Lanner

Network Appliance Platform

Hardware Platforms for Network Computing

NCA-4220 User Manual

Version: 1.0

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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

This document utilizes different font types and icons in order to make the selected text more transparent and explicable to users. Please note that this document contains the following conventions:

Font Conventions

Example	Convention	Usage
`iptables -F`	Monospace, shaded	A command to be entered at a shell command-line
Setup page	Bold	A title of a dialog box or a page
<Enter>	Between a pair of inequality signs	A physical keyboard button
"Menu**"**	Between a pair of quotation marks	A menu option or a software button to be clicked
Readme.txt	In Italic	A filename or a file path
IPMI User Guide	Underlined	The name of another document or a chapter in this document

Icon Descriptions

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

Online Resources

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

For troubleshooting the issues with your system, please check the Lanner Q&A page for a diagnostic procedure and troubleshooting steps.

Technical Support

In addition to contacting your distributor or sales representative, you could submit a request to our **Lanner Technical Support** at http://www.lannerinc.com/technical-support, where you can fill in a support ticket to our technical support department.

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Documentation Feedback

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

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Acknowledgment

Compliances and Certification

CE Certification

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A Certification

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

EMC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Safety Guidelines

- Follow these guidelines to ensure general safety:
- Keep the chassis area clear and dust-free before, 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/goggles 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.
- 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.
- Equipment is intended for installation in Restricted Access Location" (Instruction)

LITHIUM BATTERY CAUTION:

Risk of explosion could occur if battery is replaced by an incorrect type. Please dispose of used batteries according to the recycling instructions of your country.

- Installation only by a trained electrician or only by an electrically trained person who knows all the applied or related installation and device specifications..
- Do not carry the handle of power supplies when moving to other place.
- The machine can only be used in a fixed location such as labs or computer facilities.

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.
- 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.
- Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
- Product shall be used with Class 1 laser device modules.

- 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).

Caution

- Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries according to the Instructions.
- Lithium Battery Caution: Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type. Dispose batteries according to manufacturer's instructions.
- Disposal of a BATTERY into fire or a hot oven, or mechanically crushing or cutting of a BATTERY that can result in an EXPLOSION.
- Leaving a BATTERY in an extremely high temperature surrounding environment that can result in an EXPLOSION or the leakage of flammable liquid or gas.
- A BATTERY subjected to extremely low air pressure that may result in an EXPLOSION or the leakage of flammable liquid or gas.

Rack Mounting Installation Environment Precaution

1. 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.
2. Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. 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 over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. Reliable Earthing - Reliable earthing 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)."

Consignes de sécurité

Suivez ces consignes pour assurer la securite generale :

- Laissez la zone du chassis propre et sans poussiere pendant et apres l'installation.
- Ne portez pas de vetements amples ou de bijoux qui pourraient etre pris dans le chassis. Attachez votre cravate ou echarpe et remontez vos manches.
- Portez des lunettes de securite pour proteger vosmyeux.
- N'effectuez aucune action qui pourrait creer un dangermpour d'autres ou rendre l'equipement dangereux.
- Coupez completement l'alimentation en eteignant l'alimentation et en debranchant le cordon d'alimentation avant d'installer ou de retirer un chassis ou de travailler a proximite de sources d'alimentation.
- Ne travaillez pas seul si des conditions dangereuses sont presentes.
- Ne considerez jamais que l'alimentation est coupee d'un circuit, verifiez toujours le circuit. Cet appareil genere, utilise et emet une energie radiofrequence et, s'il n'est pas installe et utilise conformement aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interferences dans les communications radio.
- 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.
- Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT" (Instruction)

Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacee par une autre d'un mauvais type.
- Jetez les piles usagees conformement aux instructions.
- L'installation doit etre effectuee par un electricien forme ou une personne formee a l'electricite connaissant toutes les specifications d'installation et d'appareil du produit.
- Ne transportez pas l'unite en la tenant par le cable d'alimentation lorsque vous deplacez l'appareil.
- La machine ne peut etre utilisee qu'a un lieu fixe comme en laboratoire, salle d'ordinateurs ou salle de classe.
- 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.
- Convient pour une installation dans les salles informatiques conformément à l'article 645 du National Electrical Code et à la norme NFPA 75.
- Le produit doit être utilisé avec des modules d'appareils laser de classe 1.

Sécurité de fonctionnement

- L'equipement electrique genere de la chaleur. La temperature ambiante peut ne pas etre adequate pour refroidir l'equipement a une temperature de fonctionnement acceptable sans circulation adaptee. Verifiez que votre site propose une circulation d'air adequate.
- Verifiez que le couvercle du chassis est bien fixe. La conception du chassis permet a l'air de refroidissement de bien circuler. Un chassis ouvert laisse l'air s'echapper, ce qui peut interrompre et rediriger le flux d'air frais destine aux composants internes.
- Les decharges electrostatiques (ESD) peuvent endommager l'equipement et gener les circuits electriques. Des degats d'ESD surviennent lorsque des composants electroniques sont mal manipules et peuvent causer des pannes totales ou intermittentes. Suivez les procedures de prevention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez a ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps a la terre en touchant la partie metallique du chassis. Verifiez regulierement la valeur de resistance du bracelet antistatique, qui doit etre comprise entre 1 et 10 megohms (Mohms).

ATTENTION

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

MISE EN GARDE:

- Pile au lithium Attention: Risque d'explosion si la pile n'est pas remplacée correctement. Remplacez uniquement par un type identique ou équivalent. Jetez les piles conformément aux instructions du fabricant.
- Mise au rebut d'une BATTERIE dans un feu ou un four chaud, ou écrasement ou découpage mécanique d'une BATTERIE, pouvant entraîner une EXPLOSION.
- Laisser une BATTERIE dans un environnement extrêmement chaud pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable
- UNE BATTERIE soumise à une pression d'air extrêmement basse pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable

Consignes de sécurité électrique

- Avant d'allumer l'appareil, reliez le cable de mise a la terre de l'equipement a la terre.
- Une bonne mise a la terre (connexion a la terre) est tres importante pour proteger l'equipement contre les effets nefastes du bruit externe et reduire les risques d'electrocution en cas de foudre.
- Pour desinstaller l'equipement, debranchez le cable de mise a la terre apres avoir eteint l'appareil.
- Un cable de mise a la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm2 ou 10 AWG.

Table of Contents

CHAPTER 1: PRODUCT OVERVIEW

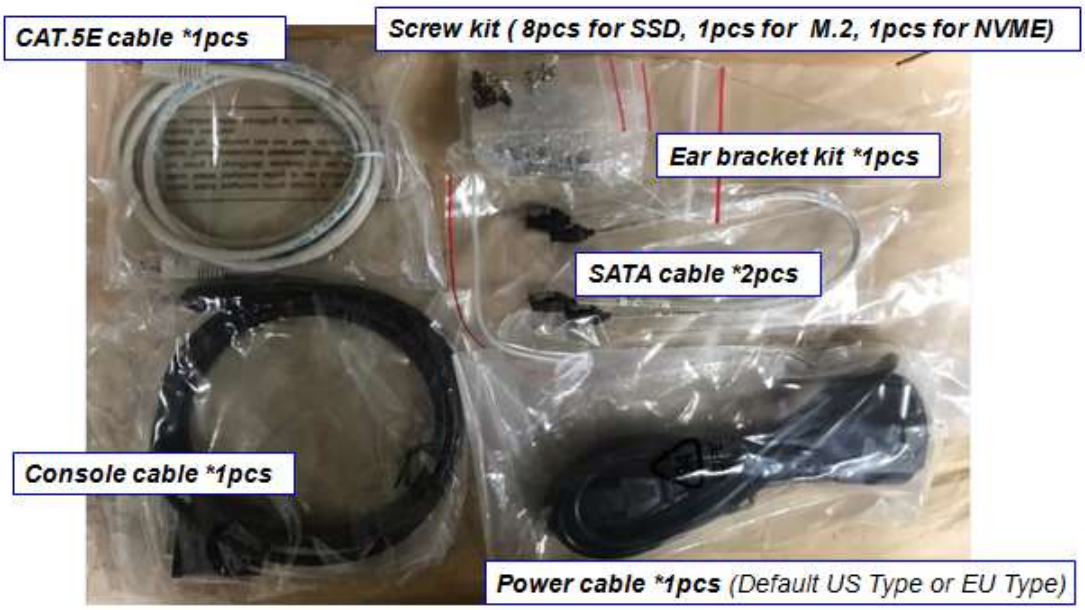
The NCA-4220 series unit is a mid range 1U rackmount network security system utilizing the cutting edge capabilities of the Intel Coffee Lake refresh CPU. The system supports up to 8 x GbE RJ45 with Gen3 bypass and 1x front NIC modules.

Main Features

- Support Intel Xeon® E, Core i7/i5/i3, and Celeron® Processor (Coffee Lake-S Processor Family)
- 2 x 288pin DDR4 2666MHz Memory, Max. 32GB
- 6~8x RJ45 LAN (by SKU), 1x NIC Module Slots, 3x Pairs of Gen3 Bypass
- 1x RJ45 Console, 2x USB 3.0
- 2x 2.5" Drive Bays, 1x M.2 SATA type 2242 B+M Key (Optional)
- 1x M.2 PCIE type/NVMe 2280 M key (by SKU)
- 1x Mini PCIE (Optional, reserved for Wi-Fi / BT)

Package Content

- NCA-4220 Network Security Platform
- Short Ear Rack mount kit with screws
- Screw Kit (for HDD, NVMe SSD, M.2 storage, MiniPCIE)
- Nameplate *(be placed on the top of the system, not in accessory box)*
- Console cable
- LAN Cable (Grey)
- SATA Cable
- Power Cable



Optional Kits

- Riser Card RC-42102A
- TPM module
- 1U Slide Kit
- IAC-MVGA03A + VGA cable
- USB 3.0 cable

Ordering Information

SKU No.	Main Features
NCA-4220A	Intel PCH C246 with 2x DDR4 UDIMM/ECC DIMM , 8x RJ45 (3 Pairs Bypass) , 1x Slim-type NIC Module (1x PCIE*8 or 2x PCIE*4)
NCA-4220B	Intel PCH Q370 with 2x DDR4 UDIMM DIMM , 8x RJ45 (3 Pairs Bypass) , 1x Slim-type NIC Module (1x PCIE*8 or 2x PCIE*4)
NCA-4220C	Intel PCH H310 with 2x DDR4 UDIMM DIMM , 6x RJ45 (3 Pairs Bypass) , 1x Slim-type NIC Module (1x PCIE*8)

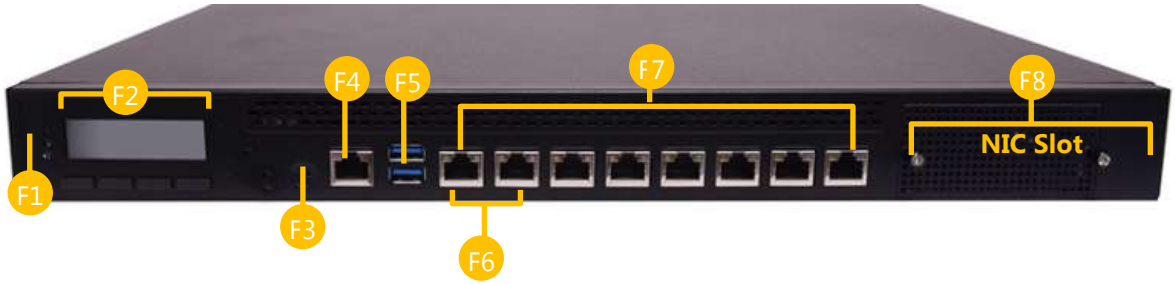
Optional Accessories

Type	Description
CPU	Support Intel Xeon® E, Core i7/i5/i3, and Celeron® Processor (Coffee Lake-S Processor Family)
Memory	DDR4 upto 2666 U DIMM 8/16GB; ECC DIMM 8/16GB (SKU A only)
M.2 storage	M.2 2242 size
2x 2.5"HDD	HDD/SSD (15mm height)
NIC	NIC Module Note: It is strongly recommended to use Lanner Slim type NIC modules on this system; please consult Lanner for product compatibility if you consider adopting modules manufactured by other vendors.
RJ45 cable	L=180cm, Cat.5e UTP Cable Grey
USB3.0 cable	USB CABLE CONN 2*10 USB 3.0 9P 50CM 90°-180° AMPHENOL RUB30-0368
VGA card with cable(50cm)	IAC-MVGA03A (MiniPCIe VGA card) VGA Cable, VGA CABLE 12P TO 15P PITCH=2.0mm 50CM HO-BASE
IAC-TPM01C	TPM2.0 module
Rail Kit	Chassis Width: standard 19"
RC-42102	Ricer Card for Rear PCIex8 Expansion slot

System Specifications

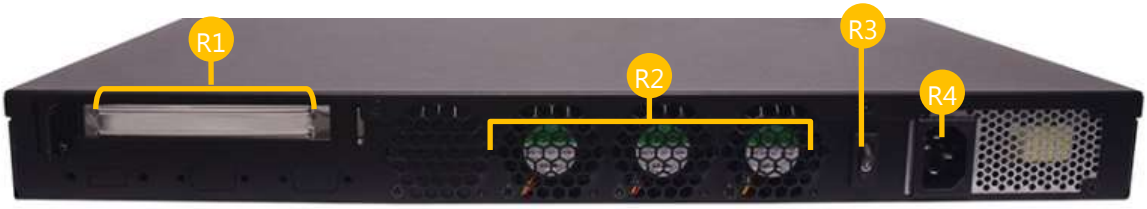
Form Factor		1U 19" Rackmount
Platform	Processor Options	Intel® Xeon® E or Core™ i7/i5/i3 or Pentium® or Celeron® (Coffeelake)
	CPU Socket	1x LGA1151 socket
	Chipset	Intel® C246/Q370/H310
	Security Acceleration	N/A
BIOS		AMI SPI Flash BIOS
System Memory	Technology	DDR4 upto 2666; ECC /U DIMM; 8/16GB (by SKU)
	Max. Capacity	32GB
	Socket	2x 288pin DIMM
Networking	Ethernet Ports	8/6 x Gbe RJ45 Intel® i210
	Bypass	3 pairs Gen.3 bypass
	NIC Module Slot	1 slot
LOM	IO Interface	N/A
	OPMA slot	N/A
I/O Interface	Reset Button	1
	LED	Power/Status/Storage
	Power Button	1x ATX Power Switch
	Console	1x RJ45
	USB	2x USB 3.0
	LCD Module	1x LCM panel
	Display	From mini-PCIe slot (Optional)
	Power input	AC power inlet on PSU
Storage	HDD/SSD Support	2x 2.5" Internal Bays
	Onboard Slots	1 x M.2 (SATA) 1 x M.2 (NVME)
Expansion	PCIe	1 x PCIe*8 FH/HL (Optional)
	mini-PCIe	1x mini-PCIe (PCIe/USB2.0)
	SIM card Slot	N/A
Miscellaneous	Watchdog	Yes
	Internal RTC with Li Battery	Yes
	TPM	Yes (Optional)
Cooling	Processor	Passive CPU heat sink
	System	3/2 x smart fans(By SKU)
Environmental Parameters	Temperature	0~40ºC Operating -40~70ºC Non-Operating
	Humidity (RH)	5~90% Operating 5~ 95% Non-Operating
System Dimensions	(WxDxH)	438mm x 321.1mm x 44mm
	Weight	6.5kg
Package Dimensions	(WxDxH)	533mm x 497mm x 209mm
	Weight	10 kg
Power	Type/Watts	200W ATX Single PSUs
	Input	AC 100-240V~,4-2A,60-50Hz
Approvals and Compliance		RoHS, CE/FCC Class A, UL

Front Panel



No.	Description	
F1	LED Indicators	 System Power System Status HDD Activity
F2	Control Panel	1x LCM + 4x control keys
F3	Reset Button	Default SW reset
F4	Console Port	1x RJ45 Console Port
F5	USB Ports	2x USB 3.0 port
F6	PXE Ports	2x RJ45 Console Port (default status: disable)
F7	LAN Slot	6~8x RJ45 Port on ®i210
F8	PCIe Slot	1x PCI-E*8 as default; 2x PCI-E*4 as optional (SKU A/B only)

Rear Panel

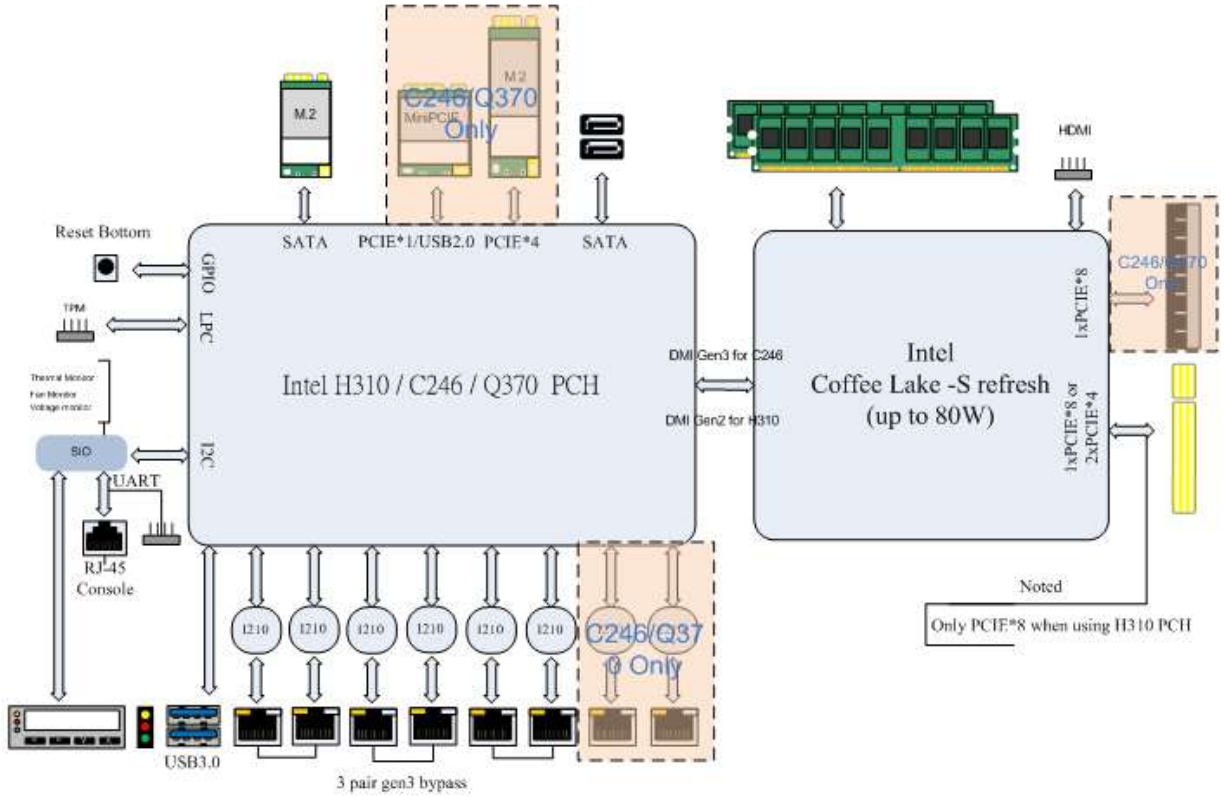


No.	Description	
R1	PCIe Expansion Slot	1 x PCIe*8 FH/HL (Optional)
R2	Cooling Fan	2~3x System Fans with SMART function (by SKU)
R3	Power switch	1 x power on/off switch
R4	power jack	1 x power jack for connection with power adapter

Motherboard Information

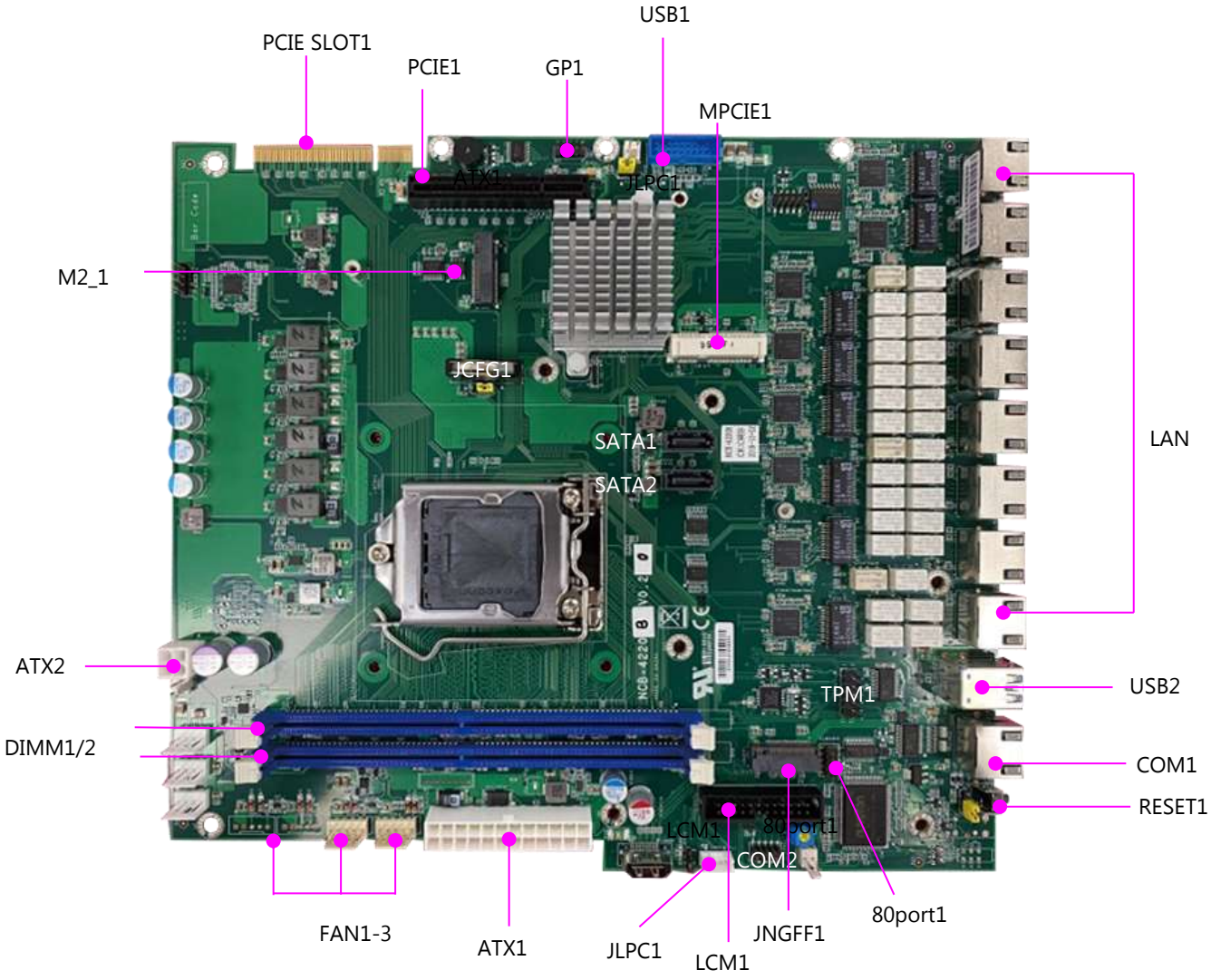
Block Diagram

The block diagram indicates how data flows among components on the motherboard. Please refer to the following figure for your motherboard's layout design.



Motherboard Layout

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

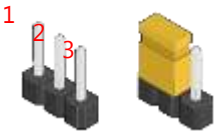
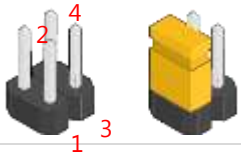


Internal Jumpers

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

Jumper Setting

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

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

RTC1：RTC reset - the clear CMOS jumper

Short Pins	Description
1-2 (Default)	Normal
2-3	Clear CMOS

RESET1：RESET - the jumper to set hardware or software reset

Short Pins	Description
1-2	Hardware Reset
2-3(Default)	Software Reset

JCFG1：Lane Normal Operation or Lane Reversed select

Short Pins	Description
1-2(Default)	NORMAL Operation(SKUA、SKUB)
2-3	Lane Reversed(SKUC)

SKU	NIC Module		**JCFG1** Jumper Setting
	Rear	Front	
NCA-4220A/B	1 PCIEX8	1 PCIeX8 or 2 PCIeX4	1-2 (Default)
NCA-4220C	N/A	1 PCIeX8	2-3

JLPC1：GEN3 Bypass Flash Jumper – select "No Flash" or "Flash" mode

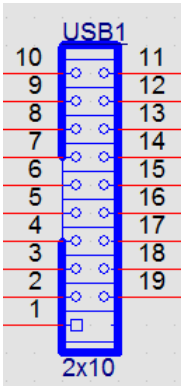
Short Pins	Description
1-2(Default)	No flash
2-3	flash

Internal Connectors

USB3.0/2.0 Interfaces

USB1：USB Connector 2x10 Pins 2.0mm

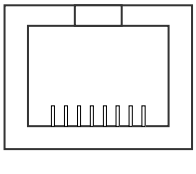
USB2：USB3.0 double-stacked type-A connectors



PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	V5USB	11	D2+
2	USB3_RX3_N	12	D2-
3	USB3_RX3_P	13	GND
4	GND	14	USB3_TX4+1
5	USB3_TX3_N	15	USB3_TX4-1
6	USB3_TX3_P	16	GND
7	GND	17	USB3_RX4+1
8	D3-	18	USB3_RX4-1
9	D3+	19	V5USB
10	KEY	20	KEY

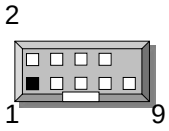
Serial Console Interface

COM1: serial console pin definitions



Pin number	Pin signal	In/Out
1	Request To Send (RTS)	
2	Data Terminal Ready (DTR)	
3	Transmitted Data (TxD)	
4	Signal Ground	
5	Signal Ground	
6	Received Data (RxD)	
7	Data Set Ready (DSR)	
8	Clear To Send (CTS)	

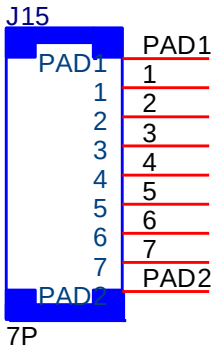
COM2: internal pin header for serial connection



Pin number	Pin signal	In/Out
1	Data Carrier Detect (DCD)	
2	Data Set Ready (DSR)	
3	Received Data (RxD)	
4	Request To Send (RTS)	
5	Transmitted Data (TxD)	
6	Clear To Send (CTS)	
7	Data Terminal Ready (DTR)	
8	Ring Indicator (RI)	
9	GND	

SATA Interface

SATA1/SATA2: 7-pin SATA signal connector for SATA storage devices



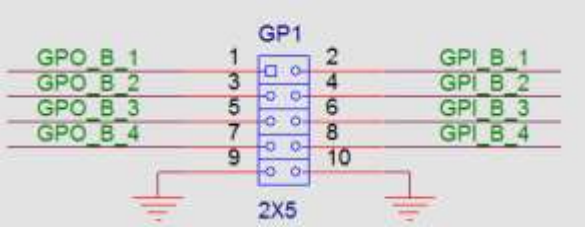
Pin number	Pin signal
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground

FAN connectors

FAN1~FAN3 cooling fan pin definition

Pin	Description
1	GND
2	P12V
3	FANIN
4	NC
5	FANOUT

Digital I/O



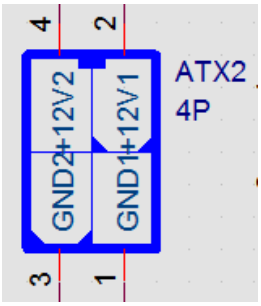
GP1: DIO connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GPO_1	2	GPI_1
3	GPO_2	4	GPI_2
5	GPO_3	6	GPI_3
7	GPO_4	8	GPI_4
9	GND	10	GND

ATX power

ATX2: 4-pin ATX power supply connector

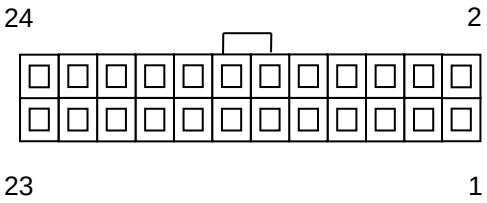
Part reference: ATX2



Pin	Pin signal
1	Ground
2	VCC12 (12V)
3	Ground
4	VCC12 (12V)

ATX1: 24-pin ATX power supply connector

Part reference: ATX2



Pin	Description	Pin	Description
1	+3.3V	2	+3.3V
3	+3.3V	4	-12V
5	Ground	6	Ground
7	+5V	8	PSON-
9	Ground	10	Ground
11	+5V	12	Ground
13	Ground	14	Ground
15	Power Good	16	NC
17	Stand-By 5V	18	+5V
19	+12V	20	+5V
21	+12V	22	+5V
23	+3.3V	24	Ground

CHAPTER 2: HARDWARE SETUP

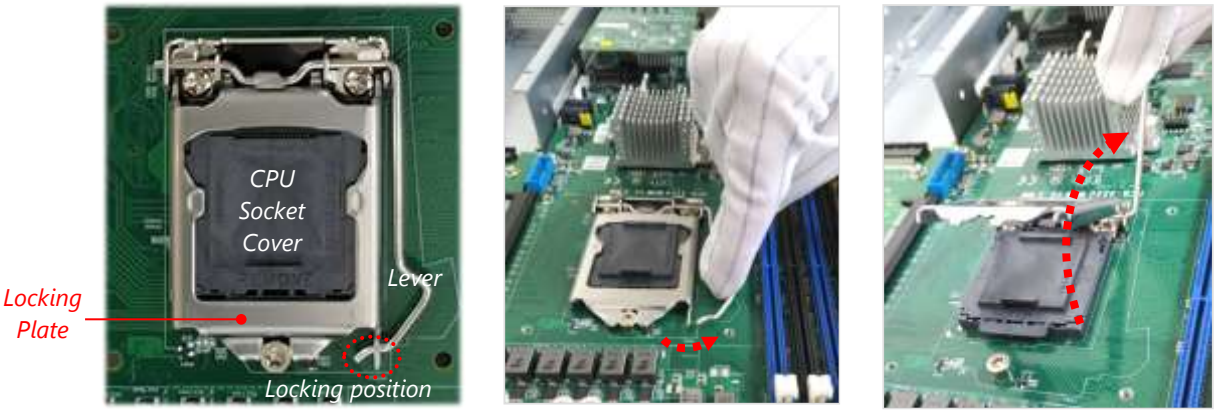
To reduce the risk of personal injury, electric shock, or damage to the system, please remove all power connections to shut down the device completely. Also, please wear ESD protection gloves when conducting the steps in this chapter.

Installing the CPU

1. Power off NCA-4220 completely.
2. Remove the two screws at the rear, as circled in the figures below.

3. Slide and pull the top compartment as the arrow of direction below. Lift the top compartment.

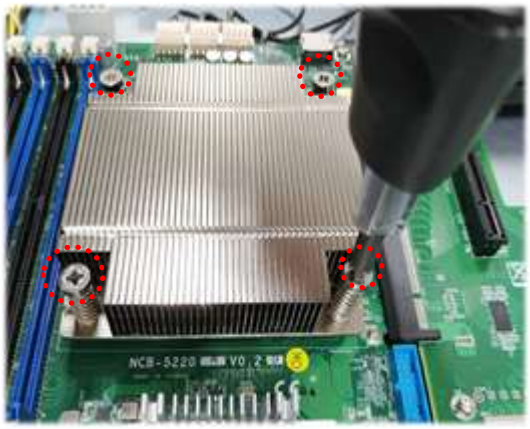
4. To install the CPU, remove the CPU socket Cover first. Lift the lever away from the locking position. The metal locking plate will automatically pop up, allowing you to remove the CPU socket cover.



5. When you extract the processor from its package, carefully hold it by its edges and avoid touching its golden contacts side. Make sure the golden triangular mark is aligned with the white one marked on the motherboard and then insert it into the socket, as indicated in the picture.

6. After the processor is correctly seated in the socket, lower the lever along with the plate, slide the end of the lever into the locking position.

7. Install the heatsink with thermal pad on it onto the motherboard by fastening its four screws onto the corresponding mounting holes on the motherboard fasteners. To apply equal pressure, please tighten the screws **diagonally** no matter you start from which corner.



8. At last, install the fan duct and secure it with the original screws.

Installing the System Memory

The motherboard supports 2 memory slots for DDR4 UDIMM with speeds of up to 2666MHz. The CPU requires at least 2 memory modules to boot and run from.

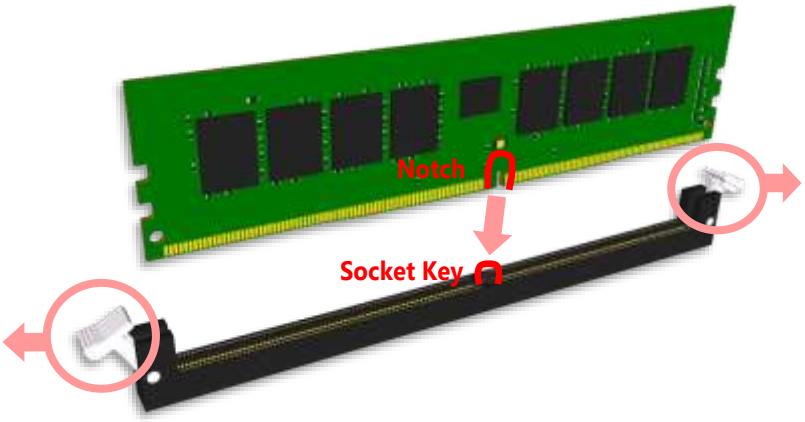
Supported System Memory Summary

Total Slots	2
Number of Channels	2 (2 DIMMs per channel)
Supported DIMM Capacity	4GB, 8GB, 16GB, 32GB
Memory Size	Maximum 32 GB UDIMM (16GB*2)
Memory Type	DDR4 ECC or Non-ECC UDIMM 2666/2400/2133 MHZ
Minimum DIMM Installed	At least 1 memory modules to boot and run from

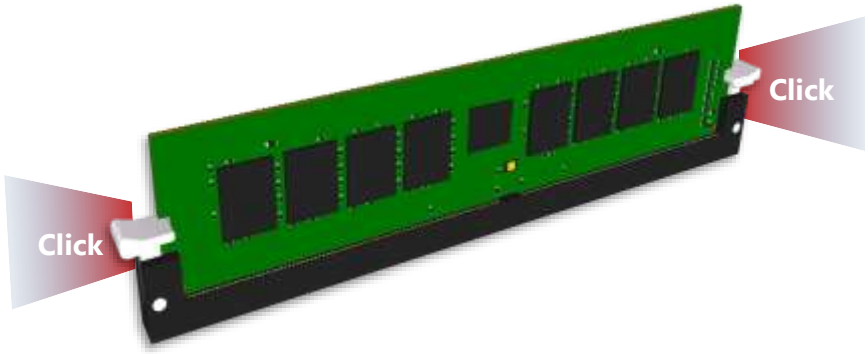
Memory Module Installation Instructions

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

1. Power off the system.
2. Pull open the DIMM slot latches.
3. Align the notch of the module with the socket key in the slot and carefully insert the card into the slot.



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

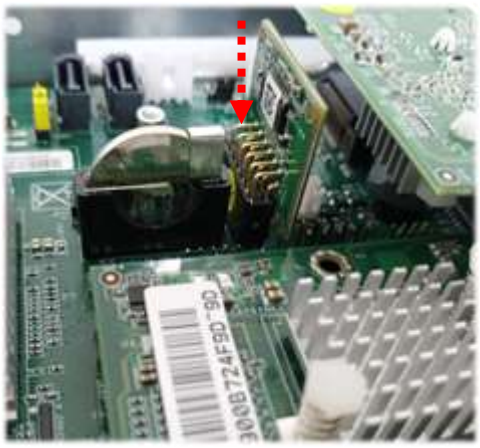


Installing the TPM Module

This system supports the TPM module card (IAC-TPM01C) through the **TPM** slot.

1. Locate the **TPM** slot.

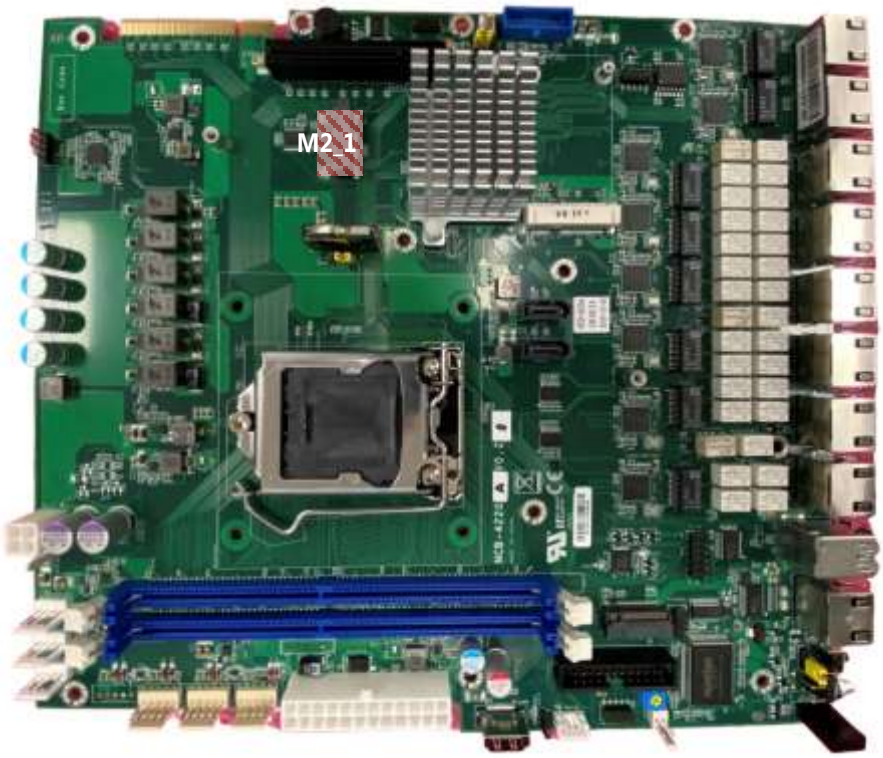
2. Insert the TPM module into the 12-pin slot. Make sure it is properly seated.



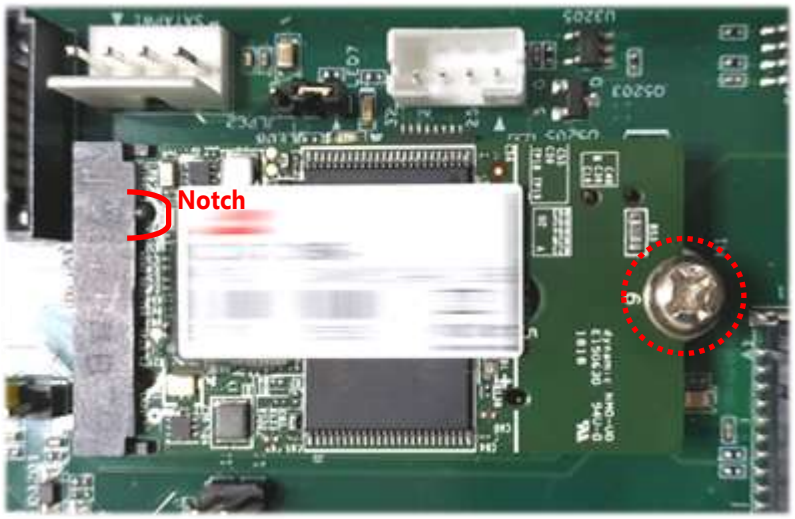
Installing the M.2 Storage Card

This system supports the M.2 storage module (2242 B+M Key) through the **M2_1** slot.

1. Locate the **M2_1** slot.



2. Insert the M.2 module into the slot at 15° angle, align the notch on the module with the corresponding socket key in the slot, and then secure it with a screw.

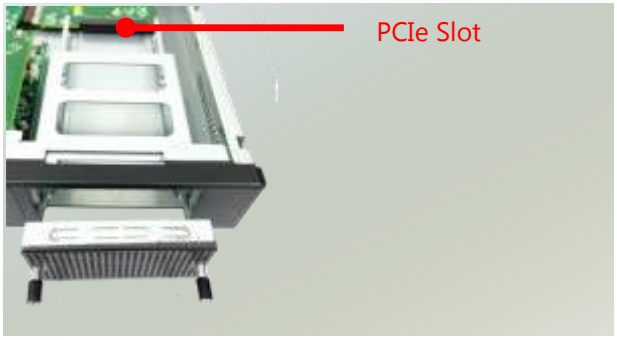


Installing the NIC Modules

This system can accommodate one **NIC** slim type modules at the front and another one at rear **FH/HL** PCIe expansion slot. Based on your application requirements, employ a combination of Riser Cards to fulfill your needs:

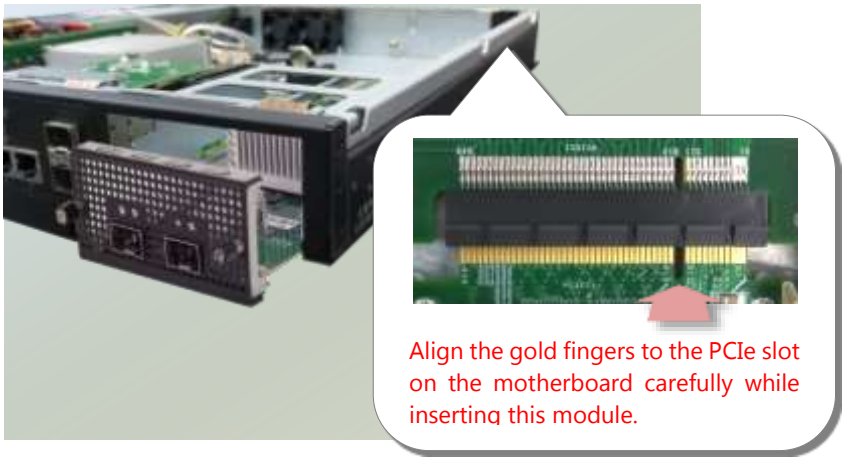
1. Rotate the two lock-screws counterclockwise and loosen them.

2. Remove the door and locate the PCIe slot for module insertion.



3. Insert your NIC Ethernet module. (The module shown in the image below is for reference only).

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



Model	Ports	Connector Speed	Chipset	PCIE Interface
NCS2-IGM806A	8	1Gb RJ-45	Intel i350AM-4	2* PCIEx4
NCS2-IGM808A	8	1Gb RJ-45	PEX8618, Intel I210AT	1* PCIEx8
NCS2-ISM802A	8	1Gb SFP	Intel i350AM-4	2* PCIEx4
NCS2-ISM803A	8	1Gb SFP	Intel i350AM-4,PEX8616	1* PCIEx8
NCS2-IMM802A	4+4	1Gb SFP, 1Gb RJ-45	i350-AM4	2*PCIEx4
NCS2-IXM204A	2	10Gb SFP+	Intel 82599ES	1* PCIEx8
NCS2-IXM205A	2	10Gb SFP+	Intel 82599ES	1* PCIEx8
NCS2-IXM405A	4	10Gb SFP+	Intel 82599ES, PEX8724	1* PCIEx8
NCS2-IXM407A	4	10Gb SFP+	Intel XL710-BM1	1* PCIEx8
NCS2-IQM201A	2	40Gb QSFP+	Intel XL710-BM2	1* PCIEx8
NCS2-IXM409A	4	10Gb SFP+	Intel XL710-BM1	1* PCIEx8
NCS2-IVM201A	2	25Gb SFP28	Intel XXV710-AM2	1* PCIEx8
NCS2-ITM401A	4	10Gb RJ-45	XL710-BM1	1* PCIEx8
NCS2-IXM206A	2	10Gb SFP+	Intel X710-BM2	1* PCIEx8

Installing the Hard Disks

The system can accommodate two 2.5" SSD/HDD at its front disk bay. With the optional SSD swappable cage, you can add another two SSD disks for system storage. After you install the hard drives, make sure the SATA data cables and SATA power cables are connected to the designated connectors on the motherboard, as indicated in the picture below.

1. Locate the disk drive tray at the corner of the system.

2. Slide the tray downwards. Then the tray will be loosened from the two latching spots.

3. Take the tray out and prepare to install a SATA 2.5" disk drive.

4. Place the disk drive as shown in the image below. Apply 2 screws for each side of the disk drive.

SATA connector this way

5. Place the tray with HDD/SSD installed back to its original spot inside the system. Remember to aim the two latching holes. Then slide the tray upwards to get it locked by the two latching spots.

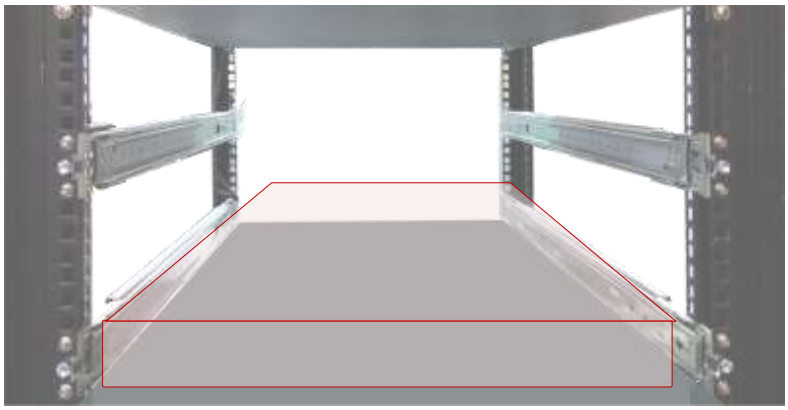
6. Establish SATA cable connection between the disk drive and the motherboard. Please apply 15+7 SATA cable to the drive while using SATA 7-pin connector and SATA 4-pin connector for the motherboard.

Mounting the System

There are various methods to mount this system based on your application and the environment. This system came with two types of mounting kits for a typical rack or enclosure mounting installation or installing this system in a rack:

- **Ear Brackets**

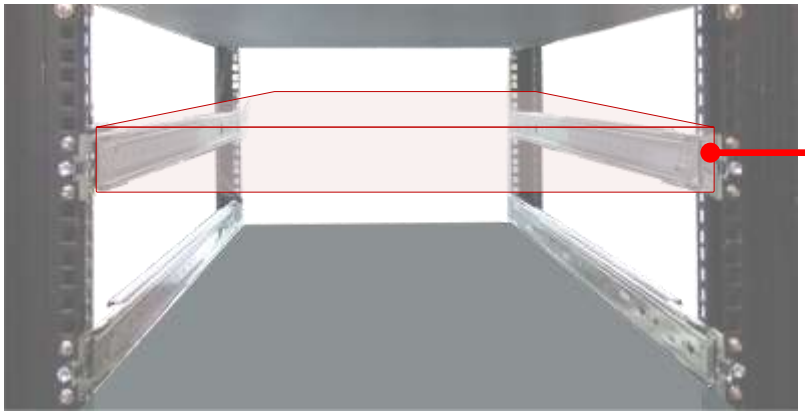
This method is quick and easy by fixing this system to the front posts of the rack while being the most unstable method, for the bracket assembly alone cannot provide sufficient support to the chassis. Please ensure the use of these brackets goes with a shelf or slide rails to prevent the chassis from falling over.



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

- **Slide Rail Kit + Short Ear Brackets**

The slidable rails allow you to access the system easily while solidly securing it on the rack.



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

Attaching the Ear Brackets

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

Take an ear bracket, align the holes on it with those on the side of the system, and lock it onto the system with three provided screws. Do the same to the other ear bracket.

The Slide Rail

The slide rail kit shall include the following items:

- **1 x pack of FL00IJ0-A screws (for securing the sliding rails on the unit)**

- **2 x Slide-Rails**

Fully stretched slide rail:

Note If any component is missing or damaged, please contact your dealer immediately for assistance.

Attaching Rail Brackets

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

2. **Slide the rail bracket out to its end.**

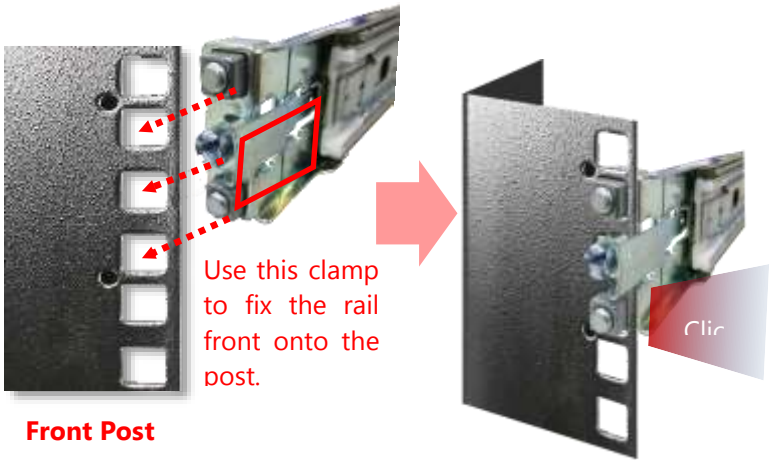
3. **To detach the rail bracket from the channel, locate and push the Release Tab on the rail bracket while sliding it out.**

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

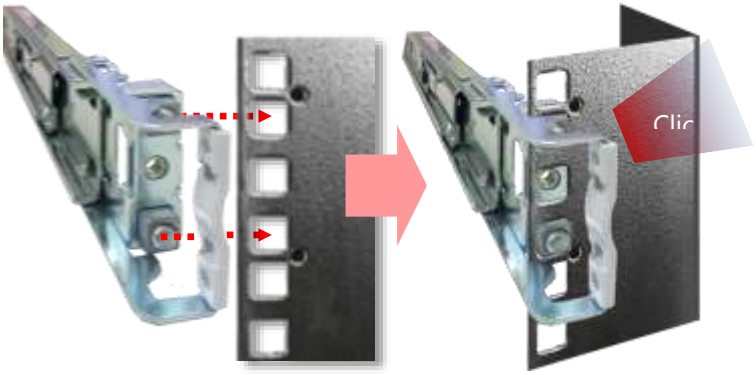
5. **Repeat Steps 1~4 to attach the rail bracket to the other side of the chassis.**

Installing the Slide Rail Assemblies

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



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

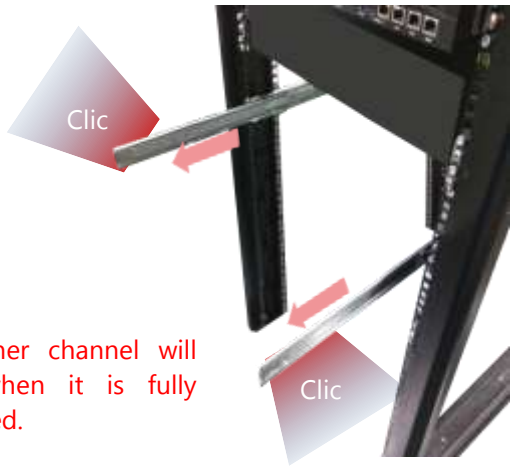


Rear Post

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

Installing the Chassis onto the Rack

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



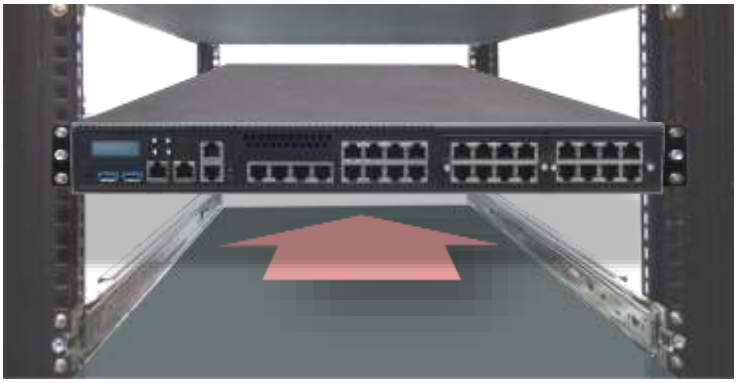
The inner channel will click when it is fully stretched.

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

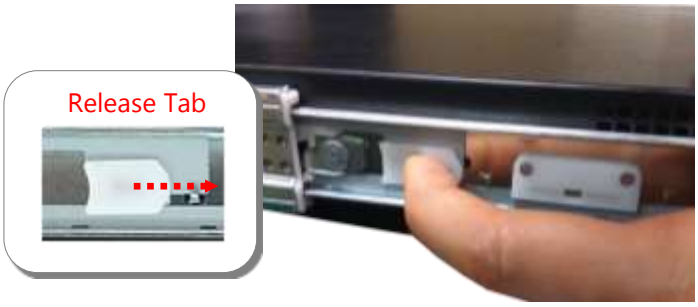
3. **Keep sliding the rails in until they stop about halfway. Press down the metal clips on both inner channels and push them further into the cabinet.**

Press down the metal clips while pushing in.

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



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



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.

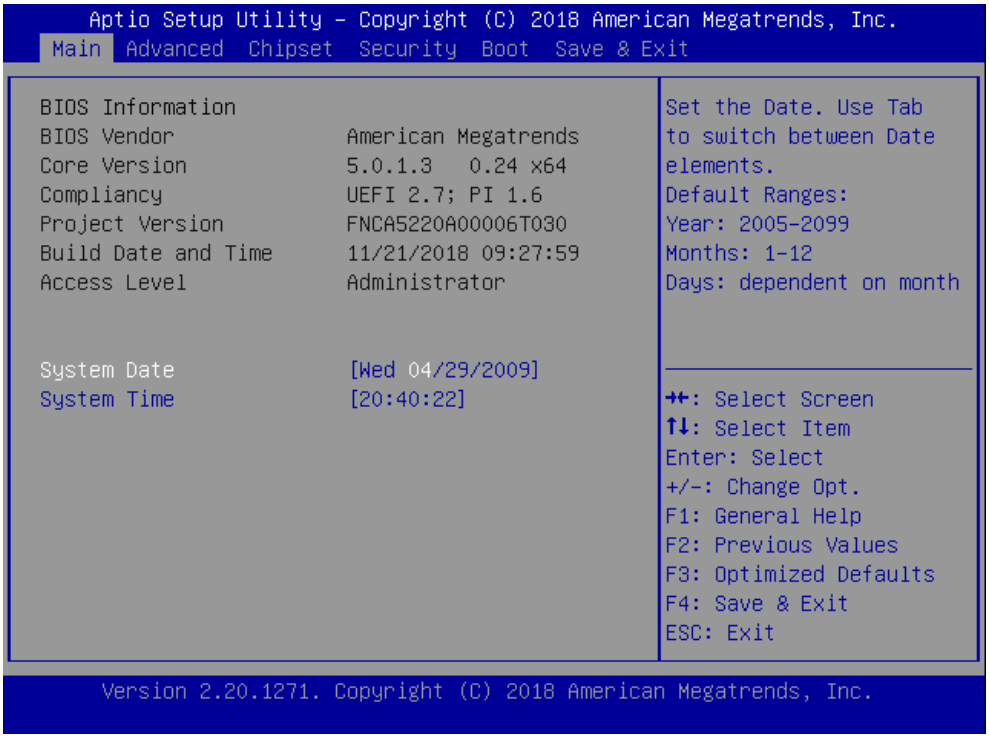
Main Setup

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

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

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

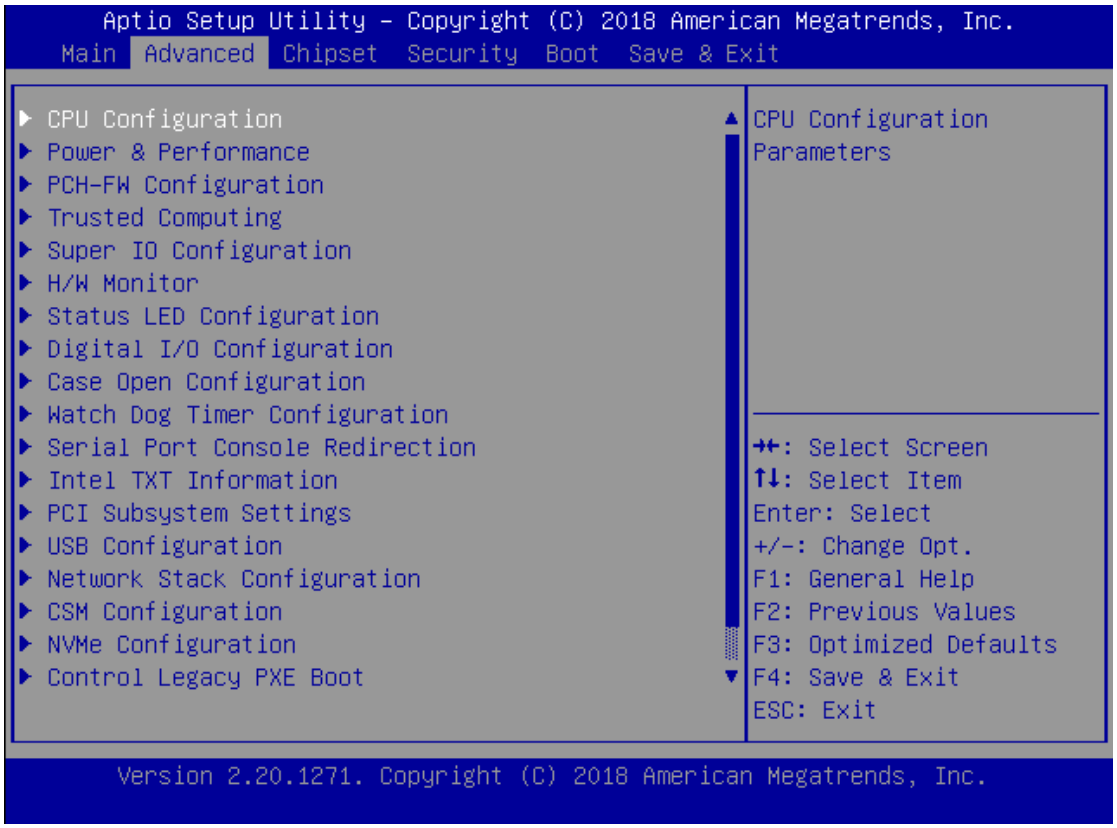
Setup main page contains BIOS information and project version information.



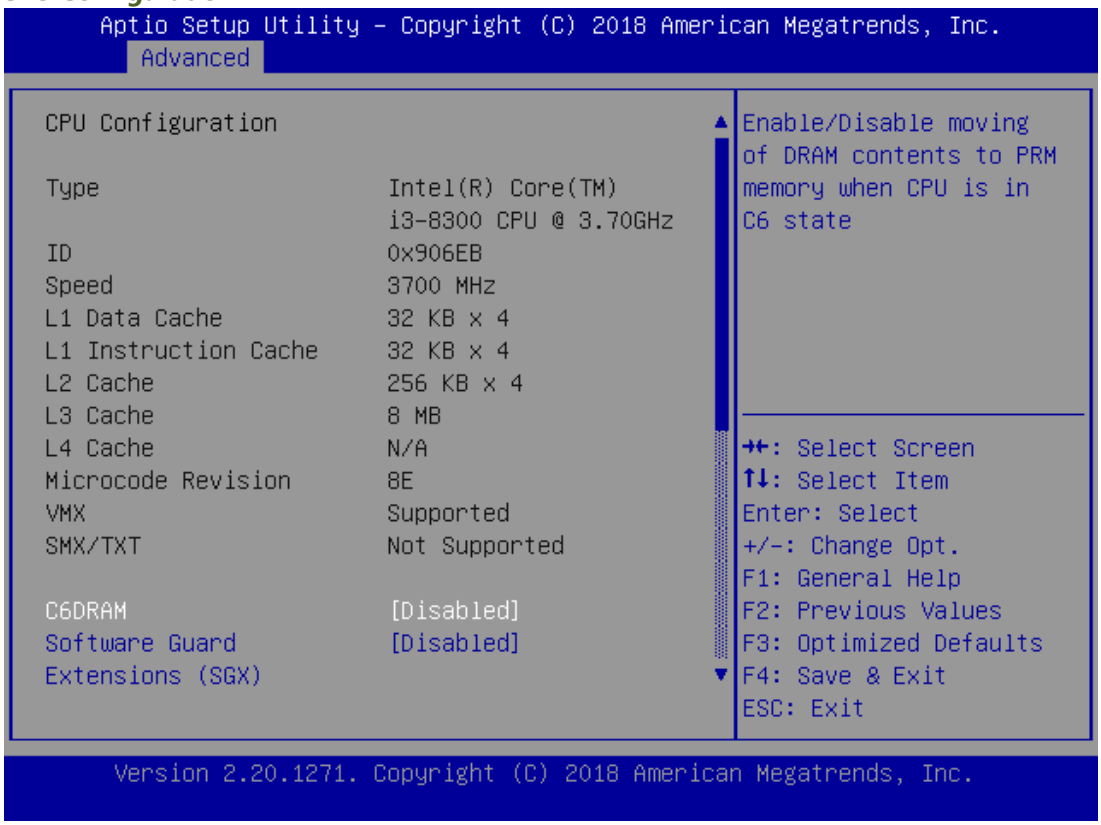
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
System Date	To set the Date, use **<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.

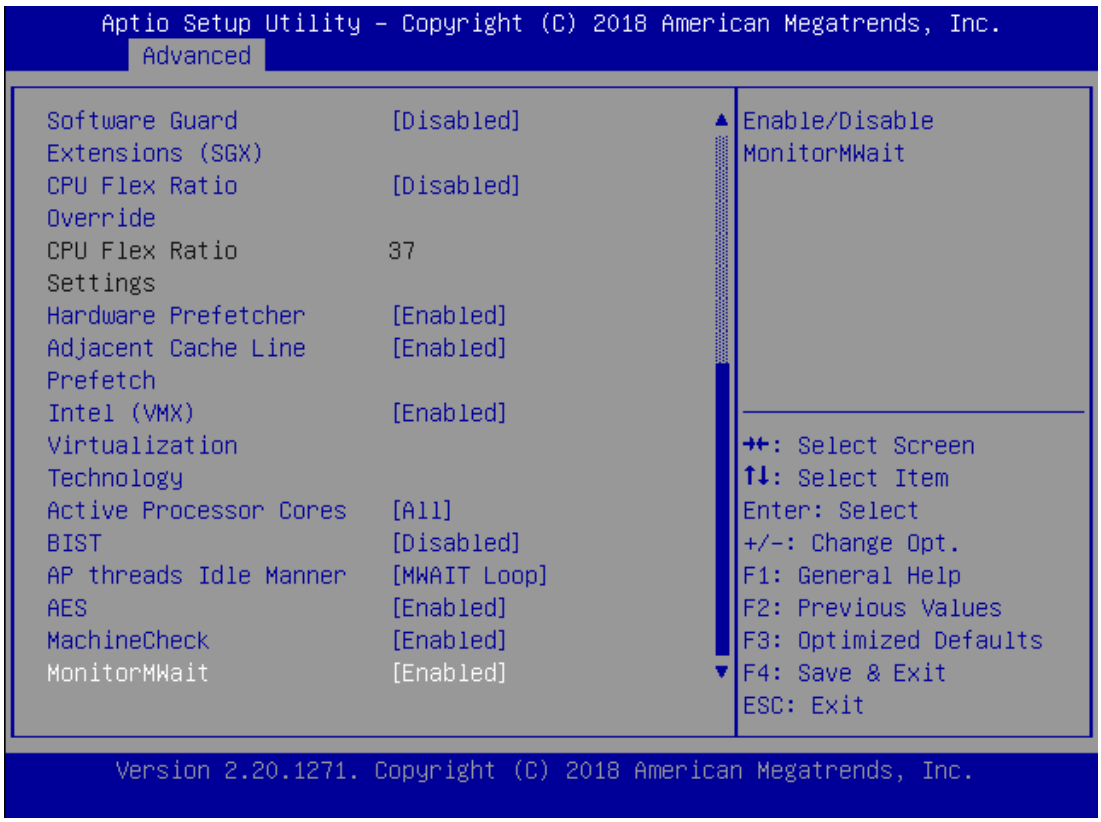
Advanced Page

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.



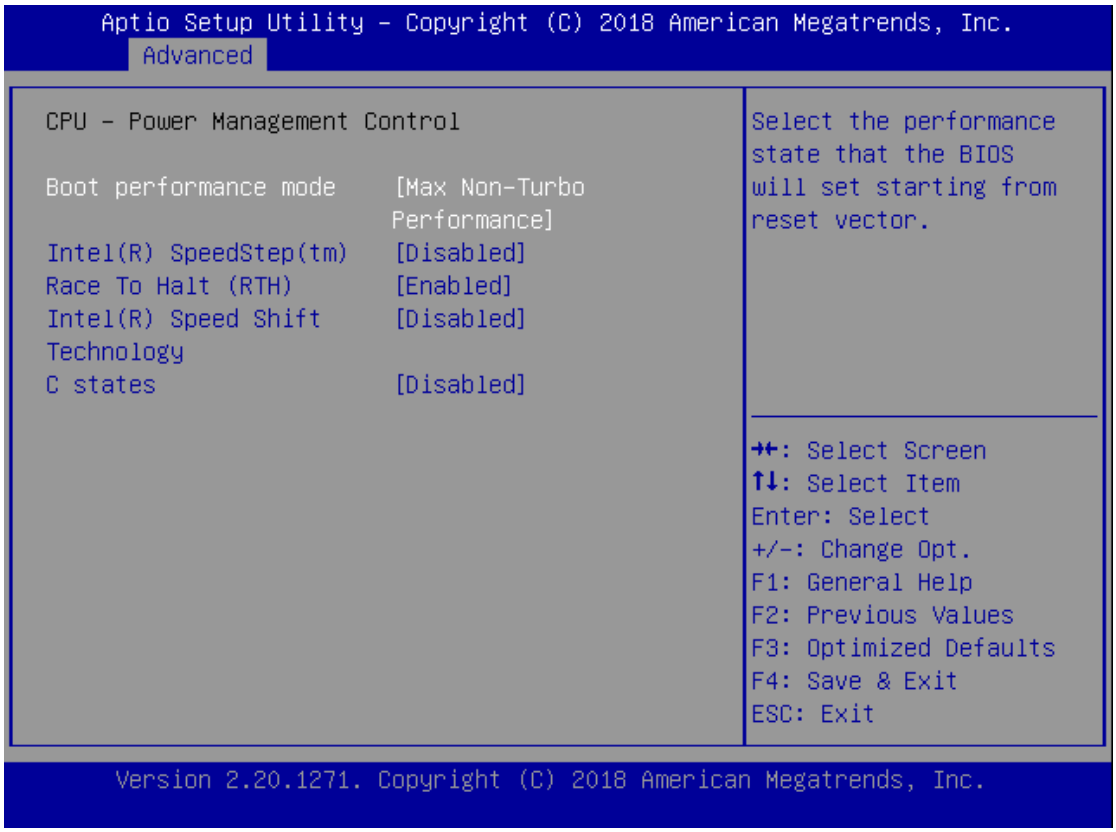
CPU Configuration





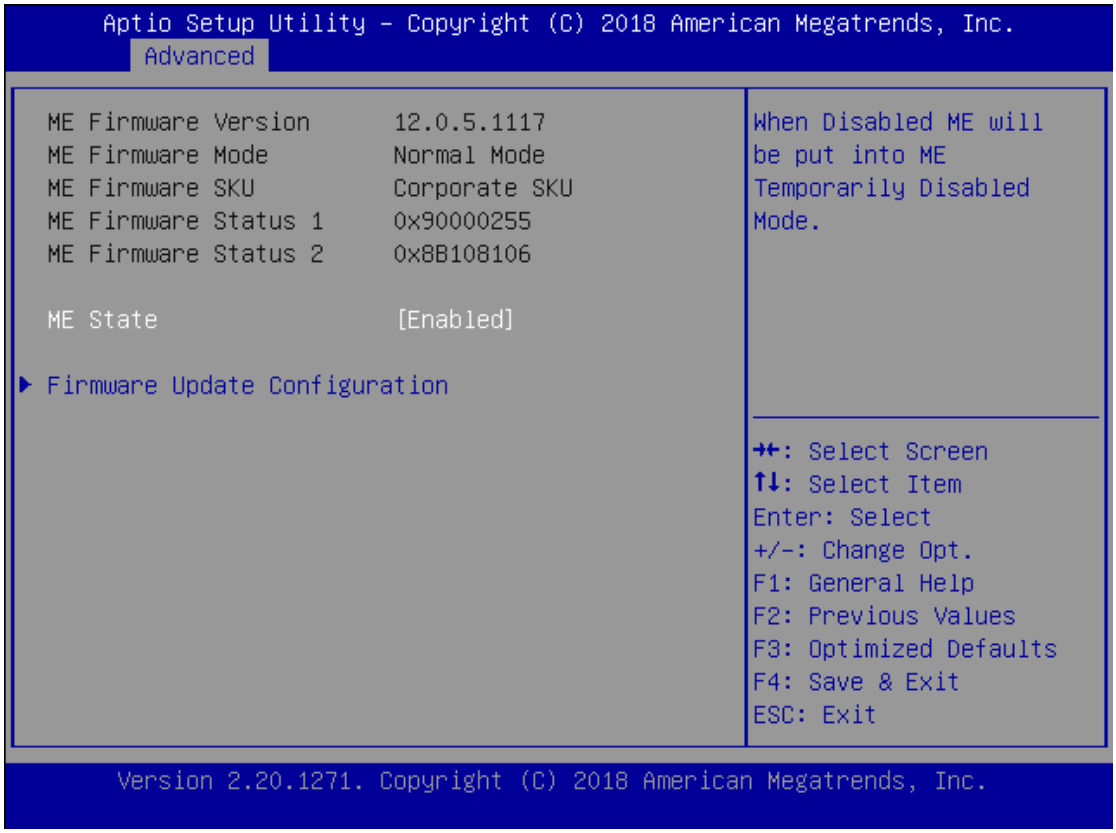
Feature	Options	Description
C6DRAM	Disabled Enabled	Enable/Disable moving of DRAM contents to PRM memory when CPU is in C6 state
Software Guard Extensions (SGX)	Disabled Enabled	Enable/Disable Software Guard Extensions (SGX)
CPU Flex Ratio Override	Disabled Enabled	Enable/Disable CPU Flex Ratio Programming
CPU Flex Ratio Override	37	Enable/Disable CPU Flex Ratio Programming
Hardware Prefetcher	Disabled Enabled	To turn on/off the MLC streamer prefetcher.
Adjacent Cache Line Prefetch	Disabled Enabled	To turn on/off prefetching of adjacent cache lines.
Intel (VMX) Virtualization Technology	Disabled Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	All 1 2 3 4 5	Number of cores to enable in each processor package.
Hyper-Threading	Disabled Enabled	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).
BIST	Disabled Enabled	Enable/Disable BIST (Built-In Self Test) on reset
AP threads Idle Manner	HALT Loop MWAIT Loop RUN Loop	AP threads Idle Manner for waiting signal to run
AES	Disabled Enabled	Enable/Disable AES (Advanced Encryption Standard)
MachineCheck	Disabled Enabled	Enable/Disable Machine Check
MonitorMWait	Disabled Enabled	Enable/Disable MonitorMWait

Power & Performance



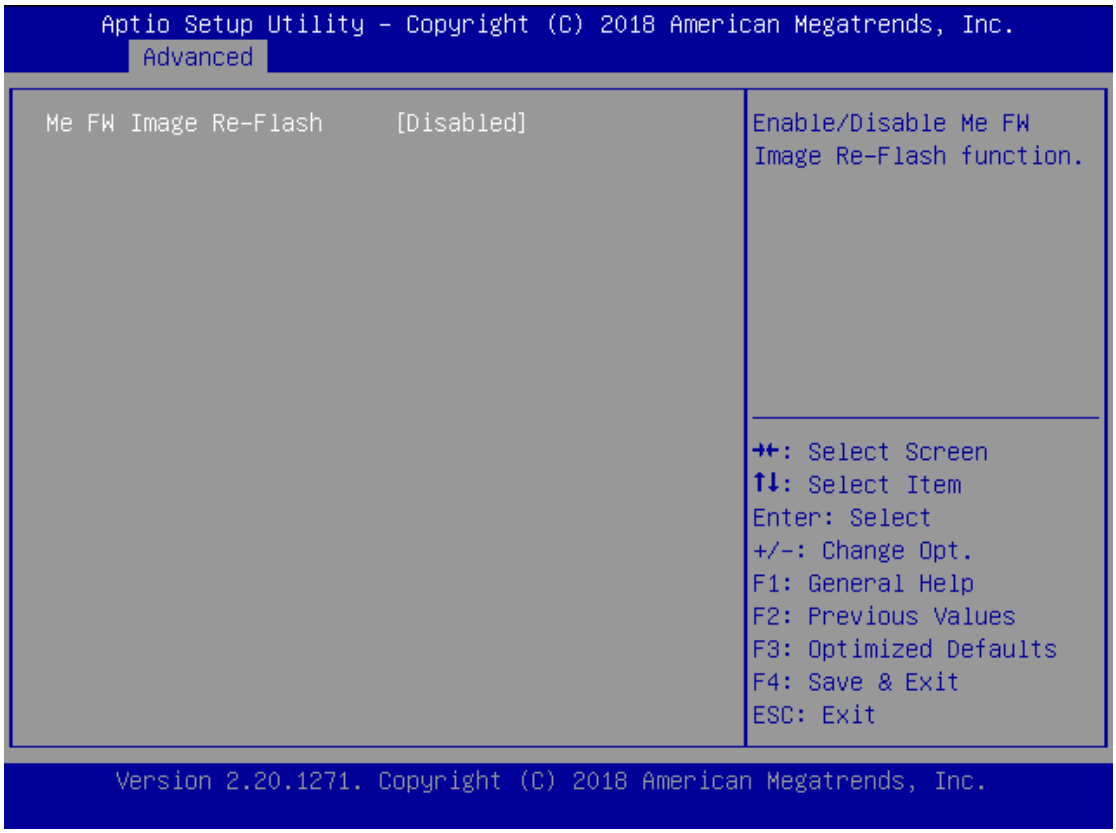
Feature	Options	Description
Boot performance mode	Max Battery Max Non-Turbo Performance Turbo Performance"	Select the performance state that the BIOS will set starting from reset vector.
Intel(R) SpeedStep(tm)	Disabled Enabled	Allows more than two frequency ranges to be supported.
Race To Halt (RTH)	Disabled Enabled	Enable/Disable Race To Halt feature. RTH will dynamically increase CPU frequency in order to enter pkg C-State faster to reduce overall power. (RTH is controlled through MSR 1FC bit 20)
Intel(R) Speed Shift Technology	Disabled Enabled	Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
C states	Disabled Enabled	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

PCH-FW Configuration



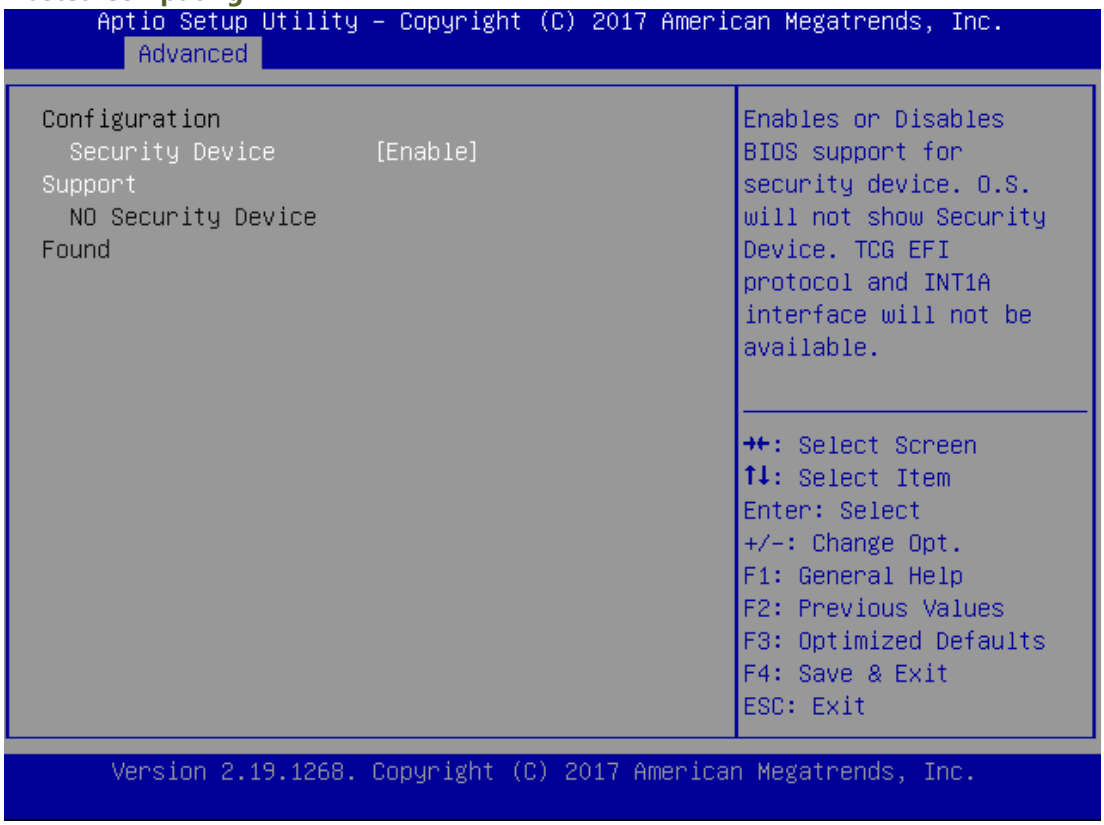
Feature	Options	Description
ME State	Disabled Enabled	When Disabled ME will be put into ME Temporarily Disabled Mode.

PCH-FW Configuration



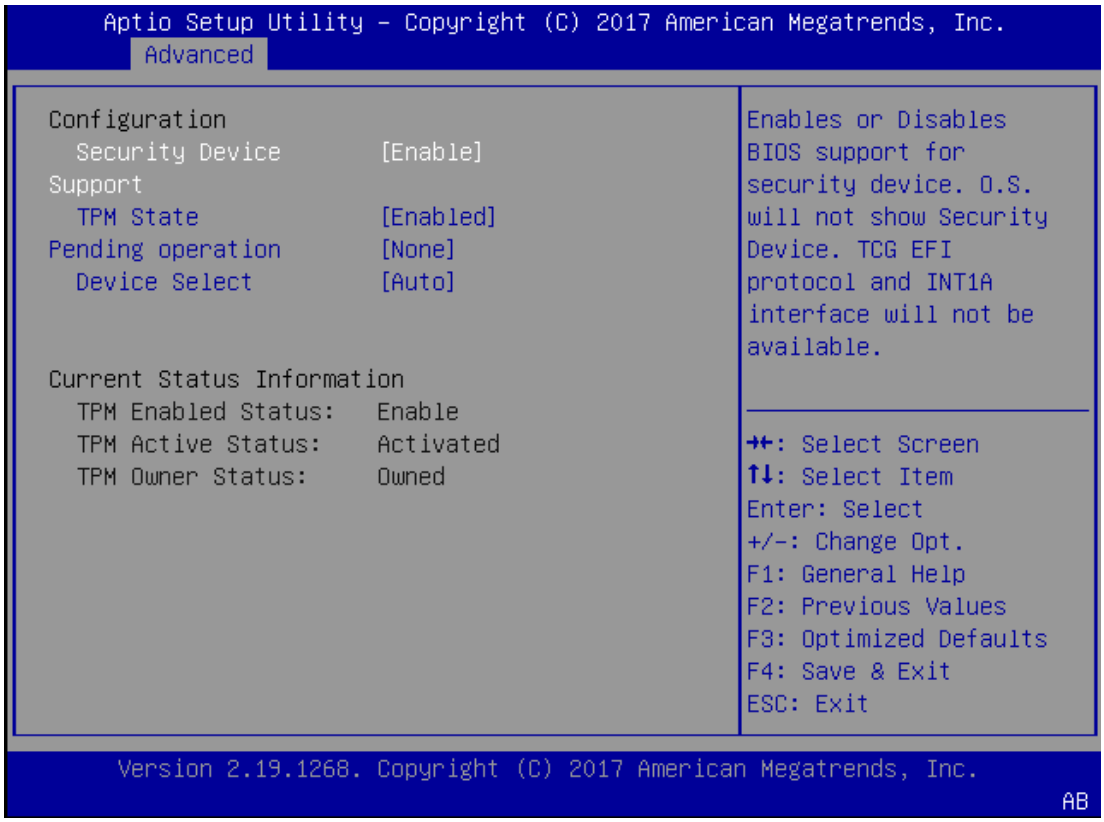
Feature	Options	Description
Me FW Image Re-Flash	Disabled Enabled	Enable/Disable Me FW Image Re-Flash function.

Trusted Computing



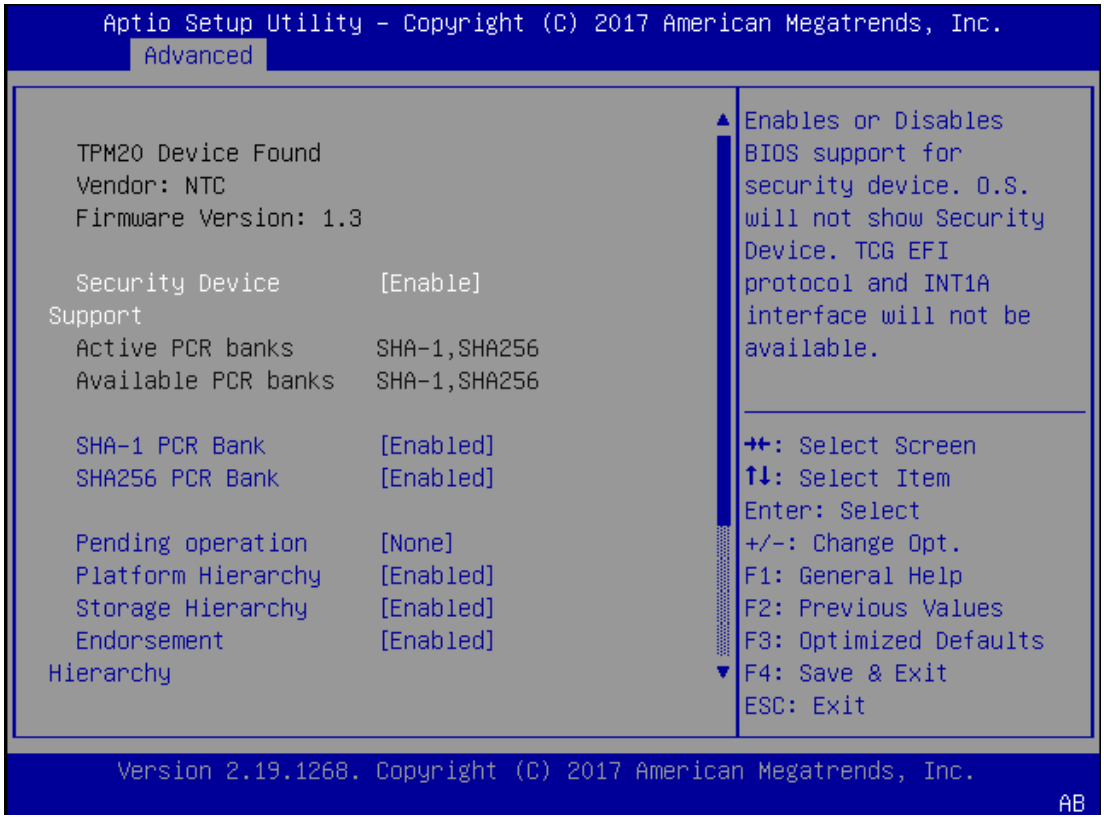
Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

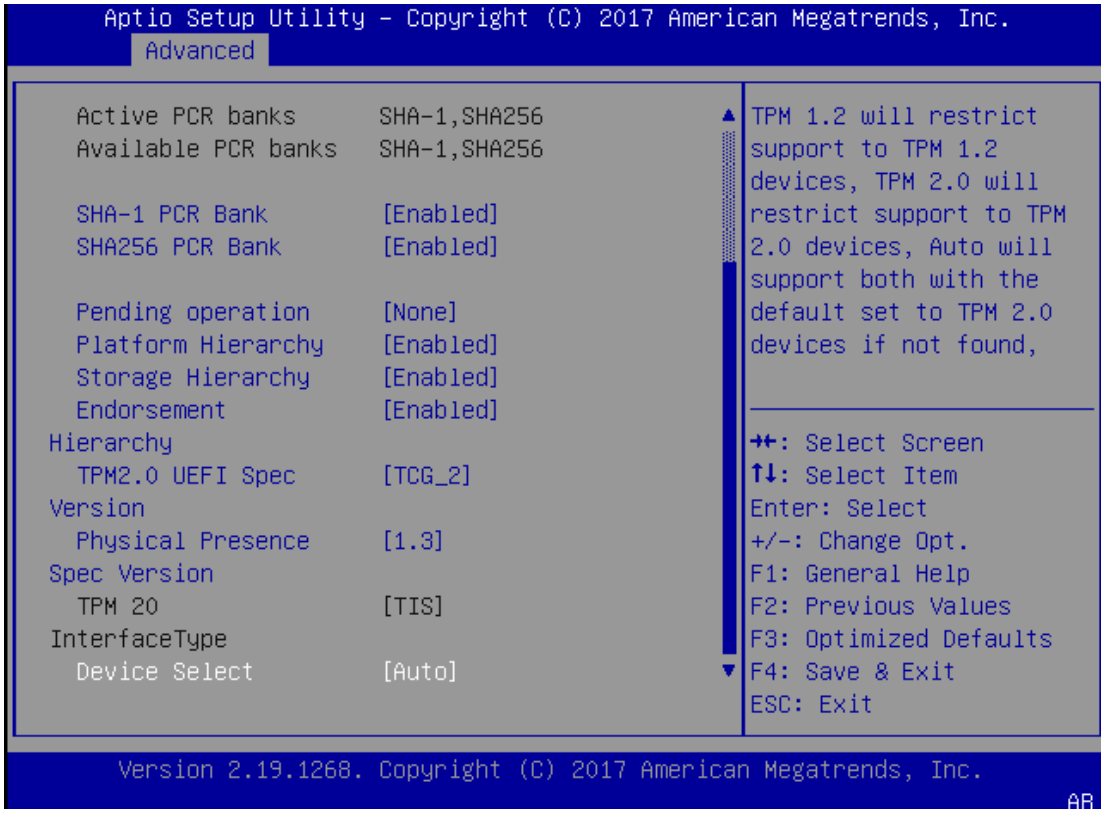
Trusted Computing (TPM1.2)



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

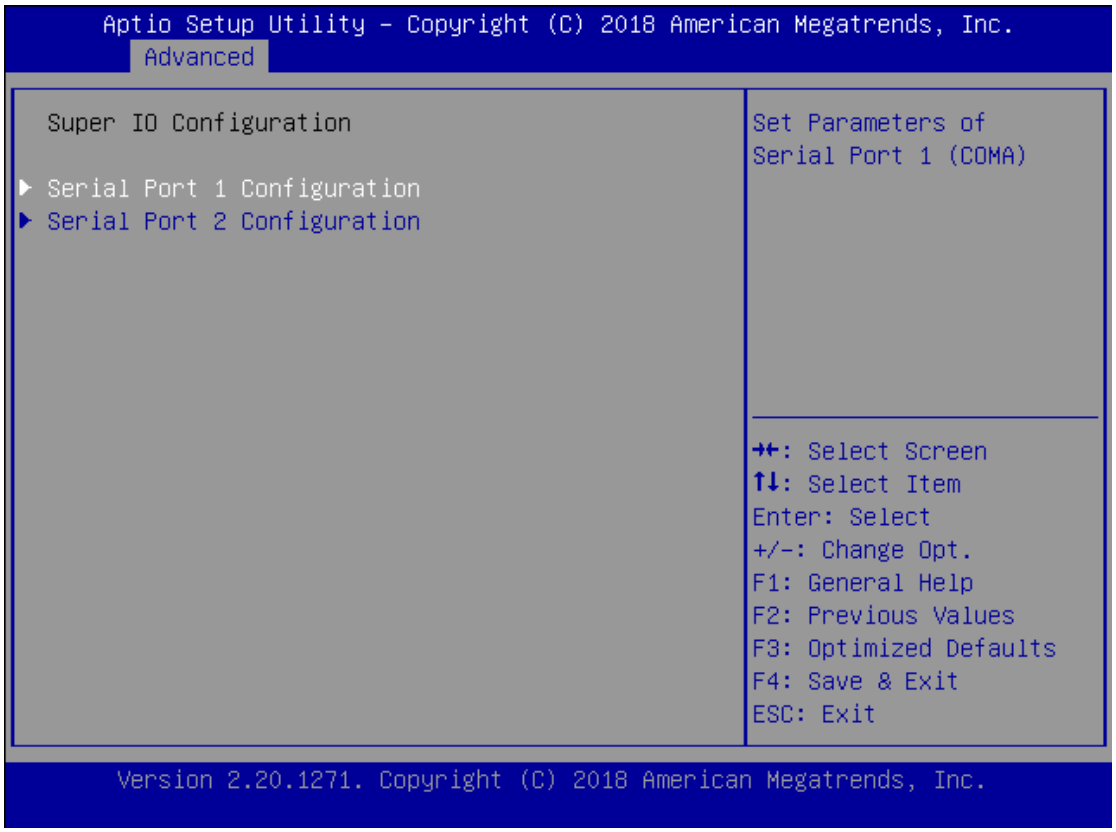
Trusted Computing (TPM2.0)



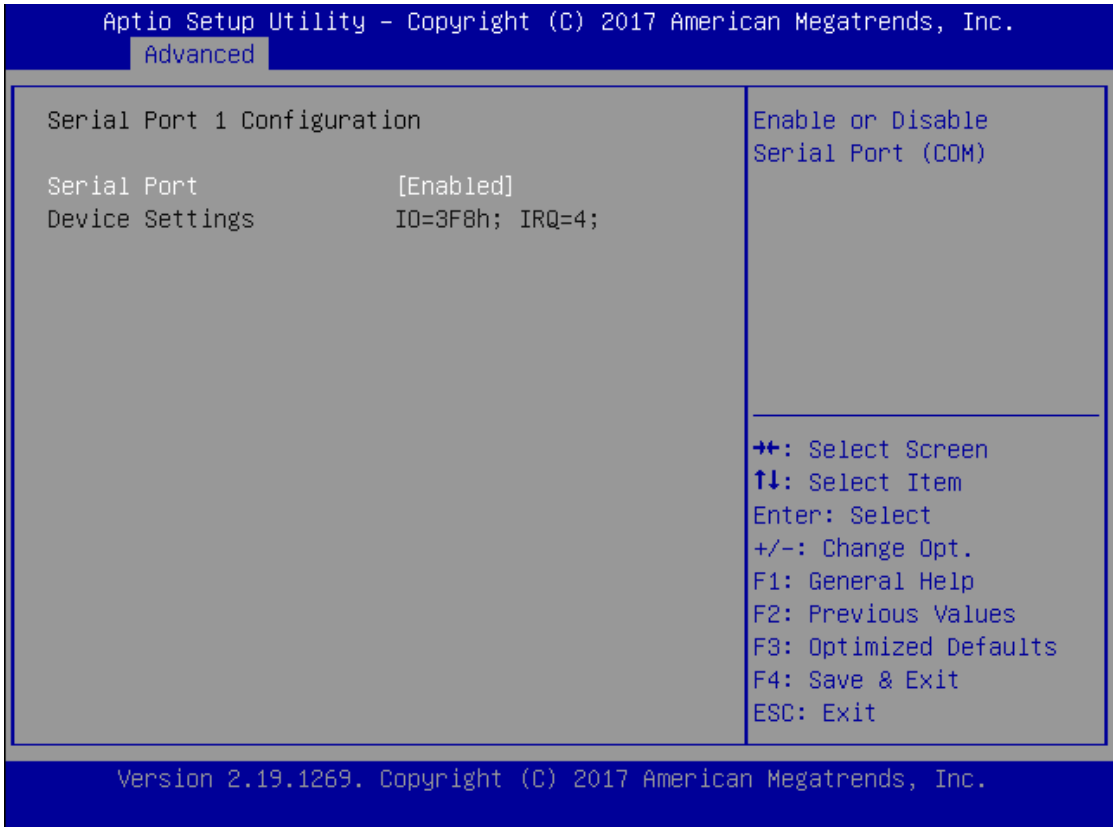


Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA-1 PCR Bank	Enabled Disabled	Enables or disables SHA-1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

Super IO Configuration

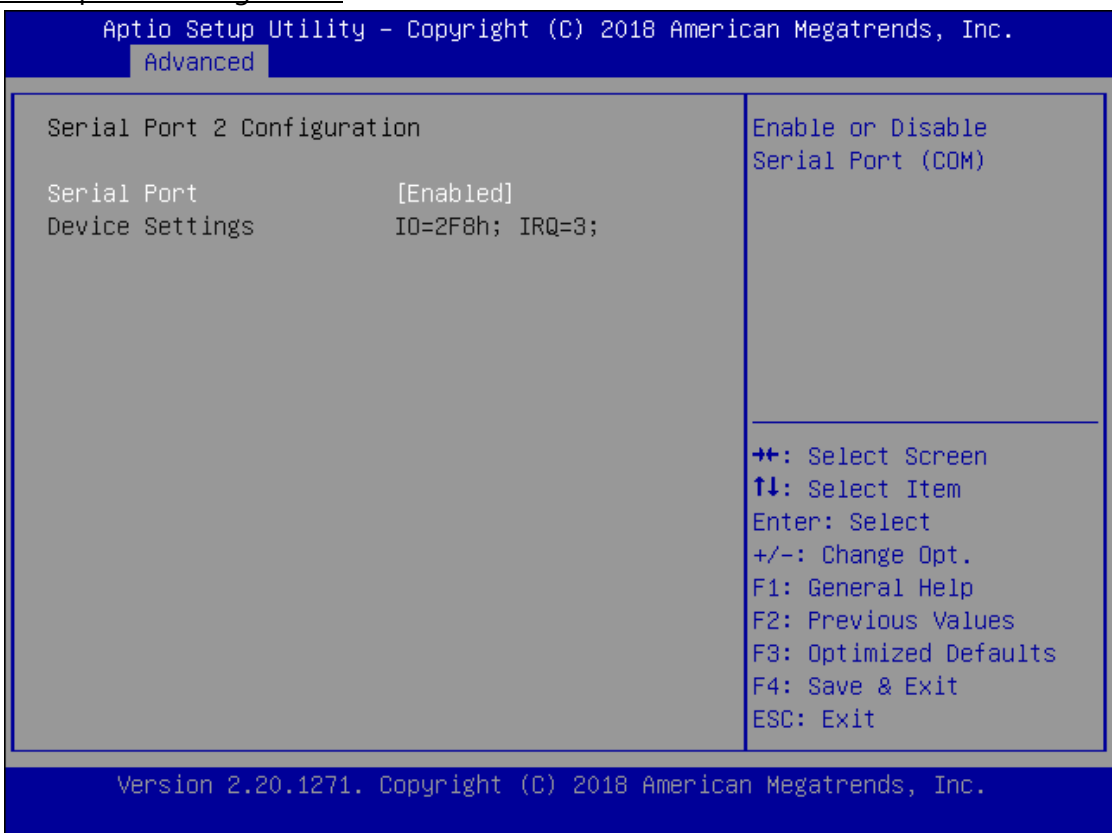


Serial port 1 Configuration



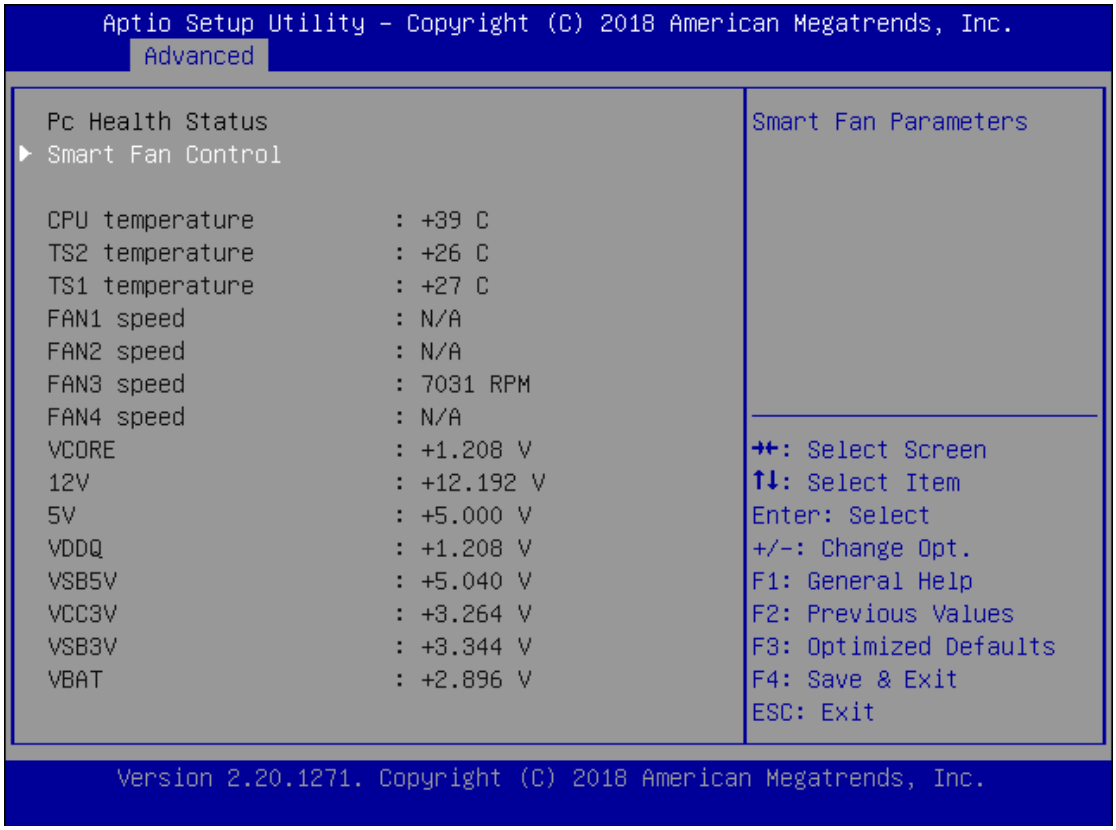
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port 1.
Device Settings	NA	IO=3F8h; IRQ = 4

Serial port 2 Configuration



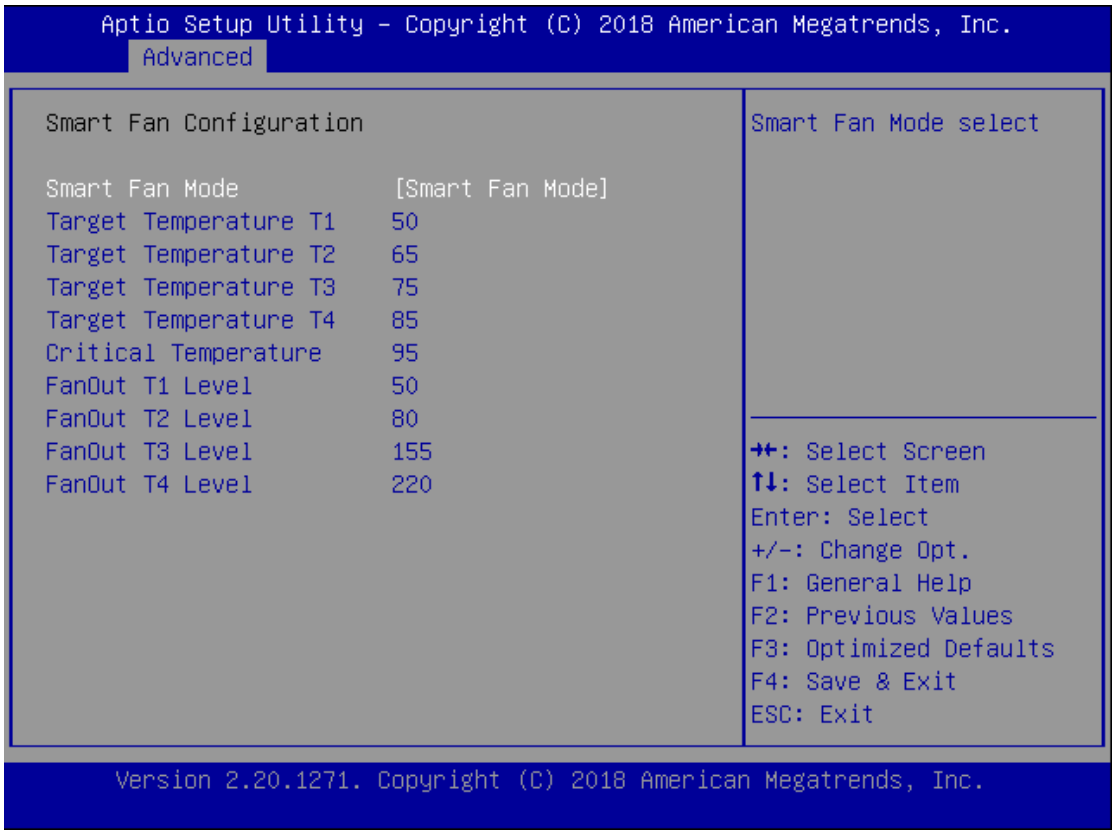
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port 2.
Device Settings	NA	IO=2F8h; IRQ = 3

H/W Monitor



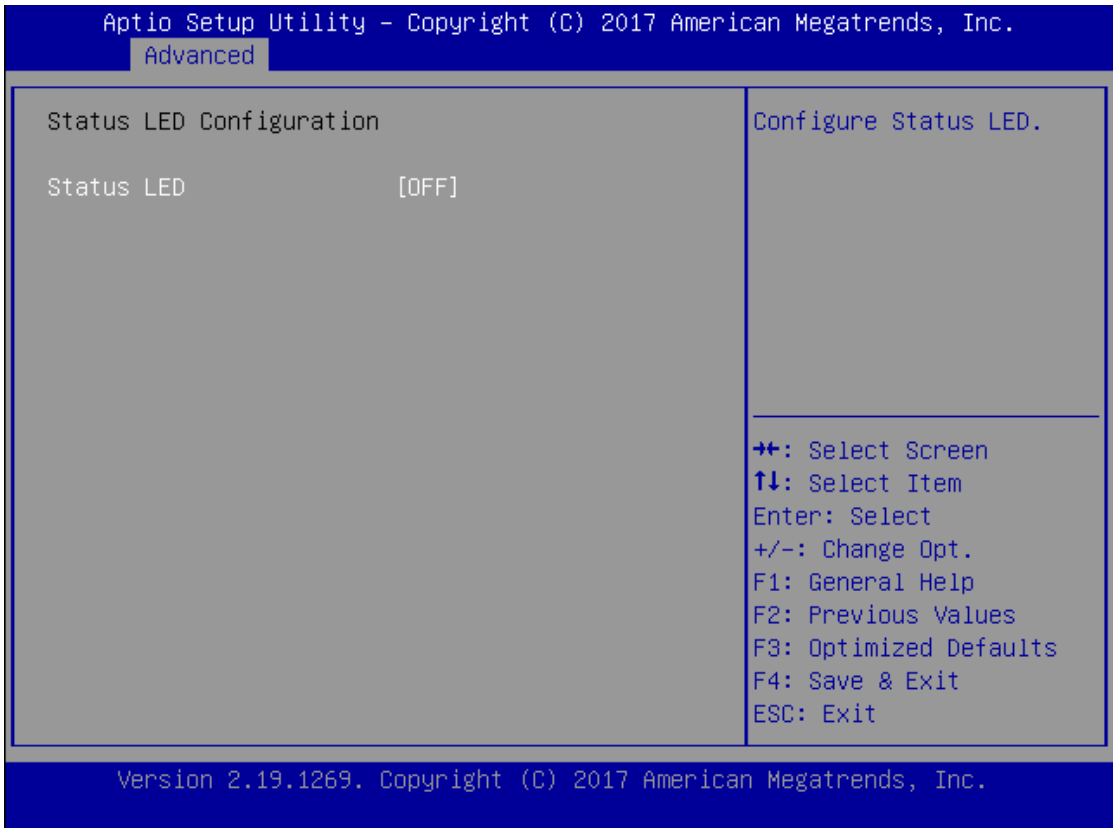
Feature	Options	Description
Smart Fan Control	None	Smart Fan Parameters

Smart Fan Control



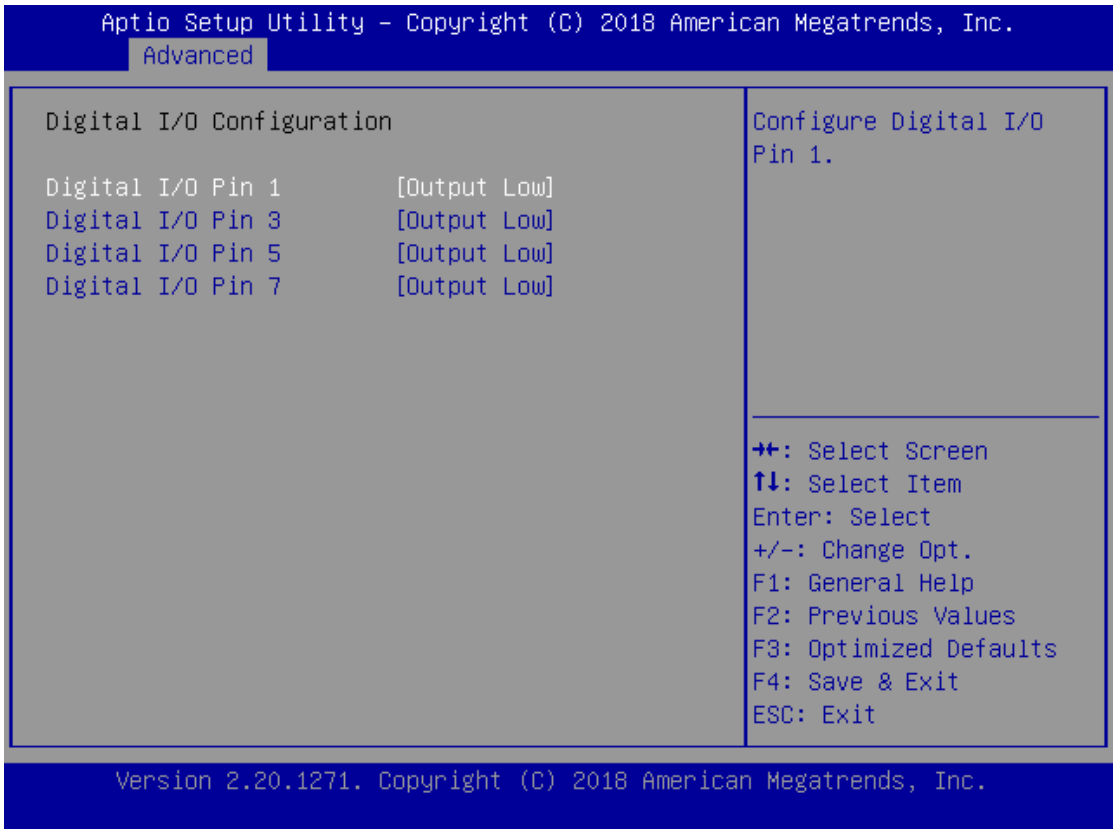
Feature	Options	Description
Smart Fan Mode	Manual Mode Smart Fan Mode	Smart Fan Mode select
Target Temperature T1	50	Input Target Temperature (Range:0 - 127)
Target Temperature T2	65	Input Target Temperature (Range:0 - 127)
Target Temperature T3	75	Input Target Temperature (Range:0 - 127)
Target Temperature T4	85	Input Target Temperature (Range:0 - 127)
Critical Temperature	95	Input Target Temperature (Range:0 - 127)
FanOut T1 Level	50	Input Target Fan Out
FanOut T2 Level	80	Input Target Fan Out
FanOut T3 Level	155	Input Target Fan Out
FanOut T4 Level	220	Input Target Fan Out

Status LED Configuration



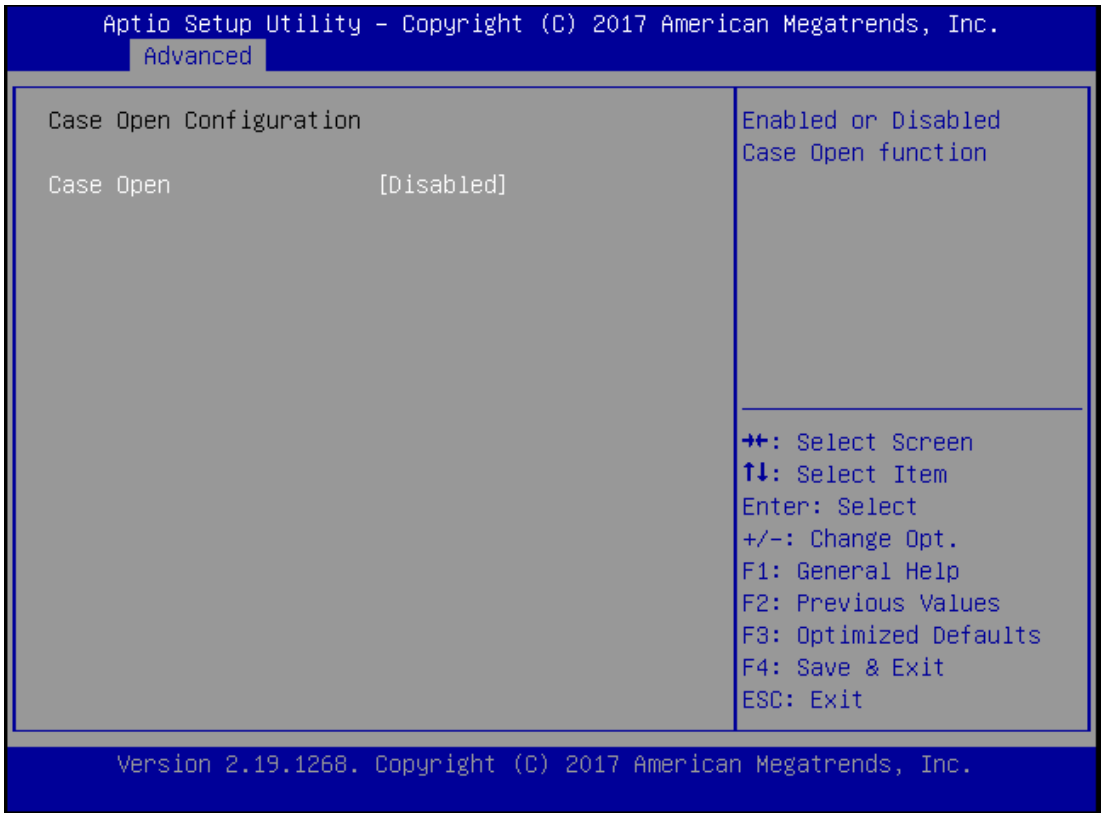
Feature	Options	Description
Status LED	OFF Green Red	Configures Status LED color

Digital I/O Configuration



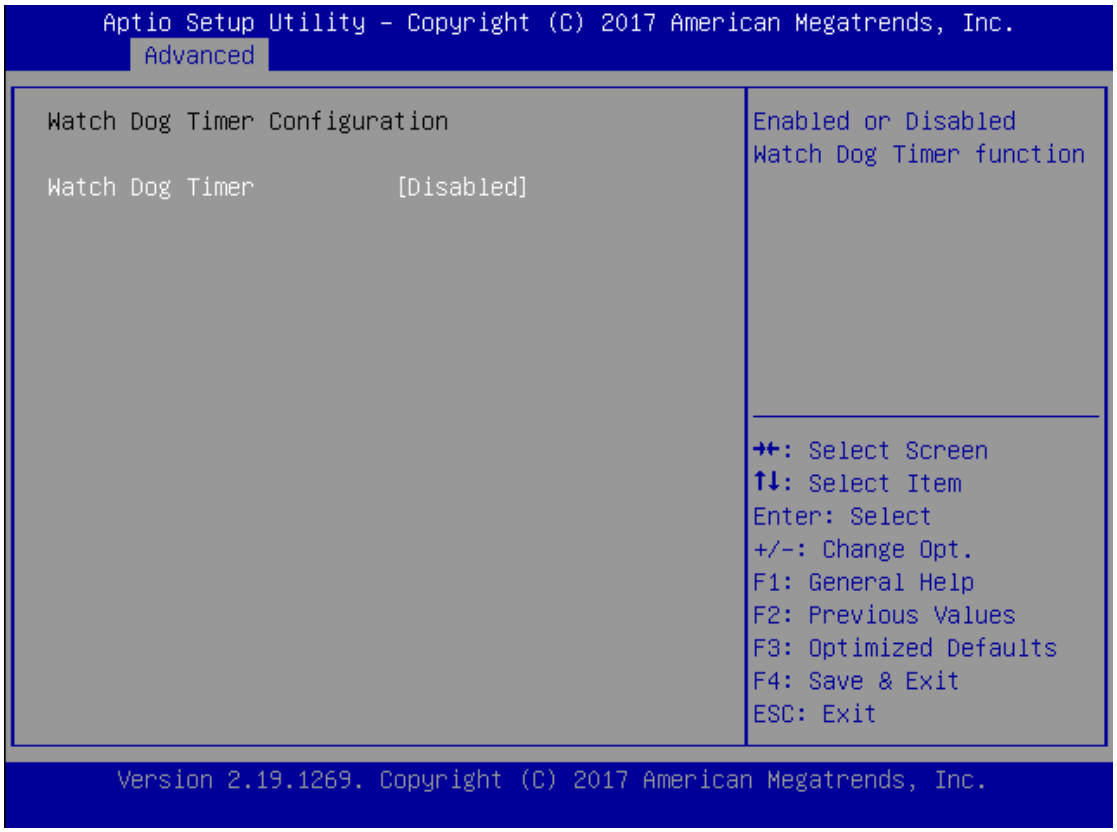
Feature	Options	Description
Digital I/O Output 1	Output Low Output High	Configure Digital I/O Pin1
Digital I/O Output 3	Output Low Output High	Configure Digital I/O Pin3
Digital I/O Output 5	Output Low Output High	Configure Digital I/O Pin5
Digital I/O Output 7	Output Low Output High	Configure Digital I/O Pin7

Case Open Configuration



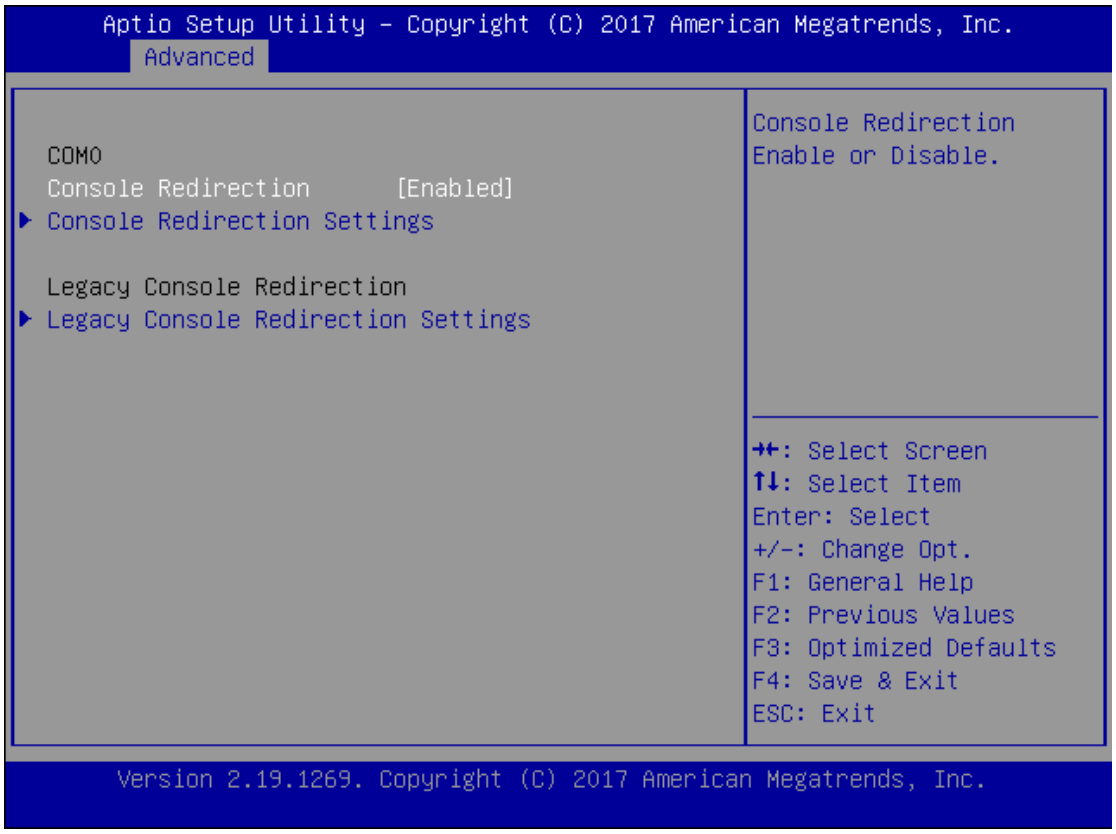
Feature	Options	Description
Case Open	Enabled Disabled	Enables or disables Case Open function

Watch Dog Timer Configuration



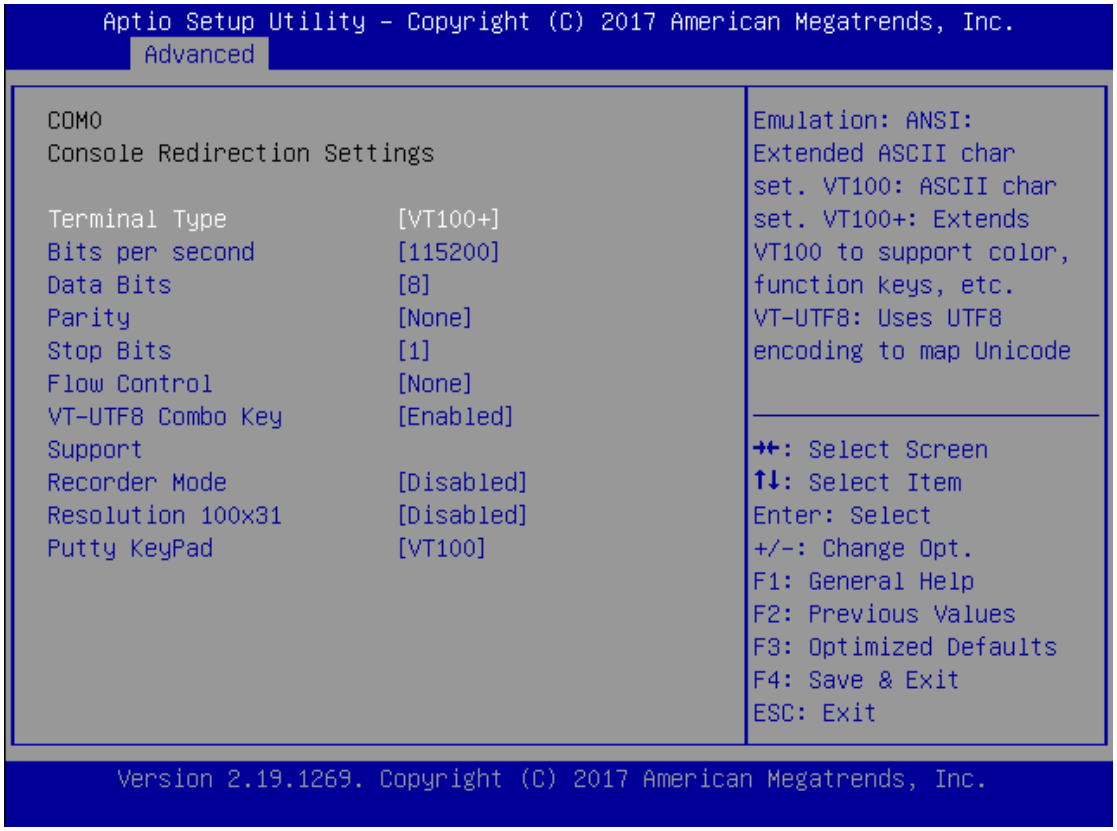
Feature	Options	Description
Watch Dog Timer	Enabled Disabled	Enables or disables Watch Dog Timer function

Serial Port Console Redirection



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

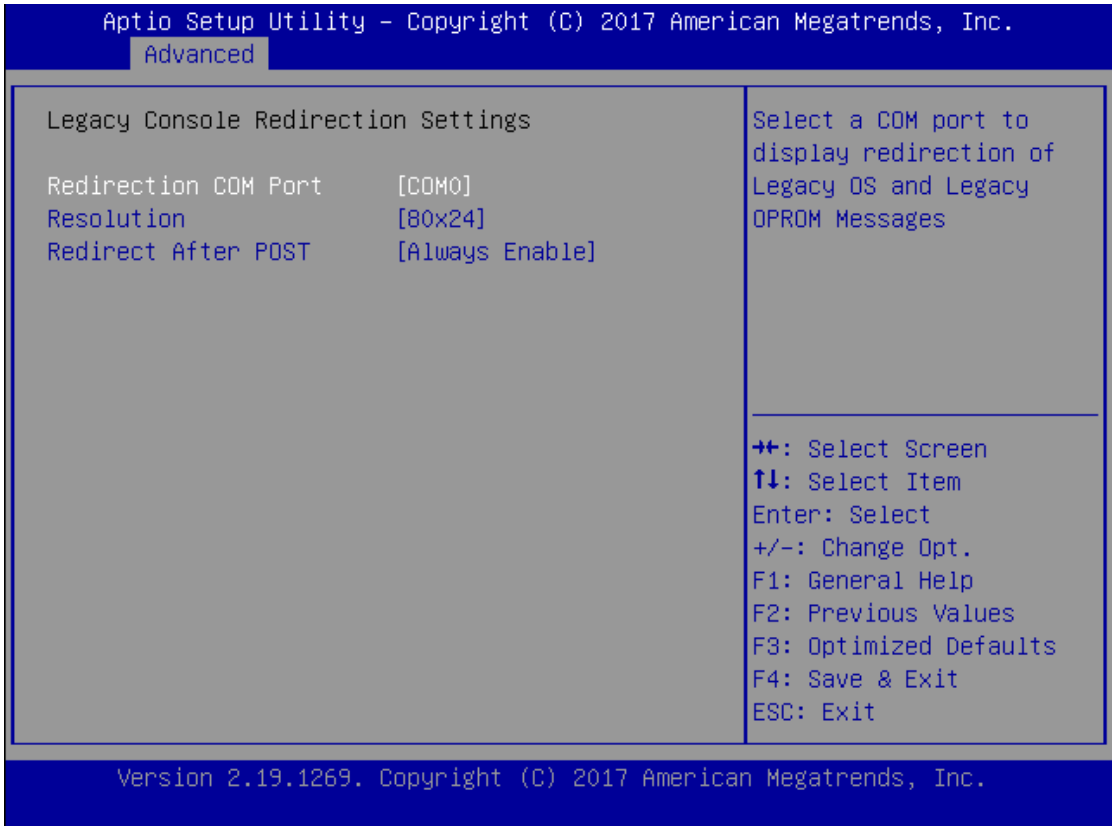
Console Redirection Settings



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	Flow Control can prevent data loss from buffer overflow.

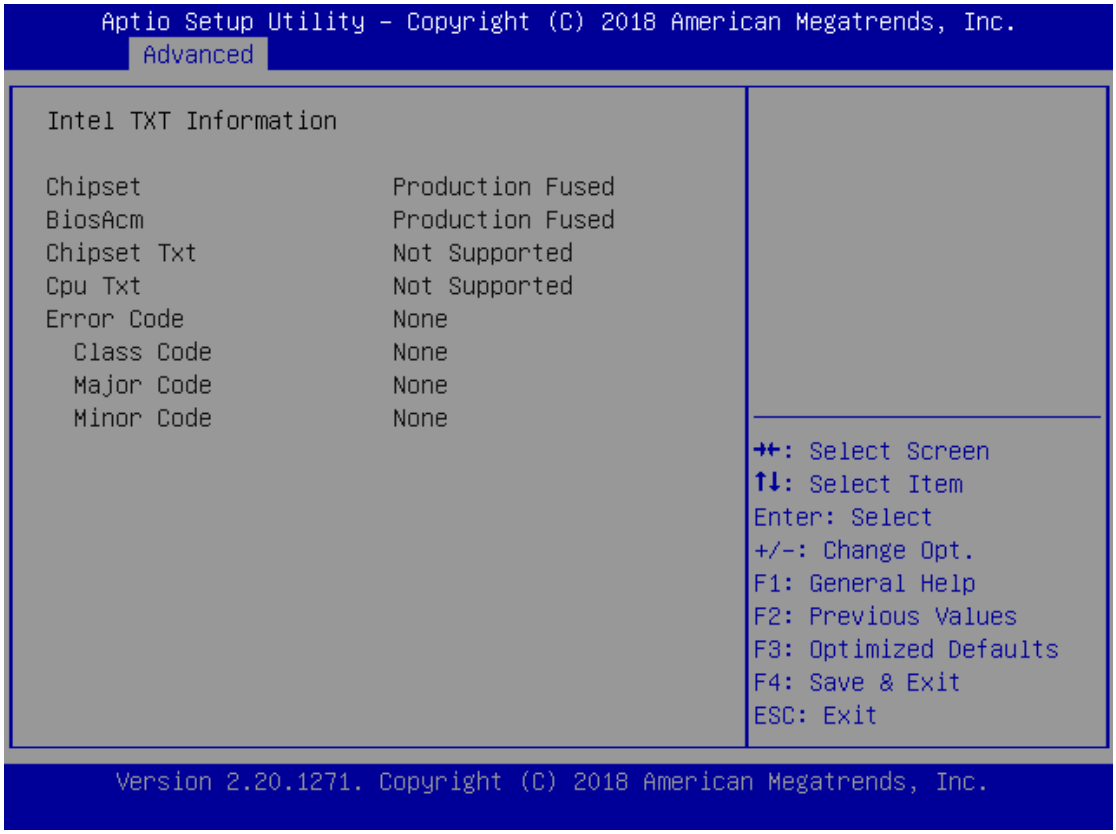
	RTS/CTS	
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal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

Console Redirection Settings

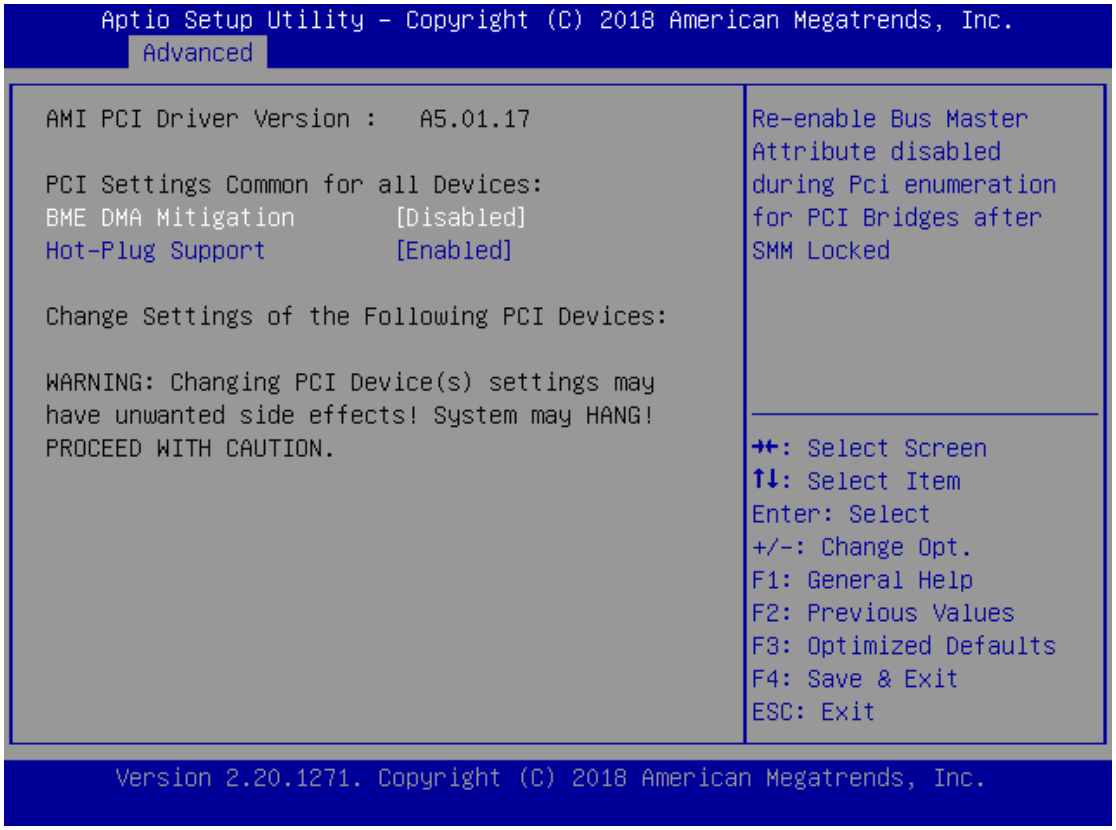


Feature	Options	Description
Redirection COM Port	COM0	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.
Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection.
Redirection After BIOS POST	Always Enable BootLoader	When **Bootloader** is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

Intel TXT Information

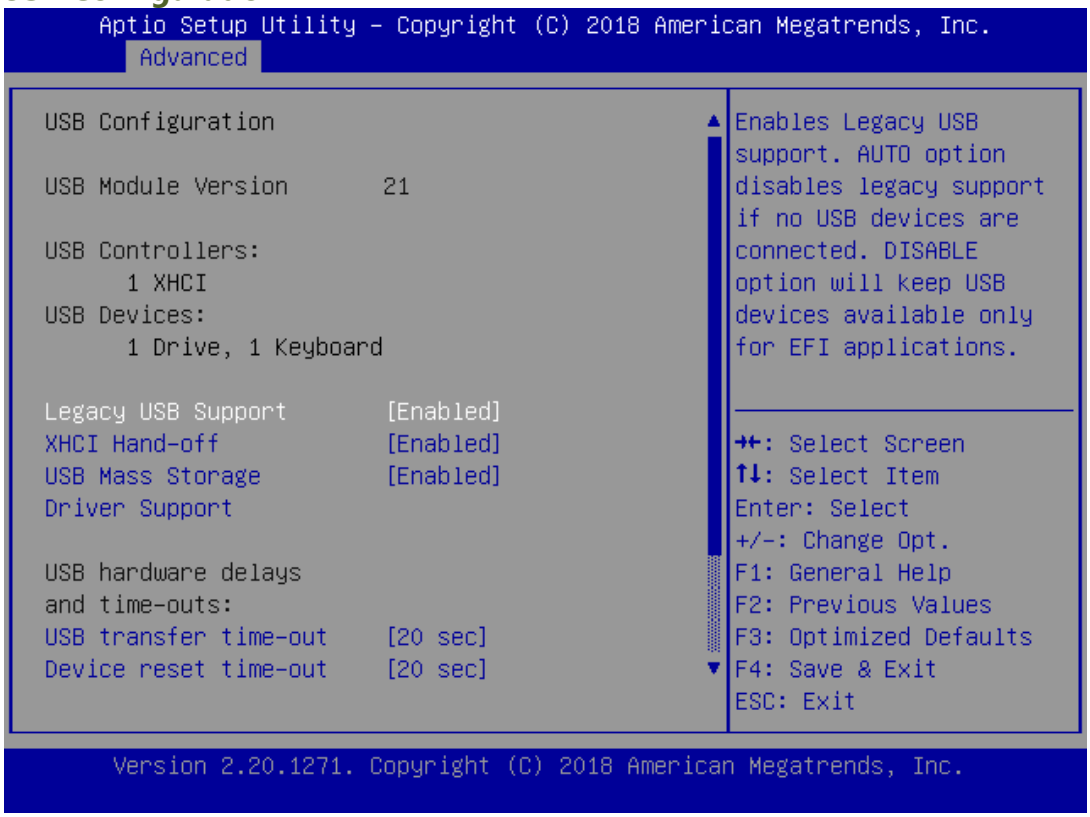


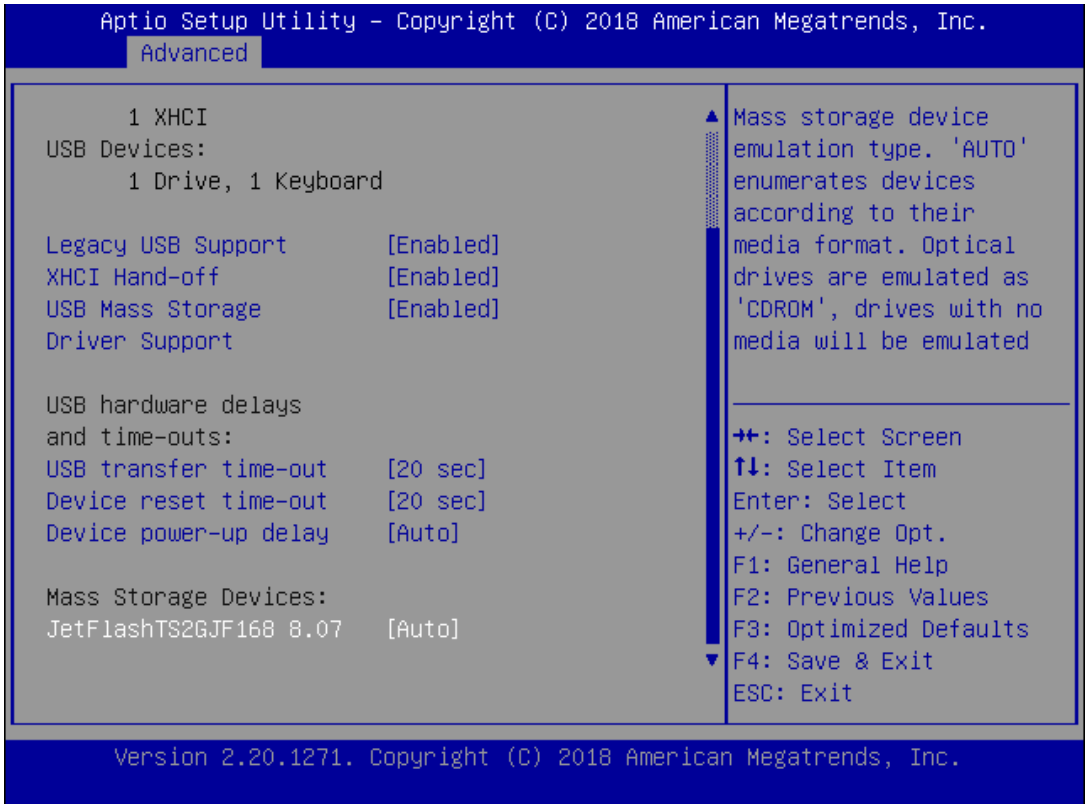
PCI Subsystem Settings



Feature	Options	Description
BME DMA Mitigation	Disabled Enabled	Re-enable Bus Master Attribute disabled during PCI enumeration for PCI Bridges after SMM Locked
Hot-Plug Support	Disabled Enabled	Globally Enables or Disables Hot-Plug support for the entire System. If System has Hot-Plug capable Slots and this option set to Enabled, it provides a Setup screen for selecting PCI resource padding for Hot-Plug.

USB Configuration

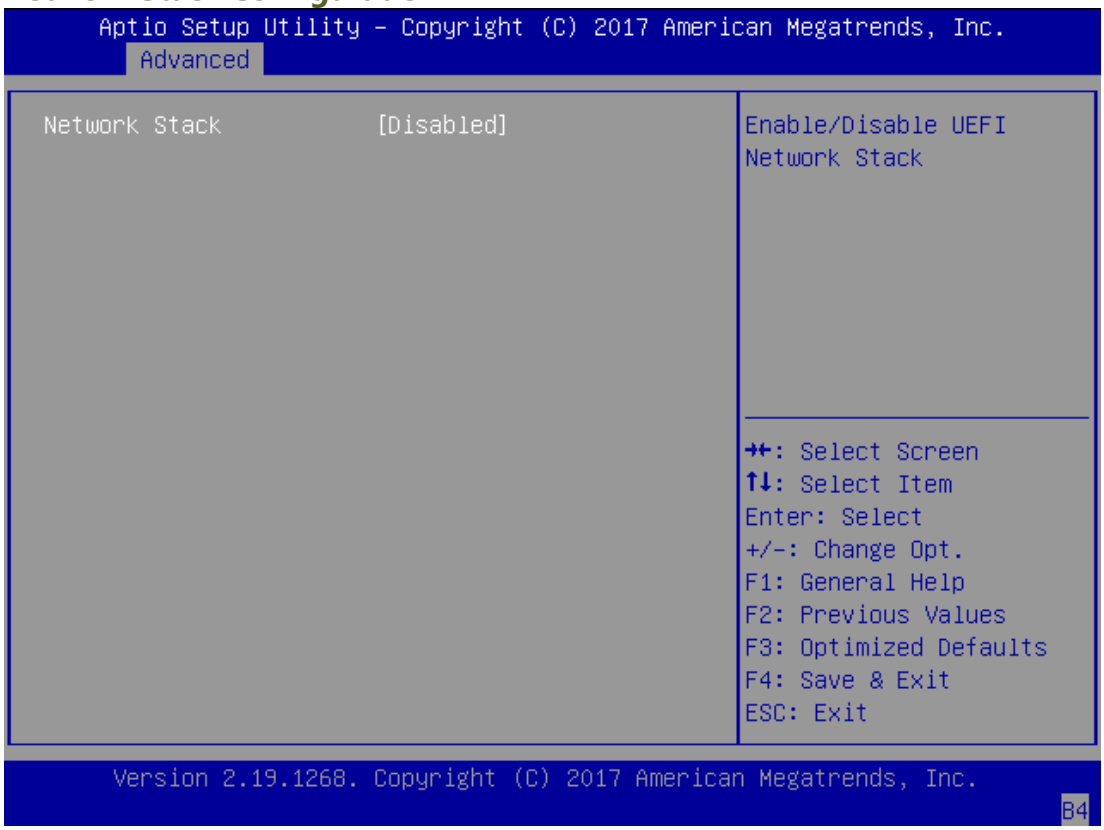




Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. **Auto** option disables legacy support if no USB devices are connected;

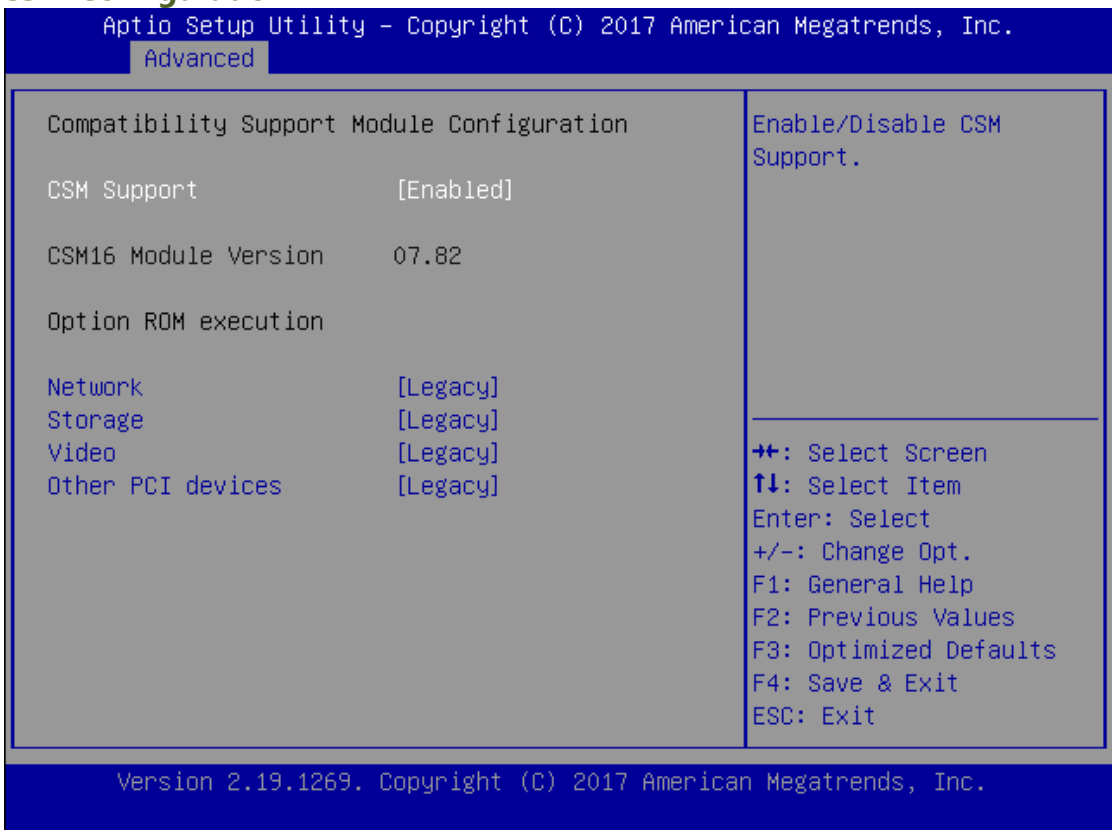
		Disabled option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enabled Disabled	Enables or disables USB Mass Storage Driver Support.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for Control, Bulk, and Interrupt transfers
Device reset time-out	1 sec 5 sec 10 sec 20 sec	USB mass storage device Start Unit command time-out
Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller. **Auto** uses default value: for a Root port, it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

Network Stack Configuration



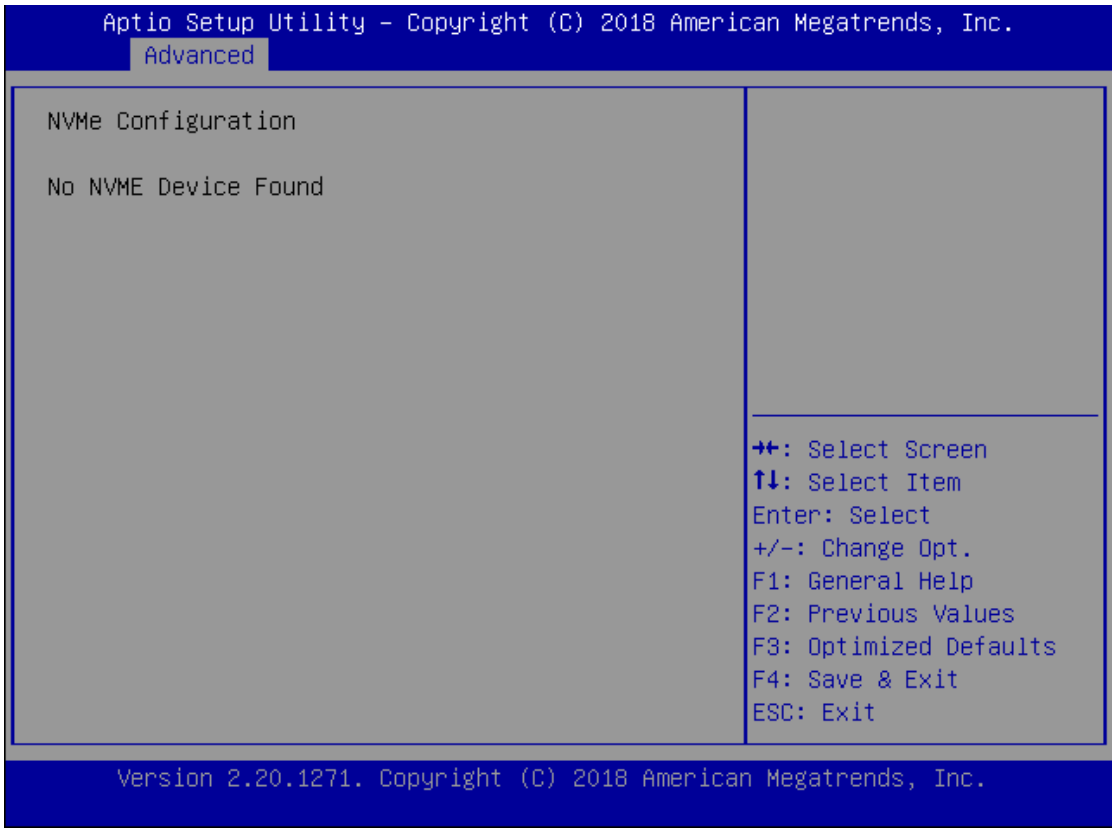
Feature	Options	Description
Network Stack	Disabled Enabled	Enables or disables UEFI Network Stack

CSM Configuration

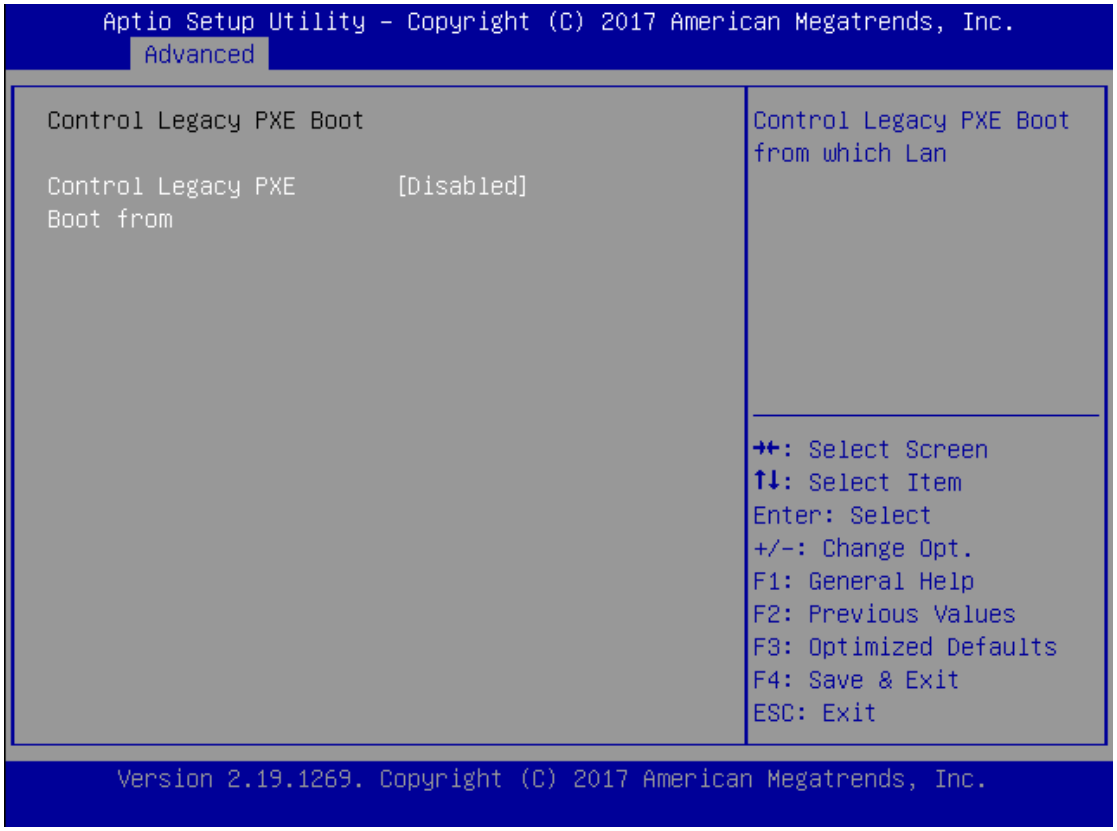


Feature	Options	Description
CSM Support	Disabled Enabled	Enables or disables CSM Support
Network	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not Launch UEFI Legacy	Controls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

NVMe Configuration



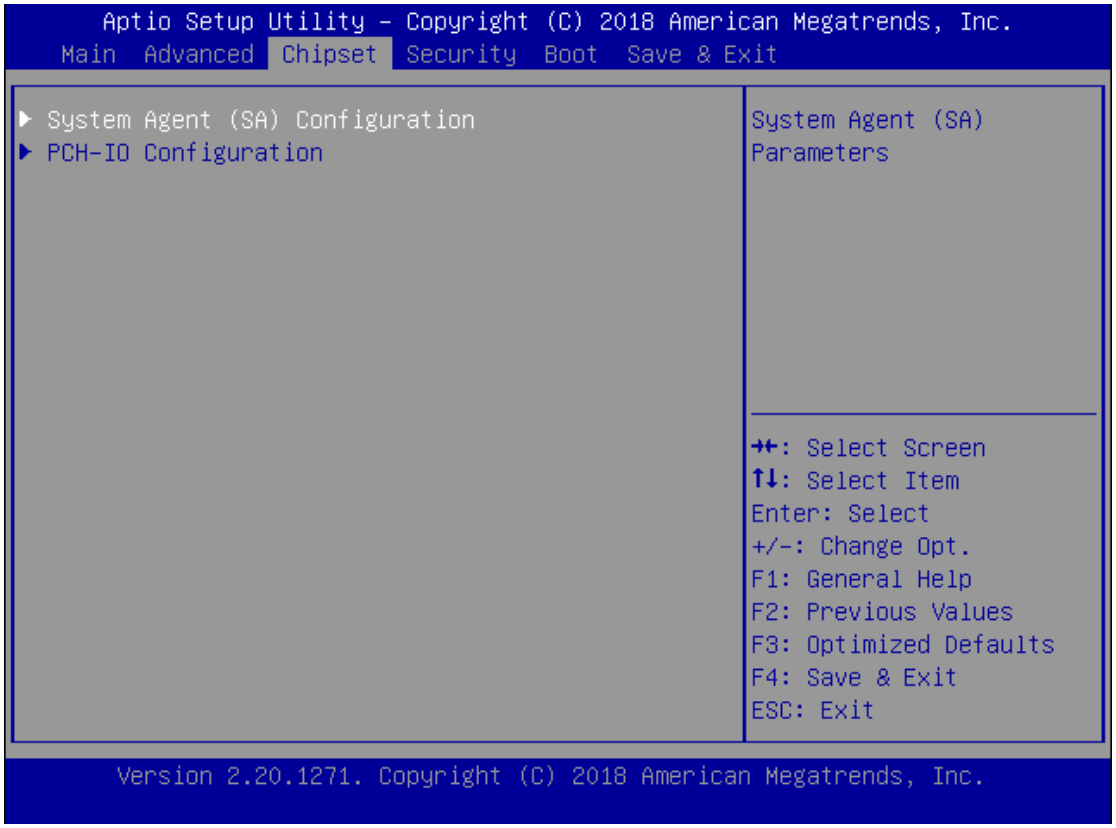
Control Legacy PXE Boot



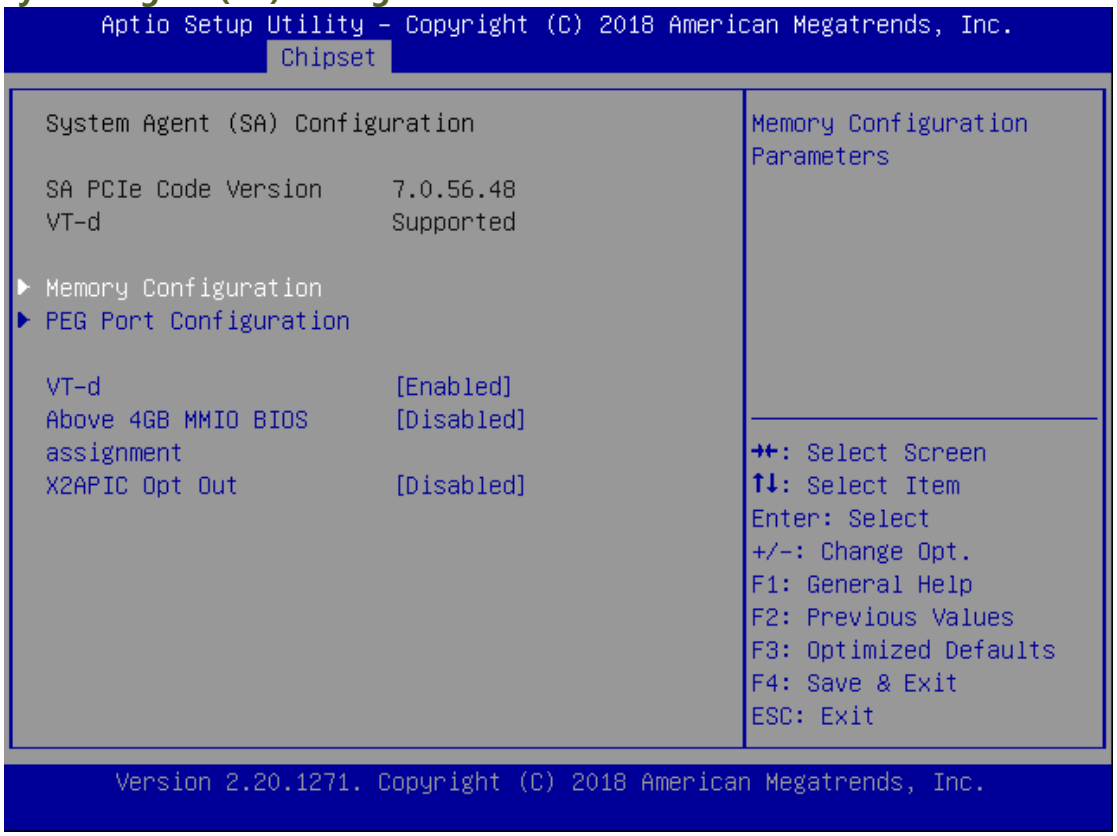
Feature	Options	Description
Control Legacy PXE Boot from	Disabled MGMT Lan1 MGMT Lan2	Control Legacy PXE Boot from which Lan

Chipset

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

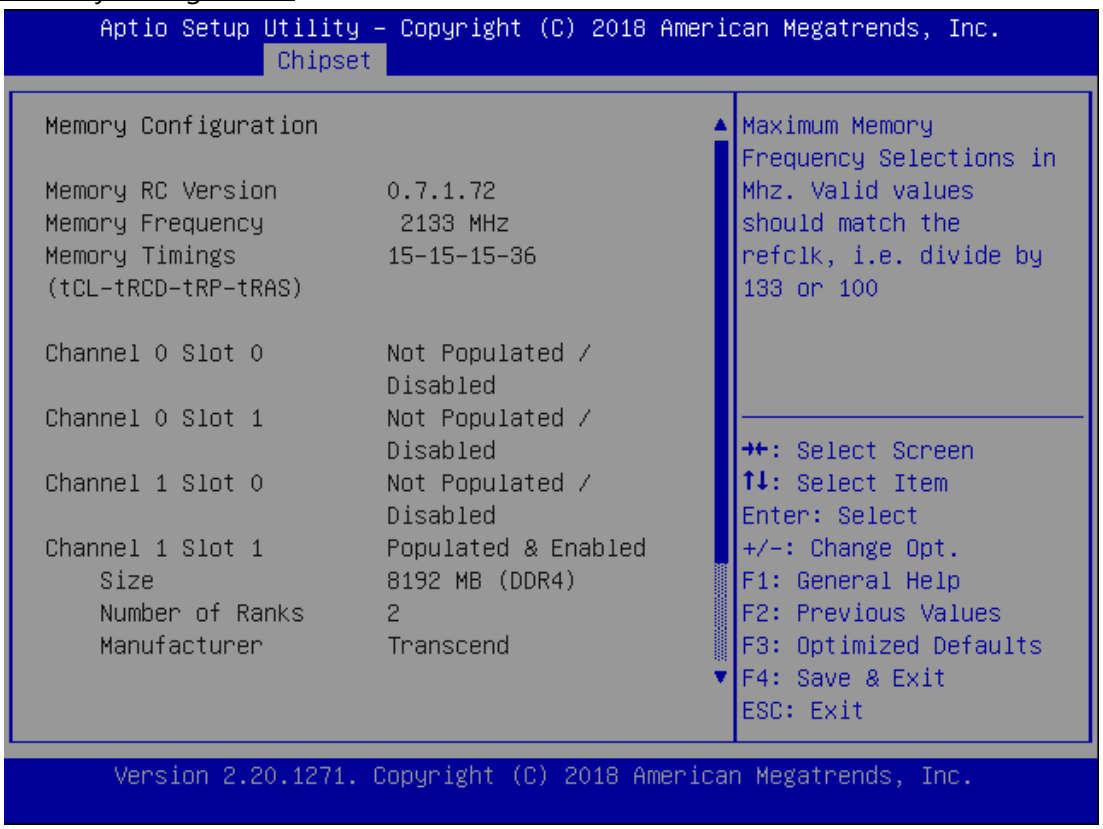


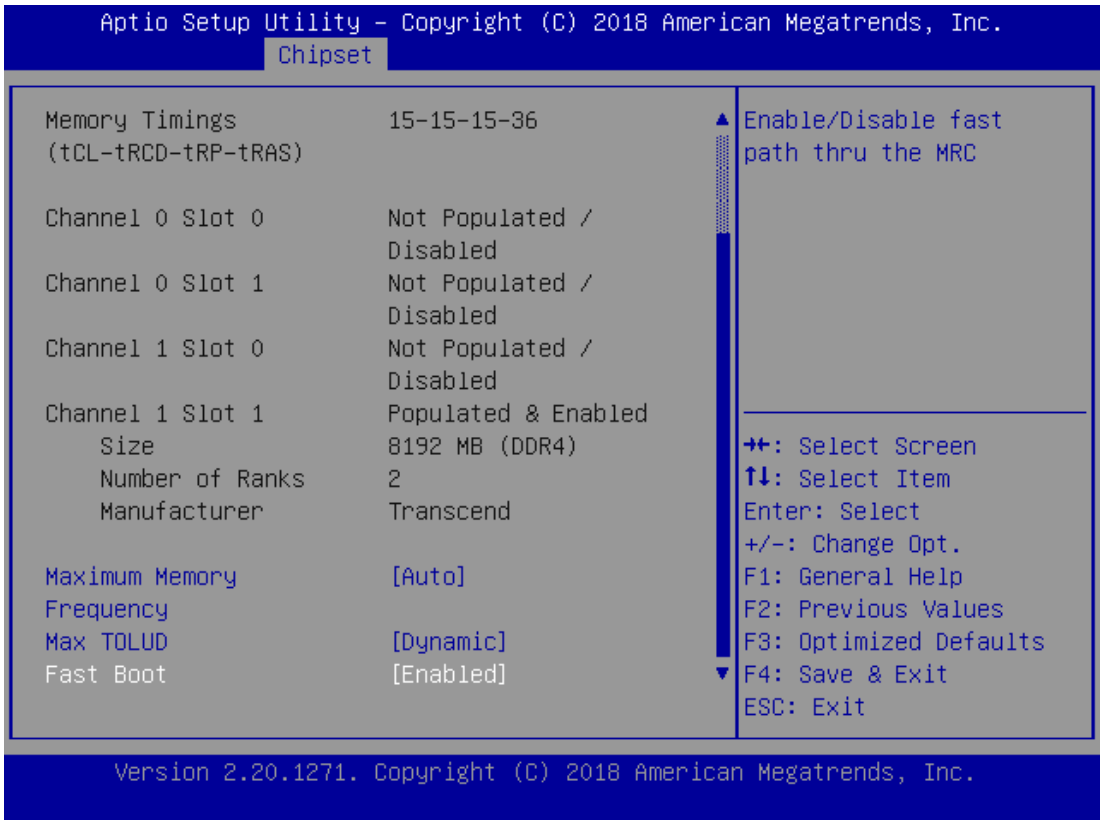
System Agent (SA) Configuration



Feature	Options	Description
VT-d	Disabled Enabled	VT-d capability
Above 4GB MMIO BIOS assignment	Disabled Enabled	Enable/Disable above 4GB MemoryMappedIO BIOS assignment This is enabled automatically when Aperture Size is set to 2048MB.
X2APIC Opt Out	Disabled Enabled	Enable/Disable X2APIC_OPT_OUT bit

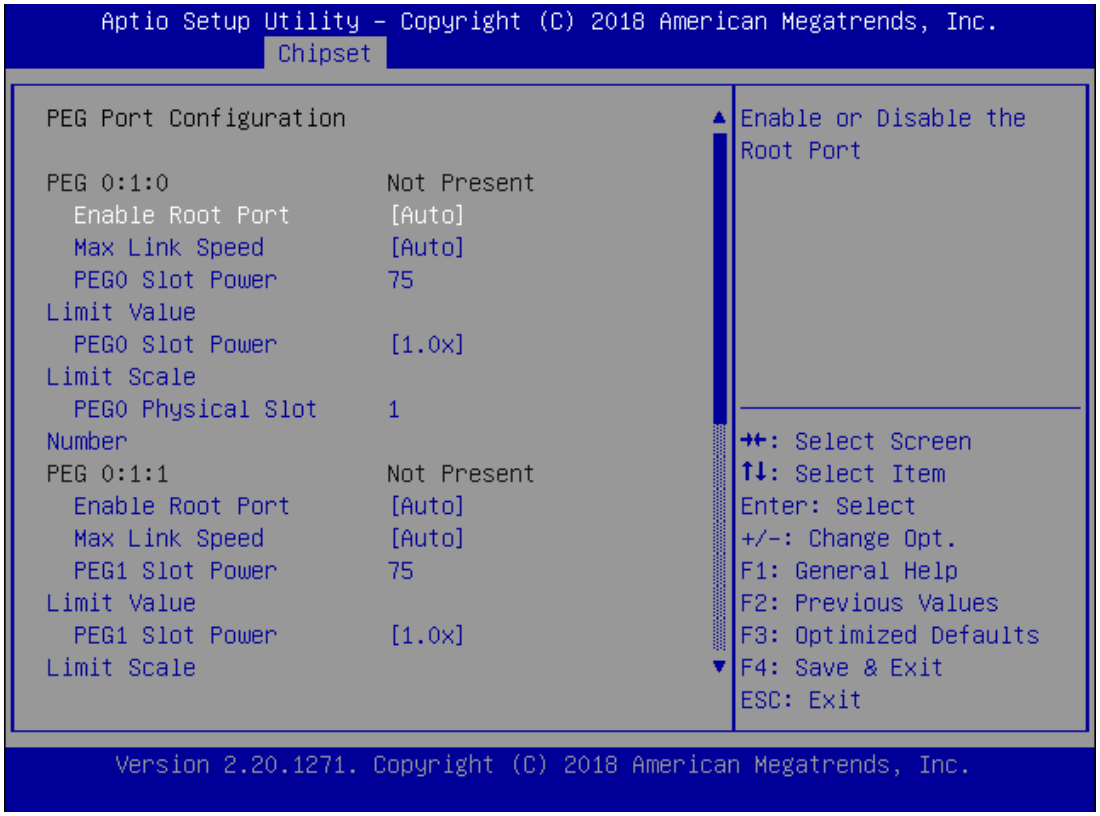
Memory Configuration

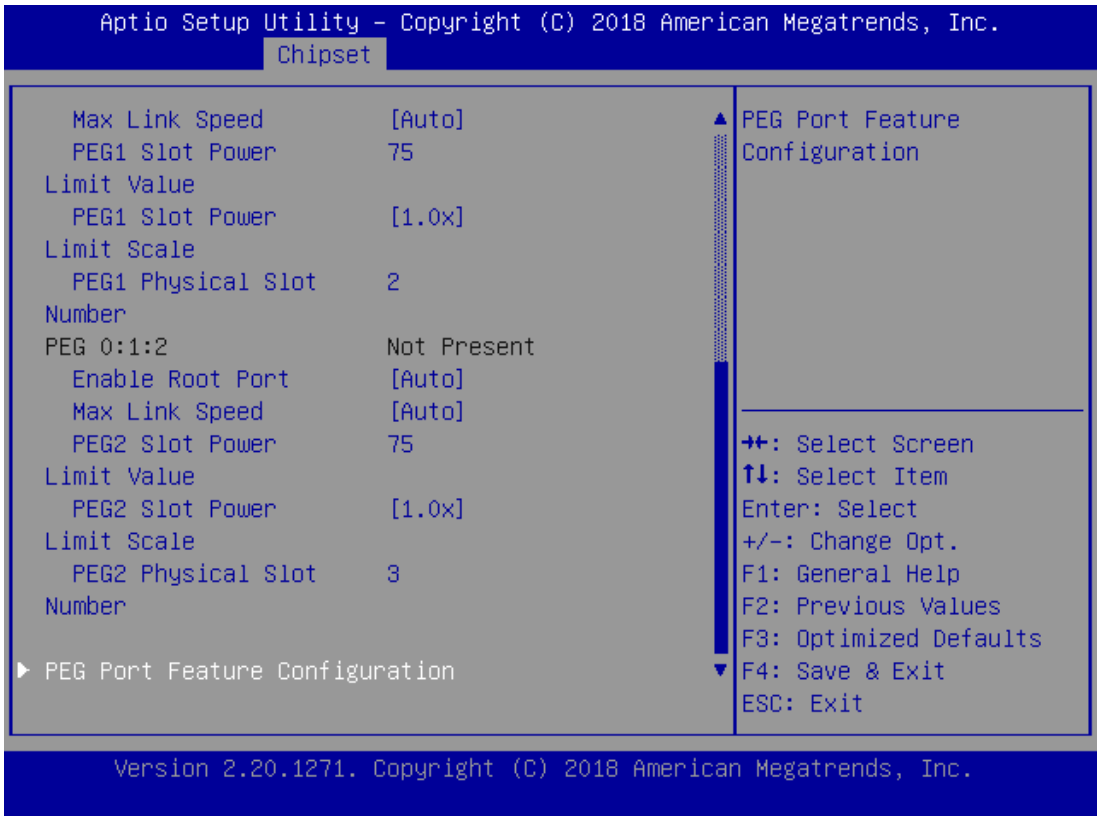




Feature	Options	Description
Maximum Memory Frequency	Auto 1067 ~ 3200	Maximum Memory Frequency Selections in Mhz. Valid values should match the refclk, i.e. divide by 133 or 100
Max TOLUD	Dynamic 1 GB ~ 3.5GB	Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller
Fast Boot	Disabled Enabled	Enable/Disable fast path thru the MRC

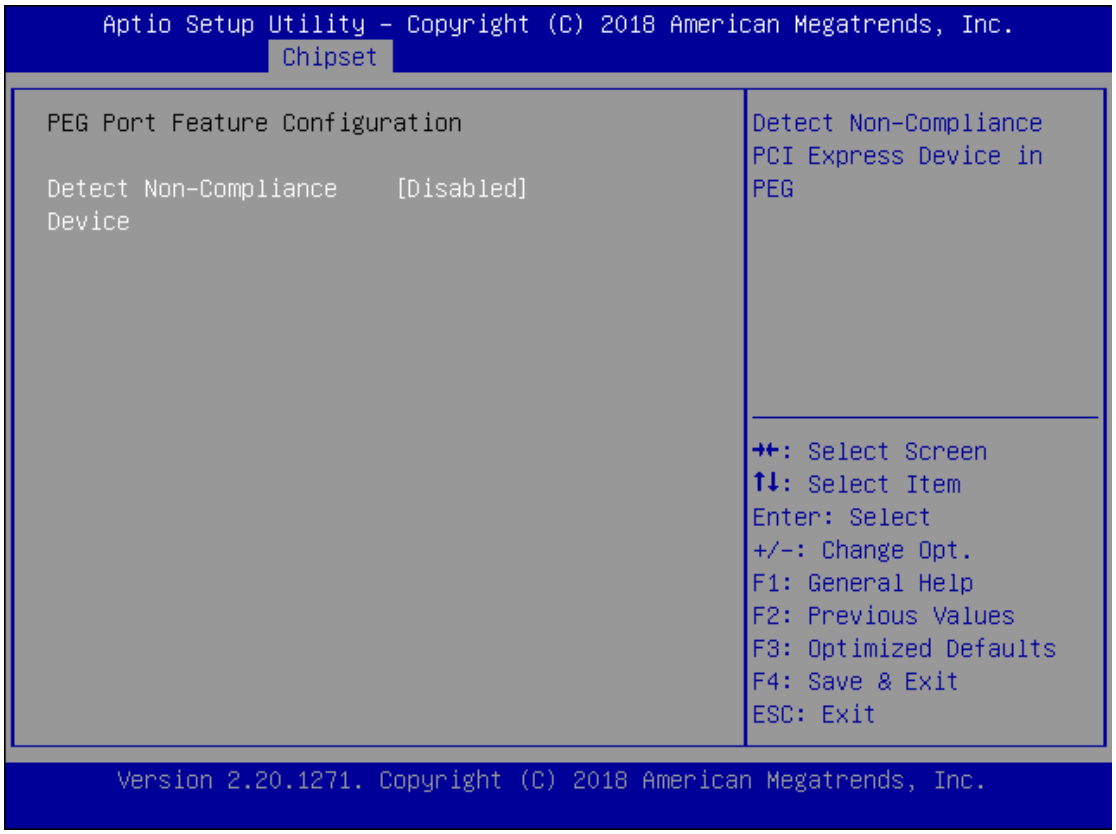
PEG Port Configuration





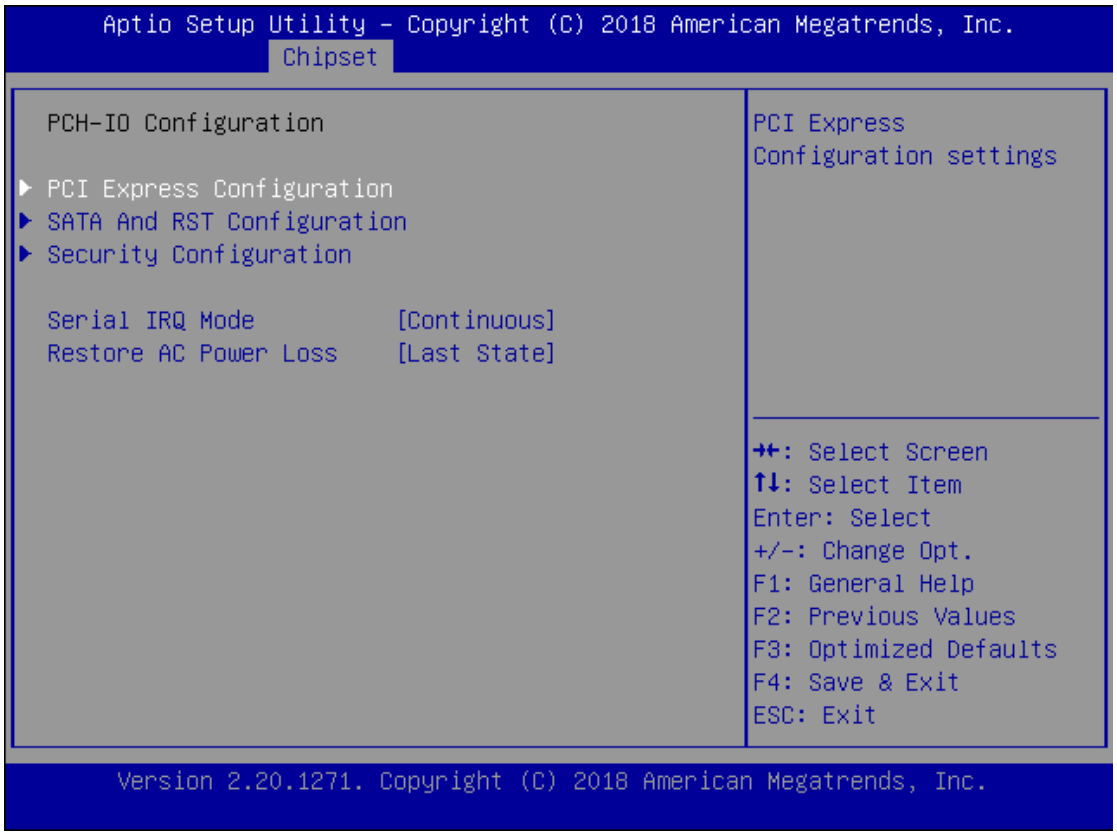
Feature	Options	Description
Enable Root Port	Disabled Enabled Auto	Enable or Disable the Root Port
Max Link Speed	Auto Gen1 Gen2 Gen3	Configure PEG 0:1:0 Max Speed
PEG0 Slot Power Limit Value	75	Sets the upper limit on power supplied by slot. Power limit (in Watts) is calculated by multiplying this value by the Slot Power Limit Scale. Values 0-255
PEG0 Slot Power Limit Scale	1.0x 0.1x 0.01x 0.001x	Select the scale used for the Slot Power Limit Value.
PEG0 Physical Slot Number	1	Set the physical slot number attached to this Port. The number has to be globally unique within the chassis. Values 0-8191

PEG Port Feature Configuration



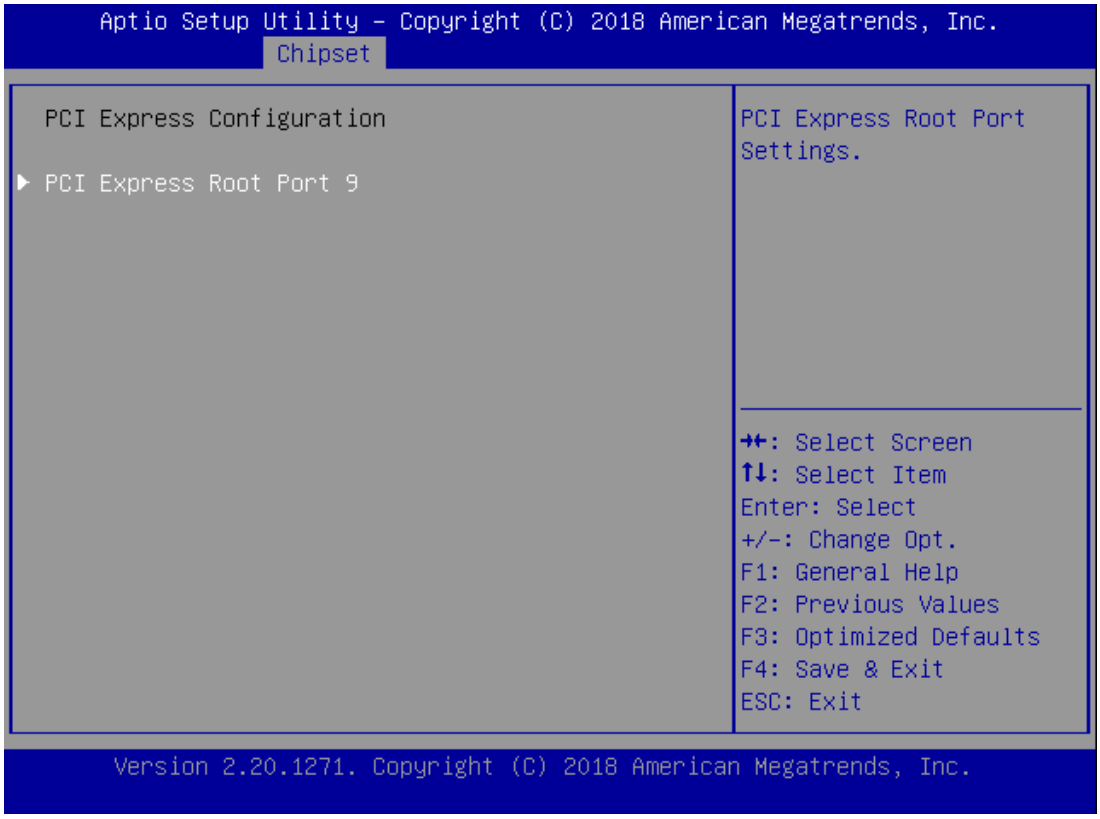
Feature	Options	Description
Detect Non-Compliance Device	Disabled Enabled	Detect Non-Compliance PCI Express Device in PEG

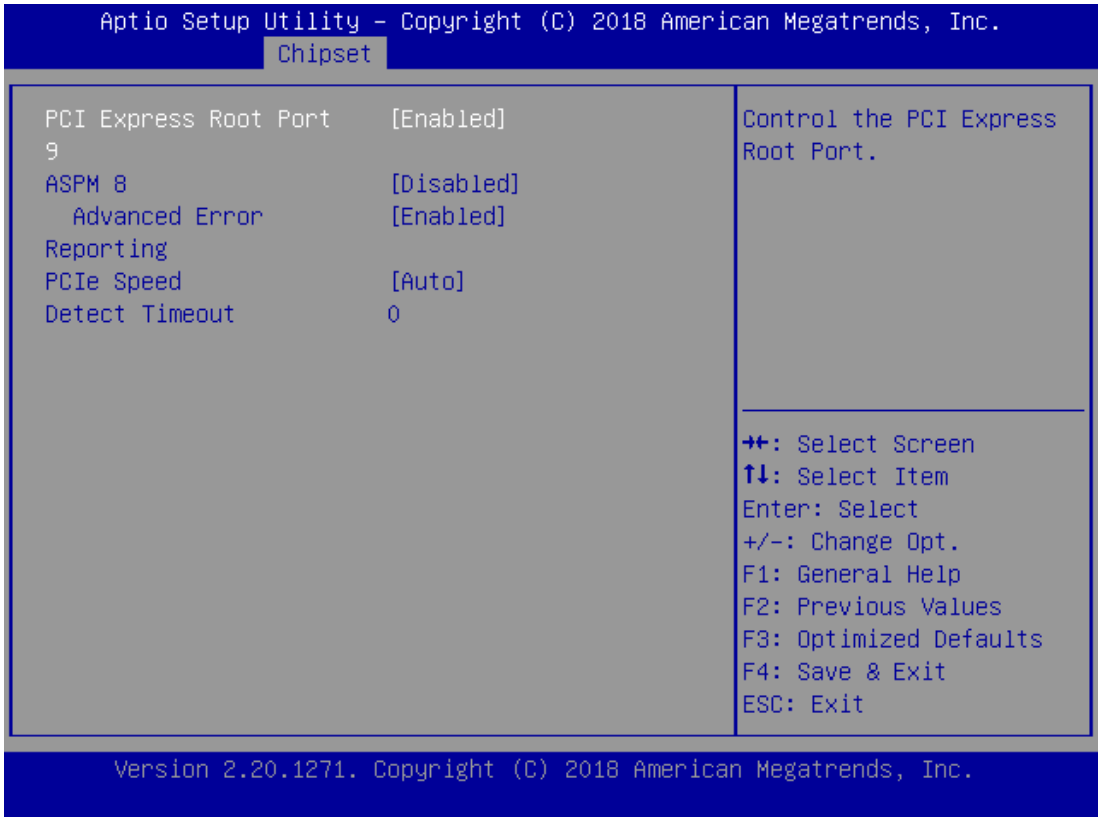
PCH-IO Configuration



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

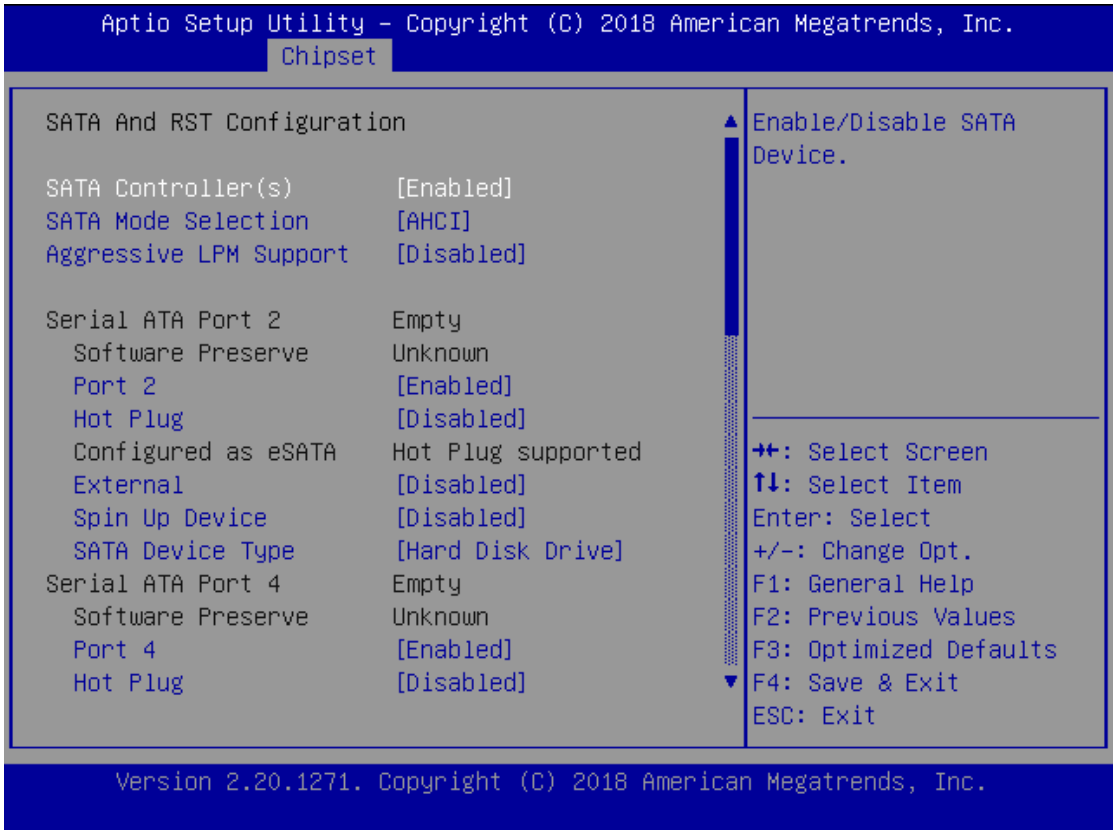
PCI Express Configuration





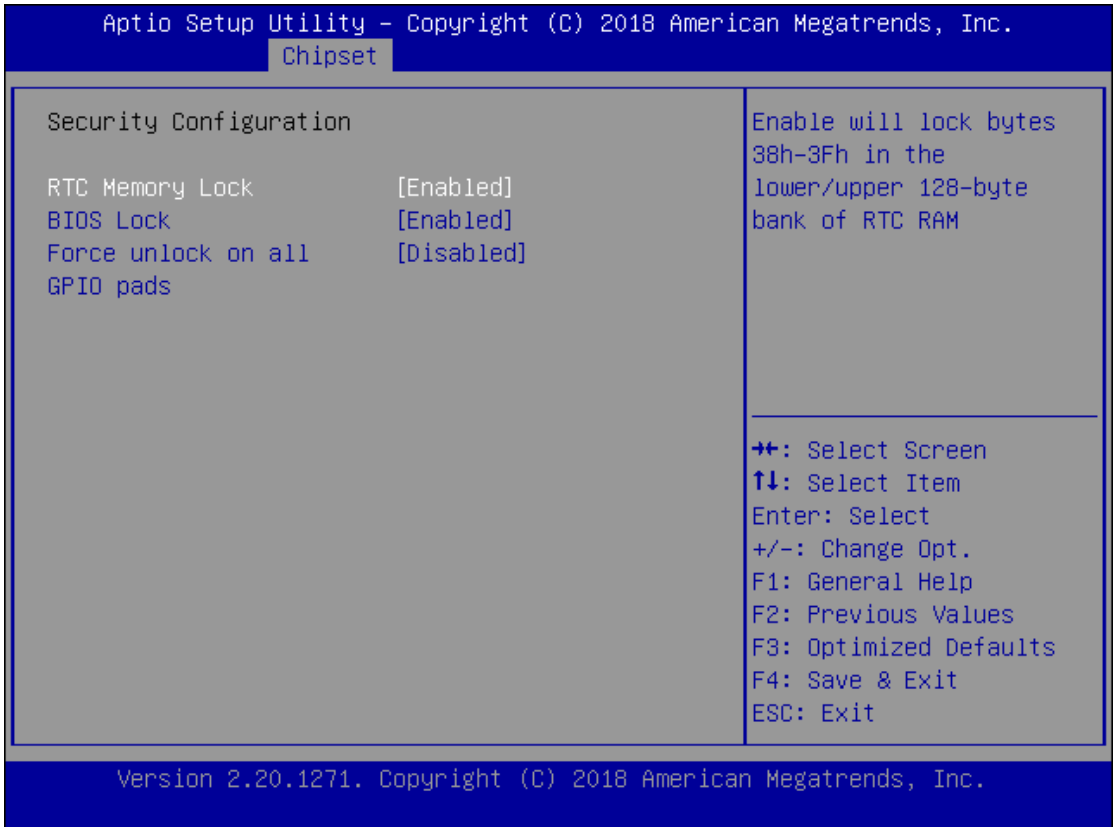
Feature	Options	Description
PCI Express Root Port 9	Disabled Enabled	Control the PCI Express Root Port.
ASPM 8	Disabled L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
Advanced Error Reporting	Disabled Enabled	Advanced Error Reporting Enable/Disable.
PCIe Speed	Auto Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

SATA And RST Configuration



Feature	Options	Description
SATA Controller(s)	Enabled Disabled	Enable/Disable SATA Device.
SATA Mode Selection	AHCI Intel RST	Determines how SATA controller(s) operate.
Aggressive LPM Support	Enabled Disabled	Enable PCH to aggressively enter link power state.
Port 2	Enabled Disabled	Enable or Disable SATA Port
Hot Plug	Enabled Disabled	Designates this port as Hot Pluggable.
External	Enabled Disabled	Marks this port as external.
Spin Up Device	Enabled Disabled	If enabled for any of ports Staggerred Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.
SATA Device Type	Hard Disk Drive Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive

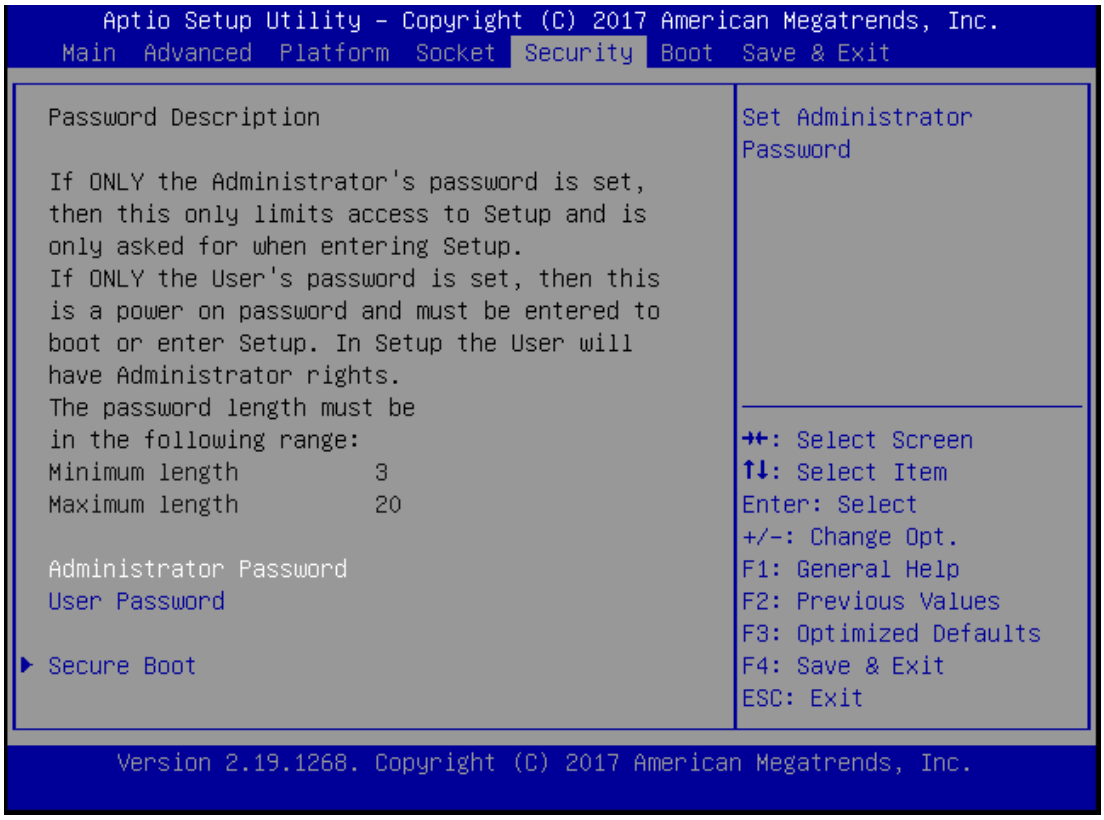
Security Configuration



Feature	Options	Description
RTC Memory Lock	Disabled Enabled	Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM
BIOS Lock	Disabled Enabled	Enable/Disable the PCH BIOS Lock Enable feature. Required to be enabled to ensure SMM protection of flash.
Force unlock on all GPIO pads	Disabled Enabled	If Enabled BIOS will force all GPIO pads to be in unlocked state

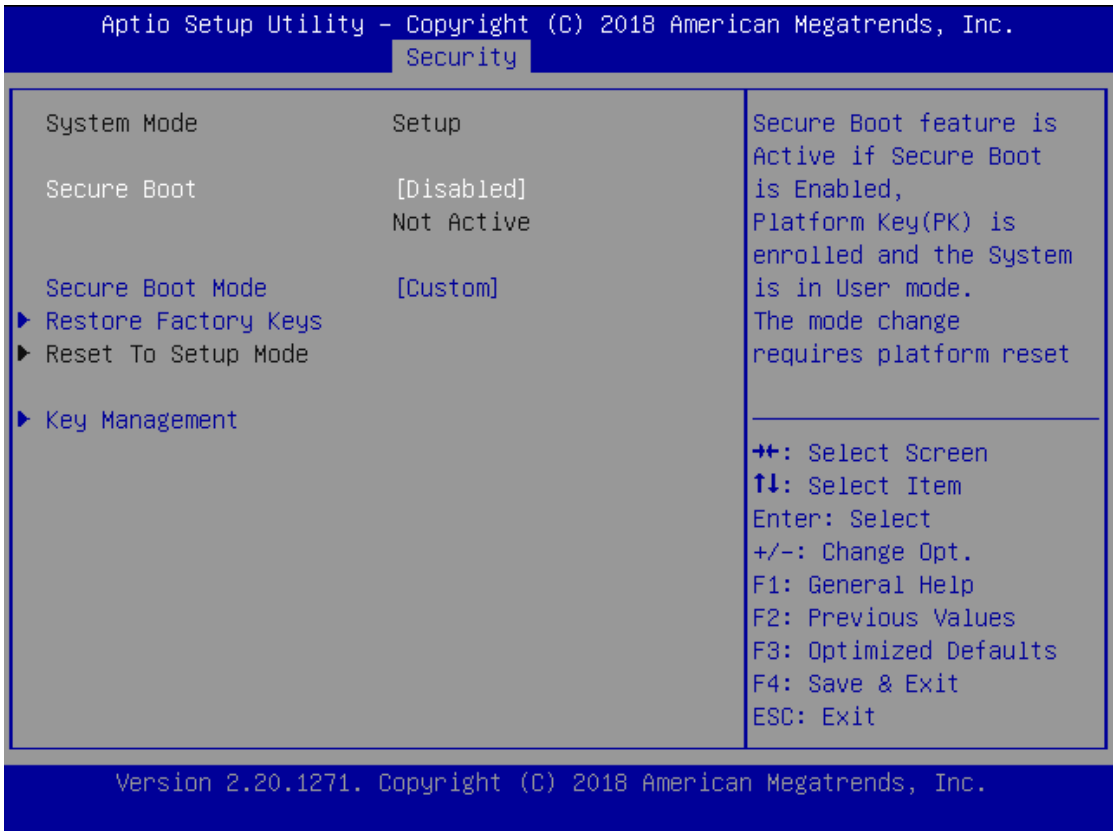
Security

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.



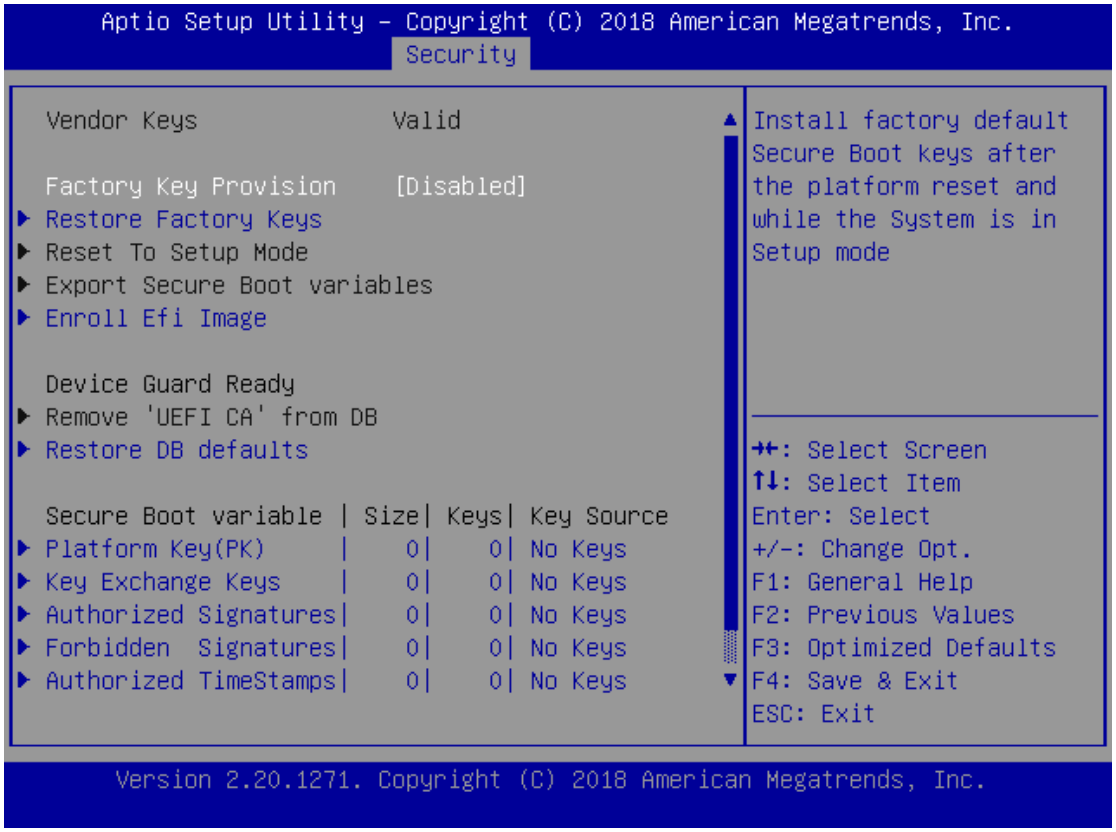
Feature	Description
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the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

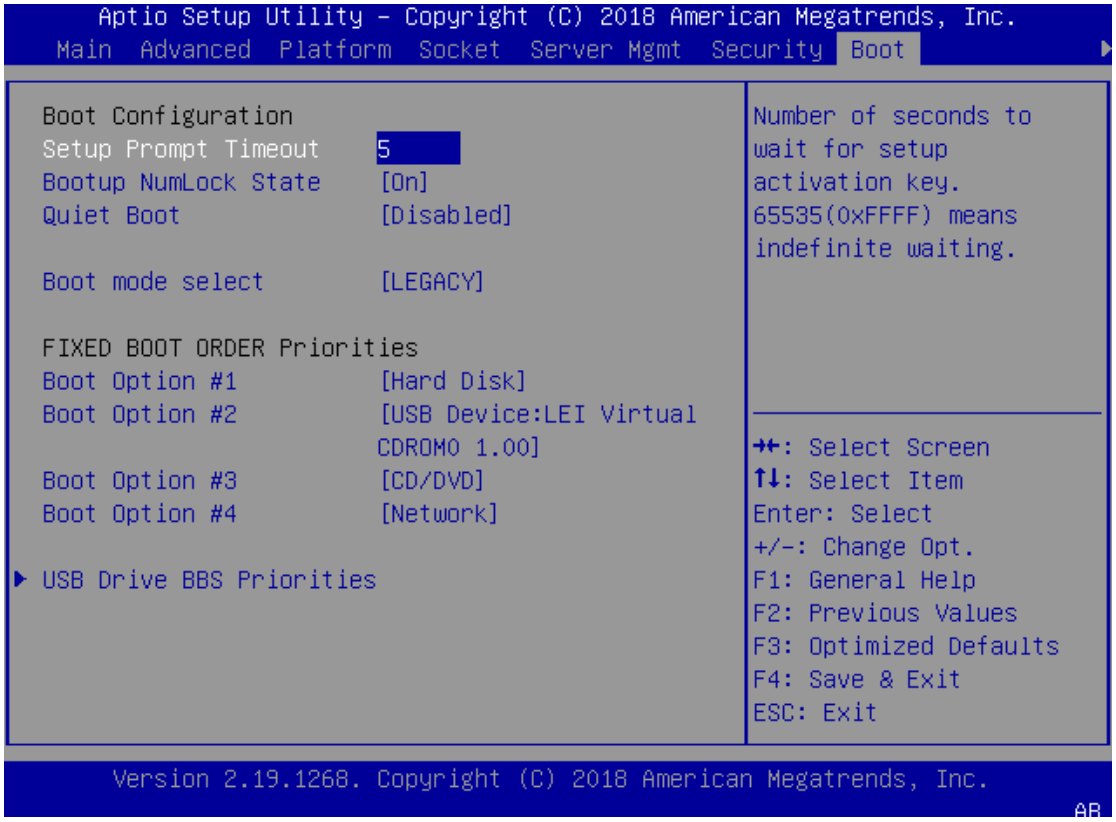
Key Management



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)
Restore DB defaults	None	Restore DB variable to factory defaults

Boot Menu

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

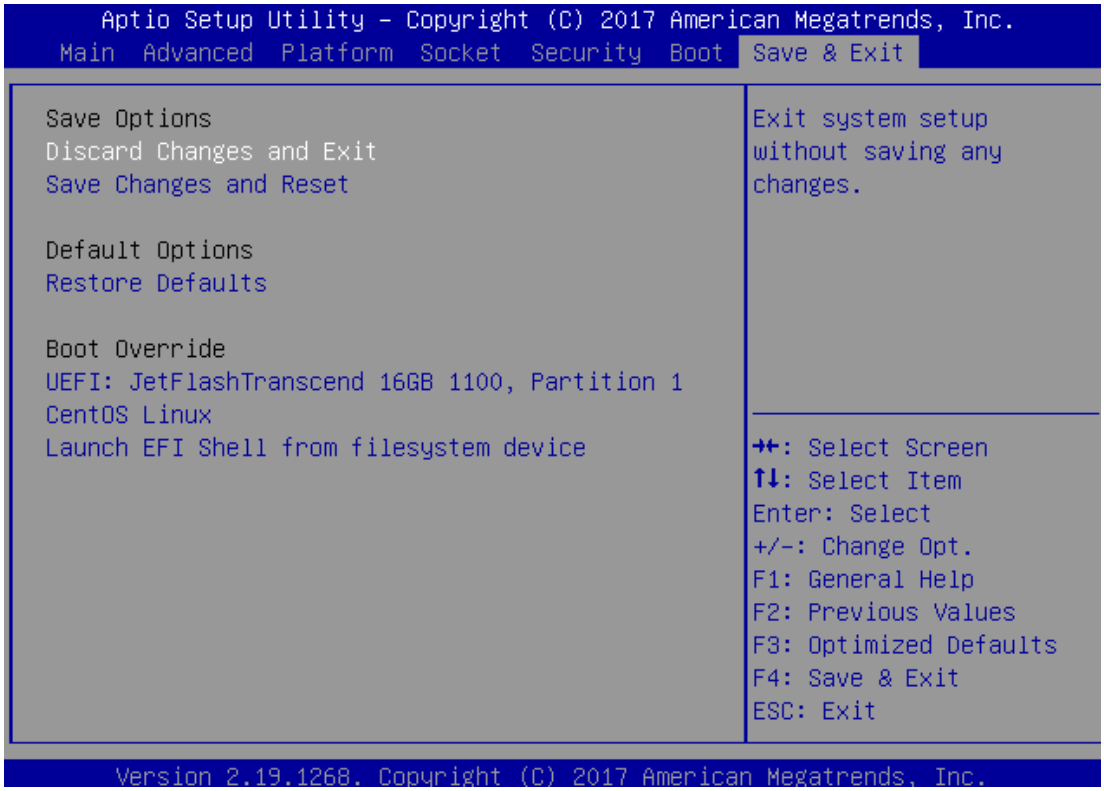


Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option.
Boot mode select	LEGACY UEFI DUAL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

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

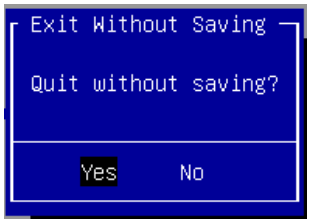
Save and Exit Menu

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



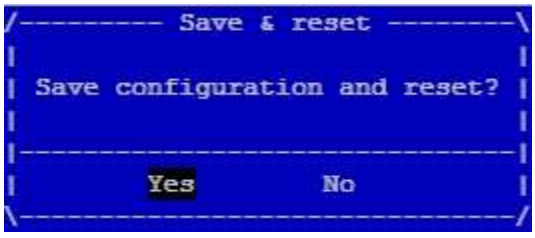
- **Discard Changes and Exit**

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



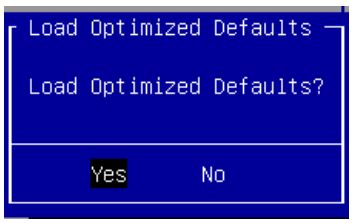
- **Save Changes and Reset**

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



- **Restore Defaults**

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



Note

The items under Boot Override were not same with image. It should depend on devices connect on system.

APPENDIX A: LED INDICATOR EXPLANATIONS

The status explanations of LED indicators on the Front Panel are as follows:

- **System Power**

Solid Green	*The system is powered on*
Off	*The system is powered off*

- **System Status**

This LED indicator is programmable. You could program it to display the operating status of the behaviors described below:

Solid Green	*Defined by GPIO*
Orange	*Defined by GPIO*
Off	*Defined by GPIO*

- **HDD Activity**

If this LED blinks, it indicates data access activities; otherwise, it remains off.

Blinking Yellow	*Data access activity*
Off	*No data access activity*

RJ45 Port

- **Link Activity**

Blinking Amber	*Link has been established, and there is activity on this port*
Solid Amber	*Link has been established, and there is no activity on this port*
Off	*No link is established*

- **Speed**

Solid Amber	*Operating as a Gigabit connection (1000 Mbps)*
Solid Green	*Operating as a 100-Mbps connection*
Off	*Operating as a 10-Mbps connection*

SPF+ Port

Link Activity

Blinking Green	*Link has been established, and there is activity on this port*
Solid Green	*Link has been established, and there is no activity on this port*
Off	*No link is established*

- **Speed**

Solid Green	*Operating as 10 Gigabit connection*
Solid Amber	*Operating as a Gigabit connection*
Off	*Operating as a 100 Mbps connection*

Appendix B: 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 the "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: The 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