

# **GIGABYTE™**

# **G293-S45-AAP1**

HPC/AI Server - 4th/5th Gen Intel® Xeon® Scalable - 2U DP 8 x PCIe Gen5 GPUs

## **User Manual**

Rev. 1.0

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## **Documentation Classifications**

In order to assist in the use of this product, Giga Computing 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 any general sales or marketing enquiries, you may also message GIGABYTE server directly by email: [server.grp@gigabyte.com](mailto:server.grp@gigabyte.com)

## Conventions

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

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

## Server Warnings and Cautions

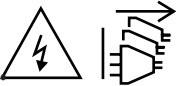
Before installing a server, be sure that you understand the following warnings and cautions.



### **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.



- Shock Hazard! Disconnect all power supply cords before servicing.
- 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 damage the contacts inside the jumper, causing intermittent problems with the function controlled 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 .....                | 9  |
| 1-1 Installation Precautions .....                   | 9  |
| 1-2 Product Specifications .....                     | 10 |
| 1-3 System Block Diagram .....                       | 14 |
| Chapter 2 System Appearance .....                    | 15 |
| 2-1 Front View .....                                 | 15 |
| 2-2 Rear View .....                                  | 15 |
| 2-3 Front Panel LED and Buttons .....                | 16 |
| 2-4 Rear System Button and LEDs .....                | 17 |
| 2-5 Power Supply Unit (PSU) LED .....                | 18 |
| 2-6 Hard Disk Drive LEDs .....                       | 19 |
| Chapter 3 System Hardware Installation .....         | 20 |
| 3-1 Removing Chassis Cover .....                     | 21 |
| 3-2 Removing and Installing the Fan Duct .....       | 22 |
| 3-3 Installing the CPU and Heat Sink .....           | 23 |
| 3-4 Installing the Memory .....                      | 25 |
| 3-4-1 Eight Channel Memory Configuration .....       | 25 |
| 3-4-2 Installing a Memory .....                      | 26 |
| 3-4-3 Processor and Memory Module Matrix Table ..... | 26 |
| 3-4-4 Memory Population Table .....                  | 27 |
| 3-5 Installing the GPU Card .....                    | 28 |
| 3-6 Installing a PCI Express Card .....              | 33 |
| 3-7 Installing the Hard Disk Drive .....             | 37 |
| 3-8 Replacing the FAN Assembly .....                 | 38 |
| 3-9 Replacing the Power Supply .....                 | 42 |
| 3-10 Cable Routing .....                             | 43 |
| Chapter 4 Motherboard Components .....               | 47 |
| 4-1 Motherboard Components .....                     | 47 |
| 4-2 Jumper Setting .....                             | 49 |
| 4-3 Backplane Board Storage Connector .....          | 50 |
| 4-3-1 CBPG086 .....                                  | 50 |
| Chapter 5 BIOS Setup .....                           | 51 |
| 5-1 The Main Menu .....                              | 53 |

|        |   |     |
|--------|---|-----|
| 5-2    | Advanced Menu .....                                 | 56  |
| 5-2-1  | Trusted Computing .....                             | 57  |
| 5-2-2  | Serial Port Console Redirection .....               | 58  |
| 5-2-3  | SIO Configuration .....                             | 62  |
| 5-2-4  | PCI Subsystem Settings .....                        | 63  |
| 5-2-5  | USB Configuration .....                             | 65  |
| 5-2-6  | Network Stack Configuration .....                   | 66  |
| 5-2-7  | Post Report Configuration .....                     | 67  |
| 5-2-8  | NVMe Configuration .....                            | 68  |
| 5-2-9  | Chipset Configuration .....                         | 69  |
| 5-2-10 | Tls Auth Configuration .....                        | 70  |
| 5-2-11 | iSCSI Configuration .....                           | 71  |
| 5-2-12 | Broadcom BCM57416 Ethernet Network Connection ..... | 72  |
| 5-2-13 | VLAN Configuration .....                            | 75  |
| 5-2-14 | Driver Health .....                                 | 77  |
| 5-3    | Chipset Menu .....                                  | 78  |
| 5-3-1  | Processor Configuration .....                       | 79  |
| 5-3-2  | Common RefCode Configuration .....                  | 82  |
| 5-3-3  | UPI Configuration .....                             | 83  |
| 5-3-4  | Memory Configuration .....                          | 84  |
| 5-3-5  | IIO Configuration .....                             | 87  |
| 5-3-6  | Advanced Power Management Configuration .....       | 89  |
| 5-3-7  | PCH Configuration .....                             | 91  |
| 5-3-8  | Miscellaneous Configuration .....                   | 94  |
| 5-3-9  | Server ME Configuration .....                       | 95  |
| 5-3-10 | Runtime Error Logging Settings .....                | 96  |
| 5-3-11 | Power Policy .....                                  | 98  |
| 5-4    | Server Management Menu .....                        | 100 |
| 5-4-1  | System Event Log .....                              | 102 |
| 5-4-2  | View FRU Information .....                          | 103 |
| 5-4-3  | BMC VLAN Configuration .....                        | 104 |
| 5-4-4  | BMC Network Configuration .....                     | 105 |
| 5-4-5  | IPv6 BMC Network Configuration .....                | 106 |
| 5-5    | Security Menu .....                                 | 107 |
| 5-5-1  | Secure Boot .....                                   | 108 |
| 5-6    | Boot Menu .....                                     | 111 |
| 5-7    | Save & Exit Menu .....                              | 113 |
| 5-8    | BIOS POST Beep code (AMI standard) .....            | 115 |
| 5-8-1  | PEI Beep Codes .....                                | 115 |
| 5-8-2  | DXE Beep Codes .....                                | 115 |



# 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<br>Dimension | <ul style="list-style-type: none"> <li>◆ 2U</li> <li>◆ 448mm (W) x 87.5mm (H) x 800mm (D)</li> </ul>  |
|  | CPU                 | <ul style="list-style-type: none"> <li>◆ 5th Generation Intel® Xeon® Scalable Processors</li> <li>◆ 4th Generation Intel® Xeon® Scalable Processors</li> <li>◆ Dual processor, CPU TDP up to 225W</li> </ul> <p data-bbox="304 464 955 479" style="color: blue;">Note: If only 1 CPU is installed, some PCIe or memory functions might be unavailable</p> |
|  | Socket              | <ul style="list-style-type: none"> <li>◆ 2 x LGA 4677</li> <li>◆ Socket E</li> </ul>  |
|  | Chipset             | <ul style="list-style-type: none"> <li>◆ Intel® C741 Chipset</li> </ul>   |
|  | Memory              | <ul style="list-style-type: none"> <li>◆ 16 x DIMM slots</li> <li>◆ DDR5 memory supported only</li> <li>◆ 8-Channel memory architecture</li> <li>◆ RDIMM modules up to 96GB supported</li> <li>◆ 3DS RDIMM modules up to 256GB supported</li> <li>◆ 5th Gen Intel® Xeon®: Up to 5600MHz</li> <li>◆ 4th Gen Intel® Xeon®: Up to 4800MHz</li> </ul>         |
|  | LAN                 | <ul style="list-style-type: none"> <li>◆ 2 x 10Gb/s BASE-T LAN ports (Broadcom® BCM57416)</li> <li>◆ Supported NCSI function</li> <li>◆ 1 x 10/100/1000 management LAN</li> </ul>   |
|  | Video               | <ul style="list-style-type: none"> <li>◆ Integrated in Aspeed® AST2600</li> <li>◆ 2D Video Graphic Adapter with PCIe bus interface</li> <li>◆ 1920x1200@60Hz 32bpp, DDR4 SDRAM</li> </ul>   |
|  | Storage             | <ul style="list-style-type: none"> <li>◆ 8 x 2.5" SATA/SAS hot-swappable bays</li> <li>◆ SAS card is required for SAS devices support</li> </ul>  |
|  | SAS                 | <ul style="list-style-type: none"> <li>◆ Supported via add-on SAS Card</li> </ul>   |
|  | RAID                | <ul style="list-style-type: none"> <li>◆ Intel® SATA RAID 0/1/10/5</li> </ul>   |

|   |                         |  |
|---|-------------------------|--|
|    | Expansion Slot          | <ul style="list-style-type: none"> <li>◆ Riser Card CRSG229 x 2: <ul style="list-style-type: none"> <li>◆ - 4 x PCIe x16 (Gen5 x16) FHFL slots, from PS7101, for GPUs</li> </ul> </li> <br/> <li>◆ Riser Card CRSG22A x 2: <ul style="list-style-type: none"> <li>◆ - 4 x PCIe x16 (Gen5 x16) FHFL slots, from PS7101, for GPUs</li> </ul> </li> <br/> <li>◆ Riser Card CRSG01F x 2: <ul style="list-style-type: none"> <li>◆ - 1 x PCIe x16 (Gen5 x16) low-profile slot, from CPU_0</li> <li>◆ - 1 x PCIe x16 (Gen5 x16) low-profile slot, from CPU_1</li> </ul> </li> <br/> <li>- Maximum limitation of GPU card: 285mm (L) x 111.5mm (W) x 39.5mm (H)</li> <li>- System is validated for population with a uniform GPU model</li> <li>- Support is not provided for mixed GPU populations</li> <li>- For the latest GPU cards QVL, please contact your GIGABYTE representative</li> </ul> |
|    | Internal Connectors     | <ul style="list-style-type: none"> <li>◆ 1 x TPM header</li> <li>◆ 1 x VROC connector</li> </ul>   |
|    | Front Panel LED/Buttons | <ul style="list-style-type: none"> <li>◆ 1 x Power button with LED</li> <li>◆ 1 x ID button with LED</li> <li>◆ 2 x LAN activity LEDs</li> <li>◆ 1 x HDD activity LED</li> <li>◆ 1 x System status LED</li> <li>◆ 1 x Reset button</li> </ul>  |
|    | Rear Panel I/O          | <ul style="list-style-type: none"> <li>◆ 2 x USB 3.2 Gen1</li> <li>◆ 1 x VGA</li> <li>◆ 2 x RJ45</li> <li>◆ 1 x MLAN</li> <li>◆ 1 x Power button with LED</li> <li>◆ 1 x ID button with LED</li> <li>◆ 1 x Reset button</li> <li>◆ 1 x NMI button</li> <li>◆ 1 x System status LED</li> </ul>  |
|  | Backplane I/O           | <ul style="list-style-type: none"> <li>◆ Backplane P/N: 9CBPG086NR-00</li> <li>◆ PCIe Gen5 x4 or SATA 6Gb/s or SAS 12Gb/s</li> </ul>   |
|  | TPM                     | <ul style="list-style-type: none"> <li>◆ 1 x TPM header with SPI interface</li> <li>◆ Optional TPM2.0 kit: CTM010</li> </ul>   |



## Power Supply

- ◆ Dual 3000W 80 PLUS Titanium redundant power supply
  
- ◆ AC Input:
  - 100-127V~/ 15.5A, 50-60Hz
  - 200-220V~/ 15.5A, 50-60Hz
  - 220-240V~/ 15.5A, 50-60Hz
  
- ◆ DC Input: 240Vdc/ 15.5A(Only for China)
  
- ◆ DC Output:
  - Max 1000W/ 100-127V~
  - + 12.2V/ 81A
  - + 12Vsb/ 3A
  - Max 2600W/ 200-220V~
  - + 12.2V/ 213A
  - + 12Vsb/ 3A
  - Max 3000W/ 220-240V~ or 240Vdc Input
  - + 12.2V/ 245A
  - + 12Vsb/ 3A

### NOTE:

- ◆ The system power supply requires C19 power cord.
- ◆ The power supply specifications provided herein is for the default server configuration. Different SKUs have different PSU specs, so please see the system rating label on the server for the accurate PSU specification.



## System Management

- ◆ Aspeed® AST2600 management controller
- ◆ GIGABYTE Management Console (AMI MegaRAC SP-X) web interface
- ◆
- ◆ Dashboard
- ◆ HTML5 KVM
- ◆ Sensor Monitor (Voltage, RPM, Temperature, CPU Status ...etc.)
- ◆ Sensor Reading History Data
- ◆ FRU Information
- ◆ SEL Log in Linear Storage / Circular Storage Policy
- ◆ Hardware Inventory
- ◆ Fan Profile
- ◆ System Firewall
- ◆ Power Consumption
- ◆ Power Control
- ◆ LDAP / AD / RADIUS Support
- ◆ Backup & Restore Configuration
- ◆ Remote BIOS/BMC/CPLD Update
- ◆ Event Log Filter
- ◆ User Management
- ◆ Media Redirection Settings
- ◆ PAM Order Settings
- ◆ SSL Settings
- ◆ SMTP Settings

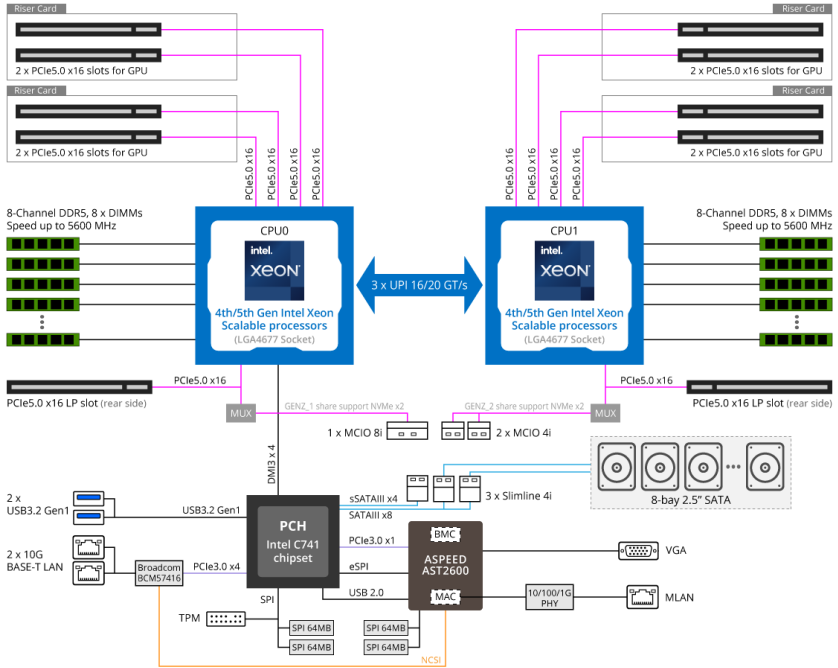


## Operating Properties

- ◆ Operating temperature: 10°C to 35°C
- ◆ Operating humidity: 8%-80% (non-condensing)
- ◆ Non-operating temperature: -40°C to 60°C
- ◆ Non-operating humidity: 20%-95% (non-condensing)

[NOTE: Please contact Technical Support for more information about optimized GPU system operating temperature](#)

# 1-3 System Block Diagram



# Chapter 2 System Appearance

## 2-1 Front View

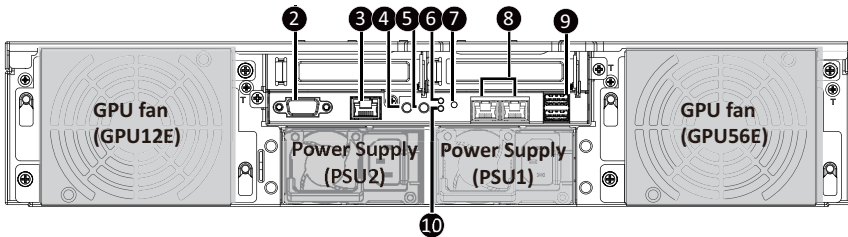


| No.  | Description                 |
|--|-----------------------------|
| 1.   | Front Panel LED and Buttons |
| <b>NOTE! Green HDD Latch Supports NVMe</b> |                             |



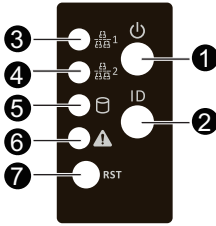
• Please Go to Chapter 2-3 Front Panel LED and Buttons for detail description of function LEDs.

## 2-2 Rear View



| No. | Description                            | No. | Description        |
|-----|--|-----|--------------------|
| 2.  | VGA Port                               | 7.  | System Status LED  |
| 3.  | 10/100/1000 Server Management LAN Port | 8.  | 10GbE LAN Port x 2 |
| 4.  | Power Button with LED                  | 9.  | USB 3.0 Port x 2   |
| 5.  | ID Button                              | 10. | NMI Button         |
| 6.  | Reset Button                           |     |                    |

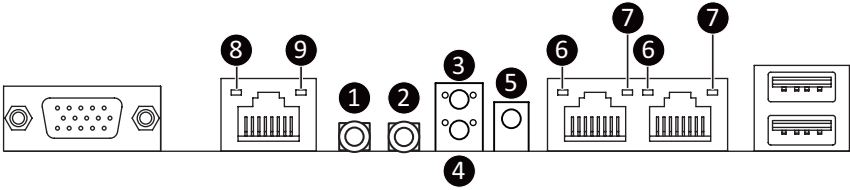
## 2-3 Front Panel LED and Buttons



| No.  | Name                     | Color       | Status   | Description   |
|------|--------------------------|-------------|----------|---|
| 1.   | Power button with LED    | Green       | On       | System is powered on  |
|      |                          | N/A         | Off      | System is not powered on or in ACPI S5 state (power off)  |
| 2.   | ID Button                |             |          | Press the button to activate system identification  |
| 3/4. | LAN 1/2 Active/Link LEDs | Green       | Solid On | Link between system and network or no access.   |
|      |                          | Green       | Blink    | Data transmission or receiving is occurring   |
|      |                          | N/A         | Off      | No data transmission or receiving is occurring  |
| 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.   |
|      |                          |             | Solid On | Critical condition, may indicate:<br>System fan failure<br>System temperature   |
|      |                          | Amber       | Blink    | Non-critical condition, may indicate:<br>Redundant power module failure<br>Temperature and voltage issue<br>Chassis intrusion |
|      |                          |             | N/A      | Off   |
| 7.   | Reset Button             |             |          | Press the button to reset the system.   |

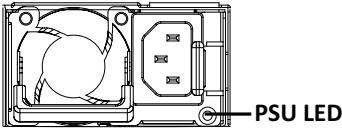


## 2-4 Rear System Button and LEDs



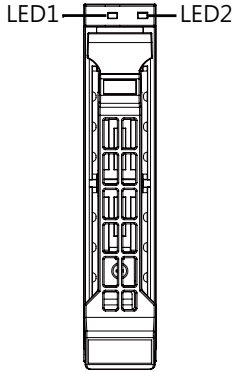
| No. | Name                      | Color  | Status   | Description   |
|-----|---------------------------|--------|----------|---|
| 1.  | Power Button with LED     | Green  | On       | System is powered on  |
|     |                           | N/A    | Off      | System is not powered on or in ACPI S5 state (power off)  |
| 2.  | ID Button                 |        |          | Press the button to activate system identification  |
| 3.  | Reset Button              |        |          | Press the button to reset the system.   |
| 4.  | NMI button                |        |          | Press the button server generates a NMI to the processor if the multiple-bit ECC errors occur, which effectively halt the server. |
| 5.  | System Status LED         | Green  | Solid On | System is operating normally.   |
|     |                           | Amber  | Solid 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>NMI error<br>Processor or terminator missing                                  |
| 6.  | 10GbE Speed LED           | Green  | On       | 10 Gbps data rate   |
|     |                           | Yellow | On       | 5Gbps, 2.5Gbps, 1Gbps data rate   |
|     |                           | N/A    | Off      | 100 Mbps data rate  |
| 7.  | 10GbE Link / Activity LED | Green  | On       | Link between system and network or no access  |
|     |                           |        | Blink    | Data transmission or reception is occurring.  |
|     |                           | N/A    | Off      | No data transmission or reception is occurring.   |
| 8.  | 1GbE Speed LED            | Yellow | On       | 1 Gbps data rate  |
|     |                           | Green  | On       | 100 Mbps data rate  |
|     |                           | N/A    | Off      | 10 Mbps data rate   |
| 9.  | 1GbE Link / Activity LED  | Green  | On       | Link between system and network or no access  |
|     |                           |        | Blink    | Data transmission or reception is occurring.  |
|     |                           | N/A    | Off      | No data transmission or reception is occurring.   |

## 2-5 Power Supply Unit (PSU) LED



| State              | Description   |
|--------------------|---|
| OFF                | No AC power to all power supplies   |
| 1Hz Green Blinking | AC present / only standby on / Cold redundant mode  |
| 2Hz Green Blinking | Power supply firmware updating mode   |
| Amber              | AC cord unplugged or AC power lost; with a second power supply in parallel still with AC input power                      |
|                    | Power supply critical event causing shut down: failure, OCP, OVP, fan failure and UVP                                     |
| 1Hz Amber Blinking | Power supply warning events where the power supply continues to operate: high temp, high power, high current and slow fan |

## 2-6 Hard Disk Drive LEDs



| RAID SKU   |   | LED1  | Locate | HDD Fault | Rebuilding        | HDD Access | HDD Present (No Access) |
|--|---|-------|--------|-----------|-------------------|------------|-------------------------|
| No RAID configuration<br>(via PCH, HBA)                  | Disk LED<br>(LED on Back Panel)         | Green | ON(*1) | OFF       |                   | BLINK (*2) | OFF                     |
|  |   | Amber | OFF    | OFF       |                   | OFF        | OFF                     |
|  | Removed HDD Slot<br>(LED on Back Panel) | Green | ON(*1) | OFF       |                   | --         | --                      |
|  |   | Amber | OFF    | OFF       |                   | --         | --                      |
| RAID configuration<br>(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.

## 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

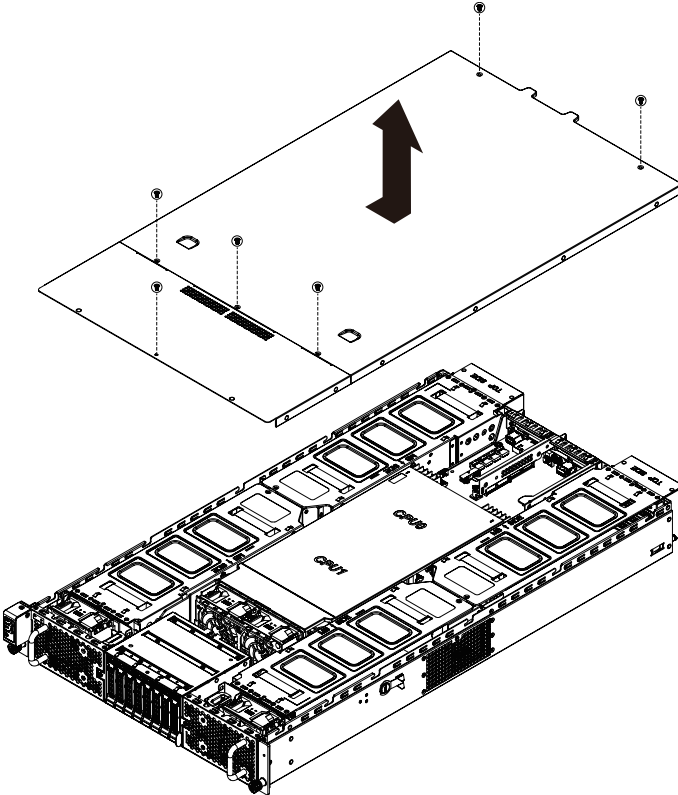


Before you remove or install the system cover

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

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

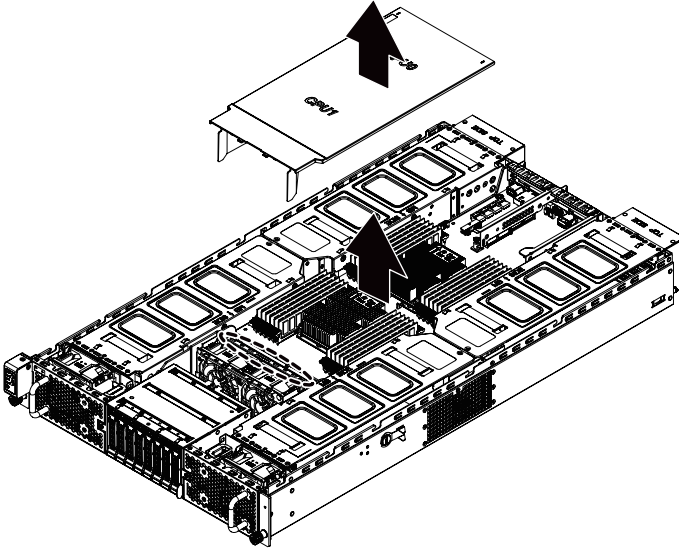
1. Remove the eight screws securing the cover.
2. Slide the cover towards the rear and remove the cover in the direction of the arrow.



## 3-2 Removing and Installing the Fan Duct

Follow these instructions to remove/install the fan duct:

1. Lift up to remove the fan duct
2. To install the fan duct, align the tabs at the front of the fan duct with the slots in the system fan compartment as shown in the image below, and then push down the fan duct into chassis until its firmly seats



### 3-3 Installing the CPU and Heat Sink



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.

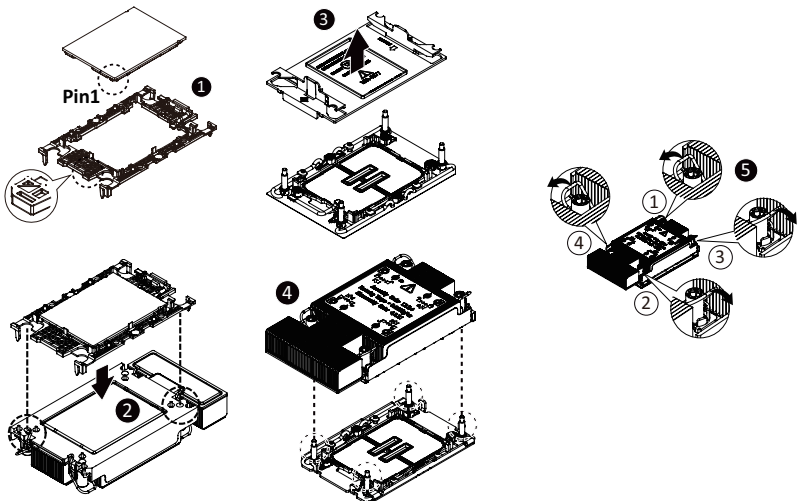


#### **WARNING!**

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.

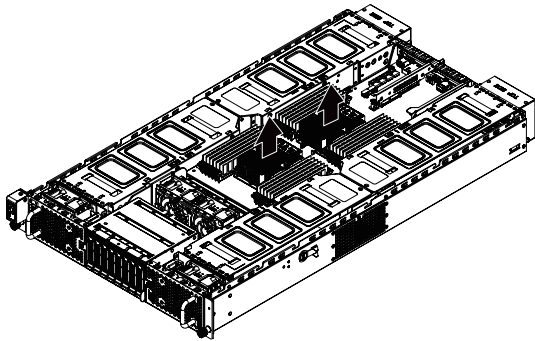
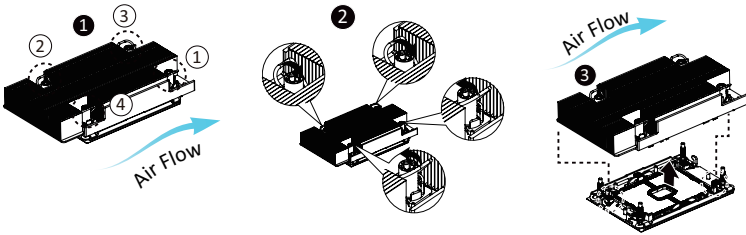
#### **Follow these instructions to install the CPU:**

1. Align and install the processor on the carrier.  
**NOTE:** Apply thermal compound evenly on the top of the CPU. Remove the protective cover from the underside of the heat sink.
2. Carefully flip the heat sink cover. Then install the carrier assembly on the bottom of the heat sink and make sure the gold arrow is located in the correct direction.
3. Remove the CPU cover.  
**NOTE:** Save the CPU cover in the event that you need to remove the CPU from the socket.
4. Align the heat sink with the CPU socket by the guide pins and make sure the gold arrow is located in the correct direction. Then place the heat sink onto the top of the CPU socket.
5. Position the rotating wires into the latch position.
6. Tighten the screws in a sequential order (1→2→3→4).  
**NOTE:** When disassembling the heat sink, loosen the screws in reverse order (4→3→2→1) and then move the rotating wires into the unlatch position.



**Follow these instructions to remove/install the heat sink:**

1. Loosen the captive screws securing the heat sink in place in reverse order (4→3→2→1).
2. Move the rotating wires into the unlatch position.
3. Lift and remove the heat sink from the system.
4. To reinstall the heat sink reverse steps 1-3 while ensuring that you tighten the captive screws in sequential order (1→2→3→4) as seen in the image below.



- When installing the heat sink to CPU, use T30-Lobe driver to tighten 4 captive nuts in sequence as 1-4.
- The screw tightening torque:  $8 \pm 0.5$  kgf-cm.



### 3-4 Installing the Memory

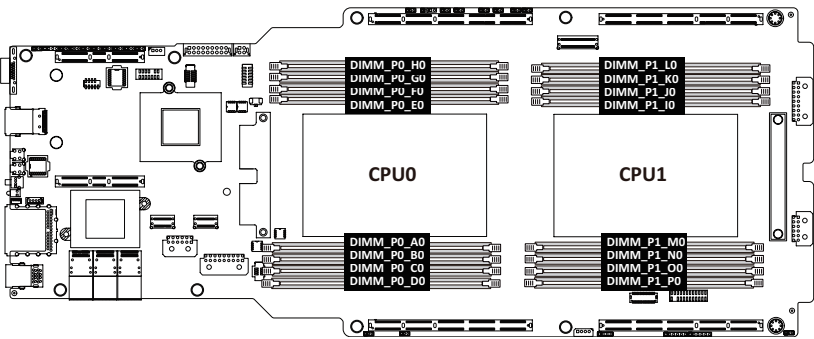


Read the following guidelines before you begin to install the memory:

- 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 DDR5 memory sockets and supports Eight Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.



### 3-4-2 Installing a Memory

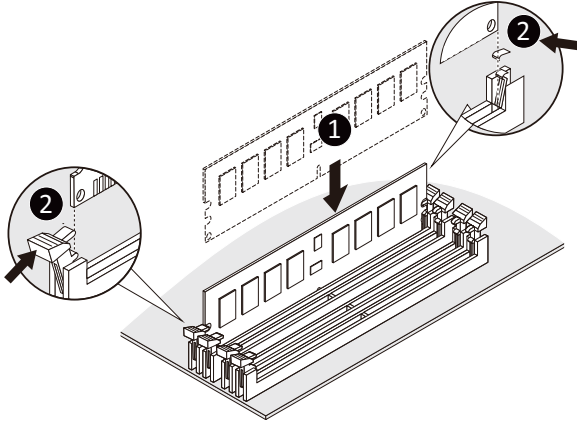


Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module.

Be sure to install DDR5 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 Processor and Memory Module Matrix Table

| Memory Q'ty<br>(for each CPU) | CPU0 |    |    |    |    |    |    |    | CPU1 |    |    |    |    |    |    |    |
|-------------------------------|------|----|----|----|----|----|----|----|------|----|----|----|----|----|----|----|
|                               | H0   | G0 | F0 | E0 | A0 | B0 | C0 | D0 | P0   | O0 | N0 | M0 | I0 | J0 | K0 | L0 |
| 1 DIMM                        |      |    |    | ✓  | ✓  |    |    |    |      |    |    | ✓  | ✓  |    |    |    |
| 2 DIMM                        |      | ✓  |    |    | ✓  |    |    |    |      | ✓  |    |    | ✓  |    |    |    |
| 4 DIMM                        |      | ✓  |    | ✓  | ✓  |    | ✓  |    |      | ✓  |    | ✓  | ✓  |    | ✓  |    |
| 6 DIMM                        |      | ✓  | ✓  | ✓  | ✓  |    | ✓  | ✓  |      | ✓  | ✓  | ✓  | ✓  |    | ✓  | ✓  |
|                               | ✓    | ✓  |    | ✓  | ✓  | ✓  | ✓  |    | ✓    | ✓  |    | ✓  | ✓  | ✓  | ✓  | ✓  |
|                               | ✓    | ✓  | ✓  |    | ✓  | ✓  |    | ✓  | ✓    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |
| 8 DIMM                        | ✓    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |

**NOTE!**

- There should be at least one DDR5 DIMM per socket.

### 3-4-4 Memory Population Table

#### 4th Gen Intel Xeon Scalable Processors-SP Memory Support

| Type      | Ranks Per DIMM and Data Width | DIMM Capacity (GB)   |                   |       | Speed (MT/s); Voltage (V); DIMM per Channel (DPC) |      |
|-----------|-------------------------------|----------------------|-------------------|-------|---|------|
|           |                               |                      |                   |       | 1DPC <sup>1</sup>                                 | 2DPC |
|           |                               | 16Gb                 | 24Gb <sup>2</sup> | 36Gb  | 1.1V  |      |
| RDIMM     | SRx8 (RC D)                   | 16GB                 | 24GB              | NA    | 4800  | 4400 |
|           | SRx4 (RC C)                   | 32GB                 | 48GB              | NA    |   |      |
|           | SRx4 (RC F) 9x4               | 32GB                 | NA                | NA    |   |      |
|           | DRx8 (RC E)                   | 32GB                 | 48GB              | NA    |   |      |
|           | DRx4 (RC A)                   | 64GB                 | 96GB              | 128GB |   |      |
|           | DRx4 (RC B) 9x4               | 64GB                 | NA                | NA    |   |      |
| RDIMM 3DS | (4R/8R)x4 (RC A)              | 2H-128GB<br>4H-256GB | NA                | NA    |   |      |

**NOTE:**

- 1DPC applies to 1SPC or 2SPC implementations (SPC - Sockets Per Channel)
- 24Gb XCC only w/ limited configs: 1DPC all DIMM types, 2DPC 96GB only. Only 8 and 16 DIMM configs, no fallbacks.

#### 5th Gen Intel Xeon Scalable Processors-SP Memory Support

| Type      | Ranks Per DIMM and Data Width | DIMM Capacity (GB)   |                   |       | Speed (MT/s); Voltage (V); DIMM per Channel (DPC) |                   |
|-----------|-------------------------------|----------------------|-------------------|-------|---|-------------------|
|           |                               |                      |                   |       | 1DPC <sup>1</sup>                                 | 2DPC              |
|           |                               | 16Gb                 | 24Gb <sup>2</sup> | 36Gb  | 1.1V  |                   |
| RDIMM     | SRx8 (RC D)                   | 16GB                 | 24GB              | NA    | 5600 <sup>3</sup>                                 | 4400 <sup>3</sup> |
|           | SRx4 (RC C)                   | 32GB                 | 48GB              | NA    |   |                   |
|           | SRx4 (RC F) 9x4               | NA                   | NA                | NA    |   |                   |
|           | DRx8 (RC E)                   | 32GB                 | 48GB              | NA    |   |                   |
|           | DRx4 (RC A)                   | 64GB                 | 96GB              | 128GB |   |                   |
|           | DRx4 (RC B) 9x4               | NA                   | NA                | NA    |   |                   |
| RDIMM 3DS | (4R/8R)x4 (RC A)              | 2H-128GB<br>4H-256GB | NA                | NA    | 5600 <sup>4</sup>                                 |                   |

**NOTE:**

- 1DPC applies to 1SPC or 2SPC implementations (SPC - Sockets Per Channel)
- 24Gb 2DPC not POR w/ 24GB and 48GB DIMMs.
- DDR5-5600 RDIMMs will be limited to 5600 MT/s 1DPC and 4400 MT/s 2DPC. DDR5-4800 DIMMs will be limited to 4800 MT/s 1DPC and 4400 MT/s 2DPC.
- DDR5-5600 DIMMs are required for 5600 and 5200 1DPC speeds.

### 3-5 Installing the GPU 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.

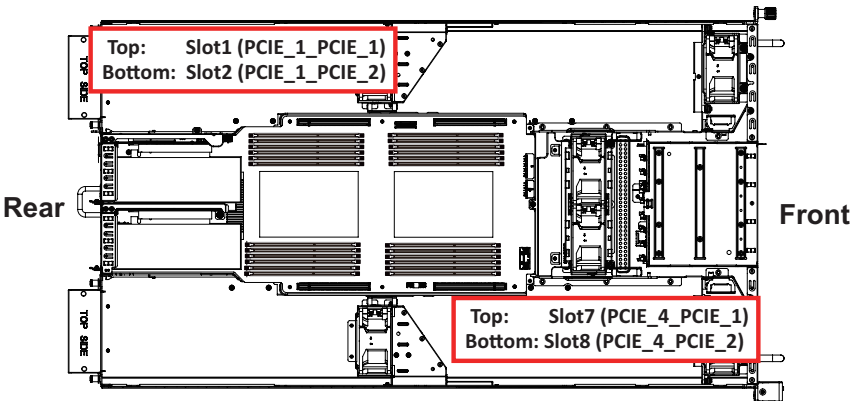


- The PCI riser assembly does not include a riser card or any cabling as standard. To install a PCI card, a riser card must be installed.

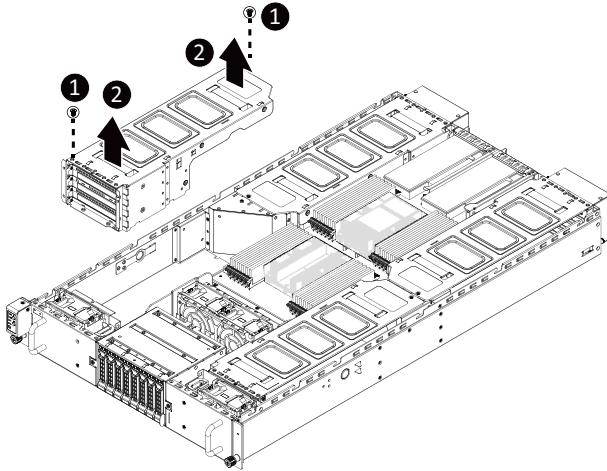
#### For Slot1/Slot2/Slot7/Slot8

#### Follow these instructions to install the GPU card:

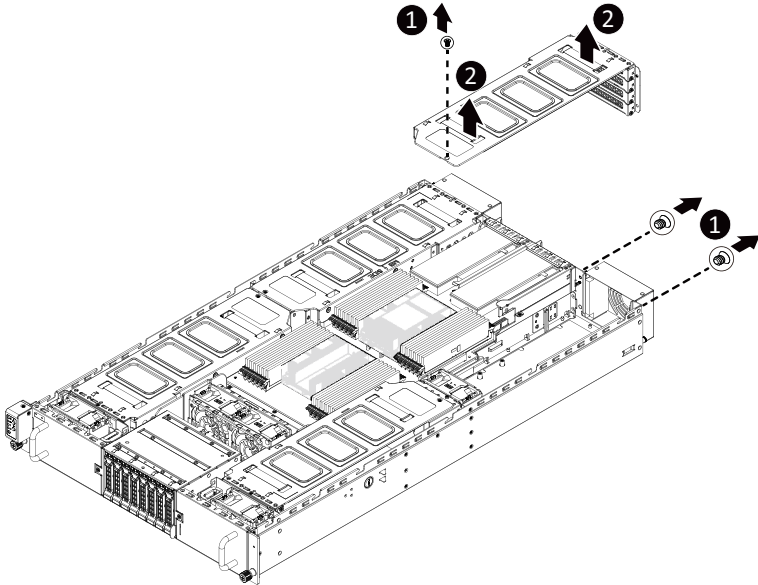
1. [For GPU12/GPU13/GPU14/GPU15] Loosen and remove the two screws securing the PCI cage at the top of the system.  
[For GPU4/GPU5/GPU6/GPU7] Loosen and remove the single screw at the top of the system and the two screws at the rear of the system securing the PCI cage.
2. Pull the two plastic handles to lift up the PCI cage from the system.
3. Insert the card into the selected slot. Make sure that the card is properly seated.
4. Secure the GPU cards in place with two screws.

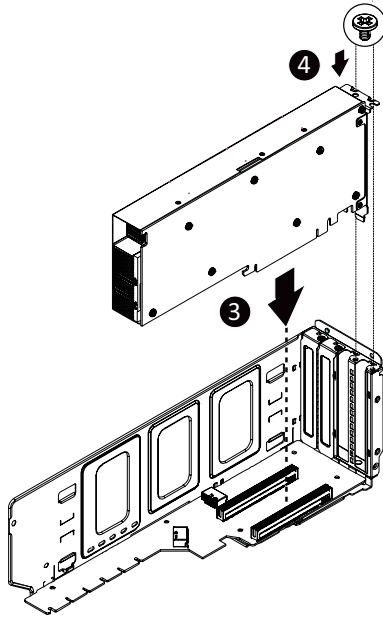


(For Slot7/Slot8)



(For Slot1/Slot2)

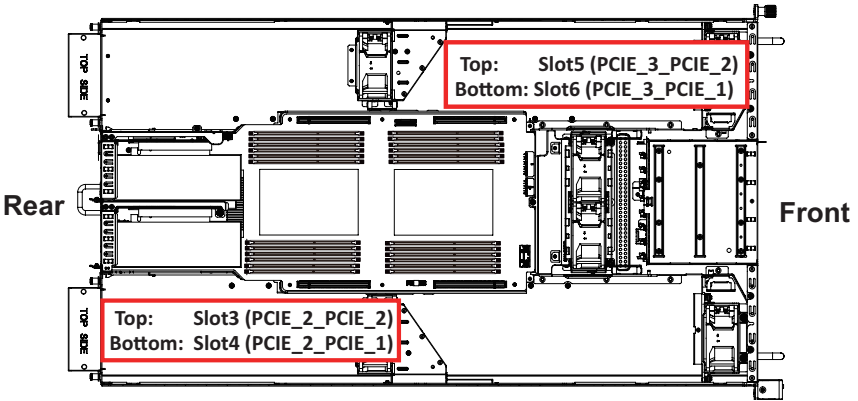




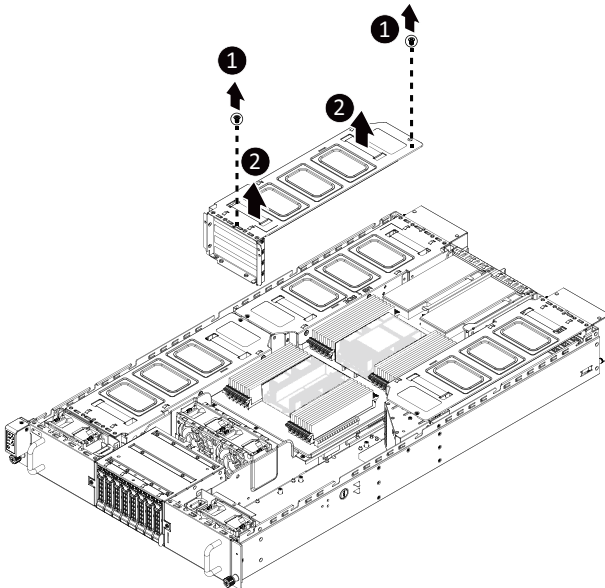
### For Slot3/Slot4/Slot5/Slot6

#### Follow these instructions to install the GPU card:

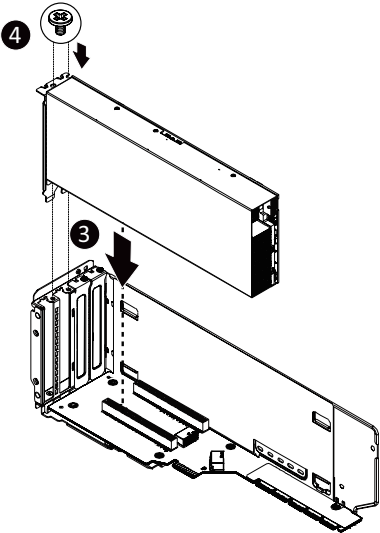
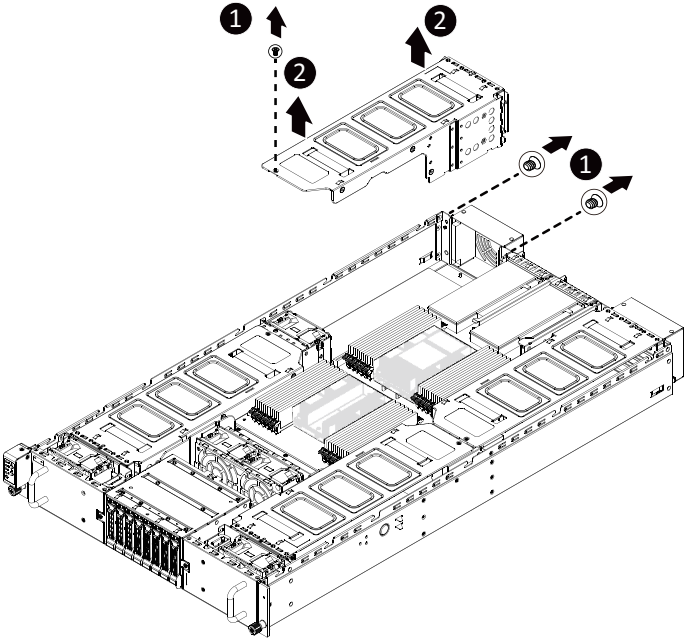
1. [For GPU8/GPU9/GPU10/GPU11] Loosen and remove the two screws securing the PCI cage at the top of the system.  
[For GPU0/GPU1/GPU2/GPU3] Loosen and remove the single screw at the top of the system and the two screws at the rear of the system securing the PCI cage.  
Pull the two plastic handles to lift up the PCI cage from the system.
2. Insert the card into the selected slot. Make sure that the card is properly seated.
3. Secure the GPU cards in place with two screws.



(For Slot5/Slot6)



(For Slot3/Slot4)





## 3-6 Installing a PCI Express Card

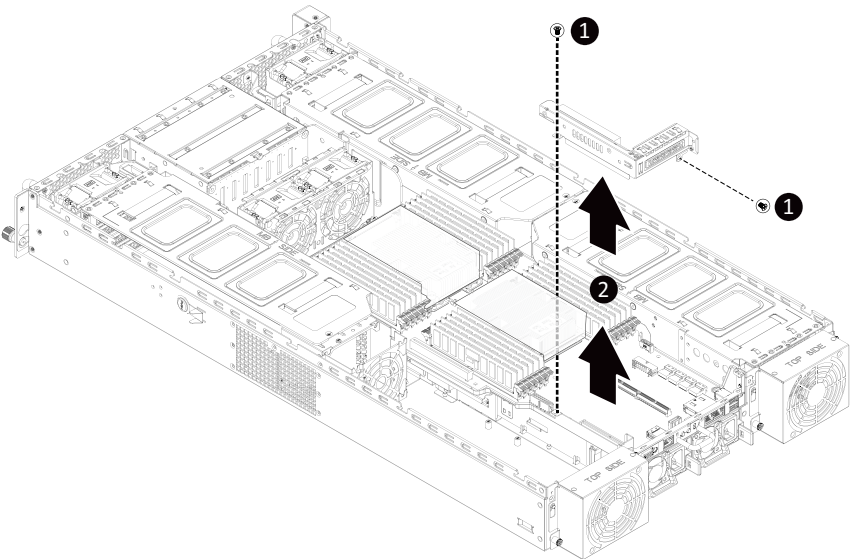


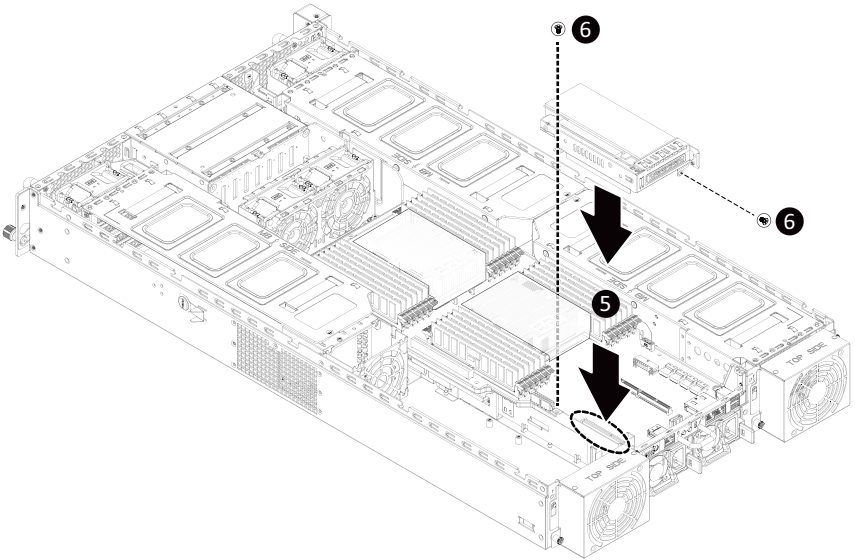
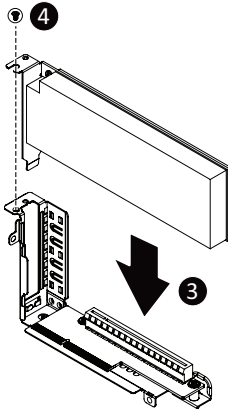
- Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered-down and all power sources have been disconnected from the server prior to installing a PCI card.

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

**Follow these instructions to install a PCI Express x8 card on right side of the system:**

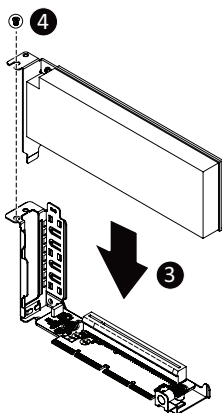
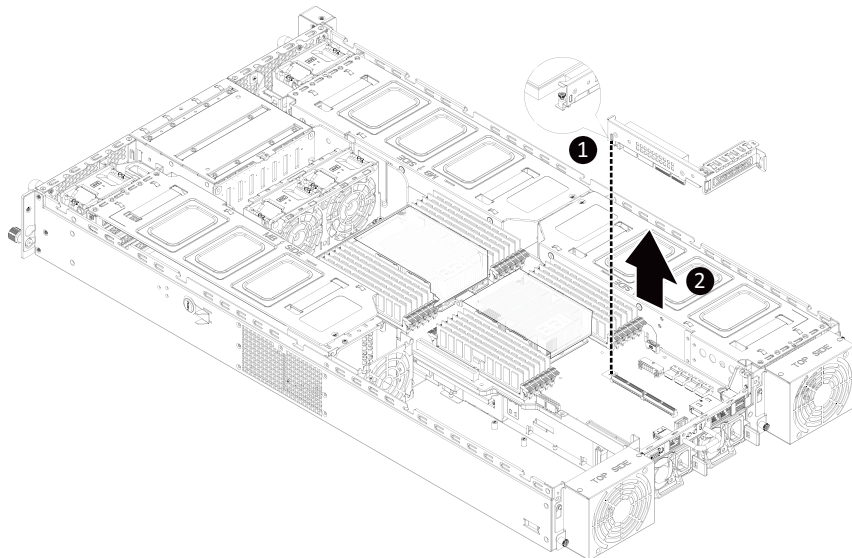
1. Loosen and remove the two screws securing the PCI Express card bracket on the right side of the system.
2. Remove the PCI Express card bracket from the system.
3. Install the PCI Express card into the bracket.
4. Secure the PCI Express card to the bracket with one screw.
5. Install the PCI Express card bracket with card back into the system, ensure that the connector on the bracket is securely installed into the connector on the motherboard as shown.
6. Secure the PCI Express card bracket with card to the system with two (2) screws.

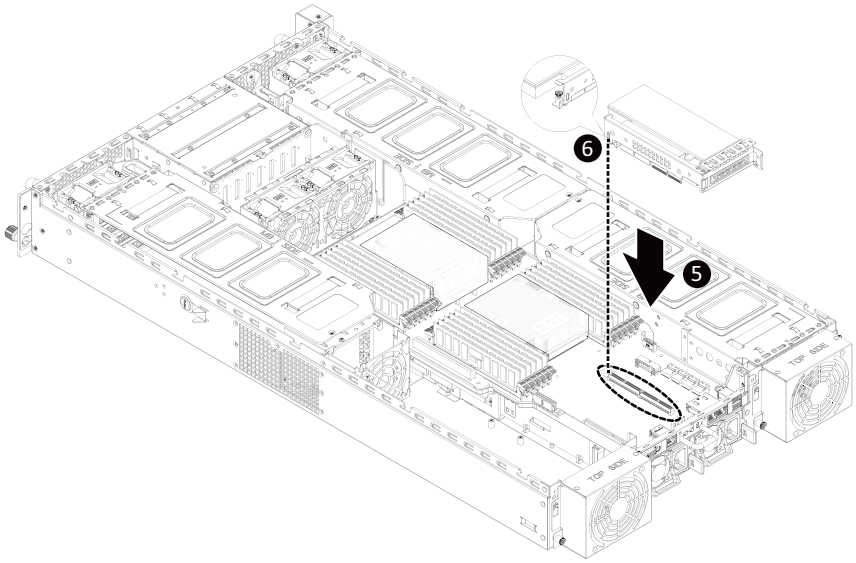




**Follow these instructions to install a PCI Express x16 card on left side of the system:**

1. Loosen the thumbnail screw securing the PCI Express card bracket on the left side of the system.
2. Remove the PCI Express card bracket from the system.
3. Install the PCI Express card into the bracket.
4. Secure the PCI Express card to the bracket with one screw.
5. Install the PCI Express card bracket with card back into the system, ensure that the connector on the bracket is securely installed into the connector on the motherboard as shown.
6. Secure the PCI Express card bracket with card to the system using the thumbnail screw.





### 3-7 Installing the Hard Disk Drive



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

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

#### Follow these instructions to install a 2.5" hard disk drive:

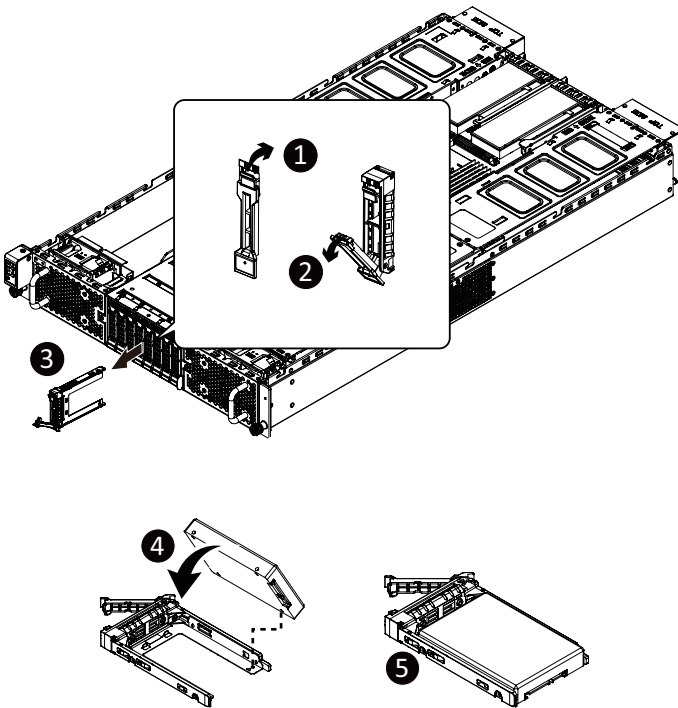
1. Press the release button.
2. Extend the locking lever.
3. Pull the locking lever in the direction indicated to remove the HDD tray.
4. Align the hard disk drive with the positioning stud on the HDD tray.
5. Slide the hard disk drive into the HDD tray.
6. Reinsert the HDD tray into the slot and close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



#### CAUTION!

We strongly recommend using enterprise level hard disk drives in the Gigabyte server system. For more information of recommended HDDs, please visit the Gigabyte website:

<https://www.gigabyte.com> and search for the specific product QVL from **Support & Downloads**.



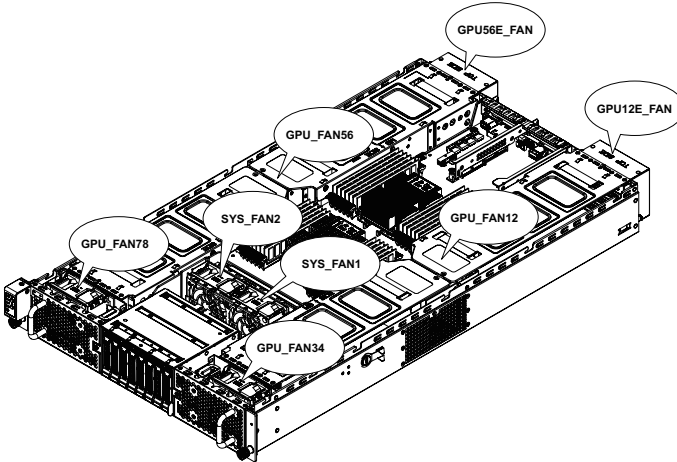
### 3-8 Replacing the FAN Assembly



#### CAUTION!

Before you remove or install the system fans follow these steps:

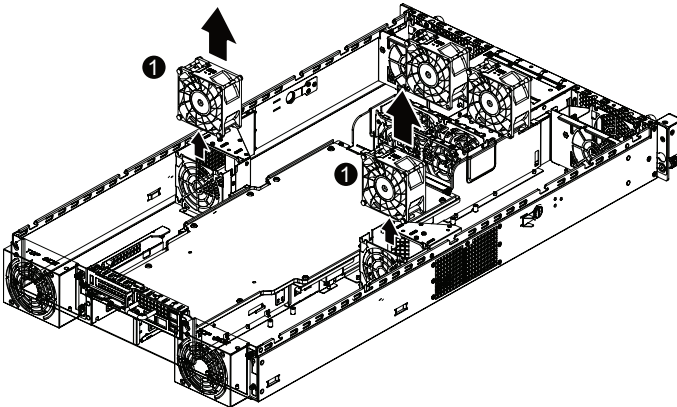
- Make sure the system is not turned on or connected to the AC power..
- Disconnect all necessary cable connections. Failure to observe these warnings could result in personal injury or damage to the equipment.

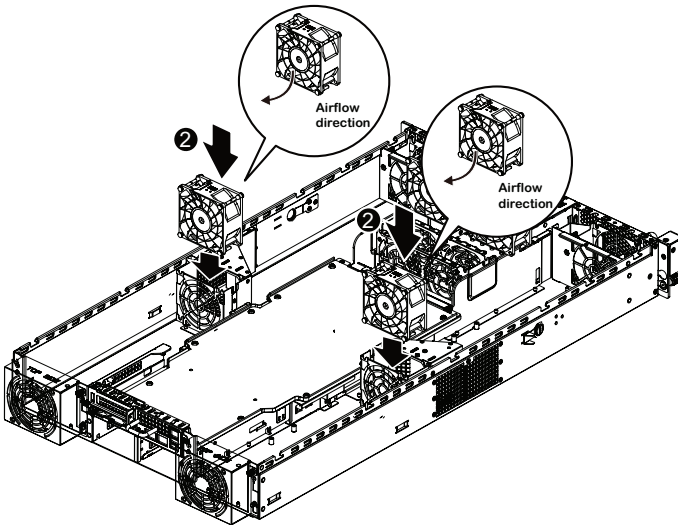


Follow these instructions to replace the fan assembly:

[For GPU\_FAN12/GPU\_FAN34/GPU\_FAN56/GPU\_FAN78]

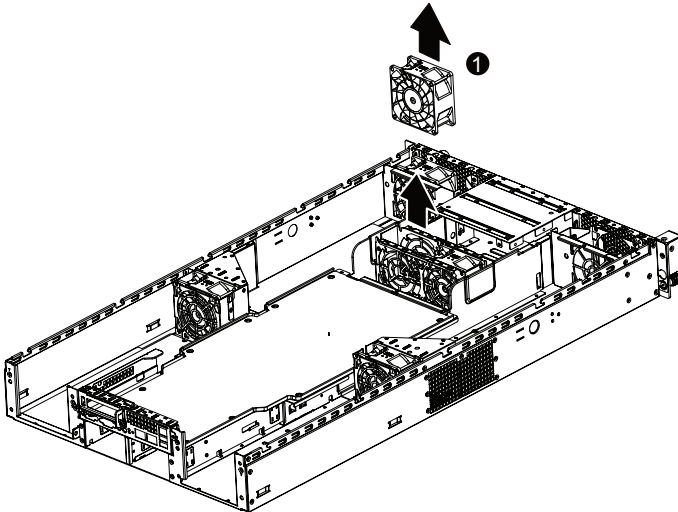
1. Disconnect the fan cable and then lift up the fan assembly from the chassis.
2. Reverse the previous steps to install the replacement fan assembly.

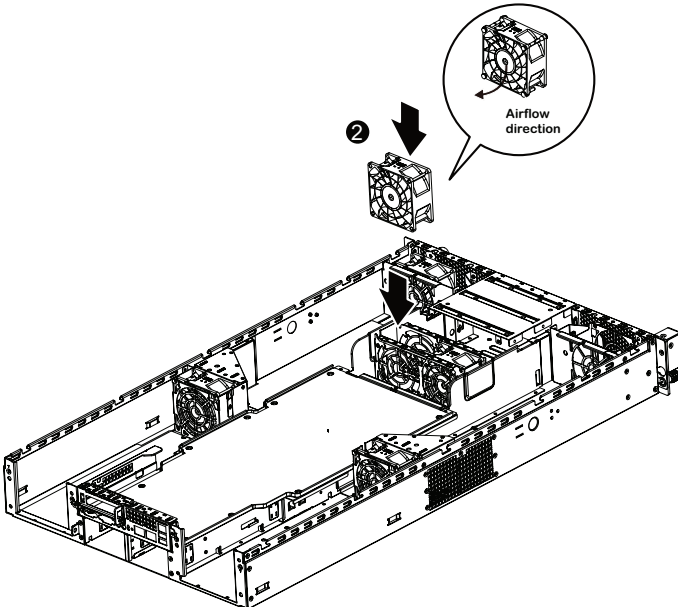




**[For SYS\_FAN1/SYS\_FAN2]**

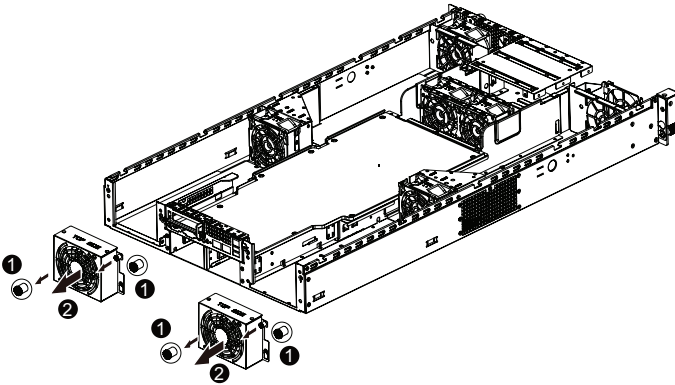
1. Disconnect the fan cable and then lift up the fan assembly from the chassis.
2. Reverse the previous steps to install the replacement fan assembly.



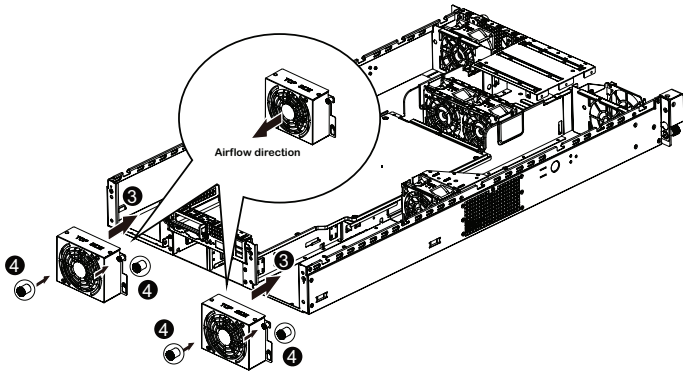


**[For GPU12E\_FAN/GPU56E\_FAN]**

1. Disconnect the fan cable and then loosen and remove the screws securing the fan cage.
2. Remove the fan cage from the system
3. Reverse the previous steps to install the replacement fan assembly.

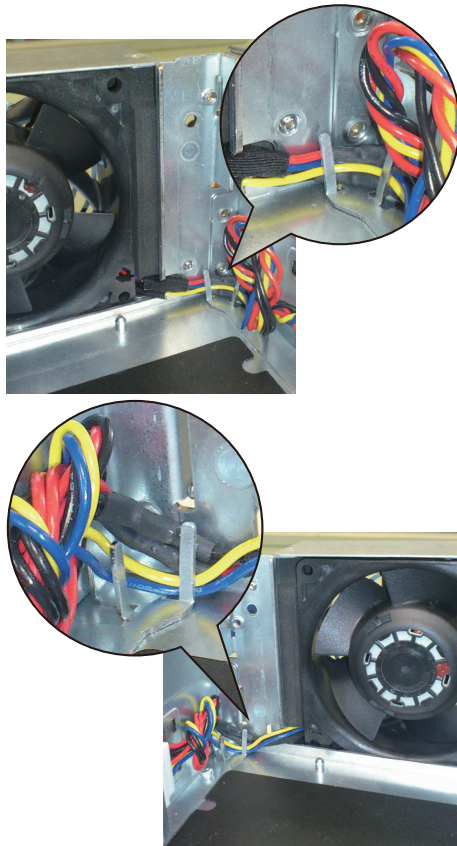






**CAUTION!**

- To avoid fan cable damage, please make sure the fan cables are firmly seated in the cable routing hooks.



### 3-9 Replacing the Power Supply

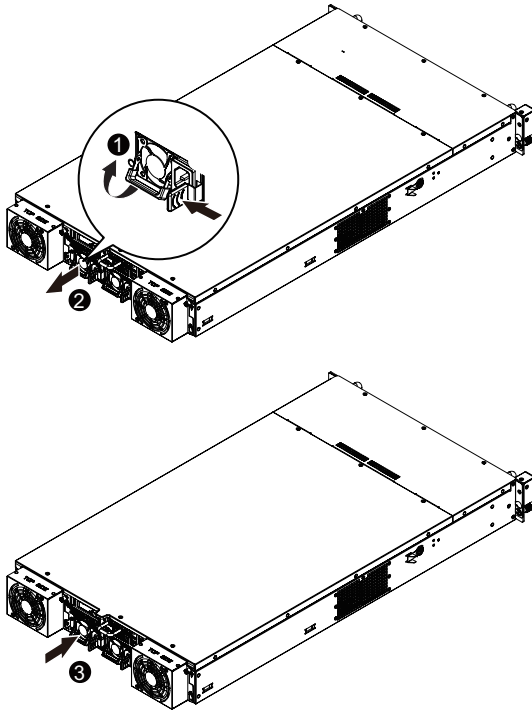


#### CAUTION!

- In order to reduce the risk of injury from electric shock, disconnect AC power from the power supply before removing it from the system.

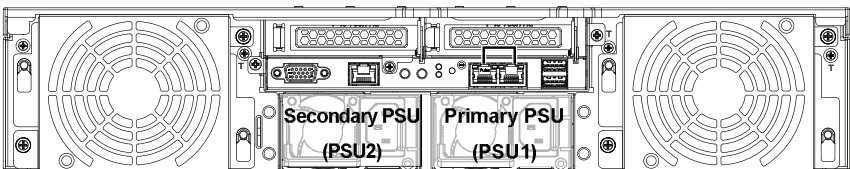
#### Follow these instructions to replace the power supply:

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

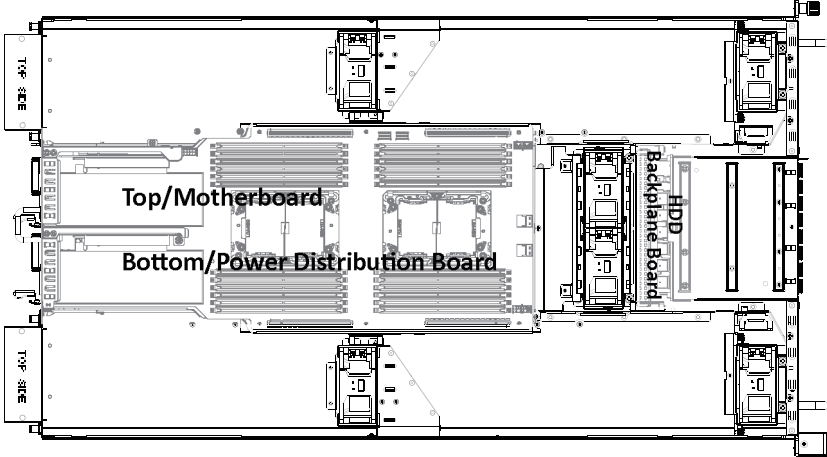


#### CAUTION!

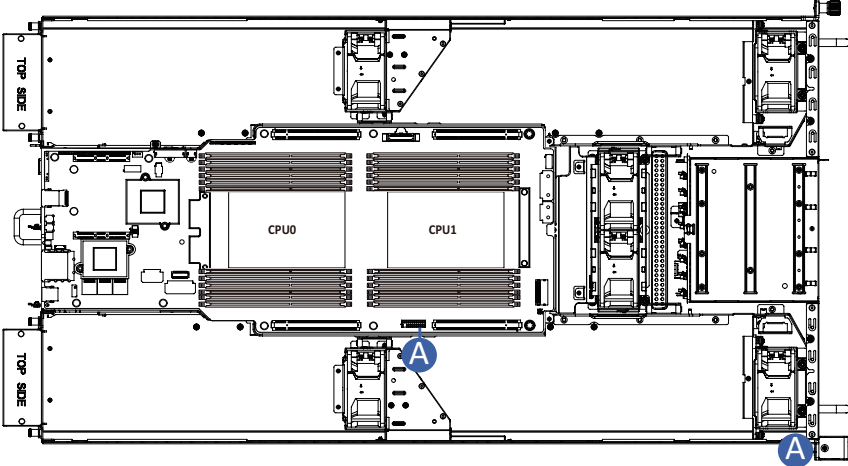
- Please see the illustration below for installation sequence.



### 3-10 Cable Routing

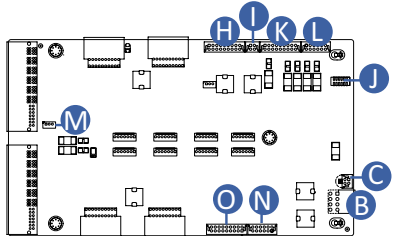
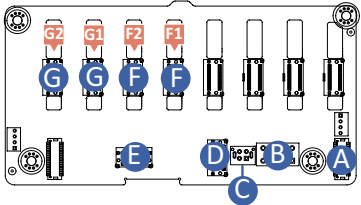
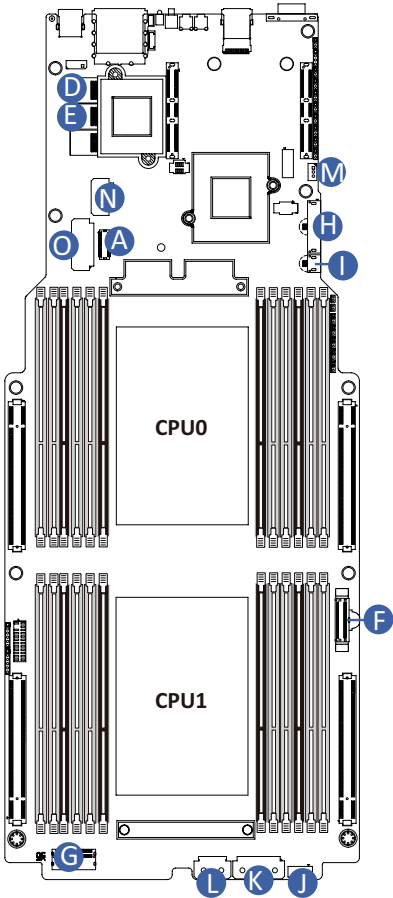


#### Front Panel IO Cable



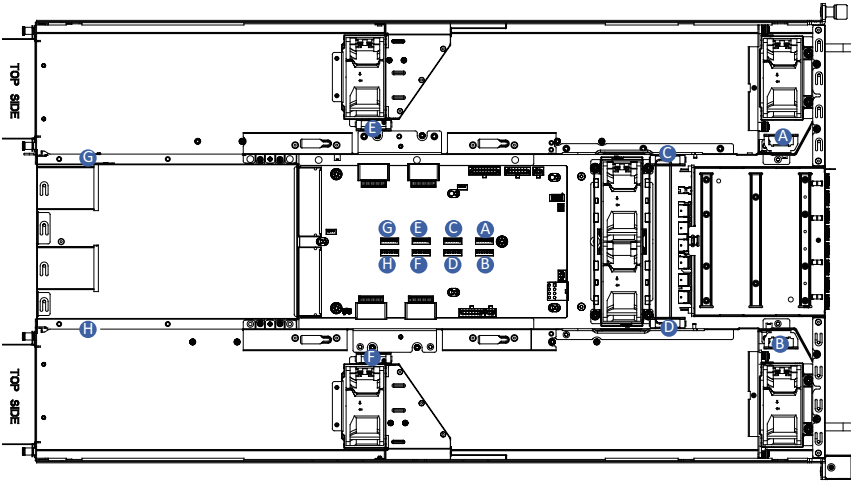
|   |                        |                |      |
|---|------------------------|----------------|------|
| A | Front Switch/LED Cable | Motherboard    | FP_1 |
|   |                        | Front IO Board | FP_1 |

Motherboard / HDD Backplane Board / Power Distribution Board



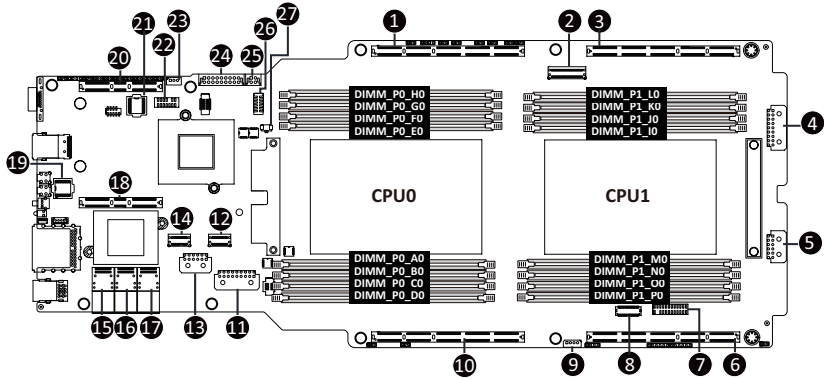
|   |                       |                          |                             |
|---|-----------------------|--------------------------|-----------------------------|
| A | BPB Cable             | Motherboard              | BP_1                        |
|   |                       | HDD Backplane Board      | BP_1                        |
| B | ATX Power Cable (2x4) | HDD Backplane Board      | BPB_PWR                     |
|   |                       | Power Distribution Board | BPB_PWR1                    |
| C | ATX Power Cable (2x2) | HDD Backplane Board      | BPB_PWR1                    |
|   |                       | Power Distribution Board | BPB_PWR2                    |
| D | SATA Cable            | Motherboard              | SL-CN1                      |
|   |                       | HDD Backplane Board      | SL_CN1                      |
| E | SATA Cable            | Motherboard              | SL-CN2                      |
|   |                       | HDD Backplane Board      | SL_CN2                      |
| F | NVMe Cable            | Motherboard              | U2_P0_PE1                   |
|   |                       | HDD Backplane Board      | F1: U2_4 (MCIO 4I Cable P1) |
|   |                       |                          | F2: U2_5 (MCIO 4I Cable P2) |
| G | NVMe Cable            | Motherboard              | U2_P1_PE3                   |
|   |                       | HDD Backplane Board      | G1: U2_6 (MCIO 4I Cable P1) |
|   |                       |                          | G2: U2_7 (MCIO 4I Cable P2) |
| H | ATX Power Cable (2x9) | Motherboard              | ATX_2X9P                    |
|   |                       | Power Distribution Board | SSI_2X9P1                   |
| I | ATX Power cable (2x2) | Motherboard              | ATX_2X2P                    |
|   |                       | Power Distribution Board | SSI_2X2P                    |
| J | SMD Cable             | Motherboard              | FP_2                        |
|   |                       | Power Distribution Board | F_PANEL                     |
| K | ATX Power Cable (2x9) | Motherboard              | ATX2_1                      |
|   |                       | Power Distribution Board | ATX2_1                      |
| L | ATX Power Cable (2x6) | Motherboard              | ATX2_2                      |
|   |                       | Power Distribution Board | ATX2_2                      |
| M | Signal Cable (1x3)    | Motherboard              | JP12V_STBY                  |
|   |                       | Power Distribution Board | P12V_STBY                   |
| N | ATX Power Cable (2x6) | Motherboard              | ATX1_2                      |
|   |                       | Power Distribution Board | ATX1_2                      |
| O | CPU Power Cable (2x9) | Motherboard              | ATX1_1                      |
|   |                       | Power Distribution Board | ATX1_1                      |

# System Fan Power Cable



# Chapter 4 Motherboard Components

## 4-1 Motherboard Components

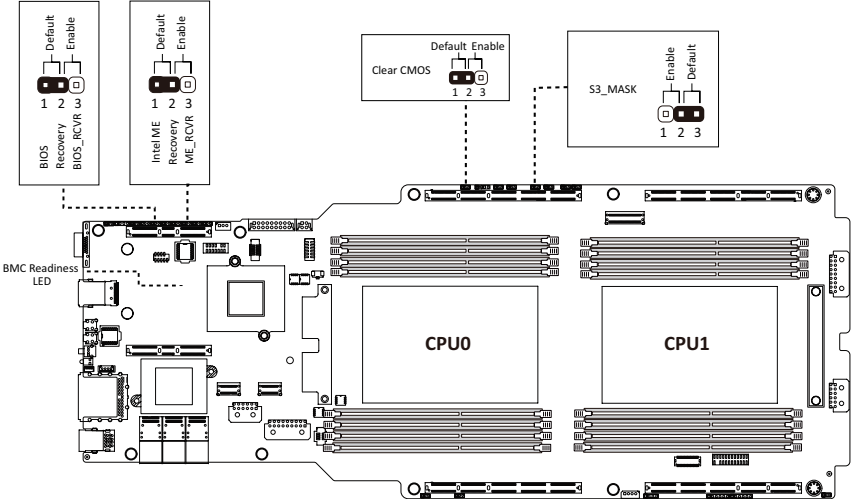


| Item | Description                            |
|------|--|
| 1    | PCIe x32 Slot #1                       |
| 2    | MCIO Connector (U2_P0_PE3/PCIe Gen5)   |
| 3    | PCIe x32 Slot #3                       |
| 4    | 2 x 9 Pin ATX Power Connector          |
| 5    | 2 x 6 Pin ATX Power Connector          |
| 6    | PCIe x32 Slot #4                       |
| 7    | Front Panel Header (Primary)           |
| 8    | HDD Back Plane Board Connector         |
| 9    | IPMB Connector                         |
| 10   | PCIe x32 Slot #2                       |
| 11   | 2 x 9 Pin ATX Power Connector          |
| 12   | MCIO Connector (U2_P1_PE1D/PCIe Gen5)  |
| 13   | 2 x 6 Pin ATX Power Connector          |
| 14   | MCIO Connector (U2_P1_PE1C/PCIe Gen5)  |
| 15   | Slimline SAS Connector (SATA #0 - #3)  |
| 16   | Slimline SAS Connector (SATA #4 - #7)  |
| 17   | Slimline SAS Connector (sSATA #0 - #3) |
| 18   | Proprietary PCIe Slot(Gen5 x16)        |
| 19   | BMC_FLH1(BMC_FLH2/at the back)         |
| 20   | Proprietary PCIe Slot(Gen5 x16)        |
| 21   | BIOS_1(BIOS_2/at the back)             |
| 22   | TPM Module Connector                   |

|    |                                |
|----|--------------------------------|
| 23 | 12V Standby Power Connector    |
| 24 | 2 x 9 Pin Power Connector      |
| 25 | 2 x 2 Pin Power Connector      |
| 26 | Front Panel Header (Secondary) |
| 27 | System Battery Cable Connector |

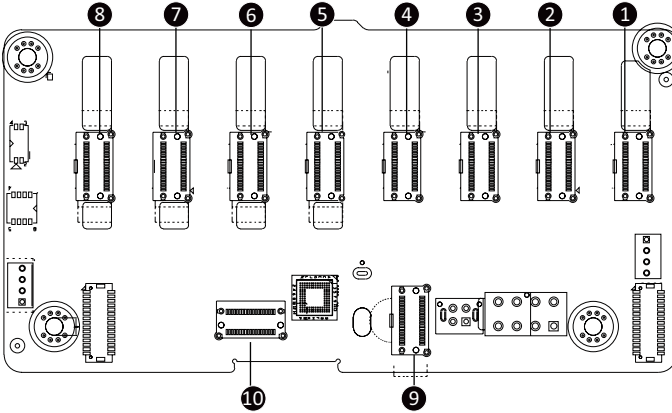


# 4-2 Jumper Setting



# 4-3 Backplane Board Storage Connector

## 4-3-1 CBPG086



| Item | Description                 |
|------|-----------------------------|
| 1    | SlimLine Connector (U2_0)   |
| 2    | SlimLine Connector (U2_1)   |
| 3    | SlimLine Connector (U2_2)   |
| 4    | SlimLine Connector (U2_3)   |
| 5    | SlimLine Connector (U2_4)   |
| 6    | SlimLine Connector (U2_5)   |
| 7    | SlimLine Connector (U2_6)   |
| 8    | SlimLine Connector (U2_7)   |
| 9    | SlimLine Connector (SL_CN1) |
| 10   | SlimLine Connector (SL_CN2) |

# 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, loading the operating system etc. The 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 any problems when 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<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 of the 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 functions of the Platform Controller Hub.

■ **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 the 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

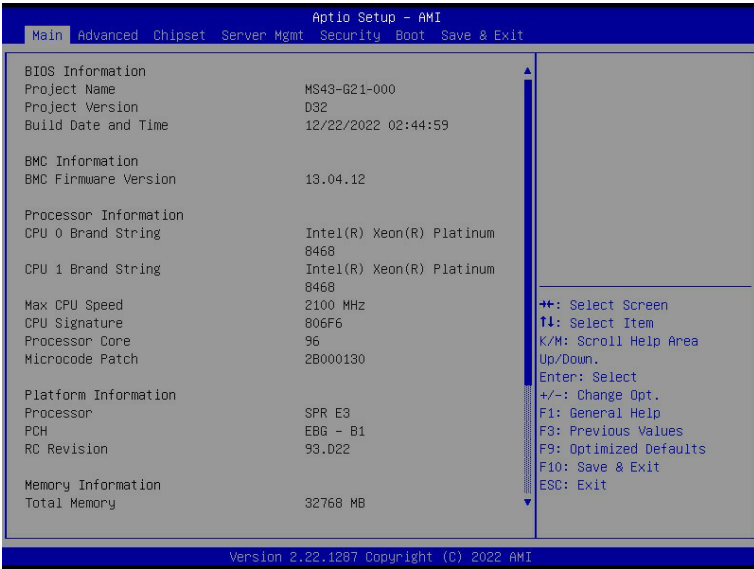
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

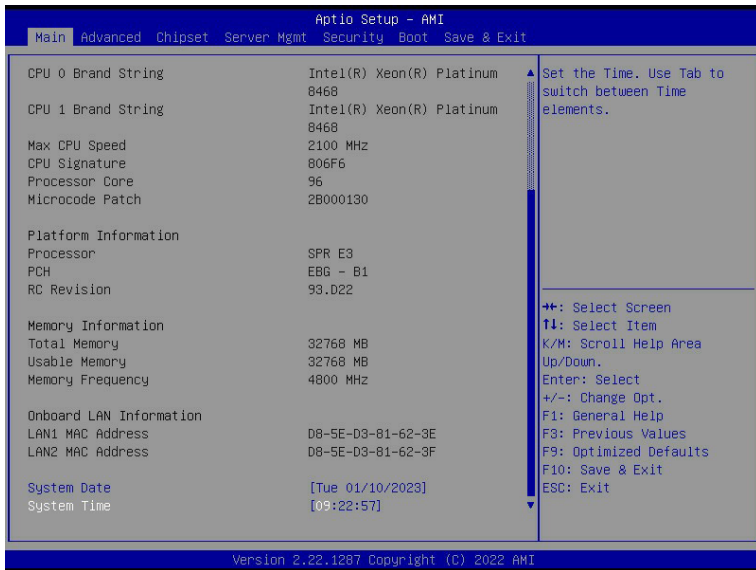
## Submenu Help

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   |  |
| Project Name   | 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 <sup>(Note1)</sup>   |  |
| BMC Firmware Version <sup>(Note1)</sup>  | Displays BMC firmware version information.                               |
| Processor Information  |  |
| CPU Brand String/ Max CPU Speed / CPU Signature / Processor Core / Microcode Patch | Displays the technical information for the installed processor(s).       |
| Platform Information   |  |
| Processor/ PCH/ RC Revision  | Displays the platform information of the installed processor(s) and PCH. |
| Memory Information   |  |
| Total Memory <sup>(Note2)</sup>  | Displays the total memory size of the installed memory.                  |
| Usable Memory <sup>(Note2)</sup>   | Displays the usable memory size of the installed memory.                 |

(Note1) Functions available on selected models..

(Note2) This section will display capacity and frequency information of the memory that the customer has installed.

| Parameter                           | Description   |
|-------------------------------------|---|
| Memory Frequency <sup>(Note2)</sup> | Displays the frequency information of the installed memory.   |
| Onboard LAN Information             |   |
| LAN# MAC Address <sup>(Note3)</sup> | Displays LAN MAC address information.                         |
| System Date                         | Sets the date following the weekday-month-day-year format.    |
| System Time                         | Sets the system time following the hour-minute-second format. |

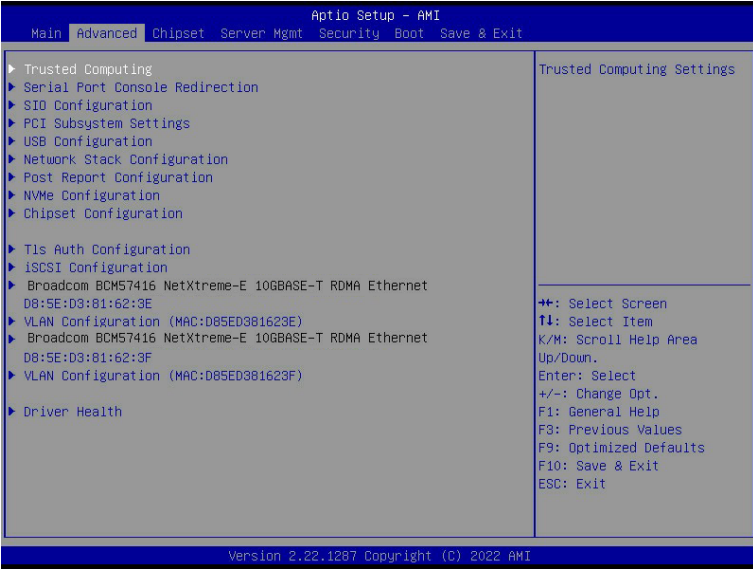
(Note2) This section will display capacity and frequency information of the memory that the customer has installed.

(Note3) The number of LAN ports listed will depend on the motherboard / system model.

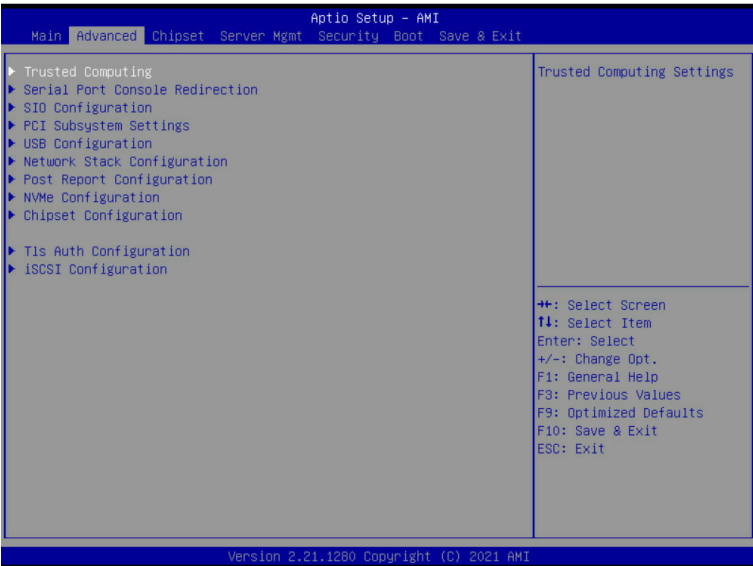
## 5-2 Advanced Menu

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

**When Boot Mode Select is set to UEFI (Default)**

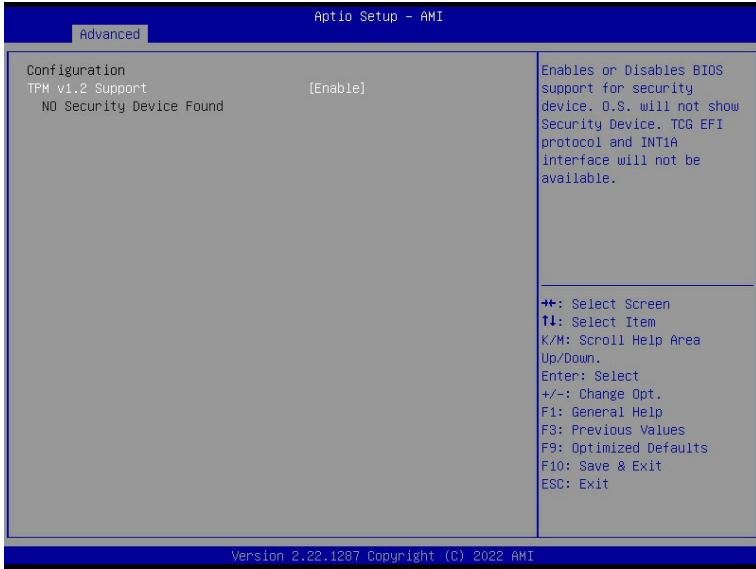


**When "Boot Mode Select" is set to Legacy in the Boot > Boot Mode Select section**



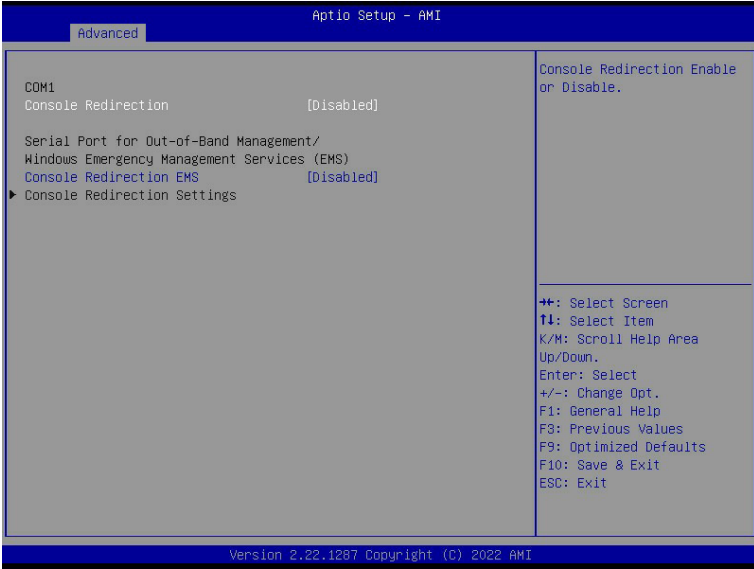


## 5-2-1 Trusted Computing



| Parameter               | Description  |
|-------------------------|--|
| Configuration           |  |
| Security Device Support | <p>Enable/Disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available.</p> <p>Options available: Enable, Disable. Default setting is <b>Enable</b>.</p> |

## 5-2-2 Serial Port Console Redirection



| Parameter                                  | Description   |
|--|---|
| COM1 Console Redirection <sup>(Note)</sup> | <p>Console redirection enables the users to manage the system from a remote location.</p> <p>Options available: Enabled, Disabled. Default setting is <b>Disabled</b>.</p>  |
| COM1 Console Redirection Settings          | <p>Press [Enter] to configure advanced items.</p> <p><b>Please note that this item is configurable when COM1 Console Redirection is set to Enabled.</b></p> <ul style="list-style-type: none"> <li>◆ Terminal Type <ul style="list-style-type: none"> <li>– Selects a terminal type to be used for console redirection.</li> <li>– Options available: VT100, VT100+, VT-UTF8, ANSI. Default setting is <b>VT100+</b>.</li> </ul> </li> <li>◆ Bits per second <ul style="list-style-type: none"> <li>– Selects the transfer rate for console redirection.</li> <li>– Options available: 9600, 19200, 38400, 57600, 115200. Default setting is <b>115200</b>.</li> </ul> </li> <li>◆ Data Bits <ul style="list-style-type: none"> <li>– Selects the number of data bits used for console redirection.</li> <li>– Options available: 7, 8. Default setting is <b>8</b>.</li> </ul> </li> </ul> |

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

| Parameter                                     | Description  |
|---|--|
| COM1 Console Redirection Settings (continued) | <ul style="list-style-type: none"> <li>◆ Parity <ul style="list-style-type: none"> <li>– A parity bit can be sent with the data bits to detect some transmission errors.</li> <li>– Even: parity bit is 0 if the num of 1's in the data bits is even.</li> <li>– Odd: parity bit is 0 if num of 1's in the data bits is odd.</li> <li>– Mark: parity bit is always 1. Space: Parity bit is always 0.</li> <li>– Mark and Space Parity do not allow for error detection.</li> <li>– Options available: None, Even, Odd, Mark, Space. Default setting is <b>None</b>.</li> </ul> </li> <li>◆ Stop Bits <ul style="list-style-type: none"> <li>– Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.</li> <li>– Options available: 1, 2. Default setting is <b>1</b>.</li> </ul> </li> <li>◆ Flow Control <ul style="list-style-type: none"> <li>– Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.</li> <li>– Options available: None, Hardware RTS/CTS. Default setting is <b>None</b>.</li> </ul> </li> <li>◆ VT-UTF8 Combo Key Support <ul style="list-style-type: none"> <li>– Enable/Disable the VT-UTF8 Combo Key Support.</li> <li>– Options available: Enabled, Disabled. Default setting is <b>Enabled</b>.</li> </ul> </li> <li>◆ Recorder Mode<sup>(Note)</sup> <ul style="list-style-type: none"> <li>– When this mode enabled, only texts will be send. This is to capture Terminal data.</li> <li>– Options available: Enabled, Disabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>◆ Resolution 100x31<sup>(Note)</sup> <ul style="list-style-type: none"> <li>– Enable/Disable extended terminal resolution.</li> <li>– Options available: Enabled, Disabled. Default setting is <b>Enabled</b>.</li> </ul> </li> <li>◆ Putty KeyPad<sup>(Note)</sup> <ul style="list-style-type: none"> <li>– Selects Function Key and KeyPad on Putty.</li> <li>– Options available: VT100, LINUX, XTERMR6, SC0, ESCN, VT400. Default setting is <b>VT100</b>.</li> </ul> </li> </ul> |

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

| Parameter  | Description  |
|--|--|
| Legacy Console Redirection   |  |
| Legacy Console Redirection Settings  | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Redirection COM Port <ul style="list-style-type: none"> <li>– Selects a COM port for Legacy serial redirection.</li> <li>– Default setting is <b>COM1</b>.</li> </ul> </li> <li>◆ Resolution <ul style="list-style-type: none"> <li>– Selects the number of rows and columns used in Console Redirection for legacy OS support.</li> <li>– Options available: 80x24, 80x25. Default setting is <b>80x24</b>.</li> </ul> </li> <li>◆ Redirect After POST <ul style="list-style-type: none"> <li>– When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS.</li> <li>– Options available: Always Enable, BootLoader. Default setting is <b>Always Enable</b>.</li> </ul> </li> </ul>   |
| Serial Port for Out-of-Band Management / Windows Emergency Management Services (EMS) Console Redirection <sup>(Note)</sup> | <p>EMS console redirection allows the user to configure Console Redirection Settings to support Out-of-Band Serial Port management.</p> <p>Options available: Enabled, Disabled. Default setting is <b>Disabled</b>.</p>   |
| Serial Port for Out-of-Band EMS Console Redirection Settings   | <p>Press [Enter] to configure advanced items.</p> <p><b>Please note that this item is configurable when Serial Port for Out-of-Band Management EMS Console Redirection is set to Enabled.</b></p> <ul style="list-style-type: none"> <li>◆ Out-of-Band Mgmt Port <ul style="list-style-type: none"> <li>– Microsoft Windows Emergency Management Service (EMS) allows for remote management of a Windows Server OS through a serial port.</li> <li>– Default setting is <b>COM1</b>.</li> </ul> </li> <li>◆ Terminal Type EMS <ul style="list-style-type: none"> <li>– Selects a terminal type to be used for console redirection.</li> <li>– Options available: VT100, VT100+, VT-UTF8, ANSI. Default setting is <b>VT100+</b>.</li> </ul> </li> <li>◆ Bits per second EMS <ul style="list-style-type: none"> <li>– Selects the transfer rate for console redirection.</li> <li>– Options available: 9600, 19200, 57600, 115200. Default setting is <b>115200</b>.</li> </ul> </li> </ul> |

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

| Parameter   | Description   |
|---|---|
| Serial Port for Out-of-Band<br>EMS Console Redirection<br>Settings(continued) | <ul style="list-style-type: none"><li>◆ Flow Control EMS<ul style="list-style-type: none"><li>– Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.</li><li>– Options available: None, Hardware RTS/CTS, Software Xon/Xoff. Default setting is <b>None</b>.</li></ul></li></ul> |

## 5-2-3 SIO Configuration



| Parameter                                     | Description   |
|---|---|
| AMI SIO Driver Version                        | Displays the AMI SIO driver version information.  |
| Super IO Chip Logical Device(s) Configuration |   |
| [*Active*] Serial Port                        | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Use This Device <ul style="list-style-type: none"> <li>– When set to Enabled allows you to configure the serial port settings. When set to Disabled, displays no configuration for the serial port.</li> <li>– Options available: Enabled, Disabled. Default setting is <b>Enabled</b>.</li> </ul> </li> <li>◆ Current: <ul style="list-style-type: none"> <li>– Displays the serial port base I/O address and IRQ.</li> </ul> </li> <li>◆ Possible: <ul style="list-style-type: none"> <li>– Configures the serial port base I/O address and IRQ. <ul style="list-style-type: none"> <li>Use Automatic Settings</li> <li>IO=3F8h; IRQ=4; DMA;</li> <li>IO=3F8h; IRQ=4; DMA;</li> <li>IO=2F8h; IRQ=4; DMA;</li> <li>IO=3E8h; IRQ=4; DMA;</li> <li>IO=2E8h; IRQ=4; DMA;</li> </ul> </li> <li>Default setting is <b>Use Automatic Settings</b>.</li> </ul> </li> </ul> |

# 5-2-4 PCI Subsystem Settings

| Advanced                                 |           |  | Aptio Setup - AMI |   |
|--|-----------|--|-------------------|---|
| PCI Bus Driver Version                   | A5.01.29  |  |                   | Enable/Disable Slot1 I/O ROM  |
| Slot1 I/O ROM                            | [Enabled] |  |                   |   |
| Slot1 Lanes                              | [Auto]    |  |                   |   |
| Slot1 Max Link Speed                     | [Auto]    |  |                   |   |
| Slot2 I/O ROM                            | [Enabled] |  |                   |   |
| Slot2 Lanes                              | [Auto]    |  |                   |   |
| Slot2 Max Link Speed                     | [Auto]    |  |                   |   |
| Slot3 I/O ROM                            | [Enabled] |  |                   |   |
| Slot3 Lanes                              | [Auto]    |  |                   |   |
| Slot3 Max Link Speed                     | [Auto]    |  |                   |   |
| Slot4 I/O ROM                            | [Enabled] |  |                   |   |
| Slot4 Lanes                              | [Auto]    |  |                   |   |
| Slot4 Max Link Speed                     | [Auto]    |  |                   |   |
| Slot9 I/O ROM                            | [Enabled] |  |                   |   |
| Slot9 Lanes                              | [Auto]    |  |                   |   |
| Slot9 Max Link Speed                     | [Auto]    |  |                   |   |
| Slot5 I/O ROM                            | [Enabled] |  |                   |   |
| Slot5 Lanes                              | [Auto]    |  |                   |   |
| Slot5 Max Link Speed                     | [Auto]    |  |                   |   |
|  |           |  |                   | ++: Select Screen<br>↑↓: Select Item<br>K/M: Scroll Help Area Up/Down.<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F8: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Exit<br>ESC: Exit |
| Version 2.22.1287 Copyright (C) 2023 AMI |           |  |                   |   |

| Advanced                                 |           |  | Aptio Setup - AMI |   |
|--|-----------|--|-------------------|---|
| Slot6 I/O ROM                            | [Enabled] |  |                   | If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.   |
| Slot6 Lanes                              | [Auto]    |  |                   |   |
| Slot6 Max Link Speed                     | [Auto]    |  |                   |   |
| Slot7 I/O ROM                            | [Enabled] |  |                   |   |
| Slot7 Lanes                              | [Auto]    |  |                   |   |
| Slot7 Max Link Speed                     | [Auto]    |  |                   |   |
| Slot8 I/O ROM                            | [Enabled] |  |                   |   |
| Slot8 Lanes                              | [Auto]    |  |                   |   |
| Slot8 Max Link Speed                     | [Auto]    |  |                   |   |
| Slot10 I/O ROM                           | [Enabled] |  |                   |   |
| Slot10 Lanes                             | [Auto]    |  |                   |   |
| Slot10 Max Link Speed                    | [Auto]    |  |                   |   |
| Onboard LAN1 I/O ROM                     | [Enabled] |  |                   |   |
| Onboard LAN2 I/O ROM                     | [Enabled] |  |                   |   |
| PCI Devices Common Settings:             |           |  |                   |   |
| Above 4G Decoding                        | [Enabled] |  |                   |   |
| SR-IOV Support                           | [Enabled] |  |                   | ++: Select Screen<br>↑↓: Select Item<br>K/M: Scroll Help Area Up/Down.<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F8: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Exit<br>ESC: Exit |
| Version 2.22.1287 Copyright (C) 2023 AMI |           |  |                   |   |

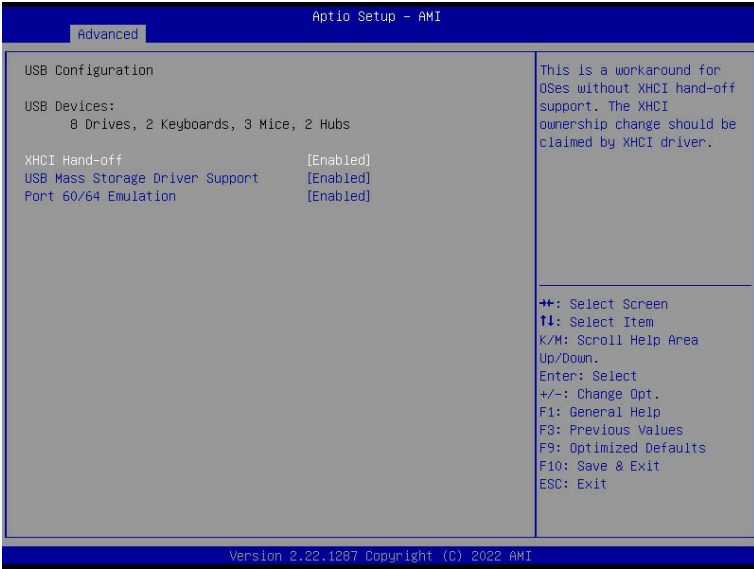
| Parameter                                     | Description   |
|---|---|
| PCI Bus Driver Version                        | Displays the PCI Bus Driver version information.  |
| PCI Express Slot # I/O ROM <sup>(Note1)</sup> | When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .                |
| Onboard LAN1/ LAN2 I/O ROM <sup>(Note2)</sup> | Enable/Disable the onboard LAN1/ LAN2 devices, and initializes device expansion ROM.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .                           |
| PCI Devices Common Settings                   |   |
| 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 <b>Enabled</b> .                          |
| 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 <b>Enabled</b> . |

(Note1) This section is dependent on the available PCIe Slot.

(Note2) This section is dependent on the available LAN controller.



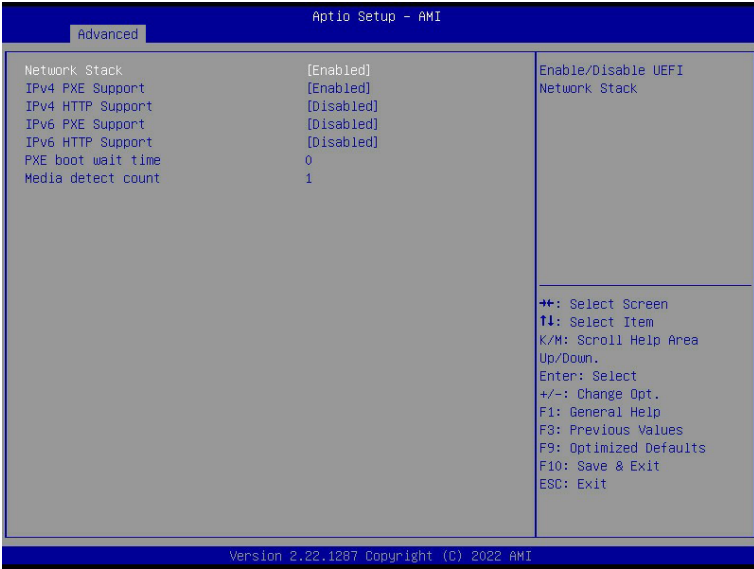
## 5-2-5 USB Configuration



| Parameter   | Description  |
|---|--|
| USB Configuration                                 |  |
| 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 <b>Enabled</b> .   |
| USB Mass Storage Driver Support <sup>(Note)</sup> | Enable/Disable the USB Mass Storage Driver Support.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .   |
| Port 60/64 Emulation                              | Enables the I/O port 60h/64h emulation support. This should be enabled for the complete USB Keyboard Legacy support for non-USB aware OS.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> . |

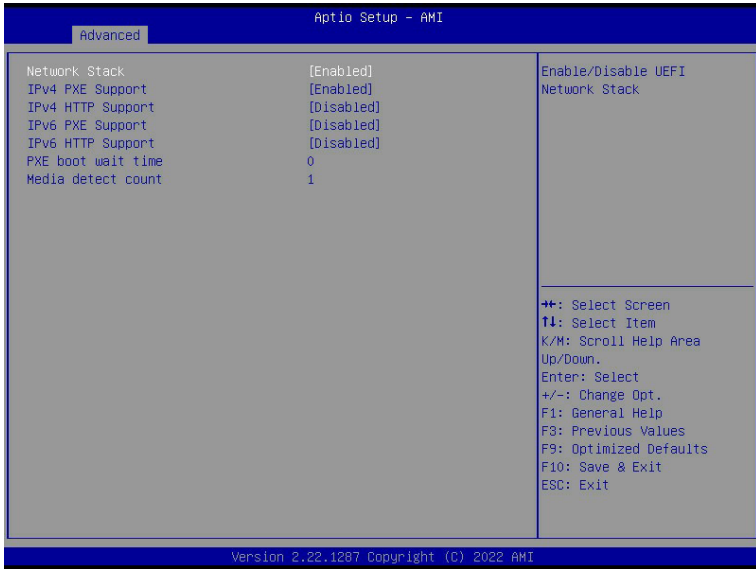
(Note) This item is present only if you attach USB devices.

## 5-2-6 Network Stack Configuration



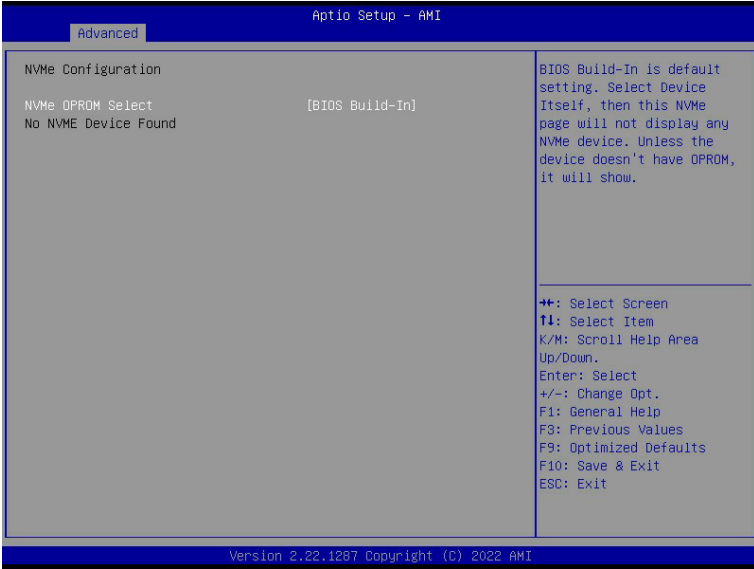
| Parameter          | Description  |
|--------------------|--|
| Network Stack      | Enable/Disable the UEFI network stack.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .                  |
| Ipv4 PXE Support   | Enable/Disable the Ipv4 PXE feature.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .                    |
| Ipv4 HTTP Support  | Enable/Disable the Ipv4 HTTP feature.<br>Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .                  |
| Ipv6 PXE Support   | Enable/Disable the Ipv6 PXE feature.<br>Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .                   |
| Ipv6 HTTP Support  | Enable/Disable the Ipv6 HTTP feature.<br>Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .                  |
| PXE boot wait time | Wait time in seconds to press ESC key to abort the PXE boot.<br>Press the <+> / <-> keys to increase or decrease the desired values. |
| Media detect count | Number of times the presence of media will be checked.<br>Press the <+> / <-> keys to increase or decrease the desired values.       |

## 5-2-7 Post Report Configuration



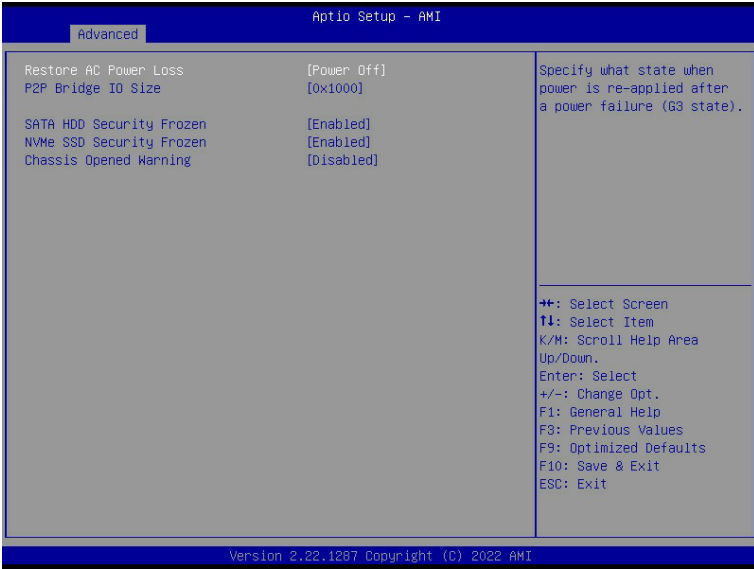
| Parameter                 | Description   |
|---------------------------|---|
| Post Report Configuration |   |
| Error Message Report      |   |
| Post Error Message        | Enable/Disable the POST Error Message support.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> . |

## 5-2-8 NVMe Configuration



| Parameter          | Description  |
|--------------------|--|
| NVMe Configuration | Displays the NVMe devices connected to the system.                                       |
| NVMe OPROM Select  | Options available: BIOS Build-In, NVMe Device. Default setting is <b>BIOS Build-In</b> . |

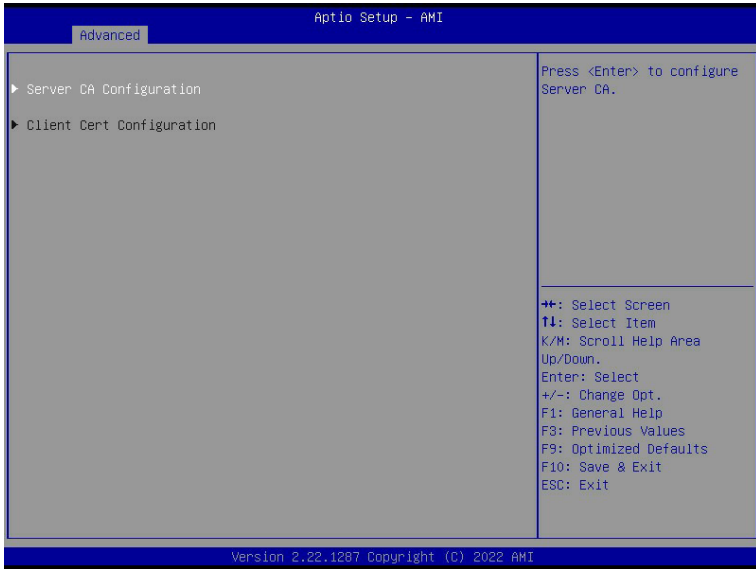
## 5-2-9 Chipset Configuration



| Parameter                                  | Description   |
|--|---|
| Restore on AC Power Loss <sup>(Note)</sup> | 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, Unspecified. 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 <b>Disabled</b> .   |
| P2P Bridge IO Size                         | Specifies P2P Bridge IO aligned to the size. Options available: 0x100, 0x150, 0x1000. Default setting is <b>0x1000</b> .  |
| P2P Performance for GPU                    | Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .   |
| SATA HDD Security Frozen                   | Enable/Disable this item to send freeze lock command to SATA HDD. Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .   |
| Chassis Opened Warning                     | Enable/Disable the chassis intrusion alert function. Options available: Enabled, Disabled, Clear. Default setting is <b>Disabled</b> .  |

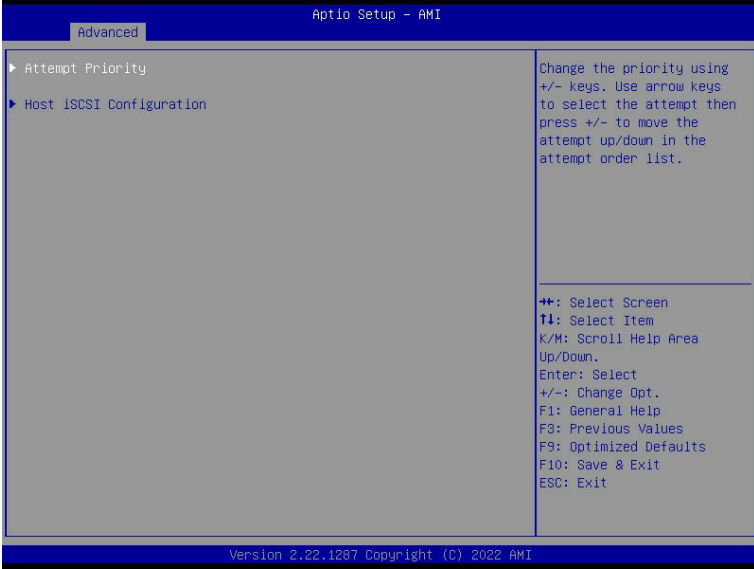
(Note) When the power policy is controlled by BMC, please wait for 15-20 seconds for BMC to save the last power state.

## 5-2-10 Tls Auth Configuration



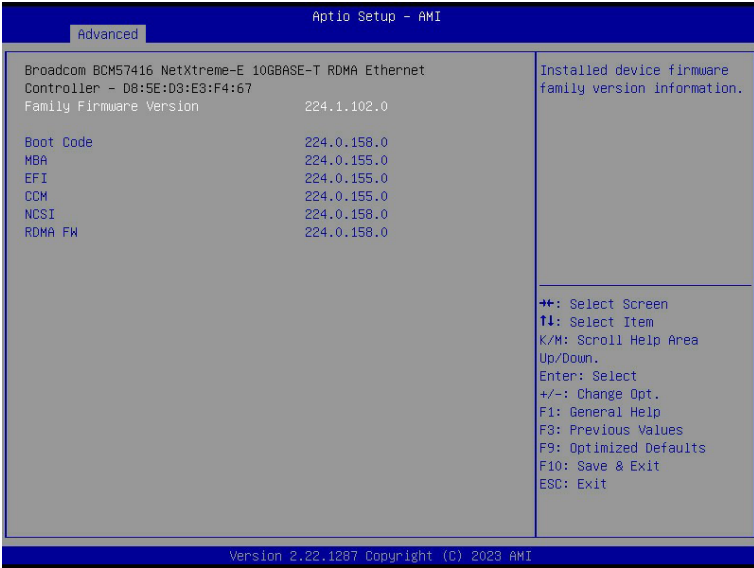
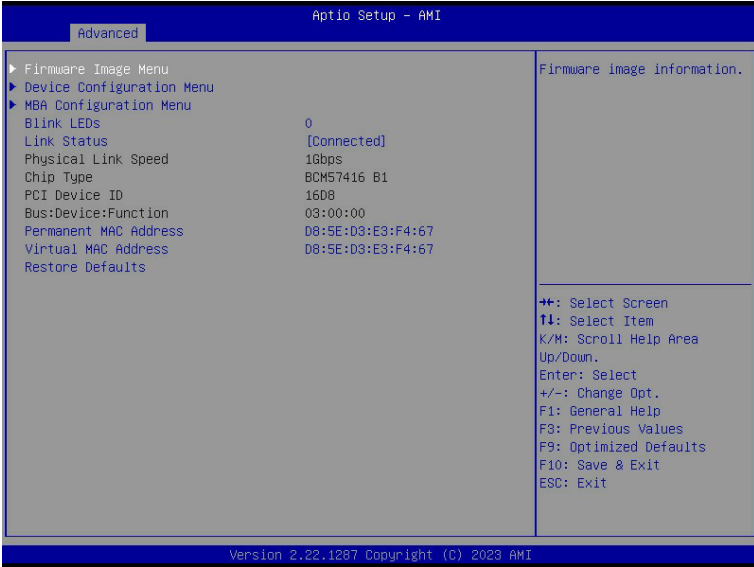
| Parameter                 | Description   |
|---------------------------|---|
| Server CA Configuration   | <p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> <li>◆ Enroll Cert               <ul style="list-style-type: none"> <li>– Press [Enter] to enroll a certificate                   <ul style="list-style-type: none"> <li>• Enroll Cert Using File</li> <li>• Cert GUID                       <ul style="list-style-type: none"> <li>Input digit character in 1111111-2222-3333-4444-1234567890ab format.</li> </ul> </li> </ul> </li> <li>– Commit Changes and Exit</li> <li>– Discard Changes and Exit</li> </ul> </li> <li>◆ Delete Cert</li> </ul> |
| Client Cert Configuration | Press [Enter] for configuration of advanced items.  |

## 5-2-11 iSCSI Configuration



| Parameter                | Description  |
|--------------------------|--|
| Attempt Priority         | <p>Press [Enter] configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Attempt Priority               <ul style="list-style-type: none"> <li>– Options available: Host Attempt, Redfish Attempt. Default setting is <b>Host Attempt</b>.</li> </ul> </li> <li>◆ Commit Changes and Exit</li> </ul>                  |
| Host iSCSI Configuration | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ iSCSI Initiator Name               <ul style="list-style-type: none"> <li>– Only IQN format is accepted. Range: from 4 to 223</li> </ul> </li> <li>◆ Add an Attempt</li> <li>◆ Delete Attempts</li> <li>◆ Change Attempt Order</li> </ul> |

## 5-2-12 Broadcom BCM57416 Ethernet Network Connection



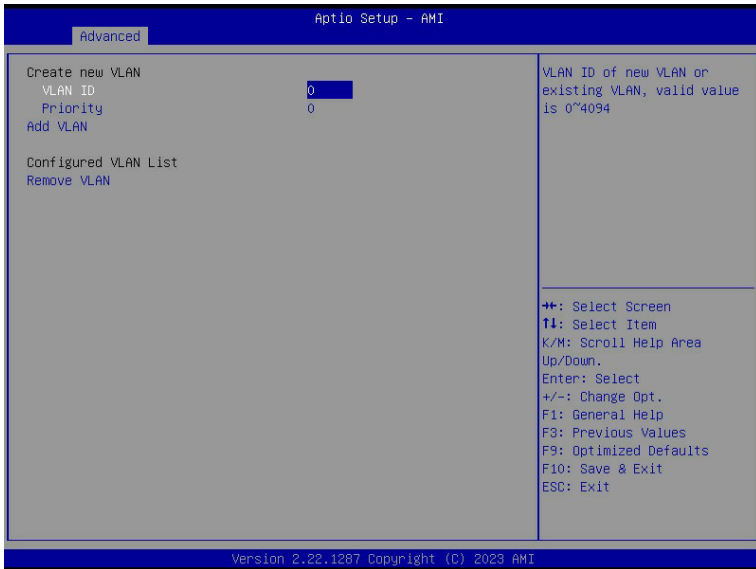
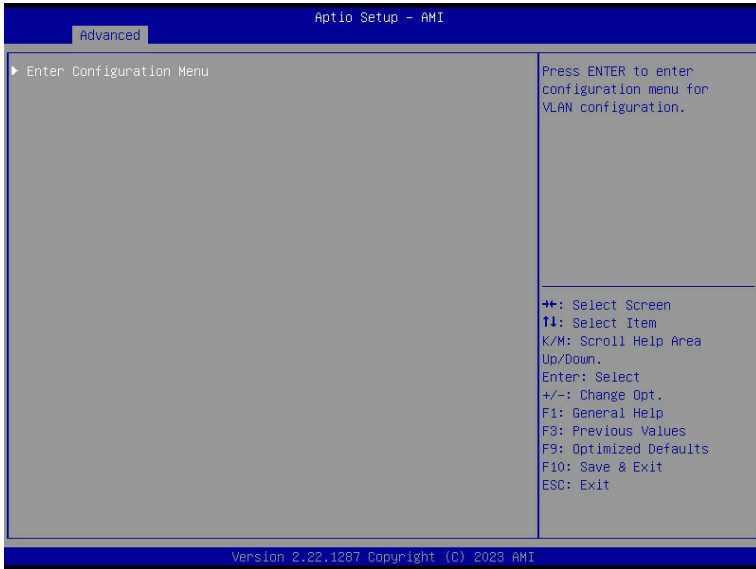


| Advanced   |            | Aptio Setup - AMI   |  |
|--|------------|---|--|
| Broadcom BCM57416 NetXtreme-E 10GBASE-T RDMA Ethernet Controller - 08:5E:D3:E3:F4:67 |            | Configure NIC Hardware Mode. Switching from multi-function to single function will result in the clearing of Virtual Function values in the extended partitions. Advanced NPar option is a feature preview only.                |  |
| Multi-Function Mode  | [SF]       | <b>++:</b> Select Screen<br><b>F1:</b> Select Item<br>K/M: Scroll Help Area Up/Down.<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F3: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Exit<br>ESC: Exit |  |
| SR-IOV   | [Disabled] |   |  |
| Number of MSI-X Vectors per VF   | 16         |   |  |
| Maximum Number of PF MSI-X Vectors   | 148        |   |  |
| Energy Efficient Ethernet  | [Disabled] |   |  |
| Operational Link Speed   | [AutoNeg]  |   |  |
| Support RDMA   | [Disabled] |   |  |
| DCB Protocol   | [Disabled] |   |  |
| LLDP nearest bridge  | [Enabled]  |   |  |
| Default EVB Mode   | [VEB]      |   |  |
| Enable PME Capability  | [Enabled]  |   |  |
| Flow Offload   | [Disabled] |   |  |
| Live Firmware Upgrade  | [Disabled] |   |  |
| Adapter Error Recovery   | [Disabled] |   |  |
| Version 2.22.1287 Copyright (C) 2023 AMI   |            |   |  |

| Advanced   |               | Aptio Setup - AMI   |  |  |  |
|--|---------------|---|--|--|--|
| Broadcom BCM57416 NetXtreme-E 10GBASE-T RDMA Ethernet Controller - 08:5E:D3:E3:F4:67 |               | Controls the enablement of legacy Boot Protocols in the Option ROM.   |  |  |  |
| Option ROM   | [Enabled]     | <b>++:</b> Select Screen<br><b>F1:</b> Select Item<br>K/M: Scroll Help Area Up/Down.<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F3: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Exit<br>ESC: Exit |  |  |  |
| Legacy Boot Protocol   | [PXE]         |   |  |  |  |
| Boot Strap Type  | [Auto Detect] |   |  |  |  |
| Hide Setup Prompt  | [Disabled]    |   |  |  |  |
| Setup Key Stroke   | [Ctrl-S]      |   |  |  |  |
| Banner Message Timeout   | 5             |   |  |  |  |
| Pre-boot Wake On LAN   | [Enabled]     |   |  |  |  |
| VLAN Mode  | [Disabled]    |   |  |  |  |
| VLAN ID (1-4094)   | 1             |   |  |  |  |
| Boot Retry Count   | [No Retry]    |   |  |  |  |
| Version 2.22.1287 Copyright (C) 2023 AMI   |               |   |  |  |  |

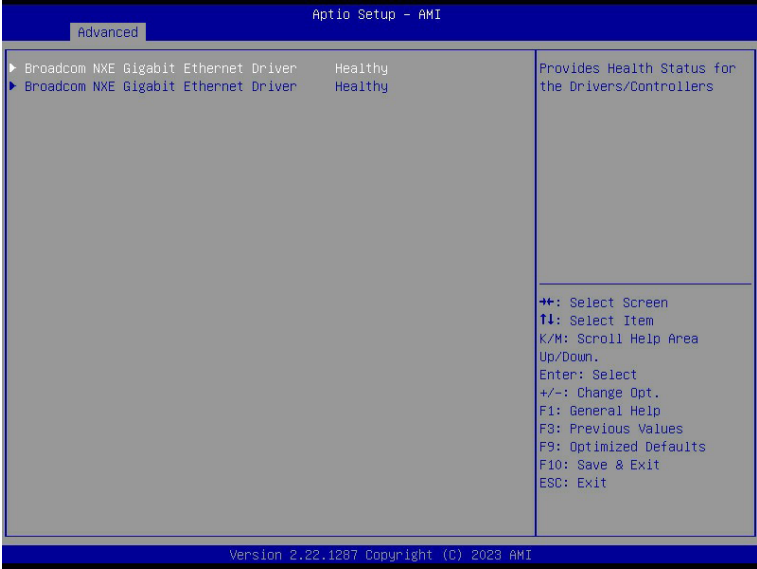
| Parameter                 | Description  |
|---------------------------|--|
| Firmware Image Properties | Press [Enter] to view the firmware version information of the device.  |
| NIC Configuration         | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Link Speed <ul style="list-style-type: none"> <li>– Default setting is <b>Auto Negotiated</b>.</li> </ul> </li> <li>◆ Wake On LAN <ul style="list-style-type: none"> <li>– 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.</li> <li>– Options available: Enabled, Disabled. Default setting is <b>Enabled</b>.</li> </ul> </li> <li>◆ LLDP Agent <ul style="list-style-type: none"> <li>– Enable/Disable firmware's LLDP Agent.</li> <li>– Options available: Enabled, Disabled. Default setting is <b>Enabled</b></li> </ul> </li> </ul> |
| Blink LEDs                | Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values (up to 15 seconds).   |
| 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.  |

## 5-2-13 VLAN Configuration



| Parameter                | Description   |
|--------------------------|---|
| Enter Configuration Menu | <p data-bbox="341 161 671 181">Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li data-bbox="341 189 519 210">◆ Create new VLAN</li> <li data-bbox="341 217 447 238">◆ VLAN ID <ul style="list-style-type: none"> <li data-bbox="376 246 802 266">– Sets VLAN ID for a new VLAN or an existing VLAN.</li> <li data-bbox="376 274 934 294">– Press the &lt;+&gt; / &lt;-&gt; keys to increase or decrease the desired values.</li> <li data-bbox="376 302 663 323">– The valid range is from 0 to 4094.</li> </ul> </li> <li data-bbox="341 330 434 351">◆ Priority <ul style="list-style-type: none"> <li data-bbox="376 359 849 379">– Sets 802.1Q Priority for a new VLAN or an existing VLAN.</li> <li data-bbox="376 387 934 407">– Press the &lt;+&gt; / &lt;-&gt; keys to increase or decrease the desired values.</li> <li data-bbox="376 415 636 435">– The valid range is from 0 to 7.</li> </ul> </li> <li data-bbox="341 443 461 464">◆ Add VLAN <ul style="list-style-type: none"> <li data-bbox="376 471 902 492">– Press [Enter] to create a new VLAN or update an existing VLAN.</li> </ul> </li> <li data-bbox="341 500 551 520">◆ Configured VLAN List</li> <li data-bbox="341 528 493 548">◆ Remove VLAN <ul style="list-style-type: none"> <li data-bbox="376 556 732 577">– Press [Enter] to remove an existing VLAN.</li> </ul> </li> </ul> |

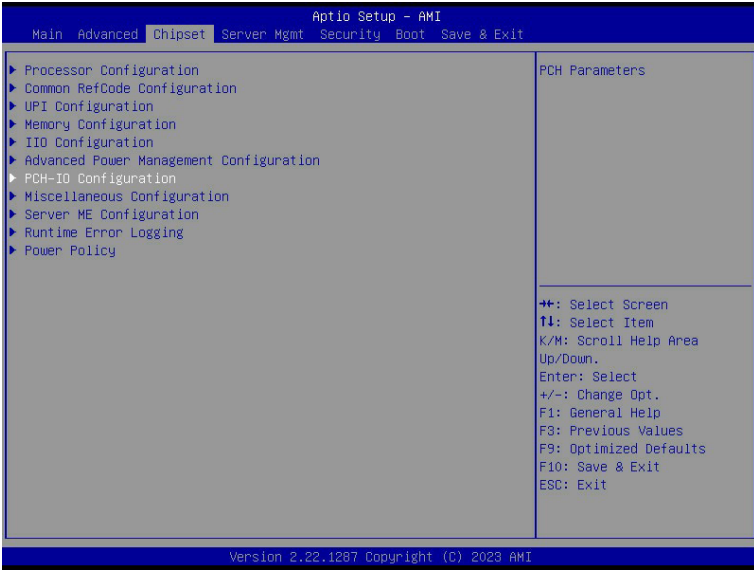
### 5-2-14 Driver Health



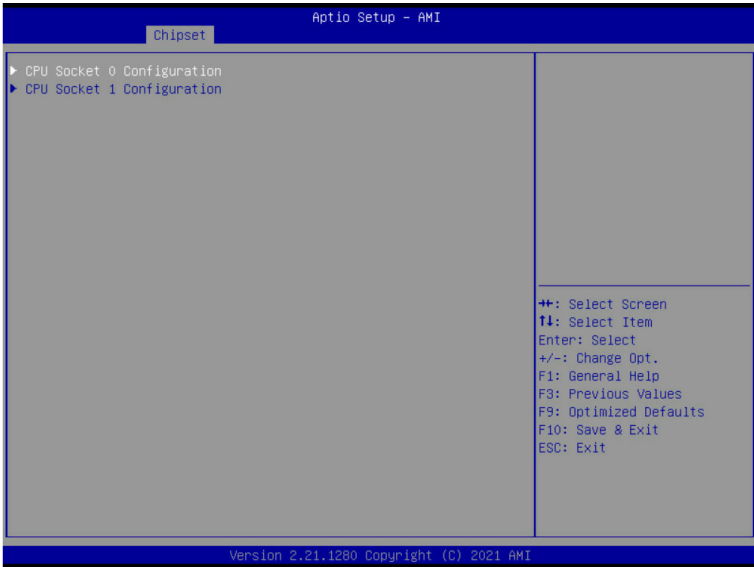
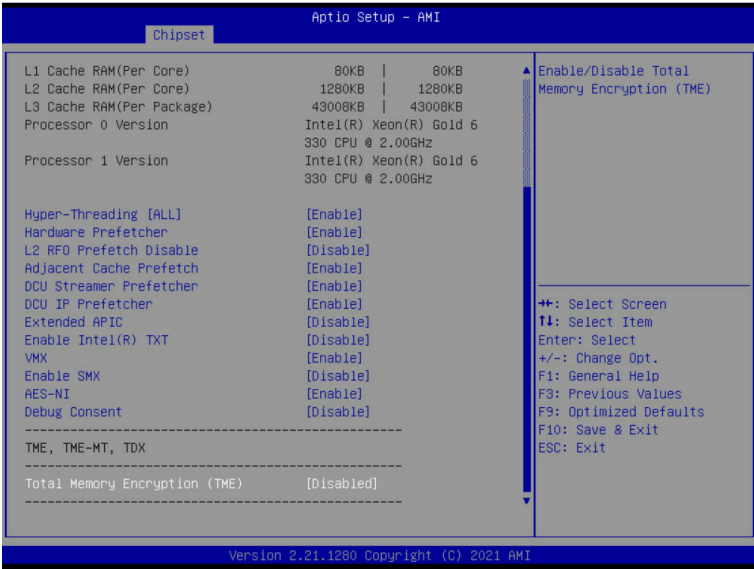
| Parameter     | Description   |
|---------------|---|
| Driver Health | Displays driver health status of the devices/controllers if installed |

## 5-3 Chipset Menu

Chipset Setup menu displays submenu options for configuring the function of Platform Controller Hub(PCH). Select a submenu item, then press <Enter> to access the related submenu screen.



### 5-3-1 Processor Configuration



| Parameter  | Description  |
|--|--|
| Processor Configuration  |  |
| Pre-Socket Configuration   | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ CPU Socket 0/1 Configuration <ul style="list-style-type: none"> <li>– Core Disable Bitmap(Hex) <ul style="list-style-type: none"> <li>• Number of Cores to enable. 0 means all cores. FFFFFFFF means to disable all cores. The maximum value depends on the number of CPUs available. Press the numeric keys to adjust desired values.</li> </ul> </li> </ul> </li> </ul> |
| Processor Socket / Processor ID / Processor Frequency / Processor Max Ratio / Processor Min Ratio / Microcode Revision / L1 Cache RAM(Per Core) / L2 Cache RAM(Per Core) / L3 Cache RAM(Per Package) / Processor # Version | Displays the technical specifications for the installed processor(s).  |
| Hyper-Threading [All]  | <p>The Hyper Threading Technology allows a single processor to execute two or more separate threads concurrently. When hyper-threading is enabled, multi-threaded software applications can execute their threads, thereby improving performance.</p> <p>Options available: Enable, Disable. Default setting is <b>Enable</b>.</p>   |
| Hardware Prefetcher  | <p>Select whether to enable the speculative prefetch unit of the processor.</p> <p>Options available: Enable, Disable. Default setting is <b>Disable</b>.</p>  |
| L2 RF0 Prefetch Disable  | Options available: Enable, Disable. Default setting is <b>Disable</b> .  |
| Adjacent Cache Prefetch  | <p>When enabled, cache lines are fetched in pairs. When disabled, only the required cache line is fetched.</p> <p>Options available: Enable, Disable. Default setting is <b>Enable</b>.</p>  |
| DCU Streamer Prefetcher  | <p>Enable/Disable DCU streamer prefetcher.</p> <p>Options available: Enable, Disable. Default setting is <b>Enable</b>.</p>  |
| DCU IP Prefetcher  | <p>Enable/Disable DCU IP Prefetcher.</p> <p>Options available: Enable, Disable. Default setting is <b>Enable</b>.</p>  |
| Extended APIC  | <p>Enable/Disable extended APIC support. Note: The VT-d will be enabled automatically when x2APIC is enabled.</p> <p>Options available: Enable, Disable. Default setting is <b>Disable</b>.</p>  |
| Enable Intel(R) TXT  | <p>Enable/Disable the Intel Trusted Execution Technology support function.</p> <p>Options available: Enable, Disable. Default setting is <b>Disable</b>.</p>   |
| VMX (Vanderpool Technology)  | <p>Enable/Disable the Vanderpool Technology. This will take effect after rebooting the system.</p> <p>Options available: Enable, Disable. Default setting is <b>Enable</b>.</p>  |
| Enable SMX   | <p>Enable/Disable the Safer Mode Extensions (SMX) support function.</p> <p>Options available: Enable, Disable. Default setting is <b>Disable</b>.</p>  |
| AES-NI   | <p>Enable/Disable the AES-NI support.</p> <p>Options available: Enable, Disable. Default setting is <b>Enable</b>.</p>   |



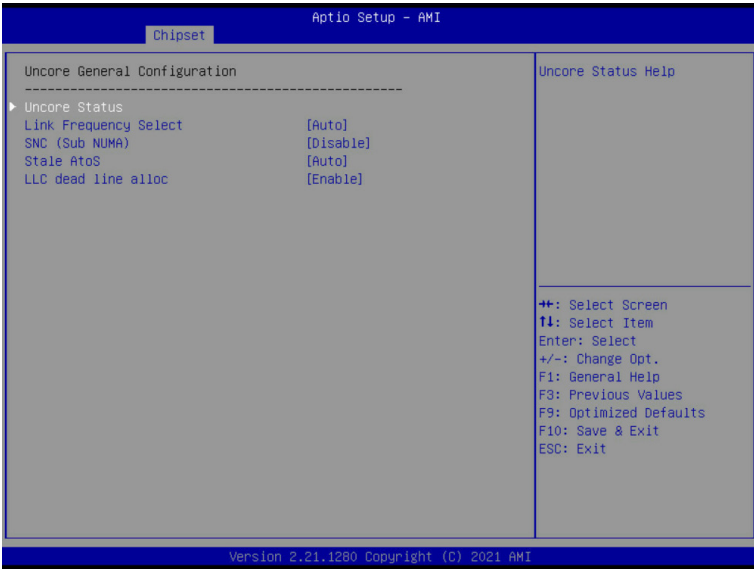
| Parameter                     | Description   |
|-------------------------------|---|
| Debug Consent                 | Options available: Enable, Disable. Default setting is <b>Disable</b> .   |
| Total Memory Encryption (TME) | Enable/Disable total memory encryption (TME).<br>Options available: Enabled, Disabled. Default setting is <b>Disabled</b> . |

### 5-3-2 Common RefCode Configuration



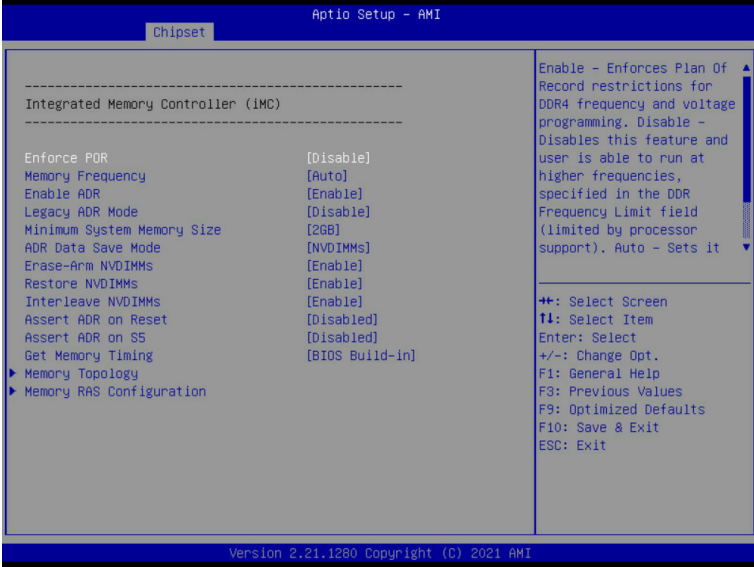
| Parameter                        | Description  |
|----------------------------------|--|
| Common RefCode Configuration     |  |
| MMIO High Base                   | Selects the MMIO High Base setting.<br>Options available: 56T, 40T, 32T, 24T, 16T, 4T, 2T, 1T, 512G, 3584T.<br>Default setting is <b>56T</b> .   |
| MMIO High Granularity Size       | Selects the allocation size used to assign memory-mapped I/O (MMIO) resources. Total mmio space can be up to 32x granularity. Per stack mmio resource assignments are multiples of the granularity where 1 unit per stack is the default allocation.<br>Options available: 1G, 4G, 16G, 64G, 256G, 1024G. Default setting is <b>256G</b> . |
| Isoc Mode                        | Enable/Disable the Isochronous support in order to meet the QoS requirements (Quality of Service).<br>Options available: Auto, Enable, Disable. Default setting is <b>Auto</b> .   |
| Numa (Non-Uniform Memory Access) | Enable/Disable Non-uniform Memory Access (NUMA) support to improve the system performance.<br>Options available: Enable, Disable. Default setting is <b>Enable</b> .   |
| Virtual Numa                     | Divide physical NUMA nodes into evenly sized virtual NUMA nodes in ACPI table. This may improve Windows performance on CPUs with more than 64 logical processors.<br>Options available: Enable, Disable. Default setting is <b>Disable</b> .   |

### 5-3-3 UPI Configuration



| Parameter                    | Description   |
|------------------------------|---|
| UnCore General Configuration | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ UnCore Status                             <ul style="list-style-type: none"> <li>– Press [Enter] to view the UnCore status.</li> </ul> </li> <li>◆ Link Frequency Select                             <ul style="list-style-type: none"> <li>– Selects the UPI link frequency.</li> <li>– Options available: 9.6GT/s, 10.4GT/s, 11.2GT/s, Auto. Default setting is <b>Auto</b>.</li> </ul> </li> <li>◆ SNC (Sub NUMA)                             <ul style="list-style-type: none"> <li>– Enable/Disable Sub NUMA Cluster function.</li> <li>– Options available: Disable, Enable SNC2 (2-clusters). Default setting is <b>Disable</b>.</li> </ul> </li> <li>◆ Stale AtoS                             <ul style="list-style-type: none"> <li>– Enable/Disable Stale A to S directory optimization.</li> <li>– Options available: Disable, Enable, Auto. Default setting is <b>Auto</b>.</li> </ul> </li> <li>◆ LLC dead line alloc                             <ul style="list-style-type: none"> <li>– Enable/Disable fill dead lines in LLC.</li> <li>– Options available: Disable, Enable, Auto. Default setting is <b>Enable</b>.</li> </ul> </li> </ul> |

### 5-3-4 Memory Configuration



| Parameter                          | Description   |
|------------------------------------|---|
| Integrated Memory Controller (iMC) |   |
| Enforce POR                        | When set to Enable, the system enforces Plan Of Record restrictions for DDR4 frequency and voltage programming.<br>Options available: POR, Disable. Default setting is <b>Disable</b> .                         |
| Memory Frequency                   | Configures the maximum memory frequency. If Enforce POR is disabled, user will be able to run at higher frequencies than the memory support (limited by processor support).<br>Default setting is <b>Auto</b> . |
| Enable ADR                         | Enables the detecting and enabling of ADR (Asynchronous DRAM Refresh) function.<br>Options available: Enable, Disable. Default setting is <b>Enable</b> .   |
| Legacy ADR Mode                    | Enable/Disable the Legacy ADR Mode.<br>Options available: Enable, Disable. Default setting is <b>Disable</b> .  |
| Minimum System Memory Size         | Configures the minimum memory size.<br>Options available: 2GB, 4GB, 6GB, 8GB. Default setting is <b>2GB</b> .   |
| ADR Data Save Mode                 | Specifies the Data Save Mode for ADR. Batterybacked or Type 01 NVDIMM.<br>Options available: Disable, Batterybacked DIMMs, NVDIMMs.<br>Default setting is <b>NVDIMMs</b> .                                      |
| Erase-Arm NVDIMMs                  | Enable/Disable Erasing and Arming NVDIMMs.<br>Options available: Enable, Disable. Default setting is <b>Enable</b> .  |

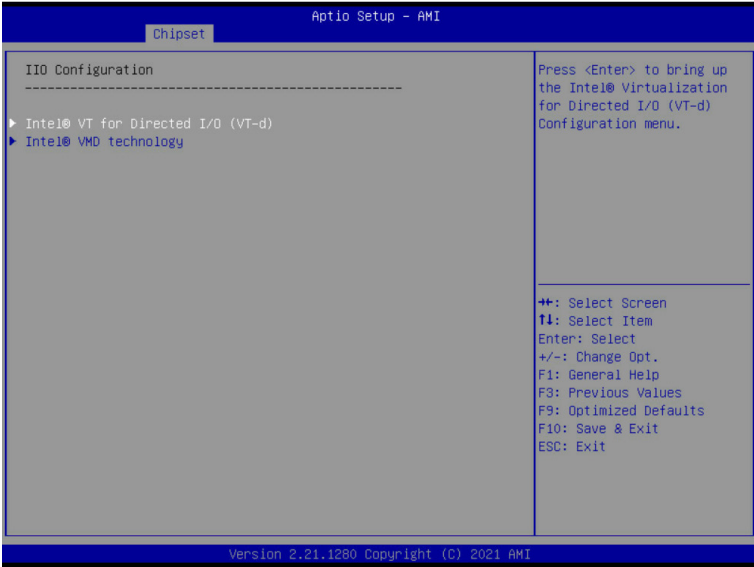
| Parameter                    | Description   |
|------------------------------|---|
| Restore NVDIMMs              | Enable/Disable Automatic restoring of NVDIMMs.<br>Options available: Enable, Disable. Default setting is <b>Enable</b> .  |
| Interleave NVDIMMs           | Controls if NVDIMMs are interleaved together or not.<br>Options available: Enable, Disable. Default setting is <b>Enable</b> .  |
| Assert ADR on Reset          | Enable/Disable Assert ADR on Reset.<br>Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .   |
| Assert ADR on S5             | Enable/Disable Assert ADR on S5.<br>Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .  |
| Get Memory Timing            | Auto is the detected SPD value and use it, otherwise use BIOS Build-in.<br>Options available: Auto, BIOS Build-in. Default setting is <b>BIOS Build-in</b> .  |
| Memory Topology              | Press [Enter] to view memory topology with DIMM population information.   |
| Memory Map <sup>(Note)</sup> | Press [Enter] to configure advanced items. <ul style="list-style-type: none"> <li>◆ Volatile Memory Mode <ul style="list-style-type: none"> <li>– Selects 1LM or 2LM mode for volatile memory.</li> <li>– Options available: 1LM, 2LM. Default setting is 2LM</li> </ul> </li> </ul>  |
| Memory RAS Configuration     | Press [Enter] to configure advanced items. <ul style="list-style-type: none"> <li>◆ RAS Type <ul style="list-style-type: none"> <li>– Displays the RAS type.</li> </ul> </li> <li>◆ New SDDC Mode <ul style="list-style-type: none"> <li>– Enable/Disable 48B SDDC ECC from ICX C0 Onwards.</li> <li>– Options available: Disabled, Enabled. Default setting is <b>Enabled</b>.</li> </ul> </li> <li>◆ Mirror Mode <ul style="list-style-type: none"> <li>– Mirror Mode will set entire 1LM memory in system to be mirrored, consequently reducing the memory capacity by half. Enables the Mirror Mode will disable the XPT Prefetch.</li> <li>– Options available: Disabled, Full Mirror Mode, Partial Mirror Mode. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>◆ Correctable Error Threshold <ul style="list-style-type: none"> <li>– Correctable Error Threshold (0x01-0x7fff) used for sparing, and leaky bucket.</li> <li>– Press the &lt;+&gt; / &lt;-&gt; keys to increase or decrease the desired values.</li> </ul> </li> <li>◆ Trigger SW Error Threshold <ul style="list-style-type: none"> <li>– Enable/Disable Sparing trigger SW Error Match Threshold.</li> <li>– Options available: Disabled, Enabled. Default setting is <b>Disabled</b>.</li> </ul> </li> </ul> |

(Note) Advanced items prompt when HBM CPU is installed.

| Parameter                               | Description   |
|---|---|
| Memory RAS Configuration<br>(continued) | <ul style="list-style-type: none"> <li>◆ Sparing SW Error Match Threshold <ul style="list-style-type: none"> <li>– Correctable Error Threshold (1-32767) used for bank level information.</li> <li>– Press the &lt;+&gt; / &lt;-&gt; keys to increase or decrease the desired values.</li> </ul> </li> <li>◆ Correctable Error Time Window <ul style="list-style-type: none"> <li>– Correctable Error time window based interface in hour (0-24).</li> <li>– Press the &lt;+&gt; / &lt;-&gt; keys to increase or decrease the desired values.</li> </ul> </li> <li>◆ Leaky bucket time window based interface <ul style="list-style-type: none"> <li>– Enable/Disable leaky bucket time window based interface.</li> <li>– Options available: Disabled, Enabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>◆ Leaky bucket low bit <ul style="list-style-type: none"> <li>– Configures leaky bucket low bit (1-63).</li> <li>– Press the &lt;+&gt; / &lt;-&gt; keys to increase or decrease the desired values.</li> </ul> </li> <li>◆ Leaky bucket high bit <ul style="list-style-type: none"> <li>– Configures leaky bucket high bit (1-63).</li> <li>– Press the &lt;+&gt; / &lt;-&gt; keys to increase or decrease the desired values.</li> </ul> </li> <li>◆ ADDDC Sparing<sup>(Note)</sup> <ul style="list-style-type: none"> <li>– Enable/Disable ADDDC Sparing.</li> <li>– Options available: Disabled, Enabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>◆ Enable ADDDC Error Injection <ul style="list-style-type: none"> <li>– Options available: Disabled, Enabled. Default setting is <b>Enabled</b>.</li> </ul> </li> <li>◆ Column Correction Disable <ul style="list-style-type: none"> <li>– Options available: Disable, Enable. Default setting is <b>Disable</b>.</li> </ul> </li> <li>◆ Set PMem Die Sparing <ul style="list-style-type: none"> <li>– Options available: Disabled, Enabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>◆ Patrol Scrub <ul style="list-style-type: none"> <li>– Options available: Disabled, Enabled, Enable at End of POST. Default setting is <b>Disabled</b>.</li> </ul> </li> </ul> |

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

### 5-3-5 I/O Configuration



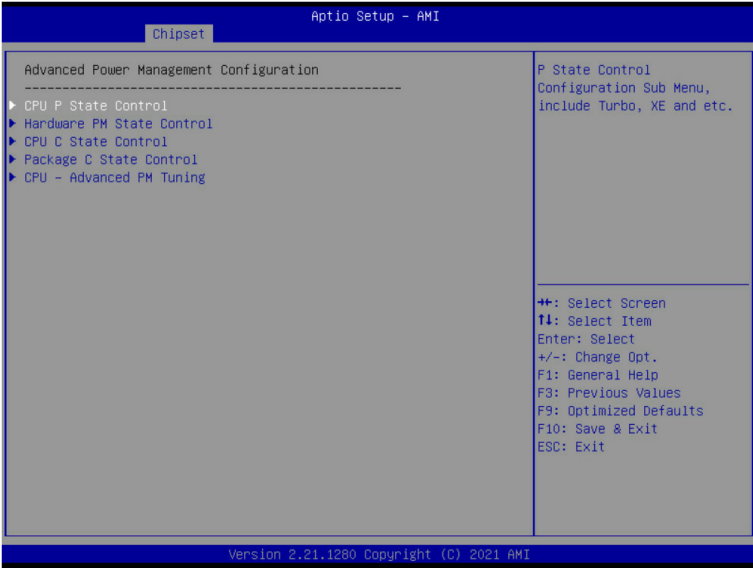
| Parameter         | Description   |
|-------------------|---|
| I/O Configuration | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Intel® VT for Directed I/O           <ul style="list-style-type: none"> <li>– Enable/Disable the Intel VT for Directed I/O (VT-d) support function by reporting the I/O device assignment to VMM through DMAR ACPI Tables.</li> <li>– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li>◆ ACS Control           <ul style="list-style-type: none"> <li>– Enable: Programs ACS only to Chipset PCIe Root Ports Bridges.</li> <li>– Disable: Programs ACS to all PCIe bridges.</li> <li>– Default setting is <b>Enable</b>.</li> </ul> </li> <li>◆ DMA Control Opt-In Flag           <ul style="list-style-type: none"> <li>– Enable/Disable DMA_CTRL_PLATFORM_OPT_IN_FLAG in DMAR table in ACPI. Not compatible with Direct Device Assignment (DDA).</li> <li>– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> <li>◆ Interrupt Remapping           <ul style="list-style-type: none"> <li>– Enable/Disable the interrupt remapping support function.</li> <li>– Options available: Auto, Enable, Disable. Default setting is <b>Auto</b>.</li> </ul> </li> <li>◆ x2APIC Opt Out           <ul style="list-style-type: none"> <li>– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> <li>◆ Pre-boot DMA Protection           <ul style="list-style-type: none"> <li>– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> </ul> |

| Parameter             | Description  |
|-----------------------|--|
| Intel® VMD technology | <p data-bbox="380 142 710 166">Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li data-bbox="380 174 921 252">◆ Intel® VMD Configuration <ul style="list-style-type: none"> <li data-bbox="418 200 751 224">– Enable/Disable Intel® VMD technology.</li> <li data-bbox="418 232 921 252">– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> <li data-bbox="380 260 921 338">◆ Intel® VMD for Non-Hotplug NVMe<sup>(Note)</sup> <ul style="list-style-type: none"> <li data-bbox="418 286 843 310">– Enable/Disable Intel® VMD for Non-Hotplug NVMe.</li> <li data-bbox="418 318 921 338">– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> </ul> |

(Note) This item appears when **Intel® VMD Configuration** is set to **Enable**.



### 5-3-6 Advanced Power Management Configuration



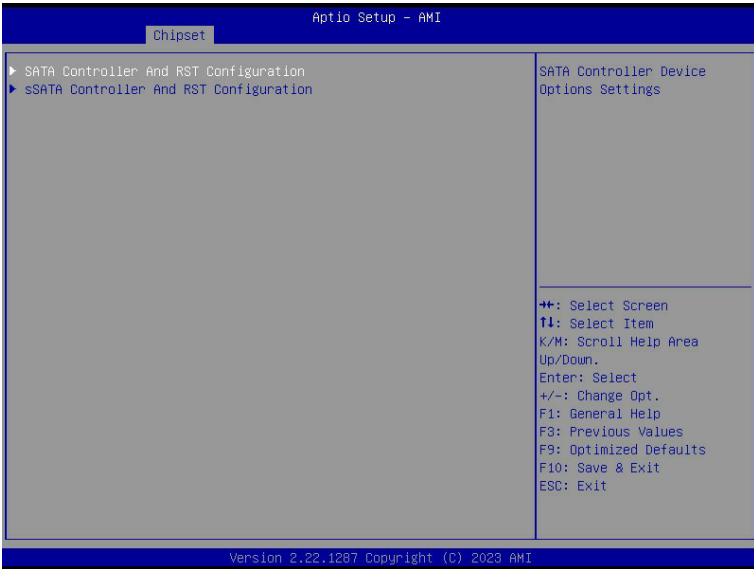
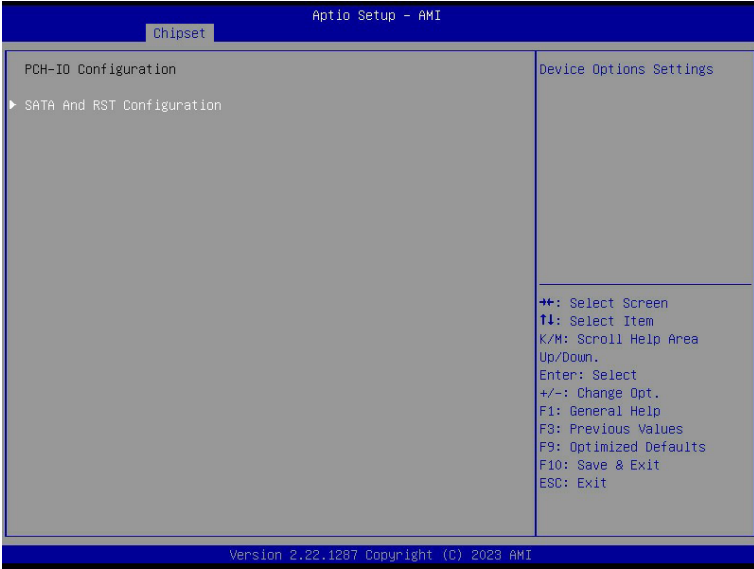
| Parameter                               | Description   |
|---|---|
| Advanced Power Management Configuration |   |
| CPU P State Control                     | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ SpeedStep (Pstates) <ul style="list-style-type: none"> <li>– Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load.</li> <li>– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li>◆ Activate SST-BF <ul style="list-style-type: none"> <li>– Enable/Disable SST-BF.</li> <li>– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> <li>◆ Configure SST-BF<sup>(Note)</sup> <ul style="list-style-type: none"> <li>– Enable/Disable BIOS to configure SST-BF High Priority Cores</li> <li>– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li>◆ Turbo Mode <ul style="list-style-type: none"> <li>– When this item is enabled, the processor will automatically ramp up the clock speed of 1-2 of its processing cores to improve its performance. When this item is disabled, the processor will not overclock any of its core.</li> <li>– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> </ul> |

(Note) This item is configurable when **Activate SST-BF** is set to **Enable**.

| Parameter                 | Description   |
|---------------------------|---|
| Hardware PM State Control | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Hardware P-States <ul style="list-style-type: none"> <li>– When this item is disabled, the processor hardware chooses a P-state based on OS Request (Legacy P-States).</li> <li>– In Native mode, the processor hardware chooses a P-state based on OS guidance.</li> <li>– In Out of Band mode, the processor hardware autonomously chooses a P-state (with no OS guidance).</li> <li>– Options available: Disable, Native Mode, Out of Band Mode, Native Mode with No Legacy Support. Default setting is <b>Native Mode</b>.</li> </ul> </li> </ul>  |
| CPU C State Control       | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Enable Monitor MWAIT <ul style="list-style-type: none"> <li>– Allows Monitor and MWAIT instructions.</li> <li>– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> <li>◆ CPU C6 Report <ul style="list-style-type: none"> <li>– Enable/Disable CPU C6(ACPI C3) report to OS.</li> <li>– Options available: Disable, Enable, Auto. Default setting is <b>Disable</b>.</li> </ul> </li> <li>◆ Enhanced Halt State (C1E) <ul style="list-style-type: none"> <li>– Core C1E auto promotion control. Takes effect after reboot.</li> <li>– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> </ul> |
| Package C State Control   | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Package C State <ul style="list-style-type: none"> <li>– Configures the state for the C-State package limit.</li> <li>– Options available: C0/C1 state, C2 state, C6(non Retention) state, Auto. Default setting is <b>Auto</b>.</li> </ul> </li> </ul>  |
| CPU - Advanced PM Tuning  | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Energy Perf BIAS <ul style="list-style-type: none"> <li>– Enters the Energy Perf BIAS submenu. <ul style="list-style-type: none"> <li>» Power Performance Tuning <ul style="list-style-type: none"> <li>• Options available: OS Controls EPB, BIOS Controls EPB, PECCI Controls EPB. Default setting is <b>OS Controls EPB</b>.</li> </ul> </li> <li>» Energy_PERF_BIAS_CFG mode<sup>(Note)</sup> <ul style="list-style-type: none"> <li>• Options available: Performance, Balanced Performance, Balanced Power, Power. Default setting is <b>Performance</b>.</li> </ul> </li> </ul> </li> </ul> </li> </ul>  |

(Note) This item is configurable when **Power Performance Tuning** is set to **BIOS Controls EPB**.

### 5-3-7 PCH Configuration



| Parameter              | Description   |
|------------------------|---|
| PCH Configuration      | Press [Enter] to configure advanced items.  |
| PCH SATA Configuration | <ul style="list-style-type: none"> <li>◆ SATA Controller <ul style="list-style-type: none"> <li>– Enable/Disable SATA controller.</li> <li>– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li>◆ Configure SATA as <ul style="list-style-type: none"> <li>– Configures on chip SATA type.</li> <li>– AHCI Mode: When set to AHCI, the SATA controller enables its AHCI functionality. Then the RAID function is disabled and cannot be access the RAID setup utility at boot time.</li> <li>– RAID Mode: When set to RAID, the SATA controller enables both its RAID and AHCI functions. You will be allowed to access the RAID setup utility at boot time.</li> <li>– Options available: AHCI, RAID. Default setting is <b>AHCI</b>.</li> </ul> </li> <li>◆ Alternate Device ID on RAID<sup>(Note 1)</sup> <ul style="list-style-type: none"> <li>– Enable/Disable Alternate Device ID on RAID mode.</li> <li>– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> <li>◆ SATA Port 0/1/2/3/4/5/6/7 <ul style="list-style-type: none"> <li>– The category identifies SATA hard drives that are installed in the computer. System will automatically detect HDD type.</li> </ul> </li> </ul> |

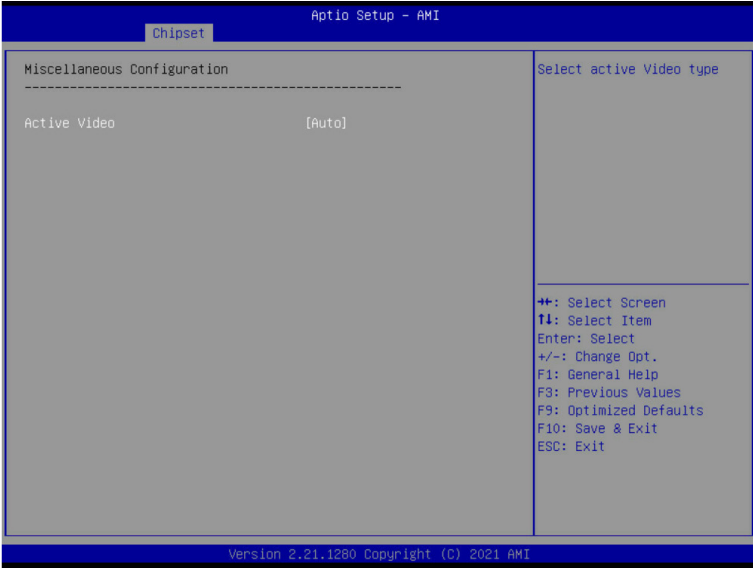
(Note 1) Only appears when HDD sets to **RAID** Mode.

| Parameter                             | Description  |
|---------------------------------------|--|
| PCH SATA Configuration<br>(continued) | <ul style="list-style-type: none"> <li>◆ Port 0/1/2/3/4/5/6/7 <ul style="list-style-type: none"> <li>– Enable/Disable Port 0/1/2/3/4/5/6/7 device.</li> <li>– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li>◆ Hot Plug (for Port 0/1/2/3/4/5/6/7)<sup>(Note 2)</sup> <ul style="list-style-type: none"> <li>– Enable/Disable HDD Hot-Plug function.</li> <li>– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li>◆ Spin Up Device (for Port 0/1/2/3/4/5/6/7)<sup>(Note 2)</sup> <ul style="list-style-type: none"> <li>– On an edge detect from 0 to 1, the PCH starts a COM reset initialization to the device.</li> <li>– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> </ul>  |
| PCH sSATA Configuration               | <ul style="list-style-type: none"> <li>◆ sSATA Controller <ul style="list-style-type: none"> <li>– Enable/Disable sSATA controller.</li> <li>– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li>◆ Configure sSATA as <ul style="list-style-type: none"> <li>– Configures on chip SATA type.</li> <li>– AHCI Mode: When set to AHCI, the SATA controller enables its AHCI functionality. Then the RAID function is disabled and cannot be access the RAID setup utility at boot time.</li> <li>– RAID Mode: When set to RAID, the SATA controller enables both its RAID and AHCI functions. You will be allowed to access the RAID setup utility at boot time.</li> <li>– Options available: AHCI, RAID. Default setting is <b>AHCI</b>.</li> </ul> </li> <li>◆ Alternate Device ID on RAID<sup>(Note 1)</sup> <ul style="list-style-type: none"> <li>– Enable/Disable Alternate Device ID on RAID mode.</li> <li>– Options available: Enable, Disable. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>◆ sSATA Port 0/1/2/3/4/5 <ul style="list-style-type: none"> <li>– The category identifies sSATA hard drives that are installed in the computer. System will automatically detect HDD type.</li> </ul> </li> <li>◆ Port 0/1/2/3/4/5 <ul style="list-style-type: none"> <li>– Enable/Disable Port 0/1/2/3/4/5 device.</li> <li>– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li>◆ Hot Plug (for Port 0/1/2/3/4/5)<sup>(Note 2)</sup> <ul style="list-style-type: none"> <li>– Enable/Disable HDD Hot-Plug function.</li> <li>– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> <li>◆ Spin Up Device (for Port 0/1/2/3/4/5)<sup>(Note 2)</sup> <ul style="list-style-type: none"> <li>– On an edge detect from 0 to 1, the PCH starts a COM reset initialization to the device.</li> <li>– Options available: Enable, Disable. Default setting is <b>Disabled</b>.</li> </ul> </li> </ul> |

(Note 1) Only appears when HDD sets to **RAID** Mode.

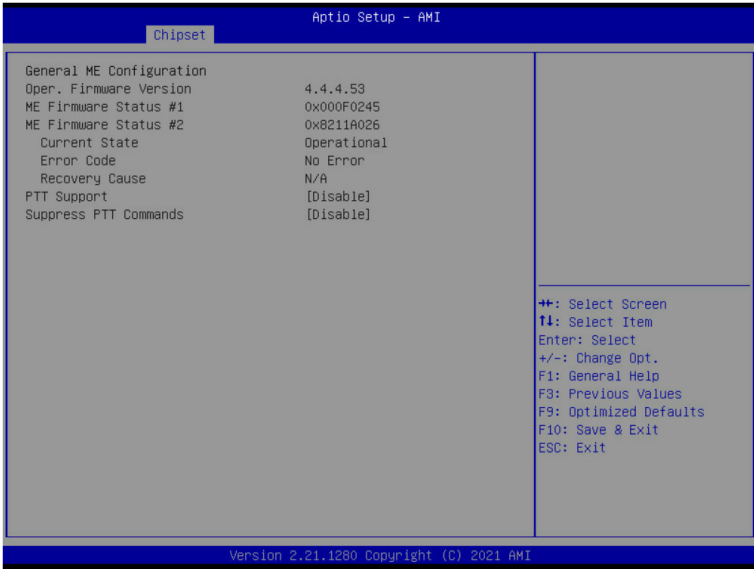
(Note 2) Only Supported when HDD is in **AHCI** or **RAID** Mode.

### 5-3-8 Miscellaneous Configuration



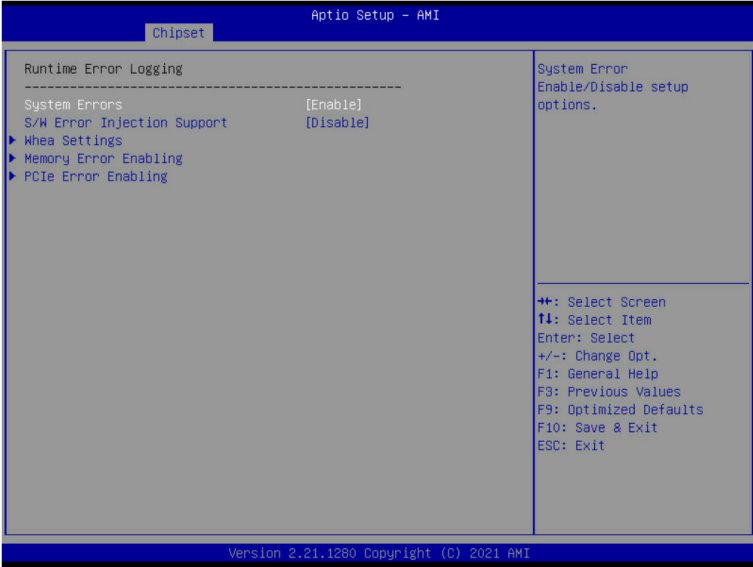
| Parameter                   | Description  |
|-----------------------------|--|
| Miscellaneous Configuration |  |
| Active Video                | Selects the active video type.<br>Options available: Auto, Onboard Device, PCIE Device, Specific PCIE Device. Default setting is <b>Auto</b> . |

### 5-3-9 Server ME Configuration



| Parameter                | Description   |
|--------------------------|---|
| General ME Configuration |   |
| Oper. Firmware Version   | Displays the operational firmware version.  |
| ME Firmware Status #1/#2 | Displays ME Firmware status information.  |
| Current State            | Displays ME Firmware current status information.                                    |
| Error Code               | Displays ME Firmware status error code.   |
| Recovery Cause           | Displays ME Firmware recovery cause.  |
| PTT Support              | Displays if the system supports the Intel® Platform Trust Technology.               |
| Suppress PTT Commands    | Displays if the system supports to Bypass TPM2 commands submitting to PTT Firmware. |

### 5-3-10 Runtime Error Logging Settings



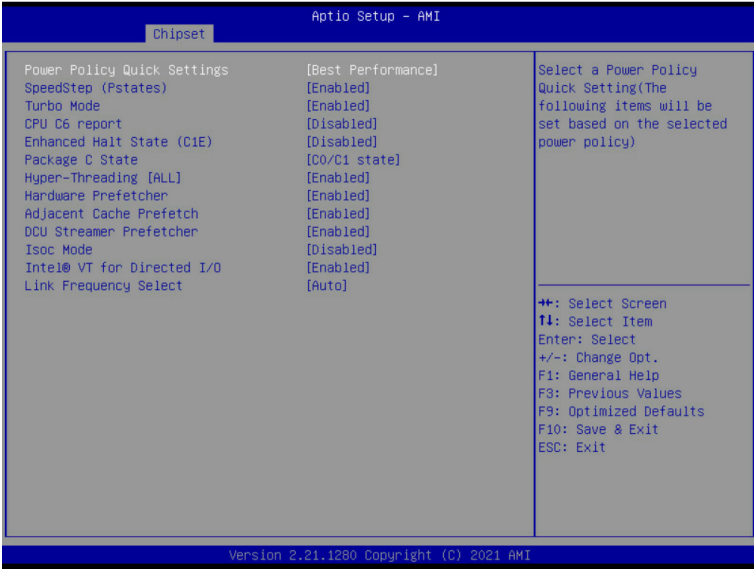
| Parameter                   | Description   |
|-----------------------------|---|
| Runtime Error Logging       |   |
| System Errors               | Enable/Disable system error logging function.<br>Options available: Enable, Disable. Default setting is <b>Enable</b> .   |
| S/W Error Injection Support | Enable/Disable software injection error logging function.<br>Options available: Enable, Disable. Default setting is <b>Disable</b> .  |
| Whea Settings               | Press [Enter] to configure advanced items. <ul style="list-style-type: none"> <li>◆ WHEA (Windows Hardware Error Architecture) Support <ul style="list-style-type: none"> <li>- Enable/Disable WHEA Support.</li> <li>- Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> </ul>  |
| Memory Error Enabling       | Press [Enter] to configure advanced items. <ul style="list-style-type: none"> <li>◆ Memory Error <ul style="list-style-type: none"> <li>- Enable/Disable Memory Error.</li> <li>- Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li>◆ Memory Corrected Error <ul style="list-style-type: none"> <li>- Enable/Disable Memory Corrected Error.</li> <li>- Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li>◆ Uncorrected Error disable Memory <ul style="list-style-type: none"> <li>- Enable/Disable the Memory that triggers Uncorrected Error.</li> <li>- Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> </ul> |



| Parameter           | Description   |
|---------------------|---|
| PCIe Error Enabling | <p data-bbox="309 142 642 166">Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li data-bbox="309 170 852 252">◆ PCIe Error <ul style="list-style-type: none"> <li data-bbox="344 200 580 224">– Enable/Disable PCIe error.</li> <li data-bbox="344 228 852 252">– Options available: Enable, Disable. Default setting is <b>Disable</b>.</li> </ul> </li> <li data-bbox="309 257 923 338">◆ Uncorrected Error<sup>(Note)</sup> <ul style="list-style-type: none"> <li data-bbox="344 286 923 310">– Enables and escalates Uncorrectable/Recoverable Errors to error pins.</li> <li data-bbox="344 315 846 338">– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li data-bbox="309 343 846 424">◆ Fatal Error Enable<sup>(Note)</sup> <ul style="list-style-type: none"> <li data-bbox="344 373 749 396">– Enables and escalates Fatal Errors to error pins.</li> <li data-bbox="344 401 846 424">– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li data-bbox="309 429 940 545">◆ Assert NMI on SERR<sup>(Note)</sup> <ul style="list-style-type: none"> <li data-bbox="344 459 940 514">– Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a system error (SERR) occurs.</li> <li data-bbox="344 519 846 542">– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> <li data-bbox="309 550 940 663">◆ Assert NMI on PERR<sup>(Note)</sup> <ul style="list-style-type: none"> <li data-bbox="344 580 940 635">– Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a processor bus parity error (PERR) occurs.</li> <li data-bbox="344 639 846 663">– Options available: Enable, Disable. Default setting is <b>Enable</b>.</li> </ul> </li> </ul> |

(Note) This item appears when **PCIe Error** is set to **Enable**.

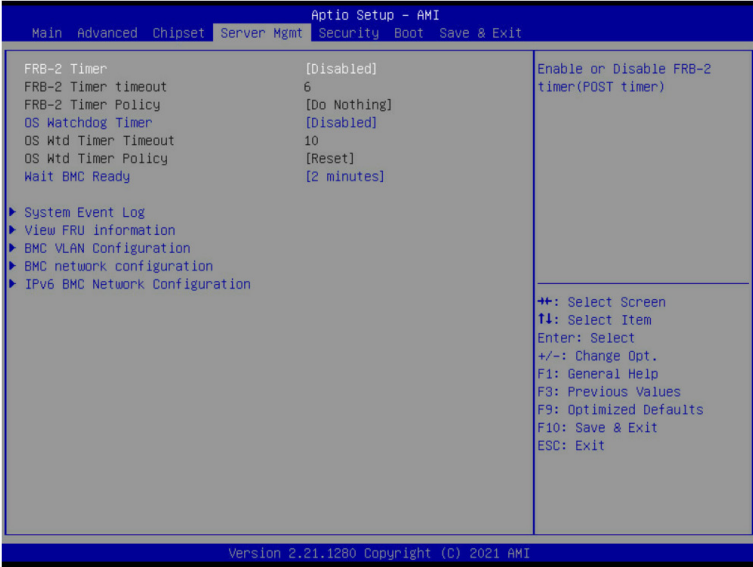
### 5-3-11 Power Policy



| Parameter                   | Description  |
|-----------------------------|--|
| Power Policy Quick Settings | Selects a Power Policy Quick Setting.<br>Options available: Standard, Best Performance, Energy Efficient, Turbo Lock. Default setting is <b>Standard</b> .   |
| SpeedStep (Pstates)         | Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .  |
| Turbo Mode                  | When this item is enabled, the processor will automatically ramp up the clock speed of 1-2 of its processing cores to improve its performance.<br>When this item is disabled, the processor will not overclock any of its core.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> . |
| CPU C6 report               | Enable/Disable the BIOS to enable the report from the CPU C6 state (ACPI C3) to the OS.<br>Options available: Disabled, Enabled, Auto. Default setting is <b>Disabled</b> .  |
| Enhanced Halt State (C1E)   | Enable/Disable the C1E support for lower power consumption. Takes effect after reboot.<br>Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .   |
| Package C State             | Configures the C-State package limit.<br>Options available: C0/C1 state, C2 state, C6(non Retention) state, C6(Retention) state, Auto. Default setting is <b>Auto</b> .  |

| Parameter                         | Description   |
|-----------------------------------|---|
| Hyper-Threading [ALL]             | The Hyper Threading Technology allows a single processor to execute two or more separate threads concurrently. When hyper-threading is enabled, multi-threaded software applications can execute their threads, thereby improving performance.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> . |
| Hardware Prefetcher               | Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .   |
| Adjacent Cache Prefetch           | Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .   |
| DCU Streamer Prefetcher           | Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .   |
| Isoc Mode                         | Enable/Disable the Isochronous support in order to meet the QoS requirements (Quality of Service).<br>Options available: Auto, Enabled, Disabled. Default setting is <b>Auto</b> .  |
| Intel® VT for Directed I/O (VT-d) | Enable/Disable the Intel VT for Directed I/O (VT-d) support function by reporting the I/O device assignment to VMM through DMAR ACPI Tables.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .   |
| Link Frequency Select             | Selects the UPI link frequency.<br>Options available: 9.6GT/s, 10.4GT/s, 11.2GT/s, Auto.<br>Default setting is <b>Auto</b> .  |

## 5-4 Server Management Menu



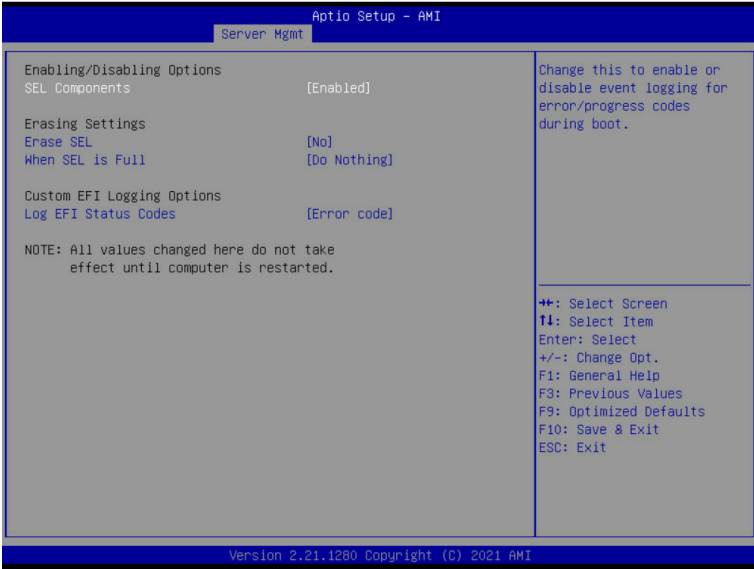
| Parameter                               | Description  |
|---|--|
| FRB-2 Timer                             | Enable/Disable FRB-2 timer (POST timer).<br>Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .                           |
| FRB-2 Timer <sup>(Note1)</sup> timeout  | Configures the FRB2 Timer timeout. The value is between 1 to 30 minutes.<br>Default setting is <b>6 minutes</b> .                                |
| FRB-2 Timer Policy <sup>(Note1)</sup>   | Configures the FRB2 Timer policy.<br>Options available: Do Nothing, Reset, Power Down, Power Cycle.<br>Default setting is <b>Do Nothing</b> .    |
| OS Watchdog Timer                       | Enable/Disable OS Watchdog Timer function.<br>Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .                         |
| OS Wtd Timer Timeout <sup>(Note2)</sup> | Configures OS Watchdog Timer. The value is between 1 to 30 minutes.<br>Default setting is <b>10 minutes</b> .                                    |
| OS Wtd Timer Policy <sup>(Note2)</sup>  | Configure OS Watchdog Timer Policy.<br>Options available: Reset, Do Nothing, Power Down, Power Cycle.<br>Default setting is <b>Reset</b> .       |
| Wait BMC Ready                          | POST wait BMC ready and reboot system.<br>Options available: Disabled, 2 minutes, 4 minutes, 6 minutes.<br>Default setting is <b>2 minutes</b> . |

(Note1) This item is configurable when **FRB-2 Timer** is set to **Enabled**.

(Note2) This item is configurable when **OS Watchdog Timer** is set to **Enabled**.

| <b>Parameter</b>               | <b>Description</b>                         |
|--------------------------------|--|
| System Event Log               | Press [Enter] to configure advanced items. |
| View FRU Information           | Press [Enter] to view the FRU information. |
| BMC VLAN Configuration         | Press [Enter] to configure advanced items. |
| BMC network Configuration      | Press [Enter] to configure advanced items. |
| IPv6 BMC Network Configuration | Press [Enter] to configure advanced items. |

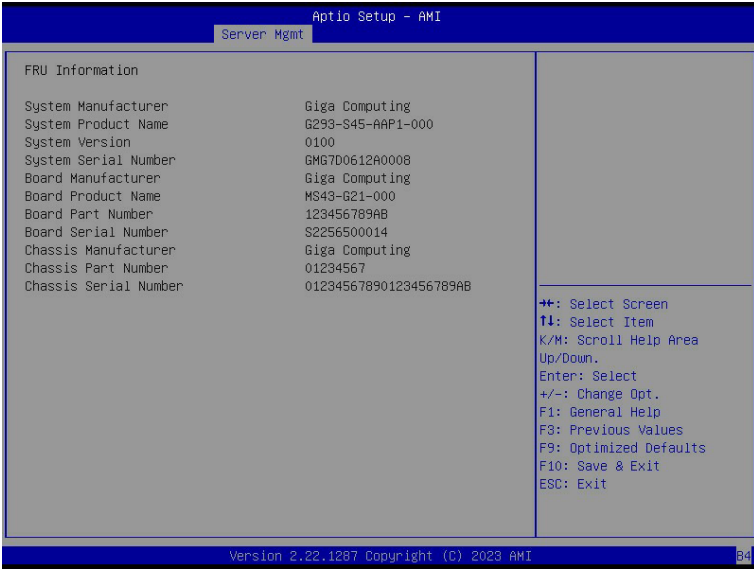
## 5-4-1 System Event Log



| 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 <b>Enabled</b> .                         |
| Erasing Settings             |  |
| Erase SEL                    | Choose options for erasing SEL.<br>Options available: No,<br>Yes, On next reset,<br>Yes, On every reset.<br>Default setting is <b>No</b> .   |
| When SEL is Full             | Choose options for reactions to a full SEL.<br>Options available: Do Nothing, Erase Immediately, Delete Oldest Record.<br>Default setting is <b>Do Nothing</b> .                             |
| 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 <b>Error code</b> . |

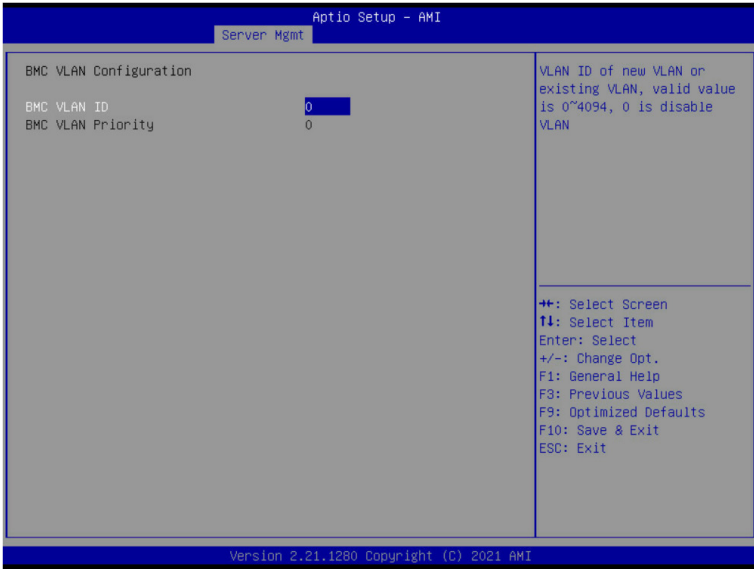
## 5-4-2 View FRU Information

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

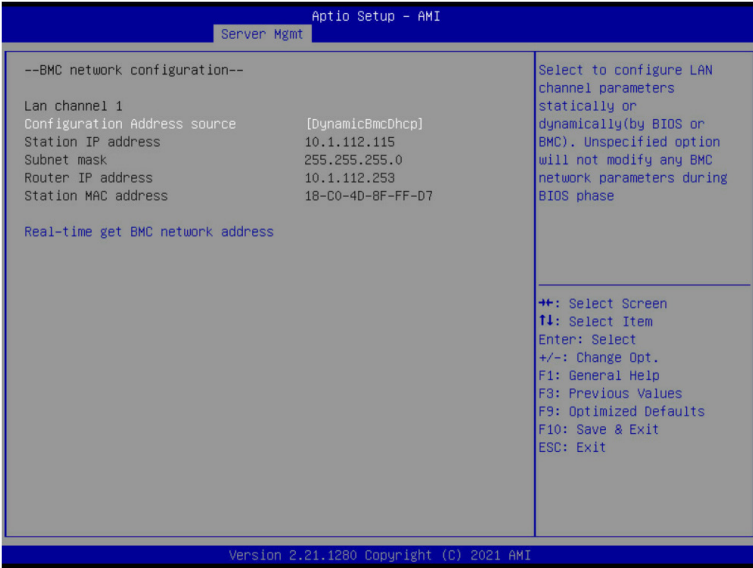
### 5-4-3 BMC VLAN Configuration



| Parameter              | Description  |
|------------------------|--|
| BMC VLAN Configuration |  |
| BMC VLAN ID            | Select to configure BMC VLAN ID. The valid range is from 0 to 4094. When set to 0, BMC VLAN ID will be disabled.                             |
| BMC VLAN Priority      | Select to configure BMC VLAN Priority. The valid range is from 0 to 7. When BMC VLAN ID is set to 0, BMC VLAN Priority will not be selected. |

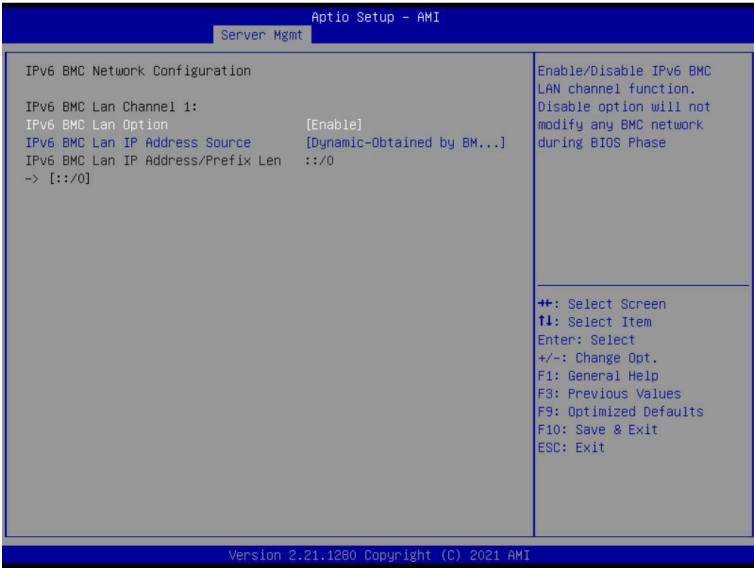


## 5-4-4 BMC Network Configuration



| Parameter                         | Description   |
|-----------------------------------|---|
| BMC network configuration         |   |
| Lan Channel 1                     |   |
| Configuration Address source      | Selects 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 <b>DynamicBmcDhcp</b> . |
| 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] will set LAN mode and Address source and then get IP, Subnet, Gateway and MAC address.  |

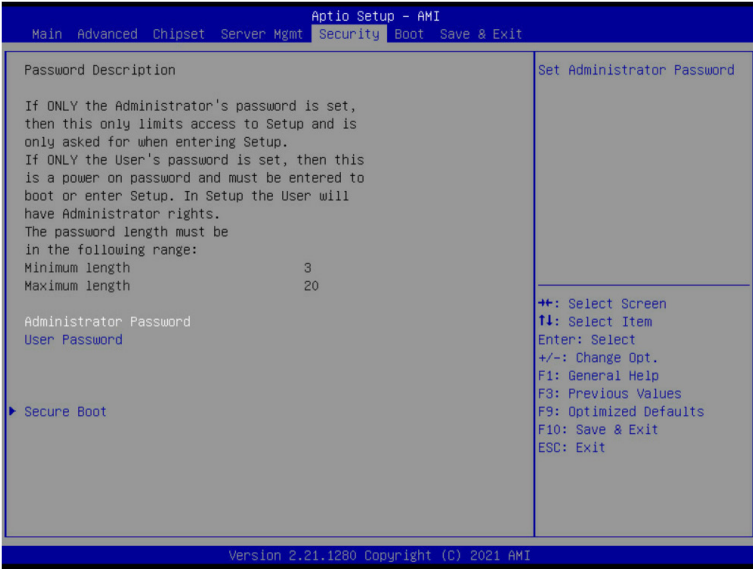
## 5-4-5 IPv6 BMC Network Configuration



| Parameter                             | Description  |
|---------------------------------------|--|
| IPv6 BMC network configuration        |  |
| IPv6 BMC Lan Channel 1                |  |
| IPv6 BMC Lan Option                   | Enable/Disable IPv6 BMC LAN channel function. When this item is disabled, the system will not modify any BMC network during BIOS phase.<br>Options available: Unspecified, Disable, Enable. Default setting is <b>Enable</b> .                   |
| IPv6 BMC Lan IP Address Source        | Selects to configure LAN channel parameters statically or dynamically (by BIOS or BMC).<br>Options available: Unspecified, Static, Dynamic-Obtained by BMC running DHCP. Default setting is <b>Enable Dynamic-Obtained by BMC running DHCP</b> . |
| IPv6 BMC Lan IP Address/Prefix Length | Check if the IPv6 BMC LAN IP address matches those displayed on the screen.  |

## 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

The Secure Boot feature is applicable if supported by your Operating System. If your Operating System is not supporting Secure Boot, the system will hang when starting the Operating System.



| Parameter                          | Description  |
|------------------------------------|--|
| System Mode                        | Displays if the system is in User mode or Setup mode.  |
| Secure Boot                        | Enable/ Disable the Secure Boot function.<br>Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .  |
| Secure Boot Mode <sup>(Note)</sup> | 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 files being loaded before the Operating System loads 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 <b>Standard</b> . |
| Restore Factory Keys               | Forces the system to user mode and installs factory default Secure Boot key database.  |
| Reset To Setup Mode                | Reset the system to Setup Mode.  |

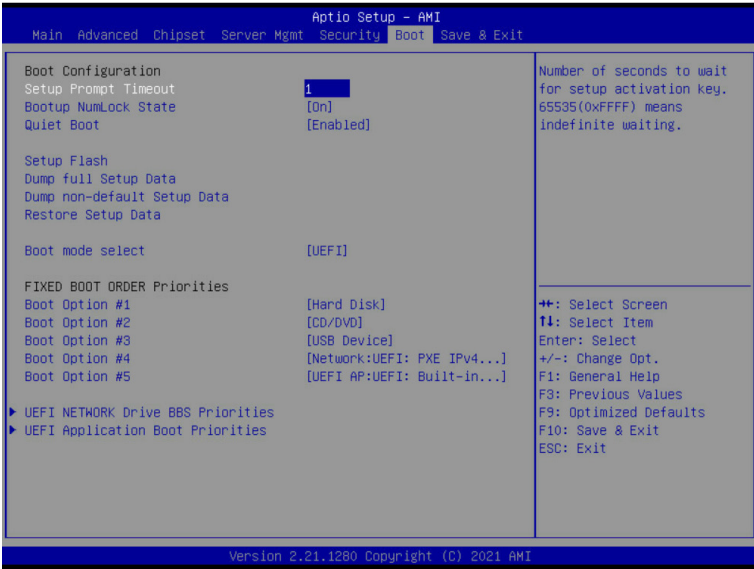
(Note) Advanced items prompt when this item is set to **Custom**.

| Parameter      | Description   |
|----------------|---|
| Key Management | <p data-bbox="334 161 666 180">Press [Enter] to configure advanced items.</p> <p data-bbox="334 189 937 236"><b>Please note that this item is configurable when Secure Boot Mode is set to Custom.</b></p> <ul style="list-style-type: none"> <li data-bbox="334 246 944 349">◆ Factory Key Provision <ul style="list-style-type: none"> <li data-bbox="370 272 944 319">– Allows to provision factory default Secure Boot keys when system is in Setup Mode.</li> <li data-bbox="370 329 905 349">– Options available: Enabled, Disabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li data-bbox="334 359 926 434">◆ Restore Factory Keys <ul style="list-style-type: none"> <li data-bbox="370 385 926 406">– Installs all factory default keys. It will force the system in User Mode.</li> <li data-bbox="370 415 605 434">– Options available: Yes, No.</li> </ul> </li> <li data-bbox="334 443 655 519">◆ Reset To Setup Mode <ul style="list-style-type: none"> <li data-bbox="370 468 655 489">– Reset the system to Setup Mode.</li> <li data-bbox="370 498 605 519">– Options available: Yes, No.</li> </ul> </li> <li data-bbox="334 528 937 603">◆ Export Secure Boot variables <ul style="list-style-type: none"> <li data-bbox="370 553 937 600">– Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.</li> </ul> </li> <li data-bbox="334 613 902 688">◆ Enroll Efi Image <ul style="list-style-type: none"> <li data-bbox="370 638 902 685">– Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db).</li> </ul> </li> <li data-bbox="334 697 536 716">◆ Device Guard Ready</li> <li data-bbox="334 725 905 773">◆ Remove 'UEFI CA' from DB <ul style="list-style-type: none"> <li data-bbox="370 751 905 773">– Press [Enter] to remove Microsoft UEFI CA from Secure Boot DB.</li> </ul> </li> <li data-bbox="334 782 701 829">◆ Restore DB defaults <ul style="list-style-type: none"> <li data-bbox="370 807 701 829">– Restore DB variable to factory defaults.</li> </ul> </li> <li data-bbox="334 838 896 885">◆ Secure Boot variable <ul style="list-style-type: none"> <li data-bbox="370 863 896 885">– Displays the current status of the variables used for secure boot.</li> </ul> </li> <li data-bbox="334 895 802 998">◆ Platform Key (PK) <ul style="list-style-type: none"> <li data-bbox="370 920 802 942">– Displays the current status of the Platform Key (PK).</li> <li data-bbox="370 951 678 973">– Press [Enter] to configure a new PK.</li> <li data-bbox="370 983 602 998">– Options available: Update.</li> </ul> </li> <li data-bbox="334 1008 942 1133">◆ Key Exchange Keys (KEK) <ul style="list-style-type: none"> <li data-bbox="370 1033 942 1055">– Displays the current status of the Key Exchange Key Database (KEK).</li> <li data-bbox="370 1064 905 1111">– Press [Enter] to configure a new KEK or load additional KEK from storage devices.</li> <li data-bbox="370 1121 671 1133">– Options available: Update, Append.</li> </ul> </li> <li data-bbox="334 1143 905 1274">◆ Authorized Signatures (DB) <ul style="list-style-type: none"> <li data-bbox="370 1168 905 1190">– Displays the current status of the Authorized Signature Database.</li> <li data-bbox="370 1199 944 1246">– Press [Enter] to configure a new DB or load additional DB from storage devices.</li> <li data-bbox="370 1255 671 1274">– Options available: Update, Append.</li> </ul> </li> <li data-bbox="334 1284 902 1415">◆ Forbidden Signatures (DBX) <ul style="list-style-type: none"> <li data-bbox="370 1309 902 1331">– Displays the current status of the Forbidden Signature Database.</li> <li data-bbox="370 1340 892 1387">– Press [Enter] to configure a new dbx or load additional dbx from storage devices.</li> <li data-bbox="370 1397 671 1415">– Options available: Update, Append.</li> </ul> </li> </ul> |

| Parameter                     | Description   |
|-------------------------------|---|
| Key Management<br>(continued) | <ul style="list-style-type: none"> <li>◆ Authorized TimeStamps (DBT) <ul style="list-style-type: none"> <li>– Displays the current status of the Authorized TimeStamps Database.</li> <li>– Press [Enter] to configure a new DBT or load additional DBT from storage devices.</li> <li>– Options available: Update, Append.</li> </ul> </li> <li>◆ OsRecovery Signatures <ul style="list-style-type: none"> <li>– Displays the current status of the OsRecovery Signature Database.</li> <li>– Press [Enter] to configure a new OsRecovery Signature or load additional OsRecovery Signature from storage devices.</li> <li>– Options available: Update, Append.</li> </ul> </li> </ul> |

## 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.



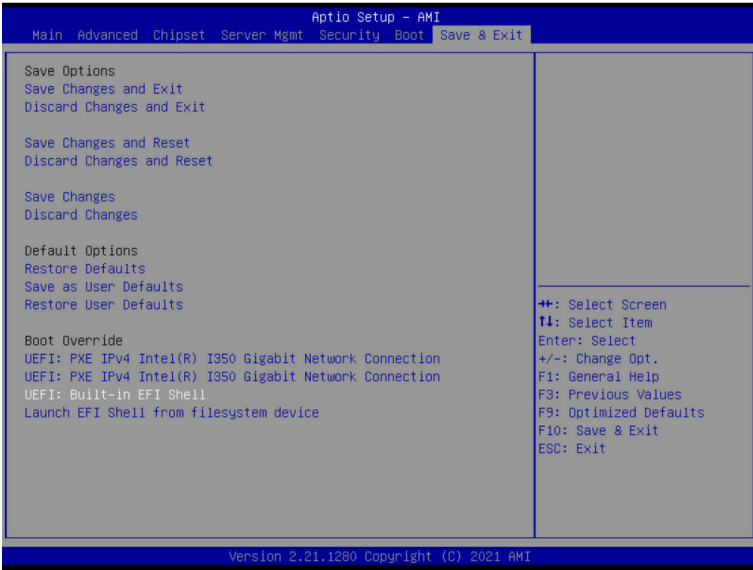
| Parameter                   | Description   |
|-----------------------------|---|
| Boot Configuration          |   |
| Setup Prompt Timeout        | Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.<br>Press the numeric keys to input the desired values. |
| Bootup NumLock State        | Enable/Disable the Bootup NumLock function.<br>Options available: On, Off. Default setting is <b>On</b> .   |
| Quiet Boot                  | Enable/Disable showing the logo during POST.<br>Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .                           |
| Setup Flash                 | Press [Enter] to run setup flash.   |
| Dump full Setup Data        | Press [Enter] to dump full setup data to file.  |
| Dump non-default Setup Data | Press [Enter] to dump non-default setup data to file.   |
| Restore Setup Data          | Press [Enter] to restore setup data from file.  |
| Boot mode select            | Selects the boot mode.<br>Options available: LEGACY, UEFI. Default setting is <b>UEFI</b> .   |

| Parameter                          | Description  |
|------------------------------------|--|
| FIXED BOOT ORDER Priorities        |  |
| Boot Option #1 / #2 / #3 / #4 / #5 | <p>Press [Enter] to configure the boot order priority.<br/>By default, the server searches for boot devices in the following sequence:</p> <ol style="list-style-type: none"><li>1. Hard drive.</li><li>2. CD-COM/DVD drive.</li><li>3. USB device.</li><li>4. Network.</li><li>5. UEFI.</li></ol> |
| 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 Save & 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 and Reset    | Restarts the system after saving the changes made.<br>Options available: Yes, No.     |
| Discard Changes and Reset | Restarts the system without saving any changes.<br>Options available: Yes, No.        |
| Save Changes              | Saves changes done so far to any of the setup options.<br>Options available: Yes, No. |
| Discard Changes           | Discards changes made and closes the BIOS setup.<br>Options available: Yes, No.       |
| Default Options           |   |

| <b>Parameter</b>                        | <b>Description</b>   |
|---|--|
| 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. |
| Save as User Defaults                   | Saves the changes made as the user default settings.<br>Options available: Yes, No.  |
| Restore User Defaults                   | Loads the user default settings for all BIOS setup parameters.<br>Options available: Yes, No.  |
| Boot Override                           | Press [Enter] to configure the device as the boot-up drive.  |
| Launch EFI Shell from filesystem device | Attempts to Launch EFI Shell application (Shell.efi) from one of the available file system devices.  |

## 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          | DXE IPL 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      |