Lanner

Network Appliance Platform

Hardware Platforms for Network Computing

NCA-6210
User Manual

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:

Note: This mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.

Warning: This exclamation point indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources

The listed websites are links to the on-line product information and technical support.

Resources	URL
Lanner	http://www.lannerinc.com
Product Resource	http://www.lannerinc.com/download-center
RMA	http://eRMA.lannerinc.com

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Compliances and Certification

CE

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

FCC Class A

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

EMC Notice

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

Safety Guidelines

Follow these guidelines to ensure general safety:
- ▶ Keep the chassis area clear and dust-free 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.

In order not to result in potential electric shock or fire, please avoid improper use narrated below:
- ▶ Replacing a battery with an incorrect type (e.g. in the case of certain lithium battery types), which can defeat a safety guard.
- ▶ Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, which can result in an explosion.
- ▶ Leaving a battery in an extremely high temperature surrounding environment, which can result in an explosion or the leakage of flammable liquid or gas.
- ▶ A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas.

Lithium Battery Caution:
- ▶ Risk of Explosion if Battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.
- ▶ Installation only by a trained electrician or only by an electrically trained person who knows all English

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Installation and Device Specifications which are to be applied.
- ▶ Do not carry the handle of power supplies when moving to another place.
- ▶ The machine can only be used in a fixed location such as labs or computer facilities.

Operating Safety

- ▶ Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- ▶ Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- ▶ 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).

Mounting Installation Precaution

Environment:

- ▶ Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- ▶ 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.
- ▶ Installation of the equipment (especially in a rack) should consider the ventilation of the system's intake (for taking chilled air) and exhaust (for emitting hot air) openings so that the amount of air flow required for safe operation of the equipment is not compromised.
- ▶ To avoid a hazardous load condition, be sure the mechanical loading is even when mounting.
- ▶ Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- ▶ Reliable earthing 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:

- ▶ 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.

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.

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.
► La machine ne peut être utilisée qu'à un lieu fixe comme en laboratoire, salle d'ordinateurs ou salle de classe.

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).

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.

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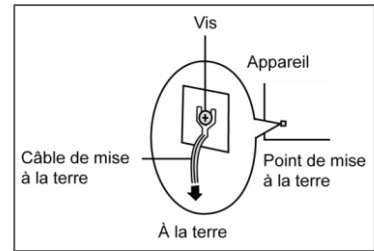
CAUTION: TO DISCONNECT POWER, REMOVE ALL POWER CORDS FROM UNIT.
注意：要断开电源，请将所有电源线从本机上拔下。
WARNUNG: Wenn Sie das Gerät zwecks Wartungsarbeiten vom Netz trennen müssen, müssen Sie beide Netzteile abnehmen.
ATTENTION: DÉBRANCHER LES TOUT CORDONS D'ALIMENTATION POUR DÉCONNECTER L'UNITÉ DU SECTEUR.

Table of Contents

CHAPTER 1: PRODUCT OVERVIEW

The NCA-6210, a 2U x86 rackmount network appliance built with 2nd gen Intel® Xeon® Scalable processor platform and C621/C627 chipset, features powerful networking processing capability, higher throughput for virtualization applications, up to 640GB DDR4 2666MHz REG DIMM and the support for 1.5x as much memory bandwidth as previous generation Intel® Xeon® processor-based server platforms.

Package Content

Your package contains the following items:

- ▶ 1x NCA-6210 Network Security Platform
- ▶ 2x Processor Carrier
- ▶ 1x Mounting Ear Brackets
- ▶ 1x HDD Screw Pack
- ▶ 2x Power Cord (Power plug type will vary by region)
- ▶ 1x Console Cable (RS232)
- ▶ 1x LAN Cable (Cross-over)
- ▶ 1x LAN Cable (Straight)

Ordering Information

SKU No.	Main Features
NCA-6210A	2x Cascade Lake (205W) / PCH C621 / 2x GbE RJ45 MGMT
NCA-6210B	2x Cascade Lake (205W) / PCH C627 / 2x 10G SFP+ MGMT
NCA-6210C	2x Cascade Lake (205W) / PCH C621 / 1x GbE RJ45 MGMT / 1x RJ45 BMC
NCA-6210D	2x Cascade Lake (205W) / PCH C627 / 2x 10G SFP+ MGMT / 1x RJ45 BMC

Optional Accessories

Model No.	Description
Short Mounting Ear Brackets with Slide-Rail Kit	A set of rackmount kit along with an accessory pack to install the system into a rack, with slide rails.
NCS2-LCM6210A	A character LCM module with keypad

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

System Specifications

Form Factor		2U 19" Rackmount
Platform	Processor Options	2nd Gen Intel® Xeon® Scalable Family Processors (Cascade Lake)
	CPU Socket	2x LGA3647
	Chipset	Intel® C621/627
	Security Acceleration	Intel® QuickAssist Technology (By SKU)
BIOS		AMI SPI Flash BIOS
System Memory	Technology	DDR4 2933/2666/2400/2133 MHz REG DIMM
	Max. Capacity	640GB
	Socket	20x 288pin DIMM
Networking	Ethernet Ports	2x GbE RJ45 Intel® i210 (By SKU); or 2x 10G SFP+ Lewisburg internal MAC (By SKU)
	Bypass	Depends on NIC module specifications
	NIC Module Slot	8 NIC Slots
LOM	IO Interface	1x RJ45 (By SKU)
	OPMA slot	IPMI Onboard (SKU C & D)
I/O Interface	Reset Button	1x Reset Button
	LED Indicators	Power/Status/Storage
	Power Button	1x ATX Power Switch
	Console Port	1x RJ45 Port; 1x mini USB Console Port (By SKU)
	USB Port	2x USB 3.0 Ports
	LCD Module	N/A (Optional)
	Display Port	1x VGA Port (Optional)
	Power Input	AC power inlet on PSU
Storage	HDD/SSD Support	2x 3.5" or 2x 2.5" Swappable Bays
	Onboard Slots	1x mSATA (M.2 by project)
Expansion	PCIe	1x PCI-E*16 FH/HL (Optional)
	mini-PCIe	N/A
Miscellaneous	Watchdog	YES
	Internal RTC with Li Battery	YES
	TPM	YES (Optional)
Cooling	Processor	Passive CPU heat sink
	System	4x Individual Hot-Swappable Cooling Fans
Environmental Parameters	Temperature	0~40ºC Operating -20~70ºC Non-Operating
	Humidity (RH)	5~90% Operating 5~ 95% Non-Operating
System Dimensions	(WxDxH)	438 x 600 x 88 mm
	Weight	24 kg
Package Dimensions	(WxDxH)	925 x 588 x 258 mm
	Weight	26 kg
Power	Type/Watts	850W 1+1 ATX Redundant PSU
	Input	AC 100~240V @47~63 Hz
Approvals and Compliance		RoHS, CE/FCC Class A, UL

Front Panel

NCA-6210 A/C

No.	Description	
F1	Reset Button	Software reset
F2	LED Indicators	System Power / System Status / HDD Activity
F3	USB Ports	2x USB 3.0
F4	RJ45 Ports	RJ-45 Console Port / RJ-45 Management Port for [NCA-6210A] or IPMI Port for [NCA-6210C] / RJ-45 Management Port
F5	Micro USB	1x Console
F6	HDD Tray	2x 3.5″ HDD Tray / HDD Status / HDD Activity
F7	NCS2 Module	8x STD NIC Module
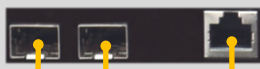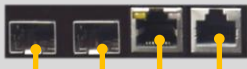
Note: Please refer to Appendix A: LED Indicator Explanations for descriptions of the LED Indicators (including those on MGMT Port, IPMI Port, GbE, SFP+ Ports and HDD trays)

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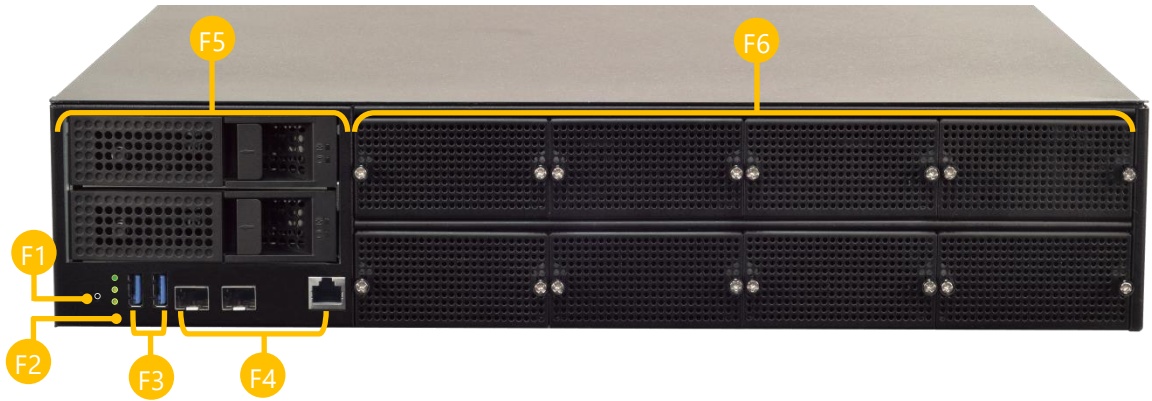
NCA-6210B

NCA-6210D

No.	Description	
F1	Reset Button	Software reset
F2	LED Indicators	System Power / System Status / HDD Activity
F3	USB Ports	2x USB 3.0
F4	RJ45 Ports	[NCA-6210B] RJ-45 Console Port / SFP+Management Ports [NCA-6210D] RJ-45 Console Port / IPMI Port / SFP+Management Ports
F5	HDD Tray	2x 3.5" HDD Tray HDD Status / HDD Activity
F6	NCS2 Module	8x STD NIC Module

Note: Please refer to Appendix A: LED Indicator Explanations for descriptions of the LED Indicators (including those on MGMT Port, IPMI Port, GbE, SFP+ Ports and HDD trays)

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Rear Panel

No.		Description
R1	Rear PCIe Expansion	1x PCIe expansion slot (Optional)
R2	Power Switch	1x Power Button
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	Fans	4 x Independent Swappable Fans
R5	Power Supply	2x 850W Redundant (N+1 Design)

CHAPTER 2: MOTHERBOARD INFORMATION

Block Diagram

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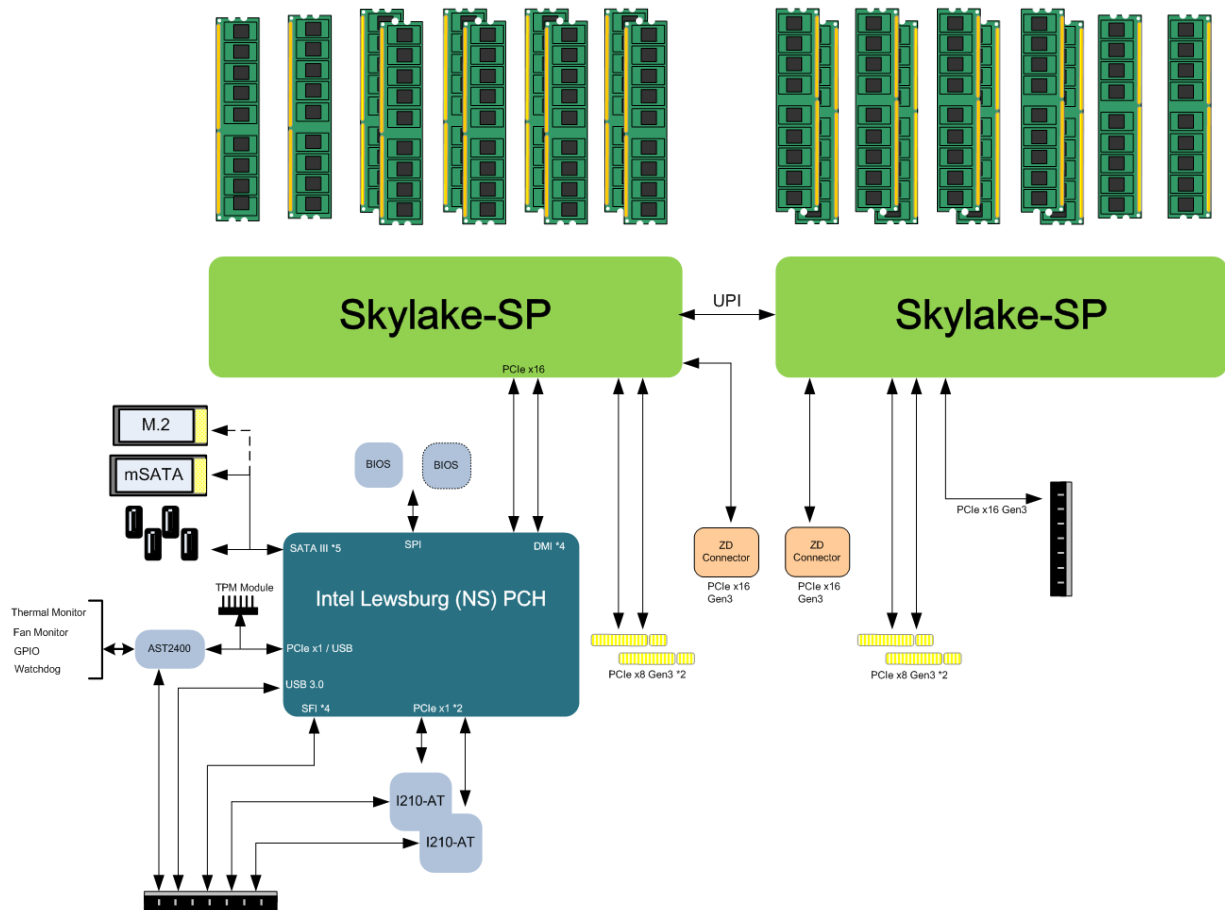
Motherboard Layout

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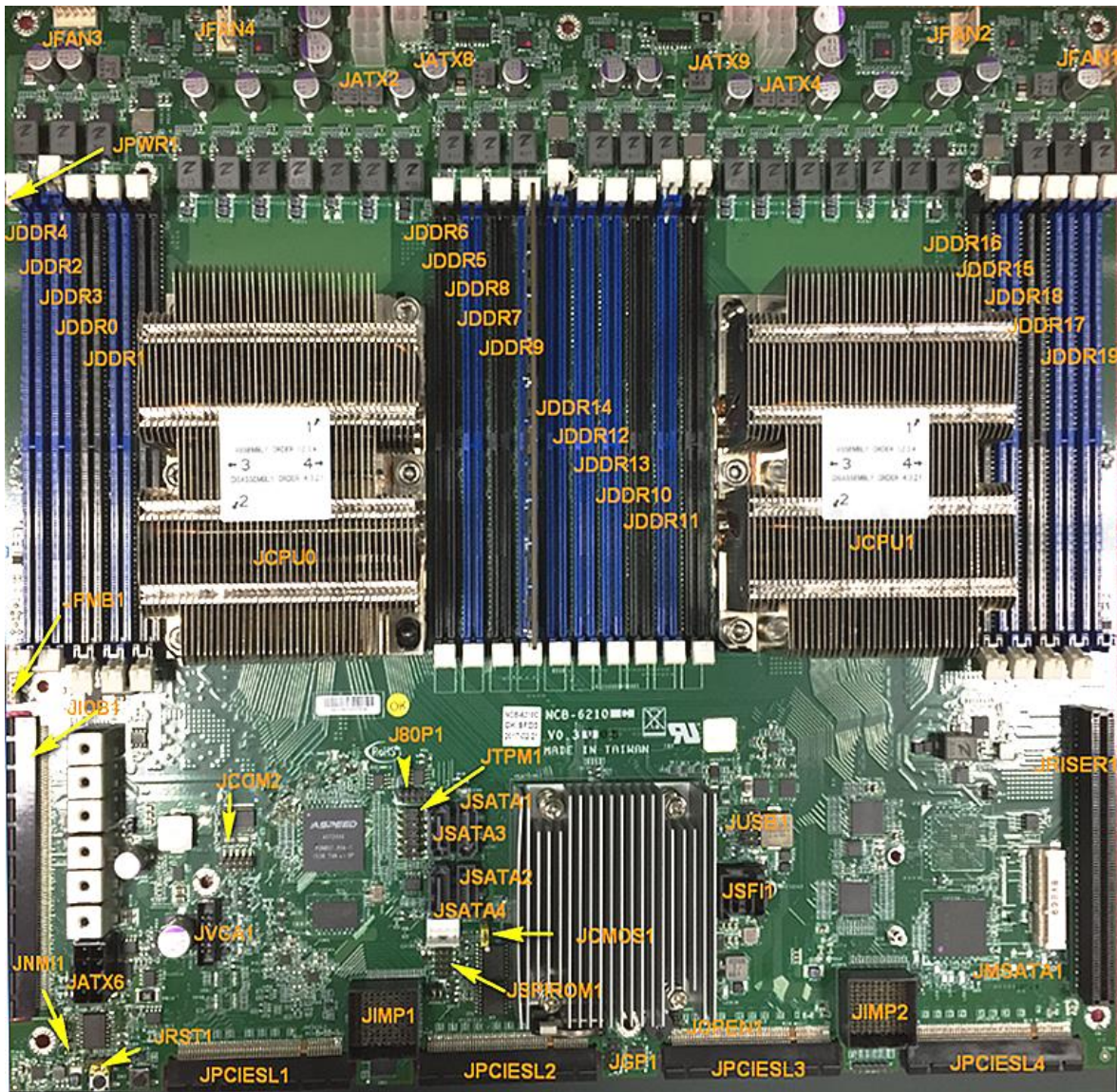
Internal Jumper & Connectors

JUSB1: USB2.0

Pin	Description	Pin	Description
1	+P5V_USB1	**2**	+P5V_USB1
3	USB20_L_N3	**4**	USB20_L_N4
5	USB20_L_P3	**6**	USB20_L_P4
7	USBGND1	**8**	USBGND1
9	USBGND1	**10**	USBGND1
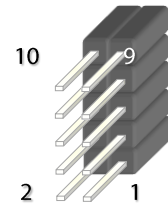
JTPM1

Pin	Description	Pin	Description
1	IRQ_SERIAL	**2**	LPC_LFRAME#
3	LPC_LAD0	**4**	CLK_24M_LPC
5	LPC_LAD1	**6**	+P3V3_AUX
7	LPC_LAD2	**8**	
9	LPC_LAD3	**10**	+P3V3
11	TPM_RST#	**12**	GND
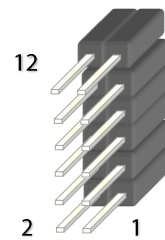
JVGA1

Pin	Description	Pin	Description
1	DAC_RO	**2**	GND
3	DAC_GO	**4**	GND
5	DAC_BO	**6**	GND
7	HSYNC_O	**8**	
9	VSYNC_O	**10**	GND
11	DDC_DATA	**12**	DDC_CLK
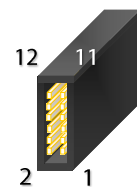
ATX6: 8-Pin Power Connector

Pin	Description	Pin	Description
1	GND	**2**	+P5V
3	GND	**4**	+P5V_SB
5	GND	**6**	+P12V_STBY_PSU
7	GND	**8**	+P12V_STBY_PSU
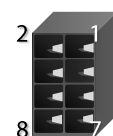
JATX8: 4 pin Power Connector (12V standby)

Pin	Description	Pin	Description
1	GND	**2**	+P12V_1_STBY
3	GND	**4**	+P12V_1_STBY

JATX2 & JATX4: 8 pin Power Connector

Pin	Description	Pin	Description
1	GND	**2**	+12V
3	GND	**4**	+12V
5	GND	**6**	+12V
7	GND	**8**	+12V
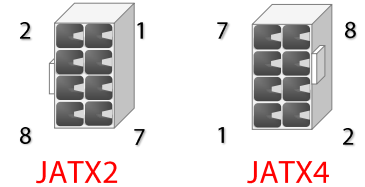
JATX9: 4 pin Power Connector (12V standby)

Pin	Description	Pin	Description
1	GND	**2**	+P12V_2_STBY
3	GND	**4**	+P12V_2_STBY

JSATA1~JSATA4: SATA Port

Pin	Description	Pin	Description
1	GND	**2**	TX_P
3	TX_N	**4**	GND
5	RX_N	**6**	RX_P
7	GND		
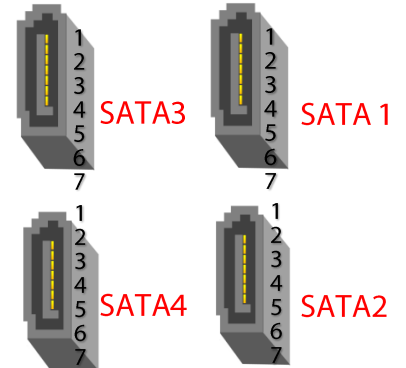
JFAN1~4: FAN Connector

Pin	Description	Pin	Description
1	GND	**2**	12V
3	RPM Sense	**4**	RPM Sense
5	WM Status		

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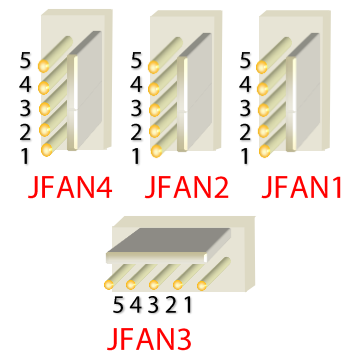
JNMI1:

Pin	Description	Pin	Description
1	GND	**2**	NMIBTN#
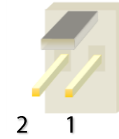
JRST1:

Setting	Description	Setting	Description
1.2 ▢■ 3 2 1	HW reset	2.3 ■▢ 3 2 1	SW reset
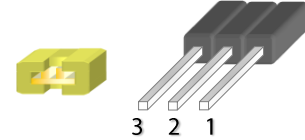
JMSATA1:
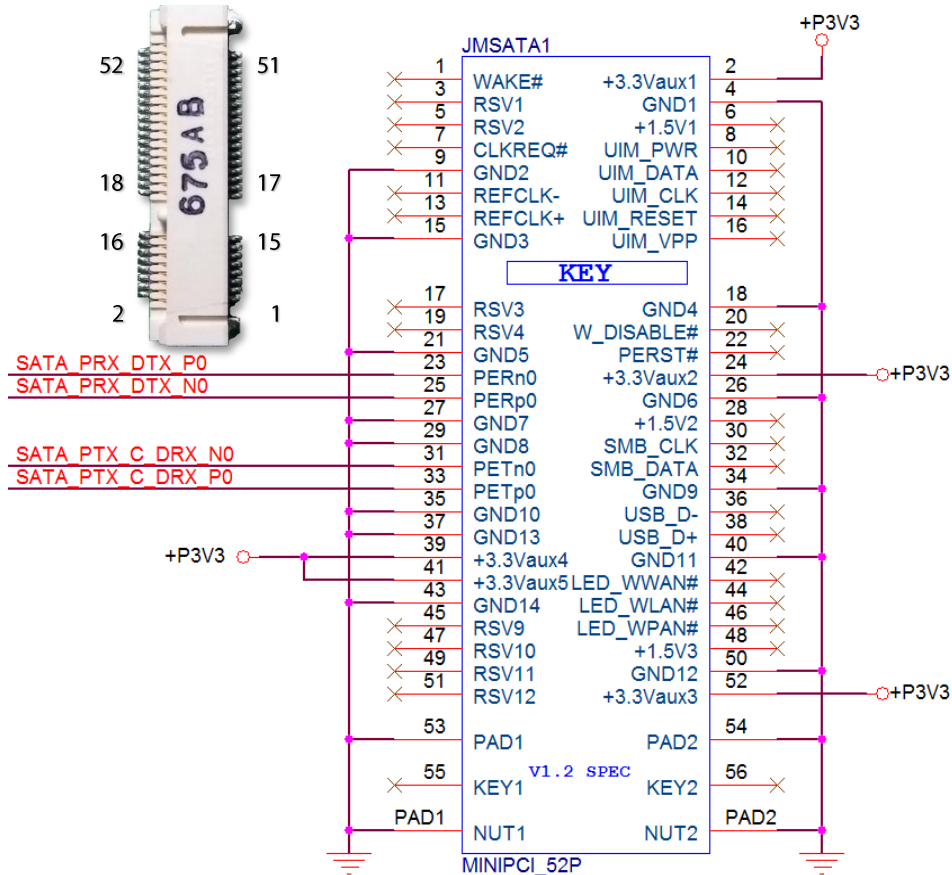
Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	WAKE#	**2**	+3.3Vaux1	**3**	RSV1	**4**	GND1
5	RSV2	**6**	+1.5V1	**7**	CLKREQ	**8**	UIM_PWR
9	GND2	**10**	UIM_DATA	**11**	REFCLK-	**12**	UIM_CLK

13	REFCLK+	14	UIM_RESET	15	GND3	16	UIM_VPP
17	RSV3	18	GND4	19	RSV4	20	W_DISABLE#
21	GND5	22	PERST#	23	PERn0	24	+3.3Vaux2
25	PERp0	26	GND6	27	GND7	28	+1.5V2
29	GND8	30	SMB_CLK	31	PETn0	32	SMB_DATA
33	PETp0	34	GND9	35	GND10	36	USB_D-
37	GND13	38	USB_D+	39	+3.3Vaux4	40	GND11
41	+3.3Vaux5	42	LED_WWAN#	43	GND14	44	LED_WLAN#
45	RSV9	46	LED_WPAN#	47	RSV10	48	+1.5V3
49	RSV11	50	GND12	51	RSV12	52	+3.3Vaux3

JCOM2: COM PORT

Pin	Description	Pin	Description
1	BMC_COM2_DCD#	2	BMC_COM2_DSR#
3	BMC_COM2_RX	4	BMC_COM2_RTS
5	BMC_COM2_TX	6	BMC_COM2_CTS#
7	BMC_COM2_DTR	8	BMC_COM2_RI#
9	COM2_GND2		
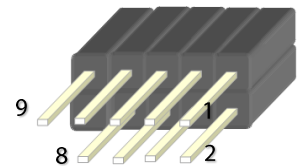
Note: The on-board BMC supports two UARTs: UART1 for console and UART2 for LCM or COM2. If UART2 is to be used for connecting LCM, the on-board COM2 pin header or a reserved COM port opening on rear panel will be of no necessity.

PMB1: PMBUS

Pin	Description	Pin	Description
1	PSU_TTL1	2	PSU_TTL2
3	ATX_PSON#	4	GND
5	ATXPWGD	6	PMBUS_CLK
7	PMBUS_DAT	8	PMBUS_ALERT#

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JOPEN1: Case open

Pin	Description	Pin	Description
1	GND	2	FM_INTRUDER#
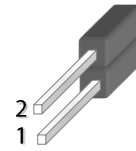
JCMOS1: Clear CMOS

Pin	Description	Pin	Description
1	VRTC	2	PCH_RTCRST#
3	GND		
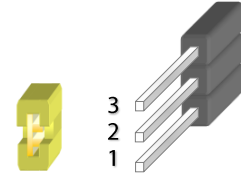
Normal (Default)

Clear CMOS

JSPIROM1: Flash BIOS

Pin	Description	Pin	Description
1	SPI_HD1#	2	SPI_CS1#_DUAL
3	SPI_CS0#_DUAL	4	+P3V3_SPI_ME
5	SPI_MISO	6	SPI_PCH_IO3
7		8	SPI_CLK
9	GND	10	SPI_MOSI
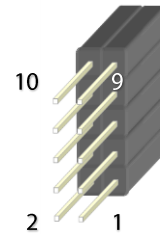
JGP1: EXT GPIO header

Pin	Description	Pin	Description
1	GPO_B_1	2	GPI_B_1
3	GPO_B_2	4	GPI_B_2
5	GPO_B_3	6	GPI_B_3
7	GPO_B_4	8	GPI_B_4
9	GND	10	GND
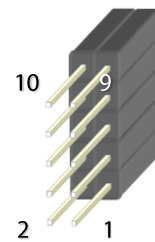
JSFI1: SFP+ (for fiber cable)
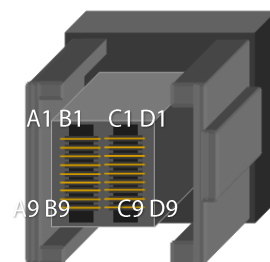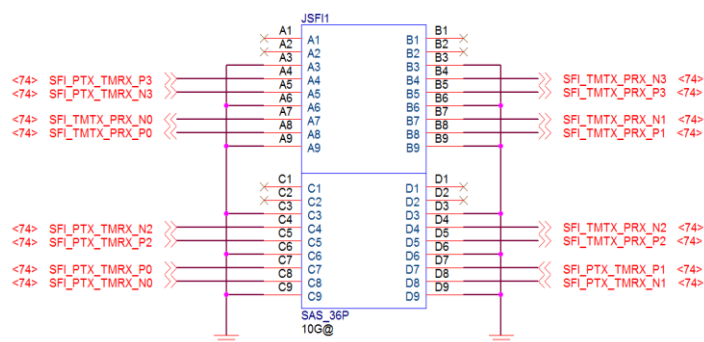
JPWRON1: Power on

Pin	Description	Pin	Description
1	GND	**2**	ATX_PSON#

JIOB1: IO board
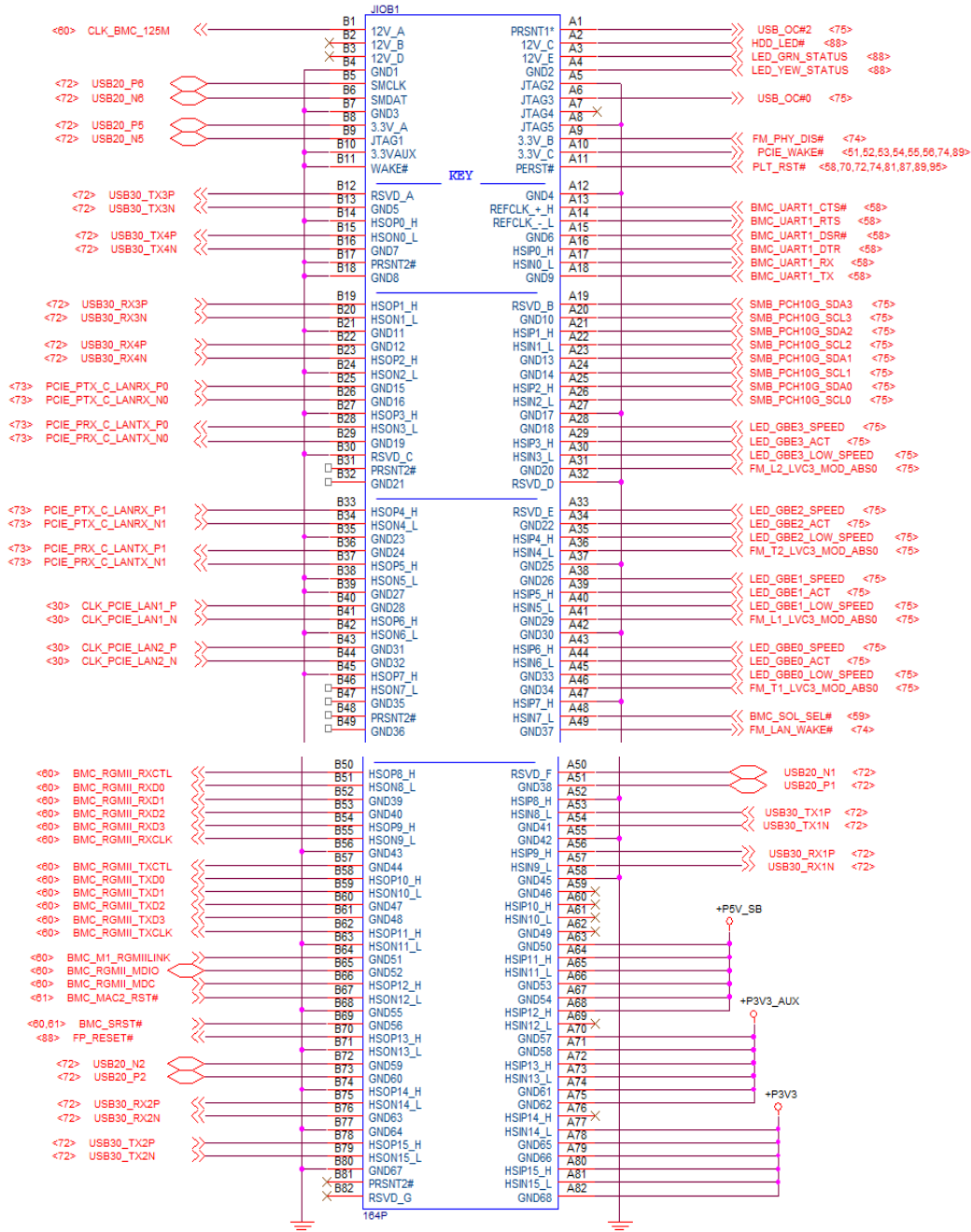
CHAPTER 3: HARDWARE SETUP

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

Opening the Chassis

1. Loosen the 2 thumb screws from the rear panel of NCA-6210.

2. Gently pull the cover backward a bit.

3. Lift the cover up to remove it.

4. Remove the cover that protects the CPUs and the fans.
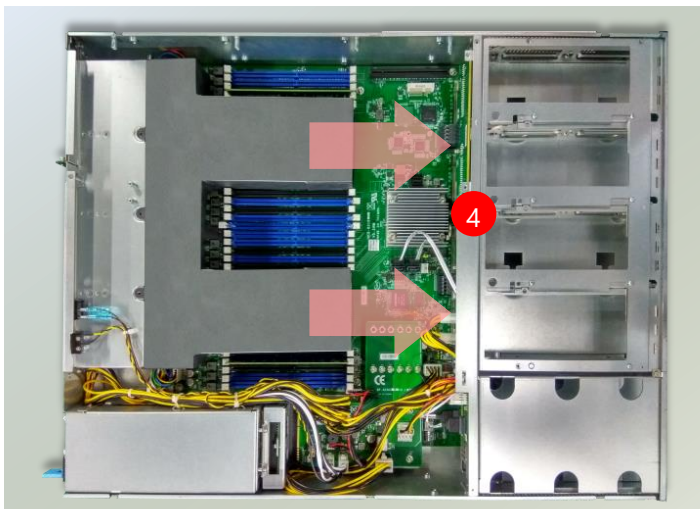
Installing the CPU

Please note that the system delivered to you is already installed with the processor and that this processor, LGA3647, comes with rather sophisticated design; therefore, the assembly of which must be handled with exclusive tools and extreme care by professionals. It is strongly recommended that you not make any adjustments to, remove or even re-install the processor on your own. If handling the processor on your own is inevitable, please read through the instructions in this section and refer to the official tutorial released by Intel® to make sure you have acquired the necessary knowledge and comply with the requirements.

Installing the processor onto motherboard involves two stages:
1. Mount the processor onto the heat sink to make a PHM (Processor + Heat Sink Module)
2. Install the PHM onto the motherboard.
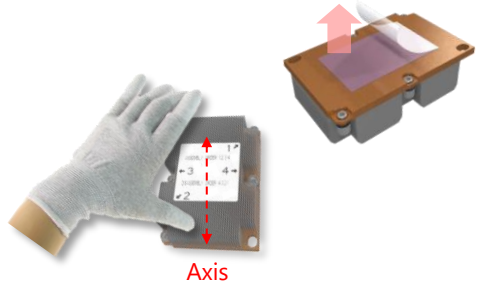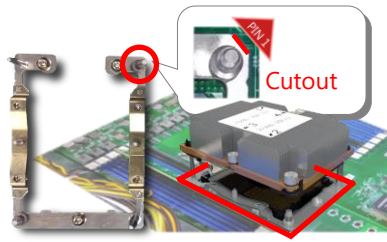
Tools Required

Tool	Description	
Torque screwdriver (Star T30)	Set to 1.36 N.m. or 12 in-lbf for tightening the nuts which fasten the PHM on the bolster plate.	
ESD Protection (ESD gloves, ESD-safe work surface, etc.)	During the entire assembly process, at least wear a pair of ESD gloves to avoid damaging or contaminating the electronic parts while enhancing your own safety.	

Note: The images of tools shown in this document are merely for reference; the actual tools you use might differ.

Parts Explanation:

Item	Description	
Processor	Please avoid touching the gold fingers or package lands of the processor even if you are wearing ESD gloves.	
Heat Sink	If a TIM (Thermal Interface Material) protective film is already attached to the base of the heat sink, remove it before you mount the processor on it. When holding it, please grip it along the axis of its fins with your thumb and your index finger.	 Axis
Processor Carrier	This is packed along with the processor. Before performing any assembly involving this part, please locate PIN1 on one of the corners, an important indicator used to align this carrier with the processor and the bolster plate correctly.	
Dust Cover	This cover is used to protect the package land surface of the processor from contamination. To remove it from the processor, grasp the holding features with your thumb and your index finger while pulling the cover off vertically.	
Bolster Plate	A robust bolster plate is used to assist in PHM alignment for installation, while effectively helping eliminate PCB bowing during compression. Please locate the Cutout on one of the four corners before starting PHM installation.	Cutout

Mounting the CPU onto the Heat Sink

1. Align the PIN1 indicator on the processor with that on the carrier.

2. Gently insert one side of the processor into the carrier and make sure the alignment feature is aligned with the latch of the carrier.
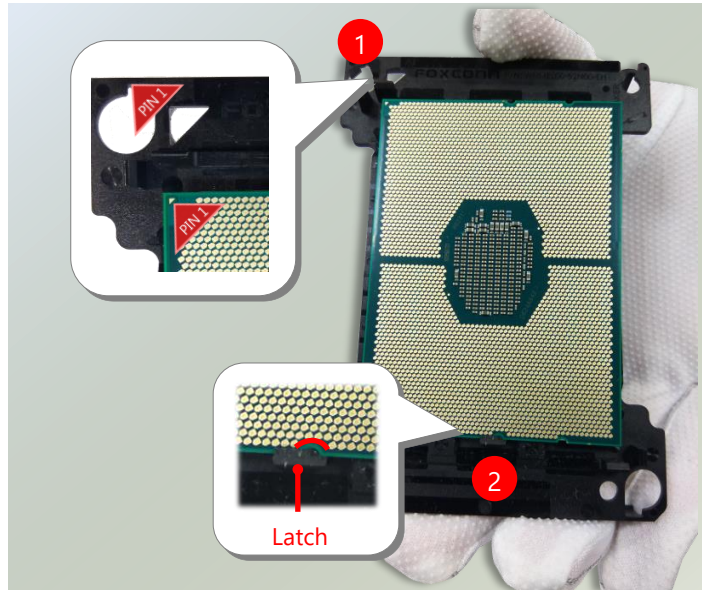
Latch

Note: During assembly, it is essential to have (1)PIN1 on the processor aligned with that on the carrier, and (2) the alignment features on the top and the bottom of the CPU aligned with the corresponding carrier latches.

3. For the other end of the carrier, align the alignment feature of the processor with the carrier latch, and then gently bend over the carrier end to have the latch clamp on the processor.

Latch

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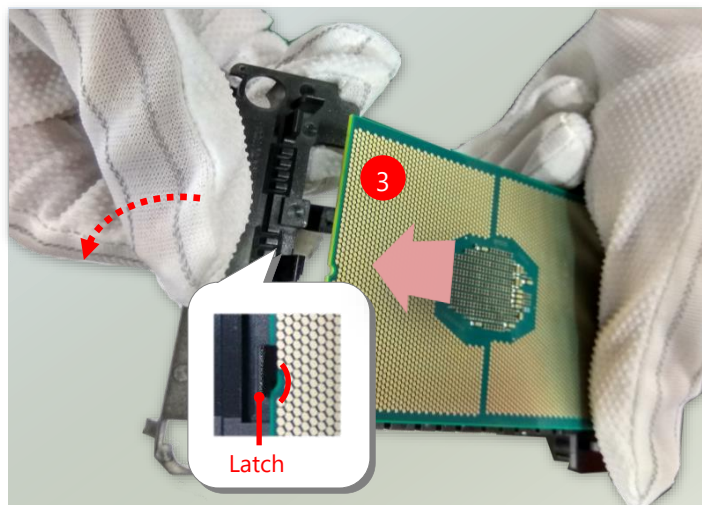
4. Align PIN1 of the processor with the corner cutout of the heat sink (if there are two corner cutouts on one heat sink, either will do).
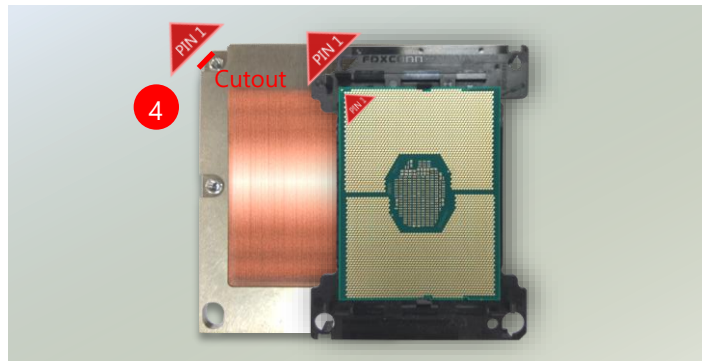
5. With a little pressure, push the four corners of the carrier down to engage their latching features with the corresponding corners of the heat sink. You might hear a clicking sound when the latch clicks into place.
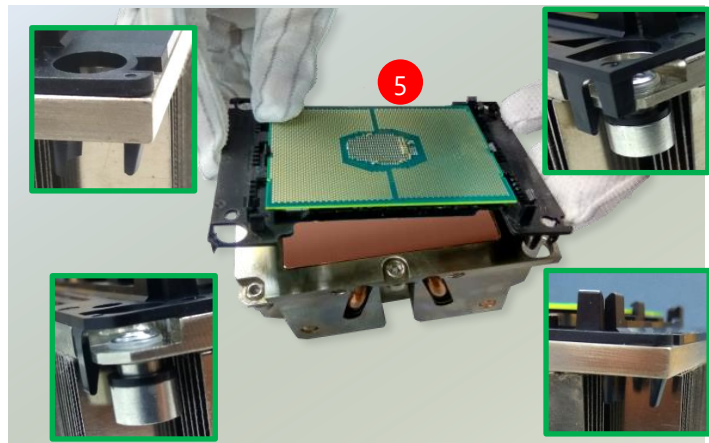
6. Go through the four corners to check if the latches are engaged. If correctly latched, the corners of the carrier should be tightly attached to the heat sink, and no gap in-between is observed.
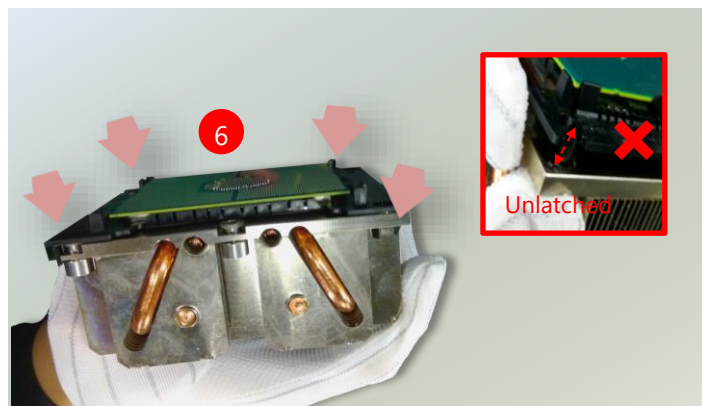
Installing the PHM onto the Motherboard

1. Remove the dust cover from the socket contacts of the motherboard.

Note: Inspect the surface of the socket under sufficient lighting to ensure there is no contamination or damage prior to the PHM installation.
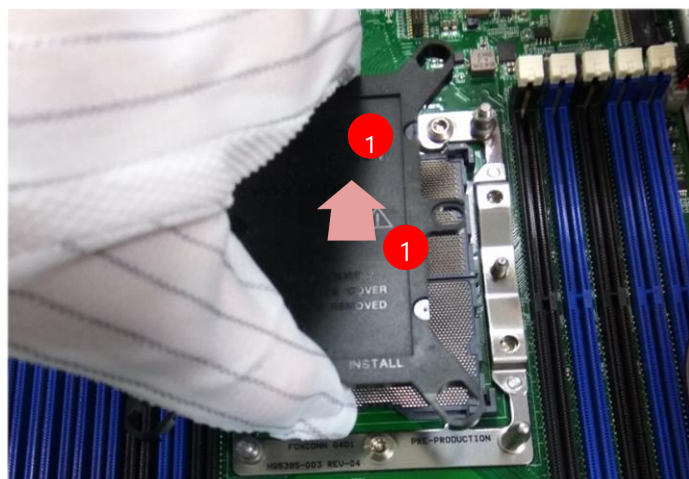
2. Flip the PHM over to align PIN1 of the carrier with the Cutout of the bolster plate.
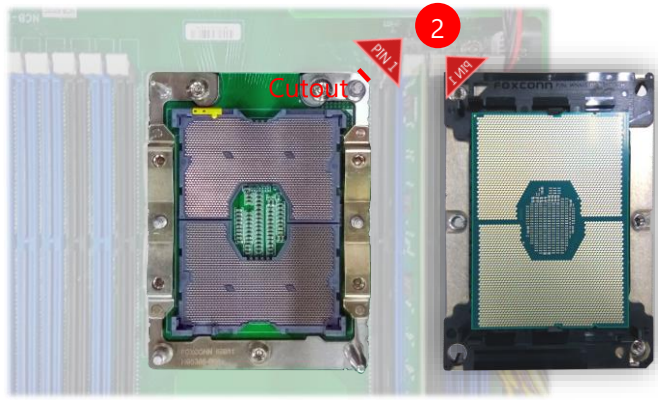
3. Flip the PHM over, with the package land of the processor facing the socket, carefully hold the PHM while lowering it vertically to engage it to the alignment pins of the bolster plate.
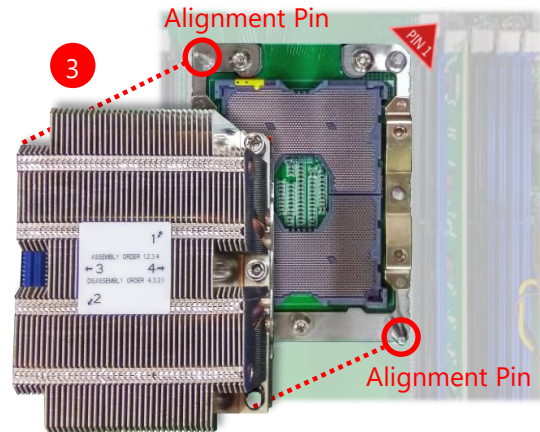
4. Make sure the PHM is sitting horizontally on the bolster plate.
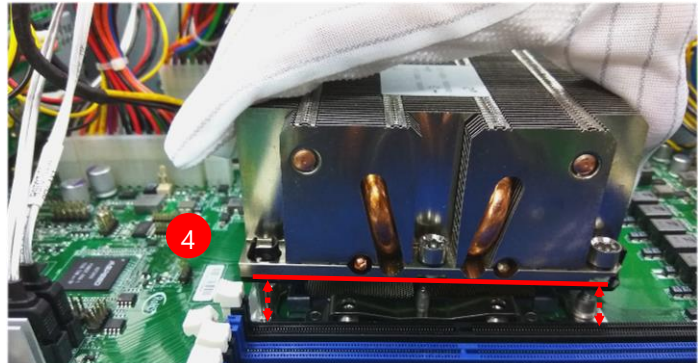
5. Use a torque driver to tighten the four nuts to 12 in-lbf into the bolster plate following the sequence indicated on the heat sink (#1→ #2→#3→#4).

Note: When fastening #3 and #4 nuts, the gap between the metal spring leaf of the bolster plate and the PHM will gradually diminish as you drive the nuts.
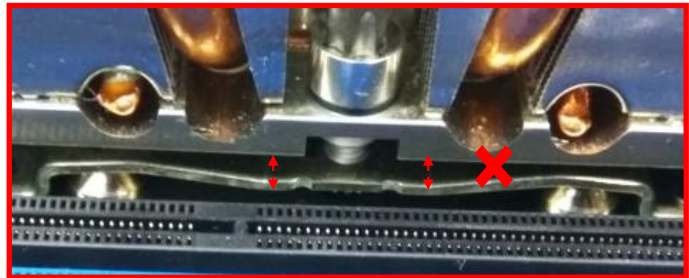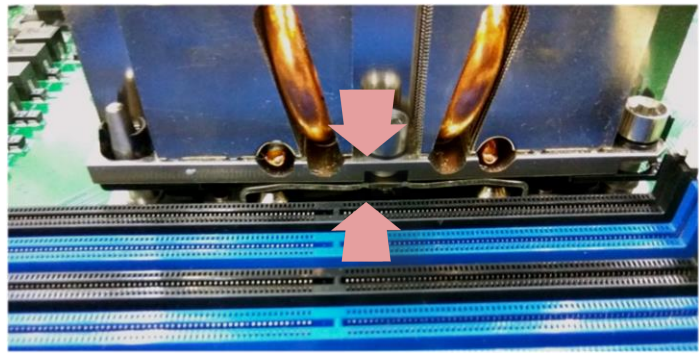
Installing the System Memory

The motherboard supports DDR4 registered DIMM memory for heavy-duty operations. Please follow the steps below to install the DIMM memory modules. The primary CPU and the secondary CPU both have 10 DIMM sockets (5 on its both sides)
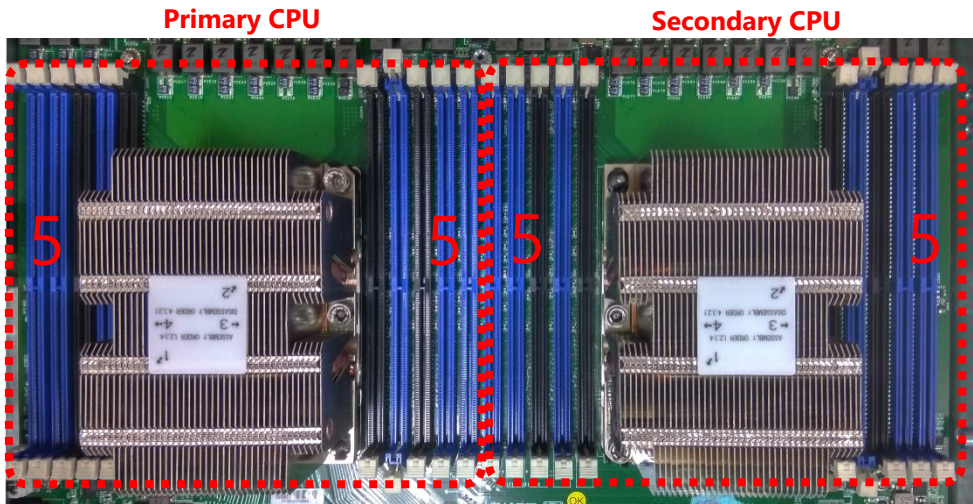
- Supported Capacities: 8/16/32 GB
- Maximum RAM: **640GB** (32GB per slot)

DIMM Population Guidelines

Please do follow the memory module installation instructions to install the DIMM, and make sure the DIMM population guidelines are met:

- Each CPU requires at least 1 memory module to boot and run from.
- If you do not plan to fill up all the sockets with 20 memory modules, always start with the blue ones for optimal performance.
- Try to split the DIMMs evenly across the CPUs.
- Please use memory modules of the same capacity, speed and from the same manufacturer to avoid compatibility issues.

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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.
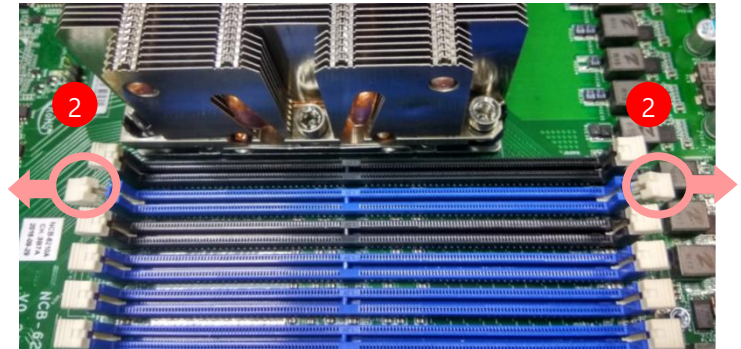
3. Align the notch of the DIMM module with the socket key in the slot.
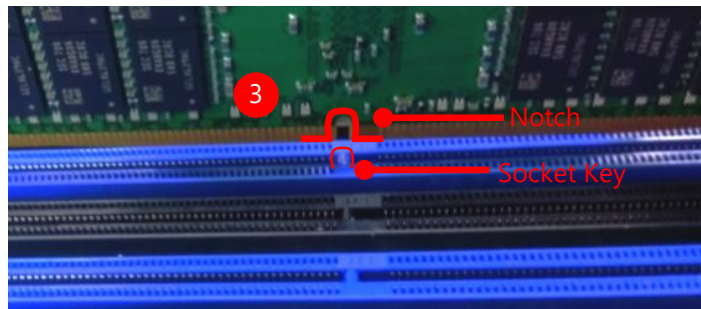
4. Insert the module into the slot until it is firmly seated. The motherboard of NCA-6210 is designed with 20 DDR DIMM sockets.
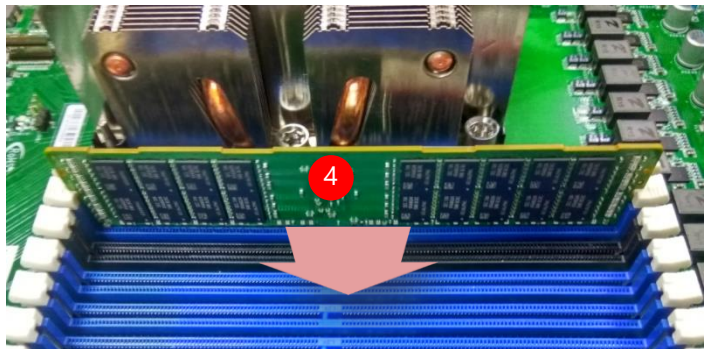
Installing mSATA

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

1. Locate the mSATA socket. Align the notch of the DIMM module with the socket key in the slot.
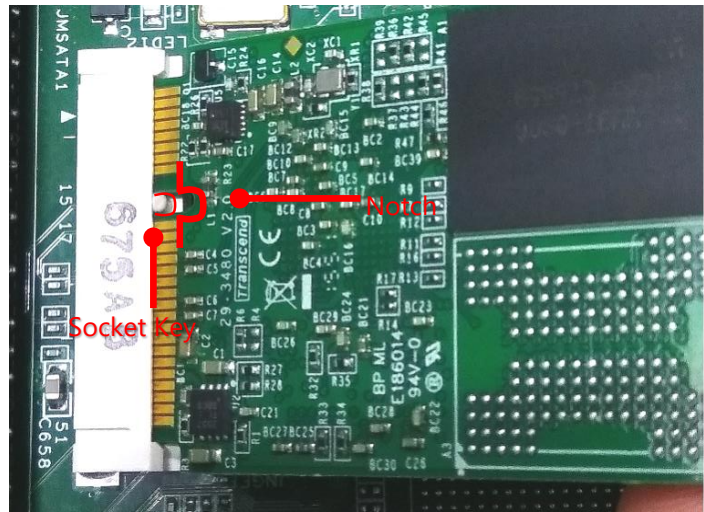
2. Insert the module at 30 degrees into the socket until it is fully seated in the connector.
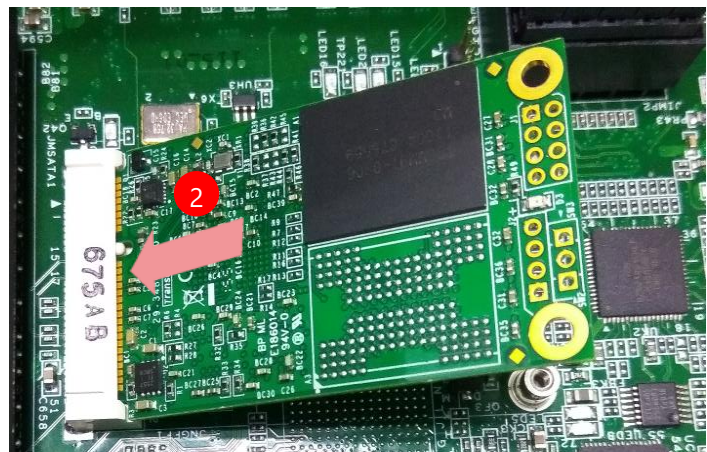
3. Push down on the module and secure it with screws that come with it.
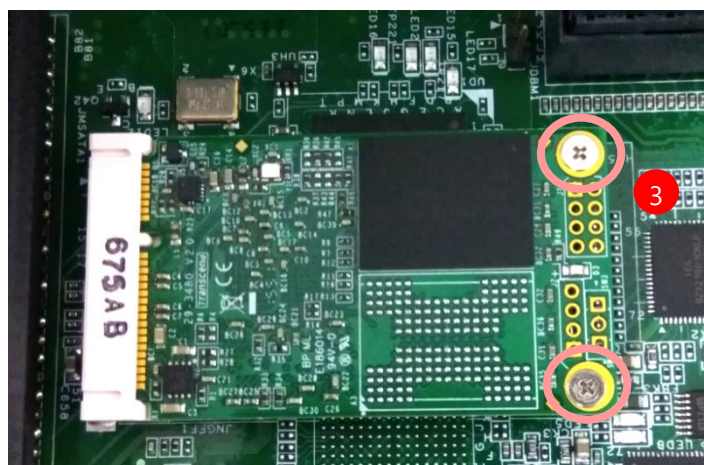
Installing the Disk Drive(s)

NCA-6210 is built with two 3.5" HDD/SSD slot (HDD preferred) drive bay. The following will discuss disk drive installation procedures based on their HDD/SSD designs.

1. Power off the system.
2. Locate the 3.5" disk bay on the front panel.

3. To remove the tray, put your finger on the tab and push it to the left to slide it open, hold the tab lever and pull out the tray.
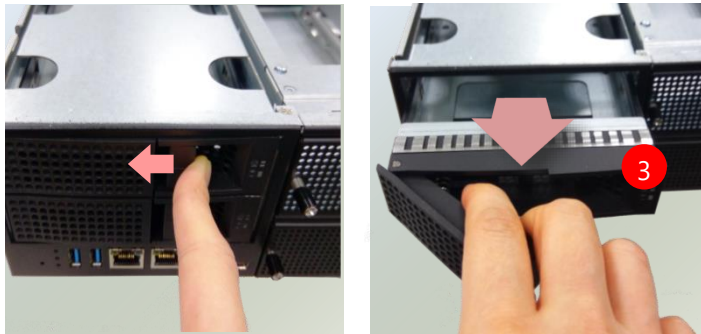
4. To mount the disk onto the empty tray, secure the hard disk on the tray with the provided disk screws. Make sure the disk connector faces towards the SATA contacts inside the system.

Disk Screws

Disk Screws

SATA Contacts
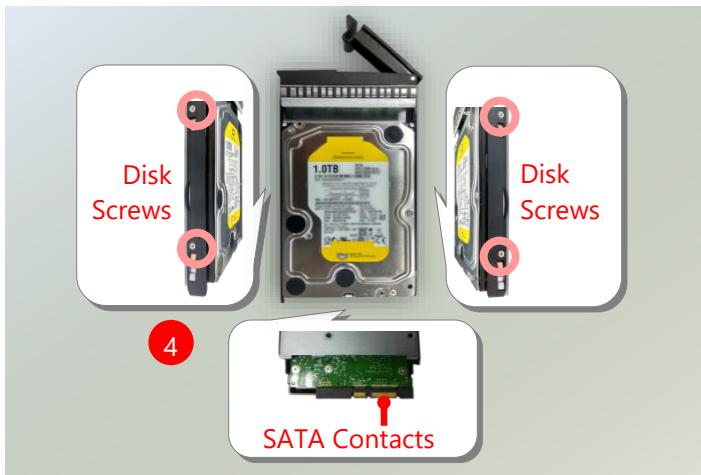
5. To install the mounted disk tray, push the tray into position in the chassis. Press the hinge tab until it clicks into place.

Installing the NIC Modules

NCA-6210 comes with 8 NIC Ethernet module slots for network bandwidth expansion. Please follow the steps for installation.

1. On the front panel, select a NIC Ethernet module slot.

2. Rotate clockwise and loosen the two lock-screws.

3. Remove the door and locate the PCIe socket for module insertion.

PCIe Socket
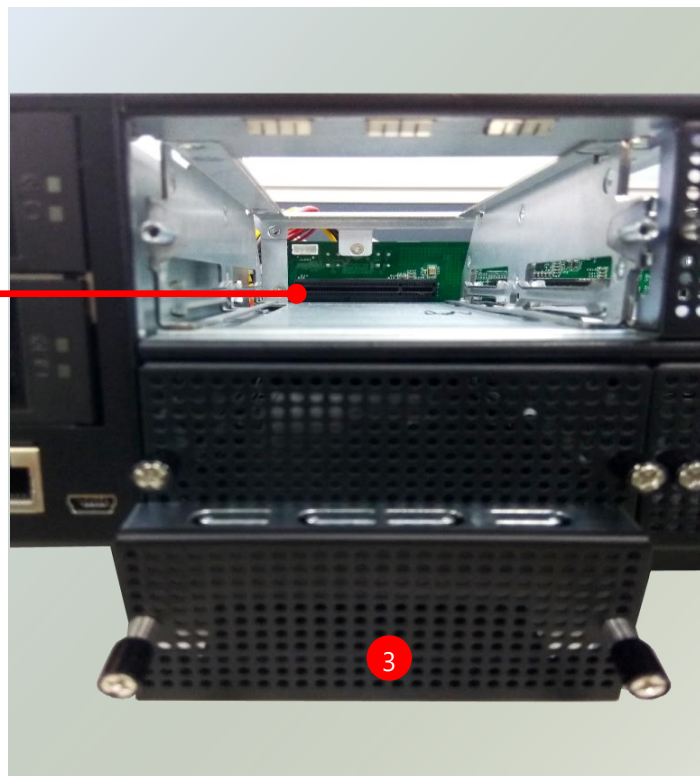
4. Insert your NIC Ethernet module. (The module shown in the image below is for reference only).
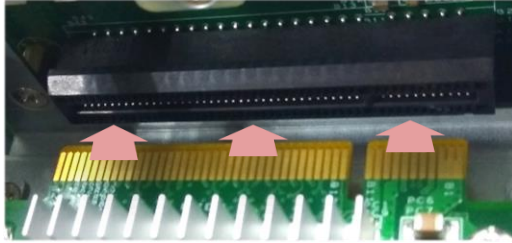
Align the golden fingers to the PCIe socket on the motherboard carefully while inserting this module.

5. Once the module is firmly seated, rotate counter-clockwise and tighten the two lock-screws.
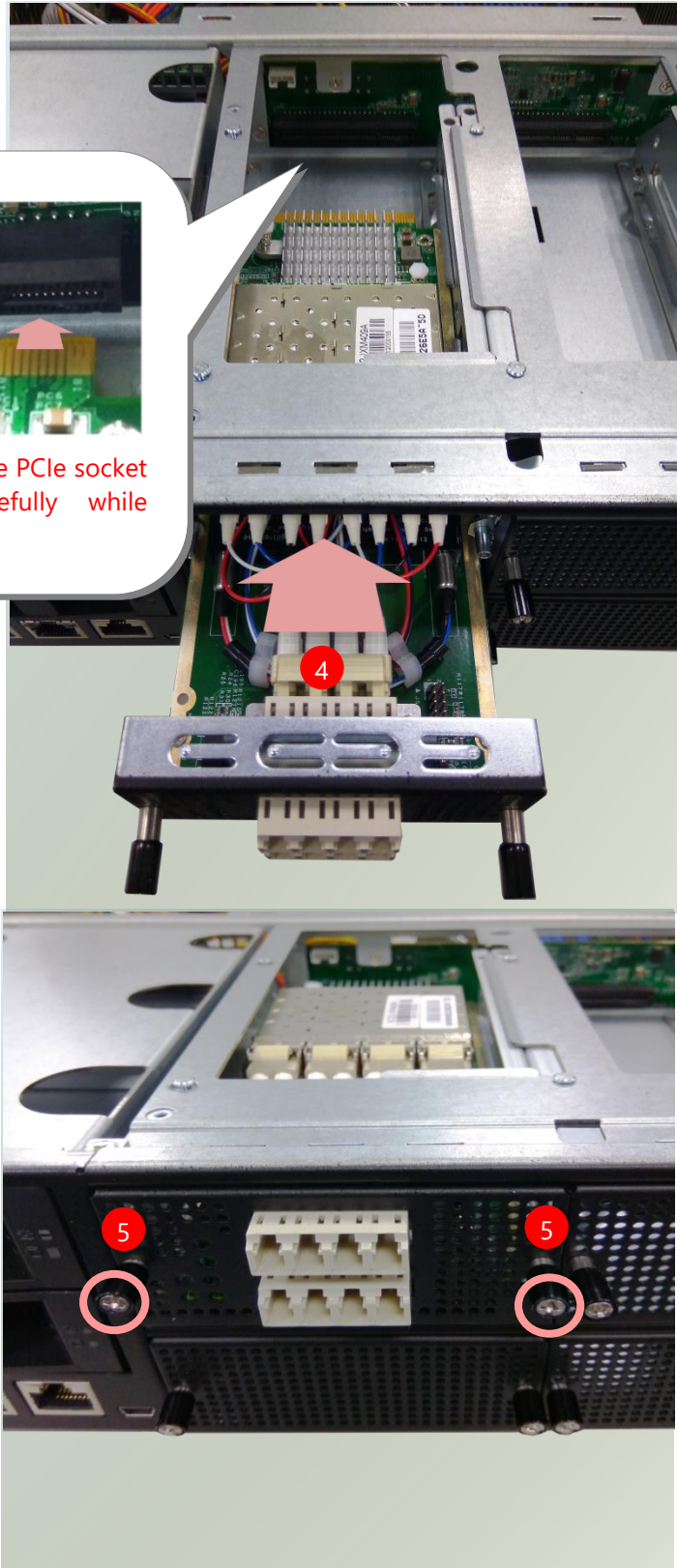
Installing the LCM Module

NCA-6210 comes with module slots for LCM module expansion. Please follow the steps for installation.

1. Open the LCM module package. The package kit will include:

▶ 1x LCM Panel

▶ 1x LCM connector cable

▶ 2x screws

2. On the front panel of NCA-6210, select the first or second module slot for LCM Module placement.
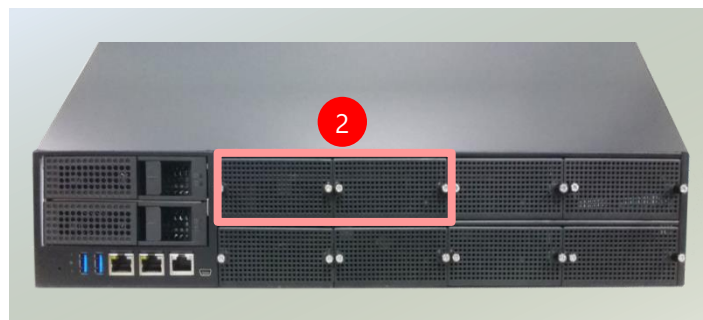
3. Loosen the two lock-screws and remove the door.

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Side-entry Connector
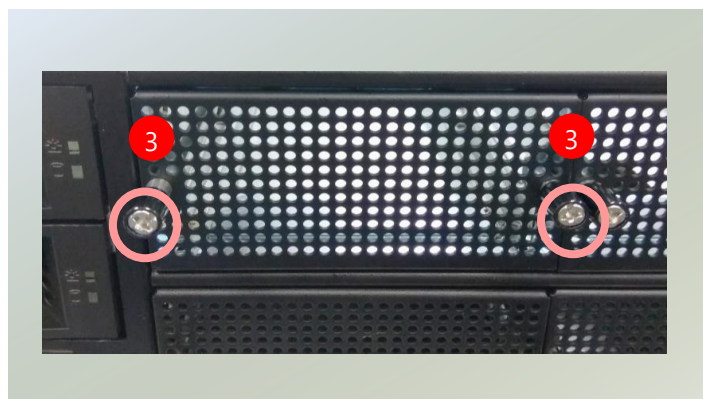
4. Locate the side-entry connector for LCM module cable insertion.

5. Install the LCM module into the module slot. Insert the connector cable into the connector, wire showing-side facing up.
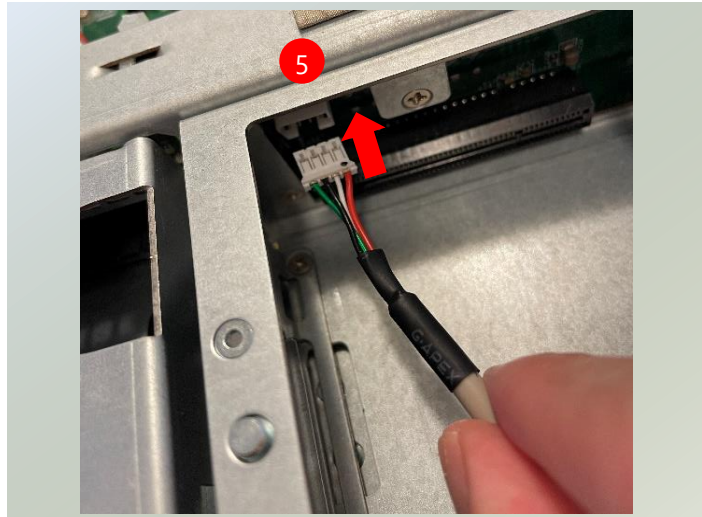
6. Screw in the two lock screws on the LCM module. The LCM module has been successfully installed.
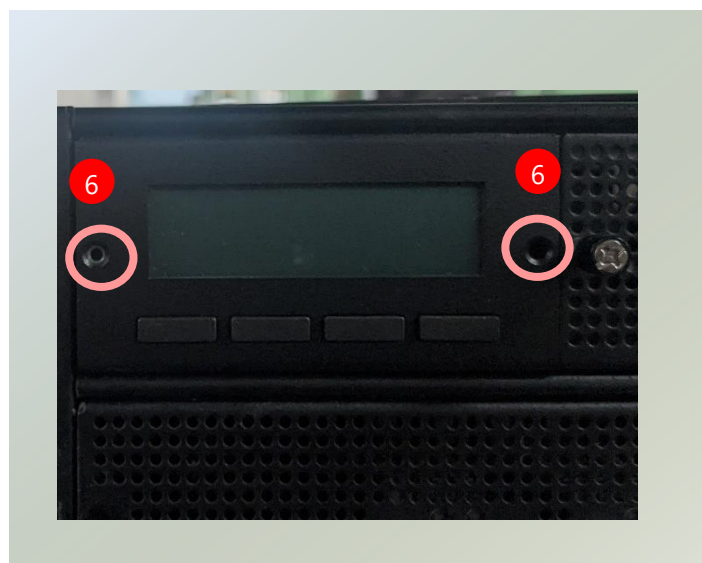
Replacing the Cooling Fans

Cooling fans may wear down eventually. Please refer to the steps below for replacing cooling fans. When

using a new cooling fan, simply reverse the steps to install the fan back onto the enclosure and the system.

1. Locate the cooling fans at the rear panel.
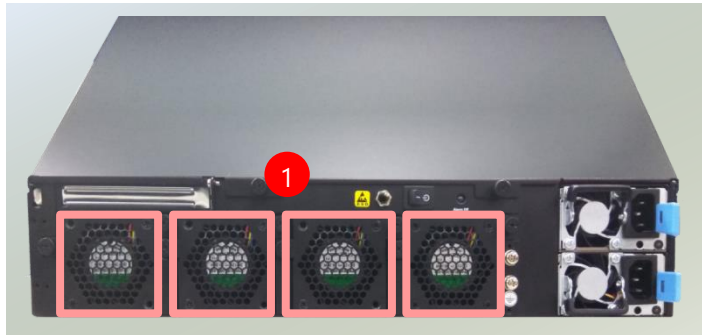
2. Loosen the two lock-screws of the fan you would like to replace.
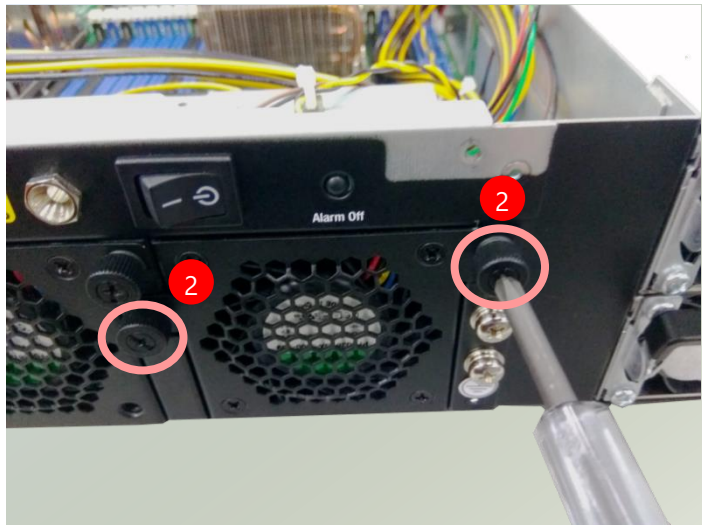
3. Hold onto the two lock-screws and pull it out.

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4. Remove the 4 screws that secure the fan.

5. Remove the 4 screws that enclose the fan.
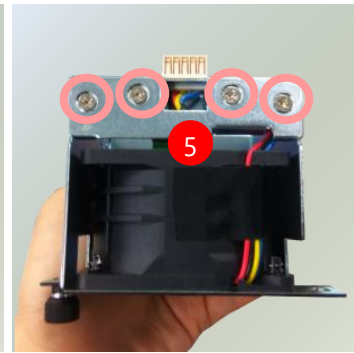
6. Take the fan connector out of the enclosure.

7. Take the worn cooling fan out.

Replacing the Power Supply Units

Power supply units may wear down eventually. Please be noted that NCA-6210 series supports 550W/850W depending on the ordering preferences. 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 system out.

    Hold the handle while pulling out the power supply unit.
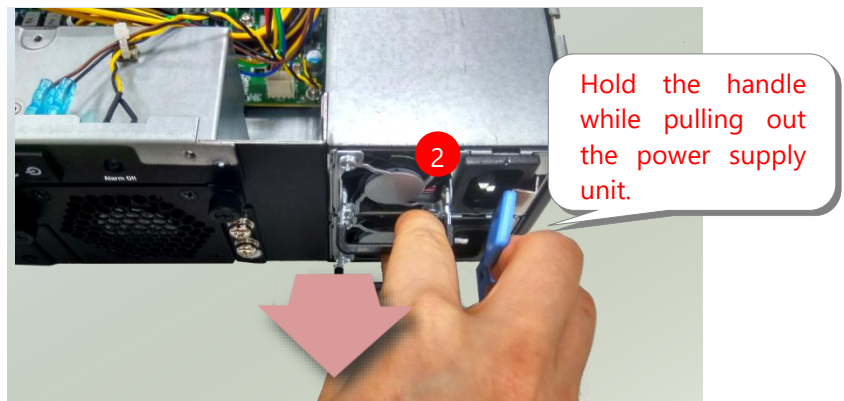
3. Locate the internal connector of the power supply unit.

    Power supply connector
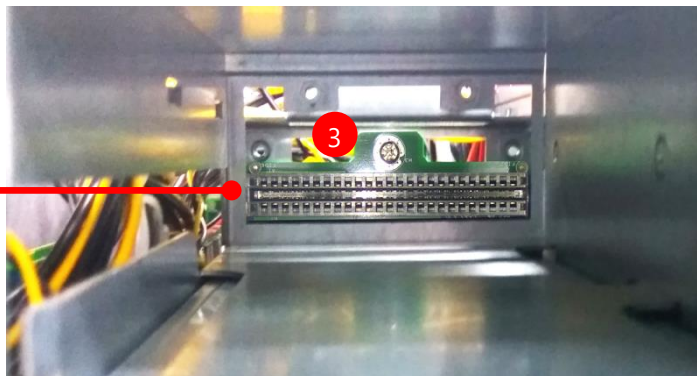
4. Insert a new power supply unit. Push the unit in until it clicks into place.

    Click

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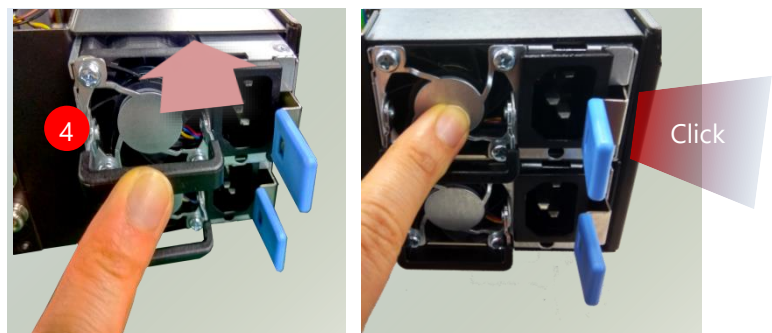
Install DC Power Supply

Connect the power cord to the connector.
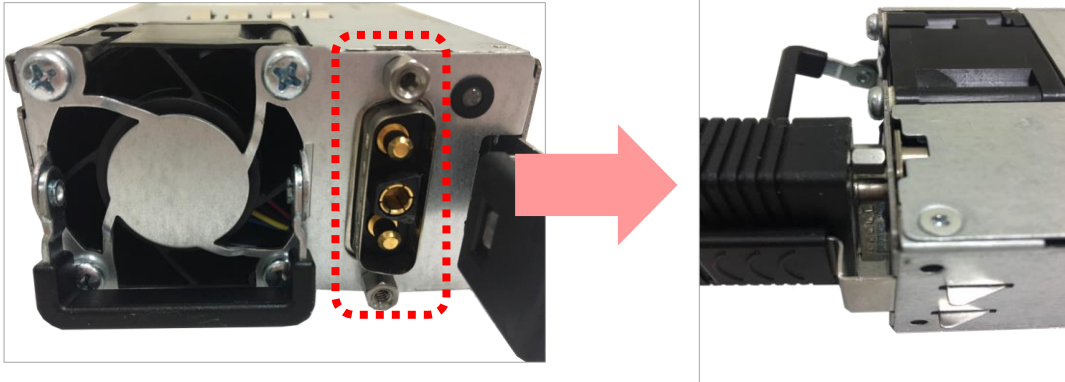
- This product is intended to be supplied by a UL Listed DC power source, rated 48-60Vdc, 30A minimum, Tma= 40 degrees C, and the altitude of operation=2000 m. If you need further assistance with purchasing the power source, please contact Lanner Electronics Inc. for further information.
- The cable should be 10AWG (20A minimum, -60V minimum).
- Use at least a 20-amp fuse for each DC breaker.

Mounting the System

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

▶ With **Mounting Ear Brackets**

This method is quick and easy by fixing this system to the front posts of the rack, but it also makes servicing the system more difficult. Please note that the use of these brackets must go with a rack shelf or slide rails to prevent the chassis from falling over, for the <u>bracket assembly alone cannot provide sufficient support to the chassis</u>.
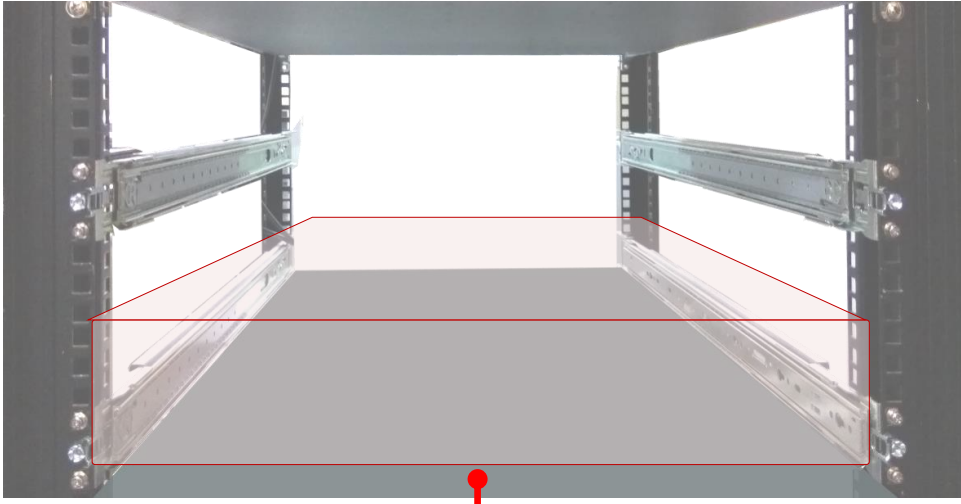
The system shall be installed on the rack along with a shelf or slide rails, for the "Mounting Ears" are meant to secure the system, not to support it.

▶ With **Slide Rail Kit + Short Mounting Ear Brackets**

This method is rather complicated, but the slidable rails allow you to access the system easily while securing it in the rack solidly.
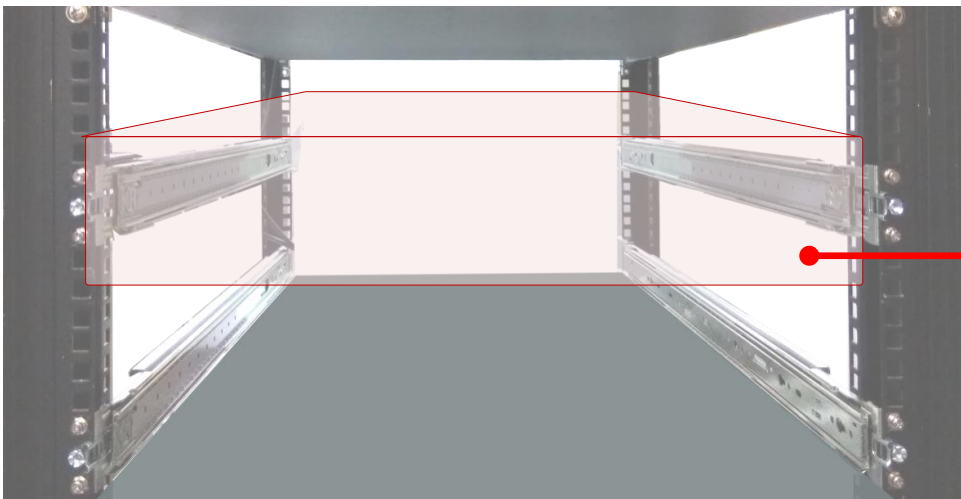
The Slide Rail Kit can secure the system while providing sufficient weight support for the device.

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Installing the System Using Mounting Ear Bracket

1. Check the package contents. The mounting ear brackets shall include the items below:

   ▶ 1x Screw Pack

   For securing the brackets on the rack posts

   For securing the brackets on the unit
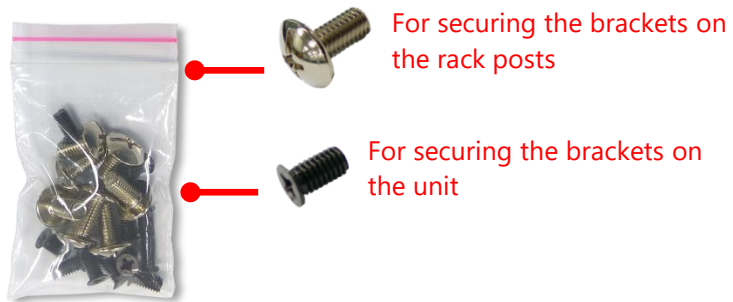
   ▶ 2x Ear Brackets

2. Secure the bracket onto one side of the chassis using <u>six</u> provided screws.
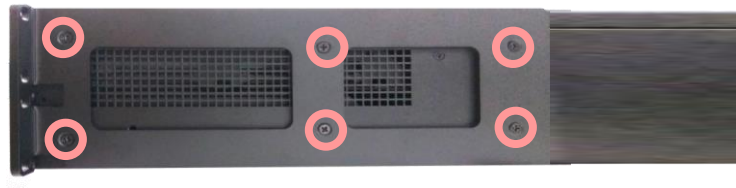
3. Secure the other bracket on the other side of the chassis.

4. Install the chassis into the rack with the brackets fixed onto the posts using the provided screws. The actual approach you take and the needed parts for assembly will depend on the supporting accessory (shelf or rail kit) you use.
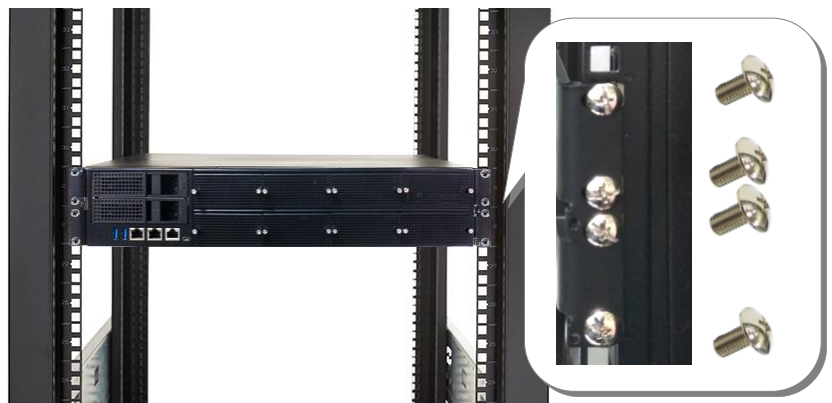
Installing the System Using the Slide Rail Kit (with Short Mounting Ear Brackets)

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

   ▶ 1x pack of <u>M4X4L</u> screws (for securing the sliding rail on the system)
   ▶ 1x pack of <u>7.1 Round Hole</u> screws (for securing the system on the rail posts)
   ▶ 2 x Slide Rails

The rail consists of the following parts:

Release Tab
Rail Lock

Outer Channel   Inner Channel   Rail Bracket
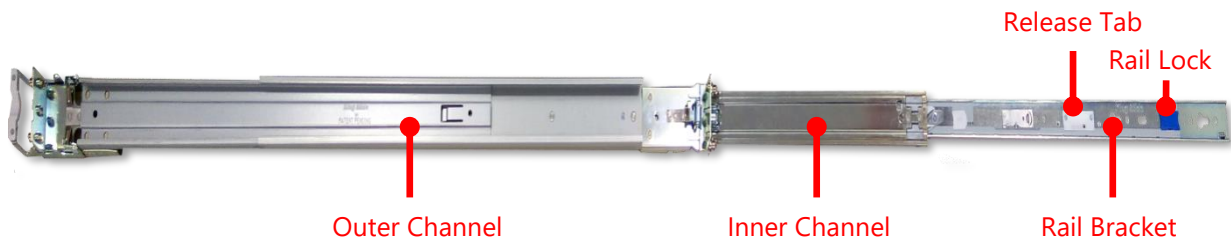
Attaching the Rail Brackets

2. Unpack a slide rail and slide the inner channel all the way to the end.

3. Stretch the bracket to the fullest.

4. Remove the bracket from the Inner Rail by pushing the Release Tab on the bracket outwards while sliding it out.

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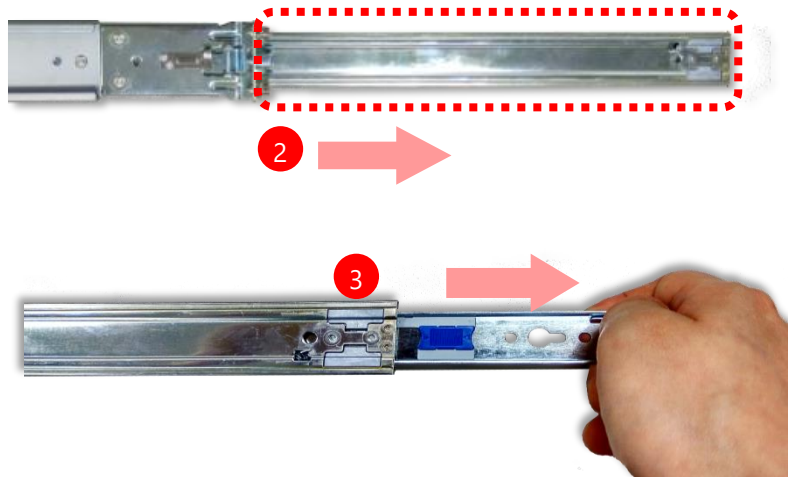
5. Align the bracket to the side of the chassis and make sure the screw-holes are matched, and then secure the bracket onto the chassis with five provided <u>M4X4L</u> screws.
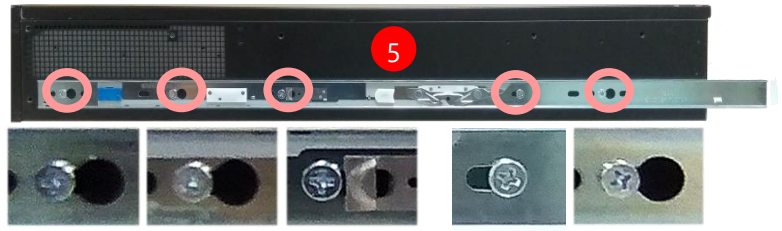
Align the screws with the indicated holes on the brackets as well as the screw holes on the side of the chassis.

6. Repeat Steps 2~5 to attach the bracket to the other side of the chassis.

Assembling the Ear Brackets

7. Check the package contents. The supplied mounting kit shall include the items below:
  ▶ 1x pack of screws
  ▶ 2x Standard Ear Brackets

For securing the brackets on the unit

Left Ear   Right Ear

8. Install the brackets on both sides of the system using the provided screws.

Right Ear

Left Ear

Installing the Slide Rails

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

9. This slide-rail kit does NOT require screw-fixing. Simply aim at **3** available screw holes on the rack front and snap the rail front into the rack post as shown in the image below. You should hear a "click" sound once it is firmly attached.

Use this clamp to fix the front end of the rail onto the post.

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

Installing the System into the Rack

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

1 The inner rail will click when it is fully stretched.

click

45

12. Hold the system with its front facing you, lift the chassis and gently engage the brackets on the model while aligning them with the slide-rail assemblies as shown in the image below, and then push the system into the cabinet.
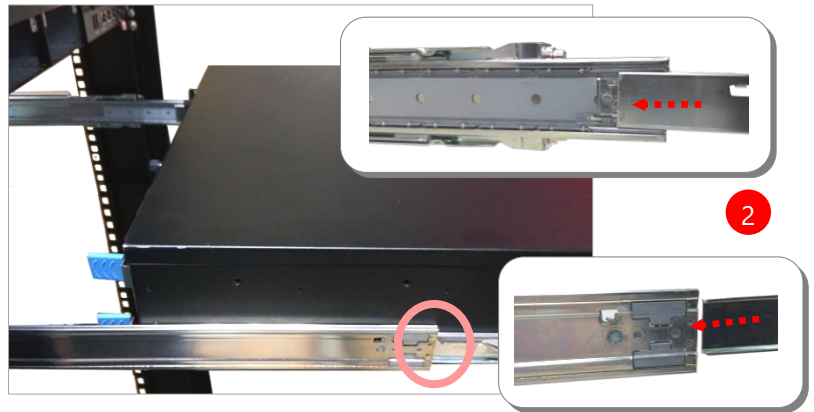
While pushing in the system, please also push and hold the Rail Lock tab on both brackets.

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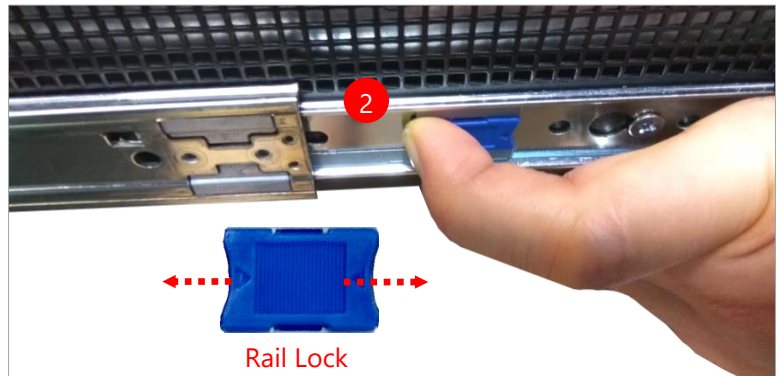
13. To remove the system from the rack, gently pull it outwards towards you while pushing the Release Tab on both sides of the brackets.

Release   Tab

CHAPTER 4: REMOTE SERVER MANAGEMENT

Overview

This chapter will introduce the features of Lanner's BMC firmware and how to perform server remote management through it. Lanner has implements IPMI 2.0 based on ASPEED service processor, performing all the BMC 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.

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 a 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

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 reset 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 user name 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.
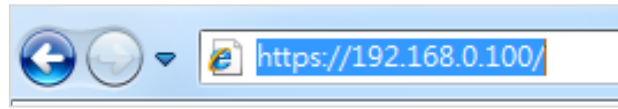
Initial access of BMC prompts you to enter the User Name and Password. A screenshot of the login screen is given below:

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.

Required Browser Settings

▶ **Enable JavaScript for this site**: The icon indicates whether the JavaScript setting is enabled in **the** browser.

▶ **Enable cookies for this site**: The icon indicates whether the cookies setting are enabled in **the** browser.

> **Note**: Cookies must be enabled in order to access the website.

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:
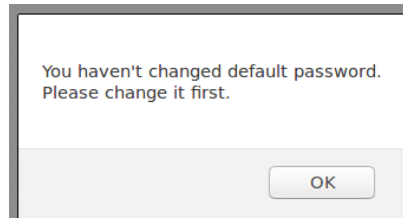
Change the default password - Dialog

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

Change the default password – Set password

Note: Duplicate usernames shouldn't exist across different 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 Introduction

The BMC Web UI consists of various menu items:

Menu Bar

The menu bar displays the following:

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

A screenshot of the menu bar is shown below:
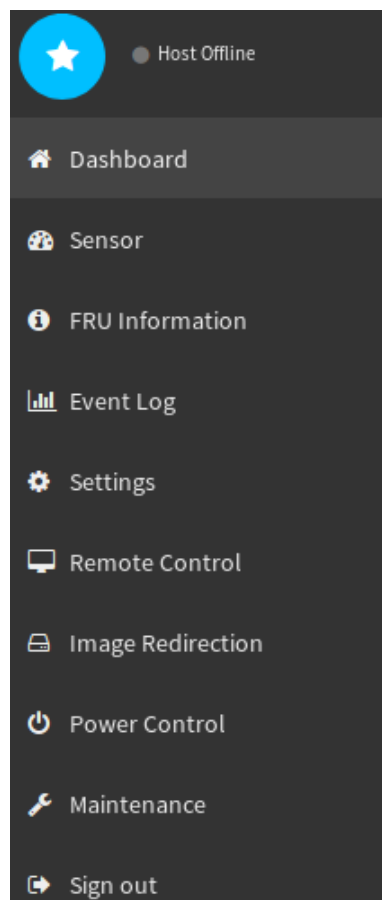
Menu Bar

Quick Button and Logged-in User

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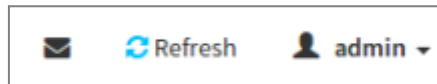
User Information

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:
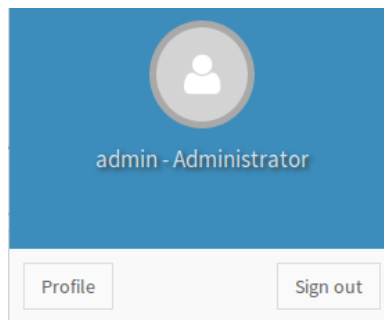
Logged-in User Information

The logged-in user information shows the logged-in user's username, his/her 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.

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CHAPTER 5: BIOS SETUP

Main Setup

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

1. Boot up the system.

2. Pressing the **<Esc>** or **<Del>** key immediately allows you to enter the Setup utility, 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

```
Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
Main  Advanced  Platform  Socket  Server Mgmt  Security  Boot

BIOS Information                              Set the Date. Use Tab
BIOS Vendor          American Megatrends      to switch between Date
Core Version         5.12   0.83 x64          elements.
Compliancy           UEFI 2.5; PI 1.4         Default Ranges:
BIOS Version         FNCA6210C00006V113       Year: 2005-2099
Build Date and Time  03/13/2018 16:37:38      Months: 1-12
Access Level         Administrator            Days: dependent on month


System Date          [Sun 01/01/2017]
System Time          [00:02:12]               →←: 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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                                                               AB
```

(The screenshots presented in this section are for reference only)

Item	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 Tine	To set the Date, use **<Tab>** to switch between Date elements.

Advanced Setup

Use [→] or [←] to select [Advanced] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

```
         Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
   Main  Advanced  Platform  Socket  Server Mgmt  Security  Boot                ▶

 ▶ iSCSI Configuration                          Configure the iSCSI
 ▶ Intel(R) Virtual RAID on CPU                 parameters.
 ▶ Trusted Computing
 ▶ Super IO Configuration
 ▶ Case Open Configuration
 ▶ LAN Boot Configuration
 ▶ Status LED Configuration
 ▶ Digital I/O Configuration
 ▶ Watch Dog Timer Configuration
 ▶ Serial Port Console Redirection              ─────────────────────────
 ▶ PCI Subsystem Settings                       →←: Select Screen
 ▶ Network Stack Configuration                  ↑↓: Select Item
 ▶ CSM Configuration                            Enter: Select
 ▶ USB Configuration                            +/-: Change Opt.
                                                F1: General Help
                                                F2: Previous Values
                                                F3: Optimized Defaults
                                                F4: Save & Exit
                                                ESC: Exit


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                                                                          AB
```

iSCSI Configuration

```
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 Advanced

 iSCSI Initiator Name                              The worldwide unique
                                                   name of iSCSI
 ▶ Add an Attempt                                  Initiator. Only IQN
                                                   format is accepted.
 ▶ Delete Attempts                                 Range is from 4 to 223

 ▶ Change Attempt Order

                                                   ↔: 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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                                                                  B4
```

Item	Description
iSCSI Initiator Name	The worldwide unique name of iSCSI Initiator. Only IQN format is accepted. The range is from 4 to 223.

Intel ® Virtual RAID on CPU

This option allows you to check RAID volume management information supported by Intel® Virtual RAID on CPU (Intel® VROC). Press <**Enter**> access the submenu.
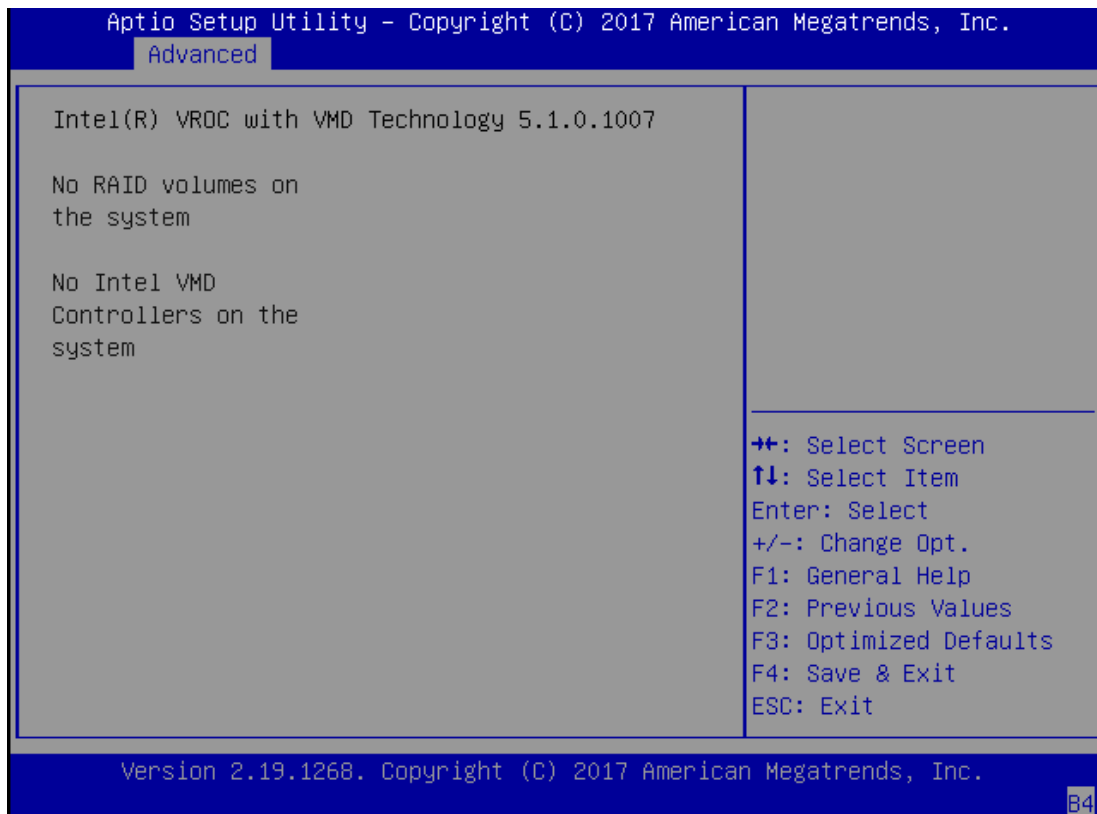
Trusted Computing

This option allows you to configure parameters regarding BIOS support for security device. Press <**Enter**> to access the submenu.

```
        Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
         Advanced

        Configuration                                Enables or Disables
          Security Device       [Enable]             BIOS support for
        Support                                      security device. O.S.
          NO Security Device                         will not show Security
        Found                                        Device. TCG EFI
                                                     protocol and INT1A
                                                     interface will not be
                         Security Device Support ──┐ lable.
                 Disable
                 Enable
                                                     lect Screen
                                                     lect Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit

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                                                                        B4
```

Item	Option	Description
Security Device Support	Enabled Disabled	Select "Enable "or "Disable "to turn on or off the BIOS support for Security Device. The default is "Enabled ". By disabling this function, OS will not show Security Device, and neither will TCG EFI protocol and INT1A interface be available.

Trusted Computing (TPM1.2)

Item	Option	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for the 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 a 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 a 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.

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Trusted Computing (TPM2.0)

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
              Advanced

                                                              ▲│Enables or Disables
                                                               │BIOS support for
          TPM20 Device Found                                   │security device. O.S.
          Vendor: NTC                                          │will not show Security
          Firmware Version: 1.3                                │Device. TCG EFI
                                                               │protocol and INT1A
          Security Device          [Enable]                    │interface will not be
       Support                                                 │available.
          Active PCR banks         SHA-1,SHA256
          Available PCR banks      SHA-1,SHA256
                                                                │
          SHA-1 PCR Bank           [Enabled]                  →←: Select Screen
          SHA256 PCR Bank          [Enabled]                  ↑↓: Select Item
                                                               Enter: Select
          Pending operation        [None]                     +/-: Change Opt.
          Platform Hierarchy       [Enabled]                  F1: General Help
          Storage Hierarchy        [Enabled]                  F2: Previous Values
          Endorsement              [Enabled]                  F3: Optimized Defaults
       Hierarchy                                            ▼│F4: Save & Exit
                                                               ESC: Exit

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                                                                            AB
```

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
              Advanced

          Active PCR banks         SHA-1,SHA256              ▲│TPM 1.2 will restrict
          Available PCR banks      SHA-1,SHA256               │support to TPM 1.2
                                                              │devices, TPM 2.0 will
          SHA-1 PCR Bank           [Enabled]                  │restrict support to TPM
          SHA256 PCR Bank          [Enabled]                  │2.0 devices, Auto will
                                                              │support both with the
          Pending operation        [None]                     │default set to TPM 2.0
          Platform Hierarchy       [Enabled]                  │devices if not found,
          Storage Hierarchy        [Enabled]
          Endorsement              [Enabled]
       Hierarchy                                               │
          TPM2.0 UEFI Spec         [TCG_2]                   →←: Select Screen
       Version                                               ↑↓: Select Item
          Physical Presence        [1.3]                     Enter: Select
       Spec Version                                          +/-: Change Opt.
          TPM 20                   [TIS]                     F1: General Help
       InterfaceType                                         F2: Previous Values
          Device Select            [Auto]                    F3: Optimized Defaults
                                                          ▼│F4: Save & Exit
                                                               ESC: Exit

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                                                                            AB
```

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Item	Option	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for the 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 a 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.

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Trusted Computing (PTT Enable)

```
        Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
        Advanced

                                                       ▲  Enables or Disables
     TPM20 Device Found                                   BIOS support for
     Vendor: INTC                                         security device. O.S.
     Firmware Version: 4.0                                will not show Security
                                                          Device. TCG EFI
     Security Device        [Enable]                      protocol and INT1A
  Support                                                 interface will not be
     Active PCR banks       SHA-1,SHA256                  available.
     Available PCR banks    SHA-1,SHA256

     SHA-1 PCR Bank         [Enabled]                  →←: Select Screen
     SHA256 PCR Bank        [Enabled]                  ↑↓: Select Item
                                                       Enter: Select
     Pending operation      [None]                     +/-: Change Opt.
     Platform Hierarchy     [Enabled]                  F1: General Help
     Storage Hierarchy      [Enabled]                  F2: Previous Values
     Endorsement            [Enabled]                  F3: Optimized Defaults
  Hierarchy                                          ▼ F4: Save & Exit
                                                       ESC: Exit

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                                                                        AB
```

```
        Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
        Advanced

     Active PCR banks       SHA-1,SHA256             ▲ TPM 1.2 will restrict
     Available PCR banks    SHA-1,SHA256               support to TPM 1.2
                                                       devices, TPM 2.0 will
     SHA-1 PCR Bank         [Enabled]                  restrict support to TPM
     SHA256 PCR Bank        [Enabled]                  2.0 devices, Auto will
                                                       support both with the
     Pending operation      [None]                     default set to TPM 2.0
     Platform Hierarchy     [Enabled]                  devices if not found,
     Storage Hierarchy      [Enabled]
     Endorsement            [Enabled]
  Hierarchy
     TPM2.0 UEFI Spec       [TCG_2]                  →←: Select Screen
  Version                                            ↑↓: Select Item
     Physical Presence      [1.3]                    Enter: Select
  Spec Version                                       +/-: Change Opt.
     TPM 20                 [CRB]                     F1: General Help
  InterfaceType                                      F2: Previous Values
     Device Select          [Auto]                  F3: Optimized Defaults
                                                   ▼ F4: Save & Exit
                                                     ESC: Exit

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                                                                        AB
```

Item	Option	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for the 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 a 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	CRB	Select the **CRB** (Communication Interface) for TPM 20 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.

Super IO Configuration

This option allows you to configure parameters about Super IO Chip. Press <**Enter**> to access the submenu.

Serial Port Configuration

Select "Serial Port 1 Configuration" or "Serial Port 2 Configuration" to enter sub setting screen.

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

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
 Advanced

Serial Port 2 Configuration                          Enable or Disable
                                                     Serial Port (COM)
Serial Port              [Enabled]
Device Settings          IO=2F8h; IRQ=3;


                  ┌───── Serial Port ─────┐
                  │ Disabled              │
                  │ Enabled               │
                  └───────────────────────┘        →←: 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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                                                                       B4
```
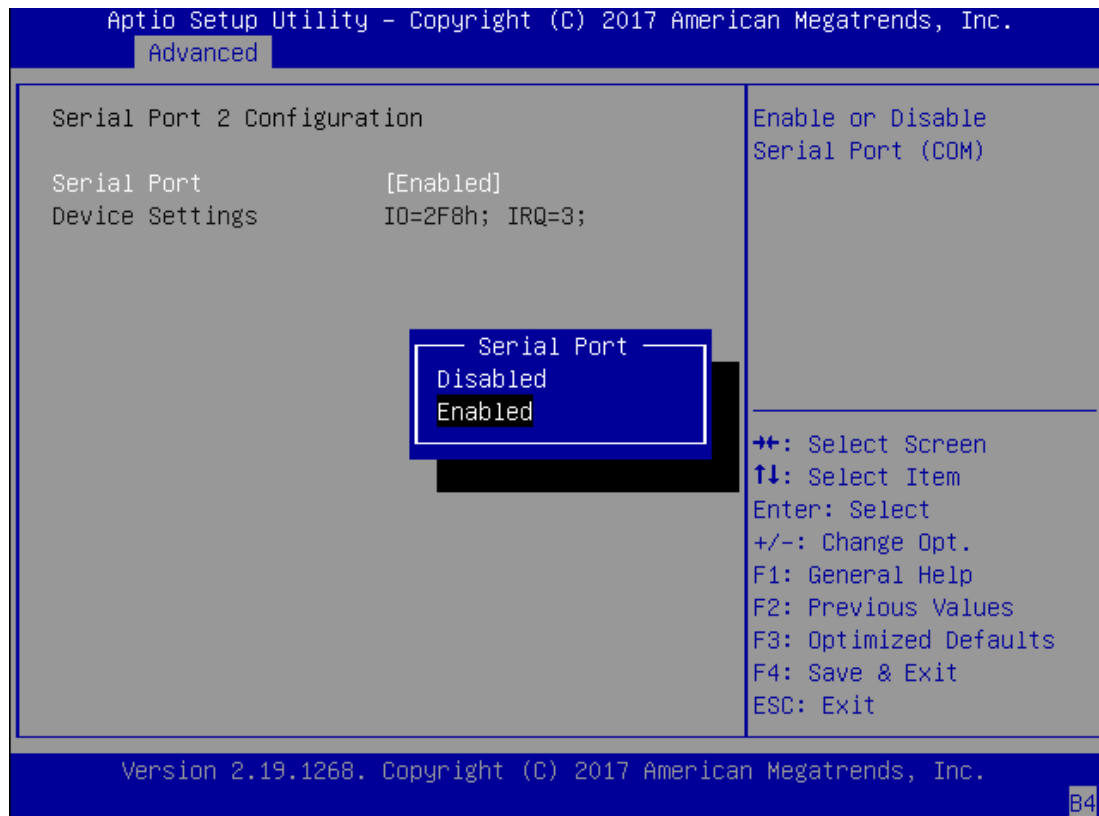
Item	Option	Description
Serial Port	**Enabled** Disabled	Enables or disables Serial Port 2
Device Settings	NA	IO=2F8h; IRQ = 3

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Case Open Configuration

If with the case's support, enabling this option will have the system sound when someone opens the case of this system, which is considered against your organization's policy.
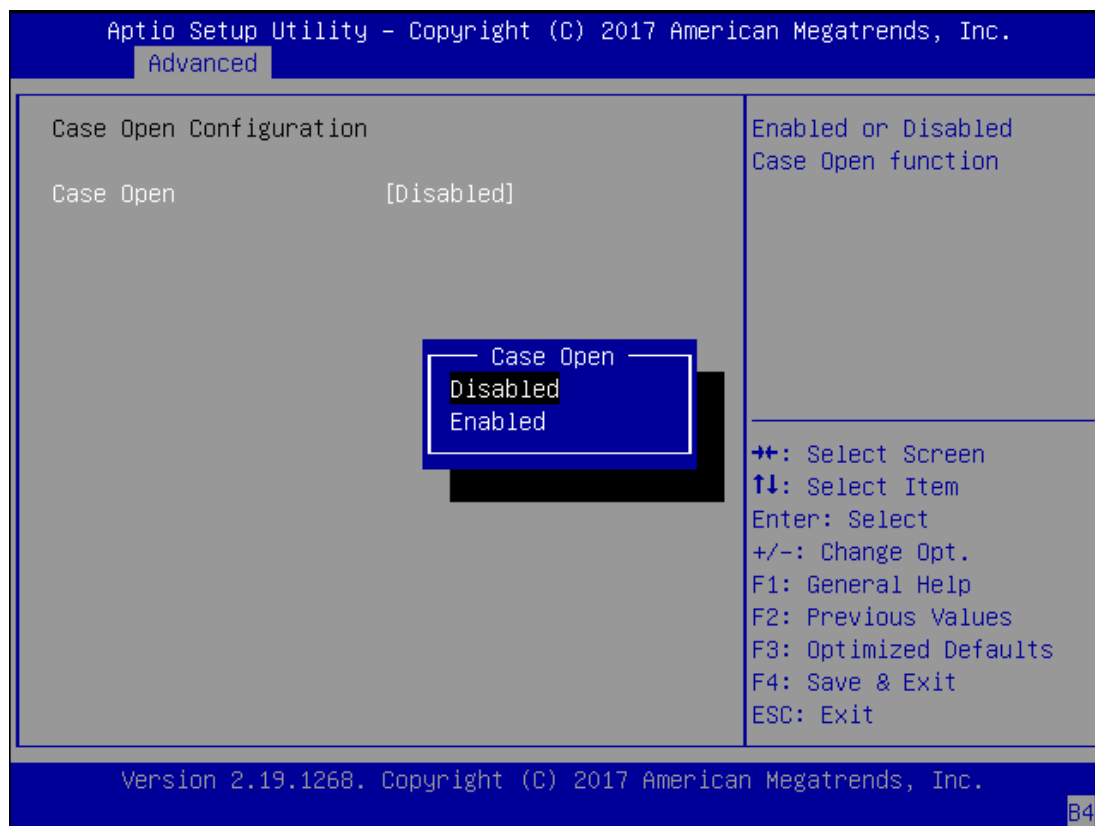
Item	Option	Description
Case Open	Enabled Disabled	Enables or disables Case Open function

LAN Boot Configuration

This option allows you to configure parameters about LAN Boot. The options provided will vary by SKU.
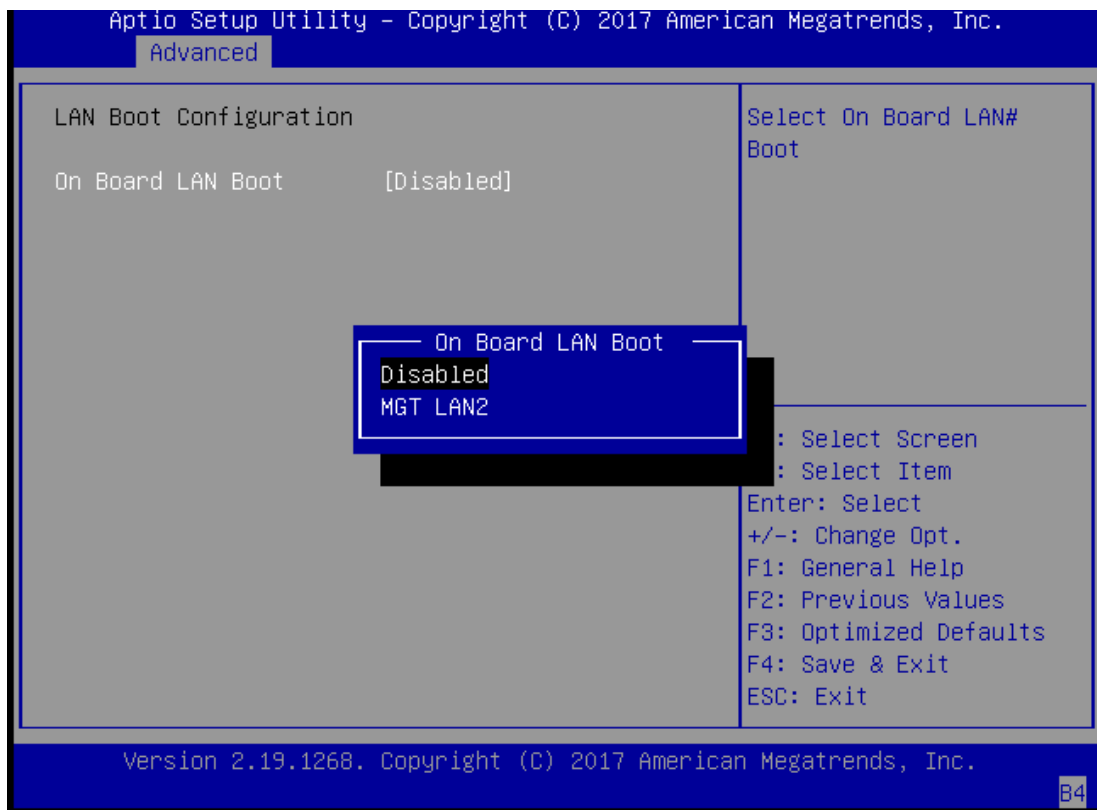
Item	Option	Description	SKU
On Board Boot	Disabled MGT LAN1 MGT LAN2	Select On Board LAN# Boot	NCA-6210A
On Board Boot	Disabled SFP LAN1 SFP LAN2	Select On Board LAN# Boot	NCA-6210B
On Board Boot	Disabled MGT LAN2	Select On Board LAN# Boot	NCA-6210C
On Board Boot	Disabled SFP LAN1 SFP LAN2	Select On Board LAN# Boot	NCA-6210D

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Status LED Configuration

This option allows you to change the color of status LED.

```
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       Advanced

  Status LED Configuration                              Configure Status LED.

  Status LED                    [DARK]




                                                        ++: 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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```
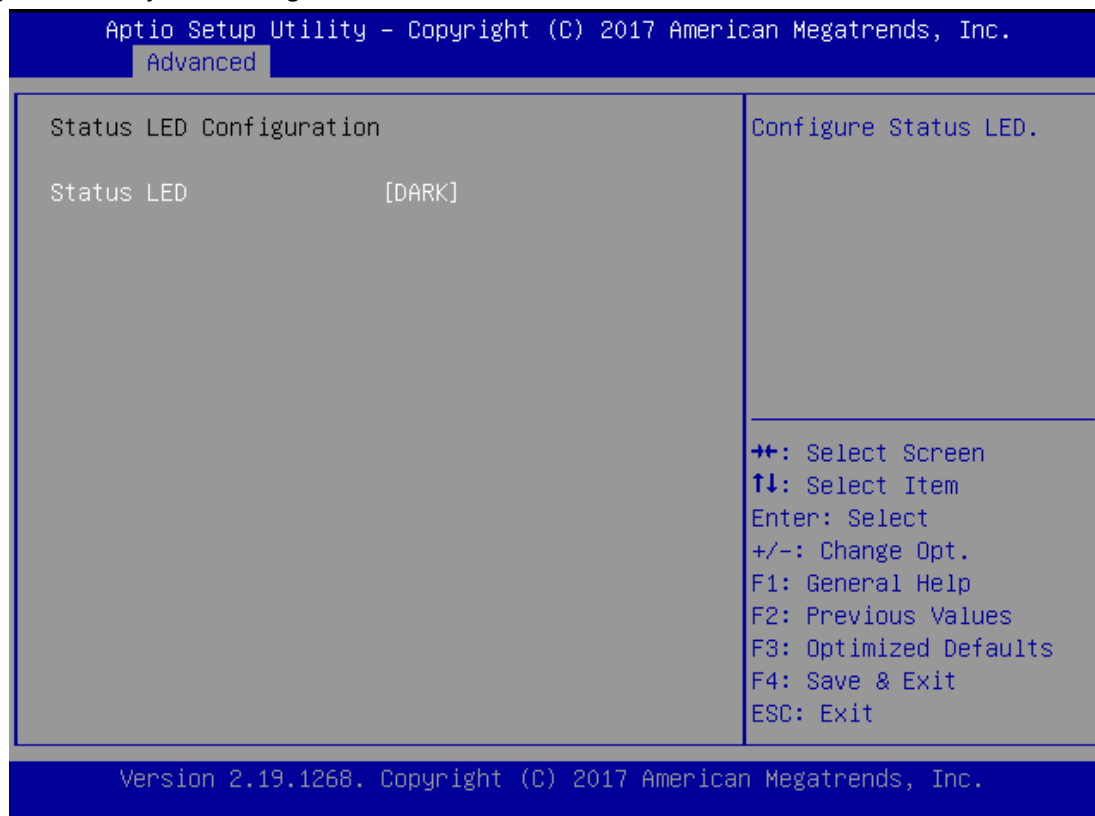
Item	Option	Description
Status LED	DARK GREEN RED	Configures Status LED color

Digital IO Configuration

This option allows you to configure parameters about Digital IO pins.
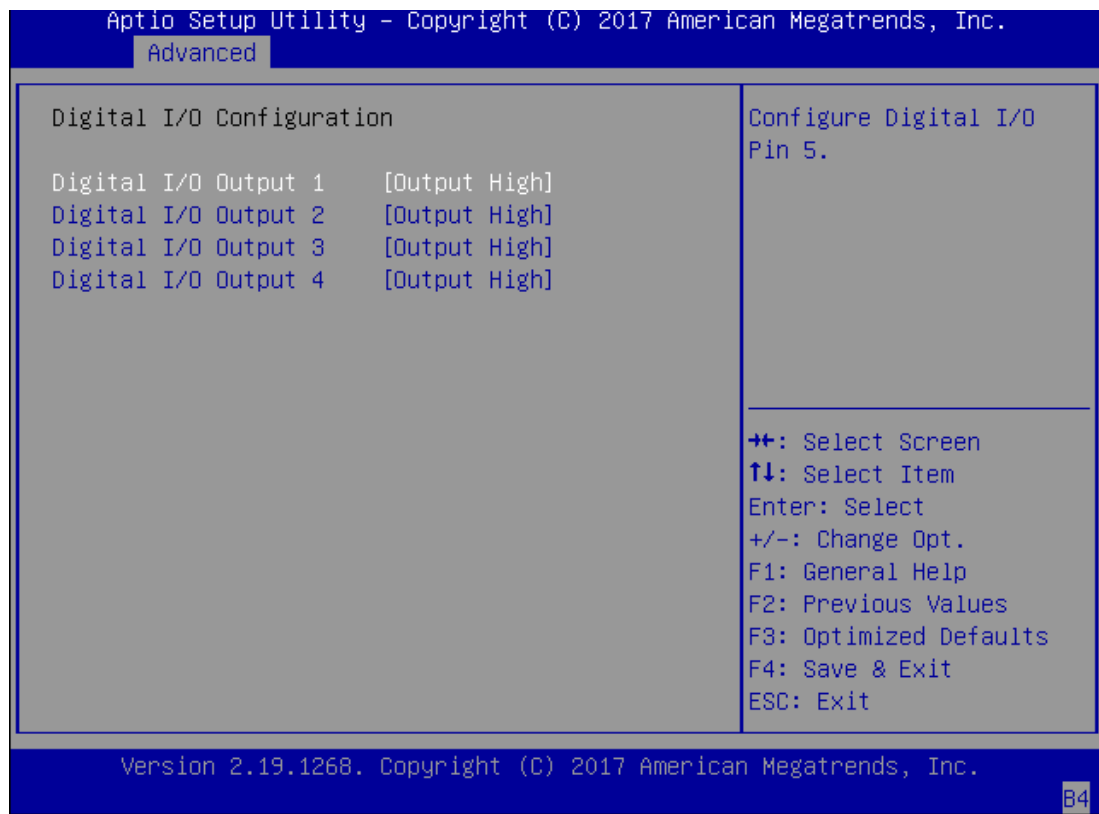
Item	Option	Description
Digital I/O Output 1	Output High Output Low	Configure Digital I/O Pin5
Digital I/O Output 2	Output High Output Low	Configure Digital I/O Pin6
Digital I/O Output 3	Output High Output Low	Configure Digital I/O Pin7
Digital I/O Output 4	Output High Output Low	Configure Digital I/O Pin8

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Watch Dog Timer Configuration

This option allows you to enable or disable the watchdog timer function.
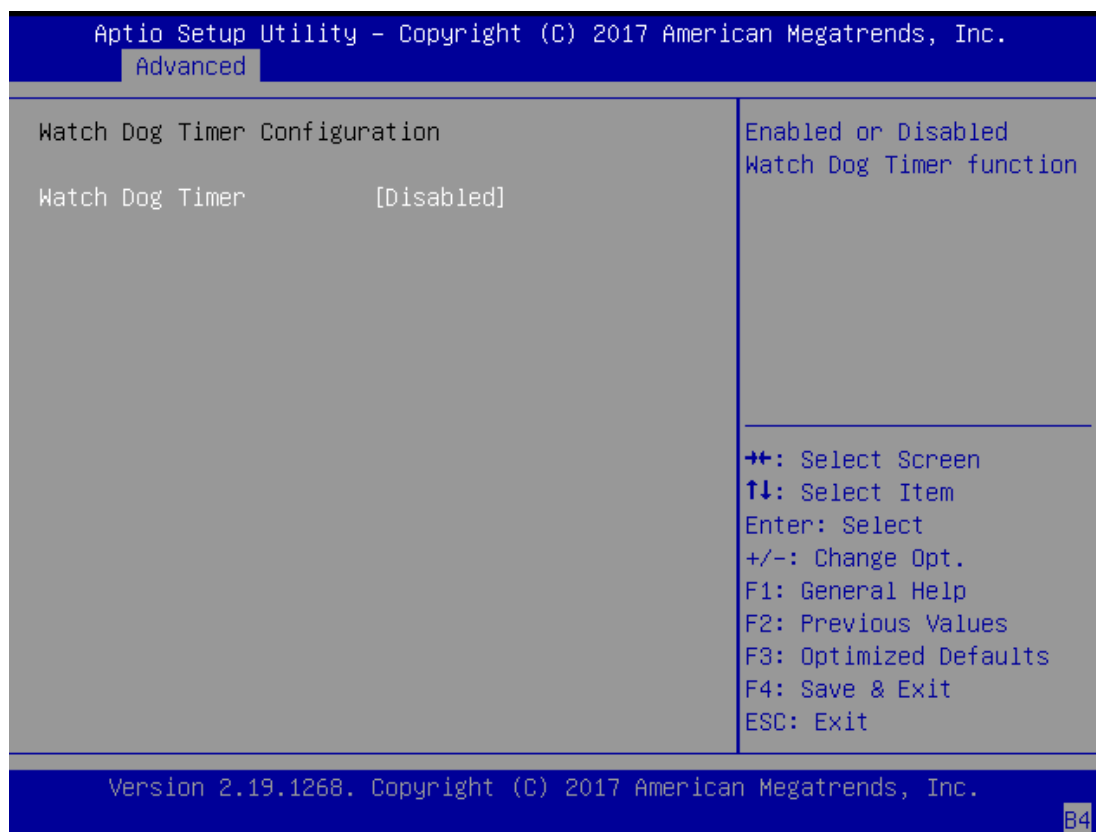
Item	Option	Description
Watch Dog Timer	Enabled Disabled	Enables or disables Watch Dog Timer function

Serial Port Console Redirection

This option allows you to configure parameters about serial port console redirection. Press <**Enter**> to access the submenu.

```
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                                                                  Console Redirection
                                                                  Enable or Disable.
         COM0
         Console Redirection      [Enabled]
       ▶ Console Redirection Settings



                                                                  ↔: Select Screen
                                                                  ↑↓: Select Item
                                                                  Enter: Select
                                                                  +/-: Change Opt.
                                                                  F1: General Help
                                                                  F2: Previous Values
                                                                  F3: Optimized Defaults
                                                                  F4: Save & Exit
                                                                  ESC: Exit

                Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```
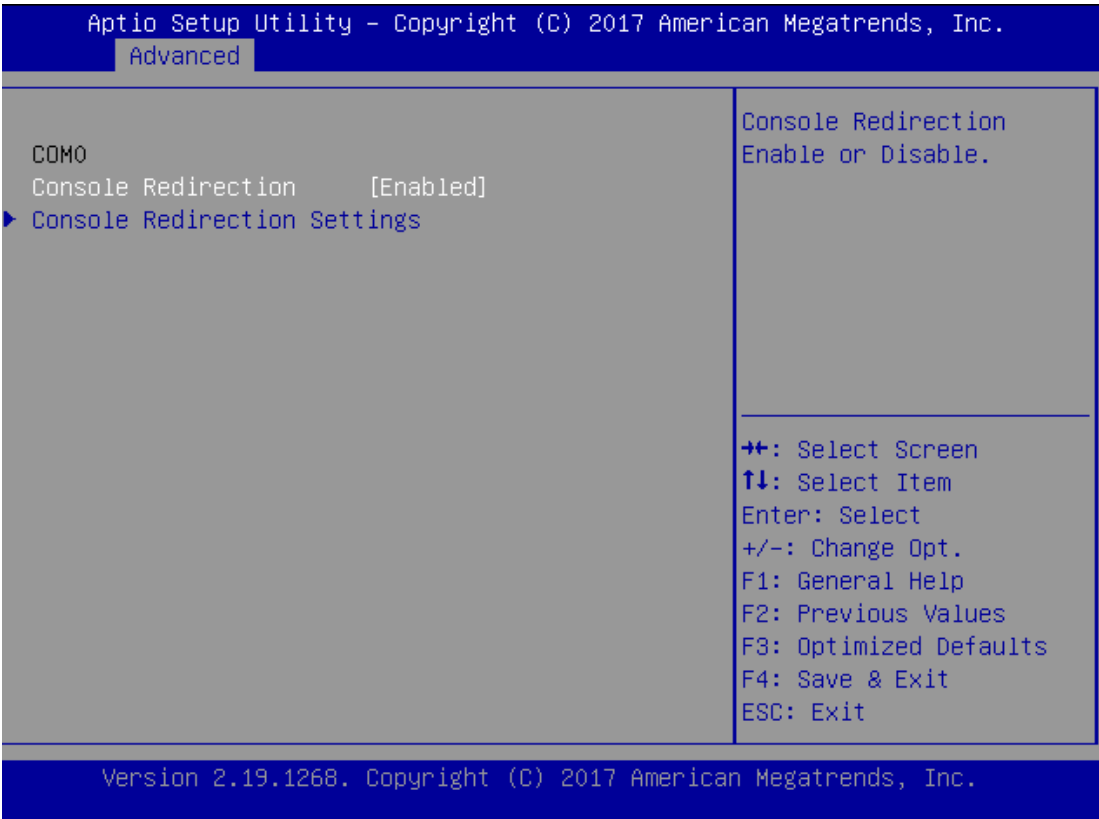
Item	Option	Description
COM0 Console Redirection	Enabled Disabled	Enables or disables Console Redirection

Console Redirection Settings

These settings specify how the host computer and the remote computer will exchange data. Both computers should have the same or compatible settings.
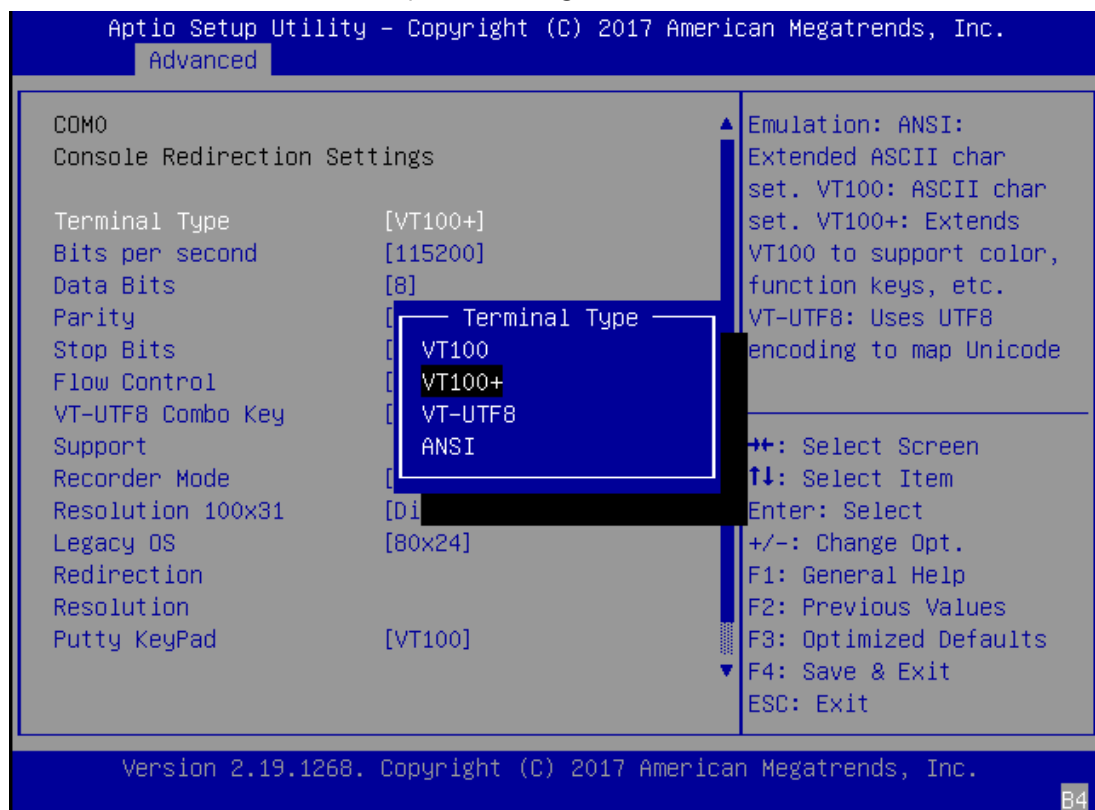
Item	Option	Description
Terminal Type	VT100 VT100+ VT-UTF8 ANSI	**VT100**: ASCII char set **VT100+**: Extends VT100 to support color, function keys, etc. **VT-UTF8**: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes **ANSI**: Extended ASCII char set
Bits per second	9600 19200 38400 57600 115200	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Data Bits	7 8	Data Bits
Parity	None Even Odd Mark Space	A parity bit can be sent with the data bits to detect some transmission errors.
Stop Bits	1 2	Indicates the end of a serial data packet.

Flow Control	None Hardware RTS/CTS	Flow Control can prevent data loss from buffer overflow.
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
Legacy OS Redirection Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection.
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Selects FunctionKey and KeyPad on Putty.
Redirection After BIOS POST	Always Enable BootLoader	When **Bootloader** is selected, Legacy Console Redirection is disabled before booting to legacy OS. When **Always Enable** is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to **Always Enable**.

PCI Subsystem Settings

This option allows you to change the PCI, PCI-X and PCI Express settings.

```
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 PCI Bus Driver          A5.01.12              Enables or Disables
 Version                                       64bit capable Devices
                                               to be Decoded in Above
 PCI Devices Common Settings:                  4G Address Space (Only
 Above 4G Decoding       [Disable]             if System Supports 64
 SR-IOV Support          [Disable]             bit PCI Decoding).




                                               ++: 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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```

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

Network Stack Configuration

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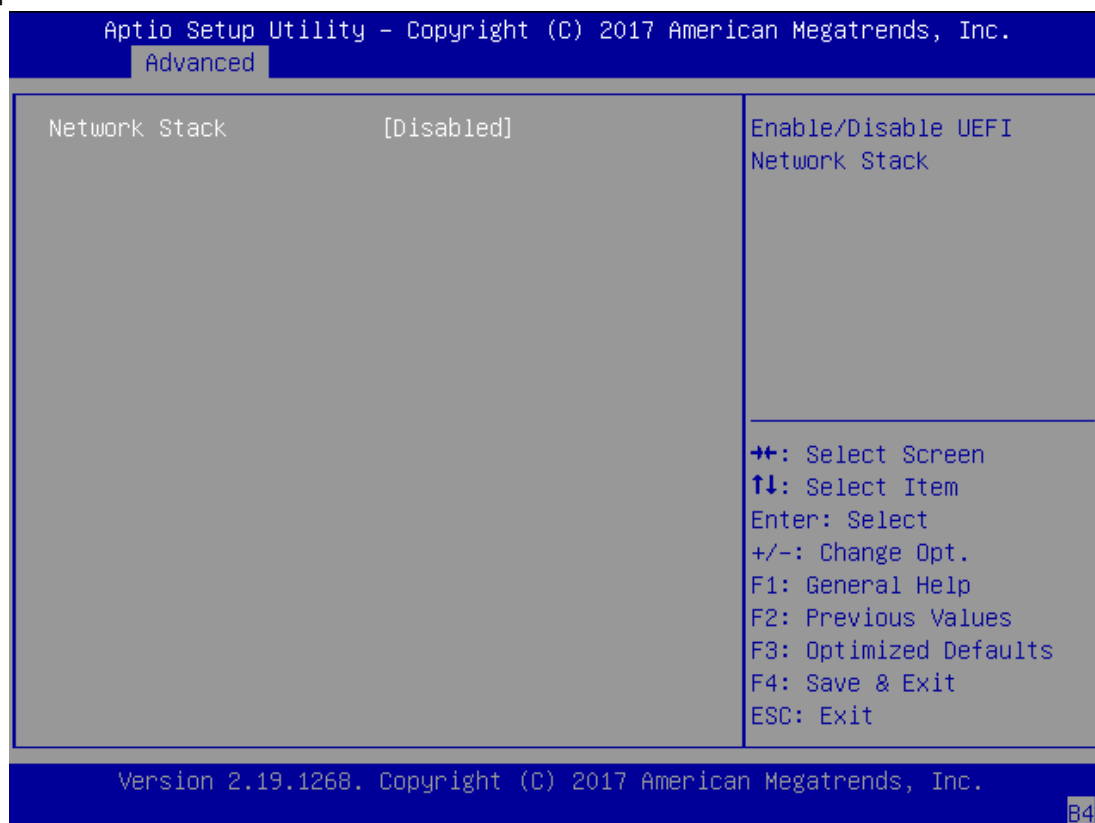
Item	Option	Description
Network Stack	Disabled Enabled	Enables or disables UEFI Network Stack
Ipv4 PXE Support	Disabled Enabled	Enables Ipv4 PXE Boot Support. If IPV4 is disabled, PXE boot option will not be created.
Ipv4 HTTP Support	Disabled Enabled	Enables Ipv4 HTTP Boot Support. If IPV4 is disabled,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

CSM Configuration

This option allows you to enable or disable ROM execution settings.

```
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 Compatibility Support Module Configuration        Enable/Disable CSM
                                                   Support.
 CSM Support                 [Enabled]

 CSM16 Module Version        07.81

 Option ROM execution

 Network                     [Legacy]
 Storage                     [Legacy]
 Video                       [Legacy]            →←: Select Screen
 Other PCI devices           [Legacy]            ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit

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                                                                        B4
```

Item	Option	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

USB Configuration

This option allows you to change USB configuration parameters.

```
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         Advanced

  USB Configuration                               ▲   Enables Legacy USB
                                                      support. AUTO option
  USB Module Version       17                         disables legacy support
                                                      if no USB devices are
  USB Controllers:                                    connected. DISABLE
       1 XHCI                                          option will keep USB
  USB Devices:                                         devices available only
       1 Drive, 1 Keyboard                             for EFI applications.


  Legacy USB Support       [Enabled]
  XHCI Hand-off            [Enabled]                →←: Select Screen
  USB Mass Storage         [Enabled]                ↑↓: Select Item
  Driver Support                                    Enter: Select
                                                    +/-: Change Opt.
  USB hardware delays                               F1: General Help
  and time-outs:                                    F2: Previous Values
  USB transfer time-out    [20 sec]                 F3: Optimized Defaults
  Device reset time-out    [20 sec]              ▼  F4: Save & Exit
                                                    ESC: Exit

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                                                                        B4
```
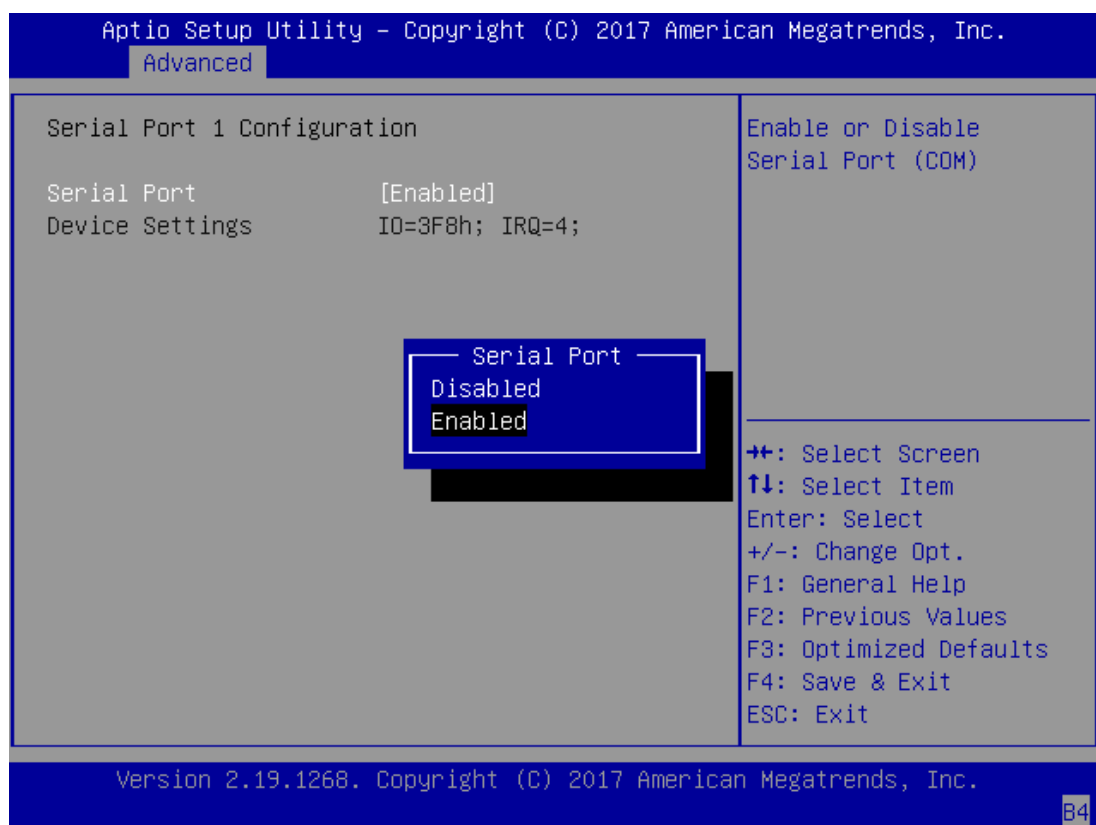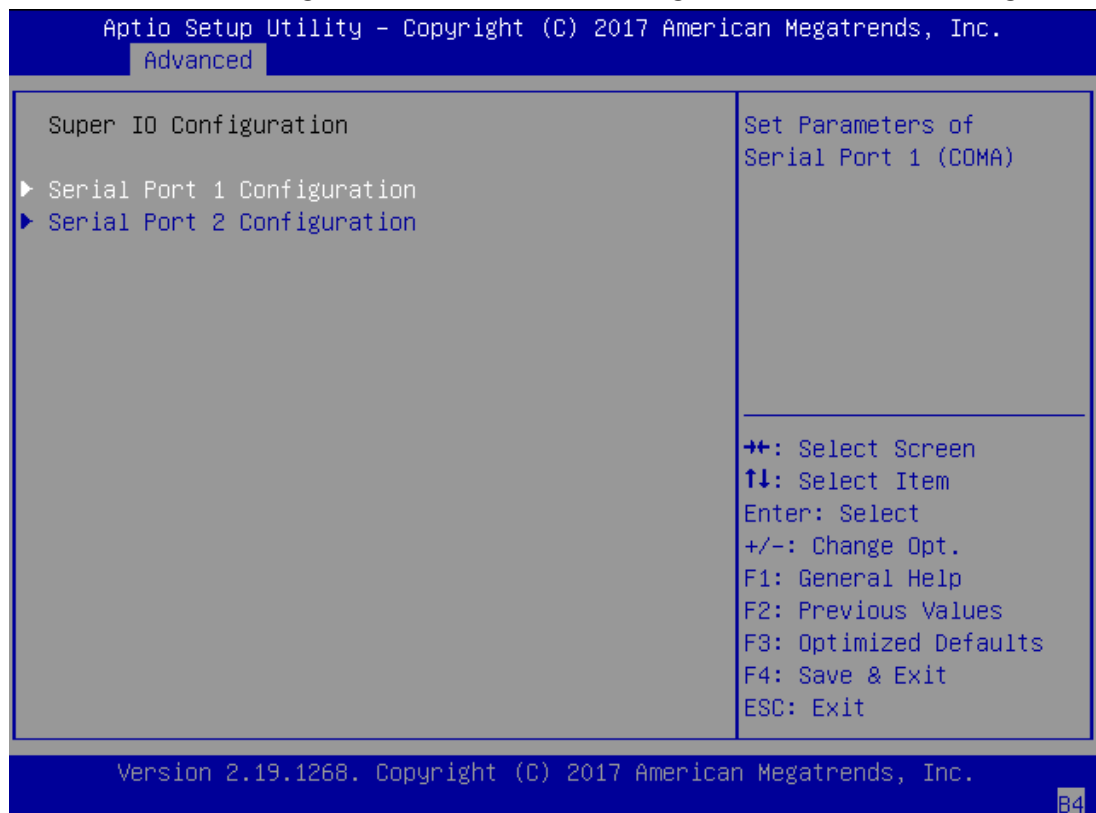
Item	Option	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. **Auto** option disables legacy support if no USB devices are connected; **Disabled** option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enabled Disabled	Enables or disables USB Mass Storage Driver Support.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for Control, Bulk, and Interrupt transfers
Device reset time-out	1 sec 5 sec 10 sec 20 sec	USB mass storage device Start Unit command time-out
Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller. **Auto** uses default value: for a Root port, it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

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Platform Setup

Use [→] or [←] to select [Platform] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

```
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 Main  Advanced  Platform  Socket  Security  Boot  Save & Exit

 ▶ PCH Configuration                      Displays and provides
 ▶ Server ME Configuration                option to change the
                                          PCH Settings




                                          →←: 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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                                                                  B4
```
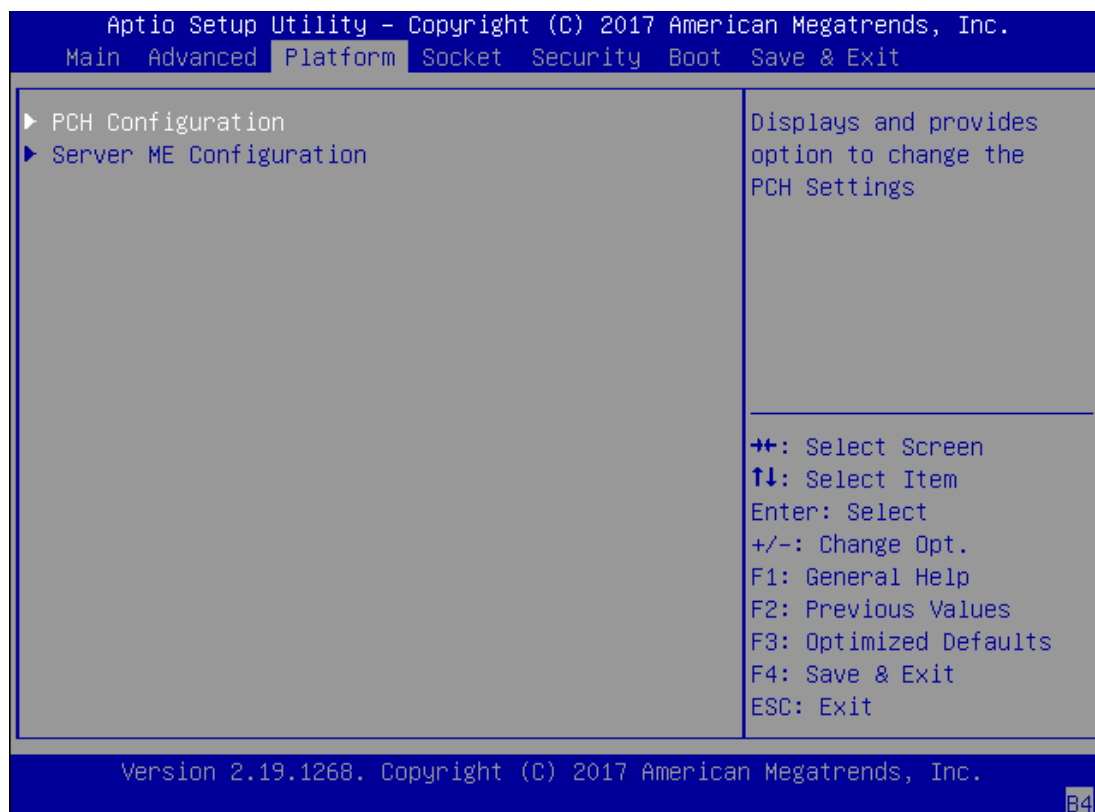
Item	Option	Description
PCH Configuration	None	Displays and provides option to change the PCH Settings
Server ME Configuration	None	Configure Server ME Technology Parameters

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PCH Configuration

This option displays and provides options to change the PCH Settings.

```
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                        Platform

    PCH Configuration                                  SATA devices and
    -------------------------------------------        settings
    ---

  ▶ PCH SATA Configuration
    Restore AC Power Loss      [Last State]
    RTC Lock                   [Enable]
    BIOS Lock                  [Enable]


                                                       →←: 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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```

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

PCH SATA Configuration

This option allows you to configure SATA devices related options.

```
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                        Platform

 PCH SATA Configuration                              Enable or Disable SATA
 ----------------------------------------------      Controller
 ---

 SATA Controller          [Enable]
 Configure SATA as        [AHCI]
 Support Aggressive       [Disable]
 Link Power Management

 SATA Port 0              [Not Installed]            ----------------------------
 SATA Port 1              [Not Installed]            →←: Select Screen
 SATA Port 2              [Not Installed]            ↑↓: Select Item
 SATA Port 3              [Not Installed]            Enter: Select
 SATA Port 4              [Not Installed]            +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit

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```

Item	Option	Description
SATA Controller	Disabled Enabled	Enables or disables SATA Controller
Configure SATA as	AHCI RAID	This will configure SATA as **RAID** or **AHCI**.
Support Aggressive Link Power Management	Disabled Enabled	Enables or disables SALP

Server ME Configuration

This option configures server ME technology parameters.

```
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                         Platform

     General ME Configuration                              Enable/disable Platform
     Oper. Firmware          0A:4.0.4.288                  Trusted Technology
     Version                                               (PTT) support
     Backup Firmware         N/A
     Version
     Recovery Firmware       0A:4.0.4.288
     Version
     ME Firmware Status #1   0x000F0245
     ME Firmware Status #2   0x88114026
        Current State        Operational
        Error Code           No Error                      →←: Select Screen
        Recovery Cause       N/A                           ↑↓: Select Item
     PTT Support             [Disable]                     Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit


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                                                                        B4
```

Item	Option	Description
PTT Support	Disable Enable	Enables or disables Platform Trusted Technology (PTT) support.

Socket Setup

Use [→] or [←] to select [Socket] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
          Main  Advanced  Platform  Socket  Security  Boot  Save & Exit

      ▶ Processor Configuration                    Displays and provides
      ▶ IIO Configuration                          option to change the
      ▶ Advanced Power Management Configuration    Processor Settings
        Numa                    [Enable]




                                                   ++: 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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```

Item	Option	Description
Processor Configuration	None	Displays and provides options to change the Processor Settings
IIO Configuration	None	Displays and provides options to change the IIO Settings
Advanced Power Management Configuration	None	Displays and provides options to change the Power Management Settings
Num	Disabled Enabled	Displays and provides options to change the Power Management Settings

Processor Configuration

In Processor Configuration, you can change the processor settings and view the current parameters.

```
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                              Socket

  Processor Configuration                            ▲  Enables Hyper Threading
  ------------------------------------------------      (Software Method to
  ---                                                   Enable/Disable Logical
  Processor BSP           50654 - SKX M0                Processor threads.
  Revision
  Processor Socket        Socket 0      Socket 1
  Processor ID            00050654* |   00050654
  Processor Frequency     2.100GHz  |   2.100GHz
  Processor Max Ratio           15H |   15H
  Processor Min Ratio           08H |   08H
  Microcode Revision      0200001E               _____
  L1 Cache RAM                 64KB |       64KB  ↔: Select Screen
  L2 Cache RAM               1024KB |     1024KB  ↑↓: Select Item
  L3 Cache RAM              16896KB |    16896KB  Enter: Select
  Processor 0 Version     Intel(R) Xeon(R) Silver +/-: Change Opt.
                          4116 CPU @ 2.10GHz      F1: General Help
  Processor 1 Version     Intel(R) Xeon(R) Silver F2: Previous Values
                          4116 CPU @ 2.10GHz    ▼ F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit

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```

```
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                              Socket

  L1 Cache RAM                 64KB |       64KB  ▲  Enable/disable AES-NI
  L2 Cache RAM               1024KB |     1024KB     support
  L3 Cache RAM              16896KB |    16896KB
  Processor 0 Version     Intel(R) Xeon(R) Silver
                          4116 CPU @ 2.10GHz
  Processor 1 Version     Intel(R) Xeon(R) Silver
                          4116 CPU @ 2.10GHz

  Hyper-Threading [ALL]    [Enable]
  Execute Disable Bit      [Enable]
  Enable Intel(R) TXT      [Disable]              _____
  VMX                      [Enable]               ↔: Select Screen
  Enable SMX               [Disable]              ↑↓: Select Item
  Hardware Prefetcher      [Enable]               Enter: Select
  Adjacent Cache           [Enable]               +/-: Change Opt.
  Prefetch                                        F1: General Help
  Extended APIC            [Disable]              F2: Previous Values
  AES-NI                   [Enable]             ▼ F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit

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```

Item	Option	Description
Hyper-Threading [ALL]	Disabled Enabled	Enables Hyper Threading (Software Method to Enable/Disable Logical Processor threads.
Execute Disable Bit	Disabled Enabled	When disabled, it forces the XD feature flag to always return 0.
Enable Intel® TXT	Disabled Enabled	Enables Intel(R) TXT
VMX	Disabled Enabled	Enables the Vanderpool Technology, which takes effect after reboot.
Enable SMX	Disabled Enabled	Enables Safer Mode Extensions
Hardware Prefetcher	Disabled Enabled	= MLC Streamer Prefetcher (MSR 1A4h Bit[0])
Adjacent Cache Prefetcher	Disabled Enabled	= MLC Spatial Prefetcher (MSR 1A4h Bit[1])
Extended APIC	Disabled Enabled	Enables or disables extended APIC support
AES-NI	Disabled Enabled	Enables or disables AES-NI support

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IIO Configuration

In Processor Configuration, you can change the processor settings and view the current parameters.

```
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                              Socket

   IIO Configuration                                 Press <Enter> to bring
   ------------------------------------------------  up the Intel® VT for
   ---                                               Directed I/O (VT-d)
                                                     Configuration menu.
 ▶ Socket0 Configuration
 ▶ Socket1 Configuration
 ▶ Intel® VT for Directed I/O (VT-d)


                                                     →←: 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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                                                                        B4
```

Item	Option	Description
Socket0 Configuration	None	None
Socket1 Configuration	None	None
Intel® VT for Directed I/O (VT-d)	None	Press **<Enter>** to bring up the Intel? VT for Directed I/O (VT-d) Configuration menu.

Socket0 Configuration

Enter to configure the settings related to PCI Express ports under Socket0.

```
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                              Socket

    IOU0 (IIO PCIe Br1)      [x8x8]              Settings related to PCI
    IOU1 (IIO PCIe Br2)      [x8x8]              Express PortS
  ▶ Socket 0 PcieBr1D00F0 - Port 1A             (0/1A/1B/1C/1D/2A/2B/2C/
  ▶ Socket 0 PcieBr1D02F0 - Port 1C              2D/3A/3B/3C/3D/4A/5A)
  ▶ Socket 0 PcieBr2D00F0 - Port 2A
  ▶ Socket 0 PcieBr2D02F0 - Port 2C

                                                 ⭢⭠: 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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```

Item	Option	Description
Socket 0 PcieBr1D00F0	None	Settings related to PCI Express Port 1A
Socket 0 PcieBr1D02F0	None	Settings related to PCI Express Port 1C
Socket 0 PcieBr2D00F0	None	Settings related to PCI Express Port 2A
Socket 0 PcieBr2D02F0	None	Settings related to PCI Express Port 2C

Socket1 Configuration

Enter to configure the settings related to PCI Express ports under Socket1.

```
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                        Socket

   IOU0 (IIO PCIe Br1)      [x8x8]              Settings related to PCI
   IOU1 (IIO PCIe Br2)      [x8x8]              Express PortS
   IOU2 (IIO PCIe Br3)      [x8x8]              (0/1A/1B/1C/1D/2A/2B/2C/
 ▶ Socket 1 PcieBr1D00F0 - Port 1A             2D/3A/3B/3C/3D/4A/5A)
 ▶ Socket 1 PcieBr1D02F0 - Port 1C
 ▶ Socket 1 PcieBr2D00F0 - Port 2A
 ▶ Socket 1 PcieBr2D02F0 - Port 2C
 ▶ Socket 1 PcieBr3D00F0 - Port 3A
 ▶ Socket 1 PcieBr3D02F0 - Port 3C

                                               ↔: 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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                                                              B4
```

Item	Option	Description
Socket 1 PcieBr1D00F0	None	Settings related to PCI Express Port 1A
Socket 1 PcieBr1D02F0	None	Settings related to PCI Express Port 1C
Socket 1 PcieBr2D00F0	None	Settings related to PCI Express Port 2A
Socket 1 PcieBr2D02F0	None	Settings related to PCI Express Port 2C
Socket 1 PcieBr3D00F0	None	Settings related to PCI Express Port 3A
Socket 1 PcieBr3D02F0	None	Settings related to PCI Express Port 3C

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Intel VT for Directed IO (VT-d)

Enter to configure the settings related to Intel® VT for Directed IO (VT-d).

```
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                            Socket

 Intel® VT for Directed I/O (VT-d)                    Enable/Disable Intel®
 ------------------------------------------------     Virtualization
 ---                                                  Technology for Directed
                                                      I/O (VT-d) by reporting
 Intel® VT for           [Disable]                    the I/O device
 Directed I/O (VT-d)                                  assignment to VMM
                                                      through DMAR ACPI
                                                      Tables.
                                                      _____

                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit

         Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

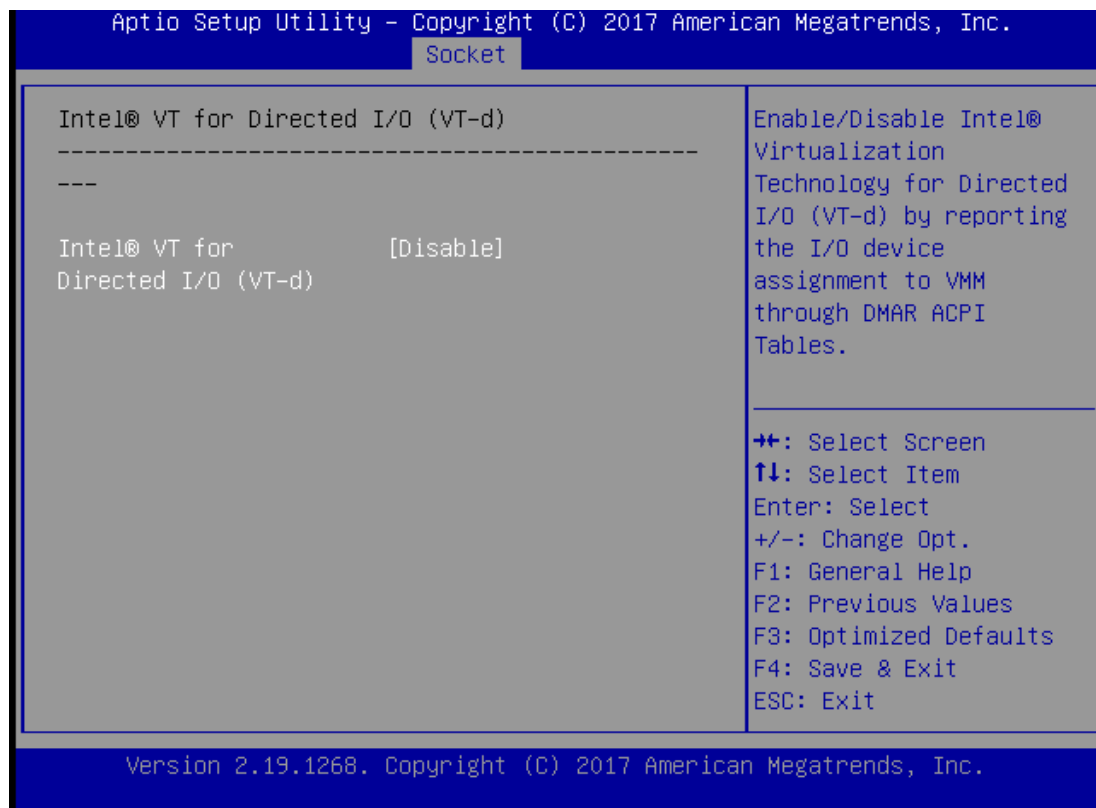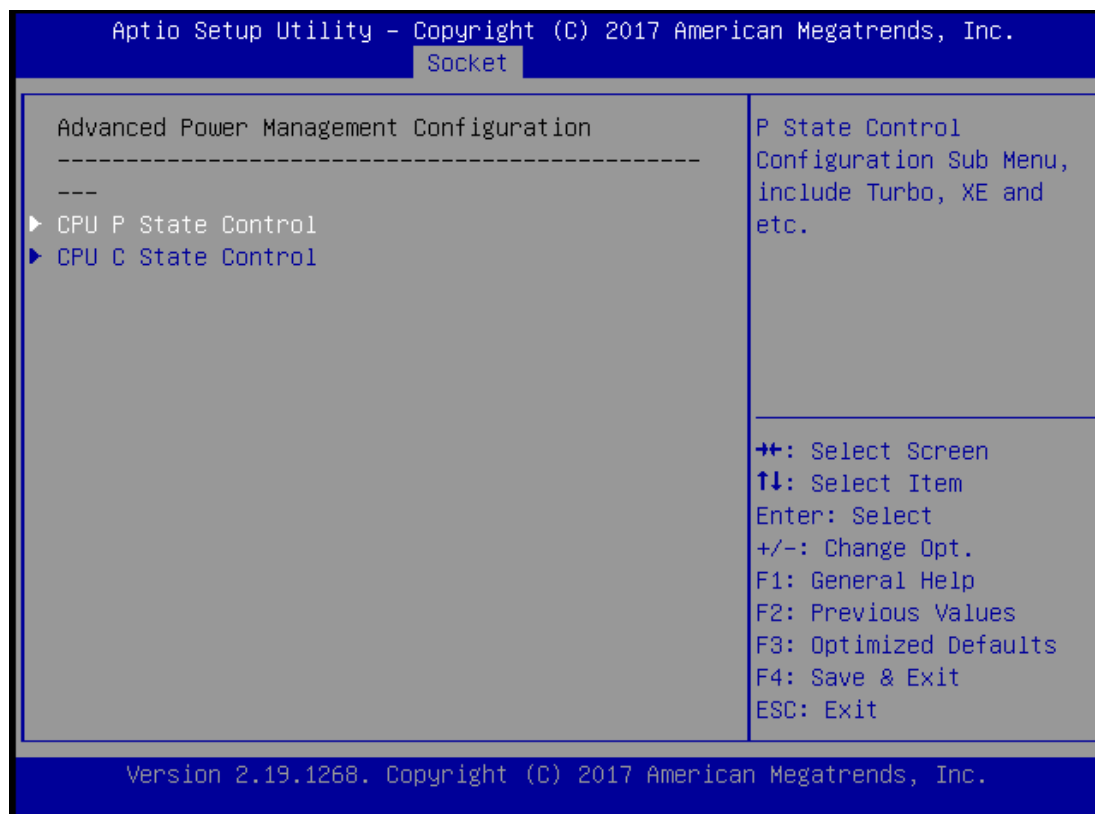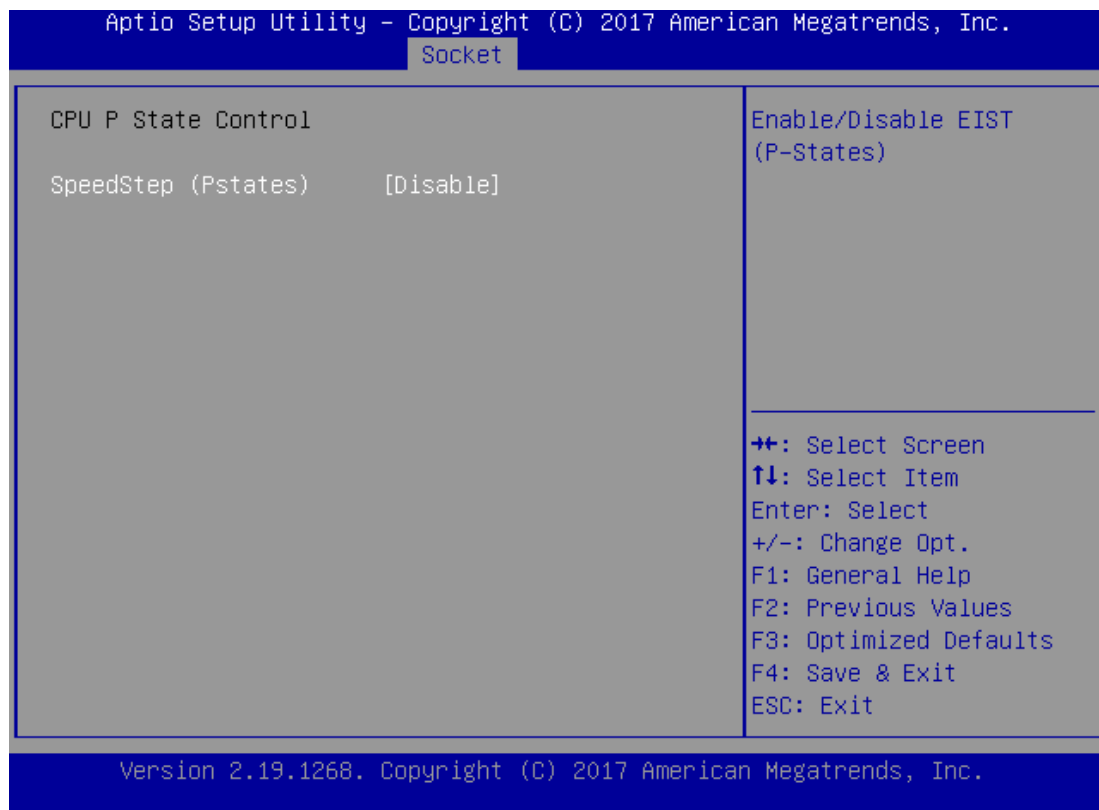| Item	Option	Description
Intel® VT for Directed I/O (VT-d)	Disabled Enabled	Press **<Enter>** to bring up the Intel? VT for Directed I/O (VT-d) Configuration menu.

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Advanced Power Management Configuration

This option allows you to modify the Power Management related settings and displays the current parameters.

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

CPU P State Control

Item	Option	Description
SpeedStep(Pstates)	Disabled Enabled	Enables or disables EIST (P-States)

CPU C State Control

```
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                                  Socket

     CPU C State Control                              Autonomous Core C-State
                                                      Control
     Autonomous Core          [Disable]
     C-State
     CPU C6 report            [Disable]
     Enhanced Halt State      [Disable]
     (C1E)




                                                      ↔: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit


          Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```
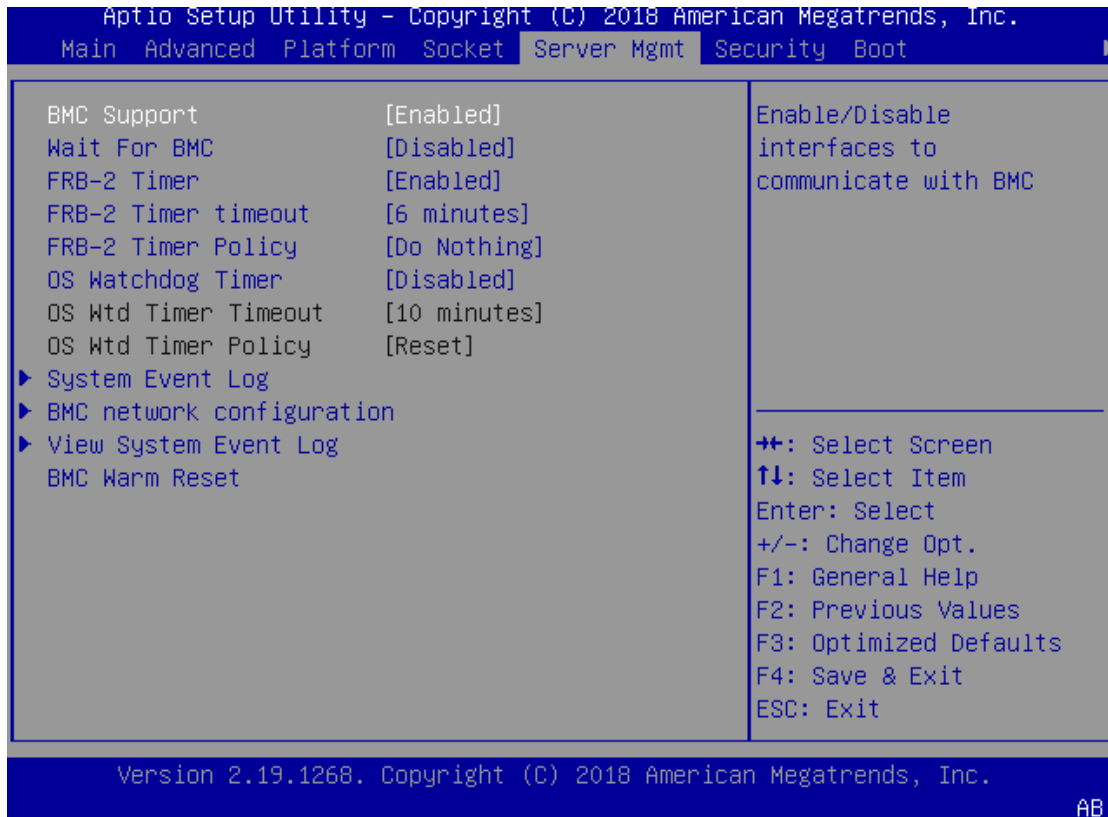
Item	Option	Description
Autonomous Core C-State	Disabled Enabled	Autonomous Core C-State Control
CPU C6 report	Disabled Enabled	Enables or disables CPU C6(ACPI C3) report to OS
Enhanced Halt State (C1E)	Disabled Enabled	Core C1E auto promotion Control. Takes effect after reboot.

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Server Mgmt Setup

Use [→] or [←] to select [Server Mgmt] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.
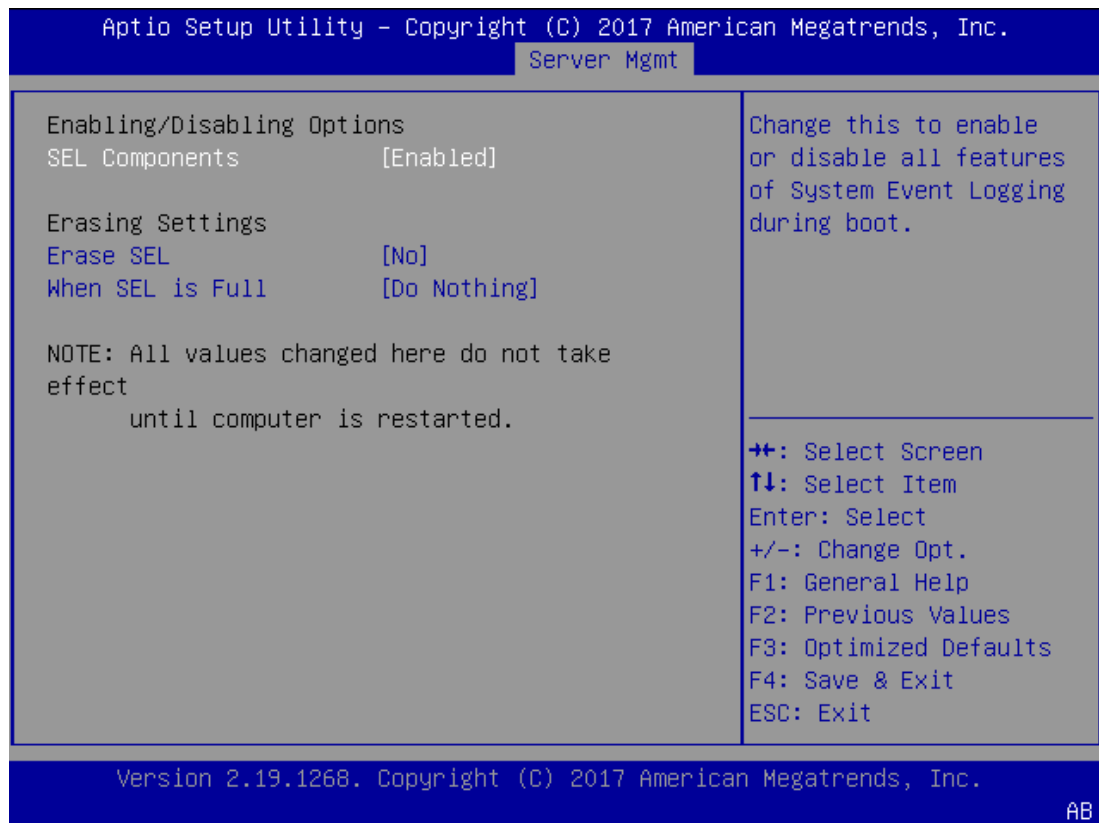

Item	Option	Description
BMC Support	**Enabled** Disabled	Enable or disables interfaces to communicate with BMC.
Wait For BMC	Enabled **Disabled**	Wait For BMC response for specified time-out. In PILOTII, BMC starts at the same time when BIOS starts during AC power ON. It takes around 30 seconds to initialize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

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Timer		OS is successfully loaded or follows the OS Boot Watchdog Timer policy.
OS Wtd Timer Timeout	5 minutes 10 minutes 15 minutes 20 minutes	Configure the length of the OS Boot Watchdog Timer. Not available if OS Boot Watchdog Timer is disabled.
OS Wtd Timer Policy	Do Nothing Reset Power Down Power Cycle	Configure how the system should respond if the OS Boot Watchdog Timer expires. Not available if OS Boot Watchdog Timer is disabled.
System Event Log	NA	Press **<Enter>** to change the SEL event log configuration.
BMC network configuration	NA	Configure BMC network parameters.
View System Event Log	NA	Press **<Enter>** to view the System Event Log Records.
BMC Warm Reset	NA	Press **<Enter>** to do Warm Reset BMC.

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System Event Log

Use this option to change the SEL event log configuration.

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

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BMC network configuration

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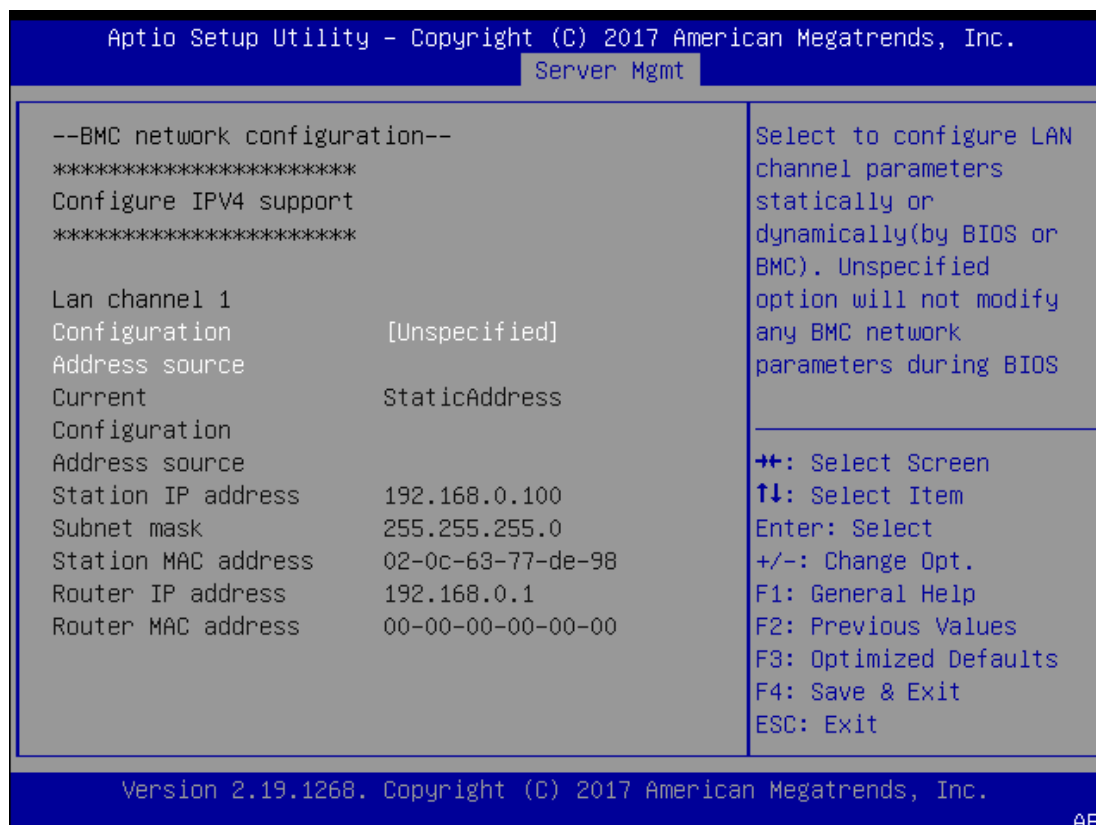
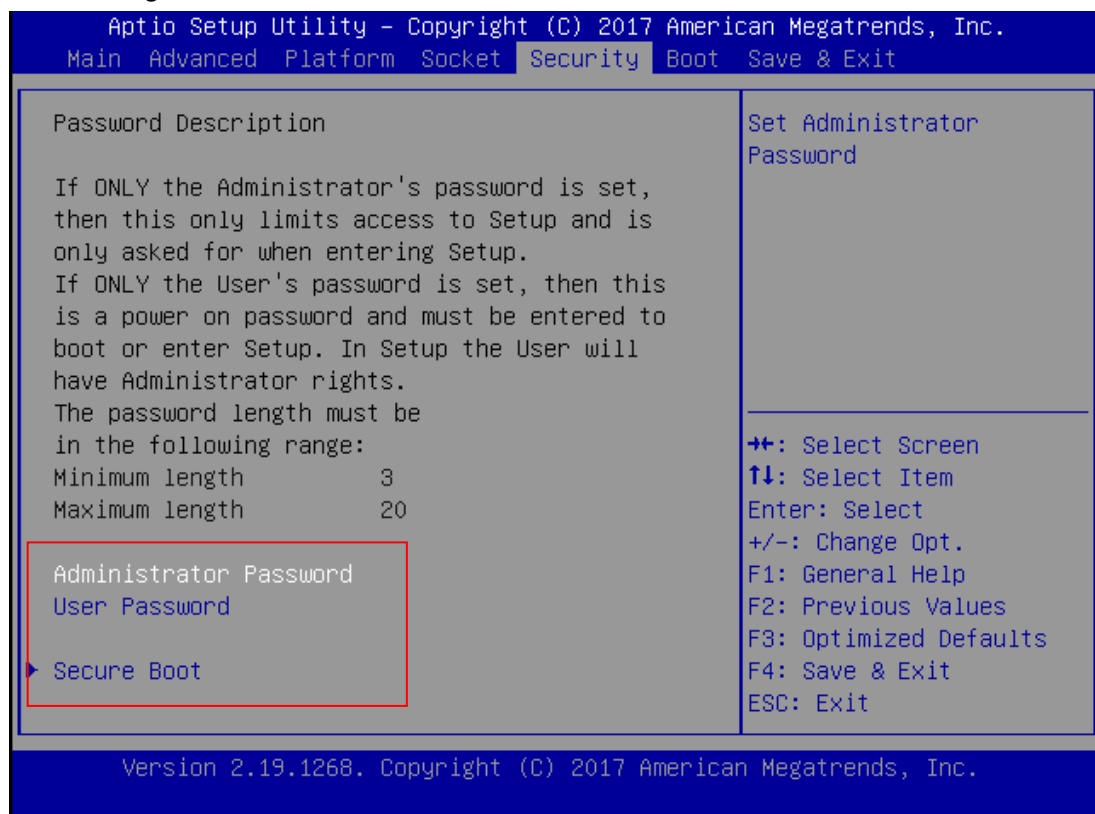| Item	Option	Description
Configuration Address source	Unspecified Static DynamicBmcDhcp	Select to configure LAN channel parameters statically or dynamically (by BIOS or BMC). The **unspecified** option will not modify any BMC network parameters during BIOS phase.

View System Event Log

This option allows you to view the System Event Log Records.
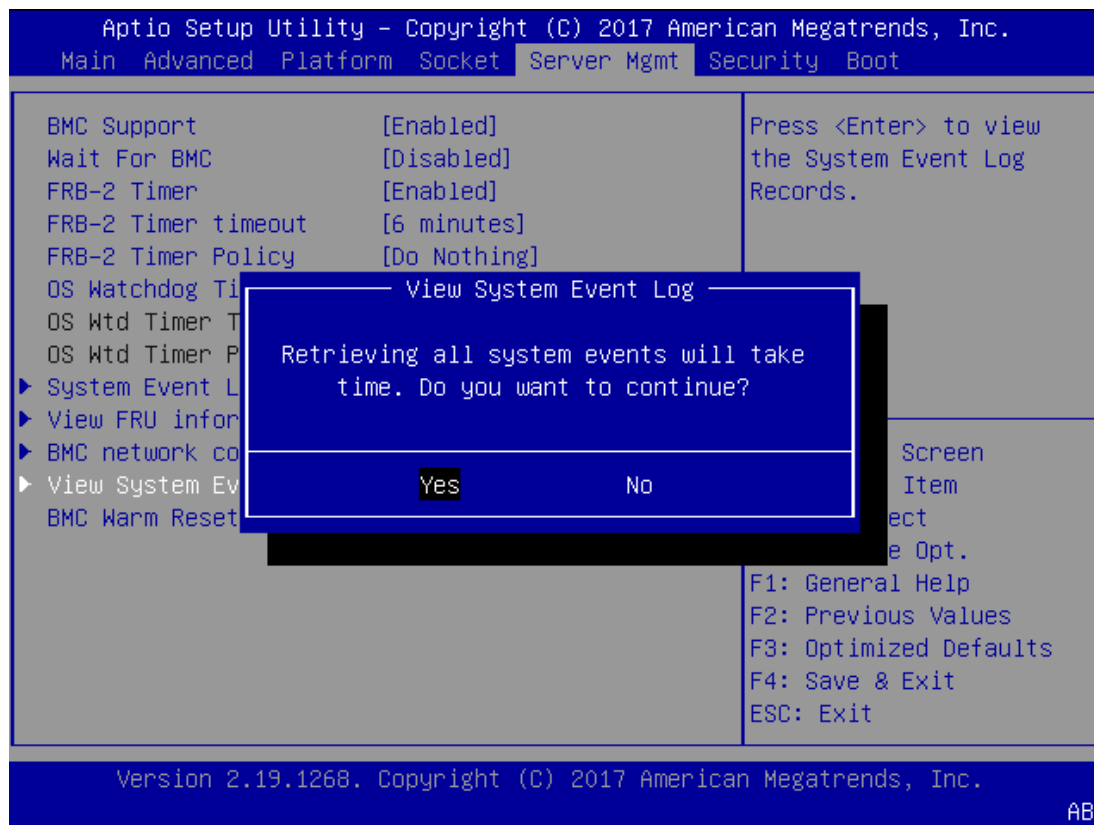
Security Setup

Use [←] / [→] to select [Security] setup screen. Under this screen, you may use [↑] [↓] to select an item you would like to configure.

Item	Description
Administrator Password	Set the administrator password. Once set, then this only limits access to Setup and is only asked for when entering Setup.
User Password	Set the user password. Once set, then this is a power-on password and must be entered to boot or enter Setup. In Setup, the user will have Administrator rights.
Secure Boot	Allows you to customize Secure Boot settings.

Secure Boot

This option allows you to customize Secure Boot settings.

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
                              Security

  System Mode            Setup                Secure Boot activated
  Secure Boot            Not Active           when
  Vendor Keys            Active                Platform Key(PK) is
                                              enrolled,
  Attempt Secure Boot    [Disable]             System mode is
  Secure Boot Mode       [Custom]             User/Deployed,
▶ Key Management                               and CSM function is
                                              disabled

                                              ───────────────────────

                                              →←: 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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```

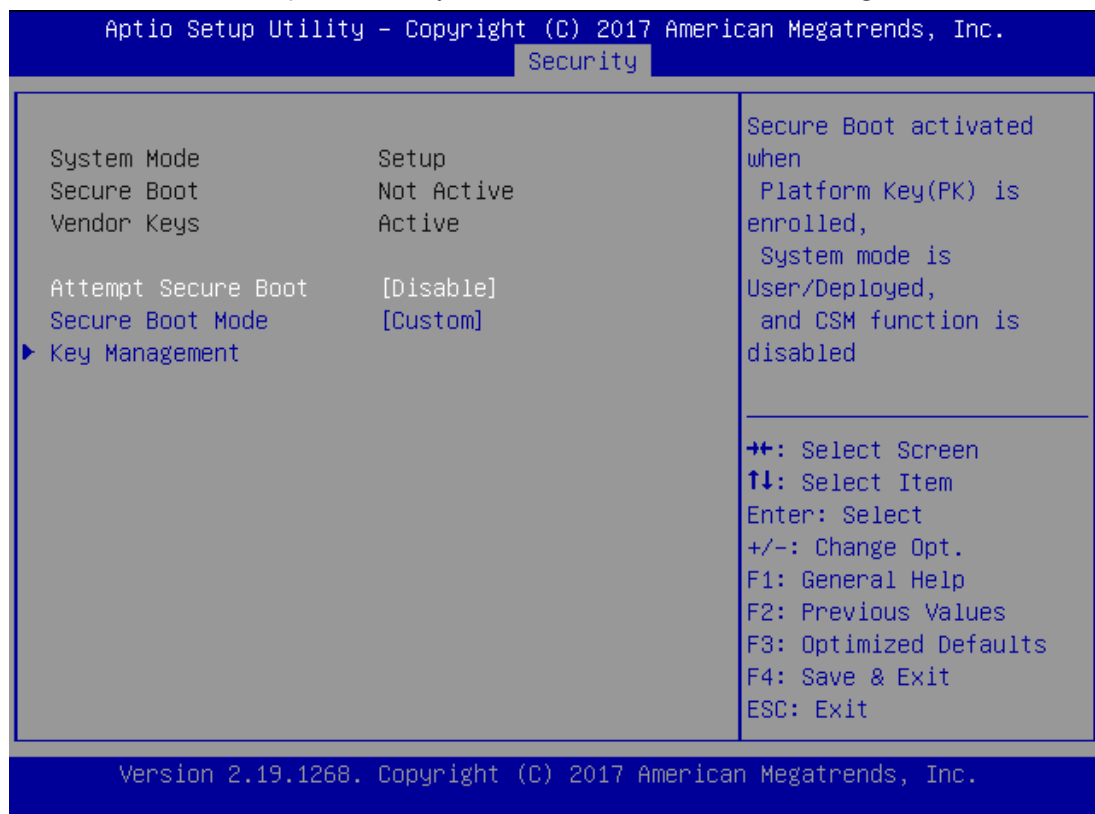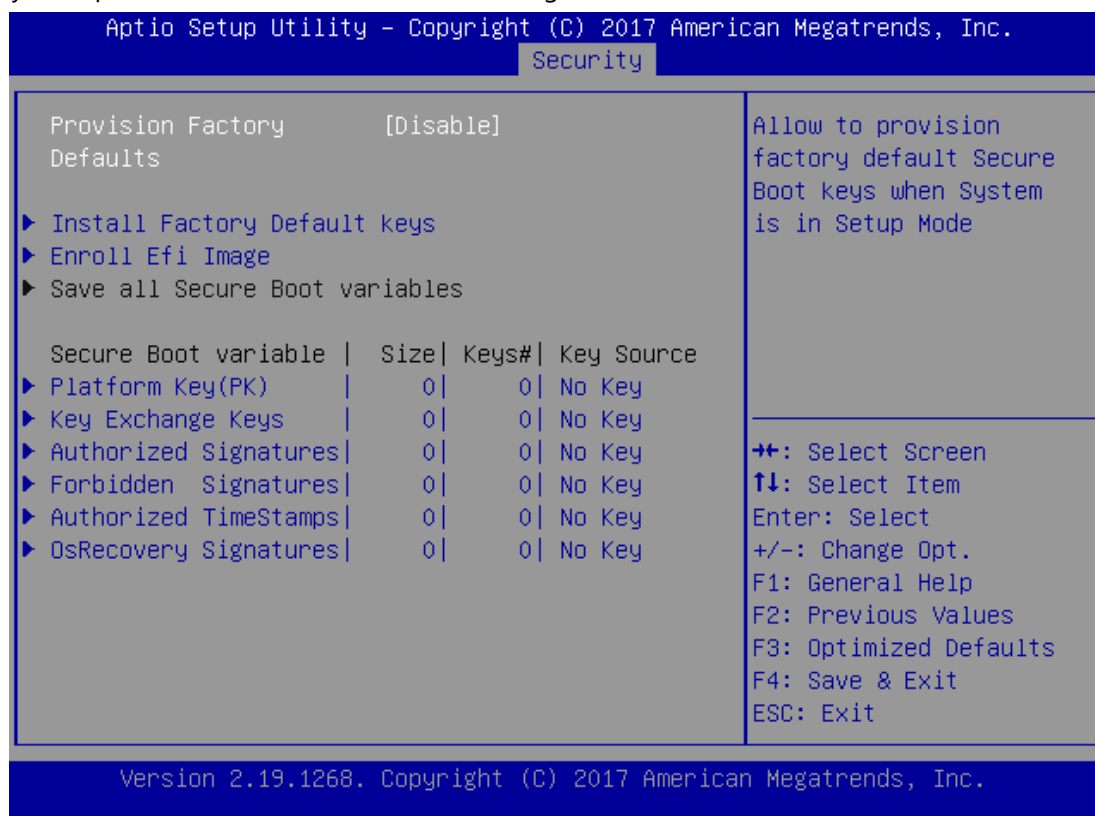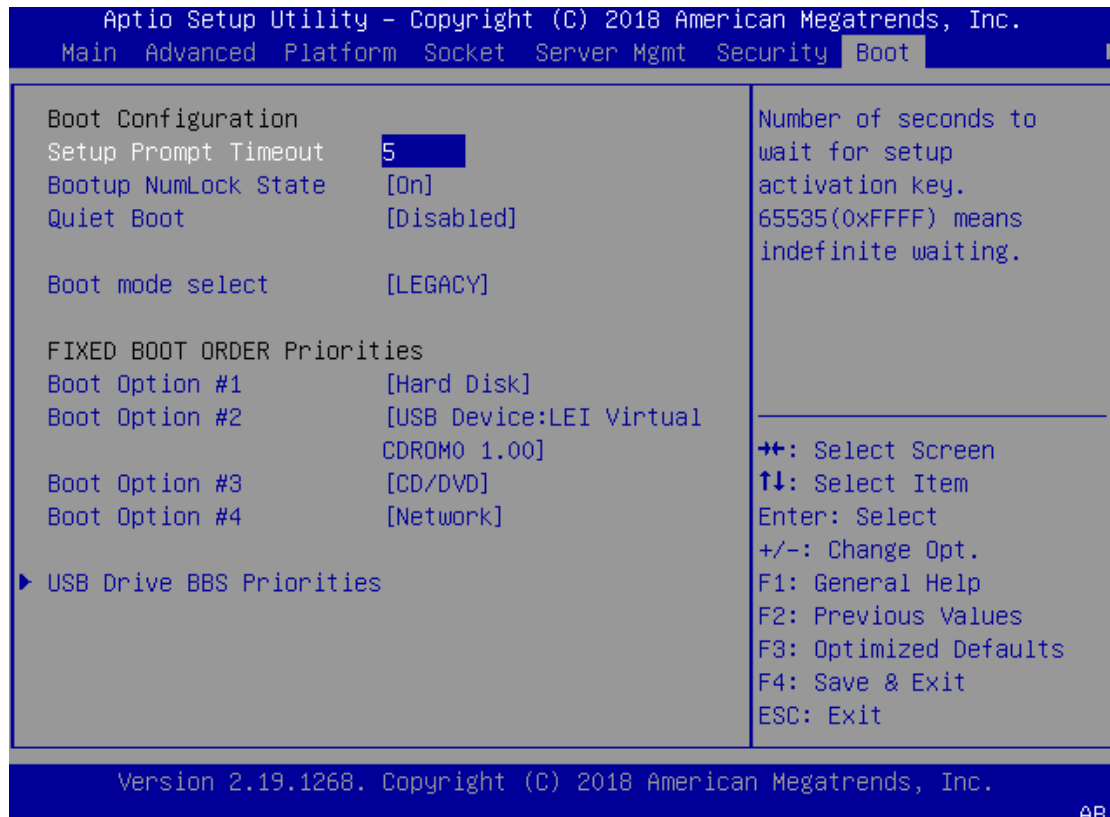| Item	Option	Description
Attempt Secure Boot	Disabled Enabled	Secure Boot is activated when Platform Key(PK) is enrolled, System mode is User/Deployed, and CSM function is disabled.
Secure Boot Mode	Standard Custom	Secure Boot mode selector: In **Custom** mode, Secure Boot Variables can be configured without authentication

---

Boot Setup

Use [←] / [→] to select [Boot] setup screen. Under this screen, you may use [↑] [↓] to select an item you would like to configure.
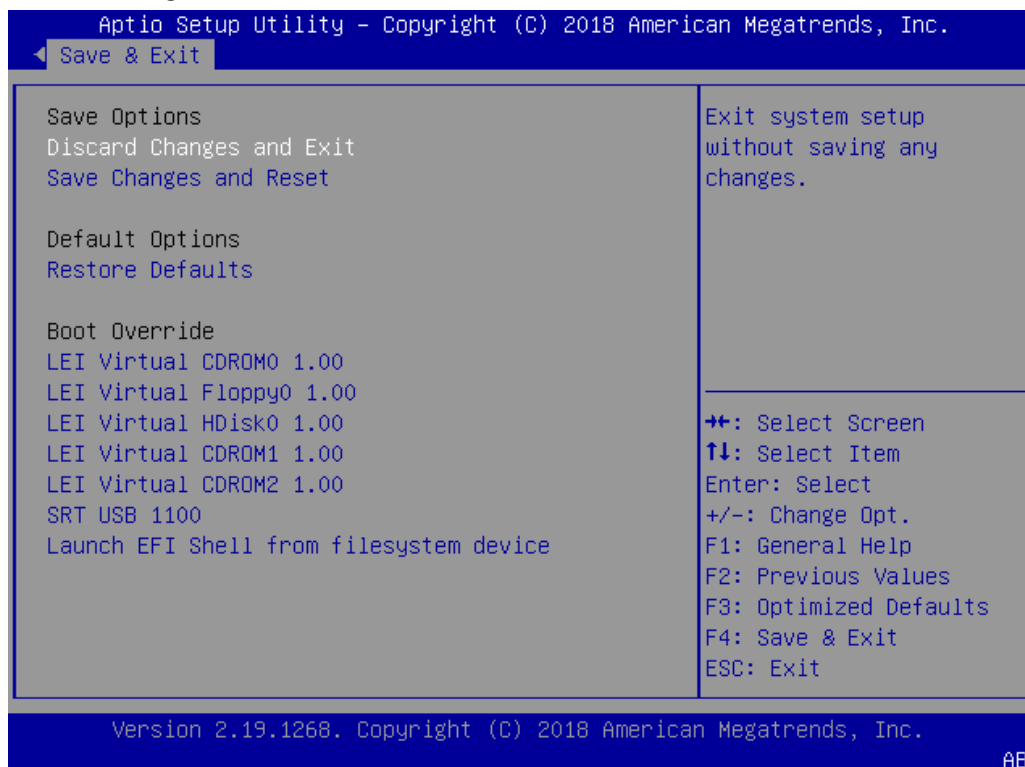
```
Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
 Main  Advanced  Platform  Socket  Server Mgmt  Security  Boot

 Boot Configuration                              Number of seconds to
 Setup Prompt Timeout        5                   wait for setup
 Bootup NumLock State        [On]                activation key.
 Quiet Boot                  [Disabled]          65535(0xFFFF) means
                                                 indefinite waiting.
 Boot mode select            [LEGACY]


 FIXED BOOT ORDER Priorities
 Boot Option #1              [Hard Disk]
 Boot Option #2              [USB Device:LEI Virtual
                             CDROM0 1.00]
 Boot Option #3              [CD/DVD]             ++: Select Screen
 Boot Option #4              [Network]            ↑↓: Select Item
                                                  Enter: Select
 ▶ USB Drive BBS Priorities                       +/-: Change Opt.
                                                  F1: General Help
                                                  F2: Previous Values
                                                  F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit


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                                                                     AB
```

Item	Option	Description
Setup Prompt Timeout	5	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 specific boot device priority sequence from available Group device.
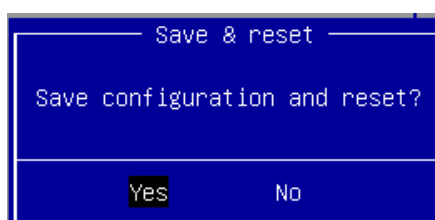
Save and Exit Setup

Use [←] / [→] to select [Save & Exit] setup screen. Under this screen, you may use [↑] [↓] to select an item you would like to configure.
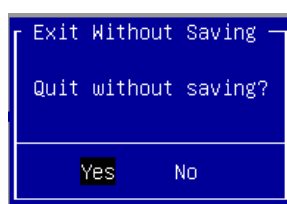
```
       Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
     ◀ Save & Exit

     Save Options                                    Exit system setup
     Discard Changes and Exit                        without saving any
     Save Changes and Reset                          changes.

     Default Options
     Restore Defaults

     Boot Override
     LEI Virtual CDROM0 1.00
     LEI Virtual Floppy0 1.00
     LEI Virtual HDisk0 1.00                         →←: Select Screen
     LEI Virtual CDROM1 1.00                         ↑↓: Select Item
     LEI Virtual CDROM2 1.00                         Enter: Select
     SRT USB 1100                                    +/-: Change Opt.
     Launch EFI Shell from filesystem device         F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit

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                                                                    AB
```

■**Save Changes and Reset**

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

```
        ┌──────── Save & reset ────────┐
        │                              │
        │ Save configuration and reset?│
        │                              │
        │       Yes        No          │
        └──────────────────────────────┘
```

■**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.

```
     ┌ Exit Without Saving ┐
     │                     │
     │ Quit without saving?│
     │                     │
     │    Yes     No       │
     └─────────────────────┘
```

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■Restore Defaults

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

```
┌ Load Optimized Defaults ┐
│                         │
│ Load Optimized Defaults?│
│                         │
├─────────────────────────┤
│      Yes      No        │
└─────────────────────────┘
```

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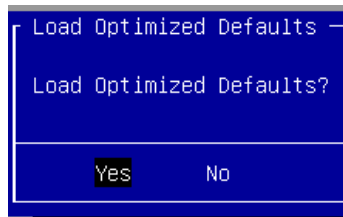
APPENDIX A: LED INDICATOR EXPLANATIONS

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

System Power
System Status
HDD Activity
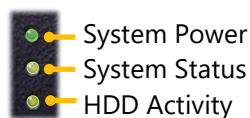
▶ **System Power**

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

▶ **System Status**

This LED indicator is <u>programmable</u>. 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*

Speed
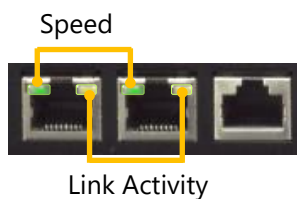
Link Activity

▶ **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*

APPENDIX B: DUAL BIOS INTRODUCTION

Why Dual BIOS?

Failure of booting up BIOS is not uncommon to most experienced users, yet it can be the worst nightmare. This occurs mostly during a power failure or a mishandled BIOS update, after a malware's attack that corrupted the data on the chip, or, at worst, due to physical damage that caused the BIOS not to function. When it happens, not merely will the recovering procedures consume considerable time and effort, but all you work might also be to no avail. Eventually, you are left with no choice but to ship the board back to the manufacturer.

Lanner understands this pain and has empowered our products with the Dual BIOS feature. Normally, the Primary BIOS is used to boot the OS during powering up; when Primary BIOS is down, the Recovery BIOS automatically jumps in to boot up the OS for the User to take further steps such as performing data backup and BIOS upgrade.

Primary BIOS is used to boot the OS during powering up.

When Primary BIOS is down, **Recovery BIOS** will automatically kicks in.
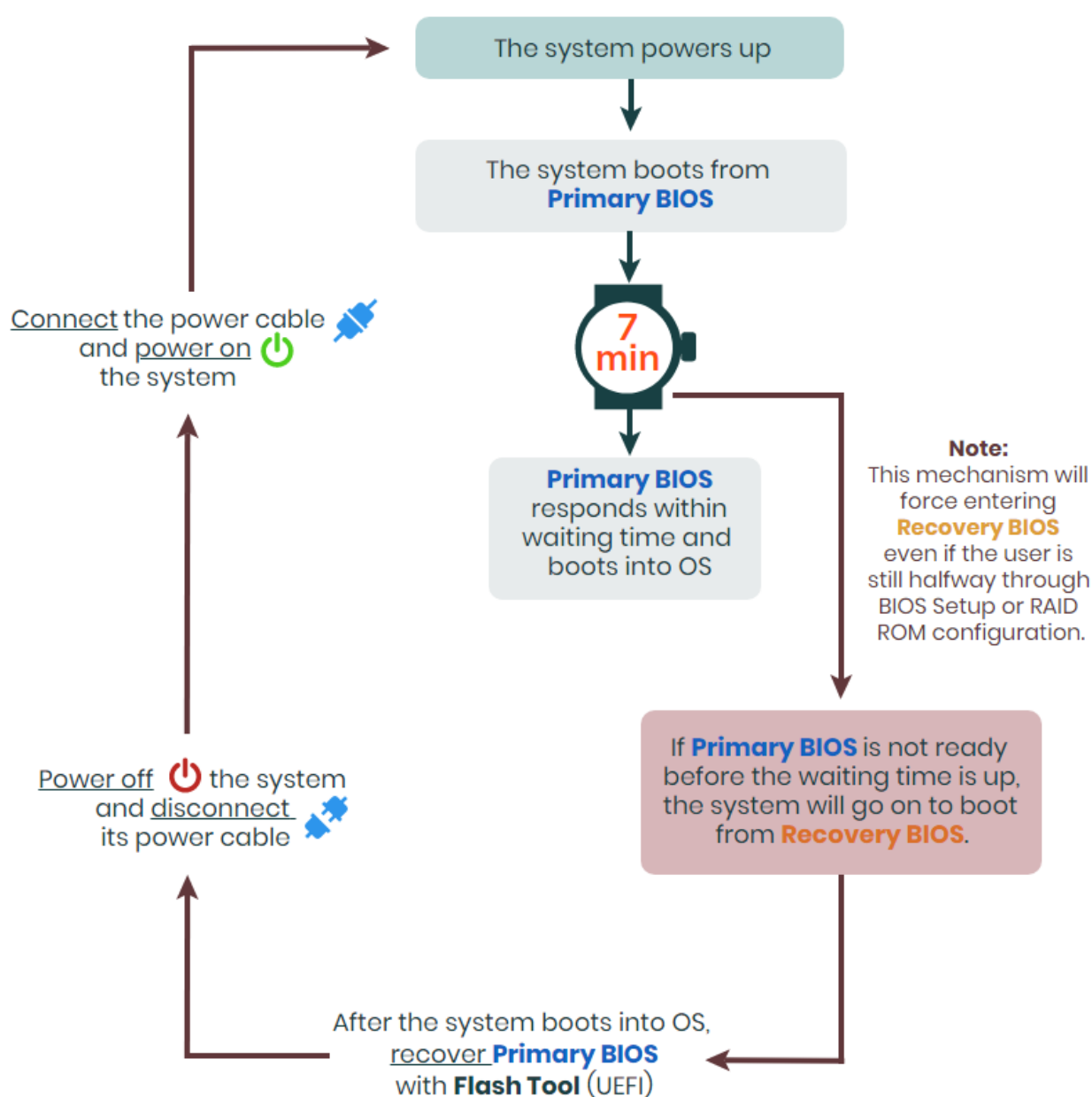
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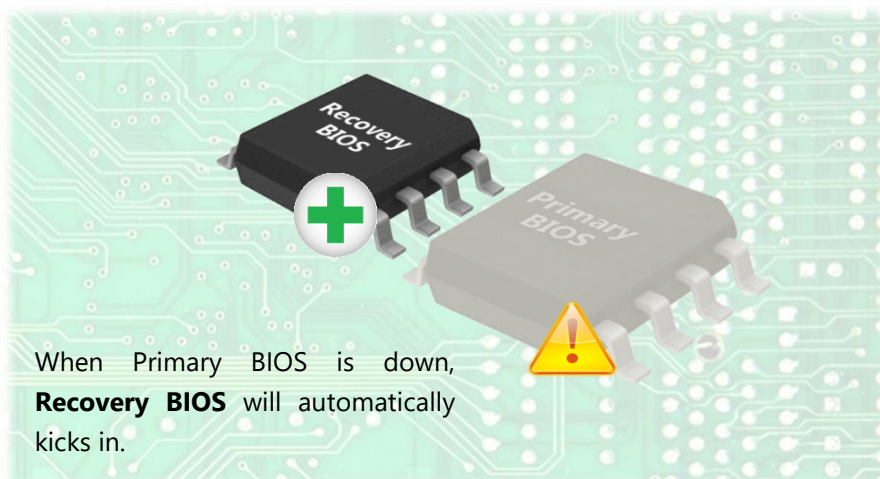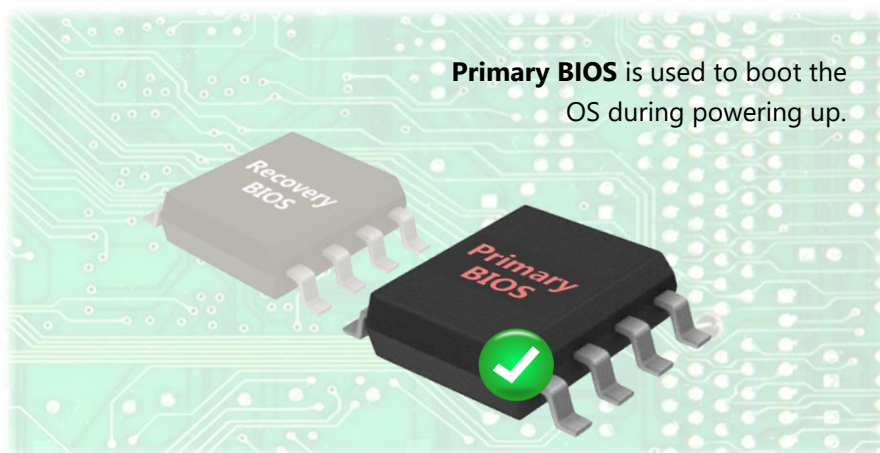
Addressing BIOS Start-up Failure with Dual BIOS

Few things can shut down a computer as completely as a corrupted BIOS. With Dual BIOS feature, you will be guaranteed to enter a healthy OS to perform thorough troubleshooting before the situation is irreparable.

How Dual BIOS Works

Dual BIOS features two physical BIOS ROMs soldered onto the motherboard, carrying two separate BIOS images. The Primary BIOS carries the image for system bootup, the parameters of which can be overwritten, while the Recovery BIOS carries the image locked to the factory default, which guarantees a safe and successful system bootup. If the Primary BIOS is not functioning correctly and fails to respond within 7 minutes, the system will invoke a bootup from the Recovery BIOS, automatically restart the system and launch the operating system.

The system powers up

The system boots from
Primary BIOS

7 min

Primary BIOS responds within waiting time and boots into OS

Note: This mechanism will force entering **Recovery BIOS** even if the user is still halfway through BIOS Setup or RAID ROM configuration.

Connect the power cable and power on the system

Power off the system and disconnect its power cable

If **Primary BIOS** is not ready before the waiting time is up, the system will go on to boot from **Recovery BIOS**.

After the system boots into OS, recover **Primary BIOS** with **Flash Tool** (UEFI)

How do I know which BIOS the system is booting from?

On POST screen, the **Boot Bios** information will display the BIOS used for this bootup.

I just found the system being booted from the Recovery BIOS, what's next?

With the Recovery BIOS at work, it can be asserted that the Primary BIOS is having such severe problem that it failed to function. Before you make certain the BIOS chip is completely corrupted, it is definitely sensible to try the last resort—updating BIOS.

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Get Ready for BIOS Update

Flashing a corrupted BOS can never be taken lightly, for once done wrongly, it is almost certain to lead to an unusable system. To get ready for a BIOS update, acquire the following BIOS resources from Lanner technical support:

- Firmware and Flash Tool
- BIOS Engineering Spec
- Release Note

Before you start, make sure you select the correct firmware version and go through the instructions for BIOS update in *BIOS Engineering Spec* and BIOS fix information in the *Release Note* thoroughly. If you cannot be certain if this version is correct for your system, please contact Lanner Technical Support.

Disclaimer
Under no circumstances will Lanner accept responsibility or liability for damages of any kind whatsoever resulting or arising directly or indirectly from a BIOS update.

⚠ Warning
DO NOT power off or reset the system during BIOS updating process.

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APPENDIX C: SETTING UP CONSOLE REDIRECTIONS

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 set in Step 2 for the server.

APPENDIX D: 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 types of communication status for the bypass function, one is "**Normal** " and another is "Bypass " status. Furthermore, the Lanner Bypass software is capable of controlling the bypass status in the following 3 instances.

► When the system powers off, it can be forced to enable the LAN Bypass function.

► When the system is in the just-on state which is a brief moment when it powers up.

► The Lanner bypass possesses 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, with 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.

► For a reference utility that contains sample code for LAN Bypass function programming, please visit http://www.lannerinc.com/support/download-center/drivers, enter the product category and download the utility package of this system.

► For a full introduction on implementation of Lanner Bypass functionalities. download *Lanner Bypass Watchdog module userguide* from http://www.lannerinc.com/category/1202-network-appliances.

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APPENDIX E: INSTALLING INTEL® LAN CONTROLLER DRIVER FOR LINUX

To install the Intel® LAN controller base driver for the Red Hat® and Linux operating system, please visit http://www.lannerinc.com/support/download-center/drivers, enter the product category and download the utility package of this system.

For the latest driver update, please visit Intel® download center at https://downloadcenter.intel.com/, use the keyword search or the filter to access the driver's product page, and then download the latest controller driver as well as the ReadMe document.

Product Name Keyword	I210
Download Type	Drivers
Operating System	Linux*
Product page	Downloads for Intel® Ethernet Controller I210 Series

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APPENDIX F: TERMS AND CONDITIONS

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.

2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.

3. The buyer will pay for repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.

4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service", RMA goods will be returned at customer's expense.

5. The following conditions are excluded from this warranty:

   ► Improper or inadequate maintenance by the customer

   ► Unauthorized modification, misuse, or reversed engineering of the product

   ► Operation outside of the environmental specifications for the product.

RMA Service

Requesting an RMA#

1. To obtain an RMA number, simply fill out and fax the "RMA Request Form" to your supplier.

2. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.

3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.

4. Mark the RMA# clearly on the box.

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

RMA Service Request Form

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

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

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01:D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
	09: Cache RMA Problem	15: PS2	21: Shut Down
03: CMOS Data Lost	10: Memory Socket Bad	16: LAN	22: Panel Fail
04: FDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
05: HDC Fail	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)
06: Bad Slot			

Request Party   **Confirmed By Supplier**

_____   _____
Authorized Signature / Date   **Authorized Signature / Date**