



Edge Computing Appliance Platform

Hardware Platforms for Edge Computing

ECA-5555 User Manual

Version: 1.5

Date of Release: 2025-07-09

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.

Conventions & Icons

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.

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Documentation Feedback

Your feedback is valuable to us, as it will help us continue to provide you with more accurate and relevant documentation. To provide any feedback, comments or to report an error, please email contact@lannerinc.com. Thank you for your time.

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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.
- ▶ CAUTION: Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions."

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.
- ▶ ATTENTION: Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebus les batteries usagées selon les instructions."

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).
- ▶ Product shall be used with Class 1 laser device modules.
- ▶ The unit is only for Skilled person to install and maintenance
- ▶ The device can only be used in a fixed location such as a lab or a machine room. When you install the device, ensure that the protective earthing connection of the socket-outlet is verified by a skilled person.

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).
- ▶ Le produit doit être utilisé avec des modules de dispositifs laser de classe 1.
- ▶ Cette machine est réservée aux techniciens à installer et à entretenir
- ▶ L'appareil ne peut être utilisé que dans un lieu fixe, tel qu'un laboratoire ou une salle de machines. Lorsque vous installez l'appareil, assurez-vous que le raccordement à la terre de protection de la prise de courant a fait l'objet d'une vérification par une personne qualifiée.

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 (T_{ma}) 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).

Installation & Operation

- ▶ This equipment must be grounded. The power cord for product should be connected to a socket-outlet with earthing connection.
Cet équipement doit être mis à la terre. La fiche d'alimentation doit être connectée à une prise de terre correctement câblée
- ▶ Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.
- ▶ The machine can only be used in a restricted access location and must be installed by a skilled person.
Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.

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

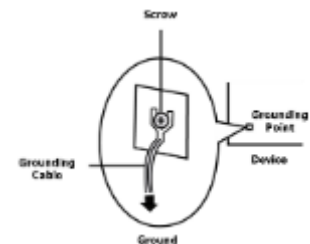
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire 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.

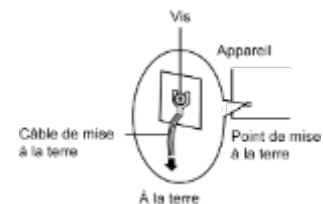
Grounding Procedure for DC Power Source

- ▶ Connect the grounding cable to the ground.
- ▶ The protection device for the DC power source must provide 30 A current.
- ▶ This protection device must be connected to the power source before DC power.



Procédure de mise à la terre pour source d'alimentation CC

- ▶ Branchez le câble de mise à la terre à la terre.
- ▶ L'appareil de protection pour la source d'alimentation CC doit fournir 30 A de courant.
- ▶ Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation CC.



Instruction for the installation of the conductor to building earth by a skilled person.

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CHAPTER 1: PRODUCT OVERVIEW

The ECA-5555, powered by the Intel® Xeon® 6 SoC Processor, is designed to empower AI-accelerated 5G RAN and MEC applications.

Main Features

- ▶ Intel® Xeon 6 SoC Processor (Codenamed Granite Rapids D)
- ▶ Intel® vRAN Boost Accelerator, Intel® Media Transcode Accelerator Support
- ▶ 2x GbE RJ45 Ports, 8x 10G/25G SFP28 Ports, 2x 100G QSFP28 Ports
- ▶ Max. 512GB DDR5 6400MHz RDIMM
- ▶ 1x RJ45 Console Port, 2x USB 3.0 Ports
- ▶ 2x M.2 NVMe 22110/2280
- ▶ Support for IEEE 1588 PTP, SyncE And Integrated GNSS for High-Precision Timing Sync
- ▶ -40~55°C Operating Temperature Range
- ▶ Intel® QuickAssist Technology

Package Content

Your package contains the following items:

- ▶ 1x ECA-5555 Edge Computing Platform
- ▶ 1x RJ45 Console Cable
- ▶ 1x GPS Antenna
- ▶ 1x Short Ear Rack Mount Kit with screws

Ordering Information

SKU	CPU	Storage	Default Port	Expansion	Power
ECA-5555A	Intel® Xeon® 6 SoC 6726P-B, 42 Cores	2x M.2 2280/22110 NVMe SSD	2x 1GbE RJ45; 8x 25G SFP28; 100G QSFP28	1x PCIe *16 FHFL (Dual Width)	AC 1200W
ECA-5555B	Intel® Xeon® 6 SoC 6556P-B, 36 Cores				DC-IN
ECA-5555C	Intel® Xeon® 6 SoC 6516P-B, 20 Cores		2x 1GbE RJ45; 8x 25G SFP28		AC 1200W
ECA-5555D	Intel® Xeon® 6 SoC 6563P-B, 38 Cores				

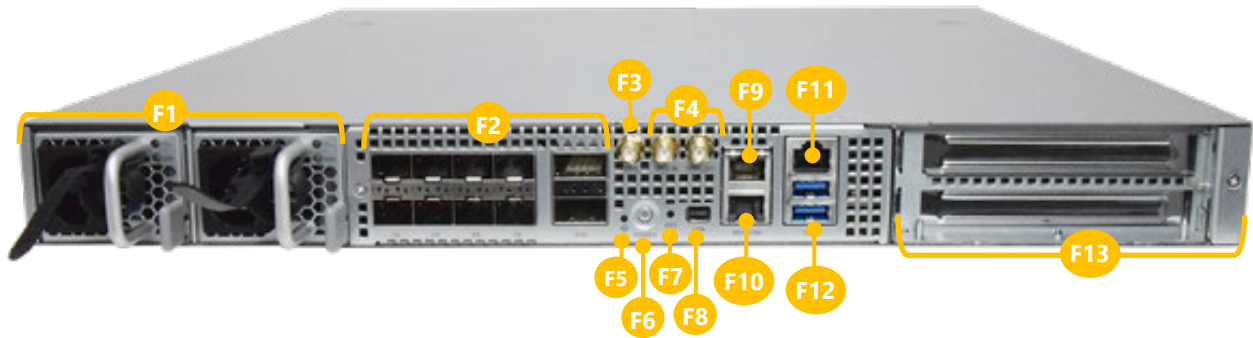
Optional Accessories

Model	P/N	Description
Rackmount Kit	098W000300014	1U Slide Rackmount Kit
DC Power Supply Unit Kit	TBE	DC CRPS Power Module

System Specifications

Form Factor		1U 19" Rackmount
Platform	Processor Options	SKU A: Intel® Xeon® 6 SoC 6726P-B, 42 Cores, 235W SKU B: Intel® Xeon® 6 SoC 6556P-B, 36 Cores, 215W SKU C: Intel® Xeon® 6 SoC 6516P-B, 20 Cores, 145W SKU D: Intel® Xeon® 6 SoC 6563P-B, 38 Cores, 235W
	Security Acceleration	Intel® QuickAssist Technology; vRAN Boost Accelerator (SKU A/B/C); Media Transcode Accelerator (SKU D)
BIOS		AMI SPI Flash BIOS
System Memory	Technology	DDR5 6400MHz RDIMM
	Max. Capacity	Up to 512GB
	Socket	4x 287-Pin DIMM
Networking	Ethernet Ports	SKU A/B: 2x 1GbE RJ45; 8x 10G/25G SFP28; 2x 100G QSFP28 SKU C/D: 2x 1GbE RJ45; 8x 10G/25G SFP28 (Time Sync/SyncE Function Supported)
	IEEE 1588	SKU A/B/C: Yes (Default); SKU D: NA (Default)
	GPS	SKU A/B/C: Yes (Default); SKU D: NA (Default)
LOM	IO Interface	1x 1GbE RJ45 LOM Port
	OPMA slot	Yes, IAC-AST2600 IPMI Module installed onboard
I/O Interface	Reset Button	1x Reset Button (Default SW Reset)
	Power Button	1x Power Button
	LED Indicator	Power / Status, refer to Appendix A
	Console Port	1x RJ45 Console Port
	MGT Port	1x RJ45 Management Port
	LOM Port	1x RJ45 LOM Port
	USB Port	2x USB 3.0 Port
	Display Port	Mini-DP via IAC-AST2600 IPMI card
Storage	Power Input	Dual 1200W AC Power Inlet OR; Dual 1200W DC Power Inlet (Optional)
	Onboard Slots	2x M.2 22110/2280 M-Key for NVMe Module
Expansion	PCIe	1x FHFL (PCIe*16, Dual Width)
Miscellaneous	Watchdog	Yes
	RTC w/ Li Battery	Yes
	TPM	Yes, IAC-TPM04A Module installed on board
Cooling	Processor	Passive CPU heat sink
	System	8x Smart Fans
Environmental Parameters	Operating Temp	SKU A/C/D: 0~55°C; SKU B: -40~55°C
	Non-Operating Temp	-40~70°C
	Humidity (RH)	5~90% RH Operating; 5~95% RH Storage
System Dimensions	(WxDxH)	438 x 450 x 44mm
	Weight	13.74kg
Package Dimensions	(WxDxH)	739 x 582 x 215mm
	Weight	18.74kg
Power	Type/Watts/Input	SKU A/C/D: 1200W AC PSU; OR 1200W DC PSU (Optional); Input: AC 90~264V @50~60 Hz; SKU B: 1300W DC Open Frame; Input: DC 45-57VDC Input
Approvals and Compliance		RoHS Directive (EU) 2015/863, CE/FCC Class A, UL, NEBS Compliance

Front Panel



No.	Description	
F1	Power Supply	AC 1+1 Redundant Power Supply
F2	LAN Port	8x 25G SFP28; 2x 100G QSFP28
F3	Antenna	1x GPS Antenna Hole
F4	1PPS Connector	IEEE 1588v2 1PPS IN/OUT Connector
F5	LED Indicators	Power / Status LED Indicators
F6	Power Button	1x Power Button
F7	Reset Button	1x Reset Button
F8	Display Port	1x VGA Port
F9	LOM Port	1x 1GbE RJ45 LOM Port
F10	MGT Port	1x 1GbE RJ45 Management Port
F11	Console Port	1x 1GbE RJ45 LOM Port
F12	USB Port	2x USB 3.0 Port
F13	PCIe Expansion	1x PCIe*16 FHL

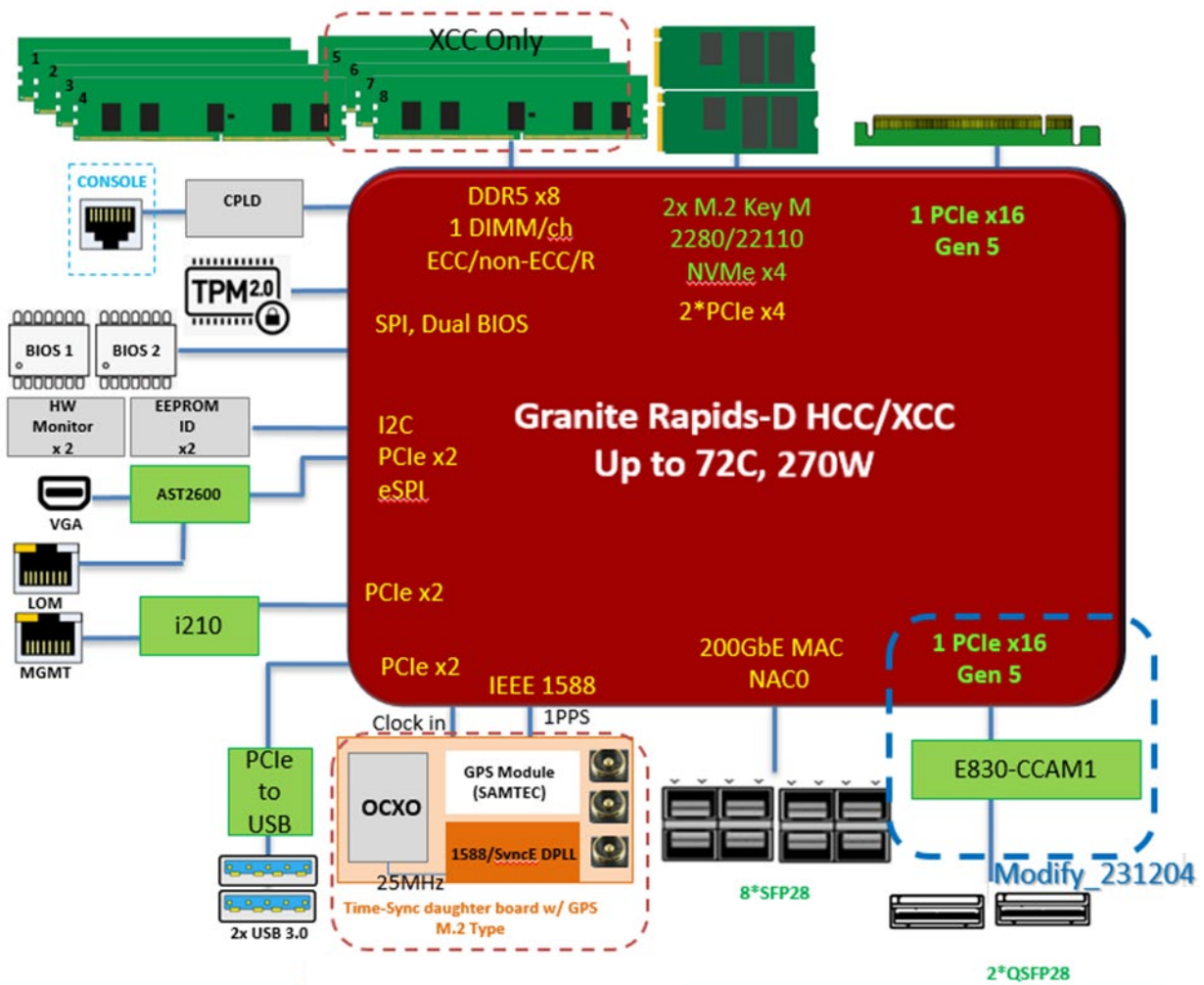
Rear Panel



No.	Description	
R1	Fan	8x Smart Fans
R2	ESD Jack	1x ESD Screw Hole
R3	Grounding	1x Ground Screw Hole

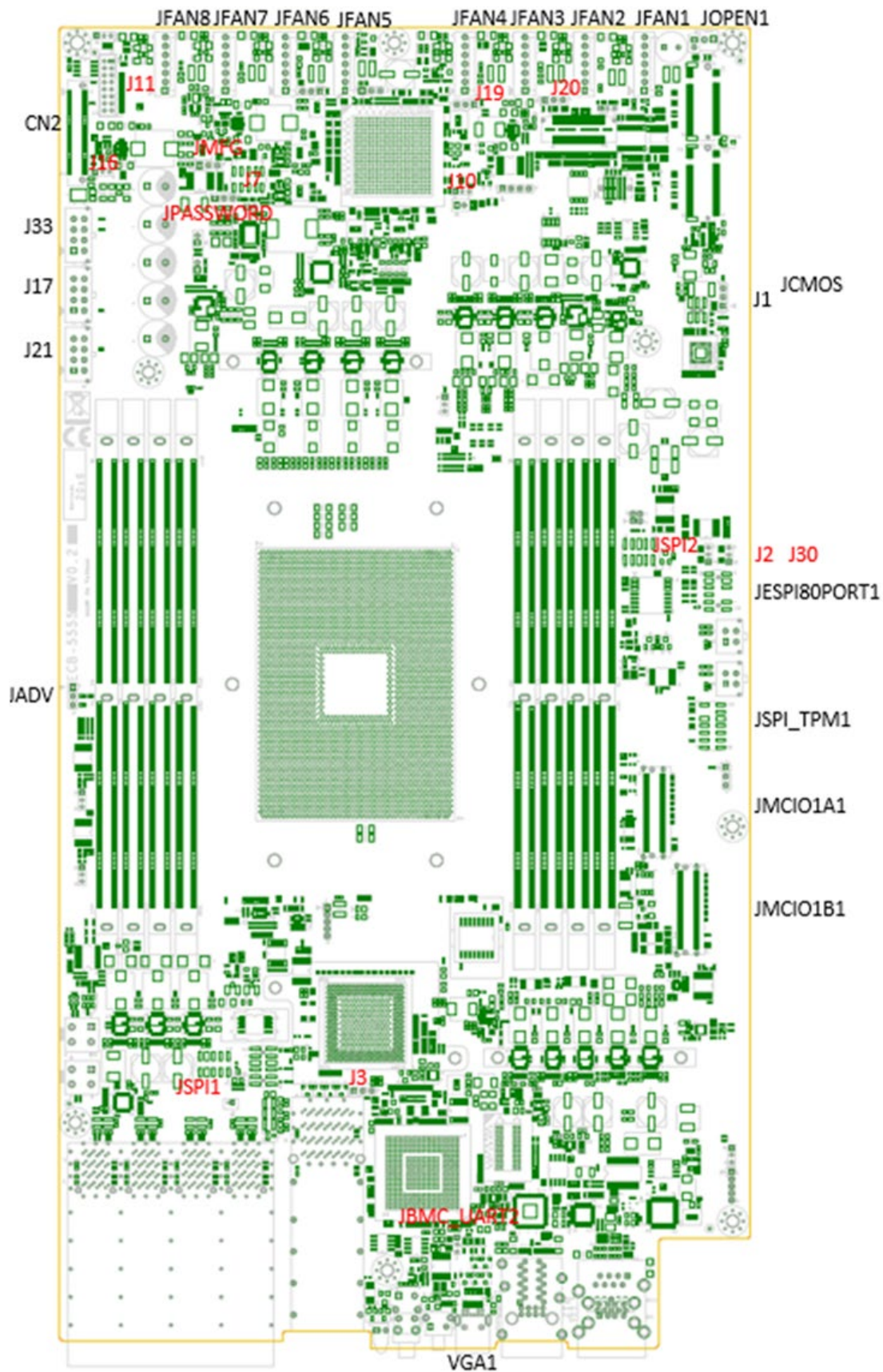
CHAPTER 2: MOTHERBOARD INFORMATION

Block Diagram



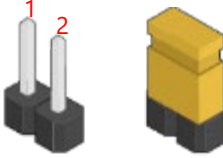
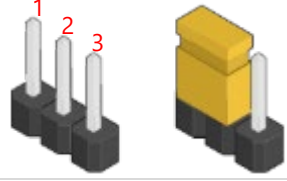
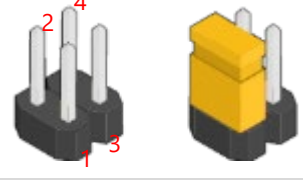
Internal Jumpers and Connectors

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.



The pin headers on the motherboard play a crucial role in controlling key functions. By placing a shunt (jumper) over the specified pins (whose numbers are labeled on the circuit board around the pin header), you can activate or deactivate specific features. Always ensure that your system is powered off before adjusting the jumpers.

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

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

Connectors Pin Assignment

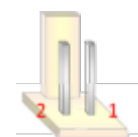
1. JFAN1~JFAN8: For Fan Module Connection

Pin	Description
1	GND
2	GND
3	+12V
4	+12V
5	RPM sense
6	RPM sense
7	PWM control



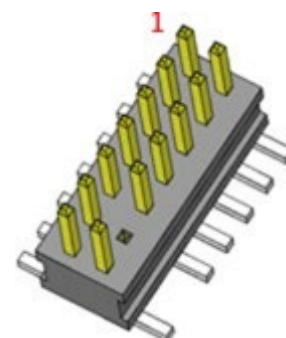
2. JOPEN1: Case Open Indication

Pin	Description
1	FP_CHASSIS_INTRUSION
2	GND



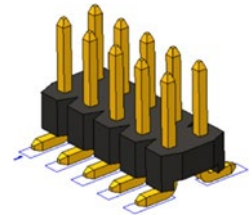
3. JSPI_TPM1: For Lanner TPM Module (IAC-TPM04)

Pin	Description	Pin	Description
1	NC	2	NC
3	NC	4	+ P1V8_AUX
5	SPI_MISO	6	NC
7	NC	8	SPI_CLK
9	GND	10	SPI_MOSI
11	TPM_PIRQ#	12	Key
13	TPM_CS0#	14	TPM_PLTRST#



4. JSPI2: SPI Fixture Debug Purpose

Pin	Description	Pin	Description
1	SPI_HOLD#	2	SPI_CS1#
3	SPI_CS0#	4	SPI_3V3
5	SPI_MISO	6	SPI_IO3
7	NC	8	SPI_CLK
9	GND	10	SPI_MOSI

**5. JBMC_UART2: For System or BMC Console Debug Purpose**

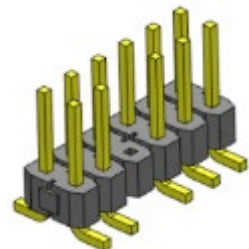
Pin #	Description
1	RX
2	TX
3	GND

**6. J11: For Lanner Power Debug Purpose**

Pin	Description	Pin	Description
1	GND	2	+P3V3_AUX
3	GND	4	+P3V3_AUX
5	PSU1_PWROK	6	PSU_PWROK
7	PSU1_AC_FAIL	8	SML1_PMBUS_ALERT
9	PSU2_PWROK	10	PWRGD_PWROK
11	PSU2_AC_FAIL	12	PS_EN
13	SMB_PMBUS1_SCL	14	PSU1_PRESENT
15	SMB_PMBUS1_SDA	16	PSU2_PRESENT

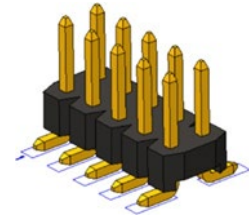
**7. JESPI80PORT: For Lanner eSPI Fixture Debug Purpose**

Pin	Description	Pin	Description
1	ESPI_CLK	2	ESPI_IO1
3	ESPI_RST#	4	ESPI_IO0
5	ESPI_CS#	6	+P3V3
7	ESPI_IO3	8	Key
9	ESPI_IO2	10	GND
11	+P3V3_AUX	12	NC

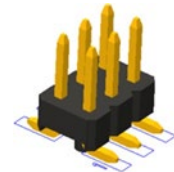


8. J7: For Lanner CPLD Debug Purpose

Pin	Description	Pin	Description
1	JTAG_PLD_TCK_R	2	GND
3	JTAG_PLD_TDO	4	+P2V5_MAX10_AUX
5	JTAG_PLD_TMS_R	6	TP_PLD_JTAG_PIN6
7	TP_PLD_JTAG_PIN7	8	JTAG_PLD_JTAGEN
9	JTAG_PLD_TDI_R	10	GND

**9. J1: S3M Boot Mode (On DIEPD) (Default: 1-2, 2-4)**

Pin	Description	Pin	Description
1	PD_CPU0_GPIO4_SPI_FLASH_MODE	2	PD_CPU0_LVC1_HDR_N
3	FM_CPU0_GPIO4_EAF_BMC_SAFS_SEL_LVC1	4	TRC_CPU0_R1_PTIO<10>
5	PU_CPU0_GPIO4_ESPI_SAFS	6	PU_CPU0_LVC1_HDR_N

**10. JADV: For Power Debug Purpose**

Pin	Description
1-2	BIOS CORE TREE EXECUTION
2-3	BIOS UNCORE TREE (DEFAULT)

**11. JCMOS: For Clear CMOS**

Pin	Description
1-2	Normal
2-3	Clear CMOS

**12. J16: FPGA Programing Enable**

Pin	Description
1-2	(DEFAULT) ENABLE PROGRAMING
2-3	DISABLE PROGRAMING

**13. JMFG: MFG Jumper**

Pin	Description
1-2	(DEFAULT) Normal
2-3	MFG MODE



14. J20: For Dual BIOS Enable

Pin	Description
1-2	Enable
2-3	Disable

**15. J19: For Boot Up BIOS Selection**

Pin	Description
1-2	First BIOS
2-3	Second BIOS

**16. J10: Force PWRON Options**

Pin	Description
1-2	DISABLE (DEFAULT)
2-3	ENABLE

**17. J2: ESPI CS0# Flow (ESPI Mode)**

Pin	Description
1-2	CS0# TO BMC (DEFAULT)
2-3	CS0# TO FPGA AND/OR ESPI CONN

**18. J30: ESPI CS1# Flow (ESPI Mode)**

Pin	Description
1-2	CS1# TO FPGA (DEFAULT)
2-3	CS1# TO ESPI CONN

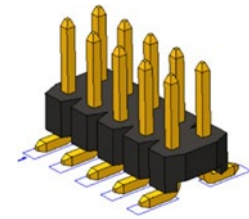
**19. J3: Disable the BMC Remote SPD Access for Security**

Pin	Description
1-2	BMC SPD REMOTE DEBUG DISABLED (DEFAULT)
2-3	BMC SPD REMOTE DEBUG ENABLED

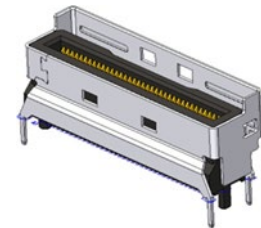


20. JSPI1: E830 SPI Fixture Debug Purpose

Pin	Description	Pin	Description
1	NC	2	NC
3	SPI_CS0#	4	+P3V3_DEDI_HDR
5	SPI_MISO	6	SPI_IO3
7	SPI_IO2	8	SPI_CLK
9	GND	10	SPI_MOSI

**21. JMCIOA: PCIE GEN5 X8 Connector**

Pin	Description	Pin	Description
B1	GND	A1	GND
B2	REFCLK+	A2	CPUPERP1
B3	REFCLK-	A3	CPUPERN1
B4	GND	A4	GND
B5	CPUPETP1	A5	CPUPERP2
B6	CPUPETN1	A6	CPUPERN2
B7	GND	A7	GND
B8	CPUPETP2	A8	CPUPERP3
B9	CPUPETN2	A9	CPUPERN3
B10	GND	A10	GND
B11	CPUPETP3	A11	CPUPERP0
B12	CPUPETN3	A12	CPUPERN0
B13	GND	A13	GND
B14	CPUPETP0	A14	CPUPERP0
B15	CPUPETN0	A15	CPUPERN0
B16	GND	A16	GND
B17	CPUPETP0	A17	CPUPERP1
B18	CPUPETN0	A18	CPUPERN1
B19	GND	A19	GND
B20	CPUPETP1	A20	CPUPERP2
B21	CPUPETN1	A21	CPUPERN2
B22	GND	A22	GND
B23	CPUPETP2	A23	CPUPERP3
B24	CPUPETN2	A24	CPUPERN3
B25	GND	A25	GND
B26	CPUPETP3	A26	REFCLK+
B27	CPUPETN3	A27	REFCLK-
B28	GND	A28	GND



B29	PWR_ON_N	A29	SMB_SCL
B30	PWR_ON_N	A30	SMB_CDA
B31	GND	A31	GND
B32	PWRFL_N	A32	WAKE#
B33	PWRFL_N	A33	PRSNTB_N
B34	GND	A34	GND
B35	PRSNTB_N	A35	+P3V3_AUX
B36	PERST_N	A36	+P3V3_AUX
B37	GND	A37	GND
B38	GND	HM2	GND
B39	GND	HM4	GND

22. JMCIO1B1: PCIE GEN5 X8 Connector

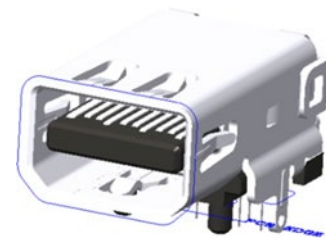
Pin	Description	Pin	Description
B1	GND	A1	GND
B2	REFCLK+	A2	CPUPERP1
B3	REFCLK-	A3	CPUPERN1
B4	GND	A4	GND
B5	CPUPETP1	A5	CPUPERP2
B6	CPUPETN1	A6	CPUPERN2
B7	GND	A7	GND
B8	CPUPETP2	A8	CPUPERP3
B9	CPUPETN2	A9	CPUPERN3
B10	GND	A10	GND
B11	CPUPETP3	A11	CPUPERP0
B12	CPUPETN3	A12	CPUPERN0
B13	GND	A13	GND
B14	CPUPETP0	A14	CPUPERP0
B15	CPUPETN0	A15	CPUPERN0
B16	GND	A16	GND
B17	CPUPETP0	A17	CPUPERP1
B18	CPUPETN0	A18	CPUPERN1
B19	GND	A19	GND
B20	CPUPETP1	A20	CPUPERP2
B21	CPUPETN1	A21	CPUPERN2
B22	GND	A22	GND
B23	CPUPETP2	A23	CPUPERP3
B24	CPUPETN2	A24	CPUPERN3



B25	GND	A25	GND
B26	CPUPETP3	A26	REFCLK+
B27	CPUPETN3	A27	REFCLK-
B28	GND	A28	GND
B29	GND	A29	SMB_SCL
B30	GND	A30	SMB_CDA
B31	GND	A31	GND
B32	NC	A32	WAKE#
B33	NC	A33	NC
B34	GND	A34	GND
B35	NC	A35	+P3V3_AUX
B36	PERST_N	A36	+P3V3_AUX
B37	GND	A37	GND
B38	GND	HM2	GND
B39	GND	HM4	GND

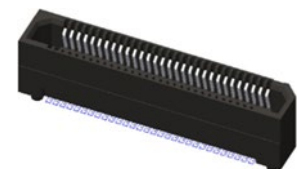
23. VGA1: Mini DP for VGA Only

Pin	Description	Pin	Description
1	GND	2	DDC_CLK
3	NC	4	DDC_DATA
5	DAC_BO	6	VSYNC_O
7	GND	8	GND
9	NC	10	HSYNC_O
11	DAC_GO	12	NC
13	GND	14	GND
15	DAC_RO	16	NC
17	NC	18	NC
19	GND	20	GND



24. CN2: SAMTEC 1588 Connector

Pin	Description	Pin	Description
1	NC	2	1588_INIT_L
3	NC	4	GX_TEMP_SENSE_N
5	NC	6	GX_TEMP_SENSE_P
7	NC	8	GND
9	GND	10	PU_RST_NET_PLL_N
11	GND	12	PLTRST_CPU0
13	P3V3_OCOX_PGD	14	GND



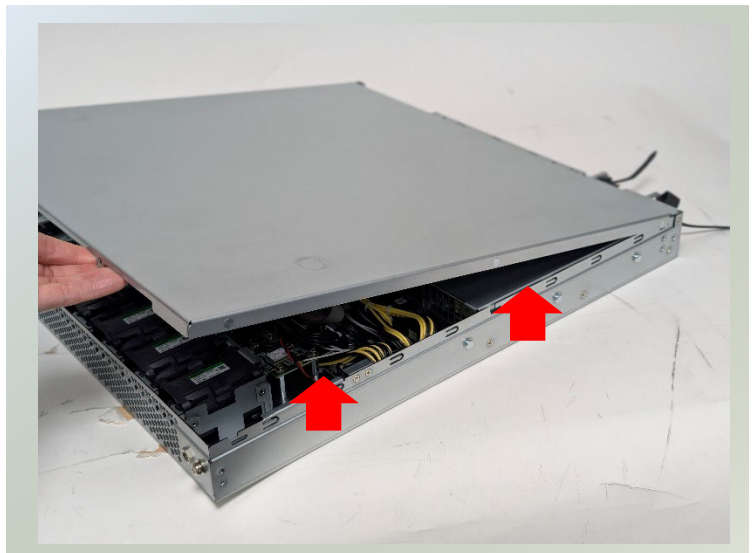
15	DPLL_PWR_EN	16	GND
17	GND	18	CLK_10M_DPLL
19	GND	20	NC
21	NC	22	GND
23	NC	24	GND
25	GND	26	EREFO_DP
27	GND	28	EREFO_DN
29	TIME_SYNC_DP	30	GND
31	TIME_SYNC_DN	32	GND
33	GND	34	TIMEREF_SYNC_DN
35	GND	36	TIMEREF_SYNC_DP
37	NC	38	GND
39	NC	40	GND
41	GND	42	HOST_PLL_SCL
43	GND	44	HOST_PLL_SDA
45	SYNCE0_DN	46	GND
47	SYNCE0_DP	48	GND
49	GND	50	GPS_TX
51	NC	52	GPS_RX
53	NC	54	NC
55	+P3V3_AUX	56	+P3V3
57	+P3V3_AUX	58	+P3V3
59	+P5V	60	+P12V_DPLL

CHAPTER 3: HARDWARE SETUP

To minimize the risk of personal injury, electric shock, or system damage, ensure all power connections are disconnected to fully shut down the device. Additionally, wear ESD protection gloves while carrying out the procedures in this chapter.

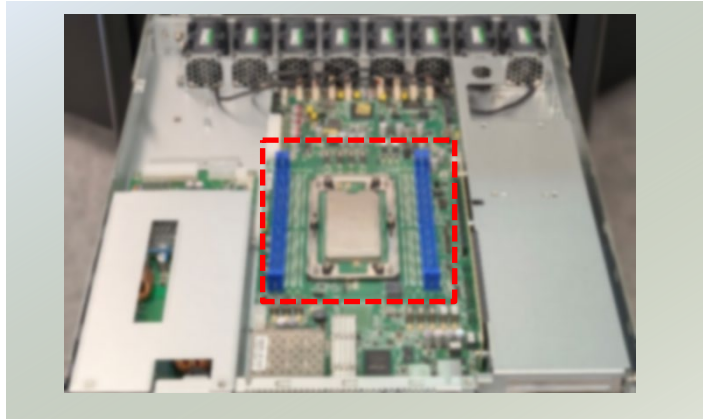
Opening the Chassis

1. Power off the system.
2. Unscrew the two (2) screws on the top cover.
3. Gently slide the cover a bit.
4. Lift the cover up to remove.

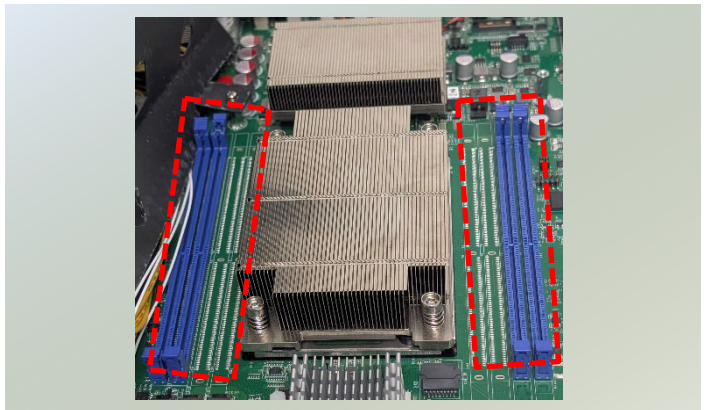


Installing the System Memory

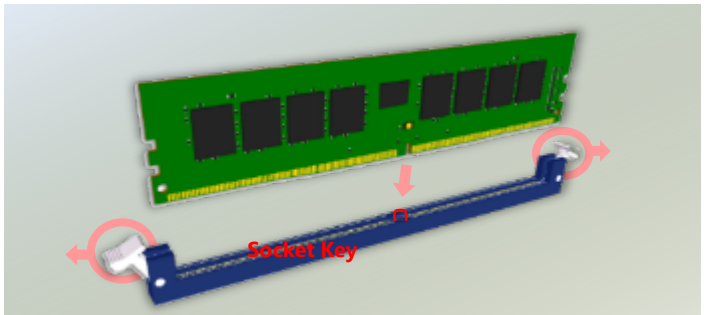
1. Power off the system and open the chassis.



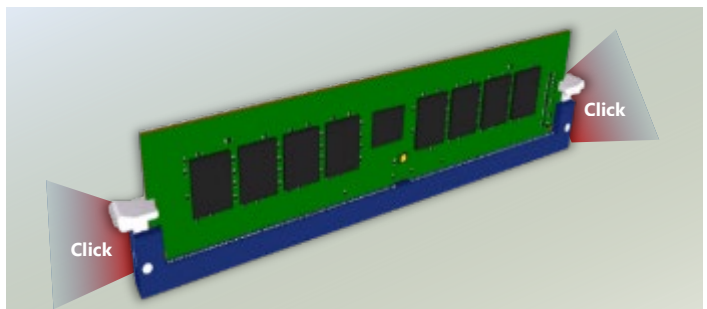
2. Locate the DIMM memory modules slots on the motherboard.



3. Pull open the DIMM slot latches. Align the notch of the memory module with the socket key in the slot.



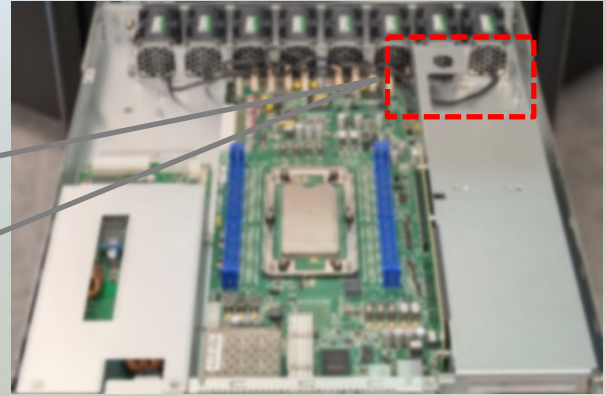
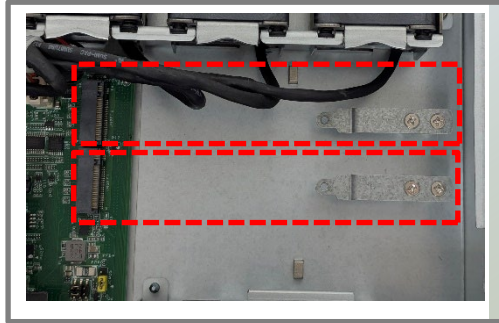
4. Push the module down into the slot until it is firmly seated and clicks into place.



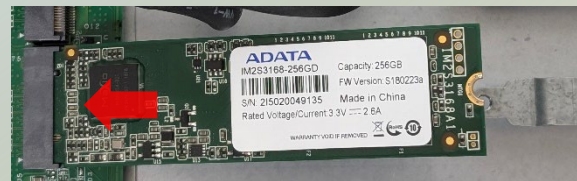
Installing M.2 Storage Modules (Optional)

This system supports two M.2 2280/22110 M-Key slots for NVMe storage module expansion. Please proceed with the following steps for installation.

1. Power down the system and open the chassis.
2. Locate the M.2 module slots on the motherboard.



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



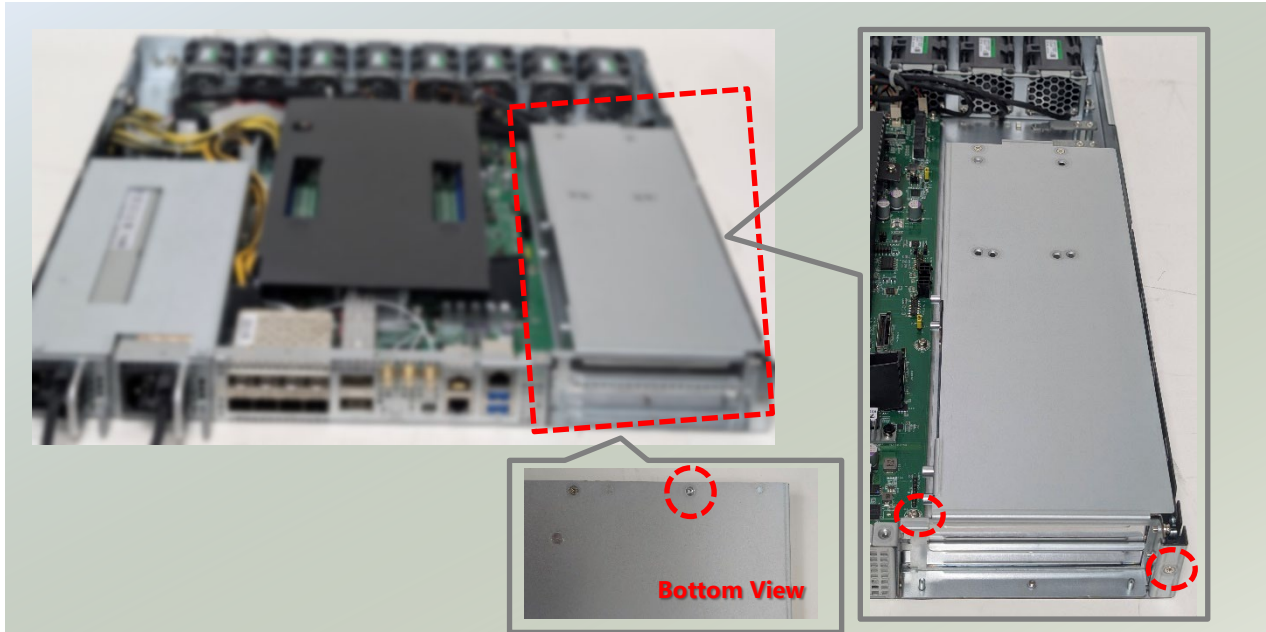
5. Push down on the module and secure it with a screw.
6. Follow the same steps to install a second storage module card.



Installing PCIe Expansion Card (Optional)

The ECA-5555 is equipped with one PCIe*16 FHFL slot, suitable for GPU graphics or acceleration card expansion. Please proceed with the following steps for installation.

1. Locate the PCIe bracket on the motherboard, and unscrew the two (2) screws on the front side and one (1) screw on the bottom side of the bracket.



3. Pick up the PCIe bracket and turn it around, align the GPU module pin slot to the socket key on the bracket. Slide the GPU module into the PCIe bracket until it is fully seated and secure with one (1) screw.



4. Turn the bracket back around and place back on the motherboard and secure it with the three original screws.



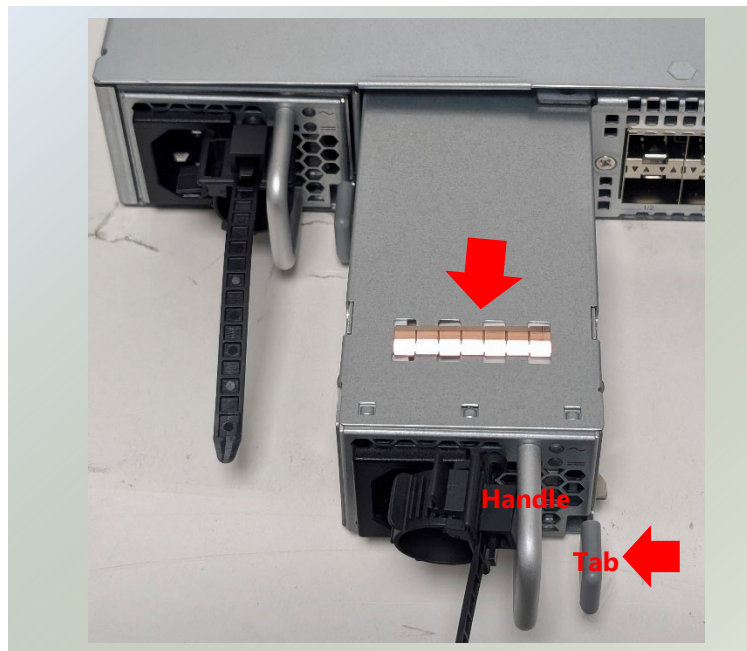
Replacing the Power Supply Units

Power supply units may wear down eventually. Please be noted that ECA-5555 series supports 800W DC PSUs. Please prepare replacement power supply units that matching this capacity.

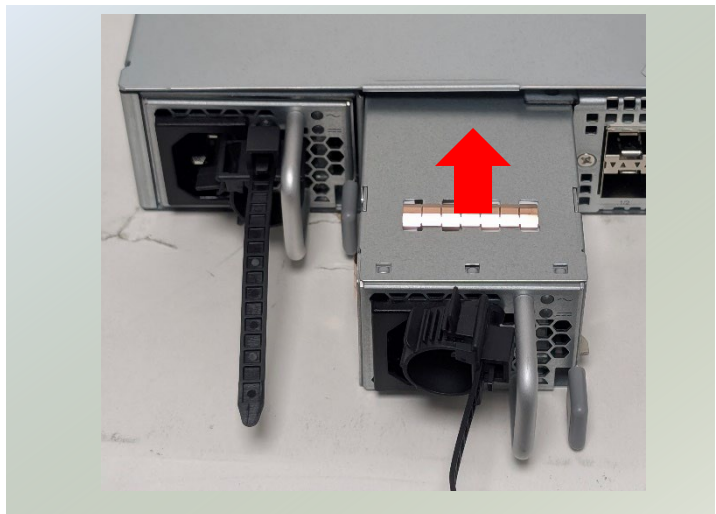
1. Power off the system. Locate the power supply units on the front panel.



2. Press on the tab and hold the handle to pull out the power supply unit.



3. Insert a new power supply unit. Push the unit in until it clicks into place. Repeat steps if replacing a second power supply unit.



CHAPTER 4: REMOTE SERVER MANAGEMENT

Overview

This document specifies the BMC firmware features. The BMC firmware implements IPMI 2.0 based on ASPEED service processor. It performs all the BMC management tasks defined by IPMI 2.0.

In addition, BMC firmware runs an embedded web-server for full configuration using Web UI, which has a low learning curve.

BMC Main Features

Feature		Description
IPMI 2.0 Standard Features	System Interface Support	• KCS (System Interface Support) • LAN (RMCP+)
	IPMI 2.0 based Management	• BMC stack with an IPMI 2.0 implementation • Sensor monitoring • System power management • Watchdog timer • Fan speed monitor and control • FRU information
	System Management	• System Event Log (SEL) • Support in IPMI stack for SOL to remotely access BIOS and text console before OS booting
	Event Log	• IPMI based user management • Multiple user permission level
	Text Console Redirection: SOL	
	User Management	
Non-IPMI Functions	Web User Interfaces	• BMC management via web user interface • Integrated KVM and Virtual Media • TLS 1.2 and TLS 1.3 support
	User authorization	• RADIUS support • LDAP support
	Security	• SSL and HTTPS support • Auto-sync time with NTP server
	Maintenance	• Remote firmware update by Web UI or Linux tool
	SNMP v3 Access	• SNMP walk to get BMC info. • SNMP set to control system power status.

BMC Firmware Functional Description

System Health Monitoring

The BMC implements system sensor monitoring feature. It could monitor voltage, temperature, and current of critical components.

System Power Management

The BMC implements chassis power and resets functions for system administrators to control and manage the system power behavior. These functions can be activated by sending the IPMI 2.0 compatible chassis commands to the BMC over messaging interfaces. The following list summarizes the supported functions.

- Chassis power on
- Chassis power off
- Chassis power cycle
- Chassis power reset
- Chassis power soft
- Server's power status report

Watchdog Timer

The BMC provides an IPMI 2.0 compatible watchdog timer which can prevent the system from system hanging.

Fan Speed Control

BMC oversees fan speed control. The fan speed can be modified by varying the duty cycle of PWM signal. The fan speed control algorithm mainly refers to the readings of on-board temperature sensors.

Field Replaceable Unit (FRU)

The BMC implements an interface for logical FRU inventory devices as specified in IPMI 2.0 specification. This functionality provides commands for system administrators to access and management the FRU inventory information.

System Event Log (SEL)

A non-volatile storage space is allocated to store system events for system status tracking.

Serial over LAN (SOL)

IPMI 2.0 SOL is implemented to redirect the system serial controller traffic over an IPMI session. System administrators can establish a SOL connection with a standard IPMI client, like IPMITOOL, to remotely interact with serial text-based interfaces such as OS command-line and serial redirected BIOS interfaces.

User Management

The BMC supports 9 IDs for IPMI user accounts. The maximum length of the username and password are 16 and 20 respectively, and the possible privilege levels are Callback, User, Operator, and Administrator. Moreover, the account creator can enable/disable the user account at any time. If not specified, the default user accounts are listed follows:

User Name	Password	User Access	Characteristics
admin	admin	Enabled	Password can be changed

Keyboard, Video, Mouse (KVM) Redirection

- The BMC provides keyboard, video, and mouse (KVM) redirection over LAN. This application is available remotely from the embedded web server.
- Support video recording, recorded videos to be downloaded & playable.

Virtual Media Redirection

- The BMC provides remote virtual CD and HD redirection. CD image could be mounted directly in KVM window. HD could be mounted by NFS and SAMBA.
- Efficient USB 2.0 based CD/DVD redirection with a typical speed of 20XCD.
- Completely secured transmission.

SNMP v3 access

The BMC provides SNMP v3 accessibility, user could use the SNMP after setup the related setting on the User List page. The following are some SNMP command examples.

1.3.6.1.4.1.51188.2.1.1 (Get Sensor Info, column-1: index, column-2: name, column-3: number, column-4: reading)

1.3.6.1.4.1.51188.1.1.0 (Get/Set Hostname)

1.3.6.1.4.1.51188.1.2.0 (Get BMC Version)

1.3.6.1.4.1.51188.1.3.0 (Get System Power Status, 0 for off, 1 for on)

1.3.6.1.4.1.51188.1.4.0 (System Power Control, 1 for off, 2 for on, 3 for cycle, 4 for soft-off)

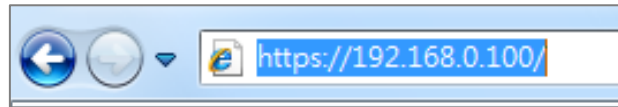
IPMI Commands Support List

COMMANDS	NETFN	CMD
IPM Device “Global” Commands		
Get Device ID	APP (06h)	01h
Cold Reset	APP (06h)	02h
Warm Reset	APP (06h)	03h
Get Device GUID	APP (06h)	08h
BMC Watchdog Timer Commands		
Reset Watchdog Timer	APP (06h)	22h
Set Watchdog Timer	APP (06h)	24h
Get Watchdog Timer	APP (06h)	25h
BMC Device and Messaging Commands		
Get System GUID	APP (06h)	37h
Get Channel Info	APP (06h)	42h
Set User Access	APP (06h)	43h
Get User Access	APP (06h)	44h
Set User Name	APP (06h)	45h
Get User Name	APP (06h)	46h
Set User Password	APP (06h)	47h
Chassis Device Commands		
Get Chassis Capabilities	Chassis (00h)	00h
Get Chassis Status	Chassis (00h)	01h
Chassis Control	Chassis (00h)	02h
Chassis Reset	Chassis (00h)	03h
Sensor Device Commands		
Get Sensor Reading Factors	S/E (04h)	23h
Get Sensor Hysteresis	S/E (04h)	25h
Get Sensor Threshold	S/E (04h)	27h
Get Sensor Event Enable	S/E (04h)	29h
Get Sensor Event Status	S/E (04h)	2Bh
Get Sensor Reading	S/E (04h)	2Dh
Get Sensor Type	S/E (04h)	2Fh
FRU Device Commands		
Get FRU Inventory Area Info	Storage (0Ah)	10h
Read FRU Data	Storage (0Ah)	11h
Write FRU Data	Storage (0Ah)	12h
SDR Device Commands		
Get SDR Repository Info	Storage (0Ah)	20h
Get SDR Repository Allocation Info	Storage (0Ah)	21h
Get SDR	Storage (0Ah)	23h
Get SDR Repository Time	Storage (0Ah)	28h
SEL Device Commands		
Get SEL Info	Storage (0Ah)	40h
Get SEL Allocation Info	Storage (0Ah)	41h

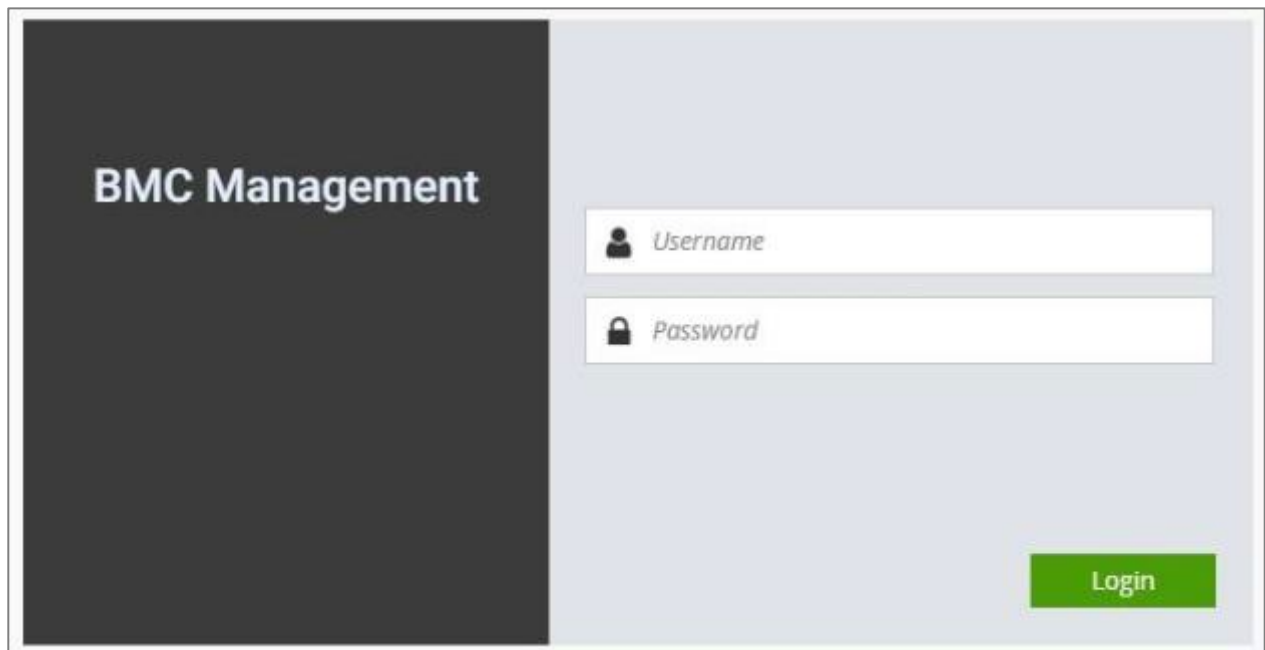
Get SEL Entry	Storage (0Ah)	43h
Delete SEL Entry	Storage (0Ah)	46h
Clear SEL	Storage (0Ah)	47h
Get SEL Time	Storage (0Ah)	48h
Set SEL Time	Storage (0Ah)	49h
Get SEL Time UTC Offset	Storage (0Ah)	5Ch
Set SEL Time UTC Offset	Storage (0Ah)	5Dh
LAN Device Commands		
Set LAN Configuration Parameters	Transport (0Ch)	01h
Get LAN Configuration Parameters	Transport (0Ch)	02h
Serial/Modem Device Commands		
Set SOL Configuration Parameters	Transport (0Ch)	21h
Get SOL Configuration Parameters	Transport (0Ch)	22h

Using BMC Web UI

In the address bar of your Internet browser, input the IP address of the remote server to access the BMC interface of that server.



Initial access of BMC prompts you to enter username and password. A screenshot of the login screen is given below:



Login Page

- ▶ **Username:** Enter your username in this field.
- ▶ **Password:** Enter your password in this field.
- ▶ **Login:** After entering the required credentials, click the **Login** to log in to Web UI.

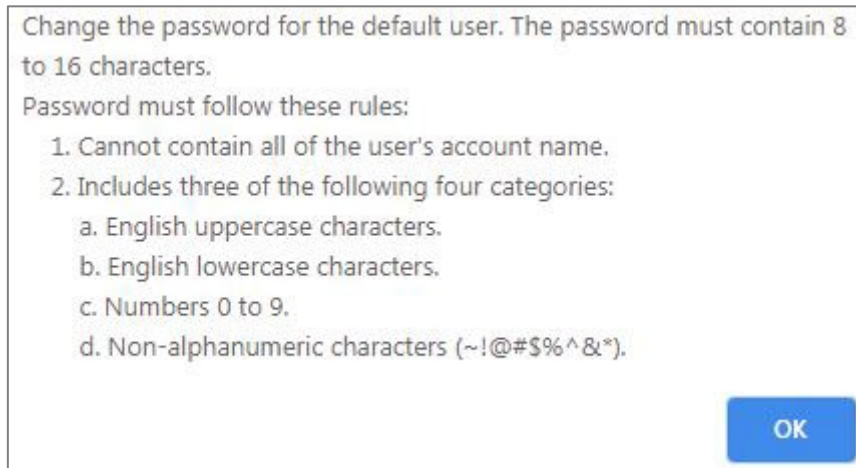


Note: (1) If not specified, the default IP to access BMC is <https://192.168.0.100>.
(2) Please use **https** to access Web UI.

Default User Name and Password

- **Username:** admin
- **Password:** admin

The default username and password are in lower-case characters. When you log in using the default username and password, you will get full administrative rights, and it will ask you to change the default password once you log in. The dialog is shown below:



Change the password for the default user. The password must contain 8 to 16 characters.

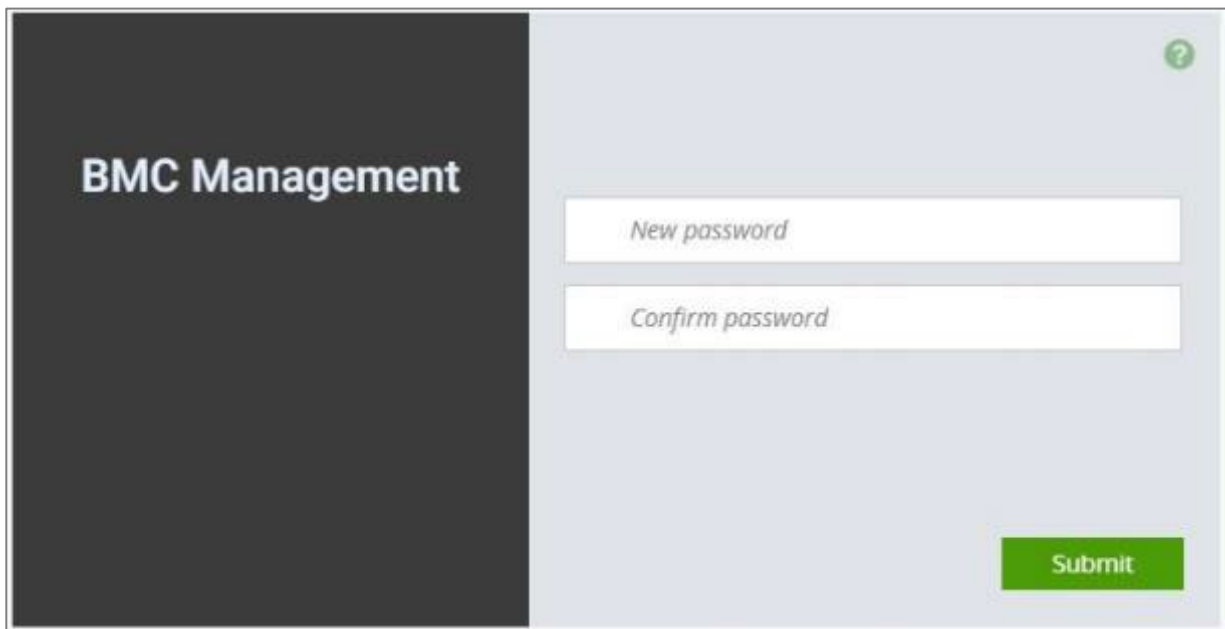
Password must follow these rules:

1. Cannot contain all of the user's account name.
2. Includes three of the following four categories:
 - a. English uppercase characters.
 - b. English lowercase characters.
 - c. Numbers 0 to 9.
 - d. Non-alphanumeric characters (~!@#\$%^&*).

OK

Change the default password - Dialog

Clicking **OK** will take you to set a password.



BMC Management

New password

Confirm password

Submit

Change the default password – Set password



Note: Duplicate usernames shouldn't exist across various authentication methods like LDAP, RADIUS or IPMI since the privilege of one Authentication method is overwritten by another authentication method during logging in, and hence the correct privilege cannot be returned properly.

First Time Wizard Introduction

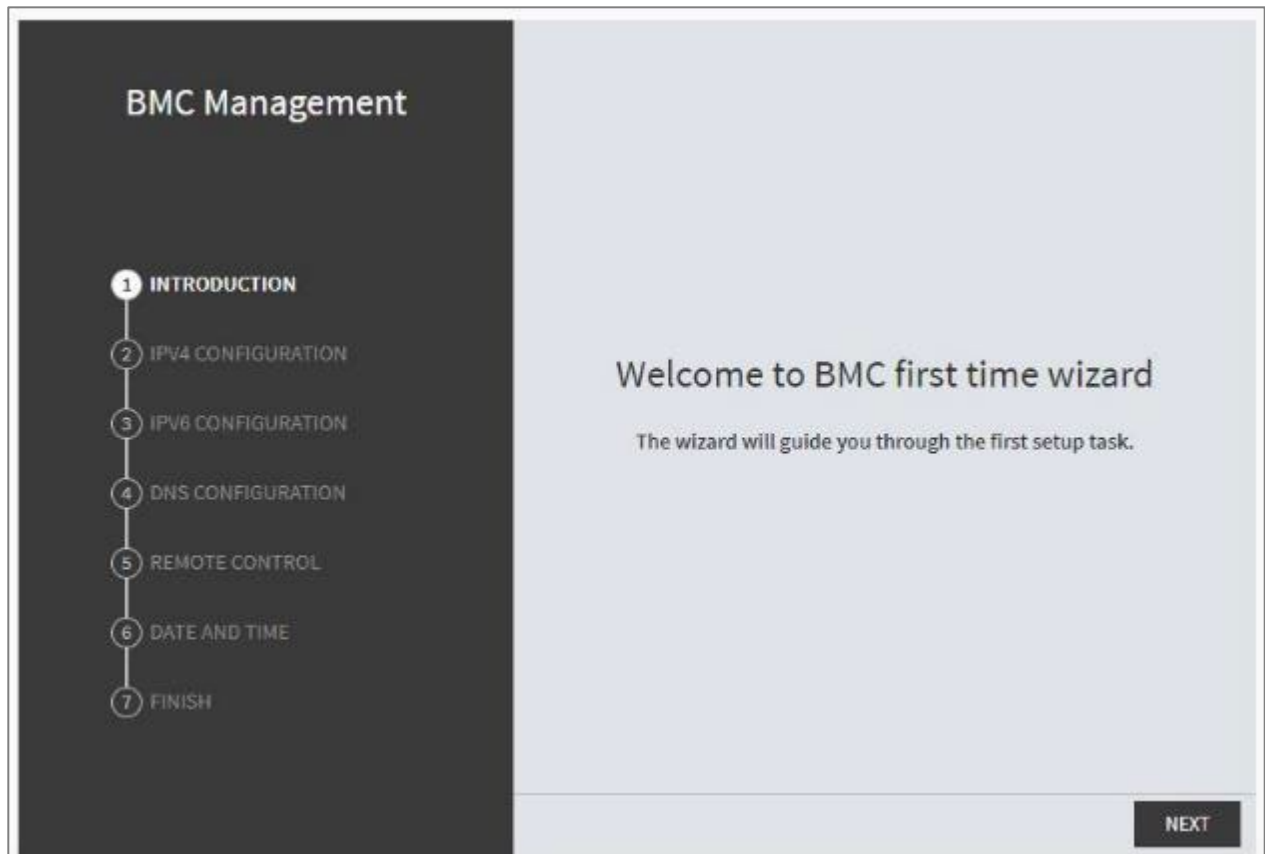
After the first-time login, you will see first time wizard welcome page as the following picture.

Please press the "Next" button and configure your BMC step by step.

On the "IPv4", "IPv6" and "DNS" pages, you could specify the hostname and network settings of BMC.

On the "Remote Control" page, you could specify allowed IP region which could access KVM and Remote media web pages.

On the "Date and Time" page, you could specify the NTP and time settings.



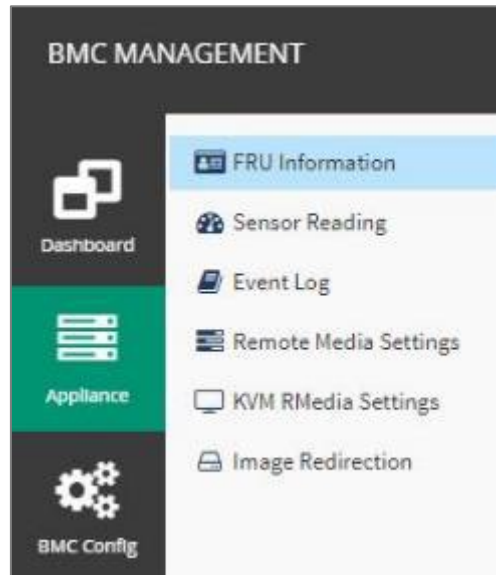
In the final page, please press "Finish" button to complete the first-time wizard. BMC will be rebooted and apply new settings. You could reconnect to the Web UI after a few minutes.

Web UI Layout Introduction

The BMC Web UI consists of various menu items:

Menu Bar

A screenshot of the menu bar is shown below:



Menu Bar

Quick Button and Logged-in User

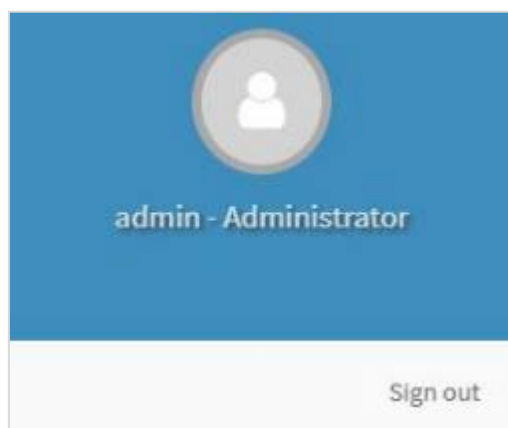
The user information and quick buttons are located at the top right of the Web UI.



User Information

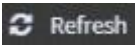
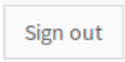
Logged-in user information: Click the icon  **admin** ▼ to view the logged-in user information.

A screenshot of the logged-in user information is shown below:



Logged-in User Information

The logged-in user information shows the logged-in user's username, privilege, with the quick buttons allowing you to perform the following functions:

- ▶ **Refresh:** Click the icon  to reload the current page.
- ▶ **Sign out:** Click the icon  to log out of the Web UI.

Logged-in user and its privilege level

This option shows the logged-in username and privilege. There are four kinds of privileges:

- ▶ **User:** Only valid commands are allowed.
- ▶ **Operator:** All BMC commands are allowed except for the configuration commands that can change the behavior of the out-of-hand interfaces.
- ▶ **Administrator:** All BMC commands are allowed.
- ▶ **No Access:** Login access denied.

Help

Help: The **Help** icon  is located at the top right of each page in Web UI. Click this help icon to view more detailed field descriptions.

CHAPTER 5: BIOS SETUP

BIOS is a firmware embedded on an exclusive chip on the system's motherboard. Lanner's BIOS firmware offering including market-proven technologies such as Secure Boot and Intel Boot Guard technology deliver solid commitments for the shield protection against malware, uncertified sequences and other named cyber threats.

BIOS Setup

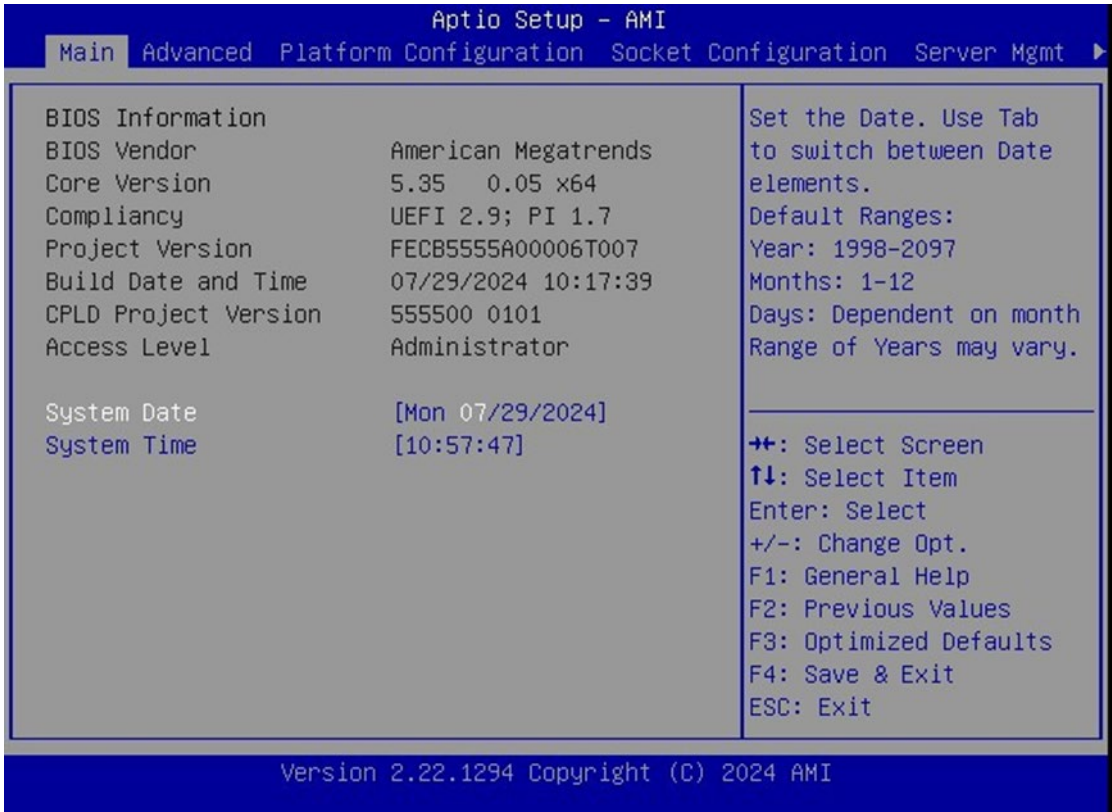
To enter the BIOS setup utility, simply follow the steps below:

1. Boot up the system.
2. Pressing the **<Tab>** or **** key immediately allows you to enter the Setup utility, and then you will be directed to the BIOS main screen. The instructions for BIOS navigations are as below:

Control Keys	Description
→←	select a setup screen
↑↓	select an item/option on a setup screen
<Enter>	select an item/option or enter a sub-menu
+/-	adjust values for the selected setup item/option
F1	display General Help screen
F2	retrieve previous values, such as the last configured parameters during the last time you entered BIOS
F3	load optimized default values
F4	save configurations and exit BIOS
<Esc>	exit the current screen

Main Page

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 BIOS Version : BIOS release version Build Date and Time : MM/DD/YYYY 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: 1998-2097 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

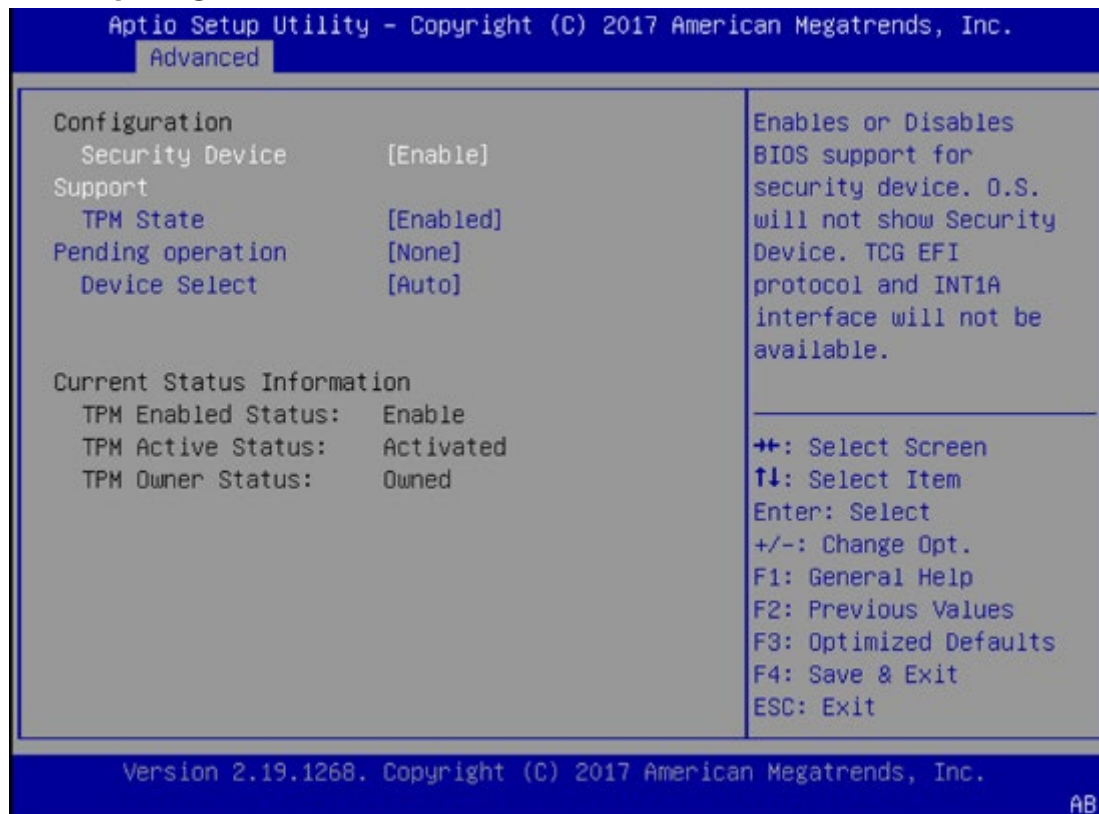
Select the **Advanced** menu item from the BIOS setup screen to enter the "Advanced" setup screen. Users can select any of the items in the left frame of the screen.



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.

Trusted Computing (TPM1.2)

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 (TPM2.0)

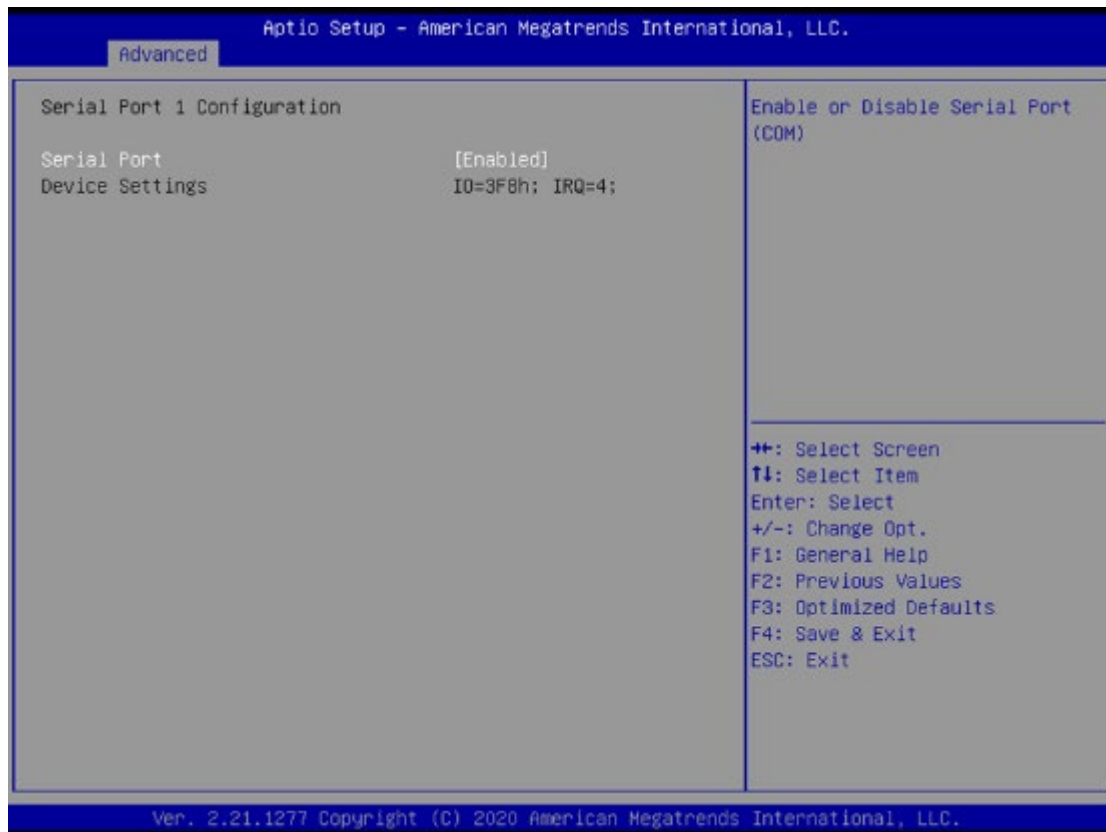
Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Active PCR banks	SHA256	
Available PCR banks	SHA256	
SHA256 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.

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.
PH Randomization	Enabled Disabled	Enables or Disables Platform Hierarchy randomization. DO NOT ENABLE THIS QUESTION IN PRODUCTION PLATFORMS. THIS IS FOR DEVELOPMENT TESTING. OVERRIDE Change Platform Auth
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.

AST2600 Super IO Configuration

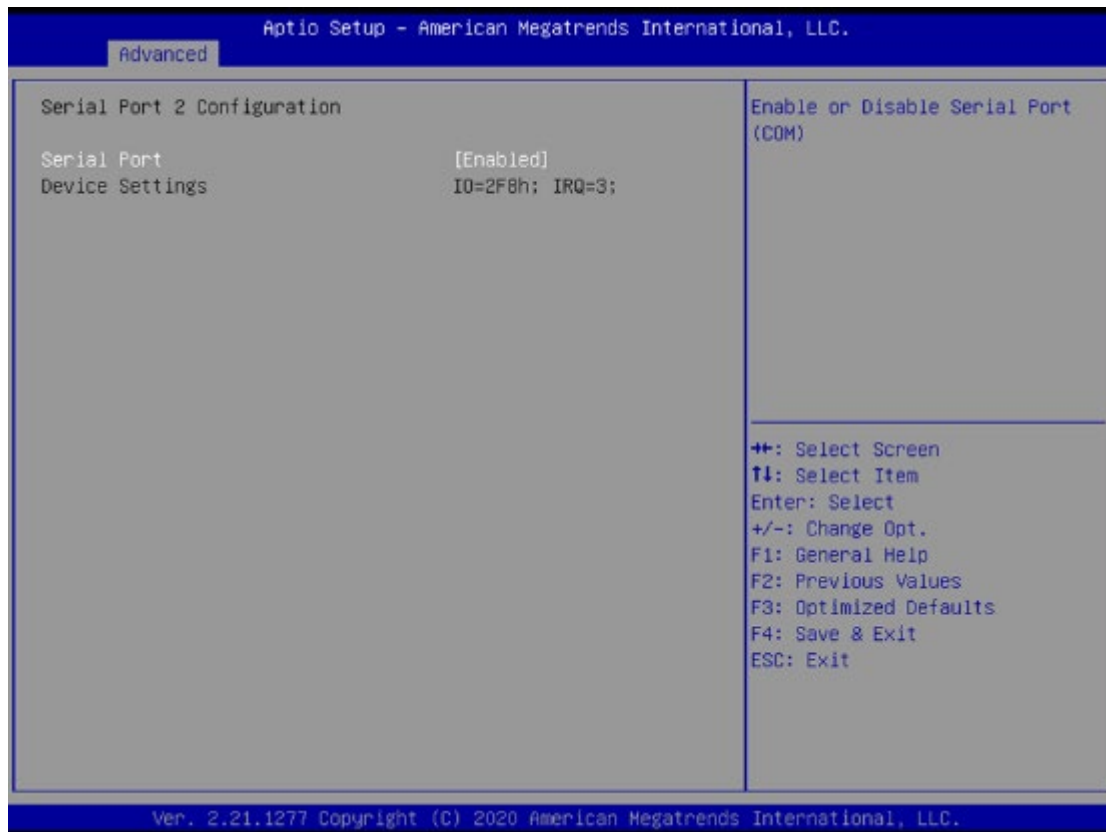


Serial Port 1 Configuration



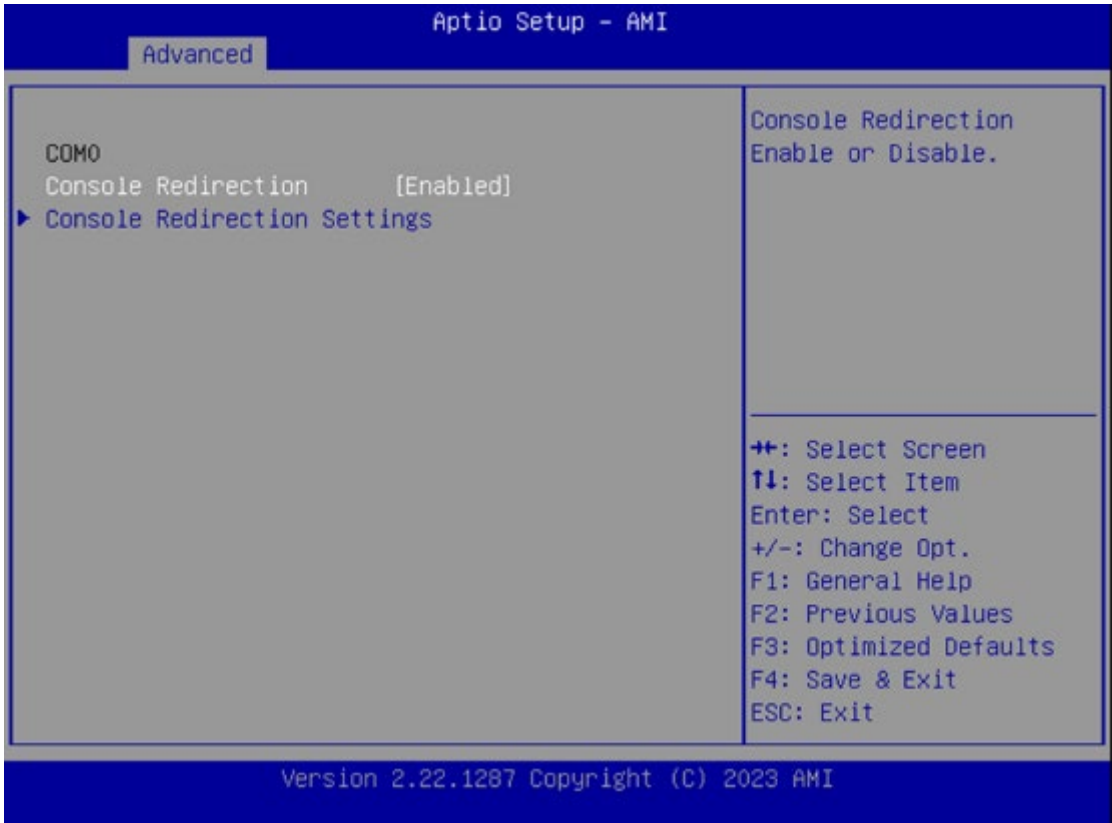
Feature	Options	Description
Serial Port	Enabled Disabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO=3F8h; IRQ = 4

Serial Port 2 Configuration



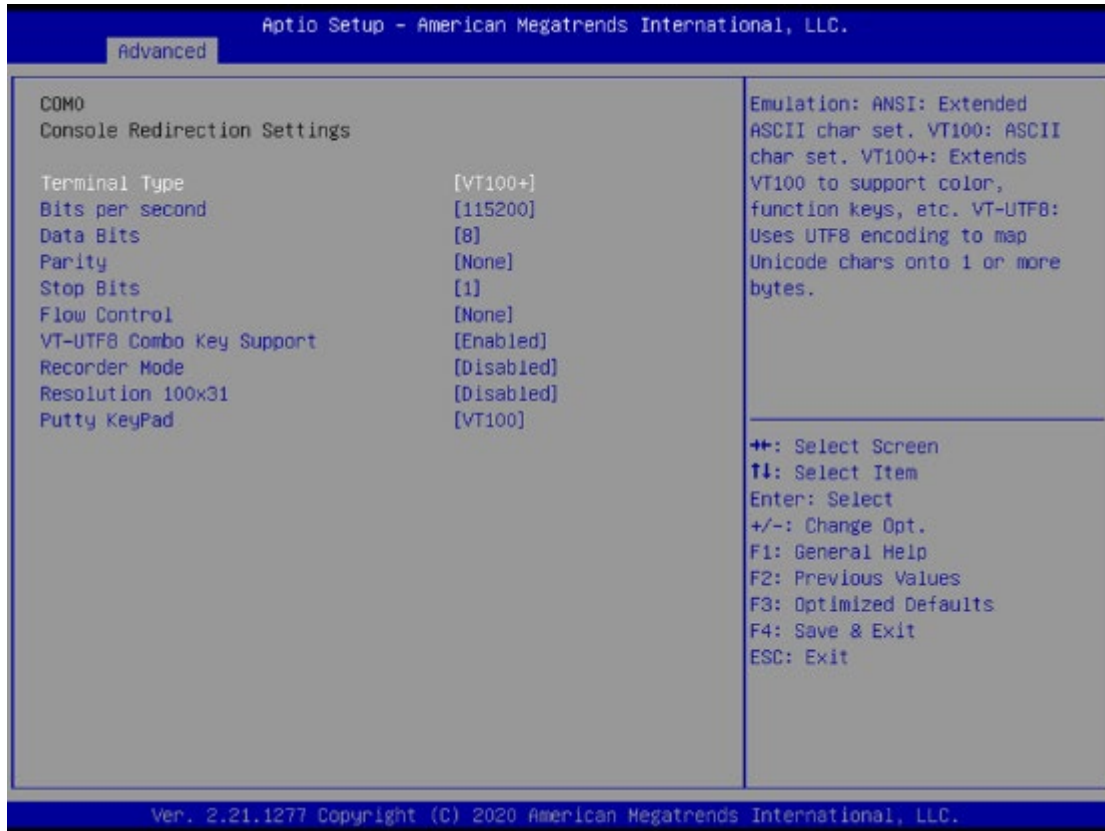
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port 2
Device Settings	NA	IO=2F8h; IRQ = 3

Serial Port Console Redirection



Feature	Options	Description
COM0 Console Redirection	Enabled Disabled	Enables or disables Console Redirection

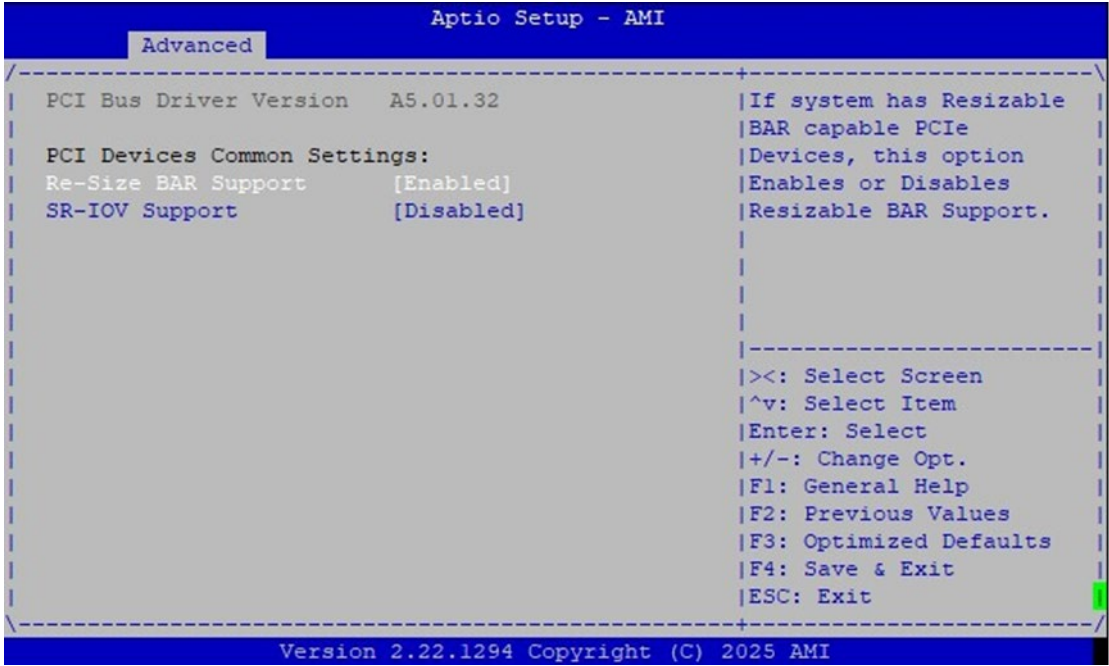
Console Redirection Settings



Feature	Options	Description
Terminal Type	VT100 VT100+ VT-UTF8 ANSI	VT100: ASCII char set VT100+: Extends VT100 to support color, function 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 other 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.

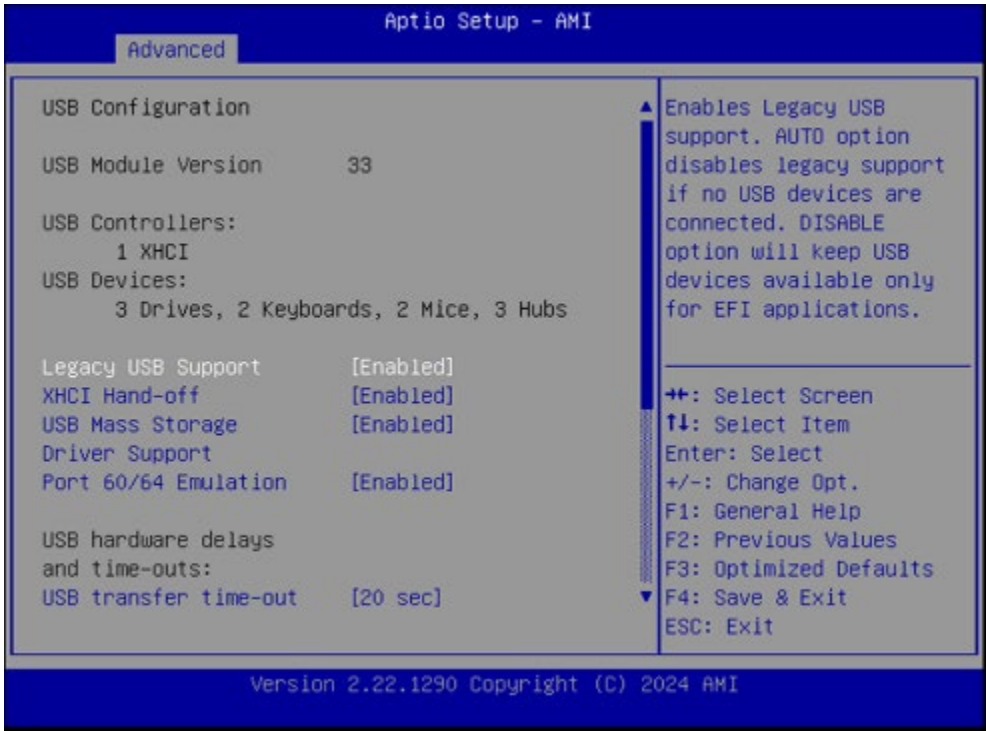
Flow Control	None Hardware RTS/CTS	Flow Control can prevent data loss from buffer overflow.
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Selects FunctionKey and KeyPad on Putty.

PCI Subsystem Settings



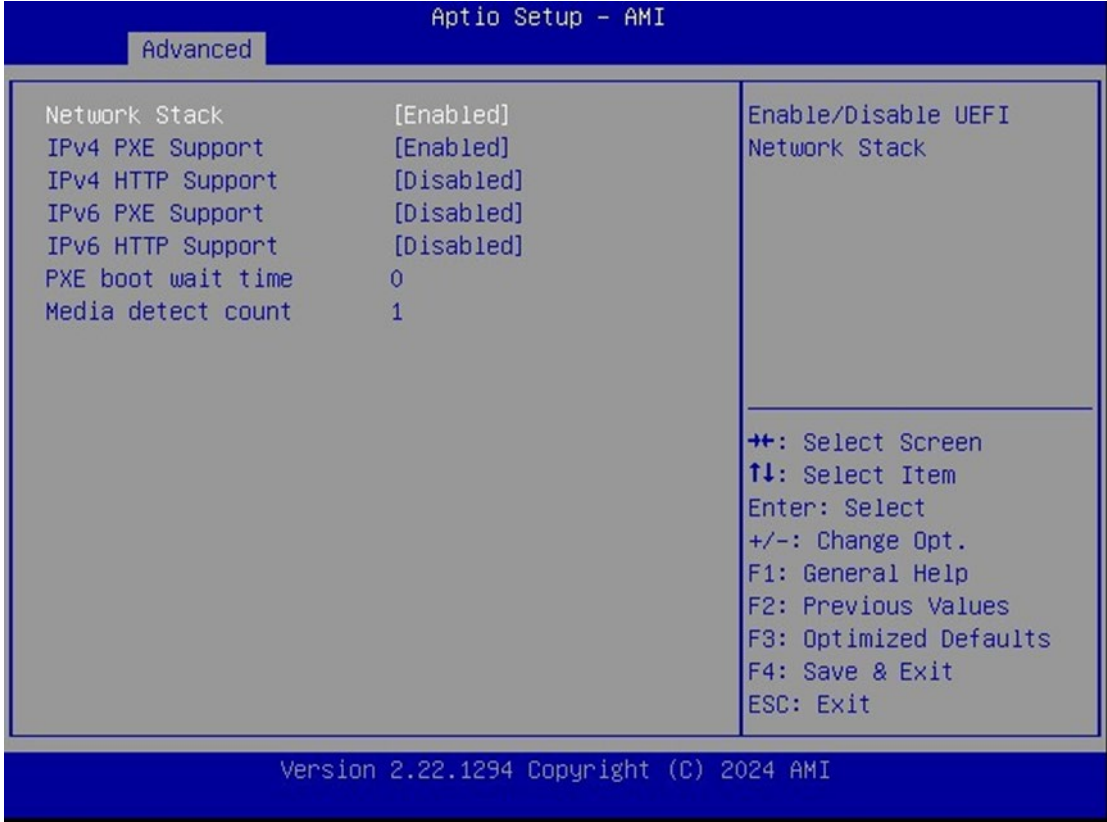
Feature	Options	Description
Re-Size BAR Support	Enabled	If system has Resizable BAR capable PCIe Devices, this option
	Disabled	Enables or Disables resizable BAR Support
SR-IOV Support	Disabled	If the system has SR-IOV capable PCIe Devices, this option
	Enabled	enables or disables Single Root IO Virtualization 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.
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	10 sec 20 sec 30 sec 40 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.

Network Stack Configuration

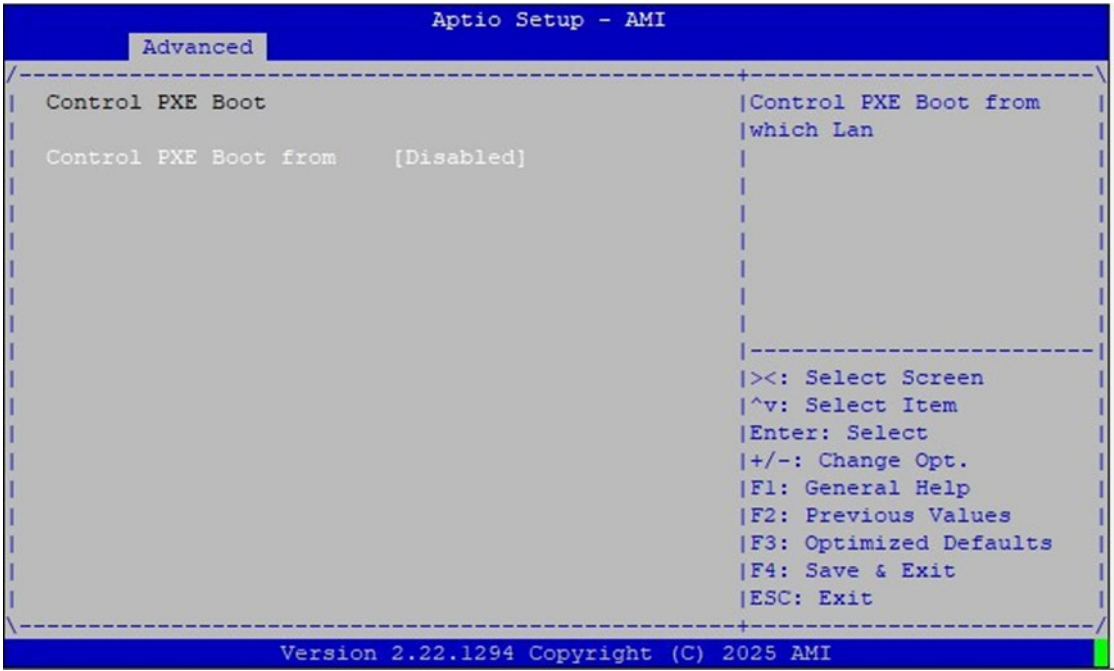


Feature	Options	Description
Network Stack	Enabled Disabled	Enable/Disable UEFI Network Stack boot support.
IPv4 PXE Support	Enabled Disabled	Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.
IPv4 HTTP Support	Enabled Disabled	Enable/Disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.
IPv6 PXE Support	Enabled Disabled	Enable/Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.
IPv6 HTTP Support	Enabled Disabled	Enable/Disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available.
PXE boot wait time	0	Wait time in seconds to press ESC the PXE boot. Use key to abort either +/- or numeric keys to set the value.
Media detect count	1	Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

NVMe Configuration

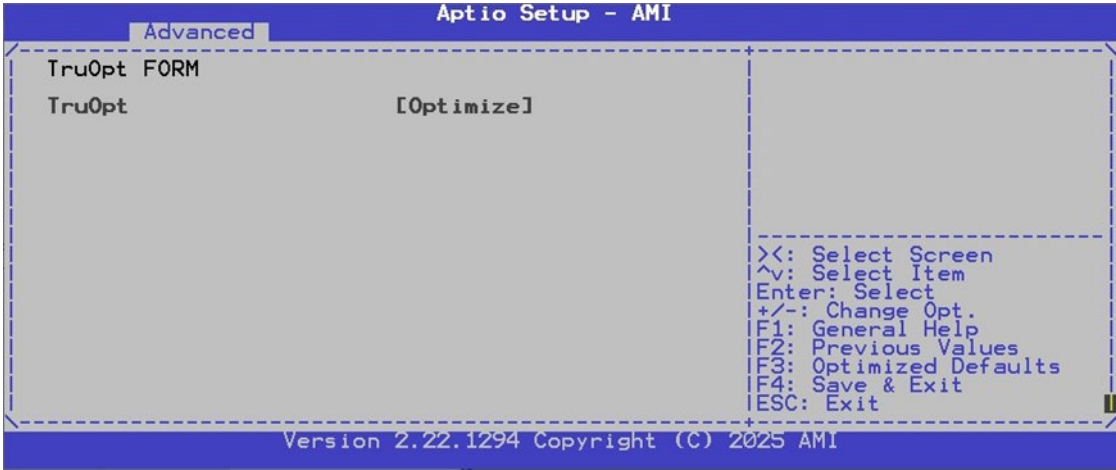


Control PXE Boot



Feature	Options	Description
Control PXE Boot from	Disabled MGT	Select On Board LAN# Boot

TruOpt FORM



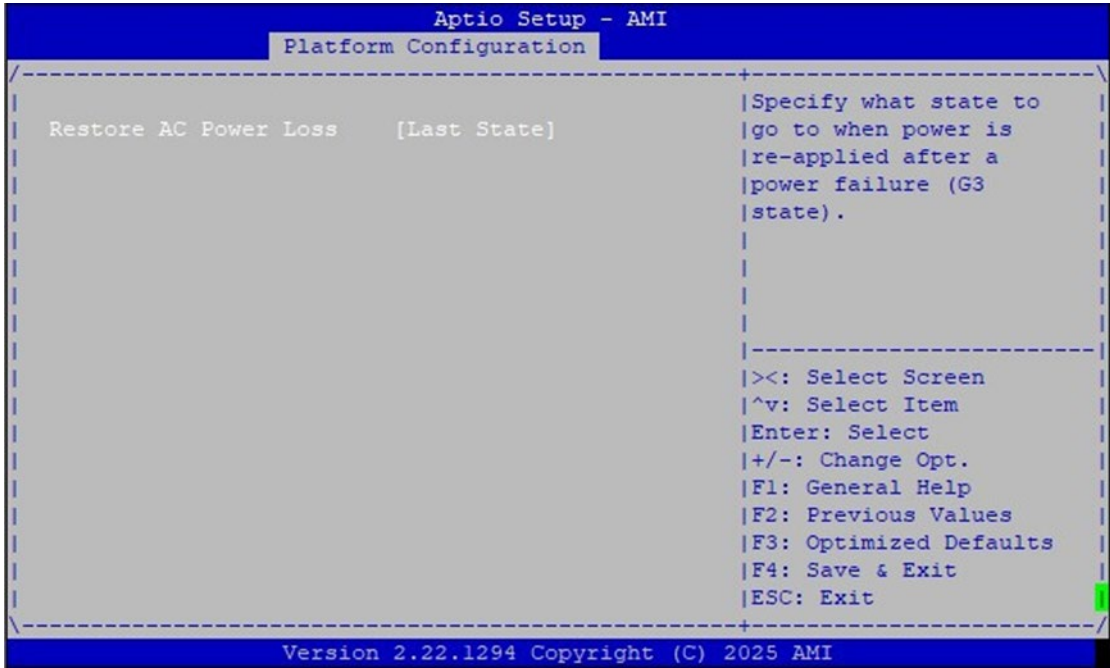
Feature	Options	Description
TruOpt	Optimize	Lanner optimization

Platform Configuration

Select the Platform 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.



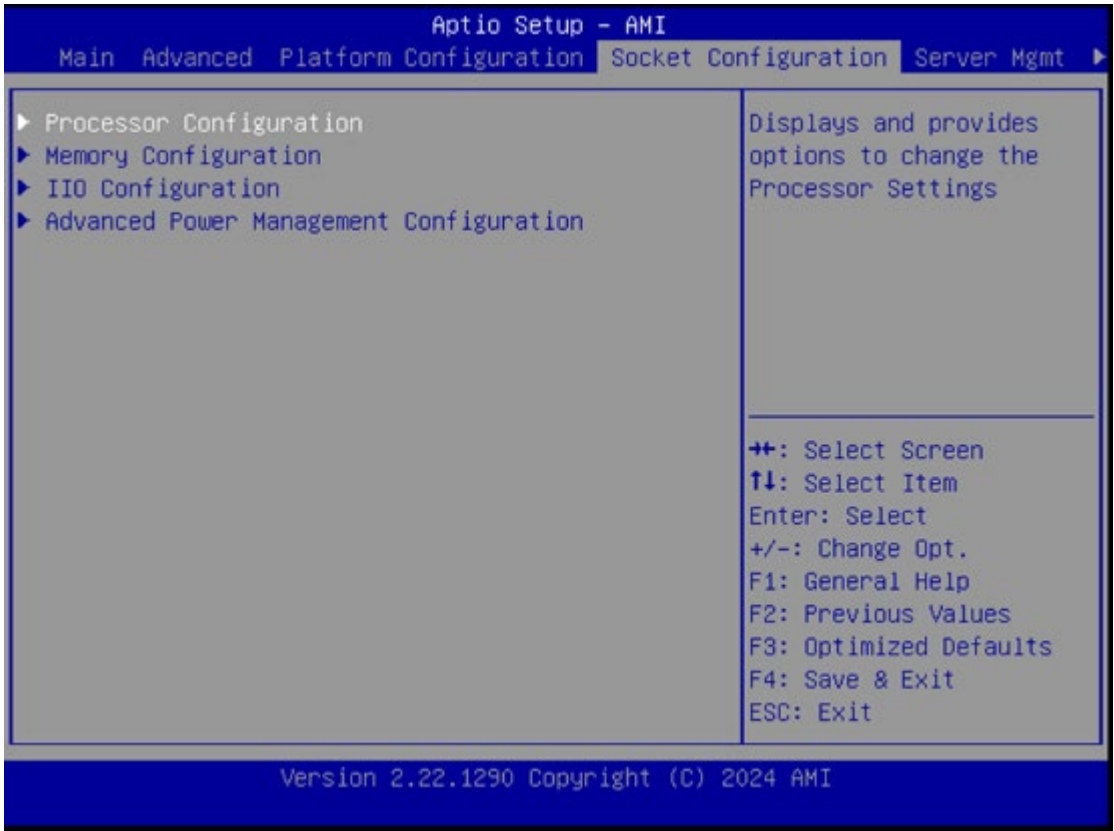
IBL-IO Configuration



Feature	Options	Description
Restore AC Power Loss	Power On Power Off Last State	Specify what state to go to when power is re-applied after a power failure (G3 state).

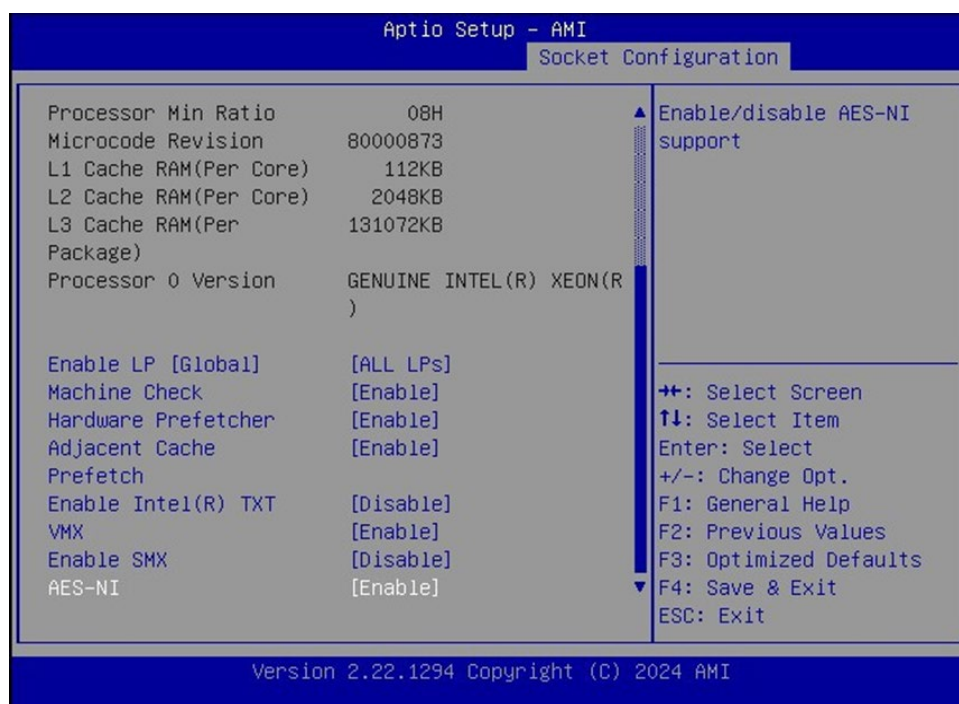
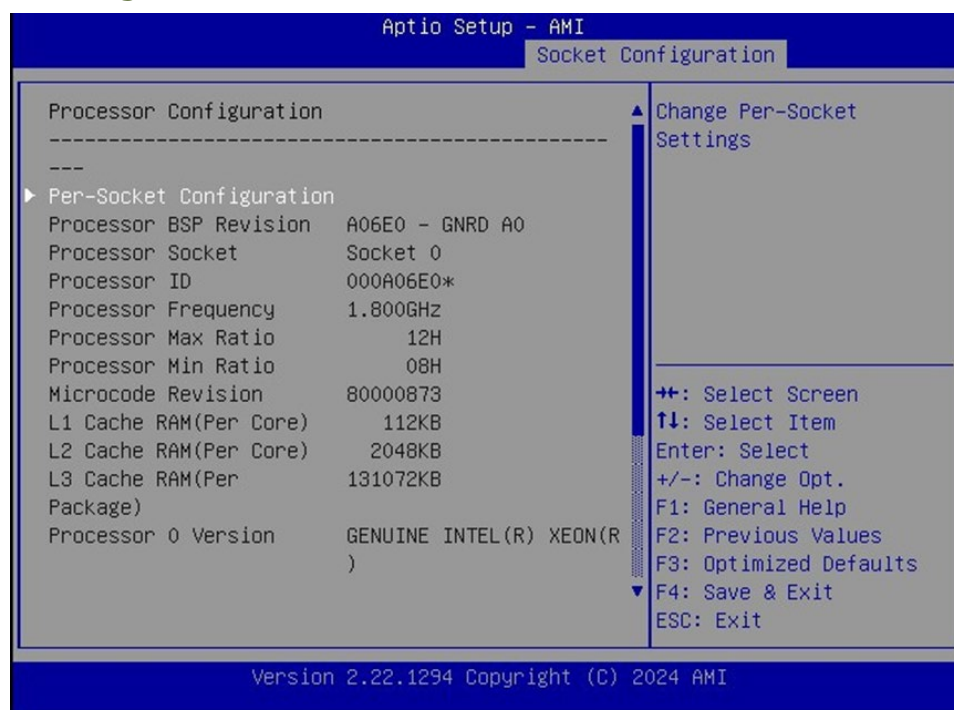
Socket

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



Feature	Options	Description
Processor Configuration	None	Displays and provides option to change the Processor Settings
Memory Configuration	None	Displays and provides option to change the Memory Settings
IIO Configuration	None	Displays and provides option to change the IIO Settings
Advanced Power Management Configuration	None	Displays and provides option to change the Power Management Settings

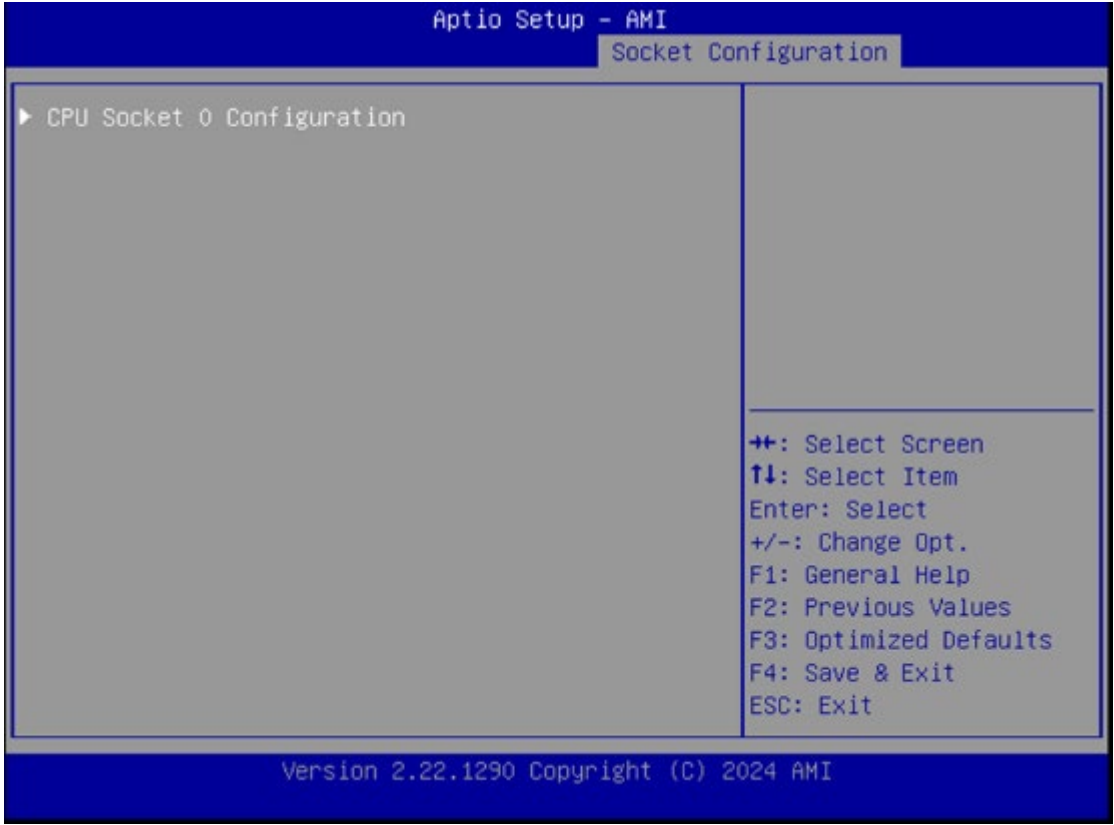
Processor Configuration



Feature	Options	Description
Enable LP	ALL LPs Single LP	Enables Logical processor (Software Method to Enable/Disable Logical Processor threads)
Machine Check	Disabled Enabled	Enable or Disable the Machine Check
Hardware Prefetcher	Disabled Enabled	= MLC Streamer Prefetcher (MSR 1A4h Bit [0])
Adjacent Cache Prefetcher	Disabled Enabled	= MLC Spatial Prefetcher (MSR 1A4h Bit [1])

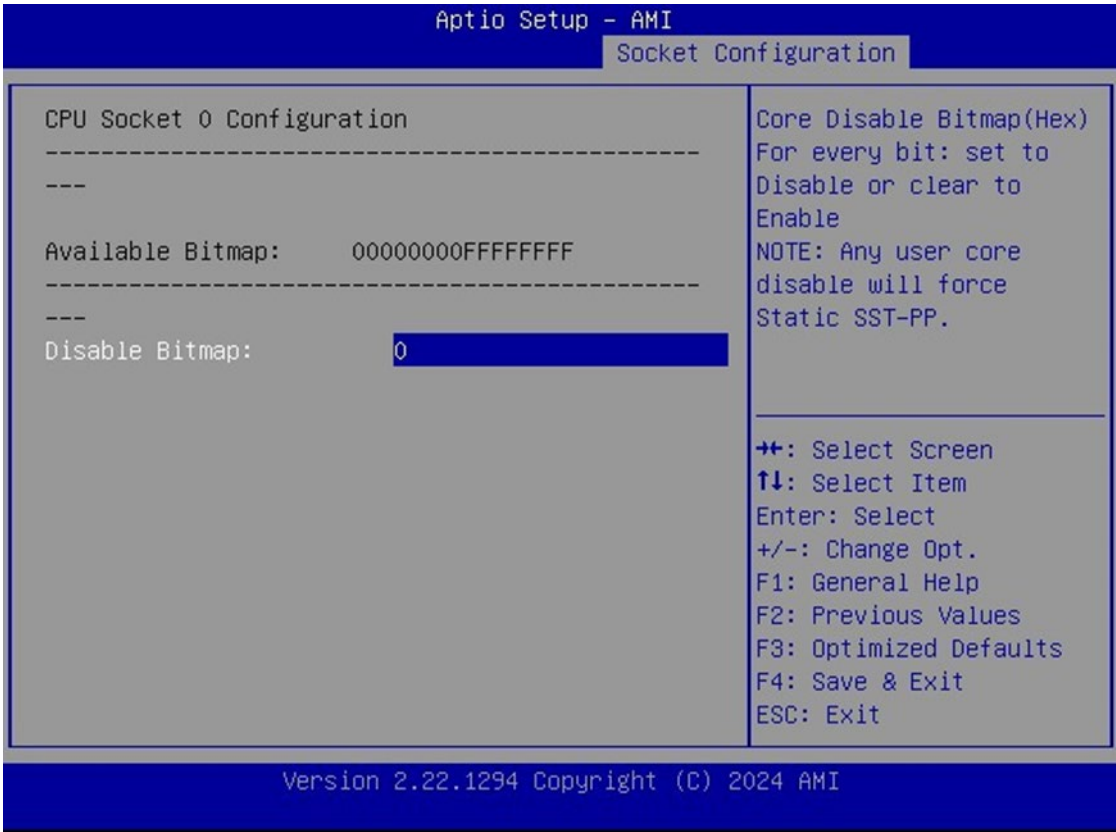
Enable Intel® TXT	Disabled Enabled	Enables Intel(R) TXT
VMX	Disabled Enabled	Enables the Vanderpool Technology, which takes effect after reboot.
Enable SMX	Disabled Enabled	Enables Safer Mode Extensions
AES-NI	Disabled Enabled	Enable/disable AES-NI support

Per-Socket Configuration



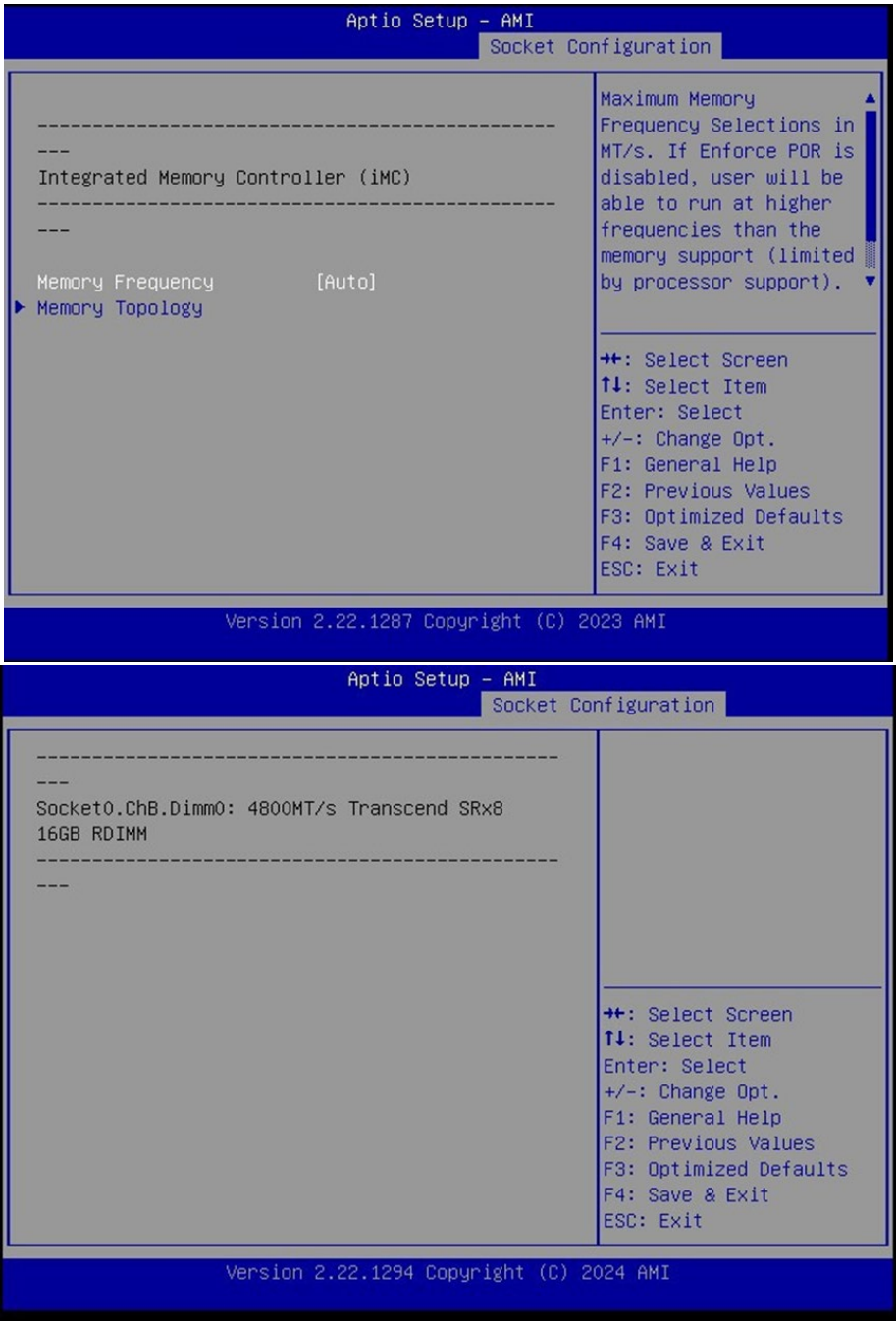
Feature	Options	Description
CPU Socket0 Configuration	None	None

CPU Socket0 Configuration



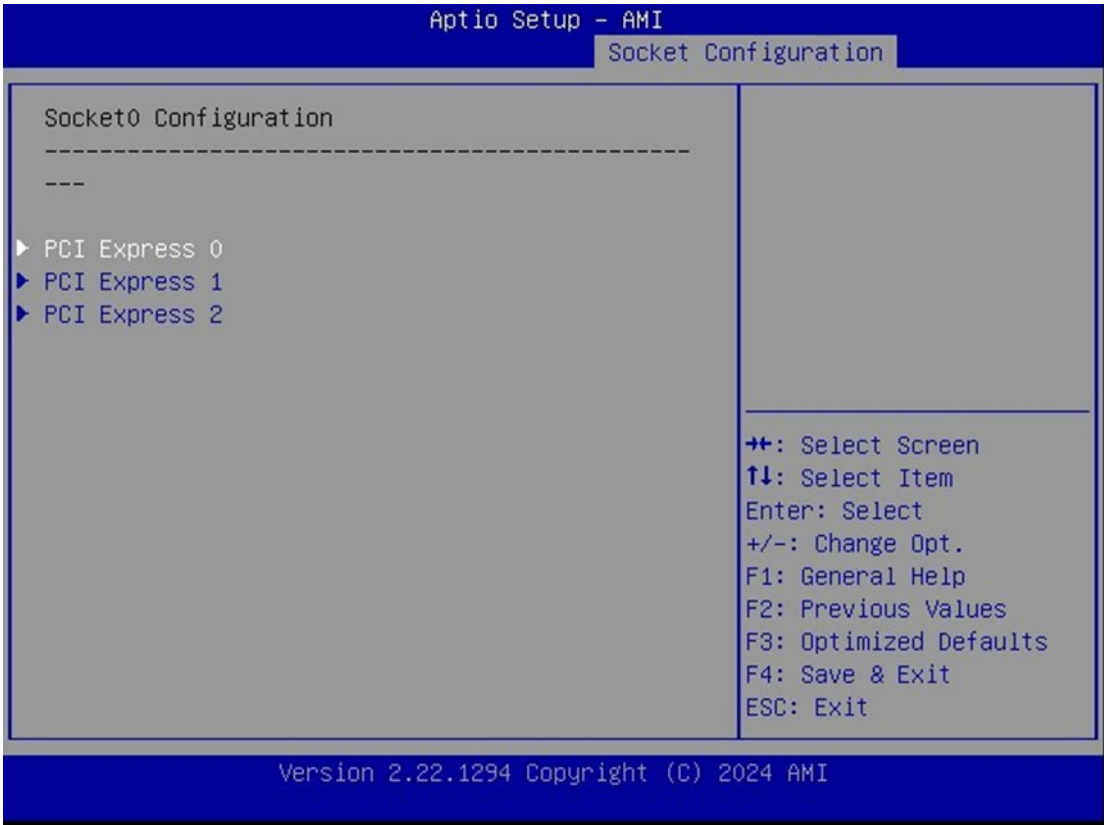
Feature	Options	Description
Core Disable Bitmap (Hex)	0	0: Enable all cores. FFFFFFFFFF: Disable all cores least one core per CPU must be enabled. Disabling all cores is an invalid configuration.

Memory Configuration



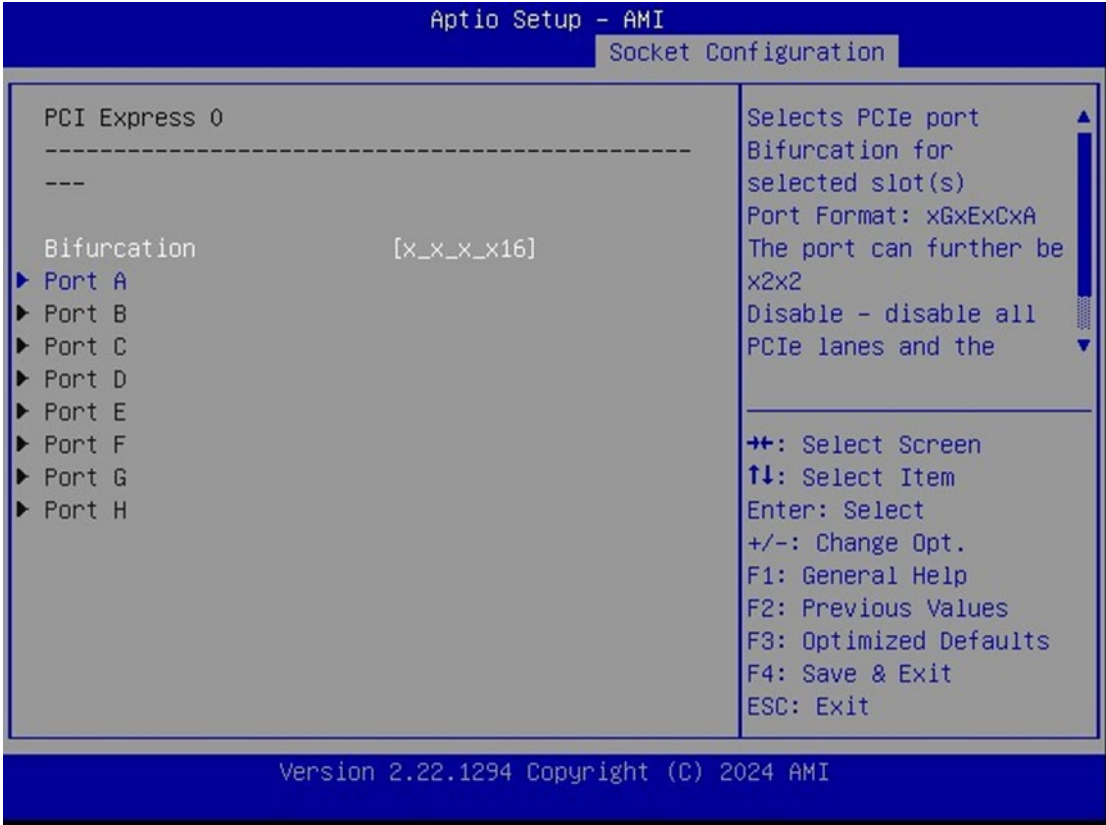
Feature	Options	Description
Memory Frequency	Auto	Maximum Memory Frequency Selections in Mhz. Do not select Reserved.
	4800	
	5200	
	5600	
	6000	
	6400	
Memory Topology	None	Displays memory topology with Dimm population information

IIO Configuration



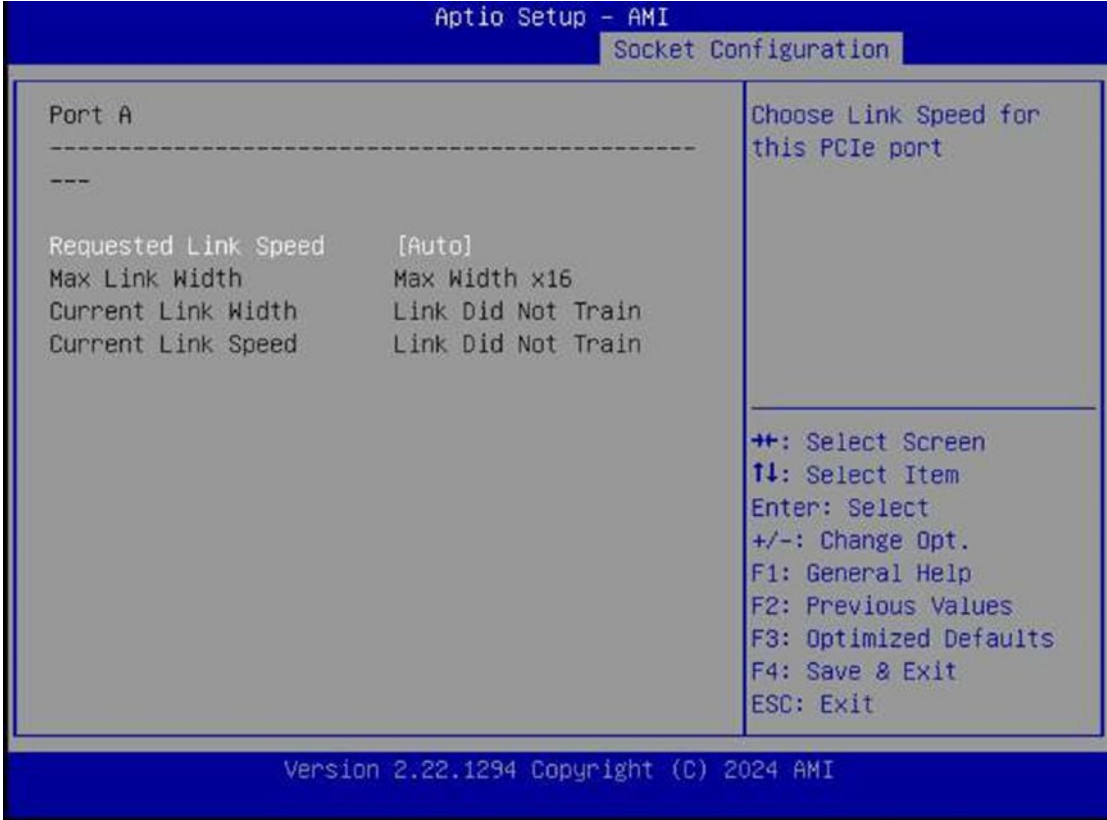
Feature	Options	Description
PCI Express 0	None	None
PCI Express 1	None	None
PCI Express 2	None	None

PCI Express 0



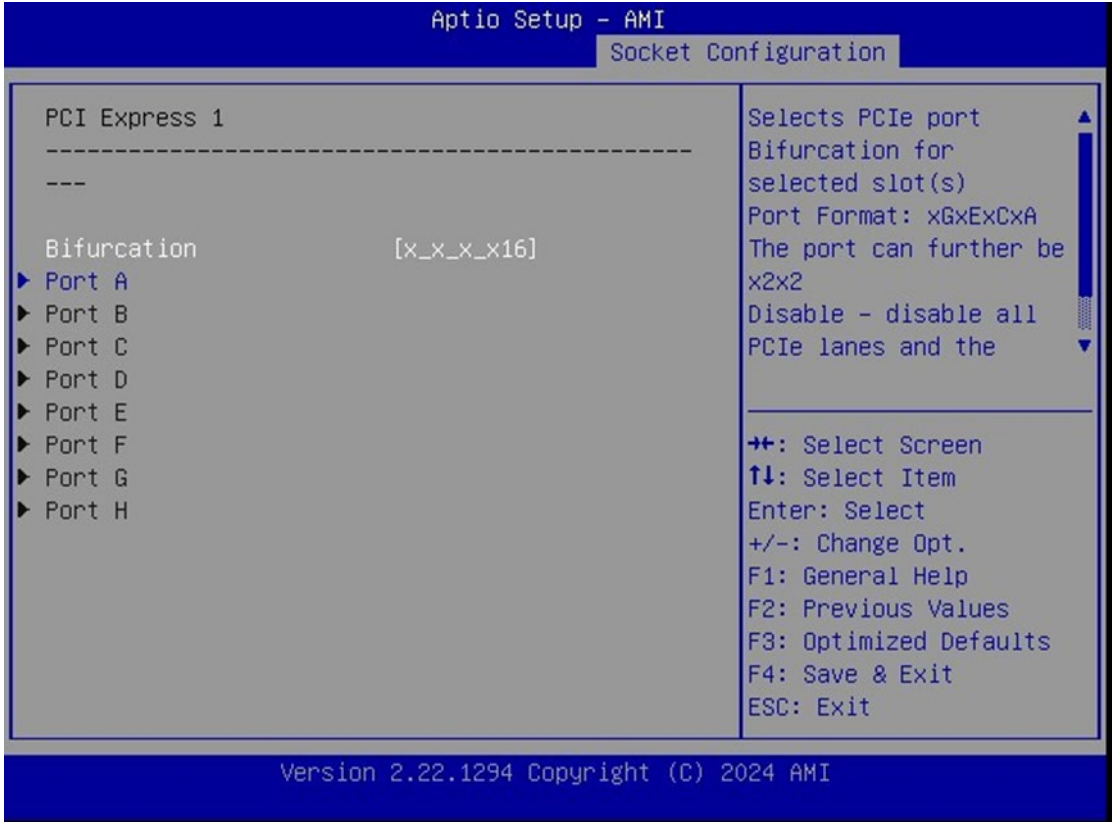
Feature	Options	Description
Bifurcation	Auto x4x4x4x4 x4x4x_x8 x_x8x4x4 x_x8x_x8 x_x_x_x16 x2x2x4x_x8 x4x2x2x_x8 x_x8x2x2x4 x2x2x4x4x4 x4x2x2x4x4 x4x4x2x2x4	Selects PCIe port Bifurcation for selected slot(s). Port Format: xGxExCxA. The port can further be x2x2 Disable – disable all PCIe lanes
Port A	None	None

Port A



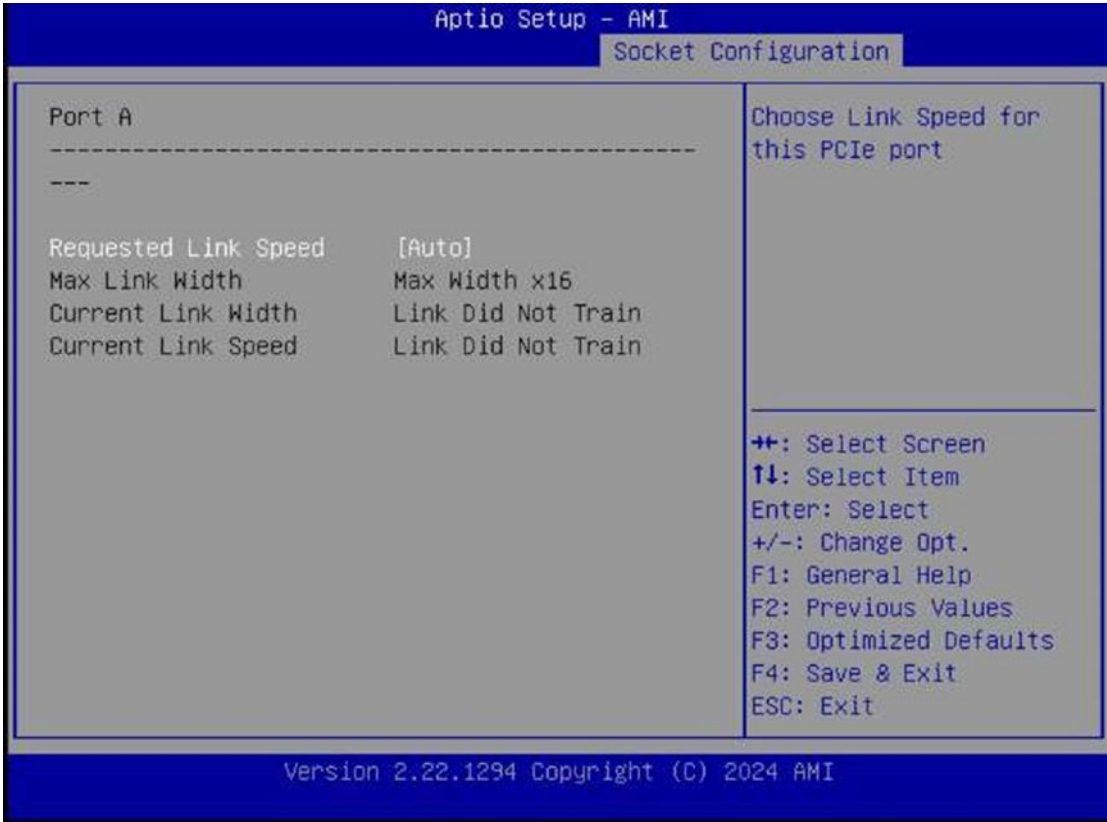
Feature	Options	Description
Requested Link Speed	Auto	Choose Link Speed for this PCIe port
	Gen 1 (2.5 GT/s)	
	Gen 2 (5 GT/s)	
	Gen 3 (8 GT/s)	
	Gen 4 (16 GT/s)	
	Gen 5 (32 GT/s)	

PCI Express 1



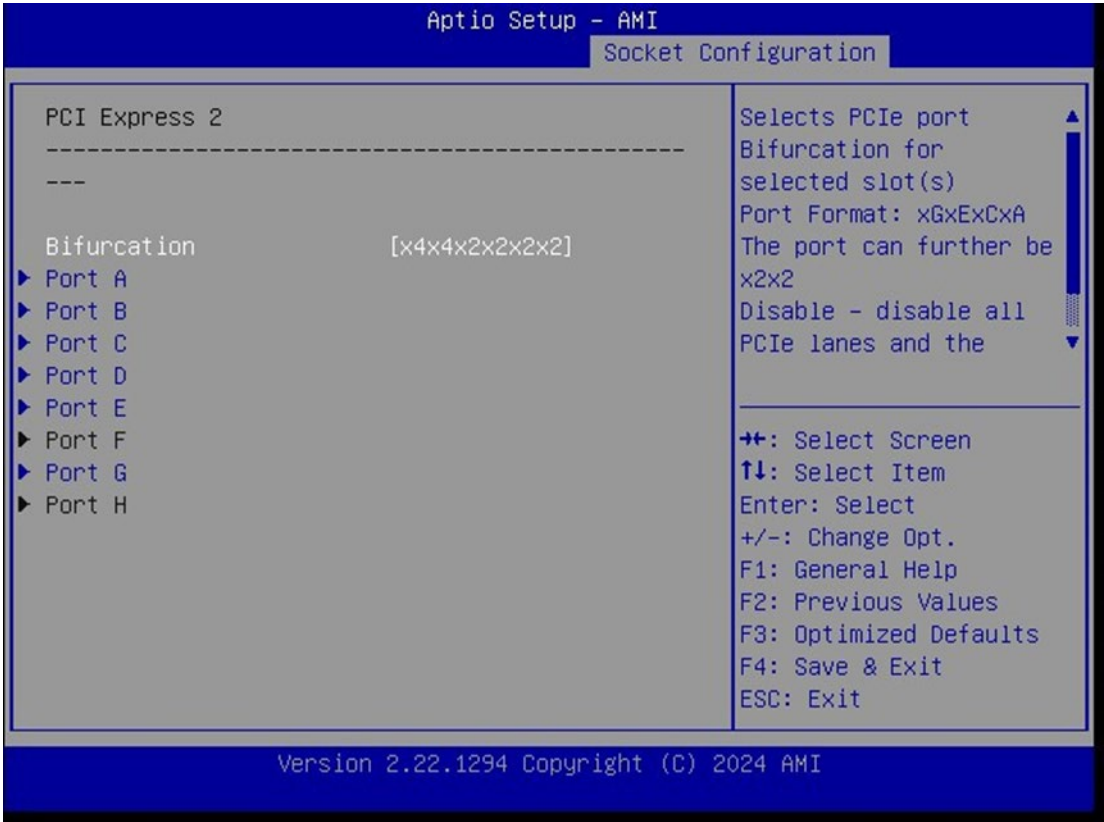
Feature	Options	Description
Bifurcation	Auto x4x4x4x4 x4x4x_x8 x_x8x4x4 x_x8x_x8 x_x_x_x16 x2x2x4x_x8 x4x2x2x_x8 x_x8x2x2x4 x2x2x4x4x4 x4x2x2x4x4 x4x4x2x2x4	Selects PCIe port Bifurcation for selected slot(s). Port Format: xGxExCx4. The port can further be x2x2 Disable – disable all PCIe lanes
Port A	None	None

Port A



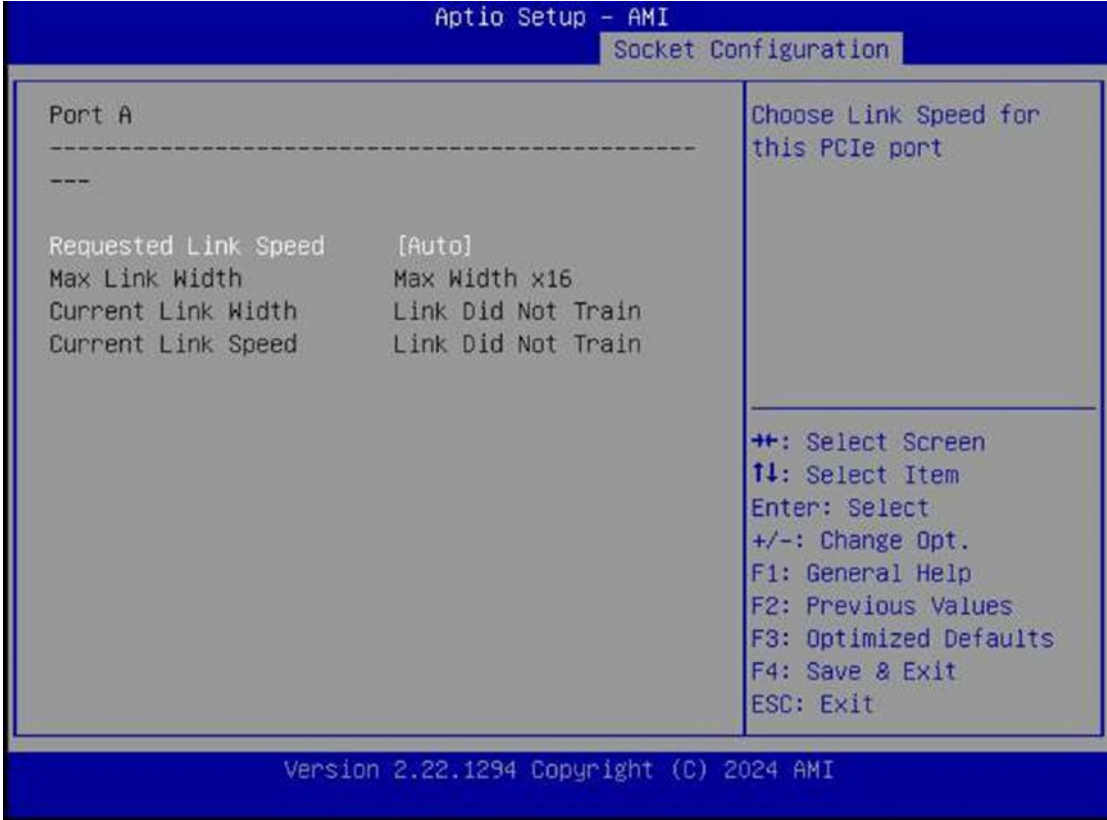
Feature	Options	Description
Link Speed	Auto Gen 1 (2.5 GT/s) Gen 2 (5 GT/s) Gen 3 (8 GT/s) Gen 4 (16 GT/s) Gen 5 (32 GT/s)	Choose Link Speed for this PCIe port

PCI Express 2



Feature	Options	Description
Bifurcation	Auto x4x4x4x4 x4x4x_x8 x_x8x4x4 x_x8x_x8 x_x_x_x16 x2x2x4x_x8 x4x2x2x_x8 x_x8x2x2x4 x2x2x4x4x4 x4x2x2x4x4 x4x4x2x2x4	Selects PCIe port Bifurcation for selected slot(s). Port Format: xGxExCx A. The port can further be x2x2 Disable – disable all PCIe lanes
Port A	None	None

Port A



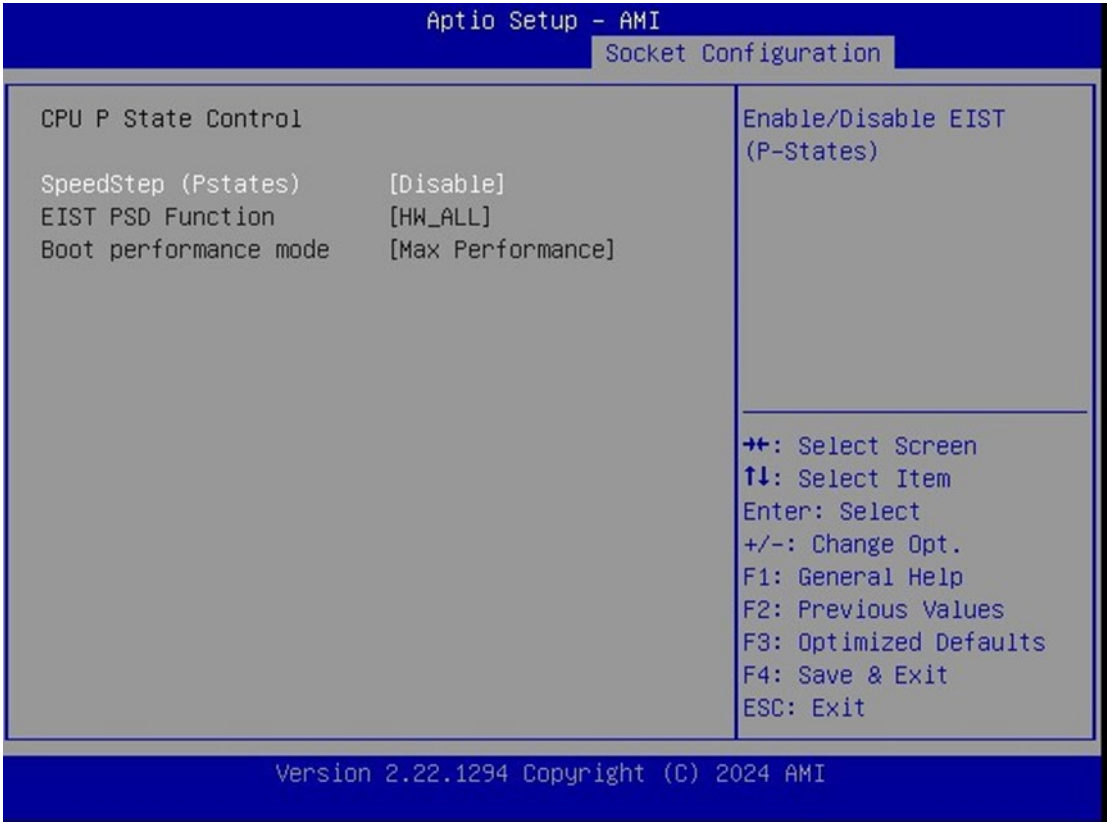
Feature	Options	Description
Requested Link Speed	Auto Gen 1 (2.5 GT/s) Gen 2 (5 GT/s) Gen 3 (8 GT/s) Gen 4 (16 GT/s) Gen 5 (32 GT/s)	Choose Link Speed for this PCIe port

Advanced Power Management Configuration



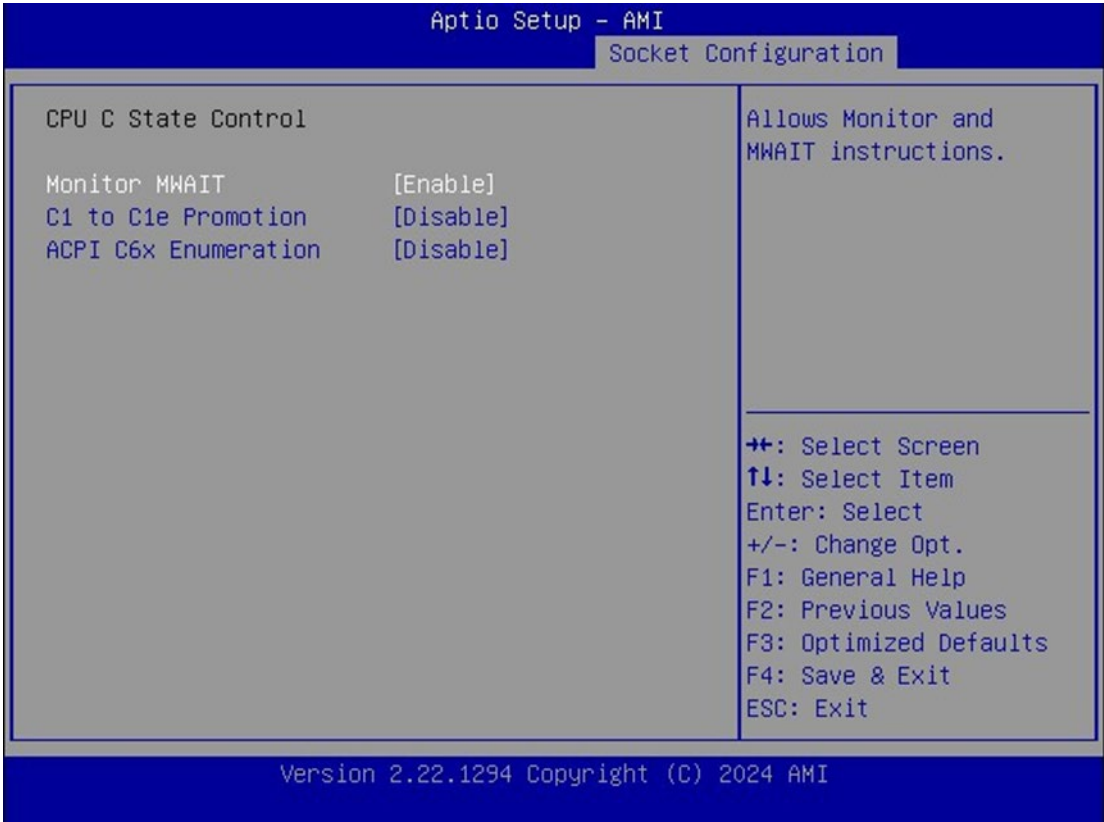
Feature	Options	Description
CPU P State Control	None	P State Control Configuration Sub Menu, include Turbo, XE and etc.
CPU C State Control	None	CPU C State setting
Package C State Control	None	P State Control Configuration Sub Menu, include Turbo, XE and etc.

CPU P State Control



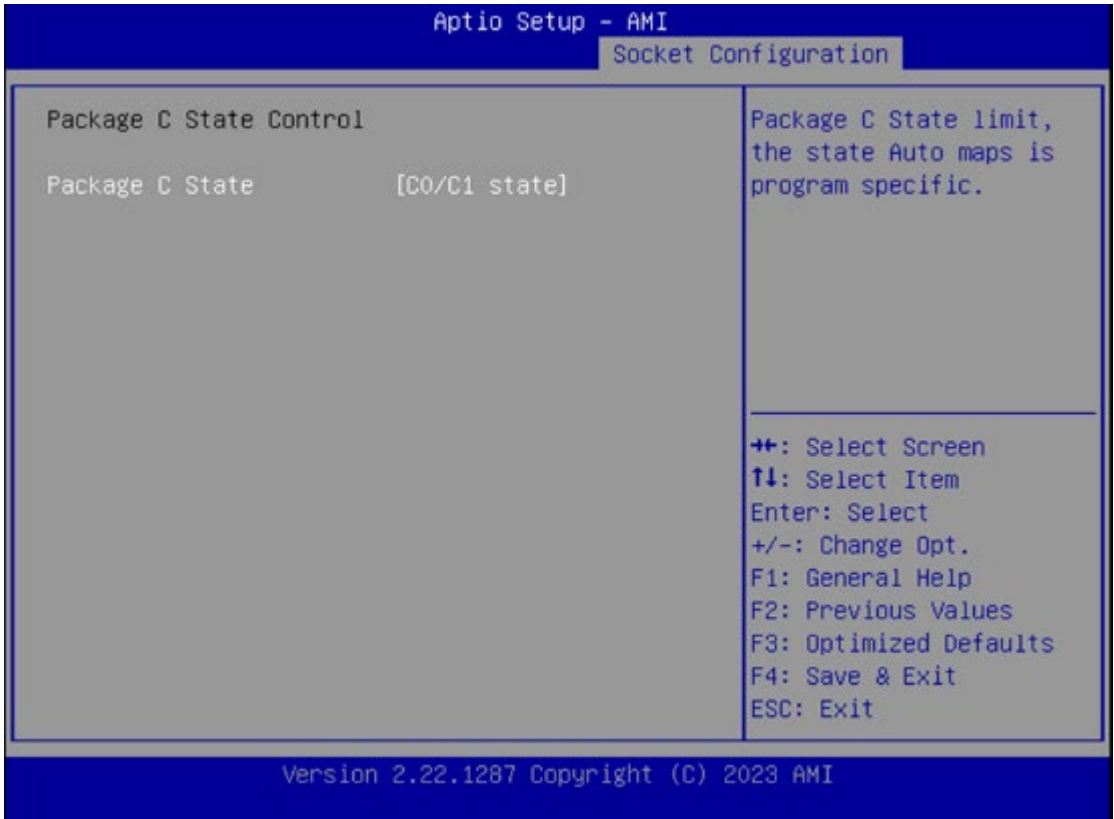
Feature	Options	Description
SpeedStep (Pstates)	Disabled Enabled	Enables or disables EIST (P-States)
EIST PSD Function	HW_ALL SW_ALL	Choose HW_ALL/SW_ALL in_PSD return
Boot performance mode	Max Performance Max Efficient Set by Intel Node Manager	Select the performance state that the BIOS will set before OS hand off.

CPU C State Control



Feature	Options	Description
Monitor MWAIT	Disabled Enabled	Allows Monitor and MWAIT instructions
C1 to C1e Promotion	Disabled Enabled	CPU will promote C1 request to C1e state.
ACPI C6x Enumeration	Disabled C6 as ACPI C2 C6 as ACPI C3 C6-P as ACPI C2 C6-P as ACPI C3 Auto	Core C1E auto promotion Control. Takes effect after reboot.

Package C State Control



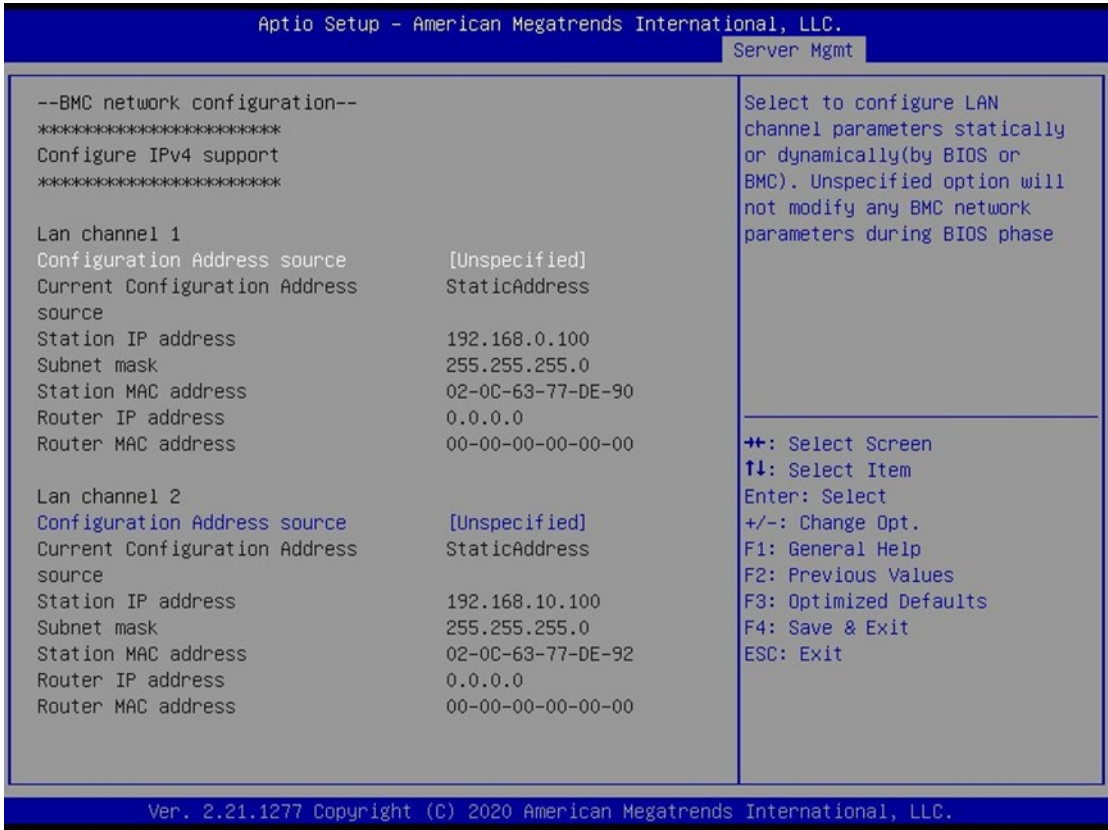
Feature	Options	Description
Package C State	C0/C1 state C2 state C6 (non Retention) state C6 (Retention) state No Limit Auto	Package C State limit, the state Auto maps is program specific.

Server Mgmt



Feature	Options	Description
BMC Support	Enabled Disabled	Enable or disables interfaces to communicate with BMC.
BMC network configuration	NA	Configure BMC network parameters.
View System Event Log	NA	Press <Enter> to view the System Event Log Records.
BMC Warm Reset	NA	Press <Enter> to do Warm Reset BMC.

BMC Network Configuration



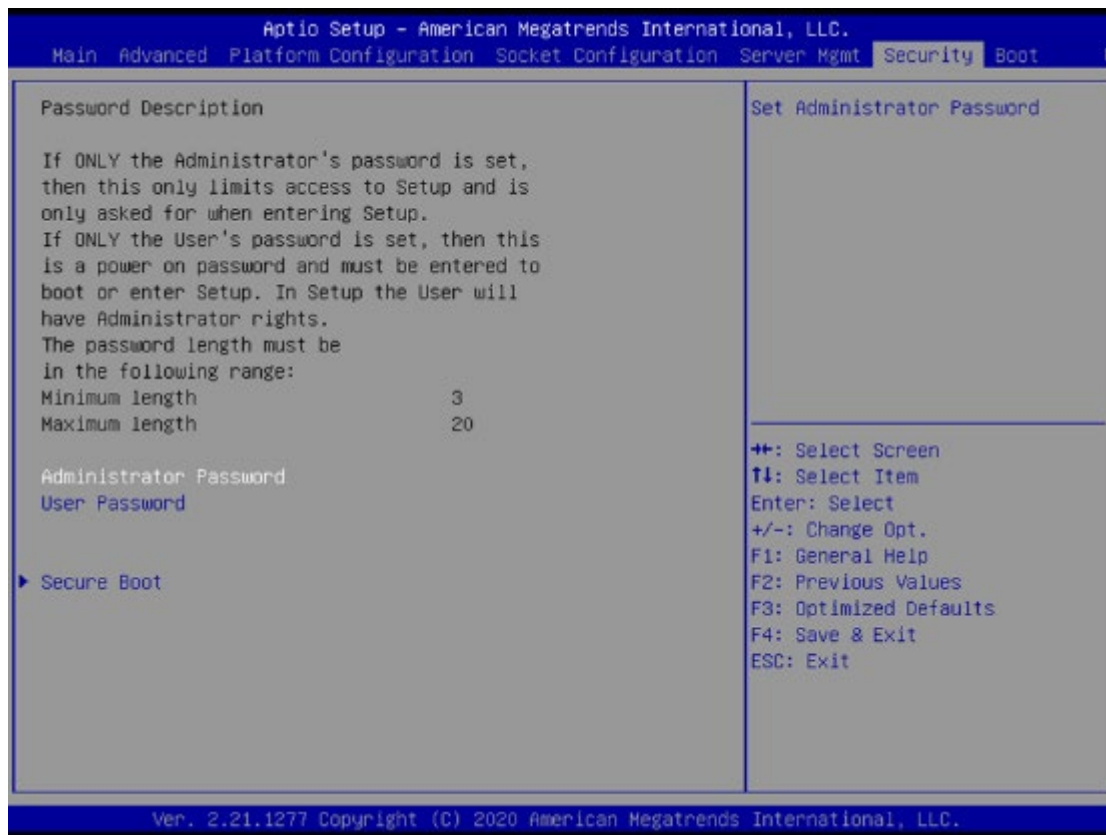
Feature	Options	Description
Configuration Address source	Unspecified Static DynamicBmcDhcp	Select to configure LAN channel parameters statically or dynamically (by BIOS or BMC). The unspecified option will not modify any BMC network parameters during BIOS phase.

View System Event Log



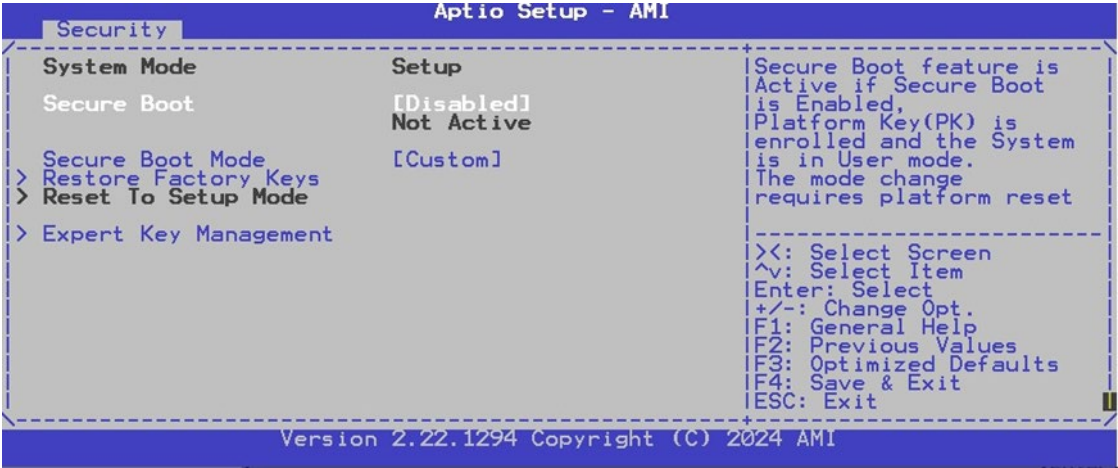
Security

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



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.
Restore Factory Keys	None	Force System to User Mode. Install factory default Secure Boot key databases.
Reset To Setup Mode	None	
Expert Key Management	None	Enables expert users to modify Secure Boot Policy variables without variable authentication.

Expert Key Management



Feature	Options	Description
Factory Key Provision	Disabled Enabled	Provision factory default keys on next re- boot only when System in Setup Mode.
Restore Factory keys	None	Force System to User Mode. Configure NVRAM to contain OEM-defined factory default Secure Boot keys.
Reset To Setup Mode	None	
Enroll Efi Image	None	Allows the image to run in Secure Boot mode. Enroll SHA256 hash of the binary into Authorized Signature Database (db)
Export Secure Boot variables	None	
Platform Key (PK)	None	Enroll Factory Defaults or load certificates from a file: 1. Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048
Key Exchange Keys (KEK)	None	Enroll Factory Defaults or load certificates from a file: 1. Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048
Authorized Signatures (db)	None	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048

Forbidden Signatures(dbx)	None	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048
Authorized TimeStamps(dbt)	None	Enroll Factory Defaults or load certificates from a file: 1. Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048
OsRecovery Signatures(dbr)	None	Enroll Factory Defaults or load certificates from a file: 1. Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048

Boot Menu

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

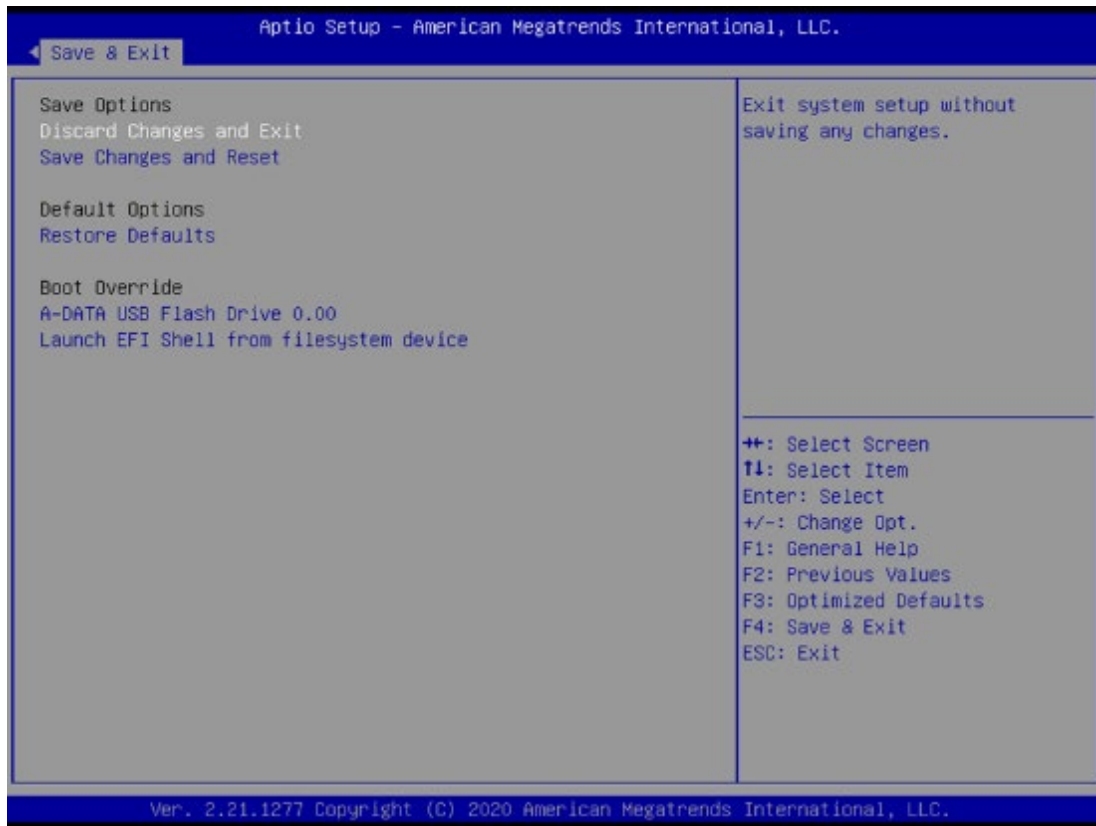


Feature	Options	Description
Setup Prompt Timeout	5	The Number of seconds to wait for setup activation key. 65535 means indefinite waiting.
BootupNumLock State	On Off	Select the keyboard NumLock state.

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

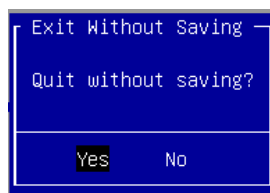
Save & Exit Menu

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 Exit

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.



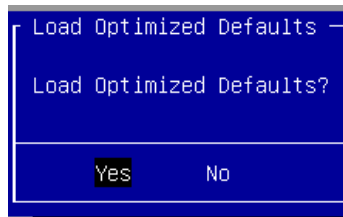
■ Save Changes and Reset

When Users have completed the system configuration changes, select this option to save the changes and exit 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 Exit"** option is selected. Select **"Yes"** to Save Changes and Exit Setup.



■ Restore Defaults

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



Note

The items under Boot Override may not have the same image as above, as it would depend on the actual devices connected on system.

APPENDIX A: LED INDICATOR EXPLANATIONS

► System Power / Status / HDD Activity



Green: System Power

Red/Green: System Status

Amber: HDD Activity

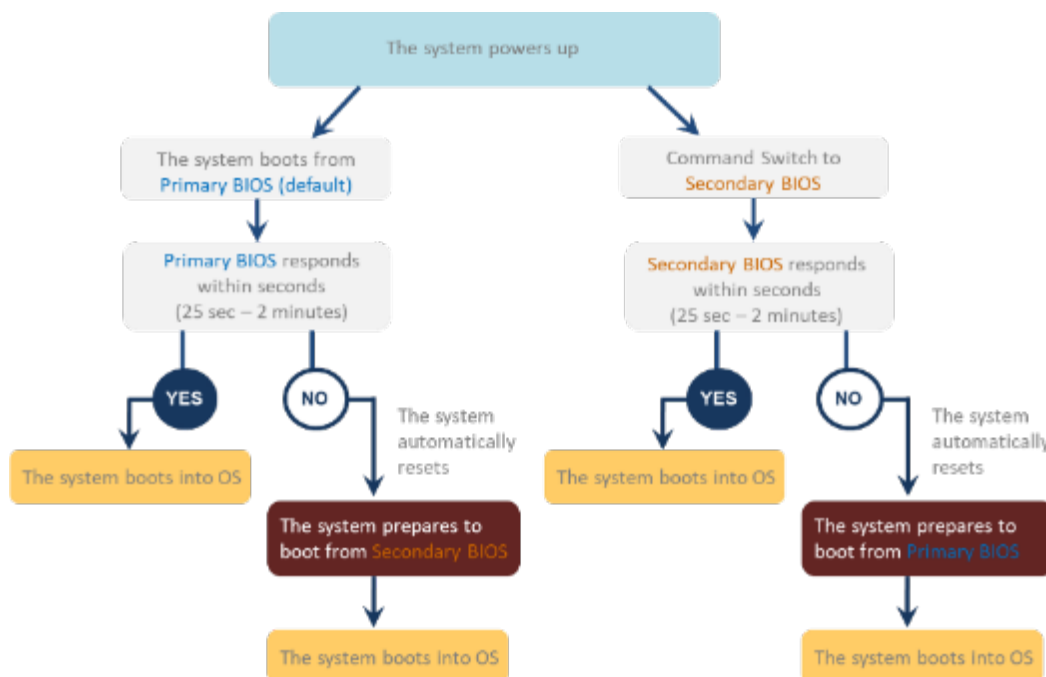
LED	COLOR ON LCM	COLOR ON BOARD	LED ACTION	DESCRIPTION
POWER	Green	Green	Steady	When system power on
	Off	Off	N/A	No power on
STATUS	Green	Green	Steady	control by GPIO
	Amber	Red	Steady	control by GPIO
	Off	Off	N/A	control by GPIO (Default) or No power on
HDD	Amber	Amber	Blinking	Blinking indicates HDD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

APPENDIX B: DUAL BIOS INTRODUCTION

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.

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.

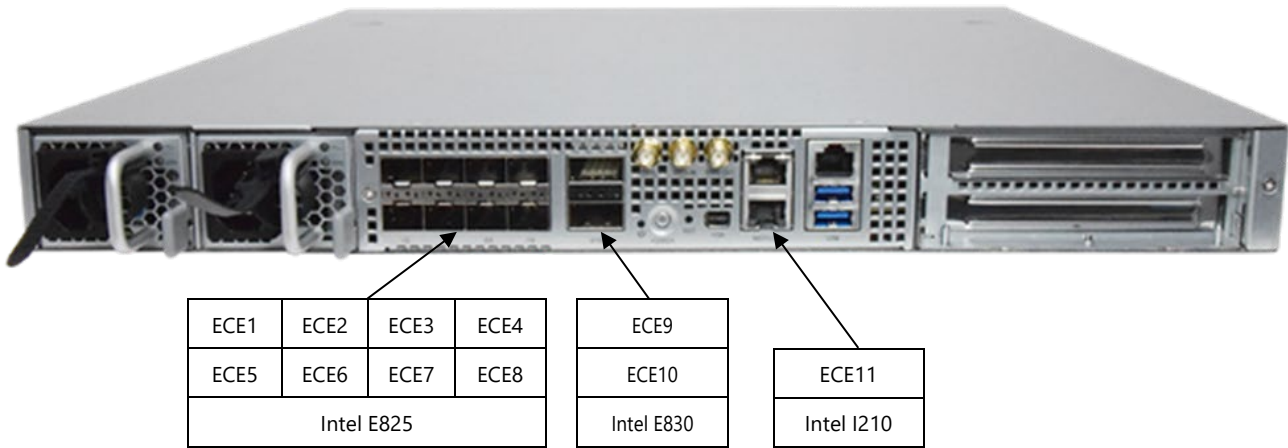
**Warning**

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: PORT MAP



PCI Bus	Switch Side	Ethernet Name
0000:13:00.2	ECE1	eno3np2
0000:13:00.0	ECE2	eno1np0
0000:1b:00.1	ECE3	eno6np1
0000:1b:00.3	ECE4	eno8np3
0000:13:00.3	ECE5	eno4np3
0000:13:00.1	ECE6	eno2np1
0000:1b:00.0	ECE7	eno5np0
0000:1b:00.2	ECE8	eno7np2
0000:6c:00.0	ECE9	ens2f0np0
0000:6c:00.1	ECE10	ens2f1np1
0000:b6:00.0	ECE11	eno9

APPENDIX D: 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 the 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 include failure details)	
		☐ Testing Purpose	
Company:		Contact Person:	
Phone No.		Purchased Date:	
Fax No.:		Applied Date:	
Return Shipping Address: _____			
Shipping by: ☐ Air Freight ☐ Sea ☐ Express _____			
☐ Others: _____			
Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

***Problem Code:**

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

Request Party

Confirmed By Supplier

Authorized Signature / Date

Authorized Signature / Date