

GS-R22PD

Four hot-pluggable systems (nodes)

Dual LGA1356 socket motherboard for Intel® Xeon® series processors

Service Guide

Rev. 1.0

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Documentation Classifications

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

- For quick set-up of the product, read the Quick Installation Guide included with the product.
- For detailed product information, carefully read the Service 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 to extend 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 such cases, please contact your regional offices or the responsible personnel/channel to provide you with further technical details.
2. Please note WHEN ORDERING SPARE PARTS, you should check the most up-to-date information available 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 SERVICE PROVIDERS, your GIGABYTE office may have a DIFFERENT part number code to those given in the FRU list of this printed Service Guide. You MUST use the list provided by your regional GIGABYTE office to order FRU parts for repair and service of customer machines.

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Box Contents

- GS-R22PD
- 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 operate your 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 for your 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 power outlet. This is a safety feature. The equipment grounding should be in accordance with local and national electrical codes. The equipment operates safely when it is used in accordance with its marked electrical ratings 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 you provide adequate space around the system for ventilation when you set up your work area. Never insert objects of any kind into the ventilation openings.
- To avoid electrical shock, always unplug all power cables and modem cables from the wall outlets before 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, or Local Area Network 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 electrical shock 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 internal components, 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 radio interference.

encelIn 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 against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate 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.

FCC part 68 (applicable to products fitted with USA modems)

The modem complies with Part 68 of the FCC Rules. On this equipment is a label that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. You must, upon request, provide this information to your telephone company. If your telephone equipment causes harm to the telephone network, the Telephone Company may discontinue your service temporarily. If possible, they will notify in advance. But, if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC. Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect proper operation of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service. The FCC prohibits this equipment to be connected to party lines or coin-telephone service. The FCC also requires the transmitter of a FAX transmission be properly identified (per FCC Rules Part 68, Sec. 68.381 (c) (3)./ for Canadian users only

Canadian Department of Communications Compliance Statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus 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 aux appareils numeriques de Classe A prescrites dans le reglement sur le brouillage radioelectrique edicte par Industrie Canada.

DOC notice (for products fitted with an Industry Canada-compliant modem)

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user satisfaction. Before installing this equipment, users ensure that it is permissible to be connected to the facilities of the local Telecommunications Company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations. Repairs to certified equipment should be made by an authorized Canadian maintenance

facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment. Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present are connected together. This precaution may be particularly important in rural areas. Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

NOTICE: The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the sum of the Load Numbers of all the devices does not exceed 100./ for European users only /

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 against harmful interference when the equipment is operated in a commercial environment. This equipment generate, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by tuning the device 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 device and receiver
- Connect the device into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio/television technician for help.












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 (Per Node)

| | | |
|---|--|--|
|  | CPU | <ul style="list-style-type: none"> ◆ Support for Dual Intel® Xeon® Sandy-bridge-EN 2S processors in 1356 socket ◆ Intel® Xeon® Quad Core in LGA 1356 socket ◆ Supports QuickPath Interconnect up to 8GT/s ◆ Enhanced Intel SpeedStep Technology (EIST) ◆ Support Intel Virtualization Technology (VT) |
|  | Chipset | <ul style="list-style-type: none"> ◆ Intel® C600 (Patsburg) Chipset |
|  | Memory | <ul style="list-style-type: none"> ◆ 12 x 1.5V/1.35V DDR3 UDIMM sockets supporting up to 96 GB of system memory ◆ 12 x 1.5V/1.35V DDR3 RDIMM/LRDIMM sockets supporting up to 384 GB of system memory ◆ Four channel memory architecture ◆ Support for 800/1066/1333 memory modules ◆ Support for ECC RDIMM/ UDIMM memory modules |
|  | LAN | <ul style="list-style-type: none"> ◆ 2 x Broadcom® BCM5720 supports 10/100/1000 Mbps (Share NIC Management support) ◆ 1 x ASPEED 2300 supports 10/100 Mbps (Dedicated management LAN port) |
|  | Expansion Slot | <ul style="list-style-type: none"> ◆ Low-Profile: ◆ 1 x PCI Express x16 slot, running at x16 (PCI_E_1/Proprietary/Gen3) ◆ Mezzanine: ◆ 1 x PCI Express x8 slot, running at x8 (PCI_E_2/Proprietary/Gen3) |
|  | Onboard Graphics | <ul style="list-style-type: none"> ◆ ASPEED AST2300 supports 128MB VRAM |
|  | Mass Storage | <ul style="list-style-type: none"> ◆ 3 x 3.5" Hot-Swap SATA/SAS HDDs ◆ Support for Intel IRST SATA RAID 0, RAID 1, RAID 5, RAID 10 |
|  | System Fans | <ul style="list-style-type: none"> ◆ 4 x 80x80x38mm 13800rpm |
|  | USB | <ul style="list-style-type: none"> ◆ 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) | <ul style="list-style-type: none"> ◆ 1 x 9-pin ATX 12V power connector ◆ 4 x SATA 3Gb/s connectors ◆ 2 x SATA 6Gb/s connectors ◆ 1 x IPMB header ◆ 1 x front panel header ◆ 1 x USB 2.0/1.1 headers ◆ 1 x Serial port header ◆ 1 x VGA header ◆ 1 x SPGPIO header ◆ 1 x PMBus header |
|  | Internal Connectors (Back Plane Board) | <ul style="list-style-type: none"> ◆ 12 x SATA/SAS 6Gb/s connectors ◆ 2 x 10-pin power connectors ◆ 2 x front panel header ◆ 4 x bridge board connectors |

| | |
|--|---|
|  Rear Panel I/O | <ul style="list-style-type: none"> ◆ 2 x USB 2.0/1.1 ports ◆ 2 x RJ-45 port ◆ 1 x Server Management LAN port ◆ 1 x COM port ◆ 1 x VGA port ◆ 1 x Power button ◆ 1 x ID Switch button ◆ 1 x NMI button ◆ 1 x BMC reset button ◆ 1 x Power status LED |
|  Front Panel LED/Buttons | <ul style="list-style-type: none"> ◆ 1 x Power button/LED ◆ 1 x ID button/LED |
|  BMC Controller | <ul style="list-style-type: none"> ◆ ASPEED AST2300 with 128Mb SPI flash |
|  Hardware Monitor | <ul style="list-style-type: none"> ◆ System voltage detection ◆ CPU/System temperature detection ◆ CPU/System fan speed detection ◆ CPU/System fan speed control <p style="margin-left: 40px;">* Whether the CPU/system fan speed control function is supported will depend on the CPU/system cooler you install.</p> |
|  BIOS | <ul style="list-style-type: none"> ◆ 64 Mb flash ◆ AMI BIOS |
|  Environment | |
| Ambient Temperature | <ul style="list-style-type: none"> ◆ Operating Temperature: 5°C to 35°C ◆ Non-operating Temperature: 0°C to 40°C |
| Relative Humidity | <ul style="list-style-type: none"> ◆ 10-80% operating Humidity at 30°C |
|  System Dimension | <ul style="list-style-type: none"> ◆ 440Wx86.5Hx735D (mm) |
|  Electrical Power Supply | <ul style="list-style-type: none"> ◆ Hot-swap 2+0 1200W 230V at 90% efficiency |

* 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 replace any component.

- Back up all important system and data files before performing any hardware configuration.
- 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 Chassis Cover

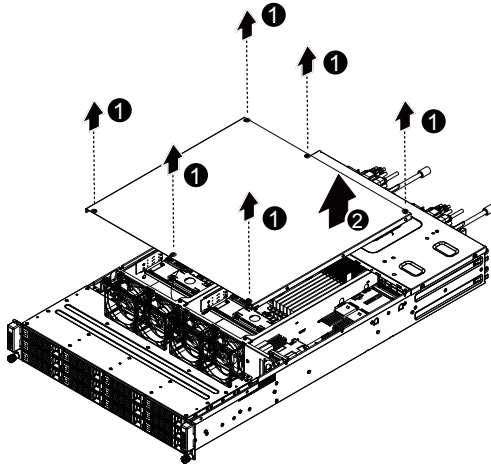


Before you remove or install the system cover

- 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 front and back cover.
2. Holding both sides of middle top cover and vertically lift it from the system.



2-2 Installing the CPU



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

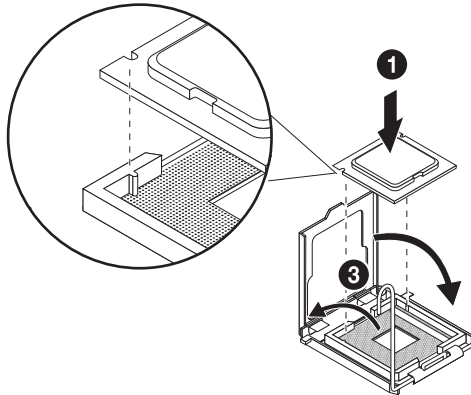
- Make sure that the motherboard supports the CPU.
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Unplug all cables from the power outlets.
- Disconnect all telecommunication cables from their ports.
- Place the system 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 components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

Follow these instructions to install the CPU:

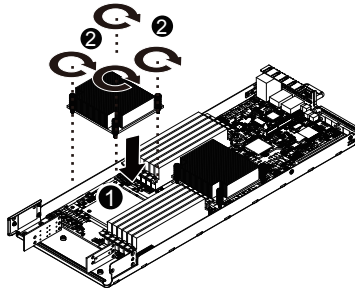
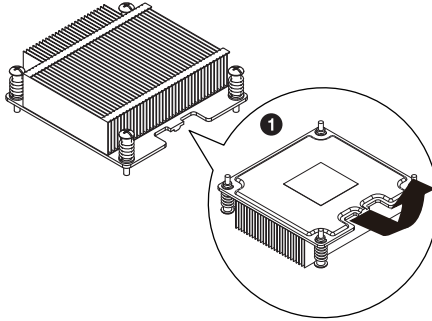
1. Raise the metal locking lever on the socket.
2. Remove the plastic covering on the CPU socket. Insert the CPU with the correct orientation. The CPU only fits in one orientation.
3. Replace the metal cover.
4. Push the metal lever back into locked position.



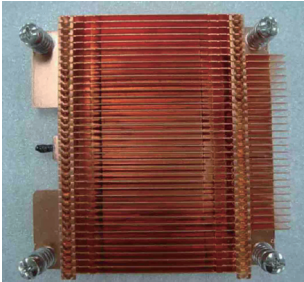
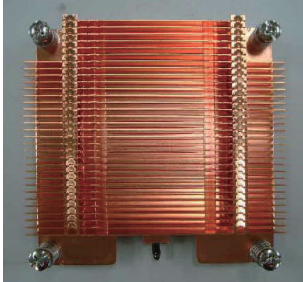
2-3 Installing the Heat Sink

Follow these instructions to install the heat sinks:

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



CPU0 and CPU1 use the different CPU heat sinks. Please see the following table for installing the correct CPU heat sink.

| CPU0 | CPU1 |
|---|---|
| P/N: 25ST1-443201-T4R | P/N: 25ST1-243201-T4R |
|  |  |

2-4 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.

2-4-1 Dual/3 Channel Memory Configuration

This motherboard provides eight DDR3 memory sockets and supports Dual/3 Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Dual Channel memory mode will double the original memory bandwidth.

The six DDR3 memory sockets are divided into three channels and each channel has two memory sockets as following:

Channel A: DDR3_P0_A0, DDR3_P0_A1 (For primary CPU)

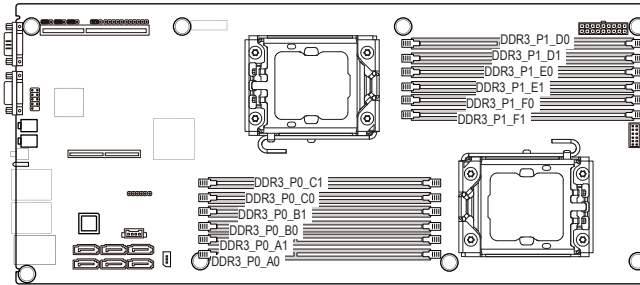
DDR3_P1_D0, DDR3_P1_D1 (For secondary CPU)

Channel B: DDR3_P0_B0, DDR3_P0_B1 (For primary CPU)

DDR3_P1_E0, DDR3_P1_E1 (For secondary CPU)

Channel C: DDR3_P0_C0, DDR3_P0_C1 (For primary CPU)

DDR3_P1_F0, DDR3_P1_F1 (For secondary CPU)



| | Channel A | Channel B | Channel C |
|--------|-------------|-------------|-------------|
| R-DIMM | DDR3_P0_A0 | DDR3_P0_B0 | DDR3_P0_C0 |
| | DDR3_P0_A1 | DDR3_P0_B1 | DDR3_P0_C1 |
| | DDR3_P1_D0 | DDR3_P1_E0 | DDR3_P1_F0 |
| | DDR3_P1_D1 | DDR3_P1_E1 | DDR3_P1_F1 |
| | Single-Rank | Single-Rank | Single-Rank |
| | Dual-Rank | Dual-Rank | Dual-Rank |
| | Quad-Rank | Quad-Rank | Quad-Rank |

| | Channel A | Channel B | Channel C |
|--------|-------------|-------------|-------------|
| U-DIMM | DDR3_P0_A0 | DDR3_P0_B0 | DDR3_P0_C0 |
| | DDR3_P0_A1 | DDR3_P0_B1 | DDR3_P0_C1 |
| | DDR3_P1_D0 | DDR3_P1_E0 | DDR3_P1_F0 |
| | DDR3_P1_D1 | DDR3_P1_E1 | DDR3_P1_F1 |
| | Single-Rank | Single-Rank | Single-Rank |
| | Dual-Rank | Dual-Rank | Dual-Rank |

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

1. Dual Channel mode cannot be enabled if only one DDR3 memory module is installed.
2. When enabling Dual 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

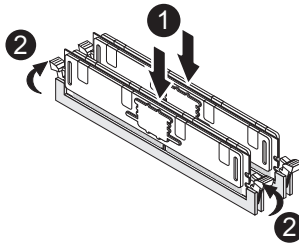


Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module.

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.



2-5 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.

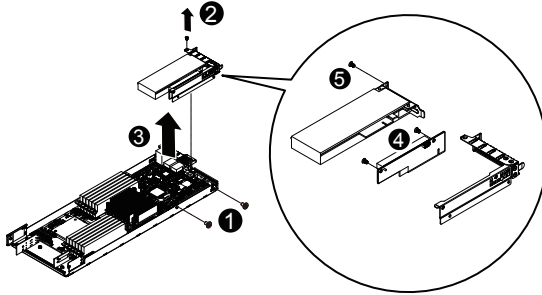
Failure to observe these warnings could result in personal injury or damage to equipment.



- 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 securing screws from the side of motherboard tray.
2. Loosen the riser bracket screw.
3. Lift the riser bracket slightly.
4. Loosen the riser bracket screws.
5. Attach the mini card to the riser bracket and secure the mini card with screws.
6. 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.
7. Align the riser bracket to the system module.



2-6 Installing the Hard Disk Drive

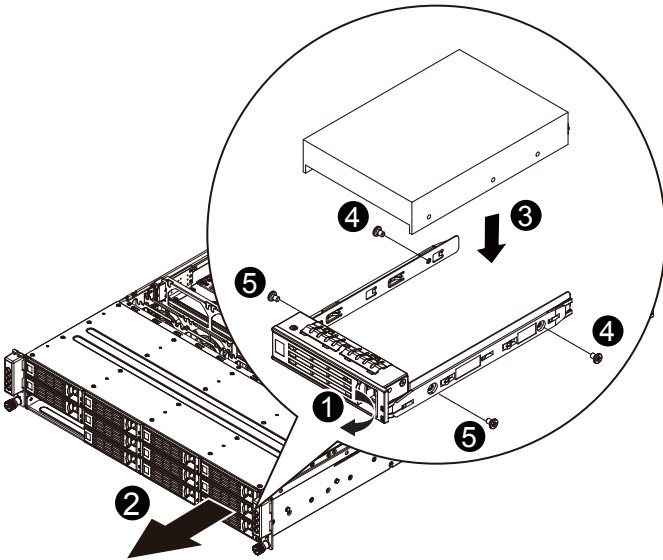


Read the following guidelines before you begin to install the Hard disk drive:

- 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:

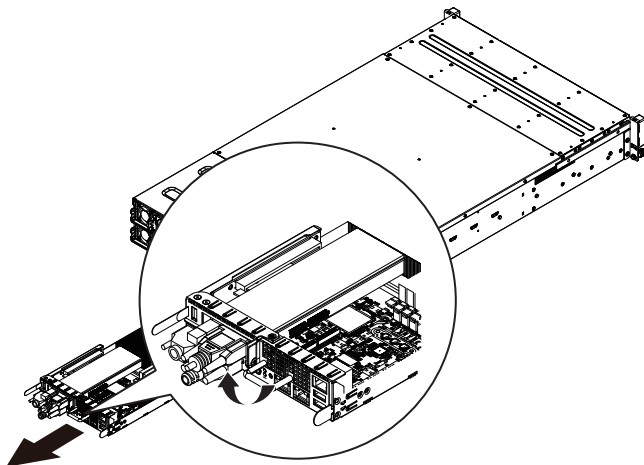
1. Press the release button.
2. Pull the locking lever to remove the HDD tray.
3. Slide hard disk into blank.
4. Secure the hard drive to the tray with four (4) screws as shown. Do not over tighten the screws. Slide the blank into the bay until it locks into place.
5. Engage the HDD Security Lock. For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



2-7 Replacing the Motherboard Tray

Follow these instructions to replace the motherboard tray:

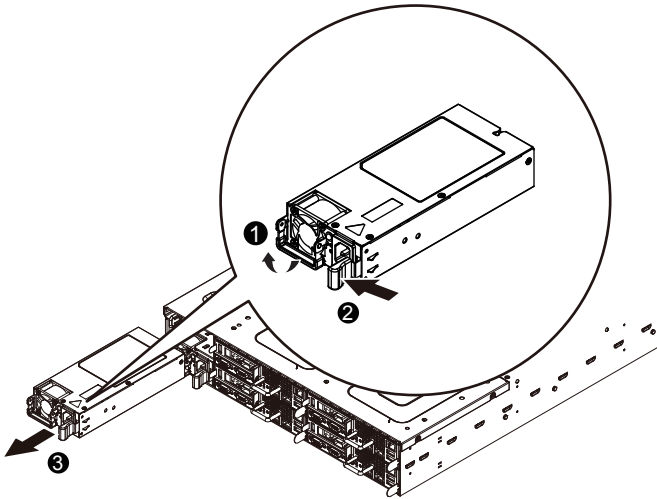
1. Remove the chassis cover. See Removing the Chassis Cover on page 14.
2. Disconnect the power, SATA, front panel, and mainboard cable connectors.
3. Pull up the tray handle and side of the motherboard tray along the direction of the arrow.



2-8 Replacing the Power Supply

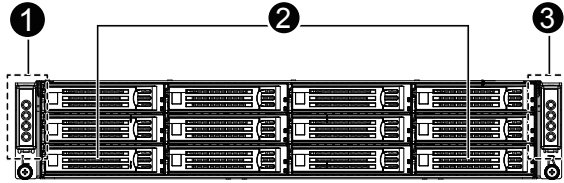
Follow these instructions to replace the power supply:

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



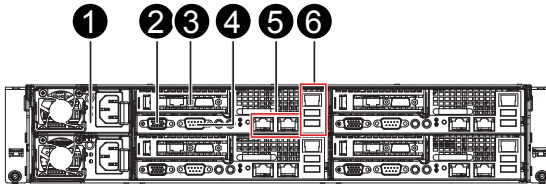
Chapter 3 System Appearance

3-1 Front View



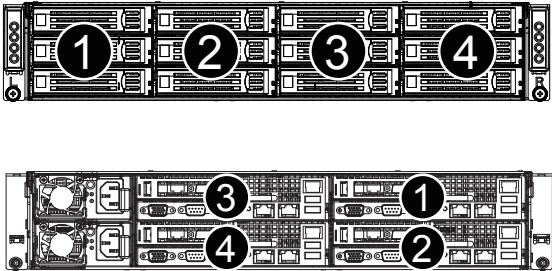
| No. | Description |
|-----|------------------------------|
| 1 | Front Panel LEDs and buttons |
| 2. | HDD bays |
| 3. | Front Panel LEDs and buttons |

3-2 Rear View

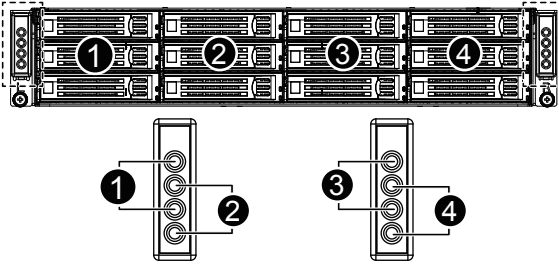


| No. | Description |
|-----|--|
| 1 | Power module |
| 2. | VGA port |
| 3. | Full-height riser card bay |
| 4. | Serial port |
| 5. | RJ-45 LAN ports |
| 6. | Management LAN port (top)/USB ports (bottom) |

3-3 HDD and Nodes Connection

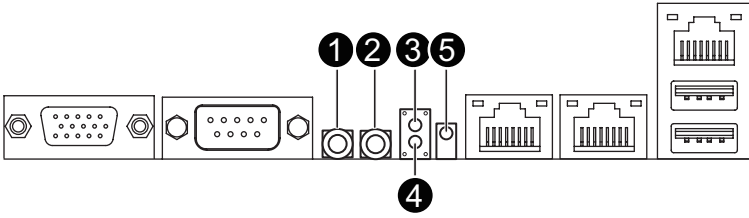


3-4 Front Panel LED and Buttons



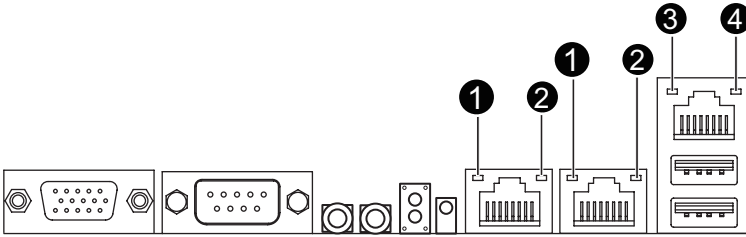
| No. | Name | Color | Status | Critical Event | Description |
|-----|----------------------|-------------|--------|----------------|---|
| 1. | Power button and LED | Amber | On | No | System has power applied to it or ACPI S0 state |
| | | | Blink | Yes | System is in ACPI S5 state (Power off) |
| | | Green | On | No | System has power applied to it or ACPI S0 State |
| | | | Blink | No | System is in ACPI S1 state (Entry S1) |
| | | Green Amber | Blink | No | System has power applied to it and in ACPI S0 state, System is in ACPI S1 state (Entry S1) |
| | | | Blink | Yes | System has power applied to it and in ACPI S0 state, System is in ACPI S1 state (Entry S1) |
| 2. | ID button and LED | Blue | On | N/A | Unit selected for identification. |
| | | N/A | Off | N/A | No identification. |
| 3. | Power button and LED | Amber | On | No | System has power applied to it or ACPI S0 State |
| | | | Blink | Yes | System is in ACPI S5 state (Power off) |
| | | Green | On | No | System has power applied to it or ACPI S0 State |
| | | | Blink | No | System is in ACPI S1 state (Entry S1) |
| | | Green Amber | Blink | Yes | System has power applied to it and in ACPI S0 state, System is in ACPI S1 state (Entry S1) |
| | | | Blink | Yes | System has power applied to it and in ACPI S0 state, System is in ACPI S1 state (Entry S1) |
| 4. | ID button and LED | Blue | On | N/A | Unit selected for identification. |
| | | N/A | Off | N/A | No identification. |

3-5 Rear System LEDs and Button



| No. | Name | Color | Status | Critical Event | Description |
|-----|----------------------|----------------|--------|----------------|---|
| 1. | Power button and LED | Green | On | N/A | System has power applied to it or ACPI S0 state |
| | | Green | Blink | N/A | System is in ACPI S1 state (sleep mode) |
| | | N/A | Off | N/A | System is powered off. System is in ACPI S4 state (hibernate mode) |
| 2. | ID button and LED | Blue | On | N/A | Unit selected for identification. |
| | | N/A | Off | N/A | No identification. |
| 3. | BMC Reset button | | | | |
| 4. | NMI button | | | | |
| 5. | Status LED | Amber | On | No | System has power applied to it or ACPI S0 State |
| | | | Blink | Yes | System is in ACPI S5 state (Power off) |
| | | Green | On | No | System has power applied to it or ACPI S0 State |
| | | | Blink | No | System is in ACPI S1 state (Entry S1) |
| | | Green Amber | Blink | Yes | System has power applied to it and in ACPI S0 state, System is in ACPI S1 state (Entry S1) |

3-6 Rear System LAN LEDs



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

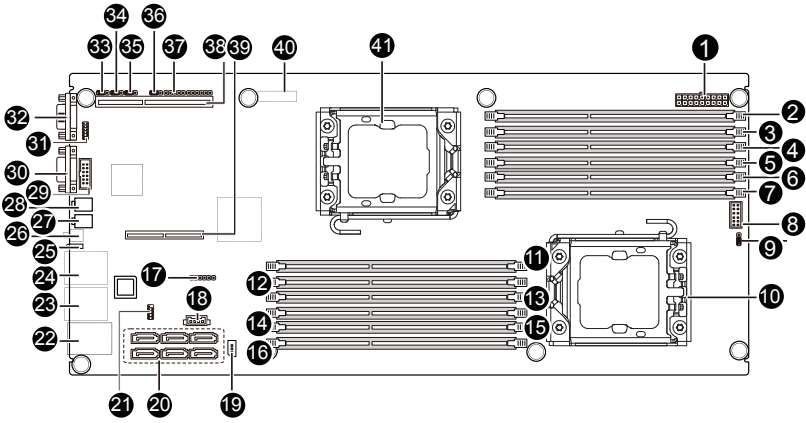
3-7 Hard Disk Drive LEDs



| LED No. | Mode | Description | Multi-Color LED | |
|-------------------------------|---------------|---|------------------|----------------------------|
| | | | LED Active Green | LED Active Amber |
| 1 | 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 |
| | Onboard 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 | On | Blink @ 4 Hz (Alternative) |
| | | RAID failed | On | On |
| | | Hard disk drive is rebuilding | Blink | Blink @ 1 Hz |
| | SAS RAID Card | 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 | On | Blink @ 4 Hz (Alternative) |
| | | RAID failed | On | On |
| Hard disk drive is rebuilding | | Blink | Blink @ 1 Hz | |
| 2 | Reserve | Reserve | Reserve | Reserve |

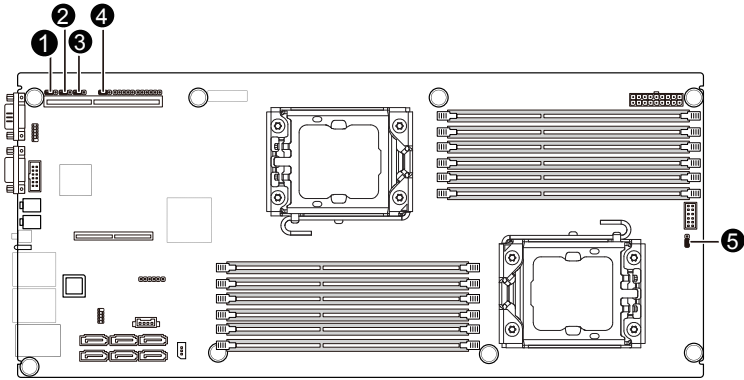
Chapter 4 Motherboard Components

4-1 GA-7PTSV Motherboard Components



| No | Code | Description |
|----|------------|--------------------------------------|
| 1 | SSI_2X9P1 | 18 pin power connector |
| 2 | DDR3_P1_D0 | Channel A slot 0 (for secondary CPU) |
| 3 | DDR3_P1_D1 | Channel A slot 1 (for secondary CPU) |
| 4 | DDR3_P1_E0 | Channel B slot 0 (for secondary CPU) |
| 5 | DDR3_P1_E1 | Channel B slot 1 (for secondary CPU) |
| 6 | DDR3_P1_F0 | Channel C slot 0 (for secondary CPU) |
| 7 | DDR3_P1_F1 | Channel C slot 1 (for secondary CPU) |
| 8 | F_PANEL | Front panel connector |
| 9 | ACK_Mode | ACK mode select jumper |
| 10 | CPU1 | Intel LGA1356 socket (Secondary CPU) |
| 11 | DDR3_P0_C1 | Channel C slot 1 (for primary CPU) |
| 12 | DDR3_P0_C0 | Channel C slot 0 (for primary CPU) |
| 13 | DDR3_P0_B1 | Channel B slot 1 (for primary CPU) |
| 14 | DDR3_P0_B0 | Channel B slot 0 (for primary CPU) |
| 15 | DDR3_P0_A1 | Channel A slot 1 (for primary CPU) |
| 16 | DDR3_P0_A0 | Channel A slot 0 (for primary CPU) |
| 17 | JTAG1 | JTAG connector |
| 18 | SATA_SGPIO | SGPIO connector |
| 19 | IPMB1 | IPMB connector |
| 20 | SATA0~5 | SATA 3Gb/s cable connectors |
| 21 | F_USB1 | Front USB cable connector |
| 22 | BMC_LAN1 | Management port (top) and USB ports |
| 23 | LAN2 | LAN2 port |
| 24 | LAN1 | LAN1 port |
| 25 | STATUS_LED | System status LED |
| 26 | NMI | NMI button |
| 27 | UID_SW | ID switch button |
| 28 | PWR_SW | Power switch button |
| 29 | COM2 | Serial cable connector |
| 30 | COM1 | Serial port |
| 31 | FP_VGA1 | VGA cable connector |
| 32 | VGA1 | VGA port |
| 33 | BIOS_WP | BIOS write protect jumper |
| 34 | CLR_CMOS | Clear CMOS jumper |
| 35 | CLR_PWD | Password clear jumper |
| 36 | BIOS_RVCR1 | BIOS recovery jumper |
| 37 | PWR_DET1 | Power detect connetor |
| 38 | PCE_1 | PCI-E slot 1 (x16 slot/Proprietary) |
| 39 | PCE_2 | PCI-E slot 2 (x8 slot/Proprietary) |
| 40 | BAT | Battery socket |
| 41 | CPU0 | Intel LGA1356 socket (Primary CPU) |

4-2 Jumper Setting



| No. | Jumper Code | Jumper Setting |
|-----|--|--|
| 1. | BIOS WP (BIOS Write Protect Jumper) | 1-2 Close: Normal operation. (Default setting) |
| | | 2-3 Close: Enable BIOS write protect function. |
| 2. | CLR_CMOS (Clearing CMOS Jumper) | 1-2 Close: Normal operation (Default setting) |
| | | 2-3 Close: Clear CMOS data |
| 3. | CLR_PWD (Clear Supervisor assword Jumper) | 1-2 Close: Normal operation. (Default setting) |
| | | 2-3 Close: Clear supervisor password. |
| 4. | BIOS_RVCR1 (BIOS Recovery Jumper) | 1-2 Close: Normal operation (Default setting) |
| | | 2-3 Close: BIOS recovery mode. |
| 5. | ACK_Mode (ACK Mode Select Jumper) | 1-2 Close: For 2U4N System. |
| | | 2-3 Close: For Open Rack System. |

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 submenu |
| <F9> | Load the Optimized BIOS default settings for the current submenu |
| <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.)

■ **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.

```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Security Server Management System Event Log Boot Options Boot Manager
System BIOS
  Version          F8
  Build Date      07/13/2012
BMC Information
  BMC Firmware Version 00.10
System Date      [Fri 07/13/2012]
System Time     [17:39:28]
Set the date. Use <Tab> to switch between data elements.
++: 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.
```

☞ **BIOS Information**

☞ **BIOS Version**

Display version number of the BIOS.

☞ **BIOS Build Date**

Display the build date of the BIOS.

☞ **BMC Information**

☞ **BMC Firmware Version**

Display version number of the frimware.

☞ **System Date**

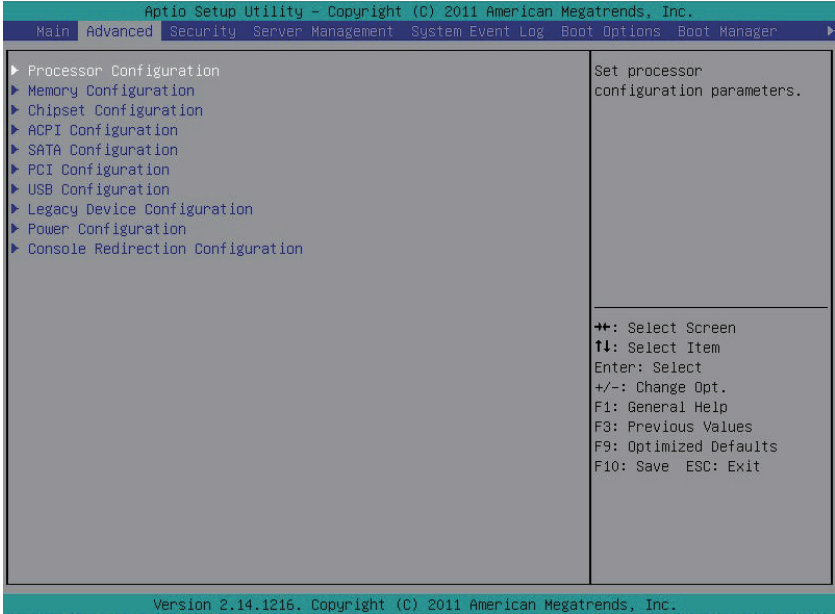
Set the date following the weekday-month-day- year format.

☞ **System Time**

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

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.



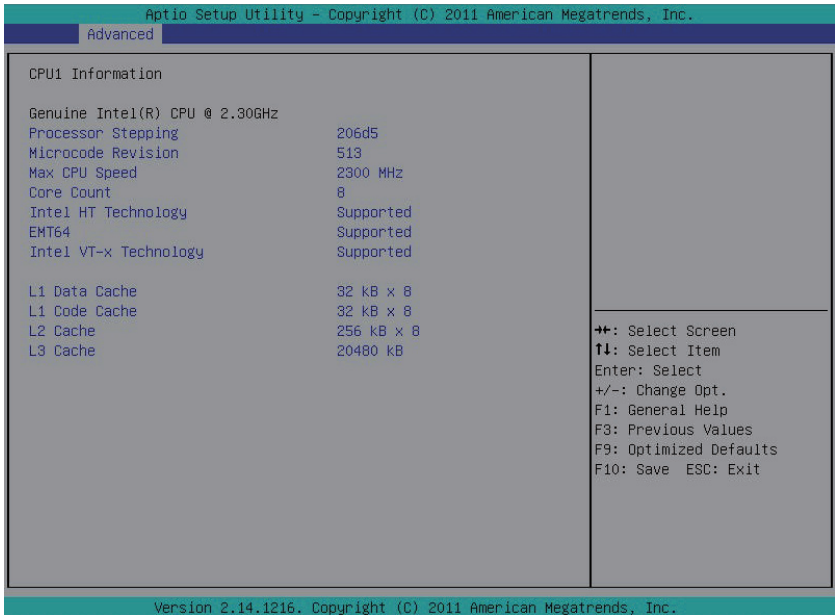
5-2-1 Processor Configuration

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

| Advanced | |
|--|--|
| <pre> ▶ CPU0 Information ▶ CPU1 Information Intel Hyper-Threading Technology [Enabled] Active Processor Cores [All] Execute Disable Bit Capability [Enabled] Hardware Prefetcher [Enabled] Adjacent Cache Line Prefetch [Enabled] Intel Virtualization Technology [Enabled] Intel EIST Technology [Enabled] Turbo Mode [Enabled] CPU C1e [Enabled] CPU C3 Report [Disabled] CPU C6 Report [Enabled] CPU C7 report [Enabled] Package C State limit [No Limit] </pre> | <pre> CPU0 Information **: Select Screen F1: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save ESC: Exit </pre> |
| Version 2.14.1216. Copyright (C) 2011 American Megatrends, Inc. | |

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

| Advanced | |
|--|--|
| <pre> CPU0 Information Genuine Intel(R) CPU @ 2.30GHz Processor Stepping 206d5 Microcode Revision 513 Max CPU Speed 2300 MHz Core Count 8 Intel HT Technology Supported EMT64 Supported Intel VT-x Technology Supported L1 Data Cache 32 kB x 8 L1 Code Cache 32 kB x 8 L2 Cache 256 kB x 8 L3 Cache 20480 kB </pre> | <pre> **: Select Screen F1: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save ESC: Exit </pre> |
| Version 2.14.1216. Copyright (C) 2011 American Megatrends, Inc. | |



☞ **CPU 0/1 Information**

☞ **Processor Stepping**

Displays the processor ID information.

☞ **Microcode Revision**

Display Microcode revision information.

☞ **Max CPU Speed**

Display the maximum processor speed.

☞ **Cores Count**

Display the information of the processor core.

☞ **Intel HT Technology**

Display Intel Hyper Threading Technology function support information.

☞ **EMT64**

Display the processor EMT64 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 total L3 Cache per socket.

☞ **Intel Hyper-Threading Technology**

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**.

☞ **Active Processor Cores** ^(Note)

Allows you to determine whether to enable all CPU cores.

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

☞ **Execute Disable Bit Capability**

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**.

☞ **Hardware Prefetcher**

Select whether to enable the speculative prefetch unit of the processor.

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

☞ **Adjacent Cache Line Prefetch**

When enabled, cache lines are fetched in pairs. When disabled, only the required cache line is fetched.

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**.

☞ **Intel EIST Support (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**.

(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.

☞ **CPU C1e (CPU Enhanced Halt)** ^(Note)

Enables or disables Intel CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption.

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 **Disabled**.

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.

5-2-2 Memory Configuration

| Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc. | | |
|--|------------------------|---|
| Advanced | | |
| Available Memory | 12288 MB | Select Yes to enable all of disabled Dimms. |
| Memory Type | DDR3 1333 MHz | |
| DDR3_P0_A0 | Present 1024 MB (DDR3) | |
| DDR3_P0_A1 | Present 1024 MB (DDR3) | |
| DDR3_P0_B0 | Present 1024 MB (DDR3) | |
| DDR3_P0_B1 | Present 1024 MB (DDR3) | |
| DDR3_P0_C0 | Present 1024 MB (DDR3) | |
| DDR3_P0_C1 | Present 1024 MB (DDR3) | |
| DDR3_P1_D0 | Present 1024 MB (DDR3) | |
| DDR3_P1_D1 | Present 1024 MB (DDR3) | |
| DDR3_P1_E0 | Present 1024 MB (DDR3) | |
| DDR3_P1_E1 | Present 1024 MB (DDR3) | |
| DDR3_P1_F0 | Present 1024 MB (DDR3) | |
| DDR3_P1_F1 | Present 1024 MB (DDR3) | |
| Re-Enable all of Memory | [No] | ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save ESC: Exit |
| Memory Mode | [Independent] | |
| NUMA | [Enabled] | |
| DDR Speed | [Auto] | |
| Channel Interleaving | [Auto] | |
| Rank Interleaving | [Auto] | |
| Thermal Throttling | [CLTT] | |
| Version 2.14.1216, Copyright (C) 2011 American Megatrends, Inc. | | |

Available Memory

Total size of system memory detected during POST.

Memory Type

Display information of installed memory type.

DIMM Group Status

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

Re-Enable all of Memory

Select 'Yes' to enable all of disabled DIMMs.

Options available: Yes/No. Default setting is **No**.

Memory Mode

Determine the memory mode.

When set to Independent 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 correctable 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: Independent /Mirroring/ Lockstep/Sparing. Default setting is **Independent**.

NUMA

Enable or Disable Non Uniform Memory Access (NUMA).

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

☞ **DDR Speed**

Determine the DDR3 speed.

Options available: Auto/Force DDR3 800/Force DDR3 1066/Force DDR3 1333/Force DDR3 1600/Force DDR3 1867. Default setting is **Auto**.

☞ **Channel Interleaving**

Enable and determine memory channel interleaving. **Enabled** allows the system to simultaneously access different channel of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting.

Options available: Auto/1 Way/2 Way/3 Way/ 4 Way. Default setting is **Auto**.

☞ **Rank Interleaving**

Enable and determine memory rank interleaving. **Enabled** allows the system to simultaneously access different ranks of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting.

Options available: Auto/1 Way/2 Way/4 Way/8 Way. Default setting is **Auto**.

☞ **Thermal Throtting**

Enable this item (OLTT) will protect the processor from overheating, preventing it from burning.

CLTT: Closed Loop Thermal Throtting.

OLTT: Open Loop Thermal Throtting.

Options available: CLTT/OLTT. Default setting is **CLTT**.

5-2-3 Chipset Configuration

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

Advanced

| | | |
|---|--------------------------|---------------------------------------|
| Intel VT-d Technology Intel(R) I/OAT | [Disabled] [Disabled] | Enable/Disable Intel VT-d technology. |
|---|--------------------------|---------------------------------------|

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⤵: Select Screen
⤴: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save ESC: Exit

☞ Intel VT-d Technology

Enable/Disable Intel VT-d Technology function.

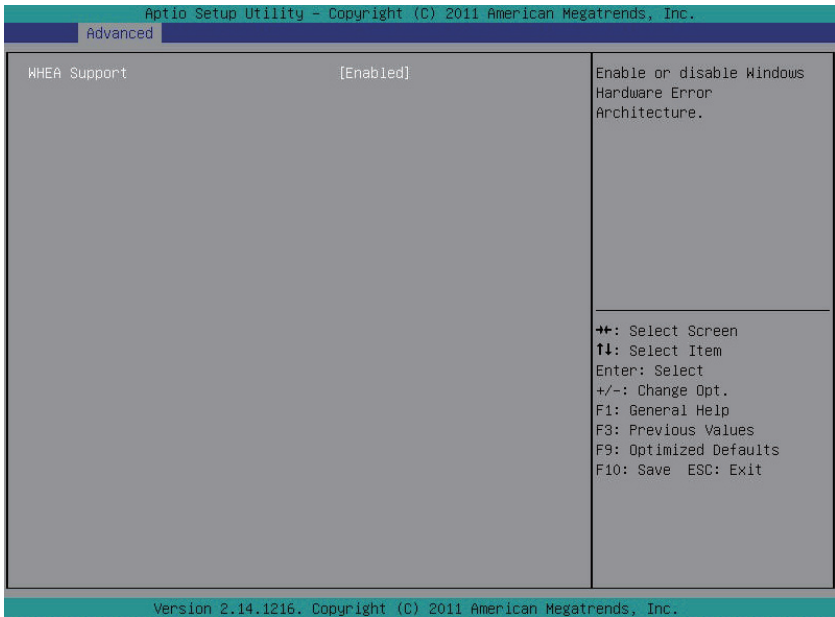
Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ Intel (R) I/OAT

Enable/Disable Intel I/OAT Technology function.

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

5-2-4 ACPI Configuration

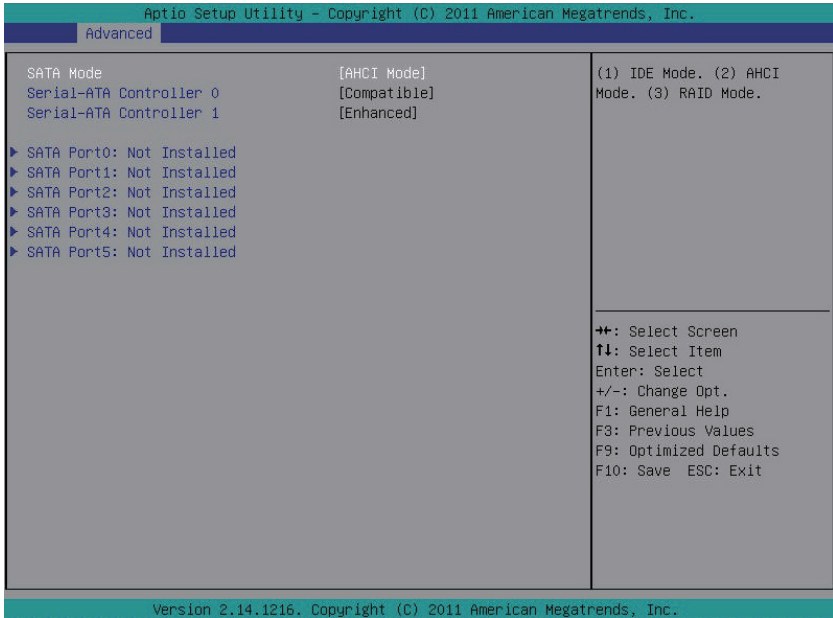


☞ **WHEA Support (Windows Hardware Error Architecture)**

Enable/Disable WHEA Support.

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

5-2-5 SATA Configuration



☞ SATA Mode

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 controller enables both its RAID and AHCI functions. You will be allowed 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 accessed the RAID setup utility at boot time.

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

☞ 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 in Native mode.

Options available: Disabled/Enhanced/Compatible.

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

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

☞ 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.

5-2-6 PCI Configuration

| Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc. | | |
|--|---------------------------|---|
| Advanced | | |
| PCIe Slot1 Switch | [Enabled] | Enable/Disable PCIe Slot1. |
| PCIe Slot2 Switch | [Enabled] | |
| PCIe Slot1 I/O ROM | [Enabled] | |
| PCIe Slot2 I/O ROM | [Enabled] | |
| Onboard LAN1 & LAN2 Controller | [LAN1 & LAN2 both Enable] | |
| Onboard LAN1 I/O ROM | [Enabled] | |
| Onboard LAN2 I/O ROM | [Disabled] | |
| Onboard LAN I/O ROM Option | [PXE] | |
| IOU1 - PCIe Port | [x8] | |
| PORT 1A Link Speed | [GEN2] | |
| IOU3 - PCIe Port | [x16] | |
| PORT 3A Link Speed | [GEN2] | |
| | | ++: 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. | | |

☞ PCIe Slot 1/2 Switch

Enable/Disable PCIe Slot 1/2.

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

☞ PCIe Slot 1/2 Option ROM

When enabled, This setting will initialize the device expansion ROM for the related PCI-E slot.

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

☞ Onboard LAN1/2 Controller

Enable/Disable Onboard LAN 1/2 controller .

Options available: LAN1 & LAN2 both Enable/LAN1 & LAN2 both Disable/LAN1 Enable, LAN2 Disable. Default setting is **LAN1 & LAN2 both Enable**.

☞ LAN1/2 Option ROM

Enable/Disable onboard LAN1 device and initialize device expansion ROM.

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

☞ Onboard LAN I/O ROM Option

Select whether to enable the selected onboard LAN device. When enabled, device expansion ROM will be initialized.

Options available: PXE/iSCSI. Default setting is **PXE**.

☞ IOU1 - PCIe Port

Options available: x4x4/x8. Default setting is **x8**.

☞ Port 1A Link Speed

Options available: GEN1/GEN2/GEN3. Default setting is **GEN2**.

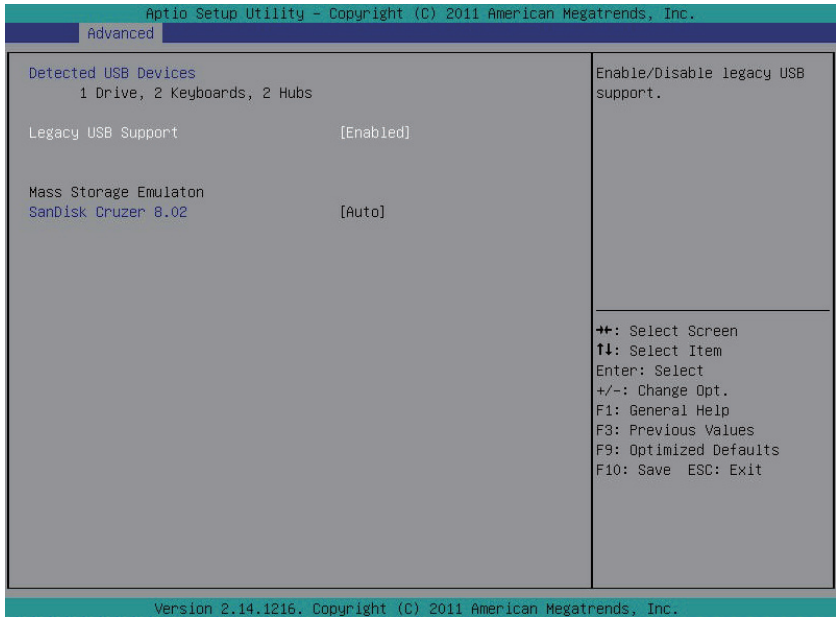
☞ **IOU3 - PCIe Port**

Options available: x4x4/x4x4x8/x8x4x4/x8x8/x16. Default setting is **x16**.

☞ **Port 3A Link Speed**

Options available: GEN1/GEN2/GEN3. Default setting is **GEN2**.

5-2-7 USB Configuration



☞ **Detected USB Devices**

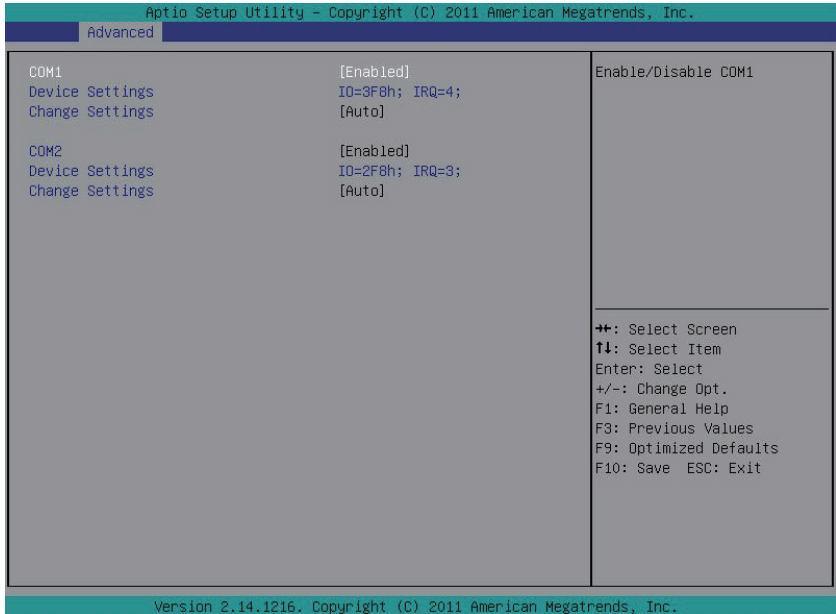
Displays the information of installed USB devices in the system.

☞ **Legacy USB Support**

Enables or disables support for legacy USB devices.

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

5-2-8 Legacy Device Configuration



☞ COM1/2

When enabled allows you to configure the serial port settings. When set to Disabled, displays no configuration for the serial ports.

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

☞ Device Settings

Displays the Serial Port 1/2 base I/O address and IRQ.

☞ Change Settings

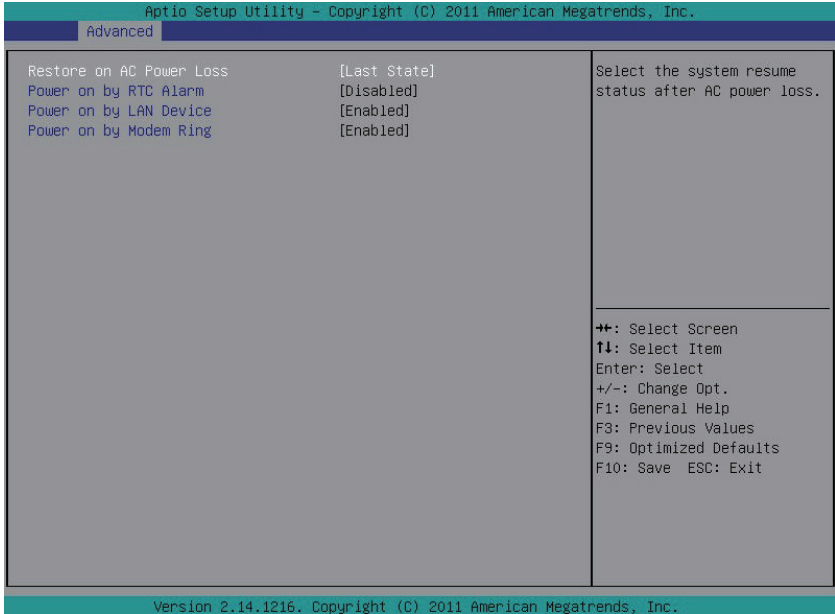
Change Serial Port 1/2 device settings. When set to Auto allows the server's BIOS or OS to select a configuration.

Options available: Auto/IO=3F8; IRQ=4/IO=3F8h; IRQ=3,4,5,6,7,10,11,12/

IO=2F8h; IRQ=3,4,5,6,7,10,11,12 /IO=3E8h; IRQ=3,4,5,6,7,10,11,12/IO=2E8h; IRQ=3,4,5,6,7,10,11,12.

Default setting is **Auto**.

5-2-9 Power Configuration



☞ Restore on AC Power Loss ^(Note)

Defines the power state to resume to after a system 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.

☞ Power On by RTC Alarm

Select whether to wake up the system when an RTC alarm is detected.

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

☞ Power On by LAN Device

Select whether to wake up the system by LAN device.

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

☞ Power On by Modem Ring

Select whether to wake up the system by modem ring.

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

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

5-2-10 Console Redirection Configuration

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Advanced

| | | |
|---------------------|------------|---|
| Console Redirection | [Disabled] | The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings. |
| | | ↑↓ : Select Screen ↑↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save ESC: Exit |

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Advanced

| | | |
|---------------------|----------|---|
| Console Redirection | [COM1] | The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings. |
| Terminal Type | [VT100] | |
| Bits per Second | [115200] | |
| Data Bits | [8] | |
| Parity | [None] | |
| Stop Bits | [1] | |
| Flow Control | [None] | |
| | | ↑↓ : Select Screen ↑↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save ESC: Exit |

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☞ **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 **VT100**.

☞ **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 bit is 0 if the num of 1's in the data bits is even.

Odd: parity bit is 0 if 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**

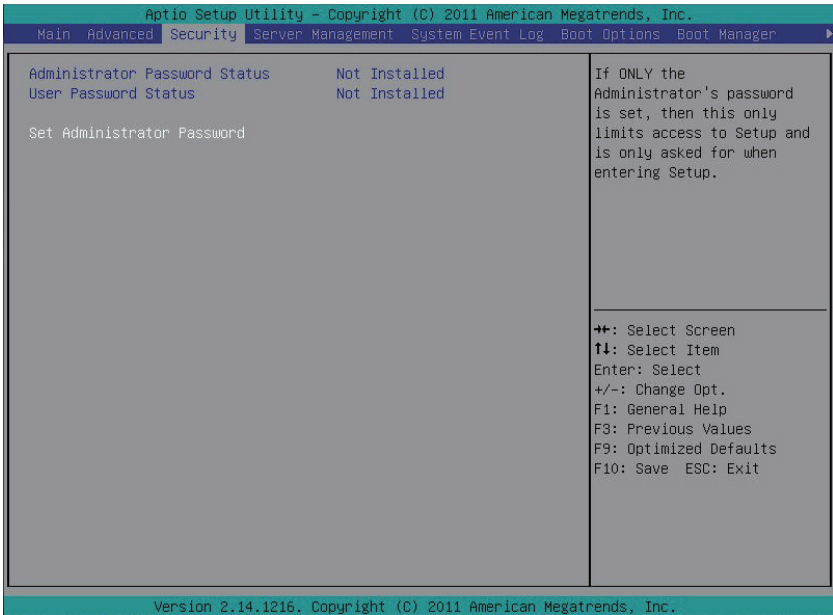
Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

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

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

5-3 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.

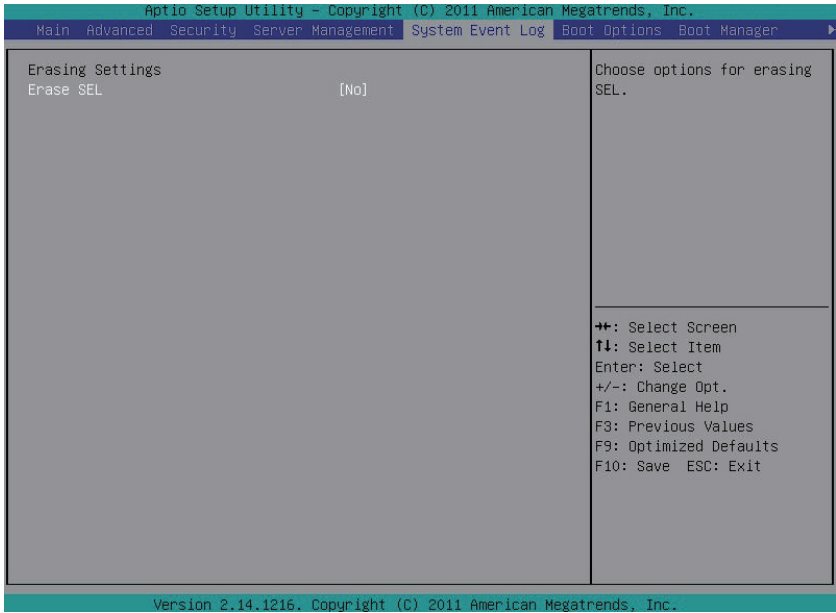
➤ Set Administrator Password

Press Enter to configure the Administrator password.

➤ Set User Password

Press Enter to configure the user password.

5-4 System Event Log Menu



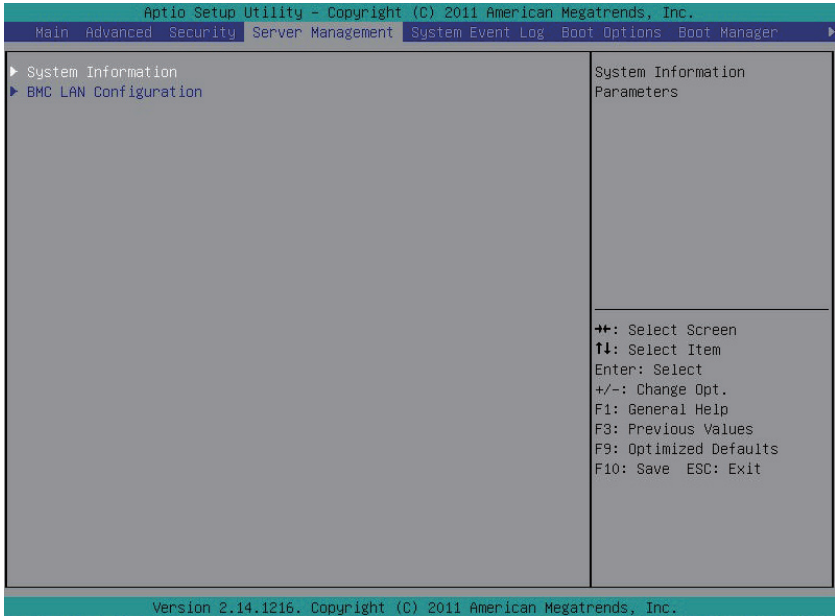
☞ Erasing Settings

☞ Erase SEL

Choose options for erasing SEL.

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

5-5 Server Management Menu



System Information

Displays basic system ID information, as well as BIOS version. Press Enter to access the related submenu.

BMC LAN Configuration

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

5-5-1 System Information

The System Management submenu is a simple display page for basic system ID information, as well as System product information. Items on this window are non-configurable.

| Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc. | |
|---|------------------------|
| Server Management | |
| System Product Name | GS-R22PD/GS-R22PD1 |
| System Serial Number | 0123456789012345678PSN |
| Base Board Product Name | GA-7PTSX |
| Base Board Serial Number | 0123456789ABC |
| LAN1 MAC Address | 50-E5-49-AA-2E-6C |
| LAN2 MAC Address | 50-E5-49-AA-2E-6D |
| BMC Information | |
| BMC Firmware Version | 01.07 |
| SDR Version | 00.08 |
| FRU Version | 00.04 |
| Fan Control Board Information | |
| FCB Firmware Version | Not Support |
| ++: Select Screen T↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save ESC: Exit | |
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5-5-2 BMC LAN Configuration

| Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc. | |
|--|---|
| Server Management | |
| Lan Channel 1 | |
| Configuration Source | [Dynamic] |
| IP Address | 010.001.111.035 |
| Subnet Mask | 255.255.255.000 |
| Default Gateway Address | 010.001.111.253 |
| | Select to configure LAN channel parameters statically or dynamically(DHCP). Do nothing option will not modify any BMC network parameters during BIOS phase |
| | ++: Select Screen T↓: 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. | |

☞ LAN Channel 1

☞ Configuration Source

Select to configure LAN channel parameters statically or dynamically (DHCP). Do nothing option will not modify any BMC network parameters during BIOS phase.

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

☞ IP Address

Display IP Address information.

☞ Subnet Mask

Display Subnet Mask information.

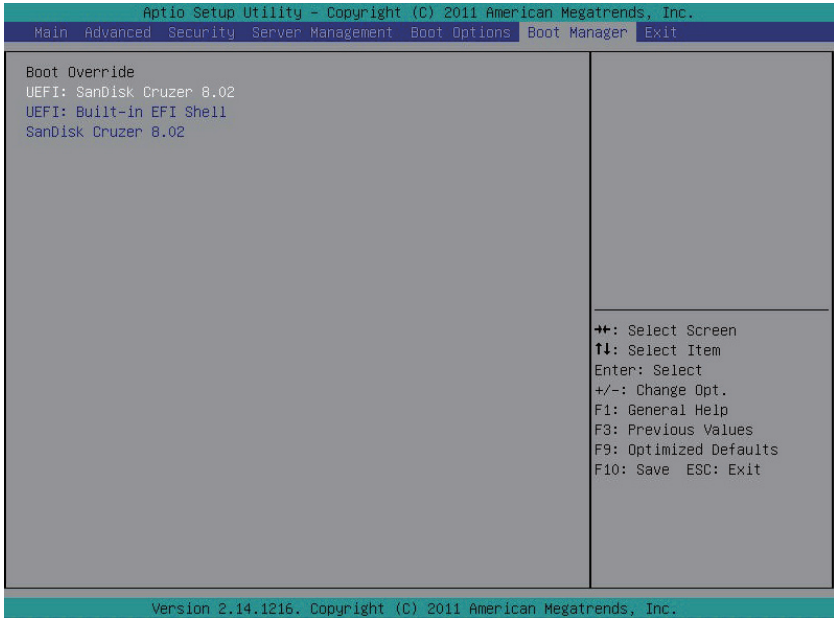
Please note that the IP address must be in three digitals, for example, 192.168.000.001.

☞ Default Gateway Address

Display Default Gateway Address information.

5-6 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 sequence:

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

☞ **Hard Drive BBS Priorities**

Press Enter to configure the boot priority.

☞ **Quiet Boot**

Enables or disables showing the logo during POST.

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

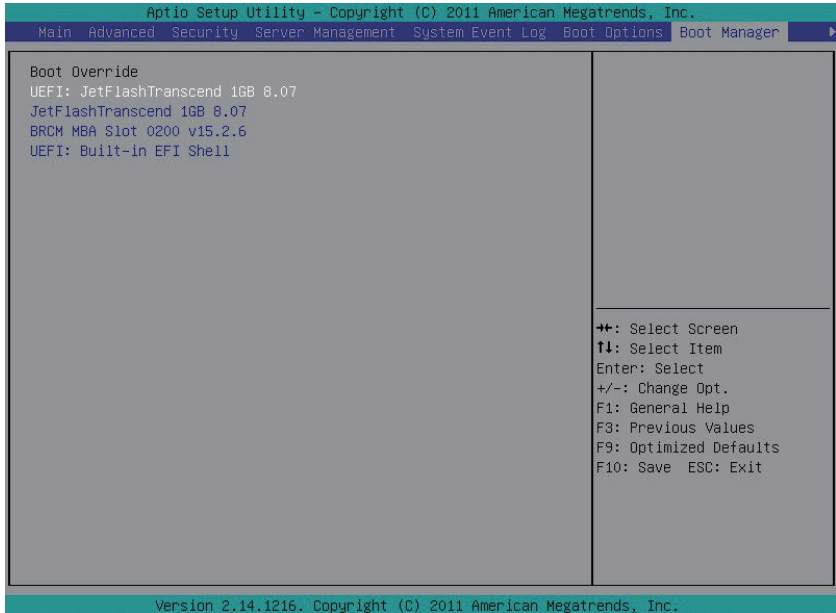
☞ **POST Error Pause**

Select whether to pause POST when a boot-up error is detected.

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.



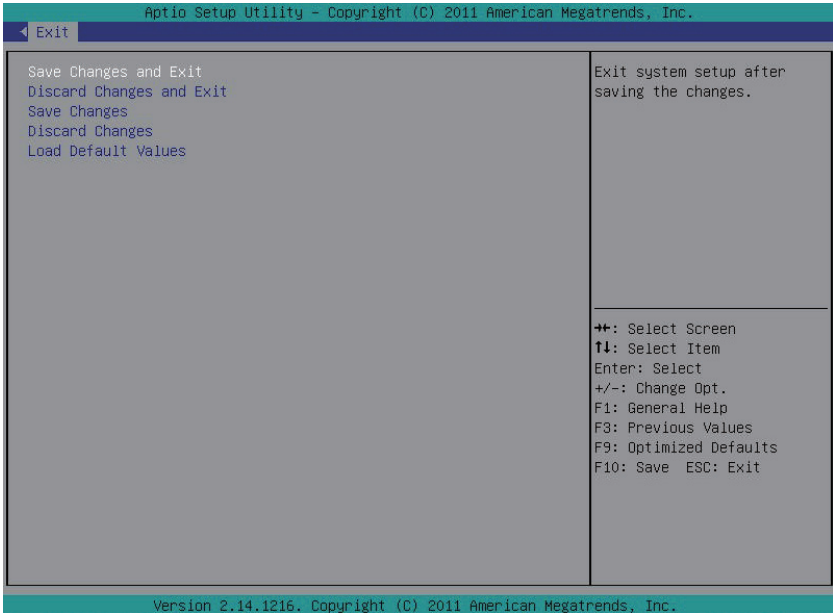
☞ Boot Override

☞ 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.