Lanner

Network Appliance Platform

Hardware Platforms for Network Computing

NCA-4210
User Manual

Version: 1.9

Date of Release:2023-11-15

About this Document

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

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

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

Icon Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:

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 https://lannerinc.com/ to access published documents and downloadable resources. For troubleshooting the issues with your system, please visit the Lanner Q&A page for diagnostic procedures and troubleshooting steps.

Technical Support

In addition to contacting your distributor or sales representative, you could submit a request to our **Lanner Technical Support**, where you can 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 to contact@lannerinc.com. Thank you for your time.

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Federal Communication Commission Interference Statement

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

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

FCC Caution

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

Note

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

Important

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

Safety Guidelines

Follow these guidelines to ensure general safety:

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

Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.

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

Lithium Battery Caution

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

Avertissement concernant la pile au lithium

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

Operating Safety

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

Sécurité de fonctionnement

- L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts

d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.
- Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).
- Le produit doit être utilisé avec des modules de dispositifs laser de classe 1.
- Cette machine est réservée aux techniciens à installer et à entretenir
- L'appareil ne peut être utilisé que dans un lieu fixe, tel qu'un laboratoire ou une salle de machines. Lorsque vous installez l'appareil, assurez-vous que le raccordement à la terre de protection de la prise de courant a fait l'objet d'une vérification par une personne qualifiée.

Mounting Installation Precautions

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

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

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."

CAUTION: TO DISCONNECT POWER, REMOVE ALL POWER CORDS FROM UNIT.
注意：要断开电源，请将所有电源线从本机上拔下。
WARNUNG: Wenn Sie das Gerät zwecks Wartungsarbeiten vom Netz trennen müssen, müssen Sie beide Netzteile abnehmen.
ATTENTION: DÉBRANCHER LES TOUT CORDONS D'ALIMENTATION POUR DÉCONNECTER L'UNITÉ DU SECTEUR.

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.

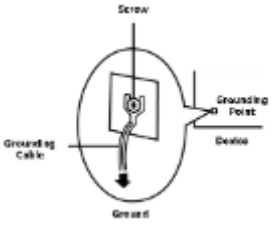
Consignes de sécurité électrique

- 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.
-

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

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.

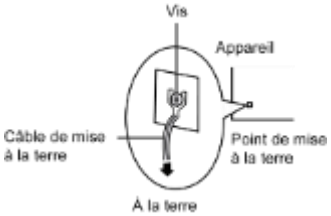


Table of Contents

Chapter 1: Product Overview 10

Main Features 10

Package Content 10

Ordering Information 11

System Specifications 12

Front Panel 13

Rear Panel 14

Block Diagram 15

Motherboard Layout 16

Chapter 2: Hardware Setup 22

Opening the Chassis 22

Installing the CPU 23

Installing System Memory 27

Installing Disk Drives 28

Installing mSATA Module 30

Installing IPMI Card 31

Replacing Cooling Fans 32

Installing NIC Module 33

Chapter 3: Software Setup 34

BIOS Setup 34

Main Page 35

Advanced Page 36

Chipset 60

Security 71

Boot Menu 72

Save and Exit Menu 73

Appendix A: Programming Watchdog Timer 75

Appendix B: Setting Up Console Redirection 76

Appendix C: Programming Generation 3 LAN Bypass 77

Appendix D: Programming the LCM 78

Appendix E: Terms and Conditions 82

Warranty Policy 82

CHAPTER 1: PRODUCT OVERVIEW

Thank you for choosing NCA-4210. The internal core of NCA-4210 is the 6th generation Intel® 14nm microprocessor, the new LGA 1151 socket, DDR4 memory support and the I/O boosting, comprehensive Intel® H110 and C236 series chipset, and flexible LAN configurations. The adoption of the 6th generation Intel® Core™ processor comes with the promise to enhance processor performance, while lowering the TDP. NCA-4210 supports flexible LAN configurations. Depending on the SKUs, there are Ethernet connectivity options of 6 x RJ-45 GbE LAN + 2 x SFP GbE LAN with 2 pairs of bypass, and 6 x RJ-45 GbE LAN with 2 pairs of bypass.

Main Features

- 6th Generation Intel® Core™ Processor (Codenamed Skylake)
- PCH: Intel® H110 or C236
- 2x DDR4 2400MHz ECC/UDIMMs (Up to 16GB each)
- 1x 3.5" or 2x 2.5" SATA HDD/SSD drive bays (disk drives not included)
- 1x mSATA socket
- 1x OPMA socket for IPMI

Package Content

Your package contains the following items:

- 1x Network Security Platform
- 1x Power Cable
- 1x Short Ear Rackmount Kit with Screws
- 1x Console Cable
- 1x LAN Cable (Grey)

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

Ordering Information

SKU No.	Description
NCA-4210A	Intel® PCH H110 with 2x DDR4 UDIMM, 6x RJ45 (2 Pairs Bypass), 1x Slim-type NIC Module (PCIEX8 only)
NCA-4210B	Intel® PCH C236 with 2x DDR4 ECC DIMM 16G/DIMM, 6x RJ45 (2 Pairs Bypass), 2x 1G SFP, 1x Slim-type NIC Module (PCIEX8 only, 2x PCIEX4 optional)
NCA-4210C	Intel® PCH C236 with 2x DDR4 ECC DIMM 16G/DIMM, 14x RJ45 (2 pairs bypass), 2x SFP, 1x Slim-type NIC Module (PCIEX8 only, 2 PCIEX 4 as optional)

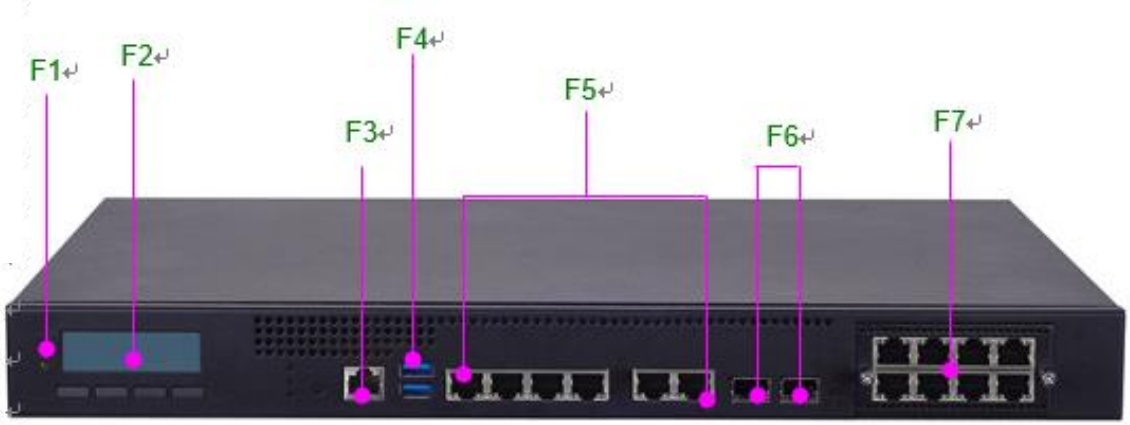
Optional Accessories

Model	Description
NCS2-IGM428A	1x Intel i350 4port RJ45 w/ 2pairs bypass
NCS2-IGM806A	2x Intel i350 8port RJ45 w/ 4pairs bypass
NCS2-ISM405A	1x Intel i350 4port SFP w/ bypass
NCS2-ISM406A	1x Intel i350 4port SFP w/o bypass
NCS2-ISM802A	2x Intel i350 8port RJ45 w/o bypass
NCS2-IXM205A	1x Intel 82599 2port SFP+ w/ bypass
NCS2-IXM405A	2x Intel 82599 4port SFP+ w/o bypass
NCS2-IGM427	
NCS2-MTX401	
NCS2-IQM201A	
AV-ICE01	
AV-ICE02	
AV-ICE03	
AV-ICE04	
AV-CVE20000	

System Specifications

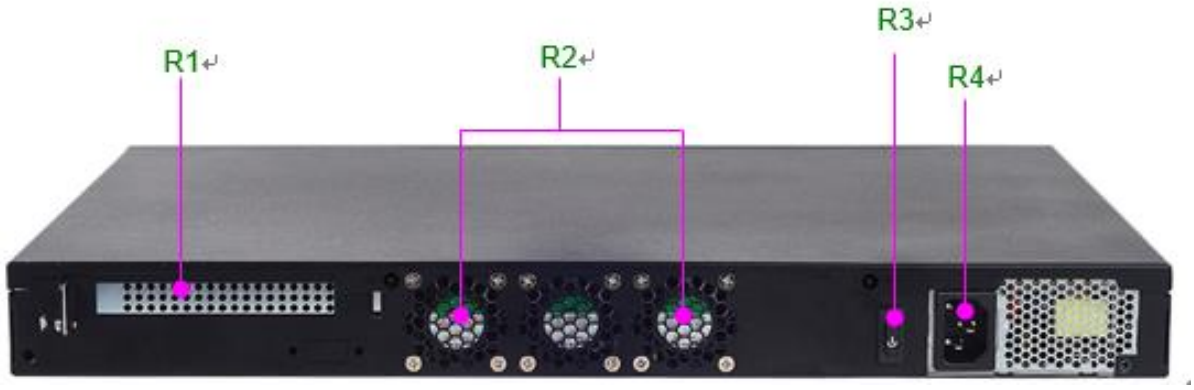
Form Factor		1U 19" Rackmount
Platform	Processor Options	Intel® Core™ i7-6700/i5-6500/i3/Pentium Series processor (codename Skylake)
	PCH	Intel® H110 or C236
	Socket	LGA1151
	CPU TDP	Approx. 65W
	Super I/O	NCT6776
BIOS		AMI SPI Flash BIOS: • Support PXE function • Support Console Redirection • Watchdog/Watchdog Control LAN Bypass Function/ Power OFF LAN Bypass Function
System Memory	Technology	DDR4 2400 MHz ECC/UDIMM
	Max. Capacity	Up to 32GB memory capacity
	Socket	2x 288pin UDIMM
Networking	Controller	SKUA: Intel® i210-AT SKUB: Intel® i210-AT & i210-IS
	Ethernet Ports	SKUA: 6x RJ45 GbE Ethernet Ports SKUB: 6x RJ45 GbE Ethernet Ports; 2x 1G SFP Ports
	Bypass	2 Pairs Bypass
	NIC Module Slot	1x Slim Type NIC Module Socket (PCIe Gen3*8 Interface) supporting 1/10/40G/Fiber/Copper/Bypass
LOM	OPMA Slot	OPMA socket to support IPMI
I/O Interface	LCM	Character Type LCM with 4x Keypads
	LED Indicator	Power / HDD/ Status
	Power Button	1x ATX Power Switch
	Console Port	1x RJ45 Console Port
	USB Port	2x USB 3.0 Type A Ports
Storage	HDD/SSD Support	1x 3.5" or 2x 2.5" HDD/SSD (disk drives not included)
	Onboard Slots	1x mSATA socket via mini-PCIe interface
Expansion	PCIe	1x PCIex8 Slot
Miscellaneous	Watchdog	Yes, through CPU
	Internal RTC w/Li Battery	Yes
	TPM	Yes (Optional)
Cooling	Processor	Passive CPU heat sink
	System	2x Smart Cooling Fans
Environmental Parameters	Temperature	Operating Temperature: 0˚C~40˚C Storage Temperature: -40˚C~70 ˚C
	Humidity (RH)	Operating Humidity: 5%~90% RH Storage Humidity: 5%~95% RH
System Dimensions	(WxDxH)	438mm x 44mm x 321mm (17.24" x 1.73" x 12.64")
	Weight	7.5kg (16.5 lbs)
Package Dimensions	(WxDxH)	TBC
	Weight	TBC
Power	Type/Watts	220W Single PSU
	Input	AC 90 to 264V @47 to 63Hz
Approvals and Compliance		RoHS, CE/FCC Class A, UL

Front Panel



No.	Description	
F1	LED Indicators	System Power System Status HDD Activity
F2	LCM	LCM with 4x Keypads
F3	Console Port	1x RJ45 Console Port
F4	USB Port	2x USB 3.0 Type-A Ports
F5	LAN Port	6x RJ45 GbE Ports
F6	SFP Port	2x SFP LAN Ports (SKUB Only)
F7	NIC	1x NIC Module with PCIe Interface

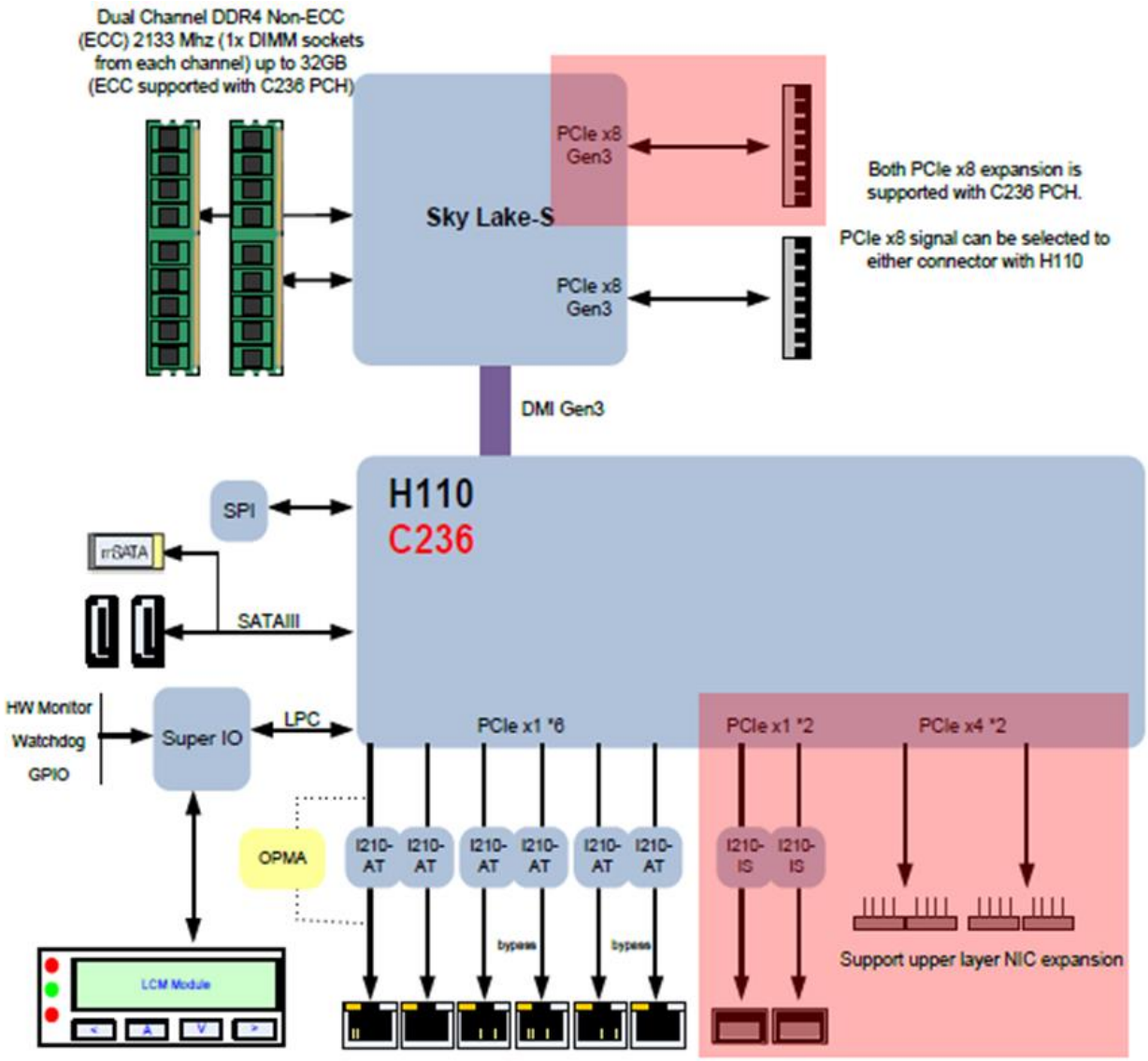
Rear Panel



No.	Description	
R1	PCIe Expansion	2x PCIe Expansion slot (Optional)
R2	Smart Fan	2x Cooling Fans
R3	Power Switch	1x Power On/OFF Switch
R4	Power Adapter	1x Power Adapter Jack

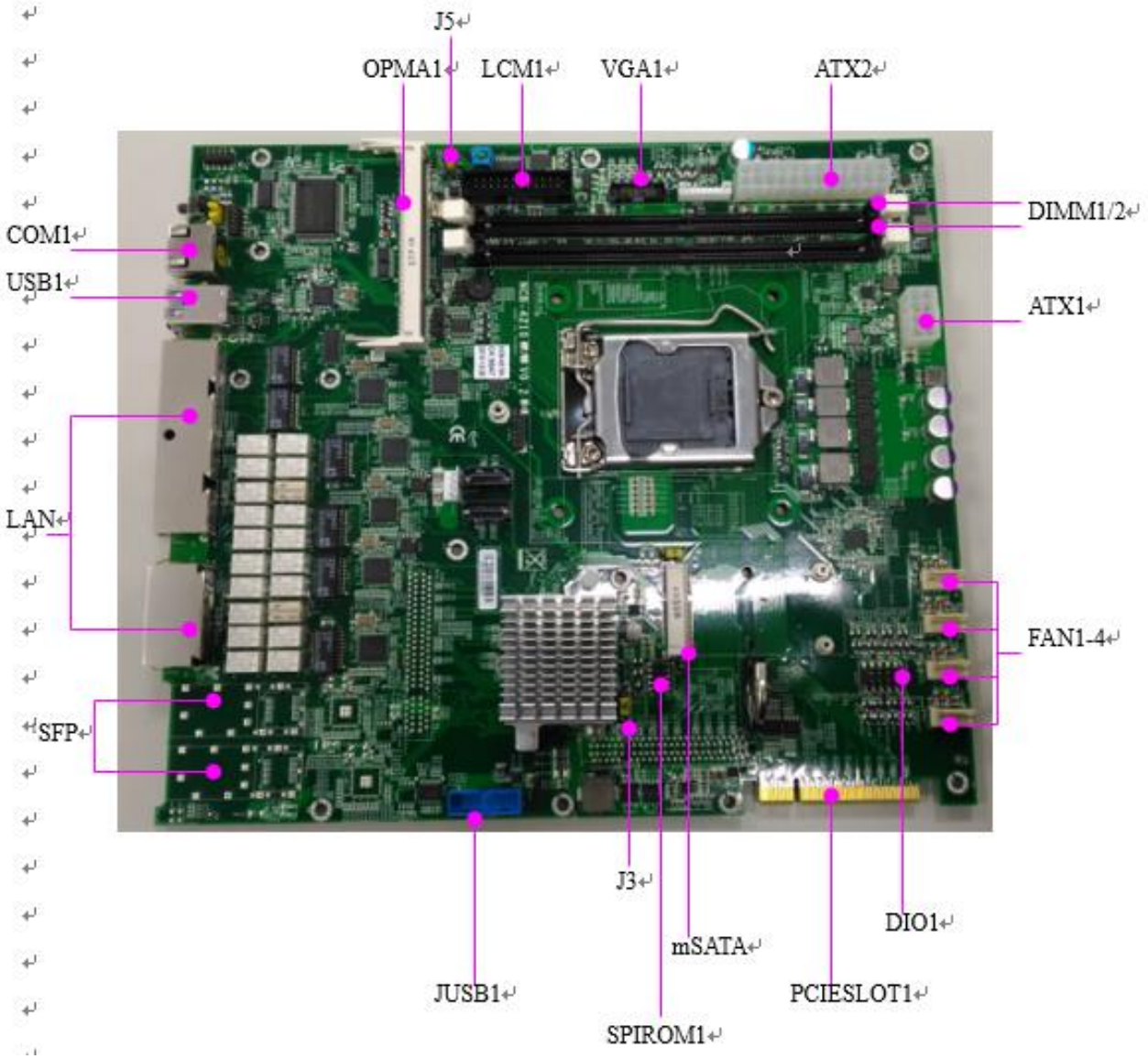
Block Diagram

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

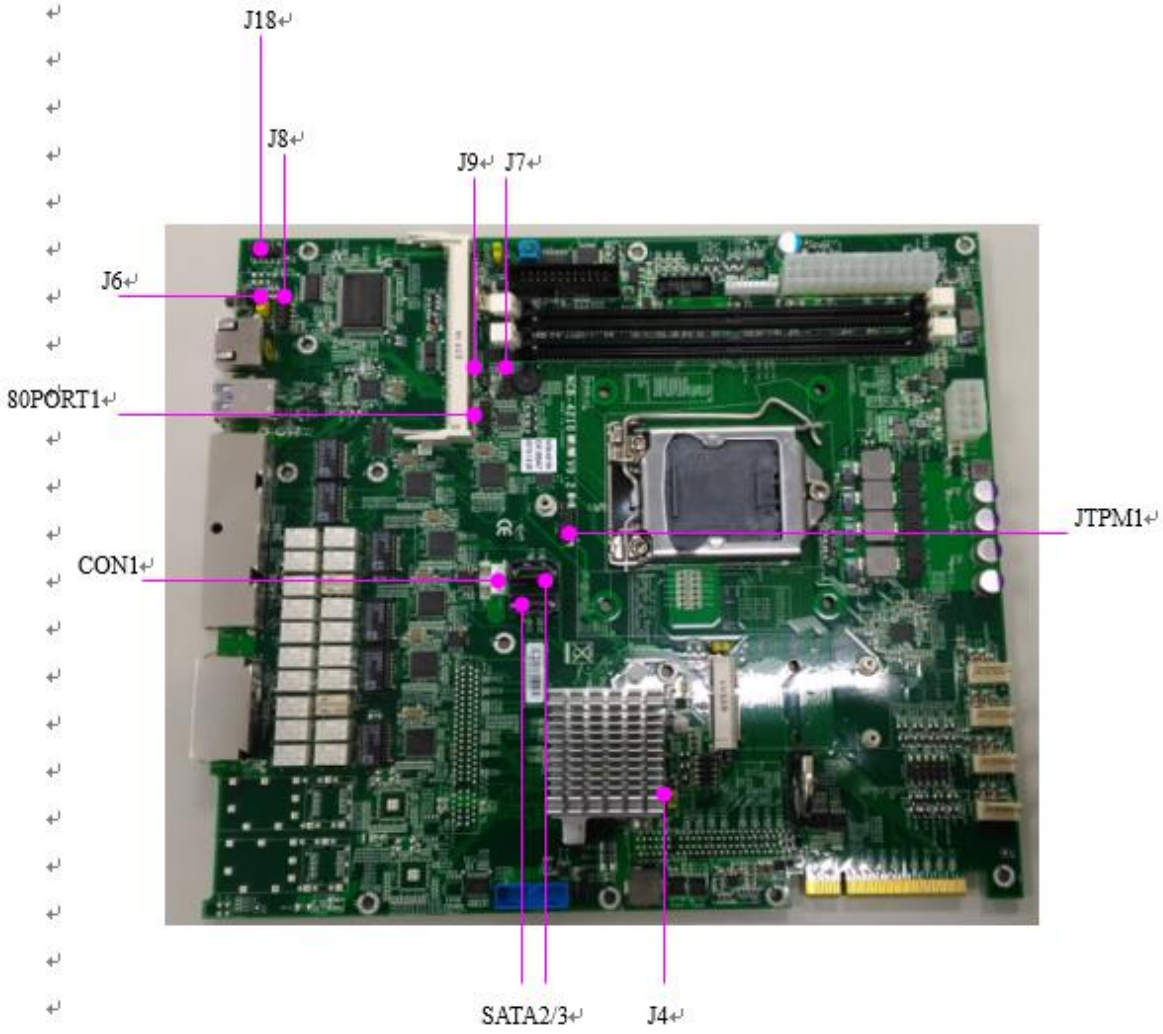


Note The 2x 1G SFP ports are only available in SKU B.

Motherboard Layout



Note SFP ports are only available in SKU B.

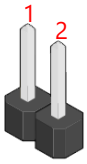
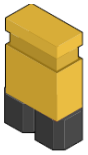
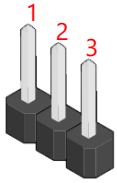
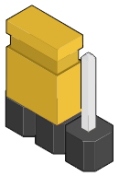
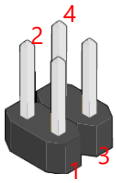
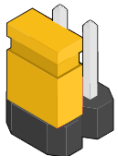


Note TPM is optional.

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 Settings

J4 RTC Reset: Clear CMOS Jumper

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

J6 Reset: Jumper to set Hardware or Software Reset

Pin #	Description
1-2	Hardware Reset
2-3 (Default)	Software Reset

J3 PCIe X8/X4 Configurations: Select 1 PCIEX8 or 2 PCIEX4 for front NIC Module (SKU B/C Only)

Pin #	Description
1-2 (Default)	1 PCIEX8
2-3	1 PCIEX4 + 1 PCIEX4

SKU[1]	NIC Module		J3 Jumper Setting
	Rear	Front	
NCA-4210B	1 PCIEX8	1 PCIEX8	1-2 (Default)
NCA-4210C		1 PCIEX4 + PCIEX4	2-3 [2]

(1) NCA-4210A comes with the default settings for one PCIEX8 on front NIC.

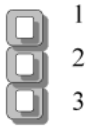
(2) NCA-4210B and NCA-4210C supports two modes for front NIC: a single PCIEX or two PCIEX4; for the latter mode to work, please adjust the J3 jumper settings from default 1-2 position to 2-3 position.

J5 Power Button Function: Select ATX or AT Power Mode

Pin #	Description
1-2 (Default)	ATX Mode
2-3	AT Mode

J9 Gen3 Bypass Flash Jumper: Select "No Flash" or "Flash" Mode

Pin #	Description
1-2 (Default)	No Flash
2-3	Flash



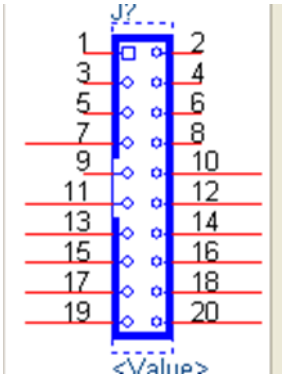
Connectors Pin Assignment

USB 3.0/2.0 Interfaces

JUSB1: USB Connector 2x10 Pins 2.0mm

USB1: USB3.0 Double-stacked Type-A Connectors

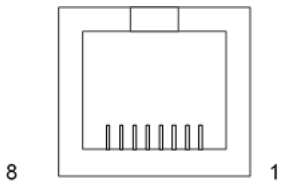
Pin #	Description	Pin #	Description
1	V5USB	11	D2+
2	USB3_RX1_N	12	D2-
3	USB3_RX1_P	13	GND
4	GND	14	USB3_TX2+1
5	USB3_TX1_N	15	USB3_TX2-1
6	USB3_TX1_P	16	GND
7	GND	17	USB3_RX2+1
8	D1-	18	USB3_RX2-1
9	D1+	19	VBUS
10	KEY	20	KEY



Serial Console Interface

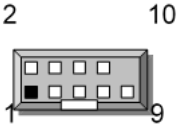
COM1: Serial Console Pin Definitions

Pin #	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)	



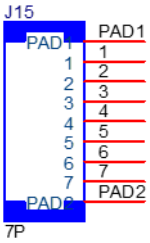
J18: Internal Pin Header for Serial Connection

Pin #	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)	



SATA Interface

SATA2/SATA3: 7-Pin SATA Signal Connector for SATA Storage Devices.



Pin #	Pin Signal
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground

Fan Connectors

Fan1~Fan4: Cooling Fan Pin Definition

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

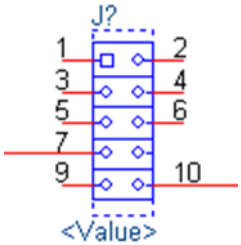
VGA Interface

VGA1: Internal VGA Connector

Pin #	Description	Pin #	Description
1	CRT-R	7	AHSYNC
2	GND	8	NC
3	CRT-G	9	AVSYNC
4	GND	10	GND
5	CRT-B	11	DDC_DATA
6	GND	12	DDC_CLK

Digital I/O

DIO1: DIO Connector

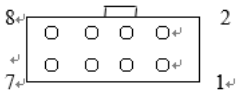


Pin #	Description	Pin #	Description
1	GPO_1	2	GPI_1
3	GPO_2	4	GPI_2
5	GPO_3	6	GPI_3
7	GPO_4	8	GPI_4
9	GND	10	GND

ATX Power

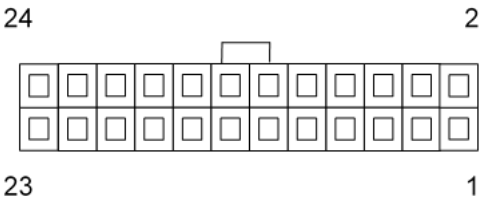
ATX1: 8-Pin ATX Power Supply Connector

Pin #	Description
1	Ground
2	VCC12 (12V)
3	Ground
4	VCC12 (12V)
5	Ground
6	VCC12 (12V)
7	Ground
8	VCC12 (12V)



ATX2: 24-Pin ATX Power Supply Connector

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.

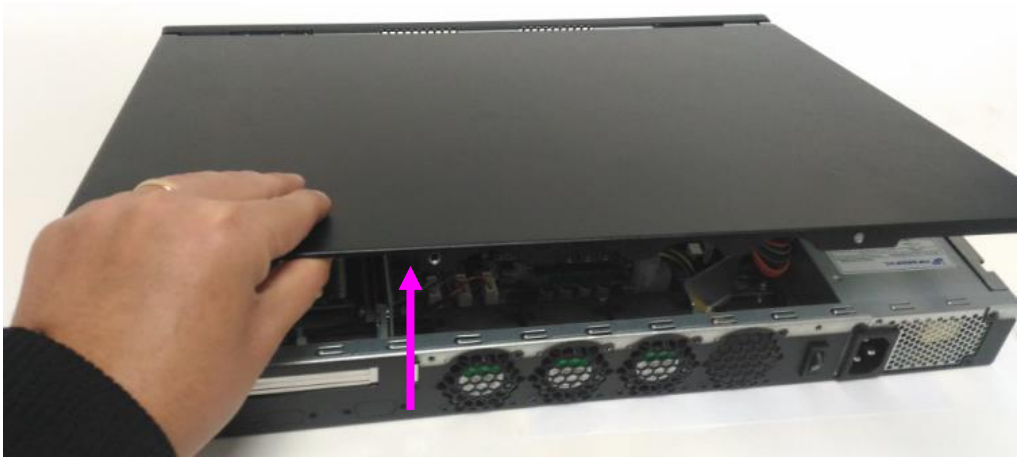
Opening the Chassis

To access some components and perform certain service procedures, you must perform the following procedures first.

1. Power off NCA-4210 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.

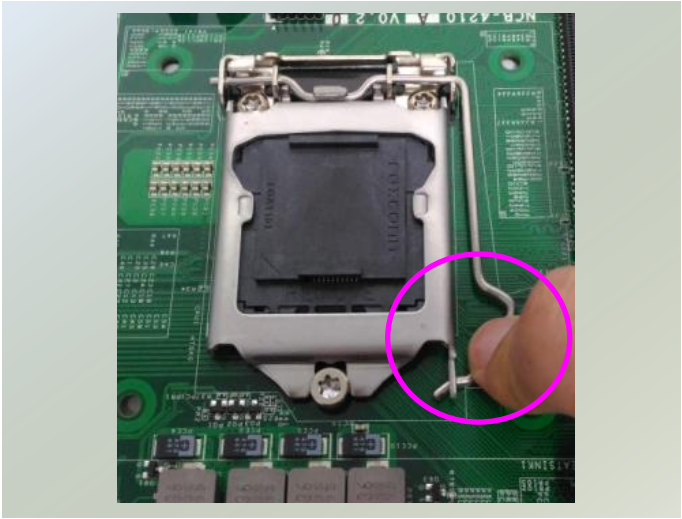
4. Lift the top compartment.



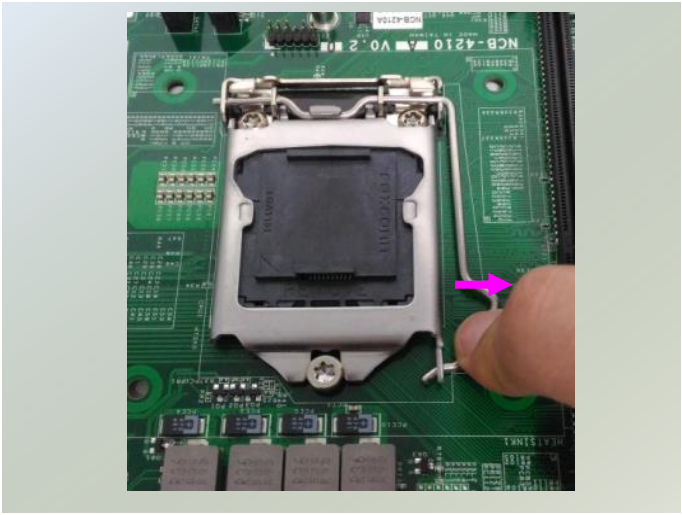
Installing the CPU

The motherboard supports 1 x 6th Generation Intel CPU (codenamed Skylake) with LGA1151 socket. Please follow the steps below for installing the processor.

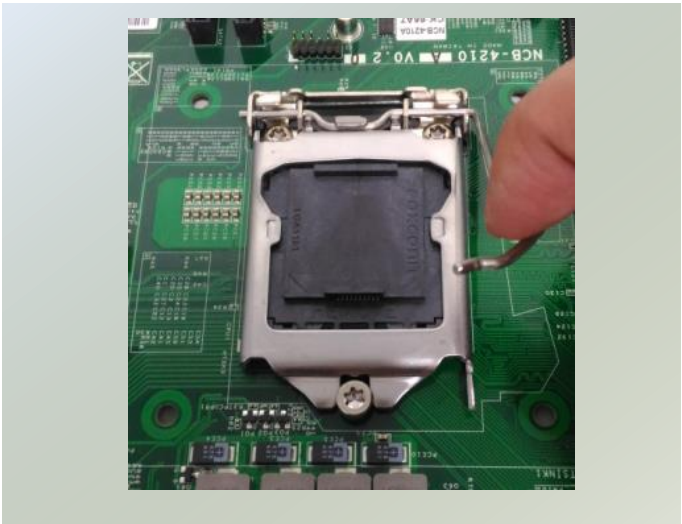
1. Press the load lever as shown in the figure.



2. Hold and drag the load lever outwards.

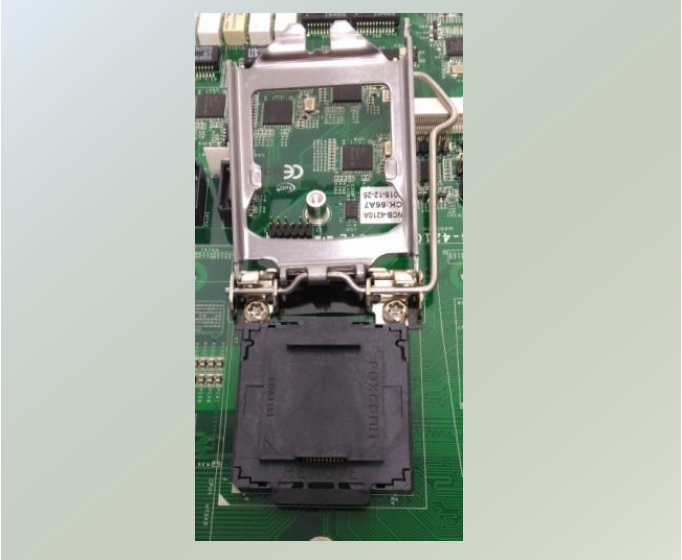


3. Drag the load lever out of the latch.



4. Move the load lever as shown.

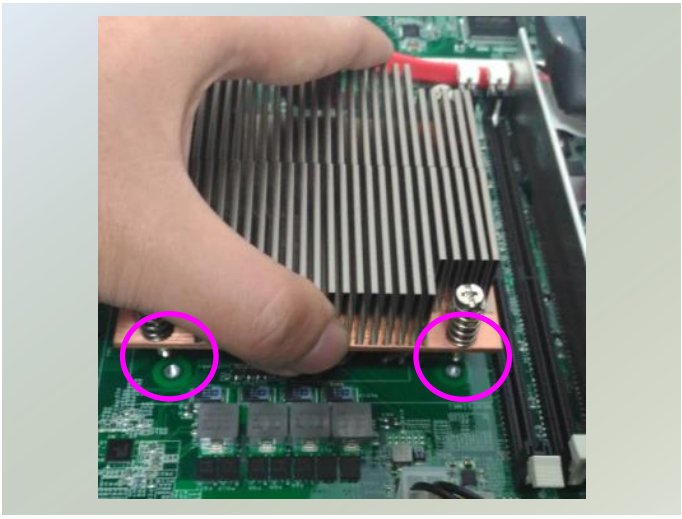
5. Once the cover is opened, you can install the CPU. Then, reverse the steps to securely lock the CPU socket.



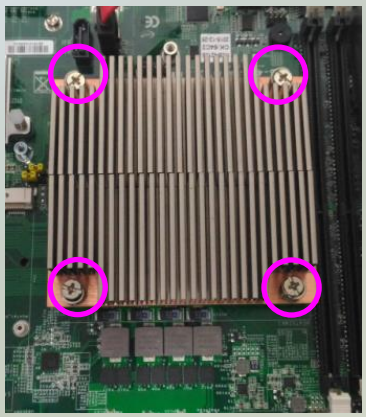
Installing the CPU Heatsink and Fan Duct

The system is supplied with a CPU heat sink and a fan duct as its thermal solution. Please refer to the steps below.

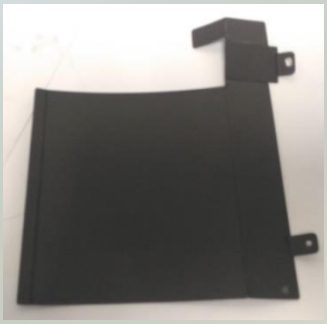
1. Prepare the supplied heat sink and place it on top of the CPU socket. Make sure the four (4) screws on the heat sink align with the four (4) screw-holes on the motherboard.



2. Tighten the four (4) screws.

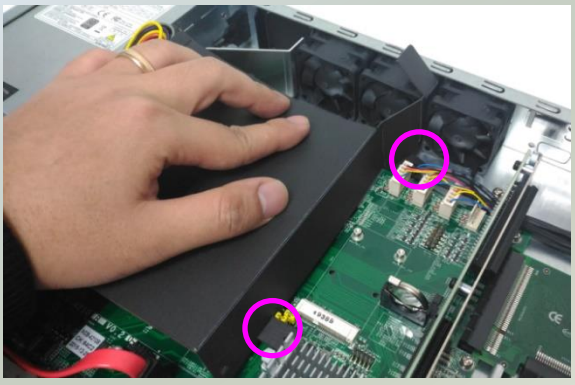


3. Prepare the supplied fan duct. The fan duct will serve as the heat radiation bracket for the CPU and the motherboard.

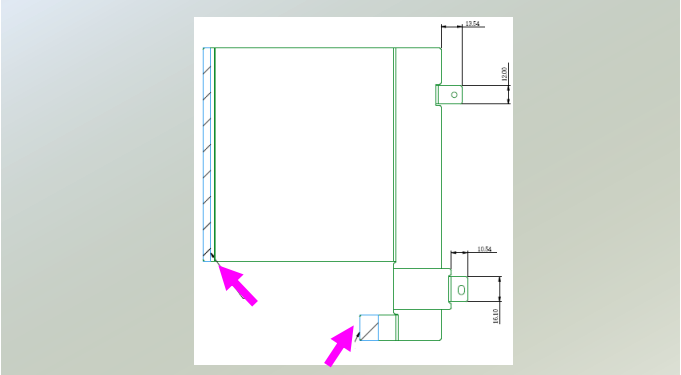


4. Fold the fan duct as shown.

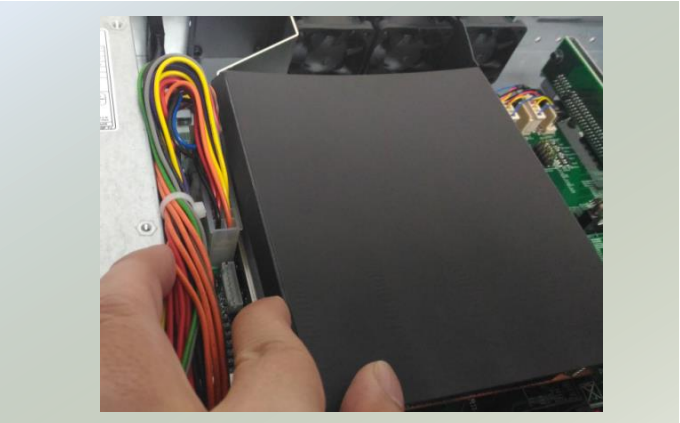
5. Place the folded fan duct on top of the heat sink. Please make sure the screw-holes are aligned. Then apply two (2) screws.



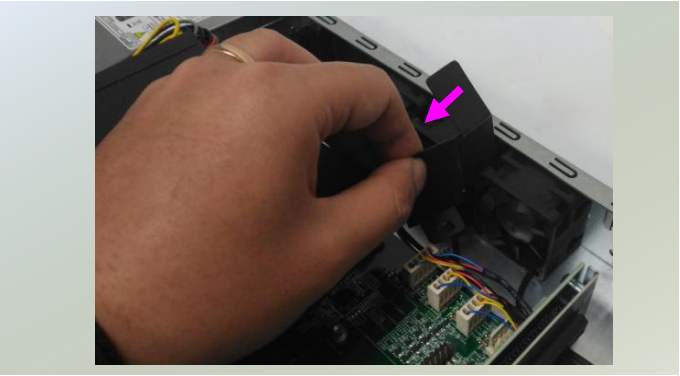
6. Remove the double-sided tapes on the back, as pointed by the two arrows.



7. Fold and attach the tape of the right side of the fan duct to the aluminum bracket.



8. Insert the part with tape at the corner between the two cooling fans. Then attach the tape to the fan.



Installing System Memory

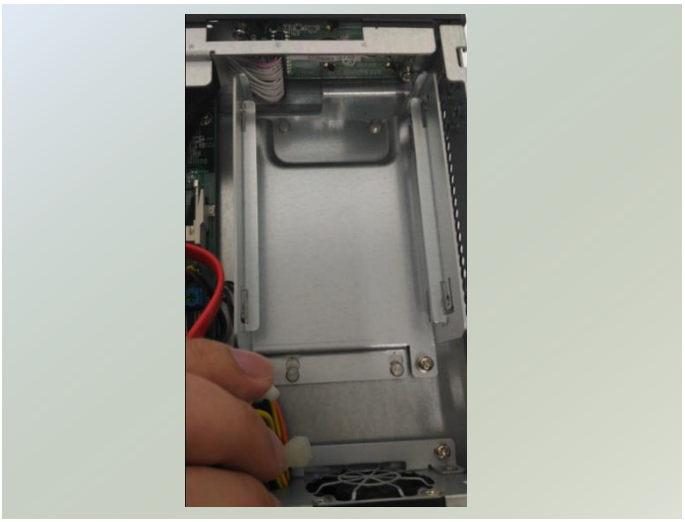
The motherboard supports DDR4 ECC/UDIMM up to 2,400MHz memory at max. 16GB per socket. Please follow the steps below to install the DIMM memory modules.

1. Power off the system and locate the DDR DIMM slot.
2. Pull open the DIMM slot latches
3. Align the DIMM module and make sure the notches of the module aligned with the socket keys in the slot.
4. Insert the module into the slot until it's firmly seated and close the latches.

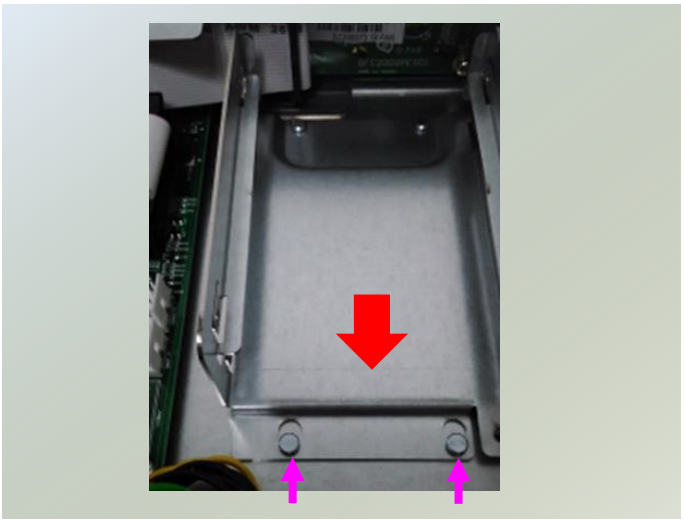
Installing Disk Drives

The system supports 1x 3.5" or 2x 2.5" SATA HDDs or SSDs as data storage. Please follow the steps below for installation. (Note: the following steps are based on 2x 2.5" SATA disk drives installation).

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 two (2) screws for each side of the disk drive.

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, using SATA 7-pin connector and SATA 4-pin connector for the motherboard.

Installing mSATA Module

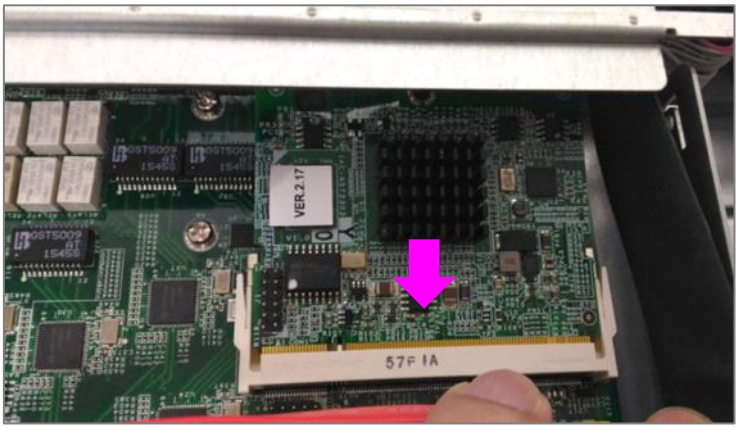
The motherboard provides one mSATA slot. Follow the procedures below for installing a mSATA card.

1. Locate the mSATA socket.
2. Insert a mSATA module as shown in the image below card.
3. Press the module down and apply two screws to secure it.

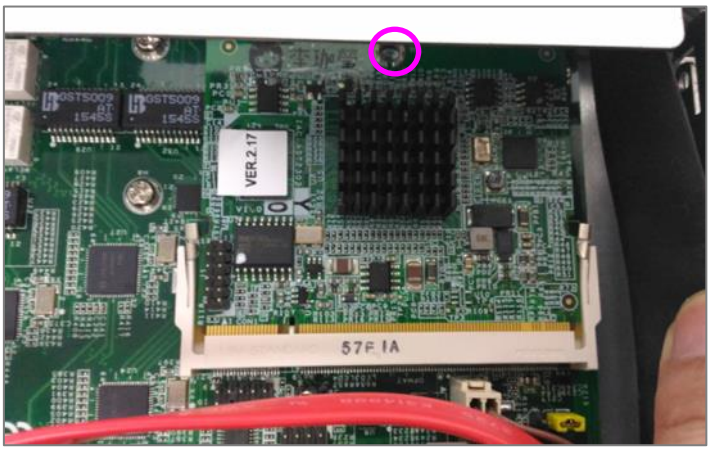
Installing IPMI Card

The motherboard provides one OPMA socket which is used to install an IPMI card. Please follow the steps below for instructions.

1. Locate the OPMA socket.
2. Insert an IPMI card into the socket and then press it down.



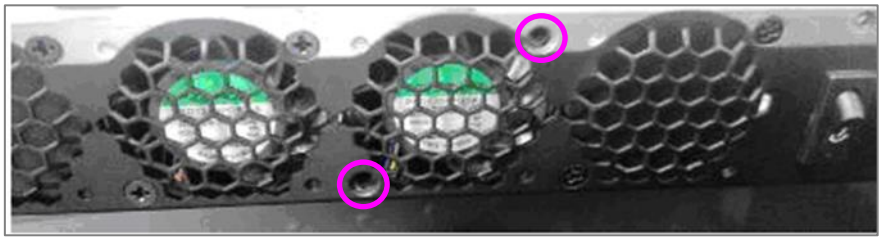
3. Apply a screw to secure the IPMI card.



Replacing Cooling Fans

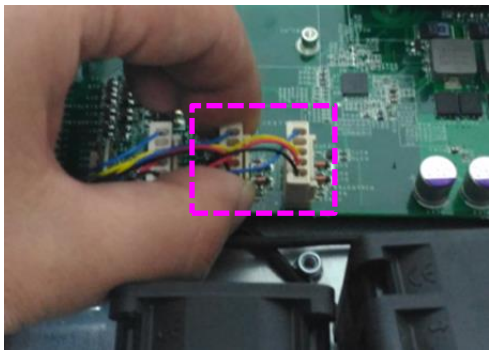
Cooling fans may wear down eventually. Please refer to the steps below for replacing cooling fans. When using a new cooling fan, just reverse the steps to install the fan back onto the enclosure and the system. NCA-4210 supports two cooling fans. To replace a worn-down fan, please follow the steps below.

1. Remove the two (2) screws on the fan chassis.



2. Apply some force and pull the fan out of its original place.

3. Unplug the fan connector.



4. Place a new fan to the original place and apply two (2) screws.

Installing NIC Module

NCA-4210 supports one Ethernet NIC module space to expand its network throughput. Please follow the instructions below.

Note: For information about compatible modules, please refer to the "Ordering Information" and "Optional Accessories" sections, or contact Lanner Sales for more details.

1. Rotate and loosen the two (2) captive screws on the bezel of the module slot and then remove the bezel.

2. Position the gold finger of module as shown in the image below. When sliding the module into the slot, make sure the module stays in the guides of the expansion slot.

3. Slide the Ethernet NIC module into the space, until it is firmly attached.
4. Secure the module with two (2) captive screws on the bezel.

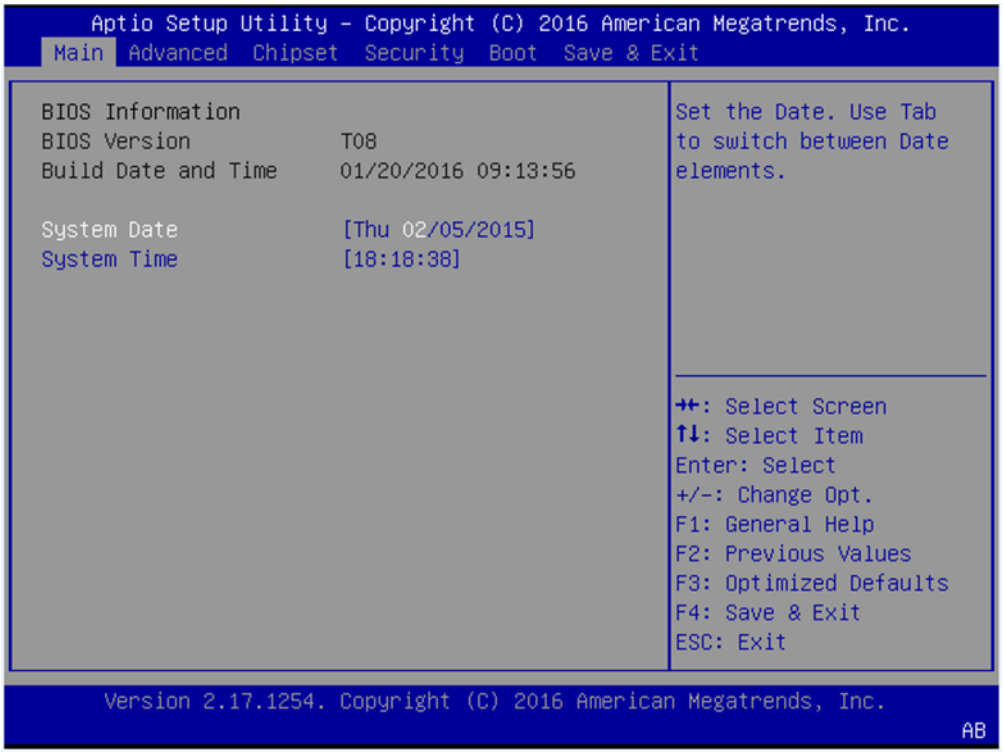
CHAPTER 3: SOFTWARE SETUP

BIOS Setup

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

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

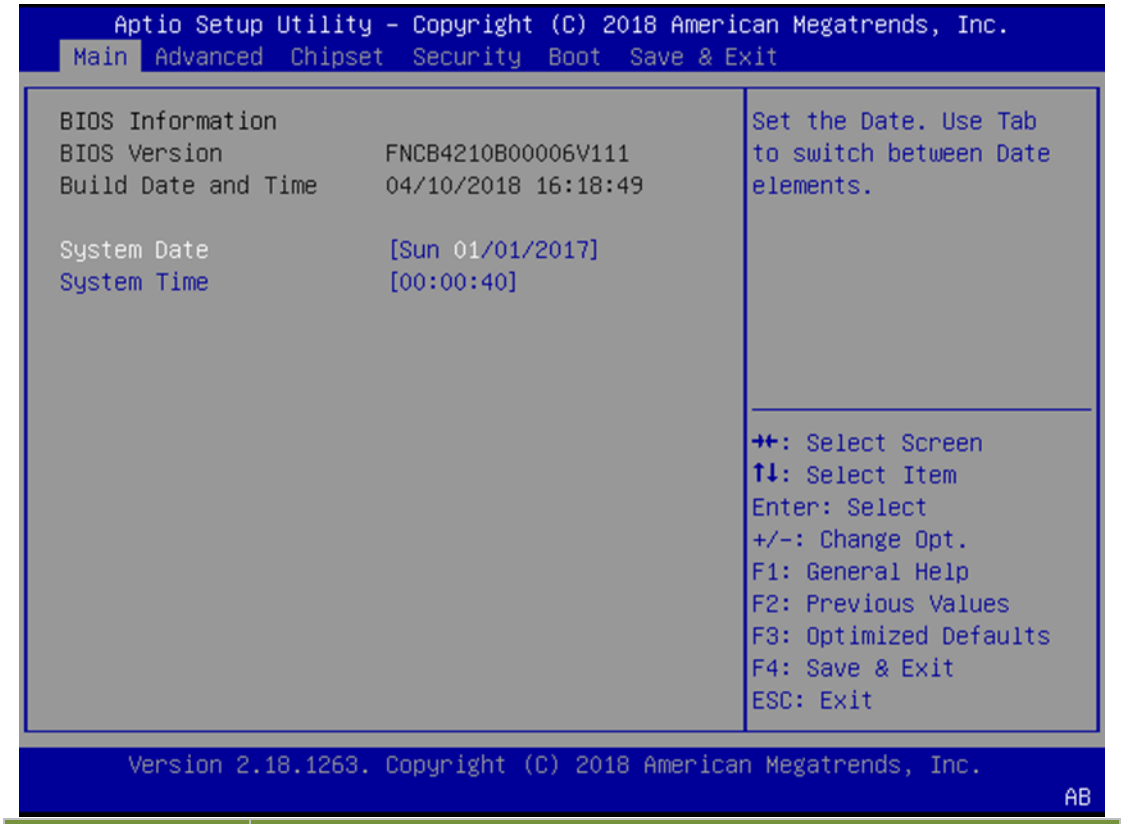
Control Keys	Description
→←	select a setup screen
↑↓	select an item/option on a setup screen
<Enter>	select an item/option or enter a sub-menu
+/-	adjust values for the selected setup item/option
F1	display General Help screen
F2	retrieve previous values, such as the last configured parameters during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



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

Main Page

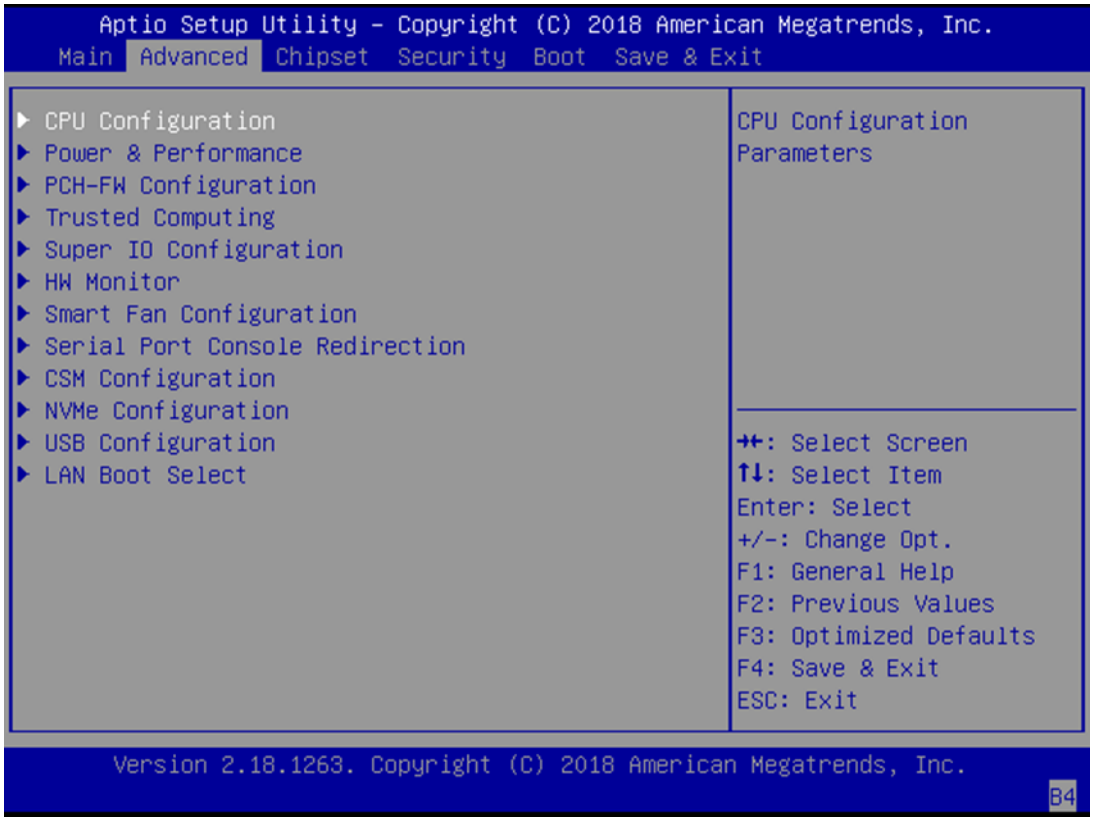
The [Main] is the first setup screen when you enter BIOS. The [Main] displays general system and BIOS information and you may configure "System Date", and "System Time".



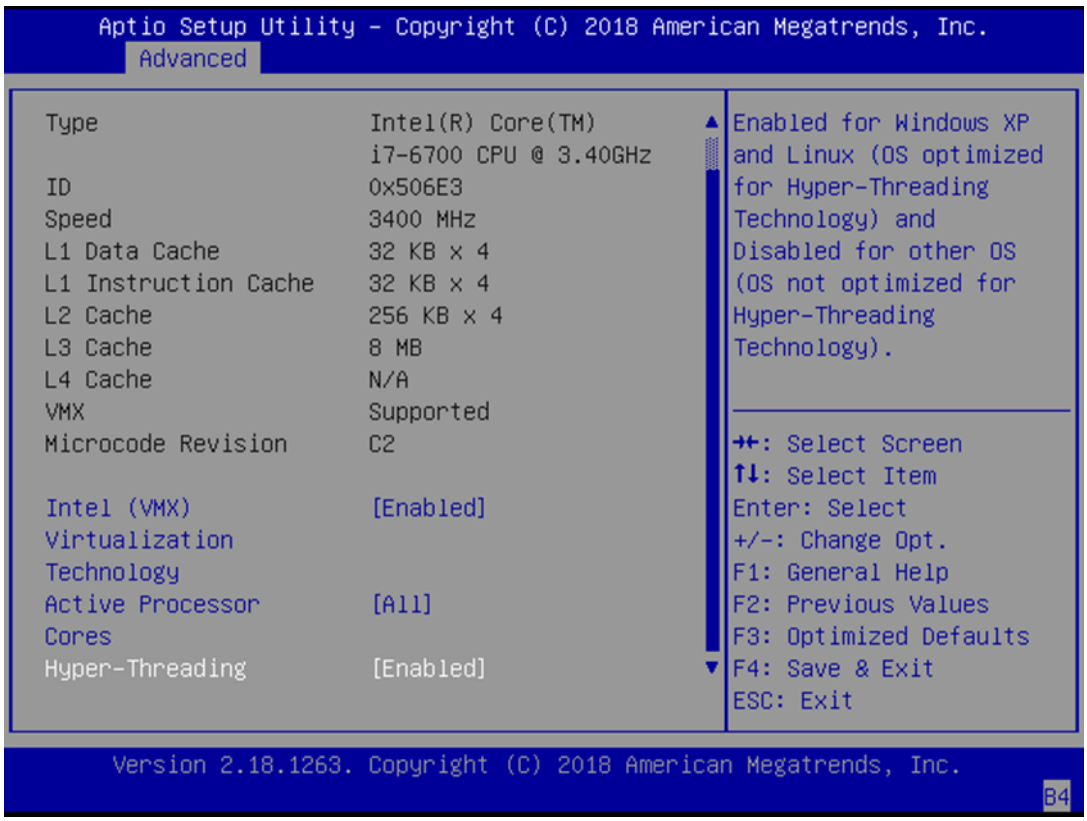
Feature	Description
BIOS Information	BIOS Version: BIOS release version Build Date and Time: MM/DD/YEAR
System Date	To set the Date, use **<Tab>** to switch between Date elements. Default Range of Year: 2005-2099 Default Range of Month: 1-12 Days: dependent on Month.
System Time	To set the Time, use **<Tab>** to switch between Time 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.

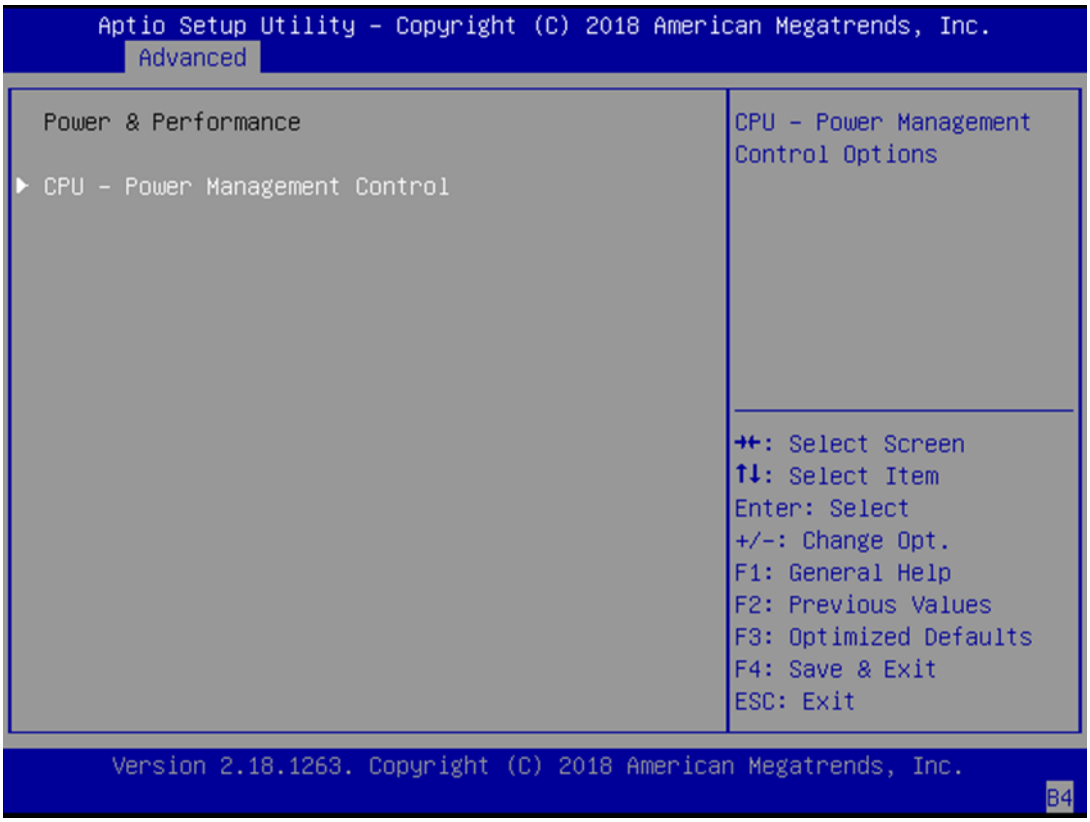


CPU Configuration

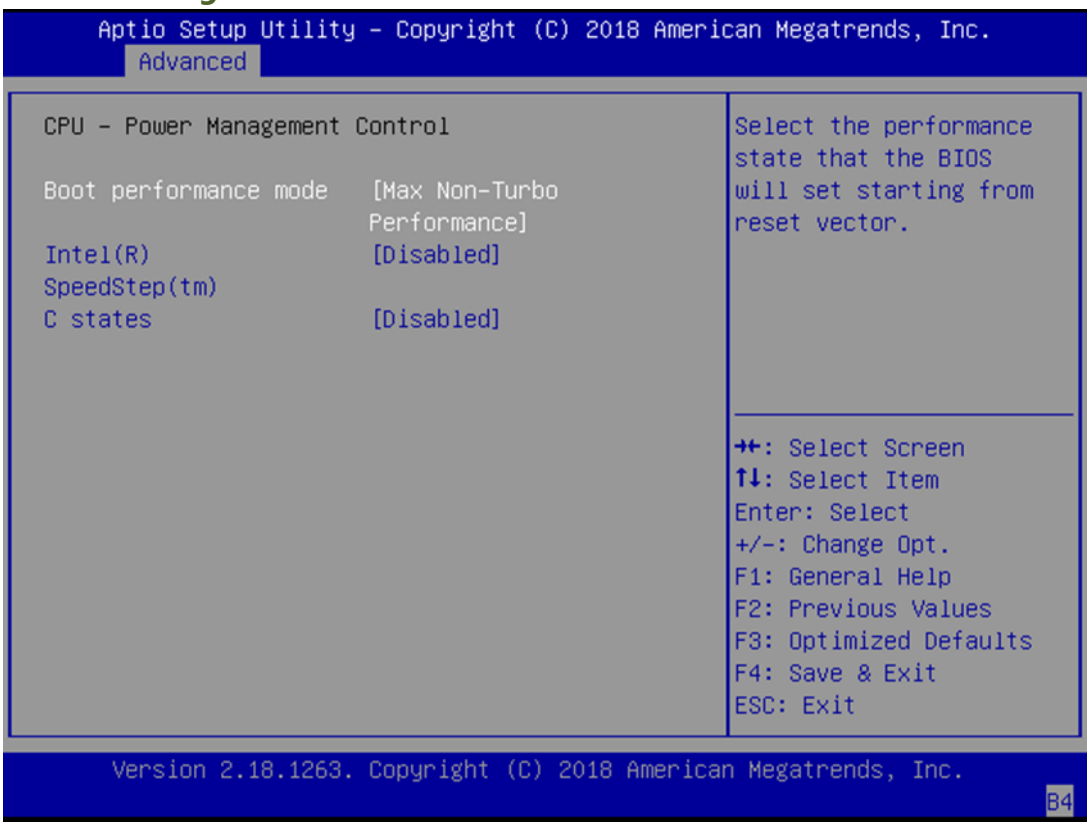


Feature	Options	Description
Intel (VMX) Virtualization Technology	Disabled Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	ALL 1 2 3	Number of cores to enable in each processor package.
Hyper-Threading	Disabled Enabled	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).

Power & Performance

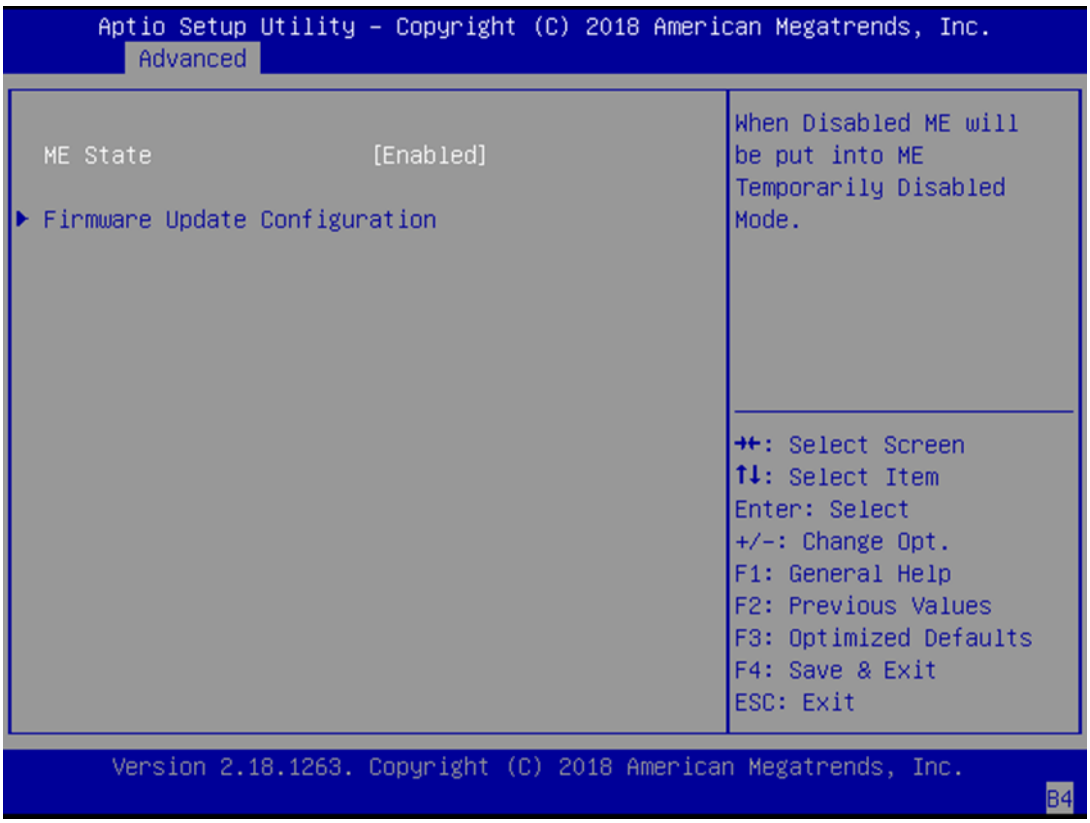


CPU - Power Management Control



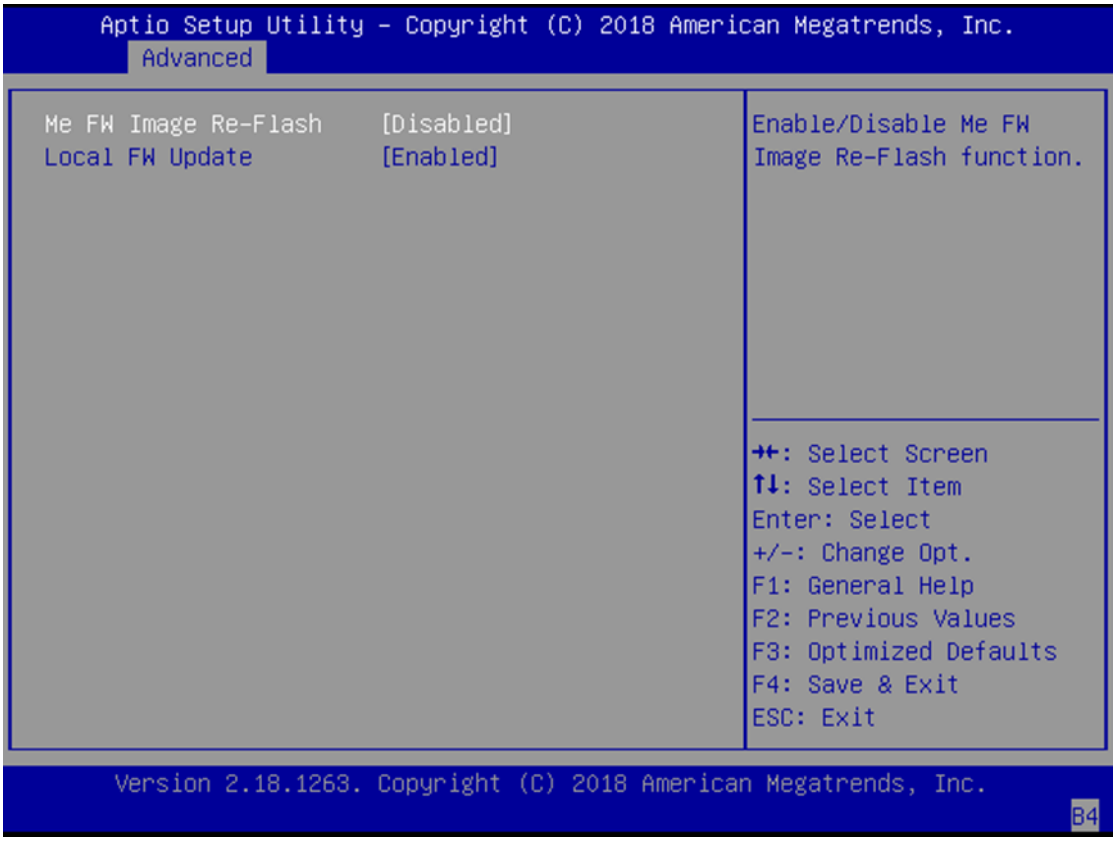
Feature	Options	Description
Boot Performance Mode	Max Non-Turbo Performance Max Battery Turbo Performance	Select the performance state that the BIOS will set starting from reset vector.
Intel(R) SpeedStep(tm)	Disabled Enabled	Allows more than two frequency ranges to be supported.
C states	Disabled Enabled	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

PCH-FW Configuration



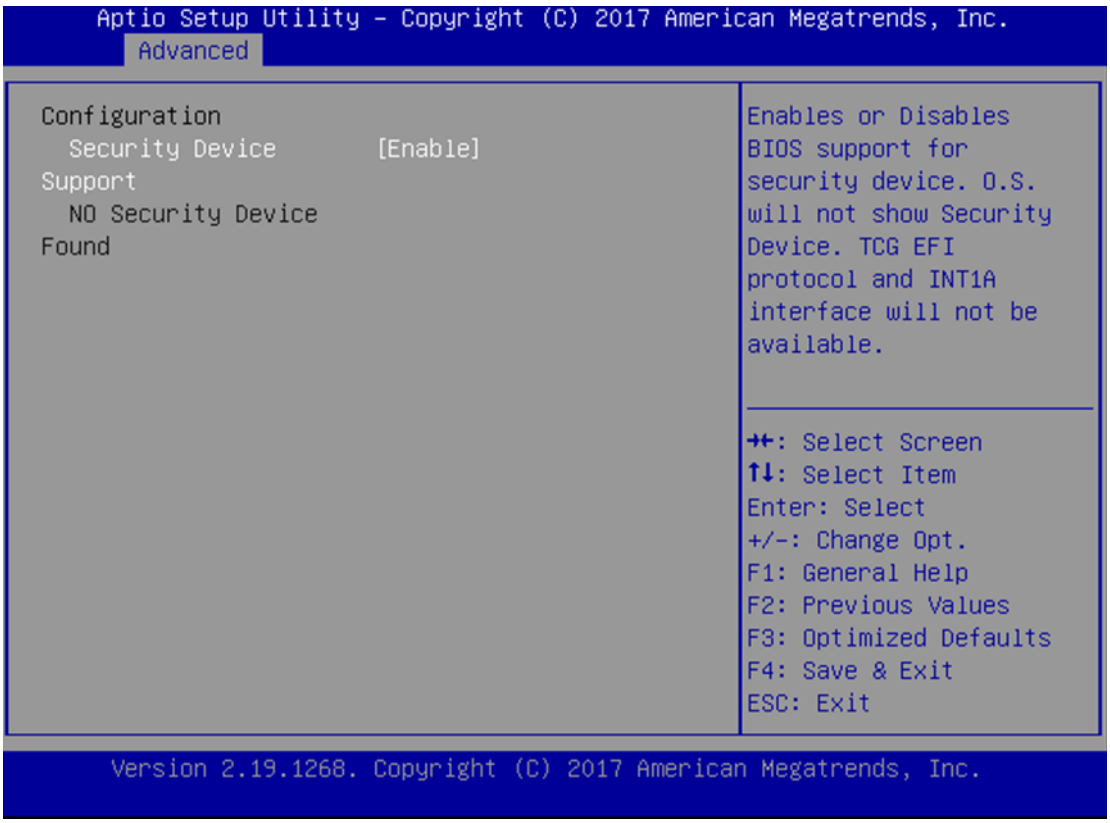
Feature	Options	Description
ME State	Disabled Enabled	When Disabled ME will be put into ME Temporarily Disabled Mode.

Firmware Update Configuration



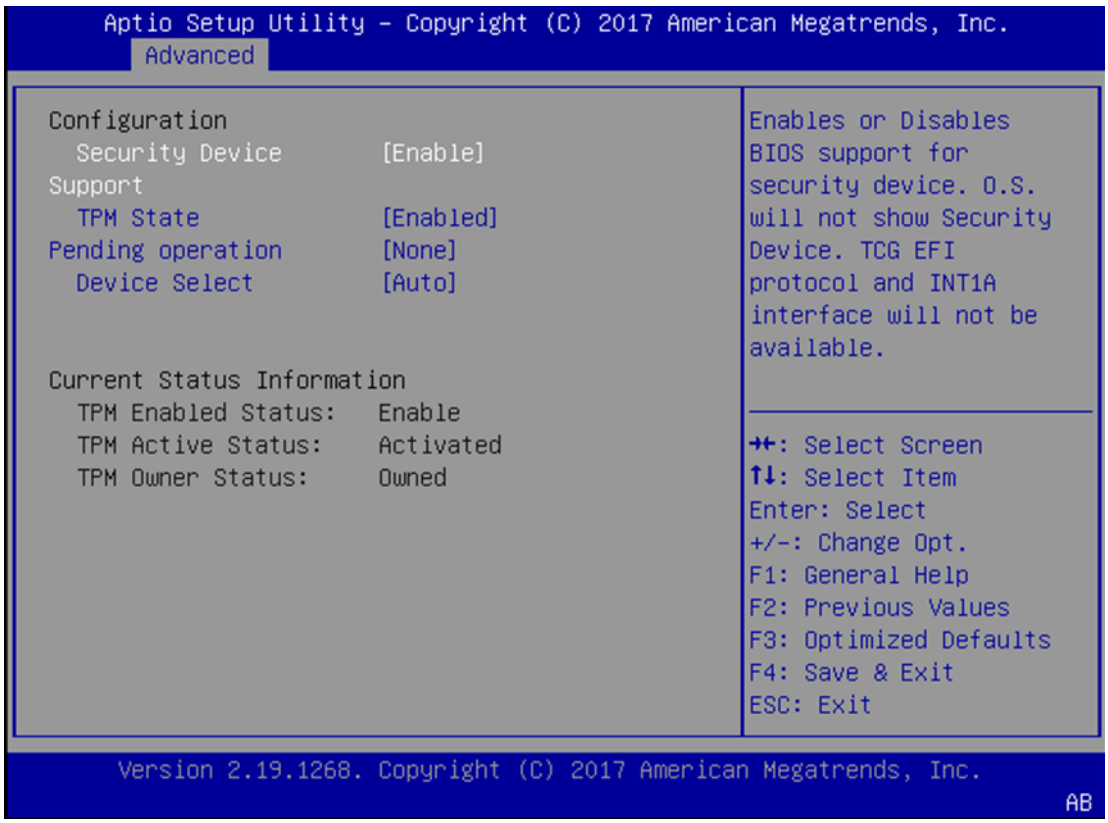
Feature	Options	Description
Firmware Update Configuration	Disabled Enabled	Configure Management Engine Technology Parameters
Local FW Update	Disabled Enabled	Options for Local FW Update function.

Trusted Computing



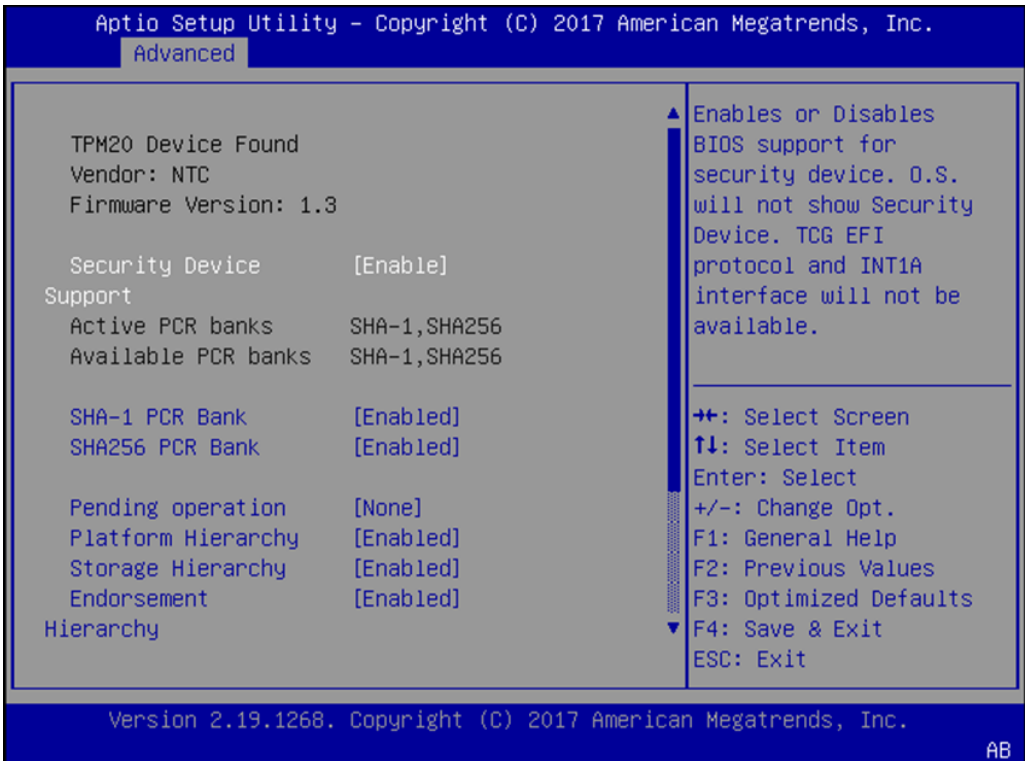
Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

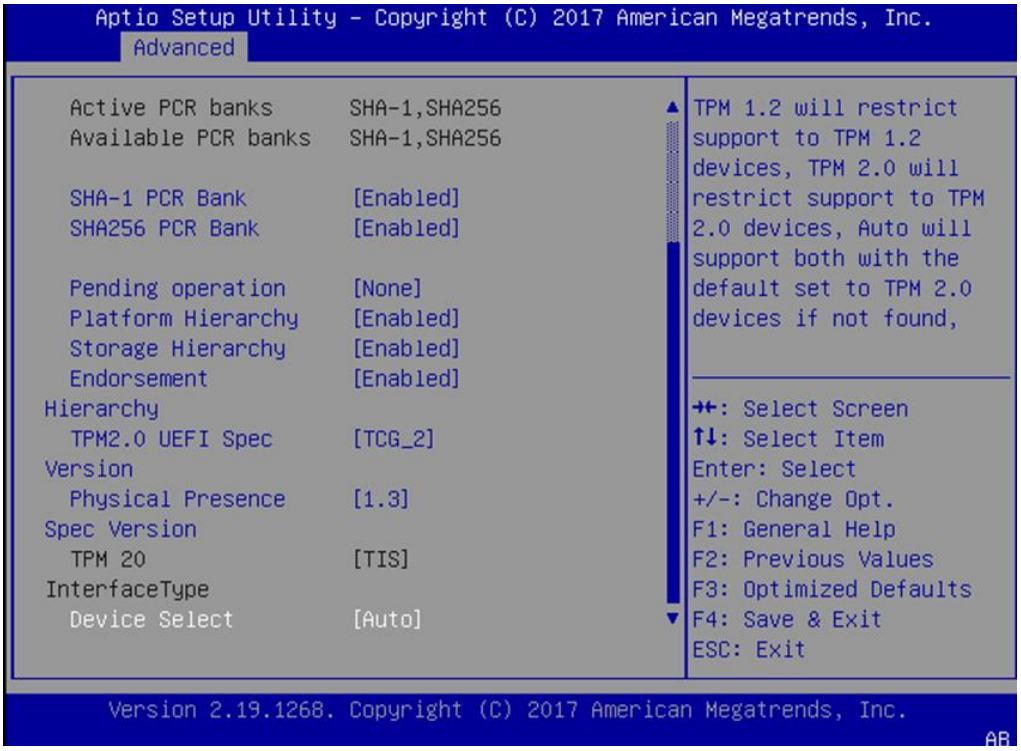
Trusted Computing (TPM1.2)



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 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)

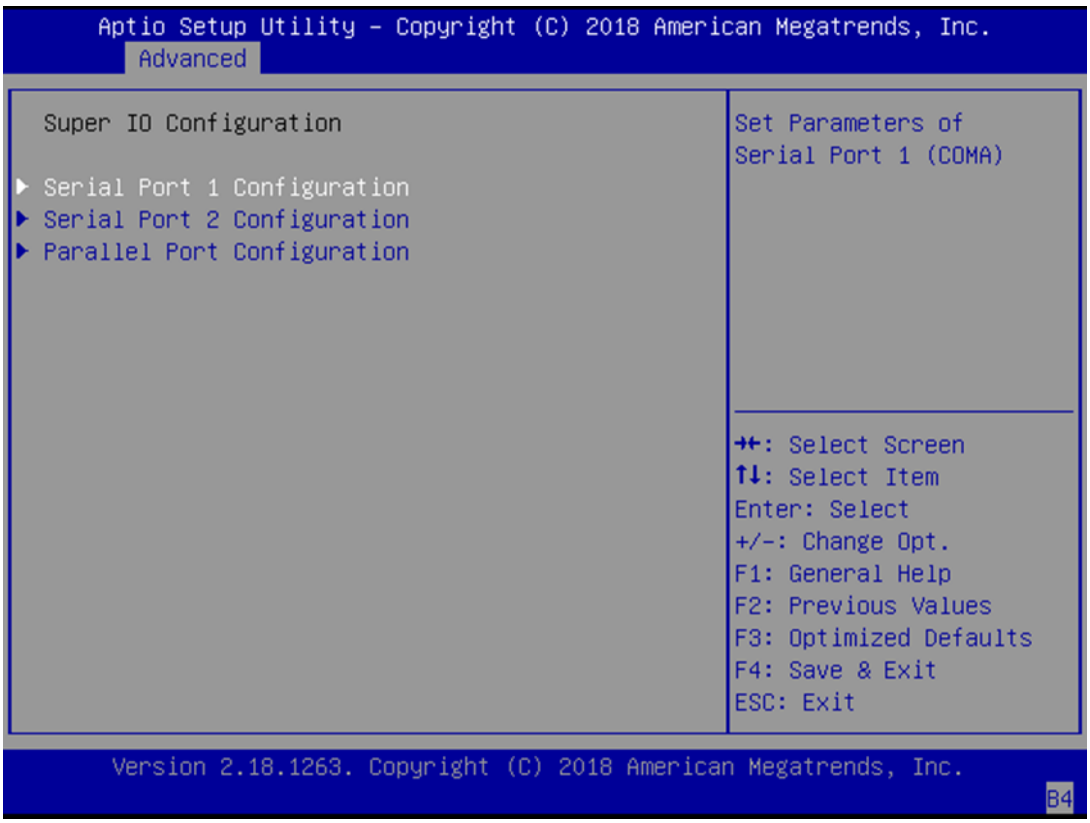




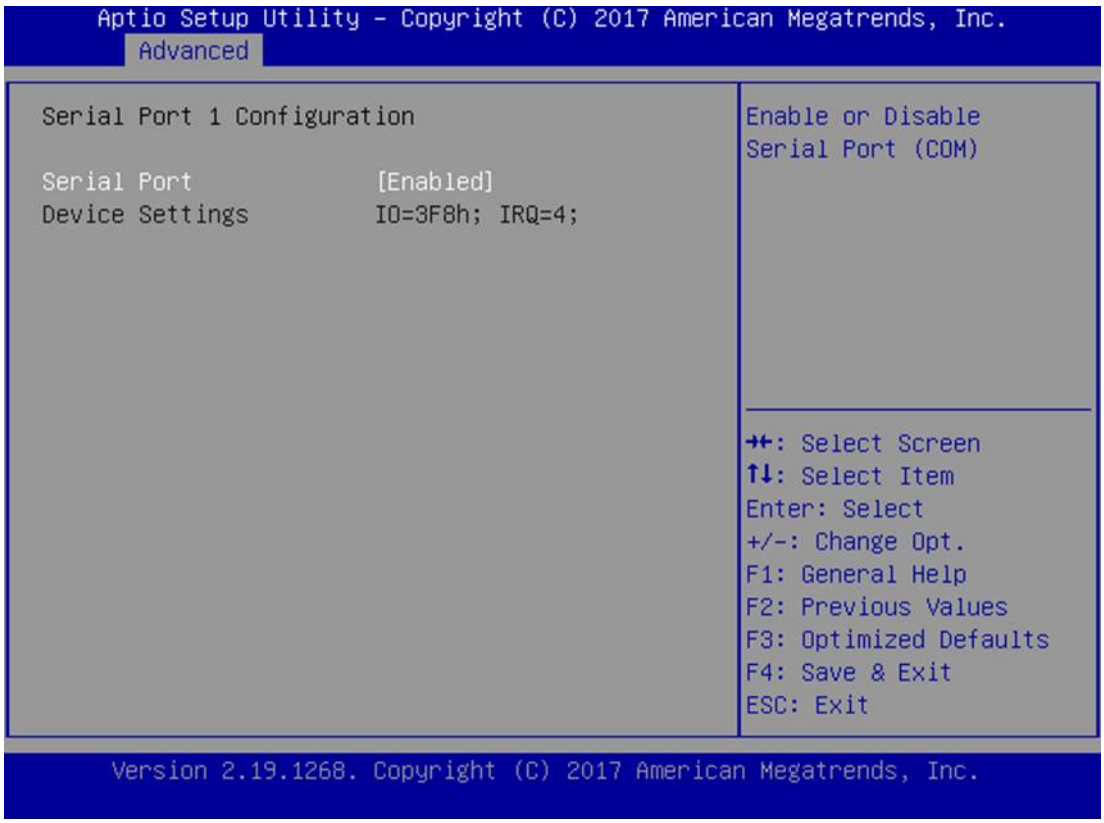
Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

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 Interface Type	TIS	Select **TPM 20 Device** for the Communication Interface.
Device Select	TPM 1.2 TPM 2.0 Auto	**TPM 1.2** will restrict support to TPM 1.2 devices; while **TPM 2.0** will restrict support to TPM 2.0 devices; **Auto** will support both with the default set to TPM 2.0 devices. If not found, TPM 1.2 devices will be enumerated.

Super IO Configuration

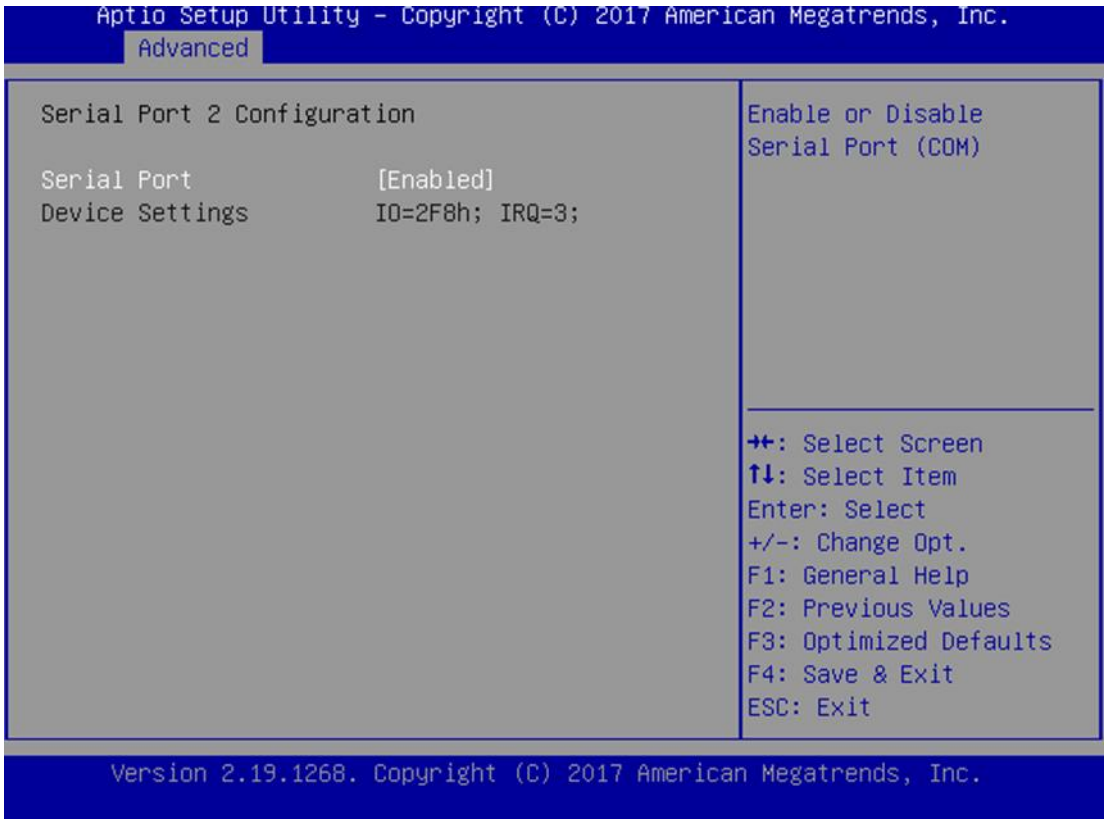


Serial Port 1 Configuration



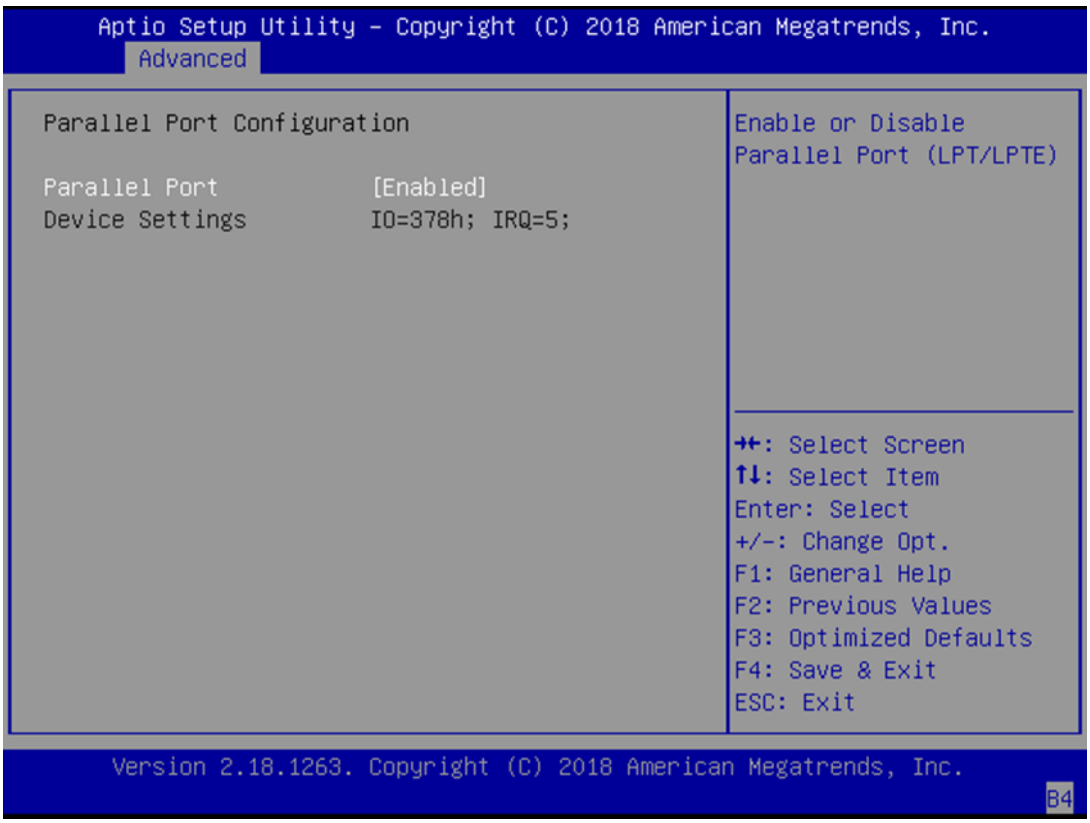
Feature	Options	Description
Serial Port	Disabled Enabled	Enables or disables Serial Port 1.
Device Settings	NA	IO=3F8h; IRQ = 4

Serial Port 2 Configuration



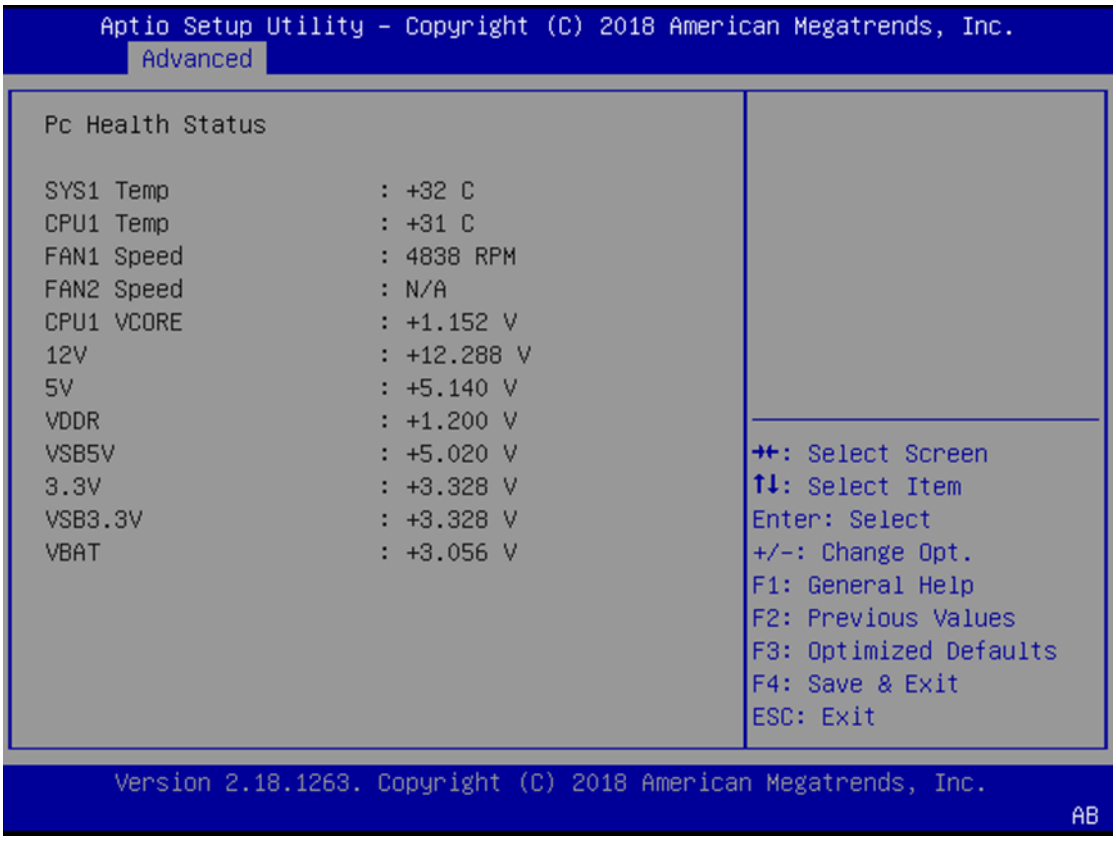
Feature	Options	Description
Serial Port	Disabled Enabled	Enables or disables Serial Port 2
Device Settings	NA	IO=2F8h; IRQ = 3

Parallel Port Configuration



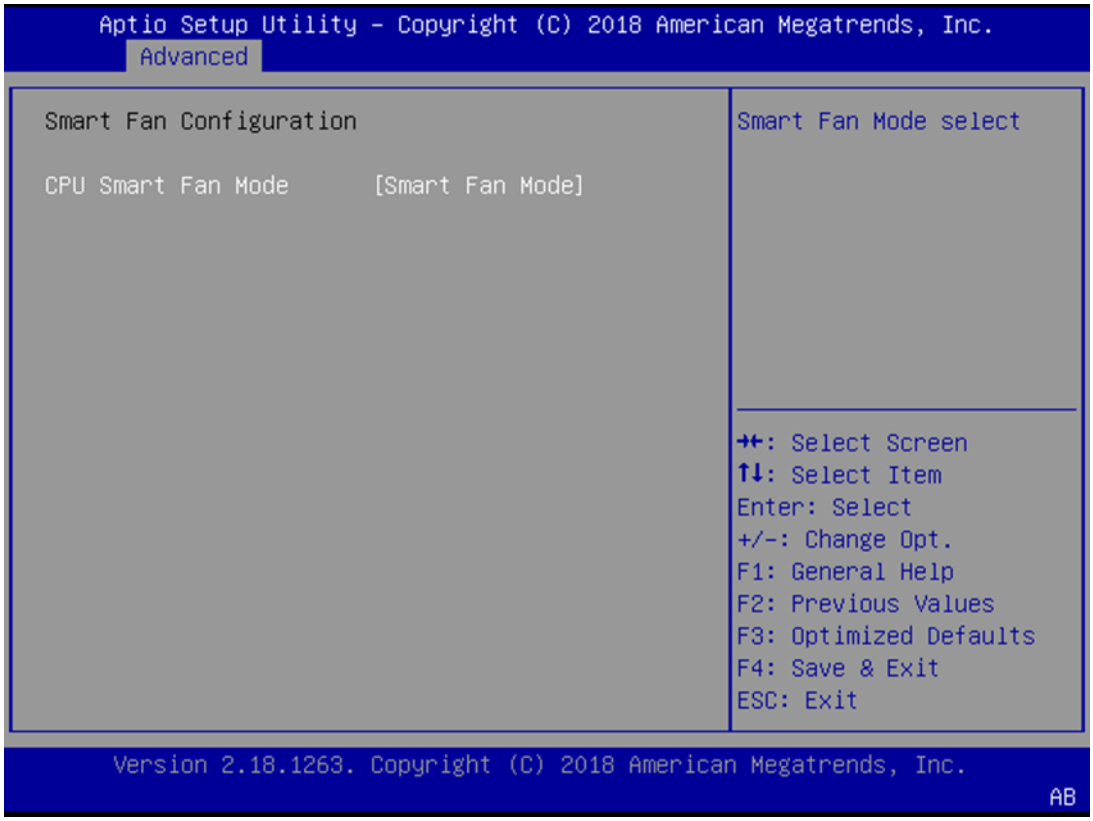
Feature	Options	Description
Parallel Port	Disabled Enabled	Enable or Disable Parallel Port (LPT/LPTE).
Device Settings	NA	IO=378h; IRQ = 5

HW Monitor



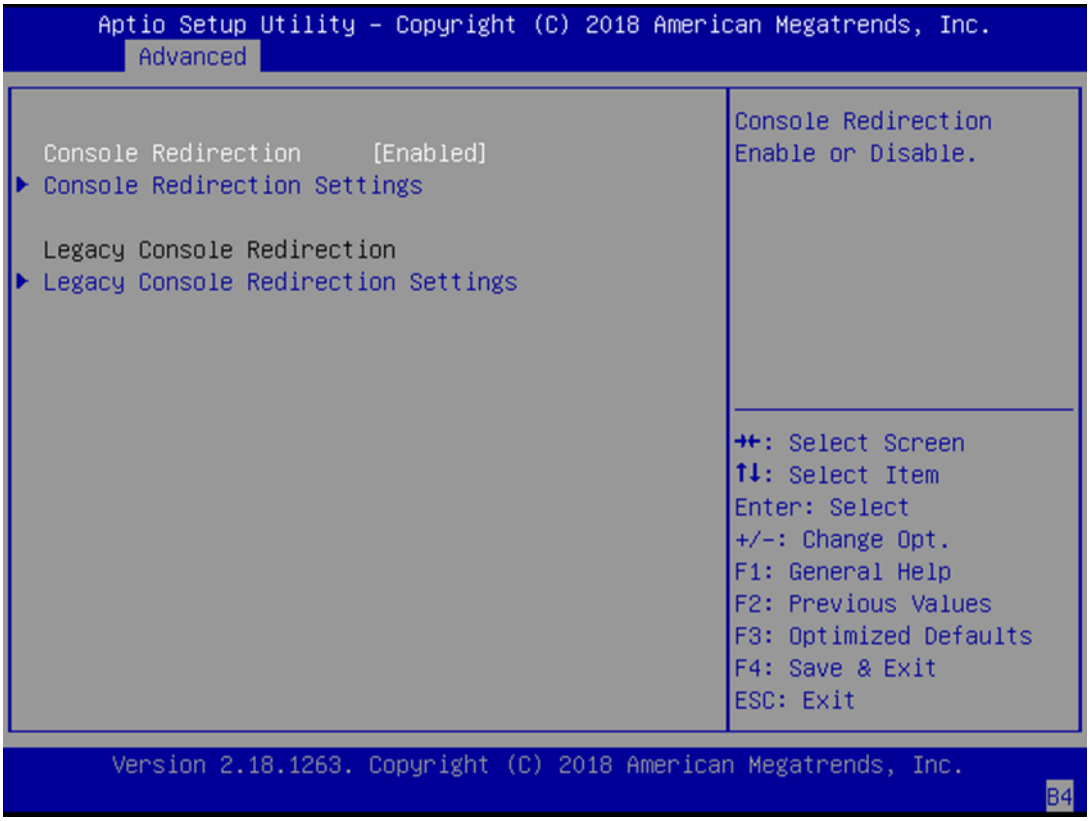
Feature	Description
SYS1 Temp	This value reports the System temperature.
CPU1 Temp	This value reports the CPU temperature.
FAN1 Speed	This value reports the System FAN1 Speed.
FAN2 Speed	This value reports the System FAN2 Speed.
CPU1 VCORE	This value reports the CPU VCORE.
12V	This value reports the 12V Input voltage.
5V	This value reports the 5V Input voltage.
VDDR	This value reports the VDDR Input voltage.
VSB5V	This value reports the VSB5V Input voltage.
3.3V	This value reports the 3.3V Input voltage.
VSB3.3V	This value reports the VSB3.3V Input voltage.
VBAT	This value reports the VBAT Input voltage.

Smart Fan Configuration



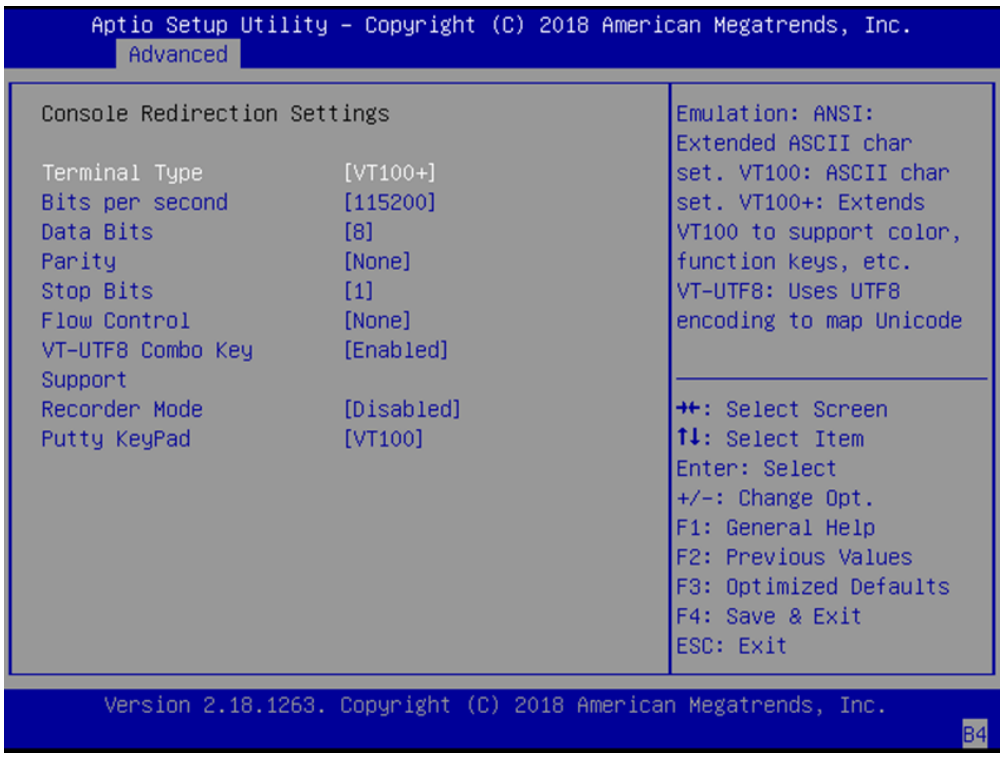
Feature	Options	Description
CPU Smart Fan Mode	Disabled Smart Fan Mode	Smart Fan Mode Select.

Serial Port Console Redirection



Feature	Options	Description
Console Redirection	Enabled Disabled	Console Redirection Enable or Disable.

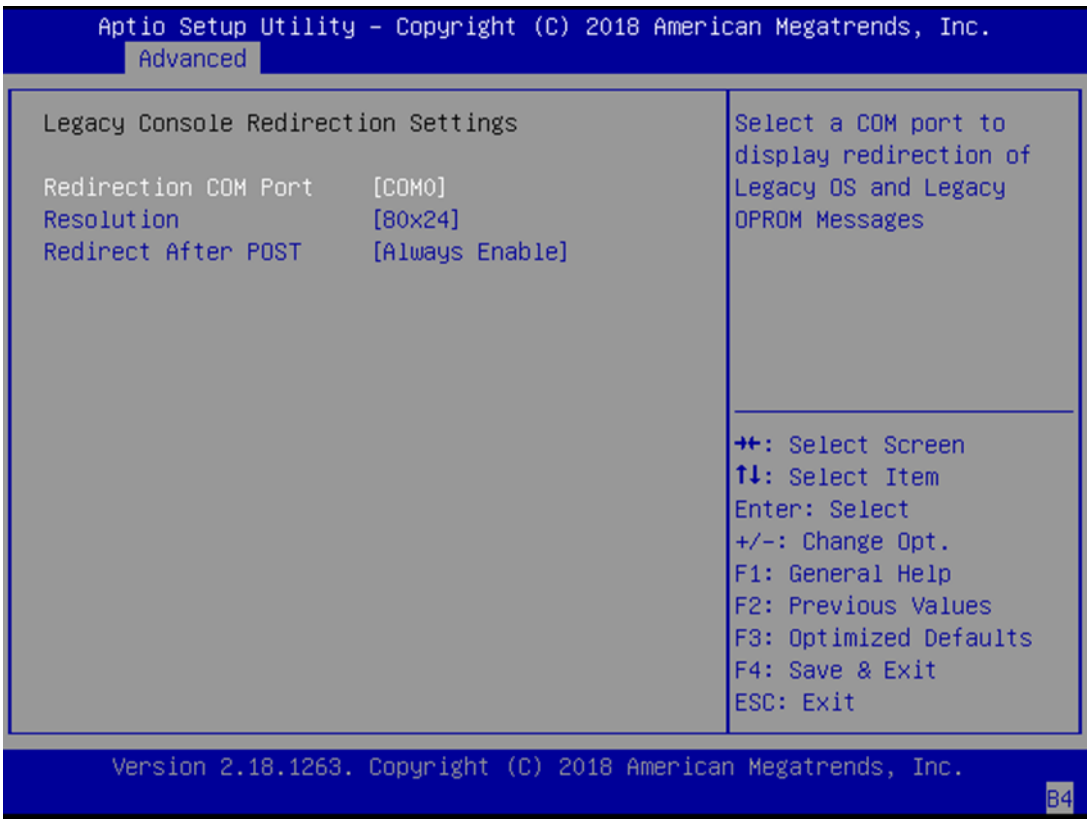
Console Redirection Settings



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

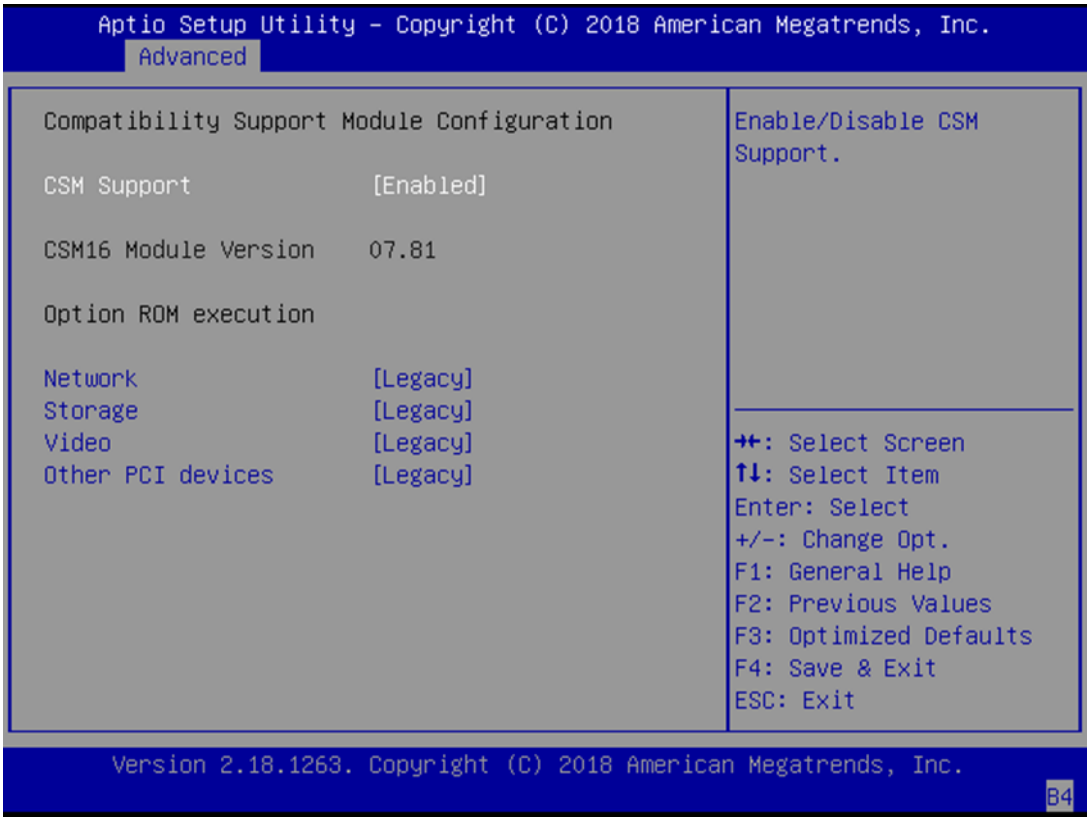
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Selects FunctionKey and KeyPad on Putty.

Legacy Console Redirection Settings



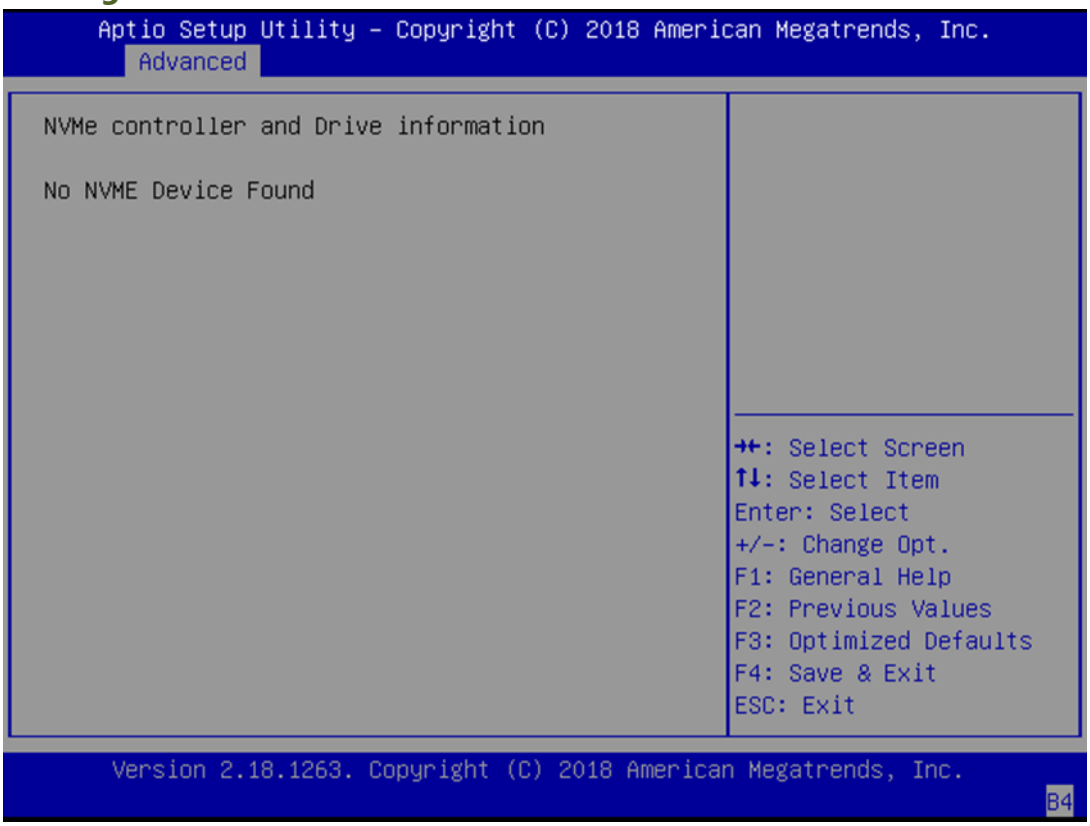
Feature	Options	Description
Redirection COM Port	COM0 COM1	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.
Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection.
Redirect After POST	Always Enable BootLoader	When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable."

CSM Configuration

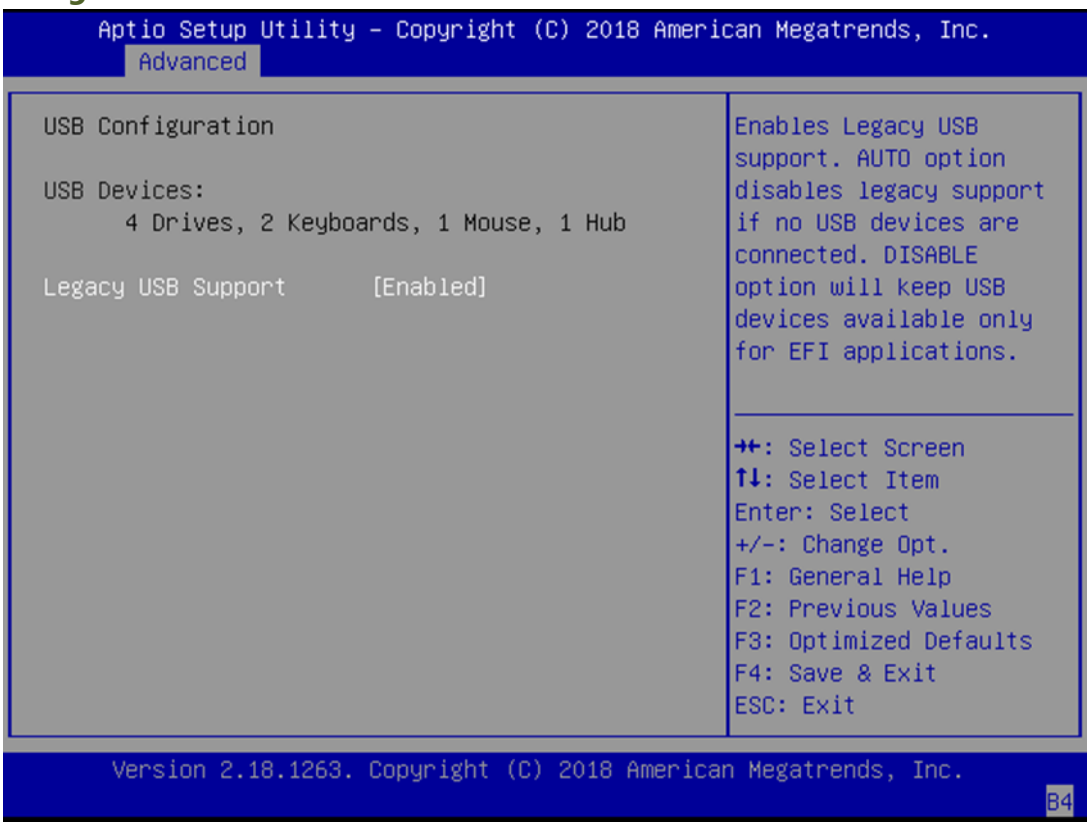


Feature	Options	Description
CSM Support	Disabled Enabled	Enables or disables CSM Support
Network	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not Launch UEFI Legacy	Controls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

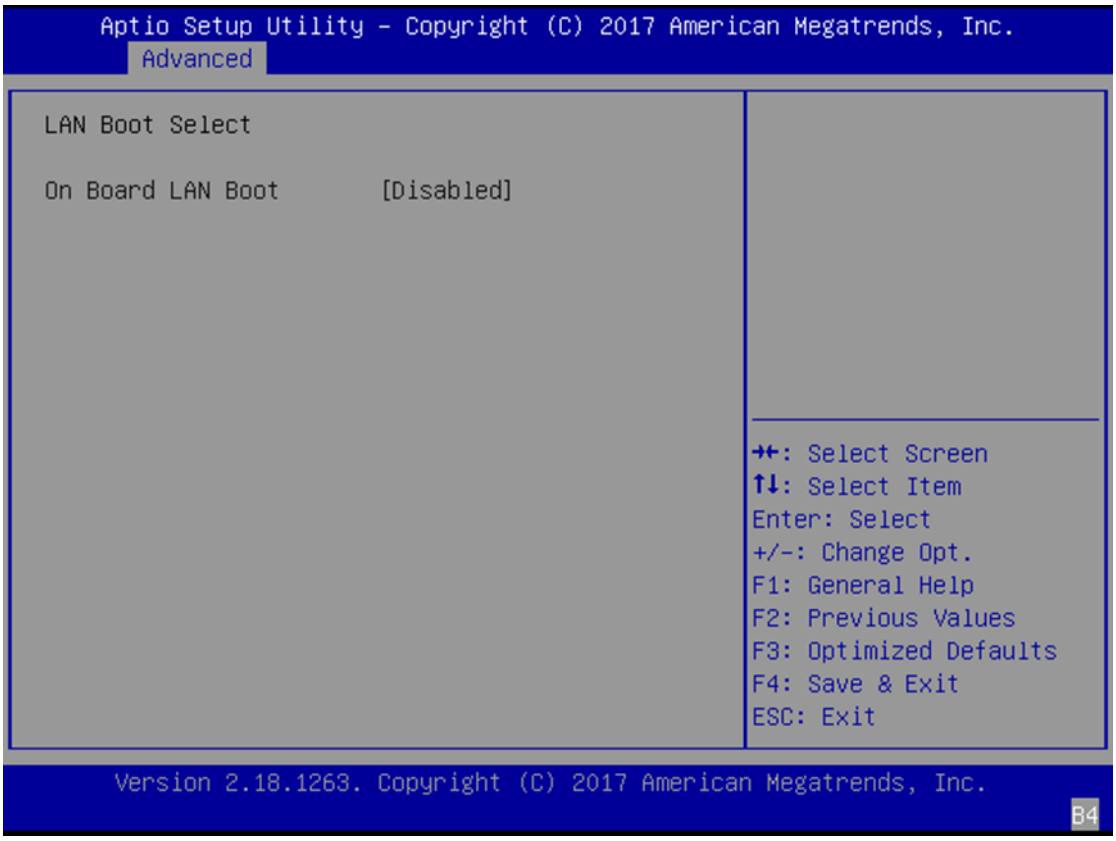


USB Configuration



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.

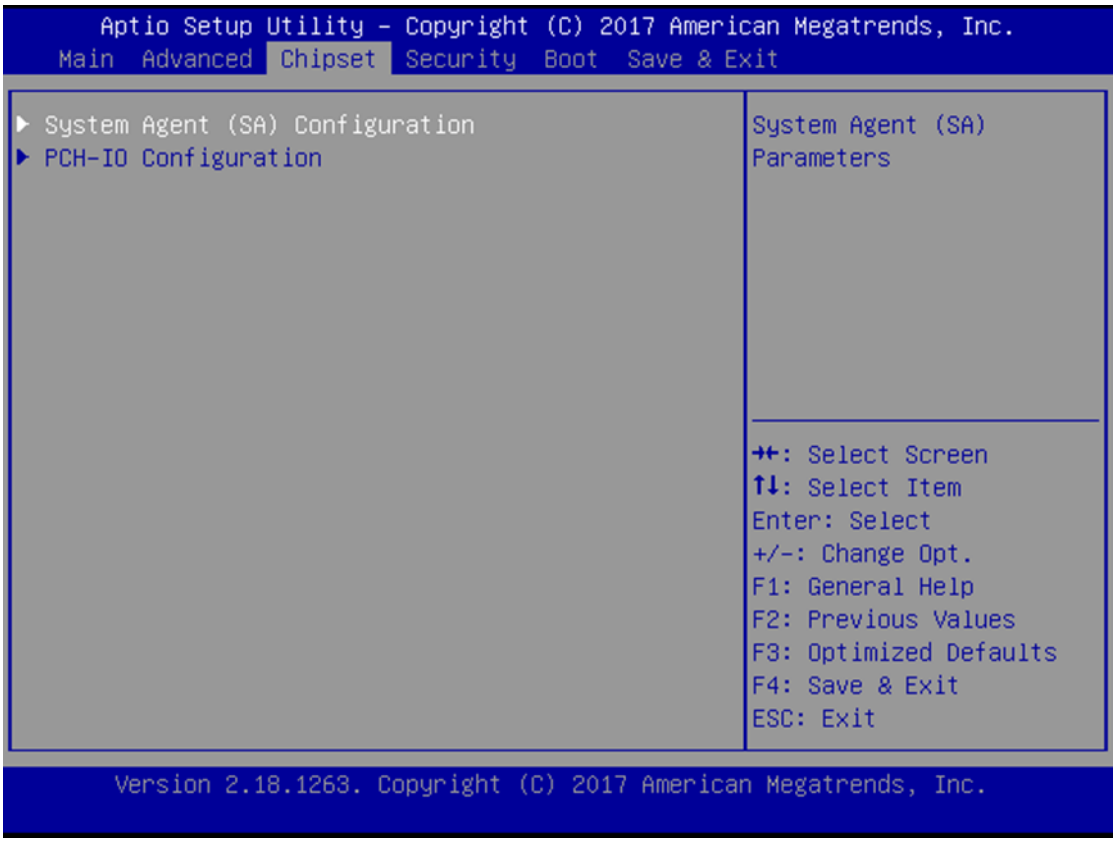
LAN Boot Select



Feature	Options	Description
On Board LAN Boot	Disabled Enabled	Select On Board LAN# Boot.

Chipset

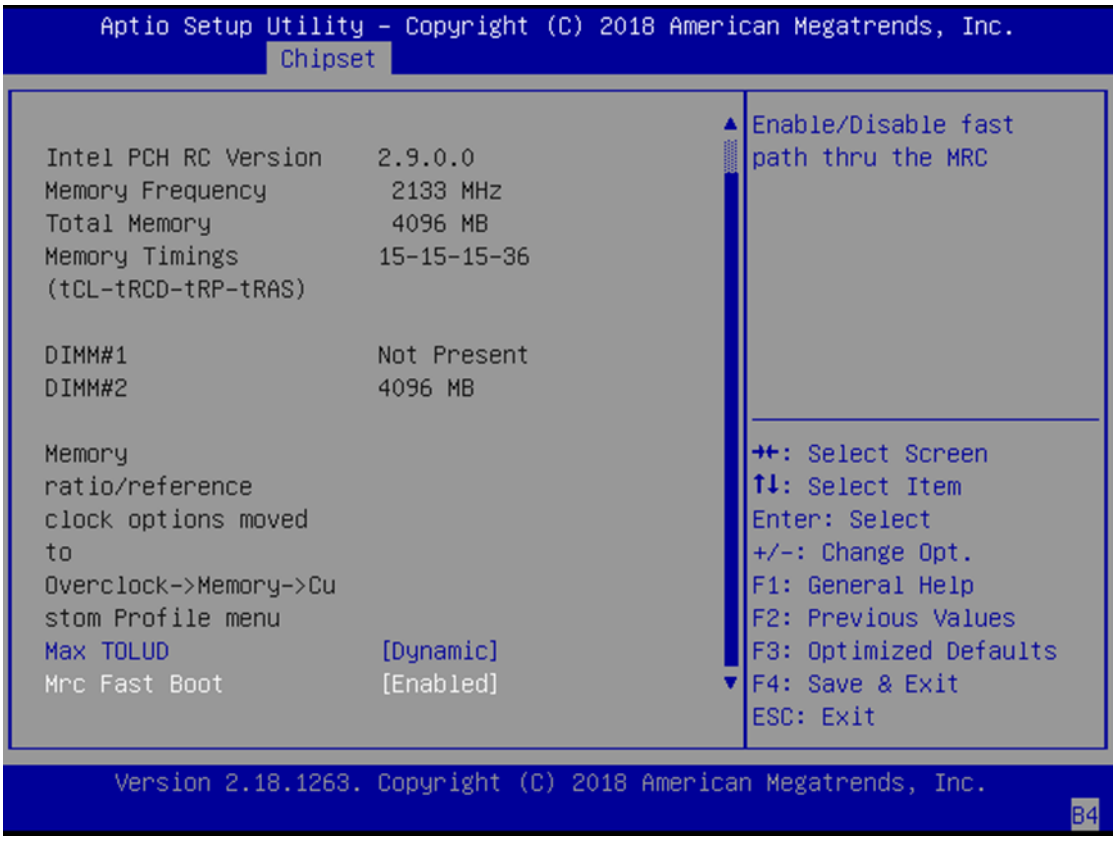
Select the Chipset menu item from the BIOS setup screen to enter the Chipset Setup screen. Users can select any of the items in the left frame of the screen.



System Agent (SA) Configuration

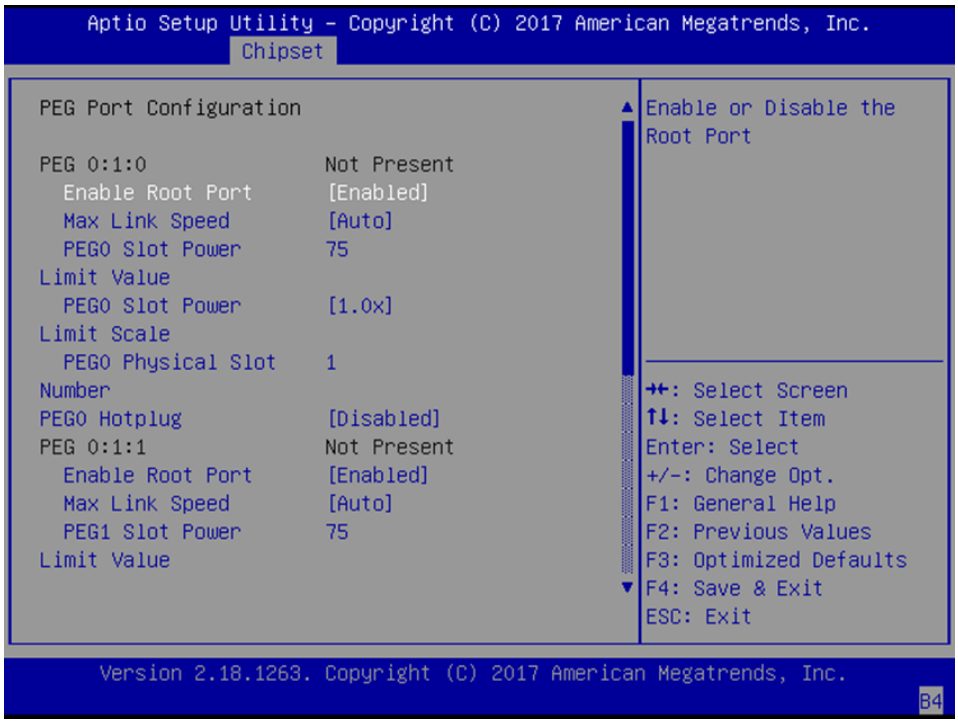
Feature	Options	Description
VT-d	Disabled Enabled	VT-d capability
Above 4GB MMIO BIOS assignment	Disabled Enabled	Enable/Disable above 4GB Memory Mapped IO BIOS assignment\n\n This is disabled automatically when Aperture Size is set to 2048MB.
X2APIC Opt Out	Disabled Enabled	Enable/Disable X2APIC_OPT_OUT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

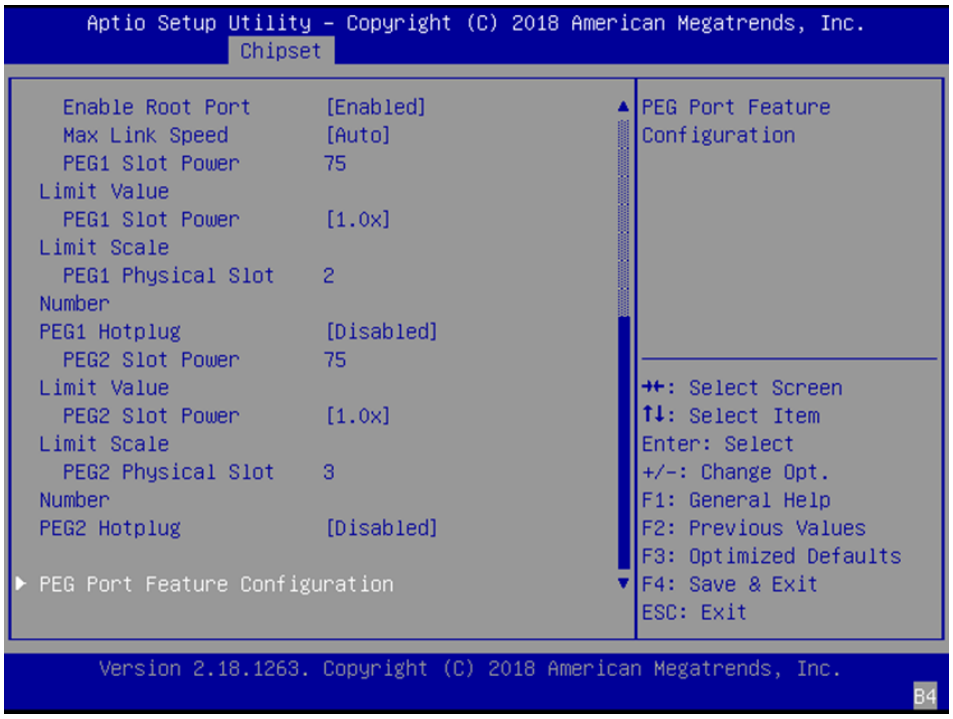
Memory Configuration



Feature	Options	Description
Max TOLUD	Dynamic 1GB 1.25GB 1.5GB 1.75GB 2GB 2.25GB 2.5GB 2.75GB 3GB 3.25GB 3.5GB	Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller"
Mrc Fast Boot	Disabled Enabled	Enable/Disable fast path thru the MRC.

PEG Port Configuration

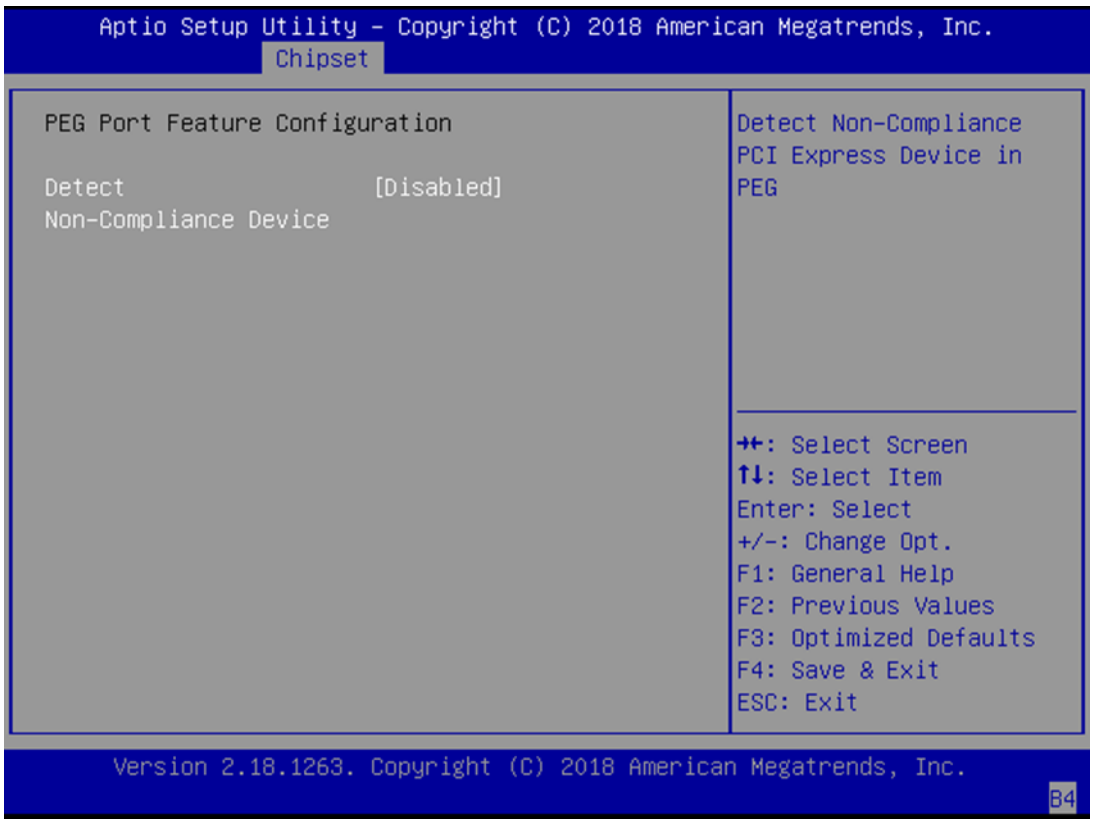




Feature	Options	Description
Enable Root Port	Disabled Enabled	Enable or Disable the Root Port.
Max Link Speed	Auto Gen1 Gen2 Gen3	Configure PEG 0:1:0 Max Speed or Configure PEG 0:1:1 Max Speed.

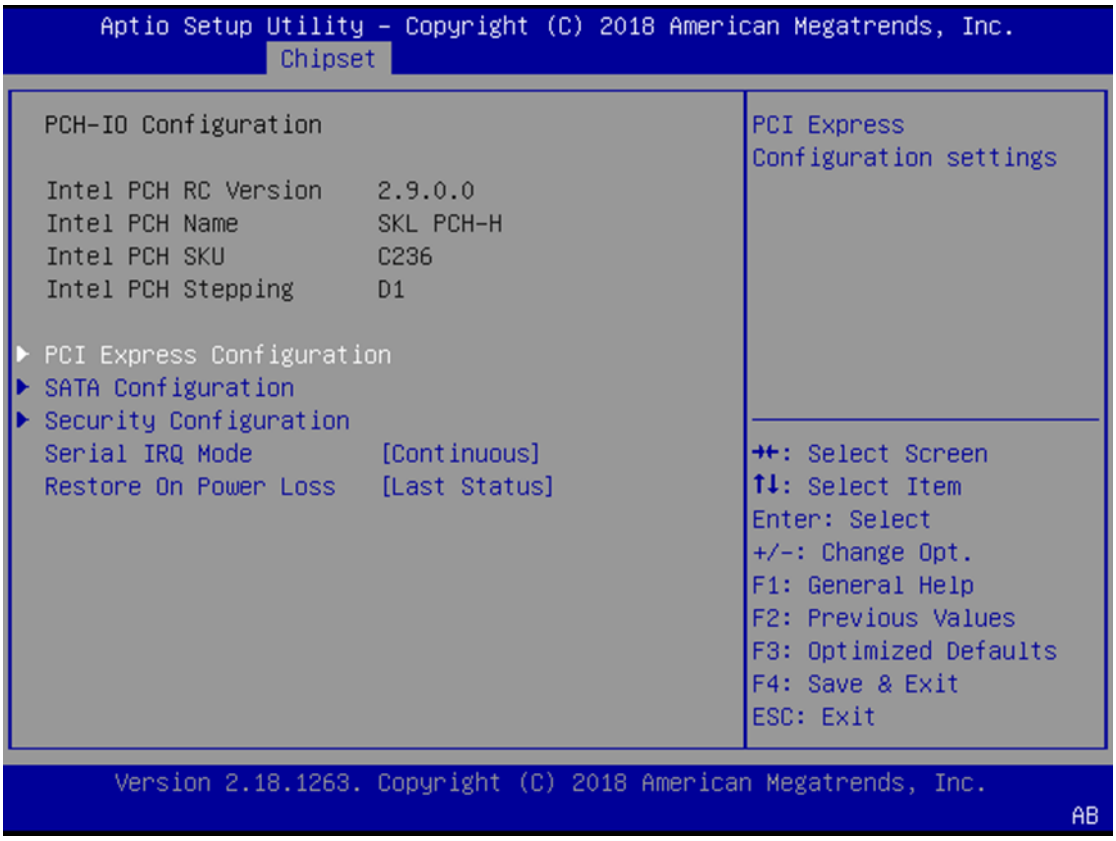
PEG0/1/2 Slot Power Limit Value	75	Sets the upper limit on power supplied by slot. Power limit (in Watts) is calculated by multiplying this value by the Slot Power Limit Scale. Values 0-255
PEG0/1/2 Slot Power Limit Scale	1.0x 0.1x 0.01x 0.001x	Select the scale used for the Slot Power Limit Value.
PEG0/1/2 Physical Slot Number	1/2/3	Set the physical slot number attached to this Port. The number must be globally unique within the chassis. Values 0-8191.
PEG0/1/2 Hotplug	Disabled Enabled	PCI Express Hot Plug Enable/Disable.

PEG Port Feature Configuration



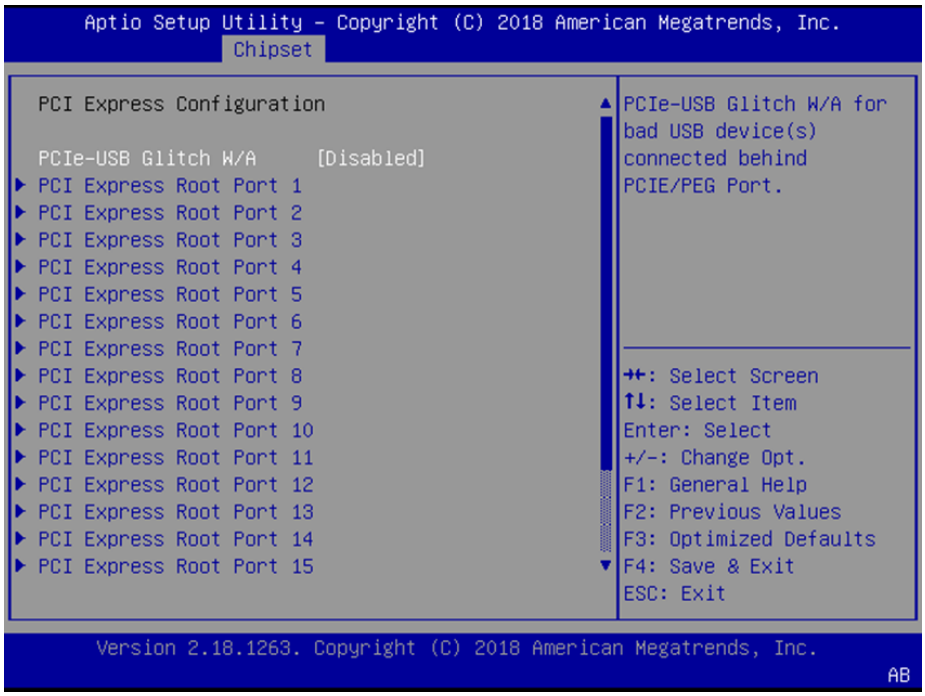
Feature	Options	Description
Detect Non-Compliance Device	Disabled Enabled	Detect Non-Compliance PCI Express Device in PEG.

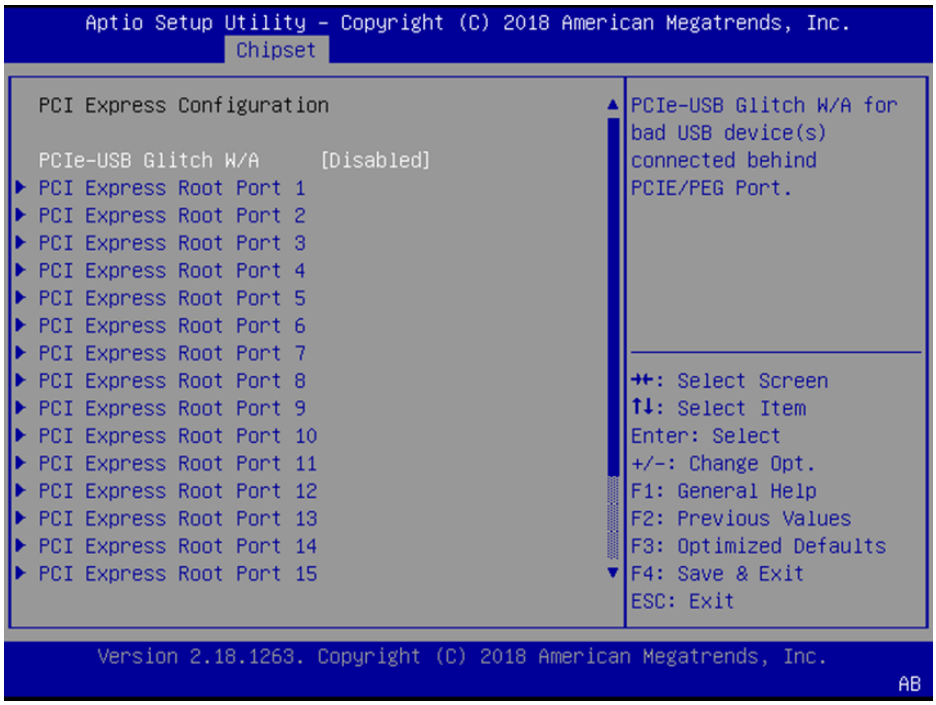
PCH-IO Configuration



Feature	Options	Description
Serial IRQ Mode	Quiet Continuous	Configure Serial IRQ Mode.
Restore AC Power Loss	Power On Power Off Last States	Restore On Power Loss.

PCI Express Configuration

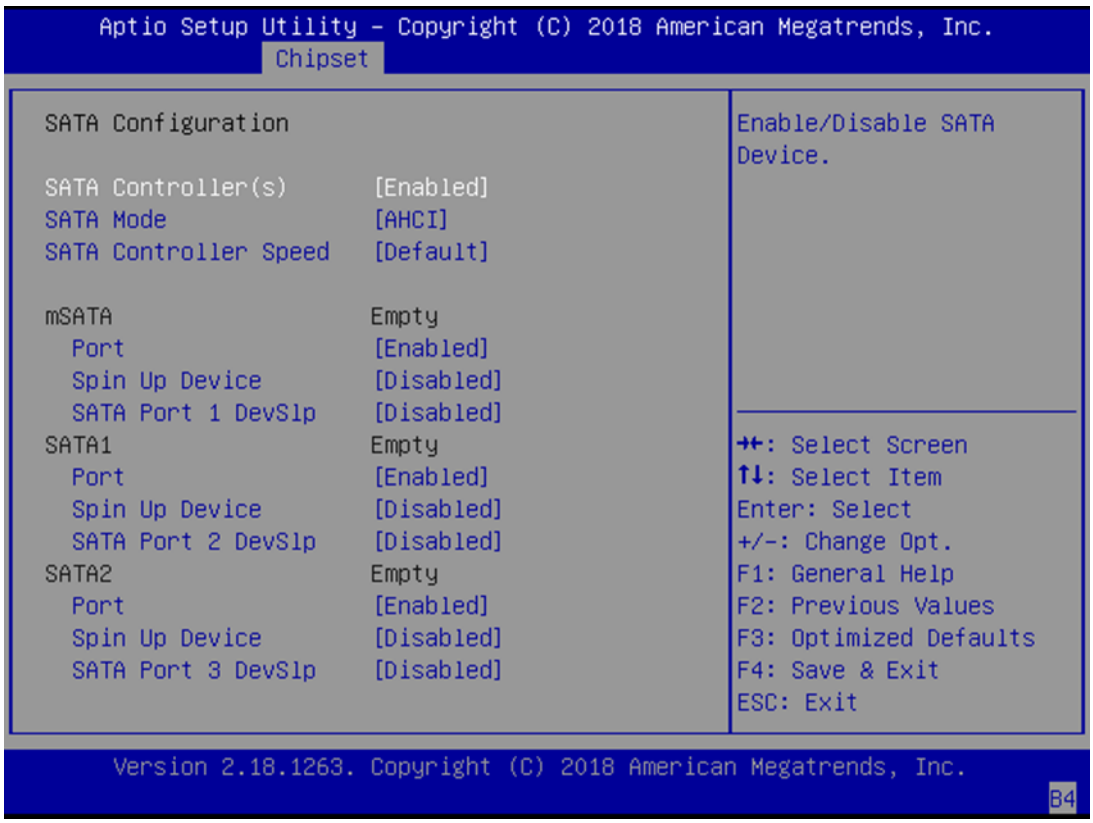




Feature	Options	Description
PCIe-USB Glitch W/A	Disabled Enabled	PCIe-USB Glitch W/A for bad USB device(s) connected behind PCIE/PEG Port.
PCI Express Root Port 1	NA	PCI Express Root Port 1 Settings
PCI Express Root Port 2	NA	PCI Express Root Port 2 Settings
PCI Express Root Port 3	NA	PCI Express Root Port 3 Settings

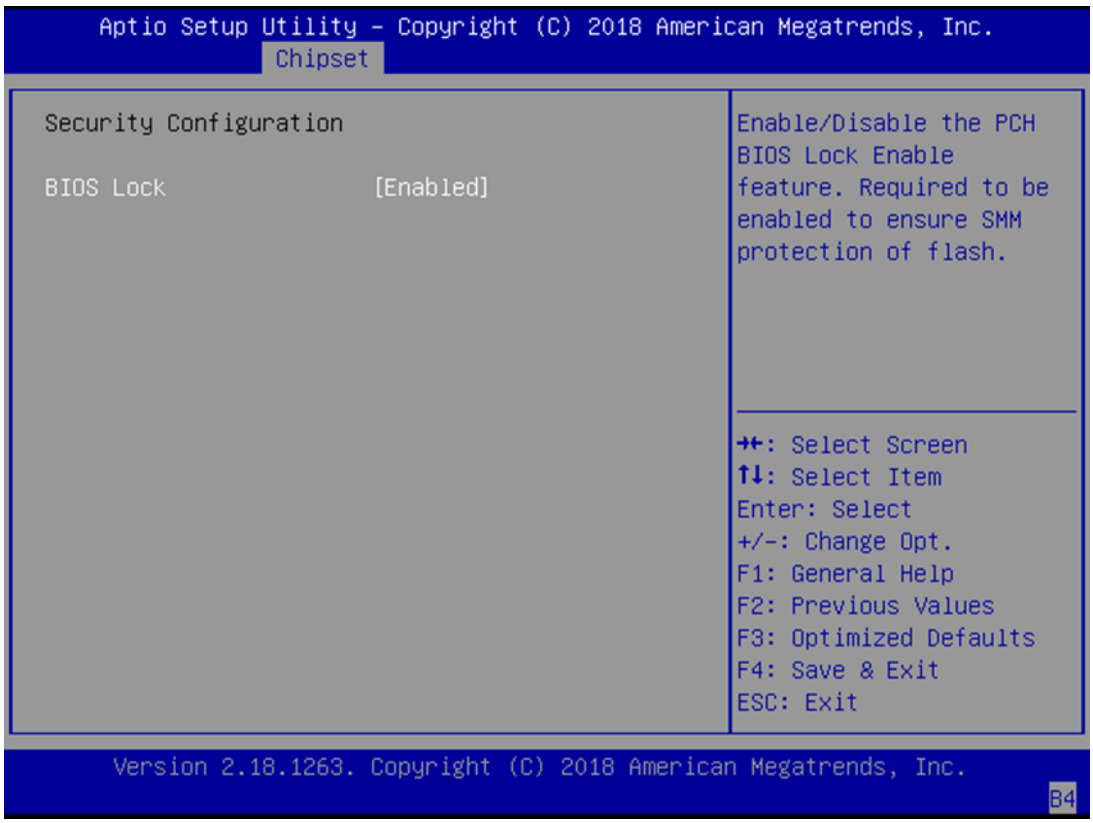
PCI Express Root Port 4	NA	PCI Express Root Port 4 Settings
PCI Express Root Port 5	NA	PCI Express Root Port 5 Settings
PCI Express Root Port 6	NA	PCI Express Root Port 6 Settings
PCI Express Root Port 7	NA	PCI Express Root Port 7 Settings
PCI Express Root Port 8	NA	PCI Express Root Port 8 Settings
PCI Express Root Port 9	NA	PCI Express Root Port 9 Settings
PCI Express Root Port 10	NA	PCI Express Root Port 10 Settings
PCI Express Root Port 11	NA	PCI Express Root Port 11 Settings
PCI Express Root Port 12	NA	PCI Express Root Port 12 Settings
PCI Express Root Port 13	NA	PCI Express Root Port 13 Settings
PCI Express Root Port 14	NA	PCI Express Root Port 14 Settings
PCI Express Root Port 15	NA	PCI Express Root Port 15 Settings

SATA Configuration



Feature	Options	Description
SATA Controller(s)	Disabled Enabled	Enable/Disable SATA Device.
SATA Mode	AHCI REID	Determines how SATA controller(s) operate.
SATA Controller Speed	Default Gen1 Gen2 Gen3	Indicates the maximum speed the SATA controller can support.

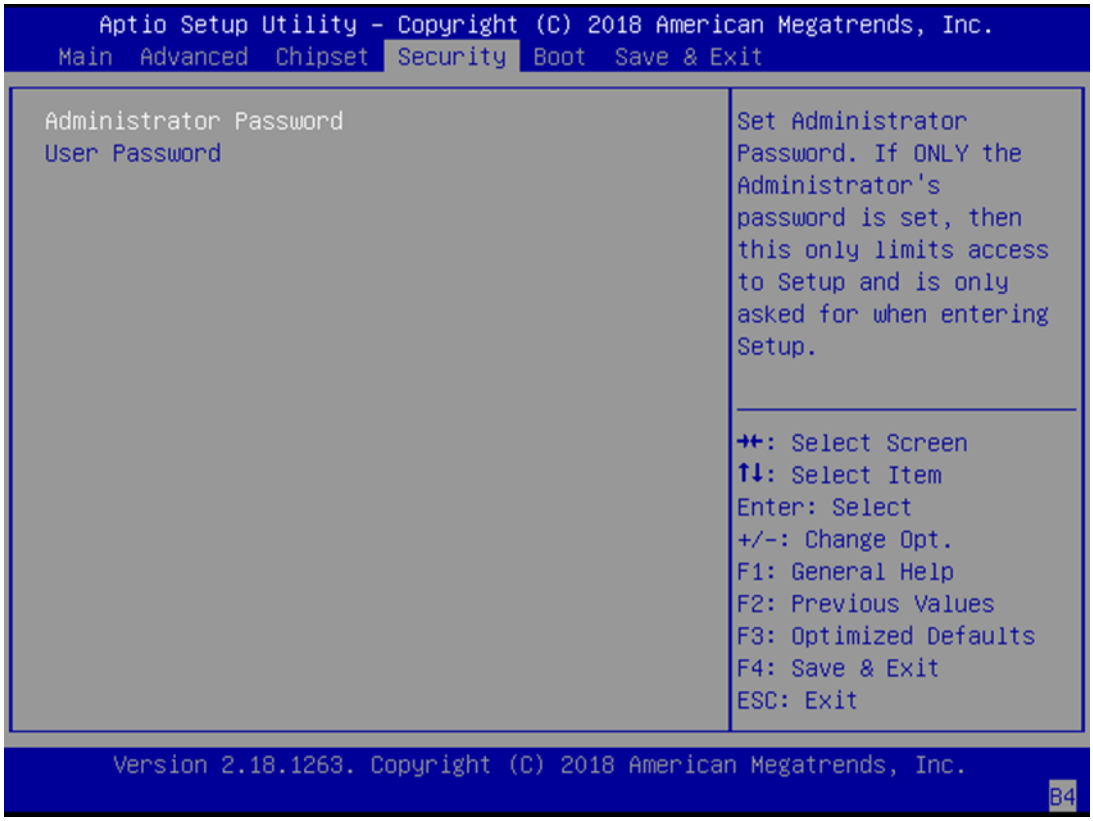
Security Configuration



Feature	Options	Description
BIOS Lock	Disabled Enabled	Enable/Disable the PCH BIOS Lock Enable feature. Required to be enabled to ensure SMM protection of flash.

Security

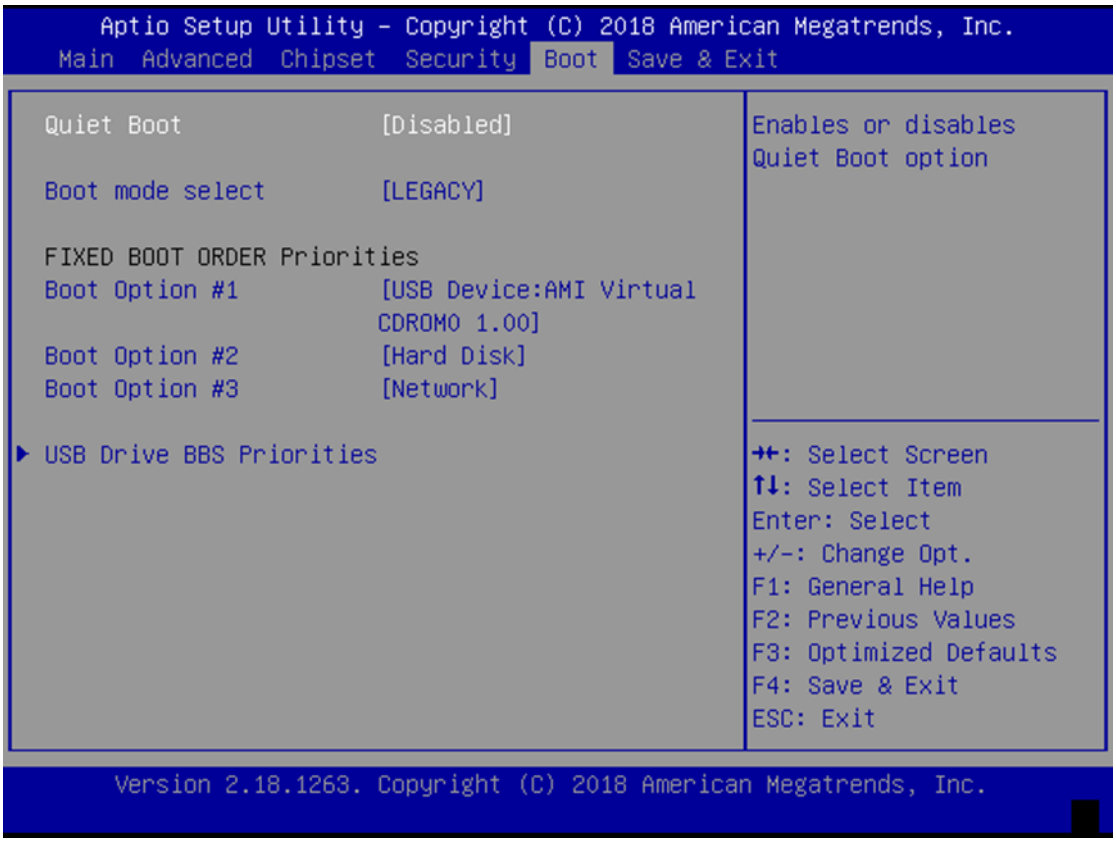
Select the Security menu item from the BIOS setup screen to enter the Security Setup screen. Users can select any of the items in the left frame of the screen.



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.

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.

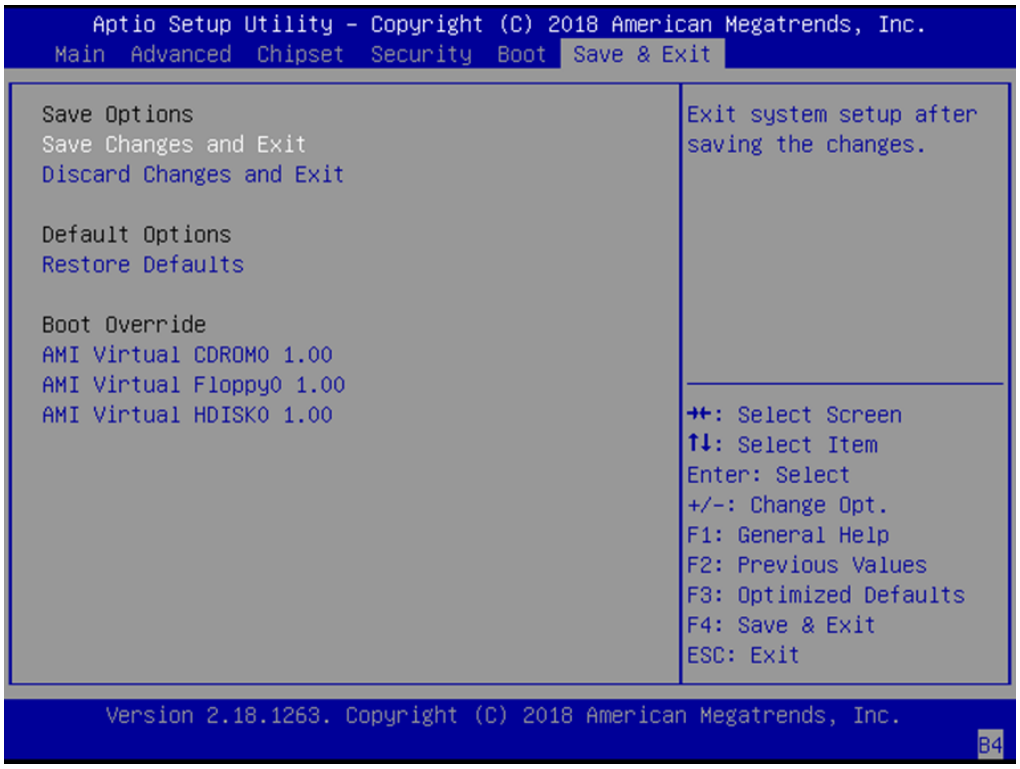


Feature	Options	Description
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option.
Boot mode select	LEGACY UEFI	Select boot mode for LEGACY or UEFI.

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

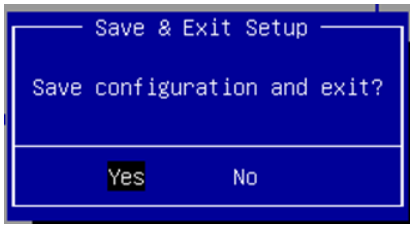
Save and Exit Menu

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.



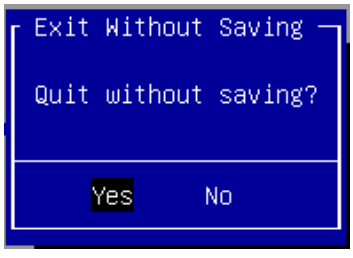
■ Save Changes and Reset

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.



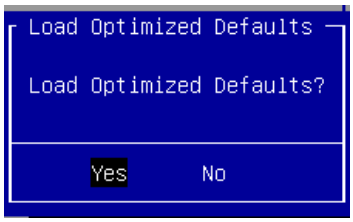
■ Discard Changes and Exit

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 be the same as the image above, as it should depend on the actual devices connect on system.

APPENDIX A: PROGRAMMING WATCHDOG TIMER

A watchdog timer is a piece of hardware that can be used to automatically detect system anomalies and reset the processor in case there are any problems. A watchdog timer is based on a counter that counts down from an initial value to zero. The software selects the counter's initial value and periodically restarts it. Should the counter reach zero before the software restarts it, the software is presumed to be malfunctioning and the processor's reset signal is asserted. Thus, the processor will be restarted as if a human operator had cycled the power.

A watchdog timer can be used to control the LAN Bypass function dynamically by programming. Lanner also provides sample code for bypass control with WDT via programming. For a reference utility that contains sample code for LAN Bypass function programming, please contact Lanner's technical support.

For thorough implementation information of Lanner Bypass and Watchdog functionalities, go to Lanner Download Center to download Lanner Bypass Implementation Manual.

APPENDIX B: SETTING UP CONSOLE REDIRECTION

Console redirection lets you monitor and configure a system from a remote terminal computer by re-directing keyboard input and text output through the serial port. The following steps illustrate how to use this feature. The BIOS of the system allows the redirection of the console I/O to a serial port. With this configured, you can remotely access the entire boot sequence through a console port.

1. Connect one end of the console cable to console port of the system and the other end to the serial port of the Remote Client System.
2. Configure the following settings in the BIOS Setup menu:
   BIOS > Advanced > Serial Port Console Redirection > Console Redirection Settings, select **115200** for the Baud Rate, **None** for Flow control, **8** for the Data Bit, **None** for Parity Check, and **1** for the Stop Bit.
3. Configure console redirection related settings on the client system. You can use a terminal emulation program that features communication with serial COM ports such as *TeraTerm* or *Putty*. Make sure the serial connection properties of the client conform to those for the server.

APPENDIX C: PROGRAMMING GENERATION 3 LAN BYPASS

The bypass function is used to link two independent Ethernet ports when the system crashes or powers off. This means if your system is equipped with a LAN Bypass function, a condition in your system will not interrupt your network traffic. Different from the previous two generations (Gen1 and Gen2), the Lanner Bypass Gen 3 employs a programming method to control the bypass function by software. There are typically two communication status for the bypass function, one is "Normal" and another is "Bypass" status. Furthermore, the Lanner Bypass software is capable to control the bypass status in the following 3 instances.

1 When the system powers off, it can be forced to enable the LAN Bypass function.
2 When the system is in the just-on state which is a brief moment when it powers up.
3 When the system is running

Please refer to the LAN_Bypass_Watchdog folder on the Driver and Manual CD.
Lanner bypass possess the following features:

1 Communication through SMBUS (I2C)
2 Independent bypass status control for each pair up to a total of 4 pairs
3 Lanner Bypass Modules can bypass systems Ethernet ports on a host system during three instances: Just-on (Just-on is the brief moment when the internal power supply turns on and booting process starts), System off, or upon software request (during run-time).
4 Software programmable bypass or normal mode
5 Software programmable timer interval:
   - JUST-ON watchdog timer, used during JUST-ON, has timer setting of 5~1275 seconds of timer interval.
   - Run-Time watchdog timer, used during run-time, has setting of 1~255 seconds of timer interval.
6 Multiple Watchdog Timers:
   -Two for run-time: It is designed to give you a more variety of controls of the bypass on port basis. By using dedicated watchdogs for different pairs of bypass, you have the flexibility to manage the bypass status for them differently.
   -One for just-on: It is designed to give you the precise control of the bypass during this phase. You can use this timer to delay enabling the bypass in just-on state.

APPENDIX D: PROGRAMMING THE LCM

The LCD panel module (LCM) is designed to provide real-time operating status and configuration information for the system. For sample LCM code, please contact Lanner's technical support.

The system supports the following 2 kinds of LCM:

- Parallel Text-based LCM: The LCM connects to the motherboard's parallel port. The LCD screen can display 2 lines, 16 (or 20) characters per line.
- USB and Serial Text or Graphic-based LCM: Our next generation LCM. Lanner engineers design a common source code to be deployed on these two differently interfaced LCM modules. Jumpers are used to select between text and graphic types. See next section.

For Parallel Text-based LCM

Build

To build program source code on Linux platform, please use the following steps as a guideline:

1 Extract the source file:

tar -xzvf plcm_drv_v0XX.tgz

(0XX is the version of the program.)

2 Change directory to the extracted folder:

cd plcm_drv_v0XX

(0XX is the version of the program.)

Note: Apply our Parallel Text-based LCM to the environment of virtualization, please use the version 013 or above of the program.

3 Type "make" to build source code:

make

After compiling, the executable programs (plcm_test, plcm_cursor_char, ppdev_test, Test) and the driver (plcm_drv.ko) will appear in the program's folder.

Note: The OS supported by Parallel Text-based LCM function includes platforms based on Linux Kernel series 2.4.x, Linux Kernel series 2.6.x and Linux Kernel series 3.0.x or above.

Install

Install the driver and create a node in the /dev directory by:

#insmod plcm_drv.ko

#mknod /dev/plcm_drv c 248 0

Note: If you cannot install the driver, check whether you have enabled the parallel port in the BIOS setting . Once the message of "insmod": error inserting 'plcm_drv.ko': -1 Input/outputerror" appears, please check that whether the major number is repeated or not. The major number needed with the "mknod" command varies with different software versions; please look up the Readme file for this value.

Execute

This section contains sample executable programs that you could test on your platform. It demonstrates some useful functionality that the LCM provides. Note that the installation needs to be completed before proceeding with these executions.

To execute, run the command:

#./plcm_test

Backlight Off/On turning off/on the backlight of the LCM display

Display Off turning off the LCM display

Cursor Off/On NOT showing/showing the cursor on the LCM display

Blinking off/On turning off/on the cursor blinking

Writing "Lanner@Taiwan" displaying the specific sentences

Reading "Lanner@Taiwan" reading the specific sentence

CGram Test displaying the user-stored characters

Keypad Testing Get the keypad input: the 1st button is read in as Left, the 2nd button is read in as Up, the 3rd button is read in as Right, and the 4th button is read in as Down)

Corresponding Commands for "plcm_test"

You can directly input the specific command to have its corresponding function worked on your LCM. This will be much more convenient once you would like to merely execute the keypad testing.

-On

— Turn on the backlight of the LCM display.

— To execute, please type:

#./plcm_test -On

-Off

— Turn off the backlight of the LCM display.

— To execute, please type:

#./plcm_test –Off

-LCM1

— Writing "Lanner@Taiwan" in line1.

— To execute, please type:

#./plcm_test -LCM1

-LCM2

— Writing "2013-11-05" in line 2.

— To execute, please type:

#./plcm_test -LCM2

Keypad

— Get the keypad input: the 1st button is read in as Left, the 2nd button is read in as Up, the 3rd button is read in as Right, and the 4th button is read in as Down.

— To execute, please type:

#./plcm_test –Keypad

Commands for plcm_cursor_char

Run this command for cursor shift & single text update

./plcm_cursor_char

Please read the options below:

Insert line select Item 1 to set the starting line as either line 1 or line 2

Move cursor right select Item 2 to move the cursor to the right

Move cursor left select Item 3 to move the cursor to the left

Add a char select Item 4 to display a character on the

LCM screen

Clean display select Item 5 to clear up the LCM display

Leave select Item 6 to exit the program

Test

This program is a testing script and runs through the following procedures in sequence:

—rmmod plcm_drv (remove the kernel mode driver module)

— insmod plcm_drv.ko (install the kernel mode driver module)

— ./plcm_test (execute the driver testing program)

— ./plcm_test -stop (stop executing the driver testing program)

— rmmod plcm_drv (remove the kernel mode driver module)

To execute, please type:

#./Test

Virtualization Implemented by Parallel

Port Pass Through

By the utilization of the parallel port pass through, the Parallel Text-based LCM implements the following three kinds of virtualization in the Guest OS.

- QEMU/KVM
- Xen
- VMWare Player

Here, we take the Fedora 20 x86_64 operation system for instance to explain 3 virtualizations respectively for parallel port pass through. Use the procedures listed below for step-by-step instructions separately based on your case.

In case of QEMU/KVM or Xen, please use the following steps as a guideline to implement the virtualization:

(1) Make sure that the Guest OS has been installed.

(2) Add the following 4 lines into the xml file
(for example, add to /etc/libvirt/qemu/<yourvirtualmachine>.xml in linux KVM):
<parallel type='dev'>
<source path='/dev/parport0'/>
<target port='0'/>
</parallel>

(3) Open a terminal in the Guest OS and then issue the following commands to install Linux Kernel drivers.
modprobe parport
modprobe parport_pc
modprobe ppdev

(4) Check that whether the /dev/parport0 exists or not. You may not find proper /dev/parport0 in the device list, please reconfirm the setup of xml file in the Guest OS.

(5) Reboot the Guest OS.

Note: It is necessary for you to install "insmod parport.ko", "parport_pc.ko" and "ppdev.ko" Linux Kernel drivers in virtualization environment before executing the "ppdev_test" testing program.

In case of VMWare Player, please use the following steps as a guideline to implement the virtualization:

(1) Make sure that the Guest OS has been installed.

(2) To set up the parallel port pass through, please enter VMWare Player's --> Virtual Machine Setting --> VMWare Player's setting page to select /dev/parport0 as parallel port device.

(3) Open a terminal in the Guest OS and then issue the following commands to install Linux Kernel drivers.
modprobe parport
modprobe parport_pc
modprobe ppdev

4) Check that whether the /dev/parport0 exists or not. You may not find proper "/dev/parport0" in the device list, please reconfirm the setup of VMWare Player's setting page described in Step 2.

(5) Reboot the Guest OS.

Note: It is still necessary for you to install "insmod parport.ko", "parport_pc.ko" and "ppdev.ko" Linux Kernel drivers in virtualization environment before executing the "ppdev_test" testing program.

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