



**NCA-5510**

**User Manual**

Rev 1.4

Aug 21th, 2018

## Revision History

Rev	Date	Descriptions
0.1	2015/08/06	Preliminary
1.0	2015/11/03	Official release
1.1	2015/12/01	Added BIOS chapter
1.2	2016/04/22	Added maximum heights for SATA storage tray
1.3	2017/08/24	Updated motherboard layout, Jumpers and Connectors List, and Jumper Setting and Connector Pin-out
1.4	2018/08/21	Modified Pin Assignment for LCM

This document contains proprietary information of Lanner Electronics Inc. –and is not to be disclosed or used except in accordance with applicable agreements.

**Copyright © 2018. All Rights Reserved.**

Copyright© 2015 Lanner Electronics Inc. All rights reserved. The information in this document is proprietary and confidential to Lanner Electronics Inc. No part of this document may be reproduced in any form or by any means or used to make any derivative work (such as translation, transformation, or adaptation) without the express written consent of Lanner Electronics Inc. Lanner Electronics Inc. reserves the right to revise this document and to make changes in content from time to time without obligation on the part of Lanner Electronics Inc. to provide notification of such revision or change.

The information in this document is furnished for informational use only, is subject to change without notice, and should not be construed as a commitment by Lanner Electronics Inc. Lanner Electronics Inc. assumes no responsibility or liability for any errors or inaccuracies that may appear in this document or any software that may be provided in association with this document.

## Online Resources

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

Resource	Website
Lanner	<a href="http://www.lannerinc.com">www.lannerinc.com</a>
Product Resources	<a href="http://www.lannerinc.com/support/download-center">www.lannerinc.com/support/download-center</a>
RMA	<a href="http://eRMA.lannerinc.com">http://eRMA.lannerinc.com</a>

## Acknowledgement

Intel, Pentium and Celeron are registered trademarks of Intel Corp.

Microsoft Windows and MS-DOS are registered trademarks of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

## Compliances and Certification

### CE Certification

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

### FCC Class A Certification

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

### EMC Notice

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

### Safety Guidelines

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

### LITHIUM BATTERY CAUTION:

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

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

### Operating Safety

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

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 Environment Precaution

1. Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) specified by the manufacturer.
2. Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."

## Consignes de sécurité

Suivez ces consignes pour assurer la securite generale :

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

## Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacee par une autre d'un mauvais type.
- Jetez les piles usagees conformement aux instructions.
- L'installation doit etre effectuee par un electricien forme ou une personne formee a l'electricite connaissant toutes les specifications d'installation et d'appareil du produit.
- Ne transportez pas l'unite en la tenant par le cable d'alimentation lorsque vous deplacez l'appareil.
- La machine ne peut etre utilisee qu'a un lieu fixe comme en laboratoire, salle d'ordinateurs ou salle de classe.

## Sécurité de fonctionnement

- L'equipement electrique genere de la chaleur. La temperature ambiante peut ne pas etre adequate pour refroidir l'equipement a une temperature de fonctionnement acceptable sans circulation adaptee. Verifiez que votre site propose une circulation d'air adequate.
- Verifiez que le couvercle du chassis est bien fixe. La conception du chassis permet a l'air de refroidissement de bien circuler. Un chassis ouvert laisse l'air s'echapper, ce qui peut interrompre et rediriger le flux d'air frais destine aux composants internes.
- Les decharges electrostatiques (ESD) peuvent endommager l'equipement et generer 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

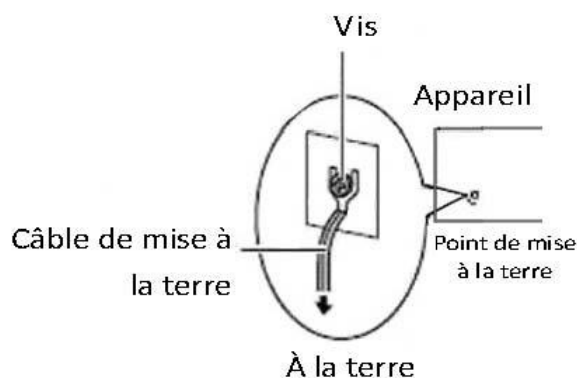
- Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- Pour désinstaller 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 mm<sup>2</sup> 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.



## Table of Contents

NCA-5510 .....	1
User Manual .....	1
Revision History .....	2
Online Resources .....	3
Acknowledgement .....	3
Compliances and Certification .....	3
CE Certification .....	3
FCC Class A Certification .....	3
EMC Notice .....	4
Safety Guidelines .....	4
LITHIUM BATTERY CAUTION: .....	4
Operating Safety .....	5
Mounting Installation Environment Precaution .....	5
Consignes de sécurité .....	6
Avertissement concernant la pile au lithium .....	6
Sécurité de fonctionnement .....	6
Consignes de sécurité électrique .....	7
Procédure de mise à la terre pour source d'alimentation CC Procédure de mise à la terre pour source d'alimentation CC .....	7
Chapter 1: Introduction .....	10
System Specification .....	11
Ordering Information .....	12
Package Contents .....	12
Optional Accessories .....	12
Chapter 2: System Overview .....	13
Mechanical Drawing .....	13
Block Diagram .....	14
Front I/Os .....	15
Rear I/Os .....	16
Chapter 3: Board Layout .....	17
Jumpers and Connectors on the Motherboard .....	17
Jumpers and Connectors List .....	18
Jumper Setting and Connector Pin-out .....	19
Chapter 4: Hardware Setup .....	28
Installing the CPU .....	30
Installing the System Memory .....	33
Installing Disk Drives .....	34
Installing a CFast Card .....	36
Installing an IPMI Card .....	36



## Network Computing Platforms

Replacing Redundant Power Supply Unit .....	37
Replacing Cooling Fans .....	38
Installing Ethernet NIC Modules.....	39
Installing Riser Card (Optional) .....	41
Rackmount Installation.....	43
Chapter 5: BIOS Setup.....	48
Main.....	49
Advanced.....	50
Above 4G Decoding .....	50
SR-IOV Support.....	50
NCT6776 Super IO Configuration.....	51
NCT7904D HW Monitor .....	54
Serial Port Console Redirection.....	56
COM Console Redirection Settings.....	57
Trusted Computing .....	63
USB Configuration .....	64
LAN Boot Select.....	68
IntelRCSetup .....	70
IOAT Configuration.....	70
Intel (R) VT for Directed I/O (VT-d) Configuration .....	73
IIO0 Configuration.....	76
Processor Configuration.....	77
PCH Configuration .....	79
PCH SATA Configuration.....	80
Security.....	83
Boot .....	84
Save & Exit.....	86
Appendix A: Programming Watchdog Timer .....	87
Appendix B: Setting up Console Redirection .....	88
Appendix C: Programming Generation 3 LAN Bypass .....	89
Appendix D: Programming the LCM .....	91
Appendix E: Terms and Conditions .....	96

## Chapter 1: Introduction

Thank you for choosing NCA-5510. NCA-5510 is a high-performance 1U rackmount network appliance utilizing Intel® Haswell-EP CPU with Wellsburg PCH, codenamed Grantley. The adoption of this platform aims to deliver supreme network performance. With Intel® Grantley, NCA-5510 supports registered DDR4 memory at 2133 MHz frequency and capacity up to 256GB. This will help maximize data efficiency in virtualization and next-generation firewall/UTM/IPS applications.

As designed for optimal network computing, NCA-5510 offers high-port density by delivering up to 32 GbE RJ-45 ports in just 1U form factor. The LAN expansion is scalable through 4 NIC slim type module slots, supporting 40G/10G/1G/Fiber/Copper/Bypass specifications. The variety and scalability makes NCA-5510 the ideal deployment for enhancing network traffic management and virtualized network security.

Other significant features include CFast NAND Flash storage, 1+1 ATX redundant power at 300W and optional TPM support.

Here is the summary of the key features:

- Intel® Xeon® processor E5-2600 v3 series on LGA2011-R3 socket (Haswell-EP)
- Intel® Chipset
- 4 NIC module slots support 40G/10G/1G/Fiber/Copper/Bypass
- DDR4 memory at 2133 MHz, maximum capacity up to 256GB
- 1 x 3.5" or 2 x 2.5" SATA HDD/SSD drive bays, max 9.5mm height (disk drive is not included)
- 1 x CFast socket

Please refer to the following chart for a detailed description of the system's specifications.

## System Specification

<b>Processor Options</b>		Intel® Haswell-EP CPU at 95W
<b>CPU Socket</b>		LGA2011-R3
<b>Chipset</b>		Intel® C612 Chipset
<b>BIOS</b>		AMI SPI BIOS <ul style="list-style-type: none"> <li>● Support PXE function</li> <li>● Support Console redirection</li> <li>● Watchdog/ Watchdog control LAN Bypass function/ Power off LAN Bypass function</li> </ul>
<b>System Memory</b>		8 x 288-pin DIMM DDR4 up to 2133MHz ECC RDIMM at 256GB
<b>USB</b>		2 x USB 2.0 Type-A ports
<b>Storage</b>		1 x 3.5" or 2 x 2.5" HDD/SSD, max 9.5mm height 1 x CFast socket
<b>Networking</b>	LAN	2x RJ-45 of 10/100/1000Mbps Ethernet ports
	Controller	2 x Intel i210AT
	Management	1 x Management Port, shared with IPMI
	NIC Module space	4 x Slim Type NIC module sockets (1xPCIE8 or 2xPCIE4)
	Console	1 x RJ-45 console port
	IPMI	OPMA socket to support IPMI IAC-AST2300 1x 10/100/GBE VGA via IPMI (OPMA socket)
<b>Fan</b>		4 x Cooling fans
<b>Display</b>	LCM	1x character type LCM
	LED	POWER/STATUS/HDD
	Keypad	4x Keypads
<b>Expansion</b>		4 x PCIe8 sockets for slim type NIC modules on the front 1 x PCIe8 half-sized module at the rear
<b>TPM</b>		1x 12-pin 2.54pitch pin header support TPM module
<b>Thermal</b>		1 x passive heat sink
<b>Physical Characteristics</b>	Form Factor	1U rackmount
	Housing	SPGC
	Dimensions	438mm x 580mm x 44mm (W x D x H)
	Mounting Options	Rackmount by sliderail

## Network Computing Platforms

<b>Environment</b>	Operating Temperature	0°C ~ 40°C
	Non-operating Temperature	-40°C ~ 70°C
	Ambient Humidity	5 to 90% (non-condensing)
<b>Power</b>	Power switch	1x power switch, slim type ATX
	Reset	1x reset, Software / Hardware reset (Control by GPIO) default SW reset
	Internal	1 x ATX 24-pin connector 1 x ATX 8-pin connector
	Input	110 to 240 VAC
	Power supply	300W 1U redundant PSU w/ PM bus
<b>Certifications</b>	EMC	CE/FCC Class A
	Green product	RoHS

## Ordering Information

<b>NCA-5510A</b>	NCB-5510A + 4 Slimtype NIC module space + NCC-5510A + IO-88951A + BP-55101A + RC-88771A(Optional)
------------------	---

## Package Contents

- 1 - NCA-5510 Network Security Platform
- 1 - power cable
- 1 - Ear Rack mount kit with screws
- 1 - Console cable
- 1 - LAN Cable (Grey)
- 1 - LAN Cable (Red)

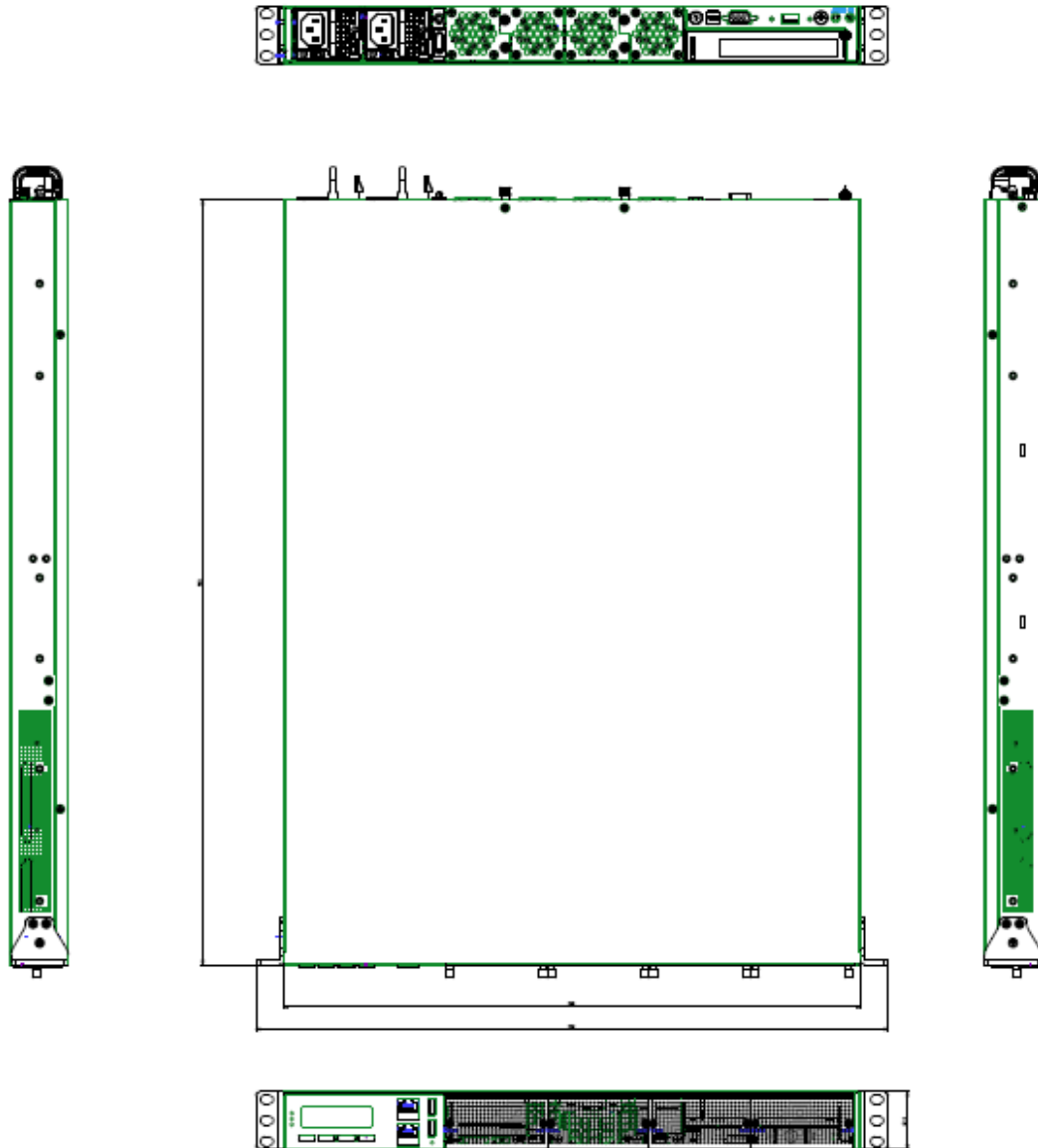
Note : If you should find any components missing or damaged, please contact your dealer immediately for assistance

## Optional Accessories

<b>NCS2-ISM405A</b>	1x Intel i350 4port SFP w/ bypass
<b>NCS2-ISM802A</b>	2x Intel i350 8port RJ45 w/o bypass
<b>NCS2-IXM405A</b>	2x Intel 82599 4port SFP+ w/o bypass
<b>NCS2-ITM202A</b>	

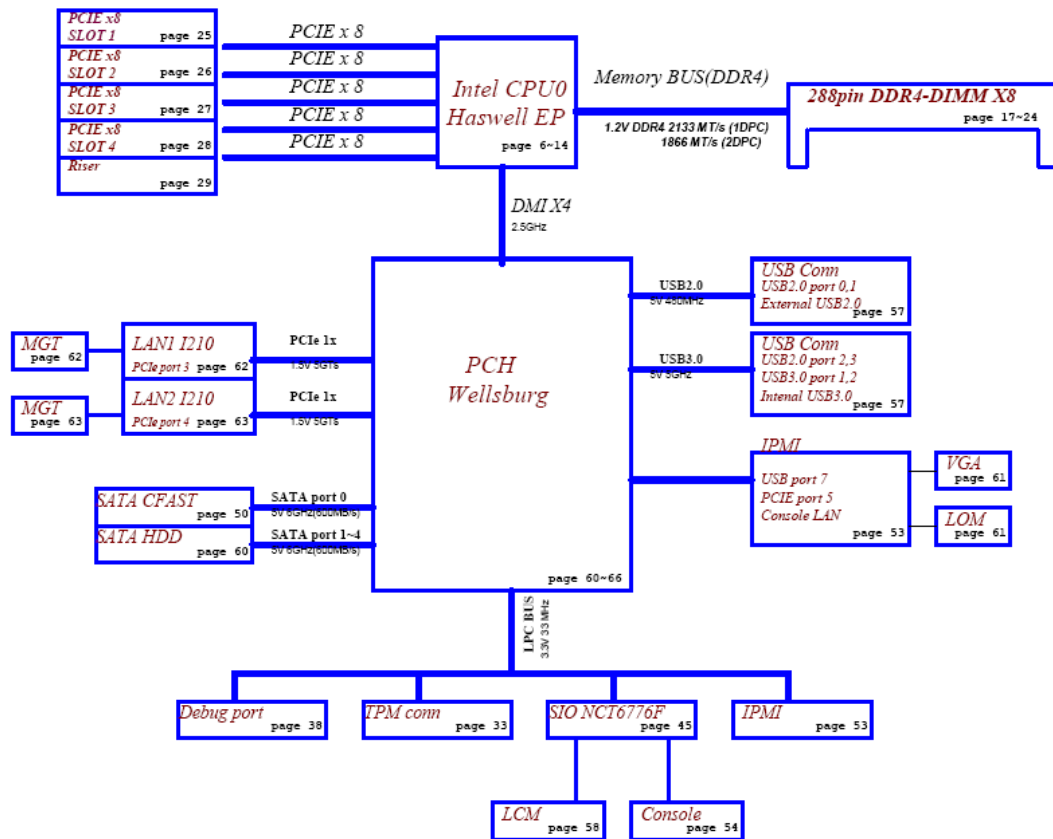
## Chapter 2: System Overview

### Mechanical Drawing

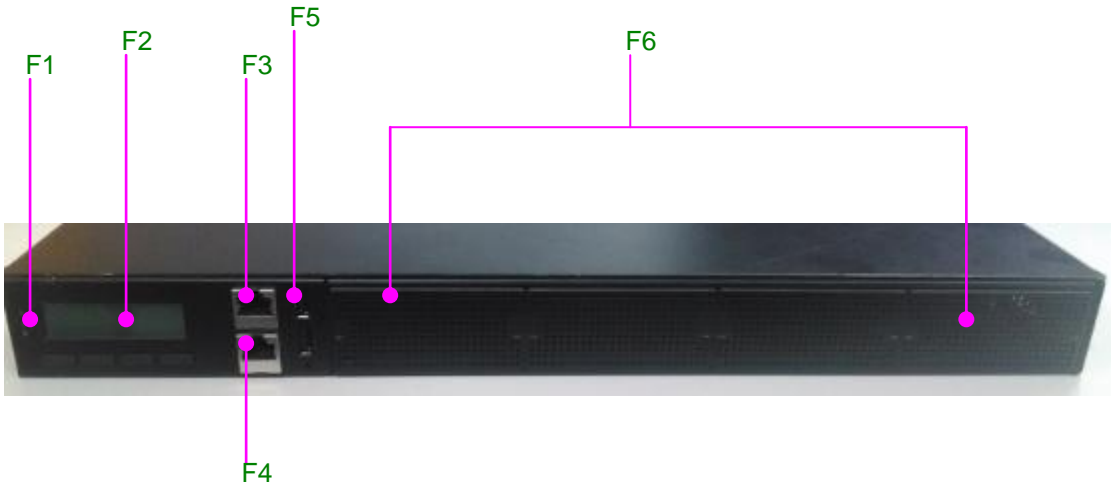


Unit: mm

## Block Diagram

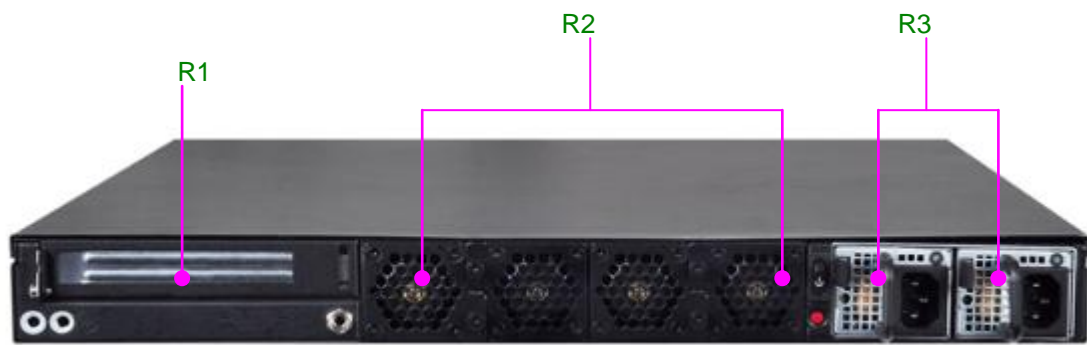


Front I/Os



F1 LED Indicators	POWER/STATUS/HDD Power: status about power supply Status: programmable status LED signals for system activities HDD: status about storage devices, such as HDD or SSD
F2 LCM	LCM with 4 x keypads
F3 LAN	1 x RJ-45 Management Port
F4 COM	1 x RJ-45 console port
F5 USB	2 x USB 2.0 Type-A ports in double stacked form
F6 NIC	4 x Slim type NIC module spaces

Rear I/Os

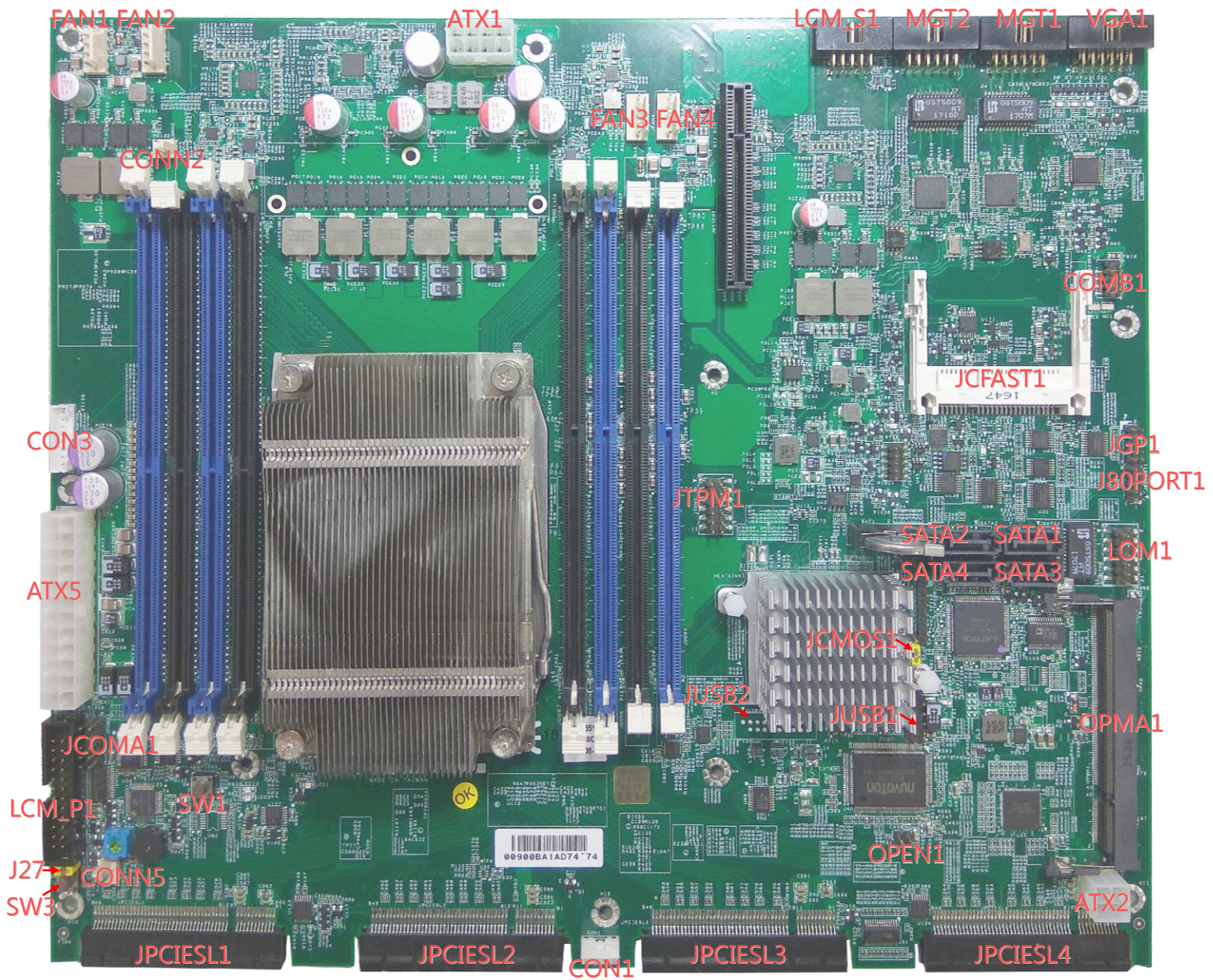


R1 PCIe Expansion	1 x PCIe expansion slot
R2 Fans	4 x replaceable cooling fans
R3 Power	2 x redundant power supply units (300W)



## Chapter 3: Board Layout

### Jumpers and Connectors on the Motherboard



## Jumpers and Connectors List

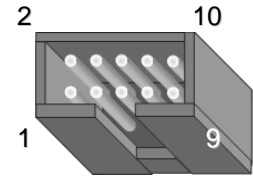
Labels	Descriptions	Remarks
LCM_S1	USB type LCM module pin header	
MGT2	An internal LAN pin header to serve as Management Port 2	
MGT1	An internal LAN pin header to serve as Management Port 1	
VGA1	VGA internal pin header	Enabled via IPMI/OPMA only
COMB1	COM port pin header	
JCFast	CFast card socket	
JGP1	GPIO	
J80PORT	Debug use	
LOM1	An internal LAN pin header to serve as LOM port	LOM is optional and must be enabled through IPMI/OPMA
SATA1, 2, 3, 4	4 x SATA signal connectors	
OPMA1	OPMA socket for IPMI card	
JCMOS1	Clear CMOS jumper setting	
JUSB1	USB 2.0 internal pin header	
JUSB2	USB 2.0/3.0 internal pin header	
OPEN1	Chassis Open Detect mainboard protection jumper	
ATX2	4-pin power connector	
FAN1~4	4 x 5-pin fan connectors	
ATX1	8-pin power connector	
CONN2	ATX Mode power switch	
CON3	PMBus connector	
ATX5	24-pin ATX power connector	
JCOMA1	COM port pin header	
LCM_P1	LCM module connector	
SW1	PSON power switch for debug	
SW3	Reset Switch	
CONN5	AT Mode power switch	
J27	Software reset jumper selection	
CON1	4-pin power connector	
JTPM1	Supports a Trusted Platform Module (TPM) system	
JCMOS1	Jumper selection to clear CMOS	

## Jumper Setting and Connector Pin-out

### LCM\_S1: USB\_LCM

USB-type front LCD Message Display Module (LCM).

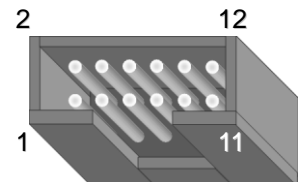
Pin	Description	Pin	Description
1	P5V_SB	2	P5V
3	USB_PCH_P5N	4	
5	USB_PCH_P5P	6	HDD_LED_N
7	GND	8	GND
9	NTXD2	10	NRXD2



### MGT2: LAN

An internal LAN pin header to serve as Management Port 2

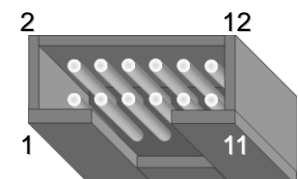
Pin	Description	Pin	Description
1	MGT2_MDIP_0	2	MGT2_MDIN_0
3	MGT2_MDIP_1	4	MGT2_MDIN_1
5	MGT2_MDIP_2	6	MGT2_MDIN_2
7	MGT2_MDIP_3	8	MGT2_MDIN_3
9	MGT_LAN2_100#	10	MGT_LAN2_ACT#
11	MGT_LAN2_1G#	12	P3V3_AUX



### MGT1: LAN

An internal LAN pin header to serve as Management Port 1

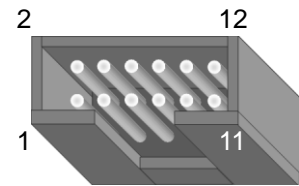
Pin	Description	Pin	Description
1	MGT1_MDIP_0	2	MGT1_MDIN_0
3	MGT1_MDIP_1	4	MGT1_MDIN_1
5	MGT1_MDIP_2	6	MGT1_MDIN_2
7	MGT1_MDIP_3	8	MGT1_MDIN_3
9	MGT_LAN1_100#	10	MGT_LAN1_ACT#
11	MGT_LAN1_1G#	12	P3V3_AUX



## VGA1: VGA

The VGA function is enabled via IPMI (OPMA socket)

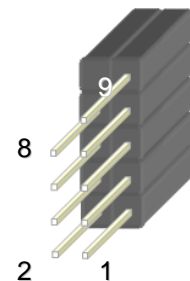
Pin	Description	Pin	Description
1	R	2	GND
3	G	4	GND
5	B	6	GND
7	H-SYNC	8	GND
9	V-SYNC	10	GND
11	Detect-display Data	12	Detect-display CLOCK



## COMB1: COM PORT

Serial COM port pin header

Pin	Description	Pin	Description
1	NDCD2-	2	NDSR2-
3	NRXD2	4	NRTS2-
5	NTXD2	6	NCTS2-
7	NDTR2-	8	NR12-
	GND	10	



## JCFAST1: CFast card socket

Pin	Description	Pin	Description
PC1	Tie to Pin 17	S1	GND
PC2	GND	S2	SATA_TX_P0
PC3		S3	SATA_TX_N0
PC4		S4	GND
PC5		S5	SATA_RX_N0
PC6		S6	SATA_RX_P0
PC7	GND	S7	GND
PC8	LED_CFAST#		
PC9			
PC10			
PC11			
PC12			
PC13	P3V3		
PC14	P3V3		
PC15	GND		
PC16	GND		
PC17	Tie to Pin 1		

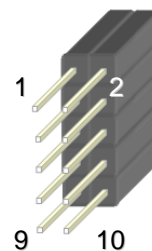




## JGP1: GPIO

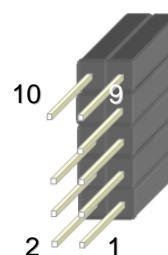
GPIO pin header

Pin	Description	Pin	Description
1	GPO_GPIO50	2	GPI_GPIO22
3	GPO_GPIO52	4	GPI_GPIO38
5	GPO_GPIO54	6	GPI_GPIO48
7	GPO_GPIO18	8	GPI_GPIO39
9	GND	10	GND



## J80PORT1 : 80Port Debug

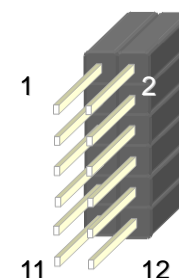
Pin	Description	Pin	Description
1	CLK	2	LAD1
3	RST-	4	LAD0
5	LRAME-	6	P3V3
7	LAD3	8	
9	LAD2	10	GND



## LOM1: LAN

An internal LAN pin header to serve as LOM port. Please be noted that the LOM function is optional and has to be enabled via IPMI/OPMA.

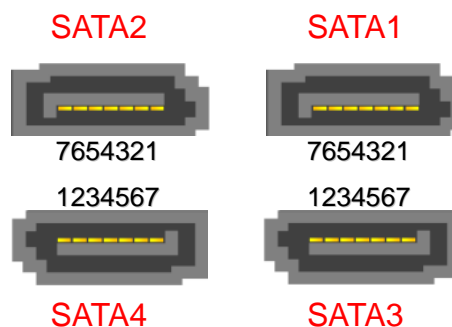
Pin	Description	Pin	Description
1	MGT0_MDIP_0	2	MGT0_MDIN_0
3	MGT0_MDIP_1	4	MGT0_MDIN_1
5	MGT0_MDIP_2	6	MGT0_MDIN_2
7	MGT0_MDIP_3	8	MGT0_MDIN_3
9	IPMI_SPEED_100_L_N	10	IPMI_ACT_L_N
11	IPMI_SPEED_1G_L_N	12	IPMI_P3V3_AUX_L



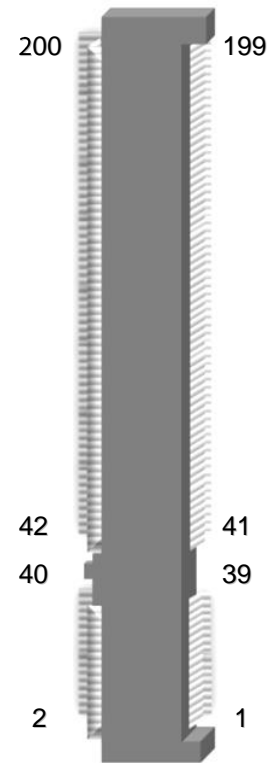
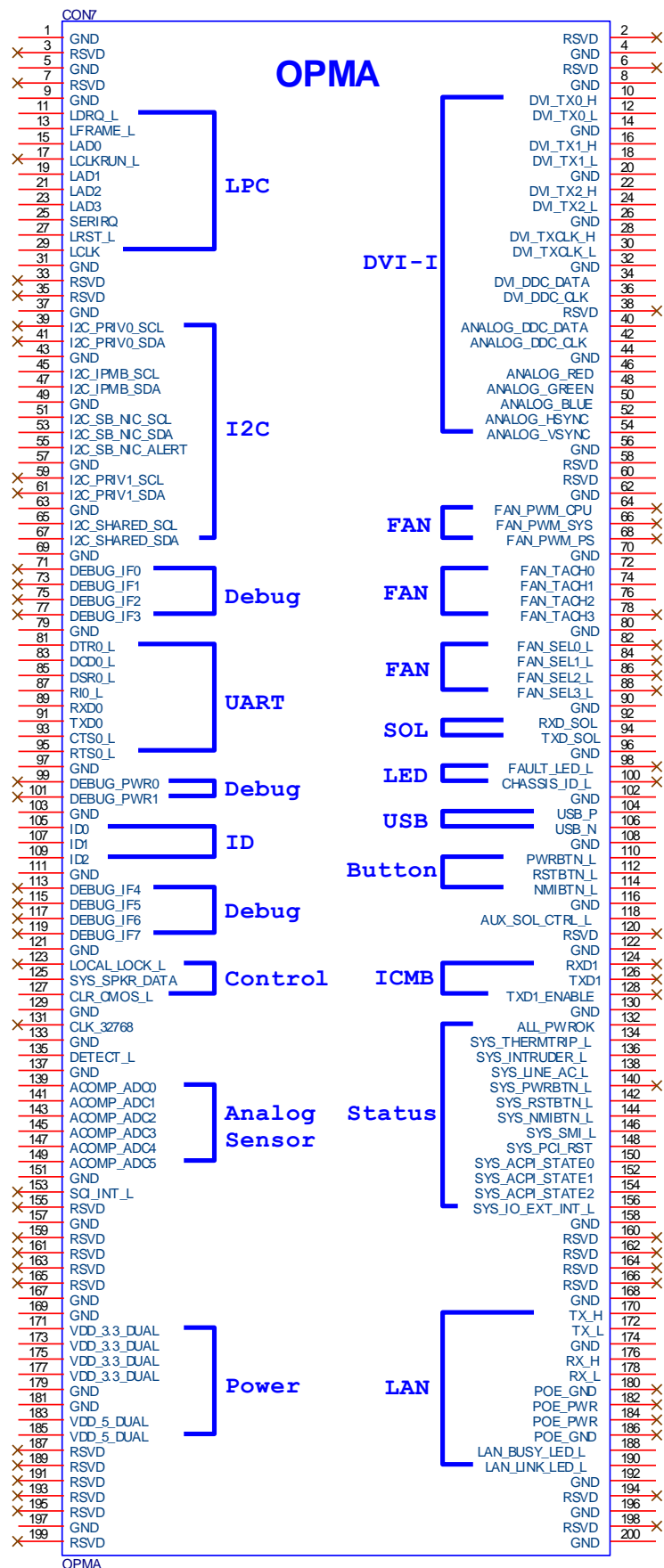
## SATA1~SATA4: SATA

SATA 7-pin signal connector for SATA storage devices

Pin	Description
1	GND
2	TX_P
3	TX_M
4	GND
5	RX_M
6	RX_P
7	GND





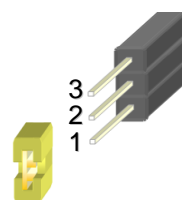
**OPMA1:** OPMA socket for IPMI card to activate IPMI functions



## JCMOS1:CMOS

Jumper selection to clear CMOS

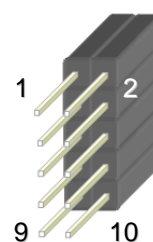
Pin		Description
Short 1-2		Normal (Default)
Short 2-3		Clear CMOS



## JUSB1: USB

USB internal pin header

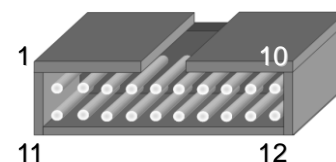
Pin	Description	Pin	Description
1	USB_VCC	2	USB_VCC
3	USBD0-	4	USBD1-
5	USBD0+	6	USBD1+
7	GND	8	GND
9	USB Port#1Ground	10	USB Port#2 Ground



## JUSB2: USB 3.0

USB internal connector with USB2.0 and USB3.0 signals

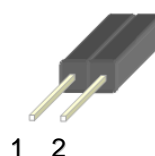
Pin	Description	Pin	Description
1	P5V_USB2	11	USB20_L_P2
2	USB30_RX1N_L	12	USB20_L_N2
3	USB30_RX1P_L	13	GND
4	GND	14	USB30_TX2P_C_L
5	USB30_TX1N_C_L	15	USB30_TX2N_C_L
6	USB30_TX1N_C_L	16	GND
7	GND	17	USB30_RX2P_L
8	USB20_L_N3	18	USB30_RX2N_L
9	USB20_L_P3	19	P5V_USB2
10	NC	20	NC



## OPEN1: CASE OPEN pin header

Chassis Open Detect mainboard protection jumper. (a short-pin cap will be connected to the top compartment of the system chassis. When the top compartment is lifted/removed, the board functions will be disabled once the jumper cap is lifted along with the top compartment. This is to protect the board from being tampered by anyone who remove the top compartment.

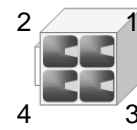
Pin	Description
1	GND
2	CSOPEN_N



1 2

## ATX2: 4 pin Power Connector

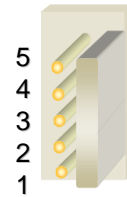
Pin	Description	Pin	Description
1	GND	2	12V
3	CSOPEN_N	4	+12V



## FAN1~4: FAN Connectors

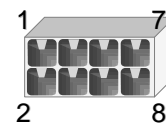
4 x 5-pin cooling fan connectors

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



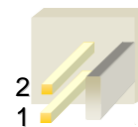
## ATX1: 8-pin Power Connector

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



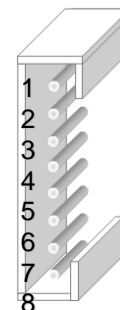
## CONN2: ATX Mode Power Switch

Pin	Description
1	GND
2	FP_SWIN_R



## CON3

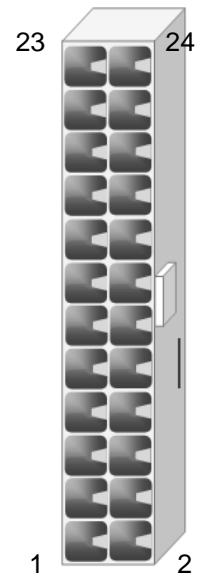
Pin	Description
1	RDPW_TTL1
2	RDPW_TTL2
3	RDPW_TTL3
4	GND
5	
6	SMB_PS_CLK
7	SMB_PS_DATA
8	IRQ_SML1_PMBUS_ALERT_N





### ATX5: 24-Pin ATX Power Connector

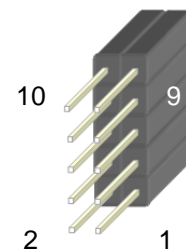
Pin	Description	Pin	Description
1	+3.3V	2	+3.3V
3	+3.3V	4	-12V
5	GND	6	GND
7	+5V	8	PSON-
9	GND	10	GND
11	+5V	12	GND
13	GND	14	GND
15	Power Good	16	NC
17	Stand-By 5V	18	+5V
19	+12V	20	+5V
21	+12V	22	+5V
23	3.3V	24	GND



### JCOMA1:COM PORT

Serial COM port pin header

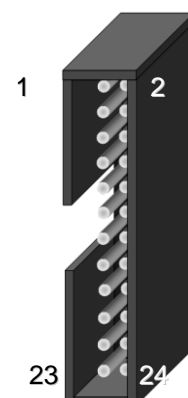
Pin	Description	Pin	Description
1	NDCD1	2	NDSR1
3	NRXD1	4	NRTS1
5	NTXD1	6	NCTS1
7	NDTR1	8	NR11
	GND	10	FP_RESET_N



### LCM\_P1:LCM

LCM module connector

Pin	Description	Pin	Description
1	P5V	2	LCM_P1
3	P_SLIN_N	4	VEE
5	P_AFD_N	6	P_INIT_N
7	LPD1	8	LPD0
9	LPD3	10	LPD2
11	LPD5	12	LPD4
13	LPD7	14	LPD6
15	LCD-	16	VCC
17	KPA1	18	KPA2

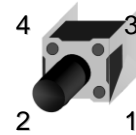


## Network Computing Platforms

19	KPA3	20	KPA4
21	LCM_RST	22	CTR_GRN
23	CTR_YEW	24	HDD_LED#

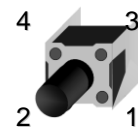
### SW1: PSON Power Switch for Debug

Pin	Description
1.2	GND
3.4	FP_SWIN_R



### SW3: Reset Switch

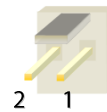
Pin	Description
1.2	GND
3.4	FP_RST_SEL



### CONN5:



AT Mode Power Switch

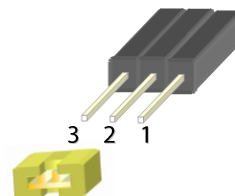
Pin	Description
1	GND
2	FP_SWIN_R



### J27: Front Panel Reset Jumper

Select Front Panel reset (software reset by default)

Pin	Description
Short 1-2 	Hardware Reset
Short 2-3 	Software Reset



### CON1

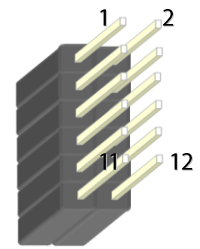
Pin	Description
1	12V
2	GND
3	GND
4	5V



## Network Computing Platforms

**JTPM1:** This connector supports a Trusted Platform Module (TPM) system

Pin	Description	Pin	Description
1	LPC_SERIRQ	2	LPC_FRAME_N
3	LPC_LAD0	4	CLK_LPC_OUT
5	LPC_LAD1	6	P3V3_STBY
7	LPC_LAD2	8	NC
9	LPC_LAD3	10	P3V3_A
11	RESET_N	12	GND



Notes: the TPM pin header is configured as optional by default. To enable it, please contact Lanner for customization order.

# Chapter 4: Hardware Setup

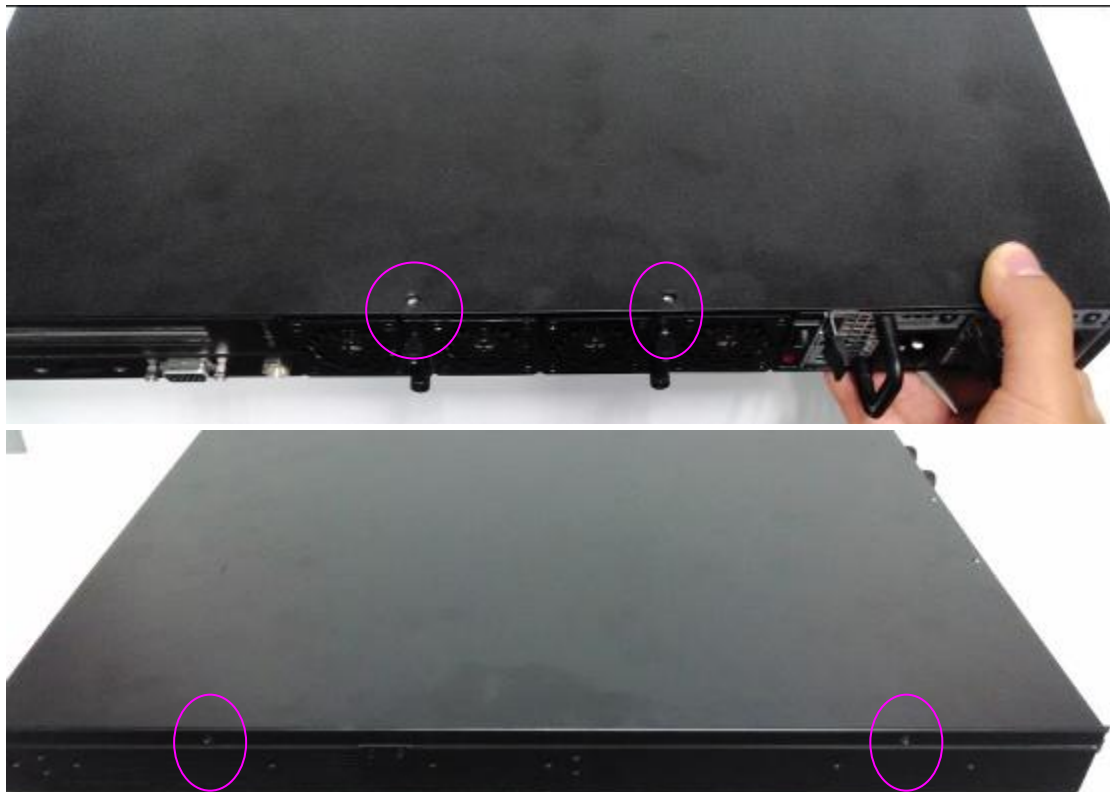
## Preparing the Hardware Installation

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

### **WARNING:**

- To reduce the risk of personal injury, electric shock, or damage to the equipment, please remove all power sources.
- Please wear ESD protected gloves before conducting the following steps.

1. Power off NCA-5510 completely.
2. Remove the screws at the rear and both sides, as circled in the figures below.



## Network Computing Platforms



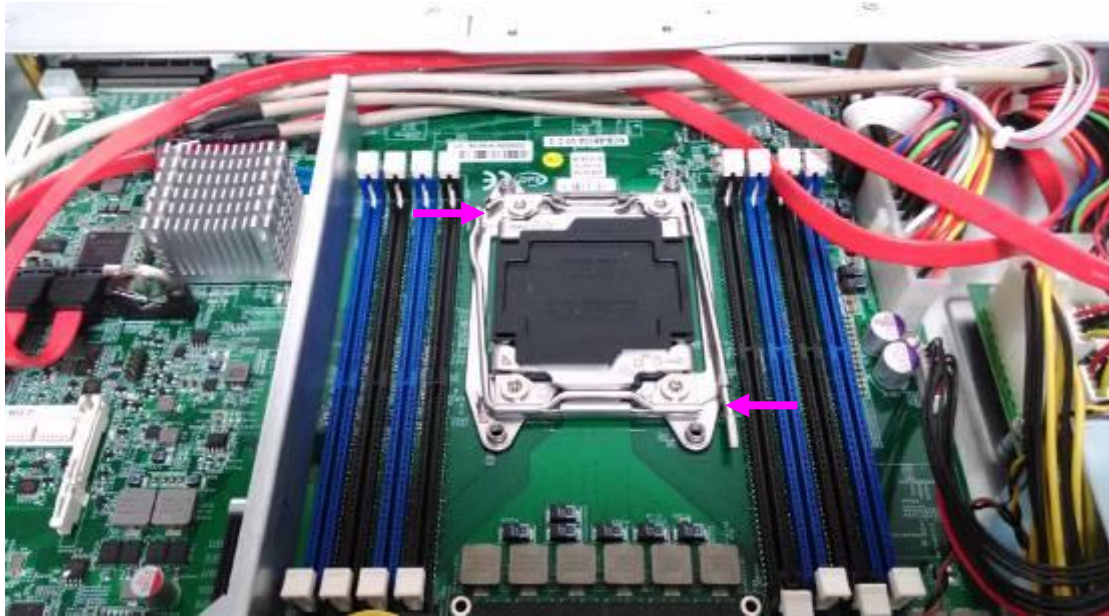
3. Slide and lift the top compartment of the chassis by following the arrows of directions as defined as step 1 and 2 below.



## Installing the CPU

The motherboard supports one Intel Haswell-EP CPU with LGA2011-R3 socket. Please follow the steps below for installing the processor.

1. Push the both left and right load levers as shown in the figure below.



2. When both load levers are released, gently pull the left load lever towards the arrow of direction as shown in the figure below.

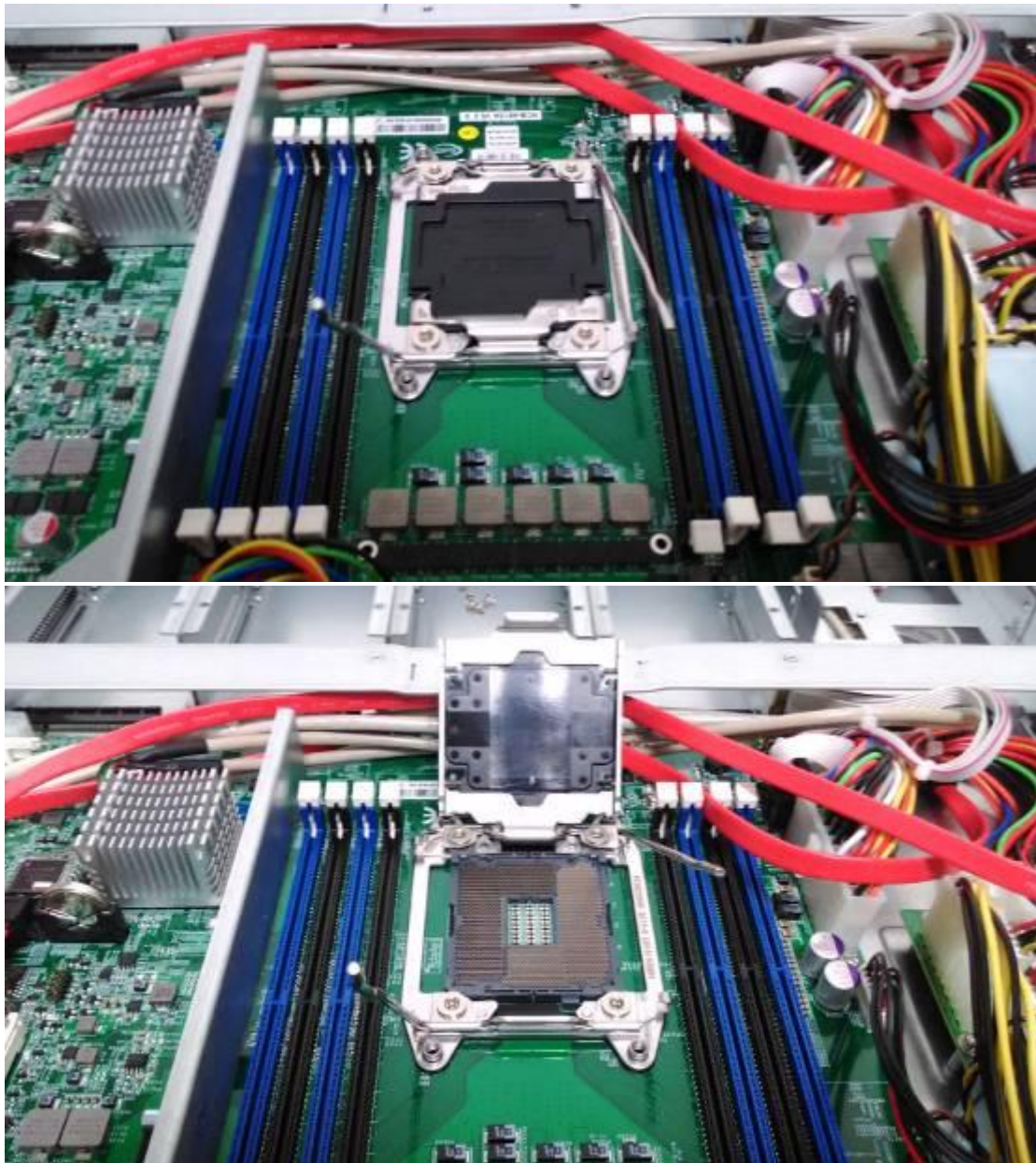


3. Now open the load plate and prepare to insert CPU. Align the CPU and the notch on the socket. The CPU should fit perfectly into the socket. Note that the CPU fits in the socket in only



## Network Computing Platforms

one direction.



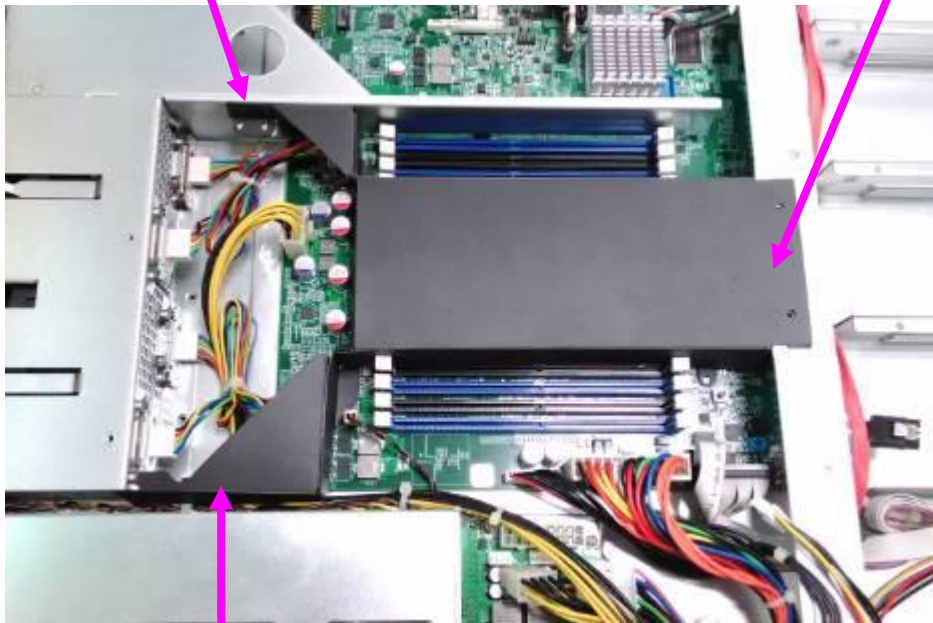
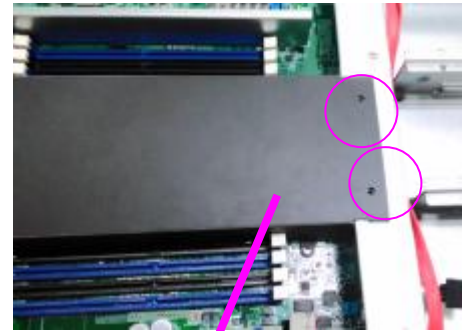
4. Reverse steps 3, 2, and 1 to close the load plate and protective cap, and return the load levers to its original positions.

5. Prepare the radiation mounting-bracket set as the figure below.

6. Clip the bracket to the edge of the motherboard, which is near the CPU. Make sure the two screw holes are aligned. Then, apply screws to secure the bracket.

7. Place the bracket along the CPU and apply screws to the holes circled in the figure below.

## Network Computing Platforms





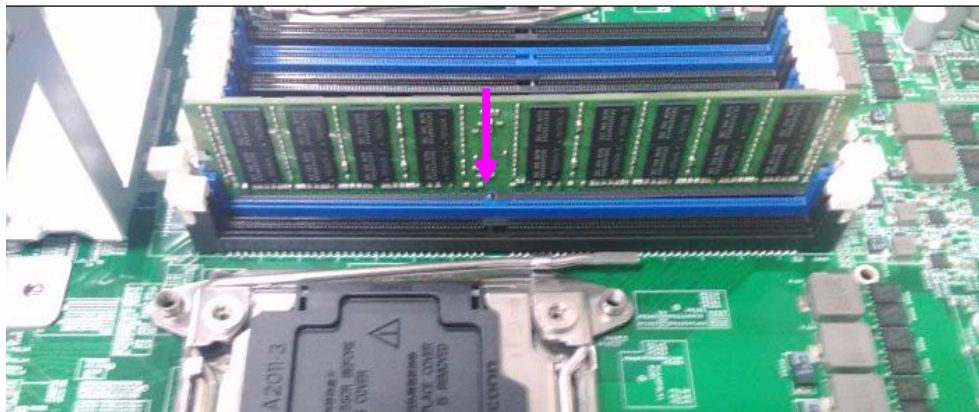
## Installing the System Memory

The motherboard supports DDR4 registered DIMM memory for heavy-duty operations. Please follow the steps below to install the DIMM memory modules.

1. Power off the system.
2. Pull open the DIMM slot latches



3. Align the DIMM module and make sure the notches of the module aligned with the socket keys in the slot.



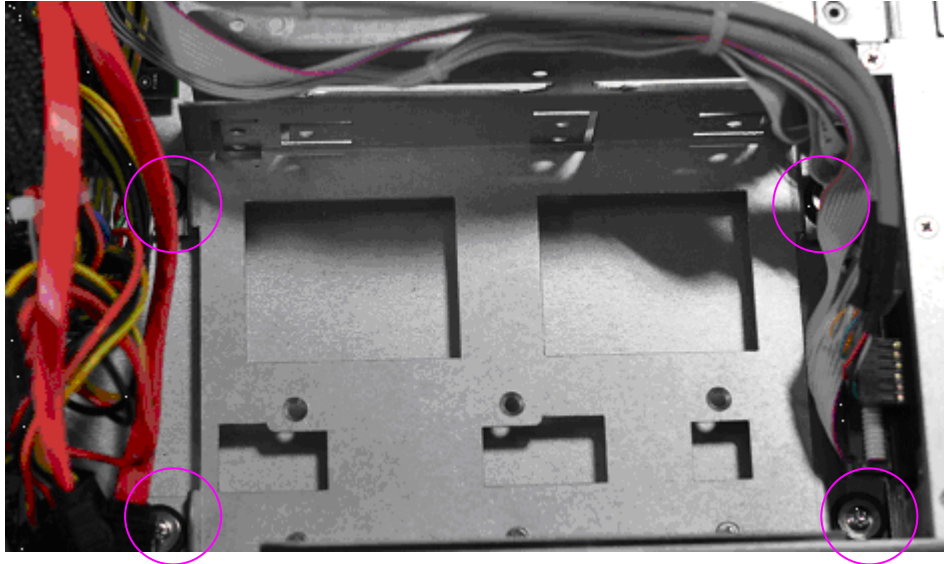
4. Insert the module into the slot until it's firmly seated.



## Installing Disk Drives

The system supports 1 x 3.5" or 2 x 2.5" SATA HDDs or SSDs (max 9.5mm height) as data storage. Please follow the steps below for installation.

1. Remove the 4 screws that secure the disk drive tray.



2. Take the tray out from the system and refer to the figures below for either 1x 3.5" SATA HDD/SSD or 2 x 2.5" SATA HDD/SSD mounting option.

3.5" HDD Installation



2.5" HDD Installation



Move the side plate to adjust for the size of the 2.5" HDD

3. Place the HDD/SSD mounted disk drive tray back to the system. Remember to connect

## Network Computing Platforms

SATA 7-pin signal cable and SATA 15-pin power cable to the installed disk drives.



4. Please remember to establish SATA connections to the motherboard.





## Installing a CFast Card

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

1. Locate the CFast socket.
2. Insert a CFast card until completed seated.



## Installing an IPMI Card

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

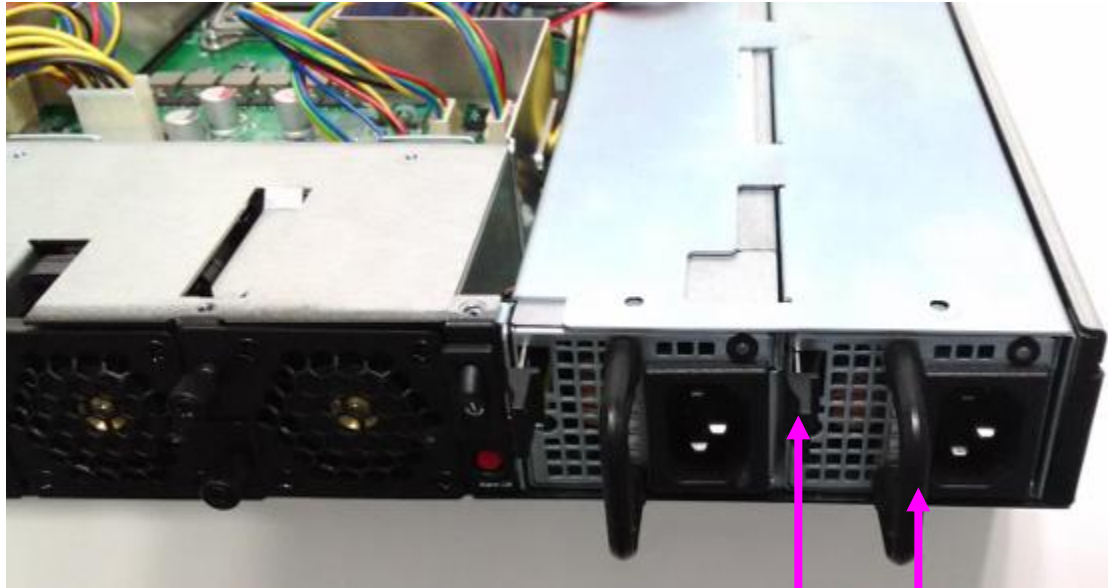
1. Locate the OPMA socket.
2. Insert an IPMI card into the socket until it is firmly seated. Please be noted that the insertion is similar to installing a SO-DIMM module.



## Replacing Redundant Power Supply Unit

NCA-5510 comes with two redundant power supply units. To replace a power supply unit when it reaches the end of its lifetime, please follow the steps below.

1. Hold the handle and the locking clip at the same time.



Locking Clip      Handle

2. Apply some force and pull it out.

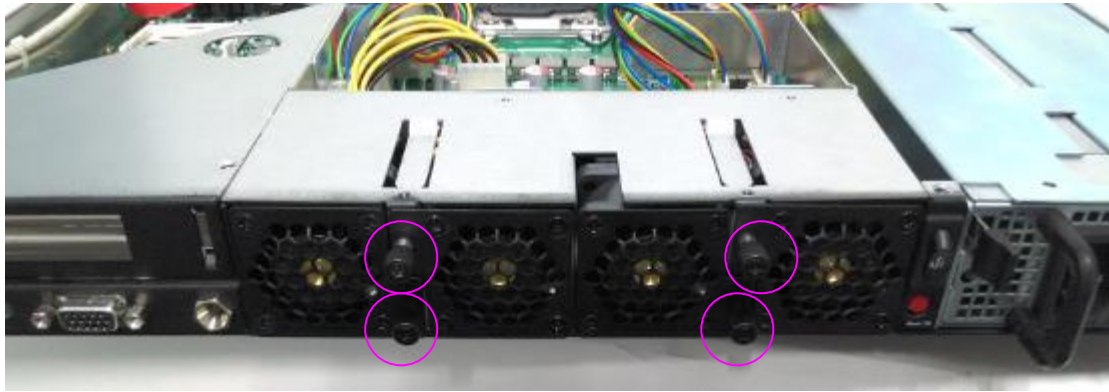


**Notes:** the power supply unit must meet the specifications of DC output 12V/24A, 300W

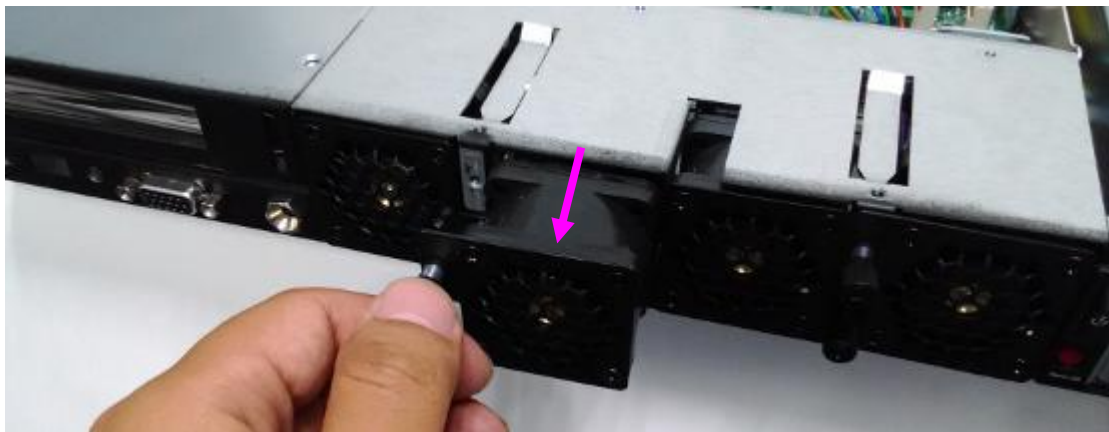
## Replacing Cooling Fans

NCA-5510 supports 4 cooling fans. To replace a worn-down fan, please follow the steps below.

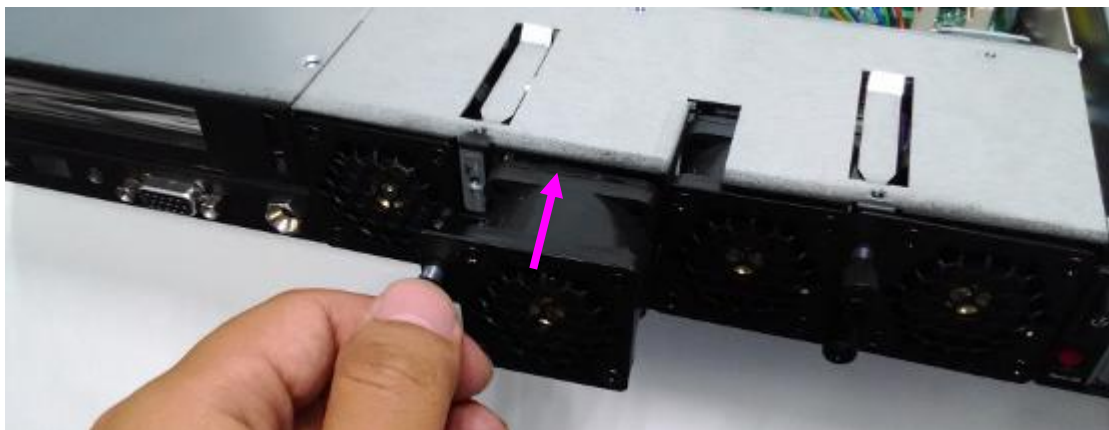
1. Rotate and loosen the locks for the fan to be replaced.



2. Hold the lock and pull fan out.



3. Insert a new cooling fan. Push it to the end and rotate the lock until it is locked and secured.





## Installing Ethernet NIC Modules

NCA-5510 can fit up to 4 Ethernet NIC modules to expand its network throughput. Please follow the instructions below.

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

1. Remove the two screws on the bezel of the module slot and open the bezel. It is strongly recommended to use mini-sized screwdriver to perform this task.

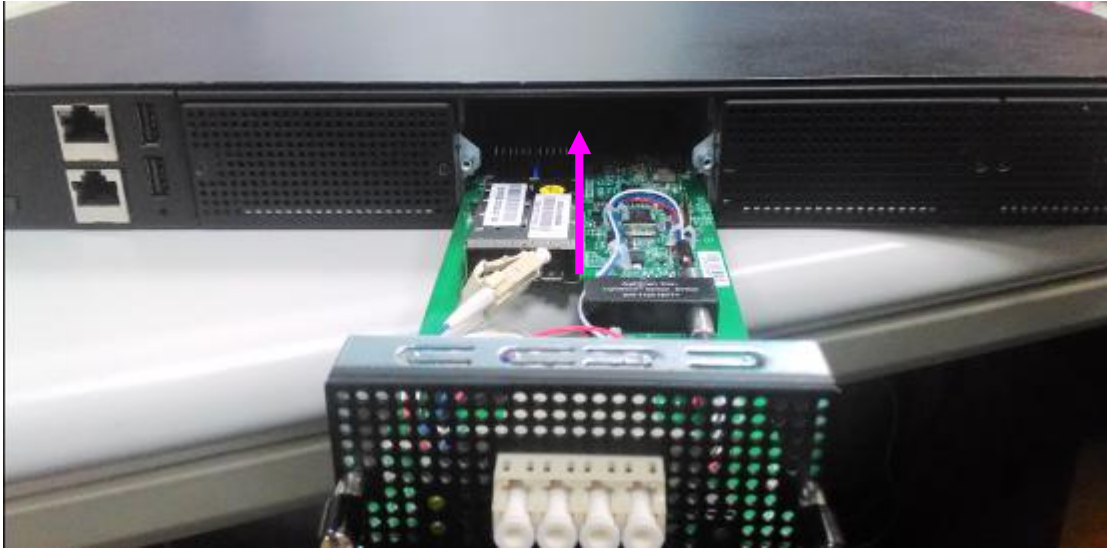


2. Position the gold finger of module as shown in the image below. When sliding the module into the slot, make sure the module stays in the guides of the expansion slot.



3. Slide your Ethernet NIC module into the space, until it is firmly attached.

## Network Computing Platforms



4. Secure the module with two screws on the bezel.

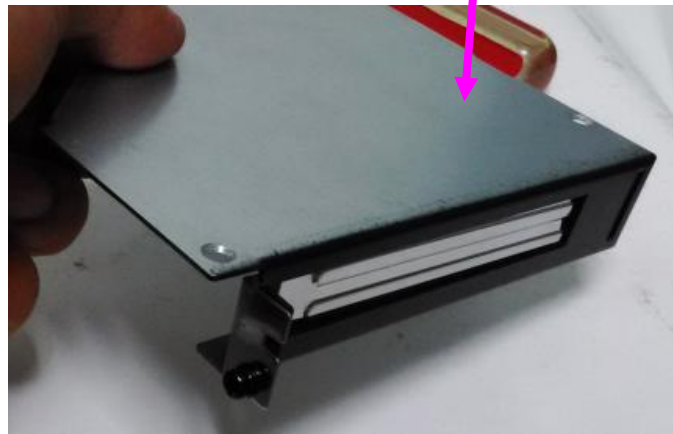




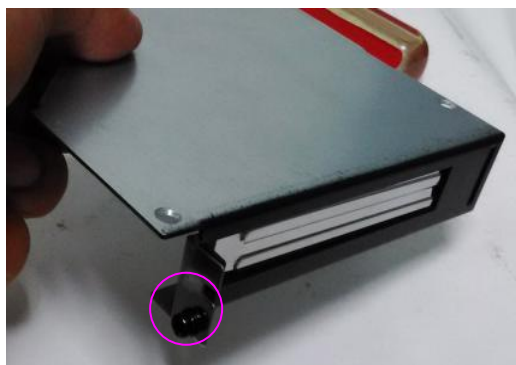
## Installing Riser Card (Optional)

NCA-5510 supports 1 x Riser Card installation. Please follow the steps below for installation. Please be noted that riser card is an optional and not included by default.

1. Remove the screws circled in the figure below and then take out the divider compartment which comes with a PCIe expansion slot.



2. Remove the screw that locks the PCIe expansion slot.



3. Attach a riser card to the bracket by applying 3 screws as circled in the figure below.

## Network Computing Platforms



4. Mount the riser card into the riser card socket. Meanwhile, mount the protection bracket back into its original place.



## Rackmount Installation

### Attach the Inner Rails

1. Check the package contents.

2 x 438mm Slide-Rails

1 x pack of screws



2. Turn a slide rail upside down and release the inner bracket.



4. Slide the inner bracket all the way up to end of the slide-rail assembly. You may hear a “click” sound.



5. Push the white slide-rail lock outwards as the arrow of direction below. Then pull the inner bracket out of the slide-rail assembly.



6.  
Releas

e the inner bracket as shown below.

## Network Computing Platforms



7. Align the inner bracket to the side of the chassis and make sure the screw-holes are matched. Then secure the bracket onto the chassis with provided screws.



8. Repeat Steps 2 to 7 for another slide-rail and attach its inner bracket onto another side of the chassis.

### Installing Slide Rails

1. In the previous section, you have already detached the inner brackets and attached them onto the chassis of your purchased model. By now, you shall install the slide-rail assemblies onto the rack.

As the image below, this slide-rail kit does NOT require screw-fixing. Simply aim at 3 available screw holes on the rack-front and lock it by clipping the slide-rail assembly to the rack-front as shown in the image below. You should hear a “click” sound once it is firmly attached.



2. For the rear rack installation, also aim at 3 available holes and click the slide-rail assembly onto the rear rack.



## Network Computing Platforms



3. Repeat Step 1 and 2 for another slide-rail assembly in order to install in onto the rack.

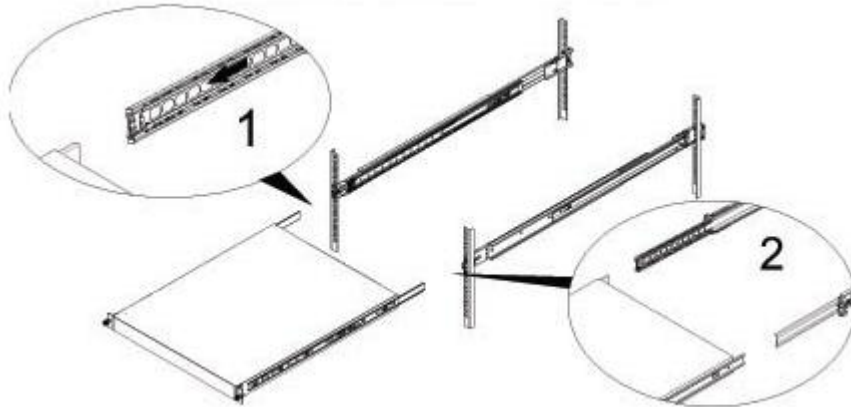


### **Installing NCA-5510 onto the Rack**

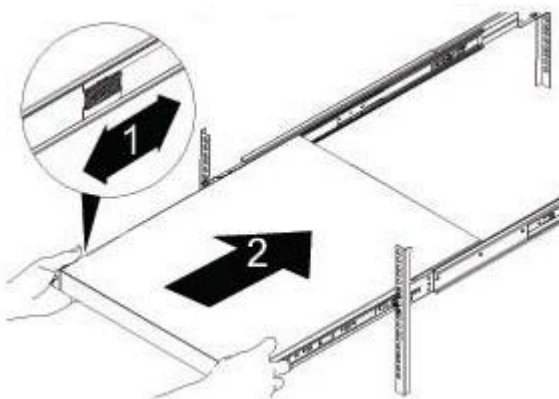
Reminder: it is strongly recommended to carry out this procedure with two or three persons.

## Network Computing Platforms

1. Hold the applicable model with its front facing you, lift the chassis and gently insert the model by aligning with the slide-rail assemblies, as shown in the image below. Then push the model as far as possible.



2. Simultaneously push the release tabs on both sides in the arrow of direction below, while pushing the appliance into the end of the rack.

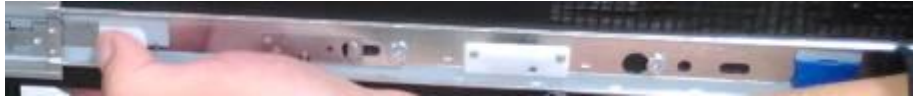


Caution: the appliance will be locked during the half way of sliding-in if the release tabs are not pushed.

## Network Computing Platforms



3. To slide the appliance out, gently pull it outwards. Then, press the slide-rail locks on both side and slide the appliance out.



## Chapter 5: BIOS Setup

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

1. Boot up the system.
2. Press <Delete> during the boot-up. Your system should be running POST (Power-On-Self-Test) upon booting up.
3. Then you will be directed to the BIOS main screen.
4. Instructions of BIOS navigations:

[<-] [>-]: select a setup screen, for instance, [Main], [Advanced], [Chipset], [Boot], [Security], and [Save & Exit]

[↑] [↓]: select an item/option on a setup screen

Enter: select an item/option or enter a sub-menu

ESC: exit the current screen

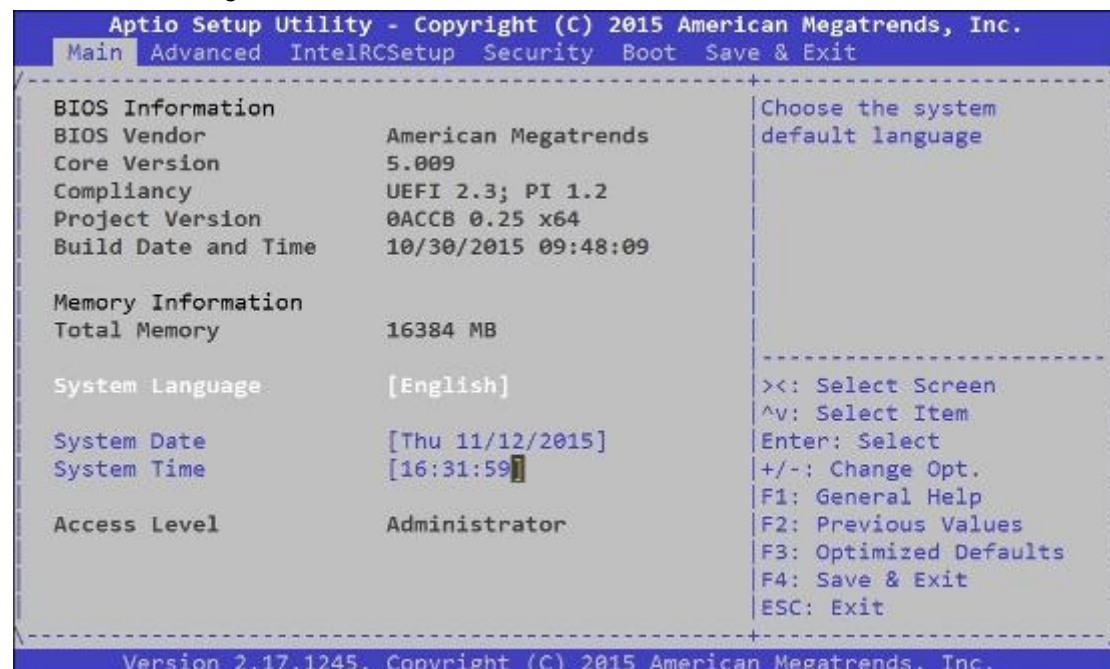
+/- = to adjust values for the selected setup item/option

F1 = to display General Help screen

F2 = to retrieve previous values, such as the parameters configured the last time you had entered BIOS.

F3 = to load optimized default values

F4 = to save configurations and exit BIOS



Notes: the images in the following section are for reference only



### Main

The [Main] is the first setup screen when you enter BIOS. The [Main] displays general system and BIOS information

and you may configure the “System Language”, “System Date”, and “System Time”.

#### BIOS Information

**BIOS Vendor:** displays BIOS vendor information

**Core Version:** displays the BIOS core version

**Compliancy:** displays the BIOS compliancy

**Project Version:** displays BIOS project version

**Build Date and Time:** displays the date and time the BIOS was built.

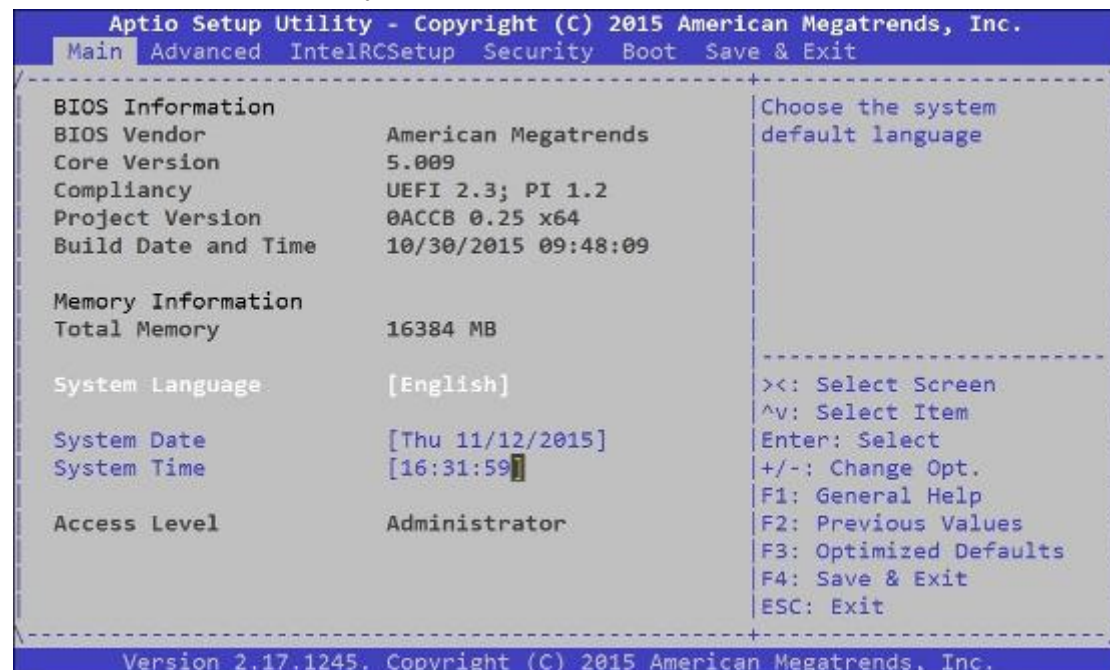
Press “Enter” if you want to configure “System Language”, “System Date”, and “System Time”.

**System Language:** English

**System Date:** Day/Month/Year

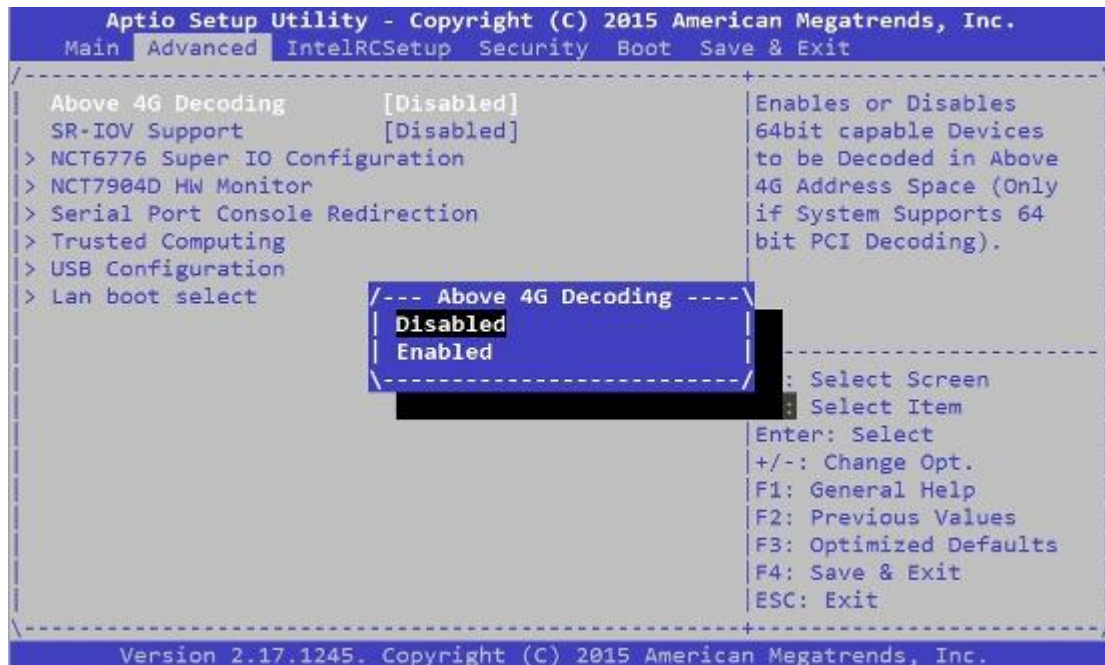
**System time:** Hour/Minutes/Seconds

**Access Level:** Administrator by default



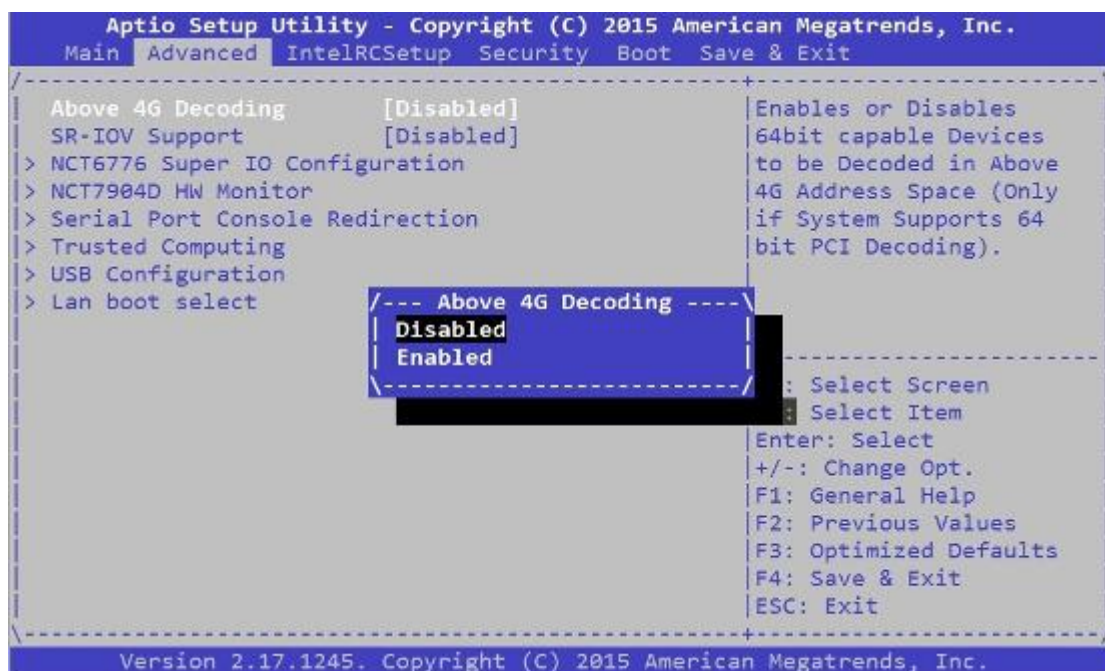
## Advanced

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



### Above 4G Decoding

This option enables or disables 64bit capable devices to be decoded in above 4G address space (only if the system supports 64bit PCI decoding). You may select “Enabled” or “Disabled”.

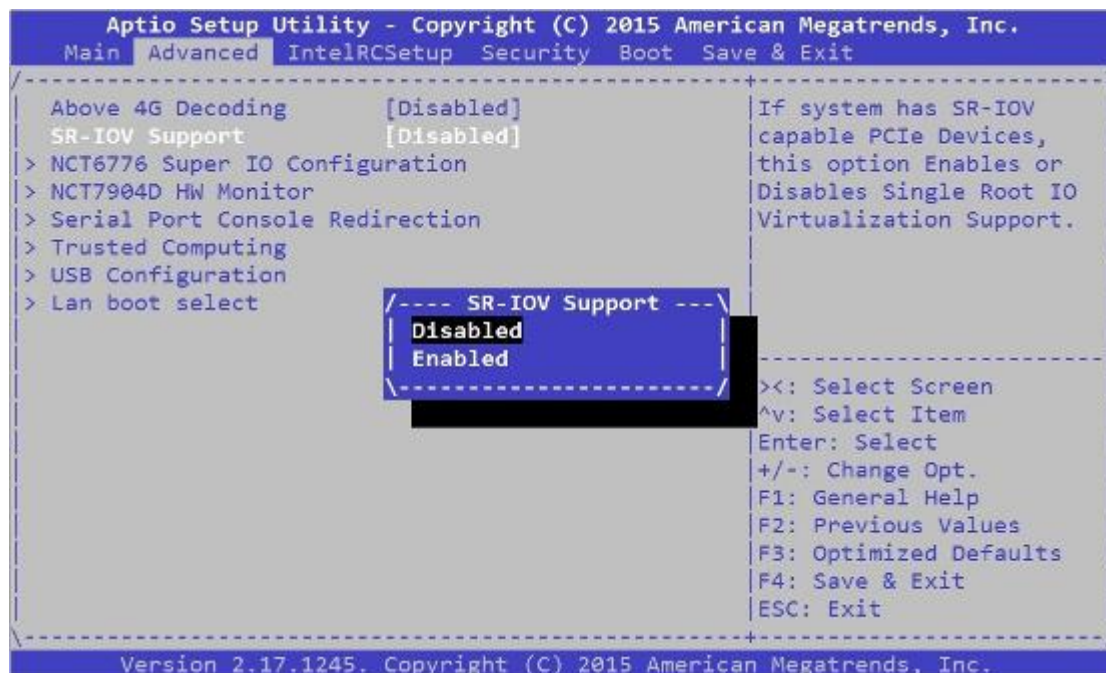


### SR-IOV Support

This option enables or disables SRIOV (Single Root I/O Virtualization) support. You may

## Network Computing Platforms

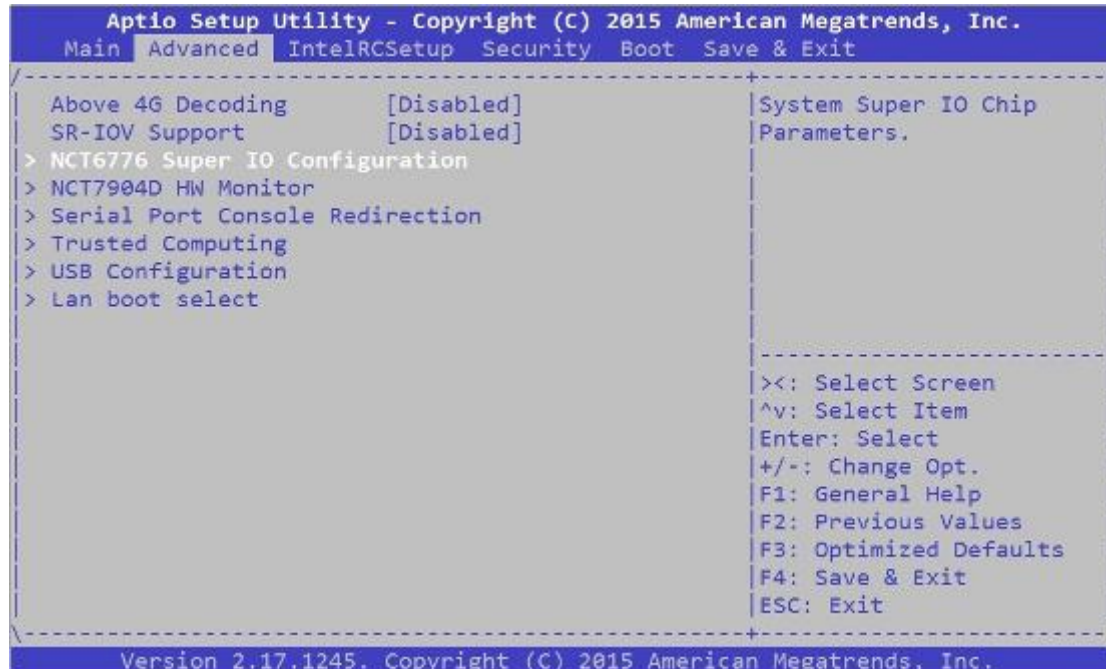
select “Enable” or “Disable”.



### NCT6776 Super IO Configuration

Press “Enter” to access configuration sub-menu for super IO chip (NCT6776) parameters.

You may access settings for Serial Port 1 or 2 or the Parallel port.

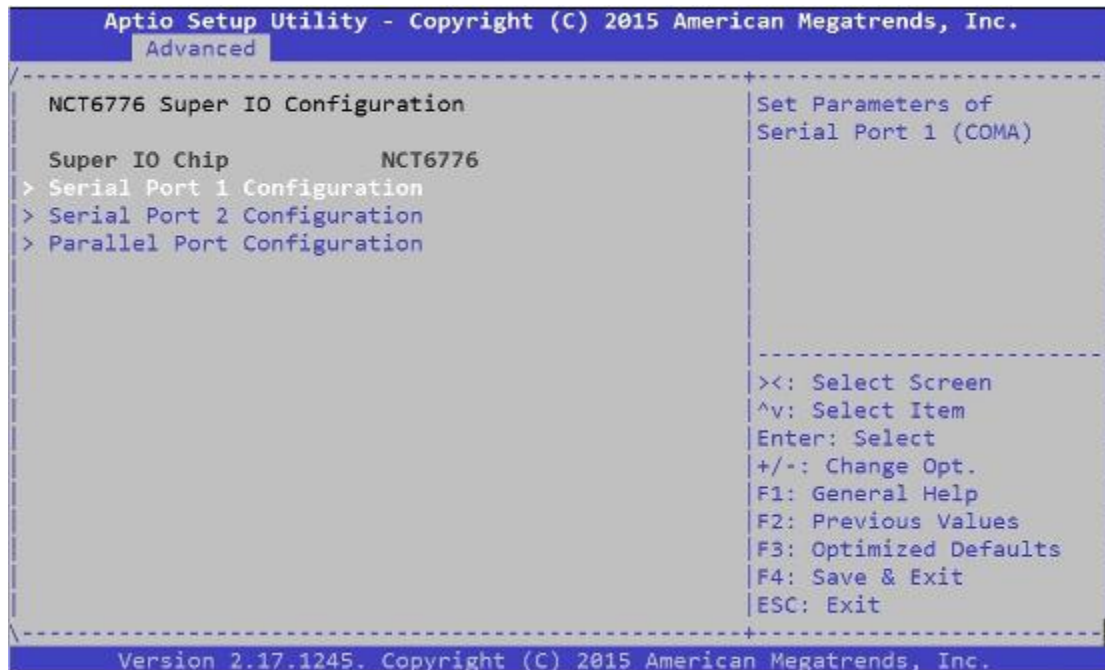


### NCT6776 Super IO Configuration - Serial Port 1 Configuration

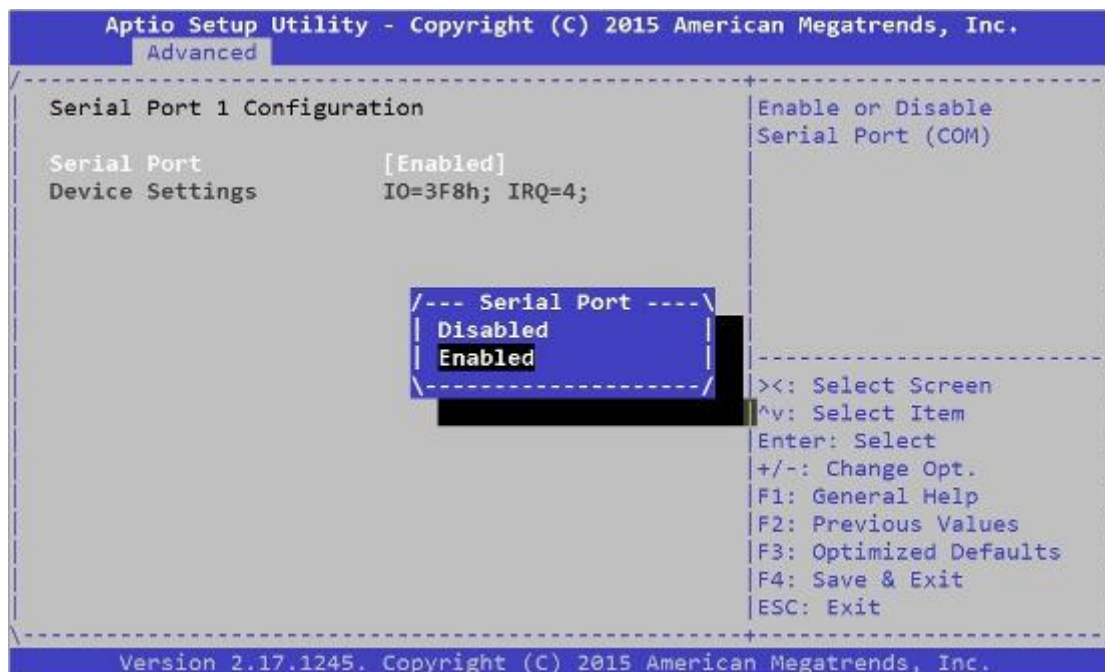
The super IO chip for this model is NCT6776. You may enable or disable Serial Port 1(COMA).



## Network Computing Platforms



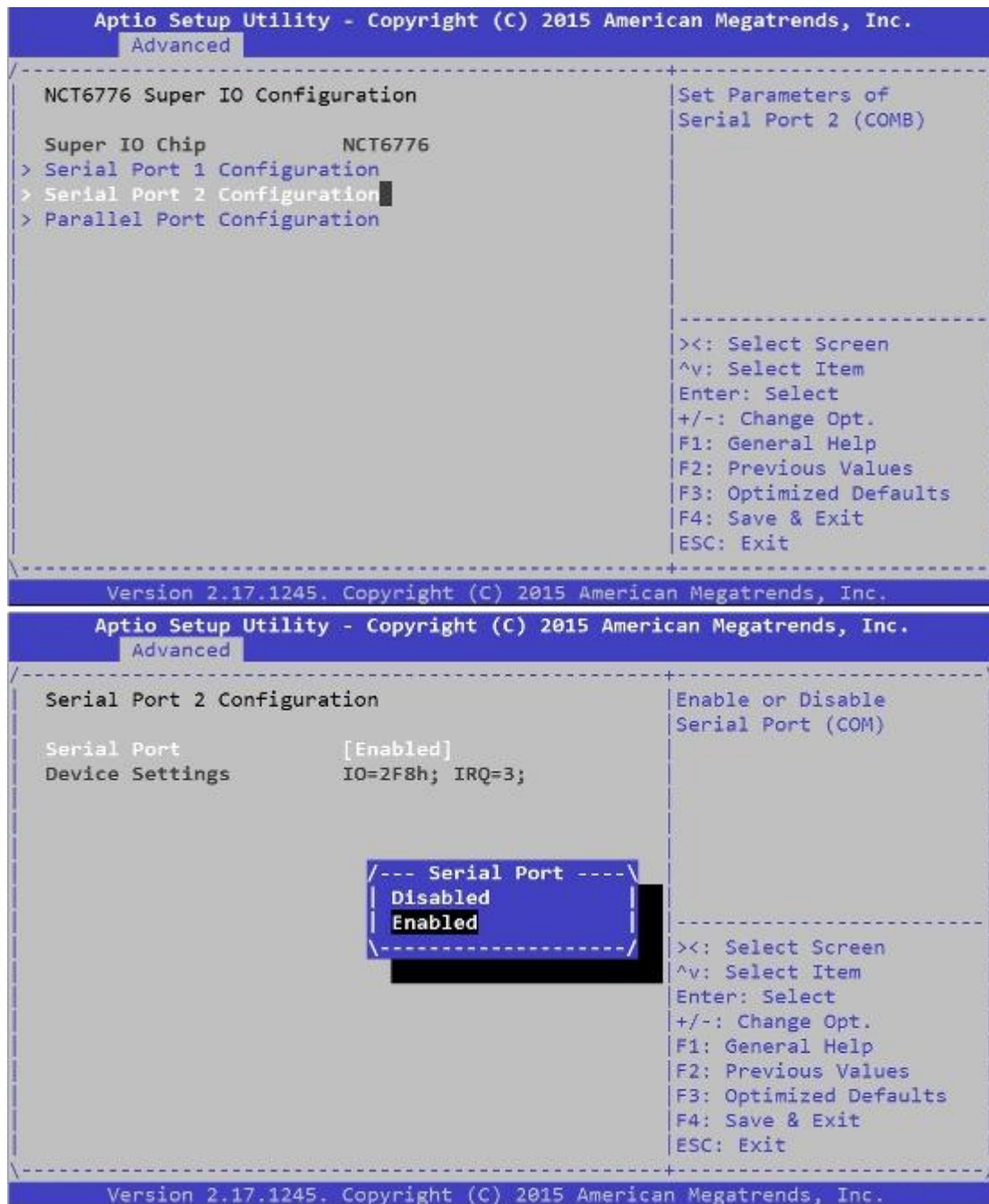
Press "Enter" to enable or disable the Serial Port 1 (COMA). Device setting is fixed as default.



### NCT6776 Super IO Configuration - Serial Port 2 Configuration

Once Serial Port 2 is accessed, you may press "Enter" to enable or disable the Serial Port 2 (COMB). Device setting is fixed as default.

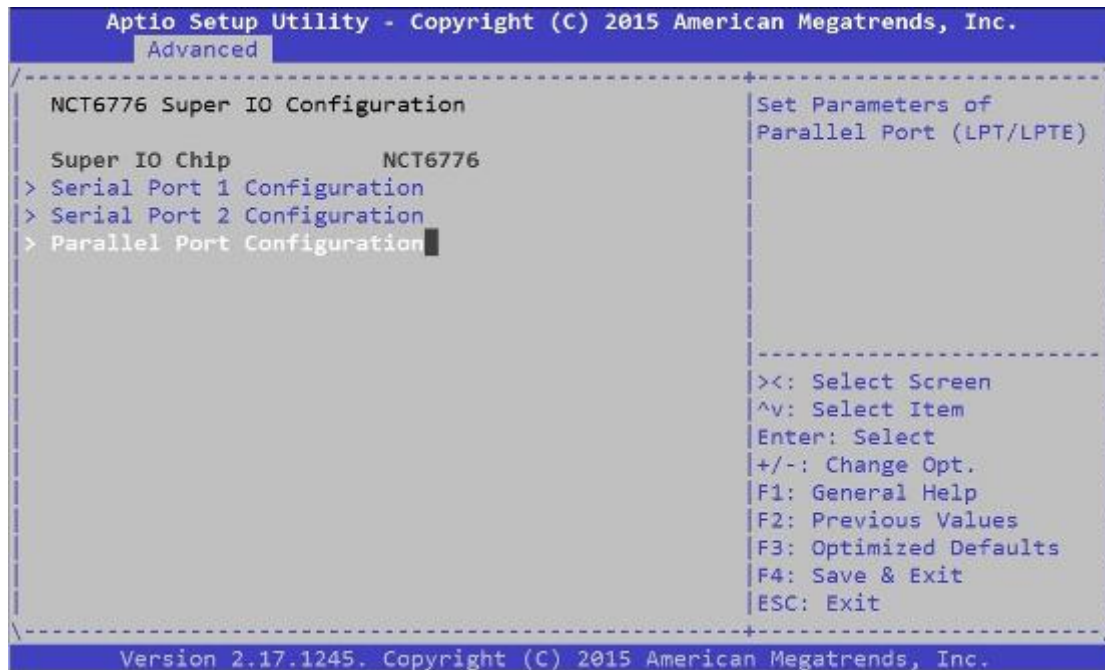
## Network Computing Platforms



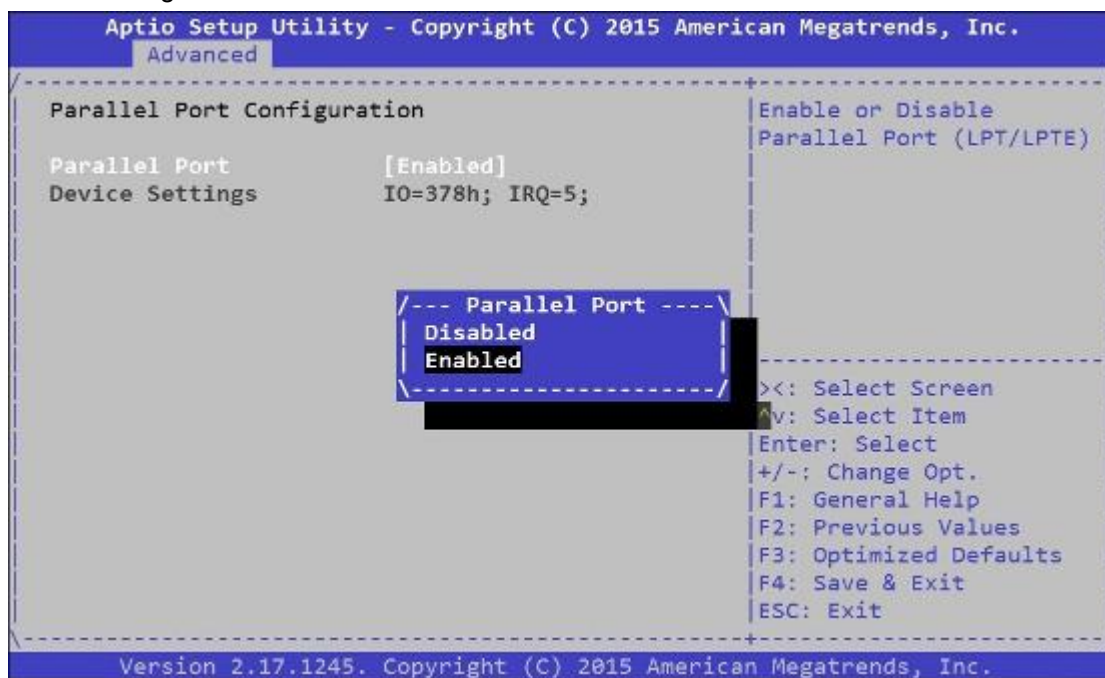
### Parallel Port Configuration

This option allows you to set parameters for parallel port (LPT/LPTE).

## Network Computing Platforms



Once Parallel Port is accessed, you may press “Enter” to enable or disable the Parallel Port. Device setting is fixed as default.



### NCT7904D HW Monitor

This option allows you to view hardware health status.

## Network Computing Platforms

```
Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
Main Advanced IntelRCSetup Security Boot Save & Exit

Above 4G Decoding      [Disabled]
SR-IOV Support         [Disabled]
> NCT6776 Super IO Configuration
> NCT7904D HW Monitor
> Serial Port Console Redirection
> Trusted Computing
> USB Configuration
> Lan boot select

Monitor hardware status

-----
><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.
```

```
Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
Advanced

Pc Health Status
> Smart Fan Mode Configuration
CPU0 Temp      : +36 C
System Temp1   : +30 C
System Temp2   : +22 C
Fan1A Speed    : N/A
Fan1B Speed    : 7670 RPM
Fan2A Speed    : N/A
Fan2B Speed    : N/A
Fan3A Speed    : N/A
Fan3B Speed    : N/A
Fan4A Speed    : N/A
Fan4B Speed    : N/A
CPU0 Vcore     : +1.818 V
PVDDQ_AB       : +1.190 V
PVDDQ_CD       : +1.190 V
P5V_SB         : +5.100 V
P5V            : +5.016 V

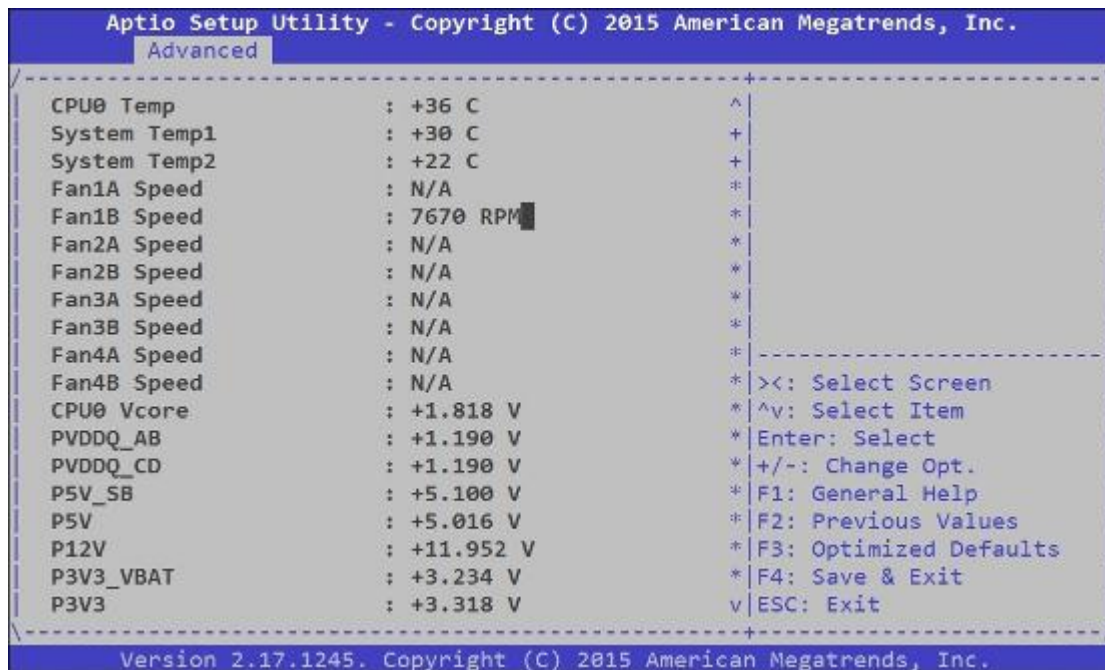
Smart Fan Mode Select

-----
><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
+ F3: Optimized Defaults
+ F4: Save & Exit
v ESC: Exit

Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.
```

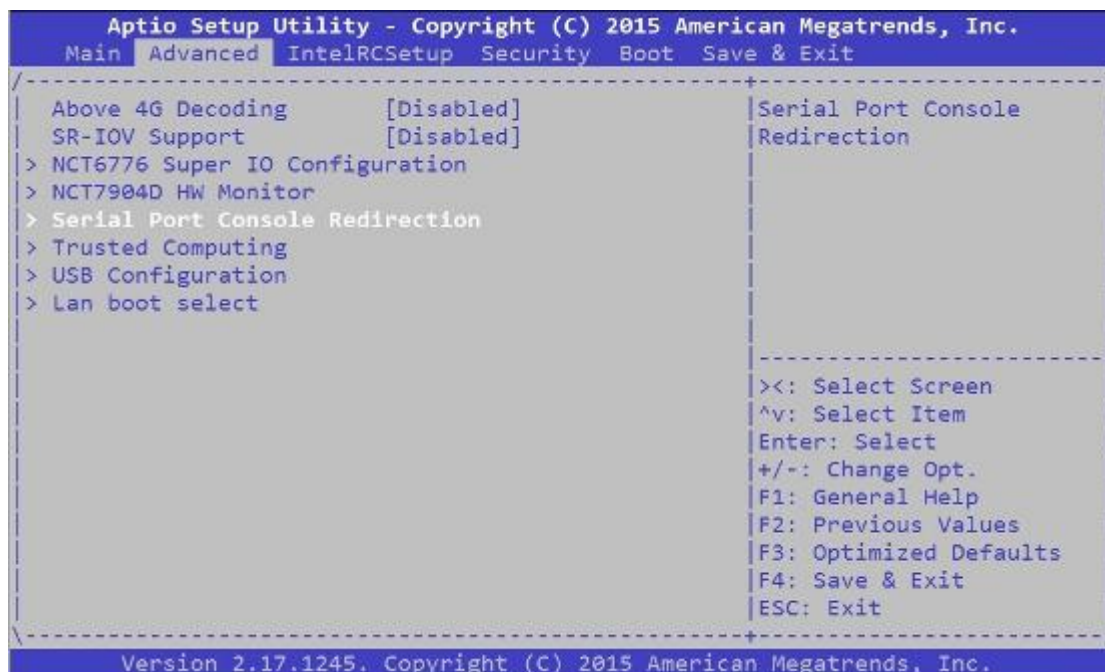


## Network Computing Platforms



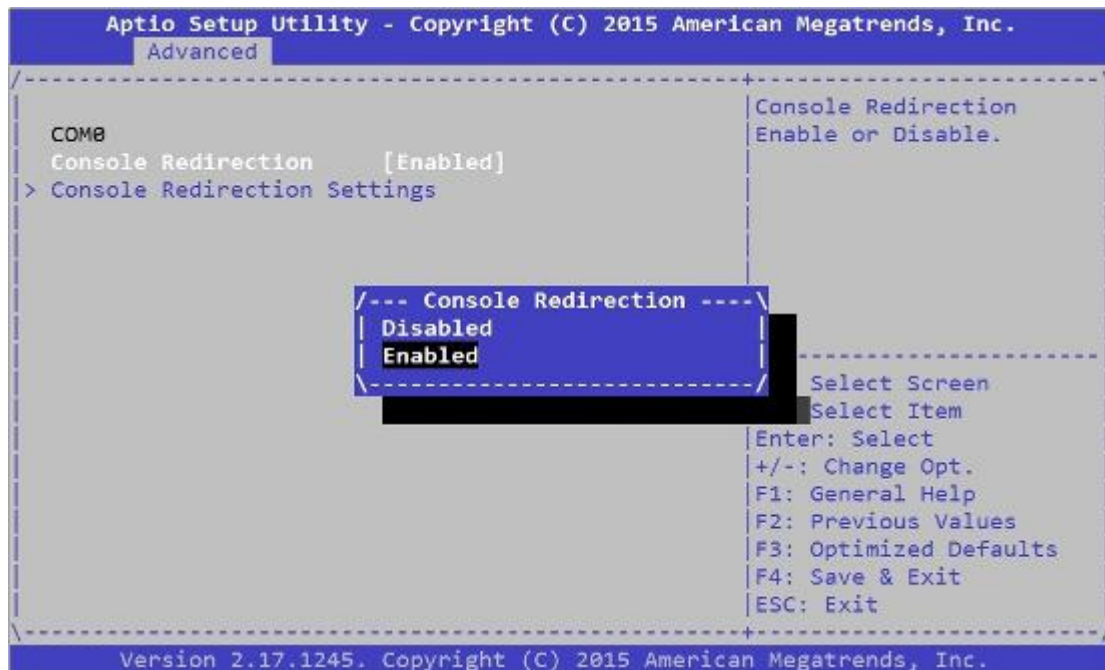
### Serial Port Console Redirection

This option allows you to configure parameters about serial port console redirection. Press “Enter” to access the submenu.

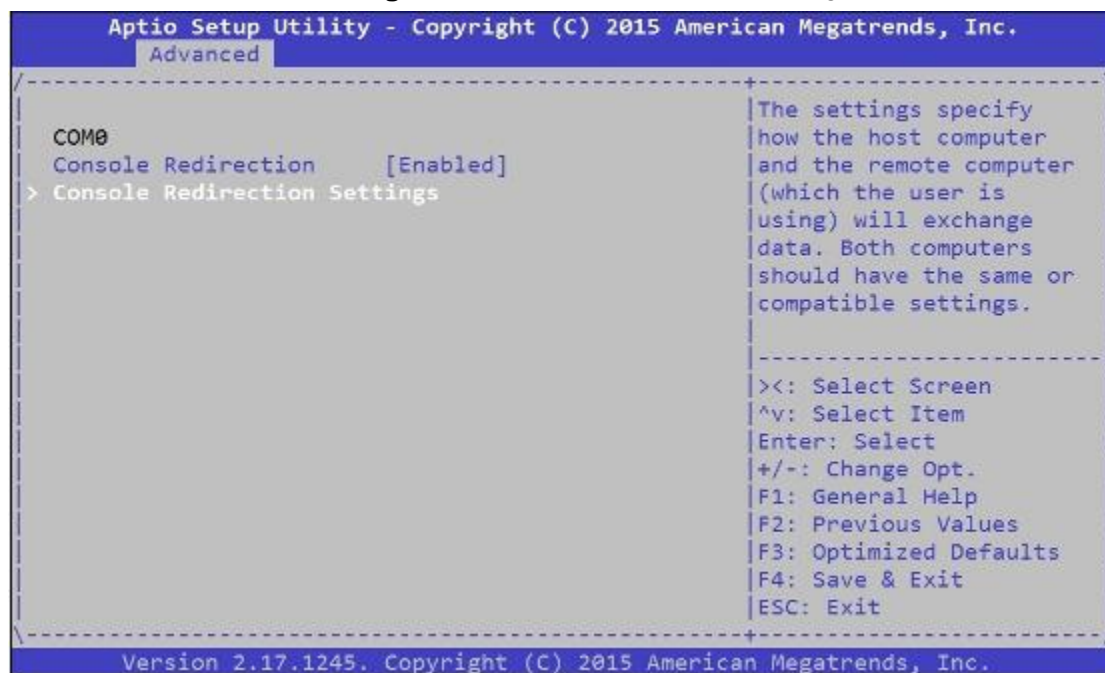


**Console Redirection:** select “Enabled” or “Disable” for COM port console redirection. The default is “Enabled”.

## Network Computing Platforms



**Console Redirection Settings:** select this item to enter the setting sub-menu.



### COM Console Redirection Settings

**Terminal Type:** the emulation configuration. Select "VT100", "VT100+", "VT-UTF8" or "ANSI".

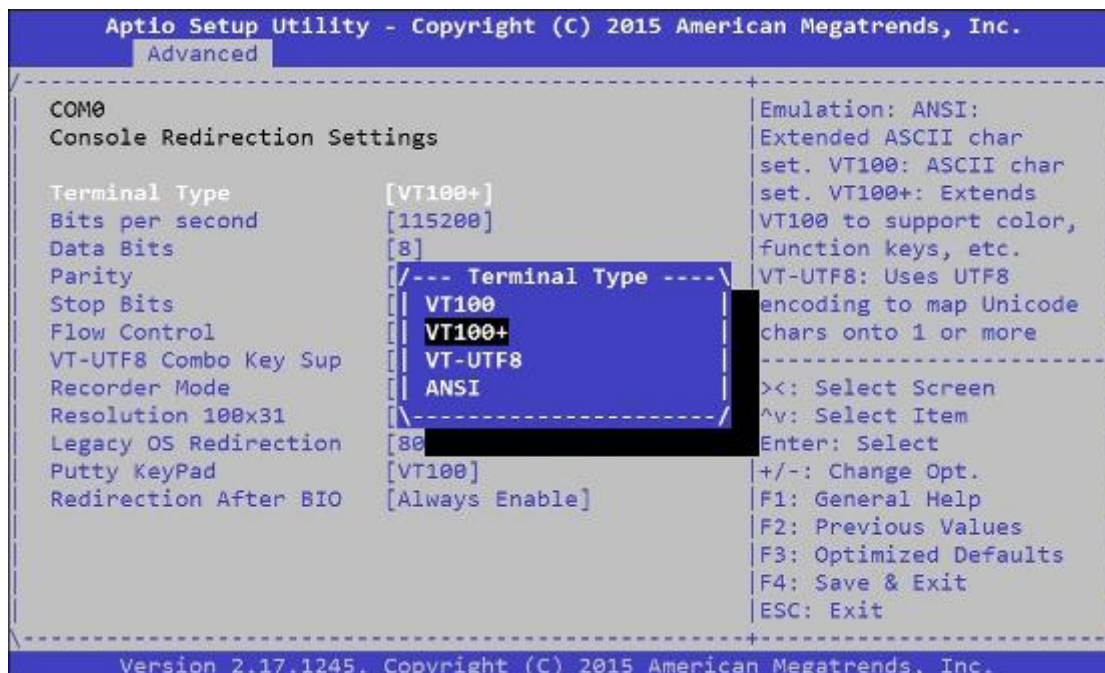
VT100: ASCII character set

## Network Computing Platforms

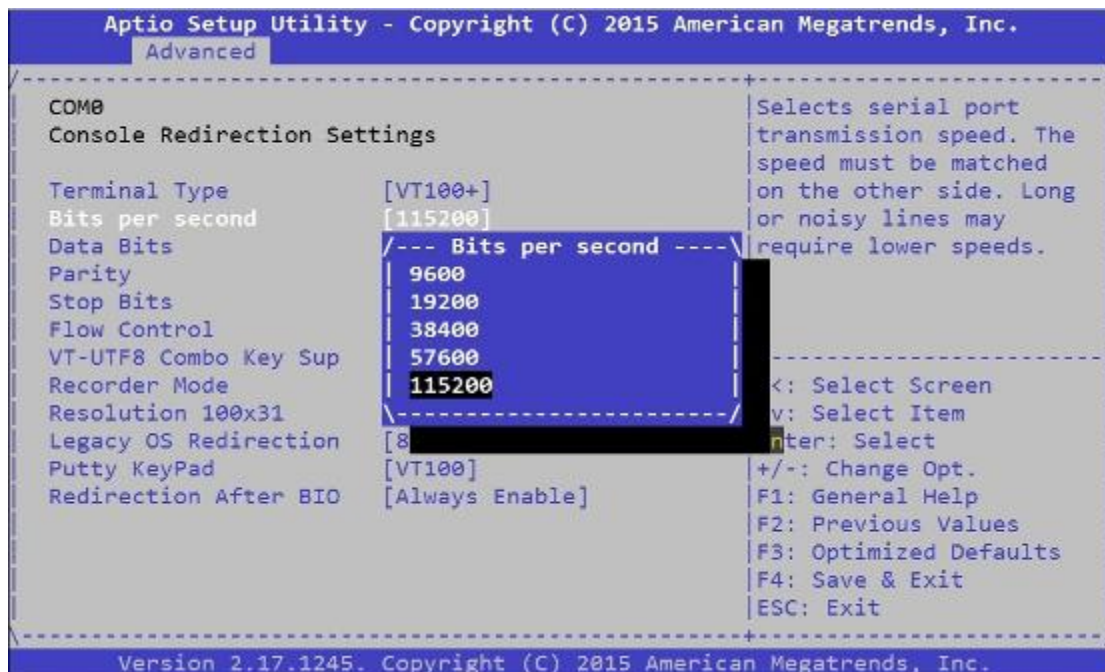
VT100+: extends VT100 to support color function keys

VT-UTF8: uses UTF8 encoding to map Unicode characters onto 1 or more

ANSI: Extended ASCII character set



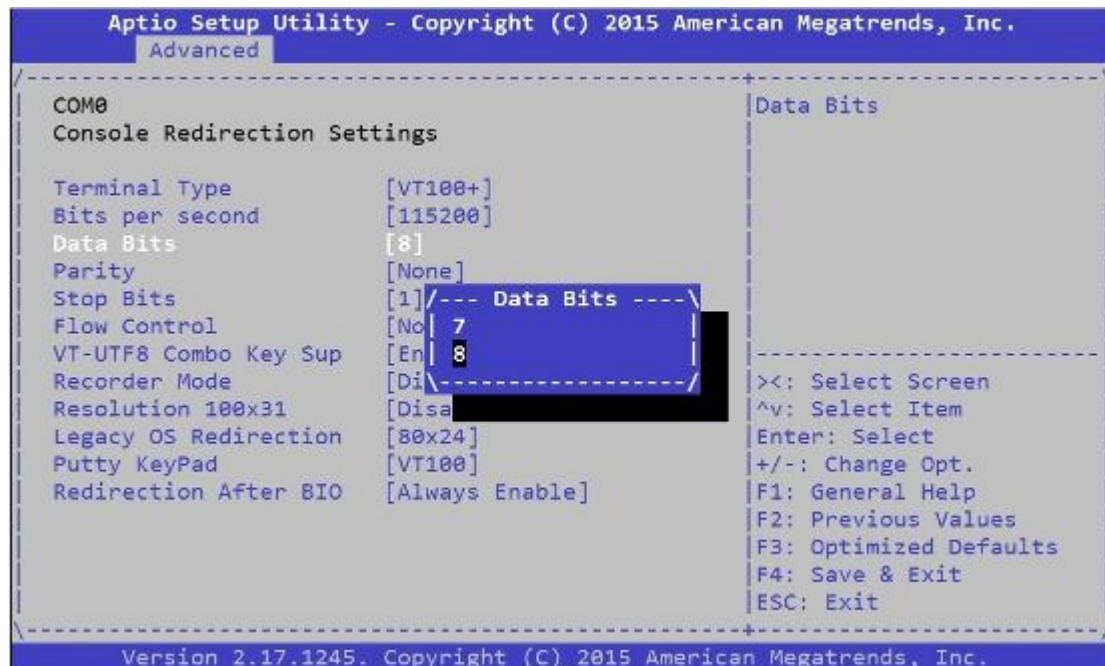
**Bits per second:** select "9600", "19200", "38400", "57600", or "115200" for bits per second. The Bps will determine serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds



**Data Bits:** select the value for data bits. In this case, "7" or "8".



## Network Computing Platforms



**Parity Bits:** a parity bit can be sent with the data bits to detect some transmission errors.

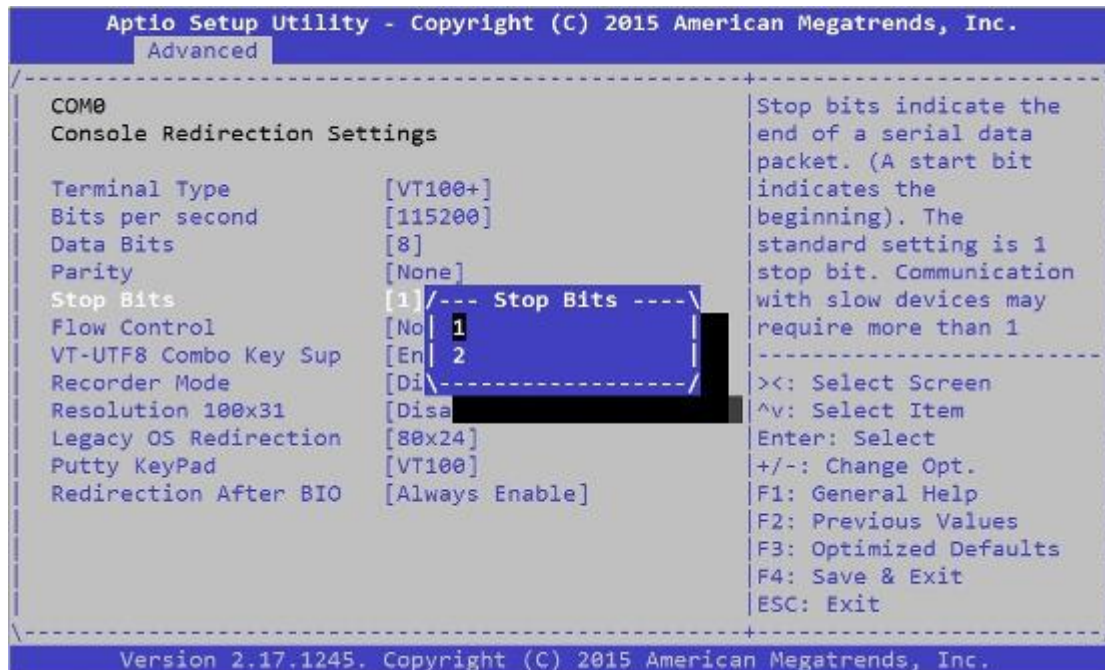
Select "None", "Even", "Odd", "Mark" or "Space".



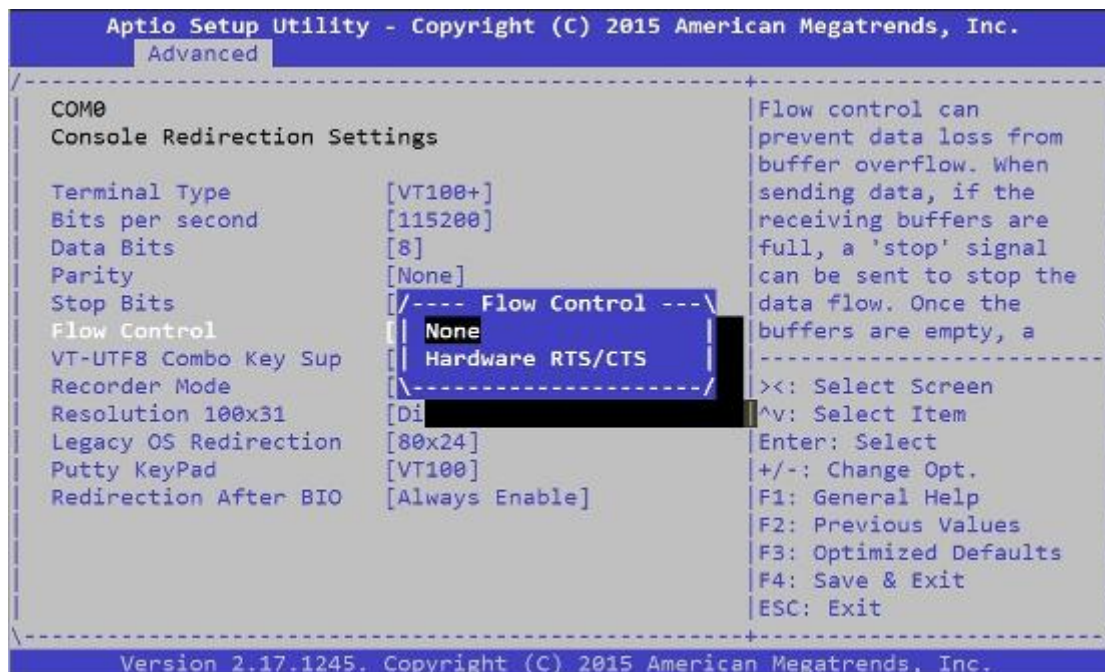
**Stop Bits:** stop bits indicate the end of a serial data packet. The standard is 1 stop bit.

Communication with slow devices may require more than 1.

## Network Computing Platforms



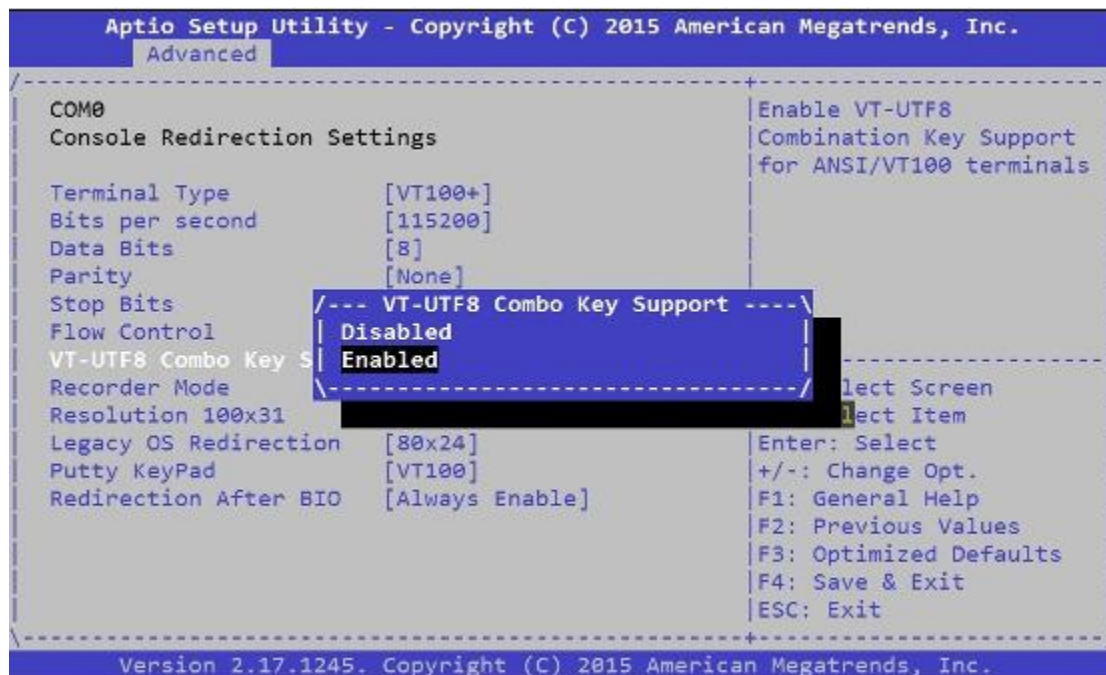
**Flow Control:** flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. You may select “None” or “Hardware RTS/CTS”, depending on the circumstances.



**VT-UTF8 Combo Key Support:** this option enables/disables VT-UTF8 combination key support for ANSI/VT100 terminals.



## Network Computing Platforms



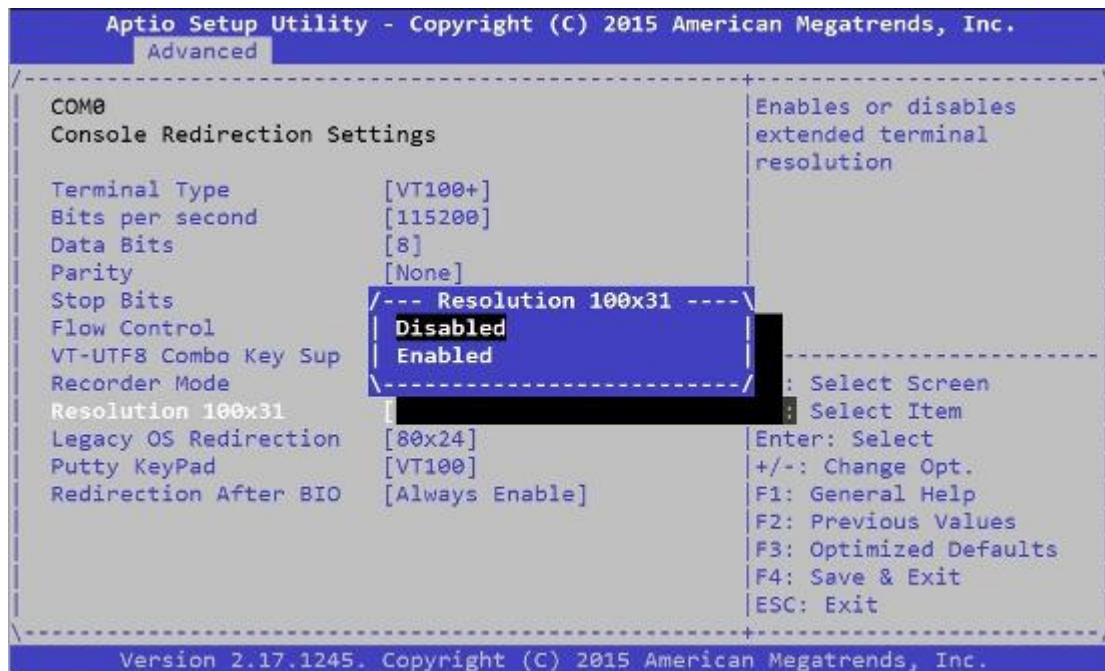
**Recorder Mode:** on this mode, when “Enabled”, only text will be sent. This is to capture terminal data.



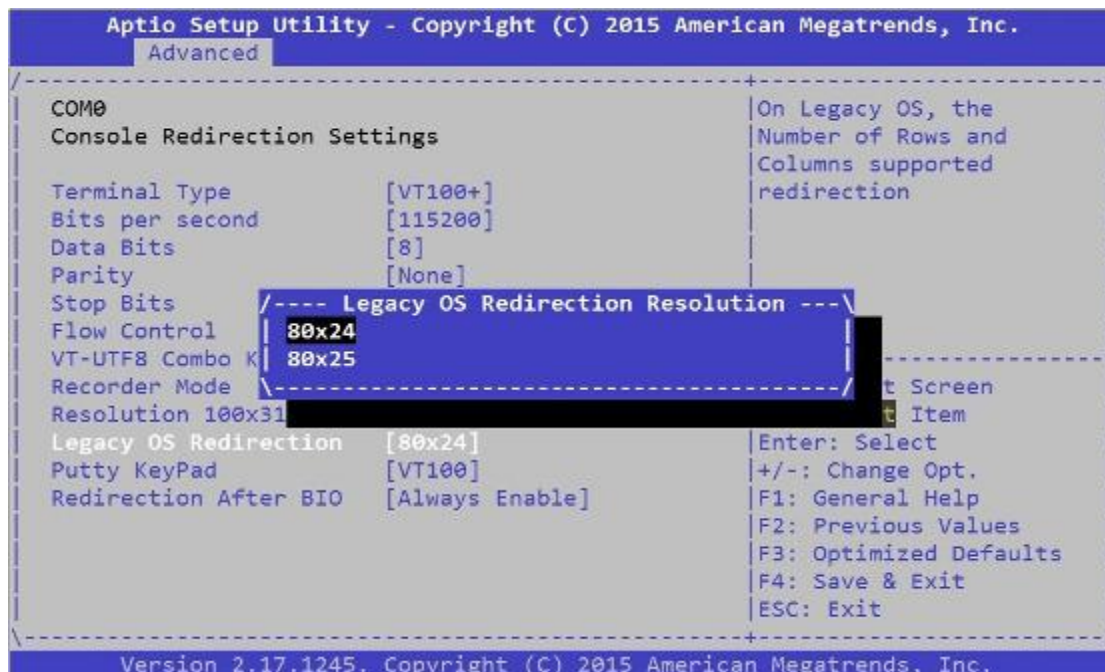
**Resolution 100 x 31:** select “Enable” or “Disable” for extended terminal resolution.



## Network Computing Platforms

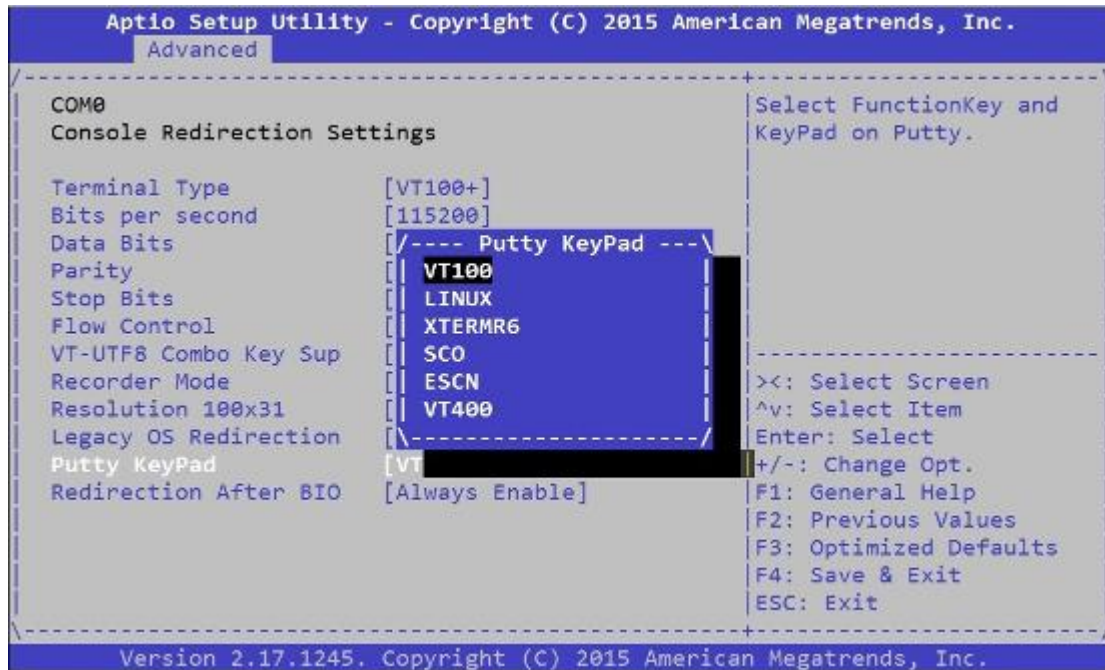


**Legacy OS Redirection Resolution:** select “80x24” or “80x25”. The default for this case is “80x24”.

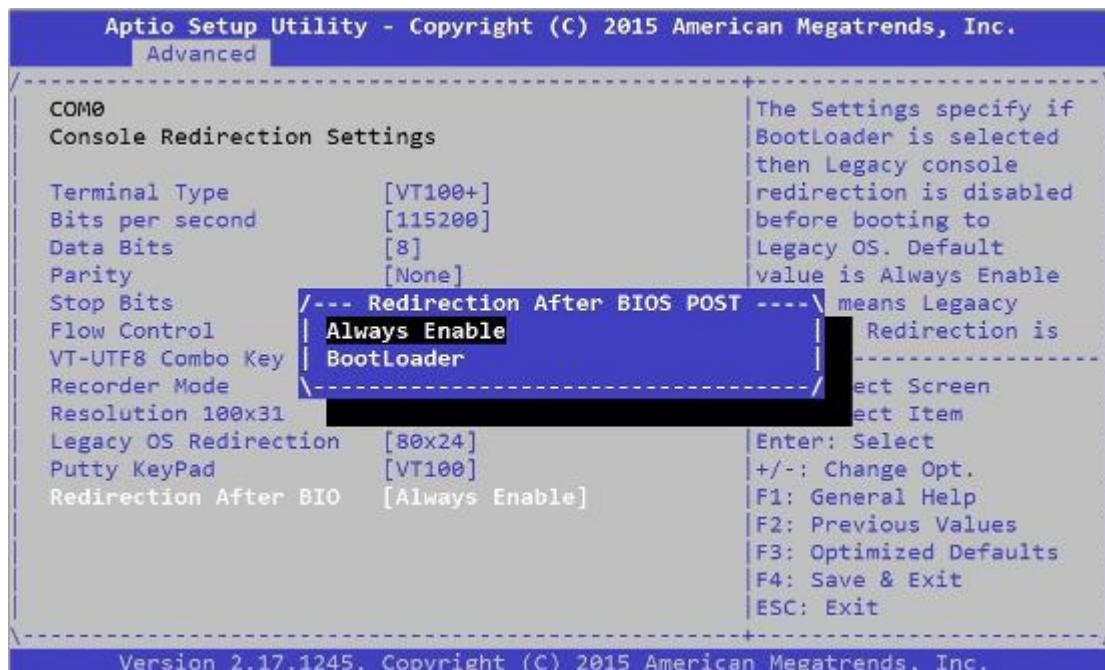


**Putty KeyPad:** select Function Key and Key Pad on Putty. You may select “VT100”, “LINUX”, “XTERMR6”, “SCO”, “ESCN”, or “VT400”.

## Network Computing Platforms



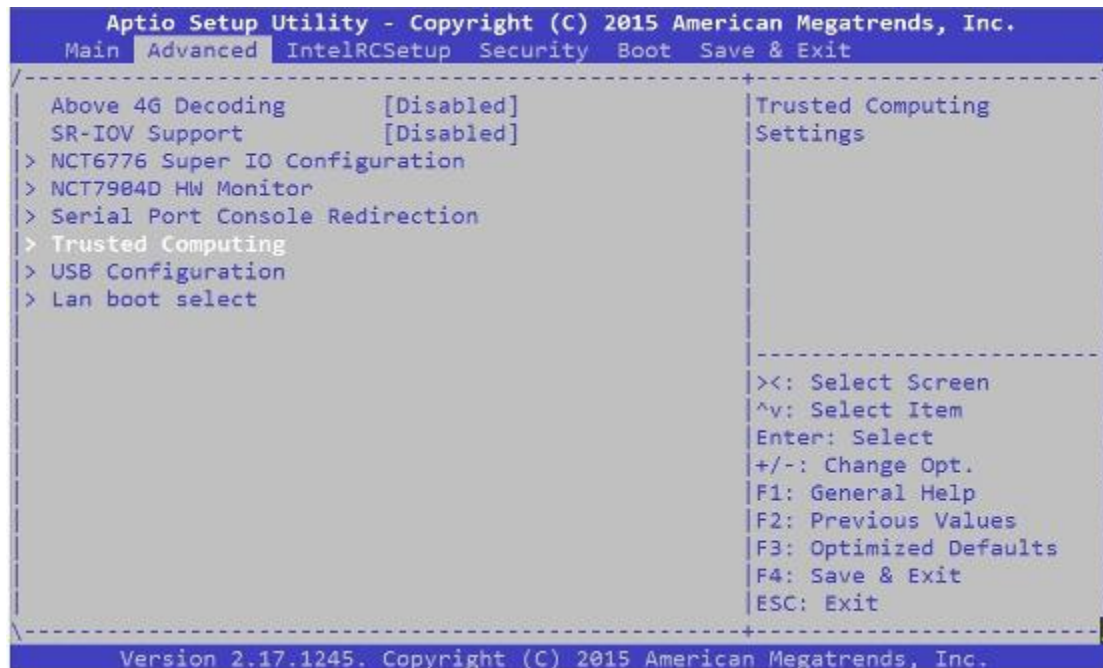
**Redirection After BIOS POST:** The settings specify if BootLoader is selected then Legacy console redirection is disabled before booting to Legacy OS. Default value is "Always Enable" which means Legacy OS console redirection is always enabled after BIOS.



## Trusted Computing

This option allows you to configure Trusted Computing Settings.

## Network Computing Platforms



### Configuration - Security Device Support

This option enables or disables BIOS support for security devices, such as TPM module. OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Note: to enable this function, TPM module must have been installed or else it will only show "No Security Device" under "Current Status Information".

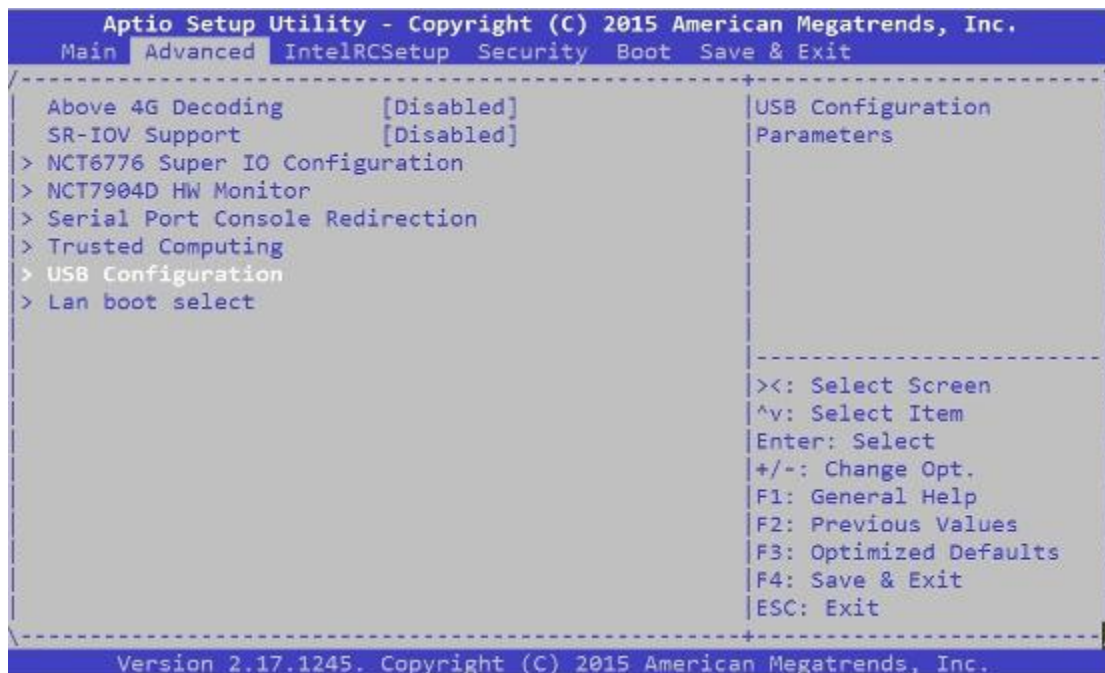


### USB Configuration

This option allows you to configure USB device Settings.



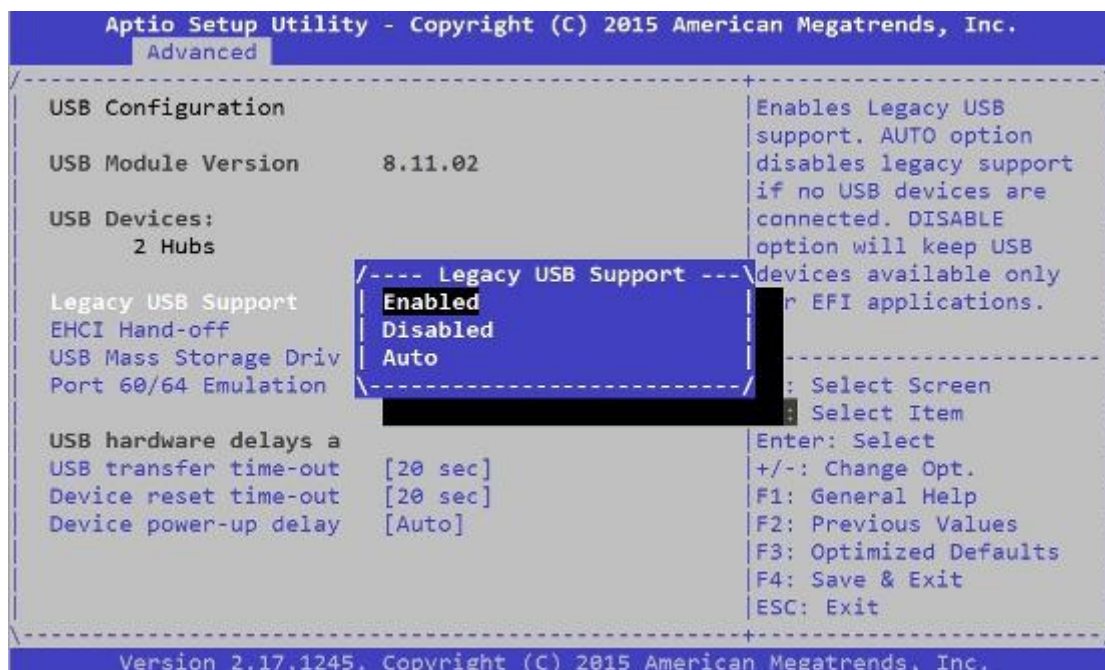
## Network Computing Platforms



**USB Module Version:** displays USB module version

**USB Devices:** displays USB devices

**Legacy USB Support:** this function enables or disables legacy USB support. Auto option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.

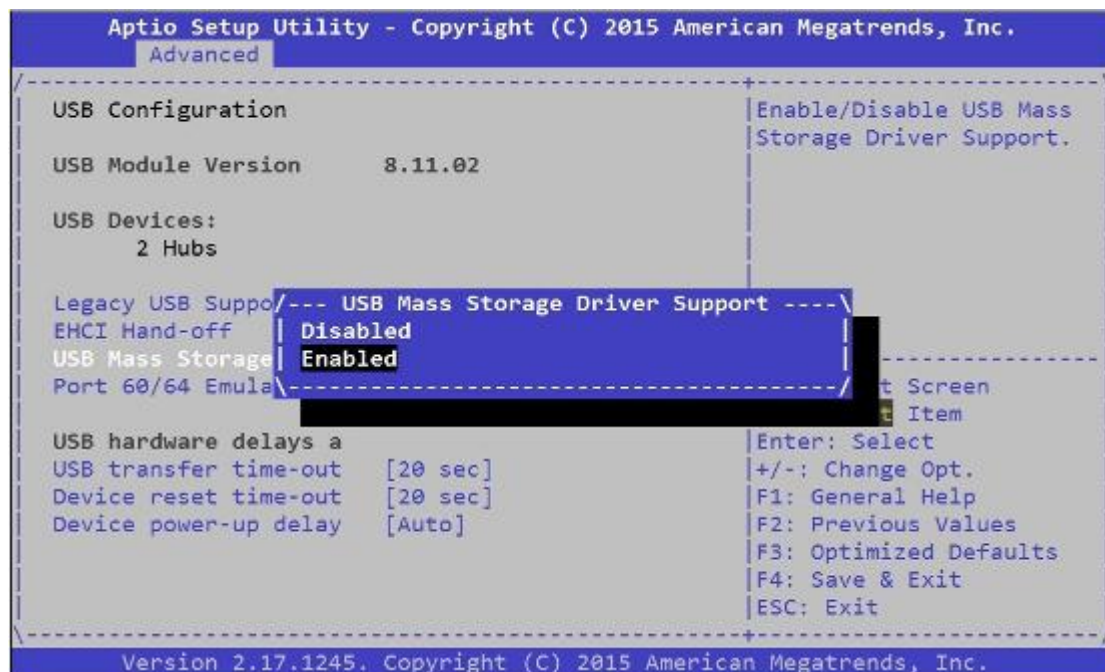


**EHCI Hand-off:** enables or disables EHCI Hand-off function. This is a workaround for operating systems without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

## Network Computing Platforms

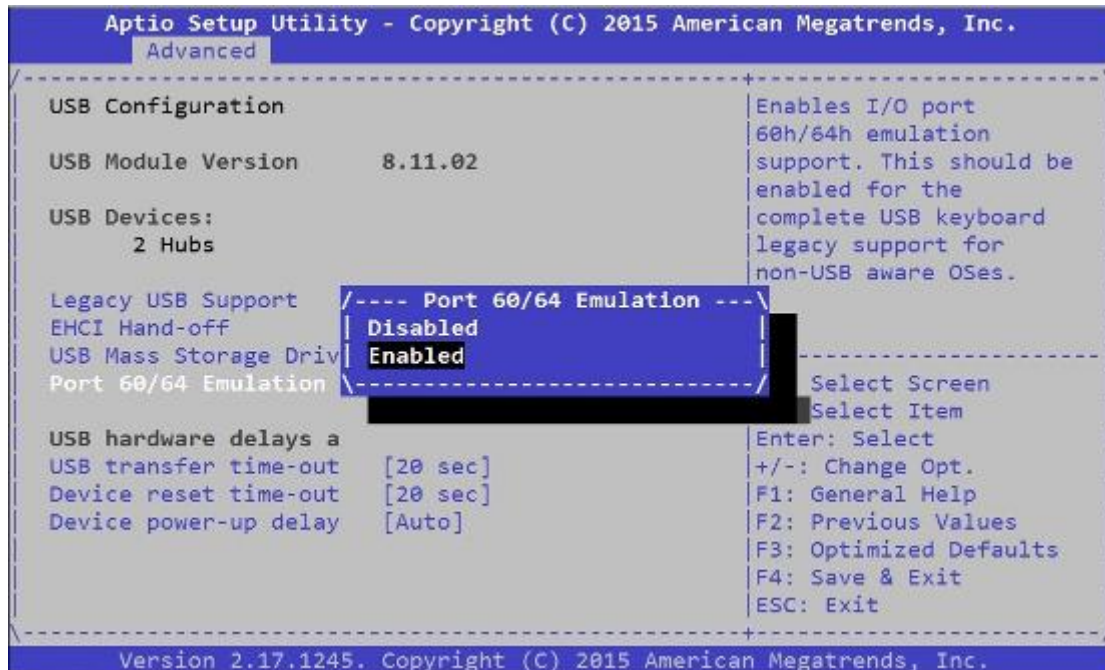


**USB Mass Storage Driver:** this option allows you to enable or disable USB mass storage driver. The default is "Enabled".

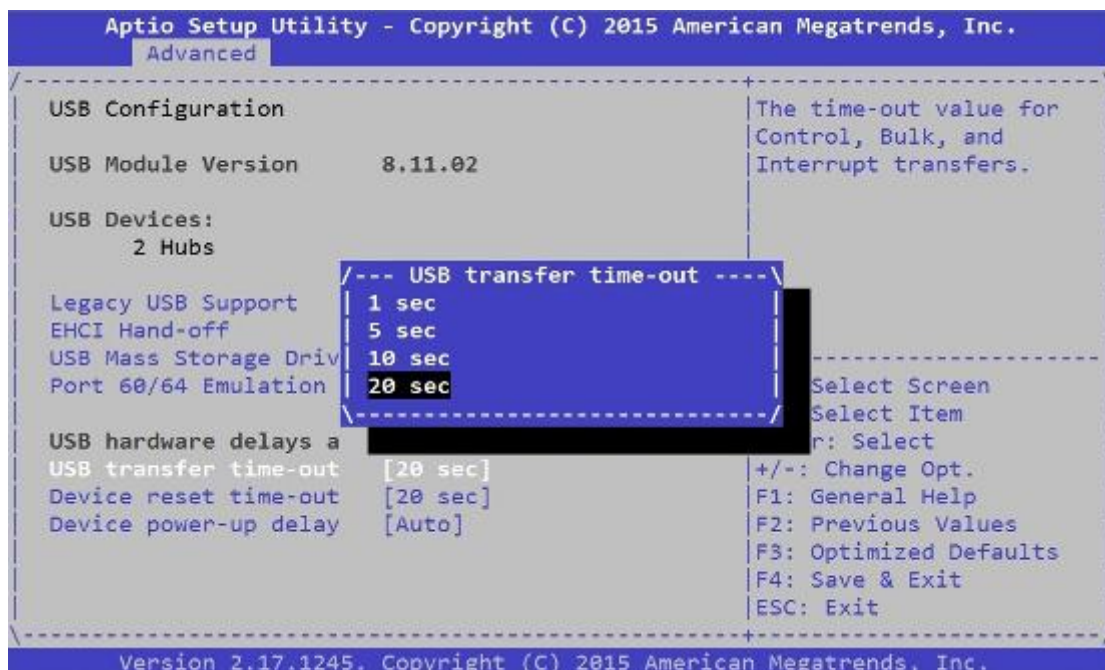


**Port 60/64 Emulation:** this option enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware operating systems.

## Network Computing Platforms



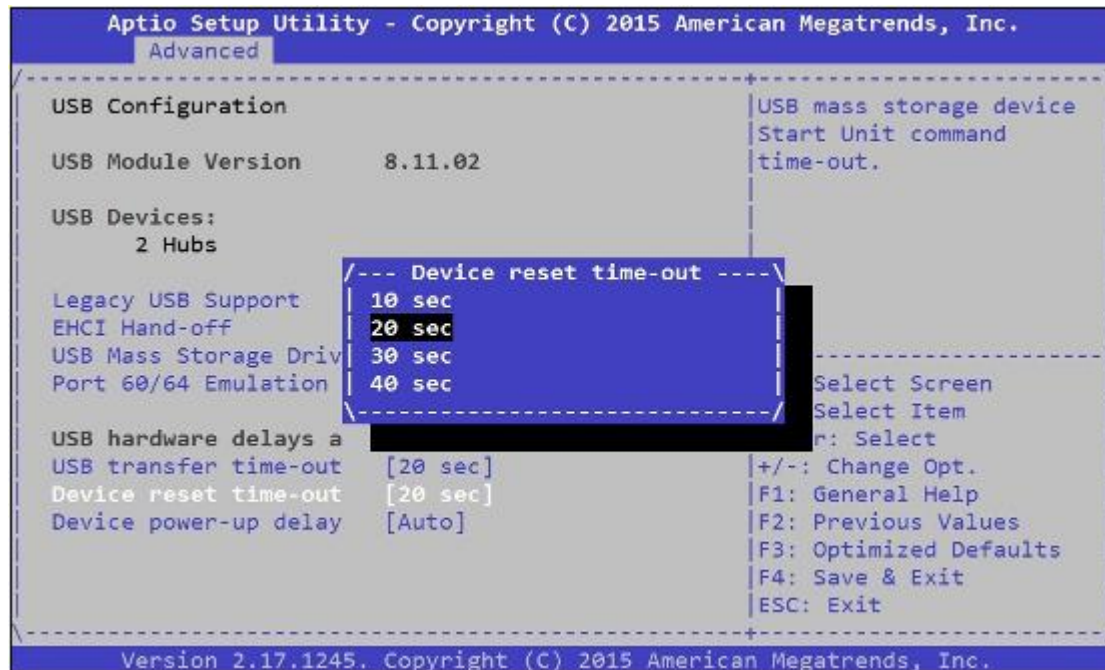
**USB transfer time-out:** set USB time-out value (1, 5, 10 or 20 seconds) for Control, Bulk and Interrupt transfers.



**Device reset time-out:** set USB mass storage device Start Unit command time-out (10, 20, 30 or 40 seconds).



## Network Computing Platforms



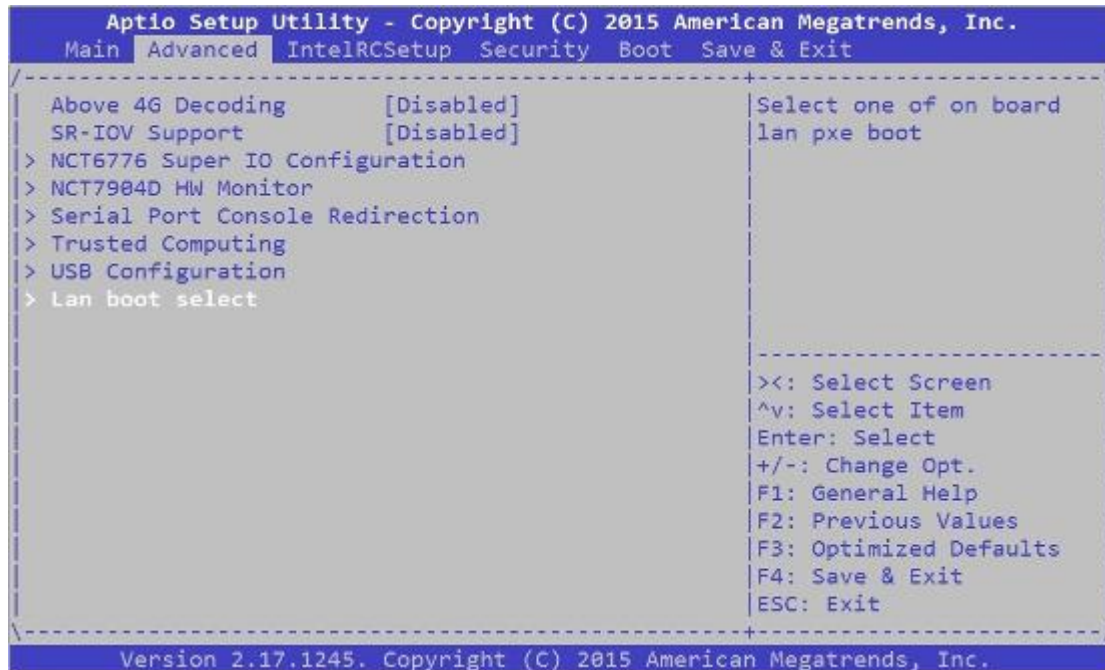
**Device power-up delay:** set the maximum time the device will take before it properly reports itself to the Host Controller. “Auto” uses default value. For example, it is 100ms as a root port.



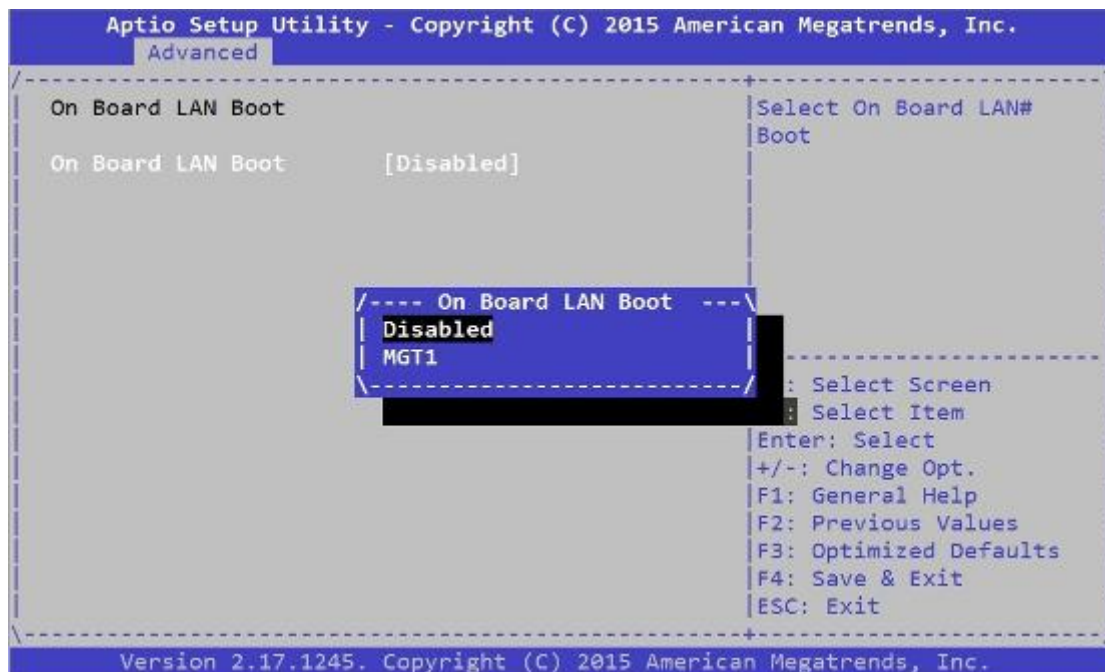
## LAN Boot Select

This option allows you to select one of the onboard LAN boot. Press “Enter” to access the sub-menu.

## Network Computing Platforms



**On Board LAN Boot:** select "Disabled" or "MGT1" management port booting priority.

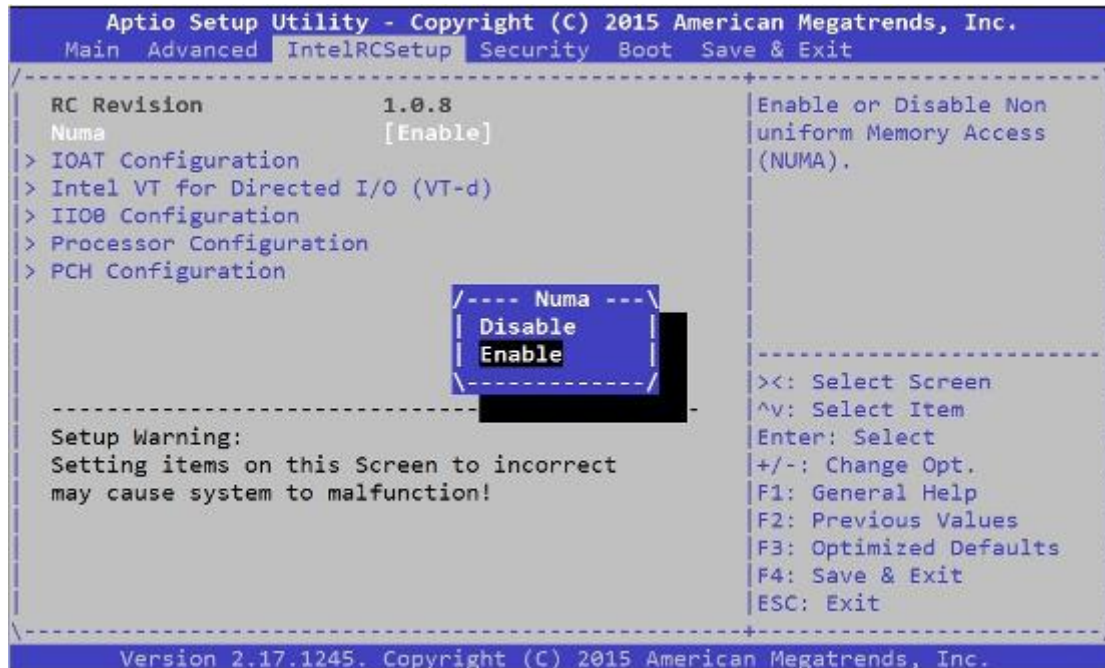


## IntelRCSetup

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

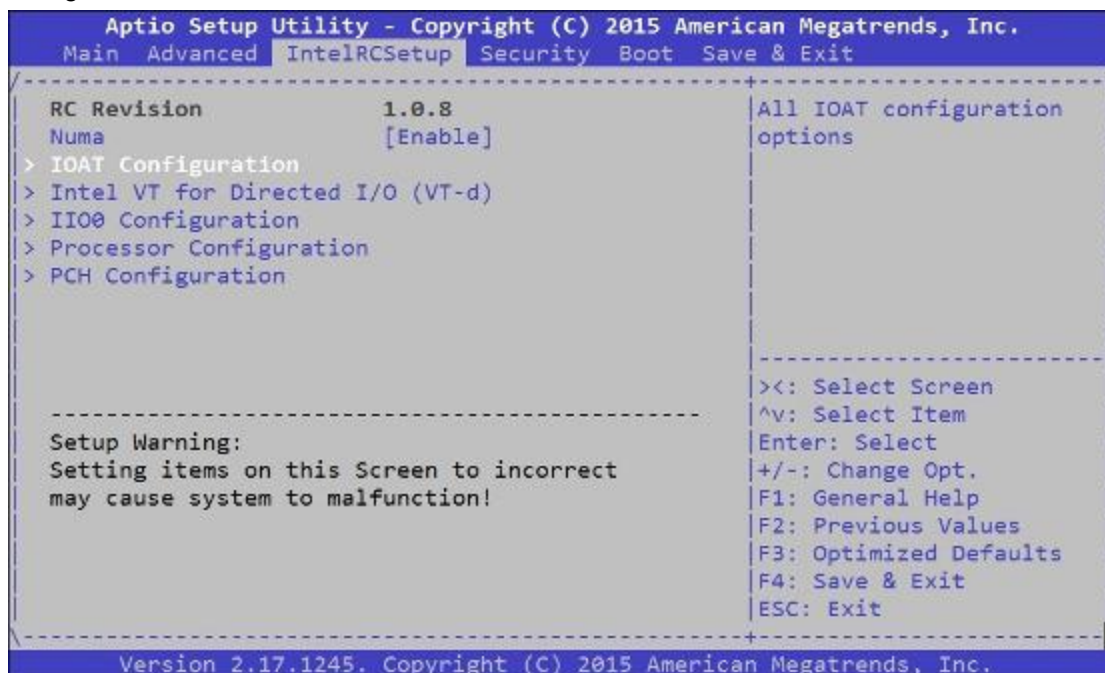
**RC Revision:** displays RC revision information

**Numa:** enables or disables Non-Uniform Memory Access (NUMA)



## IOAT Configuration

Press Enter to access the sub-menu of all IOAT (Intel I/O Acceleration Technology) configuration items.

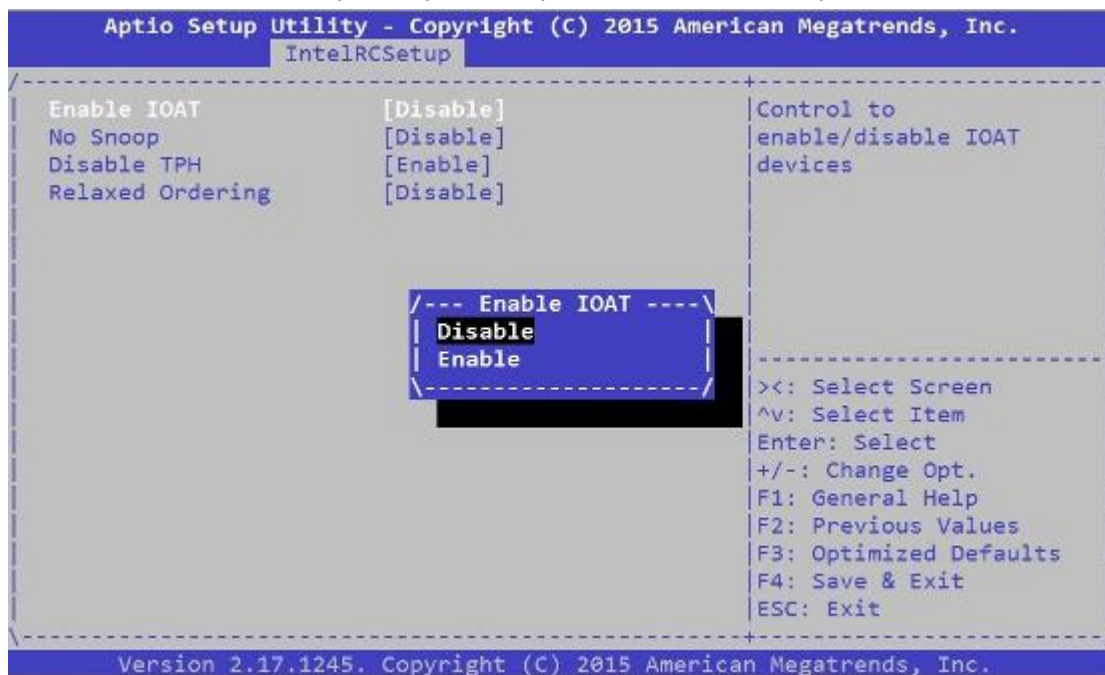


**Enable IOAT:** enables or disables IOAT devices. This function allows you to enable Intel I/O Acceleration Technology which benefits system data flows by reducing CPU overheads. The



## Network Computing Platforms

freed CPU resources will improve system responsiveness and avoid performance bottleneck.

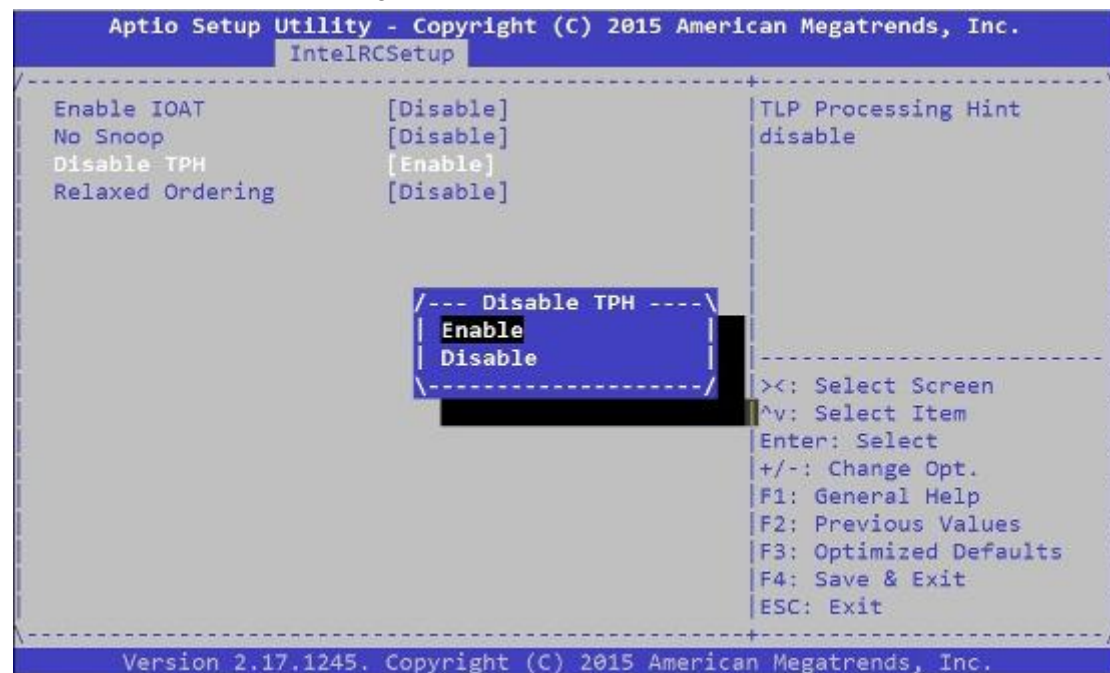


**No Snoop:** no snoop enable/disable for each CB device

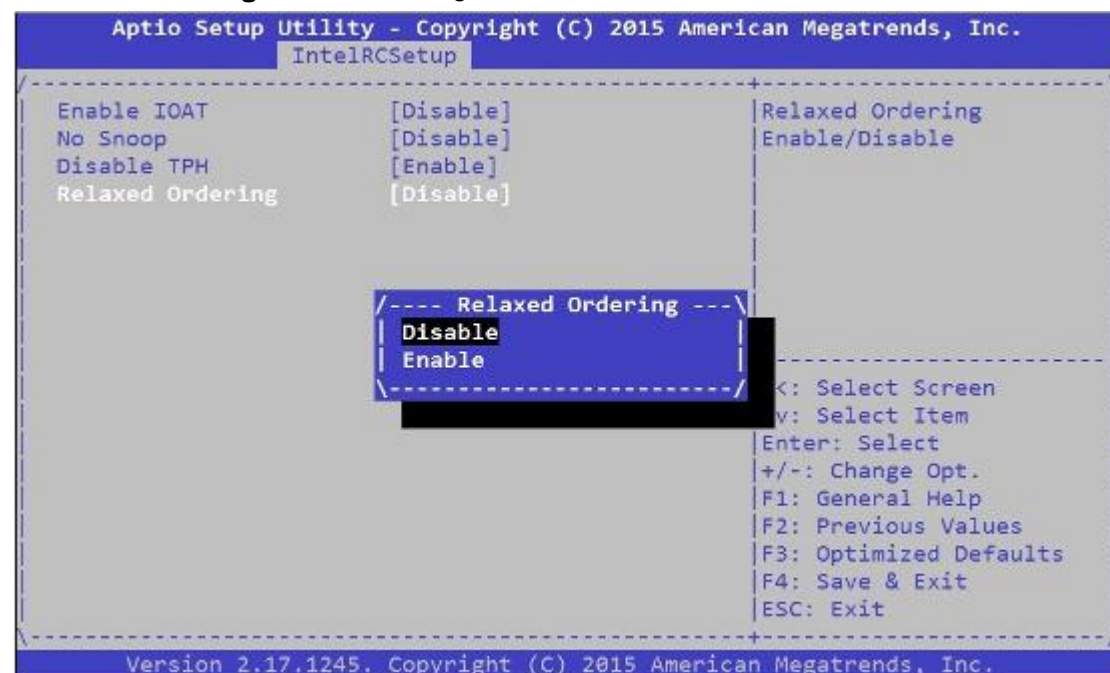


## Network Computing Platforms

### Disable TPH: TLP Processing Hint disable



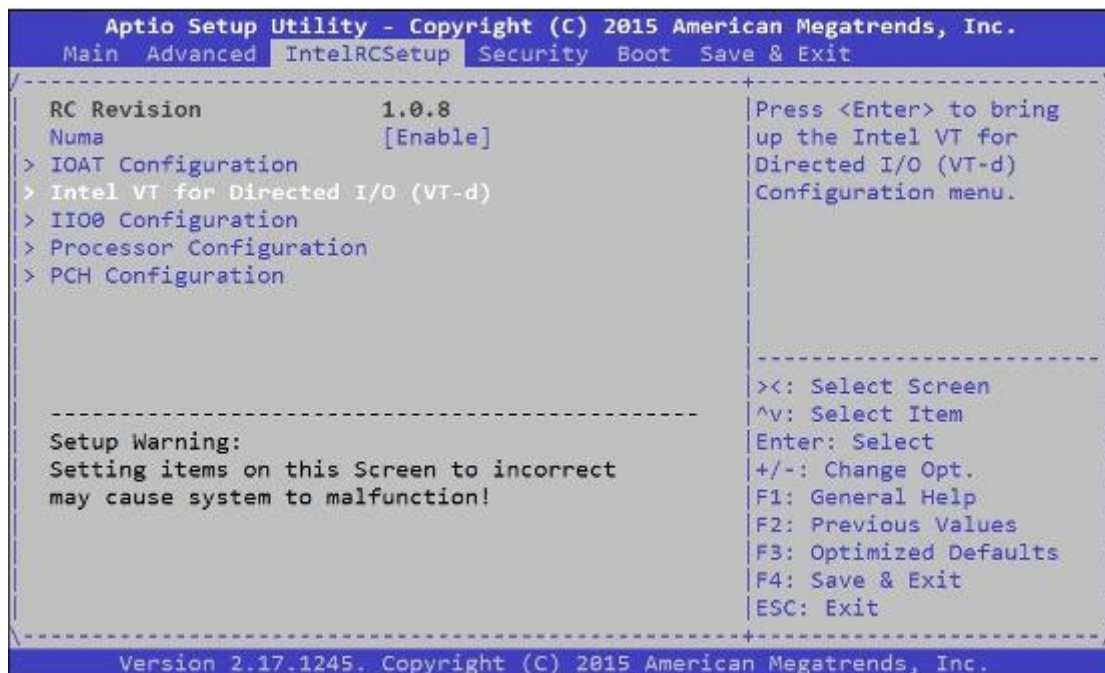
### Relaxed Ordering: relaxed ordering enable/disable.



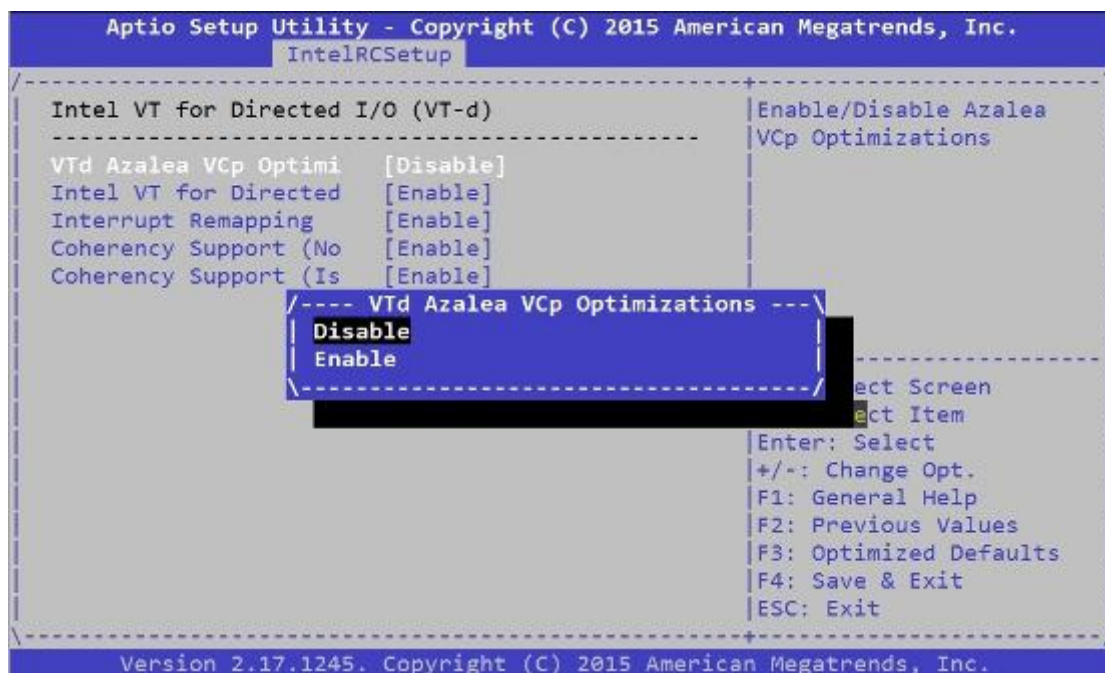


## Intel (R) VT for Directed I/O (VT-d) Configuration

This option allows users to configure items of Intel Virtualization Technology for Directed I/O (VT-d). Press "Enter" to access its sub-menu.

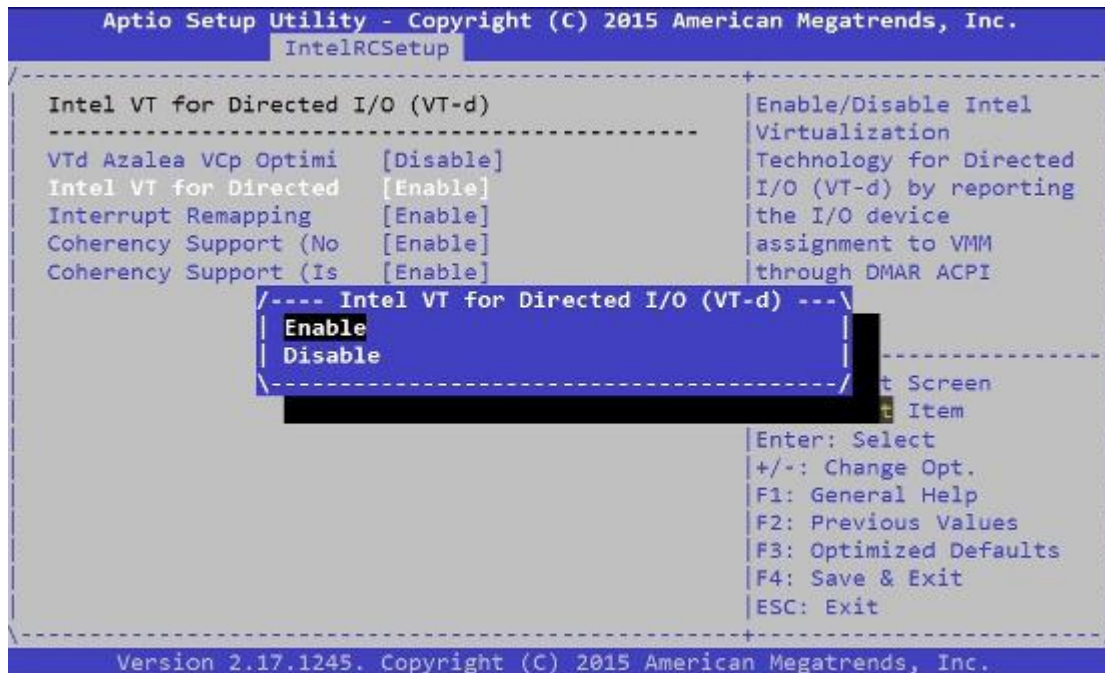


**VTd Azalea VCp Optimization:** this option allows you to enable or disable Azalea VCp Optimization.

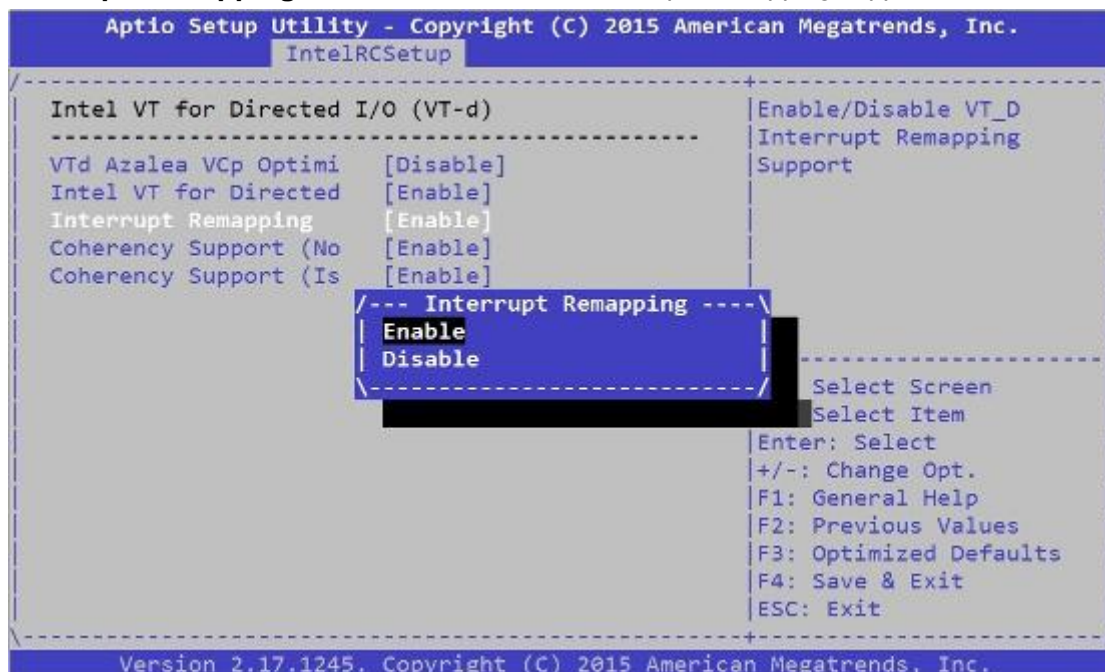


## Network Computing Platforms

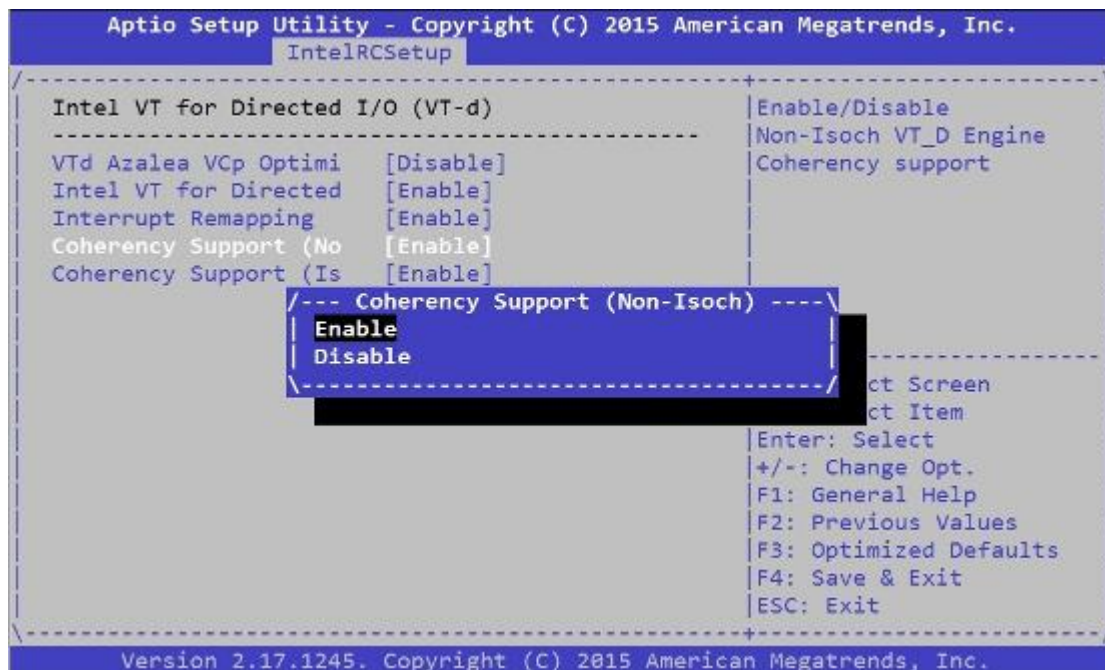
**Intel VT For Directed I/O (VT-d):** enable or disable Intel Virtualization Technology for Directed I/O (VT-d) by reporting the I/O device to VMM through DMAR ACPI tables.



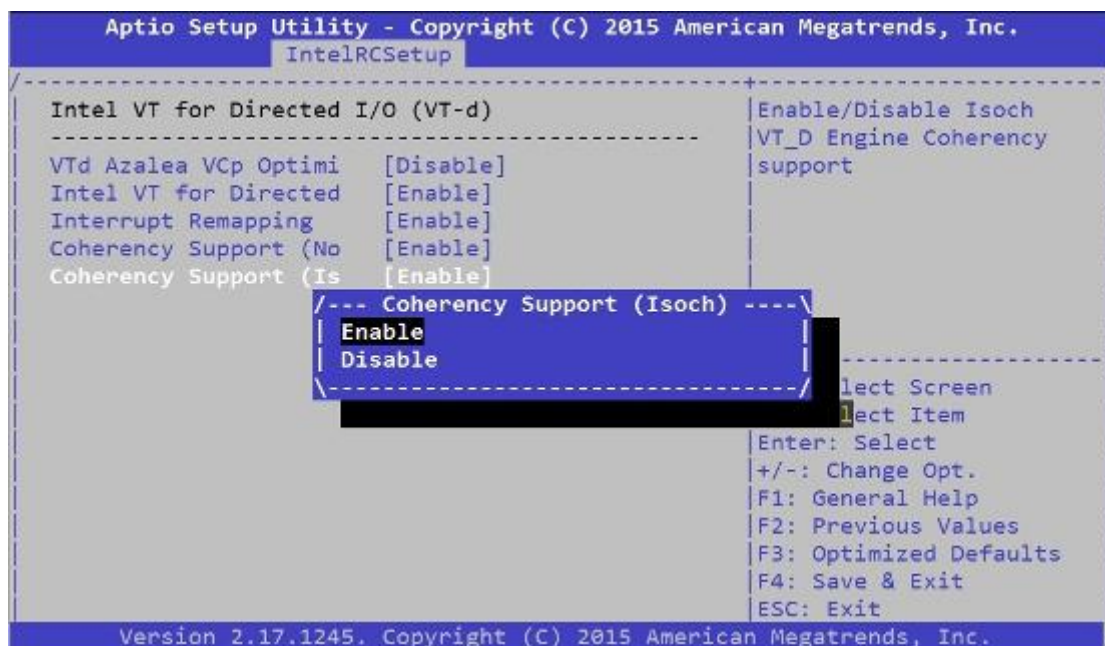
**Interrupt Remapping:** enable or disable VT-d Interrupt Remapping support.



**Coherency Support (Non-Isoch):** enable or disable VT-d Engine Coherency support.



**Coherency Support (Isoch):** enable or disable Isoch VT-d Engine Coherency support





## IIIO Configuration

This function allows users to check PCIe port lane width switch status. Press Enter to access the sub-menu.

```

Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
Main Advanced IntelRCSetup Security Boot Save & Exit

-----
RC Revision          1.0.8
Numa                 [Enable]
PCIE Port Lane Width Switch Status

> IOAT Configuration
> Intel VT for Directed I/O (VT-d)
> IIIO Configuration
> Processor Configuration
> PCH Configuration

-----
Setup Warning:
Setting items on this Screen to incorrect
may cause system to malfunction!

-----
><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

-----
Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.

```

**Set PCIe Port Bifurcation By Present Card Lane:** displays PCIe port information and status

```

Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
IntelRCSetup

-----
Set PCIe Port Bifurcation By Present Card Lane
=====
IOU2 (IIIO PCIe Port 1  [x8]
IOU0 (IIIO PCIe Port 2  [x8x8]
IOU1 (IIIO PCIe Port 3  [x8x8]

-----
><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

-----
Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.

```

## Processor Configuration

This function allows users to view and configure options that can change processor settings.

Press Enter to access the sub-menu.

```

Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
Main Advanced IntelRCSetup Security Boot Save & Exit

-----
RC Revision          1.0.8
Numa                [Enable]
> IOAT Configuration
> Intel VT for Directed I/O (VT-d)
> IIO0 Configuration
> Processor Configuration
> PCH Configuration

-----
Setup Warning:
Setting items on this Screen to incorrect
may cause system to malfunction!

-----
><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.

```

**Processor Configuration:** displays processor status and information.

```

Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
IntelRCSetup

-----
Processor Configuration
-----
Processor Socket      Socket 0
Processor ID          000306F2*
Processor Frequency    1.900GHz
Processor Max Ratio    13H
Processor Min Ratio    0CH
Microcode Revision     0000002B
L1 Cache RAM          384KB
L2 Cache RAM          1536KB
L3 Cache RAM          15360KB
Processor 0 Version     Intel(R) Xeon(R) CPU E5
                       -2609 v3 @ 1.90GHz

Execute Disable Bit    [Enable]
AES-NI                [Enable]

-----
><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

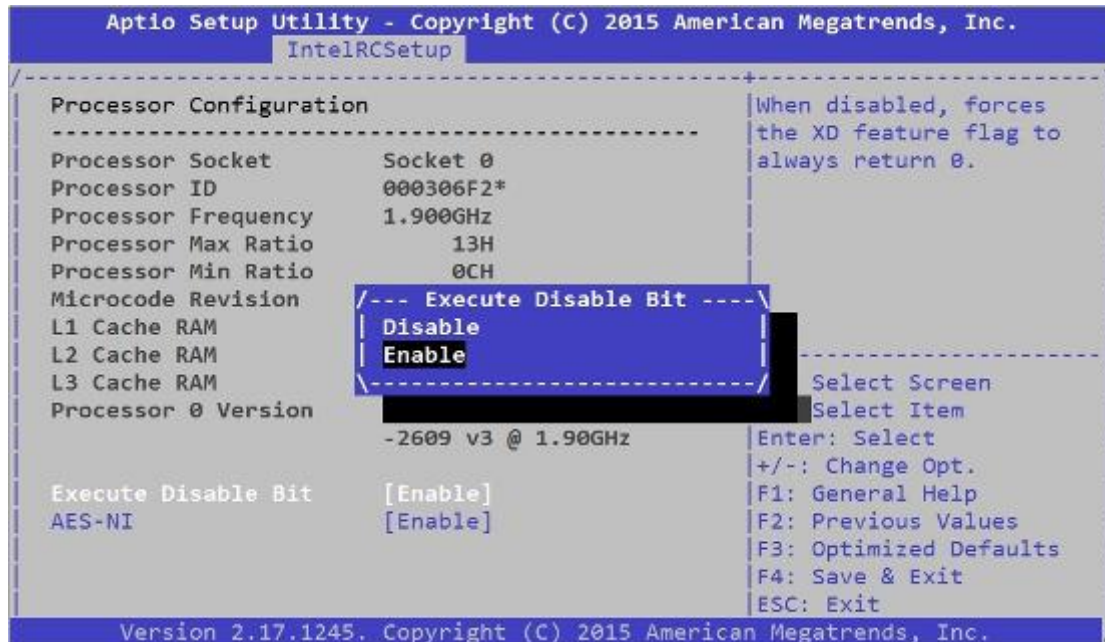
Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.

```

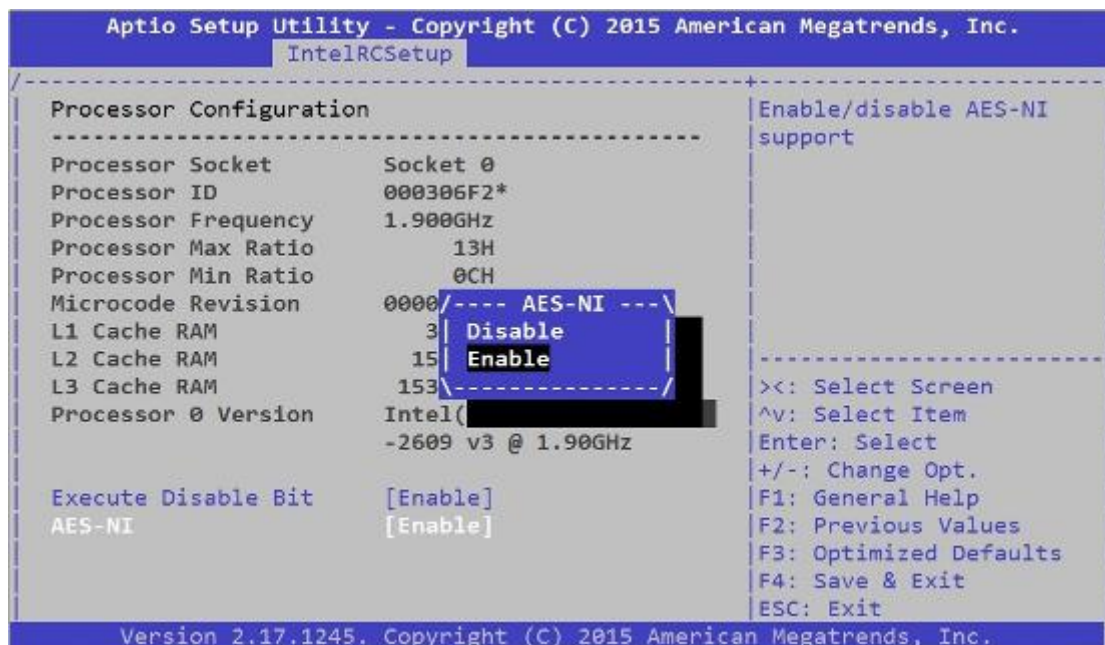


## Network Computing Platforms

**Execute Disable Bit:** an Intel hardware-based protection against malicious code. It will detect the memory in which a code can be executed or not. When enabled, it will prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS. When disabled, it forces the XD feature flag to always return 0.



**AES-NI:** enables or disables AES-NI (Advanced Encryption Standard - New Instruction) support.



## PCH Configuration

This function allows users to view and configure PCH settings. Press Enter to access the sub-menu.

```

Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
Main Advanced IntelRCSetup Security Boot Save & Exit

-----
RC Revision          1.0.8
Numa                 [Enable]
> IOAT Configuration
> Intel VT for Directed I/O (VT-d)
> IIIO Configuration
> Processor Configuration
> PCH Configuration

-----
Setup Warning:
Setting items on this Screen to incorrect
may cause system to malfunction!

-----
><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

-----
Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.

```

**PCH State after G3:** select S0/S5 for ACPI state after a G3. The default is “Last State”.

```

Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
IntelRCSetup

-----
PCH Configuration
-----
PCH state after G3    [Last State]
> PCH SATA Configuration

-----
/---- PCH state after G3 ----\
| S0                          |
| S5                          |
| Last State                   |
\-----/

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

-----
Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.

```

## PCH SATA Configuration

Press Enter to access items for SATA devices and settings.

```

Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
IntelRCSetup

PCH Configuration
-----
PCH state after G3      [Last State]
> PCH SATA Configuration

SATA devices and
settings

-----
><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.

```

**SATA Controller:** enables or disables SATA controller

```

Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
IntelRCSetup

PCH SATA Configuration
-----
SATA Controller          [Enabled]
Configure SATA as        [AHCI]

SATA Port 0              [Not Installed]
Software Preserve         Unknown
  Port 0                  /--- SATA Controller ---\
    Hot Plug              | Disabled |
    Configured as eSATA    | Enabled  |
    Spin Up Device        \-----/
    SATA Device Type       [H]
SATA Port 1              [Not Installed]
Software Preserve         Unknown
  Port 1                  [Enabled]
    Hot Plug              [Disabled]
    Configured as eSATA    Hot Plug supported
    Spin Up Device        [Disabled]
    SATA Device Type       [Hard Disk Drive]

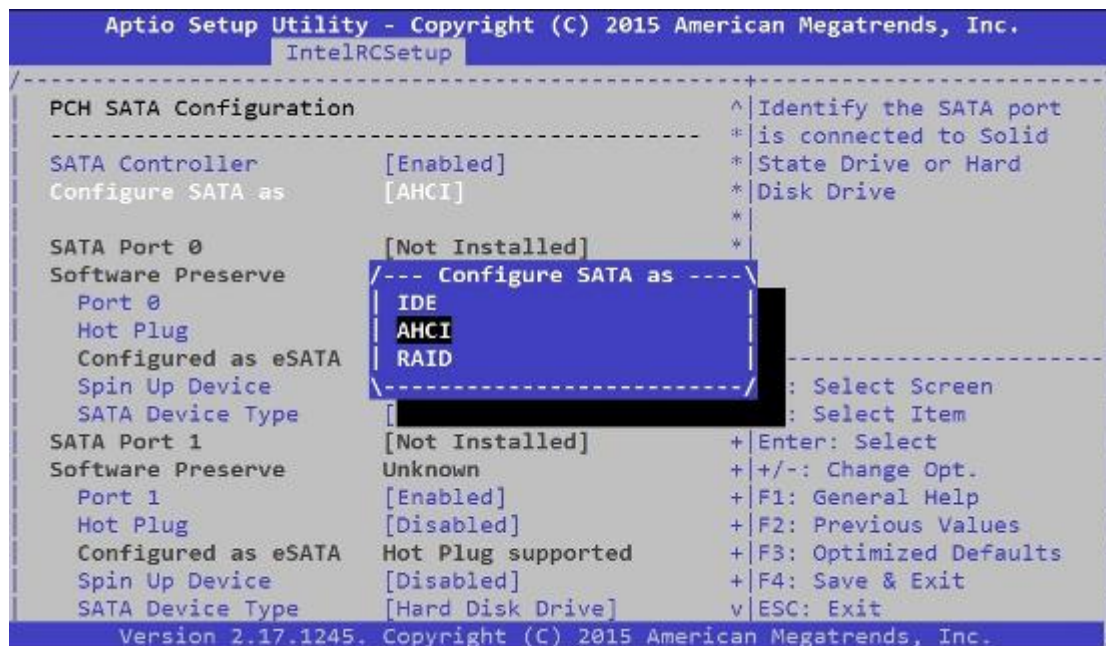
<: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.17.1245. Copyright (C) 2015 American Megatrends, Inc.

```



**Configure SATA as:** this item identifies whether the SATA port is connected to a SSD and HDD. Select IDE, AHCI or RAID. The default is "AHCI".

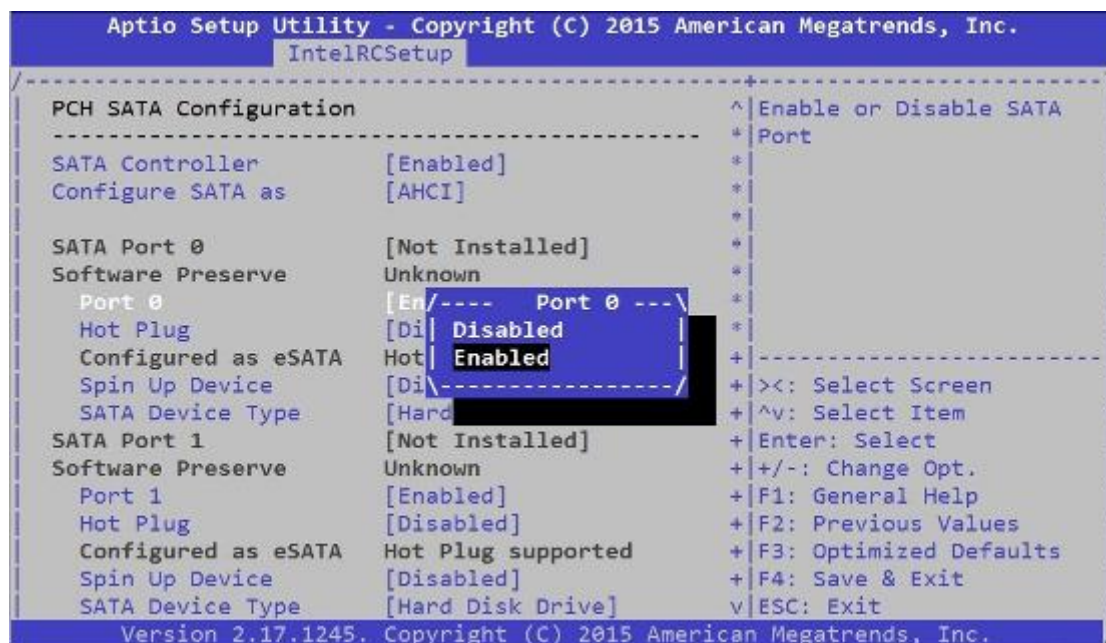


**SATA Port 0/1/2/3/4:** displays status of SATA port 0/1/2/3/4

**Software Preserve:** displays information of Software Preserve

**Port 0/1/2/3/4:** enable or disable this SATA port

\* The captured images are based on SATA port0 only. All SATA ports configurations on this BIOS version are identical.

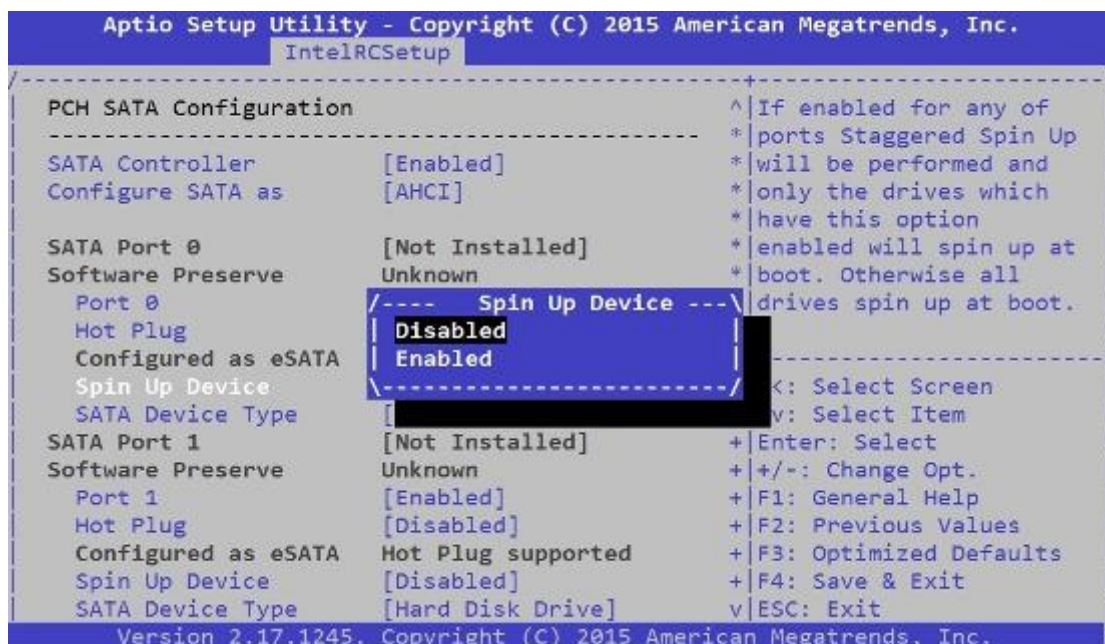


## Network Computing Platforms

**Hot Plug:** designates this port as hot pluggable



**Spin Up Device:** if enabled for any of ports, Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.





**SATA Device Type:** identifies the SATA port is connected to SSD (Solid State Drive) or HDD (Hard Disk Drive).



## Security

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

**Administrator Password:** set administrator password. Once set, then this only limits access to Setup and is only asked for when entering Setup.

**User Password:** set 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.

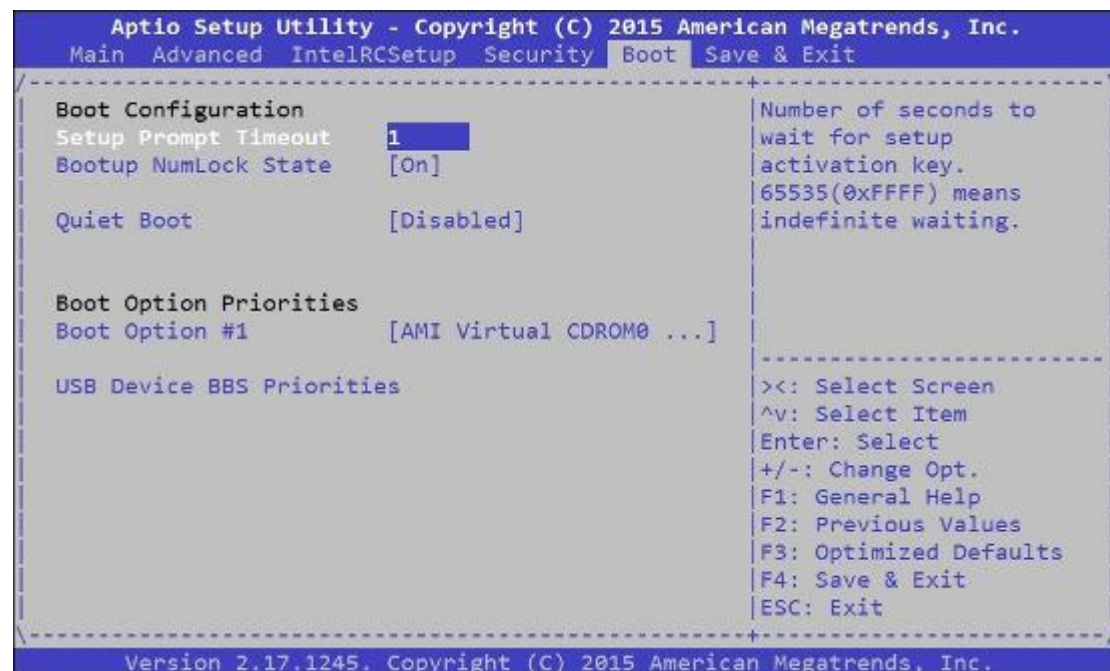


## Boot

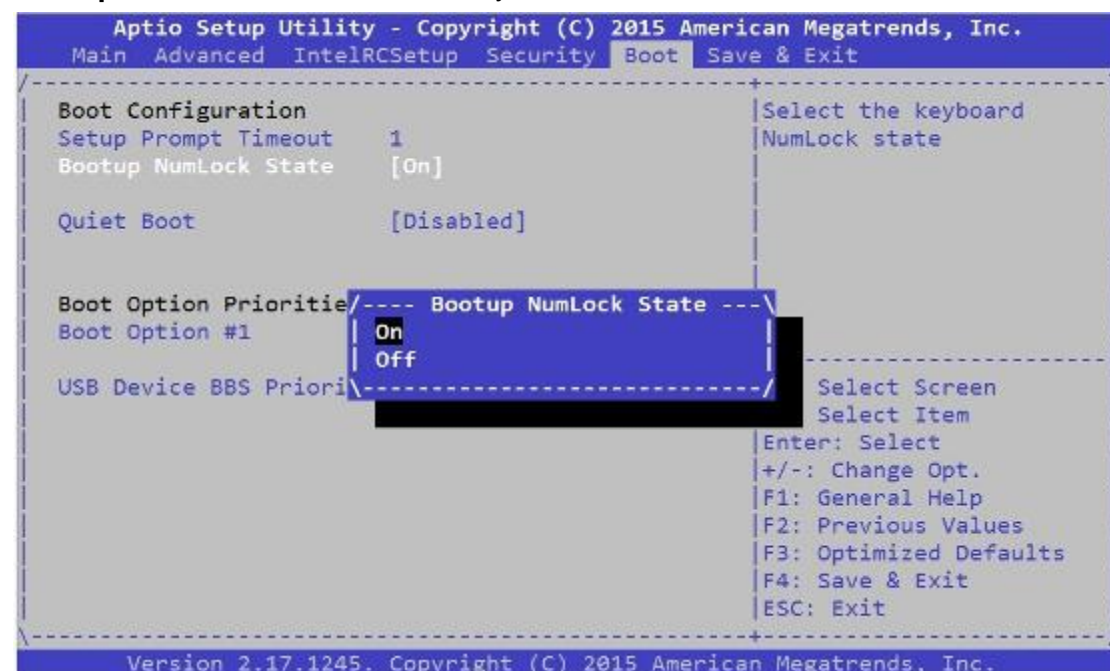
Use [←] / [→] to select [Boot] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

### Boot Configuration

**Setup Prompt Timeout:** number of seconds to wait for setup activation key. “65535 (0xFFFF)” means indefinite waiting.

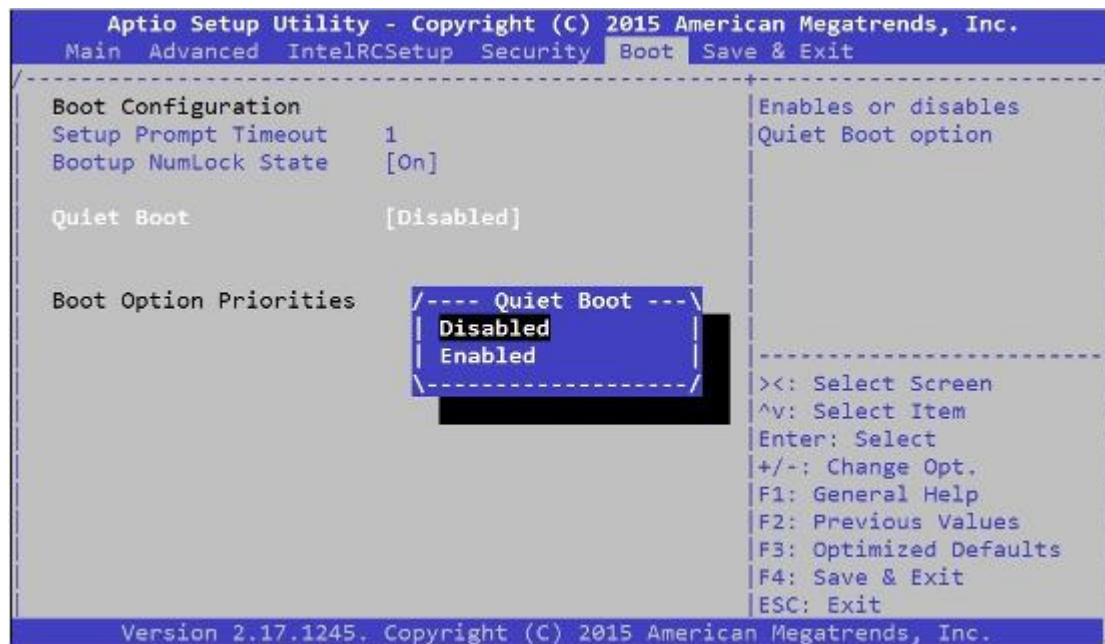


**Bootup Numlock State:** select the keyboard “Numlock” state



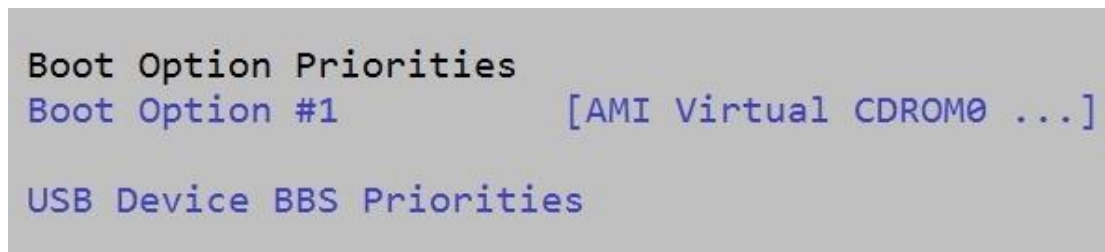
## Network Computing Platforms

**Quiet Boot:** this option allows you to enable or disable “Quiet Boot”. The default is “Disabled” based on Intel’s server environment setting.



**Boot Option #1:** set devices as boot option #1

**USB Device BBS Priorities:** set USB device BBS priorities





## Save & Exit

Use [←] / [→] to select [Save & Exit] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

**Save Changes and Exit:** exit system setup after saving the configuration changes

**Discard Changes and Exit:** exit system setup without saving the configuration changes

**Save Changes and Reset:** reset the system after saving the configuration changes

**Discard Changes and Reset:** reset the system without saving the configuration changes

### Save Options

**Save Changes:** save the configuration changes

**Discard Changes:** discard all the configuration changes

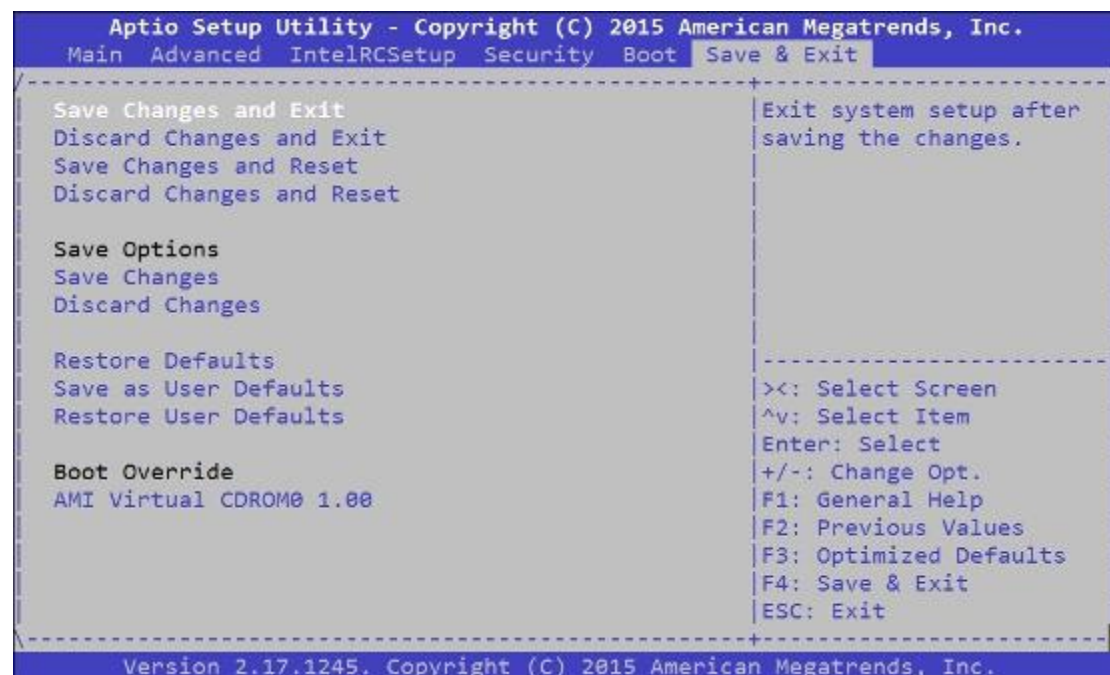
**Restore Defaults:** restore to factory default setting

**Save as User Defaults:** save changes as the new user default

**Restore User Defaults:** restore the user default

### Boot Override

#### AMI Virtual CDROM 1.00

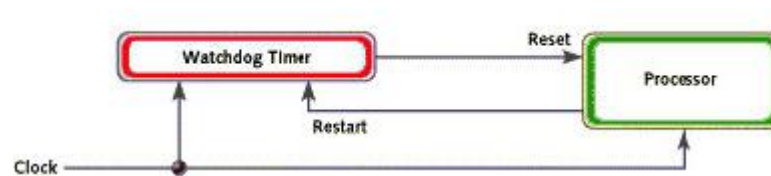




## Appendix A: Programming Watchdog Timer

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

For sample watchdog code, see *WD* folder under Driver and Utility on the *Driver and Manual CD*.



## Appendix B: Setting up Console Redirection

Console redirection lets you monitor and configure a system from a remote terminal computer by re-directing keyboard input and text output through the serial port. These following steps illustrate how to use this feature. The BIOS of the system allows the redirection of 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 serial port of the Remote Client System.

2. Configure the following settings in the BIOS Setup menu:

BIOS > Advanced > Remote Access Configuration > Serial Port Mode > [115200, 8 , n , 1 ]

3. Configure Console Redirection on the client system. The following is an example on Windows platform:

- a. A. Click the start button, point to Programs > Accessories > Communications and select Hyper Terminal.

- b. B. Enter any name for the new connection and select any icon.

- c. Click OK.

- d. From the "Connect to". Pull-down menu, select the appropriate Com port on the client system and click OK.

- e. 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.

## Appendix C: Programming Generation 3

### LAN Bypass

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

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

Please refer to the LAN\_Bypass\_Watchdog folder on the Driver and Manual CD.

Lanner bypass possess the following features:

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

For sample LAN bypass code and the Bypass Manual, see the *LAN\_Bypass* folder on the *Driver and Manual CD* or the *Lanner Support Website* at <http://www.lannerinc.com/download-center/> and browse the *download center* and look for

## Network Computing Platforms

*Lanner LAN Bypass Watchdog User Manual* under the *Accessories* folder.

For a description of the physical LAN ports equipped with this function, refer to *Front Panel Features* in *Chapter1 Introduction*.



## Appendix D: Programming the LCM

The LCD panel module (LCM) is designed to provide real-time operating status and configuration information for the system. For sample LCM code, see *LCM* folder in the *Driver and Manual CD*. The driver and the program library can also be found in the folder.

The system supports the following 2 kinds of LCM:

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

### For Parallel Text-based LCM

#### Build

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

1. Extract the source file:

```
# tar -xzf plcm_drv_v0XX.tgz
```

(0XX is the version of the program.)

2. Change directory to the extracted folder:

```
# cd plcm_drv_v0XX
```

(0XX is the version of the program.)

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

3. Type "make" to build source code:

```
# make
```

After compiling, the executable programs (plcm\_test, plcm\_cursor\_char, ppdev\_test, Test) and the driver (plcm\_drv.ko) will appear in the program's folder.

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

#### Install

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

```
#insmod plcm_drv.ko
```

```
#mknod /dev/plcm_drv c 248 0
```

### Note:

If you cannot install the driver, check whether you have enabled the parallel port in the BIOS setting . Once the message of “insmod”: error inserting ‘plcm\_drv.ko’: -1

Input/output

error” appears, please check that whether the major number is repeated or not. The major number needed with the “mknod” command varies with different software versions; please look up the Readme file for this value.

### Execute

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

To execute, run the command:

**#./plcm\_test**

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

**Display Off** turning off the LCM display

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

**Blinking off/On** turning off/on the cursor blinking

**Writing “Lanner@Taiwan”** displaying the specific sentences

**Reading “Lanner@Taiwan”** reading the specific sentence

**CGram Test** displaying the user-stored characters

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

### Corresponding Commands for “plcm\_test”

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

#### -On

— Turn on the backlight of the LCM display.

— To execute, please type:

**#./plcm\_test -On**

#### -Off

— Turn off the backlight of the LCM display.

— To execute, please type:

**#./plcm\_test -Off**

#### -LCM1

— Writing “Lanner@Taiwan” in line1.

— To execute, please type:

**#./plcm\_test -LCM1**

**-LCM2**

— Writing “2013-11-05” in line 2.

— To execute, please type:

**#./plcm\_test -LCM2**

**Keypad**

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

— To execute, please type:

**#./plcm\_test -Keypad**

**Commands for plcm\_cursor\_char**

This Run this command for cursor shift & single text update

**# ./plcm\_cursor\_char**

Please read the options below

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

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

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

**Add a char** select Item 4 to display a character on the LCM screen

**Clean display** select Item 5 to clear up the LCM display

**Leave** select Item 6 to exit the program

**Test**

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

— **rmmod plcm\_drv** (remove the kernel mode driver module)

— **insmod plcm\_drv.ko** (install the kernel mode driver module)

— **./plcm\_test** (execute the driver testing program)

— **./plcm\_test -stop** (stop executing the driver testing program)

— **rmmod plcm\_drv** (remove the kernel mode driver module)

To execute, please type:

**#./Test**

**Virtualization Implemented by Parallel**

**Port Pass Through**

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

- QEMU/KVM

## Network Computing Platforms

- Xen
- VMWare Player

Here, we take the Fedora 20 x86\_64 operation system for instance to explain 3 virtualization respectively for parallel port pass through. Use the procedures listed below for step-by-step instructions separately based on your case.

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

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

(2) Add the following 4 lines into the xml file (for example, add to /etc/libvirt/qemu/<yourvirtualmachine>.xml in linux KVM):

```
<parallel type='dev'>
<source path='/dev/parport0'/>
<target port='0'/>
</parallel>
```

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

```
# modprobe parport
# modprobe parport_pc
# modprobe ppdev
```

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

(5) Reboot the Guest OS.

Note: It is necessary for you to install “insmod parport.ko”, “parport\_pc.ko” and “ppdev.ko” Linux Kernel drivers in virtualization environment before executing the “ppdev\_test” testing program.

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

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

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

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

```
# modprobe parport
# modprobe parport_pc
# modprobe ppdev
```

4) Check that whether the /dev/parport0 exists or not. You may not find proper “/dev/parport0”



## Network Computing Platforms

in the device list, please reconfirm the setup of VMWare Player's setting page described in Step 2.

(5) Reboot the Guest OS.

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

## Appendix E: Terms and Conditions

### Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for 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.

### Requesting a RMA#

1. To obtain a 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. 4.

**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.

## Network Computing Platforms

### RMA Service Request Form

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

<b>RMA No:</b>		Reasons to Return: <input type="checkbox"/> Repair(Please include failure details) <input type="checkbox"/> Testing Purpose	
Company:		Contact Person:	
Phone No.		Purchased Date:	
Fax No.:		Applied Date:	
Return Shipping Address: _____			
Shipping by: <input type="checkbox"/> Air Freight <input type="checkbox"/> Sea <input type="checkbox"/> Express _____			
<input type="checkbox"/> 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
03: CMOS Data Lost	09: Cache RMA Problem	15: PS2	21: Shut Down
04: FDC Fail	10: Memory Socket Bad	16: LAN	22: Panel Fail
05: HDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
06: Bad Slot	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)

*Request Party*

*Confirmed By Supplier*

\_\_\_\_\_  
Authorized Signature / Date

\_\_\_\_\_  
Authorized Signature / Date