Lanner

Edge Computing Appliance Platform

Hardware Platforms for Edge Computing

ECA-4027
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.

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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

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

Contact Information

Taiwan Corporate Headquarters

Lanner Electronics Inc.

7F, No.173, Sec.2, Datong Rd.

Xizhi District, New Taipei City 22184,

Taiwan

立端科技股份有限公司

221 新北市汐止區

大同路二段 173 號 7 樓

T: +886-2-8692-6060

F: +886-2-8692-6101

E: contact@lannerinc.com

China

Beijing L&S Lancom Platform Tech. Co., Ltd.

Guodong LOFT 9 Layer No. 9 Huinan Road,

Huilongguan Town, Changping District, Beijing

102208 China

T: +86 010-82795600

F: +86 010-62963250

E: service@ls-china.com.cn

USA

Lanner Electronics Inc.

47790 Westinghouse Drive

Fremont, CA 94539

T: +1-855-852-6637

F: +1-510-979-0689

E: sales_us@lannerinc.com

Canada

Lanner Electronics Canada Ltd

3160A Orlando Drive

Mississauga, ON

L4V 1R5 Canada

T: +1 877-813-2132

F: +1 905-362-2369

E: sales_ca@lannerinc.com

Europe

Lanner Europe B.V.

Wilhelmina van Pruisenweg 104

2595 AN The Hague

The Netherlands

T: +31 70 701 3256

E: sales_eu@lannerinc.com

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Federal Communication Commission Interference Statement

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

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

FCC Caution

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

Note

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

Important

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

Safety Guidelines

Follow these guidelines to ensure general safety:

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

Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

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

Lithium Battery Caution

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

Avertissement concernant la pile au lithium

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

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).
- Product shall be used with Class 1 laser device modules.
- The unit is only for Skilled person to install and maintenance
- The device can only be used in a fixed location such as a lab or a machine room. When you install the device, ensure that the protective earthing connection of the socket-outlet is verified by a skilled person.

Sécurité de fonctionnement

- L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.
- Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).
- Le produit doit être utilisé avec des modules de dispositifs laser de classe 1.
- Cette machine est réservée aux techniciens à installer et à entretenir
- L'appareil ne peut être utilisé que dans un lieu fixe, tel qu'un laboratoire ou une salle de machines. Lorsque vous installez l'appareil, assurez-vous que le raccordement à la terre de protection de la prise de courant a fait l'objet d'une vérification par une personne qualifiée.

Mounting Installation Precautions

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

- Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- The installation of this product must be performed by trained specialists; otherwise, a non-specialist might create the risk of the system's falling to the ground or other damages.
- Lanner Electronics Inc. shall not be held liable for any losses resulting from insufficient strength for supporting the system or use of inappropriate installation components.
- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient

temperature (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

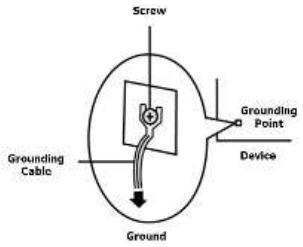
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect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

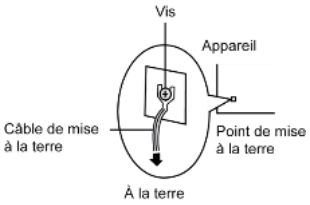
Grounding Procedure for DC Power Source

- 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.



Important

1. For DC power supply, TQ LB In=12, Wiring rage= 22-16AWG, Wire Type= Cu
2. The unit is intended to be supplied by a UL/IEC 62368-1 certified DC power source with ES1 output rated -57 V DC to -40 V DC, minimum 7-10 A with Maximum ambient temperature 65 °C or higher and altitude 5000 m.
3. This equipment must be grounded and the power cord for the equipment should be connected to a socket-outlet with earthing connection.

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

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CHAPTER 1: PRODUCT OVERVIEW

The ECA-4027 Short Depth Chassis Edge Computing Appliance features a powerful 12 or 16-core Intel® Xeon® D-2100 processor, with 8 ports 10G SFP+ and 2x 40G QSFP+ ports for AI edge-focused applications. ECA-4027 was designed to leverage multi-access edge computing by supporting a PCI-E slot for FPGA, GPU, or optional G.8272 PRTC and G.8273 Compliant IEEE 1588v2 and SyncE expansion, in addition to Intel® QuickAssist Technology for improved network performance. With wide-temperature and short-depth chassis, and on-board GPS, ECA-4027 delivers significant performance enhancement in Open RAN, making it suitable as Cell Site Gateway, Multi-access Edge Computing (MEC) server for 5G Edge Cloud, and Open RAN platform for Distributed Units.

Main Features

- Intel®Xeon D-2100 12/16 Cores Processor
- G.8272 PRTC / G.8273 Compliant IEEE 1588v2 and SyncE Timing Module (optional), onboard GPS
- Short Depth Chassis and Wide Operating Temperature -40~65°C (By SKU)
- 2x DDR4 REG, ECC RDIMM, Max. 64GB
- Front Access I/O with 1x 1GbE RJ45 Management Port share with IPMI, 8x 10G SFP+, 2x 40G QSFP+, 1x RJ45 Console, 1x USB 3.0, and front fan placement
- 2x 2.5" Internal HDD/SSD drive bays, 2x M.2 NVMe 2280 M-Key
- 1x PCIe*16 FH/HL Slot for FPGA or GPU cards (Max. Up to 75W)

Package Content

Your package contains the following items:

- 1x ECA-4027 Edge Computing Platform
- 1x RJ45 Console Cable
- 1x Short Ear Rack Mount Kit with screws
- 1x Antenna Cable Kit for GPS

Ordering Information

SKU No.	Description
ECA-4027A	Intel® Xeon® 16C D-2187NT with QAT®, 1x GbE RJ45, 8x 10G SFP+, 2x 40G QSFP+, 1x PCIe Slot, 2x M.2 storage, 2x 2.5" HDD/SSD storage, Dual DC Power, -40°C~65°C Wide Temp Support
ECA-4027B	Intel® Xeon® 12C D-2166NT with QAT®, 1x GbE RJ45, 8x 10G SFP+, 2x 40G QSFP+, 1x PCIe Slot, 2x M.2 storage, 2x 2.5" HDD/SSD storage, Dual DC Power, -40°C~65°C Wide Temp Support
ECA-4027C	Intel® Xeon® 16C D-2187NT with QAT®, 1x GbE RJ45, 8x 10G SFP+, 2x 40G QSFP+, 1x PCIe Slot, 2x M.2 storage, 2x 2.5" HDD/SSD storage, AC Power, 0°C~40°C Temp Support
ECA-4027D	Intel® Xeon® 12C D-2166NT with QAT®, 1x GbE RJ45, 8x 10G SFP+, 2x 40G QSFP+, 1x PCIe Slot, 2x M.2 Storage, 2x 2.5" HDD/SSD Storage, AC Power, 0°C~40°C Temp Support

Optional Accessories

Model	Description
Timing Module Card Kit	PSF9657-010 IEEE1588 Timing Module Kit

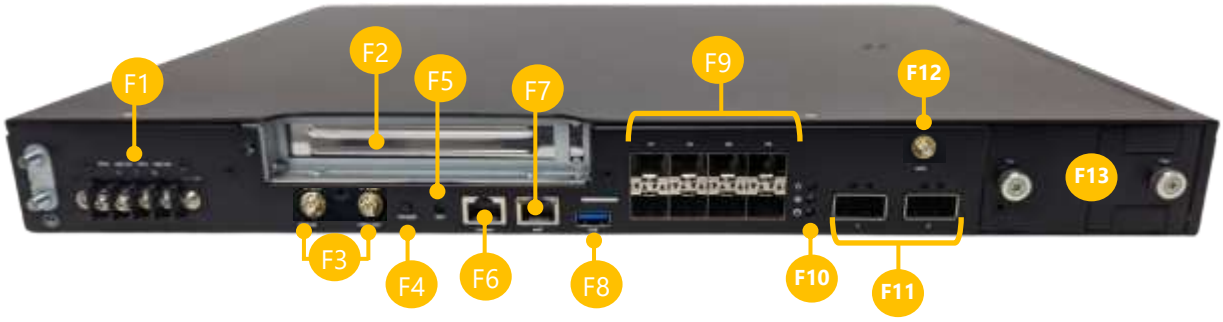
Note The latest version of IEEE-1588 and SyncE Timing Module User Manual can be found on Lanner Download Center.

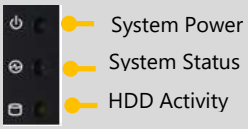
System Specifications

Form Factor		1U 19" Rackmount
Platform	Processor Options	A/C SKU: Intel® Xeon® D-2187NT (Skylake-D), 16 Cores B/D SKU: Intel® Xeon® D-2166NT (Skylake-D), 12 Cores
	CPU TDP	Up to 110W per CPU
	CPU Socket	Onboard
	Chipset	SoC
	Security Acceleration	Intel® QuickAssist Technology
BIOS		AMI SPI Flash BIOS
System Memory	Technology	DDR4 REG RDIMM, up to 2666MHz
	Max. Capacity	64GB
	Socket	2x 288pin DIMM
Networking	Ethernet Ports	1x 1GbE RJ45 Intel® i210-IT, 8x 10GbE SFP+, 2x 40G QSFP+
	IEEE 1588	Optional
	GPS	Onboard
LOM	IO Interface	1x 1GbE RJ45 via NCSI (100Mb)
	OPMA slot	N/A, onboard BMC chip
I/O Interface	Reset Button	1x Reset Button (Default SW Reset)
	Power Button	1x Power Button
	LED Indicator	Power / Status / Storage, refer to **Appendix A**
	Console Port	1x RJ45 Console Port (Default Bard Rate: 115200)
	USB Port	1x USB 3.0 Port
	Power Input	A/B SKU: Dual DC Power; C/D SKU: Single AC Power
Storage	HDD/SSD Support	2x 2.5" Internal Drive Bay
	Onboard Slots	2x M.2 NVMe 2280 M-Key
Expansion	PCIe	1x PCIe*16 FH/HL, support up to 75W device (By Project)
Miscellaneous	Watchdog	Yes
	Internal RTC w/ Li Battery	Yes
	TPM	Yes, IAC-TPM04A Module installed on board
Cooling	Processor	Passive CPU Heatsink
	System	5x Smart Fans
	Fan Specification	2x eTemp; 3x Normal
Environmental Parameters	Temperature	Operating Temperature: -40˚C ~65˚C or 0°C~40°C (By SKU) Storage Temperature: -40˚C ~70˚C
	Humidity (RH)	Operating: 5% ~ 90% RH Storage: 5% ~ 95% RH
System Dimensions	(WxDxH)	438 x 371 x 44mm
	Weight	5 kg
Package Dimensions	(WxDxH)	555 x 479 x 179mm
	Weight	7 kg
Power	Type/Watts	A/B SKU: 400W C/D SKU: 500W
	Input	A/B SKU: -57VDC ~ -40VDC Dual Input Feed (EMC -48) C/D SKU: 100~240V, 6-3A, 50-60Hz
Approvals and Compliance		RoHS Directive (EU) 2015/863, CE/FCC Class A, UL,
OS Support		Linux

Front Panel

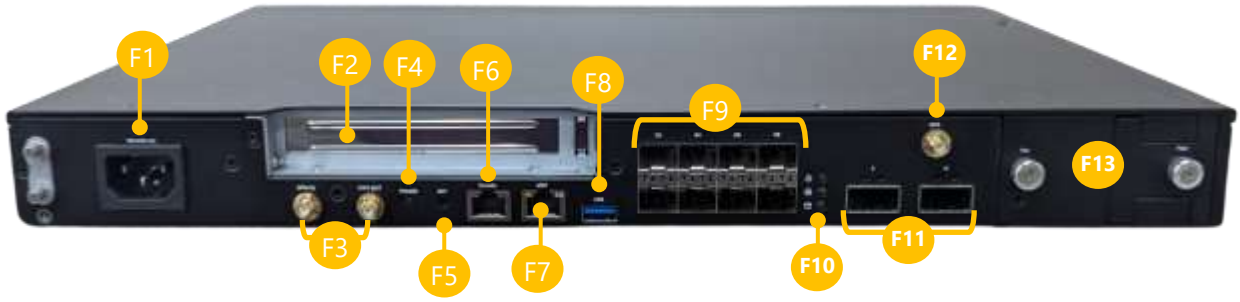
ECA-4027A / ECA-4027B

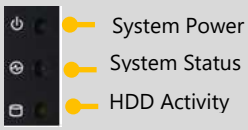


No.	Description	
F1	Power Supply	Dual DC Power
F2	PCIe Expansion	PCIe*16 Expansion Slot (FH/HL), support up to 75W (Optional)
F3	1PPS Connector	IEEE 1588v2 1PPS IN/OUT Connector
F4	Power Button	1x Power Button
F5	Reset Button	For Software Reset (control by CPLD)
F6	Console Port	1x RJ45 Console Port
F7	MGT Port	1x 1GbE RJ45 Management Port share with IPMI
F8	USB Port	1x USB 3.0 Port
F9	LAN Ports	8x 10G SFP+ Ports
F10	LED Indicators	
F11	LAN Ports	2x 40G QSFP+ Ports
F12	Antenna	1x GPS Antenna Hole
F13	Fan Tray + Fans	Fan Tray with 5x Cooling Fans

Front Panel

ECA-4027C / ECA-4027D



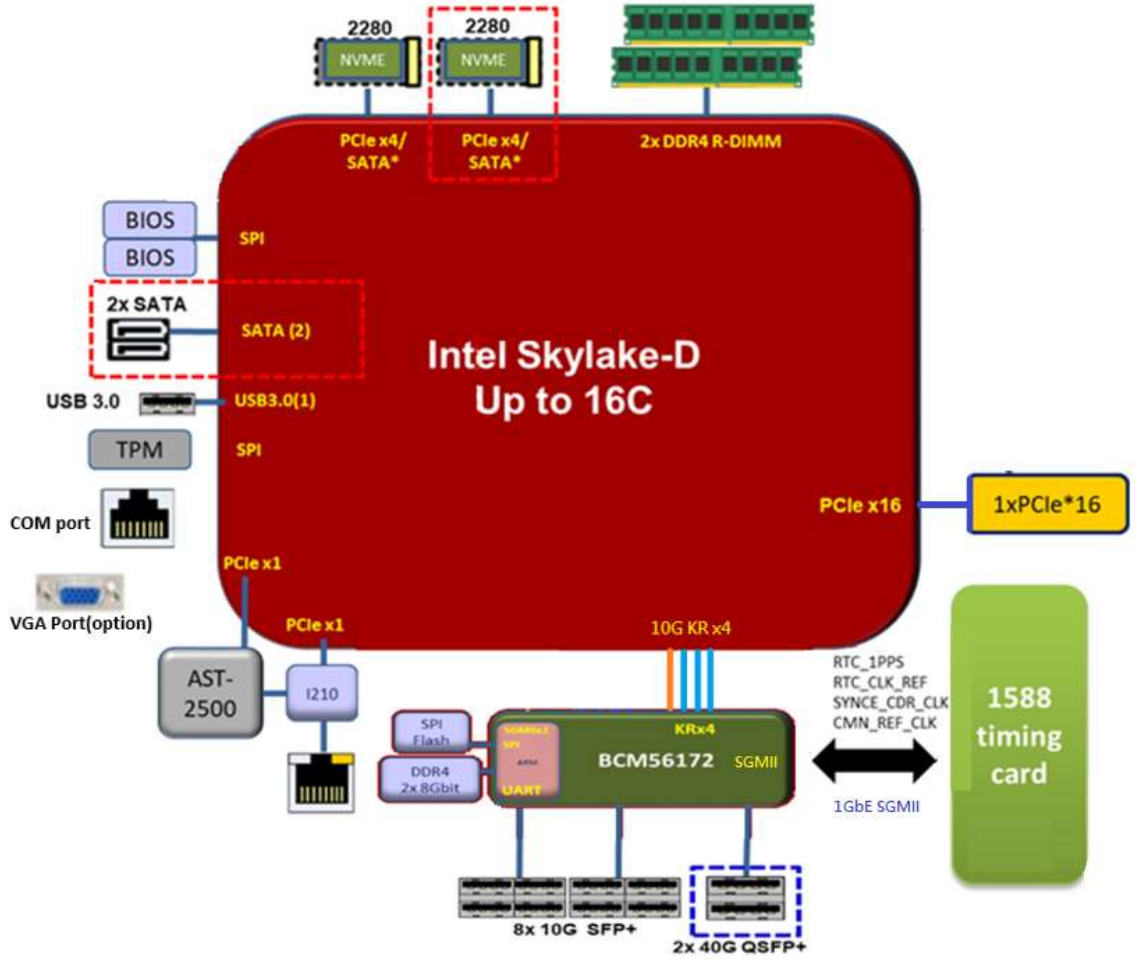
No.	Description	
F1	Power Supply	Single AC Power
F2	PCIe Expansion	PCIe*16 Expansion Slot (FH/HL), support up to 75W (Optional)
F3	1PPS Connector	IEEE 1588v2 1PPS IN/OUT Connector
F4	Power Button	1x Power Button
F5	Reset Button	For Software Reset (control by CPLD)
F6	Console Port	1x RJ45 Console Port
F7	MGT Port	1x 1GbE RJ45 Management Port share with IPMI
F8	USB Port	1x USB 3.0 Port
F9	LAN Ports	8x 10G SFP+ Ports
F10	LED Indicators	 System Power System Status HDD Activity
F11	LAN Ports	2x 40G QSFP+ Ports
F12	Antenna	1x GPS Antenna Hole
F13	Fan Tray + Fans	Fan Tray with 5x Cooling Fans

Rear Panel



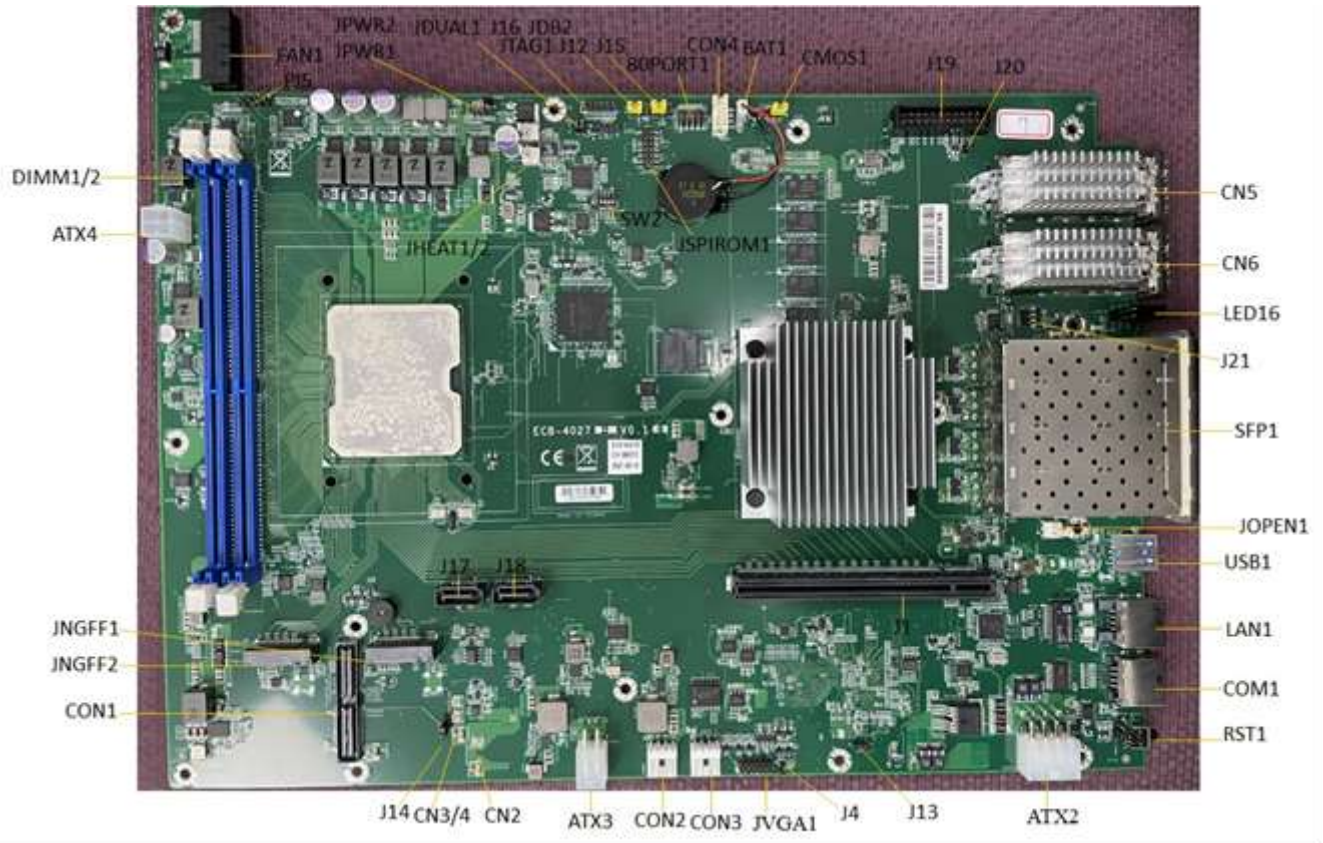
CHAPTER 2: MOTHERBOARD INFORMATION

Block Diagram



Motherboard Layout

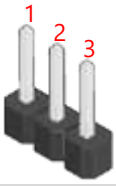
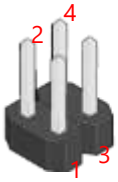
The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.



Internal Jumpers and Connectors

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

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

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

Jumper	Function
ATX2	Power input connector
ATX3/ATX4	12V power connector
J1	Gen 3 PCI Express x16 SLOT
JSPIROM1	2x7 2.0mm SPI ROM programming & TPM module pin header
CMOS1	1x3 2.54mm pin header Clear CMOS Data
80PORT1	2x5 2.0mm BIOS DEBUG PORT pin header
JOPEN1	1x2 2.54mm CASE OPEN WAFER
JVGA1	2X6 2.0mm VGA Output Header
CON2	SATA Power Connector
CON3	Power Board Temp Connector
RST1	Reset Button
BAT1	Battery Connector
J13	IPMI Debug COM Port header
J4	IPMI EXT Reset Header
J15	BIOS Boot Up Select Header
J12	Disable Dual BIOS Function Header
JDB2	CPLD Debug header
J16	PROGRAM MCU Header
JDUAL1	Select CS for Flash Fixture header
JPWR1/2	MCU SW PWR Header / PWR Header
JHEAT1/2	Heater PWR Header
PJ5	CPU PWR solution PROGRAM Header
JTAG1	CPLD PROGRAM Header
CON4	MCU PROGRAM Header
SW2	Setting MCU PROGRAM Mode Header
J21	BCM56172 COM port Heater
J19	BCM56172 ICE Heater
J20	BCM56172 Reset Heater
J14	1PPS Input Select Heater
CN3/4	1PPS Input/output Connector
CN2	GPS 1PPS Input Connector
CON1	IEEE-1588 Module Connector
JNGFF1/2	NVME Connector
J17/18	SATA Connector
LAN1	1G LAN Port Connector
COM1	COM Port
USB1	USB Port Connector

SFP1	10G Fiber Connector
CN5/6	40G Fiber Connector
DIMM1/2	DDR4 CONNECTOR

Connectors Pin Assignment

1. ATX2: Power Input Connector

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



2. ATX2/ATX4: 12V Power Connector

Pin #	Description	Pin #	Description
1	GND	3	12V
2	GND	4	12V



3. J1: Gen 3 PCI Express x16 Slot

Pin #	Description	Pin #	Description
B1	+12V	A1	NC
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	NC
B5	SMCLK	A5	NC
B6	SMDAT	A6	NC
B7	GND	A7	NC
B8	+3.3V	A8	NC
B9	NC	A9	+3.3V
B10	3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PERST#
B12	NC	A12	GND
B13	GND	A13	REFCLK+
B14	CPUPETP15	A14	REFCLK-
B15	CPUPETN15	A15	GND
B16	GND	A16	CPUPERP15
B17	NC	A17	CPUPERN15
B18	GND	A18	GND
B19	CPUPETP14	A19	NC
B20	CPUPETN14	A20	GND
B21	GND	A21	CPUPERP14
B22	GND	A22	CPUPERN14



B23	CPUPETP13	A23	GND
B24	CPUPETN13	A24	GND
B25	GND	A25	CPUPERP13
B26	GND	A26	CPUPERN13
B27	CPUPETP12	A27	GND
B28	CPUPETN12	A28	GND
B29	GND	A29	CPUPERP12
B30	NC	A30	CPUPERN12
B31	NC	A31	GND
B32	GND	A32	NC
B33	CPUPETP11	A33	NC
B34	CPUPETH11	A34	GND
B35	GND	A35	CPUPERP11
B36	GND	A36	CPUPERN11
B37	CPUPETP10	A37	GND
B38	CPUPETN10	A38	GND
B39	GND	A39	CPUPERP10
B40	GND	A40	CPUPERN10
B41	CPUPETP9	A41	GND
B42	CPUPETN9	A42	GND
B43	GND	A43	CPUPERP9
B44	GND	A44	CPUPERN9
B45	CPUPETP8	A45	GND
B46	CPUPETN8	A46	GND
B47	GND	A47	CPUPERP8
B48	NC	A48	CPUPERN8
B49	GND	A49	GND
B50	CPUPETP7	A50	NC
B51	CPUPETN7	A51	GND
B52	GND	A52	CPUPERP7
B53	GND	A53	CPUPERN7
B54	CPUPETP6	A54	GND
B55	CPUPETN6	A55	GND
B56	GND	A56	CPUPERP6
B57	GND	A57	CPUPERN6
B58	CPUPETP5	A58	GND
B59	CPUPETN5	A59	GND
B60	GND	A60	CPUPERP5
B61	GND	A61	CPUPERN5
B62	CPUPETP4	A62	GND
B63	CPUPETN4	A63	GND

B64	GND	A64	CPUPERP4
B65	GND	A65	CPUPERN4
B66	CPUPETP3	A66	GND
B67	CPUPETN3	A67	GND
B68	GND	A68	CPUPERP3
B69	GND	A69	CPUPERN3
B70	CPUPETP2	A70	GND
B71	CPUPETN2	A71	GND
B72	GND	A72	CPUPERP2
B73	GND	A73	CPUPERN2
B74	CPUPETP1	A74	GND
B75	CPUPETN1	A75	GND
B76	GND	A76	CPUPERP1
B77	GND	A77	CPUPERN1
B78	CPUPETP0	A78	GND
B79	CPUPETN0	A79	GND
B80	GND	A80	CPUPERP0
B81	NC	A81	CPUPERN0
B82	GND	A82	GND

4. JSPIROM1: 2x7 2.0mm SPI ROM Programming & TPM Module Pin Header

Pin #	Description	Pin #	Description
1	3.3V ME POWER	2	SPI_CS1#
3	SPI_CS0#	4	3.3V ME POWER
5	SPI_MISO_TPM	6	SPI_PCH_IO3
7	NC	8	SPI_CLK_TPM
9	GND	10	SPI_MOSI_TPM
11	IRQ_TPM_SPI#_R	12	NC
13	SPI_TPM_CS0#	14	RESET



5. CMOS1: 1x3 2.54mm Pin Header

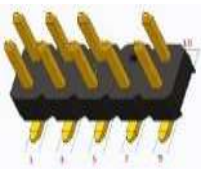
Clear CMOS Data

Pin #	Description
1-2 (Default)	Normal
2-3	Clear CMOS



6. 80PORT1: 2x5 2.0mm BIOS Debug Port Pin Header

Pin #	Description	Pin #	Description
1	CLK_24M_P80	2	LPC_LAD_1
3	RST_PORT80_N	4	LPC_LAD_0
5	LPC_FRAME_N	6	3.3V
7	LPC_LAD_3	X	X
9	LPC_LAD_2	10	GND



7. JOPEN1: 1x2 2.54mm Case Open Wafer

Pin #	Description
1	GND
2	Intruder#



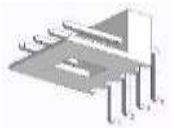
8. JVGA1: 2x6 2.0mm VGA Output Header

Pin #	Description	Pin #	Description
1	RED	2	GND
3	GREEN	4	GND
5	BLUE	6	GND
7	HSYNC	8	NC
9	VSYNC	10	GND
11	DDC_DATA_CONT	12	DDC_CLK_CONT



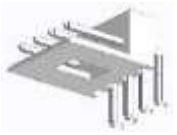
9. CON2: SATA Power Connector

Pin #	Description
1	5V
2	5V
3	GND
4	GND



10. CON3: Power Board Temp Connector

Pin #	Description
1	3.3V
2	PWRB_TEMP_SCL
3	PWRB_TEMP_SDA
4	GND



11. RST1: Reset Button

Pin #	Description
1	FP_RST_SEL
2	GND
3	GND
4	GND



12. BAT1: Battery Connector

Pin #	Description
1	VBAT
2	GND



13. J13: IPMI Debug COM Port Header

Pin #	Description
1	COM5_RX
2	COM5_TX
3	GND



14. J4: IPMI EXT Reset Header

Pin #	Description
1	IPMI_RST
2	GND



15. J15: BIOS Boot Up Select Header

Pin #	Description
1	3.3V AUX
2	BIOS_BOOT_SEL
3	GND



16. J12: Disable Dual BIOS Function Header

Pin #	Description
1	3.3V AUX
2	DUAL_BIOS_DIS
3	GND



17. JDB2: CPLD Debug Header

Pin #	Description
1	FM_DEBUG_ENGINE_TX
2	GND
3	FM_FORCE_PWR_ON_N



18. J16: Program MCU Header

Pin #	Description
1	PIO0_1
2	GND



19. JDUAL1: Select CS for Flash Fixture Header

Pin #	Description
1	SPI_CS0#
2	SPI_CS0#_DUAL
3	SPI_CS1#_DUAL
4	SPI_CS1#



20. JPWR1/2: MCU SW PWR Header / PWR Header

JPWR1

Pin #	Description
1	PWR_BTN_IGN
2	PWRON#



JPWR2

Pin #	Description
1	PWRON#
2	GND

21. JHEAT 1/2: Heater PWR Header

Pin #	Description
1	12V AUX
2	GND



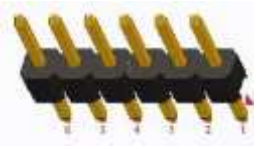
22. PJ5: CPU PWR Solution Program Header

Pin #	Description
1	NC
2	SMB_VR_DAT
3	SMB_VR_CLK
4	GND



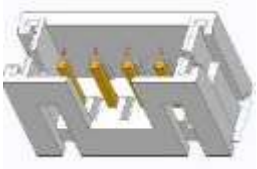
23. JTAG1: CPLD Program Header

Pin #	Description
1	3.3V AUX
2	JTAG_PLD_TDO
3	JTAG_PLD_TDI
4	JTAG_PLD_TMS
5	GND
6	JTAG_PLD_TCK



24. CON4: MCU Program Header

Pin #	Description
1	IGN3V3_SB
2	EXT_RXD
3	GND
4	EXT_TXD



25. SW2: Setting MCU Program Mode Header

Pin #	Description	Pin #	Description
1	PIO1_6_RXD	2	PIO1_7_TXD
3	PIO1_6_RXD	4	PIO1_7_TXD
5	NXP_TXD	6	NXP_RXD
7	MCU_SIN	8	MCU_SOUT



26. J21: BMC56172 COM Port Heater

Pin #	Description
1	COM0_RX
2	COM0_TX
3	GND



27. J19: BCM56172 ICE Heater

Pin #	Description	Pin #	Description
1	P3V3	2	GND
3	BCM56172_JTRST	4	NC
5	BCM56172_JTDI	6	GND
7	BCM56172_JTMS	8	GND
9	BCM56172_JTCK	10	GND
11	BCM56172_RTCK	12	GND
13	BCM56172_JTDO	14	GND
15	RESET_SOFT	16	GND
17	NC	18	GND
19	NC	20	GND

28. J20: BCM56172 Reset Heater

Pin #	Description
1	BCM56172_RESET_SOFT
2	GND

29. J14: 1PPS Input Select Heater

Pin #	Description
1	GPS_1PPS
2	1588_1PPS_IN
3	1PPS_IN



30. CN3/4: 1PPS Input / Output Connector

CN3

Pin #	Description
1	1PPS_IN
2	GND_1588
3	GND_1588



CN4

Pin #	Description
1	1PPS_OUT
2	GND_1588
3	GND_1588

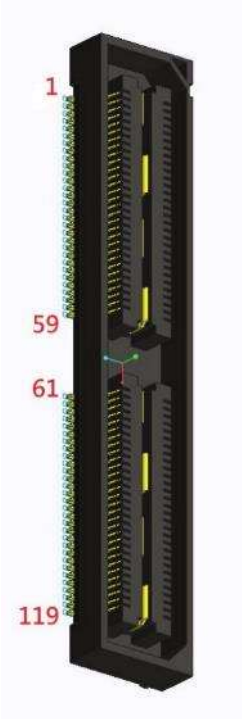
31. CN2: GPS 1PPS Input Connector

Pin #	Description
1	RF_INPUT
2	GND_GB
3	GND_GB



32. CON1: IEEE-1588 Module Connector

Pin #	Description	Pin #	Description
1	P12V	2	GND
3	P12V	4	GND
5	P12V	6	GND
7	NC	8	LANE_TX_TIM_P
9	NC	10	LANE_TX_TIM_N
11	GND	12	GND
13	NC	14	LANE_RX_TIM_P
15	NC	16	LANE_RX_TIM_N
17	GND	18	GND
19	NC	20	NC
21	NC	22	NC
23	GND	24	GND
25	NC	26	NC
27	NC	28	NC
29	GND	30	GND
31	NC	32	NC
33	NC	34	NC
35	GND	36	GND
37	NC	38	NC
39	NC	40	NC
41	GND	42	GND
43	NC	44	NC
45	NC	46	NC



47	GND	48	GND
49	L1_RCVRD_CLK	50	NC
51	GND	52	NC
53	L1_RCVRD_CLK_BKUP	54	NC
55	GND	56	1588_INT_I_N
57	1588_1PPS_IN	58	1588_INT_O_N
59	GND	60	IP_BSC_SDA1
61	F_CDR_CLK1_1588_In	62	IP_BSC_SCL1
63	GND	64	IEEE1588_MDIO
65	25M_XTALIN_IEEE1588	66	IEEE1588_MDC
67	GND	68	GND
69	25M_XTAout_IEEE1588	70	NC
71	GND	72	NC
73	RTC_CLK_REF_P	74	BS_TIME_VAL0
75	RTC_CLK_REF_N	76	NC
77	GND	78	NC
79	1588_TS_CLKP	80	BS_TIME_VAL1
81	1588_TS_CLKN	82	GND
83	25M_CLK_OUT_R	84	NC
85	NC	86	NC
87	GND	88	NC
89	1588_156_CLKP	90	NC
91	1588_156_CLKN	92	GND
93	GND	94	FRSYNC_8K_1PPS
95	MDIO2	96	1PPS_OUT
97	MDC2	98	GND
99	NC	100	PLT_RST#_A
101	NC	102	NC
103	NC	104	NC
105	NC	106	NC
107	NC	108	NC
109	NC	110	NC
111	NC	112	NC
113	NC	114	NC
115	NC	116	NC
117	NC	118	NC
119	NC	120	NC
PAD1	GND	PAD2	GND
PAD3	GND	PAD4	GND
PAD5	GND	PAD6	GND
PAD7	GND	PAD8	GND

33. JNGFF1/2: NVME Connector

JNGFF1

Pin #	Description	Pin #	Description
1	GND	2	3.3V
3	GND	4	3.3V
5	PCIE_N1TX_C_CRX_N11	6	NC
7	PCIE_N1TX_C_CRX_P11	8	NC
9	GND	10	NC
11	PCIE_CTX_C_N1RX_N11	12	3.3V
13	PCIE_CTX_C_N1RX_P11	14	3.3V
15	GND	16	3.3V
17	PCIE_N1TX_C_CRX_N10	18	3.3V
19	PCIE_N1TX_C_CRX_P10	20	NC
21	GND	22	NC
23	PCIE_CTX_C_N1RX_N10	24	NC
25	PCIE_CTX_C_N1RX_P10	26	NC
27	GND	28	NC
29	PCIE_N1TX_C_CRX_N9	30	NC
31	PCIE_N1TX_C_CRX_P9	32	NC
33	GND	34	NC
35	PCIE_CTX_C_N1RX_N9	36	NC
37	PCIE_CTX_C_N1RX_P9	38	NC
39	GND	40	NC
41	PCIE_N1TX_C_CRX_P8	42	NC
43	PCIE_N1TX_C_CRX_N8	44	NC
45	GND	46	NC
47	PCIE_CTX_C_N1RX_N8	48	NC
49	PCIE_CTX_C_N1RX_P8	50	CPU0_PCIE_RST#
51	GND	52	NGFF_CLKREQ_1N
53	CLK_PCIE_NVME1_N	54	NC
55	CLK_PCIE_NVME1_P	56	NC
57	GND	58	NC
67	NC	68	NGFF_32K_CLK_1
69	GND	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	GND		



JNGFF2

Pin #	Description	Pin #	Description
1	GND	2	3.3V
3	GND	4	3.3V
5	PCIE_N2TX_C_CRX_N3	6	NC
7	PCIE_N2TX_C_CRX_P3	8	NC
9	GND	10	NC
11	PCIE_CTX_N2RX_N3	12	3.3V
13	PCIE_CTX_N2RX_P3	14	3.3V
15	GND	16	3.3V
17	PCIE_N2TX_C_CRX_N2	18	3.3V
19	PCIE_N2TX_C_CRX_P2	20	NC
21	GND	22	NC
23	PCIE_CTX_N2RX_N2	24	NC
25	PCIE_CTX_N2RX_P2	26	NC
27	GND	28	NC
29	PCIE_N2TX_C_CRX_N1	30	NC
31	PCIE_N2TX_C_CRX_P1	32	NC
33	GND	34	NC
35	PCIE_CTX_N2RX_N1	36	NC
37	PCIE_CTX_N2RX_P1	38	NC
39	GND	40	NC
41	PCIE_N2TX_C_CRX_N0	42	NC
43	PCIE_N2TX_C_CRX_P0	44	NC
45	GND	46	NC
47	PCIE_CTX_N2RX_N0	48	NC
49	PCIE_CTX_N2RX_P0	50	CPU0_PCIE_RST1#
51	GND	52	NGFF_CLKREQ_2N
53	CLK_PCIE_NVME2_N	54	NC
55	CLK_PCIE_NVME2_P	56	NC
57	GND	58	NC
67	NC	68	NGFF_32K_CLK_2
69	GND	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	GND		

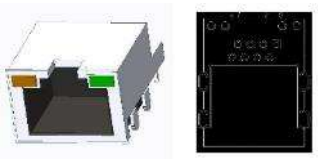
34. J17/18: SATA Connector

Pin #	Description
1	GND
2	SATA_HTX_C_DRX_P0
3	SATA_HTX_C_DRX_N0
4	GND
5	SATA_HRX_DTX_N0
6	SATA_HRX_DTX_P0
7	GND
PAD1	GND
PAD2	GND



35. LAN1: 1G LAN Port Connector

Pin #	Description	Pin #	Description
1	LAN1_MDX0P	2	LAN1_MDX0N
3	LAN1_MDX1P	4	LAN1_MDX2P
5	LAN1_MDX2N	6	LAN1_MDX1N
7	LAN1_MDX3P	8	LAN1_MDX3N
9	LAN1_LINK_ACT_N	10	3.3V AUX
11	LAN1_LINK_1000_N	12	LAN1_LINK_100_N
PAD1	GND	PAD2	GND



36. COM1: COM Port

Pin #	Description	Pin #	Description
1	NRTS2-	2	NDTR2-
3	NSOUT2	4	GND
5	GND	6	NSIN2
7	NDSR2-	8	NCTS2-
9	GND	10	GND
11	GND	12	GND

37. USB1: USB Port Connector

Pin #	Description	Pin #	Description
1	P5V_USB	2	USB20_N2_L
3	USB20_P2_L	4	GND
5	USB3_HRX_L_DTX_N1	6	USB3_HRX_L_DTX_P1
7	GND	8	USB3_HTX_L_DRX_N1
9	USB3_HTX_L_DRX_P1		
PAD1	GND	PAD2	GND
PAD3	GND	PAD4	GND



CHAPTER 2: HARDWARE SETUP

To reduce the risk of personal injury, electric shock, or damage to the system, please remove all power connections to shut down the device completely, and wear ESD protection gloves when conducting the steps in this chapter. Do not open the chassis cover when the system is in operation or after it has been powered on.

Opening the Chassis

1. Power off the system.
2. Unscrew the two (2) screws on the top cover



3. Gently slide the cover forward a bit.



4. Lift the cover up to remove.

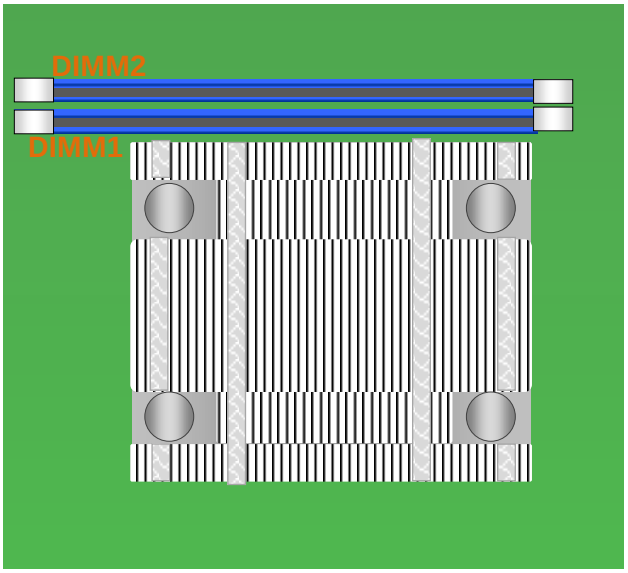


Installing the System Memory

The motherboard supports 2 memory slots for DDR4 registered DIMM.

Supported System Memory Summary

Total Slots	2
Number of Channels	2 (Channel 0~1, 1 DIMM per channel)
Supported DIMM Capacity	8GB, 16GB, 32GB
Memory Size	Maximum 64GB RDIMM (32GB*2)
Memory Type	DDR4 ECC RDIMM 2400MHZ
Minimum DIMM Installed	At least 1 memory module to boot and run from.



Memory Module Installation Instructions

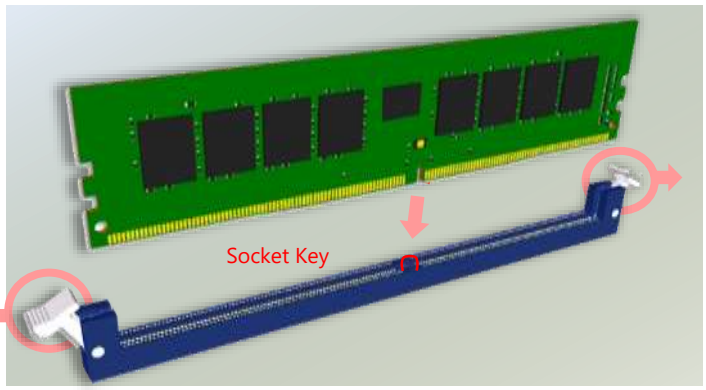
1. Power off the system and open the chassis.
2. Locate the DIMM memory modules slots on the motherboard.



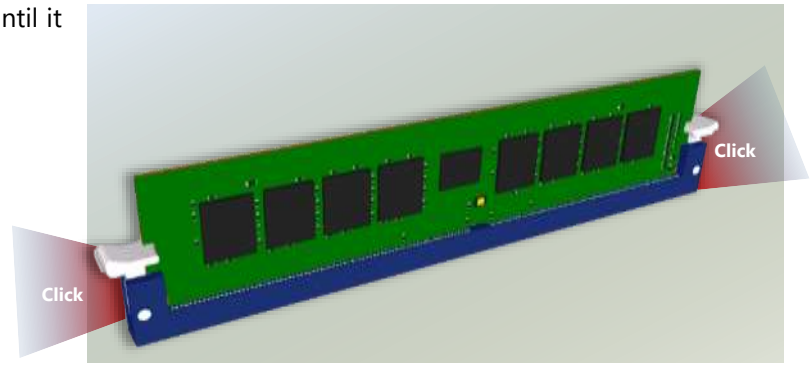
3. Pull open the white DIMM slot latches.



4. Align the notch of the memory module with the socket key in the slot.



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



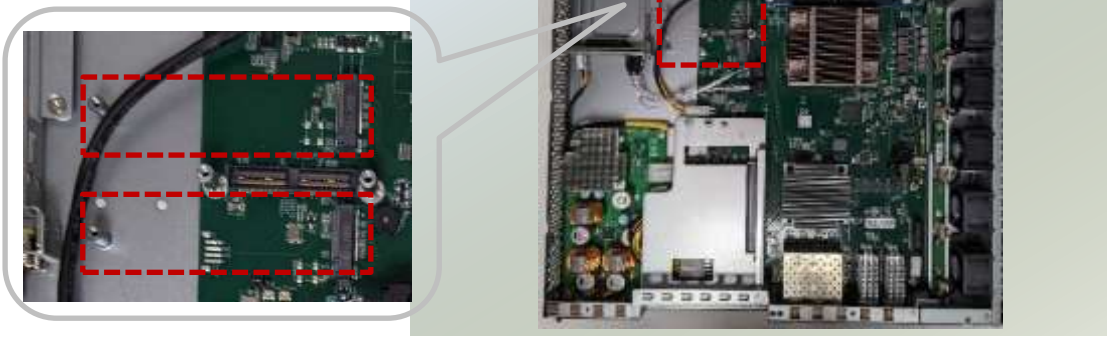
6. The memory modules have been installed.



Installing M.2 Modules (Optional)

This system supports two M.2 NVMe 2280 M Key module slot. Please follow the instructions below to install.

1. Power down the system and open the chassis.
2. Locate the M.2 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.



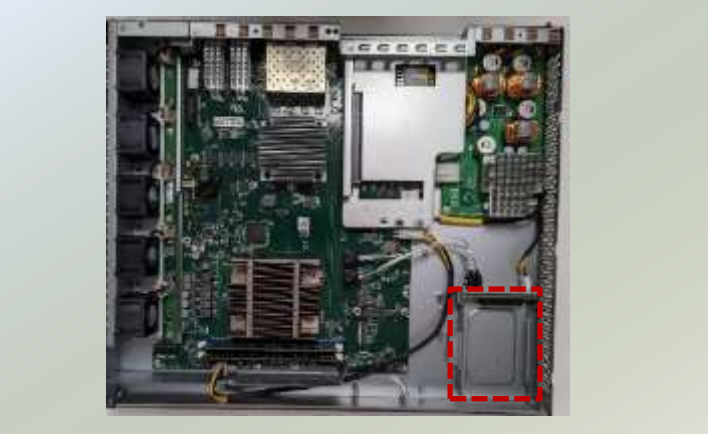
5. Push down on the module and secure it with a screw. Follow the same steps to install a second storage module card.



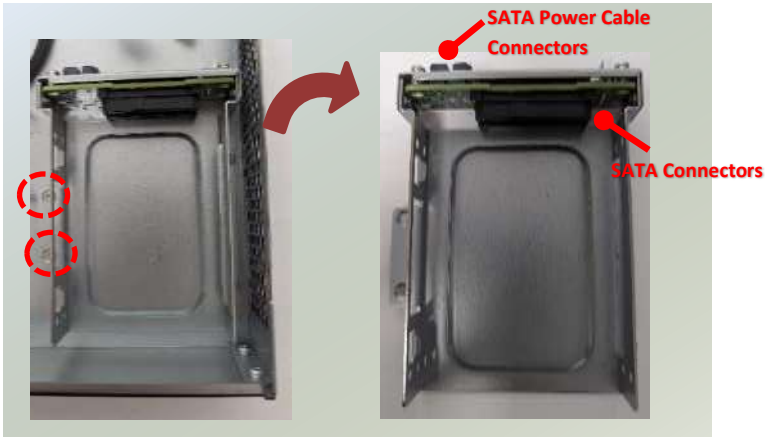
Installing the Disk Drives (Optional)

This system supports a disk drive bay, suitable for two 2.5" HDD/SSD drives. Please follow the instructions to install the disk drives.

1. Power off the system and open the chassis cover.
2. Locate the 2.5" drive bay. The drive tray should be secured to the motherboard.



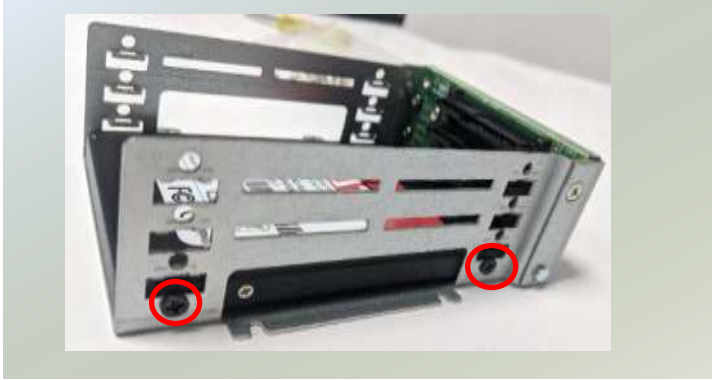
3. Loosen the two (2) screws that fixes the drive tray. Gently pull out the disk tray.



4. Slide a 2.5" HDD/SSD into the drive tray. Push in until the SATA Connector is firmly seated.



5. Secure the disk with two (2) screws on each side (four screws total).
6. Repeat steps above for second drive.



7. Connect the SATA cable and SATA power cable to the disk tray.



8. Install the tray back to the original position on the motherboard. Watch out for the embedded latch on the other side of the screws.



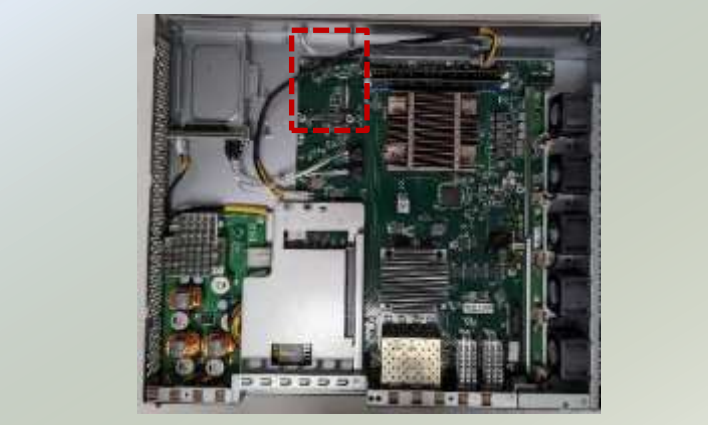
9. Secure with the two (2) screws.



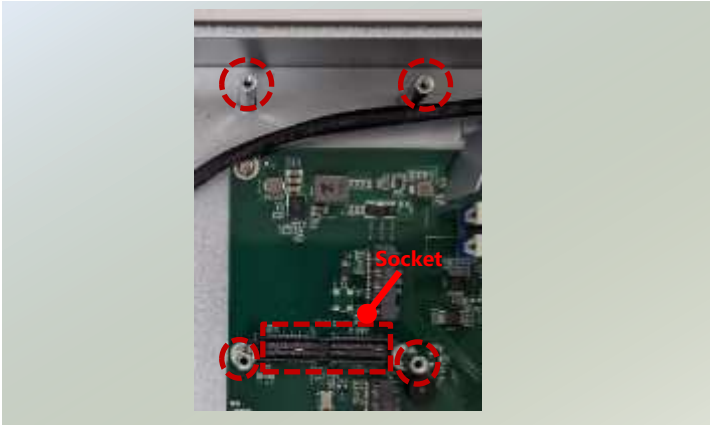
Installing Precision Time Card (Optional)

ECA-4027 supports carrier-grade IEEE 1588 precision time protocol PTPv2 to synchronize distributed device clocks. The IEEE 1588 precision time protocol card delivers precise timing signals within a sub-micro-second range, including time stamping input and schedule outputs.

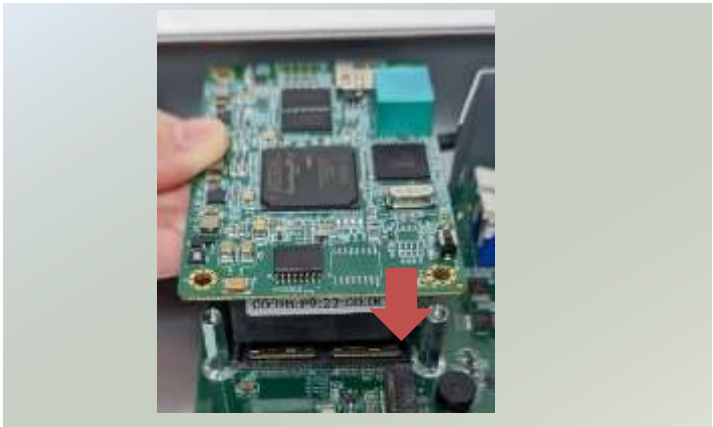
1. Power off the system and open the cover.
2. Locate the Time card socket and pillars on the motherboard.



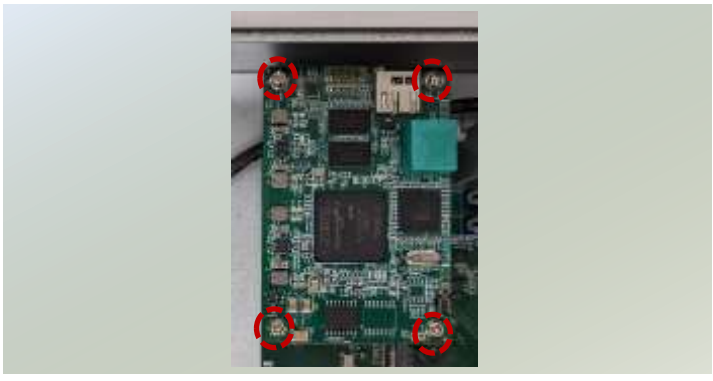
3. Unscrew the four (4) screws on the metal pillars.



4. Insert the Time card into the socket until it is fully seated in the connector.



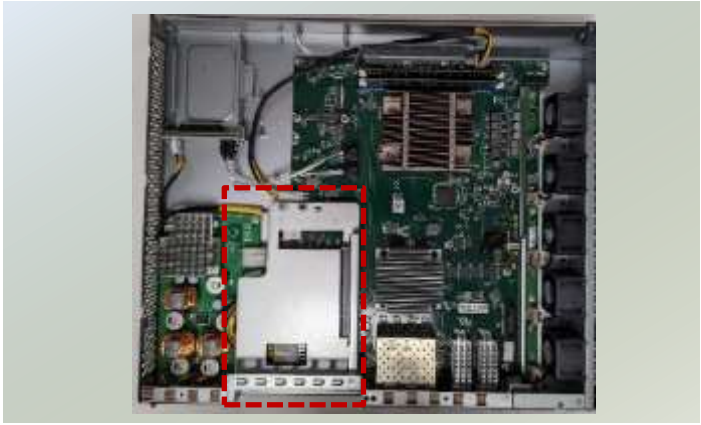
5. Secure the Time card with four (4) screws, one for each metal pillar. The installation is complete.



Installing Expansion Card (Optional)

ECA-4027 comes with an optional PCIe expansion slot for GPU graphics card or accelerator card. Please follow the instructions for installation.

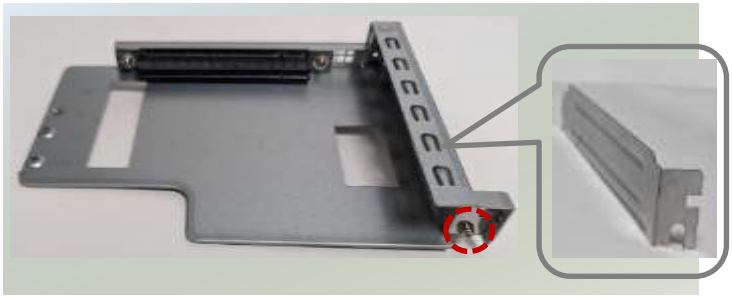
1. Power off the system and open the chassis cover.
2. Locate the PCIe slot. The slot bracket should be secured to the motherboard.



3. Remove the two (2) screws securing the slot bracket to the motherboard. Lift up the disk drive bracket.



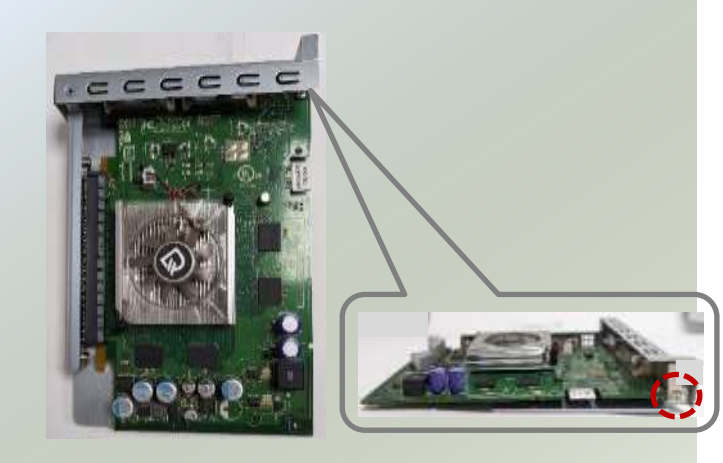
4. Next, remove the one (1) screw securing the bracket plate piece.



5. Slowly slide the GPU module card into the bracket. Make sure to align the top part.

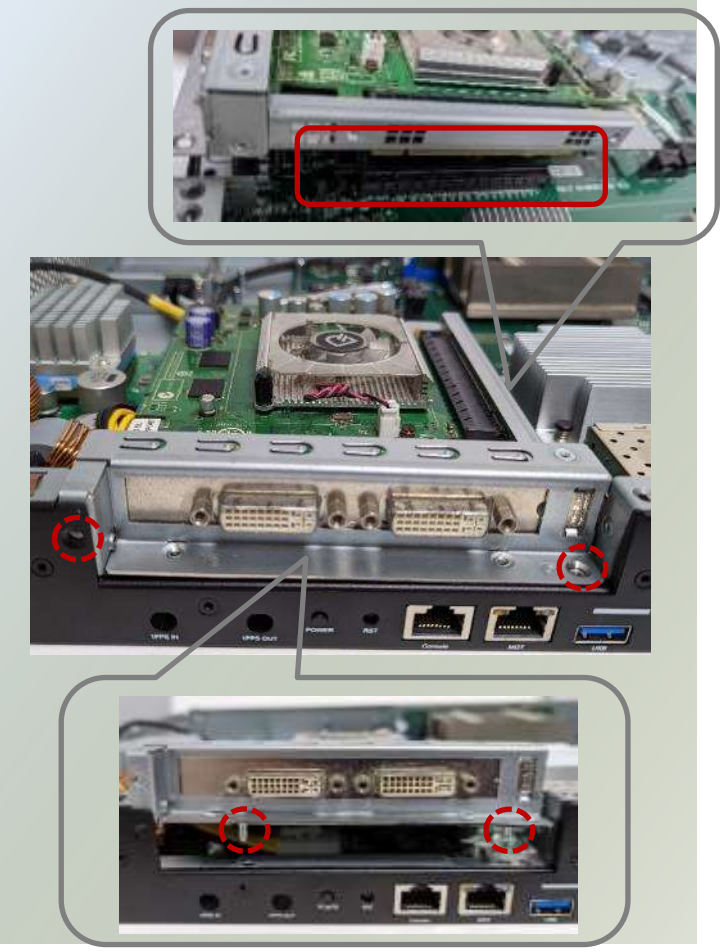


6. Align the notch of the socket key in the pin slot, insert the pins until it is fully seated.
7. Secure the GPU to the bracket with one (1) screw.



8. Install the bracket back onto the motherboard. Make sure to align the pins on the bottom, and the two pillars on the front.

9. Secure with three (3) screws. The installation is complete.



Replacing the Fan Tray

Cooling fans may eventually wear out. Please refer to the steps below for replacing cooling fan tray.

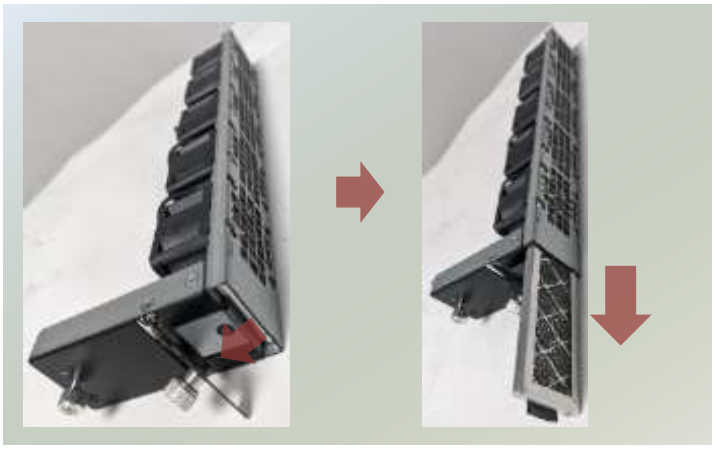
1. Power off the system and locate the Fan Tray.
2. Loosen the "Fan" labeled thumbscrew (clock-wise direction) that secures the fan tray to the system.



3. Pull the fan tray out.



4. Open the "Filter" side opening by loosening the thumbscrew (clock-wise direction), and pull out the fan filter screen (optional).



5. Insert a new fan tray.



CHAPTER 3: REMOTE SERVER MANAGEMENT

Overview

This chapter will introduce the features of Lanner's BMC firmware and how to perform server remote management through it. The BMC firmware implements IPMI 2.0 based on ASPEED service processor. It performs all the BMC management tasks defined by IPMI 2.0. BMC firmware runs an embedded web-server for full configuration using Web UI.

BMC Main Features

Feature		Description
IPMI 2.0 Standard Features	System Interface support	• KCS (System Interface Support) • LAN (RMCP+)
	IPMI 2.0 based Management	• BMC stack with an IPMI 2.0 implementation • Sensor monitoring
	System Management	• 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.

Fan Speed Control

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

Field Replaceable Unit (FRU)

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

System Event Log (SEL)

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

Serial over LAN (SOL)

IPMI 2.0 SOL is implemented to redirect the system serial controller traffic over an IPMI session. System

administrators can establish a SOL connection with a standard IPMI client, like IPMITOOL, to remotely interact with serial text-based interfaces such as OS command-line and serial redirected BIOS interfaces.

User Management

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

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

Keyboard, Video, Mouse (KVM) Redirection

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

Virtual Media Redirection

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

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

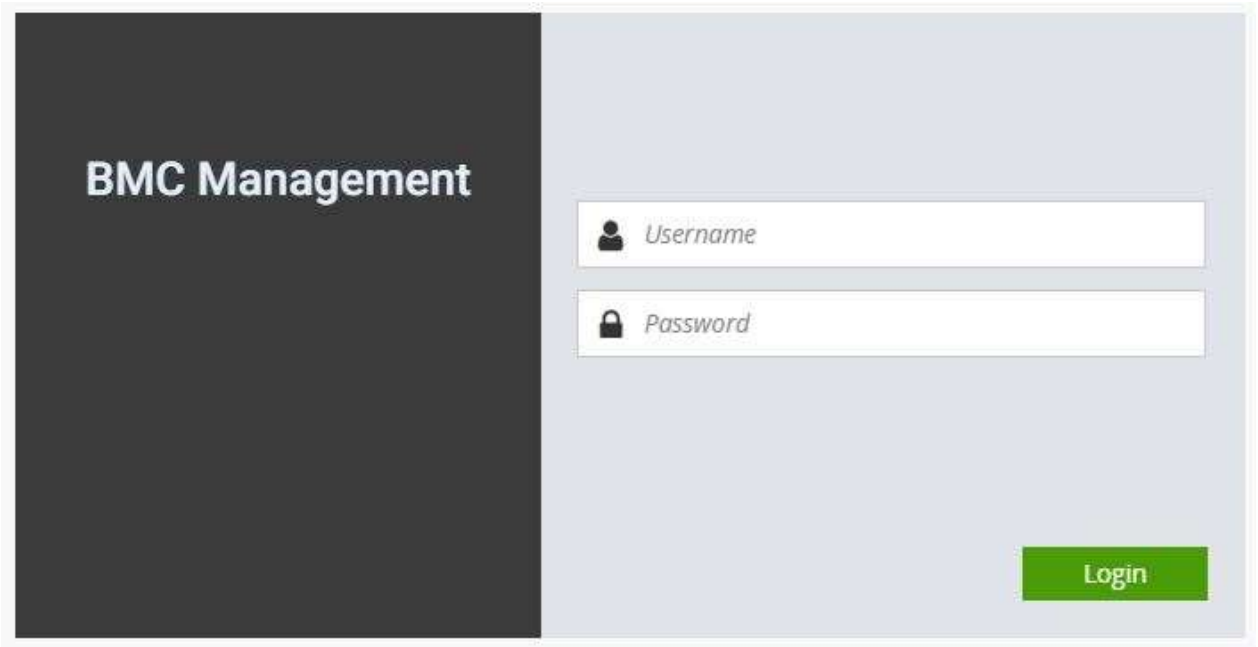
Delete SEL Entry	Storage (0Ah)	46h
Clear SEL	Storage (0Ah)	47h
Get SEL Time	Storage (0Ah)	48h
Set SEL Time	Storage (0Ah)	49h
Get SEL Time UTC Offset	Storage (0Ah)	5Ch
Set SEL Time UTC Offset	Storage (0Ah)	5Dh
LAN Device Commands		
Set LAN Configuration Parameters	Transport (0Ch)	01h
Get LAN Configuration 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

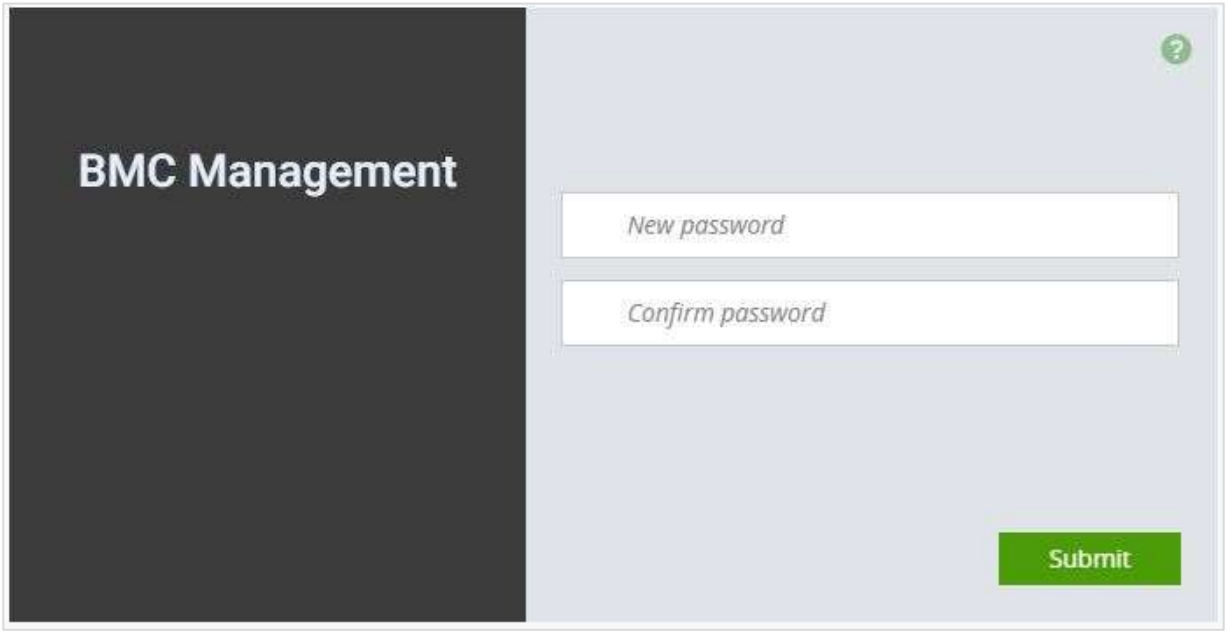
- **Username:** admin
- **Password**: admin

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 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.

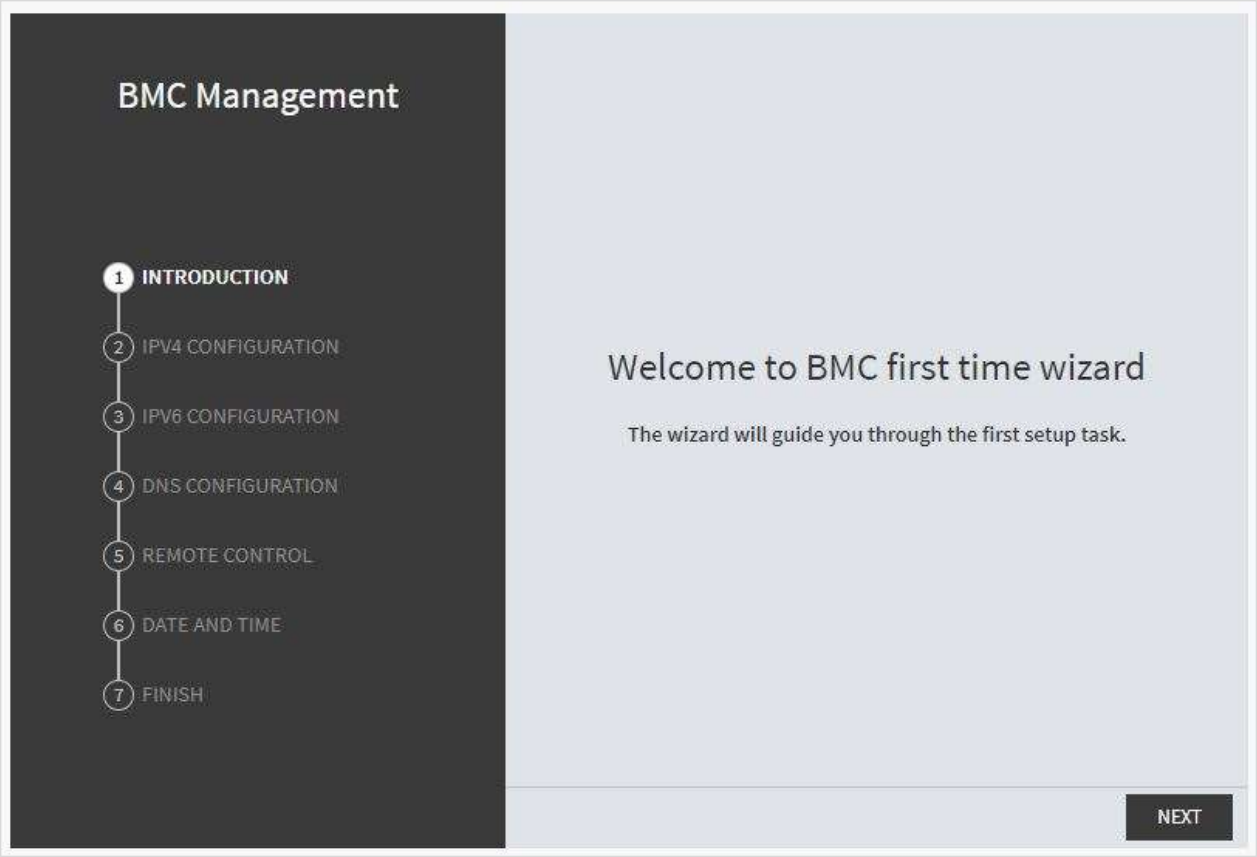
Wizard Welcome Page Introduction

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.

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

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

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



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

Web UI Layout Introduction

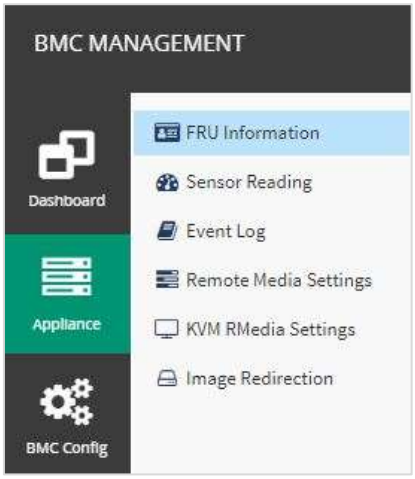
The BMC Web UI consists of various menu items:

Menu Bar

The menu bar displays the following:

- Dashboard
- Appliance – FRU Information
- 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 – Network Configuration – Remote Syslog
- BMC Config – Audit Log
- BMC Config – Maintenance – Firmware Update
- BMC Config – Maintenance – Restore Factory Defaults
- BMC Config – Maintenance – Preserve Configuration

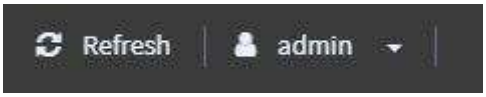
A screenshot of the menu bar is shown below:



Menu Bar

Quick Button and Logged-in User

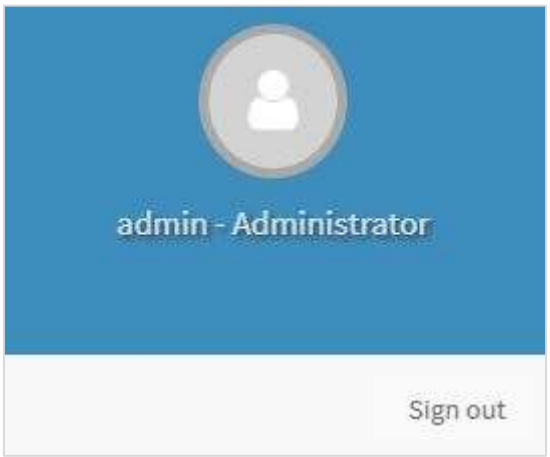
The user information and quick buttons are located at the top right of the Web UI.



User Information

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

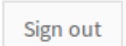
A screenshot of the logged-in user information is shown below:



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 level

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

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

Help

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

Note: The latest detailed version of BMC LTS Specification can be found on Lanner Download Center.

CHAPTER 4: BIOS SETUP

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

BIOS Setup

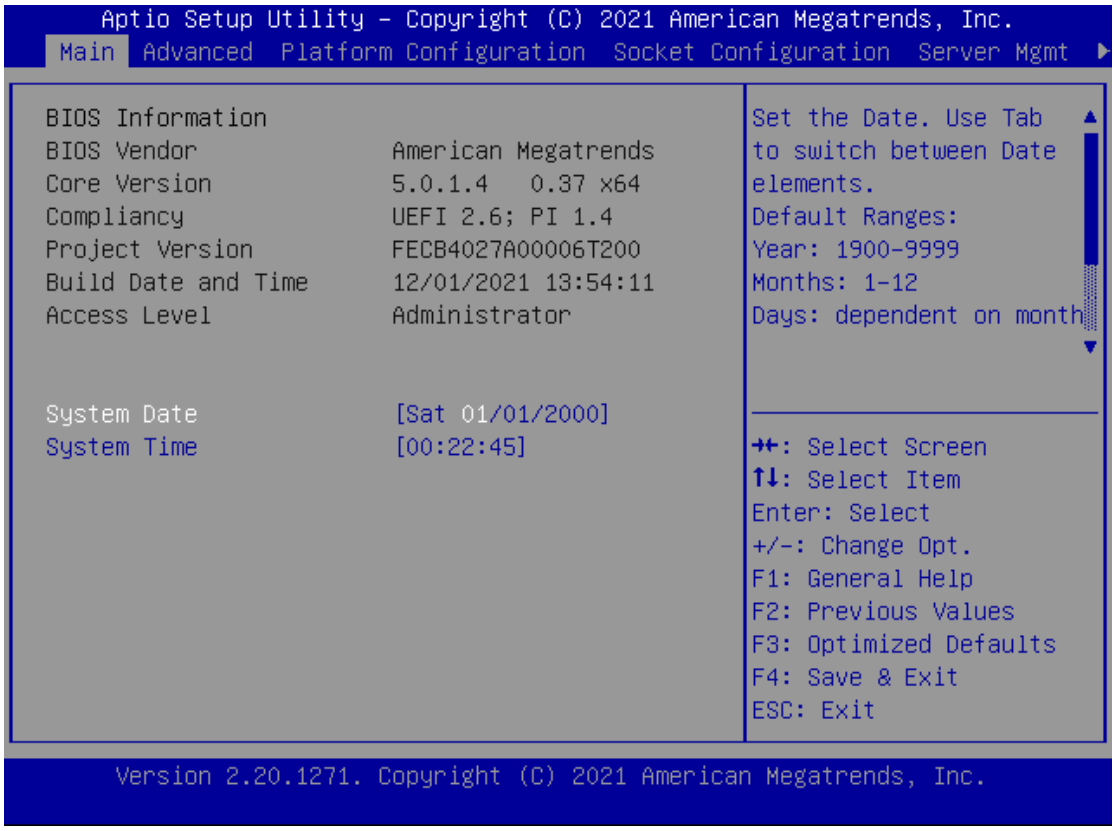
To enter the BIOS setup utility, simply follow the steps below:

1. Boot up the system.
2. Pressing the **<Esc>** 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

Main Page

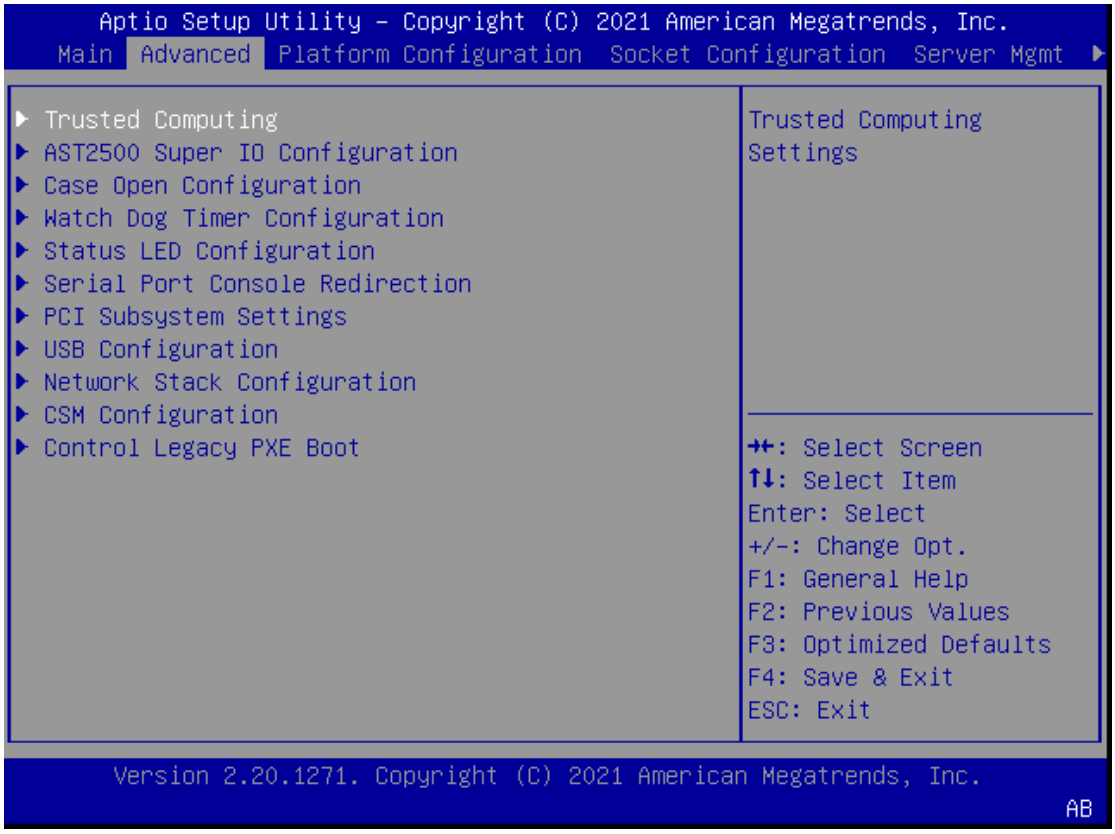
Setup main page contains BIOS information and project version information.



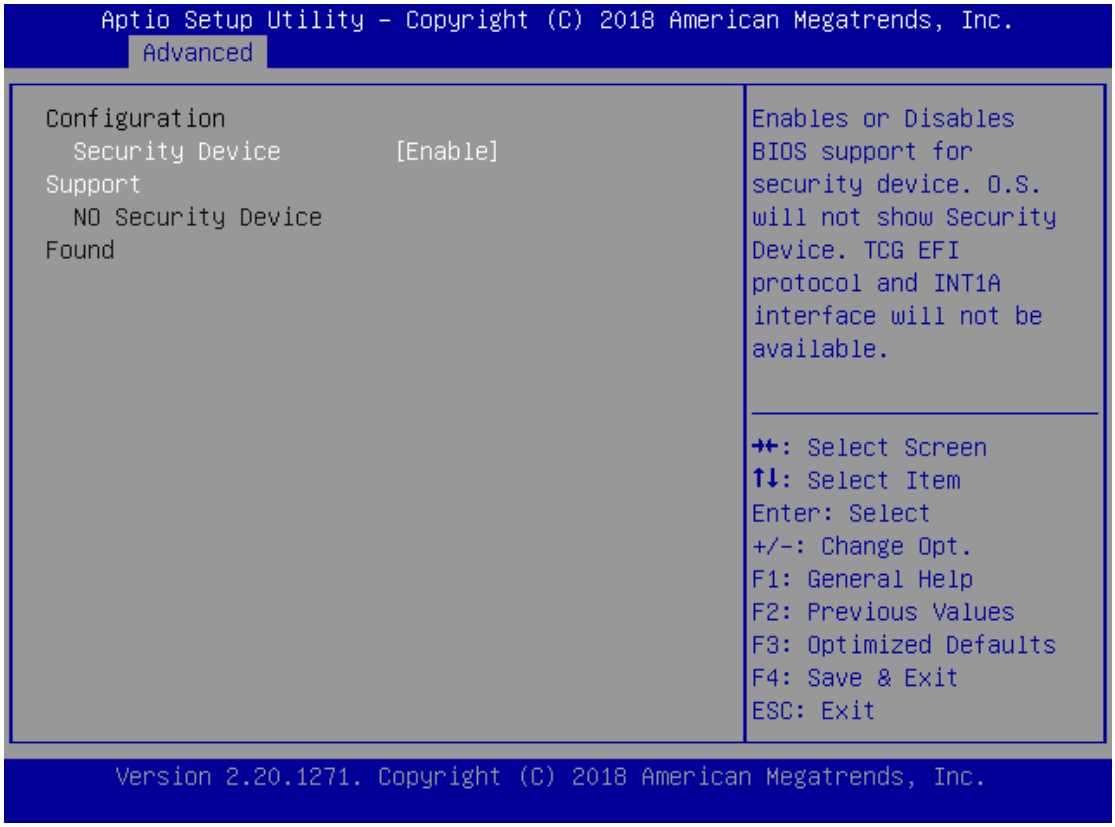
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
System Date	To set the Date, use **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

Advanced Page

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

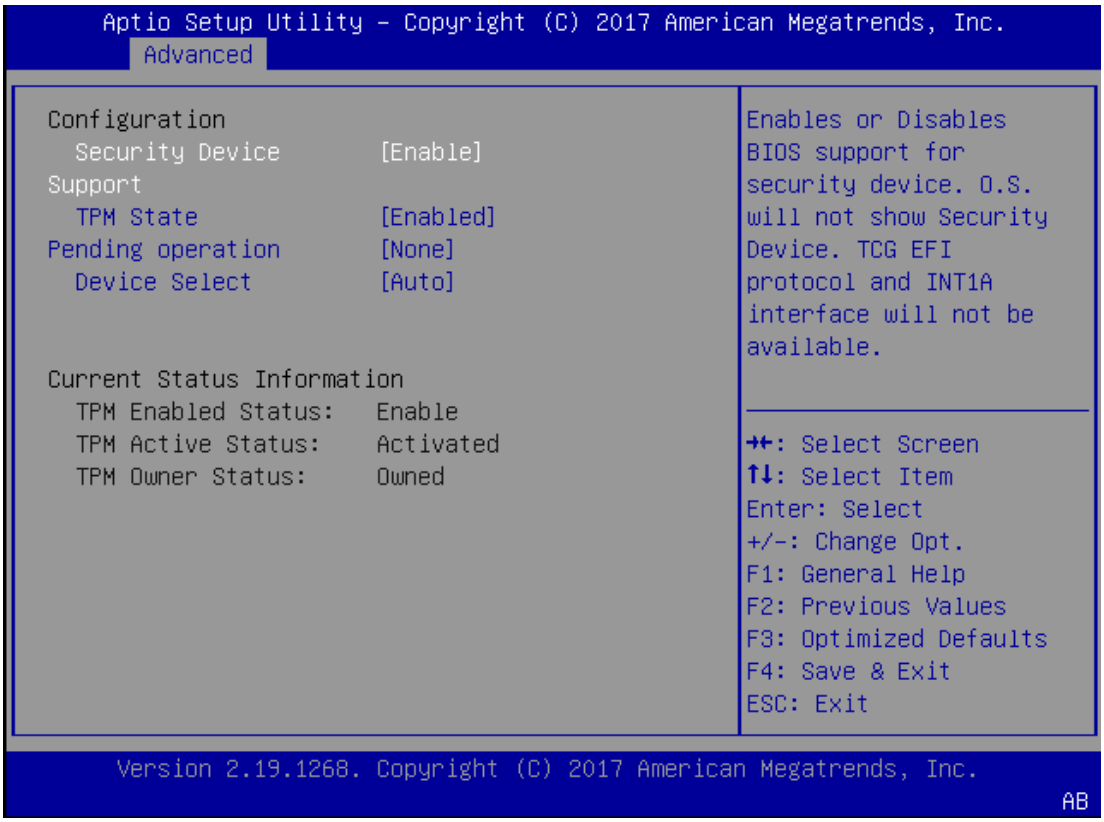


Trusted Computing



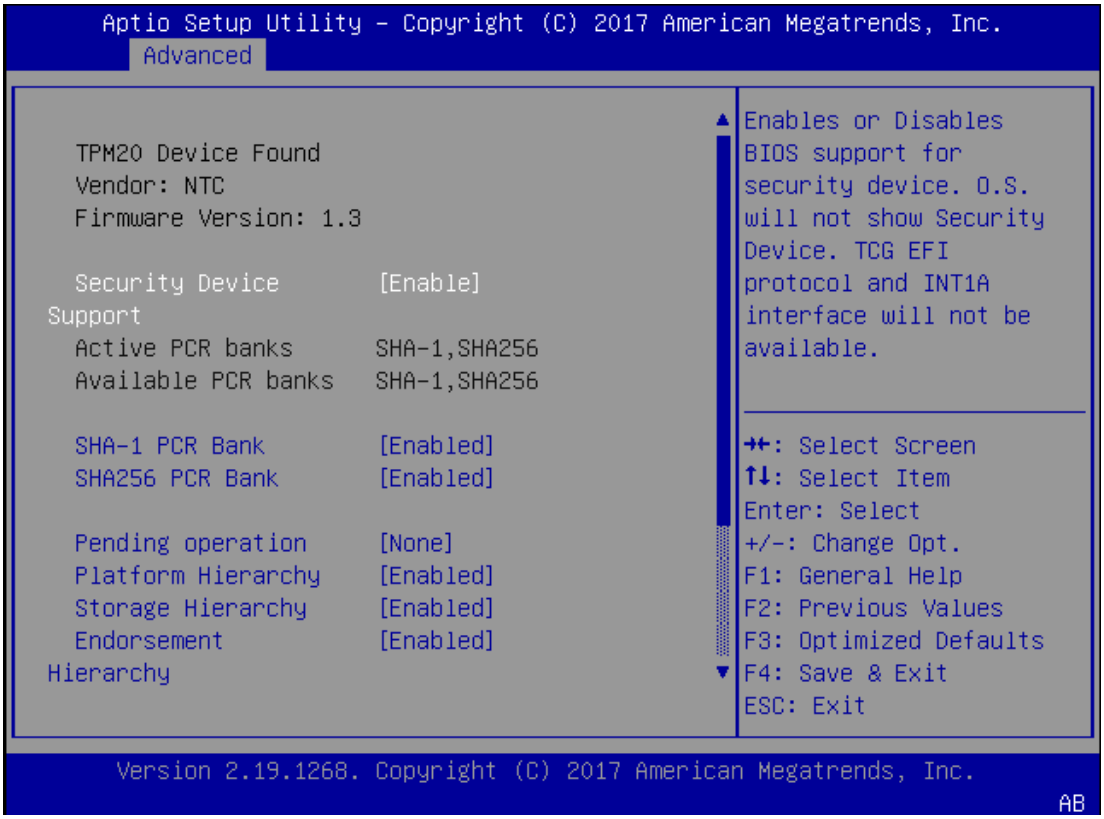
Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

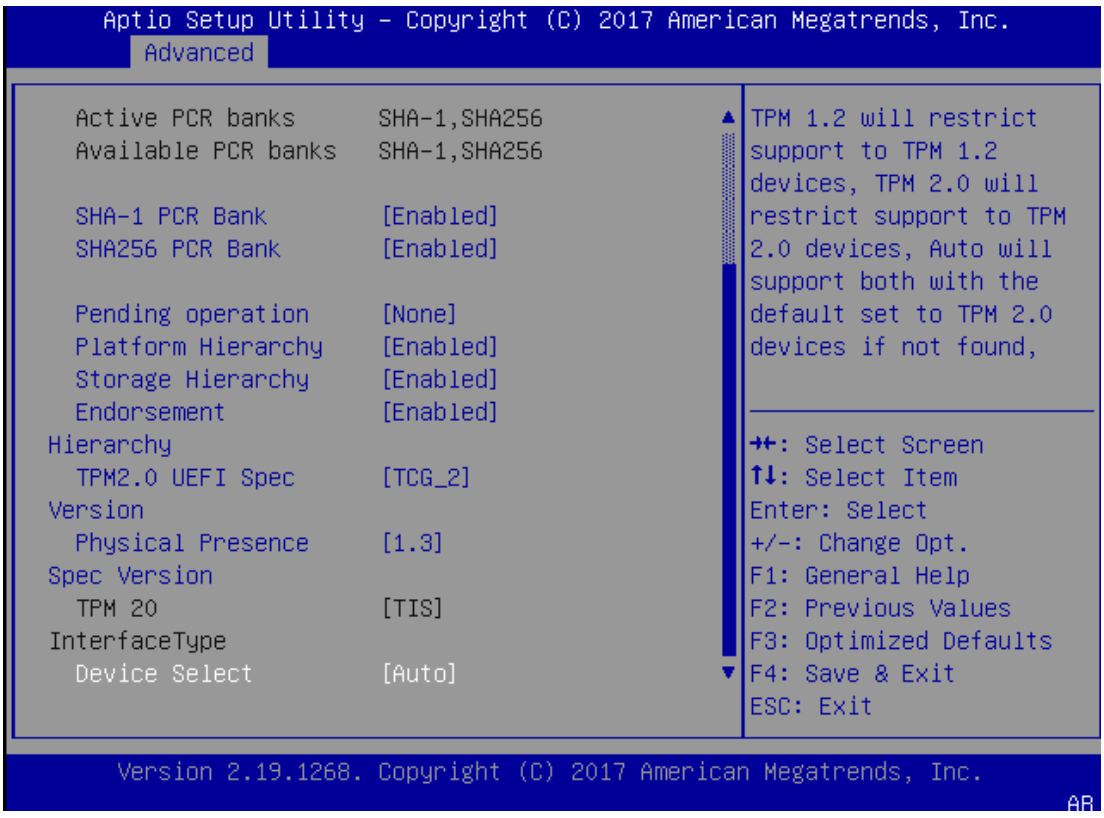
Trusted Computing (TPM1.2)



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 to change State of Security Device.
Device Select	TPM 1.2 TPM 2.0 Auto	**TPM 1.2** will restrict support to TPM 1.2 devices; while **TPM 2.0** will restrict support to TPM 2.0 devices; **Auto** will support both with the default set to TPM 2.0 devices. If not found, TPM 1.2 devices will be enumerated.

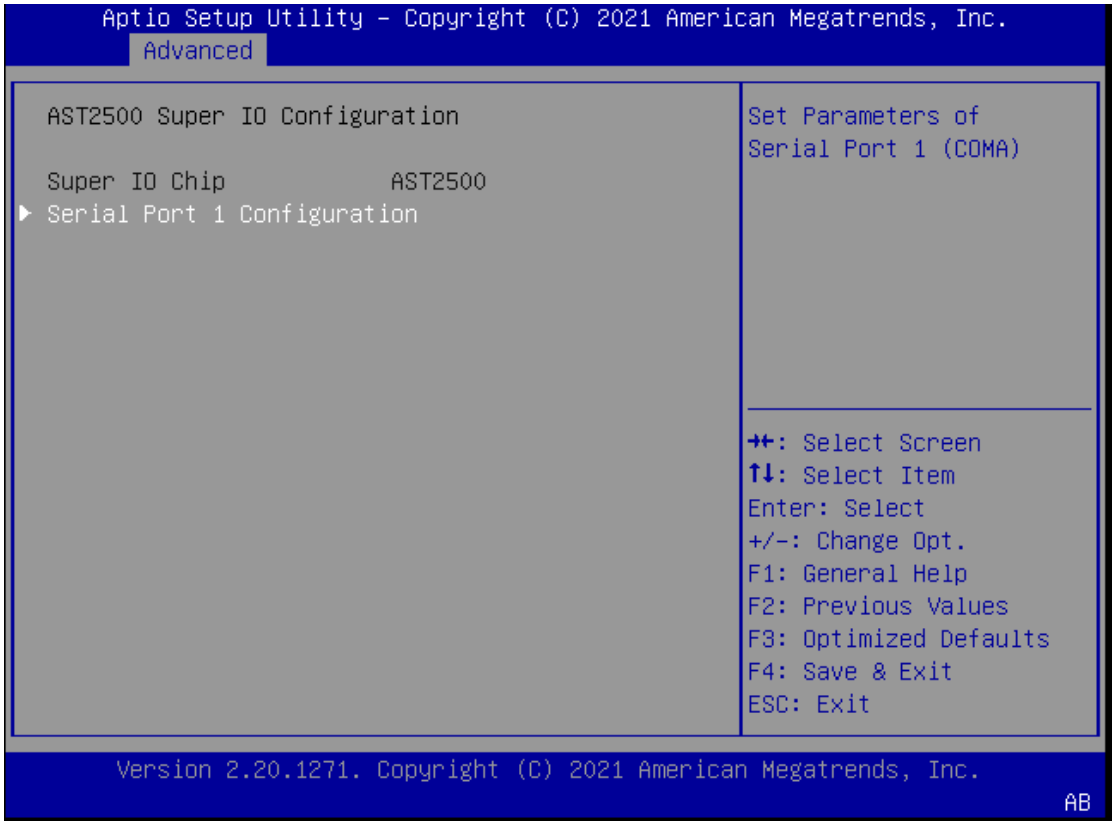
Trusted Computing (TPM2.0)



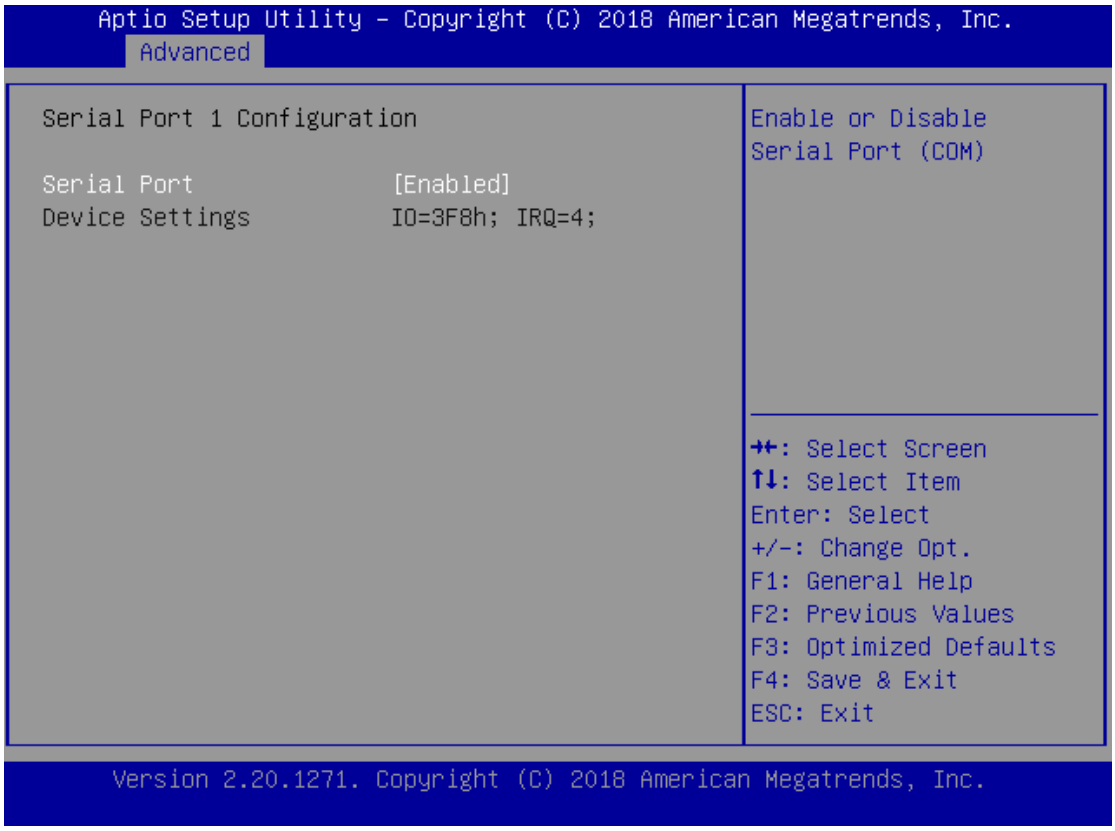


Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA-1 PCR Bank	Enabled Disabled	Enables or disables SHA-1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

AST2500 Super IO Configuration

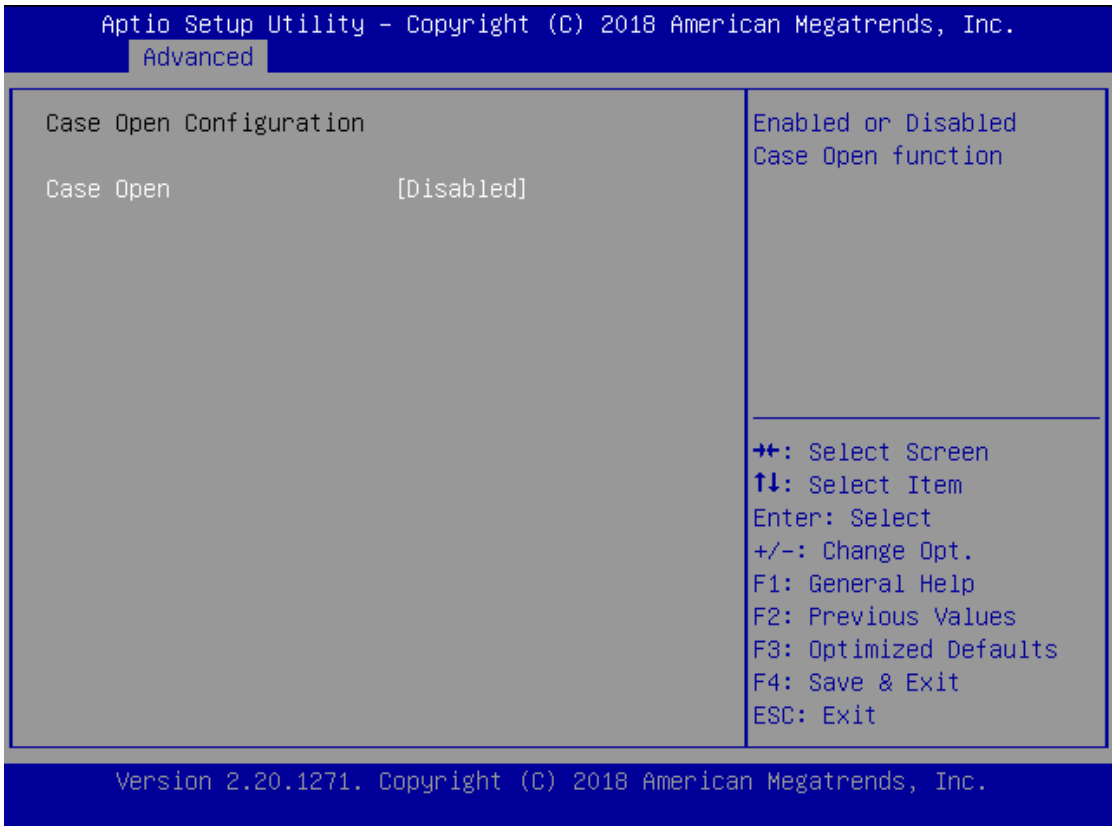


Serial Port 1 Configuration



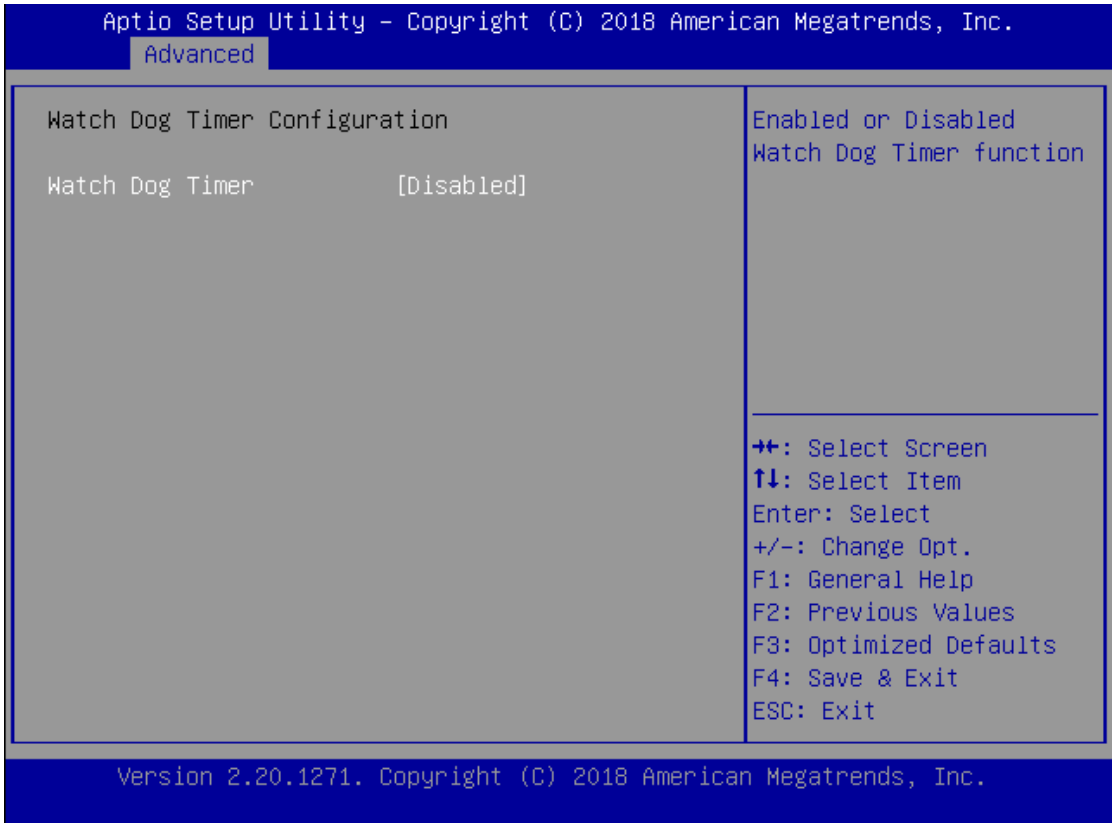
Feature	Options	Description
Serial Port	Enabled Disabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO=3F8h; IRQ = 4

Case Open Configuration



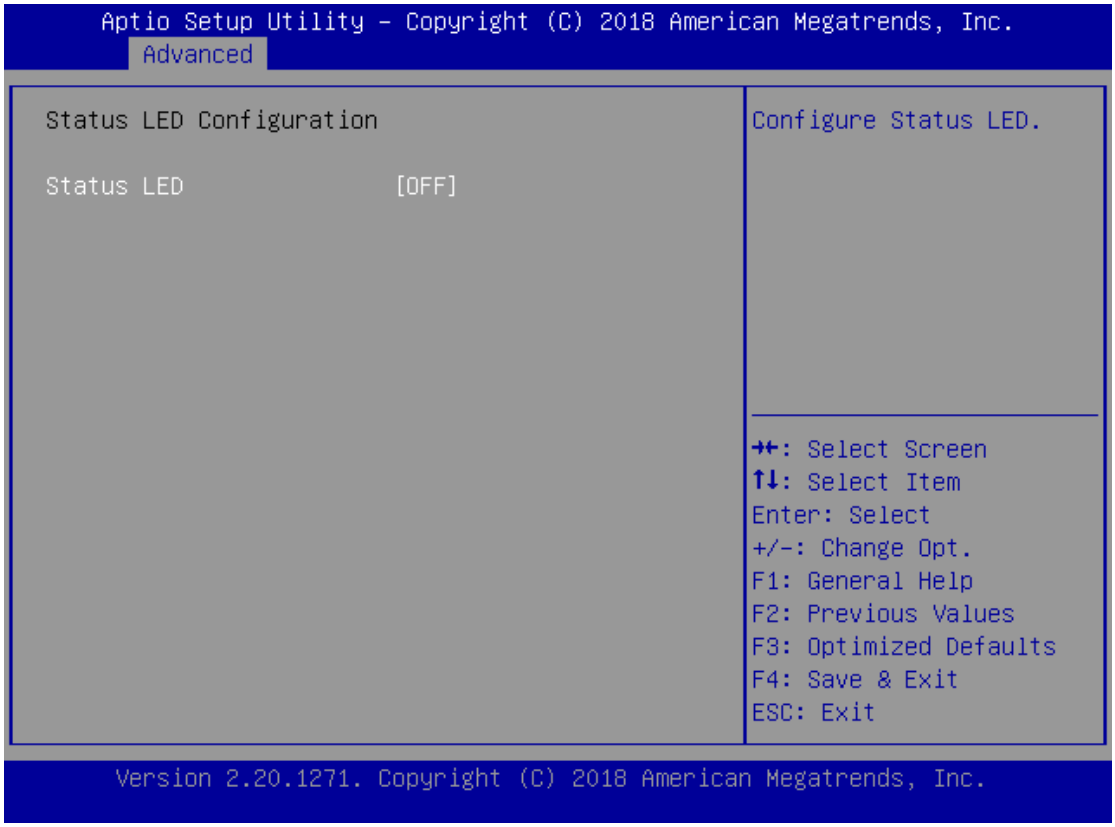
Feature	Options	Description
Case Open	Enabled Disabled	Enables or disables Case Open function

Watch Dog Timer Configuration



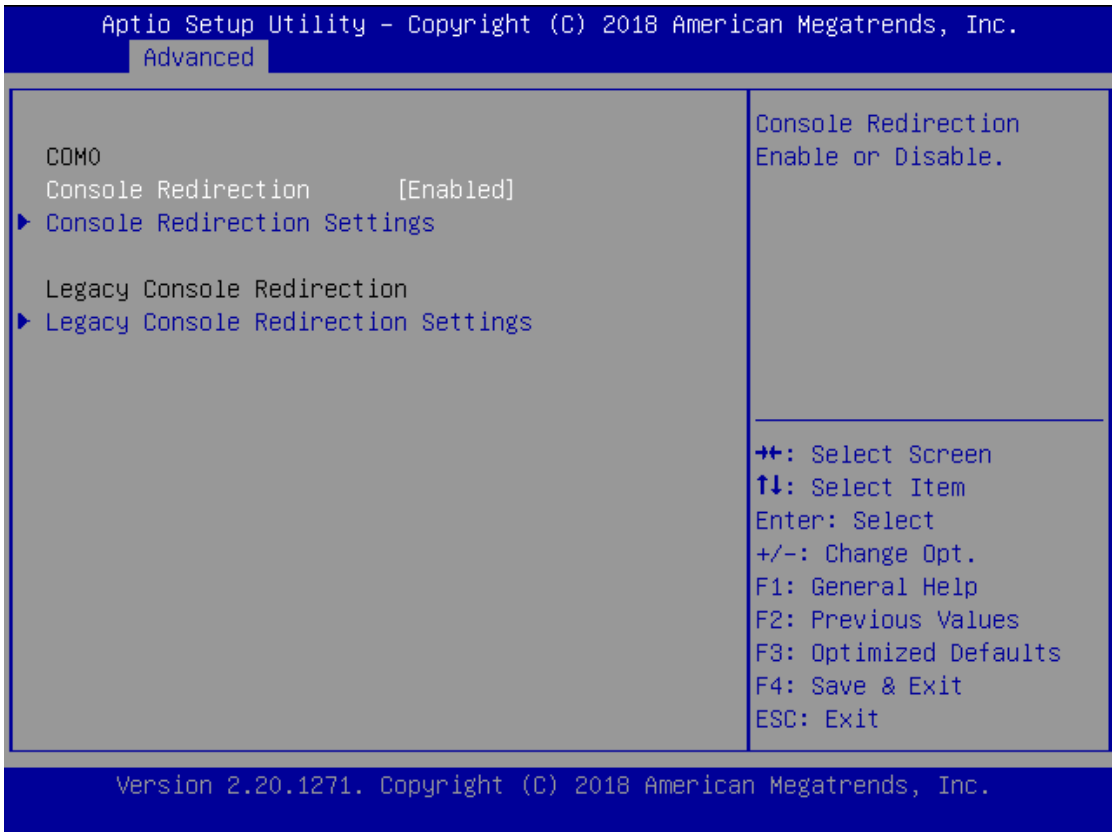
Feature	Options	Description
Watch Dog Timer	Enabled Disabled	Enables or disables Watch Dog Timer function

Status LED Configuration



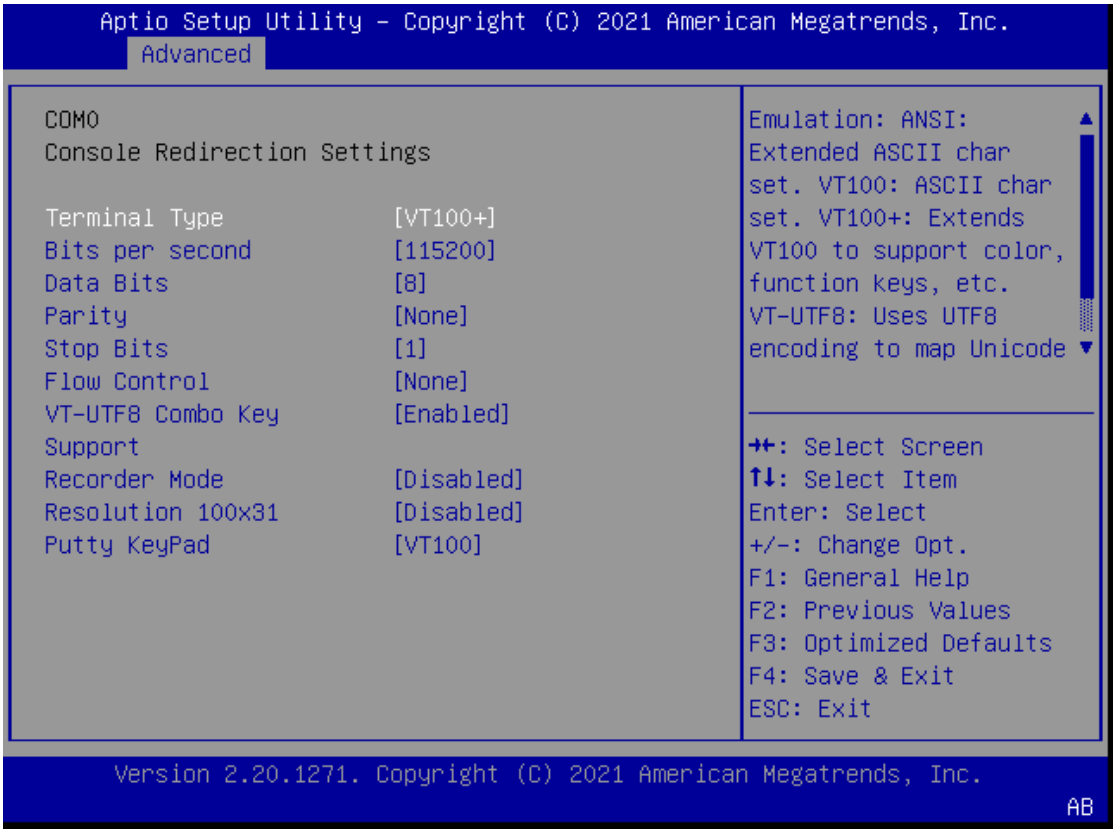
Feature	Options	Description
Status LED	OFF AMBER GREEN	Configures Status LED color

Serial Port Console Redirection



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

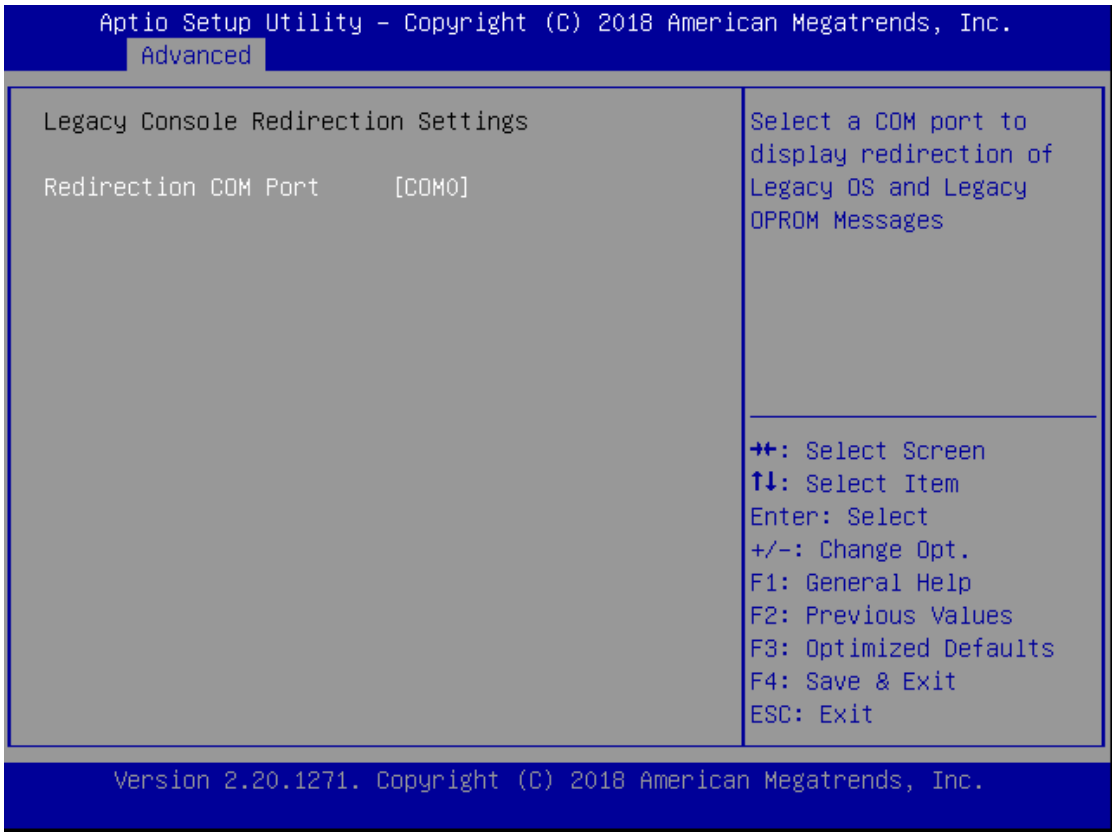
Console Redirection Settings



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

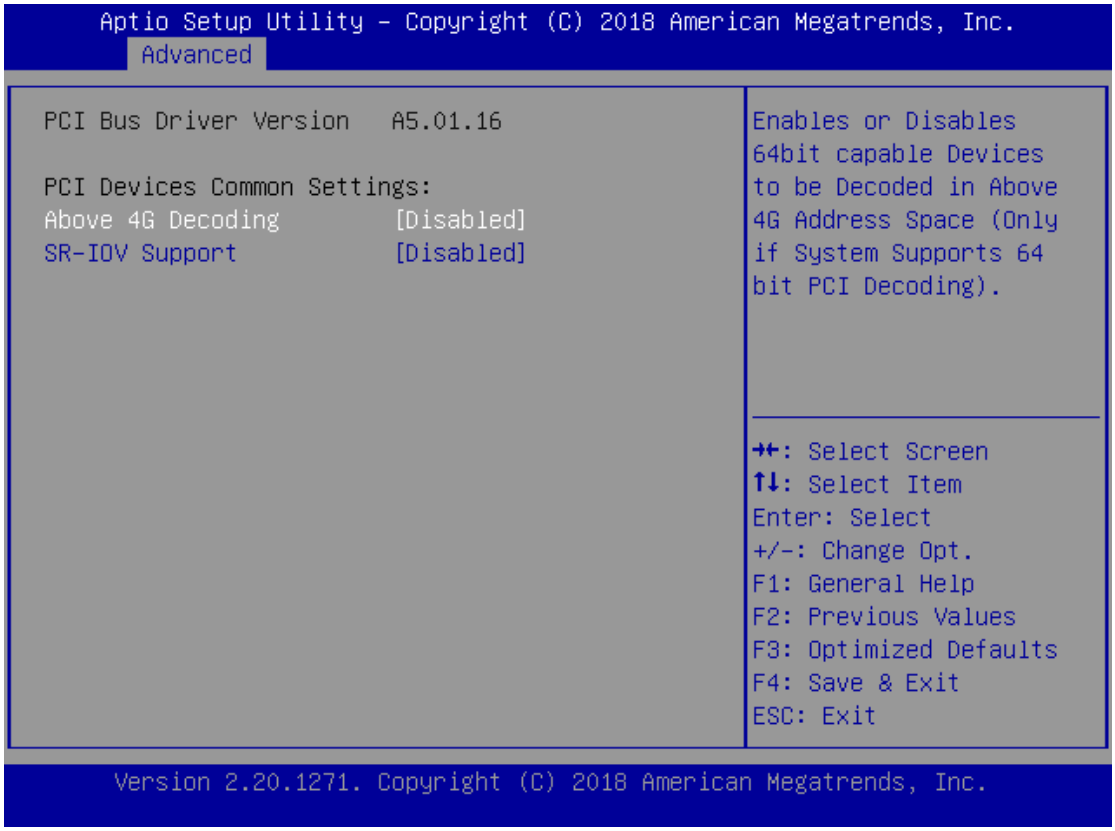
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Selects FunctionKey and KeyPad on Putty.

Console Redirection Settings



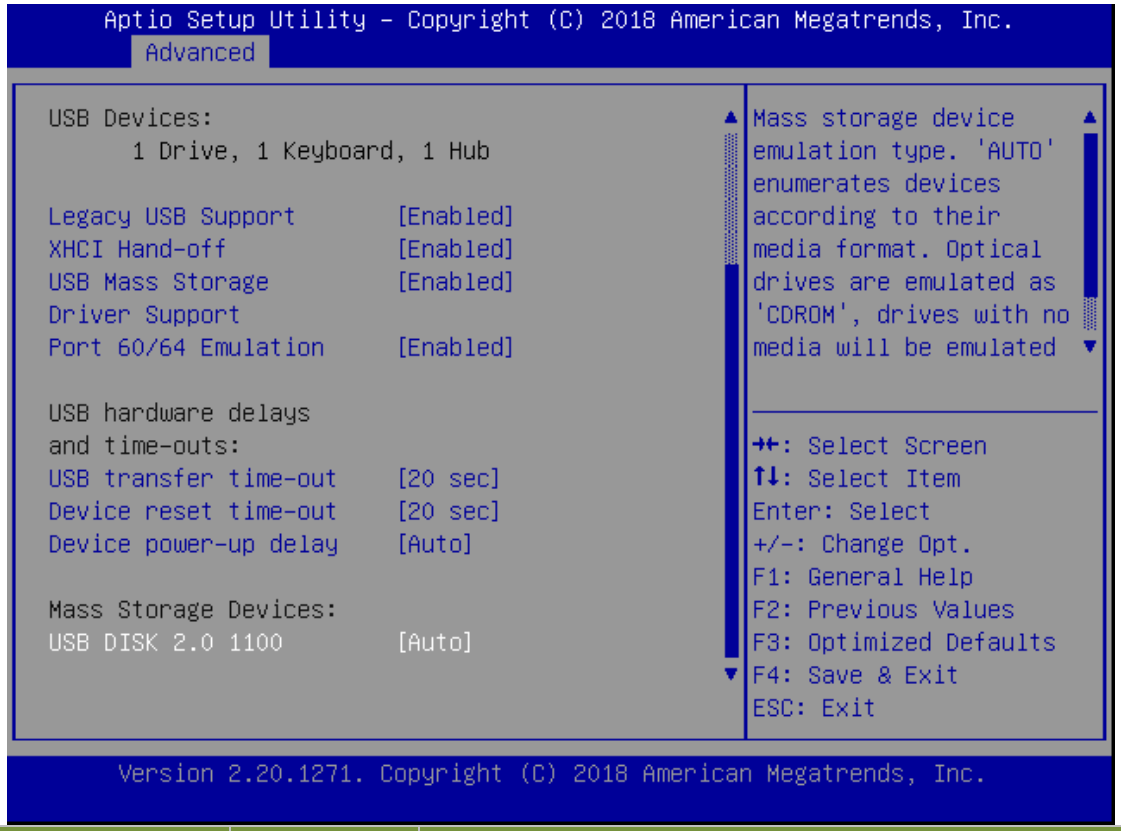
Feature	Options	Description
Redirection COM Port	COM0	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

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.

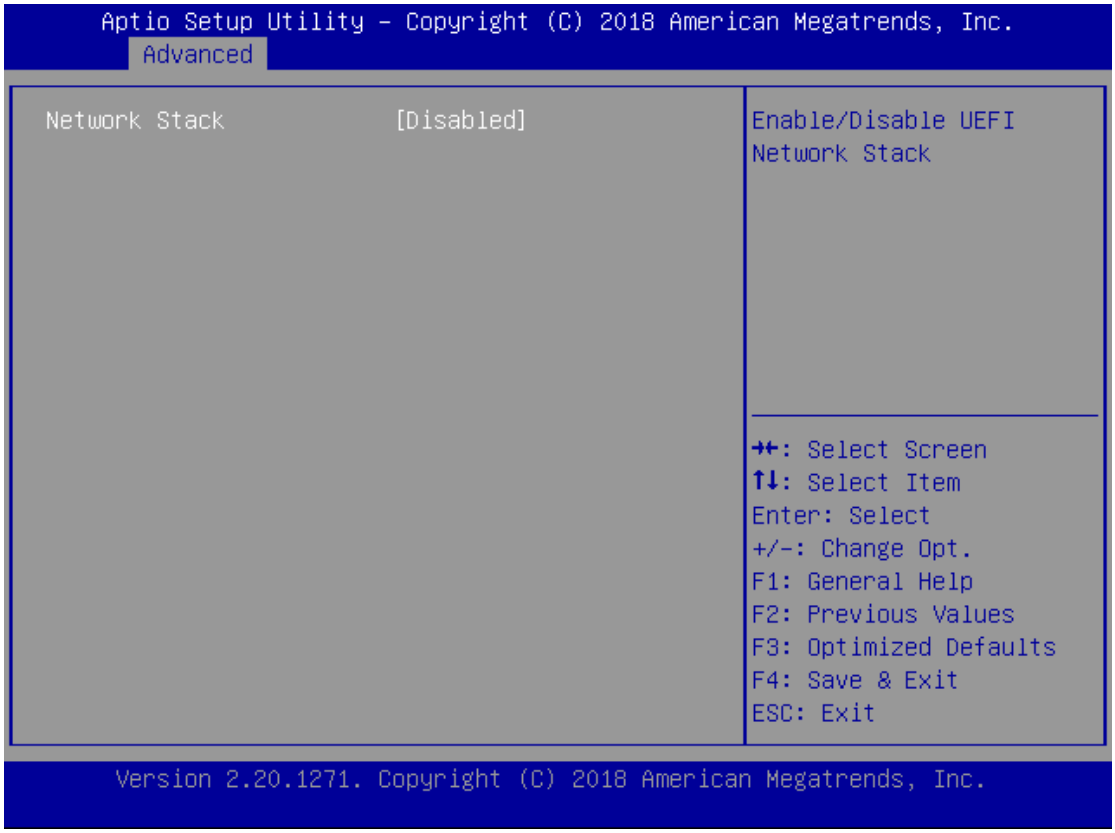
USB Configuration



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.
Port 60/64 Emulation	Enabled Disabled	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for Control, Bulk, and Interrupt transfers
Device reset time-out	1 sec 5 sec 10 sec 20 sec	USB mass storage device Start Unit command time-out

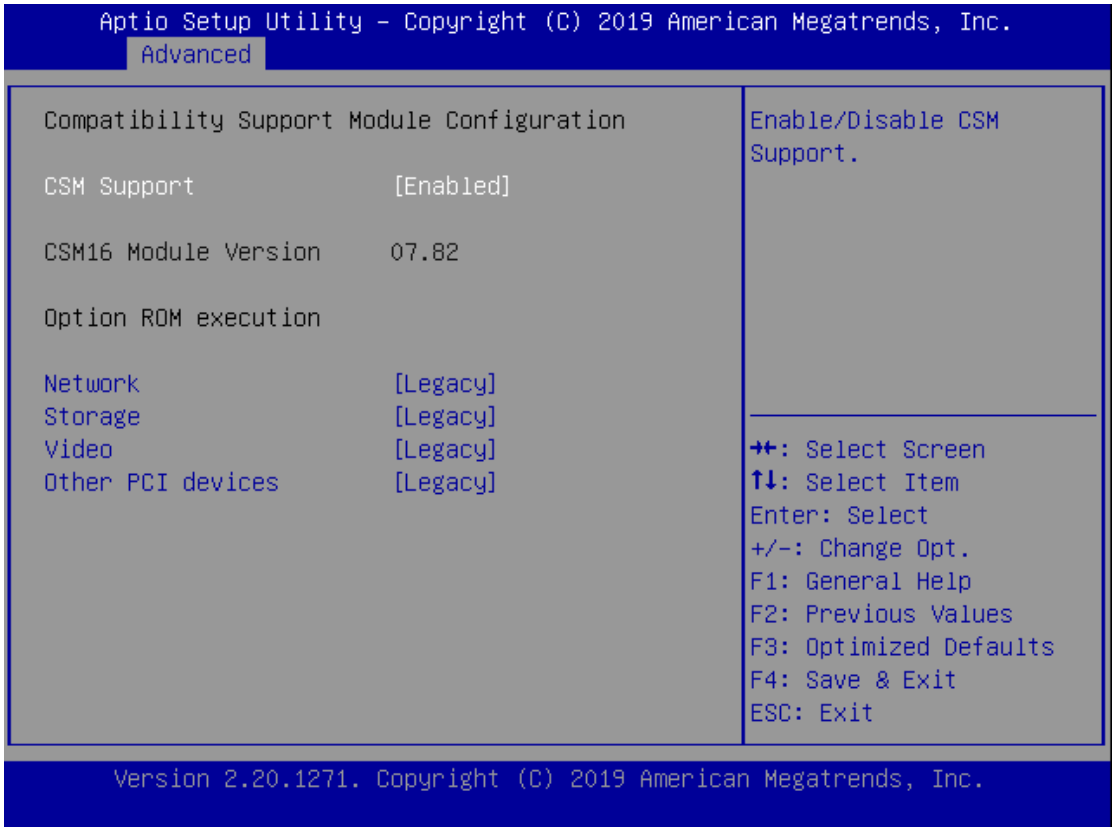
Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller. **Auto** uses default value: for a Root port, it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

Network Stack Configuration



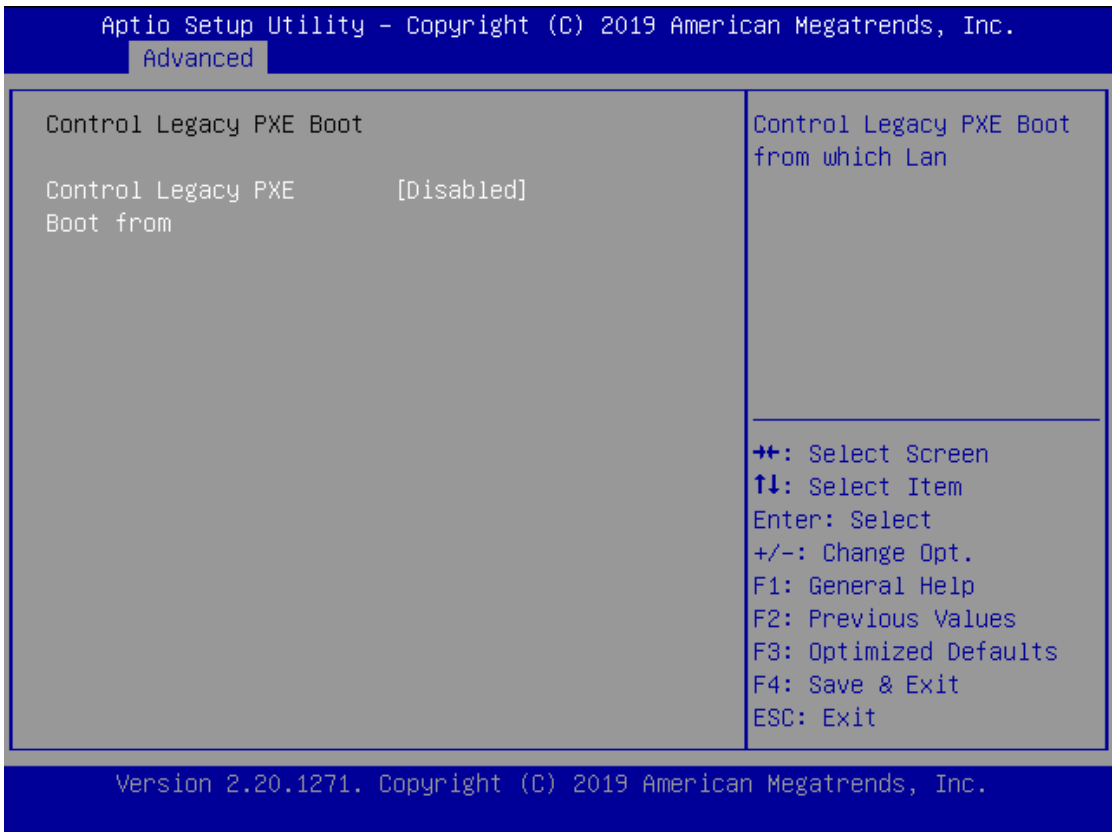
Feature	Options	Description
Network Stack	Disabled Enabled	Enables or disables UEFI Network Stack
Ipv4 PXE Support	Disabled Enabled	Enables Ipv4 PXE Boot Support. If IPV4 is disabled, PXE boot option will not be created.
Ipv4 HTTP Support	Disabled Enabled	Enables Ipv4 HTTP Boot Support. If IPV4 is disabled, 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

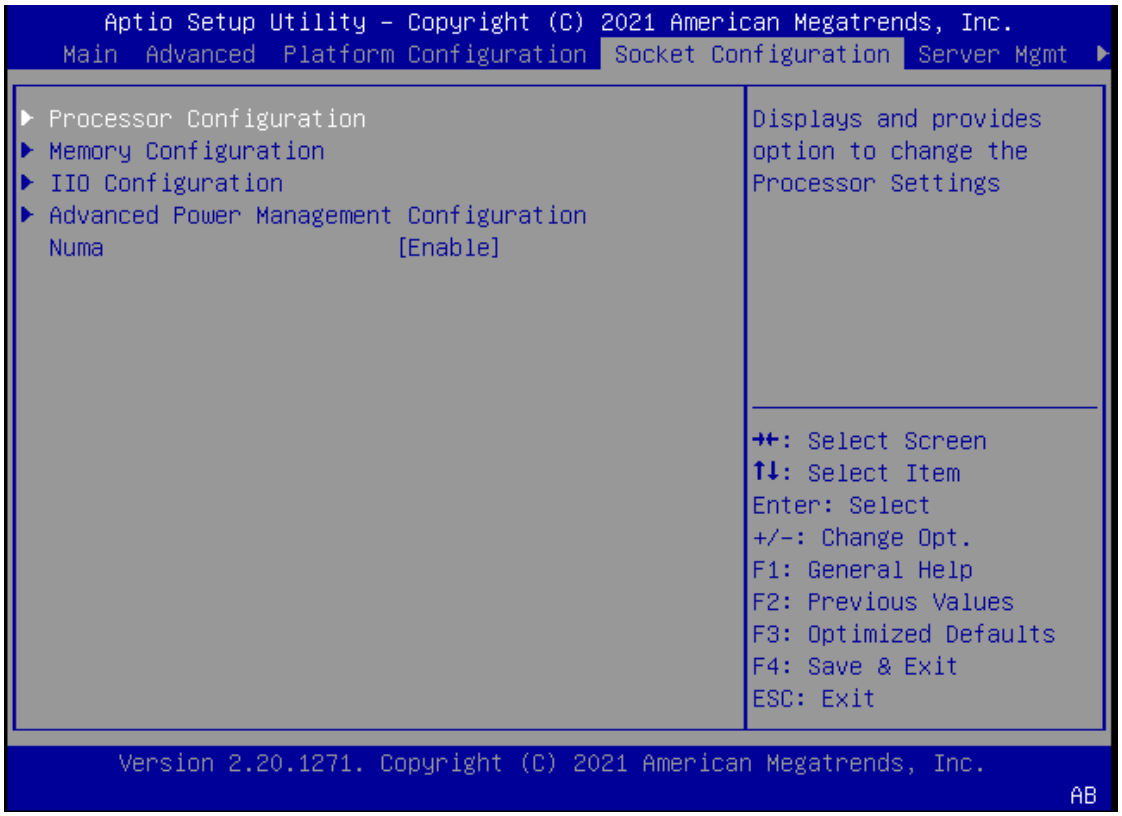
Control Legacy PXE Boot



Feature	Options	Description
Control Legacy PXE Boot from	Disabled MGT Lan1	Control Legacy PXE Boot from which LAN

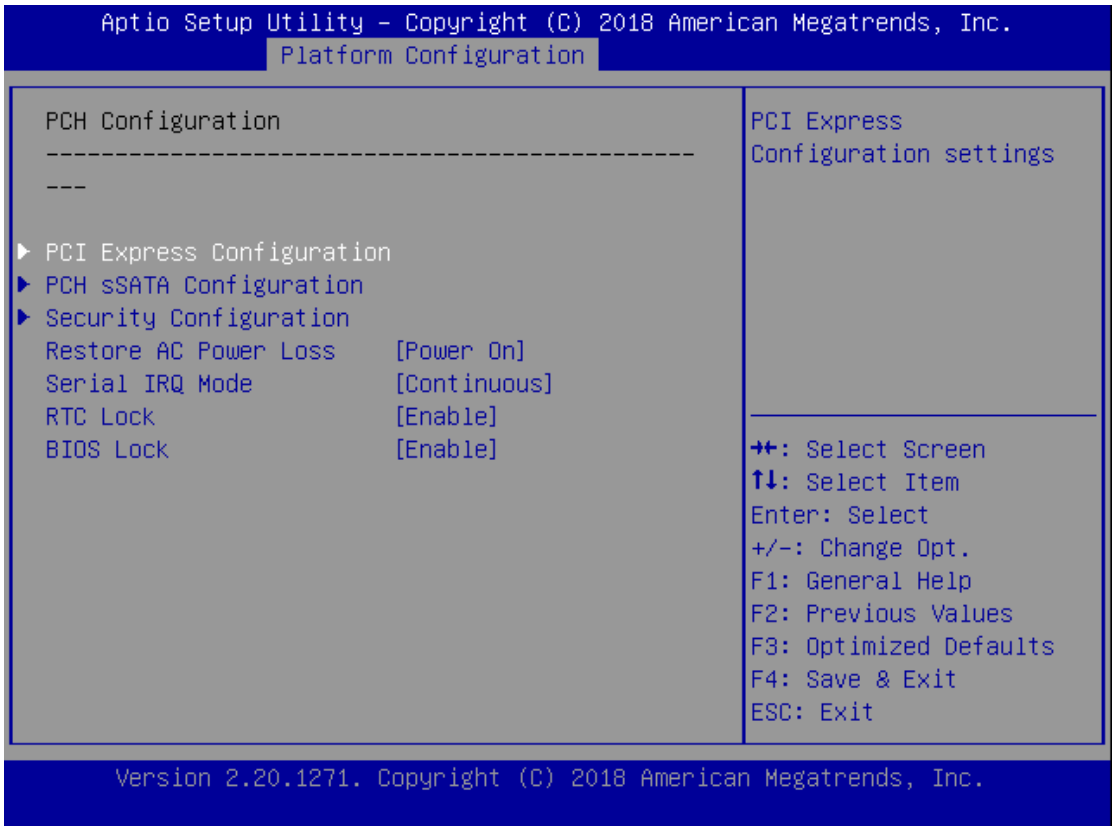
Platform Configuration

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



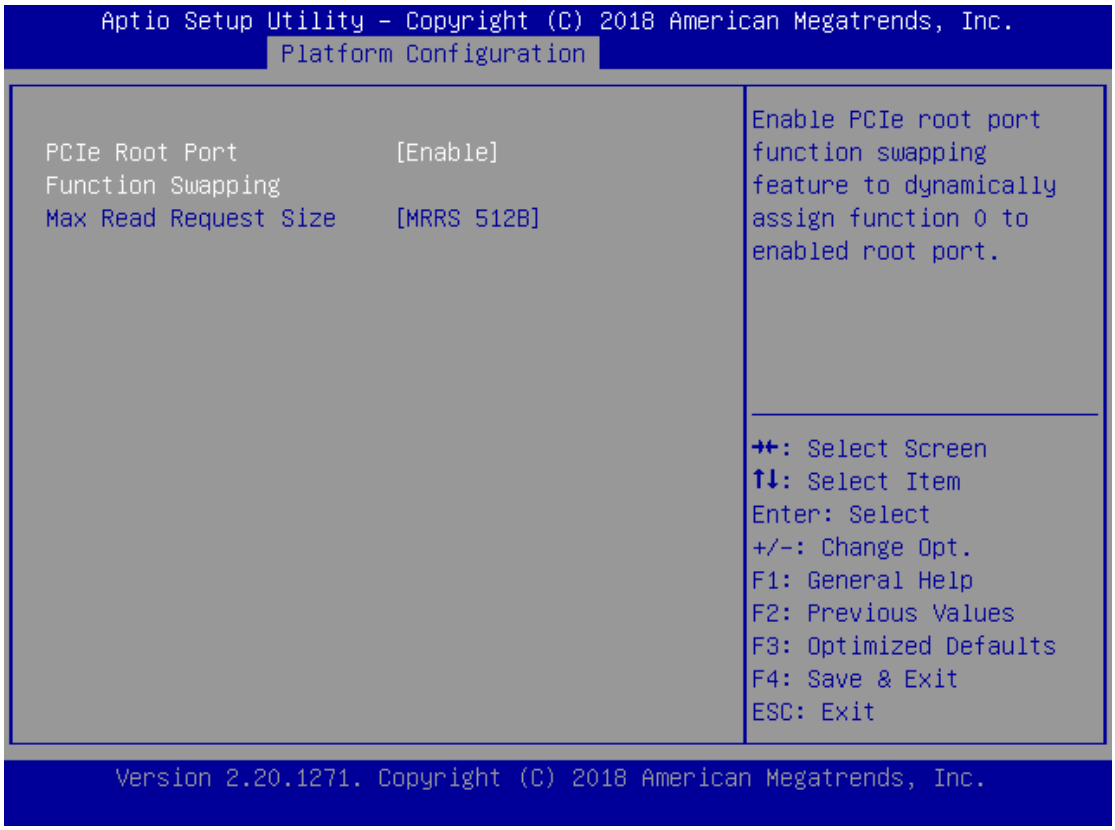
Feature	Options	Description
PCH Configuration	None	Displays and provides option to change the PCH Settings
Server ME Configuration	None	Configure Server ME Technology Parameters
Runtime Error Logging	None	Press <Enter> to view or change the runtime error log configuration.

PCH Configuration



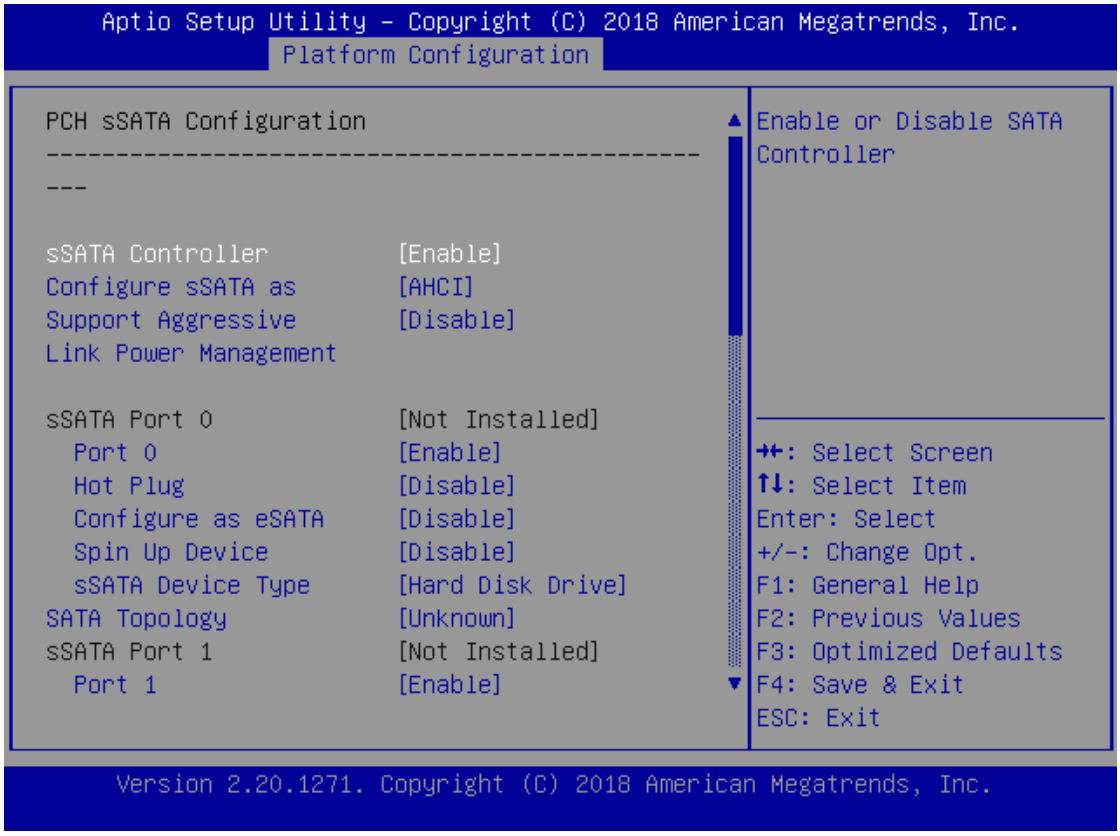
Feature	Options	Description
PCI Express Configuration	None	PCI Express Configuration settings
PCH SATA Configuration	None	SATA devices and settings
PCH sSATA Configuration	None	sSATA devices and settings
Security Configuration	None	Security Configuration settings
Restore AC Power Loss	Power ON Power Off Last State	Select S0/S5 for ACPI state after a G3
Serial IRQ Mode	Quiet Continuous	Configure Serial IRQ Mode.
RTC Lock	Disabled Enabled	Enabling this feature will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM
BIOS Lock	Disabled Enabled	Enables or disables the PCH BIOS Lock Enable feature.

PCI Express Configuration



Feature	Options	Description
PCIe Root Port Function Swapping	Disabled Enabled	Enable PCIe root port function swapping feature to dynamically assign function 0 to enabled root port.
Max Read Request Size	MRRS 128B MRRS 256B MRRS 512B MRRS 1024B MRRS 2048B MRRS 4096B	PCIE Max Read Request Size Selection.

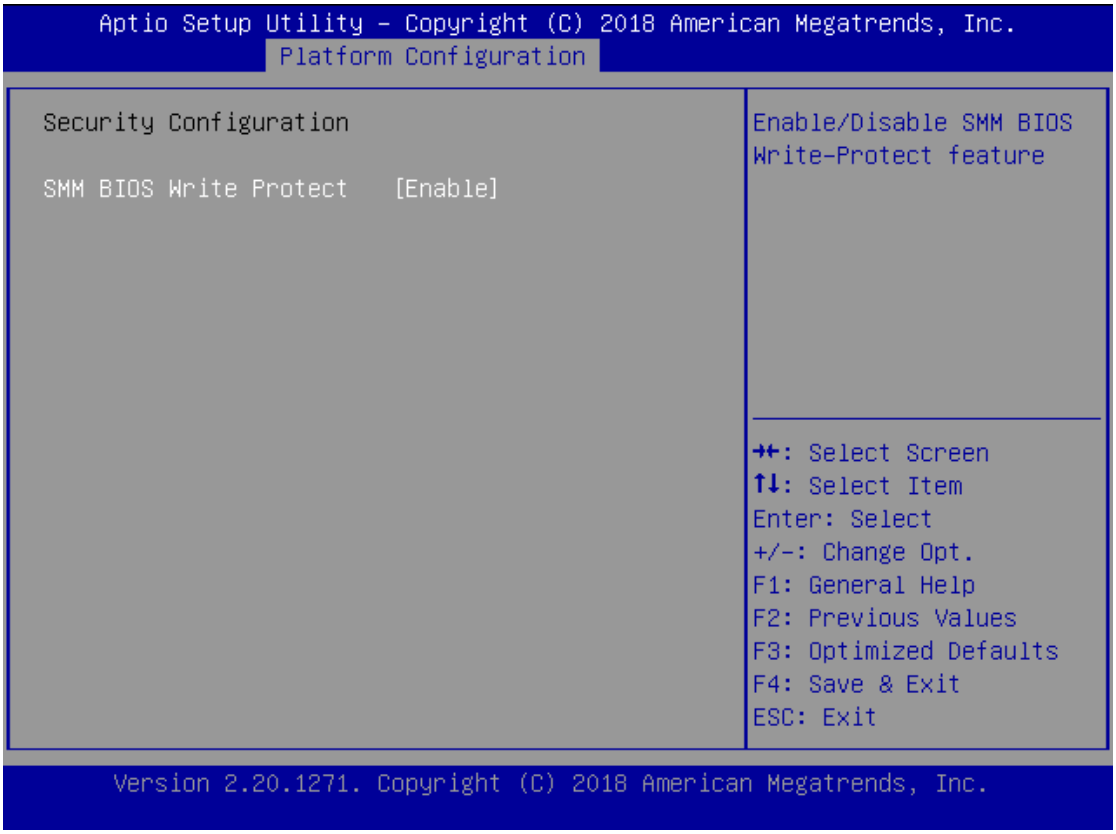
PCH sSATA Configuration



Feature	Options	Description
sSATA Controller	Disabled Enabled	Enables or disables sSATA Controller
Configure SATA as	AHCI RAID	This will configure sSATA as **RAID** or **AHCI**.
Support Aggressive Link Power Management	Disabled Enabled	Enables or disables SALP
Port 0/1/2/3/4/5	Disabled Enabled	Enable or Disable sSATA Port
Hot Plug	Disabled Enabled	Designates this port as Hot Pluggable.
Configure as eSATA	Disabled Enabled	Configures port as External SATA (eSATA)
Mechanical Presence Switch	Disabled Enabled	Controls reporting if this port has a Mechanical Presence Switch. Note: Requires hardware support.
Spin Up Device	Disabled Enabled	If enabled for any of ports Staggered Spin Up will be performed and only the drives switch has this option enabled will spin up at boot. Otherwise all drives spin up at boot.
SATA Device Type	Hard Disk Drive Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive

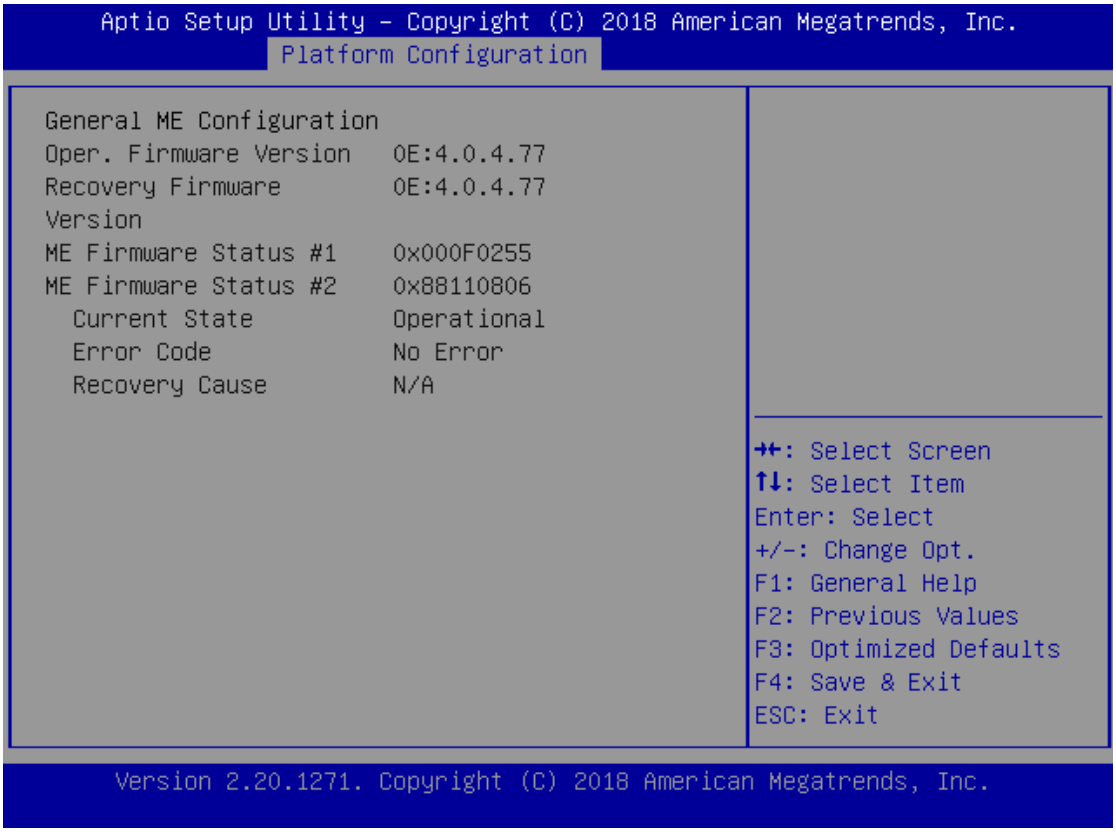
SATA Topology	Unknown ISATA Direct Connect Flex M2	Identify the SATA Topology if it is Default or ISATA or Flex or Direct Connect or M2

Security Configuration

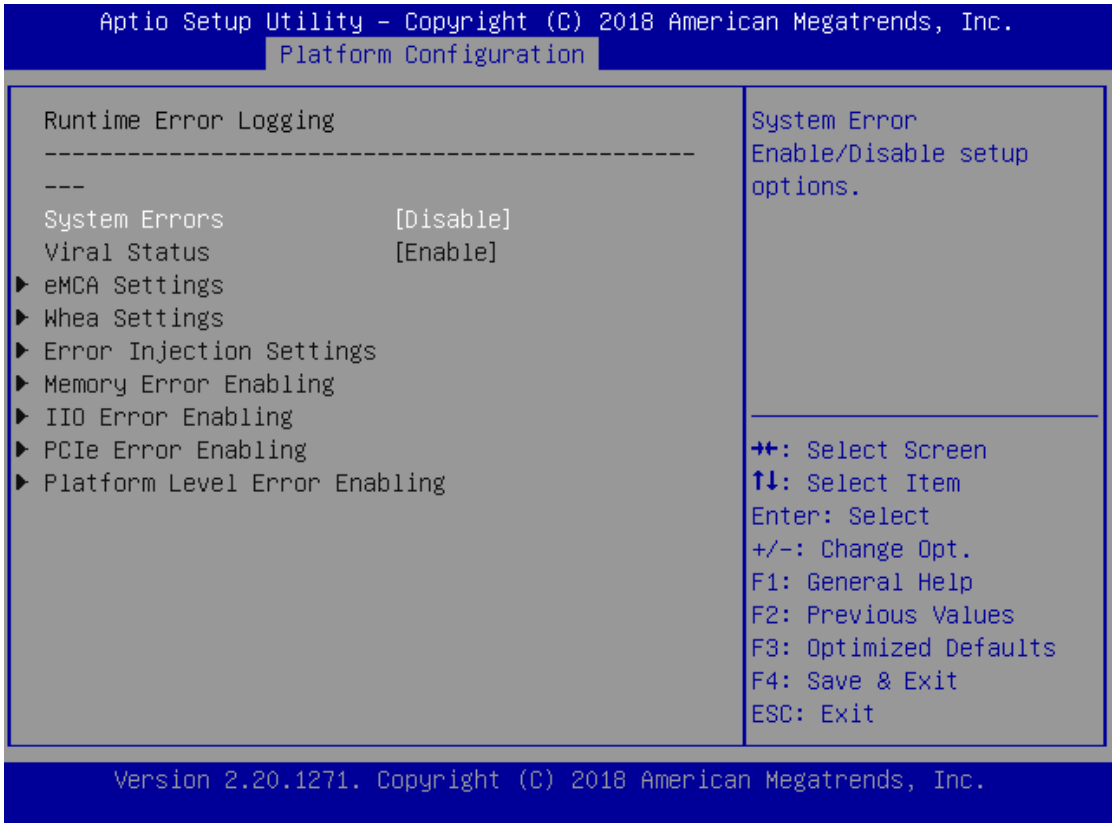


Feature	Options	Description
SMM BIOS Write Protect	Disabled Enabled	Enable/Disable SMM BIOS Write-Protect feature

Server ME Configuration



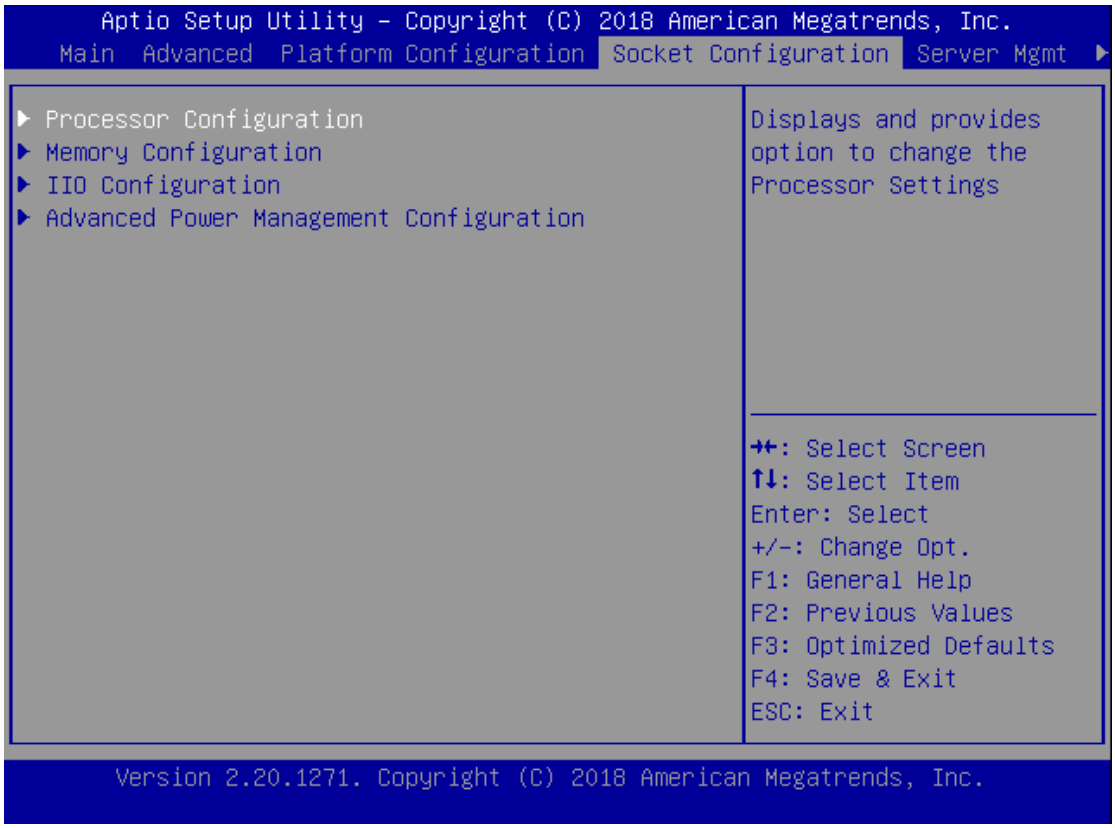
Runtime Error Logging



Feature	Options	Description
System Errors	Disabled Enabled	System Error Enable/Disable setup options.

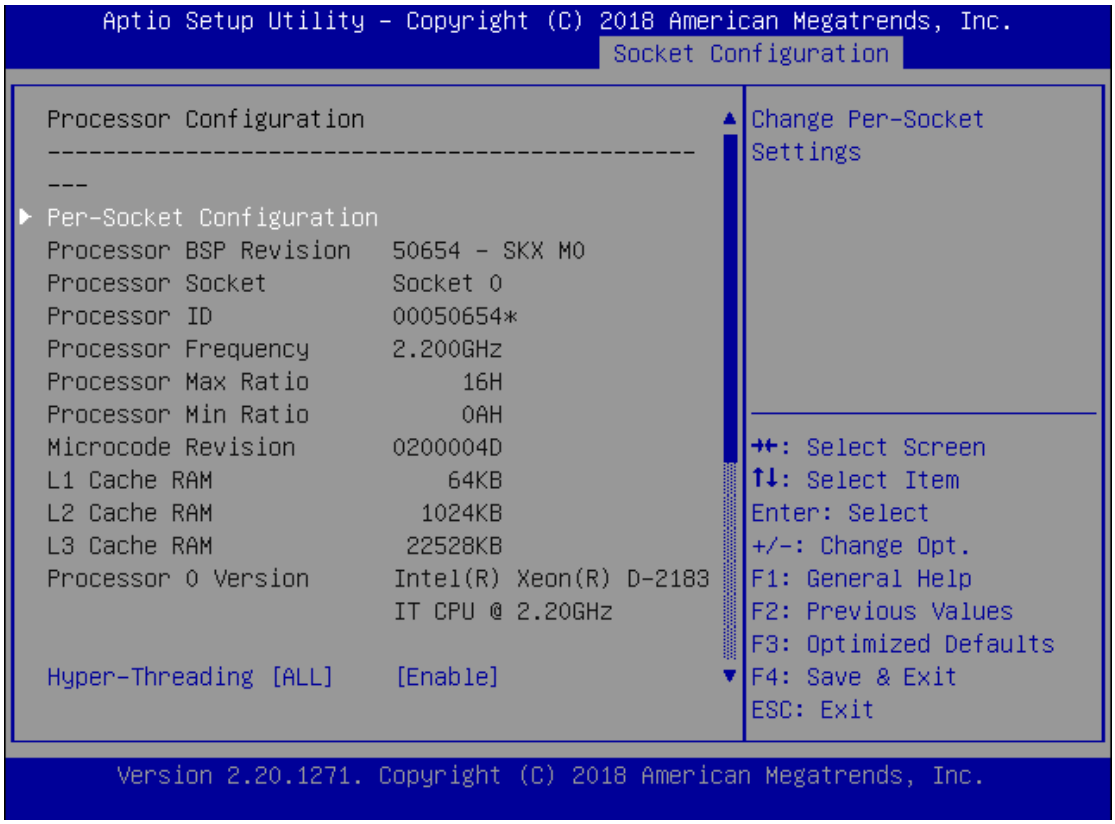
Socket Configuration

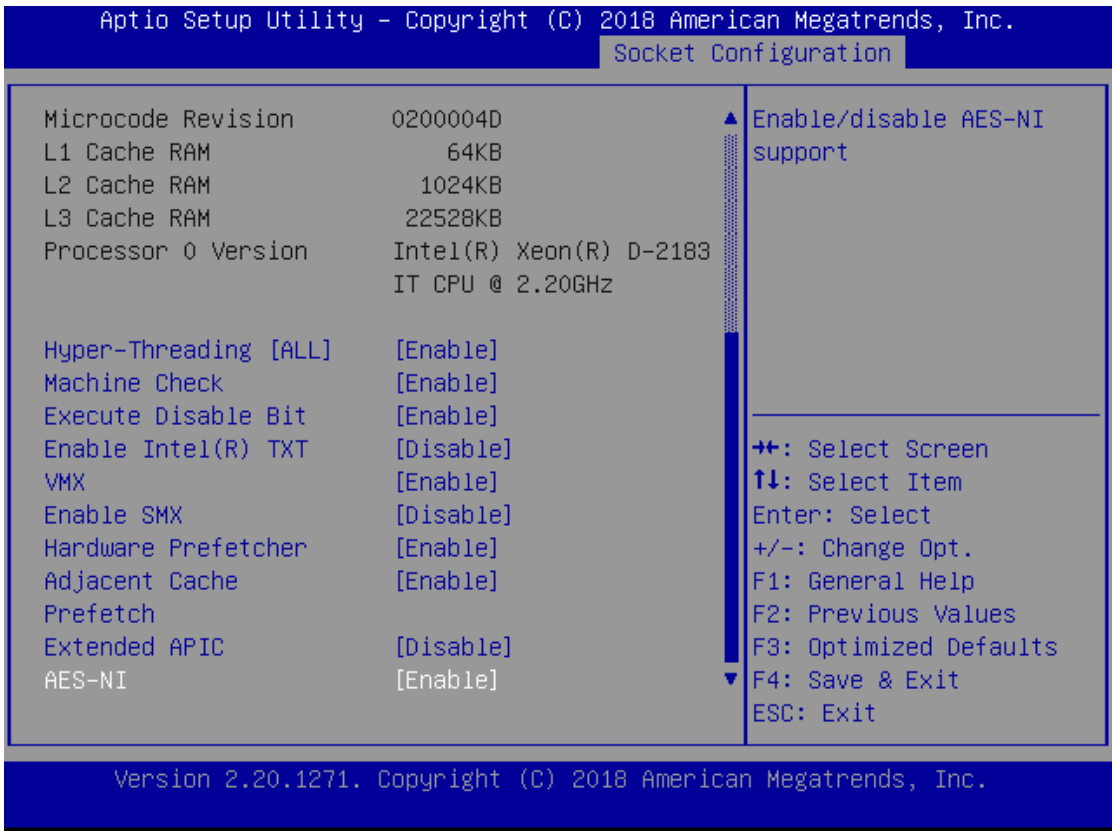
Select the Socket menu item from the BIOS setup screen to enter the Socket Setup screen. Users can select any of the items in the left frame of the screen.



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

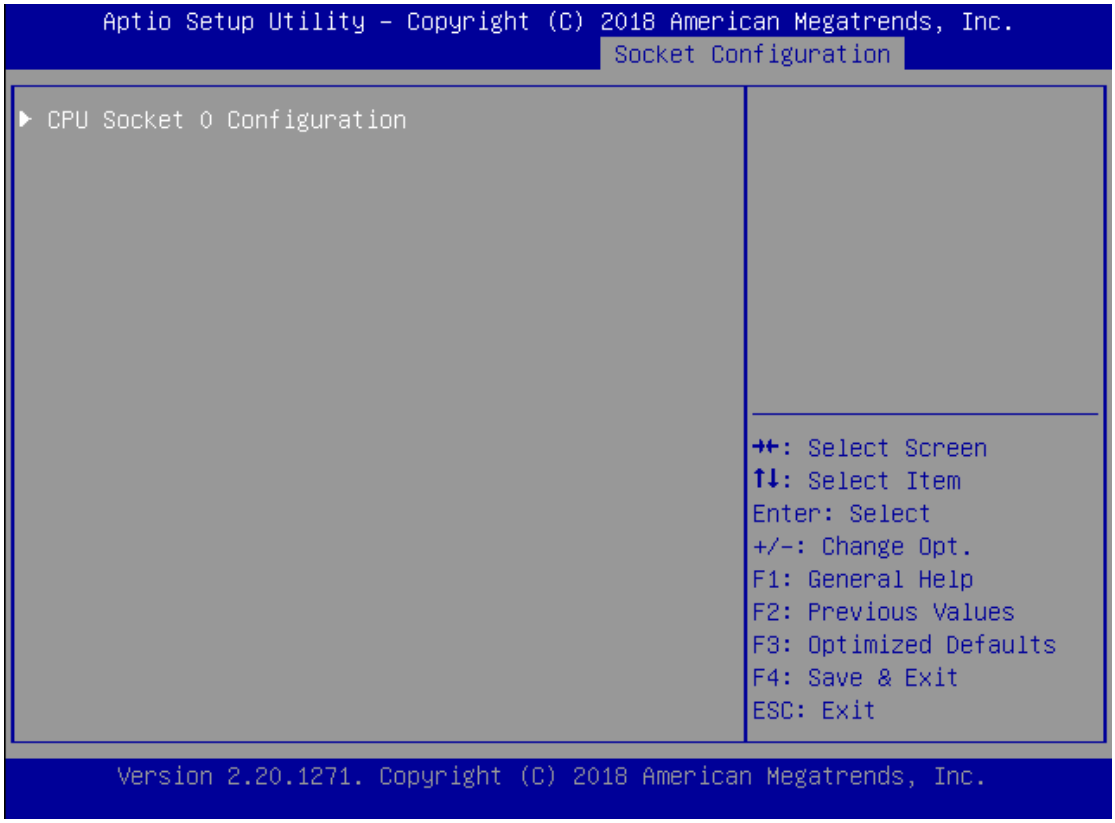
Processor Configuration





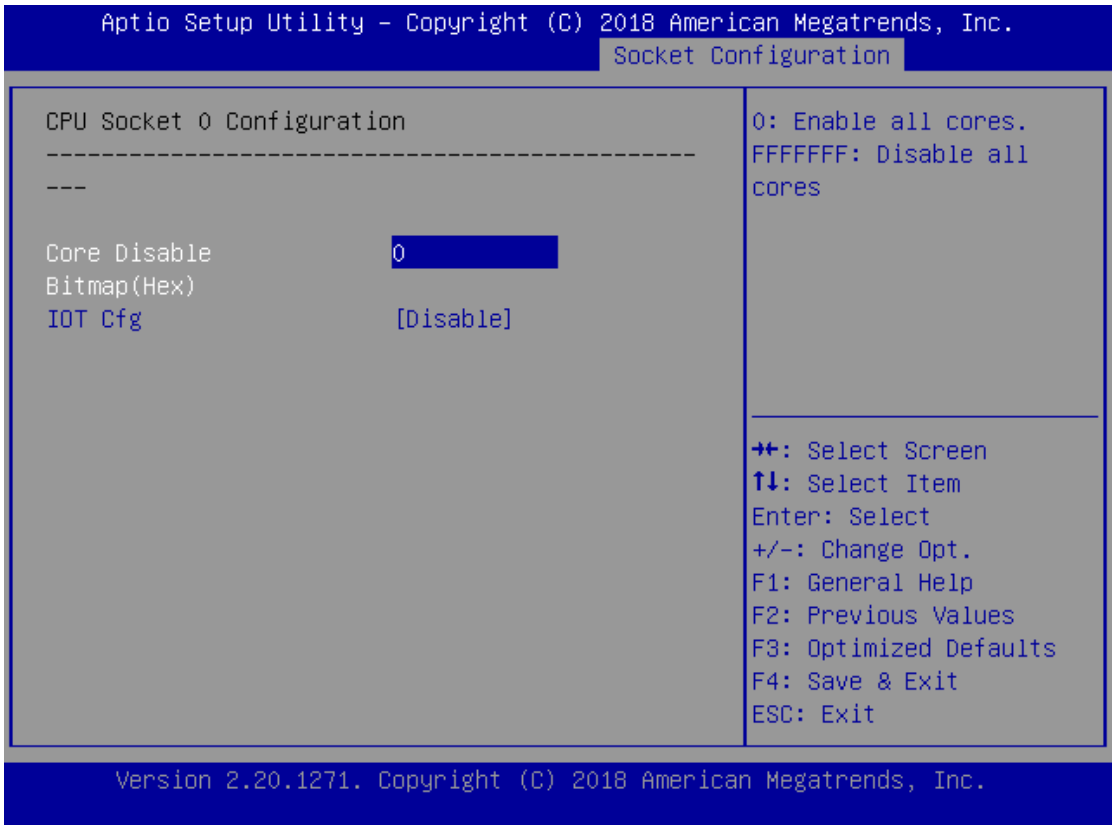
Feature	Options	Description
Hyper-Threading [ALL]	Disabled Enabled	Enables Hyper Threading (Software Method to Enable/Disable Logical Processor threads.
Machine Check	Disabled Enabled	Enable or Disable the Machine Check
Execute Disable Bit	Disabled Enabled	When disabled, it forces the XD feature flag to always return 0.
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
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
AES-NI	Disabled Enabled	Enables or disables AES-NI support

Per-Socket Configuration



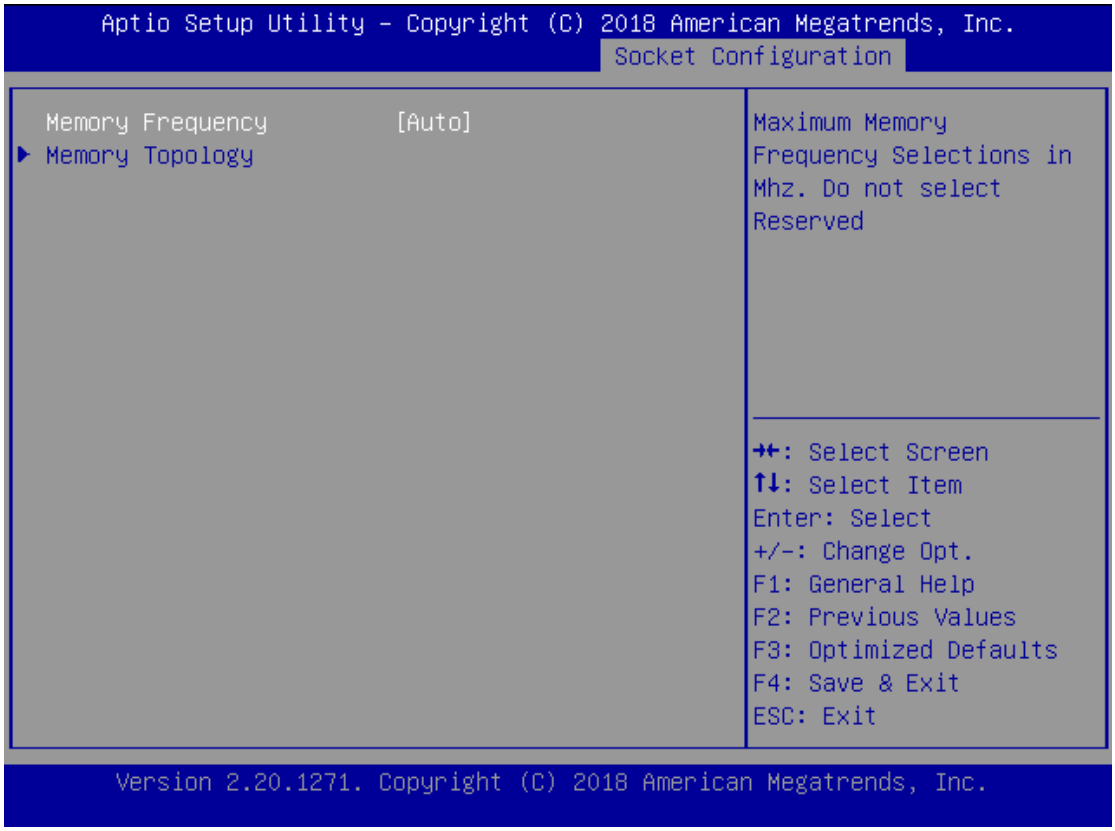
Feature	Options	Description
CPU Socket0 Configuration	None	None

CPU Socket0 Configuration



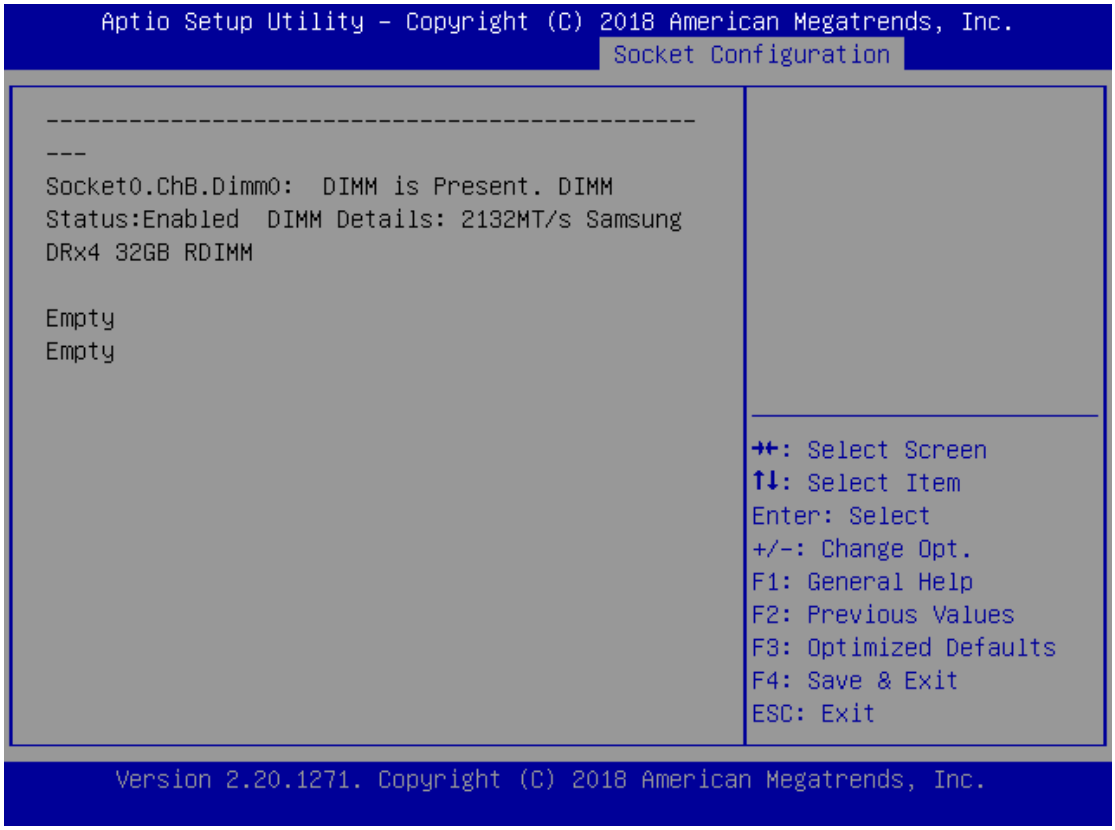
Feature	Options	Description
Core Disable Bitmap (Hex)	0	0: Enable all cores. 3fff: Disable all cores
IOT Cfg	Disabled Enabled	None

Memory Configuration

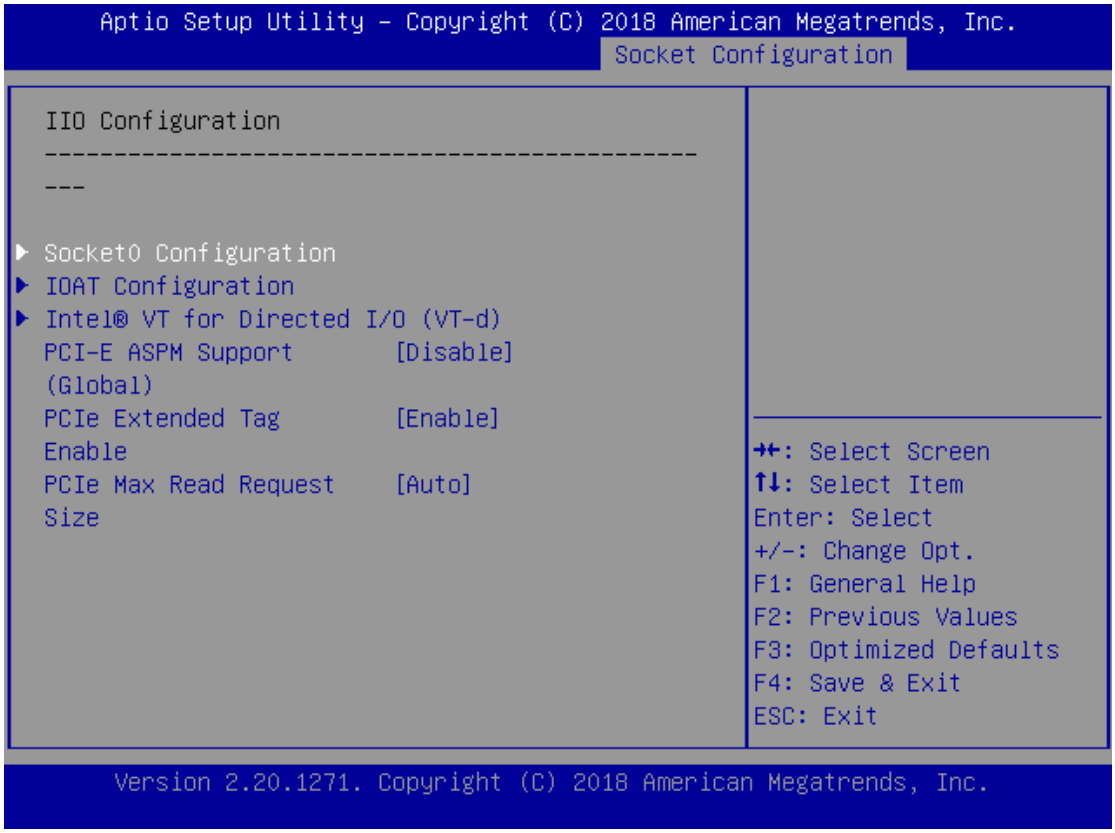


Feature	Options	Description
Memory Frequency	Auto 800 1000 1066 1200 1333 1400 1600 1800 1866 2000 2133 2200 2400 2600 2666 2800-OvrClk 2933-OvrClk 3000-OvrClk 3200-OvrClk 3400-OvrClk 3600-OvrClk	Maximum Memory Frequency Selections in Mhz. Do not select Reserved

	3733-OvrClk 3800-OvrClk 4000-OvrClk 4200-OvrClk 4266-OvrClk 4400-OvrClk	
Memory Topology	None	Displays memory topology with Dimm population information

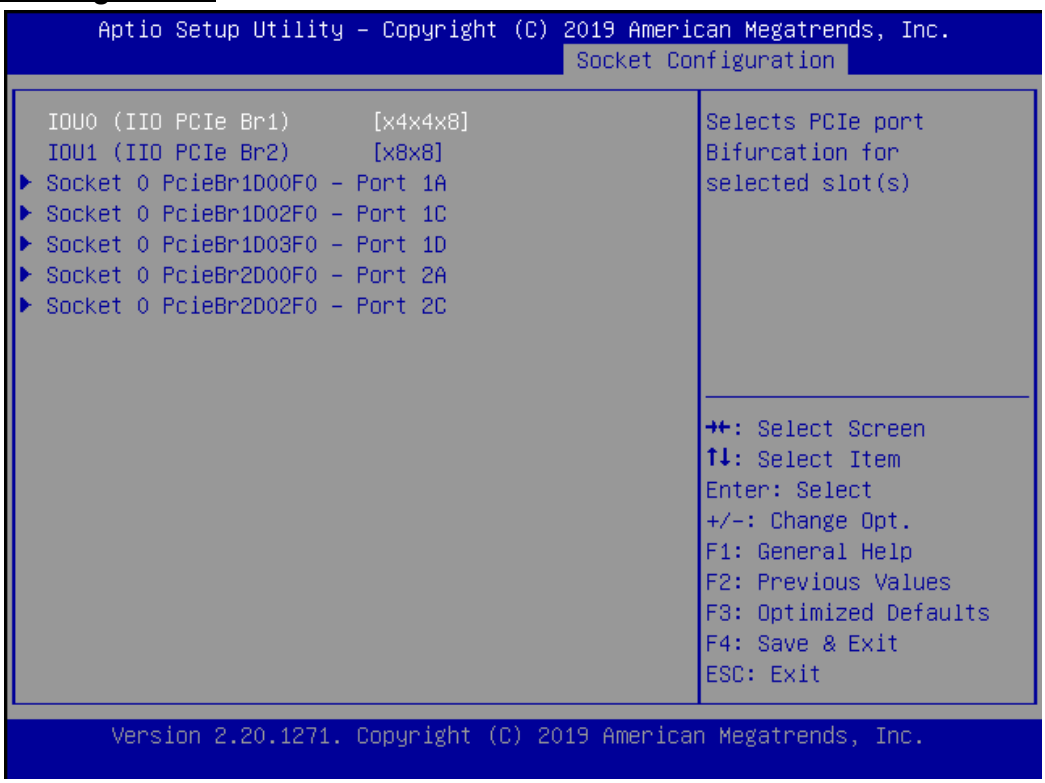


IIO Configuration



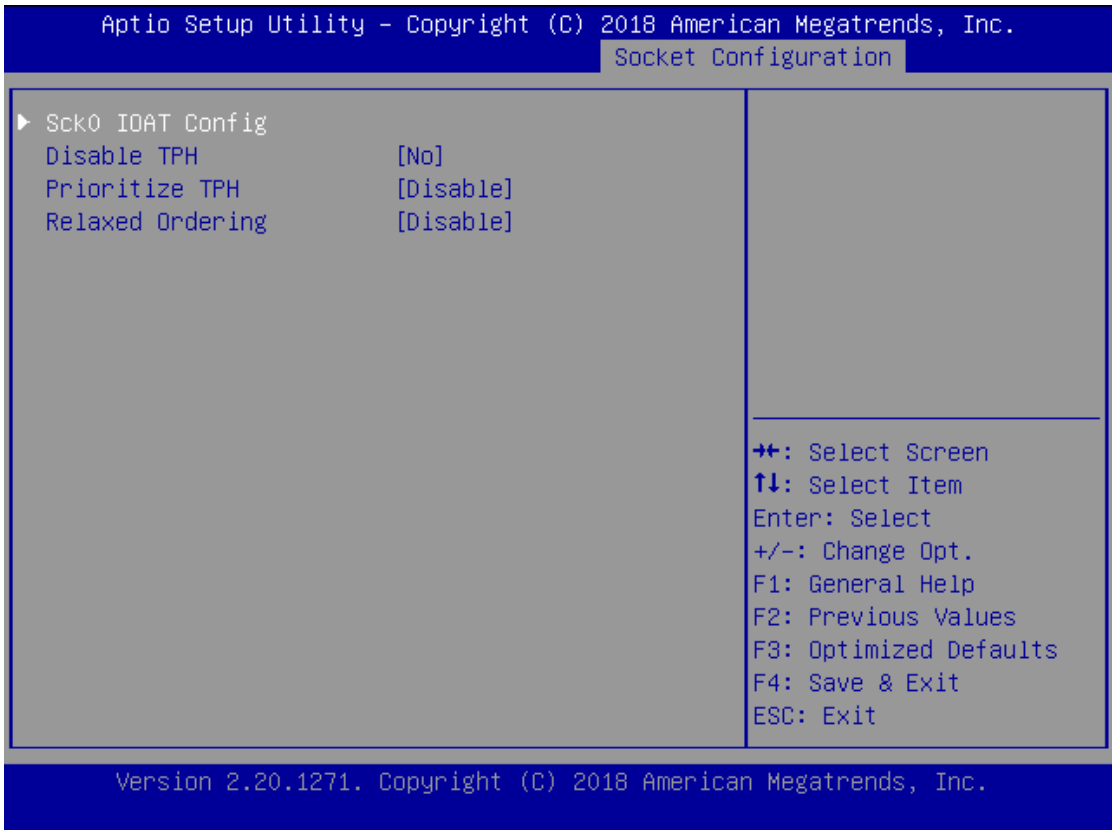
Feature	Options	Description
Socket0 Configuration	None	None
IOAT Configuration	None	All IOAT configuration options
Intel® VT for Directed I/O (VT-d)	None	Press **<Enter>** to bring up the Intel? VT for Directed I/O (VT-d) Configuration menu.
PCI-E ASPM Support (Global)	Disabled Per-Port L1 Only	This option enables / disables the ASPM support for all downstream devices.
PCIe Extended Tag Enable	Auto Disabled Enabled	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



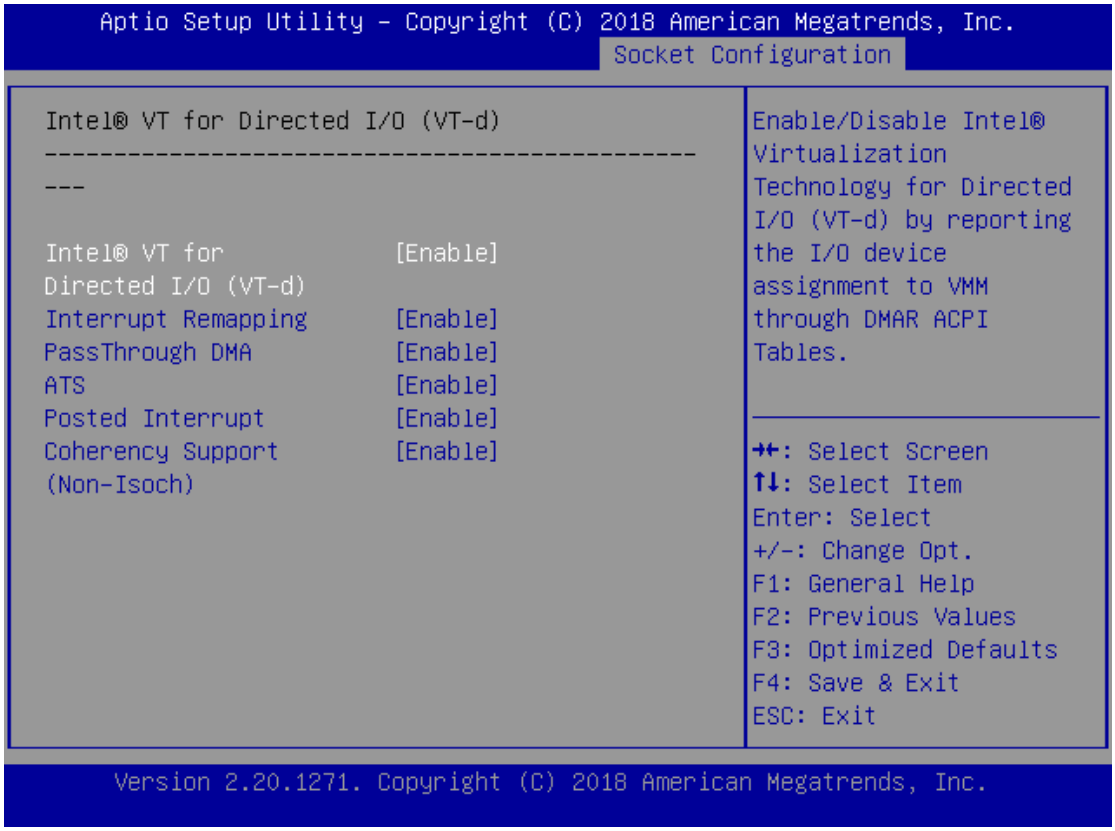
Feature	Options	Description
Socket 0 PcieBr1D00F0	None	Settings related to PCI Express Port 1A
Socket 0 PcieBr2D00F0	None	Settings related to PCI Express Port 2A
Socket 0 PcieBr2D02F0	None	Settings related to PCI Express Port 2C

IOAT Configuration



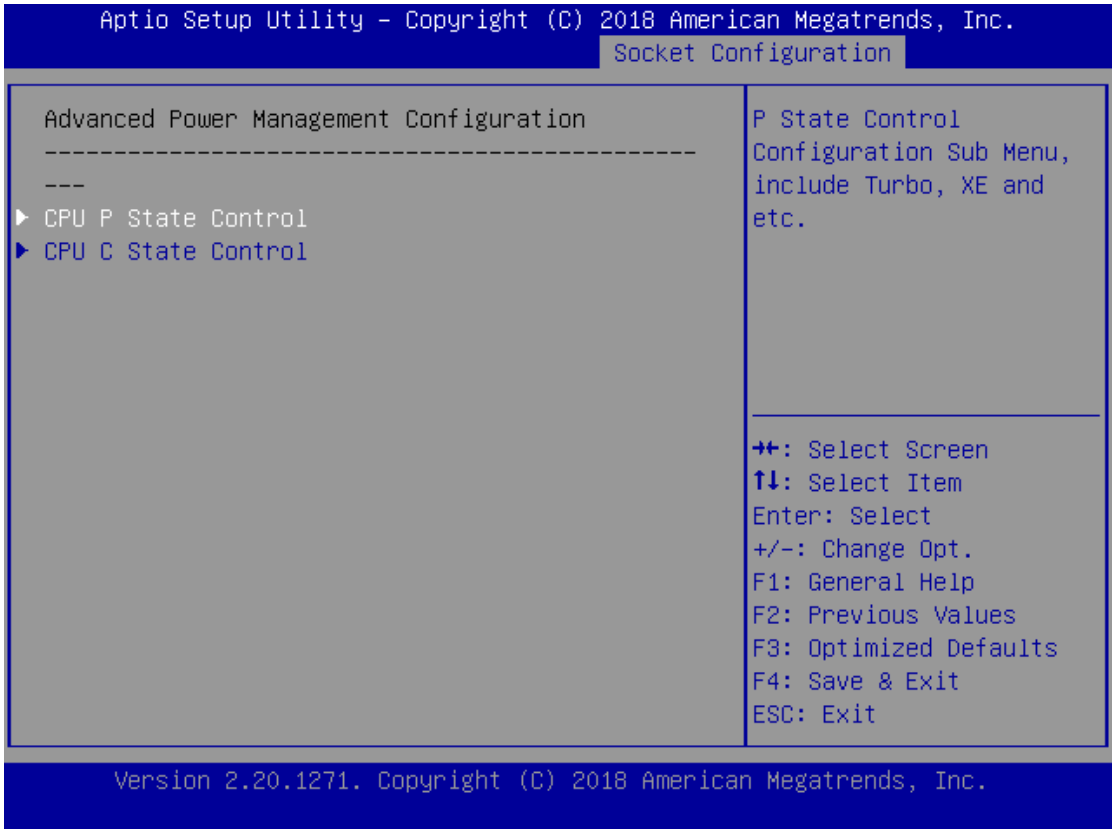
Feature	Options	Description
Sck0 IOAT Config	None	None
Disable TPH	No Yes	TLP Processing Hint disable
Prioritize TPH	Disabled Enabled	Prioritize TPH
Relaxed Ordering	Disabled Enabled	Relaxed Ordering Enable/Disable

Intel® VT for Directed I/O (VT-d)



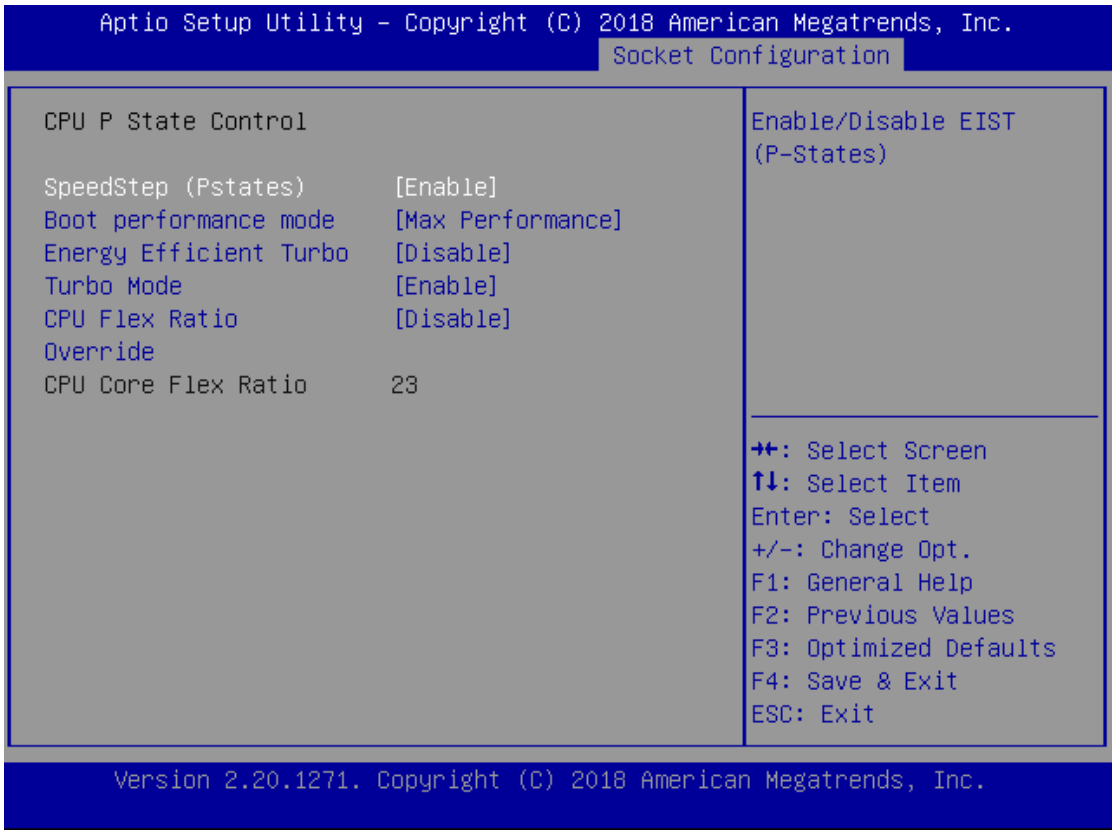
Feature	Options	Description
Intel® VT for Directed I/O (VT-d)	Disabled Enabled	Press **<Enter>** to bring up the Intel? VT for Directed I/O (VT-d) Configuration menu.
Interrupt Remapping	Disabled Enabled	Enable/Disable VT_D Interrupt Remapping Support
PassThrough DMA	Disabled Enabled	Enable/Disable Non-Isoch VT_D Engine Pass Through DMA support
ATS	Disabled Enabled	Enable/Disable Non-Isoch VT_D Engine ATS support
Posted Interrupt	Disabled Enabled	Enable/Disable VT_D posted interrupt
Coherency Support (Non-Isoch)	Disabled Enabled	Enable/Disable Non-Isoch VT_D Engine Coherency support

Advanced Power Management Configuration



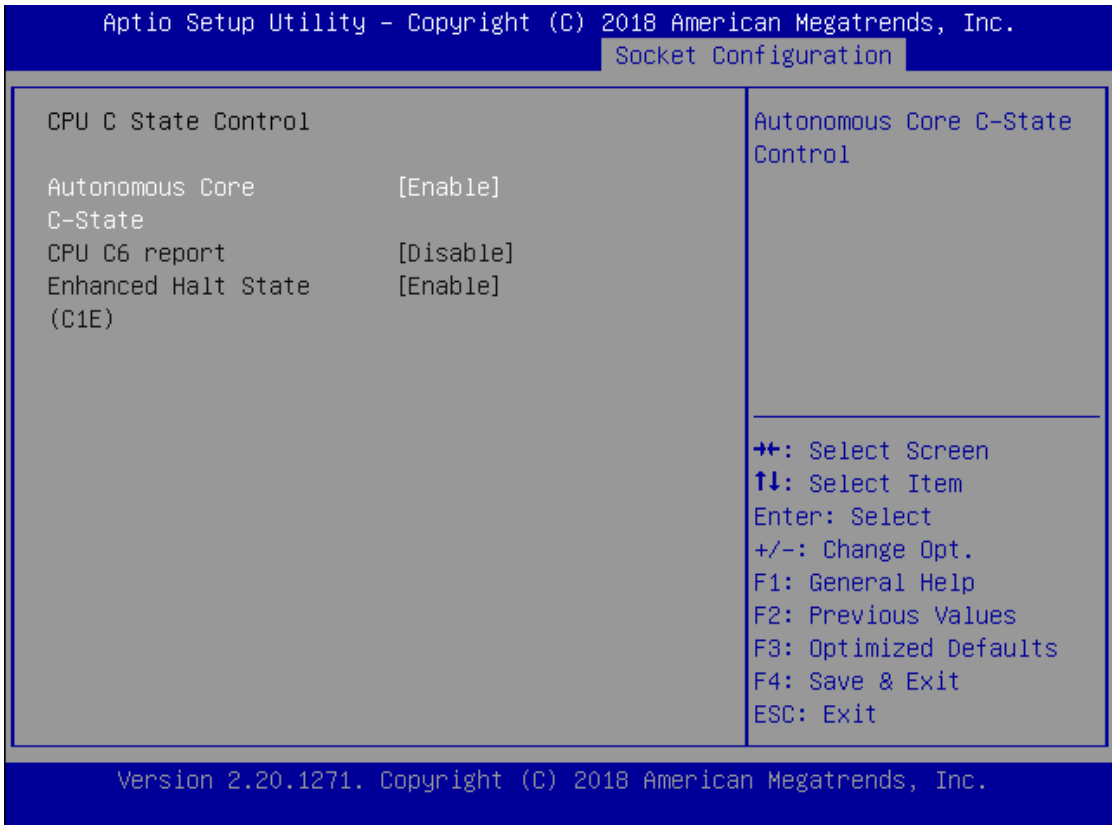
Feature	Options	Description
CPU P State Control	None	P State Control Configuration Sub Menu, include Turbo, XE and etc.
CPU C State Control	None	CPU C State setting

CPU P State Control



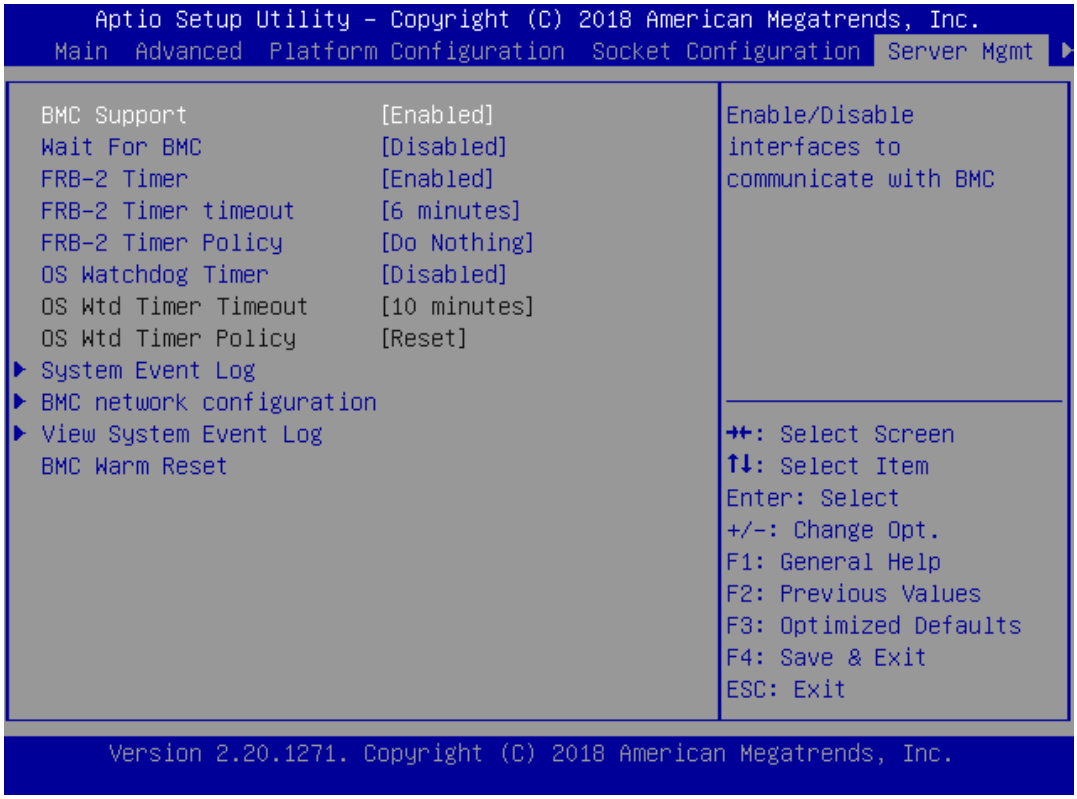
Feature	Options	Description
SpeedStep (Pstates)	Disabled Enabled	Enables or disables EIST (P-States)
Boot performance mode	Max Performance Max Efficient Set by Intel Node Manager	Select the performance state that the BIOS will set before OS hand off.
Energy Efficient Turbo	Disabled Enabled	Energy Efficient Turbo Disable, MSR 0x1FC [19]
Turbo Mode	Disabled Enabled	Enable/Disable processor Turbo Mode (requires EMTTM enabled too).
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
Autonomous Core C-State	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.

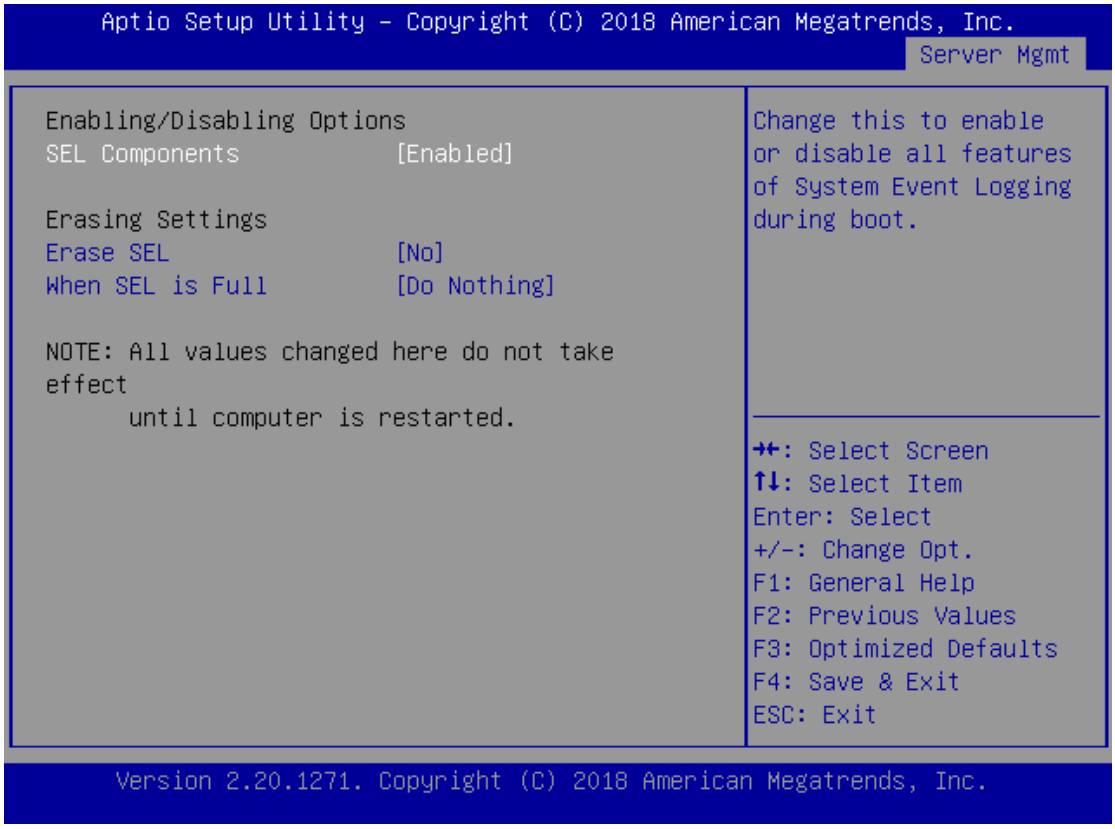
Server Mgmt



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.

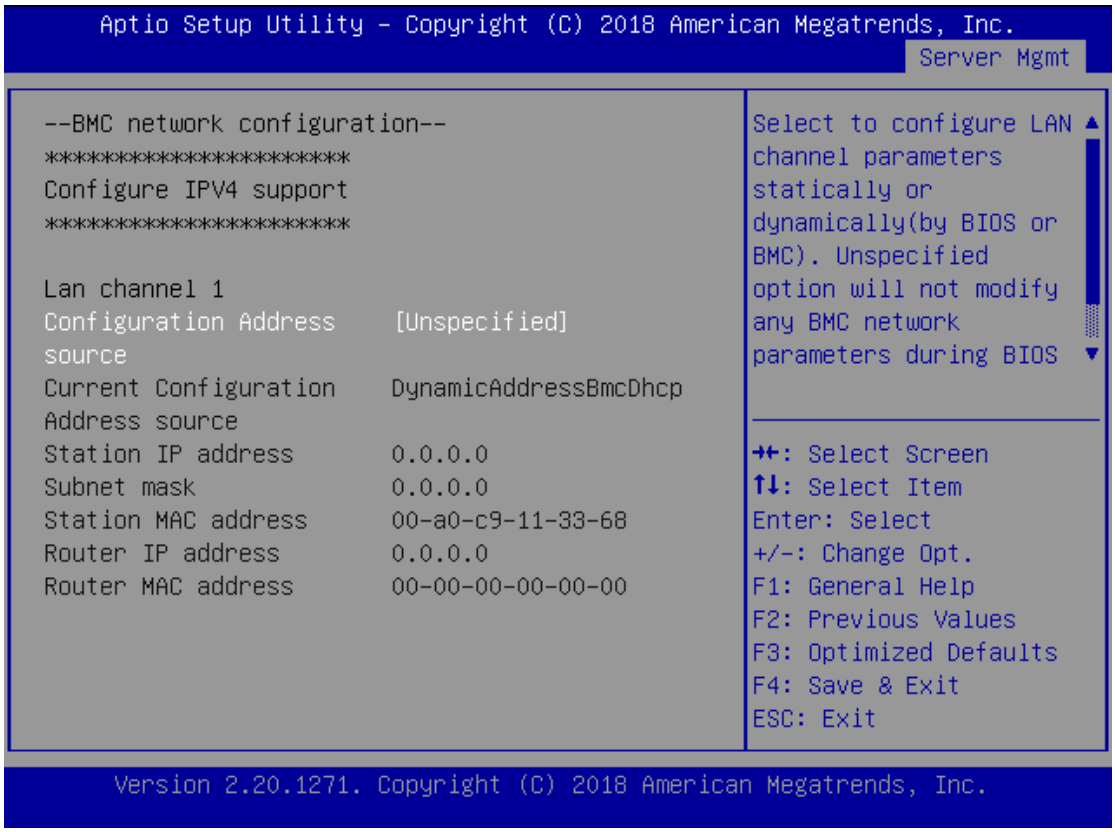
OS Wtd Timer Timeout	5 minutes 10 minutes 15 minutes 20 minutes	Configure the length of the OS Boot Watchdog Timer. Not available if OS Boot Watchdog Timer is disabled.
OS Wtd Timer Policy	Do Nothing Reset Power Down Power Cycle	Configure how the system should respond if the OS Boot Watchdog Timer expires. Not available if OS Boot Watchdog Timer is disabled.
System Event Log	NA	Press **<Enter>** to change the SEL event log configuration.
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.
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.

System Event Log



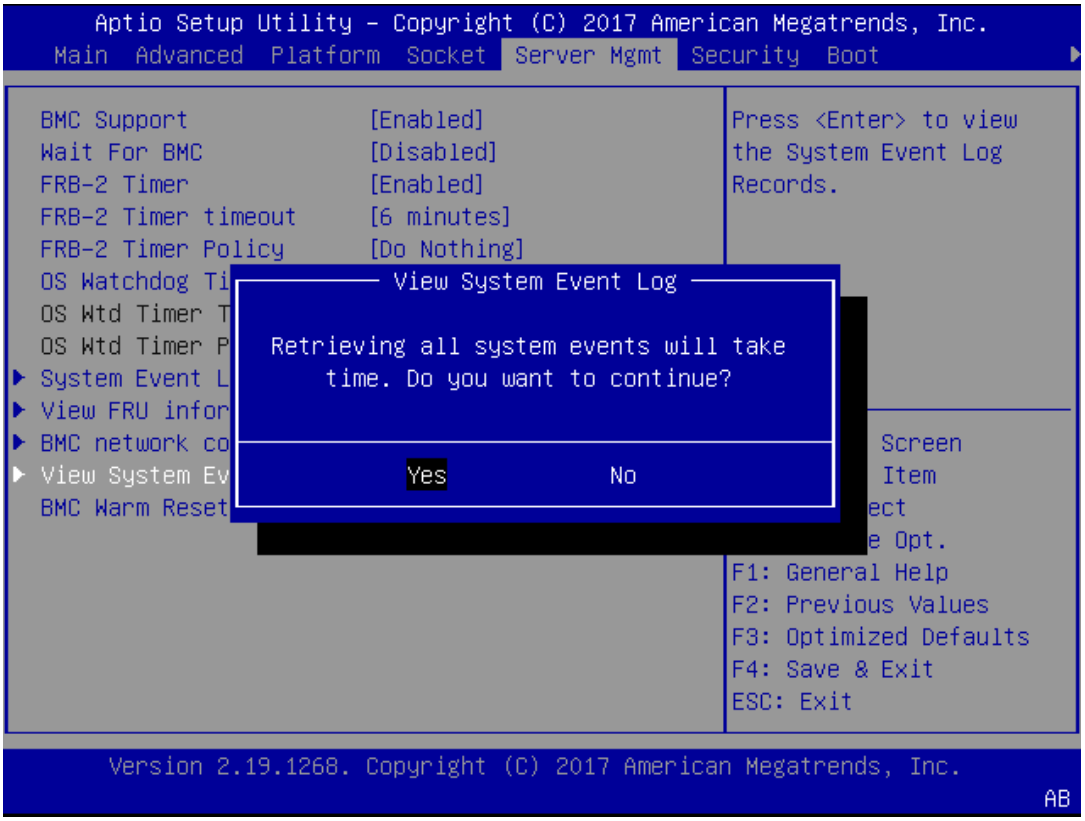
Feature	Options	Description
SEL Components	Disabled Enabled	Enables or disables all features of System Event Logging during boot.
Erase SEL	NO Yes, On next reset Yes, On every reset	Choose options for erasing SEL.
When SEL is Full	Do Nothing Erase Immediately Delete Oldest Record	Choose options for reactions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

BMC Network Configuration



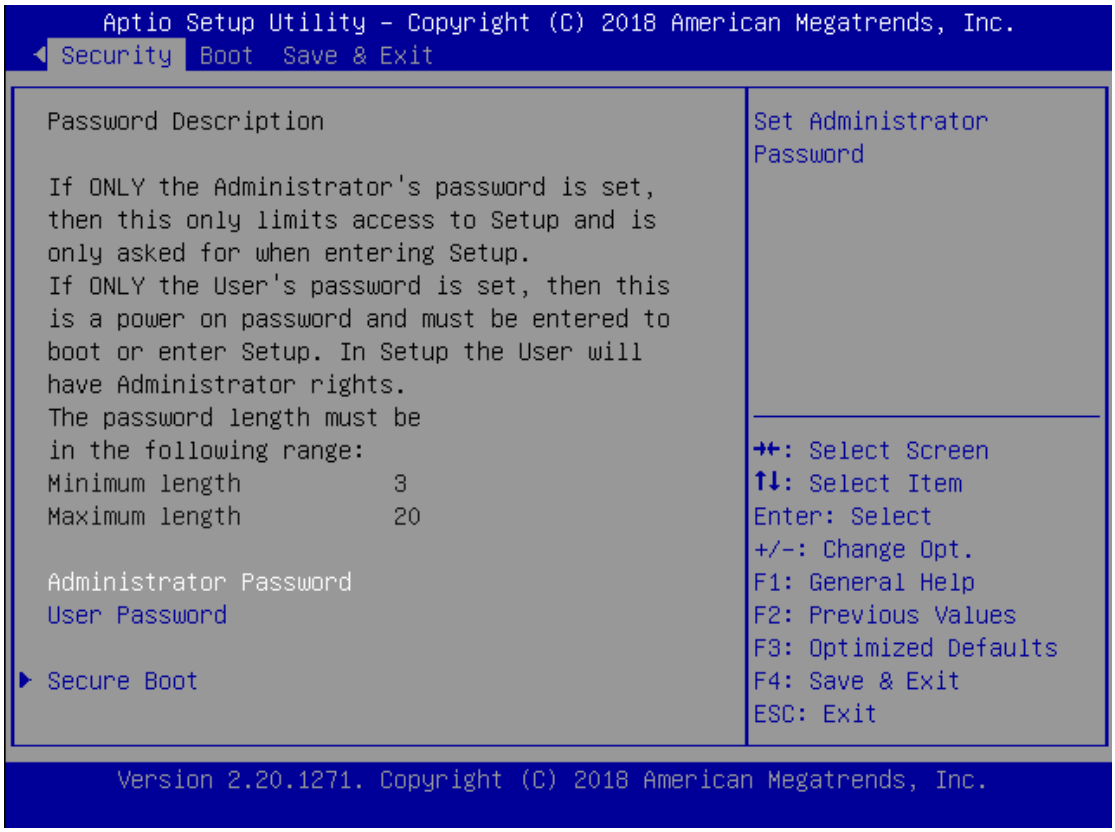
Feature	Options	Description
Configuration Address source	Unspecified Static DynamicBmcDhcp	Select to configure LAN channel parameters statically or dynamically (by BIOS or BMC). The **unspecified** option will not modify any BMC network parameters during BIOS phase.

View System Event Log



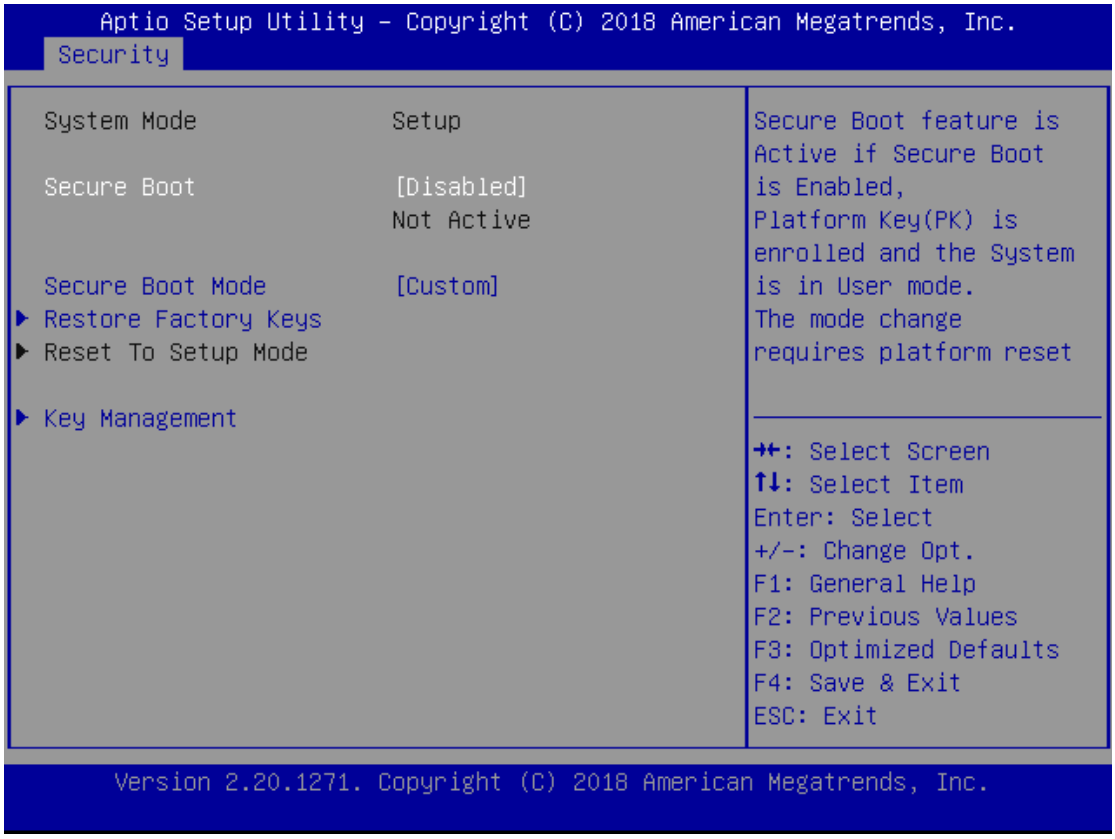
Security

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.



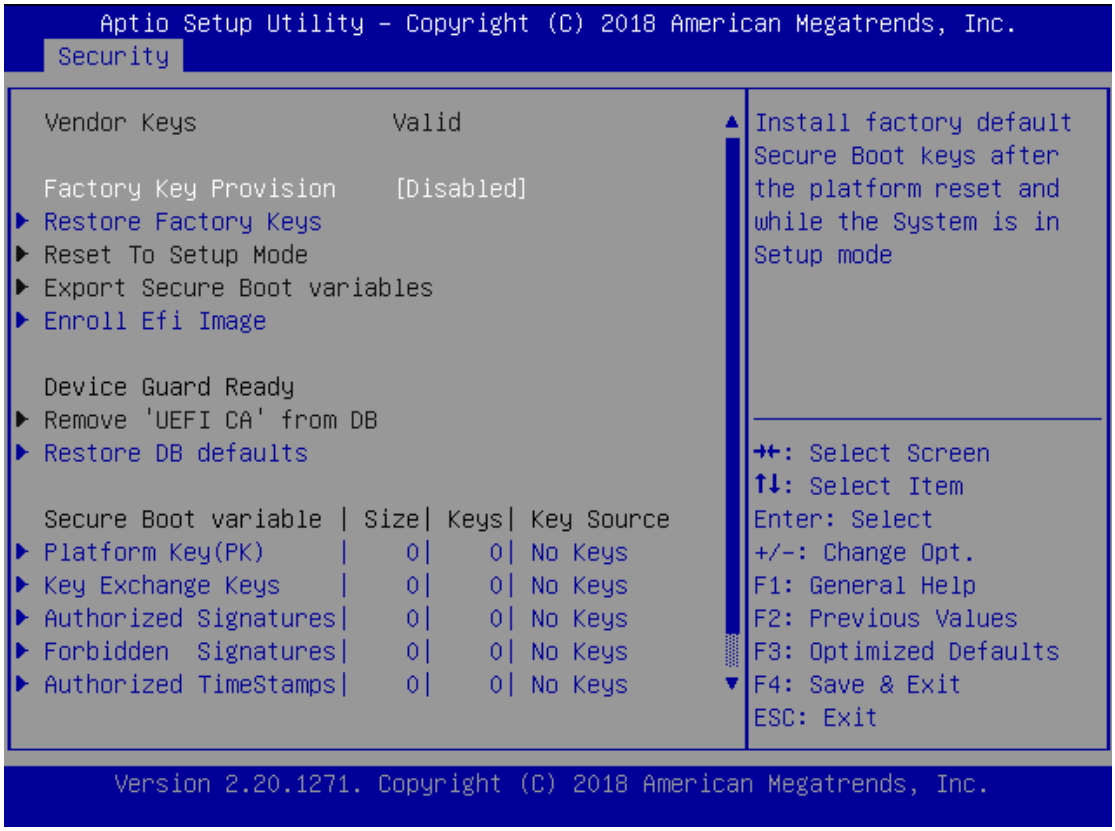
Feature	Description
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the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

Secure Boot



Feature	Options	Description
Secure Boot Enable	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	Customizable Secure Boot mode: In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

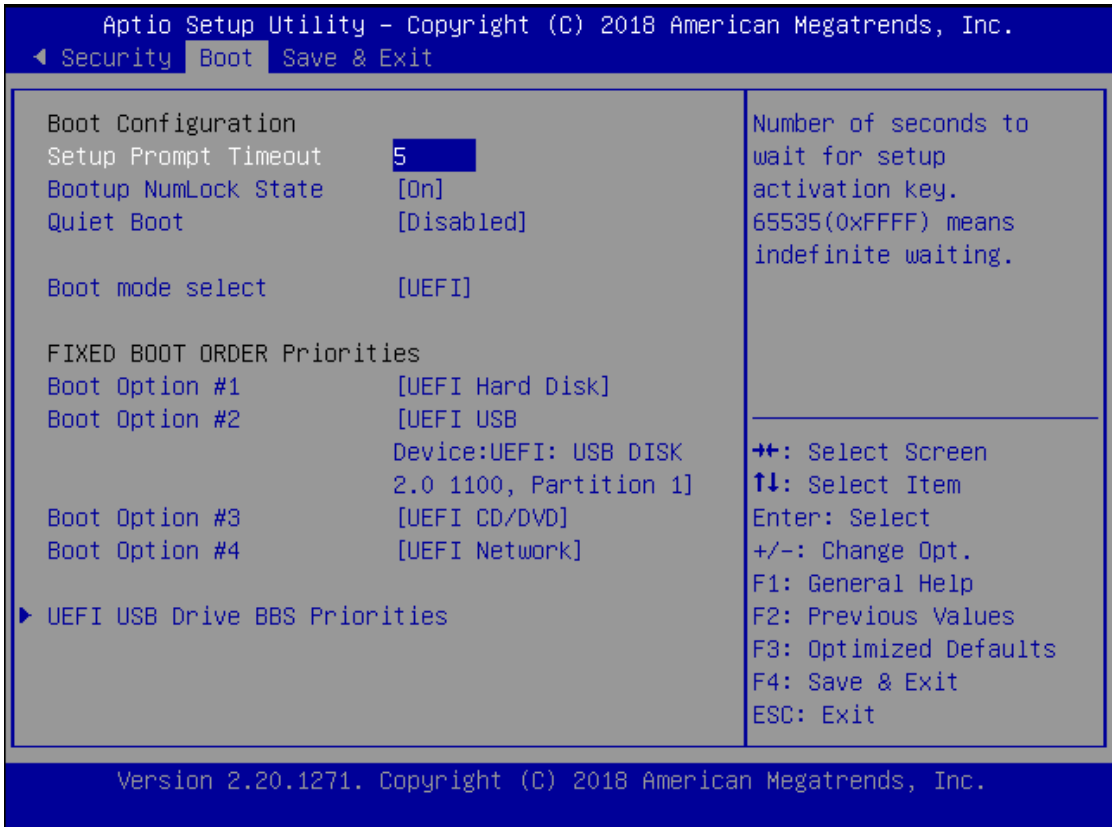
Key Management



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

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.

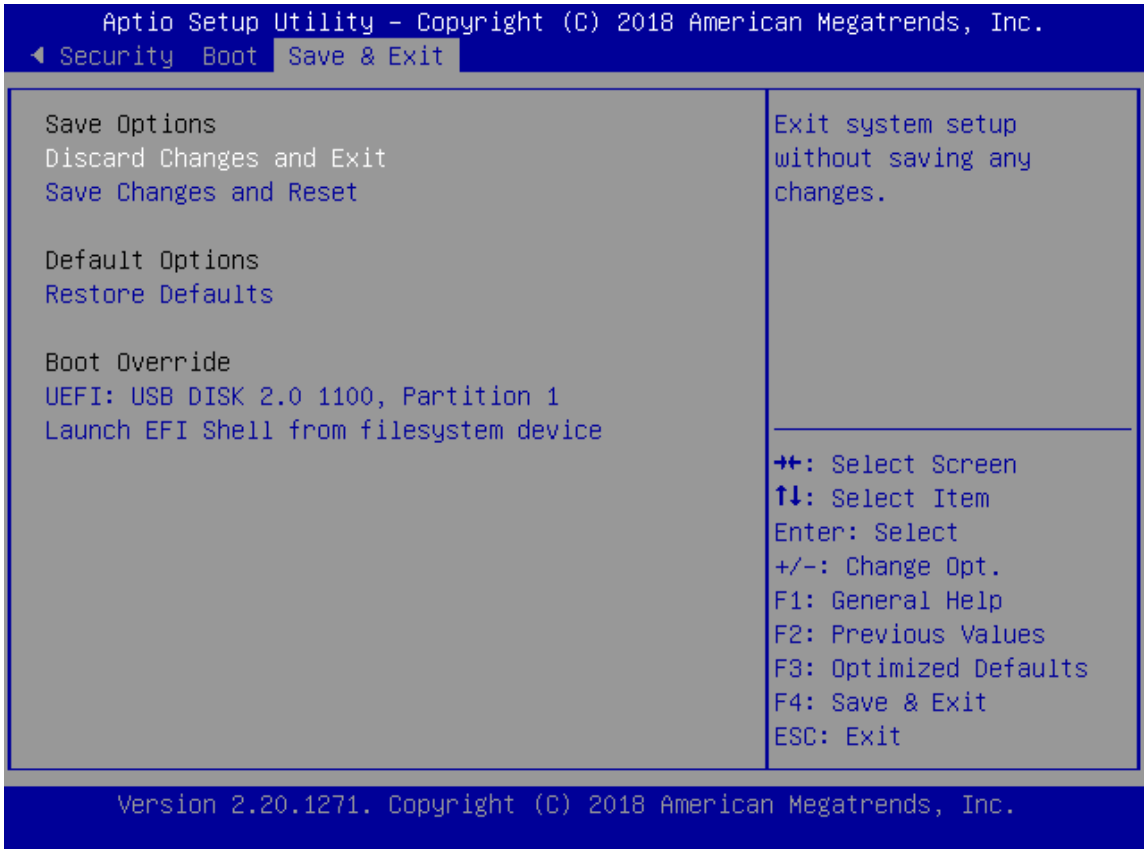


Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Optimized Boot	Disabled Enabled	Enables or disables Optimized Boot. Enabling Optimized Boot will disable Csm support ad disable connecting Network devices to decrease boot time. While disabling Optimized Boot, make sure to restore Csm Support option to previous value before enabling Optimized Boot.
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.

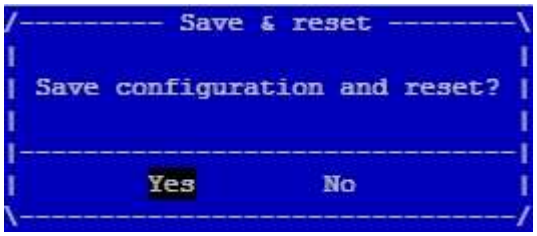
Save & Exit

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.



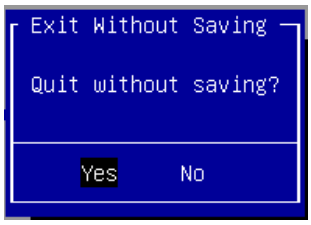
■ Save Changes and Reset

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



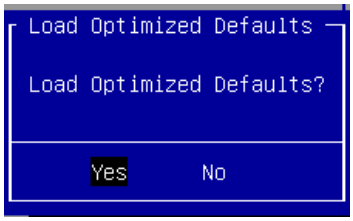
■ Discard Changes and Exit

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.



■ Restore Defaults

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

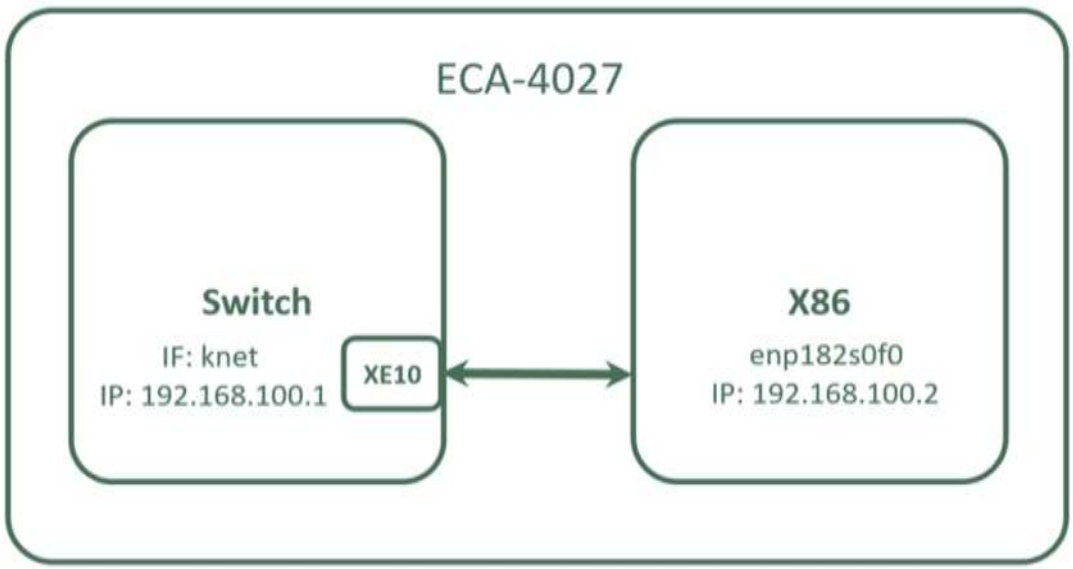


Note

The items under Boot Override may not have the same image. It would depend on devices connected on system.

CHAPTER 5: BROADCOM CLI SETUP

This section describes how to setup Broadcom Command Line Interface (CLI) via network.



1. X86 ethernet enp182s0f0(pci bus b6:00.0) set IP 192.168.100.X.

   Example:

   sudo ip addr add 192.168.100.2/24 dev enp182s0f0

2. Broadcom CLI – 192.168.100.1 at port 12345

   telnet 192.168.100.1 12345

```
mint@mint:~$ telnet 192.168.100.1 12345
Trying 192.168.100.1...
Connected to 192.168.100.1.
Escape character is '^]'.

BCM.0> ps
                ena/    speed/ link auto    STP                 lrn  inter   max  loop
          port  link    duplex scan neg?   state   pause  discrd ops   face frame  back
       xe0( 16) down    10G  FD   SW  No    Forward  TX RX   None   FA    SFI 16356
       xe1( 17) down    10G  FD   SW  No    Forward  TX RX   None   FA    SFI 16356
       xe2( 18) down    10G  FD   SW  No    Forward  TX RX   None   FA    SFI 16356
       xe3( 19) down    10G  FD   SW  No    Forward  TX RX   None   FA    SFI 16356
       xe4( 20) down    10G  FD   SW  No    Forward  TX RX   None   FA    SFI 16356
       xe5( 21) down    10G  FD   SW  No    Forward  TX RX   None   FA    SFI 16356
       xe6( 22) down    10G  FD   SW  No    Forward  TX RX   None   FA    SFI 16356
       xe7( 23) down    10G  FD   SW  No    Forward  TX RX   None   FA    SFI 16356
       xe8( 24) down    40G  FD   SW  No    Forward  TX RX   None   FA    CR4 16356
       xe9( 25) down    40G  FD   SW  No    Forward  TX RX   None   FA    CR4 16356
      xe10( 26) up      10G  FD   SW  Yes   Forward          None   FA     KR 16356
      xe11( 27) up      10G  FD   SW  Yes   Forward          None   FA     KR 16356
      xe12( 28) up      10G  FD   SW  Yes   Forward          None   FA     KR 16356
      xe13( 29) up      10G  FD   SW  Yes   Forward          None   FA     KR 16356
       ge0( 30) down     1G  FD   SW  No    Forward  TX RX   None   FA   GMII 16356
       ge1( 31) !ena     1G  FD   SW  No    Forward  TX RX   None   FA   GMII 16356
       ge2( 32) !ena     1G  FD   SW  No    Forward  TX RX   None   FA   GMII 16356
       ge3( 33) !ena     1G  FD   SW  No    Forward  TX RX   None   FA   GMII 16356
```

CHAPTER 6: BROADCOM CLI SAMPLE GUIDE

The following section aims to guide developers in utilizing the Broadcom Command Line Interface (CLI) for configuring the Broadcom Switch and establishing the necessary environment.

Note: The examples below are for reference only, and may not be the same during actual usage.

5.1 Trunking (Link Aggregation)

5.1.1 PSC (Port Selection Criteria) Usage

The macros shown in Macros for Specifying Port Selection Criteria (PSC) are designated for specifying the Port Selection Criteria (PSC), that is, how to spread the traffic across the trunk's member ports:

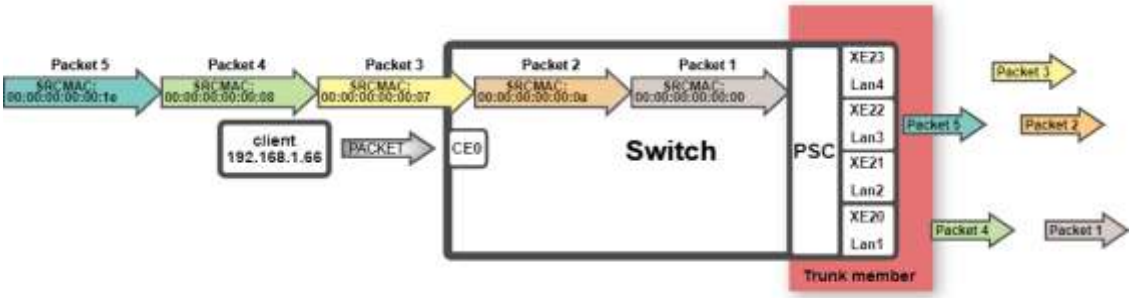
Table 2: Macros for Specifying Port Selection Criteria (PSC)

Macro	PSC Description
5.1.1.1 BCM_TRUNK_PSC_SRCMAC	Spread based on source MAC address
5.1.1.2 BCM_TRUNK_PSC_DSTMAC	Spread based on destination MAC address
5.1.1.3 BCM_TRUNK_PSC_SRCDSTMAC	Spread based on source and destination MAC address
5.1.1.4 BCM_TRUNK_PSC_SRCIP	Spread based on source IP address
5.1.1.5 BCM_TRUNK_PSC_DSTIP	Spread based on destination IP address
5.1.1.6 BCM_TRUNK_PSC_SRCDSTIP	Spread based on source and destination IP address
5.1.1.7 BCM_TRUNK_PSC_PORTFLOW	Enhanced hashing
5.1.1.8 BCM_TRUNK_PSC_ROUND_ROBIN	Round robin selection of members.

5.1.1.1 BCM_TRUNK_PSC_SRCMAC

Spread based on source MAC address.

Example: **Environmental architecture**



Load balancing based on source MAC address

The client uses the scapy command to send packets to the switch, and then it loads the distribution of traffic across trunk member ports in source MAC address. The example is for reference only.

CLI Settings:

trunk init

trunk add id=1 pbm=xe20-xe23 rtag=1

fp init

fp qset add srcip

fp group create 1 1

fp entry create 1 1

fp qual 1 srcip 192.168.1.66 255.255.255.255

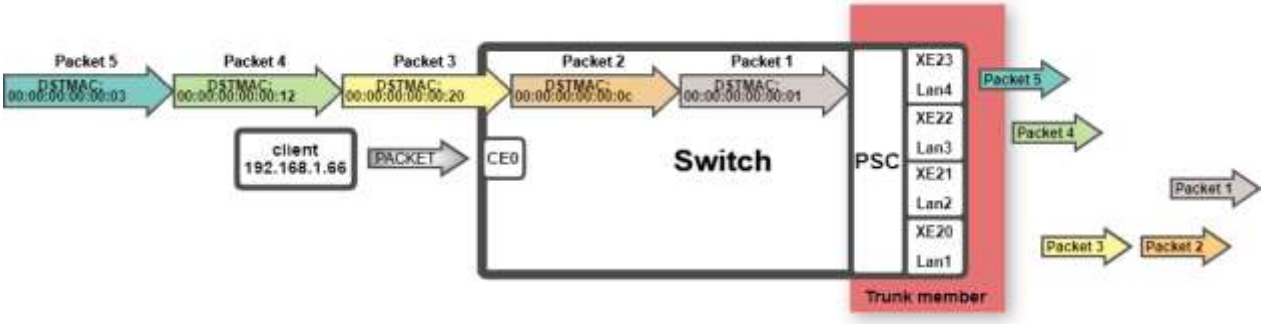
fp action add 1 redirecttrunk 1

fp entry install 1

5.1.1.2 BCM_TRUNK_PSC_DSTMAC

Spread based on destination MAC address.

Example: Environmental architecture



Load balancing based on destination MAC address

The client uses the scapy command to send packets to the switch, and then it loads the distribution of traffic across trunk member ports in destination MAC address. The example is for reference only.

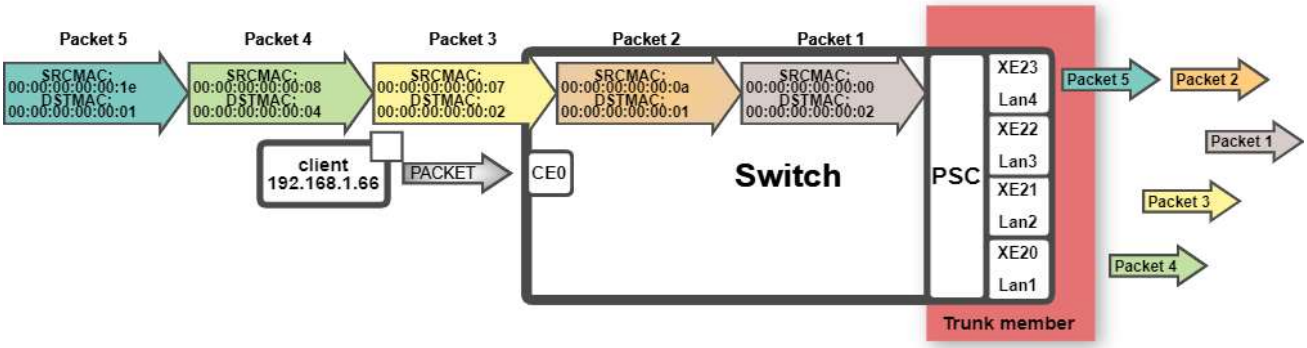
CLI Settings:

```
trunk init
trunk add id=1 pbm=xe20-xe23 rtag=2
fp init
fp qset add srcip
fp group create 1 1
fp entry create 1 1
fp qual 1 srcip 192.168.1.66 255.255.255.255
fp action add 1 redirecttrunk 1
fp entry install 1
```

5.1.1.3 BCM_TRUNK_PSC_SRCDSTMAC

Spread based on source and destination MAC address.

Example: Environmental architecture



Load balancing based on source and destination MAC address

The client uses the scapy command to send packets to the switch, and then it loads the distribution of traffic across trunk member ports in source and destination MAC address. The example is for reference only.

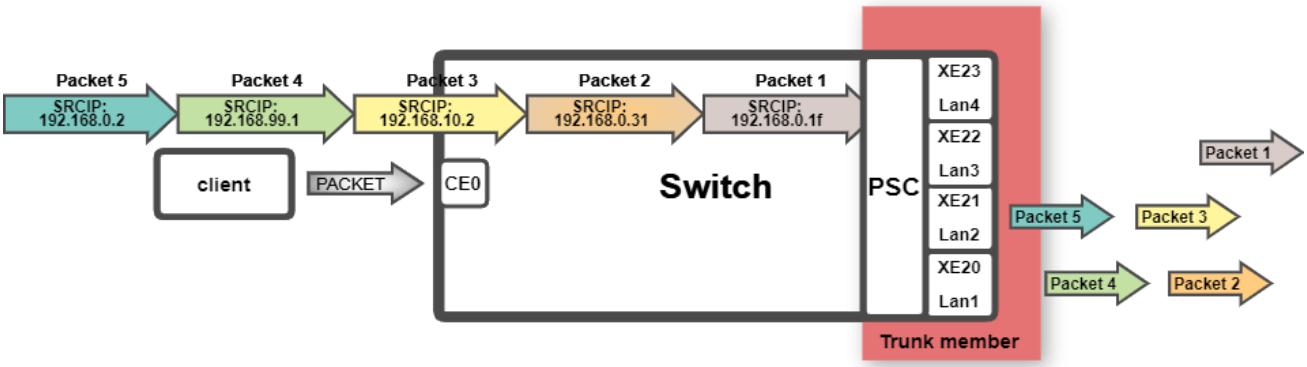
CLI Settings:

```
trunk init
trunk add id=1 pbm=xe20-xe23 rtag=3
fp init
fp qset add srcip
fp group create 1 1
fp entry create 1 1
fp qual 1 srcip 192.168.1.66 255.255.255.255
fp action add 1 redirecttrunk 1
fp entry install 1
```

5.1.1.4 BCM_TRUNK_PSC_SRCIP

Spread based on source IP address.

Example: Environmental architecture



Load balancing based on source IP address

The client uses the scapy command to send packets to the switch, and then it loads the distribution of traffic across trunk member ports in source IP address. The example is for reference only.

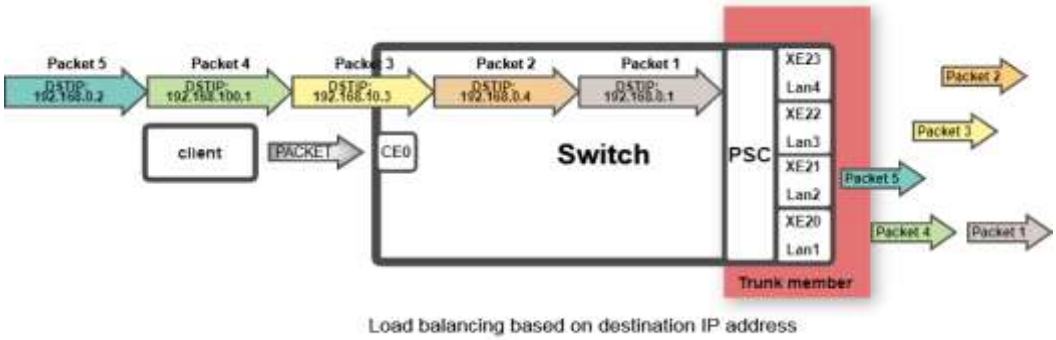
CLI Settings:

```
trunk init
trunk add id=1 pbm=xe20-xe23 rtag=4
fp init
fp qset add dstip
fp group create 1 1
fp entry create 1 1
fp qual 1 dstip 192.168.1.66 255.255.255.255
fp action add 1 redirecttrunk 1
fp entry install 1
```

5.1.1.5 BCM_TRUNK_PSC_DSTIP

Spread based on destination IP address.

Example: Environmental architecture



Load balancing based on destination IP address

The client uses the scapy command to send packets to the switch, and then it loads the distribution of traffic across trunk member ports in destination IP address. The example is for reference only.

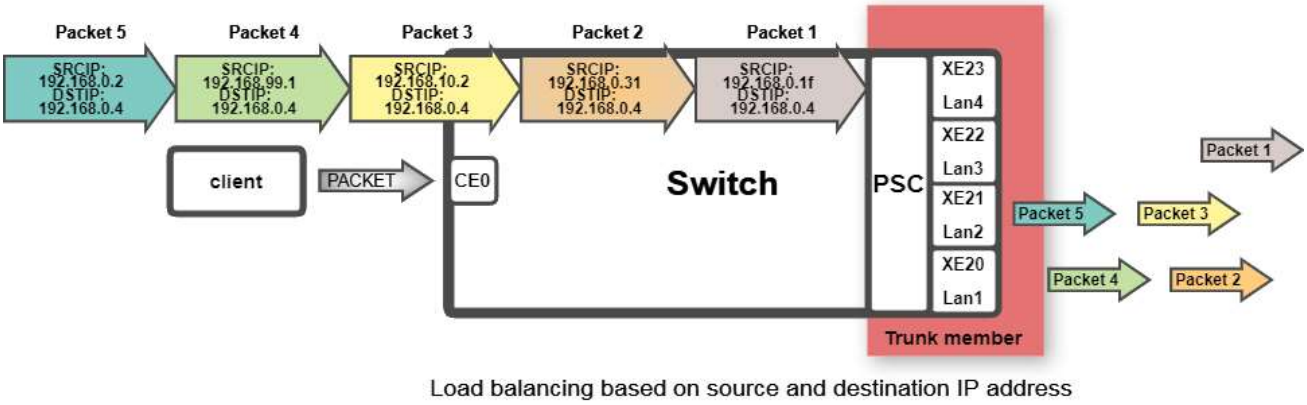
CLI Settings:

```
trunk init
trunk add id=1 pbm=xe20-xe23 rtag=5
fp init
fp qset add srcip
fp group create 1 1
fp entry create 1 1
fp qual 1 srcip 192.168.1.66 255.255.255.255
fp action add 1 redirecttrunk 1
fp entry install 1
```

5.1.1.6 BCM_TRUNK_PSC_SRCDSTIP

Spread based on source and destination IP address.

Example: Environmental architecture



Load balancing based on source and destination IP address

The client uses the scapy command to send packets to the switch, and then it loads the distribution of traffic across trunk member ports in source and destination IP address. The example is for reference only.

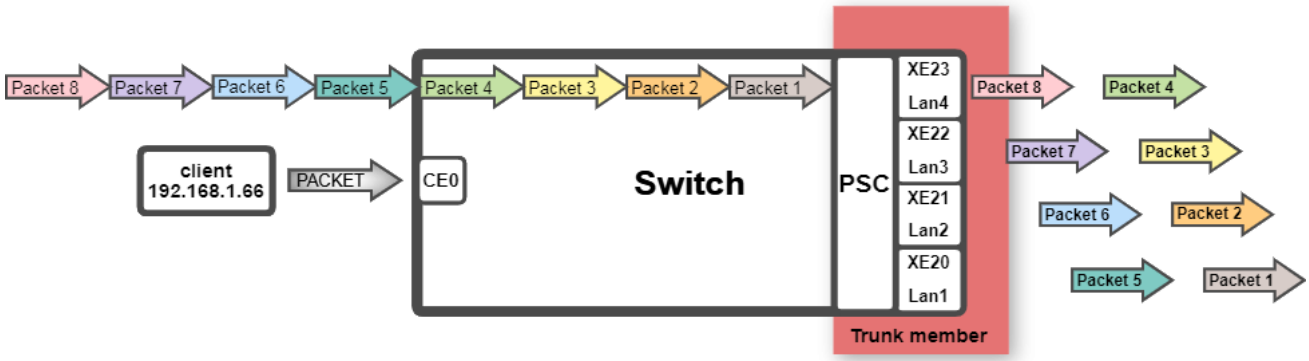
CLI Settings:

```
trunk init
trunk add id=1 pbm=xe20-xe23 rtag=6
fp init
fp qset add srcip
fp group create 1 1
fp entry create 1 1
fp qual 1 srcip 192.168.1.66 255.255.255.0
fp action add 1 redirecttrunk 1
fp entry install 1
```

5.1.1.7 BCM_TRUNK_PSC_ROUND_ROBIN

Provides Round Robin Load balancing distribution of traffic across trunk member ports.

Example: Environmental architecture



Round robin selection of members

The client uses the scapy command to send packets to the switch, and then it loads the distribution of traffic across trunk member ports in Round Robin. The example is for reference only.

CLI Settings:

```
trunk init
trunk add id=1 pbm=xe20-xe23 rtag=14
fp init
fp qset add srcip
fp group create 1 1
fp entry create 1 1
fp qual 1 srcip 192.168.1.66 255.255.255.255
fp action add 1 redirecttrunk 1
fp entry install 1
```

Test and Verify:

Use run.py in the flow_test folder, and check the returned log.

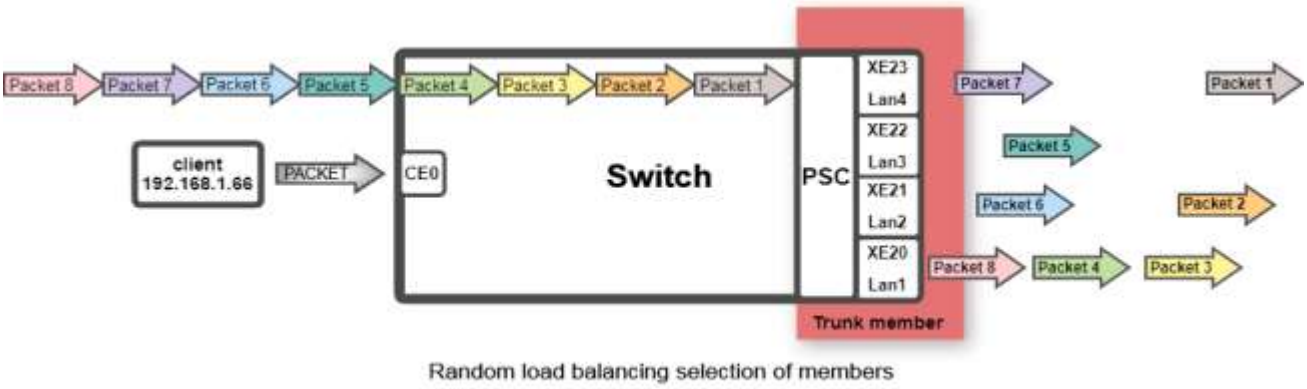
```
# ./run.py -srip 192.168.1.66 -v 2 -c 100 -rece 4
```

Number	Logic Port	Port Name	Host_IP	Target_Port	Transmit_by _SW	Received_by _sys	Received_by _TCPDump
0	69	xe20	127.0.0.1	enp11s0f0	25	25	Null
1	70	xe21	127.0.0.1	enp11s0f1	25	25	Null
2	71	xe22	127.0.0.1	enp11s0f2	25	25	Null
3	72	xe23	127.0.0.1	enp11s0f3	25	25	Null

5.1.1.8 BCM_TRUNK_PSC_ RANDOMIZED

Provides pseudo-random distribution of traffic across trunk member ports.

Example: Environmental architecture



The client uses the scapy command to send packets to the switch, and then it loads the distribution of traffic across trunk member ports in random. The example is for reference only.

CLI Settings:

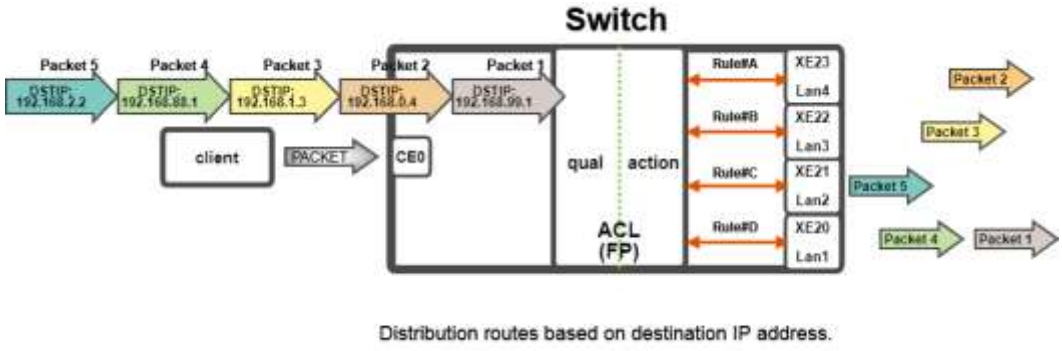
```
trunk init
trunk add id=1 pbm=xe20-xe23 rtag=16
fp init
fp qset add srcip
fp group create 1 1
fp entry create 1 1
fp qual 1 srcip 192.168.10.66 255.255.255.255
fp action add 1 redirecttrunk 1
fp entry install 1
```

5.2 ACL

5.2.1 ACL filters based on destination IP

Receiving CE0 packets, ACL based on destination IP, specify the route.

Example: Environmental architecture



Distribution routes based on destination IP address.

CLI Settings:

```
fp init
fp qset add dstip
fp group create 1 1
fp entry create 1 1
fp qual 1 dstip 192.168.99.1 255.255.0.255
fp action add 1 redirectport 0 69
fp entry install 1

fp group create 2 2
fp entry create 2 2
fp qual 2 dstip 192.168.0.4 255.255.0.255
fp action add 2 redirectport 0 72
fp entry install 2

fp group create 3 3
fp entry create 3 3
fp qual 3 dstip 192.168.1.3 255.255.0.255
fp action add 3 redirectport 0 71
fp entry install 3

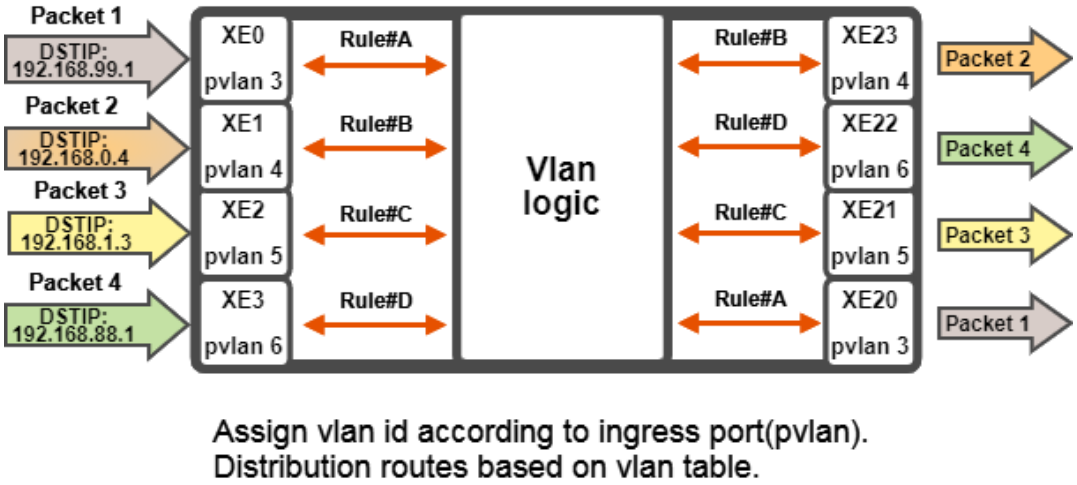
fp group create 4 4
fp entry create 4 4
fp qual 4 dstip 192.168.2.2 255.255.0.255
fp action add 4 redirectport 0 70
fp entry install 4
```

5.3 VLAN

5.3.1 VLAN allocation is based on PVLAN

Assign vlan according to the specified ingress port If the received packet is untagged.

Example: Environmental architecture



Assign vlan id according to ingress port(pvlan).
Distribution routes based on vlan table.

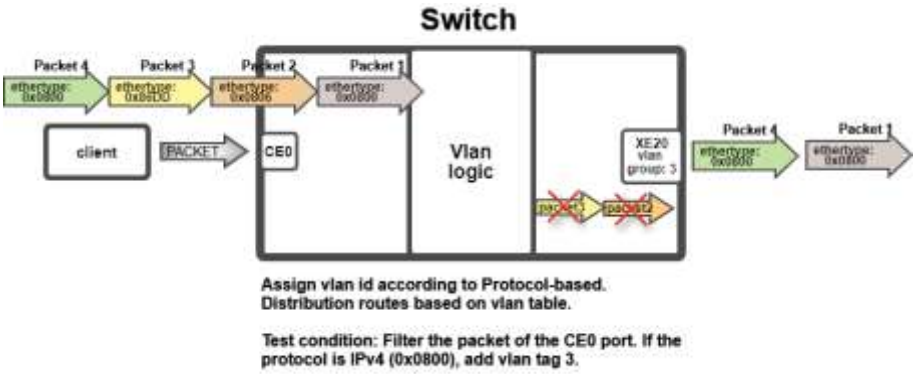
CLI Settings:

```
vlan create 3 pbm=xe0,xe20 ubm=xe0,xe20
vlan create 4 pbm=xe1,xe23 ubm=xe1,xe23
vlan create 5 pbm=xe2,xe21 ubm=xe2,xe21
vlan create 6 pbm=xe3,xe22 ubm=xe3,xe22
vlan remove 1 pbm=xe0-xe3,xe20-xe23 ubm=xe0-xe3,xe20-xe23
pvlan set xe0 3
pvlan set xe1 4
pvlan set xe2 5
pvlan set xe3 6
```

5.3.2 VLAN allocation is based on Protocol-based

If the received packet is untagged and the ether type and the frame type match a protocol-based VLAN then the VLAN assigned to the packet.

Example: Environmental architecture



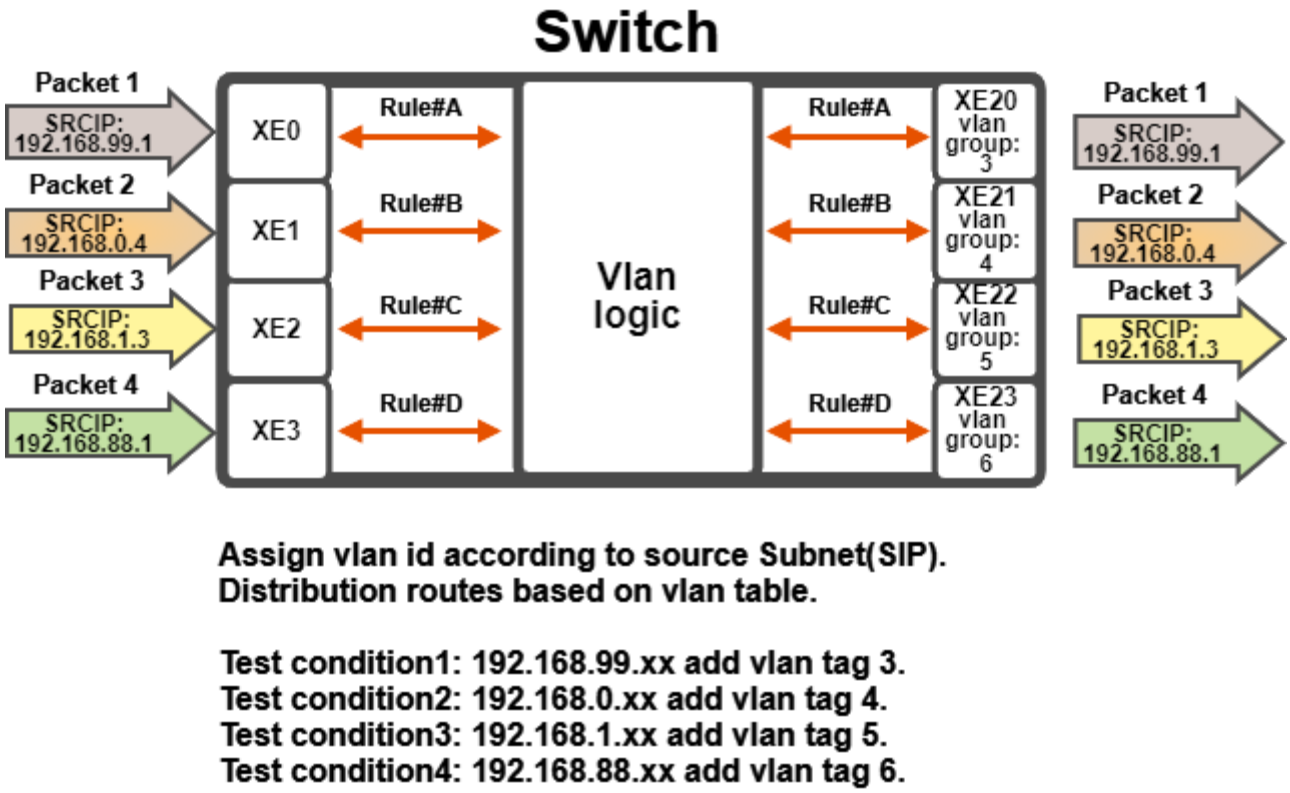
CLI Settings:

```
vlan create 3 pbm=xe20
vlan remove 1 pbm=xe20
vlan protocol add pbm=ce0 frame=0x1 ether=0x0800 vlan=3
```

5.3.3 VLAN allocation is based on source Subnet (SIP)

Add an association from source IP subnet to VLAN to use for assigning a VLAN tag to untagged packets.

Example: Environmental architecture



Assign vlan id according to source Subnet(SIP).
Distribution routes based on vlan table.

Test condition1: 192.168.99.xx add vlan tag 3.
Test condition2: 192.168.0.xx add vlan tag 4.
Test condition3: 192.168.1.xx add vlan tag 5.
Test condition4: 192.168.88.xx add vlan tag 6.

CLI Settings:

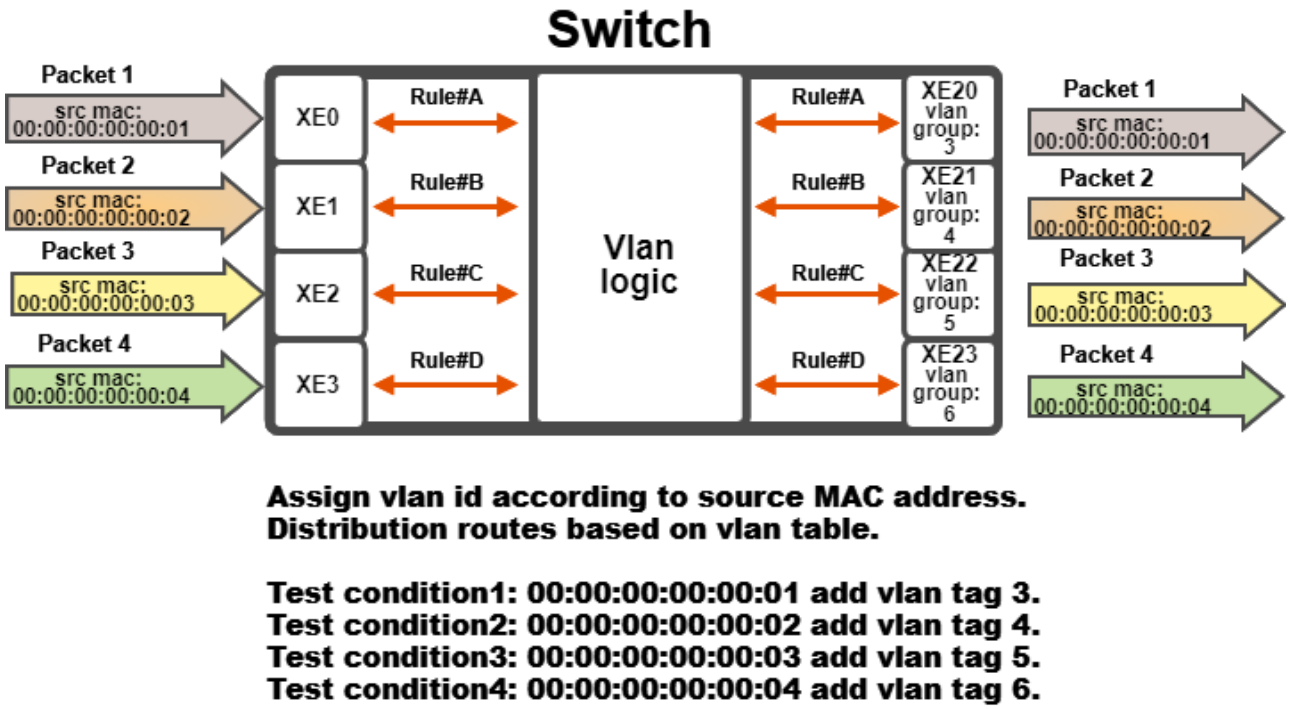
```
vlan create 3 pbm=xe20
vlan create 4 pbm=xe21
vlan create 5 pbm=xe22
vlan create 6 pbm=xe23
vlan remove 1 pbm=xe20-xe23
vlan control PreferIP4 1

vlan ip4 add ipaddr=192.168.99.1 netmask=255.255.255.0 vlan=3 prio=1
vlan ip4 add ipaddr=192.168.0.1 netmask=255.255.255.0 vlan=4 prio=1
vlan ip4 add ipaddr=192.168.1.1 netmask=255.255.255.0 vlan=5 prio=1
vlan ip4 add ipaddr=192.168.88.1 netmask=255.255.255.0 vlan=6 prio=1
```

5.3.4 VLAN allocation is based on source MAC address

Add an association from source Mac address to VLAN to use for assigning a VLAN tag to untagged packets.

Example: Environmental architecture



Assign vlan id according to source MAC address.
Distribution routes based on vlan table.

Test condition1: 00:00:00:00:00:01 add vlan tag 3.
Test condition2: 00:00:00:00:00:02 add vlan tag 4.
Test condition3: 00:00:00:00:00:03 add vlan tag 5.
Test condition4: 00:00:00:00:00:04 add vlan tag 6.

CLI Settings:

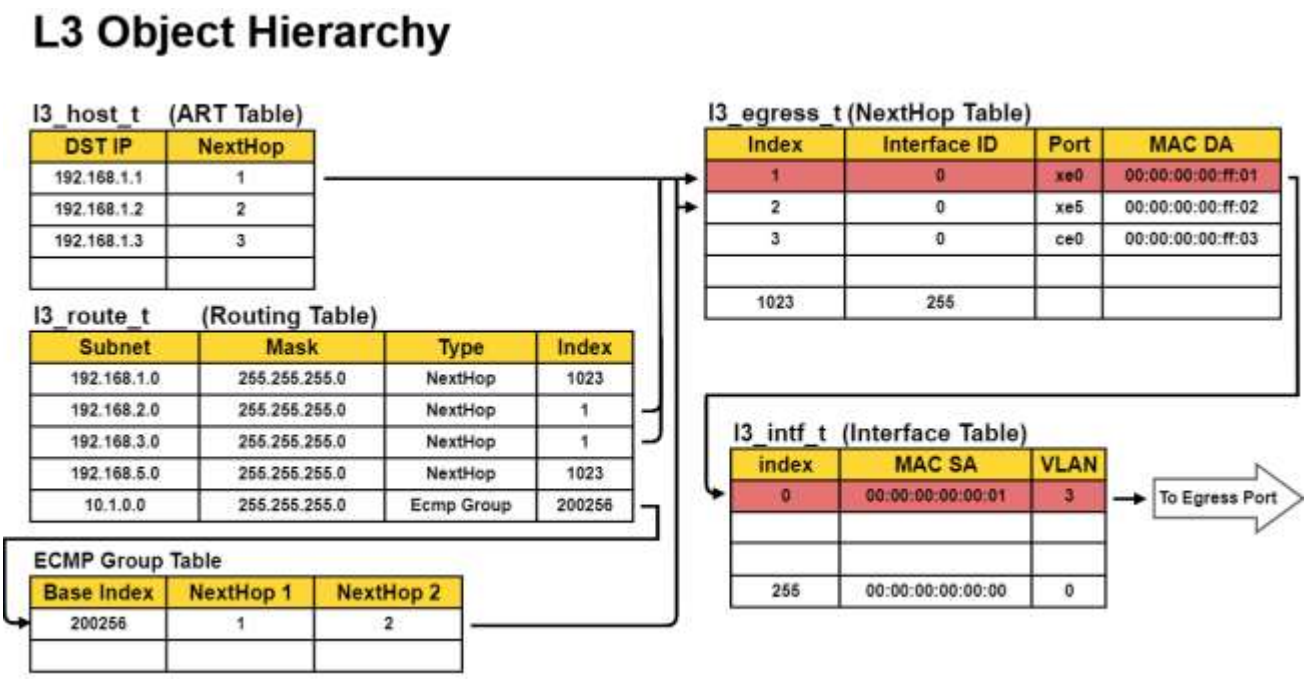
```
vlan create 3 pbm=xe20
vlan create 4 pbm=xe21
vlan create 5 pbm=xe22
vlan create 6 pbm=xe23
vlan remove 1 pbm=xe20-xe23
vlan control PreferMAC 1

vlan mac add mac=00:00:00:00:00:01 vlan=3 prio=1
vlan mac add mac=00:00:00:00:00:02 vlan=4 prio=1
vlan mac add mac=00:00:00:00:00:03 vlan=5 prio=1
vlan mac add mac=00:00:00:00:00:04 vlan=6 prio=1
```

5.4 LAYER 3

The Lanner Layer 3 APIs allow application developers to manage the Broadcom L3 switch features, including the L3 fast switching host table, L3 routing table, L3 interface table and L3 ecmp table.

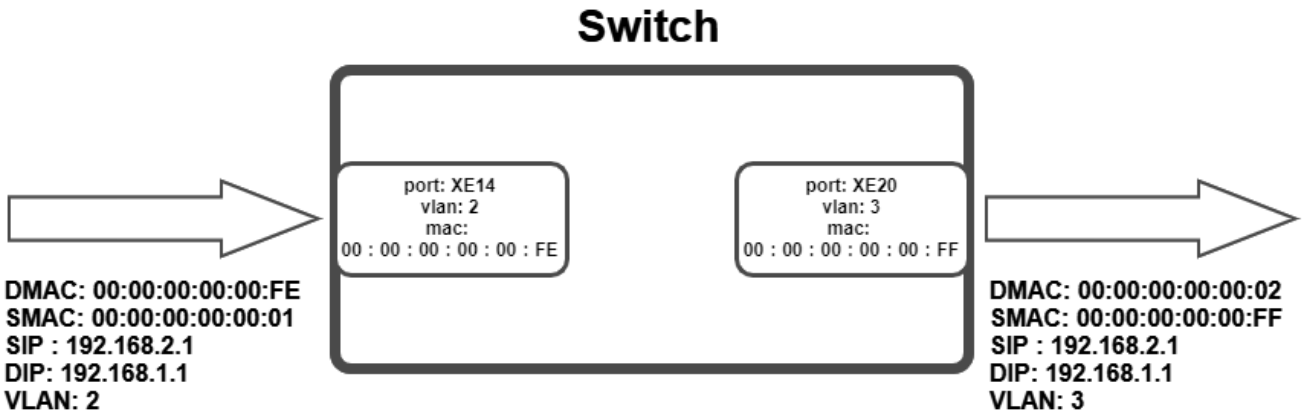
L3 packets are routed either based on subnet match, or fast-switched based on a full IP address match. These capabilities are managed in the route table and host table, respectively.



5.4.1 L3 Switching

Use L3 host table to implement L3 route.

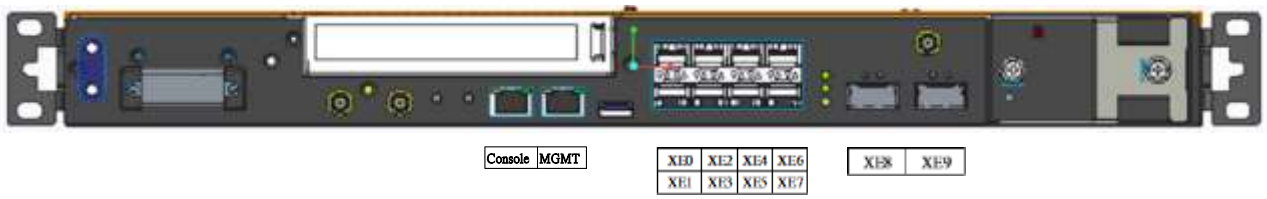
Example: Environmental architecture



CLI Settings:

```
l2 add port=cpu0 mac=00:00:00:00:00:fe vlan=2 l3=true ReplacePriority=false
l2 add port=cpu0 mac=00:00:00:00:00:ff vlan=3 l3=true ReplacePriority=false
vlan create 2 pbm=xe14
vlan create 3 pbm=xe20
vlan remove 1 pbm=xe14,xe20
l3 init
sc L3EgressMode=1
l3 intf add vlan=3 mac=00:00:00:00:00:ff intf=3
l3 egress add mac=00:00:00:00:00:02 intf=3 port=xe20
return:
New egress object index: 100002
Environment variable (egr_object_id) was set
l3 l3table add ip=192.168.1.1 intf=100002
```

PORT MAP



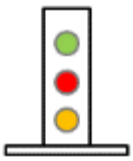
Pci bus	switch side	ethernet name
0000:b6:00.0	XE10	enp182s0f0
0000:b6:00.1	XE11	enp182s0f1
0000:b6:00.2	XE12	enp182s0f2
0000:b6:00.3	XE13	enp182s0f3

Pci bus	Front Port	ethernet name
0000:02:00.0	MGMT	enp2s0

Switch side	connected device
XE14	Timing Card (1588)

APPENDIX A: LED INDICATOR EXPLANATIONS

System Power / Status / HDD Activity



Green: System Power
Red/Green: System Status
Amber: HDD Activity

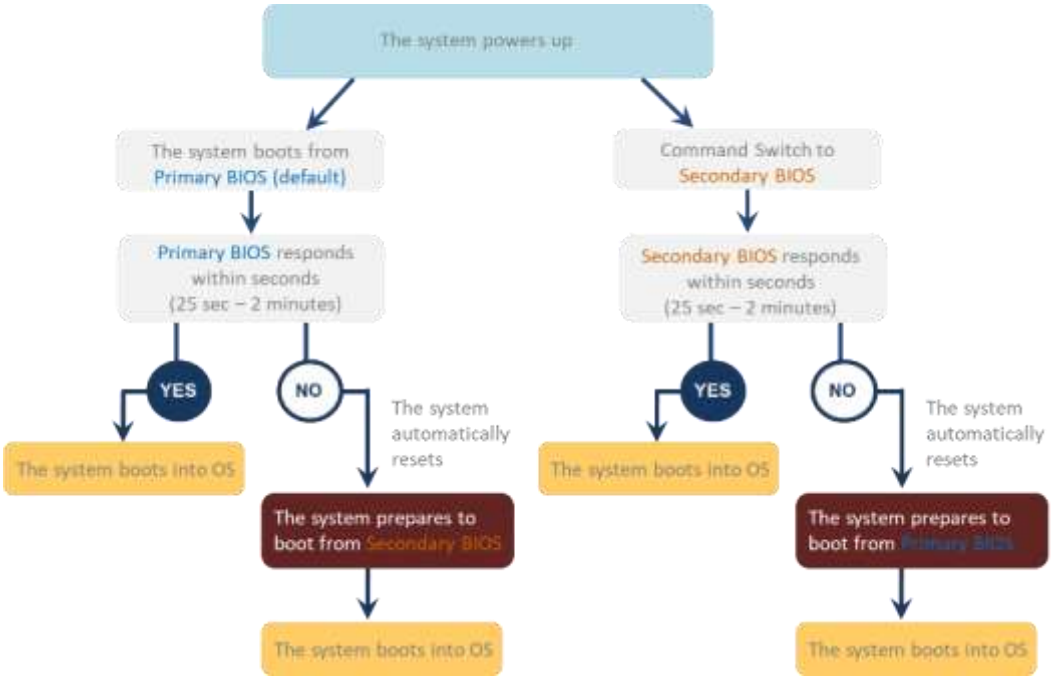
LED	COLOR ON LCM	COLOR ON BOARD	LED ACTION	DESCRIPTION
POWER	**Green**	**Green**	Steady	When system power on
	Off	Off	N/A	No power on
STATUS	**Green**	**Green**	Steady	control by GPIO
	Amber	**Red**	Steady	control by GPIO
	Off	Off	N/A	control by GPIO (Default) or No power on
HDD	**Amber**	**Amber**	Blinking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

APPENDIX B: DUAL BIOS INTRODUCTION

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

How Dual BIOS Works

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



2nd Gen Dual BIOS

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

- **Flexible recovery timer control**

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

- **Flexible Dual BIOS ROMs control.**

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

- **Flexible Dual BIOS ROMs switch**

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

	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.

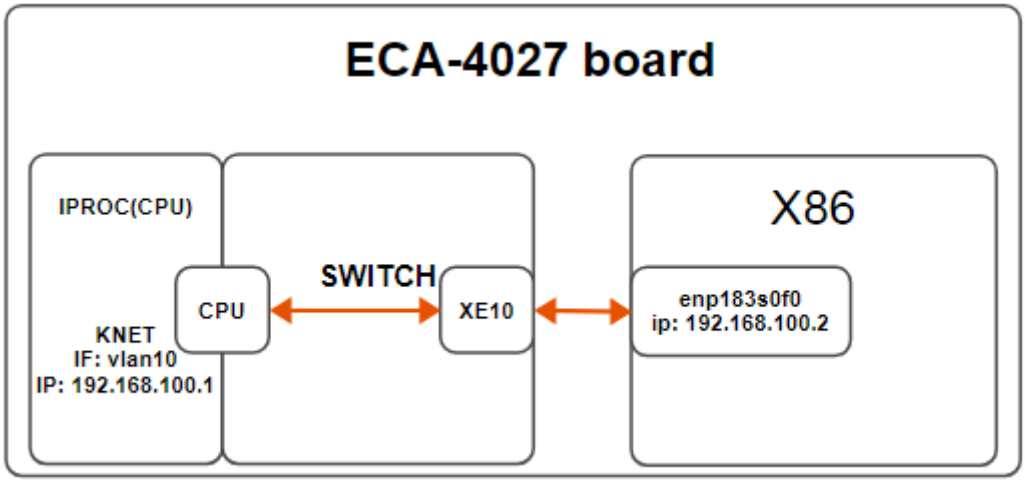
Note:
1. Dual BIOS feature cannot work with BIOS Boot Guard function
2. To update BIOS, it is mandatory to have both BIOS updated first. This is to avoid both BIOS having ME code variations, which could lead to unexpected risk and errors.
3. When the system enters BIOS menu or Option ROM, the system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

Step 1. X86 ethernet enp183s0f0(pci bus b7:00.0) set IP 192.168.100.X.



Step 2. Use telnet tool to connect to IPROC, when connecting to system, port set 23 (default), connect to bcm CLI port set 12345.

```
root@lanner-Default-string:~# telnet 192.168.100.1 12345
Trying 192.168.100.1...
Connected to 192.168.100.1.
Escape character is '^]'.

BCM.0>
```

Step 3. Login to the system, account: root.

```
Welcome to Broadcom Linux
iProc login: root
```

APPENDIX D: GPS RECEIVER FUNCTIONALITY

The ECA-4027 comes equipped with u-blox M8 GPS Receiver. For more information please refer to the user manual.

APPENDIX E: TERMS AND CONDITIONS

Warranty Policy

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

RMA Service

Requesting an RMA#

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



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

RMA Service Request Form

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

RMA No:	Reasons to Return: ▫ Repair(Please include failure details) ▫ Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address: _____ Shipping by: ▫ Air Freight ▫ Sea ▫ Express_____ ▫ Others:_____	

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01:D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
	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