82 V	
+3V	3.34 V	
+12V	12.28 V	
+5V	5.11 V	
+5VSB	5.11 V	
VBAT	3.07 V	
F1 Help	↑↓ Select Item	-/+ Change Values
ESC Exit	→← Select Menu	Enter Select ► Sub-Menu
		F9 Setup Defaults
		F10 Save and Exit



The following screens appear when you install Intel® 5200 and 5400 series CPU.

PhoenixBIOS Setup Utility		
Advanced		
Hardware Monitor		Item Specific Help
CPU1 Temperature	39°C/102°F	To select the fan speed control model.
CPU2 Temperature	N/A	
SYSTEM1 Temperature	39°C/102°F	
SYSTEM2 Temperature	29°C/84°F	
CPU FAN1 Speed	2925 RPM	
CPU FAN2 Speed	N/A	
FRN FAN1 Speed	N/A	
FRN FAN2 Speed	N/A	
FRN FAN3 Speed	N/A	
FRN FAN4 Speed	N/A	
FRN_FAN1 Speed	N/A	
REAR_FAN1 Speed	N/A	
REAR_FAN2 Speed	N/A	
Smart Fan Control	[Smart Fan II]	
CPU1 Target Temperature	[66 °C]	
CPU2 Target Temperature	[66 °C]	
F1 Help	↑↓ Select Item	-/+ Change Values
ESC Exit	→← Select Menu	Enter Select ► Sub-Menu
		F9 Setup Defaults
		F10 Save and Exit

Scroll down to display more items:

PhoenixBIOS Setup Utility			
Advanced			
Hardware Monitor			Item Specific Help
SYSTEM1 Target Temperature	[60 °C]		Full fan speed will be started when the temperature reaches the selected target value.
SYSTEM2 Target Temperature	[6 0 ° C]		
FBD_FAN1 Speed	N/A		
VCORE0 Voltage	N/A		
VCORE1 Voltage	1.25 V		
VTT	1.21 V		
+1.5V	1.56 V		
+1.8V	1.79 V		
+3V	3.28 V		
+12V	11.91 V		
+5V	4.87 V		
+5VSB	4.96 V		
VBAT	3.10 V		
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults
ESC Exit	→← Select Menu	Enter Select ▶ Sub-Menu	F10 Save and Exit

**CPU1/2 Domain 0/1 Temperature (CPU1/2 Target Temperature),
SYSTEM1/2 Temperature, CPU_FAN1/2 Speed, FRN_FAN1/2/3/4
Speed, REAR_FAN1/2 Speed**

These fields show the auto-detected values and are not user-configurable. If no CPU or fan is installed, the field shows N/A.

Smart Fan Control [Smart Fan II]

Allows you to disable or configure the Smart Fan feature.

Configuration options: [Disabled] [Smart Fan] [Smart Fan II]

**CPU1/2 Domain 0/1 Target Temperature
(CPU1/2 Target Temperature)**

Allows you to set the target CPU temperature at which the CPU fan will start running if the fan is not yet turned on. Configuration options: [54 °C]~[76 °C]

SYSTEM1/2 Target Temperature

Allows you to set the target sytem temperature at which the system fan will start running if the fan is not yet turned on.

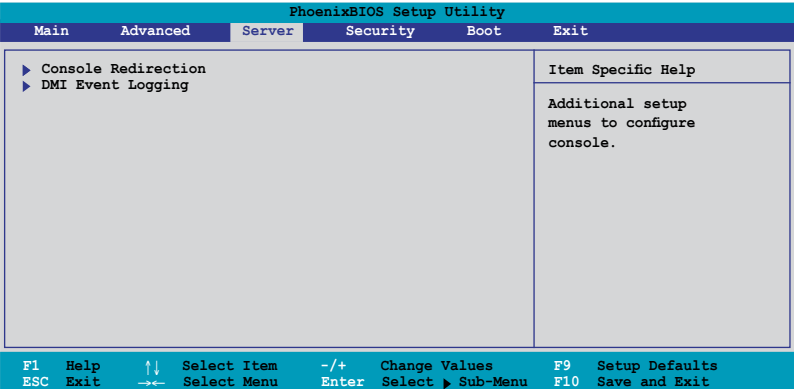
Configuration options: [49 °C]~[70 °C]

**FBD_FAN1 Speed, VCORE0/1 Voltage, VTT, +1.5V, +1.8V, +3V, +12V,
+5V, +5VSB, VBAT**

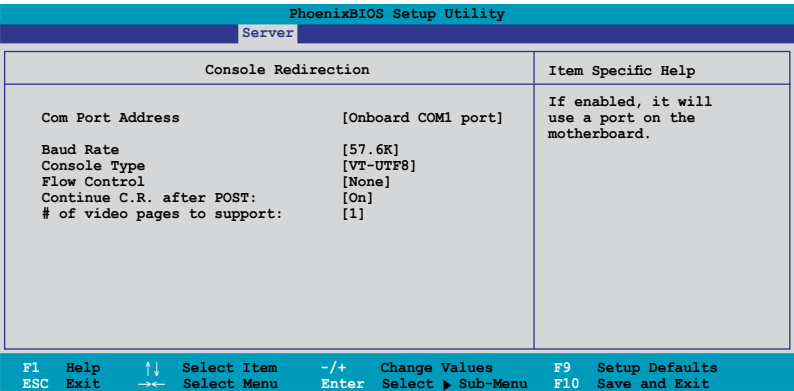
These fields show the auto-detected values and are not user-configurable.

5.5 Server menu

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



5.5.1 Console Redirection



Com Port Address [Onboard COM1 port]

Allows you to disable or select the COM port to use.
Configuration options: [Disabled] [Onboard COM1 port] [Onboard COM2 port]



The following items appear only if you set the **Com Port Address** item to [Onboard COM1 port] or [Onboard COM2 port].

Baud Rate [57.6K]

Allows you to enable the specified baud rate.

Configuration options: [300] [1200] [2400] [9600] [19.2K] [38.4K] [57.6K] [115.2K]

Console Type [VT-UTF8]

Allows you to enable the specified console type.

Configuration options: [VT100] [VT100, 8bit] [PC-ANSI, 7bit] [PC ANSI] [VT100+] [VT-UTF8] [ASCII]

Flow Control [None]

Allows you to select the flow control for console redirection.

Configuration options: [None] [XON/XOFF] [CTS/RTS]

Continue C.R. after POST [On]

Set this item to [On] if you want console redirection to continue after the operating system has loaded. Configuration options: [Off] [On]

of video pages to support [1]

Allows you to set the number of video pages to allocate for console redirection when the video hardware is not available. Press <-> or <+> to set the value, or enter the value using the numeric keypad. Configuration options: [1] ~ [8]

5.5.2 DMI Event Logging

PhoenixBIOS Setup Utility		
Server		
DMI Event Logging		Item Specific Help
Event log validity	Valid	View the contents of the DMI event log.
Event log capacity	Space Available	
View DMI event log	[Enter]	
Event Logging	[Enabled]	
ECC Event Logging	[Enabled]	
Mark DMI events as read	[Enter]	
Clear all DMI event logs	[No]	
F1 Help	↑↓ Select Item	-/+ Change Values
ESC Exit	→← Select Menu	Enter Select ► Sub-Menu
F9 Setup Defaults		F10 Save and Exit

Event log validity, Event log capacity

Displays the auto-detected system information.

View DMI event log [Enter]

Press <Enter> to view the contents of the DMI event log.

Event Logging [Enabled]

Enables or disables to allow logging of DMI events.

Configuration options: [Disabled] [Enabled]

ECC Event Logging [Enabled]

Enables or disables to allow logging of ECC events.

Configuration options: [Disabled] [Enabled]

Mark DMI events as read [Enter]

Press <Enter> to mark all DMI events in the event log as read.

Clear all DMI event logs [No]

Allows you to keep or clear the DMI event log after rebooting.

Configuration options: [No] [Yes]

5.6 Security menu

PhoenixBIOS Setup Utility					
Main	Advanced	Server	Security	Boot	Exit
Supervisor Password Is:			Clear	Item Specific Help	
User Password Is:			Clear		
Set Supervisor Password			[Enter]	Supervisor Password controls access to the setup utility.	
Set User Password			[Enter]		
Password Check			[Setup]		
Password Lock Mode			[Disabled]		
Removable Device Boot			[Enabled]		
Flash Write			[Enabled]		
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults		
ESC Exit	→← Select Menu	Enter Select	▶ Sub-Menu	F10 Save and Exit	

Supervisor Password Is: [Clear]

User Password Is: [Clear]

These fields allow you to set passwords:

To set a password:

1. Select an item then press <Enter>.
2. When prompted, type in a password using a combination of a maximum of eight (8) alpha-numeric characters, then press <Enter>.
3. Confirm the password by typing the exact characters again, then press <Enter>. The password field setting is changed to **Set**.

To clear the password:

1. Select the item **Set Supervisor Password** or **Set User Password**, depending on which password you want to clear. Press <Enter>.

The following message appears:

PhoenixBIOS Setup Utility					
Main	Advanced	Server	Security	Boot	Exit
Supervisor Password Is:			Set	Item Specific Help	
User Password Is:			Clear		
Set Supervisor Password			[Enter]	Supervisor Password controls access to the setup utility.	
Set User Password			[Enter]		
Password Check					
Password Lock Mode					
Removable Device Boot					
Flash Write					
<div style="border: 2px solid black; padding: 10px; margin: 10px auto; width: 80%;"> <p style="text-align: center;">Set Supervisor Password</p> <p>Enter Current Password []</p> <p>Enter New Password []</p> <p>Confirm New Password []</p> </div>					
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults		
ESC Exit	→← Select Menu	Enter Select	▶ Sub-Menu	F10 Save and Exit	

2. In the **Enter Current Password** field, type in your current password. Press <Enter>.
3. The cursor moves to the next field, **Enter New Password**. Press <Enter>. Do not type anything in this field.
4. The cursor moves to the next field, **Confirm New Password**. Press <Enter>. Do not type anything in this field.
5. When the confirmation message “Changes have been saved.” appears, press <Enter>.

The display returns to the Security menu. Note that the password field on top is changed to **Clear**.

A note about passwords

The Supervisor password is required to enter the BIOS Setup program preventing unauthorized access. The User password is required to boot the system preventing unauthorized use.

Forgot your password?

If you forget your password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. The RAM data containing the password information is powered by the onboard button cell battery. If you need to erase the CMOS RAM, refer to section “4.2 Jumpers” for instructions.

Password Check [Setup]

This field requires you to enter the password before entering the BIOS setup or the system. Select [Setup] to require the password before entering the BIOS Setup. Select [Always] to require the password before entering the BIOS Setup and the system. Configuration options: [Setup] [Always]

Password Lock Mode [Enabled]

When set to [Enabled], the keyboard is locked and the user has no privilege to launch the BIOS setup utility when installing adapter cards during option ROM initialization. Configuration options: [Disabled] [Enabled]

Removable Device Boot [Enabled]

Allows you to enable or disable booting from a legacy floppy, USB floppy, or IDE optical drive. Configuration options: [Disabled] [Enabled]

Flash Write [Enabled]

Set this item to [Disabled] to write-protect the BIOS flash memory. Configuration options: [Disabled] [Enabled]

5.7 Boot menu

PhoenixBIOS Setup Utility					
Main	Advanced	Server	Security	Boot	Exit
▶ Boot Device Priority				Item Specific Help	
▶ Boot Features				Specify the boot priority sequence of all boot devices.	
F1	Help	↑↓	Select Item	~/+	Change Values
ESC	Exit	→←	Select Menu	Enter	Select ▶ Sub-Menu
F9	Setup Defaults			F10	Save and Exit

5.7.1 Boot Device Priority

PhoenixBIOS Setup Utility					
				Boot	
Boot Device Priority				Item Specific Help	
Boot priority order: 1: Legacy Floppy Drives 2: PCI BEV: IBA GE Slot 0500 v 1236 3: PCI BEV: IBA GE Slot 0501 v 1236 4: 5: 6: 7: 8: Excluded from boot order:				Keys used to view or configure devices: Up and Down arrows select a device. <+> and <-> moves the device up or down. <f> and <r> specifies the device as fixed or removable. <x> excludes or includes the device to boot. <Shift + l> enables or disables a device. <1 - 4> Loads default boot sequence.	
F1	Help	↑↓	Select Item	~/+	Change Values
ESC	Exit	→←	Select Menu	Enter	Select ▶ Sub-Menu
F9	Setup Defaults			F10	Save and Exit

Refer to the following table for keys assigned to configure devices.

Key/s	Use this key to...
<Up arrow> / <Down arrow>	select a device.
<+> / <->	move the device up or down.
<f> / <r>	specify the device as fixed or removable.
<x>	exclude or include the device to boot.
<Shift + 1>	enable or disable the device.
<1 - 4>	load default boot sequence.

5.7.2 Boot Features

PhoenixBIOS Setup Utility		
		Boot
Boot Features		Item Specific Help
Quick Boot	[Enabled]	Allows the BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
Full Logo Display	[Enabled]	
Bootup Num-Lock	[On]	
PS/2 Mouse	[Auto Detect]	
Summary screen:	[Enabled]	
POST Errors	[Enabled]	
SETUP prompt	[Enabled]	
Interrupt 19 Capture	[Enabled]	
F1 Help	↑↓ Select Item	-/+ Change Values
ESC Exit	→← Select Menu	Enter Select ► Sub-Menu
F9 Setup Defaults		F10 Save and Exit

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 Logo Display [Enabled]

Allows you to enable or disable the full screen logo display feature.
Configuration options: [Disabled] [Enabled]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.
Configuration options: [Auto] [On] [Off]

PS/2 Mouse [Auto Detect]

Allows you to enable or disable support for PS/2 mouse.
Configuration options: [Disabled] [Enabled] [Auto Detect]

Summary screen: [Enabled]

When this item is enabled, the system configuration is displayed during POST.
Configuration options: [Disabled] [Enabled]

POST Errors [Enabled]

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

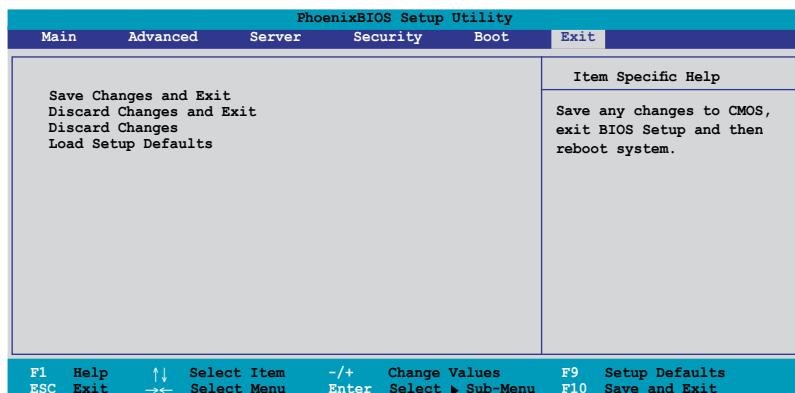
SETUP prompt [Enabled]

When this item is 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]

5.8 Exit menu



Save Changes and Exit

Select this option then press <Enter>, or simply press <F10>, to save your changes to CMOS before exiting the Setup utility.

When a confirmation window appears:

- select [Yes], then press <Enter> to save and exit.
- select [No], then press <Enter>, or simply press <Esc>, to cancel the command and return to the Exit menu.

Discard Changes and Exit

Select this option then press <Enter> if you wish to exit the Setup utility without saving your changes.

When a confirmation window appears:

- select [Yes], then press <Enter> to discard your changes and exit.
- select [No], then press <Enter>, or simply press <Esc>, to cancel the command and return to the Exit menu.

Discard Changes

Select this option to discard the changes that you made, and restore the previously saved values.

When a confirmation window appears:

- select [Yes], then press <Enter> to discard any changes and load the previously saved values.
- select [No], then press <Enter>, or simply press <Esc>, to cancel the command and return to the Exit menu.

Load Setup Defaults

Select this option then press <Enter>, or simply press <F9>, to load the optimized values for each of the Setup menu items.

When a confirmation window appears:

- select [Yes], then press <Enter> to load the default values.
- select [No], then press <Enter>, or simply press <Esc>, to cancel the command and return to the Exit menu.

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 following RAID solutions:

- Intel Matrix Storage Manager embedded in the Intel 6321ESB Southbridge supports Serial ATA hard disk drives and RAID0, RAID1, RAID0+1 and RAID5 configurations.
- LSI1068 PCI-X SAS controller supports SAS disk drives and RAID0, RAID1, and RAID1E configuration.

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 1-E (*Enhanced RAID 1*) has a striped layout with each stripe unit having a secondary (or alternate) copy stored on a different disk. You can use three or more hard disk drives for this configuration.

RAID 0+1 is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 0+1 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

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.



If you want to boot the system from a hard disk drive included in a created RAID set, copy first the RAID driver from the support CD to a floppy disk before you install an operating system to the selected hard disk drive.

6.1.2 Installing hard disk drives

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

6.1.3 Setting the RAID item in BIOS

You must set the RAID item in the BIOS Setup before you can create a RAID set from SATA hard disk drives attached to the SATA connectors supported by the Intel® 6321ESB Southbridge chip. To do this:

1. Enter the BIOS Setup during POST.
2. Go to the **Main Menu > IDE Configuration > S-ATA Configuration**, then press <Enter>.
3. Set the **SATA Controller Mode Option** item to [Enhanced], then press <Enter>.
4. Set the **SATA RAID Enable** item to [Enabled].
5. Save your changes, then exit the BIOS Setup.



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

6.1.4 RAID configuration utilities

Depending on the RAID connectors that you use, you can create a RAID set using the utilities embedded in each RAID controller. For example, use the **Intel® Matrix Storage Manager** if you installed Serial ATA hard disk drives on the Serial ATA connectors supported by the Intel® 6321ESB Southbridge.

You may use the **LSI1068 SAS Configuration Utility** if you installed SAS hard disk drives to the mini-SAS connector(s) supported by the LSI1068 PCI-X SAS controller.

Refer to the succeeding sections for details on how to use each RAID configuration utility.

6.2 Intel® Matrix Storage Manager Option ROM Utility

The Intel® Matrix Storage Manager Option ROM utility allows you to create RAID 0, RAID 1, RAID 0+1, and RAID 5 set(s) from Serial ATA hard disk drives.

To enter the Intel® Matrix Storage Manager Option ROM Utility:

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

```
Intel(R) Matrix Storage Manager option ROM v5.6.2.1002 ESB2
Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.

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

[ DISK/VOLUME INFORMATION ]

RAID Volumes:
None defined.

Physical Disks:
Port    Drive Model    Serial #    Size    Type/Status (Vol ID)
0       XXXXXXXXXXXX   XXXXXXXX   XX.XXGB  Non-RAID Disk
1       XXXXXXXXXXXX   XXXXXXXX   XX.XXGB  Non-RAID Disk
2       XXXXXXXXXXXX   XXXXXXXX   XX.XXGB  Non-RAID Disk
3       XXXXXXXXXXXX   XXXXXXXX   XX.XXGB  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 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.



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

6.2.1 Creating a RAID 0 set (Stripe)

To create a RAID 0 set:

1. From the utility main menu, select **1. Create RAID Volume**, then press <Enter>. This screen appears.

Intel(R) Matrix Storage Manager option ROM v5.6.2.1002 ESB2
Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.

[CREATE ARRAY MENU]

Name: Volume0
RAID Level: RAID0 (Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 0.0 GB

Create Volume

[DISK/VOLUME INFORMATION]

Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and cannot contain special characters.

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

2. Enter a name for the RAID 0 set, then press <Enter>.
3. Highlight **RAID Level**, press the up/down arrow key to select **RAID 0 (Stripe)**, then press <Enter>.
4. Highlight the **Disks** item, then press <Enter> to select the hard disk drives you want to include in the RAID set. The **SELECT DISKS** screen appears.

[SELECT DISKS]

Port	Drive	Model	Serial #	Size	Status
0	XXXXXX	XXXXXX		XX.XGB	Non-RAID Disk
1	XXXXXX	XXXXXX		XX.XGB	Non-RAID Disk
2	XXXXXX	XXXXXX		XX.XGB	Non-RAID Disk
3	XXXXXX	XXXXXX		XX.XGB	Non-RAID Disk

Select 2 to 4 disks to use in creating the volume.

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

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

6. Use the up/down arrow key to select the stripe size for the RAID 0 array, then press <Enter>. The available stripe size values range from 4 KB to 128 KB. The default stripe size is 128 KB.



A lower stripe size is recommended for server systems. A higher stripe size is recommended for multimedia computer systems used mainly for audio and video editing.

7. Highlight the **Capacity** item, enter the desired RAID volume capacity, then press <Enter>. The default value indicates the maximum allowed capacity.
8. When the **Create Volume** item is highlighted, press <Enter>. A warning message appears.

WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

Are you sure you want to create this volume? (Y/N) :

9. Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the **Create Array** menu.

6.2.2 Creating a RAID 1 set (Mirror)

To create a RAID 1 set:

1. From the utility main menu, select **1. Create RAID Volume**, then press <Enter>. This screen appears.

```
Intel(R) Matrix Storage Manager option ROM v5.6.2.1002 ESB2
Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.

[ CREATE ARRAY MENU ]

Name: Volume1
RAID Level: RAID1 (Mirror)
Disks: Select Disks
Strip Size: N/A
Capacity: 0.0 GB

Create Volume

[ DISK/VOLUME INFORMATION ]

Enter a string between 1 and 16 characters in length that can be used
to uniquely identify the RAID volume. This name is case sensitive
and cannot contain special characters.

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

2. Enter a name for the RAID 1 set, then press <Enter>.
3. Highlight **RAID Level**, press the up/down arrow key to select **RAID 1 (Mirror)**, then press <Enter>.
4. Follow steps 4 to 5 and 7 to 9 of the previous section to create the RAID 1 set.

6.2.3 Creating a RAID 10 set (Stripe + Mirror)

To create a RAID 10 set:

1. From the utility main menu, select **1. Create RAID Volume**, then press <Enter>. This screen appears.

```
Intel(R) Matrix Storage Manager option ROM v5.6.2.1002 ESB2
Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.

[ CREATE ARRAY MENU ]

Name: Volume1
RAID Level: RAID10 (RAID0+1)
Disks: Select Disks
Strip Size: 128KB
Capacity: 0.0 GB

Create Volume

[ DISK/VOLUME INFORMATION ]

Enter a string between 1 and 16 characters in length that can be used
to uniquely identify the RAID volume. This name is case sensitive
and cannot contain special characters.

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

2. Enter a name for the RAID 10 set, then press <Enter>.
3. Highlight **RAID Level**, press the up/down arrow key to select **RAID 10 (RAID0+1)**, then press <Enter>.
4. Follow steps 4 to 9 of section **6.2.1 Creating a RAID 0 set (striped)** to create the RAID 10 set.

6.2.4 Creating a RAID 5 set (Parity)

To create a RAID 5 set:

1. From the utility main menu, select **1. Create RAID Volume**, then press <Enter>. This screen appears.

```
Intel(R) Matrix Storage Manager option ROM v5.6.2.1002 ESB2
Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.

[ CREATE ARRAY MENU ]

Name: Volumel
RAID Level: RAID5 (Parity)
Disks: Select Disks
Strip Size: 128KB
Capacity: 0.0 GB

Create Volume

[ DISK/VOLUME INFORMATION ]

Enter a string between 1 and 16 characters in length that can be used
to uniquely identify the RAID volume. This name is case sensitive
and cannot contain special characters.

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

2. Enter a name for the RAID 5 set, then press <Enter>.
3. Highlight **RAID Level**, press the up/down arrow key to select **RAID5**, then press <Enter>.
4. Follow steps 4 to 9 of section **6.2.1 Creating a RAID 0 set (striped)** to create the RAID 5 set.

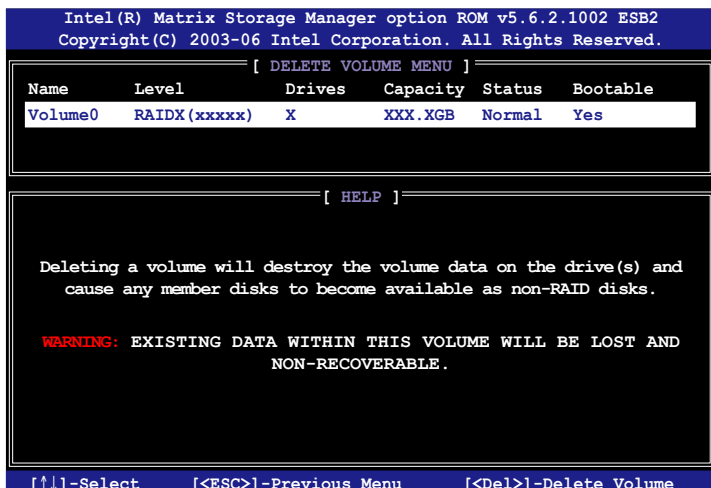
6.2.5 Deleting a RAID set



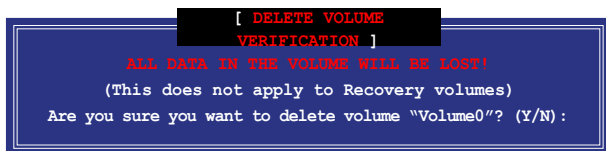
Take caution when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

1. From the utility main menu, select **2. Delete RAID Volume**, then press <Enter> to display this screen.



2. Use the up/down arrow key to select the RAID set you want to delete, then press . This window appears.



3. Press <Y> to delete the RAID set and return to the utility main menu; otherwise, press <N> to return to the **Delete Volume** menu.

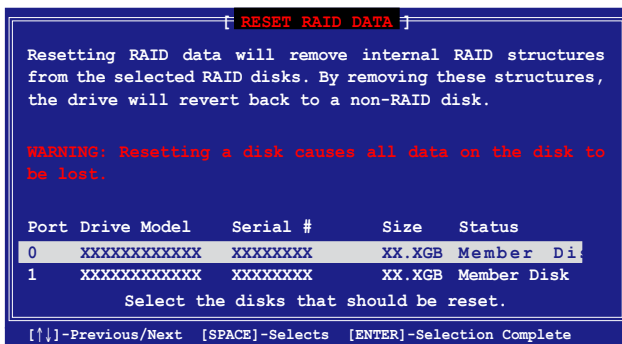
6.2.6 Resetting disks to Non-RAID



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**, then press <Enter> to display this screen.

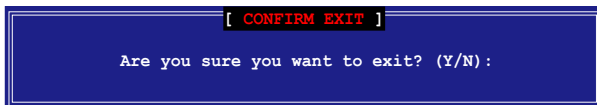


2. Use the up/down arrow key to highlight the RAID set drive you want to reset, then press <Spacebar> to select.
3. Press <Enter> to reset the RAID set drive. A confirmation message appears.
4. Press <Y> to reset the drive or press <N> to return to the utility main menu.
5. Follow steps 2 to 4 to select and reset other RAID set drives.

6.2.7 Exiting the Intel® Matrix Storage Manager

To exit the utility:

1. From the utility main menu, select **4. Exit**, then press <Enter>. This window appears.



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

6.3 Global Array Manager

You may also create a RAID set(s) in Windows[®] operating environment using the Global Array Manager (GAM) application. The GAM application is available from the motherboard support CD.



Refer to the GAM user guide in the motherboard support CD for details.

6.4 LSI Logic MPT Setup Utility

The LSI Logic MPT Setup Utility is an integrated RAID solution that allows you to create the following RAID set(s) from SAS hard disk drives supported by the LSI1068 PCI-X SAS controller:

- RAID 1 (Integrated Mirroring)
- RAID 1E (Integrated Mirroring Enhanced)
- RAID 0 (Integrated Striping)

6.4.1 Integrated Mirroring

Overview

The Integrated Mirroring (IM) feature supports simultaneous mirrored volumes with two disks (IM). Integrated Mirroring Enhanced (IME) supports three to eight disks, or seven mirrored disks plus a hot spare disk.

The IM feature supports hot swap capability, so when a disk in an IM volume fails, you can easily restore the volume, and the swapped disk is automatically re-mirrored.

Creating Integrated Mirroring volumes



- You may use disks of different sized in IM and IME volumes; however, the size of the smallest disk determines the “logical” size of each member disk.
- DO NOT combine Serial ATA and SAS disks in one volume.
- 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.

To create an IM volume:

1. Turn on the system after installing all SAS hard disk drives.
2. During POST, press <Ctrl+C> to enter the SAS configuration utility.

```
LSI Corporation. MPT SAS BIOS
MPTBIOS-6.18.00.00 (2007.08.07)
Copyright 2000-2007 LSI Corporation.

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

- The following screen appears. Select a channel and press <Enter> to enter the setup.

```

LSI Logic Config Utility          v6.18.00.00 (2007.08.07)
Adapter List Global Properties
+-----+-----+-----+-----+-----+-----+-----+
Adapter  PCI   PCI   PCI   PCI   FW Revision   Status   Boot
         BUS   Dev   Fnc   Slot
+-----+-----+-----+-----+-----+-----+-----+
SAS1068  05   03   00   00   1.15.00.00-IR Disabled   0
+-----+-----+-----+-----+-----+-----+-----+

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

```



The numbers of the channel depend on the controller.

- The **Adapter Properties** screen appears.
Use the arrow keys to select **RAID Properties**, then press <Enter>.

```

LSI Logic Config Utility          v6.18.00.00 (2007.08.07)
Adapter Properties -- SAS1068
+-----+-----+-----+
Adapter          SAS1068
PCI Slot         00
PCI Address(Bus/Dev/Func) 05.03.00
MPT Firmware Revision 1.15.00.00-IR
SAS Address      500E0180:60831008
NVIDIA Version   25.02
Status          Disabled
Boot Order       0
Boot Support     (Enabled OS only)
+-----+-----+-----+
RAID Properties
SAS Topology
Advanced Adapter Properties
+-----+-----+-----+

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

```

- The **Select New Array Type** screen appears.
Use the arrow keys to select **Create IM Volume**, then press <Enter>.

```

LSI Logic Config Utility          v6.18.00.00 (2007.08.07)
Select New Array Type -- SAS1068
+-----+-----+-----+
Create IM Volume  Create Integrated Mirror Array of 2
                  disks plus an optional hot spare. Data
                  on the primary disk may be migrated.
+-----+-----+-----+
Create IME Volume Create Integrated Mirrored Enhanced
                  Array of 3 to 8 disks including an
                  optional hot spare.
                  ALL DATA on array disks will be DELETED!
+-----+-----+-----+
Create IS Volume  Create Integrated Striping array of
                  2 to 8 disks.
                  ALL DATA on array disks will be DELETED!
+-----+-----+-----+

Esc = Exit Menu    F1/Shift+1 = Help
Enter = Choose array type to create

```


6. The Create New Array screen shows the disks you can add to make up the IM volume. Use the arrow key to select a disk, then move the cursor to the RAID Disk column. To include this disk in the array, press <+>, <->, or <Space>.
- You may also specify the Hot Spare disk here. Select the disk, then move the cursor to the Hot Spr column, then press <+>, <->, or <Space>.

```
LSI Logic Config Utility          v6.18.00.00 (2007.08.07)
Create New Array -- SAS1068

Array Type:                      IM
Array Size(MB):                  -----

Slot  Device Identifier          RAID  Hot  Drive  Pred  Size
Num                                Disk  Spr  Status Fail  (MB)
-----
0  SEAGATE ST373454SS          0003  [NO]  [NO]  -----  ---  70007
1  SEAGATE ST373454SS          0003  [NO]  [NO]  -----  ---  70007
2  SEAGATE ST373454SS          0003  [NO]  [NO]  -----  ---  35003
3  SEAGATE ST373454SS          0003  [NO]  [NO]  -----  ---  35003

Esc = Exit Menu  F1/Shift+1 = Help
SPACE/+/- = Select disk for array or hot spare  C = Create array
```



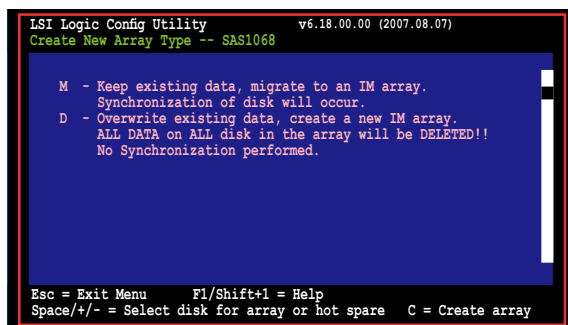
By default, the RAID Disk field shows No before array creation. This field is grayed out under the following conditions:

- The disk does not meet the minimum requirements for use in a RAID array.
- The disk is not large enough to mirror existing data on the primary drive.
- The disk has been selected as the Hot Spare for the RAID array.
- The disk is already part of another array.

7. A confirmation screen appears.

Press <M> to keep existing data on the first disk. If you choose this option, data on the first disk will be mirrored on the second disk that you will add to the volume later. Ensure the data you want to mirror is on the first disk.

Press <D> to overwrite any data and create the new IM array.

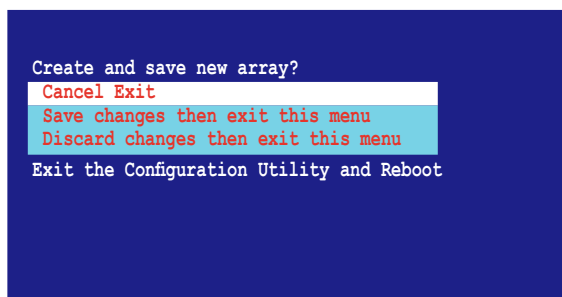


```
LSI Logic Config Utility          v6.18.00.00 (2007.08.07)
Create New Array Type -- SAS1068

M - Keep existing data, migrate to an IM array.
   Synchronization of disk will occur.
D - Overwrite existing data, create a new IM array.
   ALL DATA on ALL disk in the array will be DELETED!!
   No Synchronization performed.

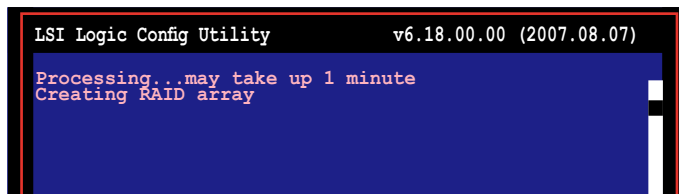
Esc = Exit Menu      F1/Shift+I = Help
Space/+/- = Select disk for array or hot spare  C = Create array
```

8. Repeat steps 5 and 6 to add the second disk to the volume.
9. When done, press <C> to create the array, then select Save changes then exit this menu then exit this menu.



```
Create and save new array?
Cancel Exit
Save changes then exit this menu
Discard changes then exit this menu
Exit the Configuration Utility and Reboot
```

10. The utility creates the array.



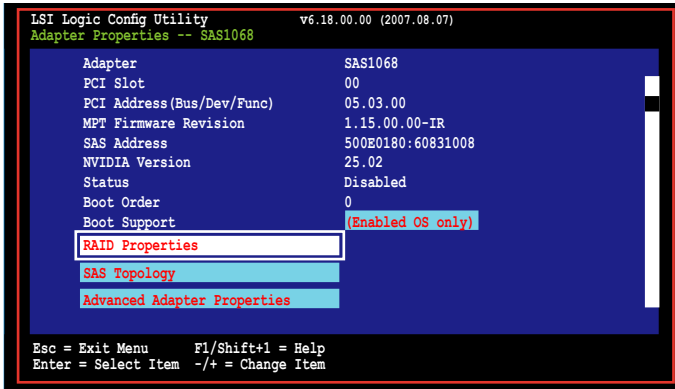
```
LSI Logic Config Utility          v6.18.00.00 (2007.08.07)

Processing...may take up 1 minute
Creating RAID array
```

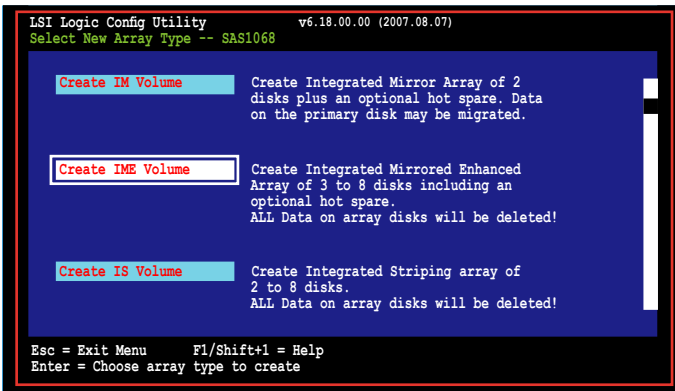
6.4.2 Integrated Mirroring Enhanced

To create an IME volume:

1. The **Adapter Properties** screen appears.
Use the arrow keys to select **RAID Properties**, then press <Enter>.



2. The **Select New Array Type** screen appears.
Use the arrow keys to select **Create IME Volume**, then press <Enter>.



3. The **Create New Array** screen shows the disks you can add to make up the IME volume.

Integrated Mirroring Enhanced (IME) supports three to eight disks, or seven mirrored disks plus a hot spare disk. Use the arrow key to select a disk, then move the cursor to the RAID Disk column. To include this disk in the array, press <+>, <->, or <Space>.

You may also specify the Hot Spare disk here. Select the disk, then move the cursor to the Hot Spr column, then press <+>, <->, or <Space>.

```
LSI Logic Config Utility          v6.18.00.00 (2007.08.07)
Create New Array -- SAS1068

Array Type:                      IME
Array Size (MB):                 51498

Slot  Device Identifier          RAID  Hot  Drive  Pred  Size
Num                                Disk  Spr  Status Fail  (MB)
-----
0  SEAGATE ST373454SS          0003  [Yes] [NO]  -----  ---  70007
1  SEAGATE ST373454SS          0003  [NO]  [NO]  -----  ---  70007
2  SEAGATE ST373454SS          0003  [Yes] [NO]  -----  ---  35003
3  SEAGATE ST373454SS          0003  [Yes] [NO]  -----  ---  35003

Esc = Exit Menu    F1/Shift+l = Help
SPACE/+/- = Select disk for array or hot spare    C = Create array
```



By default, the RAID Disk field shows No before array creation. This field is grayed out under the following conditions:

- The disk does not meet the minimum requirements for use in a RAID array.
- The disk is not large enough to mirror existing data on the primary drive.
- The disk has been selected as the Hot Spare for the RAID array.
- The disk is already part of another array.

4. Repeat step 5 to add the other disks to the volume.
5. When done, press <C> to create the array, then select Save changes then exit this menu then exit this menu.

```
Create and save new array?
Cancel Exit
Save changes then exit this menu
Discard changes then exit this menu
Exit the Configuration Utility and Reboot
```

6. The utility creates the array.

```
LSI Logic Config Utility          v6.18.00.00 (2007.08.07)

Processing...may take up 1 minute
Creating RAID array
```

6.4.3 Integrated Striping (IS) volume

Overview

The Integrated Striping (IS) feature provides RAID 0 functionality, supporting volumes with two to eight disks. You may combine an IS volume with an IM or IME volume.

Creating Integrated Striping volumes



DO NOT combine Serial ATA and SAS disks in one volume.

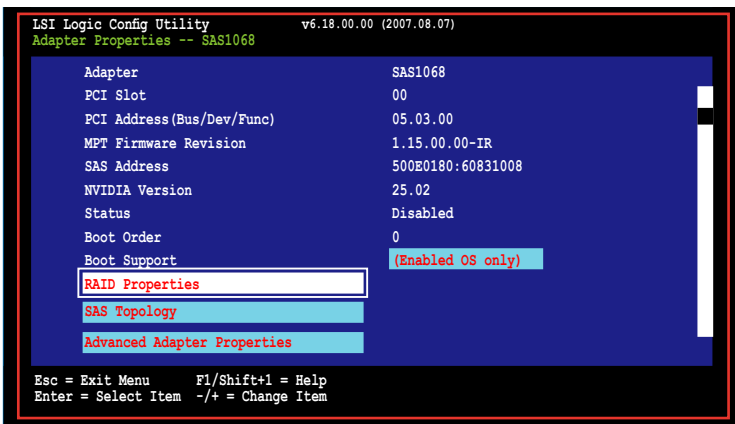
To create an IS volume:

1. Turn on the system after installing all SAS hard disk drives.
2. During POST, press <Ctrl+C> to enter the SAS configuration utility.

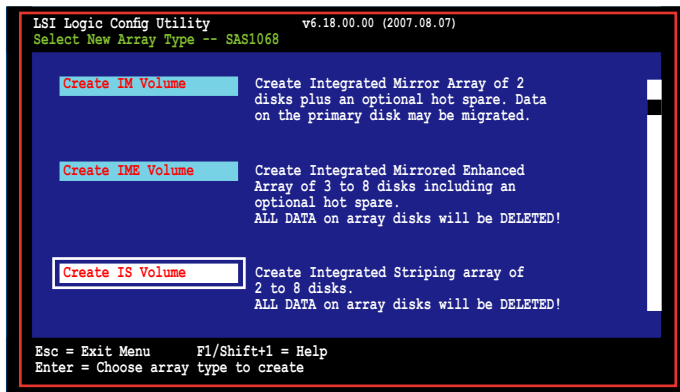
```
LSI Corporation. MPT SAS BIOS
MPTBIOS-6.18.00.00 (2007.08.07)
Copyright 2000-2007 LSI Corporation.

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

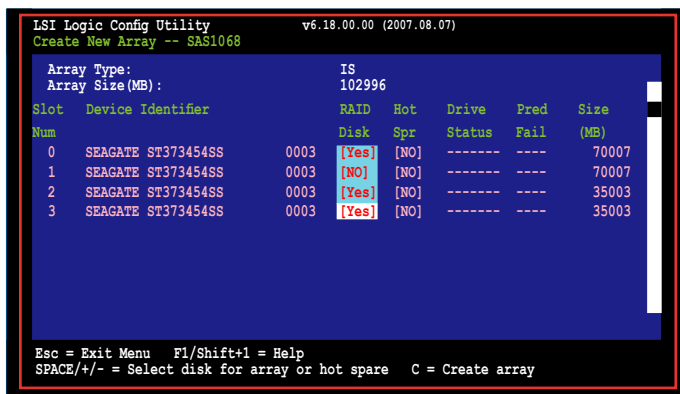
3. The **Adapter Properties** screen appears.
Use the arrow keys to select **RAID Properties**, then press <Enter>.



4. The **Select New Array Type** screen appears.
Use the arrow keys to select **Create IS Volume**, then press <Enter>.



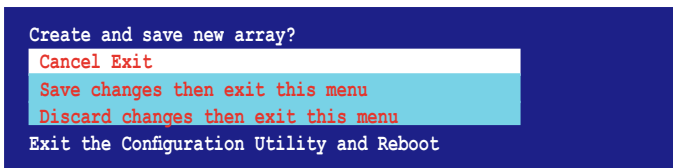
5. The **Create New Array** screen shows the disks you can add to make up the IS volume. Use the arrow key to select a disk, then move the cursor to the RAID Disk column. To include this disk in the array, press <+>, <->, or <Space>.



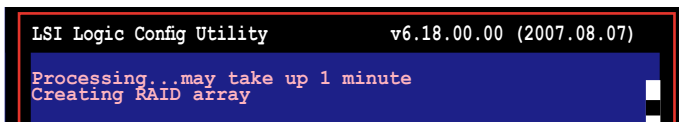
By default, the RAID Disk field shows No before array creation. This field is grayed out under the following conditions:

- The disk does not meet the minimum requirements for use in a RAID array.
- The disk is not large enough to mirror existing data on the primary drive.
- The disk has been selected as the Hot Spare for the RAID array.
- The disk is already part of another array.

6. Repeat step 5 to add the other disks to the volume.
7. When done, press <C> to create the array, then select Save changes then exit this menu.



9. The utility creates the array.



6.4.4 Managing Arrays

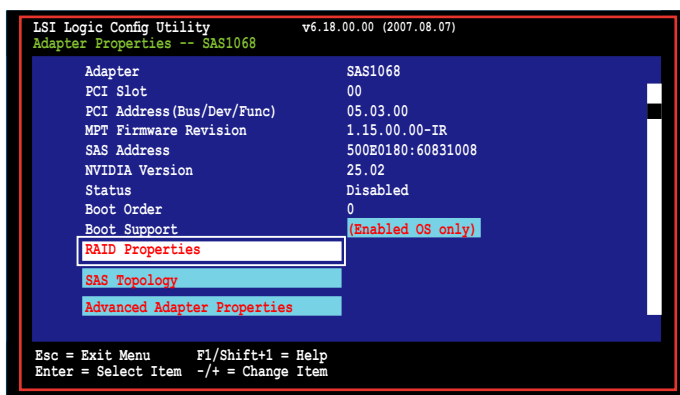
The LSI Logic MPT Setup Utility allows you to perform other tasks related to configuring and maintaining IM and IME volumes.

Refer to this section to view volume properties, manage the hot spare disk, synchronize the array, activate the array, and delete the array.

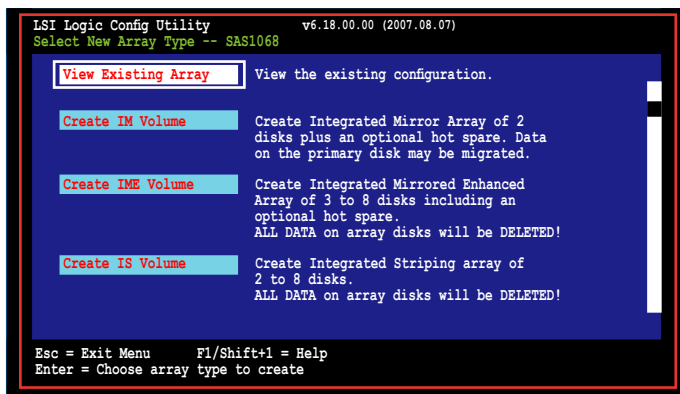
Viewing volume properties

To view volume properties:

1. On the main menu, select **RAID Properties**.



2. On the next screen that appears, select **View Existing Array**.



3. The **View Existing Array** screen appears. Here you can view properties of the RAID array(s) created. If you have configured a hot spare, it will also be listed. if you created more than one array, you may view the next array by pressing <Alt+N>.

```
LSI Logic Config Utility                                v6.18.00.00 (2007.08.07)
View Array -- SAS1068

  Array                      1 of 1
  Identifier                 LSILOGICLogical Volume 3000
  Type                      IME
  Scan Order                 0
  Size(MB)                   51498
  Status                     Optimal

  Manage Array

Slot  Device Identifier      RAID  Hot  Drive  Pred  Size
Num   Device Identifier      Disk  Spr  Status Fail  (MB)
0     SEAGATE ST373454SS      0003  Yes  NO    Ok    No   34331
2     SEAGATE ST373454SS      0003  Yes  NO    Ok    No   34331
3     SEAGATE ST373454SS      0003  Yes  NO    Ok    No   34331

Esc = Exit Menu          F1/Shift+1 = Help
Enter=Select Item      Alt+N=Next Array  C = Create an array
```

Managing hot spares

You may configure one disk as a global hot spare to protect critical data on the IM/IME volume(s). You may create the hot spare disk at the same time you create the IM/IME volume. Refer to this section when adding a hot spare disk on an existing volume.



If a disk on an IM/IME volume fails, the utility automatically rebuilds the failed disk data on the hot spare. When the failed disk is replaced, the utility assigns the replacement as the new hot spare.

To create a hot spare:

1. Follow steps 1 ~ 3 of the section “Viewing volume properties.”
2. From the **View Array** screen, select **Manage Array**, then press <Enter>.

```
LSI Logic Config Utility                                v6.18.00.00 (2007.08.07)
View Array -- SAS1068

  Array                      1 of 1
  Identifier                 LSILOGICLogical Volume 3000
  Type                      IME
  Scan Order                 0
  Size(MB)                   51498
  Status                     Optimal

  Manage Array

Slot  Device Identifier      RAID  Hot  Drive  Pred  Size
Num   ST373454SS            Disk Spr Status Fail (MB)
0     SEAGATE ST373454SS      0003 Yes NO  Ok   No   34331
2     SEAGATE ST373454SS      0003 Yes NO  Ok   No   34331
3     SEAGATE ST373454SS      0003 Yes NO  Ok   No   34331

Esc = Exit Menu      F1/Shift+1 = Help
Enter=Select Item    Alt+N=Next Array  C = Create an array
```

3. From the **Manage Array** screen select **Manage Hot Spare**, then press <Enter>.

```
LSI Logic Config Utility                                v6.18.00.00 (2007.08.07)
Manage Array -- SAS1068

  Identifier                 LSILOGICLogical Volume 3000
  Type                      IME
  Scan Order                 0
  Size(MB)                   51498
  Status                     Optimal

  Manage Hot Spare

  Synnchronize Array

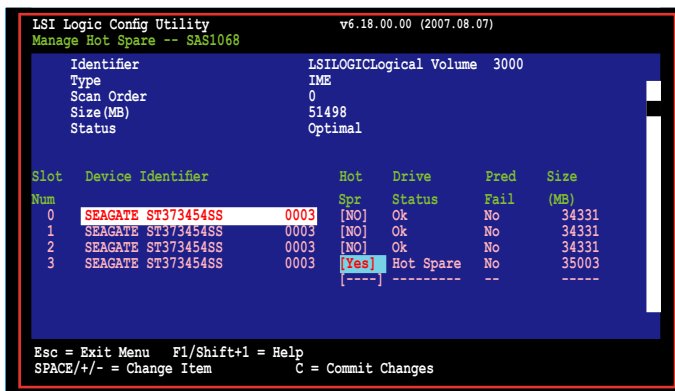
  Activate Array

  Delete Array

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

- Use the arrow key to select the disk you would like to configure as hot spare, then move the cursor to the Hot Spr column. Press <+>, <->, or <Space>. The Drive Status column field now shows Hot Spare.

Press <C> to commit the changes.

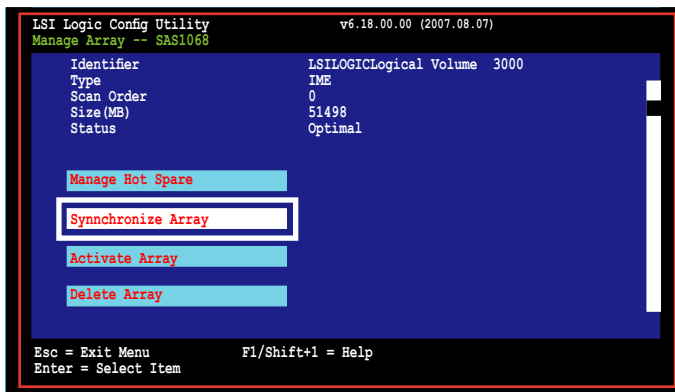


Synchronizing the array

Synchronizing the array allows the utility to resynchronize data on the mirrored disk in the array. This procedure is seldom required because data synchronization is automatically done during normal operation.

To synchronize the array:

- Follow steps 1 ~ 3 of the section “Viewing volume properties” and step 2 of the section “Managing hot spares.”
- From the **Manage Array** screen select **Synnnchroonize Array**, then press <Enter>.



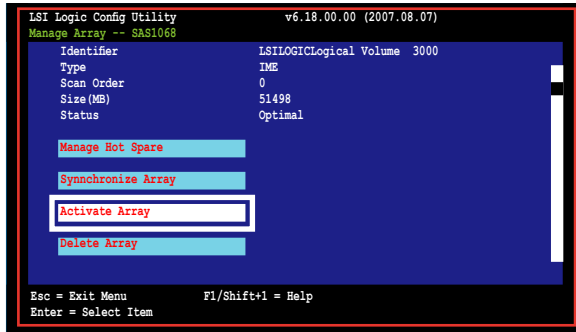
- Press <Y> to begin the synchronization, or <N> to cancel.

Activating an array

If an array is removed from one controller/computer or moved to another, the array is considered inactive. When you add the array back to the system, you may reactivate the array.

To activate the array:

1. From the **Manage Array** screen, select **Activate Array**, then press <Enter>.



2. Press <Y> to activate, or <N> to cancel.

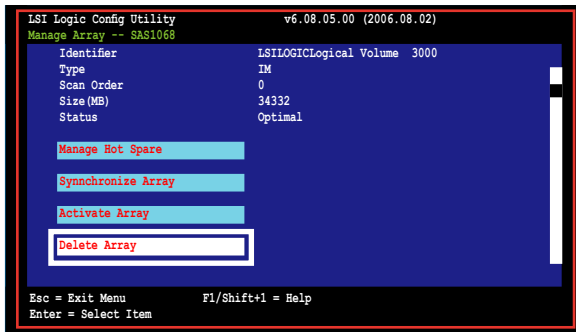
Deleting an array



- You cannot recover lost data if you delete an array. Ensure you back up important data before deleting an array.
- If you delete an IM (RAID 1) volume, the data is preserved on the primary disk.

To delete an array:

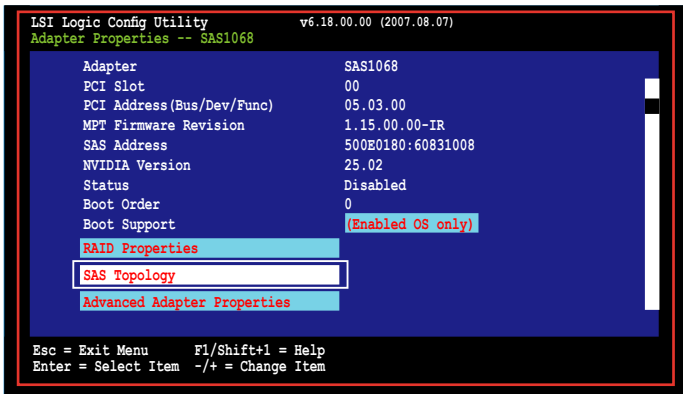
1. From the **Manage Array** screen, select **Delete Array**, then press <Enter>.



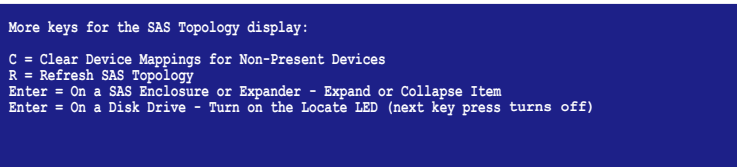
2. Press <Y> to delete, or <N> to cancel.

6.4.5 Viewing SAS topology

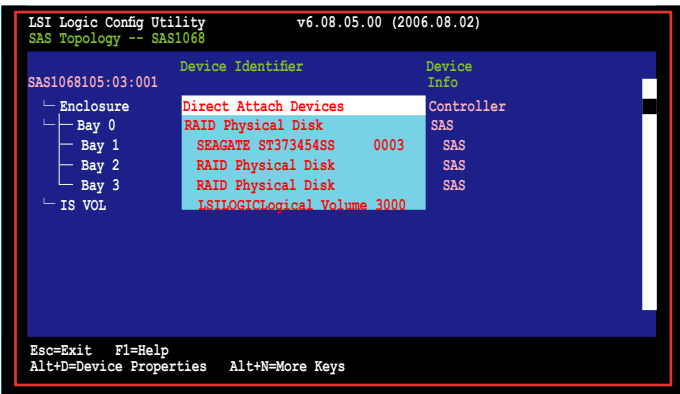
1. From the **Adapter Properties** screen, select **SAS Topology**.



Press <Alt+D> to display device properties, or <Alt+M> to display more keys.



2. Information about the volume and its member-disks are then displayed.



Selecting a boot disk

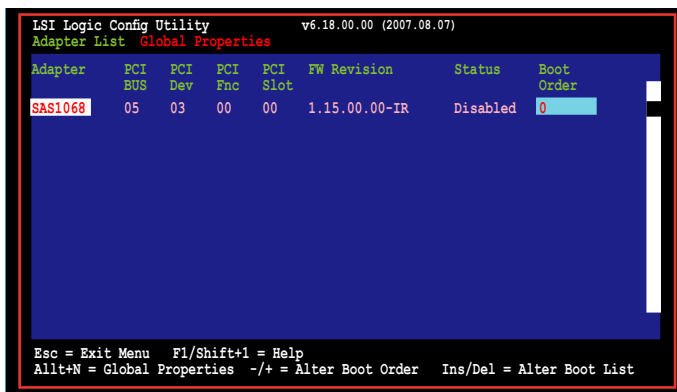
You can select a boot disk in the **SAS Topology** screen. This disk is then moved to scan ID 0 on the next boot, and remains at this position. This makes it easier to set BIOS boot device options and to keep the boot device constant during device additions and removals. There can be only one boot disk.

Follow these steps to select a boot disk:

1. In the **SAS BIOS CU**, select an adapter from the **Adapter List**.
2. Select the **SAS Topology** option.
The current topology is displayed. If the selection of a boot device is supported, the bottom of the screen lists the **Alt+B** option. This is the key for toggling the boot device. If a device is currently configured as the boot device, the **Device Info** column on the **SAS Topology** screen will show the word "Boot."
3. To select a boot disk, move the cursor to the disk and press **Alt+B**.
4. To remove the boot designator, move the cursor to the disk and press **Alt+B**. This controller will no longer have a disk designated as boot.
5. To change the boot disk, move the cursor to the new boot disk and press **Alt+B**. The boot designator will move to this disk.

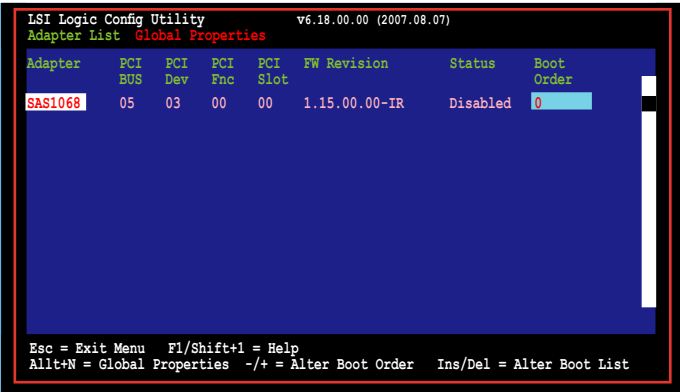


The firmware must be configured correctly in order for the **Alt+B** feature to work.



6.4.6 Global Properties

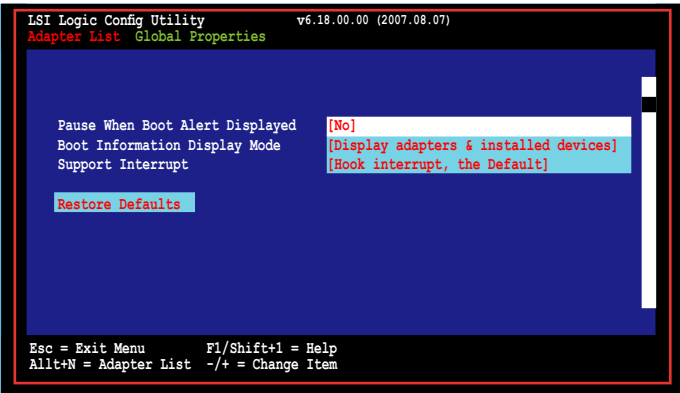
From the **Setup Utility** screen, press <Ctrl+C> to enter **LSI Logic Configuration**, then select **Global Properties**. The **Global Properties** menu allows you to change related settings.



Pause When Boot Alert Displayed

Sets whether to pause or not when the boot alert displays.

Configuration options: [Yes] [No]



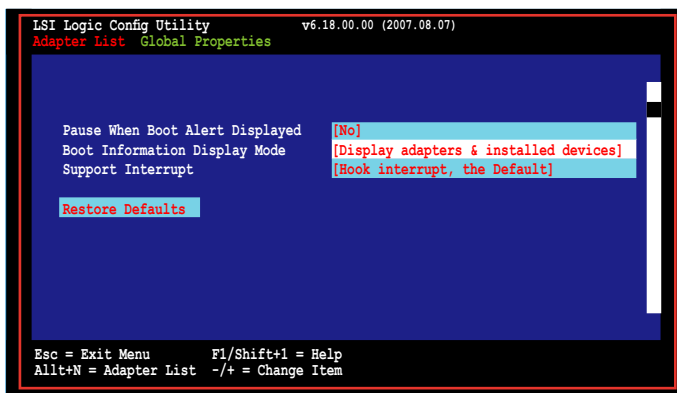
Boot Information Display Mode

Sets the disk information display mode.

Configuration options: [Display adapters & installed devices]

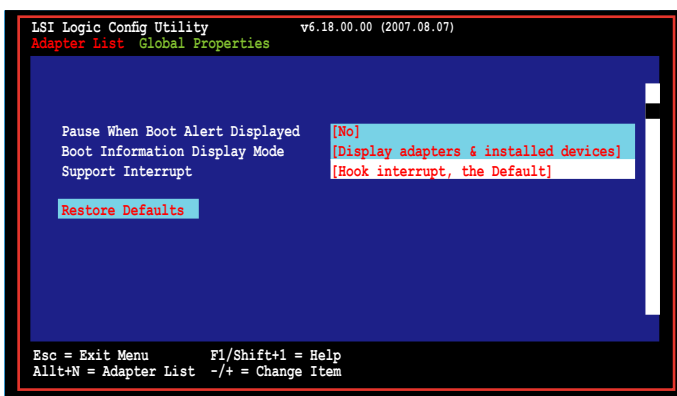
[Display minimal information] [Display adapters and all devices]

[Display adapters only]



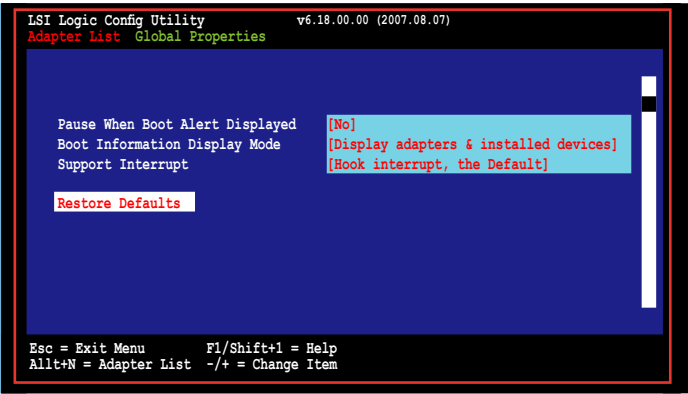
Support Interrupt

Configuration options: [Hook interrupt, the Default] [Bypass interrupt hook]



Restore Defaults

This option allows you to discard the selections you made and restore the system defaults.



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

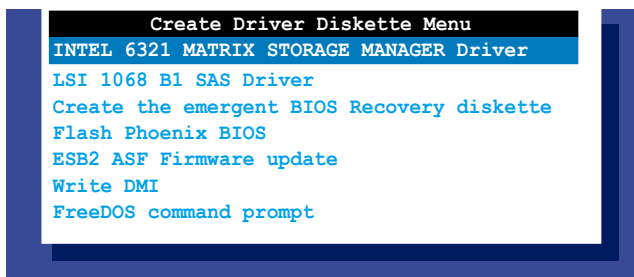


You may have to use another system to create the RAID driver disk from the system/motherboard support DVD or from the Internet.

A floppy disk with the RAID driver is required when installing Windows® or Linux 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.

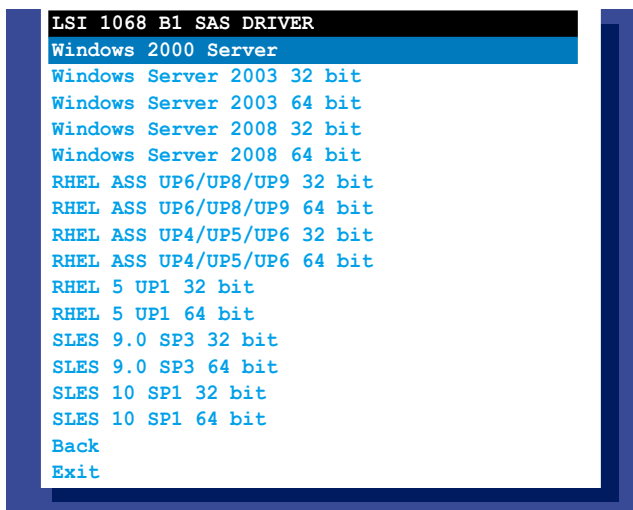


5. Use the arrow keys to select the type of RAID driver disk you want to create and press <Enter> to enter the sub-menu.

INTEL 6321 MATRIX STORAGE MANAGER Driver



LSI 1068 B1 SAS 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 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 1068 B1 SAS RAID Driver:

\Drivers\LSI 1068 B1\Driver\makedisk

3. Eject the floppy disk.

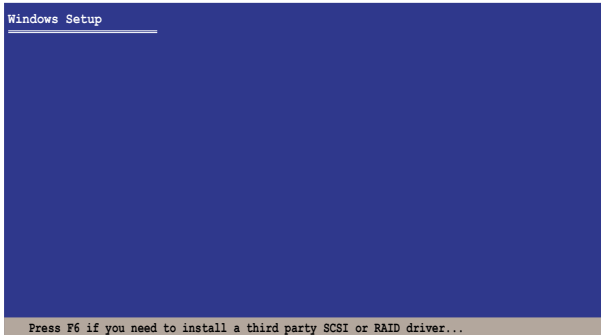
7.1.2 Installing the RAID controller driver

Windows® Server OS

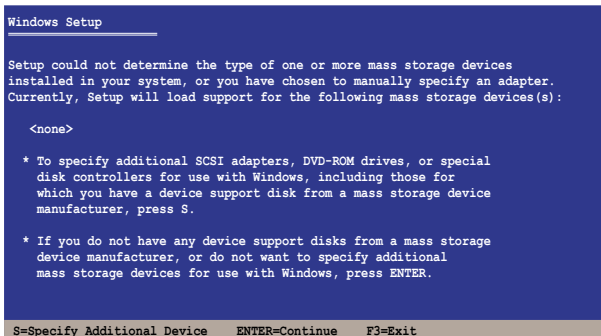
During Windows® Server OS installation

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

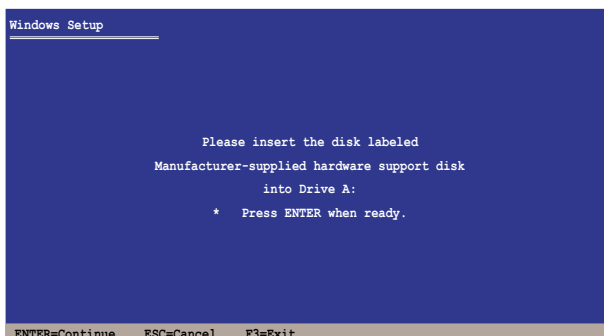
1. Boot the computer using the Windows® Server installation DVD. The Windows® Server OS Setup starts.



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. When prompted, 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, then press <Enter>.
6. The Windows® Setup loads the RAID controller drivers from the RAID driver disk. When prompted, press <Enter> to continue installation.
7. Setup then proceeds with the OS installation. Follow screen instructions to continue.

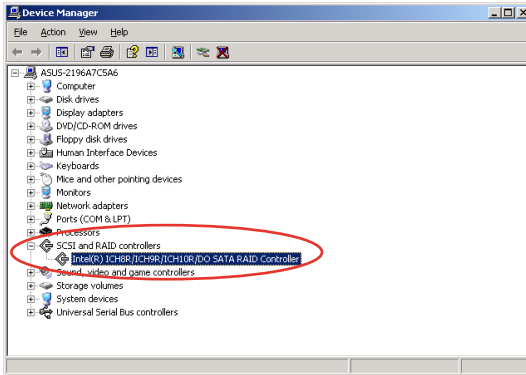
To an existing Windows® Server OS

To install the RAID controller driver on an existing Windows® Server OS

1. Restart the computer, and then log in with **Administrator** privileges.
2. Windows® automatically detects the RAID controller and displays a **New Hardware Found** window. Click **Cancel**.
3. Right-click the **My Computer** icon on the Windows® desktop, and then select **Properties** from the menu.
4. Click the **Hardware** tab, and then click the **Device Manager** button to display the list of devices installed in the system.
5. Right-click the **RAID controller** item, then select **Properties**.
6. Click the **Driver** tab, and then click the **Update Driver** button.
7. The **Upgrade Device Driver Wizard** window appears. Click **Next**.
8. Insert the RAID driver disk you created earlier to the floppy disk drive.
9. Select the option **Install the software automatically (Recommended)**, and then click **Next**.
10. The wizard searches the RAID controller drivers. When found, click **Next** to install the drivers.
11. Click **Finish** after the driver installation is done.

To verify the RAID controller driver installation:

1. Right-click the **My Computer** icon on the Windows® desktop, and then select **Properties** from the menu.
2. Click the **Hardware** tab, and then click the **Device Manager** button.
3. Click the “+” sign before the item **SCSI and RAID controllers**, and then the **Intel(R) ICH8R/ICH9R/ICH10R/DO SATA RAID Controller** item should appear.



The screen differs based on the controller.

4. Right-click the **RAID controller** driver item, and then select **Properties** from the menu.
5. Click the **Driver** tab, and then click the **Driver Details** button to display the RAID controller drivers.
6. Click **OK** when finished.

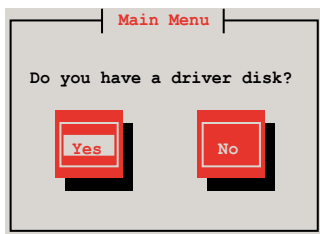
Red Hat® Enterprise Linux OS

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

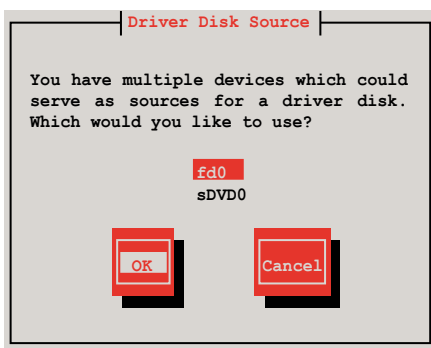
1. Boot the system from the Red Hat® Installation DVD.
2. At the `boot:`, type `linux dd`, then press <Enter>.

```
- 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
```

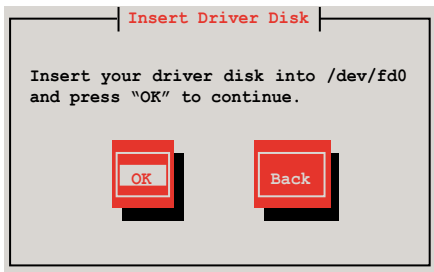
3. Select **Yes** using the <Tab> key when asked if you have the driver disk, then press <Enter>.



4. Select **fd0** using the <Tab> key when asked to select the driver disk source. Press <Tab> to move the cursor to **OK**, then press <Enter>.

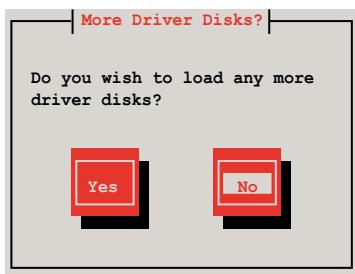


5. Insert the Red Hat® Enterprise RAID driver disk to the floppy disk drive, select **OK**, then press <Enter>.



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

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

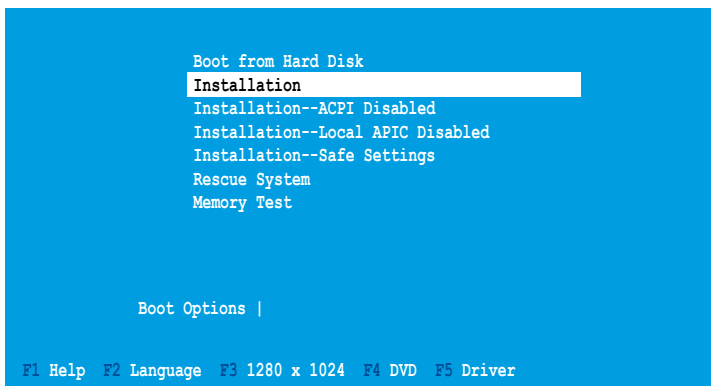


7. Follow the screen instructions to continue the OS installation.

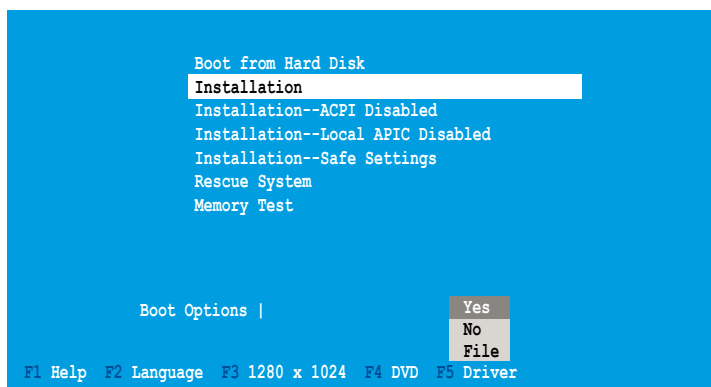
SUSE Linux OS

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

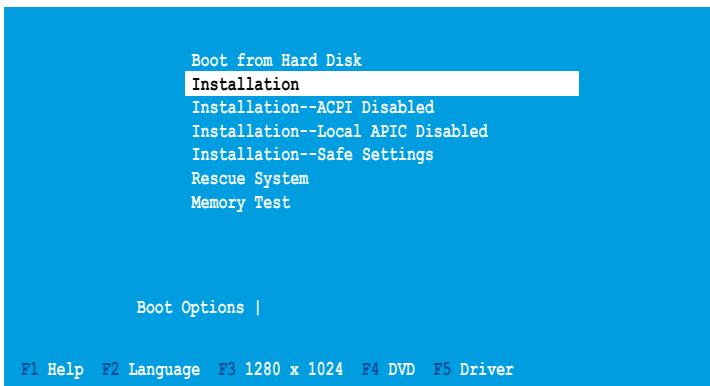
1. Boot the system from the SUSE OS installation DVD.
2. Use the arrow keys to select **Installation** from the **Boot Options** menu.



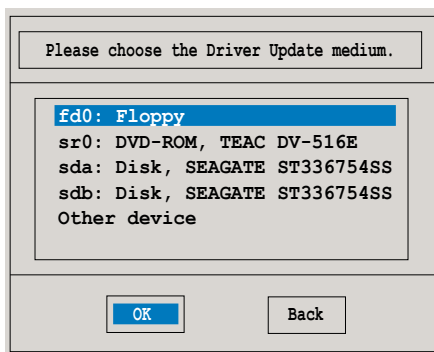
3. Press <F5>, then select **Yes** from the menu. Press <Enter>.



4. Insert the RAID driver disk to the floppy disk drive. Make sure that **Installation** from the **Boot Options** menu is selected, then press <Enter>.



5. When below screen appears, select the floppy disk drive (fd0) as the driver update medium. Select **OK**, then press <Enter>.



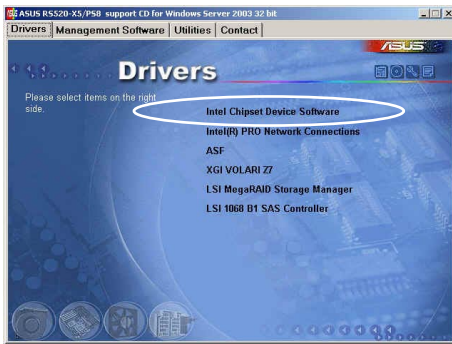
The drivers for the RAID controller are installed to the system.

7.2 Intel chipset software 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.



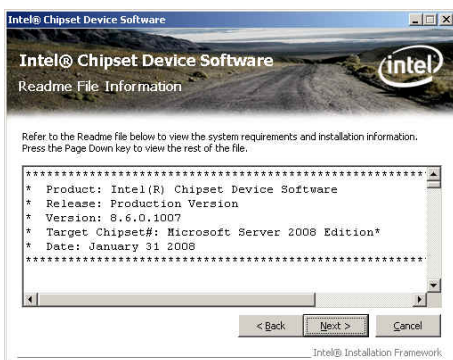
4. The **Intel(R) Chipset Device Software** window appears. Follow the screen instructions to start installation.



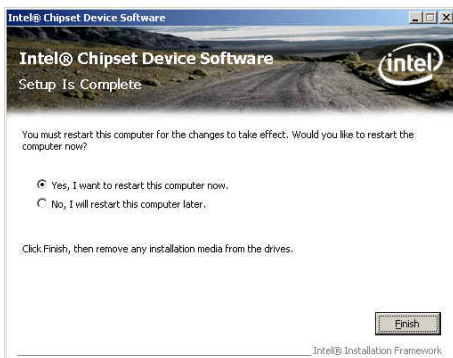
5. Select **Yes** to accept the terms of the **License Agreement** and continue the process.



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.

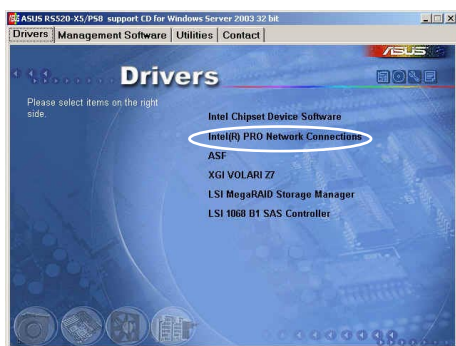
To install the LAN controller drivers

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.

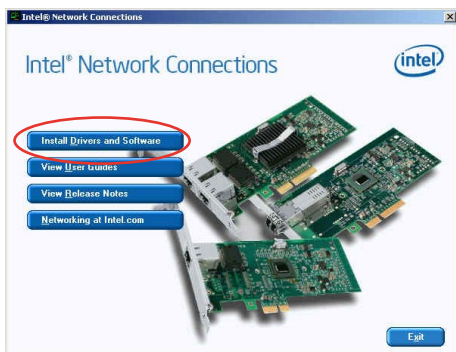


- Windows® automatically detects the LAN controllers and displays a New Hardware Found window. Click **Cancel** to close this window.
- If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to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

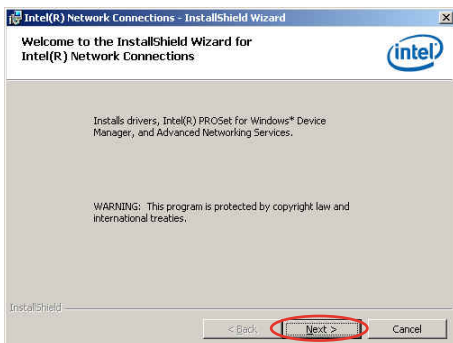
3. Click the **Intel(R) PRO Network Connections** to begin installation.



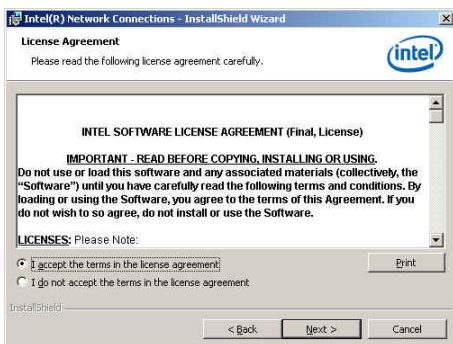
4. Click **Install Drivers and Software** option to begin installation.



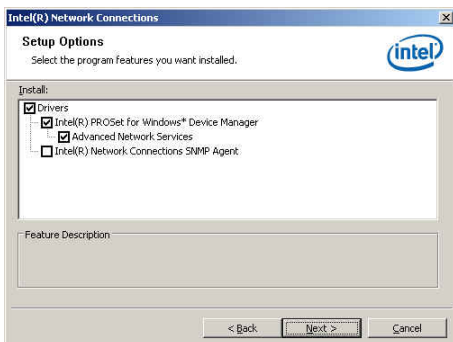
- Click **Next** when the **Intel(R) Network Connections–InstallShield Wizard** window appears.



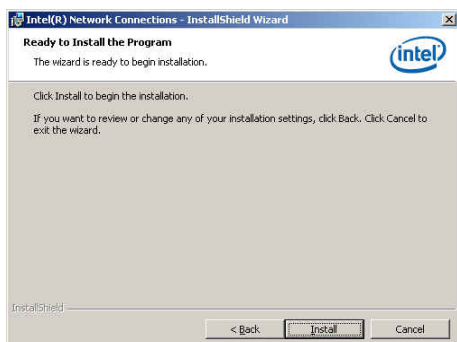
- Toggle **I accept the terms in the license agreement** and click **Next** to continue.



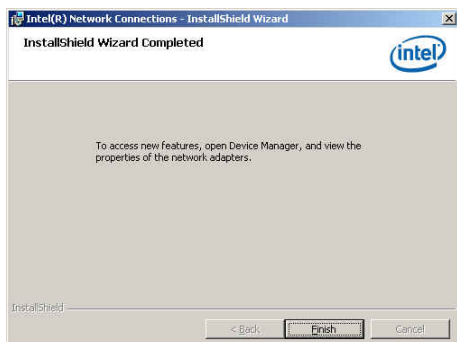
- Click the **Intel(R) PROSet for Windows Device Manager** box, and then click **Next** to start the installation.



8. Follow the screen instructions to complete installation.



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



7.4 VGA driver installation

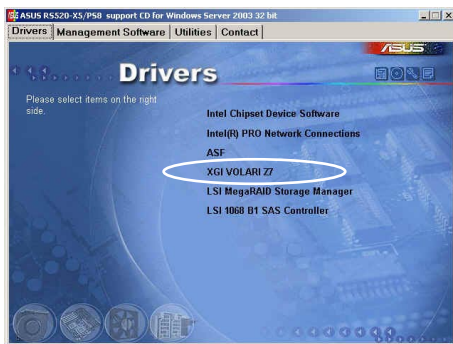
This section provides instructions on how to install the XGI® VOLARI Z7 Video Graphics Adapter (VGA) driver.

You need to manually install the XGI® VOLARI Z7 VGA driver on a Windows® Server operating system.

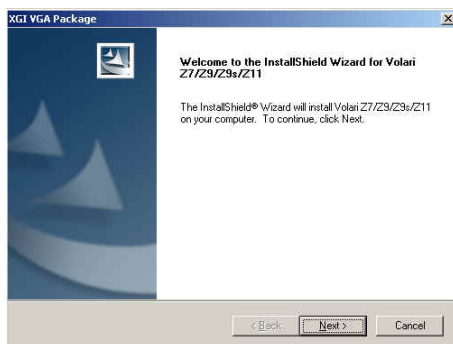
To install the XGI® VOLARI Z7 VGA driver

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.

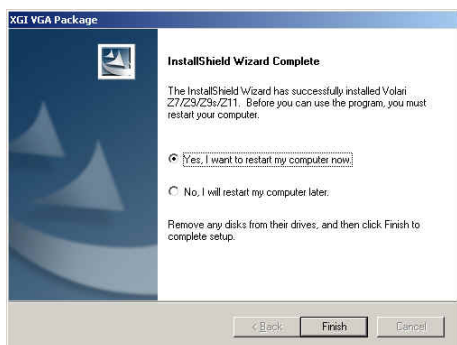
The **Drivers** menu if Autorun is enabled in your computer.



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



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



7.5 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) for updates.

7.5.1 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.



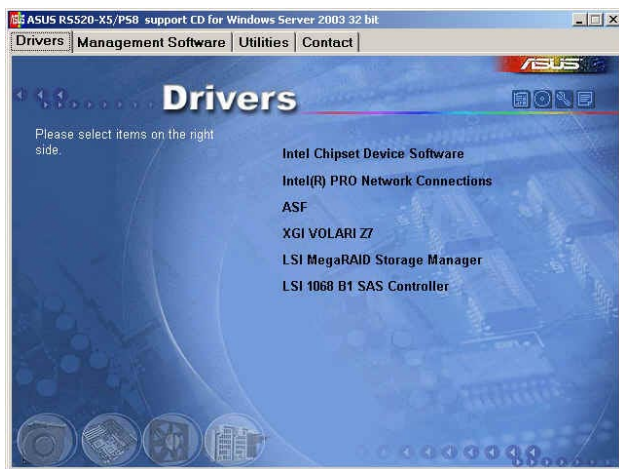
If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

7.5.2 Drivers menu

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

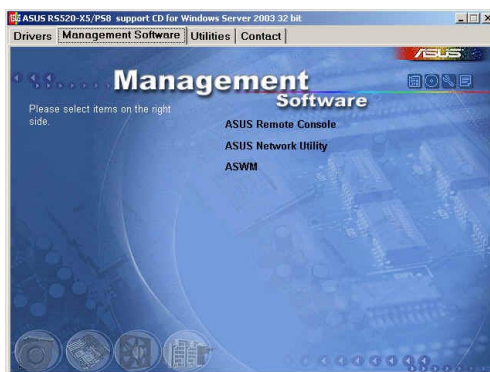


The screen display and driver options vary under different operating system versions.



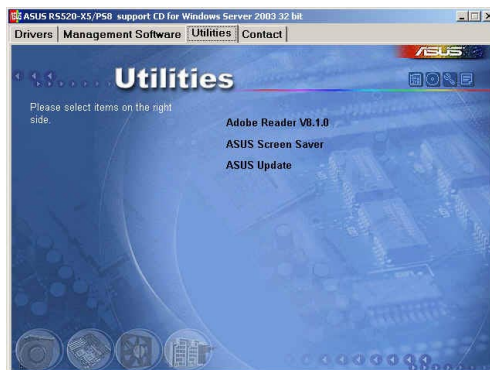
7.5.3 Management Software menu

The Management Software menu displays the available network and server monitoring applications. Click an item to install.



7.5.4 Utilities menu

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



7.5.5 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.

