Lanner

Network Appliance Platforms

Hardware Platforms for Network Computing

NCA-4035
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.

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.

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.

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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).

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

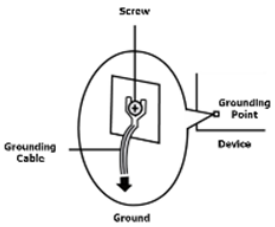
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect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

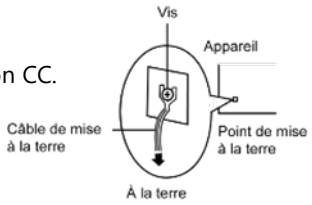
Grounding Procedure for DC Power Source

- 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.



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CHAPTER 1: PRODUCT OVERVIEW

The NCA-4035 is based on Intel® Xeon D, a branch of Xeon processors optimized for delivering ultra-low power consumption and robust performance. This appliance comes with the most innovative System-on-a-Chip built for the edge and is ideal for applications in networking, 5G and IoT/IIoT Edge computing, delivering improvement in packet processing performance, virtualized Customer Premise Equipment (vCPE) usages.

Package Content

Your package contains the following items:

- 1x NCA-4035 Network Security Platform
- 1x Power Cable
- 2x Console Cable
- 1x Short Ear Rackmount Kit (with screws)

Ordering Information

SKU No.	Main Features
NCA-4035A	Intel® D2700, 20C, 125W CPU w/ 100G QAT; 1x GbE RJ45 Console Port, 10x GbE RJ45 Ports w/ 2 Pairs of Bypass, 4x 10G SFP+ Ports, 1x NIC Module, 300W 1+1 Redundant Power Supply
NCA-4035B	Intel® D2700, 16C, 117W CPU w/ 100G QAT, 1x GbE RJ45 Console Port, 10x GbE RJ45 Ports w/ 2 Pairs of Bypass, 4x 10G SFP+ Ports, 1x NIC Module, 300W 1+1 Redundant Power Supply
NCA-4035C	Intel® D2700, 12C, 87W CPU w/ 50G QAT, 1x GbE RJ45 Console Port, 10x GbE RJ45 Ports w/ 2 Pairs of Bypass, 4x 10G SFP+ Ports, 1x NIC Module, 300W 1+1 Redundant Power Supply
NCA-4035D	Intel® D2700, 8C, 80W CPU w/ 50G QAT, 1x GbE RJ45 Console Port, 10x GbE RJ45 Ports w/ 2 Pairs of Bypass, 4x 10G SFP+ Ports, 1x NIC Module, 300W 1+1 Redundant Power Supply
NCA-4035E	Intel® D2700, 4C, 65W CPU w/o QAT, 1x GbE RJ45 Console Port, 10x GbE RJ45 Ports w/ 2 Pairs of Bypass, 4x 10G SFP+ Ports, 1x NIC Module, 350W Single Power Supply
NCA-4035F	Intel® D2800, 22C, 135W CPU w/ 100G QAT, 1x GbE RJ45 Console, 10x GbE RJ45 w/ 2 Pairs of Bypass, 4x 10G SFP+, 1x NIC Module, 1+1 Redundant PSU

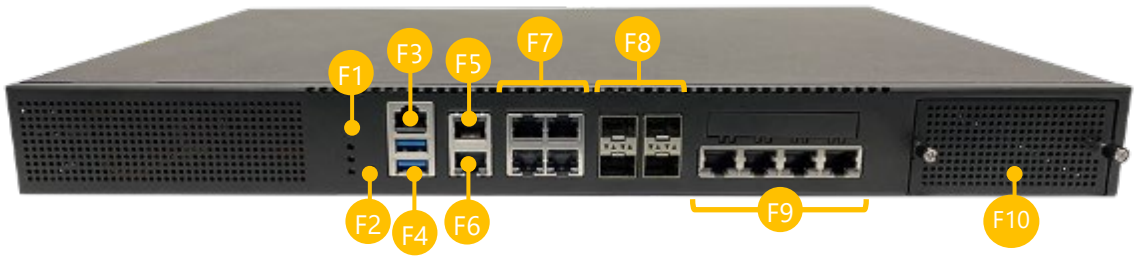
Optional Accessories

Model	Description
IO-2520IXM401A	Uplayer NIC Module Kit
IAC-AST2500E	IPMI Card Kit
DC Power Supply	DC Redundant Power Supply Module
Slide Rackmount Rail Kit	1U Rackmount kit

System Specifications

Form Factor		1U 19" Rackmount
Platform	Processor Options	SKU A: Intel® D-2798NT, 20C, 125W SKU B: Intel® D-2776NT, 16C, 117W SKU C: Intel® D-2753NT, 12C, 87W SKU D: Intel® D-2733NT, 8C, 80W SKU E: Intel® D-2712, 4C, 65W SKU F: Intel® D2899NT, 22C, 135W
	CPU Socket	1x Onboard
	Security Acceleration	Intel® QuickAssist Technology (By SKU)
BIOS		AMI SPI Flash BIOS
System Memory	Technology	SKU A/F: DDR4 3200MHz, ECC or Non-ECC SKU B: DDR4 2933MHz, ECC or Non-ECC SKU C/D/E: DDR4 2667MHz, ECC or Non-ECC
	Max. Capacity	Up to 256GB
	Socket	4x 288-pin UDIMM/RDIMM
Networking	Ethernet Ports	10x GbE RJ45 with 2 Pair Bypass; 4x 10G SFP+ (Default); Or 4x 25G SFP28 (By OEM project)
	NIC Module Slot	1x NIC Module Slot
LOM	I/O Interface	1x LOM for IPMI
	OPMA Slot	Yes
I/O Interface	Reset Button	1x Reset Button
	LED Indicator	Power/Status/Storage, refer to Appendix A
	Power Button	1x ATX Power Button
	Console Port	1x RJ45 Console Port
	USB Port	2x USB 3.0 Ports
	Power Input	1x AC Power Inlet on PSU
Storage	Onboard Slots	1x M.2 2242 (SATA) B-Key; 2x M.2 2280 (SATA) B-Key
Expansion	PCIe	1x Gen4 PCI-E*8; 1x Gen4 PCIe*16 (FHHL)
Miscellaneous	Watchdog	Yes
	Internal RTC w/ Li Battery	Yes
	TPM	Yes
Cooling	Processor	Passive CPU Heatsink
	System	4x Individual Cooling Fans with Smart Fan
Environmental Parameters	Temperature	0~40ºC Operating; -20~70ºC Non-Operating
	Humidity (RH)	5~90% Operating; 5~95% Non-Operating
System Dimensions	Size (WxDxH)	438 x 44 x 321mm
	Weight	8.6kg
Package Dimensions	Size (WxDxH)	739 x 215 x 582 mm
	Weight	15 kg
Power	Type/Watts	SKU A/B/C/D/F: 300W 1+1 Redundant PSU; SKU E: 350W Single PSU
	Input	Redundant: AC 100~240V @50~60 Hz Single: AC 100~240V @47~63Hz
OS Support		Linux
Approvals and Compliance		CE/FCC Class A, UL, RoHS

Front Panel



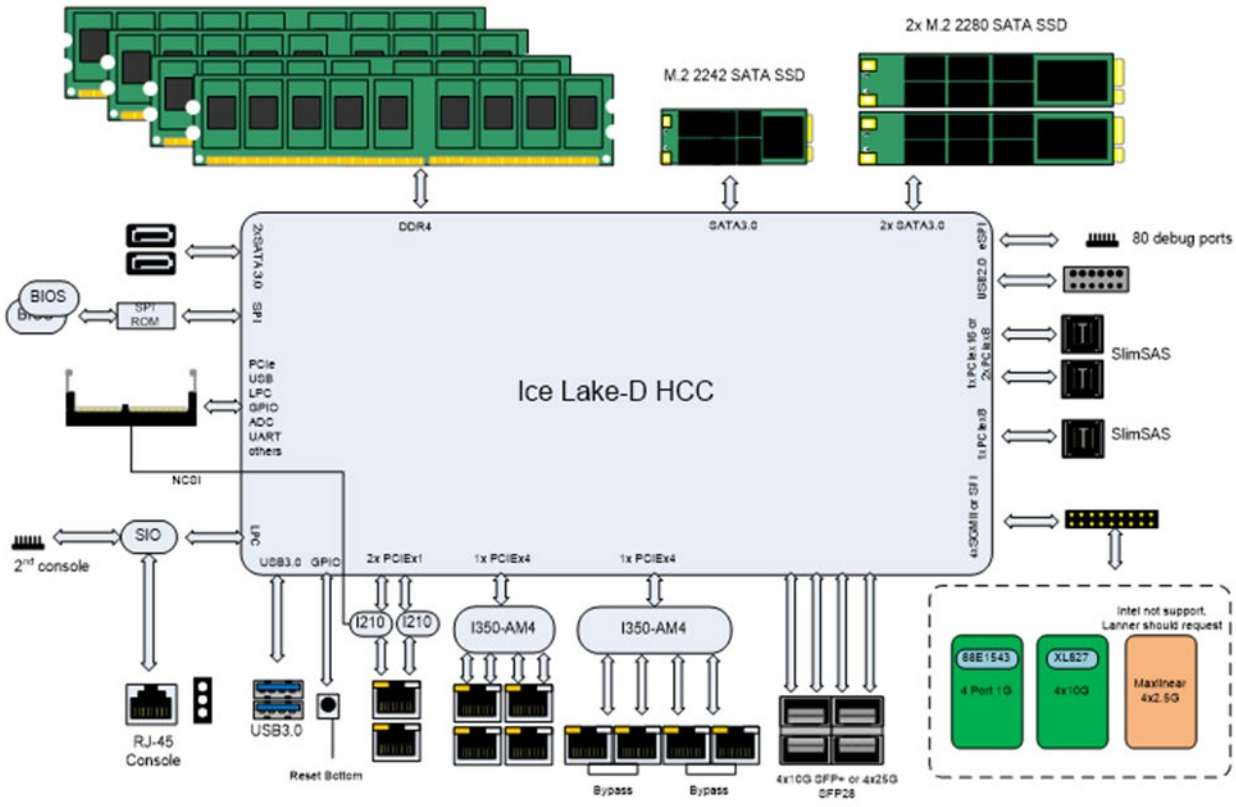
No.	Description	
F1	LED Indicators	Power/Status/Storage, pls refer to Appendix A
F2	Reset Button	1x Reset Button
F3	Console Port	1x RJ45 Console Port
F4	USB Port	2x USB 3.0 Ports
F5	LAN Port	1x RJ45 GbE LAN via I210-AT
F6	LOM Port	1x RJ45 GbE LOM Port
F7	LAN Port	4x RJ45 GbE LAN via I350-AM4
F8	LAN Port	4x 10G SFP+
F9	LAN Port	4x RJ45 GbE LAN via I350-AM4
F10	NIC Slot	1x NIC NCS2 Slim Module Slot

Rear Panel

No.	Description	
R1	PCIe Expansion Slot	PCIe*16 via 2x Slim SAS Connector (FHHL) (Optional)
R2	Cooling Fan	4x Cooling Fans
R3	Redundant PSU	SKU A/B/C/D/F : 2x 300W AC Redundant PSU (N+1 design) SKU E : 1x 350W Single AC PSU
R4	Grounding Hole	1x Semi-shearing hole for grounding screws
R5	ESD Jack	1x Semi-shearing hole for ESD screws
R6	Power Switch	1x Slim Type ATX Power Switch

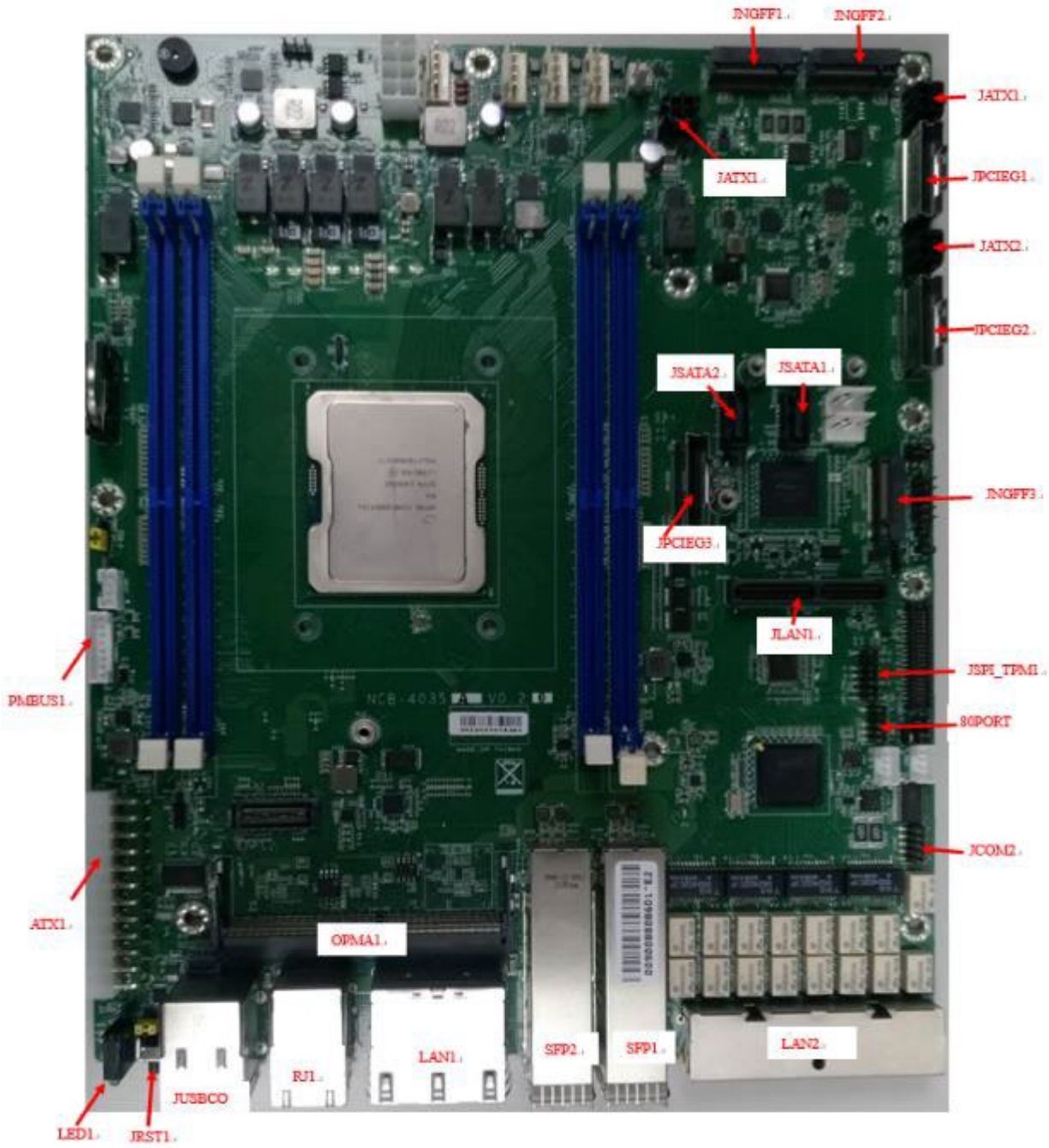
CHAPTER 2: MOTHERBOARD INFORMATION

Block Diagram



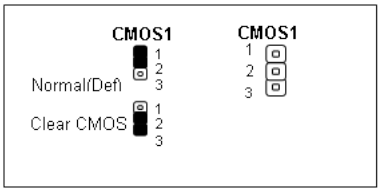
Jumpers and Connectors

The following references the pin assignments and internal connectors of the system.



Jumper & Switch Settings

CMOS1: Clear CMOS

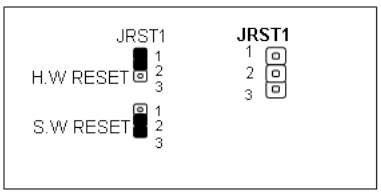


CMOS1	Description
1-2	Normal (Default)
2-3	Clear CMOS

JPWR1: External Power Button (1x2 Pin 2.43mm Wafer)

PIN	Description
1	PS_IN
2	GND

JRST1: Reset Mode Select



PIN	Description
1-2	Hardware Reset
2-3	Software Reset

JDUAL1: Select CS for Flash Fixture

Pin/Switch	Description
1-2 Short, 3-4 Short	Flash 1st SPI ROM (Default)
1-3 Short, 2-4 Short	Flash 2nd SPI ROM

J13: BIOS Boot Up / Function Select

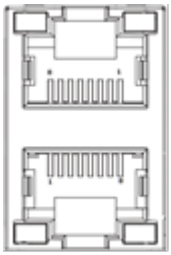
Pin/Switch	Description
1-3 Short	Boot Up from 1st SPI ROM (Default)
3-5 Short	Boot Up from 2nd SPI ROM

Pin/Switch	Description
2-4 Short	Enable Dual BIOS (Default)
4-6 Short	Disable Dual BIOS

Ethernet

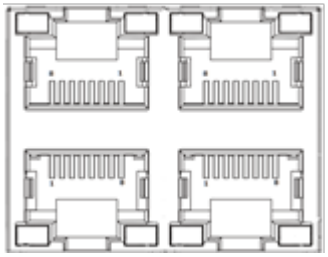
RJ1: Dual RJ-45 with LED

Pin No.	Description	
	Fast E-Net	Giga Net
1	TX+	MD0+
2	TX-	MD0-
3	RX+	MD1+
4	T45	MD2+
5	T45	MD2-
6	RX-	MD1-
7	T78	MD3+
8	T78	MD3-
	10-/100-/1000+	
10	10+/100+/1000-	
11	Link+/ACT-	
12	Link-/ACT+	



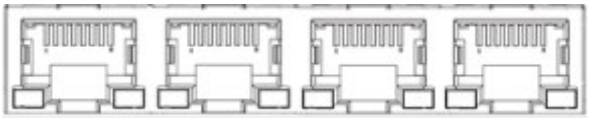
LAN1: 2x2 Port RJ-45 with LED

Pin No.	Description	
	Fast E-Net	Giga Net
N1	TX+	MD0+
2	TX-	MD0-
3	RX+	MD1+
4	T45	MD2+
5	T45	MD2-
6	RX-	MD1-
7	T78	MD3+
8	T78	MD3-
	10-/100-/1000+	
10	10+/100+/1000-	
11	Link+/ACT-	
12	Link-/ACT+	



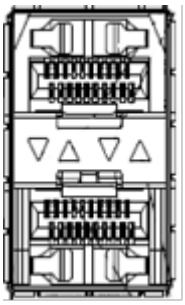
LAN2: 1x4 Port RJ-45 with LED

Pin No.	Description	
	Fast E-Net	Giga Net
N1	TX+	MD0+
2	TX-	MD0-



3	RX+	MD1+
4	T45	MD2+
5	T45	MD2-
6	RX-	MD1-
7	T78	MD3+
8	T78	MD3-
	10-/100-/1000+	
10	10+/100+/1000-	
11	Link+/ACT-	
12	Link-/ACT+	

SFP1/SFP2: SFP28 2x1 Assy with LED

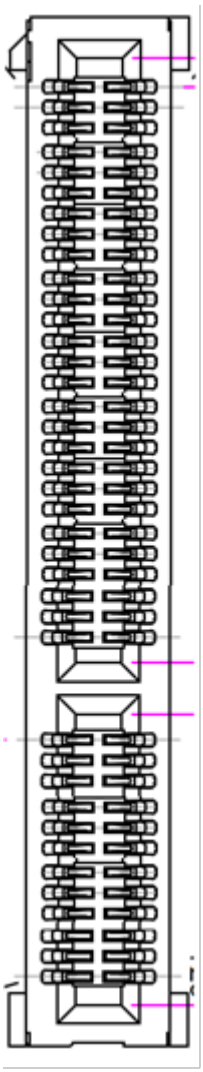


PIN	Description	PIN	Description
1	VeeT	11	VeeR
2	TxFault	12	RD-
3	TxDis	13	RD+
4	SDA	14	VeeR
5	SCL	15	VCCR
6	MOD_ABS	16	VCCT
7	RS0	17	VeeT
8	RX_LOS	18	TD+
9	RS1	19	TD-
10	VeeR	20	VeeT

JLAN1: Minimezz Connector

PIN	Description	PIN	Description
1	5VSB	2	GND
3	NC	4	CR_RX0-
5	NC	6	CR_RX0+
7	GND	8	GND
9	CR_RX1-	10	NC
11	CR_RX1+	12	NC
13	GND	14	GND
15	NC	16	CR_RX2-
17	NC	18	CR_RX2+
19	GND	20	GND
21	CR_RX3-	22	NC
23	CR_RX3+	24	NC

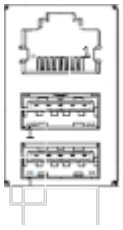
25	GND	26	GND
27	NC	28	NC
29	NC	30	PLT_RST#
31	GND	32	3VSB
33	GND	34	GND
35	PRESNT#	36	MDIO
37	12VSB	38	12VSB
39	NC	40	MDC
41	NC	42	INT#
43	GBE_SCL	44	GBE_RST#
45	GBE_SDA	46	GND
47	NC	48	CR_TX0+
49	NC	50	CR_TX0-
51	GND	52	GND
53	CR_TX2+	54	NC
55	CR_TX2-	56	NC
57	GND	58	
59	NC	60	CR_TX1+
61	NC	62	CR_TX1-
63	GND	64	GND
65	CR_TX3+	66	NC
67	CR_TX3-	68	NC
69	GND	70	GND
71	NC	72	NC
73	NC	74	NC
75	GND	76	GND
77	GND	78	GND
79	12VSB	80	12VSB



I/O Function

JUSBCOM1: USB3.0 Double Stack Type A+ Console Port Connector

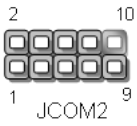
PIN	Description
1	NC
2	NC
3	NC
4	GND
5	TXD
6	RXD
7	RTS
8	CTS



PIN	Description
1	USB_VCC1
2	D1-
3	D1+
4	GND
5	USB3.0_RX-
6	USB3.0_RX+
7	GND
8	USB3.0_TX-
9	USB3.0_X+

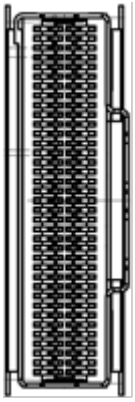
JCOM2: COM2 (Pin Header)

PIN	Description
1	DCD#
2	DSR#
3	RX
4	RTS
5	TX
6	CTS#
7	DTR
8	RI#
9	GND



Expansion

JPCIEG1/JPCIEG2: SFF-8645 Connector for PCIE Cable



PIN	Description	PIN	Description
A1	GND	B1	GND
A2	PCIE_CLK0P	B2	PCIE_RX0P
A3	PCIE_CLK0N	B3	PCIE_RX0N
A4	GND	B4	GND
A5	PCIE_TX0P	B5	PCIE_RX1P
A6	PCIE_TX0N	B6	PCIE_RX1N
A7	GND	B7	GND
A8	PCIE_TX1P	B8	PCIE_RX2P
A9	PCIE_TX1N	B9	PCIE_RX2N
A10	GND	B10	GND
A11	PCIE_TX2P	B11	PCIE_RX3P
A12	PCIE_TX2N	B12	PCIE_RX3N
A13	GND	B13	GND
A14	PCIE_TX3P	B14	PCIE_RX4P
A15	PCIE_TX3N	B15	PCIE_RX4N
A16	GND	B16	GND
A17	PCIE_TX4P	B17	PCIE_RX5P
A18	PCIE_TX4N	B18	PCIE_RX5N
A19	GND	B19	GND
A20	PCIE_TX5P	B20	PCIE_RX6P
A21	PCIE_TX5N	B21	PCIE_RX6N
A22	GND	B22	GND
A23	PCIE_TX6P	B23	PCIE_RX7P
A24	PCIE_TX6N	B24	PCIE_RX7N
A25	GND	B25	GND
A26	PCIE_TX7P	B26	PCIE_CLK1P
A27	PCIE_TX7N	B27	PCIE_CLK1N
A28	GND	B28	GND
A29	NC	B29	SCL
A30	NC	B30	SDA
A31	GND	B31	GND
A32	CONFIG1	B32	PCIE_WAKEN
A33	CONFIG2	B33	PRSNT2#
A34	GND	B34	GND
A35	PRSNT1#	B35	3VSB

A36	PLT_RST#	B36	3VSB
A37	GND	B37	GND

IPMI

OPMA1: DDR4 OPMA Pin Define

Not Standard DIMM Socket

PIN	OPMA Name	PIN	OPMA Name
1	Card detect	2	P12V_ADC11 / GPIX3
3	GND1	4	RSVD9
5	I2C_SCL8 / GPIOK6	6	SYS_UART2_DCD
7	I2C_SDA8 / GPIOK7	8	SYS_UART2_DSR
9	RSVD1	10	SYS_UART2_CTS
11	RSVD2	12	SYS_UART2_RI
13	TACH4 / GPIOO4	14	GND32
15	TACH3 / GPIOO3	16	RSVD10
17	TACH11 / GPIOP3	18	P5V_ADC10 / GPIX2
19	RSVD3	20	RSVD11
21	P3V3_ADC9 / GPIX1	22	BMC_UART_RXD
23	RSVD4	24	BMC_UART_TXD
25	GND2	26	GND33
27	I2C_SDA6 / GPIOK3	28	ADC2 / GPIW2
29	I2C_SCL6 / GPIOK2	30	ADC3 / GPIW3
31	GND3	32	ADC8 / GPIX0
33	I2C_SDA7 / GPIOK5	34	GND34
35	I2C_SCL7 / GPIOK4	36	SYS_UART1_DSR
37	GND4	38	SYS_UART1_TXD
39	SYS_UART1_DCD	40	SYS_UART1_RXD
41	SYS_UART1_CTS	42	SYS_UART1_RI
43	GND5	44	SYS_UART1_DTR
45	PWM5 / GPION5	46	SYS_UART1_RTS
47	PWM3 / GPION3	48	GND35
49	PWM0 / GPION0	50	RSVD12
51	PWM1 / GPION1	52	CPU_CORE1_ADC1 / GPIW1
53	GND6	54	ADC5 / GPIW5
55	TACH1 / GPIOO1	56	ADC4 / GPIW4
57	TACH0 / GPIOO0	58	ADC7 / GPIW7
59	TACH2 / GPIOO2	60	CPU_CORE0_ADC0 / GPIW0
61	GND7	62	ADC6 / GPIW6

63	SYS_UART2_RXD	64	RSVD13
65	SYS_UART2_TXD	66	GND36
67	SYS_UART2_RTS	68	I2C_SCL5_Transceiver/others
69	SYS_UART2_DTR	70	I2C_SDA5_Transceiver/others
71	GND8	72	GND37
73	RSVD5	74	PWM2 / GPION2
75	GND9	76	PWM4 / GPION4
77	TACH8 / GPIOP0	78	GND38
79	TACH7 / GPIOO7	80	RSVD14
81	TACH5 / GPIOO5	82	PECI_VDD
83	TACH9 / GPIOP1	84	PECI
85	TACH6 / GPIOO6	86	GND39
87	TACH10 / GPIOP2	88	BIOS_SPICK
89	GND10	90	BIOS_MOSI
91	RSVD6	92	BIOS_MISO
93	GND11	94	BIOS_CS0
95	GPIOS2 / SALT5	96	GND40
97	GPIOZ1 / NORA1 / SIOPWRGD	98	GPIOZ0 / NORA0 / SIOPB#
99	GPIOZ2 / NORA2 / SIOPBO#	100	GPIOS0 / SPI2CS1#
101	GPIOZ3 / NORA3 / SIOSCI#	102	GPIOS1 / BMCINT
103	GPIOAB1 / NORWE#	104	GPIOS3 / SALT6
105	GPIOAB2 / WDTSRT1	106	GPIOAB0 / NOROE#
107	SYS_SLP_S5_IN	108	GPIOAB3 / WDTSRT2
109	SYS_SLP_S3_IN	110	EXTRST#
111	GPIOY3 / SIOONCTRL#	112	PEWAKE# / GPIOQ7
113	BMC_SPI_SWITCH_OUT	114	GND41
115	I2C_SCL14_IPMIB2	116	I2C_SDA1_Thermail Sensors/HW_monitor
117	I2C_SDA14_IPMIB2	118	I2C_SCL1_Thermail Sensors/HW_monitor
119	GND12	120	GND42
121	PERXP	122	I2C_SCL2_MB_ID_EEPROM/LOM_EEPROM
123	PERXN	124	I2C_SDA2_MB_ID_EEPROM/LOM_EEPROM
125	GND13	126	GND43
127	PETXP	128	PERST#
129	PETXN	130	GND44
131	GND14	132	RSVD15
133	PEREFCLKP	134	RSVD16

135	PEREFCLKN	136	GND45
137	GND15	138	SOL_UART_DCD
139	SOL_UART_DSR	140	SOL_UART_RI
141	SOL_UART_DTR	142	SOL_UART_RTS
143	GND16	144	GND46
145	SYSCS# / GPIOI0	146	SYS_UART_SWITCH_OUT
147	SYSMISO / GPIOI3	148	BIOS_READY_IN
149	SYSCK / GPIOI1	150	BMC_PWRBTN_OUT
151	SYSMOSI / GPIOI2	152	BMC_READY_OUT
153	GND17	154	SYS_NMI_IN
155	GND18	156	GND47
157	SYS_SMI_IN	158	BMC_SMI_OUT
159	MDC2 / GPIOA6 / TIMER7	160	CPU_CATERR_IN
161	MDIO2 / GPIOA7 / TIMER8	162	BMC_UART_SWITCH_OUT
163	SYS_RSMRST_IN	164	GND48
165	GND19	166	CPU_THERMTRIP_IN
167	ESPI_RESET	168	BMC_RSTBTN_OUT
169	LSIRQ# / ESPIALT# / GPIOAC6	170	SYS_PWROK_IN
171	ESPI_ALERT	172	CPU0_PROCHOT_IN
173	GND20	174	CPU0_FIVR_FAULT_IN
175	LPCRST# / ESPIRST# / GPIOAC7	176	BMC_SPKR_OUT
177	LFRAMEN# / ESPICS# / GPIOAC5	178	CPU1_FIVR_FAULT_IN
179	LAD1 / ESPID1 / GPIOAC1	180	GND49
181	LAD0 / ESPID0 / GPIOAC0	182	I2C_SCL9_IPMB1
183	LAD3 / ESPID3 / GPIOAC3	184	I2C_SDA9_IPMIB1
185	LAD2 / ESPID2 / GPIOAC2	186	GND50
187	LCLK / ESPICK / GPIOAC4	188	I2C_SDA3_SMLink0
189	GND21	190	I2C_SCL3_SMLink0
191	CPU_ERR_0_IN	192	GND51

193	CPU_ERR_1_IN	194	I2C_SCL4_PMBus
195	CPU_ERR_2_IN	196	I2C_SDA4_PMBus
197	GND31	198	GND52
199	USB2A_DP	200	BMC_NMI_OUT
201	USB2A_DN	202	CPU1_PROCHOT_IN
203	GND22	204	GND53
205	RSVD7	206	LAN_100M#
207	RSVD8	208	LAN_ACT#
209	GND23	210	LAN_1G#
211	SOL_CTS3	212	GND54
213	SOL_TXD3	214	GPIOA1_MAC2LINK
215	SOL_RXD3	216	RGMII2RXD3 / RMII2RXER / GPIOV7
217	GND24	218	RGMII2RXD0 / RMII2RXD0 / GPIOV4
219	MDI0P	220	RGMII2RXCK / RMII2RCLKI / GPIOV2
221	MDI0N	222	RGMII2RXCTL / GPIOV3
223	GND25	224	RGMII2RXD2 / RMII2CRSDV / GPIOV6
225	MDI1P	226	RGMII2RXD1 / RMII2RXD1 / GPIOV5
227	MDI1N	228	GND55
229	GND26	230	MAC2 STRAP
231	MDI2P	232	RGMII2TXD3 / GPIOU3
233	MDI2N	234	RGMII2TXCK / RMII2RCLKO / GPIOT6
235	GND27	236	RGMII2TXD0 / RMII2TXD0 / GPIOU0
237	MDI3P	238	RGMII2TXD2 / GPIOU2
239	MDI3N	240	RGMII2TXCK /RMII2RCLKO /GPIOT7
241	GND28	242	RGMII2TXD1 / RMII2TXD1 / GPIOU1
243	DAC_RO	244	GND56
245	DAC_GO	246	RSVD17
247	DAC_BO	248	P1V8_SB
249	HSYNC_O	250	RSVD18
251	VSYNC_O	252	P3V3_SB_1
253	GND29	254	P3V3_SB_2
255	DDC_DATA	256	P3V3_SB_3
257	DDC_CLK	258	RSVD19
259	GND30	260	P5V_SB

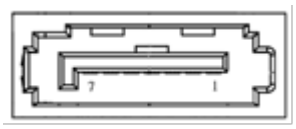
Storage

JNGFF1 / JNGFF2 / JNGFF3: M.2 Slot (M-Key)

PIN	Description	PIN	Description
1	GND	2	3V3
3	GND	4	3V3
5	NC	6	NC
7	NC	8	NC
9	GND	10	M.2 LED
11	NC	12	3V3
13	NC	14	3V3
15	GND	16	3V3
17	NC	18	3V3
19	NC	20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC
37	NC	38	NC
39	GND	40	NC
41	SATA_RX+	42	NC
43	SATA_RX-	44	NC
45	GND	46	NC
47	SATA_TX-	48	NC
49	SATA_TX+	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	NC
M-Key			
67	NC	68	NC
69	PEDET	70	3V3
71	GND	72	3V3
73	GND	74	3V3
75	GND		

JSATA1 / JSATA2: Connector (w/ SATA DOM)

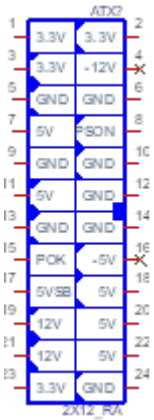
PIN	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



Power

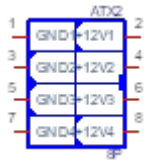
ATX1: 2x12 24P ATX Connector

PIN	Description	PIN	Description
1	3.3V	2	3.3V
3	3.3V	4	N.C
5	GND	6	GND
7	5V	8	PS_ON#
9	GND	10	GND
11	5V	12	GND
13	GND	14	GND
15	PWR_OK	16	N.C
17	5VSB	18	5V
19	12V	20	5V
21	12V	22	5V
23	3.3V	24	GND



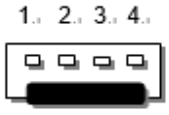
ATX2: 2x4 8P 12V2D ATX Connector

PIN	Description	PIN	Description
1	GND	2	12V
3	GND	4	12V
5	GND	6	12V
7	GND	8	12V



JSATAPW1 / JSATAPW2: SATA HDD Power Connector

PIN	Description
1	12V
2	GND
3	GND
4	5V

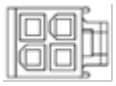


Fan1 / Fan2 / Fan3 / Fan4: Fan Connector

PIN	Description
1	GND
2	12V
3	FAN_TECH_IN1
4	FAN_TECH_IN2
5	FAN SPEEC CTRL

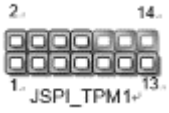
JATX1 / JATX2 / JATX3: 2x2 4P PCIE Power Connector

PIN	Description	PIN	Description
1	GND	2	12V
3	GND	4	3.3V



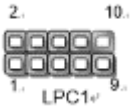
JSPI_TPM1: SPI Interface (w/ SPI TPM Function)

PIN	Description	PIN	Description
1	SPI_HOLD	2	SPI_CS1#
3	SPI_CS0#	4	SPI_VCC
5	SPI_MO	6	SPI_PCH_IO3
7	N.C	8	SPI_CLK
9	GND	10	SPI_MI
11	IRQ_TPM_SPI#	12	N.C
13	SPI_TPM_CS0#	14	PLT_RST#



80PORT1: LPC Debug 80Port (Debug only)

PIN	Description	PIN	Description
1	SPI_HOLD	2	N.C
3	SPI_CS#	4	SPI_VCC
5	SPI_MO	6	N.C
7	N.C	8	SPI_CLK
9	GND	10	SPI_MI

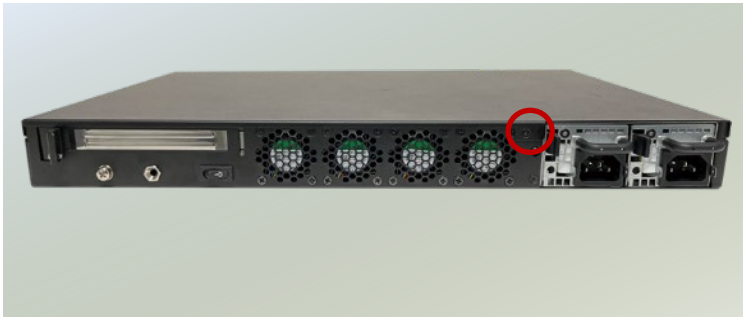


CHAPTER 3: HARDWARE SETUP

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. Power off the system and remove all power connections.
2. Remove the one (1) screw on the rear panel



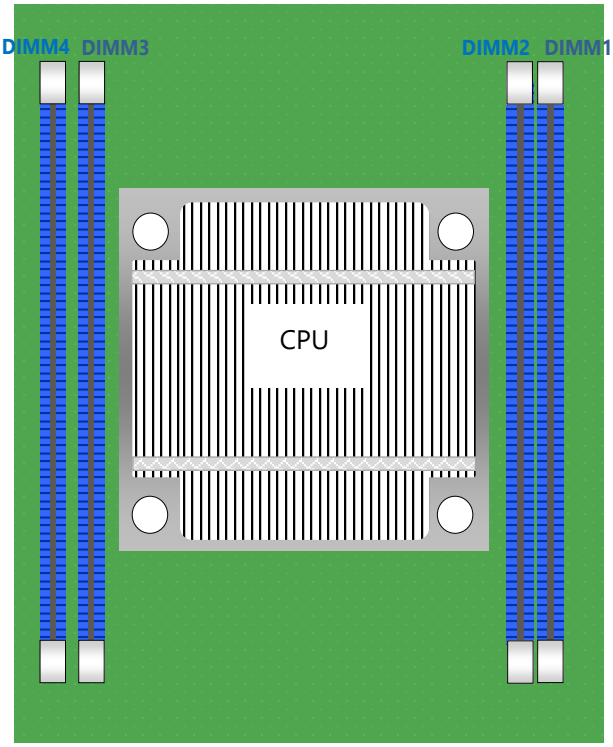
3. Gently pull the cover chassis backwards and lift up to remove.

Installing the System Memory

The motherboard supports 4x memory slots for DDR4 UDIMM/RDIMM. Please follow the steps below to install the DIMM memory module properly.

Supported System Memory Summary

Total Slots	4
Number of Channels	2 (2 DIMMs per channel)
Supported DIMM Capacity	4GB, 8GB, 16GB, 32GB, 64GB
Memory Size	Maximum 256GB (64GB*4)
Memory Type	DDR4 REG ECC, Non-ECC UDIMM/RDIMM 3200MHZ
Minimum DIMM Installed	At least 1 memory modules to boot and run

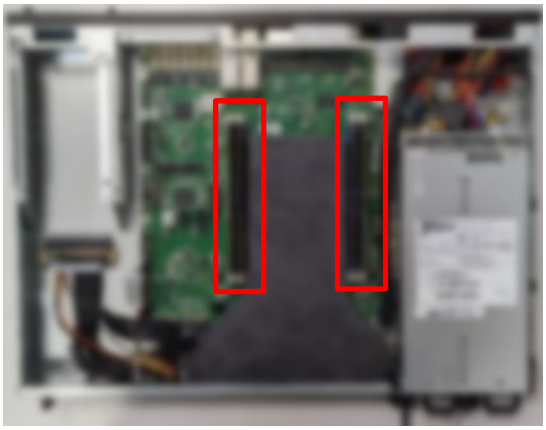


DIMM Population Guidelines

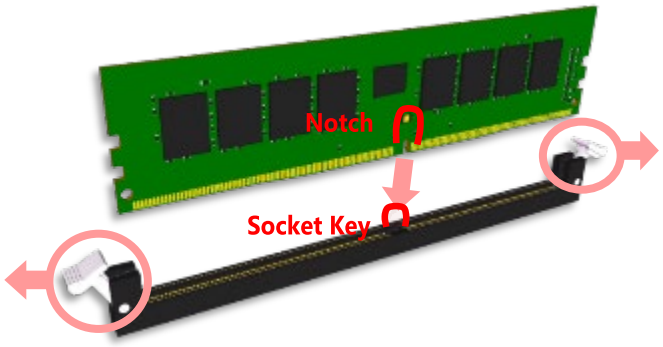
- The CPU requires at least 1 memory module to boot and run from, always insert memory module starting with the blue DIMMs for optimal performance.
- Use memory modules of the same capacity, speed, and from the same manufacturer to avoid compatibility issues and to achieve optimal CPU performance.

Memory Module Installation Instructions

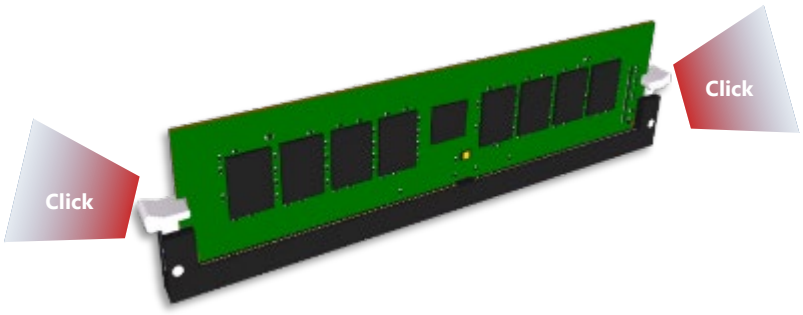
1. Power off the system, open the chassis cover.
2. Locate the DIMM memory slots.



3. Pull open the white DIMM slot latches.
4. Align the notch of the module with the socket key in the slot and carefully insert the card into the slot.



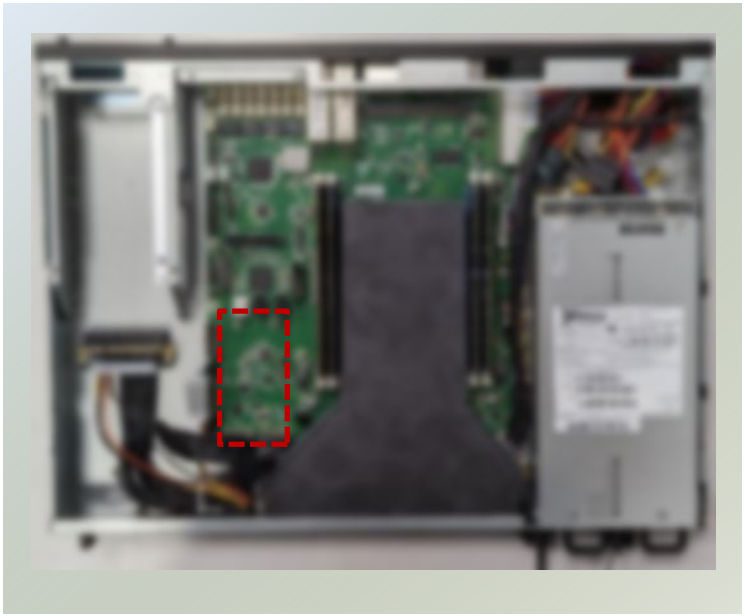
5. Push the module down into the slot until it is firmly seated. Press vertically on both corners of the card until it clicks into place.



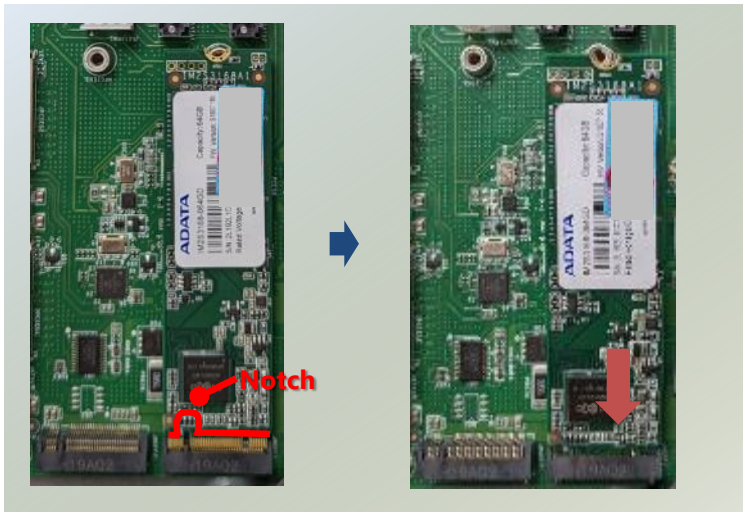
Installing M.2 Memory Cards (Optional)

The system supports three M.2 slots for additional data storage with two M.2 2280 B-Key and one M.2 2242 B-Key. Please follow the steps for installation.

1. Power off the system and open the chassis cover.
2. Locate the two M.2 2280 slots on the motherboard.



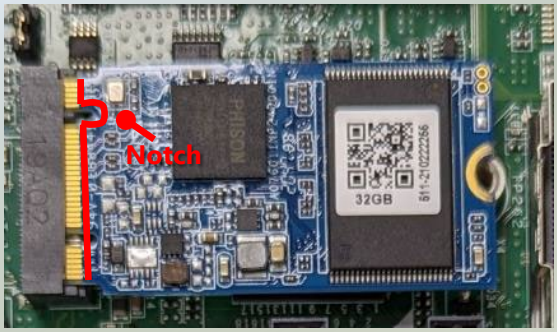
3. Align the notch of the storage card with the socket key in the pin slot.
4. Insert the module card pins at 30 degrees into the socket until it is fully seated.



5. Push down on the module card and secure it with a screw. Repeat the steps if another storage module card is to be added, secure with a screw.

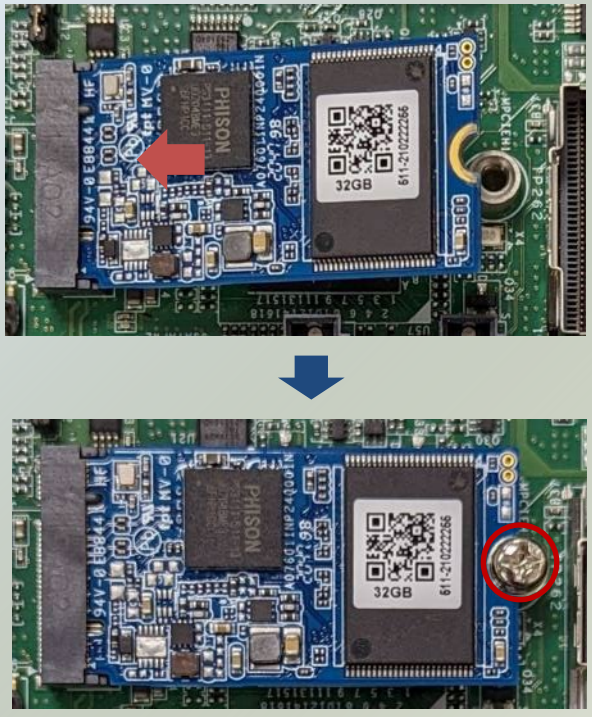
1. Power off the system and open the chassis cover.
2. Locate the one M.2 2242 slot on the motherboard.

3. Align the notch of the storage 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 card and secure it with a screw.



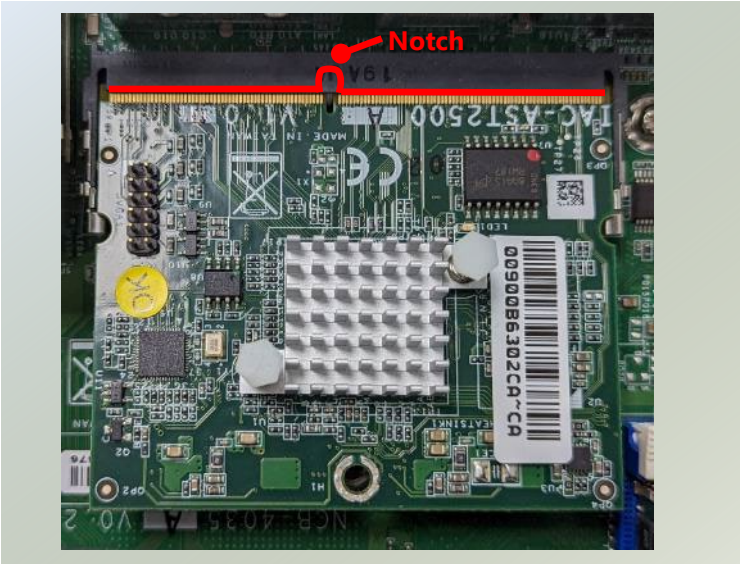
Installing IPMI BMC Card (Optional)

IPMI provides better server management, server monitoring, and remote access. IPMI is independent of the system's CPU operating system via hardware applied directly into the motherboard. Please follow the steps for installation.

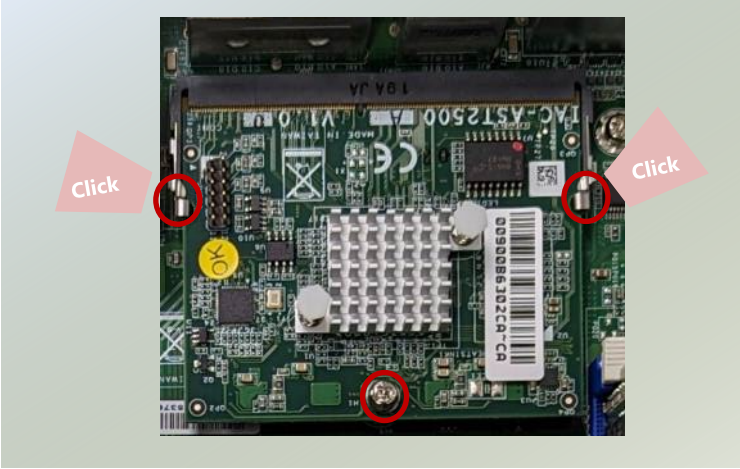
1. Power off the system and open the chassis cover.
2. Locate the IPMI module slot on the motherboard.

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 card until the slot latches catches and clicks into place. Then, secure into place with one screw.

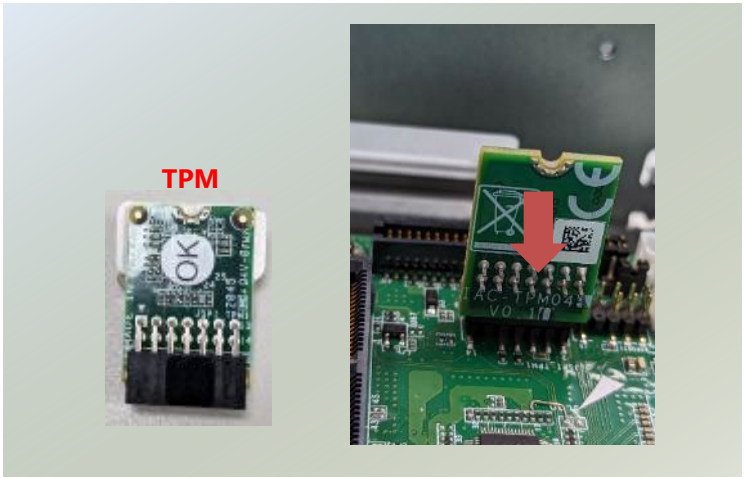


Installing TPM

The system provides one slot for a TPM module card to provide hardware-based security related functions. Follow the steps below for installations.

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

3. Insert the module card pins with the connector pins, until the module card is firmly seat.



Installing NIC Modules

NCA-4035 comes with one NIC module slot for expansion. Follow the steps for installation.

1. Locate the NIC module slot on the front panel of the system.

2. Rotate clockwise and loosen the two lock-screws, and remove the NIC module slot door.

3. Insert your NIC module. (The module shown here is for reference only.)

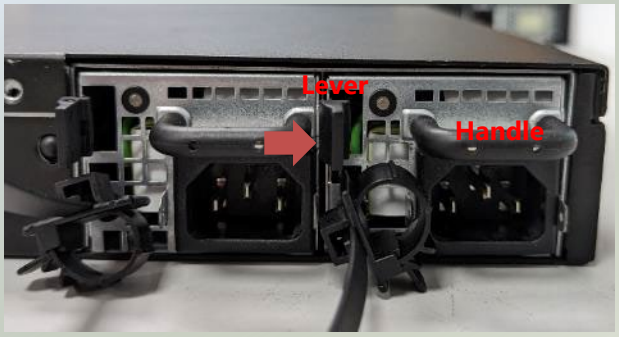
4. Once the module is firmly seated, rotate counter-clockwise and tighten the two lock screws.

Replacing the Power Supply Units

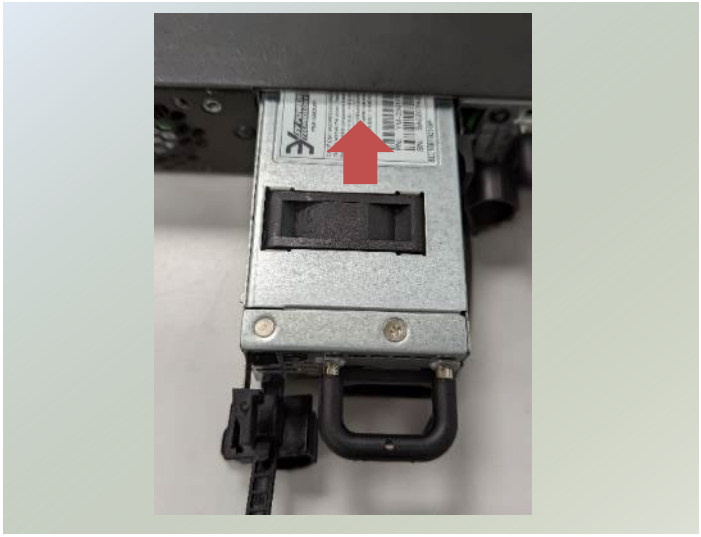
Power supply units may wear down eventually. The system supports 300W 1+1 redundant PSUs or a 350W single PSU, depending on order preferences. Please prepare the replacement power supply units matching this capacity.

1. Power off the system. Locate the power supply unit(s) on the rear panel of the system.

2. Hold the handle and push on the lever and gently pull out the power supply unit.



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

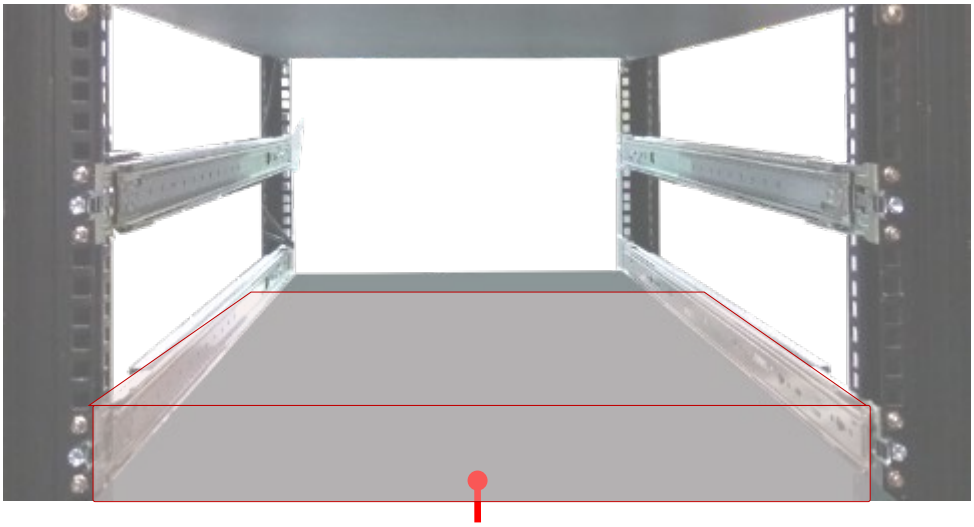


Mounting the System

There are two methods for installing this system into a rack:

- With **Mounting Ear Brackets** only

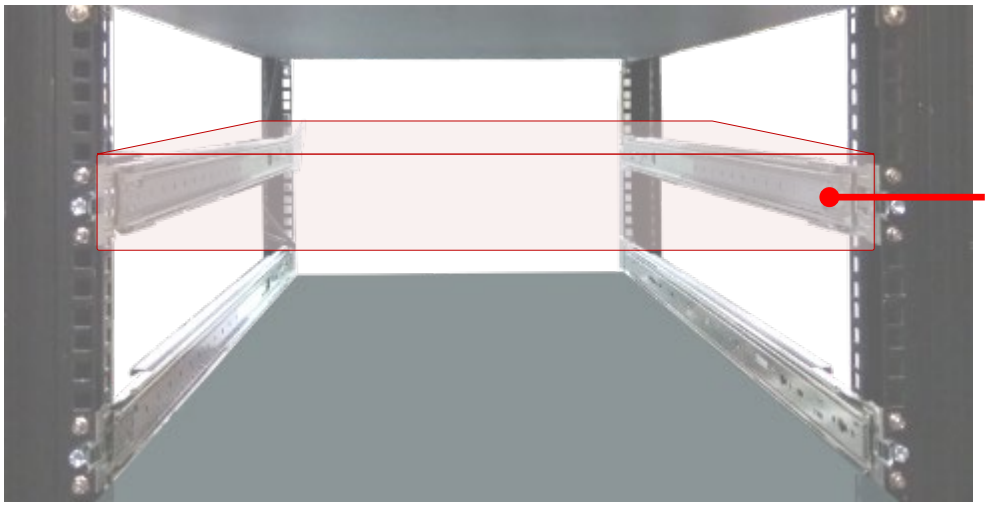
This method is quick and easy by fixing this system to the front posts of the rack, but it also makes servicing the system more difficult. Please note that the use of these brackets must go with a rack shelf or slide rails to prevent the chassis from falling over, for the bracket assembly alone cannot provide sufficiently support to the chassis.



The system shall be installed on the rack along with a shelf or slide rails, for the "Mounting Ears" are meant to secure the system, not to support it.

- With **Slide Rail Kit + Mounting Ear Brackets**

This method is rather complicated, but the slidable rails allow you to access the system easily while securing it in the rack solidly.



The Slide Rail Kit can secure the system while providing sufficient weight support for the device.

Installing the System Using Mounting Ear Brackets Only

1. Check the accessory pack for the following items:
   - 1x Screw Pack
   - 2x Ear Brackets

Screw Pack

Ear Brackets

2. Align the 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 provided screws.

3. Repeat Step 2 to attach the bracket to the other side of the chassis.

4. Install the chassis into the rack with the brackets fixed onto the posts using the provided screws. The actual approach you adopt and the needed parts for assembly will depend on the supporting accessory (shelf or rail kit) you use.

Installing the System Using the Slide Rail Kit (with Mounting Ear Brackets)

1. Check the package contents of the Slide Rail Kit. The kit shall include the following items:

   - 1x pack of M4X4L screws (for securing the Rail Brackets on the system)
   - 1x pack of 7.1 Round Hole screws (for securing the system on the rail posts)
   - 2x Slide Rails

M4X4L Screws

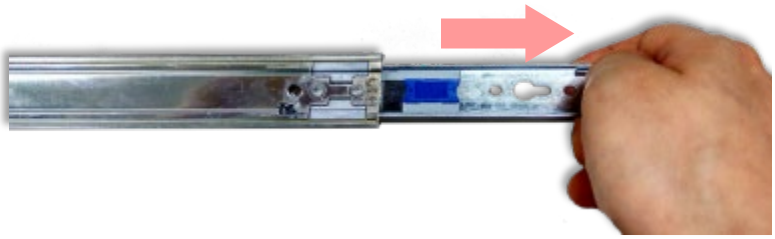
7.1 Round Hole Screws

Slide Rails

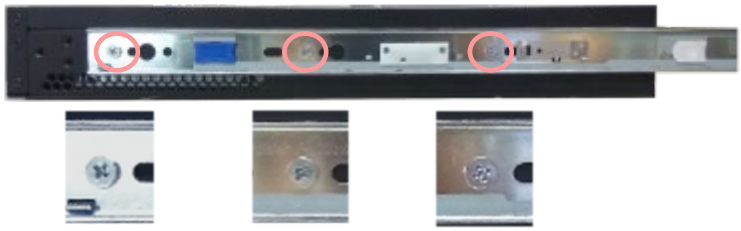
A rail consists of the following parts:

2. Unpack a slide rail and slide the Inner Rail all the way to the end.

3. Stretch the Rail Bracket to the fullest.
4. Remove the Rail Bracket from the Inner Rail by pushing the Release Tab on the bracket outwards while sliding it out.



5. Align the 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 provided M4X4L screws.

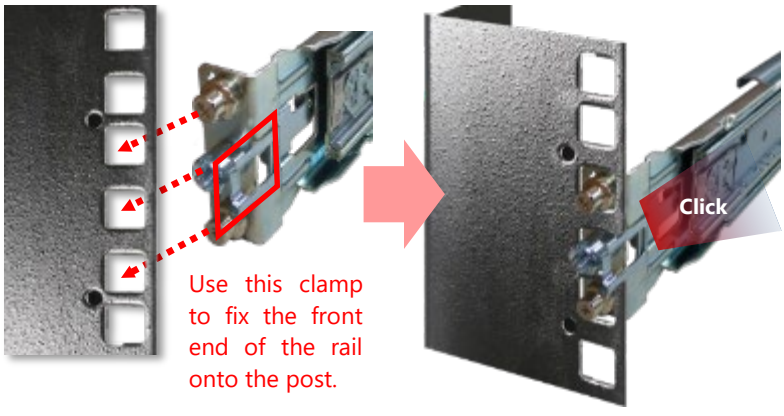


Align the screws with the holes indicated on the brackets and the screw holes on the side of the chassis.

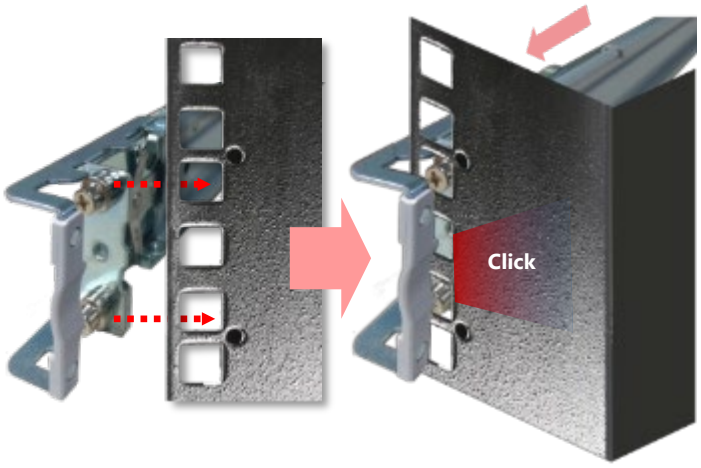
6. Repeat Steps 2~5 to attach the bracket to the other side of the chassis.
7. Follow the instructions in Installing the System Using Mounting Ear Brackets Only to attach the Mounting Ear Brackets.

Now, you shall install the slide rail assemblies onto the rack.

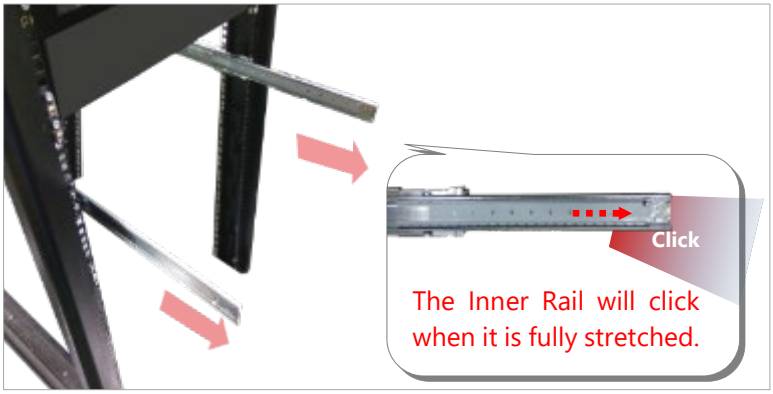
8. This slide rail kit does NOT require screw-fixing. Simply aim at three available screw holes on the rack front and snap the rail front into the rack post as shown in the image. You should hear a "click" sound once it is firmly attached.



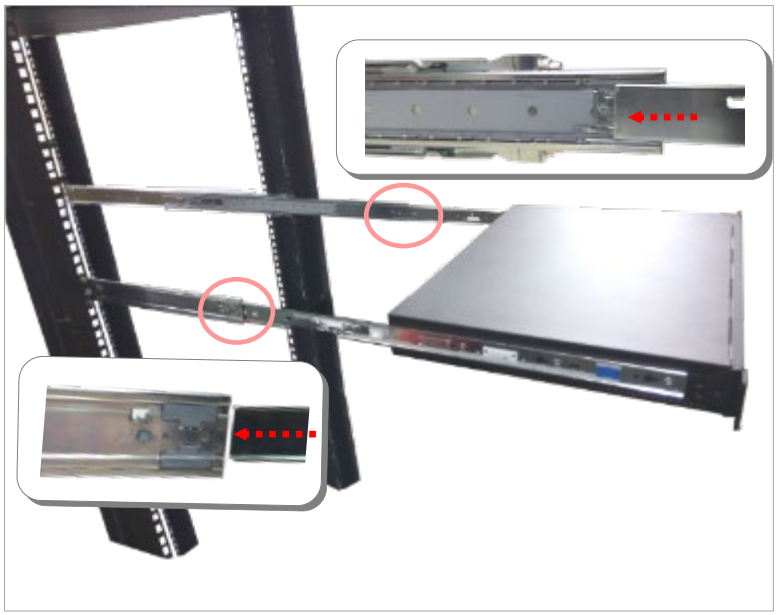
9. For the rear rack installation, slide the rail to aim and engage the bolts on the rail's rear end with the two available holes on the post, and the rail assembly will click into place.



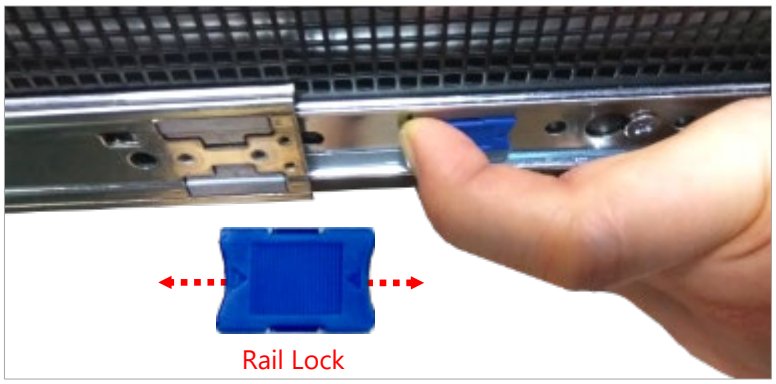
10. Stretch both Inner Rails out to their fullest extent. You will hear a click sound when they are fully stretched and locked.



11. Hold the system with its front facing you, lift the chassis and gently engage the brackets on the system while aligning them with the Inner Rails as shown in the image, and then push the system into the cabinet.

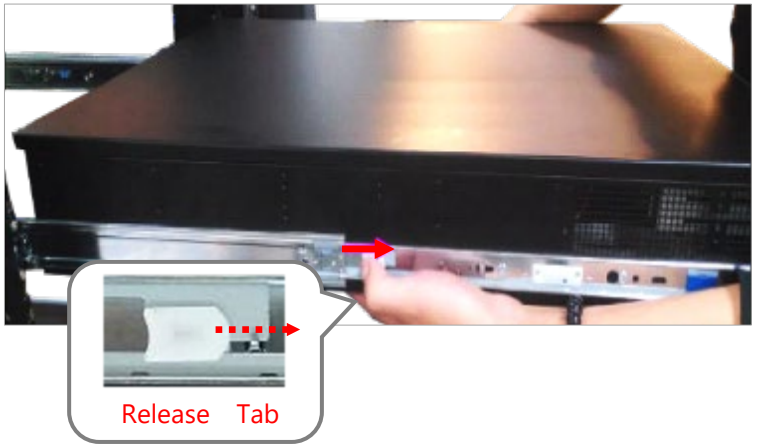


12. While pushing in the system, also push and hold the Rail Lock tab on both brackets.



Push the system all the way in until it stops.

To remove the system from the rack, gently pull it outwards, towards you, while pushing the Release Tab on both sides of the brackets.



CHAPTER 4: REMOTE SERVER MANAGEMENT

Overview

This chapter will introduce the features of Lanner's BMC firmware and how to perform server remote management through it. Lanner has implemented IPMI 2.0 based on ASPEED service processor, performing all the BMC defined by IPMI 2.0. Additionally, Lanner's BMC firmware runs an embedded web-server for full configuration using Web UI, which as 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
	System Management	• Sensor monitoring • System power management • Watchdog timer • Fan speed monitor and control • FRU information
	Event Log	• System Event Log (SEL)
	Text Console Redirection: SOL	• Support in IPMI stack for SOL to remotely access BIOS and text console before OS booting
	User Management	• IPMI based user management • Multiple user permission level
Non-IPMI functions	Web User Interfaces	• BMC management via web user interface • Integrated KVM and Virtual Media
	User authorization	• RADIUS support • LDAP support
	Security	• SSL and HTTPS support
	Maintenance	• Auto-sync time with NTP server • Remote firmware update by Web UI or Linux tool

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 summaries 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.

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 are able to 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 is allowed to 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.

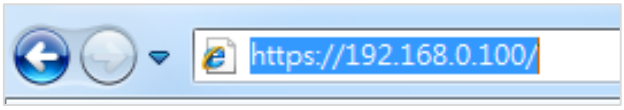
IPMI Commands Support List

COMMANDS	NETFN	CMD
IPM Device "Global" Commands		
Get Device ID	APP (06h)	00h
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

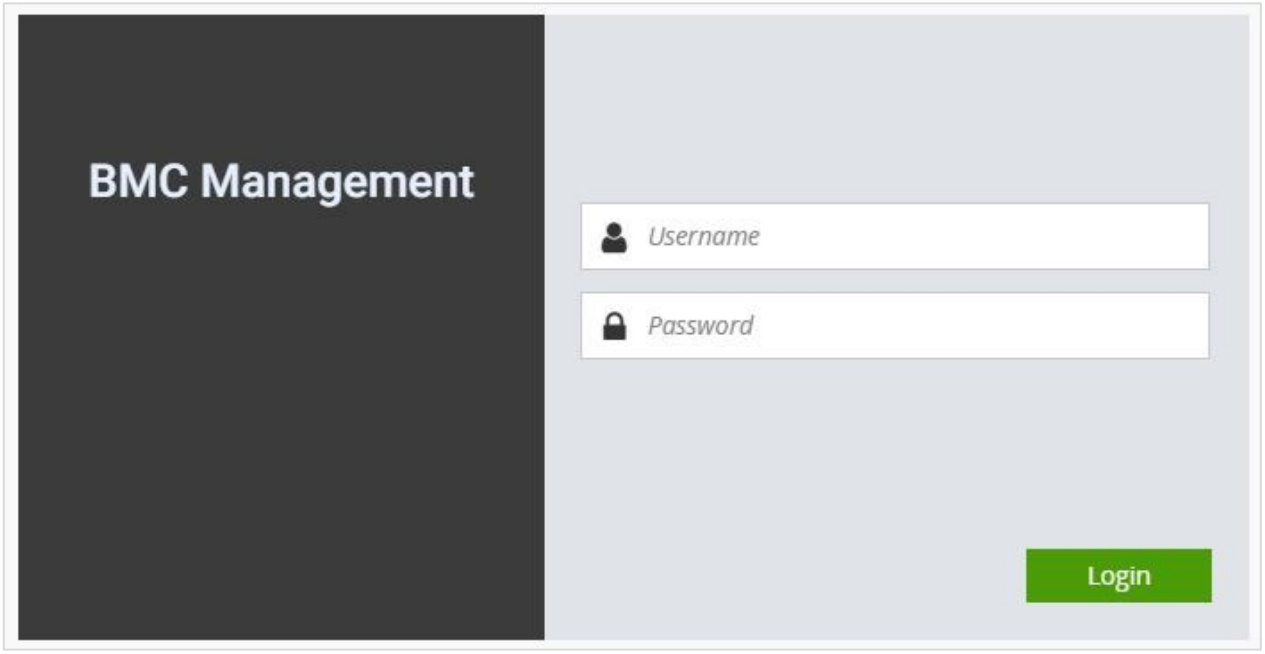
Delete SEL Entry	Storage (0Ah)	46h
Clear SEL	Storage (0Ah)	47h
Get SEL Time	Storage (0Ah)	48h
Set SEL Time	Storage (0Ah)	49h
Get SEL Time UTC Offset	Storage (0Ah)	5Ch
Set SEL Time UTC Offset	Storage (0Ah)	5Dh
LAN Device Commands		
Set LAN Configuration Parameters	Transport (0Ch)	01h
Get LAN Configuration Parameters	Transport (0Ch)	02h
Serial/Modem Device Commands		
Set User Callback Options	Transport (0Ch)	1Ah
Get User Callback Options	Transport (0Ch)	1Bh
SOL Activating	Transport (0Ch)	20h
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

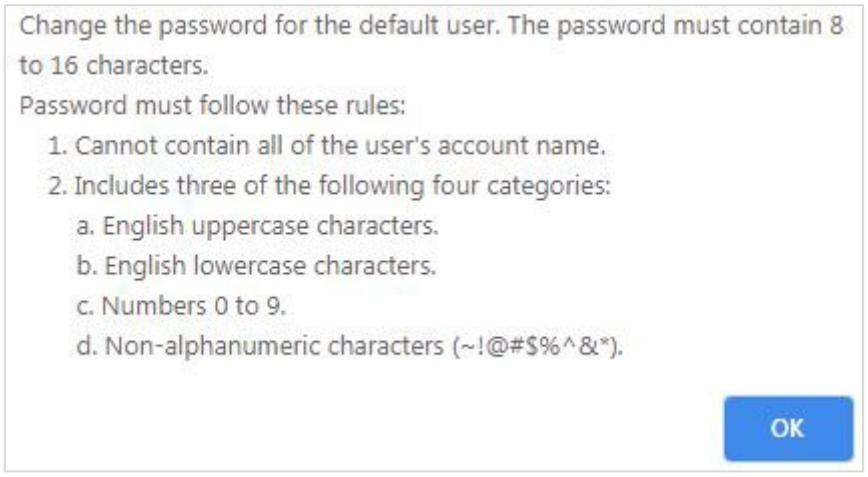
- **Username**: Enter your username in this field.
- **Password**: Enter your password in this field.
- **Login**: After entering the required credentials, click the Login to log in to Web UI.

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

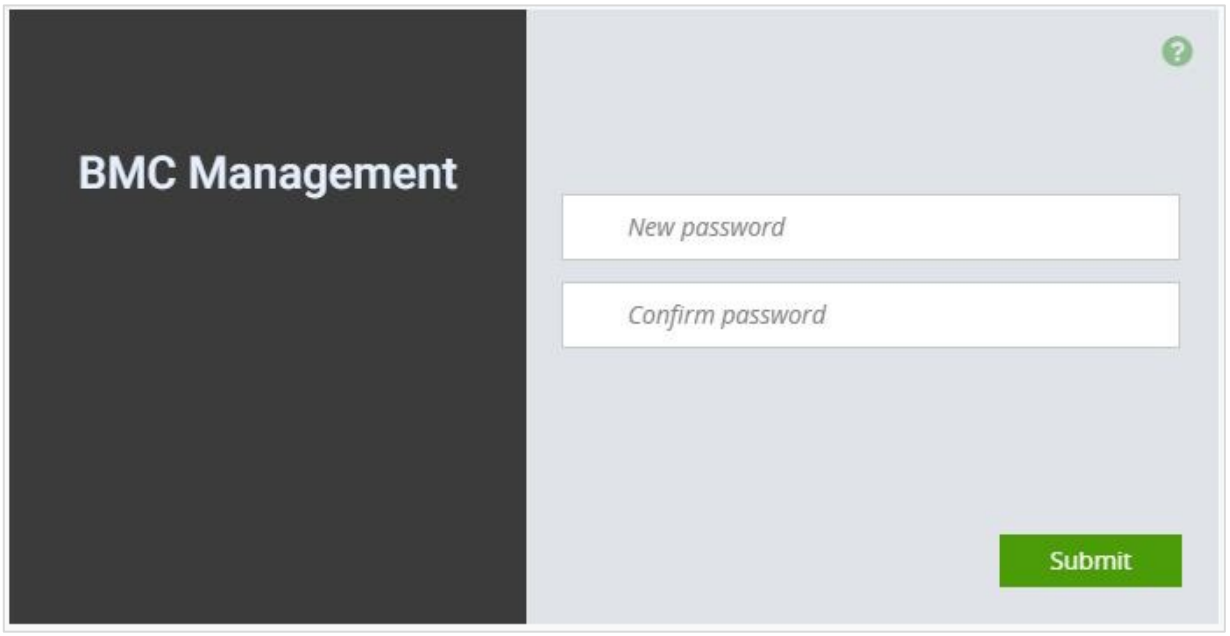
- **Username**: admin
- **Password**: admin

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 default password - Dialog

Clicking OK will take you to set a new password.



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.

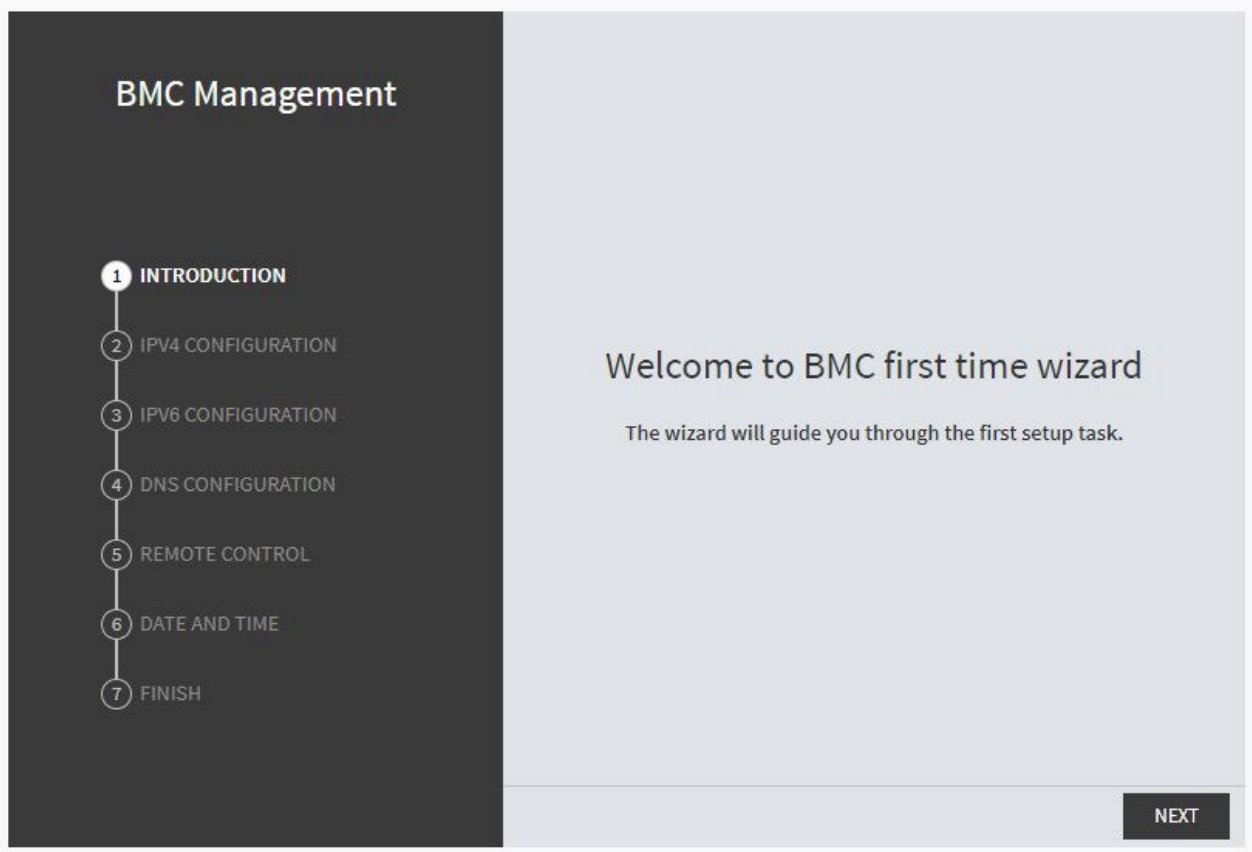
Wizard Welcome Page Introduction

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.

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

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

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



4. 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

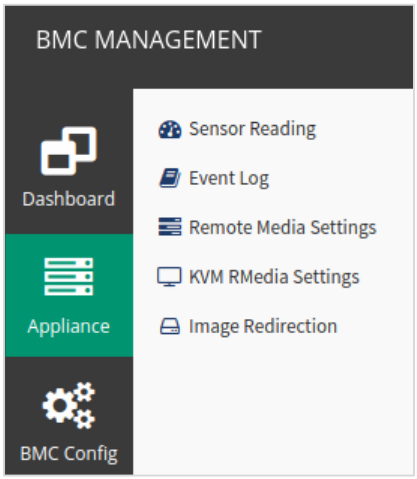
The BMC Web UI consists of various menu items:

Menu Bar

The menu bar displays the following:

- Dashboard
- Appliance – Sensor Reading
- Appliance – Event Log
- Appliance – Remote Media Settings
- Appliance – KVM RMedia Settings
- Appliance – Image Redirection
- BMC Config – Date and Time
- BMC Config – User Configuration – User List
- BMC Config – User Configuration – RADIUS Setup
- BMC Config – User Configuration – LDAP Setup
- BMC Config – User Configuration – LDAP Groups
- BMC Config – User Configuration – Login Block Settings
- BMC Config – Network Configuration – IP Settings
- BMC Config – Network Configuration – DNS Settings
- BMC Config – Network Configuration – Link Settings
- BMC Config – Network Configuration – SSL Certificate
- BMC Config – Network Configuration – Services
- BMC Config – Audit Log
- BMC Config – Maintenance – Firmware Update
- BMC Config – Maintenance – Restore Factory Defaults
- BMC Config – Maintenance – Preserve Configuration

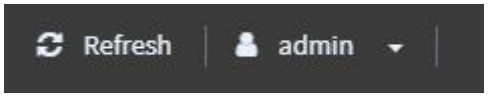
A screenshot of the menu bar is shown below:



Menu Bar

Quick Button and Logged-in User

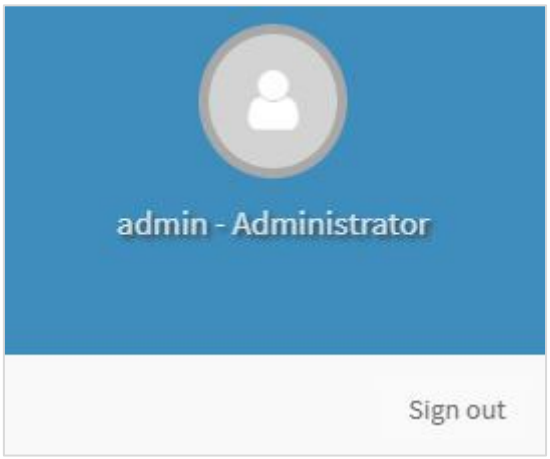
The user information and quick buttons are located at the top right of the Web UI.



User Information

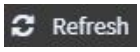
Logged-in user information: Click the icon  to view the logged-in user information.

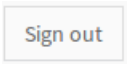
A screenshot of the logged-in user information is shown below:



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 Levels

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.

Enter BIOS Setup

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

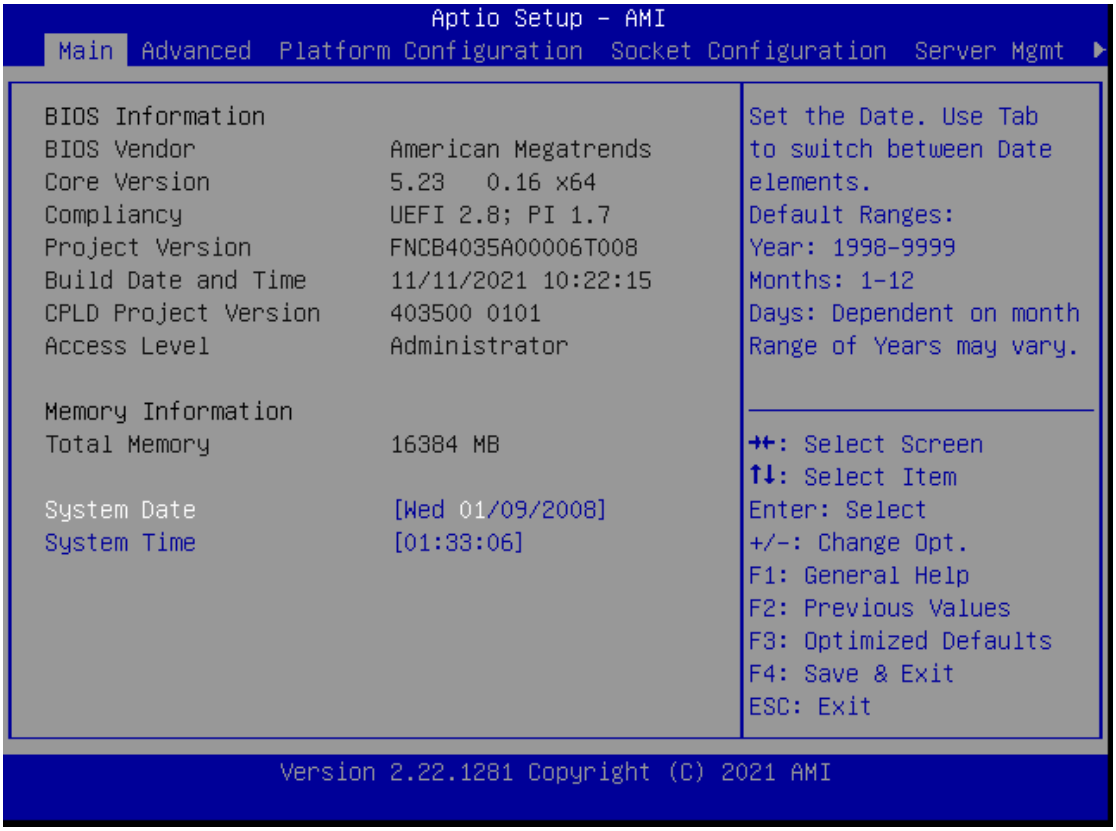
1. Boot up the system.
2. Pressing the **<Tab>** or **<Del>** key immediately allows you to enter the Setup utility, and then you will be directed to the BIOS main screen. The instructions for BIOS navigations are as below:

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

Note: The images in the following section are for reference only.

Main Page

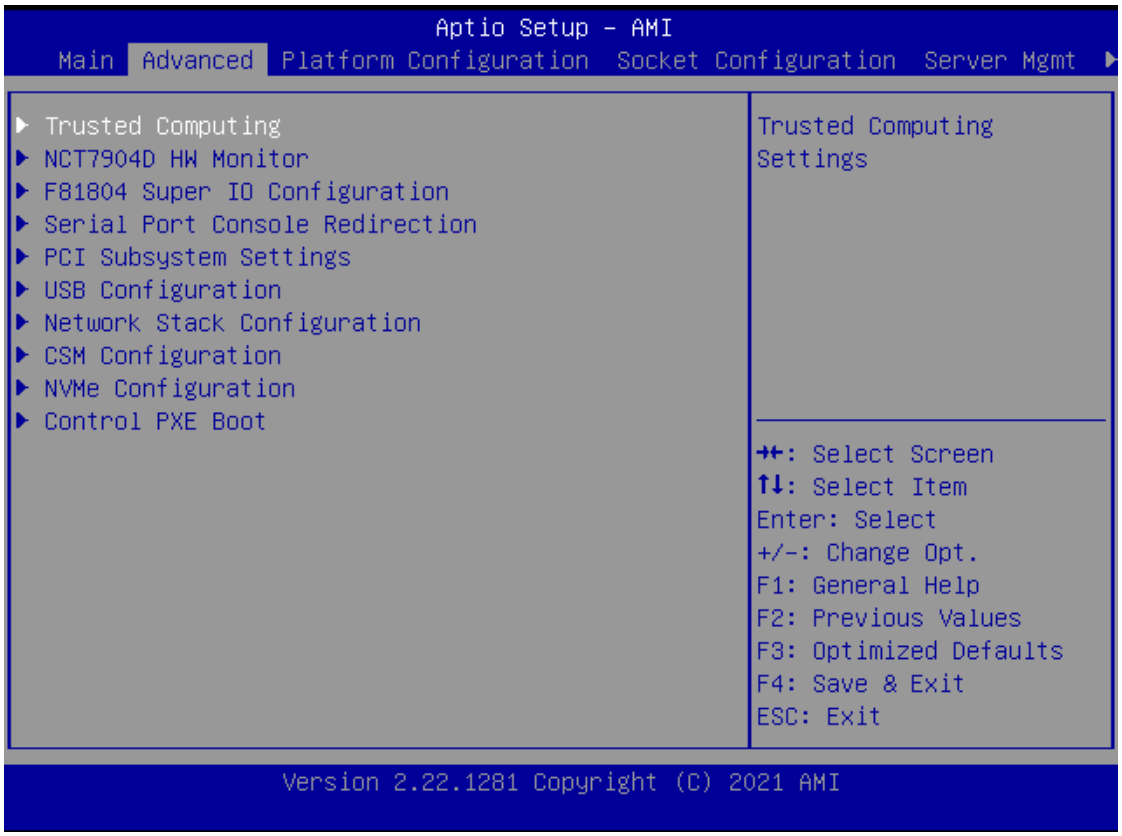
Setup main page contains BIOS information and project version information.



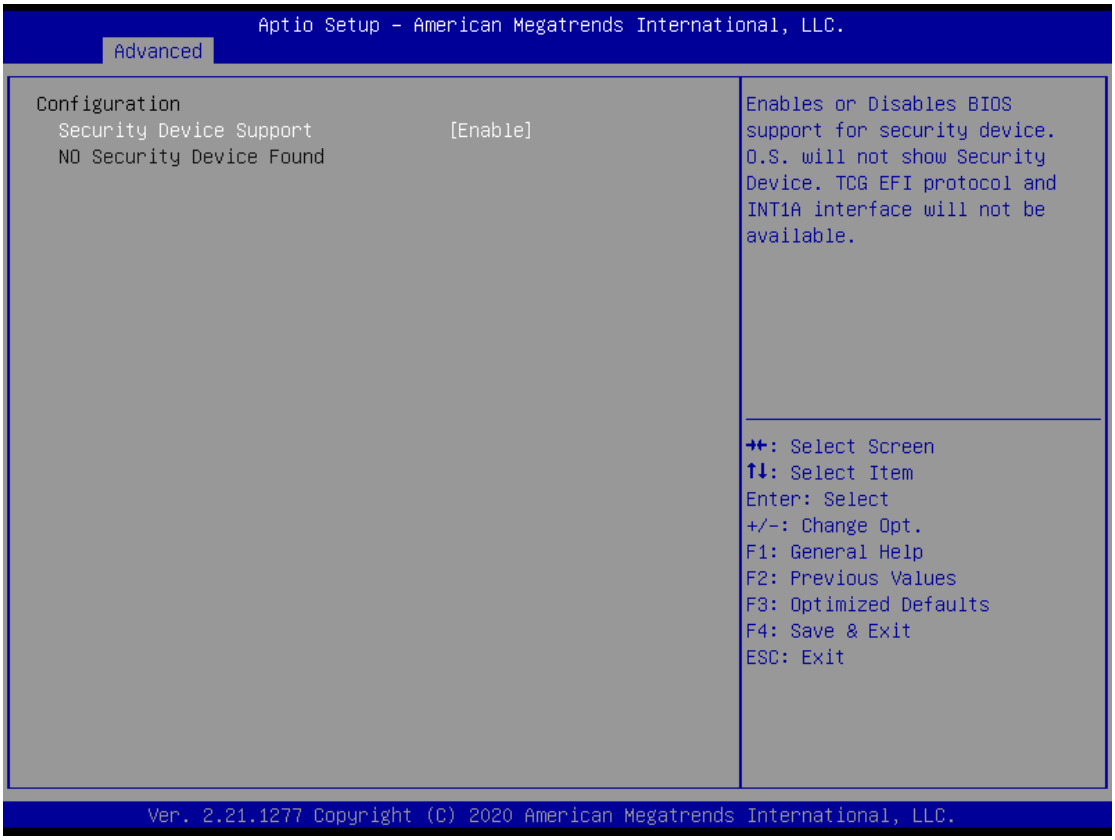
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
FSP Information	FSP version: Intel FSP binary version. RC version: Intel reference code version.
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

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.

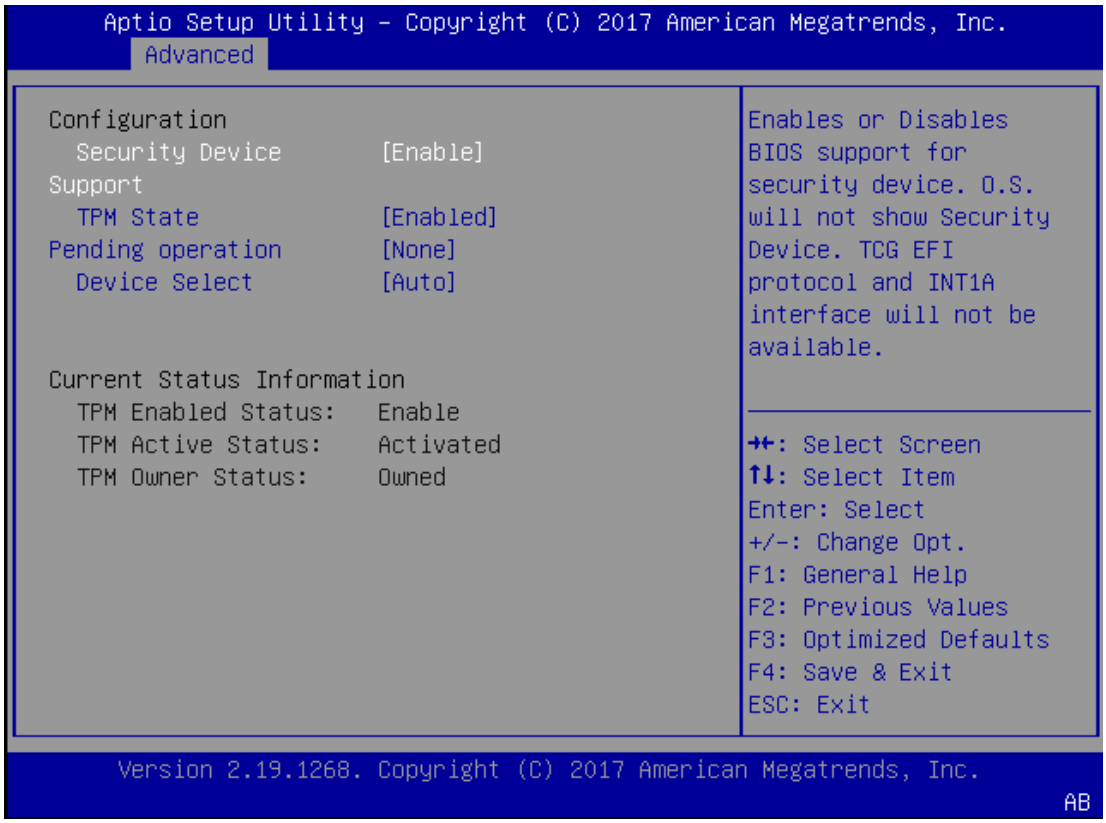


Trusted Computing



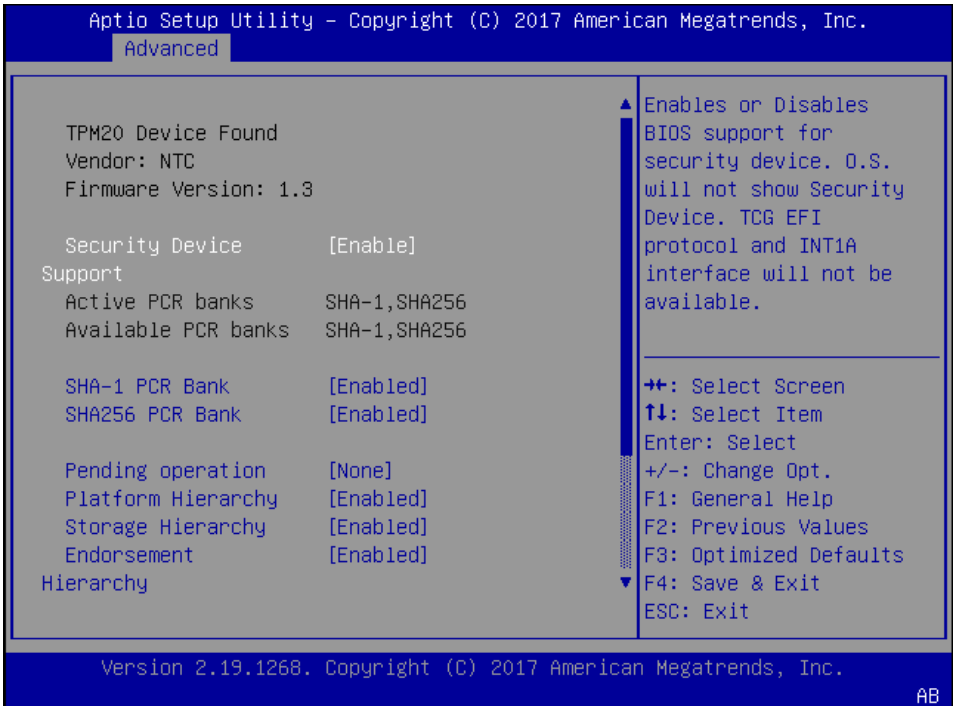
Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

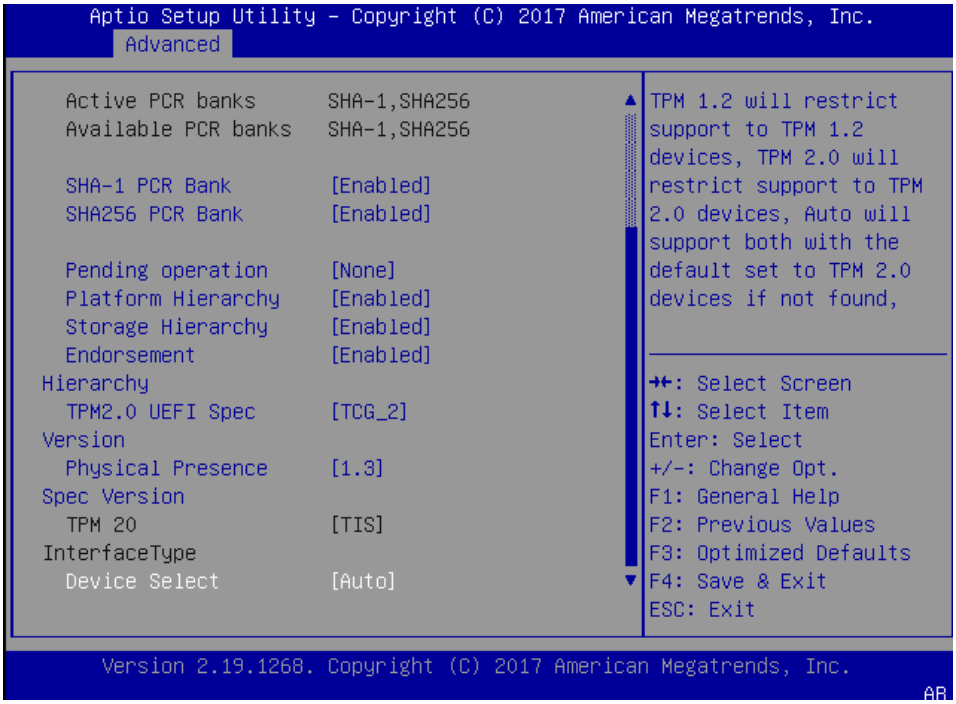
Trusted Computing (TPM1.2)



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 (TPM 2.0)

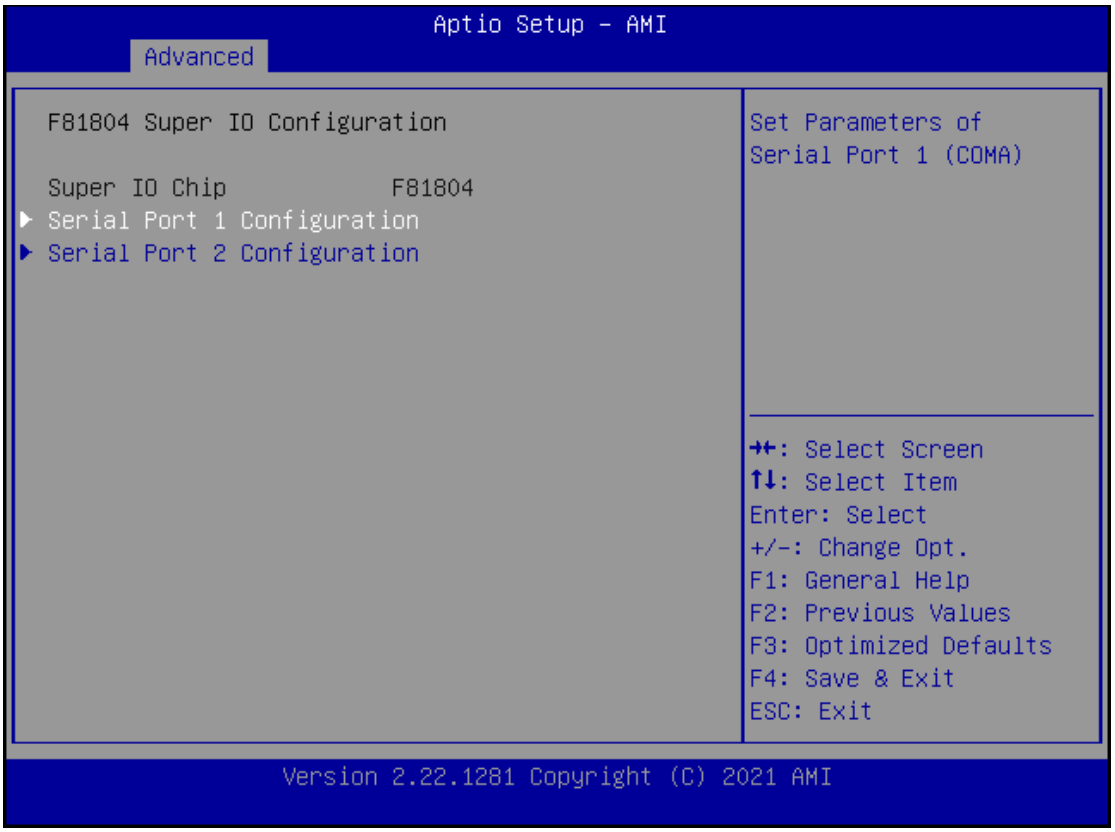




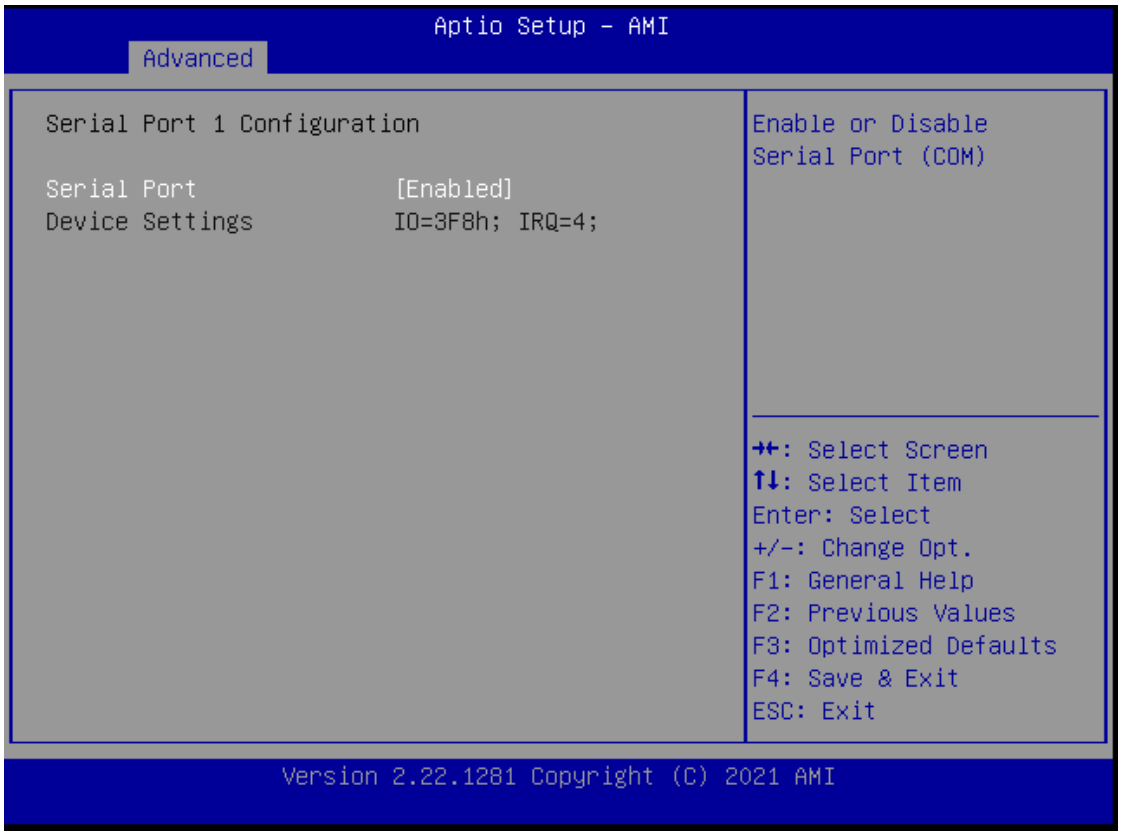
Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA-1 PCR Bank	Enabled Disabled	Enables or disables SHA-1 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 Interface Type	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.

Super IO Configuration

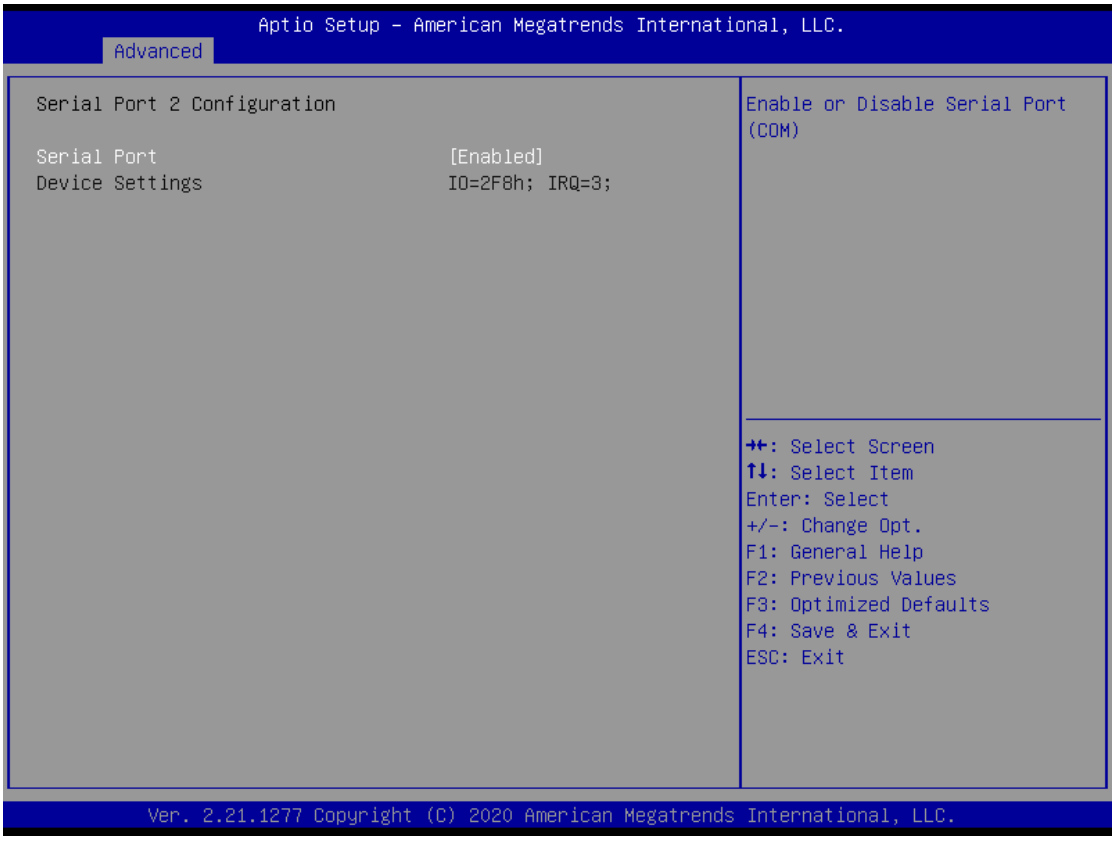


Serial Port 1 Configuration



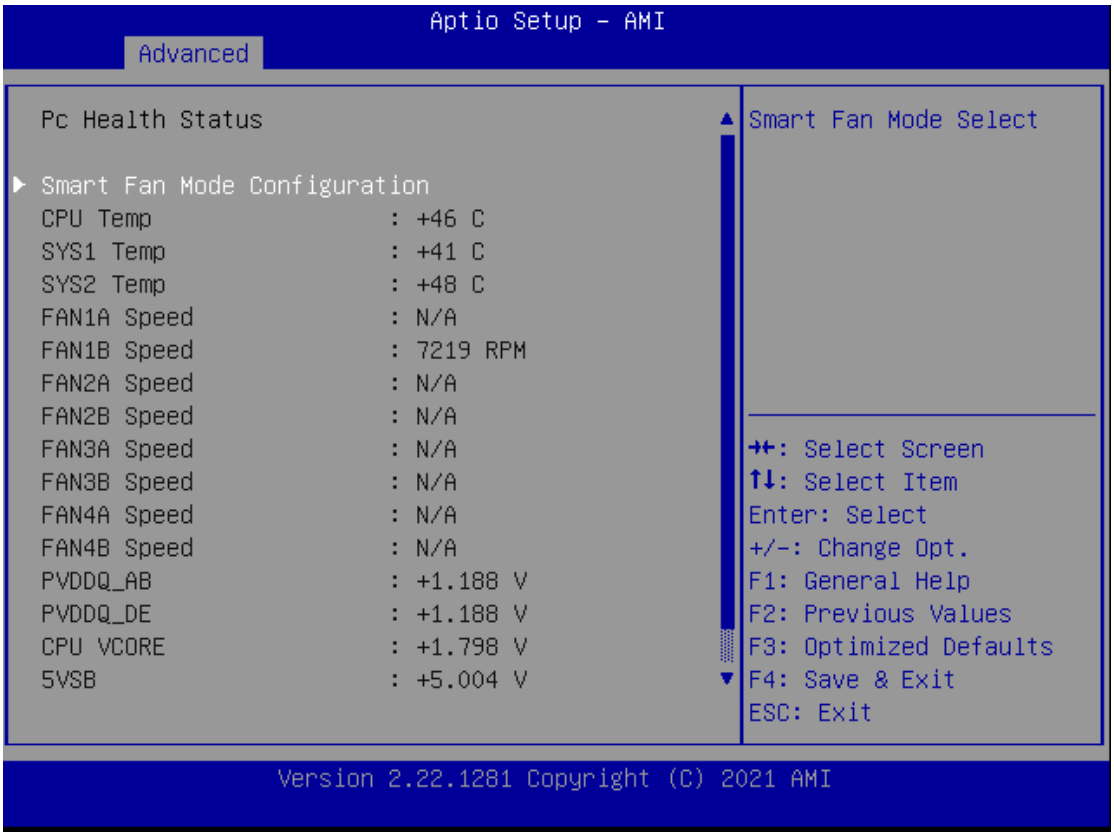
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port 1.
Device Settings	NA	IO=3F8h; IRQ = 4

Serial Port 2 Configuration



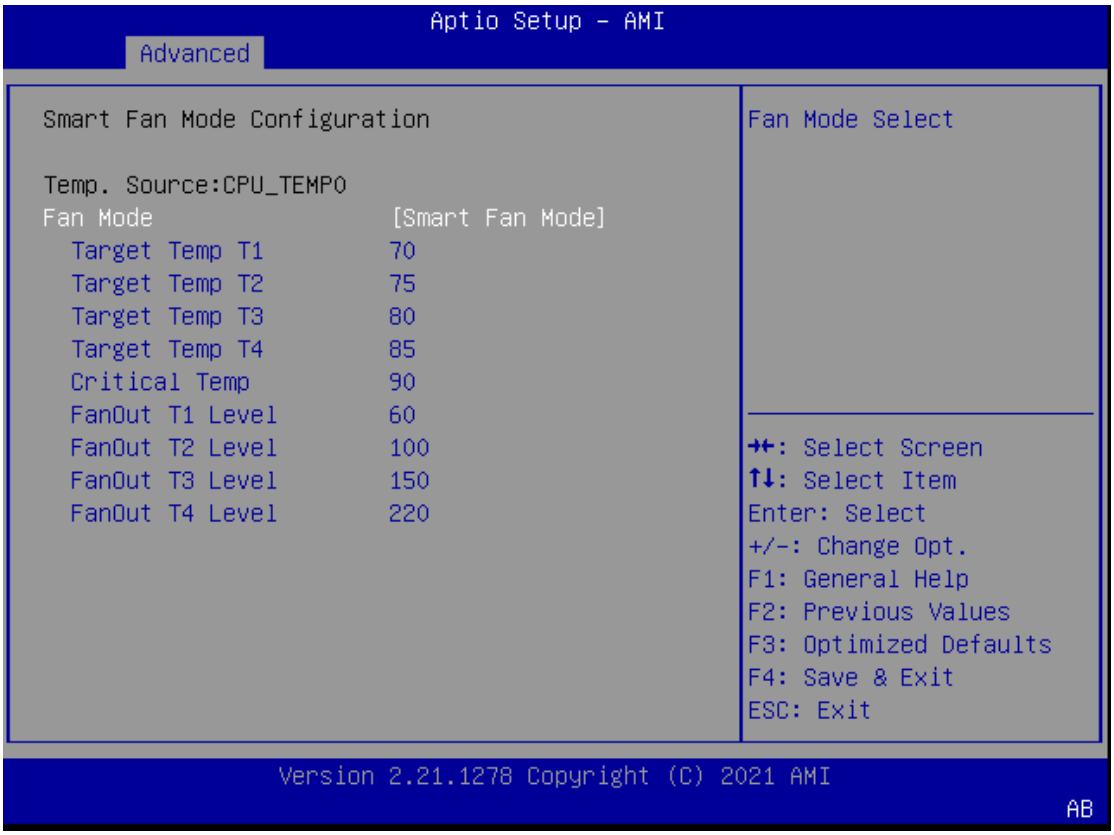
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port 2
Device Settings	NA	IO=2F8h; IRQ=4

NCT7904D H/W Monitor



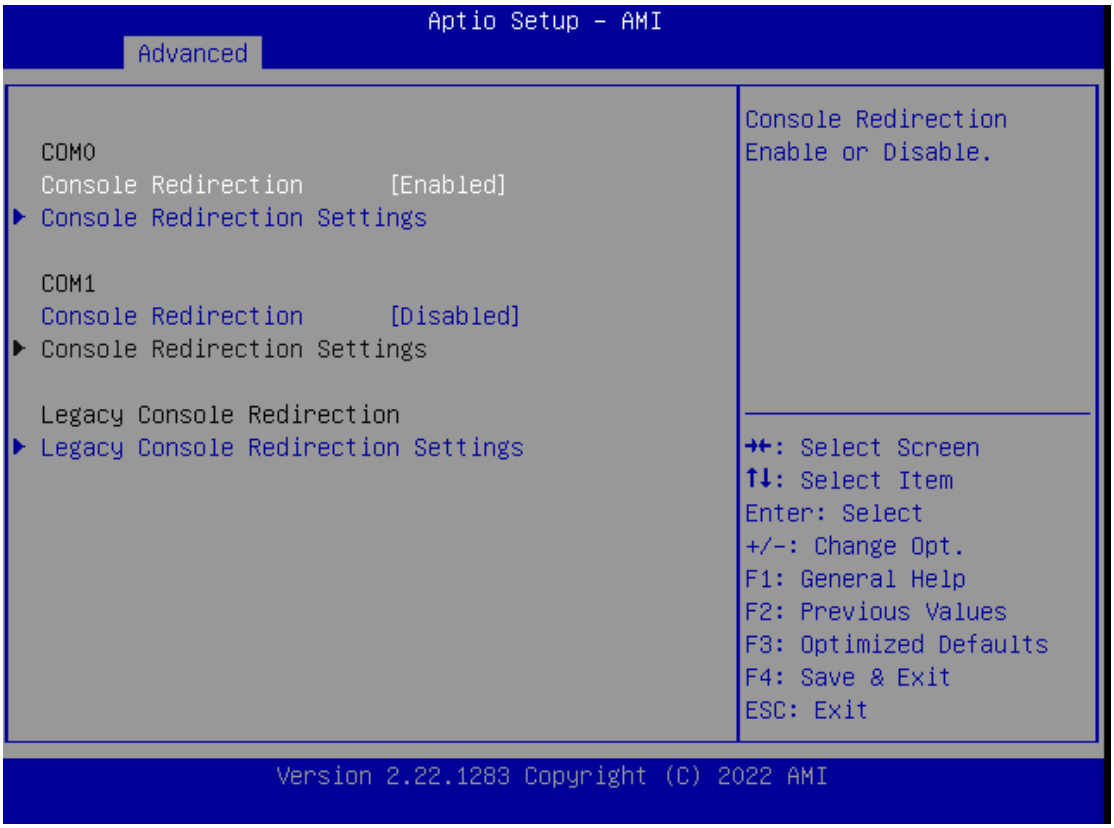
Feature	Options	Description
Smart Fan Mode Configuration	None	Smart Fan Parameters

Smart Fan Mode Configuration



Feature	Options	Description
Smart Fan Mode	Manual Mode Smart Fan Mode	Smart Fan Mode select
Target Temperature T1	70	Input Target Temperature (Range:0 - 127)
Target Temperature T2	75	Input Target Temperature (Range:0 - 127)
Target Temperature T3	80	Input Target Temperature (Range:0 - 127)
Target Temperature T4	85	Input Target Temperature (Range:0 - 127)
Critical Temperature	90	Input Target Temperature (Range:0 - 127)
FanOut T1 Level	60	Input Target Fan Out
FanOut T2 Level	100	Input Target Fan Out
FanOut T3 Level	150	Input Target Fan Out
FanOut T4 Level	220	Input Target Fan Out

Serial Port Console Redirection



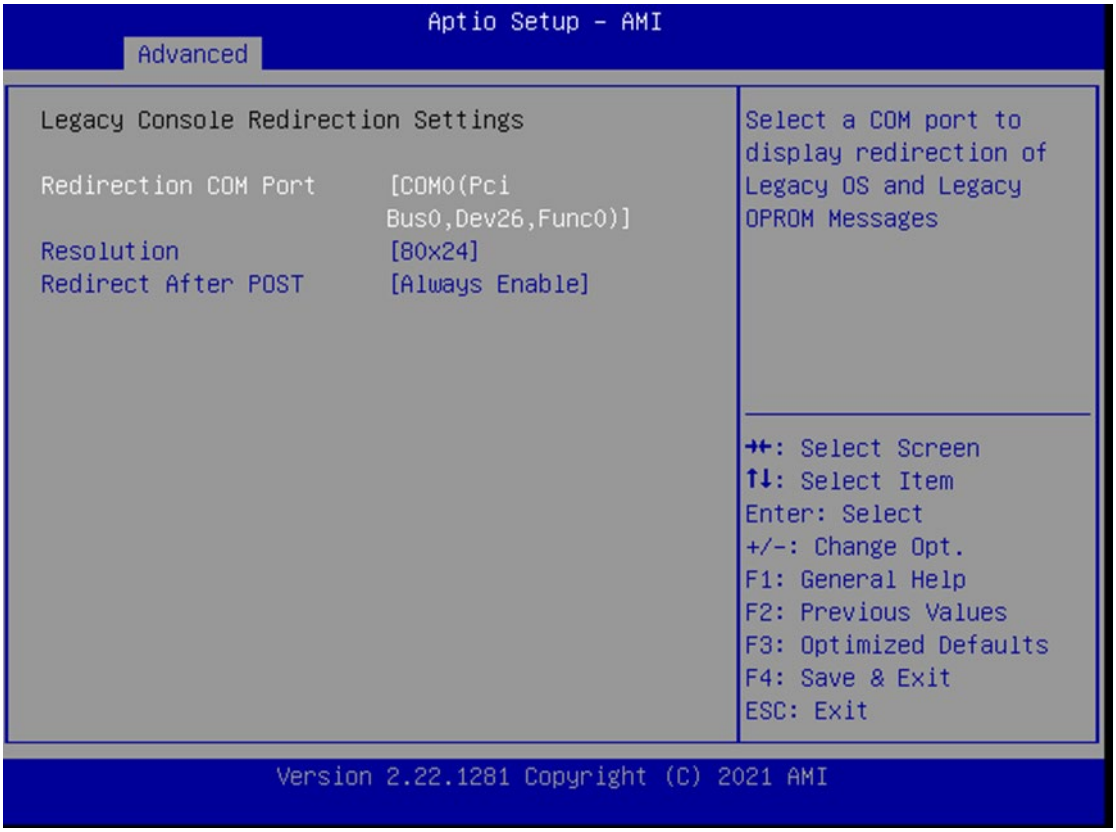
Feature	Options	Description
COM0 Console Redirection	Enabled Disabled	Enables or disables Console Redirection
Feature	Options	Description
COM1 Console Redirection	Enabled Disabled	Enables or disables Console Redirection

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

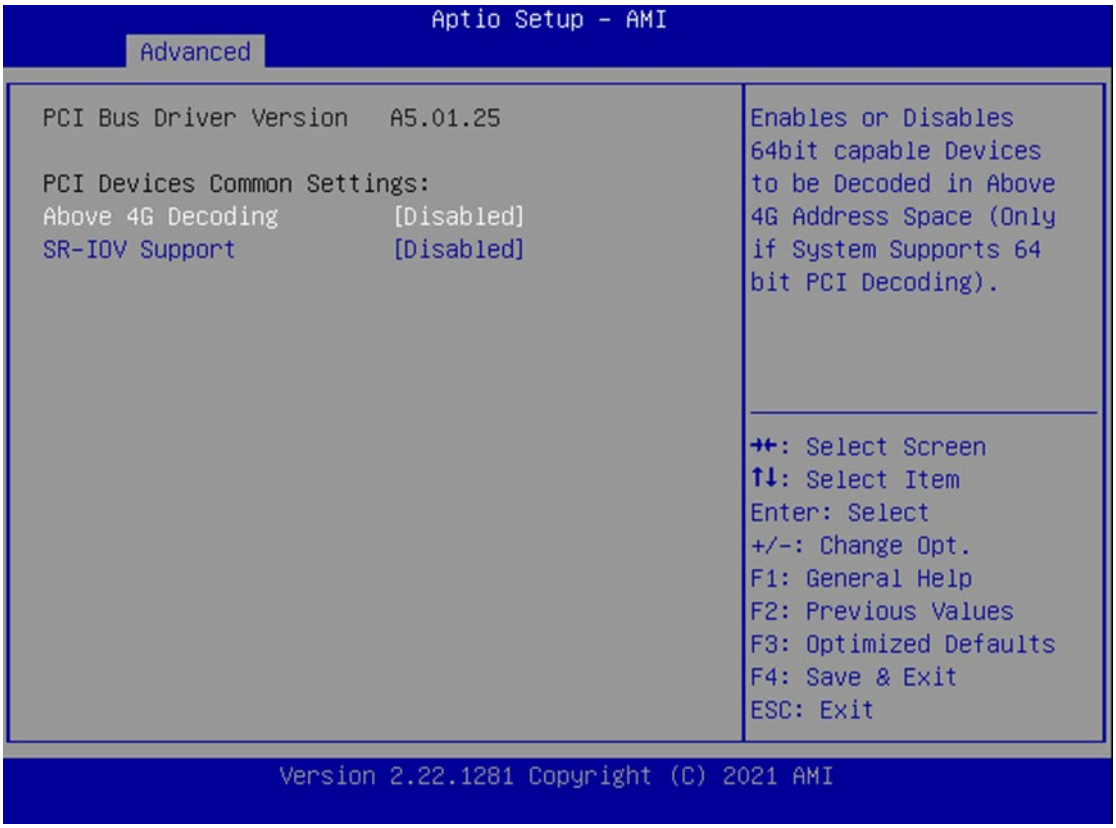
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Selects FunctionKey and KeyPad on Putty.

Legacy Console Redirection Settings



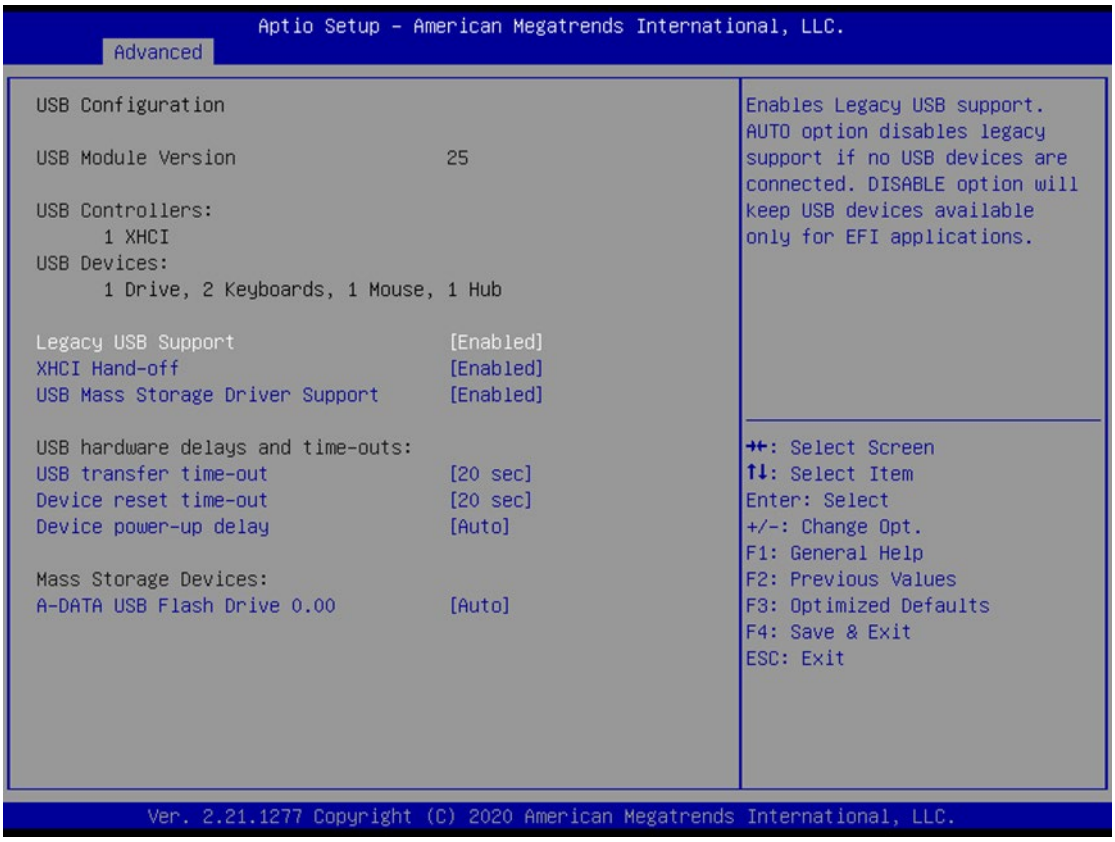
Feature	Options	Description
Legacy Serial Redirection Port	COM0	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages
Legacy OS Redirection Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection.
Redirection After BIOS POST	Always Enable BootLoader	When **Bootloader** is selected, Legacy Console Redirection is disabled before booting to legacy OS. When **Always Enable** is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to **Always Enable**.

PCI Subsystem Settings



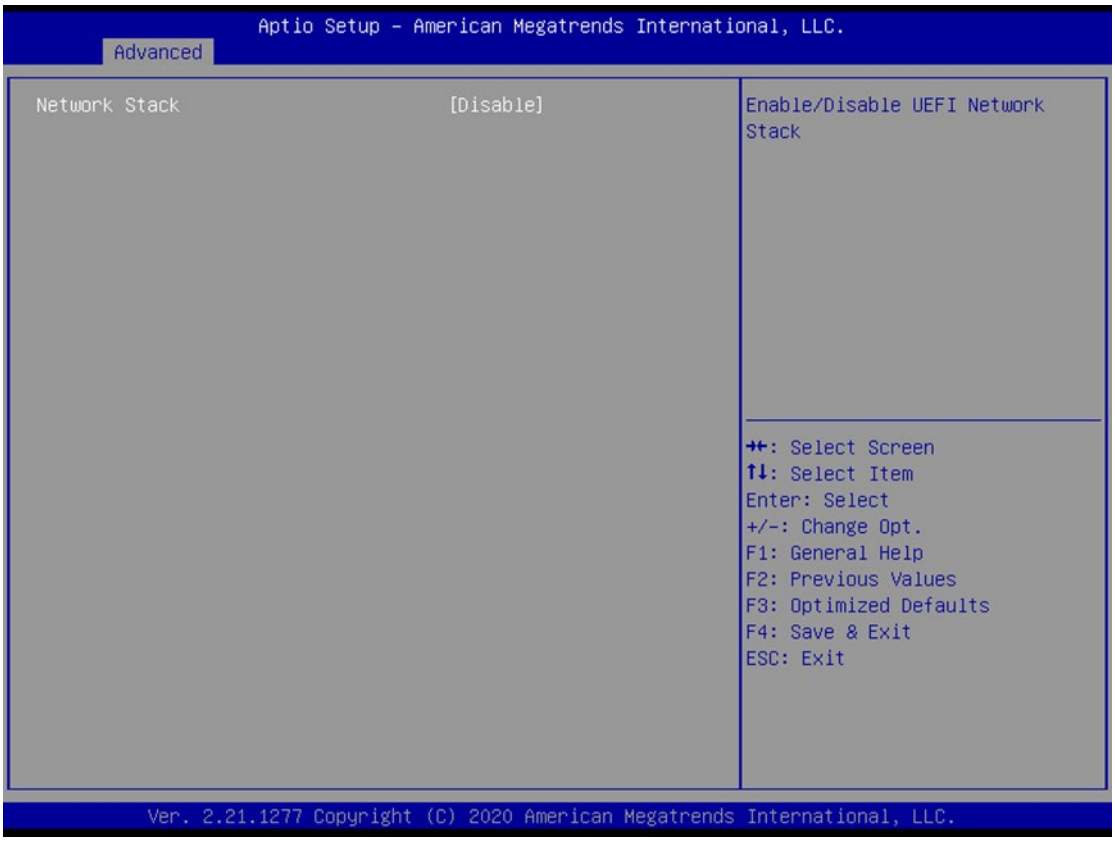
Feature	Options	Description
Above 4G Decoding	Disabled Enabled	Enables or disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding)
SR-IOV Support	Disabled Enabled	If the system has SR-IOV capable PCIe Devices, this option enables or disables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

USB Configuration



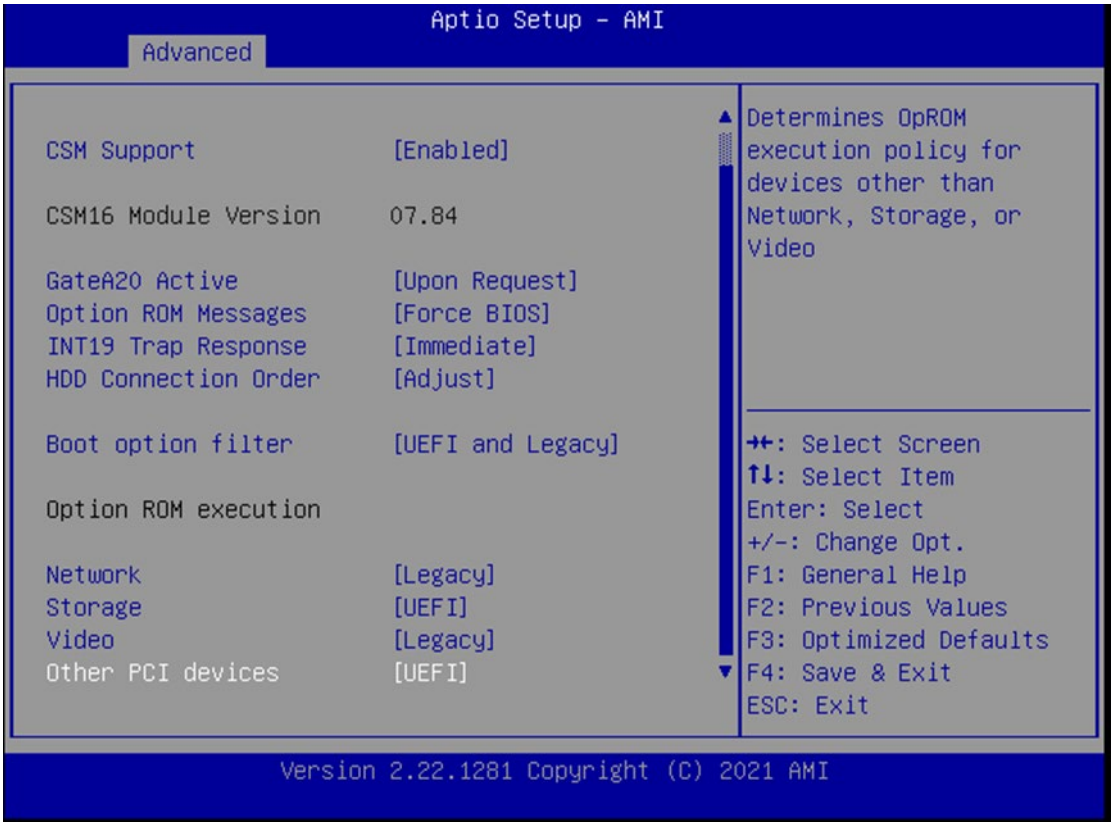
Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. **Auto** option disables legacy support if no USB devices are connected; **Disabled**option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled Disabled	This is a workaround for 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.
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.

Network Stack Configuration



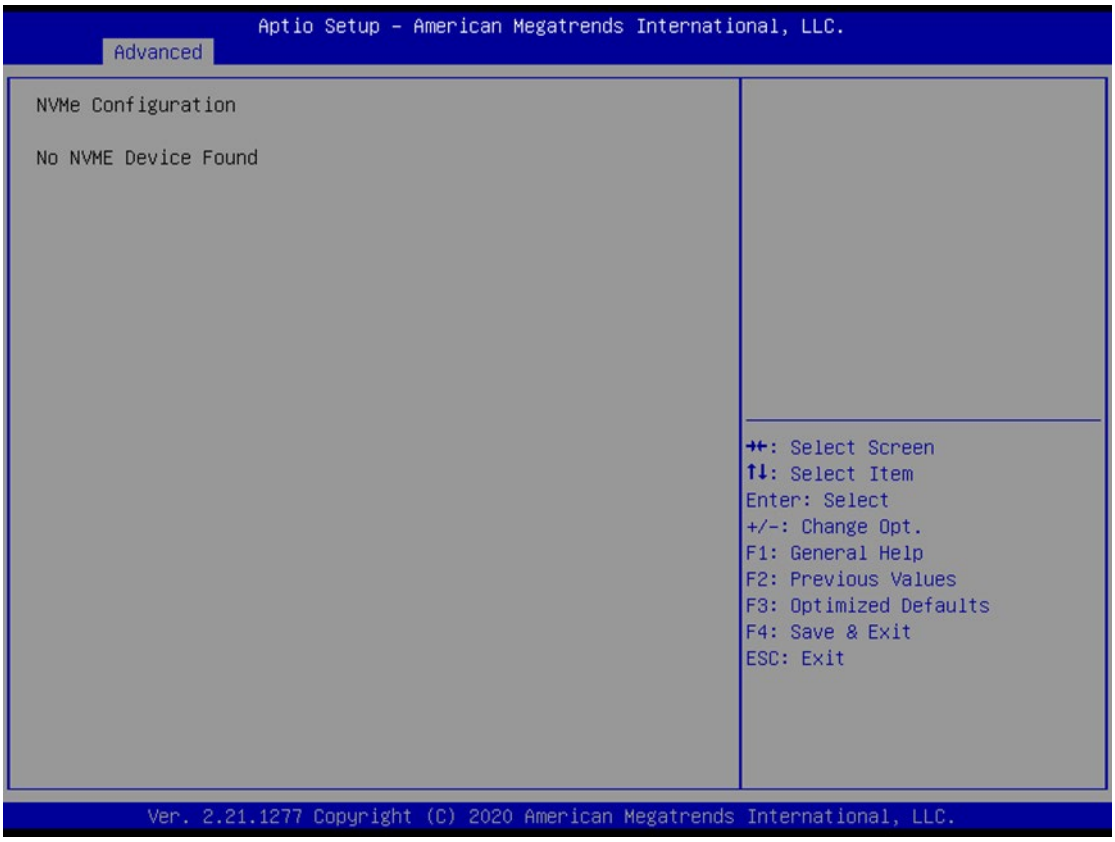
Feature	Options	Description
Network Stack	Disabled Enabled	Enables or disables UEFI Network Stack
Ipv4 PXE Support	Disabled Enabled	Enables Ipv4 PXE Boot Support. If IPV4 is disabled, PXE boot option will not be created.
Ipv4 HTTP Support	Disabled Enabled	Enables Ipv4 HTTP Boot Support. If IPV4 is disabled, HTTP boot option will not be created.
Ipv6 PXE Support	Disabled Enabled	Enables Ipv6 PXE Boot Support. If IPV6 is disabled, PXE boot option will not be created.
Ipv6 HTTP Support	Disabled Enabled	Enables Ipv6 HTTP Boot Support. If IPV6 is disabled, HTTP boot option will not be created.
PXE boot wait time	0	Wait time to press **<ESC>** key to abort the PXE boot
Media detect count	1	Number of times the presence of media will be checked

CSM Configuration

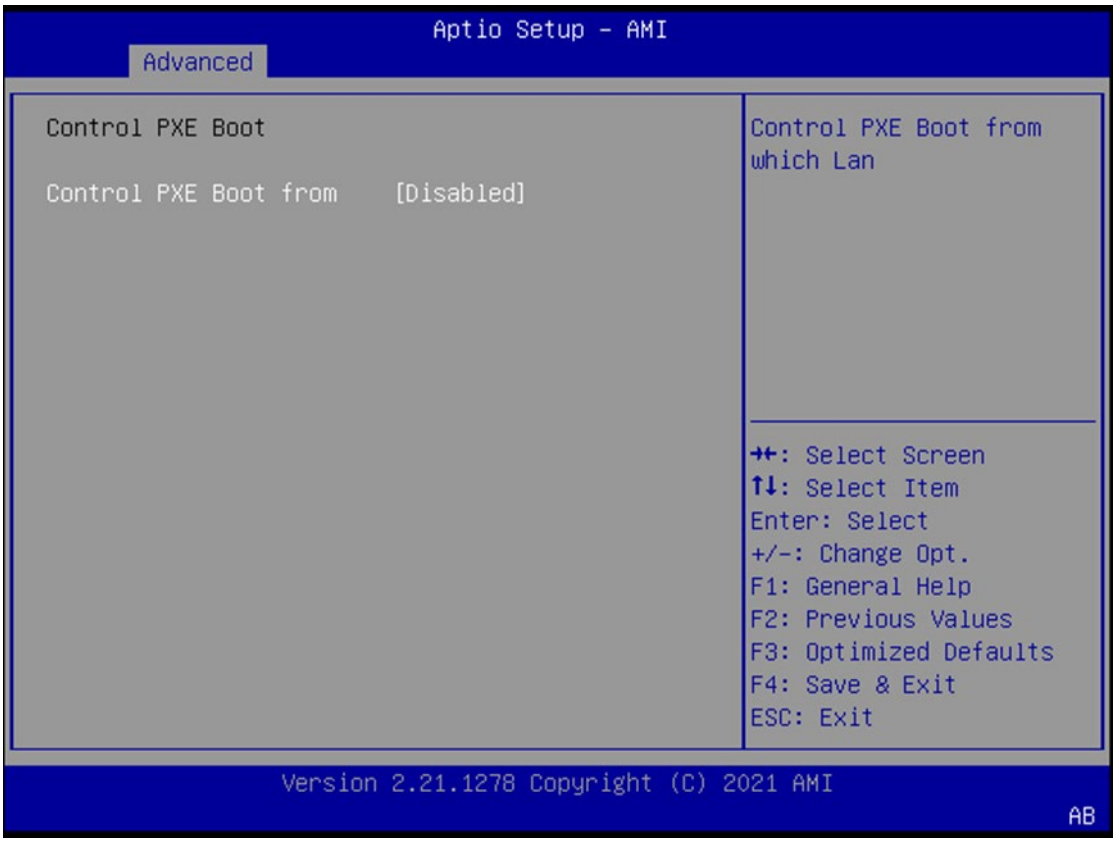


Feature	Options	Description
CSM Support	Disabled Enabled	Enables or disables CSM Support
Network	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not Launch UEFI Legacy	Controls 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



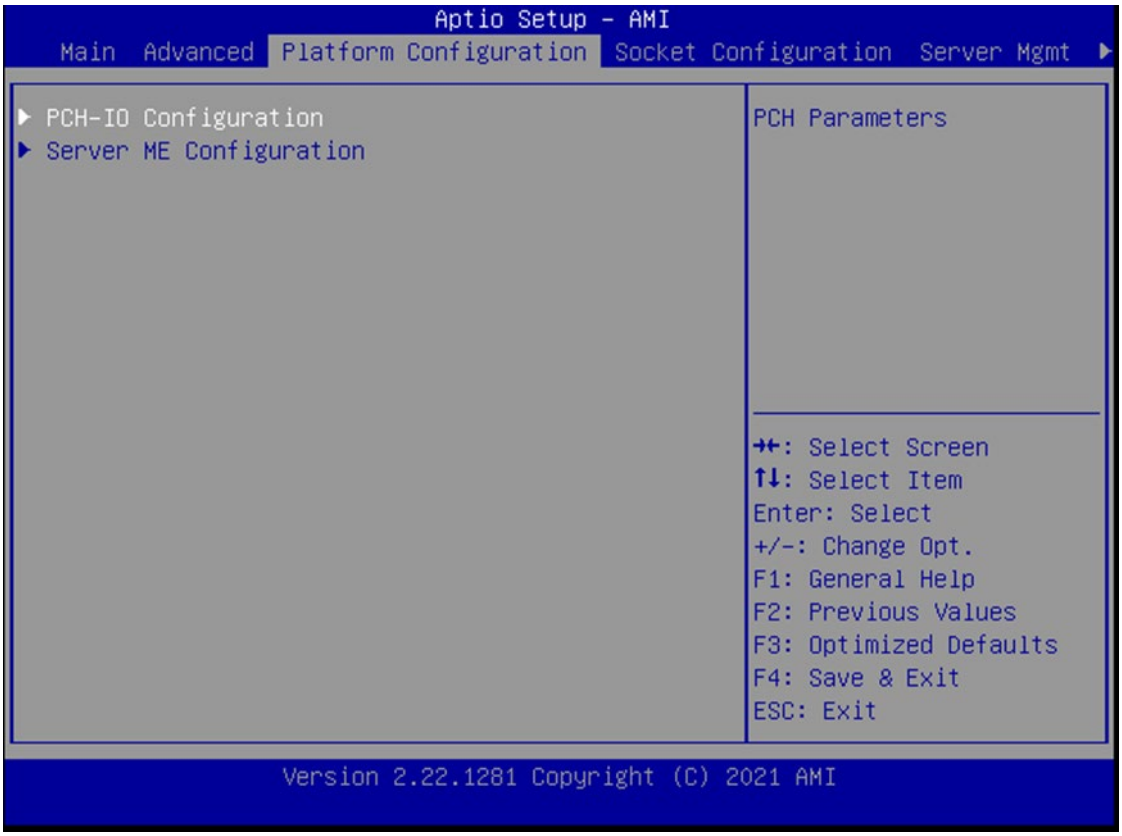
Control Legacy PXE Boot



Feature	Options	Description
Control Legacy PXE Boot from	Disabled LAN1 LAN2	Select On Board LAN# Boot

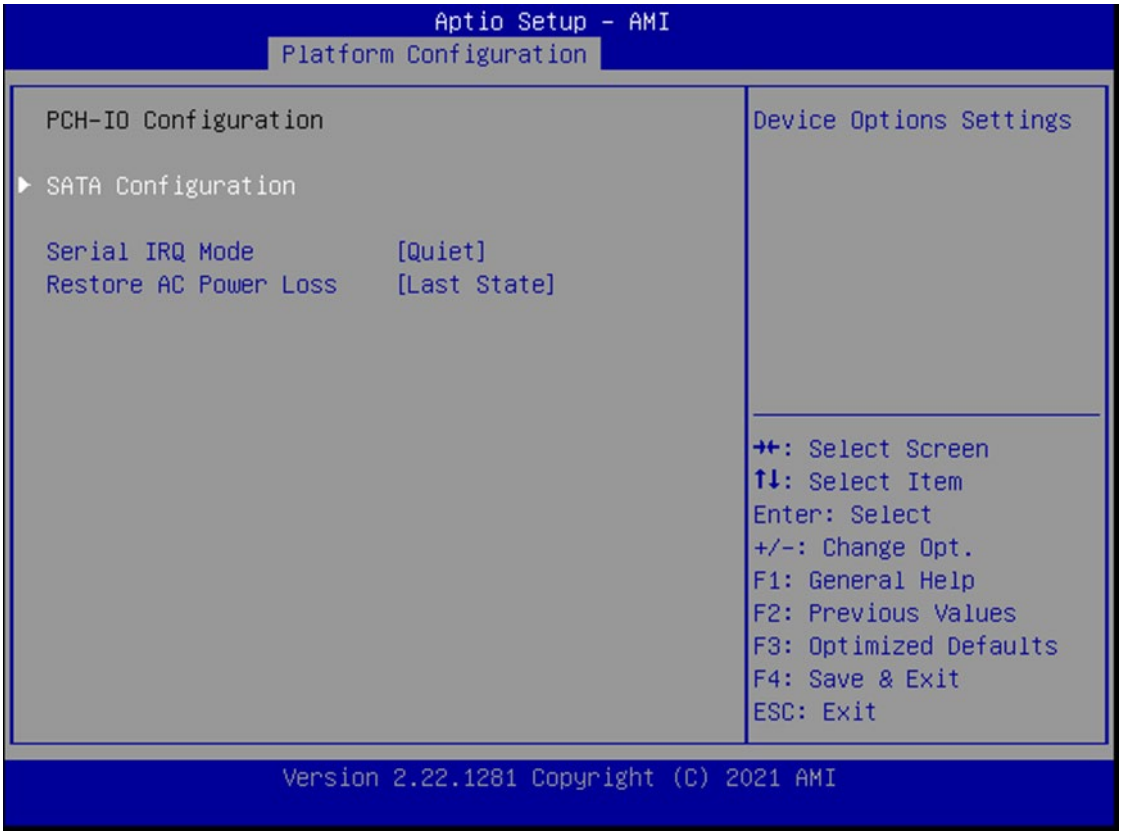
Platform

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.



Feature	Options	Description
PCH-IO Configuration	None	Displays and provides option to change the PCH Settings
Server ME Configuration	None	Configure Server ME Technology Parameters

PCH Configuration

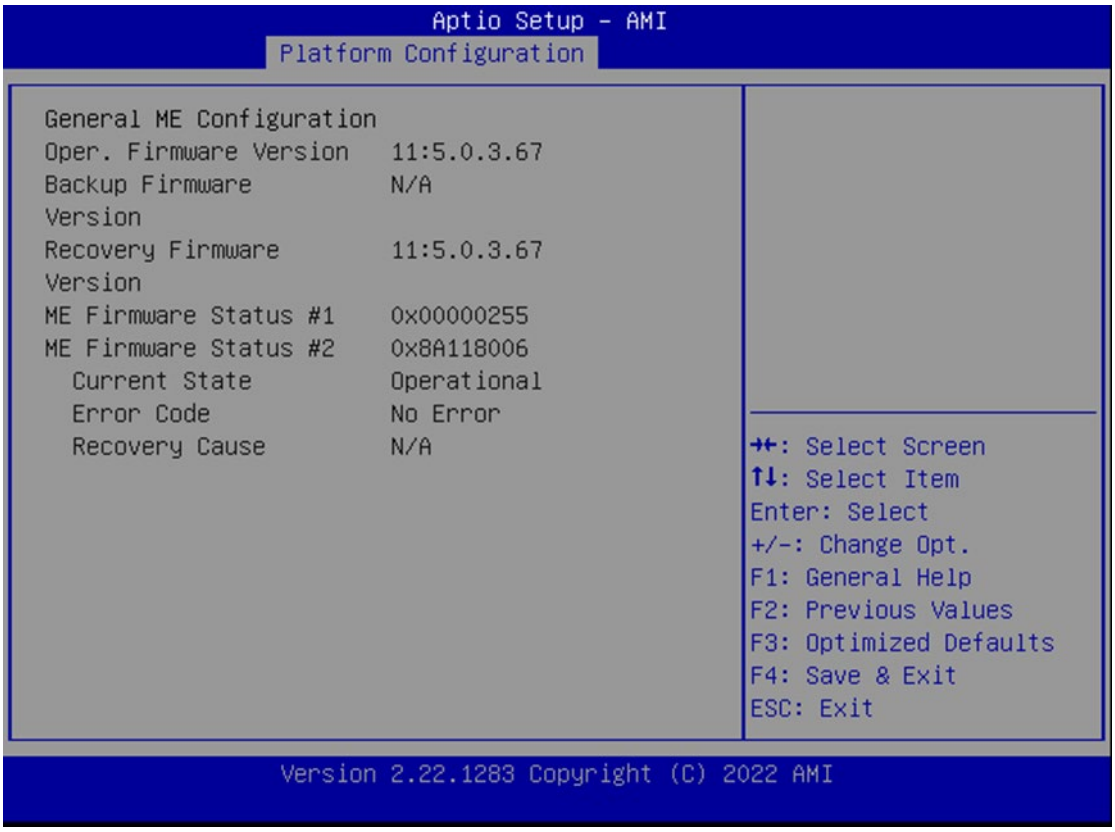


Feature	Options	Description
SATA Configuration	None	SATA devices and settings
Restore AC Power Loss	Power ON Power Off Last State	Select S0/S5 for ACPI state after a G3
Serial IRQ Mode	Quiet Continuous	Configure Serial IRQ Mode.

PCH SATA Configuration

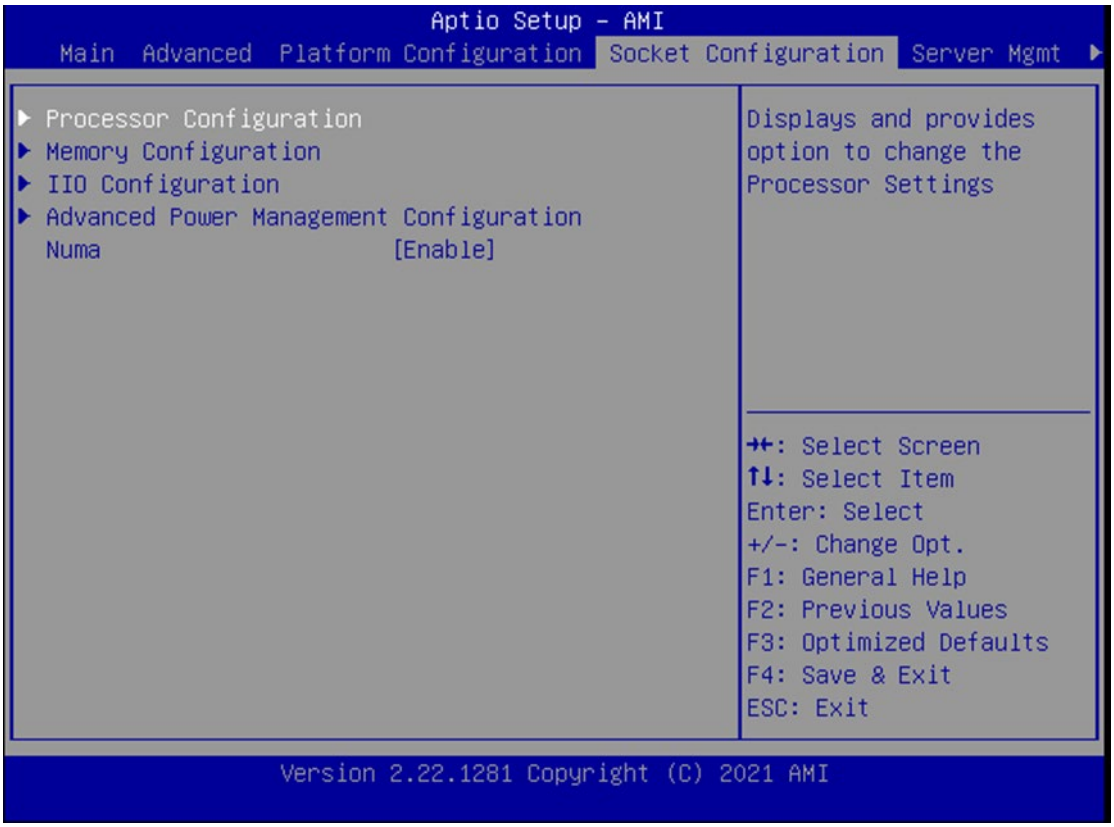
Feature	Options	Description
SATA Controller	Disabled Enabled	Enables or disables SATA Controller
Configure SATA as	AHCI RAID	This will configure SATA as **RAID** or **AHCI**.
Port 0/1/2/3/4	Disabled Enabled	Enable or Disable SATA Port
Hot Plug	Disabled Enabled	Designates this port as Hot Pluggable.
Spin Up Device	Disabled Enabled	If enabled for any of ports Staggerred Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.

Server ME Configuration



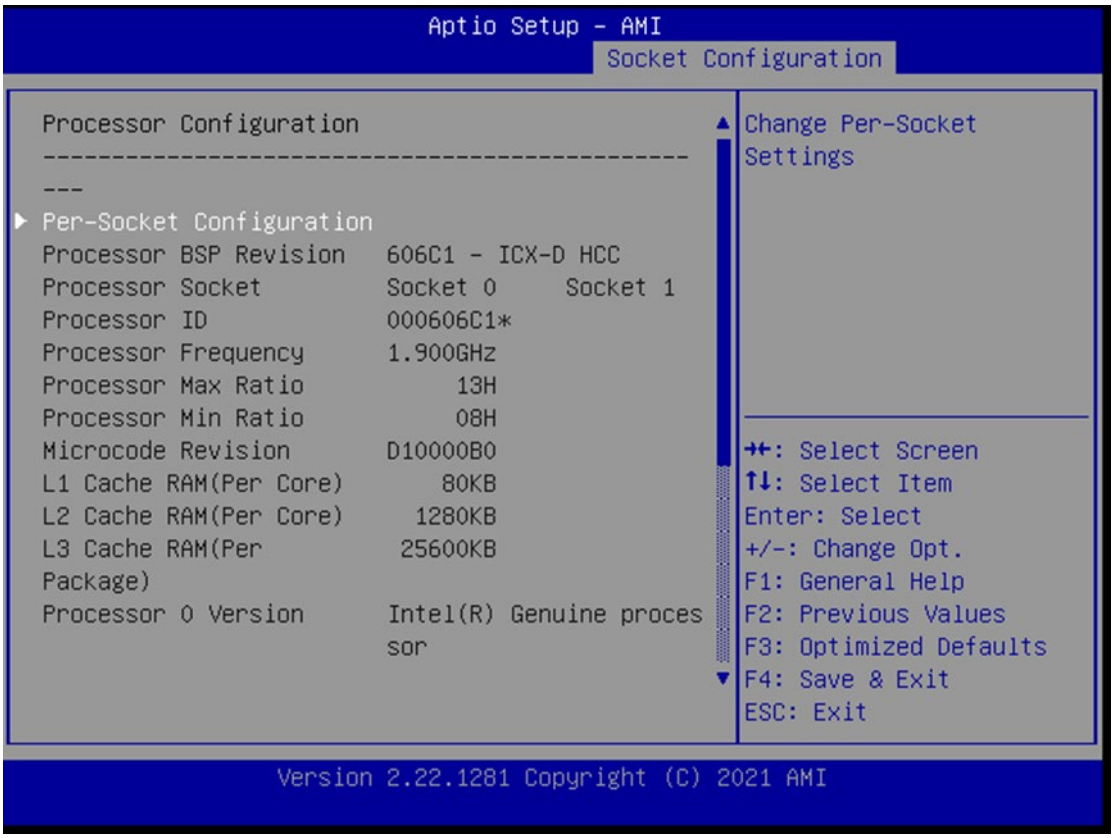
Socket

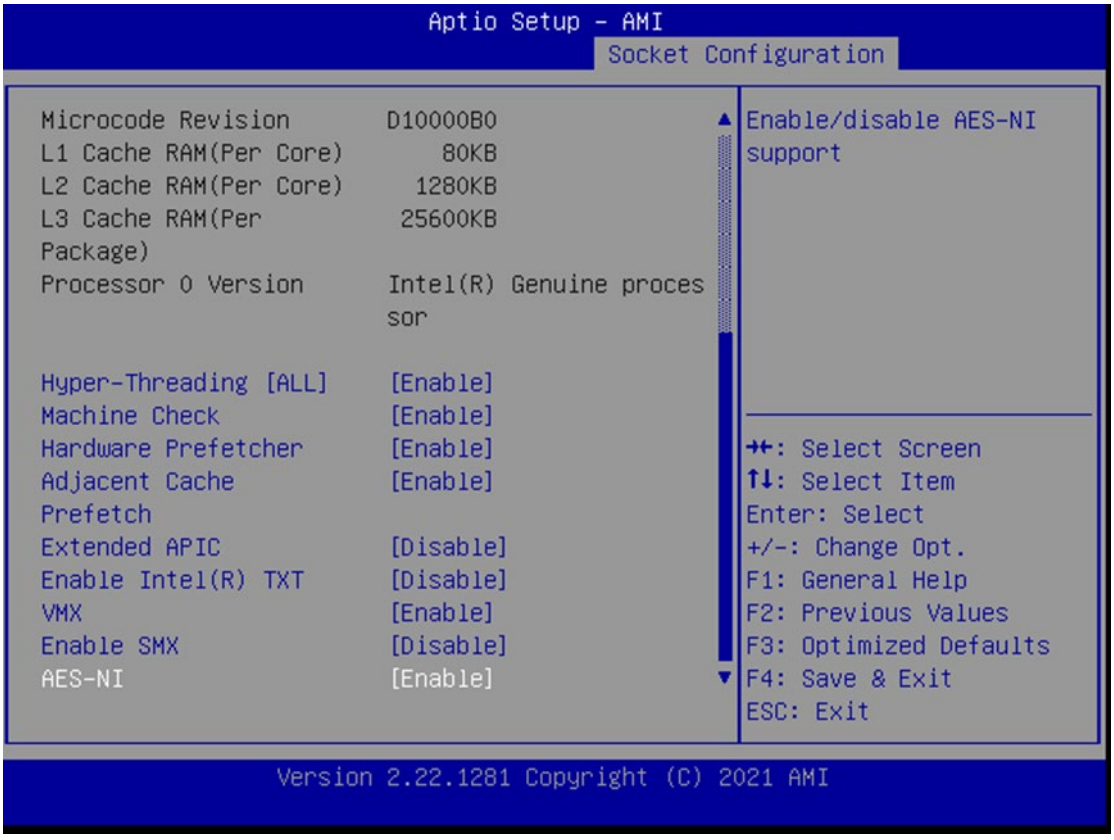
Select the Socket menu item from the BIOS setup screen to enter the Socket Setup screen. Users can select any of the items in the left frame of the screen.



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
Numa	Disabled Enabled	Displays and provides option to change the Power Management Settings

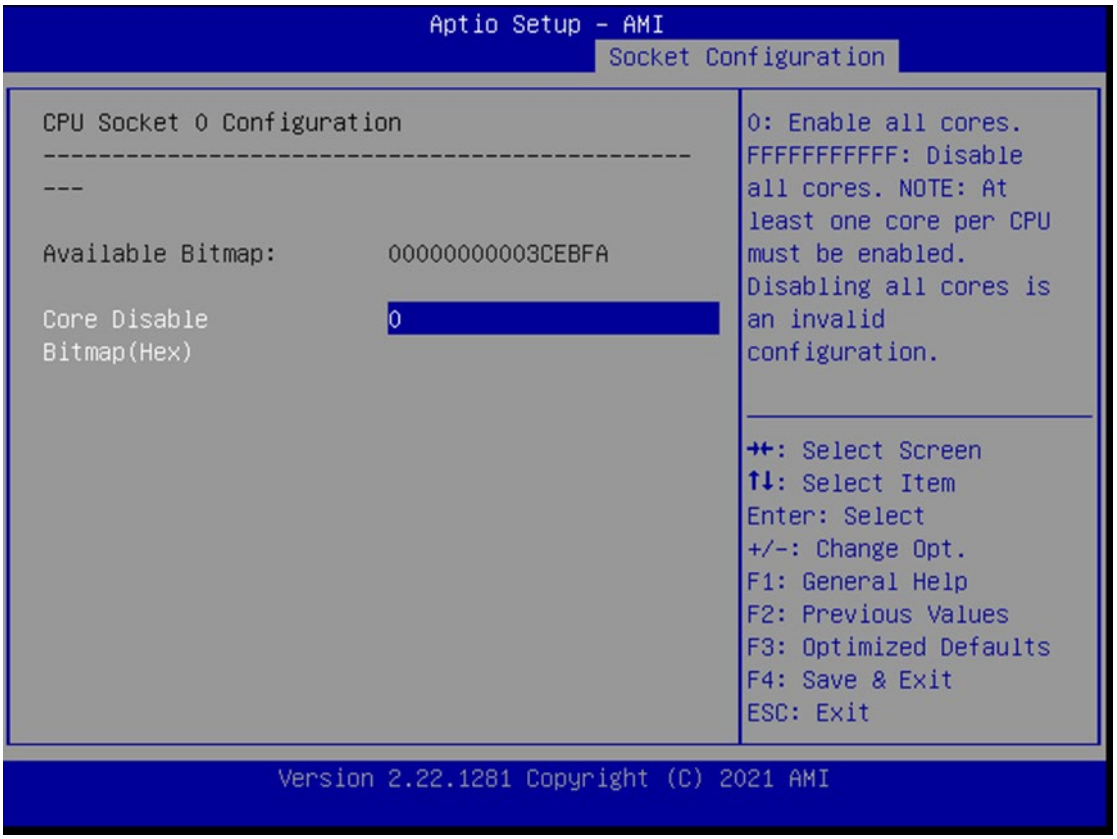
Processor Configuration





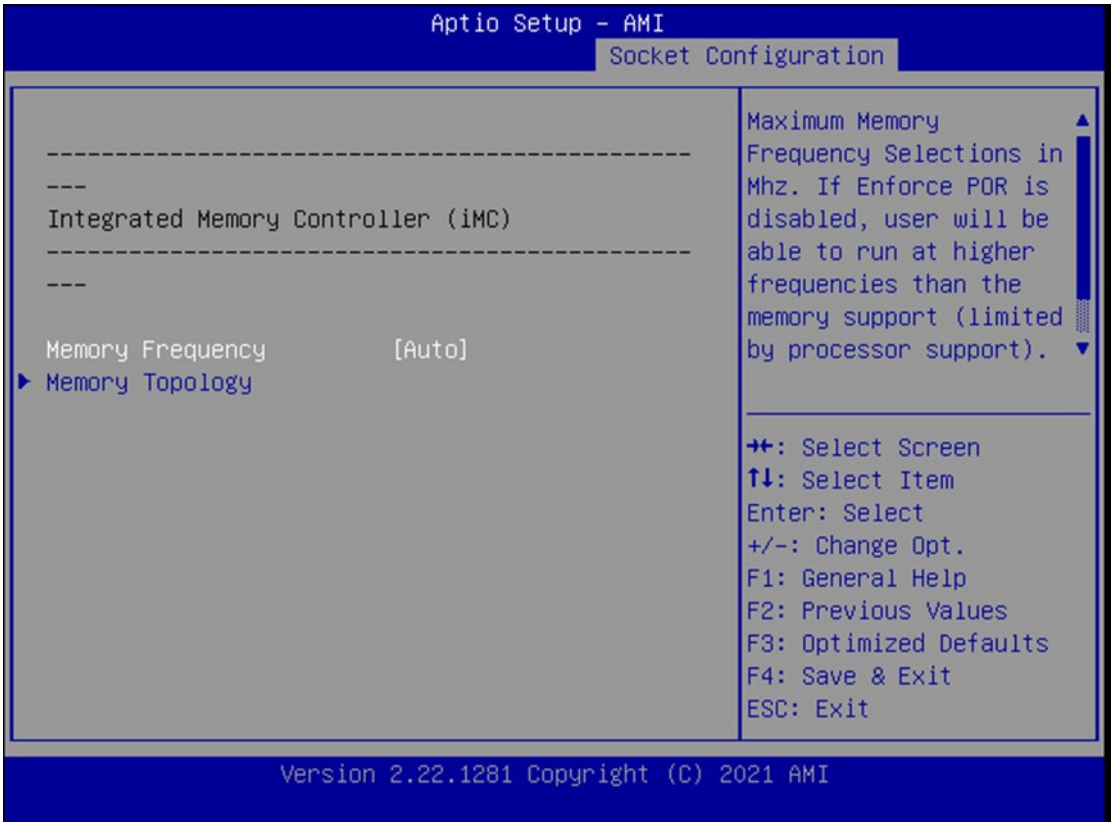
Feature	Options	Description
Hyper-Threading [ALL]	Disabled Enabled	Enables Hyper Threading (Software Method to Enable/Disable Logical Processor threads.
Machine Check	Disabled Enabled	Enable or Disable the Machine Check
Hardware Prefetcher	Disabled Enabled	= MLC Streamer Prefetcher (MSR 1A4h Bit[0])
Adjacent Cache Prefetcher	Disabled Enabled	= MLC Spatial Prefetcher (MSR 1A4h Bit[1])
Extended APIC	Disabled Enabled	Enables or disables extended APIC support
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	Enables or disables AES-NI support

CPU Socket0 Configuration



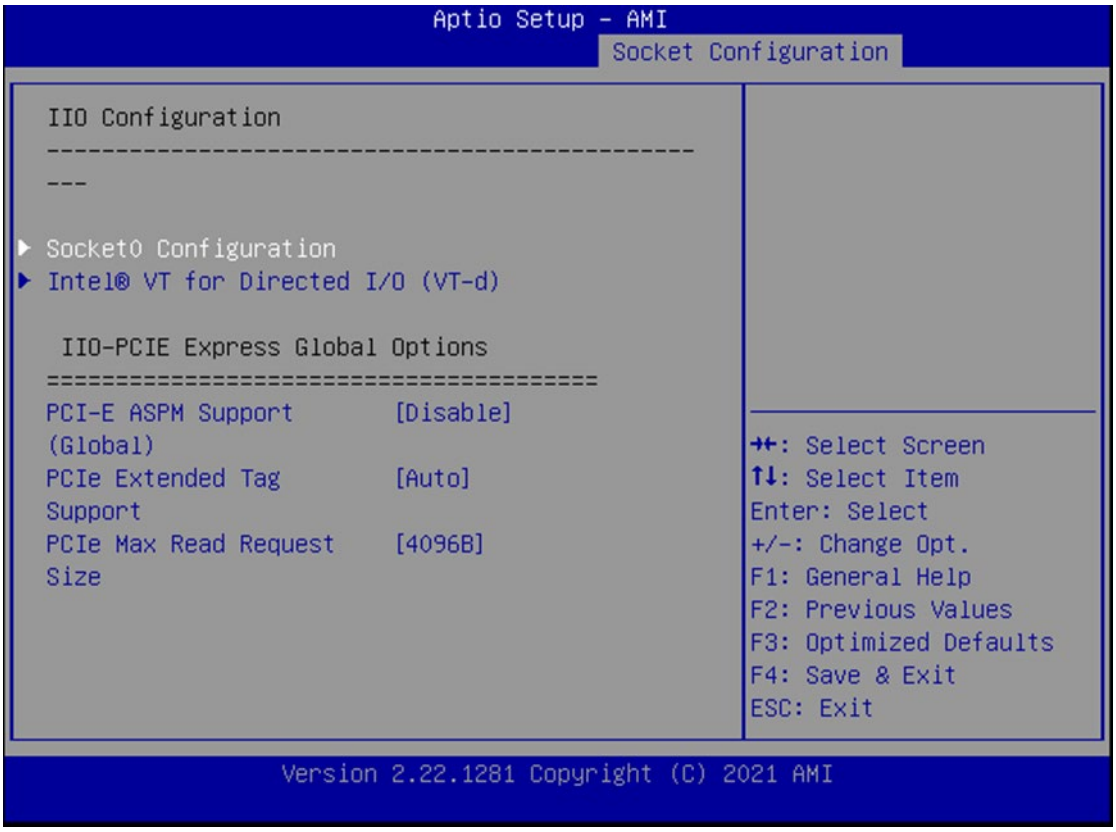
Feature	Options	Description
Core Disable Bitmap (Hex)	0	0: Enable all cores. FFFFFFFFFF: Disable all cores least one core per CPU must be enabled. Disabling all cores is an invalid configuration.

Memory Configuration



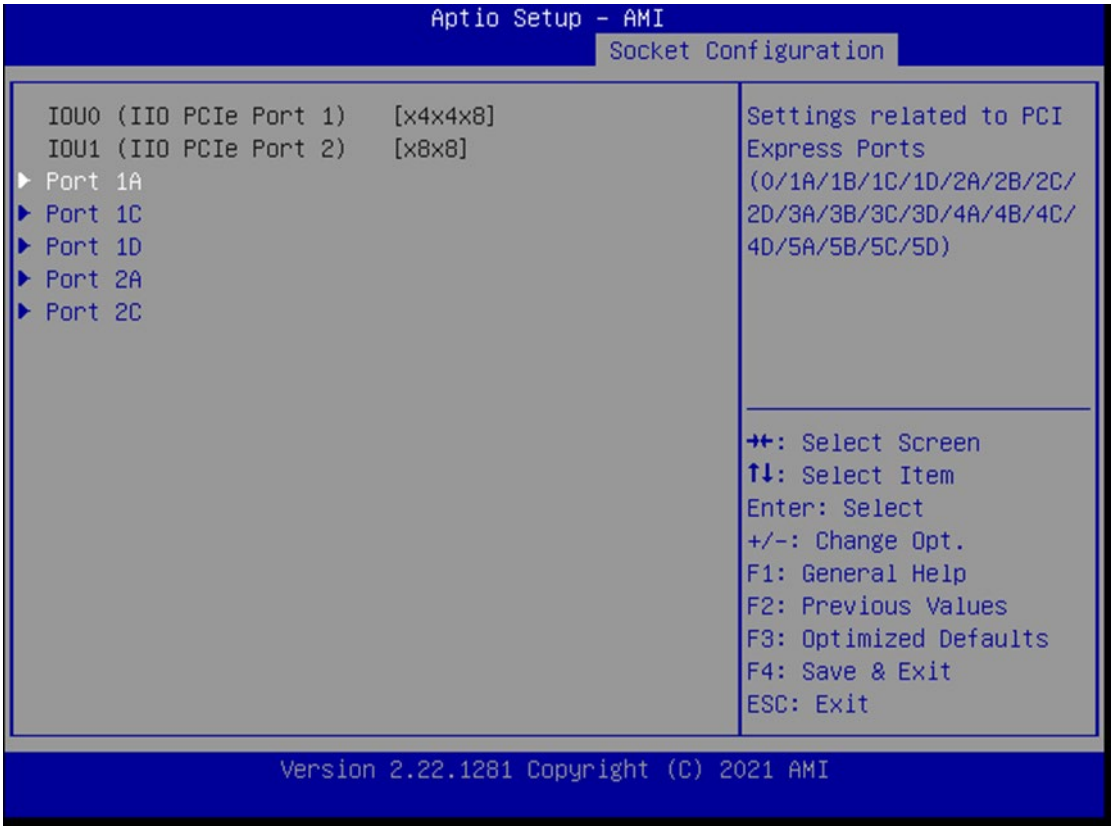
Feature	Options	Description
Memory Frequency	Auto 1200 1333 1400 1600 1800 1866 2000 2133 2200 2400 2600	Maximum Memory Frequency Selections in Mhz. Do not select Reserved
Memory Topology	None	Displays memory topology with Dimm population information

IIO Configuration



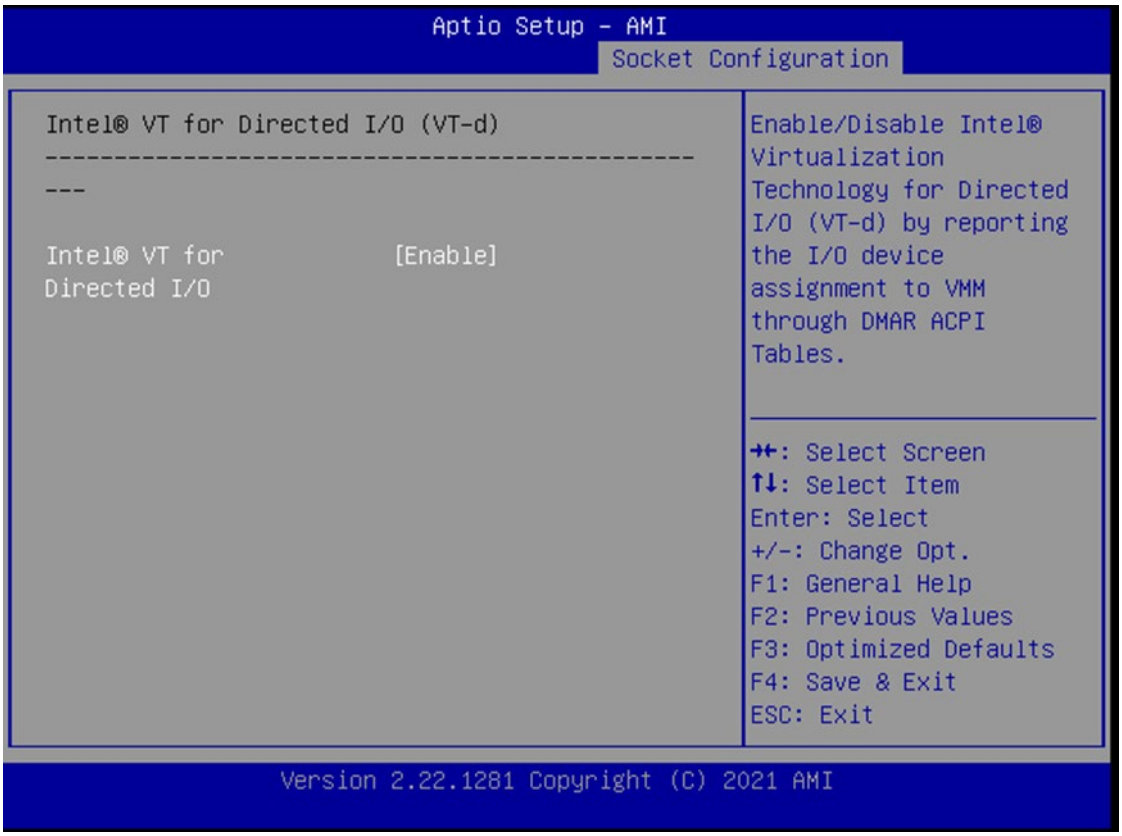
Feature	Options	Description
Socket0 Configuration	None	None
Intel® VT for Directed I/O (VT-d)	None	Press **<Enter>** to bring up the Intel? VT for Directed I/O (VT-d) Configuration menu.
PCI-E ASPM Support (Global)	No Per-Port L1 Only	This option enables / disables the ASPM support for all downstream devices.
PCIe Extended Tag Enable	Auto No Yes	Auto/Enable - BIOS sets 8-bit Tag Field for PCIe Root Port/EndPoint. Disable - BIOS sets 5-bit Tag Field for PCIe Root Port/EndPoint
PCIe Max Read Request Size	Auto 128B 256B 512B 1024B 2048B 4096B	Set Max Read Request Size in EndPoints

Socket0 Configuration



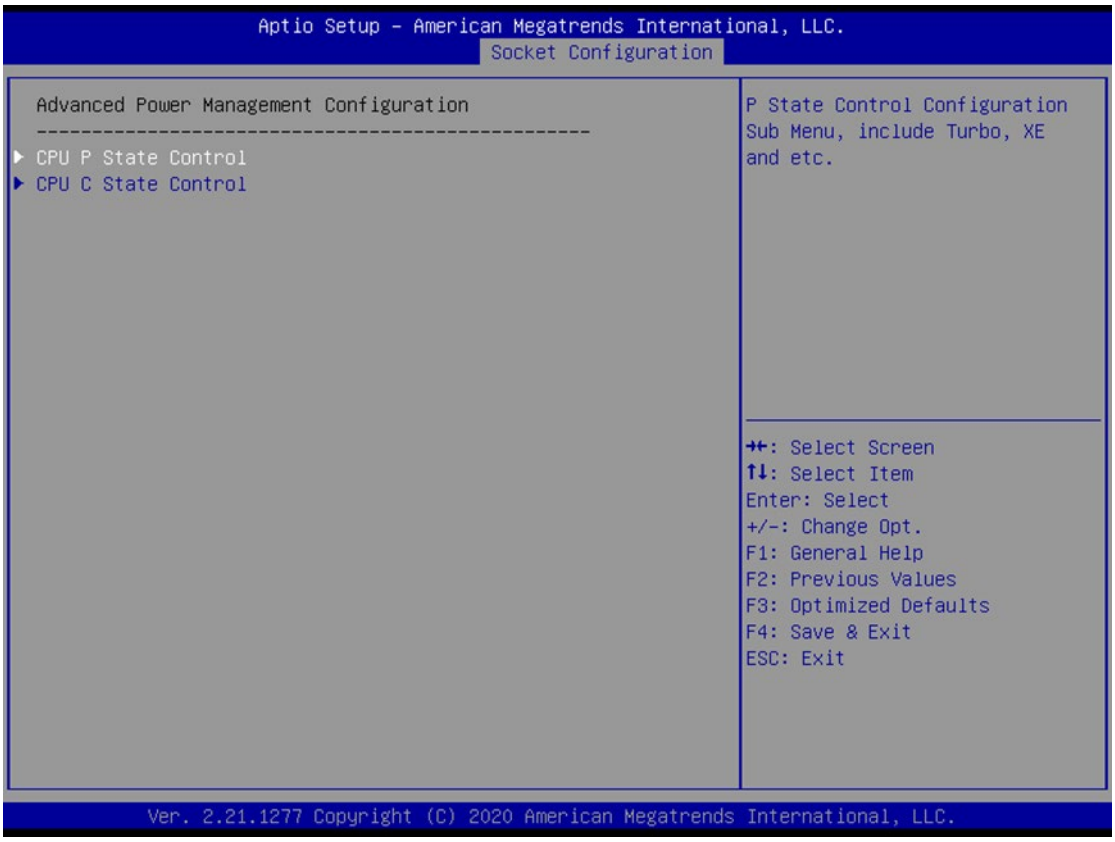
Feature	Options	Description
Socket 0 Port 1A	None	Settings related to PCI Express Port 1A
Socket 0 Port 1C	None	Settings related to PCI Express Port 2A
Socket 0 Port 1D	None	Settings related to PCI Express Port 2C
Socket 0 Port 2A	None	Settings related to PCI Express Port 4A
Socket 0 Port 2C	None	Settings related to PCI Express Port 4C

Intel® VT for Directed I/O (VT-d)



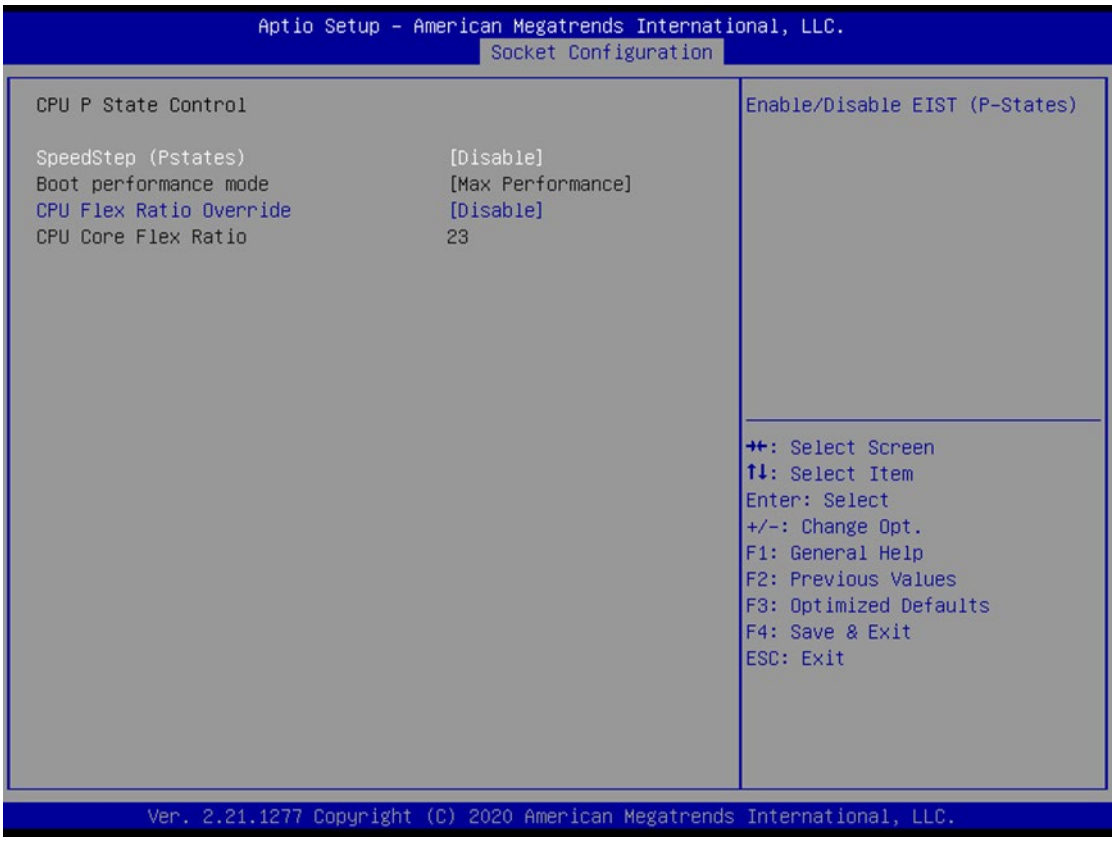
Feature	Options	Description
Intel® VT for Directed I/O (VT-d)	Enable Disable	Press **<Enter>** to bring up the Intel® VT for Directed I/O (VT-d) Configuration menu.

Advanced Power Management Configuration



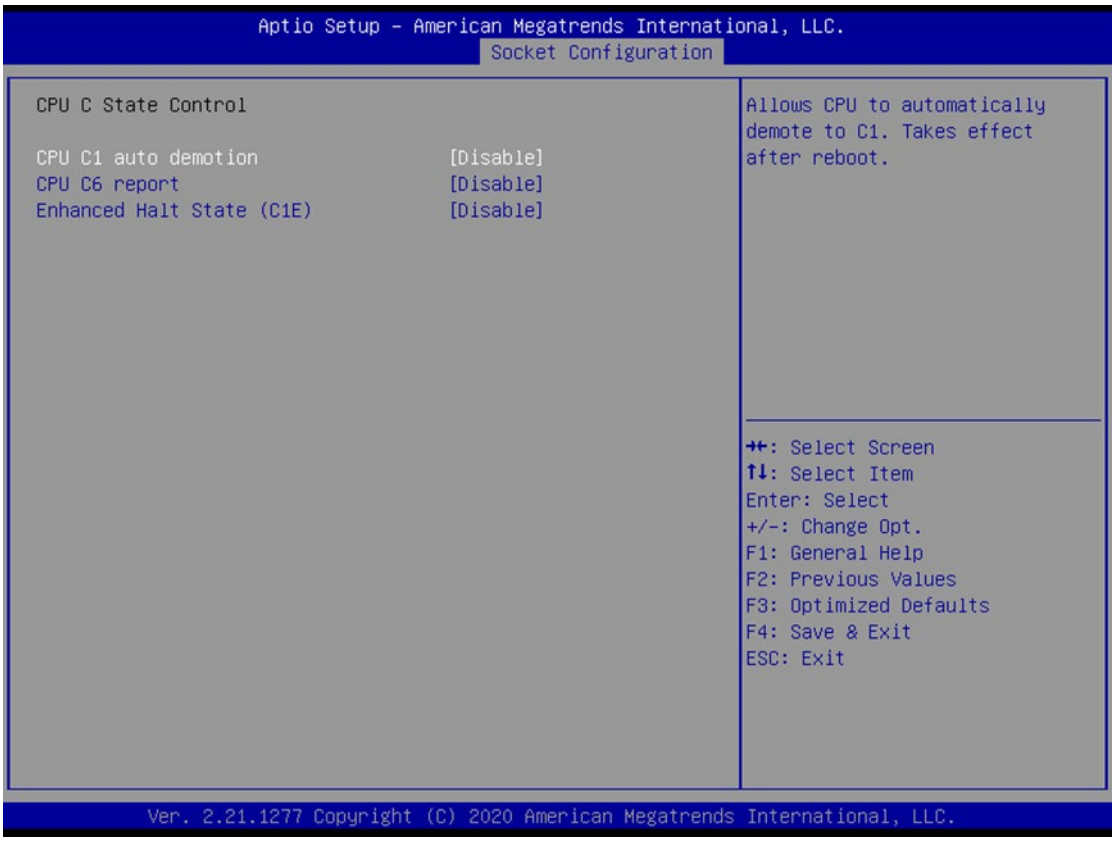
Feature	Options	Description
CPU P State Control	None	P State Control Configuration Sub Menu, include Turbo, XE and etc.
CPU C State Control	None	CPU C State setting

CPU P State Control



Feature	Options	Description
SpeedStep (Pstates)	Disabled Enabled	Enables or disables EIST (P-States)
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 Flex Ratio Override	Disabled Enabled	Enable/Disable CPU Flex Ratio Programming
CPU Core Flex Ratio	23	Non-Turbo Mode Processor Core Ratio Multiplier

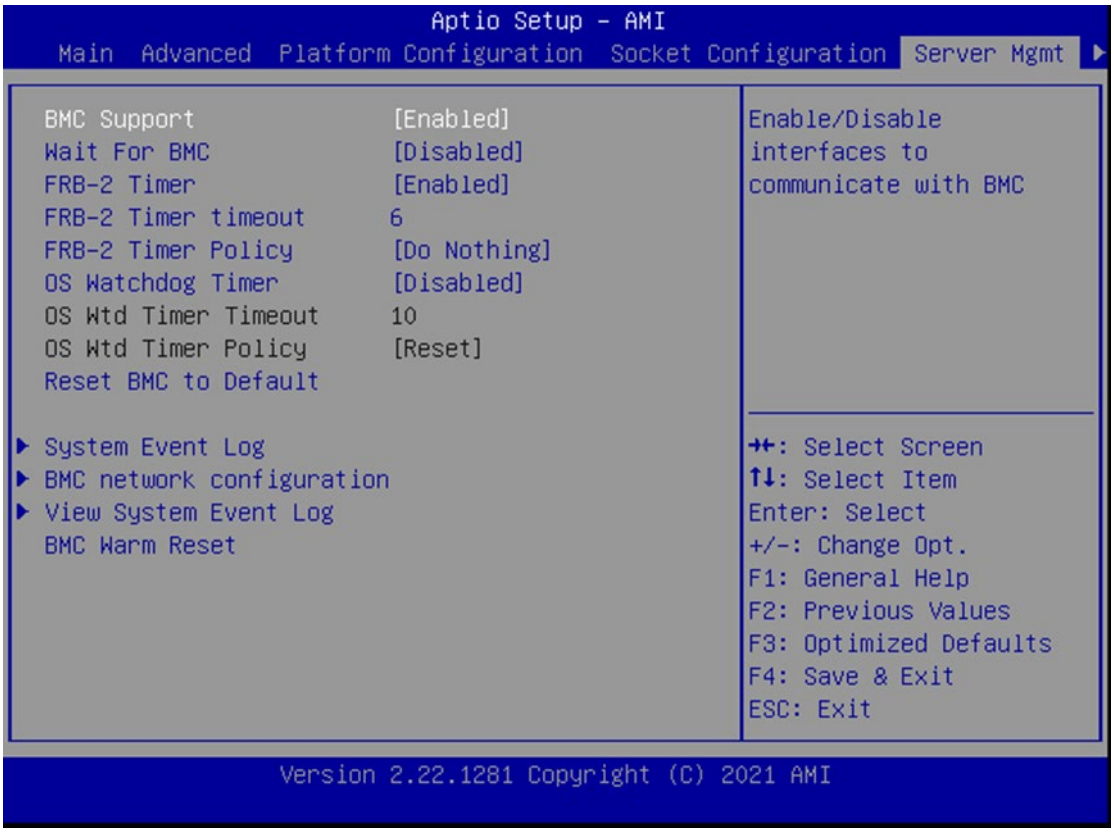
CPU C State Control



Feature	Options	Description
CPU C1 auto demotion	Disabled Enabled	Autonomous Core C-State Control
CPU C6 report	Disabled Enabled	Enables or disables CPU C6(ACPI C3) report to OS
Enhanced Halt State (C1E)	Disabled Enabled	Core C1E auto promotion Control. Takes effect after reboot.

Server Mgmt

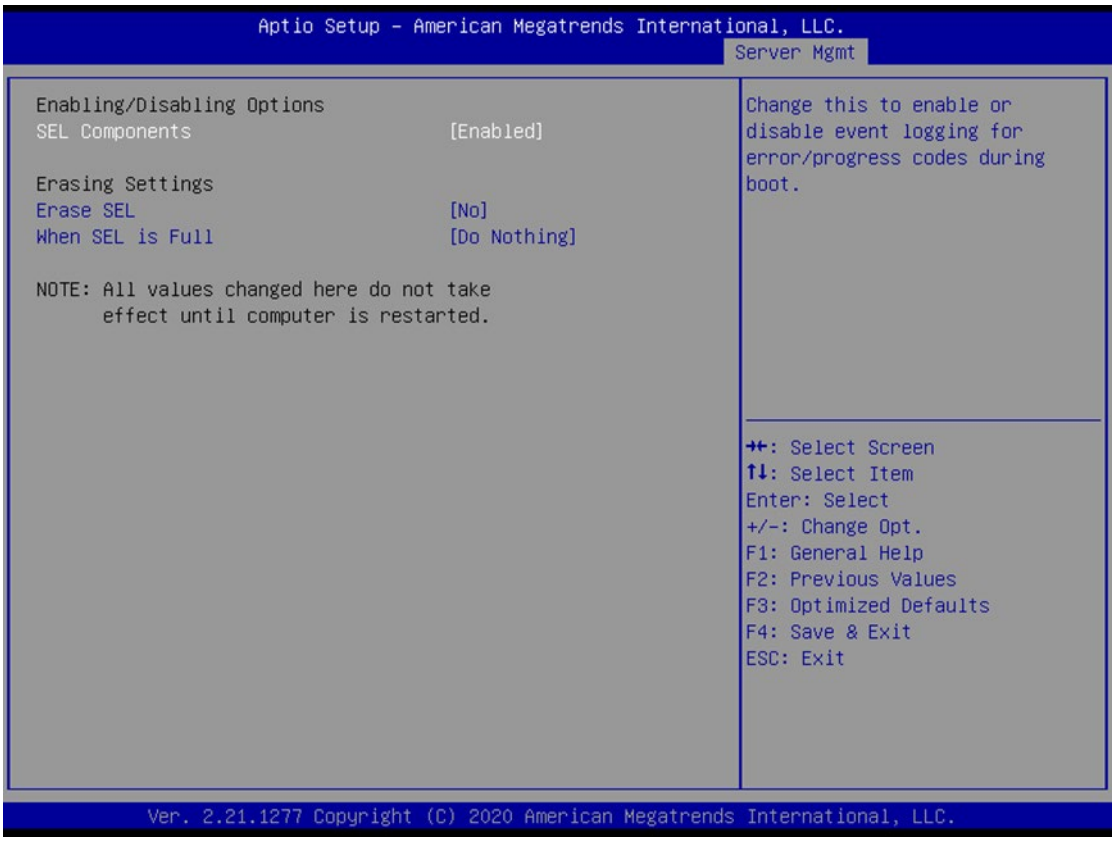
Select the Server Mgmt menu item from the BIOS setup screen to enter the Server Mgmt Setup screen. Users can select any of the items in the left frame of the screen.



Feature	Options	Description
BMC Support	Enabled Disabled	Enable or disables interfaces to communicate with BMC.
Wait For BMC	Enabled Disabled	Wait For BMC response for specified time out. In PILOTII, BMC starts at the same time when BIOS starts during AC power ON. It takes around 30 seconds to initialize Host to BMC interfaces.
FRB-2 Timer	Enabled Disabled	Enables or disables FRB-2 timer (POST timer).
FRB-2 Timer timeout	3 minutes 4 minutes 5 minutes 6 minutes	Enter value Between 3 to 6 min for FRB-2 Timer Expiration value.
FRB-2 Timer Policy	Do Nothing Reset Power Down Power Cycle	Configure how the system should respond if the FRB-2 Timer expires. Not available if FRB-2 Timer is disabled.
OS Watchdog Timer	Enabled Disabled	If enabled, it starts a BIOS timer which can only be shut off by Management Software after the OS loads. It also helps verify that the OS is successfully loaded or follows the OS Boot Watchdog Timer policy.
OS Wtd Timer Timeout	5 minutes 10 minutes 15 minutes 20 minutes	Configure the length of the OS Boot Watchdog Timer. Not available if OS Boot Watchdog Timer is disabled.

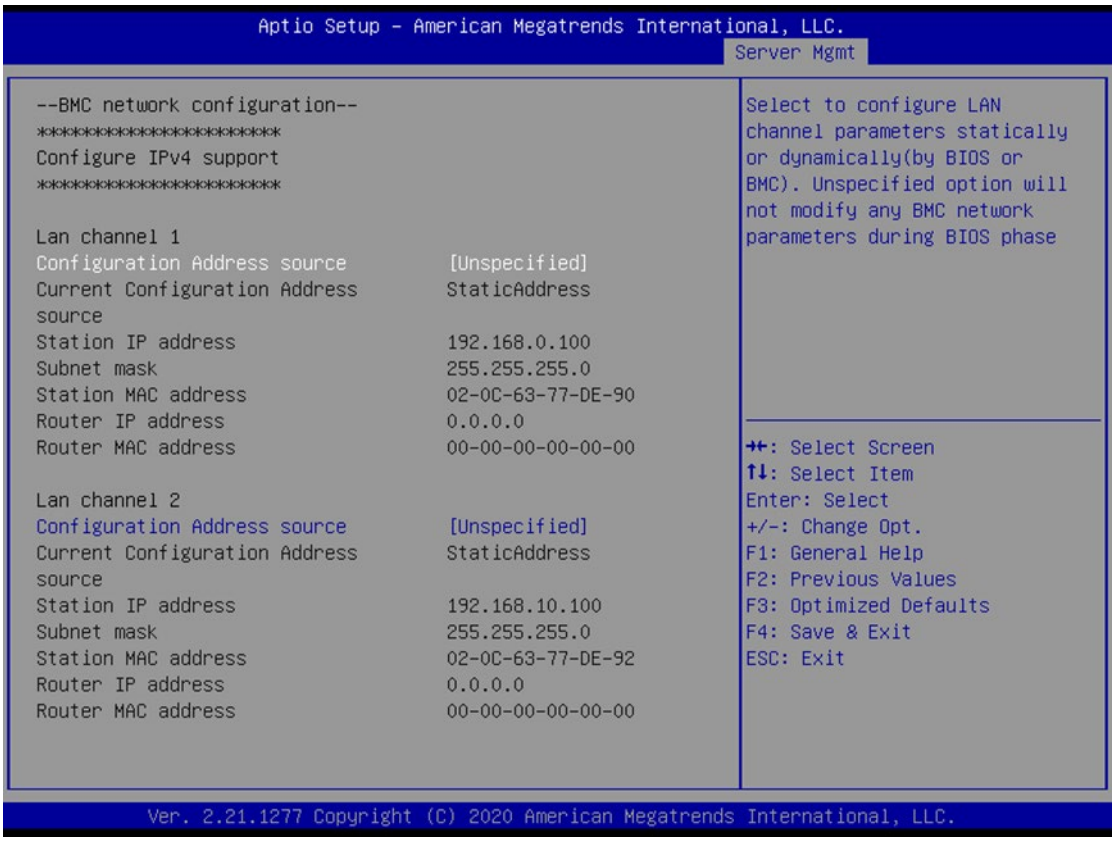
OS Wtd Timer Policy	Do Nothing Reset Power Down Power Cycle	Configure how the system should respond if the OS Boot Watchdog Timer expires. Not available if OS Boot Watchdog Timer is disabled.
System Event Log	NA	Press **<Enter>** to change the SEL event log configuration.
Reset BMC to Default	NA	Press <**Enter**> to do Reset BMC To Default
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.

System Event Log



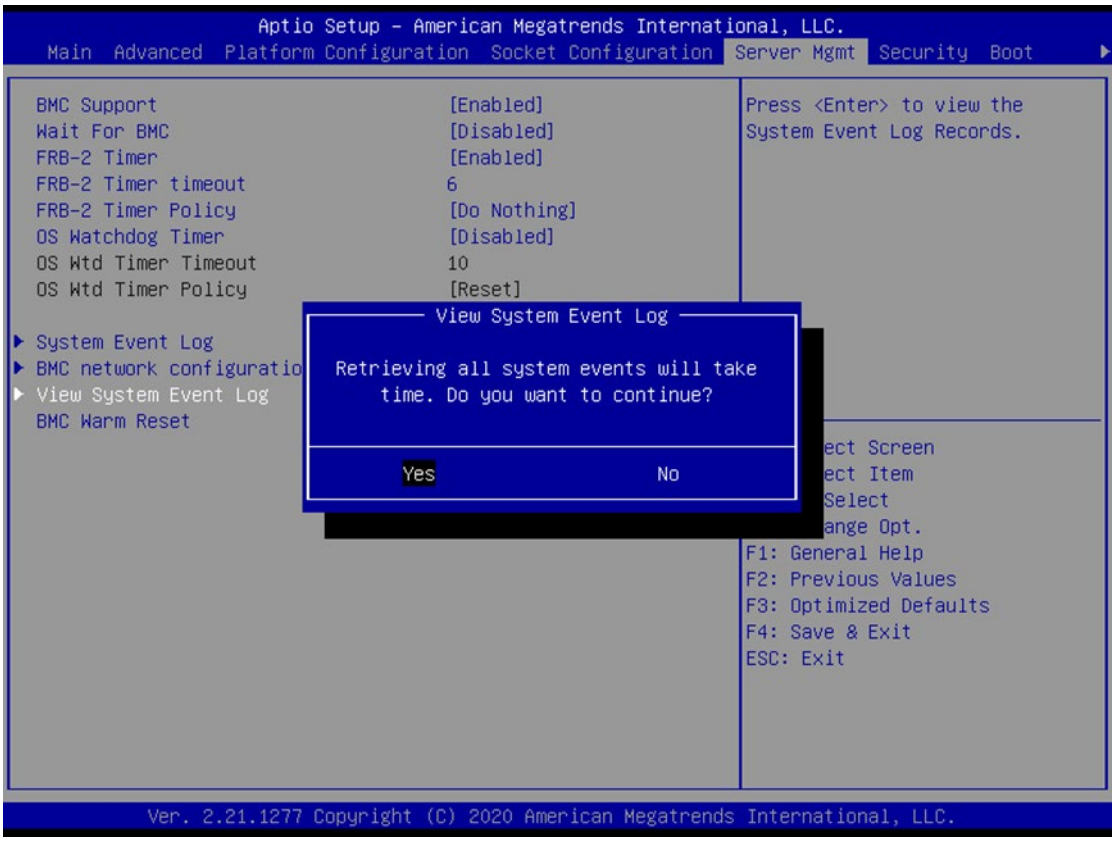
Feature	Options	Description
SEL Components	Disabled Enabled	Enables or disables all features of System Event Logging during boot.
Erase SEL	NO Yes, On next reset Yes, On every reset	Choose options for erasing SEL.
When SEL is Full	Do Nothing Erase Immediately Delete Oldest Record	Choose options for reactions to a full SEL.

BMC Network Configuration



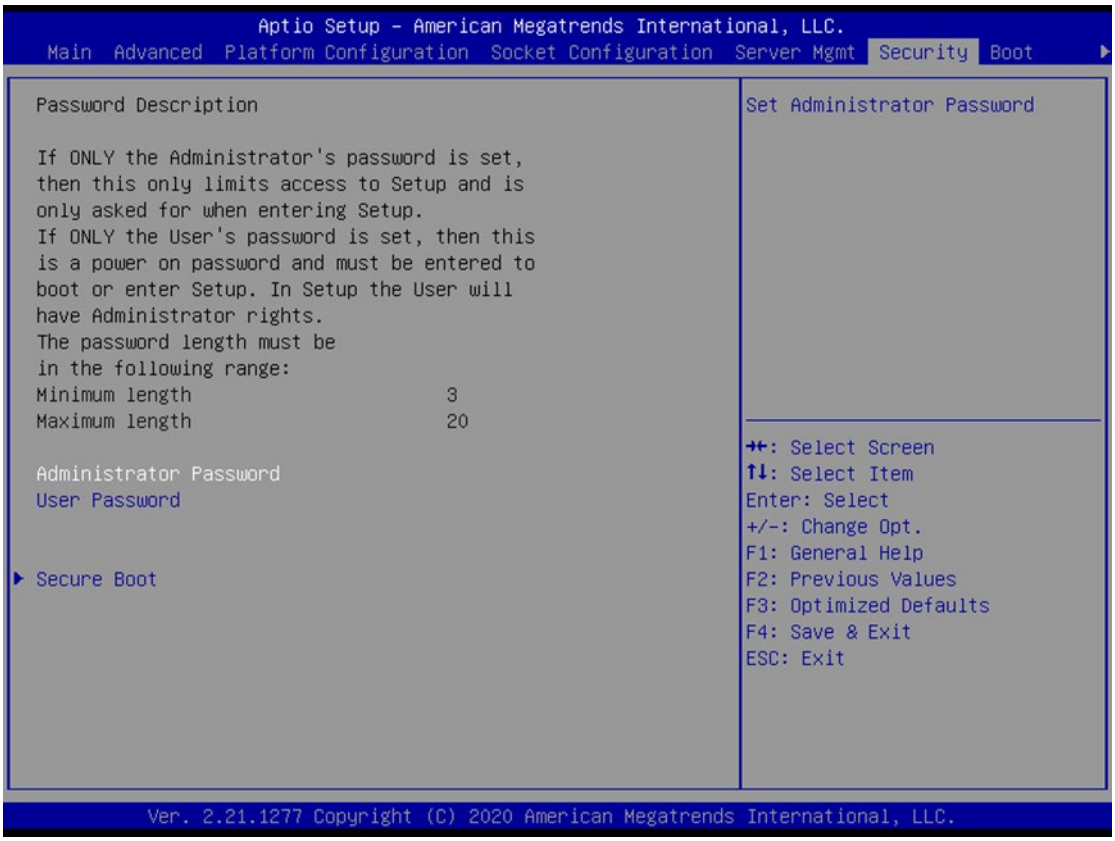
Feature	Options	Description
Configuration Address source	Unspecified Static DynamicBmcDhcp	Select to configure LAN channel parameters statically or dynamically (by BIOS or BMC). The **unspecified** option will not modify any BMC network parameters during BIOS phase.

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.

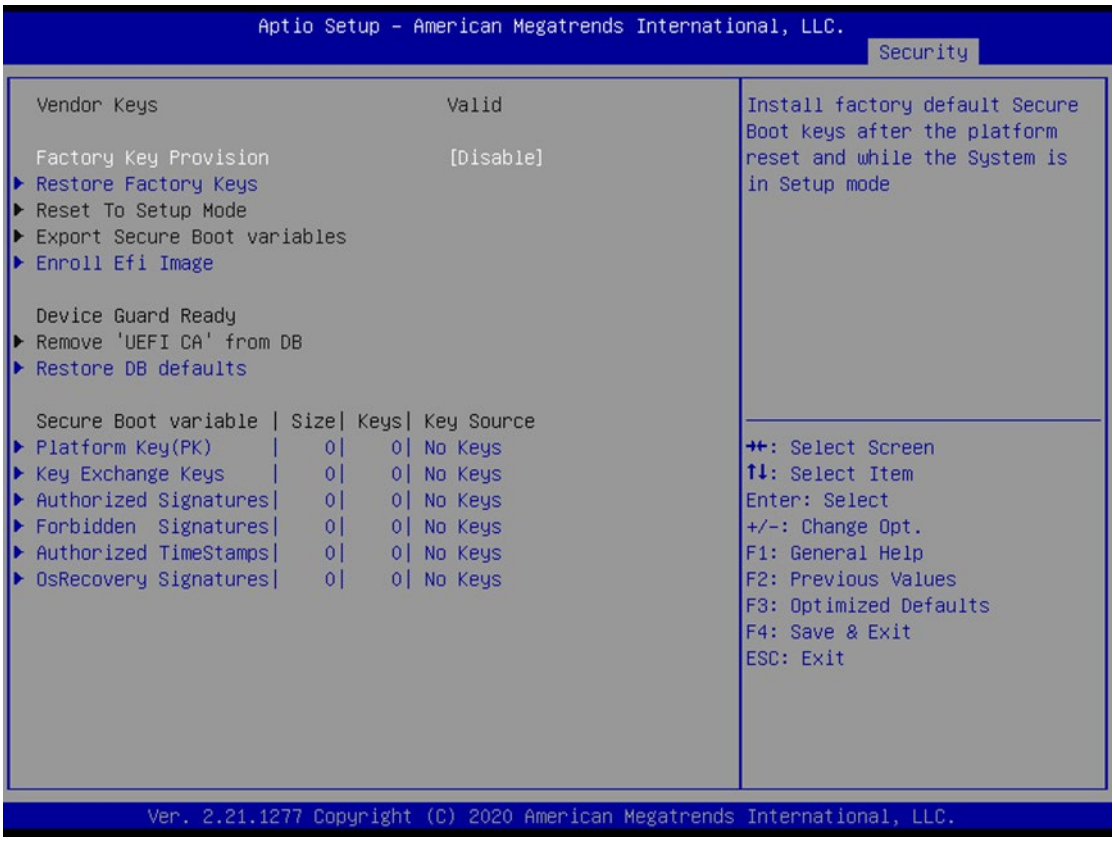


Feature	Description
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the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

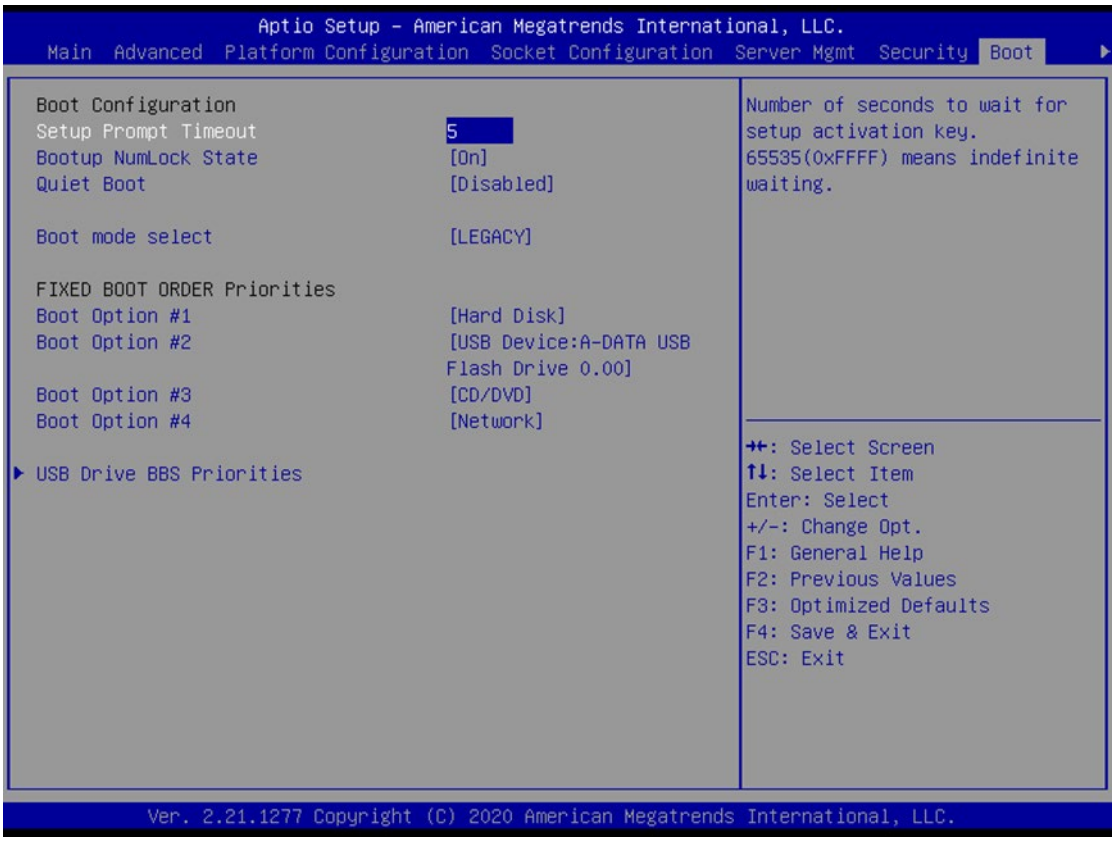
Key Management



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.
Enroll Efi Image	None	Allows the image to run in Secure Boot mode. Enroll SHA256 hash of the binary into Authorized Signature Database (db)

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.

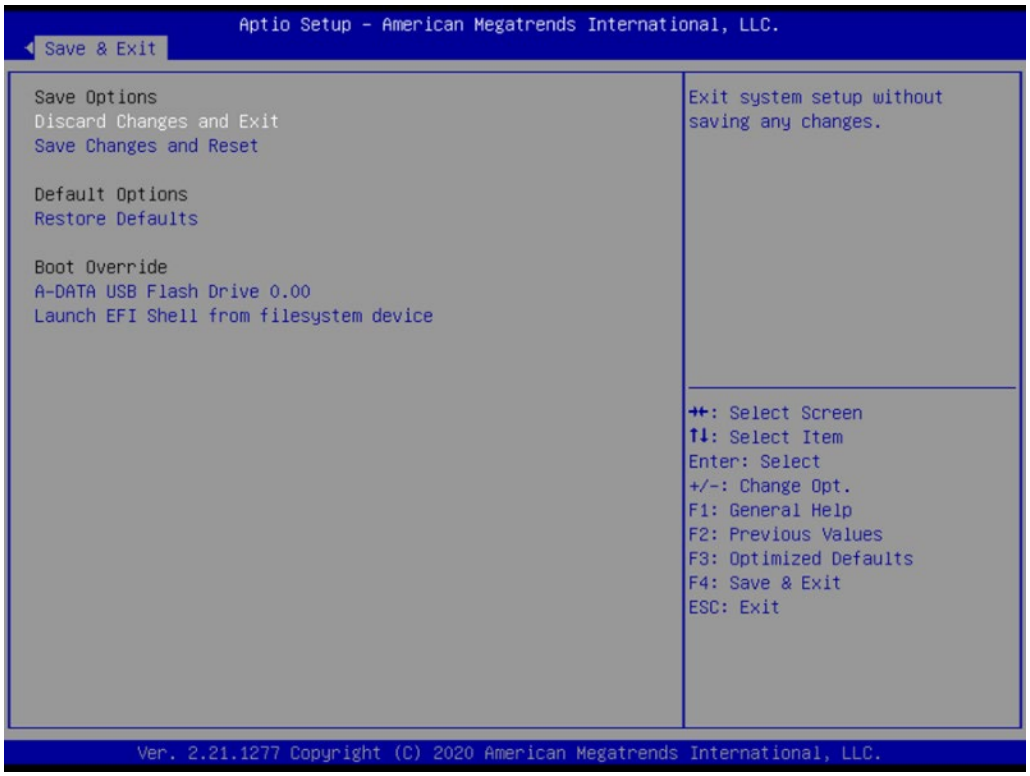


Feature	Options	Description
Setup Prompt Timeout	5	The Number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state.
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option.
Boot mode select	LEGACY UEFI DUAL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

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

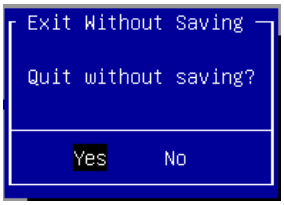
Save and Exit Menu

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.



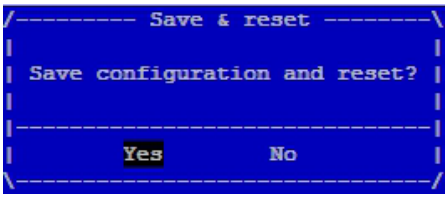
■ Discard Changes and Exit

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.



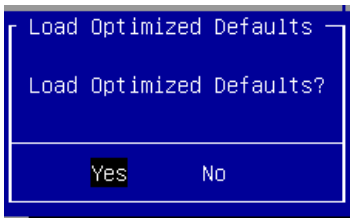
■ Save Changes and Reset

When Users have completed the system configuration changes, select this option to save the changes and 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

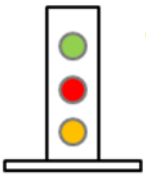
Restore default values for all setup options. Select "**Yes"**to load Optimized defaults.



PS: The items under Boot Override may not be the same as the image above as it should depend on the devices that are connect to the system.

APPENDIX A: LED INDICATOR EXPLANATIONS

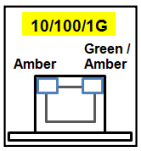
▸ Power / Status / Storage

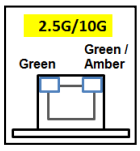


Green : Power
Green / Red : Status
Amber : Storage

LED	COLOR	LED ACTION	DESCRIPTION
Power	**Green**	Steady	System is powered ON
	OFF	N/A	System is powered OFF
Status	**Green**	Steady	System is Active
	Red	Steady	System Error
	OFF	N/A	System is powered OFF
	Note: Status bi-color LED controlled by GPIO		
Storage	**Amber**	Blinking	Storage (HDD) Active
	OFF	N/A	No Data Access

▸ 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		

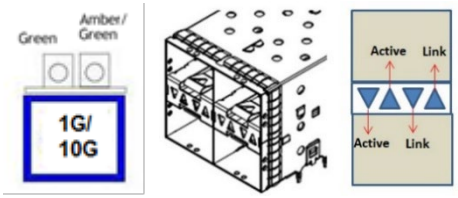
2.5Gb RJ-45 Define:

Speed	Green (Active)	Green/Amber (Link)
10/100M	Blinking / Data access	OFF
1G	Blinking / Data access	ON (**Amber**)
2.5G	Blinking / Data access	ON (**Green**)
1. When cable is plug-in and network is linked. Both LED lights 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		

10Gb RJ-45 Define:

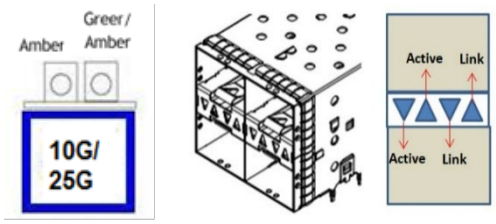
Speed	Green (Active)	Green/Amber (Link)
10/100M	Blinking / Data access	OFF
1G	Blinking / Data access	ON (**Amber**)
10G	Blinking / Data access	ON (**Green**)
1. When cable is plug-in and network is linked. Both LED will be bright. The behavior is as defined. 2. Without the Cable plug-in, the LED should be off 3. If LAN Driver controls the LED, the behavior will follow the driver		

- **(10Gb) SFP+ Light pipe LED (top location)**



Speed	Green (Active)	Amber / Green (Link)
1G	Blinking / Data access	ON **(Green)**
10G	Blinking / Steady	ON **(Green)**
Non-Link	OFF	OFF
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		

- **(25Gb) SFP28 Light pipe LED (top location)**



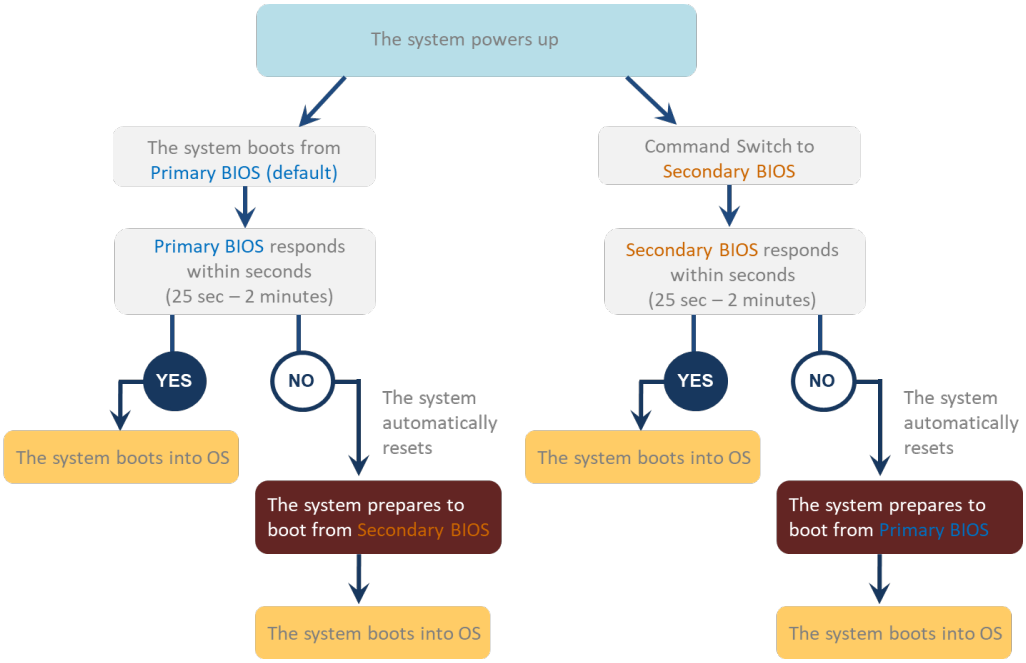
Speed	Green (Active)	Amber / Green (Link)
10G	Blinking / Data access	ON **(Green)**
1. When cable is plug-in and network is linked. Both LED will be bright. The behavior is as defined. 2. Without the Cable plug-in, the LED should be off 3. If LAN Driver controls the LED, the behavior will follow the driver		

APPENDIX B: DUAL BIOS 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.

	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.

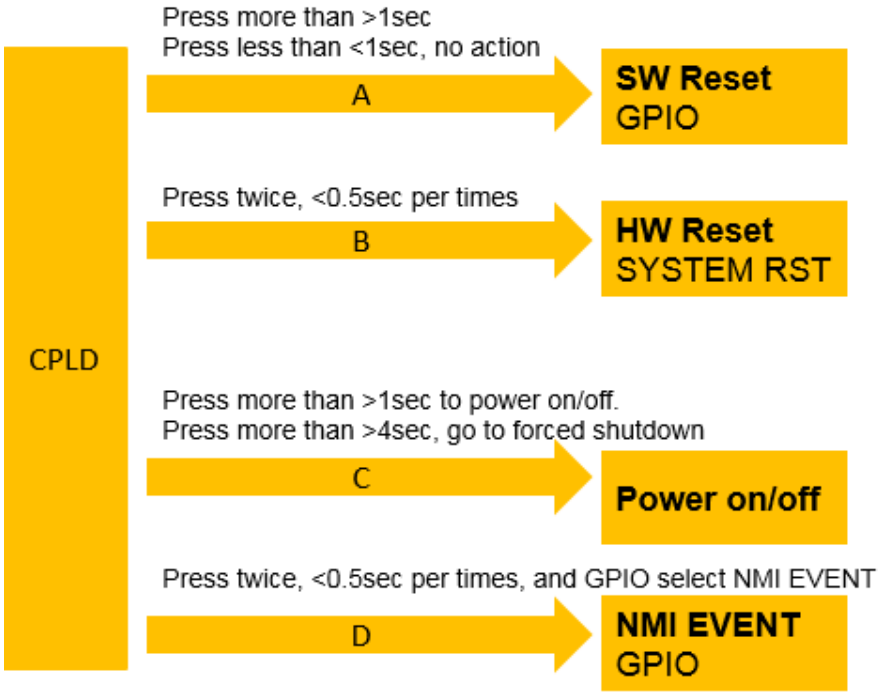
APPENDIX C: REDUNDANT POWER MODULE BEHAVIOR

Define the 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	Put back the PSU Module or Press the Mute Button	Plug-in the Power cord or Press the Mute Button

APPENDIX D: SMART POWER & RESET BUTTON

Smart Power and Reset Button – Control by CPLD



APPENDIX E: 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 F: 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 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
	09: Cache RMA Problem	15: PS2	21: Shut Down
03: CMOS Data Lost	10: Memory Socket Bad	16: LAN	22: Panel Fail
04: FDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
05: HDC Fail	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)
06: Bad Slot			

Request Party

_____

Authorized Signature / Date

Confirmed By Supplier

_____

Authorized Signature / Date