

GIGABYTE™

R282-N80

R282-N81

3rd Gen. Intel® Xeon® Scalable DP Server System - 2U 24-Bay Gen4 NVMe

User Manual

Rev. 1.0

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Documentation Classifications

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

- For detailed product information, carefully read the User's Manual.

For More Information

For related product specifications, the latest firmware and software, and related information, please visit our website at:

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For GIGABYTE distributors and resellers, additional sales & marketing materials are available from our reseller portal:

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Conventions

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

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

Server Warnings and Cautions

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



WARNING!

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

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



WARNING!

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



WARNING!

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



CAUTION!

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

Electrostatic Discharge (ESD)



CAUTION!

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

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

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

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the system and 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.

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Chapter 1 Hardware Installation

1-1 Installation Precautions

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

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

1-2 Product Specifications

| | | |
|---|----------------|---|
|  | CPU | <ul style="list-style-type: none"> ◆ 3rd Generation Intel® Xeon® Scalable Processors ◆ Intel® Xeon® Platinum Processor, Intel® Xeon® Gold Processor, Intel® Xeon® Silver Processor ◆ 10nm technology, CPU TDP up to 270W ◆ NOTE: If only 1 CPU is installed, some PCIe or memory functions might be unavailable. |
|  | Socket | <ul style="list-style-type: none"> ◆ 2 x LGA 4189 ◆ Socket P+ |
|  | Chipset | <ul style="list-style-type: none"> ◆ Intel® C621A Express Chipset |
|  | Security | <ul style="list-style-type: none"> ◆ UEFI Secure Boot ◆ Silicon root of trust ◆ SNMP Support: V2C & V3 |
|  | Memory | <ul style="list-style-type: none"> ◆ 32 x DIMM slots ◆ DDR4 memory supported only ◆ 8-channel memory architecture per processor ◆ RDIMM modules up to 64GB supported ◆ LRDIMM modules up to 128GB supported ◆ 3DS RDIMM/LRDIMM modules up to 256GB supported ◆ 1.2V modules: 3200/2933/2666 MHz |
|  | LAN | <ul style="list-style-type: none"> ◆ 2 x 1Gb/s LAN ports (Intel® I350-AM2) ◆ 1 x 10/100/1000 management LAN |
|  | Expansion Slot | <p>Riser Card CRS2033:</p> <ul style="list-style-type: none"> ◆ 1 x PCIe x16 slot (Gen4 x16), Full height half-length ◆ 2 x PCIe x8 slots (Gen4 x8), Full height half-length <p>Riser Card CRS2137:</p> <ul style="list-style-type: none"> ◆ 1 x PCIe x16 slot (Gen4 x16 o x8), Full height half-length ◆ 1 x PCIe x8 slots (Gen4 x0 or x8), Full height half-length ◆ 1 x PCIe x16 slot (Gen4 x16 or x8), shared with OCP 2.0, Full height half-length <p>Riser Card CRS2027:</p> <ul style="list-style-type: none"> ◆ 2 x PCIe x8 slots (Gen4 x8), Low profile half-length ◆ 1 x OCP 3.0 mezzanine slot with PCIe Gen4 x16 bandwidth from CPU_0 ◆ Supported NCSI function ◆ 1 x OCP 2.0 mezzanine slot with PCIe Gen3 x8 bandwidth from CPU_1 ◆ Supported NCSI function |
|  | Video | <p>R282-N80</p> <ul style="list-style-type: none"> ◆ Integrated in Aspeed® AST2500 ◆ 2D Video Graphic Adapter with PCIe bus interface ◆ 1920x1200@60Hz 32bpp, DDR4 SDRAM <p>R282-N81</p> <ul style="list-style-type: none"> ◆ Integrated in Aspeed® AST2600 ◆ 2D Video Graphic Adapter with PCIe bus interface ◆ 1920x1200@60Hz 32bpp, DDR4 SDRAM |



Storage

R282-N80

- ◆ Front side: 16 x 2.5" SATA/SAS ports, 8 x 2.5" SATA/SAS/Gen4 NVMe hybrid ports
- ◆ Rear side: 2 x 2.5" SATA/SAS hot-swappable HDD/SSD bays (Connected via SAS Expander)
- ◆ SAS card is required to enable drive bays
- ◆ Broadcom SAS35x36R expander
- ◆ Bandwidth: SATA 6Gb/s or SAS 12Gb/s per port
- ◆ Default configuration supports:
- ◆ 8 x 2.5" NVMe drives, non-supported SATA/SAS drives without SAS card
- ◆ Suggested 12Gb/s SAS cards:
- ◆ CRA4448

R282-N81

- ◆ Front side: 16 x 2.5" SATA/SAS ports, 8 x 2.5" SATA/SAS/Gen4 NVMe hybrid ports
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- ◆ Suggested 12Gb/s SAS cards:
- ◆ CRA4448



SAS

- ◆ Supported via add-on SAS Card



Internal







Connectors

- ◆ 2 x CPU fan headers
- ◆ 1 x USB 3.0 header
- ◆ 1 x TPM header
- ◆ 1 x VROC connector
- ◆ 1 x Front panel header
- ◆ 1 x HDD back plane board header
- ◆ 1 x IPMB connector
- ◆ 1 x Clear CMOS jumper
- ◆ 1 x BIOS recovery jumper



Front Panel LED/Buttons

- ◆ 2 x USB 3.0
- ◆ 1 x Power button with LED
- ◆ 1 x ID button with LED
- ◆ 1 x Reset button
- ◆ 1 x NMI button
- ◆ 1 x System status LED
- ◆ 1 x HDD activity LED
- ◆ 2 x LAN activity LEDs

| | | |
|---|---------------------------------------|---|
|  | Rear Panel I/O | <ul style="list-style-type: none"> ◆ 2 x USB 3.0 ◆ 1 x VGA ◆ 1 x COM (RJ45 type) ◆ 2 x RJ45 ◆ 1 x MLAN ◆ 1 x ID button with LED |
|  | Backplane I/O | <ul style="list-style-type: none"> ◆ 2 x USB 3.0 ◆ 1 x VGA ◆ 1 x COM (RJ45 type) ◆ 2 x RJ45 ◆ 1 x MLAN ◆ 1 x ID button with LED |
|  | TPM | <ul style="list-style-type: none"> ◆ 1 x TPM header with SPI interface ◆ Optional TPM2.0 kit: CTM010 |
|  | Power Supply | <p>2 x 1600W redundant PSUs</p> <ul style="list-style-type: none"> ◆ 80 PLUS Platinum ◆ AC Input: <ul style="list-style-type: none"> ◆ - 100-120V~/ 12A, 50-60Hz ◆ - 200-240V~/ 10.0A, 50-60Hz ◆ DC Input: <ul style="list-style-type: none"> ◆ 240Vdc, 10A ◆ DC Output: <ul style="list-style-type: none"> ◆ - Max 1000W/ 100-120V~ ◆ +12V/ 81.5A ◆ +12Vsb/ 2.5A ◆ - Max 1600W at 200-240V or 240Vdc Input ◆ +12V/ 133A ◆ +12Vsb/ 2.5A |
|  | Environment Ambient Temperature | <ul style="list-style-type: none"> ◆ Operating temperature: 10°C to 35°C ◆ Non-operating temperature: -40°C to 60°C |
|  | Relative Humidity | <ul style="list-style-type: none"> ◆ Operating humidity: 8-80% (non-condensing) ◆ Non-operating humidity: 20%-95% (non-condensing) |



System Management

R282-N80

Aspeed® AST2500 management controller

- ◆ Avocent® MergePoint IPMI 2.0 web interface:
- ◆ Network settings
- ◆ Network security settings
- ◆ Hardware information
- ◆ Users control
- ◆ Services settings
- ◆ IPMI settings
- ◆ Sessions control
- ◆ LDAP settings
- ◆ Power control
- ◆ Fan profiles
- ◆ Voltages, fans and temperatures monitoring
- ◆ System event log
- ◆ Events management (platform events, trap settings, email settings)
- ◆ Serial Over LAN
- ◆ vKVM & vMedia (HTML5)

R282-N81

Aspeed® AST2600 management controller

- ◆ GIGABYTE Management Console (AMI MegaRAC SP-X) web interface
- ◆ Dashboard
- ◆ JAVA Based Serial Over LAN
- ◆ 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



System

◆ 2U

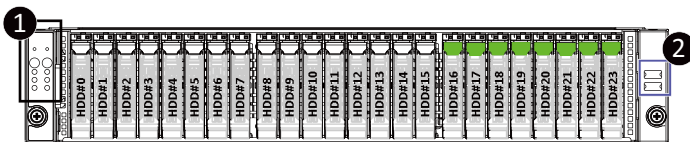
Dimension

◆ 438mm (W) x 87.5mm (H) x 730mm (D)

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

Chapter 2 System Appearance

2-1 Front View

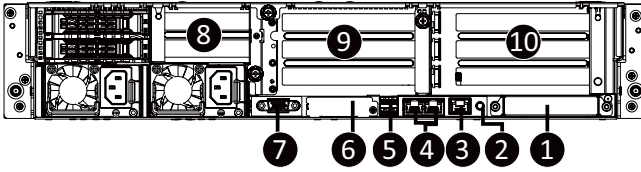


| No. | Description |
|--|------------------------------|
| 1. | Front Panel LEDs and buttons |
| 2. | Front USB 3.0 ports |
| NOTE! The Green Latch Supports NVMe | |



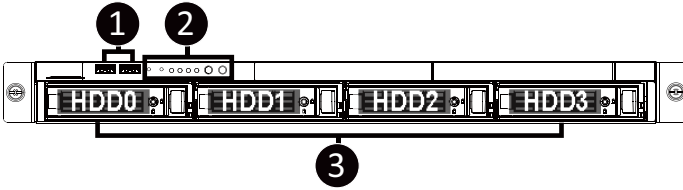
• Please Go to Chapter 2-3 Front Panel LED and Buttons for detail description of function LEDs.

2-2 Rear View



| No. | Description |
|-----|---|
| 1. | Mezzanine Slot (Option/OCP 3.0 Card/SFF Type) |
| 2. | ID Button with LED |
| 3. | Server management LAN port |
| 4. | 1GbE LAN port x 2 |
| 5. | USB 3.0 port x 2 |
| 6. | Mezzanine Slot (Option/OCP 2.0 Card) |
| 7. | VGA port |
| 8. | Low-Profile PCIe Card Slot |
| 9. | Full height |
| 10. | Full height |

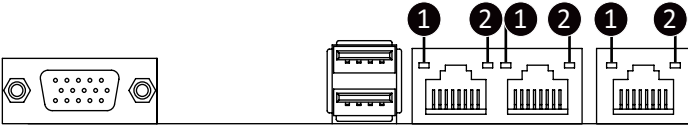
2-3 Front Panel LED and Buttons



| No. | Name | Color | Status | Description |
|-----|-----------------------|-------------|--------|---|
| 1. | Reset Button | | | Press the button to reset the system. |
| 2. | NMI button | | | Press the button server generates a NMI to the processor if the multiple-bit ECC errors occur, which effectively halt the server. |
| 3. | Power button with LED | Green | On | System is powered on |
| | | N/A | Off | System is not powered on or in ACPI S5 state (power off) |
| 4. | ID Button with LED | Blue | On | System identification is active. |
| | | N/A | Off | System identification is disabled. |
| 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 | On | System is operating normally. |
| | | | On | Critical condition, may indicates: System fan failure System temperature |
| | | Amber | Blink | Non-critical condition, may indicates: Redundant power module failure Temperature and voltage issue Chassis intrusion |
| | | | Off | Non-critical condition, may indicates: Redundant power module failure Temperature and voltage issue Chassis intrusion |
| | | N/A | Off | Non-critical condition, may indicates: Redundant power module failure Temperature and voltage issue Chassis intrusion |

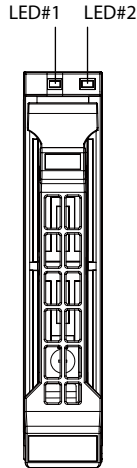
| No. | Name | Color | Status | Description |
|-----|--------------------------|-------|--------|---|
| 7. | LAN1 Active/ Link LED | Green | On | Link between system and network or no access |
| | | Green | Blink | Data transmission or receiving is occurring |
| | | N/A | Off | No data transmission or receiving is occurring |
| 8. | LAN2 Active/ Link LED | Green | 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 |

2-4 Rear System LAN LEDs



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

2-5 Hard Disk Drive LEDs



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

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



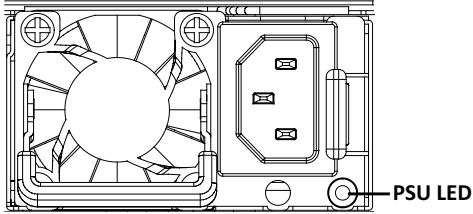
NOTE!

(*1) Depend on HBA/Utility Spec

(*2) Blink cycle depend on HDD's activity signal.

(*3) If HDD is pulled out during rebuilding, Disk status of this HDD is regarded as fault

2-6 Power Supply Unit LED



| State | Description |
|-----------------------|--|
| Green ON | Output ON and OK |
| Off | No AC power to all power supplies |
| Green BLINKING 1Hz | AC present/only dtandby output on |
| Green BLINKING 2Hz | Power supply firmware update mode |
| Amber BLINKING 1Hz | Power supply warning events where the power supply continues to operate; high temperature, hihg power, high current, slow fan. |
| Amber | Power supply critical event causing a shutdown; failure, OCP, OVP, Fan fail AC cord unplugged or AC power lost; with a second power supply in parallel still with AC input power. |

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

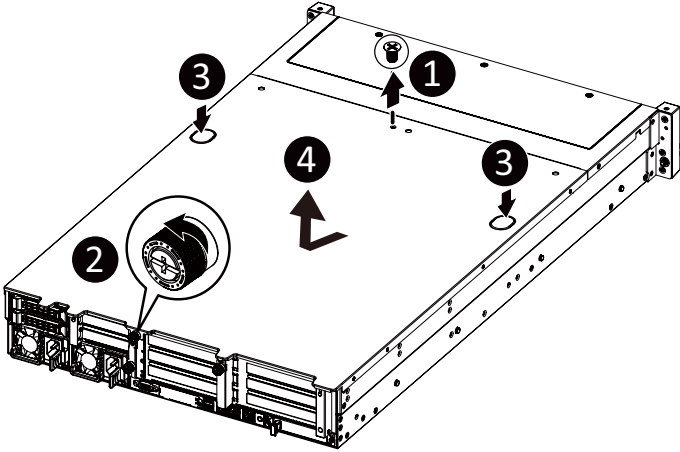


Before you remove or install the system cover

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

Follow these instructions to remove the system cover:

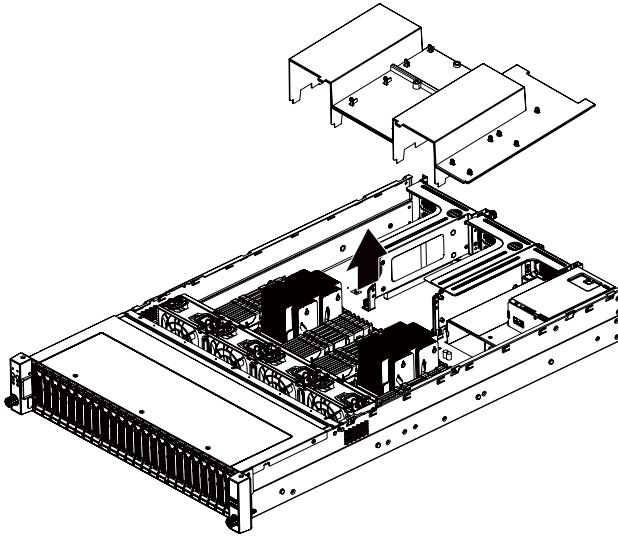
1. Loosen and remove the thumbscrew securing the back cover.
2. Push down the indentation located at the side of the back chassis
3. Slide the cover horizontally to the back and remove the cover in the direction of the arrow.



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 fan duct with the guiding groove. 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 heatsink. Then install the carrier assembly on the bottom of the heatsink and make sure the gold arrow is located in the correct direction.

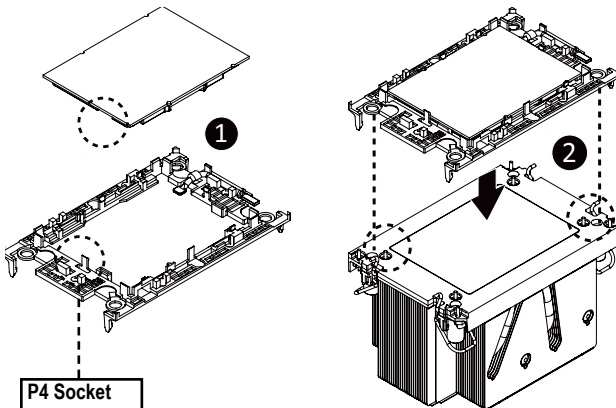
3. Remove the CPU cover.

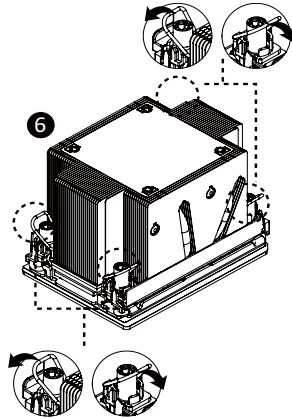
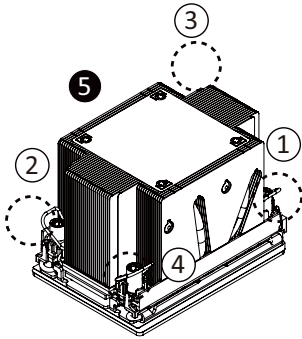
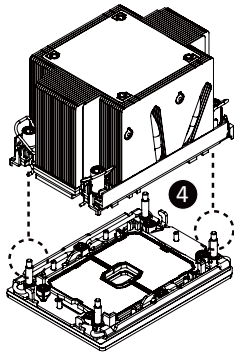
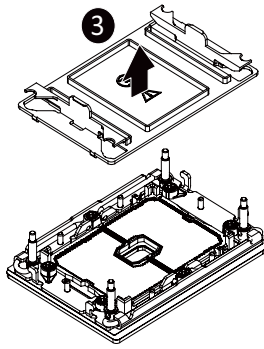
NOTE: Save and replace the CPU cover if the processor is removed from its socket.

4. Align the heatsink with the CPU socket by the guide pins and make sure the gold arrow is located in the correct direction. Then place the heatsink onto the top of the CPU socket.

5. To secure the heatsink, tighten the screws in a sequential order (1→2→3→4).

NOTE: When disassembling the heatsink, loosen the screws in reverse order (4→3→2→1).





3-4 Installing the Memory

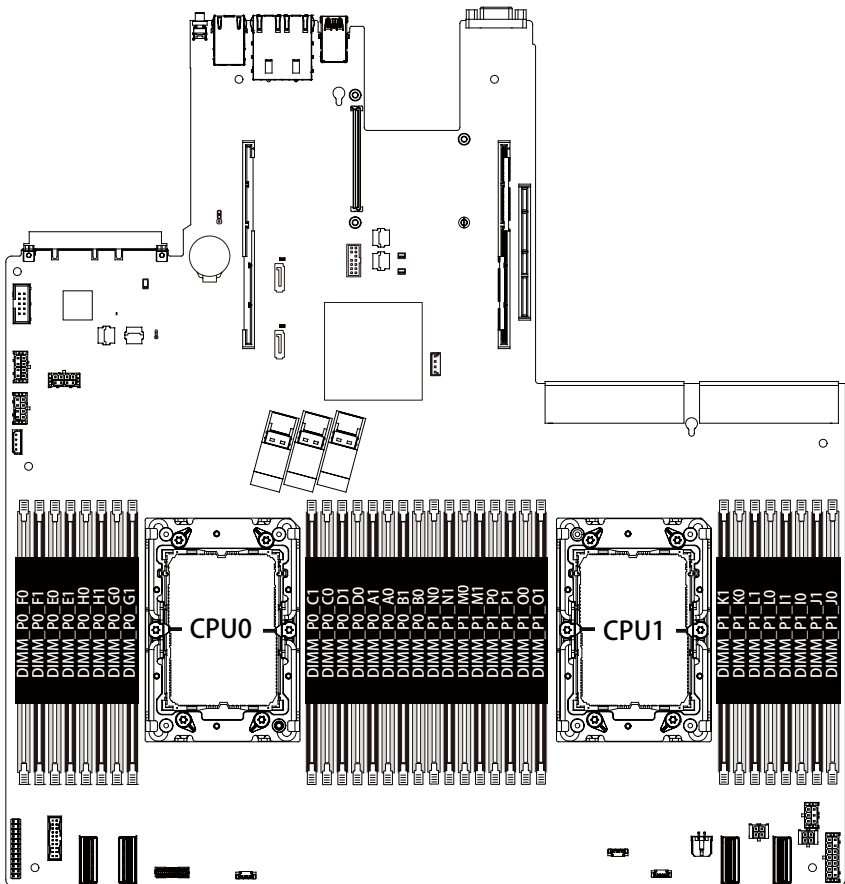


Read the following guidelines before you begin to install the memory:

- 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 32 DDR4 memory slots 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

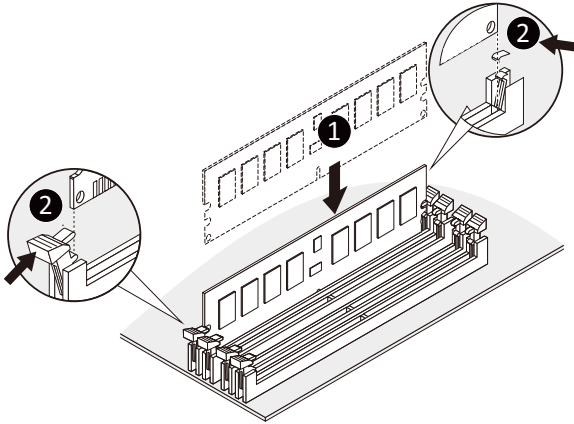


Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module.

Be sure to install DDR4 DIMMs on this motherboard.

Follow these instructions to install the Memory:

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



3-4-3 DIMM Population Table

| Type | Ranks Per DIMM and Data Width | DIMM Capacity (GB) | | Speed (MT/s); Voltage (V); Slots per Channel(SPC) and DIMM per Channel (DPC) | |
|------------|-------------------------------|---------------------|----------------------|--|------|
| | | | | 1DPC | 2DPC |
| | | 8Gb | 16Gb | 1.2V | 1.2V |
| RDIMM | SRx8 | 8GB | 16GB | 3200 | 3200 |
| RDIMM | SRx4 | 16GB | 32GB | | |
| RDIMM | DRx8 | 16GB | 32GB | | |
| RDIMM | DRx4 | 32GB | 64GB | | |
| RDIMM 3DS | (4R/8R)x4 | 2H-64GB 4H-128GB | 2H-128GB 4H-256GB | 3200 | 3200 |
| LRDIMM | QRx4 | 64GB | 128GB | | |
| LRDIMM 3DS | (4R/8R)x4 | 4H-128GB | 2H-128GB 4H-256GB | 3200 | 3200 |

NOTE!

- DIMM must be populated in sequential alphabetic order, starting with DIMM0.
- When only one DIMM is used, it must be populated in memory slot DIMM0.

3-4-4 Processor and Memory Module Matrix Table

| Memory Q'ty for each CPU | CPU0 | | | | | | | | | | | | | | CPU1 | | | | | | | | | | | | | | | | |
|-----------------------------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | B0 | B1 | A0 | A1 | D0 | D1 | C0 | C1 | G0 | H1 | H0 | E1 | E0 | F1 | F0 | J0 | J1 | I0 | I1 | L0 | L1 | K0 | K1 | O0 | O1 | P0 | P1 | M0 | M1 | N0 | N1 |
| 1 DIMM | | | v | | | | | | | | | | | | | | | v | | | | | | | | | | | | | |
| 2 DIMM | | | v | | | | | | | | | | v | | | | | v | | | | | | | | | | | v | | |
| 4 DIMM | | | v | | | v | | | v | | | | v | | | | | v | | | | v | | | v | | | v | | | |
| 6 DIMM | v | | v | | | v | | | v | | | | v | | v | v | | v | | | | v | | | v | | | v | | v | |
| 8 DIMM | v | | v | | v | v | | | v | | v | | v | | v | v | | v | | v | | v | | v | | v | | v | | v | |
| 12 DIMM | v | | v | | v | v | | v | | v | | v | | v | v | v | | v | | v | | v | | v | | v | | v | | v | |
| 16 DIMM | v | v | v | | v | v | | v | | v | | v | | v | v | v | v | v | | v | | v | | v | | v | | v | | v | |

NOTE!

- There should be at least one DDR4 DIMM per socket.
- If only one DIMM is populated in a channel, then populate it in the slot furthest away from CPU of that channel.
- Channel 0's on each memory controller (A/E/C/G, I/M/K/O) must be populated with same total capacity per channel (if populated).
- Channel 1's on each memory controller (B/F/D/H, J/N/L/P) must be populated with same total capacity per channel (if populated).

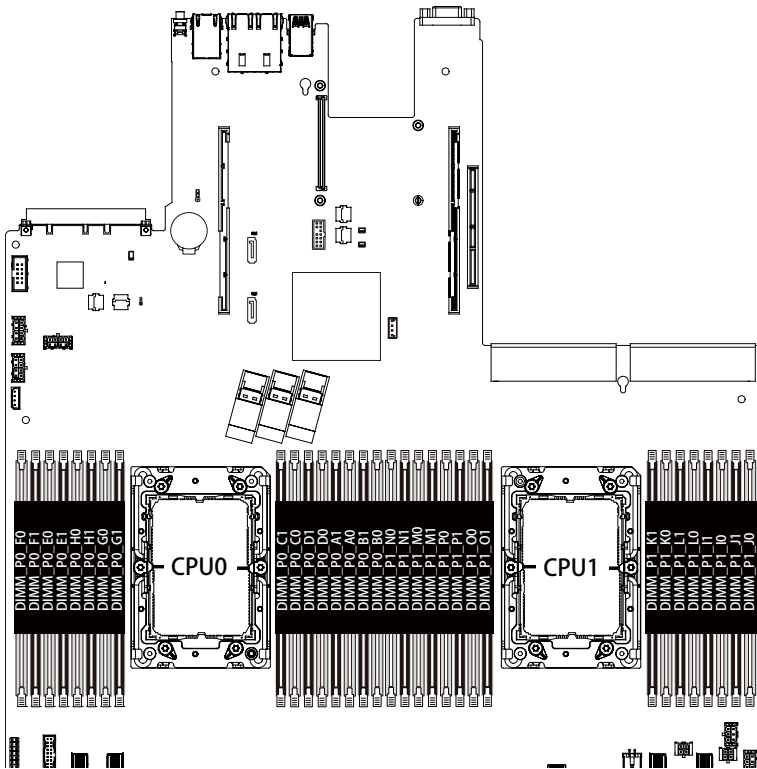
3-4-5 Intel Optane DCPMM DIMM Population Rule

Thermal conditions for DCPMM DIMM support:

- The ambient temperature must be at or below 35°C
- The Cascade Lake CPU used must have a maximum TDP of 205W
- A maximum of 12 pcs 256G DCPMM may be installed



- RDIMM / DCPMM must be installed into CPU0 memory first
- You must install one RDIMM into any slot #0 of CPU0 before installing the DCPMM. (e.g. A0/B0/C0/D0/E0/F0)
- The DCPMM must be installed into the DIMM slot #1 next to the corresponding RDIMM in slot #0 (e.g. if RDIMM is installed into DIMM slot A0, the DCPMM must be installed into DIMM slot A1)



3-5 Installing the PCI Expansion Card



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

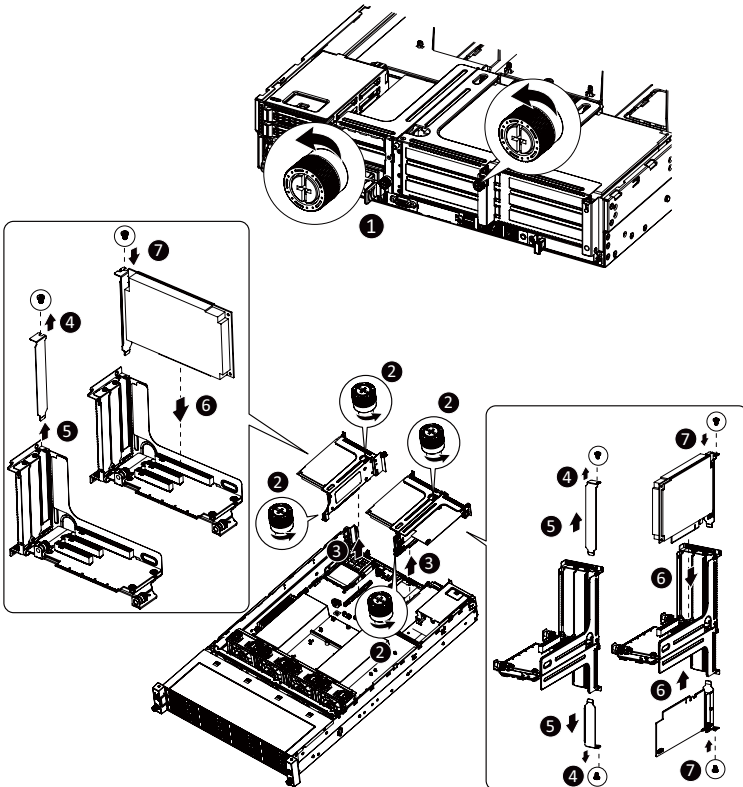
Failure to observe these warnings could result in personal injury or damage to equipment.



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

Follow these instructions to PCI Expansion card:

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



3-6 Installing the Hard Disk Drive

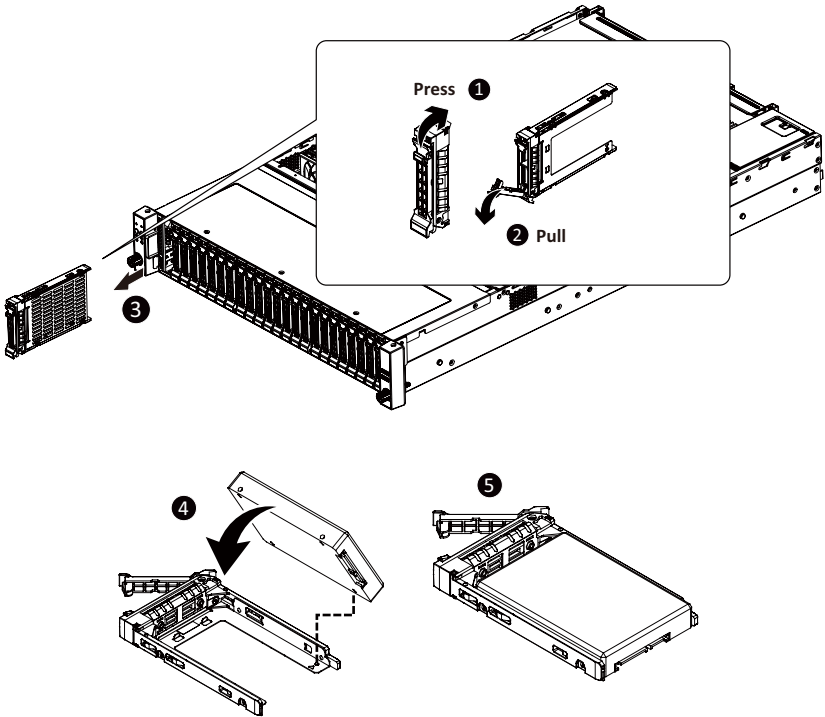


Read the following guidelines before you begin to install the Hard disk drive:

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

Follow these instructions to install the Hard disk drive:

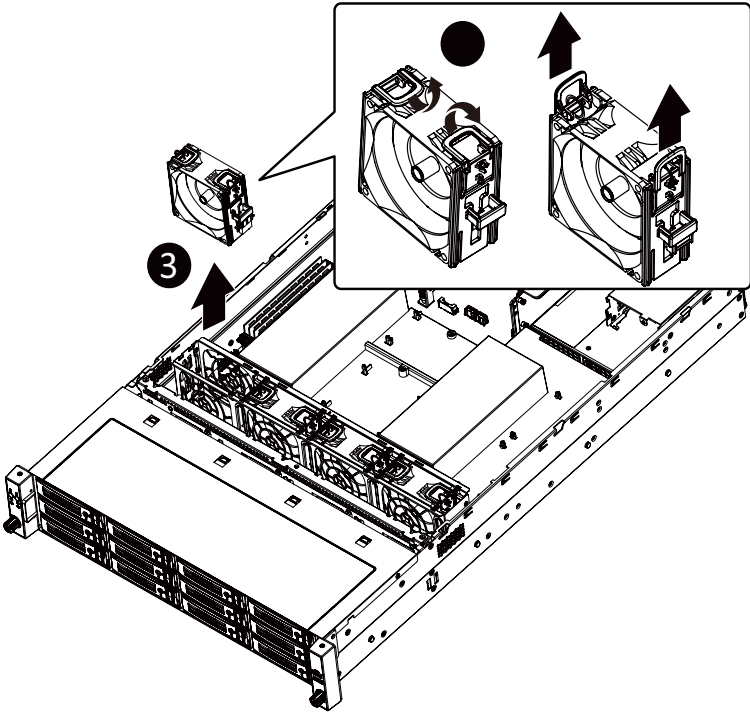
1. Press the release button.
2. Pull the locking lever to remove the HDD tray.
3. Pull apart the HDD tray.
4. Slide hard disk into the tray.
5. Push together to secure the hard drive.



3-7 Replacing the FAN Assembly

Follow these instructions to replace the fan assembly:

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



3-8 Replacing the Power Supply

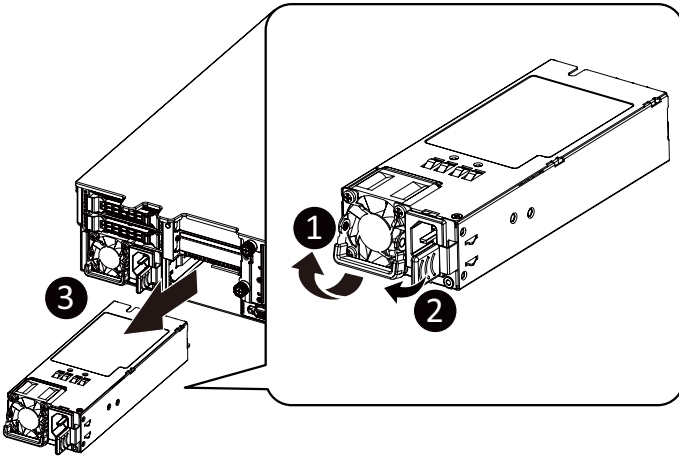


Before you remove or install the system cover

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

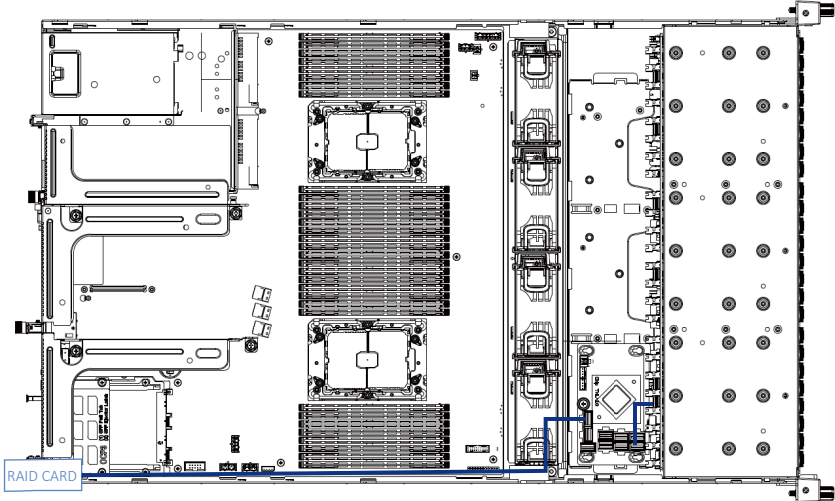
Follow these instructions to replace the power supply:

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. At the same time, pull out the power supply by using its handle.
2. Insert the replacement power supply firmly into the chassis. Connect the AC power cord to the replacement power supply.

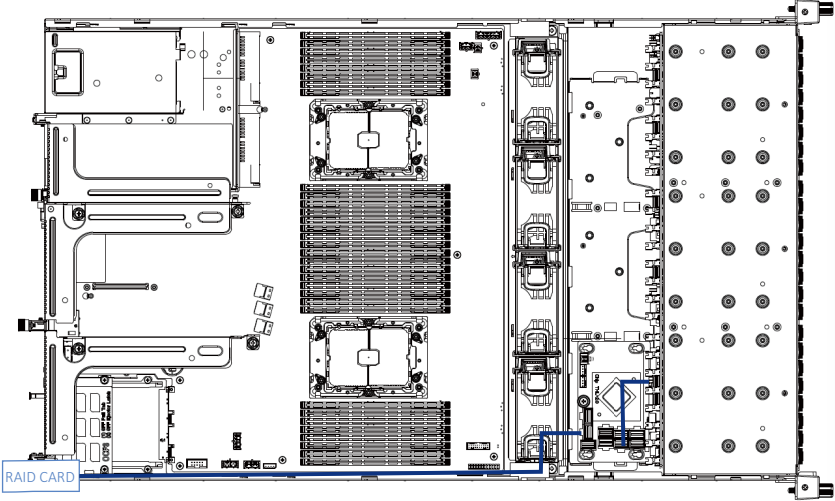


3-9 Cable Routing

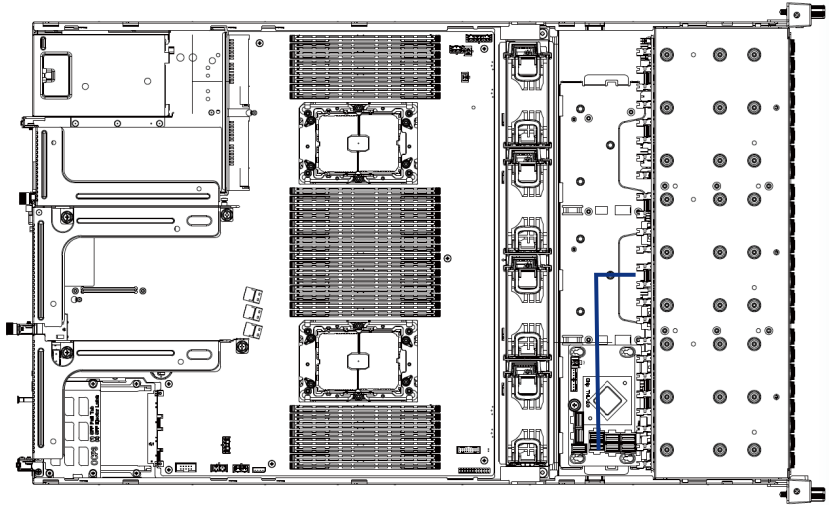
SAS0



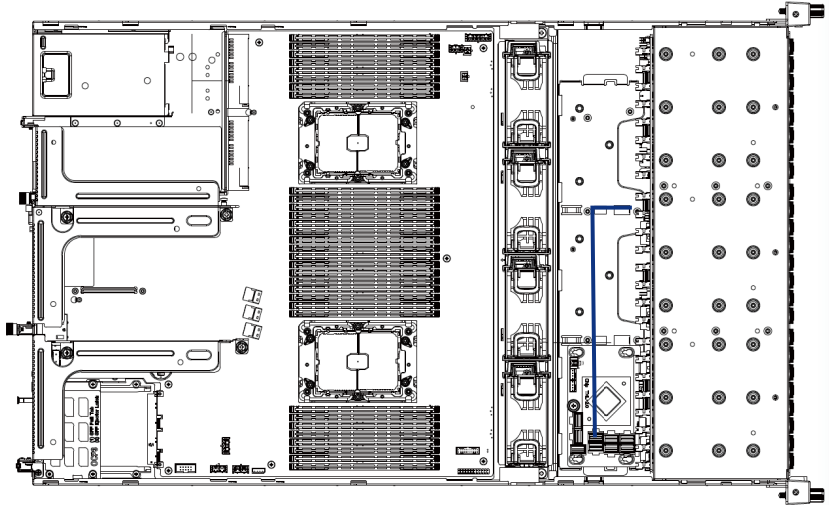
SAS1



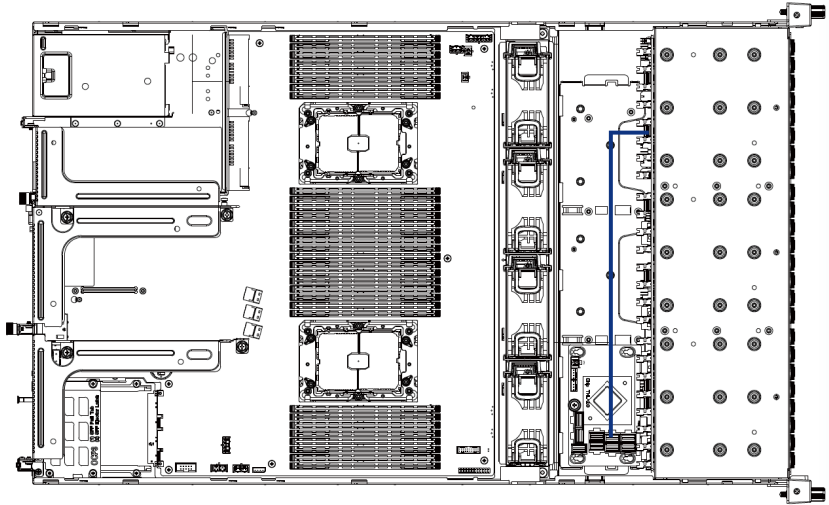
SAS2



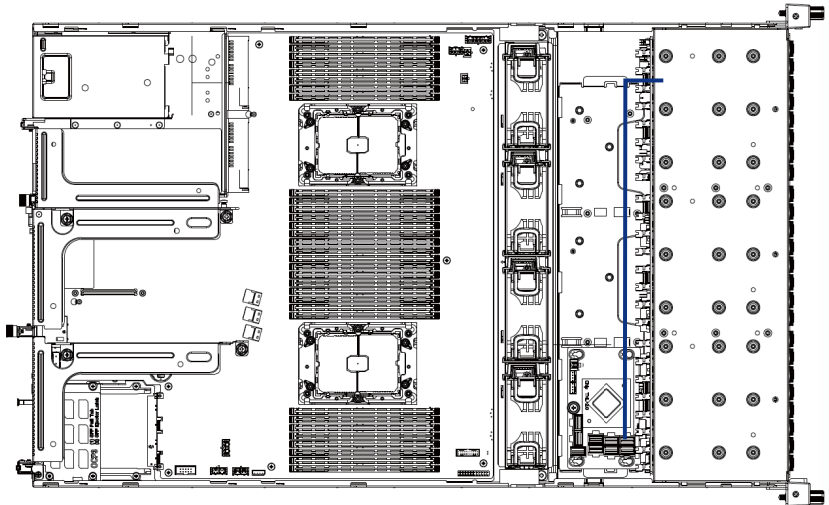
SAS3



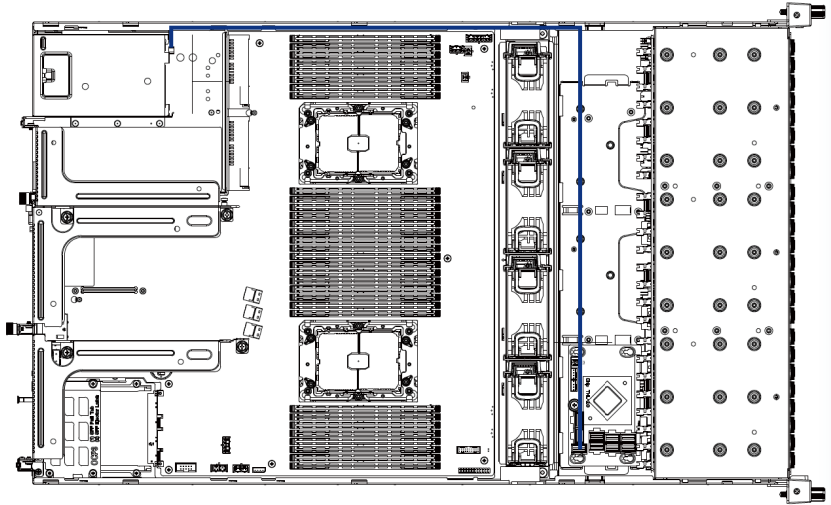
SAS4



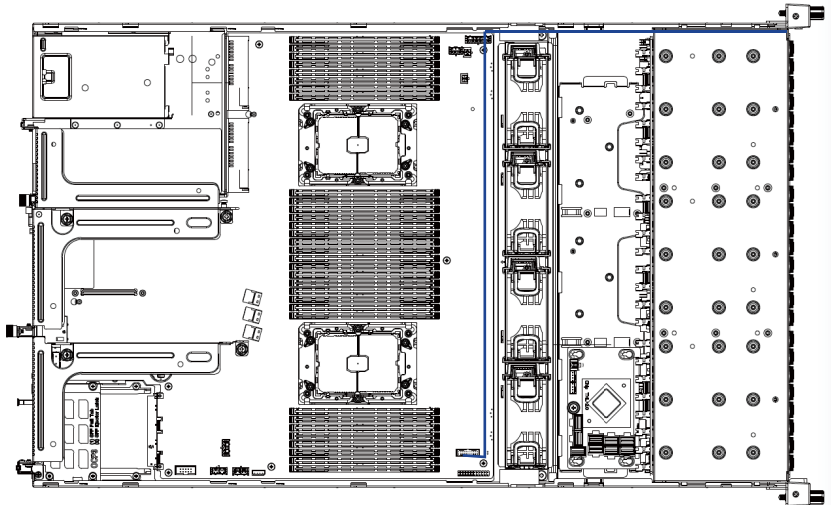
SAS5



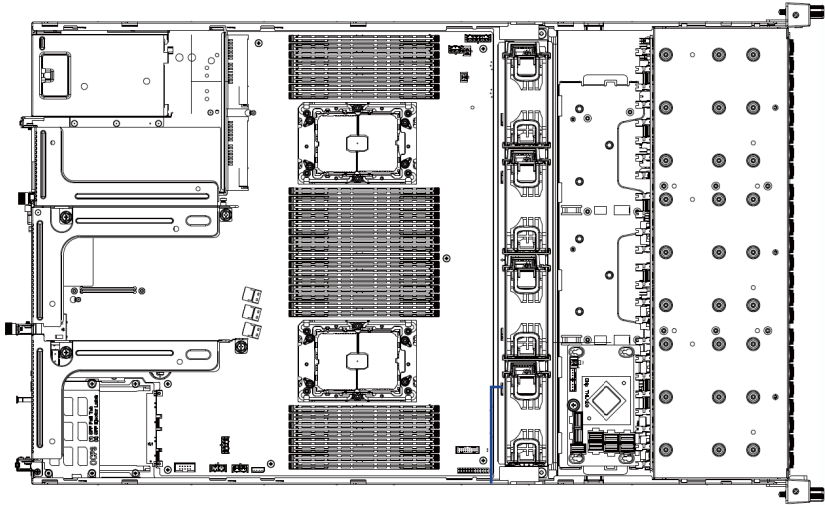
SAS6



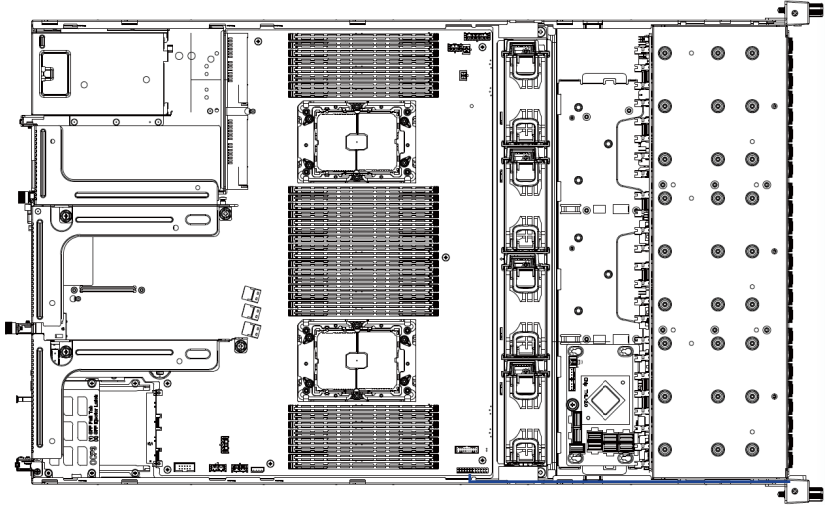
USB Cable



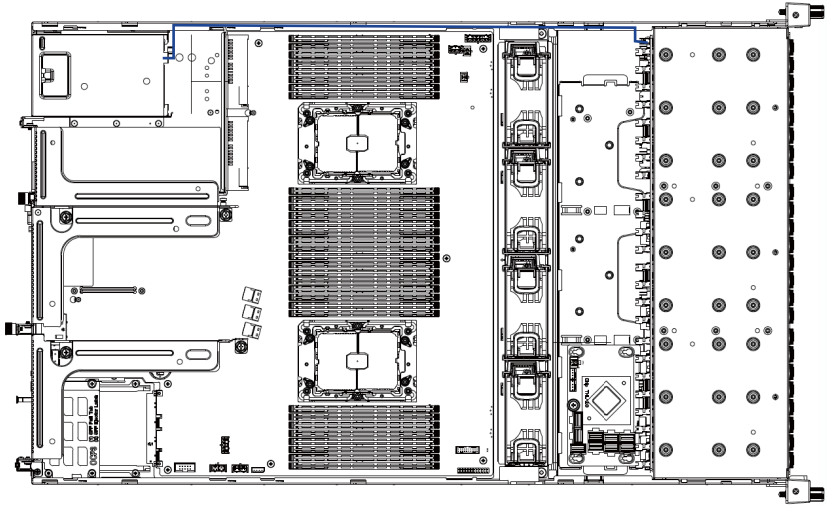
B/P Cable



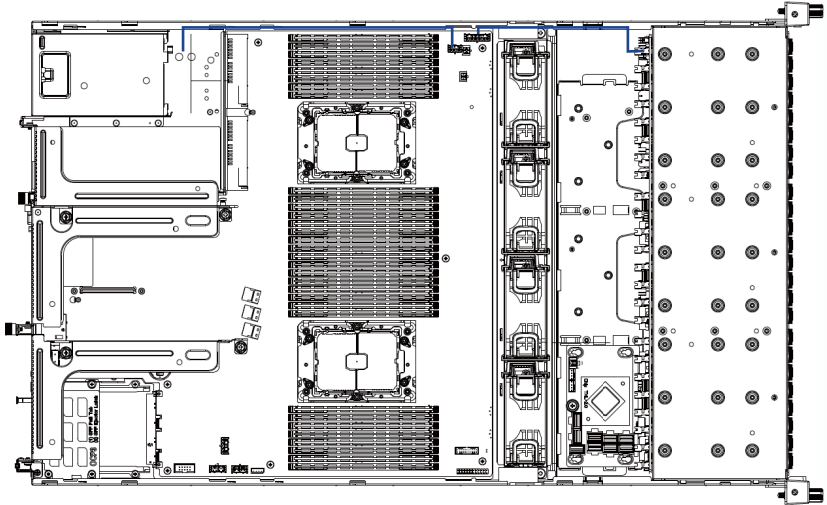
F/P Cable



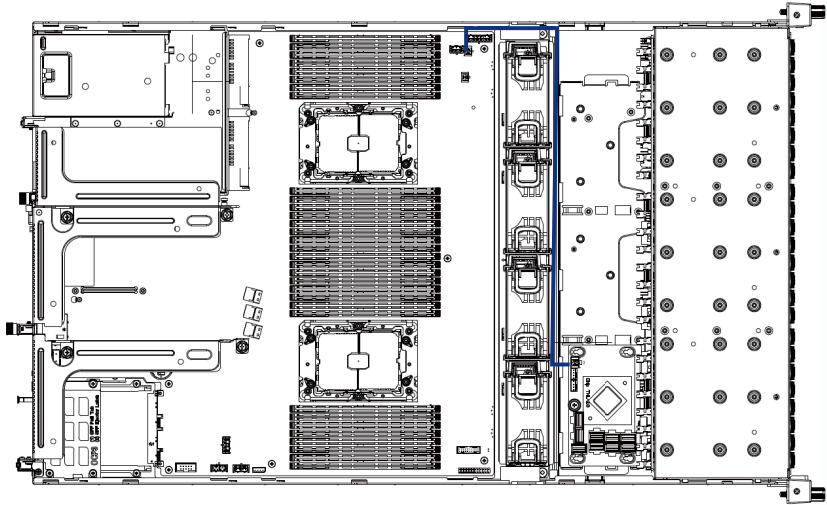
HDD BP Signal



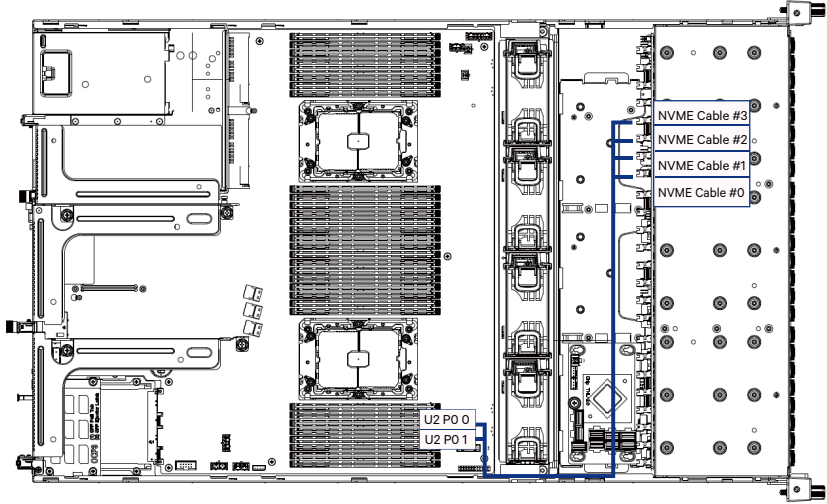
HDD Power



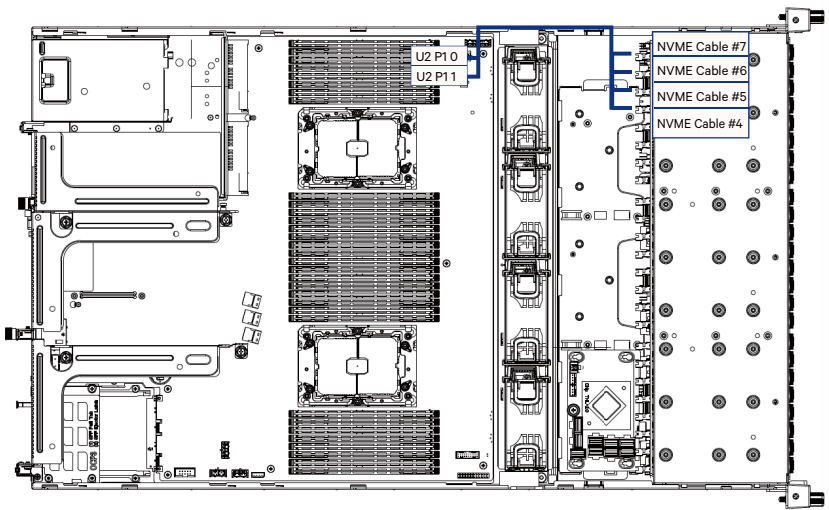
Exp Power



NVMe#0 ~ NVMe#3

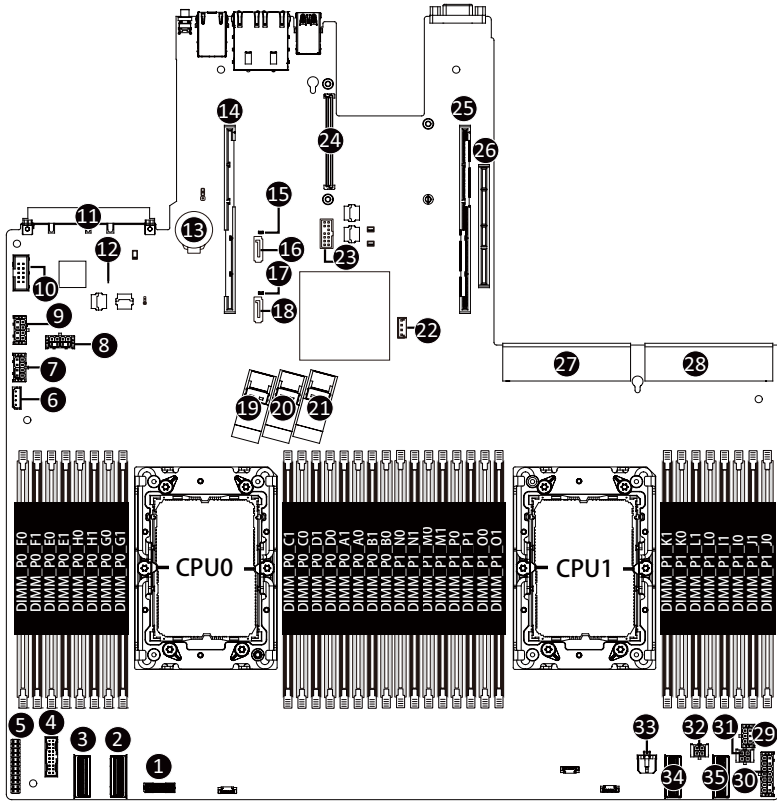


NVMe#4 ~ NVMe#7



Chapter 4 Motherboard Components

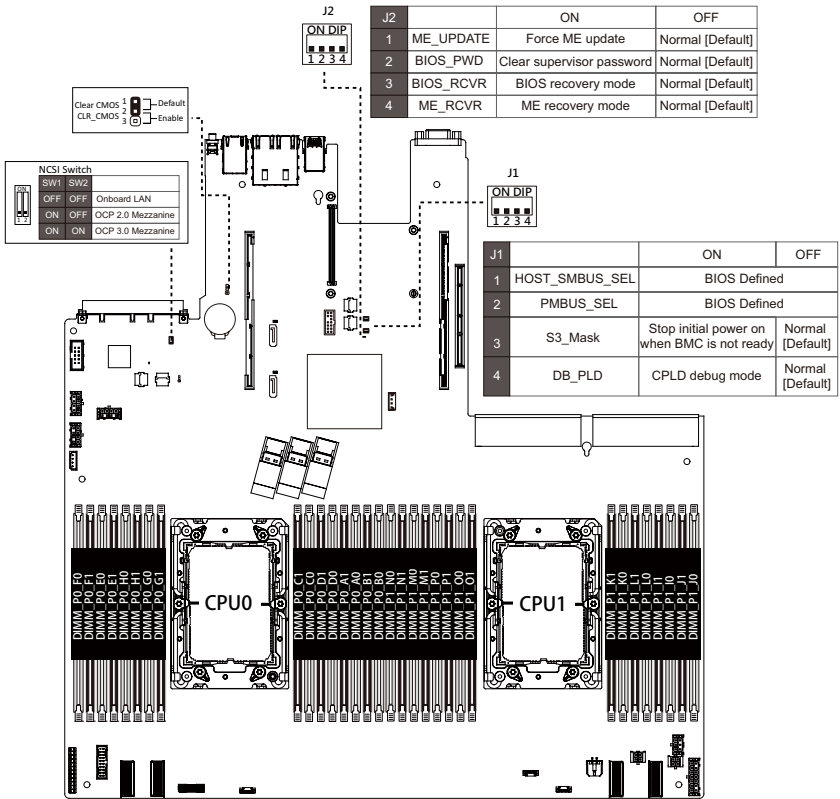
4-1 Motherboard Components



| Item | Description |
|------|---|
| 1 | HDD Back Plane Board Connector |
| 2 | SlimLine SAS Connector (U2_P0_0/PCIe Gen4) |
| 3 | SlimLine SAS Connector (U2_P0_1/PCIe Gen4) |
| 4 | Front Panel USB 3.0 Connector |
| 5 | Front Panel Connector |
| 6 | IPMB Connector |
| 7 | 2 x 4 GPU Card Power Connector (P12V_GPU2) |
| 8 | 2 x 4 GPU Card Power Connector (P12V_GPU3) |
| 9 | 2 x 4 GPU Card Power Connector (P12V_GPU1) |
| 10 | Serial Port Cable Connector |
| 11 | OCP Mezzanine Connector (OCP 3.0/SFF Type/Gen4 x16) |
| 12 | BMC Firmware Readiness LED |

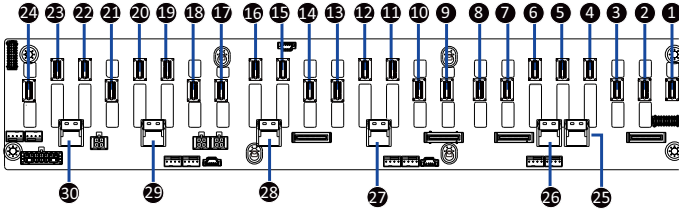
| | |
|----|---|
| 13 | System Battery |
| 14 | Riser Connector #1 (SLOT1/PCIe Gen4/x32 Slot) |
| 15 | SATA DOM Support Power Connector (for SSATA5) |
| 16 | SATA Connector (SSATA5) |
| 17 | SATA DOM Support Power Connector (for SSATA4) |
| 18 | SATA Connector (SSATA4) |
| 19 | SlimLine SAS Connector (SSATA0/SATA 6Gb/s) |
| 20 | SlimLine SAS Connector (SATA0/SATA 6Gb/s) |
| 21 | SlimLine SAS Connector (SATA1/SATA 6Gb/s) |
| 22 | VROC Upgrade Module Connector |
| 23 | TPM Module Connector (SPI Interface) |
| 24 | OCF Mezzanine Connector (OCF 2.0/Gen3 x8) |
| 25 | Riser Connector #2 (SLOT2/PCIe Gen4/x32 Slot) |
| 26 | Riser Connector #3 (SLOT3/PCIe Gen4/x16 Slot) |
| 27 | Power Supply Connector#1 (Primary) |
| 28 | Power Supply Connector#2 (Secondary) |
| 29 | 2 x 3 Pin Rear HDD Back Plane Board |
| 30 | 2 x 7 Pin HDD Back Plane Board Power Connector |
| 31 | 2 x 2 Pin Backup Power Connector (12V_BP1) |
| 32 | 2 x 2 Pin Backup Power Connector (12V_BP2) |
| 33 | 2 x 2 Pin Backup Power Connector (12V_BP3) |
| 34 | SlimLine SAS Connector (U2_P1_1/PCIe Gen4 Signal) |
| 35 | SlimLine SAS Connector (U2_P1_0/PCIe Gen4 Signal) |

4-2 Jumper Setting



4-3 Backplane Board Storage Connector

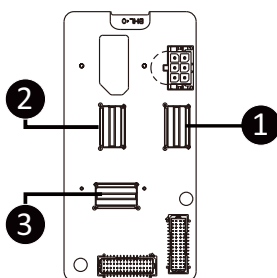
4-3-1 CBP2007



| Item | Description |
|------|----------------------------------|
| 1 | SlimLine SAS Connector (U_2_0) |
| 2 | SlimLine SAS Connector (U_2_1) |
| 3 | SlimLine SAS Connector (U_2_2) |
| 4 | SlimLine SAS Connector (U_2_3) |
| 5 | SlimLine SAS Connector (U_2_4) |
| 6 | SlimLine SAS Connector (U_2_5) |
| 7 | SlimLine SAS Connector (U_2_6) |
| 8 | SlimLine SAS Connector (U_2_7) |
| 9 | SlimLine SAS Connector (U_2_8) |
| 10 | SlimLine SAS Connector (U_2_9) |
| 11 | SlimLine SAS Connector (U_2_10) |
| 12 | SlimLine SAS Connector (U_2_11) |
| 13 | SlimLine SAS Connector (U_2_12) |
| 14 | SlimLine SAS Connector (U_2_13) |
| 15 | SlimLine SAS Connector (U_2_14) |
| 16 | SlimLine SAS Connector (U_2_15) |
| 17 | SlimLine SAS Connector (U_2_16) |
| 18 | SlimLine SAS Connector (U_2_17) |
| 19 | SlimLine SAS Connector (U_2_18) |
| 20 | SlimLine SAS Connector (U_2_19) |
| 21 | SlimLine SAS Connector (U_2_20) |
| 22 | SlimLine SAS Connector (U_2_21) |
| 23 | SlimLine SAS Connector (U_2_22) |
| 24 | SlimLine SAS Connector (U_2_23) |
| 25 | SlimLine SAS Connector (SL_SAS0) |
| 26 | SlimLine SAS Connector (SL_SAS1) |
| 27 | SlimLine SAS Connector (SL_SAS2) |

| Item | Description |
|------|----------------------------------|
| 28 | SlimLine SAS Connector (SL_SAS3) |
| 29 | SlimLine SAS Connector (SL_SAS4) |
| 30 | SlimLine SAS Connector (SL_SAS5) |

4-3-2 CBP2022



| Item | Description |
|------|----------------------------------|
| 1 | SlimLine SAS Connector (U_2_0) |
| 2 | SlimLine SAS Connector (U_2_1) |
| 3 | SlimLine SAS Connector (SL_SAS0) |

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 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 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.

```
Aptio Setup - AMI
Main  Advanced  Chipset  Server Mgmt  Security  Boot  Save & Exit

BIOS Information
Project Name           MR92-FS0-00
Project Version        F10
Build Date and Time    05/04/2021 19:56:37

BMC Information
BMC Firmware Version   12.52.05

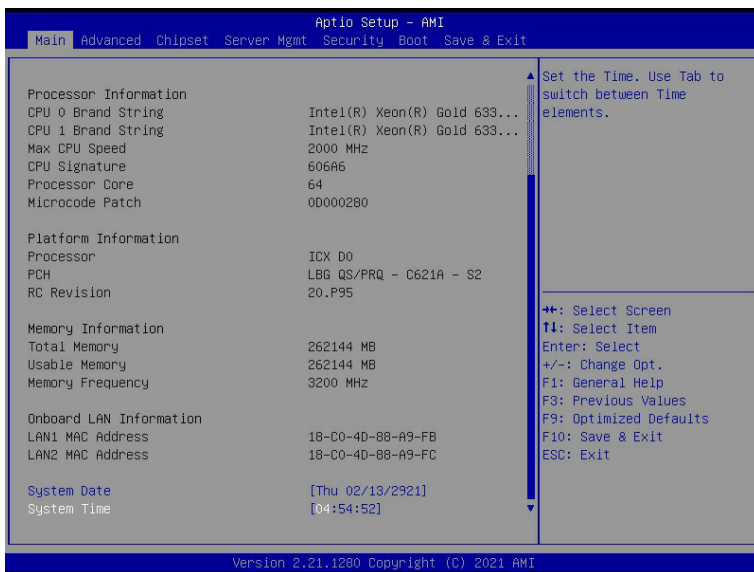
Processor Information
CPU 0 Brand String     Intel(R) Xeon(R) Gold 633...
CPU 1 Brand String     Intel(R) Xeon(R) Gold 633...
Max CPU Speed          2000 MHz
CPU Signature           606A6
Processor Core          64
Microcode Patch        0D000280

Platform Information
Processor               ICX D0
PCH                     LBG QS/PRQ - C621A - S2
RC Revision              20.P95

Memory Information
Total Memory            262144 MB
Usable Memory           262144 MB
Memory Frequency        3200 MHz

++: Select Screen
T1: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

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```



| 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 ^(Note1) | |
| BMC Firmware Version ^(Note1) | 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 ^(Note2) | Displays the total memory size of the installed memory. |
| Usable Memory ^(Note2) | 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 ^(Note2) | Displays the frequency information of the installed memory. |
| Onboard LAN Information | |
| LAN1 MAC Address ^(Note3) | Displays LAN MAC address information. |
| LAN2 MAC Address ^(Note3) | 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. |

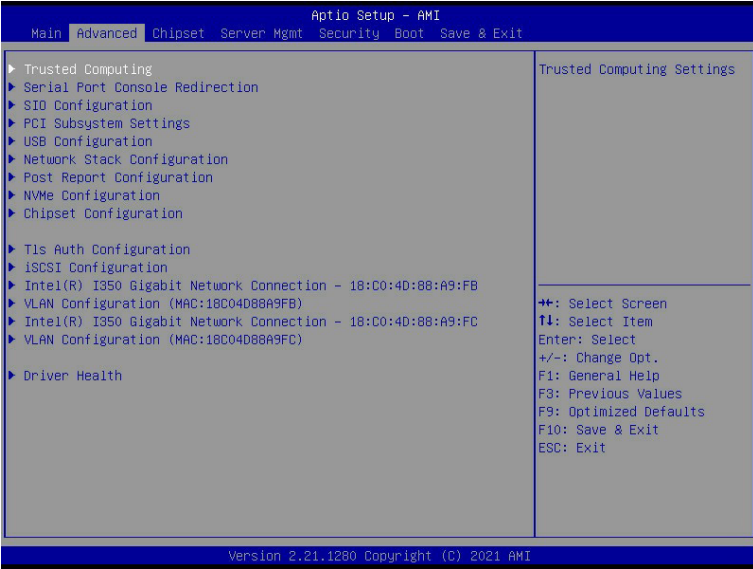
(Note2) This section will display capacity and frequency information of the memory that the customer has installed.

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

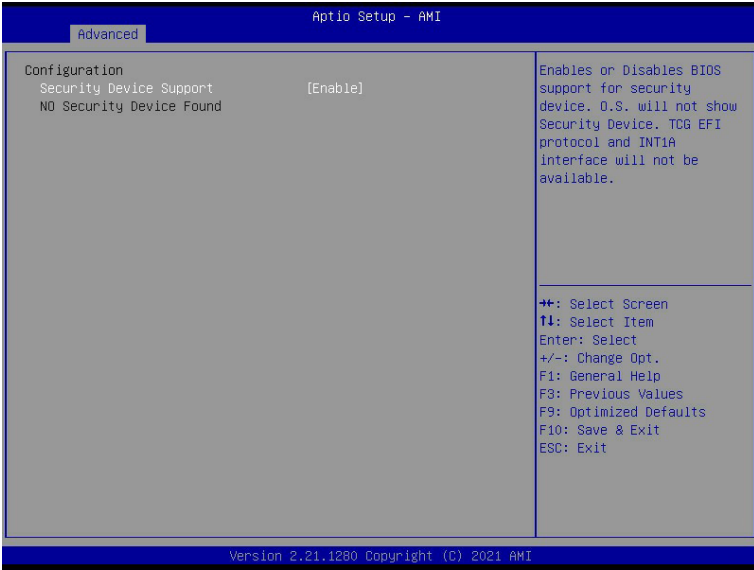
5-2 Advanced Menu

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)

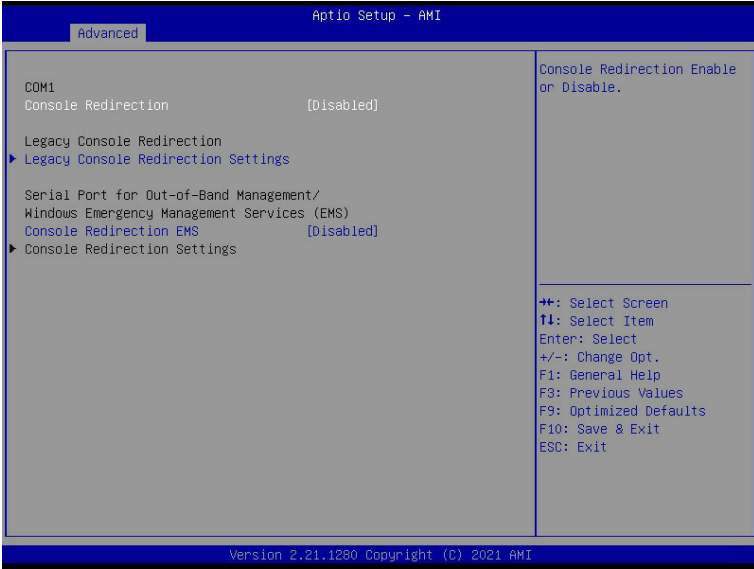


5-2-1 Trusted Computing



| 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 Enable.</p> |

5-2-2 Serial Port Console Redirection



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

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

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

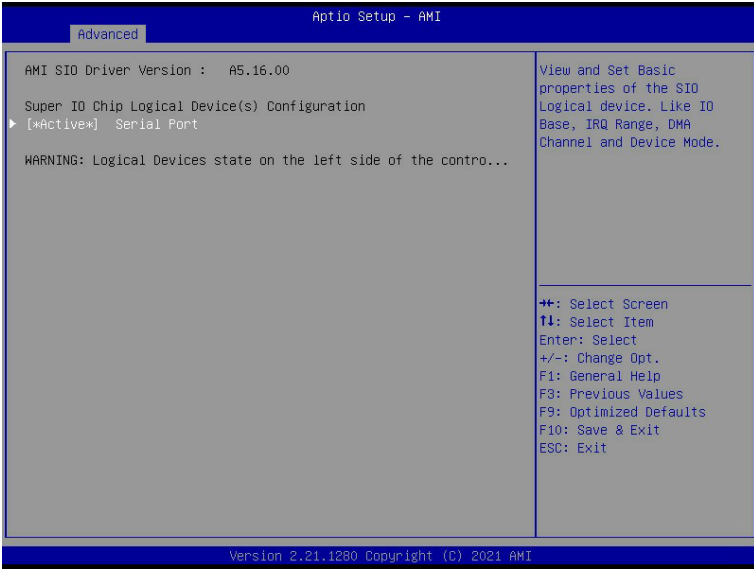
(Note) Advanced items prompt when this item is defined.

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

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

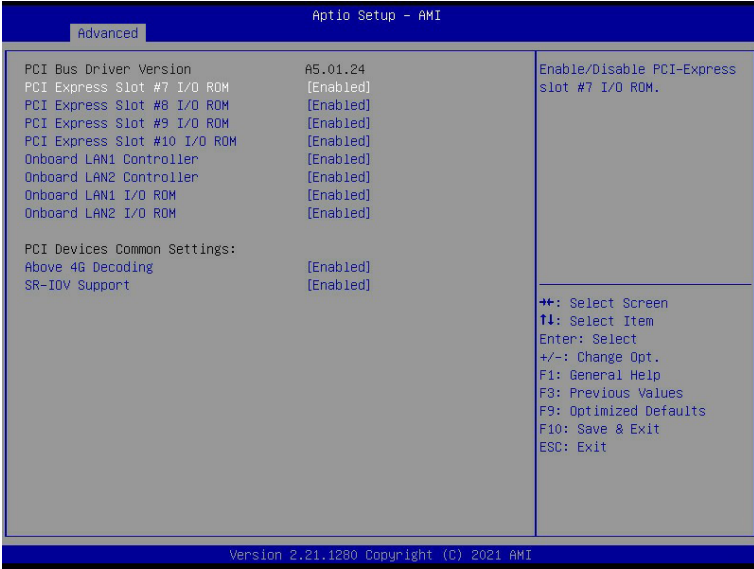
| Parameter | Description |
|---|---|
| Serial Port for Out-of-Band EMS Console Redirection Settings(continued) | <ul style="list-style-type: none"><li data-bbox="362 163 956 185">◆ Flow Control EMS<ul style="list-style-type: none"><li data-bbox="400 194 956 332">– Flow control can prevent data loss 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 data-bbox="400 341 956 396">– Options available: None, Hardware RTS/CTS, Software Xon/Xoff. Default setting is None. |

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 | Press [Enter] to configure advanced items. |
| [*Active*] Serial Port | <ul style="list-style-type: none"> ◆ Use This Device <ul style="list-style-type: none"> – When set to Enabled allows you to configure the serial port settings. When set to Disabled, displays no configuration for the serial port. – Options available: Enabled, Disabled. Default setting is Enabled. ◆ Current: <ul style="list-style-type: none"> – Displays the serial port base I/O address and IRQ. ◆ Possible: <ul style="list-style-type: none"> – Configures the serial port base I/O address and IRQ. Use Automatic Settings IO=3F8h; IRQ=4; DMA; IO=3F8h; IRQ=4; DMA; IO=2F8h; IRQ=4; DMA; IO=3E8h; IRQ=4; DMA; IO=2E8h; IRQ=4; DMA; Default setting is Use Automatic Settings. |

5-2-4 PCI Subsystem Settings

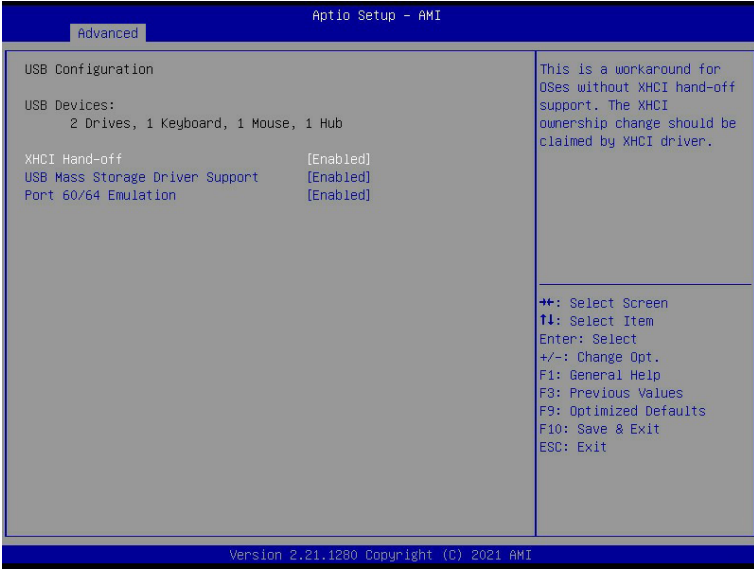


| Parameter | Description |
|--|---|
| PCI Bus Driver Version | Displays the PCI Bus Driver version information. |
| PCI Express Slot # I/O ROM ^(Note1) | When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Enabled, Disabled. Default setting is Enabled . |
| Onboard LAN1/ LAN2 Controller ^(Note2) | Enable/Disable the onboard LAN1/ LAN2 controller. Options available: Enabled, Disabled. Default setting is Enabled . |
| Onboard LAN1/ LAN2 I/O ROM ^(Note2) | Enable/Disable the onboard LAN1/ LAN2 devices, and initializes device expansion ROM. Options available: Enabled, Disabled. Default setting is Enabled . |
| PCI Devices Common Settings | |
| Above 4G Decoding | Enable/Disable memory mapped I/O to 4GB or greater address space (Above 4G Decoding). Options available: Enabled, Disabled. Default setting is Enabled . |
| SR-IOV Support | If the system has SR-IOV capable PCIe devices, this item Enable/Disable Single Root IO Virtualization Support. Options available: Enabled, Disabled. Default setting is Enabled . |

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

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

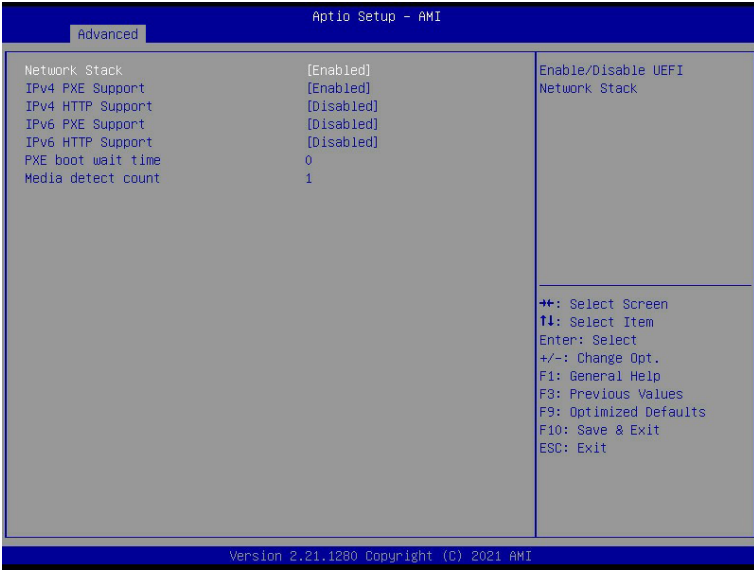
5-2-5 USB Configuration



| 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. Options available: Enabled, Disabled. Default setting is Enabled . |
| USB Mass Storage Driver Support ^(Note) | Enable/Disable the USB Mass Storage Driver Support. Options available: Enabled, Disabled. Default setting is Enabled . |
| 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. Options available: Enabled, Disabled. Default setting is Enabled . |

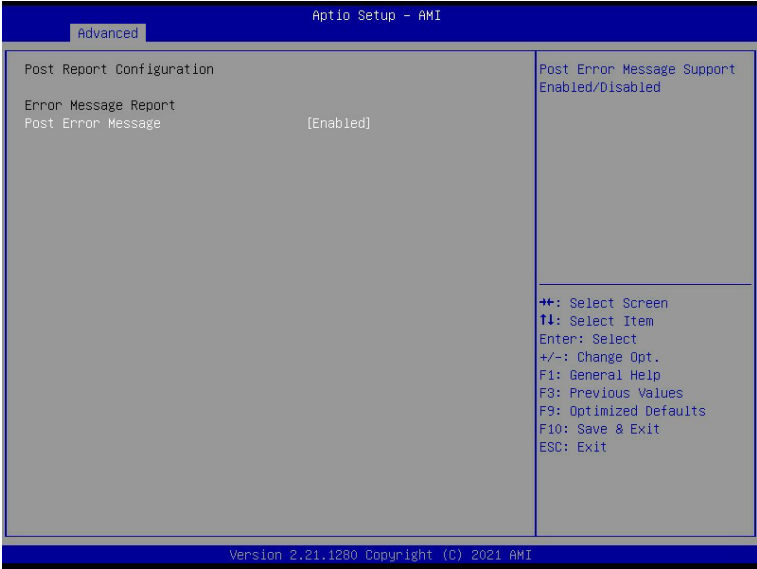
(Note) This item is present only if you attach USB devices.

5-2-6 Network Stack Configuration



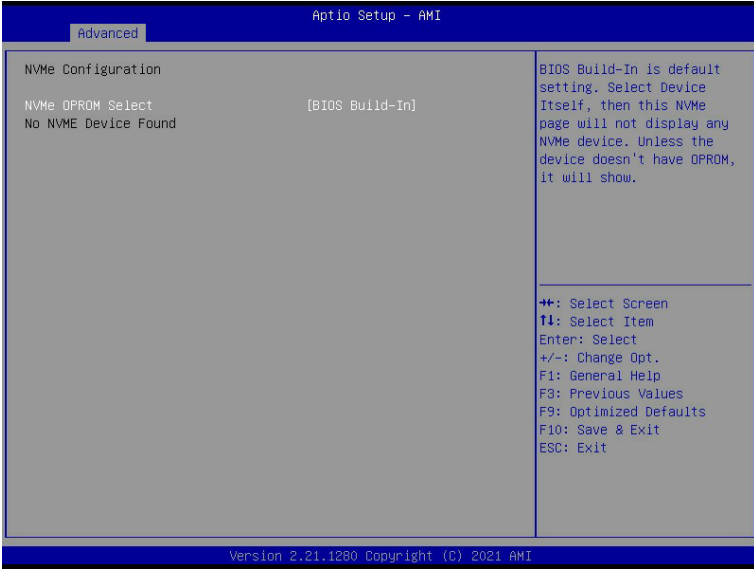
| Parameter | Description |
|--------------------|--|
| Network Stack | Enable/Disable the UEFI network stack. Options available: Enabled, Disabled. Default setting is Enabled . |
| Ipv4 PXE Support | Enable/Disable the Ipv4 PXE feature. Options available: Enabled, Disabled. Default setting is Enabled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

5-2-7 Post Report Configuration



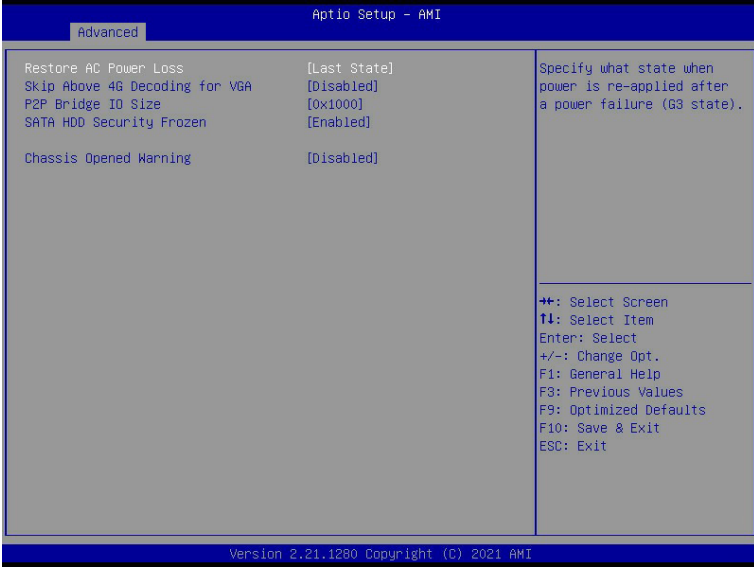
| Parameter | Description |
|---------------------------|---|
| Post Report Configuration | |
| Error Message Report | |
| Post Error Message | Enable/Disable the POST Error Message support. Options available: Enabled, Disabled. Default setting is Enabled . |

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 BIOS Build-In . |

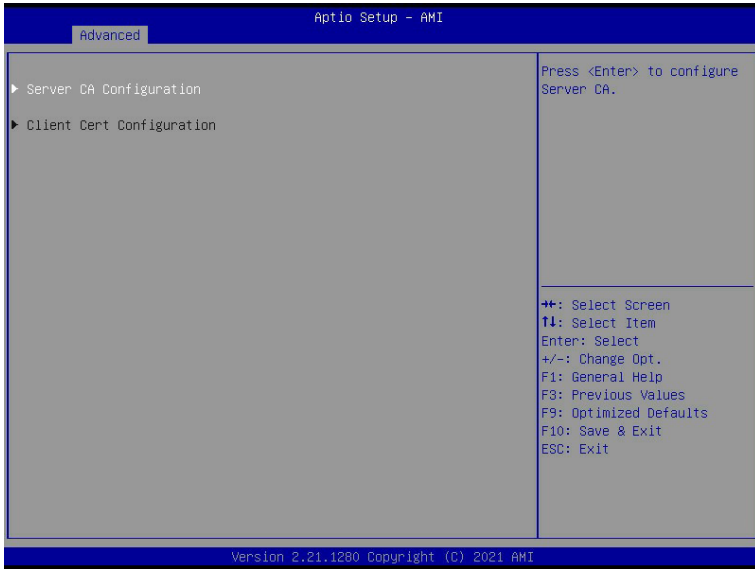
5-2-9 Chipset Configuration



| Parameter | Description |
|--|---|
| Restore on AC Power Loss ^(Note) | Defines the power state to resume to after a system shutdown that is due to an interruption in AC power. When set to Last State, the system will return to the active power state prior to shutdown. When set to Power Off, the system remains off after power shutdown. Options available: Last State, Power Off, Power On, 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 Disabled . |
| P2P Bridge IO Size | Specifies P2P Bridge IO aligned to the size. Options available: 0x100, 0x150, 0x1000. Default setting is 0x1000 . |
| SATA HDD Security Frozen | Enable/Disable this item to send freeze lock command to SATA HDD. Options available: Enabled, Disabled. Default setting is Enabled . |
| Chassis Opened Warning | Enable/Disable the chassis intrusion alert function. Options available: Enabled, Disabled, Clear. Default setting is Disabled . |

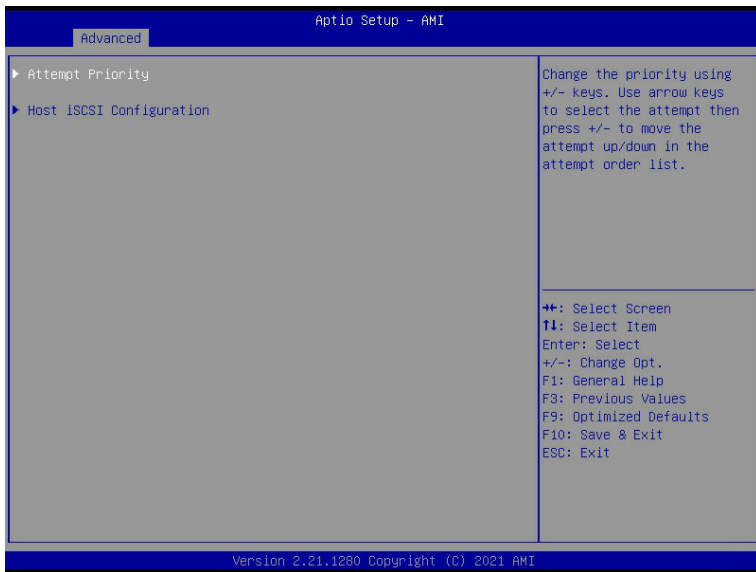
(Note) When the power policy is controlled by BMC, please wait for 15-20 seconds for BMC to save the last power state.

5-2-10 Tls Auth Configuration



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

5-2-11 iSCSI Configuration



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

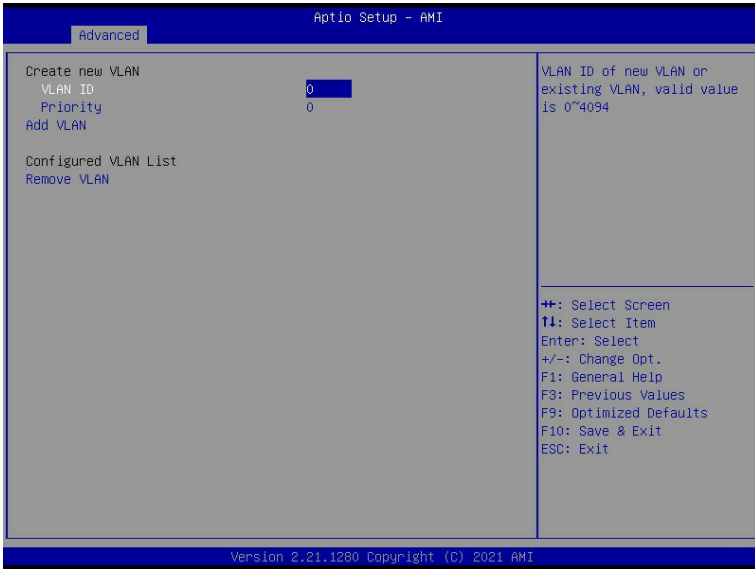
5-2-12 Intel(R) i350 Gigabit Network Connection

| Advanced | | Aptio Setup - AMI | |
|--|--|---|--|
| <p>▶ NIC Configuration</p> <p>Blink LEDs 0</p> <p>UEFI Driver Intel(R) PRO/1000 7.5.11 ...</p> <p>Adapter PBA 140422-008</p> <p>Device Name Intel(R) I350 Gigabit Net...</p> <p>Chip Type Intel I350</p> <p>PCI Device ID 1521</p> <p>PCI Address 02:00:00</p> <p>Link Status [Disconnected]</p> <p>MAC Address 18:00:4D:88:A9:FB</p> <p>Virtual MAC Address 00:00:00:00:00:00</p> | | <p>Click to configure the network device port.</p> | |
| | | <p>↔: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</p> | |
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| Advanced | | Aptio Setup - AMI | |
|--|--|---|--|
| <p>Link Speed [Auto Negotiated]</p> <p>Wake On LAN [Enabled]</p> | | <p>Specifies the port speed used for the selected boot protocol.</p> | |
| | | <p>↔: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</p> | |
| Version 2.21.1280 Copyright (C) 2021 AMI | | | |

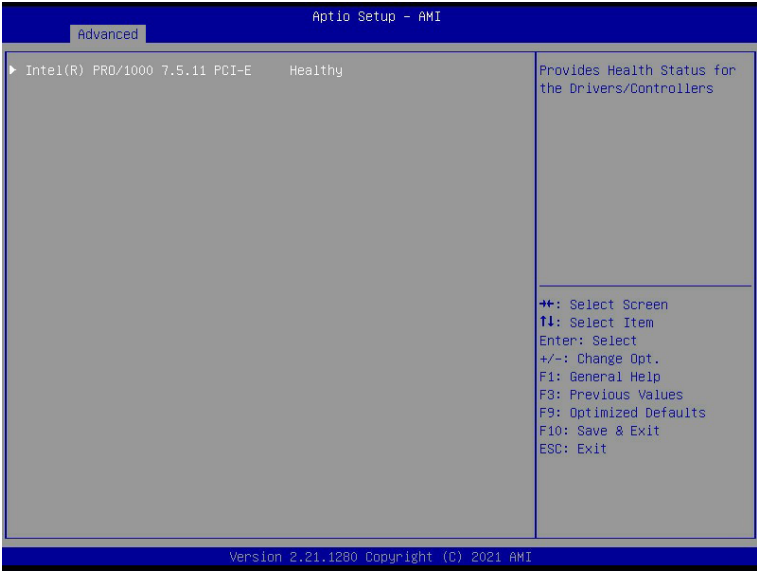
| Parameter | Description |
|---------------------|---|
| NIC Configuration | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ Link Speed <ul style="list-style-type: none"> – Allows for automatic link speed adjustment. – Options available: Auto Negotiated, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, 100 Mbps Full. Default setting is Auto Negotiated. ◆ Wake On LAN <ul style="list-style-type: none"> – 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. – Options available: Enabled, Disabled. Default setting is Enabled. |
| Blink LEDs | <p>Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values (up to 15 seconds).</p> |
| 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>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ Create new VLAN ◆ VLAN ID <ul style="list-style-type: none"> – Sets VLAN ID for a new VLAN or an existing VLAN. – Press the <+> / <-> keys to increase or decrease the desired values. – The valid range is from 0 to 4094. ◆ Priority <ul style="list-style-type: none"> – Sets 802.1Q Priority for a new VLAN or an existing VLAN. – Press the <+> / <-> keys to increase or decrease the desired values. – The valid range is from 0 to 7. ◆ Add VLAN <ul style="list-style-type: none"> – Press [Enter] to create a new VLAN or update an existing VLAN. ◆ Configured VLAN List ◆ Remove VLAN <ul style="list-style-type: none"> – Press [Enter] to remove an existing VLAN. |

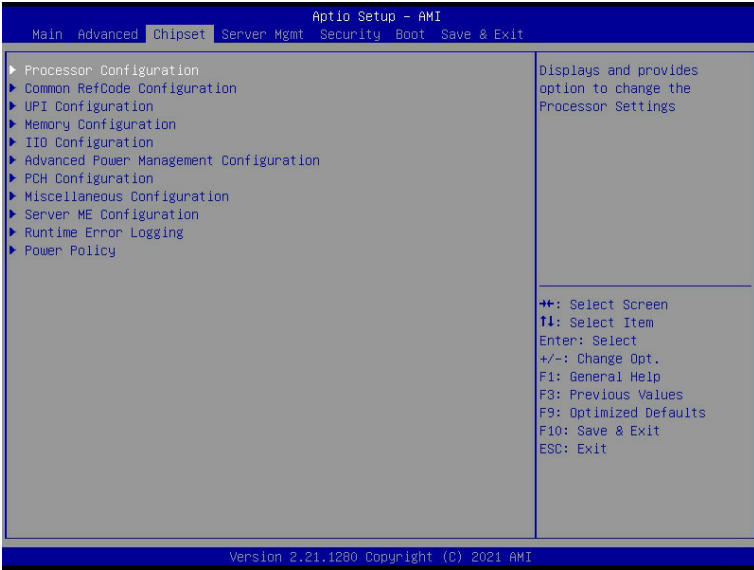
5-2-14 Driver Health



| 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

Aptio Setup - AMI

Chipset

| Processor Configuration | | Change Per-Socket Settings |
|----------------------------|--|----------------------------|
| ----- | | |
| ▶ Per-Socket Configuration | | |
| Processor Socket | Socket 0 | Socket 1 |
| Processor ID | 000606A6* | 000606A6 |
| Processor Frequency | 2.000GHz | 2.000GHz |
| Processor Max Ratio | 14H | 14H |
| Processor Min Ratio | 08H | 08H |
| Microcode Revision | 0D000280 | 0D000280 |
| L1 Cache RAM(Per Core) | 80KB | 80KB |
| L2 Cache RAM(Per Core) | 1280KB | 1280KB |
| L3 Cache RAM(Per Package) | 49152KB | 49152KB |
| Processor 0 Version | Intel(R) Xeon(R) Gold 6 338 CPU @ 2.00GHz | |
| Processor 1 Version | Intel(R) Xeon(R) Gold 6 338 CPU @ 2.00GHz | |
| Hyper-Threading [ALL] | [Enable] | |
| Hardware Prefetcher | [Enable] | |
| L2 RFD Prefetch Disable | [Disable] | |
| Adjacent Cache Prefetch | [Enable] | |
| DCU Streamer Prefetcher | [Enable] | |
| DCU IP Prefetcher | [Enable] | |
| Extended APIC | [Disable] | |
| Enable Intel(R) TXT | [Disable] | |

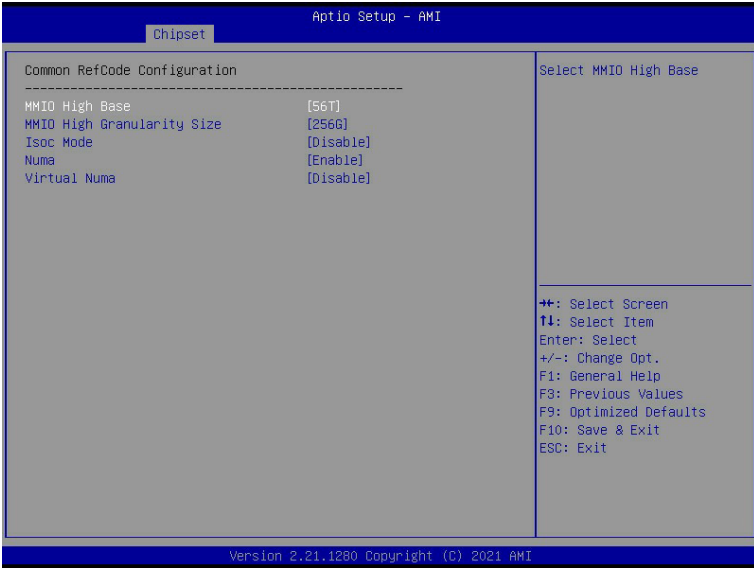
++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F3: Previous Values
 F9: Optimized Defaults
 F10: Save & Exit
 ESC: Exit

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| Parameter | Description |
|--|--|
| Processor Configuration | |
| Pre-Socket Configuration | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ CPU Socket 0/1 Configuration <ul style="list-style-type: none"> – Core Disable Bitmap(Hex) <ul style="list-style-type: none"> • 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. |
| 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 Enable.</p> |
| Hardware Prefetcher | <p>Select whether to enable the speculative prefetch unit of the processor.</p> <p>Options available: Enable, Disable. Default setting is Disable.</p> |
| L2 RF0 Prefetch Disable | Options available: Enable, Disable. Default setting is Disable . |
| 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 Enable.</p> |
| DCU Streamer Prefetcher | <p>Enable/Disable DCU streamer prefetcher.</p> <p>Options available: Enable, Disable. Default setting is Enable.</p> |
| DCU IP Prefetcher | <p>Enable/Disable DCU IP Prefetcher.</p> <p>Options available: Enable, Disable. Default setting is Enable.</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 Disable.</p> |
| Enable Intel(R) TXT | <p>Enable/Disable the Intel Trusted Execution Technology support function.</p> <p>Options available: Enable, Disable. Default setting is Disable.</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 Enable.</p> |
| Enable SMX | <p>Enable/Disable the Safer Mode Extensions (SMX) support function.</p> <p>Options available: Enable, Disable. Default setting is Disable.</p> |
| AES-NI | <p>Enable/Disable the AES-NI support.</p> <p>Options available: Enable, Disable. Default setting is Enable.</p> |

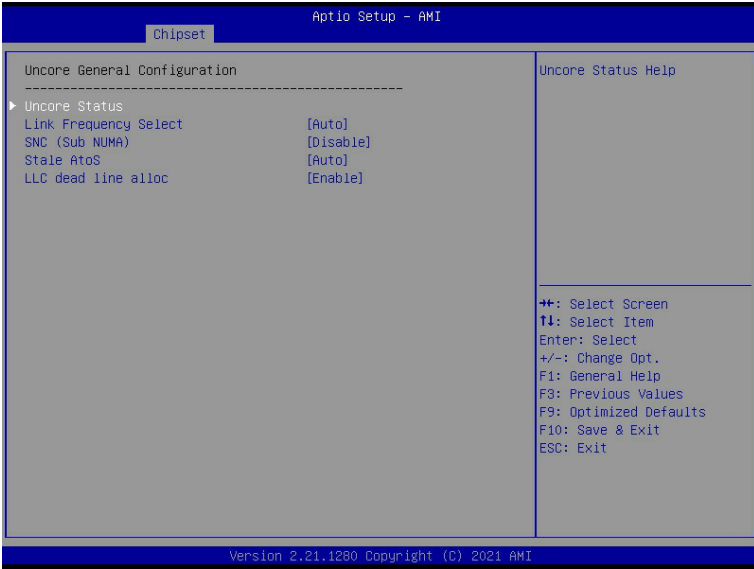
| Parameter | Description |
|-------------------------------|---|
| Debug Consent | Options available: Enable, Disable. Default setting is Disable . |
| Total Memory Encryption (TME) | Enable/Disable total memory encryption (TME). Options available: Enabled, Disabled. Default setting is Disabled . |

5-3-2 Common RefCode Configuration



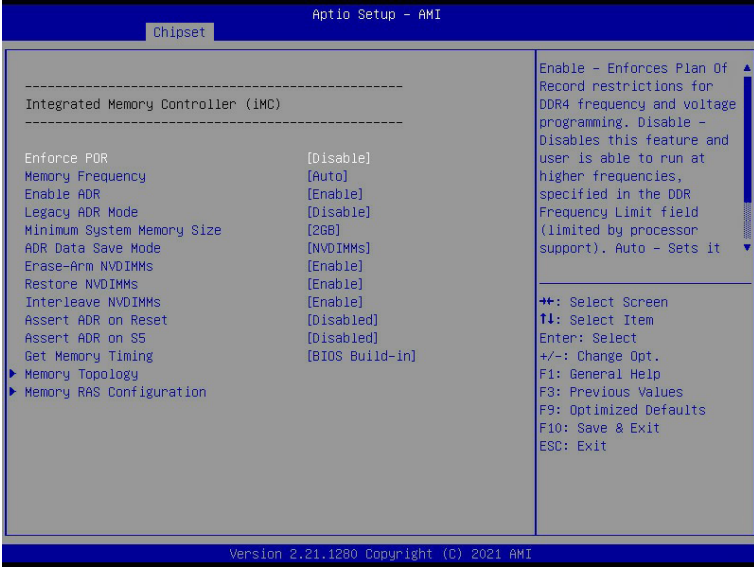
| Parameter | Description |
|----------------------------------|--|
| Common RefCode Configuration | |
| MMIO High Base | Selects the MMIO High Base setting. Options available: 56T, 40T, 32T, 24T, 16T, 4T, 2T, 1T, 512G, 3584T. Default setting is 56T . |
| MMIO High Granularity Size | Selects the allocation 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. Options available: 1G, 4G, 16G, 64G, 256G, 1024G. Default setting is 256G . |
| Isoc Mode | Enable/Disable the Isochronous support in order to meet the QoS requirements (Quality of Service). Options available: Auto, Enable, Disable. Default setting is Auto . |
| Numa (Non-Uniform Memory Access) | Enable/Disable Non-uniform Memory Access (NUMA) support to improve the system performance. Options available: Enable, Disable. Default setting is Enable . |
| 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. Options available: Enable, Disable. Default setting is Disable . |

5-3-3 UPI Configuration



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

5-3-4 Memory Configuration

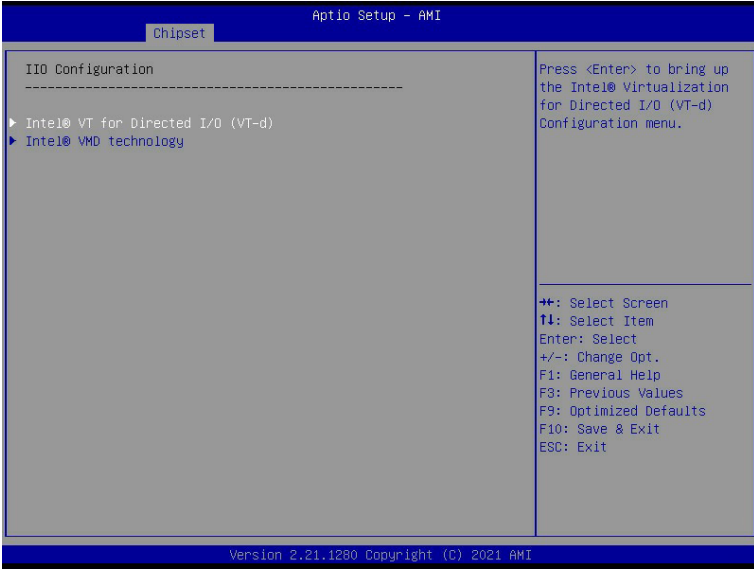


| Parameter | Description |
|---|---|
| Integrated Memory Controller (iMC) | |
| Enforce POR | When set to Enable, the system enforces Plan Of Record restrictions for DDR4 frequency and voltage programming. Options available: POR, Disable. Default setting is Disable . |
| Memory Frequency | Configures 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). Default setting is Auto . |
| Enable ADR | Enables the detecting and enabling of ADR (Asynchronous DRAM Refresh) function. Options available: Enable, Disable. Default setting is Enable . |
| Legacy ADR Mode | Enable/Disable the Legacy ADR Mode. Options available: Enable, Disable. Default setting is Disable . |
| Minimum System Memory Size | Configures the minimum memory size. Options available: 2GB, 4GB, 6GB, 8GB. Default setting is 2GB . |
| ADR Data Save Mode | Specifies the Data Save Mode for ADR. Batterybacked or Type 01 NVDIMM. Options available: Disable, Batterybacked DIMMs, NVDIMMs. Default setting is NVDIMMs . |
| Erase-Arm NVDIMMs | Enable/Disable Erasing and Arming NVDIMMs. Options available: Enable, Disable. Default setting is Enable . |

| Parameter | Description |
|--------------------------|--|
| Restore NVDIMMs | Enable/Disable Automatic restoring of NVDIMMs. Options available: Enable, Disable. Default setting is Enable . |
| Interleave NVDIMMs | Controls if NVDIMMs are interleaved together or not. Options available: Enable, Disable. Default setting is Enable . |
| Assert ADR on Reset | Enable/Disable Assert ADR on Reset. Options available: Enabled, Disabled. Default setting is Disabled . |
| Assert ADR on S5 | Enable/Disable Assert ADR on S5. Options available: Enabled, Disabled. Default setting is Disabled . |
| Get Memory Timing | Auto is the detected SPD value and use it, otherwise use BIOS Build-in. Options available: Auto, BIOS Build-in. Default setting is BIOS Build-in . |
| Memory Topology | Press [Enter] to view memory topology with DIMM population information. |
| Memory RAS Configuration | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ RAS Type <ul style="list-style-type: none"> – Displays the RAS type. ◆ New SDDC Mode <ul style="list-style-type: none"> – Enable/Disable 48B SDDC ECC from ICX C0 Onwards. – Options available: Disabled, Enabled. Default setting is Enabled. ◆ Mirror Mode <ul style="list-style-type: none"> – 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. – Options available: Disabled, Full Mirror Mode, Partial Mirror Mode. Default setting is Disabled. ◆ Correctable Error Threshold <ul style="list-style-type: none"> – Correctable Error Threshold (0x01-0x7fff) used for sparing, and leaky bucket. – Press the <+> / <-> keys to increase or decrease the desired values. ◆ Trigger SW Error Threshold <ul style="list-style-type: none"> – Enable/Disable Sparing trigger SW Error Match Threshold. – Options available: Disabled, Enabled. Default setting is Disabled. ◆ Sparing SW Error Match Threshold <ul style="list-style-type: none"> – Correctable Error Threshold (1-32767) used for bank level information. – Press the <+> / <-> keys to increase or decrease the desired values. ◆ Correctable Error Time Window <ul style="list-style-type: none"> – Correctable Error time window based interface in hour (0-24). – Press the <+> / <-> keys to increase or decrease the desired values. |

| Parameter | Description |
|---|--|
| Memory RAS Configuration (continued) | <ul style="list-style-type: none"> ◆ Leaky bucket time window based interface <ul style="list-style-type: none"> – Enable/Disable leaky bucket time window based interface. – Options available: Disabled, Enabled. Default setting is Disabled. ◆ Leaky bucket low bit <ul style="list-style-type: none"> – Configures leaky bucket low bit (1-63). – Press the <+> / <-> keys to increase or decrease the desired values. ◆ Leaky bucket high bit <ul style="list-style-type: none"> – Configures leaky bucket high bit (1-63). – Press the <+> / <-> keys to increase or decrease the desired values. ◆ ADDDC Sparing <ul style="list-style-type: none"> – Enable/Disable ADDDC Sparing. – Options available: Disabled, Enabled. Default setting is Disabled. ◆ Column Correction Disable <ul style="list-style-type: none"> – Options available: Disable, Enable. Default setting is Disable. ◆ Set PMem Die Sparing <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Disabled. ◆ Patrol Scrub <ul style="list-style-type: none"> – Options available: Disabled, Enabled, Enable at End of POST. Default setting is Disabled. |

5-3-5 IIO Configuration

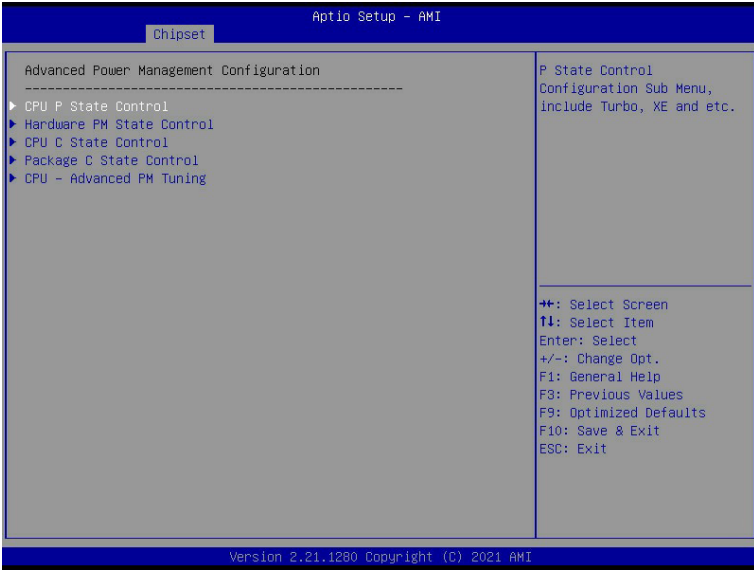


| Parameter | Description |
|-------------------|---|
| IIO Configuration | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ Intel® VT for Directed I/O <ul style="list-style-type: none"> – Enable/Disable the Intel VT for Directed I/O (VT-d) support function by reporting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

| Parameter | Description |
|-----------------------|---|
| Intel® VMD technology | <p data-bbox="373 137 953 169">Press [Enter] to configure advanced items.</p> <ul data-bbox="373 169 953 343" style="list-style-type: none"><li data-bbox="373 169 953 255">◆ Intel® VMD Configuration<ul data-bbox="416 200 953 255" style="list-style-type: none"><li data-bbox="416 200 953 232">– Enable/Disable Intel® VMD technology.<li data-bbox="416 232 953 255">– Options available: Enable, Disable. Default setting is Disable.<li data-bbox="373 255 953 343">◆ Intel® VMD for Non-Hotplug NVMe^(Note)<ul data-bbox="416 286 953 343" style="list-style-type: none"><li data-bbox="416 286 953 318">– Enable/Disable Intel® VMD for Non-Hotplug NVMe.<li data-bbox="416 318 953 343">– Options available: Enable, Disable. Default setting is Disable. |

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

5-3-6 Advanced Power Management Configuration



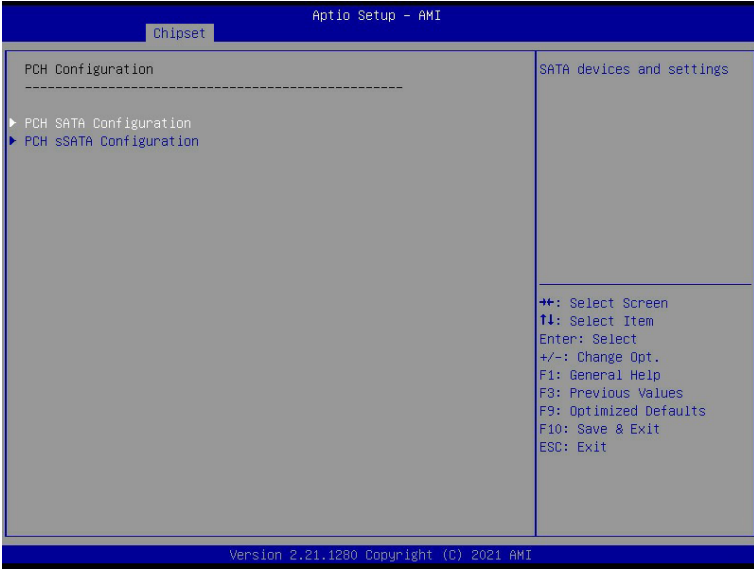
| Parameter | Description |
|---|---|
| Advanced Power Management Configuration | Press [Enter] to configure advanced items. |
| CPU P State Control | <ul style="list-style-type: none"> ◆ SpeedStep (Pstates) <ul style="list-style-type: none"> – Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load. – Options available: Enable, Disable. Default setting is Enable. ◆ Activate SST-BF <ul style="list-style-type: none"> – Enable/Disable SST-BF. – Options available: Enable, Disable. Default setting is Disable. ◆ Configure SST-BF^(Note) <ul style="list-style-type: none"> – Enable/Disable BIOS to configure SST-BF High Priority Cores – Options available: Enable, Disable. Default setting is Enable. ◆ Turbo Mode <ul style="list-style-type: none"> – 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. – Options available: Enable, Disable. Default setting is Enable. |

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

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

5-3-7 PCH Configuration



| Parameter | Description |
|------------------------|---|
| PCH Configuration | <p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ SATA Controller <ul style="list-style-type: none"> – Enable/Disable SATA controller. – Options available: Enable, Disable. Default setting is Enable. ◆ Configure SATA as <ul style="list-style-type: none"> – Configures on chip SATA type. – 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. – 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. – Options available: AHCI, RAID. Default setting is AHCI. ◆ Alternate Device ID on RAID^(Note 1) <ul style="list-style-type: none"> – Enable/Disable Alternate Device ID on RAID mode. – Options available: Enable, Disable. Default setting is Disable. ◆ SATA Port 0/1/2/3/4/5/6/7 <ul style="list-style-type: none"> – The category identifies SATA hard drives that are installed in the computer. System will automatically detect HDD type. |
| PCH SATA Configuration | |

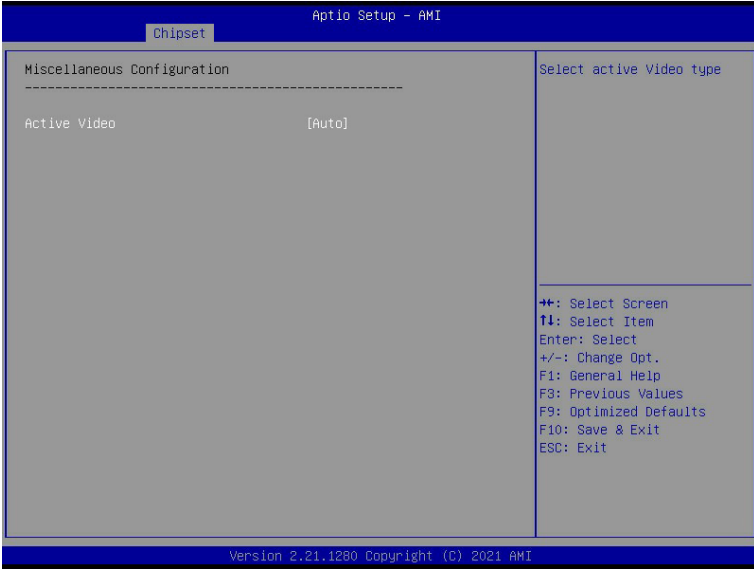
(Note 1) Only appears when HDD sets to **RAID Mode**.

| Parameter | Description |
|---------------------------------------|--|
| PCH SATA Configuration (continued) | <ul style="list-style-type: none"> ◆ Port 0/1/2/3/4/5/6/7 <ul style="list-style-type: none"> – Enable/Disable Port 0/1/2/3/4/5/6/7 device. – Options available: Enable, Disable. Default setting is Enable. ◆ Hot Plug (for Port 0/1/2/3/4/5/6/7)^(Note 2) <ul style="list-style-type: none"> – Enable/Disable HDD Hot-Plug function. – Options available: Enable, Disable. Default setting is Enable. ◆ Spin Up Device (for Port 0/1/2/3/4/5/6/7)^(Note 2) <ul style="list-style-type: none"> – On an edge detect from 0 to 1, the PCH starts a COM reset initialization to the device. – Options available: Enable, Disable. Default setting is Disable. |
| PCH sSATA Configuration | <ul style="list-style-type: none"> ◆ sSATA Controller <ul style="list-style-type: none"> – Enable/Disable sSATA controller. – Options available: Enable, Disable. Default setting is Enable. ◆ Configure sSATA as <ul style="list-style-type: none"> – Configures on chip SATA type. – 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. – 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. – Options available: AHCI, RAID. Default setting is AHCI. ◆ Alternate Device ID on RAID^(Note 1) <ul style="list-style-type: none"> – Enable/Disable Alternate Device ID on RAID mode. – Options available: Enable, Disable. Default setting is Disabled. ◆ sSATA Port 0/1/2/3/4/5 <ul style="list-style-type: none"> – The category identifies sSATA hard drives that are installed in the computer. System will automatically detect HDD type. ◆ Port 0/1/2/3/4/5 <ul style="list-style-type: none"> – Enable/Disable Port 0/1/2/3/4/5 device. – Options available: Enable, Disable. Default setting is Enable. ◆ Hot Plug (for Port 0/1/2/3/4/5)^(Note 2) <ul style="list-style-type: none"> – Enable/Disable HDD Hot-Plug function. – Options available: Enable, Disable. Default setting is Disable. ◆ Spin Up Device (for Port 0/1/2/3/4/5)^(Note 2) <ul style="list-style-type: none"> – On an edge detect from 0 to 1, the PCH starts a COM reset initialization to the device. – Options available: Enable, Disable. Default setting is Disabled. |

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

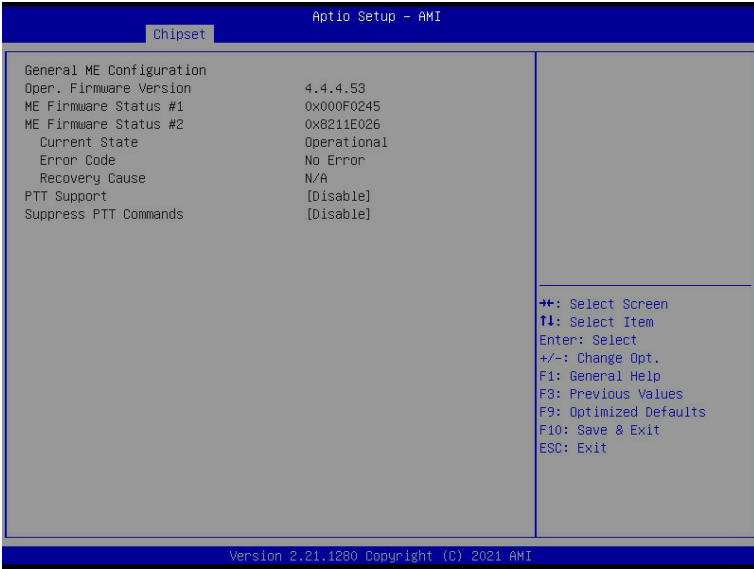
(Note 2) Only Supported when HDD is in **AHCI** or **RAID** Mode.

5-3-8 Miscellaneous Configuration



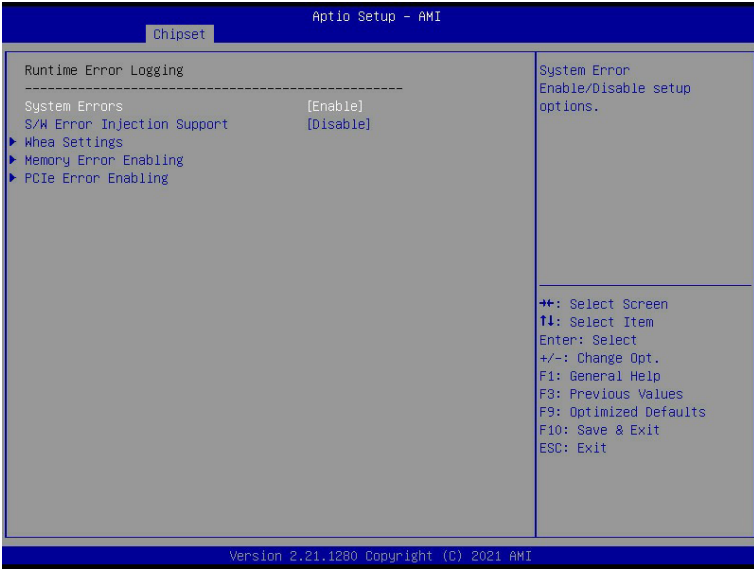
| Parameter | Description |
|-----------------------------|--|
| Miscellaneous Configuration | |
| Active Video | Selects the active video type. Options available: Auto, Onboard Device, PCIE Device, Specific PCIE Device. Default setting is Auto . |

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. |

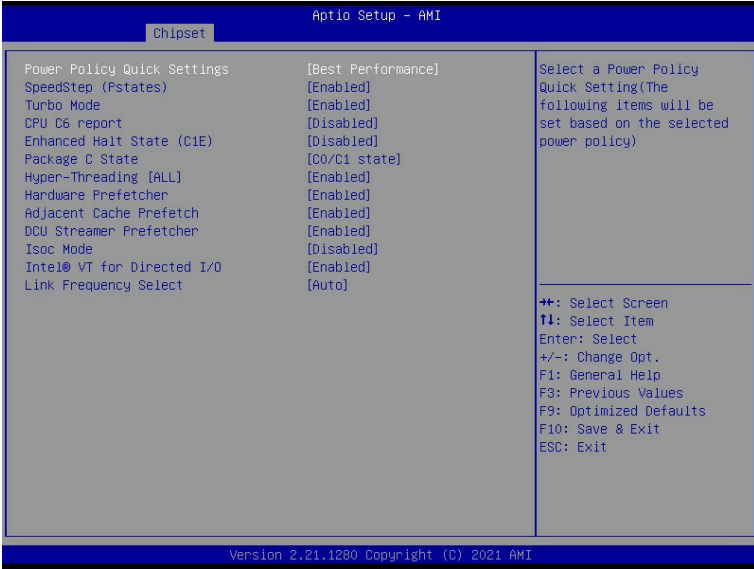
5-3-10 Runtime Error Logging Settings



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

| Parameter | Description |
|---------------------|---|
| PCIe Error Enabling | Press [Enter] to configure advanced items. <ul style="list-style-type: none">◆ PCIe Error<ul style="list-style-type: none">– Enable/Disable PCIe error.– Options available: Enable, Disable. Default setting is Enable. |

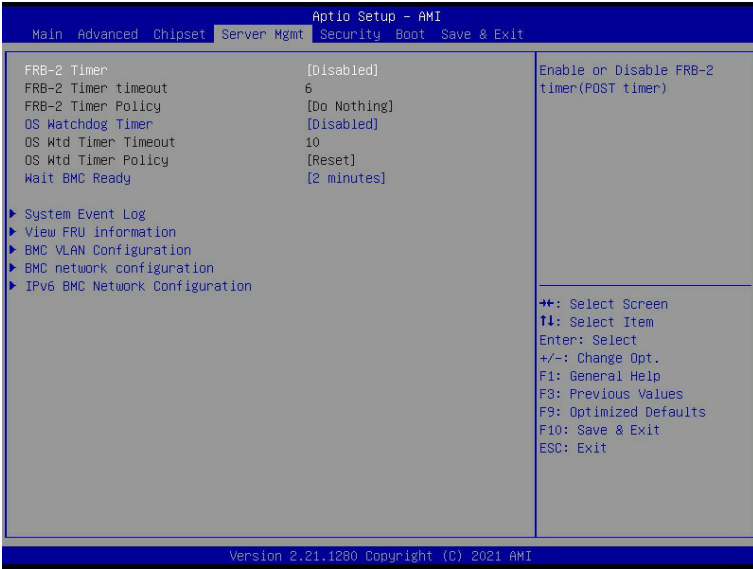
5-3-11 Power Policy



| Parameter | Description |
|-----------------------------|--|
| Power Policy Quick Settings | Selects a Power Policy Quick Setting. Options available: Standard, Best Performance, Energy Efficient, Turbo Lock. Default setting is Standard . |
| SpeedStep (Pstates) | Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load. Options available: Enabled, Disabled. Default setting is Enabled . |
| Turbo Mode | When this 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. Options available: Enabled, Disabled. Default setting is Enabled . |
| CPU C6 report | Enable/Disable the BIOS to enable the report from the CPU C6 state (ACPI C3) to the OS. Options available: Disabled, Enabled, Auto. Default setting is Disabled . |
| Enhanced Halt State (C1E) | Enable/Disable the C1E support for lower power consumption. Takes effect after reboot. Options available: Enabled, Disabled. Default setting is Disabled . |
| Package C State | Configures the C-State package limit. Options available: C0/C1 state, C2 state, C6(non Retention) state, C6(Retention) state, Auto. Default setting is Auto . |

| 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. Options available: Enabled, Disabled. Default setting is Enabled . |
| Hardware Prefetcher | Options available: Enabled, Disabled. Default setting is Enabled . |
| Adjacent Cache Prefetch | Options available: Enabled, Disabled. Default setting is Enabled . |
| DCU Streamer Prefetcher | Options available: Enabled, Disabled. Default setting is Enabled . |
| Isoc Mode | Enable/Disable the Isochronous support in order to meet the QoS requirements (Quality of Service). Options available: Auto, Enabled, Disabled. Default setting is Auto . |
| 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. Options available: Enabled, Disabled. Default setting is Enabled . |
| Link Frequency Select | Selects the UPI link frequency. Options available: 9.6GT/s, 10.4GT/s, 11.2GT/s, Auto. Default setting is Auto . |

5-4 Server Management Menu



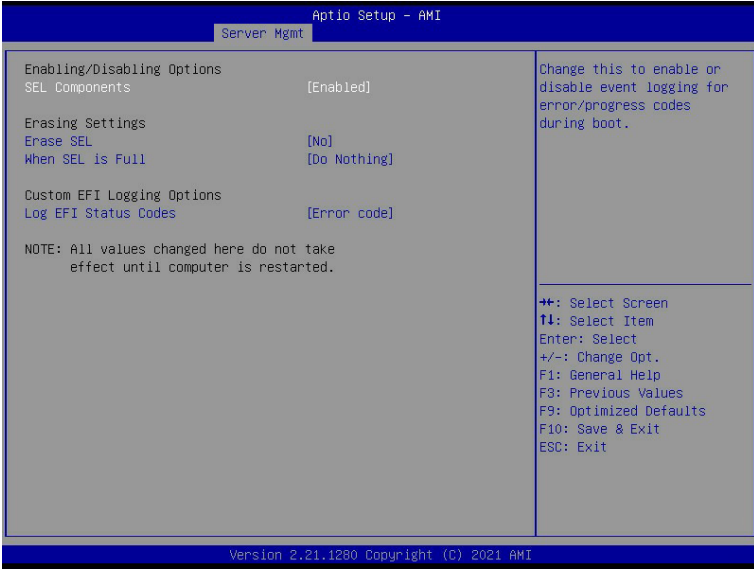
| Parameter | Description |
|---|--|
| FRB-2 Timer | Enable/Disable FRB-2 timer (POST timer). Options available: Enabled, Disabled. Default setting is Disabled . |
| FRB-2 Timer ^(Note1) timeout | Configures the FRB2 Timer timeout. The value is between 1 to 30 minutes. Default setting is 6 minutes .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

(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**.

| Parameter | Description |
|--------------------------------|--|
| 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. |

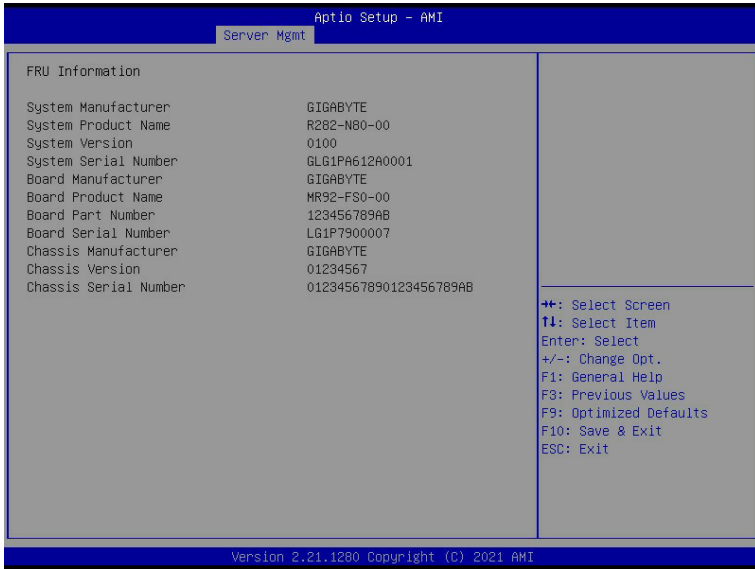
5-4-1 System Event Log



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

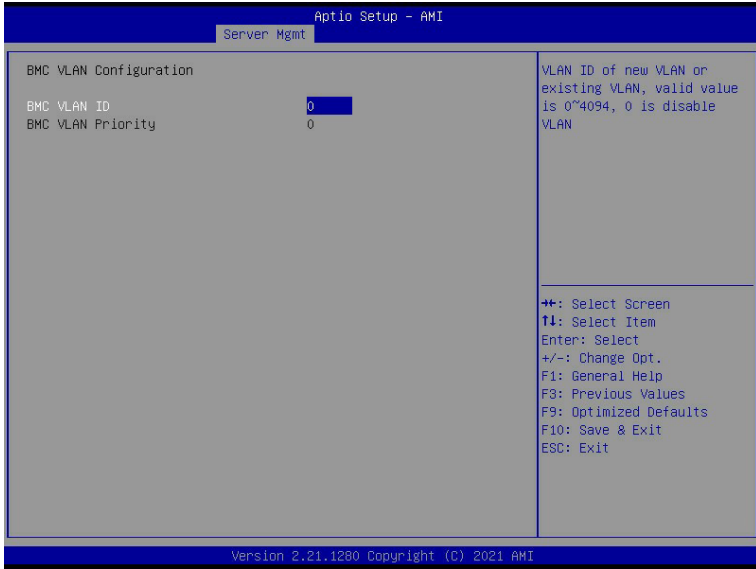
5-4-2 View FRU Information

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.



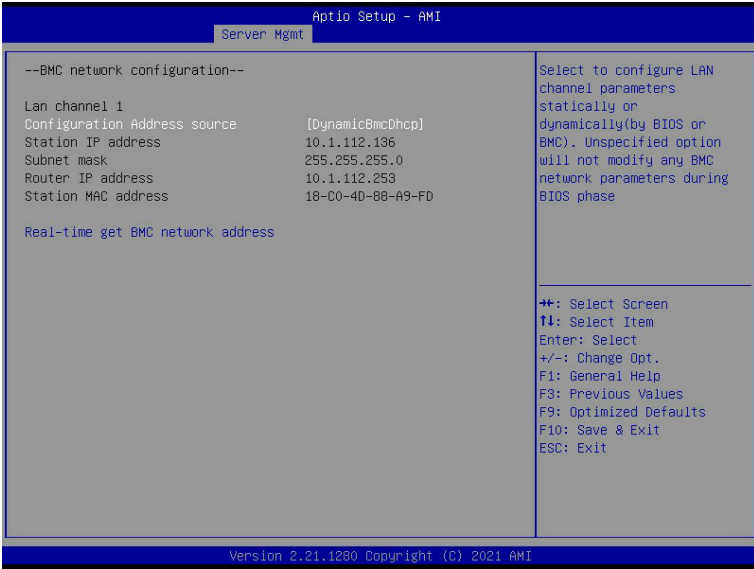
(Note) The model name will vary depends on the product you purchased

5-4-3 BMC VLAN Configuration



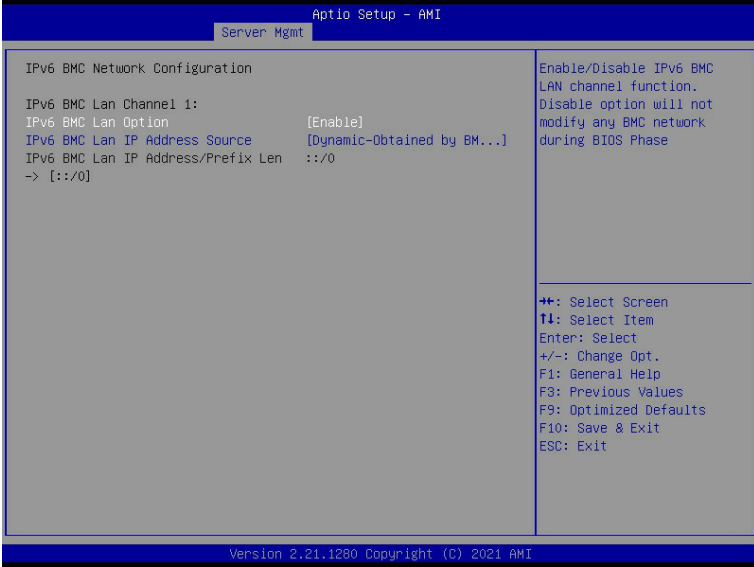
| Parameter | Description |
|------------------------|--|
| BMC VLAN Configuration | |
| BMC VLAN ID | Select to configure BMC VLAN ID. The valid range is from 0 to 4094. When set to 0, BMC VLAN ID will be disabled. |
| BMC VLAN Priority | Select to configure BMC VLAN Priority. The valid range is from 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. Options available: Unspecified, Static, DynamicBmcDhcp. Default setting is DynamicBmcDhcp . |
| Station IP address | Displays IP Address information. |
| Subnet mask | Displays Subnet Mask information. Please note that the IP address must be in three digitals, for example, 192.168.000.001. |
| Router IP address | Displays the Router IP Address information. |
| Station MAC address | Displays the MAC Address information. |
| Real-time get BMC network address | Press [Enter] will set LAN mode and Address source and then get IP, Subnet, Gateway and MAC address. |

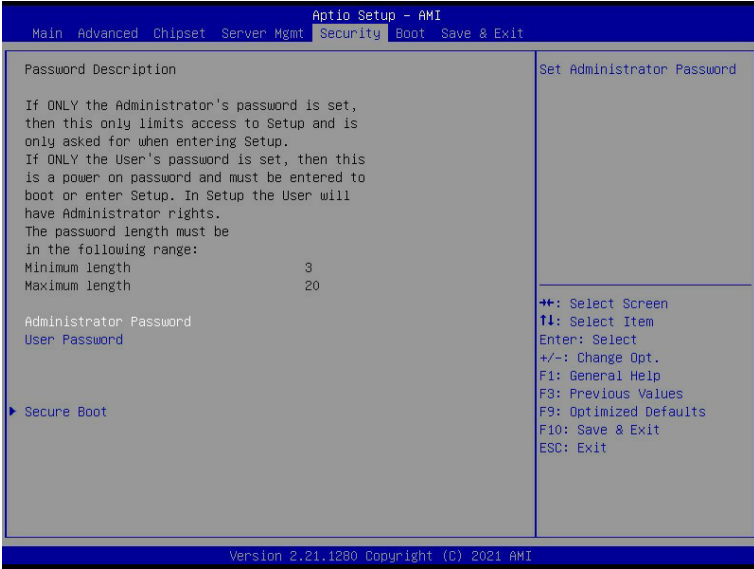
5-4-5 IPv6 BMC Network Configuration



| 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. Options available: Unspecified, Disable, Enable. Default setting is Enable . |
| IPv6 BMC Lan IP Address Source | Selects to configure LAN channel parameters statically or dynamically (by BIOS or BMC). Options available: Unspecified, Static, Dynamic-Obtained by BMC running DHCP. Default setting is Enable Dynamic-Obtained by BMC running DHCP . |
| 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 submenu is applicable when your device is installed the Windows® 8 (or above) 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. Options available: Enabled, Disabled. Default setting is Disabled . |
| Secure Boot Mode ^(Note) | Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates. This way, the system knows all files being loaded before Windows loads to the login screen have not been tampered with. When set to Standard, it will automatically load the Secure Boot keys form the BIOS databases. When set to Custom, you can customize the Secure Boot settings and manually load its keys from the BIOS database. Options available: Standard, Custom. Default setting is Custom . |
| 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. |

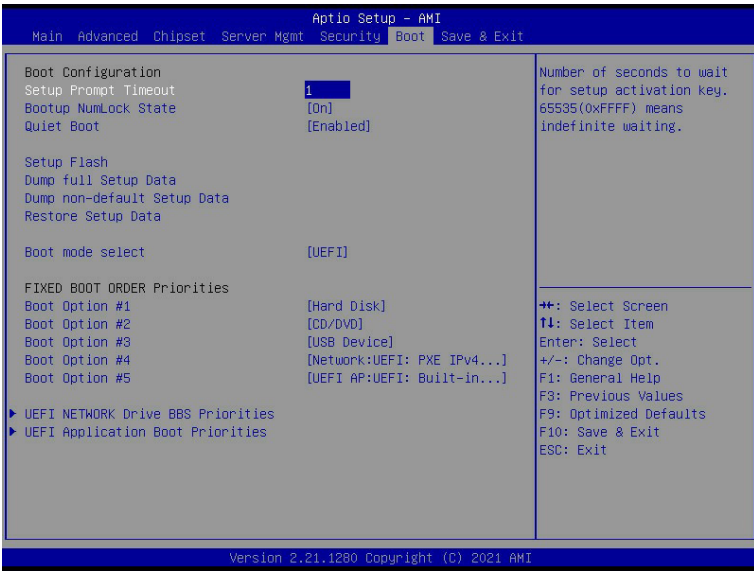
(Note) Advanced items prompt when this item is set to **Custom**.

| Parameter | Description |
|----------------|---|
| Key Management | <p data-bbox="334 158 666 177">Press [Enter] to configure advanced items.</p> <p data-bbox="334 186 937 236">Please note that this item is configurable when Secure Boot Mode is set to Custom.</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="370 272 944 323">– Allows to provision factory default Secure Boot keys when system is in Setup Mode. <li data-bbox="370 330 905 349">– Options available: Enabled, Disabled. Default setting is Disabled. <li data-bbox="334 357 926 432">◆ Restore Factory Keys <ul style="list-style-type: none"> <li data-bbox="370 384 926 402">– Installs all factory default keys. It will force the system in User Mode. <li data-bbox="370 410 604 429">– Options available: Yes, No. <li data-bbox="334 440 655 515">◆ Reset To Setup Mode <ul style="list-style-type: none"> <li data-bbox="370 467 655 486">– Reset the system to Setup Mode. <li data-bbox="370 493 604 512">– Options available: Yes, No. <li data-bbox="334 523 937 598">◆ Export Secure Boot variables <ul style="list-style-type: none"> <li data-bbox="370 550 937 600">– Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device. <li data-bbox="334 606 902 682">◆ Enroll Efi Image <ul style="list-style-type: none"> <li data-bbox="370 633 902 683">– Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db). <li data-bbox="334 689 536 708">◆ Device Guard Ready <li data-bbox="334 716 905 766">◆ Remove 'UEFI CA' from DB <ul style="list-style-type: none"> <li data-bbox="370 746 905 765">– Press [Enter] to remove Microsoft UEFI CA from Secure Boot DB. <li data-bbox="334 774 700 824">◆ Restore DB defaults <ul style="list-style-type: none"> <li data-bbox="370 804 700 823">– Restore DB variable to factory defaults. <li data-bbox="334 832 896 882">◆ Secure Boot variable <ul style="list-style-type: none"> <li data-bbox="370 862 896 881">– Displays the current status of the variables used for secure boot. <li data-bbox="334 890 802 994">◆ Platform Key (PK) <ul style="list-style-type: none"> <li data-bbox="370 917 802 936">– Displays the current status of the Platform Key (PK). <li data-bbox="370 943 678 962">– Press [Enter] to configure a new PK. <li data-bbox="370 970 602 989">– Options available: Update. <li data-bbox="334 1001 942 1133">◆ Key Exchange Keys (KEK) <ul style="list-style-type: none"> <li data-bbox="370 1028 942 1047">– Displays the current status of the Key Exchange Key Database (KEK). <li data-bbox="370 1055 905 1105">– Press [Enter] to configure a new KEK or load additional KEK from storage devices. <li data-bbox="370 1113 671 1132">– Options available: Update, Append. <li data-bbox="334 1141 905 1273">◆ Authorized Signatures (DB) <ul style="list-style-type: none"> <li data-bbox="370 1168 905 1186">– Displays the current status of the Authorized Signature Database. <li data-bbox="370 1194 944 1244">– Press [Enter] to configure a new DB or load additional DB from storage devices. <li data-bbox="370 1252 671 1271">– Options available: Update, Append. <li data-bbox="334 1281 902 1412">◆ Forbidden Signatures (DBX) <ul style="list-style-type: none"> <li data-bbox="370 1307 902 1326">– Displays the current status of the Forbidden Signature Database. <li data-bbox="370 1334 891 1384">– Press [Enter] to configure a new dbx or load additional dbx from storage devices. <li data-bbox="370 1392 671 1411">– Options available: Update, Append. |

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

5-6 Boot Menu

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

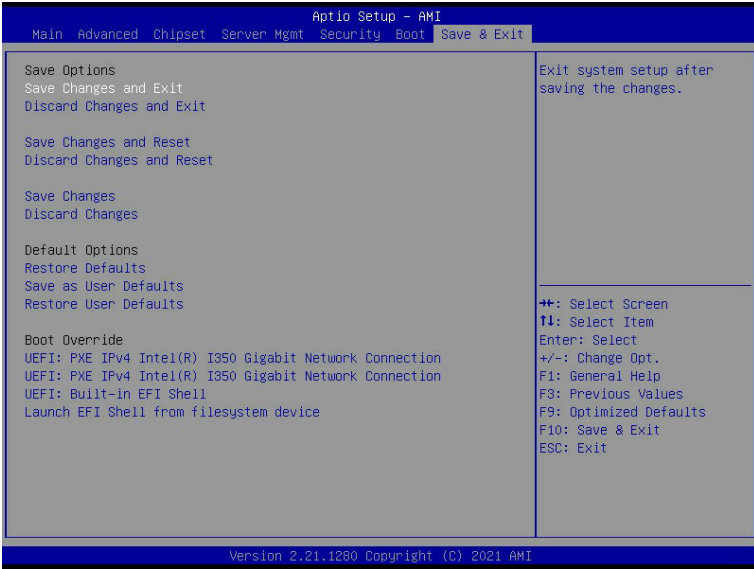


| Parameter | Description |
|-----------------------------|---|
| Boot Configuration | |
| Setup Prompt Timeout | Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Press the numeric keys to input the desired values. |
| Bootup NumLock State | Enable/Disable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

| Parameter | Description |
|------------------------------------|--|
| FIXED BOOT ORDER Priorities | |
| Boot Option #1 / #2 / #3 / #4 / #5 | <p data-bbox="402 200 948 283">Press [Enter] to configure the boot order priority. By default, the server searches for boot devices in the following sequence:</p> <ol data-bbox="437 288 912 426" style="list-style-type: none"> <li data-bbox="437 288 564 312">1. Hard drive. <li data-bbox="437 316 639 340">2. CD-COM/DVD drive. <li data-bbox="437 344 575 368">3. USB device. <li data-bbox="437 373 543 396">4. Network. <li data-bbox="437 401 522 424">5. UEFI. |
| UEFI Network Drive BBS Priorities | Press [Enter] to configure the boot priority. |
| UEFI Application Boot Priorities | Press [Enter] to configure the boot priority. |

5-7 Save & Exit Menu

The 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. Options available: Yes, No. |
| Discard Changes and Exit | Discards changes made and exits the BIOS setup. Options available: Yes, No. |
| Save Changes and Reset | Restarts the system after saving the changes made. Options available: Yes, No. |
| Discard Changes and Reset | Restarts the system without saving any changes. Options available: Yes, No. |
| Save Changes | Saves changes done so far to any of the setup options. Options available: Yes, No. |
| Discard Changes | Discards changes made and closes the BIOS setup. Options available: Yes, No. |
| Default Options | |

| Parameter | Description |
|---|--|
| Restore Defaults | Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly. Options available: Yes, No. |
| Save as User Defaults | Saves the changes made as the user default settings. Options available: Yes, No. |
| Restore User Defaults | Loads the user default settings for all BIOS setup parameters. Options available: Yes, No. |
| Boot Override | Press [Enter] to configure the device as the boot-up drive. |
| 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 |

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