GS-R12PE
GS-R12PE1

Dual LGA2011 socket motherboard for Intel® Xeon® series processors

Service Guide

Rev. 1.0

Copyright

Disclaimer

Documentation Classifications

In order to assist in the use of this product, GIGABYTE provides the following types of documentations:

- For detailed product information, carefully read the Serice Guide.

For product-related information, check on our website at:
http://www.gigabyte.com

Preface

Before using this information and the product it supports, please read the following general information.

1. This Service Guide provides you with all technical information relating to the BASIC CONFIGURATION decided for GIGABYTE's "global" product offering. To better fit local market-requirements and enhance product competitiveness, your regional office MAY have decided toextend the functionality of a machine (e.g. add-on card, modem, or extra memory capability).These LOCALIZED FEATURES will NOT be covered in this generic service guide. In suchcases, please contact your regional offices or the responsible personnel/channel to provide youwith further technical details.
2. Please note WHEN ORDERING SPARE PARTS, you should check the most up-to-date informationavailable on your regional web or channel. For whatever reason, if a part number change is made,it will not be noted in the printed Service Guide. For GIGABYTE-AUTHORIZED SERVICEPROVIDERS, your GIGABYTE office may have a DIFFERENT part number code to thosegiven in the FRU list of this printed Service Guide. You MUST use the list provided by yourregional GIGABYTE office to order FRU parts for repair and service of customer machines.

Table of Contents

Box Contents 6

Safety, Care and Regulatory Information 7

Chapter 1 Hardware Installation 10

1-1 Installation Precautions 10

1-2 Product Specifications 11

Chapter 2 System Hardware Installation 13

2-1 Removing System Cover 14

2-2 Removing and Installing the Fan Duct 15

2-3 Installing the CPU 16

2-4 Installing the Heat Sink 17

2-5 Installing the Memory 18

2-5-1 Four Channel Memory Configuration 18

2-4-2 Installing a Memory 19

2-4-3 DIMM Population Table 20

2-6 Installing the PCI Expansion Card 21

2-7 Installing the Hard Disk Drive 22

2-7-1 Hard Disk Drive Security Lock 23

2-8 Replacing the Back Plane Board 24

2-9 Replacing the Power Supply 25

2-10 Replacing the FAN Assemblly 26

Chapter 3 System Appearance 27

3-1 Front View 27

3-2 Rear View 28

3-3 Front Panel LED and Buttons 29

3-4 Rear System LAN LEDs 30

3-5 Power Supply LEDs 31

3-6 Hard Disk Drive LEDs 32

Chapter 4 Motherboard Components 33

4-1 GA-7PPSH/GA-7PPSH2 Motherboard Components 33

4-2 Jumper Setting 36

Chapter 5 BIOS Setup 38

5-1 The Main Menu 40

5-2 Advanced Menu 42
5-2-1 PCI Configuration 43
5-2-2 Trusted Computing 45
5-2-3 CPU Configuration 46
5-2-4 Runtime Error Logging 50
5-2-5 SATA Configuration 51
5-2-6 SAS Configuration 52
5-2-6 Serial Port Console Redirection 53
5-3 Chipset Menu 55
5-3-1 North Bridge Configuration 56
5-3-1-1 IOH Configuration 57
5-3-1-2 DIMM Information 60
5-3-2 South Bridge Configuration 62
5-3-3 ME Subsystem 63
5-4 Security Menu 64
5-5 Server Management Menu 65
5-5-1 System Information 66
5-5-2 BMC LAN Configuration 67
5-5-3 System Event Log 68
5-6 Boot Option Menu 69
5-7 Boot Manager 70
5-8 Exit Menu 71
5-9 BIOS Beep Codes 72
5-9-1 PEI Beep Codes 72
5-9-2 DXE Beep Codes 72
5-10 BIOS Recovery Instruction 73

Box Contents

- ☑ GS-R12PE/GS-R12PE1
- ☑ Driver CD

- The box contents above are for reference only and the actual items shall depend on the product package you obtain. The box contents are subject to change without notice.
- The motherboard image is for reference only.

Safety, Care and Regulatory Information

Important safety information

Read and follow all instructions marked on the product and in the documentation before you operateyour system. Retain all safety and operating instructions for future use.

- The product should be operated only from the type of power source indicated on the rating label.* If your computer has a voltage selector switch, make sure that the switch is in the proper position foryour area. The voltage selector switch is set at the factory to the correct voltage.
- The plug-socket combination must be accessible at all times because it serves as the main disconnecting device.
- All product shipped with a three-wire electrical grounding-type plug only fits into a grounding-type poweroutlet. This is a safety feature. The equipment grounding should be in accordance with local and nationalelectrical codes. The equipment operates safely when it is used in accordance with its marked electricalratings and product usage instructions
- Do not use this product near water or a heat source.* Set up the product on a stable work surface or so as to ensure stability of the system.
- Openings in the case are provided for ventilation. Do not block or cover these openings. Make sure youprovide adequate space around the system for ventilation when you set up your work area. Never insertobjects of any kind into the ventilation openings.
- To avoid electrical shock, always unplug all power cables and modem cables from the wall outletsbefore removing covers.
- Allow the product to cool before removing covers or touching internal components.

Precaution for Product with Laser Devices

Observe the following precautions for laser devices:

- Do not open the CD-ROM drive, make adjustments, or perform procedures on a laser device other than those specified in the product's documentation.
- Only authorized service technicians should repair laser devices.

Precaution for Product with Modems, Telecommunications, ot Local AreaNetwork Options

Observe the following precautions for laser devices:

- Do not connect or use a modem or telephone during a lightning storm. There may be a risk of electricalshock from lightning.
- To reduce the risk of fire, use only No. 26 AWG or larger telecommunications line cord.
- Do not plug a modem or telephone cable into the network interface controller (NIC) receptacle.
- Disconnect the modem cable before opening a product enclosure, touching or installing internalcomponents, or touching an uninsulated modem cable or jack.
- Do not use a telephone line to report a gas leak while you are in the vicinity of the leak.

Federal Communications Commission (FCC) Statement

Warning

This is a class A product. In a domestic environment this product may cause radiointerferenceIn which case the user may be required to take adequate measures.

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 againstharmful interference when the equipment is operated in a commercial environment. This equipmentgenerates, uses, and can radiate radio frequency energy and, if not installed and used in accordance withthe instruction manual, may cause harmful interference to radio communications. Operation of thisequipment in a residential area is likely to cause harmful interference in which case the user will berequired to correct the interference at his own expense.Properly shielded and grounded cables and connectors must be used in order to meet FCC emissionlimits. Neither the provider nor the manufacturer are responsible for any radio or television interferencecaused by using other than recommended cables and connectors or by unauthorized changes ormodifications to this equipment. Unauthorized changes or modifications could void the user's authority tooperate the equipment.
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Department of Communications Compliance Statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digitalapparatus as set out in the radio interference regulations of Industry Canada.Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables auxappareils numeriques de Classe A prescrites dans le reglement sur le brouillage radioelectrique edicte parIndustrie Canada.

Class A equipment

This device has been tested and found to comply with the limits for a class A digital device pursuant Part 15 of the FCC Rules. These limits are designed to provide reasonable protection againstharmful interference when the equipment is operated in a commercial environment. This equipmentgenerate, uses, and can radiate radio frequency energy, and if not installed and used in accordancewith the instructions, may cause harmful interference to radio communication. Operation of thisequipment in a residential area is likely to cause harmful interference, in which case the user will berequired to correct the interference at personal expence.

However, there is no guarantee that interference will not occur in a particular installation. If thisdevice does cause harmful interference to radio or television reception, which can be determined bytuning the device off and on, the user is encouraged to try to correct the interference by on or more ofthe following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the device and receiver
- Connect the device into an outlet on a circuit different from that to which the receiver isconnected'Consult the dealer or an experienced radio/television technician for help.

WEEE Symbol Statement

The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling.

- When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.
- If you need further assistance in recycling, reusing in your "end of life" product, you may contact us at the Customer Care number listed in your product's user's manual and we will be glad to help you with your effort.

Battery Warning: Incorrectly installing a battery or using incompatible battery may increase the risk of ifre explosion. Replace the battery only with the same or equivalent type.

- Do not disassemble, crush, punchture batteries.
- Do not store or place your battery pack next to or in a heat source such as a fire, heatgenerating appliance, can or exhaust vent. Heating battery cells to temperatures above 65°C (149°F) can cause explosion or fire.
- Do not attempt to open or service batteries. Do not dispose of batteries in a fire or with household waste.

Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard/system contain numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the service guide and follow these procedures:

- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

1-2 Product Specifications

Motherboard	◆ GS-R12PE: GA-7PPSH ◆ GS-R12PE1: GA-7PPSH2
CPU	◆ Support for Intel® Xeon® E5-2600 series processors in the LGA2011 package ◆ L3 cache varies with CPU ◆ Supports QuickPath Interconnect up to 8GT/s ◆ Enhanced Intel SpeedStep Technology (EIST) ◆ Support Intel Virtualization Technology (VT)
Chipset	◆ Intel® C602 (Patsburg) Chipset
Memory	◆ 24 x DDR3 DIMM sockets ◆ Support UDIMM up to 16 scokets/128GB ◆ Support RDIMM up to 24 sockets/768GB ◆ Supports 1.35V DDR3L DIMM up to 16 sockets/128 GB ◆ Four channel memory architecture ◆ Support for 800/1066/1333/1600 memory modules ◆ Support for RDIMM/UDIMM (ECC) memory modules
LAN	◆ Intel® I350 supports 10/100/1000 Mbps (GS-R12PE1) ◆ Intel® X540-AT2 supports dual 10G Base-T ethernet LAN ports (GS-R12PE)
Expansion Slot	◆ **Low-Profile:** ◆ 1 x PCI Express x16 slot, running at Gen3 x16 ◆ 1 x PCI Express x16 slot, running at Gen3 x8
Onboard Graphics	◆ ASPEED® AST2300 supports 64MB VRAM
Mass Storage	◆ 4 x 3.5" Hot-Swap SATA/SAS HDDs ◆ Support for Intel IRST SATA RAID 0, RAID 1, RAID 10
System Fans	◆ 6 x 40x40x56mm 16000rpm
USB	◆ Up to 4 USB 2.0/1.1 ports (2 on the back panel, 2 via the USB brackets connected to the internal USB headers)
Internal Connectors (Motherboard)	◆ 1 x 24-pin ATX power connector ◆ 2 x 8-pin ATX 12V power connectors ◆ 2 x Mini-SAS connectors for 8 x SAS 6Gb/s (8 ports via LSI 2008) ◆ Enablement of 1 or 2 x Mini-SAS connectors for 4 or 8 x SAS 3Gb/s in option through upgradable ROM ◆ 2 x SATA 6Gb/s connectors ◆ 1 x Mini-SAS connector for 4 x SATA 3Gb/s ◆ 1 x IPMB header ◆ 1 x front panel header ◆ 1 x back plane board header ◆ 1 x TPM headers ◆ 1 x Serial port header ◆ 2 x USB headers ◆ 1 x PSMI header ◆ 2 x System fan header ◆ 2 x CPU fan header

Internal Connectors (Back Plane Board)	◆ 12 x SATA/SAS 6Gb/s connectors ◆ 2 x 7-pin power connectors ◆ 2 x 4-pin power connectors (For optional inter HDDs) ◆ 1 x back plane board header ◆ 3 x SGPIO connectors ◆ 8 x Systen fan connectors
Rear Panel I/O	◆ 2 x USB 2.0/1.1 ports ◆ 4 x RJ-45 ports (GA-R12PE) ◆ 2 x RJ-45 ports (GA-R12PE1) ◆ 1 x Server Management LAN port ◆ 1 x COM port ◆ 1 x VGA port ◆ 1 x ID button/LED
Front Panel LED/Buttons	◆ 1 x Power button/LED ◆ 1 x ID button/LED ◆ 1 x System status LED ◆ 1 x HDD Status LED ◆ 2 x LAN LEDs ◆ 1 x Reset button ◆ 1 x NMI button
BMC Controller	◆ ASPEED® AST2300
Hardware Monitor	◆ System voltage detection ◆ CPU/System temperature detection ◆ CPU/System fan speed detection ◆ CPU/System fan speed control * Whether the CPU/system fan speed control function is supported will depend on the CPU/system cooler you install.
BIOS	◆ 1 x 64 Mbit flash ◆ AMI BIOS
Environment Ambient Temperature Relative Humidity	 ◆ Operating Temperature: 5°C to 35°C ◆ Non-operating Temperature: 0°C to 40°C ◆ 10-80% operating Humidity at 30°C
System Dimension	◆ 429.8Wx43.5Hx709D (mm)
Electrical Power Supply	◆ Hot-swap 1+1 Redundant 650W 380VDC at 80 plus platnium (GS-R12PE) ◆ Hot-swap 1+1 Redundant 650W 110~220VAC at 80 plus gold (GS-R12PE1)

* GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.

Chapter 2 System Hardware Installation

Pre-installation Instructions

Perform the steps below before you open the server or before you remove or replaceany component.

- Back up all important system and data files before performing any hardwareconfiguration.
- Turn off the system and all the peripherals connected to it.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.

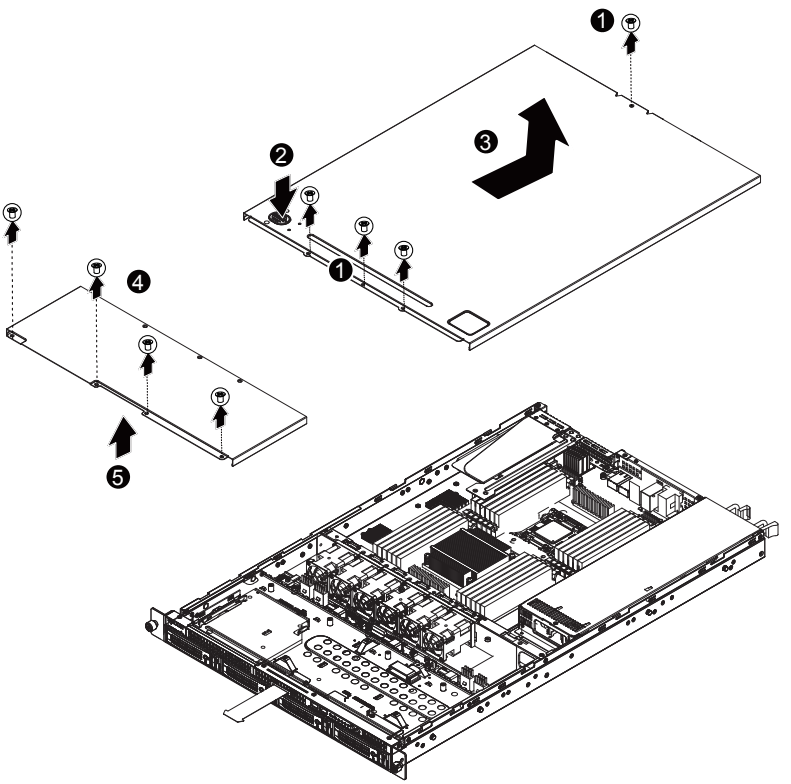
2-1 Removing System Cover

Before you remove or install the system cover

- Make sure the system is not turned on or connected to AC power.

Follow these instructions to remove the system cover:

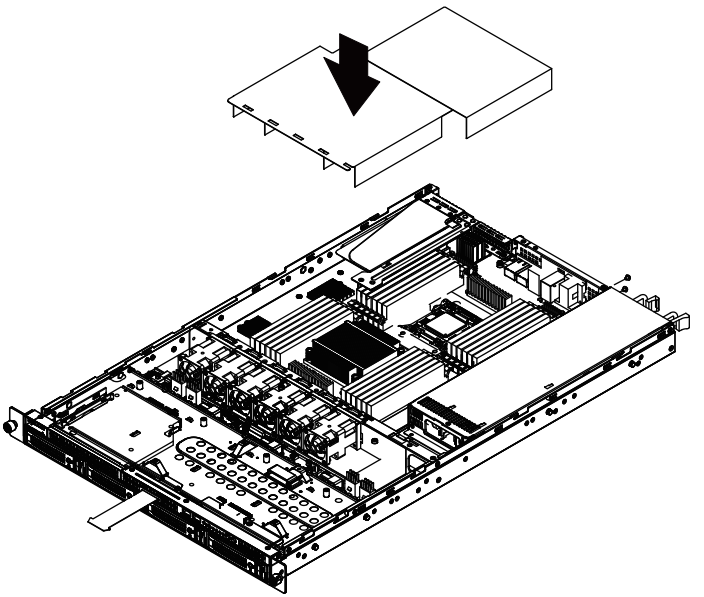
1. Loosen and remove the screws securing the back cover.
2. Push down the indentation located at the side of the back chassis
3. Slide the cover horizontally to the back using the traction pad and remove the back cover in the direction of the arrow.
4. Loosen and remove the screws securing the front top cover.
5. Remove the front top cover from the system.



2-2 Removing and Installing the Fan Duct

Follow these instructions to remove/install the fan duct:

1. Lift up to remove the fan duct
2. To install the fan duct, align the fan duct with the guiding groove. Push down the fan duct into chassis until its firmly seats



2-3 Installing the CPU

Read the following guidelines before you begin to install the CPU:

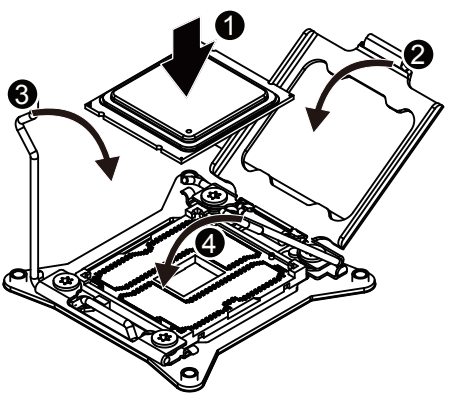
- Make sure that the motherboard supports the CPU.
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Unplug all cables from the power outlets.
- Disconnect all telecommunication cables from their ports.
- Place the system unit on a flat and stable surface.
- Open the system according to the instructions.

WARNING!

Failure to properly turn off the server before you start installing componentsmay causeserious damage. Do not attempt the procedures described in the following sections unless youare a qualified servicetechnician.

Follow these instructions to install the CPU:

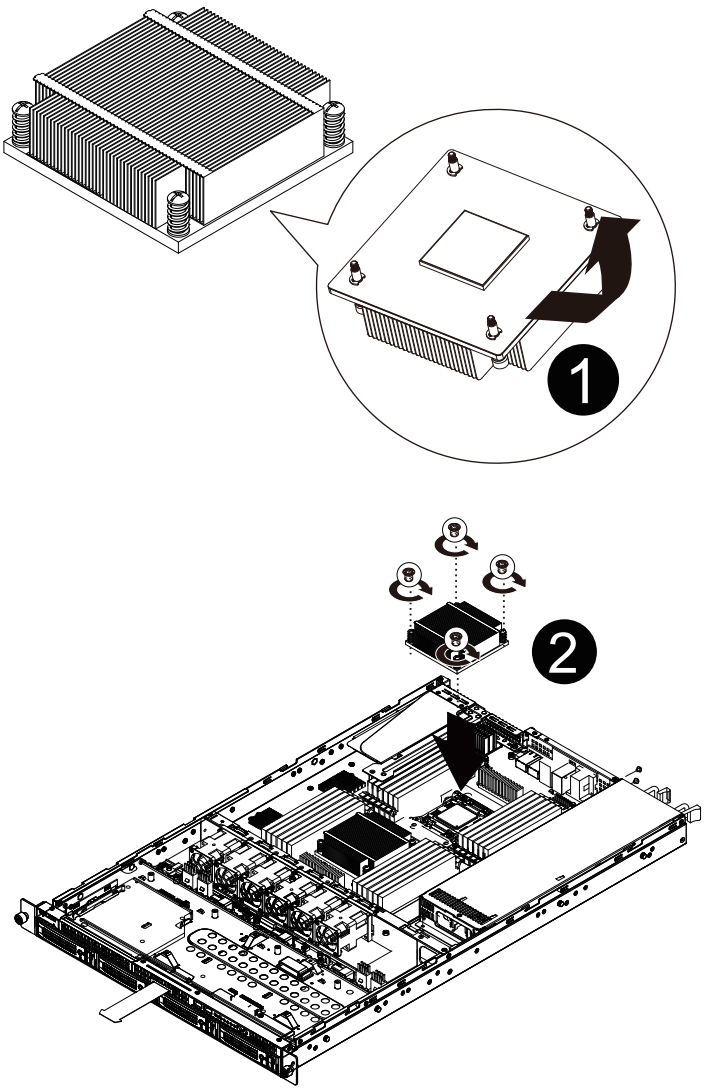
1. Raise the metal locking lever on the socket.
2. Remove the plastic covering on the CPU socket.Insert the CPU with the correct orientation. The CPU only fits in one orientation.
3. Replace the metal cover.
4. Push the metal lever back into locked position.



2-4 Installing the Heat Sink

Follow these instructions to install the heat sinks:

1. Apply thermal compound evenly on the top of the CPU.
   Remove the protective cover from the underside of the heat sink.
2. Place the heat sink(s) on top of the CPU and tighten the four positioning screws.



2-5 Installing the Memory

Read the following guidelines before you begin to install the memory:

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

2-5-1 Four Channel Memory Configuration

This motherboard provides eight DDR3 memory sockets and supports Four Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Four Channel memory mode will be four times of the original memory bandwidth.

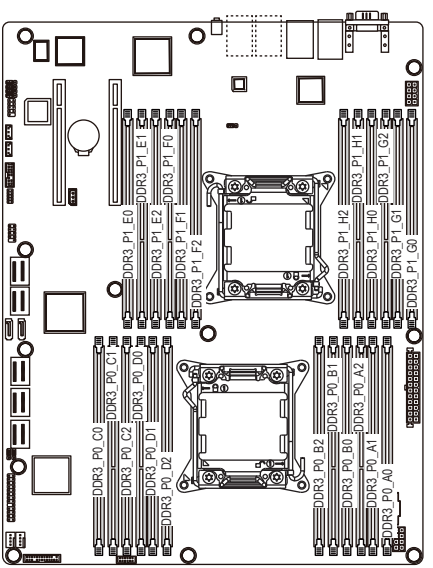
The four DDR3 memory sockets are divided into four channels each channel has two memory sockets as following:

Channel 1: DDR3_P0_A0, DDR3_P0_A1, DDR3_P0_A2 (For pimary CPU)
DDR3_P1_E0, DDR3_P1_E1, DDR3_P1_E2 (For secondary CPU)

Channel 2: DDR3_P0_B0, DDR3_P0_B1, DDR3_P0_B2 (For pimary CPU)
DDR3_P1_F0, DDR3_P1_F1, DDR3_P1_F2 (For secondary CPU)

Channel 3: DDR3_P0_C0, DDR3_P0_C1, DDR3_P0_C2 (For pimary CPU)
DDR3_P1_G0, DDR3_P1_G1, DDR3_P1_G2 (For secondary CPU)

Channel 4: DDR3_P0_D0, DDR3_P0_D1, DDR3_P0_D2 (For pimary CPU)
DDR3_P1_H0, DDR3_P1_H1, DDR3_P1_H2 (For secondary CPU)



Due to CPU limitations, read the following guidelines before installing the memory in Four Channel mode.

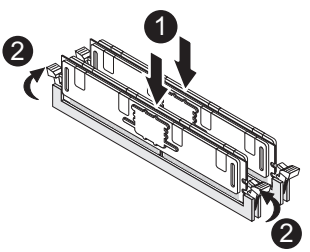
1. Four Channel mode cannot be enabled if only one DDR3 memory module is installed.
2. When enabling Four Channel mode with two or four memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used for optimum performance.

2-4-2 Installing a Memory

Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module.
Be sure to install DDR3 DIMMs on this motherboard.

Follow these instructions to install the Memory:

1. Insert the DIMM memory module vertically into the DIMM slot, and push it down.
2. Close the plastic clip at both edges of the DIMM slots to lock the DIMM module.
3. Reverse the installation steps when you wish to remove the DIMM module.



2-4-3 DIMM Population Table

3 Slots Per Channel (UDIMM)			
1DPC		2DPC	
1.35V	1.5V	1.35V	1.5V
n/a	1066, 1333	n/a	1066, 1333
n/a	1066, 1333	n/a	1066, 1333
n/a	1066, 1333	n/a	1066, 1333
1066	1066, 1333	1066	1066, 1333
1066	1066, 1333	1066	1066, 1333

3 Slots Per Channel (RDIMM)					
1DPC		2DPC		3DPC	
1.35V	1.5V	1.35V	1.5V	1.35V	1.5V
1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	n/a	800, 1066
1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	n/a	800, 1066
1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	n/a	800, 1066
1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	n/a	800, 1066
800	1066	800	800	n/a	n/a
800	1066	800	800	n/a	n/a

3 Slots Per Channel (LRDIMM)			
1DPC and 2DPC		3DPC	
1.35V	1.5V	1.35V	1.5V
1066	1066, 1333	1066	1066
1066	1066, 1333	1066	1066

2-6 Installing the PCI Expansion Card

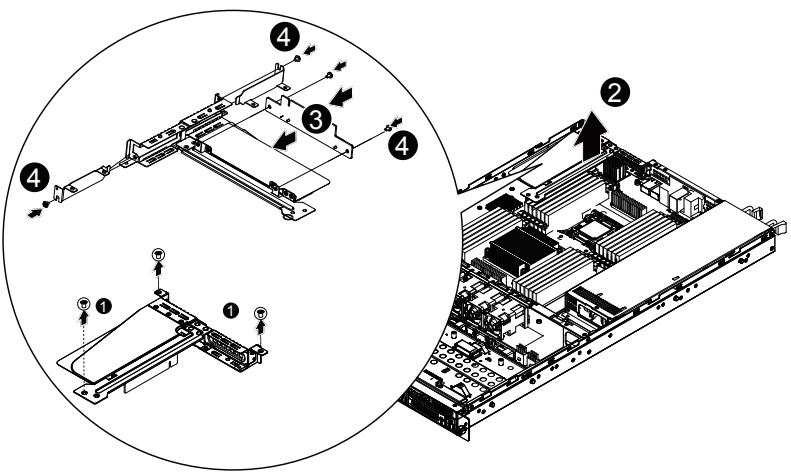
- Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered-down and all power sources have been disconnected from the server prior to installing a PCI card.

Failure to observe these warnings could result in personal injury or damage to equipment.

- The PCI riser assembly does not include a riser card or any cabling as standard. To install a PCI card, a riser card must be installed.

Follow these instructions to PCI Expansion card:

1. Loosen the riser bracket screwsand lift the riser bracket slightly, then pull it out from the server chassis.
2. Orient the PCI card with the riser guide slot and push in the direction of the arrow until the PCI card sits in the PCI card connector. Secure the PCI card with the screw.



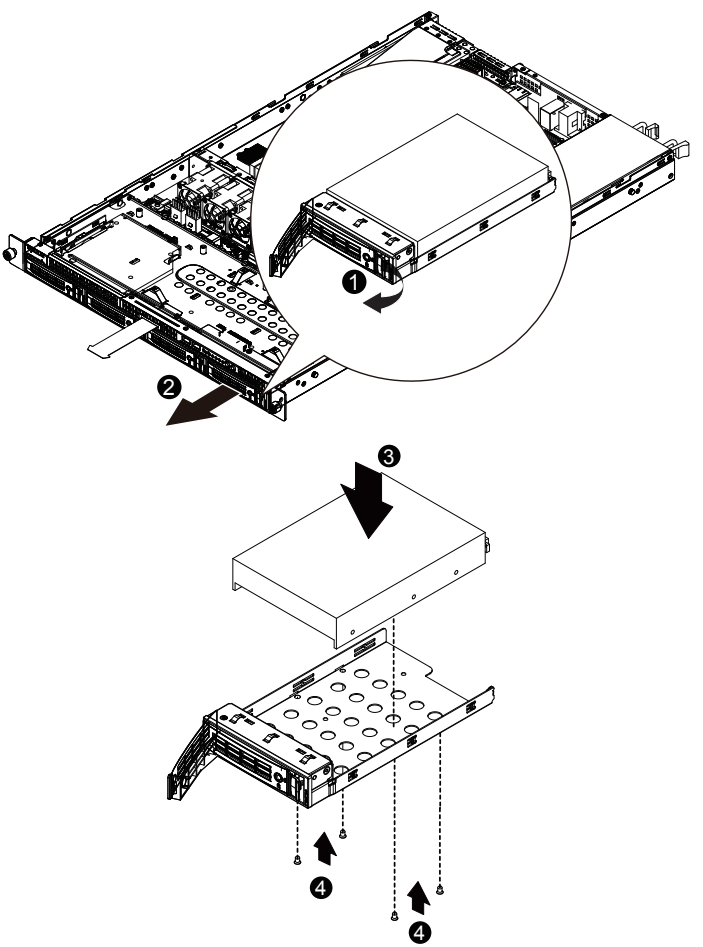
2-7 Installing the Hard Disk Drive

Read the following guidelines before you begin to install the Hard disk drive:

- Take note of the drive tray orientation before sliding it out.
- The tray will not fit back into the bay if inserted incorrectly.
- Make sure that the HDD is connected to the HDD connector on the backplane.

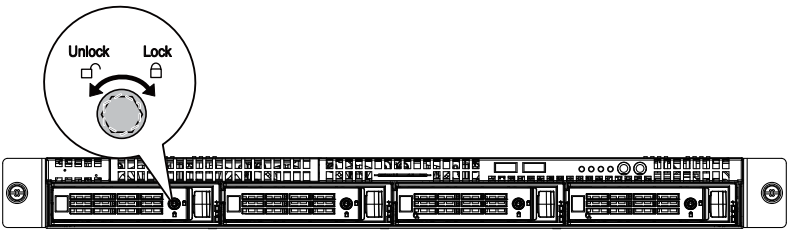
Follow these instructions to Hard disk drive:

1. Press the release button.
2. Pull the locking lever to remove the HDD tray.
3. Slide hard disk into blank.
4. Secure the hard drive to the tray with four (4) screws as shown. Do not over tighten thescrews. Slide the blank into the bay until it locks into place.
5. Engage the HDD Security Lock. For detail instruction, please see the following section.



2-7-1 Hard Disk Drive Security Lock

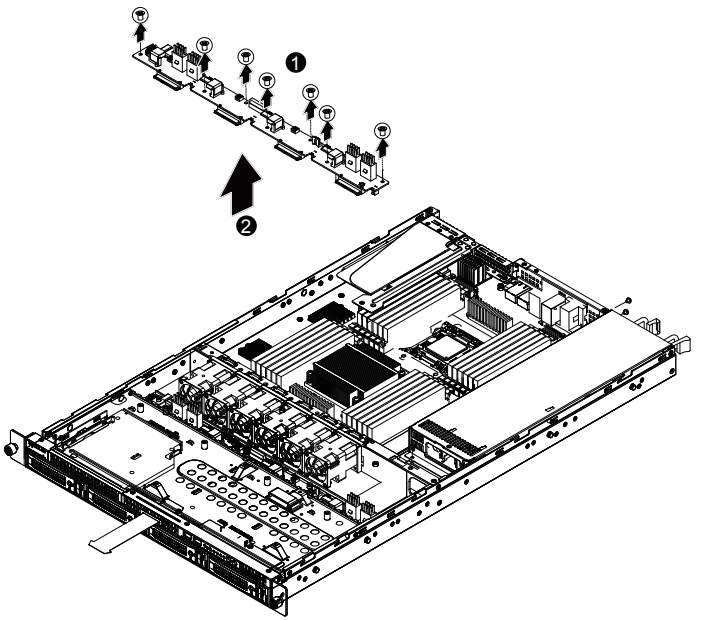
The HDD bays incorporate a security screw to prevent accidental HDD release.To engage the lock, turn the security screw clock-wise toward the Lock symbol. To disengage the lock,turn the security screw counter clock-wise toward the Unlock symbol as shown.



2-8 Replacing the Back Plane Board

Follow these instructions to replace the back plane board:

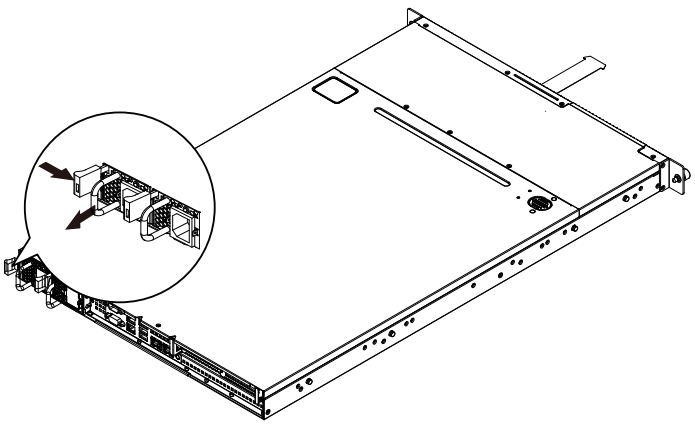
1. Remove the chassis cover. See Removing the System Cover on page 14.
2. Loosen and remove the screws securing the back plane boardas illustration arrow show.
3. Replace the back plane board into chassis and secure with screws.



2-9 Replacing the Power Supply

Follow these instructions to replace the power supply:

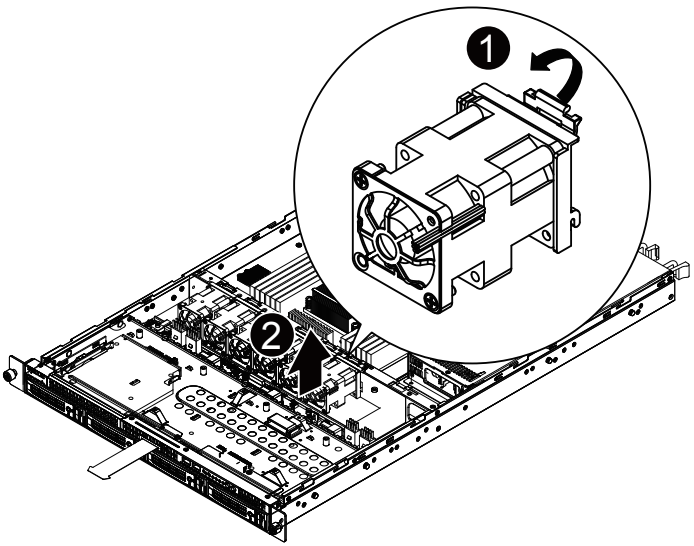
1. Disconnect the power cables.
2. Pull up the power supply handle and press the retaining clip on the right side of the power supply along the direction of the arrow. At the same time, pull out the power supply by using its handle.
3. Insert the replacement power supply firmly into the chassis. Connect the AC power cord to the replacement power supply.



2-10 Replacing the FAN Assemblly

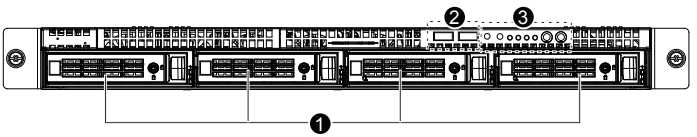
Follow these instructions to replace the fan assembly:

1. Remove thefan assemble pulling the rear edge in the direction of the arrow.
2. Lift up the fan assembly from the chassis.
3. Reverse the previous steps to install the replacement fan assembly.



Chapter 3 System Appearance

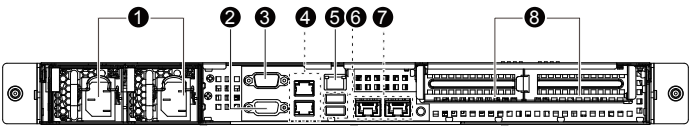
3-1 Front View



No.	Decription
1	HDD bays
2.	USB ports
3.	Front Panel LEDs and buttons

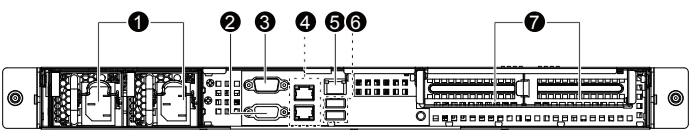
3-2 Rear View

GS-R12PE



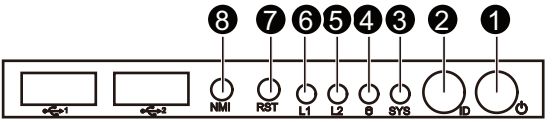
No.	Decription
1	Power modules
2.	VGA port
3.	Serial port
4.	RJ-45 LAN ports
5.	Management LAN port
6.	USB ports
7.	10G LAN ports
8.	PCI Express card bays

GS-R12PE1



No.	Decription
1	Power modules
2.	VGA port
3.	Serial port
4.	RJ-45 LAN ports
5.	Management LAN port
6.	USB ports
7.	PCI Express card bays

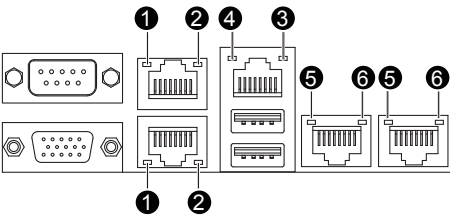
3-3 Front Panel LED and Buttons



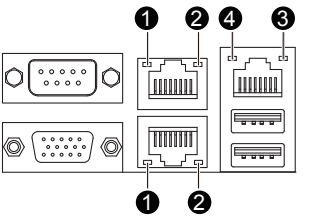
No.	Name	Color	Status	Description
1.	Power button and LED	Green	On	System has power applied to itor ACPI S0 state
		Green	Blink	System is in ACPI S1 state (sleep mode)
		N/A	Off	System is not powered on or in ACPI S5 state (power off) System is in ACPI S4 state (hlbernate mode)
2.	ID button and LED	Blue	On	System identification is active
		N/A	Off	System identification is disabled
3.	System Status LED	Green	On	Running or normal peration.
		Amber	On	There's at least one sensor that has critical alert..
		N/A	Off	System not ready
4.	HDD Status LED	Green	On	HDD access
		N/A	Off	Idle
5.	LAN 2 LED	Green	On	Link between system and network or no access
		Green	Blink	Network access
6.	LAN 1 LED	Green	On	Link between system and network or no access
		Green	Blink	Network access
7.	Reset button			
8.	NMI button			

3-4 Rear System LAN LEDs

GS-R12PE

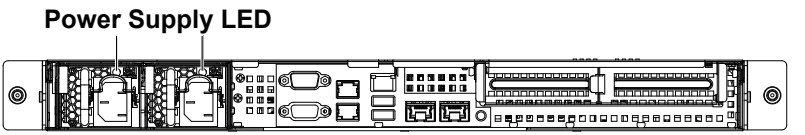


GS-R12PE1



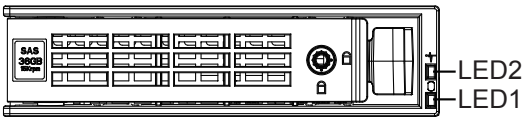
No.	Name	Color	Status	Description
1	Connection/ Speed LED	Orange	On	Linking at 1 Gbps data rate
			Blink	Identify 1 Gbps data rate
		Green	On	Linking at 100 Mbps data rate
			Blink	Identify 100 Mbps data rate
		N/A	Off	Linking at 10 Mbps data rate
2.	Activity LED	Green	Blink	Data transmission or receiving is occurring
			On	Link between system and network or no access
			Off	No data transmission or receiving is occurring
3.	Activity LED	Green	Blink	Data transmission or receiving is occurring
			On	Link between system and network or no access
			Off	No data transmission or receiving is occurring
4.	Connection/ Speed LED	Green	On	Linking at 100 Mbps data rate
			Blink	Identify 100 Mbps data rate
		N/A	Off	Linking at 10 Mbps data rate
5.	Connection/ Speed LED	Orange	On	Linking at 1 Gbps data rate
			Blink	Identify 1 Gbps data rate
			On	10 Gbps data rate
		Green	Blink	Identify 10 Gbps data rate
		N/A	Off	10 Mbps or 100 Mbpsdata rate
6.	Activity LED	Green	Blink	Data transmission or receiving is occurring
			On	Link between system and network or no access
			Off	No data transmission or receiving is occurring

3-5 Power Supply LEDs



Power Supply Status	Color
Power Switch On	Blinking Green → Red →Green
Normal State	Green
Power Switch Off	Green →Red Blinking →Green
Standby (AC In, Only +5VSB output)	Blinking Green
Power Fail	Red
Fan Fail	Blinking Red

3-6 Hard Disk Drive LEDs

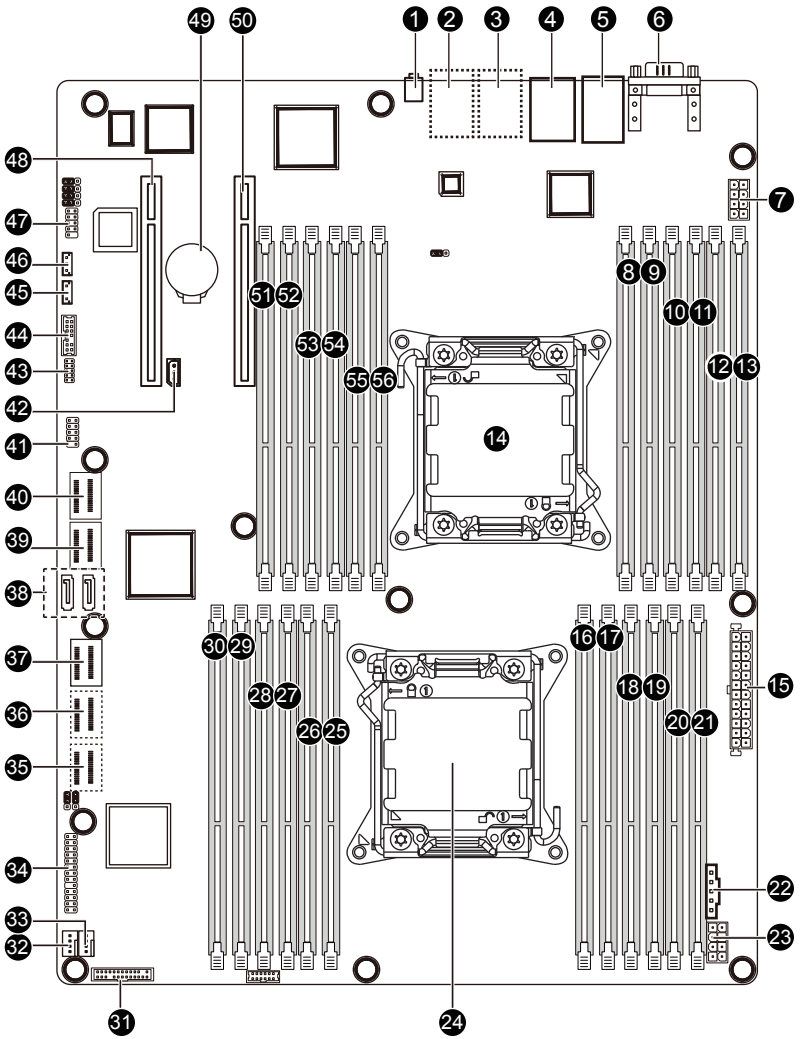


Mode	Description	LED1 (Green) Active	LED2 (Amber) Active
Non-RAID	Hard disk drive is not present	Off	Off
	Hard disk drive is present but not active	On	Off
	Hard disk drive is present and active	Blink	Off
LSI RAID (3rd RAID Controller)	Hard disk drive is not present	Off	Off
	Hard disk drive is present but not active	On	Off
	Hard disk drive is present and active	Blink	Off
	Location	Blink	Blink @ 4 Hz
	RAID failed (HDD remove)	--	On
	Hard disk drive is rebuilding	On/Blink	Blink @ 1 Hz
SCU RAID	Hard disk drive is not present	Off	Off
	Hard disk drive is present but not active	On	Off
	Hard disk drive is present and active	Blink	Off
	Location	Blink	Blink @ 4 Hz
	RAID failed	--	On
	Hard disk drive is rebuilding	Blink	Blink @ 1 Hz

- When HDD is not accessing, the LED2 (Active) will have differnet behavior depends on the HDD definition. It can function for staggered spinup, activity indication, both, or nothing.

Chapter 4 Motherboard Components

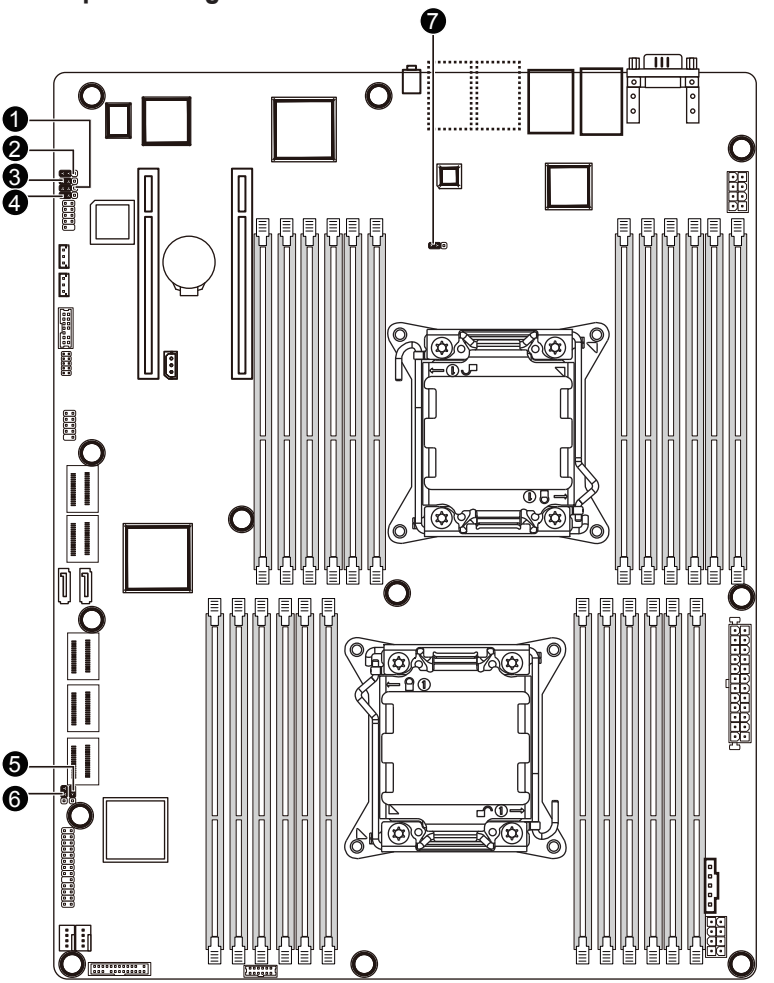
4-1 GA-7PPSH/GA-7PPSH2 Motherboard Components



Item	Code	Description
1	ID_SW1	ID switch
2	10GLAN2	LAN2 port (10G LAN port/GS-R12PE/GA-7PPSH)
3	10GLAN1	LAN1 port (10G LAN port/GS-R12PE/GA-7PPSH)
4	MLAN1	BMC Management LAN port (top) / USB ports (bottom)
5	GLAN1_2	LAN1/2 port (1 GbE LAN port)
6	COM_VGA1	Serial port (top)/ VGA port (bottom)
7	P12V_AUX2	8 pin power connector
8	DDR3_P1_H2	Channel 4 slot 2 (for secondary CPU)
9	DDR3_P1_H1	Channel 4 slot 1 (for secondary CPU)
10	DDR3_P1_H0	Channel 4 slot 0 (for secondary CPU)
11	DDR3_P1_G2	Channel 3 slot 2 (for secondary CPU)
12	DDR3_P1_G1	Channel 3 slot 1 (for secondary CPU)
13	DDR3_P1_G0	Channel 3 slot 0 (for secondary CPU)
14	CPU1	Intel LGA2011 socket (Secondary CPU)
15	ATX1	24-pin power connector
16	DDR3_P0_B2	Channel 2 slot 2 (for primary CPU)
17	DDR3_P0_B1	Channel 2 slot 1 (for primary CPU)
18	DDR3_P0_B0	Channel 2 slot 0 (for primary CPU)
19	DDR3_P0_A2	Channel 1 slot 2 (for primary CPU)
20	DDR3_P0_A1	Channel 1 slot 1 (for primary CPU)
21	DDR3_P0_A0	Channel 1 slot 0 (for primary CPU)
22	PWR_DET1	PMBus connector
23	P12V_AUX1	8 pin power connector
24	CPU0	Intel LGA2011 socket (Primary CPU)
25	DDR3_P0_D2	Channel 4 slot 2 (for primary CPU)
26	DDR3_P0_D1	Channel 4 slot 1 (for primary CPU)
27	DDR3_P0_D0	Channel 4 slot 0 (for primary CPU)
28	DDR3_P0_C2	Channel 3 slot 2 (for primary CPU)
29	DDR3_P0_C1	Channel 3 slot 1 (for primary CPU)
30	DDR3_P0_C0	Channel 3 slot 0 (for primary CPU)
31	BP_1	HDD back plane board connector
32	SYS_FAN2	System fan connector
33	SYS_FAN1	System fan connector
34	F_PANEL1	Front panel connector
35	MINISAS5	Mini SAS cable connector (From LSI2008/GS-R12PE/GA-7PPSH)
36	MINISAS4	Mini SAS cable connector (From LSI2008/GS-R12PE/GA-7PPSH)
37	MINISAS3	Mini SAS cable connector (SATA 3.0Gb/s signal)
38	SATA0/1	SATA 6.0Gb/s connectors
39	MINISAS2	Mini SAS cable connector
40	MINISAS1	Mini SAS cable connector
41	USB2	Front USB connector
42	IPMB1	IPMB connector

43	USB1	Front USB connector
44	TPM_1	TPM connector
45	SKU_KEY1	PBG A SKU Select connector
46	RAID_KEY1	RAID Select connector
47	COM2	Serial cable connector
48	PCI-E_2	PCI-E slot 2 (Gen3 /x16 slot /x8 bus)
49	BAT1	Battery socket
50	PCI-E_1	PCI-E slot 2 (Gen3 /x16 slot /x16 bus)
51	DDR3_P1_E0	Channel 1 slot 0 (for secondary CPU)
52	DDR3_P1_E1	Channel 1 slot 1 (for secondary CPU)
53	DDR3_P1_E2	Channel 1 slot 2 (for secondary CPU)
54	DDR3_P1_F0	Channel 2 slot 0 (for secondary CPU)
55	DDR3_P1_F1	Channel 2 slot 1 (for secondary CPU)
56	DDR3_P1_F2	Channel 2 slot 2 (for secondary CPU)

4-2 Jumper Setting



No.	Jumper Code	Jumper Setting
1.	BIOS WP1 (BIOS Write Protect Jumper)	1-2 Close: Normal operation. (Default setting)
		2-3 Close: Enable BIOS write protect function.
2.	FLASH_DP1 (Flash Descriptor Security Jumper)	1-2 Close: Flash Descriptor Security Overridden
		2-3 Close: Flash Descriptor Security in effect. (Default setting)
3.	SSB_ME1 (ME enable/ disable Jumper)	1-2 Close: Normal operation. (Default setting)
		2-3 Close: Disable ME function.

4.	CLR_CMOS1 (Clearing CMOS Jumper)	1-2 Close: Normal operation (Default setting)
		2-3 Close: Clear CMOS data
5.	BIOS_RVCR1 (BIOS Recovery Jumper)	1-2 Close: Normal operation (Default setting)
		2-3 Close: BIOS recovery mode.
6.	PASSWORD1 (Skip Supervisor password Jumper)	1-2 Close: Normal operation (Default setting)
		2-3 Close: Skip supervisor password.
7.	BMC_FRB1 (Force to Stop FRB3 Timer Jumper)	1-2 Close: Normal operation (Default setting)
		2-3 Close: Force to Stop FRB3 Timer

Chapter 5 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the EFI on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <F2> key during the POST when the power is turned on.

- BIOS flashing is potentially risky, if you do not encounter problems of using the current BIOS version, it is recommended that you don't flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Load Optimized Defaults" section in this chapter or introductions of the battery/clearing CMOS jumper in Chapter 1 for how to clear the CMOS values.)

BIOS Setup Program Function Keys

<←><→>	Move the selection bar to select the screen
<↑><↓>	Move the selection bar to select an item
<Enter>	Execute command or enter the submenu
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu
<F1>	Show descriptions of general help
<F3>	Restore the previous BIOS settings for the current submenus
<F9>	Load the Optimized BIOS default settings for the current submenus
<F10>	Save all the changes and exit the BIOS Setup program

- **Main**
  This setup page includes all the items in standard compatible BIOS.
- **Advanced**
  This setup page includes all the items of AMI BIOS special enhanced features.
  (ex: Auto detect fan and temperature status, automatically configure hard disk parameters.)
- **Chipset**
  This setup page includes all the submenu options for configuring the function of North Bridge and South Bridge.
  (ex: Auto detect fan and temperature status, automatically configure hard disk parameters.)
- **Security**
  Change, set, or disable supervisor and user password. Configuration supervisor password allows you to restrict access to the system and BIOS Setup.
  A supervisor password allows you to make changes in BIOS Setup.
  A user password only allows you to view the BIOS settings but not to make changes.
- **Server Management**
  Server additional features enabled/disabled setup menus.
- **Boot Options**
  This setup page provides items for configuration of boot sequence.
- **Boot Manager**
  This setup page provides configuration of boot up devices.
- **Exit**
  Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.)
  Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.)

5-1 The Main Menu

Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter other sub-menu.

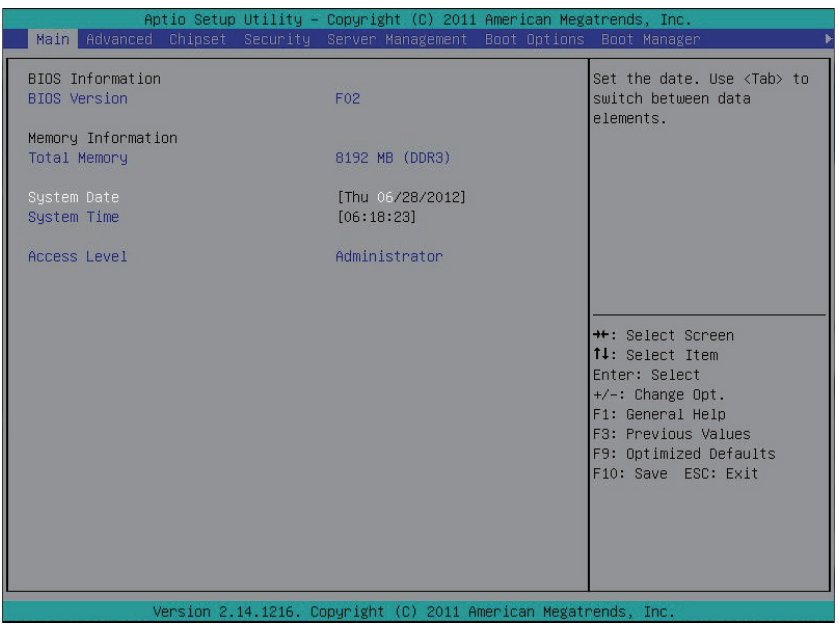
Main Menu Help

The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

Submenu Help

While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu. Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu.

- When the system is not stable as usual, select the **Load Default Values** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.



☞ **BIOS Information**

☞ **BIOS Version**

Display version number of the BIOS.

☞ **Memory Information**

☞ **Total Memory**

Determines how much total memory is present during the POST.

☞ **System Date**

Set the date following the weekday-month-day- year format.

☞ **System Time**

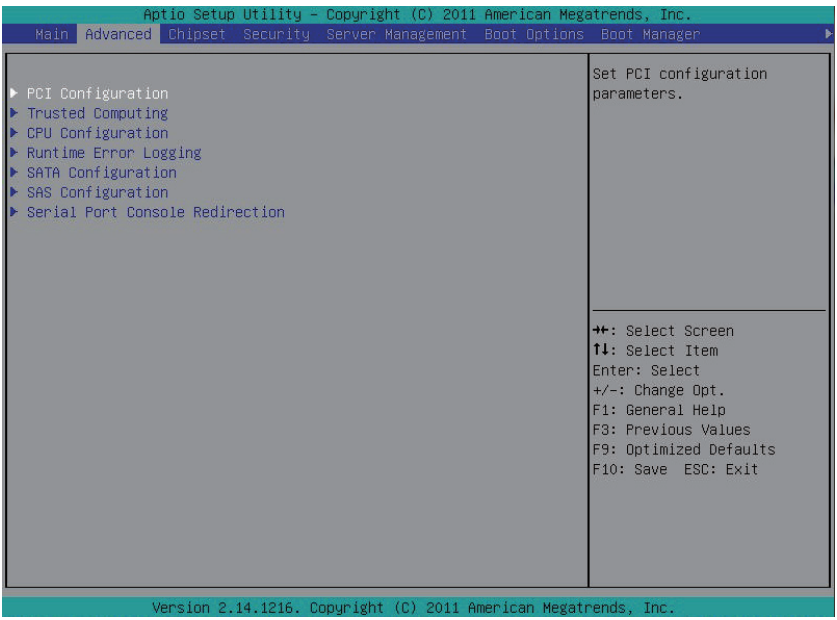
Set the system time following the hour-minute- second format.

☞ **Access Level**

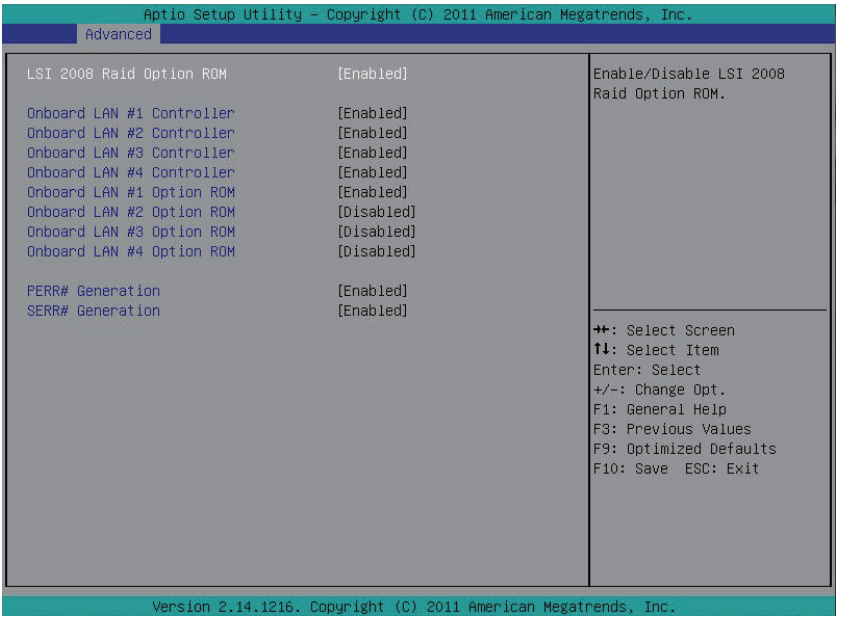
Display the current accessing level information.

5-2 Advanced Menu

The Advanced menu display submenu options for configuring the function of various hardware components. Select a submenu item, then press Enter to access the related submenu screen.



5-2-1 PCI Configuration



☞ **LSI 2008 Raid ROM (Optional)**(Note)

When enabled, This setting will initialize the device expansion ROM for the LSI 2008 RAID.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Onboard LAN1/2 Controller**

Enable/Disable Onboard LAN controller .
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Onboard LAN3/4 Controller (Optional)**

Enable/Disable Onboard LAN controller .
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **LAN1/2 Option ROM**

Enable/Disable onboard LAN1 device and initialize device expansion ROM.
Options available: Enabled/Disabled.
Default setting for LAN 1 Option ROM is **Enabled**.
Default setting for LAN 2 Option ROM are **Disabled**.

☞ **LAN3/4 Option ROM (Optional)**

Enable/Disable onboard LAN1 device and initialize device expansion ROM.
Options available: Enabled/Disabled.
Default setting is **Disabled**.

(Note) If you want build RAID on two LSI RAID devices, please set **Boot Priority** first.

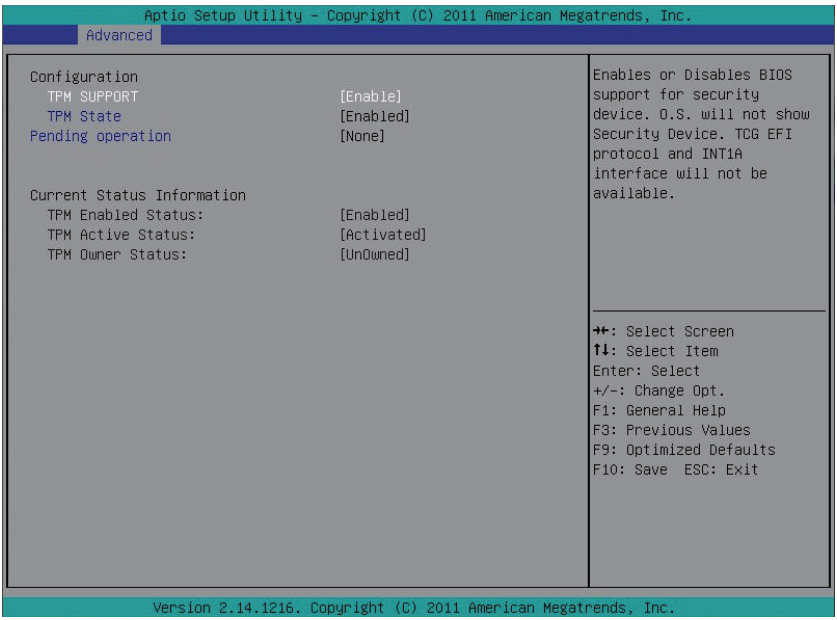
☞ **PERR Generation**

When this item is set to enabled, PCI bus parity error (PERR) is generated and is routed to NMI. Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **SERR Generation**

When this item is set to enabled, PCI bus system error (SERR) is generated and is routed to NMI. Options available: Enabled/Disabled. Default setting is **Enabled**.

5-2-2 Trusted Computing



☞ **TPM Support**

Select Enabled to activate TPM support feature.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **TPM State** (Note)

Select Enabled to activate TPM State function.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Pending Operation** (Note)

Determine the action when operation is pending.

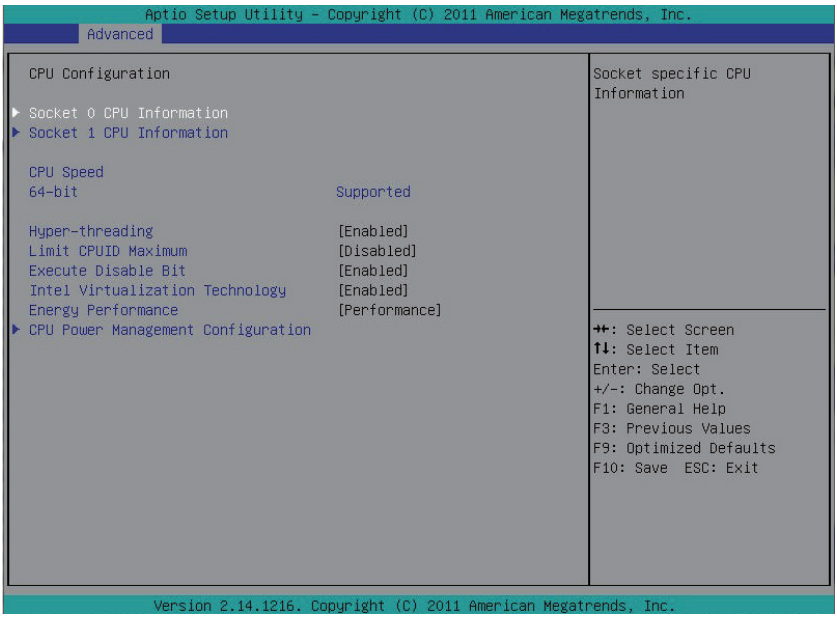
Options available: None. Default setting is **None**.

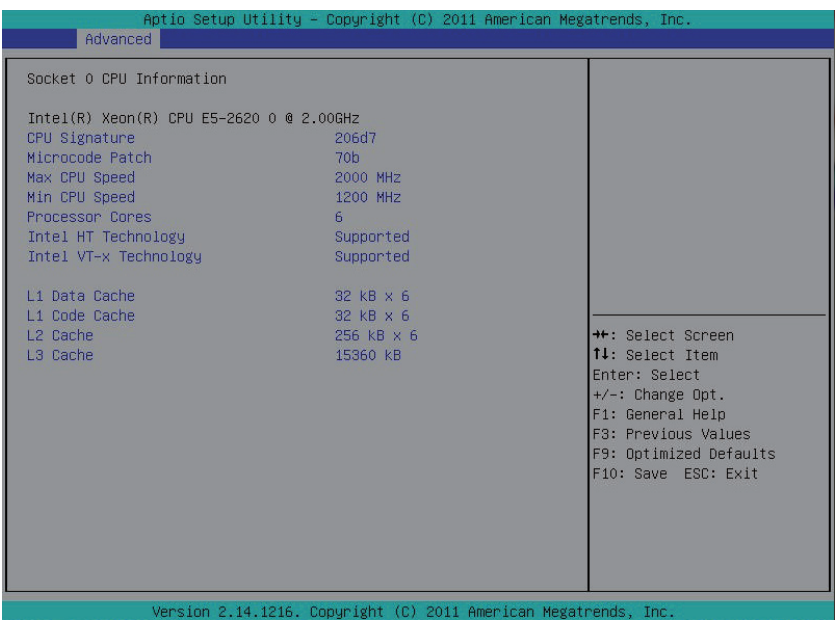
☞ **Current Status Information**

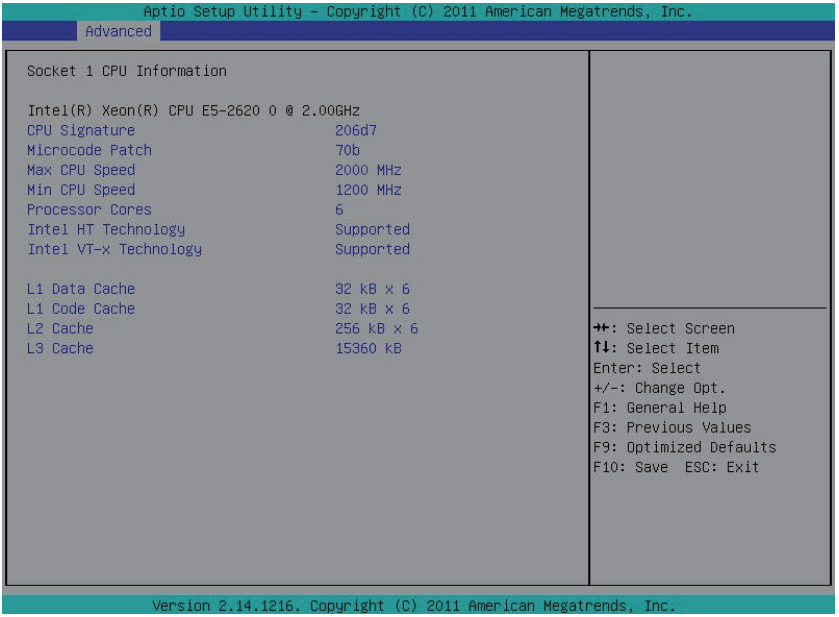
Display current TPM status information.

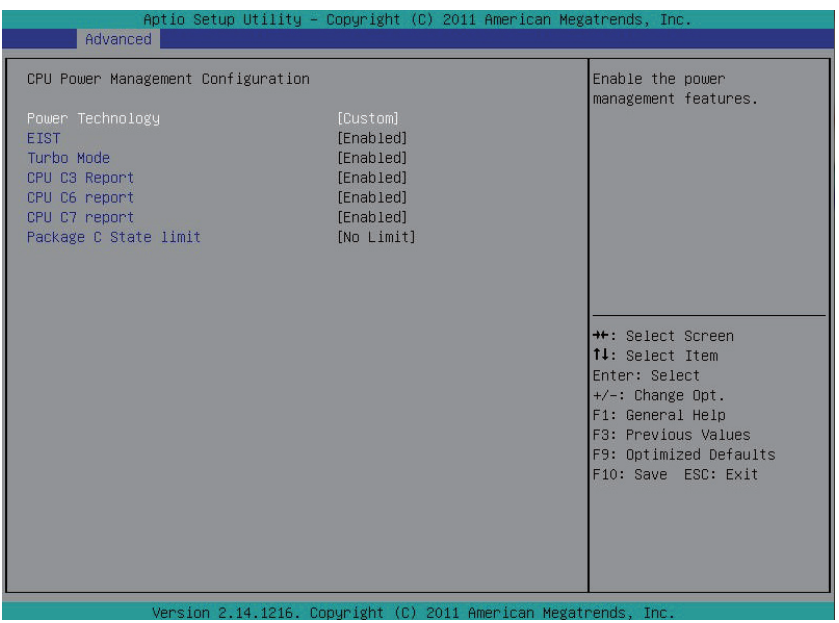
(Note) This item appears when the TPM module is attached.

5-2-3 CPU Configuration






Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Socket 1 CPU Information
Intel(R) Xeon(R) CPU E5-2620 0 @ 2.00GHz
CPU Signature 206d7
Microcode Patch 70b
Max CPU Speed 2000 MHz
Min CPU Speed 1200 MHz
Processor Cores 6
Intel HT Technology Supported
Intel VT-x Technology Supported
L1 Data Cache 32 kB x 6
L1 Code Cache 32 kB x 6
L2 Cache 256 kB x 6
L3 Cache 15360 kB
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save ESC: Exit
Version 2.14.1216. Copyright (C) 2011 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
CPU Power Management Configuration
Power Technology [Custom]
EIST [Enabled]
Turbo Mode [Enabled]
CPU C3 Report [Enabled]
CPU C6 report [Enabled]
CPU C7 report [Enabled]
Package C State limit [No Limit]
Enable the power management features.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save ESC: Exit
Version 2.14.1216. Copyright (C) 2011 American Megatrends, Inc.

☞ **Socket 0/1 Information**

☞ **CPU Signature**

Displays the processor ID information.

☞ **Microcode Patch**

Display Microcode patch.

☞ **Max CPU Speed**

Display the maximum processor speed.

☞ **Min CPU Speed**

Display the minimum processor speed.

☞ **Processor Cores**

Display the information of the processor core.

☞ **Intel HT Technology**

Display Intel Hyper Threading Technology function support information.

☞ **Intel VT-x Technology**

Display Intel Virtualization Technology function support information.

☞ **Cache Information**

☞ **L1 Data Cache**

Display the information of L1 Data Cache.

☞ **L1 Code Cache**

Display the information of L1 Code Cache.

☞ **L2 Cache**

Display the information of L2 Cache per Core.

☞ **L3 Cache**

Display the information of L3 Cache per Core.

☞ **CPU Speed**

Display the current installed CPU speed.

☞ **64-bit**

Display the supported infprmation of installed CPU.

☞ **Hyper-threading**

The Intel Hyper Threading Technology allows a single processor to execute two or more separate threads concurrently. When hyper-threading is enabled, multi-threaded software applications can execute their threads, thereby improving performance.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Limit CPUID Maximum**

When enabled, the processor will limit the maximum COUID input values to 03h when queried, even if the processor suppports a higher CPUID input value.

When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Execute Disable Bit**

When enabled, the processor prevents the execution of code in data-only memory pages. This provides some protection against buffer overflow attacks.

When disabled, the processor will not restrict code execution in any memory area. This makes the processor more vulnerable to buffer overflow attacks.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Intel Virtualization Technology**

Select whether to enable the Intel Virtualization Technology function. VT allows a single platform to run multiple operating systems in independent partitions.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Energy Performance**

Energy Performance Bias is Intel CPU function.
The larger value in MSR_ENERGY_PERFORMANCE_BIAS register,
CPU will save more power but lose more performance.
Note: This register will be changed by OS too if OS support it like Windows 2008 or newer Linux.
Options available:
Performance : Write value 0 into MSR_ENERGY_PERFORMANCE_BIAS
Balanced Performance: Write value 7 into MSR_ENERGY_PERFORMANCE_BIAS
Balanced Energy: Write value 11 into MSR_ENERGY_PERFORMANCE_BIAS
Energy Efficient: Write value 15 into MSR_ENERGY_PERFORMANCE_BIAS
Default setting is **Performance**.

☞ **CPU Management Configuration**

☞ **Power Technology**

Configure the power management features.
Options available: Disable/Energy Efficient/Custom. Default setting is **Custom**.

☞ **EIST (Enhanced Intel SpeedStep Technology)**

Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Turbo Mode**

When this feature is enabled, the processor can dynamically overclock one or two of its four processing cores to improve performance with applications that are not multi-threaded or optimized for quad-core processors.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **CPU C3/C6 Report** (Note)

Allows you to determine whether to let the CPU enter C3/C6 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C3/C6 state is a more enhanced power-saving state than C1.
Options available for C3 Report: ACPI C2/ACPI C3/Disabled. Default setting is **Enabled**.
Options available for C6 Report: Enabled/Disabled. Default setting is **Enabled**.

☞ **CPU C7 Report** (Note)

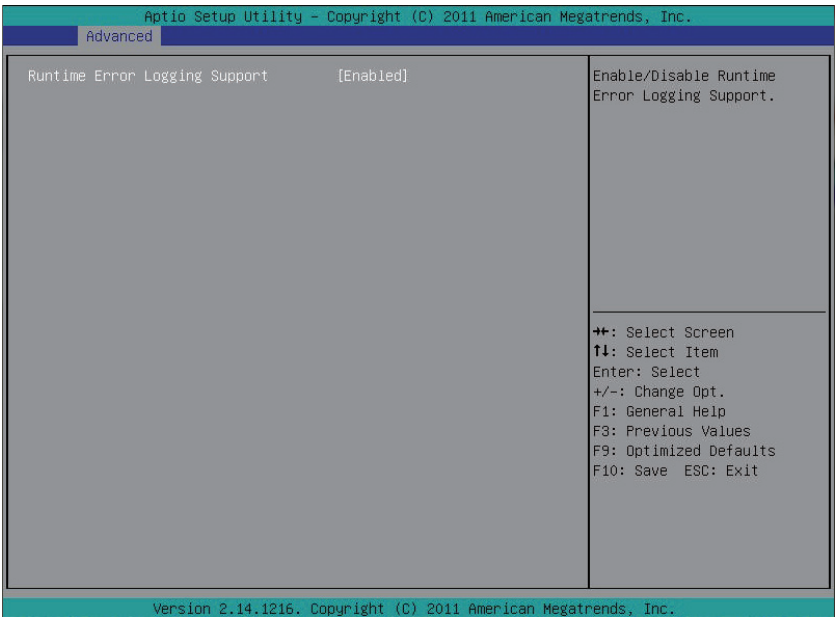
Allows you to enable or disable the CPU C7 (ACPI C3) report.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Package C State Limit**

Configure state for the C-State package limit.
Options available: C0/C1/C6/C7/No Limit. Default setting is **No Limit**.

(Note) This item is present only if you install a CPU that supports this feature. For more information about Intel CPUs' unique features, please visit Intel's website.

5-2-4 Runtime Error Logging

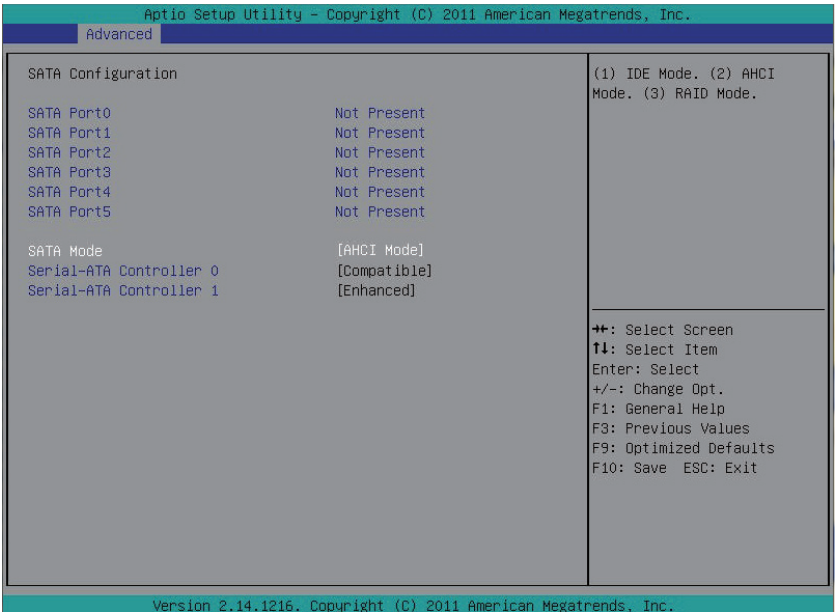


☞ **Runtime Error Logging Support**

Enable/Disable Runtime error logging support.

Options available: Enabled/Disabled. Default setting is **Enabled**.

5-2-5 SATA Configuration



☞ SATA Mode(Note)

Select the on chip SATA type.

IDE Mode: When set to IDE, the SATA controller disables its RAID and AHCI functions and runs in the IDE emulation mode. This is not allowed to access RAID setup utility.

RAID Mode: When set to RAID, the SATA controllerenables both its RAID and AHCI functions. You will be allows access the RAID setup utility at boot time.

AHCI Mode: When set to AHCI,the SATA controller enables its AHCI functionality. Then the RAID function is disabled and cannot be access the RAID setup utility at boot time.

Options available: IDE/RAID/AHCI/Disabled. Default setting is **AHCI Mode**.

☞ SATA Port 0/1/2/3/4/5

Displays the installed HDD devices information. Press [Enter] to view detail information of the installed HDD devices.

☞ Serial ATA Controller 0/1

Determine the onboard SATA controller mode.

Compatible: SATA and PATA drives are auto-detected and placed in Legacy mode.

Enhanced: SATA and PATA drives are auto-detected and placed inNative mode.

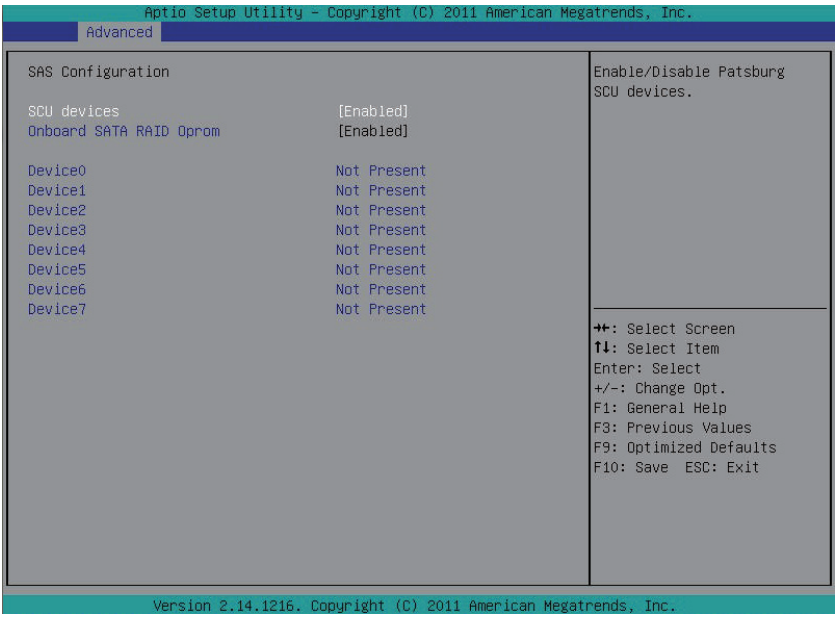
Options available: Disabled/Enhanced/Compatible.

Default setting for Serial ATA 0 is **Compatible**.

Default setting for Serial ATA 1 is **Enhanced**.

(Note) This item will not appear when the SATA mode is set ot RAID mode.

5-2-6 SAS Configuration



☞ **SCU devices**

Enable/Disable Patsburg SCU devices.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Onboard SAS oprom**

Enable/Disable onboard SAS option ROM.

Options available: Enabled/Disabled. Default setting is **Enabled**.

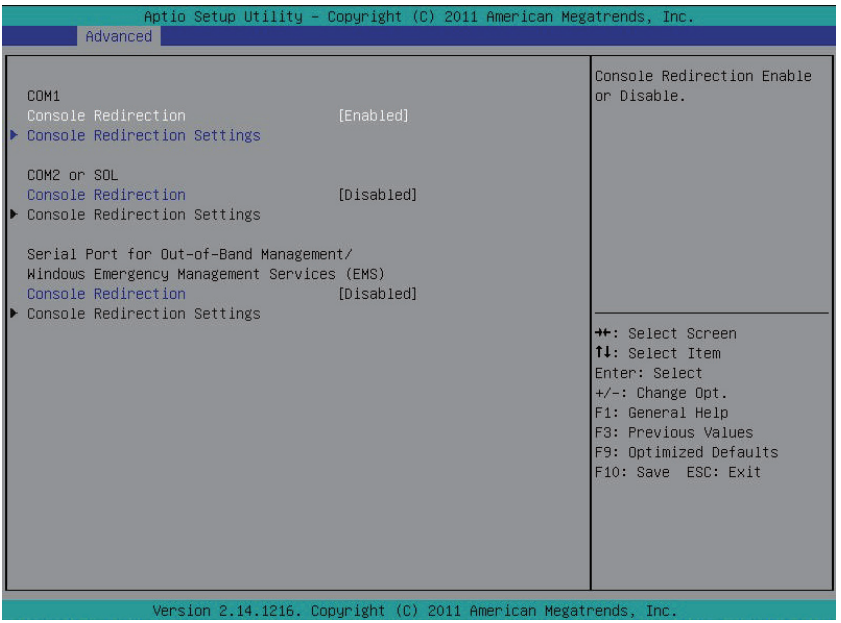
☞ **SAS Configuration** (Note)

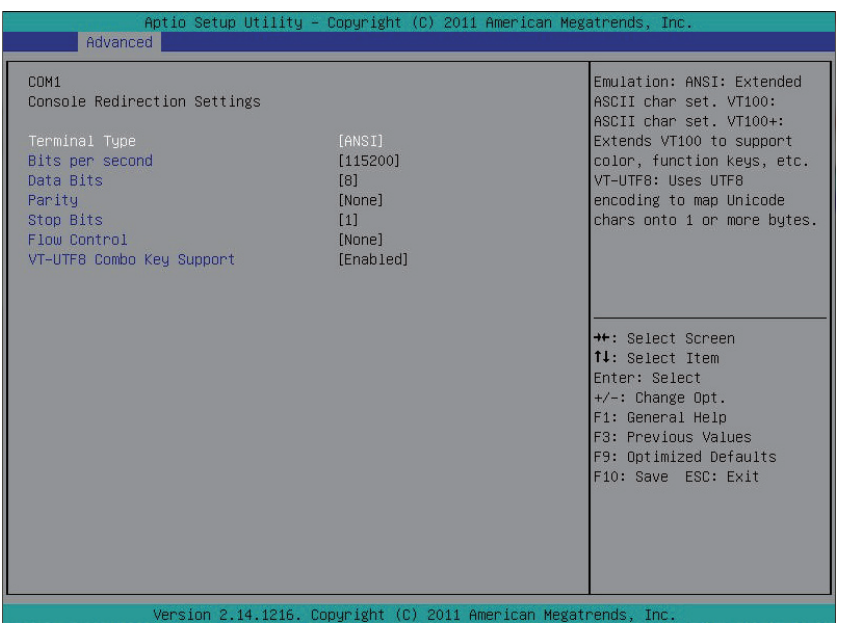
☞ **Device 0/1/2/3/4/5/6/7**

Displays the installed HDD devices information.

(Note) This item will appear when the SAS device is attached.

5-2-6 Serial Port Console Redirection





☞ Console Redirection (Note)

Select whether to enable console redirection for specified device. Console redirection enables users to manage the system from a remote location.

Options available: Disabled/COM1/ COM2 or SOL.Default setting is **Disabled**.

☞ Terminal Type

Select a terminal type to be used for console redirection.

Options available: VT100/VT100+/ANSI /VT-UTF8. Default setting is **ANSI**.

☞ Bits per second

Select the baud rate for console redirection.

Options available: 9600/19200/57600/115200. Default setting is **115200**.

☞ Data Bits

Select the data bits for console redirection.

Options available: 7/8. Default setting is **8**.

☞ Parity

A parity bit can be sent with the data bits to detect some transmission errors.

Even: parity bi is 0 if the num of 1's in the data bits is even.

Odd: parity bit is0if num of 1's the data bits is odd.

Mark: parity bit is always 1. Space: Parity bit is always 0.

Mark and Space Parity do not allow for error detection.

Options available: None/Even/Odd/Mark/Space. Default setting is **None**.

☞ Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

Options available: 1/2. Default setting is **1**.

☞ Flow Control

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

Options available: None/Hardware RTS/CTS. Default setting is **None**.

☞ VT-UTF8 Combo Key Support

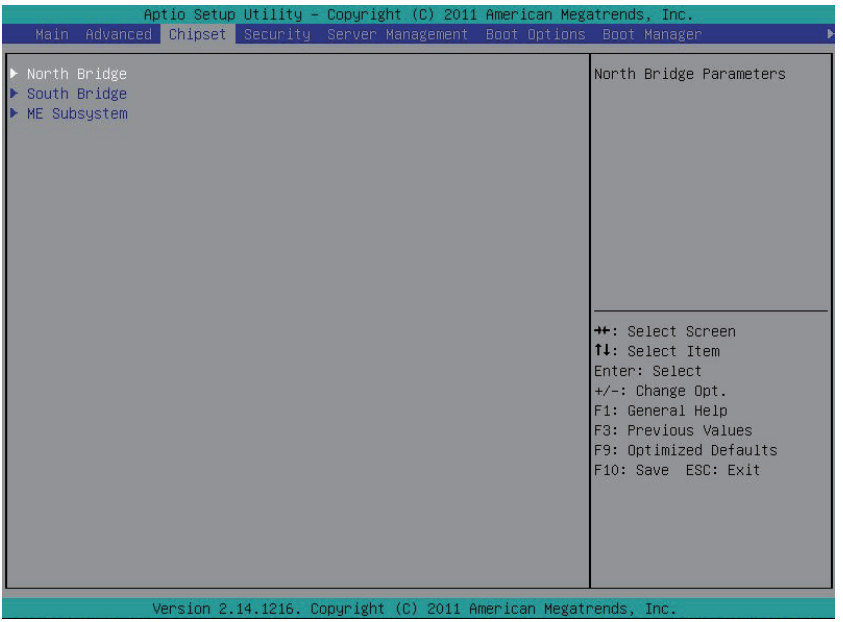
Enable/Disable VT-UTF8 Combo Key Support.

Options available: Enabled/Disabled. Default setting is **Enabled**.

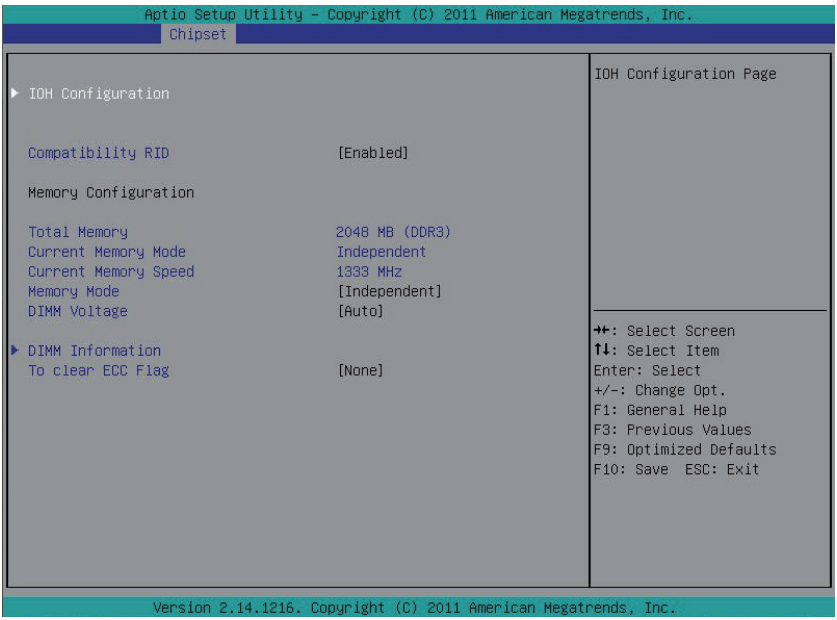
(Note) Advanced items prompt when this item is defined.

5-3 Chipset Menu

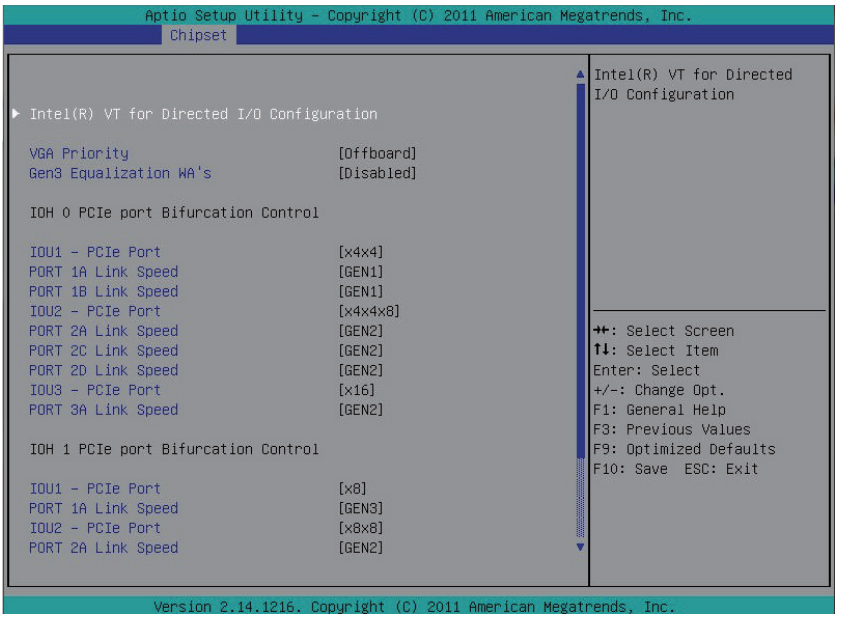
The Chipset menu display submenu options for configuring the function of North Bridge and South Bridge. Select a submenu item, then press Enter to access the related submenu screen.

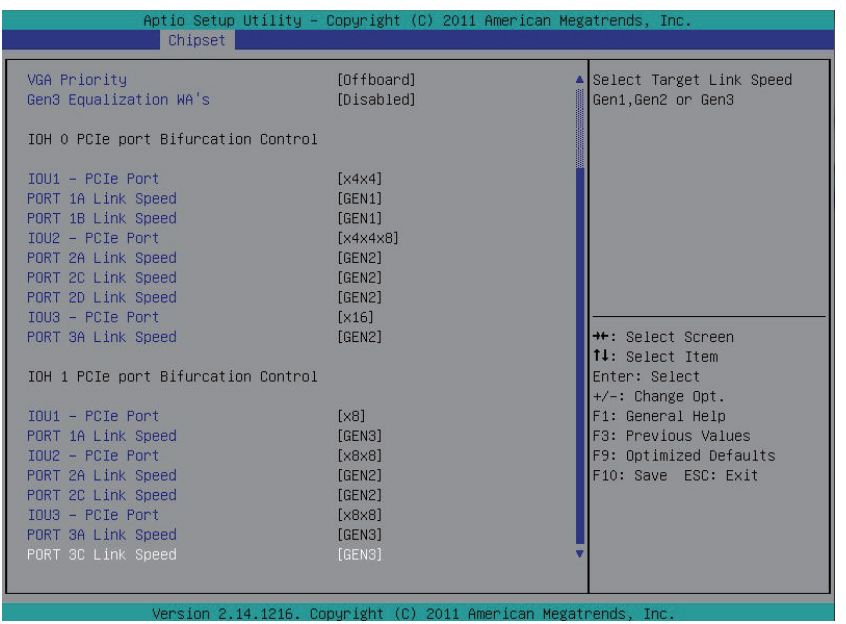


5-3-1 North Bridge Configuration



5-3-1-1 IOH Configuration





☞ **IOH Configuration**

☞ **Intel(R) VT for Directed I/O Configuration**

☞ **Intel(R) I/OAT**

Enable/Disable Intel OAT Technology function.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **ATS Support**

Enable/Disable VT-d Engine Address Translation Service (ATS) support..

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **VGA Priority**

Define the display device priority.

Options available: Onboard/Offboard. Default setting is **Offboard**.

☞ **Gen3 Equalization WA's**

Enable/DIsable the support for Gen3 Equalization Workaround.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **IOH 0/1 PCIe port Bifurcation Control**

☞ **IOU1 - PCIe Port**

Options available: x4x4/x8.

☞ **PORT 1A Link Speed**

Options available: Gen1/Gen2/Gen3.

☞ **PORT 1B Link Speed**

Options available: Gen1/Gen2/Gen3.

☞ **IOU2 - PCIe Port**

Options available: x4x4x4x4/x4x4x8/x8x4x4/x8x8/x16.

☞ **PORT 2A Link Speed**

Options available: Gen1/Gen2/Gen3.

☞ **PORT 2C Link Speed**

Options available: Gen1/Gen2/Gen3.

☞ **PORT 2D Link Speed (Only for IOH 0 PCIe port)**

Options available: Gen1/Gen2/Gen3.

☞ **IOU3 - PCIe Port**

Options available: x4x4x4x4/x4x4x8/x8x4x4/x8x8/x16.

☞ **PORT 3A Link Speed**

Options available: Gen1/Gen2/Gen3.

☞ **Compatibility RID**

Enable/Disable Compatibility RID function.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Memory Configuration**

☞ **Total Memory**

Determines how much total memory is present during the POST.

☞ **Current Memory Mode**

Displays the cuurent memory mode. Memory mode can be determined in **Memory Mode** item.

☞ **Current Memory Speed**

Displays the cuurent memory speed.

☞ **Memory Mode**

Determine the memory mode.

When set to Indendent mode, all DIMMs are available to the operation system.

When set to Mirroring mode, the motherboard maintains two identical (redundant) copies of all data in memory.

When set to Lockstep mode, the motherboard uses two areas of memory to run the same set of operations in parallel.

When set to Sparing mode, a preset threshold of coorectable errors is used to trigger fail-over. The spare memory is put online and used as active memory in place of the failed memory.

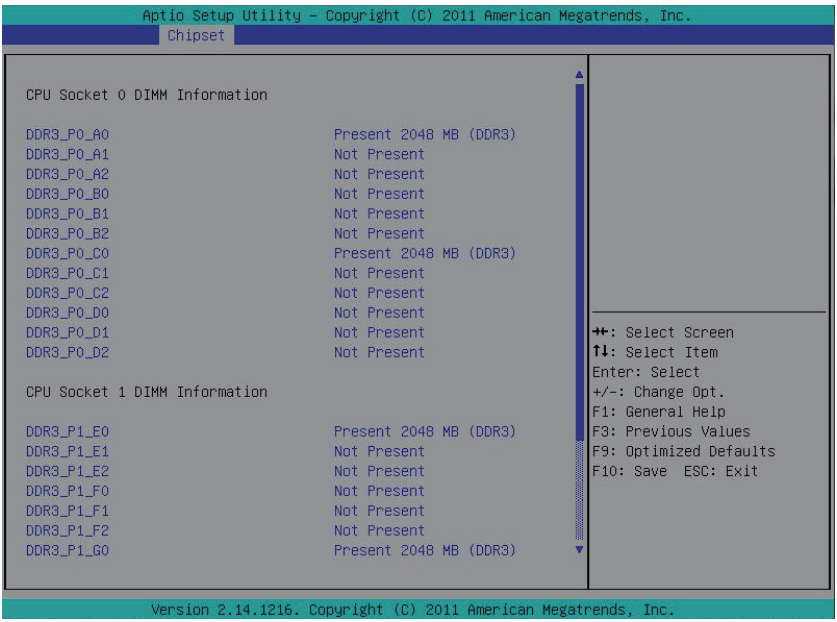
Options available: Indpendent /Mirroring/ Lockstep/Sparing. Default setting is **Indpendent**.

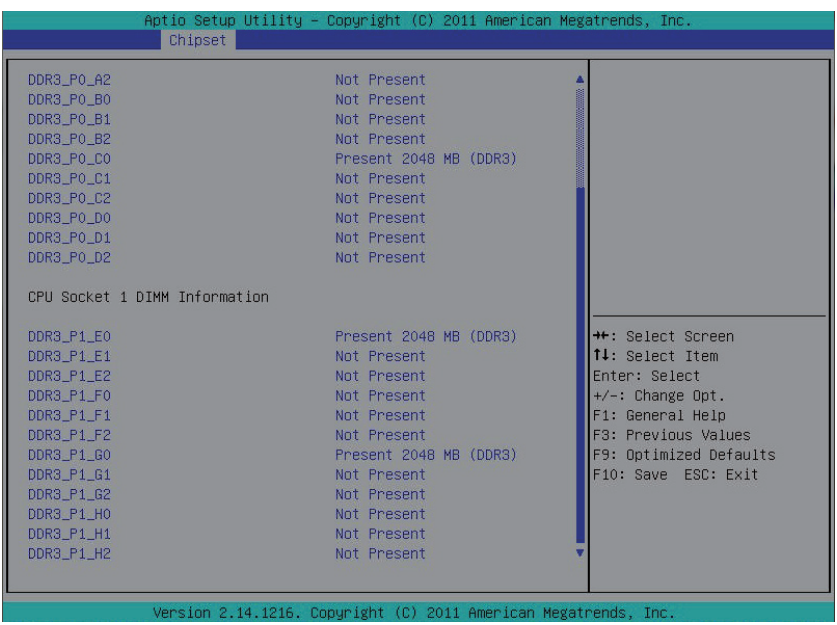
☞ **DIMM Voltage**

Configure the DIMM voltage.

Options available: Auto/ Force 1.5v/Force 1.35v. Default setting is **Auto**.

5-3-1-2 DIMM Information





☞ **DIMM Information:**

☞ **DIMM Group: CPU Socket 0/1 DIMM Information**

CPU Socket 0: DDR3_P0_A0/DDR3_P0_A1/DDR3_P0_A2/
DDR3_P0_B0/DDR3_P0_B1/DDR3_P0_B2
DDR3_P0_C0/DDR3_P0_C1/DDR3_P0_C2
DDR3_P0_D0/DDR3_P0_D1/DDR3_P0_D2 Status

CPU Socket 1: DDR3_P1_E0/DDR3_P1_E1/DDR3_P1_E2/
DDR3_P1_F0/DDR3_P1_F1/DDR3_P1_F2
DDR3_P1_G0/DDR3_P1_G1/DDR3_P1_G2
DDR3_P1_H0/DDR3_P1_H1/DDR3_P1_H2 Status

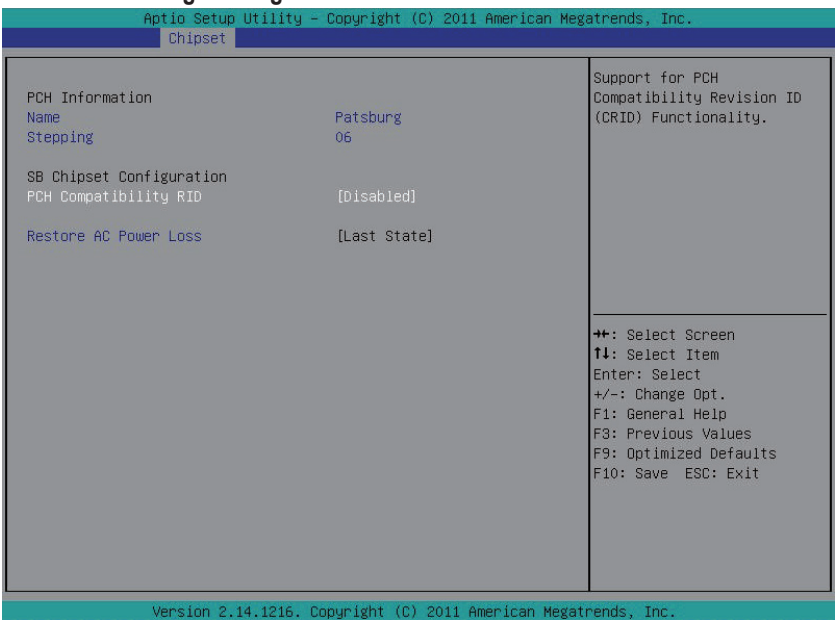
The size of memory installed on each of the DDR3 slots.

☞ **To clear ECC Flag**

To clear ECC Flag. When DDR3 Channel is maskdoff after ECC multibit errors, it's required to clear ECC flag to make masked off channels be available.

Options available: None. Default setting is **None**.

5-3-2 South Bridge Configuration



☞ **PCH Information:**

☞ **Name/Stepping Information**

Displays the name and stepping information of the south bridge.

☞ **SB Chipset Configuration:**

☞ **PCH Compatibility RID**

Enable/Disable Compatibility RID function.

Options available: Enabled/Disabled. Default setting is **Disabled**.

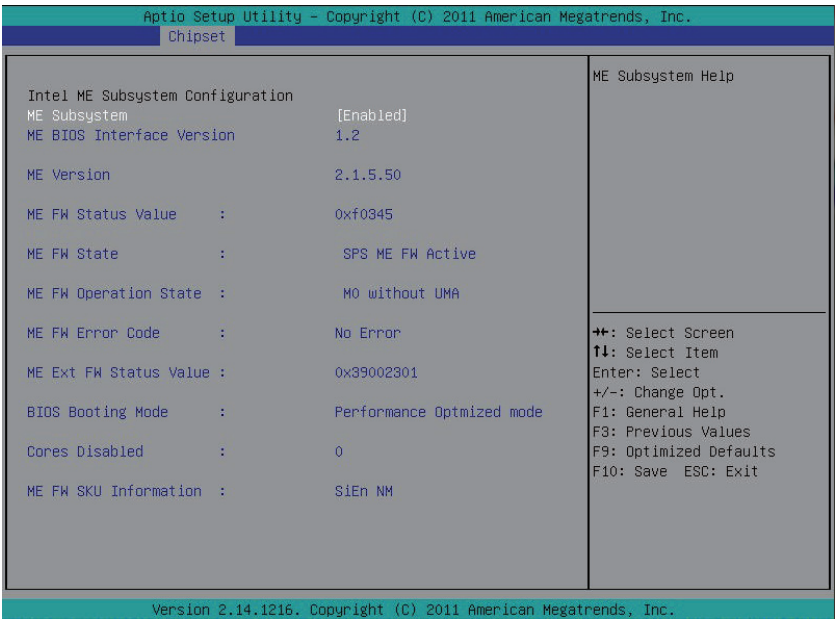
☞ **Restore on AC Power Loss** (Note)

Defines the power state to resume to after a sys- tem shutdown that is due to an interruption in AC power. When set to Last State, the system will return to the active power state prior to shutdown. When set to Stay Off, the system remains off after power shutdown.

Options available: Last State/Stay Off/Power On. The default setting depends on the BMC setting.

(Note) When the power policy is controlled by BMC, please wait for 15-20 seconds for BMC to save the last power state.

5-3-3 ME Subsystem



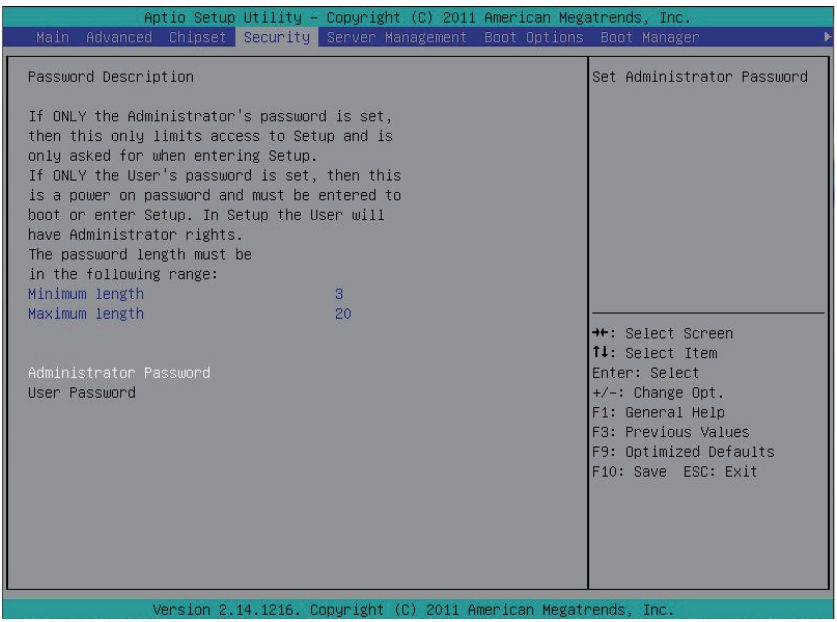
☞ ME Subsystem Configuration

Enable/Disable ME subsystem configuration.

Options available: Enabled/Disabled. Default setting is **Enabled**.

5-4 Security Menu

The Security menu allows you to safeguard and protect the system from unauthorized use by setting up access passwords.



There are two types of passwords that you can set:

- Administrator Password

  Entering this password will allow the user to access and change all settings in the Setup Utility.

- User Password

  Entering this password will restrict a user's access to the Setup menus. To enable or disable this field, a Administrator Password must first be set. A user can only access and modify the System Time, System Date, and Set User Password fields.

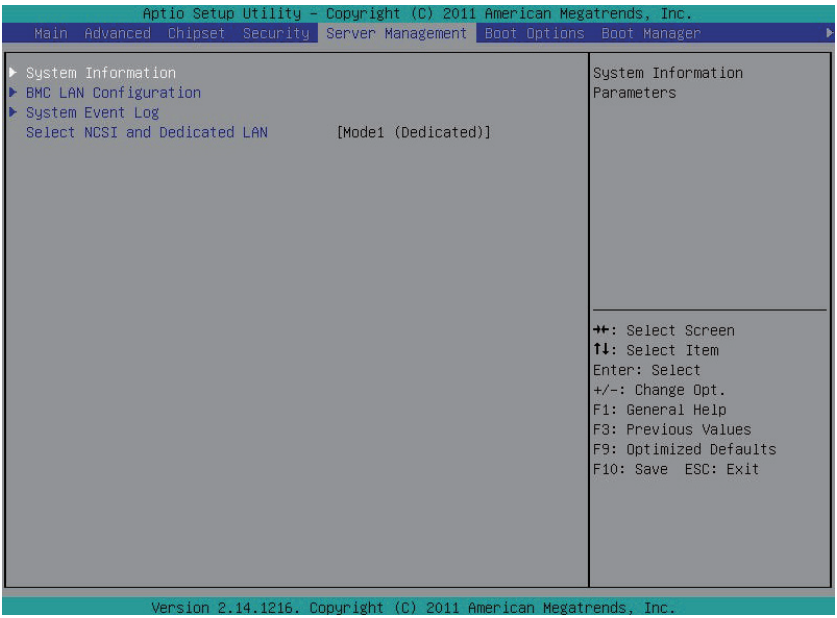
☞ **Set Administrator Password**

Press Enter to configure the Administrator password.

☞ **Set User Password**

Press Enter to configure the user password.

5-5 Server Management Menu



☞ **System Information**

Displays the BMC information of firmware version,SOR version, and FRU version.

☞ **BMC LAN Configuration**

BMC LAN Configuration. Press Enter to access the related submenu.

☞ **System Event Log**

System Event Log Configuration. Press Enter to access the related submenu.

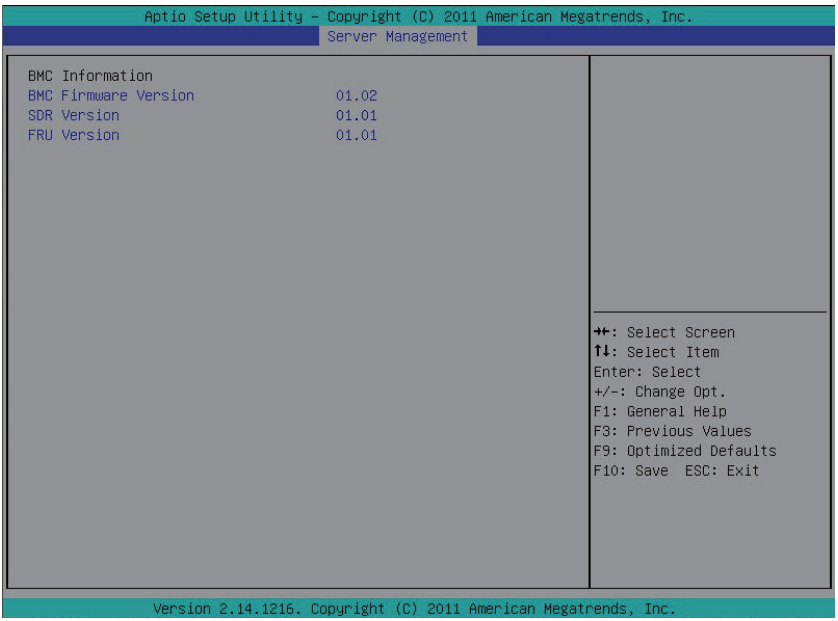
☞ **Select NCSI and Dedicated LAN**

Switch NCSI and dedicated LAN and send KCS command.

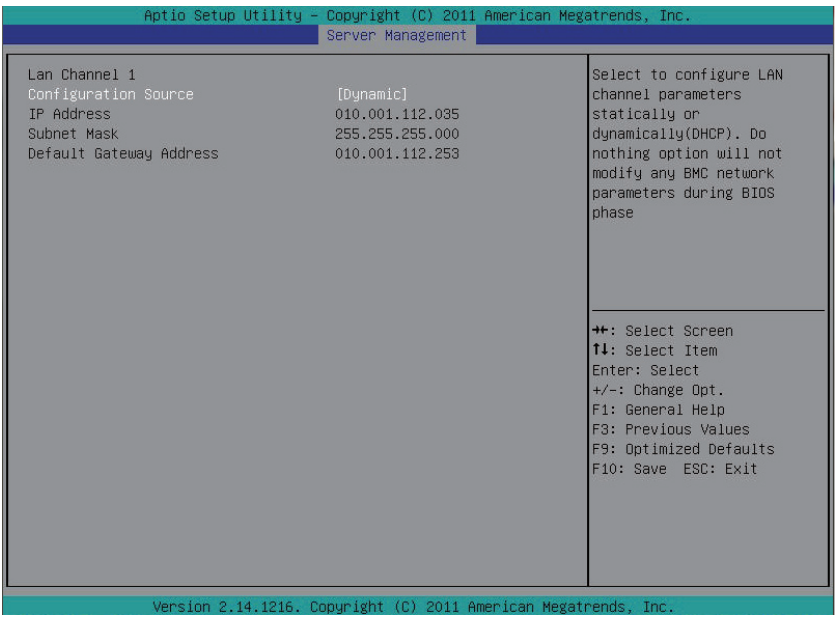
Options available: Mode2(NSCI)/ Mode1 (Dedicated). Default setting is **Mode1 (Dedicated)**.

5-5-1 System Information

The System Management submenu is a simple display page for BMC information of firmware version,SOR version, and FRU version. Items on this window are non-configurable.



5-5-2 BMC LAN Configuration



☞ **LAN Channel 1**

☞ **Configuration Source**

Select to configure LAN channel parameters statically or dynamically (DHCP). Do nothing option willnot modify any BMC network parameters during BIOS phase.

Options available: Static/Dynamic/Do Nothing. Default setting is **Do Nothing**.

☞ **IP Address**

Display IP Address information.

☞ **Subnet Mask**

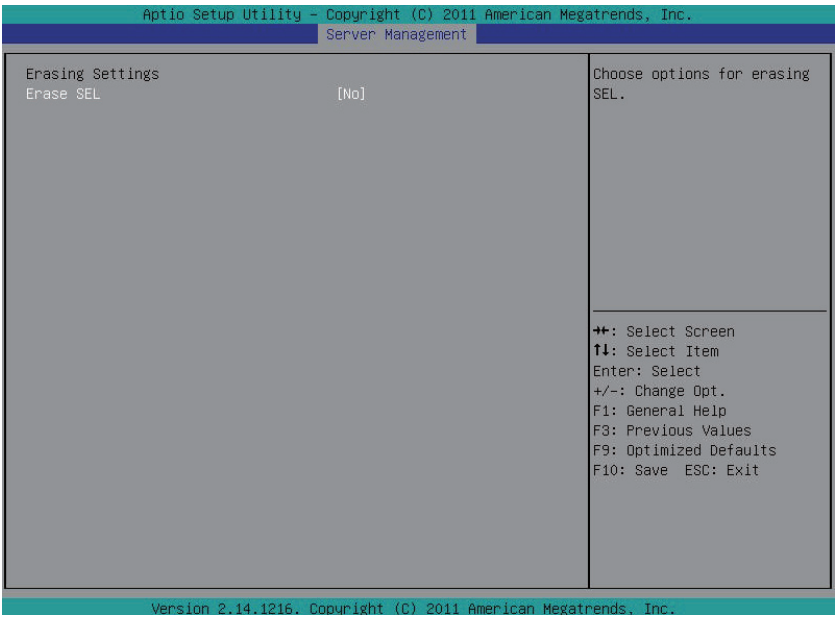
Display Subnet Mask information.

Please note that the IP address must be in three digitals, for example, 192.168.000.001.

☞ **Default Gateway Address**

Display Default Gateway Address information.

5-5-3 System Event Log



☞ **Erasing Settings**

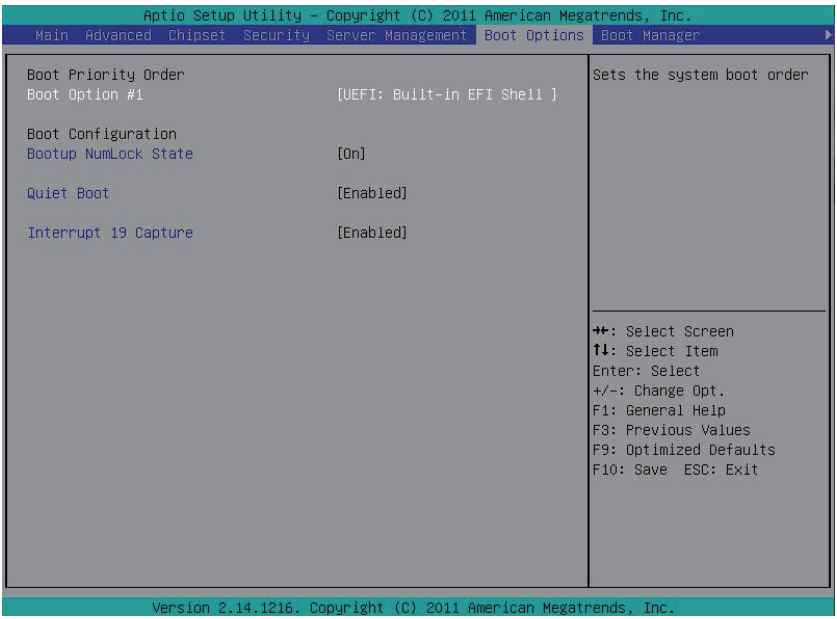
☞ **Erase SEL**

Choose options fro erasing SEL.

Options available: No/Yes,On next reset/Yes, On every reset. Default setting is **No**.

5-6 Boot Option Menu

The Boot menu allows you to set the drive priority during system boot-up. BIOS setup will display an error message if the legacy drive(s) specified is not bootable.



☞ Boot Priority Order

☞ Boot Option

Press Enter to configure the boot priority.

By default, the server searches for boot devices in the following secquence:

1. Hard drive.
2. Network device.
3. UEFI device.

☞ Bootup Configuration

☞ Bootup NumLock State

Enable or Disable Bootup NumLock function.

Options available: On/Off. Default setting is **On**.

☞ Quiet Boot

Enables or disables showing the logo during POST.

Options available: Enabled/Disabled. Default setting is **Enabled**.

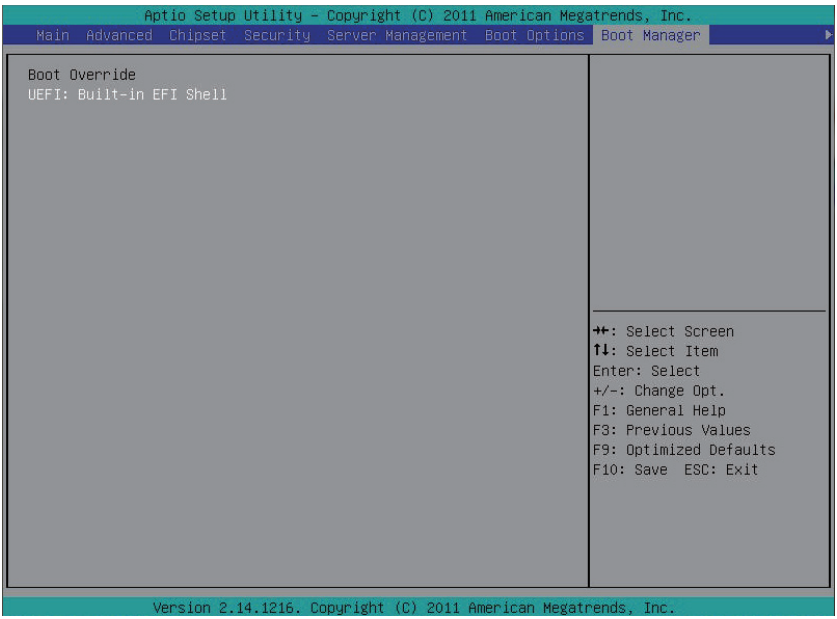
☞ Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When enabled, this BIOS feature allows the ROM BIOS of those host adaptors to "capture" Interrupt 19 during the boot process so that drives attached to these adaptors can function as bootable disks.

Options available: Enabled/Disabled. Default setting is **Enabled**.

5-7 Boot Manager

The Boot manager menu allows you to specify the boot-up drive. BIOS setup will display an error message if the legacy drive(s) specified is not bootable.



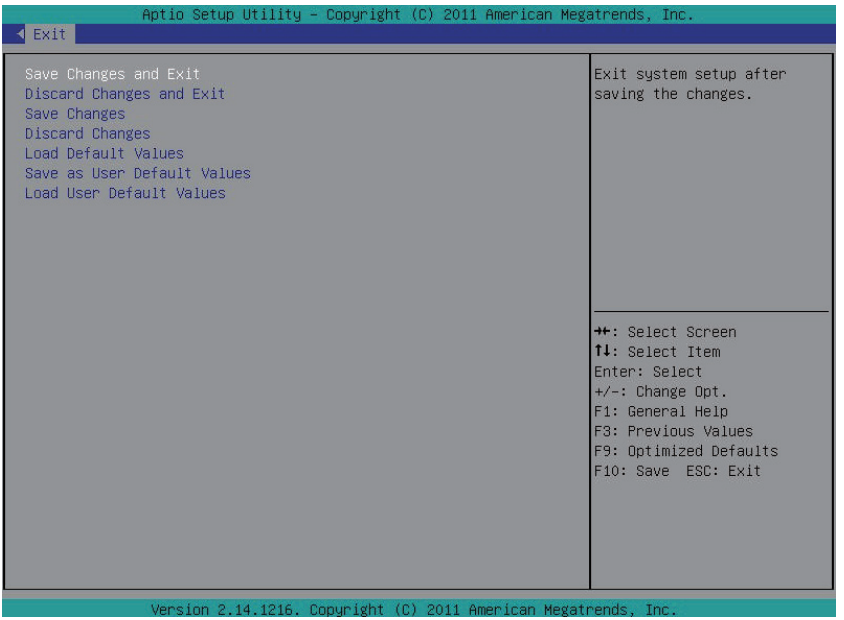
☞ **Boot Override**

☞ **UEFI: Built-in EFI Shell**

Press Enter to configure the device as the boot-up drive.

5-8 Exit Menu

The Exit menu displays the various options to quit from the BIOS setup. Highlight any of the exit options then press **Enter**.



☞ Save Changes and Exit

Saves changes made and close the BIOS setup.

Options available: Yes/No.

☞ Discard Changes and Exit

Discards changes made and close the BIOS setup.

Options available: Yes/No.

☞ Save Changes

Saves changes made in the BIOS setup.

Options available: Yes/No.

☞ Discard Changes

Discards all changes made in the BIOS setup.

Options available: Yes/No.

☞ Load Default Values

Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly.

Options available: Yes/No.

5-9 BIOS Beep Codes

5-9-1 PEI Beep Codes

# of Beeps	Description
1	Memory not Installed.
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXEIPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

5-9-2 DXE Beep Codes

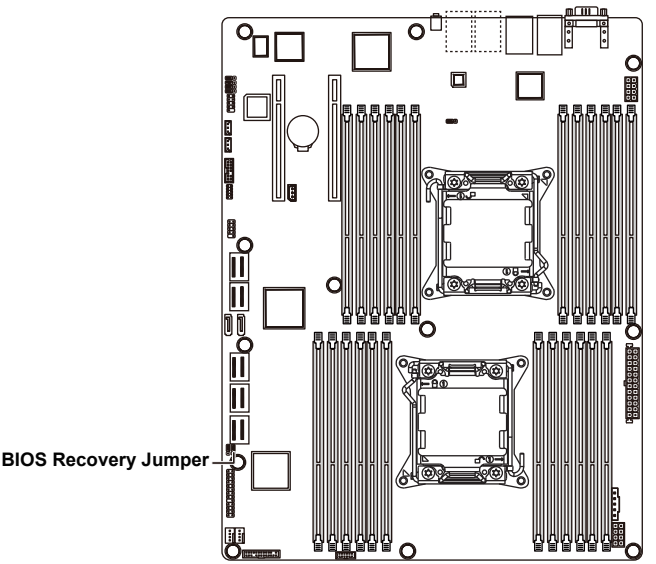
# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met

5-10 BIOS Recovery Instruction

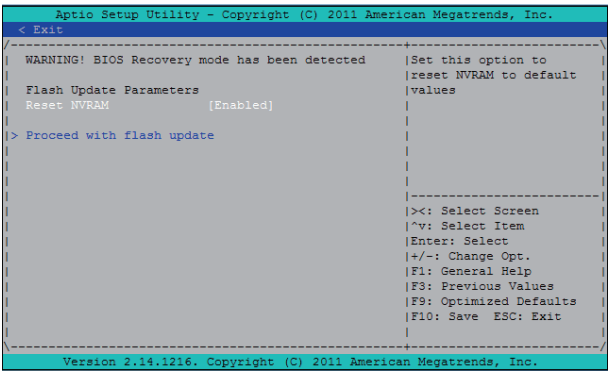
The system has an embedded recovery technique. In the event that the BIOS becomes corrupt the boot block can be used to restore the BIOS to a working state. To restore your BIOS, please follow the instructions listed below:

Recovery Instruction:

1. Change xxx.ROM to flashabl.rom.
2. Copy flashabl.rom and AFUDOS.exe to USB diskette.
3. Setting BIOS Recovery jump to enabled status.



4. Boot into BIOS recovery.
5. Run Proceed with flash update.



6. BIOS updated.