Lanner

Network Appliance Platform

Hardware Platforms for Network Computing

NCA-4112 User Manual

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About this Document

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

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

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

Conventions & Icons

This document utilizes different font types and icons in order to make selected text more transparent and explicable to users. 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 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** at http://www.lannerinc.com/technical-support where you can fill in a support ticket to our technical support department.

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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.

Avertissement concernant la pile au lithium

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

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Sécurité de fonctionnement

- L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.

- Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

Mounting Installation Precautions

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

- Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- The installation of this product must be performed by trained specialists; otherwise, a non-specialist might create the risk of the system's falling to the ground or other damages.
- Lanner Electronics Inc. shall not be held liable for any losses resulting from insufficient strength for supporting the system or use of inappropriate installation components.
- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Grounding - Reliable grounding of rack mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Electrical Safety Instructions

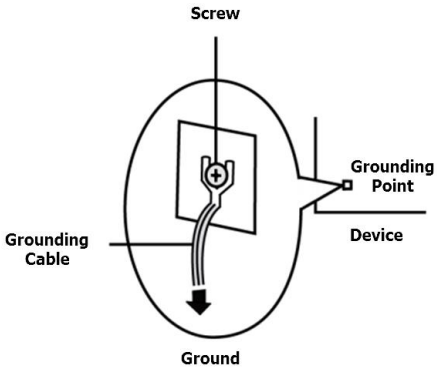
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire is required and the part connecting the conductor must be greater than 4 mm2 or 10 AWG.

Consignes de sécurité électrique

- Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm2 ou 10 AWG.

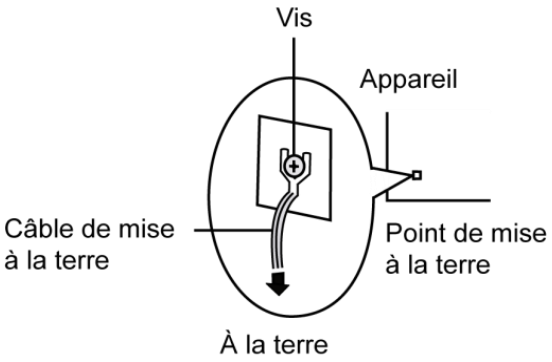
Grounding Procedure for DC Power Source

- Loosen the screw of the earthing point.
- 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

- Desserrez la vis du terminal de mise à la terre.
- 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.



- 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 has installation instructions by a skilled person (for Fan side).
  Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.
  Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.

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

Table of Contents

CHAPTER 1: PRODUCT OVERVIEW

Main Features

- AMD EPYC 3000 series (3151 / 3251 depend on SKU)
- Max 8 x front GBE ports with 3 pair gen3 bypass and 2 x10G SFP+
- 1 x front NCS2 NIC module support (PCIe G3 x8 or x4x4)
- 1 x front LTE Carrier for LTE Module
- TPM/ IPMI/ Dual BIOS optional
- Redundant PSU Design (Single PSU design Reserved)
- 2x2.5" HDD storage bay
- 1 x M.2 2242 for Storage
- 1 x mPCIE for Wifi

Package Content

Your package contains the following items:

- 1x NCA-4112 Network Security Platform (Packing reserve 438 slide rail space)
- 2x Power cord (Default US)
- 1x long Ear Rack mount kit with screws
- 1x Console cable (RJ45 Type)
- 1x LAN Cable (Grey)
- 1x SAS Cable

Optional Accessories

Type	Description
RC-Card (RC-41121A)	PCIE Riser Card For Rear Expansion Slot (PCIEx8 Connector)
LTE Kit (WM1S1-7455A-NCA4112、WM1S1-7511A-NCA4112)	LTE Carrier with one mPCIE slot and two sim card slots for LTE Connectivity
NCS2 Module	
1U Slide Kit	
Field Replacement Module	FAN Modules

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.

Slim Type NIC Module					
Module	Ports	Connector Speed	Chipset	PCIe Interface	LAN Bypass
NCS2-IGM806A	8	1Gb RJ-45	Intel i350AM-4	2* PCIEx4	G3
NCS2-ISM405A	4	1Gb SFP	Intel i350AM-4	1* PCIEx4	Fiber Bypass Non-Latching
NCS2-ISM802A	8	1Gb SFP	Intel i350AM-4	2* PCIEx4	N/A

NCS2-IMM802A	4+4	1Gb SFP 1Gb RJ-45	Intel i350AM-4	2*PCIEx4	G3
NCS2-IXM405A	4	10Gb SFP+	Intel 82599ES PEX8724	1* PCIEx8	N/A
NCS2-IXM407A	4	10Gb SFP+	Intel XL710-BM1	1* PCIEx8	N/A
NCS2-IQM201A	2	40Gb QSFP+	Intel XL710-BM2	1* PCIEx8	N/A
NCS2-IXM801A	8	10Gb SFP+	Intel XL710-BM1	2*PCIEx4	N/A
NCS2-ISM406A	4	1Gb SFP	Intel i350AM-4	1* PCIEx4	N/A
NCS2-IGM808A	8	1Gb RJ-45	PEX8618 Intel I210AT	1* PCIEx8	G3
NCS2-IGM428A	4	1Gb RJ-45	Intel i350AM-4	1* PCIEx4	G3
NCS2-IXM205A	2	10Gb SFP+	Intel 82599ES	1* PCIEx8	Fiber Bypass Non-Latching Controller
NCS2-IXM409A	4	10Gb SFP+	Intel XL710-BM1	1* PCIEx8	multi mode / latch

Ordering Information

SKU No.	Main Features
NCA-4112**A**	AMD 3251+ 8x GbE RJ45 W/ 3 Pairs bypass +2 x 10G SFP+
NCA-4112**B**	AMD 3251+ 8x GbE RJ45 W/ 3 Pairs bypass
NCA-4112**C**	AMD 3151+ 8x GbE RJ45 W/ 3 Pairs bypass +2 x 10G SFP+
NCA-4112**D**	AMD 3151+ 8x GbE RJ45 W/ 3 Pairs bypass

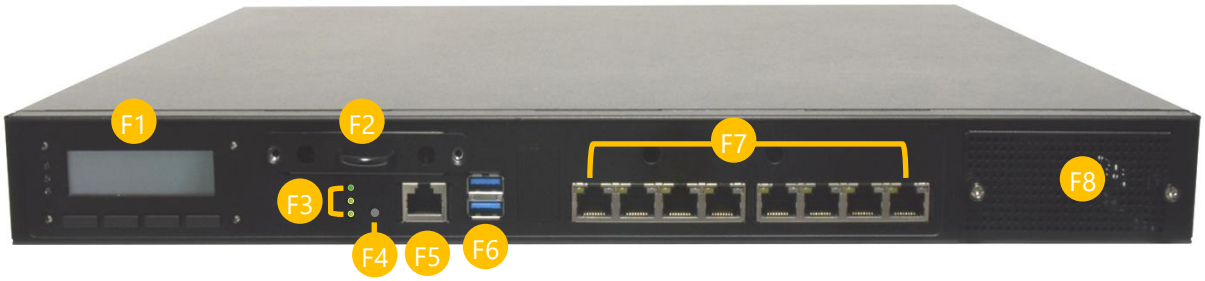
System Specifications

Form Factor		1U 19" Rackmount
Platform	Processor Options	AMD EPYC™ 3000 Series 4~8 Cores
	CPU Socket	onboard
	Chipset	SoC
	Security Acceleration	10Gbps Encryption + 10Gbps Decryption
BIOS		AMI SPI Flash BIOS
System Memory	Technology	DDR4 2666 MHz REG DIMM
	Max. Capacity	128GB
	Socket	4x 288-pin DIMM
Networking	Ethernet Ports (By SKU)	8x GbE RJ45 IntelR i350-AM4 2 x 10G SFP+
	Bypass	3x Pairs of Gen3
	NIC Module Slot	1 (for 1 x PCIe*8 or 2 x PCIe*4)
LOM	IO Interface	1x RJ45 *Share with ETH0
	OPMA slot	Yes
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, 4 x Keypads
	Display	From OPMA Slot for VGA (Optional)
	Power input	AC Power Inlet on PSU
Storage	HDD/SSD Support	2x 2.5" Bays
	Onboard Slots	1x M.2 2242, 1 x Mini-PCIe
Expansion	PCIe	1x PCIe*2 (Optional)

	mini-PCIe	1x Mini PCIe (for Wifi)
Miscellaneous	Watchdog	Yes
	Internal RTC with Li Battery	Yes
	TPM	TPM 1.2/2.0
Cooling	Processor	Passive CPU heat sink
	System	2x Cooling Fans w/ Smart Fan
Environmental Parameters	Temperature	0~40ºC Operating -20~70ºC Non-Operating
	Humidity (RH)	5~90% Operating 5~ 95% Non-Operating
System Dimensions	(WxDxH)	438 x 431 x 44 mm
	Weight	TBD
Package Dimensions	(WxDxH)	582 x 548 x 182 mm
	Weight	TBD
Power	Type/Watts	Redundant 300W Power Adapter
	Input	100~240VAC,50~60Hz, 5~3A
Approvals and Compliance		RoHS, CE/FCC, UL

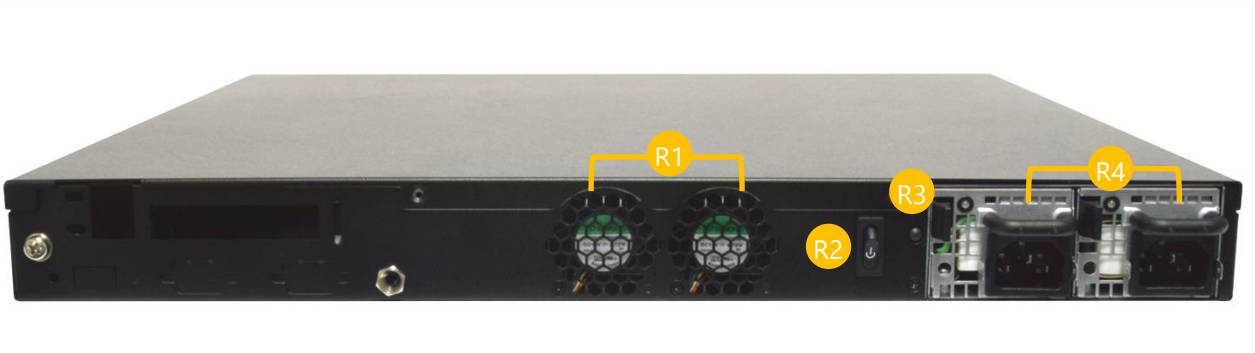
Front Panel

SKU B/D



No.	Description	
F1	LCD Panel	1x LCD display + 4x hard key
F2	SIM Holder	Extractable SIM card drawer with 2x SIM slot for LTE modules
F3	LED Indicators	
F4	Reset Button	- Press once for software reset - Press twice for hardware reset
F5	Console Port	1x RJ-45 Management Port
F6	USB Ports or SFP+ Ports	2x USB 3.0 (SKU B/D) 2x 10G SFP+ Port (A/C)
F7	LAN Port	8x RJ45 port
F8	NIC Slot	1 x NIC module space with PCIe interface

Rear Panel

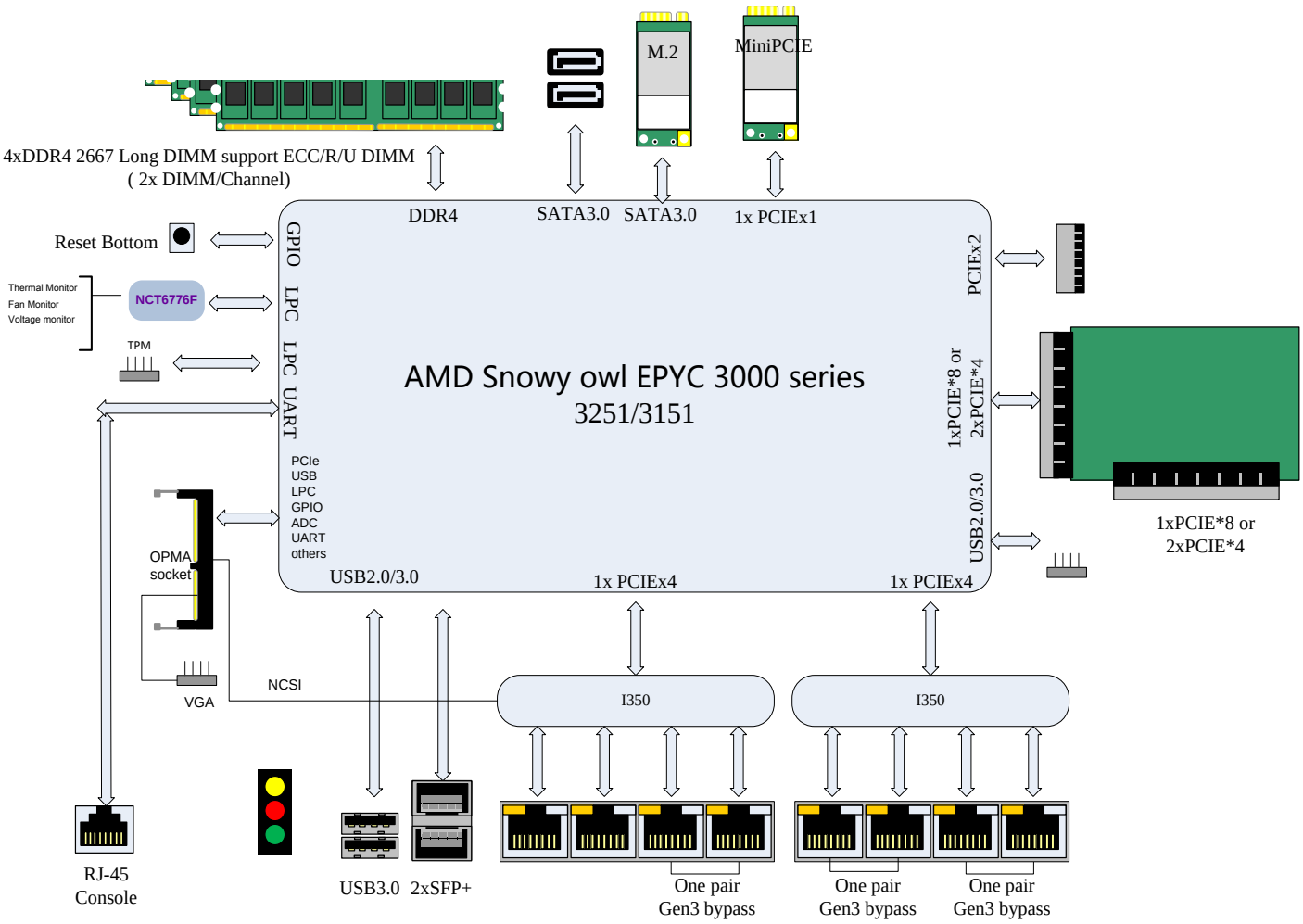


No.	Description	
R1	Fans	2 x Independent Swappable Fans
R2	Power Switch	1 x Power Button - Short press to power off the system; - Long press (> 4sec) to force the system to shut down - Short press twice to have GPIO select **NMI EVENT**
R3	Alarm off Button	An audible alarm will sound when the system's redundant power is missing. Press this button to turn the alarm off.
R4	Power Supply	2x 300W Redundant (N+1 Design)

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.

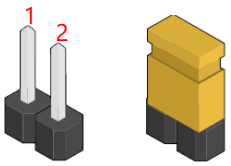
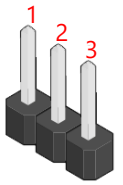
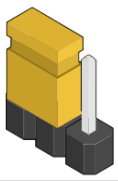
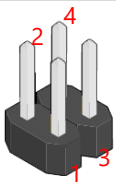
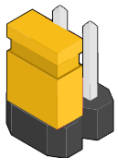


Internal Jumpers

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.

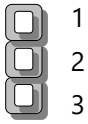
Jumper Setting

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

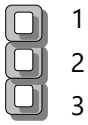
JCOM1：RTC reset

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



SWJ6：RESET

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

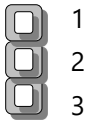


ATPW1：AT/ATX Mode selection

Action	Description
w/o Jumper(default)	ATX mode
w/ Jumper	AT mode

J4：GEN3 LAY Bypass programming

Pin	Description
1-2 (Default)	Normal
2-3	Programming



Internal Connectors

ATX1: Power Supply Connector

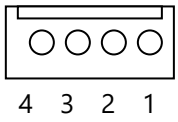
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	+3.3V
3	+3.3V	4	NC
5	GND	6	GND
7	+5V	8	PSON
9	GND	10	GND
11	+5V	12	GND
13	GND	12	GND
15	PROK	16	NC
17	5VSB	18	+5V
19	+12V	20	+5V
21	+12V	22	+5V
23	+3.3V	24	GND

ATX2: Power Supply Connector

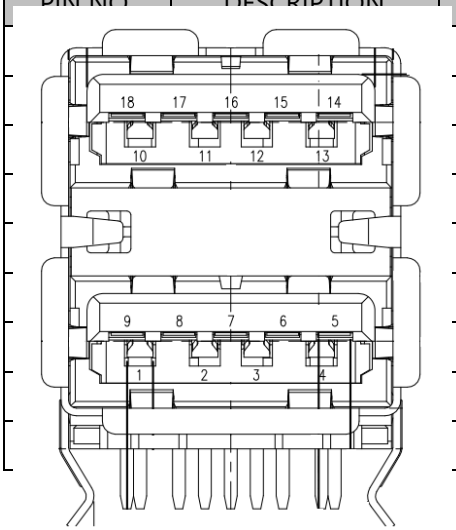
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	GND	4	+12V
5	GND	6	+12V
7	GND	8	+12V

CON2~3: SATA Power Connector 1x4 Pins 2.54mm

Pin number	Pin signal
1	12V
2	Ground
3	Ground
4	5V



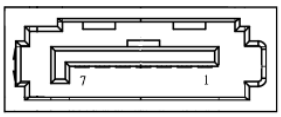
USB1 : USB3.0 Dual CONN



PIN NO.	DESCRIPTION
10	USB5V
11	D2-
12	D2+
13	GND
14	SSRX2-
15	SSRX2+
16	GND
17	SSTX2-
18	SSTX2+

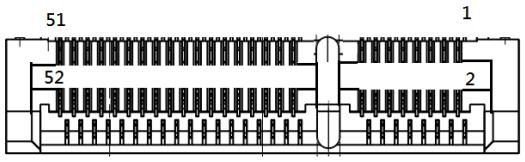
SATA1~2:180º SATA CONNECTOR

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



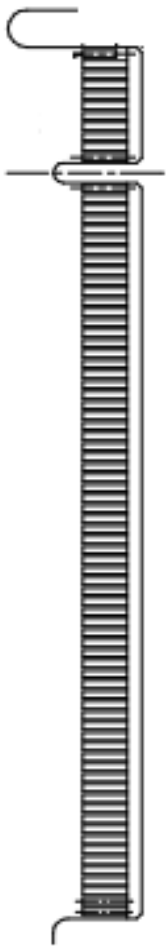
MPCIE1: MiniPCIE Socket

Pin	Description	Pin	Description
1	Wake	27	GND
2	VCC3	28	VCC1P5
3	NC_RSV1	29	GND
4	GND	30	NC
5	NC_RSV2	31	TXN
6	VCC1P5	32	NC
7	CLKREQ	33	TXP
8	NC_UIM_PWR	34	GND
9	GND	35	GND
10	NC_UIM_DATA	36	USB_D-
11	REFCLK-	37	GND
12	NC_UIM_CLK	38	USB_D+
13	REFCLK+	39	VCC3
14	NC_UIM_RST	40	GND
15	GND	41	VCC3
16	NC_UIM_VPP	42	NC_LED_WWAN#
17	NC_RSV3	43	GND
18	GND	44	LED_WLAN#
19	NC_RSV4	45	NC_RSV9
20	W_DISABLE	46	NC_LED_WPAN#
21	GND	47	NC_RSV10
22	RSEST	48	VCC1P5
23	RXN	49	MINI_LED#
24	VCC3	50	GND
25	RXP	51	NC_RSV12
26	GND	52	VCC3



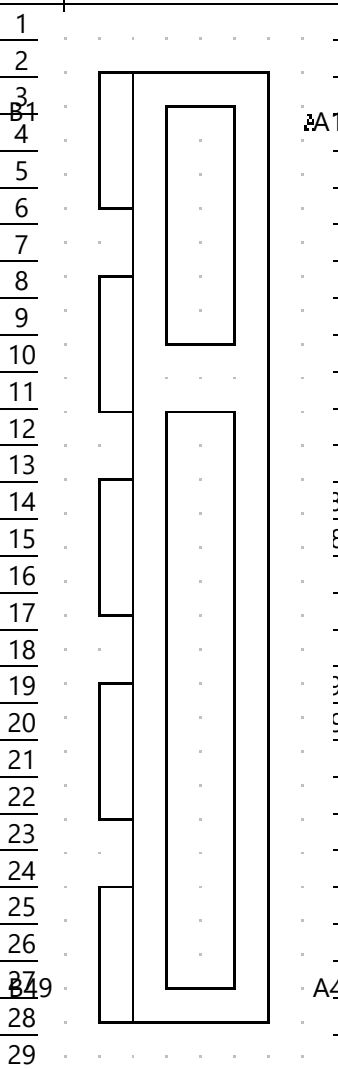
JPCIE1: PCIe x8 G/F

Pin	Side B	Side A
1	+12V	GND
2	+12V	+12V
3	+12V	+12V
4	GND	GND
5	SMB_CLK	NC
6	SMB_DAT	NC
7	GND	NC
8	P3V3	CFG6
9	NC	P3V3
10	P3VSB	P3V3
11	WAKE#	PLTRST_PCIE_N
12	NC	GND
13	GND	CLK_0_DP
14	PCIE_TX_P7	CLK_0_DN
15	PCIE_TX_N7	GND
16	GND	PCIE_RX_P7
17	NC	PCIE_RX_N7
18	GND	GND
19	PCIE_TX_P6	NC
20	PCIE_TX_N6	GND
21	GND	PCIE_RX_P6
22	GND	PCIE_RX_N6
23	PCIE_TX_P5	GND
24	PCIE_TX_N5	GND
25	GND	PCIE_RX_P5
26	GND	PCIE_RX_N5
27	PCIE_TX_P4	GND
28	PCIE_TX_N4	GND
29	GND	PCIE_RX_P4
30	CLK_1_DP	PCIE_RX_N4
31	CLK_1_DN	GND
32	GND	NC
33	PCIE_TX_P3	NC
34	PCIE_TX_N3	GND
35	GND	PCIE_RX_P3
36	GND	PCIE_RX_N3
37	PCIE_TX_P2	GND
38	PCIE_TX_N2	GND
39	GND	PCIE_RX_P2
40	GND	PCIE_RX_N2
41	PCIE_TX_P1	GND
42	PCIE_TX_N1	GND
43	GND	PCIE_RX_P1
44	GND	PCIE_RX_N1
45	PCIE_TX_P0	GND
46	PCIE_TX_N0	GND
47	GND	PCIE_RX_P0
48	NC	PCIE_RX_N0
49	GND	GND



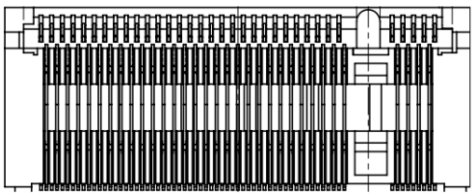
PCIE2: 180º PCIe x8 Connector

Pin	Side B	Side A
1		GND
2		+12V
3		+12V
4		GND
5		NC
6		NC
7		NC
8		NC
9		P3V3
10		P3V3
11		PLTRST_PCIE_N
12		GND
13		CLK_1_DP
14		CLK_1_DN
15		GND
16		PCIE_RX_P8
17		PCIE_RX_N8
18		GND
19		NC
20		GND
21		PCIE_RX_P9
22		PCIE_RX_N9
23		GND
24		GND
25		NC
26		NC
27		GND
28		GND
29		NC
30	NC	NC
31	NC	GND
32	GND	NC
33	NC	NC
34	NC	GND
35	GND	NC
36	GND	NC
37	NC	GND
38	NC	GND
39	GND	NC
40	GND	NC
41	NC	GND
42	NC	GND
43	GND	NC
44	GND	NC
45	NC	GND
46	NC	GND
47	GND	NC
48	NC	NC
49	GND	GND



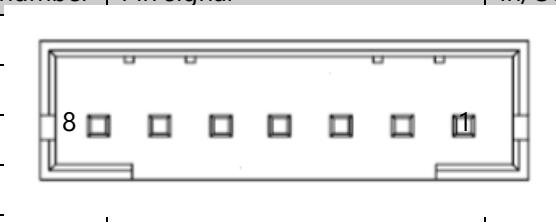
JNGFF1: M.2 M - key

1 75



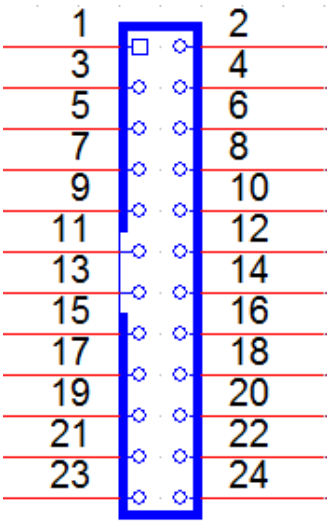
Pin	Description	Pin	Description
1	GND	2	+P3V3
3	GND	4	+P3V3
5	PAIR3_RXN	6	NC
7	PAIR3_RXP	8	NC
9	GND	10	NC
11	PAIR3_TXN	12	+P3V3
13	PAIR3_TXP	14	+P3V3
15	GND	16	+P3V3
17	PAIR2_RXN	18	+P3V3
19	PAIR2_RXP	20	NC
21	GND	22	NC
23	PAIR2_TXN	24	NC
25	PAIR2_TXP	26	NC
27	GND	28	NC
29	PAIR1_RXN	30	NC
31	PAIR1_RXP	32	NC
33	GND	34	NC
35	PAIR1_TXN	36	NC
37	PAIR1_TXP	38	NC
39	GND	40	NC
41	PAIR0_RXP	42	NC
43	PAIR0_RXN	44	NC
45	GND	46	NC
47	PAIR0_TXN	48	NC
49	PAIR0_TXP	50	RESET#
51	GND	52	CLKREQ
53	CLK_N	54	WAKE#
55	CLK_P	56	NC
57	GND	58	NC
67	NC	68	CLK32K
69	NC	70	+P3V3
71	GND	72	+P3V3
73	GND	74	+P3V3
75	GND		

JPMBUS1 : PMBUS

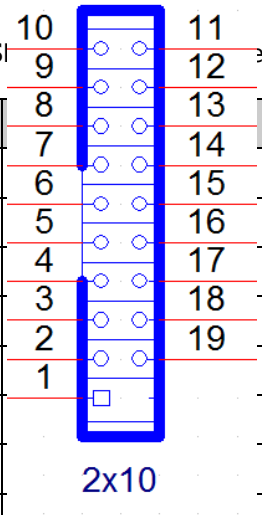
Pin number	Pin signal	In/Out
1		
2		
3		
4		
5	NC	
6	PMBUS_CLK	
7	PMBUS_DATA	
8	NC	

CM1: LCM module

Pin	Description	Pin	Description
1	5V	2	GND
3	SLIN	4	VEE
5	AFD	6	INIT
7	PD1	8	PD0
9	PD3	10	PD2
11	PD5	12	PD4
13	PD7	14	PD6
15	LCD_N	16	5V
17	KPA1	18	KPA2
19	KPA3	20	KPA4
21	RST	22	CRT_GRN
23	CTR_YLW	24	HD_LED



LTE_USI eader

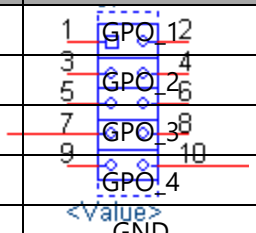


Pin		Pin	Description
1		11	D2+
2		12	D2-
3		13	GND
4		14	USB3_TX2+1
5		15	USB3_TX2-1
6		16	GND
7		17	USB3_RX2+1
8		18	USB3_RX2-1

9	D1+	19	V5USB
10	LTE_PWR	20	KEY

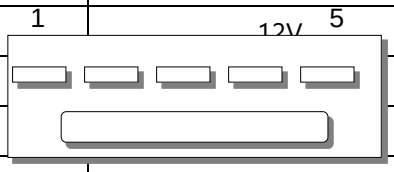
JGP1:DIO Port

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



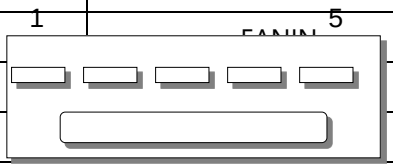
FAN1: 5Pin FAN connector

Pin No.	Description
1	GND
2	12V
3	
4	
5	FANOUT



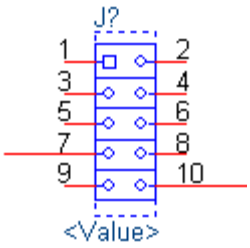
FAN2~3: 5Pin FAN connector

Pin No.	Description
1	GND
2	12V
3	
4	
5	



COM2:COM Port 2.0 mm Pin Header SMD 2x5

PIN NO.	DESCRIPTION
1	Data Carrier Detect (DCDA #)
2	Data Set Ready (DSRA #)
3	Receive Data (RXDA)
4	Request To Send (RTSA #)
5	Transmit Data (TXDA)
6	Clear To Send (CTSA #)
7	Data Terminal Ready (DTRA #)
8	Ring Indicator (RIA #)
9	Ground (GND)
10	Key pin



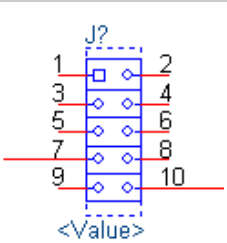
JPWR1 : Power button cable

Pin	Description
1	GND
2	PWRON#

TPM1: 2.54 Pin header 2x6

Pin	Description	Pin	Description
1	SERIRQ	2	LFRAME
3	LAD0	4	CLK
5	LAD1	6	3VSB
7	LAD2	8	NC
9	LAD3	10	3V3
11	RST	12	GND

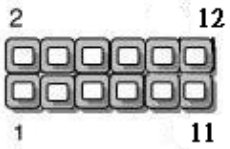
LCM_1: 2.54 SMD Pin header 2x5

Pin		Pin	Description
1		2	P5V
3		4	NC
5		6	HDD_LED
7		8	GND
9		10	COM2_RX

LOM1: 2.54 SMD Pin header 2x6

Pin	Description	Pin	Description
1	MDIP0	2	MDIN0
3	MDIP1	4	MDIN1
5	MDIP2	6	MDIN2
7	MDIP3	8	MDIN3
9	SPEED_100_N	10	ACT_N
11	SPEED_1G_N	12	P3VSB

VGA1: 2.54 SMD Pin header 2x6



Pin	Description	Pin	Description
1	CRT_RED	2	GND
3	CRT_GREEN	4	GND
5	CRT_BLUE	6	GND
7	CRT_HSYNC	8	NC
9	CRT_VSYNC	10	GND
11	DDC_DATA	12	DDC_CLK

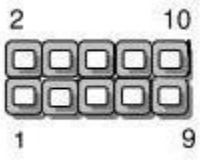
JOPEN1 : Case open cable

Pin	Description
1	GND
2	CSOPEN#

JSPIROM1: 2.0mm SMD Pin header SMD 2X5

Pin	Description	Pin	Description
1	NC	2	NC
3	SPI_CS_L	4	V_3P3_SPI
5	SPI_MISO	6	SPI_HOLD0_L
7	NC	8	SPI_CLK
9	GND	10	SPI_MOSI

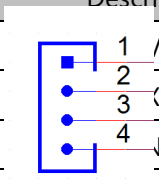
J80PORT1: 2.0mm Pin header 2x5



PIN	DESCRIPTION	PIN	DESCRIPTION
1	CLK	2	LAD1
3	RST-	4	LAD0
5	LRAME-	6	P3V3
7	LAD3	8	KEY
9	LAD2	10	GND

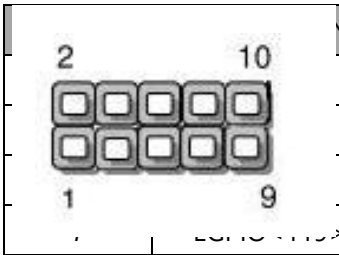
CON1: GEN3 Bypass programming pin header

Pin	Description
1	/SB
2	D
3	ND
4	D



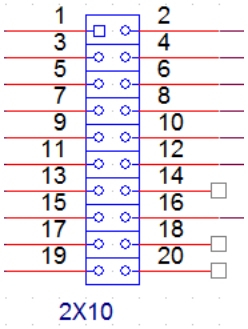
J3: 2.0mm SMD Pin header 2x5 (MG9094 Test)

		PIN	DESCRIPTION
		2	SGPIO_SMBUS_CLK
		4	SGPIO_SMBUS_DATA
		6	SGPIO0_CLK
		8	SGPIO0_DATAOUT
9	GND	10	SGPIO0_LOAD



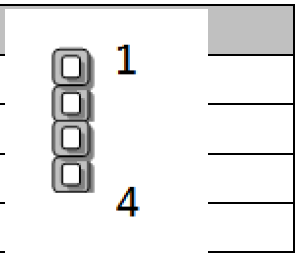
JHDT1: 1.27mm SMD Pin header 2X10 (HDT debug)

PIN	DES TION	PIN	DESCRIPTION
1	P1V8SB	2	HDT_TCK
3	GND	4	HDT_TMS
5	GND	6	HDT_TDI
7	GND	8	HDT_TDO
9	HDT_TRST_L	10	PWROK
11	PD	12	RESET_L
13	PD	14	NC
15	PD	16	HDT_DBREQ_L
17	GND	18	NC
19	P1V8SB	20	NC



JACE1: 2.54 Pin header 1x4

Pin	
1	
2	
3	
4	

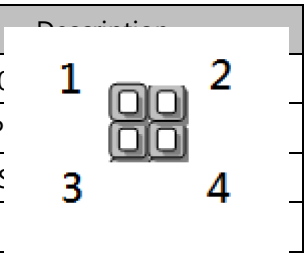


J5 : 2.0mm Pin header (Disable RTC voltage)

Pin	Description
W/O Jumper (default)	Normal
W/ Jumper	Disable RTC power

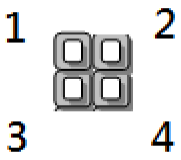
JCK1: 2.00mm Pin header 1x4(SMBUS Swap)

Pin	Description
1	P0
2	P
3	S
4	



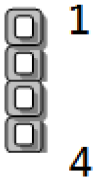
JDA1: 2.00mm Pin header 1x4(SMBUS Swap)

Pin	Description
1	P0_SPD_SMBUS_DATA
2	P0_HP_SMBUS_DATA
3	SFPP_SMBUS_DATA
4	P0_BMC_SDA



PJ1: 2.54 SMD Pin header 1x4 (Power PWM controller programming)

Pin	Description
1	NC
2	GND
3	VR_SMBUS_SDA
4	VR_SMBUS_CLK

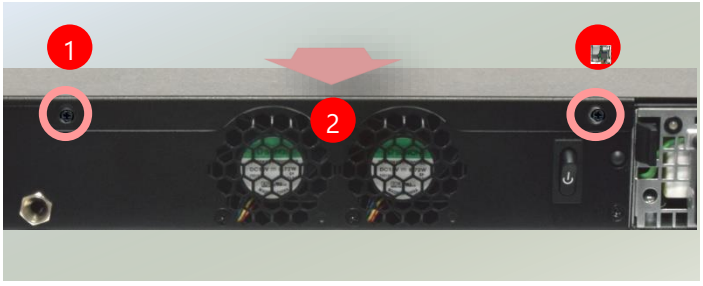


CHAPTER 2: HARDWARE SETUP

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.

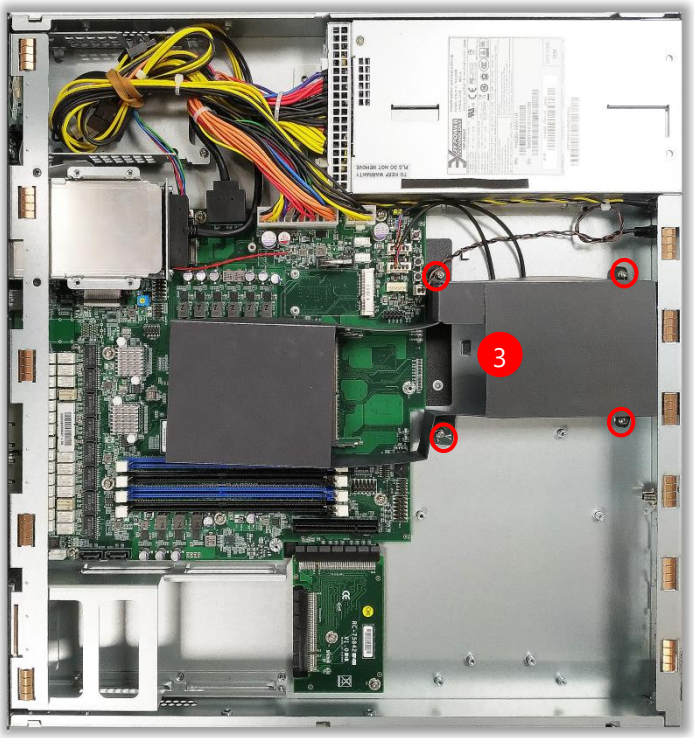
Opening the Chassis

1. Loosen the 2 thumb screws from the rear panel .

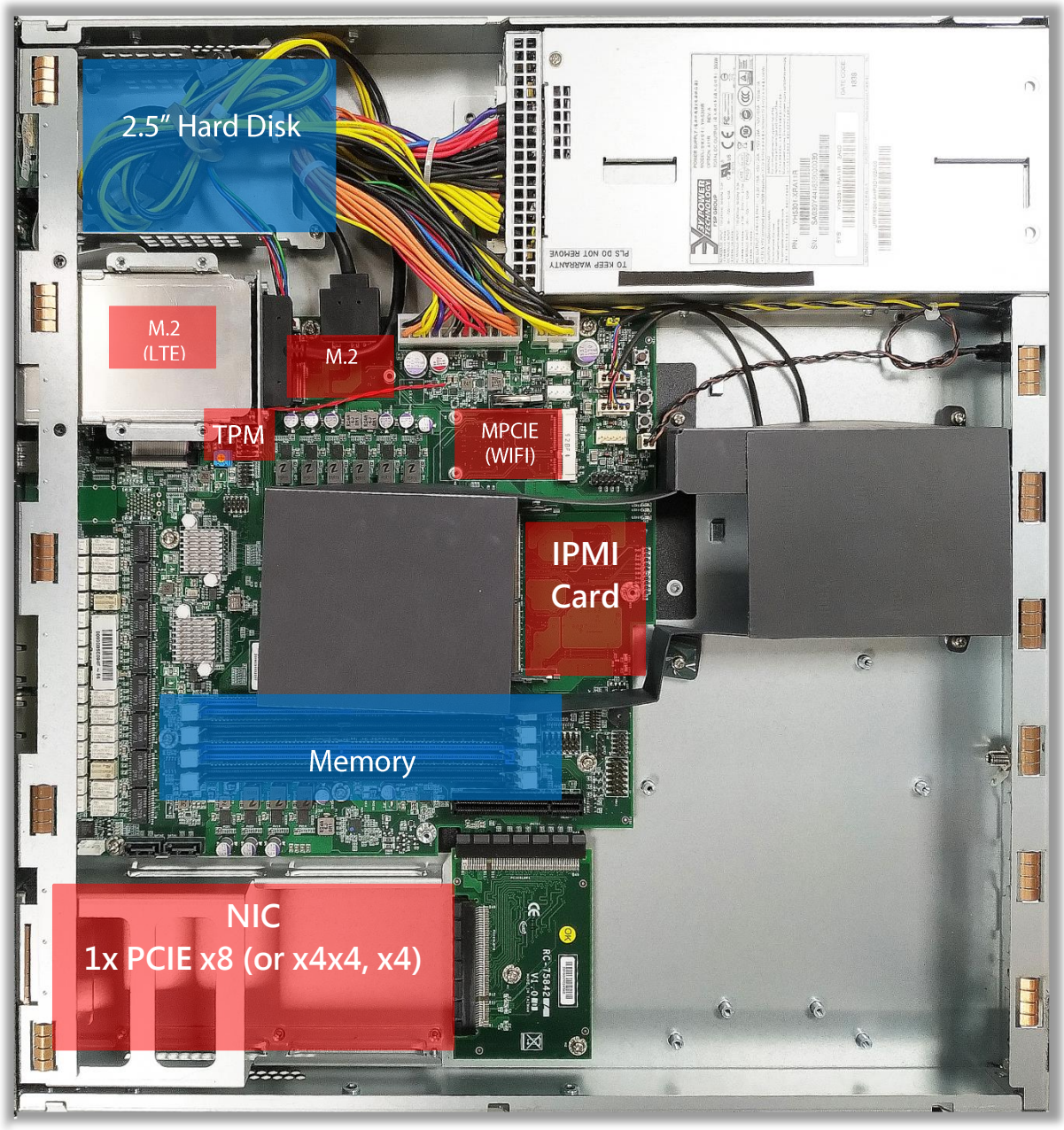


2. Gently pull the cover backward a bit, and lift the cover up to remove it.

3. Loosen the screws indicated in the picture and remove the cover that encloses the CPUs and the fans.



This system supports multiple wireless connectivity methods with two M.2 slots and a MPCIE slot. Based on your application and modules used, install modules in the corresponding slots.



Installing the System Memory

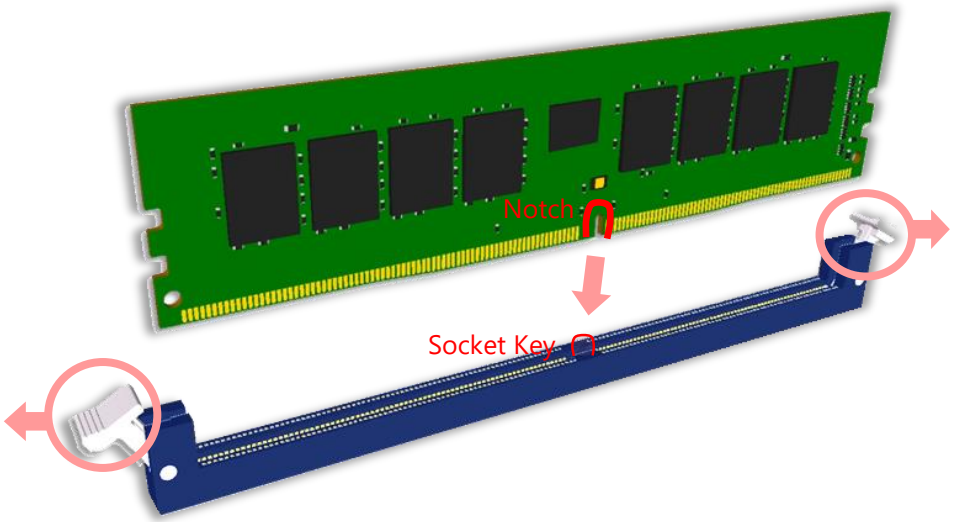
The motherboard supports 16 memory slots for DDR4 registered DIMM.

Total Slots	4 (4 slots per processor)
Number of Channels	4 (Channel 0~1, 2 DIMM per channel) per processor
Supported DIMM Capacity	4GB, 8GB, 16GB, 32GB
Memory Size	Maximum 128 GB RDIMM (32GB*4)
Memory Type	DDR4 2666 MHz ECC/U/R DIMM
Minimum DIMM Installed	Each processor requires at least 2 memory modules to boot and run from.

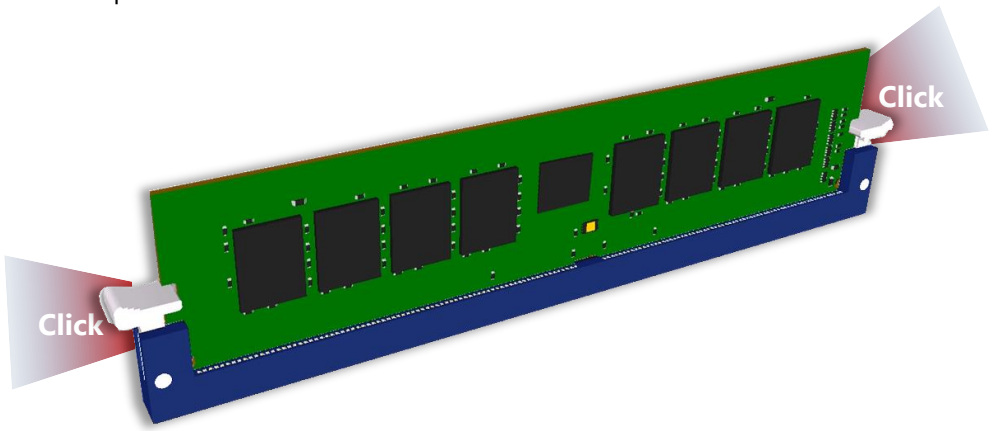
Memory Module Installation Instructions

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.

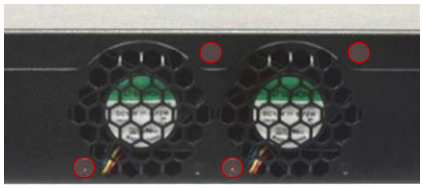


4. Push the module down into the slot until it is firmly seated. Press vertically on both corners of the card until it clicks into place.



Replacing the 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.



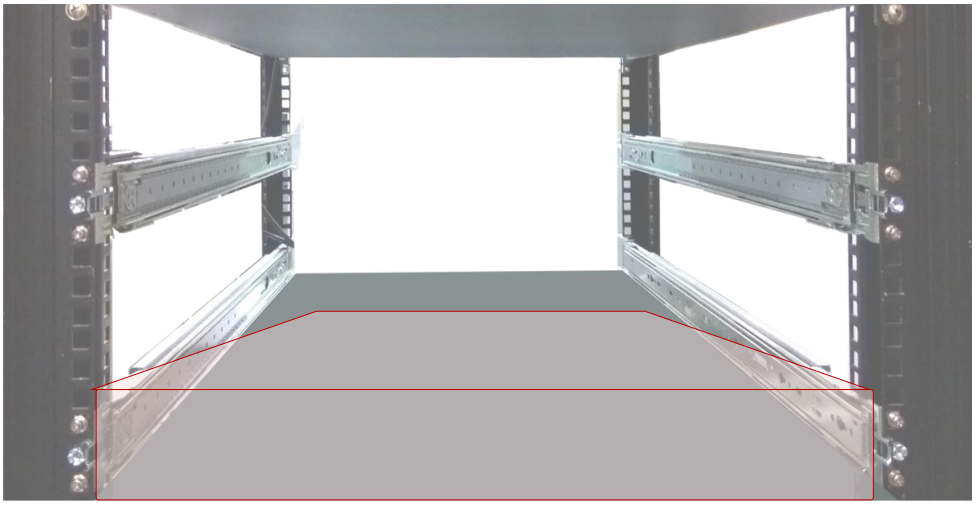
1. Remove the chassis cover.
2. From the rear side of the fan, loosen the screw that secures the fan connector.
3. Disconnect the fan connector.
4. Take out the worn fan and disconnect its power cable connector from the motherboard.
5. Install a new fan by reversing the above 2-4 steps.

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**

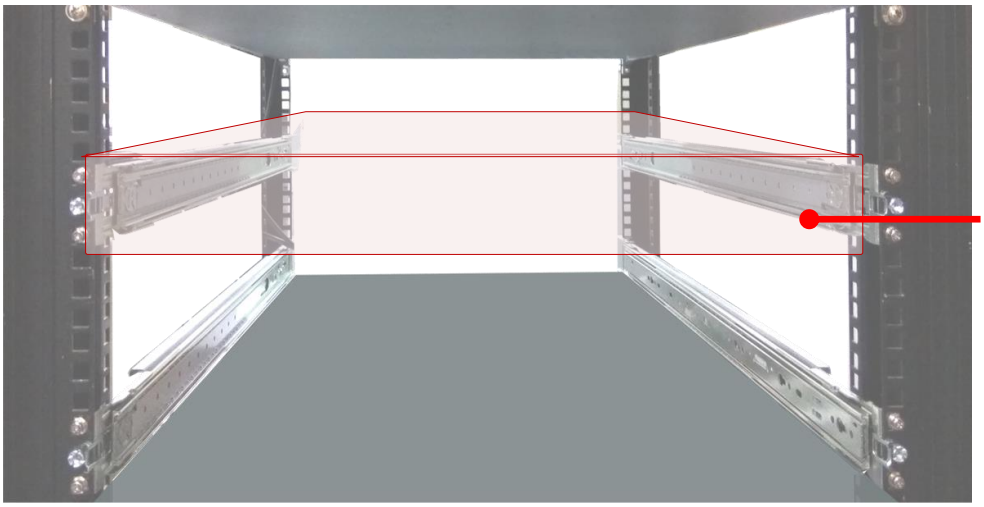
This method is quick and easy by fixing this system to the front posts of the rack while being the most unstable method, for the bracket assembly alone cannot provide sufficient support to the chassis. Please ensure the use of these brackets goes with a shelf or slide rails to prevent the chassis from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

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



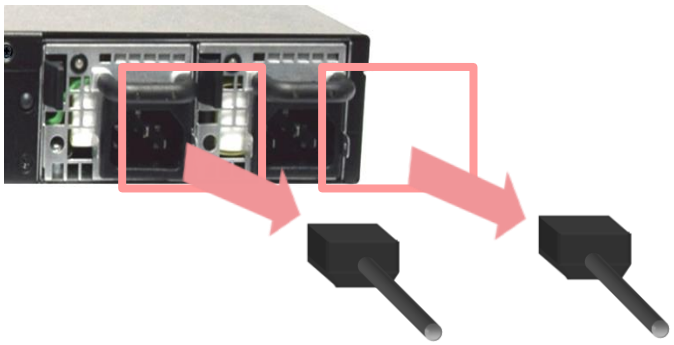
The Slide Rail Kit can secure the system while providing sufficient weight support for the device.

Installing the AC Power Supply

Power supply units wear down eventually. Please be noted that this system supports only 300W PSU. Please prepare the power supply units matching this capacity.

1. On the rear panel, locate the power supply units and disconnect the power cords.

2. Pull the original unit out and replace it with a new one.



CHAPTER 3: SOFTWARE SETUP

Remote Server Management

Overview

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

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

For detailed instructions on using each function, please refer to the full version of NCA-4020 BMC manuals available on.

BMC Main Features

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

BMC Firmware Functional Description

System health monitoring

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

System Power Management

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

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

Watchdog Timer

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

Fan Speed Control

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

Field Replaceable Unit (FRU)

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

System Event Log (SEL)

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

Serial over LAN (SOL)

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

User Management

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

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

Keyboard, Video, Mouse (KVM) Redirection

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

Virtual Media Redirection

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

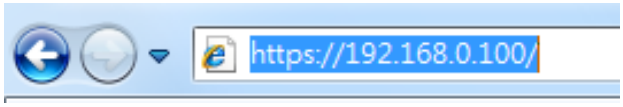
IPMI Commands Support List

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

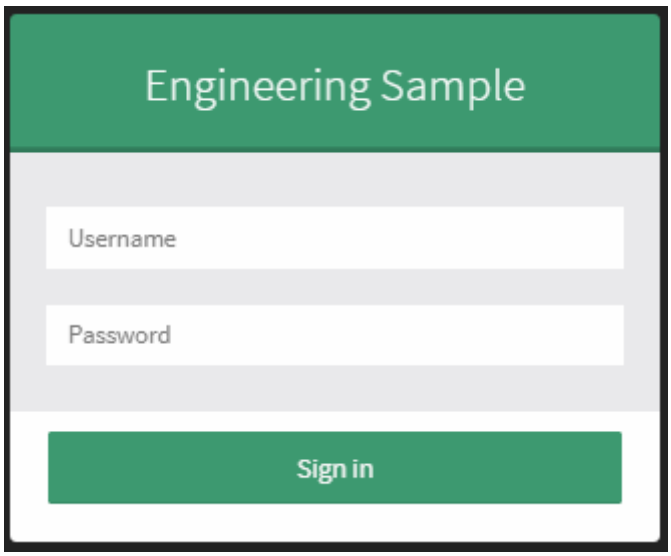
Clear SEL	Storage (0Ah)	47h
Get SEL Time	Storage (0Ah)	48h
Set SEL Time	Storage (0Ah)	49h
Get SEL Time UTC Offset	Storage (0Ah)	5Ch
Set SEL Time UTC Offset	Storage (0Ah)	5Dh
LAN Device Commands		
Set LAN Configuration Parameters	Transport (0Ch)	01h
Get LAN Configuration Parameters	Transport (0Ch)	02h
Serial/Modem Device Commands		
Set User Callback Options	Transport (0Ch)	1Ah
Get User Callback Options	Transport (0Ch)	1Bh
SOL Activating	Transport (0Ch)	20h
Set SOL Configuration Parameters	Transport (0Ch)	21h
Get SOL Configuration Parameters	Transport (0Ch)	22h

Using BMC Web UI

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



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



Login Page

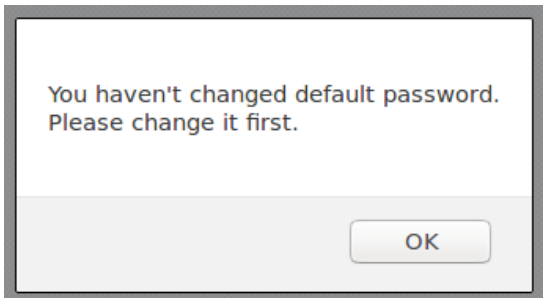
- **Username**: Enter your username in this field.
- **Password**: Enter your password in this field.
- **Sign me in**: After entering the required credentials, click the **Sign me in** to log in to Web UI.

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

Default User Name and Password

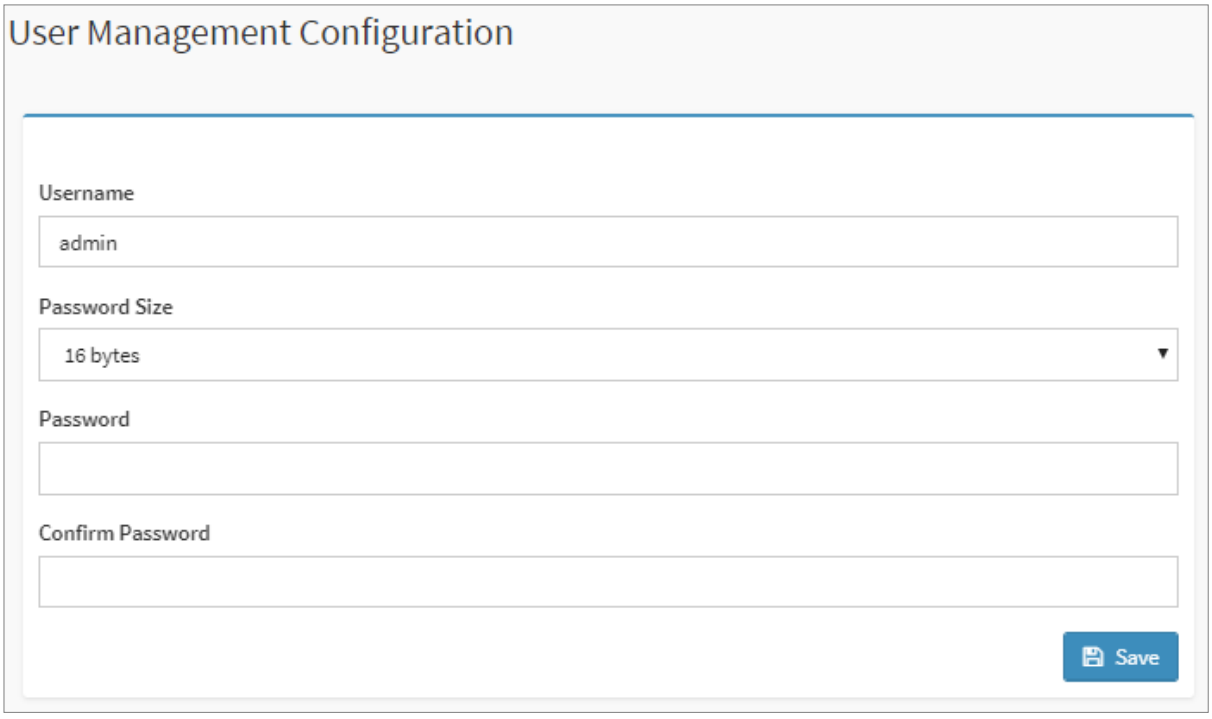
- **Username:** admin
- **Password**: admin

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



Change the default password - Dialog

Clicking **OK** will take you to the User Management Configuration page to set a password.



Change the default password – Set password

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

Web UI Layout

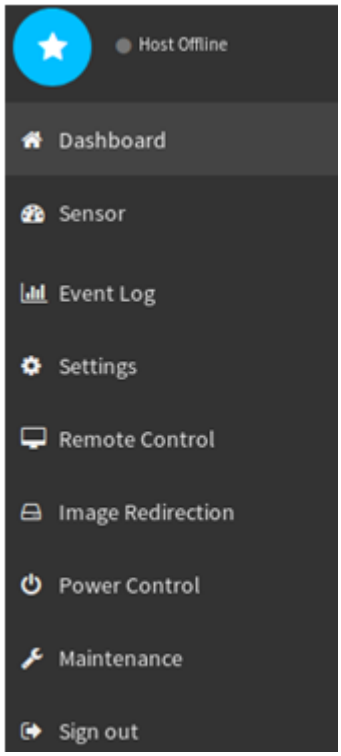
The BMC Web UI consists of various menu items:

Menu Bar

The menu bar displays the following:

- Dashboard
- Sensor
- Event Log
- Settings
- Remote Control
- Image Redirection
- Power Control
- Maintenance
- Sign out

A screenshot of the menu bar is shown below:



Menu Bar

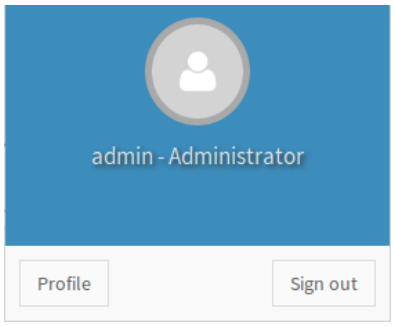
Quick Button and Logged-in User

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

User Information

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

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



Logged-in User Information

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

- **Notification**: Click the icon to view the notification messages.
- **Refresh**: Click the icon Refresh to reload the current page.
- **Sign out**: Click the icon Sign out to log out of the Web UI.

Logged-in user and its privilege level

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

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

Help

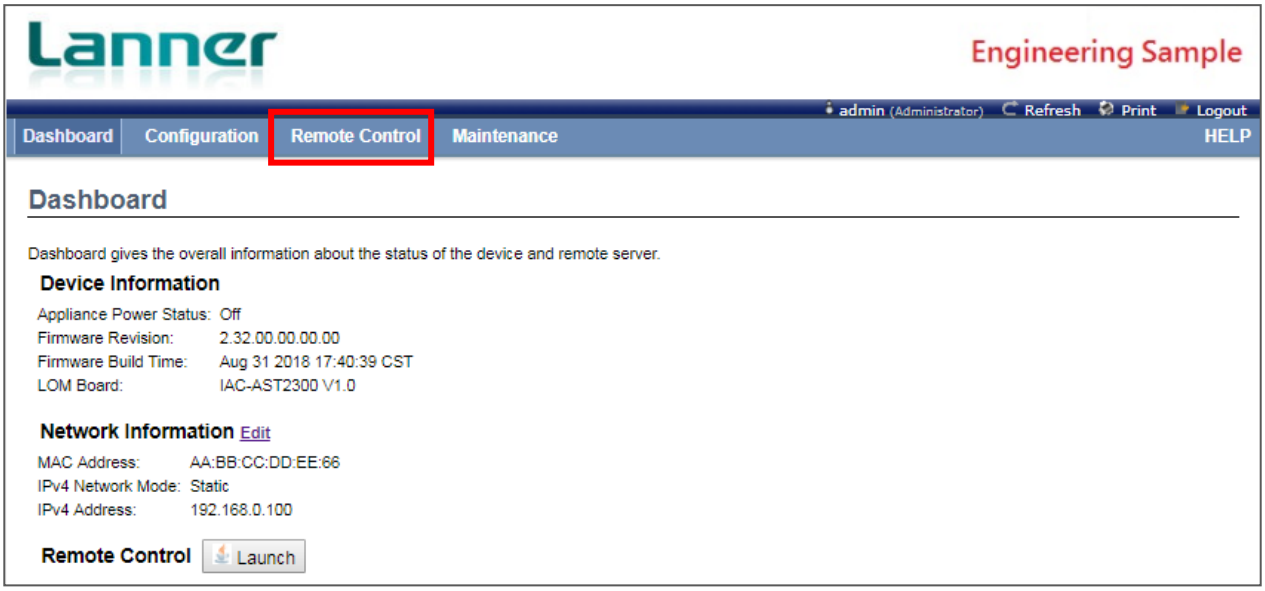
Help: The **Help** icon is located at the top right of each page in Web UI. Click this help icon to view more detailed field descriptions.

Installing Operating System

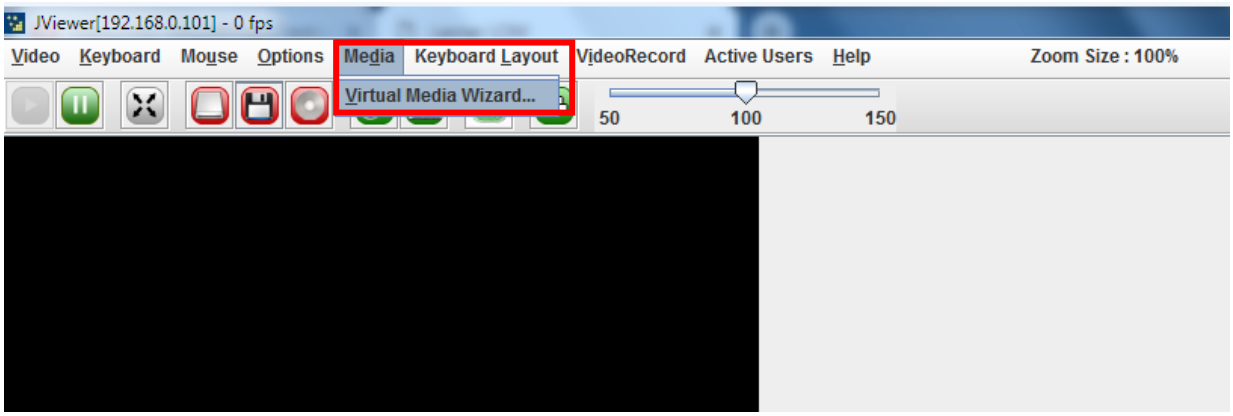
If your system is shipped without an operating system, install the supported operating system using the following resources.

Via IPMI Interface

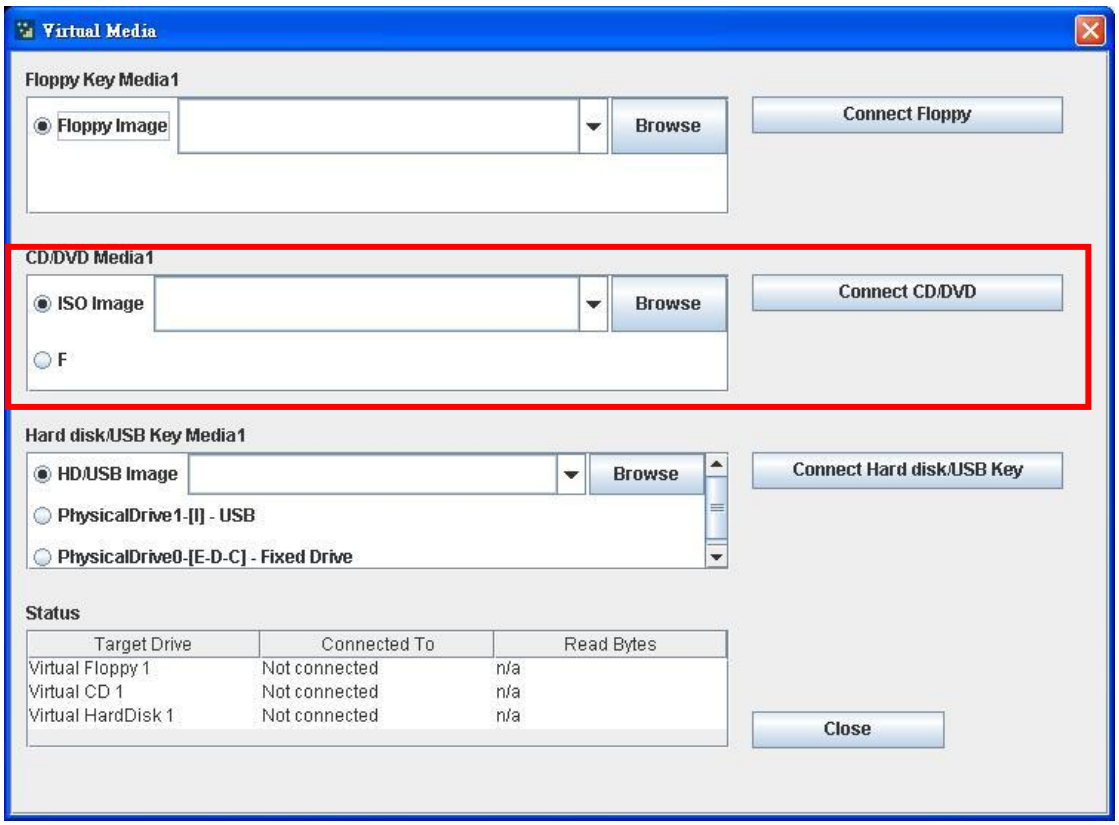
1. Download the ISO image and make a bootable DVD from it.
2. Connect a DVD player or other type of readers (floppy disk, or a drive) to a computer.
3. Connect to your target system from this computer. (Refer to Remote Server Management for instructions on how to access the target system through Web UI.
4. After entering the main screen, select "Remote Control">"Console Redirection," and then click on "Java Console."



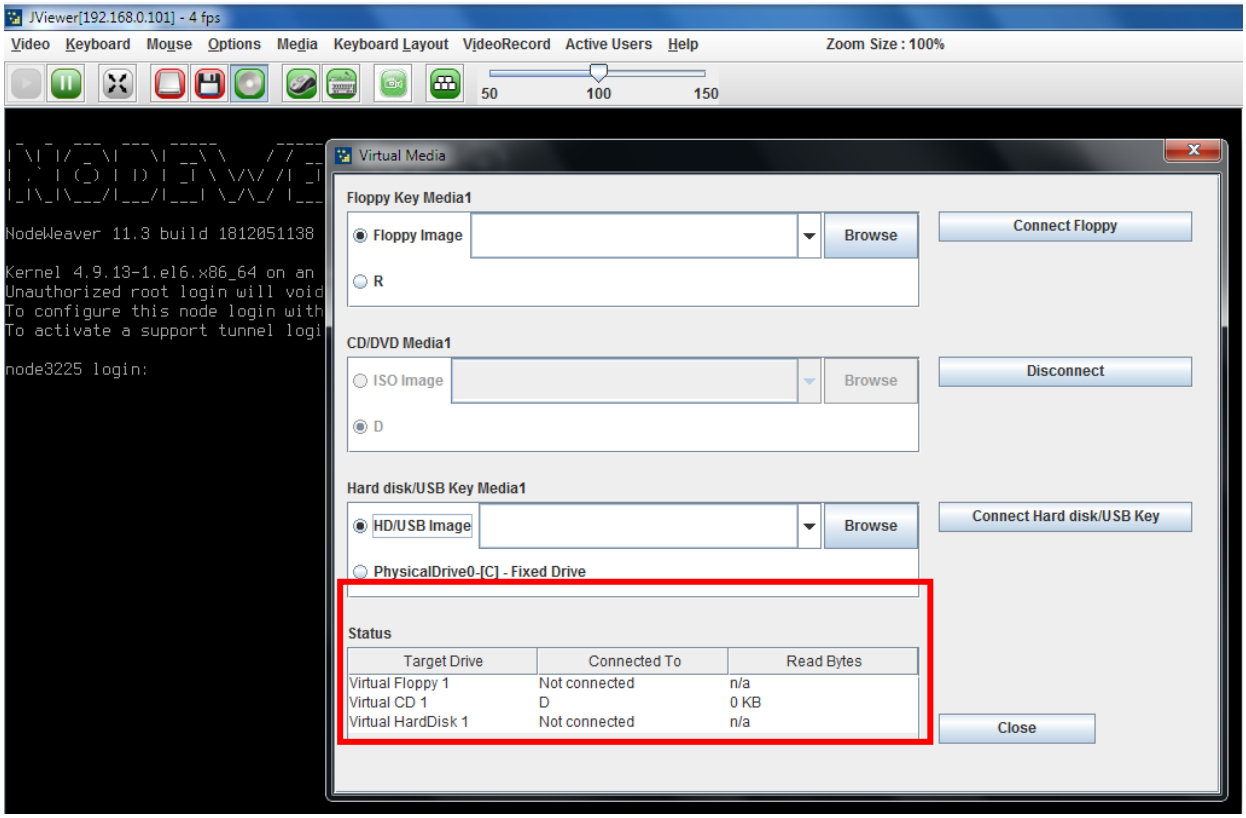
5. After a JViewer screen pops up, select "Media" and then "Virtual Media Wizard" from the toolbar.



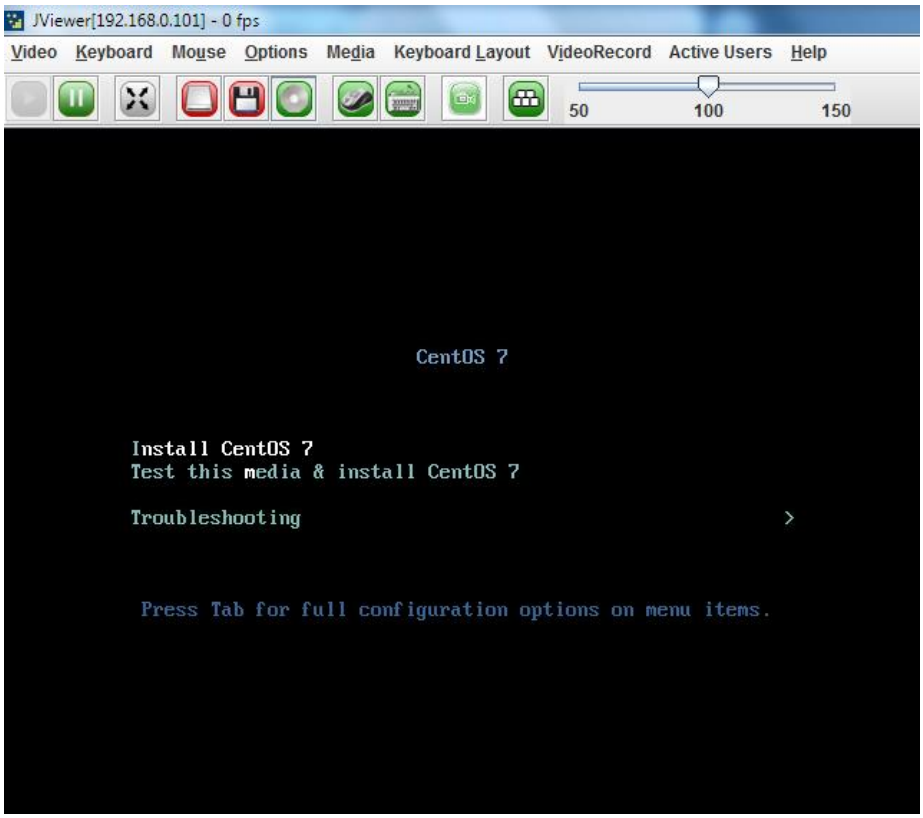
6. On **Virtual Media** screen, select your media type to load the image. For example, click on "Browse" of **CD/DVD Media 1** and then "Connect CD/DVD."



7. The **Status** window will display the connection status.



8. The installation process will automatically start. Please follow the onscreen instruction to complete the rest of the steps and restart the target system manually.



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.

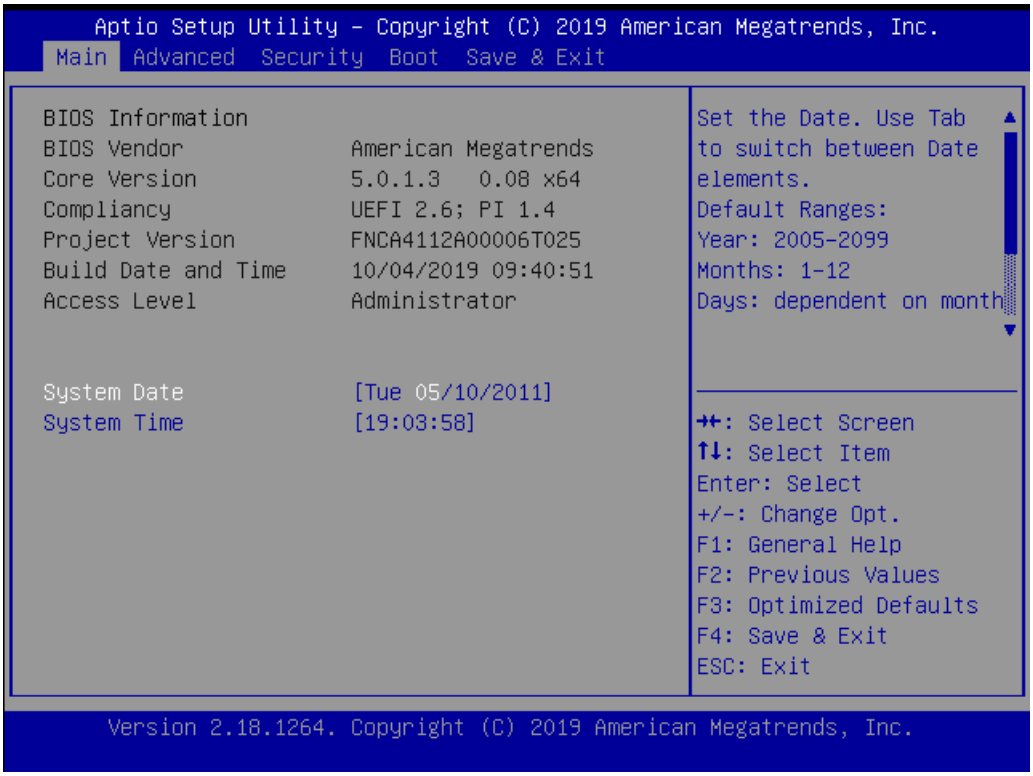
Main Setup

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

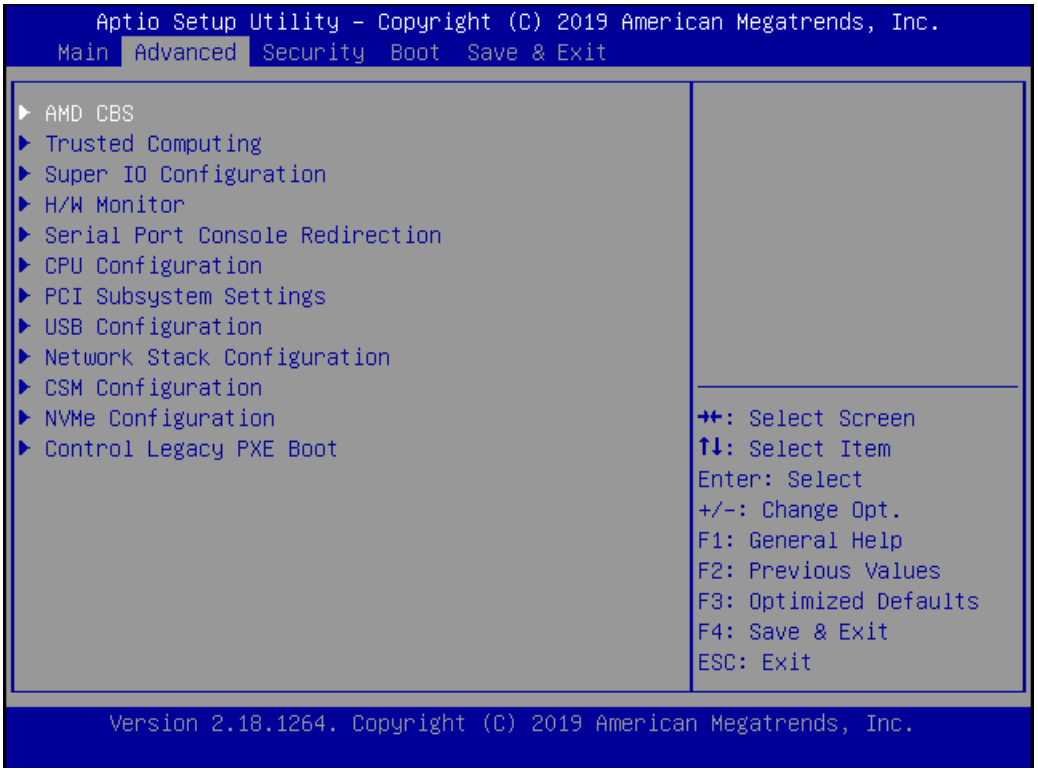
Setup main page contains BIOS information and project version information.



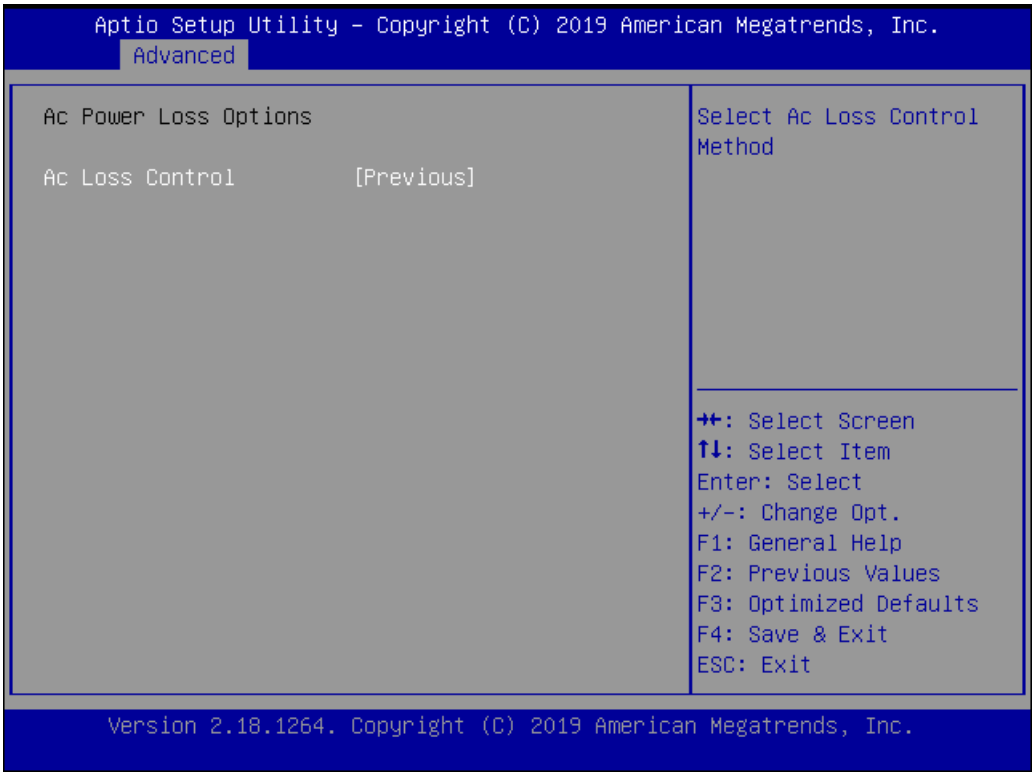
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
System Date	To set the Date, use **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

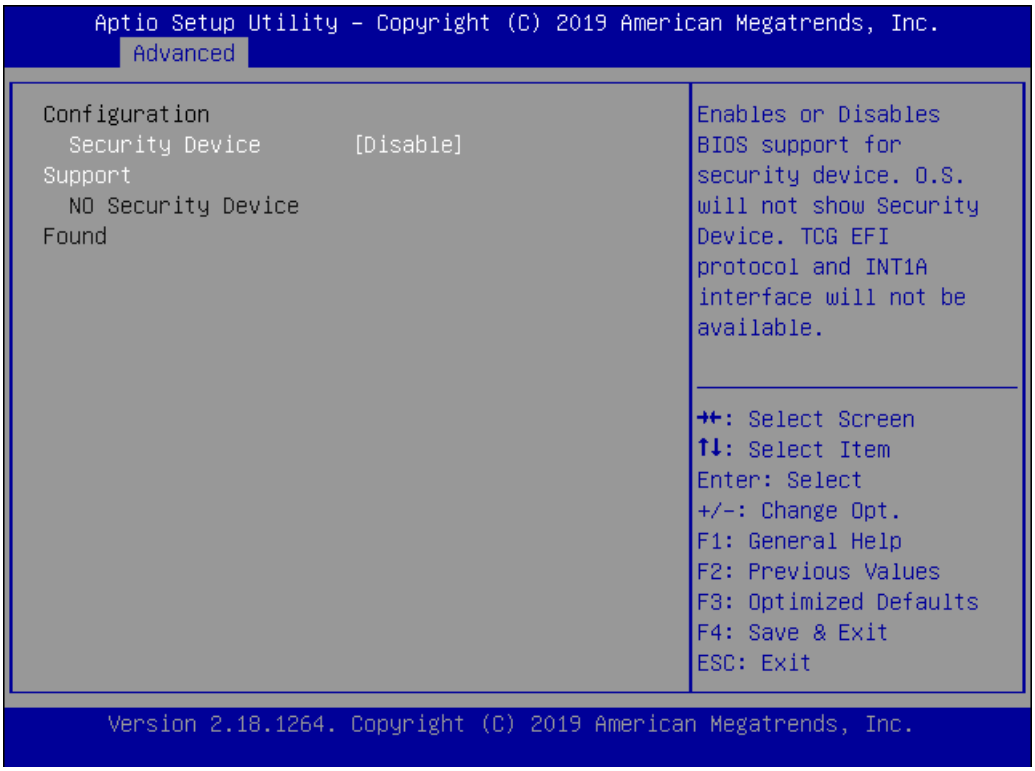


AMD CBS



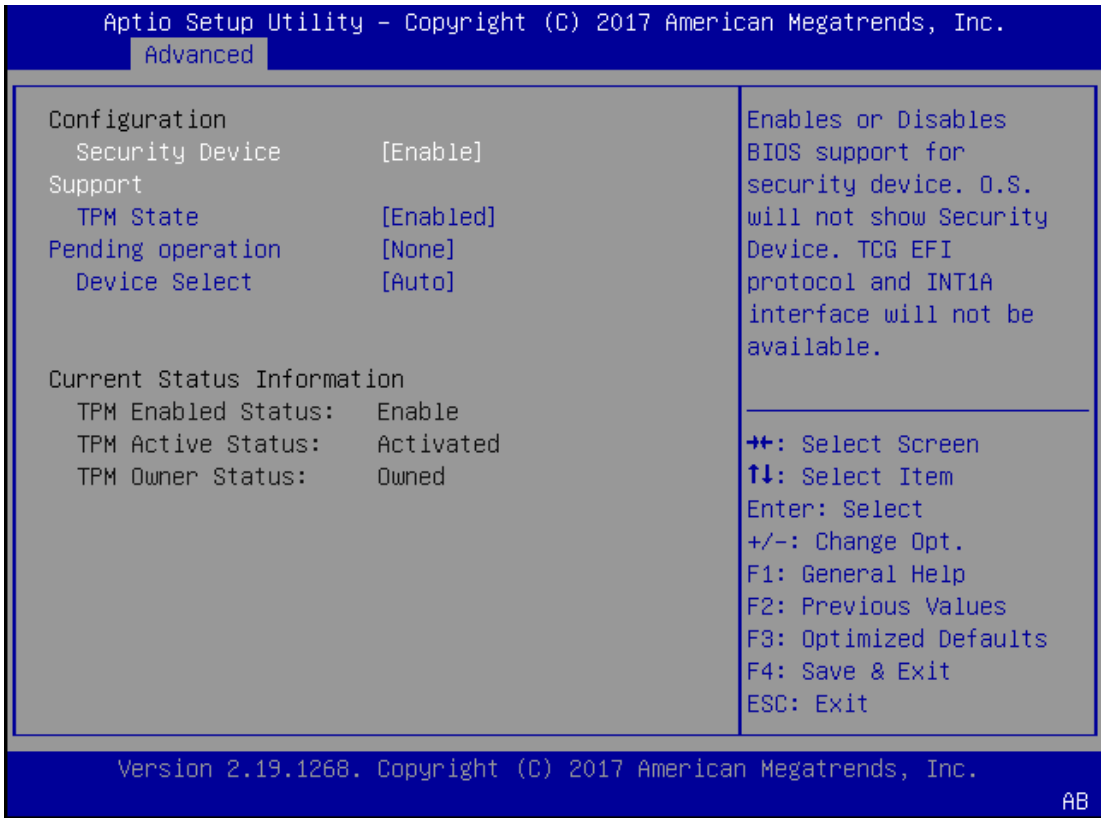
Feature	Options	Description
Ac Loss Control	Always Off Always On Previous	Select Ac Loss Control Method

Trusted Computing



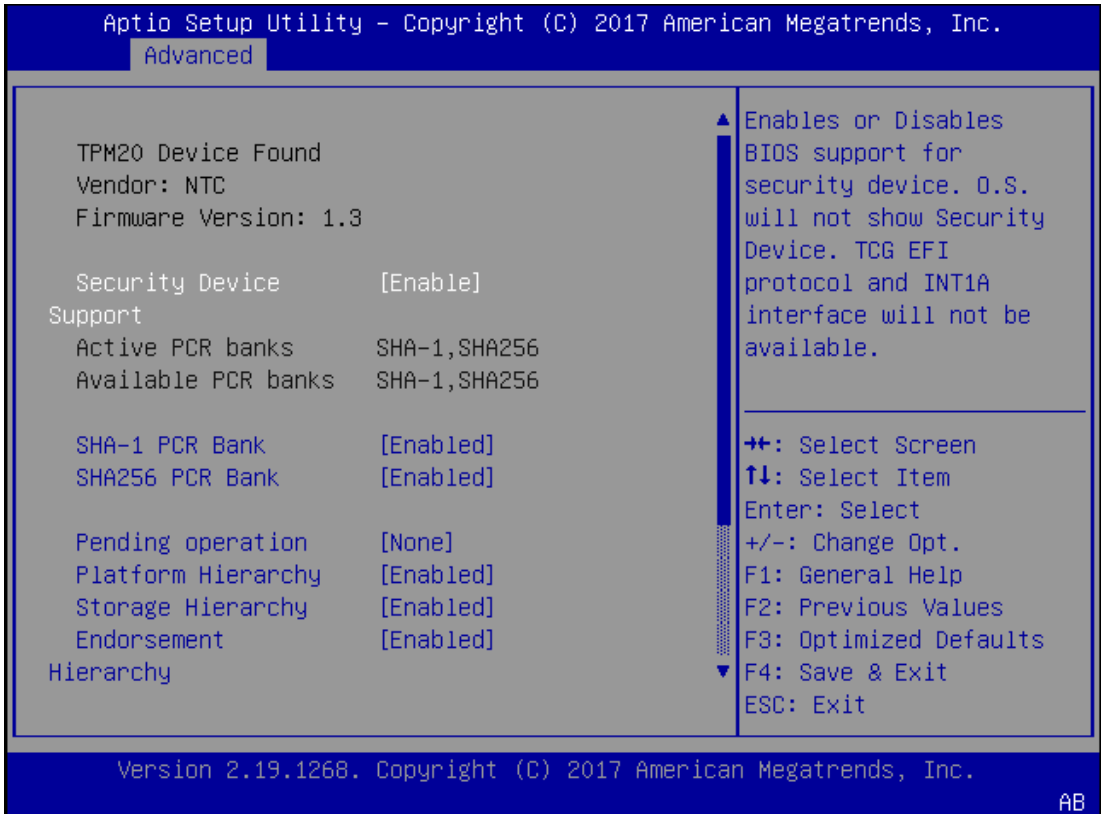
Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

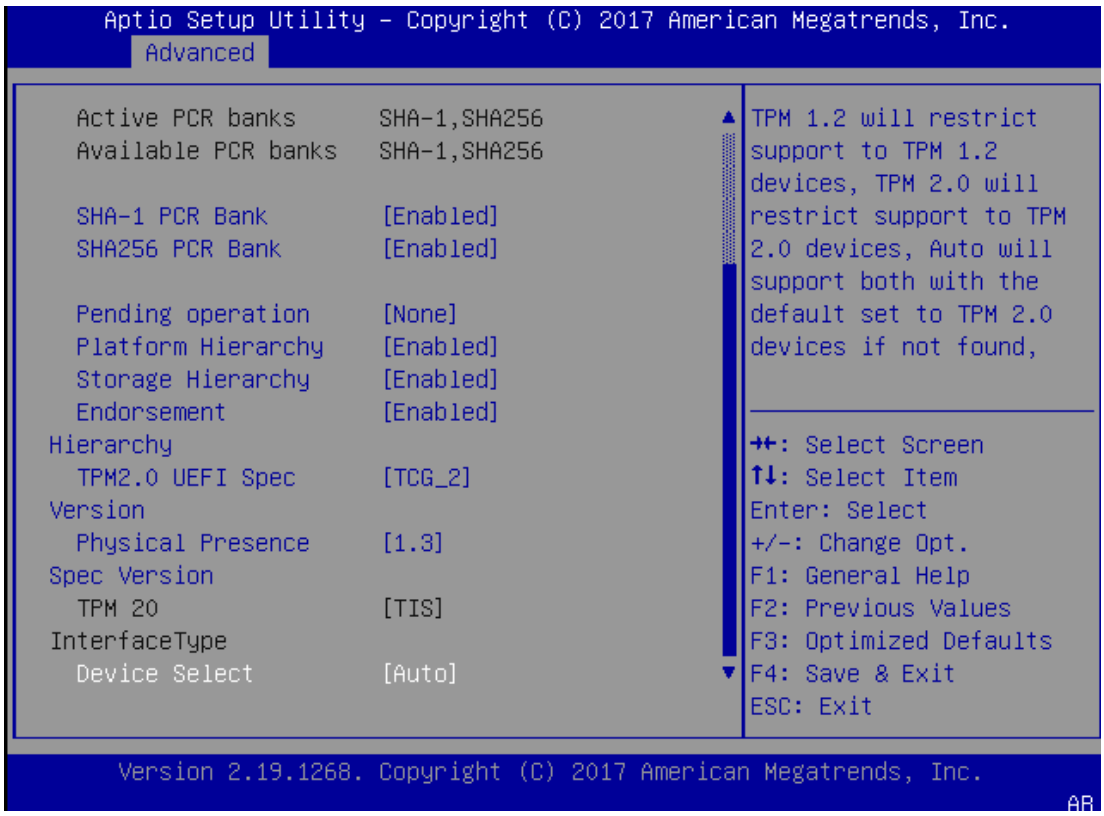
Trusted Computing (TPM1.2)



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.

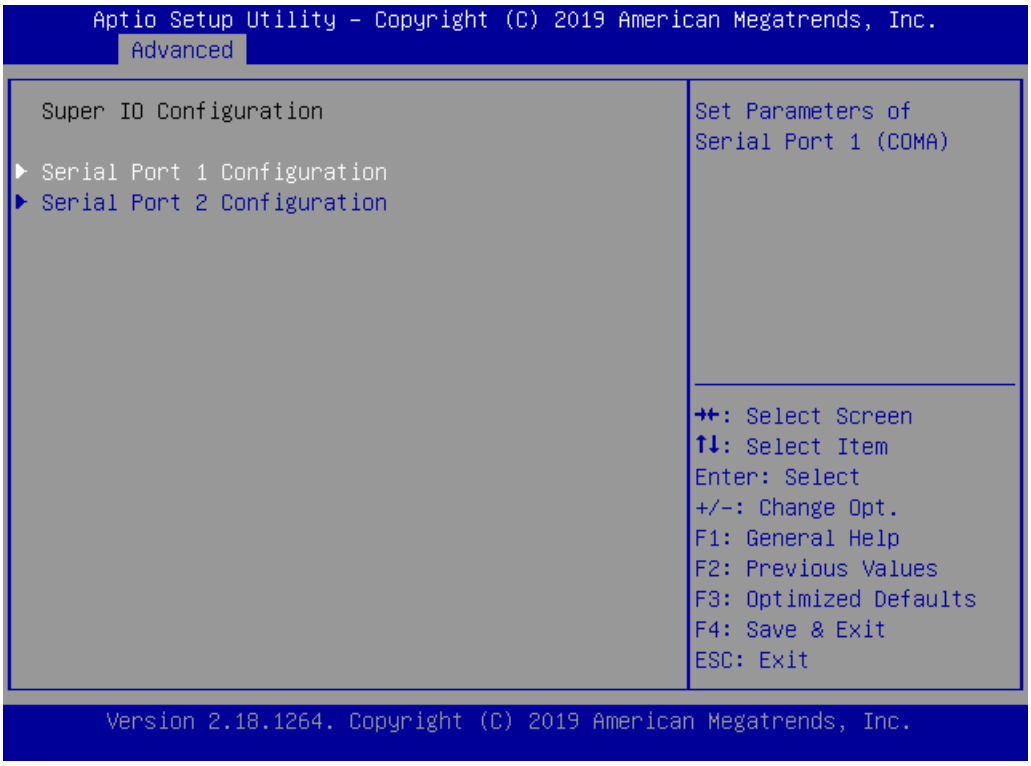
Trusted Computing (TPM2.0)



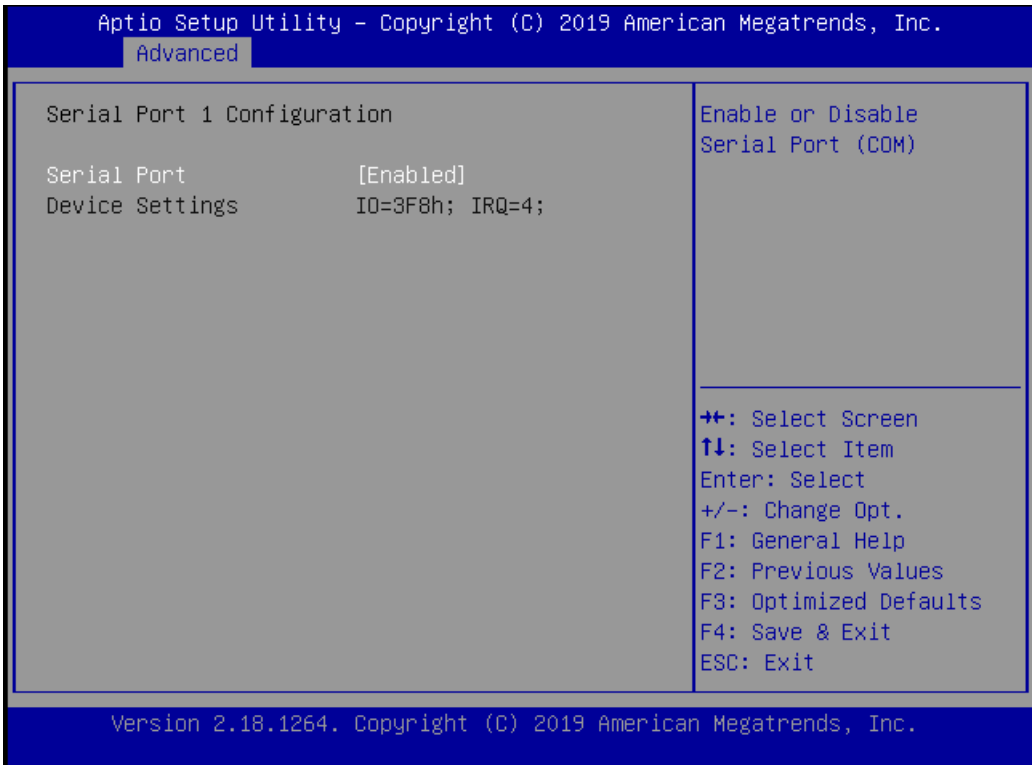


Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA-1 PCR Bank	Enabled Disabled	Enables or disables SHA-1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

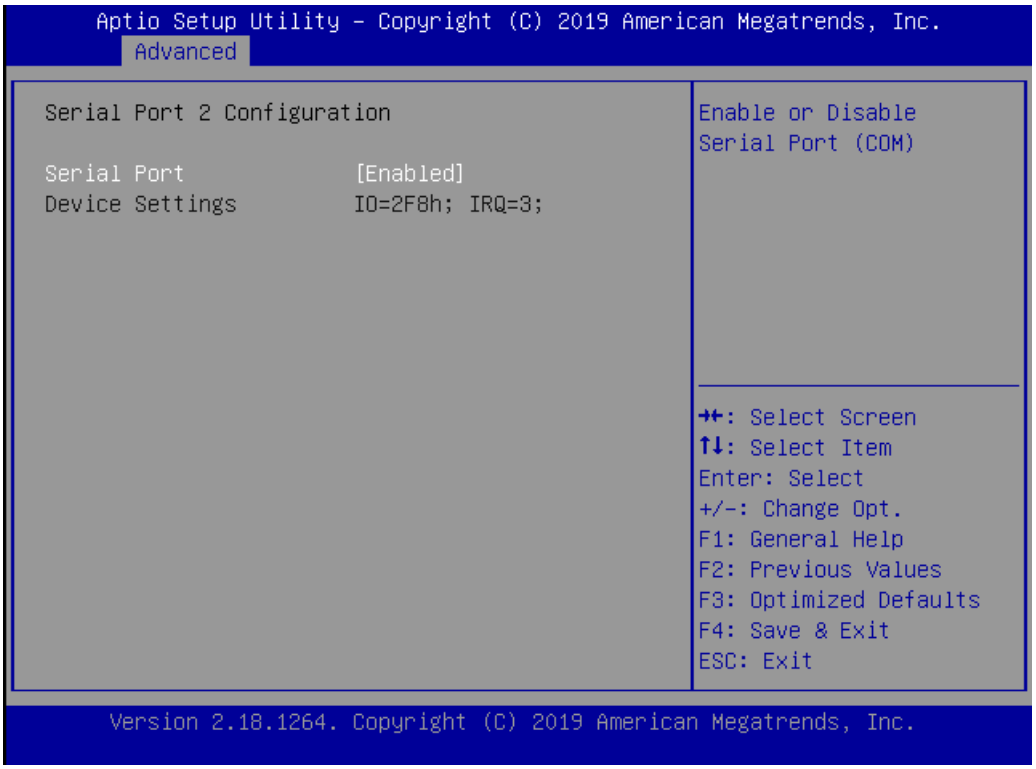


Serial port 1 Configuration



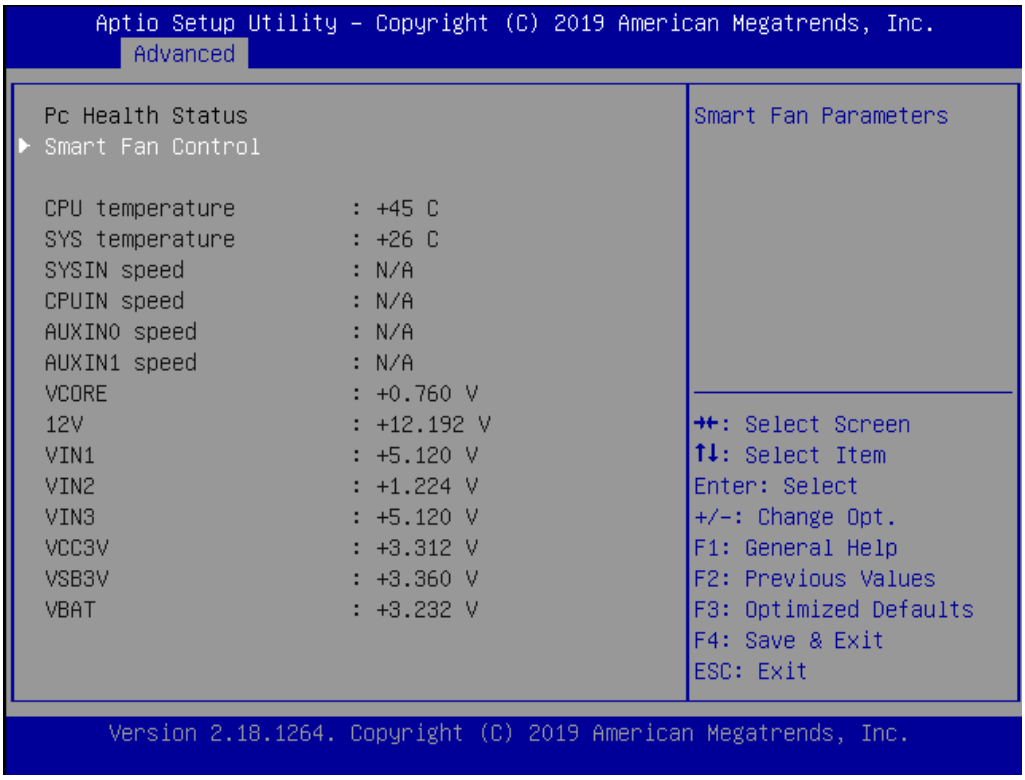
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port(COM).
Device Settings	NA	IO=3F8h; IRQ = 4

Serial port 2 Configuration



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

H/W Monitor


Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced
Pc Health Status
Smart Fan Control
CPU temperature : +45 C
SYS temperature : +26 C
SYSIN speed : N/A
CPUIN speed : N/A
AUXIN0 speed : N/A
AUXIN1 speed : N/A
VCORE : +0.760 V
12V : +12.192 V
VIN1 : +5.120 V
VIN2 : +1.224 V
VIN3 : +5.120 V
VCC3V : +3.312 V
VSB3V : +3.360 V
VBAT : +3.232 V
Smart Fan Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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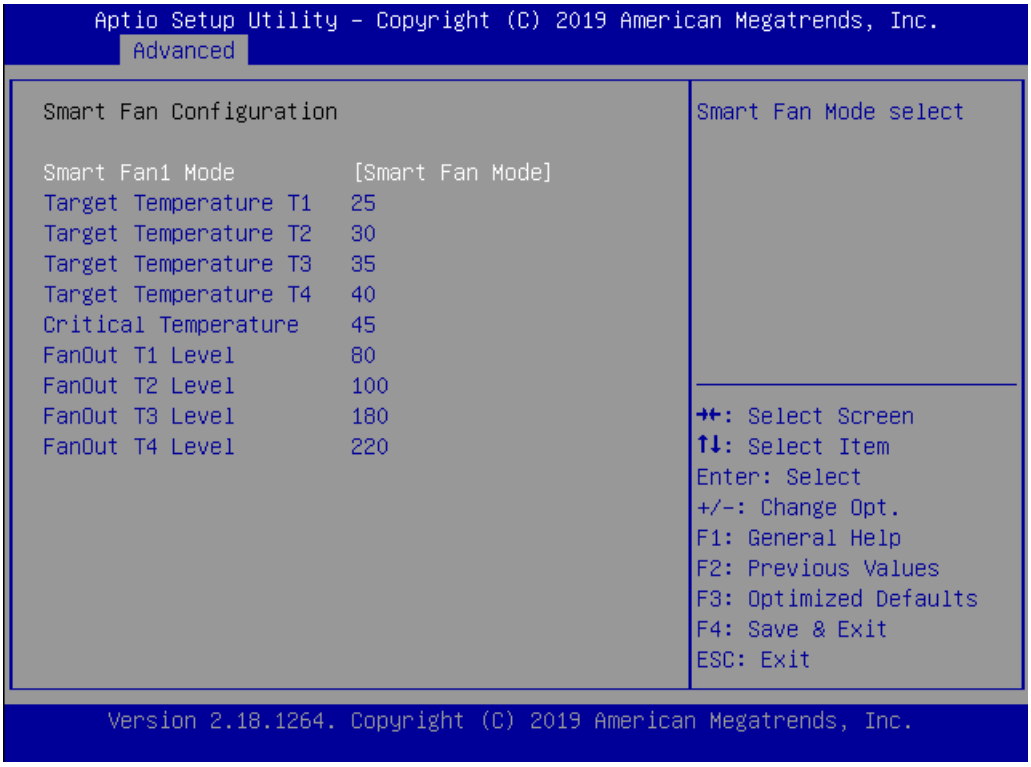
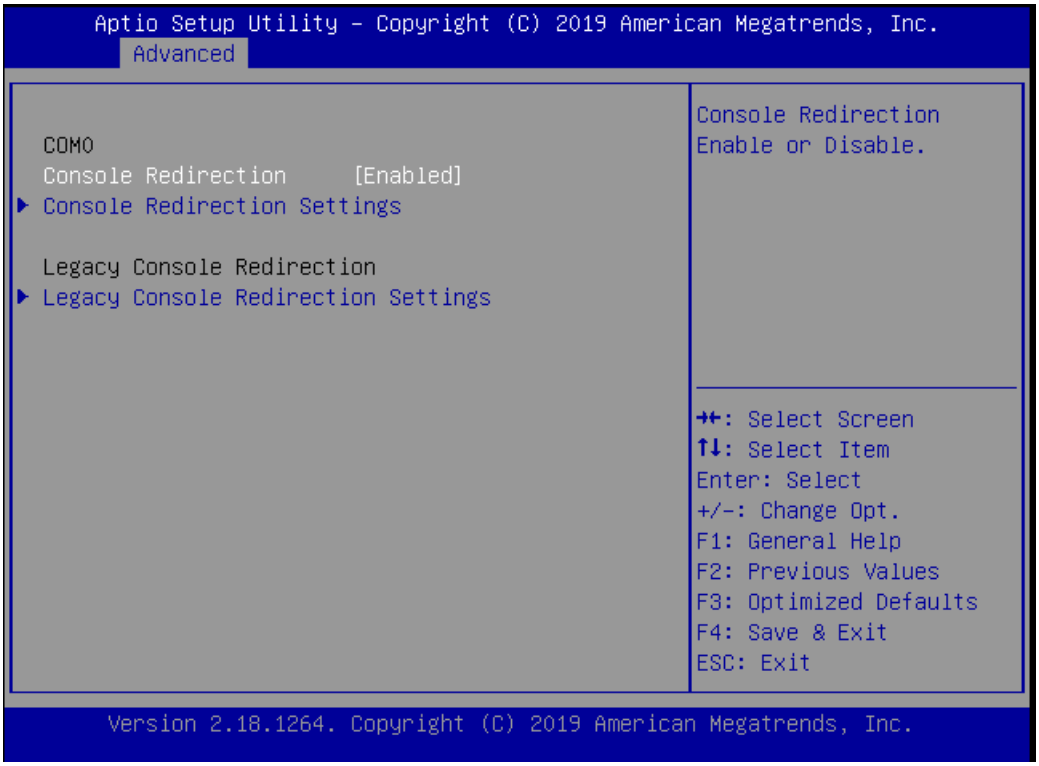
Smart Fan Control



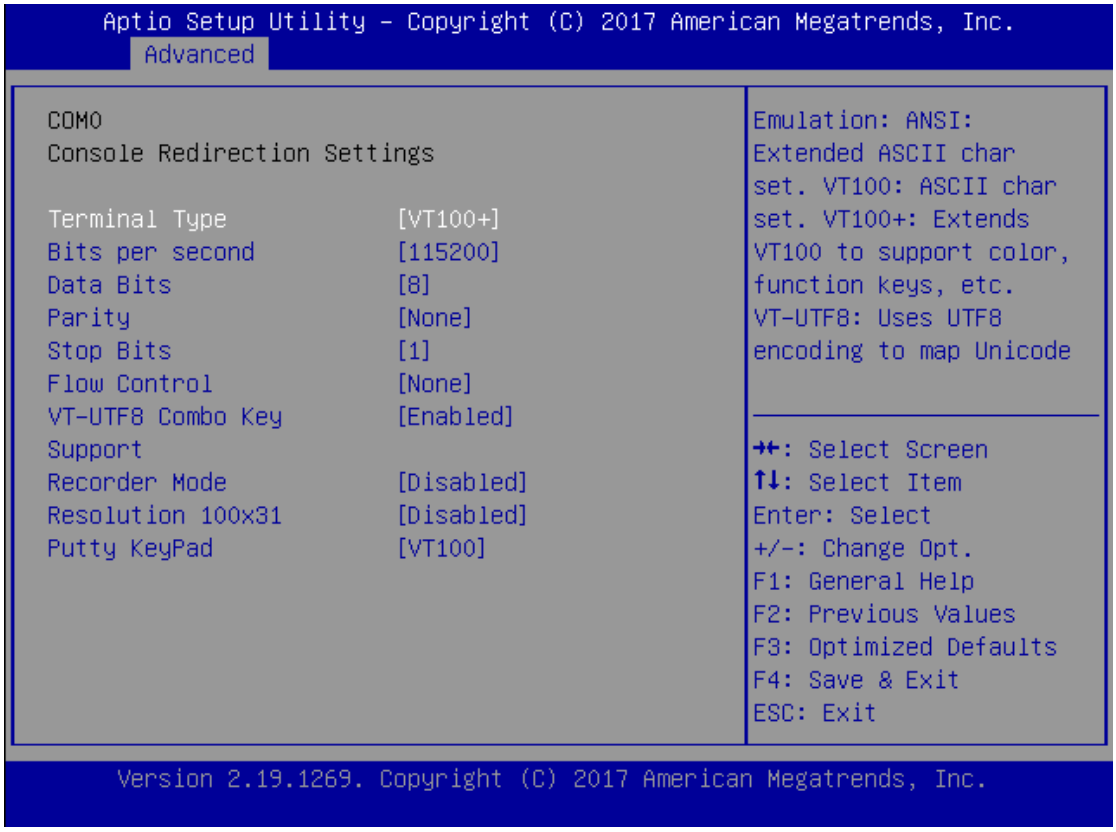
Feature	Options	Description
Smart Fan1 Mode	Manual Mode Smart Fan Mode	Smart Fan Mode select
Target Temperature T1		Input Target Temperatur (Range:0 - 127)
Target Temperature T2		Input Target Temperatur (Range:0 - 127)
Target Temperature T3		Input Target Temperatur (Range:0 - 127)
Target Temperature T4		Input Target Temperatur (Range:0 - 127)
Critical Temperature		Input Target Temperatur (Range:0 - 127)
FanOut T1 Level		Input Target Fan Out
FanOut T2Level		Input Target Fan Out
FanOut T3 Level		Input Target Fan Out
FanOut T4 Level		Input Target Fan Out

Serial Port Console Redirection



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

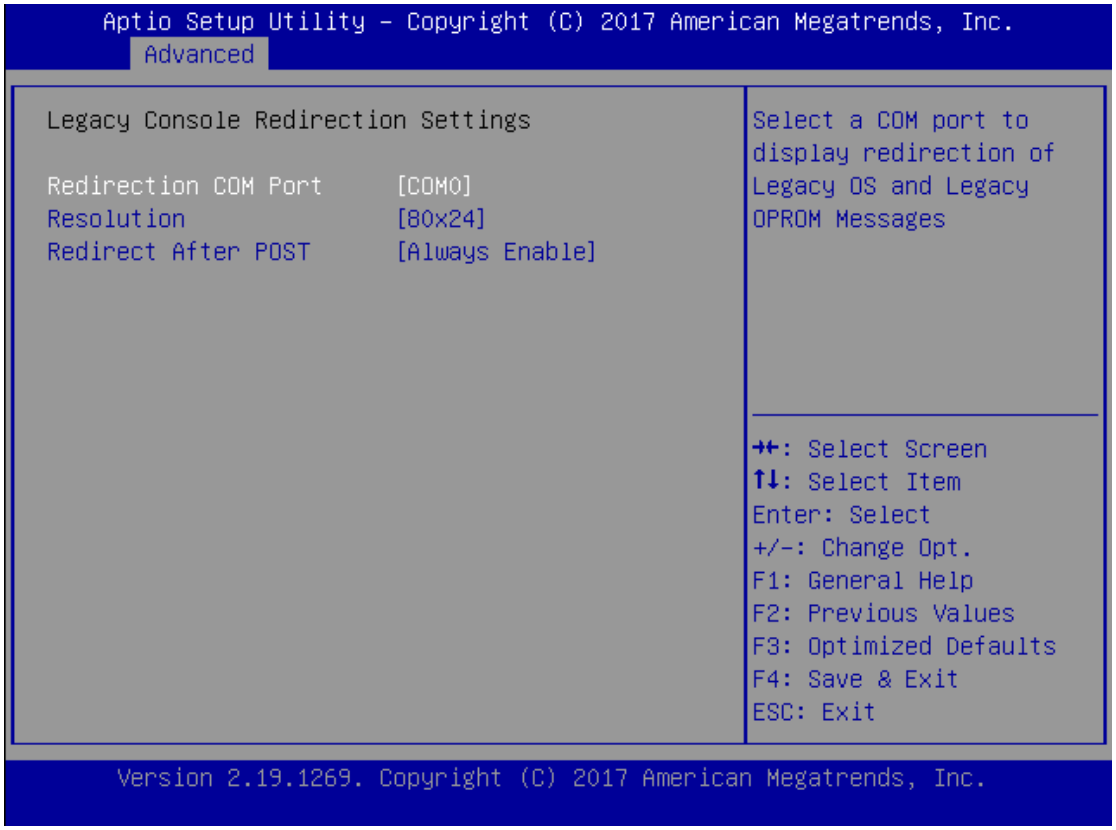
Console Redirection Settings



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	Flow Control can prevent data loss from

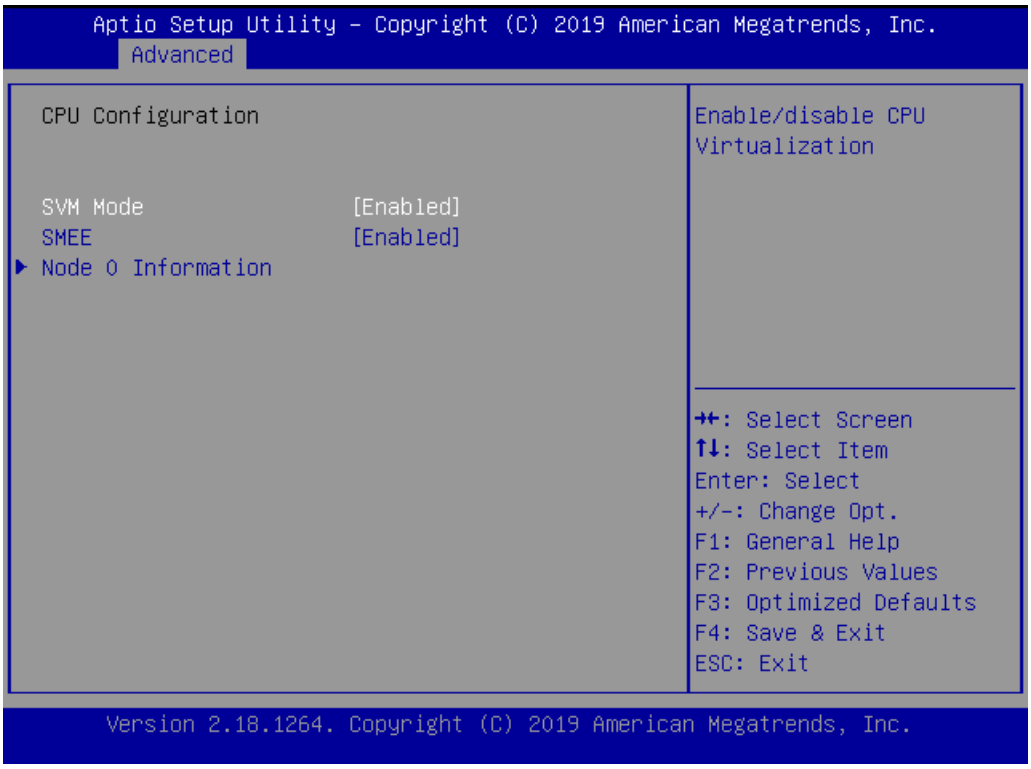
	Hardware RTS/CTS	buffer overflow.
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or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

Legacy Console Redirection Settings



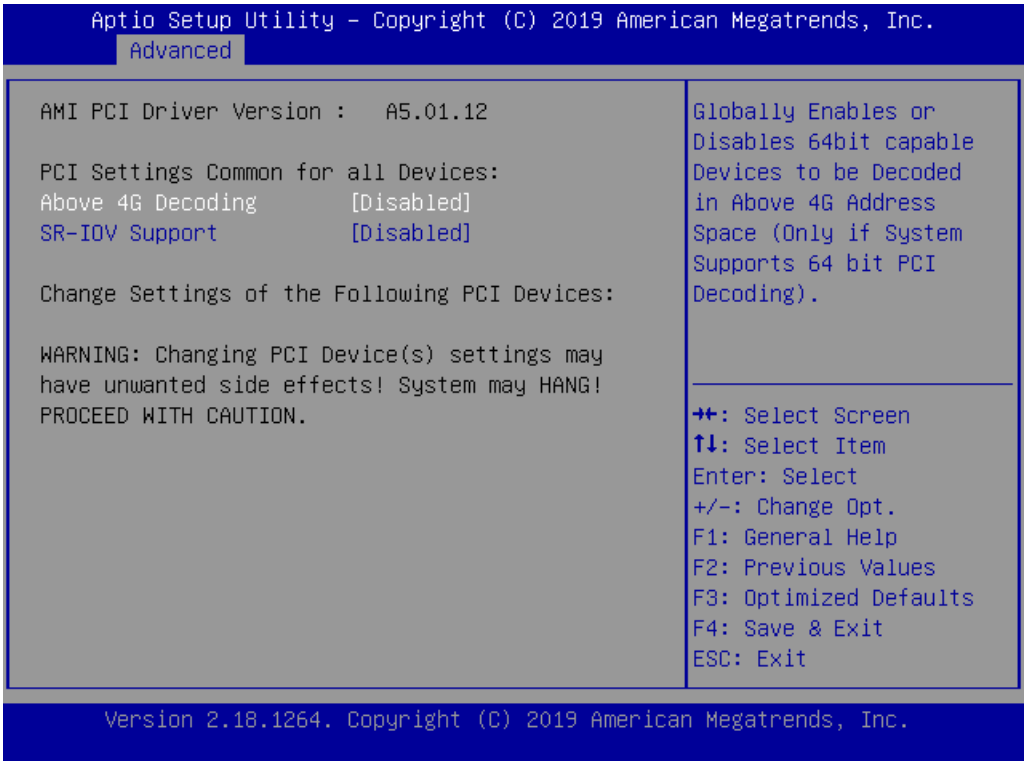
Feature	Options	Description
Redirection COM Port	COM0	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.
Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection.
Redirection After BIOS POST	Always Enable BootLoader	When **Bootloader** is 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**.

CPU Configuration



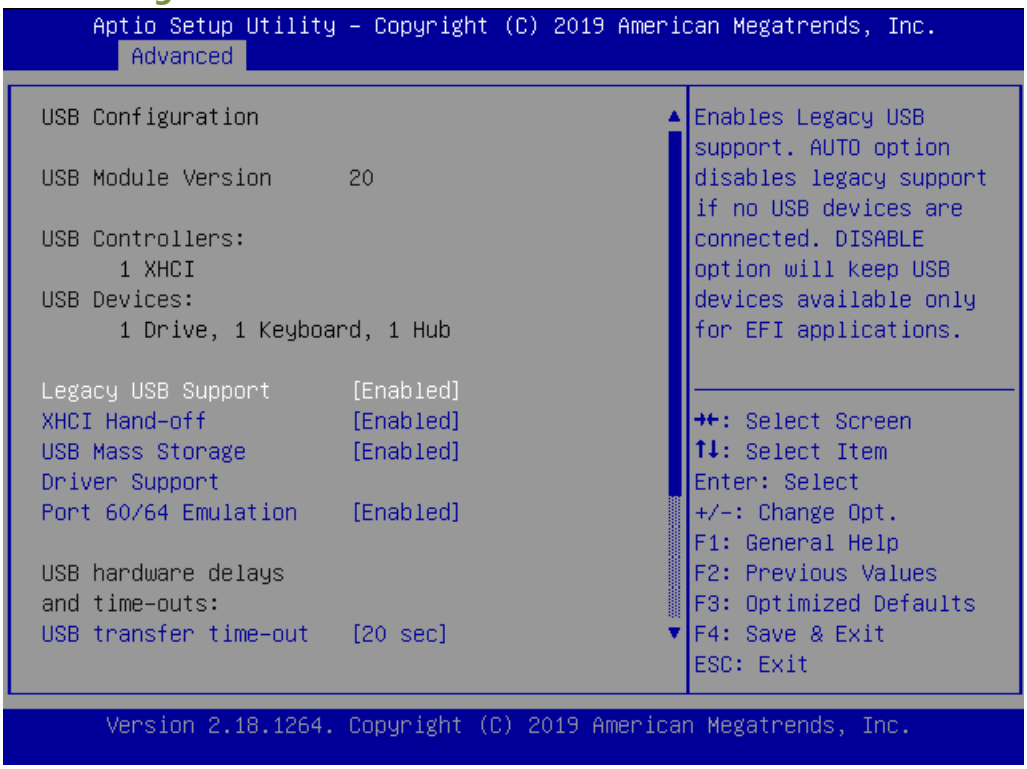
Feature	Options	Description
SVM Mode	Enabled Disabled	Enable/disable CPU Virtualization
SMEE	Enabled Disabled	Control secure memory encryption enable

PCI Subsystem Settings



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

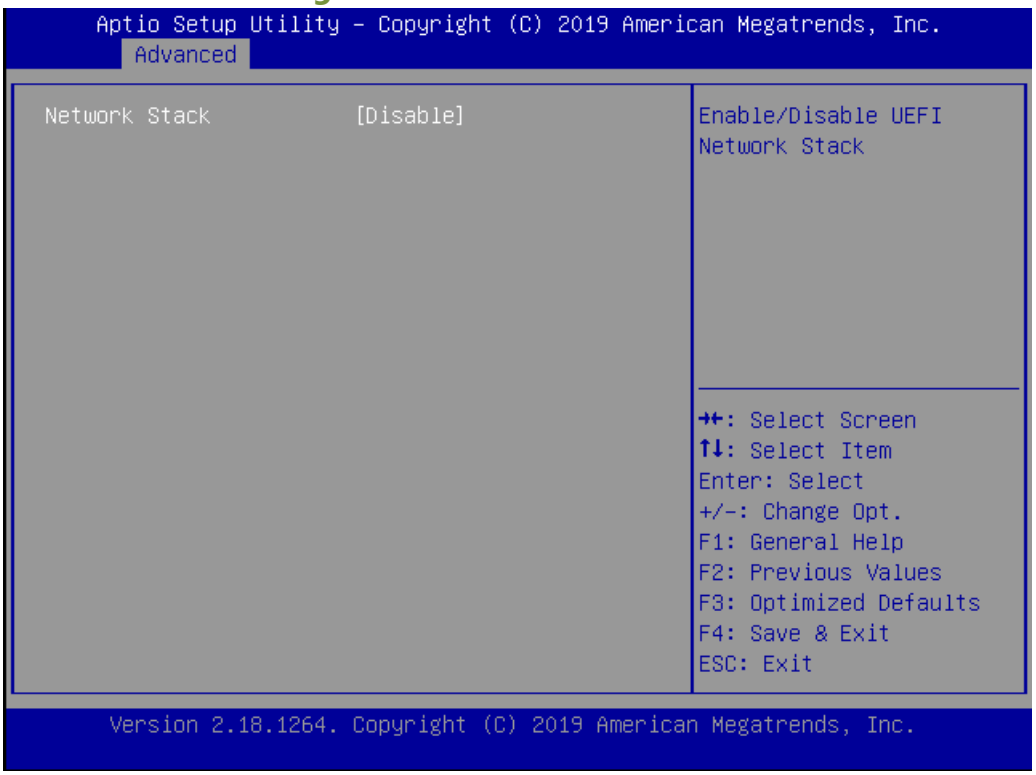
USB Configuration



Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. **Auto** option disables legacy support if no USB devices are connected; **Disabled** option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enabled Disabled	Enables or disables USB Mass Storage Driver Support.
Port 60/64 Emulation	Enabled Disabled	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for Control, Bulk, and Interrupt transfers
Device reset time-out	1 sec 5 sec	USB mass storage device Start Unit command time-out

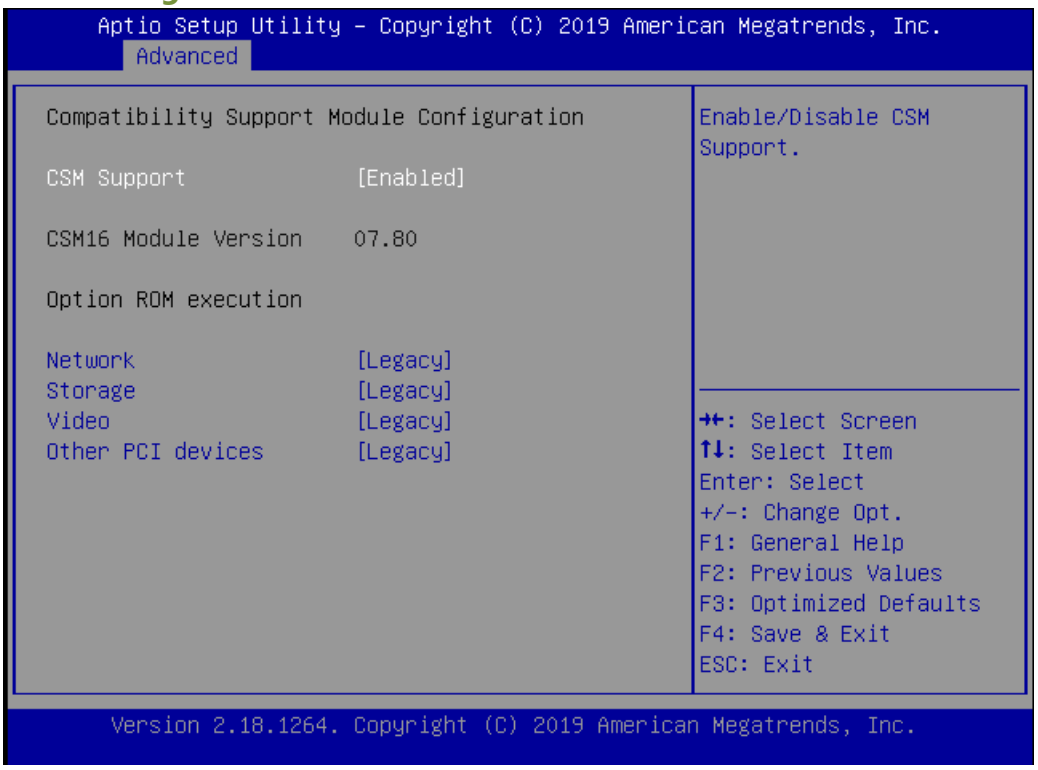
	10 sec 20 sec	
Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller. **Auto** uses default value: for a Root port, it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

Network Stack Configuration



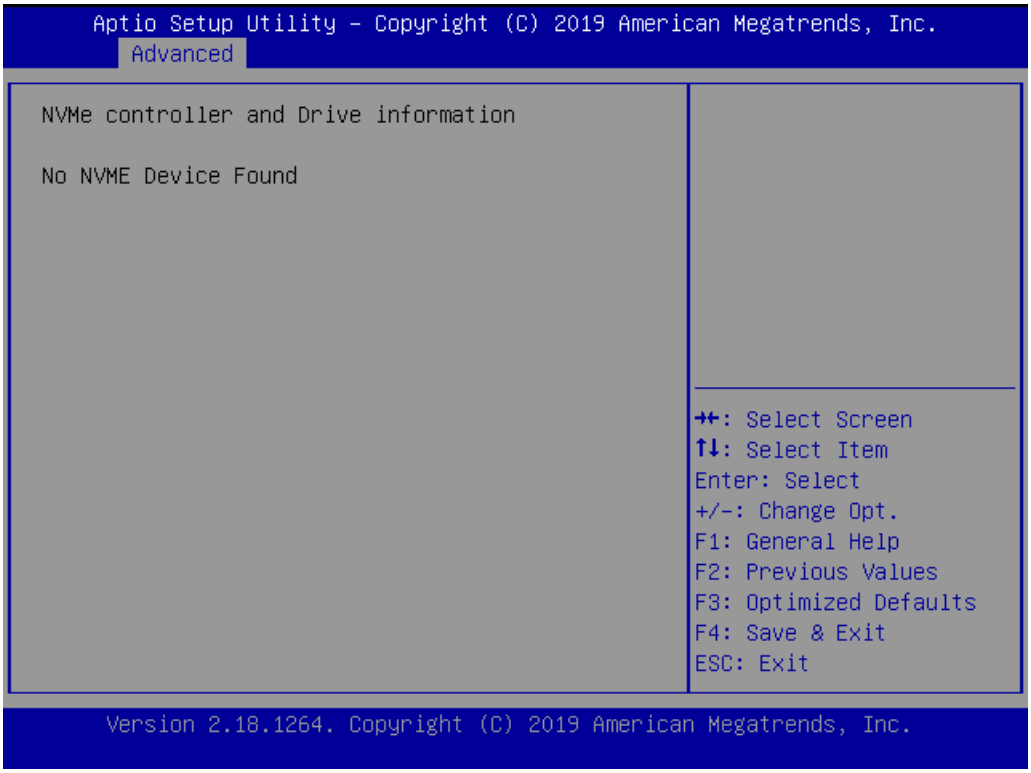
Feature	Options	Description
Network Stack	Disabled Enabled	Enables or disables UEFI Network Stack

CSM Configuration

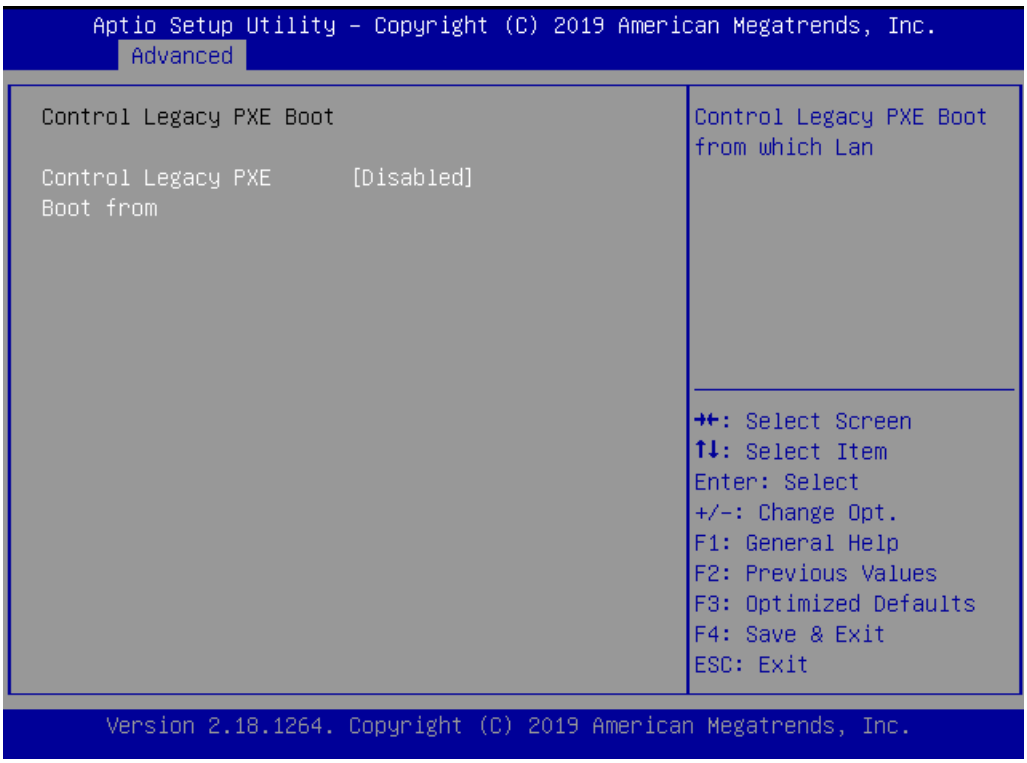


Feature	Options	Description
CSM Support	Disabled Enabled	Enables or disables CSM Support
Network	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not Launch UEFI Legacy	Controls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



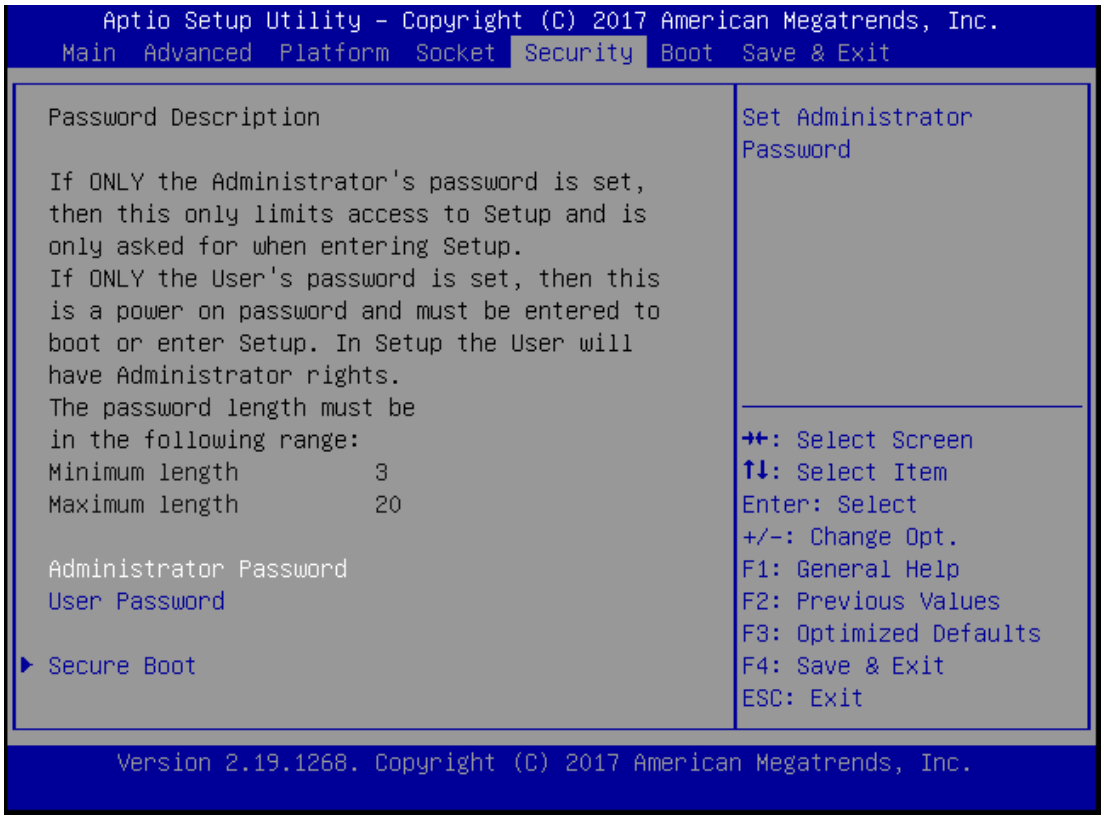
Control Legacy PXE Boot



Feature	Options	Description
Control Legacy PXE Boot from t	Disabled MGT LAN1	Control Legacy PXE Boot from which Lan

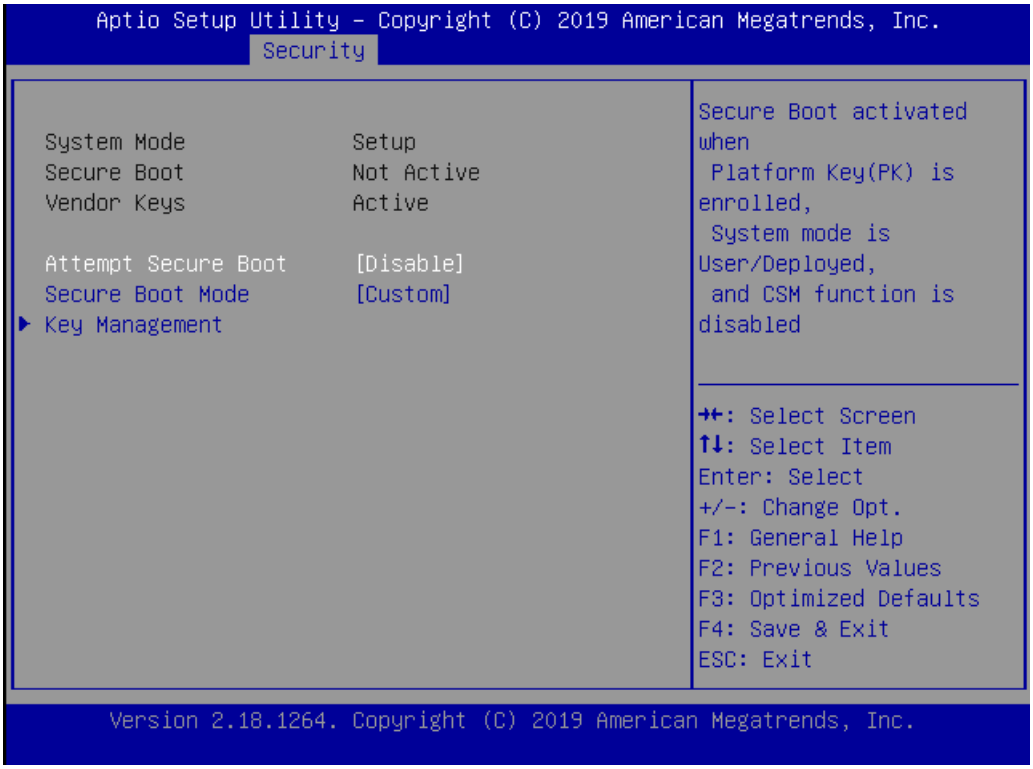
Security

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.



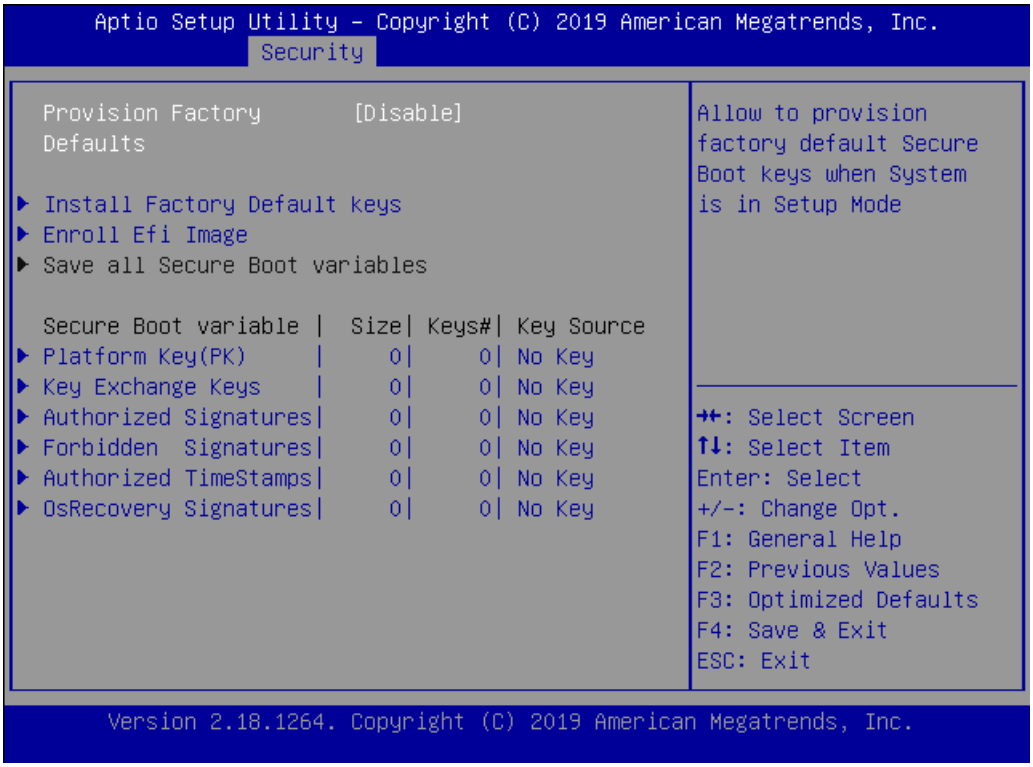
Feature	Description
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the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

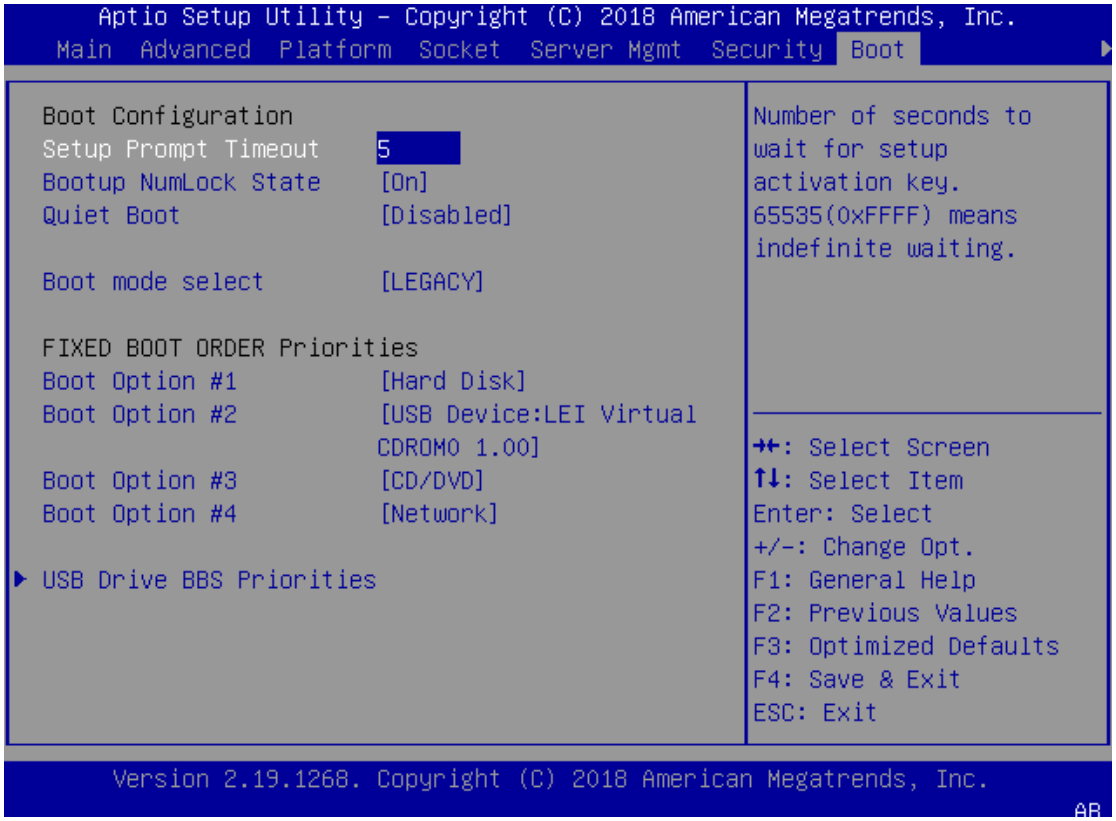
Key Management



Feature	Options	Description
Provision Factory Defaults	Disabled Enabled	Allow to provision factory default Secure Boot keys when System is in Setup Mode
Install Factory Default keys	None	Force System to User Mode - install all Factory Default keys
Enroll Efi Image	None	Allow the image to run in\nSecure Boot mode.\nEnroll SHA256 hash of the binary into Authorized Signature Database (db)

Boot Menu

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



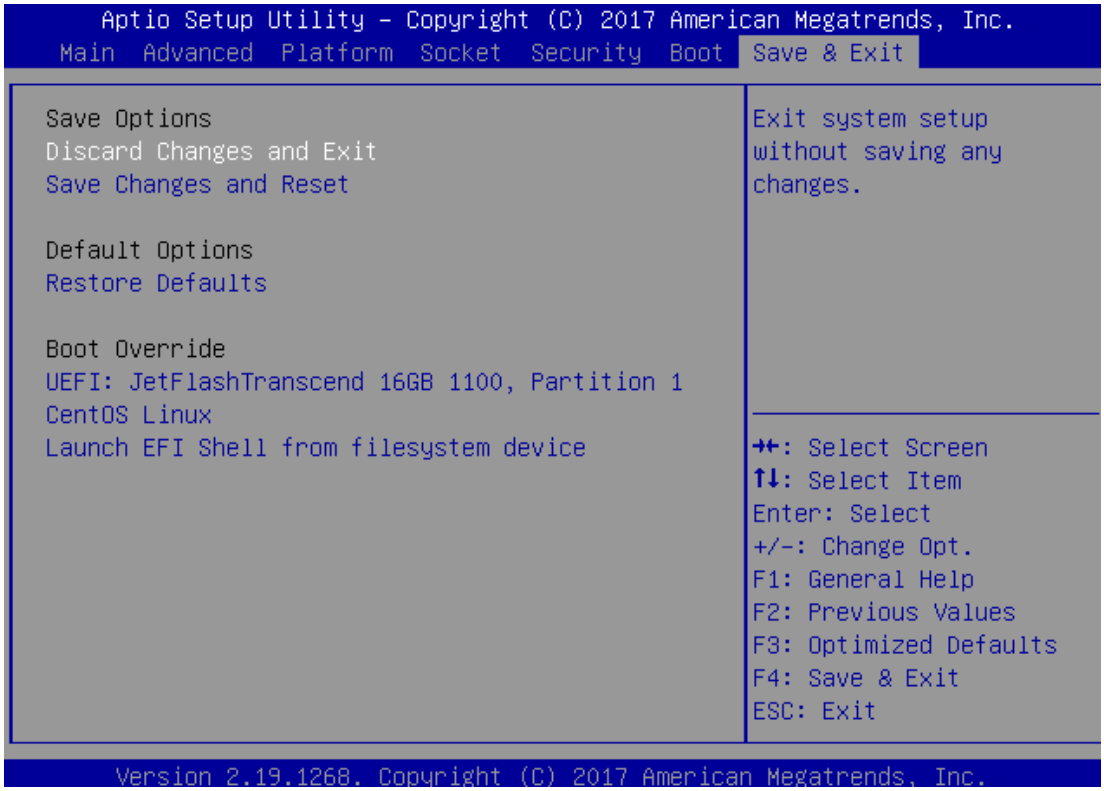
Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option.
Boot mode select	LEGACY UEFI DUAL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

Choose boot priority from boot option group.

Choose specifies boot device priority sequence from available Group device.

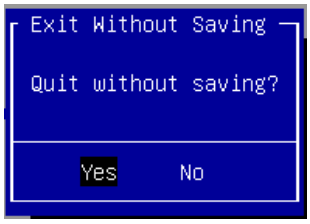
Save and Exit Menu

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



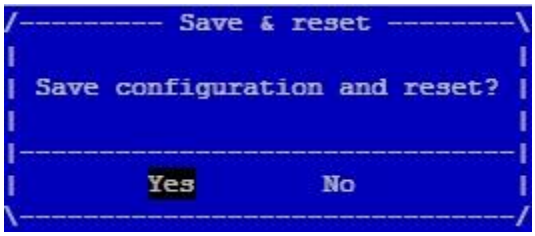
■ Discard Changes and Exit

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



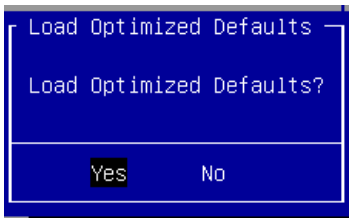
■ Save Changes and Reset

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



■ Restore Defaults

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



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 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*
Solid Red	*Defined by GPIO*
Off	*Defined by GPIO*

- **HDD Activity**

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

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

- **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*

- **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 "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