Lanner

Network Appliance Platforms

Hardware Platforms for Network Computing

NCA-5330
User Manual

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About this Document

This manual describes the overview of the various functionalities of this product, and the information you need to get it ready for operation. It is intended for those who are:

- responsible for installing, administering and troubleshooting this system or Information Technology professionals.
- assumed to be qualified in the servicing of computer equipment, such as professional system integrators, or service personnel and technicians.

The latest version of this document can be found on Lanner's official website, available either through the product page or through the Lanner Download Center page with a login account and password.

Icon Description

The icons are used in the manual to serve as an indication of interest topics or important messages.

Icon	Usage
 **Note or Information**	This mark indicates that there is something you should pay special attention to while using the product.
 **Warning or Important**	This mark indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources

To obtain additional documentation resources and software updates for your system, please visit the Lanner Download Center. As certain categories of documents are only available to users who are logged in, please be registered for a Lanner Account at http://www.lannerinc.com/ to access published documents and downloadable resources.

Technical Support

In addition to contacting your distributor or sales representative, you could submit a request at our Lanner Technical Support and fill in a support ticket to our technical support department.

Documentation Feedback

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Acknowledgment

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Note

1. An unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.
2. Use only shielded cables to connect I/O devices to this equipment.
3. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Important

1. Operations in the 5.15-5.25GHz band are restricted to indoor usage only.
2. This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

Safety Guidelines

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit; always check the circuit.

Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.
- Portez des lunettes de sécurité pour protéger vos yeux.
- N'effectuez aucune action qui pourrait créer un danger pour d'autres ou rendre l'équipement dangereux.
- Coupez complètement l'alimentation en éteignant l'alimentation et en débranchant le cordon d'alimentation avant d'installer ou de retirer un châssis ou de travailler à proximité de sources d'alimentation.
- Ne travaillez pas seul si des conditions dangereuses sont présentes.
- Ne considérez jamais que l'alimentation est coupée d'un circuit, vérifiez toujours le circuit. Cet appareil génère, utilise et émet une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

Lithium Battery Caution

- There is risk of explosion if the battery is replaced by an incorrect type.
- Dispose of used batteries according to the instructions.
- Installation should be conducted only by a trained electrician or only by an electrically trained person who knows all installation procedures and device specifications which are to be applied.
- Do not carry the handle of power supplies when moving to another place.
- Please conform to your local laws and regulations regarding safe disposal of lithium battery.
- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.
- Leaving a battery in an extremely high temperature environment can result in an explosion or the leakage of flammable liquid or gas.
- A battery subjected to extremely low air pressure may result in an explosion or the leakage of flammable liquid or gas.

Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- Jetez les piles usagées conformément aux instructions.
- L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Sécurité de fonctionnement

- L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.
- Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

Mounting Installation Precautions

The following should be put into consideration for rack-mount or similar mounting installations:

- Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- The installation of this product must be performed by trained specialists; otherwise, a non-specialist might create the risk of the system's falling to the ground or other damages.
- Lanner Electronics Inc. shall not be held liable for any losses resulting from insufficient strength for supporting the system or use of inappropriate installation components.
- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Grounding - Reliable grounding of rack mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).
- Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
- The machine can only be used in a restricted access location and must be installed by a skilled person.

Warning

- Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts.
- Product shall be used with Class 1 laser device modules.

Avertissement

- Équipement de classe I. Ce matériel doit être relié à la terre. La fiche d'alimentation doit être raccordée à une prise de terre correctement câblée. Une prise de courant mal câblée pourrait induire des tensions dangereuses sur des parties métalliques accessibles.
- Le produit doit être utilisé avec des modules de dispositifs laser de classe 1.

Electrical Safety Instructions

Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire (green-and-yellow) is required and the part connecting the conductor must be greater than 4 mm2 or 10 AWG.

Consignes de sécurité électrique

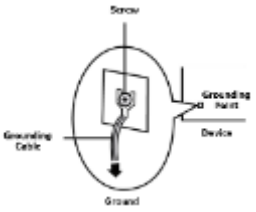
- Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes

du bruit externe et réduire les risques d'électrocution en cas de foudre.

- Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm2 ou 10 AWG.

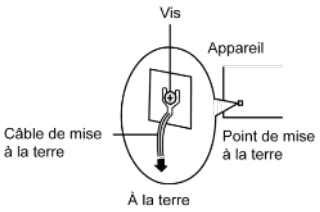
Grounding Procedure for This Device

- Connect the grounding cable to the ground.
- The protection device for the DC power source must provide 40A current.
- This protection device must be connected to the power source before DC power.



Procédure de mise à la terre l'équipement

- Branchez le câble de mise à la terre à la terre.
- L'appareil de protection pour la source d'alimentation CC doit fournir 40A de courant.
- Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation CC.



The product is intended to be supplied by UL listed DC power source with rated 46-72Vdc, 40A minimum, maximum operating ambient is 40 degree C minimum and the altitude of operation = 5000m minimum. (The power cable should be used at 8 AWG minimum.)

Table of Contents

CHAPTER 1: PRODUCT OVERVIEW

The NCA-5330 makes available accelerated workloads with its high-per-core-performance, reduced energy consumption and minimized TCO: its outstanding hardware features make it the ideal platform for application delivery, mobile edge computing, WAN optimization, DPI/IPS/IDS, NFV/SDN and NGFW/UTM.

Package Content

Your package contains the following items:

- 1x NCA-5330 Network Security Platform
- 1x RJ45 Console Cable, 1x RJ45 LAN Cable
- 2x SATA(SAS) Cables, 2x SATA Power Cables
- 8x HDD screws
- 1x CPU Heatsink
- 2x Power Cable
- 1x Short Ear Rack mount kit with screws

Note If you should find any components missing or damaged, please contact your dealer immediately for assistance.

Optional Accessories

Model No.	Description
IAC-TPM04A	TPM Module (SPI) Kit
IAC-AST2600D	IPMI Module Card Kit for NCSI Share (NCA-5330)
Rear PCIe Kit	Rear PCIe*8 bracket and Gen5 High-speed Cable (4x MCIO to PCIe 5.0) Kit for PCIe Expansion (NCA-5330A)
0P1W000130010	1300W AC Power Module (Default: Two units pre-installed)
0P1W00018801R	1600W DC Power Module
080W000886000	DC Power Cable
098W000300014	Slide Rackmount Kit for 1U chassis (438mm wide)
PSFA740-010	Short Ear Rackmount Kit with Screws
Fan Kit	High RPM Hot Swap Fan Kit for NCA-5330A

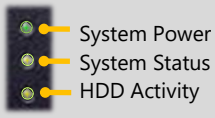
Ordering Information

SKU No.	Main Features
NCA-5330A	AMD Zen4 Genoa/Bergamo, 128C, 280W-360W CPU, 1x GbE RJ45, 4x NIC Module Slots, 1x RJ45 Console

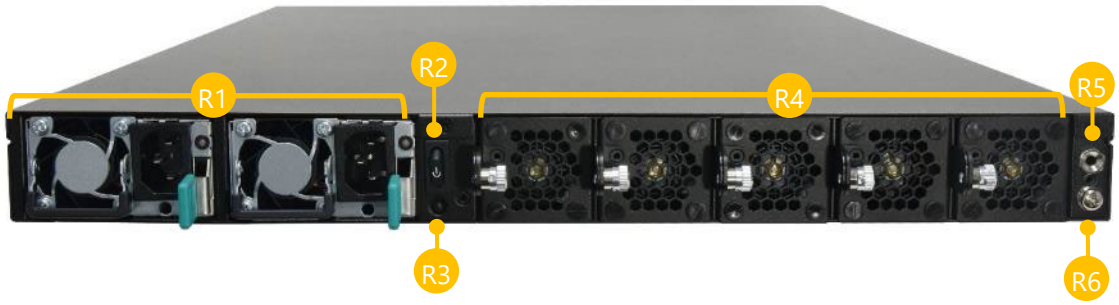
System Specifications

Form Factor		1U 19" Rackmount
Platform	Processor Options	AMD EPYC 9004 Series Processors (Codenamed Genoa/Bergamo)
	CPU Socket	AMD SP5
	CPU TDP	360W
	Chipset	SoC
	Security Acceleration	AMD Enhanced Security
BIOS		AMI SPI Flash BIOS
System Memory	Technology	DDR5 4800MHz R-DIMM
	Max. Capacity	Up to 512GB
	Socket	8x 288-Pin DIMM Socket
Networking	Ethernet Ports	1x GbE RJ45 Port, Intel i210-AT (Support PXE; Default Disabled)
	NIC Module Slot	4x NIC Module Slots
LOM	I/O Interface	1x Shared with MGT RJ45 Port (Optional)
	OPMA slot	Yes, Socket Type
I/O Interface	Reset Button	1x Reset Button (Default Software Reset Control by GPIO)
	LED	Power/Status/Storage , refer to **Appendix A**
	Power Button	1x ATX Power Switch
	Console	1x RJ45 Console Port
	USB	2x USB 3.0 Port
	Power Input	AC Power Inlet on PSU
Storage	HDD/SSD Support	2x 2.5" Internal SSD/HDD Note: Hot-swap capability is not supported
	Onboard Slots	1x M.2 2280 M-Key (SATA III/PCIe*5)
Expansion	PCIe	1x PCIE*8 HH/HL (Optional)
Miscellaneous	Watchdog	Yes
	Internal RTC w/ Li Battery	Yes
	TPM	N/A (Default); TPM 2.0 (Optional)
Cooling	Processor	Passive CPU Heatsink
	System	5x Individual Hot-swappable Cooling Fans
Environmental Parameters	Temperature	0~40°C Operating; -20~70°C Non-Operating
	Humidity (RH)	5~90% Operating; 5~95% Non-Operating
System Dimensions	Size (WxDxH)	438 x 650 x 44 mm
	Weight	11.27kg
Package Dimensions	Size (WxDxH)	841 x 588 x 215mm
	Weight	17.59kg
Power	Type/Watts	1300W, 1+1 ATX Redundant PSU
	Input	AC 100V~240V @47~63Hz
OS Support		Linux
Approvals and Compliance		RoHS Directive (EU) 2015/863, CE/FCC Class A, UL

Front Panel

No.	Description	
F1	Reset button	1x Reset Button
F2	LED Indicators	 System Power System Status HDD Activity
F3	USB Port	2x USB 3.0 Ports
F4	LAN Port	1x RJ45 LAN Port w/ LED for MGMT & Share w/ LOM (Optional)
F5	Console Port	1x RJ45 Console Port
F6	NIC Module Slot	4x NCS2 Slim Type NIC Module; or 2x N2S NIC Module (By Project)

Rear Panel

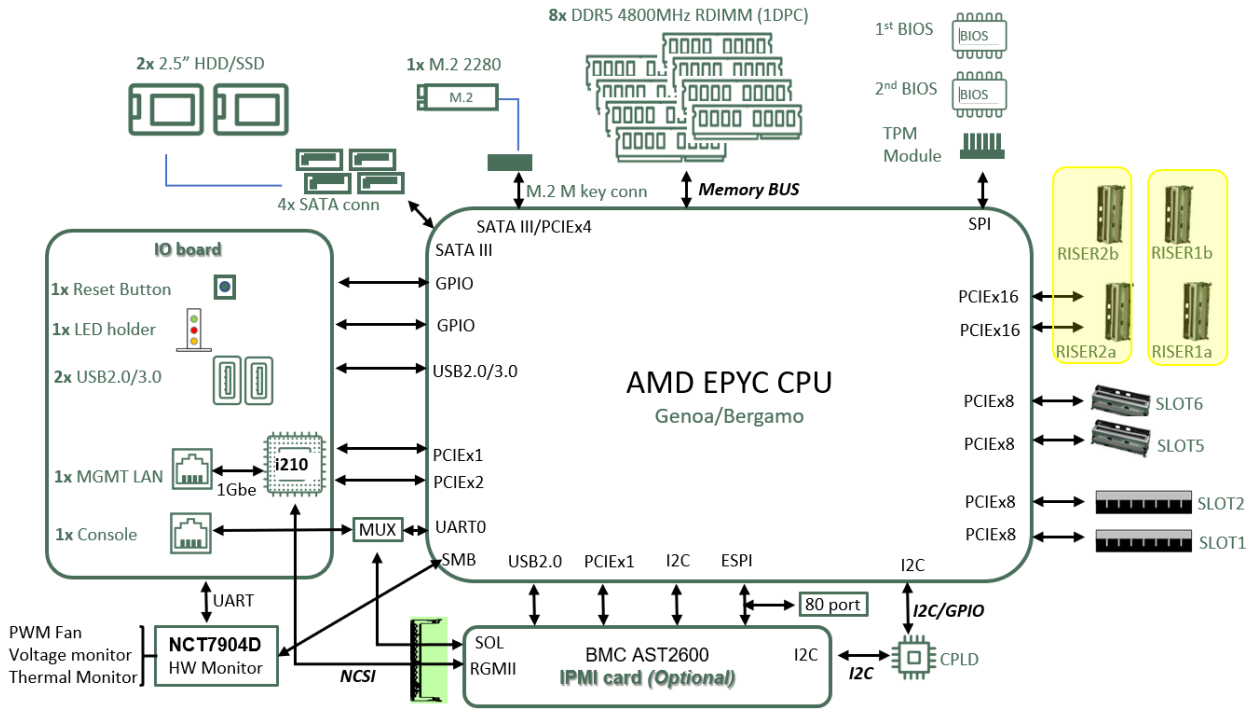


No.	Description	
R1	Power Supply	2x 1300W AC 1+1 Redundant CRPS Power Supply
R2	Power Switch	1x Power Switch I/O Button
R3	Alarm Reset	1x Alarm Reset Button
R4	Fans	5x Hot-swappable Cooling Fans
R5	ESD Jack	1x ESD Screw Hole
R6	Ground Hole	1x Ground Screw Hole

Motherboard Information

Block Diagram

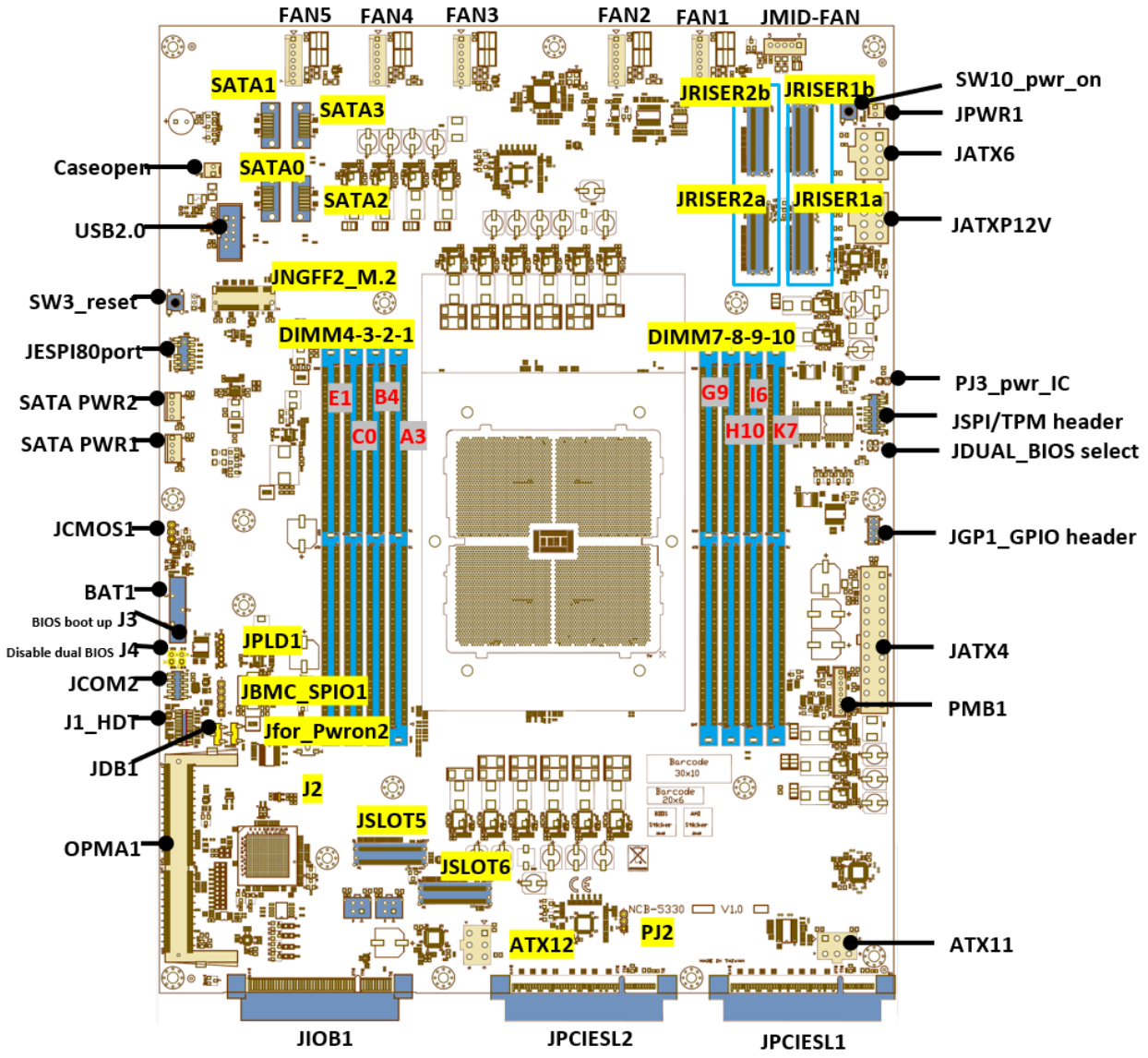
The block diagram indicates how data flows among components on the motherboard.



Note: The Intel NCSI (Network Controller Sideband Interface) is limited to 100Mbps, despite sharing a connection with the Intel i210, which is capable of 1Gbps. This discrepancy occurs because the actual bandwidth for NCSI is constrained to 100Mbps, regardless of the 1Gbps speed capability of the Intel i210.

Motherboard Layout

The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.



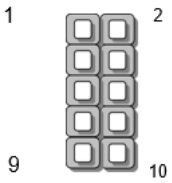
Note: JRISER1a and JRISER1b combined support one PCIEx16 slot, while JRISER1a alone supports a single PCIEx8 slot. The same configuration applies to JRISER2a and JRISER2b. bandwidth for NCSI is constrained to 100Mbps, regardless of the 1Gbps speed capability of the Intel i210.

Internal Jumpers and Connectors

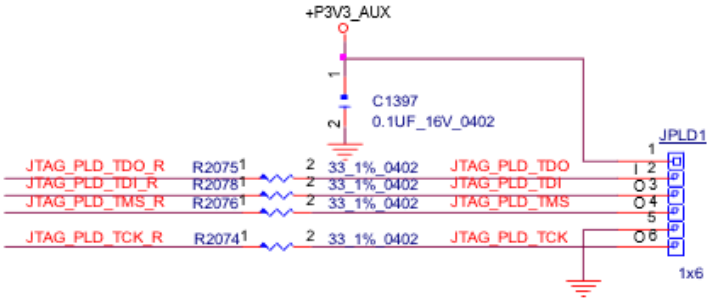
The pin headers on the motherboard are often associated with important functions. With the shunt (Jumper) pushed down on the designated pins (the pin numbers are printed on the circuit board, surrounding the pin header), certain feature can be enabled or disabled. While changing the jumpers, make sure your system is turned off.

JUSB1: USB2.0

Pin No.	Description	Pin No.	Description
1	+P5V_USB1	2	
3	USB20_L_N3	4	
5	USB20_L_P3	6	
7	USBGND1	8	
9	USBGND1	10	

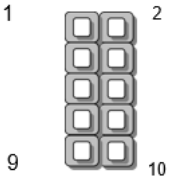


JPLD1: CPLD JTAG



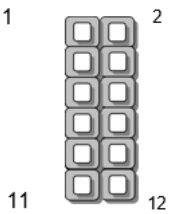
JGP1

Pin No.	Description	Pin No.	Description
1	GPO_B_1	2	GPI_B_1
3	GPO_B_2	4	GPI_B_2
5	GPO_B_3	6	GPI_B_3
7	GPO_B_4	8	GPI_B_4
9	GND	10	GND



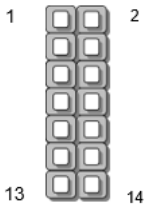
JESPI80PORT1

Pin No.	Description	Pin No.	Description
1	ESPI_CLK	2	ESPI_IO1
3	ESPI_RST#	4	ESPI_IO0
5	ESPI_CS#	6	+P3V3
7	ESPI_IO3	8	NA
9	ESPI_IO2	10	GND
11	+P3V3_AUX	12	



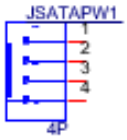
JSPI_TPM1

Pin No.	Description	Pin No.	Description
1	SPI_HD1#	2	SPI_CS1#
3	SPI_CS0#_DUAL	4	+P3V3_SPI_PCH_AUX
5	SPI_MISO_TPM	6	HEADER_SPI_PCH_IO3
7		8	SPI_CLK_TPM
9	GND	10	SPI_MOSI_TPM
11	IRQ_TPM_SPI#_R	12	
13	SPI_TPM_CS0#	14	RST_PLTRST_PLD_B_N



JSATAPW1 & 2

Pin No.	Description
1	+P12V
2	GND
3	GND
4	+P5V

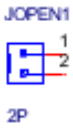


JPWR1

Pin No.	Description
1	GND
2	PWRON#

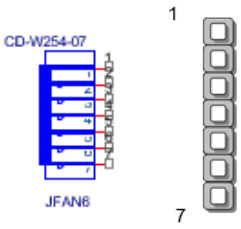
JOPEN1

Pin No.	Description
1	GND
2	PWRON#



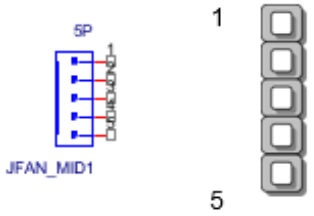
JFAN1~5: FAN Connector

Pin No.	Description
1	GND
2	GND
3	+P12V_FAN
4	+P12V_FAN
5	RPM Sense
6	RPM Sense
7	PWM Status



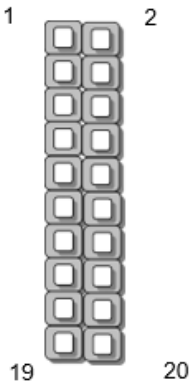
JFAN_MID

Pin No.	Description
1	GND
2	+P12V_FAN
3	RPM Sense
4	RPM Sense
5	PWM Status



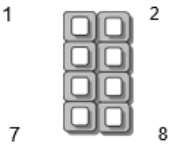
J1: HDT Connector

Pin No.	Description	Pin No.	Description
1	+P_VDD_18_SUS	2	HDT_HDR_TCK
3	GND	4	HDT_HDR_TMS
5	GND	6	HDT_HDR_TDI
7	GND	8	HDT_HDR_TDO
9	HDT_HDR_TRST_L	10	HDT_HDR_PWROK_R
11	HDT_CONN_XTRIG_L6	12	HDT_HDR_RESET_L_R
13	HDT_CONN_XTRIG_L7	14	
15	HDT_CONN_XTRIG_L5	16	HDT_HDR_DBREQ_L
17	GND	18	HDT_HDR_TESTEN
19	+P_VDD_18_SUS	20	HDT_HDR_TCK



J2: BP

Pin No.	Description	Pin No.	Description
1	P0_BP0	2	GND
3	P0_BP1	4	GND
5	P0_BP2	6	GND
7	P0_BP3	8	GND



JDB1: BMC Debug Connector

Pin No.	Description
1	UART5_RX
2	GND
3	UART5_TX

PJ3: PWR IC Coding Power Connector

Pin No.	Description
1	+P3V3_AUX
2	--

PJ2: PWR IC I2C Connector

Pin No.	Description
1	P0_REGS_I2C_SDA
2	P0_REGS_I2C_SCL
3	GND

JBMC_SGPI01

Pin No.	Description
1	SGPIO_DEBUG_PLD_CLK
2	SGPIO_DEBUG_PLD_DOUT
3	SGPIO_DEBUG_PLD_DIN
4	SGPIO_DEBUG_PLD_LD_N
5	GND

SW3

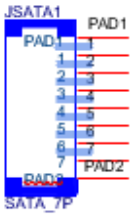
Front Panel RST Button

SW10

Power ON Button

JSATA1~4

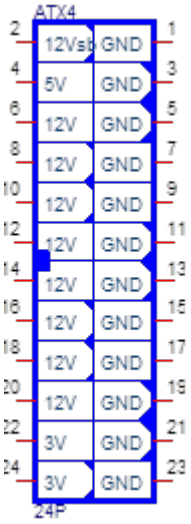
Pin No.	Description
1	GND
2	TX_P
3	TX_N
4	GND
5	RX_N
6	RX_P
7	GND



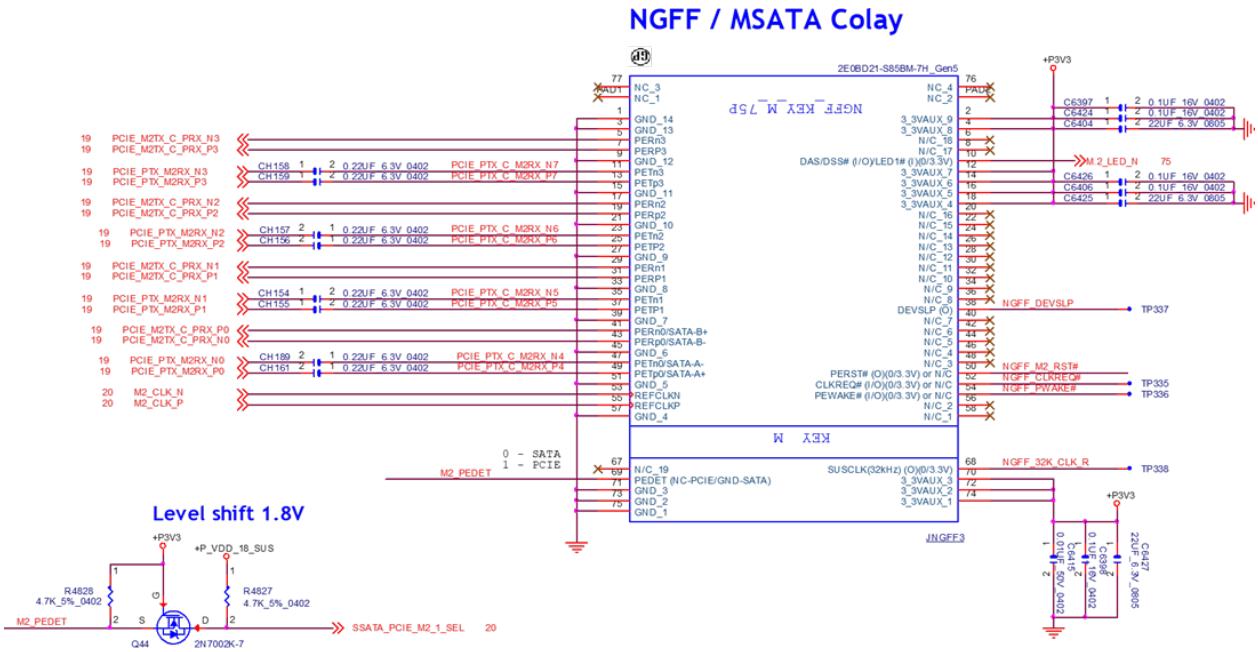
POWER CONNECTOR

ATX4: 24-Pin Power Connector

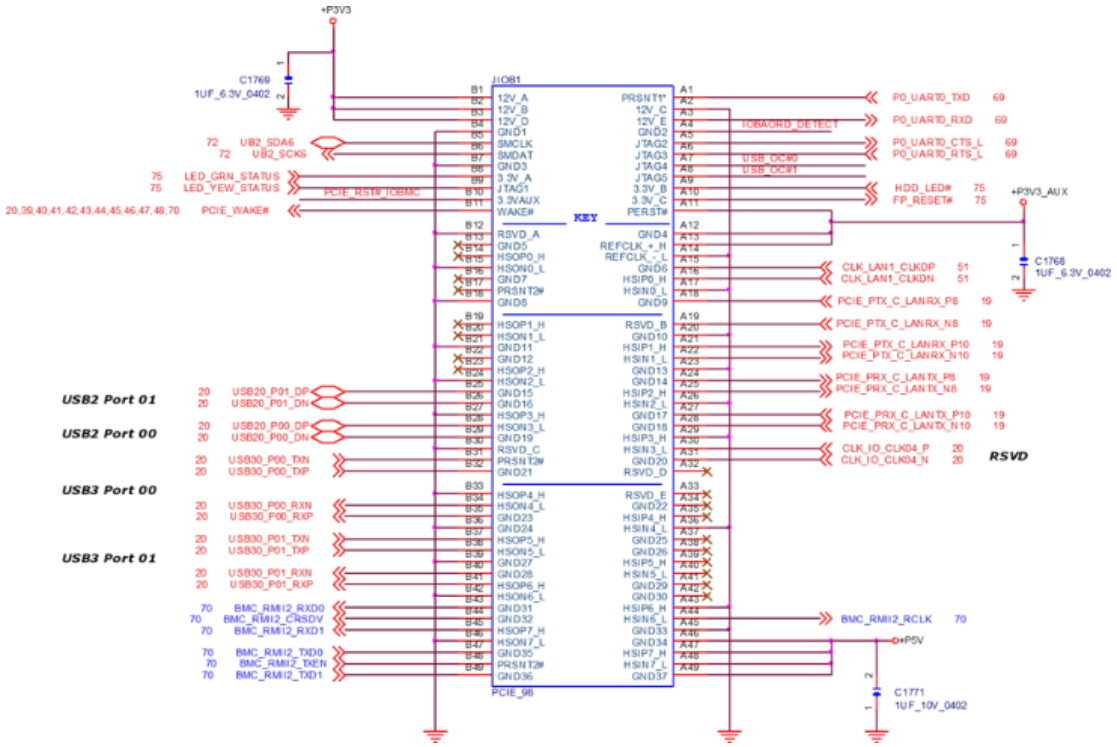
Pin No.	Description	Pin No.	Description
2	12VSB	1	GND
4	5V	3	GND
6	12V	5	GND
8	12V	7	GND
10	12V	9	GND
12	12V	11	GND
14	12V	13	GND
16	12V	15	GND
18	12V	17	GND
20	12V	19	GND
22	3V	21	GND
24	3V	23	GND



JNGFF3

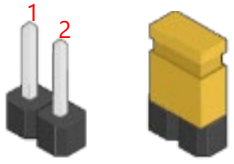
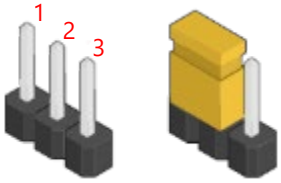
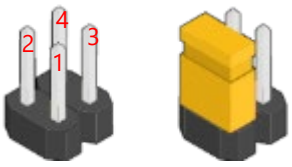


JIOB: IO Board



Jumper Setting

To short the designated pins, push the jumper down on them so that they become **SHORT**. To make the pins setting **OPEN**, simply remove the jumper cap.

2-Pin Header		3-Pin Header		4-Pin Header	
					
Open	Short	Open	(1-2) Jumped	Open	(1-2) Jumped

JFOR_PWRON2 (1-2)

1-2 Disable (Default)

2-3 Enable

Pin No.	Description
1	--
2	FM_FORCE_PWRON_LVC3
3	+P3V3_AUX

JCMOS1 (1-2)

1-2 Normal

2-3 Clear CMOS

Pin No.	Description
1	+VRTC
2	BMC_ASSERT_CLR_CMOS
3	GND

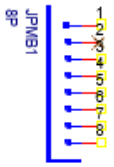
JRST1 (1-2)

1-2 SW Reset (Default)

2-3 HW Reset

Pin No.	Description
1	FP_CPLD_RST#
2	FP_RESET#
3	P0_SYS_RESET_L

JPMB1: PMBUS

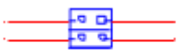


Pin No.	Description	Pin No.	Description
1	P3V3_SB	2	
3	ATX_PSON#	4	GND
5	ATXPWGD	6	PMBUS_CLK
7	PMBUS_DAT	8	PMBUS_ALERT#

J JDUAL1: Chip Select

1-2; 3-4: Flash 1st BIOS (Default)

1-3; 2-4: Flash 2nd BIOS



Pin No.	Description	Pin No.	Description
1	SPI_PCH_MUXED_CS0_N	2	SPI_ CS0#_DUAL
3	SPI_ CS1#_DUAL	4	SPI_PCH_MUXED_CS1_N

J3 (1~2): BIOS Boot Up Select

1-2 Force Boot Up from BIOS2

Pin No.	Description
1	GND
2	BIOS_BOOT_SEL

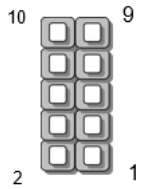
J4 (1~2): Disable Dual BIOS Function

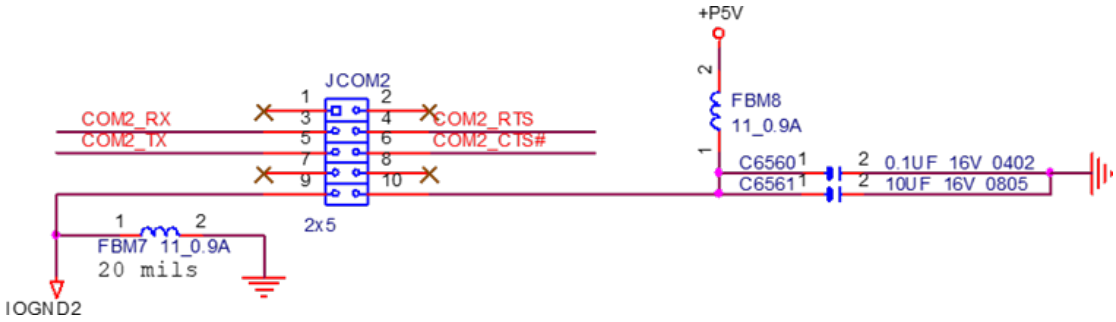
1-2: Disable Dual BIOS

Pin No.	Description
1	GND
2	DUAL_BIOS_SEL

JCOM2

Pin No.	Description	Pin No.	Description
1		2	
3	COM2_RX	4	COM2_RTS
5	COM2_TX	6	COM2_CTS#
7		8	
9	GND	10	+P5V





CHAPTER 2: HARDWARE SETUP

To reduce the risk of personal injury, electric shock, or damage to the system, please remove all power connections to shut down the device completely and wear ESD protection gloves when handling the installation steps.

Opening the Chassis

1. Loosen the two (2) screws on the rear panel.

2. Gently slide the top cover backward a bit.

3. Lift the cover up to remove it.

Installing the CPU

The LGA3647 processor features a complex design that requires assembly with specialized tools and careful handling by professionals. It is highly advised not to adjust, remove, or reinstall the processor yourself. If self-handling is unavoidable, ensure you thoroughly read the instructions provided in this section and possess the requisite knowledge and tools to comply with the guidelines.

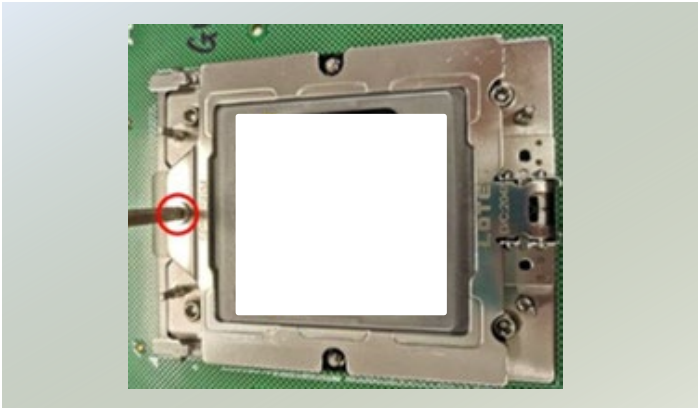
Tools Required

Tool	Description	
Torque Screwdriver (Star T30)	Set to 1.36 N.m. or 12 in-lbf for tightening the nuts which fasten the PHM on the bolster plate.	
ESD Protection (ESD gloves, ESD-safe work surface, etc.)	Throughout the assembly process, it is essential to wear ESD gloves to prevent damage or contamination of electronic parts and enhance your personal safety.	

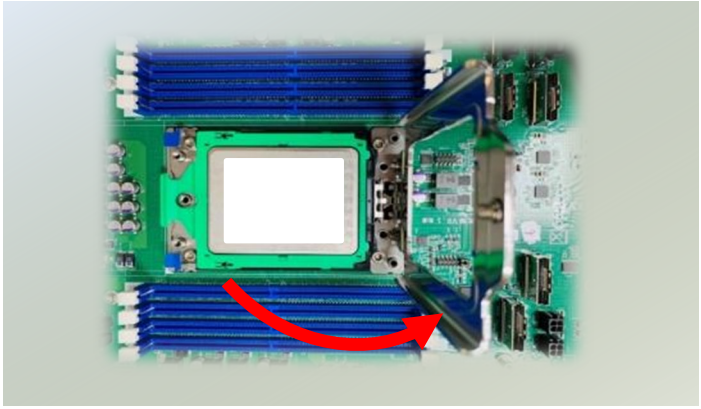
Note: The tool images in this document are for reference only; the actual tools you use may vary.

Mounting the CPU onto the Heat Sink

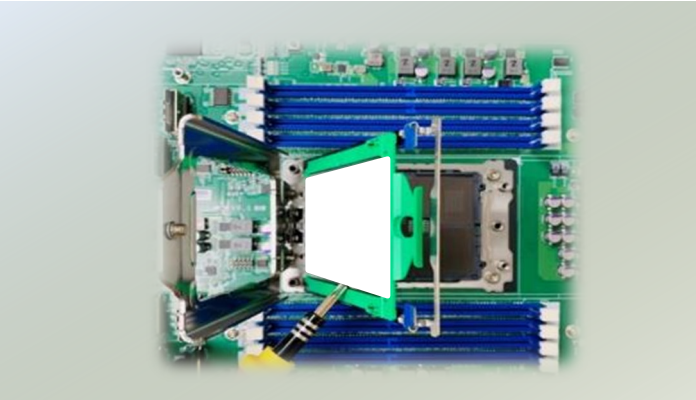
1. Loosen the one (1) screw (circled in red) securing the metal frame, using a Torx T20 screwdriver.



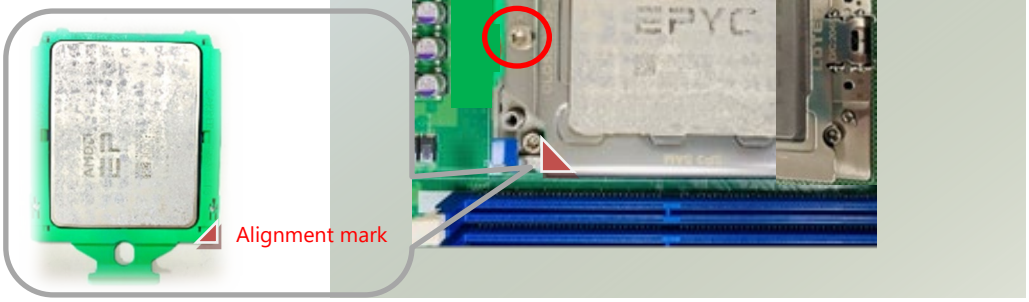
2. Once the screw is loosened, the metal frame will automatically pivot up.



3. Carefully lift the inner frame using the blue tab and remove the protective cap.

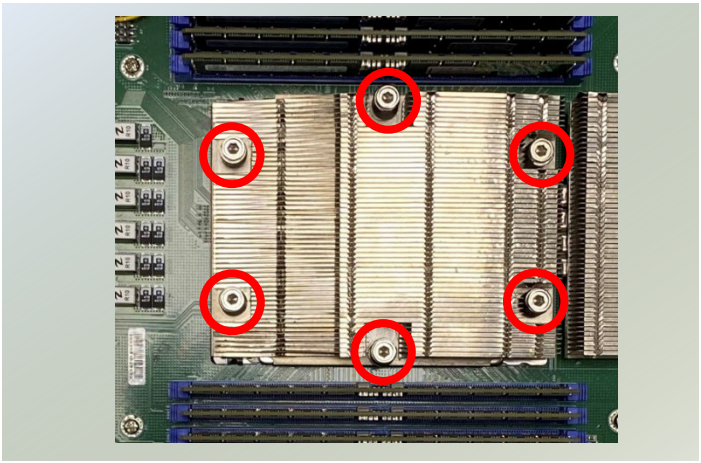


4. Carefully insert the CPU, ensuring that the alignment corner marked on the CPU matches that of the metal frame. Secure the frame with the original one (1) screw.



5. Next, place the hest sink over the CPU and secure with six (6) screws.

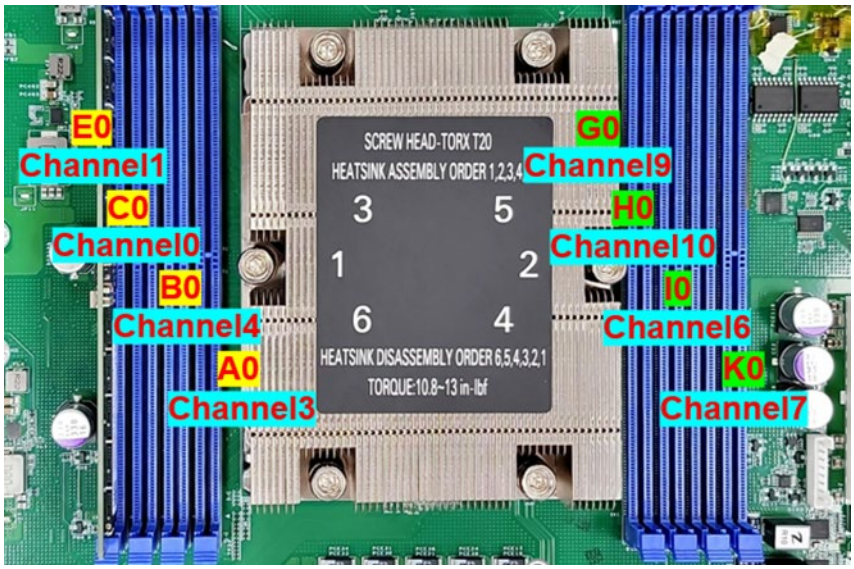
Noted: Ensure all six screws are tightened, as the system will not start up if the screws are not secured.

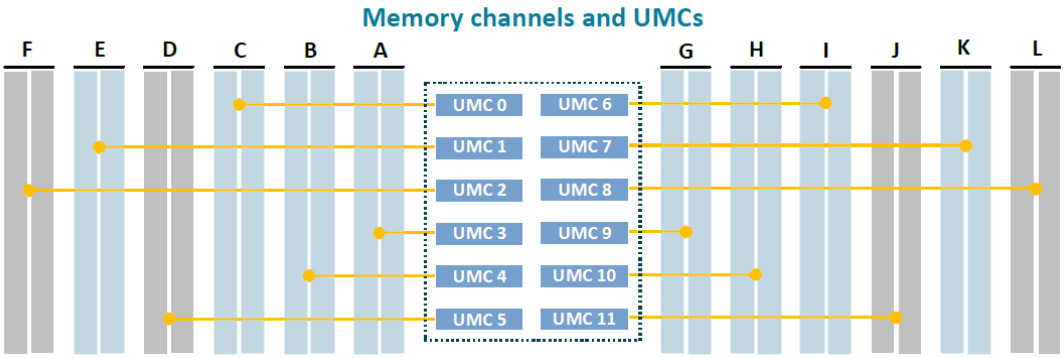


Installing the System Memory

Each 4th Gen AMD EPYC processor (9004 Series) includes 12 Unified Memory Controllers (UMC). Each UMC controls a single memory channel, and each channel can be populated with either 1 DIMMs, as described above. The tables and images in this User Guide are examples for reference purposes only.

UMC#: UMC on the AMD EPYC processor that controls the memory channel.

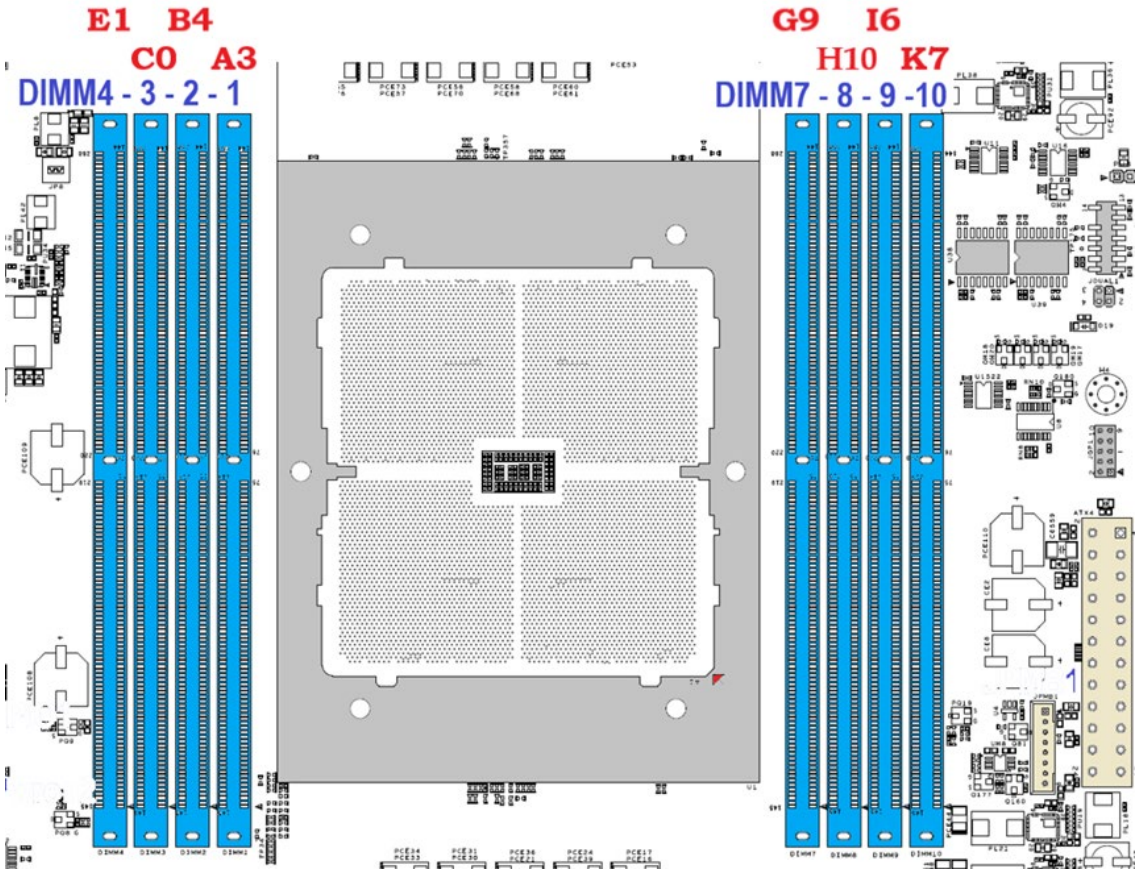




Memory Channel Notation	Memory Channel #	UMC #
A	3	3
B	4	4
C	0	0
E	1	1
G	9	9
H	10	10
I	6	6
K	7	7

Supported System Memory:

Total Slots	8
Number of Channels	8x channels；One DIMM per channel (1DPC)
Supported DIMM Capacity	16GB 1Rx8；32GB 1Rx4；32GB 2Rx8；64GB 2Rx4
Memory Size	Maximum 512GB RDIMM (64GB*8)
Memory Type	DDR5 REG, ECC RDIMM 4800MHz
Minimum DIMM Installed	Each processor requires at least 4 memory modules to boot and run from.



DIMM Population Guidelines:

• All DIMM modules must be RDIMM or RDIMM 3DS module types with the same ECC configuration. Do not mix DIMM module types within a memory channel.

• Do not mix x4 and x8 DIMMs within a memory channel.

• Do not mix 3DS and non-3DS memory modules in a 2DPC system.

Note: Ecosystem memory vendors may not support all of the DIMM and DRAM sizes and configurations listed in this guide.

To obtain a balanced memory configuration:

• Populate each socket with 1, 2, 4, 6, or 8 memory channels.

• Use the same memory configuration in all populated memory channels.

• Use the same DIMM configuration for each processor socket.

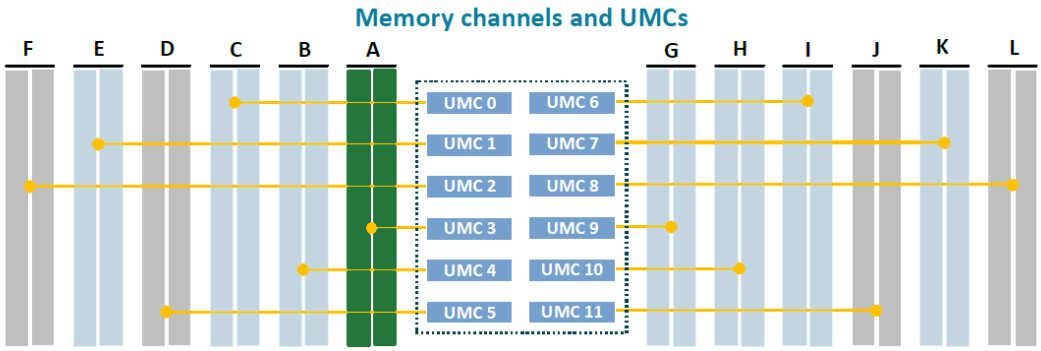
Using a greater number of lower-capacity DIMMs is the best way to boost memory bandwidth compared to this configuration. For example, if you need 128GB of RAM, then consider populating either:

• 2x64GB DIMMs for double the memory bandwidth performance.

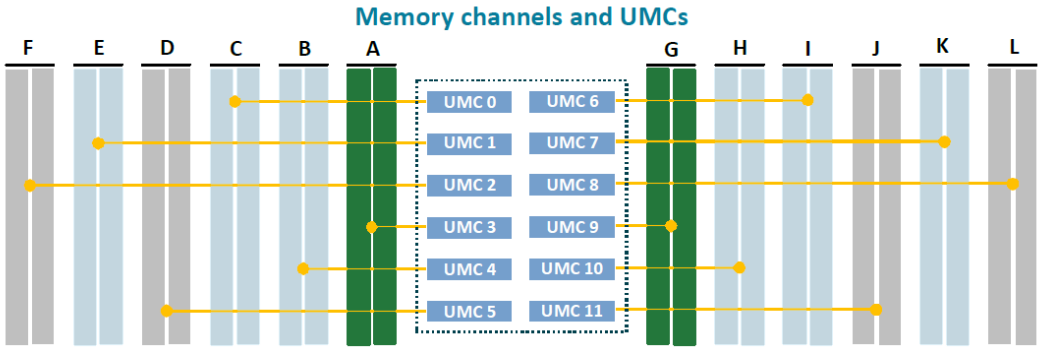
• 4x32GB DIMMs for quadruple the memory bandwidth performance.

• 8x16GB DIMMs for eight times the memory bandwidth performance.

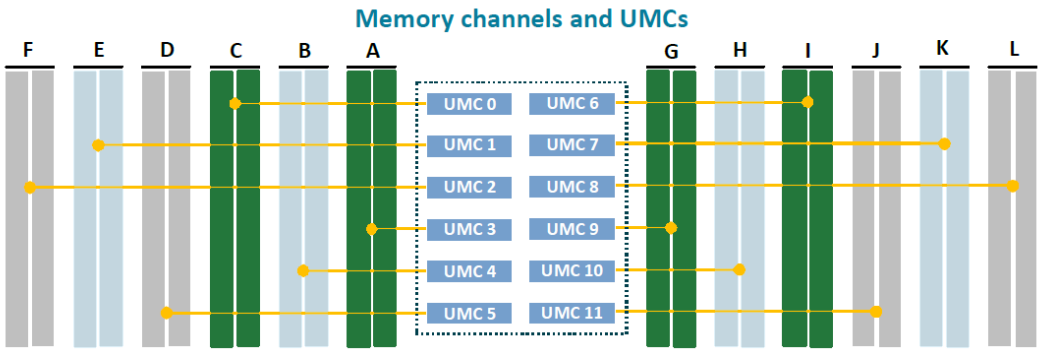
1-Channel Configuration



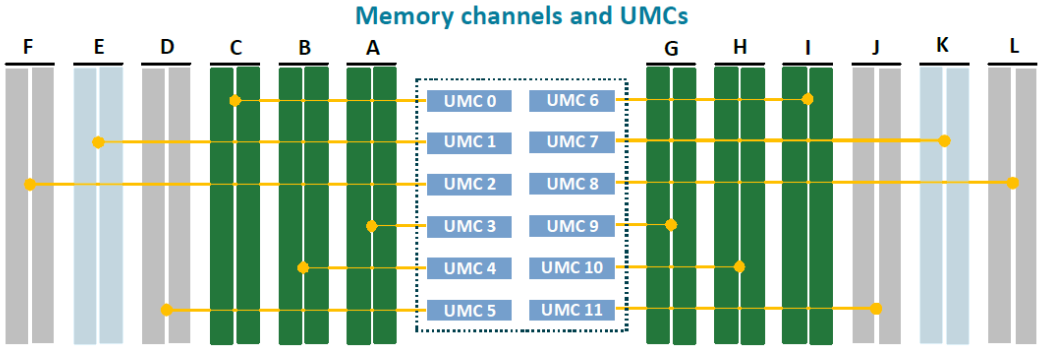
2-Channel Configuration



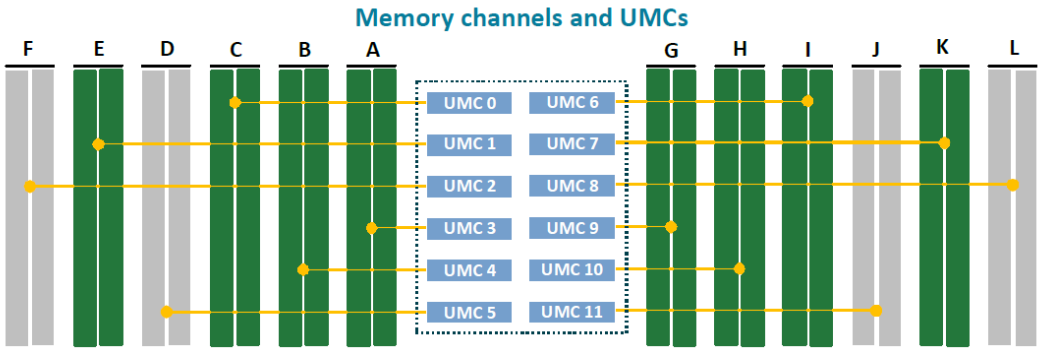
4-Channel Configuration



6-Channel Configuration



8-Channel Configuration



High-Performance Computing (HPC)

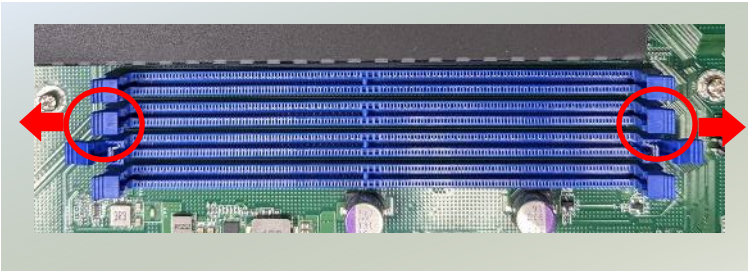
DIMM Size (GB)	# of Memory Channels			
1DPC	2	4	6	8
32	64	128	192	256
64	128	256	384	512
96	192	384	576	768
128	256	512	768	1024
256	512	102	1536	2048

High-Performance Computing (HPC)

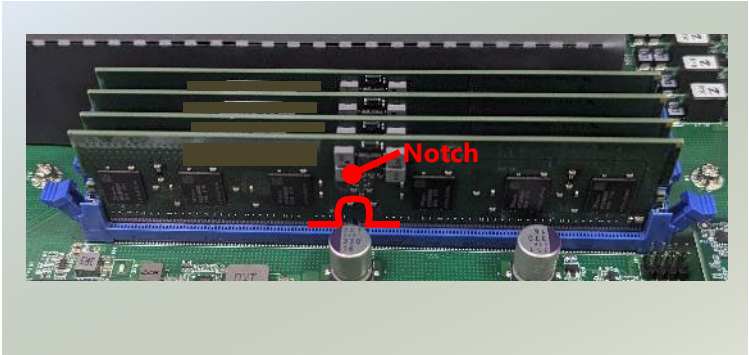
Memory Module Installation Instructions

Please follow the steps below to install the DIMM memory modules.

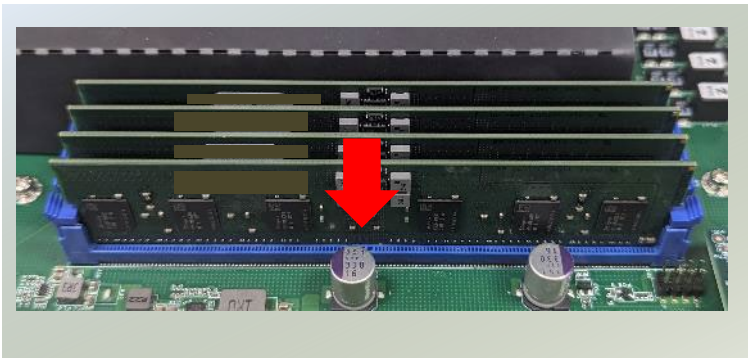
1. Power off the system and open the chassis cover.
2. Pull open the DIMM slot latches.



3. Align the notch of the DIMM module with the socket key in the slot.



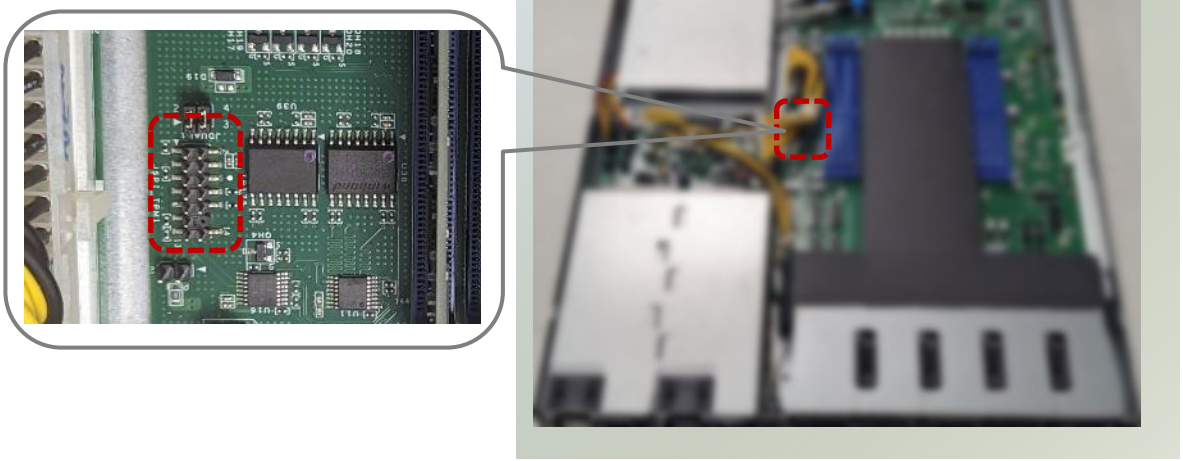
4. Insert the module into the slot until it is firmly seated. (photo image for reference only)



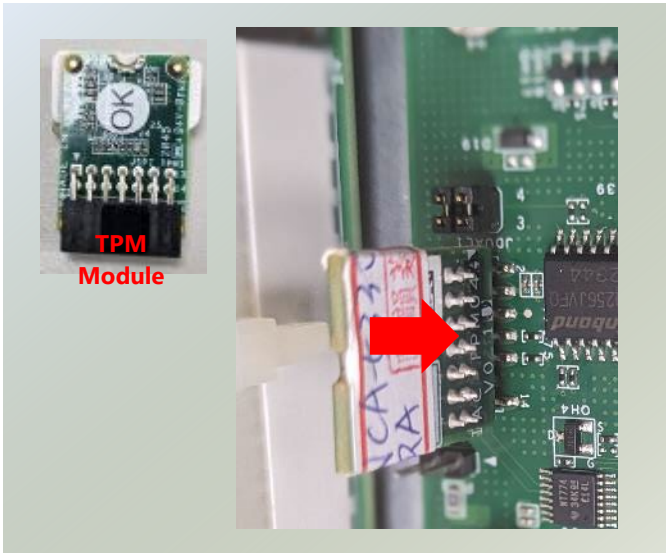
Installing TPM Module (Optional)

The motherboard provides one TPM slot. Follow the procedures below for installing a TPM module.

1. Power off the system and open the chassis cover.
2. Locate the TPM slot on the motherboard.



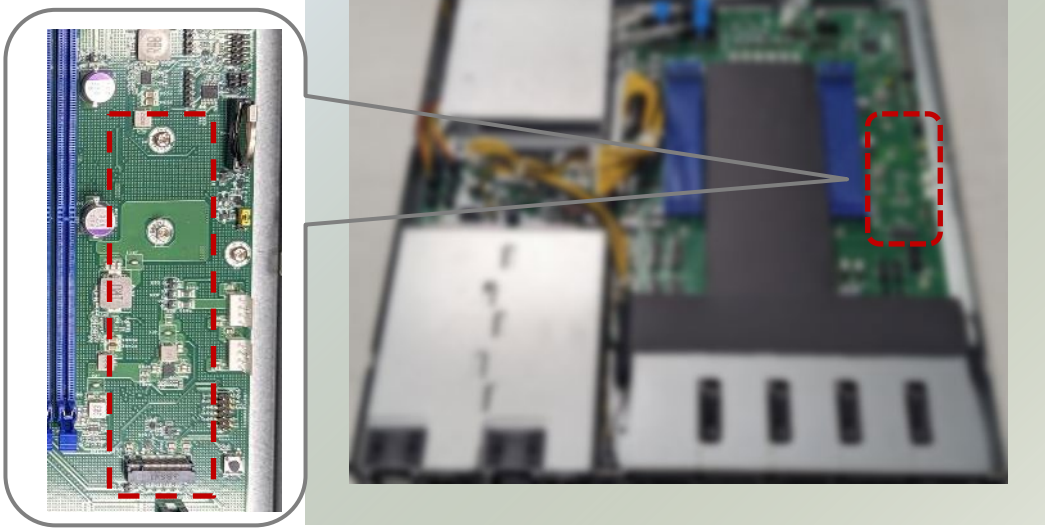
3. Insert the TPM module into the pins until it is fully seated.



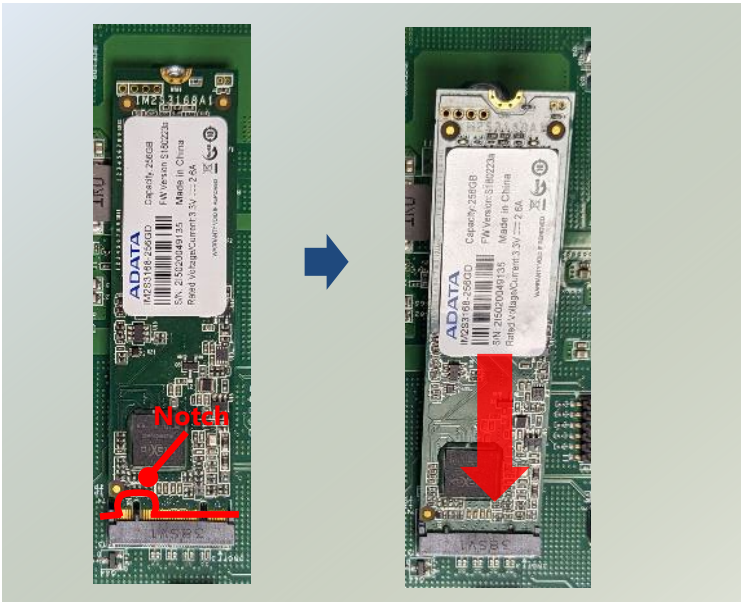
Installing M.2 SSD Memory Card (Optional)

NCA-5330 comes with an additional M.2 SSD memory card slot. Please follow the steps for installation.

1. Power off the system and open the chassis cover
2. Locate the M.2 slot on the motherboard.



3. Align the notch of the M.2 memory card with the socket key in the pin slot.
4. Insert the M.2 memory card pins at 30 degrees into the socket until it is fully seated.

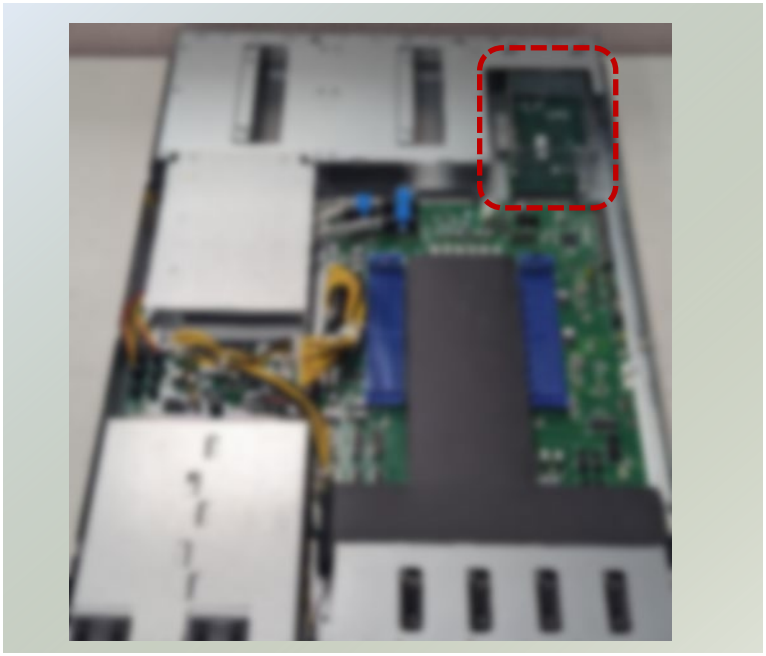


5. Push down on the module and secure it with a screw.

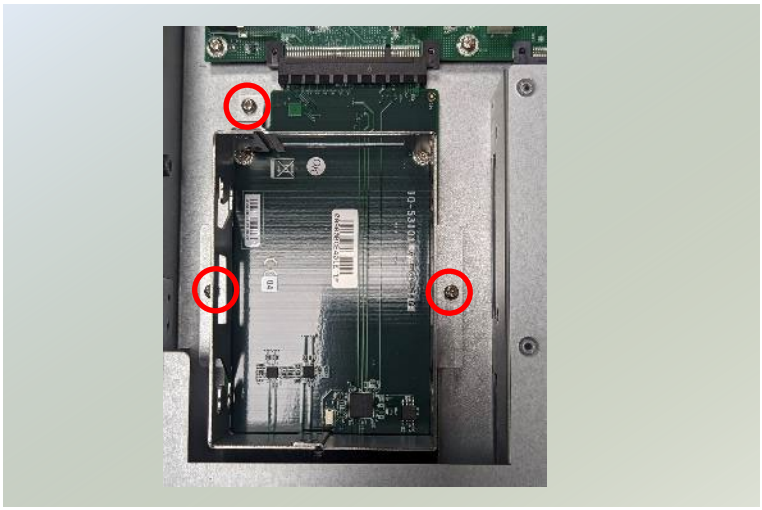
Installing the Disk Drive(s)

NCA-5330 is built with two 2.5" HDD/SSD slot drive bay. The following will discuss disk drive installation procedures based on their HDD/SSD designs.

1. Power off the system and open the chassis cover.
2. Locate the 2.5" disk bay.

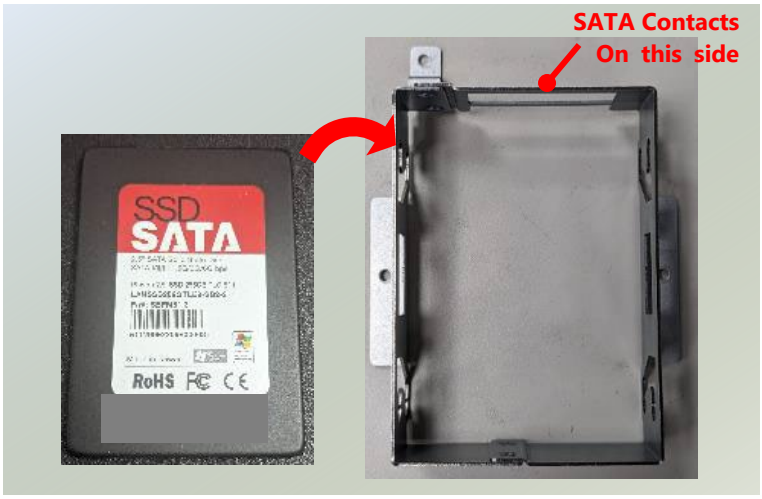


3. Loosen the three (3) screws that fixes the disk tray onto the motherboard. Gently pull out the disk tray.



4. Mount the disk drive onto the empty tray. Make sure the disk drive's SATA contacts are facing towards the inside the system.

   Repeat if a second disk drive will be placed.



5. Screw in the hard disk on both sides (two (2) screws on each side).

Screw

Repeat if a second disk drive will be placed.

Left Side

Right Side

6. Install the tray back to the original position on the motherboard and secure with the three (3) screws.

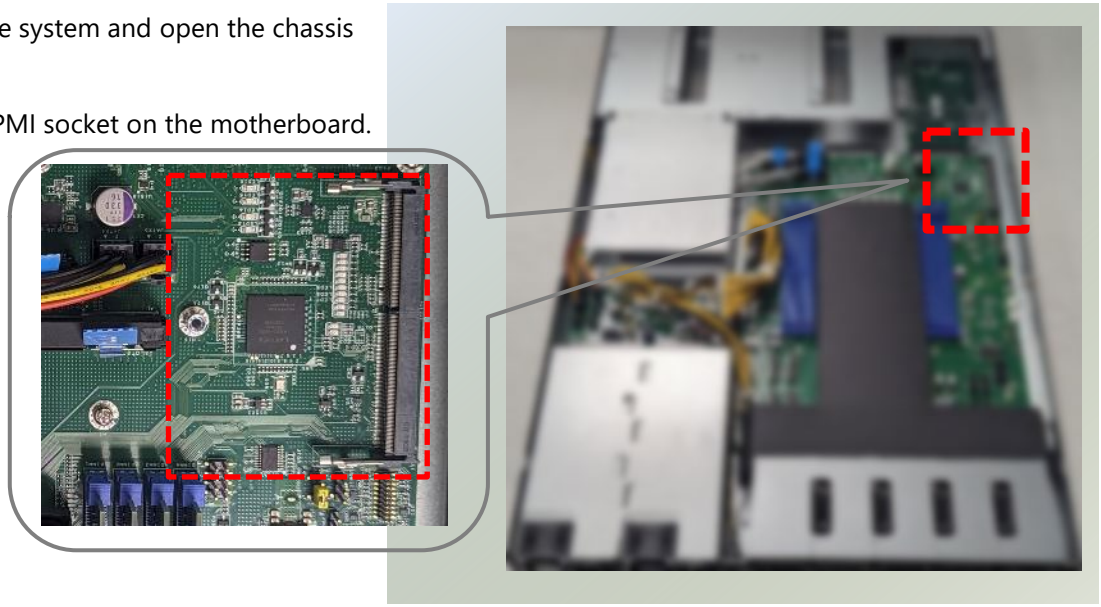
7. Connect the SATA cable and SATA power cable to the hard disks.

Note: Retrieve the SATA cable and SATA power cable from the accessory box to connect the HDD/SSD.

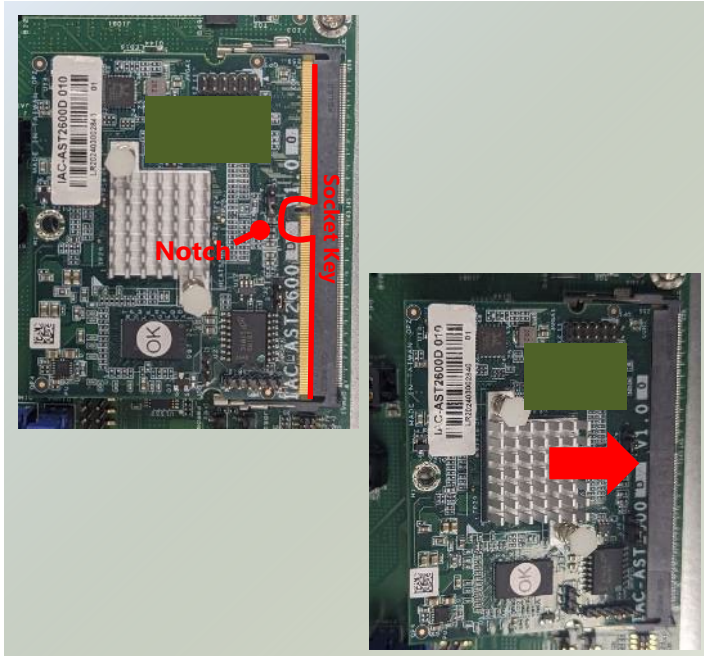
Installing the IPMI Module (Optional)

The motherboard provides one IPMI slot. Follow the procedures below for installing an IPMI card.

1. Power off the system and open the chassis cover.
2. Locate the IPMI socket on the motherboard.



3. Align the notch of the IPMI card with the socket key in the slot.
4. Insert at 30 degrees into the socket until it is fully seated in the connector.



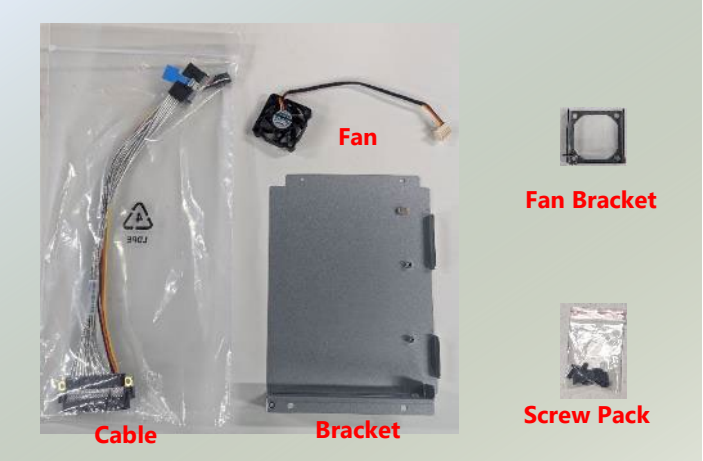
5. Push down on the IPMI card and secure it with one (1) screw.

Installing Rear PCIe Module (Optional)

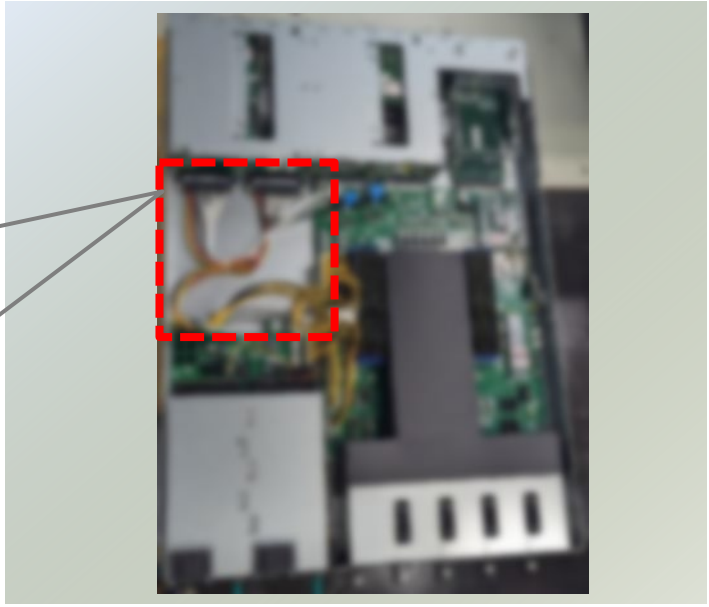
NCA-5330 comes with one PCIe*8 Gen 5 Half Height Half Length (HHHL) expansion slot (Optional) for graphics card, ethernet or accelerator card. Please proceed with the following steps for installation.

1. The Rear PCIe Kit will include:

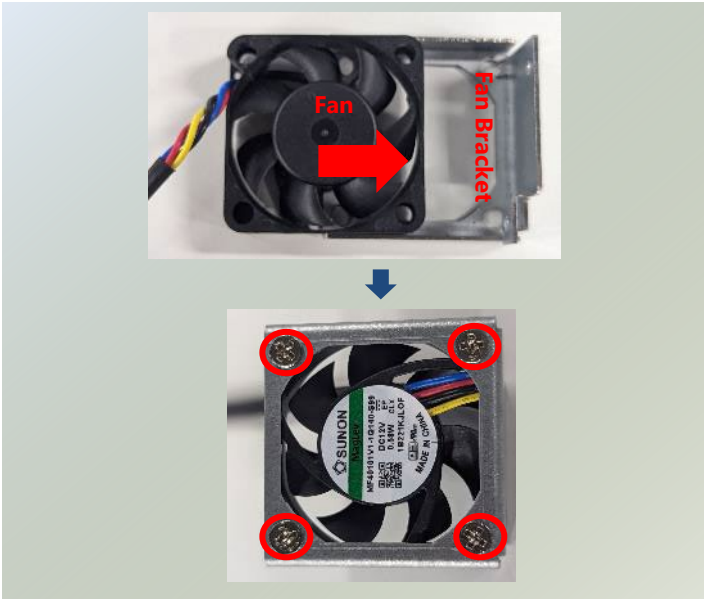
- 1x PCIe Bracket
- 4x PCIe Gen5 High Speed Cable Set
- 1x Swappable Fan
- 1x Fan Bracket
- 1x Screw Pack



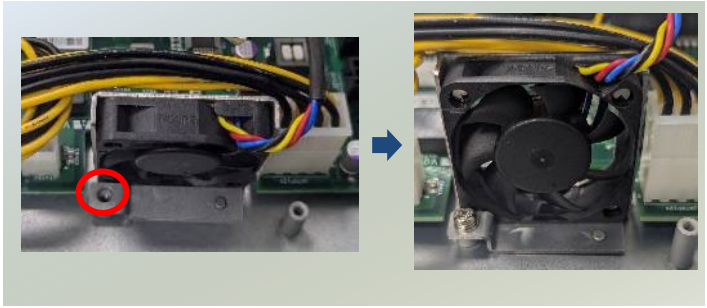
2. Power off the system and open the chassis cover. Locate the placement for PCIe expansion on the motherboard.



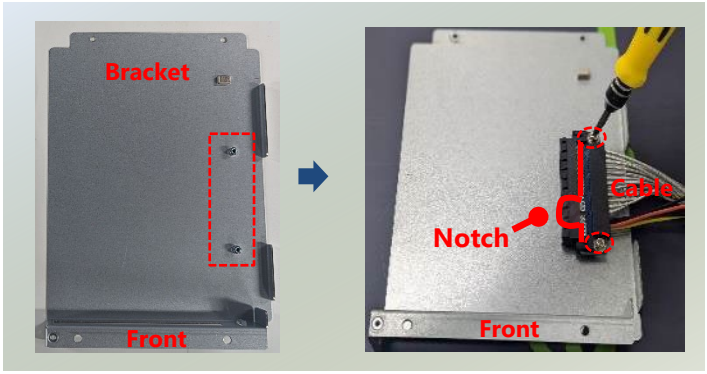
3. Carefully position the fan into the fan bracket and fasten it with four (4) screws on the bottom side.



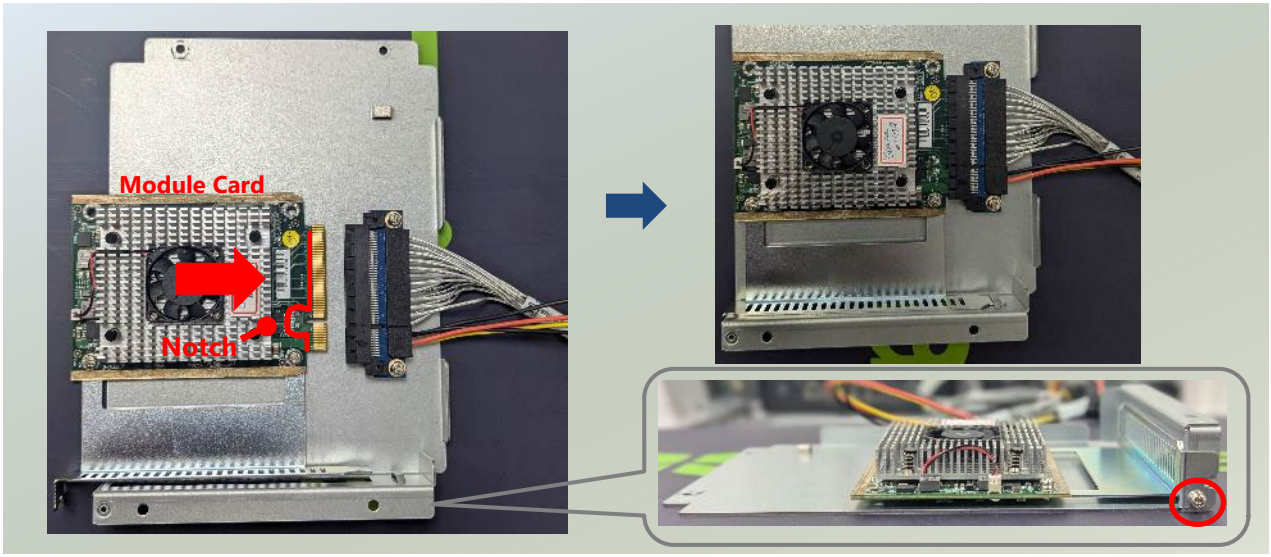
4. Position the fan bracket in the system and secure it with one screw.



3. Next, install the PCIe module card. Position the cables onto the bracket and use two (2) screws to secure the cable plate. Ensure the notch on the cable plate is positioned towards the front of the bracket.



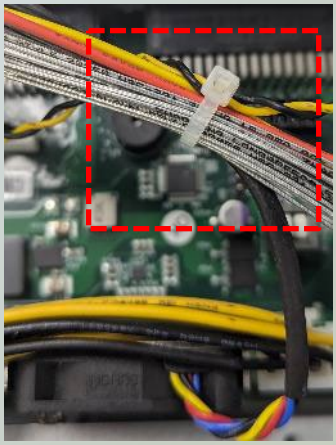
4. Align the module card with the PCIe bracket. Slide the module into the PCIe bracket until it is fully seated. Secure it with one screw on the side.

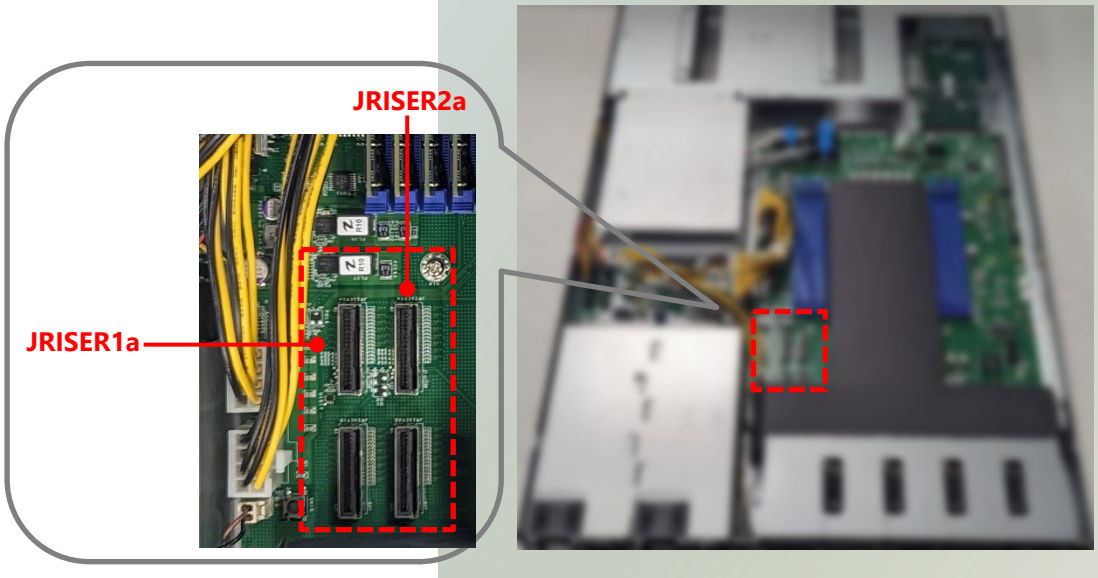


5. Gently turn the PCIe bracket upside down and place it onto the motherboard.

6. Secure it with three (3) screws.

6. Bundle all the cables, including the fan cable and module card cables, and secure them with a zip tie. Then, connect the other ends to of the cables to JRISER1a or JRISER2a (refer to motherboard layout).





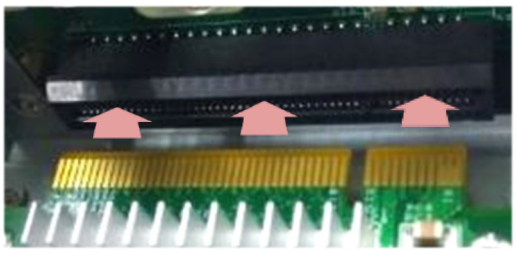
Installing the NIC Modules

NCA-5330 comes with NIC Ethernet module slots for network bandwidth expansion. Please follow the steps for installation.

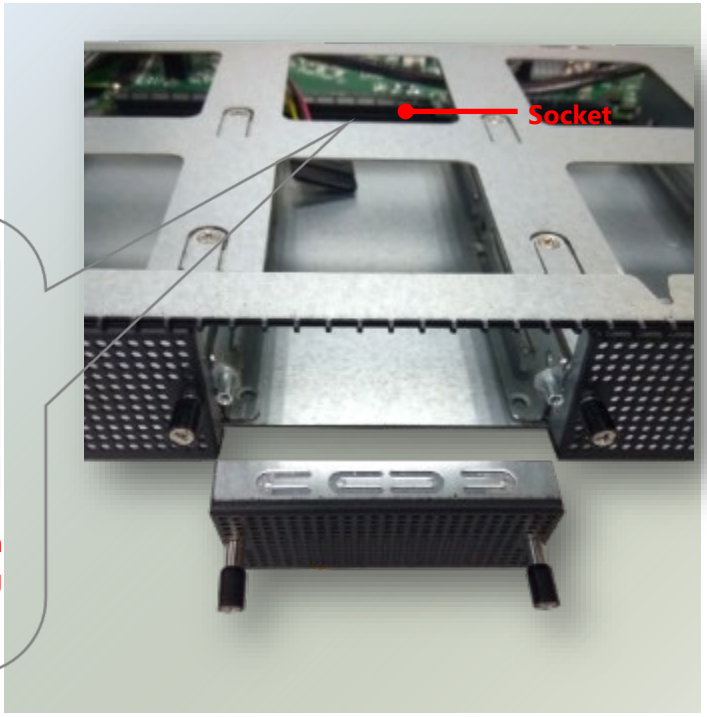
1. Power off the system and open the chassis cover.
2. On the front panel, select a NIC Ethernet module slot.

3. Rotate clockwise and loosen the two (2) lock-screws and remove the door.

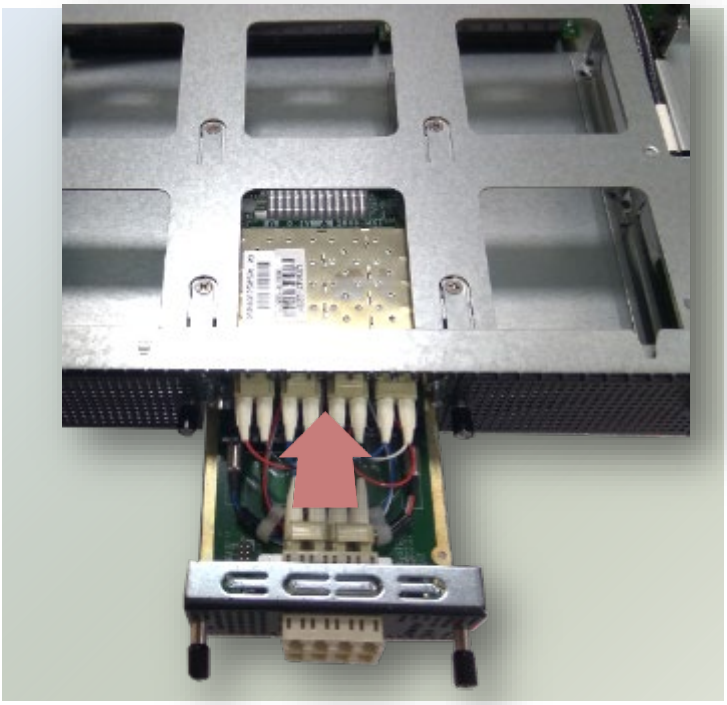
4. Locate the socket pin for module insertion.



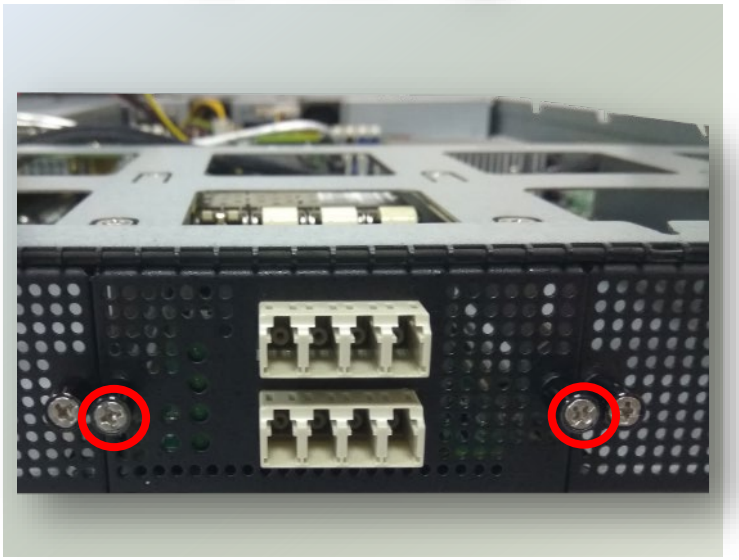
Align the golden fingers to the socket on the motherboard carefully while inserting this module.



5. Insert the NIC module. (Module shown in the image is for reference only).



6. Once the module is firmly seated, rotate counter-clockwise and tighten the two (2) lock-screws.

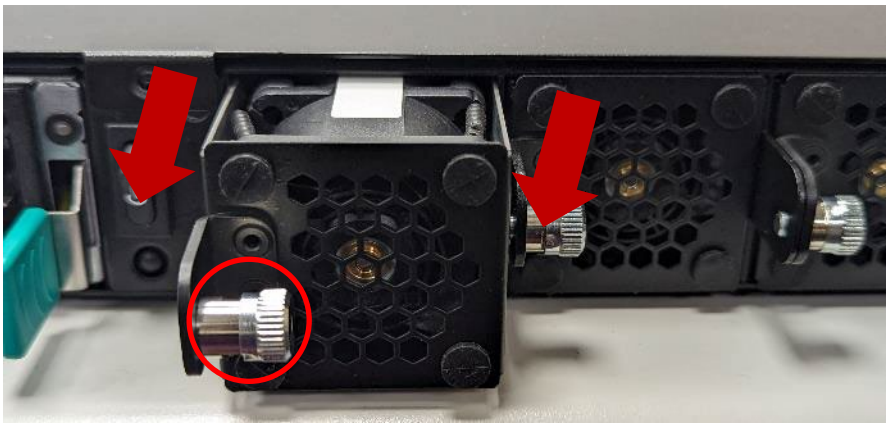


Replacing the Cooling Fans

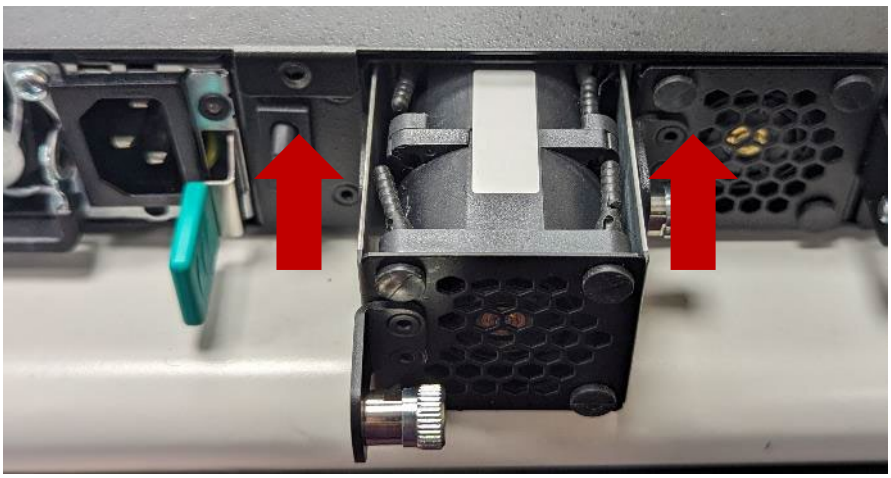
Cooling fans may wear down eventually. Please refer to the steps below for replacing cooling fans. When using a new cooling fan, just reverse the steps to install the fan back onto the enclosure and the system.

1. On the rear panel, loosen the lock-screw of the fan you would like to replace.

2. Hold onto the lock-screw and pull out the single fan. Disconnect its power cable connect from the motherboard.



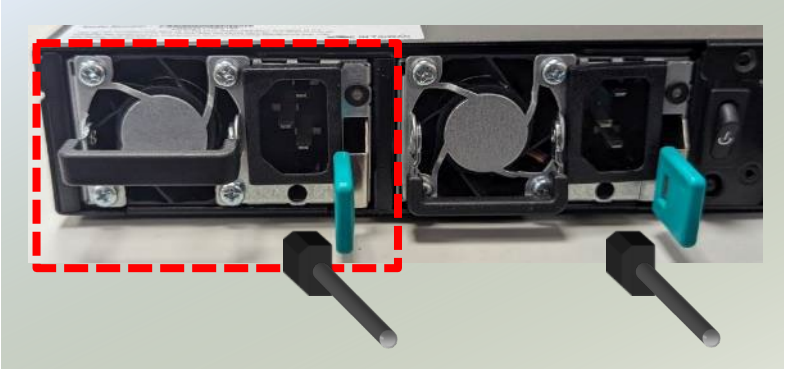
3. Install a new fan by reversing the above steps.



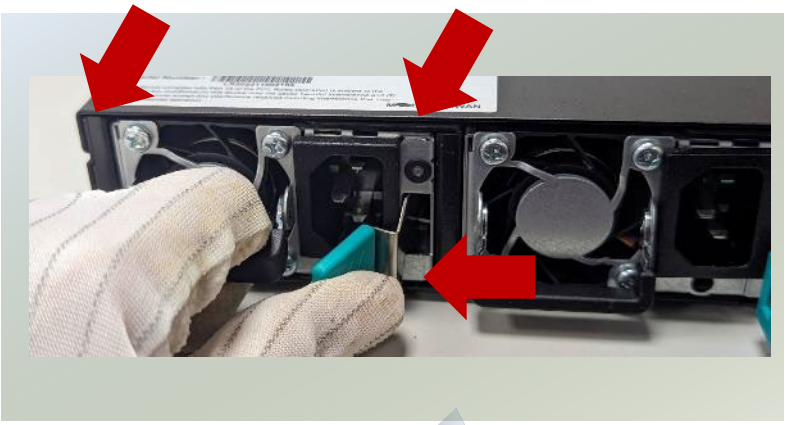
Replacing the DC Power Supply (Optional)

Power supply units wear down eventually. Please be noted that the NCA-5330 supports only 550W PSU. Please prepare the power supply units matching this capacity.

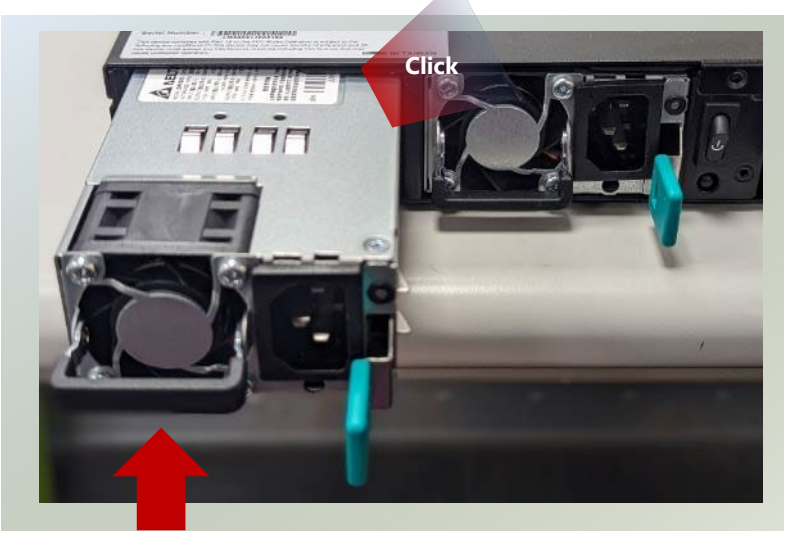
1. On the rear panel, locate the power supply units and disconnect the power cords.



2. Hold the handle and pull out the original power supply unit.



3. Insert a new power supply unit. Push the unit until it clicks into place.



Mounting the System

The system can be installed in a rack, with the slidable rails allowing access to the system while solidly securing the system. Please follow the steps below for installation.

Attaching the Short Ear Brackets

The Ear Brackets come with six screws, as shown below.

Take an ear bracket, align the holes on it with those on the side of the system, and secure onto the system with the three (3) provided screws. Repeat to secure the other ear bracket.

Attaching the Slide Rail (Optional)

The slide rail kit shall include the following items:

1x pack screws

2x Slide-rails

Fully stretched slide rail:

Attaching Rail Brackets

1. Unpack a slide rail and slide the inner channel to its end.

2. Slide the rail bracket out to its end.

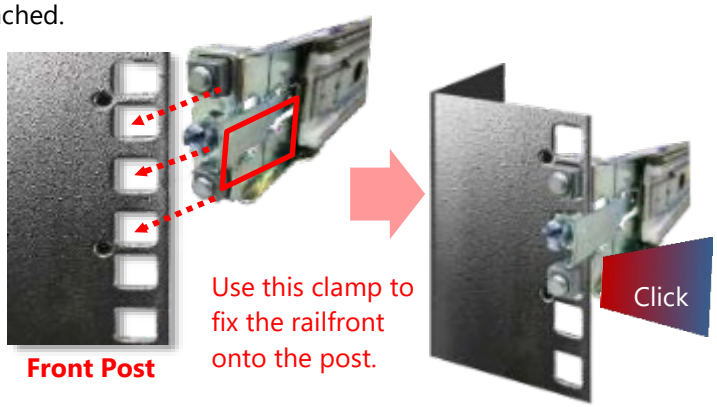
3. To detach the rail bracket from the channel, locate and push the Release Tab on the rail bracket while sliding it out.

4. Align the rail bracket to the side of the chassis and make sure the screw-holes are matched, and then secure the bracket onto the chassis with three (3) provided screws.

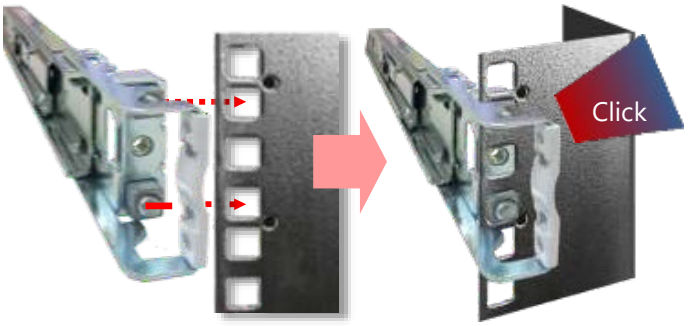
5. Repeat Steps 1~4 to attach the rail bracket to the other side of the chassis.

Installing the Slide Rail Assemblies

1. This slide-rail kit does NOT require screw-fixing. Aim at three (3) available screw holes on the rack front and lock it by clipping the rail's front end to the post, as shown in the image below. You should hear a "click" sound once it is firmly attached.



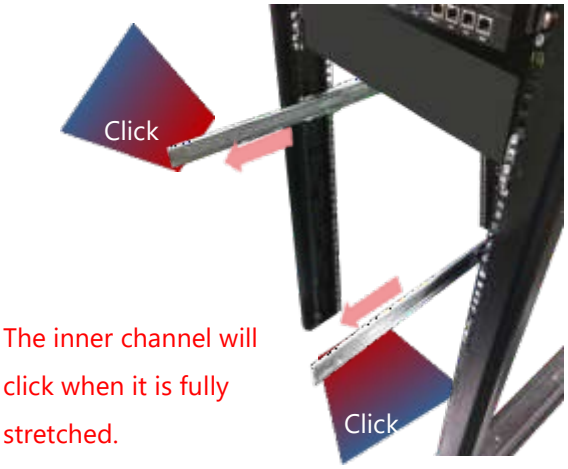
2. For the rear rack installation, slide the rail to aim and engage the bolts on the rail's rear end with the two (2) available holes on the post, and the rail assembly will click into place.



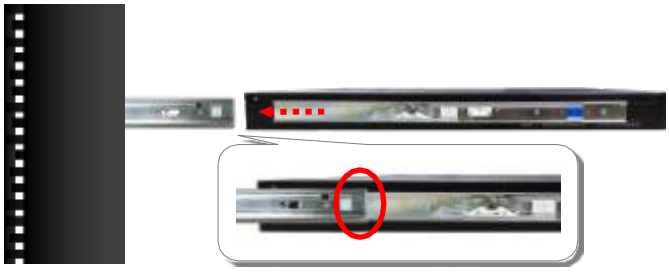
3. Repeat Steps 1~2 to install the other rail onto the post.

Installing the Chassis onto the Rack

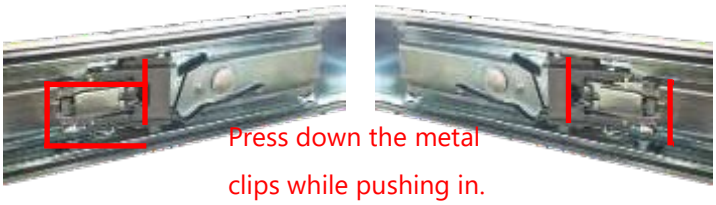
1. Stretch both of the inner channels out to their fullest extent. You will hear a click sound when they are fully stretched and locked.



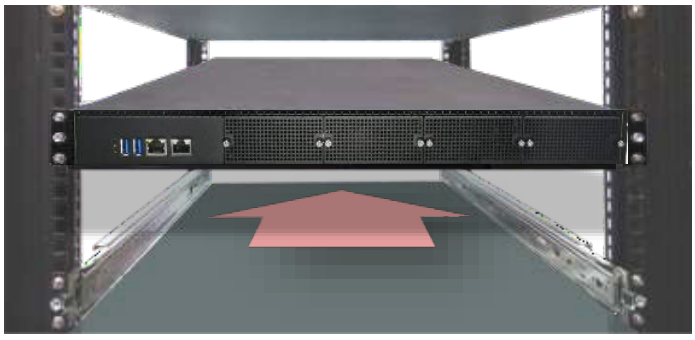
2. Hold the chassis with its front facing you, lift and gently insert it by aligning with the slide-rail assemblies as shown in the image, and then push the unit into the cabinet.



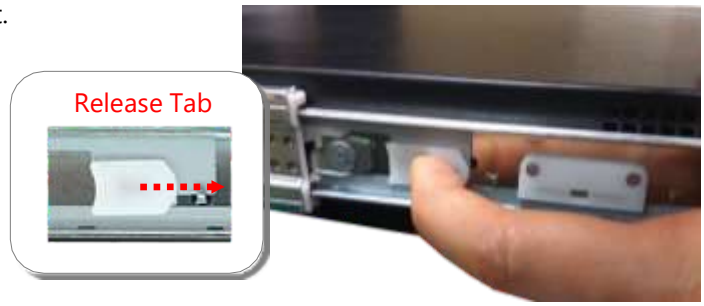
3. Keep sliding the rails in until they stop about halfway. Press down the metal clips on bother inner channels and push them further into the cabinet.



4. To have the chassis completely inserted into the rack, pull and hold the Rail Lock tab on both brackets while pushing in the chassis.



To detach the chassis from the rack, pull the Release Tabs on both sides of the brackets towards you while gently sliding the chassis out.



CHAPTER 3: BIOS SETUP

BIOS (Basic Input / Output System) is the program that controls the computer boot process.

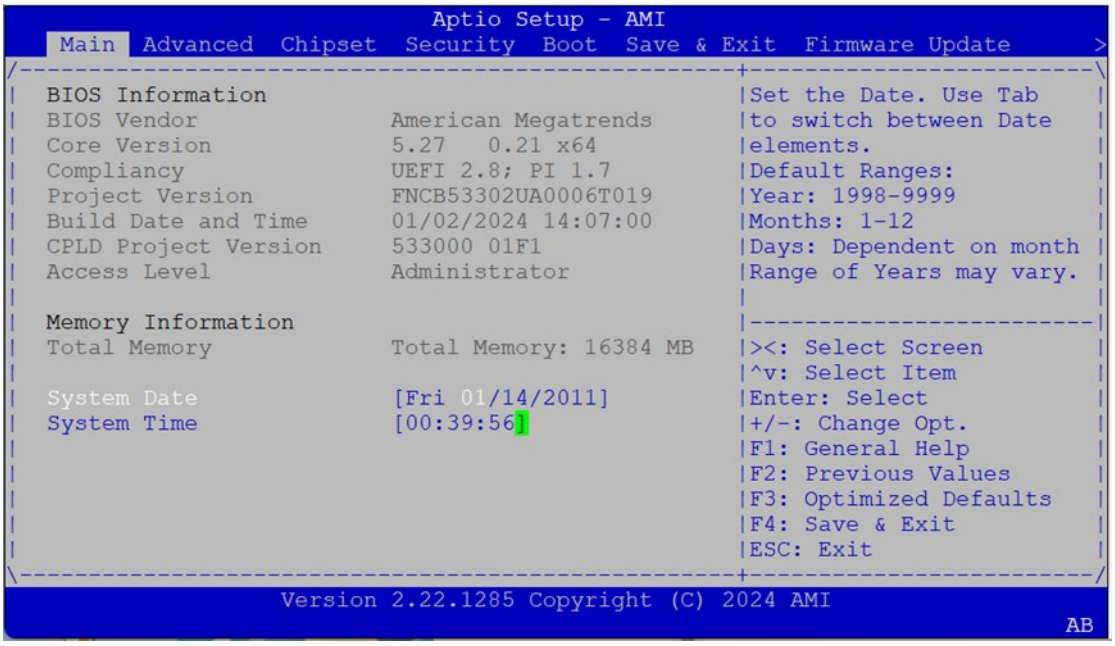
Entering Setup

The system has AMI BIOS built-in, with a SETUP utility that allows users to configure required settings or to activate certain system features. Pressing the **<Tab>** or **<Del>** key immediately allows you to enter the Setup utility.

Control Keys	Description
→←	select a setup screen, for instance, [Main], [Advanced], [Platform Configuration], [Socket Configuration], [Server Mgmt], [Security], [Boot], and [Save & Exit]
↑↓	select an item/option on a setup screen
<Enter>	select an item/option or enter a sub-menu
+/-	to adjust values for the selected setup item/option
F1	to display General Help screen
F2	to access past configurations, such as the settings adjusted during your last BIOS session
F3	to load optimized default values
F4	to save configurations and exit BIOS
<Esc>	to exit the current screen

Main

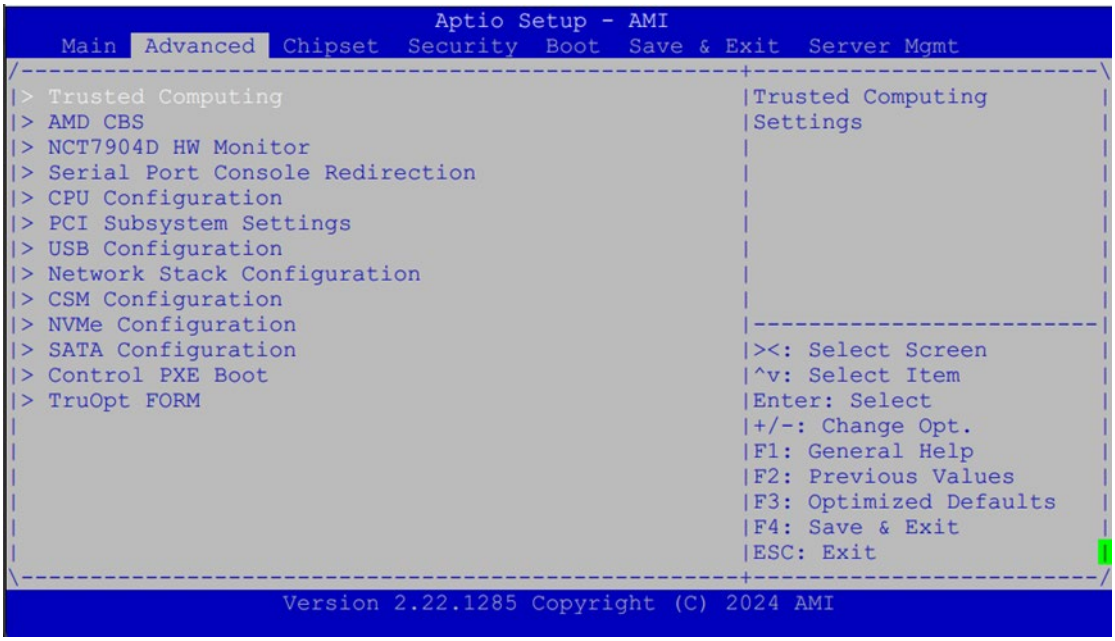
Setup main page contains BIOS information and project version information.



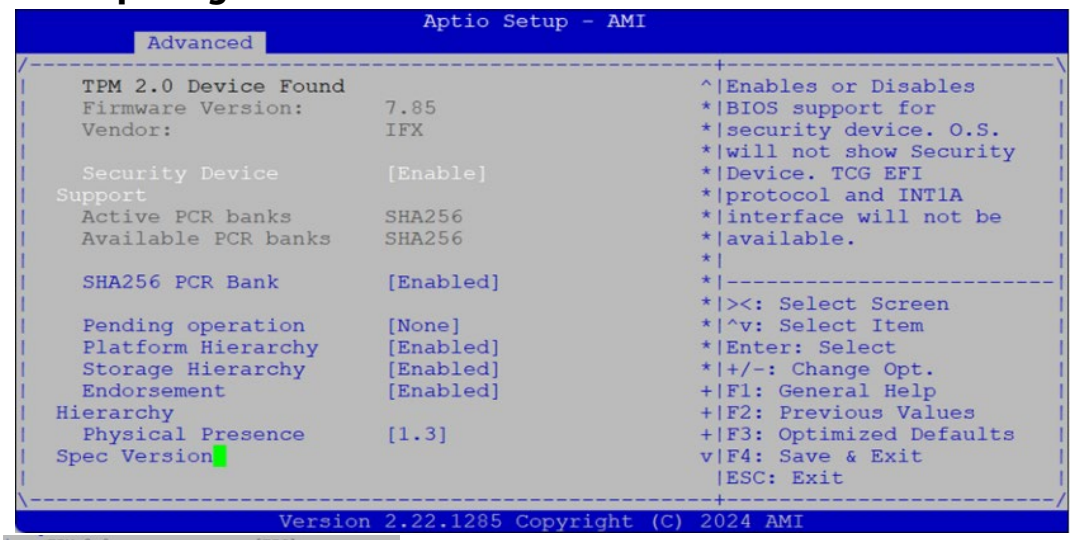
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY CPLD Project Version: CPLD firmware version Access Level: Administrator / User
Memory Information	Total Memory: by case
System Date	To set the Date, use **<Tab>** to switch between Date elements. Default Range of Year: 2005-2099 Default Range of Month: 1-12 Days: dependent on Month.
System Time	To set the Date, use**<Tab>**to switch between Date elements.

Advanced Page

Select the **Advanced** menu item from the BIOS setup screen to enter the "Advanced" setup screen. Users can select any of the items in the left frame of the screen.

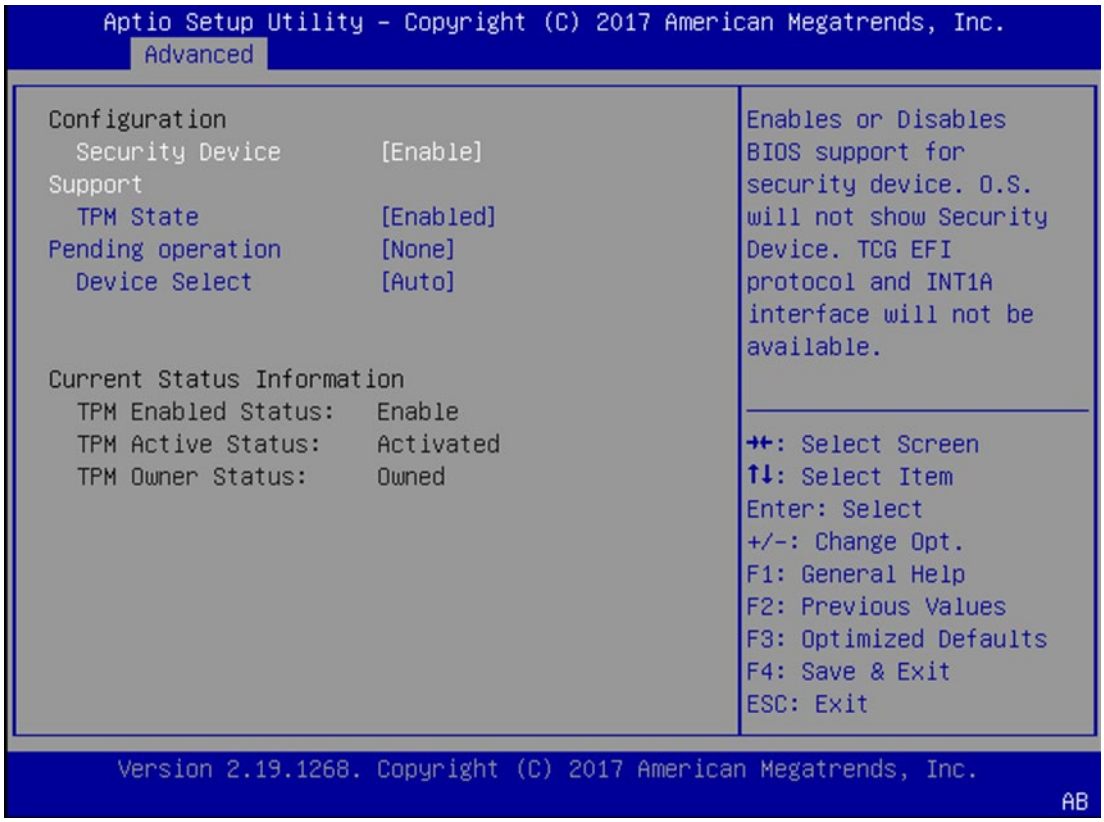


Trusted Computing



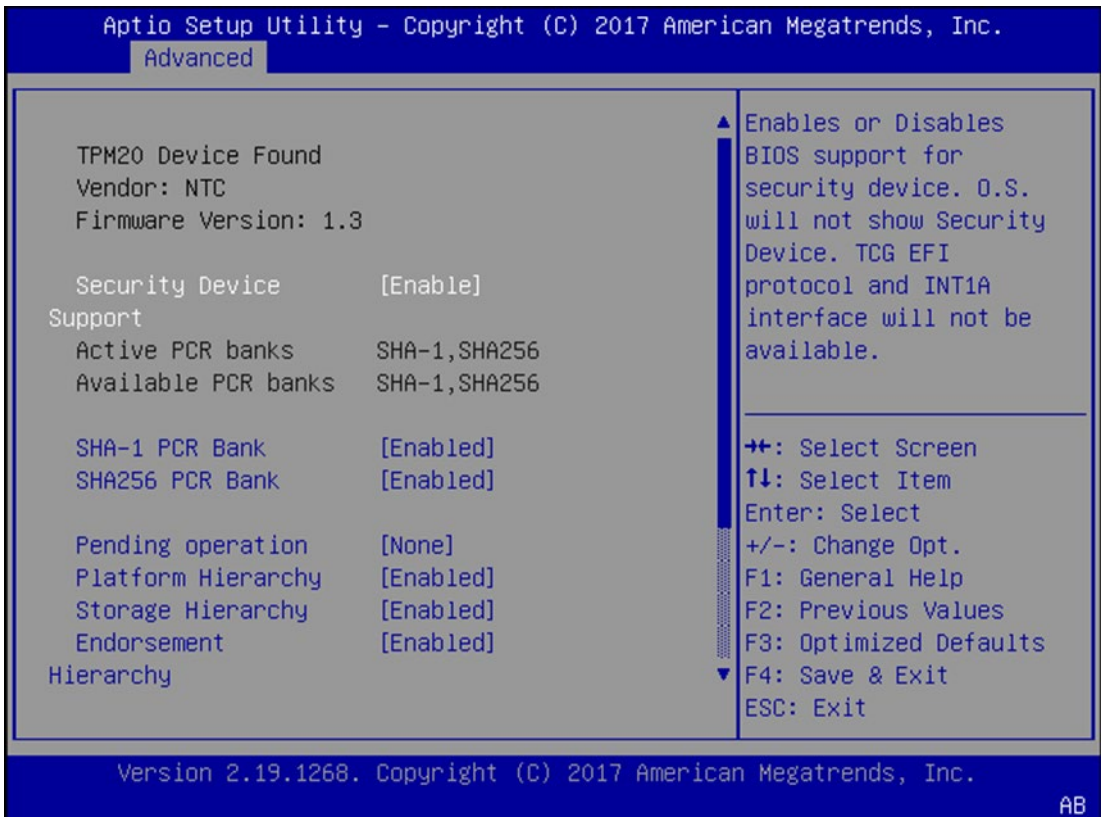
Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA256 PCR Bank	Enabled Disabled	Enable or DisableSHA256 PCR Bank
Pending operation	None TPM Clear	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.
Platform Hierarchy	Enabled Disabled	Enable or Disable Platform Hierarchy
Storage Hierarchy	Enabled Disabled	Enable or Disable Storage Hierarchy
Endorsement Hierarchy	Enabled Disabled	Enable or Disable Endorsement Hierarchy
Physical Presence Spec Version	1.2 1.3	Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.
PH Randomization	Enabled Disabled	Enables or Disables Platform Hierarchy randomization. DO NOT ENABLE THIS QUESTION PRODUCTION PLATFORMS. THIS IS FOR DEVELOPMENT TESTING. OVERRIDE ChangePlatformAuth
Device Select	TPM 1.2 TPM 2.0 Auto	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found.
Disable Block Sid		Override to allow SID authentication in TCG Storage device.

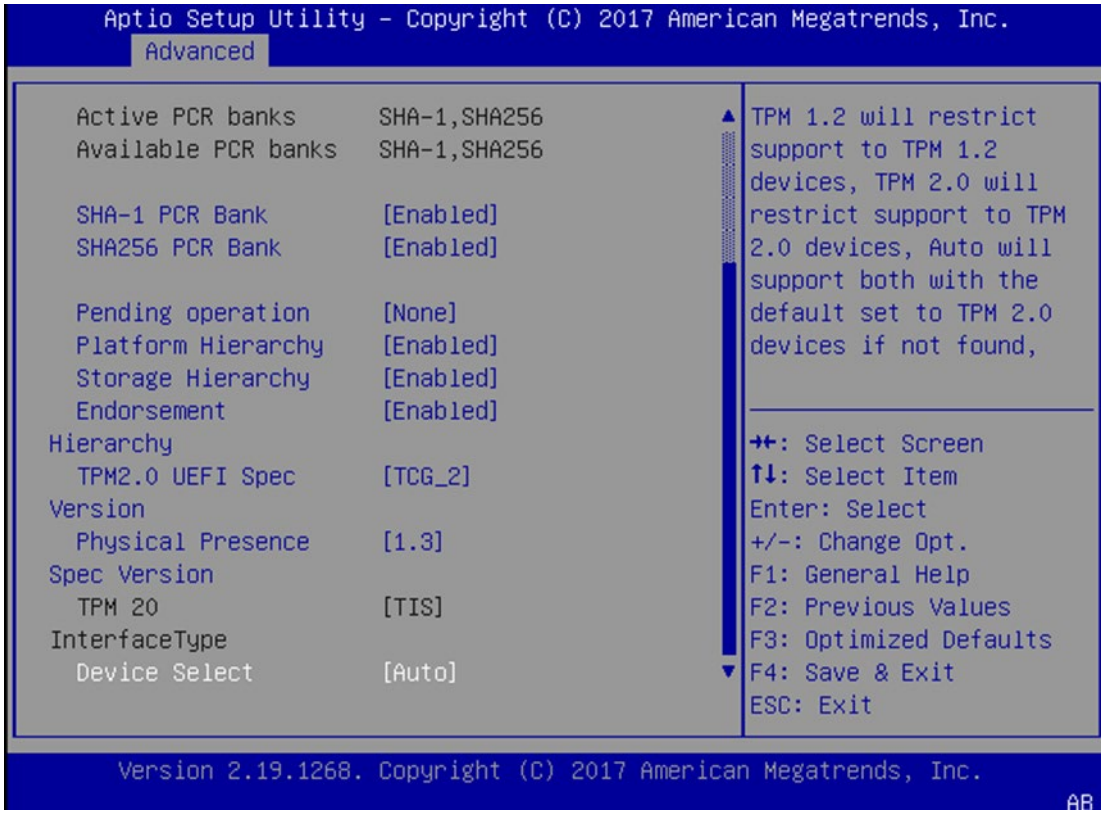
Trusted Computing (TPM 1.2)



Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
TPM State	Enabled Disabled	Enables or disables Security Device. NOTE: Your computer will reboot during restart in order to change State of the Device.
Pending operation	None TPM Clear	Schedules an Operation for the Security Device. NOTE: Your computer will reboot during restart in order to change State of Security Device.
Device Select	TPM 1.2 TPM 2.0 Auto	**TPM 1.2** will restrict support to TPM 1.2 devices; while **TPM 2.0** will restrict support to TPM 2.0 devices; **Auto** will support both with the default set to TPM 2.0 devices. If not found, TPM 1.2 devices will be enumerated.

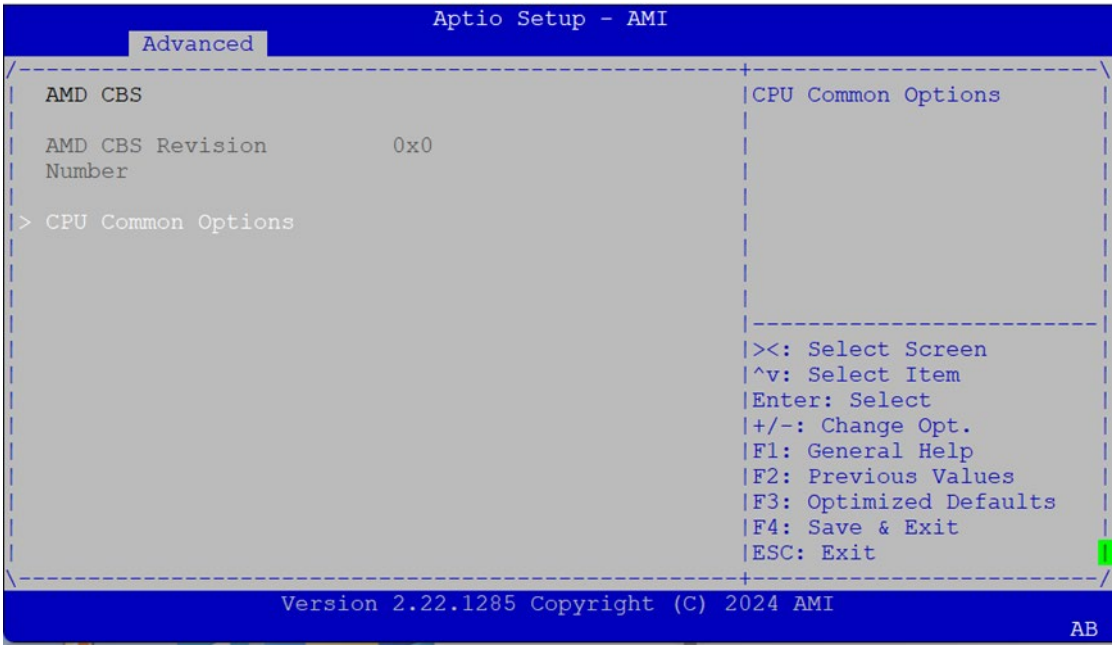
Trusted Computing (TPM 2.0)





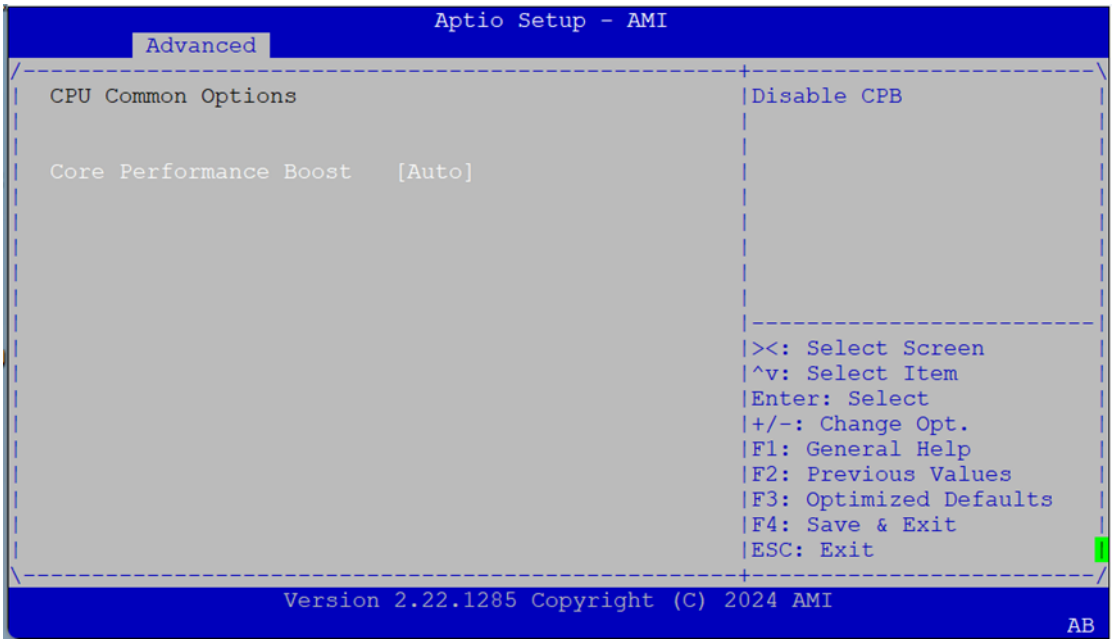
Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA-1 PCR Bank	Enabled Disabled	Enables or disables SHA-1 PCR Bank.
SHA256 PCR Bank	Enabled Disabled	Enables or disables SHA256 PCR Bank.
Pending operation	None TPM Clear	Schedules an Operation for the Security Device. NOTE: Your computer will reboot during restart in order to change State of Security Device.
Platform Hierarchy	Enabled Disabled	Enables or disables Platform Hierarchy.
Storage Hierarchy	Enabled Disabled	Enables or disables Storage Hierarchy.
Endorsement Hierarchy	Enabled Disabled	Enables or disables Endorsement Hierarchy.
TPM2.0 UEFI Spec Version	TCG_1_2 TCG_2	Select the TCG2 Spec Version, **TCG_1_2**: Supports the Compatible mode for Win8/Win10 **TCG_2**: Supports new TCG2 protocol and event format for Win10 or later.
Physical Presence Spec Version	1.2 1.3	Select to tell OS to support PPI Spec Version 1.2 or 1.3. NOTE: Some HCK tests might not support 1.3.
TPM 20 InterfaceType	TIS	Select **TPM 20 Device** for the Communication Interface.
Device Select	TPM 1.2 TPM 2.0 Auto	**TPM 1.2** will restrict support to TPM 1.2 devices; while **TPM 2.0** will restrict support to TPM 2.0 devices; **Auto** will support both with the default set to TPM 2.0 devices. If not found, TPM 1.2 devices will be enumerated.

AMD CBS Page



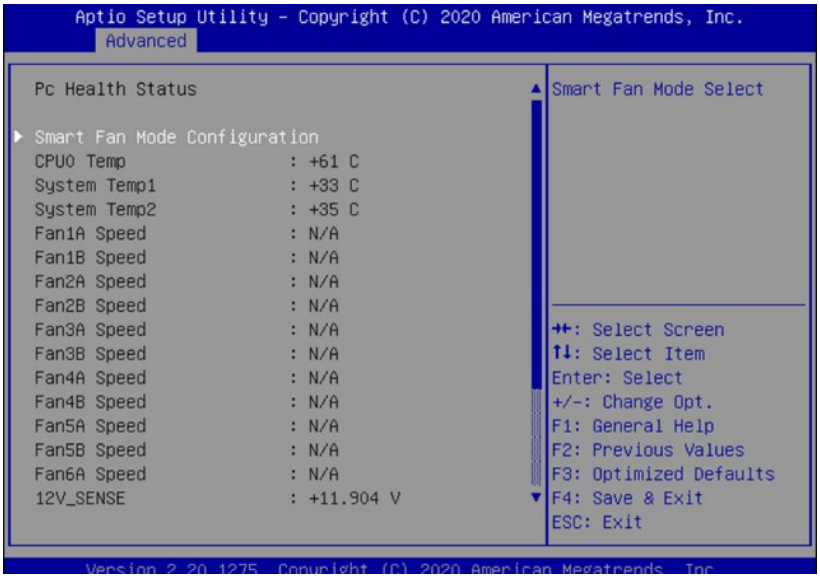
Feature	Options	Description
CPU Common Options		For AI performance, open CPB for users to control CPU Core Performance Boost.

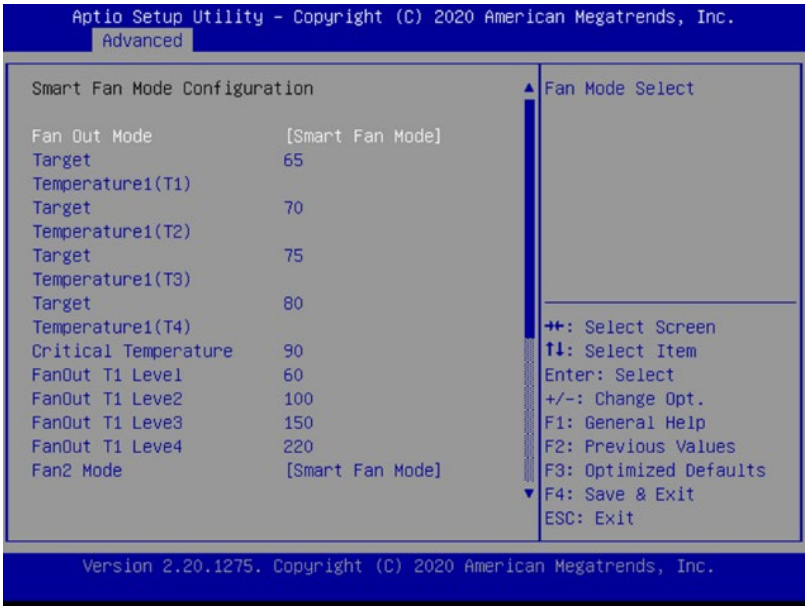
Core Performance Boost

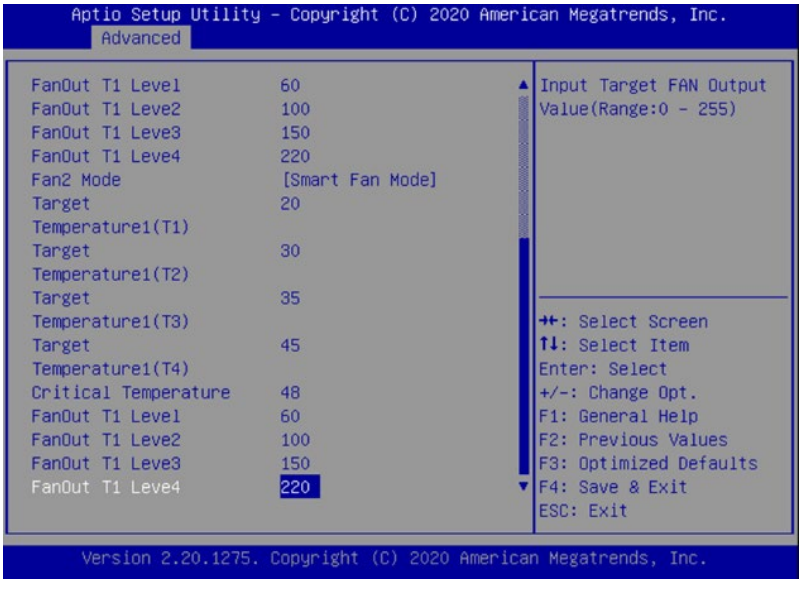


Feature	Options	Description
Core Performance Boost	Auto Disable	If set **Auto** CPB feature will control by CPU itself (If supported). If set **Disable**, CPB will not work.

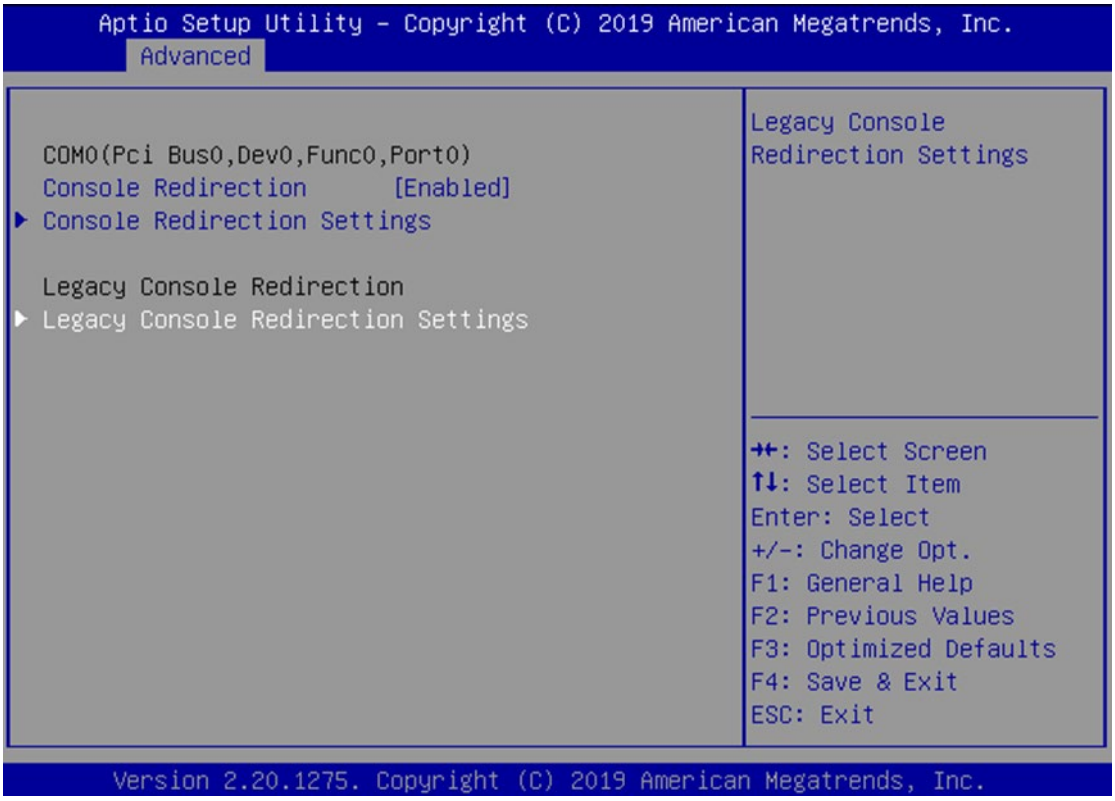
NCT7904D HW Monitor





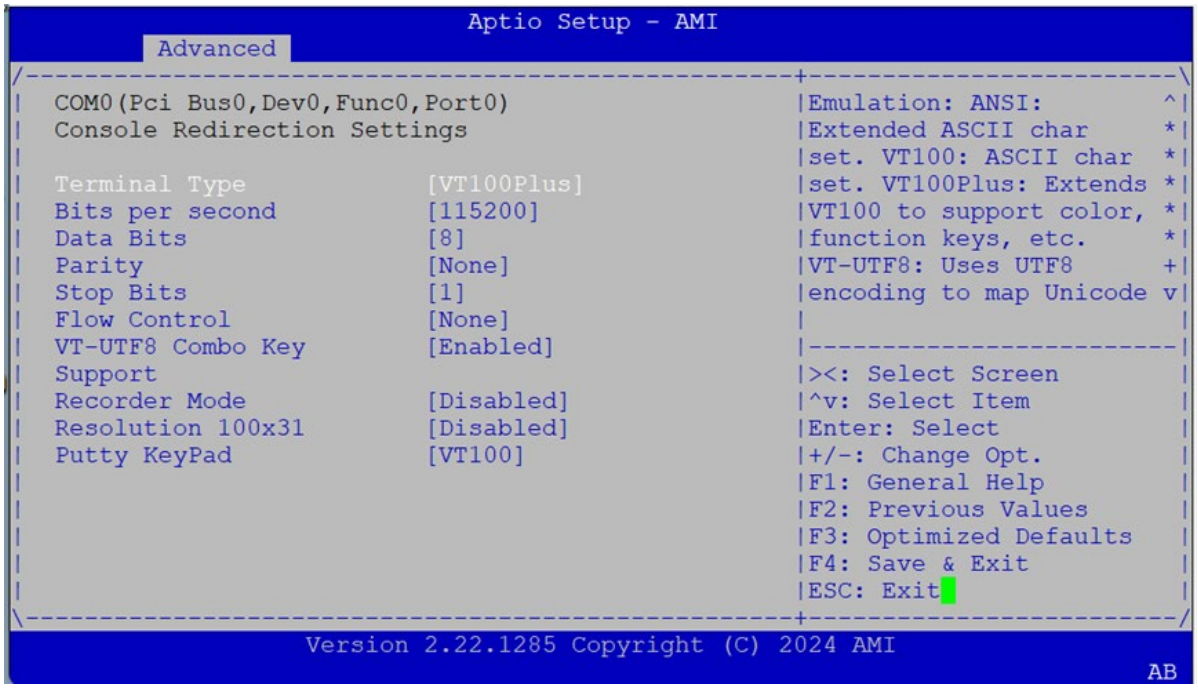


Serial Port Console Redirection



Feature	Options	Description
Console Redirection	Enabled Disabled	Enables or disables Console Redirection.

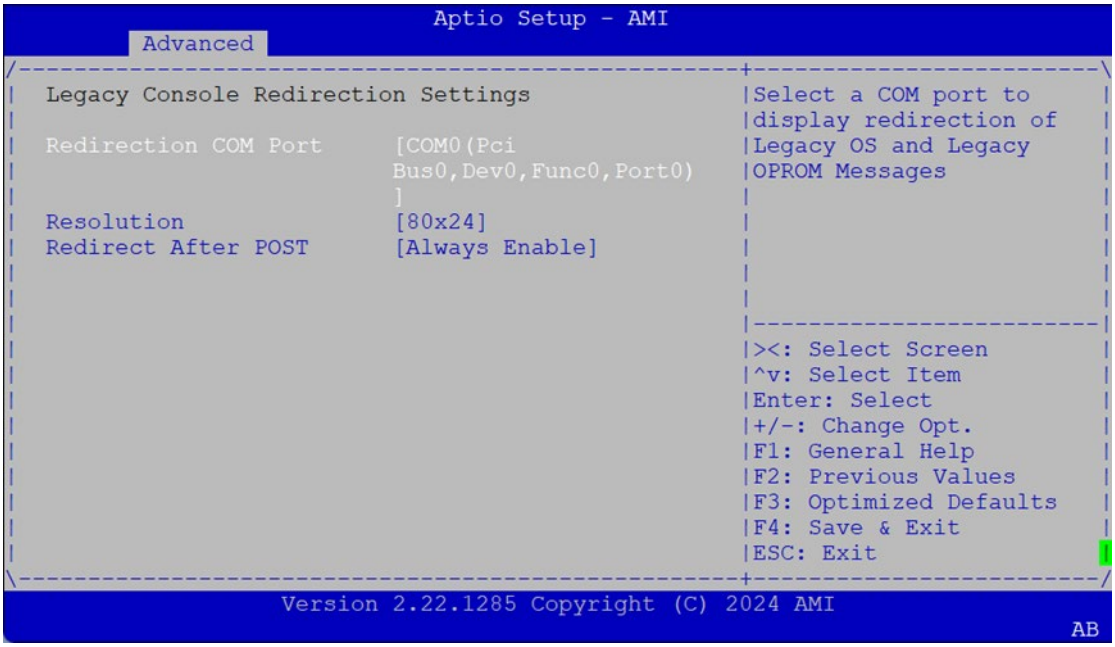
Console Redirection Setting



Feature	Options	Description
Terminal Type	VT100 VT100+ VT-UTF8 ANSI	VT100: ASCII char set VT100+: Extends VT100 to support color, funciton keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes ANSI: Extended ASCII char set
Bits per second	9600 19200 38400 57600 115200	Selects serial port transmission speed. The speed must be matched on the othre side. Long or noisy lines may require lower speeds.
Data Bits	7 8	Data Bits
Parity	None Even Odd Mark Space	A parity bit can be sent with the data bits to detect some transmission errors.
Stop Bits	1 2	Indicates the end of a serial data packet.
Flow Control	None Hardware RTS/CTS	Flow Control can prevent data loss from buffer overflow.
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT 100 terminals

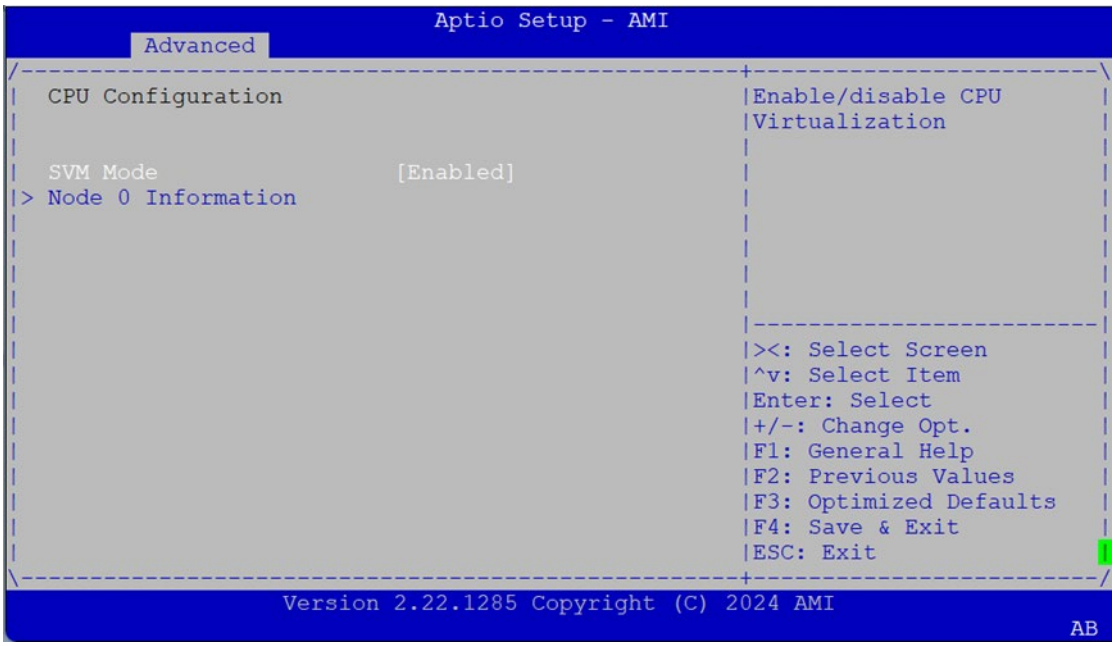
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Selects Function Key and Keypad on Putty.

Legacy Console Redirection Setting



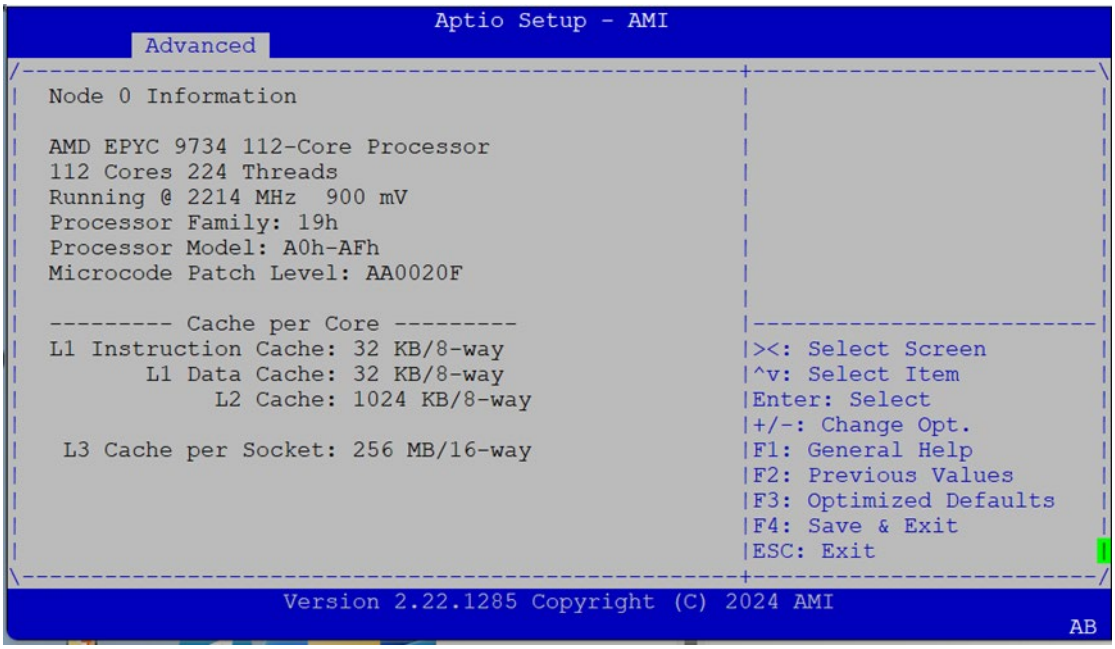
Feature	Options	Description
Redirection COM Port	COM0(Pci Bus0,Dev0,Func0,Port0)	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages
Resolution	80*24 80*25	On Legacy OS, the Number of Rows and Columns supported redirection
Redirect After POST	Always Enable BootLoader	When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is always on.

CPU Configuration

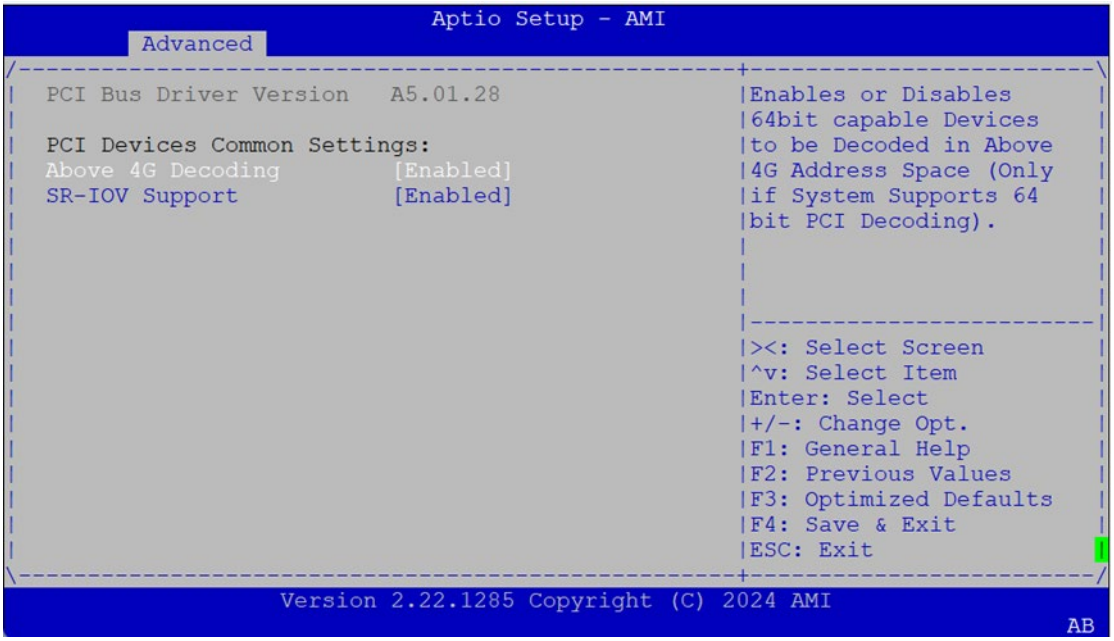


Feature	Options	Description
SVM Mode	Disabled Enabled	Enable/disable CPU Virtualization

Node 0 Information

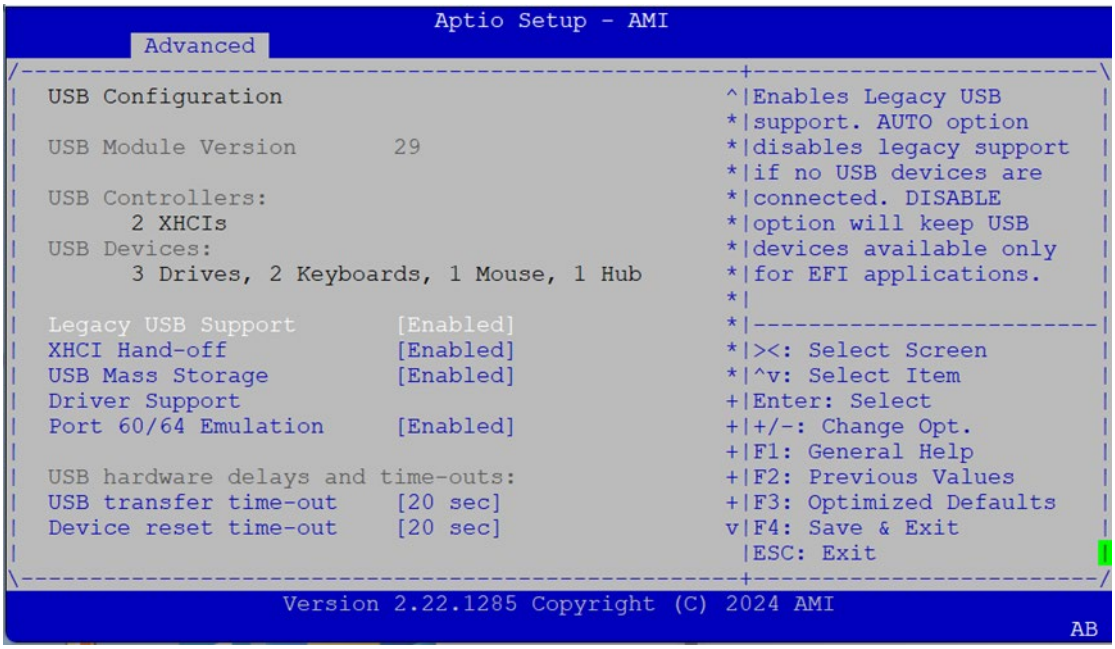


PCI Subsystem Settings



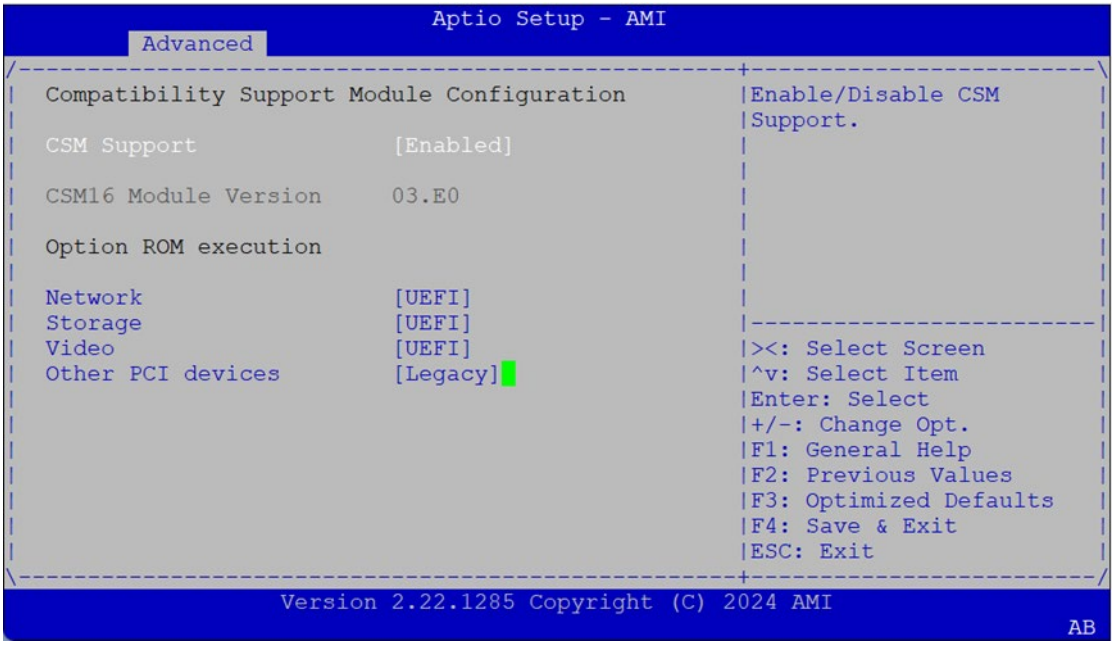
Feature	Options	Description
Above 4G Decoding	Disabled Enabled	Globally Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64-bit PCI Decoding).
SR-IOV Support	Disabled Enabled	If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.

USB Configuration



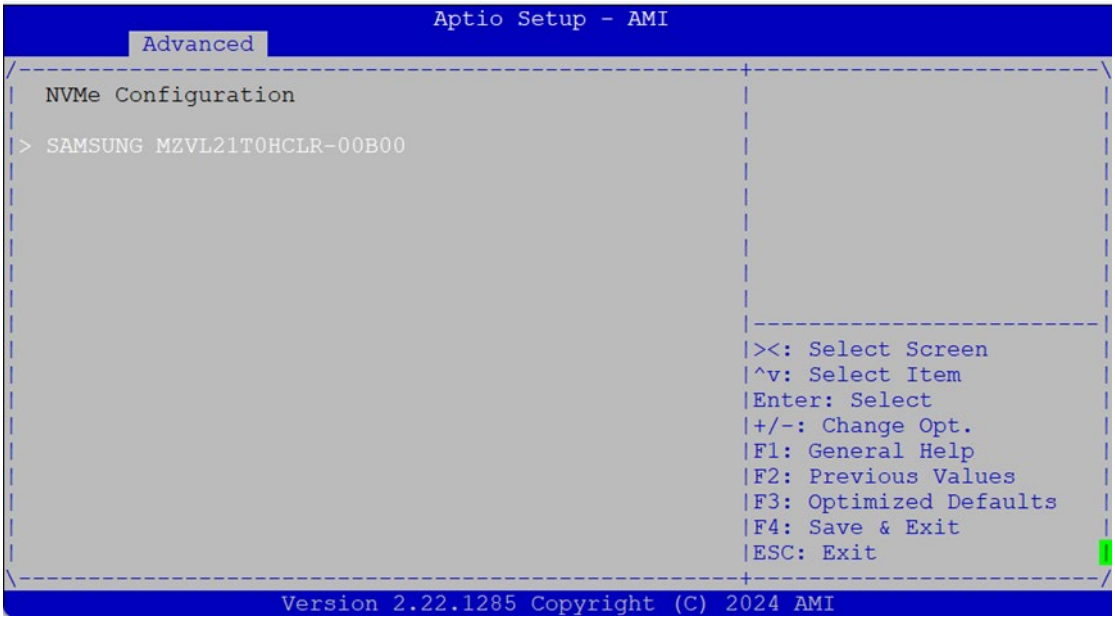
Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. **Auto** option disables legacy support if no USB devices are connected; **Disabled**option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enabled Disabled	Enables or disables USB Mass Storage Driver Support.
Port 60/64 Emulation	Enabled Disabled	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for Control, Bulk, and Interrupt transfers
Device reset time-out	1 sec 5 sec 10 sec 20 sec	USB mass storage device Start Unit command time-out
Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller. **Auto** uses default value: for a Root port, it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

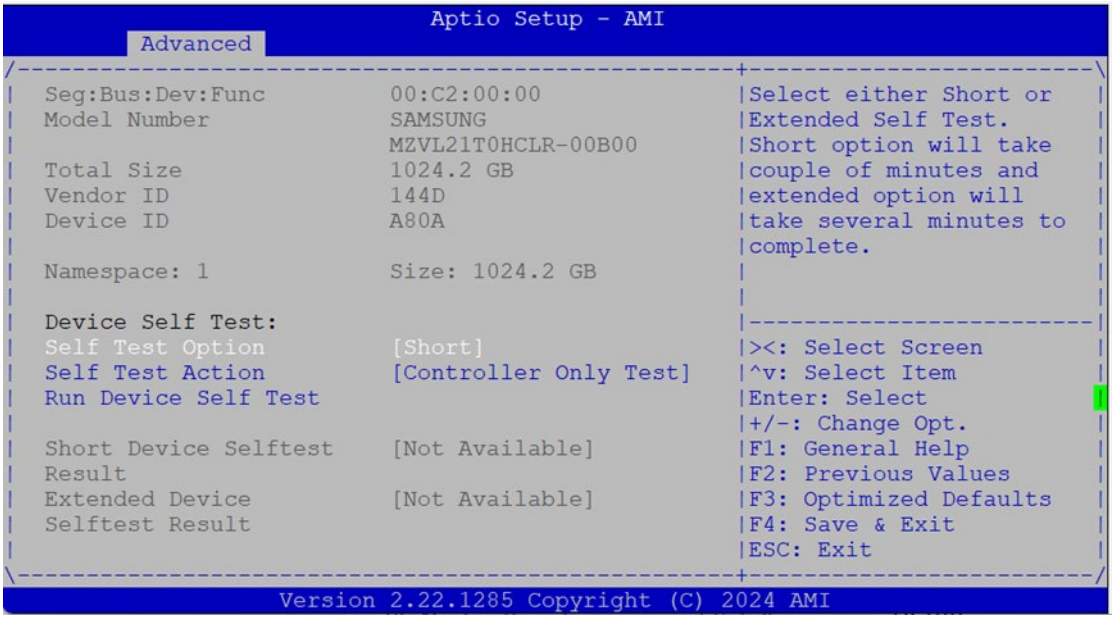
CSM Configuration



Feature	Options	Description
CSM Support	Disabled Enabled	Enables or disables CSM Support
Network	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Video OpROM
Other PCI device	Do Not Launch UEFI Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video

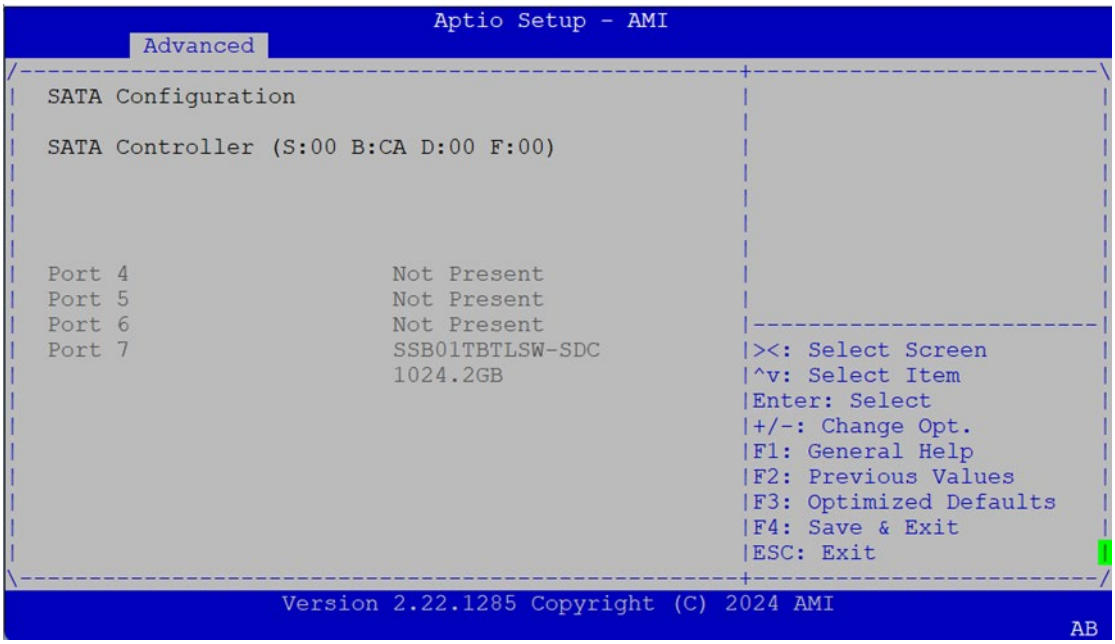
NVMe Configuration



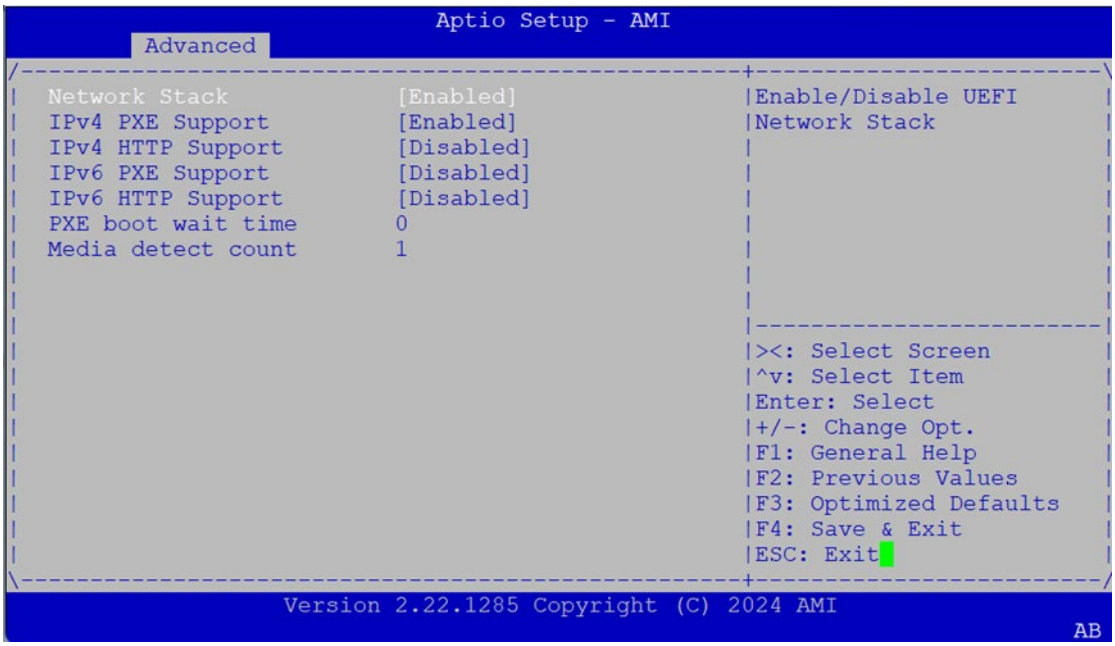


Feature	Options	Description
Self Test Option	Short Extended	Select either Short or Extended Self-Test. Short option will take couple of minutes and extended option will take several minutes to complete.
Self Test Action	Controller Only Test Controller and NameSpace Test	Select either to test Contoller alone or Controller and NameSpace. Selecting Controller and Namespace option will take lot longer to complete the test.
Run Device Self Test		Perform device self-test for the corresponding Option and Action selected by user. Pressing 'Esc' key will abort the test. Result shown below is the recent result

SATA Configuration

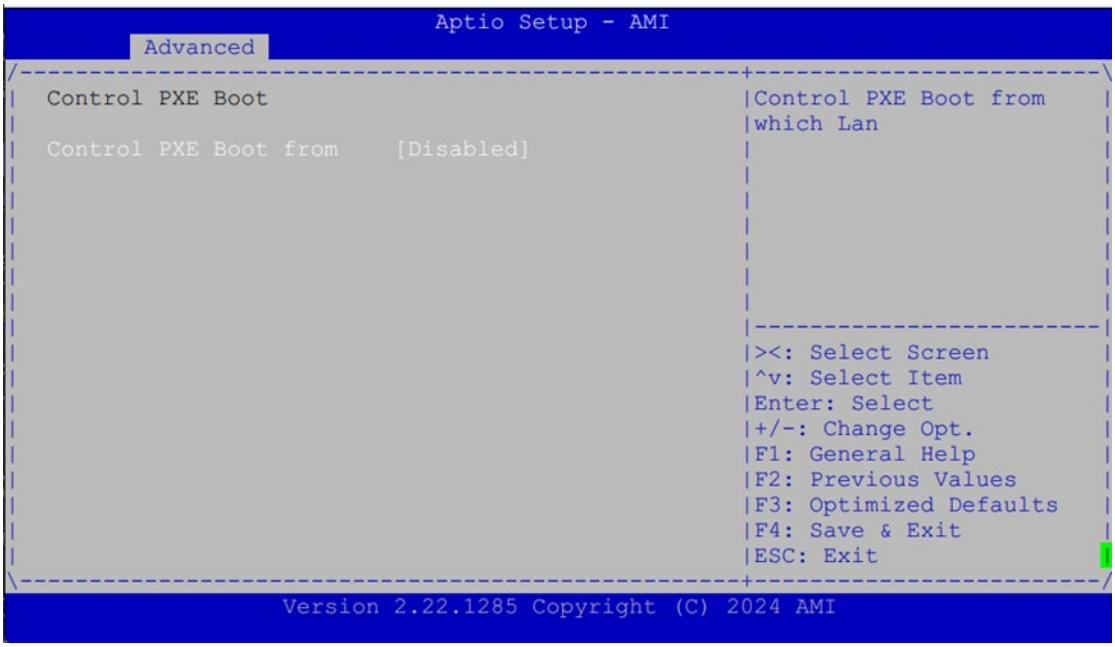


Network Stack Configuration



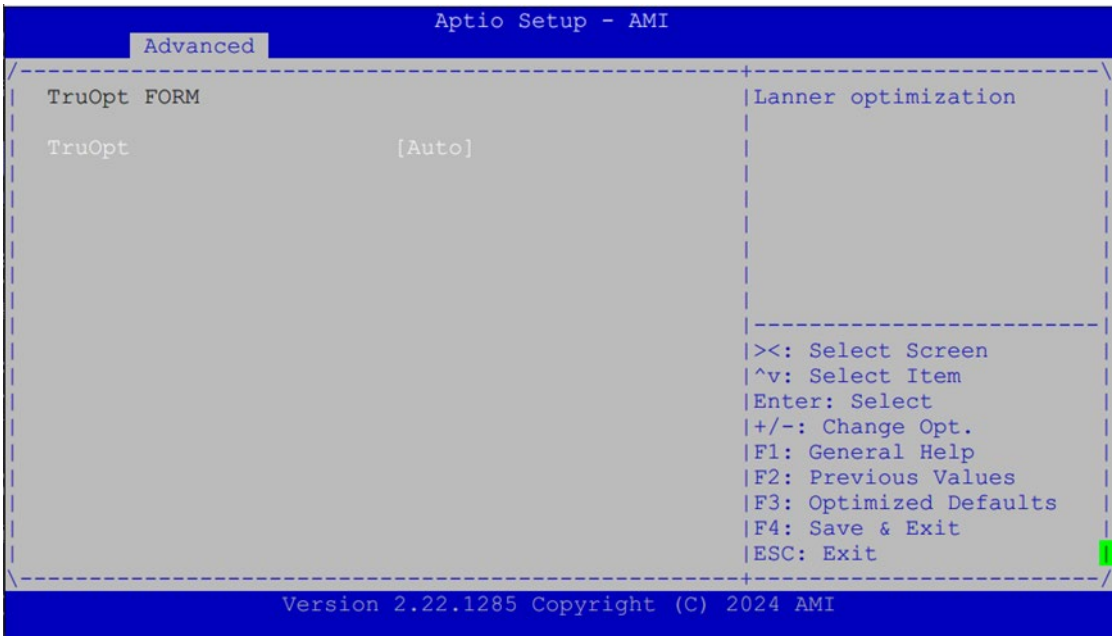
Feature	Options	Description
Network Stack	Enable Disable	Enable/Disable UEFI Network Stack
IPv4 PXE Support	Enable Disable	Enable/Disable IPv4 PXE boot support
IPv4 HTTP Support	Enable Disable	Enable/Disable IPv4 HTTP boot support.
IPv6 PXE Support	Enable Disable	Enable/Disable IPv6 PXE boot support
IPv6 HTTP Support	Enable Disable	Enable/Disable IPv6 HTTP boot support.
PXE boot wait time	0	Wait time in seconds to press ESC key to abort the PXE boot.
Media detect count	1	Number of times the presence of media will be checked.

Control PXE Boot



Feature	Options	Description
Control PXE Boot	Enable Disable	Control PXE Boot from which LAN

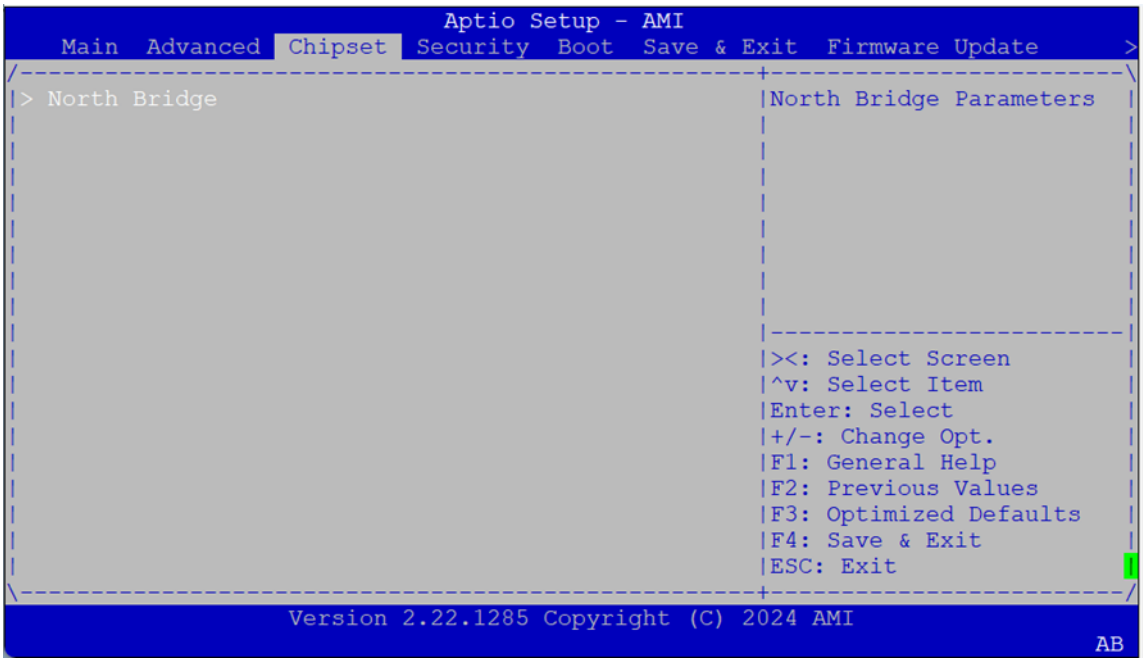
TruOpt FORM



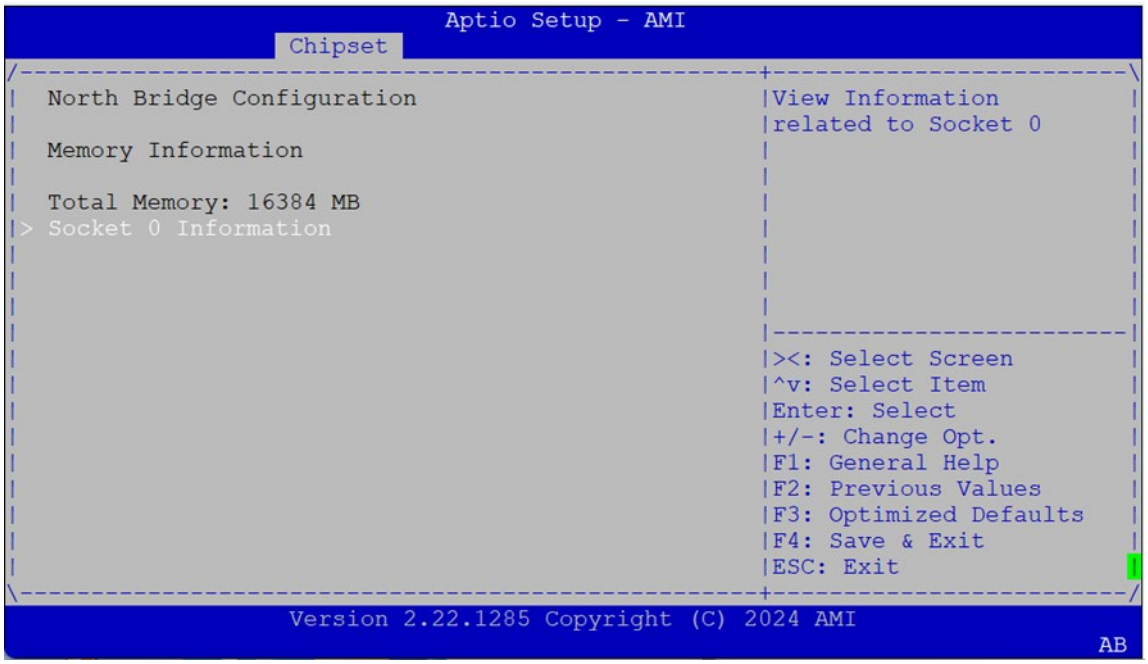
Feature	Options	Description
TruOpt	Enable Auto	Lanner optimization of DPDK tuning.

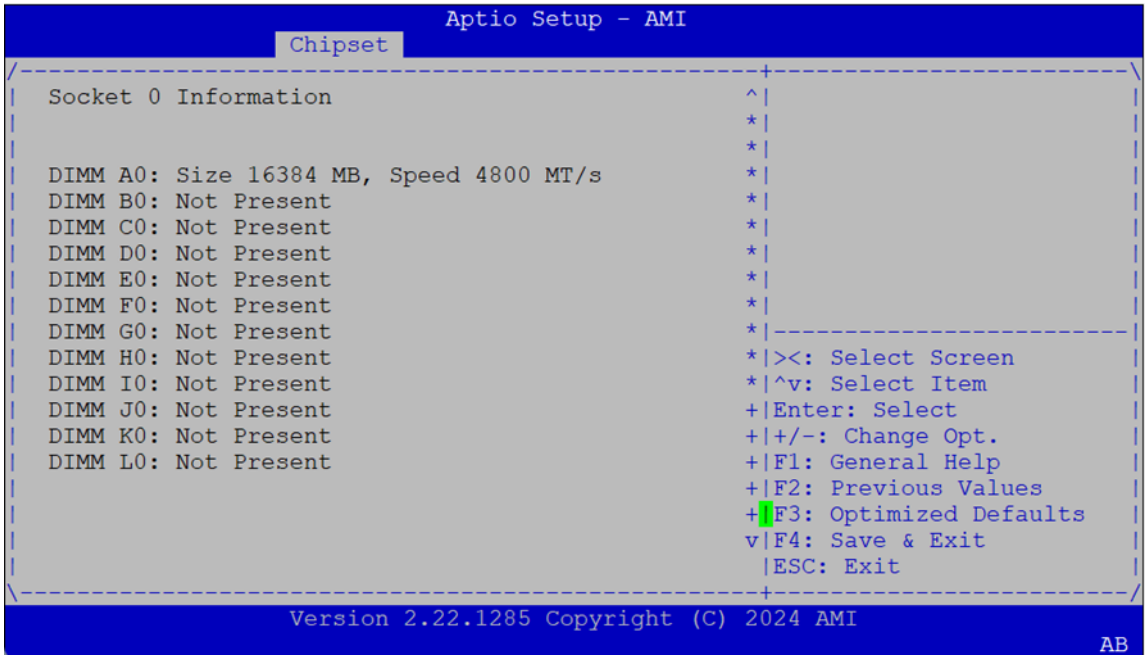
Chipset

Select the Chipset menu item from the BIOS setup screen to enter the Platform Setup screen. Users can select any of the items in the left frame of the screen.

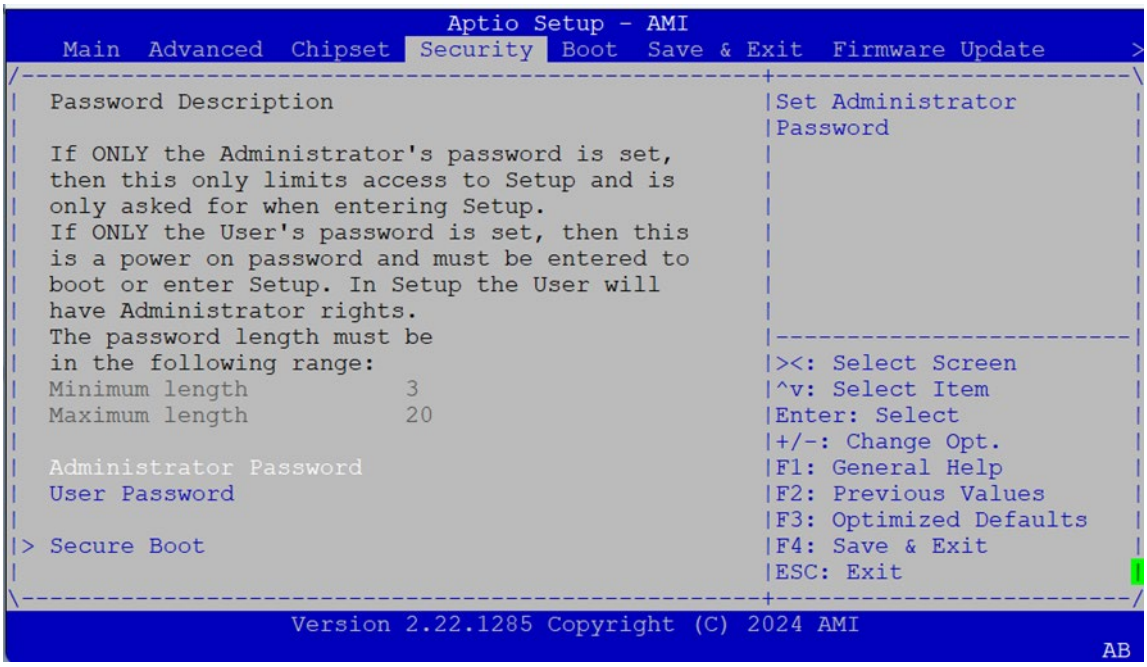


North Bridge



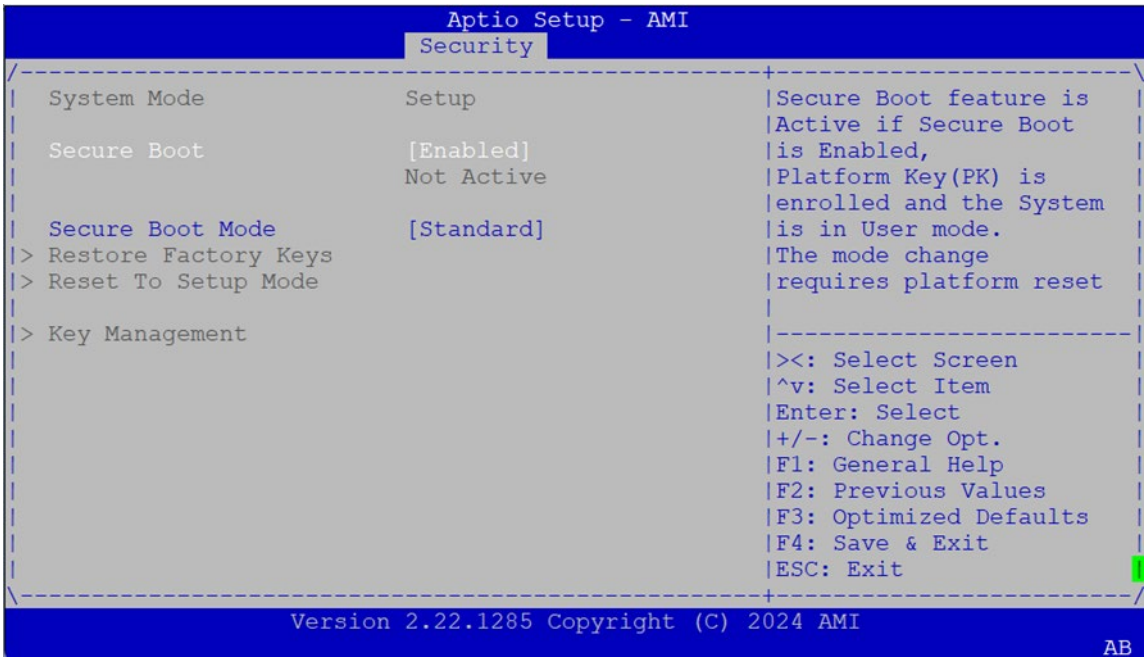


Security



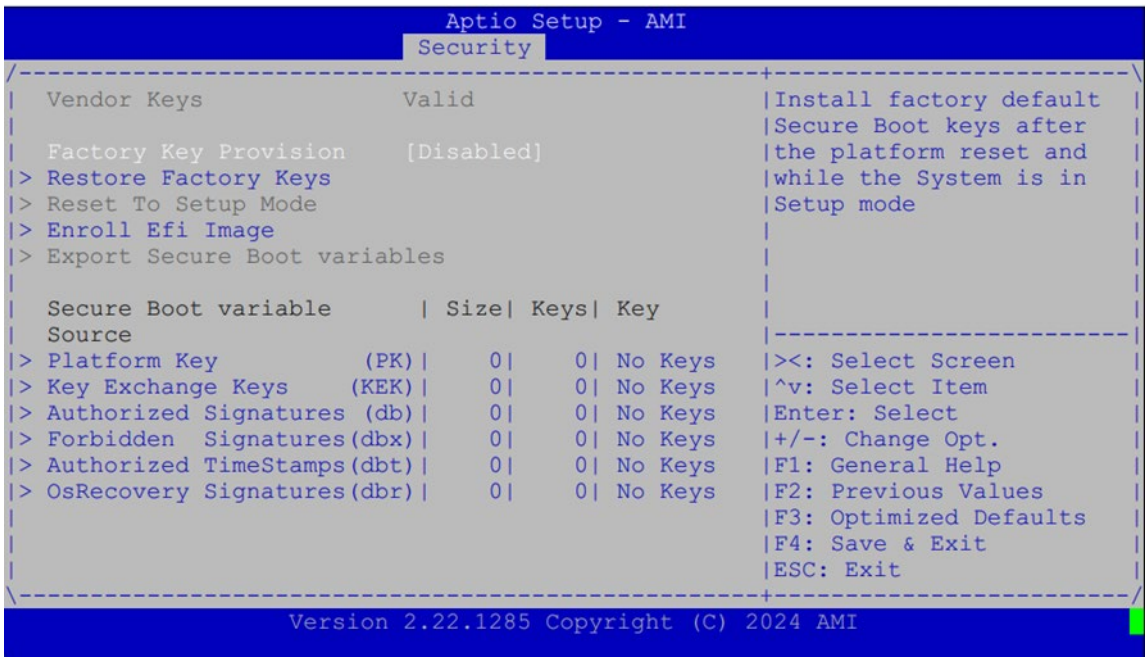
Feature	Description
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the User will have Administrator rights.

Secure Boot



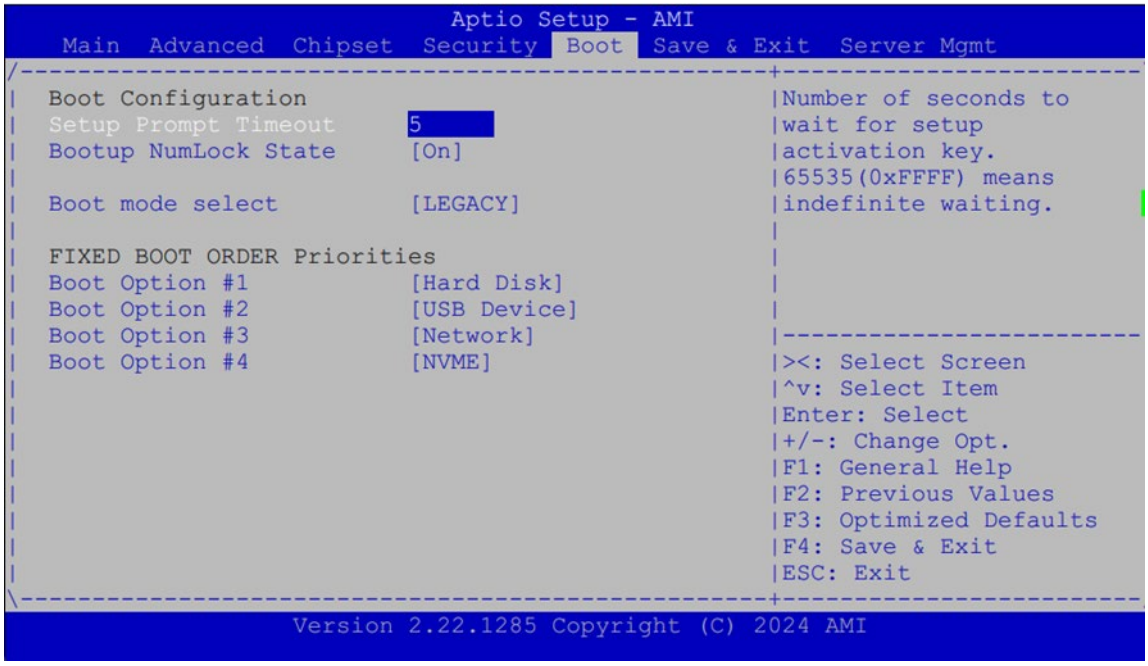
Feature	Options	Description
Secure Boot	Disabled Enabled	Secure Boot is activated when Platform Key (PK) is enrolled, System mode is User/Deployed, and CSM function is disabled.
Secure Boot Mode	Standard Custom	Secure Boot mode selector: In **Custom** mode, Secure Boot Variables can be configured without authentication

Key Management



Feature	Options	Description
Factory Factory Provision	Disabled Enabled	Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode
Restore Factory keys	None	Force System to User Mode. Install factory default Secure Boot key databases
Enroll Efi Image	None	Allow Efi image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)

Boot Menu

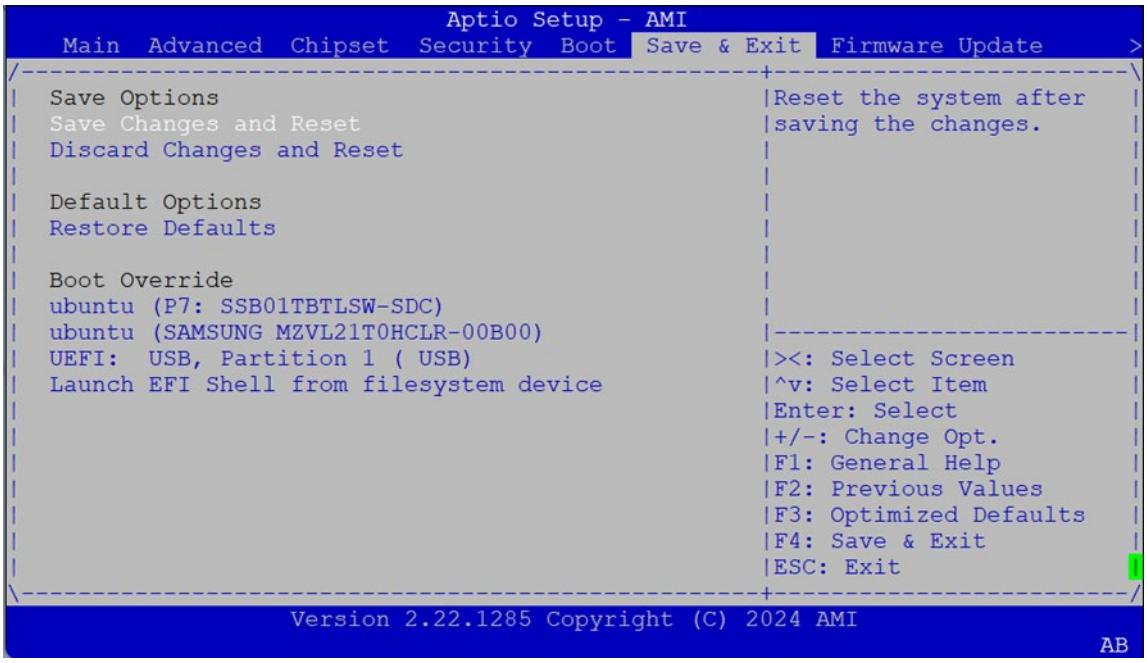


Feature	Options	Description
Setup Prompt Timeout	5	The Number of seconds to wait for setup activation key. 65535 means indefinite waiting.
BootupNumLock State	On Off	Select the keyboard NumLock state.
Boot mode select	LEGACY UEFI DUAL	Select boot mode for LEGACY or UEFI.

- Choose boot priority from boot option group
- Choose specifies boot device priority sequence from available group device.

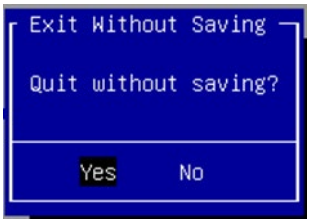
Save and Exit Menu

Select the Save and Exit menu item from the BIOS setup screen to enter the Save and Exit Setup screen. Users can select any of the items in the left frame of the screen.



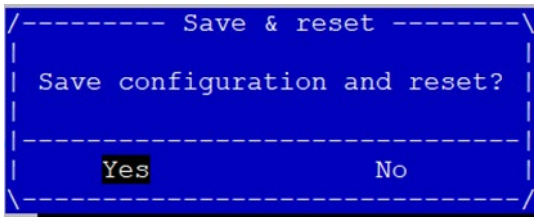
■ Discard Changes and Reset

Select this option to quit Setup without saving any modifications to the system configuration. The following window will appear after the **"Discard Changes and Exit"** option is selected. Select **"Yes"** to Discard changes and Exit Setup.



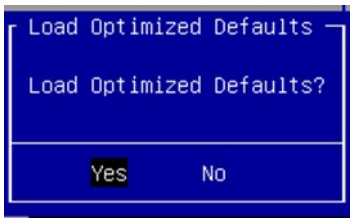
Save Changes and Reset

When Users have completed the system configuration changes, select this option to save the changes and reset from BIOS Setup in order for the new system configuration parameters to take effect. The following window will appear after selecting the **"Save Changes and Reset"** option is selected. Select **"Yes"** to Save Changes and reset.



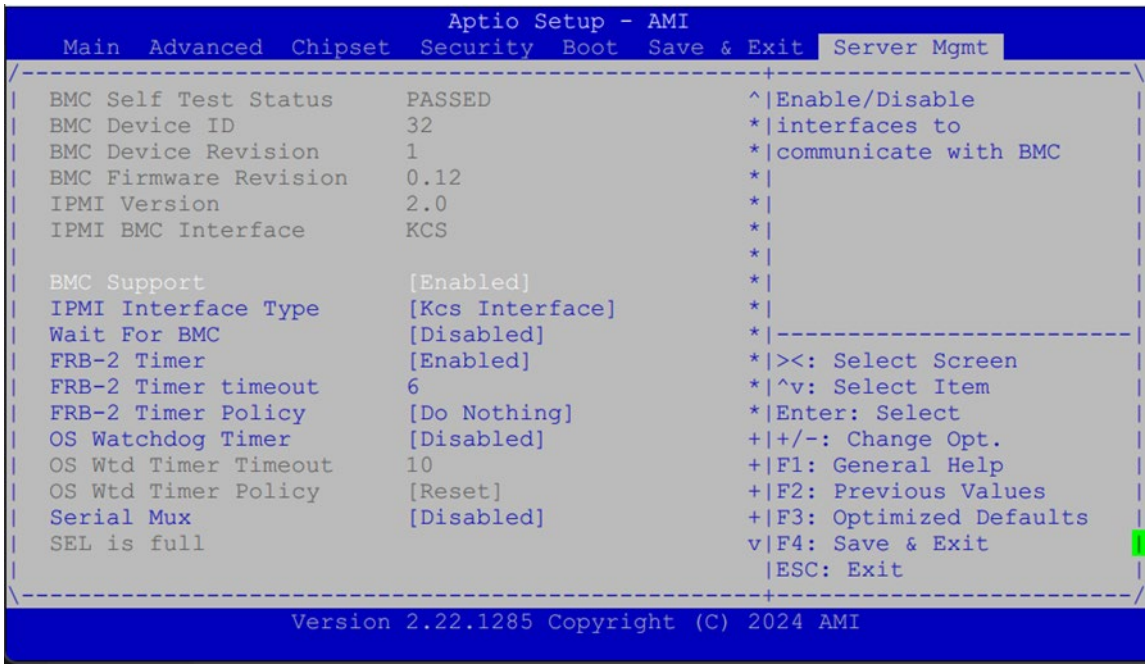
Restore Defaults

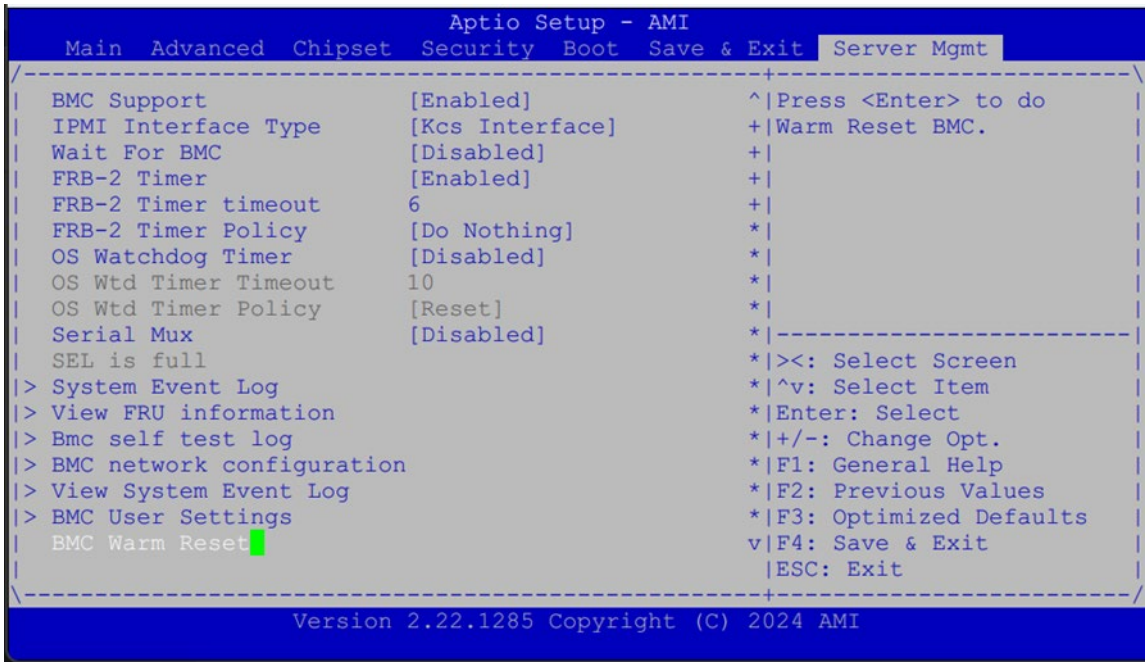
Restore default values for all setup options. Select **"Yes"** to load Optimized defaults.



NOTE: The items under Boot Override may not be the same as the image above, as it should depend on the actual devices connected to the system.

Server Mgmt

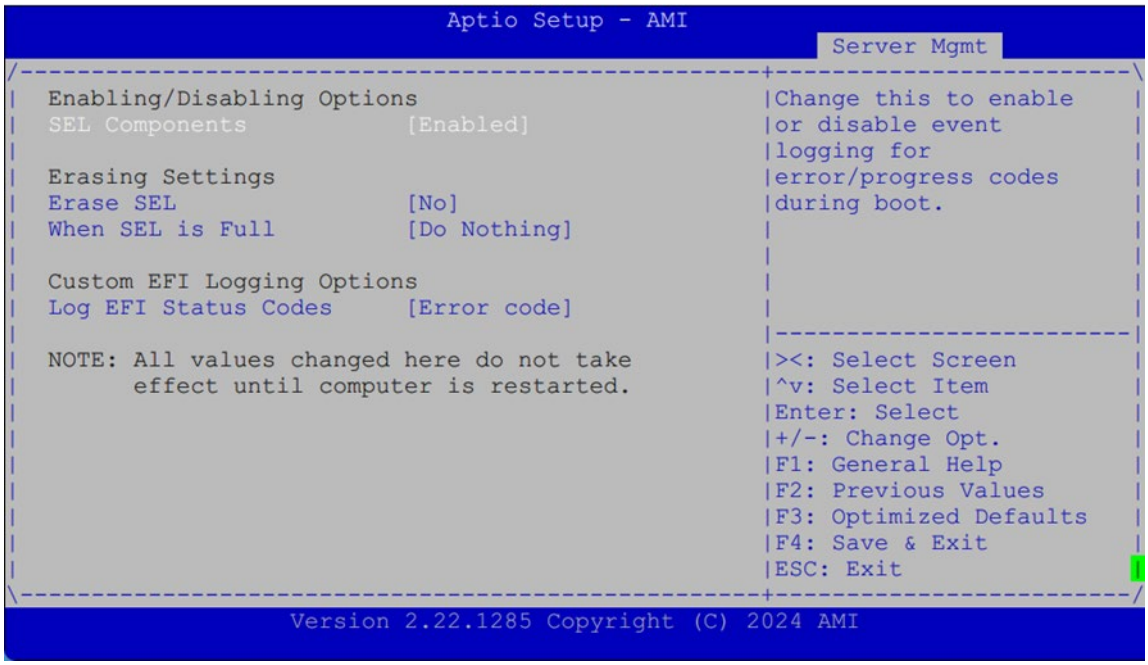




Feature	Options	Description
BMC Support	Enabled Disable	Enable/Disable interfaces to communicate with BMC
IPMI Interface Type	Kcs Interface Bt Interface Ipmb interface Usb interface	Type of Interface to communicate BMC from HOST
Wait For BMC	Enabled Disabled	Wait For BMC response for specified time out.

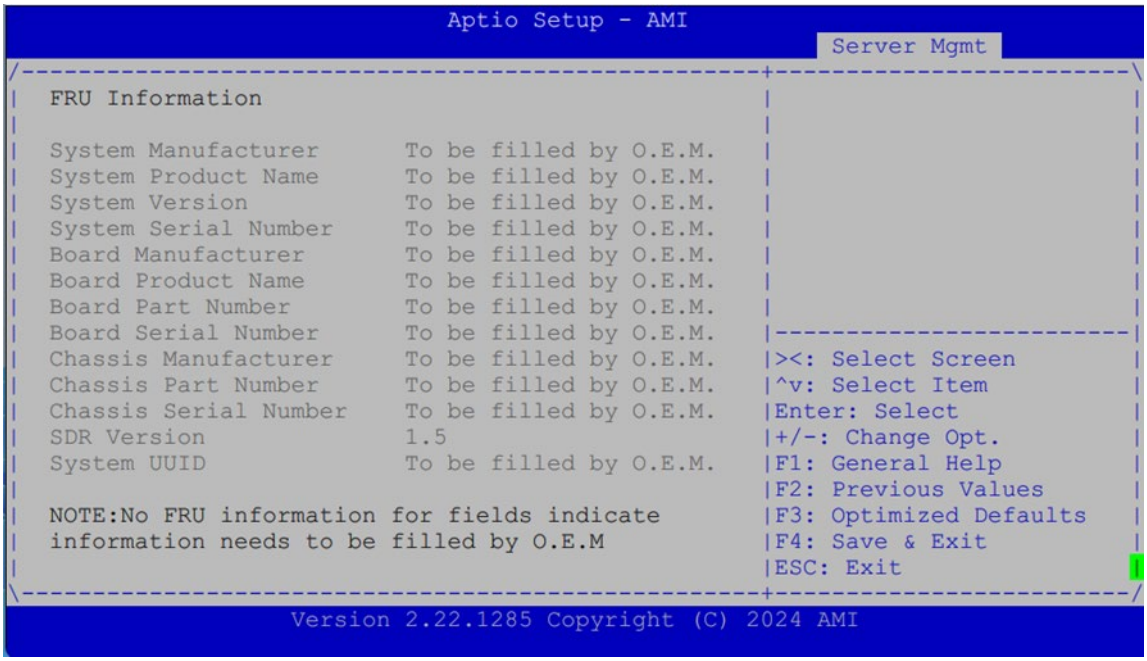
FRB-2 Timer	Enabled Disabled	Enable or Disable FRB-2 timer (POST timer)
FRB-2 Timer timeout	6	Enter value Between 1 to 30 min for FRB-2 Timer Expiration
FRB-2 Timer Policy	Do Nothing Reset Power Down Power Cycle	Configure how the system should respond if the FRB-2 Timer expires.
OS Watchdog Timer	Enabled Disabled	If enabled, starts a BIOS timer which can only be shut off by Management Software after the OS loads.
Serial Mux	Enabled Disabled	Press <Enter> to enable or disable Serial Mux configuration.
BMC Warm Reset		Press <Enter> to do Warm Reset BMC.

System Event Log

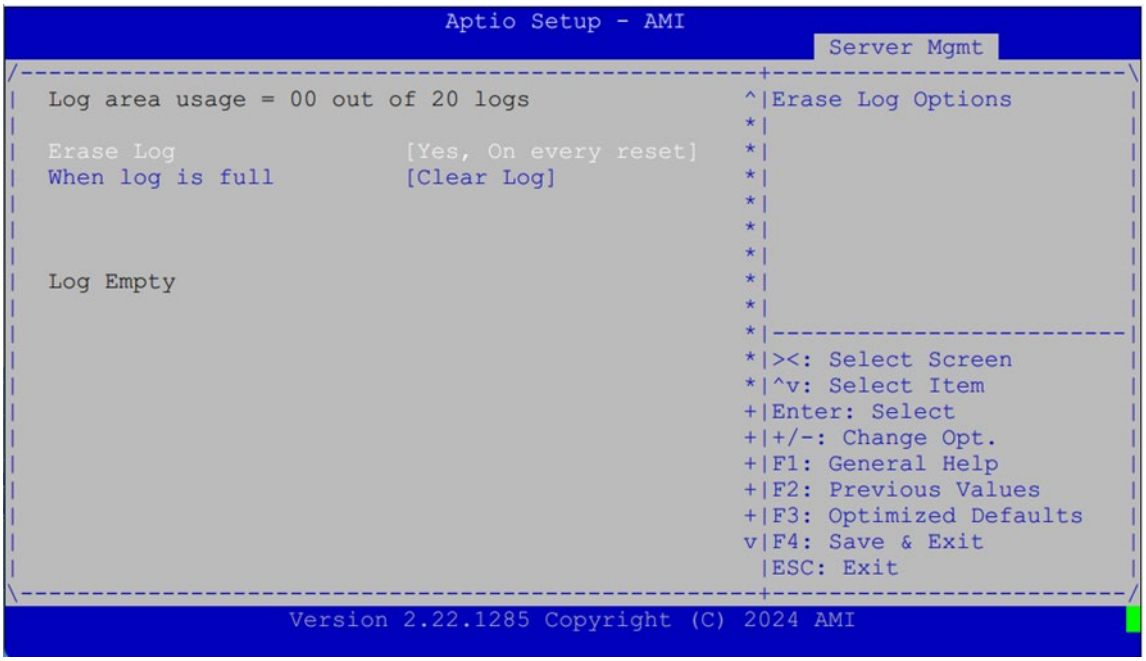


Feature	Options	Description
SEL Components	Enabled Disabled	Change this to enable or disable event logging for error/progress codes during boot.
Erase SEL	No Yes, On next reset Yes, On every reset	Choose options for erasing SEL.
When SEL is Full	Do Nothing Erase Immediately Delete Oldest Record	Choose options for reactions to a full SEL.
Log EFI Status Codes	Disabled Both Error code Progress code	Disable the logging of EFI Status Codes or log only error code or only progress code or both.

View FRU Information

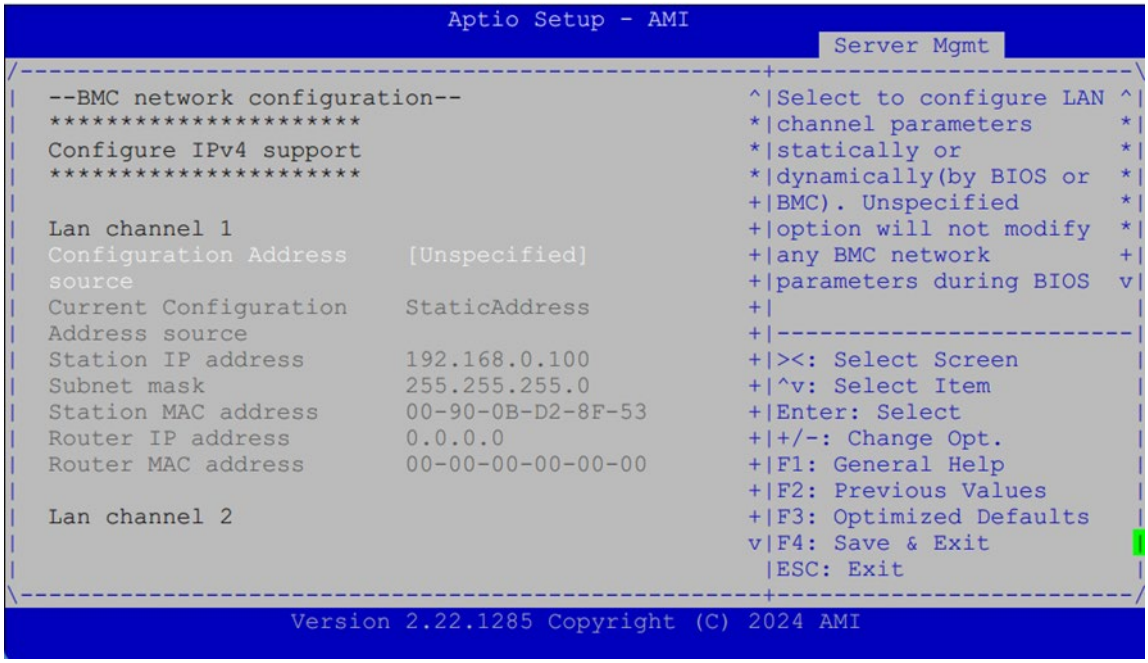


BMC Self-Test Log



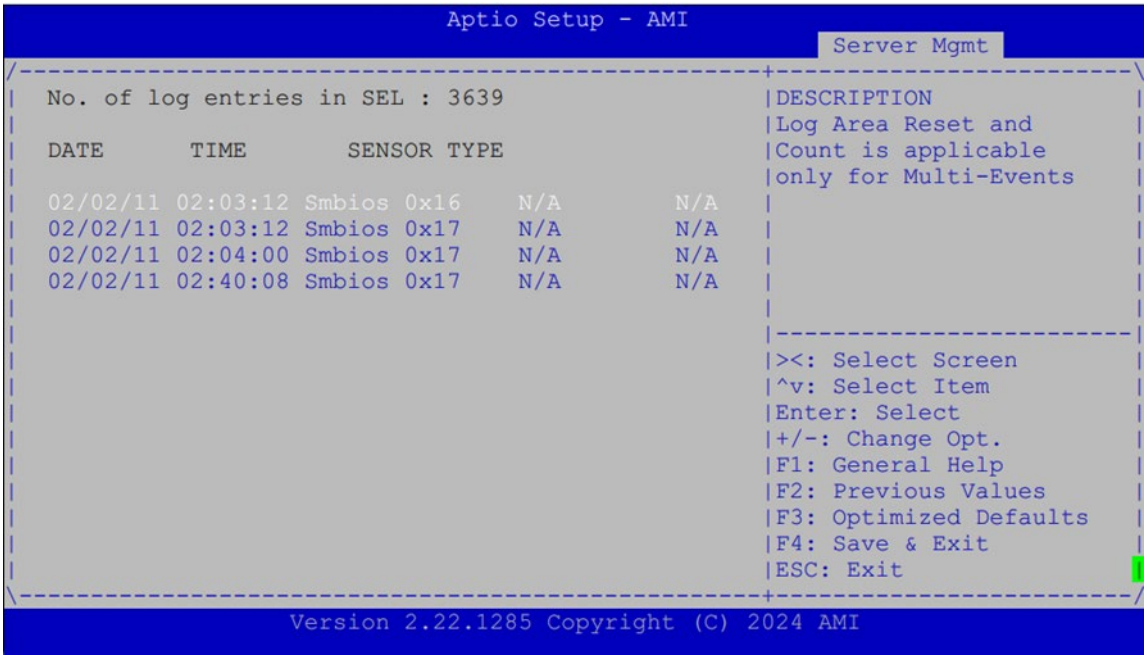
Feature	Options	Description
Erase Log	Yes, On every reset No	Erase Log Options
When log is full	Clear Log Do not log any more	Select the action to be taken when log is full

BMC Network Configuration

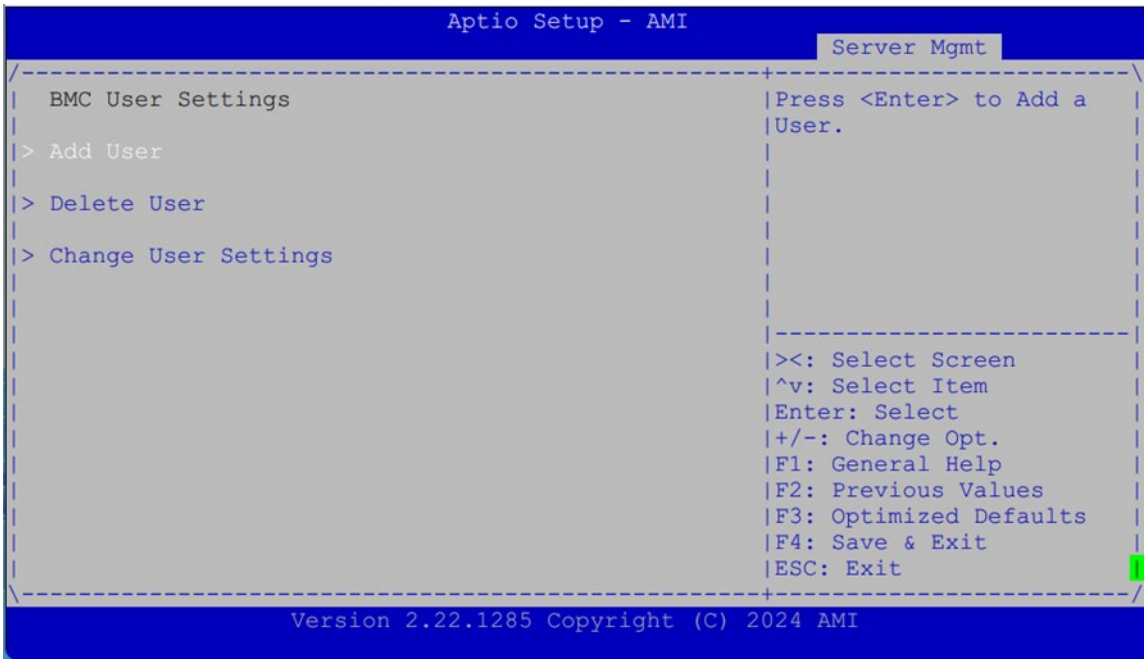


Feature	Options	Description
Configuration Address Source	Unspecified Static DynamicBmcDhcp DynamicBmcNonDhcp	Select to configure LAN channel parameters statically or dynamically (by BIOS or BMC).

View System Event Log



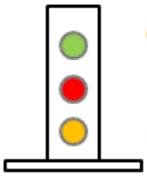
BMC User Settings



Feature	Description
Add User	Press <Enter> to Add a User.
Delete User	Press <Enter> to Delete a User.
Change User Settings	Press <Enter> to Change User Settings.

APPENDIX A: LED INDICATOR EXPLANATIONS

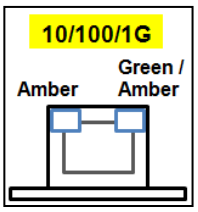
▸ System Power / Status / HDD Activity



Green : Power
Green / Red : Status
Amber : HDD

LED	COLOR ON LCM	COLOR ON BOARD	LED ACTION	DESCRIPTION
POWER	**Green**	**Green**	Steady	When system power on
	Off	Off	N/A	No power on
STATUS	**Green**	**Green**	Steady	control by GPIO
	Amber	**Red**	Steady	control by GPIO
	Off	Off	N/A	control by GPIO (Default) or No power on
HDD	**Amber**	**Amber**	**Blinking**	Blinking indicates HDD activity Include SATA / NVME
	Off	Off	N/A	No data access or No power on

▸ RJ-45 LAN LED



1Gb RJ-45 Define:

Speed	Amber (Active)	Green/Amber (Link)
10M	Blinking / Data access	OFF
100M	Blinking / Data access	ON (**Green**)
1G	Blinking / Data access	ON (**Amber**)

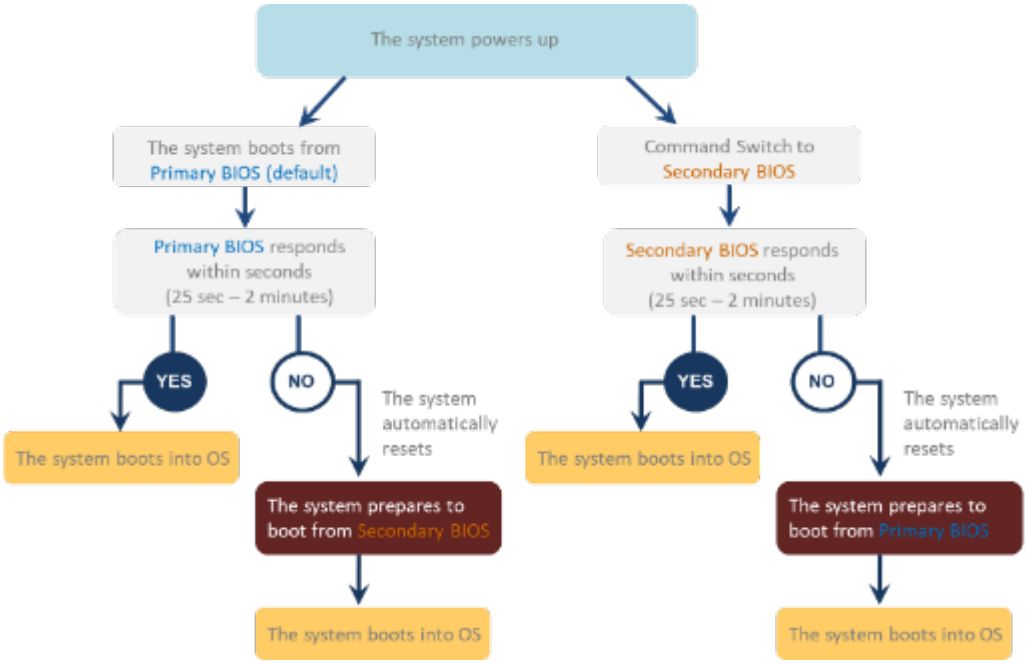
1. When cable is plug-in and network is linked. Both LED will be bright. The behavior is as defined.
2. Without the Cable plug-in, the LED should be off
3. If LAN Driver controls the LED, the behavior will follow the driver

APPENDIX B: DUAL BIOS GEN 2 FUNCTION

Failure when booting up BIOS is not uncommon and can occur most often during a power failure, a mishandled BIOS update, a malware attack resulting in data corruption. When it happens, recovering procedures consume considerable time and effort. Lanner understands this pain and have empowered our products with the Dual BIOS feature.

How Dual BIOS Works

Dual BIOS features two physical BIOS ROMs soldered onto the motherboard, carrying two separate BIOS images. If the Primary BIOS (default) is not functioning correctly and fails to respond within seconds (~25 seconds to 2 minutes, depend upon appliance), the system will invoke a bootup from the Secondary BIOS, automatically restarting the system and launch the operating system.



2nd Gen Dual BIOS

To provide increased flexibility and usage protection, Lanner has released the 2nd Gen Dual BIOS function on Lanner appliances. With 2nd Gen Dual BIOS, both the primary BIOS and secondary BIOS can be updated and flashed using the BIOS Tool to run different versions of BIOS ROMS independently for maximum compatibility. This additionally allow users to switch BIOS ROMS for booting up, toggling between primary BIOS and secondary BIOS.

- **Flexible recovery timer control**

Users can designate the amount of time before recovery BIOS launch. The amount of time is no longer fixed to 7 minutes.

- **Flexible Dual BIOS ROMs control.**

Users can flash both the Primary BIOS and Secondary BIOS, thus run different versions of BIOS ROMS independently for maximum compatibility.

- **Flexible Dual BIOS ROMs switch**

The 2nd Gen Dual BIOS allow users to choose one of the BIOS ROMS (Primary BIOS/Secondary BIOS) for booting up. Use software command prompt to toggle between Primary BIOS and Secondary BIOS.

	Gen1 Dual BIOS	Gen2 Dual BIOS
Function	Primary / Recovery 2ND BIOS for recovery purpose	Primary / Secondary (Peer to Peer) Both BIOS can let the system work
Detection Time	7 min	Seconds (By platform design)
2nd BIOS updated	Only using the SPI facility	By BIOS tool command or SPI facility
MAC/DMI	Only for BIOS1	For both BIOS
CPLD Interface	GPIO	LPC or eSPI (By Platform)

Figure 1. Gen 1 vs Gen 2 Dual BIOS comparison chart

Few things can shut down a computer as completely as a corrupted BIOS. With Dual BIOS feature, you will be guaranteed to enter a healthy OS to perform thorough troubleshooting before the situation is irreparable.

Get Ready for BIOS Update

Flashing a BIOS needs to be carefully completed, especially pertaining to a corrupted BIOS, which can lead to an unusable system if done incorrectly. To get ready for a BIOS update, acquire the following BIOS resources from Lanner technical support:

- Firmware and Flash Tool
- BIOS Engineering Spec

Before you start, make sure you select the correct firmware version, correct BIOS (Primary or Secondary) and go through the instructions for BIOS update in *BIOS Engineering Spec* thoroughly. If you cannot be certain if this version is correct for your system, please contact Lanner Technical Support.

Note:
1. Dual BIOS feature cannot work with BIOS Boot Guard function
2. To update BIOS, it is mandatory to have both BIOS updated first. This is to avoid both BIOS having ME code variations, which could lead to unexpected risk and errors.
3. When the system enters BIOS menu or Option ROM, the system will not reboot automatically.

Warning
DO NOT power off or reset the system during BIOS updating process.

Disclaimer
Under no circumstances will Lanner accept responsibility or liability for damages of any kind whatsoever resulting or arising directly or indirectly from a BIOS update.

APPENDIX C: REDUNDANT POWER MODULE BEHAVIOR

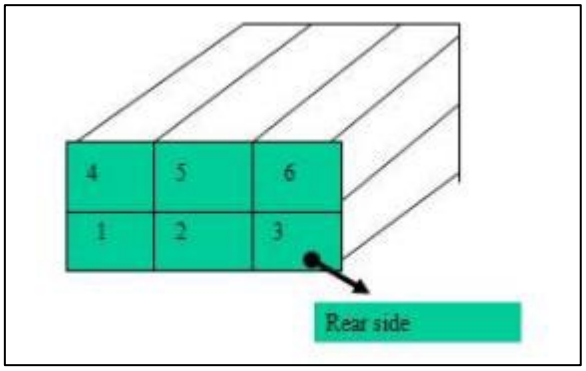
Define Alarm and Mute behavior

	Power Module Fail	Power Module Remove	Power Cord Remove
Buzzer	**Alarm**	**Alarm**	**Alarm**
Mute	Change back the Good PSU Module or Press the Mute Button	Place back the PSU Module or Press the Mute Button	Plug-in the Power cord or Press the Mute Button

Define the Sequence of the Power Module

PSU Sequence – The detection is from the left to the right side, from the bottom to the top.

Example:

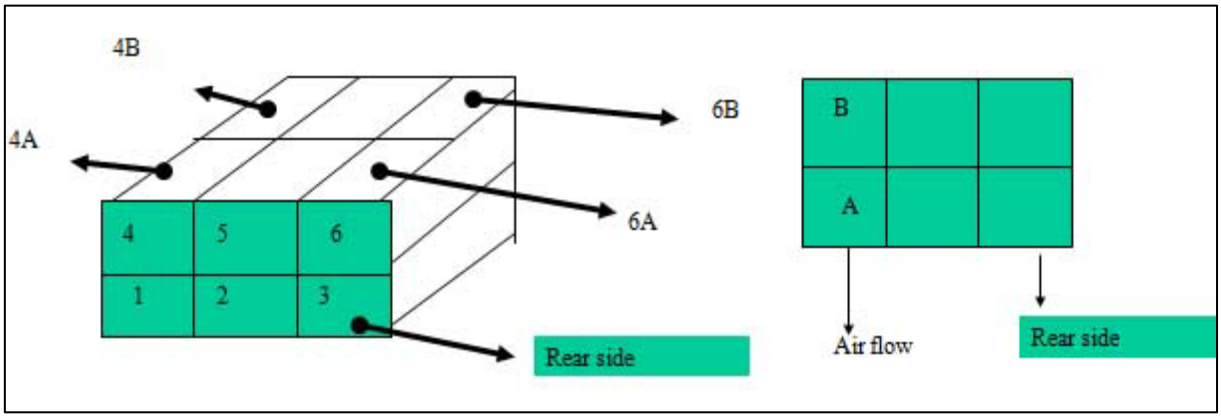


APPENDIX D: FAN SEQUENCE

Define the Sequence of the Fan

Fan Sequence – The detection is from the left to the right side, from the bottom to the top side.

Example:



APPENDIX E: SMART POWER AND RESET BUTTON

Smart Power and Reset Button – Control by CPLD

APPENDIX F: ESD/SURGE ENHANCEMENT

Electrostatic Discharge (ESD): IEC-61000-4-2	Contact Discharge	Air Discharge	STD
Level 1	±2 kV	±2 kV	
Level 2	±4 kV	±4 kV	4K Contact
Level 3	±6 kV	±8 kV	8K Air
Level 4 (TBD)	±8 kV	±15 kV	New Requirement
			STD
Surge Immunity (LAN) IEC-61000-4-5	Test Level		
Level 0	25V		
Level 1	500V		
Level 2	1kV		V (Current)
Level 3 (TBD)	2kV		New Requirement
Level 4	4kV		
			STD
Electrical Fast Transient (EFT): IEC-61000-4-4			
Level 1	0.5kV		
Level 2	1kV		V (Current)
Level 3 (TBD)	2kV		New Requirement
Level 4	4kV		

APPENDIX G: TERMS AND CONDITIONS

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after-service freight charges for goods returned to the user.
3. The buyer will pay for repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:
   - Improper or inadequate maintenance by the customer
   - Unauthorized modification, misuse, or reversed engineering of the product
   - Operation outside of the environmental specifications for the product.

RMA Service

Requesting an RMA#

1. To obtain an RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
2. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
4. Mark the RMA# clearly on the box.

Note

Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No:	Reasons to Return: ☐ Repair (Please describe failure details) ☐ Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Apply Date:
Return Shipping Address: _____	
Shipping by: ☐ Air Freight ☐ Sea ☐ Express:_____	☐ Others:_____

Item	GP	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

***Problem Code:**

01:D.O.A.
02: Second Time R.M.A.
03: CMOS Data Lost
04: FDC Fail
05: HDC Fail
06: Bad Slot
07: BIOS Problem
08: Keyboard Controller Fail
09: Cache RMA Problem
10: Memory Socket Bad
11: Hang Up Software
12: Appearance Damage
13: SCSI
14: LPT Port
15: PS2
16: LAN
17: COM Port
18: Watchdog Timer
19: DIO
20: Buzzer
21: Shut Down
22: Panel Fail
23: CRT Fail
24: Others (Pls specify)

Requested by

_____

Authorized Signature / Date

Confirmed by supplier

_____

Authorized Signature / Date