

HPC-1420-ISSE

1U DP Xeon HPC system w/12*FBD,
4*SAS, Dual GbE

E3058
First Edition V1.00
February 2007

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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 A 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 A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

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

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, make sure 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 menu and describes the BIOS parameters.

6. Chapter 6: RAID configuration

This chapter tells how to change system settings through the BIOS Setup menu. 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.

8. Appendix: Reference information

This appendix includes additional information that you may refer to when configuring the motherboard.

Conventions

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



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 information to aid in completing 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. Advantech Server Web-based Management (ASWM) user guide
This manual tells how to set up and use the proprietary Advantech server management utility.

2. Advantech websites

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

CHAPTER

1

Product Introduction

1.1 System package contents

Check your system package for the following items.

Chassis	1U rackmount chassis
Motherboard	HPC-1420-ISSE motherboard
Components	1 x 700W redundant power supply 1 x Slim optical drive 4 x Hot-swap HDD trays 1 x SAS/SATA2 backplanes 2 x CPU heatsink PCI riser card Front I/O shield Redundant power supply riser card 3 x Bridge card 2 x Device fans (40mm x 28mm) 5 x System fans (40mm x 56mm) 1 x Airduct
Cables	AC power cable System cables Pre-connected device/power cables
Accessories	Rackmount rail kit HPC-1420-ISSE user guide HPC-1420-ISSE support CD Chassis ears (left, right) Bag of screws 1 x Serial port cable module



-
1. Contact your dealer immediately if any of the items is damaged or missing.
 2. The server not include floppy device. Please use external USB floppy (optional) if needs to install any software or update BIOS.
-

1.2 System specifications

The HPC-1420-ISSE is a 1U barebone server system featuring the HPC-1420-ISSE motherboard. The server supports dual Intel LGA771 Xeon processors with EM64T technology, plus other latest technologies through the chipsets onboard.

Chassis	Rackmount 1U
Motherboard	HPC-1420-ISSE
Chipset	North Bridge: Intel® 5000P MCH South Bridge: Intel® ESB2E I/O Bridge: Intel® PXH-V
CPU	Supports Dual LGA771 sockets Intel® Xeon processors Supports Dual-Core Xeon Dempsey1066/Woodcrest1333 processor Supports Intel® Extended Memory 64-bit Technology (EM64T) Supports Enhanced Intel® SpeedStep Technology (EIST)
Memory	12 x 240-pin Fully Buffer DIMM (FBD) sockets support registered ECC DDRII-667/533 MHz memory modules Supports 256MB up to 48GB system memory
LAN	2 x Gigabit LAN (Intel® ESB2E supports)
VGA	ATI ES1000(RN50) VGA controller Supports 32MB display memory
Storage	LSI SAS1068 controller supports: - 8 x SAS drives, supports RAID 0, RAID 1, RAID 0+1 and RAID 1E configuration - Zero-Channel RAID card (optional)
Expansion slots	1 x full-length 64-bit/133MHz 3V PCI-X slot (on a riser card) 1 x full-length PCI-Express x8 slot (on a riser card) 1 x half-length PCI-Express x8 slot (on a riser card) 1 x PCI-X slot for LSI 8300XLP ZCR Management Board
Front panel	4 x 3.5-inch hot-swappable SAS/SATA-II HDD bays 1 x Slim optical drive 2 x USB 2.0 ports Power switch Reset switch Location switch LEDs: Power, HDD access, location, message, LAN 1, LAN 2 HDD LEDs: Status, activity
Rear panel	1 x PS/2 keyboard port 1 x PS/2 mouse port 1 x Serial port* 1 x VGA port 2 x USB 2.0 ports 2 x RJ-45 ports (with LEDs) 1 x RJ-45 port, only for ASMB3** LAN management card (Optional) 2 x Power connector (one for redundant, both with LEDs)

(continued on the next page)

Management	Advantech Server Web-based Management
Hardware monitors	Voltage, temperature, and fan speed monitoring Automatic System Restart (ASR) feature
Power supply	700W redundant power supply, 100V~240V, 47Hz~63Hz***
Dimensions	686mm (l) x 444mm (w) x 43.4mm (h)

* This module for user install self (Refer to section 2.6.1).

** Only supports proprietary IPMI2.0 LAN management card.

*** If you need second power supply for redundant, please contact your dealer immediately to upgrade.



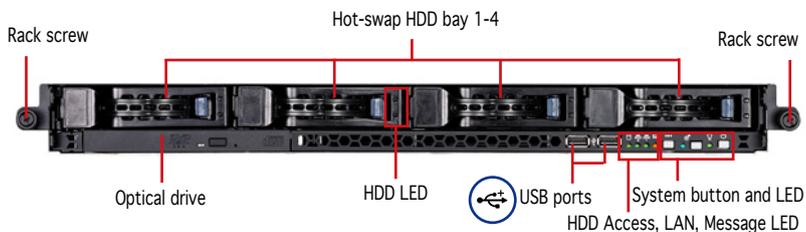
Refer to "Chapter 4 Motherboard information" for details on the internal connectors.

1.3 Front panel features

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

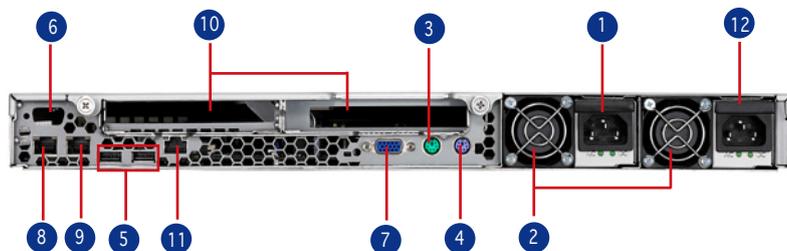


Refer to section 1.6.1 Front panel LEDs for the LED descriptions.



1.4 Rear panel features

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



- | | |
|--|--|
| 1. Redundant AC power socket | 8. LAN port 1 |
| 2. Rear fans | 9. LAN port 2 |
| 3. PS/2 mouse port | 10. 2 x Expansion slots |
| 4. PS/2 keyboard port | 11. LAN port 3 (Only supports proprietary IMPI2.0 LAN management card) |
| 5. USB ports | 12. Second redundant AC power socket (Optional) |
| 6. Serial port (for user install self) | |
| 7. VGA port | |



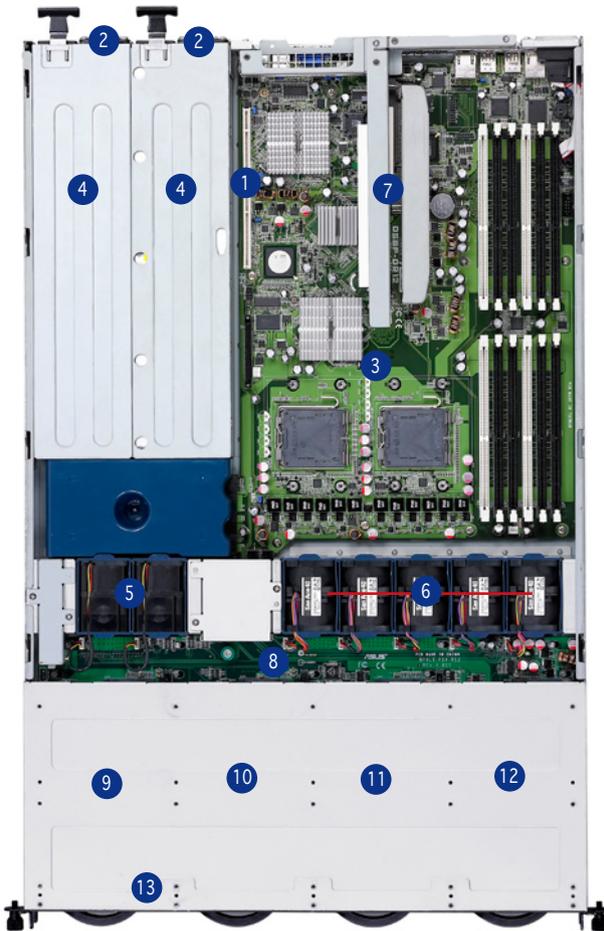
The ports for the PS/2 keyboard, PS/2 mouse, USB, VGA, and Gigabit LAN do not appear on the rear panel if motherboard is not present.



Refer to section 1.6.2 Rear panel LEDs for the LED descriptions.

1.5 Internal features

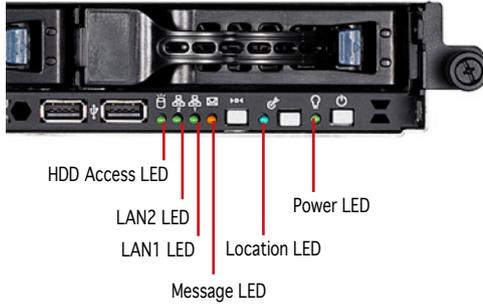
The barebone server includes the basic components as shown.



- | | |
|----------------------------------|---------------------------------|
| 1. PCI-X riser card bracket | 8. SAS/SATA-II backplane |
| 2. Power supply rear fans | 9. Hot-swap HDD tray 1 (port0) |
| 3. HPC-1420-ISSE motherboard | 10. Hot-swap HDD tray 2 (Port1) |
| 4. Redundant power supply | 11. Hot-swap HDD tray 2 (Port2) |
| 5. Device fans (40mm x 56mm) x 2 | 12. Hot-swap HDD tray 2 (Port3) |
| 6. System fans (40mm x 28mm) x 5 | 13. Slim optical drive |
| 7. PCI-X and PCI-E riser card | |

1.6 LED information

1.6.1 Front panel LEDs



LED	Display status	Description
Power LED	ON	System power ON
HDD Access LED	OFF Blinking	No activity Read/write data into the HDD
HDD Status access	ON OFF	HDD is present No HDD present
Message LED	OFF ON	System is in normal condition; no incoming event ASWM detects a system problem; (Log in to ASWM to identify and resolve)
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

1.6.2 HDD status LED

HDD status LED 1



HDD status LED2

SCSI	HDD LED	status	Description
LDE1	GREEN	ON	SAS/SATA-II HDD power ON
	RED	ON	SASHDD failure
	RED/GREEN	Blinking	SAS RAID reset
LDE2	GREEN	Blinking	Read/write data into the SAS HDD

1.6.3 Rear panel LEDs



ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10Mbps connection
Green	Linked	Orange	100Mbps connection
Blinking	Linking	Green	1000Mbps connection

CHAPTER

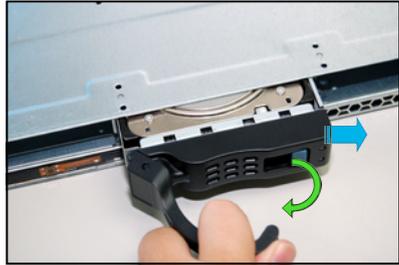
2

Hardware Setup

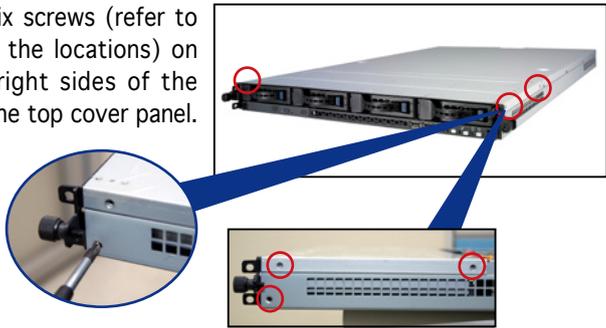
2.1 Chassis cover

2.1.1 Remove the front cover

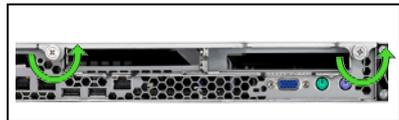
1. Push the blue button to the right side and pull the lever outward (see the figure) to remove the hard disk tray.



2. Remove the six screws (refer to the figure for the locations) on the left and right sides of the front side of the top cover panel.



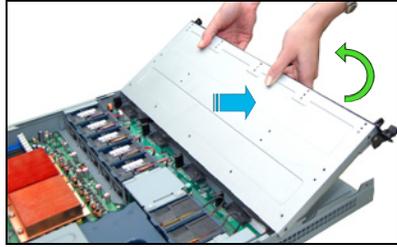
3. Loosen the two screws that secure the top cover panel to the rear panel (refer to the figure for the locations). Please note that do not remove the screws when loosening them.



4. Push the back cover panel backward until it is half inch away from the front side of the top cover panel.



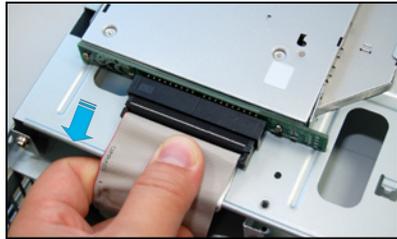
5. Push the front side of the top cover panel forward and lift it to expose the cable connectors and slots underneath.



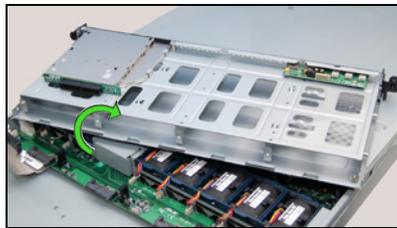
6. Disconnect the LED cable from the connector on the module joint to the front panel.



7. Disconnect the optical drive cable and power cable.

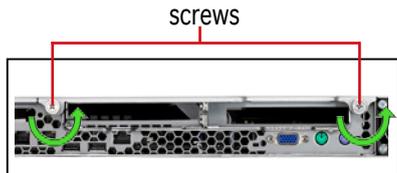


8. Remove the front upper panel and set it aside.

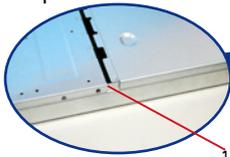


2.1.2 Removing the rear cover

1. Loosen the two screws that fasten the upper panel cover to the rear panel cover. Please note do not remove the screws when loosening them.



2. Push the back side of the top cover panel backward until it is half inch away from the front upper cover panel.



1/2 inch distance

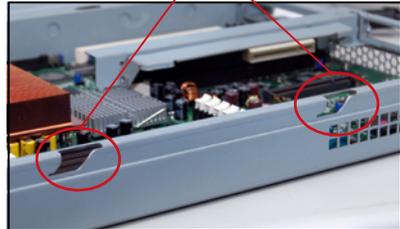


3. Remove the back top cover panel.

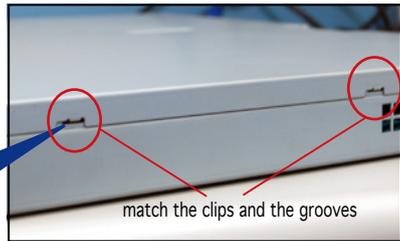
2.1.3 Install the rear cover

1. Locate the grooves (see the figure). Push the top cover panel toward the front panel.

Match the upper cover panel to the grooves on the left and right sides.



2. Match the clips of the top cover panel with the grooves (see the figure), and then clinch. Leave a half inch distance between the front edge of the top cover panel and the rear panel.



match the clips and the grooves



firmly clinched

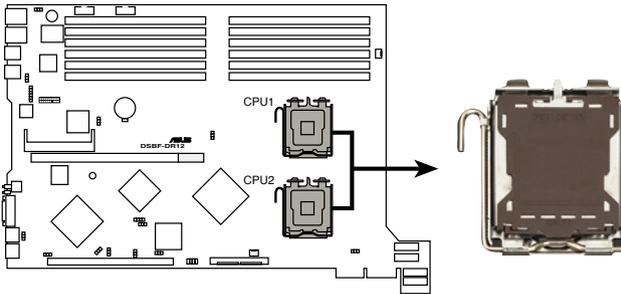
3. Fasten the two screws as shown below.

screws



2.2 Install the CPU and heatsink

Advantech HPC-1420-ISSE sever system is powered by the DSBF-DR12 sever board, which comes with two ZIF type LGA771 CPU sockets. Intel Xeon LGA771 CPU has a Dual-Core architecture with 2M L2 cache.



DSBF-DR12 CPU Socket 771

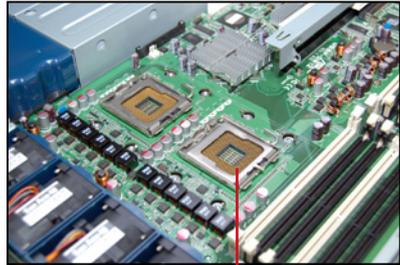


You can install one or two CPUs in this board. When installing only one CPU, please install it in socket 1.

2.2.1 Installing a CPU

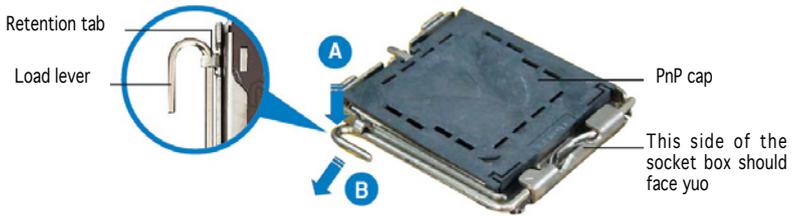
To install a CPU:

1. Locate the CPU socket on the motherboard.



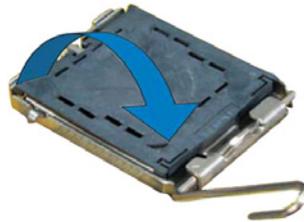
CPU1 socket

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

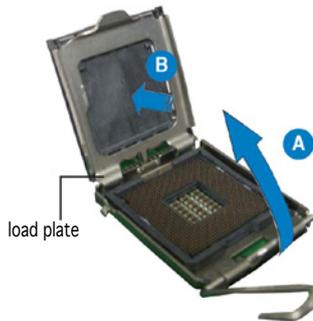


To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

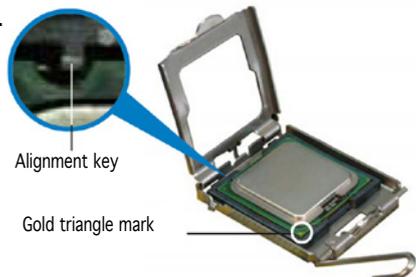
3. Lift the load lever in the direction of the arrow.



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



5. Position the CPU over the socket, making sure 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.



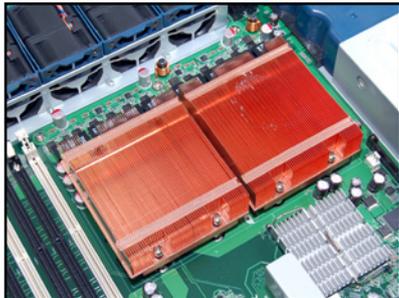
If you want to install a second CPU, follow the steps above.



2.2.2 Install the CPU heatsink

To install the CPU heatsink:

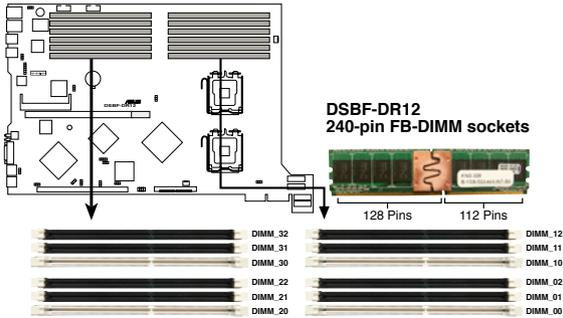
1. Put the heatsink on the installed CPU, match the screws with the screw holes on the board.
2. Fasten two screws at a time in a diagonal sequence, and then the other two.
3. Repeat step 1-2 to install the second CPU heatsink.



2.3 System memory

2.3.1 Overview

This server board comes with twelve Double Data Tate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets, support 240-pin Ecc Registered FBD memory modules.



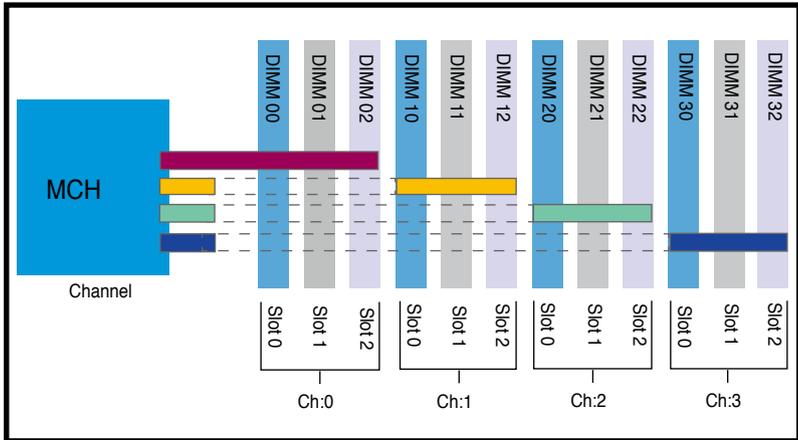
2.3.2 Memory configurations

You may install 512MB, 1GB, 2GB and 4GB fully buffered Ecc registered 533/667 DDR2 DIMMs into the DIMM sockets.



1. Please install DIMMs with the same CAS latency. We recommend that you using DIMMs from the same company.
2. Please do not install SS and DS DIMMs together, otherwise the system might not boot properly.
3. We recommend that you install even number of DIMMs. If you install only one or singular number of DIMMs, or double FBD DIMMs, please install it on the white sockets (such as DIMM_00/DIMM_10).
4. Due to chipset resource allocation and the numbers of PCI devices installed, the system may detected less than 24GB system memory when you installed twelve 2GB DDR2 memory modules.
5. When you install three memory modules, the system is in unsymmetric dual-channel mode, and the system performance is in between the performances of single-channel and dual-channel modes.

Rank population



DIMM installation reference table

Numbers of DIMM	Slots options
1	DIMM_00
2	DIMM_00,DIMM_10
4	DIMM_00,DIMM_10,DIMM_20,DIMM_30
6	DIMM_00,DIMM_10,DIMM_20,DIMM_30,DIMM_01,DIMM_11
8	DIMM_00,DIMM_10,DIMM_20,DIMM_30,DIMM_01,DIMM_11, DIMM_21,DIMM_31
10	DIMM_00,DIMM_10,DIMM_20,DIMM_30,DIMM_01,DIMM_11, DIMM_21,DIMM_31,DIMM_02,DIMM_12
12	DIMM_00,DIMM_10,DIMM_20,DIMM_30,DIMM_01,DIMM_11, DIMM_21,DIMM_31,DIMM_02,DIMM_12,DIMM_22,DIMM_32



- 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, DIMM_10, DIMM_20, and DIMM_30.

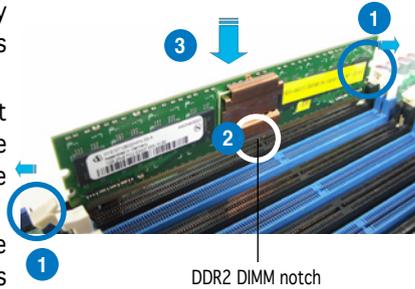
2.3.3 Installing a DIMM

To install a DIMM:



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

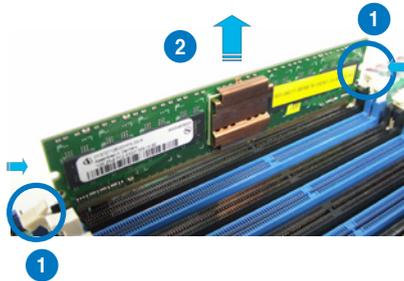
1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



- A DDR2 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 DDR2 DIMM sockets do not support DDR DIMMs. DO not install DDR DIMMs to the DDR2 DIMM sockets.

2.3.4 Removing a DIMM

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



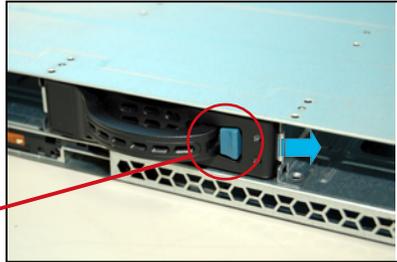
Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2.4 Hot-swap hard disk drives

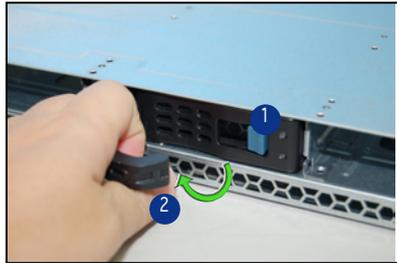
To install a hot-swap HDD:

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.

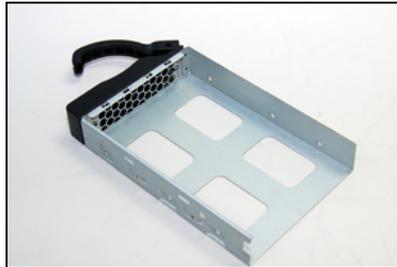
retaining button



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



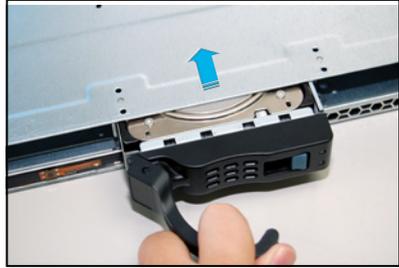
3. Take note of the drive tray holes. Each side has three holes to fit different types of hard disk drives. Use two screws on each side to secure the hard disk drive.



4. Place a hard disk drive on the tray, then secure it 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 SAS/SATA connector on the drive connects to the SAS/SATA connector on the backplane. Refer to the section 2.7 SAS/SATA backplane cabling for more information.

6. Push the tray level until clicks, and secures the drive tray in place. The drive tray is correctly placed when its front edge aligns with the bay edge.
7. Refer step 1 to 6 if you wish to install a second , third and/or fourth drive.



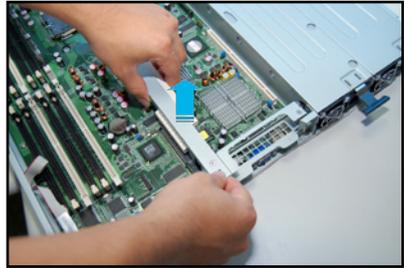
2.5 Expansion slots

2.5.1 Installing expansion card

Advantech HPC-1420-ISSE sever has a specially designed PCI riser card. If you want to install PCI-X and PCI Express x8 expansion cards, you have to remove the mental brackets on the real panel of the chassis first.

To install the PCI-X card: (the slot support PCI-X or 3.3V compatible PCI cards.)

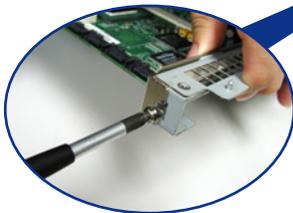
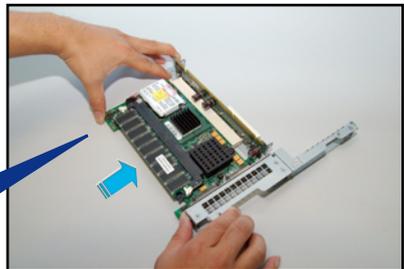
1. You can install one PCI Express x8 card and one PCI-X card. Please carefully hold the PCI-X riser card and pull it off from the PCI-X slot on the board.



2. Set the riser card aside. Using a cross screw driver to remove the screws as shown.



3. Insert a PCI-X card into the slot of the riser card, then put the screws back and fasten it.



To install a PCI Express x8 card: (the slot supports PCI-E x8, x4 and x1 cards)

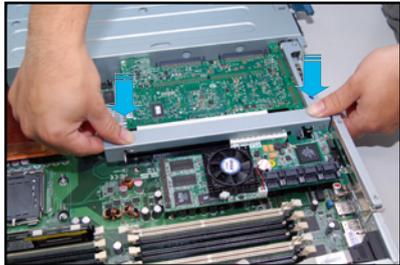
1. Follow the steps 1-2 on the last page to remove the riser card. Using a cross screw driver to remove the screws on the bracket.
2. Insert the PCI Express card into the slot, and then secure it with the screws.



2.5.2 Reinstall the riser card

To reinstall the transfer card:

1. Take note of the holes on the riser card bay. The two pegs on the riser card bracket should match these holes ensure that the bracket is properly in place.

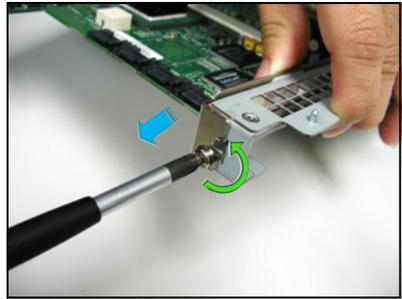
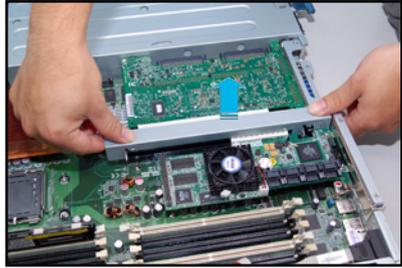


2. Insert the PCI riser card with the installed expansion cards into the PCI riser card slot on the board. Make sure the golden fingers are completely inserted into the slots and the metal barcket is properly matched with the rear panel.

2.5.3 Remove the expansion cards

To change expansion cards:

1. Pull the riser card upward (see the arrow in the figure) as shown to release it from the slot.
2. Set the riser card aside, and then using a screw driver to remove the screws on the card.
3. Remove the expansion card from the riser card.



2.5.4 Installing the SAS expansion slot

This product package provide a SAS expansion module for you to purchase optionally. If you want to install any peripheral SAS devices, please follow the steps below:

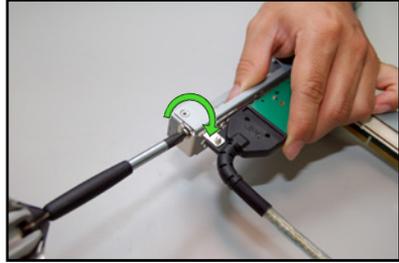
1. Remove the riser card from the system.



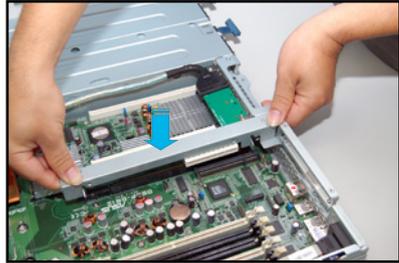
This optional module will use the slot on the PCI riser card, please consider the total number of expansion cards you plan to install in the system.



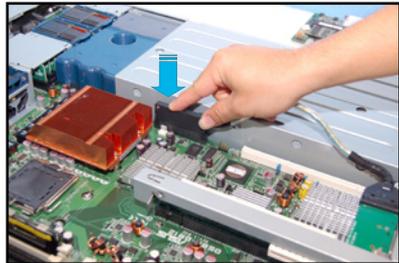
2. Prepare the SAS expansion module. connect it to the riser card and secure it.



3. Put back the riser card to its slot on the board.



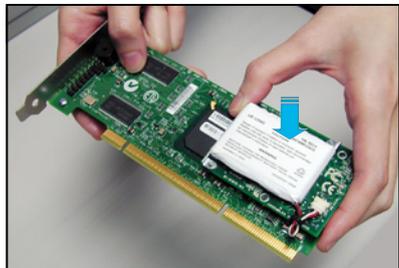
4. Connect the cable.



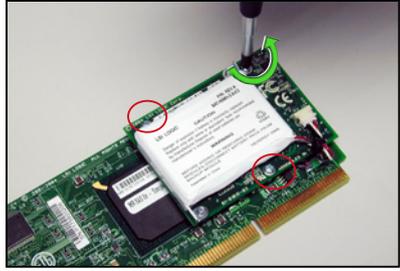
2.5.5 Install ZCR card (Optional)

The system package provide an optional ZCR card. If you want to install it, follow the steps below:

1. The ZCR card comes with a battery module card(optional), before you install the ZCR card, remove the battery module card and install a battery first.

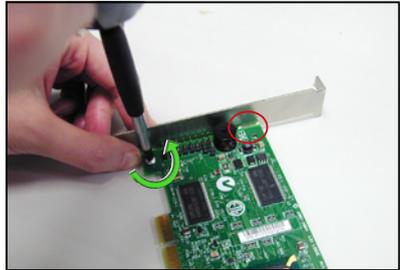


- Using a screw driver to secure the three screws on the battery module cards.

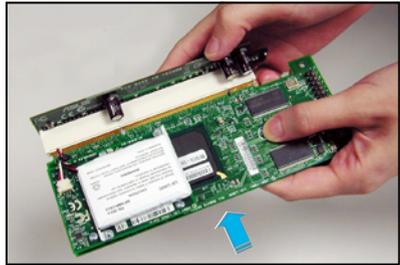


If there is no battery module card on your ZCR card, please skip step 1-2 and start from step 3.

- Using a screw driver to remove the two screws that secures the bracket of the ZCR card.



- Insert the ZCR card into the slot on the transfer card.



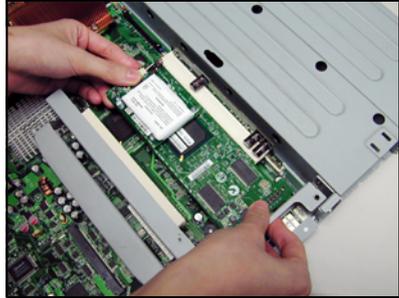
- Put the two retaining poles into the holes on the system board.



The two retaining poles are provided along with the ZCR card package.



6. Insert the transfer card with the installed ZCR card into the transfer card slot on the system board.



7. Using two screws to secure the card with the retaining poles on the system board.



2.5.6 Configuring an expansion card

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

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 5 for information on BIOS set up.
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	N/A	Programmable Interrupt
3*	11	Communications Port (COM2) *
4*	12	Communications Port (COM1) *
5*	13	Sound Card (sometimes LPT2)
6	14	Floppy Disk Controller
7*	15	Printer Port (PT1)
8	3	System CMOS/Real time clock
9*	4	ACPI Mode when used
10*	5	IRQ Holder for PCI Steering
11*	6	IRQ Holder for PCI Steering
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

*These IRQs are usually available for expansion cards.

IRQ assignments for this motherboard

	INTA#	INTB#	INTC#	INTD#	REQ#	GNT#
PATA controller	PIRQA#					
SATA controller	PIRQD#					
SMBus controller	PIRQB#					
USB UHCI controller 1	PIRQA					
USB UHCI controller 2	PIRQD					
USB 2.0 UHCI controller	PIRQH					
82563EBX1	PIRQB					
82563EBX2	PIRQB					
ATI Rage XL	PIRQB				REQ1#	GNT1#
PCI Slot1 (64-bit)	PXIRQ0	PXIRQ1	PXIRQ2	PXIRQ3	PXREQ0	PXGNT0
PCI Express Slot 2	PIRQA#					
PCI Slot 2 (64-bit)	PXH_IRQ#0	PXH_IRQ#1	PXH_IRQ#2	PXH_IRQ#3	REQ0#	GNT0#



When using PCI cards on shared slots, ensure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

2.6 Cable connections



Pre-connected system cables

1. PSU connecting card (connects PSU and the board)
2. Rear panel SAS/SATA2 power connector (hide under the panel, connects to PSU)
3. IDE cable port (hide under chassis, connect rear panel SAS/SATA2 to optical drive)
4. System Fan connector (connect rear panel SAS/SATA2 to system fan)
5. Bridge cards (three), (hide under the cover panel, connect the system board to rear panel SAS/SATA2)
6. Device fan connector (rear panel SAS/SATA2 to device fan)
7. COM1 cable port (system board to COM1 opening)

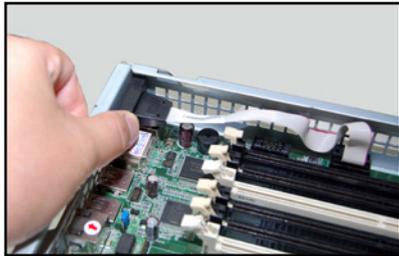
2.6.1 Serial Port cable

The system package provides a set of COM port cable module. You can install it into the COM1 opening on the rear panel. To install it:

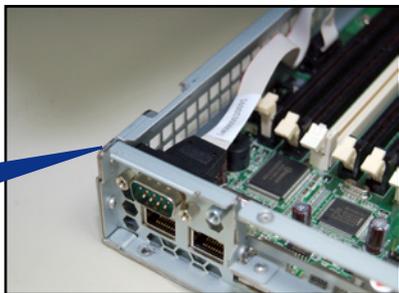
1. Prepare the COM1 port cable module from your product package.



2. Open the top cover panel. Connect one end of the cable to the COM1 connector on the board, and then fit the other end into the COM1 opening of the rear panel.

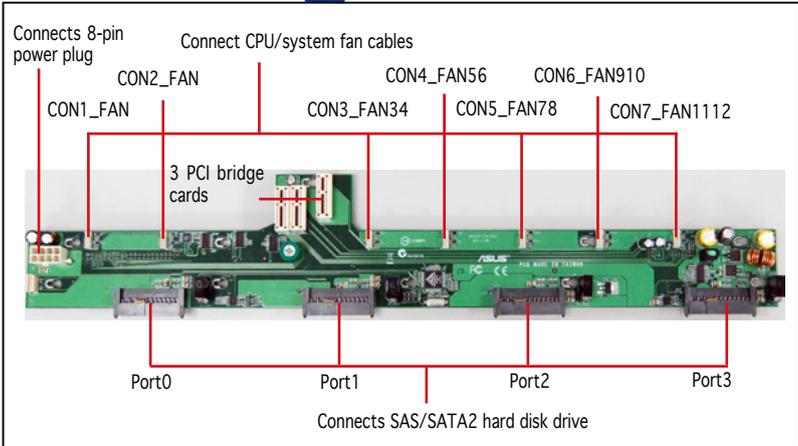
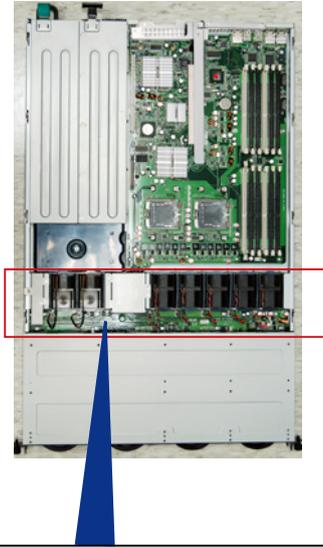


3. Secure the rear panel COM1 port to the rear panel using the two screws (see the figure).



4. Re-place the top cover panel.

2.7 SAS/SATA backplane cabling



The system fans run in full speed during POST.

2.8 Remove components

Before install/uninstall devices, you might need to remove the pre-installed components in the system. This section tells you how to remove/install the components.

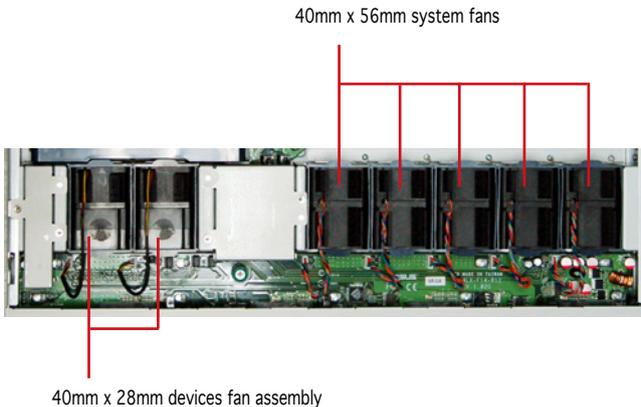
1. System fans
2. Device fans
3. Redundant PSU and power backplane board
4. SAS/SATA2 Backplane and bridge cards
5. Optical drive
6. Motherboard

2.8.1 System fans

The system provides the follow fan sets:

- Five 40mm x 56mm 15500rpm fans (Dual-fans for unit)
- Two 40mm x 28mm 15500rpm fans

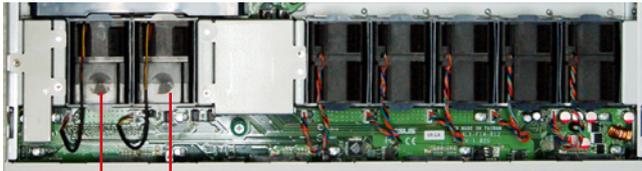
Refer to the figure below for the location of the fans.



Improper installation of the fan assembly might cause CPU overheat or system shut down.

2.8.2 Device fans

The system comes with two 40mm x 28mm device fans (15500 rpm), please refer to the figure below for the location.



40mm x 28mm device fan assembly

To remove the device fans:

1. Disconnect the device fan cable from the connector on the backplane board.
2. Lift the fan, then set aside.



To install the device fan:

1. Insert the fan to the fan cage. Take note of the airflow directional arrows embossed on the fan side.
2. Connect the device fan cable to the fan connector on the backplane board.



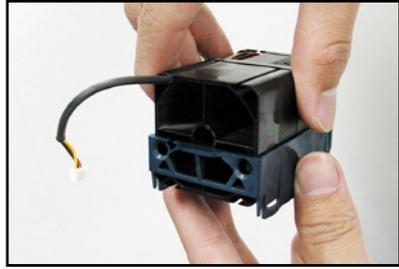
2.8.3 Device fan with dummy case

The device fan for the PSU comes with a dummy case that allows it to fit in the fan cage. Follow these instructions when replacing these fans.

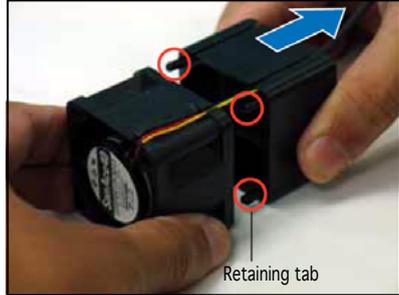
1. Follow the instruction above to remove the fan from the system.
2. Using a screw driver to remove the two screws on the fan assembly as shown.



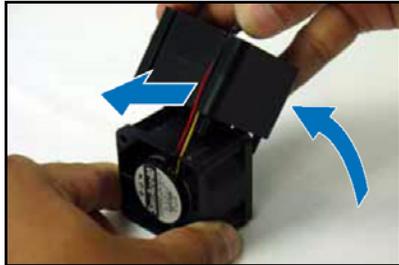
- 3. Remove the fan from the fan assembly as shown.



- 4. Uninstall the fan following the instructions in the pervious section.
- 5. Pull the dummy case to the direction of the arrow to disengage its pegs from the device fan.

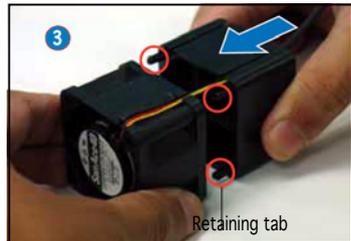
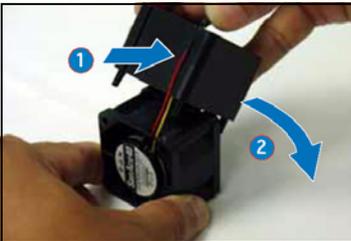


- 6. Move the half of the cover box upward, then remove the cables (as arrow show).
- 7. Replace the device fan.



To change the fan and reinstall the dummy case:

- 1. Put the fan power cables into the cable groove on dummy case as shown.
- 2. Move the half part of the dummy case to the back of the fan as shown.
- 3. Match the retaining tab with its notch and lock it.
- 4. Put the device fan with the dummy case into the fan cage.



2.8.4 Redundant PSU and Power backplane board

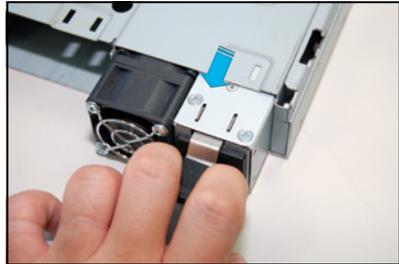
The system comes with a PSU that can be easily removed/installed. To remove the PSU and the Power backplane board:

To remove the redundant PSU:

1. Press the retaining tab on the PSU as shown.

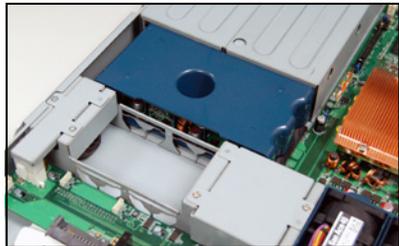


2. Pull the PSU outward and remove it.
3. Follow step 1-2 to remove another PSU.



Remove the Power backplane board

1. After remove the PSU, remove the device fan as shown.



2. Using a screw driver to remove the two screws on the power cable cover.



3. Remove the 8-pin power cable connected to the SAS/SATA backplane board.



4. Push the power backplane board as shown until it is completely removed from the motherboard.



5. Set the power backplane board aside.



6. Using a screw driver to remove the screw on the back of the power backplane board, then remove the PSU power backplane board.



Install the PSU and Power backplane

1. Match the screw with the screw hole and use a screw driver to fasten it as shown to secure the power backplane board with the cover.



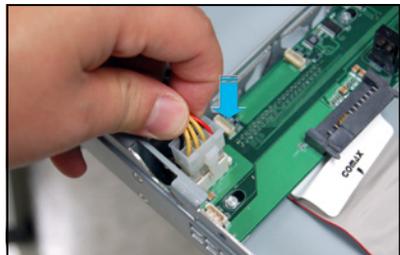
2. Put the power backplane board into its place as shown.



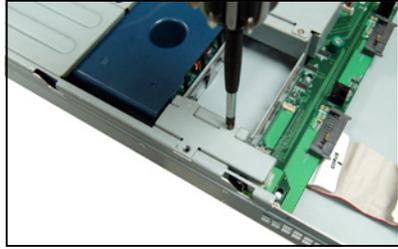
3. Push the power backplane board forward as shown until a slight sound indicates the board is firmly connected to the motherboard.



4. Connect the 8-pin power cable to the rear panel SAS/SATA2 backplane board.



- Using a screw driver to fasten the two screws on the power cable cover.



- Put the device fan into its groove and connect the power cable.



- Push the PSU into the chassis until a slight sound indicates it is properly seated in its place.

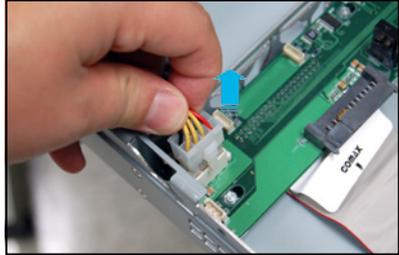


2.8.5 SAS/SATA2 Backpanel and Bridge Card

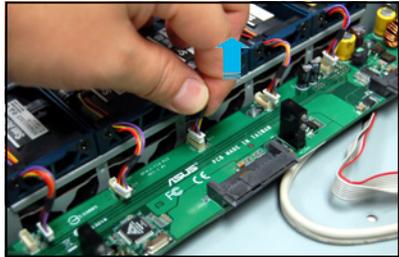
Follow the steps below to remove/install SAS/SATA2 Backplane and the Bridge Card.

To remove the bridge card and and SAS/SATA Backplane:

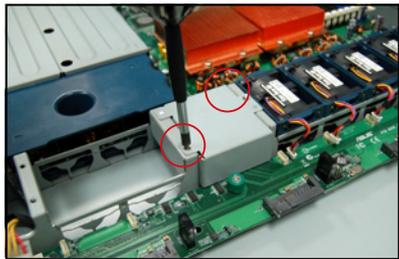
1. Remove the top cover panel, then disconnect the 8-pin power cord to the SAS/SATA2 rear panel.



2. Disconnect the fan cables to the rear panel.



3. Using a screw driver to remove the screws on the cover of the bridge card.



4. Remove the cover panel to expose the bridge card that connects SAS/SATA2 rear panel and the system board.



5. Hold the bridge card and pull out it.



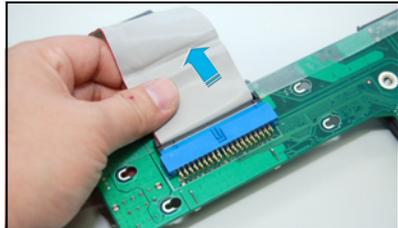
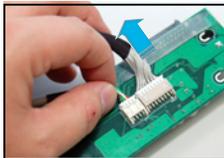
6. Loosen the screws on the SAS/SATA2 Backplane.



7. Push the SAS/SATA2 Backplane as shown and remove it.

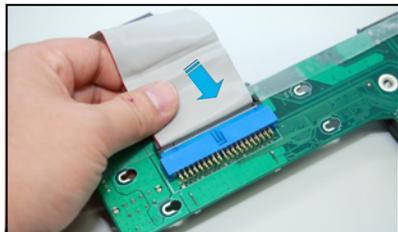
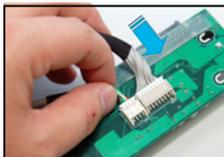


8. Remove the IDE cable and FPB/USB cable.



Install Bridge card and SAS/SATA2 Backplane

1. Connect the IDE and FPB/USB cable.



2. Push the SAS/SATA2 Backplane as shown until it is firmly seated.



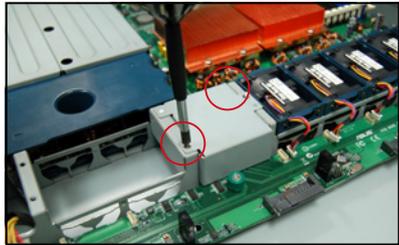
3. Fasten the screws.



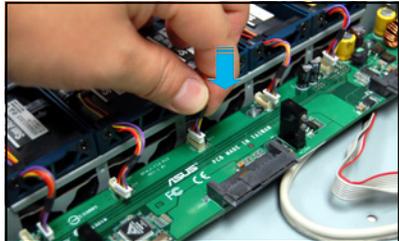
4. Insert the bridge cards.



5. Reinstall the Bridge cards cover, use cross screw driver to fasten it.



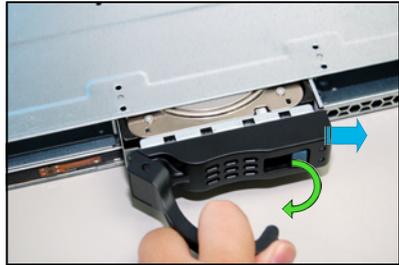
6. Connect all the fan cables and 8-pin power cable.



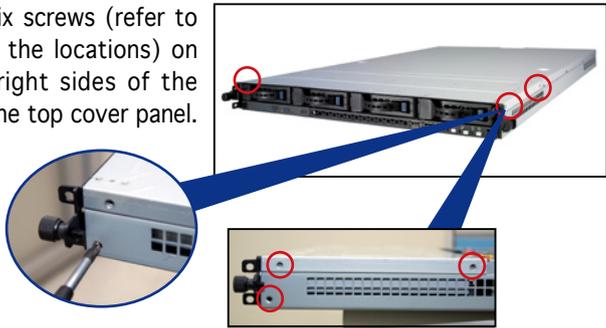
2.8.6 Optical drive

The system come with a DVD drive (CD-ROM/DVD-ROM), follow the steps below if you want to change it:

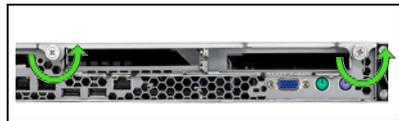
1. Push the blue button to the right side and pull the lever outward (see the figure) to remove the hard disk tray.



2. Remove the six screws (refer to the figure for the locations) on the left and right sides of the front side of the top cover panel.



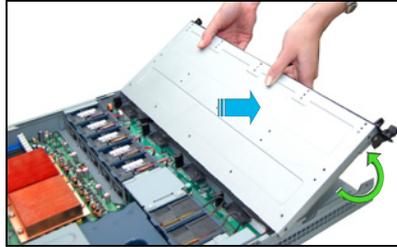
3. Loosen the two screws that scure the top cover panel to the rear panel (refer to the figure for the locations). Please note that do not remove the screws when loosening them.



4. Push the back cover panel backward until it is half inch away from the front side of the top cover panel.



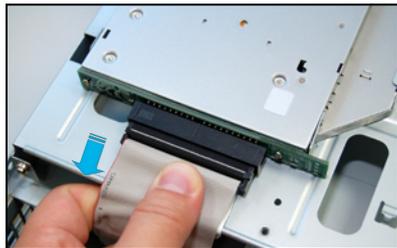
5. Lift the front side of the top cover panel to expose the cables connectors underneath.



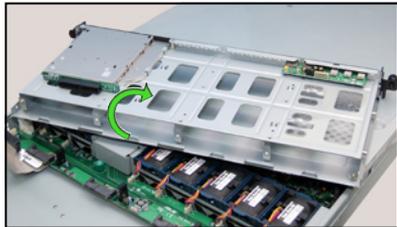
6. Disconnect the LED cables to the front panel.



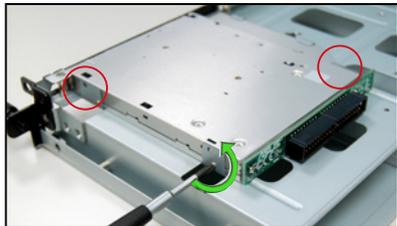
7. Disconnect the cable and power cable of the optical drive.



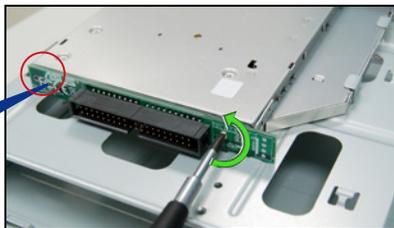
8. Remove the front side of the top cover panel and set it aside.



9. Use a Phillips screwdriver (cross) to remove the screw that secures the drive.



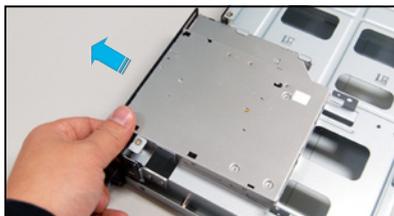
10. Using a screw driver to remove the screws as shown, and remove the riser card.



11. Pull the optical drive carefully and remove it as shown.

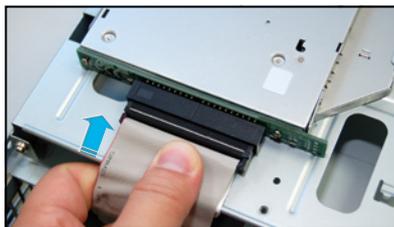
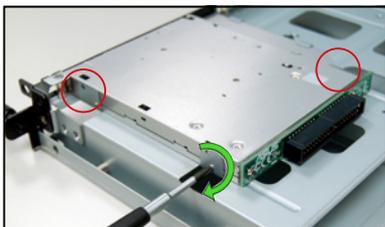
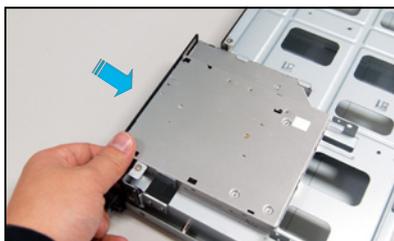


The IDE interface of this system is specially designed, please do not use optical drive of other brands. Otherwise the optical drive might be damaged due to compatibility problem.



Follow the steps below to reinstall the optical drive:

1. Place the optical drive in its place as shown.
2. Using a screw driver fasten the screws to secure the riser card to the optical drive.
3. Secure the three screws that secure the optical drive as shown.
4. Connect the cables and put back the front side of the front cover.

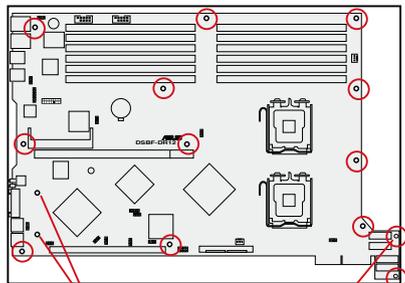
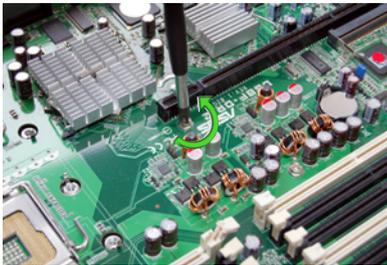


2.8.7 Motherboard

Remove the motherboard

To remove the motherboard:

1. Remove all the signal cables and power cables connected to the system board. Please refer to section 2.6 for more information about cables.
2. Remove all the devices including CPU, heatsink, PCI transer card and FBD memory modules that connect to the board. Please refer to the relevant sections for more information.
3. Remove the PCI riser card and the screws on it.
4. Remove the PSU Power backplane and the bridge card. Remove all the components connected to the board as shown.
5. Remove the thirteen screws that secure the board to the chassis.



Retaining poles

securing holes

6. Remove the boards from the chassis carefully as shown.



The retaining pole is for securing the ZCR card.

Install the motherboard

To install the motherboard:

1. Hold the board by edges as shown and carefully place it in the chassis.
2. Carefully move the board into its place until it is properly seated.



3. Match all the screw hole and secure the board to the chassis using the thirteen screws.



4. Follow the steps in previous sections to install the PSU Power backplane, Bridge card and cables. Refer to section 2.6 for the instruction of connecting cables.
5. Reinstall the CPU and heatsink, PCI riser card and FBD memory modules.

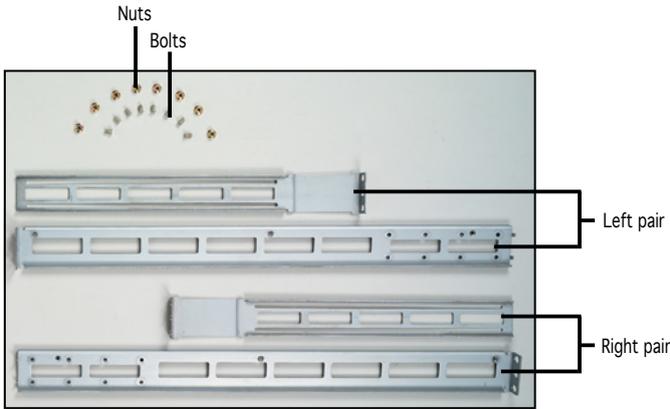
CHAPTER

3

Installation Options

3.1 Rackmount rail kit items

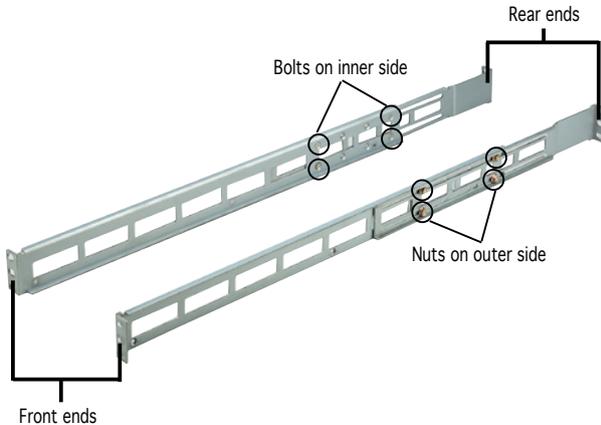
If you have the rackmount rail kit, it contains two pairs of rails (one pair for each side of the barebone system), and eight (8) pairs of nut-and-bolt type screws.



3.2 Rack rails assembly

To assemble the rack rails:

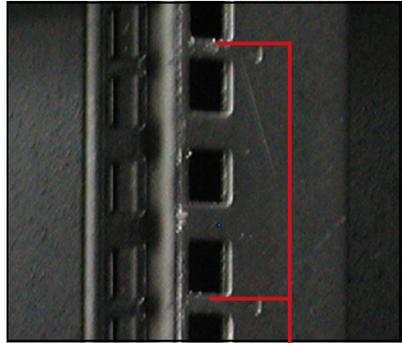
1. Determine the depth of the rack where you wish to install the system.
2. Match one long and one short rail to your desired length, and fix them together using four (4) pairs of nuts and bolts.
3. Repeat step 2 to assemble the other rail pair.



3.3 Attaching the rails to the rack

To attach the rails to the rack:

1. Select one unit of space (1U) on the rack where you wish to install the barebone server.
2. Remove the screws from the 1U space on the rack front.



1U space

3. Align the front end holes of a rack rail pair to the 1U space.
4. Drive in two screws on the outer holes to secure the front end.



5. Find the rear 1U space that corresponds to the front 1U space where you attached the rail.
6. Remove the screws from the rear 1U space, and align the rear end holes.
7. Drive in two screws on the outer holes to secure the rear end.
8. From the rack front, find the corresponding 1U space for the second rail pair.
9. Repeat steps 2 to 7 to attach the second rail pair. When properly installed, the rack rails appear as shown.



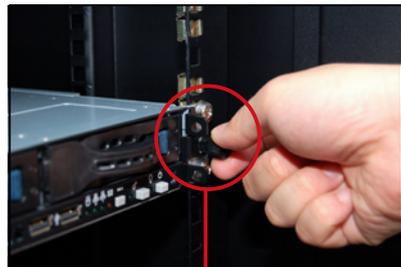
3.4 Rackmounting the server

To mount the server to the rack:

1. Firmly hold the server on both sides and insert the rear panel side to the front end of the rack rail, then carefully push the server all the way to the back until the front panel fits the front end of the rack, and the rack screws on the server match the middle hole on the rack.



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



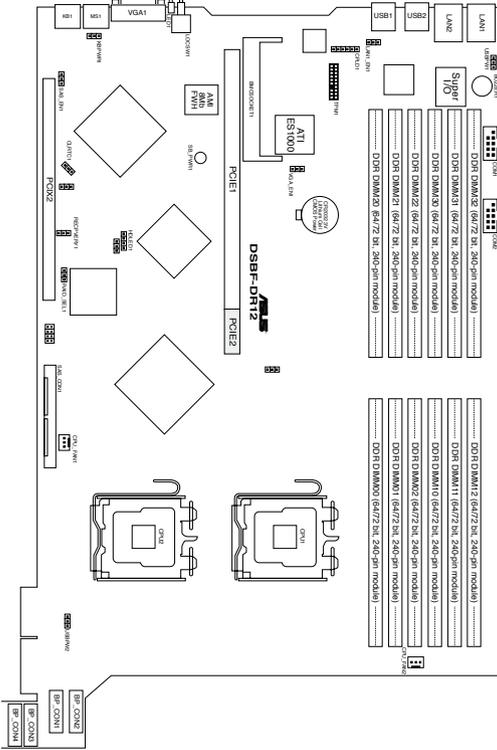
Rack screw

CHAPTER

4

Motherboard Information

4.1 Motherboard layout



Layout contents

Slots/Sockets	Page
1. CPU sockets	4-2
2. FBD DIMM sockets	4-2
3. PCI/PCI-X slots	4-2
4. Zero-Channel RAID socket	4-2
5. Mini-PCI socket	4-2

Jumpers	Page
1. Clear RTC RAM (3-pin CLRTC1)	4-4
2. USB device wake-up (3-pin USBPW12, USBPW34)	4-5
3. Keyboard power (3-pin KBPWR1)	4-5
4. VGA controller setting (3-pin VGA_EN1)	4-6
5. Gigabit LAN1 controller setting (3-pin LAN1_EN1)	4-6
6. SAS setting (3-pin SAS_EN1)	4-7
7. Force BIOS recovery setting (3-pin RECOVERY1)	4-8

Internal connectors	Page
1. Hard disk activity LED connector (4-pin HDLED1)	4-8
2. Serial port connector (10-1 pin COM2)	4-13

4.2 Jumpers

1. Clear RTC RAM (CLRRTC1)

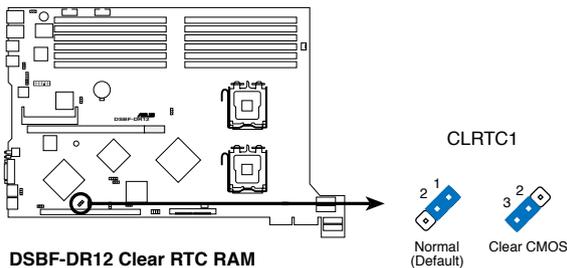
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. 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 CLRRTC jumper default position. Removing the cap will cause system boot failure!

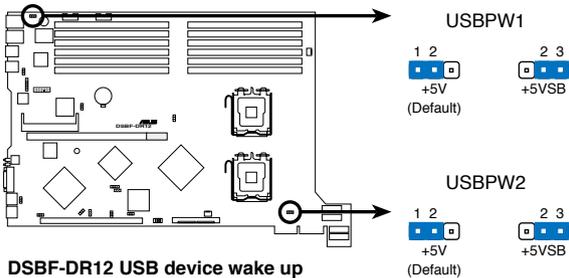


2. USB device wake-up (3-pin USBPW12)

Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S4 sleep mode (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).

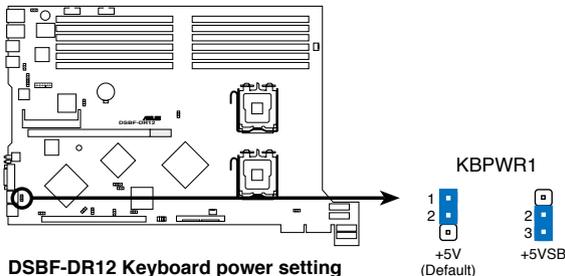


- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system would not power up.
- If you are using Windows 2000, you need to install Service Pack 4 to wake up the system from S4 sleep mode.
- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.



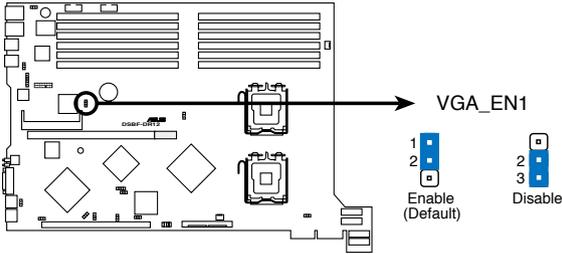
3. Keyboard power (3-pin KBPWR1)

This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) to wake up the computer when you press a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS.



4. VGA controller setting (3-pin VGA_EN1)

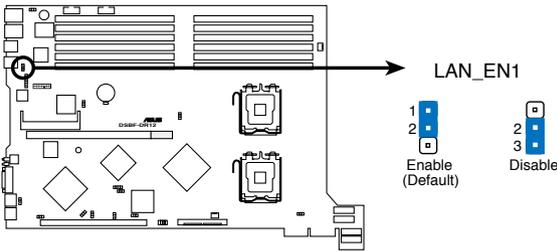
These jumpers allow you to enable or disable the onboard ATI RAGE-XL PCI VGA controller. Set to pins 1-2 to activate the VGA feature.



DSBF-DR12 VGA setting

5. Gigabit LAN1 controller setting (3-pin LAN1_EN1)

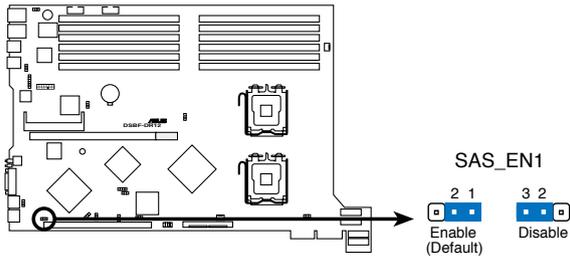
This jumper allows you to enable or disable the onboard Intel Gigabit LAN1 (Intel ESB2E Support) controller. Set to pins 1-2 to activate the Gigabit LAN feature.



DSBF-DR12 LAN_EN setting

6. SAS controller setting (3-pin SAS_EN1)

This jumper allows you to enable or disable the onboard LSI SAS1068 controller. Set to pins 1-2 to activate the SAS feature, and support RAID configurations.



DSBF-DR12 SAS setting



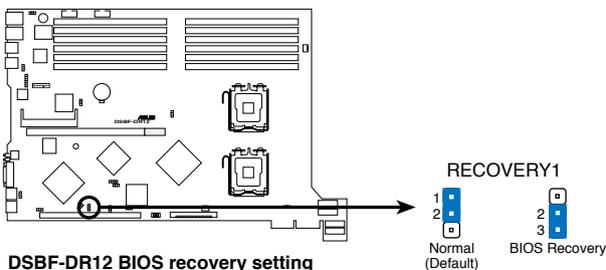
Important! If set to pin 2-3 to disable the SAS feature, the motherboard will not detect HDDs.

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 (xxxx-xxx.ROM) and the AFUDOS.EXE utility.
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.

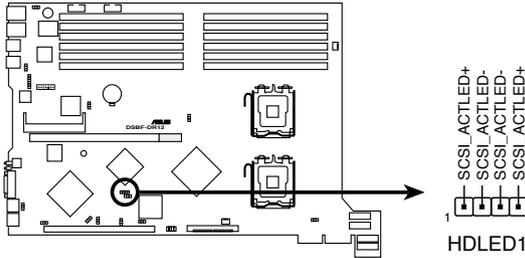


DSBF-DR12 BIOS recovery setting

4.3 Connectors

1. IDE connectors (40-1 pin PRI_IDE, SEC_IDE)

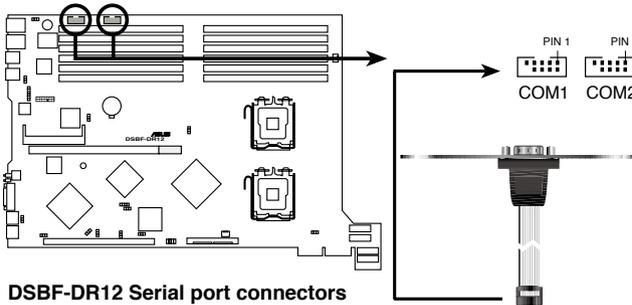
This connector supplies power to the hard disk activity LED. The read or write activities of any device connected to the SCSI connectors or the SATA connectors cause this LED to light up.



DSBF-DR12 SAS/SATA2 card activity LED connector

2. 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.



DSBF-DR12 Serial port connectors

CHAPTER

5

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.)

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 1/2 Floppy Drive icon.
 - d. Click File from the menu, then select Format. A Format 3 1/2 Floppy Disk window appears.
 - e. Select Create an MS-DOS startup disk from the format options field, then click Start.
2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.
 3. Delete config.sys and autoexec.bat from floppy disk.



Phlash16 does not run in any environment with memory management such as an MS-DOS Window or Window Console. Do not run MS-DOS with CONFIG.SYS or AUTOEXEC.BAT. Do not open any memory manager such as HIMEM.SYS or EMM.386. Refer to Appendix for detailed information.

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 Advantech web site. Save the file to a floppy disk.



Make sure 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. After posting and reading the boot data from floppy, press <F5> to bypass some unnecessary files.
5. When the A:> appears, replace the bootable floppy disk with the floppy disk containing the new BIOS file and the Phoenix Phlash16 Utility.
6. At the prompt, type the following command string:
<Format>
Phlash16 /mode=3 [Driver label][File Name]
<Example>
Phlash16 /mode=3 A:\BIOS.WPH
7. The Phoenix Phlash16 Utility automatically updates the BIOS.



Do not turn off or reset the system during the flashing process!

8. Restart the system after the utility completes the updating process. Make sure you remove the floppy disk from the drive.



When you execute the Phlash16.exe. program and the screen displays "Cannot flash if Memory Managers" error message, refer to the Appendix to solve it.

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 “4.1 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.

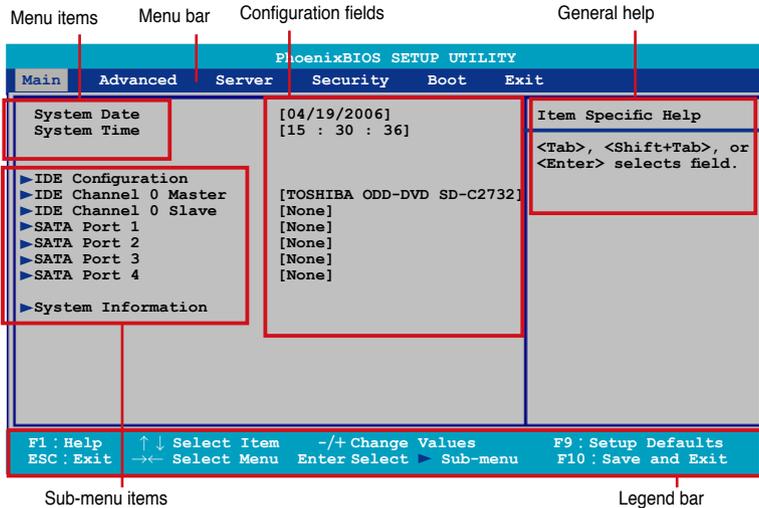
If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

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 Default Settings item under the Exit Menu. See section “4.8 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 Advantech website (www.Advantech.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 server configuration
- Security For changing the security configuration
- 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>.

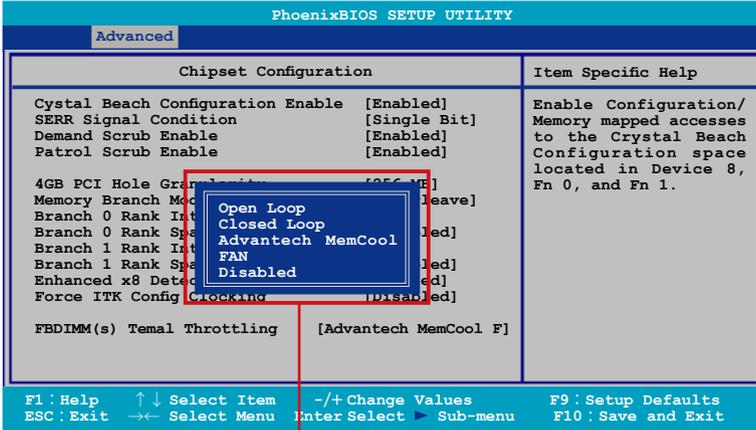
5.2.6 Configuration fields

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.



Pop-up menu

5.2.8 General help

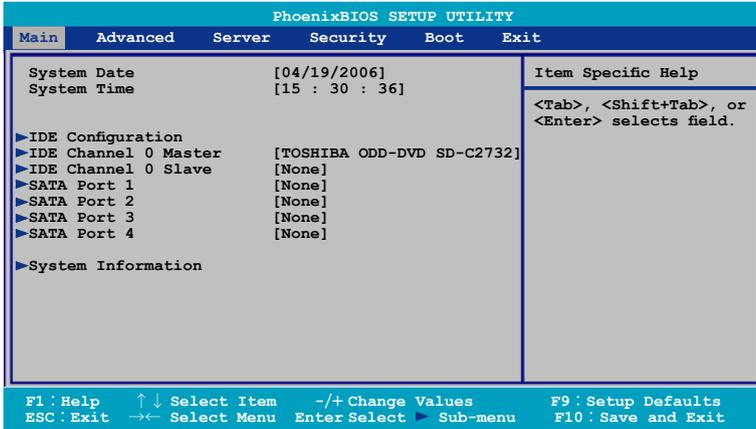
At the top right corner of the menu screen is a brief description of the selected item.

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.



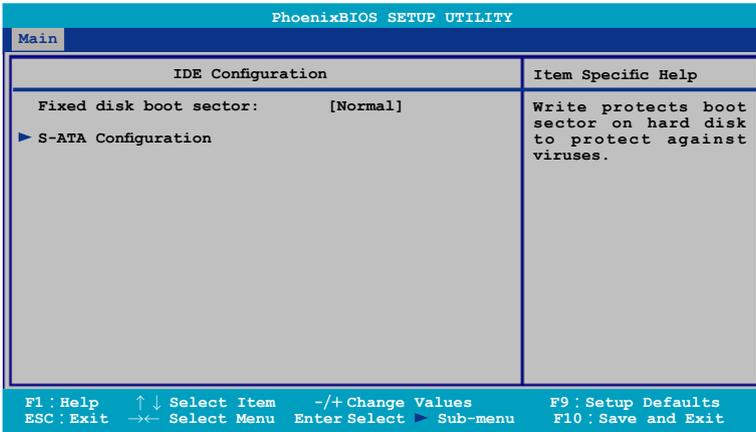
5.3.1 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

5.3.2 System Time [xx:xx:xx]

Allows you to set the system time.

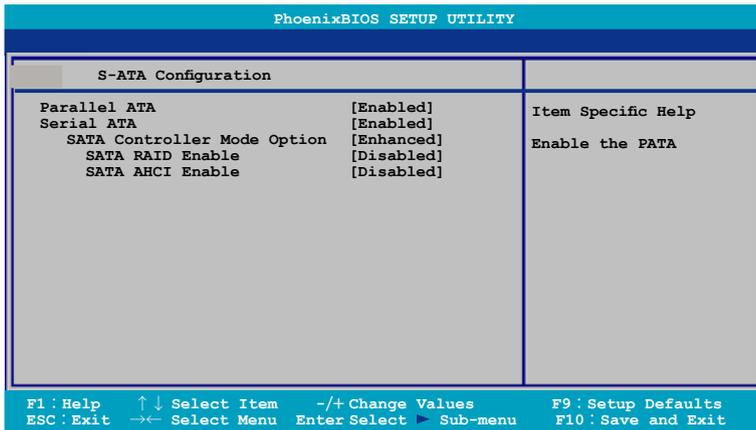
5.3.4 IDE Configuration



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



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]



The following items appear only if you set the Serial ATA Option item to [Enabled].

Native Mode Operation [Disabled]

Allows you to choose the ATA native mode. Some operating systems are not supported under native mode. Configuration options: [Auto] [Serial ATA]

SATA Controller Mode Option [Enhanced]

Allows selection of the Serial ATA operation mode depending on the installed operating system(OS). Set to [Enhanced] mode if you are using native OS, e.g. Windows 2000/XP. Set to [Compatible] mode if you are using legacy OS, e.g. Windows ME/98/NT, MS-DOS. Configuration options: [Enhanced] [Compatible]



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]

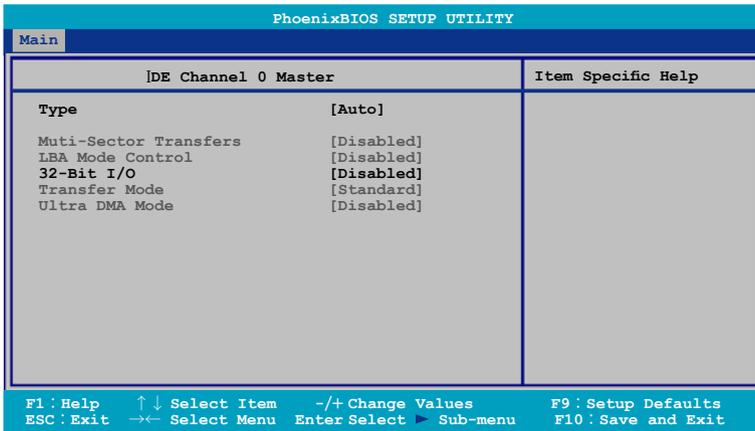


The following items appear only if you set the SATA RAID enabled option item to [Disabled]

SATA AHCI Enable [Disabled]

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

5.3.5 IDE Channel 0 Master/Slave SATA Port 1/2/3/4



Type [Auto]

The BIOS automatically detects the values opposite the dimmed items. These values are not user-configurable.

Muti-Sector Transfers [Disabled]

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

LBA Mode Control [Disabled]

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

32-Bit I/O [Disabled]

Enables or disables 32-bit data transfer. Configuration options: [Disabled] [Enabled]

Transfer Mode [Disabled]

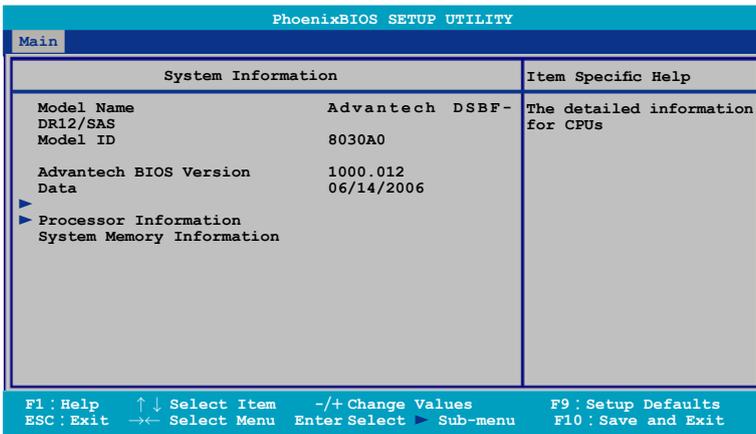
Shows the data transfer mode if the hard disk supports this feature.

Ultra DMA Mode [Disabled]

When this item is set to [Auto], the UDMA capability allows improved transfer speeds and data integrity for supported IDE devices. Configuration options: [Disabled] [Auto]

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.



The items in this menu are non-user configurable.

Model Name/Model ID

Displays the auto-detected model information.

Advantech BIOS Version

Displays the auto-detected BIOS information.

Data

Displays the date of the BIOS version.

Processor

Displays the CPU information.

PhoenixBIOS SETUP UTILITY		
Main		
Processor Information		Item Specific Help
***CPU1: Brand Intel(R) Xeon(TM) CPU 3.00GHz Speed 3.00GHz Ratio Actual 18 Max 18 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
ESC: Exit	→← Select Menu	Enter Select ▶ Sub-menu
		F9: Setup Defaults
		F10: Save and Exit



These items are not configurable. The screen displays the information of the second CPU if you installed two CPUs in the system.

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 : 2048 MB DIMM-00 -- 2048MB,AMB Temperature:46 DIMM-01 -- None DIMM-02 -- None DIMM-10 -- None DIMM-11 -- None DIMM-12 -- None DIMM-20 -- None DIMM-21 -- None DIMM-22 -- None DIMM-30 -- None DIMM-31 -- None DIMM-32 -- 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
ESC: Exit	→← Select Menu	Enter Select ▶ Sub-menu
		F9: Setup Defaults
		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
<p>WARNING: Setting wrong value in below sections may cause system to malfunction.</p> <ul style="list-style-type: none"> ▶ Advanced Processor Options ▶ Chipset Configuration ▶ PCI Configuration ▶ ICH USB Control Sub-Menu ▶ Peripheral Devices Configuration ▶ ACPI Configuration ▶ Power On Configuration ▶ Hardware Monitor 		<p>Item Specific Help</p> <p>Option for CPU</p>	
<p>F1 : Help ↑↓ Select Item -/+ Change Values F9 : Setup Defaults ESC : Exit →← Select Menu Enter Select ▶ Sub-menu F10 : Save and Exit</p>			

5.4.1 Advanced Processor Options

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

Scroll down to display the following item:

Discrete MTRR Allocation	[Disabled]	
Intel EIST support	[Enabled]	
<p>F1 : Help ↑↓ Select Item -/+ Change Values F9 : Setup Defaults ESC : Exit →← Select Menu Enter Select ▶ Sub-menu F10 : Save and Exit</p>		

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]

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 [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: [Disabled] [Enabled]

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

Configuration options: [Disabled] [Enabled]

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]



The "*" mark items only for technical personnel uses to debug.

Echo TPR [Disabled]

Configuration options: [Disabled] [Enabled]

Discrete MTRR Allocation [Disabled]

Configuration options: [Disabled] [Enabled]

Intel EIST support [Enabled]

Enable or disable the Intel EIST function. Configuration options: [Disabled] [Enabled].

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.

The screenshot shows the PhoenixBIOS SETUP UTILITY interface. At the top, there is a blue header with the text 'PhoenixBIOS SETUP UTILITY'. Below the header, a sub-menu 'Advanced' is selected. The main content area is a table with two columns: 'Chipset Configuration' and 'Item Specific Help'. The table lists various configuration options and their current status. At the bottom of the screen, there is a blue bar with navigation instructions: 'F1 : Help', 'ESC : Exit', '↑ ↓ Select Item', '→ ← Select Menu', '-/+ Change Values', 'Enter Select', '▶ Sub-menu', 'F9 : Setup Defaults', and 'F10 : Save and Exit'.

Chipset Configuration	Item Specific Help
Crystal Beach Configuration 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 [Single Bit]	
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]	
Branch 1 Rank Interleave [4:1]	
Branch 1 Rank Sparing [Disabled]	
Enhanced x8 Detection [Enabled]	
Force ITK Config Clocking [Disabled]	
FBDIMM(s) Temal Throttling [Advantech MemCool F]	

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 [Single Bit]

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

Demand Scrub Enable [Enabled]

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

Patrol Scrub Enable [Enabled]

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

4GB PCI Hole Granularity [Enabled]

Allows you to select the granularity of the PCI hole for PCI resource. Configuration options: [256 MB] [512 MB] [1.0 GB] [2.0 GB]

Memory Branch Mode [Enabled]

Allows you to select the memory branch mode. Configuration options: [Sequential] [Interleave] [Mirror] [Single Channel0]

Branch 0 Rank Interleave [4:1]

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

Branch 0 Rank Sparing [Disabled]

Allows you to enable or disable the Branch 0 rank/DIMM Sparing feature. Configuration options: [Disabled] [Enabled]

Branch 1 Rank Interleave [4:1]

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

Branch 1 Rank Sparing [Disabled]

Allows you to enable or disable the Branch 1 rank/DIMM Sparing feature. 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 Thermal Throttling [Advantech MemCool F]

Allows you to disable or set the thermal throttling control. Configuration options: [Open Loop] [Close Loop] [Advantech MemCool FAN] [Disabled]



We recommend set [Advantech MemCool] to obtain better fan management.

5.4.3 PCI Configuration

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



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

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]	
▶ PCI Device, Slot #1	
▶ PCI Device, Slot #2	
▶ PCI Device, Slot #3	
F1 : Help ↑ ↓ Select Item -/+ Change Values F9 : Setup Defaults ESC : Exit → ← Select Menu Enter Select ▶ Sub-menu 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 And Play O/S [No]

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

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]

PCI Device, Slot #1/#2/#3

Option ROM Scan [Enabled]

Configuration options: [Disabled] [Enabled]

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]	Enabled USB host controller.
USB 2.0 Controller	[Enabled]	
Legacy USB Support	[Enabled]	

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

USB Function [Enabled]

Enable or disable the USB controller Configuration options [Disabled] [Enabled]



The following items appear only if you enabled USB function.

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.

Peripheral Devices Configuration		Item Specific Help
Serial port A	[Enabled]	Configure Serial port A using options: [Disabled] No Configuration [Enabled] User Configuration [Auto] BIOS or OS chooses Configuration (OS Controlled) Displayed when controlled by OS
Base I/O address	[3F8]	
Interrupt	[IRQ 4]	
Serial port B	[Enabled]	
Mode	[Normal]	
Base I/O address	[2F8]	
Interrupt	[IRQ 3]	
F1 : Help ↑ ↓ Select Item -/+ Change Values F9 : Setup Defaults ESC : Exit → ← Select Menu Enter Select ▶ Sub-menu F10 : Save and Exit		

Serial port A [Enabled]

Allows you to configure serial port A. Configuration options: [Disabled] [Enabled]



The following items appears only when you set serial Port A as Enabled.

Base I/O address [378]

Allows you to select the base I/O address for serial port A. Configuration options: [3F8] [2F8] [3E8] [2E8]

Interrupt [IRQ 4]

Allows you to set the interrupt for serial port A. Configuration options: [IRQ 3] [IRQ 4]

Serial port B [Enabled]

Allows you to configure serial port B. Configuration options: [Disabled] [Enabled]



The following items appears only when you set Serial Port B as Enabled.

Mode [Normal]

Allows you to set the mode for serial port B. Configuration options: [Normal] [IR] [ASK-IR]

Base I/O address [2F8]

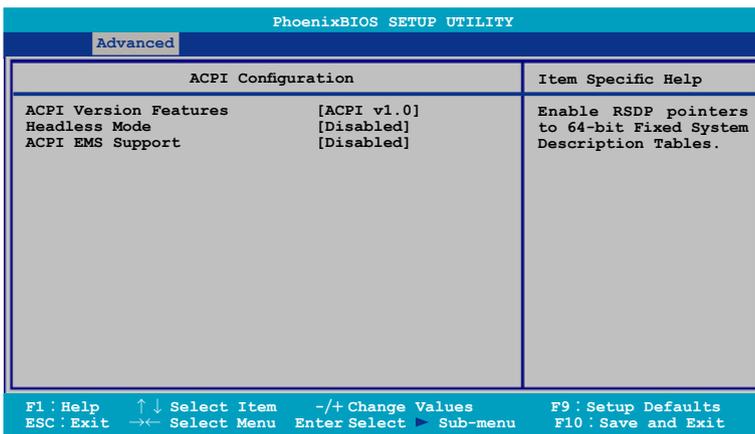
Allows you to select the base I/O address for serial port B. Configuration options: [3F8] [2F8] [3E8] [2E8]

Interrupt [IRQ 3]

Allows you to set the interrupt for serial port B. Configuration options: [IRQ 3] [IRQ 4]

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.



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]

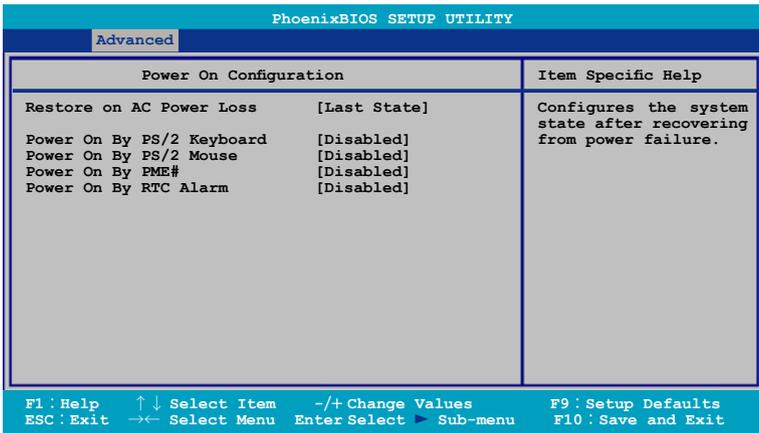
Allows you to enable or disable the headless operation mode through ACPI. Configuration options: [Disabled] [Enabled]

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.



Restore on AC Power Loss [Power Off]

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 Up By PS/2 Keyboard [Disabled]

Allows you to use specific keys on the PS/2 keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Power Up By PS/2 Mouse [Disabled]

When set to [Enabled], this parameter allows you to use the PS/2 mouse to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

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.

PhoenixBIOS SETUP UTILITY		
Advanced		
Hardware Monitor		Item Specific Help
CPU1 Domain 0 Temperature	47°C/116°F	When the current temperature equals this limit, the fan will be turned on IF it is not already.
CPU1 Domain 1 Temperature	52°C/125°F	
CPU2 Domain 0 Temperature	N/A	
CPU2 Domain 1 Temperature	N/A	
SYSTEM 1 Temperature	26°C/78°F	
SYSTEM 2 Temperature	31°C/87°F	
FAN1	2925 RPM	
FAN2	667 RPM	
FAN3	667 RPM	
FAN4	667 RPM	
FAN5	667 RPM	
FAN6	667 RPM	
FAN7	667 RPM	
FAN8	667 RPM	
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:



The CPU 1/2 Domain 0/1 Target Temperature and SYSTEM 1/2 Target Temperature items appear only when you set Smart Fan Control as [Smart Fan]

PhoenixBIOS SETUP UTILITY		
Advanced		
Hardware Monitor		Item Specific Help
CPU1 Domain 0 Target Temperature	[075]	When the current temperature equals this limit, the fan will be turned on IF it is not already.
CPU1 Domain 1 Target Temperature	[075]	
CPU2 Domain 0 Target Temperature	[075]	
CPU2 Domain 1 Target Temperature	[075]	
SYSTEM 1 Target Temperature	[060]	
SYSTEM 2 Target Temperature	[060]	
FAN9	N/A	
FAN10	N/A	
FAN11	N/A	
FAN12	N/A	
VCORE0 Voltage	1.25 V	
VCORE1 Voltage	N/A	
VVT	1.30 V	
+1.5V	1.47 V	
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
+1.8V	1.77 V	When the current temperature equals this limit, the fan will be turned on IF it is not already.
+3V	3.24 V	
+12V	11.80 V	
+5V	5.08 V	
+5VSB	5.06 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 Temperature, CPU1/2 Domain 1 Temperature, SYSTEM1/2 Temperature,FRN1/2/3/4/5/6 /7/8

These fields show the auto-detected values and are not user-configurable. If no fan is installed, the field shows 0 RPM.

Smart Fan Control [Smart Fan II]

Allows you to disable or configure the Smart Fan feature. Configuration options: [Disabled] [Smart Fan] [Smart Fan II]



The CPU 1/2 Domain 0/1 Target Temperature and SYSTEM 1/2 Target Temperature appear only when you set Smart Fan Control as [Smart Fan]

CPU1/2 Domain 0 Target Temperature [075]

CPU1/2 Domain 1 Target Temperature [075]

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

SYSTEM1/2 Target Temperature

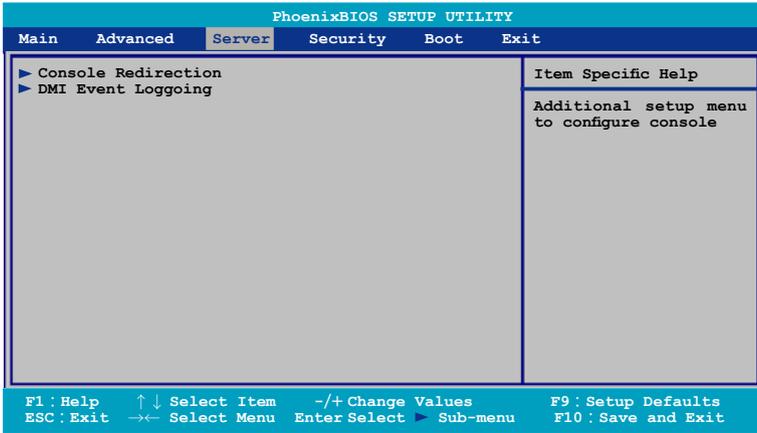
Allows you to set the target system temperature at which the system fan will start running if the fan is not yet turned on.

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

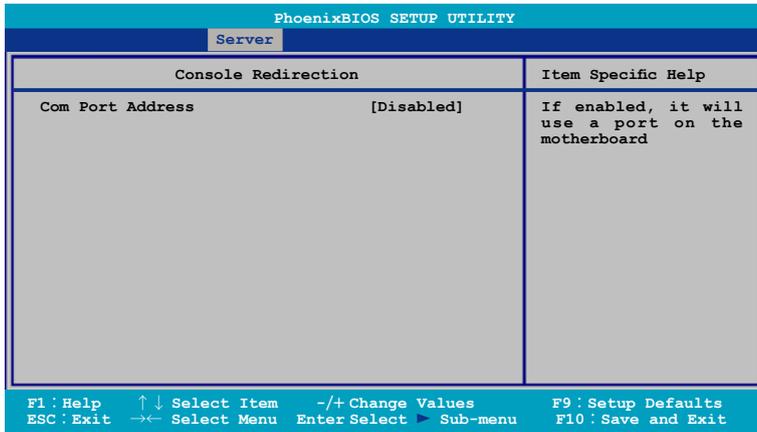
These fields show the auto-detected values and are not user-configurable.

5.5 Server menu

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



Console Redirection



Com Port Address [Disabled]

Allows you to disable or select the COM port to use. Configuration options: [Disabled] [On-board COM A] [On-board COM B]



The following items appear only if you set the Com Port Address item to [On-board COM A] or [On-board COM B].

Baud Rate [115.2K]

Allows you to enable the specified baud rate. Configuration options: [300] [1200] [2400] [9600] [19.2K] [38.4K] [57.6K] [115.2K]

Console Type [PC-ANSI, 7bit]

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]

Console Connection [Direct]

Allows you to select the console connection. [Direct] indicates that the console is connected directly to the system. [Via modem] indicates that a modem is used to connect. Configuration options: [Direct] [Via modem]

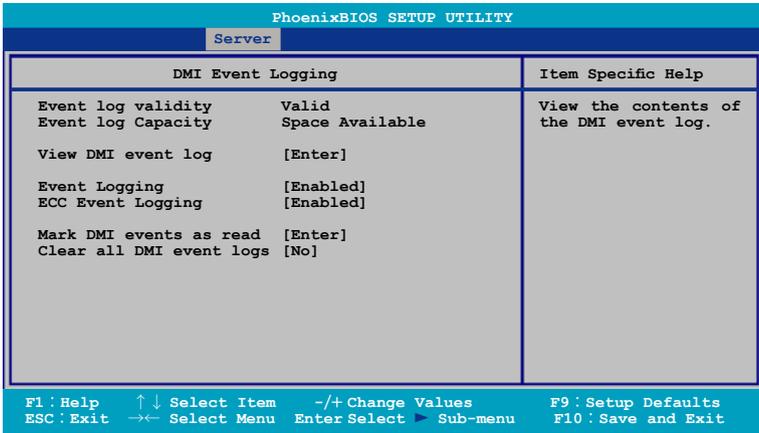
Continue C.R. after POST [Off]

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]

DMI Event Logging



View DMI event log [Enter]

Press <Enter> to display the information of DMI event log.

Event Logging [Enabled]

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

Ecc Event Logging [Enabled]

Allows you to enable or disable the ECC Event Logging function. Configuration options: [Enabled] [Disabled]

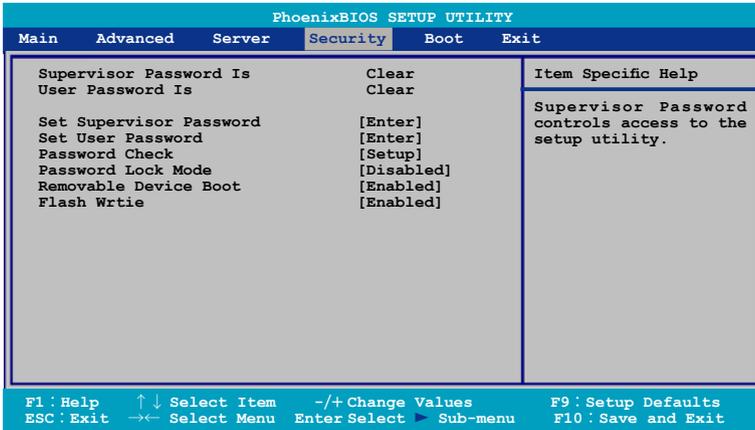
Mark DMI events as read [Enter]

Press enter to enable the MARK DMI events as read function.

Clear all DMI event logs [No]

[No] [Yes] Allows you to clear/keep all DMI event logs. Configuration options: [No] [Yes]

5.6 Security menu



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. Type in a password using a combination of a maximum of eight (8) alpha-numeric characters, then press <Enter>.
3. When prompted, 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:



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 “Password has been changed” 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 “2.6 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 [System] to require the password before entering the system. Configuration options: [Setup] [System]

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]

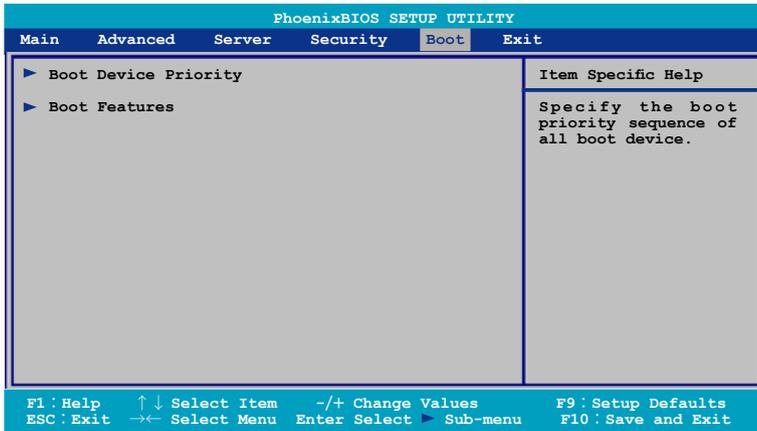
Removable Device Boot [Enabled]

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

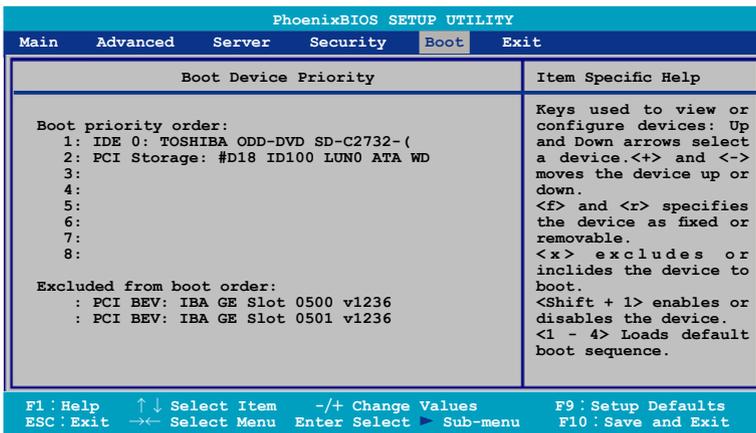
Flash Write [Enabled]

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

5.7 Boot menu



5.7.1 Boot Device Priority



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 Support	[Auto Detect]	
Summary screen	[Enabled]	
POST Errors	[Enabled]	
SETUP prompt	[Enabled]	
Interrupt 19 Capture	[Enabled]	
F1 : Help ↑↓ Select Item -/+ Change Values F9 : Setup Defaults		
ESC : Exit ← Select Menu Enter Select ► Sub-menu 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]



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

Bootup Num-Lock [On]

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

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]

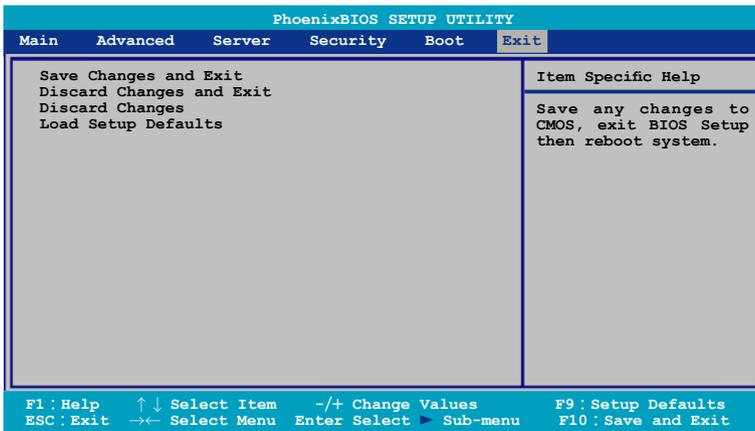
SETUP prompt [Enabled]

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

RAID Configuration

6.1 Setting up RAID

The motherboard comes with LSI 1068 PCI-X SAS chipset that allows you to set RAID 0, RAID 1, and RAID 1E configurations.

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.



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. Refer to Chapter 7 for details.

6.1.2 Installing hard disk drives

To install the SAS hard disks for RAID configuration:

1. Install the SAS hard disks into the drive bays following the instructions in the chapter 2.
2. Connect the SAS interface cable connectors at the back of the SAS drives.
3. Connect the other end of the SAS interface cable to the SAS connector on the motherboard.

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. 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 by adjust the jumper RAID_SEL1. For example, 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 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)

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

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 Logic Corp. MPT SAS BIOS
MPTBIOS-6.05.06.00 (2005.01.16)
Copyright 2000-2005 LSI Logic Corp.
*** RELEASE VERSION ***

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

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

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Adapter Properties -- SAS1068

Adapter          SAS1068
PCI Slot         00
PCI Address(Bus/Dev/Func) 07:03:00
MPT Firmware Revision 0.07.01.00-IR
SAS Address      00000001:00000008
Status          Enabled
Boot Order      0
Boot Support    [Enabled BIOS & OS]

RAID Properties
SAS Topology
Advanced Adapter Properties

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

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

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
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
```

5. 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 MPT Setup Utility          v6.05.06.00 (2006.01.16)
Create New Array -- SAS1068
Array Type:                          IM
Array Size(MB):                      -----

Slot  Device Identifier              RAID  Hot   Drive  Pred  Size
Num   ID                               Disk  Spr   Status Fail  (MB)
-----
4     SAS  HDS722580VLSA80 A63A [No]  [No]  -----  ---  78533
5     FUJITSU MAX3147RC 0104 [No]  [No]  -----  ---  140272
6     SAS  HDS722580VLSA80 A63A [No]  [No]  -----  ---  78533
7     SAS  HDS722580VLSA80 A63A [No]  [No]  -----  ---  78533

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



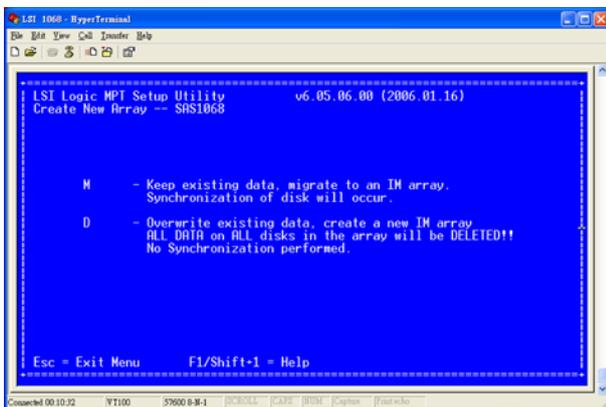
By default, the RAID Disk field shows No before array creation. This field is grayed out under the following conditions:

- 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.

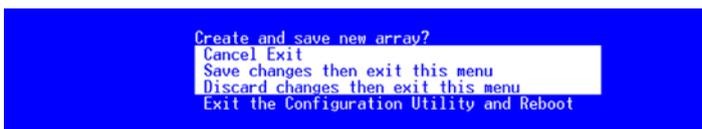
6. A confirmation screen appears.

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. Make sure the data you want to mirror is on the first disk.

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



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



9. The utility creates the array.



6.2.2 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>.

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Adapter Properties -- SAS1068

Adapter                SAS1068
PCI Slot               00
PCI Address(Bus/Dev/Func) 07:03:00
MPT Firmware Revision  0.07.01.00-IR
SAS Address            00000001:00000008
Status                Enabled
Boot Order             0
Boot Support           [Enabled BIOS & OS]

[RAID Properties]
[SAS Topology]
[Advanced Adapter Properties]

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

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

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
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
```

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 MPT Setup Utility          v6.05.06.00 (2006.01.16)
Create New Array -- SAS1068
Array Type:                           IME
Array Size(MB):                        117301

Slot  Device Identifier              RAID  Hot  Drive  Pred  Size
Num   Device Identifier              Disk  Spr  Status  Fail  (MB)
 4   SAS   HDS722580VLSA80 A63A  [Yes] [No]  -----  ---   78533
 5   FUJITSU MAX314 7RC   0104  [No]  [No]  -----  ---  140272
 6   SAS   HDS722580VLSA80 A63A  [Yes] [No]  -----  ---   78533
 7   SAS   HDS722580VLSA80 A63A  [Yes] [No]  -----  ---   78533

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.

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 MPT Setup Utility          v6.05.06.00 (2006.01.16)

Processing...may take up to 1 minute
Creating RAID Array...

```

6.2.3 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 Logic Corp. MPT SAS BIOS
MPTBIOS-6.05.06.00 (2005.01.16)
Copyright 2000-2005 LSI Logic Corp.
*** RELEASE VERSION ***

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

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

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Adapter Properties -- SAS1068

Adapter          SAS1068
PCI Slot         00
PCI Address(Bus/Dev/Func)  07:03:00
MPT Firmware Revision  0.07.01.00-IR
SAS Address      00000001:00000008
Status          Enabled
Boot Order      0
Boot Support    [Enabled BIOS & OS]

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 MPT Setup Utility          v6.05.06.00 (2006.01.16)
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 IWE 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

```

- 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>.

```

LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Create New Array -- SAS1068
Array type:                          IS
Array Size(MB):                       234603

Slot  Device Identifier              RAID  Hot   Drive   Pred   Size
Num   Num                          Disk  Spr   Status Fail   (MB)
  4   SAS   HDS722580VLSA80  A63A  [Yes] [No]   -----   ---   78533
  5   FUJITSU  MAX3147RC          0104  [No]  [No]   -----   ---  140272
  6   SAS   HDS722580VLSA80  A63A  [Yes] [No]   -----   ---   78533
  7   SAS   HDS722580VLSA80  A63A  [Yes] [No]   -----   ---   78533

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.

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 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
```

9. The utility creates the array.

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)

Processing...may take up to 1 minute
Creating RAID Array...
```

6.2.4 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.

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Adapter Properties -- SAS1068

Adapter          SAS1068
PCI Slot         00
PCI Address(Bus/Dev/Func) 07:03:00
MPT Firmware Revision 0.07.01.00-IR
SAS Address      00000001:00000008
Status           Enabled
Boot Order       0
Boot Support     [Enabled BIOS & OS]

[RAID Properties]
[SAS Topology]
[Advanced Adapter Properties]

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

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

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Select New Array Type -- SAS1068

[View Existing Array] View the existing configuration.

[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!
```

- TheView 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 MPT Setup Utility          v6.05.06.00 (2006.01.16)
View Array -- SAS1068
  Array                               1 of 1
  Identifier                           LSILOGICLogical Volume 3000
  Type                                 IME
  Scan Order                           4
  Size (MB)                             117301
  Status                                Optimal

  Manage Array

Slot Num  Device Identifier          RAID  Hot  Drive  Pred  Size
         Num                    Disk Spr Status Fail (MB)
  4 SAS   HDS722580VLSA80 A63A    Yes No  Ok    No   78200
  5 SAS   HDS722580VLSA80 A63A    Yes No  Ok    No   78200
  7 SAS   HDS722580VLSA80 A63A    Yes No  Ok    No   78200

Esc = Exit Menu          F1/Shift+l = Help
Alt+D = Device Properties  Alt+N = Next Array  Alt+M = More Keys

```

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 MPT Setup Utility          v6.05.06.00 (2006.01.16)
View Array -- SAS1068
  Array                               1 of 1
  Identifier                           LSILOGICLogical Volume 3000
  Type                                 IME
  Scan Order                           4
  Size (MB)                            117301
  Status                               Optimal

  Manage Array

Slot Num  Device Identifier          RAID Hot Drive Pred Size
         Num                        Disk Spr Status Fail (MB)
  4      SAS   HDS722580VLSA80 A63A  Yes No  Ok   No   78200
  5      SAS   HDS722580VLSA80 A63A  Yes No  Ok   No   78200
  7      SAS   HDS722580VLSA80 A63A  Yes No  Ok   No   78200

Esc = Exit Menu          F1/Shift+1 = Help
Alt+D = Device Properties  Alt+N = Next Array  Alt+M = More Keys
```

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

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Manage Array -- SAS1068

Identifier                           LSILOGICLogical Volume 3000
Type                                 IM
Scan Order                           4
Size(MB)                              78201
Status                               Optimal

  Manage Hot Spare
  Synchronize 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.

```

LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Manage Hot Spare -- SAS1068

Identifier          LSILOGICLogical Volume 3000
Type                IM
Scan Order          4
Size(MB)            78201
Status              Optimal

Slot  Device Identifier  Hot  Drive  Pred  Size
Num   SAS               Spr  Status Fail  (MB)
 4    SAS  HDS722580VLSA80 A63A [No] Primary No   78201
 5    FUJITSU MAX3147RC  0104 [No] ----- --- 140272
 6    SAS  HDS722580VLSA80 A63A [No] Secondary No  78201
 7    SAS  HDS722580VLSA80 A63A [Yes] Hot Spare No  78533

Esc = Exit Menu      Fl/Shift+l = Help
Space/+/- = Change Item  C = Commit 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 Synchronize Spare, then press <Enter>.

```

LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Manage Array -- SAS1068

Identifier          LSILOGICLogical Volume 3000
Type                IM
Scan Order          4
Size(MB)            78201
Status              Optimal

Manage Hot Spare
Synchronize Array
Activate Array
Delete Array

Esc = Exit Menu      Fl/Shift+l = Help
Enter = Select Item

```

- 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>.

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Manage Array -- SAS1068

Identifier          LSILOGICLogical Volume 3000
Type               IM
Scan Order         4
Size(MB)           78201
Status             Optimal

  Manage Hot Spare
  Synchronize Array
  Activate Array
  Delete Array

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

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

Deleting an array



- You cannot recover lost data if you delete an array. Make sure 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>.

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Manage Array -- SAS1068

Identifier          LSILOGICLogical Volume 3000
Type               IM
Scan Order         4
Size(MB)           78201
Status             Optimal

Manage Hot Spare
Synchronize Array
Activate Array
Delete Array

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

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

Viewing SAS topology

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

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
Adapter Properties -- SAS1068

Adapter          SAS1068
PCI Slot         00
PCI Address(Bus/Dev/Func) 07:03:00
MPT Firmware Revision 0.07.01.00-TR
SAS Address      00000001:00000008
Status           Enabled
Boot Order       0
Boot Support     [Enabled BIOS only]

[RAID Properties]
[SAS Topology]
[Advanced Adapter Properties]

Esc = Exit Menu          F1/Shift+1 = Help
Alt+D = Device Properties  Alt+M = More Keys
```

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

```
More keys for the SAS Topology display:

C = Clear Device Mappings for Non-Present Devices
R = Refresh SAS Topology
Enter = On a SAS Enclosure or Expander - Expand or Collapse Item
Enter = On a Disk Drive - Turn on the Locate LED (next key press turns off)
```

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

```
LSI Logic MPT Setup Utility          v6.05.06.00 (2006.01.16)
SAS Topology -- SAS1068

SAS1068(07:03:00)
+ Controller
  | Phy 4
  | Phy 5
  | Phy 6
  + Phy 7
+ IS VOL

Device Identifier
Direct Attach Devices
RAID Physical Disk
FUJITSU MAX3147RC      0104
RAID Physical Disk
RAID Physical Disk
LSI106ICLogical Volume 3000

Device Info
Controller
SATA
SATA
SATA

Esc = Exit Menu          F1/Shift+1 = Help
Alt+D = Device Properties  Alt+M = More Keys
```

6.2.5 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.

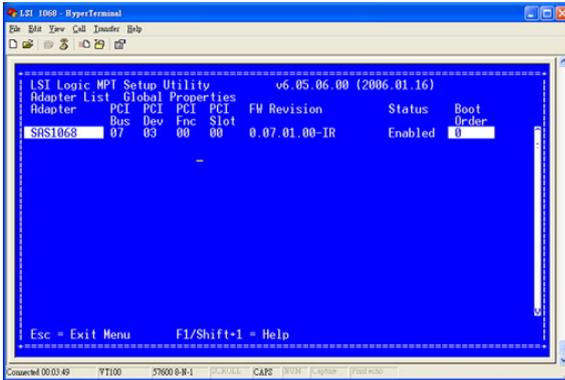
The current topology is displayed. If the selection of a boot device is supported, the bottom of the screen lists the Alt+B option. This is the key for toggling the boot device. If a device is currently configured as the boot device, the Device Info column on the SAS Topology screen will show the word "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.

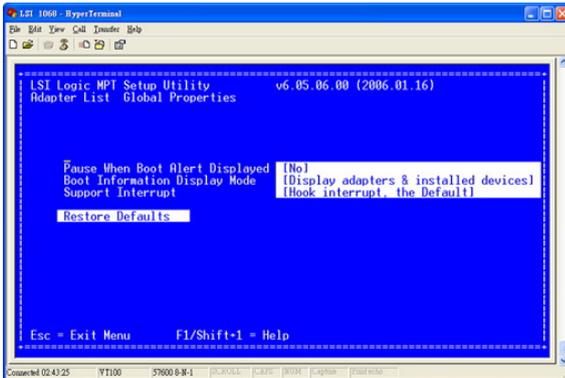
6.2.6 Global_Properties

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.



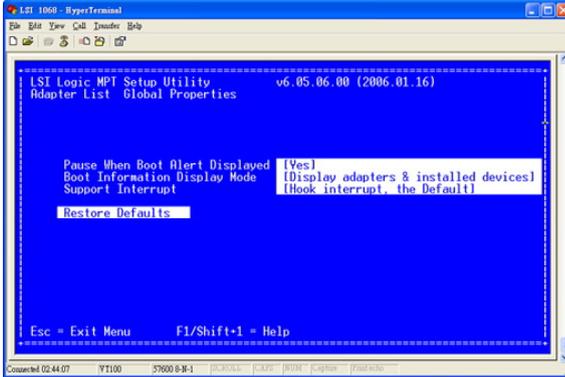
Pause When Boot Alert Displayed

Sets whether to pause when the boot alert displays. Configuration options: [Yes] [No]



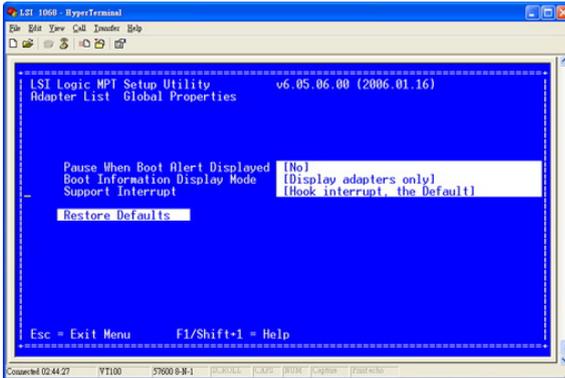
Boot Information Display Mode

Sets the disk information display mode. Configuration options: [Display adapters & installed devices] [Display adapters only]



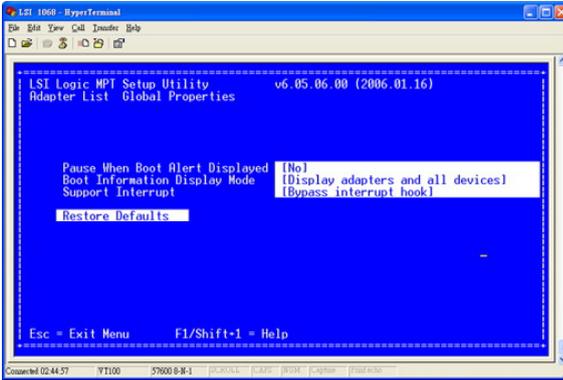
Support Interrupt

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

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 CD or from the Internet.

A floppy disk with the RAID driver is required when installing Windows® 2000/XP or Red Hat® Enterprise AS3.0 update 7/SuSE 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 CD).

To create a RAID driver disk in DOS environment:

1. Place the motherboard support CD in the optical drive.
2. Restart the computer, then enter the BIOS Setup.
3. Select the optical drive as the first boot priority to boot from the support CD. Save your changes, then exit the BIOS Setup.
4. Restart the computer.
5. Press any key when prompted to boot from CD.

```
Loading FreeDOS FAT KERNEL GO!  
Press any key to boot from CDROM...
```

The Makedisk menu appears.

```
A) FreeDOS command prompt  
B) Create LSI 1068 SAS for Win2k / Win2k3 32 bit Driver Disk  
C) Create LSI 1068 SAS for RHEL3 UP6 32 bit Driver Disk  
D) Create LSI 1068 SAS for RHEL3 UP6 64 bit Driver Disk  
E) Create LSI 1068 SAS for RHEL4 UP2 32 bit Driver Disk  
F) Create LSI 1068 SAS for RHEL4 UP2 64 bit Driver Disk  
G) Write HPC-1420-ISSE FRU  
H) ESB2 ASF Fireware update  
I) Create the emergent BIOS Recovery diskette  
Please choose A TO I:
```

6. Place a blank, high-density floppy disk to the floppy disk drive, then select the type of RAID driver disk you want to create by typing the number before the option
7. Press <Enter>.
8. Follow screen instructions to create the driver disk.



For systems with Red Hat® Enterprise versions that are not listed in the Makedisk menu, explore the support CD and copy the RAID driver disk from the following path: For Intel® 6321 LSI MegaRAID: \Drivers\6321 LSI MegaRAID\Driver\Linux\megaswr-drvr-bin.tgz For LSI 1068 SAS: \Drivers\LSI 1068\Driver\Linux\

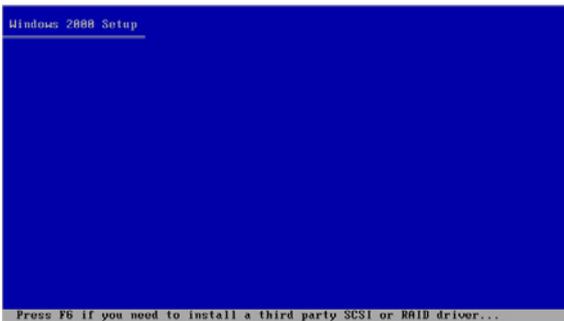
7.1.2 Installing the RAID controller driver

Windows® 2000/2003 Server OS

During Windows® 2000/2003 Server OS installation

To install the RAID controller driver when installing Windows® 2000/2003 Server OS:

1. Boot the computer using the Windows® 2000/2003 Server installation CD. The Windows® 2000/2003 Setup starts.



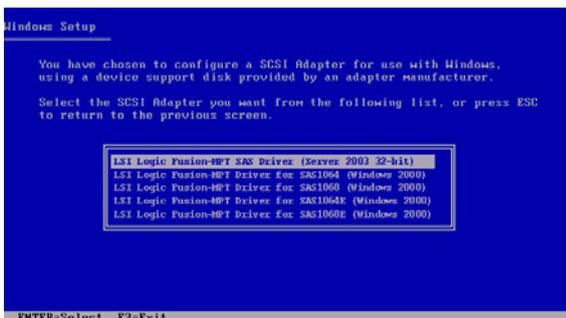
2. Press <F6> when the message “Press F6 if you need to install a third party SCSI or RAID driver...” appears at the bottom of the screen.
3. When prompted, press <S> to specify an additional device.



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



5. Select the RAID controller driver from the list, then press <Enter>.



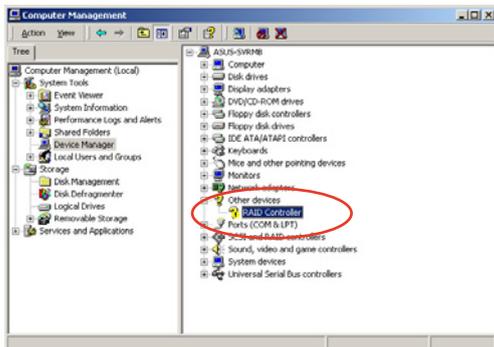
- Intel® 6321ESB Intel MATRIX STORAGE driver:
 - If SATA RAID mode is to be enabled, select Intel ESB2 SATA RAID Controller (Server ESB2).
 - If SATA AHCI mode is enabled, select Intel ESB2 SATA AHCI Controller (Server ESB2).

- Intel® 6321ESB LSI Logic Embedded SATA RAID driver:
 - For Windows 2000 or 32bit Windows Server 2003 OS, select LSI Logic Embedded SATA RAID.
 - For 64bit Windows Server 2003 OS, select LSI Logic Embedded SATA RAID(Intel IA32E).
 - LSI1068 PCI-X SAS controller driver:
 - For Windows 2000, select LSI Logic Fusion-MPT Drivers for SAS 1068 (Windows 2000).
 - For 32bit Windows Server 2003, select LSI Logic Fusion-MPT SAS Driver (Server 2003 32-bit).
 - For 64bit Windows Server 2003, select LSI Logic Fusion-MPT SAS Driver (Server 2003 x64).
6. The Windows® 2000/2003 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® 2000/2003 Server OS

To install the RAID controller driver on an existing Windows® 2000/2003 Server OS:

1. Restart the computer, 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 , then select Properties from the menu.
4. Click the Hardware tab, then click the Device Manager button to display the list of devices installed in the system.

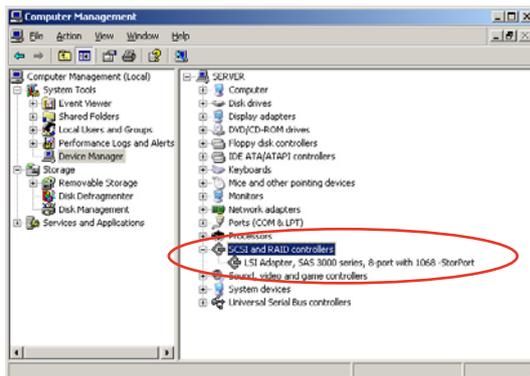


5. Right-click the RAID controller item, then select Properties.
6. Click the Driver tab, then click the Update Driver button.
7. The Upgrade Device Driver Wizard window appears. Click Next.
8. Insert the RAID driver disk you created earlier to the floppy disk drive.
9. Select the option “Search for a suitable driver for my device (recommended), 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 , then select Properties from the menu.
2. Click the Hardware tab, then click the Device Manager button.
3. Click the “+” sign before the item SCSI and RAID controllers, then the LSI Adapter, SAS 3000 series, 8-port with 1068-StorPort item should appear.



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

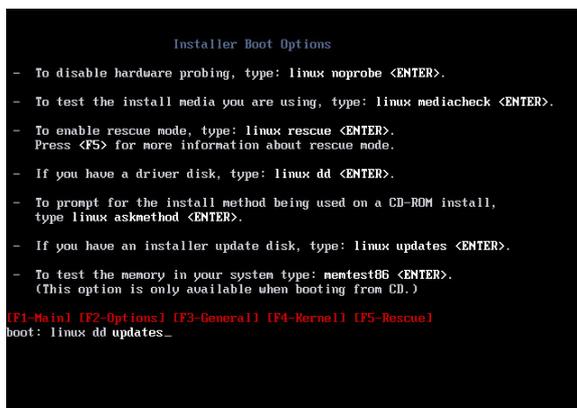
Red Hat® Enterprise AS3.0 update 7

To install the Intel® 6321ESB LSI Logic Embedded SATA RAID controller driver when installing Red Hat® Enterprise AS3.0 update 7 OS:

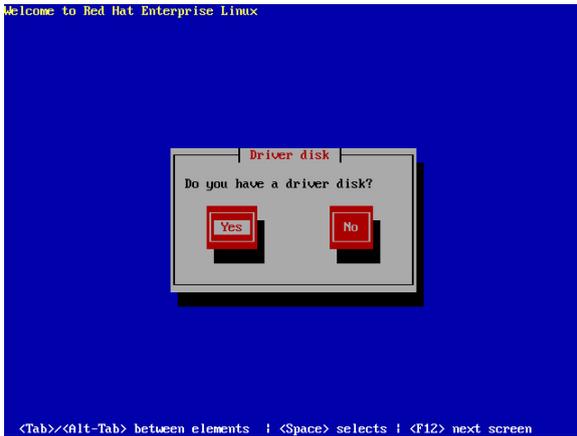
1. Boot the system from the Red Hat® Installation CD.



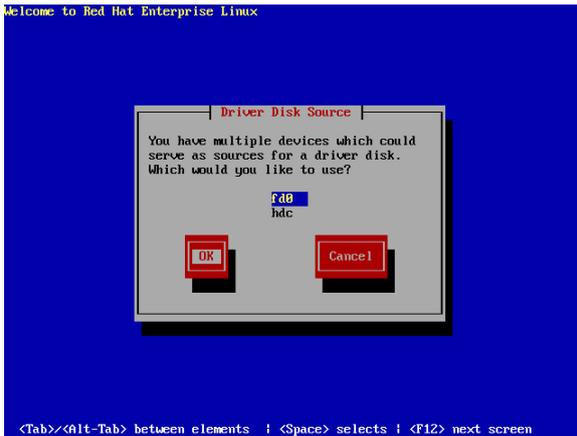
2. At the `boot:`, type `linux dd updates`, then press <Enter>.



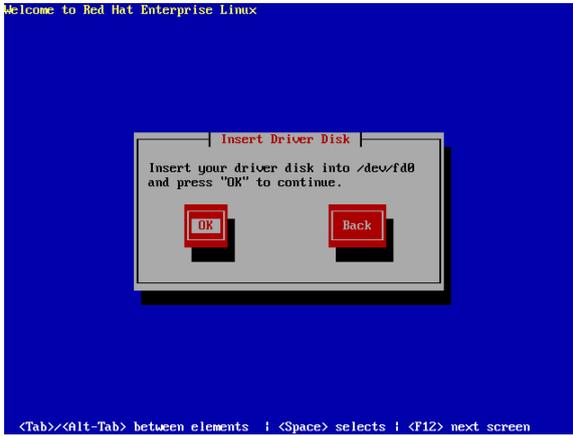
3. Select Yes using the <Tab> key when asked if you have the driver disk. Press <Enter>



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. When prompted, insert the Red Hat® Enterprise ver. 3.0 RAID driver disk to the floppy disk drive, select OK, then press <Enter>.



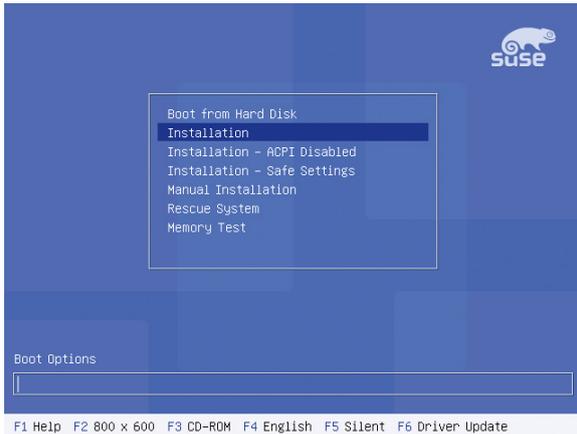
The drivers for the RAID controller are installed to the system.

6. Follow screen instructions to continue the OS installation.

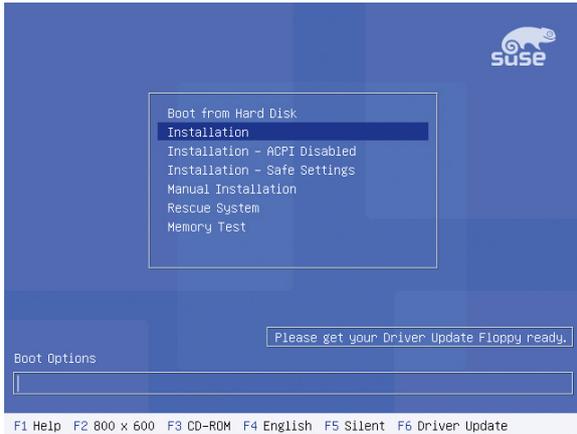
SuSE Linux

To install the RAID controller driver when installing SuSE Linux OS:

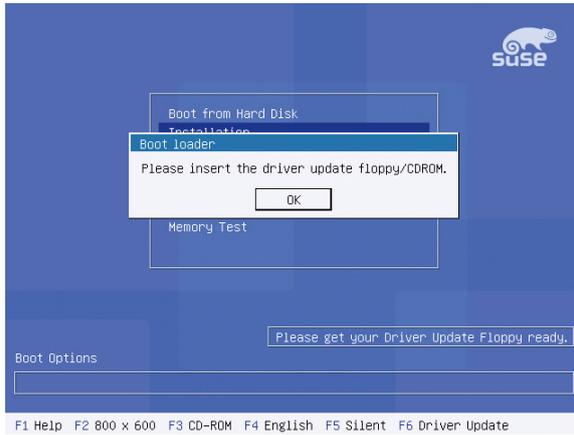
1. Boot the system from the SuSE Installation CD.
2. Select Installation from the Boot Options menu, then press <Enter>.



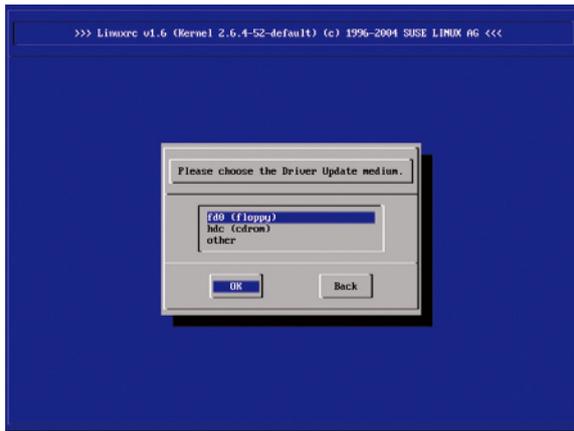
3. A message instructs you to prepare the RAID driver disk. Press <F6>.



- When prompted, insert the RAID driver disk to the floppy disk drive, then press <Enter>.



- When prompted, 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.

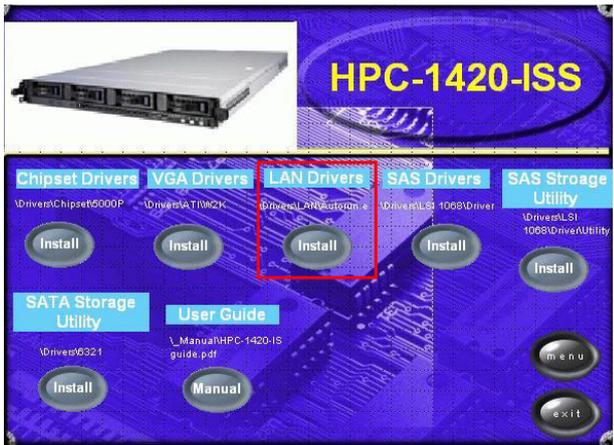
7.2 LAN driver installation

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

7.2.1 Windows 2000/Server 2003

To install the Intel® Gigabit LAN controller driver on a Windows® 2000/Server 2003 OS:

1. Restart the computer, and then log on with Administrator privileges.
2. Insert the motherboard/system support CD to the optical drive. The CD automatically displays the Drivers menu if Autorun is enabled in your computer.
 - Windows® automatically detects the LAN controllers and displays a window. Click Cancel to close this window.
 - If Autorun is NOT enabled in your computer, browse the contents of the support CD to locate the file AUTORUN.EXE from the \Drivers\LAN folder. Double-click the AUTORUN.EXE and follow step 4 to run the installation.
3. Click the LAN Drivers option.



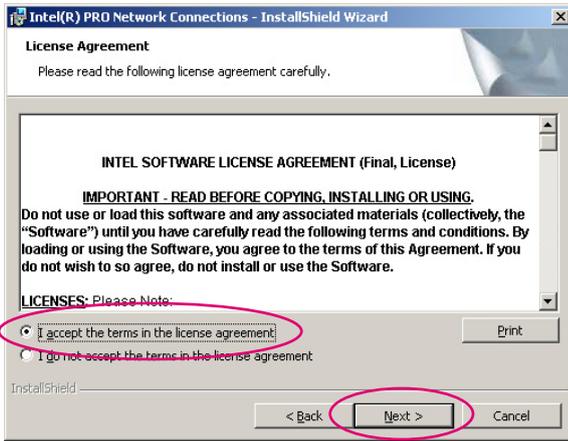
4. Click the Install Drivers option to begin installation.



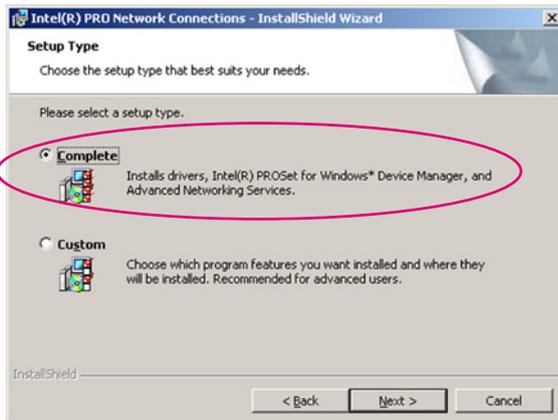
5. Click Next button when the Intel® PRO Network Connections - InstallShield Wizard window appears.



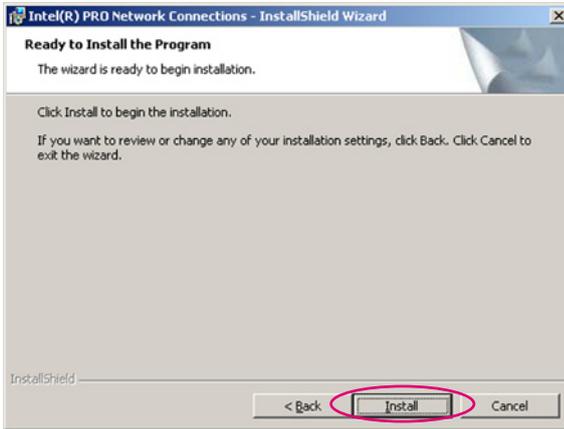
6. Select the “I accept the terms in the license agreement” and then click the Next button.



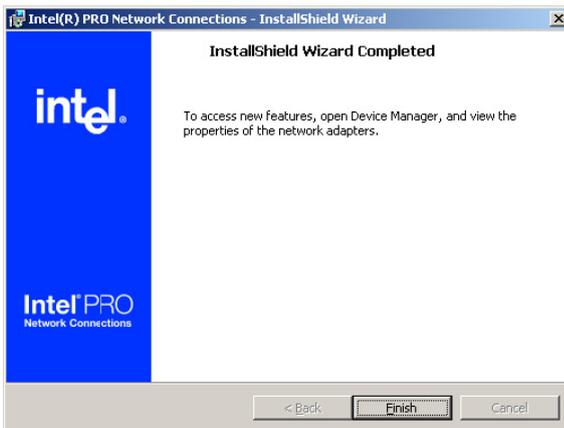
7. Press the Complete and click Next button to fully install the driver, Intel® PROSet for Windows Device Manager and Advanced Networking Services.



8. Follow the screen instructions to complete installation.

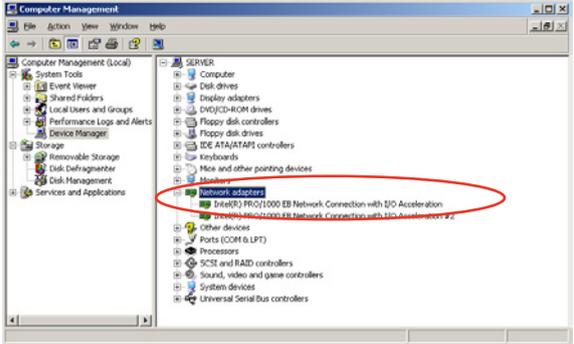


9. When finished, press Finish to continue.



To verify the LAN controller driver installation:

1. Right-click the My Computer icon on the Windows® desktop , then select Properties from the menu.
2. Click the Hardware tab, then click the Device Manager button.
3. Click the “+” sign before the item Network adapters, then Intel(R) PRO/1000 EB Network Connection with I/O Acceleration item should appear.



7.2.2 Red Hat/SuSE Linux

Follow these instructions when installing the Intel® LAN controller base driver for the in Red Hat® and SuSE Linux operating system.

Before installing the LAN driver:

Before installing the LAN driver, you must install the kernel development application. To install the kernel development:

1. Insert the Linux OS installation CD Disk 1 to the optical drive.
2. Double click “Application” > “System setting” > “Add / Remove application”.
3. Select “Kernel Development” from the Development Tools.
4. Follow the later steps and add different CDs according to the instructions displayed.

Building the driver from the TAR file:

1. Insert the motherboard/system support CD to the optical drive and mount the optional drive in the Linux platform.
2. Copy the base driver tar file from the motherboard/system support CD to the directory of your local hard disk. The name format of driver file is “e1000-<Version>.tar.gz”.

For example: the file name of driver version 7.0.38 is “e1000-7.0.38.tar.gz”.

- The Intel® LAN driver for Linux OS is located in:
 \Drivers\INTEL 82563EB\PRO1000\LINUX
3. Untar or unzip the archive.
 tar xzf e1000-x.x.x.tar.gz
 4. Change to the driver src directory.
 cd e1000-x.x.x/src/
 5. Use the command “makeinstall” to compile the driver module.
 makeinstall
 6. After reboot the system, please refer to Linux distribution documentation to configure the network protocol and IP address.

7.3 VGA driver installation

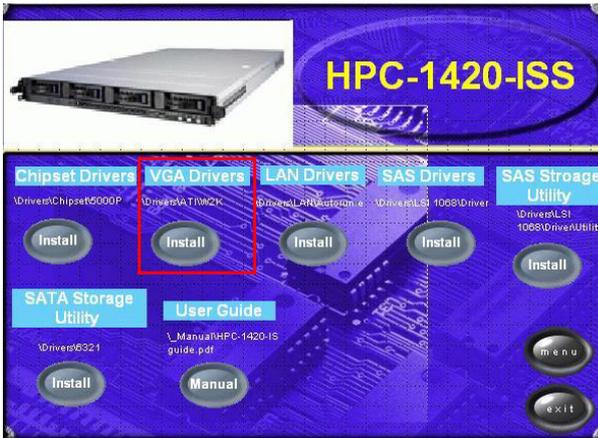
This section provides instructions on how to install the ATI® ES1000 Video Graphics Adapter (VGA) driver.

7.3.1 Windows 2000/Server 2003

You need to manually install the ATI® ES1000 VGA driver on a Windows 2000 / Server 2003 operating system. To install the ATI® ES1000 VGA driver:

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

The Drivers menu if Autorun is enabled in your computer.



3. Click the item VGA Drivers from the menu.

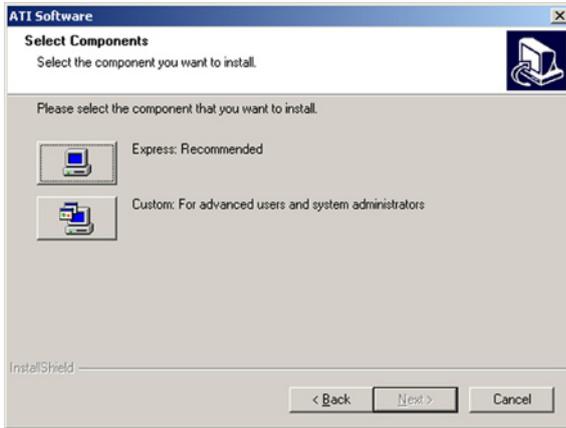
4. The ATI Software window appears. Follow the screen instructions to complete installation.



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



6. Press the  button to activate quick installation.



7. After completing the installation, restart the computer.



APPENDIX

A

Reference Information

A.1 Intel EM64T



- The motherboard is fully compatible with Intel Pentium 4 processors running on 32-bit operating system.
- The motherboard comes with a BIOS file that supports EM64T. You can download the latest BIOS file from the Advantech website (www.Advantech.com/support/download/) if you need to update the BIOS file. See Chapter 5 for details.
- Visit www.intel.com for more information on the EM64T feature.
- Visit www.microsoft.com for more information on Windows 64-bit OS.

Using the Intel EM64T feature

To use Intel EM64T feature:

1. Install an Intel Pentium 4 CPU that supports the Intel EM64T.
2. Install a 64-bit operating system (Windows XP Professional x64 Edition or Windows Server 2003 x64 Edition).
3. Install the 64-bit drivers for the motherboard components and devices from the support CD.
4. Install the 64-bit drivers for expansion cards or add-on devices, if and.



Refer to the expansion card or add-on device(s) documentation, or visit the related website, to verify if the card/device supports a 64-bit system.

A.2 Enhanced Intel SpeedStep Technology (EIST)



- The motherboard comes with a BIOS file that supports EIST. You can download the latest BIOS file from the Advantech website (www.Advantech.com/support/download/) if you need to update the BIOS. See chapter 5 for details.
- Visit www.intel.com for more information on the EIST feature.

A.2.1 System requirements

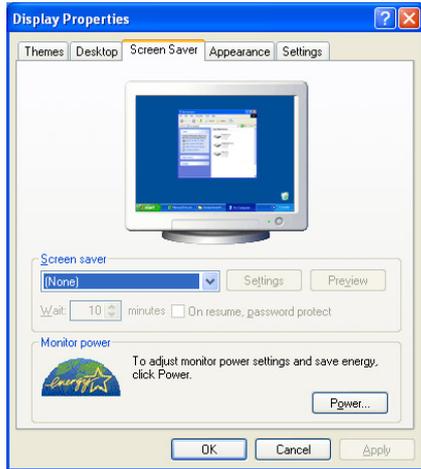
Before using EIST, check your system if it meets the following requirements:

- Intel Pentium 4 processor with EIST support.
- BIOS file with EIST support.
- Operating system with EIST support (Windows XP SP2/Windows Server 2003 SP1/Linux 2.6 kernel or later versions).

A.2.2 Using the EIST

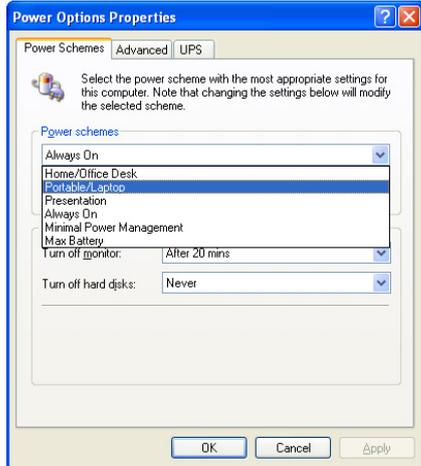
To use the EIST feature:

1. Turn on the computer, then enter the BIOS Setup.
2. Go to the **Advanced Menu**. Highlight **Advanced Processor Options**, then press <Enter>.
3. Set the **Intel EIST Support** item to [Enabled], then press <Enter>.
4. Press <F10> to save your changes and exit the BIOS setup.
5. After the computer restarts, right click on a blank space on the desktop, then select **Properties** from the pop-up menu.
6. When the **Display Properties** window appears, click the **Screen Saver** tab.
7. Click the **Power** button on the Monitor power section to open the **Power Options Properties** window.



8. On the Power schemes section, click , then select any option *except* **Home/Office Desktop** or **Always On**.
9. Click **Apply**, then click **OK**.
10. Close the **Display Properties** window.

After you adjust the power scheme, the CPU internal frequency slightly decreases when the CPU loading is low.



The screen displays and procedures may vary depending on the operating system.

A.3 PHLASH16.EXE and memory managers

Phlash16 may fail if your system is using memory managers, in which case the utility will display the following message:

Memory manager error message



If you see this message after you execute Pflash16, you must disable the memory manager on your system. Follow the instructions in the Disabling memory managers section in this chapter.

Because Pflash16.EXE may require the use of extended memory, it will not run if it detects the presence of an extended-memory manager such as HIMEM.SYS, EMM386, or QEMM. To avoid conflict with disk caching programs, the program checks for VCPI, DPMS and XMS.



The program does not check for VDISK because MS-DOS 5 and later versions do not support that server.

If the program detects any of these utilities, the program reports a failure and terminates.

Disabling memory managers

To avoid failure when flashing, you must disable the memory managers that load from CONFIG.SYS and AUTOEXEC.BAT. There are two recommended procedures for disabling the memory managers, depending on the operating system you are using. One consists of pressing the <F5> key (only if you are using MS-DOS 5.0 or above), and the other requires the creation of a boot disk.

