GIGABYTE™

R181-T90
R181-T92

Dual ThunderX2 Processors ARM Server

User Manual

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 documentation:

- User Manual: detailed information & steps about the installation, configuration and use of this product (e.g. motherboard, server barebones), covering hardware and BIOS.
- User Guide: detailed information about the installation & use of an add-on hardware or software component (e.g. BMC firmware, rail-kit) compatible with this product.
- Quick Installation Guide: a short guide with visual diagrams that you can reference easily for installation purposes of this product (e.g. motherboard, server barebones).

Please see the support section of the online product page to check the current availability of these documents.

For More Information

For related product specifications, the latest firmware and software, and other information please visit our website at http://www.gigabyte.com

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For further technical assistance, please contact your GIGABYTE representative or visit https://esupport.gigabyte.com/ to create a new support ticket

For any general sales or marketing enquiries, you may also message GIGABYTE server directly by email: server.grp@gigabyte.com

Conventions

The following conventions are used in this user's guide:

	NOTE! Gives bits and pieces of additional information related to the current topic.
	CAUTION! Gives precautionary measures to avoid possible hardware or software problems.
	WARNING! Alerts you to any damage that might result from doing or not doing specific actions.

Server Warnings and Cautions

Before installing a server, be sure that you understand the following warnings and cautions.

WARNING!

To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Unplug the power cord from the power supply to disconnect power to the equipment.
- Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.

WARNING!

To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

WARNING!

This server is equipped with high speed fans. Keep away from hazardous moving fan blades during servicing.

CAUTION!

- Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.
- Danger of explosion if battery is incorrectly replaced.
- Replace only with the same or equivalent type recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instructions.

Electrostatic Discharge (ESD)

CAUTION!

ESD CAN DAMAGE DRIVES, BOARDS, AND OTHER PARTS. WE RECOMMEND THAT YOU PERFORM ALL PROCEDURES AT AN ESD WORKSTATION. IF ONE IS NOT AVAILABLE, PROVIDE SOME ESD PROTECTION BY WEARING AN ANTI-STATIC WRIST STRAP ATTACHED TO CHASSIS GROUND -- ANY UNPAINTED METAL SURFACE -- ON YOUR SERVER WHEN HANDLING PARTS.

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges without any component and pin touching. After removing a board from its protective wrapper or from the system, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

System power on/off: To remove power from system, you must remove the system from rack. Make sure the system is removed from the rack before opening the chassis, adding, or removing any non hot-plug components.

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the system and discon-nect the cables attached to the system before servicing it. Otherwise, personal injury or equipment damage can result.

Electrostatic discharge (ESD) and ESD protection: ESD can damage drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground (any unpainted metal surface on the server) when handling parts.

ESD and handling boards: Always handle boards carefully. They can be extremely sensi-tive to electrostatic discharge (ESD). Hold boards only by their edges. After removing a board from its protective wrapper or from the system, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that can be gripped with fin-gertips or with a pair of fine needle nosed pliers. If the jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can dam-age the contacts inside the jumper, causing intermittent problems with the function con-trolled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool used to remove a jumper, or the pins on the board may bend or break.

CAUTION!

Risk of explosion if battery is replaced incorrectly or with an incorrect type. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

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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

CPU	(R181-T90)	◆ 2 x Cavium™ ThunderX2® CN9975 ARM processors ◆ 64bit ARMv8 architecture ◆ 28 cores per processor, 2.0GHz ◆ 16nm technology
	(R181-T92)	◆ 2 x Cavium™ ThunderX2® CN9980 ARM processors ◆ 64bit ARMv8 architecture ◆ 32 cores per processor, 2.2GHz ◆ 16nm technology
Memory		◆ 24 x DIMM slots ◆ DDR4 memory supported only ◆ 8-channel memory architecture per processor ◆ RDIMM modules up to 64GB supported ◆ 1.2V modules: 2666/2400/2133 MHz ◆ - NOTE: GIGABYTE recommends to follow the QVL when selecting memory modules to avoid any system compatibility issues ◆ - NOTE: DDR4 2666 Mhz with 1DPC, DDR4 2400 with 2DPC
LAN		◆ 2 x 10Gb/s SFP+ LAN ports (QLogic® QL41102) ◆ 1 x 10/100/1000 management LAN port
Video		◆ Integrated in Aspeed® AST2500 ◆ 2D Video Graphic Adapter with PCIe bus interface ◆ 1920x1200@60Hz 32bpp, DDR4 SDRAM
Expansion Slot		◆ Riser Card CRS1021: ◆ - 2 x PCIe x8 slots (Gen3 x8), Low profile half-length ◆ Riser Card CRS1015: ◆ - 1 x PCIe x16 slot (Gen3 x16), Low profile half-length ◆ 2 x OCP mezzanine slots ◆ - PCIe Gen3 x16 ◆ - Type1, P1, P2, P3, P4
Storage		◆ 10 x 2.5" hot-swappable HDD bays ◆ Onboard Broadcom® SAS3008 controller ◆ Supports 8 x SAS / 2 x SATAIII or 10 x SATAIII hard drives ◆ - NOTE: GIGABYTE recommends to follow the QVL when selecting hard drives to avoid any system compatibility issues
SAS		◆ Supported
RAID		◆ RAID 0/1/1E/10

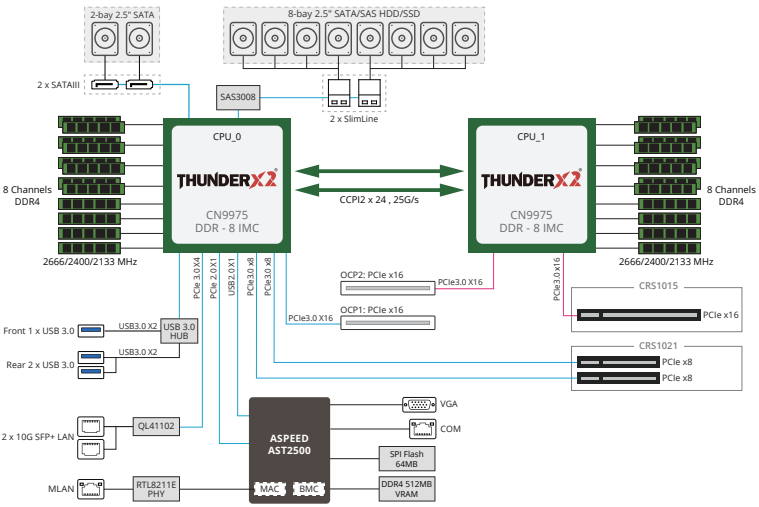
Internal Connectors	◆ 2 x Power supply connectors ◆ 2 x SlimSAS connectors ◆ 2 x SATA 7-pin connectors ◆ 1 x USB 3.0 header ◆ 1 x Front panel header ◆ 1 x HDD back plane board header ◆ 1 x PMBus connector ◆ 1 x IPMB connector ◆ 1 x Clear CMOS switch ◆ 1 x BIOS recovery switch
Front Panel LED/Buttons	◆ 1 x USB 3.0 ◆ 1 x Power button with LED ◆ 1 x ID button with LED ◆ 1 x Reset button ◆ 2 x LAN activity LEDs ◆ 1 x HDD activity LED ◆ 1 x System status LED
Rear Panel I/O	◆ 2 x USB 3.0 ◆ 1 x VGA ◆ 1 x COM (RJ45 type) ◆ 2 x SFP+ ◆ 1 x MLAN ◆ 1 x ID button with LED
Backplane I/O	◆ 10 x SATA/SAS ports ◆ Bandwidth: SATAIII 6Gb/s or SAS 12Gb/s per port
TPM	◆ 1 x TPM header with LPC interface ◆ Optional TPM2.0 kit: CTM000

System Management	◆ Aspeed® AST2500 management controller ◆ Avocent® MergePoint IPMI 2.0 web interface: ◆ Network settings ◆ Network security settings ◆ Hardware information ◆ Users control ◆ Services settings ◆ IPMI settings ◆ Sessions control ◆ LDAP settings ◆ Power control ◆ Fan profiles ◆ Voltages, fans and temperatures monitoring ◆ System event log ◆ Events management (platform events, trap settings, email settings) ◆ Serial Over LAN ◆ vKVM & vMedia (HTML5)
Power Supply	◆ 2 x 1200W redundant PSUs ◆ 80 PLUS Platinum ◆ AC Input: ◆ - 100-240V~/ 12-7A, 50-60Hz ◆ DC Input: ◆ - 240Vdc/ 6A ◆ DC Output: ◆ - Max 1000W/ 100-240V~ ◆ +12V/ 80.5A ◆ +12Vsb/ 3A ◆ - Max 1200W/ 200-240V~ or 240Vdc input ◆ +12V/ 97A ◆ +12Vsb/ 3A
Environment Ambient Temperature Relative Humidity	◆ Operating temperature: 10°C to 35°C ◆ Non-operating temperature: -40°C to 60°C ◆ Operating humidity: 8-80% (non-condensing) ◆ Non-operating humidity: 20%-95% (non-condensing)
System Dimension	◆ 1U ◆ 438mm (W) x 43.5mm (H) x 730mm (D)

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

1-3 System Block Diagram

R181-T90



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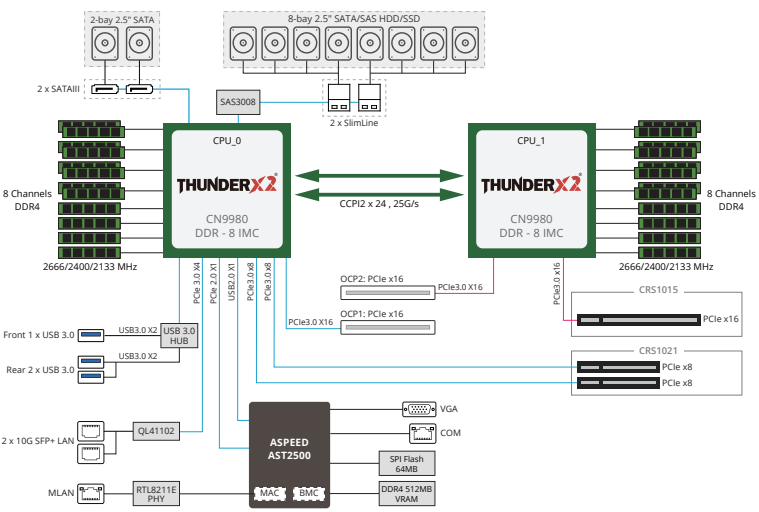

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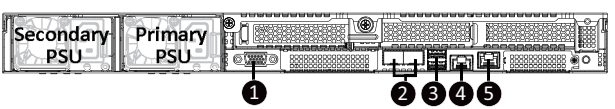
Chapter 2 System Appearance

2-1 Front View

No.	Description
1.	Front Panel LEDs and buttons
2.	Front USB 3.0 ports

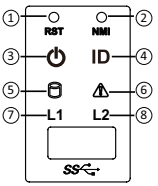
- Please Go to Chapter **2-3 Front Panel LED** and Buttons for detail description of function LEDs.

2-2 Rear View



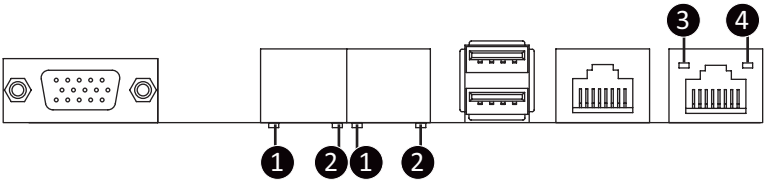
No.	Description
1.	VGA port
2.	10G SFP+ LAN Port x 2
3.	USB 3.0 Port x 2
4.	Serial Port
5.	10/100/1000 Server management LAN port

2-3 Front Panel LED and Buttons



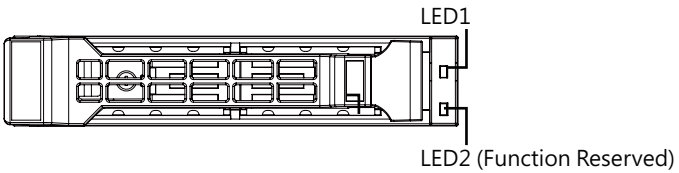
No.	Name	Color	Status	Description
1.	Reset Button			Press the button to reset the system.
2.	NMI button			Press the button server generates a NMI to the processor if the multiple-bit ECC errors occur, which effectively halt the server.
3.	Power button with LED	Green	On	System is powered on
		Green	Blink	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 (hibernate mode)
4.	ID Button			Press the button to activate system identification
5.	HDD Status LED	Green	On	HDD locate
			Blink	HDD access
		Amber	On	HDD fault
		Green/ Amber	Blink	HDD rebuilding
		N/A	Off	No HDD access or no HDD fault.
6.	System Status LED	Green	Solid On	System is operating normally.
		Amber	Solid On	Critical condition, may indicate: System fan failure System temperature
			Blink	Non-critical condition, may indicate: Redundant power module failure Temperature and voltage issue Chassis intrusion
		N/A	Off	System is not ready, may indicate: POST error NMI error Processor or terminator missing
7/8.	LAN 1/2 Active/Link LEDs	Green	Solid On	Link between system and network or no access.
		Green	Blink	Data trasmission or receiving is occuring
		N/A	Off	No data transmission or receiving is occuring

2-4 Rear System LAN LEDs



No.	Name	Color	Status	Description
1.	10GbE Speed LED	Yellow	On	10 Gbps data rate
		Green	On	1 Gbps data rate
		N/A	Off	100 Mbps data rate
2.	10GbE 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.	1GbE Speed LED	Yellow	On	1 Gbps data rate
		Green	On	100 Mbps data rate
		N/A	Off	10 Mbps data rate
4.	1GbE 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

2-5 Hard Disk Drive LEDs



RAID SKU	LED #1	Locate	HDD Fault	Rebuilding	HDD Access	HDD Present (No Access)
No RAID configuration (via HBA, ICH)	Disk LED (LED on Back Panel)	Green	ON(*1)	OFF	Green	OFF
		Amber	OFF	OFF	Amber	OFF
	Removed HDD Slot (LED on Back Panel)	Green	ON(*1)	OFF	Green	--
		Amber	OFF	OFF	Amber	--
RAID configuration (via HW RAID Card, or SW RAID Card)	Disk LED	Green	ON	OFF	Alternately	OFF
		Amber	OFF	ON	(Low Speed: 2 Hz)	OFF
	Removed HDD Slot	Green	ON(*1)	OFF	(*3)	--
		Amber	OFF	ON	(*3)	--

NOTE:

*1: Depends on HBA/Utility Spec.

*2: Blink cycle depends on HDD's activity signal.

*3: If HDD is pulled out during rebuilding, the disk status of this HDD is regarded as faulty.

Chapter 3 System Hardware Installation

Pre-installation Instructions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous. Follow the simple guidelines below to avoid damage to your computer or injury to yourself.

- Always disconnect the computer from the power outlet whenever you are working inside the computer case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal system of the computer case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Do not flex or stress the circuit board.
- Leave all components inside the static-proof packaging until you are ready to use the component for the installation.

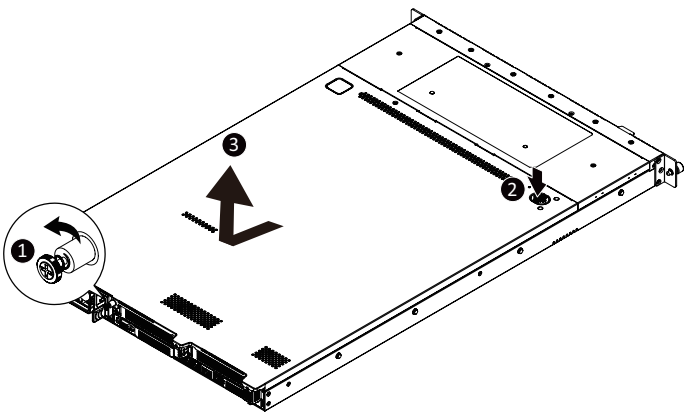
3-1 Removing Chassis Cover

Before you remove or install the system cover

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

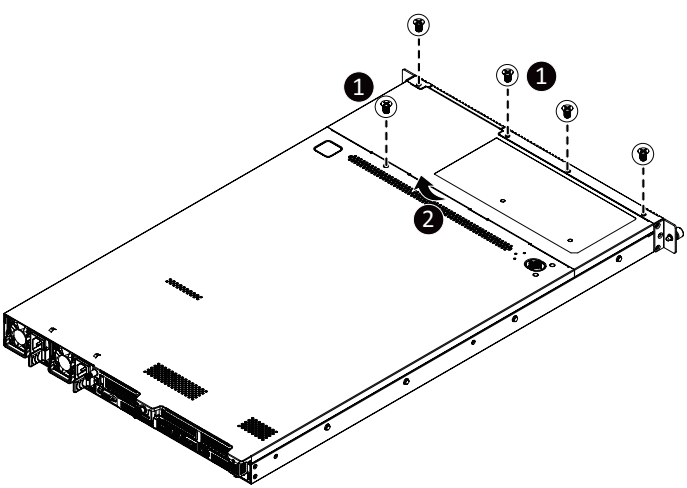
Follow these instructions to remove the rear system cover:

1. Loosen and remove the thumbscrew 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 and remove the cover in the direction of the arrow.



Follow these instructions to remove the front system cover:

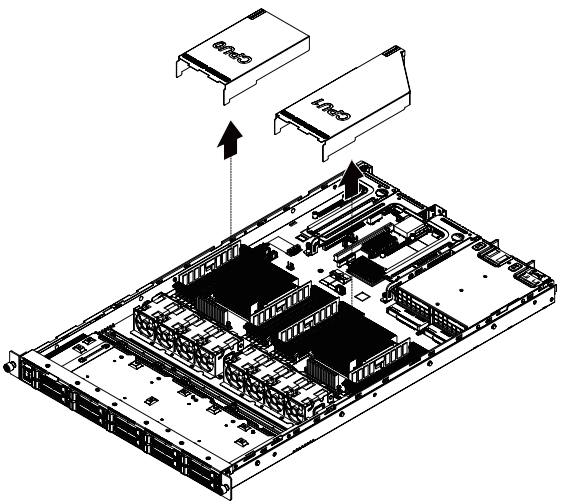
1. Remove the five screws securing the front system cover to the system.
2. Flip open the front system cover.



3-2 Removing and Installing the Fan Duct

Follow these instructions to remove/install the fan duct:

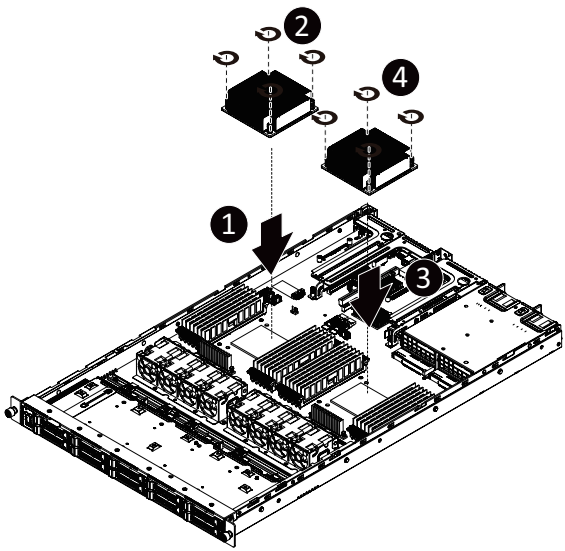
1. Lift up to remove the two fan ducts
2. To install the fan duct, align the fan duct with the guiding groove. Push down the fan duct into chassis until its firmly seats



3-3 Installing the CPU Heat Sink

Follow these instructions to install the CPU Heat Sink:

1. Align and place the heatsink onto the top of the CPU socket.
2. To secure the heatsink, tighten the four screws to the CPU socket.
3. Repeat steps 1-2 for the second CPU and heatsink.
4. To remove the heatsinks and CPUs, follow steps 1-2 in reverse order.



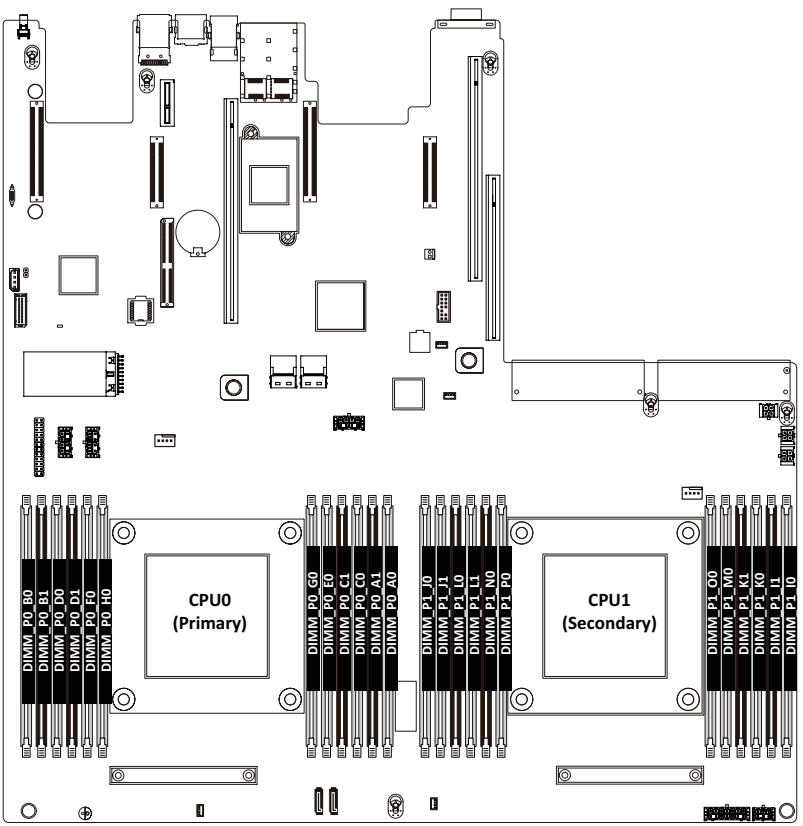
3-4 Installing the Memory

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.

3-4-1 Eight Channel Memory Configuration

This motherboard provides 24 DDR4 memory sockets and supports Eight 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.



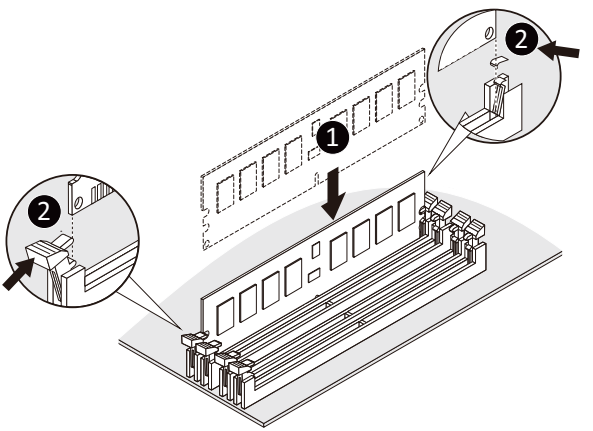
3-4-2 Installing a Memory

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 DDR4 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 want to remove the DIMM module.



3-4-3 DIMM Population Table

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V) Slot Per Channel (SPC) DIMM Per Channel (DPC)		
				1 Slot per Channel	2 Slots per Channel	
		DIMM Density		1DPC	1DPC	2DPC
		4Gb	8Gb	1.2V	1.2V	1.2V
RDIMM	SRx4	NA	16GB	2666	2666	2400
RDIMM	DRx8	8GB	16GB			
RDIMM	DRx4	16GB	32GB			

3-5 Installing the PCI Expansion Card

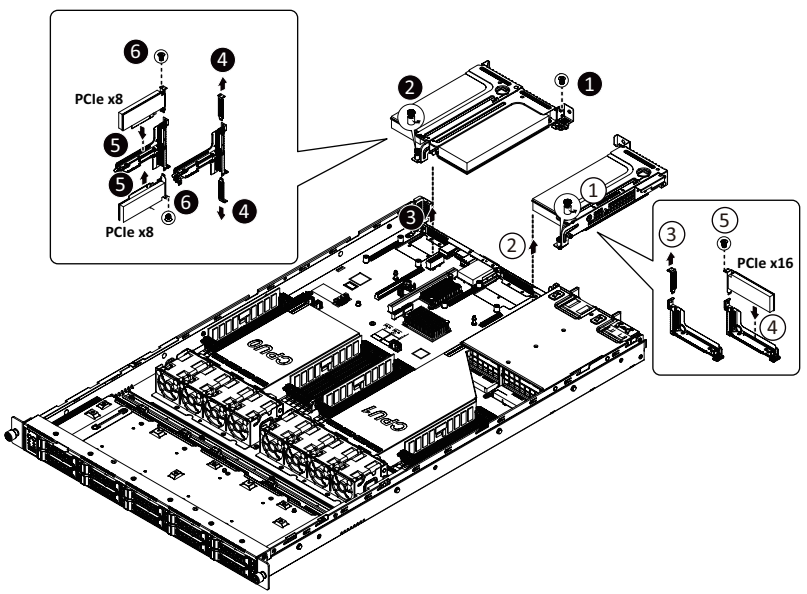
- Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered-down and all power sources have been disconnected from the server prior to installing a PCI card.

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. Remove the securing special screw on the riser bracket.
2. Remove the thumbscrew on the riser bracket
3. Lift up the riser bracket out of system.
4. Remove the slot covers from the riser bracket.
5. Orient the PCI-E card with the riser guide slot and push in the direction of the arrow until the PCI-E card sits in the PCI card connector.
6. Secure the PCI-E card with the screw.
7. Reverse the steps 3 - 1 to install the riser bracket.



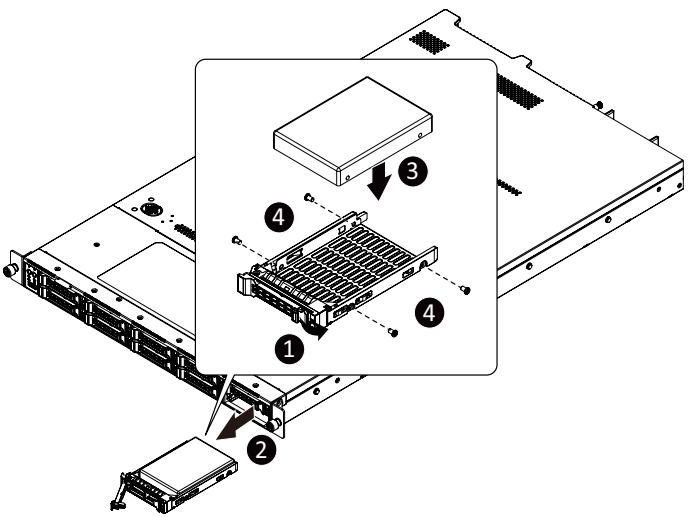
3-6 Installing the Hard Disk Drive

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 install a hard disk drive:

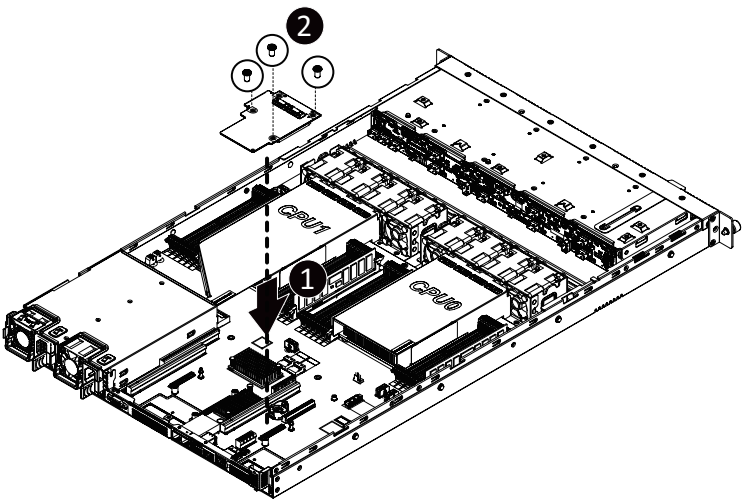
1. Press the release button.
2. Extend the locking lever and pull the locking lever to remove the HDD tray.
3. Place the hard disk drive into the HDD tray.
4. Secure the hard disk drive to the HDD tray with four screws.



3-7 Installing the Mezzanine Card

Follow these instructions to install a mezzanine card:

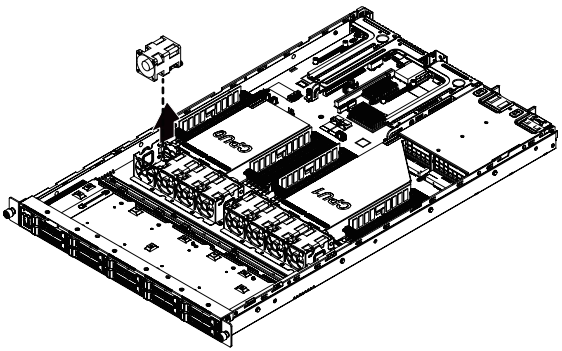
1. Insert the mezzanine card into the system ensuring that the connector on the mezzanine card connects to the connector on the motherboard.
2. Secure the mezzanine card to the system with three screws.



3-8 Replacing the FAN Assemblly

Follow these instructions to replace the fan assembly:

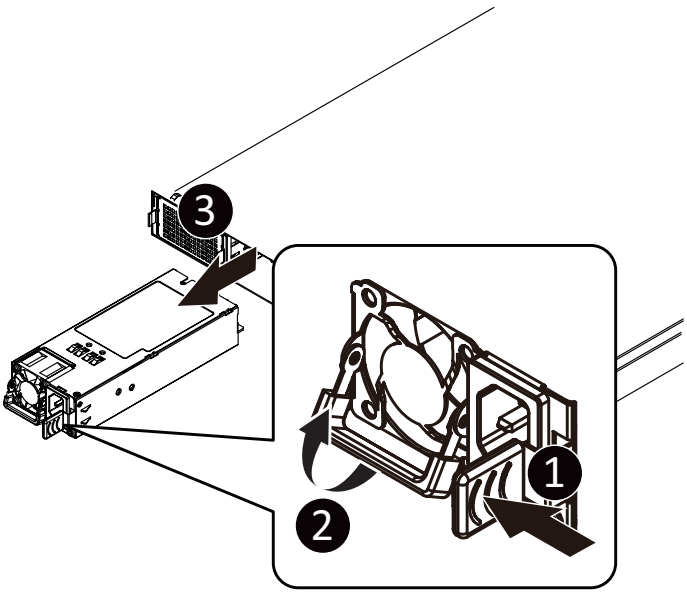
1. Lift up the fan assembly from the chassis.
2. Reverse the previous steps to install the replacement fan assembly.



3-9 Replacing the Power Supply

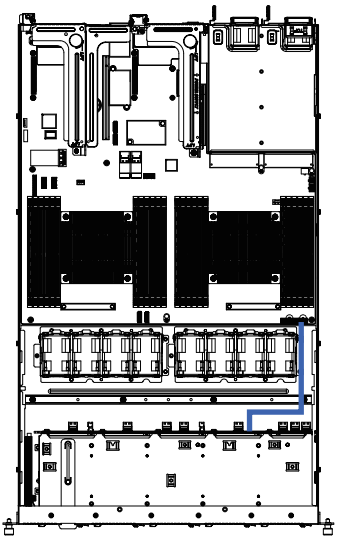
Follow these instructions to replace the power supply:

1. Press the retaining clip on the right side of the power supply along the direction of the arrow.
2. Pull up the power supply handle at the same time and pull out the power supply.
3. Insert the replacement power supply firmly into the chassis. Connect the AC power cord to the replacement power supply.

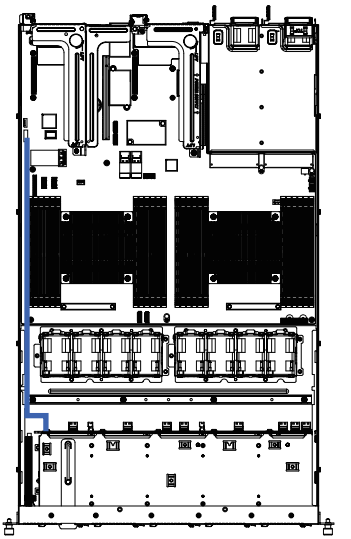


3-10 Cable Routing

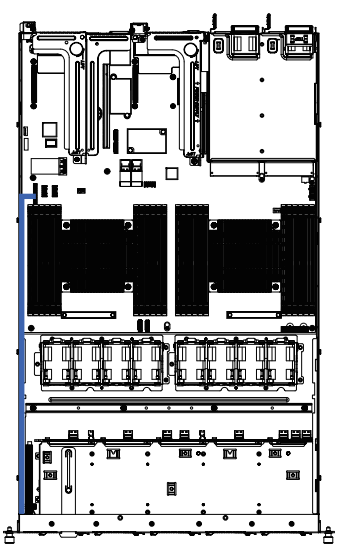
HDD Back Plane Board Power Cable



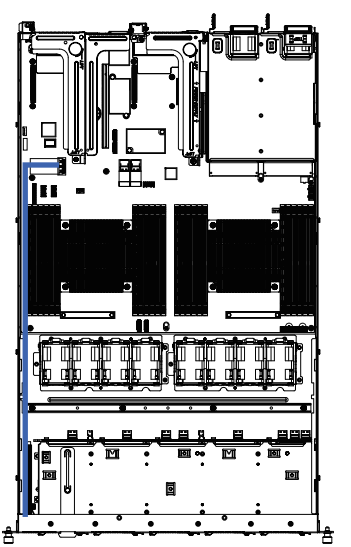
HDD Back Plane Board Signal Cable



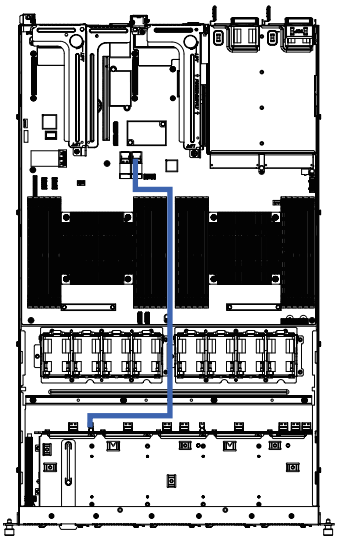
Front IO Board Cable



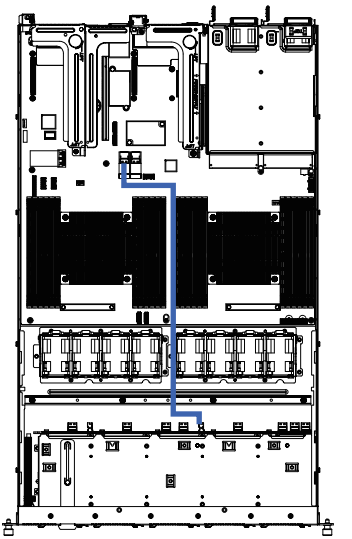
Front Panel USB 3.0 Cable



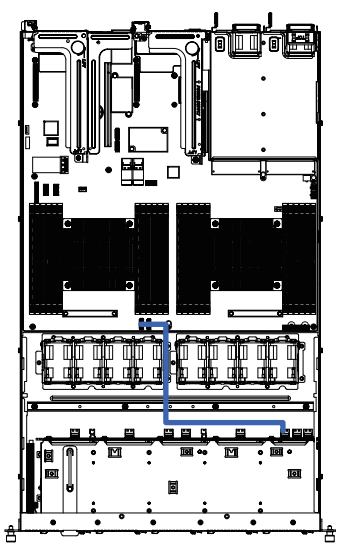
On-Board SATA to HDD Back Plane Board Cable (SATA0-3)



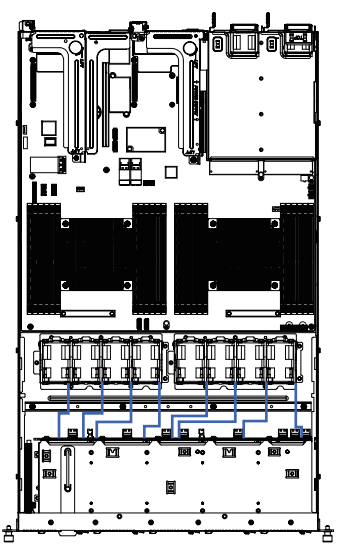
On-Board SATA to HDD Back Plane Board Cable (SATA4-7)



On-Board SATA to HDD Back Plane Board Cable (SATA0/SATA1)



System Fan Cable



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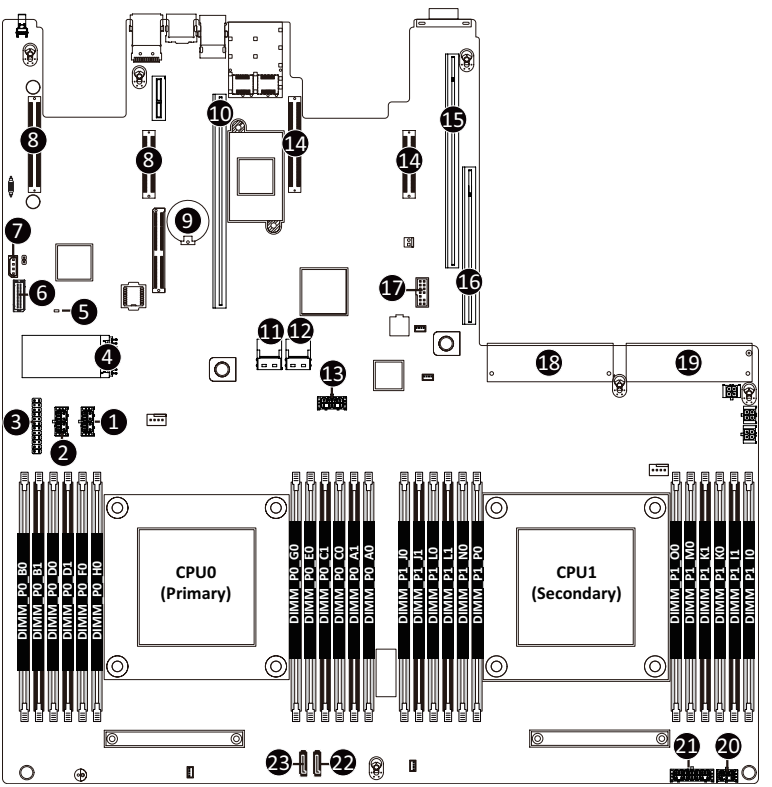
Chapter 4 Motherboard Components

4-1 Motherboard Components

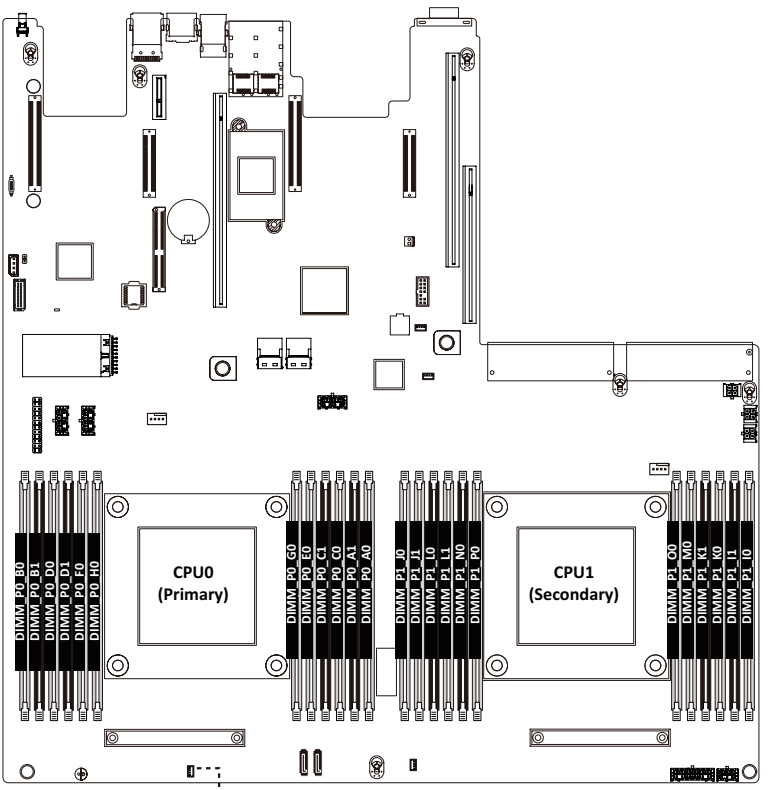


Item	Description
1	2 x 4 Pin GPGPU Power Connector
2	2 x 4 Pin GPGPU Power Connector
3	Front Panel Header
4	Front Panel USB 3.0 Connector
5	BMC Firmware Readiness LED

6	HDD Back Plane Board Connector
7	Case Open Intrusion Header
8*	IPMB Connector
9	OCP Mezzanine Connector #1 (Supports NCSI Function)
10	System Battery
11	Riser Connector #1
12	SlimLine Connector (SATA3/SAS/ #4~#7/From LSI)
13	SlimLine Connector (SATA3/SAS/#0~#3/From LSI)
14	2 x 4 Pin GPGPU Power Connector
15	OCP Mezzanine Connector #2
16	Riser Connector #3
17	TPM Module Connector
18	Power Supply Connector #1 (Primary)
19	Power Supply Connector #2 (Secondary)
20	HDD Back Plane Board Power Connector (Rear HDD)
21*	HDD Back Plane Board Power Connector (Front HDD)
22	SATA3 6Gb/s Connector #0
23	SATA3 6Gb/s Connector #1 (CPU0)

NOTE! Set the NCSI switch to **On** to enable NCSI fucnction.

4-2 Jumper Settings



SYS_JP1

		ON	OFF
1	RVSD	Reserved/No Function	Reserved/No Function
2	CLR_PASSWD	Clear supervisor password	Normal [Default]
3	RVSD	Reserved/No Function	Reserved/No Function
4	RVSD	Reserved/No Function	Reserved/No Function

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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> or <ESC> 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 **Exit** section in this chapter or introductions of the battery/clearing CMOS jumper in Chapter 4 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
<+>	Increase the numeric value or make changes
<->	Decrease the numeric value or make changes
<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 processor, network, North Bridge, South Bridge, and System event logs.
- **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.
- **Boot**
  This setup page provides items for configuration of boot sequence.
- **Save & 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.)
- **Server Management**
  Server additional features enabled/disabled setup menus.

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.

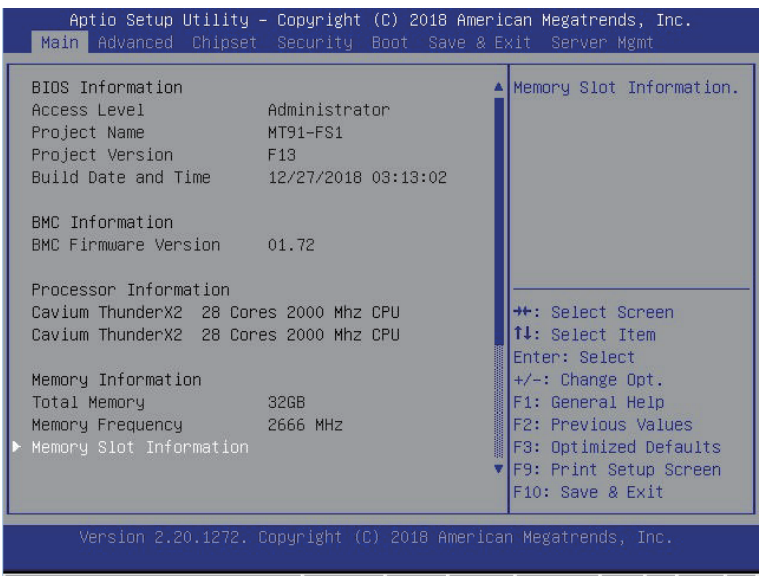
Main Menu Help

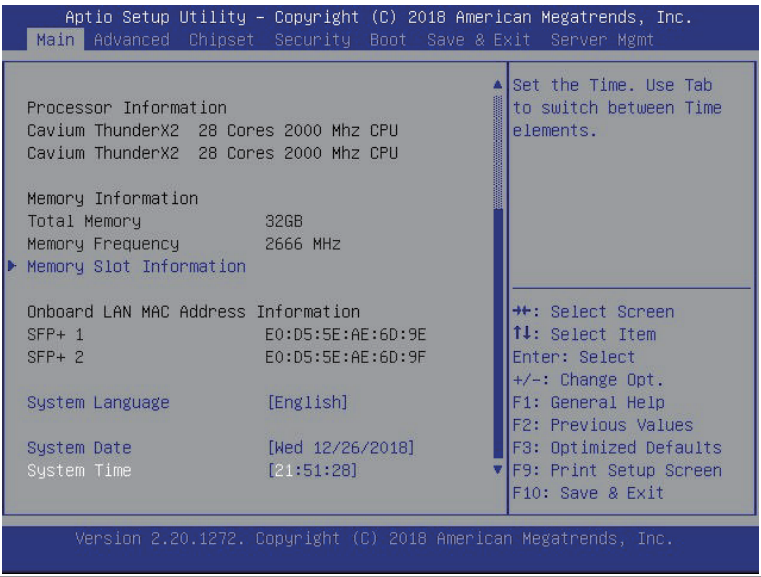
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

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 **Restore Defaults** 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.





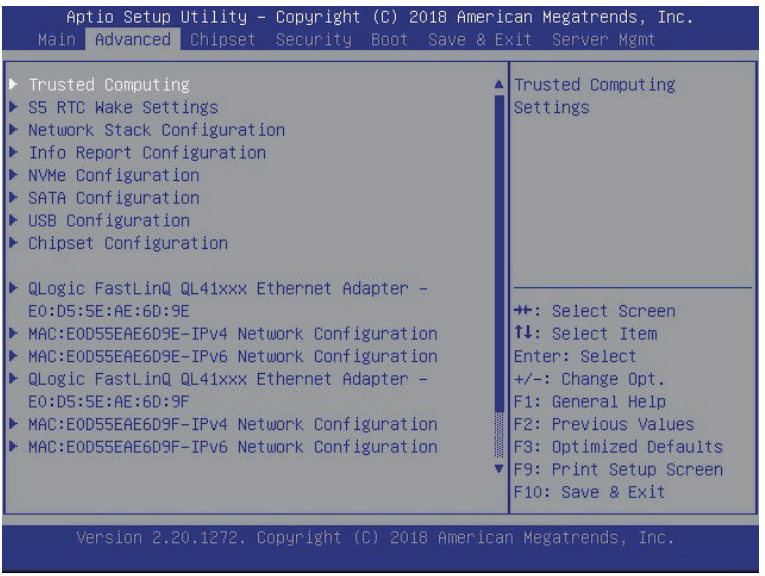
Parameter	Description
BIOS Information	
Access Level	Displays the access privilege level information.
Project Name(Note)	Displays the project name information.
Project Version	Displays version number of the BIOS setup utility.
Build Date and Time	Displays the date and time when the BIOS setup utility was created.
BMC Information(Note)	
BMC Firmware Version(Note)	Displays BMC firmware version information.
Processor Information	
	Displays the technical specifications for the installed processor(s).
Memory Information	
Total Memory(Note)	Displays the total memory size of the installed memory.
Memory Frequency(Note)	Displays the frequency information of the installed memory.
Memory Slot Information	Press [Enter] to view the installed memory information.
Onboard LAN MAC Address Information(Note)	
LAN1 MAC Address(Note)	Displays LAN MAC address information.
LAN2 MAC Address (Note)	Displays LAN MAC address information.

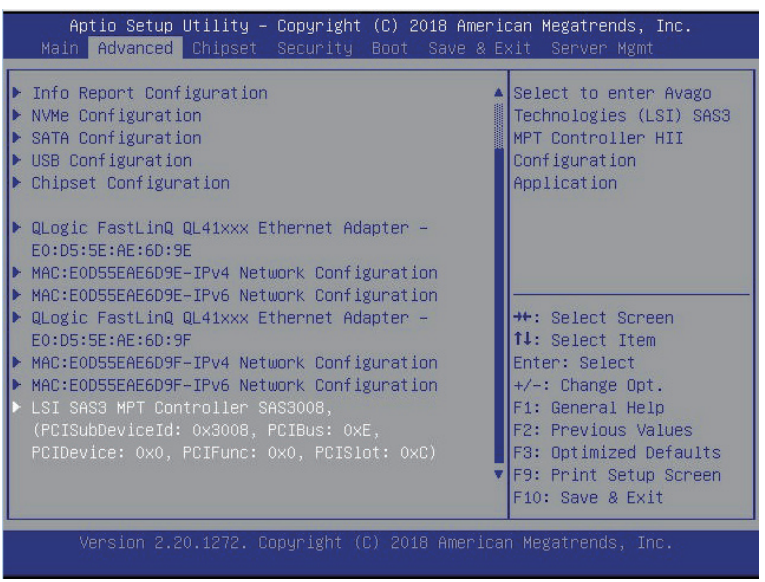
(Note) Corresponds to the model name of GIGABYTE server you are using.

Parameter	Description
System Date	Sets the date following the weekday-month-day-year format.
System Time	Sets the system time following the hour-minute-second format.

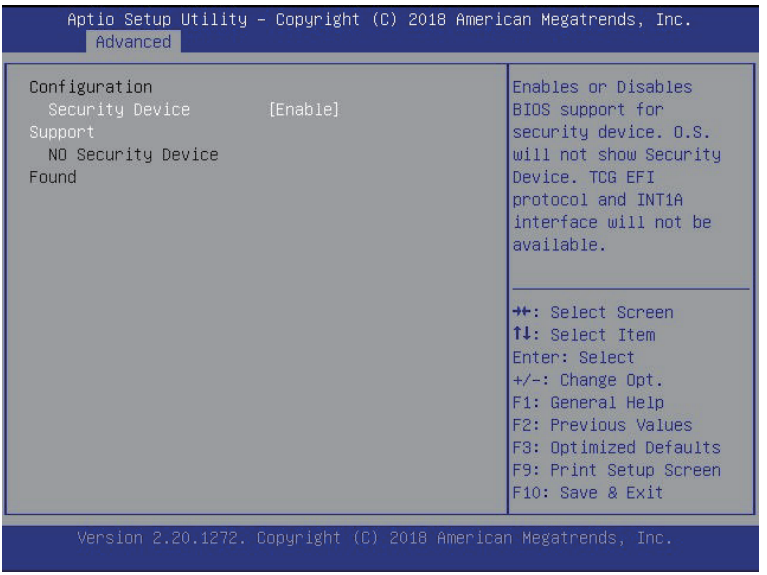
5-2 Advanced Menu

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.



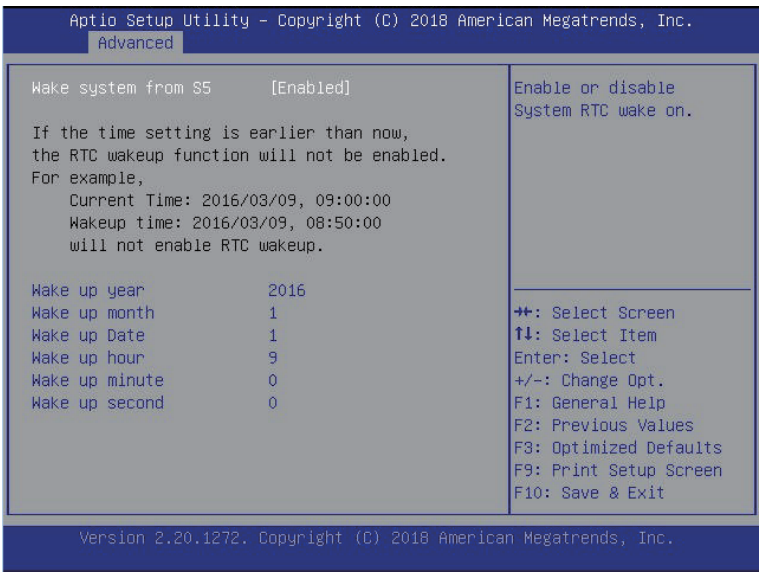


5-2-1 Trusted Computing



Parameter	Description
Configuration	
Security Device Support	Enable/Disable the TPM support feature. Options available: Enable/Disable. Default setting is **Enable**.
Current Status Information	Displays current TPM status information.

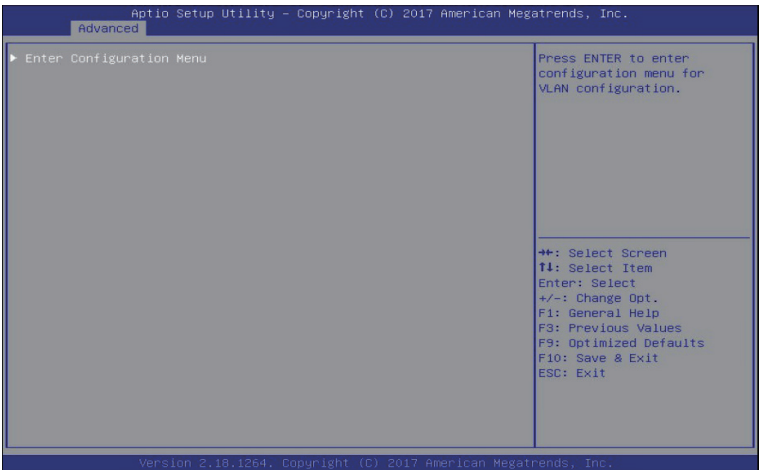
5-2-2 S5 RTC Wake Setting



Parameter	Description
Wake system from S5(Note)	Enable or disable System wake on alarm event. When enabled, System will wake on the hr:min:sec specified. Default setting is **Disabled**.
Wake up year	Press <+> and <-> to define the wake up year.
Wake up month	Press <+> and <-> to define the wake up month.
Wake up Date	Press <+> and <-> to define the wake up date.
Wake up hour	Press <+> and <-> to define the wake up hour.
Wake up minute	Press <+> and <-> to define the wake up minute.
Wake up second	Press <+> and <-> to define the wake up second.

(Note) This item appears when **Wake system from S5** is set to **Enabled**.

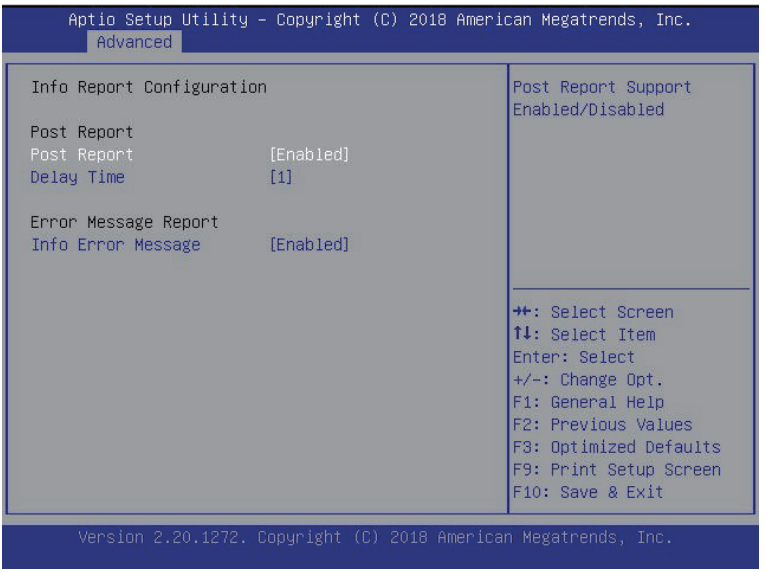
5-2-3 Network Stack Configuration



Parameter	Description
Network Stack	Enable/Disable the UEFI network stack. Options available: Enabled/Disabled. Default setting is **Enabled**.
Ipv4 PXE Support(Note)	Enable/Disable the Ipv4 PXE feature. Options available: Enabled/Disabled. Default setting is **Enabled**.
Ipv4 HTTP Support(Note)	Enable/Disable the Ipv4 HTTP feature. Options available: Enabled/Disabled. Default setting is **Disabled**.
Ipv6 PXE Support(Note)	Enable/Disable the Ipv6 PXE feature. Options available: Enabled/Disabled. Default setting is **Disabled**.
Ipv6 HTTP Support(Note)	Enable/Disable the Ipv6 HTTP feature. Options available: Enabled/Disabled. Default setting is **Disabled**.
PXE boot wait time(Note)	Press the <+> / <-> keys to increase or decrease the desired values.
Media detect count(Note)	Press the <+> / <-> keys to increase or decrease the desired values.

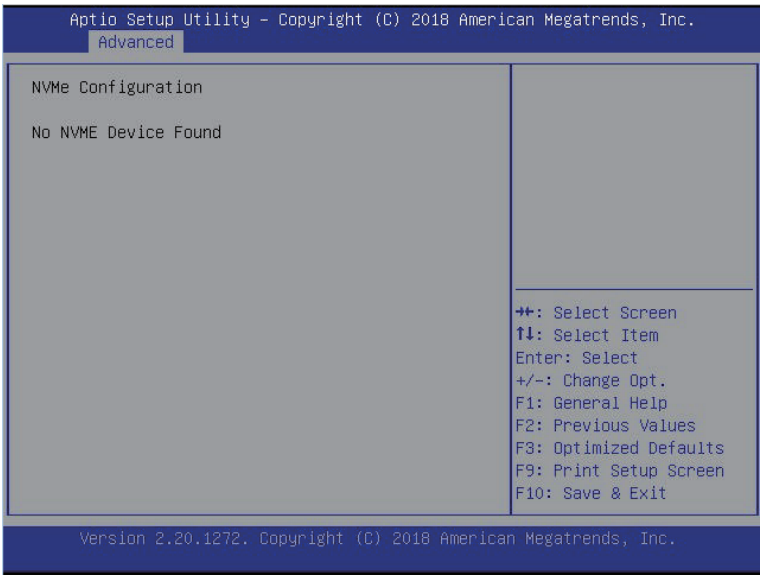
(Note) This item appears when **Network Stack** is set to **Enabled**.

5-2-4 Info Report Configuration



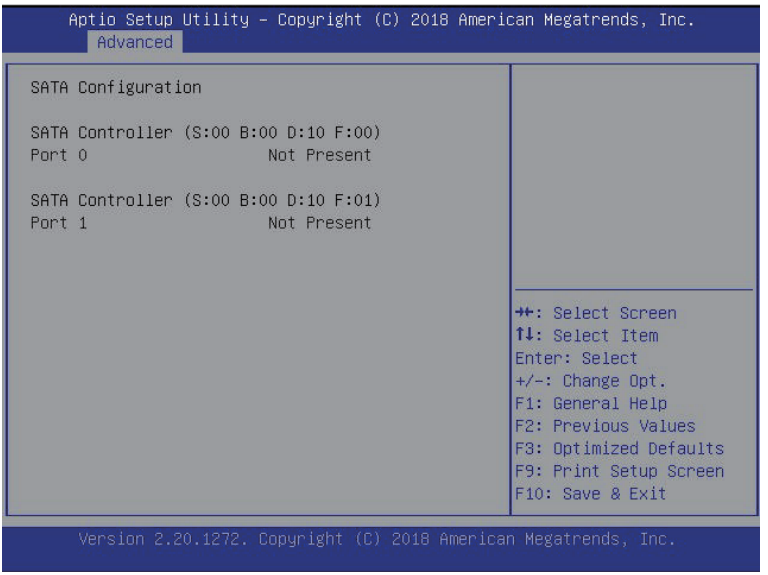
Parameter	Description
Info Report Configuration	
Post Report	
Post Report	Enable/Disable the POST Report support. Options available: Enabled/Disabled. Default setting is **Enabled**.
Delay Time	Post Report wait time 0~10 seconds. Options available: 0/1/2/3/4/5/6/7/8/9/Until Press ESC.
Error Message Report	
Post Error Message	Enable/Disable the POST Error Message support. Options available: Enabled/Disabled. Default setting is **Enabled**.

5-2-5 NMVe Configuration



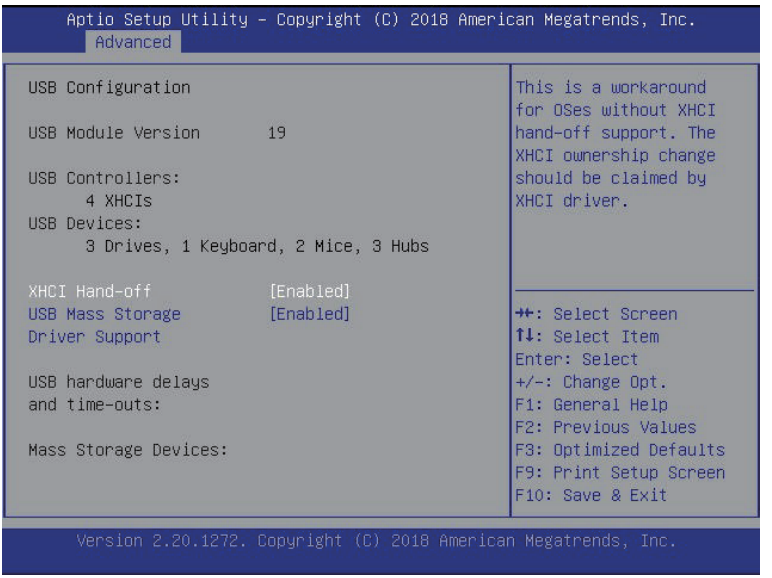
Parameter	Description
NVMe Configuration	Displays the NVMe devices connected to the system.

5-2-6 SATA Configuration



Parameter	Description
SATA Configuration	
SATA Controller #	Displays the SATA device connected to the system.

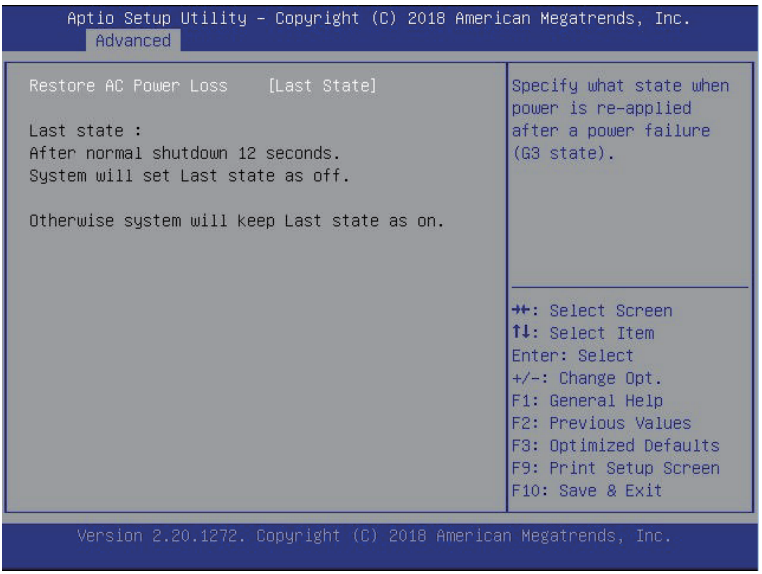
5-2-7 USB Configuration



Parameter	Description
USB Configuration	
USB Module Version	Displays the USB module version information.
USB Controller	Displays the USB controller information.
USB Devices:	Displays the USB devices connected to the system.
XHCI Hand-off	Enable/Disable the XHCI (USB 3.0) Hand-off support. Options available: Enabled/Disabled. Default setting is **Enabled**.
USB Mass Storage Driver Support(Note)	Enable/Disable the USB Mass Storage Driver Support. Options available: Enabled/Disabled. Default setting is **Enabled**.

(Note) This item is present only if you attach USB devices.

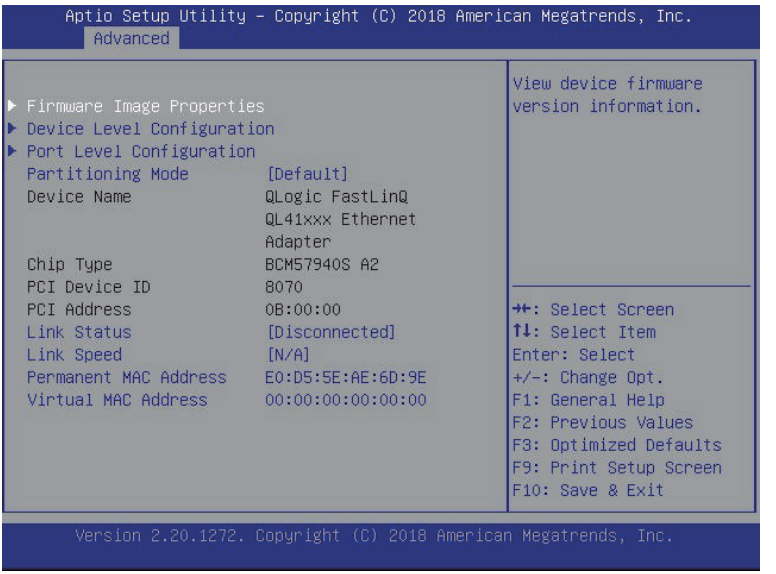
5-2-8 Chipset Configuration



Parameter	Description
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 Power Off, the system remains off after power shutdown. Options available: Last State/Power Off/Power On. The default setting depends on the BMC setting.
Skip Above 4G Decoding for VGA	Enable/Disable 64bit capable devices to be decoded in Skip Above 4G Address VGA Space. Options available: Enabled/Disabled. Default setting is **Disabled**.
P2P Bridge IO Size	Sets P2P Bridge IO aligned to the size. Options available: 0x100/0x150/0x1000. Default setting is **0x1000**.
Chassis Opened Warning	Enable/Disable the chassis intrusion alter function. Options available: Enabled/Disabled/Clear. Default setting is **Disabled**.

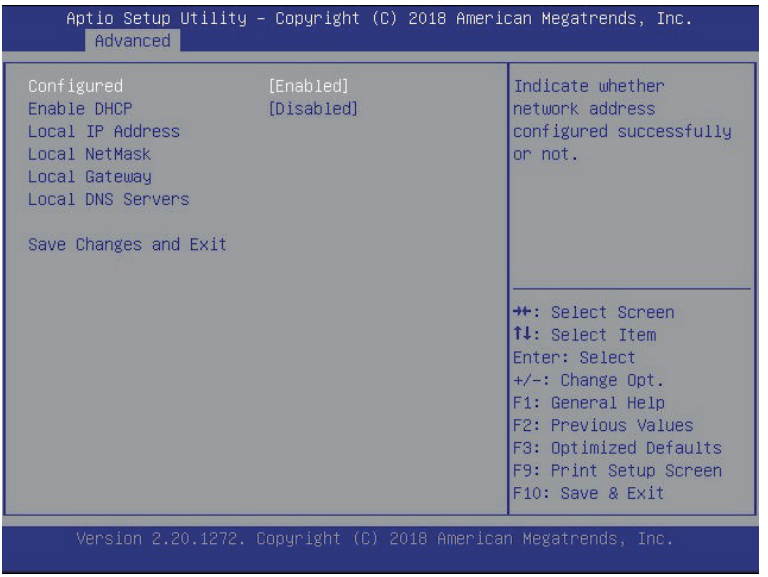
(Note) When the power policy is controlled by BMC, please wait for 15-20 seconds for BMC to save the last power state.

5-2-9 Ethernet Adapter Configuration



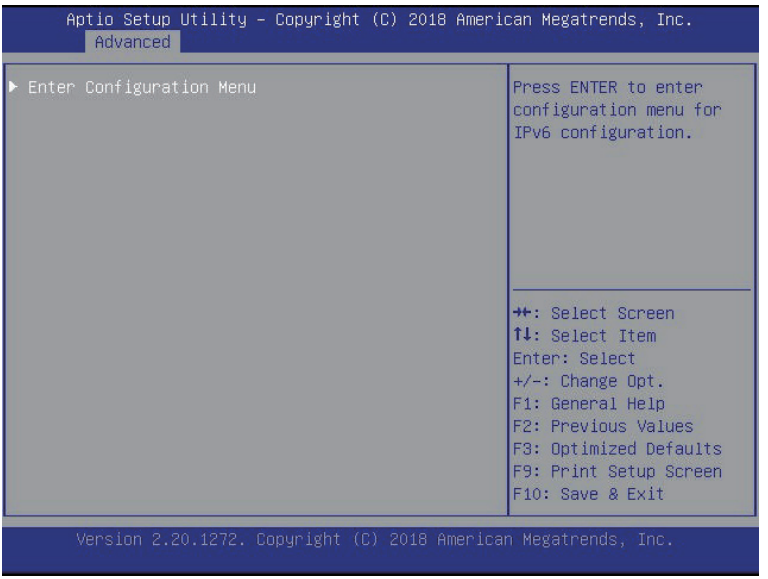
Parameter	Description
Firmware Image Properties	Press [Enter] to access the related submenu screen.
Device Level Configuration	Press [Enter] to access the related submenu screen.
Port Level Configuration	Press [Enter] to access the related submenu screen.
Partitioning Mode	Options available: Default/NPAR. Default setting is **Default**.
Device Name	Displays the technical specifications for the Network Interface Controller.
Chipset Type	Displays the technical specifications for the Network Interface Controller.
PCI Device ID	Displays the technical specifications for the Network Interface Controller.
PCI Address	Displays the technical specifications for the Network Interface Controller.
Link Status	Displays the technical specifications for the Network Interface Controller.
Link Speed	Displays the technical specifications for the Network Interface Controller.
Permanent MAC Address	Displays the technical specifications for the Network Interface Controller.
Virtual MAC Address	Displays the technical specifications for the Network Interface Controller.

5-2-10 MAC IPv4 Network Configuration



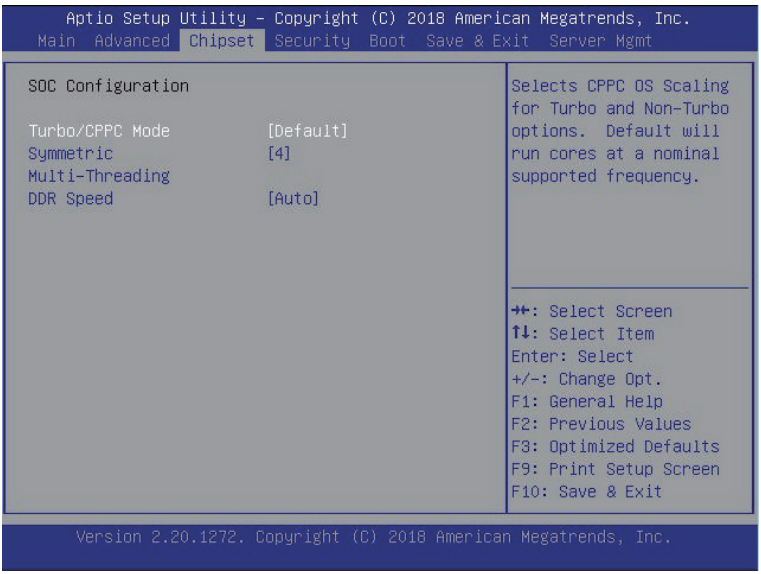
Parameter	Description
Configuraed	Option available: Enabled/Disabled. Default setting is **Enabled**.
Enable DHCP	Option available: Enabled/Disabled. Default setting is **Enabled**.
Local IP Address	Press [Enter] to congigure Local IP address.
Local NetMask	Press [Enter] to congigure Local NetMask.
Local Gateway	Press [Enter] to congigure Local Gateway.
Local DNS Servers	Press [Enter] to congigure Local DNS Server.
Save Changes and Exit	When you finish the configuration in this page, press enter to save and to exit the configuration.

5-2-11 MAC IPv6 Network Configuration



Parameter	Description
Enter Configuration Menu	Press [Enter] to access the related submenu screen.

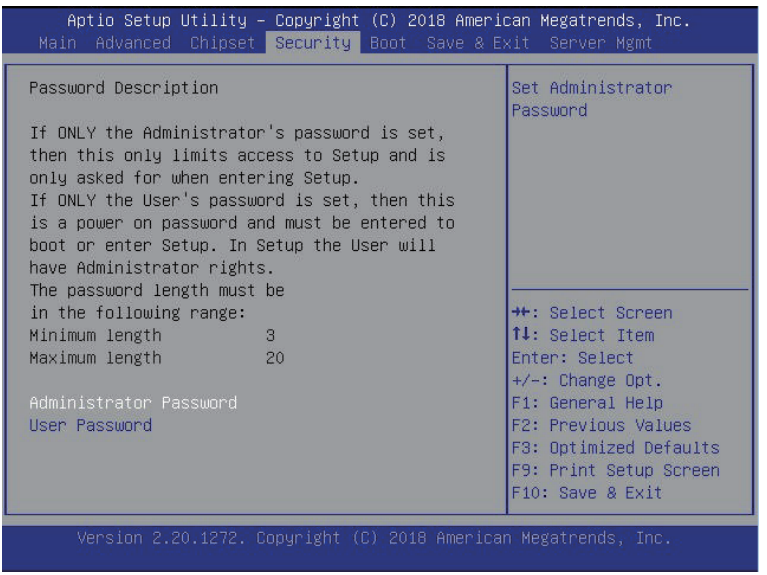
5-3 Chipset Setup Menu



Parameter	Description
SOC Configuration	
Turbo/CCPC Mode	Selects CPPC OS Scaling for Turbo and Non-Turbo options. Default will run cores ar a nomimal supported frequency. Option avaiable: Default/Autonomous - CPPC off/Autonomous - CPPC On/ OSPM Turbo/ OSPM Non-Turbo. Default setting is **Default**.
Symmertic Multi-Treading	Option avaiable: 4/2/1. Default setting is **4**.
DDR Speed	Option avaiable: Auto/1600/1866/2133/2400/2666 Default setting is **Auto**.

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.

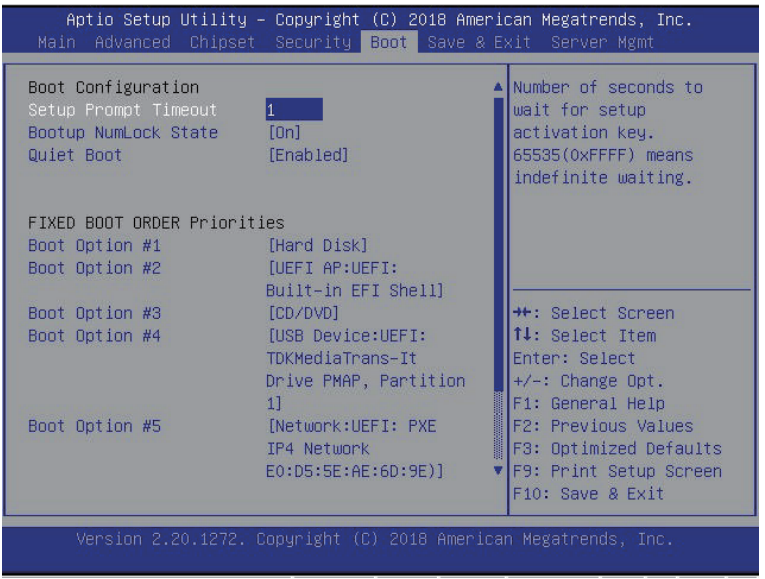
- User Password

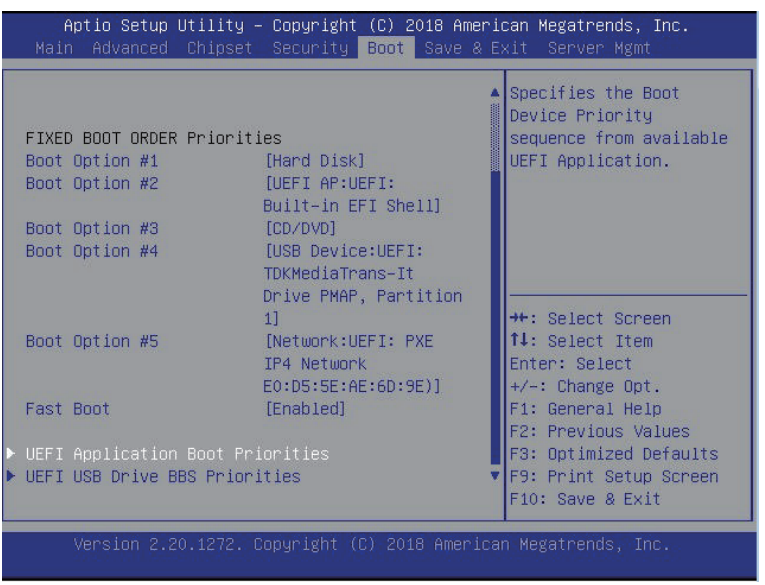
  Entering this password will restrict a user's access to the Setup menus. To enable or disable this field, a Administrator Password must first be set. A user can only access and modify the System Time, System Date, and Set User Password fields.

Parameter	Description
Administrator Password	Press [Enter] to configure the administrator password.
User Password	Press [Enter] to configure the user password.

5-5 Boot 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.





Parameter	Description
Boot Configuration	
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Press the numeric keys to input the desired values.
Bootup NumLock State	Enable/Disable the Bootup NumLock function. Options available: On/Off. Default setting is **On**.
Quiet Boot	Enable/Disable showing the logo during POST. Options available: Enabled/Disabled. Default setting is **Enabled**.
FIXED BOOT ORDER Priorities	
Boot Option #1 / #2 / #3 / #4 / #5	Press [Enter] to configure the boot priority. By default, the server searches for boot devices in the following sequence: 1. Hard drive. 2. CD-COM/DVD drive. 3. USB device. 4. Network. 5. UEFI.
UEFI sUEFI Application Boot Priorities	Press [Enter] to configure the boot priority.
UEFI Network Drive BBS Prioritie	Press [Enter] to configure the boot priority.

5-5-1 UEFI Application Boot Priorities

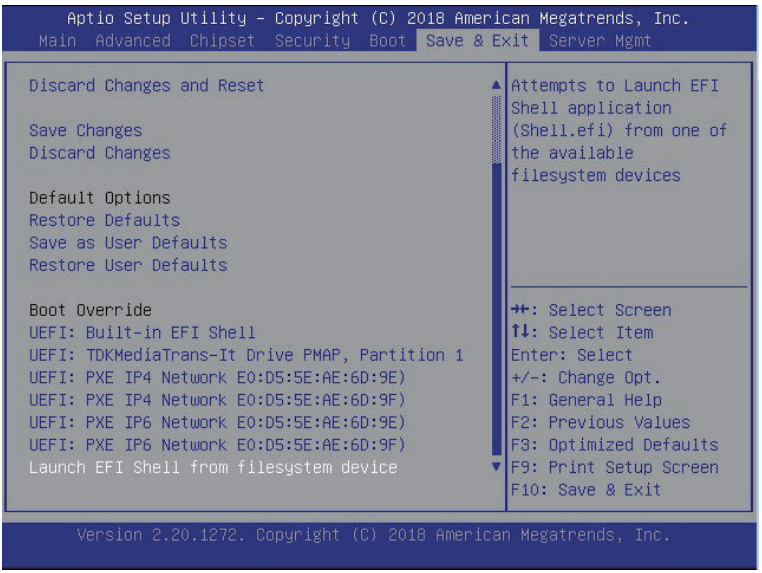
The UEFI application boot priorities submenu allows you to specify the boot device priority from the available UEFI applications during system boot-up. BIOS setup will display an error message if the legacy drive(s) specified is not bootable.

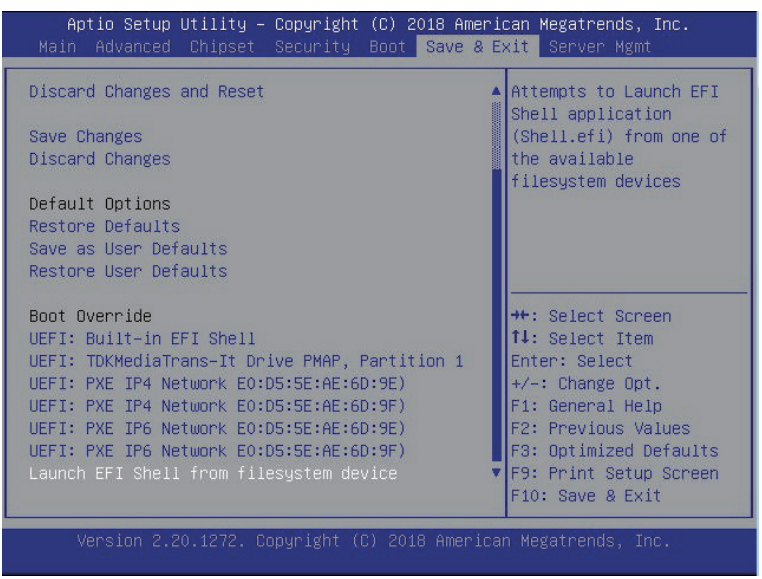
5-5-2 UEFI NETWORK Drive BBS Priorities

The UEFI network drive BBS priorities submenu allows you to specify the boot device priority from the available UEFI network drives during system boot-up. BIOS setup will display an error message if the legacy drive(s) specified is not bootable.

5-6 Save & Exit Menu

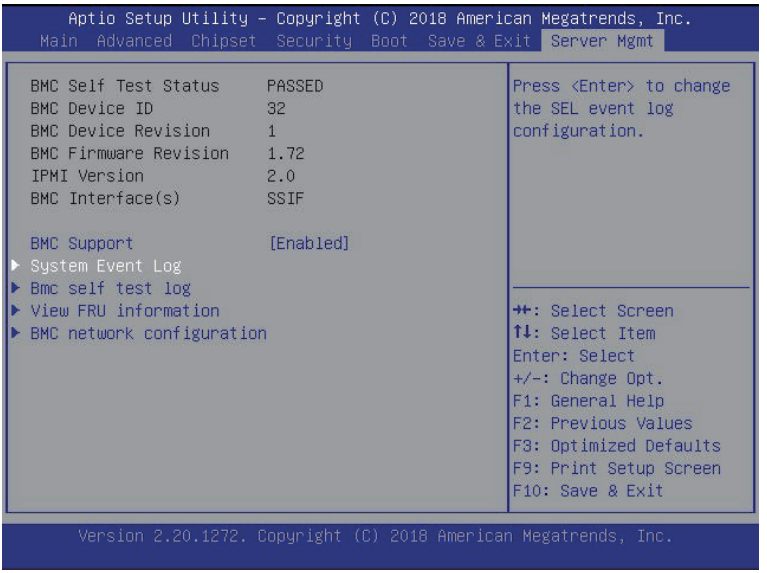
The Exit menu displays the various options to quit from the BIOS setup. Highlight any of the exit options then press **Enter**.





Parameter	Description
Save Options	
Save Changes and Exit	Saves changes made and closes the BIOS setup. Options available: Yes/No.
Discard Changes and Exit	Discards changes made and exits the BIOS setup. Options available: Yes/No.
Save Changes and Reset	Restarts the system after saving the changes made. Options available: Yes/No.
Discard Changes and Reset	Restarts the system without saving any changes. Options available: Yes/No.
Save Changes	Saves changes made in the BIOS setup. Options available: Yes/No.
Discard Changes	Discards changes made and closes the BIOS setup. Options available: Yes/No.
Default Options	
Restore Defaults	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.
Save as User Defaults	Saves the changes made as the user default settings. Options available: Yes/No.
Restore User Defaults	Loads the user default settings for all BIOS setup parameters. Options available: Yes/No.
Boot Override	Press [Enter] to configure the device as the boot-up drive.

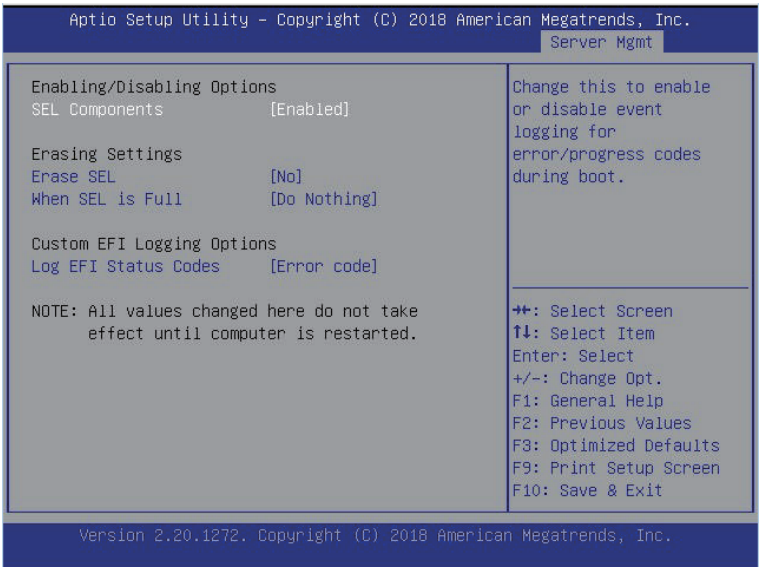
5-7 Server Management Menu



Parameter	Description
BMC Self Test Status	Displays BMC Self Test status information.
BMC Device ID	Displays BMC device ID information.
BMC Device Revision	Displays BMC device revision information.
BMC Firmware Revision	Displays BMC firmware revision information.
IPMI Version	Displays IPMI version information.
BMC Interface (s)	Displays BMC interface information.
System Event Log	Press [Enter] to configure advanced items.
BMC Self Test Log	Press [Enter] to configure advanced items.
View FRU Information	Press [Enter] to view the advanced items.
BMC network configuration	Press [Enter] to configure advanced items.

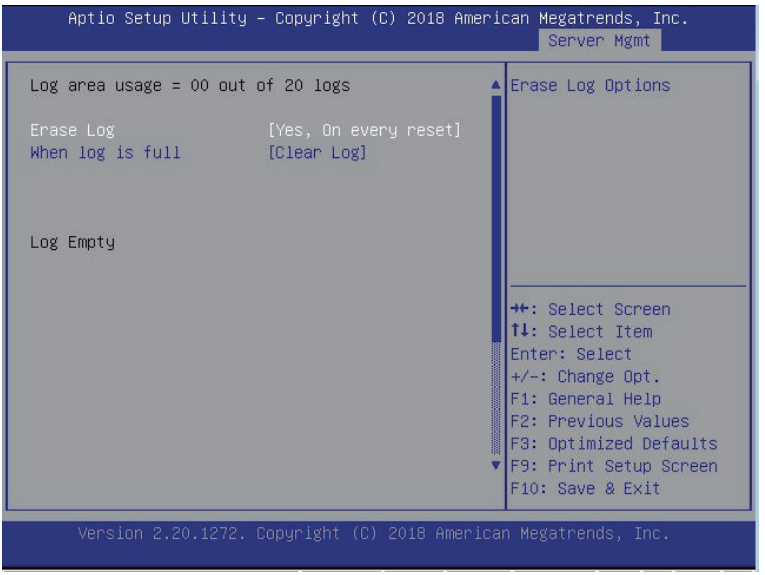
(Note) Advanced items prompt when this item is set to **Enabled**.

5-7-1 System Event Log



Parameter	Description
Enabling / Disabling Options	
SEL Components	Change this item to enable or disable all features of System Event Logging during boot. Options available: Enabled/Disabled. Default setting is **Enabled**.
Erasing Settings	
Erasing SEL	Choose options for erasing SEL. Options available: No/Yes, On next reset/Yes, On every reset. Default setting is **No**.
When SEL is Full	Choose options for reactions to a full SEL. Options available: Do Nothing/Erase Immediately. Default setting is **Do Nothing**.
Custom EFI Logging Options	
Log EFI Status Codes	Enable/Disable the logging of EFI Status Codes (if not already converted to legacy). Options available: Disabled/Both/Error code/Progress code. Default setting is **Error code**.

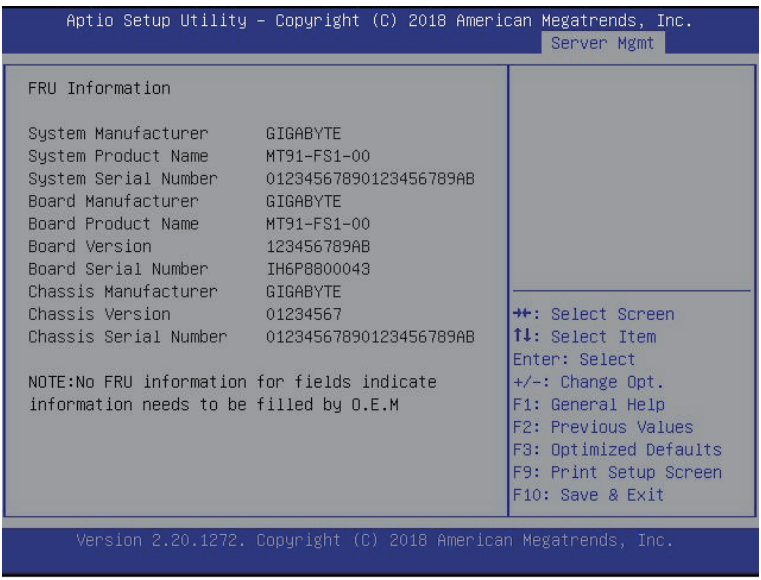
5-7-2 View Self Test Log



Parameter	Description
Log area usage = 00 out of 20 logs	
Erase Log	Choose options for erasing log. Options available: No/Yes, On next reset/Yes, On every reset. Default setting is **No**..
When log is full	Choose options for reactions to a full log. Options available: Do Nothing/Clear Log. Default setting is **Clear Log**.

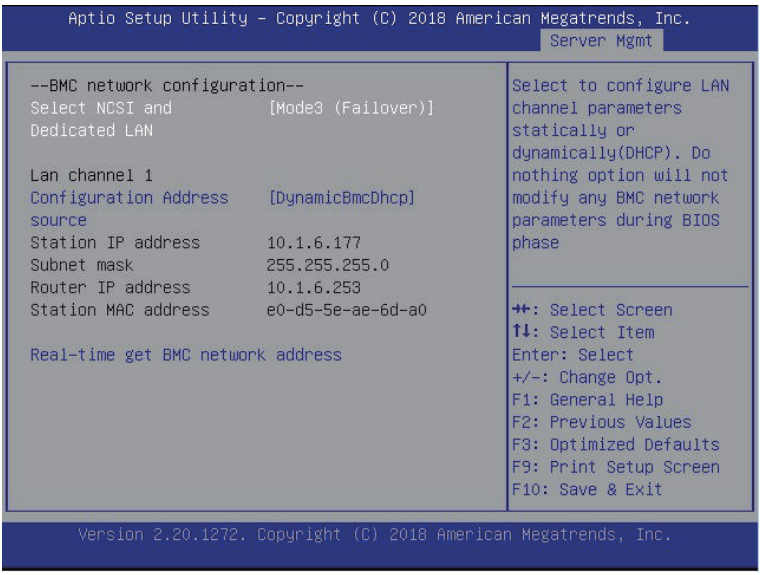
5-7-3 View FRU Information

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



(Note) Corresponds to the model name of GIGABYTE server you are using.

5-7-4 BMC Network Configuration



Parameter	Description
BMC network configuration	
Select NCSI and Dedicated LAN	Switch NCSI and dedicated LAN and send KCS command. Options available: Do Nothing/Mode1 (Dedicated)/Mode2(NSCI)/Mode3 (Failover). Default setting is **Mode1 (Dedicated)**.
Lan Channel 1	
Configuration Address 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: Unspecified/Static/DynamicBmcDhcp. Default setting is **DynamicBmcDhcp**.
Station IP address	Displays IP Address information.
Subnet mask	Displays Subnet Mask information. Please note that the IP address must be in three digitals, for example, 192.168.000.001.
Router IP address	Displays the Router IP Address information.
Station MAC address	Displays the MAC Address information.
Real-time synchronize BMC network parameter values	Press [Enter] to synchronize the BMC network parameter values.