GIGABYTE™

# R152-P33

Ampere® Altra® Max ARM Server - 1U 8-Bay NVMe

User Manual

Rev. 1.0

## Copyright



## Disclaimer



## 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

For GIGABYTE distributors and resellers, additional sales & marketing materials are available from our reseller portal: http://reseller.b2b.gigabyte.com

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!**<br>Gives bits and pieces of additional information related to the current topic. |
|  | **CAUTION!**<br>Gives precautionary measures to avoid possible hardware or software problems. |
|  | **WARNING!**<br>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 all the power cords from the power supplies to disconnect power to the equipment.

- 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.**

**WARNING!**

**This equipment is intended to be used in Restrict Access Location. The access can only be gained by Skilled person.**

**Only authorized by well trained professional person can access the restrict access location.**

**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 disconnect 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 sensitive 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 fingertips 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.

# Table of Contents

# 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

**NOTE:**

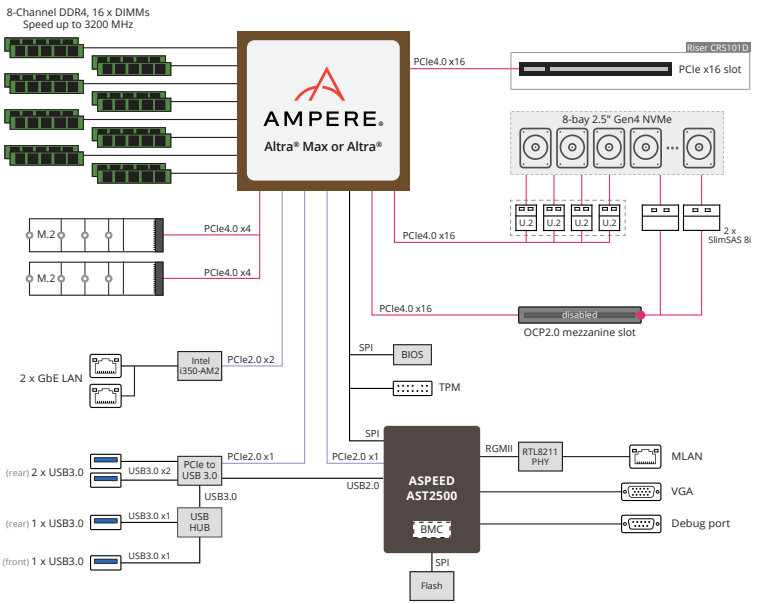
**We reserve the right to make any changes to the product specifications and product-related information without prior notice.**

| | |
|---|---|
| System Dimension | ◆ 1U<br>◆ 438 (W) x 43.5 (H) x 660 (D) mm |
| CPU | ◆ Ampere® Altra® Max or Altra® Processor<br>◆ Single processor, 7nm technology<br>◆ Up to 128-core per processor<br><br>NOTE: supports CPU Q80-33 at ambient 30°C |
| Socket | ◆ Single socket<br>◆ LGA4926 |
| Chipset | ◆ System on Chip |
| Memory | ◆ 16 x DIMM slots<br>◆ DDR4 memory supported only<br>◆ 8-Channel memory architecture<br>◆ RDIMM modules up to 256GB supported<br>◆ LRDIMM modules up to 256GB supported<br>◆ Up to 4TB of memory capacity supported per processor<br>◆ Memory speed: Up to 3200 MHz<br><br>**NTOE!** Only supports configurations with 1,2, 4, 6, 8,12, or 16 DIMMs |
| LAN | ◆ 2 x 1GbE LAN ports (1 x Intel® I350-AM2)<br>◆ 1 x 10/100/1000 Mbps management LAN |
| Video | ◆ Integrated in Aspeed® AST2500<br>◆ 2D Video Graphic Adapter with PCIe bus interface<br>◆ 1920x1200@60Hz 32bpp |
| Storage | ◆ 8 x 2.5" NVMe hot-swappable SSD bays from onboard NVMe ports<br>◆ non-supported SATA devices |
| Expansion Slot | **Riser Card CRS101D**:<br>◆ 1 x PCIe x16 slot (Gen4 x16), Full height half-length<br><br>2 x M.2 slots:<br>◆ M-key<br>◆ PCIe Gen4 x4<br>◆ Supports 2242/2260/2280/22110 cards |

| | |
|---|---|
| Internal I/O | ◆ 2 x M.2 slots<br>◆ 1 x USB 3.0 header<br>◆ 1 x USB 2.0 header<br>◆ 1 x TPM header<br>◆ 1 x Front panel header<br>◆ 1 x HDD back plane board header<br>◆ 1 x PMBus connector<br>◆ 1 x IPMB connector<br>◆ 1 x Clear CMOS jumper<br>◆ 1 x Buzzer |
| Front I/O | ◆ 1 x USB 3.2 Gen1 Port<br>◆ 1 x Power button with LED<br>◆ 1 x ID button with LED<br>◆ 1 x Reset button<br>◆ 2 x LAN activity LEDs<br>◆ 1 x HDD activity LED<br>◆ 1 x System status LED |
| Rear I/O | ◆ 3 x USB 3.2 Gen1<br>◆ 1 x VGA<br>◆ 1 x Debug port<br>◆ 2 x RJ45<br>◆ 1 x MLAN<br>◆ 1 x ID button with LED |
| Backplane I/O | ◆ Backplane P/N: 9CBP10A5NR-00<br>◆ Speed and bandwidth:<br>◆ PCIe Gen4 x4 |
| TPM | ◆ 1 x TPM header with SPI interface<br>◆ Optional TPM2.0 kit: CTM010 |

| | |
|---|---|
| Power Supply | ◆ 2 x 1100W redundant power supply<br>◆ 80 PLUS Platinum<br><br>AC Input:<br>◆ 100-240V~/ 12-6A, 50-60Hz<br><br>DC Input:<br>◆ 190-310Vdc/ 7A<br><br>◆ DC Output:<br>Max 850W/ 100-240Vac~<br>+12V/ 70A<br>+5Vsb/ 3A<br>- Max 1100W/ 200-240Vac<br>+12V/ 90.5A<br>+5Vsb/ 3A |
| System Management | ◆ Aspeed® AST2500 management controller<br>◆ GIGABYTE Management Console (AMI MegaRAC SP-X) web interface<br><br>◆ Dashboard<br>◆ HTML5 KVM<br>◆ Sensor Monitor (Voltage, RPM, Temperature, CPU Status ...etc.)<br>◆ Sensor Reading History Data<br>◆ FRU Information<br>◆ SEL Log in Linear Storage / Circular Storage Policy<br>◆ Hardware Inventory<br>◆ Fan Profile<br>◆ System Firewall<br>◆ Power Consumption<br>◆ Power Control<br>◆ LDAP / AD / RADIUS Support<br>◆ Backup & Restore Configuration<br>◆ Remote BIOS/BMC/CPLD Update<br>◆ Event Log Filter<br>◆ User Management<br>◆ Media Redirection Settings<br>◆ PAM Order Settings<br>◆ SSL Settings<br>◆ SMTP Settings |
| Operating Properties | ◆ Operating temperature: 10°C to 35°C<br>◆ Operating humidity: 8%-80% (non-condensing)<br>◆ Non-operating temperature: -40°C to 60°C<br>◆ Non-operating humidity: 20%-95% (non-condensing) |

# 1-3 System Block Diagram



This page intentionally left blank

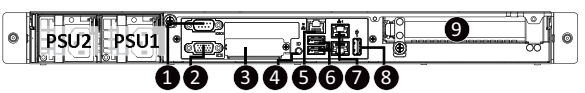
# Chapter 2 System Appearance

## 2-1 Front View


| No. | Description |
|---|---|
| 1. | Front USB 3.2 Gen1 Port |
| 2. | Front Panel LEDs and Buttons |
| **Note! Drives with green latches support NVMe.** | |

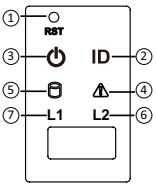
- Please Go to Chapter **2-3 Front Panel LED** and Buttons for detail description of function LEDs.

## 2-2 Rear View



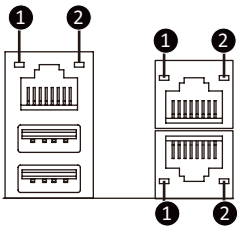

| No. | Description |
|---|---|
| 1. | Serial Port |
| 2. | VGA Port |
| 3. | Mezzanine Card Slot (Option/OCP V2.0 Card) |
| 4. | ID Button |
| 5. | 10/100/1000 Server management LAN port |
| 6. | UUSB 3.2 Gen1 Port x 2 |
| 7. | GbE LAN Port x 2 |
| 8. | USB 3.2 Gen1 Port |
| 9. | PCIe Card Slot (PCIe x16) |

## 2-3 Front Panel LED and Buttons



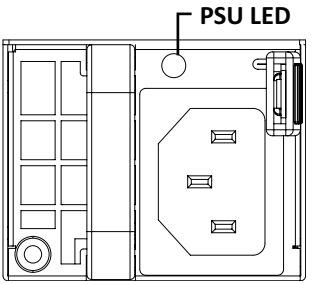

| No. | Name | Color | Status | Description |
|---|---|---|---|---|
| 1. | Reset Button | | | Press the button to reset the system. |
| 2. | ID Button | | | Press the button to activate system identification |
| 3. | Power button with LED | Green | On | System is powered on |
| | | Green | Blink | System is in ACPI S1 state (sleep mode) |
| | | N/A | Off | • System is not powered on or in ACPI S5 state (power off)<br>• System is in ACPI S4 state (hibernate mode) |
| 4. | System Status LED | Green | On | System is operating normally. |
| | | Amber | On | Critical condition, may indicate:<br>System fan failure<br>System temperature |
| | | | Blink | Non-critical condition, may indicate:<br>Redundant power module failure<br>Temperature and voltage issue<br>Chassis intrusion |
| | | N/A | Off | System is not ready, may indicate:<br>POST error<br>Processor or terminator missing |
| 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./7. | LAN 1/2 Active/Link LEDs | Green | 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. | 1GbE Speed LED | Yellow | On | 1 Gbps data rate |
| | | Green | On | 100 Mbps data rate |
| | | N/A | Off | 10 Mbps data rate |
| 2. | 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 Power Supply Unit (PSU) LED




| State | Description |
|---|---|
| OFF | Indicates no AC power to all power supplies |
| 1Hz Blink GREEN | Indicates AC present/ only standby on/ Cold redundant mode |
| Red | Indicates power supply critical event causing shut down: failure, OCP, OVP, Fan Fail, UVP |
| 0.5Hz Blink Red | Indicates AC cord unplugged or AC power lost; with a second power supply in parallel still with AC input power. |
| 1Hz Blink Red/Green Alternative | Indicates power supply warning events where the power supply continues to operate: high temp, high power, high current, slow fan. |

## 2-6 Hard Disk Drive LEDs


| RAID SKU | | LED1 | Locate | HDD Fault | Rebuilding | HDD Access | HDD Present (No Access) |
|---|---|---|---|---|---|---|---|
| No RAID configuration (via HBA) | Disk LED (LED on Back Panel) | Green | ON(*1) | OFF | | BLINK (*2) | OFF |
| | | Amber | OFF | OFF | | OFF | OFF |
| | Removed HDD Slot (LED on Back Panel) | Green | ON(*1) | OFF | | -- | -- |
| | | Amber | OFF | OFF | | -- | -- |
| RAID configuration (via HW RAID Card or SW RAID Card) | Disk LED | Green | ON | OFF | | BLINK (*2) | OFF |
| | | Amber | OFF | ON | (Low Speed: 2 Hz) | OFF | OFF |
| | Removed HDD Slot | Green | ON(*1) | OFF | (*3) | -- | -- |
| | | Amber | OFF | ON | (*3) | -- | -- |

| LED 2 | HDD Present | No HDD |
|---|---|---|
| Green | ON | OFF |

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.

This page intentionally left blank

# Chapter 3 System Hardware Installation

**Pre-installation Instructions**

Computer components and electronic circuit boards can be damaged electrostatic discharge. 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.

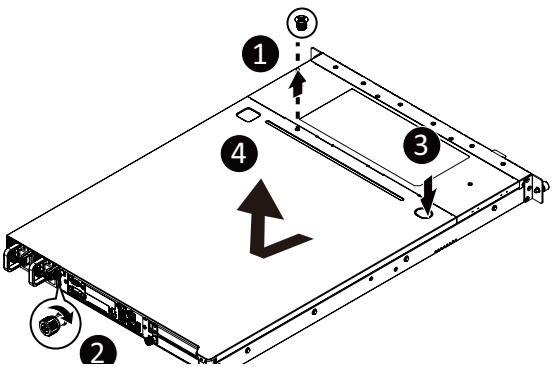
## 3-1 Removing Chassis Cover

Before you remove or install the system cover

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

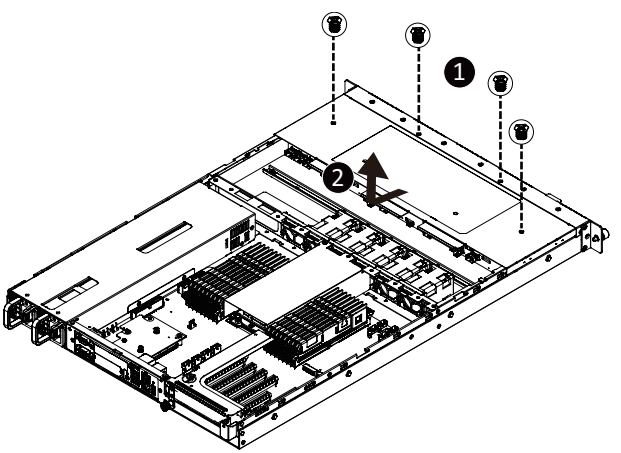
**Follow these instructions to remove the rear system cover:**

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:**

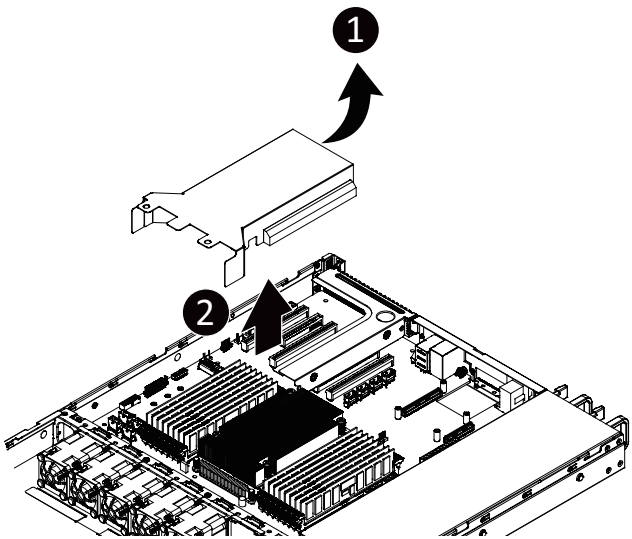
1. Remove the four screws securing the front system cover to the system.
2. Flip open the front system cover.



## 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 Removing and Installing the CPU

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

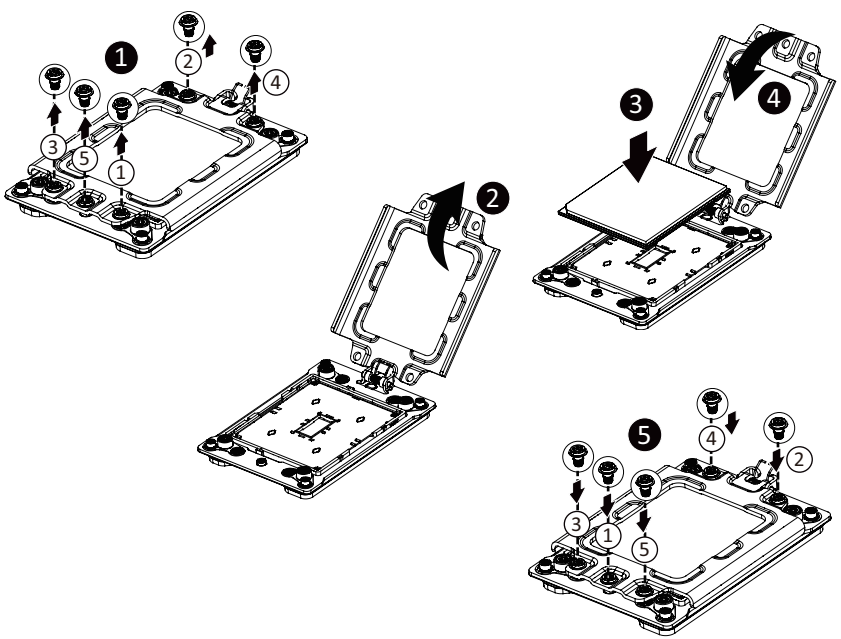
- Make sure that the motherboard supports the CPU.
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Unplug all cables from the power outlets.
- Disconnect all telecommunication cables from their ports.
- Place the system 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. Loosen the three captive screws securing the CPU cover in sequential order (1→2→3→4→5).
2. Flip open the CPU cover.
3. Remove the CPU carrier from the CPU frame using the handle on the CPU carrier.
4. Install the CPU into place in the CPU socket.
5. Flip the CPU cover into place over the CPU socket.
6. Tighten the CPU cover screws in sequential order (1→2→3→4→5) to secure the CPU cover in place.
7. To remove the CPUs, follow steps 1-6 in reverse order.



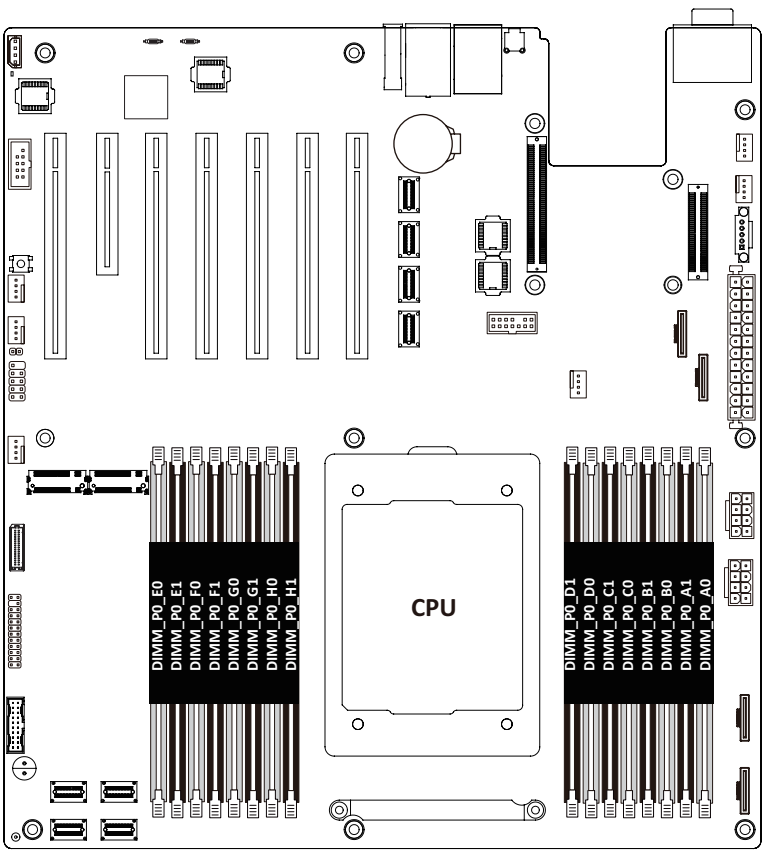
## 3-4 Installing the Memory

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 16 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.



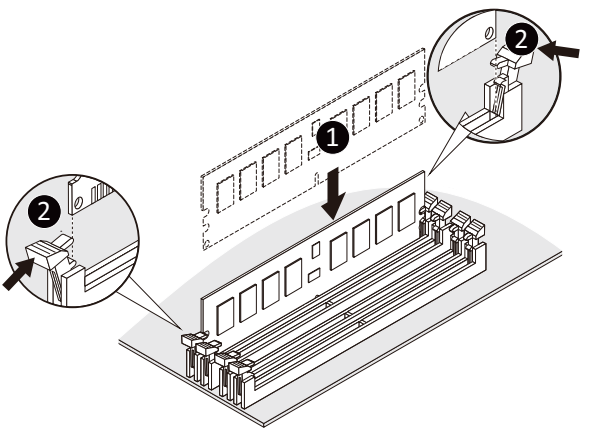
## 3-4-2 Installing a Memory

**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 | 2DPC |
| | | 8Gb | 1.2V | 1.2V |
| RDIMM | SRx4 | 16GB | 3200 | 3200 |
| RDIMM | DRx8 | 16GB | | |

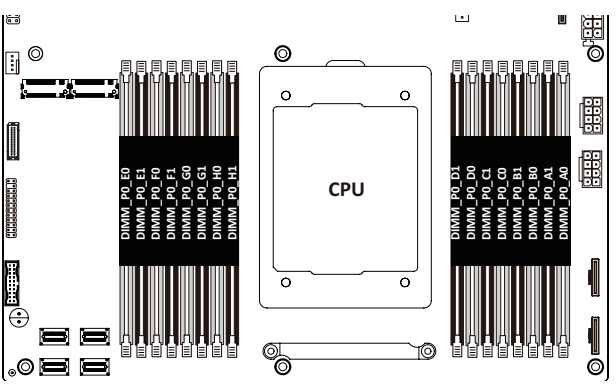
## 3-4-4 Altra Platform DDR4 Suggest Configuration Table

| Channels Used | Channels used ( ✓ = Memory Installed) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | DIMM_P0_E0 | DIMM_P0_F0 | DIMM_P0_G0 | DIMM_P0_H0 | DIMM_P0_D0 | DIMM_P0_C0 | DIMM_P0_B0 | DIMM_P0_A0 |
| 1 | | | | | | | | ✓ |
| 1 | ✓ | | | | | | | |
| 2 | ✓ | | | | | | | ✓ |
| 4 | ✓ | ✓ | | | | | ✓ | ✓ |
| 6 | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| 8 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

| Channels Used | Channels used ( ✓ = Memory Installed) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | DIMM_P0_E0<br>DIMM_P0_E1 | DIMM_P0_F0<br>DIMM_P0_F1 | DIMM_P0_G0<br>DIMM_P0_G1 | DIMM_P0_H0<br>DIMM_P0_H1 | DIMM_P0_D0<br>DIMM_P0_D1 | DIMM_P0_C0<br>DIMM_P0_C1 | DIMM_P0_B0<br>DIMM_P0_B1 | DIMM_P0_A0<br>DIMM_P0_A1 |
| 1 | | | | | | | | ✓ ✓ |
| 1 | ✓ ✓ | | | | | | | |
| 2 | ✓ ✓ | | | | | | | ✓ ✓ |
| 4 | ✓ ✓ | ✓ ✓ | | | | | ✓ ✓ | ✓ ✓ |
| 6 | ✓ ✓ | ✓ ✓ | ✓ ✓ | | | ✓ ✓ | ✓ ✓ | ✓ ✓ |
| 8 | ✓ ✓ | ✓ ✓ | ✓ ✓ | ✓ ✓ | ✓ ✓ | ✓ ✓ | ✓ ✓ | ✓ ✓ |

### 1 DIMM Per Channel

| Channels Used | Channels used ( ✓ = Memory Installed) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | DIMM_P0_E0 | DIMM_P0_F0 | DIMM_P0_G0 | DIMM_P0_H0 | DIMM_P0_D0 | DIMM_P0_C0 | DIMM_P0_B0 | DIMM_P0_A0 |
| 8 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



## 3-5 Installing the PCI Expansion Card

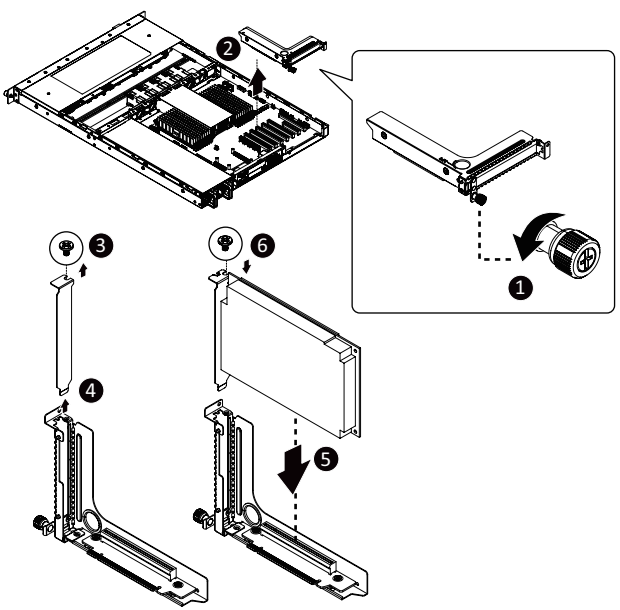
- Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered-down and all power sources have been disconnected from the server prior to installing a PCI card.

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



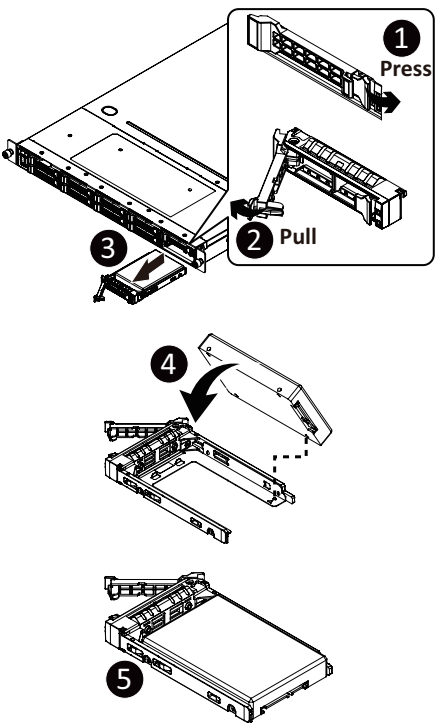
## 3-6 Installing the Hard Disk Drive

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 2.5" hard disk drive:**

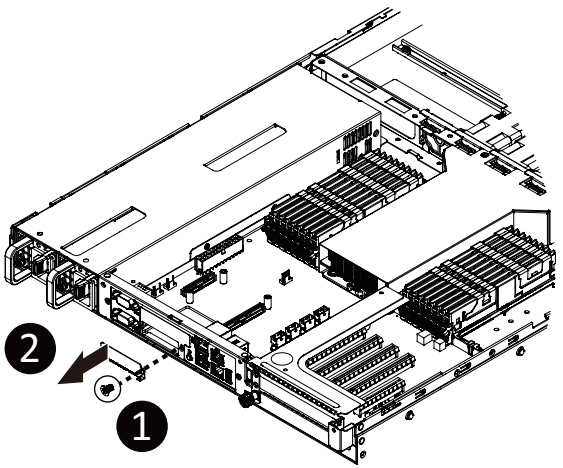
1. Press the release button.
2. Extend the locking lever.
3. Pull the locking lever to remove the HDD tray.
4. Align the hard disk drive with the positioning screw on the HDD tray.
5. Slide hard disk drive into the blank HDD tray.
6. Reinsert the HDD tray into the slot and close the locking lever.

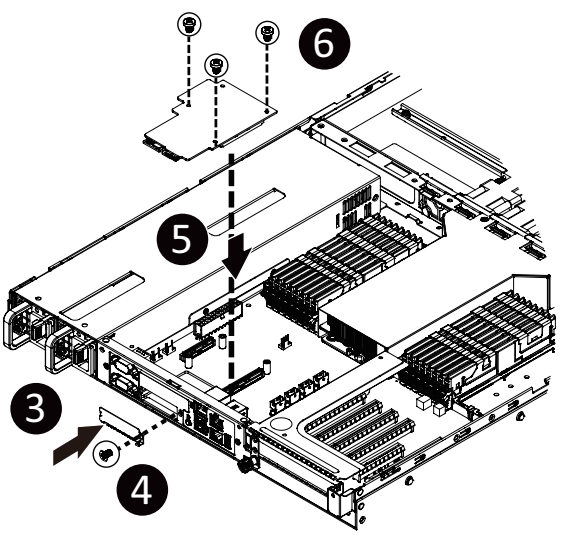


## 3-7 Installing the Mezzanine Card (Optional)

**Follow these instructions to install a mezzanine card:**

1. Remove the screw securing the mezzanine card slot cover.
2. Remove the slot cover from the system.
3. Insert the OCP 2.0 mezzanine card into the compartment ensuring that the card is firmly connected to the connector on the motherboad.
4. Secure the OCP 2.0 mezzanine card into the system with three screws.
5. Reverse steps 3-4 to replace the OCP 2.0 mezzanine card.



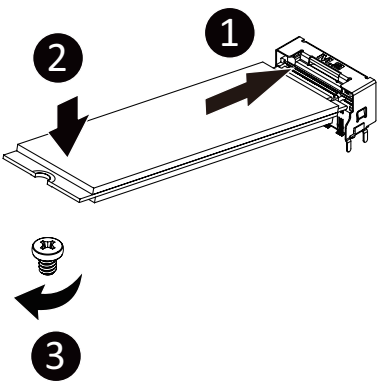
## 3-8 Installing and Removing an M.2 Solid State Drive

**Follow these instructions to install an optional M.2 solid state drive (SSD):**

**NOTE:**

**To install/remove the M.2 heatsink use a No. 1 Phillips-head screwdriver with a screw torque of 1.5 ± 0.2 kgf*cm**

1. Place the solid state drive into the M.2 connector.
2. Secure the solid state drive to the motherboard with a single screw.
   **NOTE:** The position of the screw will depend on the size of the SSD. Refer to the second image below for proper placement.
3. Reverse steps 1-2 to remove the solid state drive.



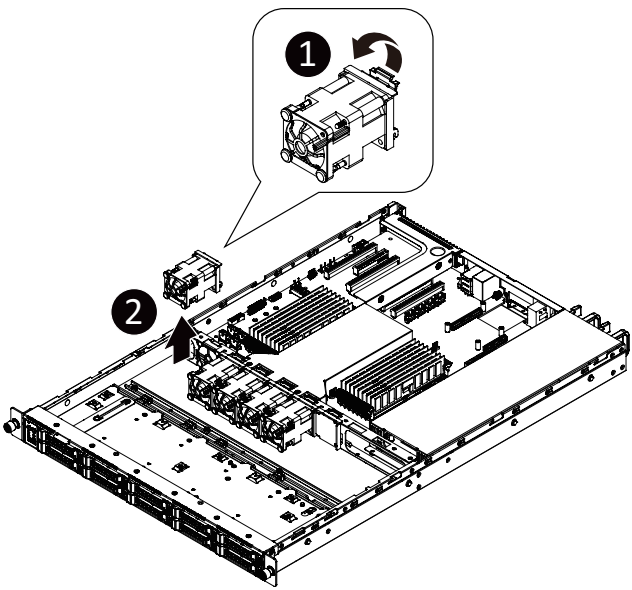
## 3-9 Replacing the FAN Assembly

- 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 removing/installing a system fan.

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

**Follow these instructions to replace the fan assembly:**

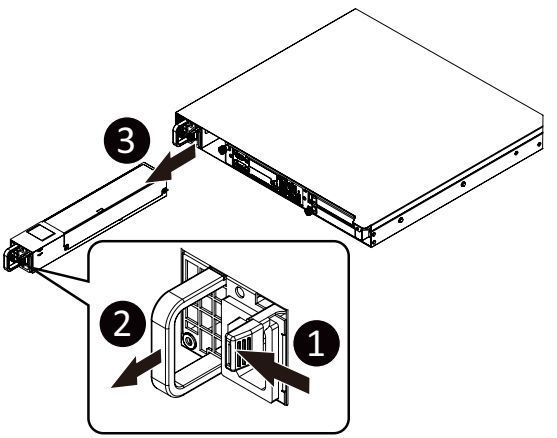
1. Lift up the fan assembly from the chassis.
2. Reverse the previous steps to install the replacement fan assembly.



## 3-10 Replacing the Power Supply

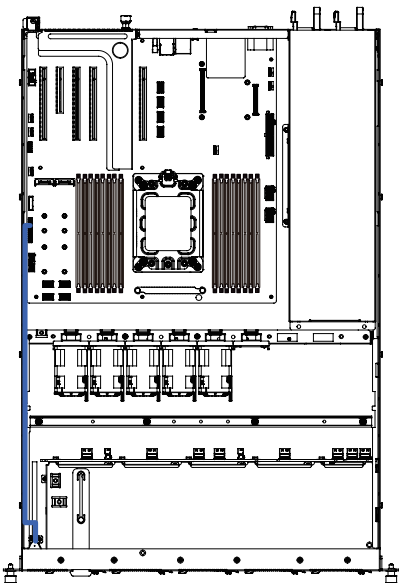
**Follow these instructions to replace the power supply:**

1. Press the retaining clip on the left side of the power supply unit along the direction of the arrow.
2. Pull the power supply handle at the same time and pull out the power supply unit.
3. Insert the replacement power supply unit firmly into the chassis. Connect the AC power cord to the replacement power supply.
4. Repeat steps 1-3 for replacement of the second power supply.

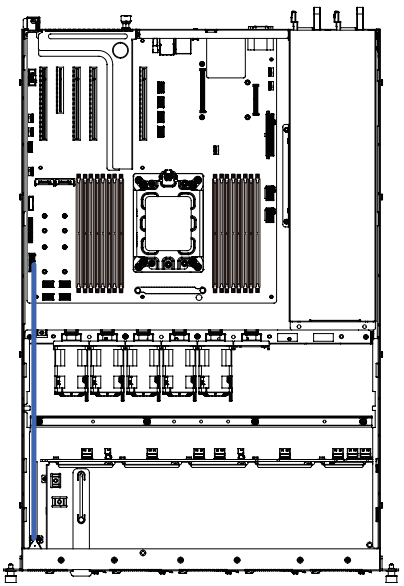


## 3-11 Cable Routing

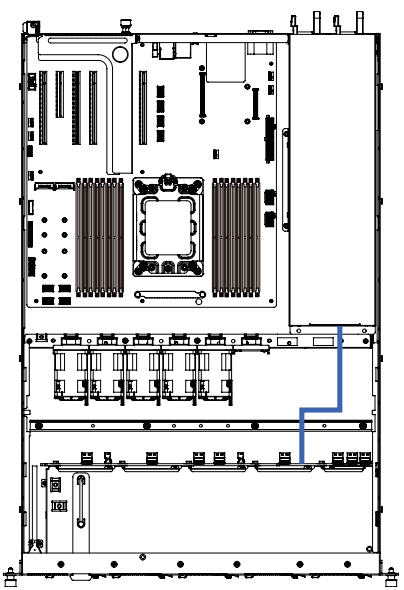
**Front Switch Cable/Front LED Cable**



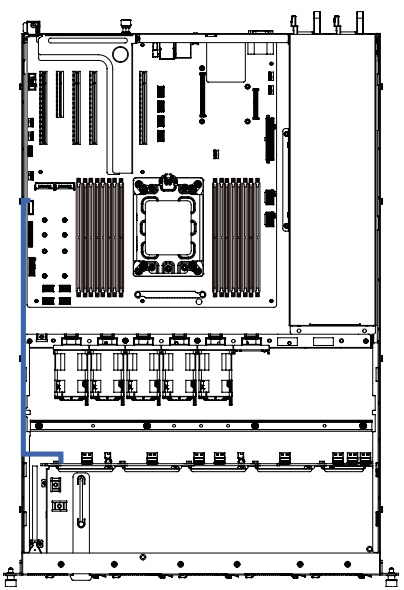
**Front Panel USB 3.0 Cable**



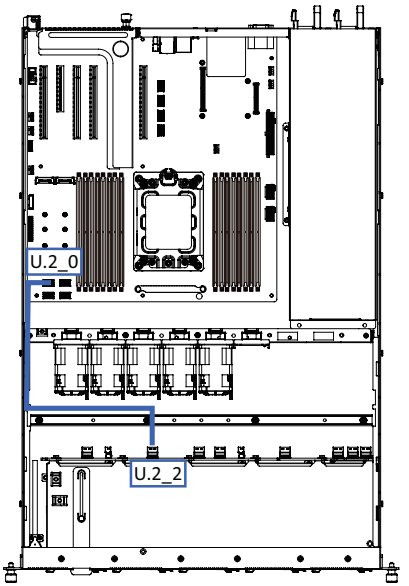
**HDD Back Plane Board Power Cable**



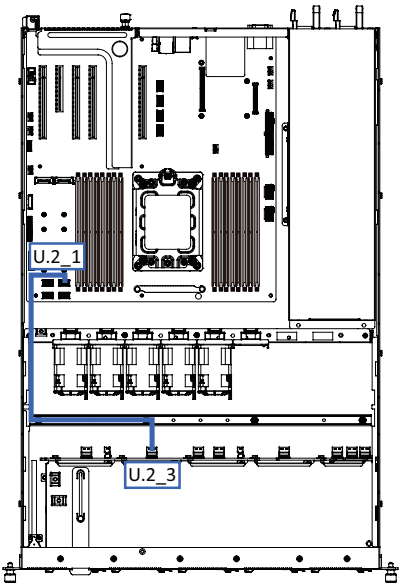
**HDD Back Plane Board Signal Cable**



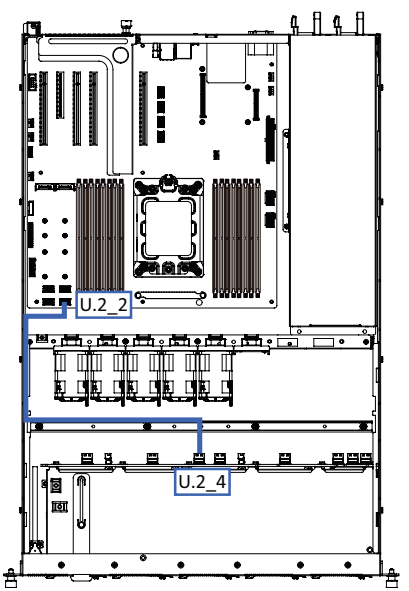
**U.2 NVMe to HDD Back Plane Board Cable (NVMe2)**



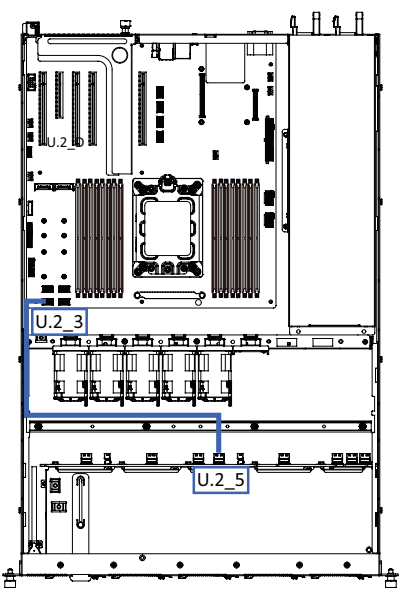

**U.2 NVMe to HDD Back Plane Board Cable (NVMe3)**



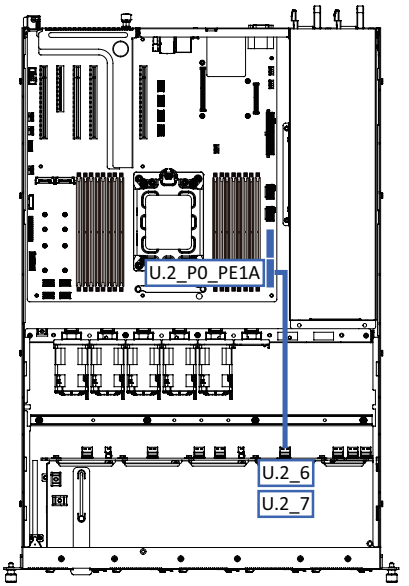

**U.2 NVMe to HDD Back Plane Board Cable (NVMe4)**



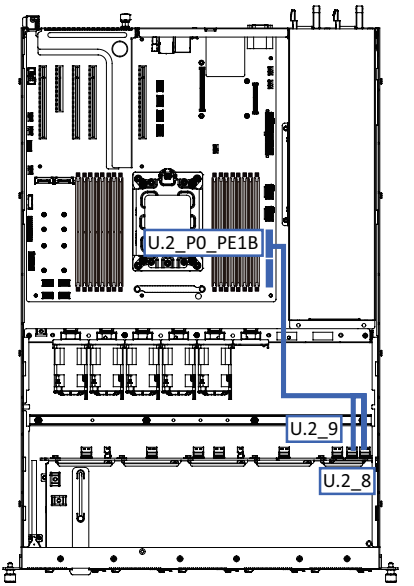

**U.2 NVMe to HDD Back Plane Board Cable (NVMe5)**



**U.2 NVMe to HDD Back Plane Board Cable (NVMe6/NVMe7)**

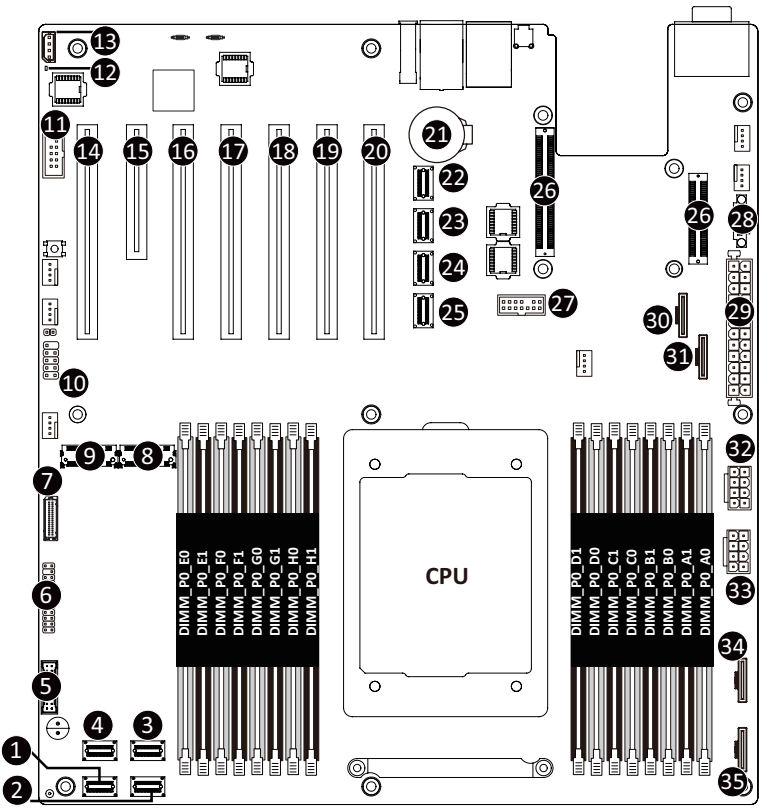



**U.2 NVMe to HDD Back Plane Board Cable (NVMe8/NVMe9)**



# Chapter 4 Motherboard Components

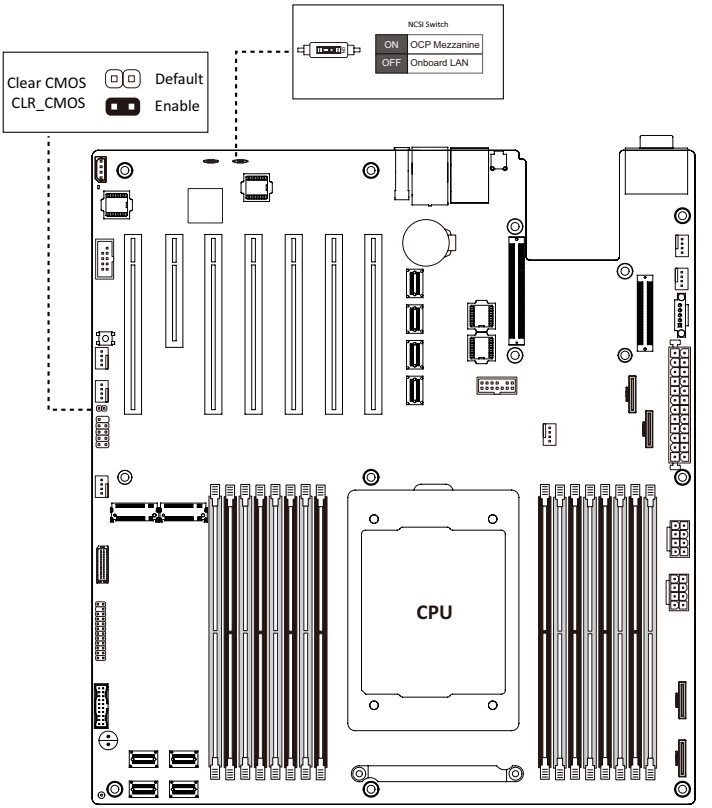
## 4-1 Motherboard Components




| Item | Description |
|---|---|
| 1 | SlimLine SAS Connector (U2_3) |
| 2 | SlimLine SAS Connector (U2_2) |
| 3 | SlimLine SAS Connector (U2_1) |
| 4 | SlimLine SAS Connector (U2_0) |
| 5 | Front panel USB 3.0 Connector |
| 6 | Front Panel Connector |
| 7 | HDD Back Plane Board Connector |

| | |
|---|---|
| 8 | M.2 Connector (PCIe4 x4, NGFF-22110) |
| 9 | M.2 Connector (PCIe4 x4, NGFF-22110) |
| 10 | USB 2.0 Connector |
| 11 | Serial Port Cable Connector |
| 12 | BMC Firmware Readiness LED |
| 13 | IPMB Connector |
| 14 | PCIe x16 Slot #1 (x8 Signal) |
| 15 | PCIe x8 Slot #2 (x8 Signal) |
| 16 | PCIe x16 Slot #3 (x8 Signal) |
| 17 | PCIe x16 Slot #4 (x16 Signal) |
| 18 | PCIe x16 Slot #5 (x8 Signal) |
| 19 | PCIe x16 Slot #6 (x16 Signal) |
| 20 | PCIe x16 Slot #7 (x16 Signal) |
| 21 | System Battery |
| 22 | SlimLine SAS Connector (SLINK0) |
| 23 | SlimLine SAS Connector (SLINK1) |
| 24 | SlimLine SAS Connector (SLINK2) |
| 25 | SlimLine SAS Connector (SLINK3) |
| 26 | OCP Mezzanine Connector |
| 27 | TPM Module Connector |
| 28 | PMBus Connector |
| 29 | 2 x 13 Pin Power Connector |
| 30 | SlimLine Connector (U2_A0) |
| 31 | SlimLine Connector (U2_B0) |
| 32 | 2 x 4 Pin 12V Power Connector |
| 33 | 2 x 4 Pin 12V Power Connector |
| 34 | SlimLine Connector (U2_P0_PE1B) |
| 35 | SlimLine Connector (U2_P0_PE1A) |

## 4-2 Jumper Settings



This page intentionally left blank

# 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 <DEL> 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 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 |
| <+> | 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<br>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.
- **Server Management**
  Server additional features enabled/disabled setup menus.
- **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.)

# 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.

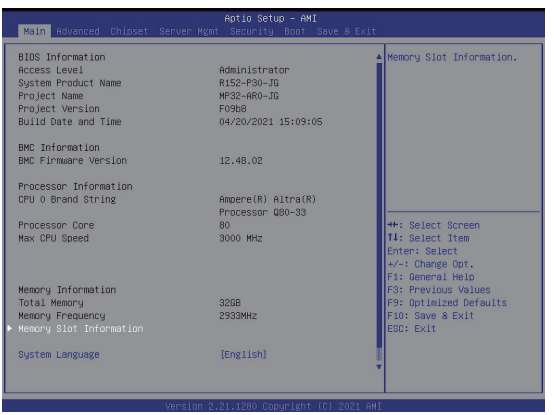
**Main Menu Help**

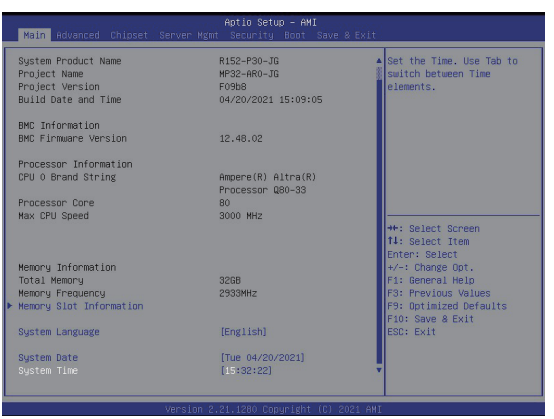
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

**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.

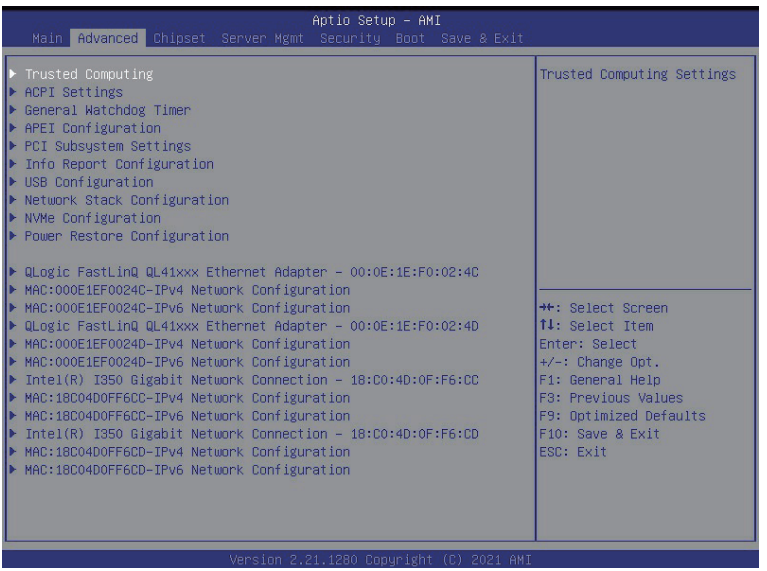


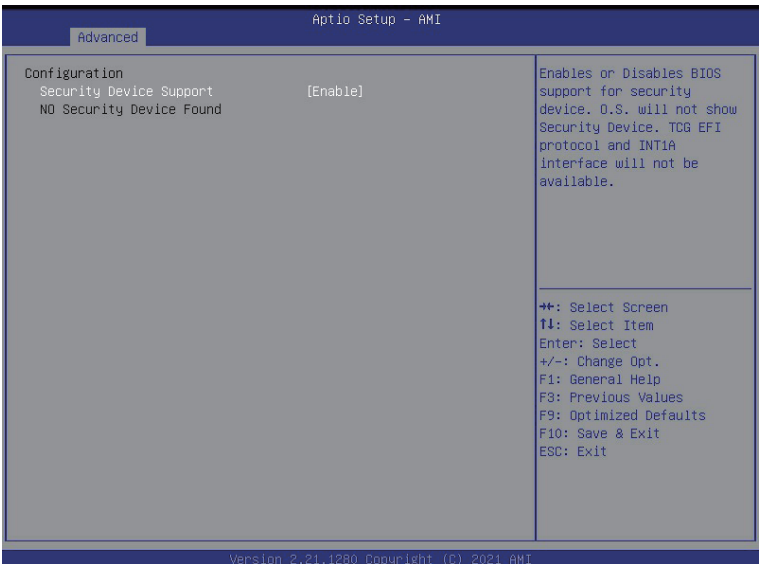
| Parameter | Description |
|---|---|
| BIOS Information | |
| Access Level | Display the privileges level information. |
| System Project Name | Displays the system project name information. |
| Project Name | Displays the motherboard project name information. |
| Project Version | Displays version number of the BIOS setup utility. |
| Build Date and Time | Displays the date and time when the BIOS setup utility was created. |
| BMC Information | |
| BMC Firmware Version | Displays version number of the BIOS setup utility. |
| Processor Information | |
| CPU0 Brand String<br>Processor Core<br>Max CPU Speed | Displays the technical specifications for the installed processor. |
| Memory Information | |
| Total Memory<br>Memory Frequency | Displays the technical specifications for the installed memory. |
| Memory Slot Information | Press [Enter] to view installed memory slot information. |
| System Language | Option: English |
| 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.

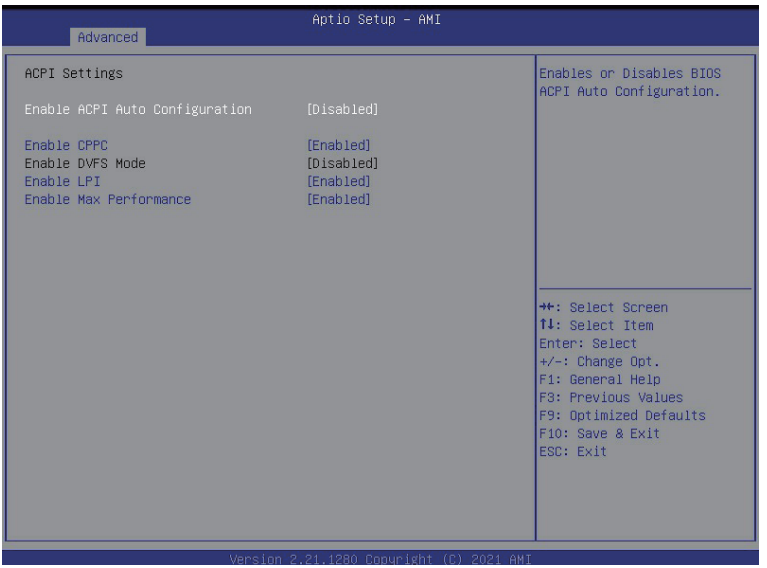


## 5-2-1 Trusted Computing



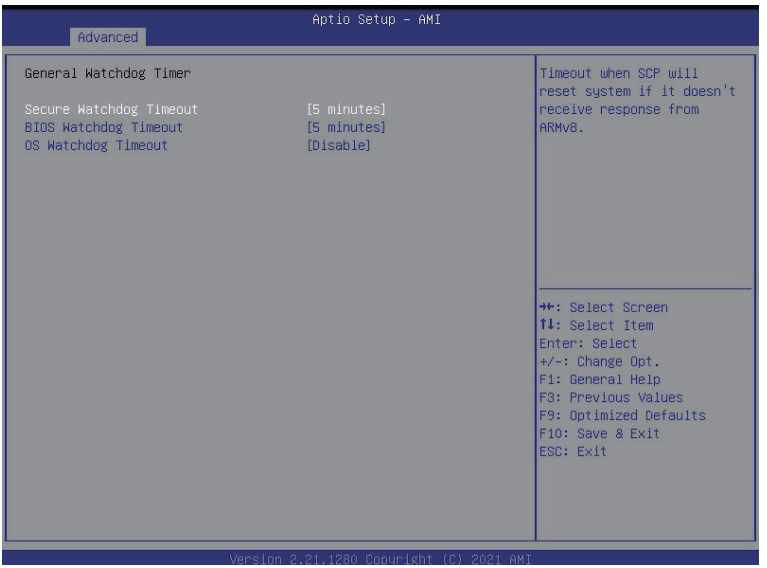

| Parameter | Description |
|---|---|
| Configuration | |
| Security Device Support | Select Enabled to activate TPM support feature.<br>Options available: Enable/Disable. Default setting is **Enable**. |

## 5-2-2 ACPI Settings



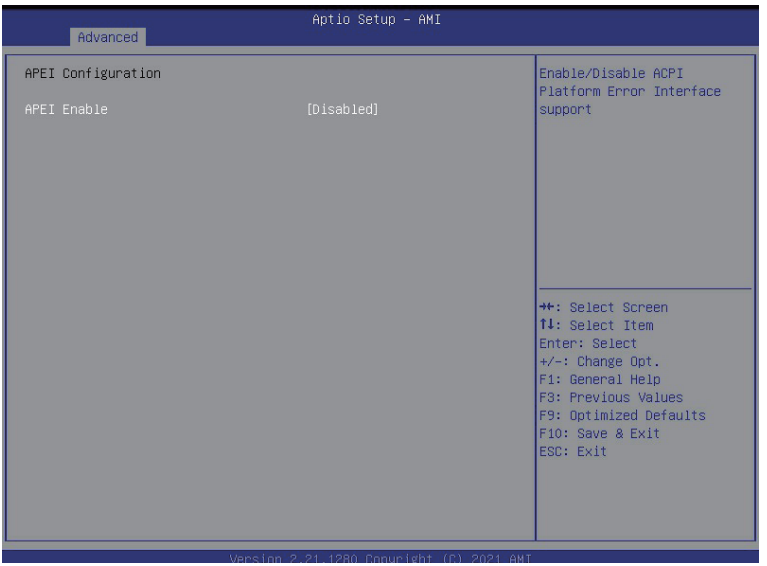

| Parameter | Description |
|---|---|
| ACPI Settings | |
| Enable ACPI Auto Configuration | Enable or disable BIOS ACPI auto configuration.<br>Options available: Enabled/Disabled. Default setting is **Enabled**. |
| Enable CPPC | Enable or disable CPPC.<br>Options available: Enable/Disable. Default setting is **Enabled**. |
| Enable DVFS Mode | Options available: Enabled/Disabled. Default setting is **Disabled**. |
| Enable LPI | Options available: Enabled/Disabled. Default setting is **Enabled**. |
| Enable Max Performance | Options available: Enabled/Disabled. Default setting is **Enabled**. |

## 5-2-3 General Watchdog



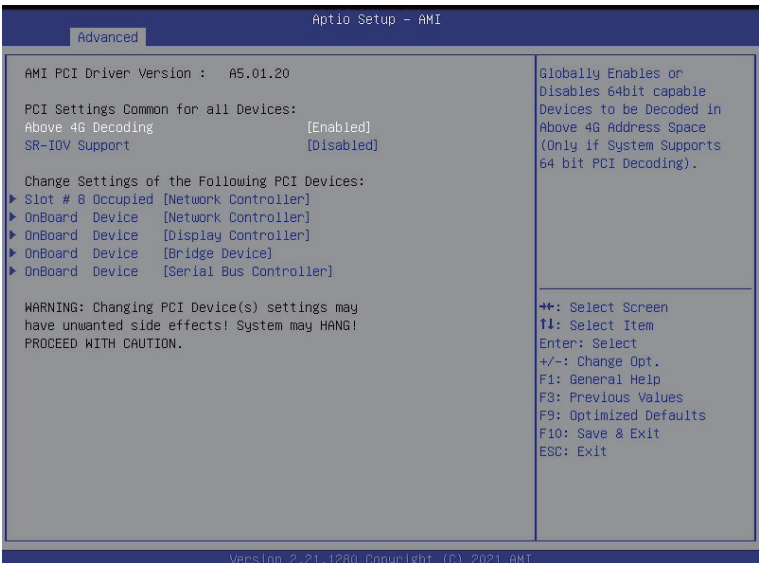

| Parameter | Description |
|---|---|
| General Watchdog Timer | |
| Secure Watchdog Timeout | Timeout when SCP will reset system if it doesn't receive response from ARMv8.<br>Options available: 5 minutes/6 minutes/10 minutes/15 minutes/25 minutes.<br>Default setting is **5 minutes**. |
| BIOS Watchdog Timeout | Options available: 5 minutes/6 minutes/10 minutes/15 minutes/25 minutes.<br>Default setting is **5 minutes**. |
| OS Watchdog Timeout | Timeout when boot OS.<br>Options available: Disable/3 minutes/4 minutes/5 minutes/6 minutes/ 10 minutes/15 minutes/20 minutes.<br>Default setting is **Disable**. |

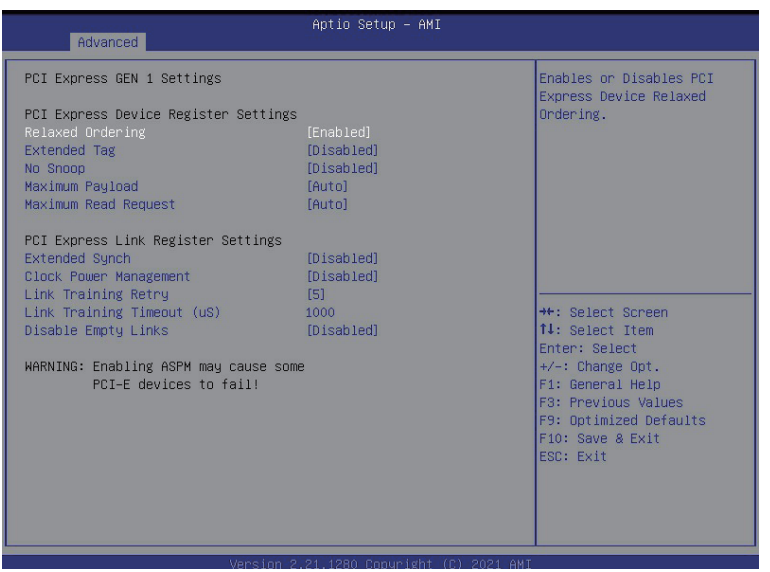
## 5-2-4 APEI Configuration




| Parameter | Description |
|---|---|
| APEI Configuration | |
| APEI Enable | Enable/Disable ACPI Platform Error Interface support.<br>Options available: Enabled/Disabled.<br>Default setting is **Disabled**. |

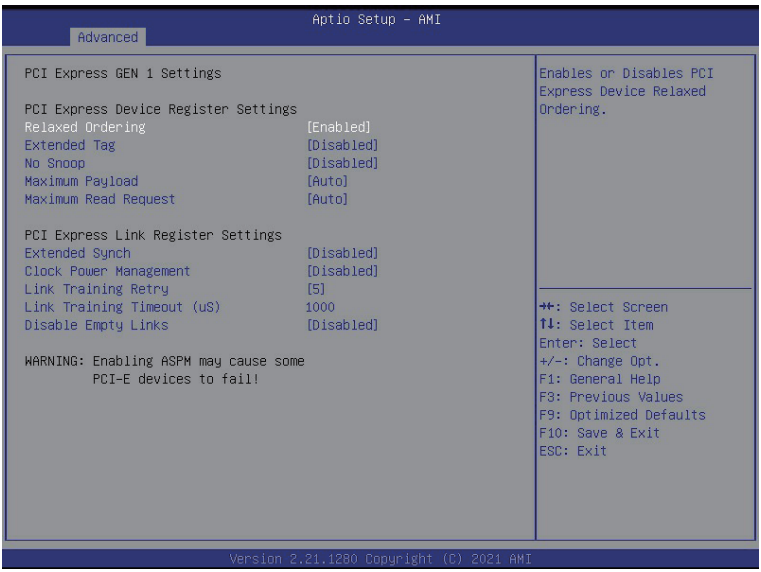
## 5-2-5 PCI Subsystem Settings



| Parameter | Description |
|---|---|
| AMI PCI Bus Driver Version | Displays the AMI PCI Bus Driver version information. |
| Above 4G Decoding | Enable/Disable memory mapped I/O to 4GB or greater address space (Above 4G Decoding).<br>Options available: Enabled/Disabled. Default setting is **Disabled**. |
| SR-IOV Support | If the system has SR-IOV capable PCIe devices, this item Enable/Disable Single Root IO Virtualization Support.<br>Options available: Enabled/Disabled. Default setting is **Enabled**. |
| Change Settings of the Following PCI Devices | |
| Slot #8 Occupied<br>Onboard Device_# | ◆ PCI Latency Timer<br>– Value to be programmed onto PCI Latency Timer Register.<br>Options available: 32/64/96/128/160/192/224/248 PCI Bus Clocks. Default setting is **32 PCI Bus Clocks**.<br><br>◆ PCI-X Latency Timer<br>– Value to be programmed onto PCI Latency Timer Register.<br>Options available: 32/64/96/128/160/192/224/248 PCI Bus Clocks. Default setting is **64 PCI Bus Clocks**.<br><br>◆ VGA Palette Snoop<br>– Enable or disable VGA Palette Registers Snooping.<br>Options available: Enabled/Disabled. Default setting is **Disabled**.<br><br>◆ PERR#<br>– Enable or disable PCI device to generate PERR.<br>Options available: Enabled/Disabled. Default setting is **Disabled**.<br>◆ SERR#<br>– Enable or disable PCI device to generate SERR.<br>Options available: Enabled/Disabled. Default setting is **Disabled**. |
| Disable Above 4G Decoding | Options available: Enabled/Disabled. Default setting is **Disabled**. |
| Disable PCIe Init | Options available: Enabled/Disabled. Default setting is **Disabled**. |
| Disable PCIe GEN2 | Options available: Enabled/Disabled. Default setting is **Disabled**. |

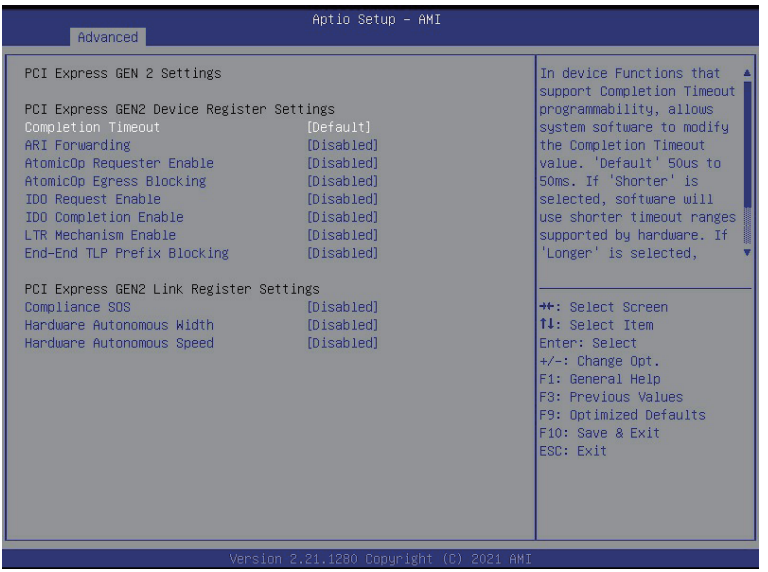
## 5-2-5-1 PCI Express GEN 1 Settings




| Parameter | Description |
|---|---|
| PCI Express GEN1 Setting | PCI Express GEN1 Device Register Settings<br>◆ Relaxed Ordering<br>– Enable or disable PCI Express Device Relaxed Ordering.<br>Options available: Enabled/Disabled. Default setting is **Enabled**.<br><br>◆ Extend Tag<br>– If enabled, allows device to use 8-bit Tag field as a requester.<br>Options available: Enabled/Disabled. Default setting is **Disabled**.<br><br>◆ No Snoop<br>– Enable or disable PCI Express Device No Snoop option.<br>Options available: Enabled/Disabled. Default setting is **Disabled**.<br><br>◆ Maximum Payload<br>– Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.<br>Options available: Auto/128 Bytes/ 256 Bytes. Default setting is **Auto**. |

| Parameter | Description |
|---|---|
| PCI Express GEN1 Setting | PCI Express Device Link Register Settings<br>◆ Maximum Read Request<br>– Set Maximum Read Request of PCI Express Device or allow System BIOS to select the value.<br>Options available: Auto/128 /256/512/1024/2048/4096 Bytes. Default setting is **Auto**.<br><br>◆ Extended Synch<br>– If enabled, allows generation of Extended Synchronization patterns.<br>Options available: Enabled/Disabled. Default setting is **Disabled**.<br><br>◆ Clock Power Management<br>– If support by hardware and set to 'Enabled', the device is permitted to use CLKREQ# signal for power management of link clock in accordance to protocol defined in appropriate form factor specification.<br>Options available: Enabled/Disabled. Default setting is **Disabled**.<br><br>◆ Link Training Retry<br>– Defines numbers of Retry Attempts software will take to retrain the link if previous training attempt was unsuccessful.<br>Options available: Disabled/2/3/5. Default setting is **Disabled**.<br><br>◆ Link Training Timeout (uS)<br>Press '+' and '-' keys to set the values.<br>◆ Link Training Retry<br>– Defines numbers of Retry Attempts software will take to retrain the link if previous training attempt was unsuccessful.<br>–<br>◆ Disable Empty Links<br>– In order to save software will disable unpopulated PCI Express Device links, if this option set to 'Disabled Link'.<br>Options available: Enabled/Disabled. Default setting is **Disabled**. |

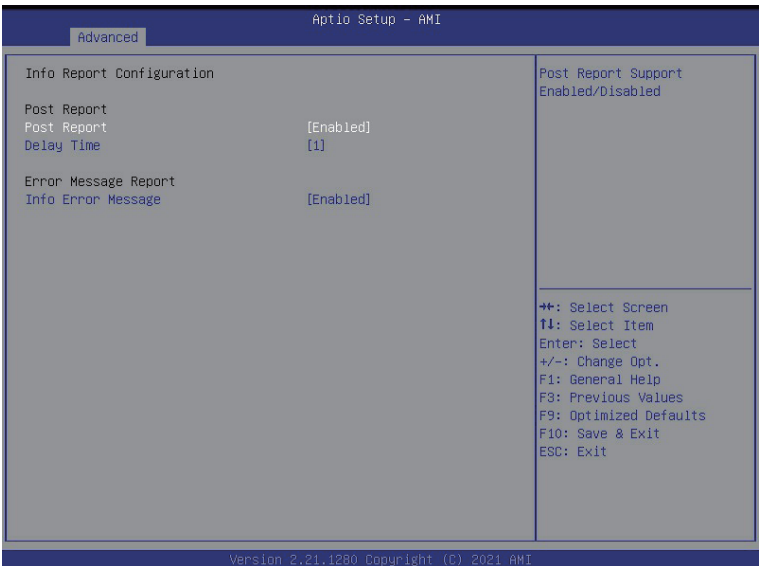
## 5-2-5-2 PCI Express GEN 2 Settings



| Parameter | Description |
|---|---|
| | PCI Express GEN2 Device Register Settings<br>◆ Completion Timeout<br>– In device Functions that support Completion Timeout programmability, allows system software to modify the Completion Timeout value. 'Default' 50us to 50ms. If 'Shorter' is selected, software will use shorter timeout ranges supported by hardware. If 'Longer' is selected, software will use longer timeout ranges.<br>Options available: Default/Shorter/Longer/Disabled. Default setting is **Default**.<br><br>◆ ARI Forwarding<br>– If supported by hardware and set to 'Enabled', the Downstream Port disables its traditional Device Number field being 0 enforcement when turning a Type1 Configuration Request into a Type0 Configuration Request, permitting access to Extended Functions in an ARI Device immediately below the Port. |
| PCI Express GEN2 Setting | Options available: Default/Shorter/Longer/Disabled. Default setting is **Default**.<br><br>◆ AtomicOp Requester Enable<br>– If supported by hardware and set to 'Enabled', this function initiates AtomicOp Requests only if Bus Master Enable bit is in the Command Register Set.<br>Options available: Enabled/Disabled. Default setting is **Disabled**.<br><br>◆ AtomicOp Egress Blocking<br>– If supported by hardware and set to 'Enabled', outbound AtomicOp Requestsvia Egress Ports will be blocked.<br>Options available: Enabled/Disabled. Default setting is **Disabled**.<br><br>◆ IDO Request Enable<br>– If supported by hardware and set to 'Enabled', this permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated..<br>Options available: Enabled/Disabled. Default setting is **Disabled**. |

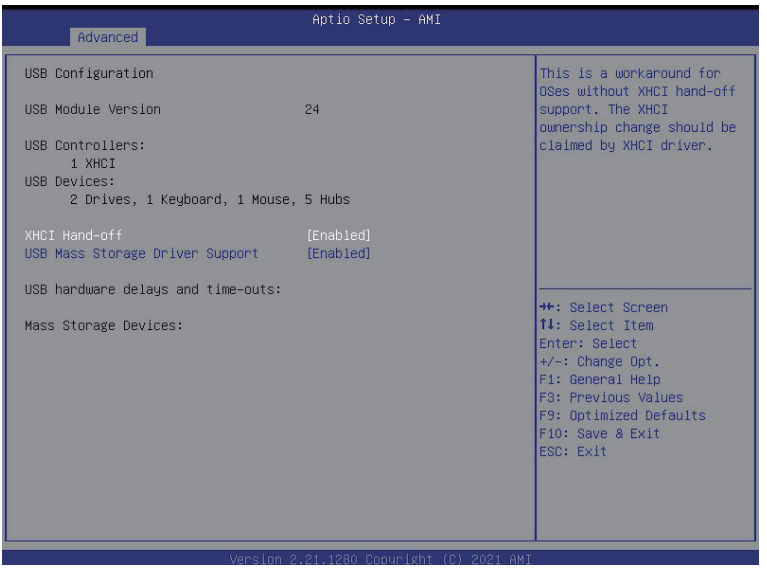
| Parameter | Description |
|---|---|
| PCI Express GEN2 Setting | PCI Express GEN2 Device Register Settings<br><br>◆ IDO Request Enable<br>– If supported by hardware and set to 'Enabled', this permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated.<br>Options available: Enabled/Disabled. Default setting is **Disabled**.<br>◆ IDO Completion Enable<br>– If supported by hardware and set to 'Enabled', this permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated.<br>Options available: Enabled/Disabled. Default setting is **Disabled**.<br>◆ LTR Mechanism Enable<br>– If supported by hardware and set to 'Enabled', this enables the Latency Tolerance Reporting (LTR) Mechanism.<br>Options available: Enabled/Disabled. Default setting is **Disabled.**<br>◆ End-End TLP Prefix Blocking<br>– If supported by hardware and set to 'Enabled', this function will block forwarding of TLPs containing End-End TLP Prefixes.<br>Options available: Enabled/Disabled. Default setting is **Disabled.**<br><br>PCI Express GEN2 Device Link Settings<br><br>◆ Compliance SOS<br>– If supported by hardware and set to 'Enabled', this will force LTSSM to send SKP Ordered Sets between sequences when sending Compliance Pattern or Modified Compliance Pattern.<br>Options available: Enabled/Disabled. Default setting is **Disabled.**<br>◆ Hardware Autonomous Width<br>– If supported by hardware and set to 'Disabled', this will disable the hardware's ability to change link width except width size reduction for the purpose of correcting unstable link operation.<br>Options available: Enabled/Disabled. Default setting is **Disabled.**<br>◆ Hardware Autonomous Speed<br>– If supported by hardware and set to 'Disabled', this will disable the hardware's ability to change link speed except speed rate reduction for the purpose of correcting unstable link operation<br>Options available: Enabled/Disabled. Default setting is **Disabled.** |

## 5-2-6 Info Report Configuration




| Parameter | Description |
|---|---|
| Info Report Configuration | |
| Post Report | |
| Post Report | Enable/Disable Post Report support.<br>Options available: Enabled/Disabled. Default setting is Enabled. |
| Delay Time | Options available: 0/1/2/3/4/5/6/78/9/10/Util Press ESC.<br>Default setting is **1**. |
| Error Message Report | |
| Info Error Message | Enable/Disable Info Error Message support.<br>Options available: Enabled/Disabled. Default setting is **Enabled**. |

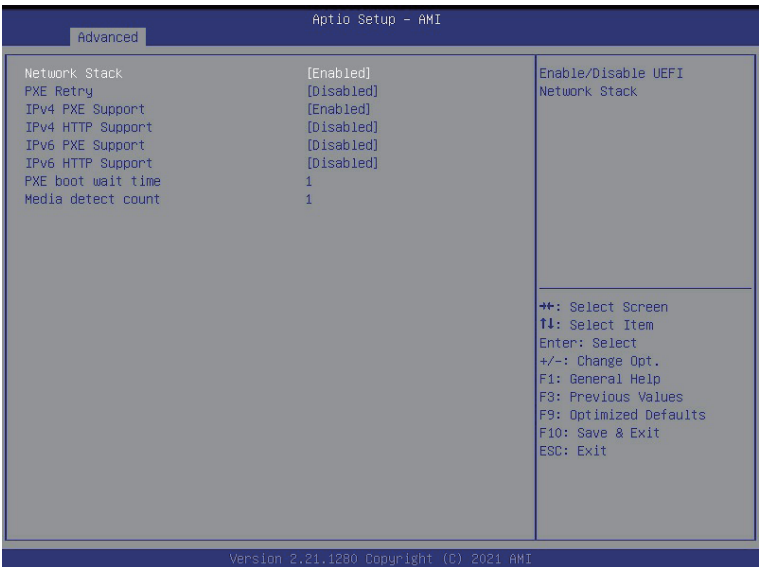
## 5-2-7 USB Configuration




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

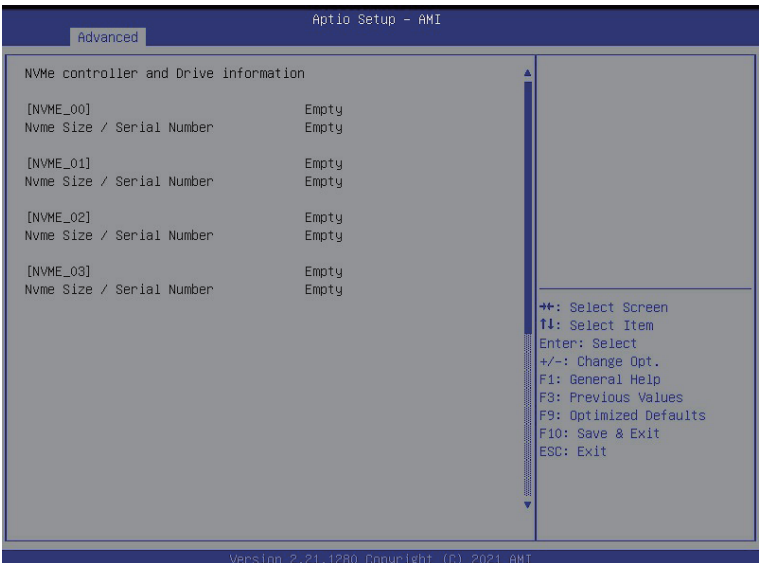
(Note) This item is present only if you attach USB devices.

## 5-2-8 Network Stack



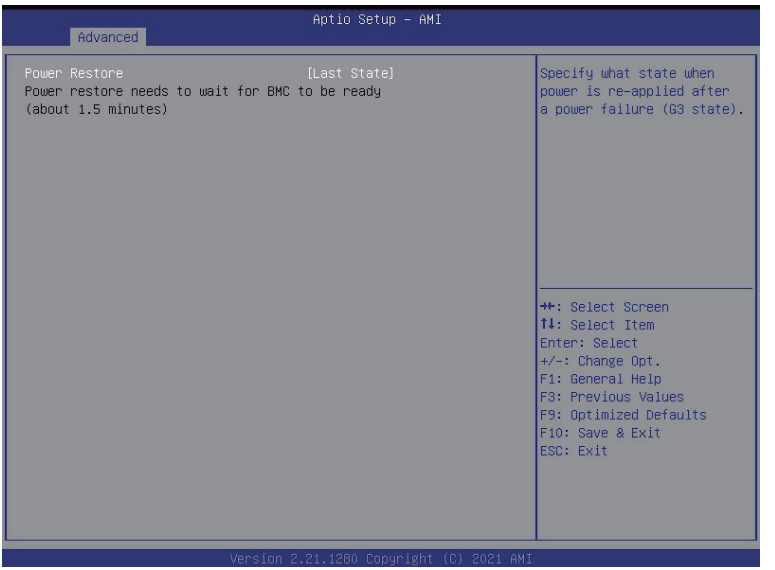

| Parameter | Description |
|---|---|
| Network Stack | Enable/Disable the UEFI network stack.<br>Options available: Enabled/Disabled. Default setting is **Enabled**. |
| Ipv4 PXE Support | Enable/Disable the Ipv4 PXE feature.<br>Options available: Enabled/Disabled. Default setting is **Enabled**. |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

## 5-2-9 NVMe Configuration



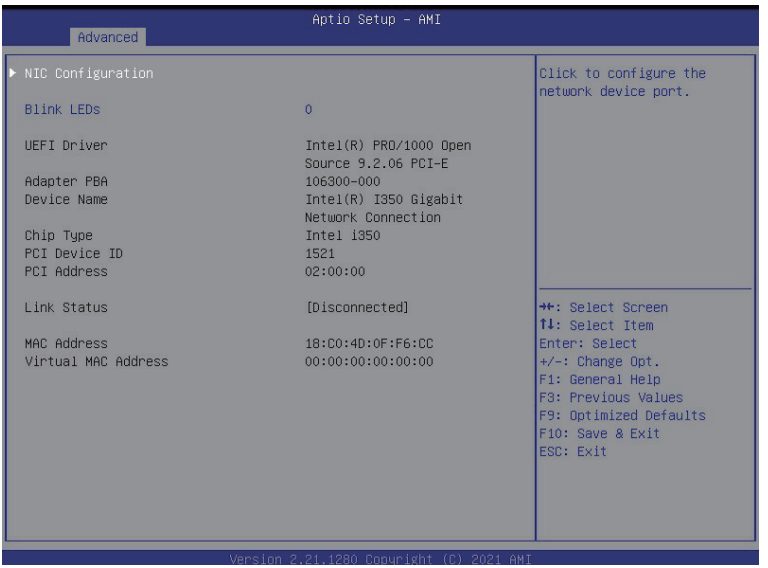

| Parameter | Description |
|---|---|
| NVMe controller and Drive Information | Displays the NVMe devices connected to the system. |

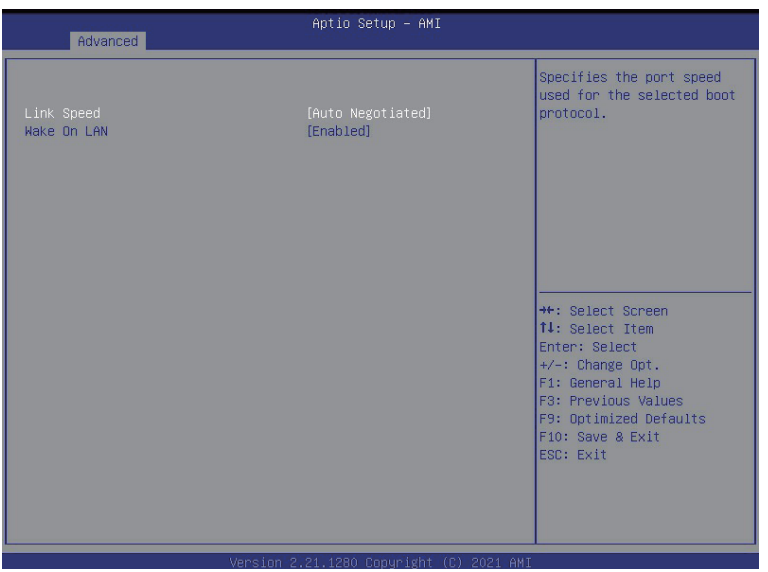
## 5-2-10 Power Restore Configuration




| Parameter | Description |
|---|---|
| Power Restore | Specify what state when power is re-applied after a power failure (G3 state).<br>Options available: Last State/Power On/Power Off.<br>Default setting is **Last State**. |

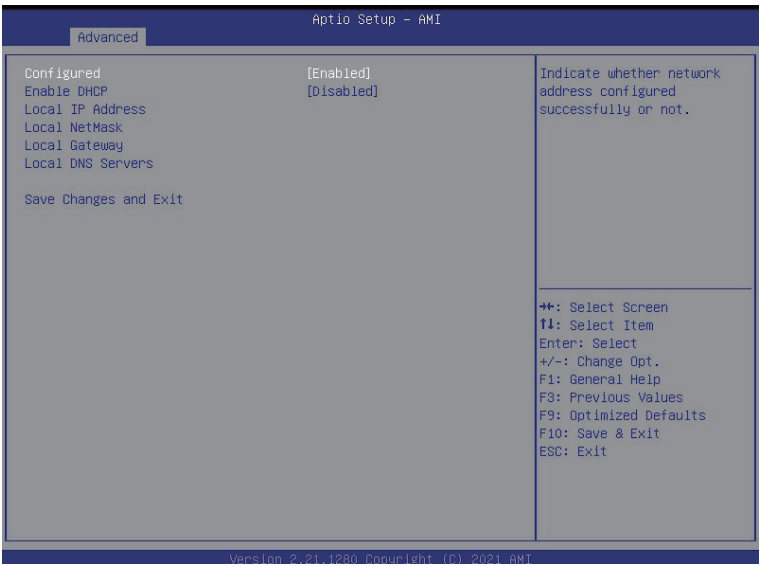
## 5-2-11 Intel(R) I350 Gigabit Network Connection



| Parameter | Description |
|---|---|
| NIC Configuration | Press [Enter] to configure advanced items.<br>◆ Link Speed<br>– Allows for automatic link speed adjustment.<br>– Options available: Auto Negotiated/10 Mbps Half/10 Mbps Full/100 Mbps Half/100 Mbps Full. Default setting is **Auto Negotiated**.<br>◆ Wake On LAN<br>– Enables power on of the system via LAN. Note that configuring Wake on LAN in the operating system does not change the value of this setting, but does override the behavior of Wake on LAN in OS controlled power states.<br>– Options available: Enabled/Disabled. Default setting is **Enabled**. |
| Blink LEDs | Identifies the physical network port by blinking the associated LED.<br>Press the numeric keys to adjust desired values. |
| UEFI Driver | Displays the technical specifications for the Network Interface Controller. |
| Adapter PBA | Displays the technical specifications for the Network Interface Controller. |
| Device Name | Displays the technical specifications for the Network Interface Controller. |
| Chip 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. |
| MAC Address | Displays the technical specifications for the Network Interface Controller. |
| Virtual MAC Address | Displays the technical specifications for the Network Interface Controller. |

## 5-2-12 MAC IPv4 Network Configuration




| Parameter | Description |
|---|---|
| Configured(Note) | Options available: Enabled/Disabled. Default setting is **Disabled.** |
| Enable DHCP | Options available: Enabled/Disabled. Default setting is **Enabled.** |
| Local IP Address | Press [Enter] to configure local IP address. |
| Local NetMask | Press [Enter] to configure local NetMask. |
| Local Gateway | Press [Enter] to configure local Gateway |
| Local DNS Servers | Press [Enter] to configure local DNS servers |
| Save Changes and Exit | Press [Enter] save all configurations. |

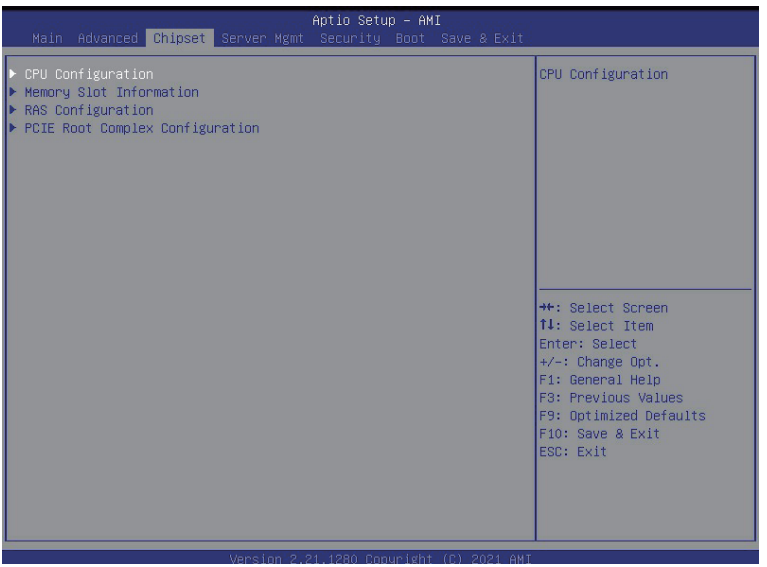
(Note) Advance items prompt when this item set to **Enabled**.

## 5-2-13 MAC IPv6 Network Configuration


| Parameter | Description |
|---|---|
| Enter Configuration Menu | Press [Enter] for configuration of advanced items. |

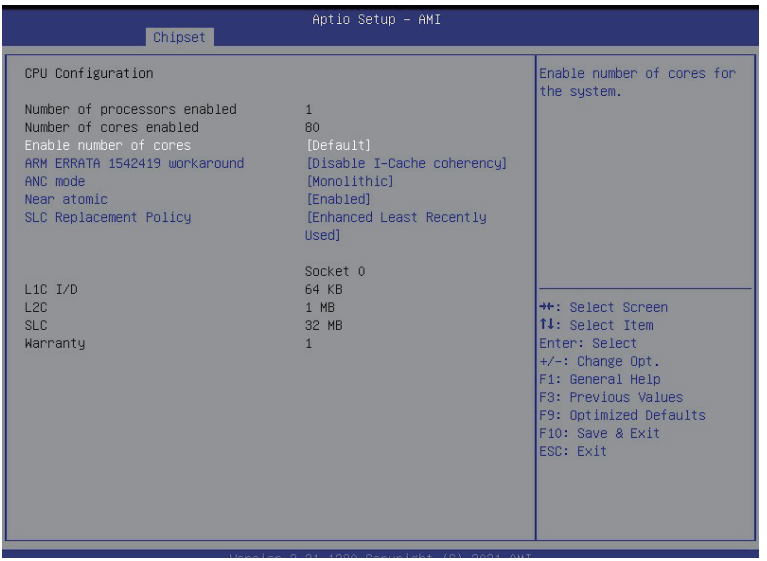
## 5-3 Chipset Setup Menu

Chipset Setup menu displays submenu options for configuring the function of the North Bridge. Select a submenu item, then press [Enter] to access the related submenu screen.



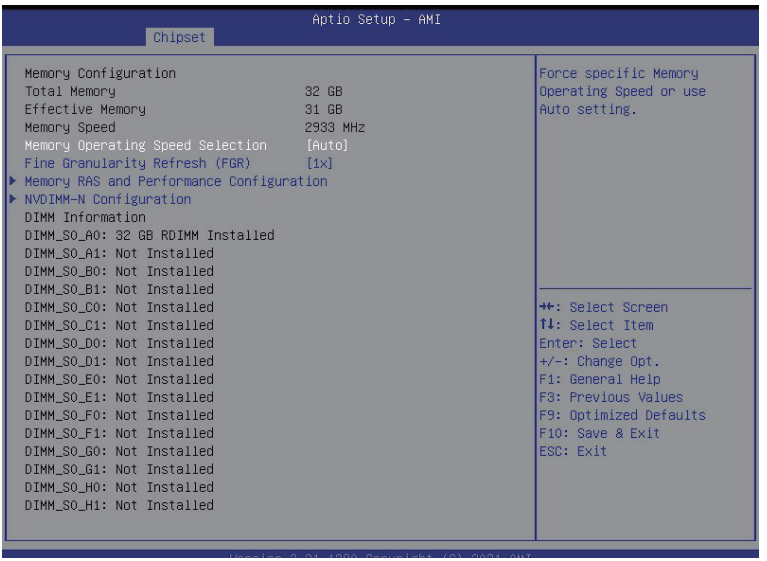

| Parameter | Description |
|---|---|
| CPU Configuration | Press [Enter] for configuration of advanced items. |
| Memory Slot Configuration | Press [Enter] for configuration of advanced items. |
| RAS Configuration | Press [Enter] for configuration of advanced items. |
| PCIE Root Complex Configuration | Press [Enter] for configuration of advanced items. |

## 5-3-1 CPU Configuration



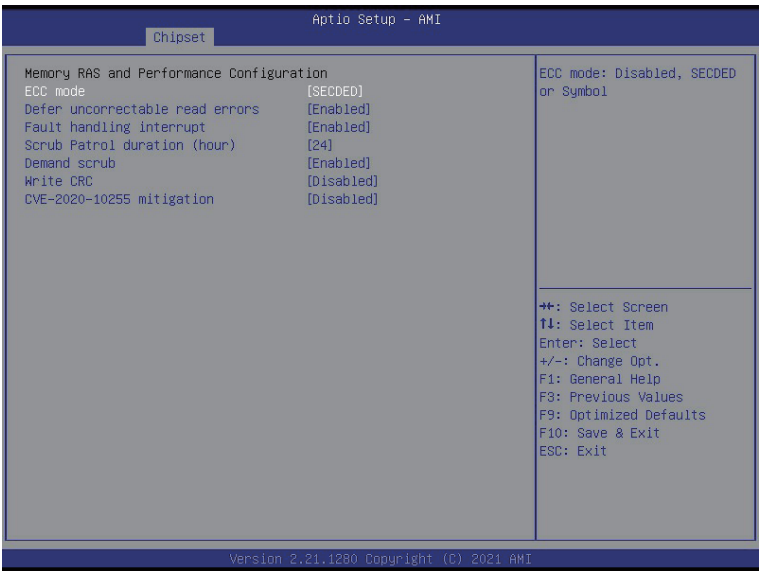

| Parameter | Description |
|---|---|
| CPU Configuration | |
| Numbers of processor enabled | Displays the number of installed processor information. |
| Enable number of cores | Option: Default/2/4/6/8/10/12/14/16/18/20/22/24/26/28/30/32/34/36....80.<br>Default Setting is **Default**. |
| ARM ERRATA 1542419 workaround | Option available: Disable I-Cache coherency/Software solution/Disable.<br>Default Setting is **Disable I-Cache coherency**. |
| ANC mode | Option available: Monolithic/Hemisphere/Quadrant.<br>Default Setting is **Monolithic**. |
| Near atomic | Enable/disable cacheable atomic instruction executed near in CPU.<br>Option available: Enabled/Disabled.<br>Default Setting is **Enabled**. |
| SLC Replacement Policy | Option available: Enhanced Least Recently Used/Linear-Feedback Shift Register.<br>Default Setting is **Enhanced Least Recently Used**. |
| L1C I/D<br>L2C<br>SLC<br>Warranty | Displays the technical specifications for the installed processor. |

## 5-3-2 Memory Slot Information



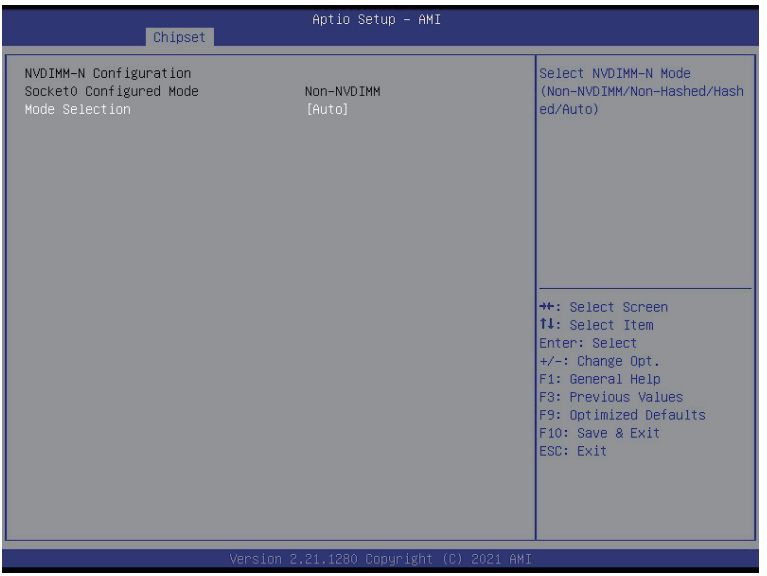

| Parameter | Description |
|---|---|
| Memory Configuration | |
| Total Memory<br>Effective Memory<br>Memory Speed | Displays the technical specifications for the installed DIMM. |
| Memory Operating Speed Selection | Option available: Auto/2133/2400/2666/2933/3200.<br>Default setting: **Auto**. |
| Fine Granularity Refresh (FGR) | Select DDR Fine Granularity Refresh (FGR) mode.<br>Option available: 1x/2x/4x. Default setting is **1x**. |
| Memory RAS and Performance Configuration | Press [Enter] for advanced configuration. |
| NVDIMM -N Configuration | Press [Enter] for advanced configuration. |
| DIMM Information | Display installed DIMM information. |

### 5-3-2-1 Memory RAS and Performance Configuration



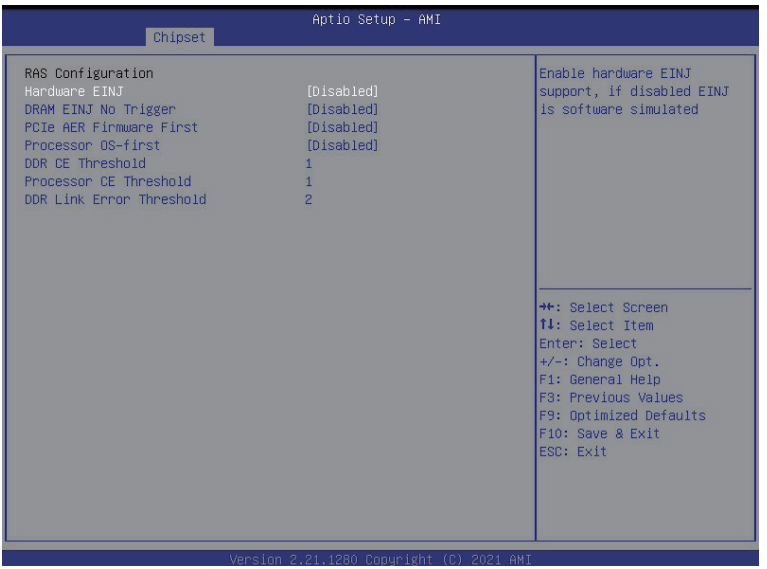

| Parameter | Description |
|---|---|
| Memory RAS and Performance Configuration | |
| ECC Mode | Option available: Disabled/SECDED/Symbol<br>Default setting: SECDED. |
| Defer uncorrectable read errors | Option available: Enabled/Disabled.<br>Default setting: **Disabled**. |
| Fault handling interrupt | Option available: Enabled/Disabled.<br>Default setting: **Enabled**. |
| Scrub Patrol duration (hour) | Option available: 1....24.<br>Default setting: **24**. |
| Demand scrub | Option available: Enabled/Disabled.<br>Default setting: **Enabled**. |
| Write CRC | Option available: Enabled/Disabled.<br>Default setting: **Disabled**. |
| CVE=2020-10255 mitigation | Option available: Enabled/Disabled.<br>Default setting: **Disabled**. |

### 5-3-2-2 NVDIMM-N Configuration



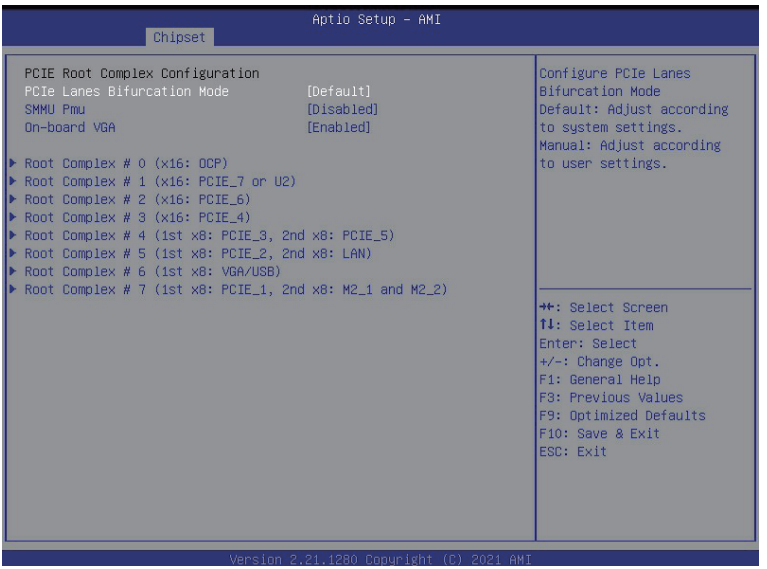

| Parameter | Description |
|---|---|
| NVDIMM-N Configuration | |
| Socket0 Configuration | |
| Mode Selection | Select NVDIMM-N Mode.<br>Option available: Non-NVDIMM/Non-Hashed/Hashed/Auto.<br>Default setting: **Auto**. |

## 5-3-3 RAS Configuration




| Parameter | Description |
|---|---|
| RAS Configuration | |
| Hardware EINJ | Option available: Enabled/Disabled.<br>Default setting: **Disabled**. |
| PCIe AER Firmware First | Option available: Enabled/Disabled.<br>Default setting: **Disabled**. |
| DDR CE Threshold | Press '+" or "-" to configure the threshold. |
| Processor CE Threshold | Press '+" or "-" to configure the threshold. |
| DDR Kink Error Threshold | Press '+" or "-" to configure the threshold. |

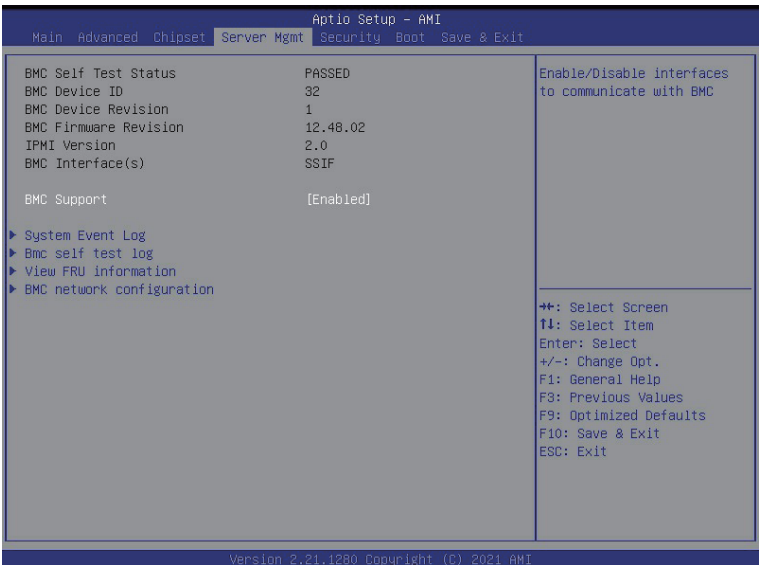
## 5-3-4 PCIE Root Complex Configuration




| Parameter | Description |
|---|---|
| PCIE Root Complex Configuration | |
| PCIe Lanes Bifurcation | Option available: Manual/Default.<br>Default setting: **Default**. |
| SMMU Pmu | Enable/Disable PMU feature for SMMU.<br>Option available: Enabled/Disabled.<br>Default setting: **Disabled**. |
| On-board VGA | Enable/Disable on-board VGA.<br>Option available: Enabled/Disabled.<br>Default setting: **Enabled**. |
| Root Complex_#(Note) | Press [Enter] to view advanced items. |

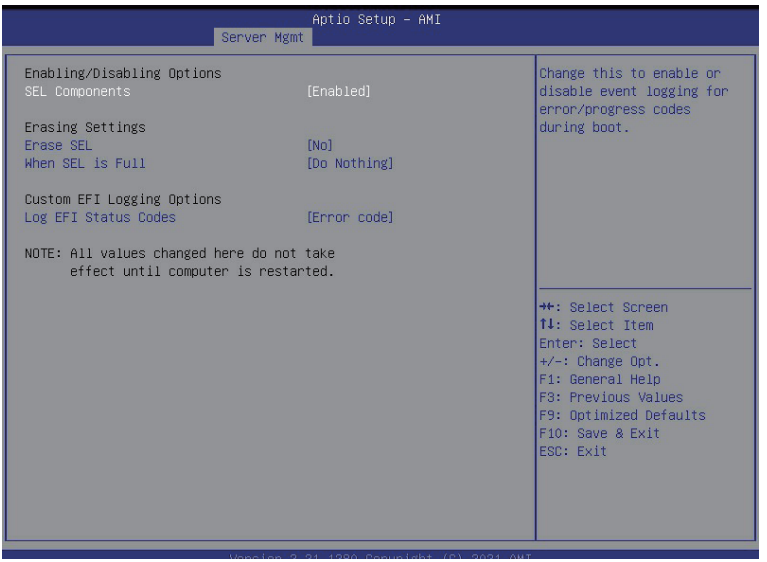
(Note) Advance items can be configurable when PCIe Lanes Bifurcation is set to **Manual**.

# 5-4 Server Management Menu




| Parameter | Description |
|---|---|
| BMC Support | Enable/Disable interfaces to communicate with BMC.<br>Options available: Enabled/Disabled. Default setting is **Enabled**. |
| System Event Log | Press [Enter] to configure advanced items. |
| BMC self test | 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. |

## 5-4-1 System Event Log



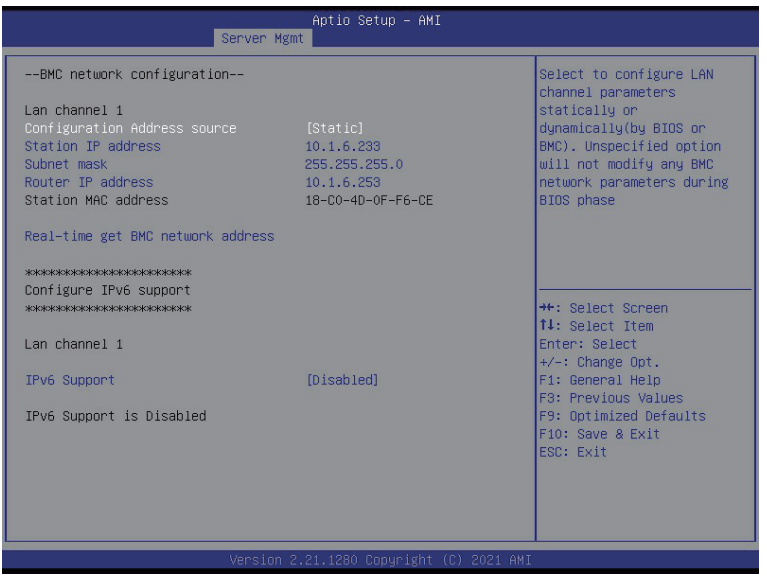

| Parameter | Description |
|---|---|
| Enabling / Disabling Options | |
| SEL Components | Change this item to enable or disable all features of System Event Logging during boot.<br>Options available: Enabled/Disabled. Default setting is **Enabled**. |
| Erasing Settings | |
| Erasing SEL | Choose options for erasing SEL.<br>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.<br>Options available: Do Nothing/Erase Immediately/Delete Oldest Record. 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).<br>Options available: Disabled/Both/Error code/Progress code. Default setting is **Error code**. |

## 5-4-2 BMC self test


| Parameter | Description |
|---|---|
| log area usage =00 out of 20 logs | |
| Erase Log | Options available: No/Yes, On next reset/Yes, On every reset.<br>Default setting is **No**. |
| When Log is full | Configuration for reactions to a full log.<br>Option available: Do not log any more/Clear Log.<br>Default setting is **Do not log any more**. |

## 5-4-3 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) The model name will vary depends on the product you purchased.

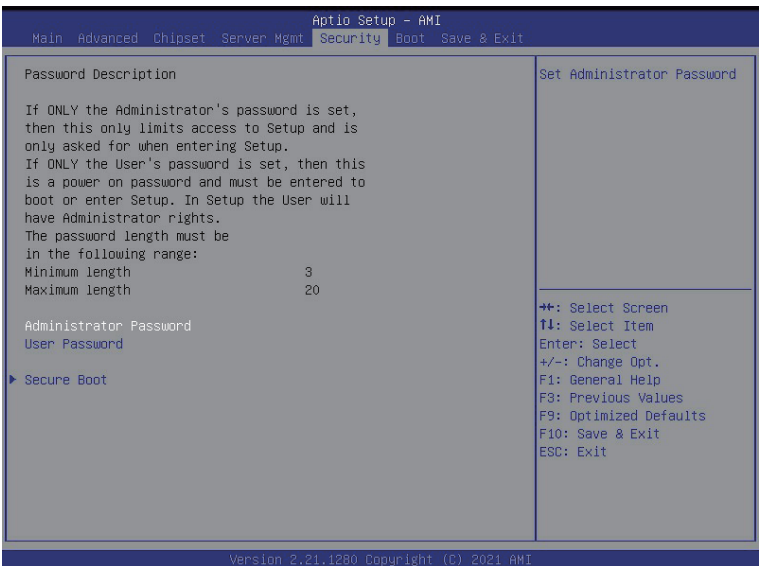
## 5-4-4 BMC Network Configuration


| Parameter | Description |
|---|---|
| BMC network configuration | |
| 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.<br>Options available: Unspecified/Static/DynamicBmcDhcp. Default setting is **DynamicBmcDhcp**. |
| Station IP address | Displays IP Address information. |
| Subnet mask | Displays Subnet Mask information.<br>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 get BMC network address | Press [Enter] to synchronize the BMC network address |
| IPV6 Support(Note) | Option available: Enabled/Disabled.<br>Default Setting is **Disabled**. |

(Note) Advance items can be configurable when IPV6 Support is set to **Enabled**.

# 5-5 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

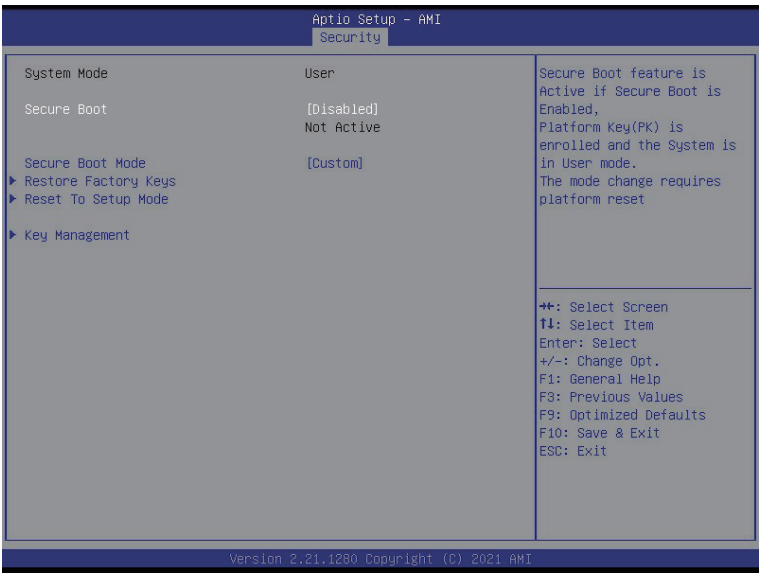
  Entering this password will allow the user to access and change all settings in the Setup Utility.

- 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. |
| Secure Boot | Press [Enter] to configure advanced items. |

## 5-5-1 Secure Boot



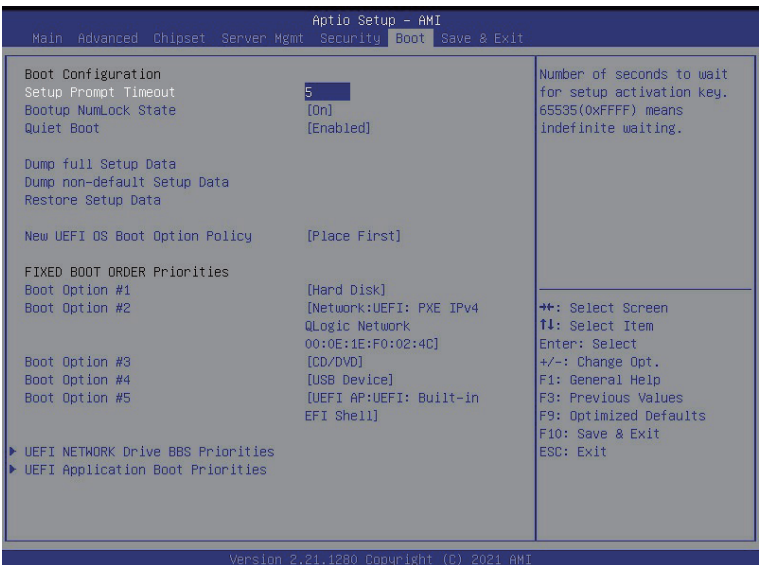

| Parameter | Description |
|---|---|
| System Mode | Displays the system is in User mode or Setup mode. |
| Secure Boot Mode(Note) | Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates. This way, the system knows all the files being loaded before Windows loads and gets to the login screen have not been tampered with.<br>When set to Standard, it will automatically load the Secure Boot keys form the BIOS databases.<br>When set to Custom, you can customize the Secure Boot settings and manually load its keys from the BIOS database.<br>Options available: Standard/Custom. Default setting is Custom. |

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

| Parameter | Description |
|---|---|
| Key Management | Press [Enter] to configure advanced items.<br>**Please note that this item is configurable when Secure Boot Mode is set to Custom.**<br>◆ Provision Factory Defaults<br>– Allows to provision factory default Secure Boot keys when system is in Setup Mode.<br>– Options available: Enabled/Disabled. Default setting is **Disabled**.<br>◆ Install Factory Default Keys<br>– Installs all factory default keys. It will force the system in User Mode.<br>– Options available: Yes/No.<br>◆ Enroll Efi Image<br>– Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db).<br>◆ Save all Secure Boot variables<br>– Press [Enter] to save all Secure Boot Keys and Key variables.<br>◆ Secure Boot variable<br>– Displays the current status of the variables used for secure boot.<br>◆ Platform Key (PK)<br>– Displays the current status of the Platform Key (PK).<br>– Press [Enter] to configure a new PK.<br>– Options available: Set New.<br>◆ Key Exchange Keys (KEK)<br>– Displays the current status of the Key Exchange Key Database (KEK).<br>– Press [Enter] to configure a new KEK or load additional KEK from storage devices.<br>– Options available: Set New/Append.<br>◆ Authorized Signatures (DB)<br>– Displays the current status of the Authorized Signature Database.<br>– Press [Enter] to configure a new DB or load additional DB from storage devices.<br>– Options available: Set New/Append.<br>◆ Forbidden Signatures (DBX)<br>– Displays the current status of the Forbidden Signature Database.<br>– Press [Enter] to configure a new dbx or load additional dbx from storage devices.<br>– Options available: Set New/Append.<br>◆ Authorized TimeStamps (DBT)<br>– Displays the current status of the Authorized TimeStamps Database.<br>– Press [Enter] to configure a new DBT or load additional DBT from storage devices.<br>– Options available: Set New/Append.<br>◆ OsRecovery Signatures<br>– Displays the current status of the OsRecovery Signature Database.<br>– Press [Enter] to configure a new OsRecovery Signature or load additional OsRecovery Signature from storage devices.<br>– Options available: Set New/Append. |

## 5-6 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.

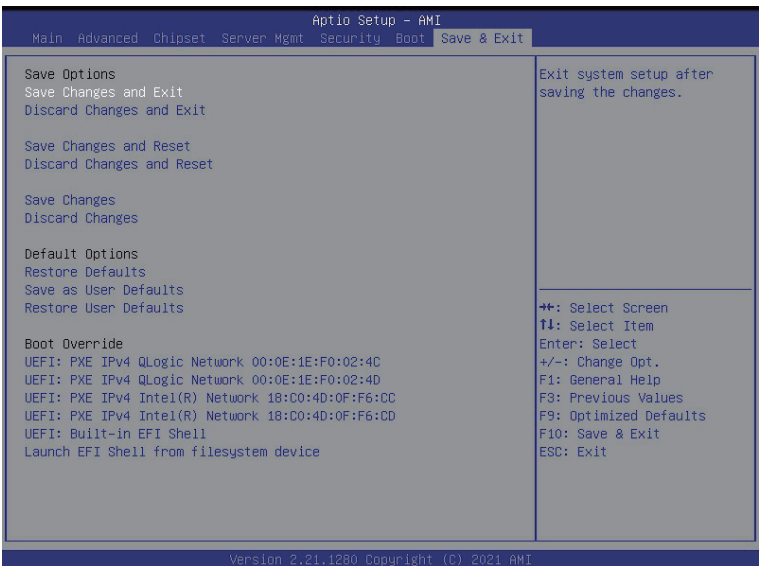



| Parameter | Description |
|---|---|
| Boot Configuration | |
| Setup Prompt Timeout | Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.<br>Press the numeric keys to input the desired values. |
| Bootup NumLock State | Enable/Disable the Bootup NumLock function.<br>Options available: On/Off. Default setting is **On**. |
| Quiet Boot | Enable/Disable showing the logo during POST.<br>Options available: Enabled/Disabled. Default setting is **Enabled**. |
| Boot mode select | Selects the boot mode.<br>Options available: LEGACY/UEFI. Default setting is **UEFI**. |

| Parameter | Description |
|---|---|
| Dump full Setup Data | |
| Dump non-default Setup Data | |
| Restore Setup Date | |
| New UEFI OS Boot Option Policy | Option available: Default/Place First/Place Last.<br>Default setting is **Place First**/. |
| FIXED BOOT ORDER Priorities | |
| Boot Option #1 / #2 / #3 / #4 / #5 | Press [Enter] to configure the boot priority.<br>By default, the server searches for boot devices in the following sequence:<br>1. Hard drive.<br>2. CD-COM/DVD drive.<br>3. USB device.<br>4. Network.<br>5. UEFI. |
| UEFI Network Drive BBS Priorities | Press [Enter] to configure the boot priority. |
| UEFI Application Boot Priorities | Press [Enter] to configure the boot priority. |

## 5-7 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.<br>Options available: Yes/No. |
| Discard Changes and Exit | Discards changes made and exits the BIOS setup.<br>Options available: Yes/No. |
| Save Changes | Save changes done so far to any of the setup options.<br>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.<br>Options available: Yes/No. |
| Boot Override | Press [Enter] to configure the device as the boot-up drive. |

## 5-8 BIOS POST Beep code (AMI standard)

### 5-8-1 PEI Beep Codes

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

### 5-8-2 DXE Beep Codes

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