Netberg Demos R430
M2 server. User manual.

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1.1. Conventions

Several different typographic conventions are used throughout this manual. Refer to the following examples for common usage.

Bold type face denotes menu items, buttons and application names.

Italic type face denotes references to other sections, and the names of the folders, menus, programs, and files.

`<Enter>` type face denotes keyboard keys.

Warning information appears before the text it references and should not be ignored as the content may prevent damage to the device.

CAUTIONS APPEAR BEFORE THE TEXT IT REFERENCES, SIMILAR TO NOTES AND WARNINGS. CAUTIONS, HOWEVER, APPEAR IN CAPITAL LETTERS AND CONTAIN VITAL HEALTH AND SAFETY INFORMATION.

Indicates information that is important to know for the proper completion of a procedure, choice of an option, or completing a task.

Highlights general or useful information and tips.

1.2. Acronyms

Word	Definition
A/D	Analog to Digital
ACPI	Advanced Configuration and Power Interface
ASF	Alerting Standard Forum
Asserted	Active-high (positive true) signals are asserted when in the high electrical state (near power potential). Active-low (negative true) signals are asserted when in the low electrical state (near ground potential).
BIOS	Basic Input/Output System
BIST	Built-In Self Test
BMC	At the heart of the IPMI architecture is a microcontroller called the Baseboard management controller (BMC)
Bridge	Circuitry connecting one computer bus to another, allowing an agent on one to access the other
BSP	Bootstrap processor
Byte	8-bit quantity
CLI	Command Line Interface
CMOS	In terms of this specification, this describes the PC-AT compatible region of battery-backed 128 bytes of memory, which normally resides on the base-board
CPU	Central Processing Unit
Deasserted	A signal is deasserted when in the inactive state. Active-low signal names have "_L" appended to the end of the signal mnemonic. Active-high signal names have no "_L" suffix. To reduce confusion when referring to active-high and active-low signals, the terms one/zero, high/low, and true/false are not used when describing signal states.
DTC	Data Transfer Controller
EEPROM	Electrically Erasable Programmable Read-Only Memory
EMP	Emergency Management Port
FRU	Field Replaceable Unit
GB	1024 MB.
GPIO	General Purpose Input/Out
HSC	Hot-Swap Controller
Hz	Hertz (1 cycle/second)
I2C	Inter-Integrated Circuit bus
IANA	Internet Assigned Numbers Authority
IBF	Input buffer
ICH	I/O Controller Hub

Word	Definition
ICMB	Intelligent Chassis Management Bus
IERR	Internal Error
IP	Internet Protocol
IPMB	Intelligent Platform Management Bus
IPMI	Intelligent Platform Management Interface
ITP	In-Target Probe
KB	1024 bytes.
KCS	Keyboard Controller Style
KVM	Keyboard, Video, Mouse
LAN	Local Area Network
LCD	Liquid Crystal Display
LCT	Lower Critical Threshold
LED	Light Emitting Diode
LNCT	Lower Non-Critical Threshold
LNRT	Lower Non-Recoverable Threshold
LPC	Low Pin Count
LSI	Large Scale Integration
LUN	Logical Unit Number
MAC	Media Access Control
MB	1024 KB
MD2	Message Digest 2 - Hashing Algorithm
MD5	Message Digest 5 - Hashing Algorithm - Higher Security
Ms	Milliseconds
Mux	Multiplexer
NIC	Network Interface Card
NMI	Nonmaskable Interrupt
NM	Node Management
OBF	Output buffer
OEM	Original Equipment Manufacturer
Ohm	Unit of electrical resistance
PDB	Power Distribution Board
PEF	Platform Event Filtering
PEP	Platform Event Paging
PERR	Parity Error
POH	Power-On Hours

Word	Definition
POST	Power-On Self Test
PWM	Pulse Width Modulation
RAC	Remote Access Card
RAM	Random Access Memory
RMCP	Remote Management Control Protocol
ROM	Read Only Memory
RTC	Real-Time Clock. Component of the chipset on the baseboard.
RTOS	Real Time Operation System
SCI	Serial Communication Interface
SDC	SCSI Daughter Card
SDR	Sensor Data Record
SEEPROM	Serial Electrically Erasable Programmable Read-Only Memory
SEL	System Event Log
SERR	System Error
SMBus	A two-wire interface based on the I2C protocol. The SMBus is a low-speed bus that provides positive addressing for devices, as well as bus arbitration
SMI	Server Management Interrupt. SMI is the highest priority nonmaskable interrupt
SMM	Server Management Mode
SMS	Server Management Software
SNMP	Simple Network Management Protocol
SOL	Serial Over LAN
UART	Universal Asynchronous Receiver/Transmitter
UCT	Upper Critical Threshold
UDP	User Datagram Protocol
UNCT	Upper Non-Critical Threshold
UNRT	Upper Non-Recoverable Threshold
WDT	Watchdog Timer
Word	16-bit quantity

1.3. Safety Information

1.3.1. Important Safety Instructions

Read all caution and safety statements in this document before performing any of the instructions.

Warnings

Heed safety instructions: Before working with the server, whether using this manual or any other resource as a reference, pay close attention to the safety instructions. Adhere to the assembly instructions in this manual to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this manual. Use of other products / components will void the UL listing and other regulatory approvals of the product and will most likely result in non-compliance with product regulations in the region(s) in which the product is sold.

System power on/off: The power button DOES NOT turn off the system AC power. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before opening the chassis, adding, or removing any components.

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

Electrostatic discharge (ESD) and ESD protection: ESD can damage drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground any unpainted metal surface on the server when handling parts.

ESD and handling boards: Always handle boards carefully. They can be extremely sensitive to electrostatic discharge (ESD). Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that can be gripped with fingertips or with a pair of fine needle nosed pliers. If the jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool used to remove a jumper, or the pins on the board may bend or break.

1.4. Disclaimer

The information in this document is subject to change without notice. The manufacturer makes no representations or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose. Furthermore, the manufacturer reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of the manufacturer to notify any person of such revision or changes.

For the latest information and updates please refer to www.netbergtw.com

All the illustrations in this technical guide are for reference only and are subject to change without prior notice.

Chapter 2. About the Server

2.1. Introduction

This document is for the person who installs, administers, and troubleshoots servers and storage systems. Netberg assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

The Demos R430 M2 70-70 and 1-70 configuration server systems can support Motherboard Node 1&2 (Upper and Lower) and Dummy Motherboard Tray (Upper) Motherboard Node (Lower) individually. The motherboard supports two processor sockets that can accommodate up to two Intel® Xeon E5-2600 v3/v4 series processors, and features the Intel® C612 PCH chipset; Sixteen registered DDR4 memory module slots for each motherboard enable you to add up to 1TB of total memory. ECC support provides extra security against system failure.

2.2. System Features

This chapter describes the external features of this server. It includes specific sections that identify these features and specifications.

Table 2.1. Specifications

Form Factor	**1 or 2 independent nodes in a 4U chassis**
Chassis Size (L x W x H)	900 mm x 448 mm x 175 mm
Processor	(2) Intel® Xeon® processor E5-2600 v3/v4 family per node
Chipset	Intel® C612 (Wellsburg)
SAS Controller	LSI SAS HBA/RAID controller
Memory	(16) DDR4 1333/1600/1866/2133/2400 MHz per node
PCI-E	• 1x PCI-Express 3.0 x8 OCP Mezz (from CPU1) • 2x PCI-Express 3.0 x8 LP (from CPU1) • 1x PCI-Express 3.0 x16 (from CPU1) • 1x PCI-Express 3.0 x16 LP (from CPU2)
SW RAID Options	Microsoft Storage Spaces
HW RAID Options	LSI Syncro CS Cluster-in-a-box Solution (optional)
Storage	• 2 x SFF SATA G3 SSD on each MLB, total 4 x SFF drives. • 70x LFF SAS G3 HDD on HDD backplane boards.
Network	2x Intel® Powerville I350 1G BaseT RJ45 2x Intel® 10G SFP+ ports (option) 2x Intel® 10G Base-T ports (option)
Management Port	1x Dedicated management 10/100BASE-T port (BMC AST2400)
Integrated Graphics	Aspeed AST2400 8 MB DDR3 video memory
Rear I/O	• 1x Power button w/LED • 2x USB 3.0 ports per node • 1x VGA D-sub per node • 1x RJ45 (dedicated for BMC) per node • 2x RJ45 1G BASE-T ports • 1x COM port • 1x ID LED (blue)
Cooling	12 x 6038 heavy-duty PWM fans with optimal fan speed control
Power Support Unit	• 4x 1400W high efficiency redundant PSU • 115/230VAC input, 50/60Hz, 240VDC input
Current	12AAC (low line) / 10AAC (high line) input, 10ADC input
Restriction of Hazardous Substances (RoHS)	Yes

Form Factor	**1 or 2 independent nodes in a 4U chassis**
Intel Node Management Support	Yes
System Management	IPMI v2.0 Compliant, on board "KVM over IP" support
Weight	Maxi-weight: 105KG
Temperature	Operating System: +5°C ~ +35°C Non-operating System (with package): -40°C ~ +70°C
Humidity	Operating System: +20% ~ +80% Non-operating System (with package): +10% ~ +90%

2.3. Package Contents

The following list includes the package components:

1 x 2U chassis system

1 x Power cord

1 x Rail kit

2.4. A Tour of the System

The following illustrations show the major component parts of these two variants.

2.4.1. System

Figure 2.1. System Top View

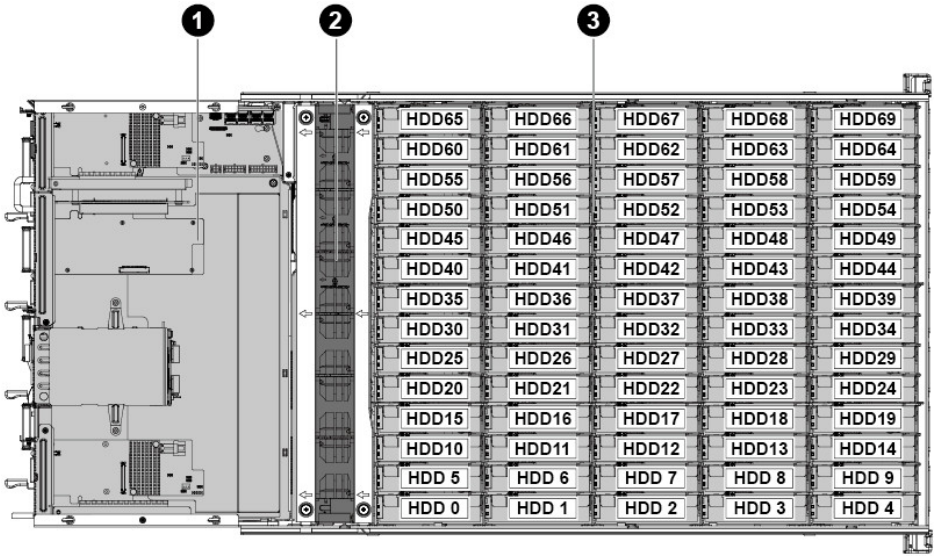


Table 2.2. System Top View

No.	Description
1	Motherboard Node 1&2 (Upper and Lower)
2	System Fan Module
3	HDDs for Motherboard 1&2

2.4.2. System Front View

The front view of this 4U server allows easy access to seven HDD backplanes. In addition, seven backplanes with HDD LEDs are located on the front.

Figure 2.2. Front View

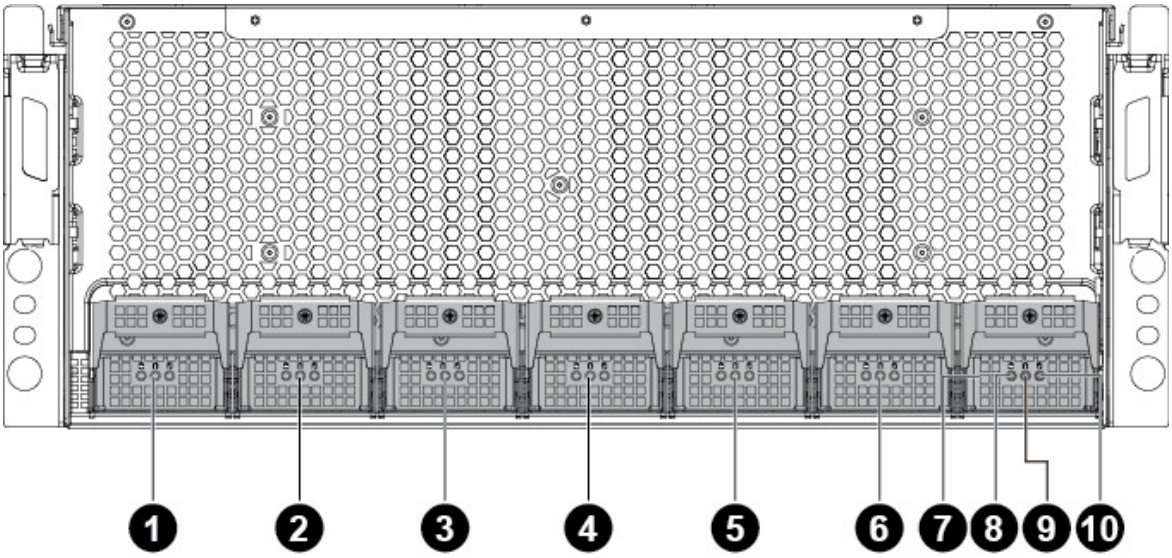


Table 2.3. System Front View

No.	Description
1	HDD Backplane 1
2	HDD Backplane 2
3	HDD Backplane 3
4	HDD Backplane 4
5	HDD Backplane 5
6	HDD Backplane 6
7	HDD Backplane 7
8	HDD Activity LED
9	HDD Fault LED
10	HDD Present LED

2.4.3. System Rear View

The server back view includes upper and lower motherboard node, the back panels with system buttons and LEDs, four power supplies and OCP card.

Figure 2.3. System Rear View 70-70 configuration

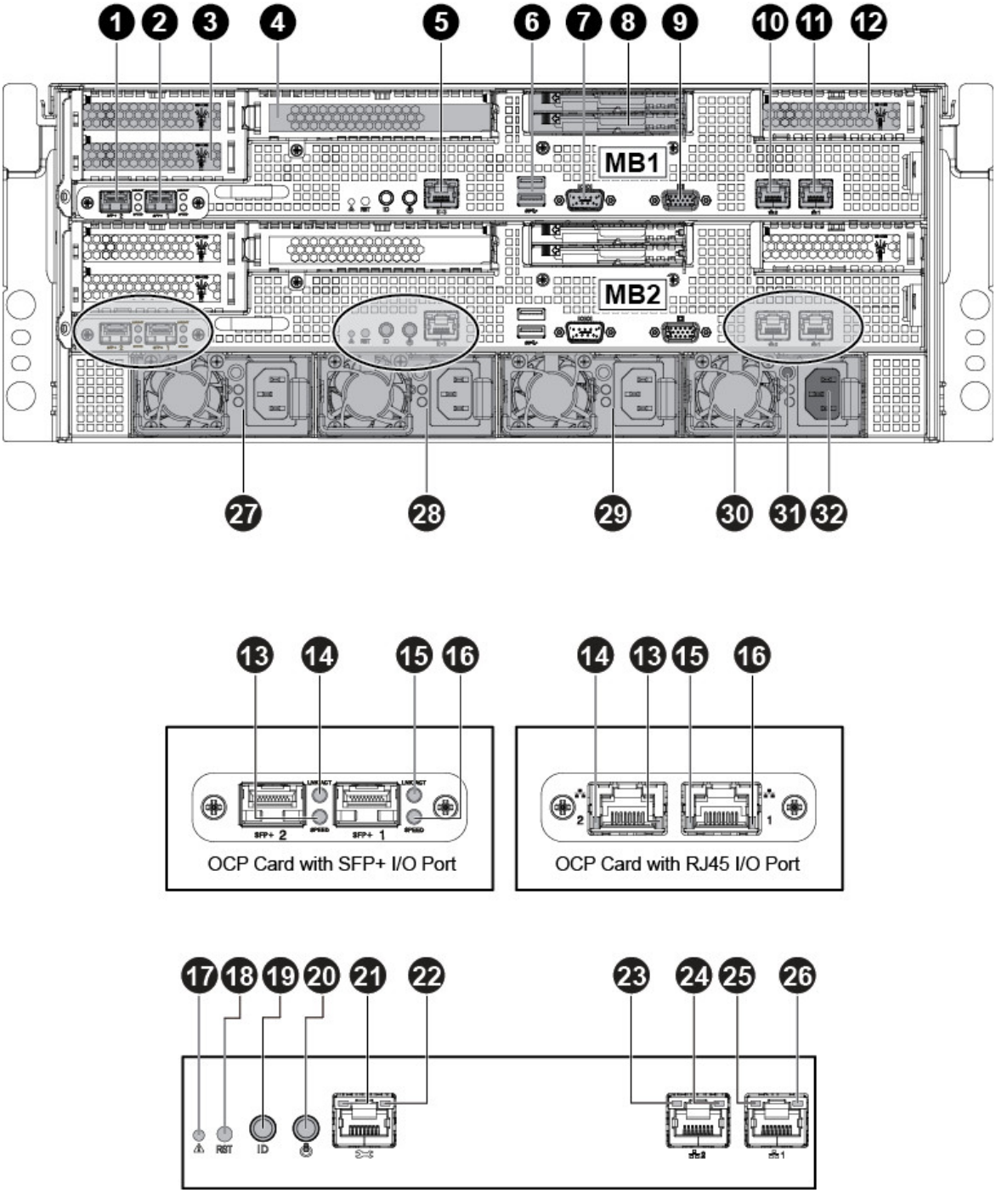
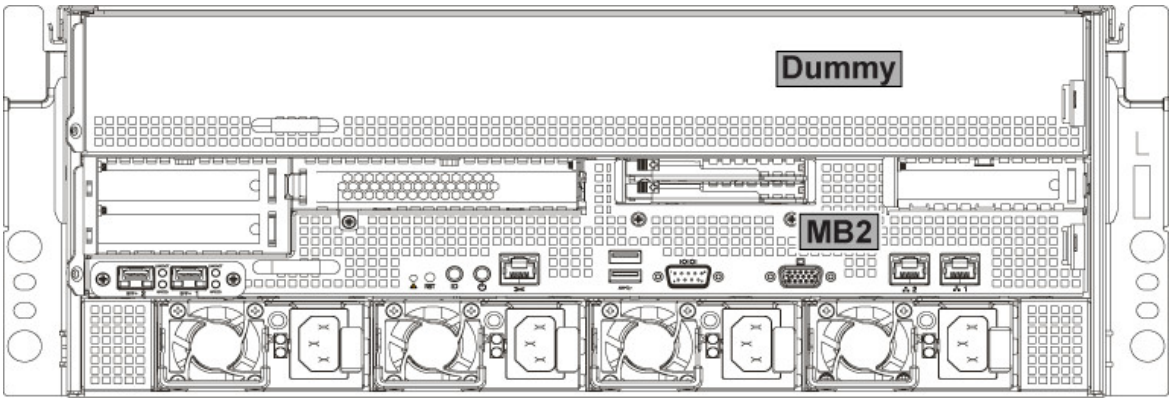


Table 2.4. System Rear View

No.	Description
1	OCP NIC 2 Port
2	OCP NIC 1 Port

No.	Description
3	Expansion Slot 1/2
4	Expansion Slot 3
5	Management NIC Port
6	Dual USB Port
7	Serial Port
8	7mm SSD 1/2
9	VGA Connector
10	1G NIC 2 Port
11	1G NIC1 Port
12	Expansion Slot 4
13	Speed LED of OCP NIC 2 Port
14	Link / Activity LED of OCP NIC 2 Port
15	Link / Activity LED of OCP NIC 1 Port
16	Speed LED of OCP NIC 1 Port
17	Motherboard System Health LED
18	BMC Reset Button
19	Motherboard ID Button / LED
20	Motherboard Power Button / LED
21	Link / Activity LED of Management NIC Port
22	Speed LED of Management NIC Port
23	Link / Activity LED of 1G NIC 2 Port
24	Speed LED of 1G NIC 2 Port
25	Link / Activity LED of 1G NIC 1 Port
26	Speed LED of 1G NIC1 Port
27	Power Supply 1
28	Power Supply 2
29	Power Supply 3
30	Power Supply 4
31	Power Supply Status LED
32	Power Connector

Figure 2.4. System Rear View 1-70 configuration



Refer to Table 2.4, “System Rear View” for the designations of the components and devices of the motherboard node.

2.4.4. Buttons and System LED description

This server is equipped with system LED indicators, and buttons located on the front panels. The front panel status LEDs allow constant monitoring of basic system functions while the server is operating. These LEDs provide visual cues to the status of power and ID of each node.

The detailed LED information on the front view is shown below:

Table 2.5. Front View LEDs

Type of LED	Color	Status	Function
HDD Activity	Green	On	HDD is installed.
	Green	Blinking	HDDs are accessing data (RAID optimal) or RAID rebuilding.
	Green	Off	No HDD is installed.
HDD Fail	Red	On	HDD is failed.
	Red	Blinking	HDD RAID is rebuilding.
	Red	Off	Normal
HDD Online	Blue	Blinking	HDD is locating or RAID rebuilding
	Blue	Off	Normal

The detailed LED information on the rear view is shown below:

Table 2.6. Rear View LEDs

Type of LED	Color	Status	Function
Motherboard 1/2 Power	Green	On	Green for motherboard power on.
		Off	Off for motherboard is powered off.
Motherboard 1/2 Health	Red	On	On for critical event happens

Type of LED	Color	Status	Function
		Off	Off for motherboard works normally or not power up.
Motherboard 1/2 ID	Blue	On	Indicates the node is selected
		Off	Not selected

Table 2.7. LED Information of 1G NIC Port

Type of LED		Color	Status	Function
NIC 1/2	Link/Activity	Green	On	LAN link on
			Blinking	LAN link and access
			Off	No link
	Speed	Green	On	1Gbps connection
		Amber	On	100Mbps connection
		-	Off	No link

Table 2.8. LED Information of Management NIC Port

Type of LED		Color	Status	Function
NIC 1/2	Link/Activity	Green	On	LAN link on
			Blinking	LAN link and access
			Off	No link
	Speed	Green	On	100Mbps connection
			Off	10Mbps connection

Figure 2.5. Backplane LEDs

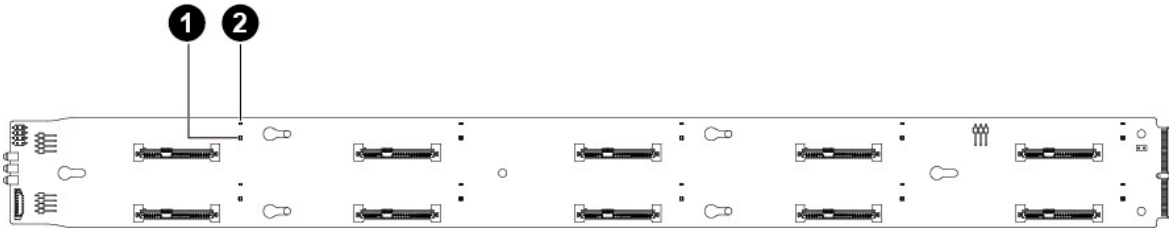


Table 2.9. Backplane LEDs

No.	Description
1	HDD Status LED
2	HDD Activity LED

The detailed LED information on the backplane is shown below:

Table 2.10. LED Information

Type of LED	Color	Status	Function
HDD Status	Red	On	HDD is failed

Type of LED	Color	Status	Function
	Red	Blinking	HDD RAID is rebuilding
	Red	Off	Normal
	Blue	Blinking	HDD is locating or RAID rebuilding
	Blue	Off	Normal
HDD Online	Green	On	HDD is installed
	Green	Bliking	HDD is accessing data (RAID optimal) or RAID is rebuilding
	-	Off	No HDD is installed

Chapter 3. Installing Hardware

3.1. Safety Measures

Always ask for assistance to move or lift the system.

Only perform troubleshooting as authorized by the product documentation, or as directed by a service and support team. Repairs not authorized by warranty may void the warranty and damage the system.

Always make sure to disconnect the system from the AC electrical source. Powering down the system DOES NOT ensure there is no electrical activity in the system.

Server components and circuit boards are easily damaged by discharges of static electricity. Working on servers that are connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid personal injury or damage to the server.

Always disconnect the server from the power outlet whenever you are working inside the server case.

Wear a grounded wrist strap. If none are available, discharge any personal static electricity by touching the bare metal chassis of the server case, or the bare metal body of any other grounded device.

Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Do not touch the components on the unless it is necessary to do so. Do not flex or stress circuit boards.

Leave all replacement components inside their static-proof packaging until you are ready to use them.

3.2. Top Cover

3.2.1. Removing a Top Cover

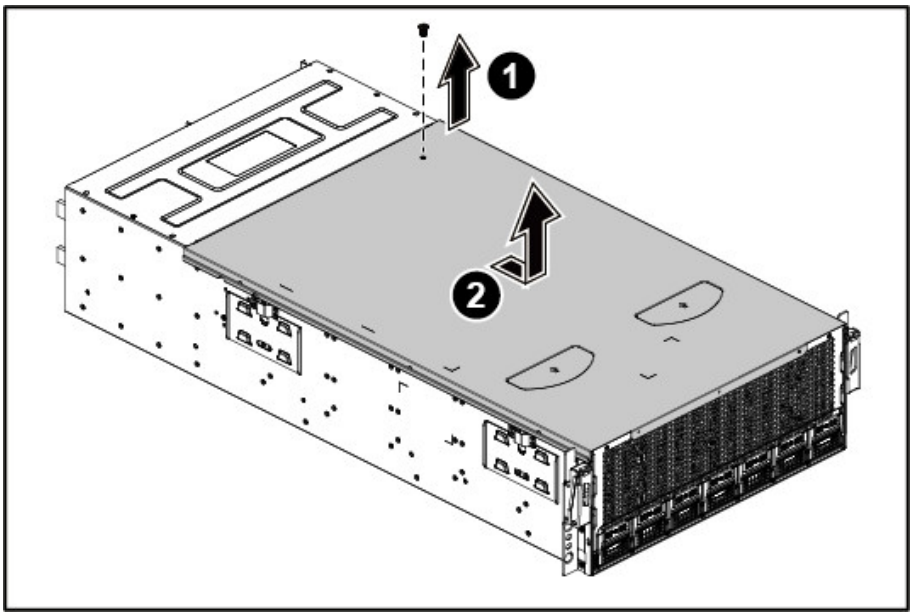
ENSURE ALL POWER IS DISCONNECTED FROM THE SYSTEM BEFORE PROCEEDING.

The server is a 4U form factor designed for easy assembly and disassembly, making the replacement of internal components very convenient.

1. Release the screw on the chassis cover.

2. Slide the front cover horizontally to the front and remove it along the direction of the arrow.

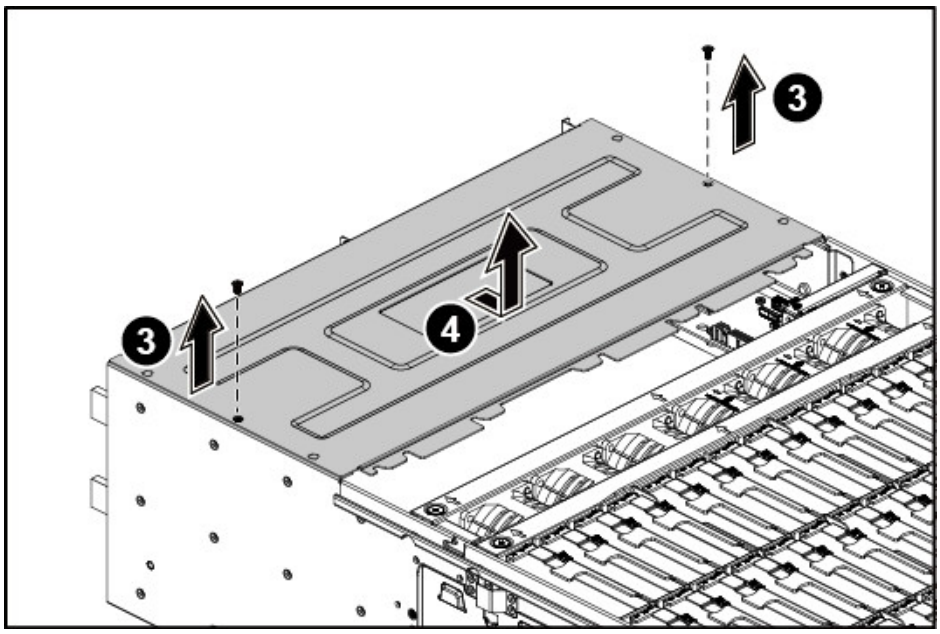
Figure 3.1. Removing the Top Front Chassis Cover



3. Loosen the screws on the top rear chassis cover.

4. Slide the rear cover horizontally to the front and remove it along the direction of the arrow.

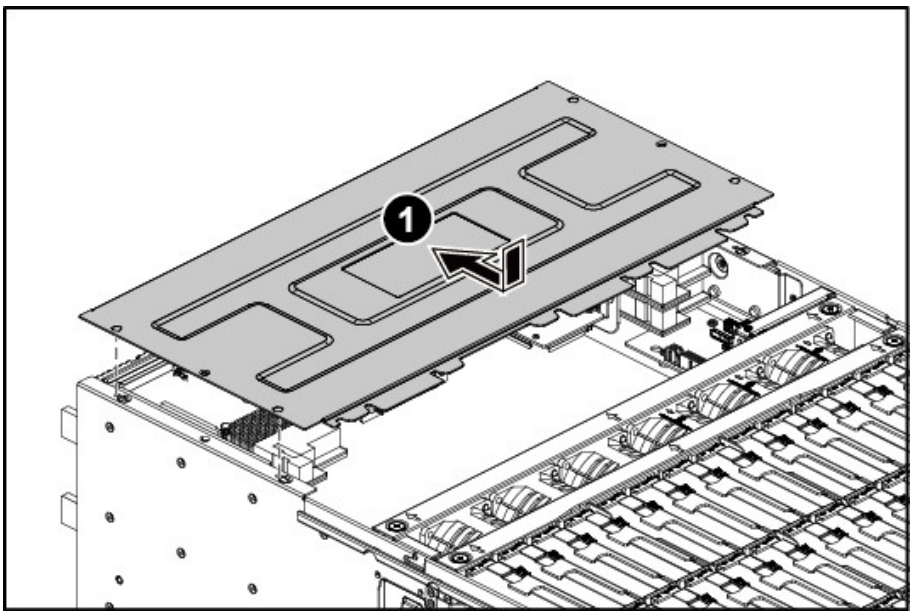
Figure 3.2. Removing the Top Rear Chassis Cover



3.2.2. Installing a Top Cover

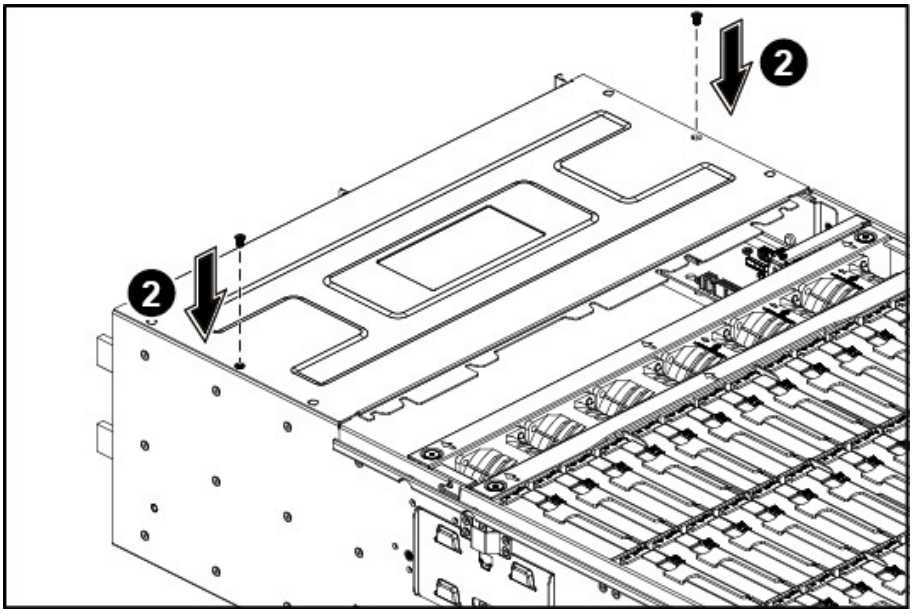
1. Locate the top rear chassis cover on the chassis as shown below and then slide it to the back until it is closed.

Figure 3.3. Sliding the Top Rear Chassis Cover to the Back



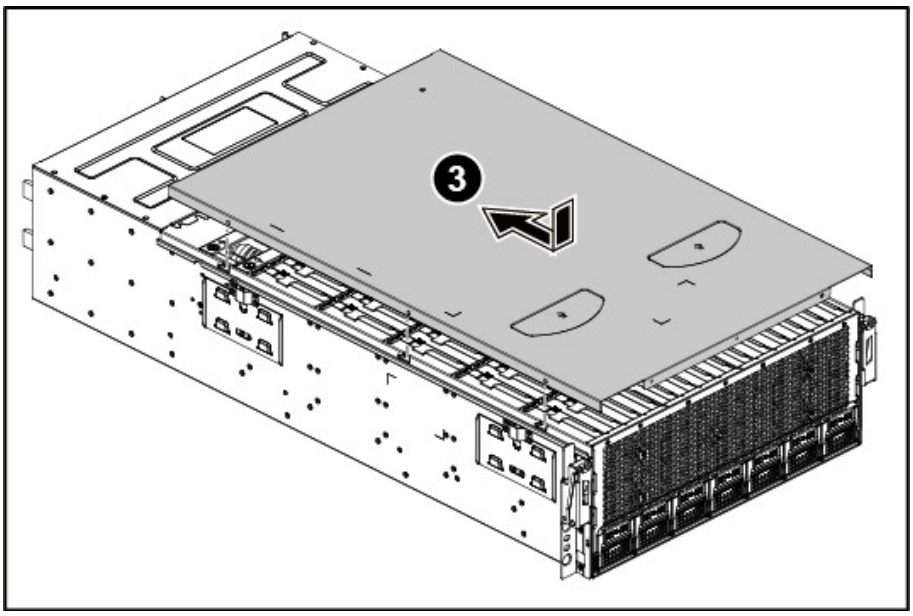
2. Secure the rear chassis cover with two screws.

Figure 3.4. Tightening the Screws of Rear Chassis Cover



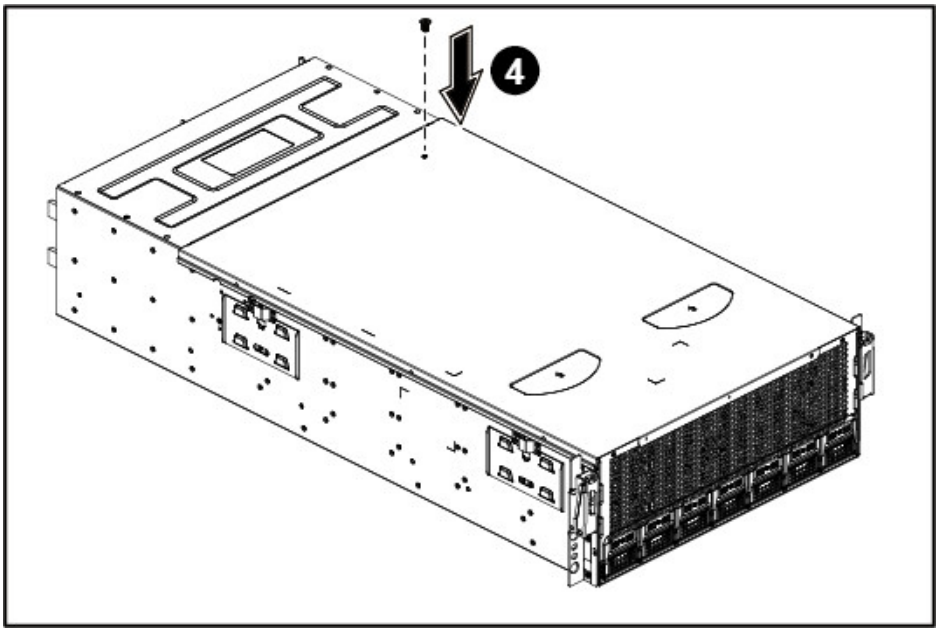
3. Locate the top front cover on the chassis as shown below and then slide it to the back until it is closed and connected with the rear chassis cover in place.

Figure 3.5. Sliding the Top Front Chassis Cover to the Back



4. Secure the front chassis cover with one screw.

Figure 3.6. Tightening the Screw of Front Chassis Cover



This system must be operated with the chassis cover installed to ensure proper cooling.

3.3. Power Supply Unit

This server is designed with four 1400W power supplies.

Partial redundancy is supported on design with a throttling feature to downgrade power consumption when a PSU is faulty or has been removed. A single faulty PSU can be replaced without system shut down.

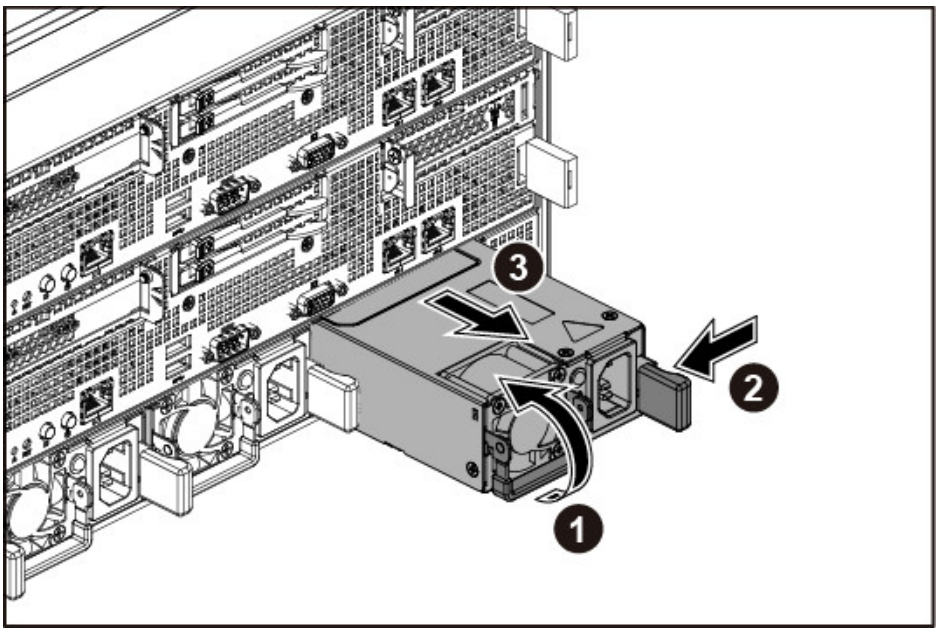
DISCONNECT THE POWER SUPPLY UNIT FROM THE POWER SOURCE BEFORE REMOVING PSU. FAILURE TO DO SO COULD RESULT IN DAMAGE TO THE EQUIPMENT OR PERSONAL INJURY.

The redundant power supply unit can be replaced without shutting down the system.

3.3.1. Removing a Power Supply Unit

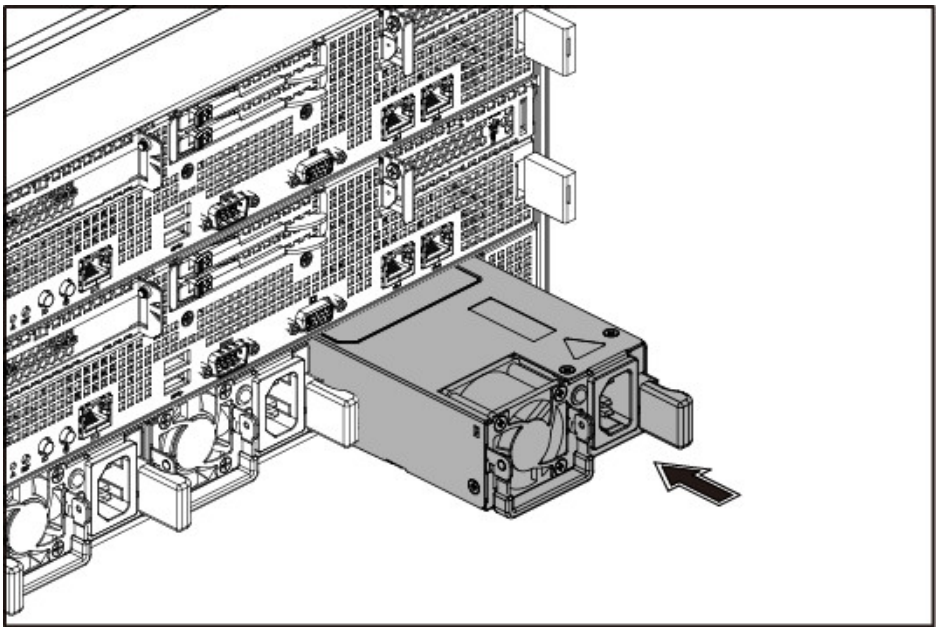
1. Pull up the handle.
2. Press the retaining clip on the right side of the power supply along the direction of the arrow.
3. At the same time, pull out the power supply. (The power supply takes considerable force to remove.)

Figure 3.7. Removing the Power Supply



3.3.2. Installing a Power Supply Unit

Figure 3.8. Installing a Power Supply Unit



Insert the replacement power supply firmly into the bay. The retaining clip should snap. Connect the AC power cord to the replacement power supply.

3.4. Hard Disk Drives

The server can support 70 x 3.5” hot-pluggable SATA/SAS HDDs.

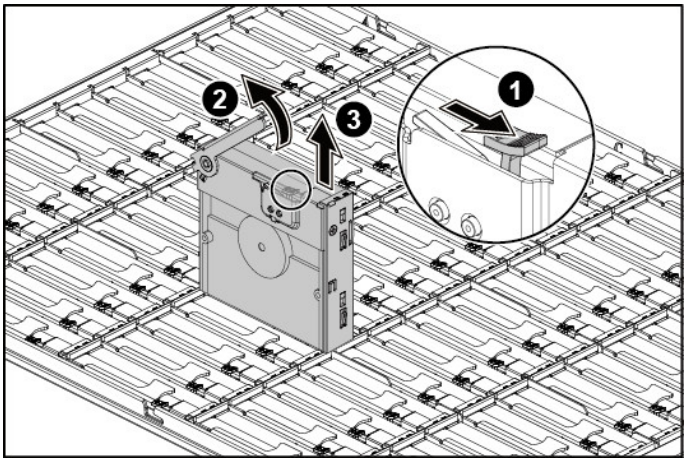
NOTE:

- Take note of the drive tray orientation before sliding it out.
- The tray will not fit back into the bay if inserted incorrectly.

3.4.1. Removing a 3.5” Hard Drive tray

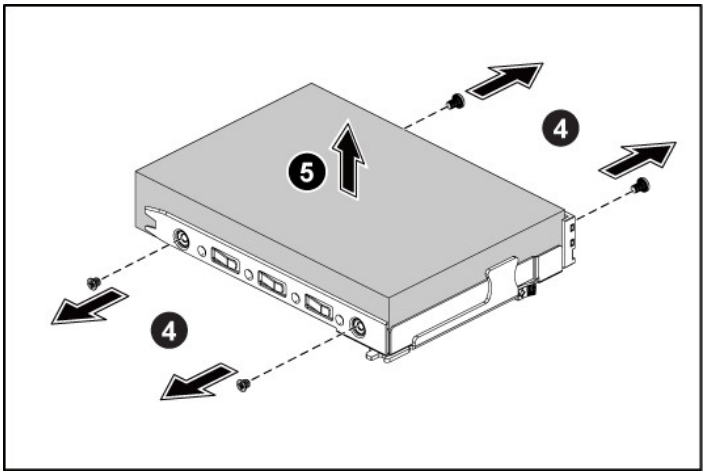
1. Push the release button.
2. Pull the lever open.
3. Slide the HDD assembly out of the HDD bay.

Figure 3.9. Removing the HDD Assembly



4. Loosen the four screws that secure the HDD.
5. Lift the HDD out of the HDD tray.

Figure 3.10. Removing the HDD

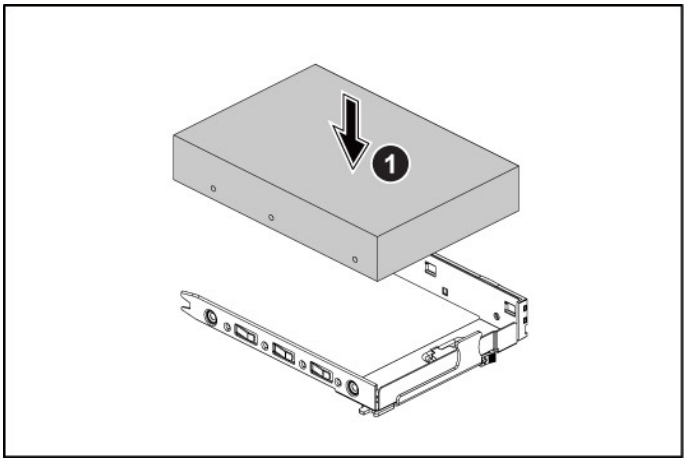


3.4.2. Installing a 3.5” Hard Drive tray

Do not force the tray handle closed. If resistance is encountered, check the hard drive is properly inserted and the hard drives on either side are properly inserted.

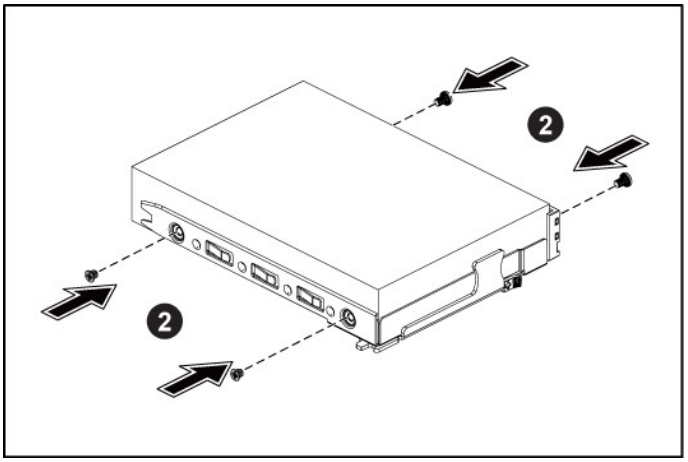
1. Place the HDD to the HDD tray.

Figure 3.11. Placing the HDD to the HDD Tray



2. Secure the HDD to the HDD tray with four screws.

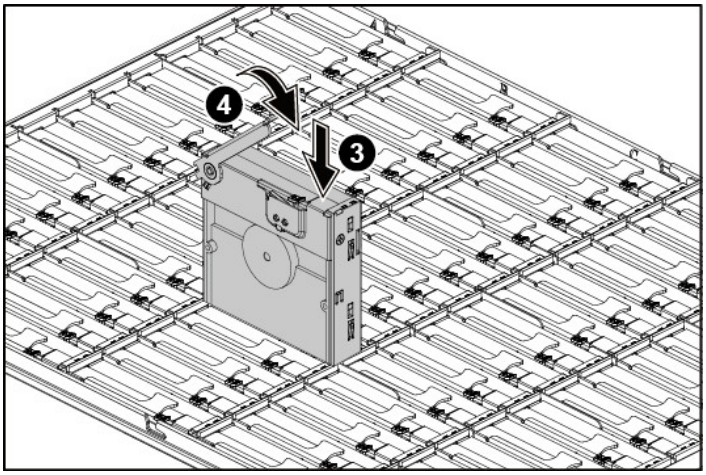
Figure 3.12. Fastening the Screws



3. Carefully insert the HDD assembly into the HDD bay with the lever lifted until it completely enters the HDD bay.

4. Push the lever back in place.

Figure 3.13. Installing the HDD Assembly



Make sure that the HDD is connected to the HDD connector on the backplane.

3.5. 3.5” SATA/SAS HDD Backplanes

Demos R430 M2 12G SAS 70-70 and 1-70 configuration systems support seven 3.5” SATA/SAS HDD backplanes, which support up to 70 x 3.5” SATA/SAS HDDs in the system.

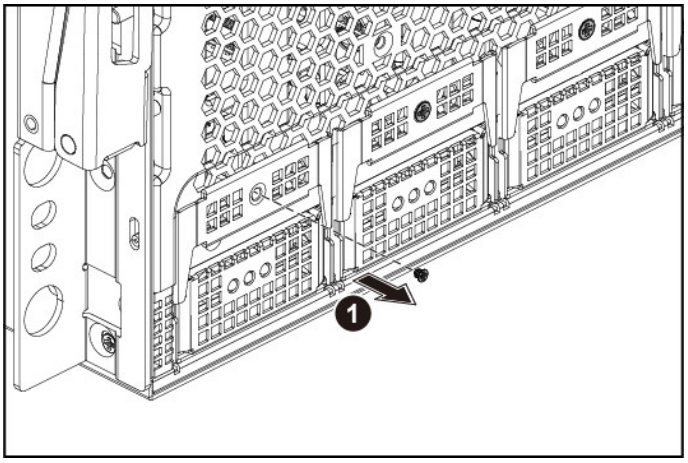
Before you remove or install the 3.5” SATA/SAS HDD bakcplane, please follow the steps below:

1. Make sure the server is not turned on or connected to AC power.
2. Remove the chassis cover. To remove the chassis cover, see Section 3.2, “Top Cover”.
3. Remove the HDDs. To remove the HDDs, see Section 3.4.1, “Removing a 3.5” Hard Drive tray”.
4. Disconnect all necessary cables.

3.5.1. To remove the backplane

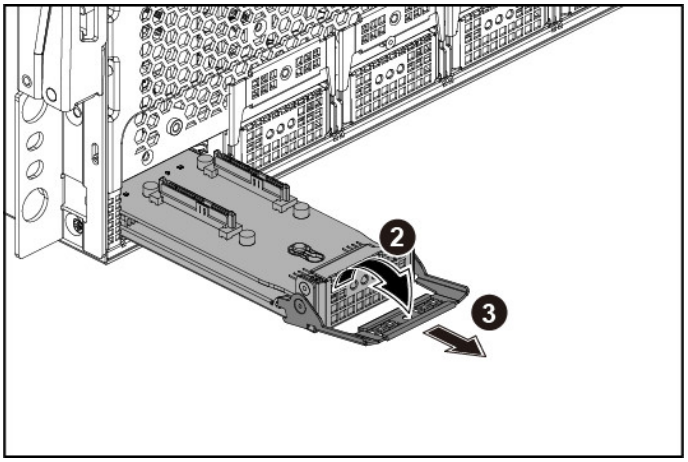
1. Remove the screw that secures the backplane assembly.

Figure 3.14. Loosening the Screw



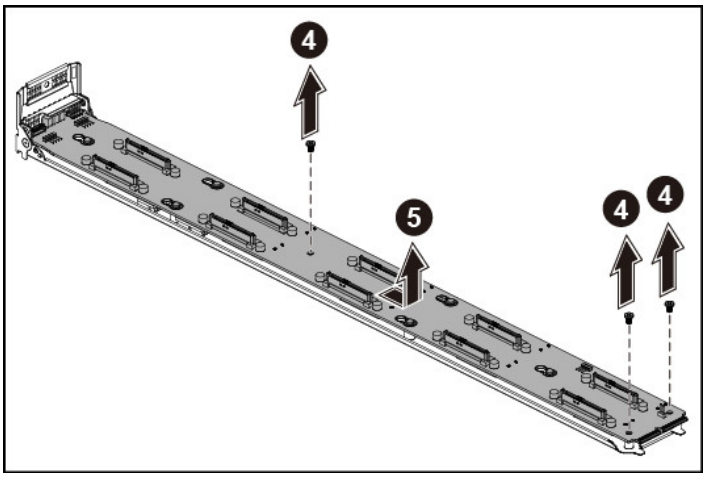
2. Pull down the backplane assembly handle.
3. Remove the backplane assembly out of the cage.

Figure 3.15. Removing the Backplane Assembly



4. Loosen the screws that secure the backplane.
5. Remove the backplane out of the tray.

Figure 3.16. Removing the Backplane



3.5.2. To install the backplane

Reverse the steps above to install the backplane.

3.6. Mainboard Modules

The multi-node server system can be populated with up to two nodes. Each motherboard module supports up to two Intel® E5-2600 v3/v4 series processors.

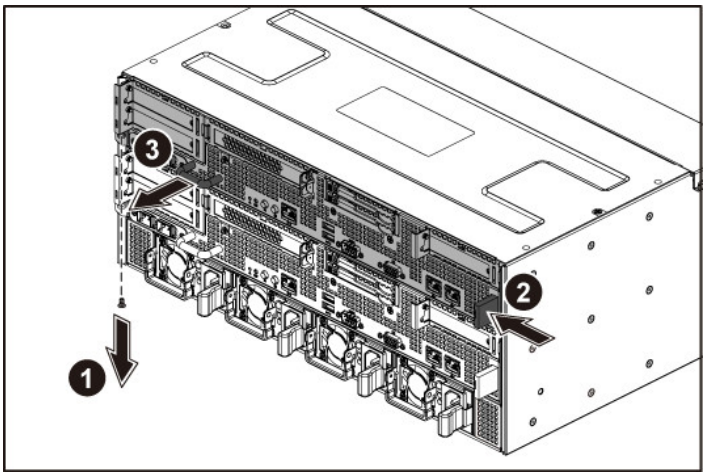
ATTENTION: Please make sure the top rear chassis cover is installed when removing or installing any motherboard node to prevent the docking board connectors on the interposer board from damage.

3.6.1. Removing a Mainboard Module

There are no restraining latches on the modules. When removing a module make sure to support the module from underneath as it is removed. Serious hazard warning.

1. Loosen the screw that secure the motherboard node
2. Press the retaining latch.
3. Slide the motherboard node of the chassis by using the handle.

Figure 3.17. Removing the Motherboard Node

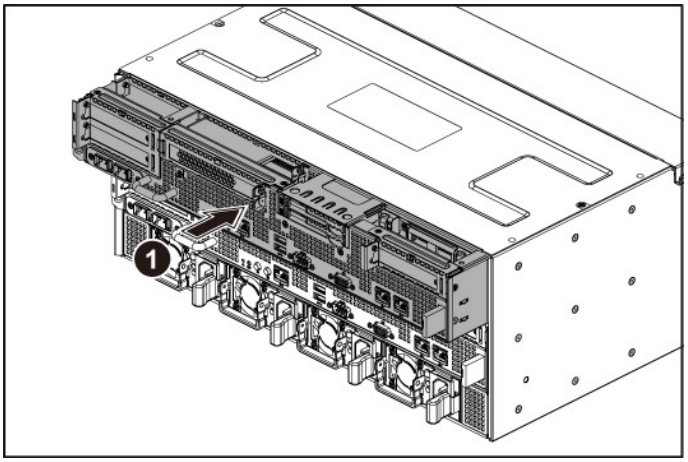


3.6.2. Installing a Mainboard Module

IF MAINBOARD MODULE IS NOT PROVIDED, A DUMMY MODULE MUST BE INSTALLED, TO ALLOW PROPER COOLING OF THE SYSTEM.

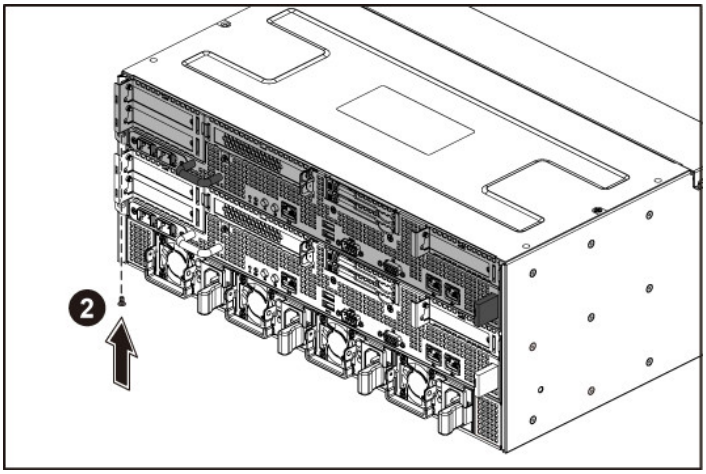
1. Push the node into the chassis until it’s completely seated in place.

Figure 3.18. Installing a Mainboard Module



2. Secure the screw.

Figure 3.19. Securing the Screw

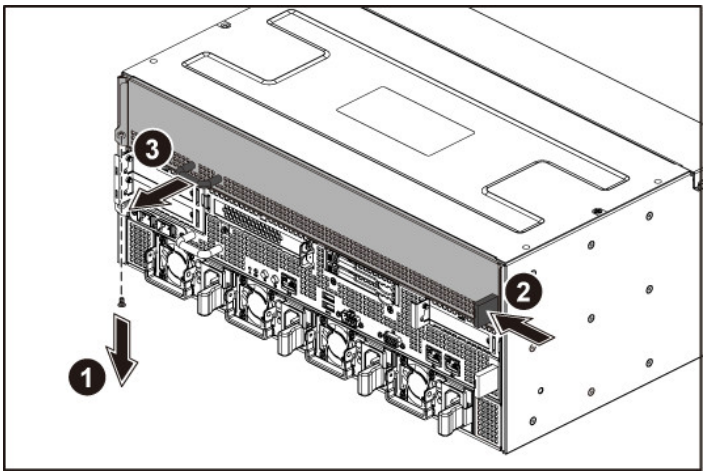


3.7. Dummy Motherboard Tray

3.7.1. To remove the dummy motherboard tray

1. Loosen the screw that secure the dummy motherboard tray
2. Push the dummy motherboard tray into the chassis until it's completely seated in place.
3. Press the retaining latch.
4. Slide the motherboard node of the chassis by using the handle

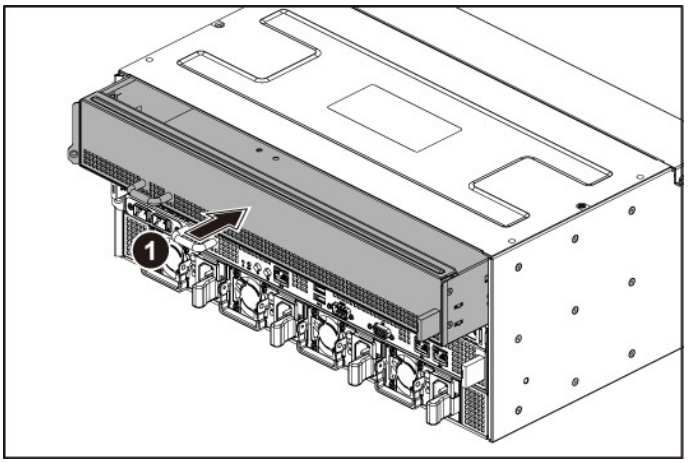
Figure 3.20. Removing the Dummy Motherboard Tray



3.7.2. To install the dummy motherboard tray

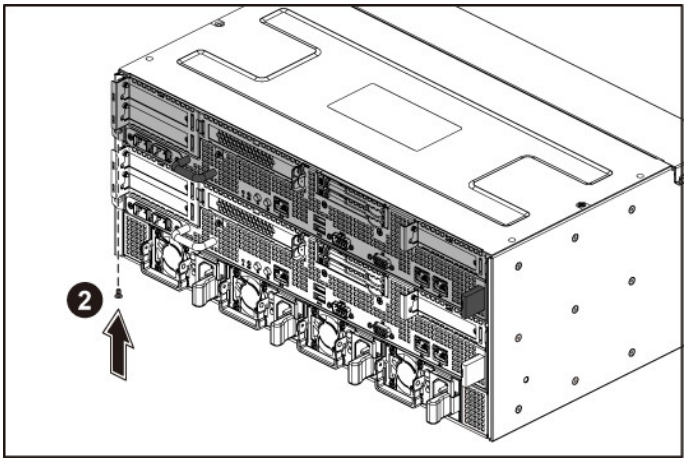
1. Push the dummy motherboard tray into the chassis until it's completely seated in place.

Figure 3.21. Installing the Dummy Motherboard Tray



2. Secure the screw.

Figure 3.22. Securing the Screw



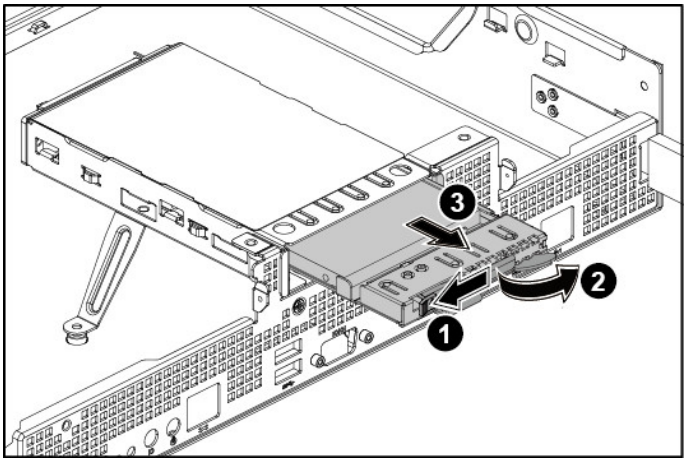
3.8. 7mm SSD

- Take note of the drive tray orientation before sliding it out.
- The tray will not fit back into the bay if inserted incorrectly.

3.8.1. To remove a SSD

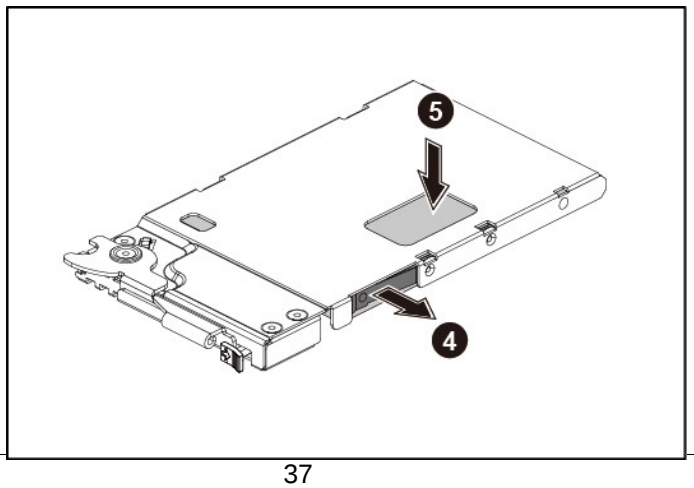
1. Push the release button.
2. Pull the lever open.
3. Slide the SSD assembly out of the SSD bay.

Figure 3.23. Sliding out the SSD Assembly



4. Pull the spring outwards to loosen the SSD from the SSD tray.
5. Push the SSD out of the SSD tray.

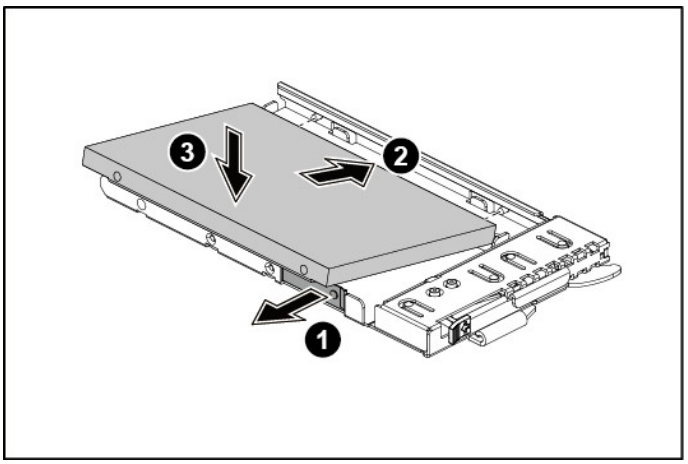
Figure 3.24. Removing the SSD



3.8.2. To install a SSD

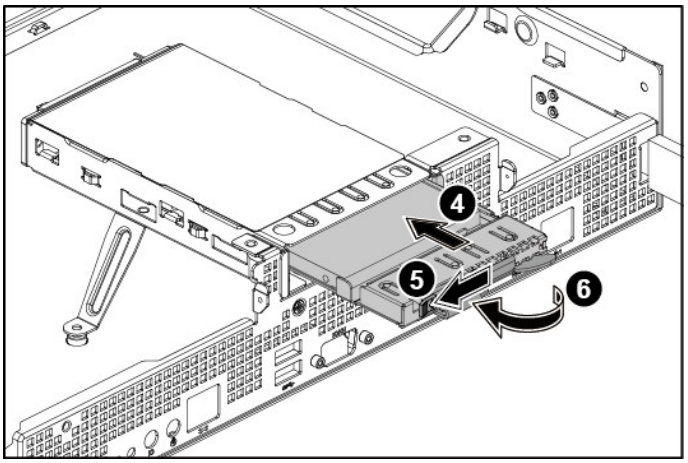
1. Pull the spring outwards.
2. Meanwhile, place the SSD with a slight inclination into SSD tray as shown below.
3. Push the SSD into the SSD tray right in place.

Figure 3.25. Placing the SSD



4. Push the SSD assembly into the SSD cage with the lever open.
5. Push the release button.
6. Close the lever back.

Figure 3.26. Installing the SSD Assembly



Make sure that the SSD is connected to the SSD connector on the SSD backplane.

3.8.3. To remove the SSD cage

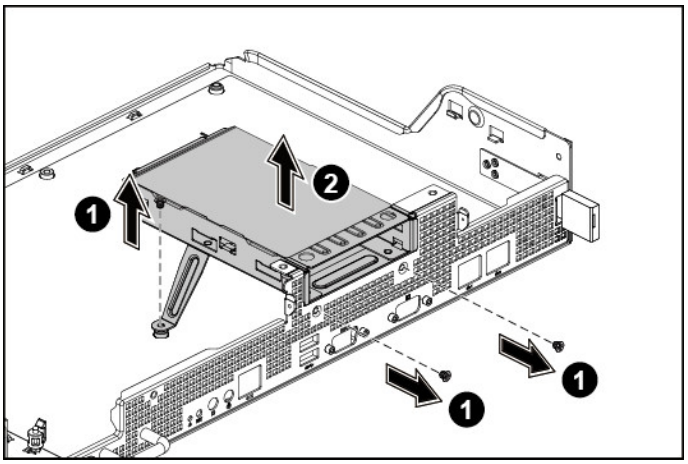
Before you remove or install the SSD Cage, please follow the steps below:

1. Make sure the server is not turned on or connected to AC power.
2. Remove the motherboard node. To remove the motherboard node, see Section 3.6.1, “Removing a Mainboard Module”
3. Remove the SSDs. To remove the SSDs, see Section 3.8.1, “To remove a SSD”
4. Disconnect all necessary cables.

To remove the SSD cage:

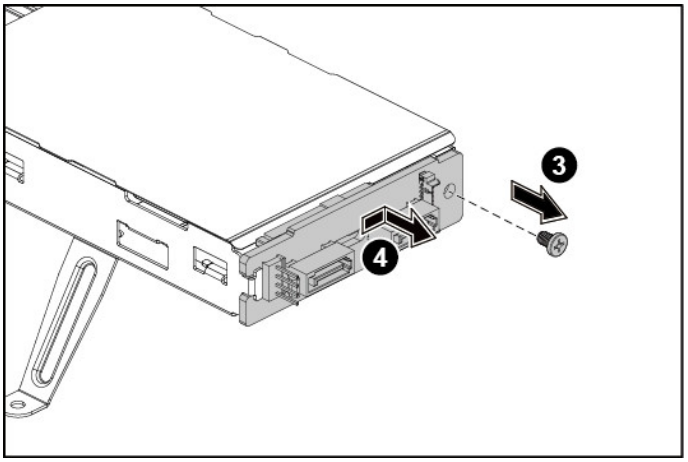
1. Loosen the screw that secures the SSD cage.
2. Remove the SSD cage out of the motherboard node.

Figure 3.27. Removing the SSD Cage



3. Loosen the screw that secures the SSD backplane.
4. Remove the SSD backplane.

Figure 3.28. Removing the SSD Backplane



3.8.4. To install the SSD cage

Reverse the steps above to install the SSD cage.

3.9. OCP Card

The server supports two types of OCP cards, one is with two 1G NIC Ports; and the other is with two 10G NIC ports. Since they share the same procedures, here only takes the OCP card with 10G NIC ports as an example for your reference.

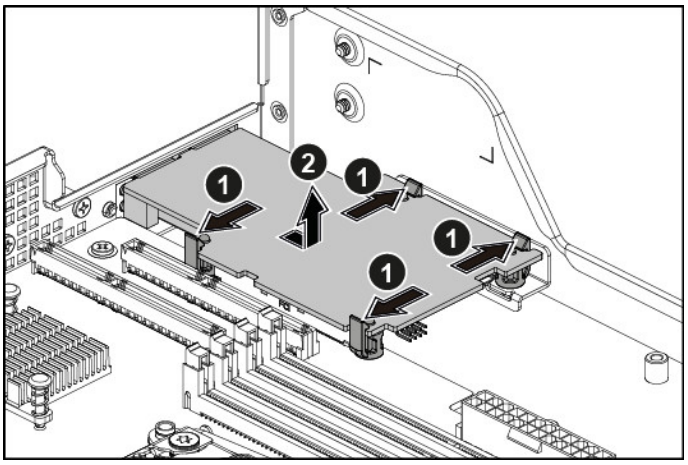
Before you remove or install the HBA card, please follow the steps below:

1. Make sure the server is not turned on or connected to AC power.
2. Remove the chassis cover. To remove the chassis cover, see Section 3.2, “Top Cover”
3. Remove the node. To remove the node, see Section 3.6.1, “Removing a Mainboard Module”
4. Disconnect all necessary cables.

3.9.1. To remove the OCP card

1. Open the locking clips that secure the OCP card.
2. Remove the OCP card out of the chassis.

Figure 3.29. Removing the OCP Card



3.9.2. To install the OCP card

Reverse the steps above to install the OCP card.

3.10. Fan Duct

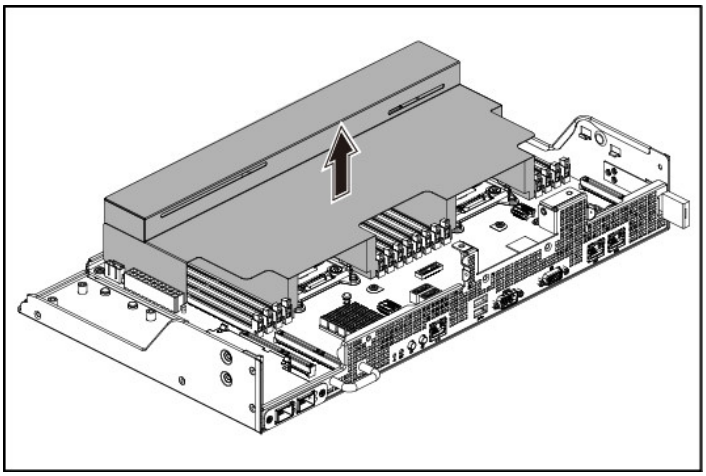
Before you remove or install the fan duct, please follow the steps below:

1. Make sure the server is not turned on or connected to AC power.
2. Remove the chassis cover. To remove the chassis cover, see Section 3.2, “Top Cover”
3. Remove the node. To remove the node, see Section 3.6.1, “Removing a Mainboard Module”
4. Disconnect all necessary cables.

3.10.1. To remove the fan duct

Lift up the fan ducts to remove them from the motherboard.

Figure 3.30. Removing the Fan Ducts



3.10.2. To install the fan duct

Reverse the steps above to install the fan duct.

3.11. Riser Cards

The server supports three riser cards, which are left, middle and right riser cards as follows:

- Left riser card: 2 x PCI-E x8 slots
- Middle riser card: 1 x PCI-E x16 slot
- Right riser card: 1 x PCI-E x16 slot

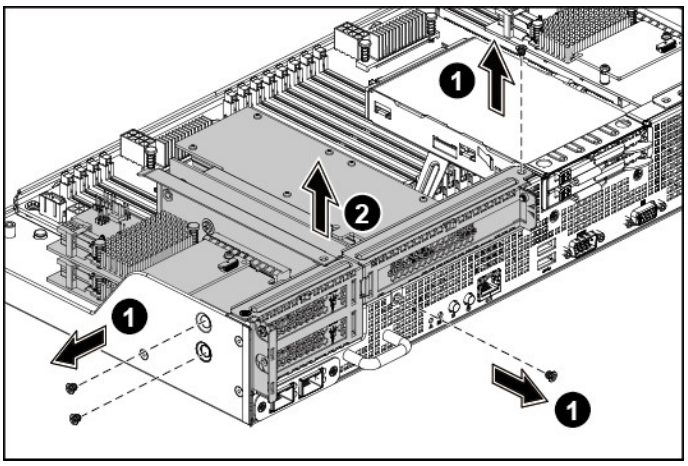
Before you remove or install the riser cards, please follow the steps below:

1. Make sure the server is not turned on or connected to AC power.
2. Remove the chassis cover. To remove the chassis cover, see Section 3.2, “Top Cover”
3. Remove the node. To remove the node, see Section 3.6.1, “Removing a Mainboard Module”
4. Disconnect all necessary cables.

3.11.1. To remove the left/middle riser cards

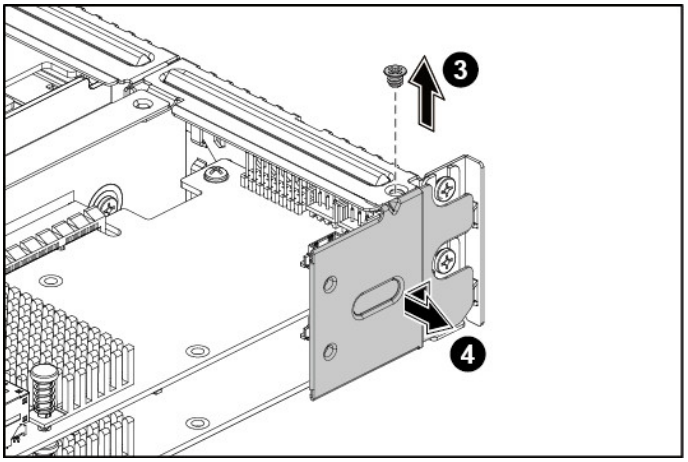
1. Loosen the screws that secure the expansion-card assembly.
2. Remove the expansion-card assembly out of the motherboard node.

Figure 3.31. Removing the Expansion-Card Assembly



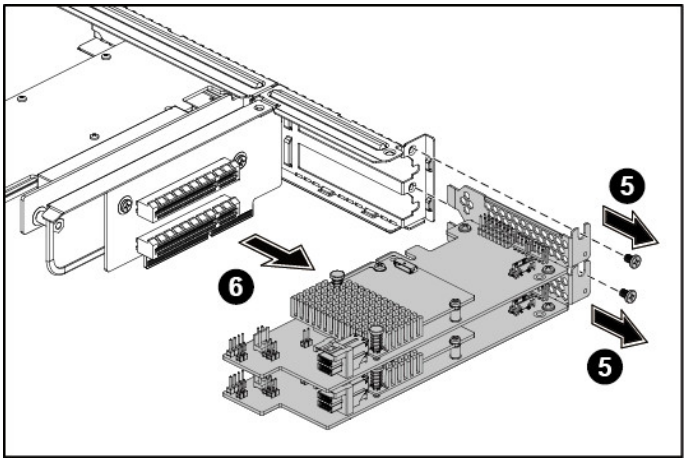
3. Loosen the screw that secures the locking bracket with the expansion-card assembly.
4. Remove the locking bracket along the direction of the arrow.

Figure 3.32. Removing the Locking Bracket



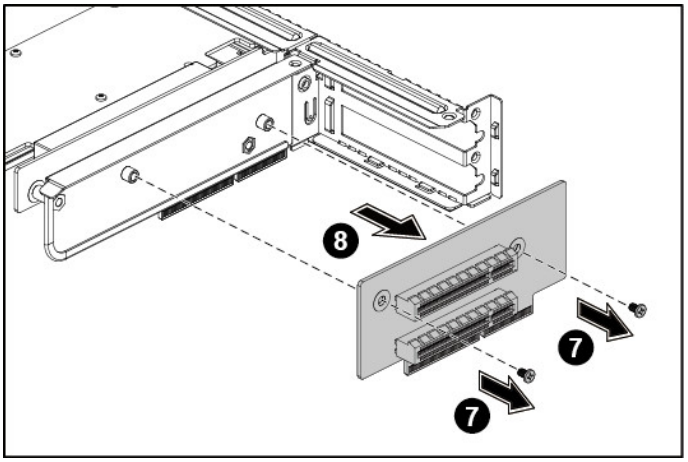
5. Loosen the screws that secure the left expansion cards.
6. Remove the left expansion cards.

Figure 3.33. Removing the Left Expansion Cards



7. Loosen the screws that secure the left riser card.
8. Remove the left riser card.

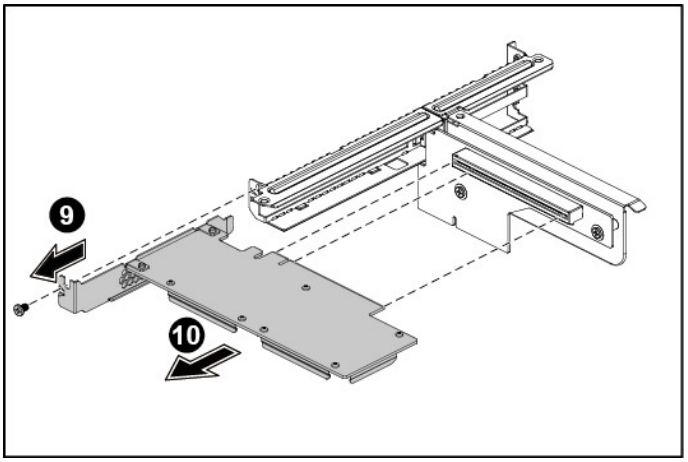
Figure 3.34. Removing the Left Riser Card



9. Loosen the screw that secures the middle expansion card.

10. Remove the middle expansion card.

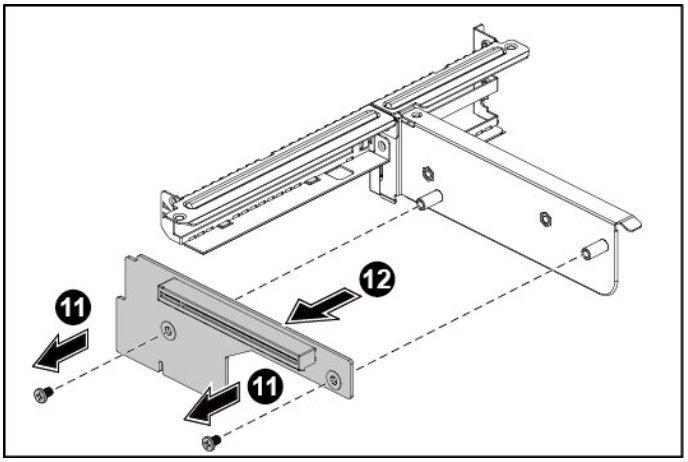
Figure 3.35. Removing the Middle Expansion Card



11. Loosen the screw that secures the middle riser card.

12. Remove the middle riser card.

Figure 3.36. Removing the Middle Riser Card



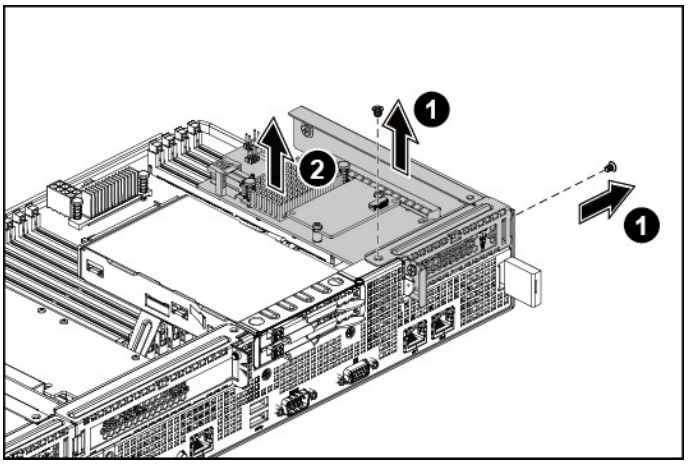
3.11.2. To install the left/middle riser card

Reverse the steps above to install the left/middle riser card.

3.11.3. To remove the right riser card

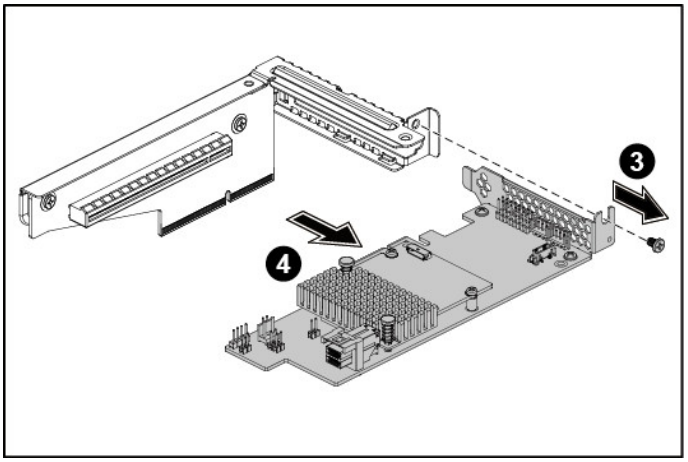
1. Loosen the screws that secure the expansion-card assembly.
2. Remove the expansion-card assembly out of the motherboard node.

Figure 3.37. Removing the Expansion-Card Assembly



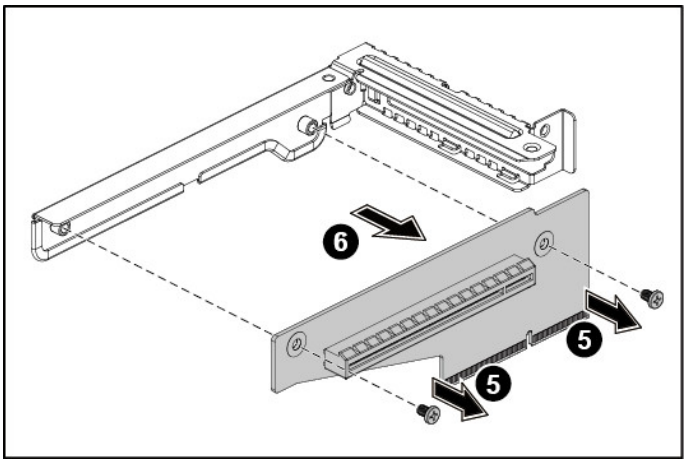
3. Loosen the screws that secure the right expansion card.
4. Remove the expansion card.

Figure 3.38. Removing the Right Expansion Card



5. Loosen the screws that secure the right riser card.
6. Remove the right riser card.

Figure 3.39. Removing the Right Riser Card



3.12. Motherboard

The server can support two motherboards.

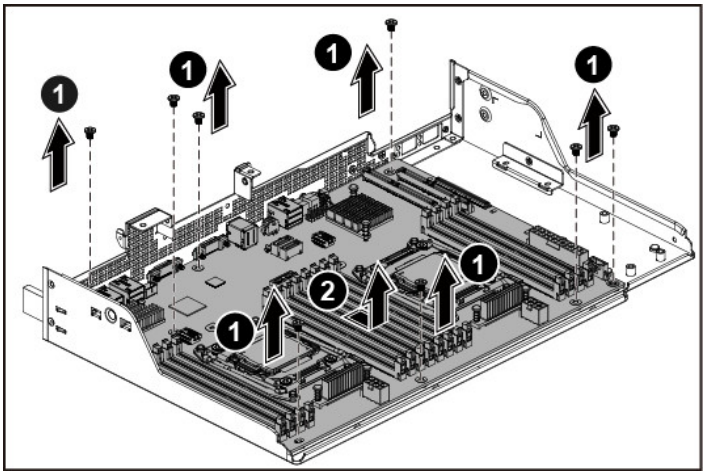
Before you remove or install the motherboard, please follow the steps below:

1. Make sure the server is not turned on or connected to AC power.
2. Remove the motherboard node. To remove the motherboard node, see Section 3.6.1, “Removing a Mainboard Module”.
3. Remove the fan duct. To remove the fan duct, see Section 3.10, “Fan Duct”.
4. Remove the left/middle expansion-card assembly. To remove the left/middle expansion-card assembly, see Section 3.11.1, “To remove the left/middle riser cards”.
5. Remove the right expansion-card assembly. To remove the right expansion-card assembly, see Section 3.11.3, “To remove the right riser card”.
6. Remove the OCP card. To remove the OCP card, see Section 3.9.1, “To remove the OCP card”.
7. Disconnect all necessary cables.

3.12.1. To remove the motherboard

Loosen the eight screws, and then slide the motherboard back, up and out of the assembly.

Figure 3.40. Removing the Motherboard



3.12.2. To install the motherboard

Reverse the steps above to install the motherboard.

3.13. Heat Sink

3.13.1. To remove the heat sink

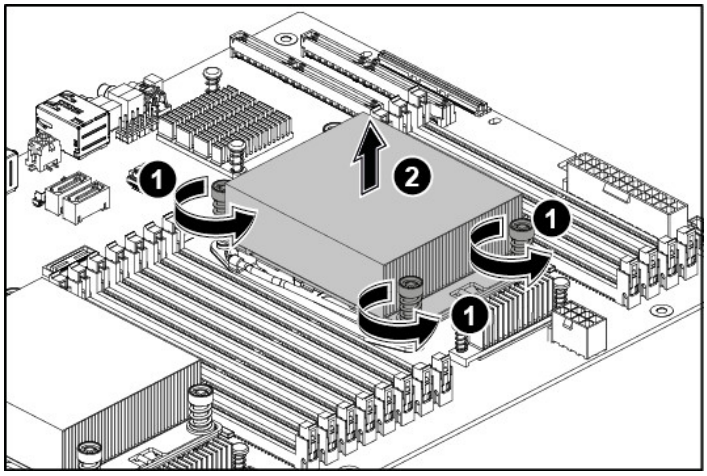
Before you remove or install the heat sink, please follow the steps below:

1. Make sure the server is not turned on or connected to AC power.
2. Remove the node. To remove the node, please see Section 3.6.1, “Removing a Mainboard Module”.
3. Remove the fan duct. To remove the fan duct, please see Section 3.10, “Fan Duct”.
4. Disconnect all necessary cables.

Steps:

1. Loosen the four securing screws.
2. Lift the heat sink up from the installed processor

Figure 3.41. Removing the Heat Sink



3.13.2. To install the heat sink

Reverse the steps above to install the heat sink.

Before you put the heat sink on top of the installed processor, please do not forget to check if the grease is complete on bottom of the heat sink.

3.14. Processor

This motherboard supports Intel® Xeon E5-26xx v3/v4 series processors.

3.14.1. To remove a processor

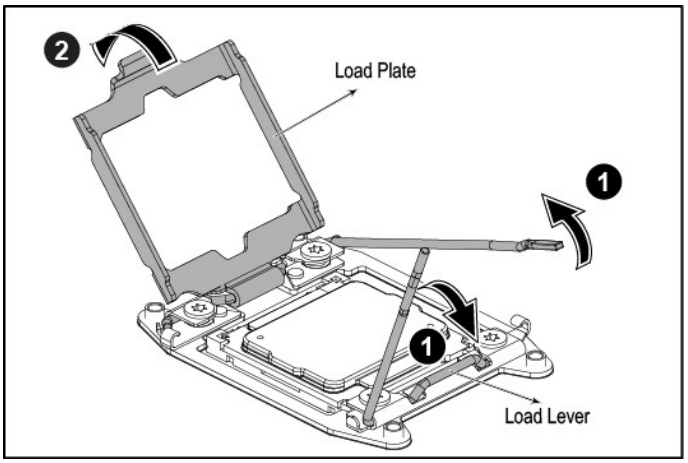
Before you remove or install the processor, please follow the steps below:

1. Make sure the server is not turned on or connected to AC power.
2. Remove the node. To remove the node, please see Section 3.6.1, “Removing a Mainboard Module”.
3. Remove the heat sink. To remove the heat sink, please see Section 3.13, “Heat Sink”.

Steps:

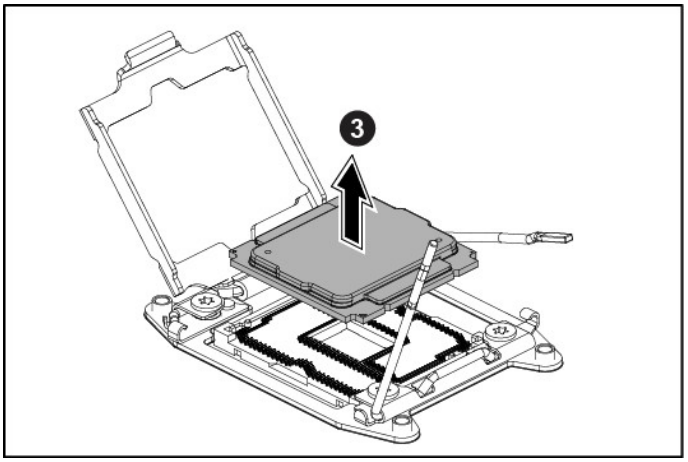
1. Unlock the two load levers and lift them up.
2. Open the load plate.

Figure 3.42. Opening the Load Plate



3. Lift the processor out of the socket.

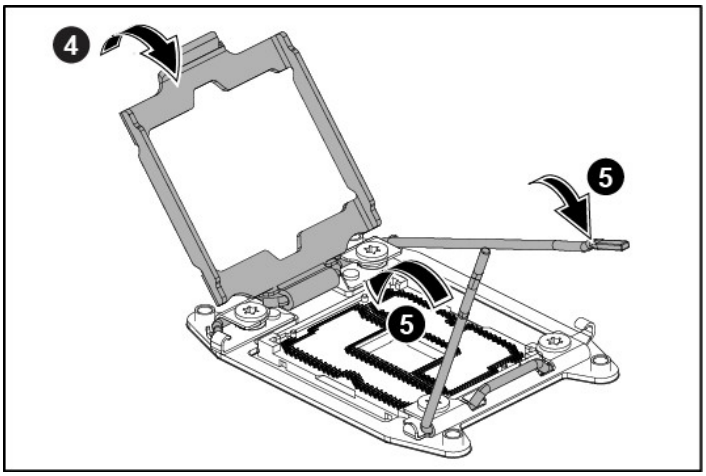
Figure 3.43. Lifting the Processor out of the Socket



4. Close the load plate.

5. Lock the load lever.

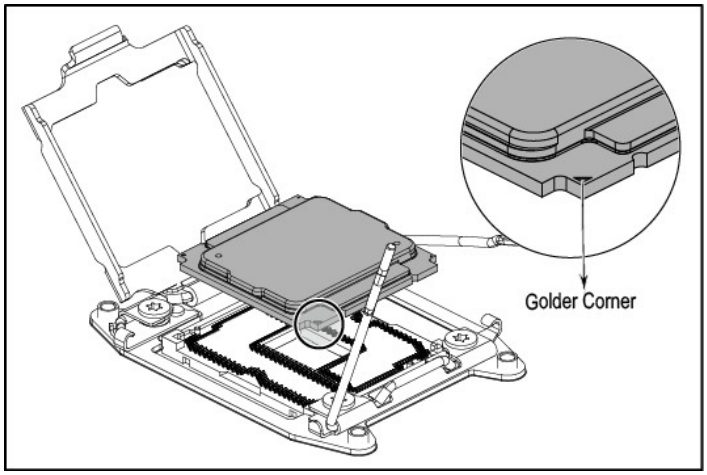
Figure 3.44. Closing the Load Plate



3.14.2. To install a processor

Reverse the steps above to install the processor. However, when inserting the processor into the socket, make sure that the processor is installed following the fool-proof design as the picture shows:

Figure 3.45. Placing the Processor



When the processor is in place, press it firmly on the socket while you push down the socket lever to secure the processor. The lever clicks on the socket indicating that it is locked.

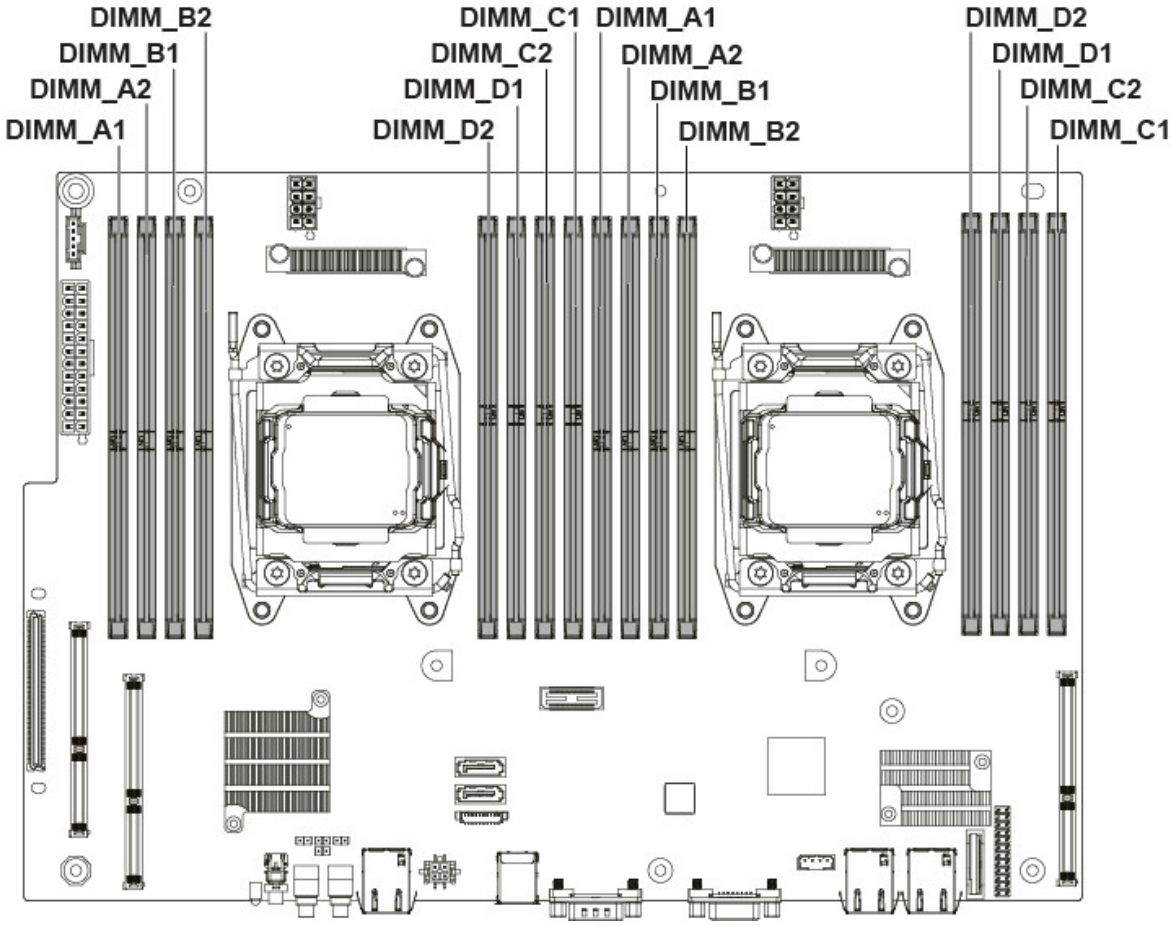
The processor fits only in one orientation. Do not force the processor into the socket to avoid bending the pins and damaging the processor. If the processor does not fit completely, check its orientation or check for bent pins.

3.15. Memory

This motherboard supports 16 DDR4 2133/2400 MT/s DIMMs, RDIMMs, and LRDIMMs. Each processor supports four DDR4 channels.

The DIMM sequence of sixteen DIMM sockets is respectively shown below.

Figure 3.46. DIMM Socket Location



3.15.1. DDR4 3 slots per channel (SPC) DIMM population configuration

All allowed DIMM population configration for three slots per channel designs are shown in the table below:

1. Three slots per channel RDIMM population configuration within a channel

Configuration number	POR speed	DIMM2	DIMM1	DIMM0
1	DDR4-1866, 1600	Empty	Empty	Single-rank

Configuration number	POR speed	DIMM2	DIMM1	DIMM0
2	DDR4-1866, 1600	Empty	Empty	Dual-rank
3	DDR4-1866, 1600	Empty	Single-rank	Single-rank
4	DDR4-1866, 1600	Empty	Single-rank	Dual-rank
5	DDR4-1866, 1600	Empty	Dual-rank	Dual-rank
6	DDR4-1333	Single-rank	Single-rank	Single-rank
7	DDR4-1333	Single-rank	Single-rank	Dual-rank
8	DDR4-1333	Single-rank	Dual-rank	Dual-rank
9	DDR4-1333	Dual-rank	Dual-rank	Dual-rank

1. Three slots per channel LR-DIMM population configuration within a channel

Configuration number	POR speed	DIMM2	DIMM1	DIMM0
1	DDR4-1866, 1600	Empty	Empty	Quad-rank+
2	DDR4-1866, 1600	Empty	Quad-rank+	Quad-rank+
3	DDR4-1600, 1333	Quad-rank+	Quad-rank+	Quad-rank+

3.15.2. DDR4 2 slots per channel (SPC) DIMM population configuration

All allowed DIMM population configration for two slots per channel designs are shown in the table below:

1. Two slots per channel RDIMM population configuration within a channel

Configuration number	POR speed	DIMM1	DIMM0
1	DDR4-2133, 1866, 1600	Empty	Single-rank
2	DDR4-2133, 1866, 1600	Empty	Dual-rank
3	DDR4-1866, 1600	Single-rank	Single-rank
4	DDR4-1866, 1600	Single-rank	Dual-rank
5	DDR4-1866, 1600	Dual-rank	Dual-rank

1. Two slots per channel LR-DIMM population configuration within a channel

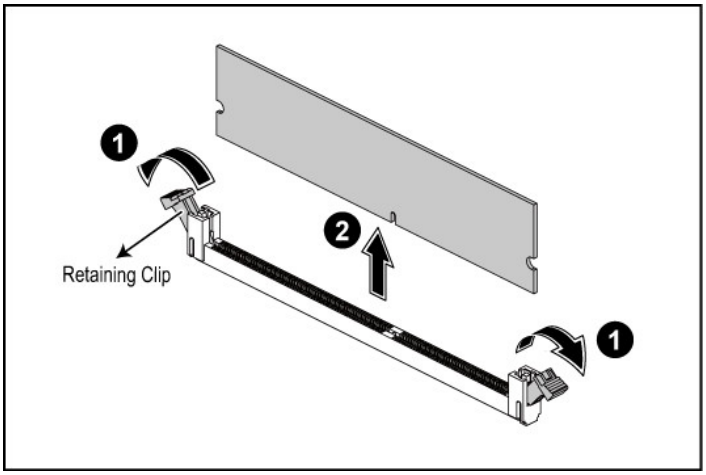
Configuration number	POR speed	DIMM1	DIMM0
1	DDR4-2133, 1866, 1600	Empty	Quad-rank+
2	DDR4-1866, 1600	Quad-rank+	Quad-rank+

3.15.3. To remove a DIMM

1. Unlock a DIMM socket by pressing the retaining clips outward. This action releases the module and partially lifts it out of the socket.

2. Lift out the DIMM.

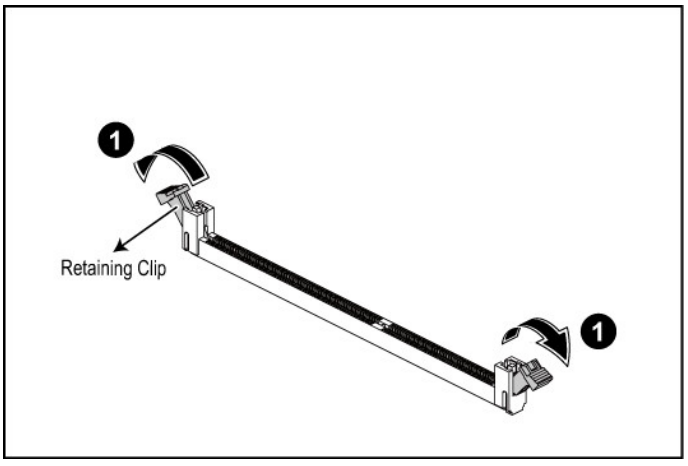
Figure 3.47. Lifting the DIMM out of the Socket



3.15.4. To install a DIMM

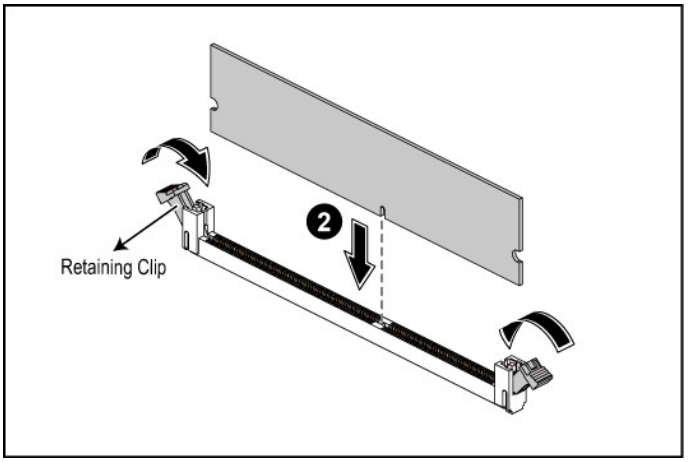
1. Unlock a DIMM socket by pressing the retaining clips outward.

Figure 3.48. Pressing the Retaining Clips Outward



2. Align the notch on the DIMM to the break on the socket. Carefully insert the DIMM into the socket until the retaining clips snap back in place.

Figure 3.49. Inserting the DIMM into the Socket

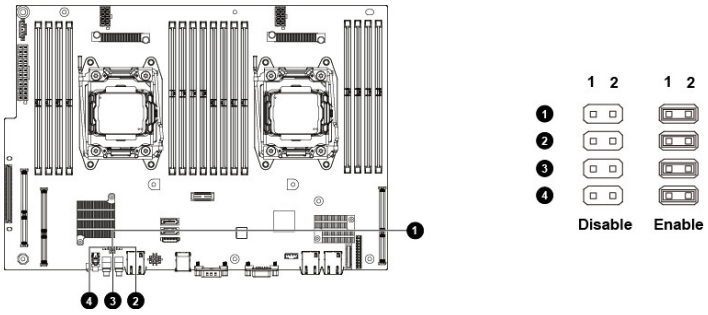


DIMMs fit in only one direction. DO NOT force a DIMM into the socket to avoid damaging the DIMM.

3.16. System Jumper Settings

The location of jumpers on the motherboard is shown below#

Figure 3.50. System Jumper Settings



Item	Functions	Off	On
1	BIOS Recovery	*Disabled	Enabled
2	Password Reset	*Disabled	Enabled
3	ME FW Recovery	*Disabled	Enabled
4	CMOS Clear	*Disabled	Enabled

The * in the table of system configuration jumpers describes the default status.

3.17. Docking Board

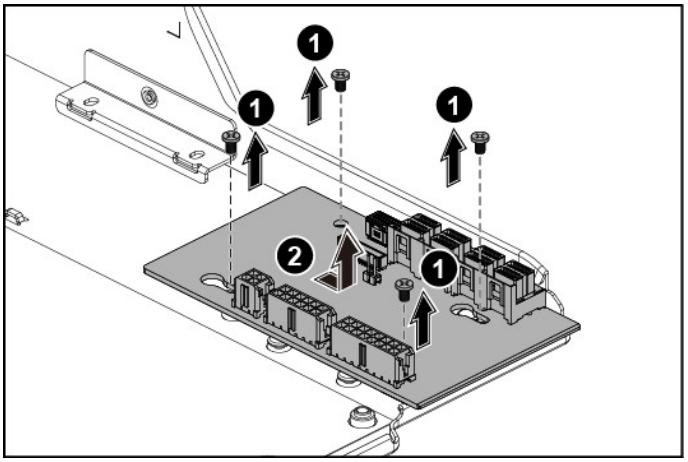
Before you remove or install the docking board, please follow the steps below:

1. Make sure the server is not turned on or connected to the AC power.
2. Remove the motherboard node. To remove the motherboard node, see Section 3.6.1, “Removing a Mainboard Module”
3. Disconnect all the necessary cables.

3.18. To remove the docking board

1. Loosen the screws that secure the docking board.
2. Remove the docking board out of the motherboard node along the direction of the arrow..

Figure 3.51. Removing the Docking Board



3.18.1. To install the docking board

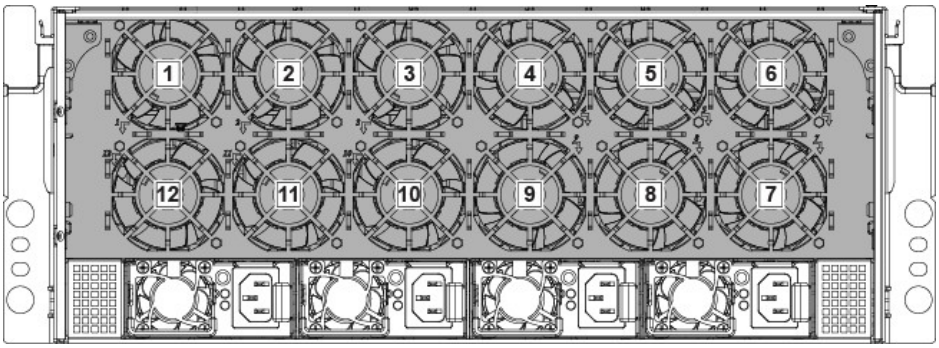
Reverse the steps above to install the docking board.

3.19. System Fans

Subdividing the motherboard area and the backplane area is a metal cage that holds the system fans. This server contains 12 system fans which are located inside the chassis. These system fans maintain the ideal temperature for the motherboards, backplanes and disk drives.

The sequence of system fans is shown below for your reference:

Figure 3.52. System Fan Sequence



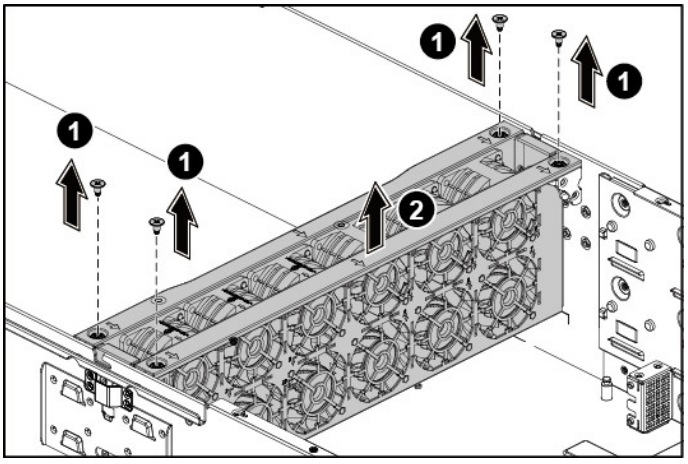
Before you remove or install the system fans, please follow the steps below:

1. Make sure the server is not turned on or connected to the AC power.
2. Remove the chassis cover. To remove the chassis cover, see Section 3.2, “Top Cover”
3. Disconnect all the necessary cables.

3.19.1. To remove the system fans

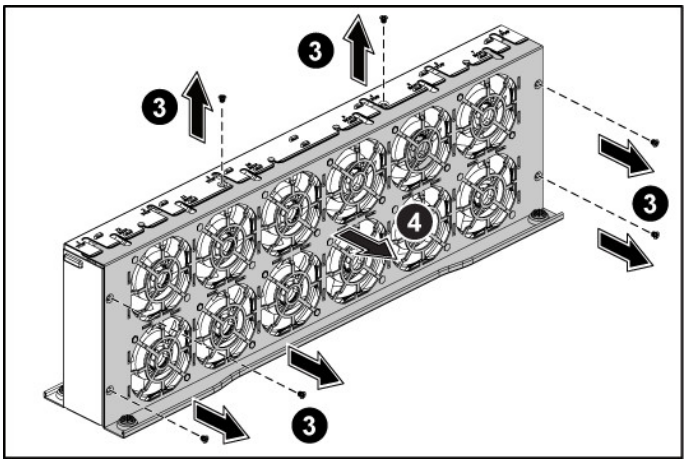
1. Loosen the screws that secure the system fan cage.
2. Remove the system fan cage out of the chassis along the direction of the arrow.

Figure 3.53. Removing the System Fan Cage



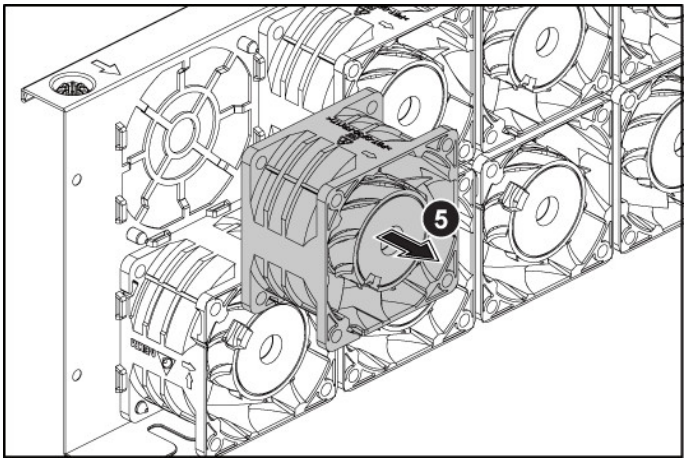
3. Loosen the screws that secure the back cover.
4. Remove the back cover out of the system fan cage.

Figure 3.54. Removing the Back Cover



5. Remove the single fan from the system fan cage.

Figure 3.55. Removing the System Fan



3.19.2. To install the system fans

Reverse the steps above to install the system fans.

When installing the system fan cage into the chassis, the arrows on the system fan cage must point to the direction of power supplies.

When installing the system fans, recommend to install them in the order of system fan 1 and system fan 12 from left to right.

3.20. Interposer Board

The system supports an interposer board seated on the middle plane and connected to the two docking boards.

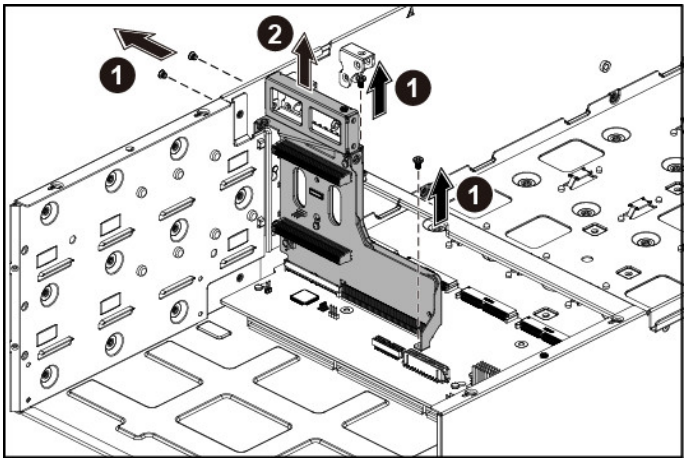
Before you remove or install the interposer board, please follow the steps below:

1. Make sure the server is not turned on or connected to the AC power.
2. Remove the chassis cover. To remove the chassis cover, see Section 3.2, “Top Cover”
3. Remove the motherboard node. To remove the motherboard node, see Section 3.6.1, “Removing a Mainboard Module”
4. Disconnect all the necessary cables.

3.20.1. To remove the interposer board

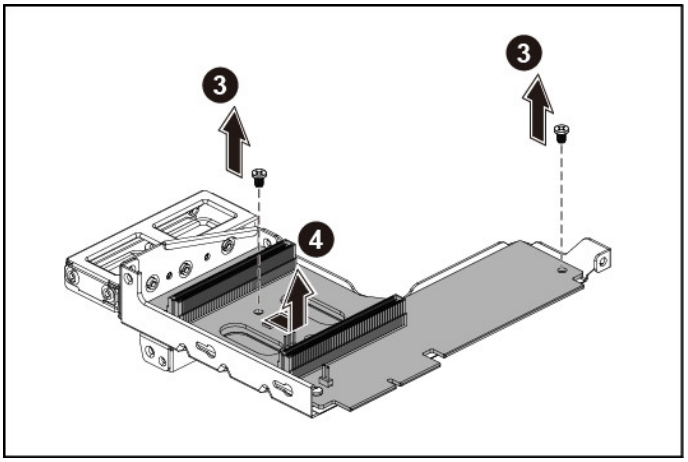
1. Loosen the screws that secure the interposer-board assembly.
2. Lift the interposer-board assembly out of the chassis.

Figure 3.56. Removing the Interposer-Board Assembly



3. Loosen the screws that secure the interposer board.
4. Remove the interposer board out of the tray along the direction of the arrow.

Figure 3.57. Removing the Interposer Board



3.20.2. To install the interposer board

Reverse the steps above to install the interposer board.

3.21. Middle Plane

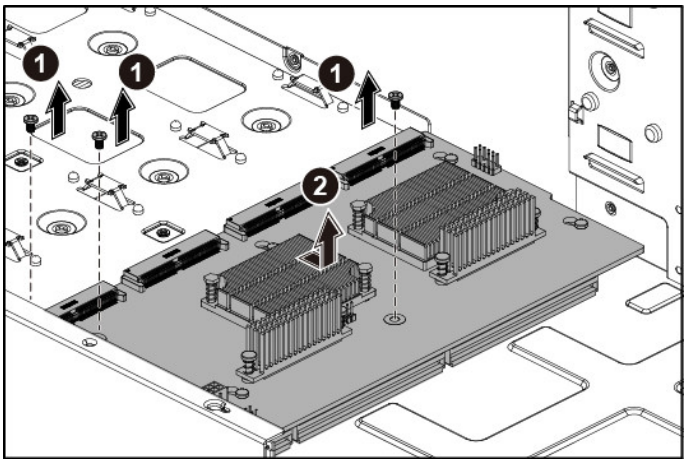
Before you remove or install the middle plane, please follow the steps below:

1. Make sure the server is not turned on or connected to the AC power.
2. Remove the chassis cover. To remove the chassis cover, see Section 3.2, “Top Cover”
3. Remove the system fan cage. To remove the system fan cage, see Section 3.19.1, “To remove the system fans”
4. Remove the interposer board. To remove the interposer board, see Section 3.20.1, “To remove the interposer board”
5. Disconnect all the necessary cables.

3.21.1. To remove the middle plane

1. Loosen the screws that secure the middle plane.
2. Remove the middle plane out of the chassis along the direction of the arrow.

Figure 3.58. Removing the Middle Plane



3.21.2. To install the middle plane

Reverse the steps above to install the middle plane.

3.22. Sensor Board

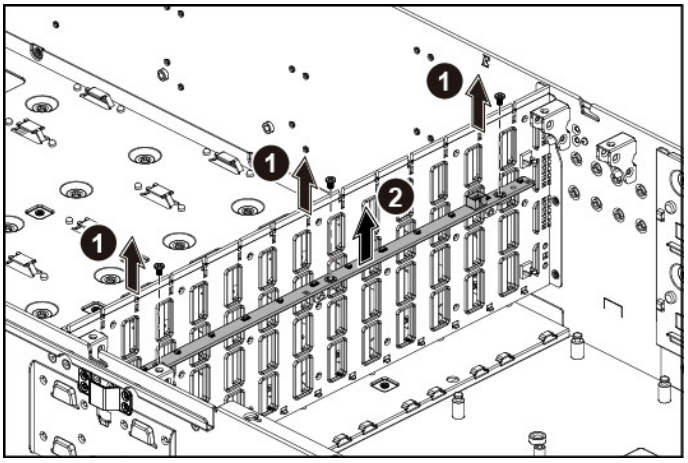
Before you remove or install the sensor board, please follow the steps below:

1. Make sure the server is not turned on or connected to the AC power.
2. Remove the chassis cover. To remove the chassis cover, see Section 3.2, “Top Cover”
3. Remove the system fan cage. To remove the system fan cage, see Section 3.19.1, “To remove the system fans”
4. Disconnect all the necessary cables.

3.22.1. To remove the sensor board

1. Loosen the screws that secure the sensor board.
2. Remove the sensor board out of the chassis.

Figure 3.59. Removing the sensor board



3.22.2. To install the sensor board

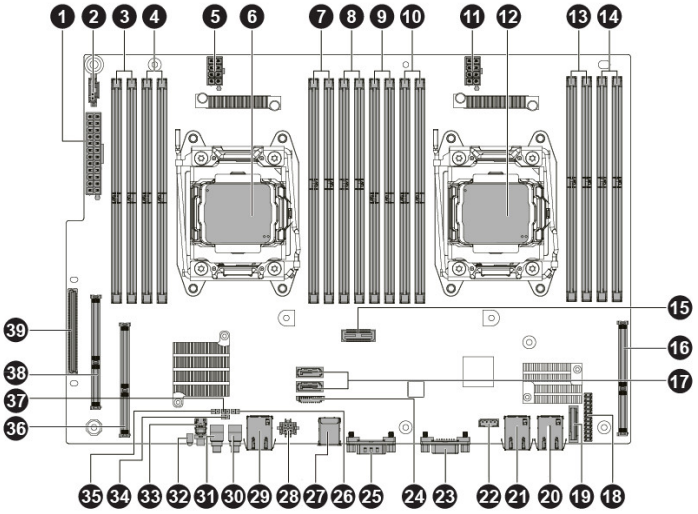
Reverse the steps above to install the sensor board.

Chapter 4. Connectors

4.1. Motherboard Overview

The following illustrations display the most important motherboard components.

Figure 4.1. Mainboard Overview



1. Mainboard Connectors

ITEM	DESCRIPTION
1	2x12pin Power Connector (J55)
2	PMBus Connector (J48)
3	CPU1 DIMM Slots A1/A2 (J1, J15)
4	CPU1 DIMM Slots B1/B2 (J16, J17)
5	2x4pin Power Connector (CPU1) (J54)
6	Processor socket 1 (CPU1)
7	CPU1 DIMM Slots D2/D1 (J21, J20)
8	CPU1 DIMM Slots C2/C1 (J19, J18)
9	CPU2 DIMM Slots A1/A2 (J22, J23)
10	CPU2 DIMM Slots B1/B2 (J24, J25)
11	2x4pin Power Connector (CPU2) (J56)
12	Processor Socket 2 (CPU2)
13	CPU2 DIMM Slots D2/D1 (J29, J28)
14	CPU2 DIMM Slots C2/C1 (J27, J26)
15	CPU XDP Socket (J30)
16	PCI-E x16 Slot (J74)
17	SATA HDD Backplane Connector 1/2 (J66, J65)
18	Front Panel Connector (J14)

ITEM	DESCRIPTION
19	System Battery (BH1)
20	1G NIC 1 Port (J12)
21	1G NIC 2 Port (J13)
22	IPMB Connector (J47)
23	VGA Connector (J62)
24	SATA HDD Backplane LED Connector (J69)
25	Serial Port (J7)
26	Password Reset Jumper (J3)
27	Dual USB Port (J41)
28	SATA HDD Backplane Power Connector (J68)
29	Management NIC Connector (J81)
30	Power Button / LED (SW4)
31	ID Button / LED (SW5)
32	System Health LED (CR25)
33	BMC Reset Button (SW1)
34	ME FW Recovery Jumper (J34)
35	CMOS Clear Jumper (J35)
36	PCI-E x16 Slot (J73)
37	BIOS Recovery Jumper (J2)
38	PCI-E x16 Slot (J70)
39	OCP Mezzanine Slot (J5)

Chapter 5. BIOS

5.1. BIOS Setup Utility

This section describes the BIOS Setup Utility options. You can run BIOS Setup with or without an operating system being present. Onboard devices are configured with the BIOS Setup utility that is embedded in flash ROM.

The configuration utilities allow you to modify the CMOS RAM and NVRAM. The actual hardware configuration is accomplished by the BIOS POST routines and the BIOS Plug-N-Play auto-configuration manager. The configuration utilities update a checksum for both areas, so potential data corruption is detected by the BIOS before the hardware configuration is saved. If the data is corrupted, the BIOS requests that the user reconfigure the system and reboot.

Because the BIOS code is the most often changed part of the motherboard design, the BIOS information described in this section may be a little different compared to the actual BIOS that contained in your motherboard.

In following table, Settings in bold are BIOS Setup Defaults.

5.1.1. Entering BIOS Setup

BIOS Setup is started by pressing <DEL> or <F2> during boot time when the logo is displayed.

When Quiet Boot is disabled, the message "press <DEL> or <F2> to enter setup" will be displayed on the diagnostics screen.

5.1.2. Main features

BIOS Setup has the following features: 1. The server board BIOS will only be available in English. 2. BIOS Setup is functional via console redirection over various terminal emulation standards. This may limit some functionality for compatibility, e.g., usage of colors, some keys or key sequences, or support of pointing devices.

5.1.3. Setup Page

The setup page layout is sectioned into functional areas. Each occupies a specific area of the screen and has dedicated functionality. The following table lists and describes each functional area.

Table 5.1. BIOS Setup Page Layout

FUNCTIONAL AREA	DESCRIPTION
Title Bar	The title bar is located at the top of the screen and It may also display navigational information. displays the title of the form (page) the user is currently viewing.
Setup Item List	The Setup Item List is a set of controllable and informational items. Each item in the list occupies the left column of the screen. A Setup Item may also open a new window with more options for that functionality on the board.

Item Specific Help Area	The Item Specific Help area is located on the right side of the screen and contains help text for the highlighted Setup Item. Help information may include the meaning and usage of the item, allowable values, effects of the options, etc.
Keyboard Command Bar	The Keyboard Command Bar is located at the bottom right of the screen and continuously displays help for keyboard special keys and navigation keys.

5.1.4. Keyboard Commands

The bottom right portion of the Setup screen provides a list of commands that are used to navigate through the Setup utility. These commands are displayed at all times.

Each Setup menu page contains a number of features. Except those used for informative purposes, each feature is associated with a value field. This field contains user-selectable parameters. Depending on the security option chosen and in effect by the password, a menu feature's value may or may not be changeable. If a value is non-changeable, the feature's value field is inaccessible and displays as grayed out.

Table 5.2. BIOS Setup: Keyboard Command

KEY	OPTION	DESCRIPTION
<Enter>	Execute	Command The <Enter> key is used to activate sub-menus when the selected feature is a sub-menu, or to display a pick list if a selected option has a value field, or to select a sub-field for multi-valued features like time and date. If a pick list is displayed, the <Enter> key will select the currently highlighted item, undo the pick list, and return the focus to the parent menu.
<Esc>	Exit	The <Esc> key provides a mechanism for backing out of any field. When the <Esc> key is pressed while editing any field or selecting features of a menu, the parent menu is re-entered.
		When the <Esc> key is pressed in any sub-menu, the parent menu is re-entered. When the <Esc> key is pressed in any major menu, the exit confirmation window is displayed and the user is asked whether changes can be discarded. If "No" is selected and the <Enter> key is pressed, or if the <Esc> key is pressed, the user is returned to where he/she was before <Esc> was pressed, without affecting any existing any settings. If "Yes" is selected and the <Enter> key is pressed, setup is exited and the BIOS returns to the main System Options Menu screen.
-	Select Item	The up arrow is used to select the previous value in a pick list, or the previous option in a menu item's option list. The selected item must then be activated by pressing the <Enter> key.
Down arrow	Select Item	The down arrow is used to select the next value in a menu item's option list, or a value field's pick list. The selected item must then be activated by pressing the <Enter> key.

Left and right arrows	Select Menu	The left and right arrow keys are used to move between the major menu pages. The keys have no affect if a sub-menu or pick list is displayed.
<Tab>	Select Field	The <Tab> key is used to move between fields. For example, <Tab> can be used to move from hours to minutes in the time item in the main menu.
-	Change Value	The minus key on the keypad is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list.
+	Change Value	The plus key on the keypad is used to change the value of the current menu item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code than the plus key on the other keyboard, but will have the same effect.
F8	Previous Values	Pressing <F8> makes the following message to appear: Load Previous Values? Yes/No If Yes is highlighted and <Enter> is pressed, all Setup fields are set to their previous values. If No is highlighted and <Enter> is pressed, or if the <Esc> key is pressed, the user is returned to where they were before <F8> was pressed without affecting any existing field values.
F9	Setup Defaults	Pressing <F9> makes the following message to appear: Load Optimized Defaults? Yes/No If Yes is highlighted and <Enter> is pressed, all Setup fields are set to their default values. If No is highlighted and <Enter> is pressed, or if the <Esc> key is pressed, the user is returned to where they were before <F9> was pressed without affecting any existing field values.
F10	Save and Exit	Pressing <F10> makes the following message to appear: Save configuration and exit? Yes/No If Yes is highlighted and <Enter> is pressed, all changes are saved and Setup is exited. If No is highlighted and <Enter> is pressed, or the <Esc> key is pressed, the user is returned to where they were before <F10> was pressed without affecting any existing values.

5.1.5. Menu Selection Bar

The Menu Selection Bar is located at the top of the BIOS Setup Utility screen. It displays the major menu selections available to the user. By using the left and right arrow keys, the user can select the menus listed here.

5.1.6. Server Platform Setup Utility Screens

The sections below describe the screens available for the configuration of a server platform. In these sections, tables are used to describe the contents of each screen. These tables follow the following guidelines:

The text and values in the Setup Item, Options, and Help columns in the tables are displayed on the BIOS Setup screens.

- **Bold text** in the Options column of the tables indicates default values. These values are not displayed in bold on the setup screen. The bold text in this document is to serve as a reference point.
- The Comments column provides additional information where it may be helpful. This information does not appear in the BIOS Setup screens.
- Information in the screen shots that is enclosed in brackets (< >) indicates text that varies, depending on the option(s) installed. For example <Current Date> is replaced by the actual current date.
- Information that is enclosed in square brackets ([]) in the tables indicates areas where the user needs to type in text instead of selecting from a provided option.

Whenever information is changed (except Date and Time) the systems requires a save and reboot to take place. Pressing **<ESC>** will discard the changes and boot the system according to the boot order set from the last boot.

5.2. Main

The Main screen is the screen that is first displayed when BIOS Setup is entered, unless an error has occurred. If an error has occurred, the Error Manager screen will be displayed instead.

Figure 5.1. Main Screen

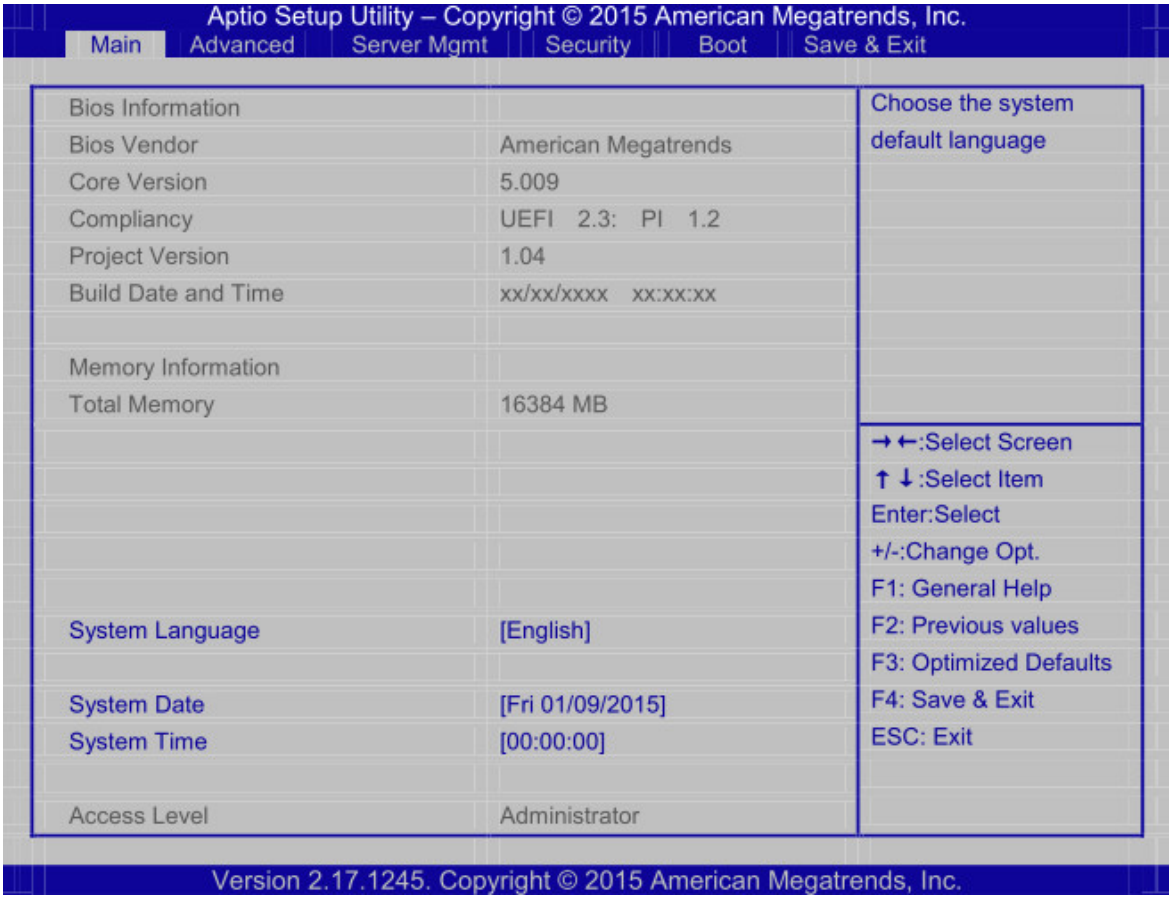


Table 5.3. Main Screen Fields

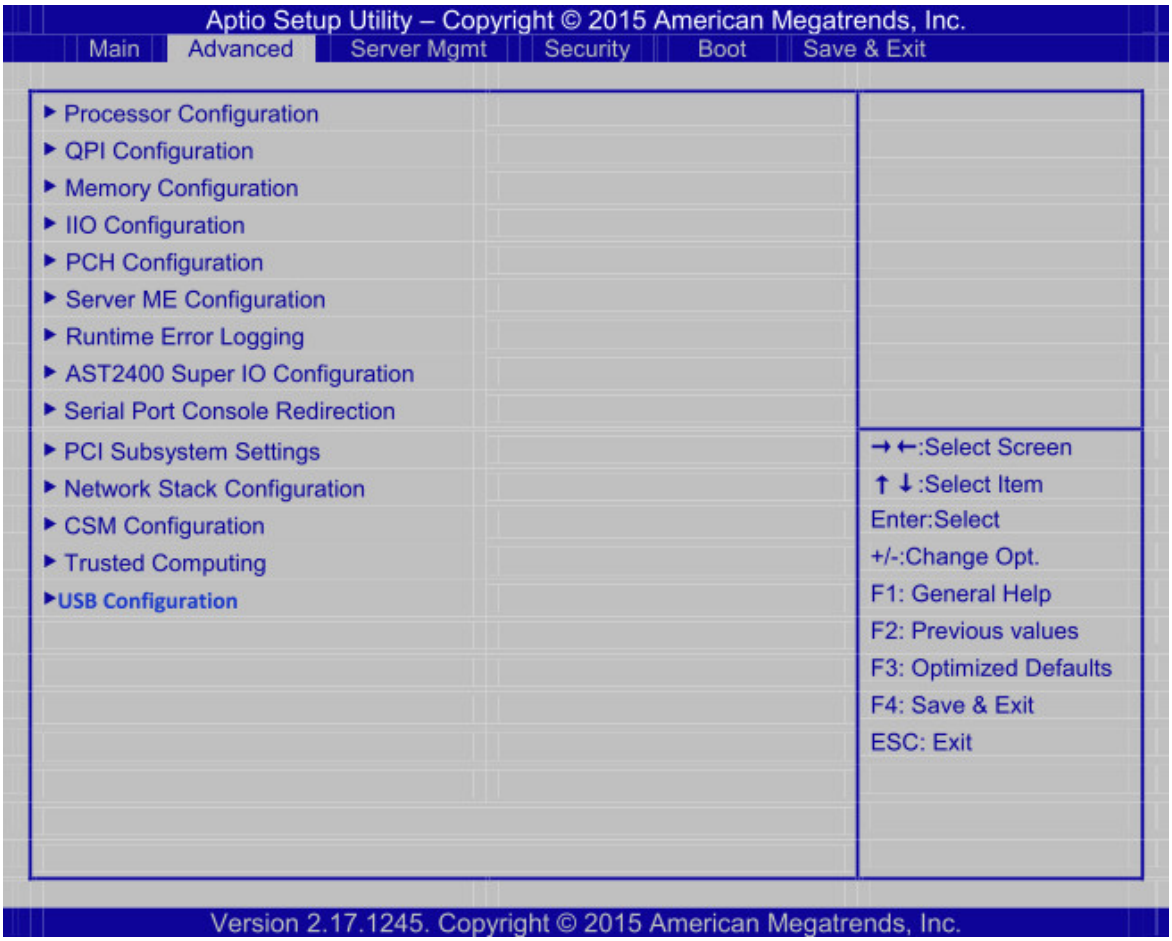
Menu Fields	Settings	Comments
Main		
System time	Current time	Displays the current time.
System date	Current date	Displays the current date.

5.3. Advanced Screen

The Advanced screen provides an access point to configure several options. On this screen, the user selects the option that is to be configured. Configurations are performed on the selected screen, not directly on Advanced screen.

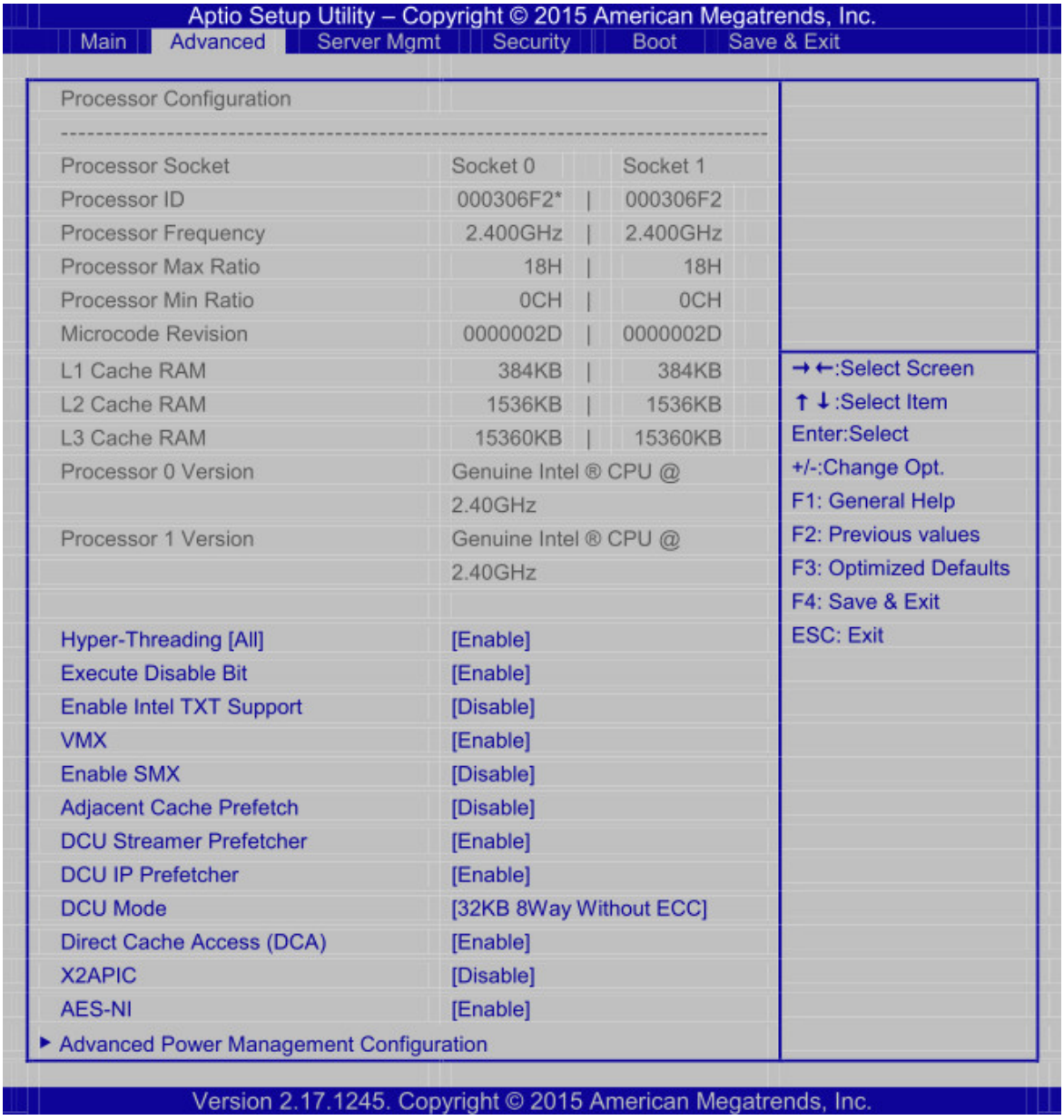
To access this screen from Main screen, press the right arrow until Advanced screen is chosen.

Figure 5.2. Advanced Screen



5.3.1. Processor Configuration

Figure 5.3. Processor Configuration

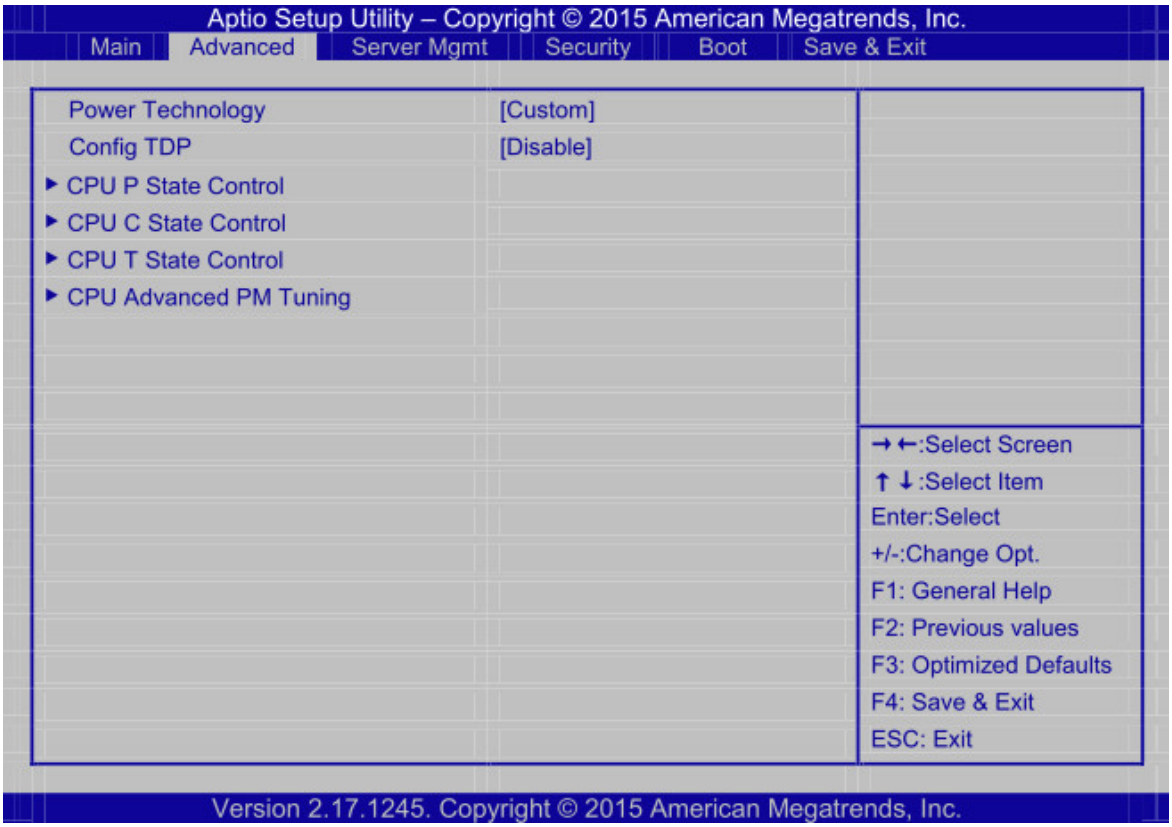


Menu Fields	Settings	Comments
Advanced \ Processor Configuration		
Hyper-Threading [ALL]	Disabled Enabled	Enables Hyper Threading (Software Method to Enable/Disable Logical Processor threads.
Execute Disable Bit	Disabled	When disabled, forces the XD feature flag to always return 0.

Menu Fields	Settings	Comments
	Enabled	
Enable Intel TXT Support	Disabled Enabled	Enables Intel Trusted Execution Technology Configuration. Please disable "EV DFX Features" when TXT is enabled.
VMX	Disabled Enabled	Enables the Vanderpool Technology, takes effect after reboot.
Enable SMX	Disabled Enabled	Enables Safer Mode Extensions.
Adjacent Cache Prefetch	Disabled Enabled	MLC Spatial Prefetcher (MSR 1A4h Bit[1])
DCU Streamer Prefetcher	Disabled Enabled	DCU streamer prefetcher is an L1 data cache prefetcher (MSR 1A4h [2]).
DCU IP Prefetcher	Disabled Enabled	DCU IP prefetcher is an L1 data cache prefetcher (MSR 1A4h [3]).
DCU Mode	32KB 8way Without ECC 16KB 4way with ECC	MSR 31h Bit [0] - A write of 1 selects the DCU mode as 16KB 4-way with ECC.
Direct Cache Access (DCA)	Disabled Enabled Auto	Enables Direct Cache Access
X2APIC	Disabled Enabled	Enable/disable extended APIC support
AES-NI	Disabled Enabled	Enable/disable AES-NI support

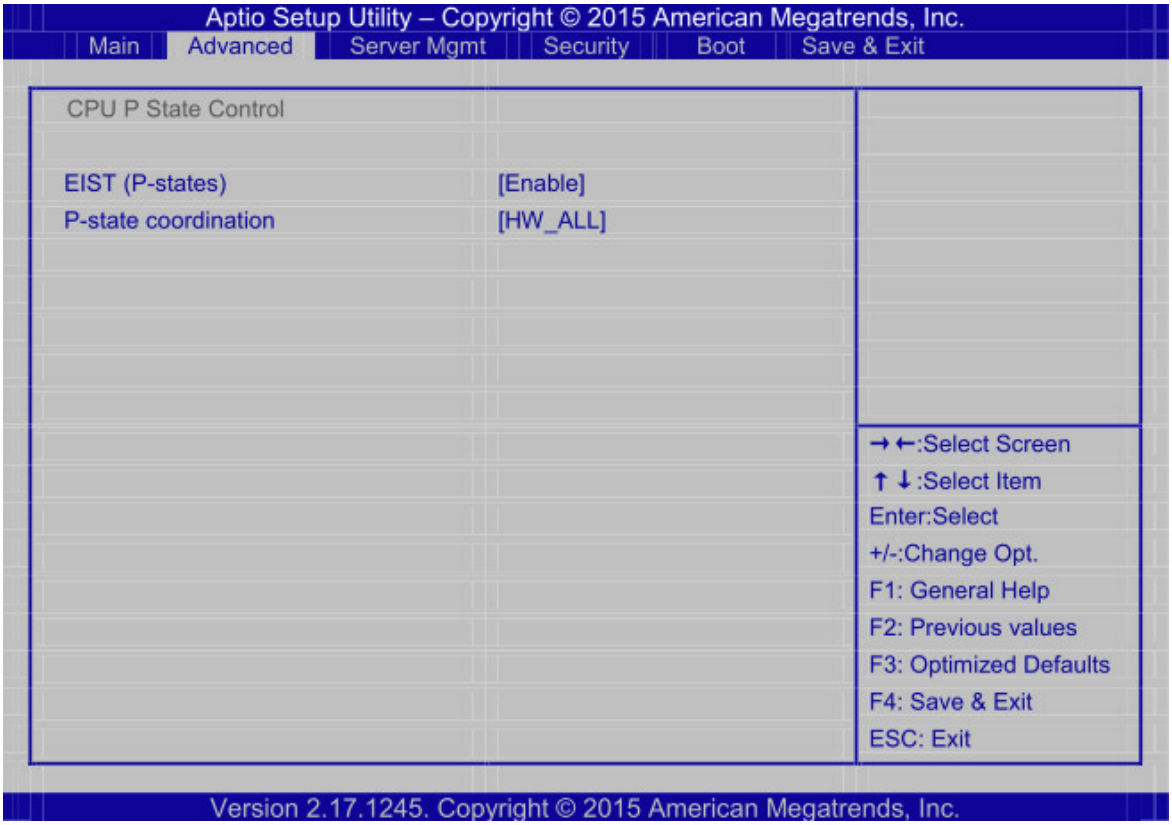
5.3.1.1. Advanced Power Management Configuration

Figure 5.4. Advanced Power Management Configuration



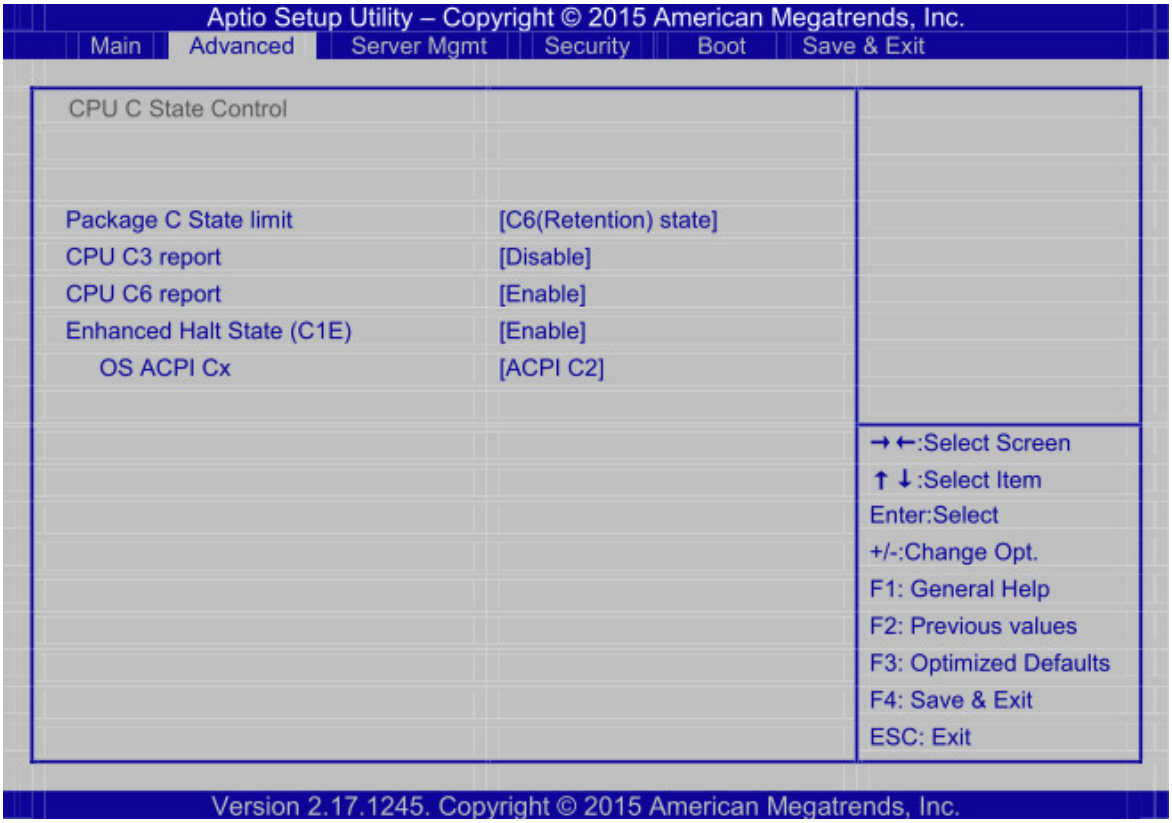
Menu Fields	Settings	Comments
Advanced \ Processor Configuration \ Advanced Power Management Configuration		
Power Technology	Disable Energy Efficient Custom	Enables the power management features.
Config TDP	Disabled Enabled	Option to disable/enable Config TDP

5.3.1.2. CPU P State Control



Menu Fields	Settings	Comments
Advanced \ Processor Configuration \ Advanced Power Management Configuration \ CPU P State Control		
EIST (P-states)	Disabled	When enabled, OS sets CPU frequency according load. When disabled, CPU frequency is set at max non-turbo.
P-state coordination	HW_ALL SW_ALL SW_ANY	HW_ALL (hardware) coordination is recommended over SW_ALL and SW_ANY (software coordination).

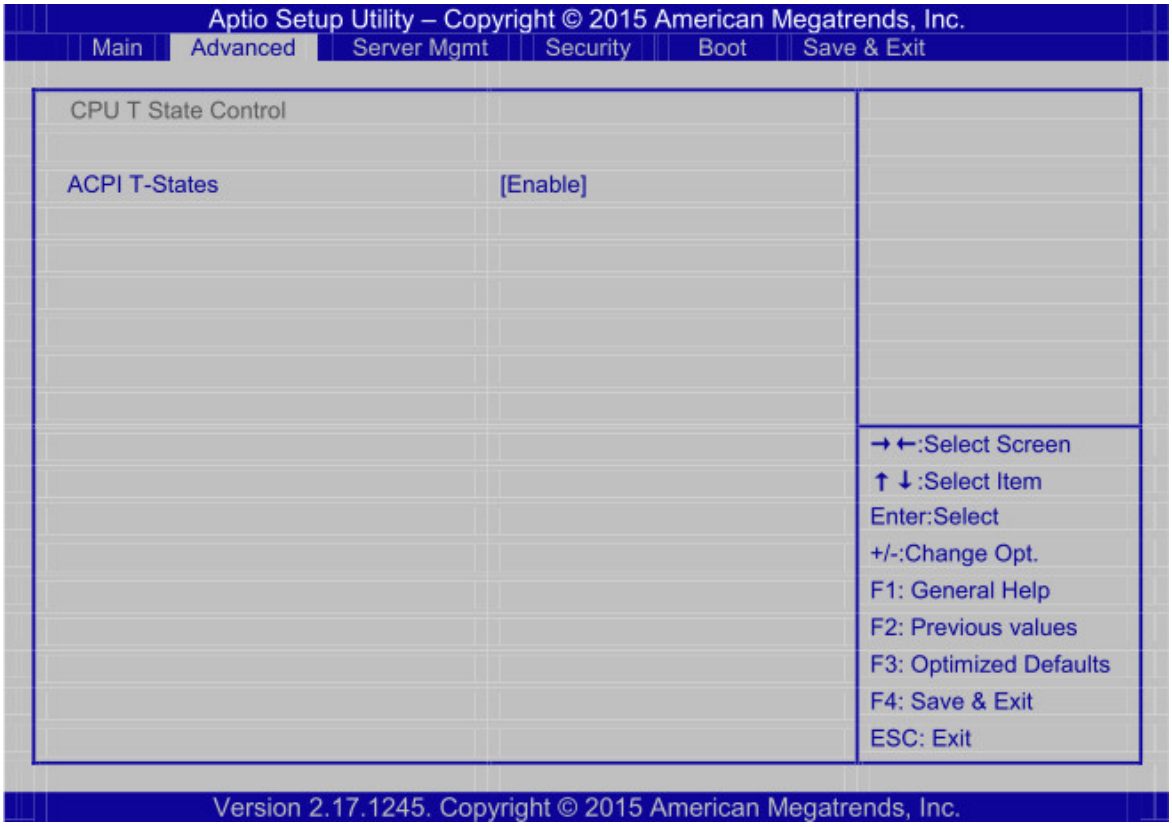
5.3.1.3. CPU C State Control



Menu Fields	Settings	Comments
Advanced \ Processor Configuration \ Advanced Power Management Configuration \ CPU C State Control		
Package C State limit	C0/C1 state C1 state C6 (non Retention) state C6 (Retention) state No Limit	Package C State limit
CPU C3 report	Disabled Enabled	Enable/Disable CPU C3 (ACPI C2) report to OS. Recommended to be disabled.
CPU C6 report	Disabled Enabled	Enable/Disable CPU C6(ACPI C2) report to OS

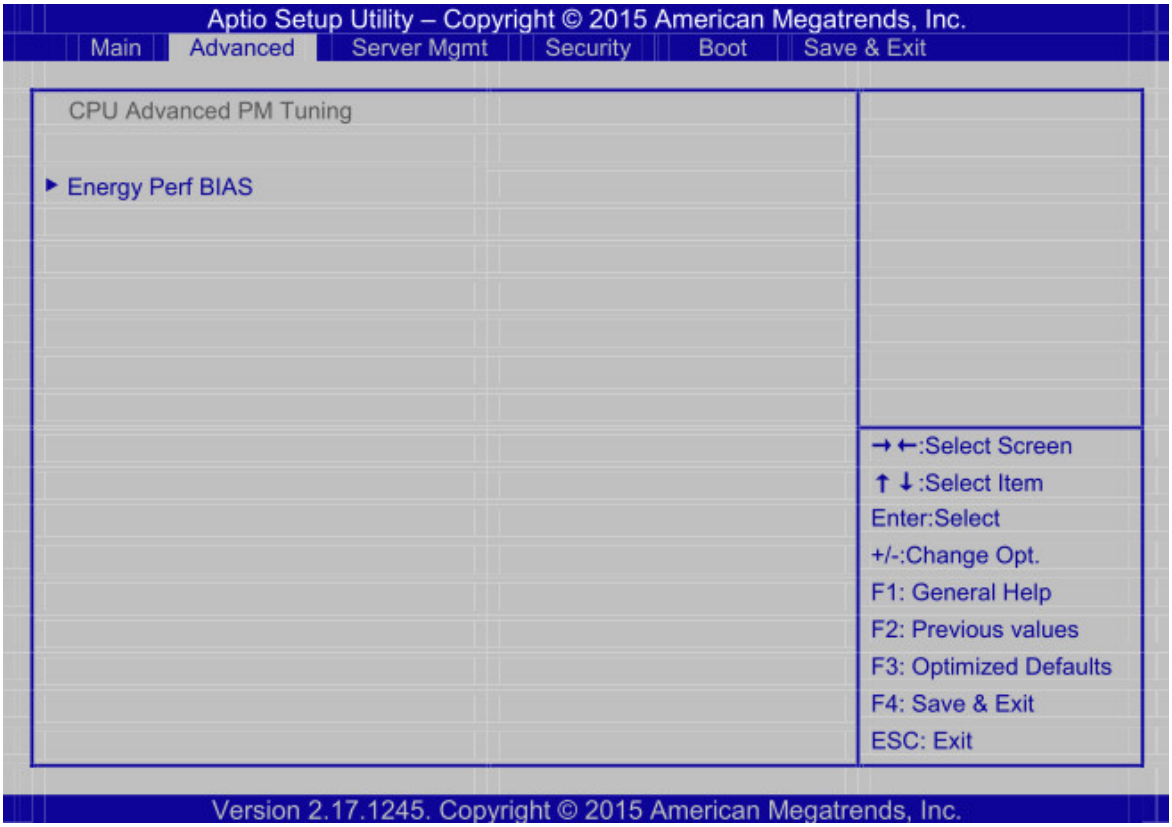
Menu Fields	Settings	Comments
		Recommended to be enabled.
Enhanced Halt State (C1E)	Disabled Enabled	Enables the Enhanced C1E state of the CPU, takes effect after reboot.
OS ACPI Cx	ACPI C2 ACPI C3	Report CC3/CC6 to OS ACPI C2 or ACPI C3

5.3.1.4. CPU T State Control

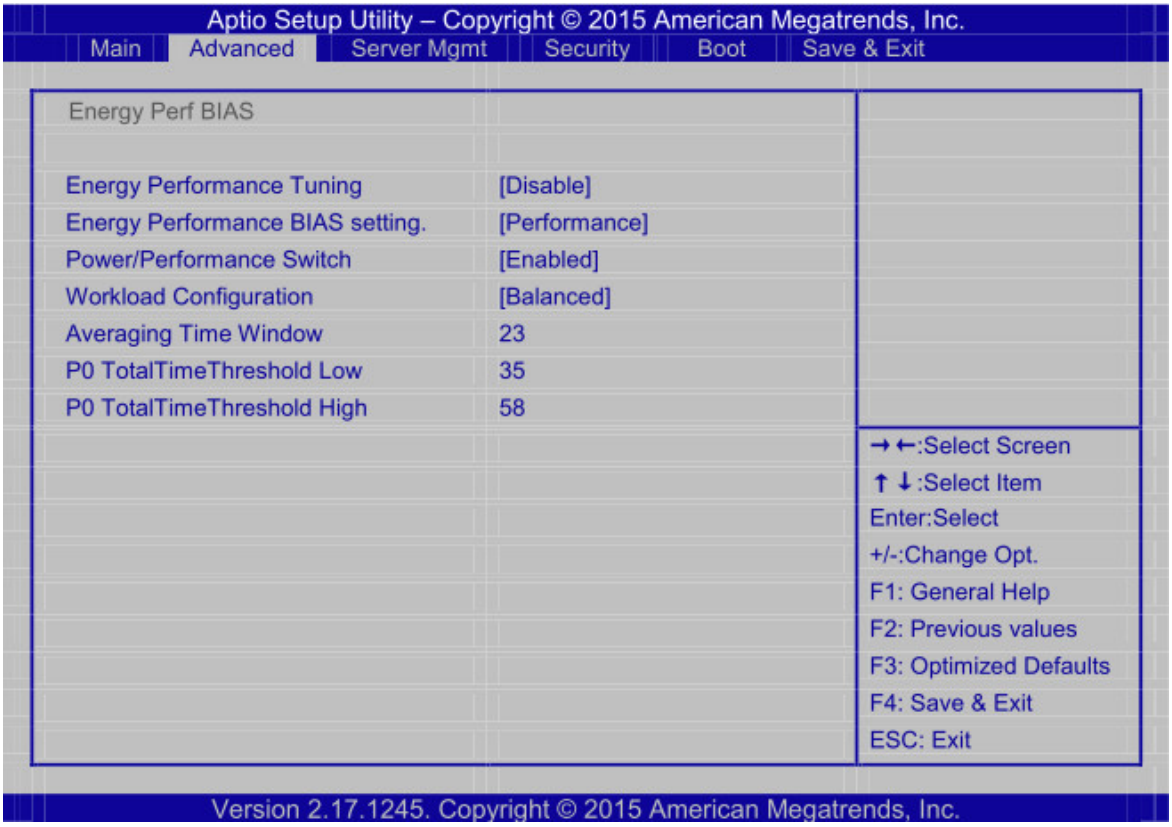


Menu Fields	Settings	Comments
Advanced \ Processor Configuration \ Advanced Power Management Configuration \ CPU T State Control		
ACPI T-States	Disabled Enabled	Enable/Disable CPU throttling by OS. Throttling reduces power consump-tion.

5.3.1.5. CPU Advanced PM Tuning



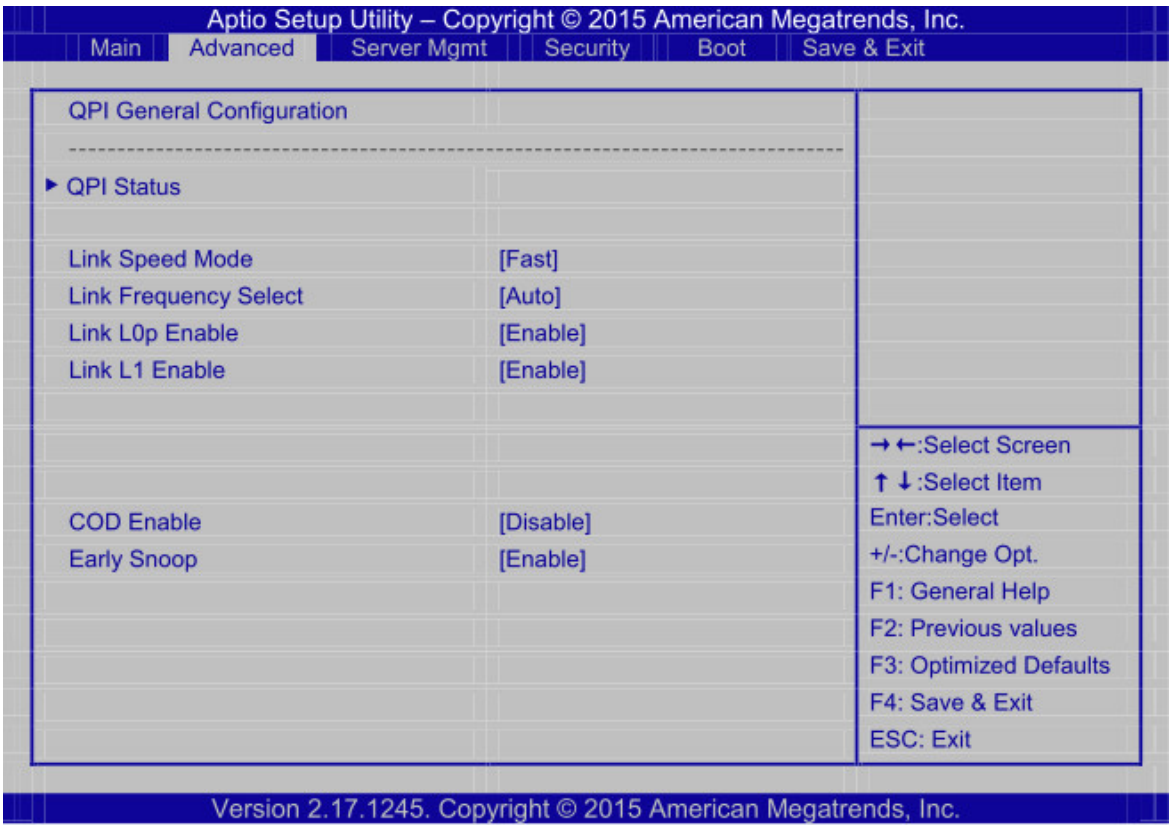
5.3.1.6. Energy Perf BIAS



Menu Fields	Settings	Comments
Advanced \ Processor Configuration \ Advanced Power Management Configuration \ CPU Advanced PM Tuning \ Energy Perf BIAS		
Energy Performance Tuning	Disabled Enabled	Selects whether BIOS or Operating System chooses energy performance bias tuning.
Energy Performance BIAS setting	Performance Balanced Performance Balanced Power Power	Set Energy Performance BIAS, which overrides OS setting.
Power/Performance Switch	Disabled Enabled	MSR 1FCh Bit[24] = PWR_PERF_TUNING_ENABLE_DYN_SWITCHING
Workload Configuration	Balanced I/O sensitive	Optimization for the workload characterization. Balanced is recommended.

Menu Fields	Settings	Comments
Averaging Time Window	23	This is used to control the effective window of the average for C0 an P0 time
P0 TotalTimeThreshold Low	35	The HW switching mechanism DISABLES the performance setting (0) when the total P0 time is less than this threshhold
P0 TotalTimeThreshold High	58	The HW switching mechanism ENABLES the performance setting (0) when the total P0 time is greater than this threshhold

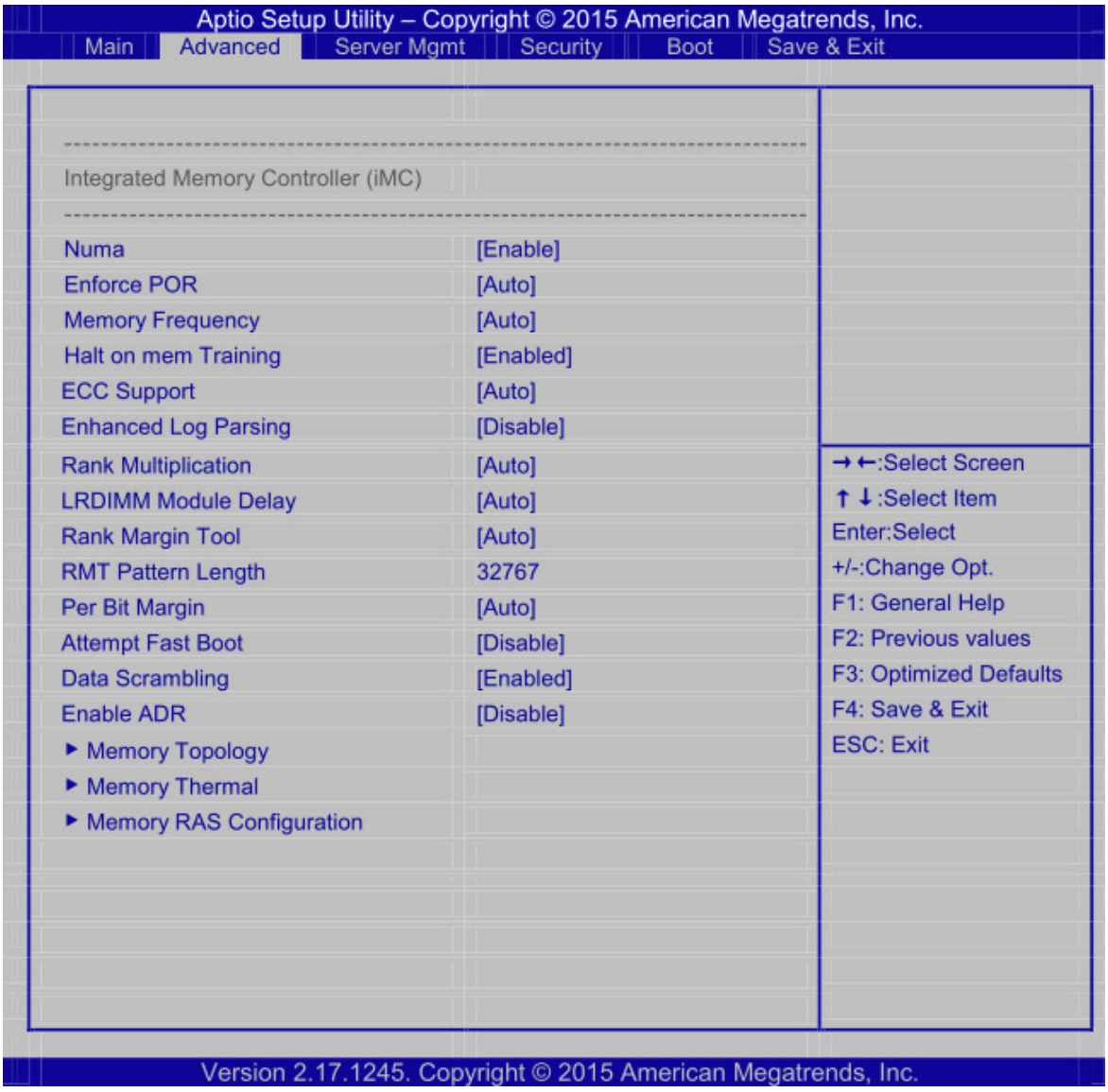
5.3.2. QPI Configuration



Menu Fields	Settings	Comments
Advanced \ QPI Configuration		
Link Speed Mode	Slow Fast	Select the QPI link speed as either the POR speed (Fast) or default speed (Slow)
Link Frequency Select	6.4GB/s	Allows for selecting the QPI Link Frequency

Menu Fields	Settings	Comments
	8.0GB/s 9.6GB/s Auto Auto Limited	
Link L0p Enable	Disabled Enabled	Link L0p Enable
Link L1 Enable	Disabled Enabled	Link L1 Enable
COD Enable	Disabled Enabled	Enable/disable Cluster on Die.
Early Snoop	Disabled Enabled	Select Snoop Mode

5.3.3. Memory Configuration

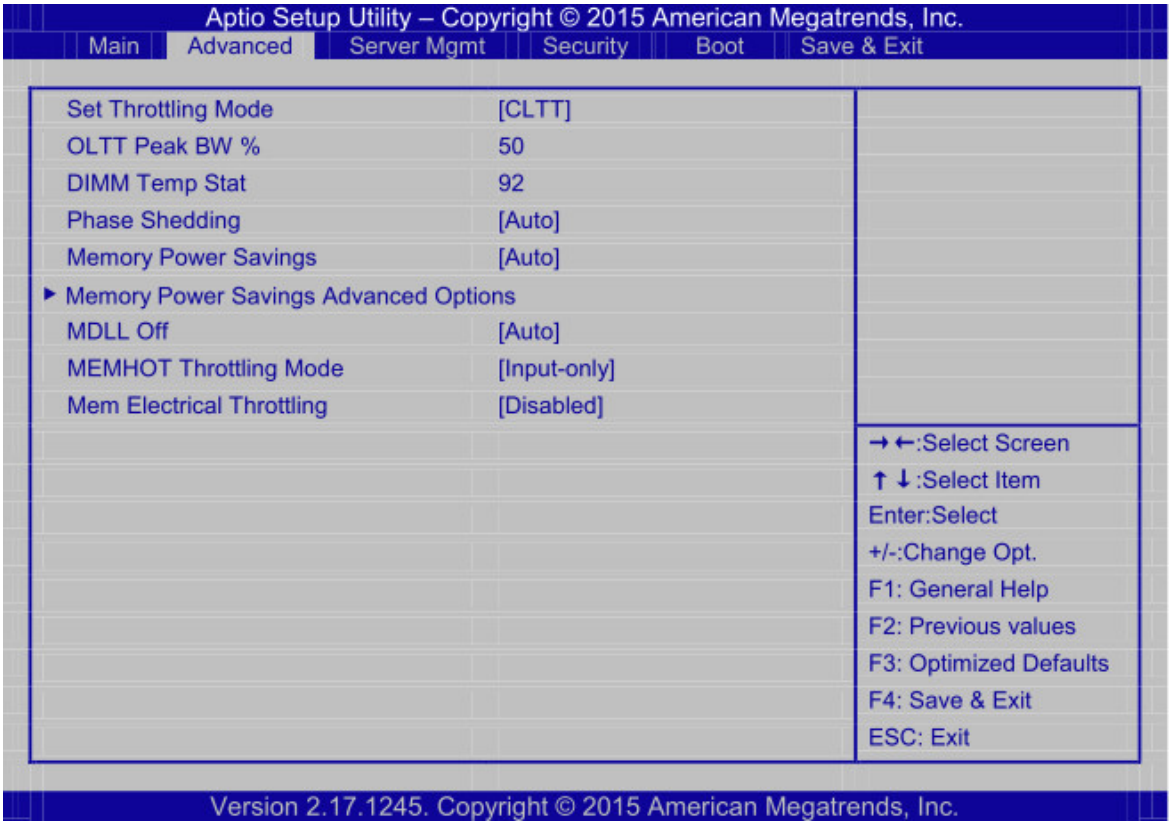


Menu Fields	Settings	Comments
Advanced \ Memory Configuration		
Numa	Disabled Enabled	Enable or Disable Non uniform emory Access (NUMA).
Enforce POR	Auto Enforce POR Disabled	Enable to enforce POR restrictions for DDR4 frequency and voltage pro-gramming

Menu Fields	Settings	Comments
	Enforce Stretch Goals	
Memory Frequency	Auto/1333/1400/1600/1800/1867/2000/2133//2200/2400/2600/2667/2800/2993/3000/3200	Maximum Memory Frequency Selections in Mhz. Do not select Reserved
Halt on Memory Training Error	Disabled Enabled	Halt on Memory Training Error Disable/Enable
Multi-Threaded MRC	Auto Disabled Enabled	Enable to execute the Memory Reference Code multi-threaded
ECC Support	Auto Disabled Enabled	Enable/Disable DDR ECC support
Enhanced Log Parsing	Disabled Enabled	Enables additional output in debug log for easier machine parsing
Rank Multiplication	Auto Enabled	Force the Rank Multiplication factor for LRDIMM
LRDIMM Module Delay	Disabled Auto	When Disabled, MRC will not use SPD bytes 90-95 for LRDIMM Module Delay. When Auto, MRC will boundary check the values and use default values, if SPD is 0 or out of range
Memory Type	UDIMMs only RDIMMs only UDIMMs and RDIMMs	Selects the Memory type supported by this platform.
Rank Margin Tool	Auto Disable Enable	Enables the rank margin tool to run after DDR4 memory training
RMT Pattern Length	32767	Sets the pattern length for the Rank Margin Tool
Per Bit Margin	Auto	Enables the per bit margining

Menu Fields	Settings	Comments
	Disabled Enabled	
Attempt Fast Boot	Auto Disabled Enabled	When enabled, portions of memory reference code will be skipped when possible to increase boot speed
Data Scrambling	Auto Disabled Enabled	Enables data scrambling
Enable ADR	Disabled Enabled	Enables the detecting and enabling of ADR

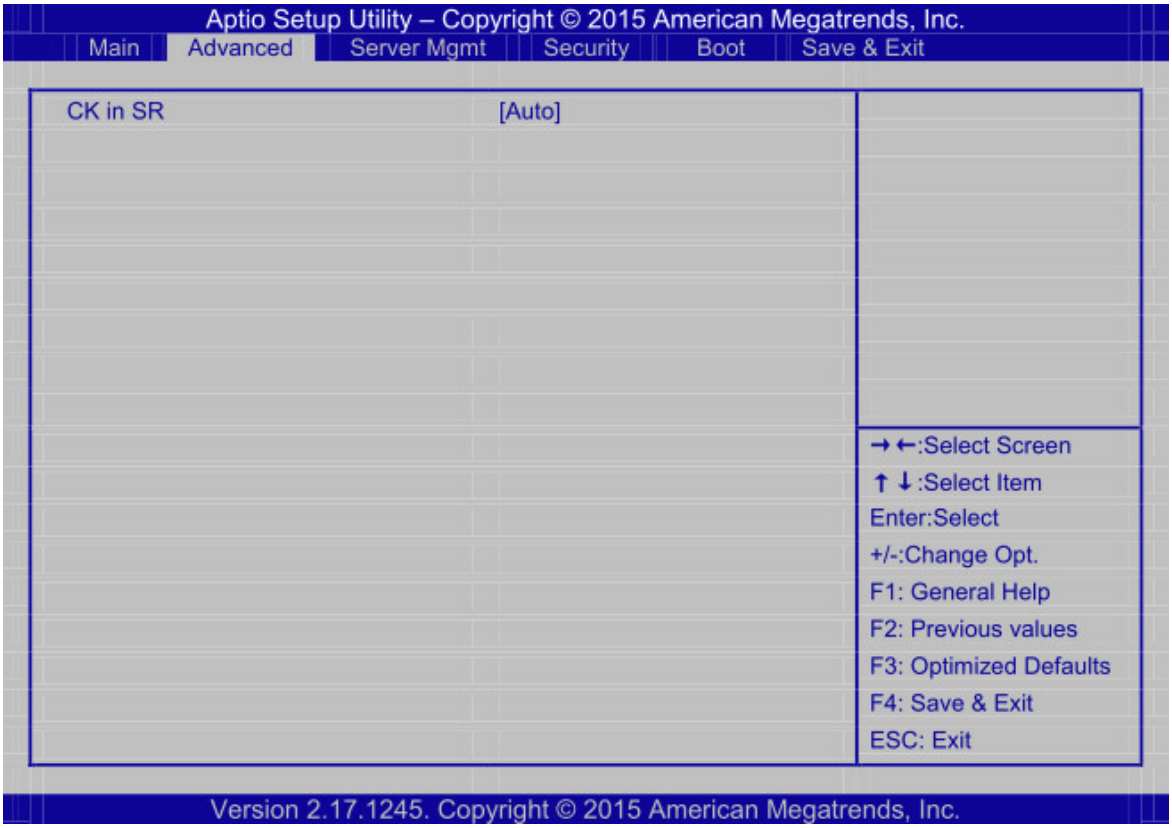
5.3.4. Memory Thermal



Menu Fields	Settings	Comments
Advanced \ Memory Configuration \ Memory Thermal		

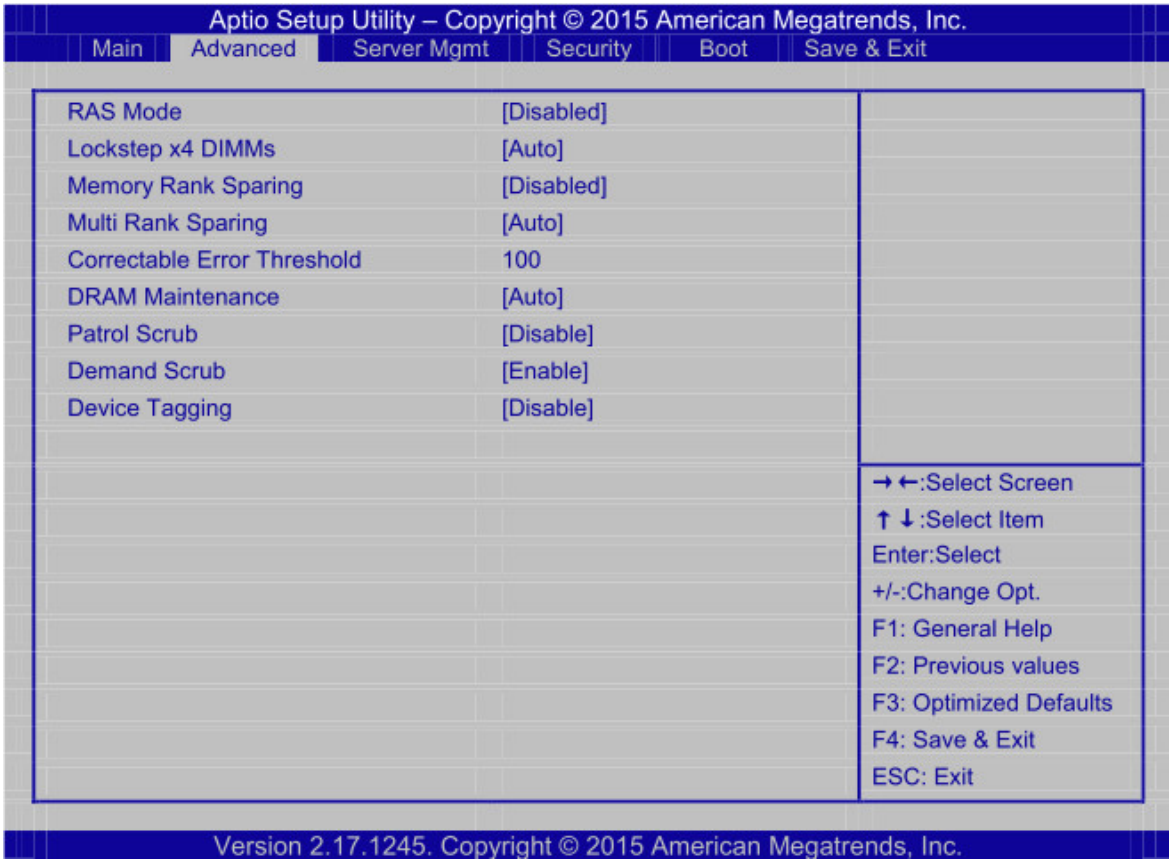
Menu Fields	Settings	Comments
Set Throttling Mode	Disabled OLTT CLTT	Configure Thermal Throttling Mode. Select OLTT or CLTT mode.
OLTT Peak BW %	50	Valid Offset 25 - 100. This is a percentage of the peak bandwidth allowed for OLTT
DIMM Temp Stat	92	Select DIMMTEMPSTAT as temp_mid or temp_hi.
Phase Shedding	Auto Disabled Enabled	VR Static Phase Shedding Support. PS0: full-phase, PS1: single-phase, typically <18A load, PS2: fixed loss, typically <5A load
Memory Power Savings	Auto Disabled APD On User Defined	Configures CKE and related Memory Power Savings Features
MDLL Off	Auto Disabled Enabled	Enable to shut down MDLL during SR
MEMHOT Throttling Mode	Disabled Output-only Input-only	Configure MEMHOT Input and Output Mode: Mem Hot Sense Therm Throt or Mem Hot Output Therm Throt.
Mem Electrical Throttling	Disabled Enabled Auto	Configure Memory Electrical Throttling

5.3.4.1. Memory Power Savings Advanced Options



Menu Fields	Settings	Comments
Advanced \ Memory Configuration \ Memory Thermal \ Memory Power Savings Advanced Options		
CK in SR	Auto Driven Tri-State Pulled Low Pulled High	Configures CK behavior during self-refresh

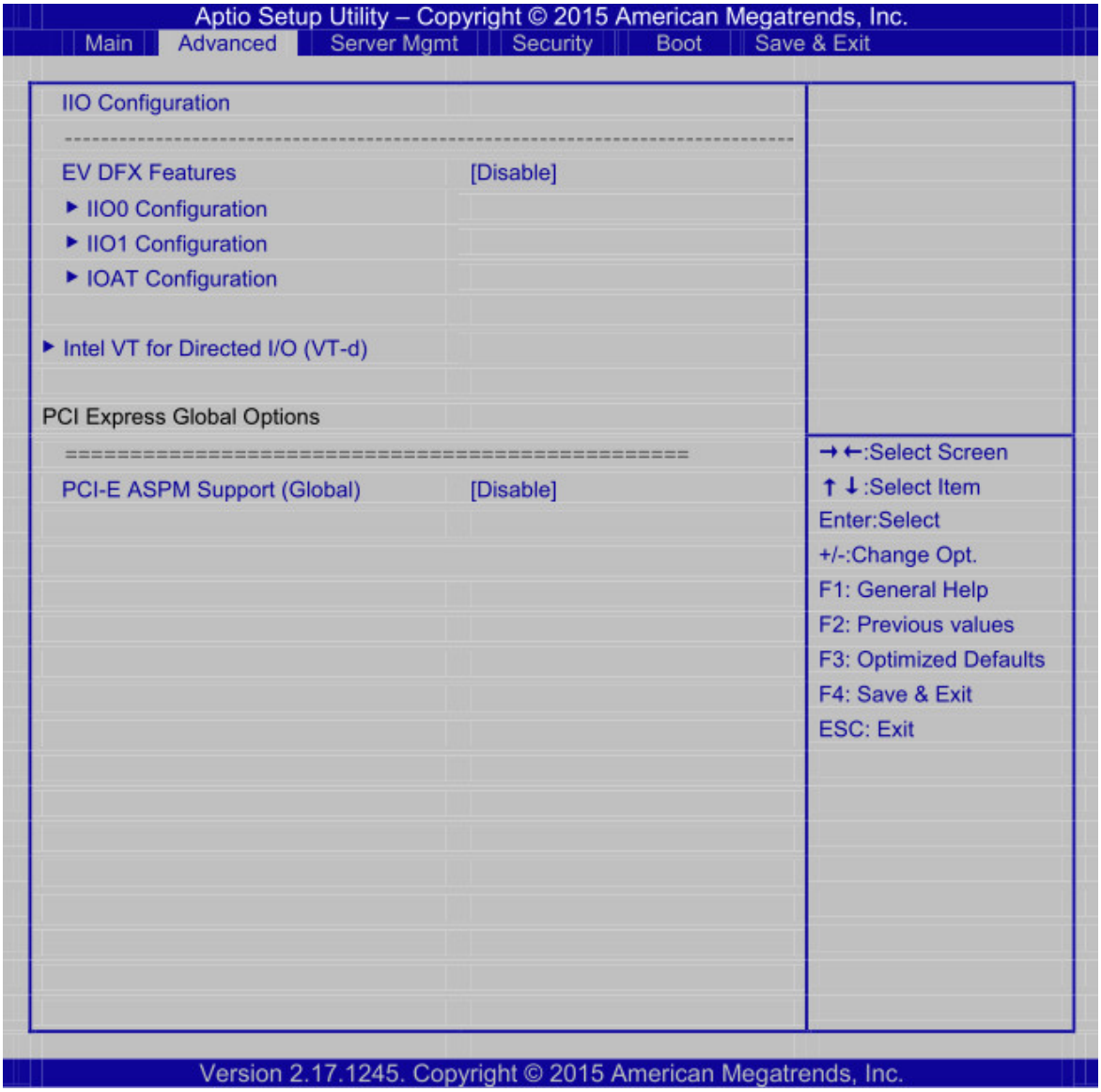
5.3.4.2. Memory RAS Configuration



Menu Fields	Settings	Comments
Advanced \ Memory Configuration \ Memory RAS Configuration		
RAS Mode	Disabled Mirror Lockstep Mode	Enable/Disable RAS modes. Enabling Sparing and Mirroring is not supported. Incase if enabled, Sparing will be selected.
Lockstep x4 DIMMs	Auto Disabled Enabled	Enable/Disable Lockstep for x4 DIMMs
Memory Rank Sparing	Disabled Enabled	Enable/Disable Memory Rank Sparing
Multi Rank Sparing	One Rank Two Rank Three Rank	Set Multi Rank Sparing number, Auto can support 50% ranks per channel

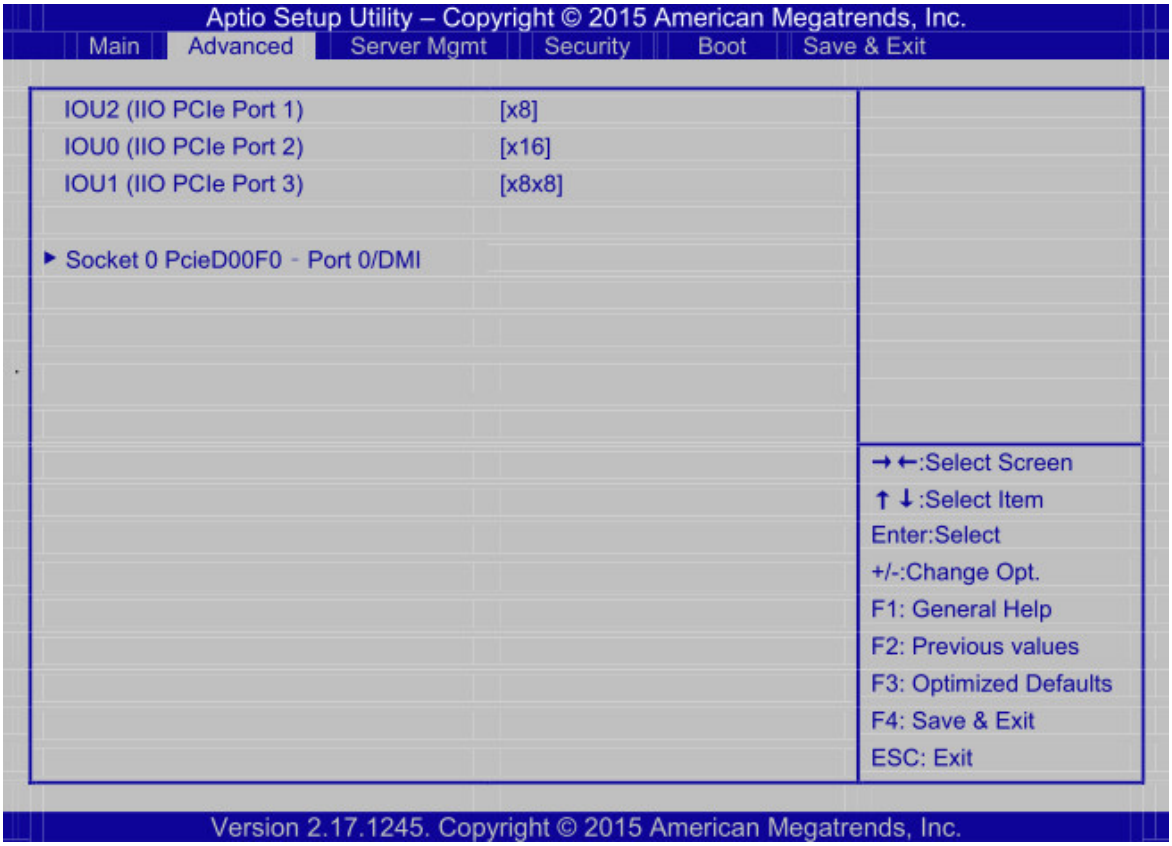
Menu Fields	Settings	Comments
	Auto	
Correctable Error Threshold	100	Correctable Error Threshold (1 - 32767) used for sparing, tagging, and leaky bucket
DRAM Maintenance	Auto Manual Disabled	Select Manual to customize DRAM Maintenance settings
Patrol Scrub	Disabled Enabled	Enable/Disable Patrol Scrub
Demand Scrub	Disabled Enabled	Enable/Disable Demand Scrub
Device Tagging	Disabled Enabled	Enable/Disable Device Tagging

5.3.5. IIO Configuration



Menu Fields	Settings	Comments
Advanced \ IIO Configuration		
EV DFX Features	Disabled Enabled	Set this option to allow DFX Lock Bits to remain clear
PCI-E ASPM Support (Global)	Disabled L1 Only	This option enables / disables the ASPM support for all downstream devices.

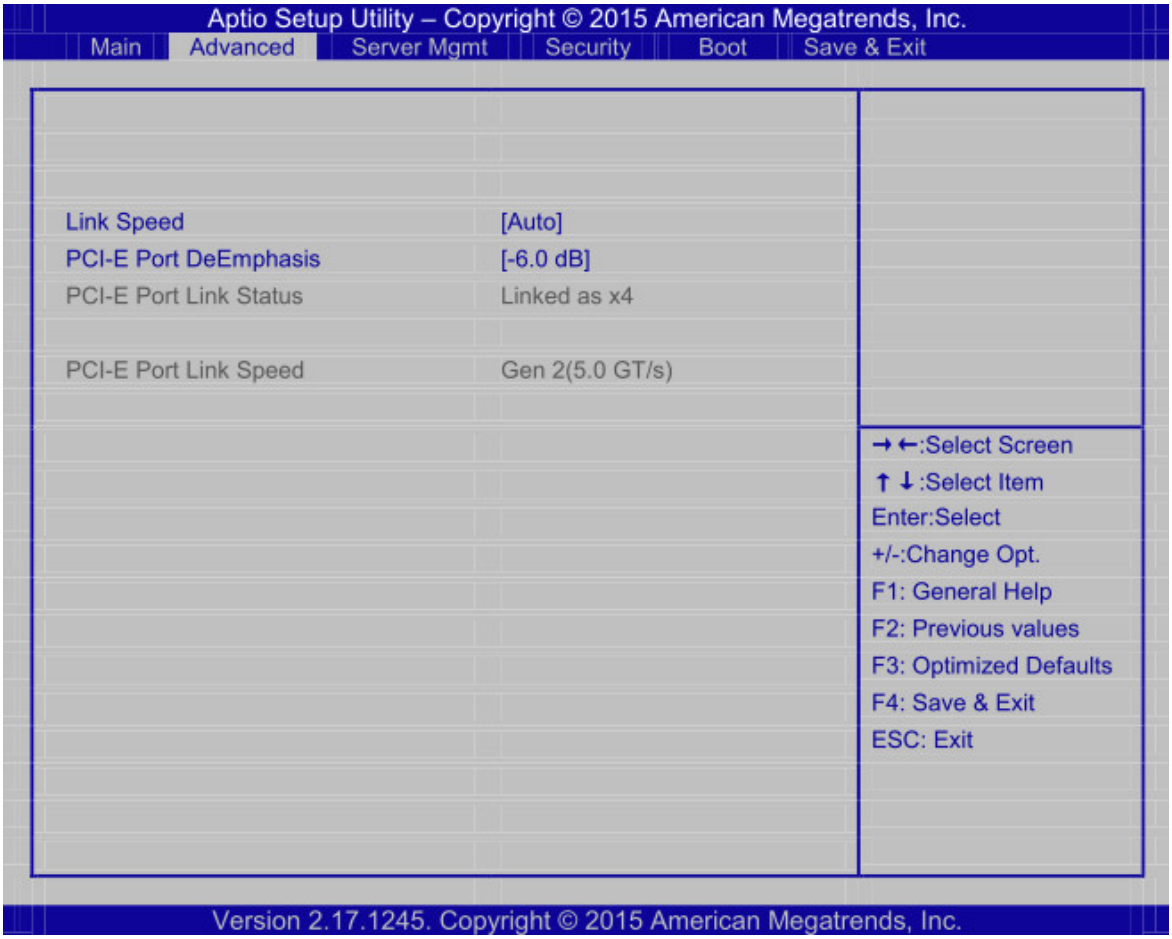
5.3.5.1. IIO0 Configuration



Menu Fields	Settings	Comments
Advanced \ IIO Configuration \ IIO0 Configuration		
IOU2 (IIO PCIe Port 1)	x4x4 x8 Auto	Selects PCIe port Bifurcation for selected slot(s)
IOU0 (IIO PCIe Port 2)	x4x4x4x4 x4x4x8 x8x4x4 x8x8 x16 Auto	Selects PCIe port Bifurcation for selected slot(s)
IOU1 (IIO PCIe Port 3)	x4x4x4x4	Selects PCIe port Bifurcation for selected slot(s)

Menu Fields	Settings	Comments
	x4x4x8 x8x4x4 x8x8 x16 Auto	

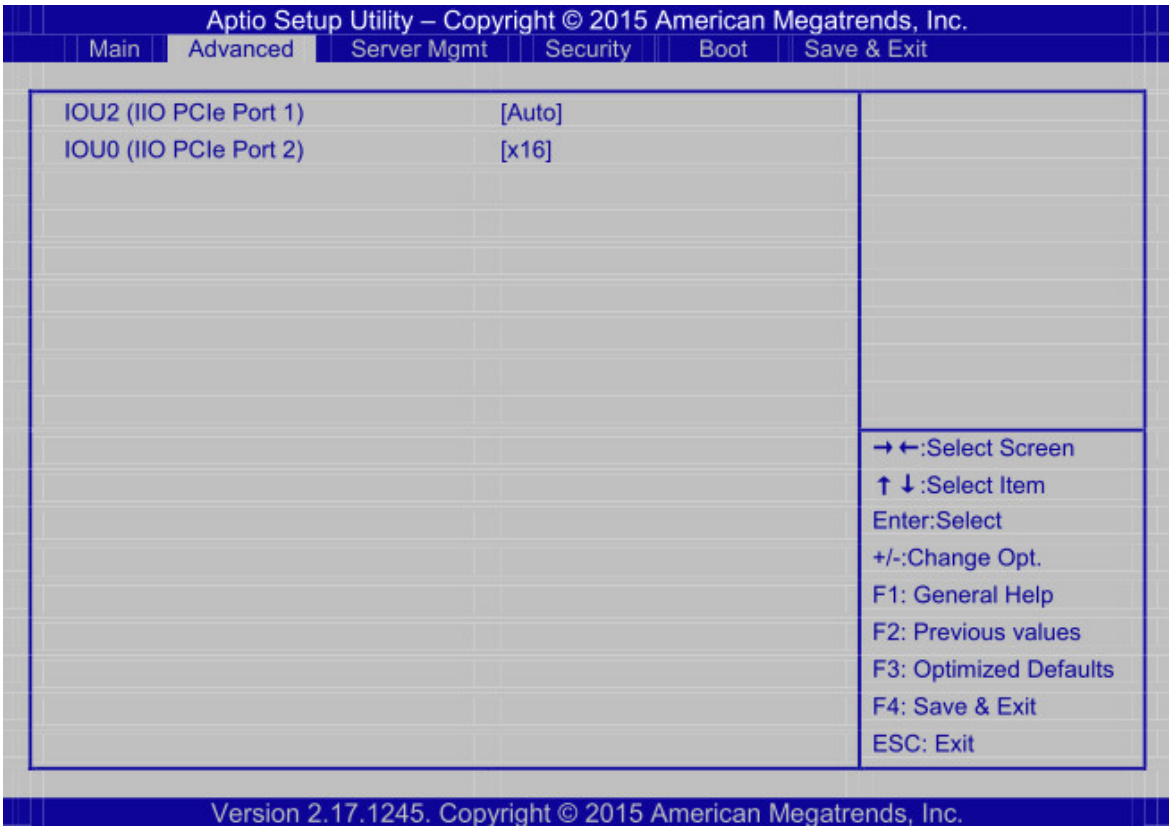
5.3.5.2. Socket 0 PcieD00F0-Port0/DMI



Menu Fields	Settings	Comments
Advanced \ IIO Configuration \ IIO0 Configuration \ Socket 0 PcieDxxFx – Port xx		
Link Speed	Auto Gen 1 (2.5 GT/s) Gen 2 (5 GT/s)	

Menu Fields	Settings	Comments
	Gen 3 (8 GT/s)	
PCI-E Port DeEmphasis	-6.0 dB -3.5 dB	De-Emphasis control (LNKCON2[6]) for this PCIe port.

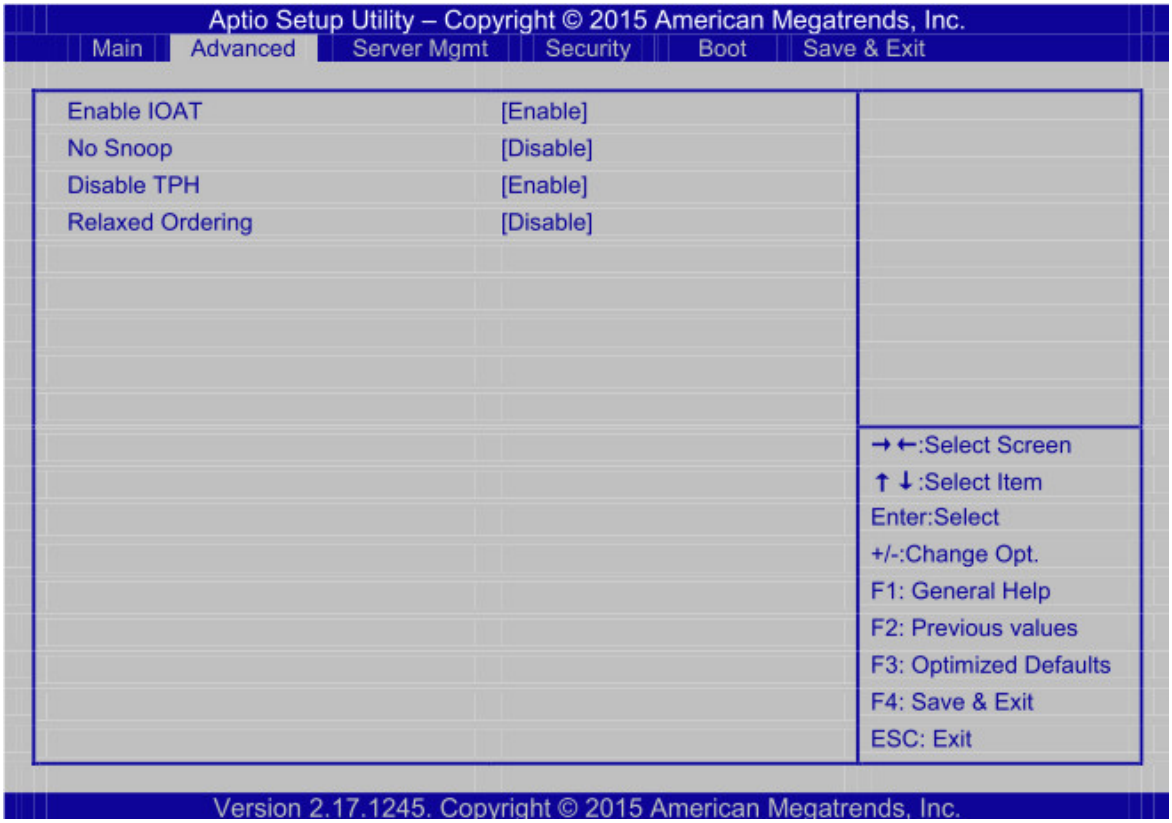
5.3.5.3. IIO1 Configuration



Menu Fields	Settings	Comments
Advanced \ IIO Configuration \ IIO1 Configuration		
IOU2 (IIO PCIe Port 1)	x4x4 x8 Auto	Selects PCIe port Bifurcation for selected slot(s)
IOU0 (IIO PCIe Port 2)	x4x4x4x4 x4x4x8 x8x4x4 x8x8	Selects PCIe port Bifurcation for selected slot(s)

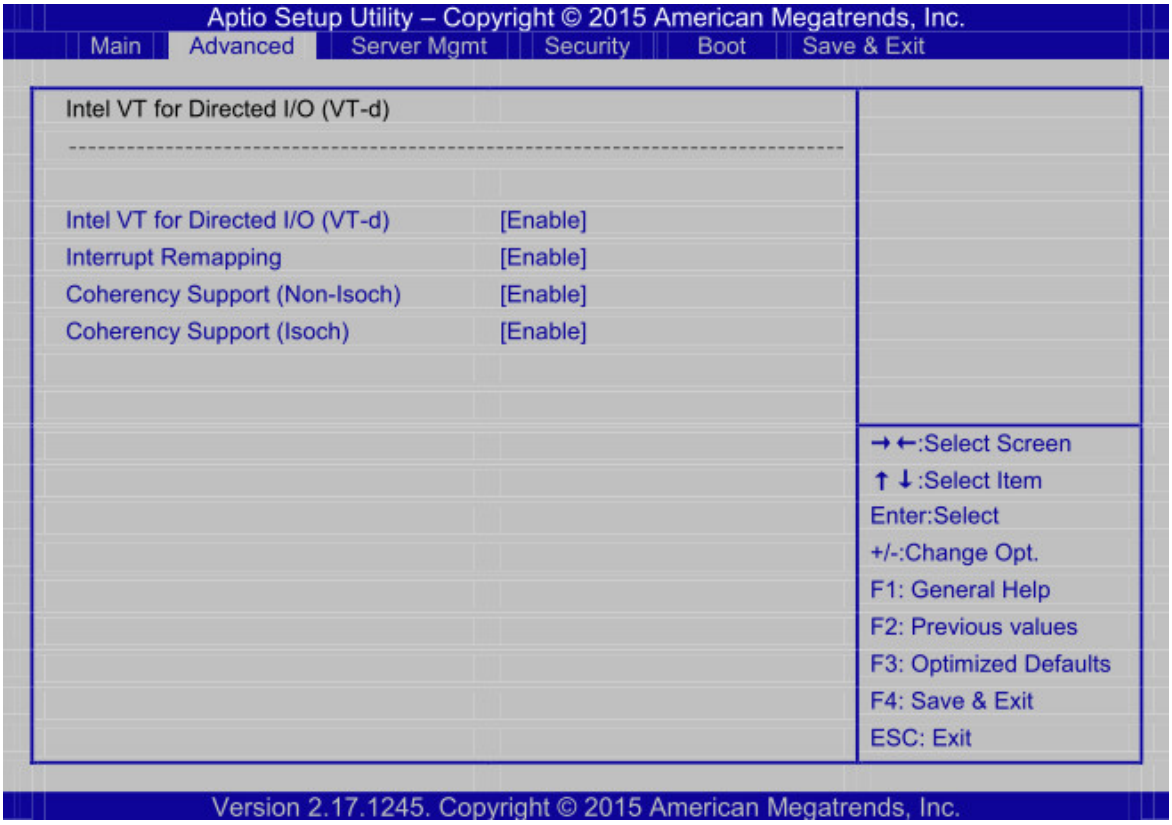
Menu Fields	Settings	Comments
	x16 Auto	

5.3.5.4. IOAT Configuration



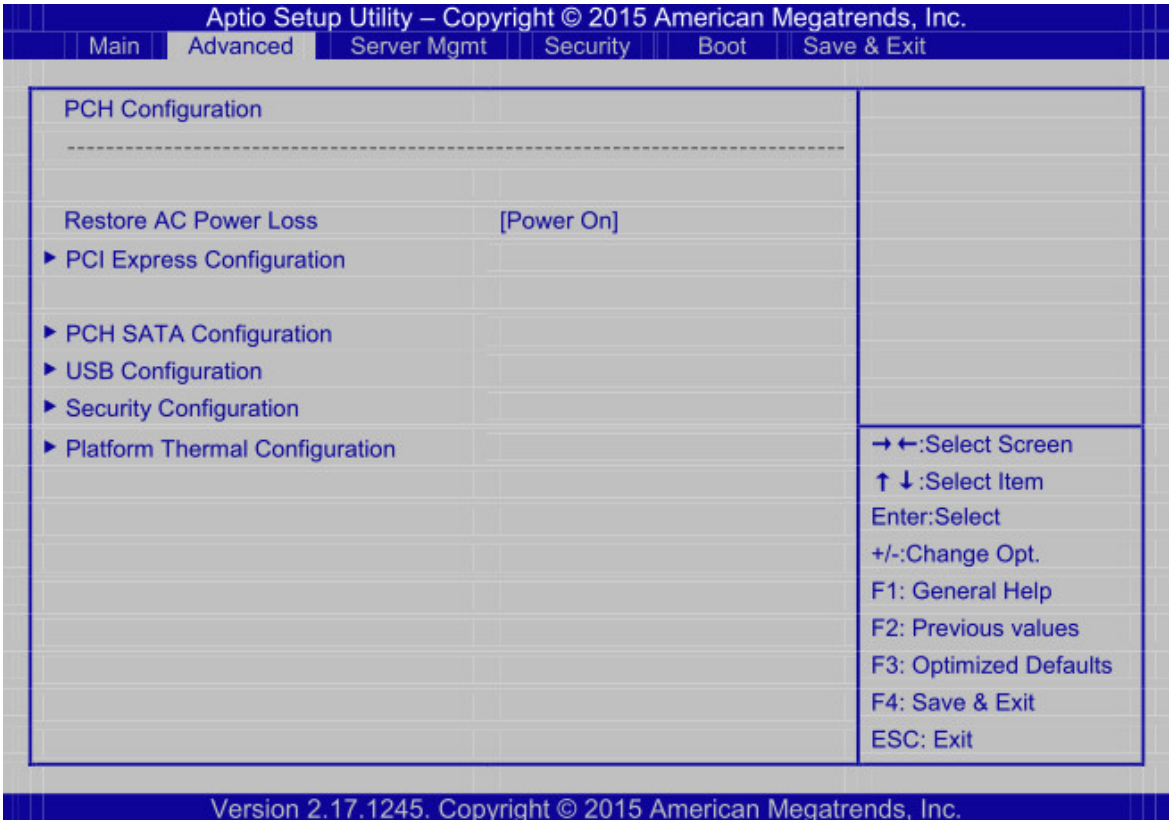
Menu Fields	Settings	Comments
Advanced \ IIO Configuration \ IOAT Configuration		
Enable IOAT	Disabled Enabled	Control to enable/disable IOAT devices
No Snoop	Disabled Enabled	No Snoop Enable/Disable for each CB device
Disable TPH	Enabled Disabled	TLP Processing Hint disable
Relaxed Ordering	Disabled Enabled	Relaxed Ordering Enable/Disable

5.3.5.5. Intel VT for Directed I/O (VT-d)



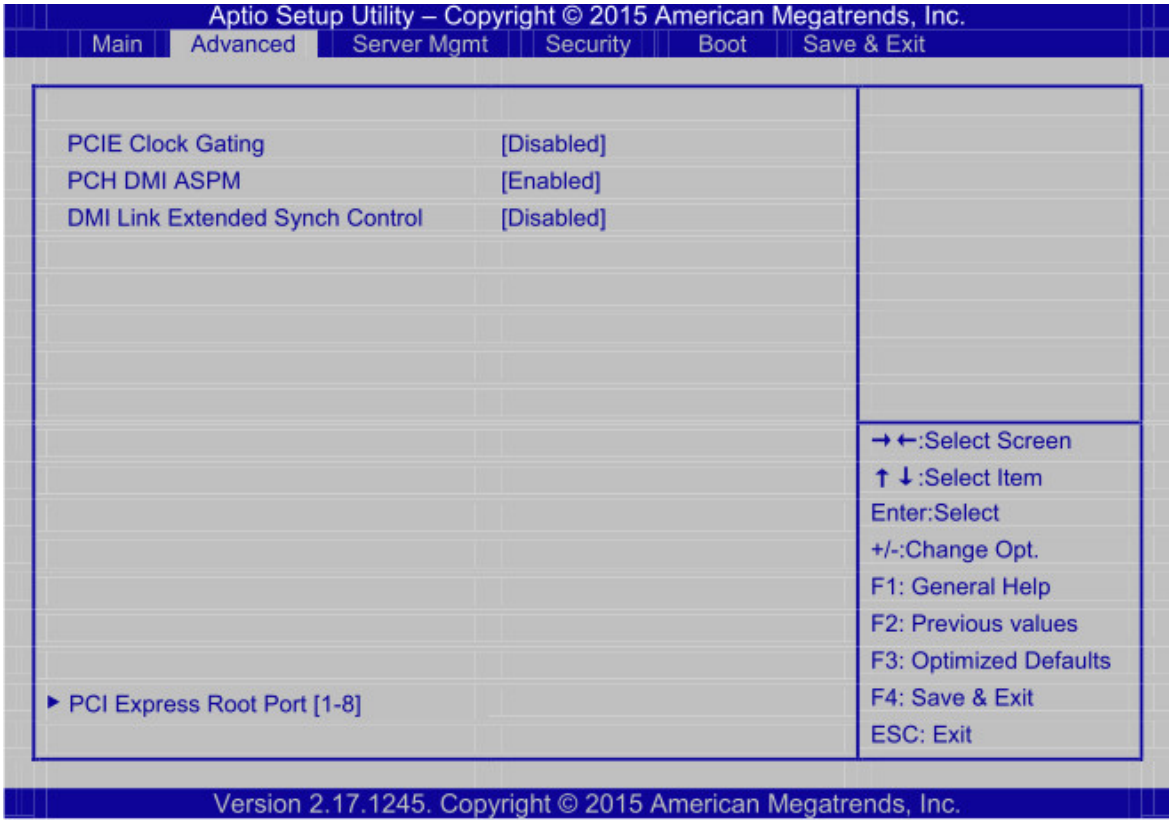
Menu Fields	Settings	Comments
Advanced \ IIO Configuration \ Intel VT for Directed I/O (VT-d)		
Intel VT for Directed I/O (VT-d)	Enabled Disabled	Enable/Disable Intel Virtualization Technology for Directed I/O (VT-d) by reporting the I/O device assignment to VMM through DMAR ACPI Tables.
Interrupt Remapping	Enabled Disabled	Enable/Disable VT_D Interrupt Remapping Support
Coherency Support (Non-Isoch)	Enabled Disabled	Enable/Disable Non-Isoch VT_D Engine Coherency support
Coherency Support (Isoch)	Enabled Disabled	Enable/Disable Isoch VT_D Engine Coherency support

5.3.6. PCH Configuration



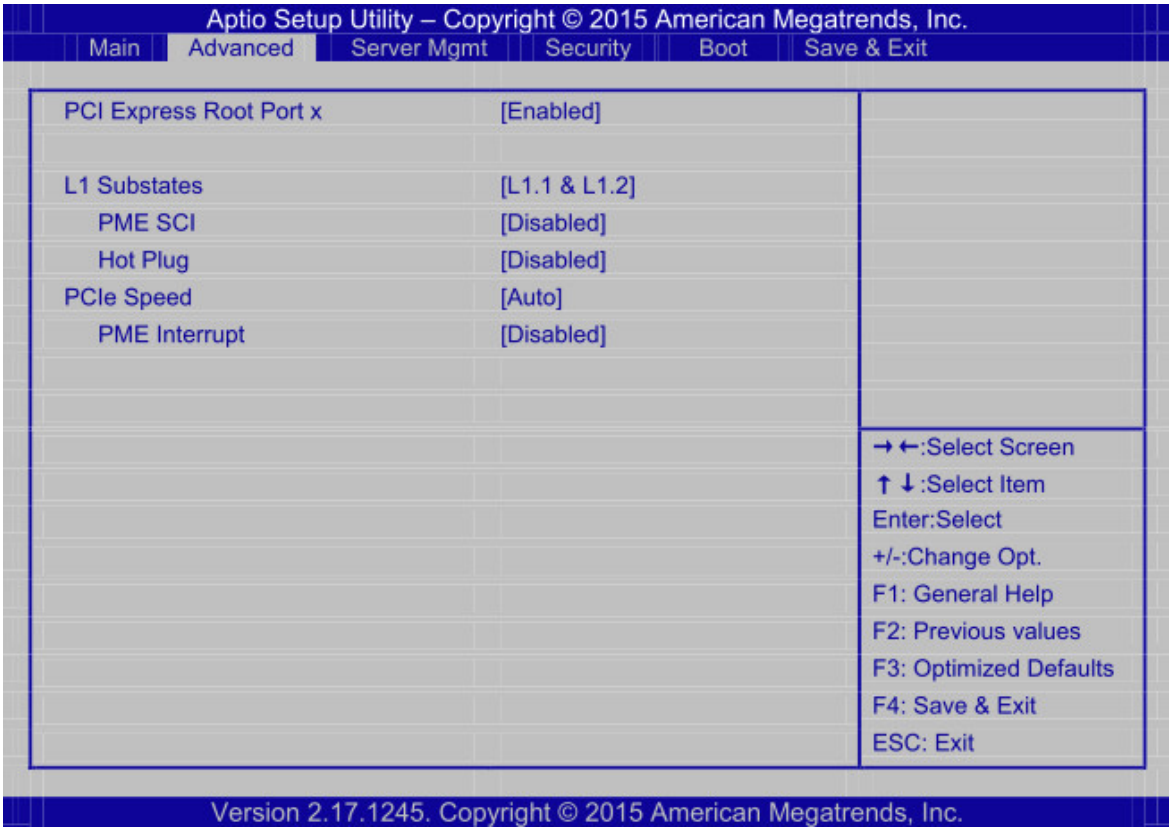
Menu Fields	Settings	Comments
Advanced \ PCH Configuration		
Restore AC Power Loss	Power Off Power On Last State	Select AC power state when power is re-applied after a power failure.

5.3.6.1. PCI Express Configuration



Menu Fields	Settings	Comments
Advanced \ PCH Configuration \ PCI Express Configuration		
PCIE Clock Gating	Disabled Enabled	PCIE Clock Gating Enable/Disable for all PCH PCIE Ports.
PCH DMI ASPM	Disabled Enabled	PCH DMI ASPM Setting
DMI Link Extended Synch Control	Disabled Enabled	The control of Extended Synch on SB side of the DMI Link.

5.3.6.2. PCI Express Root Port x



Menu Fields	Settings	Comments
Advanced \ PCH Configuration \ PCI Express Configuration \ PCI Express Root Port x		
PCI Express Root Port x	Disabled Enabled	Control the PCI Express Root Port.
L1 Substates	Disabled L1.1 L1.2 L1.1 & L1.2	PCI Express L1 Substates settings
PME SCI	Disabled Enabled	PCI Express PME SCI Enable/Disable.
Hot Plug	Disabled Enabled	PCI Express Hot Plug Enable/Disable.
PCIe Speed	Auto Gen1	Configure PCIe Speed

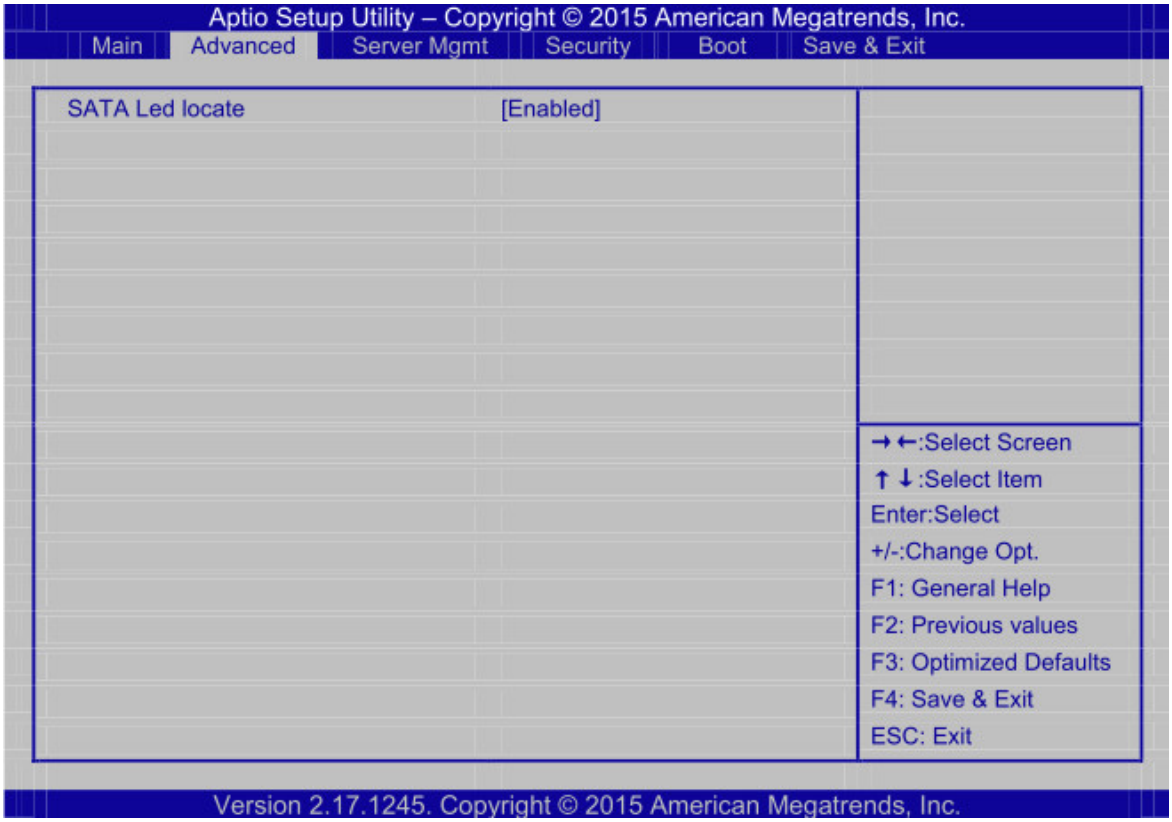
Menu Fields	Settings	Comments
	Gen2	
PME Interrupt	Disabled Enabled	PCI Express PME Interrupt Enable/Disable.

5.3.6.3. PCH SATA Configuration

Menu Fields	Settings	Comments
Advanced \ PCH Configuration \ PCH SATA Configuration		

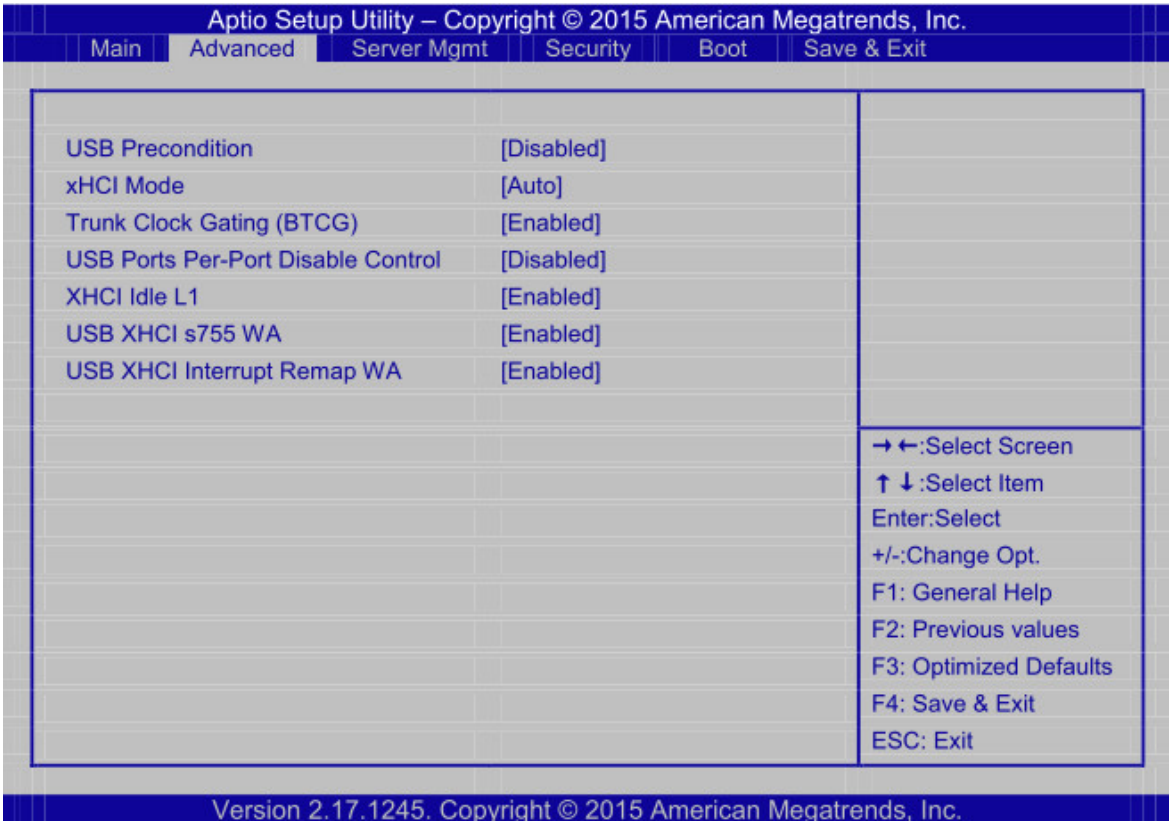
Menu Fields	Settings	Comments
SATA Controller	Disabled Enabled	Enable or Disable SATA Controller
Configure SATA as	IDE AHCI RAID	This will configure SATA as IDE, RAID or AHCI.
SATA test mode	Disabled Enabled	Enable/Disable SATA test mode
Support Aggressive Link Power Management	Disabled Enabled	Enables/Disables SALP
Hot Plug	Disabled Enabled	Designates this port as Hot Pluggable.
Spin Up Device	Disabled Enabled	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	Hard Disk Drive Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive

5.3.6.4. SATA Mode Options



Menu Fields	Settings	Comments
Advanced \ PCH Configuration \ PCH SATA Configuration \ SATA Mode options		
SATA Led locate	Disabled Enabled	If enabled LED/SGPIO hardware is attached

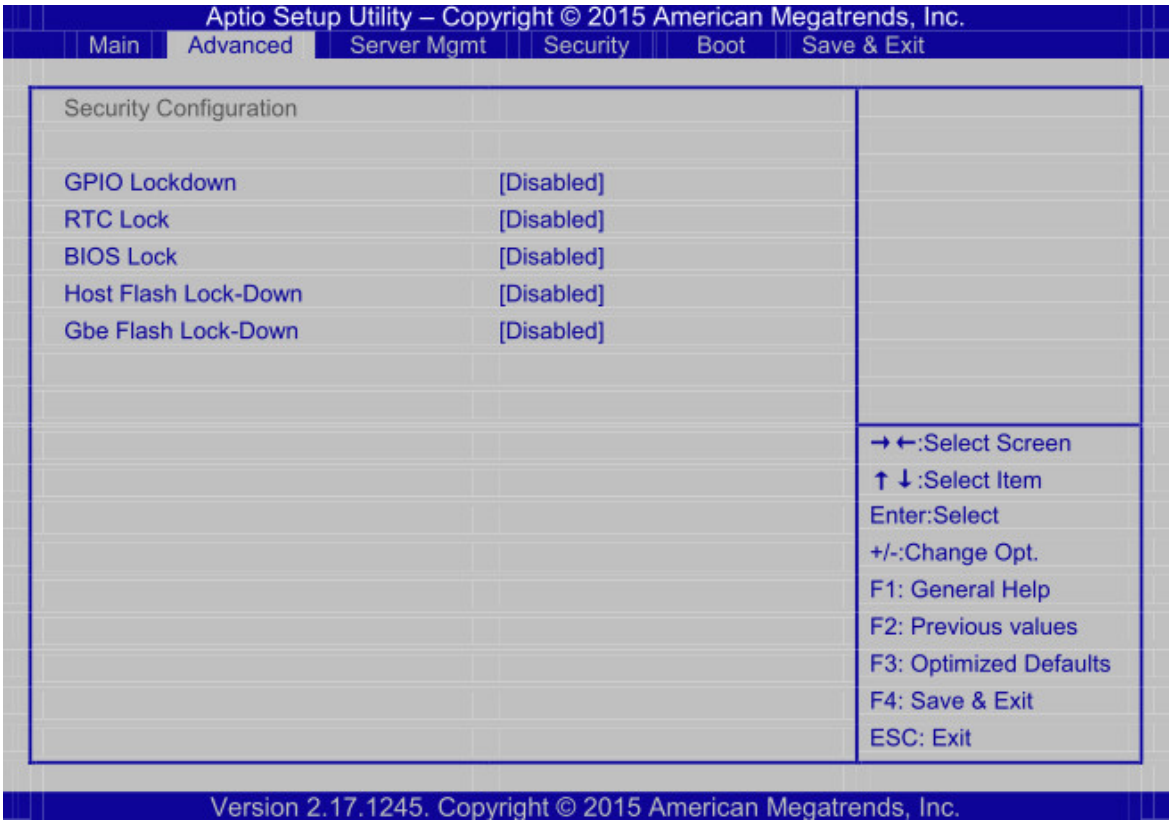
5.3.6.5. USB Configuration



Menu Fields	Settings	Comments
Advanced \ PCH Configuration \ USB Configuration		
USB Precondition	Disabled Enabled	Precondition work on USB host controller and root ports for faster enumeration.
xHCI Mode	Smart Auto Auto Enabled Disabled Manual	Mode of operation of xHCI controller.
Trunk Clock Gating (BTCG)	Disabled Enabled	Enable/Disable BTCG
USB Ports Per-Port Disable Control	Disabled Enabled	Control each of the USB ports (0~13) disabling.

Menu Fields	Settings	Comments
XHCI Idle L1	Disabled Enabled	Enabled XHCI Idle L1. Disabled to workaround USB3 hot plug will fail after 1 hot plug removal. Please put the system to G3 for the new settings to take effect.
USB XHCI s755 WA	Disabled Enabled	ONLY for WBG < B1! Enable/Disable USB XHCI s755 WA to avoid CATERRs.
USB XHCI Interrupt Remap WA	Disabled Enabled	Enable/Disable USB XHCI s116 WA. ENABLE = hides MSI capability on XHCI

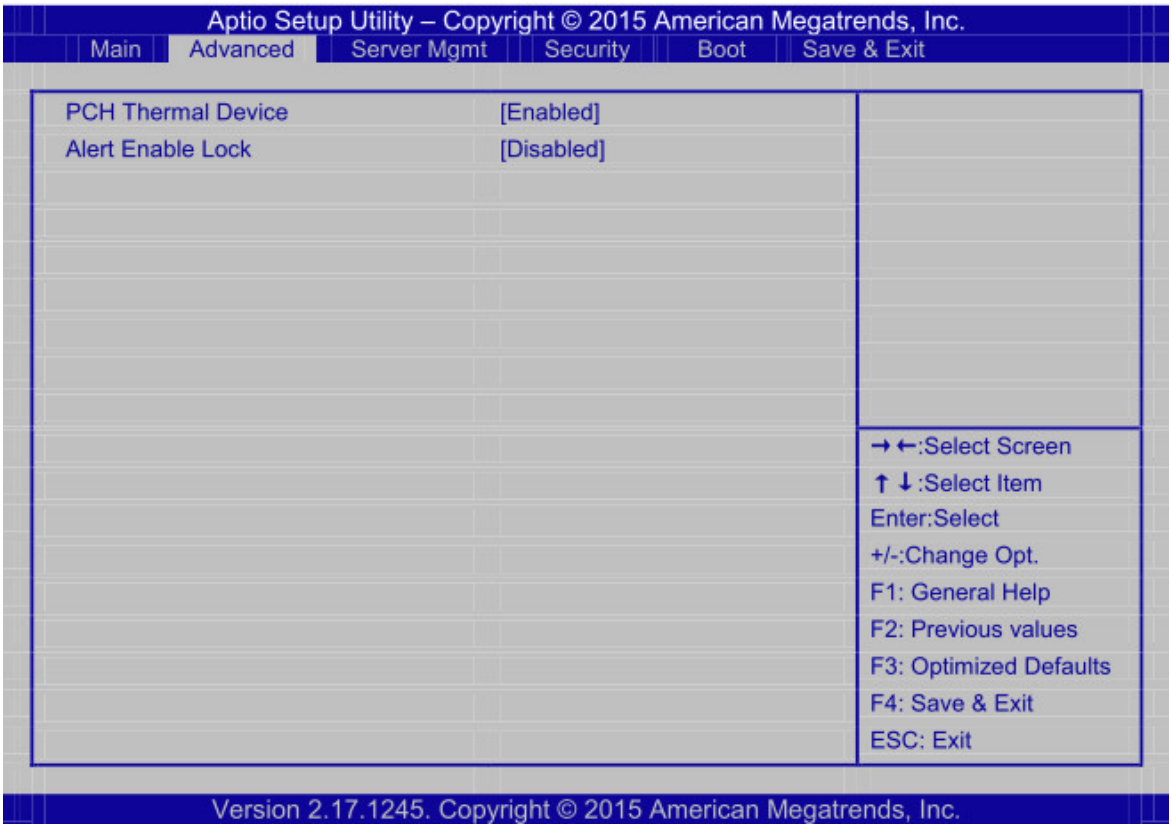
5.3.6.6. Security Configuration



Menu Fields	Settings	Comments
Advanced \ PCH Configuration \ Security Configuration		
GPIO Lockdown	Disabled Enabled	Enable/Disable the PCH GPIO Lockdown feature.

Menu Fields	Settings	Comments
RTC Lock	Disabled Enabled	Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM
BIOS Lock	Disabled Enabled	Enable/Disable the PCH BIOS Lock Enable feature.
Host Flash Lock-Down	Disabled Enabled	Enable/Disable Host Flash Lock-Down
Gbe Flash Lock-Down	Disabled Enabled	Enable/Disable Gbe Flash Lock-Down

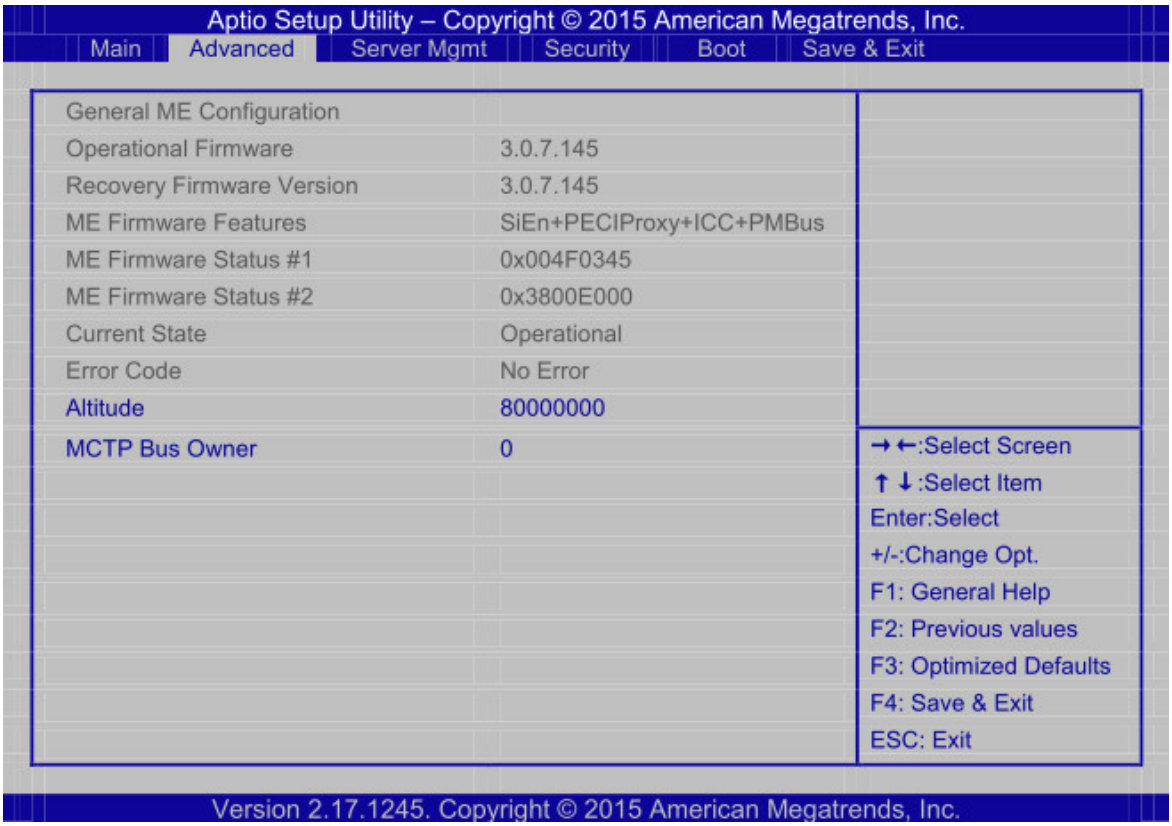
5.3.6.7. Platform Thermal Configuration



Menu Fields	Settings	Comments
Advanced \ PCH Configuration \ Platform Thermal Configuration		
PCH Thermal Device	Disabled Enabled	Enable/Disable PCH Thermal Device(D31:F6)

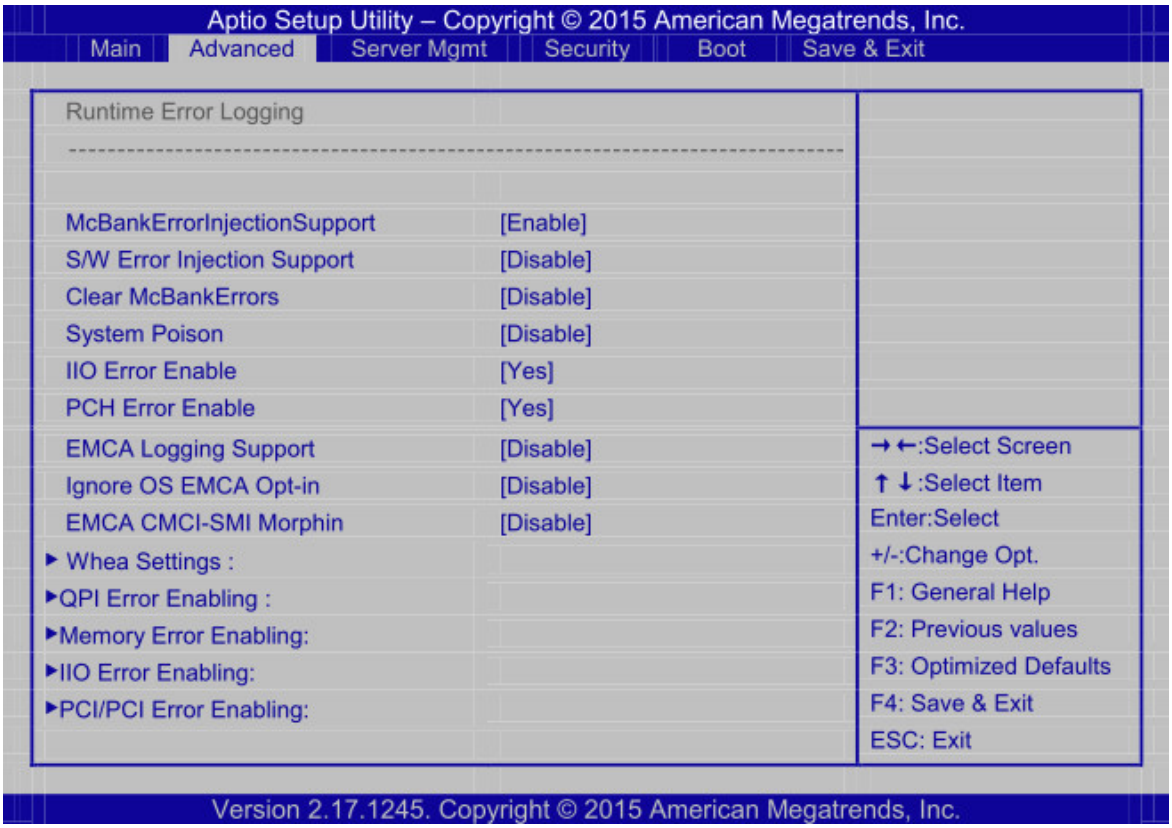
Menu Fields	Settings	Comments
	Auto	
Alert Enable Lock	Disabled Enabled	Lock all Alert Enable settings

5.3.7. Server ME Configuration



Menu Fields	Settings	Comments
Advanced \ Server ME Configuration		
Altitude	80000000	The altitude of the platform location above the see level, expressed in meters. The hex number is decoded as 2's complement signed integer. Provide the 80000000 value if the altitude is unknown.
MCTP Bus Owner	0	MCTP bus owner location on PCIe: [15:8] bus, [7:3] device, [2:0] function. If all zeros sending bus owner is disabled.

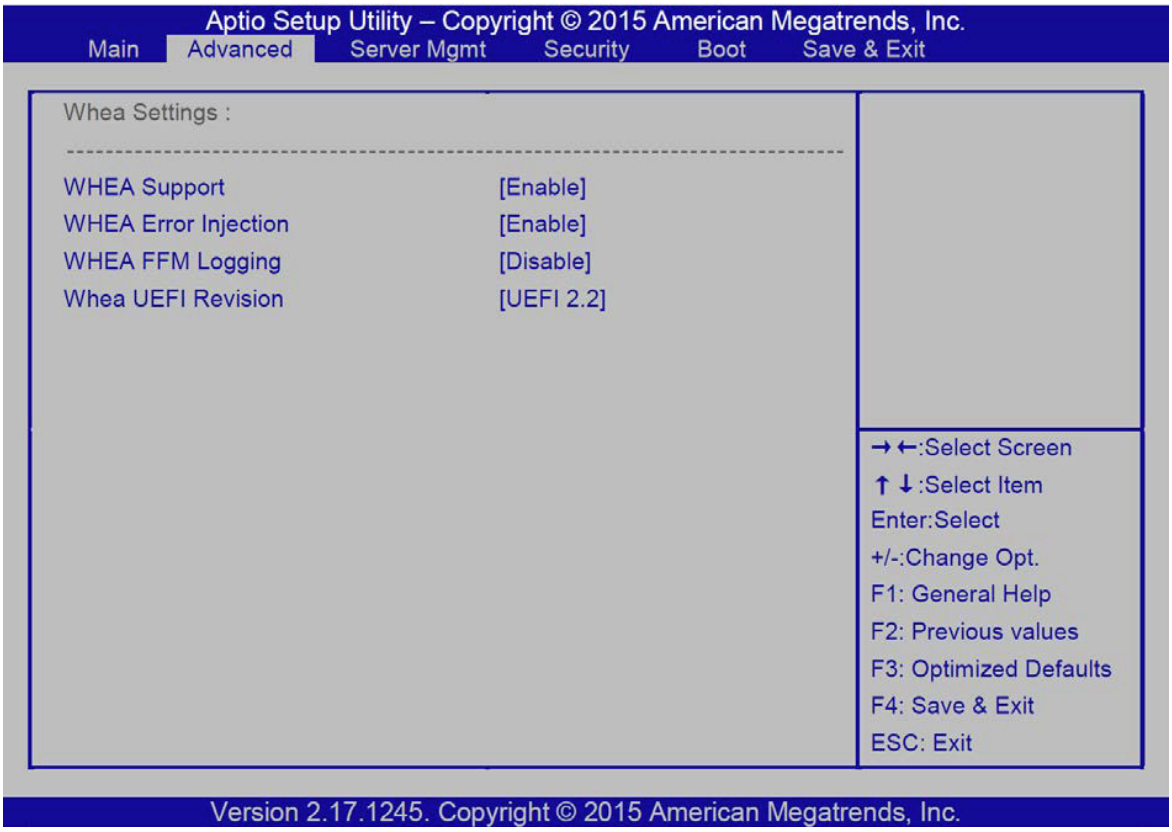
5.3.8. Runtime Error Logging



Menu Fields	Settings	Comments
Advanced \ Runtime Error Logging		
McBankErrorInjectionSupport	Disabled Enabled	Enables or Disables McBank Error Injection Support.
S/W Error Injection Support	Disabled Enabled	When Enabled S/W Error Injection is supported by unlocking MSR 0x790
Clear McBankErrors	Disabled Enabled	Enables or Disables clearing MCBank errors on warm reset.
System Poison	Disabled Enabled	Enable/Disable Core, Uncore and IIO Poison
IIO Error Enable	no yes	
PCH Error Enable	no yes	

Menu Fields	Settings	Comments
EMCA Logging Support	Disabled Enabled	Enable/Disable EMCA Logging
Ignore OS EMCA Opt-in	Disabled Enabled	Enable/Disable Ignore OS EMCA Opt-in and log
EMCA CMCI-SMI Morphin	Disabled Enabled	Enable/Disable EMCA CSMI

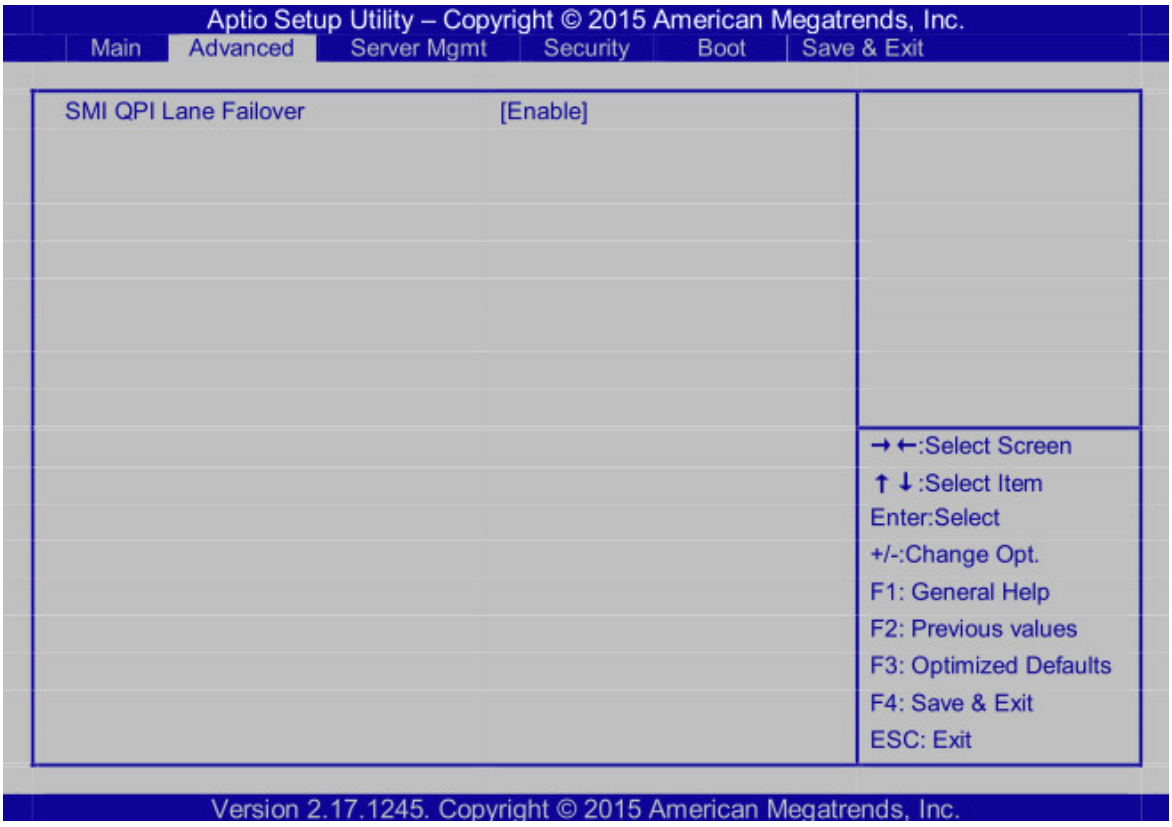
5.3.8.1. Whea Settings



Menu Fields	Settings	Comments
Advanced \ Runtime Error Logging \ WHEA Settings		
WHEA Support	Disabled Enabled	Enable or disable the WHEA support
WHEA Error Injection	Disabled Enabled	Whea EINJ ACPI 5.0 support for set error type with address and vendor extensions.

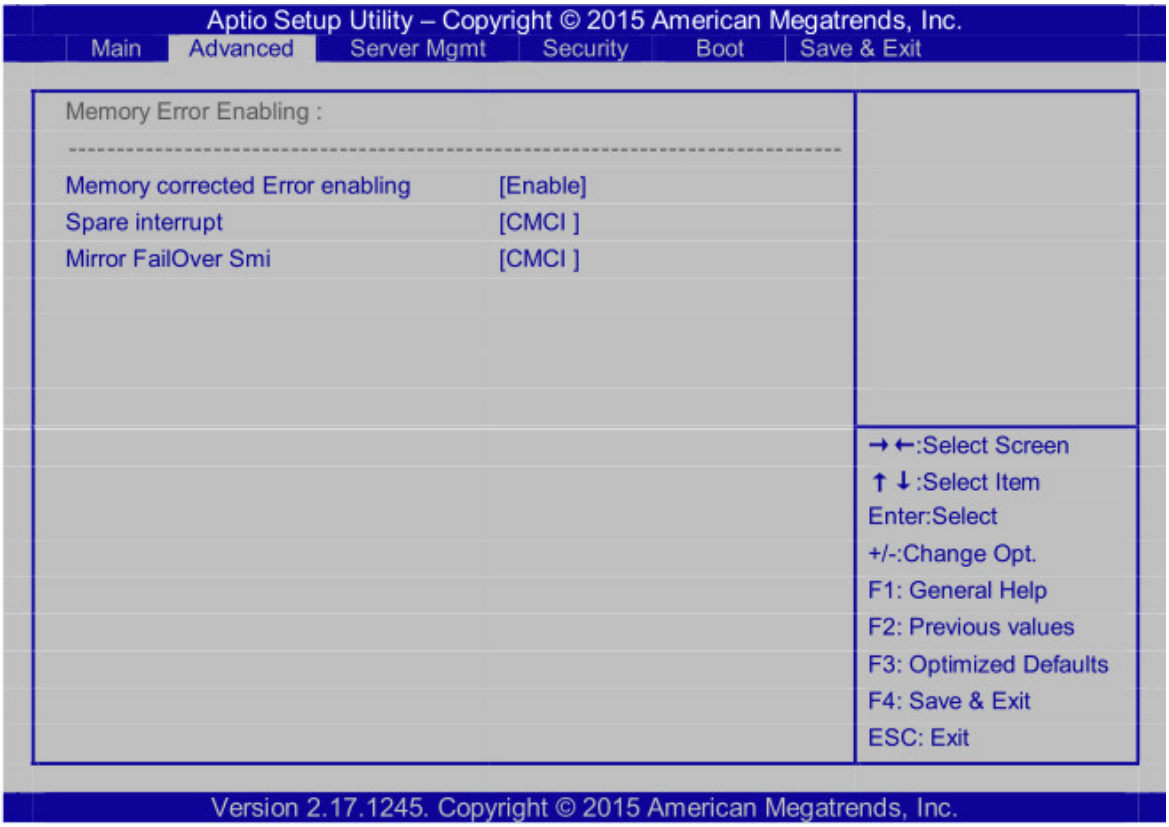
Menu Fields	Settings	Comments
WHEA FFM Logging	Disabled Enabled	Enable/Disable Whea FFM logging of errors.
Whea UEFI Revision	UEFI 2.2 UEFI 2.3.1	UEFI revision of Whea error format.

5.3.8.2. QPI Error Enabling



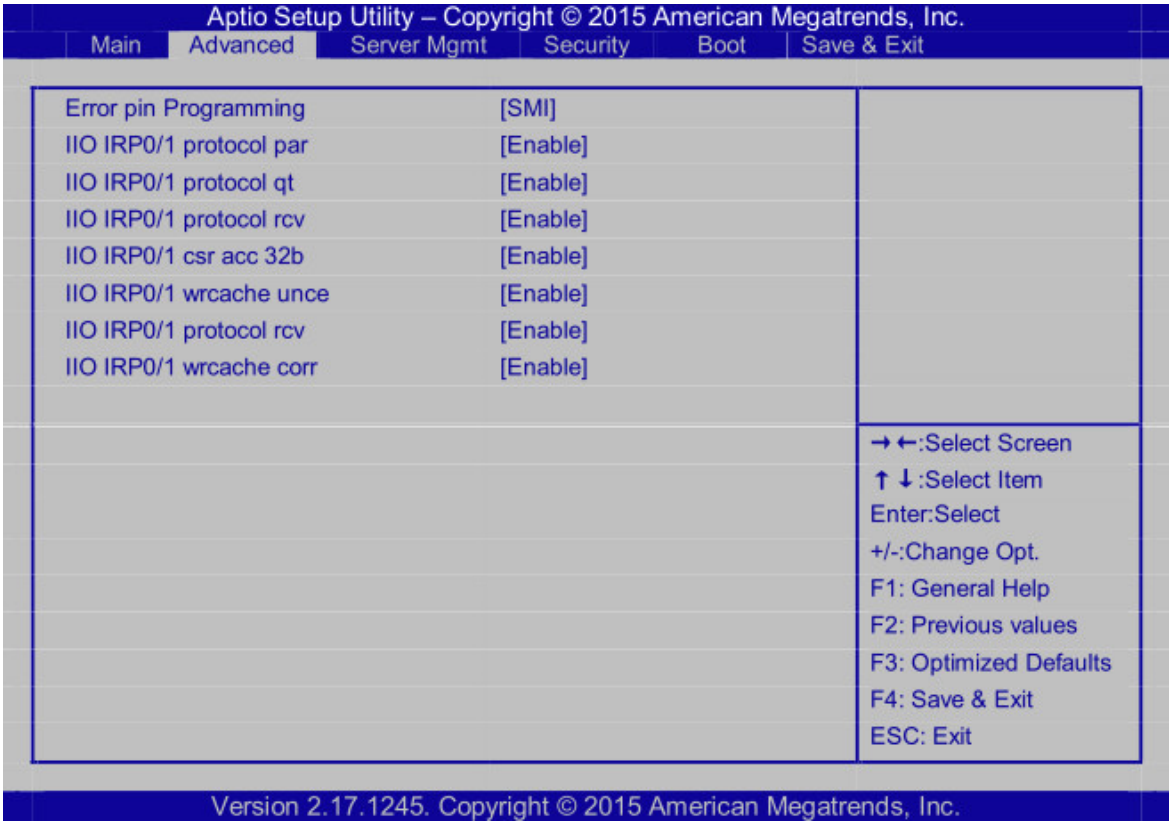
Menu Fields	Settings	Comments
Advanced \ Runtime Error Logging \ QPI Error Enabling		
SMI QPI Lane Failover	Disabled Enabled	Enable/disables SMI when clock/data failover is set.

5.3.8.3. Memory Error Enabling



Menu Fields	Settings	Comments
Advanced \ Runtime Error Logging \ Memory Error Enabling		
Memory corrected Error enabling	Disabled Enabled	Enable / Disables Memory corrected Errors
Spare interrupt	SMI CMCI Error Pin	Select SMI/CMCI/ErrPin for spare interrupt
Mirror FailOver Smi	SMI CMCI	Enable/Disable Mirror FailOver SMI generation

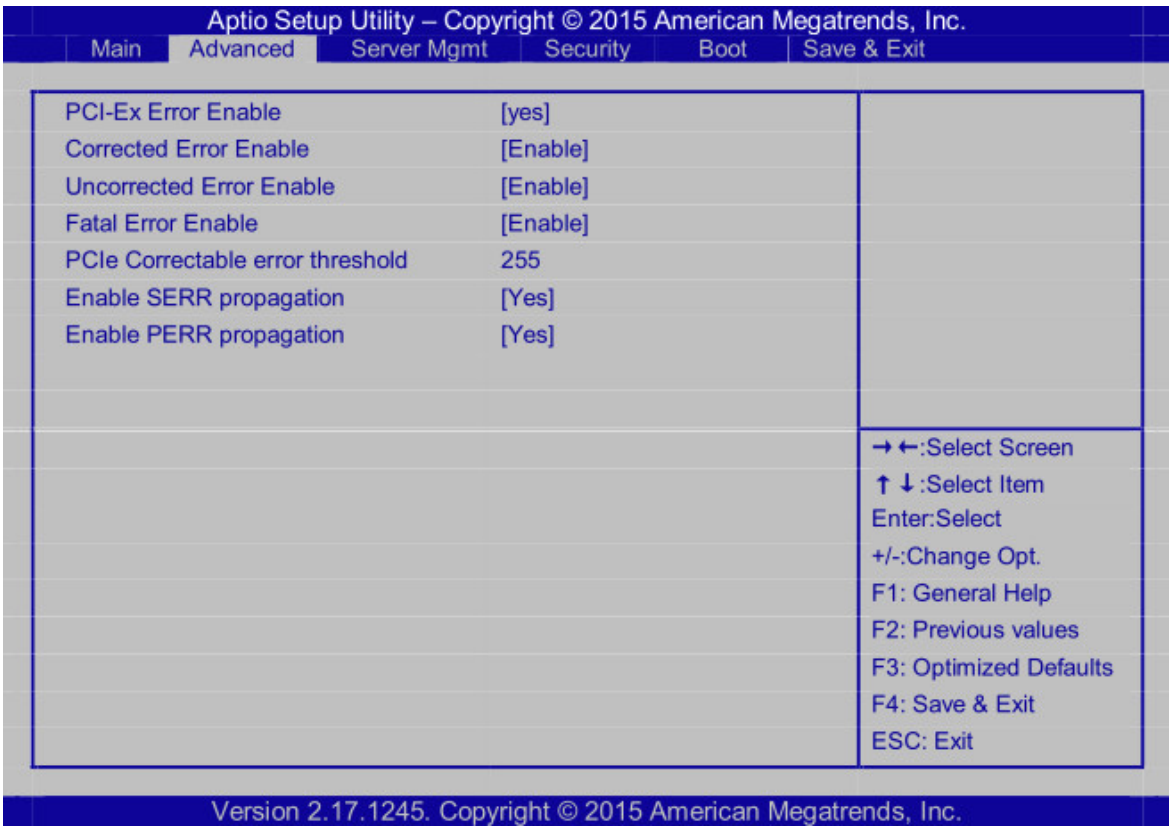
5.3.8.4. IIO Error Enabling



Menu Fields	Settings	Comments
Advanced \ Runtime Error Logging \ IIO Error Enabling		
Error pin Programming	SMI	Error pin Programming.
IIO IRP0/1 protocol par	Disabled Enabled	Enable or disable Coherent Interface protocol IIO parity error reporting.
IIO IRP0/1 protocol qt	Disabled Enabled	Enable or disable IIO Coherent Interface protocol queue table overflow or underflow error reporting.
IIO IRP0/1 protocol rcv	Disabled Enabled	Enable or disable IIO Coherent Interface protocol layer received unexpected response or completion error reporting.
IIO IRP0/1 csr acc 32b	Disabled Enabled	Enable or disable IIO Coherent Interface CSR Access Crossing 32-bit Boundary error reporting.
IIO IRP0/1 wrcache unce	Disabled Enabled	Enable or disable IIO Coherent Interface Write Cache Un-correctable ECC error reporting.

Menu Fields	Settings	Comments
IIO IRP0/1 protocol rcv	Disabled Enabled	Enable or disable IIO Coherent Interface Protocol Layer Received Poisoned Packet error reporting.
IIO IRP0/1 wrcache corr	Disabled Enabled	Enable or disable IIO Coherent Interface Write Cache Correctable ECC error reporting.

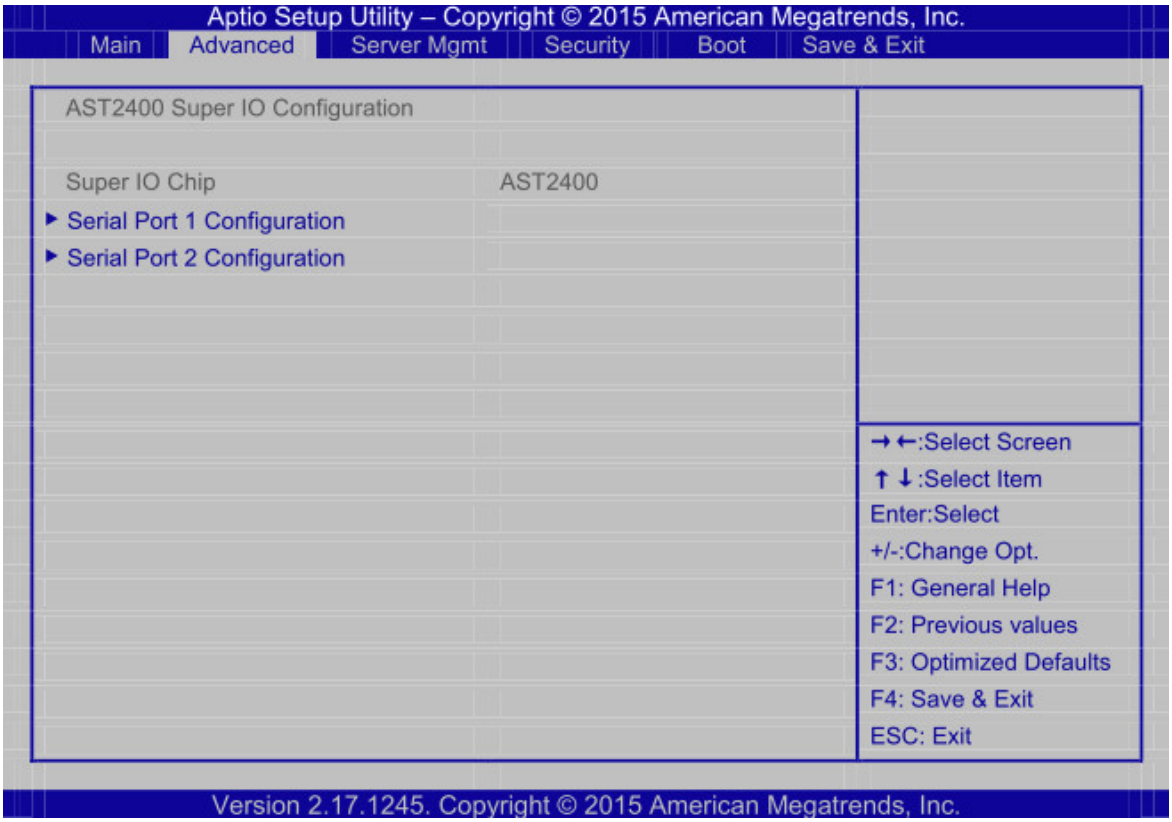
5.3.8.5. PCI/PCI Error Enabling



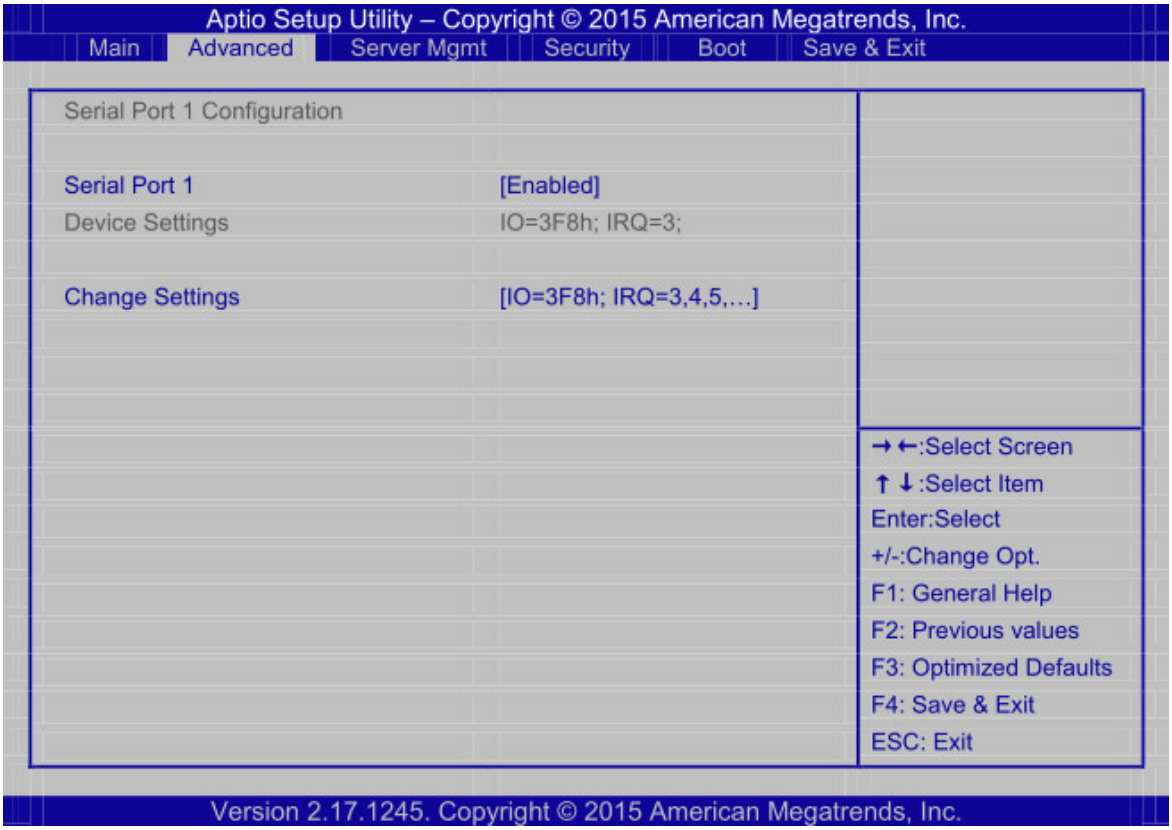
Menu Fields	Settings	Comments
Advanced \ Runtime Error Logging \ PCI/PCI Error Enabling :		
PCI-Ex Error Enable	no yes	
Corrected Error Enable	Disabled Enabled	Enable/Disable PCIe Correctable errors.
Uncorrected Error Enable	Disabled Enabled	Enable/Disable PCIe Uncorrectable errors.

Menu Fields	Settings	Comments
Fatal Error Enable	Disabled Enabled	Enable/Disable PCIe Fatal errors.
PCIe Correctable error threshold	255	PCIe CE threshold (1-255), 0-No threshold.
Enable SERR propagation	no yes	
Enable PERR propagation	no yes	

5.3.9. AST2400 Super IO Configuration

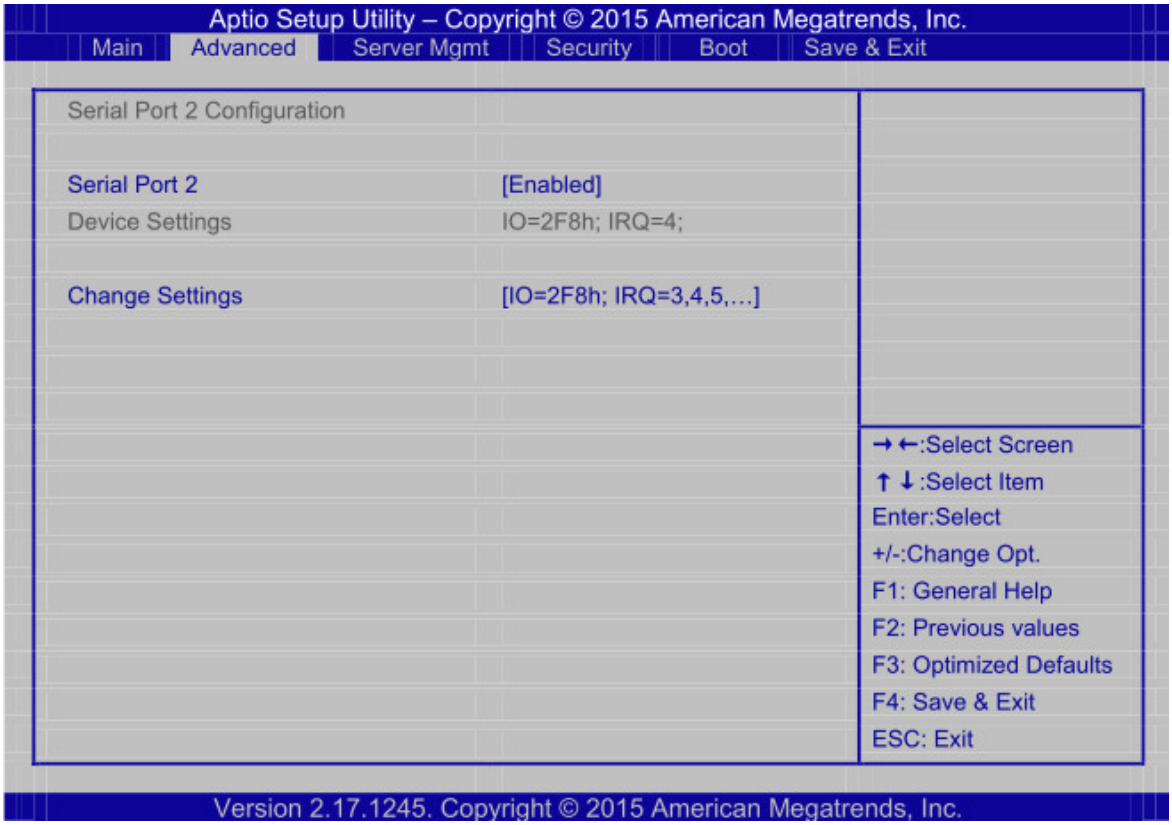


5.3.9.1. Serial Port 1 Configuration



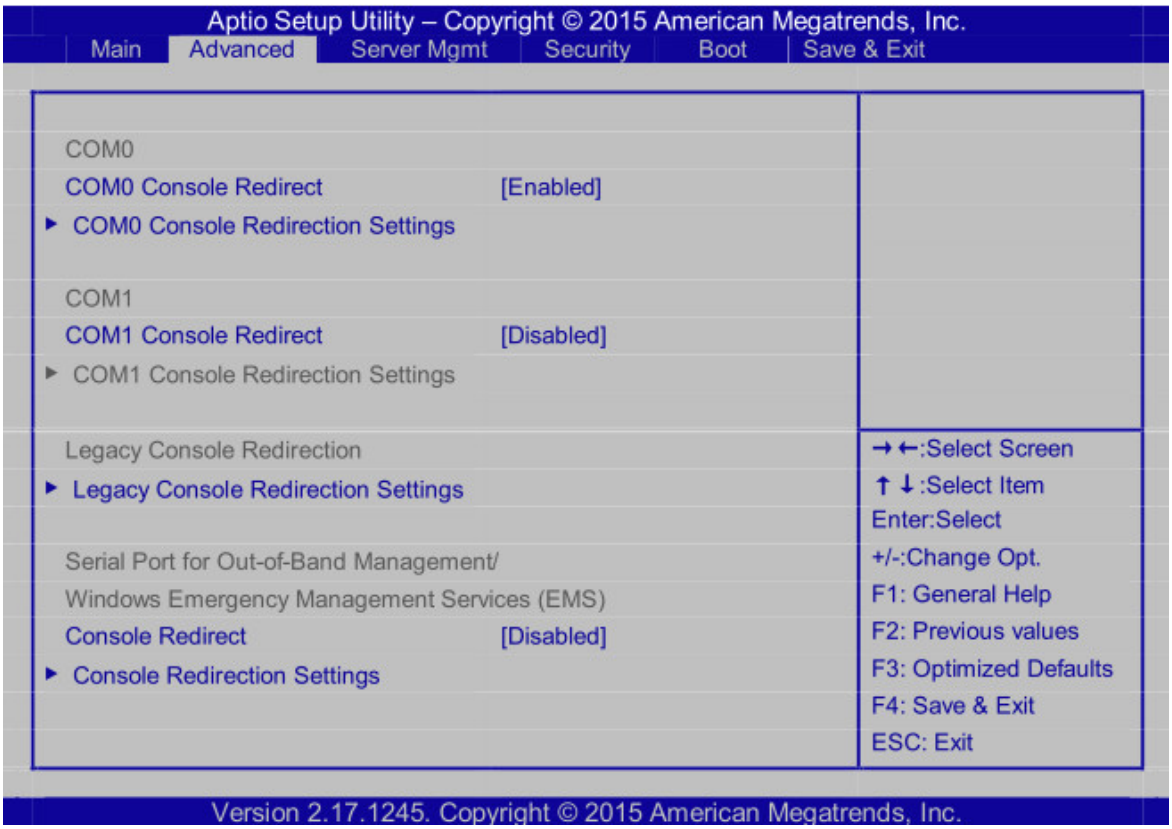
Menu Fields	Settings	Comments
Advanced \ AST2400 Super IO Configuration \ Serial Port 1 Configuration		
Serial Port 1	Disabled Enabled	Enable or Disable Serial Port (COM)
Change Settings	Auto IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

5.3.9.2. Serial Port 2 Configuration



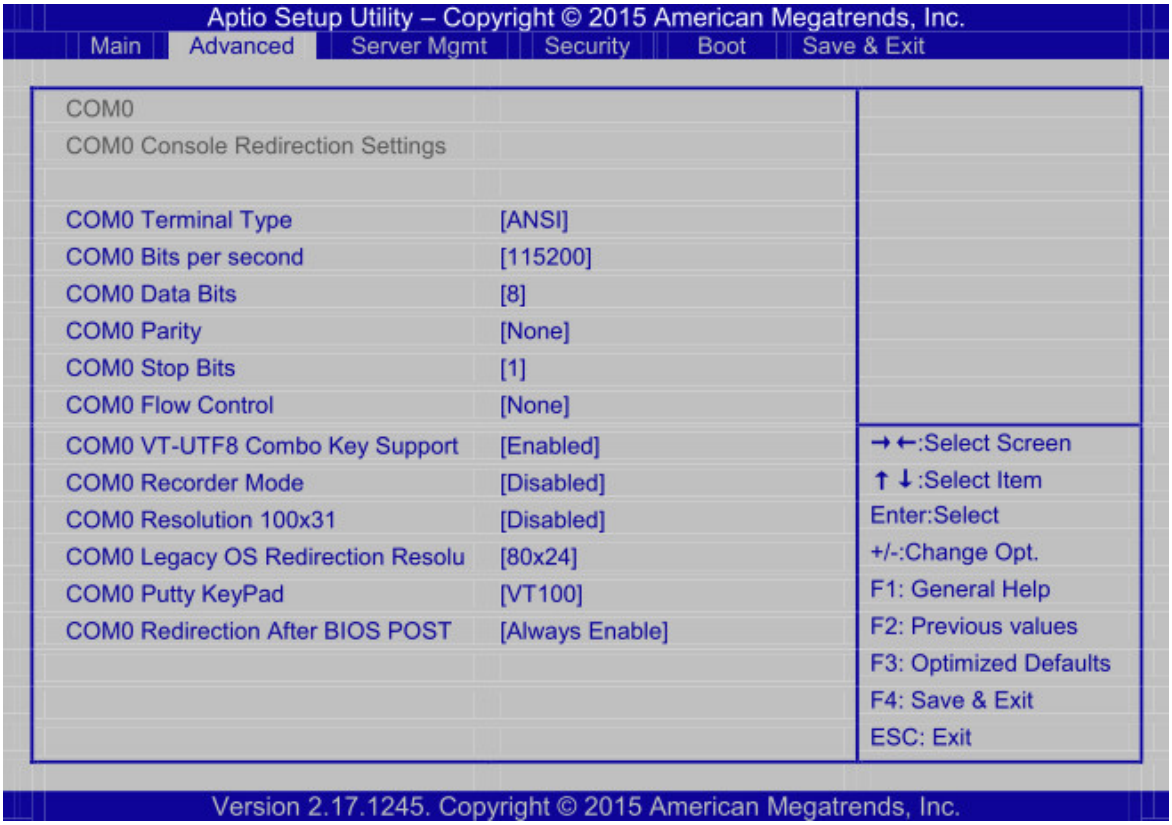
Menu Fields	Settings	Comments
Advanced \ AST2400 Super IO Configuration \ Serial Port 2 Configuration		
Serial Port 2	Disabled Enabled	Enable or Disable Serial Port (COM)
Change Settings	Auto IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

5.3.10. Serial Port Console Redirection



Menu Fields	Settings	Comments
Advanced \ Serial Port Console Redirection		
COM0 Console Redirection	Disabled Enabled	Console Redirection Enable or Disable.
COM1 Console Redirection	Disabled Enabled	Console Redirection Enable or Disable.
Console Redirect	Disabled Enabled	Console Redirection Enable or Disable.

5.3.10.1. COM0 Console Redirection Settings

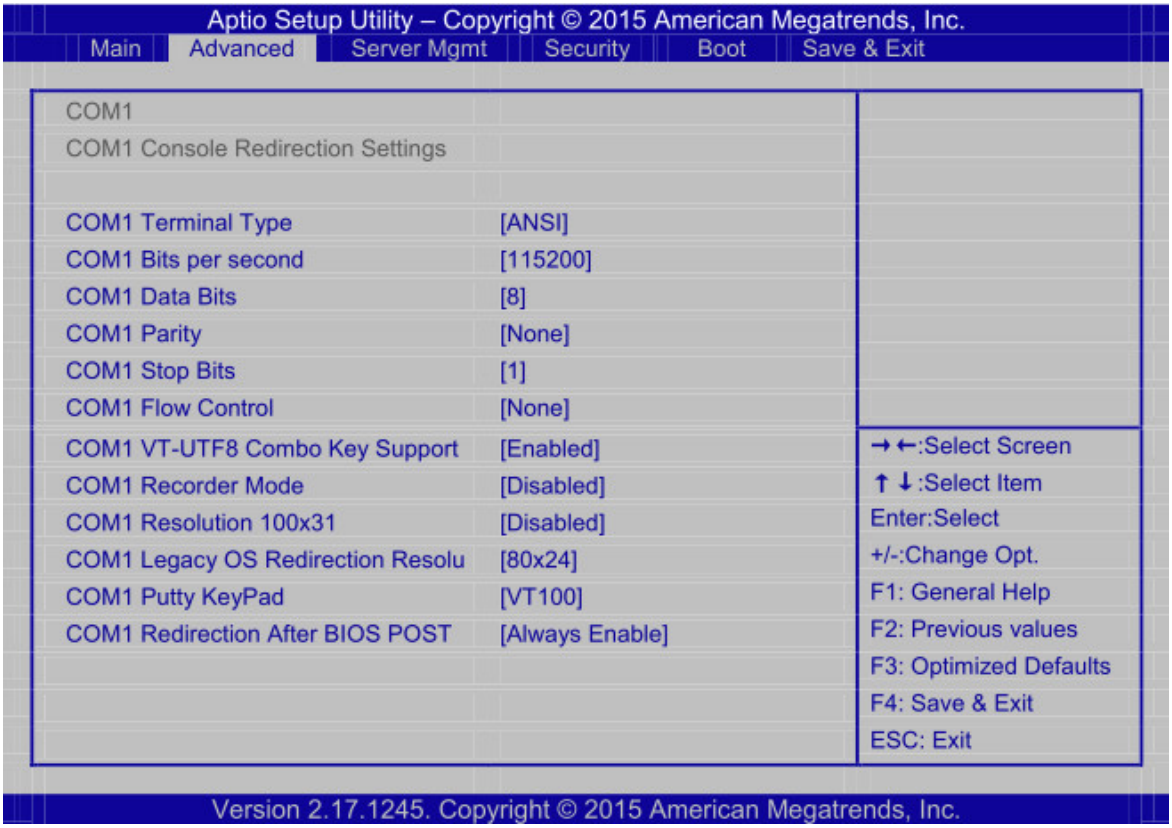


Menu Fields	Settings	Comments
Advanced \ Serial Port Console Redirection \ COM0 Console Redirection Settings		
COM0 Terminal Type	VT100 VT100+ VT-UTF8 ANSI	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color,function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
COM0 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.
COM0 Data Bits	7 8	Data Bits

Menu Fields	Settings	Comments
COM0 Parity	None Even Odd Mark Space	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.
COM0 Stop Bits	1 2	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit
COM0 Flow Control	None Hardware RTS/CTS	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. Once the buffers are empty, a *start* signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
COM0 VT-UTF8 Combo Key Support	Disabled Enabled	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals
COM0 Recorder Mode	Disabled Enabled	With this mode enabled only text will be sent. This is to capture Terminal data
COM0 Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
COM0 Legacy OS Redirection Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection
COM0 Putty Keypad	VT100 LINUX XTERMR6 SC0 ESCN VT400	Select FunctionKey and KeyPad on Putty

Menu Fields	Settings	Comments
COM0 Redirection After BIOS POST	Always Enable Boot Loader	The Settings specify if BootLoader is selected than Legacy console redirection is disabled before booting to Legacy OS. Default value is Always Enable which means Legacy console Redirection is enabled for Legacy OS.

5.3.10.2. COM1 Console Redirection Settings

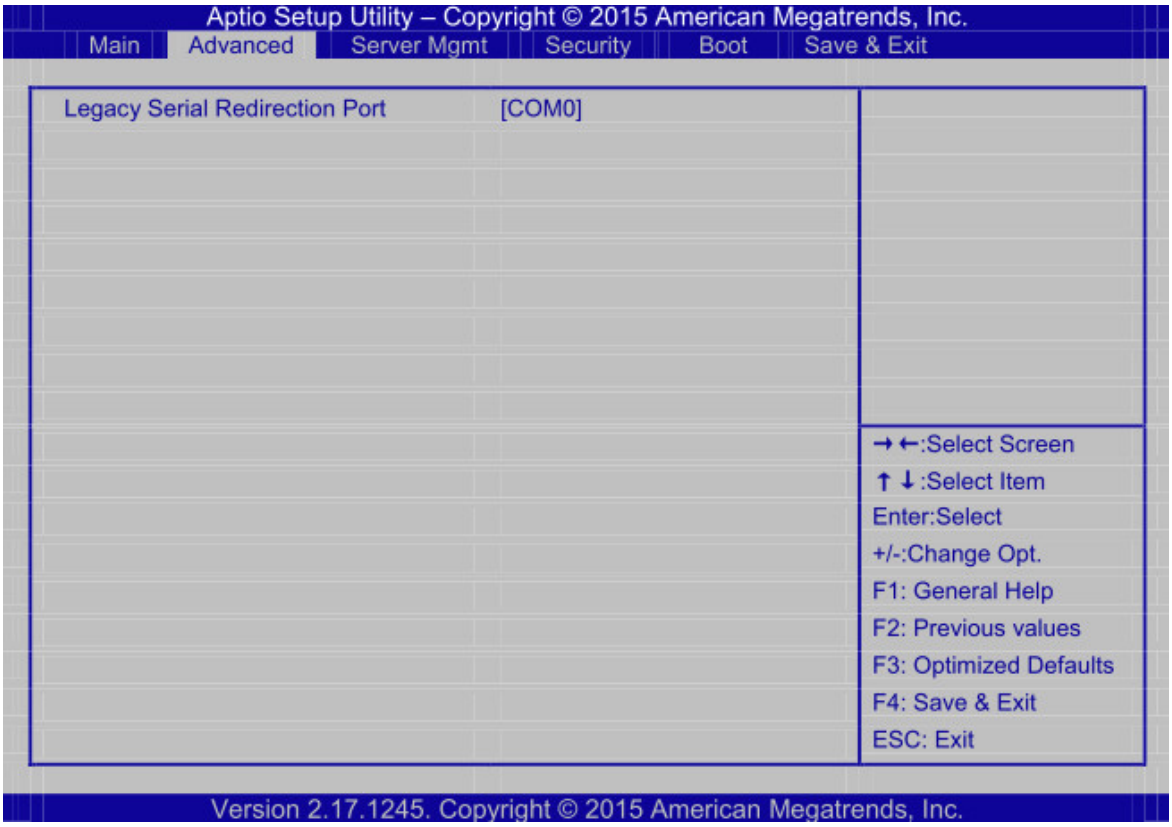


Menu Fields	Settings	Comments
Advanced \ Serial Port Console Redirection \ COM1 Console Redirection Settings		
COM1 Terminal Type	VT100 VT100+ VT-UTF8 [ANSI	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color,function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
COM1 Bits per second	9600 19200 38400	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

Menu Fields	Settings	Comments
	57600 115200	
COM1 Data Bits	7 8	Data Bits
COM1 Parity	None Even Odd Mark Space	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.
COM1 Stop Bits	1 2	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit
COM1 Flow Control	None Hardware RTS/CTS	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. Once the buffers are empty, a *start* signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
COM1 VT-UTF8 Combo Key Support	Disabled	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals
COM1 Recorder Mode	Disabled Enabled	With this mode enabled only text will be sent. This is to capture Terminal data
COM1 Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
COM1 Legacy OS Redirection Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection
COM1 Putty Keypad	VT100 LINUX XTERMR6	Select FunctionKey and KeyPad on Putty

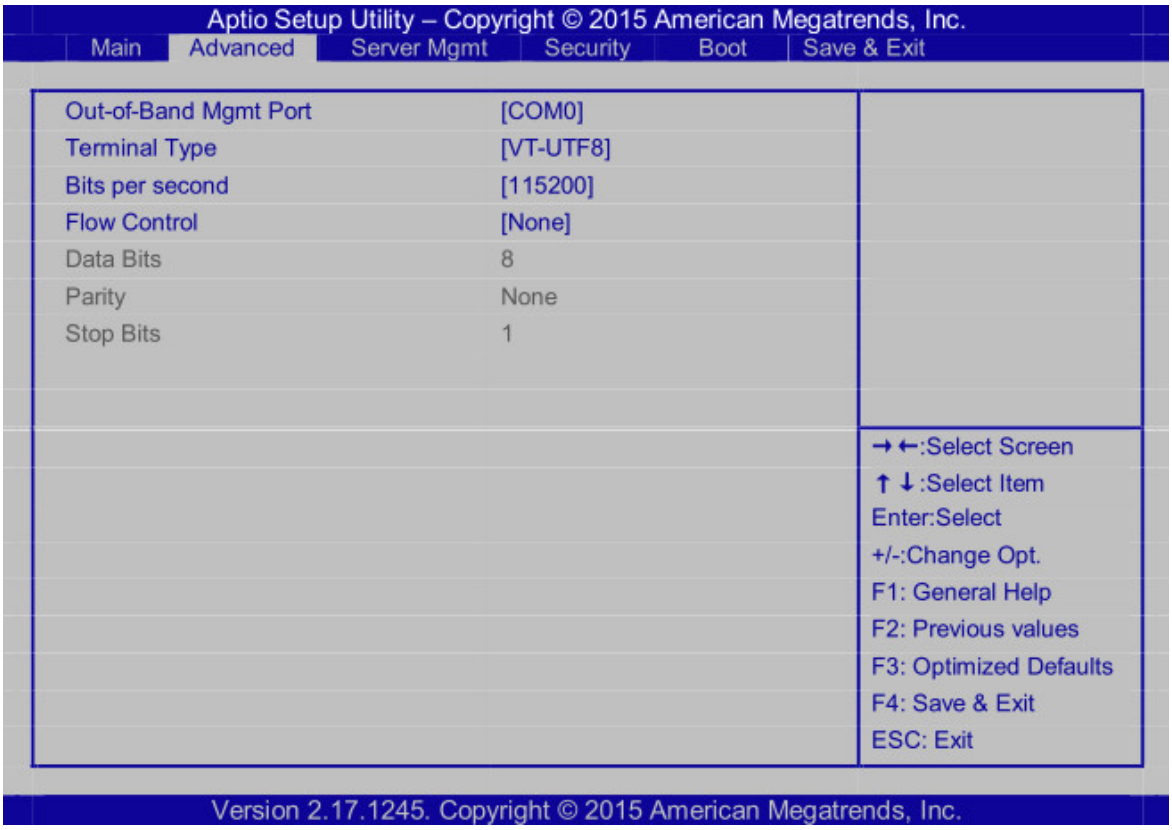
Menu Fields	Settings	Comments
	SC0 ESCN VT400]	
COM1 Redirection After BIOS POST	Always Enable Boot Loader	The Settings specify if BootLoader is selected than Legacy console redirection is disabled before booting to Legacy OS. Default value is Always Enable which means Legacy console Redirection is enabled for Legacy OS.

5.3.10.3. Legacy Console Redirection Settings



Menu Fields	Settings	Comments
Advanced \ Serial Port Console Redirection \ Legacy Console Redirection Settings		
Legacy Serial Redirection Port	COM0 COM1	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages

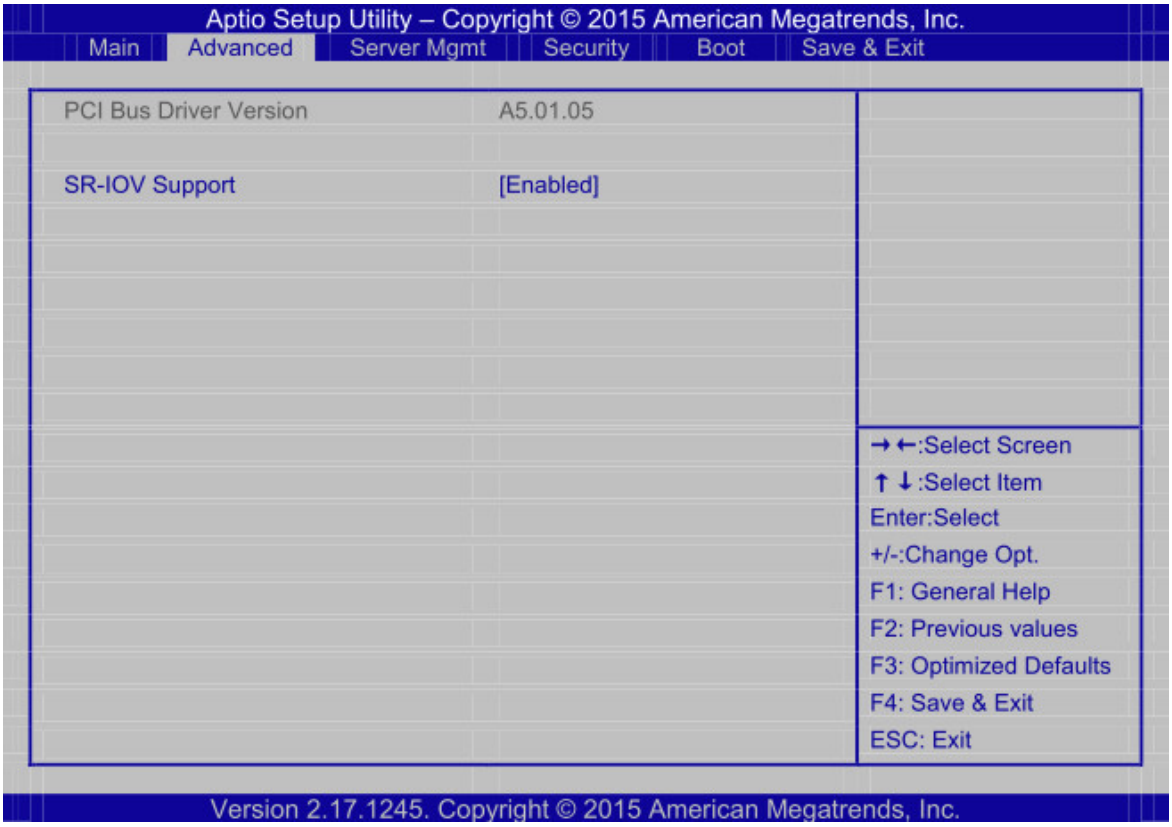
5.3.10.4. Console Redirection Settings



Menu Fields	Settings	Comments
Advanced \ Serial Port Console Redirection \ Console Redirection Settings		
Out-of-Band Mgmt Port	COM0 COM1	Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.
Terminal Type	VT100 VT100+ VT-UTF8 ANSI	VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.
Bits per second	9600 19200 57600 115200	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

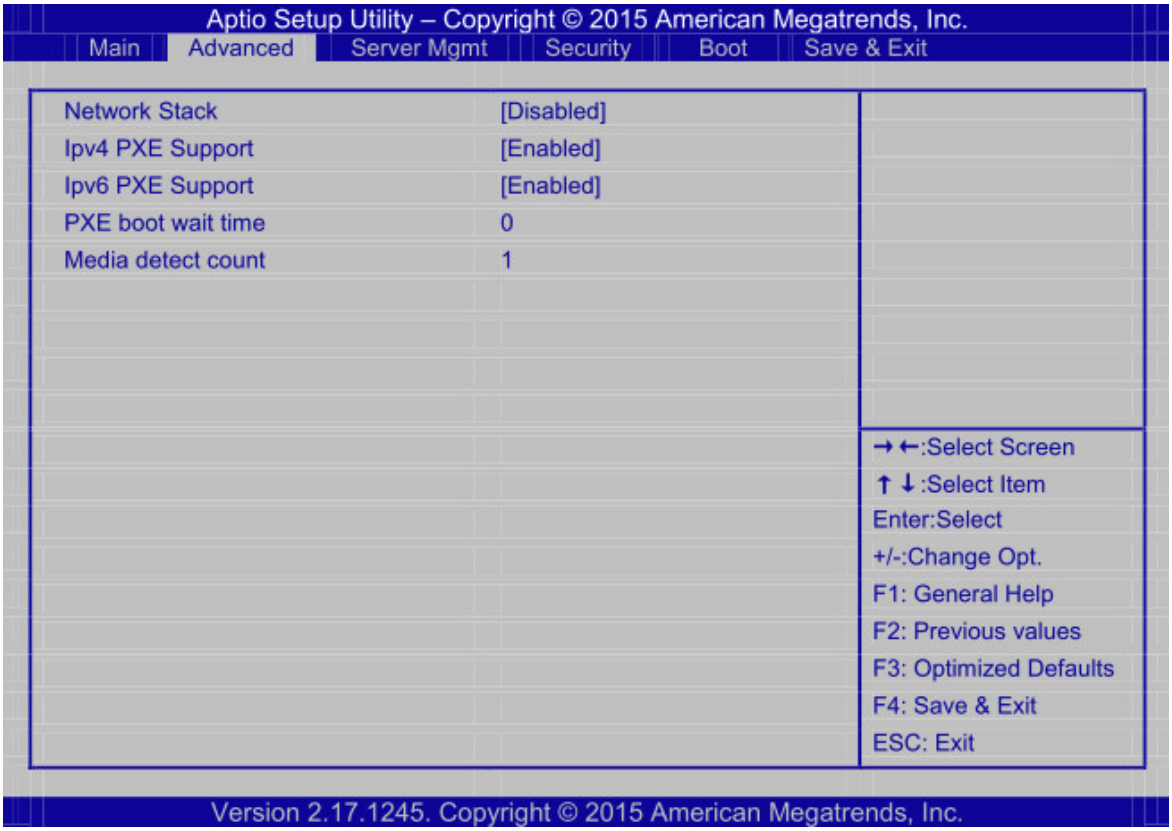
Menu Fields	Settings	Comments
Flow Control	None Hardware RTS/ CTS Software Xon/Xoff	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a *stop* signal can be sent to stop the data flow. Once the buffers are empty, a *start* signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

5.3.11. PCI Subsystem Settings



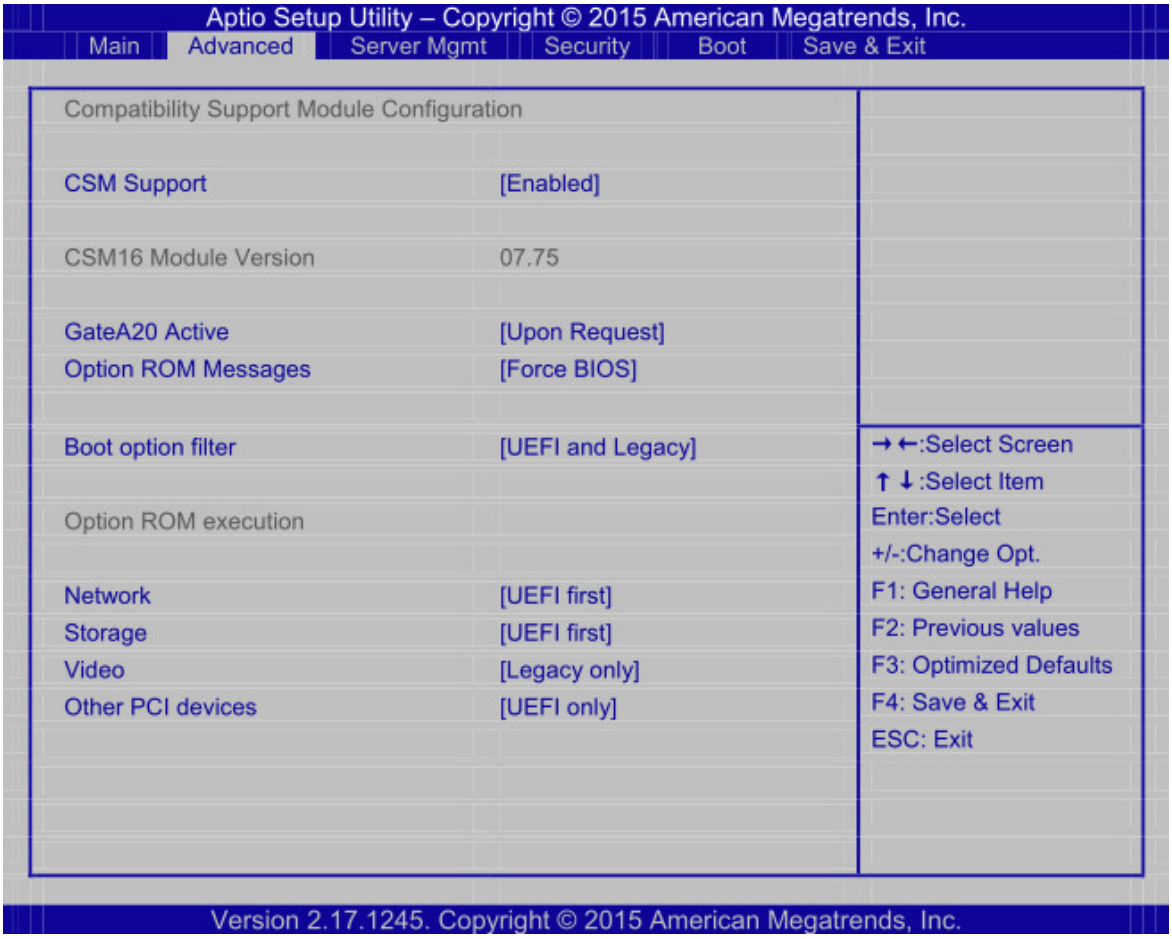
Menu Fields	Settings	Comments
Advanced \ PCI Subsystem Settings		
SR-IOV Support	Disabled Enabled	If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support

5.3.12. Network Stack Configuration



Menu Fields	Settings	Comments
Advanced \ Network Stack Configuration		
Network Stack	Disabled Enabled	Enable/Disable UEFI Network Stack
Ipv4 PXE Support	Disabled Enabled	Enable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot option will not be created
Ipv6 PXE Support	Disabled Enabled	Enable Ipv6 PXE Boot Support. If disabled IPV6 PXE 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 presence of media will be checked

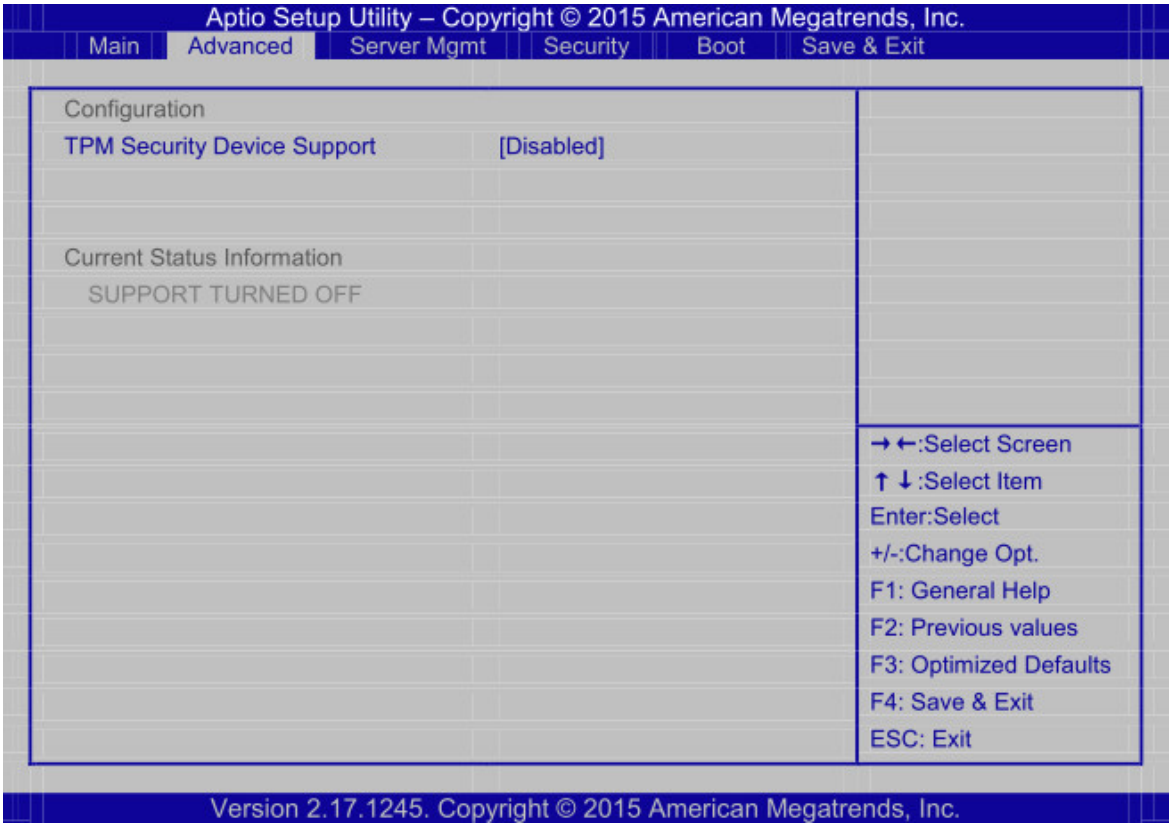
5.3.13. CSM Configuration



Menu Fields	Settings	Comments
Advanced \ CSM Configuration		
CSM Support	Disabled Enabled	Enable/Disable CSM Support.
GateA20 Active	Upon Request Always	UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Option ROM Messages	Force BIOS Keep Current	Set display mode for Option ROM
Boot option filter	UEFI and Legacy Legacy only	This option controls Legacy/UEFI ROMs priority

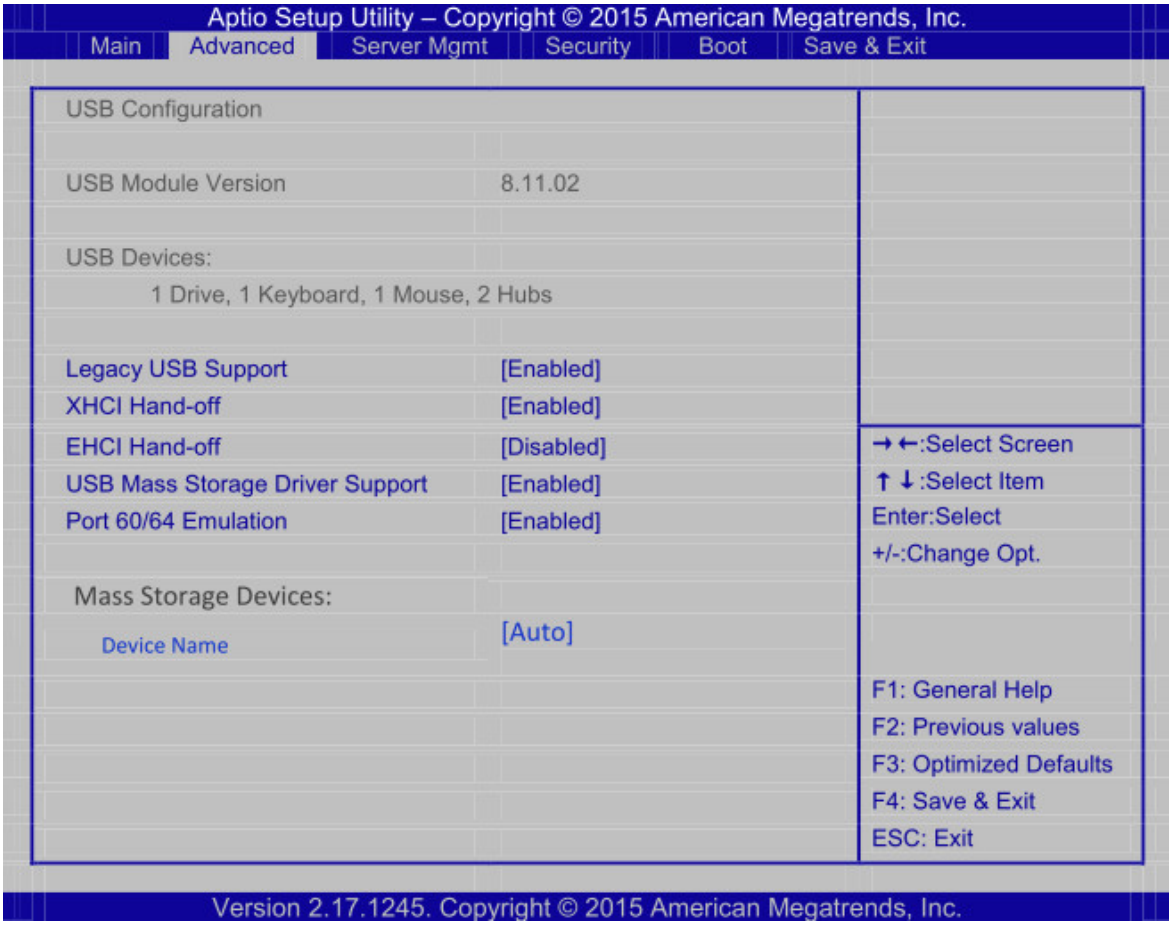
Menu Fields	Settings	Comments
	UEFI only	
Network	Do not launch UEFI only Legacy only UEFI first Legacy first	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do not launch UEFI only Legacy only UEFI first Legacy first	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do not launch UEFI only Legacy only UEFI first Legacy first	Controls the execution of UEFI and Legacy Video OpROM
Other PCI devices	UEFI only Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video

5.3.14. Trusted Computing



Menu Fields	Settings	Comments
Advanced \Trusted Computing		
TPM Security Device Support	Disabled Enabled	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

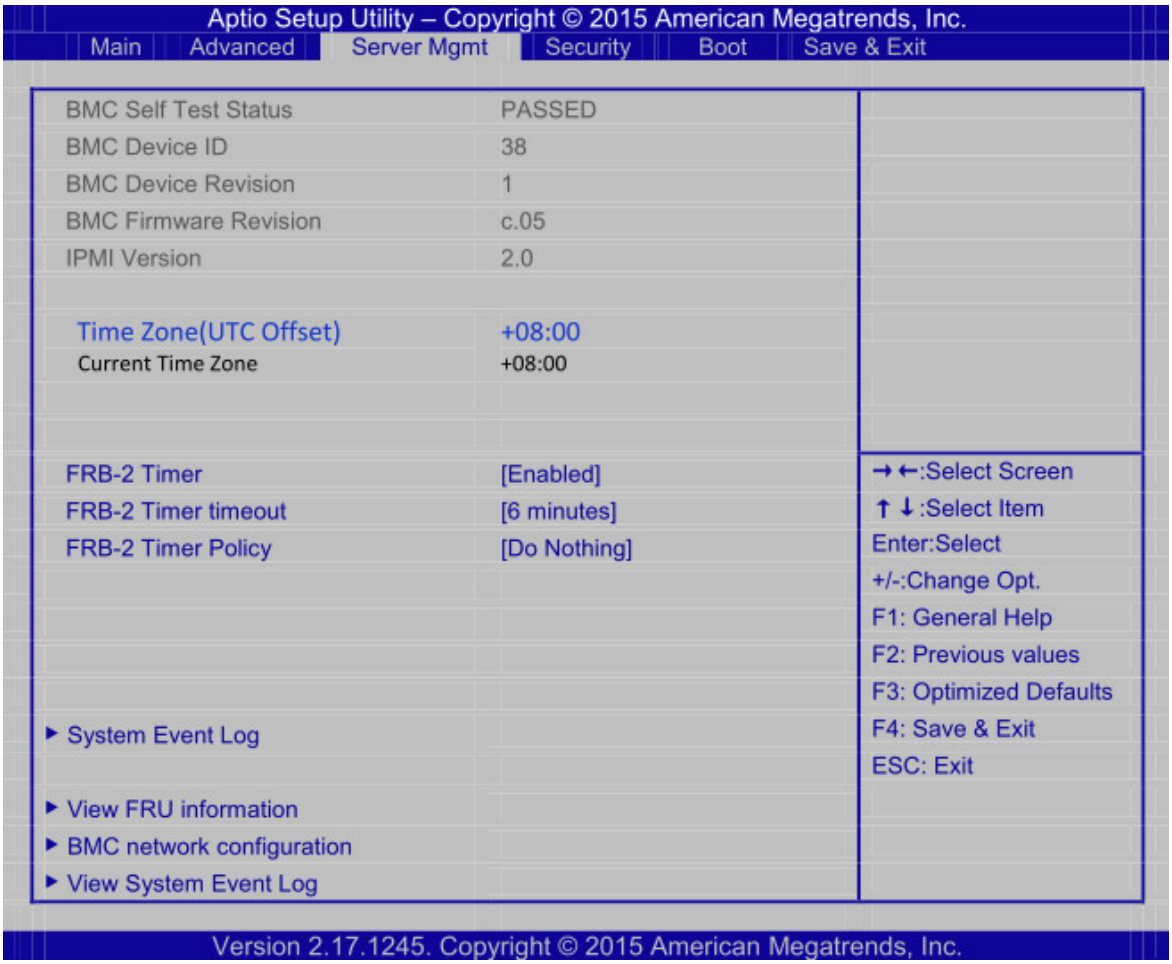
5.3.15. USB Configuration



Menu Fields	Settings	Comments
Advanced \ USB Configuration		
Legacy USB Support	Enabled Disabled Auto	Enables 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.
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.
EHCI Hand-off	Disabled Enabled	This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

Menu Fields	Settings	Comments
USB Mass Storage Driver Support	Enabled Disabled	Enable/Disable USB Mass Storage Driver Support
Port 60/64 Emulation	Enabled Disabled	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard l
Device Name (1)	Auto Floppy Forced FDD Hard Disk CD-ROM	Mass storage device emulation type. *AUTO* enumerates devices according to their media format. Optical drives are emulated as *CDROM*, drives with no media will be emulated according to a drive type.

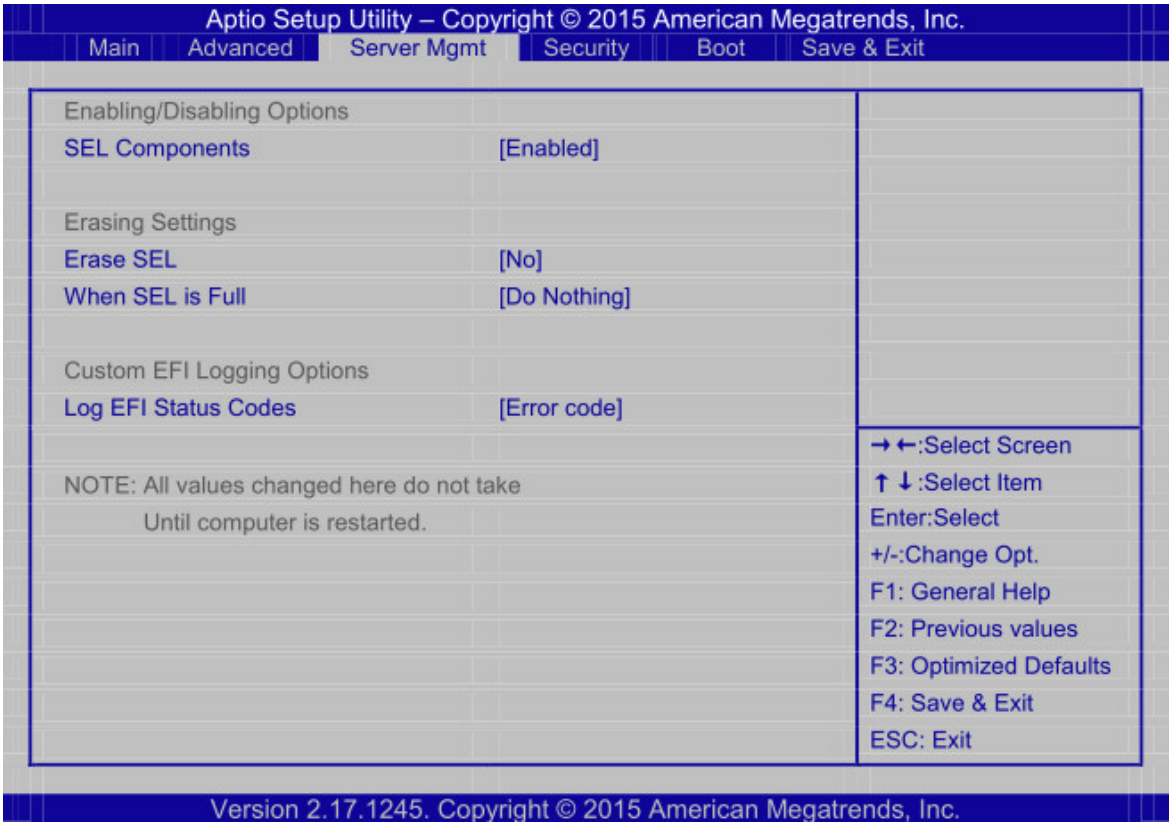
5.4. Server Management



Menu Fields	Settings	Comments
Server Mgmt		
Time Zone(UTC Offset)	+08:00	Enter UTC Offset in hours i.e. from -24:00 to +24:00. These values will be converted into minutes and programmed to BMC. Enter 0x7FFF to consider BIOS time as local time.
FRB-2 Timer	Enabled Disabled	Enable or Disable FRB2 timer(POST timer)
FRB-2 Timer timeout	3 minutes 4 minutes 5 minutes	Enter value Between 3 to 6 min for FRB2 Timer Expiration value

Menu Fields	Settings	Comments
	6 minutes	
FRB-2 Timer Policy	Do Nothing Reset Power Down	Configure how the system should respond if the FRB2 Timer expires. Not available if FRB2 Timer is disabled.

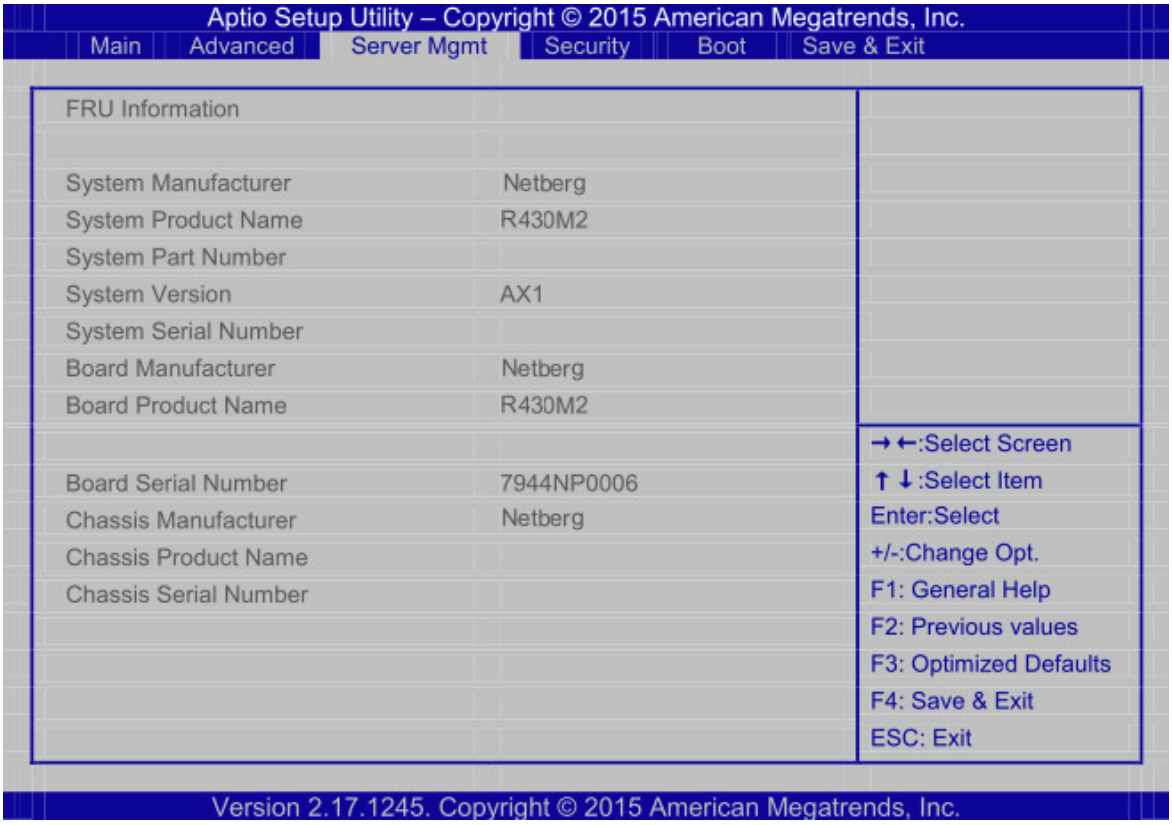
5.4.1. System Event Log



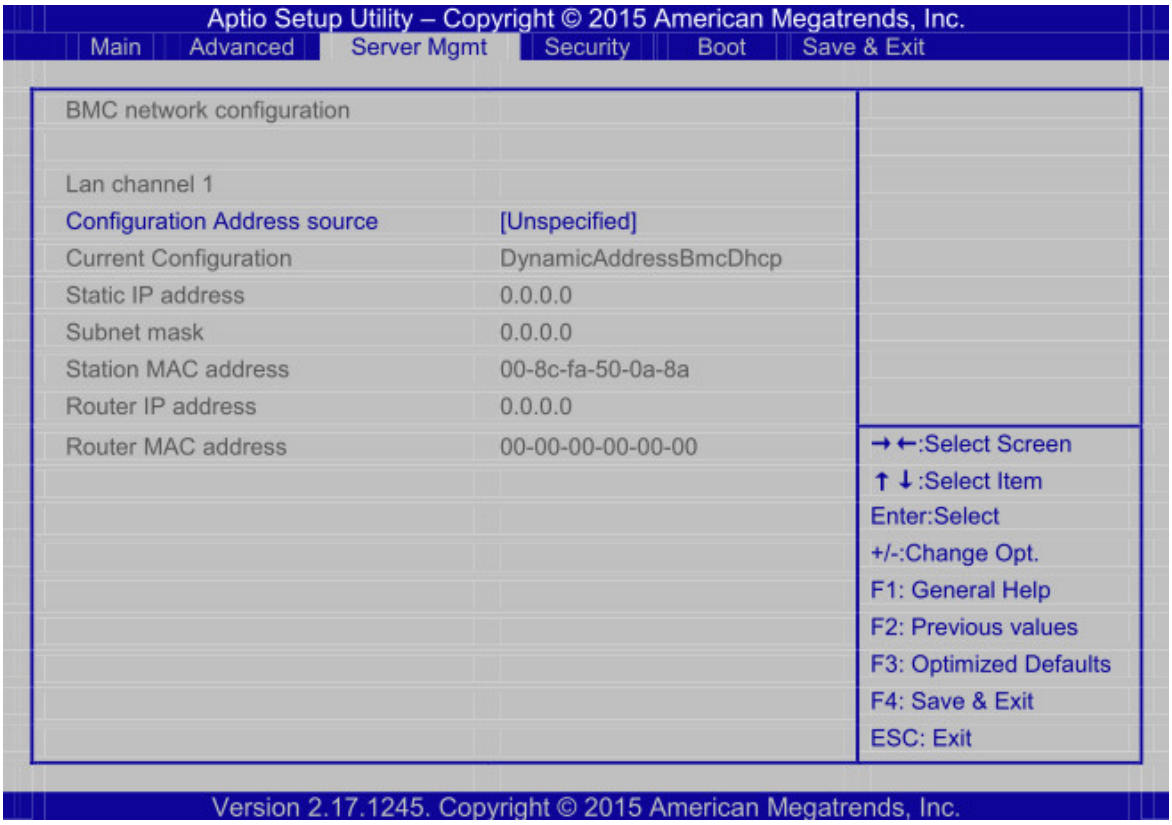
Menu Fields	Settings	Comments
Server Mgmt \ System Event Log		
SEL Components	Disabled Enabled	Change this to enable or disable all features of System Event Logging during boot.
Erase SEL	No Yes, On next reset Yes, On every reset	Choose options for erasing SEL.

Menu Fields	Settings	Comments
When log is full	Do Nothing	Choose options for reactions to a full SEL.
Log EFI Status Codes	Disabled Both Error code Progress code	Disable the logging of EFI Status Codes or log only error code or only progress code or both.

5.4.2. View FRU Information

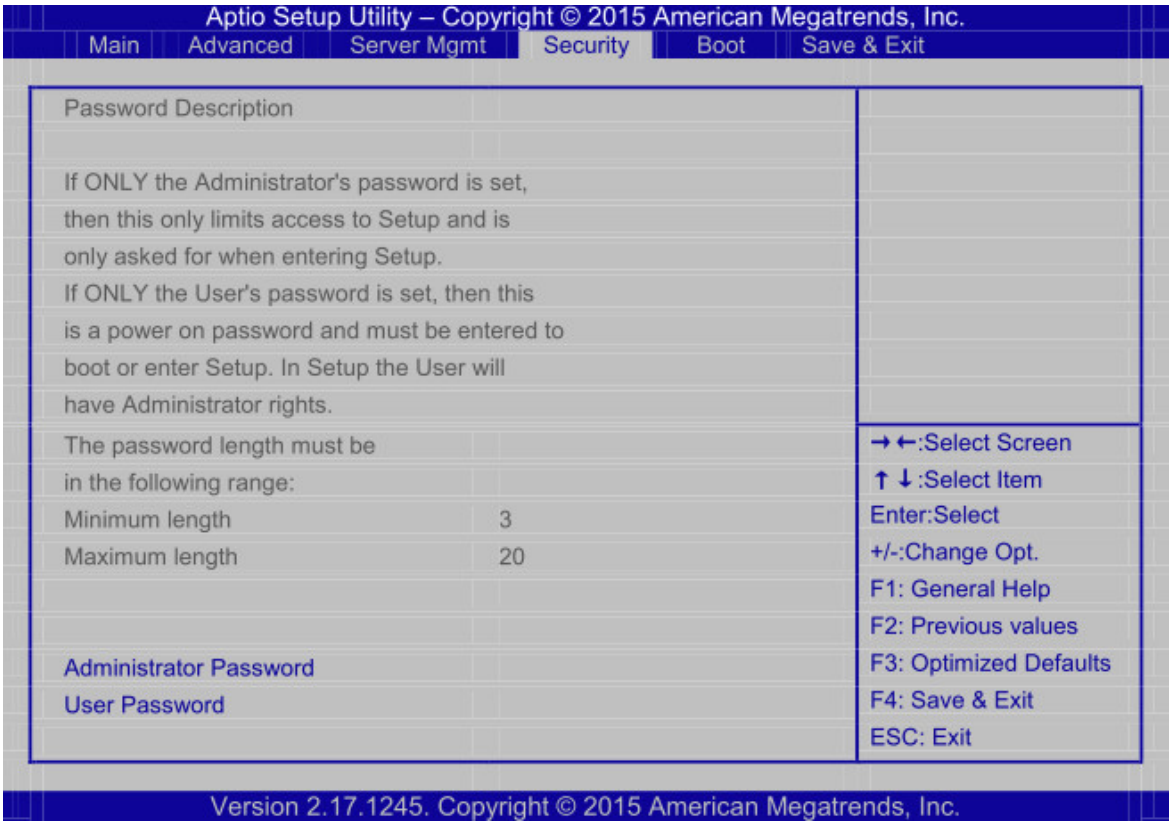


5.4.3. BMC Network Configuration



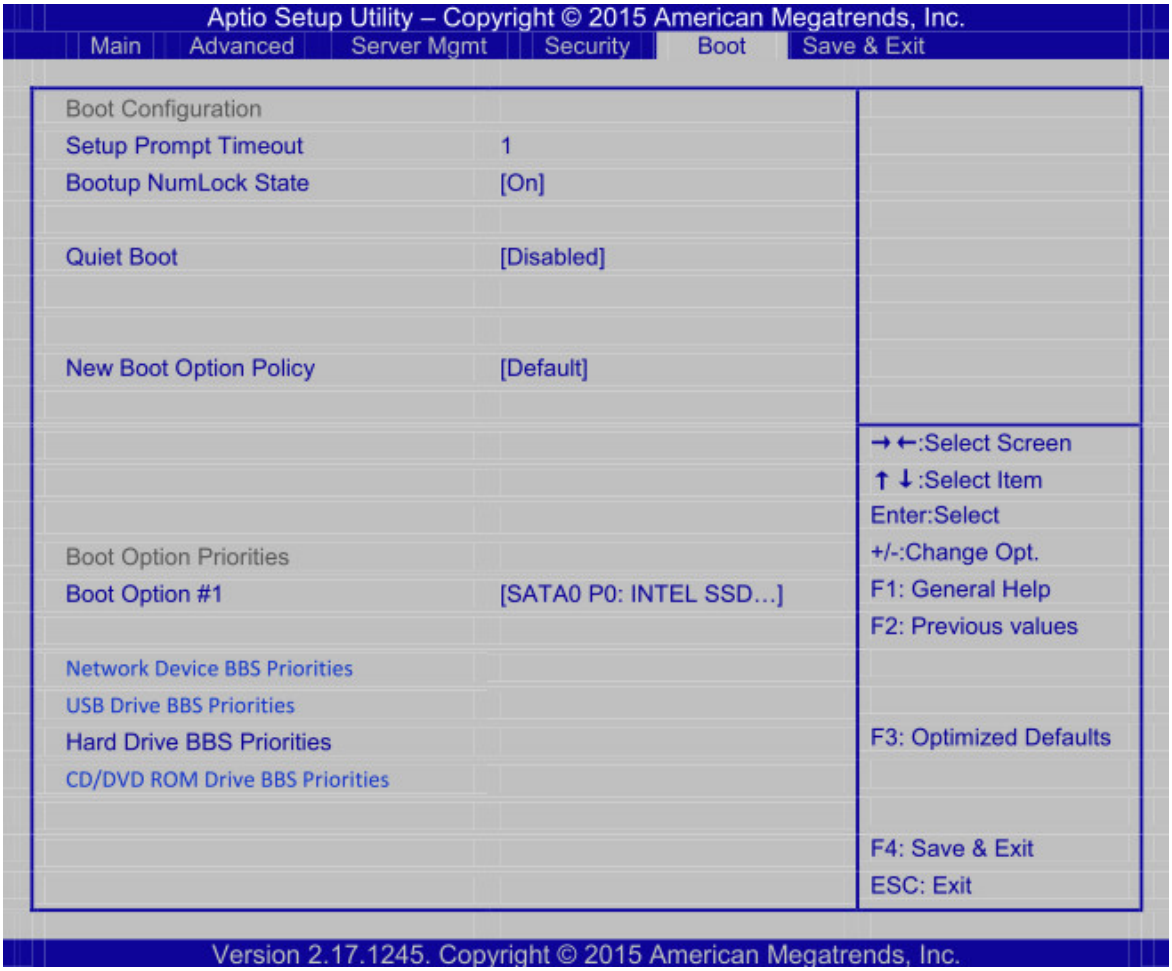
Menu Fields	Settings	Comments
Server Mgmt \ BMC network Configuration		
Configuration Address source	Unspecified Static DynamicBmcDhcp DynamicBmc-NonDhcp	Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC). Keep Current Address Source option will not modify any BMC network parameters during BIOS phase.

5.5. Security Menu



Menu Fields	Settings	Comments
Security		
Administrator Password		Set Administrator Password.
User Password		Set User Password.

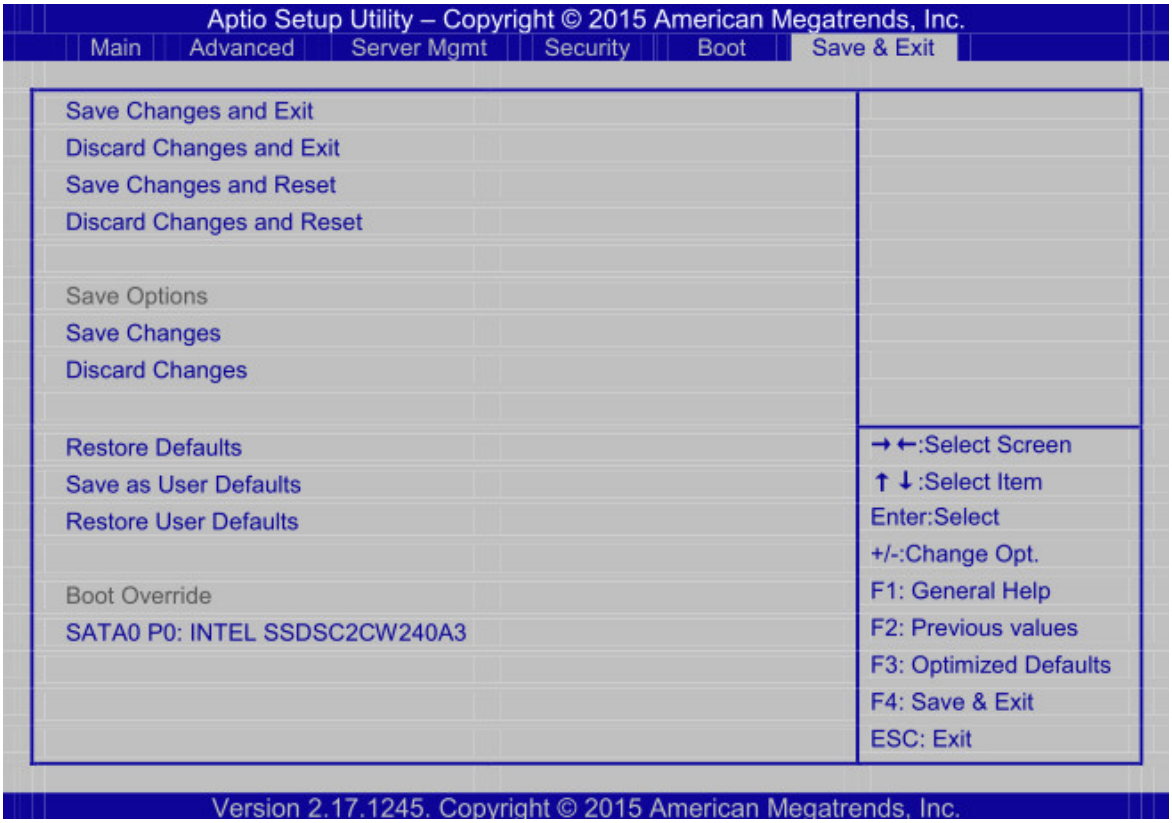
5.6. Boot



Menu Fields	Settings	Comments
Boot		
Setup Prompt Timeout	1	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option
New Boot Option Polic	Default Place First Place Last	Controls the placement of newly de-fected UEFI boot optons

Menu Fields	Settings	Comments
Floppy Drive BBS Priorities (1) Hard Drive BBS Priorities (1) CD/DVD ROM Drive BBS Priorities (1) Network Device BBS Priorities (1)		Set the order of the legacy devices in this group

5.7. Save&Exit Menu



Menu Fields	Settings	Comments
Save & Exit		
Save Changes and Exit		Exit system setup after saving the changes.
Discard Changes and Exit		Exit system setup without saving any changes.
Save Changes and Reset		Reset the system after saving the changes.
Discard Changes and Reset		Reset the system without saving any changes.
Save Changes		Save Changes done so far to any of the setup options.
Discard Changes		Discard Changes done so far to any of the setup options.
Restore Defaults		Restore/Load Default values for all the setup options.
Save as User Defaults		Save the changes done so far as User Defaults.

Menu Fields	Settings	Comments
Restore User Defaults		Restore the User Defaults to all the setup options.
Boot Override		Choose Boot Path.

5.8. Utility

5.8.1. BIOS Requirements

Table 5.4. BIOS Requirements Description

Utilities	File Name	Description
Flash BIOS Image under DOS	AFUDOS.EXE xxxxxxxx.ROM FBB.BAT	AMI Aptio Flash Utility & ROM image
Flash BIOS Image under EFI	AfuEfix64.EFI xxxxxxxx.ROM FBBefi.NSH	AMI Aptio Flash Utility & ROM image
Flash BIOS Image under Linux	afulnx_64 xxxxxxxx.ROM FBBlnx.SH	AMI Aptio Flash Utility & ROM image
Flash BIOS Image under Windows	AFUWINx64.EXE xxxxxxxx.ROM FBBwin.BAT	AMI Aptio Flash Utility & ROM image
Recovery Mode	ROM image file	ROM image
Flash BIOS and ME Image under DOS	AFUDOS.EXE xxxxxxxx.BIN FBBME.BAT	AMI Aptio Flash Utility & FW image
Flash BIOS and ME Image under EFI	AfuEfix64.EFI xxxxxxxx.BIN FBBMEefi.NSH	AMI Aptio Flash Utility & FW image
Flash BIOS and ME Image under Linux	afulnx_64 xxxxxxxx.BIN FBBMElnx.SH	AMI Aptio Flash Utility & FW image
Flash BIOS and ME Image under Windows	AFUWINx64.EXE xxxxxxxx.BIN FBBMEwin.BAT	AMI Aptio Flash Utility & FW image
Flash FW Image under EFI	spsFPT.EFI	Intel ME update utility & FW image

Utilities	File Name	Description
	Fparts.txt xxxxxxxx.BIN	

5.8.2. ROM Flash

5.8.2.1. Update under DOS prompt:

1. Copy AFUDOS.EXE, FBB.BAT and RomFileName.rom (ROM image) to bootable storage.
2. Plug the bootable storage (ex :USB disk) and boot to dos prompt (no Himem).
3. Run FBB.BAT (depending on if Boot Block needs to be updated).

   FBB.BAT: Update BIOS with boot lock.
4. Restart the system and load the BIOS default values.

5.8.2.2. Update under EFI Shell

1. Copy AfuEfix64.efi, FBB.nsh and RomFileName.rom (ROM image) to bootable storage.
2. Boot into BIOS setup and select Built-in EFI Shell to boot.
3. Run FBB.nsh
4. Restart system & load BIOS default value.

5.8.2.3. Update ME FW with the whole image file under Linux environment

1. Copy afulnx_64, FBBMElnx.sh and XXXXXXXX.BIN to USB disk.
2. Plug the USB disk and boot into Linux environment.
3. Copy afulnx_64, FBBMElnx.sh and XXXXXXXX.BIN to desktop from USB disk.
4. Open Terminal and key command below:
   - “chmod 777 afulnx_64”
   - “chmod 777 FBBMElnx.sh”
   - “chmod 777 XXXXXXXX.BIN”
5. Run “FBBMElnx.sh” or “AfuEfix64 XXXXXXXX.BIN /P /B /N /X /ME”

After flash programming is done, turn off SUT and then power on the system.

5.8.2.4. BIOS Recovery

A BIOS recovery can be accomplished from one of the following devices: an USB Disk-On-Key/CD-ROM, an ATAPI CD-ROM/DVD. The recovery media must include the BIOS image file, RomFileName.rom in the root directory.

Enter recovery mode:

1. Set the recovery jumper (J2).
2. Damaging the ROM image, which will cause the system to enter recovery and update the system ROM without the boot lock.

The recovery mode procedure:

1. Insert or plug-in the recovery media with the RomFileName.rom file.
2. Power on system and wait for recovery process complete.
3. Restart system and load BIOS default.

Chapter 6. Rail Kit Assembly

6.1. Unpacking the System

Unpack your system and identify each item.

Whenever you need to lift the system, get others to assist you. To avoid injury, do not attempt to lift the system by yourself.

The system is not fixed to the rack or mounted on the rails. To avoid personal injury or damage to the system, you must adequately support the system during installation and removal.

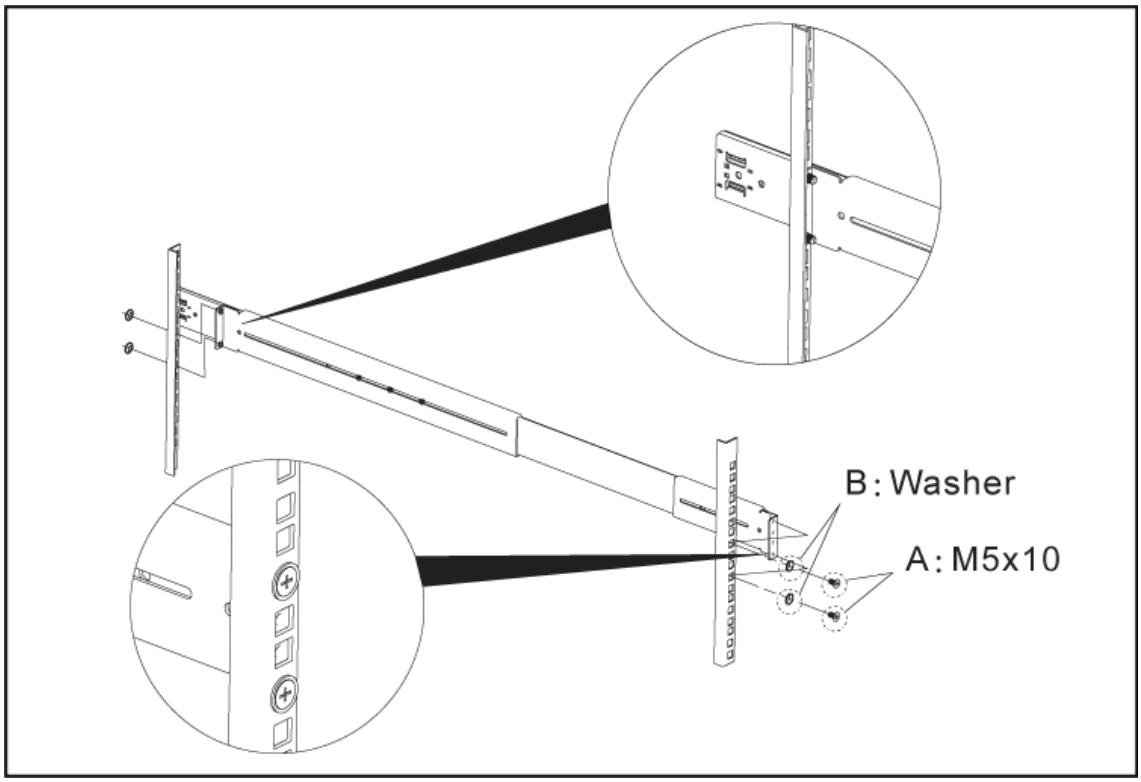
To avoid a potential electrical shock hazard, a third wire safety grounding conductor is necessary for the rack installation. The rack equipment must provide sufficient airflow to the system to maintain proper cooling.

WHEN INSTALLING RAILS IN A SQUARE-HOLE RACK IT IS IMPORTANT TO ENSURE THAT THE SQUARE PEG SLIDES THROUGH THE SQUARE HOLES.

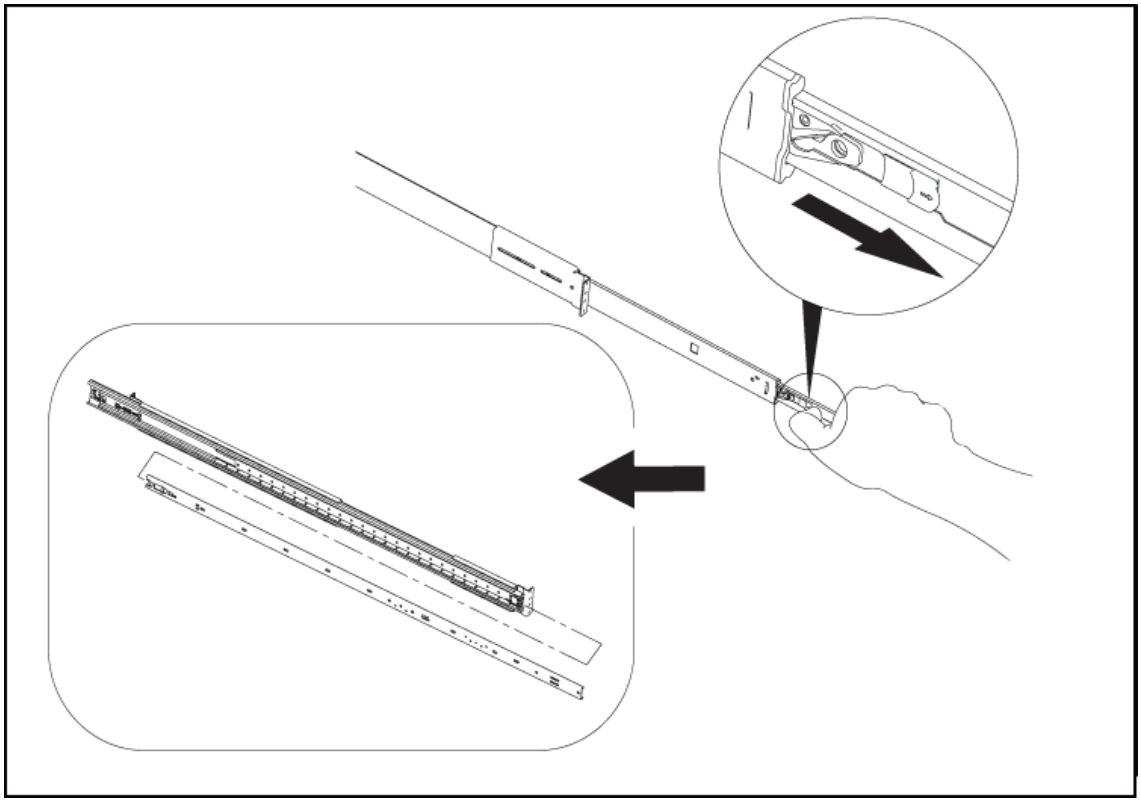
SQUARE STUDS MUST BE FLUSH WITH THE RACK POSTS TO INSTALL PROPERLY.

6.2. Rack installation

1. Attach outer member to the rack



2. Release and detach the inner member from the slide

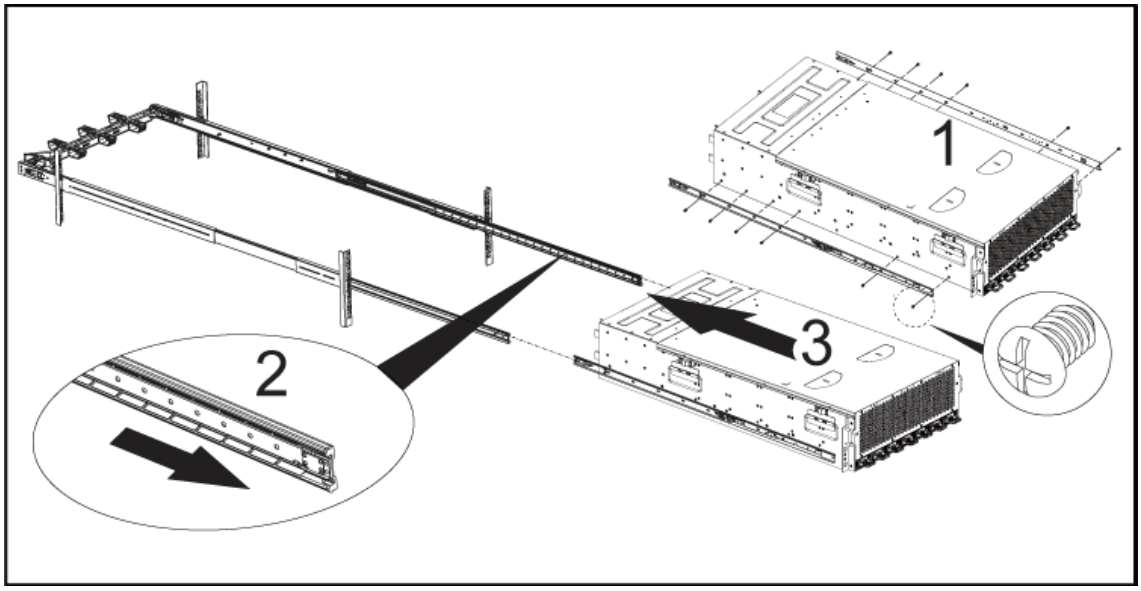


3. Inner member option

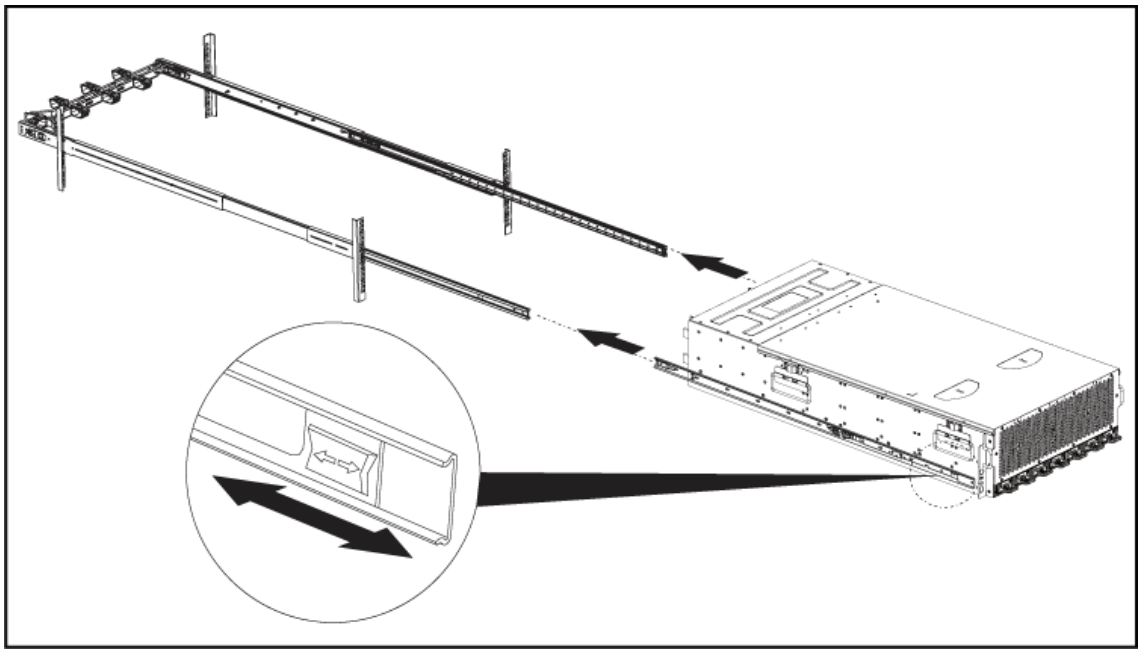
(1)Attach inner member to the system.

Ensure ball bearing retainer is locked forward on the intermediate member

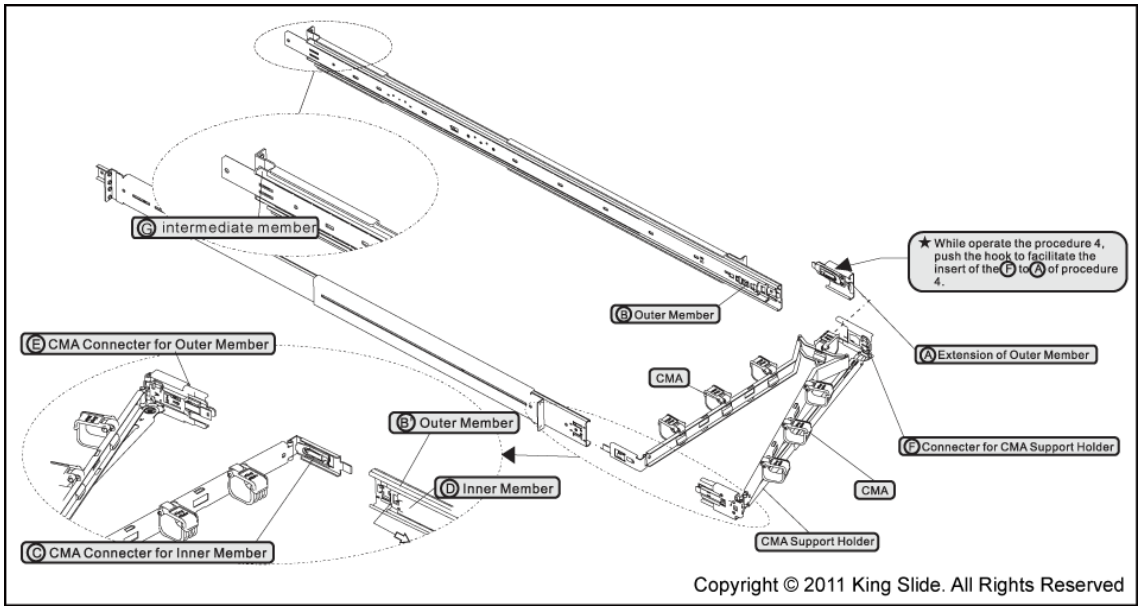
(2)Horizontally install system half way into slide rail.



4. Slide release tab and push system into rack



5. Cable management arm installation



Procedure 1: Attach A (extension of outer member) to the rear part of B (outer member.)

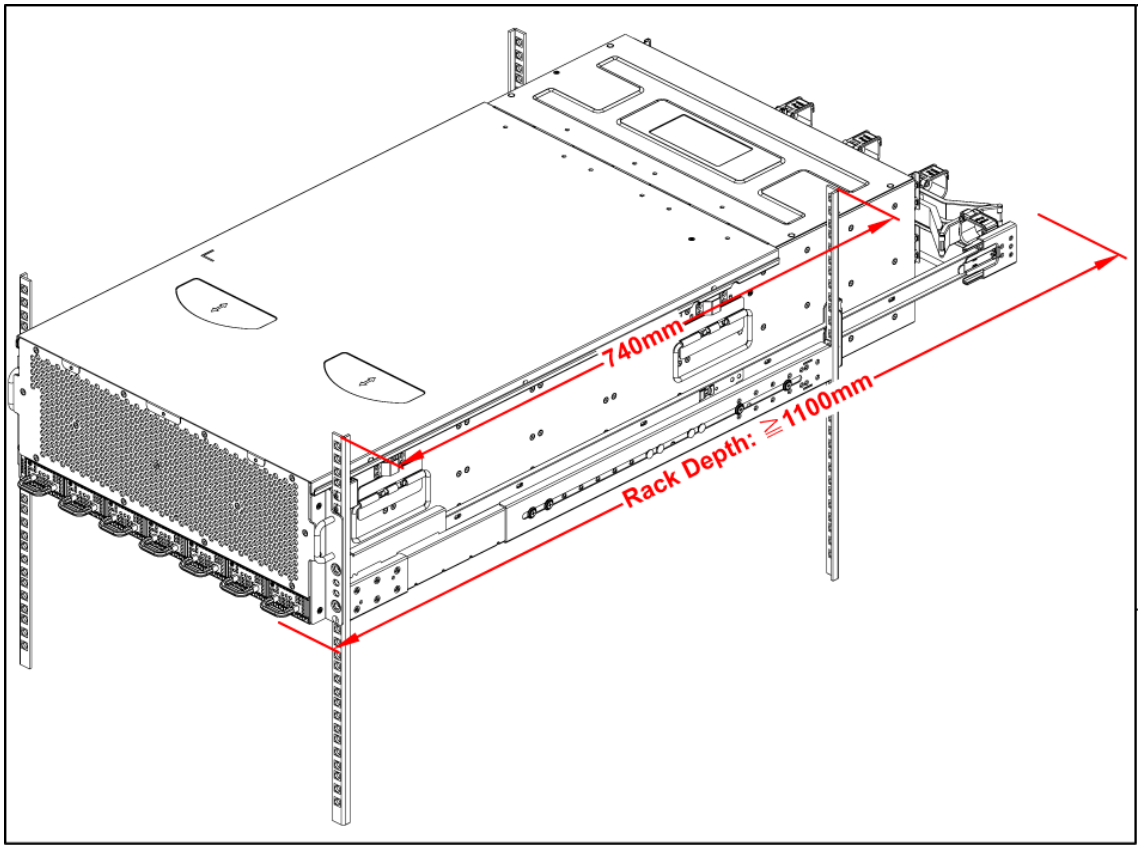
Procedure 2: Push forward the B and G slightly.

Procedure 3: Attach C (CMA connecter for inner member) into the rear part of D (inner member).

Procedure 4: Attach E (CMA connecter for outer member) to the rear part of B' (the other outer member).

Procedure 5: Insert F (connecter for CMA support holder) to A (extension of outer member).

6. Rack depth: >=1100mm


740mm
Rack Depth: ≧1100mm

Chapter 7. Troubleshooting

7.1. Server Boot Issue Topics

System does not Boot after initial installation:

- “Power Cord Not Plugged In”
- Mainboard Module Configuration Issues
- “Processor Issues”
- “Memory Issues”
- “Monitor Issues”
- “Power Supply, Chassis and Fan Issues”
- “Cable Issues”
- “Electrical Short or Overload”
- “Defective Components”

System does not boot after configuration changes:

- “Hardware Changes”
- “Software Changes”
- “BIOS Changes”
- “Installation Problems”
- “Troubleshooting External Connections”

7.2. System does not Boot after Initial Installation

7.2.1. Power Cord Not Plugged In

If the power supply cable is not plugged into the chassis power connector, the system cannot boot up, even though chassis front panel LEDs and the fan may be operational. Verify that the power connections are good.

7.2.2. Processor Issues

Boot failure situations are also caused by the following: Incompatible processor - ensure the selected processor model is correct for your server board. If the processor is compatible, try removing and reinstalling the processor to ensure it is installed correctly.

Processor overheat - the system does not boot or shuts down shortly after booting.

- Ensure that the cooling fans are correctly installed and running.
- Ensure that the correct thermal interface material or the thermal grease is applied to the processor.
- Ensure that the power supply fan is running.
- Ensure that the air intakes for the fans are unobstructed.

7.2.3. Memory Issues

If you have installed incompatible memory modules, the system may not boot. Verify the memory you've installed has been tested with your board (Please refer to www.etegro.com for details on valid memory). If the installed memory is compatible, remove and reinstall the memory modules. Defective memory modules may cause boot errors. To isolate a specific memory module as defective, boot the system with just one memory module installed at a time.

7.2.4. Monitor Issues

Monitor configurations can cause boot failure. Run through the following checklist to verify monitor operation:

- Ensure the monitor is plugged in and turned on.
- Ensure all cables are connected properly between the monitor and the computer.
- Check the brightness and contrast controls on the monitor are not too low.

Most monitors employ indicator LEDs showing status. Refer to the monitor's documentation to confirm operation. If the probem still persists, try replacing the monitor or test the monitor on a different AC outlet/different system.

7.2.5. Power Supply, Chassis and Fan Issues

- Ensure that the chassis and power supply is appropriate for system requirement.
- Ensure all power cables and connectors are firmly connected to the power supply and the AC outlet.
- If the power supply or the AC outlet has an on/off switch, make sure that it is on and verify that the outlet is supplying current.
- Check for foreign objects inside the chassis such as screws that can short circuit connections.
- To isolate a specific PSU as defective, boot the system with just one PSU installed at a time.
- Check fan speed in WEBUI & event log to find out if there are any defective fans. If failure happens, please contact your dealer for assistance.

7.2.6. Cable Issues

Ensure that all cable connections, both internal and external, are attached correctly and securely.

7.2.7. Electrical Short or Overload

Remove non-essential items such as extra controller cards (e.g SAS 6G Mezz/B, 10G Mezz/B) or HDD devices to check for shorts and overloads.

If the system boots correctly, there may be a short or overload associated with one of the components.

Replace each of non-essential items one at a time to isolate which one is causing the problem.

If the problem occurs even after removing the non-essential components, the problem has to be with the server board, power supply, memory, or processor.

7.2.8. Defective Components

Defective components, especially processor and memory, can cause system boot issues.

- Swap the memory modules with known good memory. Verify correct operation of the suspected memory in a known working system.
- Swap the processor with a known good processor. Verify correct operation of the suspected processor in a known working system.

7.3. System does not boot after Configuration Changes

7.3.1. Hardware Changes

If the system does not boot after making changes to hardware or adding new components, verify that the component installed is compatible with the server.

7.3.2. Software Changes

If you recently installed new software or new device drivers:

- Try booting into Safe Mode and uninstall the new software or driver. If you can now boot normally, there may be a compatibility issue between the new software or driver and some component in your system. Contact the soft- ware manufacturer for assistance.

7.3.3. BIOS Changes

Changes to some advanced BIOS settings can cause boot issues. Changes to Advanced BIOS settings should only be made by experienced users.

If the BIOS Setup Utility is accessible by pressing **F2** during boot, reset the BIOS to factory defaults by pressing **F9**. Save and exit the BIOS Setup

If you cannot access the BIOS Setup Utility, clear the CMOS by performing the following steps:

1. Power down the server. Do not unplug the power cord.
2. Open the server chassis
3. Move the CMOS CLEAR jumper from the default operation position, covering pins 1 and 2, to the reset / clear CMOS, covering pins 2 and 3.
4. Remove AC power.
5. Wait 5 seconds.
6. Move the jumper back to default position, covering pins 1 and 2.
7. Close the server chassis and power up the server.

The CMOS is now cleared and can be reset by going into BIOS setup.

Please refer to www.etegro.com for the BIOS update.

7.3.4. Installation Problems

Perform the following checks if you are troubleshooting an installation problem:

Check all cable and power connections (including all rack cable connections). Unplug the power cord, and wait one minute. Then reconnect the power cord and try again. If the network is report-

ing an error, see if the server has enough memory and disk space available. Remove all added options, one at a time, and try to power up the system. If after removing an option the server works, you may find that it is a problem with the option or a configuration problem between the option and the server. Contact the option vendor for assistance.

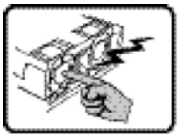
- If the system doesn't power on, check the LED display. If the power LED is not on, you may not be receiving AC power. Check the AC power cord to make sure that it is securely connected.

7.3.5. Troubleshooting External Connections

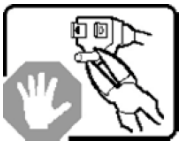
Loose or improperly connected cables are the most likely source of problems for the system, monitor, and other peripherals (such as a keyboard, mouse, or other external device). Ensure that all external cables are securely attached to the external connectors on your system.

Chapter 8. Installation and Assembly Safety Instructions

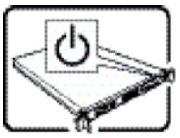
Guidelines



The power supply in this product contains no user-serviceable parts. Refer servicing only to qualified personnel.



Do not attempt to modify or use the supplied AC power cord if it is not the exact type required. A product with more than one power supply will have a separate AC power cord for each supply.



The power button on the system does not turn off system AC power.

To remove AC power from the system, you must unplug each AC power cord from the wall outlet or power supply.

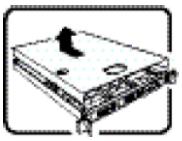
The power cord(s) is considered the disconnect device to the main (AC) power. The socket outlet that the system plugs into shall be installed near the equipment and shall be easily accessible.

SAFETY STEPS: Whenever you remove the chassis covers to access the inside of the system, follow these steps:

1. Turn off all peripheral devices connected to the system.
2. Turn off the system by pressing the power button.
3. Unplug all AC power cords from the system or from wall outlets.
4. Label and disconnect all cables connected to I/O connectors or ports on the back of the system.

5. Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system - any unpainted metal surface - when handling components.

6. Do not operate the system with the chassis covers removed.

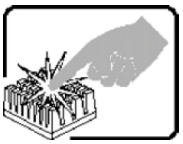


After you have completed the six SAFETY steps above, you can remove the system covers. To do this:

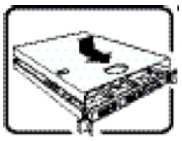
1. Unlock and remove the padlock from the back of the system if a padlock has been installed.

2. Remove and save all screws from the covers.

3. Remove the cover(s).



A microprocessor and heat sink may be hot if the system has been running. Also, there may be sharp pins and edges on some board and chassis parts. Contact should be made with care. Consider wearing protective gloves.



For proper cooling and airflow, always reinstall the chassis covers before turning on the system. Operating the system without the covers in place can damage system parts. To install the covers:

1. Check first to make sure you have not left loose tools or parts inside the system.

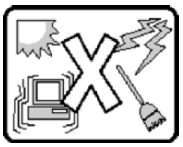
2. Check that cables, add-in cards, and other components are properly installed.

3. Attach the covers to the chassis with the screws removed earlier, and tighten them firmly.

4. Insert and lock the padlock to the system to prevent unauthorized access inside the system.

5. Connect all external cables and the AC power cord(s) to the system.

Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Dispose of used batteries according to manufacturer's instructions.



The system is designed to operate in a typical office environment.

Choose a site that is:

- Clean and free of airborne particles (other than normal room dust).
- Well ventilated and away from sources of heat including direct sunlight.
- Away from sources of vibration or physical shock.
- Isolated from strong electromagnetic fields produced by electrical devices.
- In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm.
- Provided with a properly grounded wall outlet.
- Provided with sufficient space to access the power supply cord(s), because they serve as the product's main power disconnect.

The server system is safety certified as rack-mounted equipment for use in a server room or computer room, using the customer rack kit.

The rail racks are designed to carry only the weight of the server system. Do not place additional load onto any rail-mounted equipment.

System rack kits are intended to be installed in a rack by trained service technicians.

Heavy object. Indicates two people are required to safely handle the system.

Chapter 9. Server Safety Information

To reduce the risk of bodily injury, electrical shock, fire, and equipment damage, read this document and observe all warnings and precautions in this guide before installing or maintaining your server product.

In the event of a conflict between the information in this document and information provided with the product or on the website for a particular product, the product documentation takes precedence.

Your server should be integrated and serviced only by technically qualified persons.

You must adhere to the guidelines in this guide and the assembly instructions in your server manuals to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products / components will void the UL Listing and other regulatory approvals of the product, and may result in noncompliance with product regulations in the region(s) in which the product is sold.

9.1. Safety Warnings and Cautions

To avoid personal injury or property damage, before you begin installing the product, read, observe, and adhere to all of the following safety instructions and information. The following safety symbols may be used throughout the documentation and may be marked on the product and / or the product packaging.

Indicates the presence of a hazard that may cause minor personal injury or property damage if the CAUTION is ignored.

Indicates the presence of a hazard that may result in serious personal injury if the WARNING is ignored.

Indicates potential hazard if indicated information is ignored.

Indicates shock hazards that result in serious injury or death if safety instructions are not followed.

Indicates hot components or surfaces.

Indicates do not touch fan blades, may result in injury.

Indicates to unplug all AC power cord(s) to disconnect AC power.

Please recycle battery.

The rail racks are designed to carry only the weight of the server system. Do not use rail-mounted equipment as a workspace. Do not place additional load onto any rail-mounted equipment.

Indicates two people are required to safely handle the system.

Restricted Access Location: The server is intended for installation only in a Server Room or Computer Room where both these conditions apply:

- access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken; and
- access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the location.

9.2. Intended Application Uses

This product was evaluated as Information Technology Equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environments (such as medical, industrial, residential, alarm systems, and test equipment), other than an ITE application, may require further evaluation.

9.3. Site Selection

The system is designed to operate in a typical office environment. Choose a site that is:

- Clean, dry, and free of airborne particles (other than normal room dust).
- Well-ventilated and away from sources of heat including direct sunlight and radiators.
- Away from sources of vibration or physical shock.
- Isolated from strong electromagnetic fields produced by electrical devices.
- In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm.
- Provided with a properly grounded wall outlet.
- Provided with sufficient space to access the power supply cord(s), because they serve as the product’s main power disconnect.
- Provided with either two independent AC power sources or two independent phases from a s single source.

9.4. Equipment Handling Practices

Reduce the risk of personal injury or equipment damage:

- Conform to local occupational health and safety requirements when moving and lifting equipment.
- Use mechanical assistance or other suitable assistance when moving and lifting equipment.
- To reduce the weight for easier handling, remove any easily detachable components.

9.5. Power and Electrical Warnings

THE POWER BUTTON, INDICATED BY THE STAND-BY POWER MARKING, DOES NOT COMPLETELY TURN OFF THE SYSTEM AC POWER, 5V STANDBY POWER IS ACTIVE WHENEVER THE SYSTEM IS PLUGGED IN. TO REMOVE POWER FROM SYSTEM, YOU MUST UNPLUG THE AC POWER CORD FROM THE WALL OUTLET. YOUR SYSTEM MAY USE MORE THAN ONE AC POWER CORD. MAKE SURE ALL AC POWER CORDS ARE UNPLUGGED. MAKE SURE THE AC POWER CORD(S) IS / ARE UNPLUGGED BEFORE YOU OPEN THE CHASSIS, OR ADD OR REMOVE ANY NON HOT-PLUG COMPONENTS.

DO NOT ATTEMPT TO MODIFY OR USE AN AC POWER CORD IF IT IS NOT THE EXACT TYPE REQUIRED. A SEPARATE AC CORD IS REQUIRED FOR EACH SYSTEM POWER SUPPLY.

SOME POWER SUPPLIES IN SERVERS USE NEUTRAL POLE FUSING. TO AVOID RISK OF SHOCK USE CAUTION WHEN WORKING WITH POWER SUPPLIES THAT USE NEUTRAL POLE FUSING.

SOME POWER SUPPLIES IN SERVERS USE NEUTRAL POLE FUSING. TO AVOID RISK OF SHOCK USE CAUTION WHEN WORKING WITH POWER SUPPLIES THAT USE NEUTRAL POLE FUSING.

THE POWER SUPPLY IN THIS PRODUCT CONTAINS NO USER-SERVICEABLE PARTS. DO NOT OPEN THE POWER SUPPLY. HAZARDOUS VOLTAGE, CURRENT AND ENERGY LEVELS ARE PRESENT INSIDE THE POWER SUPPLY. RETURN TO MANUFACTURER FOR SERVICING.

WHEN REPLACING A HOT-PLUG POWER SUPPLY, UNPLUG THE POWER CORD TO THE POWER SUPPLY BEING REPLACED BEFORE REMOVING IT FROM THE SERVER.

TO AVOID RISK OF ELECTRIC SHOCK, TURN OFF THE SERVER AND DISCONNECT THE POWER CORD, TELECOMMUNICATIONS SYSTEMS, NETWORKS, AND MODEMS ATTACHED TO THE SERVER BEFORE OPENING IT.

9.6. Power Cord Warnings

If an AC power cord was not provided with your product, purchase one that is approved for use in your country.

TO AVOID ELECTRICAL SHOCK OR FIRE, CHECK THE POWER CORD(S) THAT WILL BE USED WITH THE PRODUCT AS FOLLOWS:

- Do not attempt to modify or use the AC power cord(s) if they are not the exact type required to fit into the grounded electrical outlets.
- The power cord(s) must meet the following criteria: The power cord must have an electrical rating that is greater than that of the electrical current rating marked on the product.

THE POWER CORD MUST HAVE SAFETY GROUND PIN OR CONTACT THAT IS SUITABLE FOR THE ELECTRICAL OUTLET.

THE POWER SUPPLY CORD(S) IS / ARE THE MAIN DISCONNECT DEVICE TO AC POWER. THE SOCKET OUTLET(S) MUST BE NEAR THE EQUIPMENT AND READILY ACCESSIBLE FOR DISCONNECTION.

THE POWER SUPPLY CORD(S) MUST BE PLUGGED INTO SOCKET-OUTLET(S) THAT IS /ARE PROVIDED WITH A SUITABLE EARTH GROUND.

9.7. System Access Warnings

TO AVOID PERSONAL INJURY OR PROPERTY DAMAGE, THE FOLLOWING SAFETY INSTRUCTIONS APPLY WHENEVER ACCESSING THE INSIDE OF THE PRODUCT:

- Turn off all peripheral devices connected to this product.
- Turn off the system by pressing the power button to off.
- Disconnect the AC power by unplugging all AC power cords from the system or wall outlet.
- Disconnect all cables and telecommunication lines that are connected to the system.
- Retain all screws or other fasteners when removing access cover(s). Upon completion of accessing inside the product, refasten access cover with original screws or fasteners.
- Do not access the inside of the power supply. There are no serviceable parts in the power supply. Return to manufacturer for servicing.
- Power down the server and disconnect all power cords before adding or replacing any non hot-plug component. When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing the power supply from the server.

IF THE SERVER HAS BEEN RUNNING, ANY INSTALLED PROCESSOR(S) AND HEAT SINK(S) MAY BE HOT.

UNLESS YOU ARE ADDING OR REMOVING A HOT-PLUG COMPONENT, ALLOW THE SYSTEM TO COOL BEFORE OPENING THE COVERS. TO AVOID THE POSSIBILITY OF COMING INTO CONTACT WITH HOT COMPONENT(S) DURING A HOT-PLUG INSTALLATION, BE CAREFUL WHEN REMOVING OR INSTALLING THE HOT-PLUG COMPONENT(S).

TO AVOID INJURY DO NOT CONTACT MOVING FAN BLADES. IF YOUR SYSTEM IS SUPPLIED WITH A GUARD OVER THE FAN, DO NOT OPERATE THE SYSTEM WITHOUT THE FAN GUARD IN PLACE.

9.8. Rack Mount Warnings

The following installation guidelines are required by UL for maintaining safety compliance when installing your system into a rack.

The equipment rack must be anchored to an unmovable support to prevent it from tipping when a server or piece of equipment is extended from it. The equipment rack must be installed according to the rack manufacturer's instructions.

Install equipment in the rack from the bottom up, with the heaviest equipment at the bottom of the rack. Extend only one piece of equipment from the rack at a time. You are responsible for installing a main power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the server(s).

To avoid risk of potential electric shock, a proper safety ground must be implemented for the rack and each piece of equipment installed in it.

Elevated Operating Ambient - If installed in a closed or multiunit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable 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).

9.9. Electrostatic Discharge (ESD)

ESD CAN DAMAGE DRIVES, BOARDS, AND OTHER PARTS. WE RECOMMEND THAT YOU PERFORM ALL PROCEDURES AT AN ESD WORKSTATION. IF ONE IS NOT AVAILABLE, PROVIDE SOME ESD PROTECTION BY WEARING AN ANTISTATIC WRIST STRAP ATTACHED TO CHASSIS GROUND — ANY UNPAINTED METAL SURFACE — ON YOUR SERVER WHEN HANDLING PARTS.

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrap- per. Do not slide board over any surface.

9.10. Other Hazards

Battery Replacement

THERE IS THE DANGER OF EXPLOSION IF THE BATTERY IS INCORRECTLY REPLACED. WHEN REPLACING THE BATTERY, USE ONLY THE BATTERY RECOMMENDED BY THE EQUIPMENT MANUFACTURER.

DISPOSE OF BATTERIES ACCORDING TO LOCAL ORDINANCES AND REGULATIONS.

DO NOT ATTEMPT TO RECHARGE A BATTERY.

DO NOT ATTEMPT TO DISASSEMBLE, PUNCTURE, OR OTHERWISE DAMAGE A BATTERY.

9.11. Cooling and Airflow

CAREFULLY ROUTE CABLES AS DIRECTED TO MINIMIZE AIRFLOW BLOCKAGE AND COOLING PROBLEMS. FOR PROPER COOLING AND AIRFLOW, OPERATE THE SYSTEM ONLY WITH THE CHASSIS COVERS INSTALLED. OPERATING THE SYSTEM WITHOUT THE COVERS IN PLACE CAN DAMAGE SYSTEM PARTS. TO INSTALL THE COVERS:

- Check first to make sure you have not left loose tools or parts inside the system.
- Check that cables, add-in cards, and other components are properly installed.

Attach the covers to the chassis according to the product instructions.

9.12. Laser Peripherals or Devices

TO AVOID RISK OF RADIATION EXPOSURE AND / OR PERSONAL INJURY: - Do not open the enclosure of any laser peripheral or device. - Laser peripherals or devices are not serviceable. Return to manufacturer for servicing.

Use certified and rated Laser Class I for Optical Transceiver product.

Chapter 10. Regulatory and Compliance Information

This server complies with the following safety requirements:

Table 10.1. Product Safety Requirements

IEC 60950-1	Safety of Information Technology Equipment
EN 60950-1	Safety of Information Technology Equipment Including Electrical Business Equipment, European Committee for Electrotechnical Standardization (CEN-ELEC)
UL 60950-1	Safety of Information Technology Equipment
UL 94	Tests for Flammability of Plastic Materials for Parts in Devices & Appliances
GB4943	Safety of Information Technology Equipment

10.1. Electromagnetic Compatibility Notices

10.1.1. FCC Verification Statement (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

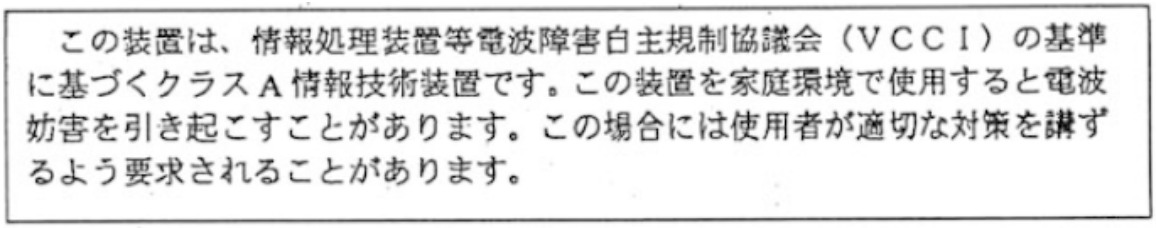
Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals, that are not shielded and grounded may result in interference to radio and TV reception.

10.1.2. Europe (CE Declaration of Conformity)

This product has been tested in accordance too, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

10.1.3. VCCI (Japan)


この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

English translation of the notice above:

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

10.1.4. Regulated Specified Components

To maintain the UL listing and compliance to other regulatory certifications and/or declarations, the following regulated components must be used and conditions adhered to. Interchanging or use of other component will void the UL listing and other product certifications and approvals.

Updated product information for configurations can be found on the site at the following URL:

www.etegro.com

If you do not have access to the Web address, please contact your local representative.

- Add-in cards: must have a printed wiring board flammability rating of minimum UL94V-1. Add-in cards containing external power connectors and/or lithium batteries must be UL recognized or UL listed. Any add-in card containing modem telecommunication circuitry must be UL listed. In addition, the modem must have the appropriate telecommunications, safety, and EMC approvals for the region in which it is sold.

- Peripheral Storage Devices: must be UL recognized or UL listed accessory and TUV or VDE licensed. Maximum power rating of any one device is 19 watts. Total server configuration is not to exceed the maximum loading conditions of the power supply.

10.1.5. Restriction of Hazardous Substances (RoHS) Compliance

ETegro Technologies, inc. has a system in place to restrict the use of banned substances in accordance with the European Directive 2002/95/EC. Compliance is based on declaration that materials banned in the RoHS Directive are either (1) below all applicable threshold limits or (2) an approved / pending RoHS exemption applies.

RoHS implementation details are not fully defined and may change.

Threshold limits and banned substances are noted below:

- Quantity limit of 0.1% by mass (1000 PPM) for:
  - Lead
  - Mercury
  - Hexavalent Chromium
  - Polybrominated Biphenyls Diphenyl Ethers (PBDE)
- Quantity limit of 0.01% by mass (100 PPM) for:
  - Cadmium

10.1.6. End of Life / Product Recycling

Product recycling and end-of-life take-back systems and requirements vary by country. Contact the retailer or distributor of this product for information about product recycling and / or take-back.