

GIGABYTE™

G294-A22-AAP2

HPC/AI Server

- Intel® Xeon® 6 Processors
- 2U UP 8 x PCIe Gen5 GPUs (with PCIe switches)

User Manual

Rev. 1.0

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Documentation Classifications

In order to assist in the use of this product, Giga Computing provides the following types of documentation:

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

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

For More Information

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

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 all the power cords from the power supplies to disconnect power to the equipment.



- Shock Hazard! Disconnect all power supply cords before servicing.
- Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.



WARNING!

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



WARNING!

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



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 fin-gertips or with a pair of fine needle nosed pliers. If the jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can 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.

CAUTION!

"Warning Stability hazard"

"The slide-rail may tip over causing serious personal injury"

- Before extending the rack to its installation position, read the installation instructions.
- Do not put any load on the slide-rail mounted equipment in the installation position.
- Do not leave the slide-rail mounted equipment in the installation position.



WARNING!

This equipment is intended to be used in Restrict Access Location. The access can only be gained by Skilled person. Only authorized by well trained professional person can access the restrict access location.

- This equipment is not intended for use by children.



WARNING!

The equipment should only be repaired, maintained or replaced by skilled personnel.

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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



NOTE:

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

	System	♦ 2U
	Dimension	♦ 438 x 87.5 x 962 (depth including 112 mm rear fans)
	Motherboard	♦ MA24-G20
	CPU	♦ Intel® Xeon® 6 Processors - Intel® Xeon® 6900-Series Processors ♦ Dual processor, TDP up to 500W
	Socket	♦ 2 x LGA 7529 ♦ Socket BR
	Chipset	♦ System on Chip
	Memory	♦ 12 x DIMM slots ♦ Support DDR5 RDIMM/MRDIMM ^[1] ♦ 12-Channel memory per processor ♦ RDIMM: Up to 6400 MT/s ♦ MRDIMM: Up to 8800 MT/s
[1] MRDIMMs are supported only on select Intel® Xeon® 6 processors with P-cores.		
	LAN	Rear: ♦ 2 x 10Gb/s LAN (1 x Intel® X710-AT2) - Support NCSI function ♦ 1 x 10/100/1000 Mbps Management LAN
	Video	♦ Integrated in ASPEED® AST2600 - 1 x VGA port
	Storage	Front hot-swap: ♦ 8 x 2.5" Gen5 SATA/SAS-4 ^[1] - (SATA via CRS2810) Internal M.2 (Expansion card): ♦ 2 x M.2 (2280), PCIe Gen 4 x4, occupied for SATA
[1] SAS card is required to support SAS drives.		

	PCIe Expansion Slot	◆ 8 x FHFL x16 (Gen5 x16) or 8 x FHFL x16 (Gen5 x8), for GPUs ◆ 2 x LP x16 (Gen5 x16), from PEX89048
		[NOTE] The system supports 4 x NVIDIA H200 NVL PCIe GPUs at 25°C ambient, arranged as two 2-GPU sets, each with a 2-way NVLink bridge.
		[NOTE] The system supports 4 x RTX PRO™ 6000 Blackwell Server Edition GPUs at 25°C ambient.
		[NOTE] GPU video output ports are not available due to mechanical limitations.
		[NOTE] The system is only validated with a uniform GPU model.
	Front I/O	◆ 1 x Power button with LED ◆ 1 x ID button with LED ◆ 1 x Reset button ◆ 2 x LAN activity LEDs ◆ 1 x Storage activity LED ◆ 1 x System status LED
	Rear I/O	◆ 2 x USB 3.2 Gen1 ports (Type-A) ◆ 1 x VGA port ◆ 2 x RJ45 ports ◆ 1 x MLAN port ◆ 1 x Power button with LED ◆ 1 x ID button with LED ◆ 1 x NMI button ◆ 1 x Reset button ◆ 1 x System status LED
	Security Modules	◆ 1 x TPM header with SPI interface ◆ - Optional TPM2.0 kit: CTM012 ◆ 1 x PRoT connector (only enabled on RoT SKU)



Power Supply

- ◆ Dual 3000W 80 PLUS Titanium redundant power supply^[1]
- ◆ AC Input:
 - 100-127V~/ 15.5A, 50-60Hz
 - 200-220V~/ 15.5A, 50-60Hz
 - 220-240V~/ 15.5A, 50-60Hz
- ◆ DC Input(Only for China): 240Vdc/ 15.5A
- ◆ DC Output:
 - Max 1000W/ 100-127V~
+12.2V/ 81A
+12Vsb/ 3A
 - Max 2600W/ 200-220V~
+12.2V/ 213A
+12Vsb/ 3A
 - Max 3000W/ 220-240V~ or 240Vdc Input
+12.2V/ 245A
+12Vsb/ 3A

^[1] The system power supply requires C19 power cord.



OS Certifications

- ◆ [Windows Server 2025](#)



System Fans

- ◆ 8 x 80x80x80mm

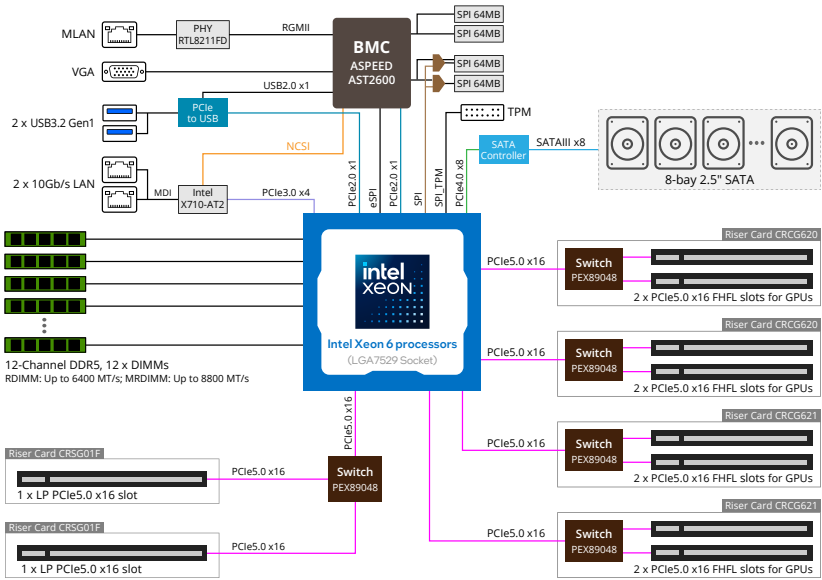


Operating Properties

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

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

1-3 System Block Diagram



Chapter 2 System Appearance

2-1 Front View

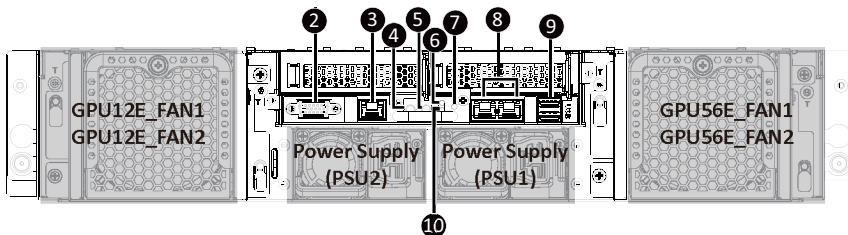


No.	Description
1.	Front Panel LED and Buttons
NOTE! Green HDD Latch Supports NVMe	



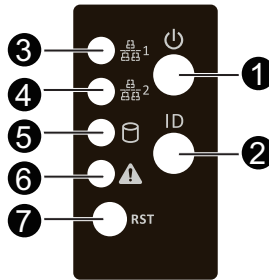
- Please Go to Chapter 2-3 Front Panel LED and Buttons for detail description of function LEDs.

2-2 Rear View



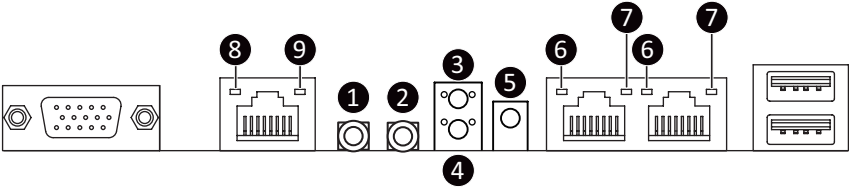
No.	Description	No.	Description
2.	VGA Port	7.	System Status LED
3.	Management LAN Port	8.	Data LAN Port x 2
4.	Power Button with LED	9.	USB 3.0 Port x 2
5.	ID Button	10.	NMI Button
6.	Reset Button		

2-3 Front Panel LED and Buttons



No.	Name	Color	Status	Description
1.	Power button with LED	Green	On	System is powered on
		N/A	Off	System is not powered on or in ACPI S5 state (power off)
2.	ID Button			Press the button to activate system identification
3/4.	LAN 1/2 Active/Link LEDs	Green	Solid On	Link between system and network or no access.
		Green	Blink	Data trasmission or receiving is occuring
		N/A	Off	No data transmission or receiving is occuring
5.	HDD Status LED	Green	On	HDD locate
			Blink	HDD access
		Amber	On	HDD fault
		Green/Amber	Blink	HDD rebuilding
		N/A	Off	No HDD access or no HDD fault.
6.	System Status LED	Green	Solid On	System is operating normally.
		Amber	Solid On	Critical condition, may indicate: System fan failure System temperature
				Non-critical condition, may indicate: Redundant power module failure Temperature and voltage issue Chassis intrusion
		N/A	Off	System is not ready, may indicate: POST error NMI error Processor or terminator missing
7.	Reset Button			Press the button to reset the system.

2-4 Rear System Button and LEDs



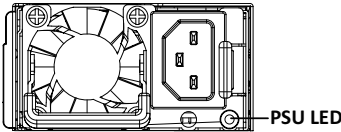
No.	Name	Color	Status	Description
1.	Power Button with LED	Green	On	System is powered on
		N/A	Off	System is not powered on or in ACPI S5 state (power off)
2.	ID Button			Press the button to activate system identification
3.	Reset Button			Press the button to reset the system.
4.	NMI button			Press the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

System Appearance

2-5 Power Supply Unit (PSU) LED

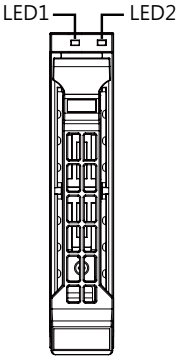


NOTE!
The power supply may be vary based on the system configuration.



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

2-6 Hard Disk Drive LEDs



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

LED 2	HDD Present	No HDD
Green	ON	OFF

NOTE:

*1: Depends on HBA/Utility Spec.

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

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

Chapter 3 System Hardware Installation



Pre-installation Instructions

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

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

3-1 Removing Chassis Cover

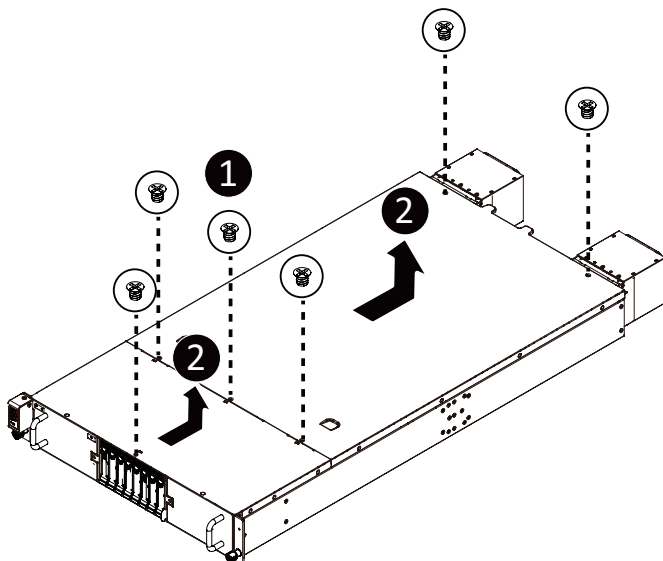


Before you remove or install the system cover

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

Follow these instructions to remove the system cover:

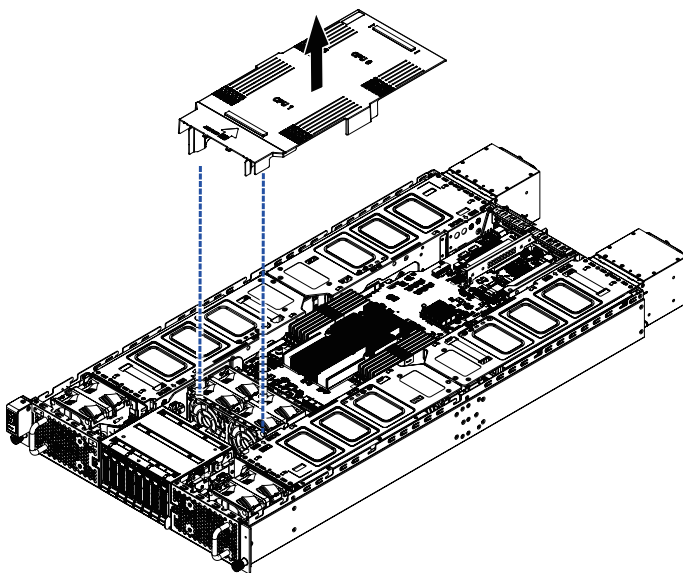
1. Remove the eight screws securing the cover.
2. Slide the cover towards the rear and remove the cover in the direction of the arrow.



3-2 Removing and Installing the Air Duct

Follow these instructions to remove/install the fan duct:

1. Lift up to remove the fan duct
2. To install the fan duct, align the tabs at the front of the fan duct with the slots in the system fan compartment as shown in the image below, and then push down the fan duct into chassis until it 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 server and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Unplug all cables from the power outlets.
- Disconnect all telecommunication cables from their ports.
- Place the system unit on a flat and stable surface.
- Open the system according to the instructions.

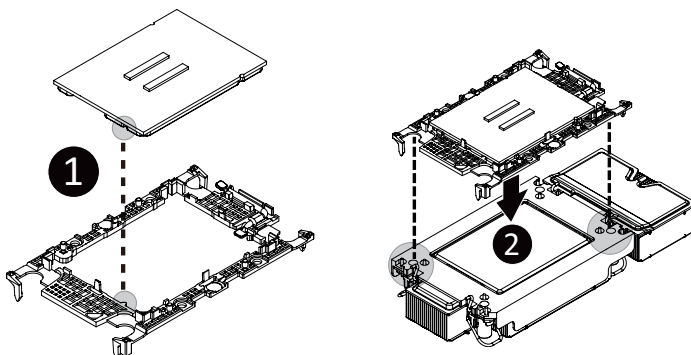


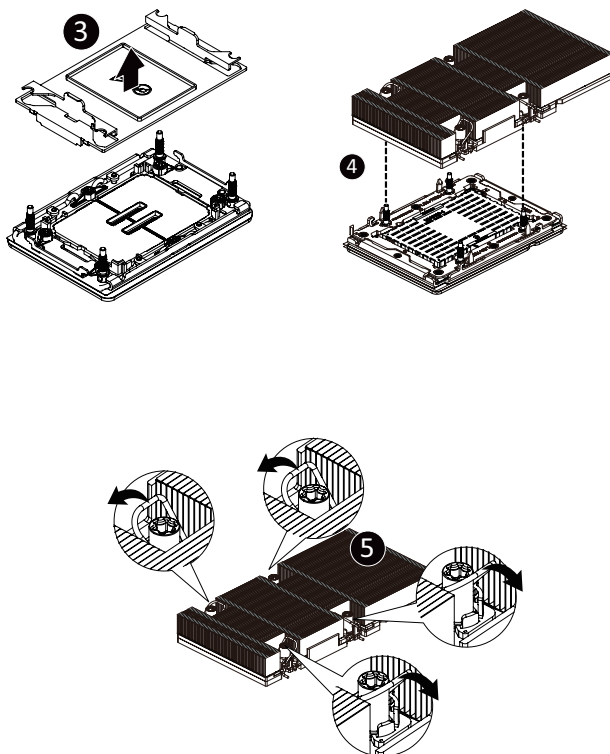
WARNING!

Failure to properly turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

Follow these instructions to install the CPU:

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





- When installing the heat sink to CPU, use T30-Lobe driver to tighten 4 captive nuts in sequence as 1-4.
- Please refer to the Heatsink Label for the screw tightening torque value.

3-4 Installing the Memory

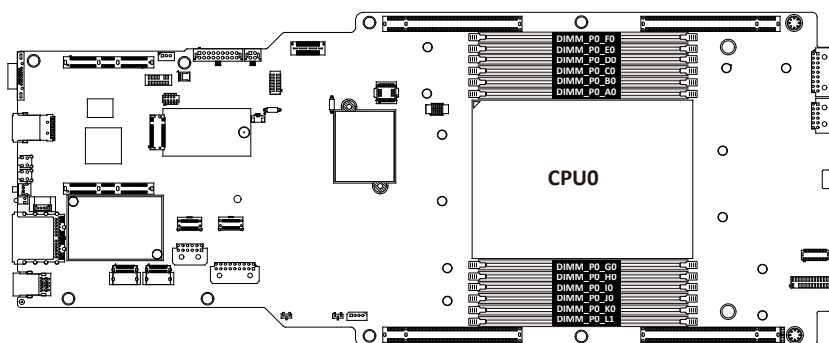


Read the following guidelines before you begin to install the memory:

- 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 server 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 Twelve Channel Memory Configuration

This motherboard provides 12 DDR5 memory sockets and supports 12-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

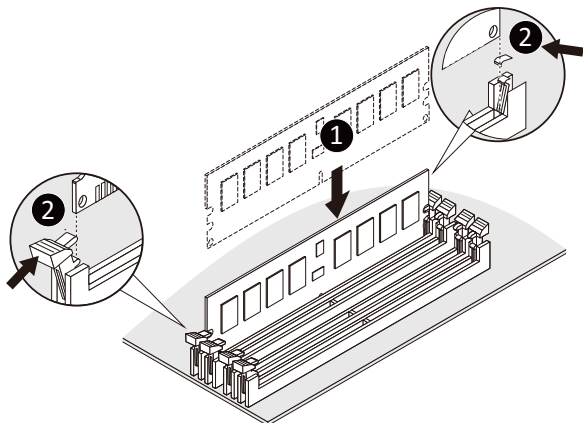


Before installing a memory module, make sure to turn off the server and unplug the power cord from the power outlet to prevent damage to the memory module.

Be sure to install DDR5 DIMMs on this motherboard.

Follow these instructions to install the Memory:

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



3-4-3 Processor and Memory Module Matrix Table

Memory Q'ty for each CPU	CPU0											
	L0	K0	J0	I0	H0	G0	A0	B0	C0	D0	E0	F0
1 DIMM							V					
8 DIMM	V	V	V	V					V	V	V	V
		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

3-4-4 DIMM Population Table

Intel Xeon 6900E-Series Memory Support

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)			Channel Speed (MT/s); Voltage (V); Slots per Channel (SPC) & DIMMs per Channel (DPC)
		DRAM Density			1DPC/2SPC
		16Gb	24Gb	32Gb	1.1V
RDIMM	1Rx4	32GB	48GB		6400, 6000, 5600, 5200, 4800 (DDR5-6400 rated RDIMMS only)
	2Rx4	64GB	96GB	128GB	
RDIMM 3DS	8Rx4	256GB			

Intel Xeon 6900E-Series CXL Memory Support

Native DDR5 Memory Per Socket				CXL Memory Per Socket				
Slot 0 DIMM Ranks	Slot 0 DIMM Capacity (GB)	DIMM Type	DRAM Density (Gb)	CXL Memory Channels	CXL Memory Type	CXL Capacity Per Device/ Module	CXL Interleave	CXL Mode
2Rx4	64	10x4	16	1+1	DDR5 x16	2ch 64 GB	Hetero x 16	Hetero
1Rx4	32	10x4	16	1+1+1	DDR5 x16	2ch 64 GB	1x3 (BIOS)	1LM+Intel® Flat Memory Mode

NOTE:

- Intel Xeon 6900E-series CXL memory configs are 1DPC only for native DDR5
- CXL Memory Channel notation: # of devices per root port, with root ports separated by "+". i.e. 2+2+2+2 = four root ports populated with two devices per root port
- CXL Interleave notation: sets x ways. i.e. 2x4 = two sets of four-way interleaves
- CXL Modes:
 - 1LM+Vol = DDR5 and CXL memory visible to SW as separate tiers, separately interleaved
 - Hetero = DDR5 and CXL memory interleaved together in one 16-way set
 - Flat2LM = HW manages data movement between DDR5 and CXL memory, total capacity visible to SW

Intel Xeon 6900P-Series Memory Support

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)			Channel Speed (MT/s); Voltage (V); Slots per Channel (SPC) & DIMMs per Channel Density (DPC)
		DRAM Density			1DPC/1SPC
		16Gb	24Gb	32Gb	1.1V
RDIMM	1Rx4	32GB	48GB		6400, 6000, 5600, 5200, 4800 (DDR5-6400 rated RDIMMS only)
	2Rx8	32GB	48GB		
	2Rx4	64GB	96GB	128GB*	
RDIMM 3DS	8Rx4	256GB			8800, 8000, 7200 (MRDIMM-8800 only)
MCR DIMM	2Rx8	32GB			
	2Rx4	64GB	48GB		
	4Rx8	64GB	96GB	128GB	
	4Rx4 (2U)	128GB	96GB		
	4Rx4 (2U)			256GB	

Intel Xeon 6900P-Series CXL Memory Support

Native DDR5 Memory Per Socket				CXL Memory Per Socket				
Slot0 DIMM Ranks	Slot0 DIMM Capacity (GB)	DIMM Type	DRAM Density (Gb)	CXL Memory Channels	CXL Memory Type	CXL Capacity Per Device/ Module	CXL Interleave	CXL Mode
2Rx4	64	10x4	16	1+1	DDR5 x16	2ch 64 GB	hetero x16	Hetero
2Rx4	64	10x4	16	2+2+2+2	DDR5 x8	64 GB	1x8*, 2x4, 4x2	1LM+Vol
2Rx4	64	10x4	16	1+1+1	DDR4 x8	128 GB	1x3 (BIOS)	1LM+Intel® Flat Memory Mode

NOTE:

- Intel Xeon 6900P-series processors CXL memory configs are 1DPC only ('Slot 0') for native DDR5
- CXL Memory Channel notation: # of devices per root port, with root ports separated by "+". i.e. 2+2+2+2 = four root ports
- populated with two devices per root port
- CXL Interleave notation: sets x ways. i.e. 2x4 = Set of two modules, interleaved four-way
- CXL Modes:
 - 1LM+Vol = Native DDR5 ('1LM') and (volatile) CXL memory visible to SW as separate tiers, separately interleaved
 - Hetero x16 = DDR5 and (volatile) CXL memory interleaved together in one 16-way set (See graphic in next slide)
 - Flat Memory Mode = HW manages data movement between DDR5 and CXL memory, total capacity visible to SW

3-5 Installing the GPU Card

3-5-1 Installing the GPU



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

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

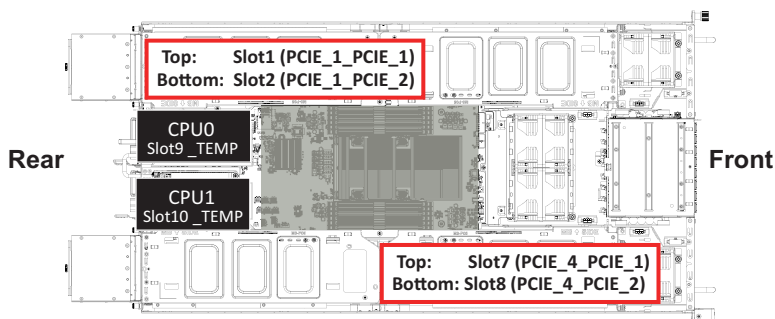


- The PCI riser assembly does not include a riser card or any cabling as standard. To install a PCI card, a riser card must be installed.

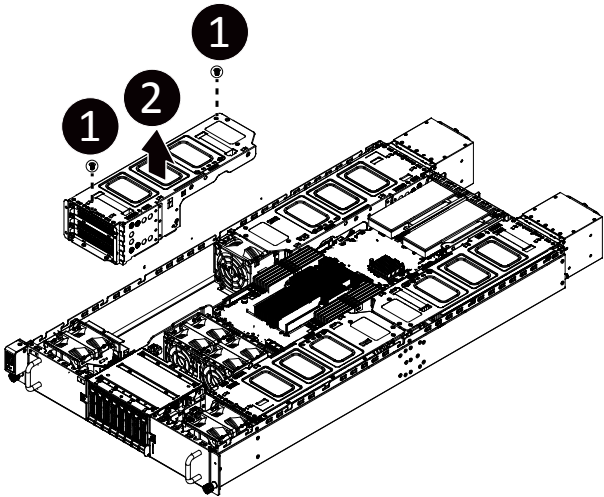
For Slot1/Slot2/Slot7/Slot8

Follow these instructions to install the GPU card:

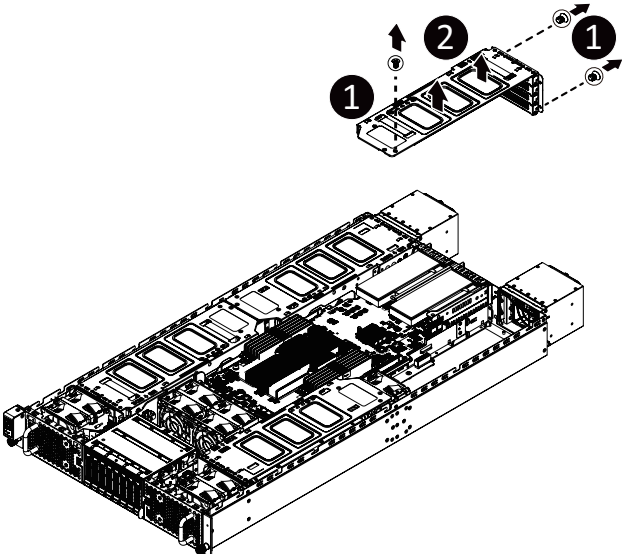
1. [For Slot7/Slot8] Loosen and remove the two screws securing the PCI cage at the top of the system.
[For Slot1/Slot2] Loosen and remove the single screw at the top of the system and the two screws at the rear of the system securing the PCI cage.
2. Pull the two plastic handles to lift up the PCI cage from the system.
3. Insert the card into the selected slot. Make sure that the card is properly seated.
4. Secure the GPU cards in place with two screws.

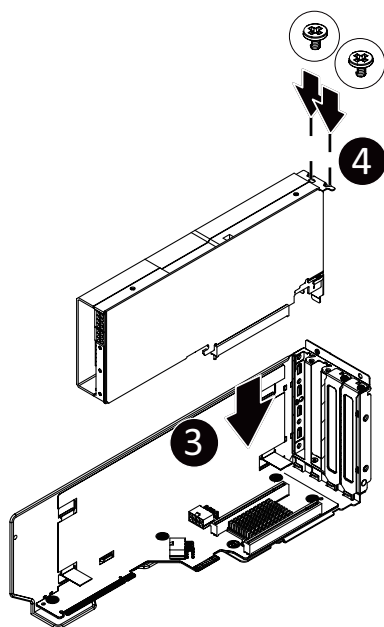


(For Slot7/Slot8)



(For Slot1/Slot2)

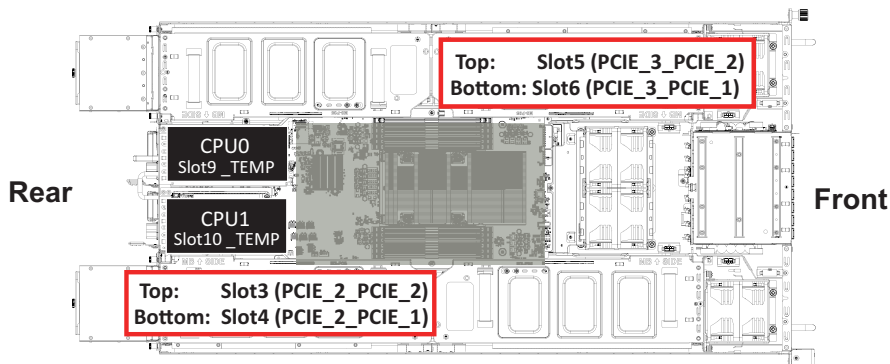




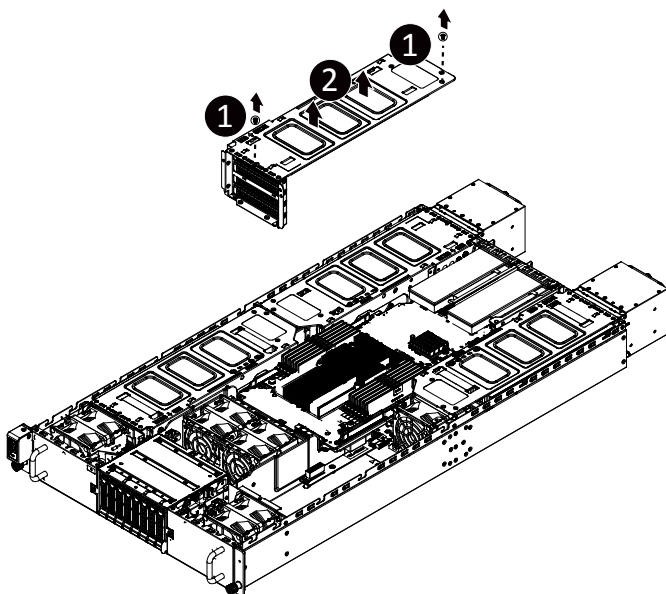
For Slot3/Slot4/Slot5/Slot6

Follow these instructions to install the GPU card:

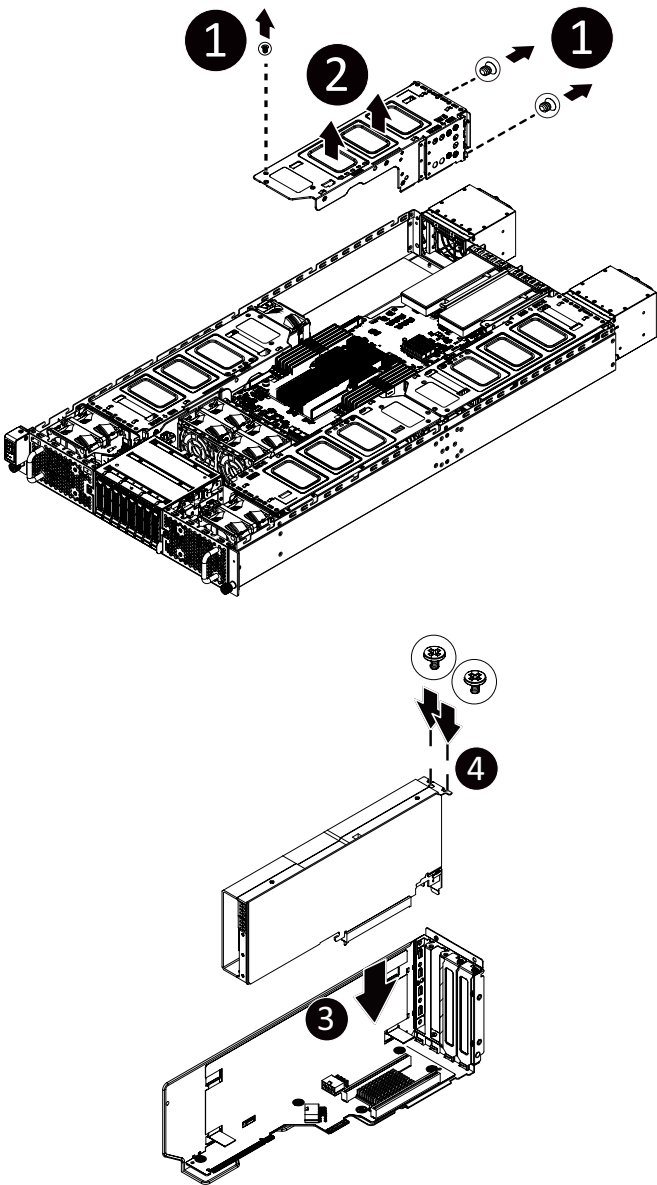
1. [For Slot5/Slot6] Loosen and remove the two screws securing the PCI cage at the top of the system.
[For Slot3/Slot4] Loosen and remove the single screw at the top of the system and the two screws at the rear of the system securing the PCI cage.
Pull the two plastic handles to lift up the PCI cage from the system.
2. Insert the card into the selected slot. Make sure that the card is properly seated.
3. Secure the GPU cards in place with two screws.



(For Slot5/Slot6)

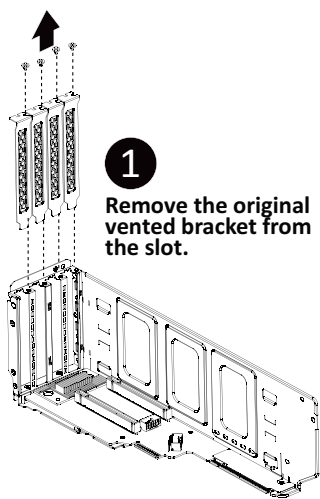


(For Slot3/Slot4)

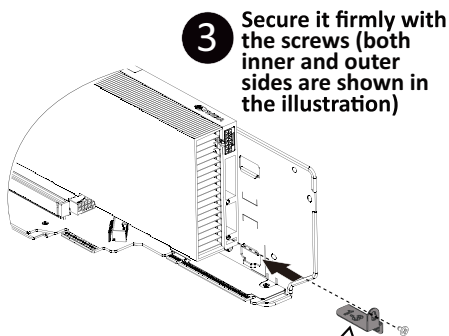


3-5-2 Installing NVIDIA H200 NVL PCIe GPU

Single H200 GPU - For Slot3/Slot4/Slot5/Slot6

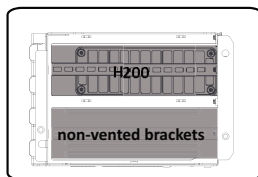
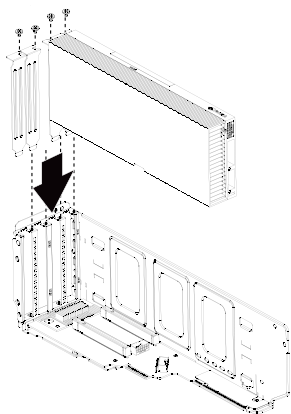


1
Remove the original vented bracket from the slot.

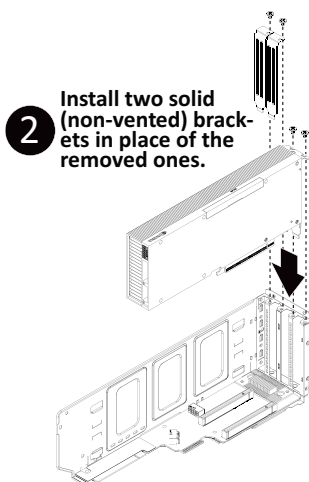
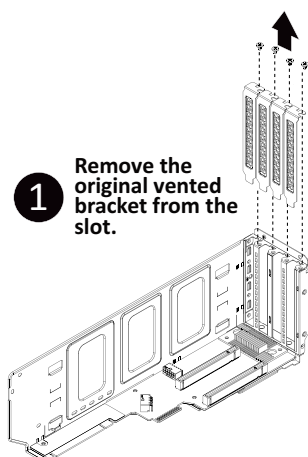


3
Secure it firmly with the screws (both inner and outer sides are shown in the illustration)

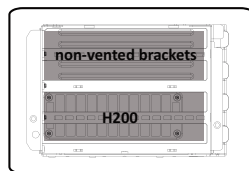
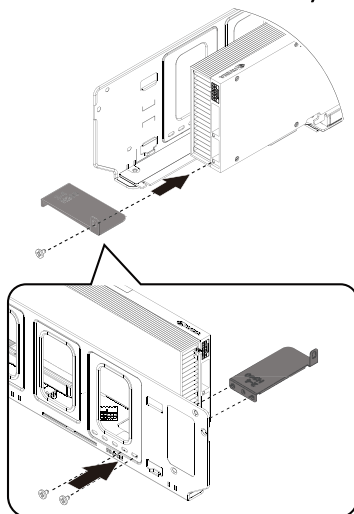
2
Install two solid (non-vented) brackets in place of the removed ones.



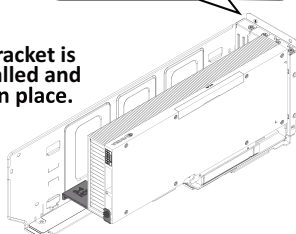
4
Ensure the bracket is properly installed and firmly fixed in place.



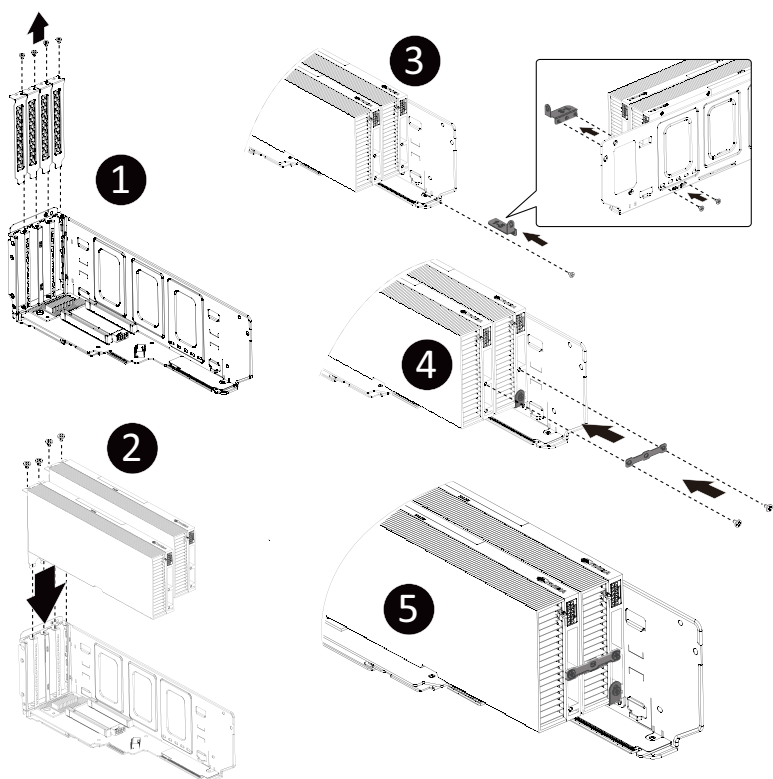
3 Secure it firmly with the screws (both inner and outer sides are shown in the illustration)



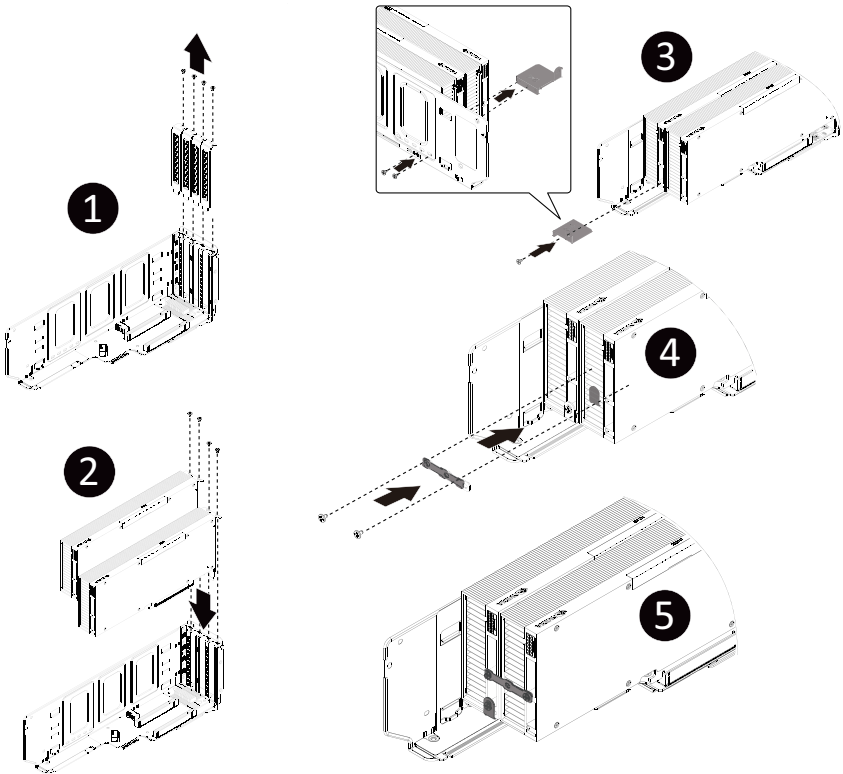
4 Ensure the bracket is properly installed and firmly fixed in place.



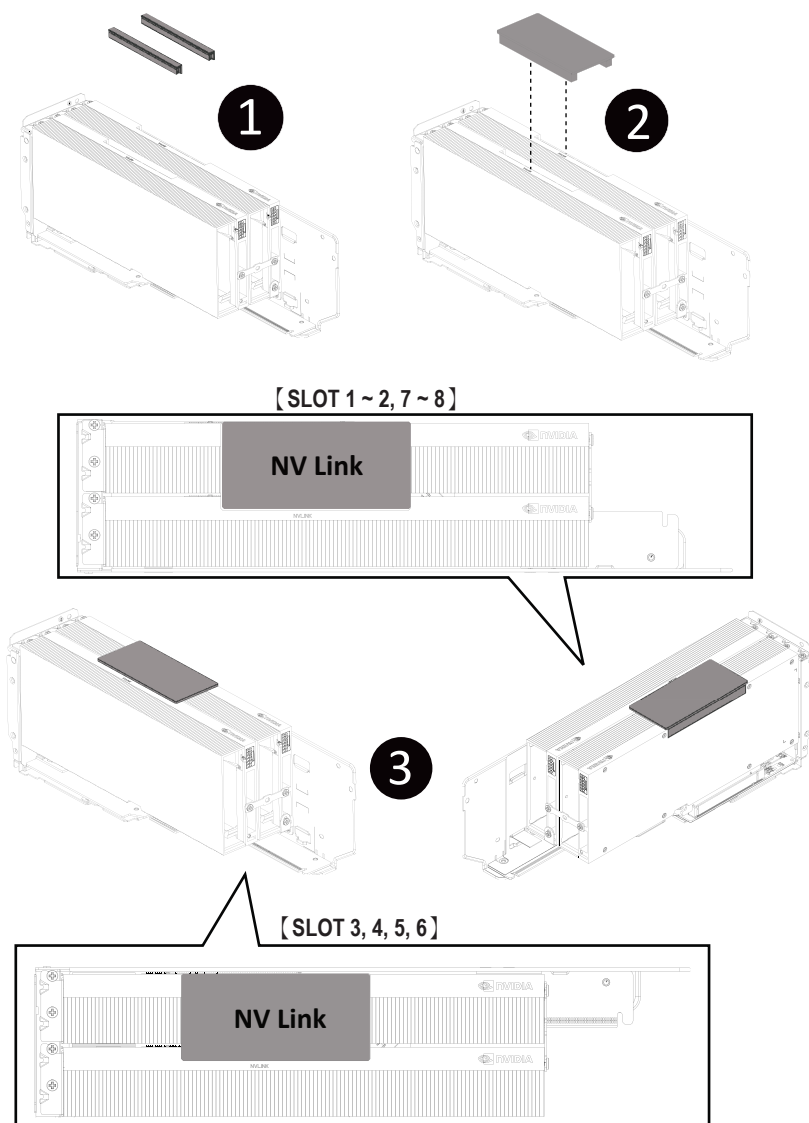
Dual H200 GPUs - For Slot3/Slot4/Slot5/Slot6



Dual H200 GPUs - For Slot1/Slot2/Slot7/Slot8



Dual H200 GPUs - NVIDIA NVLINK Bridge



• Please visit GIGABYTE's official website to download the [GPU Card Option Kit Installation](#).

3-6 Installing a PCI Express Card

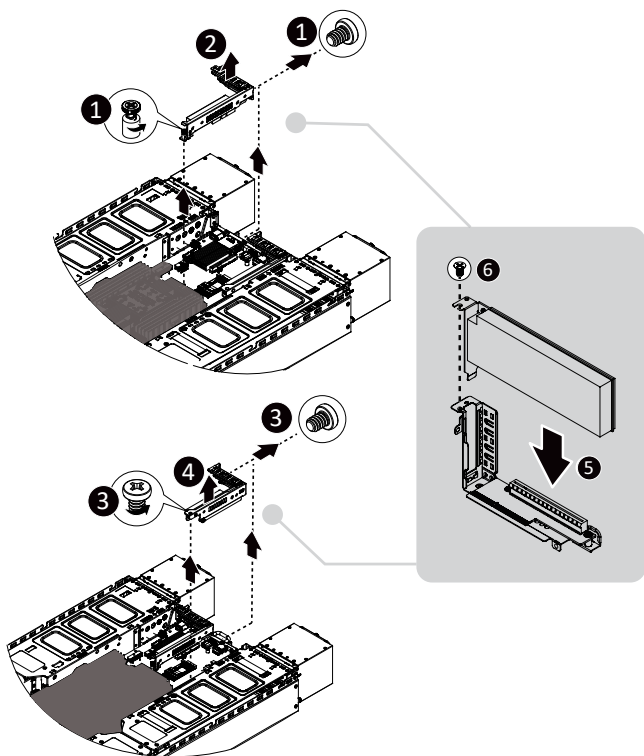


- Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered-down and all power sources have been disconnected from the server prior to installing a PCI card.

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

Follow these instructions to install a PCI Express card on the system:

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



3-7 Installing the Hard Disk Drive



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

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

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

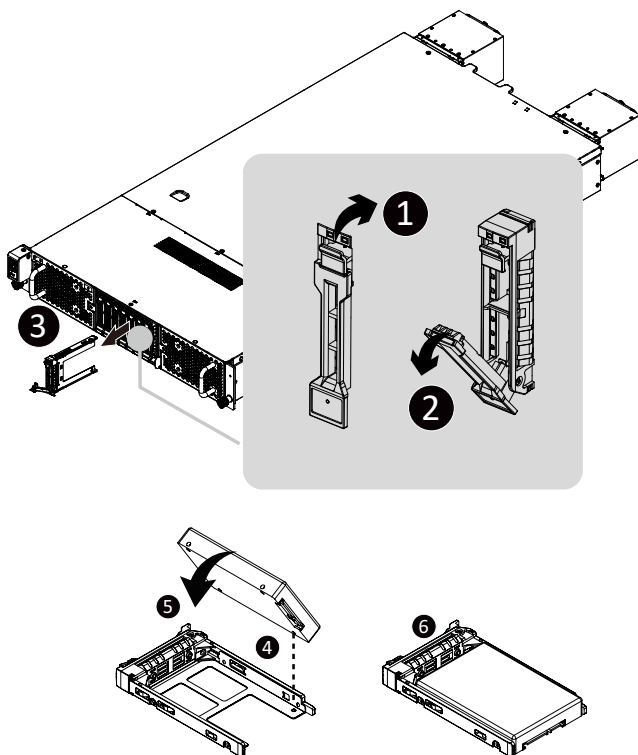
1. Press the release button.
2. Extend the locking lever.
3. Pull the locking lever in the direction indicated to remove the HDD tray.
4. Align the hard disk drive with the positioning stud on the HDD tray.
5. Slide the hard disk drive into the HDD tray.
6. Reinsert the HDD tray into the slot and close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



CAUTION!

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

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



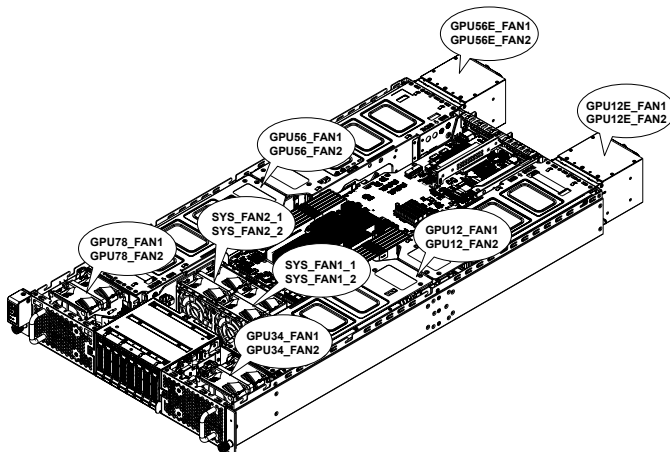
3-8 Replacing the FAN Assembly



CAUTION!

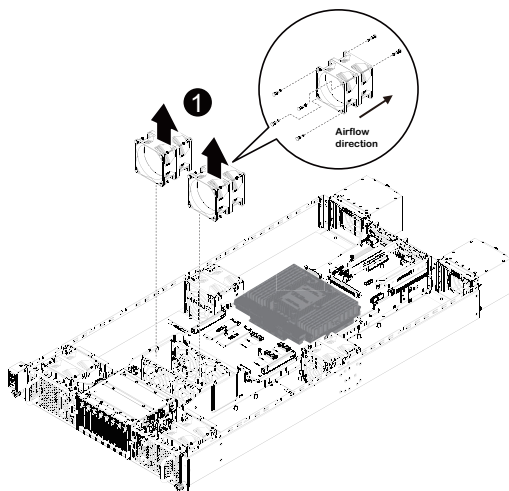
Before you remove or install the system fans follow these steps:

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



[For SYS_FAN1_1/SYS_FAN1_2/ SYS_FAN2_1/ SYS_FAN2_2]

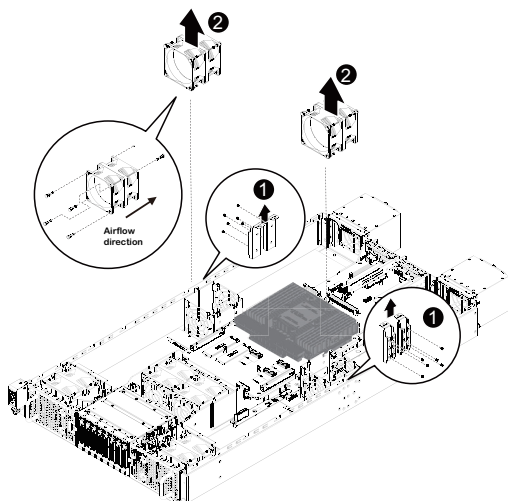
1. Disconnect the fan cable and then lift up the fan assembly from the chassis.
2. Reverse the previous steps to install the replacement fan assembly.



Follow these instructions to replace the fan assembly:

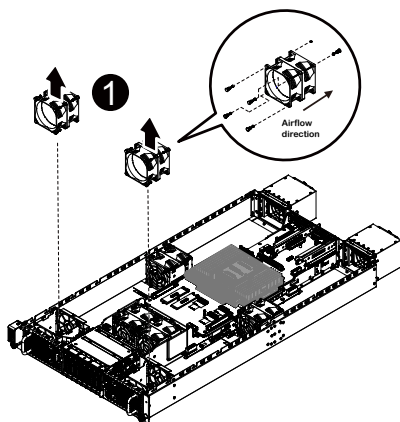
[For GPU12_FAN1/GPU12_FAN2/GPU56_FAN1/GPU56_FAN2]

3. Remove the screws and the bracket.
4. Then lift up the fan assembly from the chassis.
5. Reverse the previous steps to install the replacement fan assembly.



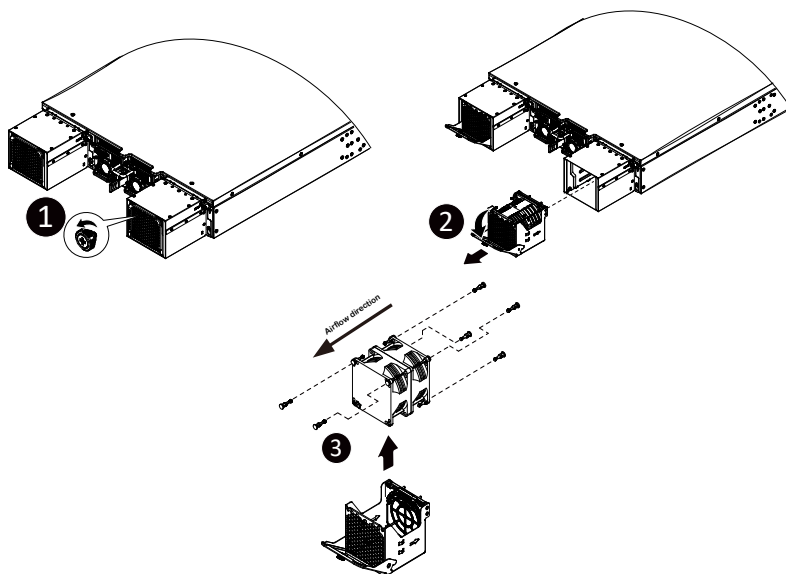
[For GPU34_FAN1/GPU34_FAN2/ GPU78_FAN1/ GPU78_FAN2]

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



[For GPU12E_FAN/GPU56E_FAN]

1. Loosen and remove the screws securing the fan cage.
2. Remove the fan cage from the system
3. Remove the fan from the cage.
4. Reverse the previous steps to install the replacement fan assembly.



3-9 Replacing the Power Supply

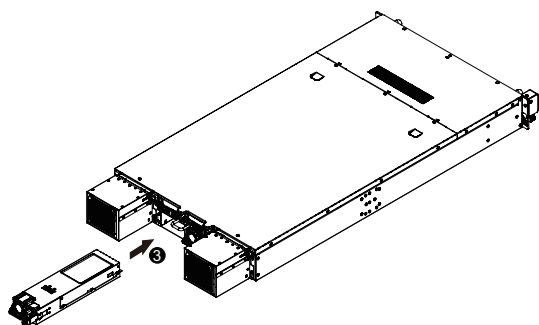
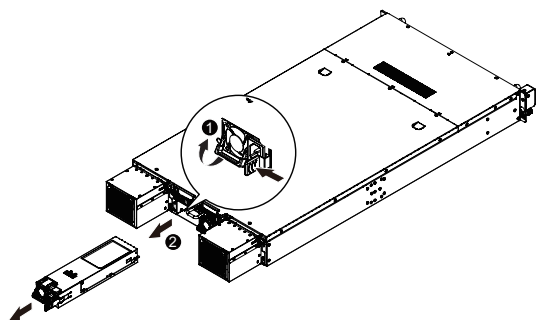


CAUTION!

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

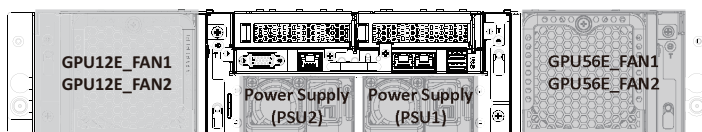
Follow these instructions to replace the power supply:

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

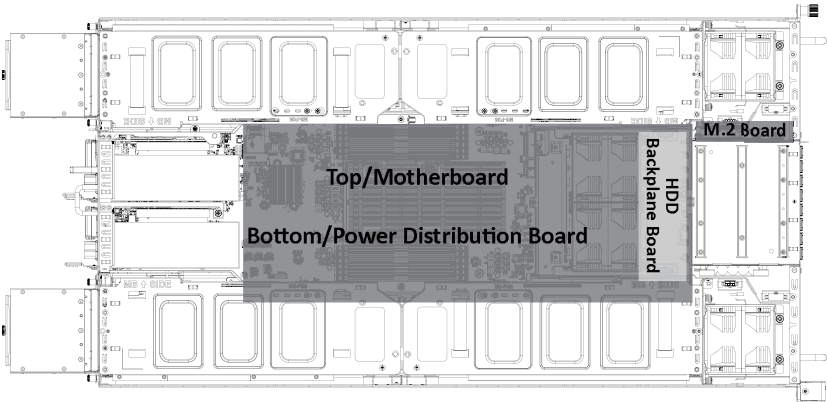


CAUTION!

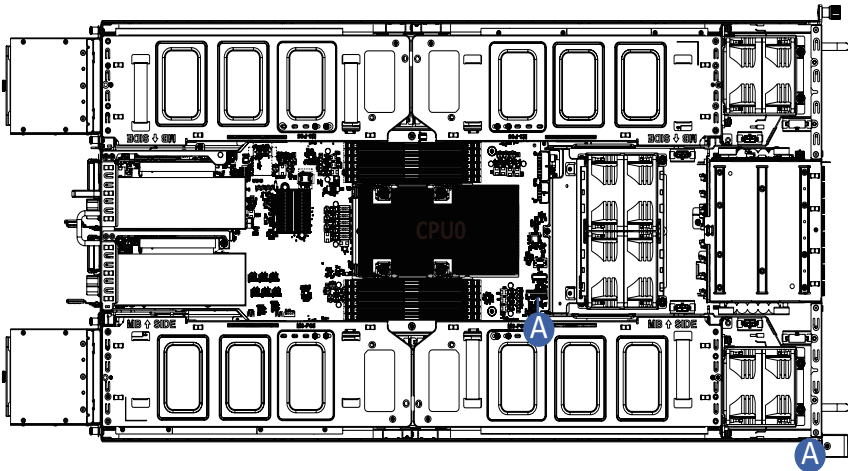
- Please see the illustration below for installation sequence.



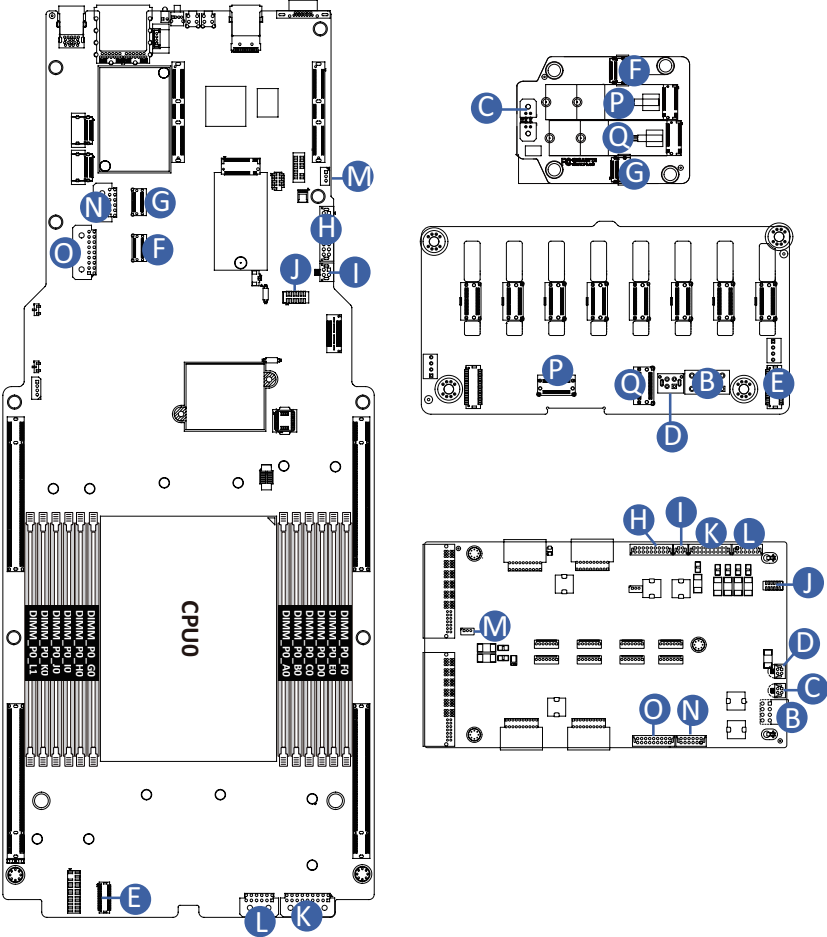
3-10 Cable Routing



Front Panel IO Cable

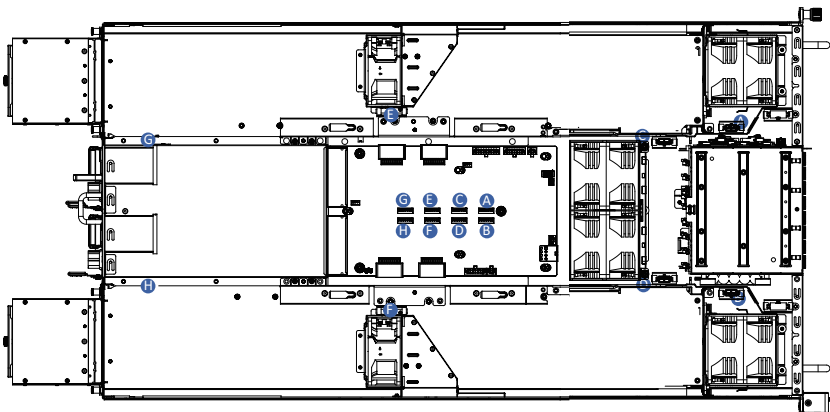


A	Front Switch/LED Cable	Motherboard	FP_1
		Front IO Board	FP_1



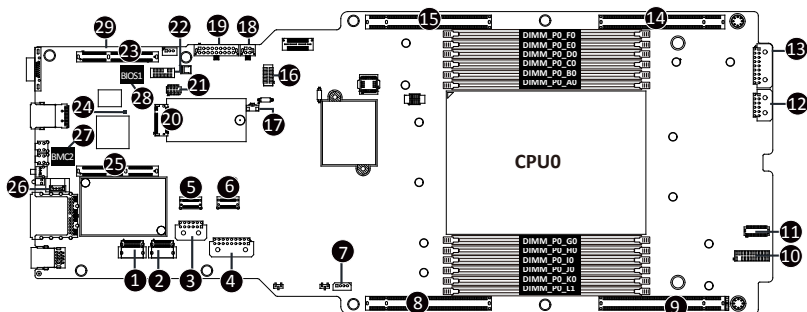
B	ATX Power Cable (2x4)	HDD Backplane Board	BPB_PWR
		Power Distribution Board	BPB_PWR1
C	ATX Power Cable (2x2)	M.2 Board	HDD_2X2P1
		Power Distribution Board	BPB_PWR2
D	Power Cable	Power Distribution Board	BPB_PWR3
		HDD Backplane Board	BPB_PWR1
E	BPB Cable	Motherboard	BP_1
		HDD Backplane Board	BP_1
F	MCIO Cable	Motherboard	U2_P0_PE1C
		M.2 Board	U2_1
G	MCIO Cable	Motherboard	U2_P0_PE1A
		M.2 Board	U2_0
H	ATX Power Cable (2x9)	Motherboard	SSI_2X9P
		Power Distribution Board	SSI_2X9P1
I	ATX Power cable (2x2)	Motherboard	SSI_2X2P
		Power Distribution Board	SSI_2X2P
J	SMD Cable	Motherboard	FP_2
		Power Distribution Board	F_PANEL
K	ATX Power Cable (2x9)	Motherboard	ATX2_1
		Power Distribution Board	ATX2_1
L	ATX Power Cable (2x6)	Motherboard	ATX2_2
		Power Distribution Board	ATX2_2
M	Signal Cable (1x3)	Motherboard	JP12V_STBY
		Power Distribution Board	P12V_STBY
N	ATX Power Cable (2x6)	Motherboard	ATX1_2
		Power Distribution Board	ATX1_2
O	CPU Power Cable (2x9)	Motherboard	ATX1_1
		Power Distribution Board	ATX1_1
P	MCIO Cable	HDD Backplane Board	SL_CN2
		M.2 Board	SATA_RA4
Q	MCIO Cable	HDD Backplane Board	SL_CN1
		M.2 Board	SATA_RA4

System Fan Power Cable



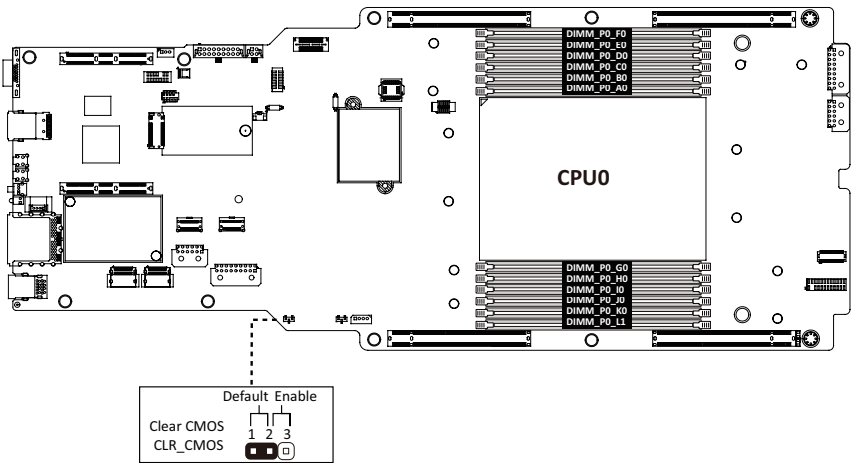
Chapter 4 Motherboard Components

4-1 Motherboard Components



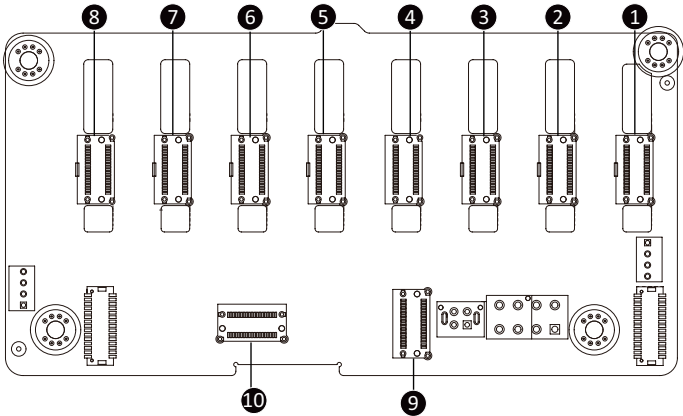
Item	Description	Item	Description
1	MCIO Connector (U2_PEX_2A/PCIe Gen5)	15	PCIe x16 Slot #1 (PCIE_1)
2	MCIO Connector (U2_PEX_2C/PCIe Gen5)	16	Front Panel Header (FP_2/Secondary)
3	2 x 6 Pin ATX Power Connector (ATX1_2)	17	System Battery Cable Connector (BAT)
4	2 x 9 Pin ATX Power Connector (ATX1_1)	18	2 x 2 Pin Power Connector (SSI_2X2P)
5	MCIO Connector (U2_P0_PE1A/PCIe Gen5)	19	2 x 9 Pin Power Connector (SSI_2X9P)
6	MCIO Connector (U2_P0_PE1C/PCIe Gen5)	20	PRoT Module Connector (PROT)
7	IPMB Connector (IPMB)	21	COM Port Header (COM1)
8	PCIe x16 Slot #2 (PCIE_2)	22	TPM Module Connector (SPI_TPM)
9	PCIe x16 Slot #4 (PCIE_4)	23	Proprietary PCIe Slot (GENZ_1/Gen5 x16)
10	Front Panel Header (FP_1/Primary)	24	BMC Firmware Readiness LED (LED_BMC)
11	HDD Back Plane Board Connector (BP_1)	25	Proprietary PCIe Slot (GENZ_2/Gen5 x16)
12	2 x 6 Pin ATX Power Connector (ATX2_2)	26	VROC Module Connector (SW_RAID)
13	2 x 9 Pin ATX Power Connector (ATX2_1)	27	BMC_FLH2 (BMC_FLH1 at the back)
14	PCIe x16 Slot #3 (PCIE_3)	28	BIOS_1 (BIOS_2 at the back)
		29	Case Open Intrusion Alert (CASE_OPEN)

4-2 Jumper Setting



4-3 Backplane Board Storage Connector

4-3-1 CBPG086



Item	Description
1	MCIO Connector (U_2_0)
2	MCIO Connector (U_2_1)
3	MCIO Connector (U_2_2)
4	MCIO Connector (U_2_3)
5	MCIO Connector (U_2_4)
6	MCIO Connector (U_2_5)
7	MCIO Connector (U_2_6)
8	MCIO Connector (U_2_7)
9	MCIO Connector (SL_CN1)
10	MCIO Connector (SL_CN2)

Chapter 5 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the EFI on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters, loading the operating system etc. The BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the 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

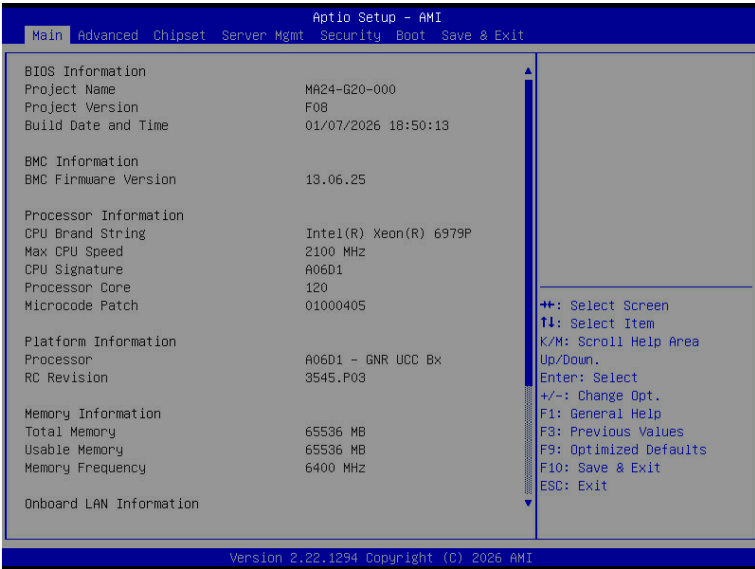
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

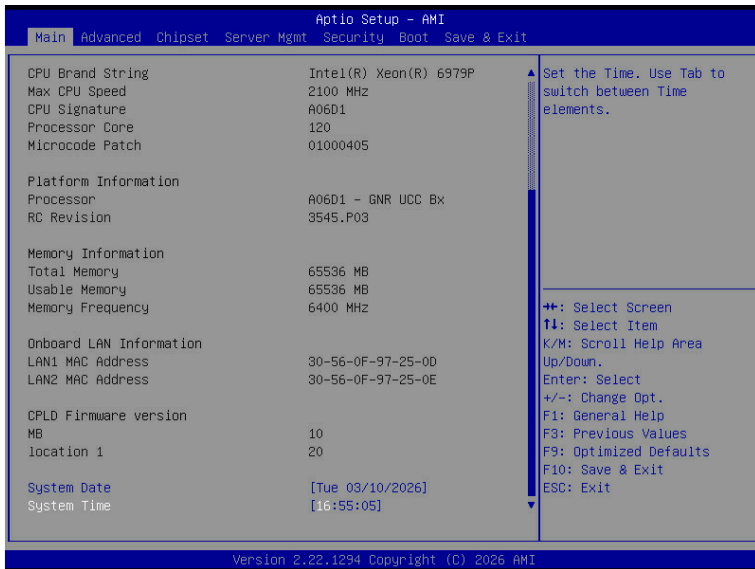
Submenu Help

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.





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 information of the installed processor(s) and PCH.
Memory Information ^(Note2)	
Total Memory	Displays the total memory size of the installed memory.
Usable Memory	Displays the usable memory size of the installed memory.

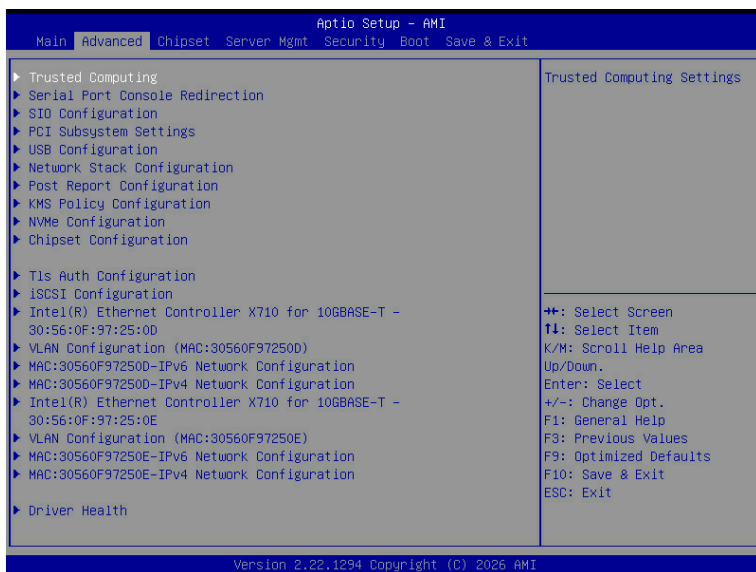
(Note1) Functions available on selected models.

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

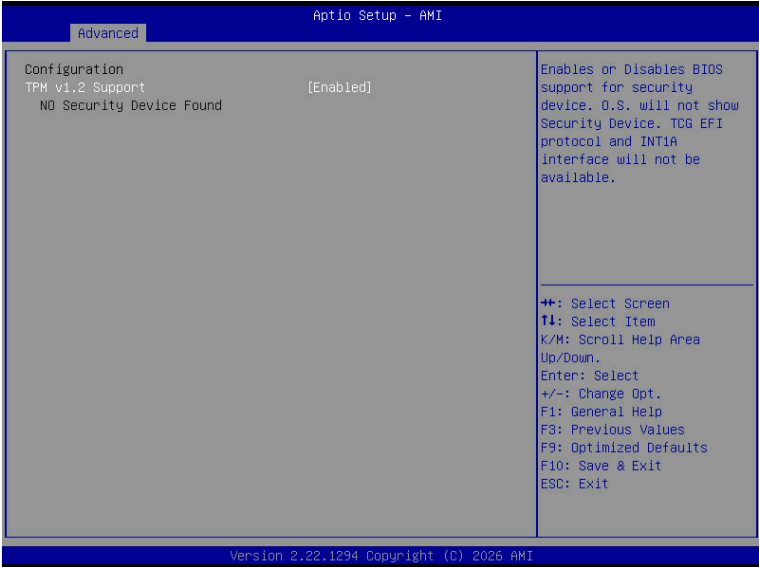
Parameter	Description
Memory Frequency	Displays the frequency information of the installed memory.
System Date	Sets the date following the weekday-month-day-year format.
System Time	Sets the system time following the hour-minute-second format.

5-2 Advanced Menu

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

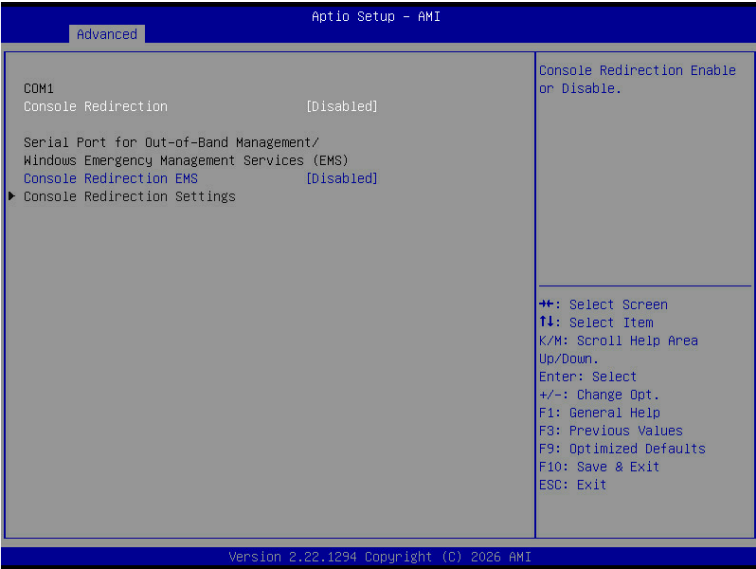


5-2-1 Trusted Computing



Parameter	Description
Configuration	
TPM v1.2 Support	Enable/Disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available. Options available: Disable, Enable. Default setting is Enable .

5-2-2 Serial Port Console Redirection



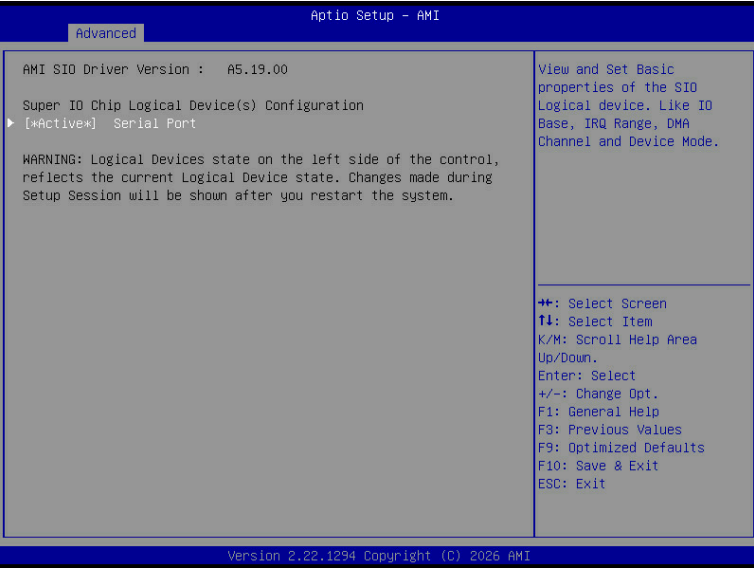
Parameter	Description
COM1 Console Redirection ^(Note)	Console redirection enables the users to manage the system from a remote location. Options available: Enabled, Disabled. Default setting is Disabled .
COM1 Console Redirection Settings	Press [Enter] to configure advanced items. Please note that this item is configurable when COM1 Console Redirection is set to Enabled. ◆ Terminal Type – Selects a terminal type to be used for console redirection. – Options available: VT100, VT100PLUS, VT-UTF8, ANSI. Default setting is VT100PLUS. ◆ Bits per second – Selects the transfer rate for console redirection. – Options available: 9600, 19200, 38400, 57600, 115200. Default setting is 115200. ◆ Data Bits – 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)	◆ Parity – A parity bit can be sent with the data bits to detect some transmission errors. – Even: parity bit is 0 if the num of 1's in the data bits is even. – Odd: parity bit is 0 if num of 1's 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 – Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit. – Options available: 1, 2. Default setting is 1. ◆ Flow Control – Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. – Options available: None, Hardware RTS/CTS. Default setting is None. ◆ VT-UTF8 Combo Key Support – Enable/Disable the VT-UTF8 Combo Key Support. – Options available: Enabled, Disabled. Default setting is Enabled. ◆ Recorder Mode – 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 – Enable/Disable extended terminal resolution. – Options available: Enabled, Disabled. Default setting is Enabled. ◆ Putty KeyPad – Selects Function Key and KeyPad on Putty. – Options available: VT100, LINUX, XTERMR6, SC0, ESCN, VT400. Default setting is VT100.

Parameter	Description
Serial Port for Out-of-Band Management / Windows Emergency Management Services (EMS) Console Redirection ^(Note)	EMS console redirection allows the user to configure Console Redirection Settings to support Out-of-Band Serial Port management. Options available: Enabled, Disabled. Default setting is Disabled.
Serial Port for Out-of-Band EMS Console Redirection Settings	Press [Enter] to configure advanced items. Please note that this item is configurable when Serial Port for Out-of-Band Management EMS Console Redirection is set to Enabled. ◆ Out-of-Band Mgmt Port – 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 – Selects a terminal type to be used for console redirection. – Options available: VT100, VT100PLUS, VT-UTF8, ANSI. Default setting is VT100PLUS. ◆ Bits per second EMS – Selects the transfer rate for console redirection. – Options available: 9600, 19200, 57600, 115200. Default setting is 115200. ◆ Flow Control EMS – 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, 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.
	◆ Use This Device – 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. ◆ Logical Device Settings/Current: – Displays the serial port base I/O address and IRQ. ◆ Possible: – Configures the serial port base I/O address and IRQ.
[*Active*] Serial Port	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

Aptio Setup - AMI

Advanced

PCI Bus Driver Version	A5.01.32	Enable/Disable SLOT1 I/O ROM
SLOT1 I/O ROM	[Enabled]	
SLOT1 PXE Boot	[Enabled]	
SLOT2 I/O ROM	[Enabled]	
SLOT2 PXE Boot	[Enabled]	
SLOT3 I/O ROM	[Enabled]	
SLOT3 PXE Boot	[Enabled]	
SLOT4 I/O ROM	[Enabled]	
SLOT4 PXE Boot	[Enabled]	
SLOT5 I/O ROM	[Enabled]	** : Select Screen T1 : Select Item K/M : Scroll Help Area Up/Down. Enter : Select +/- : Change Opt. F1 : General Help F3 : Previous Values F9 : Optimized Defaults F10 : Save & Exit ESC : Exit
SLOT5 PXE Boot	[Enabled]	
SLOT6 I/O ROM	[Enabled]	
SLOT6 PXE Boot	[Enabled]	
SLOT7 I/O ROM	[Enabled]	
SLOT7 PXE Boot	[Enabled]	
SLOT8 I/O ROM	[Enabled]	
SLOT8 PXE Boot	[Enabled]	

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Aptio Setup - AMI

Advanced

SLOT18 PXE Boot	[Enabled]	If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.
M.2_0 I/O ROM	[Enabled]	
M.2_0 Data Link Feature Exchange function	[Auto]	
M.2_0 PXE Boot	[Enabled]	
M.2_0 Lanes	[Auto]	
M.2_0 Max Link Speed	[Auto]	
M.2_1 I/O ROM	[Enabled]	
M.2_1 Data Link Feature Exchange function	[Auto]	
M.2_1 PXE Boot	[Enabled]	** : Select Screen T1 : Select Item K/M : Scroll Help Area Up/Down. Enter : Select +/- : Change Opt. F1 : General Help F3 : Previous Values F9 : Optimized Defaults F10 : Save & Exit ESC : Exit
M.2_1 Lanes	[Auto]	
M.2_1 Max Link Speed	[Auto]	
Onboard LAN1 & LAN2 Controller	[Enabled]	
Onboard LAN1 I/O ROM	[Enabled]	
Onboard LAN2 I/O ROM	[Enabled]	
PCI Devices Common Settings:		
Re-Size BAR Support	[Disabled]	
SR-IOV Support	[Enabled]	

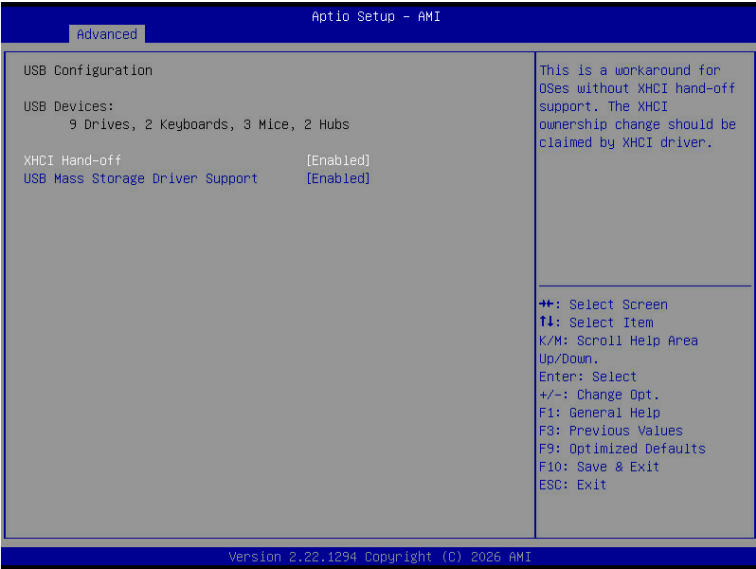
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Parameter	Description
PCI Bus Driver Version	Displays the PCI Bus Driver version information.
SLOT# I/O ROM ^(Note1)	When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Enabled, Disabled. Default setting is Enabled .
SLOT# Lanes ^(Note1)	Change the PCIe lanes. Default setting is Auto .
SLOT# Max Link Speed ^(Note1)	Configure PCIe max link speed. Options available: Auto, Gen1, Gen2, Gen3, Gen4, Gen5. Default setting is Auto .
M2M I/O ROM ^(Note2)	Enable/Disable M2M devices, and initializes device expansion ROM. Options available: Enabled, Disabled. Default setting is Enabled .
M2M Lanes ^(Note2)	Change the M2M PCIe lanes. Options available: Auto, x4, x2x2. Default setting is Auto .
M2M Max Link Speed ^(Note2)	Configure M2M max link speed. Options available: Auto, Gen1, Gen2, Gen3, Gen4, Gen5. Default setting is Auto .
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 M.2 Slot.

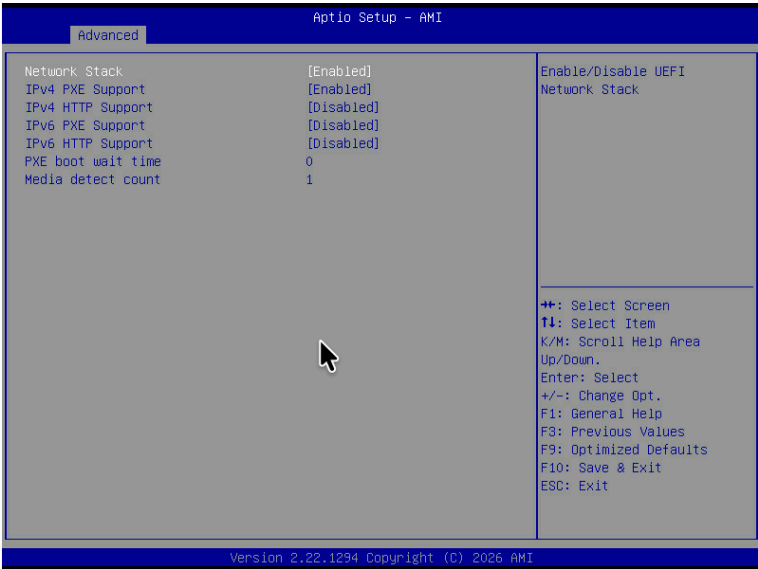
5-2-5 USB Configuration



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 OSes. Options available: Enabled, Disabled. Default setting is Enabled .

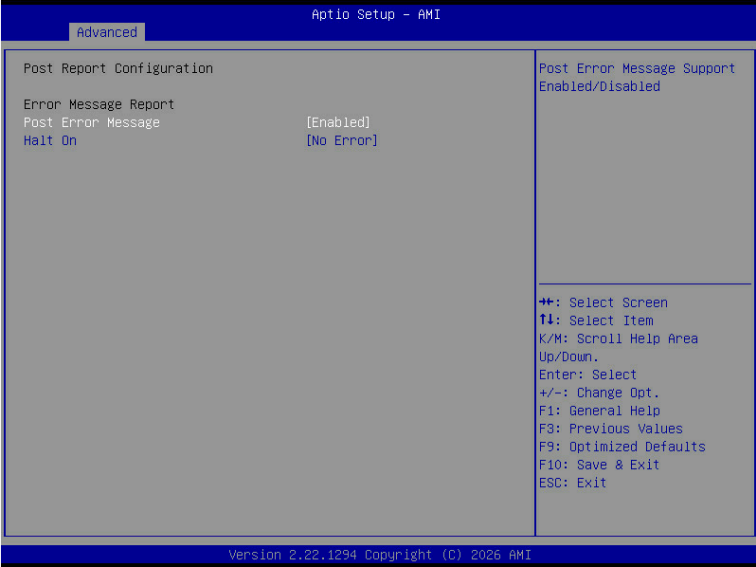
(Note) This item is present only if you attach USB devices.

5-2-6 Network Stack Configuration



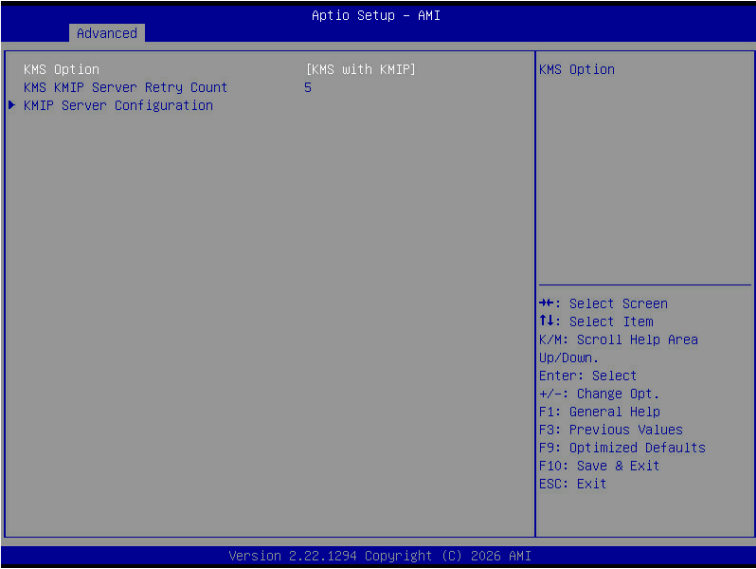
Parameter	Description
Network Stack	Enable/Disable the UEFI network stack. Options available: Enabled, Disabled. Default setting is Enabled .
Ipv4 PXE Support	Enable/Disable the Ipv4 PXE feature. Options available: Enabled, Disabled. Default setting is Enabled .
Ipv4 HTTP Support	Enable/Disable the Ipv4 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 Disabled .
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 .
Halt On	Options available: No Error, All Error. Default setting is No Error .

5-2-8 KMS Policy Configuration

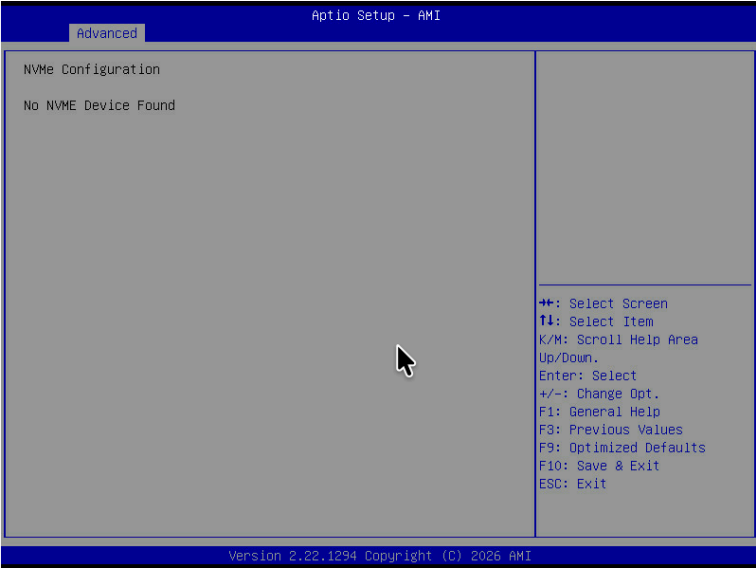


Parameter	Description
KMS Option	Options available: KMS with KMIP, Disabled. Default setting is KMS with KMIP .
KMS KMIP Server Retry Count	Define KMS KMIP Server Retry Count.

Aptio Setup - AMI		
Advanced		
KMIP Server IP address	0.0.0.0	Enter IP4 address in dotted-decimal notation Example: 192.168.10.12
KMIP TCP Port number	5696	
Time Zone	[GMT +8]	
Client Credentials	[Enabled]	
Client UserName	UserName	
Client Password		
KMS TLS Certificate Size		
▶ CA Certificate	0	
▶ Client Certificate	0	
▶ Client Private Key	0	
		++: Select Screen T↓: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.22.1294 Copyright (C) 2026 AMI		

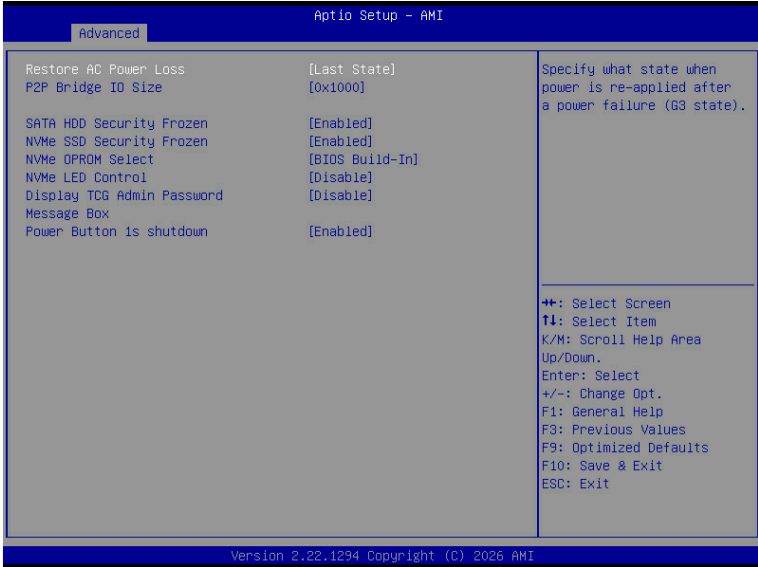
Parameter	Description
KMIP Server IP address	
KMIP TCP Port Number	
Time Zone	Enter the correct timem zone for this server. Default setting is GMT+8 .
Client Credentials	Use User and password credentials to authenticate the Client. Options available: Enabled, Disabled, Clear. Default setting is Enabled .
Client UserName	Enter Client identify: UserName. Name Length: 0-63 characters.
Client Password	Enter Client identify: Password. Password Length: 0-31 characters.
KMS TLC Certificate / Size	
CA Certificate	Enroll factory defaults or load the KMS TLS certificates from the file.
Client Certificate	Enroll factory defaults or load the KMS TLS certificates from the file.
Client Private Key	Enroll factory defaults or load the KMS TLS certificates from the file.

5-2-9 NVMe Configuration



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

5-2-10 Chipset Configuration

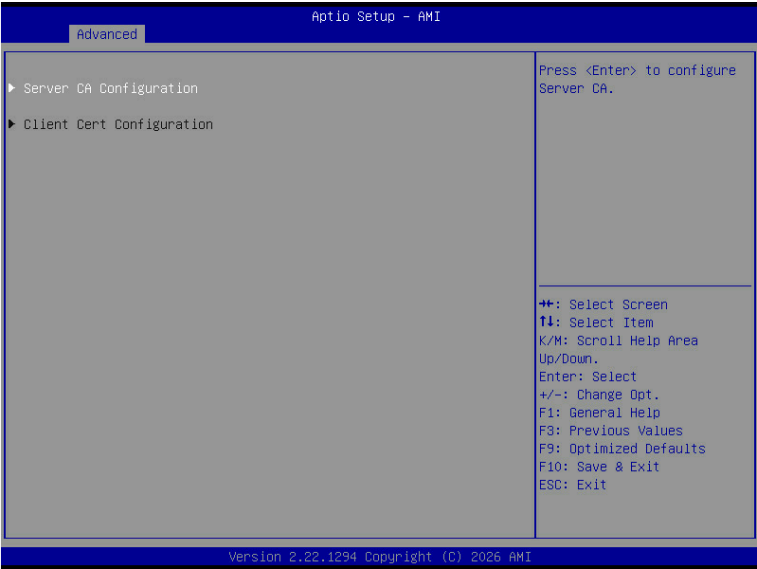


Parameter	Description
Restore on AC Power Loss ^(Note)	Defines the power state to resume to after a system shutdown that is due to an interruption in AC power. When set to Last State, the system will return to the active power state prior to shutdown. When set to Power Off, the system remains off after power shutdown. Options available: Last State, Power Off, Power On, Unspecified. The default setting depends on the BMC setting.
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 .
NVMe SSD Security Frozen	Attempt to send freeze lock command to NVMe SSDs during boot. Options available: Enabled, Disabled. Default setting is Enabled .
NVMe OPROM Select	Options available: BIOS Build-In, NVMe Device, Disabled. Default setting is BIOS Build-In .
NVMe LED Control	Enable/Disable allow user control NVMe LED. It only available the NVMe device direct connect to CPU. Options available: Disable, Enable. Default setting is Disable .

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

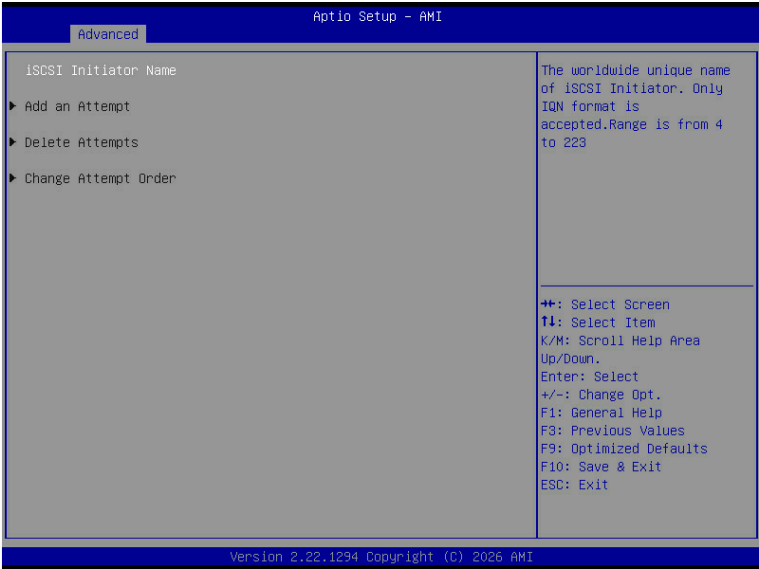
Parameter	Description
Chassis Opened Warning	Enable/Disable the chassis intrusion alert function. Options available: Enabled, Disabled, Clear. Default setting is Disabled .

5-2-11 Tls Auth Configuration



Parameter	Description
Server CA Configuration	Press [Enter] for configuration of advanced items. ◆ Enroll Cert – Press [Enter] to enroll a certificate • Enroll Cert Using File • Cert GUID - Input digit character in 1111111-2222-3333-4444-1234567890ab format. – Commit Changes and Exit – Discard Changes and Exit ◆ Delete Cert
Client Cert Configuration	Press [Enter] for configuration of advanced items.

5-2-12 iSCSI Configuration



Parameter	Description
Attempt Priority	Press [Enter] configure advanced items. - Attempt Priority - Use arrow keys to select the attempt, then press +/- keys to move the attempt up/down in the attempt order list. - Commit Changes and Exit
Host iSCSI Configuration	Press [Enter] to configure advanced items. - iSCSI Initiator Name - Only IQN format is accepted. Range: from 4 to 223 - Add an Attempt - Delete Attempts - Change Attempt Order

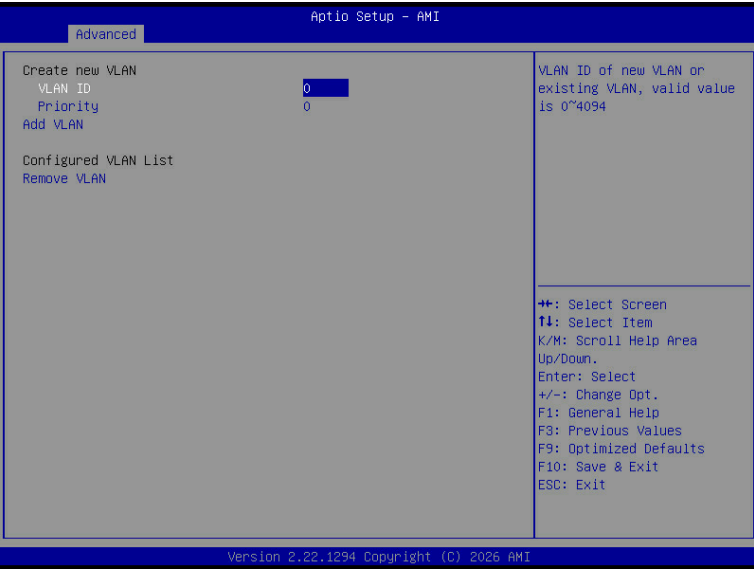
5-2-13 Intel® Ethernet Controller X710 for 10GB BASE-L

Aptio Setup - AMI		
Advanced		
► Firmware Image Properties ► NIC Configuration Blink LEDs 0 UEFI Driver Intel(R) 40GbE 5.0.12 Adapter PBA H64862-000 Device Name Intel(R) Ethernet Controller X710 for 10GBASE-T Chip Type Intel X710 PCI Device ID 15FF PCI Address 40:00:00 Link Status [Disconnected] MAC Address 30:56:0F:97:25:0D Virtual MAC Address 00:00:00:00:00:00		View device firmware version information. ⬆: Select Screen ⬇: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
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Aptio Setup - AMI		
Advanced		
Link Speed [Auto Negotiated] Wake On LAN [Enabled] Legacy Virtual LAN ID 0 LLDP Agent [Enabled]		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. ⬆: Select Screen ⬇: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.22.1294 Copyright (C) 2026 AMI		

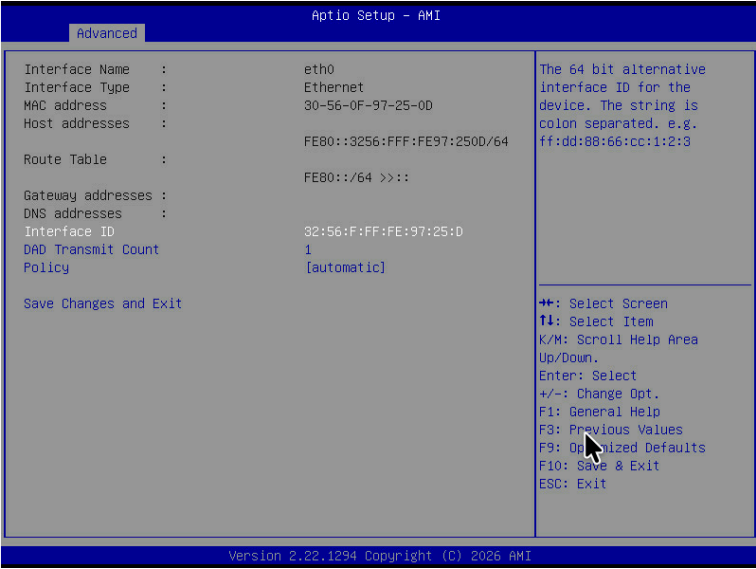
Parameter	Description
Firmware Image Properties	Press [Enter] to view the firmware version information of the device.
NIC Configuration	Press [Enter] to configure advanced items. ◆ Link Speed – Default setting is Auto Negotiated. ◆ Wake On LAN – Enables power on of the system via LAN. Note that configuring 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. ◆ LLDP Agent – Enable/Disable firmware's LLDP Agent. – Options available: Enabled, Disabled. Default setting is Enabled
Blink LEDs	Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values (up to 15 seconds).
UEFI Driver	Displays the technical specifications for the Network Interface Controller.
Adapter PBA	Displays the technical specifications for the Network Interface Controller.
Device Name	Displays the technical specifications for the Network Interface Controller.
Chip Type	Displays the technical specifications for the Network Interface Controller.
PCI Device ID	Displays the technical specifications for the Network Interface Controller.
PCI Address	Displays the technical specifications for the Network Interface Controller.
Link Status	Displays the technical specifications for the Network Interface Controller.
MAC Address	Displays the technical specifications for the Network Interface Controller.
Virtual MAC Address	Displays the technical specifications for the Network Interface Controller.

5-2-14 VLAN Configuration



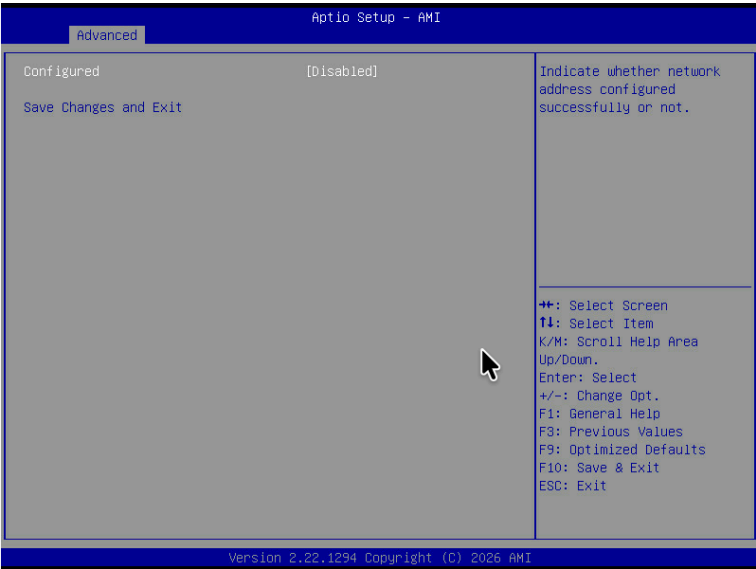
Parameter	Description
Enter Configuration Menu	Press [Enter] to configure advanced items. ♦ Create new VLAN ♦ VLAN ID – Sets VLAN ID for a new VLAN or an existing VLAN. – Press the <+> / <-> keys to increase or decrease the desired values. – The valid range is from 0 to 4094. ♦ Priority – Sets 802.1Q 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 – Press [Enter] to create a new VLAN or update an existing VLAN. ♦ Configured VLAN List ♦ Remove VLAN – Press [Enter] to remove an existing VLAN.

5-2-15 MAC IPv6 Network Configuration



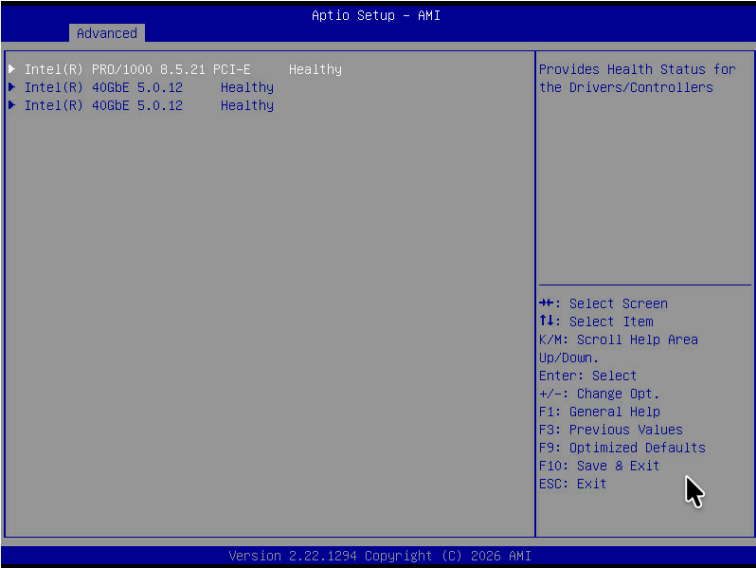
Parameter	Description
Enter Configuration Menu	Press [Enter] to configure advanced items. - Displays the MAC Address information. - Interface ID - The 64 bit alternative interface ID for the device. The string is colon separated. e.g. ff:dd:88:66:cc:1:2:3. - DAD Transmit Count - The number of consecutive Neighbor solicitation messages sent while performing Duplicate Address Detection on a tentative address. A value of zero indicates that Duplicate Address Detection is not performed. - Policy - Options available: automatic, manual. Default setting is automatic. - Save Changes and Exit - Press [Enter] to save all configurations.

5-2-16 MAC IPv4 Network Configuration



Parameter	Description
Configured	Indicates whether network address is configured successfully or not. Options available: Enabled, Disabled. Default setting is Disabled .
Enable DHCP ^(Note)	Options available: Enabled, Disabled. Default setting is Disabled .
Local IP Address ^(Note)	Press [Enter] to configure local IP address.
Local NetMask ^(Note)	Press [Enter] to configure local NetMask.
Local Gateway ^(Note)	Press [Enter] to configure local Gateway
Local DNS Servers ^(Note)	Press [Enter] to configure local DNS servers
Save Changes and Exit	Press [Enter] to save all configurations.

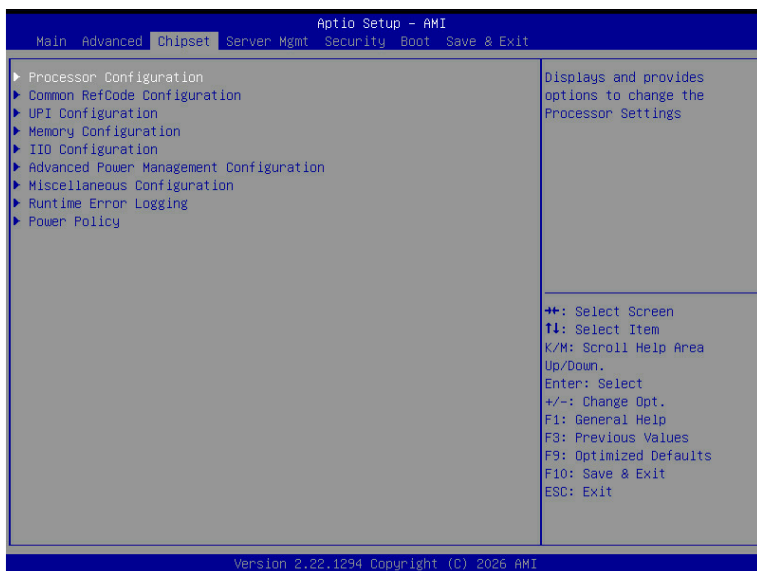
5-2-17 Driver Health



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

Chipset		Aptio Setup - AMI																																									
Processor Configuration		Change Per-Socket Settings																																									
Per-Socket Configuration <table border="0"> <tr> <td>Processor Socket</td> <td>Socket 0</td> <td></td> <td></td> </tr> <tr> <td>Processor ID</td> <td>000A06D1*</td> <td> </td> <td>N/A</td> </tr> <tr> <td>Processor Frequency</td> <td>2.100GHz</td> <td> </td> <td>N/A</td> </tr> <tr> <td>Processor Max Ratio</td> <td>15H</td> <td> </td> <td>N/A</td> </tr> <tr> <td>Processor Min Ratio</td> <td>08H</td> <td> </td> <td>N/A</td> </tr> <tr> <td>Microcode Revision</td> <td>01000405</td> <td> </td> <td>N/A</td> </tr> <tr> <td>L1 Cache RAM(Per Core)</td> <td>112KB</td> <td> </td> <td>N/A</td> </tr> <tr> <td>L2 Cache RAM(Per Core)</td> <td>2048KB</td> <td> </td> <td>N/A</td> </tr> <tr> <td>L3 Cache RAM(Per Package)</td> <td>516096KB</td> <td> </td> <td>N/A</td> </tr> <tr> <td>Processor 0 Version</td> <td>Intel(R) Xeon(R) 6979P</td> <td></td> <td></td> </tr> </table>				Processor Socket	Socket 0			Processor ID	000A06D1*		N/A	Processor Frequency	2.100GHz		N/A	Processor Max Ratio	15H		N/A	Processor Min Ratio	08H		N/A	Microcode Revision	01000405		N/A	L1 Cache RAM(Per Core)	112KB		N/A	L2 Cache RAM(Per Core)	2048KB		N/A	L3 Cache RAM(Per Package)	516096KB		N/A	Processor 0 Version	Intel(R) Xeon(R) 6979P		
Processor Socket	Socket 0																																										
Processor ID	000A06D1*		N/A																																								
Processor Frequency	2.100GHz		N/A																																								
Processor Max Ratio	15H		N/A																																								
Processor Min Ratio	08H		N/A																																								
Microcode Revision	01000405		N/A																																								
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L3 Cache RAM(Per Package)	516096KB		N/A																																								
Processor 0 Version	Intel(R) Xeon(R) 6979P																																										
Enable LP [Global] [ALL LPs] Hardware Prefetcher [Enable] Adjacent Cache Prefetch [Enable] DCU Streamer Prefetcher [Auto] DCU IP Prefetcher [Enable] LLC Prefetch [Disable] Homeless Prefetch [Auto] FB Thread Slicing [Disable] AMP Prefetch [Enable] Enable Intel(R) TXT [Disable]		++: Select Screen T1: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit																																									
Version 2.22.1294 Copyright (C) 2026 AMI																																											

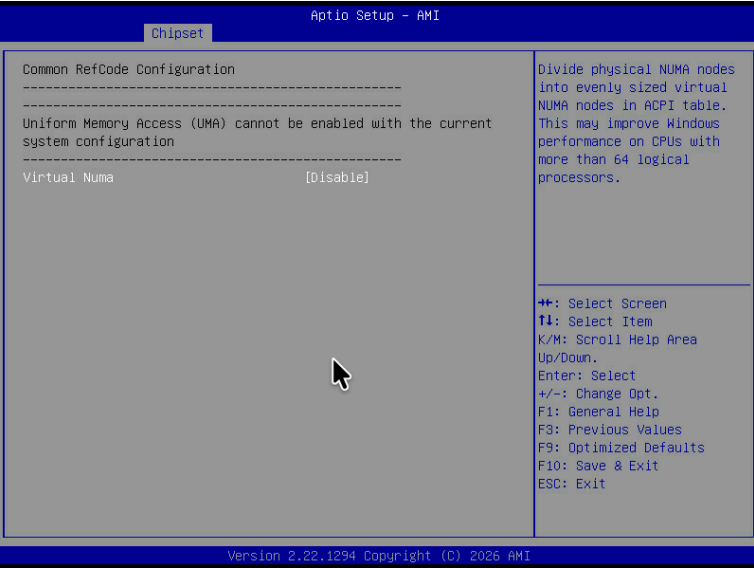
Chipset		Aptio Setup - AMI	
Processor Reserved Memory [Outputs]		In Field Scan (IFS)	
PRMRR Size per domain 16 MiB PRM Size per socket 16 MiB PRM Size per system 16 MiB			
Software Guard Extension (SGX) [Outputs]			
SGX activation state Deactivated SGX memory population for SGX enabling is not POR. Please check your memory population. SGX error code [HEX] 16			
Software Guard Extension (SGX) [Inputs]			
SGX Factory Reset [Disabled] SW Guard Extensions (SGX) [Disabled] SGX Package Info In-Band Access [Disabled] SGX PRMRR Size Requested [Auto]			
In Field Scan (IFS)			
In Field Scan (IFS)		++: Select Screen T1: Select Item K/M: Scroll Help Area Up/Down. 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	Press [Enter] to configure advanced items. • CPU Socket 0 Configuration – Core Disable Bitmap(Hex) • 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 Die Type / 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).
Enable LP [Global]	Enables Logical processor (Software Method to Enable/Disable Logical Processor threads). Options available: ALL LPs, Single LP. Default setting is ALL LPs.
Hardware Prefetcher	Select whether to enable the speculative prefetch unit of the processor. Options available: Enable, Disable. Default setting is Enable.
L2 RF0 Prefetch Disable	Options available: Enable, Disable. Default setting is Disable .
Adjacent Cache Prefetch	When enabled, cache lines are fetched in pairs. When disabled, only the required cache line is fetched. Options available: Enable, Disable. Default setting is Enable.
DCU Streamer Prefetcher	Enable/Disable DCU streamer prefetcher. Options available: Enable, Disable. Default setting is Enable.
DCU IP Prefetcher	Enable/Disable DCU IP Prefetcher. Options available: Enable, Disable. Default setting is Enable.
Extended APIC	Enable/Disable extended APIC support. Note: The VT-d will be enabled automatically when x2APIC is enabled. Options available: Enable, Disable. Default setting is Enable.
Enable Intel(R) TXT	Enable/Disable the Intel Trusted Execution Technology support function. Options available: Enable, Disable. Default setting is Disable.
VMX	Enable/Disable the Vanderpool Technology. This will take effect after rebooting the system. Options available: Enable, Disable. Default setting is Enable.
Enable SMX	Enable/Disable the Safer Mode Extensions (SMX) support function. Options available: Enable, Disable. Default setting is Disable.
AES-NI	Enable/Disable the AES-NI support. Options available: Enable, Disable. Default setting is Enable.
Debug Consent	Options available: Enable, Disable. Default setting is Disable .

Parameter	Description
Memory Encryption (TME) ^(Note)	Enable/Disable memory encryption (TME). Options available: Enabled, Disabled. Default setting is Disabled .
Total Memory Encryption Multi-Tenant (TME-MT)	Options available: Enabled, Disabled. Default setting is Disabled .
Processor CFR Configuration	Press [Enter] to configure advanced items. ◆ Provision S3M CFR – Options available: Disable, Enable. Default setting is Enable. ◆ Manual Commit S3M FW CFR – Options available: Disable, Enable, Auto. Default setting is Auto. ◆ Provision PUcode CFR – Options available: Disable, Enable. Default setting is Enable. ◆ Manual Commit PUcode CFR – Options available: Enable, Disable, Auto. Default setting is Auto. ◆ Socket0 CFR Revision Info – Displays CFR Revision information of the socket.

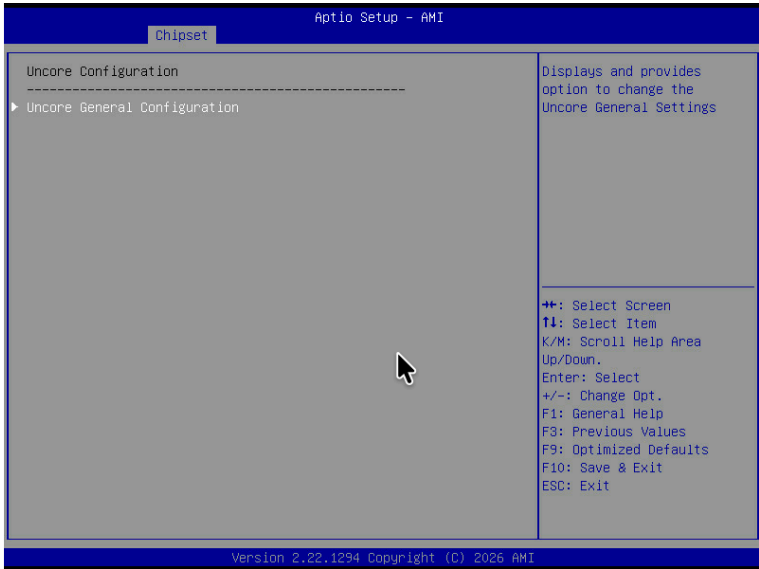
(Note) Advanced items prompt when this item is defined.

5-3-2 Common RefCode Configuration



Parameter	Description
Common RefCode Configuration	
Numa	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 .

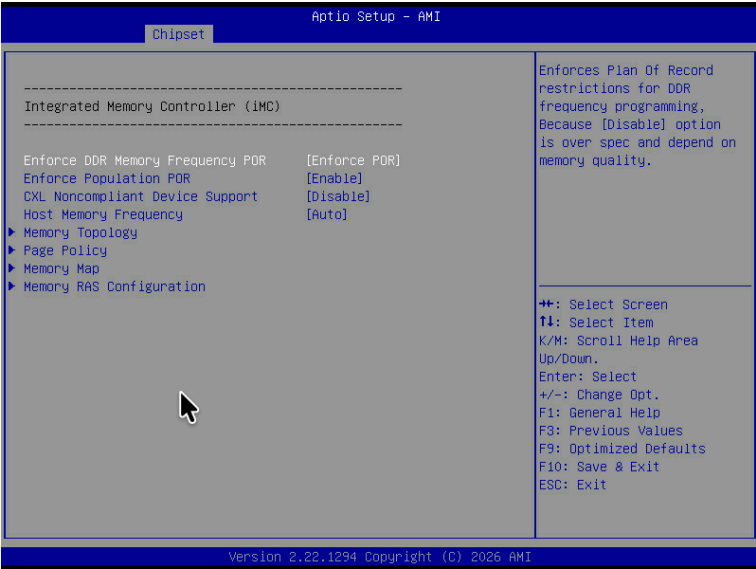
5-3-3 UPI Configuration



Parameter	Description
UPI General Configuration	Press [Enter] to configure advanced items.
	◆ UPI Status – Press [Enter] to view the Uncore status.
	◆ Link Frequency Select – Selects the UPI link frequency. – Options available: 12.8GT/s, 14.4GT/s, 16.0GT/s, Auto, Use Per Link Setting. Default setting is Auto.
	◆ SNC – Enable/Disable Sub NUMA Cluster function. – Options available: Auto, Disable, Enable SNC2 (2-clusters), Enable SNC4 (4-clusters). Default setting is Auto.
	◆ Stale AtoS – Enable/Disable Stale A to S directory optimization. – Options available: Disable, Enable, Auto. Default setting is Auto.
	◆ LLC dead line alloc – Enable/Disable fill dead lines in LLC. – Options available: Disable, Enable, Auto. Default setting is Enable.
	◆ MMCFG Size – Options available: 64M, 128M, 256M, 512M, 1G, 2G, Auto. Default setting is 512M.
	◆ MMIO High Base – Options available: 56T, 40T, 32T, 24T, 16T, 4T, 2T, 1T, 512G, 3584T. Default setting is 4T.

Parameter	Description
UPI General Configuration (continued)	◆ MMIO High Granularity Size – Selects the allocation size used to assign mmioh resources. – Options available: 1G, 4G, 16G, 64G, 256G, 1024G. Default setting is 64G. ◆ Limit CPU PA to 46 bits – Options available: Disable, Enable. Default setting is Disable.

5-3-4 Memory Configuration



Parameter	Description
Integrated Memory Controller (iMC)	
Enforce DDR Memory Frequency POR	When set to Enable, the system enforces Plan Of Record restrictions for DDR frequency programming. Options available: POR, Disable. Default setting is POR .
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, Auto. Default setting is Auto .
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, Copy to Flash. Default setting is NVDIMMs .
Assert ADR on Reset	Enable/Disable Assert ADR on Reset. Options available: Enabled, Disabled. Default setting is Disabled .

Aptio Setup - AMI		
Chipset		
Intel(R) Flat Memory Mode Support	[Disabled]	Enable or disable Intel(R) Flat Memory Mode support
DDR CXL Heterogeneous Interleave support	[Disabled]	
		++: Select Screen T1: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
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Aptio Setup - AMI		
Chipset		
----- Memory RAS Configuration Setup -----		Full Mirror Mode will set entire 1LM memory in system to be mirrored, consequently reducing the memory capacity by half. Partial Mirror Mode will enable the required size of memory to be mirrored. If rank sparing is enabled partial mirroring will not take effect. Enabling any
Mirror Mode	[Disabled]	
UEFI ARM Mirror	[Disabled]	++: Select Screen T1: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Mirror TADO	[Disabled]	
Correctable Error Threshold	7FFF	
Leaky bucket time window based interface	[Disabled]	
Leaky bucket low bit	28	
Leaky bucket high bit	29	
ADDDC Sparing	[Disabled]	
Patrol Scrub	[Enable at End of POST]	
Patrol Scrub Interval	24	
DDR5 ECS	[Enabled]	
Version 2.22.1294 Copyright (C) 2026 AMI		

Parameter	Description
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 Map ^(Note1)	Press [Enter] to configure advanced items. ♦ Volatile Memory Mode – Selects 1LM or 2LM mode for volatile memory. – Options available: 1LM, 2LM. Default setting is 2LM.
Memory RAS Configuration	Press [Enter] to configure advanced items. ♦ Mirror Mode^(Note2) – 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. ♦ Partial Mirror 1 Size (GB) – Selects multiplier of 1GB for the size of the SAD to be created. ♦ Correctable Error Threshold – 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^(Note2) – Enable/Disable Sparing trigger SW Error Match Threshold. – Options available: Disabled, Enabled. Default setting is Disabled. ♦ SW Per Bank Threshold – SW Per Bank Threshold (1-0x7FFF) used for DDR bank level error. – Press the <+> / <-> keys to increase or decrease the desired values. ♦ SW Correctable Error Time Window – SW Correctable Error time window based interface in hour (0-24). – Press the <+> / <-> keys to increase or decrease the desired values. ♦ Leaky bucket time window based interface^(Note2) – Enable/Disable leaky bucket time window based interface. – Options available: Disabled, Enabled. Default setting is Disabled.

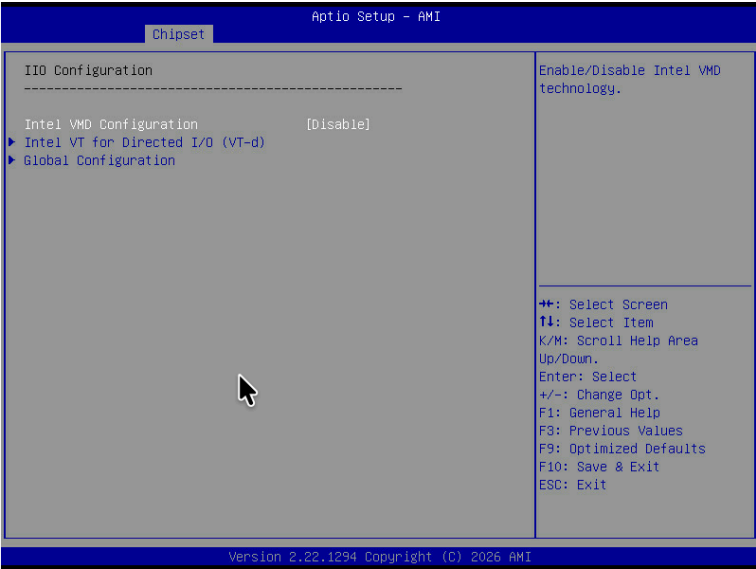
(Note1) Advanced items prompt when HBM CPU is installed.

(Note2) Advanced items prompt when this item is defined.

Parameter	Description
Memory RAS Configuration (continued)	♦ Leaky bucket time window based interface Hour – Leaky bucket time window based interface hour used for DDR (0-24). – Press the <+> / <-> keys to increase or decrease the desired values. ♦ Leaky bucket time window based interface Minute – Leaky bucket time window based interface minute used for DDR (0-60). – Press the <+> / <-> keys to increase or decrease the desired values. ♦ Leaky bucket low bit – Configures leaky bucket low bit (0x1 - 0x29). – Press the <+> / <-> keys to increase or decrease the desired values. ♦ Leaky bucket high bit – Configures leaky bucket high bit (0x1 - 0x29). – Press the <+> / <-> keys to increase or decrease the desired values. ♦ ADDDC Sparing^(Note) – Enable/Disable ADDDC Sparing. – Options available: Disabled, Enabled. Default setting is Disabled. ♦ Enable ADDDC Error Injection – Options available: Disabled, Enabled. Default setting is Enabled. ♦ Patrol Scrub – Options available: Disabled, Enable at End of POST. Default setting is Enable at End of POST. ♦ Patrol Scrub Interval – Selects the number of hours (1-24) required to complete full scrub. A value of zero means auto. ♦ DDR5 ECS – Options available: Disabled, Enabled, Enable ECS with Result Collection. Default setting is Enabled.

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

5-3-5 IIO Configuration



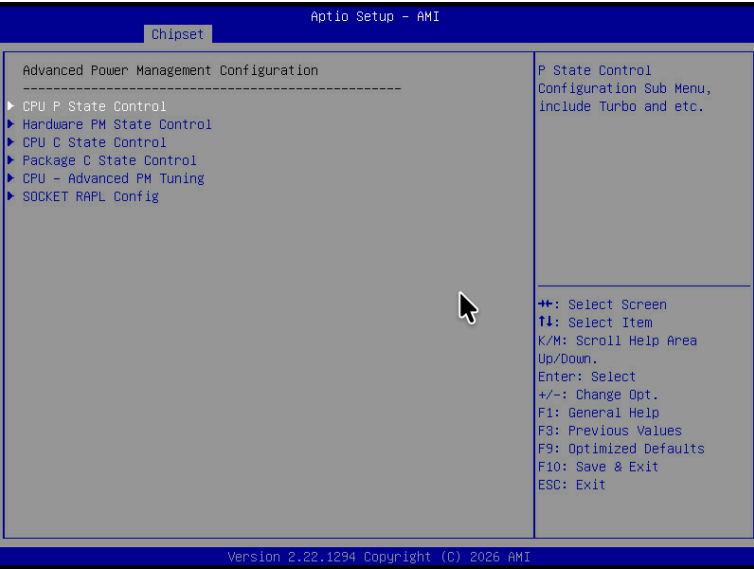
Parameter	Description
IIO Configuration	
Intel® VT for Directed I/O (VT-d)	Press [Enter] to configure advanced items. ◆ Intel® VT for Directed I/O – Enable/Disable the Intel VT for Directed I/O (VT-d) support function by reporting the I/O device assignment to VMM through DMAR ACPI Tables. – Options available: Enable, Disable. Default setting is Enable. ◆ Cache Allocation – Options available: Enable, Disable. Default setting is Enable. ◆ DMA Control Opt-In Flag – 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 – Enable/Disable the interrupt remapping support function. – Options available: Auto, Enable, Disable. Default setting is Auto ◆ x2APIC Opt Out – Options available: Enable, Disable. Default setting is Disable. ◆ Pre-boot DMA Protection – Options available: Enable, Disable. Default setting is Disable.

Parameter	Description
Intel® VT for Directed I/O (VT-d) (continued)	◆ PCIe ACSCTL – Enable/Disable overwrite of PCI Access Control Services Control register in PCI root ports. – Options available: Disable, Enable. Default setting is Disable. ◆ Source Validation^(Note) – Options available: Disabled, Enabled. Default setting is Disabled. ◆ Translation Blocking^(Note) – Options available: Disabled, Enabled. Default setting is Disabled. ◆ P2P Request Redirect^(Note) – Options available: Disabled, Enabled. Default setting is Enabled. ◆ P2P Completion Redirect^(Note) – Options available: Disabled, Enabled. Default setting is Enabled. ◆ Upstream Forwarding Enable^(Note) – Options available: Disabled, Enabled. Default setting is Enabled.
Intel® VMD technology	Press [Enter] to configure advanced items. ◆ Intel® VMD Configuration – Enable/Disable Intel® VMD technology. – Options available: Enable, Disable. Default setting is Disable. ◆ Intel® VMD for Non-Hotplug NVMe^(Note1) – Enable/Disable Intel® VMD for Non-Hotplug NVMe. – Options available: Enable, Disable. Default setting is Disable.
I/O-PCIe Express Global Options	
PCIe Max Read Request Size	Options available: Auto, 128B, 256B, 512B, 1024B, 2048B, 4096B. Default setting is 4096B .
Pcie Relaxed Ordering	Options available: No, Yes. Default setting is Yes .

(Note) This item is available when **PCIe ACSCTL** is set to **Enable**.

(Note1) This item appears when **Intel® VMD Configuration** is set to **Enable**.

5-3-6 Advanced Power Management Configuration

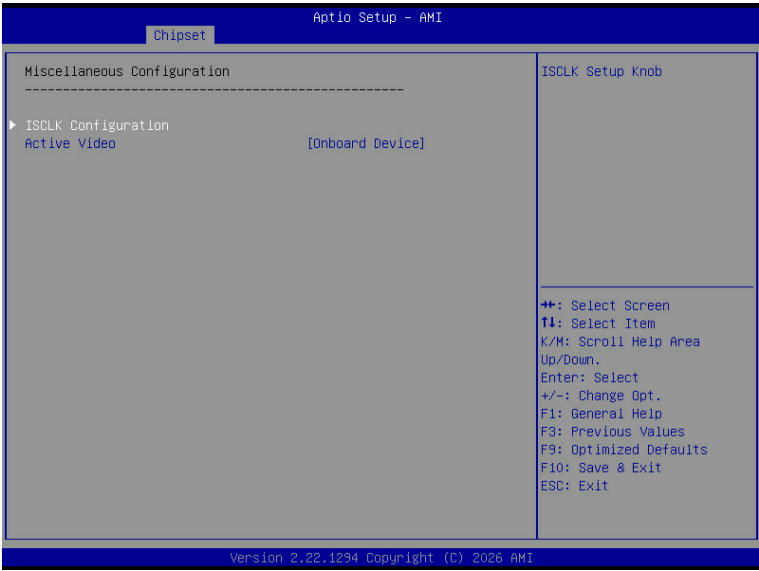


Parameter	Description
CPU P State Control	Press [Enter] to configure advanced items. - SpeedStep (Pstates) - Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load. - Options available: Enable, Disable. Default setting is Enable. - 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: Enable, Disable. Default setting is Enable.
Hardware PM State Control	Press [Enter] to configure advanced items. - Hardware P-States - 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.

Parameter	Description
CPU C State Control	Press [Enter] to configure advanced items. ◆ Enable Monitor MWAIT – Allows Monitor and MWAIT instructions. – Options available: Disable, Enable, Auto. Default setting is Auto. ◆ CPU C6 Report – Enable/Disable CPU C6(ACPI C3) report to OS. – Options available: Disable, Enable, Auto. Default setting is Auto. ◆ Enhanced Halt State (C1E) – Core C1E auto promotion control. Takes effect after reboot. – Options available: Enable, Disable. Default setting is Enable.
Package C State Control	Press [Enter] to configure advanced items. ◆ Package C State – Configures the state for the C-State package limit. – Options available: C0/C1 state, C2 state, C6(non Retention) state, C6(Retention) state, No Limit, Auto. Default setting is Auto.
CPU - Advanced PM Tuning	Press [Enter] to configure advanced items. ◆ Energy Perf BIAS – Press [Enter] to configure advanced items. » Power Performance Tuning • Options available: OS Controls EPB, BIOS Controls EPB, PECI Controls EPB. Default setting is OS Controls EPB. » Energy_PERF_BIAS_CFG mode^(Note) • Options available: Performance, Balanced Performance, Balanced Power, Power. Default setting is Balanced Performance.
SOCKET RAPL Config	Press [Enter] to configure advanced items. ◆ PL1 Power Limit – PL1 Power Limit in Watts. The value may vary from 0 to Fused Value. If the value is 0, the fused value will be programmed. – Default setting is 0. ◆ PL1 Time Window – PL1 value in seconds. The value may vary from 0 to 448. – Default setting is 1. ◆ PL2 Power Limit – PL2 Power Limit in Watts. The value may vary from 0 to Fused Value. If the value is 0, BIOS programs 120% * TDP. – Default setting is 0. ◆ PL2 Time Window – PL1 value in seconds. The value may vary from 0 to 0.438. – Default setting is 0.012.

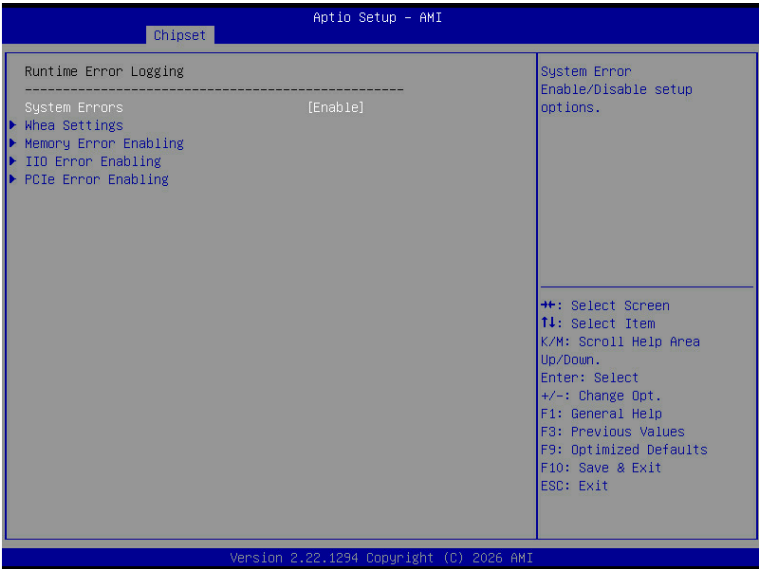
(Note) This item is configurable when **Power Performance Tuning** is set to **BIOS Controls EPB**.

5-3-7 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 .
External SSC - CK440	Enables Spread spectrum - only affects external clock generator. Options available: SSC Off, SSC = -0.3%, SSC = -0.5%, Hardware. Default setting is SSC Off .

5-3-8 Runtime Error Logging Settings

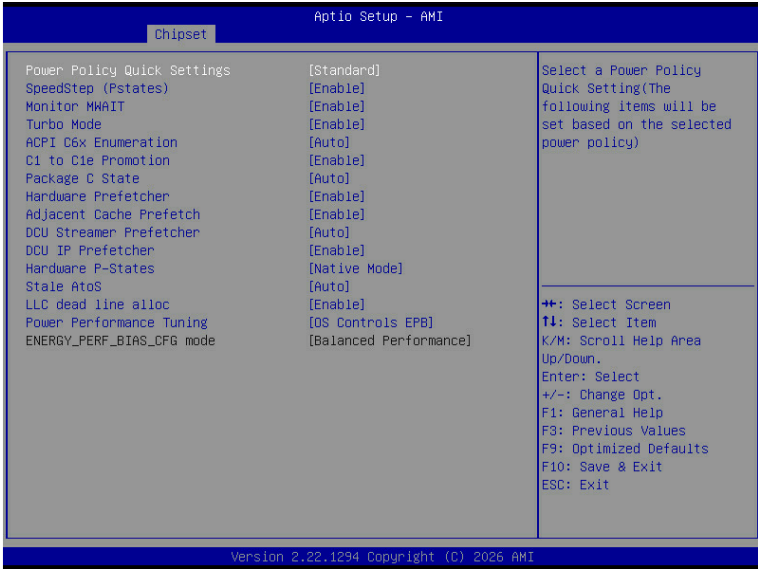


Parameter	Description
Runtime Error Logging	
System Errors	Enable/Disable system error logging function. Options available: Enable, Disable. Default setting is Enable .
S/W Error Injection Support	Enable/Disable software injection error logging function. Options available: Enable, Disable. Default setting is Disable .
Whea Settings	Press [Enter] to configure advanced items. ◆ WHEA (Windows Hardware Error Architecture) Support – Enable/Disable WHEA Support. – Options available: Enable, Disable. Default setting is Enable.
Memory Error Enabling	Press [Enter] to configure advanced items. ◆ Memory Corrected Error – Enable/Disable Memory Corrected Error. – Options available: Enable, Disable. Default setting is Enable. ◆ Uncorrected Error disable Memory – 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. ◆ PCIe Error – Enable/Disable PCIe error. – Options available: Enable, Disable. Default setting is Disable. ◆ Uncorrected Error^(Note) – Enables and escalates Uncorrectable/Recoverable Errors to error pins. – Options available: Enable, Disable. Default setting is Enable. ◆ Fatal Error Enable^(Note) – Enables and escalates Fatal Errors to error pins. – Options available: Enable, Disable. Default setting is Enable. ◆ Assert NMI on SERR^(Note) – Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a system error (SERR) occurs. – Options available: Enabled, Disabled. Default setting is Enabled. ◆ Assert NMI on PERR^(Note) – Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a processor bus parity error (PERR) occurs. – Options available: Enabled, Disabled. Default setting is Enabled.

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

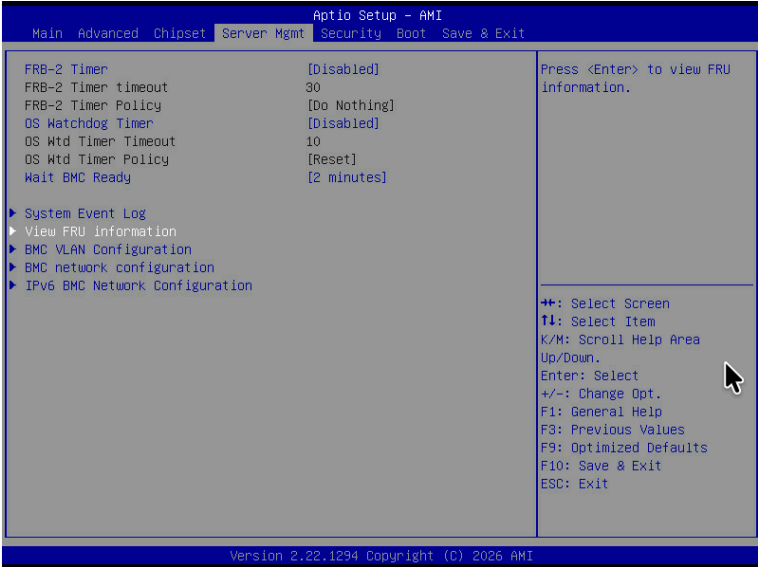
5-3-9 Power Policy



Parameter	Description
Power Policy Quick Settings	Selects a Power Policy Quick Setting. Options available: Standard, Best Performance, Energy Efficient. 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: Enable, Disable. Default setting is Enable .
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: Enable, Disable. Default setting is Enable .
CPU C6 report	Enable/Disable the BIOS to enable the report from the CPU C6 state (ACPI C3) to the OS. Options available: Disable, Enable, Auto. Default setting is Auto .
Enhanced Halt State (C1E)	Enable/Disable the C1E support for lower power consumption. Takes effect after reboot. Options available: Enable, Disable. Default setting is Enable .
Package C State	Configures the C-State package limit. Options available: C0/C1 state, C2 state, C6(non Retention) state, C6(Retention) state, No Limit, Auto. Default setting is Auto .

Parameter	Description
Enable LP [Global]	Enables Logical processor (Software Method to Enable/Disable Logical Processor threads). Options available: ALL LPs, Single LP. Default setting is ALL LPs .
Hardware Prefetcher	Options available: Enable, Disable. Default setting is Enable .
Adjacent Cache Prefetch	Options available: Enable, Disable. Default setting is Enable .
DCU Streamer Prefetcher	Options available: Enable, Disable. Default setting is Enable .
Intel® VT for Directed I/O	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 .

5-4 Server Management Menu



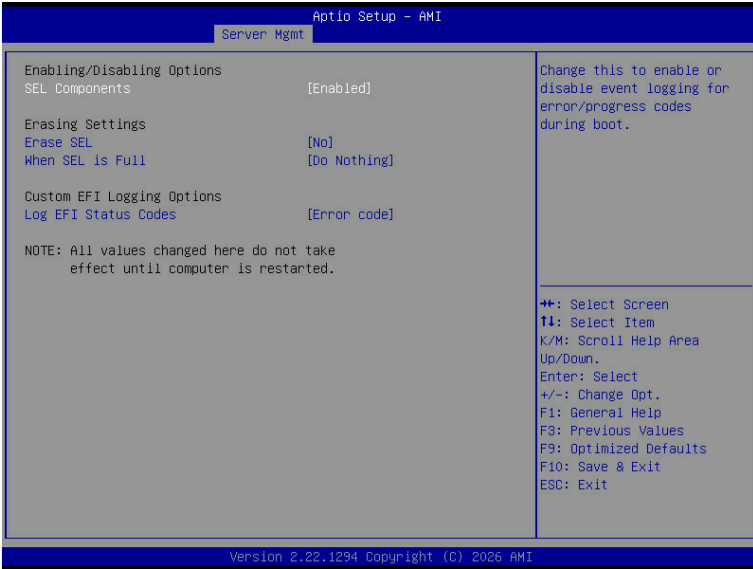
Parameter	Description
FRB-2 Timer	Enable/Disable FRB-2 timer (POST timer). Options available: Enabled, Disabled. Default setting is Enabled .
FRB-2 Timer ^(Note1) timeout	Configures the FRB2 Timer timeout. The value is between 1 to 30 minutes. Default setting is 6 minutes .
FRB-2 Timer Policy ^(Note1)	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.

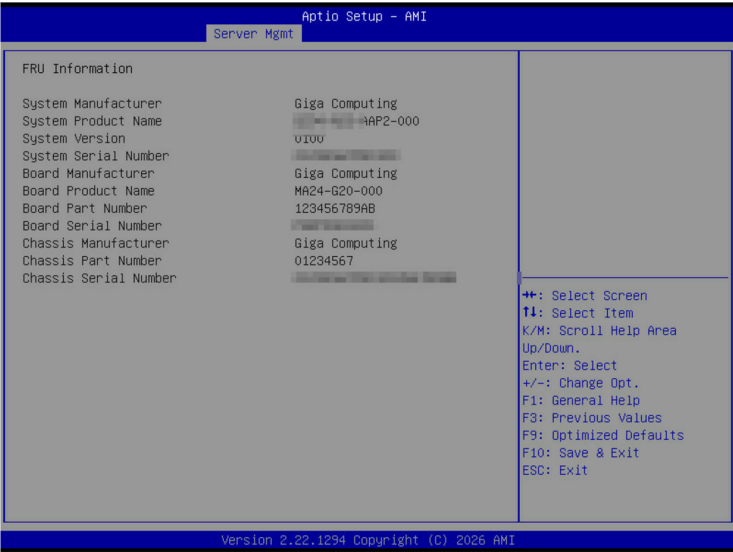
5-4-1 System Event Log



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 .

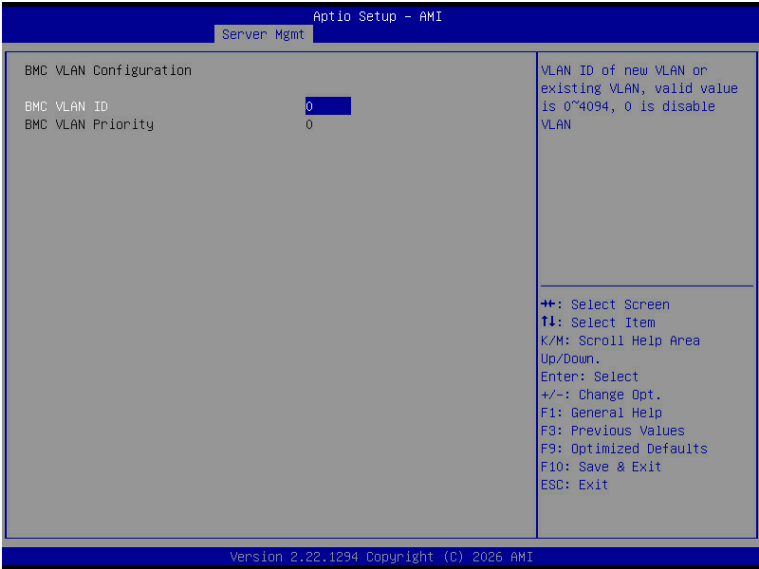
5-4-2 View FRU Information

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.



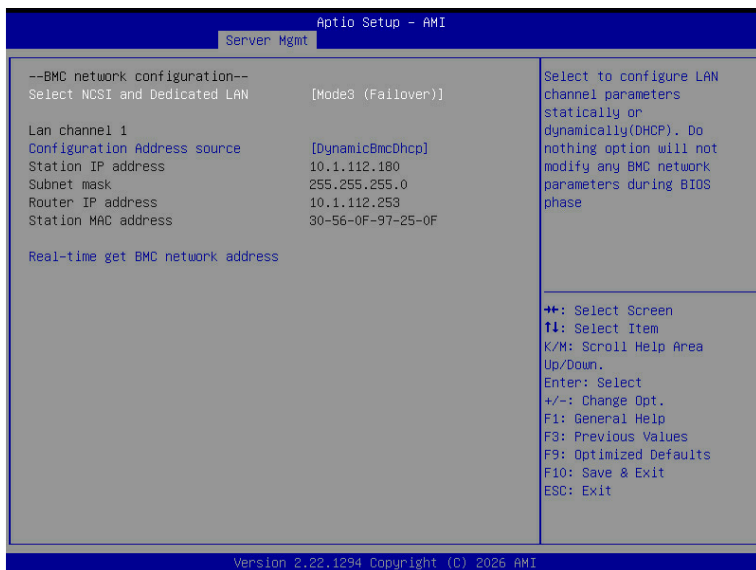
(Note) The model name will vary depends on the product you purchased

5-4-3 BMC VLAN Configuration



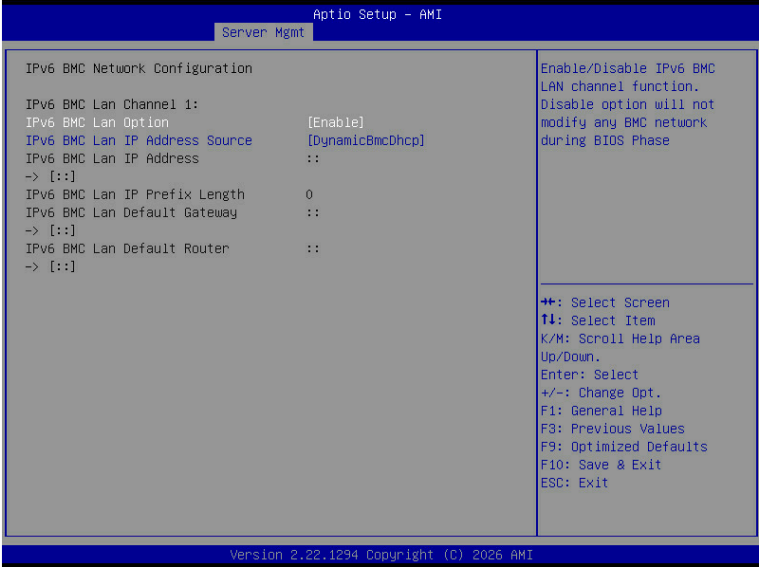
Parameter	Description
BMC VLAN Configuration	
BMC VLAN ID	Select to configure BMC VLAN ID. The valid range is from 0 to 4094. When set to 0, BMC VLAN ID will be disabled.
BMC VLAN Priority	Select to configure BMC VLAN Priority. The valid range is from 0 to 7. When BMC VLAN ID is set to 0, BMC VLAN Priority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

5-4-4 BMC Network Configuration



Parameter	Description
BMC network configuration	
Select NCSI and Dedicated LAN	Options available: Do Nothing, Model1(Dedicated), Model2(NCSI), Mode3(Failover). Default setting is Do Nothing .
Lan Channel 1	
Configuration Address source	Selects to configure LAN channel parameters statically or dynamically (DHCP). 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.

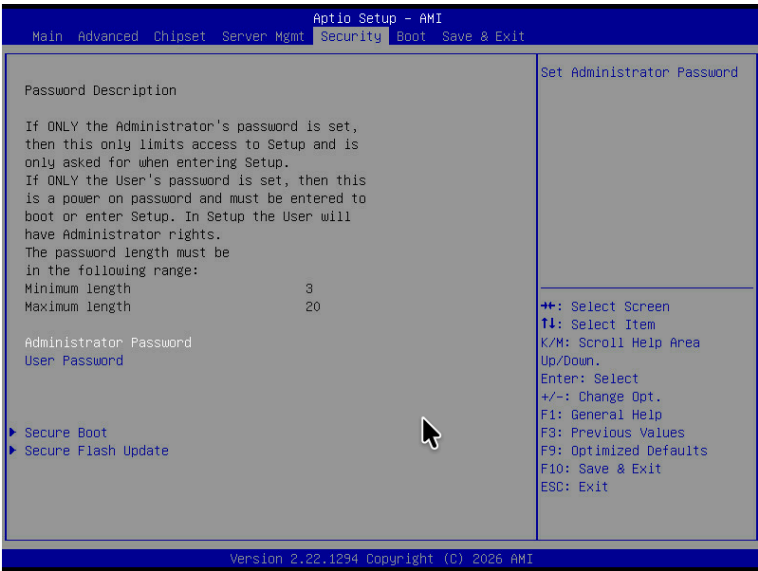
5-4-5 IPv6 BMC Network Configuration



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 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.



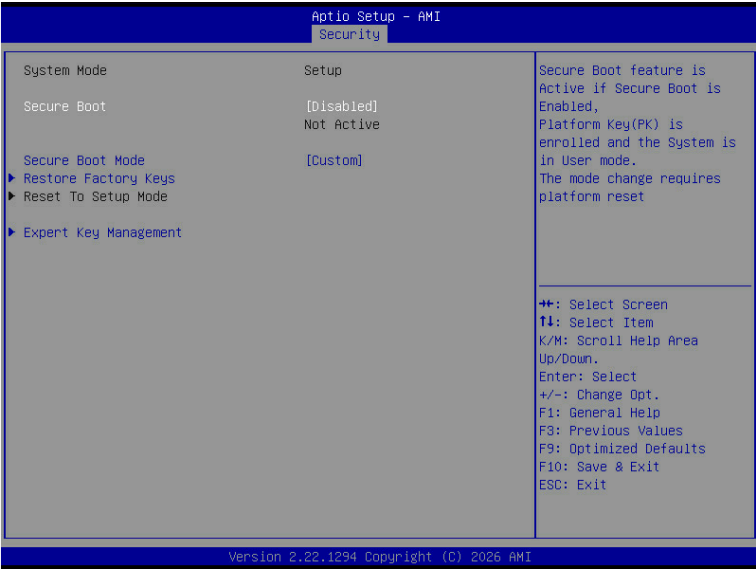
There are two types of passwords that you can set:

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



Parameter	Description
System Mode	Displays if the system is in User mode or Setup mode.
Secure Boot	Enable/ Disable the Secure Boot function. 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 the Operating System 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.

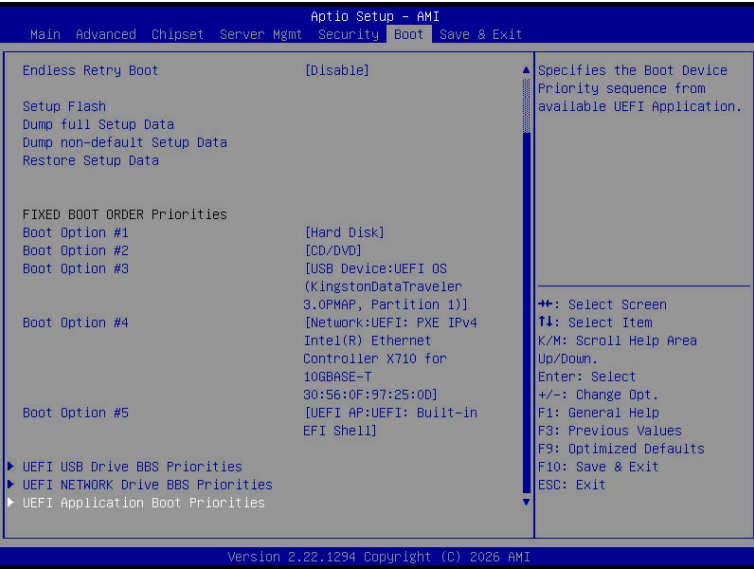
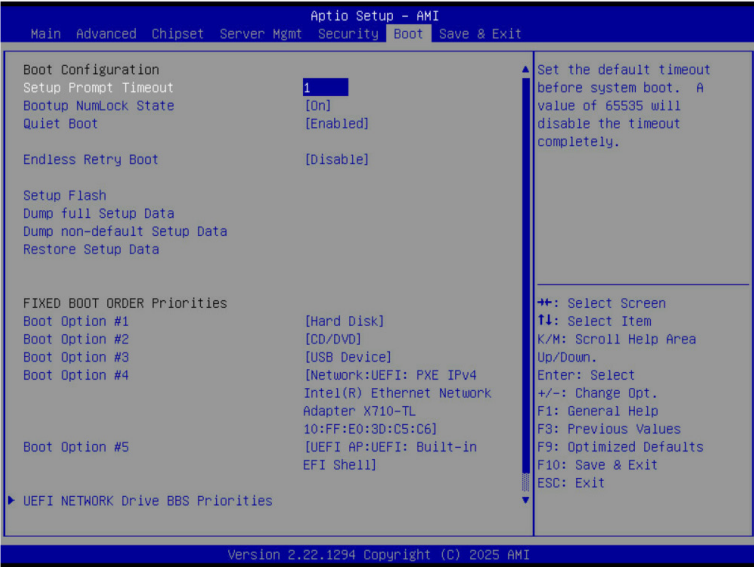
(Note) Advanced items prompt when this item is set to **Custom**.

Parameter	Description
Key Management	Press [Enter] to configure advanced items. Please note that this item is configurable when Secure Boot Mode is set to Custom. ◆ Factory Key Provision – Allows to provision factory default Secure Boot keys when system is in Setup Mode. – Options available: Enabled, Disabled. Default setting is Disabled. ◆ Restore Factory Keys – Installs all factory default keys. It will force the system in User Mode. – Options available: Yes, No. ◆ Reset To Setup Mode – Reset the system to Setup Mode. – Options available: Yes, No. ◆ Enroll Efi Image – Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db). ◆ Export Secure Boot variables – Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device. ◆ Secure Boot variable – Displays the current status of the variables used for secure boot. ◆ Platform Key (PK) – Displays the current status of the Platform Key (PK). – Press [Enter] to configure a new PK. – Options available: Update. ◆ Key Exchange Keys (KEK) – Displays the current status of the Key Exchange Key Database (KEK). – Press [Enter] to configure a new KEK or load additional KEK from storage devices. – Options available: Update, Append. ◆ Authorized Signatures (DB) – Displays the current status of the Authorized Signature Database. – Press [Enter] to configure a new DB or load additional DB from storage devices. – Options available: Update, Append. ◆ Forbidden Signatures (DBX) – Displays the current status of the Forbidden Signature Database. – Press [Enter] to configure a new dbx or load additional dbx from storage devices. – Options available: Update, Append.

Parameter	Description
Key Management (continued)	♦ Authorized TimeStamps (DBT) – 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 – 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

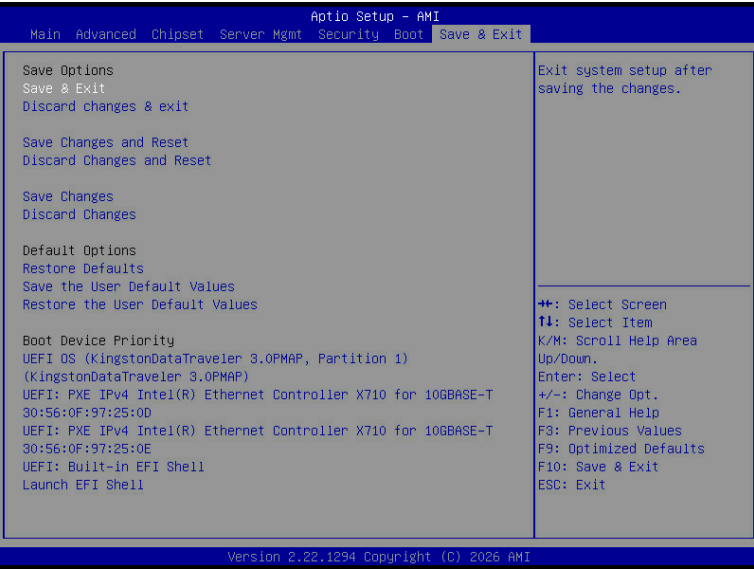
The Boot menu allows you to set the drive priority during system boot-up. BIOS setup will display an error message if the legacy drive(s) specified is not bootable.



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 .
Endless Retry Boot	Options available: Disable, Enable. Default setting is Disable .
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.
FIXED BOOT ORDER	
Priorities	
Boot Option #1 / #2 / #3 / #4 / #5	Press [Enter] to configure the boot order priority. By default, the server searches for boot devices in the following sequence: 1. Hard drive. 2. CD-COM/DVD drive. 3. USB device. 4. Network. 5. UEFI.
UEFI 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 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	

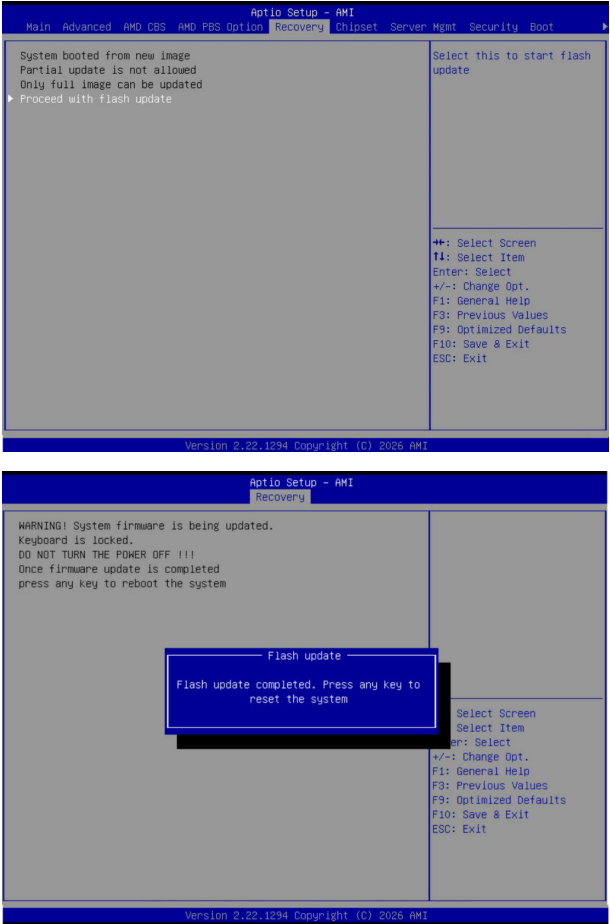
Parameter	Description
Restore Defaults	Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly. Options available: Yes, No.
Save the User Default Values	Saves the changes made as the user default settings. Options available: Yes, No.
Restore the User Default Values	Loads the user default settings for all BIOS setup parameters. Options available: Yes, No.
Boot Device Priority	Press [Enter] to configure the device as the boot-up drive.
Launch EFI Shell	Attempts to Launch EFI Shell application (Shell.efi) from one of the available file system devices.

5-8 BIOS Recovery

The system has an embedded recovery technique. In the event that the BIOS becomes corrupt the boot block can be used to restore the BIOS to a working state. To restore your BIOS, please follow the instructions listed below:

Recovery Instruction:

1. Copy the XXX.rom to USB diskette.
2. Setting BIOS Recovery jump to enabled status.
3. Boot into BIOS recovery.
4. Run Proceed with flash update.
5. BIOS updated.



5-9 BIOS POST Beep code (AMI standard)

5-9-1 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

5-9-2 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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