STRATOS S400 Series

S400-X44E

4U Server

Technical Guide

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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!

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

CAUTION!

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.

Note:

Highlights general or useful information and tips.

Acronyms

TERM	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 baseboard
CPU	Central Processing Unit

TERM	DEFINITION
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)
I^2C	Inter-Integrated Circuit bus
IANA	Internet Assigned Numbers Authority
IBF	Input buffer
ICH	I/O Controller Hub
ICMB	Intelligent Chassis Management Bus
IERR	Internal Error
IP	Internet Protocol
IPMB	Intelligent Platform Management Bus
IPMI	Intelligent Platform Management Interface

TERM	DEFINITION
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	Non-maskable Interrupt
NM	Node Management
OBF	Output buffer
OEM	Original Equipment Manufacturer
Ohm	Unit of electrical resistance
PDB	Power Distribution Board

TERM	DEFINITION
PEF	Platform Event Filtering
PEP	Platform Event Paging
PERR	Parity Error
POH	Power-On Hours
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 I^2C 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 non-maskable interrupt
SMM	Server Management Mode
SMS	Server Management Software
SNMP	Simple Network Management Protocol

TERM	DEFINITION
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

Safety Information

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.

Revision History

Refer to the table below for the updates made to this manual.

DATE	CHAPTER	UPDATES

Copyright

Version 1.0 / October 23, 2012

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.QuantaQCT.com

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

About the Book

This manual is written for system technicians who are responsible for troubleshooting, upgrading, and repairing the server chassis. This document provides an overview of the hardware features of the chassis, troubleshooting information, and instructions on how to add and replace components of the multi-node server series. The document also provides information on the BIOS, and Baseboard Management Controller (BMC).

For the latest version of this manual, see www.QuantaQCT.com.

About the Server

Chapter 1

1.1. Introduction

System Features

The system comprises a 4U/28” long chassis using a standard SSI mainboard. Some of the major features are as follows:

Major Features:

Chipset

Intel® Romley -EP 4S platform (Patsburg -D)

Processors

Intel®Xeon® E5-4600 series Sandy Bridge -EP 4S or Ivy Bridge -EP 4S processor, up to four units

PCIe

PCIe x16 Gen3 slots x 5, PCIe x 8 slots x 3, PCIe x8 Gen3 x 1 slot for mezzanine card

Note:
Expansion cards are optional components.

Memory

DIMM slots x 48, twelve slots/per CPU, DDR3-800/1066/1333/1600 supporting RDIMM, LRDIMM, UDIMM

Storage

SAS/SATA ports x8, Slim-line SATA port x1 for DVD-RW device, SATA port x1 for 5.25” tape backup device

Network

Single chip dual port Ethernet device Twinville (X540) (SKU1) or Powerville (I350)(SKU2)

Specifications

Form Factor

Rack-mount server with a height of 4U

Chassis Size (L x W x H)

- 704 mm x 424 mm x 173.8 mm
- 27.71” x 16.69” x 6.84”

Mainboard Size (W x L)

- 414.02 mm x 533.40 mm
- 16.3” x 21”

Processor

Up to four Intel®Xeon® E5-4600 series Sandy Bridge -EP 4S or Ivy Bridge -EP 4S processor with bus speed of 8.0GT/s,6.4 GT/s, 5.86 GT/s and 4.8 GT/s.

Romley-EP 4S (Intel® Xeon® E5-4600 series) processors supports the following features:

- Up to 8-cores and 16-threads per CPU
- 2.5MB L3 cache
- Intel® Turbo Boost Technology
- Four full-width, bidirectional Intel® QuickPath Interconnects (QPI) at 8.0GT/s, 6.4 GT/s, 5.86 GT/s, or 4.8 GT/s.
- Integrated Memory Controller – supports DDR3 800, 978 ,1066 and 1333 via a memory buffer
- Up to 40 lanes integrated PCIe3* per socket
- Supports 2S/4S configurations
- Intel®QuickPathinterconnect with 2 x 8GT/s links
- Cost-Optimized(lowerBOM vs. premiumEX)
- Ring architecture implementation, includes Directory Bit & adds Home Snoop, Route Thru, and more Node IDs
- Socket-R (LGA 2011)

Chipset

Intel® Romley -EP 4S platform (Patsburg -D)

Memory

- DIMM slots x 48, twelve slots/per CPU, up to 1.024 TB
- DDR3-800/1066/1333/1600 supporting RDIMM, LRDIMM, UDIMM

Storage

- Hot-swappable 2.5” SAS/SATA 6 Gb/s hard disk drives, up to eight units
- Slim-line SATA port for DVD-RW device
- SATA port for 5.25” tape backup device

HDD Backplane

Hot-swappable backplane

PCIe Expansion Slot

- PCIe x16 Gen3 slots x 5
- PCIe x 8 Gen3 slots x 3
- PCIe x8 Gen3 x1 slot (mezzanine card)

Network

- Single chip dual port Ethernet device Twinville (X540) (for SKU1)
- Powerville (I350)(for SKU2)

Management Port

10/100 MB/s RJ45 LAN port for management (BMC)

Integrated Graphics BMC

Aspeed AST2300 8MB DDR3 Video memory

Rear I/O

- External USB
- Management port
- LAN1 port
- LAN2 port
- ID button
- PCIe mezzanine slot
- Serial port
- VGA port

Power Supply

System supports up to four 1100W hot-swappable power supply modules in a 3+1 redundant configuration

1.1. Package Contents

The following list includes the package components for a 4U configuration:

- 4U chassis system
- Power cord (optional)
- CD (technical guide included)
- Rail kit

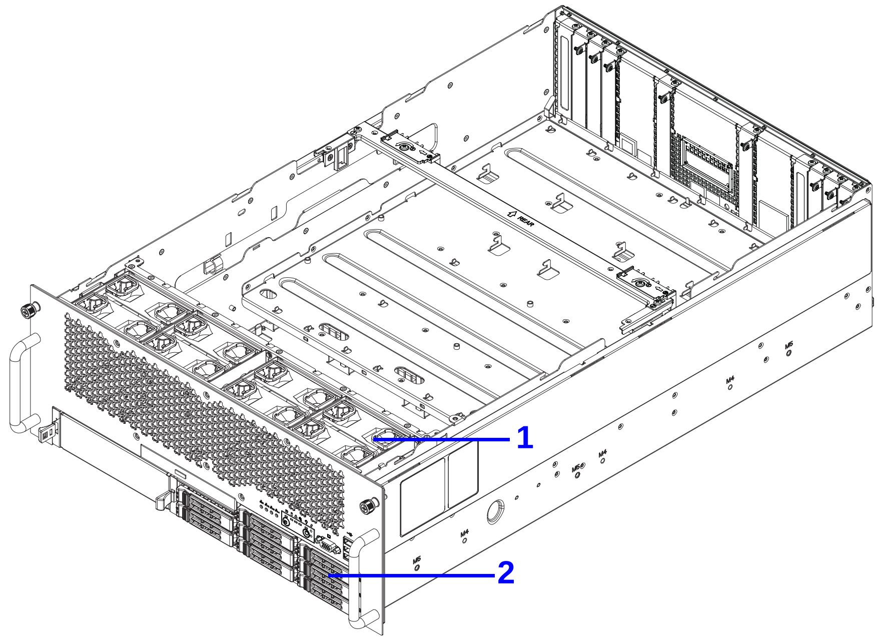
Important:
Server configurations may vary. Confirm your sales representative for the exact items included in your order.

1.2. A Tour of the System

System Overview

The S400-X44E is available as a 2.5” HDD system.

2.5” HDD System



2.5” HDD System Component Overview

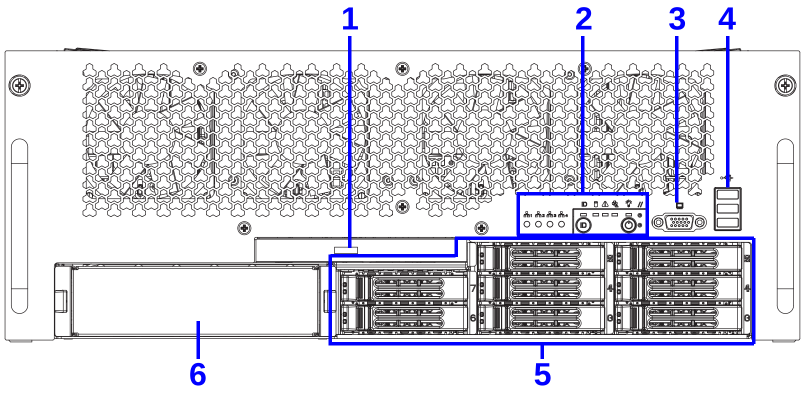
2.5” HDD System Component Description

NO.	ITEM	DESCRIPTION
1. 1	Fans	Fan module cage
2. 2	2.5 Hard Drives	2.5” hard disk drives (HDD) cage (x8)

System Front Features

Configuration

2.5” HDD Configuration



2.5” HDD Configuration

2.5” HDD Configuration

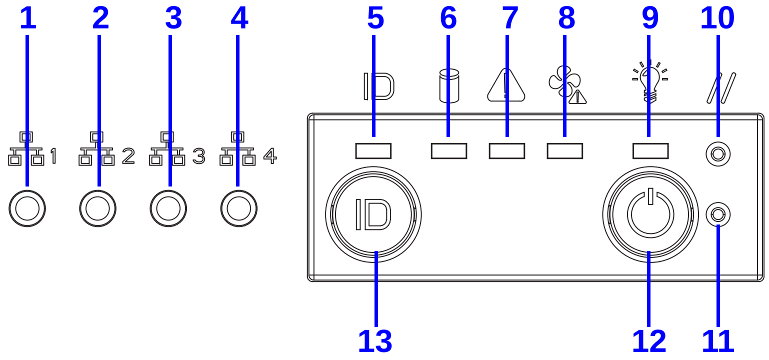
NO.	ITEM	DESCRIPTION
1. 1	Optical Drive	Insert an optical drive here
2. 2	Control Panel	Control system
3. 3	VGA port	Connect a monitor to this port
4. 4	USB port	USB ports (2.0 compliant)

2.5” HDD Configuration (Continued)

NO.	ITEM	DESCRIPTION
5. 5	HDD Bays	HDD array
6. 6	Tape Drive Bay	Insert a tape drive here

Control Panel

Control Panel Features



Control Panel Features

Control Panel Features

ITEM	ICON	NAME	DESCRIPTION
7. 1	🖧	LAN1 LED	LAN access

Control Panel Features (Continued)

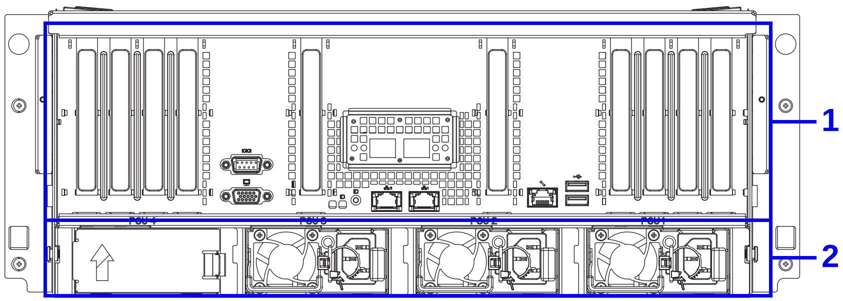
ITEM	ICON	NAME	DESCRIPTION
8. 2	🖧	LAN2 LED	LAN access
9. 3	🖧	LAN3 LED	LAN access
10.4	🖧	LAN4 LED	LAN access
11.5		ID LED	Lights for system identification
12.6	🛢	HDD Activity LED	Hard disk drive access
13.7	⚠	Fault LED	Provides critical and non-critical failure notification
14.8	⚠	Fan fault LED	Amber: On, fan fault OFF: No fan fault
15.9	💡	Power LED	Green: ON, system power on OFF: system off
16.10	//	Reset Button	Press to restart the system when the system is powered on
17.11		NMI button	Asserts NMI
18.12	⏻	Power Button	Based on System Off, Push Button to PSU and System on
			Based on System on, Push Button to PSU and System off

Control Panel Features (Continued)

ITEM	ICON	NAME	DESCRIPTION
19.13		Identification Button	Push to activate ID LED

System Rear Features

Configuration

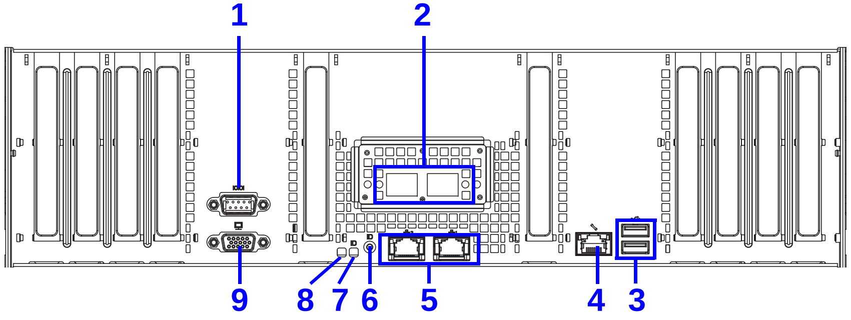


System Rear Configuration

System Rear Configuration

NO.	ITEM	DESCRIPTION
20.1	I/O ports	Connect I/O devices to these ports.
1. 2	Power Supply Unit	Power supply unit (PSU)

I / O Features



System Rear I/O Features

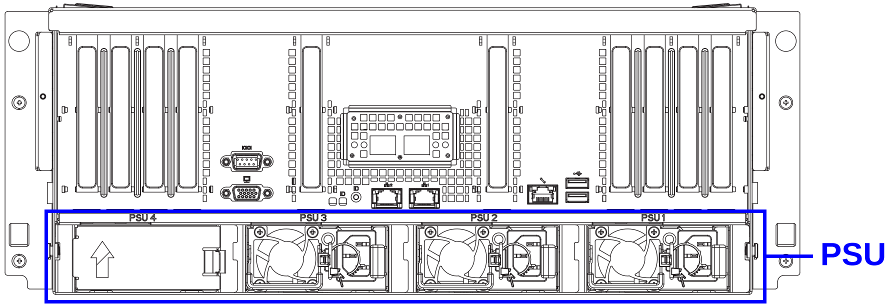
System Rear I/O Features

Item	Icon	Name	Description
1		Serial port	Connect serial devices to this port
2		SFP+ ports	Connect SPF+ cables
3		USB port	USB ports (2.0 compliant)
4	🔧	Dedicated Management LAN Port	
5	🖧	LAN	LAN access
6		Fault LED	Provides critical and non-critical failure notification
7		ID LED	Lights for system identification

System Rear I/O Features (Continued)

Item	Icon	Name	Description
8		Identification Button	Push to activate ID LED
9		VGA port	Connect a monitor to this port

Power Sub-System



PSU Description

A system can have more than one power supply units (PSU). The primary PSU and redundant backup(s). Redundant backup(s) are optional.

Power Supply Units by Model

MODEL	PSU	AC INPUT
	(1) 1100W high efficiency PSU, 100-240VAC (Default)	110/220V

Note:
To use PSUs other than the models listed make sure to contact the system dealer first and obtain authorized approval.

LED Status Definitions

I/O LED Description

I/O LED Description

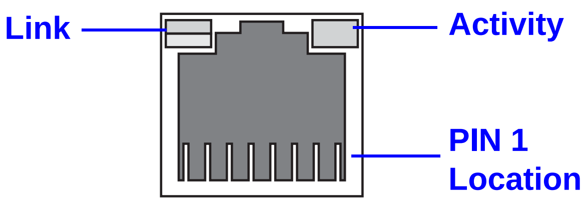
NAME		COLOR		CONDITION	DESCRIPTION
ID LED		Blue		ON	Unit selected for identification
		-		OFF	No identification requested
LAN1 LED (upper)	Link/ Act	Green		ON	LAN Link
		Green	Black	Blinking	LAN Access (off when there is traffic)
		-		OFF	Disconnect
	Speed	Green		ON	Green, link speed is 1000Mbits/sec
		Amber		ON	Amber, link speed is 100Mbits/sec
		-		OFF	OFF, link speed is 10Mbits/sec

I/O LED Description (Continued)

NAME		COLOR		CONDITION	DESCRIPTION
LAN2 LED (lower)	Link/ Act	Green		ON	LAN Link
		Green	Black	Blinking	LAN Access (off when there is traffic)
		-		OFF	Disconnect
	Speed	Green		ON	Green, link speed is 1000Mbits/sec
		Amber		ON	Amber, link speed is 100Mbits/sec
		-		OFF	OFF, link speed is 10Mbits/sec
Service Port (LAN3)LED	Link/ Act	Green		ON	LAN Link
		Green	Black	Blinking	LAN Access (off when there is traffic)
		-		OFF	Disconnect
	Speed	Green		ON	Green, link speed is 1000Mbits/sec
		Amber		ON	Amber, link speed is 100Mbits/sec
		-		OFF	OFF, link speed is 10Mbits/sec

LAN LED

The system mainboard has one I350 or X540 (optional) Ethernet controller and two 1GbE or 10GbE (optional) ports. Each RJ45 connector has two built-in LEDs. See the following illustration and table for details.



RJ45 LAN Connector

1 GbE and 10 GbE LED Description

	10 GBE CHIP ONBOARD		1 GBE CHIP ONBOARD	
	Link	Activity	Link	Activity
10 GbE LED	Green	Green Blinking	N/A	N/A
1 GbE LED	Amber	Green Blinking	Amber	Green Blinking
100M	Off	Green Blinking	Green	Green Blinking

Control Panel LED

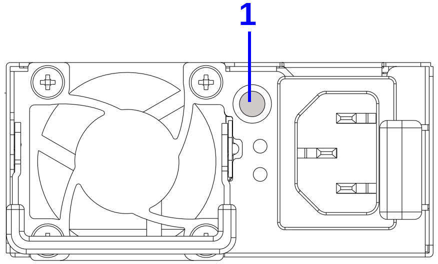
Control Panel LED Description

NAME	COLOR	CONDITION	DESCRIPTION
Power LED	Green	ON	System power on
		OFF	System power off
Identification	Blue	ON	Unit selected for identification
		OFF	No identification requested
Fault LED	Amber	Blinking	Critical Failure: critical fan, voltage, temperature state.
			Non-Critical Failure: non-critical fan, voltage, temperature state, CPU thermal trip.
		OFF	SEL Cleared
			DC Off
			Last pending warning or error has been de-asserted.
HDD Activity	Green	Blinking	Hard disk drive access (only on board SATA port)
		OFF	No access (non-SAS)
LAN1 LED	Green	ON	Link
	Green	Blinking	LAN Access (off when there is traffic)

Control Panel LED Description (Continued)

NAME	COLOR	CONDITION	DESCRIPTION
LAN2 LED	Green	ON	Link
	Green	Blinking	LAN Access (off when there is traffic)

PSU LED



PSU LED

PSU LED Description

NO	FEATURE	STATUS	DESCRIPTION
1	PSU LED	Green	Normal operation
		Yellow	Fault

Installing Hardware

Chapter 2

2.1. Safety Measures

⚠ **WARNING!**

Always ask for assistance to move or lift the system.

⚠ **WARNING!**

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.

⚠ **WARNING!**

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.

⚠ **WARNING!**

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.

⚠ **WARNING!**

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

⚠ **WARNING!**

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.

⚠ **WARNING!**

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

⚠ **WARNING!**

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

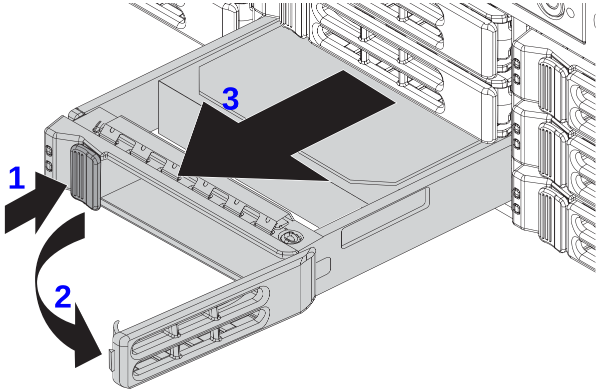
⚠ **WARNING!**

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

2.2. Hard Disk Drives

Removing a 2.5” Swappable HDD Assembly

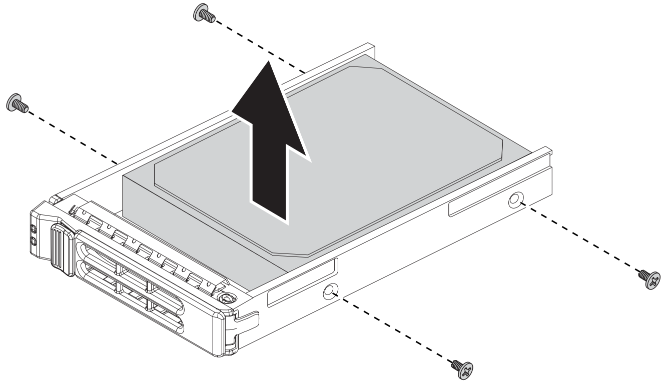
1. Press the tray handle button.
2. Pull the HDD tray handle open.



Removing HDD Assembly

3. Grasp the tray handle and pull the tray out of the system.

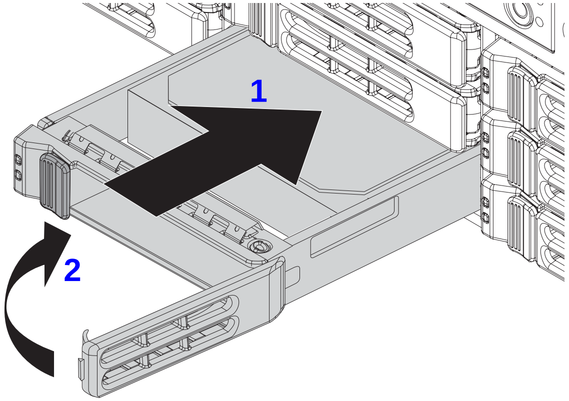
Removing a 2.5” Swappable HDD from an HDD Tray



Disassembling HDD Assembly

4. Remove the screws securing the HDD to the HDD tray.
5. Remove the HDD from the HDD tray.

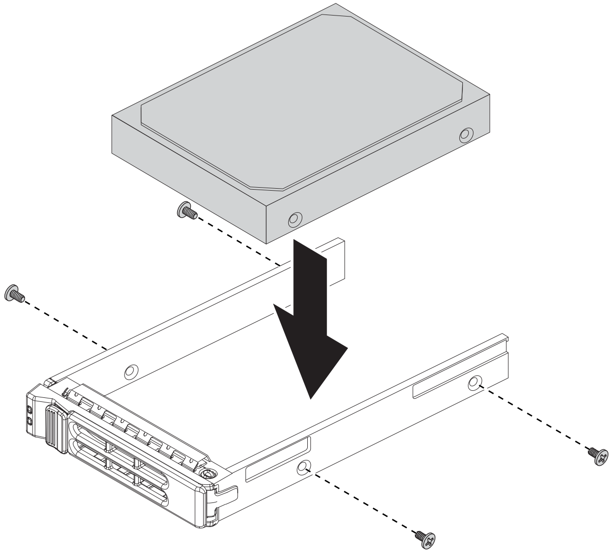
Installing a 2.5” Swappable HDD Assembly



Installing HDD Assembly

1. Insert the HDD assembly into the system. Make sure the hard drive is fully inserted.
2. Push the tray handle closed.

Installing a 2.5” Swappable HDD into an HDD Tray



Assembling HDD Tray

3. Install the HDD into the HDD tray.
4. Secure the HDD to the HDD tray with screws.

2.3. Power Supply Unit

CAUTION!

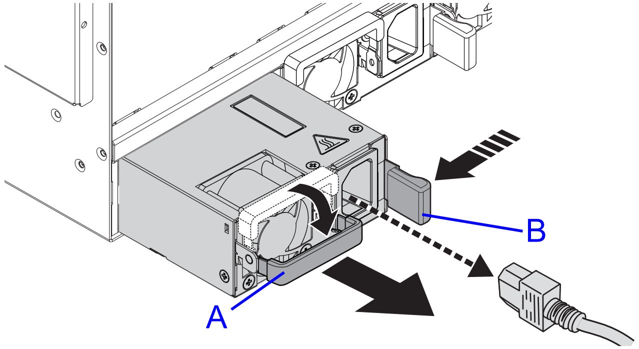
DISCONNECT THE POWER SUPPLY UNIT FROM THE POWER SOURCE BEFORE REMOVING PSU. FAILURE TO DO SO COULD RESULT IN DAMAGE TO THE EQUIPMENT OR PERSONAL INJURY.

Note:

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

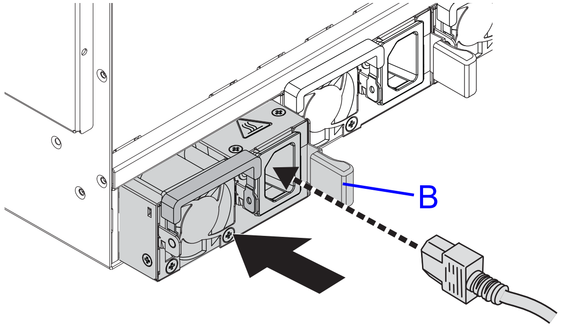
Removing a PSU

1. Pull the PSU handle (A) up to the open position.
2. Press and hold the locking latch (B) lever.
3. Pull the PSU from the system.



Removing the PSU

Installing a PSU



Installing a Power Supply Unit

Insert the power supply unit (PSU) into the system. Make sure the PSU is flush with the system and the locking latch lever (B) is locked in place.

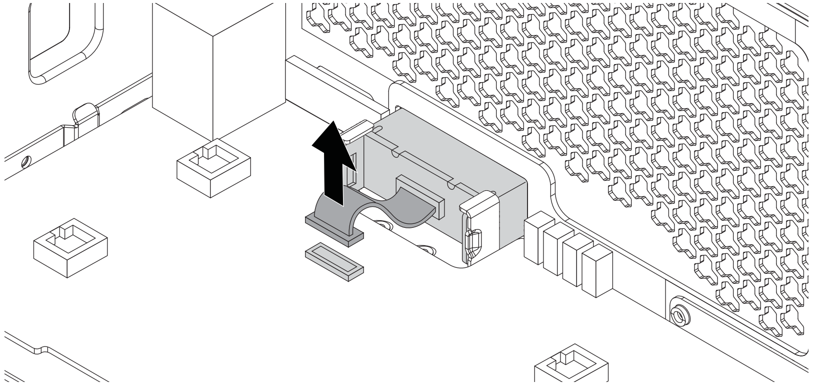
2.4. Operator Panel

Removing a Operator Panel Assembly

Prerequisite:

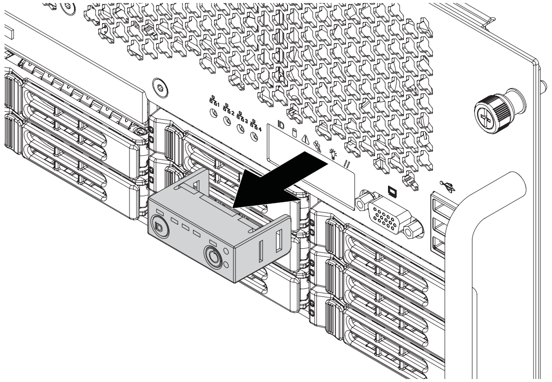
Remove the top cover. See *Opening the Top Cover*.

1. Disconnect the operator panel cable from the connector on mainboard.



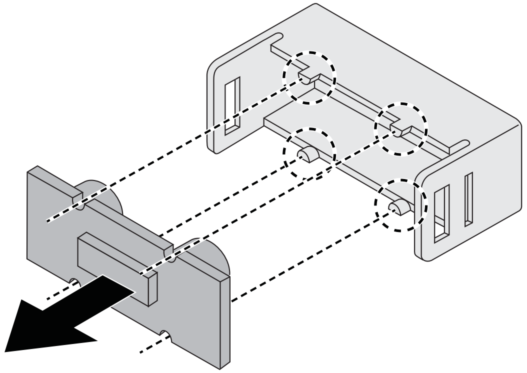
Disconnecting the Operator Panel Cable

2. Remove the operator panel assembly from the chassis.



Removing the Operator Panel Assembly

3. Remove the operator panel board from the panel housing.



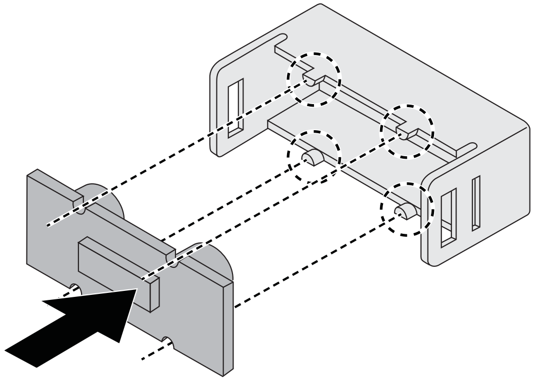
Disassembling the Operator Panel

Installing a Operator Panel Assembly

Prerequisite:

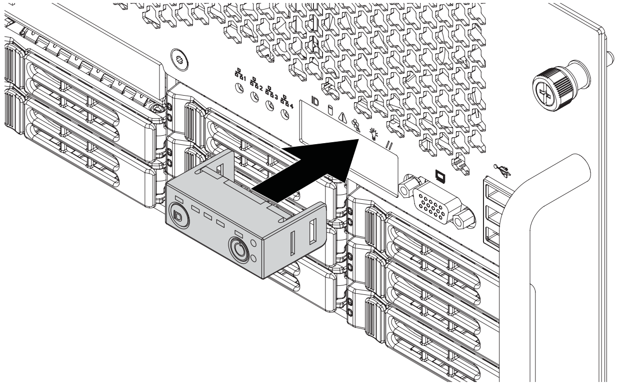
Remove the top cover. See *Opening the Top Cover*.

1. Secure the operator panel board on the panel housing.



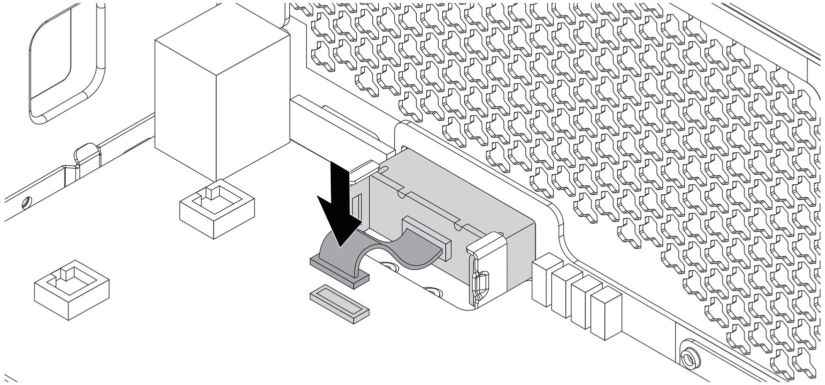
Assembling the Operator Panel

2. Install the operator panel assembly into the chassis.



Installing the Operator Panel Assembly

3. Connect the operator panel cable to the connector on mainboard.



Connecting the Operator Panel Cable

1.

2.5. Top Cover

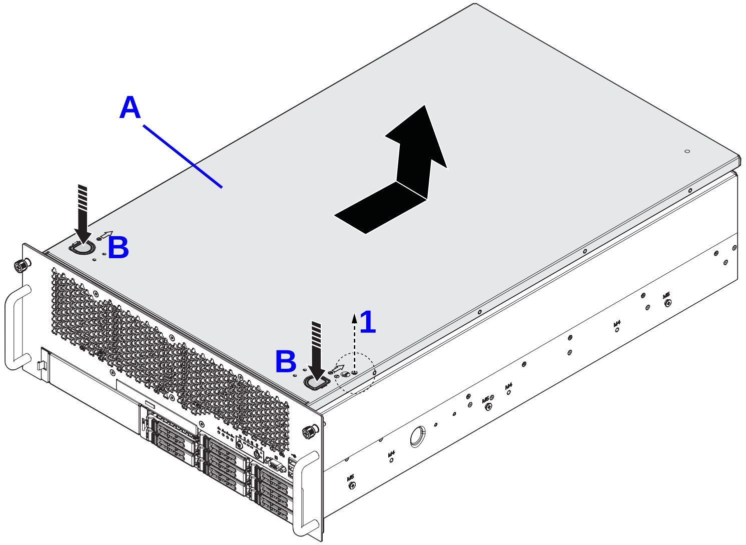
Removing a Top Cover

Prerequisite:

Turn off the system and any attached peripherals.

Unplug the AC power cables and disconnect all peripherals, LAN lines and any other cables.

1. Remove the screw(s) from the top cover (A).
2. Press the release button(s) (B) and slide the top cover (A).
3. Lift the top cover off the chassis.

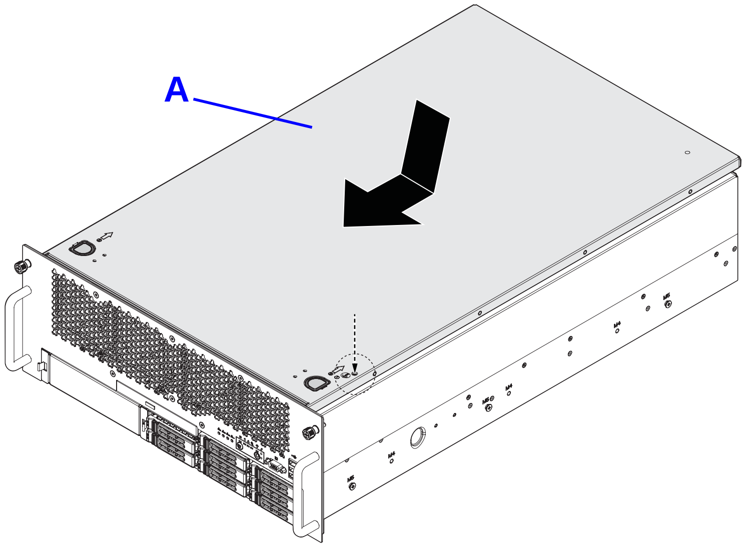


Opening Top Cover

Installing a Top Cover

1. Place the top cover (A) on the chassis.
2. Slide the top cover into place.

3. Install and secure the screw(s) into the top cover.



Closing Top Cover

1.

2.6. Processor Heat Sinks

Removing a Processor Heat Sink

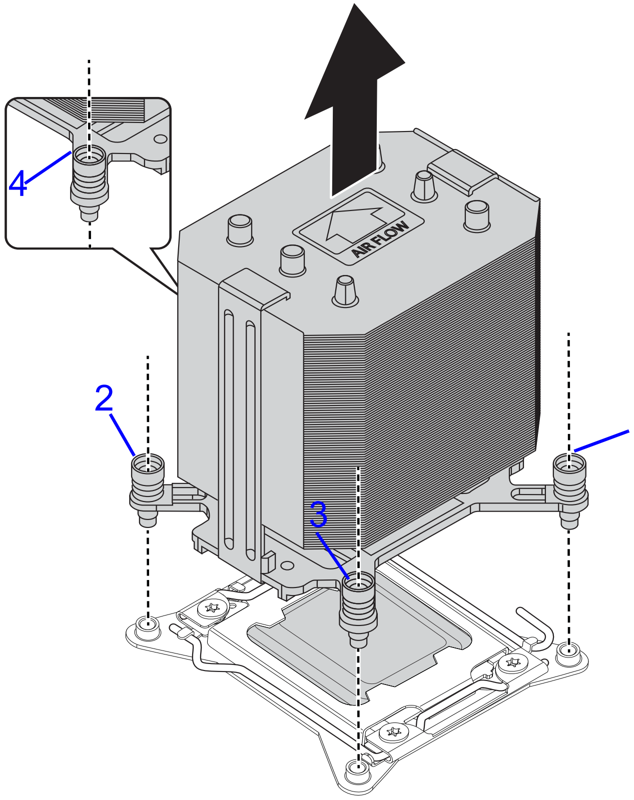
WARNING!

The heatsink remains hot after the system has been powered down. Allow sufficient time to cool before handling system components.

Prerequisite:

Remove the top cover. See *Opening the Top Cover*.

1. Loosen the captive screw(s) securing the heat sink to the mainboard.



Removing the Heat Sink

2. Remove the heat sink.

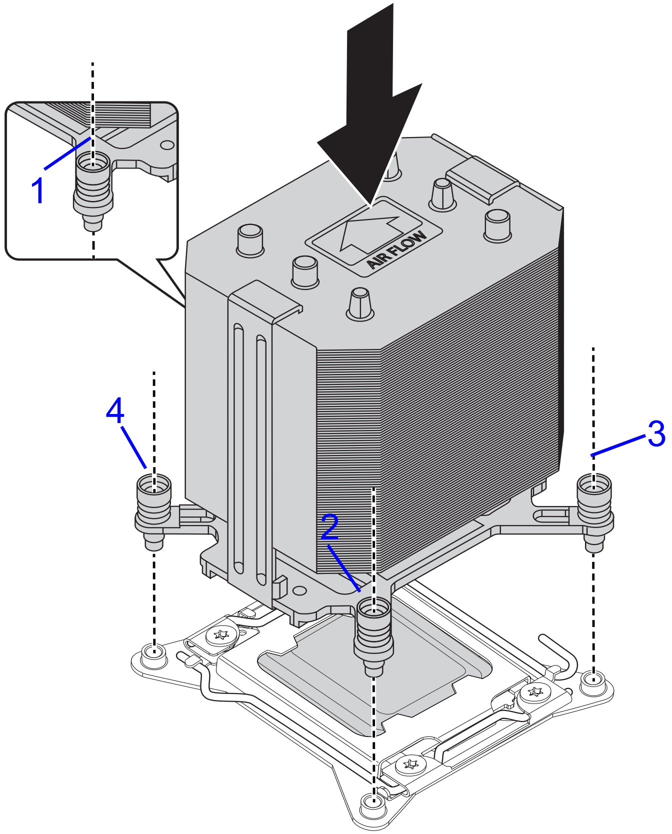
Installing a Processor Heat Sink

Note:
To install a processor heat sink on processor number 2, see *Installing an Air Baffle*.

Prerequisite:

Remove the top cover. See *Opening the Top Cover*.

1. Place the heat sink on the processor.



Installing Heat Sink

2. Secure the heat sink with the captive screw(s) in the order shown on the image *Installing Heat Sink*.

1.

2.7. Air Baffle

Removing an Air Baffle

This procedure applies to the processor number 2 heat sink removal. See the numbering of the processors in *Mainboard Connectors and Jumpers* section.

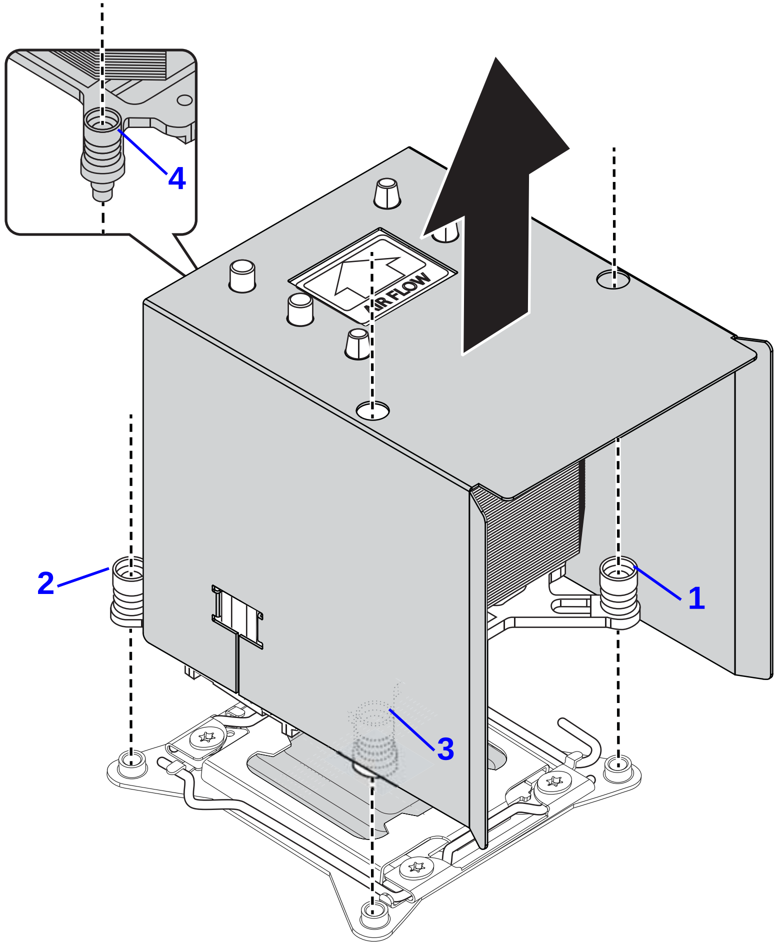
WARNING!

The heatsink remains hot after the system has been powered down. Allow sufficient time to cool before handling system components.

Prerequisite:

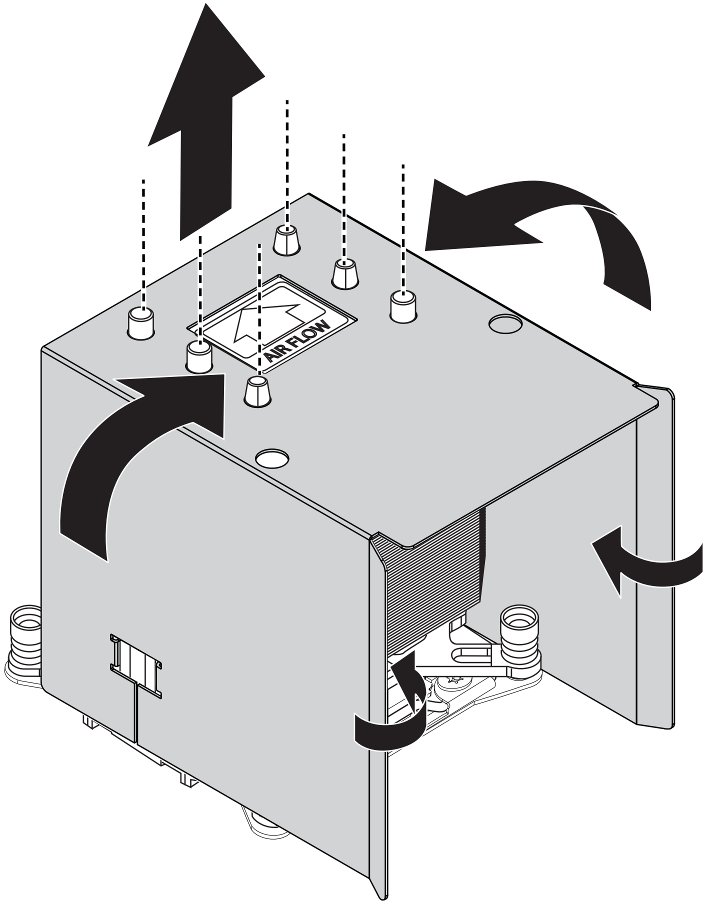
Remove the top cover. See *Opening the Top Cover*.

1. Loosen the captive screw(s) securing the heat sink assembly to the mainboard in an order shown on the following image:



Removing Heat Sink Assembly

2. Remove the heat sink assembly.
3. Release the air baffle from adhesive on top of the heat sink.



Removing Air Baffle

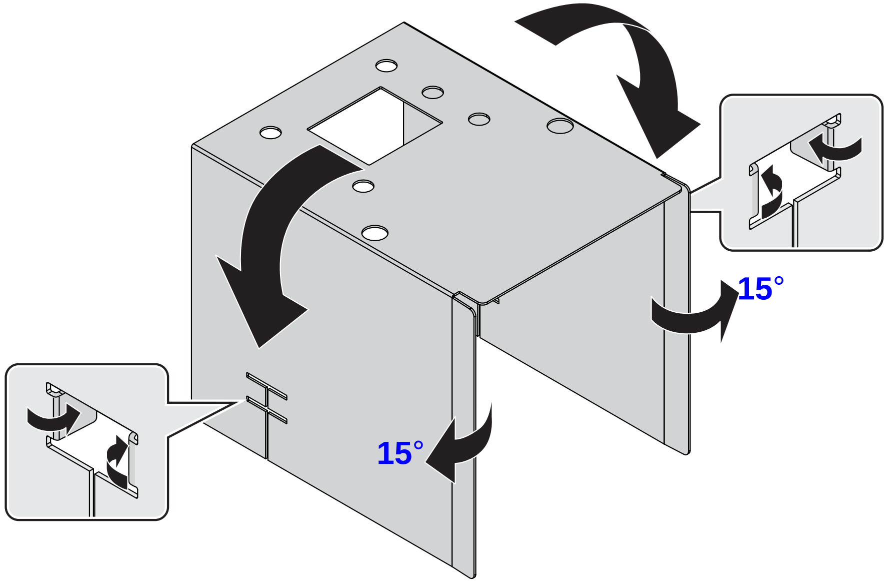
Installing an Air Baffle

This procedure applies to the processor number 2 heat sink air baffle. See the numbering of the processors in *Mainboard Connectors and Jumpers* section.

Prerequisite:

Remove the top cover. See *Opening the Top Cover*.

4. Leaving the adhesive area inside, fold the air baffle as shown on the following image:

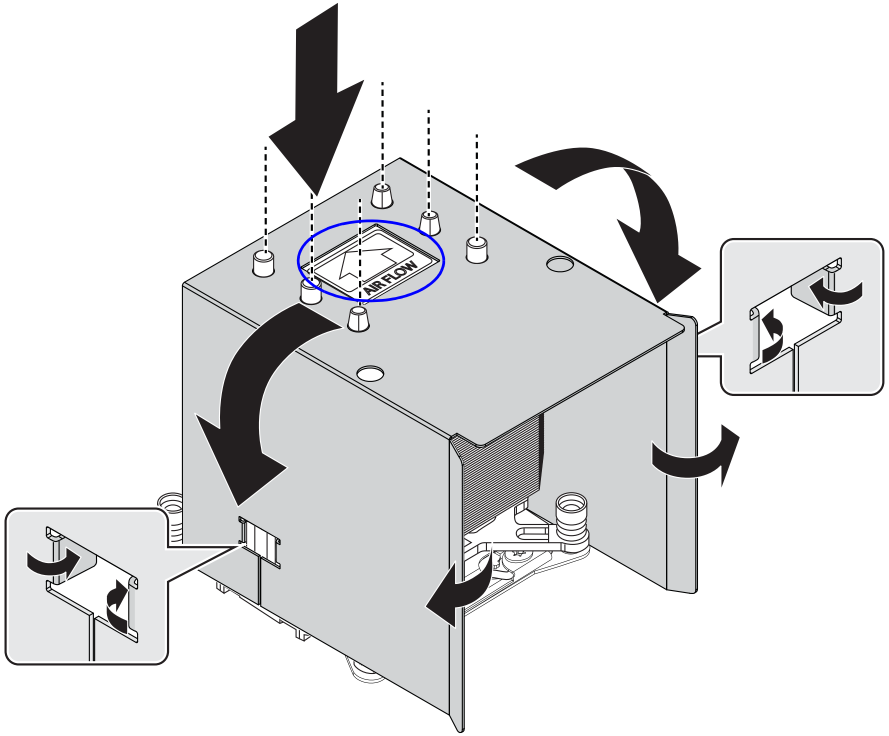


Folding Air Baffle

WARNING!

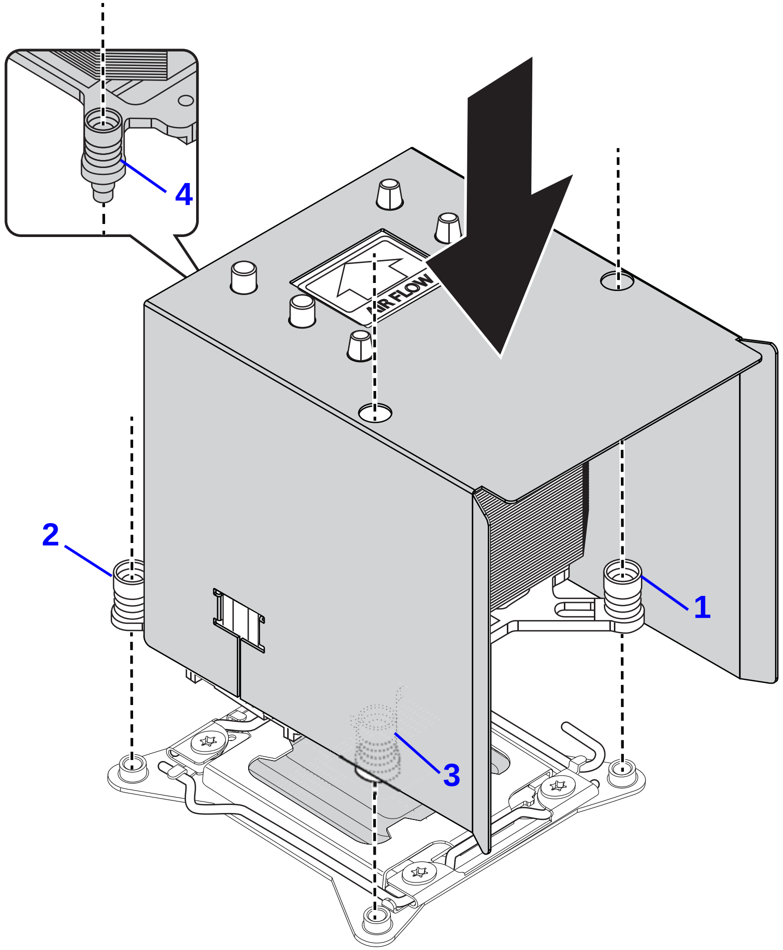
Before installing an air baffle on heat sink, take a note of the AIR FLOW arrow on top of the heat sink to avoid blocking proper system cooling. See *Sealing Air Baffle*.

5. Align holes on air baffle with the pins on top of the heat sink.
6. Seal air baffle on heat sink. Make sure the sides of the air baffle are secured.



Sealing Air Baffle

7. Secure heat sink assembly with captive screw(s) in the order shown on the image *Installing Heat Sink Assembly*.



Installing Heat Sink Assembly

8.

2.8. Processors

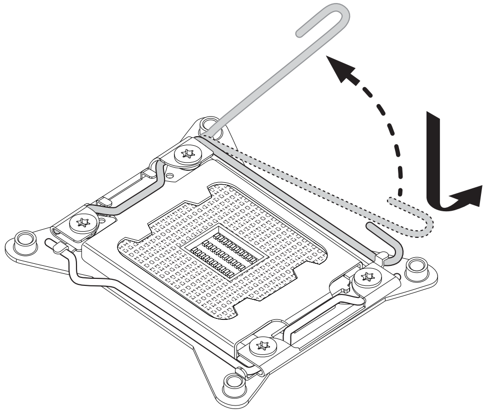
Removing a Processor

WARNING!
The processor remains hot after the system has been powered down. Allow sufficient time to cool before handling system components.

Prerequisite:

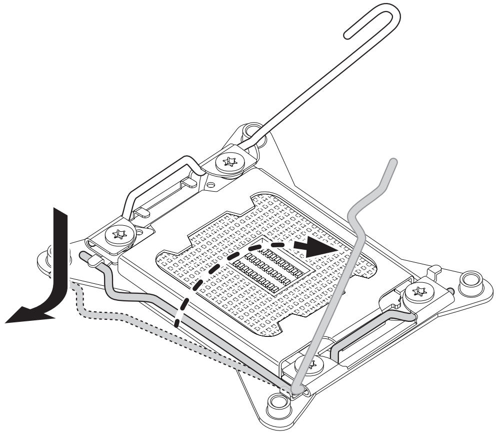
Remove the CPU heatsink. See *Removing a Heatsink*.

1. Press the unlocking lever of the processor socket down and upwards as shown.



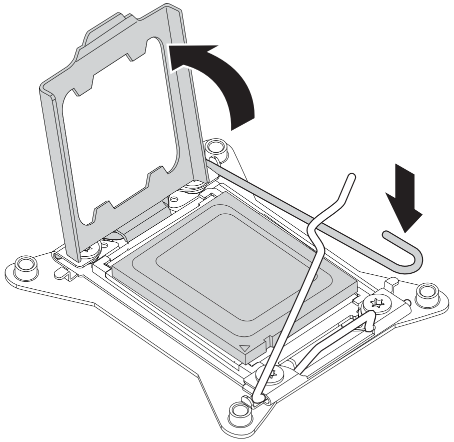
Release Unlocking Lever

2. Press the locking lever of the processor socket down and upwards.
3. Pull the locking lever fully open as shown.



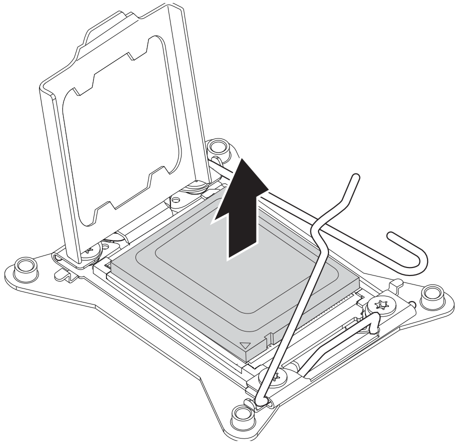
Release Locking Lever

4. Press down on unlocking lever and lift load plate fully open.



Load Plate Opening

5. Remove processor.

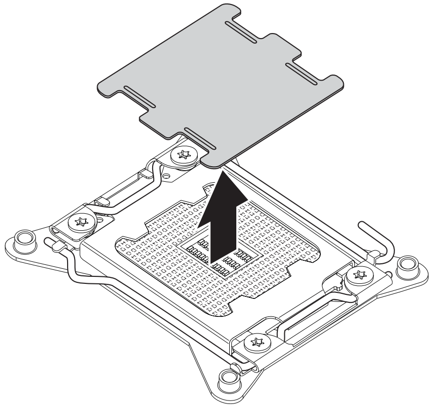


Processor Removal

Installing a Processor

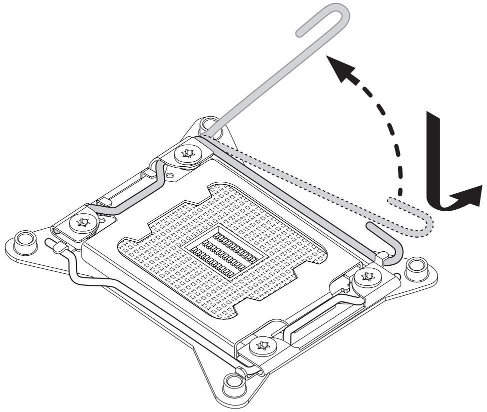
Note:
Use the socket cover to protect the socket when the socket is empty.

1. Remove the dust cover.



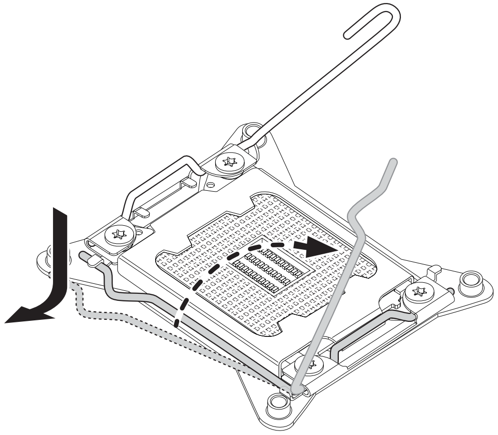
Dust Cover Removal

1. Press the unlocking lever of the processor socket down and upwards as shown.



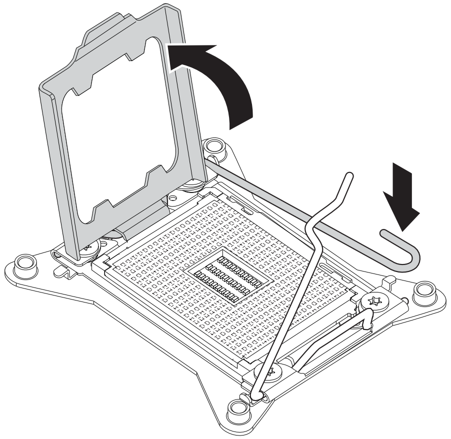
Release Unlocking Lever

2. Press the locking lever of the processor socket down and upwards.
3. Pull the locking lever fully open as shown.



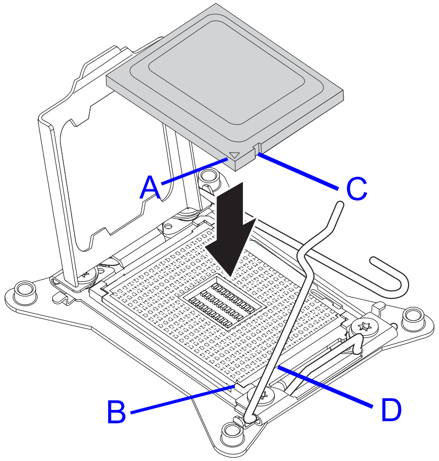
Release Locking Lever

4. Press down on unlocking lever and lift load plate fully open.



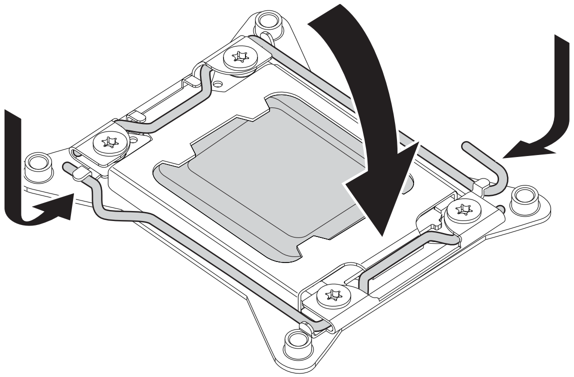
Load Plate Opening

5. .Locate the pin-1 (A) on processor and the pin-1 (B) corner of the socket.
6. Locate the indent (C) on processor and corresponding tab (D) on socket.



Installing Processor

7. Replace the processor bracket, unlocking and locking levers to lock the processor in place.



Replacing Processor Bracket

Note:
Use the socket cover to protect the socket when the socket is empty.

8. Repeat steps 1 through 7 for the remaining processors.

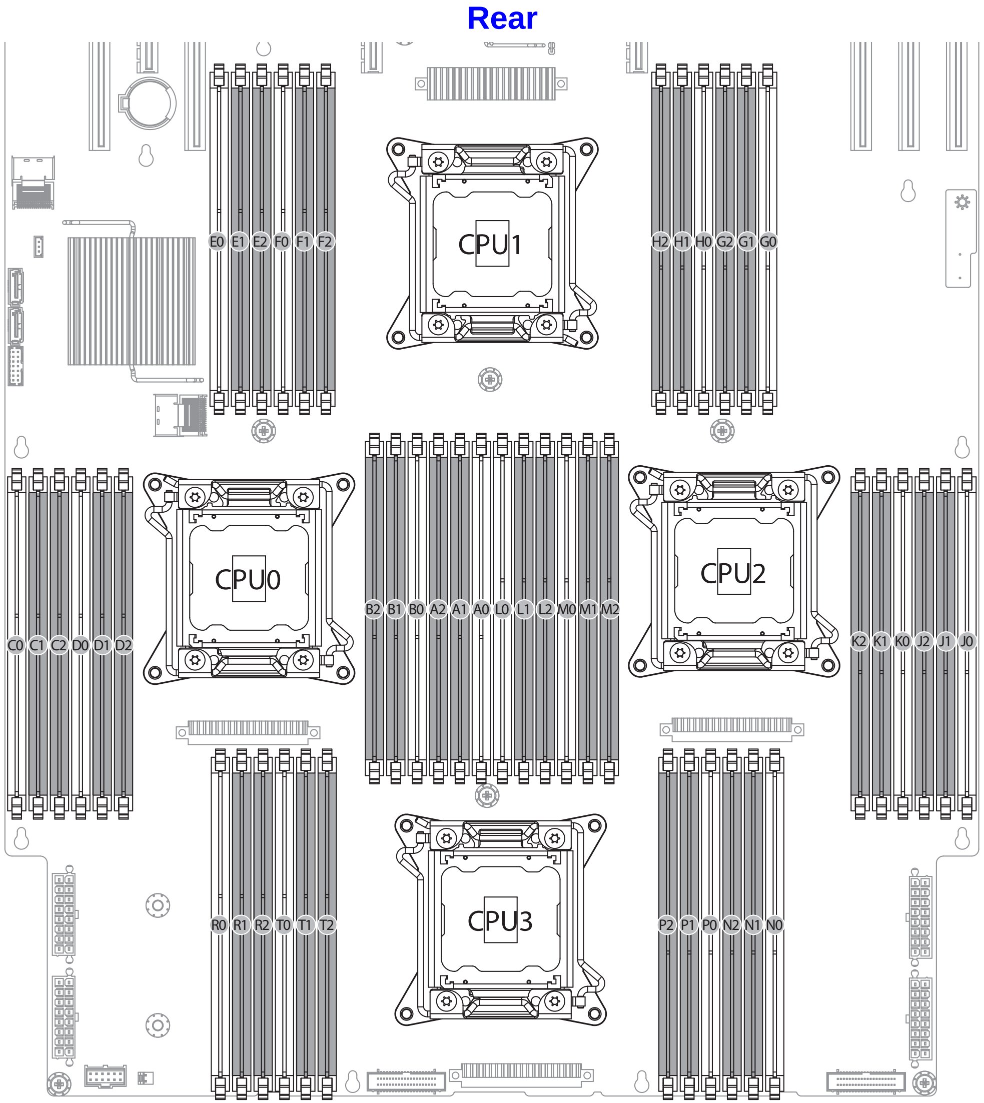
2.9. Memory Modules

WARNING!

Mainboard is supplied with all DIMM slots populated with dummy DIMMs for proper air flow. When installing and replacing memory modules, only remove those dummy DIMMs that are to be directly replaced. All DIMM slots must be occupied at all times by either a memory module or dummy DIMM.

General Guidelines

All multi-node servers have specific rules for the population of memory on the individual mainboards that must be obeyed. Refer to the following individual server rules for information on how to populate the particular server required



Memory Population Configuration

Memory Support List

DIMM Configuration Parameters

PARAMETER	POSSIBLE VALUE
DIMM Type	RDIMM (w/ECC) or UDIMM (w or w/o ECC) or LRDIMM
DIMM Construction	RDIMM raw cards: ● A (1Rx8), B (2Rx8), C (1Rx4), D (2Rx4), E/J (2Rx4), F/AB (4Rx4), or H (4Rx8) UDIMM raw cards: ● A (1Rx8), B (2Rx8), C (1Rx16), D (1Rx8 w/ECC), E (2Rx8 w/ ECC) LRDIMM raw cards: ● C/K (4Rx4 DDP), B (4Rx8 P)
DIMM Frequencies	DDR3-800, DDR3-1066, DDR3-1333, DDR3-1600

Memory Population Configurations

RDIMM Population Configurations within a Channel (Three Slots per Channel)

CONFIGURATION NUMBER	POR SPEED	1N OR 2N	DIMM2	DIMM1	DIMM0
1	● A: DDR3-1333, 1066 ● B: DDR3-1600, 1333, 1066	1N	Empty	Empty	Single-Rank
2	● A: DDR3-1333, 1066 B: DDR3-1600, 1333, 1066	1N	Empty	Empty	Dual-rank

RDIMM Population Configurations within a Channel (Three Slots per Channel) (Continued)

CONFIGURATION NUMBER	POR SPEED	1N OR 2N	DIMM2	DIMM1	DIMM0
3	● A: DDR3 - 1066 ● B: DDR3 -1066	1N	Empty	Empty	Quad-rank
4	● A: DDR3 -1333, 1066 ● B: DDR3 - 1333, 1066	1N	Empty	Single-rank	Single-rank
5	● A: DDR3 -1333, 1066 B: DDR3 - 1333, 1066	1N	Empty	Sinle-rank	Dual-rank

RDIMM Population Configurations within a Channel (Three Slots per Channel) (Continued)

CONFIGURATION NUMBER	POR SPEED	1N OR 2N	DIMM2	DIMM1	DIMM0
6	● A: DDR3 -1333, 1066 B: DDR3 - 1333, 1066	1N	Empty	Dual-rank	Dual-rank
7	● A: DDR3 -800 ● B: DDR3 -800	1N	Empty	Single-rank	Quad-rank
8	● A: DDR3 -800 B: DDR3-800	1N	Empty	Dual-rank	Quad-rank
9	● A: DDR3 -800 B: DDR3-800	1N	Empty	Quad-rank	Quad-rank

RDIMM Population Configurations within a Channel (Three Slots per Channel) (Continued)

Configuration Number	POR Speed	1N or 2N	DIMM2	DIMM1	DIMM0
10	● A: DDR3-800 B: DDR3-800	1N	Single-rank	Single-rank	Single-rank
11	● A: DDR3-800 B: DDR3-800	1N	Single-rank	Single-rank	Dual-rank
12	● A: DDR3-800 B: DDR3-800	1N	Single-rank	SDual-rank	Dual-rank
13	● A: DDR3-800 B: DDR3-800	1N	Dual-rank	Dual-rank	Dual-rank

UDIMM Population Configurations within a Channel (Three Slots per Channel)

Configuration Number	POR Speed	1N or 2N	DIMM2	DIMM1	DIMM0
1	● A: DDR3-1333, 1066 ● B: DDR3-1600, 1333, 1066	1N	Empty	Empty	Single-Rank
2	● A: DDR3-1333, 1066 B: DDR3-1600, 1333, 1066	1N	Empty	Empty	Dual-rank

UDIMM Population Configurations within a Channel (Three Slots per Channel) (Continued)

CONFIGURATION NUMBER	POR SPEED	1N OR 2N	DIMM2	DIMM1	DIMM0
3	● A: DDR3-1333, 1066 ● B: DDR3-1066, 1333, 1066	2N	Empty	Single-rank	Single-rank
4	● A: DDR3-1333, 1066 ● B: DDR3-1066, 1333, 1066	2N	Empty	Single-rank	Dual-rank
5	● A: DDR3-1333, 1066 ● B: DDR3-1066, 1333, 1066	2N	Empty	Dual-rank	Dual-rank

Removing Memory Modules

CAUTION!

HANDLE THE MEMORY MODULE BY THE EDGES AT ALL TIMES.

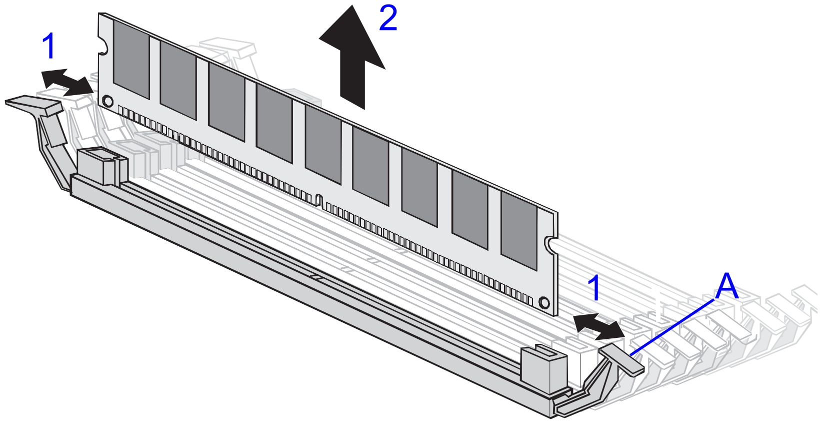
WARNING!

Memory modules remain hot after the system is powered down. Allow sufficient time for the memory modules to cool before handling system components.

Prerequisite:

Remove the top cover. See *Opening the Top Cover*..

1. Press down on the two memory module slot levers (A). The memory module partially ejects.

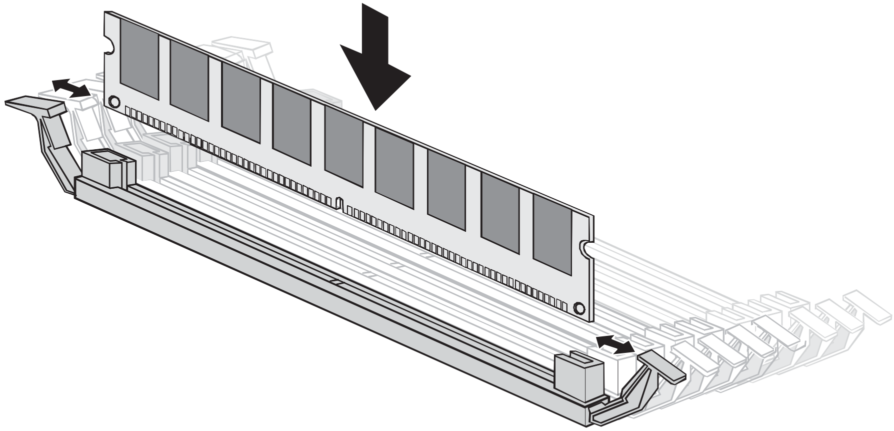


Removing Memory Modules

2. Lift out the memory module.

Installing Memory Modules

Push the memory module firmly into the memory module slot. The locking latches should automatically close over the edges of the memory board when fully inserted into the slot.



Installing Memory Modules

CAUTION!

HANDLE THE MEMORY MODULE BY THE EDGES AT ALL TIMES.

Note:

Make sure the notch in the memory board aligns with the obstruction in the memory slot.

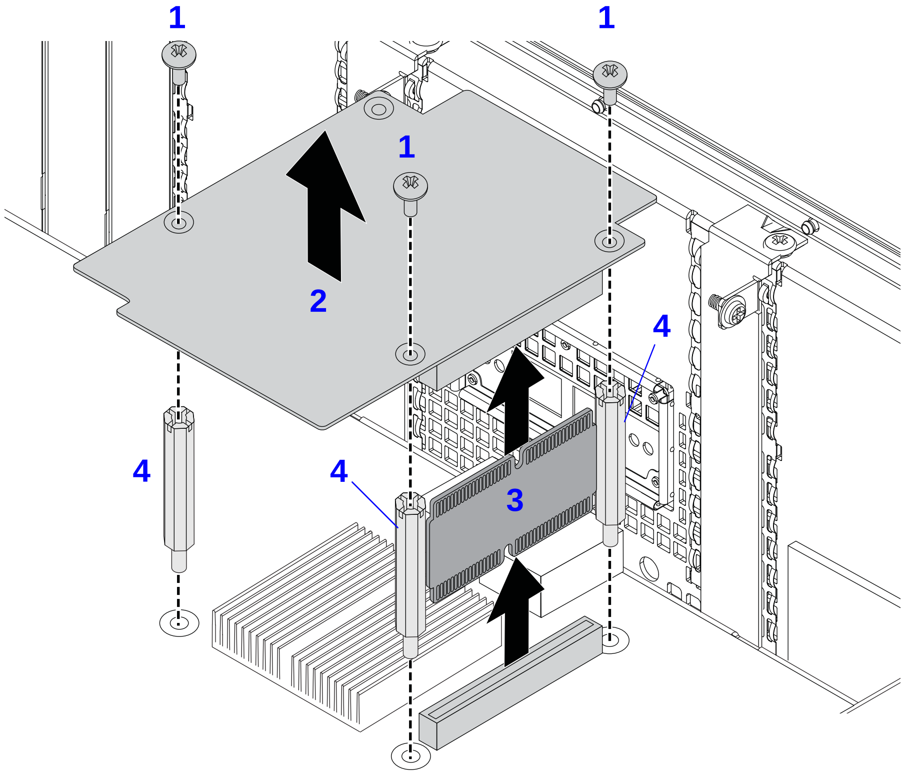
2.10. Expansion Cards

Removing a 10G/40G SFP Mezzanine Card

Prerequisite:

Remove the top cover. See *Removing a Top Cover*.

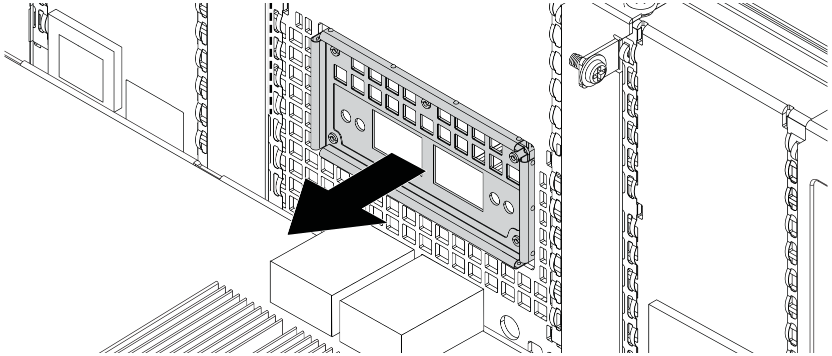
1. Remove screw(s) from mezzanine assembly.



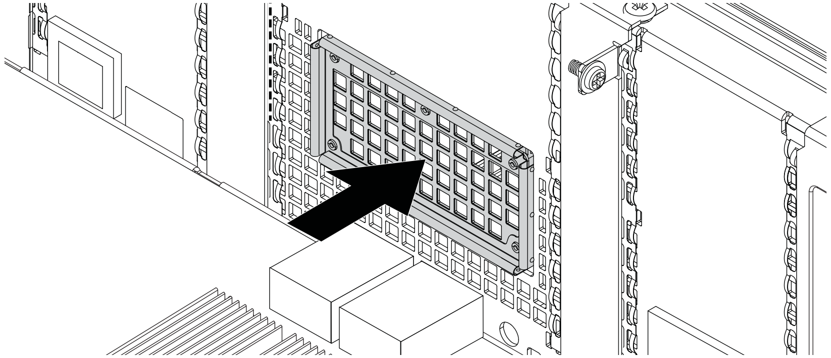
Removing SFP+ Mezzanine Assembly

2. Disconnect the mezzanine card from the linking board.

3. Disconnect the linking board from the mainboard connector.
4. Remove standoff(s) from the mainboard.
5. Remove the mezzanine card.
6. Replace the I/O shield on the rear panel.



Rear Panel I/O Shield (1 of 2)



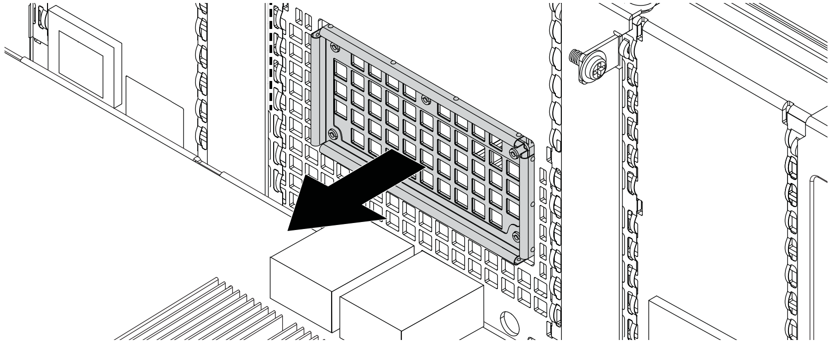
Rear Panel I/O Shield (2 of 2)

Installing a 10G/40G SFP Mezzanine Assembly

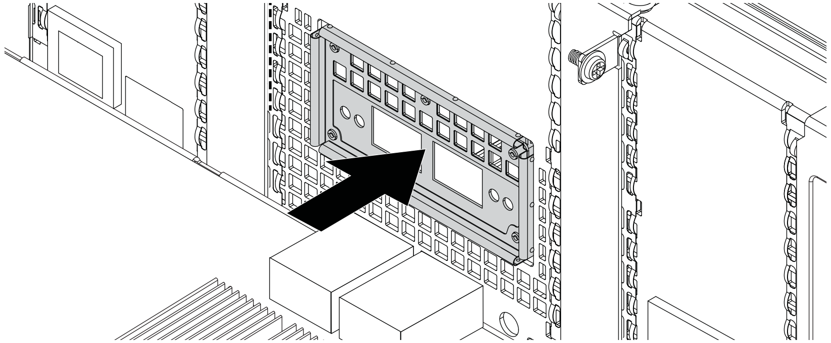
Prerequisite:

Remove the top cover. See *Removing a Top Cover*.

1. Replace the I/O shield to provide openings for the SFP+ mezzanine card.

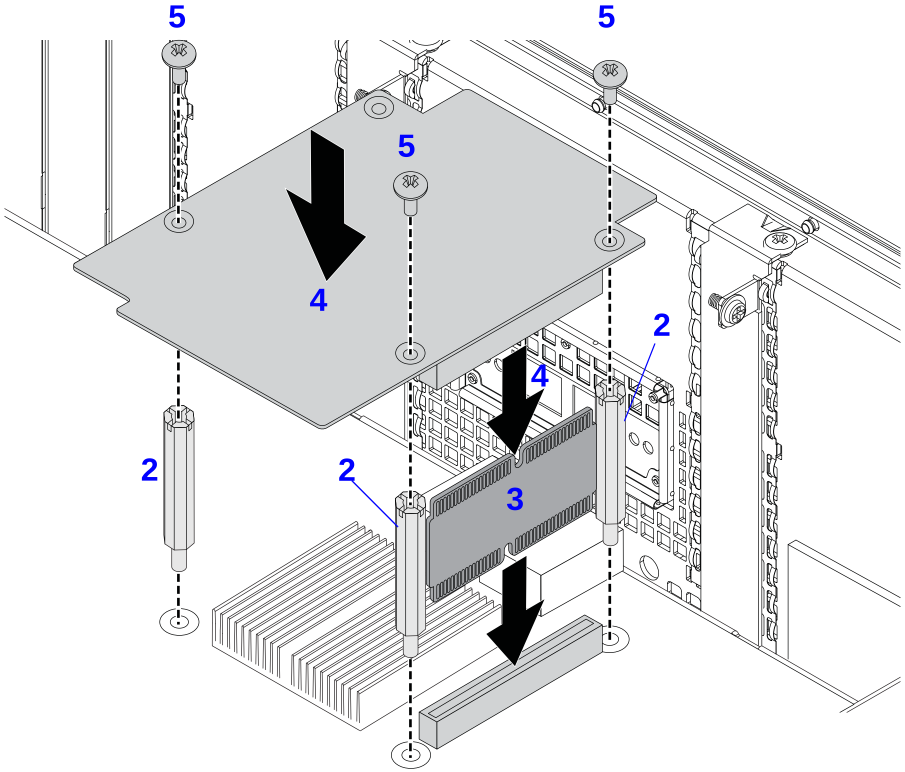


Rear Panel I/O Shield (1 of 2)



Rear Panel I/O Shield (2 of 2)

2. Secure standoff(s) to the mainboard.



Installing a SFP+ Mezzanine Assembly

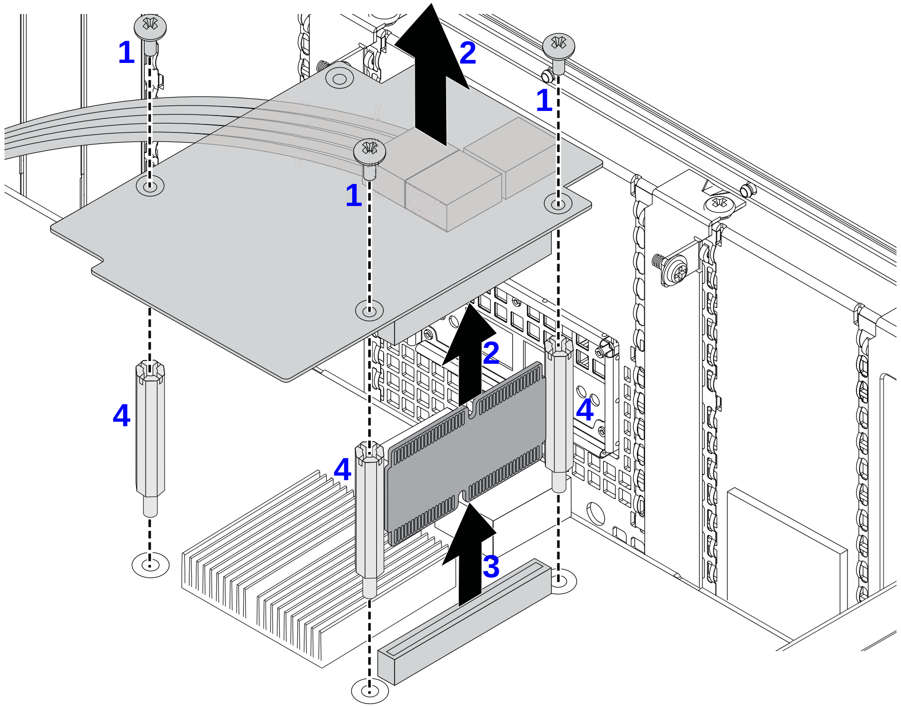
3. Connect the linking board to the mainboard connector.
4. Connect the mezzanine card to the linking board.
5. Install and secure the screw(s) to the mezzanine card.

Removing a SAS Mezzanine Assembly

Prerequisite:

Remove the top cover. See *Removing a Top Cover*.

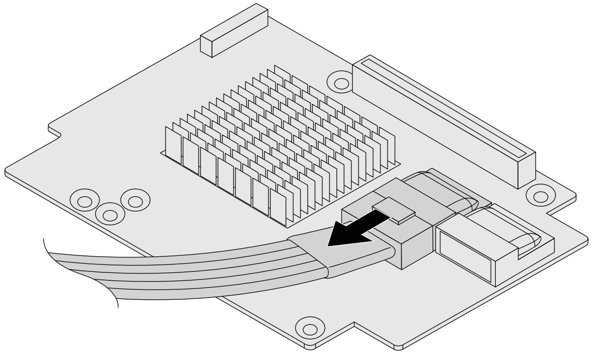
1. Remove screw(s) from SAS mezzanine assembly.



Removing a SAS Mezzanine Card

2. Disconnect mezzanine card from the linking board.

3. Disconnect the linking board from the mainboard connector.
4. Remove the standoff(s) from the mainboard.
5. Gently flip the mezzanine card and disconnect SAS cable(s) from the card.



Disconnecting Cable

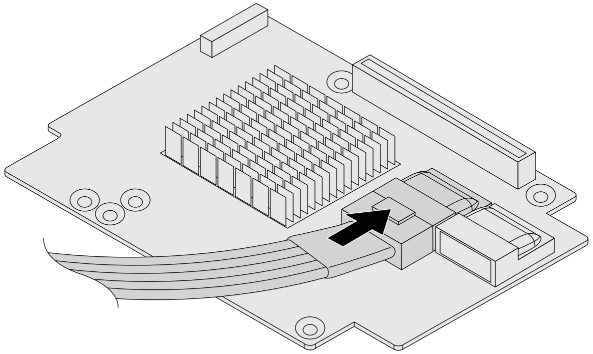
6. Remove the mezzanine card.

Installing a SAS Mezzanine Assembly

Prerequisite:

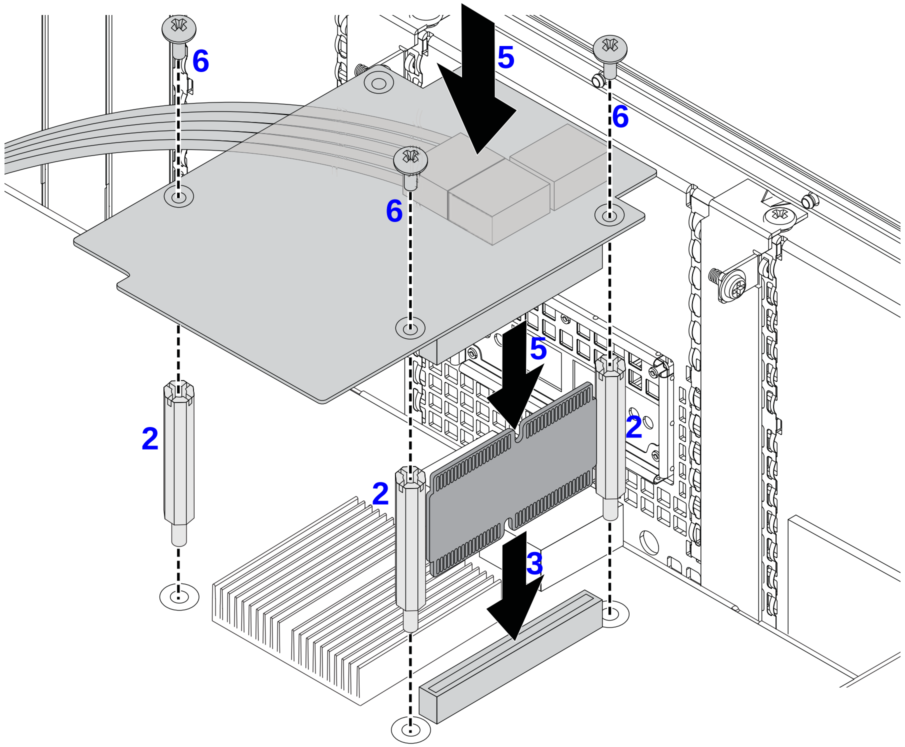
Remove the top cover. See *Removing a Top Cover*.

1. Connect the mini SAS cable to the mezzanine card (SAS ports 0 to 3).



Connecting Cable

2. Secure the standoff(s) to the mainboard.



Installing a SAS Mezzanine Assembly

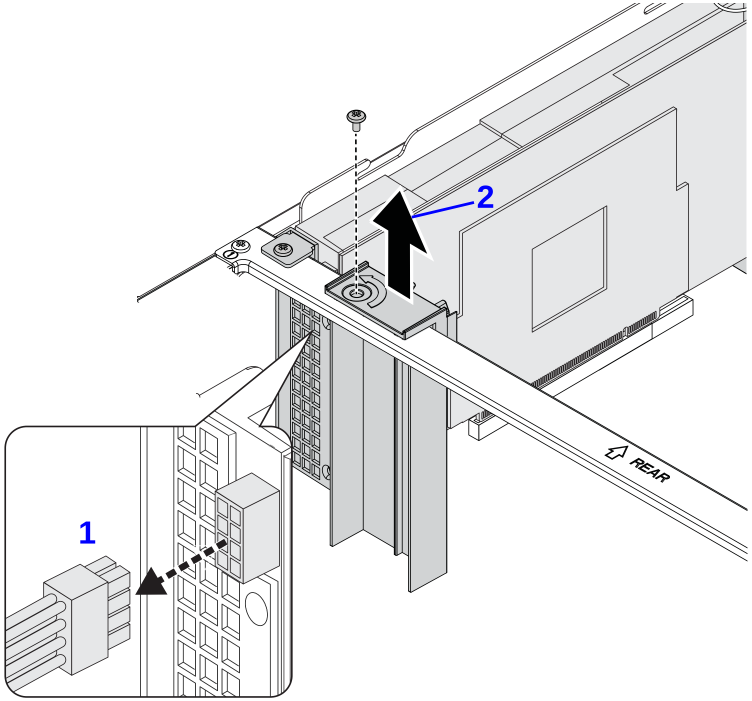
3. Connect linking board to the mainboard connector.
4. Gently flip the mezzanine assembly.
5. Connect the mezzanine assembly to the linking board.
6. Install and secure the screw(s) to the mezzanine assembly.

Removing a GPGPU Assembly

Prerequisite:

Remove the top cover. See *Removing a Top Cover*.

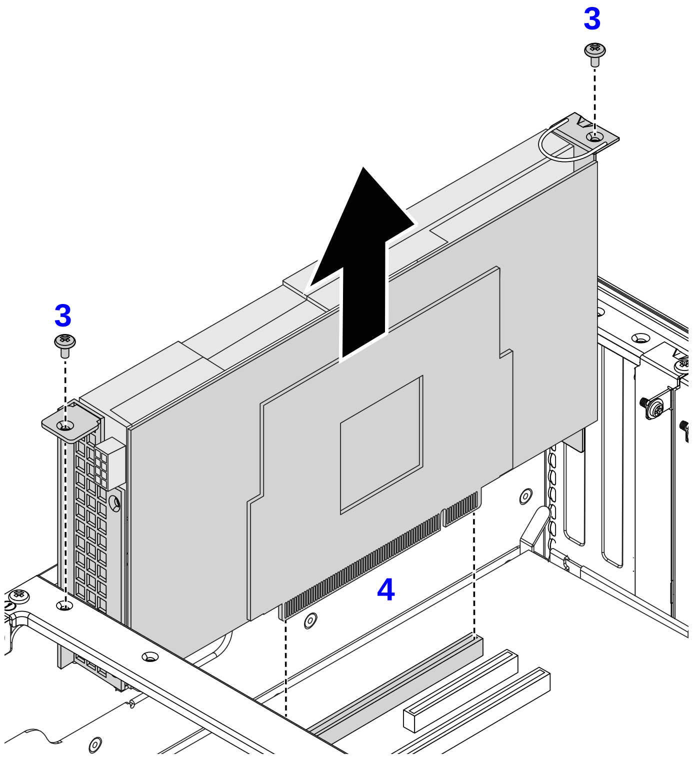
1. Disconnect cable from GPGPU assembly.



Disconnecting a GPGPU Cable from Assembly

2. If only one GPGPU card is installed, remove a dummy GPU bracket in adjacent slot.

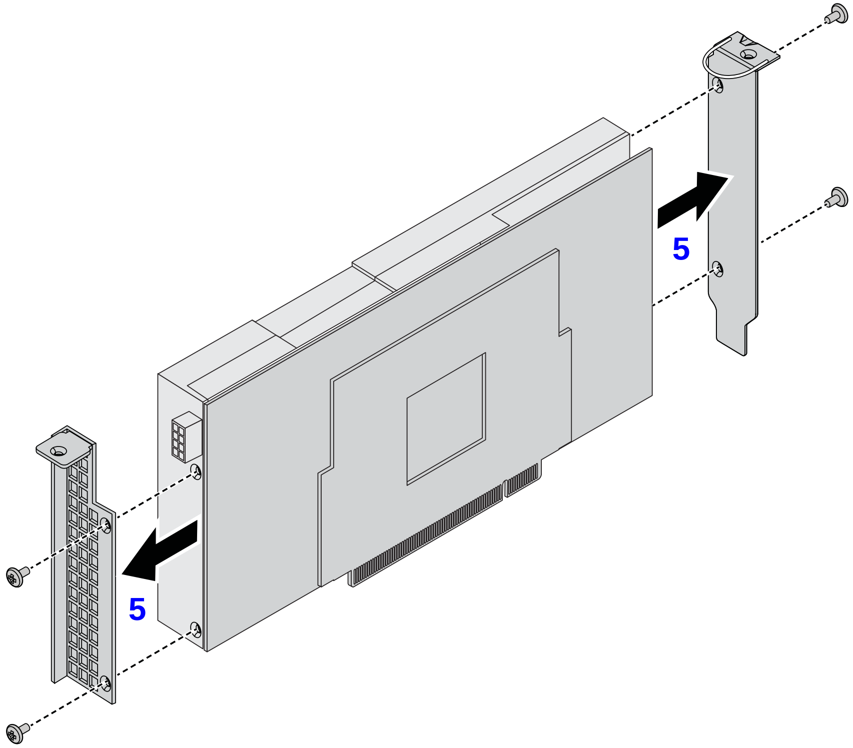
3. Remove screw(s) from GPGPU assembly.



Removing GPGPU Assembly Screw(s)

4. Disconnect GPGPU assembly from mainboard connector.

5. Remove front and rear GPGPU brackets.



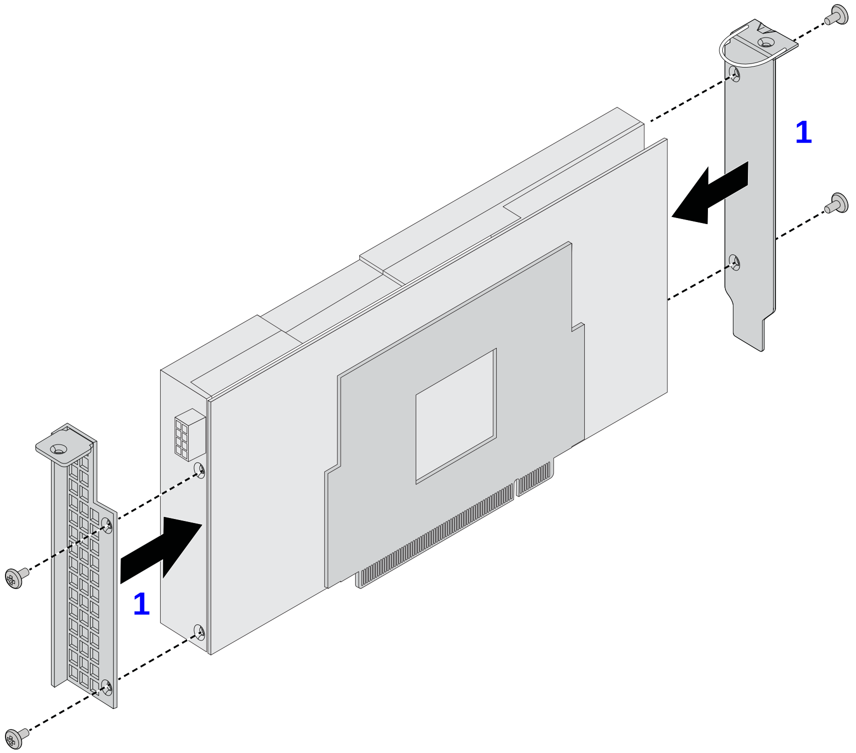
Removing GPGPU Assembly Brackets

Installing a GPGPU Assembly

Prerequisite:

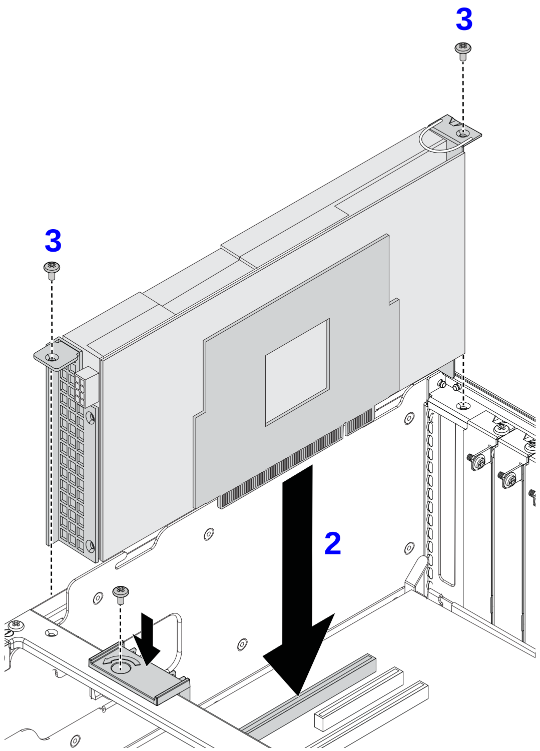
Remove the top cover. See *Removing a Top Cover*.

6. Secure front and rear GPGPU brackets to the assembly.



Securing GPGPU Assembly Brackets

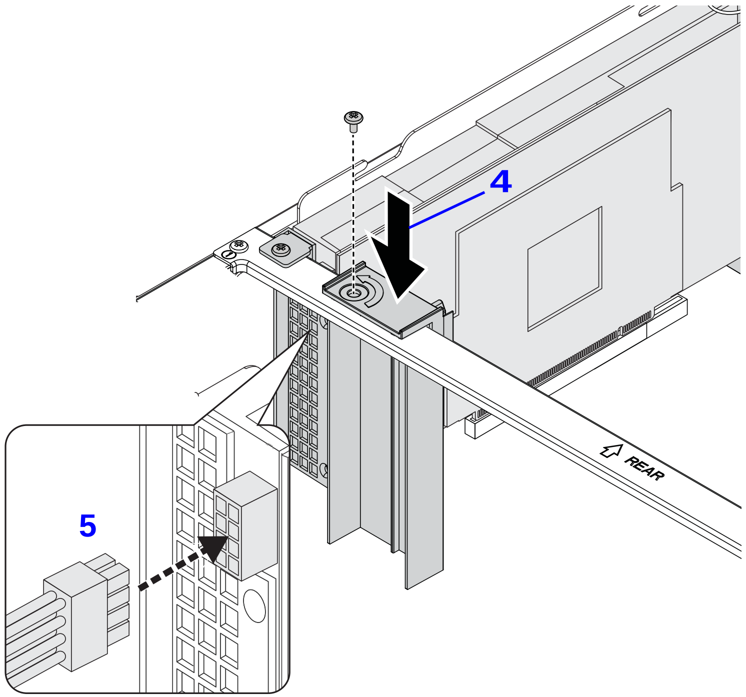
7. Connect GPGPU assembly to mainboard connector.



Securing GPGPU Assembly Screw(s)

8. Secure screw(s) to the GPGPU assembly.

9. If only one GPGPU card is installed, secure a dummy GPU bracket in adjacent slot.



Connecting a GPGPU Cable to an Assembly

10. Connect cable to the GPGPU assembly.

2.11. Mainboard Module

Removing a Mainboard Module

Prerequisite:

Remove the top cover. See *Opening the Top Cover*.

Disconnect all cables from mainboard.

Remove air duct. See *Removing an Air Duct*.

Remove memory modules. See *Removing Memory Modules*.

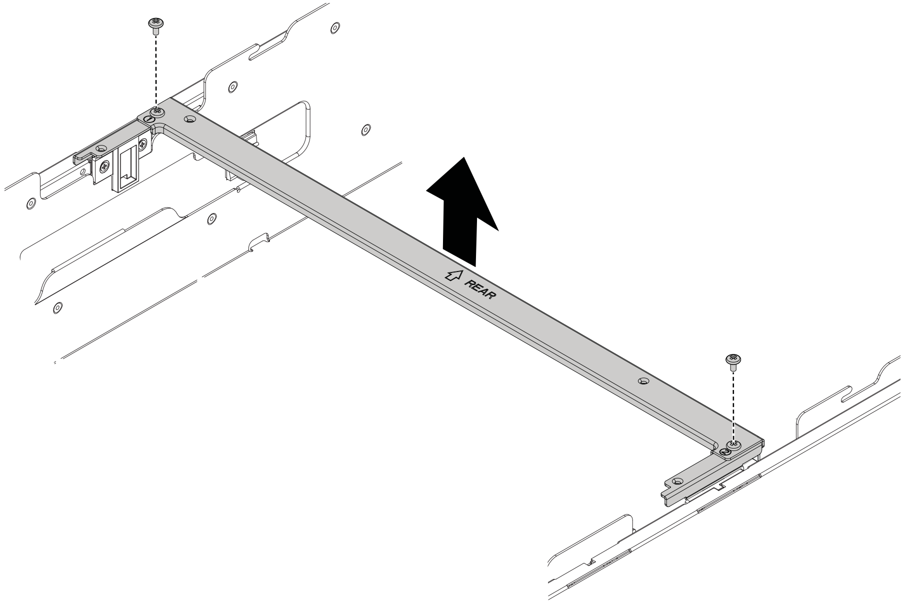
Remove heatsink. See *Removing a Processor Heat Sink*.

Remove processor. See *Removing a Processor*.

Remove mezzanine card. See *Removing a 10G/40G SFP Mezzanine Card*.

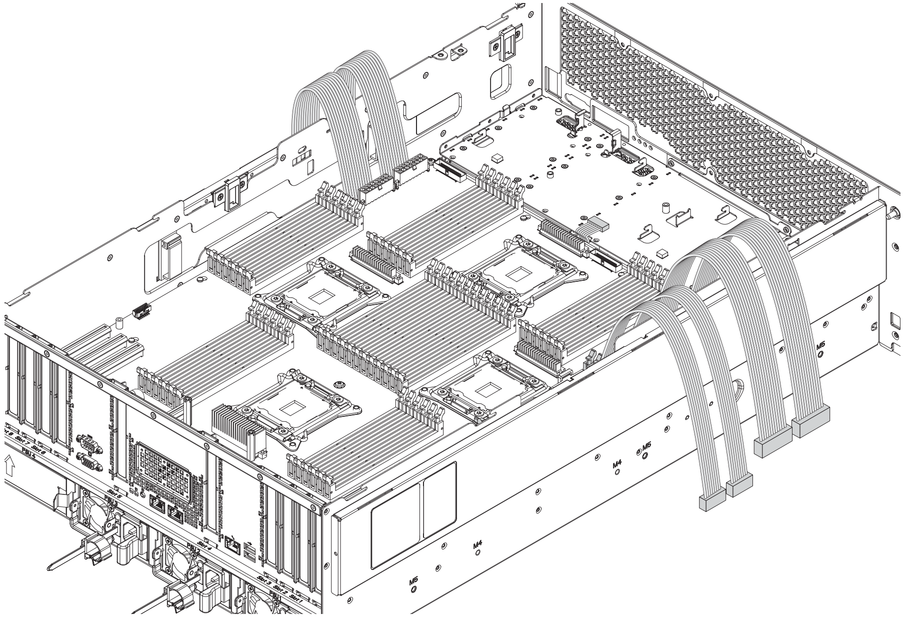
Remove GPGPU card. See *Removing a SAS Mezzanine Assembly*.

1. Remove screw(s) from bridge board (A).
2. Remove bridge bracket.



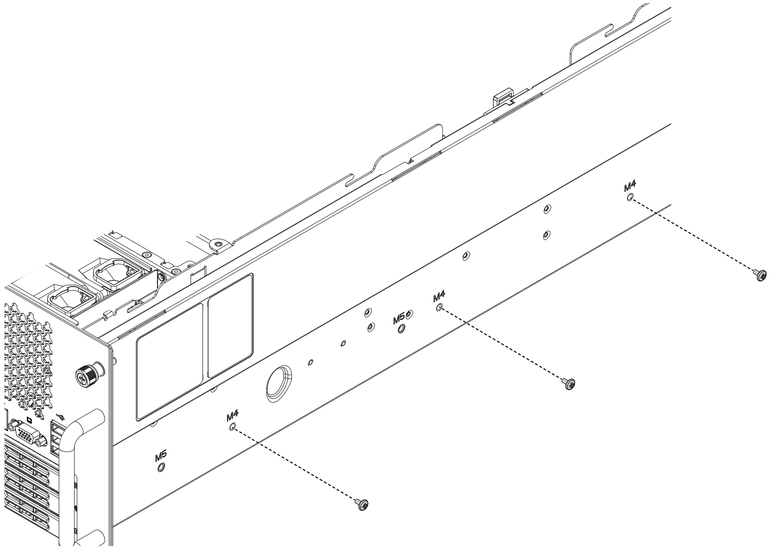
Removing Bridge Bracket

3. Guide cables away from mainboard assembly.



Guiding Cables

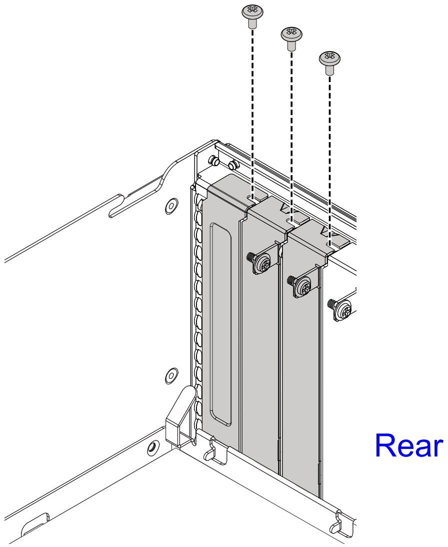
4. Remove screw(s) from both sides of the chassis.



Removing Screws

5. Remove screw(s) from all PCIe slot dust cover(s).

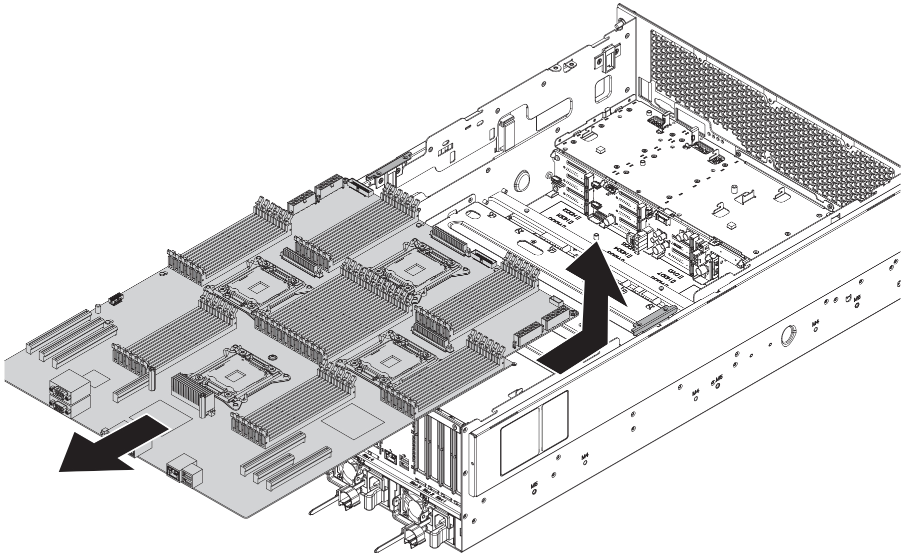
6. Remove PCIe slot dust cover(s).



Removing Dust Covers

7. Hold the hooks and pull the mainboard module assembly towards front panel to release from securing tabs on chassis.

8. Remove mainboard module assembly.

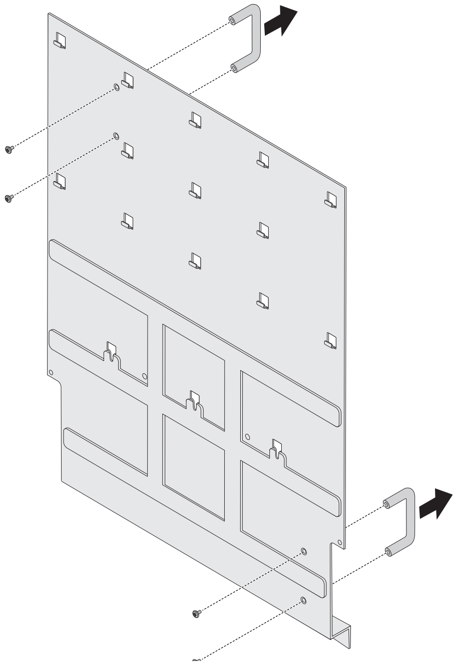


Mainboard Module Assembly Removal

9. Angle mainboard assembly 90° degrees on a surface with connectors on rear facing up.

10. Remove screw(s) from hooks on middle frame (A).

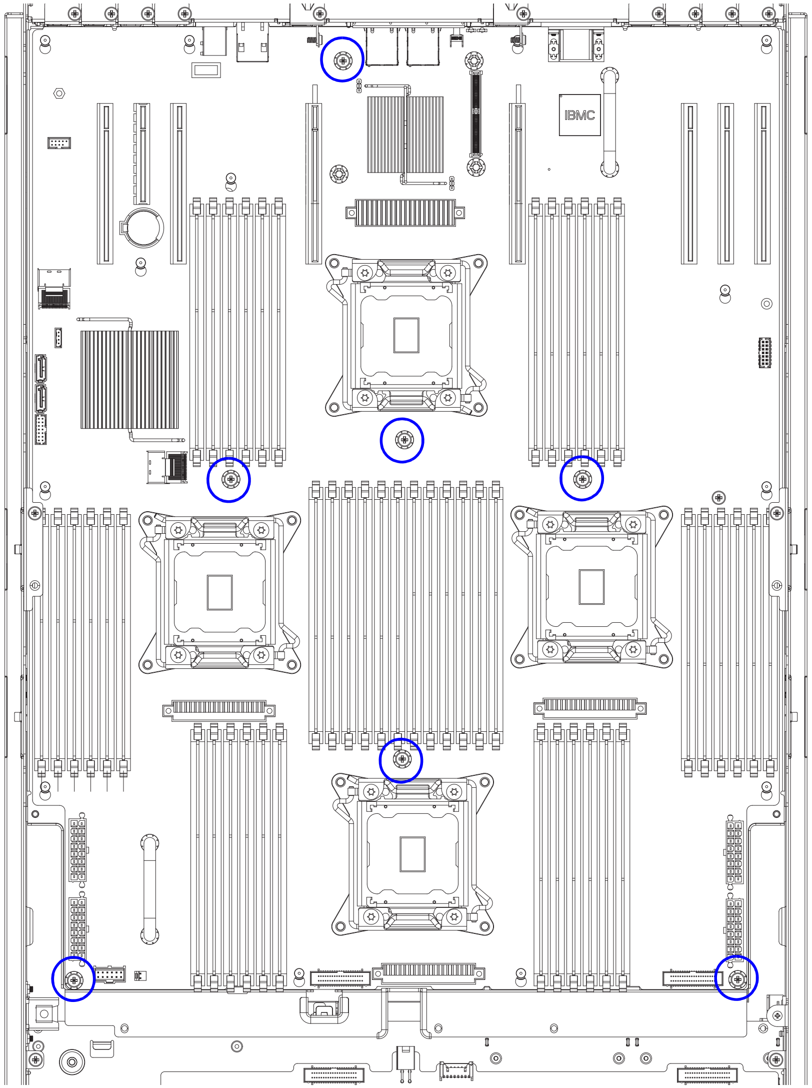
11. Remove hooks.



Removing Hooks from Middle Frame

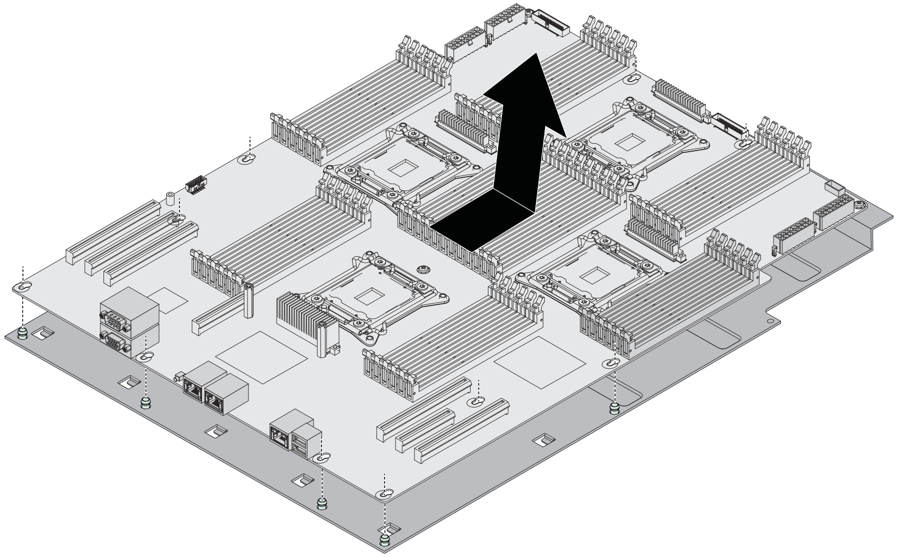
12. Place mainboard on surface middle frame down.

13. Remove screw(s) from mainboard module.



Removing Screws

14. Slide mainboard to realase from pins.

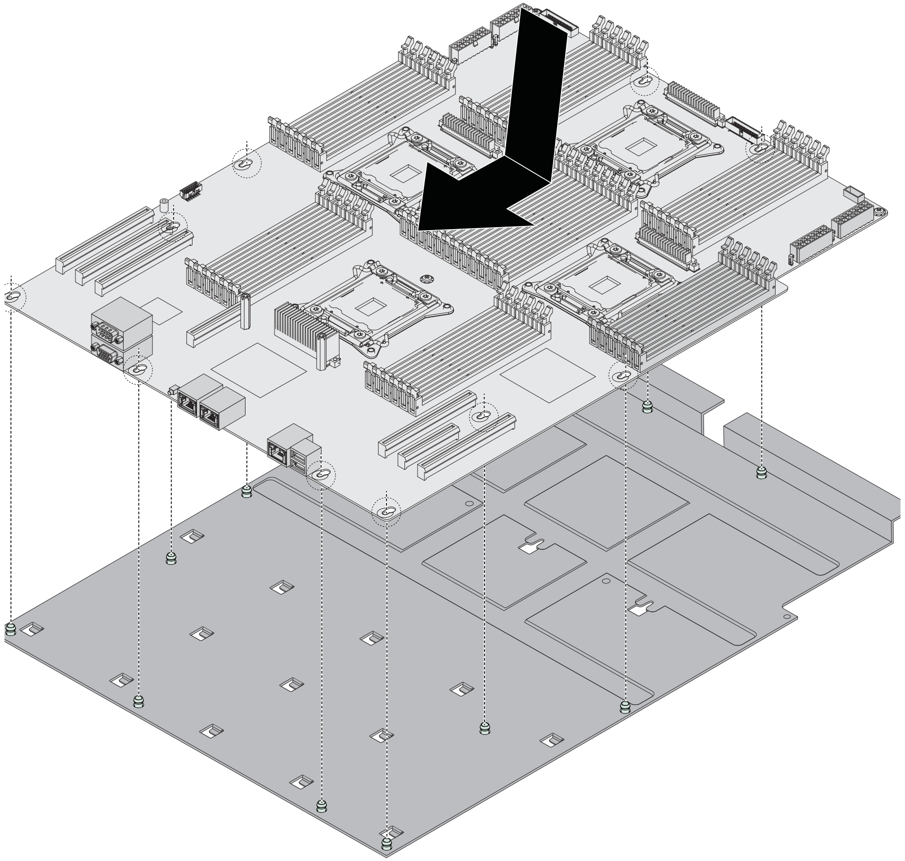


Removing Mainboard

1.

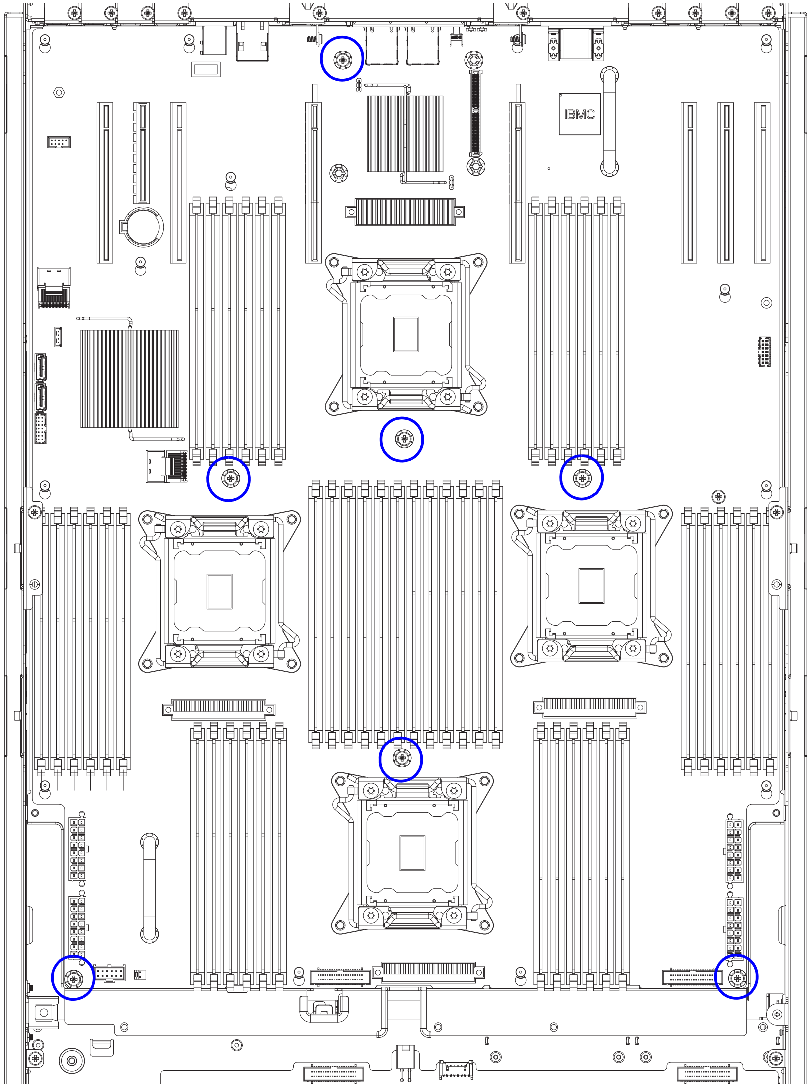
Installing a Mainboard Module

1. Align pin holes on mainboard with pins on middle frame.
2. Install mainboard on middle frame.
3. Slide mainboard to secure to the pins on middle frame.



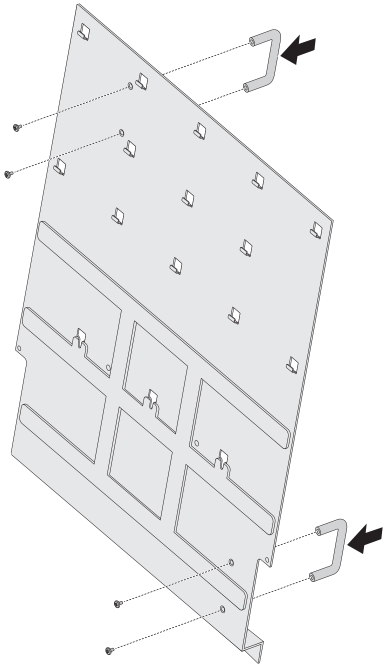
Installing Mainboard on Middle Frame

4. Install screw(s) to mainboard module.



Installing Screws

5. Angle mainboard assembly 90° degrees on a surface with connectors on rear facing up.
6. IAlign hooks with screw holes on middle frame.
7. Install hooks.
8. nstall screw(s) to hooks on middle frame.



Installing Hooks

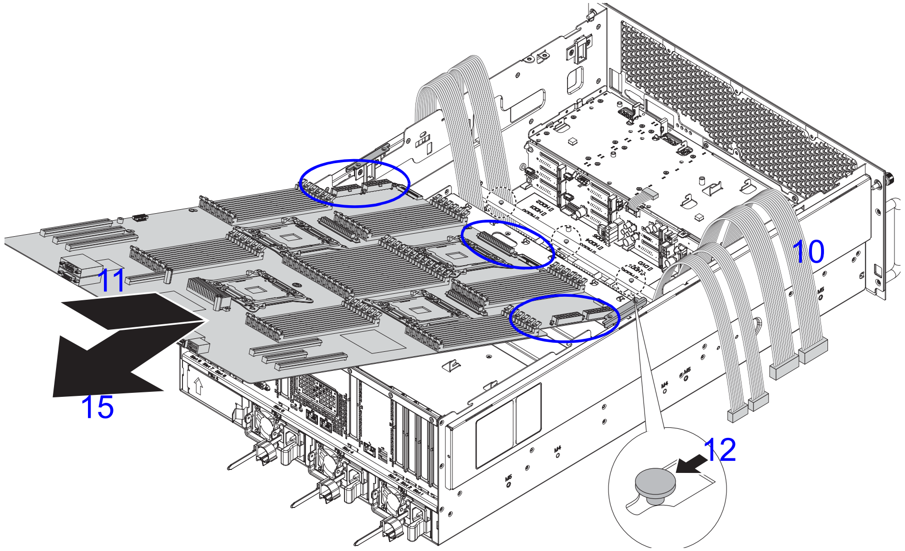
9. Place mainboard on surface middle frame down.
10. Guide cables on the sides of the chassis.
11. Angle mainboard assembly to the chassis.

12. Align mainboard assembly with the tabs on chassis and slots on rear panel.

CAUTION!

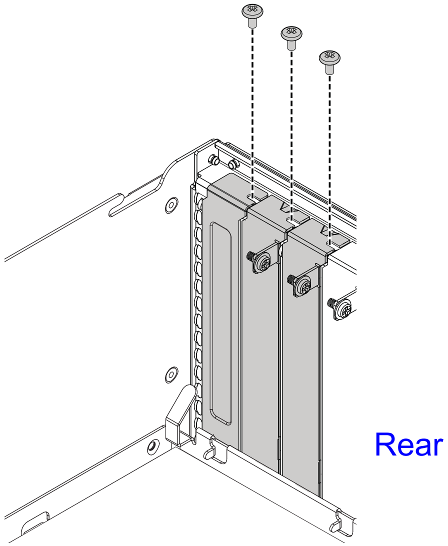
TO AVOID DAMAGING THE CABLES, MAKE SURE THE CABLES WOULD NOT GET CAUGHT AT MAINBOARD ASSEMBLY INSTALLATION.

13. Guide cables through the openings on the mainboard assembly.
14. Install mainboard assembly.
15. Slide mainboard assembly to secure to the tabs on chassis.



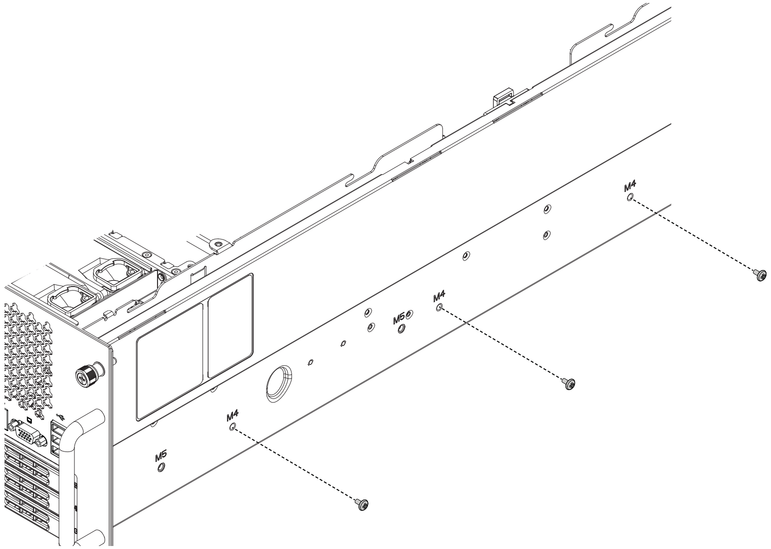
Installing Memory Assembly

16. Align PCIe slot dust covers with the slots on chassis.
17. Install and secure PCIe slot dust covers to the chassis with the screw(s).



Mainboard Installation

18. Install screw(s) to the sides of the chassis.

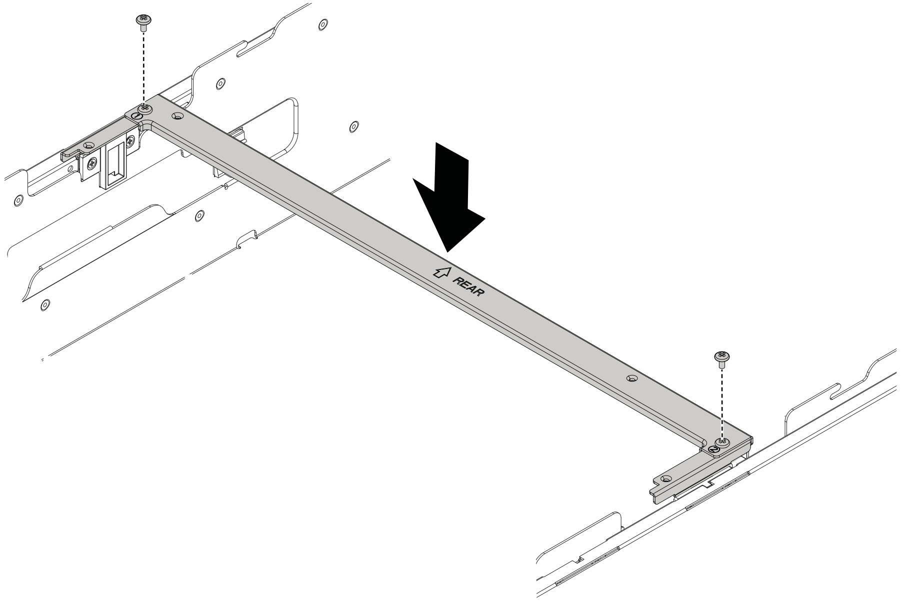


Installing Screws

19. Align screw holes on bridge bracket with the screw holes on chassis.

20. Install bridge bracket.

21. Install and secure screw(s) to the bridge bracket.



Installing Bridge Bracket

22. Install cables to the connectors. See *Cable Routing*.

1.

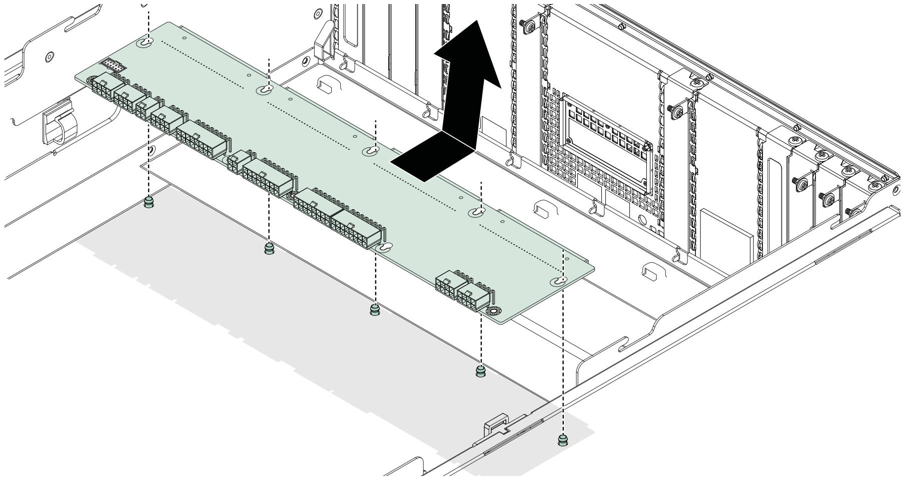
2.1. Power Distribution Board

Removing a PDB

Prerequisite:

Remove the PSU(s) from the chassis.

1. Disconnect the cable(s) from the PDB.
2. Remove the screw(s) from the PDB.
3. Slide the PDB to release it from the chassis pins.

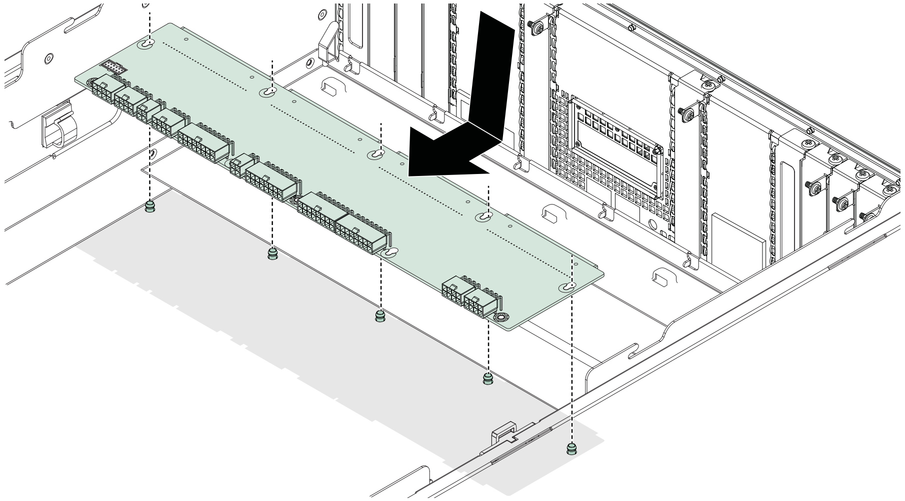


Removing a PDB

4. Remove the PDB from the chassis.

Installing a PDB

1. Align the holes in the PDB with the chassis pins.
2. Insert the chassis pins in the PDB holes.
3. Slide the PDB to secure it to the chassis pins.



Inserting a PDB

4. Install and secure the screw(s) into the PDB.

2.2. HDD Backplane

Removing a HDD Backplane

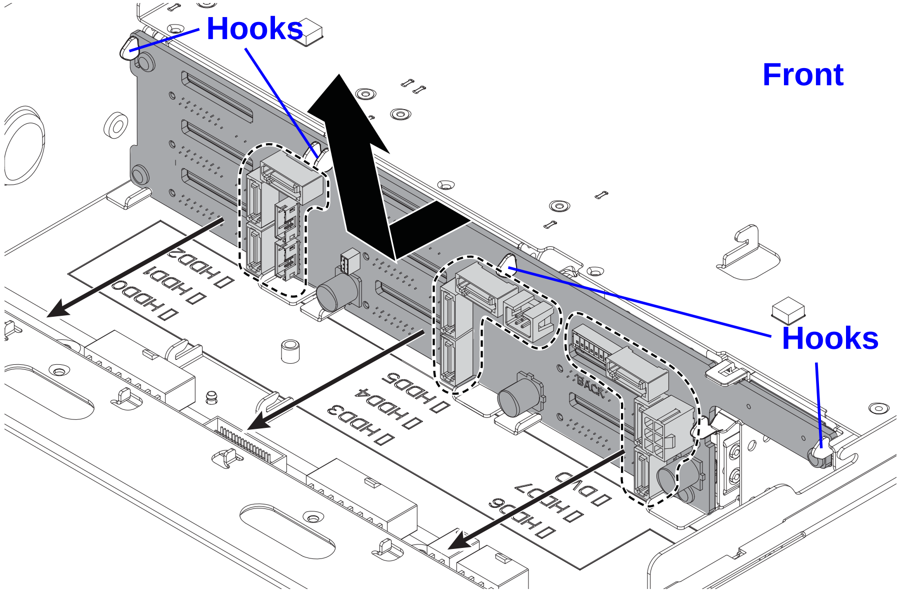
Prerequisite:

Remove the mainboard. See *Removing a Mainboard Module*.

Remove all swappable HDD assemblies.

Remove the optical drive assembly.

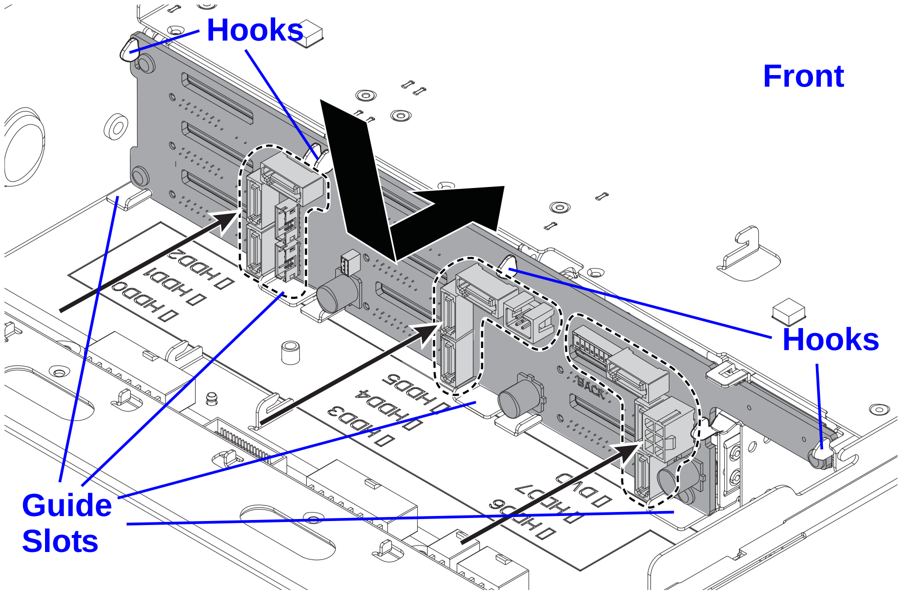
1. Remove all cables from the HDD backplane.
2. Lift the HDD backplane over the hooks.
3. ,Tilt and remove the HDD backplane from the chassis.



Removing a HDD Backplane

Installing a HDD Backplane

1. Align the HDD backplane at an angle to the chassis.
2. Insert the HDD backplane so it sits in the chassis guide slots.
3. Tilt and lift the HDD backplane over the hooks.



Installing a HDD Backplane

2.3. Air Duct

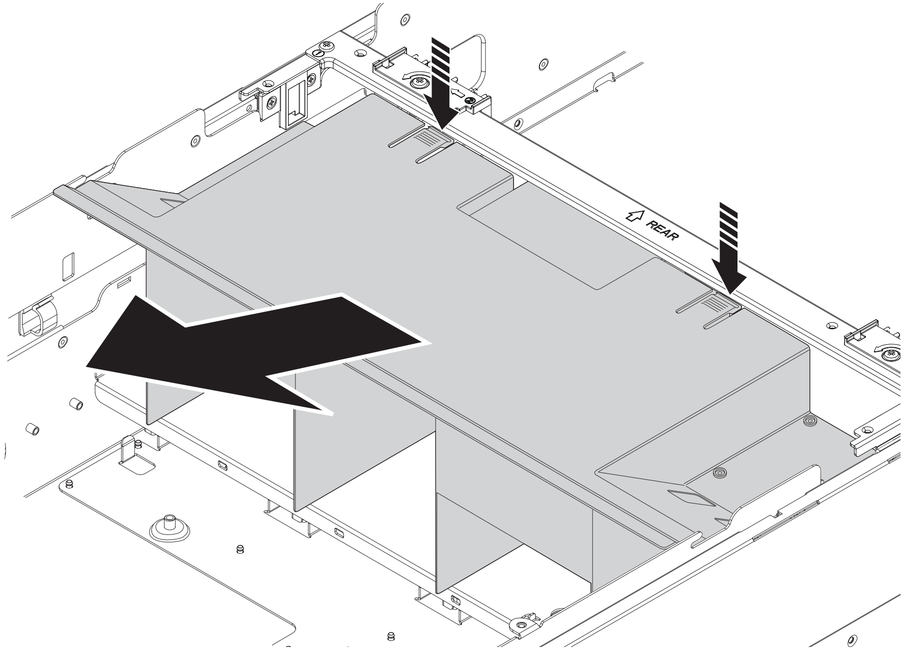
Removing an Air Duct

Prerequisite:

Remove the top cover. See *Removing a Top Cover*.

1. Press the air duct tabs.

1. Remove the air duct from the chassis.



Removing an Air Duct

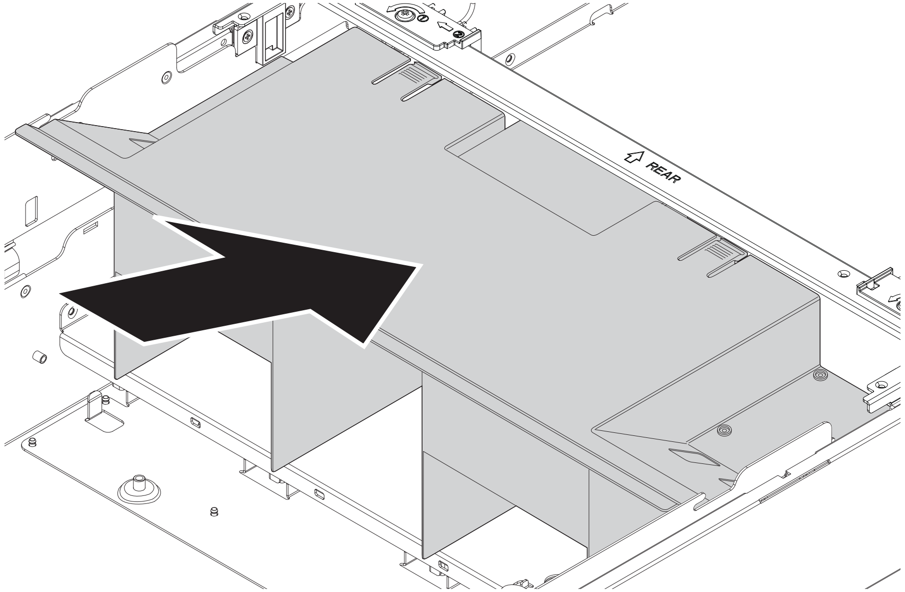
Installing an Air Duct

Prerequisite:

Remove the top cover. See *Removing a Top Cover*.

WARNING!
Air ducts are needed for the proper cooling of the system. To prevent damage to the system, when installing the air duct, make sure the arrow on top of the air duct points towards the rear panel of the mainboard module.

1. Align the air duct with the middle bracket and insert the plastic tabs into the wells in the middle bracket.



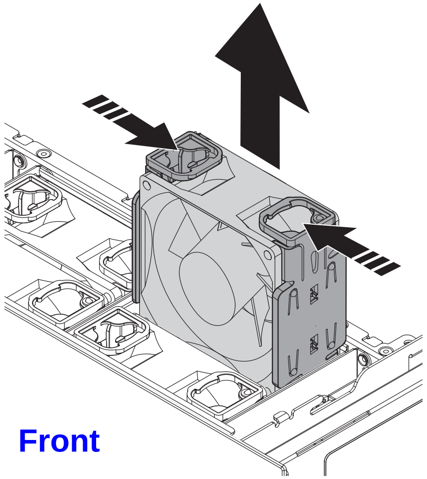
Installing the Air Duct

2. Install the air duct.

2.4. Hot Swap Fan Module

Removing a Hot Swap Fan Module

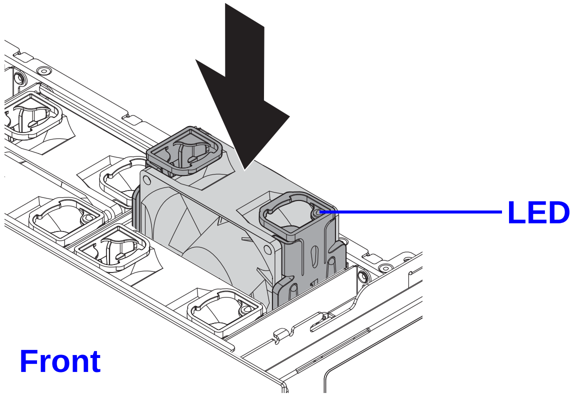
1. Push the release latches inwards.
2. Remove the fan module from the chassis.



Removing Hot Swap Fan Module

Installing a Hot Swap Fan Module

1. Align the fan module with the fan cage.
2. Insert the fan module into the chassis.



Installing Hot Swap Fan Module

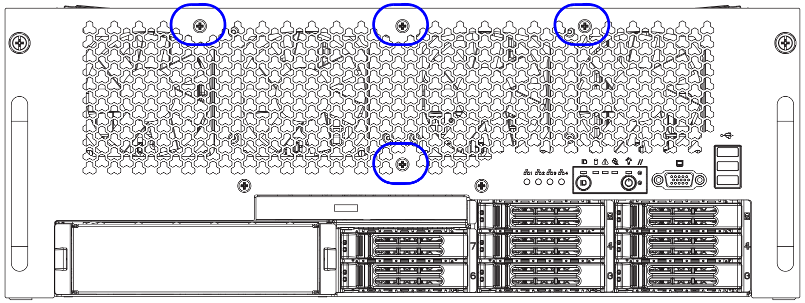
2.5. Fan Module Assembly

Removing a Fan Cage

Prerequisite:

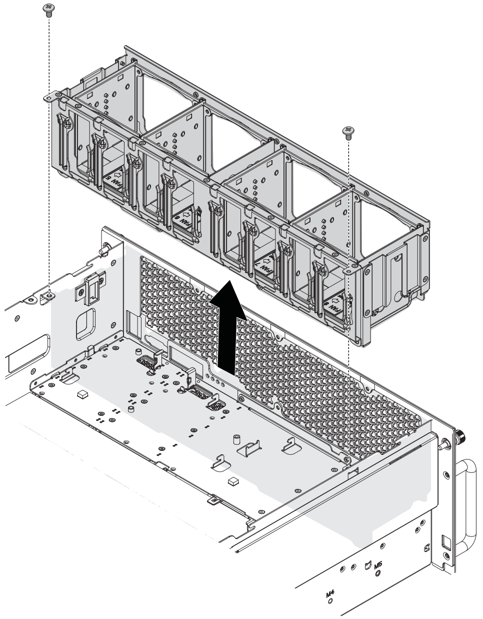
Remove all the fan modules.

1. Remove the screw(s) from the front of the chassis.



Fan Cage Front Panel Screws

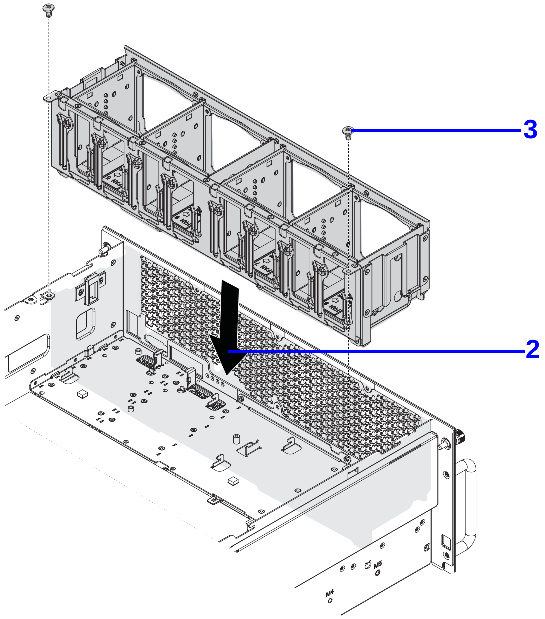
2. Remove the screw(s) from the top of the fan cage and remove the fan cage from the chassis.



Removing Fan Cage

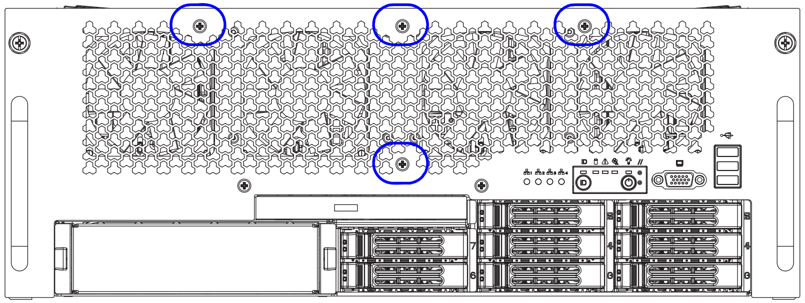
Installing a Fan Cage

1. Align the fan cage with the chassis.
2. Insert the fan cage into the chassis.
3. Install and secure the screw(s) into the top of the fan cage.



Inserting Fan Cage

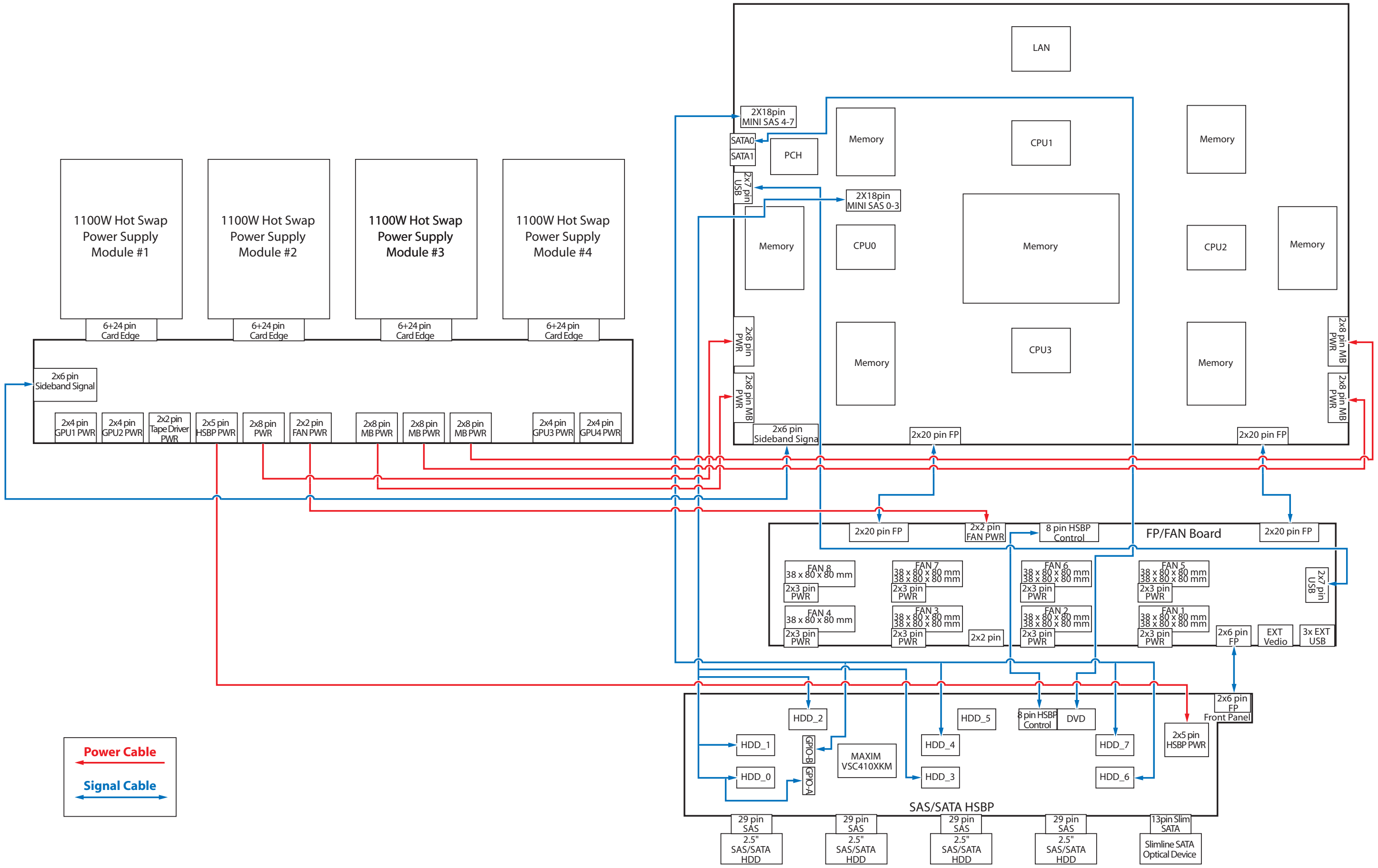
4. Insert the screw(s) into the front of the chassis.



Fan Cage Front Panel Screws

2.6. Cable Routing

The following image illustrates cable routing in the system.



System Cable Routing

BIOS

Chapter 3

3.1. BIOS Setup Utility

The BIOS Setup utility is provided to perform system configuration changes and to display current settings and environment information.

The BIOS Setup utility stores configuration settings in system non-volatile storage. Changes affected by BIOS Setup will not take effect until the system is rebooted. The BIOS Setup Utility can be accessed during POST by using the <**DEL**> or <**F2**> key.

The following sections describe the look and behavior for platform Setup.

Operation

BIOS Setup has the following features:

- The server board BIOS will only be available in English.
- 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.

Setup Page Layout

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.

BIOS Setup Page Layout

FUNCTIONAL AREA	DESCRIPTION
Title Bar	The title bar is located at the top of the screen and displays the title of the form (page) the user is currently viewing. It may also display navigational information.
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.

BIOS Setup Page Layout (Continued)

FUNCTIONAL AREA	DESCRIPTION
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.

Entering BIOS Setup

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

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

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."

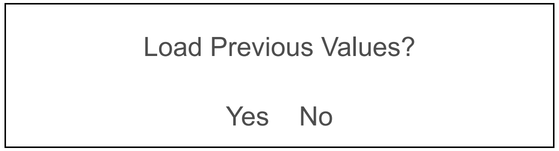
Keyboard Commands

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.

Keyboard Commands (Continued)

KEY	OPTION	DESCRIPTION
<**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 submenu, 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.
↓	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.
↔	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.

Keyboard Commands (Continued)

KEY	OPTION	DESCRIPTION
<**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> causes the following 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

Keyboard Commands (Continued)

KEY	OPTION	DESCRIPTION
<**F9**>	Setup Defaults	Pressing <**F9**> causes the following 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**> causes 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.

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.

Server Platform Setup Utility Screens

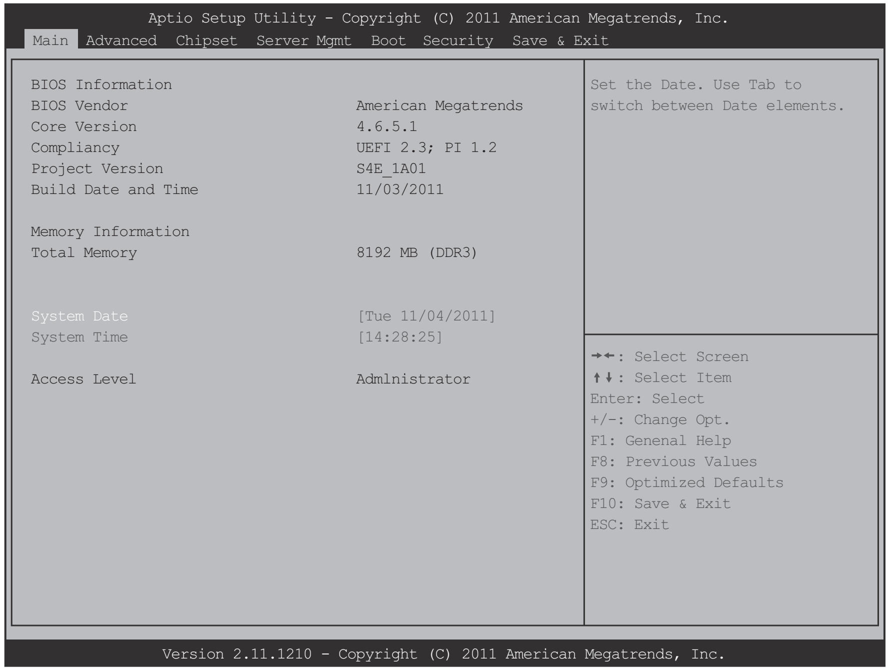
The sections below describe the screens available for the configuration of a server platform. In these sections, tables are used to describe the contents of each screen. These tables follow the following guidelines:

- 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.

Main Screen

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.



```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Main  Advanced  Chipset  Server Mgmt  Boot  Security  Save & Exit

  BIOS Information                                   Set the Date. Use Tab to
  BIOS Vendor                 American Megatrends   switch between Date elements.
  Core Version                4.6.5.1
  Compliancy                  UEFI 2.3; PI 1.2
  Project Version             S4E_1A01
  Build Date and Time         11/03/2011

  Memory Information
  Total Memory                8192 MB (DDR3)


  System Date                 [Tue 11/04/2011]
  System Time                 [14:28:25]
                                                     →←: Select Screen
  Access Level                Admlnistrator          ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: Genenal Help
                                                     F8: Previous Values
                                                     F9: Optimized Defaults
                                                     F10: Save & Exit
                                                     ESC: Exit

        Version 2.11.1210 - Copyright (C) 2011 American Megatrends, Inc.
```

Main Screen

Main Screen Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
BIOS Vendor			Information only. Displays the BIOS Vendor.
Core Version			Information only. Displays the AMI BIOS Core version.
Compliancy			Information only. Displays the BIOS compliancy.
Project Version			Information only. Displays the Project version.
Build Date			Information only. Displays the BIOS build date.
Total Memory			Information only. Displays the Total System Memory Size.
System Data	[Day of week MM/DD/YYYY]	Set the Date. Use Tab to switch between Date elements.	
System Time	[HH:MM:SS]	Set the Time. Use Tab to switch between Time elements.	

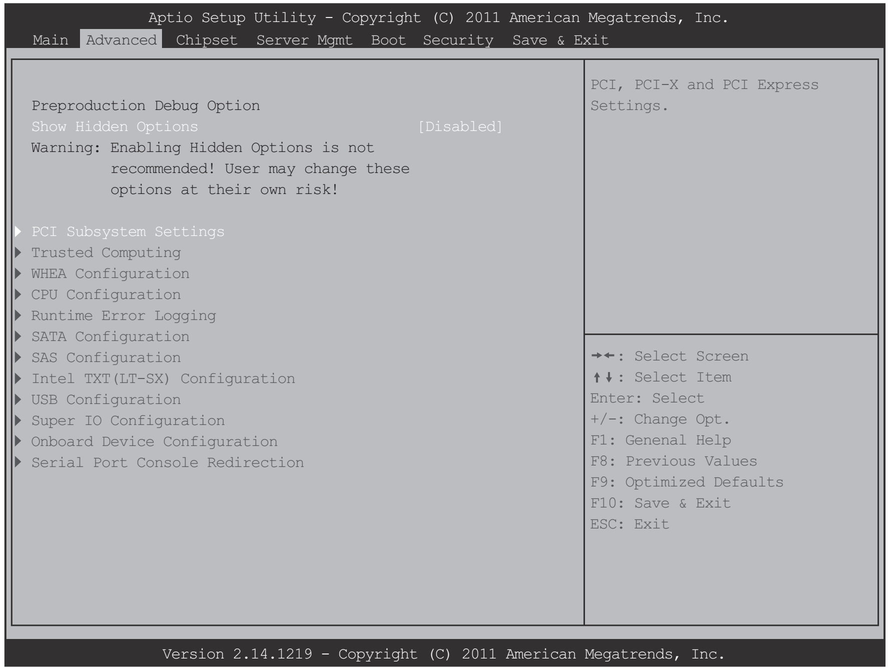
Main Screen Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Access Level			Information only. Displays the Access Level.

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.



```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Main  Advanced  Chipset  Server Mgmt  Boot  Security  Save & Exit

                                                               PCI, PCI-X and PCI Express
  Preproduction Debug Option                                   Settings.
  Show Hidden Options                         [Disabled]
  Warning: Enabling Hidden Options is not
           recommended! User may change these
           options at their own risk!

▶ PCI Subsystem Settings
▶ Trusted Computing
▶ WHEA Configuration
▶ CPU Configuration
▶ Runtime Error Logging
▶ SATA Configuration
▶ SAS Configuration                                            →←: Select Screen
▶ Intel TXT(LT-SX) Configuration                               ↑↓: Select Item
▶ USB Configuration                                            Enter: Select
▶ Super IO Configuration                                       +/-: Change Opt.
▶ Onboard Device Configuration                                 F1: Genenal Help
▶ Serial Port Console Redirection                              F8: Previous Values
                                                               F9: Optimized Defaults
                                                               F10: Save & Exit
                                                               ESC: Exit

                 Version 2.14.1219 - Copyright (C) 2011 American Megatrends, Inc.
```

Advanced Screen

Advanced Screen

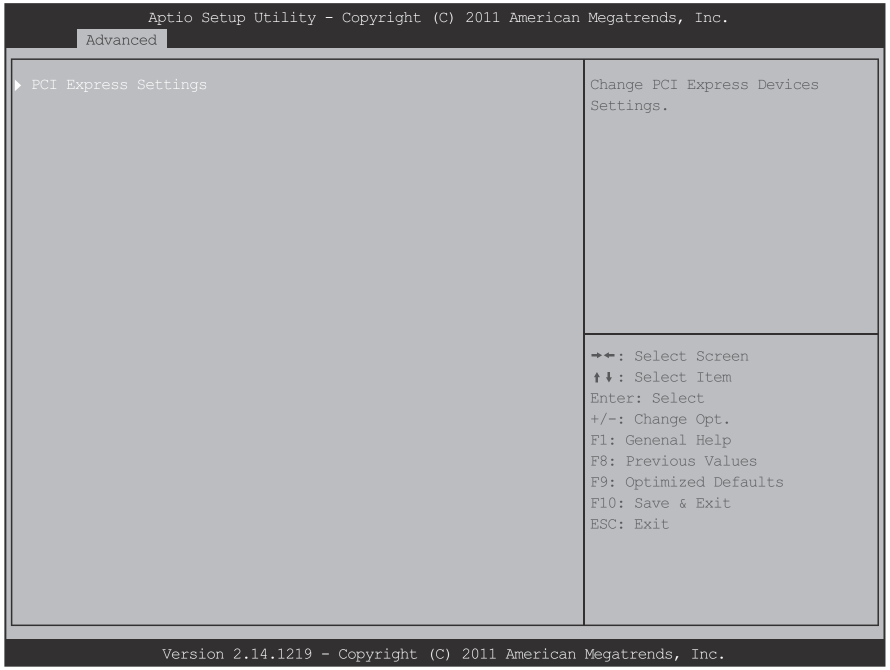
SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Show Hidden Options	**[Disabled]** [Enabled]	Show Hidden Options for debug purpose only. It will be removed at PVT stage.	This option would be removed after PVT Stage.
PCI Subsystem Settings		PCI, PCI-X and PCI Express Settings.	
Trusted Computing		Trusted Computing Settings.	
WHEA Configuration		General WHEA Configuration settings.	
CPU Configuration		CPU Configuration Parameters.	
Runtime Error Logging		Runtime Error Logging Support Setup Options	
SATA Configuration		SATA Devices Configuration.	
SAS Configuration		SAS Devices Configuration.	
Intel TXT(LT-SX) Configuration		Intel Trusted Execution Technology Configuration	
USB Configuration		USB Configuration Parameters.	

Advanced Screen (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Super IO Configuration		System Super IO Chip Parameters.	
Onboard Device Configuration		Onboard Device Parameters.	
Serial Port Console Redirection		Serial Port Console Redirection.	

PCI Screen

The PCI Screen provides fields to configure PCI add-in cards, the onboard NIC controllers, and video options. To access this screen from the Main screen, select Advanced | PCI.



```
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Advanced

▸ PCI Express Settings                Change PCI Express Devices
                                      Settings.

                                      →←: Select Screen
                                      ↑↓: Select Item
                                      Enter: Select
                                      +/-: Change Opt.
                                      F1: Genenal Help
                                      F8: Previous Values
                                      F9: Optimized Defaults
                                      F10: Save & Exit
                                      ESC: Exit

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```
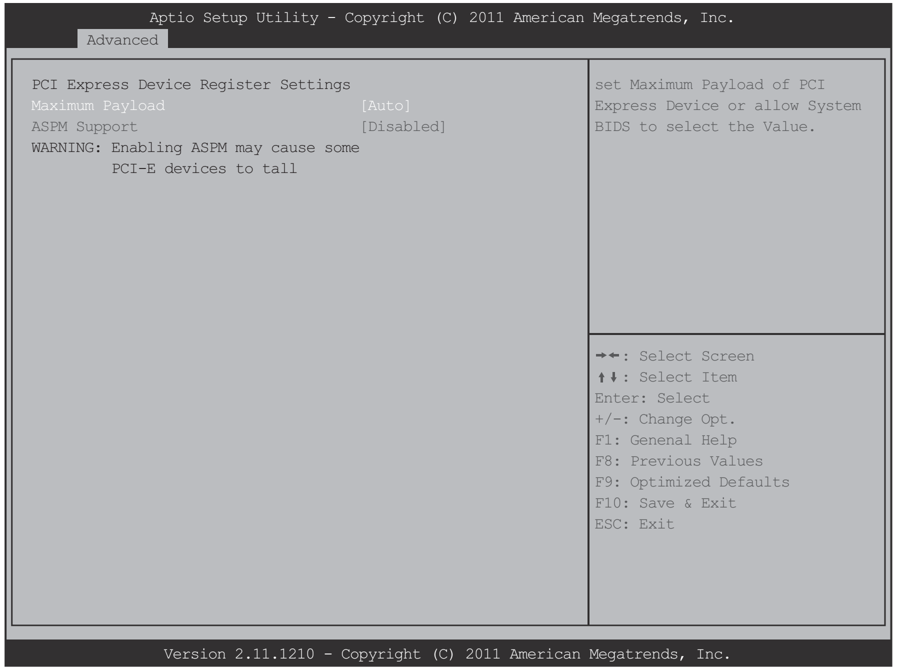

PCI Subsystem Settings Screen

PCI Subsystem Settings Screen

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
PCI Express Settings		Change PCI Express Devices Settings.	

PCI Express Settings Screen



```
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      Advanced

 PCI Express Device Register Settings                    set Maximum Payload of PCI
 Maximum Payload                      [Auto]             Express Device or allow System
 ASPM Support                         [Disabled]         BIDS to select the Value.
 WARNING: Enabling ASPM may cause some
          PCI-E devices to tall

                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: Genenal Help
                                                         F8: Previous Values
                                                         F9: Optimized Defaults
                                                         F10: Save & Exit
                                                         ESC: Exit

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```
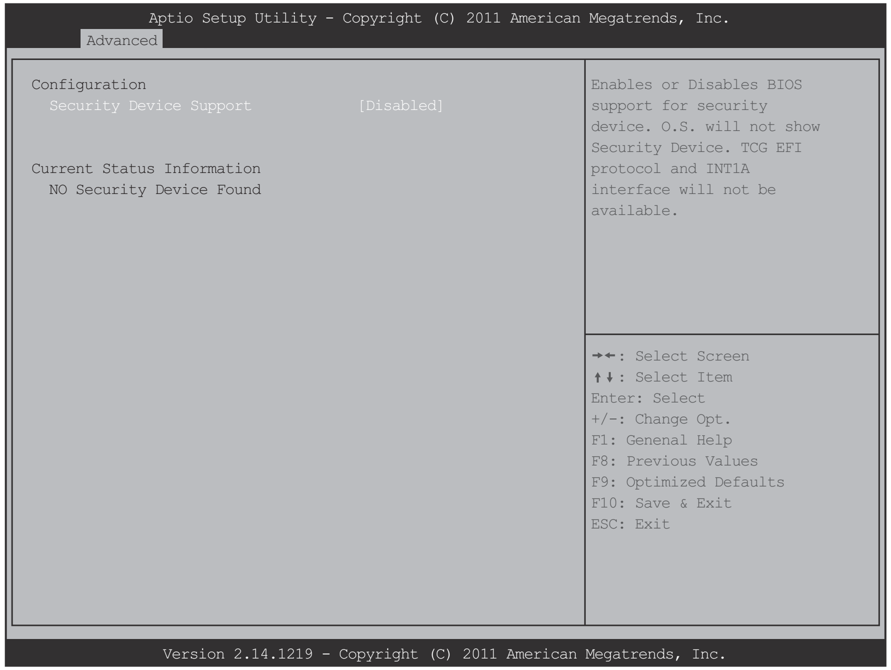

PCI Express Settings Screen

PCI Express Settings Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Maximum Payload	[**Auto**] [128 Bytes] [256 Bytes] [512 Bytes] [1024 Bytes] [2048 Bytes] [4096 Bytes]	Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.	
ASPM Support	[**Disabled**] [Auto] [Force L0s]	Set the ASPM Level: Force L0s - Force all links to L0s State : AUTO - BIOS auto configure : DISABLE - Disables ASPM	

TPM Screen



```
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        Advanced

  Configuration                                     Enables or Disables BIOS
    Security Device Support         [Disabled]      support for security
                                                    device. O.S. will not show
                                                    Security Device. TCG EFI
  Current Status Information                        protocol and INT1A
    NO Security Device Found                        interface will not be
                                                    available.

                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: Genenal Help
                                                    F8: Previous Values
                                                    F9: Optimized Defaults
                                                    F10: Save & Exit
                                                    ESC: Exit

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```
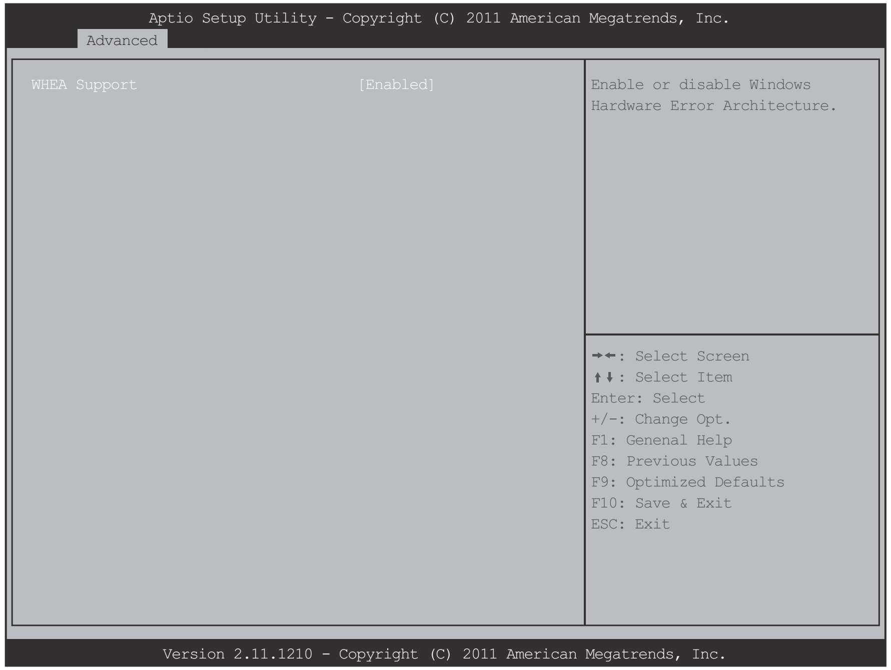

Trusted Computing Screen

Trusted Computing Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
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.	
Current Status Information			Information only. Displays the Current Status Information

WHEA Support Screen



```
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Advanced

WHEA Support                        [Enabled]

Enable or disable Windows
Hardware Error Architecture.

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: Genenal Help
F8: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

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```

WHEA Support Screen

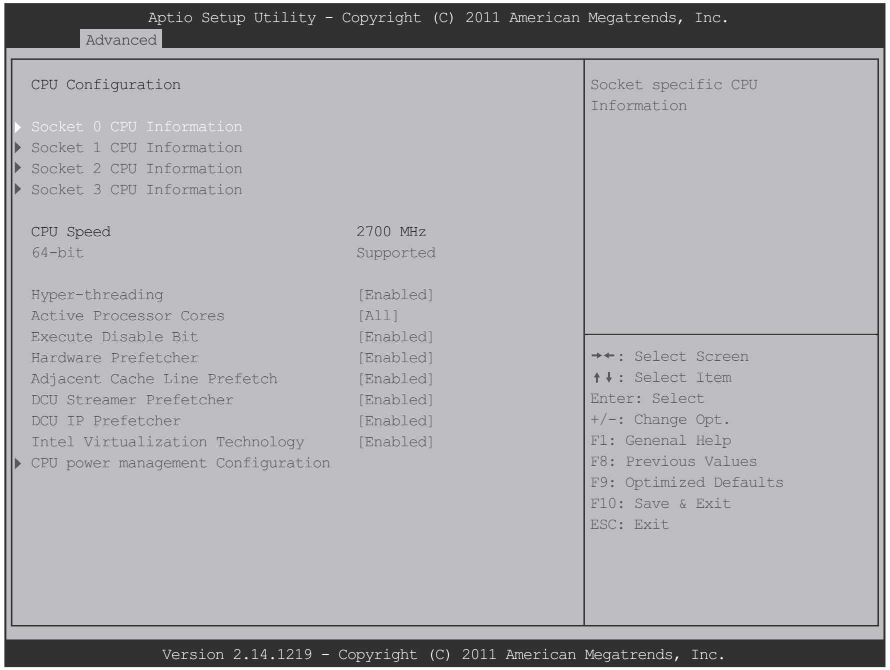
WHEA Support Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
WHEA Support	[Disabled] [**Enabled**]	Enable or disable Windows Hardware Error Architecture. When Enabled the BIOS would publishes WHEA-specific ACPI tables that describe the platform error interfaces for the OS as Spec, and also implements the ASL code to support and enable WHEA capability in the platform.	

Processor Configuration Screen

The Processor screen provides a place for the user to view the processor core frequency, system bus frequency, and enable or disable several processor options. The user can also select an option to view information about a specific processor.

To access this screen from the Main screen, select Advanced | Processor.



```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
      Advanced
  CPU Configuration                                       Socket specific CPU
                                                          Information
► Socket 0 CPU Information
► Socket 1 CPU Information
► Socket 2 CPU Information
► Socket 3 CPU Information

  CPU Speed                           2700 MHz
  64-bit                              Supported

  Hyper-threading                     [Enabled]
  Active Processor Cores              [All]
  Execute Disable Bit                 [Enabled]
  Hardware Prefetcher                 [Enabled]           →←: Select Screen
  Adjacent Cache Line Prefetch        [Enabled]           ↑↓: Select Item
  DCU Streamer Prefetcher             [Enabled]           Enter: Select
  DCU IP Prefetcher                   [Enabled]           +/-: Change Opt.
  Intel Virtualization Technology     [Enabled]           F1: Genenal Help
► CPU power management Configuration                      F8: Previous Values
                                                          F9: Optimized Defaults
                                                          F10: Save & Exit
                                                          ESC: Exit

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```

Processor Configuration Screen

Processor Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Socket 0 CPU Information		Socket specific CPU Information.	
Socket 1 CPU Information		Socket specific CPU Information.	
Socket 2 CPU Information		Socket specific CPU Information.	
Socket 3 CPU Information		Socket specific CPU Information.	
CPU Speed			Information only. Displays the speed of the processor.
64-bit			Information only. Displays 64-t supported or not.
Hyper-threading	[Disabled] [**Enabled**]	Enabled for Windows® Server® 2008 R2 or above and Red Hat® Enterprise Linux® (OS optimized for Hyper-Threading Technology).	

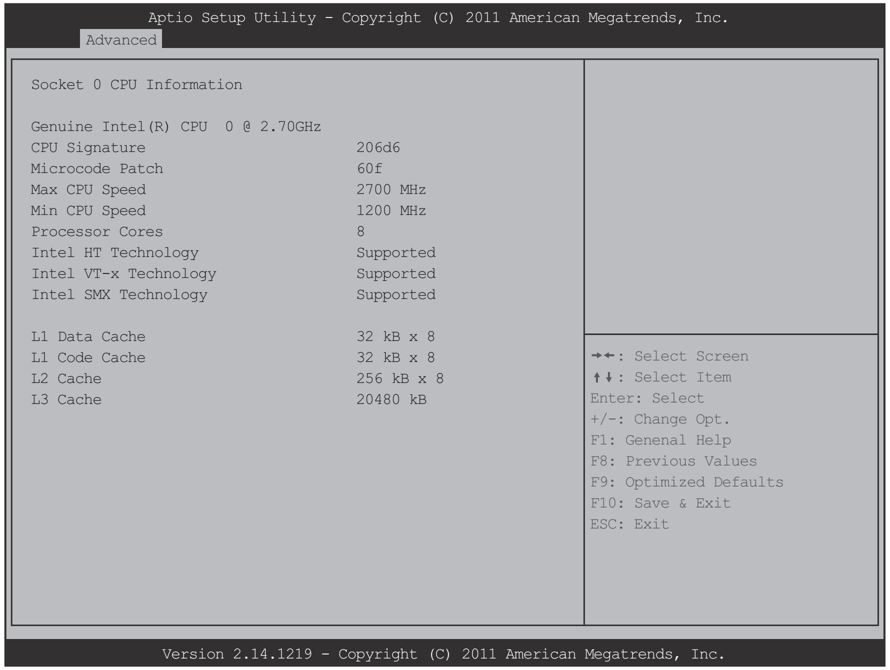
Processor Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Active Processor Core	[**All**] [1] [2] [4] [6]	Number of cores to enable in each processor package.	Except 1 core, enabling odd numbers of processor cores is not supported. The options listed also depend on current using processor core number.
Execute Disable Bit	[Disabled] [**Enabled**]	The supporting OS: ● Microsoft® Windows® Sever 2008 R2 SP1 Enterprise (64-bit, including Hyper-V, VDI for S1B) ● Red Hat® Enterprise Linux® Update 3 X86_64, RHEL 6 update 3 ● VMware® vSphere 5 (including ESXi 5.0).	

Processor Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Hardware Prefetcher	[Disabled] [**Enabled**]	To turn on/off prefetching of adjacent cache lines.	
Adjacent Cache Line Prefetch	[Disabled] [**Enabled**]	To turn on/off the Mid Level Cache (L2) streamer prefetcher.	
DCU Streamer Prefetcher	[Disabled] [**Enabled**]	Enable prefetcher of next L1 Data line based upon multiple loads in same cache line.	
DCU IP Prefetcher	[Disabled] [**Enabled**]	Enable prefetcher of next L1 line based upon sequential load history.	
Intel Virtualization Technology	[Disabled] [**Enabled**]	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.	
CPU Power Management Configuration		CPU Power Management Configuration Parameters	

Socket 0 CPU Information Screen



```
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Advanced

Socket 0 CPU Information

Genuine Intel(R) CPU  0 @ 2.70GHz
CPU Signature                     206d6
Microcode Patch                   60f
Max CPU Speed                     2700 MHz
Min CPU Speed                     1200 MHz
Processor Cores                   8
Intel HT Technology               Supported
Intel VT-x Technology             Supported
Intel SMX Technology              Supported

L1 Data Cache                     32 kB x 8
L1 Code Cache                     32 kB x 8
L2 Cache                          256 kB x 8
L3 Cache                          20480 kB

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: Genenal Help
F8: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

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```

Socket 0 CPU Information Screen

Socket 0 CPU Information Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
CPU Signature			Information only. Displays the CPU Signature.

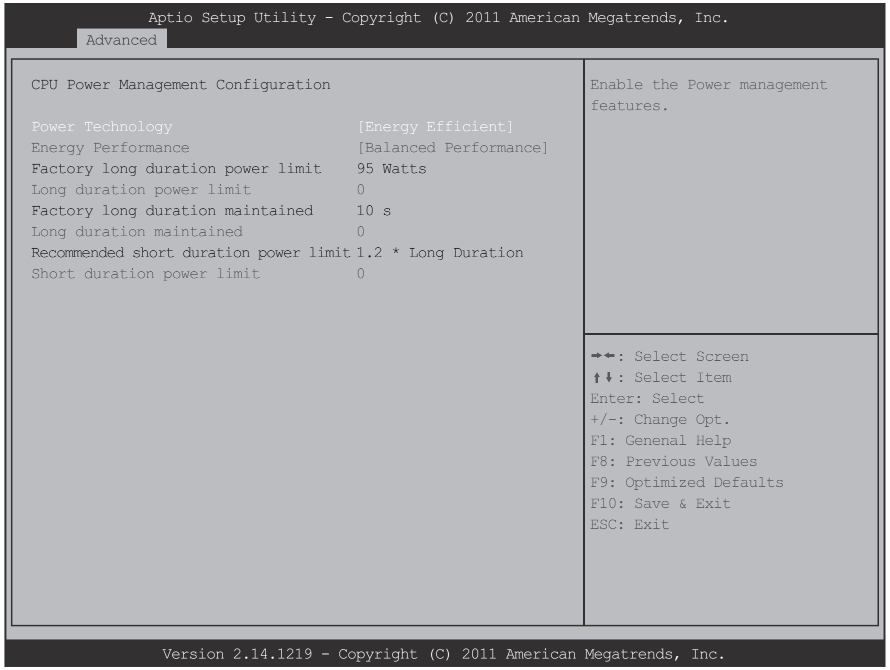
Socket 0 CPU Information Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Microcode Patch			Information only. Displays the Microcode Patch.
Max CPU Speed			Information only. Displays the Max CPU Speed.
Min CPU Speed			Information only. Displays the Min CPU Speed.
Processor Cores			Information only. Displays the number of Processor Cores.
Intel HT Technology			Information only. Displays Intel HT Technology supported or not.
Intel VT-x Technology			Information only. Displays Intel VT-x Technology supported or not.
Intel SMX Technology			Information only. Displays Intel SMX Technology supported or not.
L1 Data Cache			Information only. Displays the size of L1 Data Cache.

Socket 0 CPU Information Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
L1 Code Cache			Information only. Displays the size of L1 Code Cache.
L2 Cache			Information only. Displays the size of L2 Cache.
L3 Cache			Information only. Displays the size of L3 Cache.

CPU Power Management Configuration Screen



```
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      Advanced

  CPU Power Management Configuration                       Enable the Power management
                                                           features.
  Power Technology                    [Energy Efficient]
  Energy Performance                  [Balanced Performance]
  Factory long duration power limit   95 Watts
  Long duration power limit           0
  Factory long duration maintained    10 s
  Long duration maintained            0
  Recommended short duration power limit 1.2 * Long Duration
  Short duration power limit          0

                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: Genenal Help
                                                           F8: Previous Values
                                                           F9: Optimized Defaults
                                                           F10: Save & Exit
                                                           ESC: Exit

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```

CPU Power Management Configuration Screen

CPU Power Management Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Power Technology	[Disabled] [**Energy Efficient**] [Custom]	Enable the power management features.	

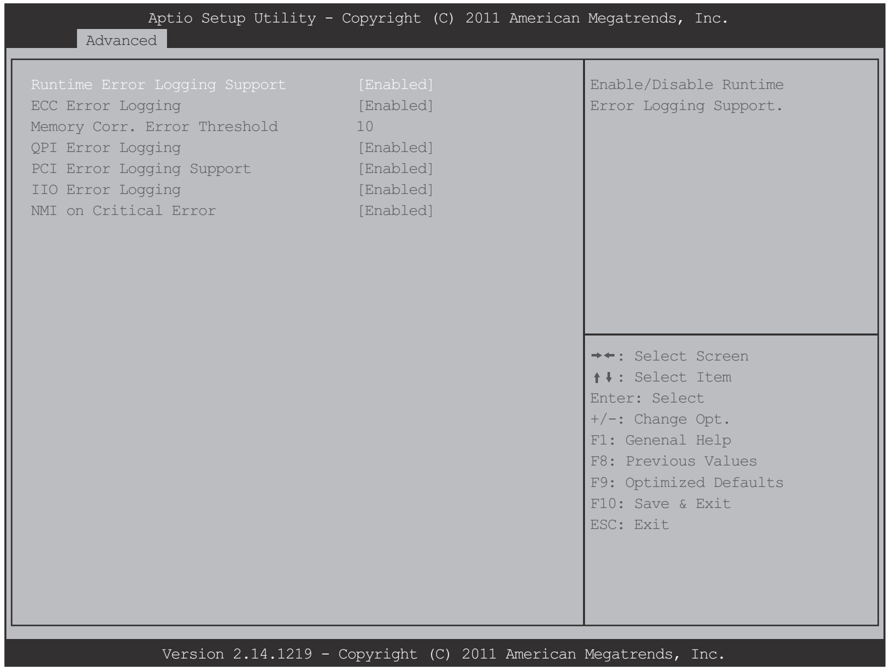
CPU Power Management Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
EIST	[Disabled] [**Enabled**]	Enable/Disable Intel SpeedStep.	Option only show when “Processor Technology” = [Custom]
Turbo Mode	[Disabled] [**Enabled**]	Turbo Mode.	Option only show when “Processor Technology” = [Custom]
CPU C3 Report	[**Disabled**] [Enabled]	Enable/Disable CPU Core C3 report to OS.	Option only show when “Processor Technology” = [Custom]
CPU C6 Report	[Disabled] [**Enabled**]	Enable/Disable CPU Core C6 report to OS.	Option only show when “Processor Technology” = [Custom]
CPU C7 Report	[**Disabled**] [Enabled]	Enable/Disable CPU Core C7 report to OS.	Option only show when “Processor Technology” = [Custom]
Energy Performance	[Performance] [**Balanced Performance**] [Balanced Energy] [Energy Efficient]	Optimize between performance and power savings. Microsoft® Windows Server® 2008 and later OS overrides this value according to its power plan.	

CPU Power Management Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Factory long duration power limit			Information only. Displays the Factory long duration power limit.
Long duration power limit		Long duration power limit in Watts.	
Factory long duration maintained			Information only. Displays the Factory long duration maintained.
Long duration maintained		Time window which the long duration power is maintained.	
Recommended short duration power limit			Information only. Displays the Recommended short duration power.
Short duration power limit		Short duration power limit in Watts.	

Runtime Error Logging Screen



```
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      Advanced

  Runtime Error Logging Support         [Enabled]    Enable/Disable Runtime
  ECC Error Logging                     [Enabled]    Error Logging Support.
  Memory Corr. Error Threshold          10
  QPI Error Logging                     [Enabled]
  PCI Error Logging Support             [Enabled]
  IIO Error Logging                     [Enabled]
  NMI on Critical Error                 [Enabled]

                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: Genenal Help
                                                     F8: Previous Values
                                                     F9: Optimized Defaults
                                                     F10: Save & Exit
                                                     ESC: Exit

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```

Runtime Error Logging Screen

Runtime Error Logging Fields

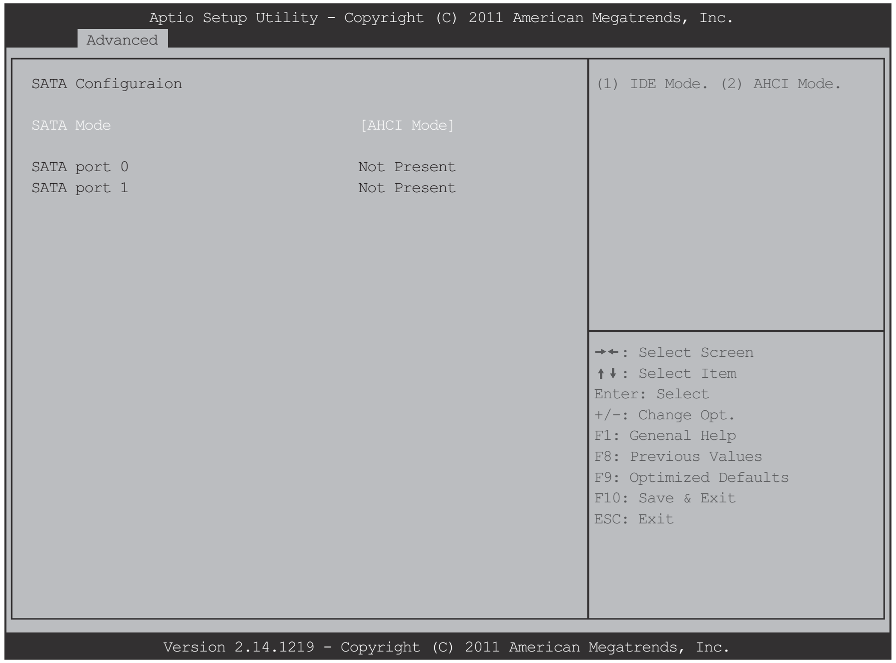
SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Runtime Error Logging Support	[Disabled] [**Enabled**]	Enable/Disable Runtime Error Logging Support.	

Runtime Error Logging Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
ECC Error Logging	[Disabled] [**Enabled**]	Enable/Disable ECC Error Logging.	
Memory Corr. Error Threshold		Enter the Memory Correctable Error Threshold value	This can be set to a value between 1 to 15. Default is 10.
QPI Error Logging	[Disabled] [**Enabled**]	Enable/Disable QPI Error Logging	
PCI Error Logging Support	[Disabled] [**Enabled**]	Enable/Disable PCI Error Logging Support	
IIO Error Logging	[Disabled] [**Enabled**]	Enable/Disable IIO Error Logging	
NMI on Critical Error	[Disabled] [**Enabled**]	Enable/Disable NMI generation on fatal or uncorrectable error	

SATA Controller Screen

The SATA Controller screen provides fields to configure SATA hard disk drives. It also provides information on the hard disk drives that are installed.



```
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Advanced

SATA Configuraion                                   (1) IDE Mode. (2) AHCI Mode.

SATA Mode                        [AHCI Mode]

SATA port 0                      Not Present
SATA port 1                      Not Present

                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: Genenal Help
                                                    F8: Previous Values
                                                    F9: Optimized Defaults
                                                    F10: Save & Exit
                                                    ESC: Exit

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```
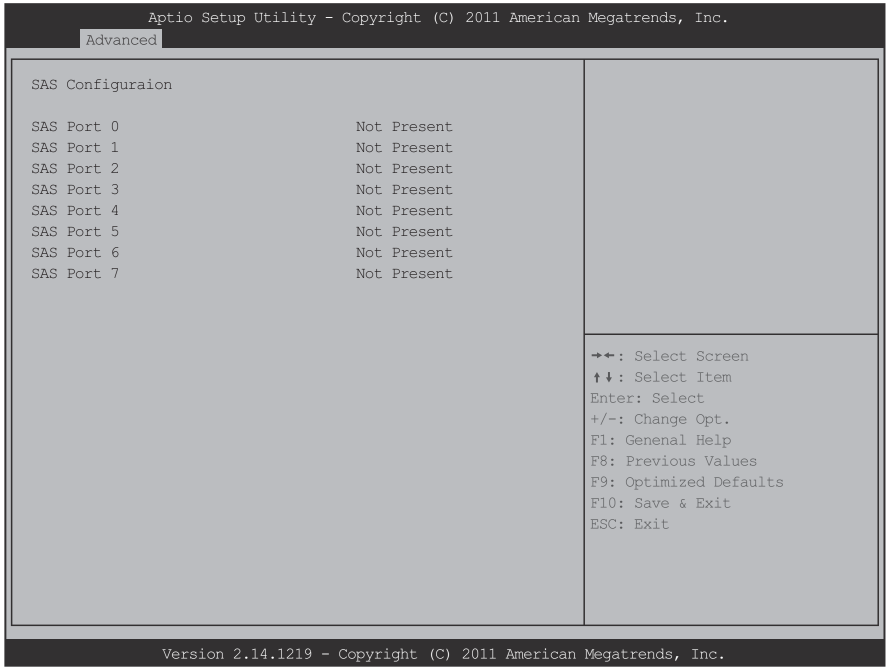

SATA Controller Configuration Screen

SATA Controller Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
SATA Mode	[Disabled] [IDE Mode] [**AHCI Mode**]	(1) IDE Mode. (2) AHCI Mode.	Select SATA Type for onboard SATA ports.
Serial-ATA Controller 0	[Disabled] [Enhanced] [**Compatible**]	Enabled/Disabled Serial AT A Controller 0.	
SATA Port0			Information only. Displays the device on Port0.
SATA Port1			Information only. Displays the device on Port1.

SAS Configuration Screen



```
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    Advanced

SAS Configuraion

SAS Port 0                    Not Present
SAS Port 1                    Not Present
SAS Port 2                    Not Present
SAS Port 3                    Not Present
SAS Port 4                    Not Present
SAS Port 5                    Not Present
SAS Port 6                    Not Present
SAS Port 7                    Not Present

                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: Genenal Help
                                                   F8: Previous Values
                                                   F9: Optimized Defaults
                                                   F10: Save & Exit
                                                   ESC: Exit

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```

SAS Configuration Screen

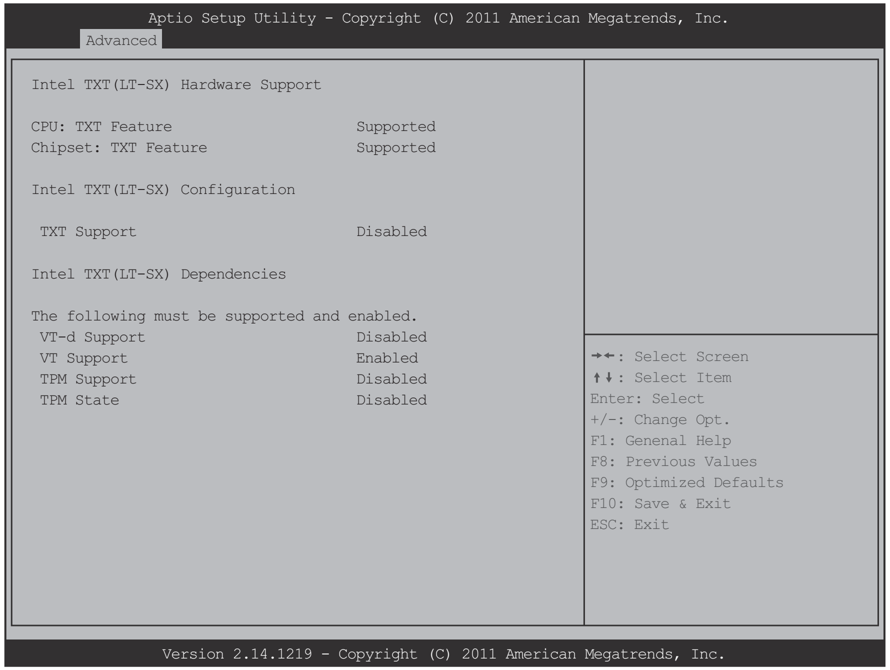
SAS Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
SAS Port 0			Information only. Displays the device on SAS Port 0.

SAS Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
SAS Port 1			Information only. Displays the device on SAS Port 1.
SAS Port 2			Information only. Displays the device on SAS Port 2.
SAS Port 3			Information only. Displays the device on SAS Port 3.
SAS Port 4			Information only. Displays the device on SAS Port 4.
SAS Port 5			Information only. Displays the device on SAS Port 5.
SAS Port 6			Information only. Displays the device on SAS Port 6.
SAS Port 7			Information only. Displays the device on SAS Port 7.

Intel TXT(LT-SX) Screen



```
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Advanced

Intel TXT(LT-SX) Hardware Support

CPU: TXT Feature                     Supported
Chipset: TXT Feature                 Supported

Intel TXT(LT-SX) Configuration

 TXT Support                         Disabled

Intel TXT(LT-SX) Dependencies

The following must be supported and enabled.
 VT-d Support                        Disabled
 VT Support                          Enabled
 TPM Support                         Disabled
 TPM State                           Disabled

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: Genenal Help
F8: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

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```

Intel TXT(LT-SX) Configuration Screen

Intel TXT(LT-SX) Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
CPU: TXT Feature			Information only. Displays the CPU: TXT Feature.

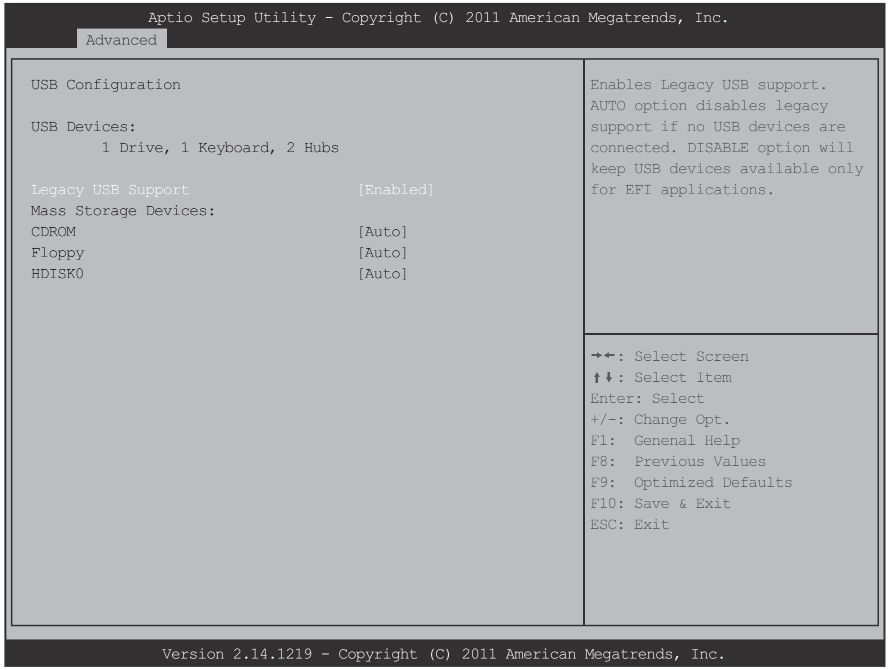
Intel TXT(LT-SX) Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Chipset: TXT Feature			Information only. Displays the Chipset: TXT Feature.
TXT Support	[**Disabled**] [Enabled]	TXT requires a properly configured TPM, LT-SX enabled CPU, and the below dependencies be met.	Only selectable when “CPU: TXT Feature”, “Chipset: TXT Feature”, “VT-d Support”, “VT Support”, “TPM Support” and “TPM State” are all supported.
VT-d Support			Information only. Displays the VT-d Support.
VT Support			Information only. Displays the VT Support.
TPM Support			Information only. Displays Intel TPM Support.
TPM State			Information only. Displays Intel TPM State.

USB Configuration Screen

The USB Configuration screen provides fields to configure the USB controller options.

To access this screen from the Main screen, select Advanced | USB Configuration.



```
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      Advanced

USB Configuration                                     Enables Legacy USB support.
                                                      AUTO option disables legacy
USB Devices:                                          support if no USB devices are
        1 Drive, 1 Keyboard, 2 Hubs                   connected. DISABLE option will
                                                      keep USB devices available only
Legacy USB Support                    [Enabled]       for EFI applications.
Mass Storage Devices:
CDROM                                 [Auto]
Floppy                                [Auto]
HDISK0                                [Auto]

                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1:  Genenal Help
                                                      F8:  Previous Values
                                                      F9:  Optimized Defaults
                                                      F10: Save & Exit
                                                      ESC: Exit

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```

USB Configuration Screen

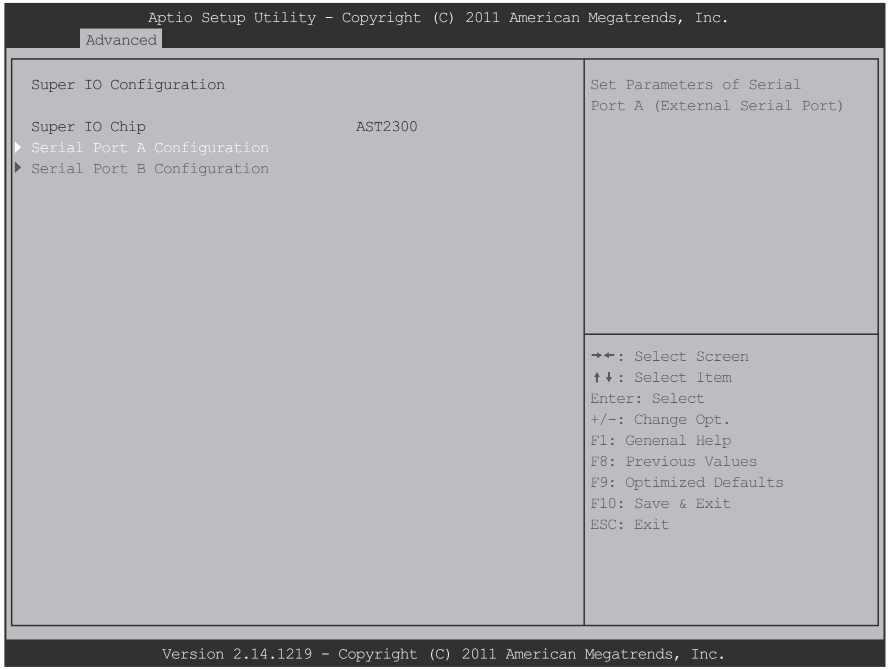
USB Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
USB Devices:			Information only. Display all of the USB devices attached.
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.	
Mass Storage Devices	[**Auto**]		Information only. Display all of the Mass Storage Devices attached.

Super I/O Configuration Screen

The Serial Ports screen provides fields to configure the Serial Port [COM Port].

To access this screen from the Main screen, select Advanced | Super IO Configuration.



```
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Advanced

Super IO Configuration                              Set Parameters of Serial
                                                    Port A (External Serial Port)
Super IO Chip                       AST2300
▶ Serial Port A Configuration
▶ Serial Port B Configuration

                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: Genenal Help
                                                    F8: Previous Values
                                                    F9: Optimized Defaults
                                                    F10: Save & Exit
                                                    ESC: Exit

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```
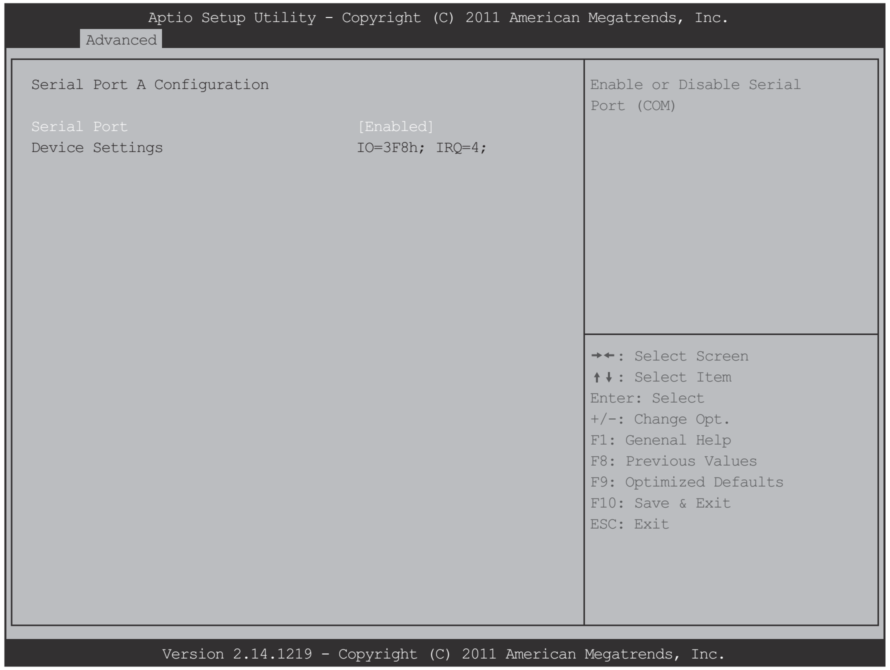

Super I/O Configuration Screen

Super I/O Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Super IO Chip			Information only. Display Super IO Chip.
Serial Port A Configuration		Set Parameters of Serial Port A (External Serial Port).	
Serial Port B Configuration		Set Parameters of Serial Port B (Internal Serial Port).	

Serial Port Configuration Screen



```
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    Advanced

  Serial Port A Configuration                              Enable or Disable Serial
                                                           Port (COM)
  Serial Port                        [Enabled]
  Device Settings                    IO=3F8h; IRQ=4;



                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: Genenal Help
                                                           F8: Previous Values
                                                           F9: Optimized Defaults
                                                           F10: Save & Exit
                                                           ESC: Exit

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```
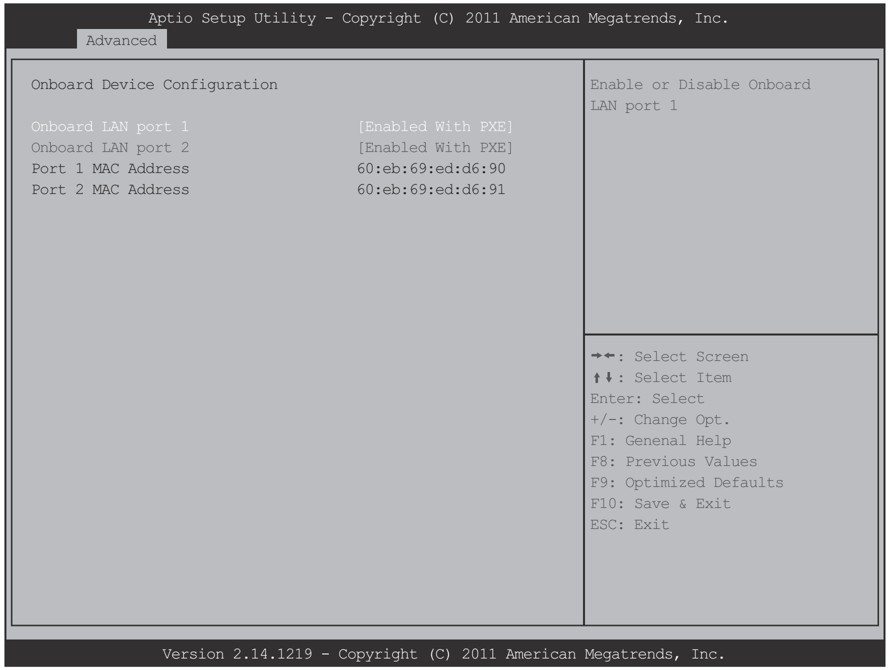

Serial Port Configuration Screen

Serial Port Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Serial Port	[Disabled] [**Enabled**]	Enable or Disable Serial Port (COM).	
Device Settings			Information only. Display Device Settings.

Onboard Device Configuration Screen



```
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    Advanced

Onboard Device Configuration                                  Enable or Disable Onboard
                                                              LAN port 1
Onboard LAN port 1                  [Enabled With PXE]
Onboard LAN port 2                  [Enabled With PXE]
Port 1 MAC Address                  60:eb:69:ed:d6:90
Port 2 MAC Address                  60:eb:69:ed:d6:91

                                                              →←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: Genenal Help
                                                              F8: Previous Values
                                                              F9: Optimized Defaults
                                                              F10: Save & Exit
                                                              ESC: Exit

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```
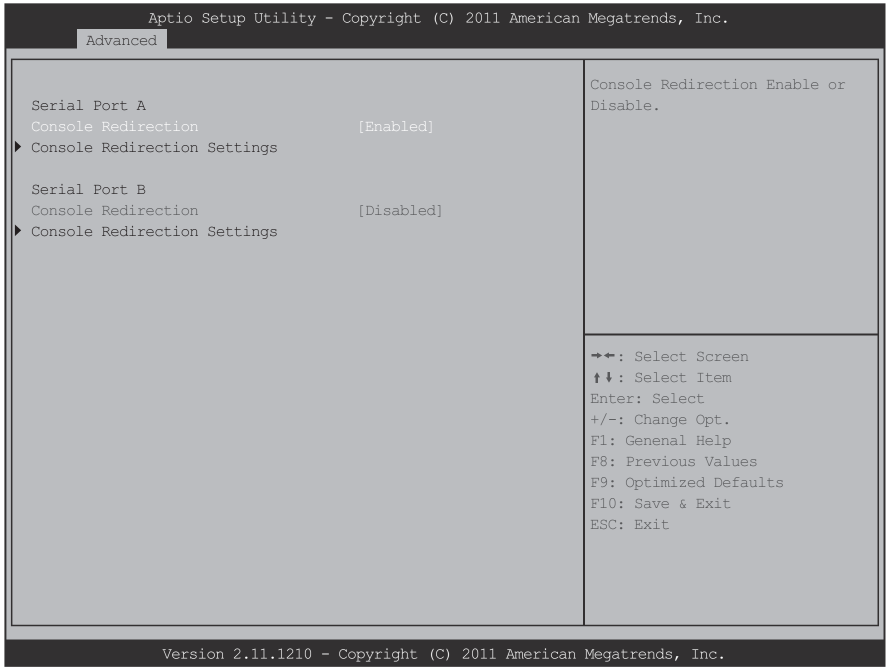

Onboard Device Configuration Screen

Onboard Device Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Onboard LAN port 1	[Disabled] [**Enabled With PXE**] [Enabled Without PXE] [iSCSI Remote Boot]	Enable or Disable Onboard LAN port 1.	
Onboard LAN port 2	[Disabled] [**Enabled With PXE**] [Enabled Without PXE] [iSCSI Remote Boot]	Enable or Disable Onboard LAN port 2.	
Port 1 MAC Address			Information only. Display Port 1 MAC Address.
Port 2 MAC Address			Information only. Display Port 2 MAC Address.

Console Redirection Screen



```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
        Advanced

                                                           Console Redirection Enable or
  Serial Port A                                            Disable.
  Console Redirection                 [Enabled]
► Console Redirection Settings

  Serial Port B
  Console Redirection                 [Disabled]
► Console Redirection Settings

                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: Genenal Help
                                                           F8: Previous Values
                                                           F9: Optimized Defaults
                                                           F10: Save & Exit
                                                           ESC: Exit

              Version 2.11.1210 - Copyright (C) 2011 American Megatrends, Inc.
```

Console Redirection Screen

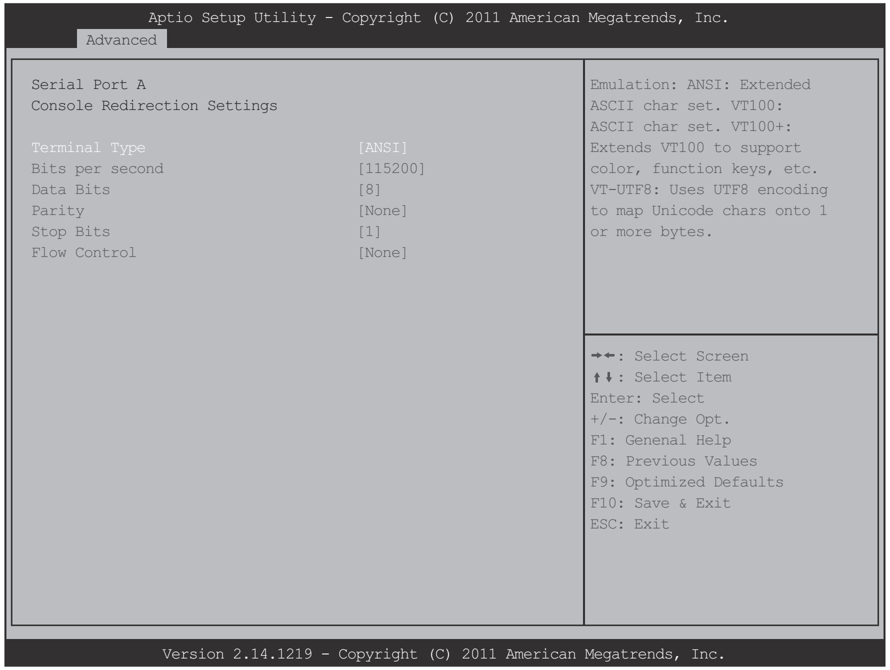
Console Redirection Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Console Redirection	[**Disabled**] [Enabled]	Console Redirection Enable or Disable.	

Console Redirection Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Console Redirection Settings		The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.	Only accessible if Console Redirection is set to [Enabled].

Console Redirection Settings Screen



```
             Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
        Advanced

  Serial Port A                                        Emulation: ANSI: Extended
  Console Redirection Settings                         ASCII char set. VT100:
                                                       ASCII char set. VT100+:
  Terminal Type                     [ANSI]             Extends VT100 to support
  Bits per second                   [115200]           color, function keys, etc.
  Data Bits                         [8]                VT-UTF8: Uses UTF8 encoding
  Parity                            [None]             to map Unicode chars onto 1
  Stop Bits                         [1]                or more bytes.
  Flow Control                      [None]

                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: Genenal Help
                                                       F8: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Exit
                                                       ESC: Exit

             Version 2.14.1219 - Copyright (C) 2011 American Megatrends, Inc.
```

Console Redirection Settings Screen

Console Redirection Settings Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
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.	
Bits per second	[9600] [19200] [38400] [57600] [**115200**]	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.	
Data Bits	[7] [**8**]	Data Bits	

Console Redirection Settings Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
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.	
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.	

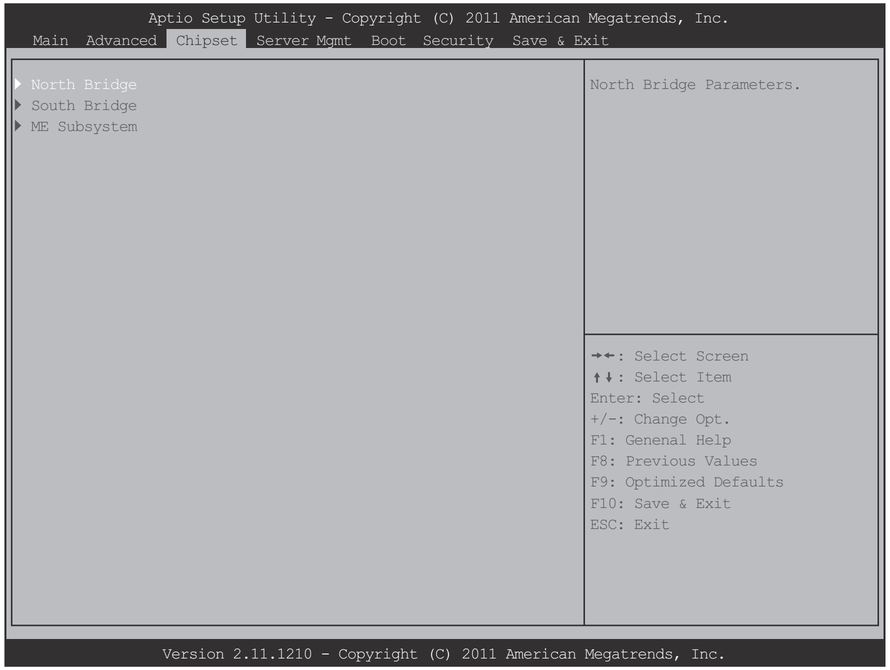
Console Redirection Settings Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
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.	

Chipset Screen

The Chipset 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 the Chipset screen.

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



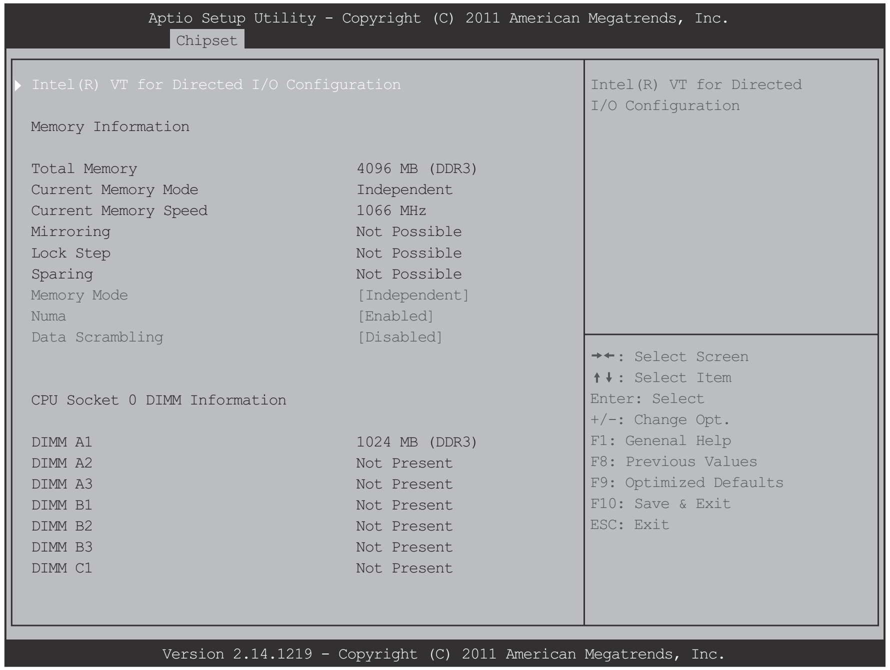
```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Main  Advanced  Chipset  Server Mgmt  Boot  Security  Save & Exit

 ▶ North Bridge                                      North Bridge Parameters.
 ▶ South Bridge
 ▶ ME Subsystem

                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: Genenal Help
                                                     F8: Previous Values
                                                     F9: Optimized Defaults
                                                     F10: Save & Exit
                                                     ESC: Exit

                 Version 2.11.1210 - Copyright (C) 2011 American Megatrends, Inc.
```

Chipset Screen

Chipset Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
North Bridge		North Bridge Parameters.	
South Bridge		South Bridge Parameters.	
ME Subsystem		ME Subsystem Parameters.	

North Bridge Screen



```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
            Chipset

▸ Intel(R) VT for Directed I/O Configuration            Intel(R) VT for Directed
                                                         I/O Configuration
  Memory Information

  Total Memory                      4096 MB (DDR3)
  Current Memory Mode               Independent
  Current Memory Speed              1066 MHz
  Mirroring                         Not Possible
  Lock Step                         Not Possible
  Sparing                           Not Possible
  Memory Mode                       [Independent]
  Numa                              [Enabled]
  Data Scrambling                   [Disabled]
                                                         →←: Select Screen
                                                         ↑↓: Select Item
  CPU Socket 0 DIMM Information                          Enter: Select
                                                         +/-: Change Opt.
  DIMM A1                           1024 MB (DDR3)       F1: Genenal Help
  DIMM A2                           Not Present          F8: Previous Values
  DIMM A3                           Not Present          F9: Optimized Defaults
  DIMM B1                           Not Present          F10: Save & Exit
  DIMM B2                           Not Present          ESC: Exit
  DIMM B3                           Not Present
  DIMM C1                           Not Present

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```

North Bridge Configuration Screen

North Bridge Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Intel(R) VT for Directed I/O Configuration		Intel(R) VT for Directed I/O Configuration.	

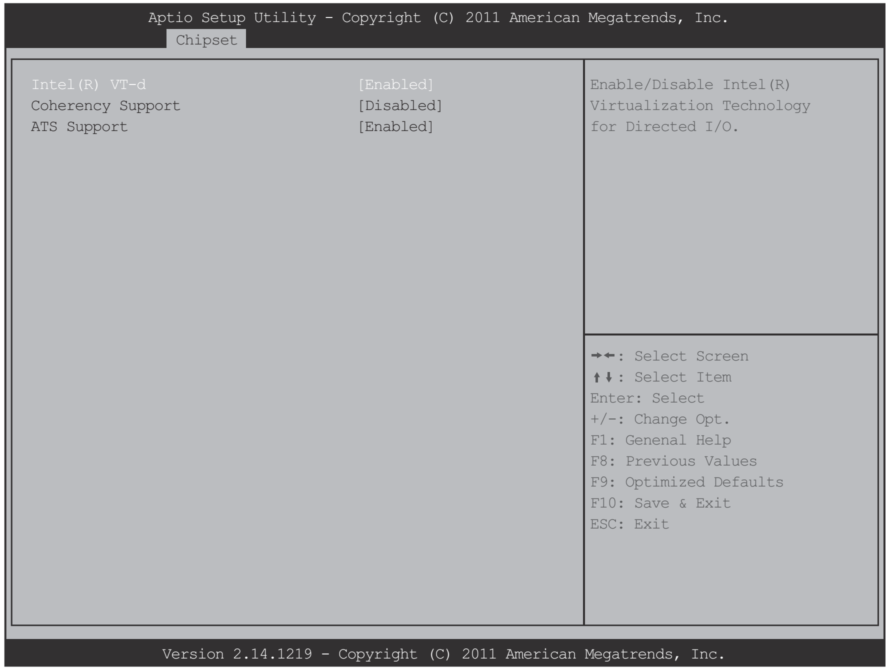
North Bridge Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Total Memory			Information only. Displays the Total Memory.
Current Memory Mode			Information only. Displays the Current Memory Mode.
Current Memory Speed			Information only. Displays the Current Memory Speed.
Mirroring			Information only. Displays the Mirroring support state.
Lock Step			Information only. Displays the Lock Step support state.
Sparing			Information only. Displays the Sparing support state.

North Bridge Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Memory Mode	[**Independent**] [Mirroring] [Lock Step] [Sparing]	Select the mode for memory initialization	If unsupported memory mode is selected, BIOS will use “Independent” as current memory mode during next boot. BIOS will not use the user-select unsupported memory mode until the memory population method is changed to support userselect memory mode.
Numa	[Disabled] [**Enabled**]	Enable or Disable Non uniform Memory Access (NUMA)	
Data Scrambling	[**Disabled**] [Enabled]	Enable/Disable Data Scrambling	
DIMM Information			Information only. Displays the DIMM information.

Intel(R) VT-d Screen



```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
              Chipset

 Intel(R) VT-d                         [Enabled]       Enable/Disable Intel(R)
 Coherency Support                     [Disabled]      Virtualization Technology
 ATS Support                           [Enabled]       for Directed I/O.

                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: Genenal Help
                                                       F8: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Exit
                                                       ESC: Exit

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```

Intel(R) VT-d Screen

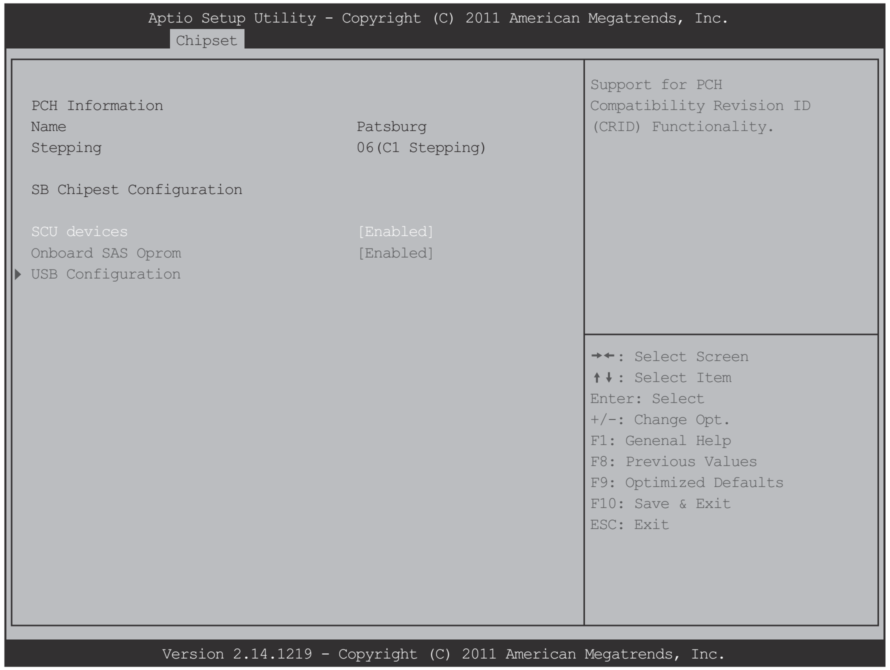
Intel(R) VT-d Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Intel® VT-d	[Disabled] [**Enabled**]	Enable/Disable Intel® Virtualization Technology for Directed I/O.	

Intel(R) VT-d Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Coherency Support	[**Disabled**] [Enabled]	Enabled/Disabled VT-d Engine Coherency Support.	
ATS Support	[Disabled] [**Enabled**]	Enabled/Disabled VT-d Engine Address Translation Services (ATS) support.	

South Bridge Screen



```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                 Chipset

                                                          Support for PCH
  PCH Information                                         Compatibility Revision ID
  Name                                  Patsburg          (CRID) Functionality.
  Stepping                              06(C1 Stepping)

  SB Chipest Configuration

  SCU devices                           [Enabled]
  Onboard SAS Oprom                     [Enabled]
► USB Configuration
                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: Genenal Help
                                                          F8: Previous Values
                                                          F9: Optimized Defaults
                                                          F10: Save & Exit
                                                          ESC: Exit

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```

South Bridge Screen

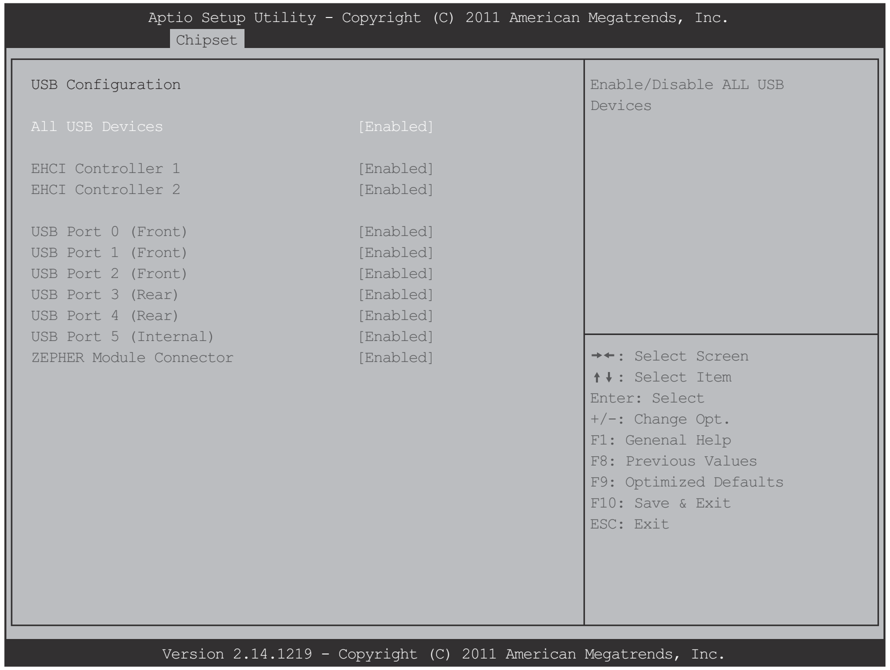
South Bridge Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
SCU devices	[Disabled] [**Enabled**]	Enable/Disable Patsburg SCU devices.	

South Bridge Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Onboard SAS Oprom	[Disabled] [**Enabled**]	Enabled/Disabled onboard SAS option rom if Launch Storage OpROM is enabled.	
USB Configuration		USB Configuration.	

USB Configuration Screen



```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                   Chipset
 USB Configuration                                     Enable/Disable ALL USB
                                                       Devices
 All USB Devices                     [Enabled]

 EHCI Controller 1                   [Enabled]
 EHCI Controller 2                   [Enabled]

 USB Port 0 (Front)                  [Enabled]
 USB Port 1 (Front)                  [Enabled]
 USB Port 2 (Front)                  [Enabled]
 USB Port 3 (Rear)                   [Enabled]
 USB Port 4 (Rear)                   [Enabled]
 USB Port 5 (Internal)               [Enabled]
 ZEPHER Module Connector             [Enabled]         →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: Genenal Help
                                                       F8: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Exit
                                                       ESC: Exit

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```

USB Configuration Screen

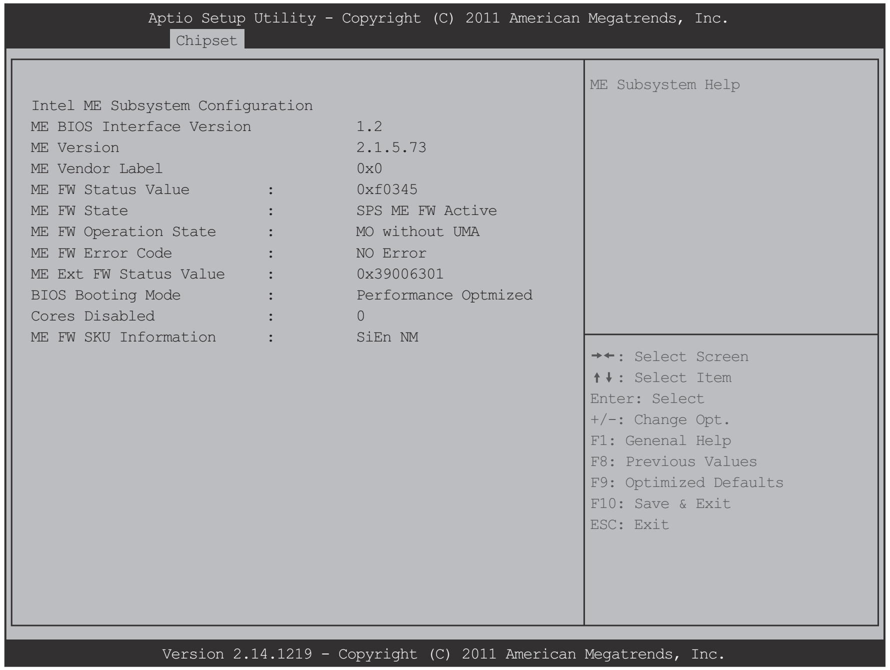
USB Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
All USB Devices	[Disabled] [**Enabled**]	Enabled/Disabled ALL USB Devices	

USB Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
EHCI Controller 1	[Disabled] [**Enabled**]	Enabled/Disabled USB EHCI Controller 1.	Disable the EHCI Controller would disable all USB ports from it.
EHCI Controller 2	[Disabled] [**Enabled**]	Enabled/Disabled USB EHCI Controller 2.	Disable the EHCI Controller would disable all USB ports from it.
USB Port 0 (Front)	[Disabled] [**Enabled**]	Enabled/Disabled USB Port 0 (Front).	
USB Port 1 (Front)	[Disabled] [**Enabled**]	Enabled/Disabled USB Port 1 (Front).	
USB Port 2 (Front)	[Disabled] [**Enabled**]	Enabled/Disabled USB Port 2 (Front).	
USB Port 3 (Rear)	[Disabled] [**Enabled**]	Enabled/Disabled USB Port 3 (Rear).	
USB Port 4 (Rear)	[Disabled] [**Enabled**]	Enabled/Disabled USB Port 4 (Rear).	
USB Port 5 (Internal)	[Disabled] [**Enabled**]	Enabled/Disabled USB Port 5 (Internal).	
ZEPHER Module Connector	[Disabled] [**Enabled**]	Enabled/Disabled ZEPHER Module Connector.	

ME Subsystem Screen



```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
        Chipset

 Intel ME Subsystem Configuration                               ME Subsystem Help
 ME BIOS Interface Version              1.2
 ME Version                             2.1.5.73
 ME Vendor Label                        0x0
 ME FW Status Value        :            0xf0345
 ME FW State               :            SPS ME FW Active
 ME FW Operation State     :            MO without UMA
 ME FW Error Code          :            NO Error
 ME Ext FW Status Value    :            0x39006301
 BIOS Booting Mode         :            Performance Optmized
 Cores Disabled            :            0
 ME FW SKU Information     :            SiEn NM
                                                                →←: Select Screen
                                                                ↑↓: Select Item
                                                                Enter: Select
                                                                +/-: Change Opt.
                                                                F1: Genenal Help
                                                                F8: Previous Values
                                                                F9: Optimized Defaults
                                                                F10: Save & Exit
                                                                ESC: Exit

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```

ME Subsystem Screen

ME Subsystem Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
ME BIOS Interface Version			Displays the ME BIOS Interface Version.
ME Version			Displays the ME Version.

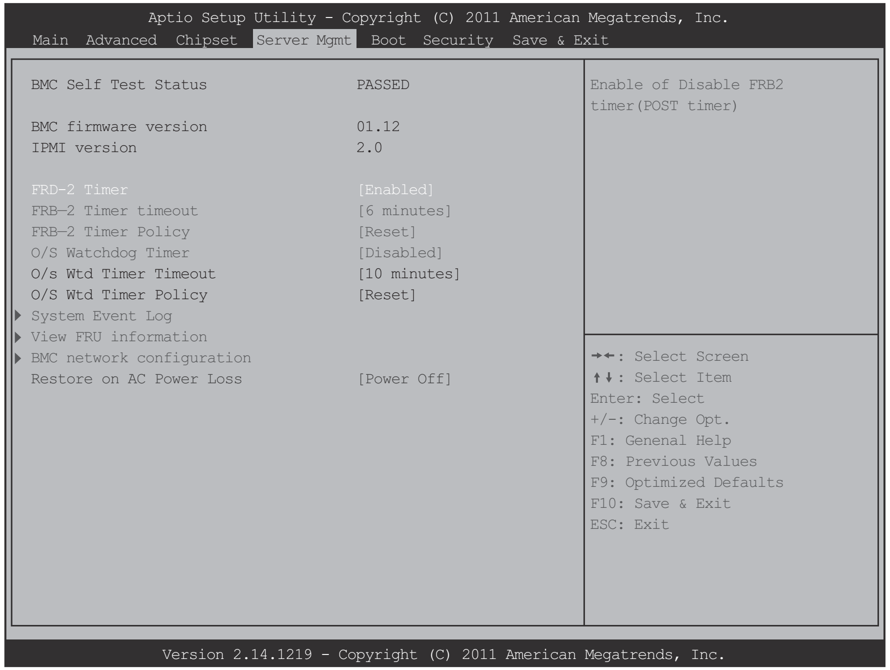
ME Subsystem Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
ME Vendor Label			Information only. Displays the ME Vendor Label.
ME FW Status Value			Displays the ME FW Status Value.
ME FW State			Displays the ME FW State.
ME FW Operation State			Displays the ME FW Operation State.
ME FW Error Code			Displays the ME FW Error Code.
ME Ext FW Status Value			Displays the ME Ext FW Status Value.
BIOS Booting Mode			Displays the BIOS Booting Mode.
Cores Disabled			Displays the Cores Disabled.
ME FW SKU Information			Displays the ME FW SKU Information.

Server Management Screen

The Server Management screen displays information of the BMC and allows the user to configure desired settings.

To access this screen from the Main screen, select Server Mgmt Options.



```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Main  Advanced  Chipset  Server Mgmt  Boot  Security  Save & Exit

  BMC Self Test Status                  PASSED              Enable of Disable FRB2
                                                            timer(POST timer)
  BMC firmware version                  01.12
  IPMI version                          2.0

  FRD-2 Timer                           [Enabled]
  FRB—2 Timer timeout                   [6 minutes]
  FRB—2 Timer Policy                    [Reset]
  O/S Watchdog Timer                    [Disabled]
  O/s Wtd Timer Timeout                 [10 minutes]
  O/S Wtd Timer Policy                  [Reset]
▶ System Event Log
▶ View FRU information
▶ BMC network configuration                                 →←: Select Screen
  Restore on AC Power Loss              [Power Off]         ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: Genenal Help
                                                            F8: Previous Values
                                                            F9: Optimized Defaults
                                                            F10: Save & Exit
                                                            ESC: Exit

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```

Server Management Configuration Screen

Server Management Configuration Fields

SETUP ITEM	Options	HELP TEXT	COMMENTS
BMC Self Test Status			Information only. Displays theBMC Self Test Status.
BMC firmware version			BMC firmware version.
IPMI version			IPMI version.
FRB-2 Timer	[**Enabled**] [Disabled]	Enable or Disable FRB2 timer (POST timer).	
FRB-2 Timer timeout	[3 minutes] [4 minutes] [5 minutes] [**6 minutes**]	Enter value Between 3 to 6 min for FRB2 Timer Expiration value.	Not available if FRB2 Timer is disabled.
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.	

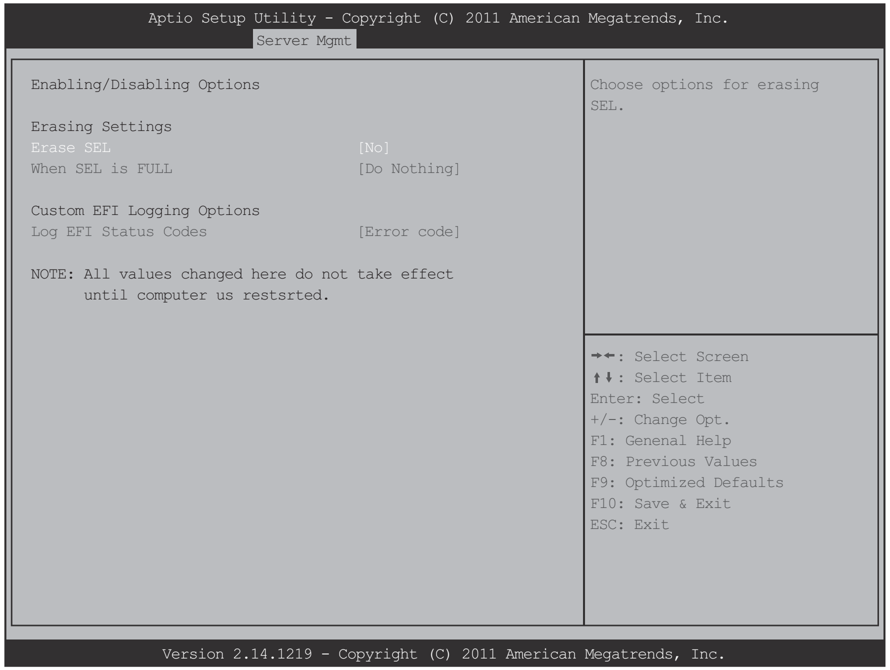
Server Management Configuration Fields (Continued)

SETUP ITEM	Options	HELP TEXT	COMMENTS
O/S Watchdog Timer	[Enabled] [**Disabled**]	If enabled, starts BIOS timer which can only be shut off by Intel Management Software after OS loads to determine OS successfully loaded or follows O/S Boot Watchdog Timer policy.	
O/S Wtd Timer Timeout	[5 minutes] [**10 minutes**] [15 minutes] [20 minutes]	Configure the length of the O/S Boot Watchdog Timer. Not available if O/S Boot Watchdog Timer is disabled.	Not available if O/S Watchdog Timer is disabled.
O/S Wtd Timer Policy	[Do Nothing] [**Reset**] [Power Down]	Configure how the system should respond if the O/S Boot Watchdog Timer expires. Not available if O/S Boot Watchdog Timer is disabled.	Not available if O/S Watchdog Timer is disabled.
System Event Log		Press <**Enter**> to change the SEL event log configuration.	

Server Management Configuration Fields (Continued)

SETUP ITEM	Options	HELP TEXT	COMMENTS
View FRU information		Press <**Enter**> to view FRU information.	
BMC network configuration		Configure BMC network parameters.	
Restore on AC Power Loss	[Power On] [**Power Off**] [Last State]	System action to take on AC power loss.	

System Event Log Screen



```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                            Server Mgmt

 Enabling/Disabling Options                                Choose options for erasing
                                                           SEL.
 Erasing Settings
 Erase SEL                           [No]
 When SEL is FULL                    [Do Nothing]

 Custom EFI Logging Options
 Log EFI Status Codes                [Error code]

 NOTE: All values changed here do not take effect
       until computer us restsrted.

                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: Genenal Help
                                                           F8: Previous Values
                                                           F9: Optimized Defaults
                                                           F10: Save & Exit
                                                           ESC: Exit

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```

System Event Log Screen

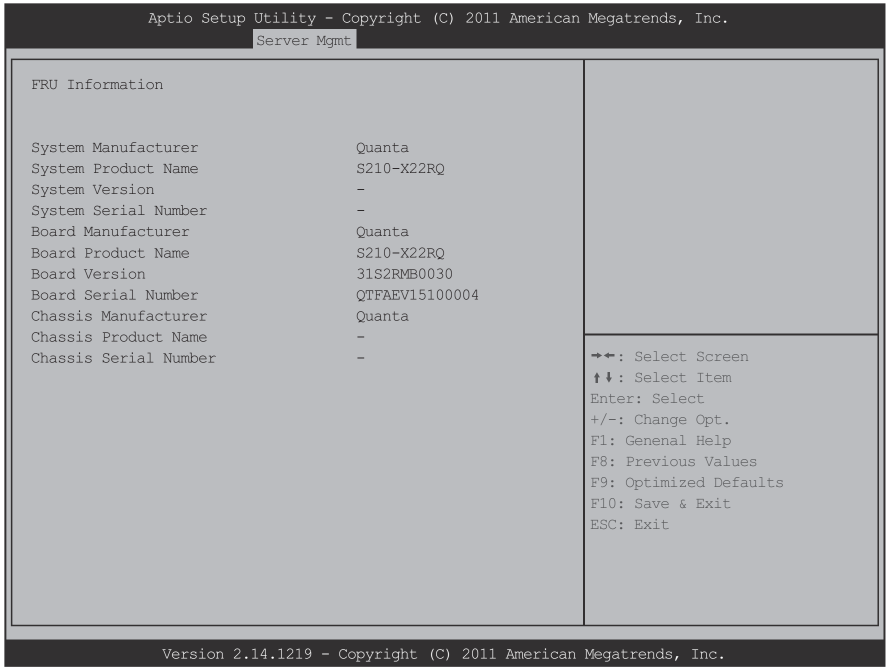
System Event Log Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Erase SEL	[**No**] [Yes, On next reset] [Yes, On every reset]	Choose options for erasing SEL.	

System Event Log Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
When SEL is Full	**[Do Nothing]** [Erase Immediately]	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.	

FRU Information Screen



```
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Server Mgmt

FRU Information


System Manufacturer          Quanta
System Product Name          S210-X22RQ
System Version               -
System Serial Number         -
Board Manufacturer           Quanta
Board Product Name           S210-X22RQ
Board Version                31S2RMB0030
Board Serial Number          QTFAEV15100004
Chassis Manufacturer         Quanta
Chassis Product Name         -
Chassis Serial Number        -

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: Genenal Help
F8: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

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```

FRU Information Screen

FRU Information Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
System Manufacturer			Information only. Displays the System Manufacturer.

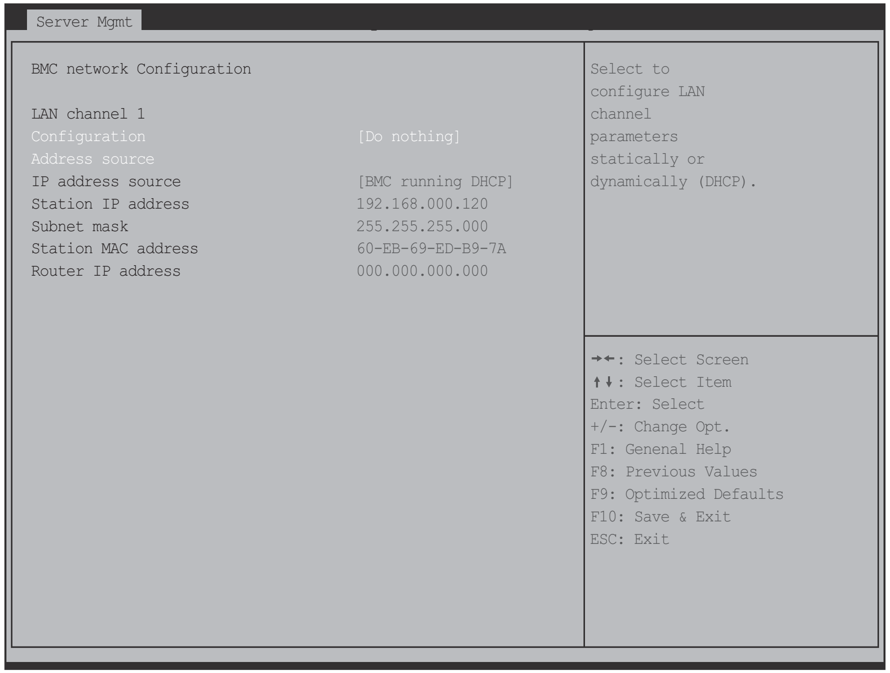
FRU Information Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
System Product Name			Information only. Displays the System Product Name.
System Version			Information only. Displays the System Version.
System Serial Number			Information only. Displays the System Serial Number.
Board Manufacturer			Information only. Displays the Board Manufacturer.
Board Product Name			Information only. Displays the Board Product Name.
Board Version			Information only. Displays the Board Version.
Board Serial Number			Information only. Displays the Board Serial Number.
Chassis Manufacturer			Information only. Displays the Chassis Manufacturer.

FRU Information Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Chassiss Product Name			Information only. Displays the Chassis Product Name.
Chassis Serial Number			Information only. Displays the Chassis Serial Number.

BMC Network Configuration Screen



```
BMC network Configuration                                   Select to
                                                            configure LAN
LAN channel 1                                               channel
Configuration                      [Do nothing]             parameters
Address source                                              statically or
IP address source                  [BMC running DHCP]       dynamically (DHCP).
Station IP address                 192.168.000.120
Subnet mask                        255.255.255.000
Station MAC address                60-EB-69-ED-B9-7A
Router IP address                  000.000.000.000

                                                            →←: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: Genenal Help
                                                            F8: Previous Values
                                                            F9: Optimized Defaults
                                                            F10: Save & Exit
                                                            ESC: Exit
```

BMC Network Configuration Screen

BMC Network Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
BMC LAN Port Configuration	[Dedicated-NIC] [Shared-NIC] [**No Change**]	BMC LAN Port Configuration.	Options for send to Dedicated NIC or Shared NIC

BMC Network Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Current BMC LAN Port State			Information only. Displays the current BMC LAN Port State.
Configuration Address source	[**Do Nothing**] [Static on next reset] [Dynamic Obtained by BMC]	Select to configure LAN channel parameters statically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.	
IP address source			Information only. Displays the IP address source.
Station IP address			Gray-out if "Configuration source" = [Do Nothing]
Subnet mask			Gray-out if "Configuration source" = [Do Nothing]
Station MAC address			Information only. Displays the Station MAC address.

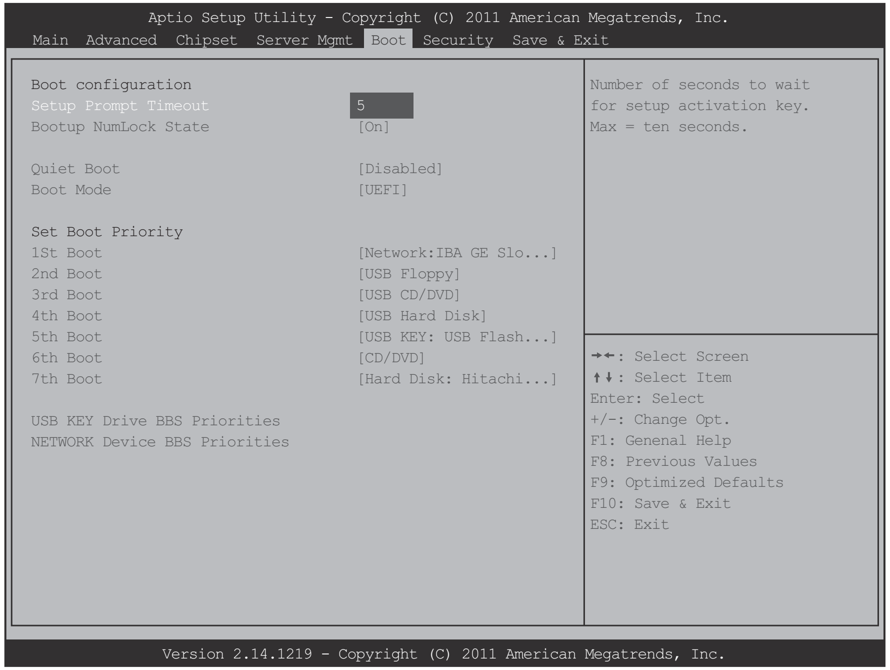
BMC Network Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Router IP address			Gray-out if "Configuration source" = [Do Nothing]
IPv6 Mode	[**Disabled**] [Enabled]	Disabled/Enabled IPv6 internet protocol support.	
IPv6 Auto-Config	[**Unspecified**] [Static] [Dynamic Obtained by BMC running DHCP]	Select to configure LAN channel parameters statically or dynamically (by BIOS or BMC).	Options only show when "IPv6 Mode" = [Enabled]
IPv6 IP Address		Enter IPv6 BMC Lan IP Address.	Options only show when "IPv6 Auto-Config" = [Static].
IPv6 Prefix Length		Enter IPv6 BMC Lan IP Prefix Length.	Options only show when "IPv6 Auto-Config" = [Static].
IPv6 Gate-Way Address		Enter IPv6 BMC Lan Default Gateway.	Options only show when "IPv6 Auto-Config" = [Static].

Boot Option Screen

The Boot Options screen displays any bootable media encountered during POST, and allows the user to configure desired boot device.

To access this screen from the Main screen, select Boot Options.



```
             Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Main  Advanced  Chipset  Server Mgmt  Boot  Security  Save & Exit

  Boot configuration                                Number of seconds to wait
  Setup Prompt Timeout           5                  for setup activation key.
  Bootup NumLock State           [On]               Max = ten seconds.

  Quiet Boot                     [Disabled]
  Boot Mode                      [UEFI]

  Set Boot Priority
  1St Boot                       [Network:IBA GE Slo...]
  2nd Boot                       [USB Floppy]
  3rd Boot                       [USB CD/DVD]
  4th Boot                       [USB Hard Disk]
  5th Boot                       [USB KEY: USB Flash...]
  6th Boot                       [CD/DVD]           →←: Select Screen
  7th Boot                       [Hard Disk: Hitachi...]  ↑↓: Select Item
                                                    Enter: Select
  USB KEY Drive BBS Priorities                      +/-: Change Opt.
  NETWORK Device BBS Priorities                     F1: Genenal Help
                                                    F8: Previous Values
                                                    F9: Optimized Defaults
                                                    F10: Save & Exit
                                                    ESC: Exit

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```

Boot Option Screen

Boot Option Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Setup Prompt Timeout	[<number>]	Number of seconds to wait for setup activation key. Max = ten seconds.	Default = 5.
Boot up NumLock State	[**On**] [Off]	Select the keyboard NumLock state.	
Quiet Boot	[Disabled] [**Enabled**]	Enables or disables Quiet Boot option.	
Boot Mode	[Legacy] [**UEFI**]		This item decides what devices (Legacy or UEFI) BIOS should try to boot when let the system auto boot up without manually select boot device.

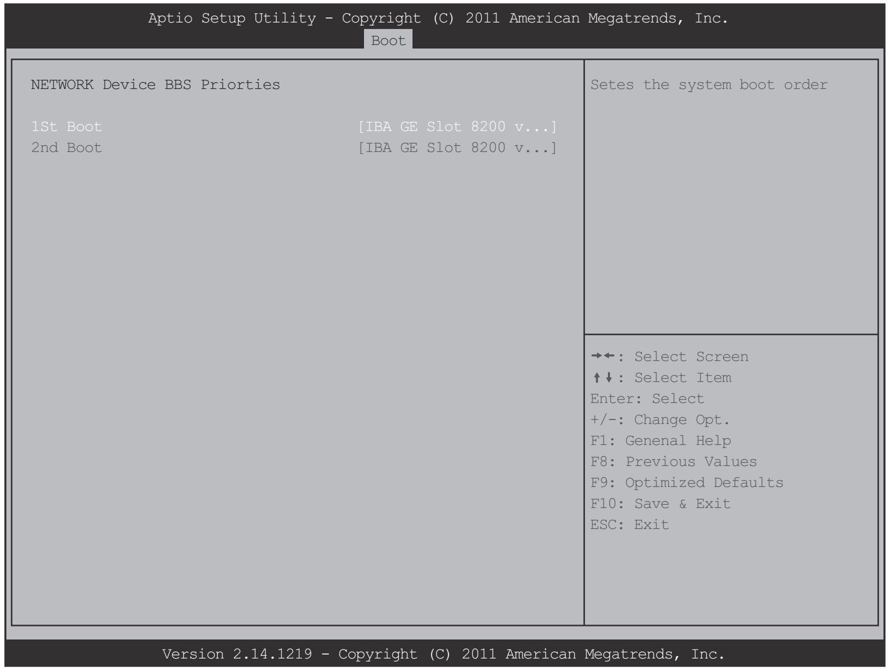
Boot Option Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
1st Boot 2nd Boot 3rd Boot 4th Boot 5th Boot 6th Boot 7th Boot		Sets the system boot order.	Default priority : ● 1st: Network ● 2nd: USB Floppy ● 3rd: USB CD/DVD ● 4th: USB Hard Disk ● 5th: USB KEY ● 6th: CD/DVD ● 7th: Hard Disk
CD/DVD ROM Drive BBS Priorities		Specifies the Boot Device Priority sequence from available CD/DVD Drives.	Only appears when at least one CD/DVD Drive is detected.
Hard Drive BBS Priorities		Specifies the Boot Device Priority sequence from available Hard Drives.	Only appears when at least one Hard Disk is detected.
USB Floppy Drive BBS Priorities		Specifies the Boot Device Priority sequence from available USB Floppy Drives.	Only appears when at least one USB Floppy is detected.

Boot Option Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
USB CD/ DVD ROM Drive BBS Priorities		Specifies the Boot Device Priority sequence from available USB CD/ DVD Drives.	Only appears when at least one USB CD/DVD ROM is detected.
USB Hard-Disk Drive BBS Priorities		Specifies the Boot Device Priority sequence from available USB HardDisk Drives.	Only appears when at least one USB Hard Disk is detected.
USB KEY Drive BBS Priorities		Specifies the Boot Device Priority sequence from available USB KEY Drives.	Only appears when at least one USB KEY is detected.
Network Device BBS Priorities		Specifies the Boot Device Priority sequence from available NETWORK Drives.	Only appears when at least one NETWORK Device is detected.

Network Device



```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                              Boot

NETWORK Device BBS Priorties                      Setes the system boot order

1St Boot                   [IBA GE Slot 8200 v...]
2nd Boot                   [IBA GE Slot 8200 v...]

                                                  →←: Select Screen
                                                  ↑↓: Select Item
                                                  Enter: Select
                                                  +/-: Change Opt.
                                                  F1: Genenal Help
                                                  F8: Previous Values
                                                  F9: Optimized Defaults
                                                  F10: Save & Exit
                                                  ESC: Exit

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```

Network Device Screen

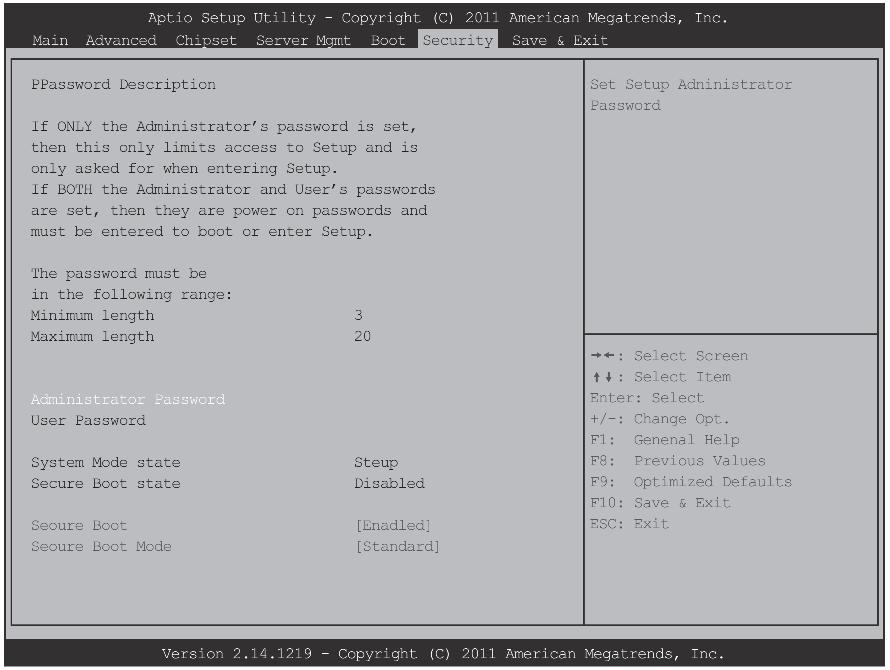
Network Device Fields

Setup Item	Options	Help Text	Comments
1st Boot	[<Device String 1>] [<Device String 2>] … [Disabled]	Sets the system boot order	
2nd Boot	[<Device String 1>] [<Device String 2>] … [Disabled]	Sets the system boot order	

Security Screen

The Security screen provides fields to enable and set the user and administrative password and to lockout the front panel buttons so they cannot be used.

To access this screen from the Main screen, select the Security option.



```
           Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Main  Advanced  Chipset  Server Mgmt  Boot  Security  Save & Exit

  PPassword Description                              Set Setup Adninistrator
                                                     Password
  If ONLY the Administrator’s password is set,
  then this only limits access to Setup and is
  only asked for when entering Setup.
  If BOTH the Administrator and User’s passwords
  are set, then they are power on passwords and
  must be entered to boot or enter Setup.

  The password must be
  in the following range:
  Minimum length                     3
  Maximum length                     20
                                                     →←: Select Screen
                                                     ↑↓: Select Item
  Administrator Password                             Enter: Select
  User Password                                      +/-: Change Opt.
                                                     F1:  Genenal Help
  System Mode state                  Steup           F8:  Previous Values
  Secure Boot state                  Disabled        F9:  Optimized Defaults
                                                     F10: Save & Exit
  Seoure Boot                        [Enadled]       ESC: Exit
  Seoure Boot Mode                   [Standard]

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```

Security Configuration Screen

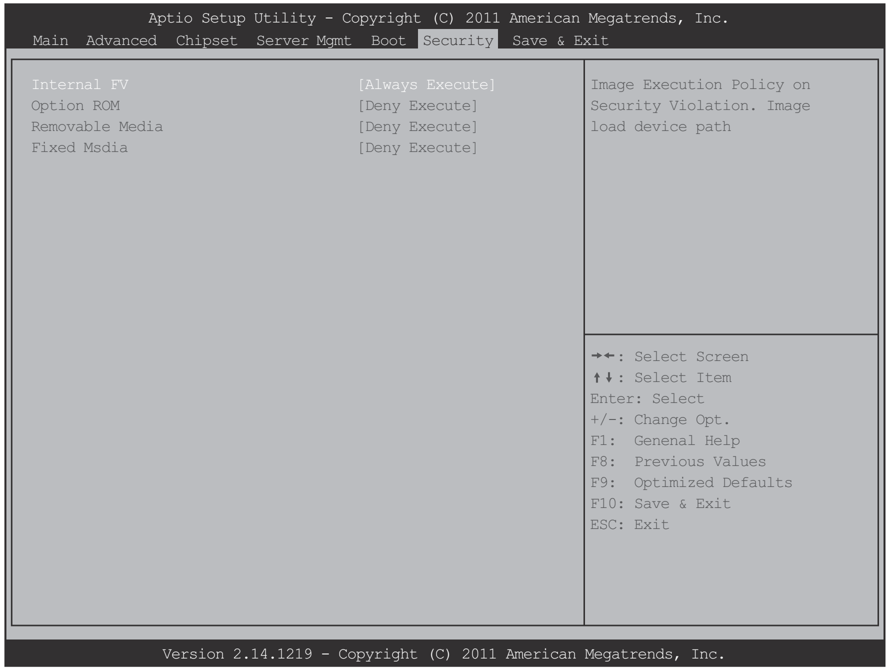
Security Configuration Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Administrator Password		Set Setup Administrator Password.	
User Password		Set User Password.	Not available if Administrator Password is not set.
System Mode state			Information only. Displays the System Mode state.
Secure Boot state			Information only. Displays the Secure Boot state.
Secure Boot	[Disabled] [**Enabled**]	Secure Boot flow control. Secure Boot is possible only if system runs in User Mode	
Secure Boot Mode	[**Standard**] [Custom]	Secure Boot mode selector. 'Standard' – fixed Secure boot policy, 'Custom' – Changeable Image Execution policy and Secure Boot Key databases.	

Security Configuration Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Image Execution Policy		Press <**Enter**> to manage the Image Execution Policy on Security Violation.	Option only show when "Secure Boot Mode" = [Custom]
Key Management		Press <**Enter**> to modify the content of the Secure Boot variables.	Option only show when "Secure Boot Mode" = [Custom]

Image Execution Policy Screen



```
        Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Main  Advanced  Chipset  Server Mgmt  Boot  Security  Save & Exit

  Internal FV                          [Always Execute]   Image Execution Policy on
  Option ROM                           [Deny Execute]     Security Violation. Image
  Removable Media                      [Deny Execute]     load device path
  Fixed Msdia                          [Deny Execute]

                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1:  Genenal Help
                                                          F8:  Previous Values
                                                          F9:  Optimized Defaults
                                                          F10: Save & Exit
                                                          ESC: Exit

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```

Image Execution Policy Screen

Image Execution Policy Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Internal FV	[**Always Execute]**	Image Execution Policy on Security Violation. Image load device path.	

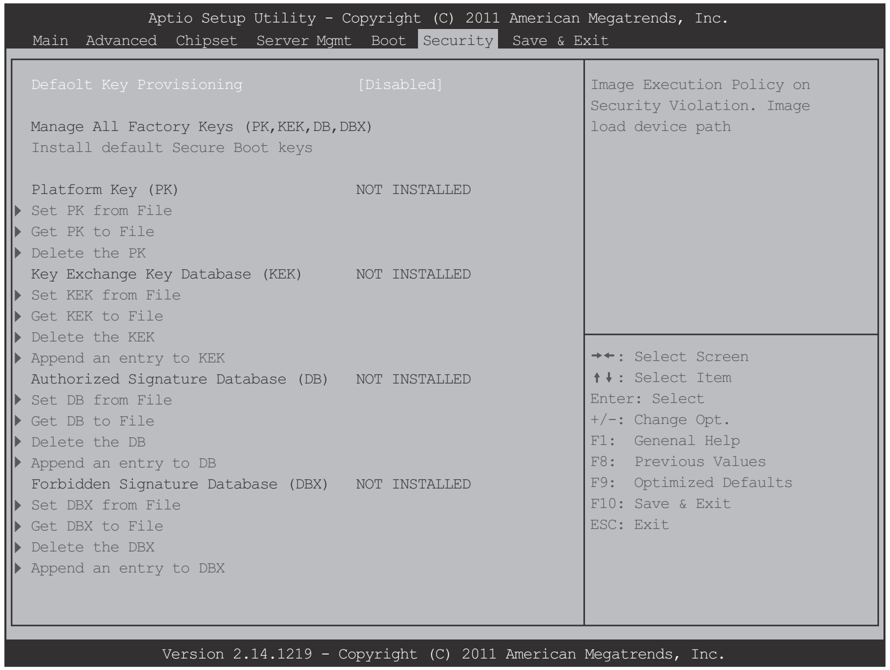
Image Execution Policy Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Option ROM	[Always Execute] [Always Deny] [Allow Execute] [Defer Execute] [**Deny Execute**] [Query User]	Image Execution Policy on Security Violation. Image load device path	
Removable Media	[Always Execute] [Always Deny] [Allow Execute] [Defer Execute] [**Deny Execute**] [Query User]	Image Execution Policy on Security Violation. Image load device path	

Image Execution Policy Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Fixed Media	[Always Execute] [Always Deny] [Allow Execute] [Defer Execute] [**Deny Execute**] [Query User]	Image Execution Policy on Security Violation. Image load device path	

Key Management Screen



```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Main  Advanced  Chipset  Server Mgmt  Boot  Security  Save & Exit

   Defaolt Key Provisioning             [Disabled]          Image Execution Policy on
                                                            Security Violation. Image
   Manage All Factory Keys (PK,KEK,DB,DBX)                  load device path
   Install default Secure Boot keys

   Platform Key (PK)                    NOT INSTALLED
 ▶ Set PK from File
 ▶ Get PK to File
 ▶ Delete the PK
   Key Exchange Key Database (KEK)      NOT INSTALLED
 ▶ Set KEK from File
 ▶ Get KEK to File
 ▶ Delete the KEK
 ▶ Append an entry to KEK                                   →←: Select Screen
   Authorized Signature Database (DB)   NOT INSTALLED       ↑↓: Select Item
 ▶ Set DB from File                                         Enter: Select
 ▶ Get DB to File                                           +/-: Change Opt.
 ▶ Delete the DB                                            F1:  Genenal Help
 ▶ Append an entry to DB                                    F8:  Previous Values
   Forbidden Signature Database (DBX)   NOT INSTALLED       F9:  Optimized Defaults
 ▶ Set DBX from File                                        F10: Save & Exit
 ▶ Get DBX to File                                          ESC: Exit
 ▶ Delete the DBX
 ▶ Append an entry to DBX

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```

Key Management Screen

Key Management Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Default Key Provisioning	[**Disabled**] [Enabled]	Force OEM default Secure Boot Keys if System is in Setup Mode.	

Key Management Fields (Continued)

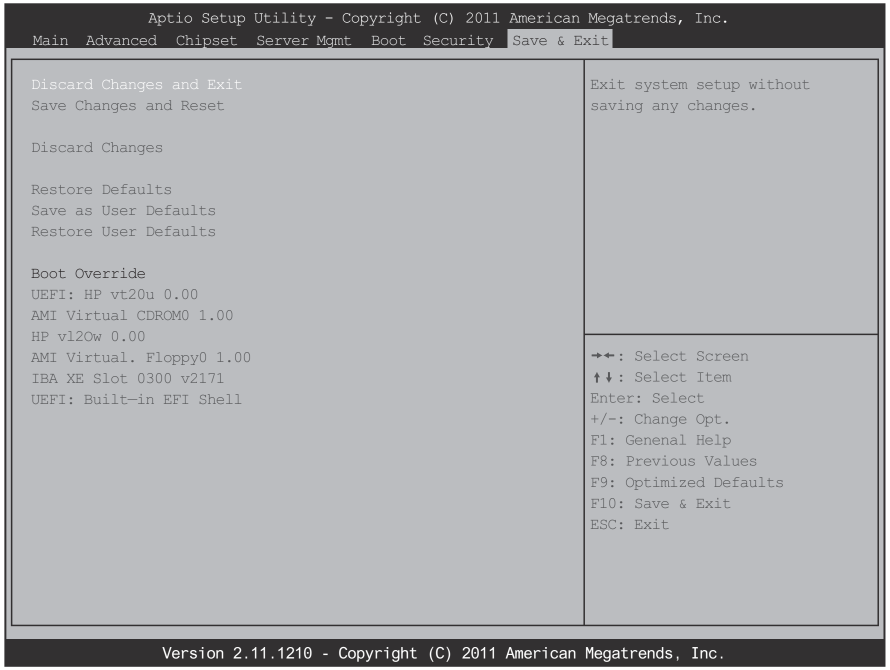
SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Install default Secure Boot keys		Force System to User Mode – install default Secure Boot Variables (PK,KEK,db,dbx). Change takes effect after reboot.	
Set (PK,KEK,DB, DBX) from File		Launches the file browser to set Efi Variable from the file. The file data must be formatted as Efi Variable with TimeBased Authenticated Header.	
Get (PK,KEK,DB, DBX) to File		Dump content of the Variable to a file with a matching name in selected file system's root.	
Delete the (PK,KEK,DB, DBX)		Delete the Variable.	

Key Management Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Append an entry to (KEK,DB,DBX)		Lauches the file browser to Append new Signature Database from the file. The file data must be formatted as Efi Variable with TimeBased Authenticated Header.	

Exit Screen

The Exit screen allows the user to choose to save or discard the configuration changes made on the other screens. It also provides a method to restore the server to the factory defaults or to save or restore a set of user defined default values. If Restore Defaults is selected, the default settings, noted in bold in the tables in this chapter, will be applied. If Restore User Default Values is selected, the system is restored to the default values that the user saved earlier, instead of being restored to the factory defaults.



```
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Main  Advanced  Chipset  Server Mgmt  Boot  Security  Save & Exit

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

Discard Changes

Restore Defaults
Save as User Defaults
Restore User Defaults

Boot Override
UEFI: HP vt20u 0.00
AMI Virtual CDROM0 1.00
HP v120w 0.00
AMI Virtual. Floppy0 1.00                    →←: Select Screen
IBA XE Slot 0300 v2171                       ↑↓: Select Item
UEFI: Built–in EFI Shell                     Enter: Select
                                             +/-: Change Opt.
                                             F1: Genenal Help
                                             F8: Previous Values
                                             F9: Optimized Defaults
                                             F10: Save & Exit
                                             ESC: Exit

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```

Exit Screen

Exit Fields

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Discard Changes and Exit		Exit system setup without saving any changes.	

Exit Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
Save Changes and Reset		Reset the system after saving the changes.	
Discard Changes		Discards changes done so far to any of the setup questions.	
Restore Defaults		Restore/Load Default values for all the setup options.	
Save as User Defaults		Save the changes done so far as User Defaults.	
Restore User Defaults		Restore the User Defaults to all the setup options.	
[<Device String 1>]			Boot with Device <Device String 1>.
[<Device String 2>]			Boot with Device <Device String 2>.
[<Device String 3>]			Boot with Device <Device String 3>.
[<Device String 4>]			Boot with Device <Device String 4>.
[<Device String 5>]			Boot with Device <Device String 5>.

Exit Fields (Continued)

SETUP ITEM	OPTIONS	HELP TEXT	COMMENTS
[<Device String 6>]			Boot with Device <Device String 6>.

Loading BIOS Defaults

Different mechanisms exist for resetting the system configuration to the default values. When a request to reset the system configuration is detected, the BIOS loads the default system configuration values during the next POST. The request to reset the system to the defaults can be sent in the following ways:

- A request to reset the system configuration can be generated by pressing <**F9**> from within the BIOS Setup utility.
- A reset system configuration request can be generated by moving the clear system configuration jumper.

BIOS settings are stored on NVRAM. Only the D4 setting uses the CMOS. BIOS implements a mechanism to clear NVRAM and CMOS.

After clearing CMOS by battery or jumper, all variables in the BIOS setup Menu load with the default values. BMC related variables, like Set *BMC LAN Configuration* in BIOS setup menu, are able to synchronize from BMC.

3.2. BIOS Update Utility

The flash ROM contains system initialization routines, the BIOS Setup Utility, and runtime support routines. The exact layout is subject to change, as determined by BIOS. The flash ROM also contains initialization code in compressed form for onboard peripherals, like SCSI, NIC and video controllers. The complete ROM is visible, starting at physical address 4 GB minus the size of the flash ROM device.

A 16-KB parameter block in the flash ROM is dedicated to storing configuration data that controls the system configuration (ESCD). Application software must use standard APIs to access these areas; application software cannot access the data directly.

BIOS Update Utility

Server platforms support DOS-based, Windows-based, and Linux-based firmware update utilities. This utility loads a fresh copy of the BIOS into the flash ROM.

The BIOS update may affect the following items:

- The system BIOS, including the recovery code, setup utility and strings.
- Onboard video BIOS, RAID BIOS, and other option ROMS for the devices embedded on the server board.
- Memory reference code.
- Microcode updates.
- ME Firmware

Recovery Mode

Recovery process can be initiated by setting the recovery jumper. BIOS would detect the recovery jumper set and start to execute recovery code.

The BIOS consists of three parts, the Main BIOS Section, the NVRAM Section, and the Boot Block Recovery Section. The Main BIOS Section and the NVRAM Section will be updated during recovery process, but the Boot Block will be preserved.

BIOS recovery could be held through a USB removable drive, and the recovery media must include the BIOS image file, S4E_REC.ROM.

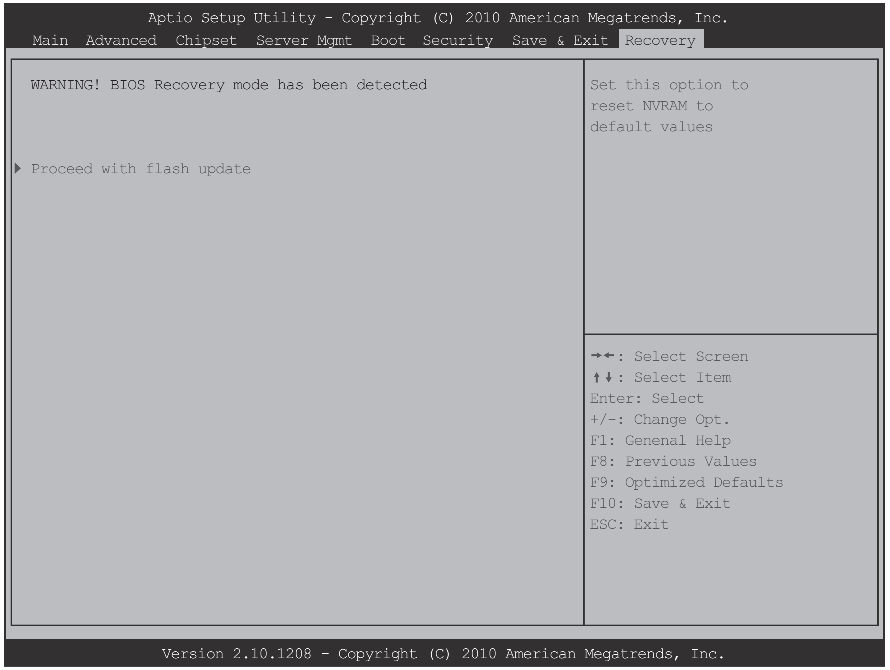
Recovery Flow

The BIOS has an embedded recovery technique in the 'boot block'. In the event that the BIOS becomes corrupt, the boot block can be used to restore the BIOS to a working state. The routine is called when the 'system block' of the BIOS is empty or corrupt. The restore routine when called will access the USB drive looking for a file named S4E_REC.ROM. This is the reason the USB drive light comes on and the drive appears to be in use. If the file (S4E_REC.ROM) is found it is loaded into the 'system block' of the BIOS to replace the corrupted information To restore your BIOS copy the most recent version of your mainboards BIOS file to a USB key and rename it S4E_REC.ROM

The recovery mode procedure is as follows:

1. Rename the good known BIOS as S4E_REC.ROM.
2. Plug in a removable USB disk.
3. Save the S4E_REC.ROM. file into the removable USB disk.
4. Short the BIOS recovery jumper. See *Mainboard Jumpers*.
5. Power on the server.

The system will automatically enter BIOS Setup menu and display a Recovery page as follows:



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WARNING! BIOS Recovery mode has been detected

▶ Proceed with flash update

Set this option to reset NVRAM to default values

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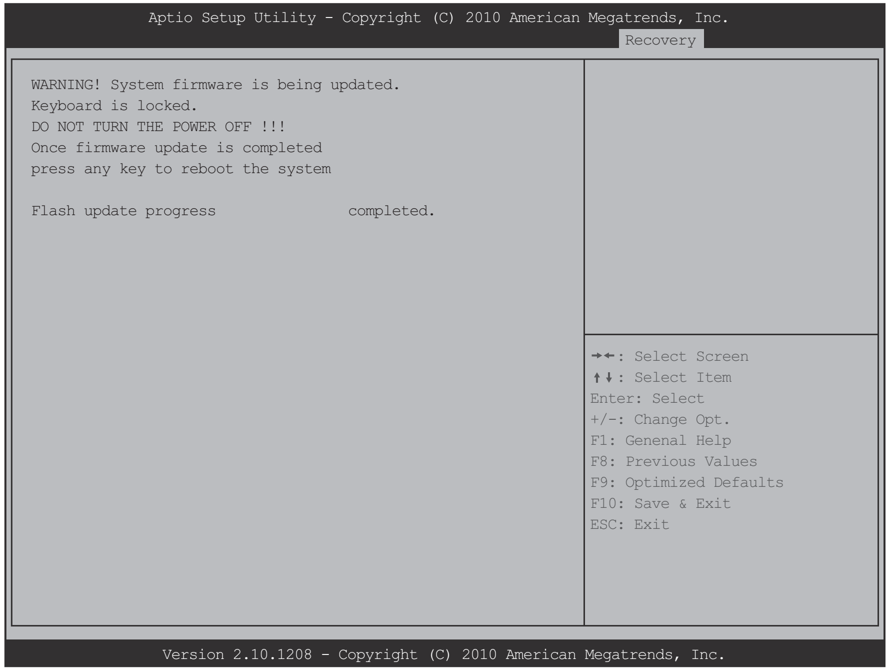
BIOS Recovery Menu

The recovery process begins.

6. Set the BIOS recovery jumper back to default position and wait until the recovery process is completed. See *Mainboard Jumpers*and Figure .



```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
                                              Recovery

WARNING! System firmware is being updated.
Keyboard is locked.
DO NOT TURN THE POWER OFF !!!
Once firmware update is completed
press any key to reboot the system

Flash update progress               completed.

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: Genenal Help
F8: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

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```

BIOS Recovery Completed

Reboot the system with the new BIOS.

Clear CMOS

The following steps will load the BIOS defaults by jumber:

1. Power down the system.
2. Move CMOS clear jumper from pins 1-2 to pins 2-3 for a few seconds. See *Mainboard Jumpers*.
3. Move CMOS clear jumper back to pins 1-2. See *Mainboard Jumpers*.
4. System automatically powers on.
5. Check BIOS defaults are loaded.

Clear Password

To clear password by jumper, do the following:

6. Power down the system.
7. Move Password Clear Jumper from pins 1-2 to pins 2-3.
8. Move Password Clear Jumper from pins 2-3 to pins 1-2.
9. Power on the system.
10. Check password is cleared.

3.3. Server Management

The BIOS supports many standard-based server management features and several proprietary features. The Intelligent Platform Management Interface (IPMI) is an industry standard and defines standardized, abstracted interfaces to platform management hardware. The BIOS implements many proprietary features that are allowed by the IPMI specification, but these features are outside the scope of the IPMI specification. This section describes the implementation of the standard and proprietary features.

Console Redirection

The BIOS supports redirection of both video and keyboard via a serial link (serial port). When console redirection is enabled, the local, or host server, keyboard input and video output are passed both to the local keyboard and video connections, and to the remote console through the serial link. Keyboard inputs from both sources are considered valid and video is displayed to both outputs.

As an option, the system can be operated without a host keyboard or monitor attached to the system and run entirely via the remote console. Utilities that can be executed remotely include BIOS Setup.

Serial Configuration Settings

For optimal configuration of Serial Over LAN or EMP see the BMC Specification.

The BIOS does not require that the splash logo be turned off for console redirection to function. The BIOS supports multiple consoles, some of which are in graphics mode and some in text mode. The graphics consoles can display the logo and the text consoles receive the redirected text.

Keystroke Mapping

During console redirection, the remote terminal sends keystrokes to the local server. The remote terminal can be a dumb terminal with a direct connection and running a communication program. The keystroke mapping follows VT-UTF8 format with the following extensions.

Keystroke Mappings

KEY	ANSI ESCAPE SEQUENCE	WINDOWS PLATFORM DESIGN NOTE
F1	<ESC><Shift>op	<ESC>1
F2	<ESC><Shift>oq	<ESC>2

Keystroke Mappings (Continued)

KEY	ANSI ESCAPE SEQUENCE	WINDOWS PLATFORM DESIGN NOTE
F3	<ESC><Shift>or	<ESC>3
F4	<ESC><Shift>os	<ESC>4
F5		<ESC>5
F6		<ESC>6
F7		<ESC>7
F8		<ESC>8
F9		<ESC>9
F10		<ESC>0
F11		<ESC>!
F12		<ESC>@
Home	<ESC>[<Shift>h	<ESC>h
End	<ESC>[<Shift>k	<ESC>k
Ins		<ESC>+
Del		<ESC>-
Page Up		<ESC>?
Page Down		<ESC>/
System Reset		<ESC>R<ESC>r<ESC>R

Limitations

- BIOS Console redirection terminates after an operating system has being loaded. The operating system is responsible for continuing console redirection after that.
- BIOS console redirection is a text console. Graphical data, such as a logo, are not redirected.

Interface to Server Management

If the BIOS determines that console redirection is enabled, it will read the current baud rate and pass this value to the appropriate management controller via the Intelligent Platform Management Bus (IPMB).

PXE Boot

The BIOS supports the EFI PXE implementation. To utilize this, the user must load EFI Simple Network Protocol driver and the UNDI driver specific for the network interface card being used. The UNDI driver should be included with the network interface card. The Simple Network Protocol driver can be obtained from http://developer.intel.com/technology/framework.

The BIOS supports legacy PXE option ROMs in legacy mode and includes the necessary PXE ROMs in the BIOS image for the onboard controllers. The legacy PXE ROM is required to boot a non-EFI operating system over the network.

Checkpoints

A checkpoint is either a byte or word value output to Debug port. The BIOS outputs checkpoints throughout bootblock and Power-On Self Test (POST) to indicate the task the system is currently executing. Checkpoints are very useful in aiding software developers or technicians in debugging problems that occur during the pre-boot process.

Checkpoint Ranges

Checkpoint Ranges

STATUS CODE RANGE	DESCRIPTION
0x01 – 0x0B	SEC execution
0x0C – 0x0F	SEC errors
0x10 – 0x2F	PEI execution up to and including memory detection
0x30 – 0x4F	PEI execution after memory detection
0x50 – 0x5F	PEI errors
0x60 – 0x8F	DXE execution up to BDS
0x90 – 0xCF	BDS execution
0xD0 – 0xDF	DXE errors
0xE0 – 0xE8	S3 Resume (PEI)

Checkpoint Ranges (Continued)

STATUS CODE RANGE	DESCRIPTION
0xE9 – 0xEF	S3 Resume errors (PEI)
0xF0 – 0xF8	Recovery (PEI)
0xF9 – 0xFF	Recovery errors (PEI)

Standard Checkpoints

SEC Phase

SEC Phase

STATUS CODE	DESCRIPTION
0x00	Not used
Progress Codes	
0x01	Power on. Reset type detection (soft/hard).
0x02	AP initialization before microcode loading
0x03	North Bridge initialization before microcode loading
0x04	South Bridge initialization before microcode loading
0x05	OEM initialization before microcode loading
0x06	Microcode loading
0x07	AP initialization after microcode loading
0x08	North Bridge initialization after microcode loading

SEC Phase (Continued)

STATUS CODE	DESCRIPTION
0x09	South Bridge initialization after microcode loading
0x0A	OEM initialization after microcode loading
0x0B	Cache initialization
SEC Error Codes	
0x0C – 0x0D	Reserved for future AMI SEC error codes
0x0E	Microcode not found
0x0F	Microcode not loaded

PEI Phase

PEI Phase

STATUS CODE	DESCRIPTION
Progress Codes	
0x10	PEI Core is started
0x11	Pre-memory CPU initialization is started
0x12	Pre-memory CPU initialization (CPU module specific)
0x13	Pre-memory CPU initialization (CPU module specific)
0x14	Pre-memory CPU initialization (CPU module specific)
0x15	Pre-memory North Bridge initialization is started
0x16	Pre-Memory North Bridge initialization (North Bridge module specific)

PEI Phase (Continued)

STATUS CODE	DESCRIPTION
0x17	Pre-Memory North Bridge initialization (North Bridge module specific)
0x18	Pre-Memory North Bridge initialization (North Bridge module specific)
0x19	Pre-memory South Bridge initialization is started
0x1A	Pre-memory South Bridge initialization (South Bridge module specific)
0x1B	Pre-memory South Bridge initialization (South Bridge module specific)
0x1C	Pre-memory South Bridge initialization (South Bridge module specific)
0x1D – 0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other).
0x30	Reserved for ASL (see ASL Status Codes section below)
0x31	Memory Installed
0x32	CPU post-memory initialization is started

PEI Phase (Continued)

STATUS CODE	DESCRIPTION
0x33	CPU post-memory initialization. Cache initialization
0x34	CPU post-memory initialization. Application Processor(s) (AP) initialization
0x35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
0x36	CPU post-memory initialization. System Management Mode (SMM) initialization
0x37	Post-Memory North Bridge initialization is started
0x38	Post-Memory North Bridge initialization (North Bridge module specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)
0x3A	Post-Memory North Bridge initialization (North Bridge module specific)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
0x3F – 0x4E	OEM post memory initialization codes
0x4F	DXE IPL is started

PEI Phase (Continued)

STATUS CODE	DESCRIPTION
PEI Error Codes	
0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed
0x52	Memory initialization error. Invalid memory size or memory modules do not match.
0x53	Memory initialization error. No usable memory detected
0x54	Unspecified memory initialization error.
0x55	Memory not installed
0x56	Invalid CPU type or Speed
0x57	CPU mismatch
0x58	CPU self test failed or possible CPU cache error
0x59	CPU micro-code is not found or micro-code update is failed
0x5A	Internal CPU error
0x5B	Reset PPI is not available
0x5C – 0x5F	Reserved for future AMI error codes
S3 Resume Progress Codes	
0xE0	S3 Resume is stared (S3 Resume PPI is called by the DXE IPL)
0xE1	S3 Boot Script execution

PEI Phase (Continued)

STATUS CODE	DESCRIPTION
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4 – 0xE7	Reserved for future AMI progress codes
S3 Resume Error Codes	
0xE8	S3 Resume Failed
0xE9	S3 Resume PPI not Found
0xEA	S3 Resume Boot Script Error
0xEB	S3 OS Wake Error
0xEC – 0xEF	Reserved for future AMI error codes
Recovery Progress Codes	
0xF0	Recovery condition triggered by firmware (Auto recovery)
0xF1	Recovery condition triggered by user (Forced recovery)
0xF2	Recovery process started
0xF3	Recovery firmware image is found
0xF4	Recovery firmware image is loaded
0xF5 – 0xF7	Reserved for future AMI progress codes
Recovery Error Codes	
0xF8	Recovery PPI is not available
0xF9	Recovery capsule is not found

PEI Phase (Continued)

STATUS CODE	DESCRIPTION
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AMI error codes

DXE Phase

DXE Phase

STATUS CODE	DESCRIPTION
0x60	DXE Core is started
0x61	NVRAM initialization
0x62	Installation of the South Bridge Runtime Services
0x63	CPU DXE initialization is started
0x64	CPU DXE initialization (CPU module specific)
0x65	CPU DXE initialization (CPU module specific)
0x66	CPU DXE initialization (CPU module specific)
0x67	CPU DXE initialization (CPU module specific)
0x68	PCI host bridge initialization
0x69	North Bridge DXE initialization is started
0x6A	North Bridge DXE SMM initialization is started
0x6B	North Bridge DXE initialization (North Bridge module specific)
0x6C	North Bridge DXE initialization (North Bridge module specific)

DXE Phase (Continued)

STATUS CODE	DESCRIPTION
0x6D	North Bridge DXE initialization (North Bridge module specific)
0x6E	North Bridge DXE initialization (North Bridge module specific)
0x6F	North Bridge DXE initialization (North Bridge module specific)
0x70	South Bridge DXE initialization is started
0x71	South Bridge DXE SMM initialization is started
0x72	South Bridge devices initialization
0x73	South Bridge DXE Initialization (South Bridge module specific)
0x74	South Bridge DXE Initialization (South Bridge module specific)
0x75	South Bridge DXE Initialization (South Bridge module specific)
0x76	South Bridge DXE Initialization (South Bridge module specific)
0x77	South Bridge DXE Initialization (South Bridge module specific)
0x78	ACPI module initialization
0x79	CSM initialization
0x7A – 0x7F	Reserved for future AMI DXE codes
0x80 – 0x8F	OEM DXE initialization codes
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started

DXE Phase (Continued)

STATUS CODE	DESCRIPTION
0x93	PCI Bus Hot Plug Controller Initialization
0x94	PCI Bus Enumeration
0x95	PCI Bus Request Resources
0x96	PCI Bus Assign Resources
0x97	Console Output devices connect
0x98	Console input devices connect
0x99	Super IO Initialization
0x9A	USB initialization is started
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0x9E – 0x9F	Reserved for future AMI codes
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xA4	SCSI initialization is started
0xA5	SCSI Reset
0xA6	SCSI Detect

DXE Phase (Continued)

STATUS CODE	DESCRIPTION
0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAA	Reserved for ASL (see ASL Status Codes section below)
0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB0	Runtime Set Virtual Address MAP Begin
0xB1	Runtime Set Virtual Address MAP End
0xB2	Legacy Option ROM Initialization
0xB3	System Reset
0xB4	USB hot plug
0xB5	PCI bus hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)

DXE Phase (Continued)

STATUS CODE	DESCRIPTION
0xB8 – 0xBF	Reserved for future AMI codes
0xC0 – 0xCF	OEM BDS initialization codes
DXE Error Codes	
0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found
0xD7	No Console Input Devices are found
0xD8	Invalid password
0xD9	Error loading Boot Option (LoadImage returned error)
0xDA	Boot Option is failed (StartImage returned error)
0xDB	Flash update is failed
0xDC	Reset protocol is not available

ACPI / ASL Checkpoints

ACPI/ASL Checkpoints

STATUS CODE	DESCRIPTION
0x01	System is entering S1 sleep state
0x02	System is entering S2 sleep state
0x03	System is entering S3 sleep state
0x04	System is entering S4 sleep state
0x05	System is entering S5 sleep state
0x10	System is waking up from the S1 sleep state
0x20	System is waking up from the S2 sleep state
0x30	System is waking up from the S3 sleep state
0x40	System is waking up from the S4 sleep state
0xAC	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

OEM-Reserved Checkpoint Ranges

OEM Reserved Checkpoint Ranges

Status Code	Description
0x05	OEM SEC initialization before microcode loading
0x0A	OEM SEC initialization after microcode loading
0x1D – 0x2A	OEM pre-memory initialization codes
0x3F – 0x4E	OEM PEI post memory initialization codes
0x80 – 0x8F	OEM DXE initialization codes
0xC0 – 0xCF	OEM BDS initialization codes

BMC

Chapter 4

4.1. Server Management Software

Introduction

This section introduces the Baseboard Management Controller (BMC), its recovery procedure in DOS, Linux, and Windows environment as well as web-based graphical user interface (GUI).

BMC Key Features and Functions

- Supports IPMI v1.5 and v2.0
- Out-of-band monitoring and control for sever management over LAN.
- Share NIC and dedicated NIC for remote management via network
- The FRU information report includes main board part number, product name, manufacturer, etc.
- Health status/Hardware monitoring report.
- Events log, view, and clear.
- Event notification via chassis LED indicator and PET (Platform Event Trap).
- Platform Event Filtering (PEF) to take selected actions for selected events, including NMI.
- Chassis management includes power control and a status report, front panel buttons and LED control.
- Watchdog and auto server restart and recovery
- Supports multi-session users, and alert destination for LAN channel.
- Support IPMB connecter that advanced server management card can communicate with BMC.

Power System

BMC controls system power through GPIO pins and IPMI chassis commands.

Front Panel User Interface

The BMC provides control panel interface functionality including indicators (Fault/status and Identify LEDs) and buttons (Power/ ID).

Power Button

The Power buttons allow to control the system status.

ID Button

The control panel Chassis Identify button toggles the state of the Chassis ID LED. If the ID LED is off, then a button press will turn the LED on (blinking). If the LED is on, a button press or IPMI Chassis Identify command will turn the LED off.

LEDs

The following table contains information on Status, ID and Heartbeat LED's

Status LED, ID LED, and Heartbeat LED

LEDS	COLOR	STATUS	DESCRIPTION
Status LED	Amber	Blinking	System Event [4.1.57] (See following Status LED table.)
	Green	On	Normal status without System Event
ID LED	Blue	Off	Normal status
		Blinking	Identify the system
Heartbeat LED	Green	Solid On/ Off	BMC is not Ready
		Blinking	BMC is Ready

The following table contains information on Status LED when amber blinking.

Status LED Activity

NO.	STATUS LED ACTIVITY	DESCRIPTION
1.	Temperature Sensor	Non-critical / critical event asserted
2	Fan Sensors	Non-critical / critical event asserted
3	Voltage Sensors	Critical event asserted
4	Power Supply	State asserted

Status LED Activity (Continued)

NO.	STATUS LED ACTIVITY	DESCRIPTION
5.	Processor	Thermal trip
6	Event Logging Disable	● SEL almost full ● SEL full
7	Post Error	System firmware error
8	Memory	● Correctable EEC error ● Uncorrectable ECC error ● Correctable ECC error logging limit reached
9.	PCI-E Bus	● Bus correctable error ● Bus uncorrectable error ● Bus fatal error
10	Watchdog 2	● Timer expired ● Hard Reset ● Power Down ● Power cycle

LAN Interface

BMC LAN interface is assigned to dedicated NIC LAN (Default) and a shared NIC. IPMI Specification v2.0 defines how IPMI messages, encapsulated in RMCP/RMCP+ packet format, can be sent to and from the BMC. This capability allows a remote console application to access the BMC and perform the following operations:

- Chassis control: obtain chassis status, reset and power-up the chassis
- Obtain system sensor status
- Obtain and Set system boot options
- Obtain Field Replaceable Unit (FRU) information
- Obtain System Event Log (SEL) entries
- Obtain Sensor Data Records (SDR)
- Set Platform Event Filtering (PEF)
- Set LAN configurations

In addition, the BMC supports LAN alerting in the form of SNMP traps that conform to the IPMI Platform Event Trap (PET) format.

Session and User

This BMC supports ten (10) user accounts. Each can have a different user name, password and privilege level. Four accounts can login simultaneously. The available user privilege levels are User, Operator, and Administrator.

RMCP+

Besides RMCP defined by DMTF, BMC also supports RMCP+ protocol defined in IPMI 2.0.

- Authentication Algorithm types supported: RAKP-none, RAKP-HMAC-SHA1, RAKP-HMAC-MD5.
- Integrity Algorithm types supported: none, HMAC-SHA1-96, HMAC-MD5-128, MD5-128.
- Confidentiality Algorithm types supported: none, AES-CBC-128.

Serial Over LAN

BMC supports 1 IPMI (Spec v2.0) specific SOL session. BMC supports redirect data from UART interface.

Time Sync

In S400-X44E BMC design, BMC does not have a local RTC to know what time it is. Each time the server powers on, BIOS will use Set SEL Time command to initialize BMC time. The remote console program interpret this time as pre-initial.

SEL

BMC supports IPMI 1.5/2.0 standard SEL operation. It can keep to maximum 909 entries SEL log. Event happened in BIOS side will be logged by using Add SEL Entry command. BMC will store them in FLASH, the time stamp field will be filled by BMC. When SEL is full, the new SEL won’t be logged but will go through PEF as usual. If AC powers off, all SELs will remain in NV.

Platform Event

Platform Event Filter

The BMC implements selectable action on an event or LAN alerting base on event. By default, no any PEF entries or actions exist, applications need to configure it to enable.

- The number of Platform Event Filter Table is 40.
- The number of Alert Policy Table is 120 and Alert Destination Table is 30. (Include Dedicated and Shared NIC)
- The policy to match an event to Platform Event Filter Table entry is IPMI 1.5 standard.
- The action support Power Off, Power Reset, Power Cycle and NMI.
- All Platform Event Filter Table is default disabled.
- PEF Startup Delay and Last Processed Event tracking is not supported.
- PEF table lookup isn't correlated to log SEL to SEL Repository.
- Serial Alerting is no support.

BMC Firmware Update

The BMC will allow users to upgrade firmware image on following entities:

- BMC
- All other upgradable entities

The update capability is provided by local and remote interfaces.

DOS Recovery Utility

SOCFLASH Utility

WebUI Update

Remote update can be performed through the remote Web console.

Temperature Monitoring

The supported temperature sensors are included in the following table.

Temperature Monitoring

TEMPERATURE (°C)	SENSOR NUMBER	LCT	LNCT	UNCT	UCT	UNRT	READING AVAILABLE
Temp_CPU0	0xB0	N/A	N/A	Tjmax -1	Tjmax	N/A	DA
Temp_CPU1	0xB1	N/A	N/A	Tjmax -1	Tjmax	N/A	DA
Temp_CPU2	0xB2	N/A	N/A	Tjmax -1	Tjmax	N/A	DA
Temp_CPU3	0xB3	N/A	N/A	Tjmax -1	Tjmax	N/A	DA
Temp_MB1	0xB4	N/A	N/A	57	59	N/A	DA
Temp_MB2	0xB5	N/A	N/A	57	59	N/A	DA

Temperature Monitoring (Continued)

TEMPERATURE (°C)	SENSOR NUMBER	LCT	LNCT	UNCT	UCT	UNRT	READING AVAILABLE
Temp_DIMM_AB	0xB6	N/A	N/A	92	94	N/A	DA
Temp_DIMM_CD	0xB7	N/A	N/A	92	94	N/A	DA
Temp_DIMM_EF	0xB8	N/A	N/A	92	94	N/A	DA
Temp_DIMM_GH	0xB9	N/A	N/A	92	94	N/A	DA
Temp_DIMM_JK	0xBA	N/A	N/A	92	94	N/A	DA
Temp_DIMM_LM	0xBB	N/A	N/A	92	94	N/A	DA
Temp_DIMM_NP	0xBC	N/A	N/A	92	94	N/A	DA
Temp_DIMM_RT	0xBD	N/A	N/A	92	94	N/A	DA

Temperature Monitoring (Continued)

TEMPERATURE (°C)	SENSOR NUMBER	LCT	LNCT	UNCT	UCT	UNRT	READING AVAILABLE
Temp_FP	0xBE	N/A	N/A	46	48	N/A	DA
Temp_HSBP	0xBF	N/A	N/A	48	50	N/A	DA
Temp_LAN	0xC0	N/A	N/A	103	105	N/A	DA
Temp_PCH	0xC1	N/A	N/A	89	91	N/A	DA
Temp_GPU_Slot1	0x40	N/A	N/A	95	100	105	DA
Temp_GPU_Slot3	0x41	N/A	N/A	95	100	105	DA
Temp_GPU_Slot6	0x42	N/A	N/A	95	100	105	DA
Temp_GPU_Slot8	0x44	N/A	N/A	95	100	105	DA

Temperature Monitoring (Continued)

TEMPERATURE (°C)	SENSOR NUMBER	LCT	LNCT	UNCT	UCT	UNRT	READING AVAILABLE
In reading available: ● AI. AC in ● DA. DC on and After post end ● DB. DC on and Before post end ● Tjmax is stored in CPU, it’s different with different type of CPU.							

Voltage Monitoring

The system supports the following voltage sensors:

Voltage Monitoring

Voltage Sensor	Sensor Number	Normal	LCT	LNCT	UNCT	UCT	Reading Available
PVCCP_CPU0	0xC4	1.00V	0.65V	0.668V	1.847V	1.883V	DA
PVCCP_CPU1	0xC5	1.00V	0.65V	0.668V	1.847V	1.883V	DA
PVCCP_CPU2	0xC6	1.00V	0.65V	0.668V	1.847V	1.883V	DA
PVCCP_CPU3	0xC7	1.00V	0.65V	0.668V	1.847V	1.883V	DA
P1V1_PBG	0xC8	1.1V	1.019V	1.046V	1.163V	1.181V	DA
P3V_VBAT	0xC9	3.0V	2.797V	2.855V	3.377V	3.464V	AI
P5V_STBY	0xCA	5.0V	4.64V	4.736V	5.264V	5.36V	AI

Voltage Monitoring (Continued)

Voltage Sensor	Sensor Number	Normal	LCT	LNCT	UNCT	UCT	Reading Available
P12V_AUX	0xCB	12.0V	11.069V	11.364V	12.662V	12.839V	AI
P12V	0xCC	12.0V	11.069V	11.364V	12.662V	12.839V	DA
P5V	0xCD	5.0V	4.64V	4.736V	5.264V	5.36V	DA
P3V3_STBY	0xCE	3.3V	3.06V	3.135V	3.48V	3.54V	AI
P3V3	0xCF	3.3V	3.06V	3.135V	3.48V	3.54V	DA

Fan Speed Monitoring

The fan speed thresholds are included in the following table.

Fan Speed Monitoring

ROTATION (RPM)	SENSOR NUMBER	LCT	LNCT	UNCT	UCT	READING AVAILABLE
FAN_SYS1	0x38	480	1040	N/A	N/A	DA
FAN_SYS2	0x39	480	1040	N/A	N/A	DA
FAN_SYS3	0x3A	480	1040	N/A	N/A	DA
FAN_SYS4	0x3B	480	1040	N/A	N/A	DA
FAN_SYS5	0x3C	480	1040	N/A	N/A	DA
FAN_SYS6	0x3D	480	1040	N/A	N/A	DA
FAN_SYS7	0x3E	500	1040	N/A	N/A	DA
FAN_SYS8	0x3F	500	1040	N/A	N/A	DA

Processor Error Detection

Thermal Trip / Processor Hot

Thermal Trip and Processor Hot can be detected by GPIO. When an error is detected, the event will be added to SEL.

Watchdog

For the BIOS and OS Agent watchdog, this system adopts a standard design as specified IPMI 1.5.

Pre-Timeout Interrupt Support

For the watchdog pre-timeout's interrupt, BMC supports SMI and NMI. SMI is used in BIOS implementation already, so using the watchdog with pre-timeout SMI is not recommended.

Timeout Action Support

For watchdog timeout actions, BMC supports power down, power cycle and power reset.

IPMI 1.5 / 2.0 Command Support List

This chapter lists all IPMI 1.5 / 2.0 mandatory and optional command support. For more detailed information please refer to the core IPMI Commands Support document. In the following section, if the command support is the same as that listed in the core IPMI commands support document, a detail description is omitted. Items listed hereafter are the only exceptions to the core document. For the following command information refers to *"IPMI v2.0 Document Revision 1.0 February 12, 2004 June 12, 2009 Markup"*. Should there be any discrepancy the IPMI specification takes priority.

IPM Device Global Commands

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Get Device ID	App	01h	M	Yes
Cold Reset	App	02h	O	Yes
Warm Reset	App	03h	O	No
Get Self Test Results	App	04h	M	Yes
Manufacture Test On	App	05h	O	Yes
Set ACPI Power State	App	06h	O	Yes
Get ACPI Power State	App	07h	O	Yes

IPM Device Global Commands (Continued)

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Get Device GUID	App	08h	O	Yes
Broadcast Commands				
Broadcast 'Get Device ID	App	01h	M	No

BMC Device and Messaging Commands

Device and Messaging Commands

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Set BMC Global Enables	App	2Eh	M	Yes
Get BMC Global Enables	App	2Fh	M	Yes
Clear Message Buffer Flags	App	30h	M	Yes
Get Message Buffer Flags	App	31h	M	Yes
Enable Message Channel Receive	App	32h	O	Yes
Get Message	App	33h	M	Yes

Device and Messaging Commands (Continued)

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Send Message	App	34h	M	Yes
Read Event Message Buffer	App	35h	O	Yes
Get BT Interface Capabilities	App	36h	M	No
Get System GUID	App	37h	O	Yes
Get Channel Authentication Capabilities	App	38h	O	Yes
Get Session Challenge	App	39h	O	Yes
Activate Session Command	App	3Ah	O	Yes
Set Session Privilege Level Command	App	3Bh	O	Yes
Close Session	App	3Ch	O	Yes
Get Session Information	App	3Dh	O	Yes
Get Authentication Code Command	App	3Fh	O	Yes
Set Channel Access Commands	App	40h	O	Yes
Get Channel Access Commands	App	41h	O	Yes
Get Channel Info Command	App	42h	O	Yes

Device and Messaging Commands (Continued)

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Set User Access Commands	App	43h	O	Yes
Get User Access Commands	App	44h	O	Yes
Set User Name Commands	App	45h	O	Yes
Get User Name Commands	App	46h	O	Yes
Set User Password Commands	App	47h	O	Yes
Active Payload Command	App	48h	O	Yes
Deactivate Payload Command	App	49h	O	Yes
Get Payload Activation Status	App	4Ah	O	Yes
Get Payload Instance Info Command	App	4Bh	O	Yes
Set User Payload Access	App	4Ch	O	Yes
Get User Payload Access	App	4Dh	O	Yes
Get Channel Payload Support	App	4Eh	O	Yes

Device and Messaging Commands (Continued)

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Get Channel Payload Version	App	4Fh	O	Yes
Get Channel OEM Payload Info	App	50h	O	Yes
Master Write-Read I^{2}C	App	52h	M	Yes
Get Channel Cipher Suites	App	54h	O	Yes
Suspend/Resume Payload Encryption	App	55h	O	Yes
Set Channel Security Keys	App	56h	O	Yes
Get System Interface Capabilities	App	57h	O	No

BMC Watchdog Timer Commands

Watchdog Timer Commands

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Reset Watchdog Timer	App	22h	M	Yes
Set Watchdog Timer	App	24h	M	Yes
Get Watchdog Timer	App	25h	M	Yes

Chassis Commands

Chassis Commands

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Get Chassis Capabilities	Chassis	00h	M	Yes
Get Chassis Status	Chassis	01h	M	Yes
Chassis Control	Chassis	02h	M	Yes
Chassis Reset	Chassis	03h	O	No
Chassis Identify	Chassis	04h	O	Yes
Set Chassis Capabilities	Chassis	05h	O	Yes
Set Power Restore Policy	Chassis	06h	O	Yes
Get System Reset Cause	Chassis	07h	O	Yes
Set System Boot Options	Chassis	08h	O	Yes
Get System Boot Options	Chassis	09h	O	Yes
Set Front Panel Button Enable	Chassis	0Ah	O	Yes
Set Power Cycle Interval	Chassis	0Bh	O	Yes

Chassis Commands (Continued)

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Get POH Counter	Chassis	0Fh	O	No

Event Commands

Event Commands

COMMAND	NETFN	CMD	O/M		SUPPORTED?
			EVENT RECEIVER	EVENT GENERATOR	
Set Event Receiver	S/E	00h	M	M	Yes
Get Event Receiver	S/E	01h	M	M	Yes
Platform Event	S/E	02h	M	M	Yes

SEL Commands

SEL Commands

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Get SEL Info	Storage	40h	M	Yes
Get SEL Allocation Info	Storage	41h	O	Yes
Reserve SEL	Storage	42h	O	Yes
Get SEL Entry	Storage	43h	M	Yes
Add SEL Entry	Storage	44h	M	Yes
Partial Add SEL Entry	Storage	45h	M	No*
Delete SEL Entry	Storage	46h	O	Yes
Clear SEL	Storage	47h	M	Yes
Get SEL Time	Storage	48h	M	Yes
Set SEL Time	Storage	49h	M	Yes
Get Auxiliary Log Status	Storage	5Ah	O	No
Set Auxiliary Log Status	Storage	5Bh	O	No
* “Partial Add SEL” is not supported when “Add SEL” is active.				

SDR Repository Commands

SDR Repository Commands

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Get SDR Repository Info	Storage	20h	M	Yes
Get SDR Repository Allocation Info	Storage	21h	O	No
Reserve SDR Repository	Storage	22h	M	Yes
Get SDR	Storage	23h	M	Yes
Add SDR	Storage	24h	M	No
Partial ADD SDR	Storage	25h	M	Yes
Delete SDR	Storage	26h	O	No
Clear SDR Repository	Storage	27h	M	Yes
Get SDR Repository Time	Storage	28h	O	Yes
Set SDR Repository Time	Storage	29h	O	Yes
Enter SDR Repository Update Mode	Storage	2Ah	O	No
Exit SDR Repository Update Mode	Storage	2Bh	O	No
Run Initialization Agent	Storage	2Ch	O	Yes

FRU Inventory Device Commands

FRU Inventory Device Command s

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Get FRU Inventory Area Info	Storage	10h	M	Yes
Read FRU Inventory Data	Storage	11h	M	Yes
Write FRU Inventory Data	Storage	12h	M	Yes

Sensor Device Commands

Sensor Device Commands

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Get Device SDR Info	S/E	20h	O	No
Get Device SDR	S/E	21h	O	No
Reserve Device SDR Repository	S/E	22h	O	No
Get Sensor Reading Factors	S/E	23h	O	Yes
Set Sensor Hysteresis	S/E	24h	O	Yes
Get Sensor Hysteresis	S/E	25h	O	Yes
Set Sensor Threshold	S/E	26h	O	Yes
Get Sensor Threshold	S/E	27h	O	Yes
Set Sensor Event Enable	S/E	28h	O	Yes
Get Sensor Event Enable	S/E	29h	O	Yes
Re-arm Sensor Events	S/E	2Ah	O	Yes
Get Sensor Event Status	S/E	2Bh	O	Yes
Get Sensor Reading	S/E	2Dh	M	Yes
Set Sensor Type	S/E	2Eh	O	No
Get Sensor Type	S/E	2Fh	O	No
Set Sensor Reading and Event Status	S/E	30h	M	Yes

LAN Command

LAN Commands

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Set LAN Configuration Parameters*	Transport	01h	M	Yes
Get LAN Configuration Parameters*	Transport	02h	M	Yes
Suspend BMC ARP	Transport	03h	O	No
Get IP/UDP/RMCP Statistics	Transport	04h	O	No
*Parameters 9 and 25 are not supported.				

SOL Command

SOL Command

COMMAND	NETFN	CMD	O/M	SUPPORTED?
SOL Activating	Transport	20h	O	No
Set SOL Configuration Parameters	Transport	21h	O	Yes
Get SOL Configuration Parameters	Transport	22h	O	Yes

PEF / PET Alerting Commands

PEF/PET Alerting Commands

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Get PEF Capabilities	S/E	10h	M	Yes
Arm PEF Postpone Timer	S/E	11h	M	Yes
Set PEF Configuration Parameters	S/E	12h	M	Yes
Get PEF Configuration Parameters	S/E	13h	M	Yes
Set Last Processed Event ID	S/E	14h	M	Yes

PEF/PET Alerting Commands

COMMAND	NETFN	CMD	O/M	SUPPORTED?
Get Last Processed Event ID	S/E	15h	M	Yes
Alert Immediate	S/E	16h	O	Yes
PET Acknowledge	S/E	17h	O	Yes

OEM Command

OEM Command

NO.	COMMAND	NETFN / LUN	CMD	C	U	O	A
1	Set POST Start	0x30/00	0x73				X
2	Set POST End	0x30/00	0x74				X
3	Set DIMM Information	0x30/00	0x1C				X
4	Get DIMM Information	0x30/00	0x1D		X	X	X
5	Set Processor Information	0x30/00	0x1A				X
6	Get Processor Information	0x30/00	0x1B		X	X	X
7	Set BIOS Version	0x30/00	0x72				X
8	Get BIOS Version	0x30/00			X	X	X

4.2. BMC Recovery

This section provides guidelines on BMC recovery process in DOS, Linux, and Windows systems.

Recovery Process in DOS System

To recover BMC on a DOS system, do as follows:

1. Boot into DOS.
2. Navigate to the *Upgrade Utilit*y folder.
3. Run *dos.bat*.

The BMC recovery is complete.

Recovery Process in Linux System

To recover BMC on a Linux system, do as follows:

1. Boot into Linux.
2. Navigate to the *Upgrade Utility* folder.
3. Run *linux.sh*.

The BMC recovery is complete.

Recovery Process in Windows System

To recover BMC on a Windows system, do as follows:

1. Boot into Windows.
2. Navigate to the *Upgrade Utility* folder.
3. Run *win.bat*.

The BMC recovery is complete.

4.3. Web Graphical User Interface for ESMS

Using the Web GUI

The BMC firmware features an embedded web server enabling users to connect to the BMC using a Web browser (e.g. Microsoft Internet Explorer). The Web GUI shows system information, system events, system status of managed servers, and other system-related information.

The Web-based GUI is supported on the following browsers:

- Internet Explorer 7 and above
- Firefox 2.0 and above
- Google Chrome 2.0 and above
- Safari 3.0 and above
- Opera 9.64 and above

Login

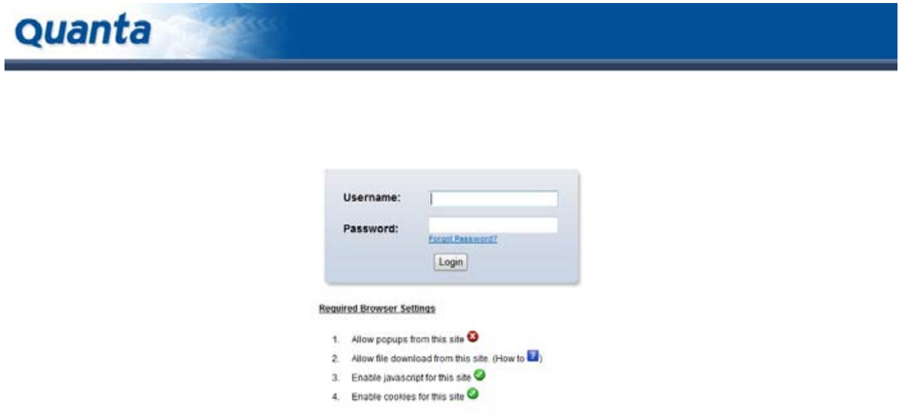
Enter the IP address or URL (default DHCP\static IP address) into the address bar of the web browser.

When connecting to the BMC the Login screen prompts for the username and password. This authentication with SSL protection prevents unauthorized intruders from gaining access to the BMC web server.

When a user is authenticated they can manage the server according to the privilege of their role.

The OEM Proprietary, Administrator and Operator privilege levels are authorized to login to the web interface. The User and

No Access privilege levels do not allow access through the BMC web GUI.



Required Browser Settings

1. Allow popups from this site ✗
2. Allow file download from this site. (How to ?)
3. Enable javascript for this site ✓
4. Enable cookies for this site ✓

Login Web Page

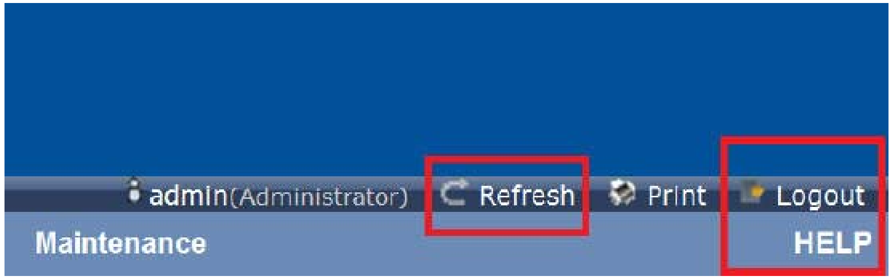
Default Username and Password

FIELD	DEFAULT
Username	admin
Password	admin

After passing authentication, the following web page appears.

Note:
The default username and password are in lowercase characters. It is advised to change the admin password once you have logged in.

Click the **Help** button on the right corner of the page for assistance, the **Refresh** button to refresh the page, or the **Logout** button to exit.



Main Web Page

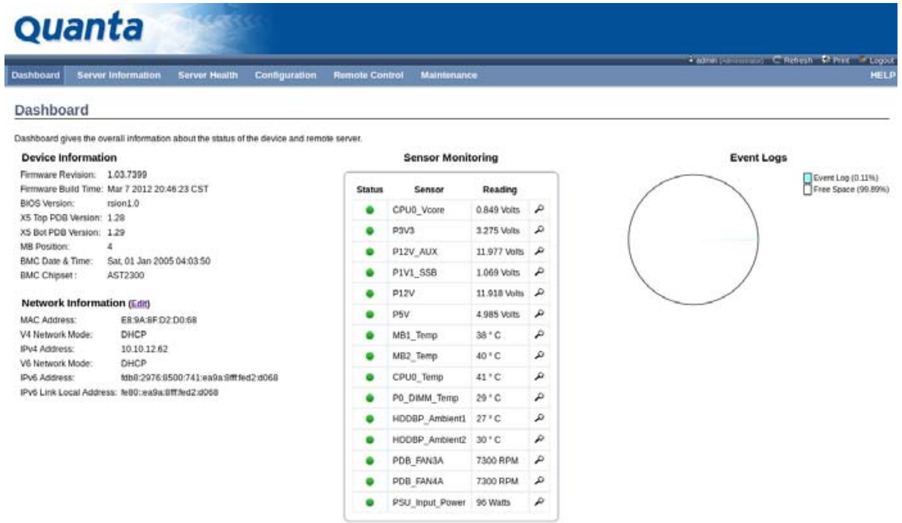
Main Web Page

MENU ITEM	DESCRIPTION
System Information	Shows system information.
Server Health	Monitoring status of the server.
Configuration	Configuration of the IPMI settings.
Remote Control	Launch KVM console and perform power control.
Maintenance	Allows the user to do firmware update.
Language	Sets interface language. **Note:** Currently only supports English.

Dashboard

The Dashboard page displays the overall information on status of the device.

To open the **Dashboard** page, click Dashboard from the main menu. A sample screenshot of the Dashboard page is as follows:



Dashboard

Dashboard gives the overall information about the status of the device and remote server.

Device Information

Firmware Revision:	1.03.7399
Firmware Build Time:	Mar 7 2012 20:46:23 CST
BIOS Version:	rsion1.0
X5 Top PDB Version:	1.28
X5 Bot PDB Version:	1.29
MB Position:	4
BMC Date & Time:	Sat, 01 Jan 2005 04:03:50
BMC Chipset :	AST2300

Network Information (Edit)

MAC Address:	E8:9A:8F:D2:D0:68
V4 Network Mode:	DHCP
IPv4 Address:	10.10.12.62
V6 Network Mode:	DHCP
IPv6 Address:	fdb8:2976:8500:741:ea9a:8fff:fed2:d068
IPv6 Link Local Address:	fe80::ea9a:8fff:fed2:d068

Sensor Monitoring

Status	Sensor	Reading	
●	CPU0_Vcore	0.849 Volts	
●	P3V3	3.275 Volts	
●	P12V_AUX	11.977 Volts	
●	P1V1_SSB	1.069 Volts	
●	P12V	11.918 Volts	
●	P5V	4.985 Volts	
●	MB1_Temp	38 ° C	
●	MB2_Temp	40 ° C	
●	CPU0_Temp	41 ° C	
●	P0_DIMM_Temp	29 ° C	
●	HDDBP_Ambient1	27 ° C	
●	HDDBP_Ambient2	30 ° C	
●	PDB_FAN3A	7300 RPM	
●	PDB_FAN4A	7300 RPM	
●	PSU_Input_Power	96 Watts	

Dashboard

A brief description of the Dashboard page is given in the next section.

Device Information

The Device Information displays the following information:

Device Information Page

ITEM	DESCRIPTION
Firmware Revision	The revision number of the firmware.
Firmware Build Time	Firmware date and time.
BMC Chipset	This field shows BMC chipset type.

Note:

BMC Chipset type support list is as follows:

- AST2300: supports virtual KVM function and related setting item.
- AST2300 without RKVM: does not support virtual KVM function and related setting item.

Note:

If BMC Chipset type is AST2300 without RKVM, the Console Redirection, Mouse Mode, Remote Session, and Virtual Media menu items are not visible.

Network Information

The Network Information of the device with the following fields is shown in the following table. To edit the network Information, click **Edit**.

Network Information

ITEM	DESCRIPTION
MAC Address	Read only field showing the IP address of the device.
V4 Network Mode	The v4 network mode options are the following disable, static, or DHCP.
IPv4 Address	The IPv4 address of the device (could be static or DHCP).
V6 Network Mode	The v6 network mode options are disable, static, or DHCP.
IPv6 Address:	The IPv6 address of the device.

Sensor Monitoring

Lists all the available sensors on the device.

The status column displays the state of the device as follows:

STATUS (ICON)	DESCRIPTION
🟢	Normal state
⚠	Warning state
🔴	Critical state

If you click on 🔍 , the sensor page for that particular sensor will be displayed.

Event Logs

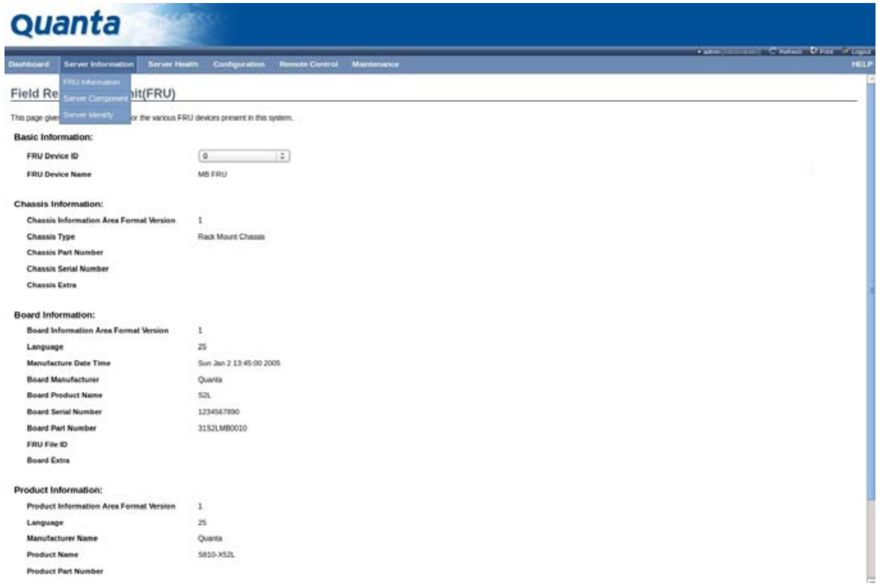
A graphical representation of all events incurred by various sensors as well as occupied/available space in logs. Clicking on the color-coded rectangle in the Legend for the chart, allows to view a list of specific events only.

Server Information

The Server Information Group consists of the following three items:

- FRU Information
- Server Component
- Server Identify

The following screenshot displays the Server Information menu items:



Field Re nit(FRU)

This page give or the various FRU devices present in this system.

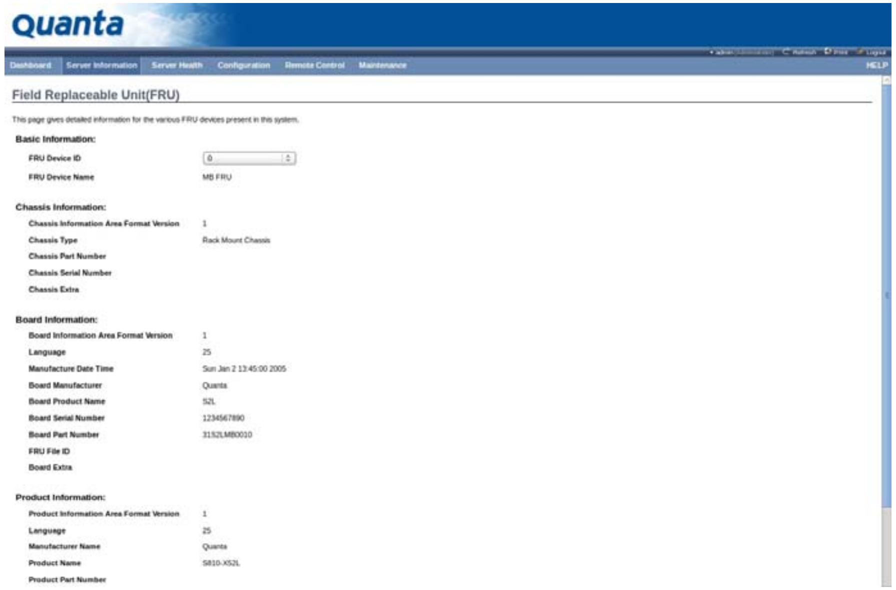
Basic Information:	
FRU Device ID	0
FRU Device Name	MB FRU
Chassis Information:	
Chassis Information Area Format Version	1
Chassis Type	Rack Mount Chassis
Chassis Part Number	
Chassis Serial Number	
Chassis Extra	
Board Information:	
Board Information Area Format Version	1
Language	25
Manufacture Date Time	Sun Jan 2 13:45:00 2005
Board Manufacturer	Quanta
Board Product Name	S2L
Board Serial Number	1234567890
Board Part Number	31S2LMB0010
FRU File ID	
Board Extra	
Product Information:	
Product Information Area Format Version	1
Language	25
Manufacturer Name	Quanta
Product Name	S810-X52L
Product Part Number	

Server Information – Menu

FRU Information

The FRU Information Page displays the BMC FRU file information. The information displayed in this page is Basic Information, Common Header Information, Chassis Information, Board Information and Product Information of the FRU device.

To open the FRU Information Page, click on **FRU Information** on top menu. Select a FRU Device ID from the Basic Information section to view the details of the selected device. A screenshot of FRU Information page is shown as follows:



Field Replaceable Unit(FRU)

This page gives detailed information for the various FRU devices present in this system.

Basic Information:

FRU Device ID	0
FRU Device Name	MB FRU

Chassis Information:

Chassis Information Area Format Version	1
Chassis Type	Rack Mount Chassis
Chassis Part Number	
Chassis Serial Number	
Chassis Extra	

Board Information:

Board Information Area Format Version	1
Language	25
Manufacture Date Time	Sun Jan 2 13:45:00 2005
Board Manufacturer	Quanta
Board Product Name	S2L
Board Serial Number	1234567890
Board Part Number	31S2LMB0010
FRU File ID	
Board Extra	

Product Information:

Product Information Area Format Version	1
Language	25
Manufacturer Name	Quanta
Product Name	S810-X52L
Product Part Number	

FRU Information Page

A brief description of the fields is given in the following sections.

Basic Information

Basic Information

ITEM	DESCRIPTION
FRU device ID	The ID of the device.
FRU Device Name	The device name of the selected FRU device.

Chassis Information

- Chassis Information Area Format Version
- Chassis Type
- Chassis Part Number
- Chassis Serial Number
- Chassis Extra

Board Information

- Board Information Area Format Version
- Language
- Manufacture Date Time
- Board Manufacturer

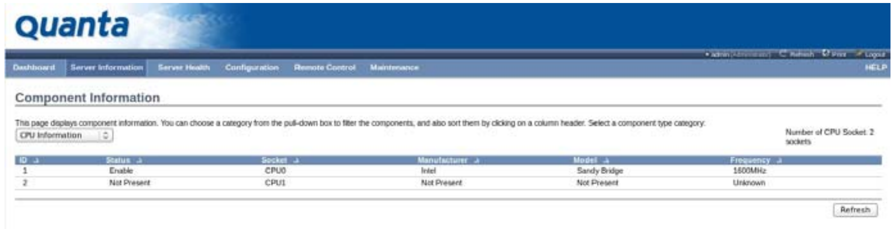
- Board Product Name
- Board Serial Number
- Board Part Number
- FRU File ID
- Board Extra

Product Information

- Product Information Area Format Version
- Language
- Manufacturer Name
- Product Name
- Product Part Number
- Product Version
- Product Serial Number
- Asset Tag

Server Component

The Component Information page displays the CPU and memory information.



Component Information

This page displays component information. You can choose a category from the pull-down box to filter the components, and also sort them by clicking on a column header. Select a component type category:

CPU Information

Number of CPU Socket: 2 sockets

ID	Status	Socket	Manufacturer	Model	Frequency
1	Enable	CPU0	Intel	Sandy Bridge	1600MHz
2	Not Present	CPU1	Not Present	Not Present	Unknown

Refresh

Component Information Page

Component Information Page

ITEM	DESCRIPTION
CPU Information	Displays the following information: ● CPU ID, ● Status, ● Socket, ● Manufacturer, ● Model, ● Frequency

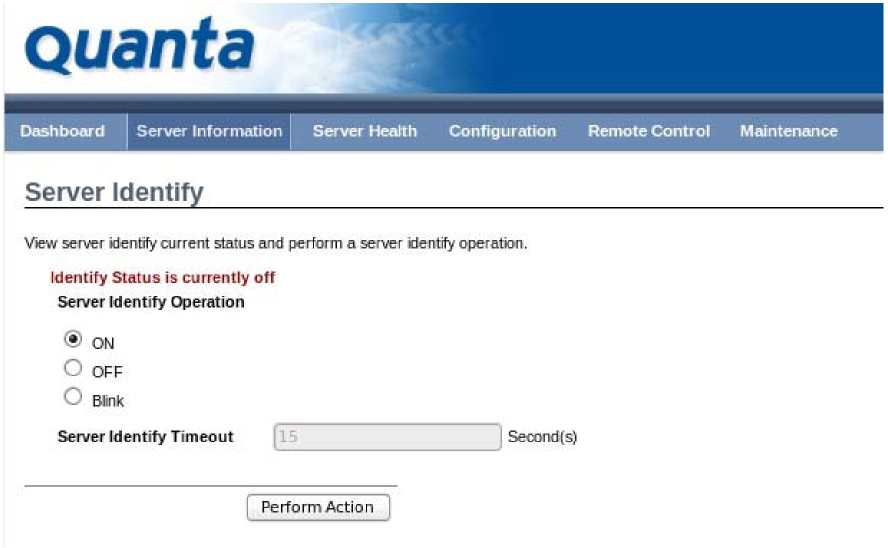
Component Information Page (Continued)

ITEM	DESCRIPTION
Memory Information	Displays the following information: ● Memory ID, ● Status, ● Socket, ● Module Size, ● Model, ● Frequency, and ● Memory type*.

Note:
*DDR3 ECC or non-ECCUDIMM, RDIMM, and LRDIMM memory types support both normal voltage (1.5V) and low voltage (1.35V).

Server identify

The Server Identify page displays the indicator LED status. You can select a Server Identify Operation to control the indicator LED.



Server Identify

View server identify current status and perform a server identify operation.

Identify Status is currently off

Server Identify Operation

◉ ON
○ OFF
○ Blink

Server Identify Timeout 15 Second(s)

Perform Action

Server Identify Page

Server Identify Page

ITEM	DESCRIPTION
Current Server Identify Status	The server status: On or Off.

Server Identify Page (Continued)

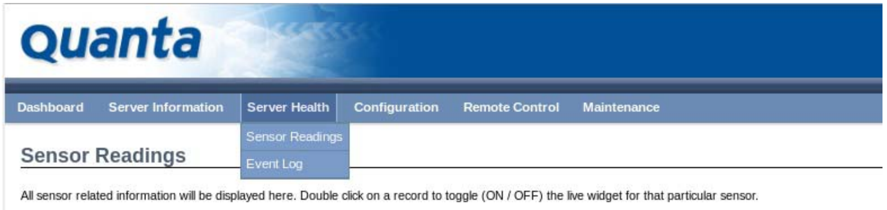
ITEM	DESCRIPTION
Server Identify Operation	Server identify LED operation with the following options: ● ON ● OFF ● Blink
Server Identify Timeout	Server timeout value when a Blink Identify Operation is selected. For Blink Operation the time period must be from 1 to 255 seconds. When 255 seconds is selected, the blinking is continuous.
Perform Action	Executes the selected Server Identify Operation.

Server Health Group

The Server Health Group consists of the following three items:

- Sensor Readings
- Event Log
- System and Audio Log

The Server Health screenshot allows to select Sensor Readings or Event Log as shown in the following image:



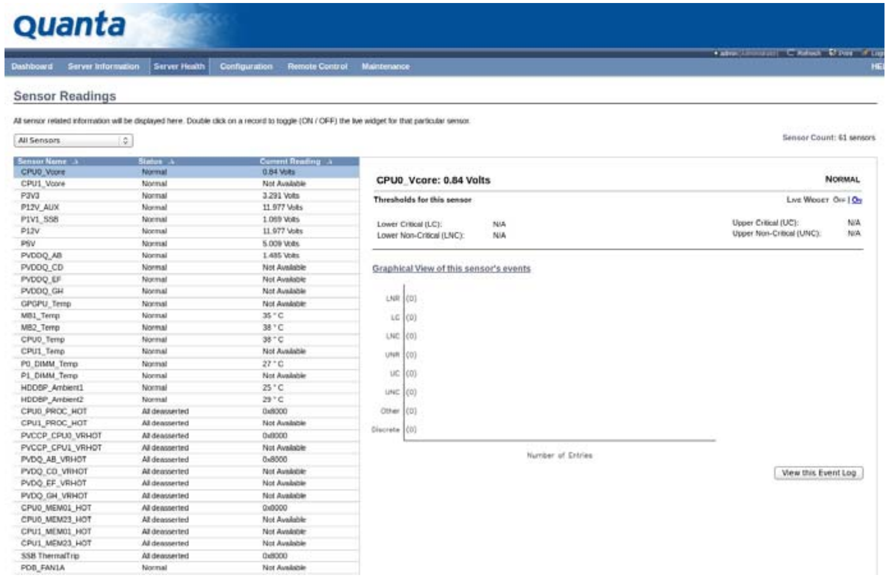
All sensor related information will be displayed here. Double click on a record to toggle (ON / OFF) the live widget for that particular sensor.

Server Health – Menu

Sensor Readings

The Sensor Readings page displays all the sensor related information.

To open the Sensor readings page, click **Server Health > Sensor Readings** from the top menu. Click on a record to display more information on a particular sensor, including thresholds and a graphical representation of all associated events. A screenshot of Sensor Readings page is shown in the following image:



Sensor Readings

All sensor related information will be displayed here. Double click on a record to toggle (ON / OFF) the live widget for that particular sensor.

Sensor Count: 61 sensors

Sensor Name	Status	Current Reading
CPU0_Vcore	Normal	0.84 Volts
CPU1_Vcore	Normal	Not Available
P3V3	Normal	3.291 Volts
P12V_AUX	Normal	11.977 Volts
P1V1_SSB	Normal	1.069 Volts
P12V	Normal	11.977 Volts
P5V	Normal	5.009 Volts
PVDDQ_AB	Normal	1.485 Volts
PVDDQ_CD	Normal	Not Available
PVDDQ_EF	Normal	Not Available
PVDDQ_GH	Normal	Not Available
GPGPU_Temp	Normal	Not Available
MB1_Temp	Normal	35 ° C
MB2_Temp	Normal	38 ° C
CPU0_Temp	Normal	38 ° C
CPU1_Temp	Normal	Not Available
P0_DIMM_Temp	Normal	27 ° C
P1_DIMM_Temp	Normal	Not Available
HDDBP_Ambient1	Normal	25 ° C
HDDBP_Ambient2	Normal	29 ° C
CPU0_PROC_HOT	All deasserted	0x8000
CPU1_PROC_HOT	All deasserted	Not Available
PVCCP_CPU0_VRHOT	All deasserted	0x8000
PVCCP_CPU1_VRHOT	All deasserted	Not Available
PVDQ_AB_VRHOT	All deasserted	0x8000
PVDQ_CD_VRHOT	All deasserted	Not Available
PVDQ_EF_VRHOT	All deasserted	Not Available
PVDQ_GH_VRHOT	All deasserted	Not Available
CPU0_MEM01_HOT	All deasserted	0x8000
CPU0_MEM23_HOT	All deasserted	Not Available
CPU1_MEM01_HOT	All deasserted	Not Available
CPU1_MEM23_HOT	All deasserted	Not Available
SSB ThermalTrip	All deasserted	0x8000
PDB_FAN1A	Normal	Not Available

CPU0_Vcore: 0.84 Volts NORMAL

Thresholds for this sensor LIVE WIDGET OFF | ON

Lower Critical (LC):	N/A	Upper Critical (UC):	N/A
Lower Non-Critical (LNC):	N/A	Upper Non-Critical (UNC):	N/A

Graphical View of this sensor's events

Sensor Readings Page

A brief description of the Sensor Readings page fields is given in the following sections.

Sensor Type

You can select a specific type of sensor from a drop-down menu. The list of sensors include the Sensor Name, Status, and Current Reading. The All Sensors option allows to view all the available sensor details, and select a specific type of sensor.

When a specific type of sensor is selected, on the right hand side of the screen will be displayed the Thresholds for the sensor.

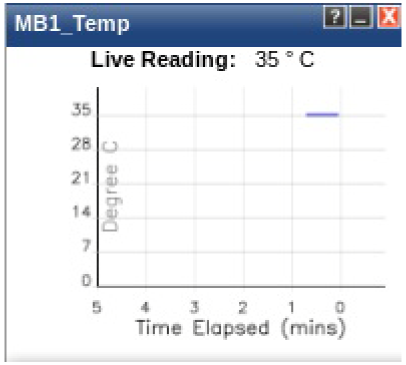
The total of six thresholds are available as follows:

- Lower Non-Recoverable (LNR)
- Lower Critical (LC)
- Lower Non-Critical (LNC)
- Upper Non-Recoverable (UNR)
- Upper Critical (UC)
- Upper Non-Critical (UNC)

The threshold states can be Lower Non-critical - going low, Lower Non-critical - going high, Lower Critical - going low, Lower Critical - going high, Lower Non-recoverable - going low, Lower Non-recoverable - going high, Upper Non-critical - going low, Upper Non-critical - going high, Upper Critical - going low, Upper Critical - going high, Upper Non-recoverable - going low, Upper Non-recoverable - going high.

Live Widget

The widget window can be turned On and Off for a selected sensor. Widget provides a dynamic representation of the readings for the sensor. The following image shows and example widget:



Widget Window

Note:

Widgets provide real time information on a particular sensor. User can track a sensor's behavior over a specific amount of time at specific intervals. The result will be displayed as a line graph on the widget. The data on widgets are updating in real time until the widget is closed.

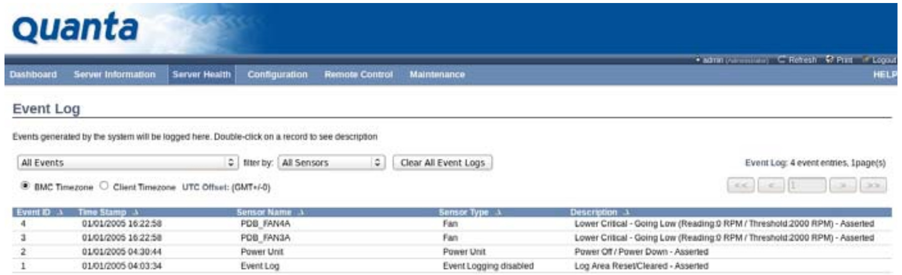
View this Event Log

View the Event Log page for the selected sensor.

Event Log

This page displays the list of event logs occurred by the different sensors on this device. Double click on a record to see the details of that entry. You can use the sensor type or sensor name filter options to view those specific events or you can also sort the list of entries by clicking on any of the column headers.

To open the Event Log page, click **Server Health > Event Log** from the top menu. A sample screenshot of Event Log page is shown below.



Event Log

Events generated by the system will be logged here. Double-click on a record to see description

All Events filter by: All Sensors Clear All Event Logs

Event Log: 4 event entries, 1page(s)

● BMC Timezone ○ Client Timezone UTC Offset: (GMT+/-0)

Event ID	Time Stamp	Sensor Name	Sensor Type	Description
4	01/01/2005 16:22:58	PDB_FAN4A	Fan	Lower Critical - Going Low (Reading:0 RPM / Threshold:2000 RPM) - Asserted
3	01/01/2005 16:22:58	PDB_FAN3A	Fan	Lower Critical - Going Low (Reading:0 RPM / Threshold:2000 RPM) - Asserted
2	01/01/2005 04:30:44	Power Unit	Power Unit	Power Off / Power Down - Asserted
1	01/01/2005 04:03:34	Event Log	Event Logging disabled	Log Area Reset/Cleared - Asserted

Event Log Page

A brief description of the Even Log page fields is given in the following sections.

Event Log Category

The category could be either a sensor-specific event, BIOS generated event or system management software event.

Event Log Category

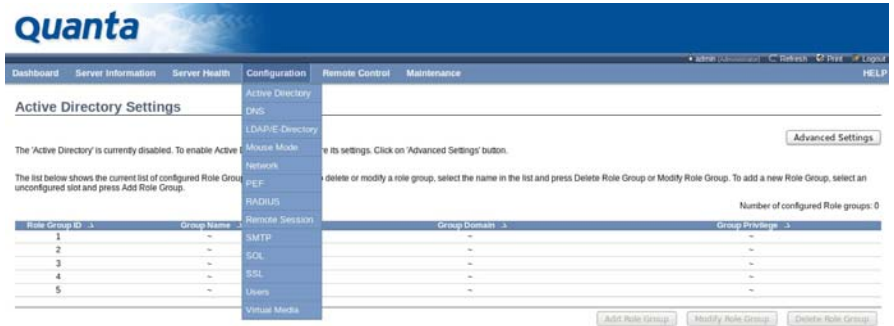
ITEM	DESCRIPTION
Filter Type	The type of filter listed. **Note:** Once the Event Log category and Filter type are selected, the list of events will be displayed with the Event ID, Time Stamp, Sensor Type, Sensor Name and Description.
BMC Timezone	BMC UTC offset timestamp value of the events.
Client Timezone	Events of client UTC offset timestamp.
Clear All Event Logs	Deletes all the existing records for all the sensors.

Procedure:

1. From the **Event Log Category** drop down menu select the event categories.
2. From the **Filter Type** drop down list select the sensor name filter to view the event for the selected filter.
3. Select either **BMC Timezone** or **Client Timezone**.
4. To clear all events from the list, click **Clear All Event Logs** button.

Configuration Group

Configuration Group page allows access to various configuration settings. A screenshot of the Configuration Group menu is shown in the following figure:



Active Directory Settings

The 'Active Directory' is currently disabled. To enable Active [illegible]e its settings. Click on 'Advanced Settings' button.

The list below shows the current list of configured Role Grou[illegible] delete or modify a role group, select the name in the list and press Delete Role Group or Modify Role Group. To add a new Role Group, select an unconfigured slot and press Add Role Group.

Number of configured Role groups: 0

Role Group ID	Group Name	Group Domain	Group Privilege
1	~	~	~
2	~	~	~
3	~	~	~
4	~	~	~
5	~	~	~

Configuration Group Menu

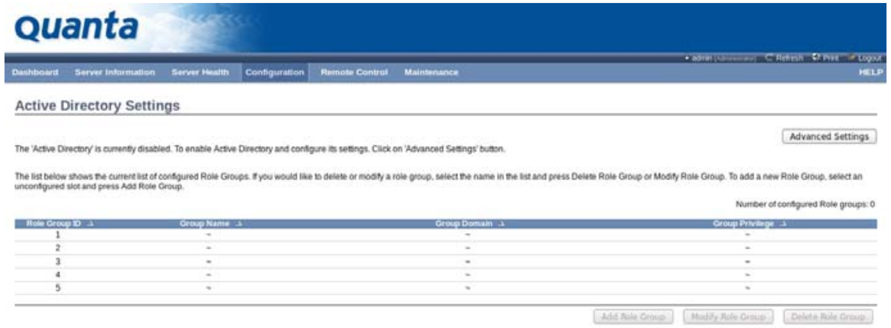
A detailed description of the Configuration menu is given in the following sections.

Active Directory

An Active Directory (AD) is a directory structure used in Microsoft Windows based computers and servers, to store information and data on networks and domains. AD provides a variety of functions including the ability to provide information on objects, organizes these objects for easy retrieval and access, allows the access of end users and administrators, and allows the administrator to set up security for the directory.

This Active Directory Settings page as shown on the following figure, allows to Configure Active Directory Server Settings.

To open Active Directory Settings page, click **Configuration > Active Directory** from the main menu. A sample screenshot of Active Directory Settings Page is shown in the following screenshot:



Active Directory Settings

The 'Active Directory' is currently disabled. To enable Active Directory and configure its settings. Click on 'Advanced Settings' button.

The list below shows the current list of configured Role Groups. If you would like to delete or modify a role group, select the name in the list and press Delete Role Group or Modify Role Group. To add a new Role Group, select an unconfigured slot and press Add Role Group.

Number of configured Role groups: 0

Role Group ID	Group Name	Group Domain	Group Privilege
1	~	~	~
2	~	~	~
3	~	~	~
4	~	~	~
5	~	~	~

Active Directory Settings Page

Active Directory Settings Page

ITEM	DESCRIPTION
Advanced Settings	Active Directory advanced settings configuration options are as follows: ● Enable Active Directory Authentication, ● User Domain name, ● Time Out, and ● Up to three Domain Controller Server Addresses.

Active Directory Settings Page (Continued)

ITEM	DESCRIPTION
Role Group ID	The name that identifies the role group in the Active Directory. ● Role Group Name is a string of 255 alpha-numeric characters. ● Special symbols hyphen and underscore are allowed.
Group Name	This name identifies the role group in Active Directory. **Note:** ● Role Group Name is a string of 255 alpha-numeric characters. ● Special symbols hyphen and underscore are allowed.
Group Domain	The domain where the role group is located. **Note:** ● Domain Name is a string of 255 alpha-numeric characters. ● Special symbols hyphen, underscore and dot are allowed.
Group Privilege	The level of privilege to assign to this role group.
Add Role Group	To add a new role group to the device.
Modify role Group	To modify that role group. Alternatively, double click on the configured slot.
Delete Role Group	To delete an existing Role Group.

Procedure:

Entering the details in Advanced Active Directory Settings Page

1. Click on **Advanced Settings** to open the Advanced Active Directory Settings Page.

   Advanced Active Directory Settings Page

2. In the Active Directory Settings Page, enter the following details.
3. **Active Directory Authentication:** To enable/disable Active Directory, check or uncheck the **Enable** checkbox respectively.

Note:
If you have enabled Active Directory Authentication, enter the required information to access the Active Directory server.

4. Specify the Domain Name for the user in the **User Domain Name** field. e.g. MyDomain.com
5. Specify the time (in seconds) to wait for Active Directory queries to complete in the **Time Out** field.

Note:

- Default Time out value: 120 seconds.
- Range from 15 to 300 allowed.

6. Configure IP addresses in **Domain Controller Server Address1, Domain Controller Server Address2 & Domain Controller Server Address3**.

Note:
IP address of Active Directory server: At least one Domain Controller Server Address must be configured.

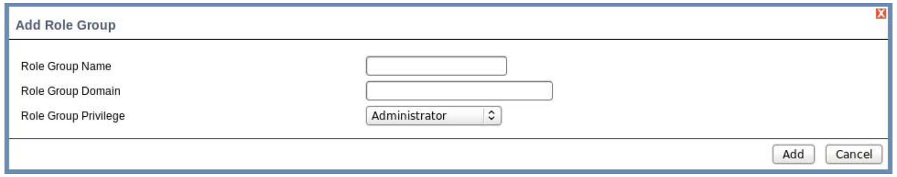
- IP Address made of 4 numbers separated by dots as in "xxx.xxx.xxx.xxx".
- Each number ranges from 0 to 255.
- First number must not be 0.

Note:
Domain Controller Server Addresses will supports IPv4 Address format and IPv6 Address format.

7. Click **Save** to save the entered settings and return to Active Directory Settings Page.
8. Click **Cancel** to cancel the entry and return to Active Directory Settings Page.

To add a Role Group

9. In the Active Directory Settings Page, select a blank row and click **Add Role Group** to open the Add Role group Page as shown in the screenshot below.



Add Role Group

Role Group Name

Role Group Domain

Role Group Privilege: Administrator

Add Role group Page

10. In the **Role Group Name** field, enter the name that identifies the role group in the Active Directory.

Note:

- Role Group Name is a string of 255 alpha-numeric characters.
- Special symbols hyphen and underscore are allowed.

11. In the **Role Group Domain** field, enter the domain where the role group is located.

Note:

- Domain Name is a string of 255 alpha-numeric characters.
- Special symbols hyphen, underscore and dot are allowed.

12. In the **Role Group Privilege** field, enter the level of privilege to assign to this role group.

13. Click **Add** to save the new role group and return to the Role Group List.

14. Click **Cancel** to cancel the settings and return to the Role Group List.

To modify a Role Group

15. In the Advanced Directory Settings Page, select the row that you wish to modify and click **Modify Role Group**.

16. Make the necessary changes and click **Save**.

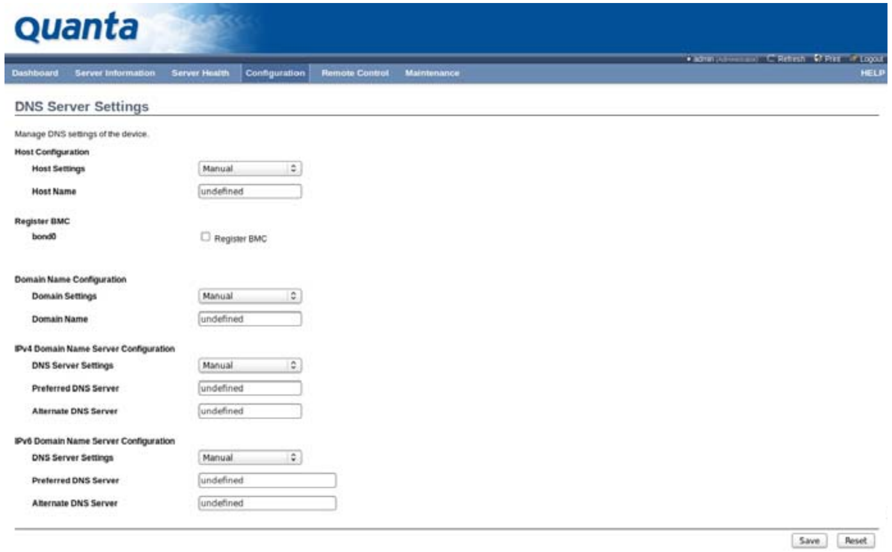
To delete a Role Group

17. In the Advanced Directory Settings Page, select the row that you wish to delete and click **Delete Role Group**.

DNS

The **Domain Name System (DNS)** is a distributed hierarchical naming system for computers, services, or any resource connected to the Internet or a private network. It associates the information with domain names assigned to each of the participants. Most importantly, it translates domain names meaningful to humans into the numerical (binary) identifiers associated with networking equipment for the purpose of locating and addressing these devices worldwide. The DNS Server settings page is used to manage the DNS settings of a device.

To open DNS Server Settings page, click **Configuration > DNS** from the main menu. A sample screenshot of DNS Server Settings Page is shown in the screenshot below.



DNS Server Settings

Manage DNS settings of the device.

Host Configuration

- Host Settings: Manual
- Host Name: undefined

Register BMC

- bond0: ☐ Register BMC

Domain Name Configuration

- Domain Settings: Manual
- Domain Name: undefined

IPv4 Domain Name Server Configuration

- DNS Server Settings: Manual
- Preferred DNS Server: undefined
- Alternate DNS Server: undefined

IPv6 Domain Name Server Configuration

- DNS Server Settings: Manual
- Preferred DNS Server: undefined
- Alternate DNS Server: undefined

DNS Server Settings Page

The fields of DNS Server Settings page are explained below.

DNS Server Settings Page

ITEM	DESCRIPTION
Host configuration	
Host Settings	Choose either Automatic or Manual settings.

DNS Server Settings Page (Continued)

ITEM	DESCRIPTION
Host Name	It displays hostname of the device. If the Host setting is chosen as Manual, then specify the hostname of the device.
Domain Name Configuration	
Domain Settings	It lists the option for domain interface as Manual, v4 or v6 for multiLAN channels. **Note:** If you choose DHCP, then select v4 or v6 for DHCP servers.
Domain Name	It displays the domain name of the device. If the Domain setting is chosen as Manual, then specify the domain name of the device. If you chose Automatic, the Domain Name cannot be configured as it will be done automatically. The field will be disabled.
IPv4 Domain Name Server Configuration	
DNS Server Settings:	It lists the option for v4 DNS settings for the device, Manual and available LAN interfaces.
Preferred DNS Server	The DNS (Domain Name System) server v4 address to be configured to the device. ● IP Address made of 4 numbers separated by dots as in "xxx.xxx.xxx.xxx". ● Each number ranges from 0 to 255. ● First number must not be 0.
Alternate DNS Server	
IPv6 Domain Name Server Configuration	

DNS Server Settings Page (Continued)

ITEM	DESCRIPTION
DNS Server Settings	It lists the option for v6 DNS settings for the device, Manual and available LAN interfaces. If you choose Manual setting, you have to configure the DNS Server IP addresses. If you have chosen DHCP, then you have to select the interface from which the IP address is to be received. Example of IPv6 address - 2001:db8:0:101
Preferred DNS Server, Alternate DNS Server	Specify the DNS (Domain Name System) server v6 address to be configured to the device.
Save	To save the entered changes.
Reset	To reset the entered changes.

Procedure:

1. Choose the **Host Configuration** as either Automatic or Manual.

Note:
Under Automatic, a Host Name is not necessary but under Manual, a Host Name is not.

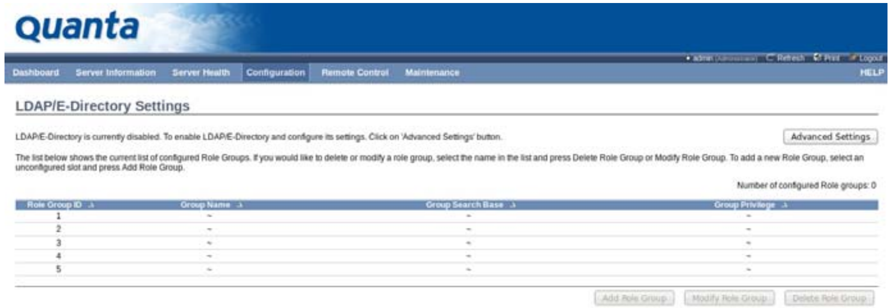
2. Enter the **Host Name** in the given field if you have chosen Manual Configuration.
3. Under **Register BMC**,
   - Check the option **Register BMC** to register with this DNS settings.
   - Choose the option Direct Dynamic DNS to register with direct dynamic DNS or choose **DHCP Client FQDN** to register through DHCP server.
4. In the **Domain name Configuration Settings**,
   - Select the domain settings from the dropdown list.
   - Enter the **Domain Name** in the given field
5. In **IPv4 Domain Name Server Configuration**,
   - Select the **DNS Server Settings**, from the dropdown list.
   - In the **Preferred DNS Server** field, enter the preferred IP address.
   - In the **Alternate DNS Server** field, enter the alternate address.
6. In **IPv6 Domain Name Server Configuration**,
   - Select the **DNS Server Settings**, from the dropdown list.
   - In the **Preferred DNS Server** field, enter the preferred IP address.
   - In the **Alternate DNS Server** field, enter the alternate address.
7. Click **Save** to save the entries.
8. Click **Reset** to reset the entries.

LDAP / E-Directory

The **Lightweight Directory Access Protocol (LDAP)** is an application protocol for querying and modifying data of directory services implemented in Internet Protocol (IP) networks.

LDAP is an Internet protocol that BMC can use to authenticate users. If you have an LDAP server configured on your network, you can use it as an easy way to add, manage and authenticate BMC users. This is done by passing login requests to your LDAP Server. This means that there is no need to define an additional authentication mechanism, when using the BMC. Since your existing LDAP Server keeps an authentication centralized, you will always know who is accessing the network resources and can easily define the user or group-based policies to control access.

To open LDAP Settings page, click **Configuration > LDAP** from the main menu. A sample screenshot of LDAP Settings Page is shown in the screenshot below.



LDAP/E-Directory Settings

LDAP/E-Directory is currently disabled. To enable LDAP/E-Directory and configure its settings. Click on 'Advanced Settings' button.

The list below shows the current list of configured Role Groups. If you would like to delete or modify a role group, select the name in the list and press Delete Role Group or Modify Role Group. To add a new Role Group, select an unconfigured slot and press Add Role Group.

Number of configured Role groups: 0

Role Group ID	Group Name	Group Search Base	Group Privilege
1	~	~	~
2	~	~	~
3	~	~	~
4	~	~	~
5	~	~	~

LDAP Settings Page

The fields of LDAP Settings Page are explained below.

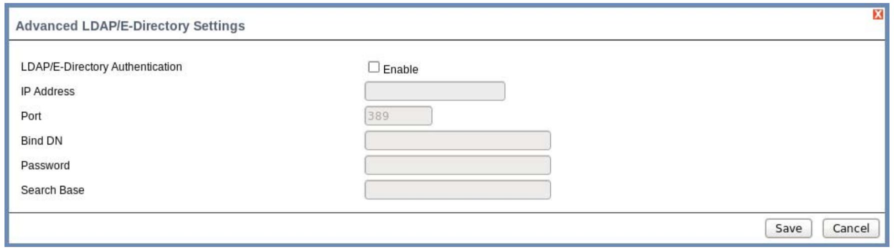
LDAP Settings Page

ITEM	DESCRIPTION
Advanced Settings	To configure LDAP Advanced Settings. Options are Enable LDAP Authentication, IP Address, Port and Search base.
Add Role Group	To add a new role group to the device. Alternatively, double click on a free slot to add a role group.
Modify Role Group	To modify the particular role group.
Delete Role Group	To be delete a role group from the list.

Procedure:

Entering the details in Advanced LDAP Settings Page

1. In the LDAP Settings Page, click Advanced Settings. A sample screenshot of LDAP Settings page is given below.



Advanced LDAP/E-Directory Settings

LDAP/E-Directory Authentication	□ Enable
IP Address	
Port	389
Bind DN	
Password	
Search Base	

Advanced LDAP Settings

2. To enable/disable LDAP Authentication, check or uncheck the **Enable** checkbox respectively.

Note:
At login prompt, enter username to login as an LDAP group member.

3. Enter the IP address of LDAP server in the **IP Address** field.

Note:

- IP Address made of 4 numbers separated by dots as in 'xxx.xxx.xxx.xxx'.
- Each Number ranges from 0 to 255.
- First Number must not be 0.
- Supports IPv4 Address format and IPv6 Address format.

4. Specify the LDAP Port in the **Port** field.

Note:
Default Port is 389. For Secure connection, default port is 636.

5. Enter the Search Base. The Search base tells the LDAP server which part of the external directory tree to search. The search base may be something equivalent to the organization, group of external directory.

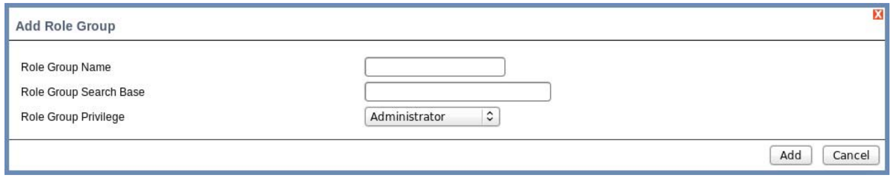
Note:

- Searchbase is a string of 4 to 63 alpha-numeric characters.
- It must start with an alphabetical character.
- Special Symbols like dot(.), comma(,), hyphen(-), underscore(_), equal-to(=) are allowed.
- Example: ou=login,dc=domain,dc=com.

6. Click **Save** to save the settings.
7. Click **Cancel** to cancel the modified changes.

To add a new Role Group

8. In the LDAP Settings Page, select a blank row and click **Add Role Group** to open the Add Role group Page as shown in the screenshot below.



Add Role Group

Role Group Name

Role Group Search Base

Role Group Privilege: Administrator

Add Role group Page

9. In the **Role Group Name** field, enter the name that identifies the role group.

Note:

- Role Group Name is a string of 255 alpha-numeric characters.
- Special symbols hyphen and underscore are allowed.

10. In the Role Group Search Base field, enter the path from where the role group is located to Base DN.

Note:

- Search Base is a string of 255 alpha-numeric characters.
- Special symbols hyphen, underscore and dot are allowed.

11. In the **Role Group Privilege** field, enter the level of privilege to assign to this role group.
12. Click **Add** to save the new role group and return to the Role Group List.
13. Click **Cancel** to cancel the settings and return to the Role Group List.

To Modify Role Group

14. In the LDAP Settings Page, select the row that you wish to modify and click Modify Role Group.
15. Make the necessary changes and click Save.

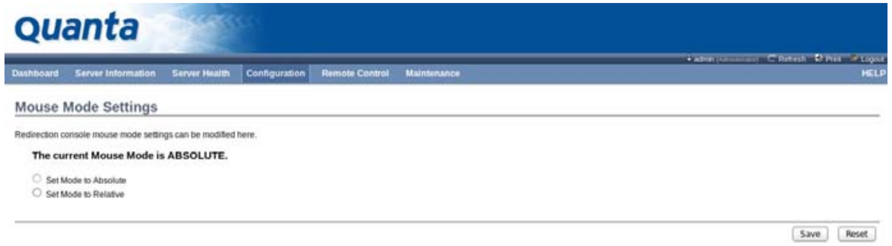
To Delete a Role Group

16. In the LDAP Settings Page, select the row that you wish to delete and click Delete Role Group.

Mouse Mode

Redirection Console handles mouse emulation from local window to remote screen in either of two methods. User has to be an Administrator to configure this option.

To open Mouse Mode page, click **Configuration > Mouse Mode** from the main menu. A sample screenshot of Mouse Mode Settings Page is shown in the screenshot below.



Mouse Mode Settings

Redirection console mouse mode settings can be modified here.

The current Mouse Mode is ABSOLUTE.

○ Set Mode to Absolute
○ Set Mode to Relative

Mouse Mode Settings Page

The fields of Mouse Mode Settings page are explained below.

Mouse Mode Settings Page

ITEM	DESCRIPTION
Absolute Mode	The absolute position of the local mouse is sent to the server.
Relative Mode	Relative mode sends the calculated relative mouse position displacement to the server.
Save	To save any changes made.

Mouse Mode Settings Page (Continued)

ITEM	DESCRIPTION
Reset	To Reset the modified changes.

Procedure:

1. Choose either of the following as your requirement:
   - Set Mode to Absolute

Note:
Applicable for all Windows versions, versions above RHEL6, and versions above FC14.

   - Set Mode to Relative

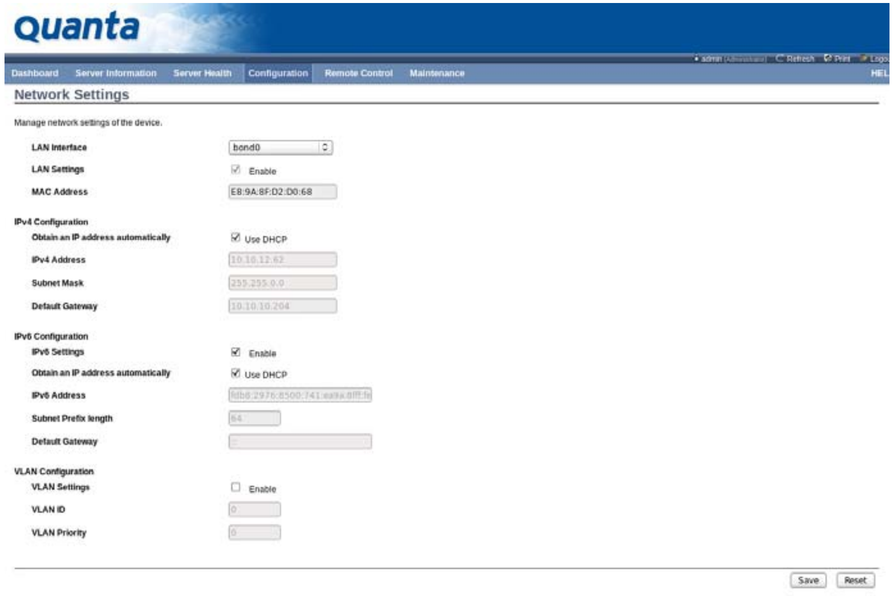
Note:
Applicable for all Windows versions, versions above RHEL6, and versions above FC14.

2. Click **Save** button to save the changes made.
3. Click **Reset** to reset the modified changes.

Network

The Network Settings Page is used to configure the network settings for the available LAN channels.

To open Network Settings page, click **Configuration > Network** from the main menu. A sample screenshot of Network Settings Page is shown in the screenshot below.



Network Settings

Manage network settings of the device.

LAN Interface: bond0
LAN Settings: ☑ Enable
MAC Address: E8:9A:8F:D2:D0:68

IPv4 Configuration
Obtain an IP address automatically: ☑ Use DHCP
IPv4 Address: 10.10.12.62
Subnet Mask: 255.255.0.0
Default Gateway: 10.10.10.204

IPv6 Configuration
IPv6 Settings: ☑ Enable
Obtain an IP address automatically: ☑ Use DHCP
IPv6 Address: fdb8:2976:8500:741:ea9a:8fff:fe
Subnet Prefix length: 64
Default Gateway: ::

VLAN Configuration
VLAN Settings: □ Enable
VLAN ID: 0
VLAN Priority: 0

Network Settings Page

The fields of Network Settings page are explained below.

Network Settings Page

ITEM	DESCRIPTION
LAN Interface	Lists the LAN interfaces.
LAN Settings	To enable or disable the LAN Settings.

Network Settings Page (Continued)

ITEM	DESCRIPTION
MAC Address	This field displays the MAC Address of the device. This is a read only field.
IPv4 Settings	This option lists the IPv4 configuration settings. ● Obtain IP Address automatically: This option is to dynamically configure IPv4 address using DHCP (Dynamic Host Configuration Protocol). ● IPv4 Address, Subnet Mask, and Default Gateway: These fields are for specifying the static IPv4 address, Subnet Mask and Default Gateway to be configured to the device. **Note:** ● IP Address made of 4 numbers separated by dots as in "xxx.xxx.xxx.xxx". ● Each Number ranges from 0 to 255. ● First Number must not be 0.

Network Settings Page (Continued)

ITEM	DESCRIPTION
IPv6 Configuration	This option lists the following IPv6 configuration settings. ● IPv6 Settings: This option is to enable the IPv6 settings in the device. ● Obtain an IPv6 address automatically: This option is to dynamically configure IPv6 address using DHCP (Dynamic Host Configuration Protocol). ● IPv6 Address: To specify a static IPv6 address to be configured to the device. Eg: 2004:2010 ● Subnet Prefix length: To specify the subnet prefix length for the IPv6 settings. **Note:** Value ranges from 0 to 128. ● Default Gateway: Specify v6 default gateway for the IPv6 settings.

Network Settings Page (Continued)

ITEM	DESCRIPTION
VLAN Configuration	It lists the VLAN configuration settings. ● VLAN Settings: To enable/disable the VLAN support for selected interface. ● VLAN ID: The Identification for VLAN configuration. ■ Value ranges from 1 to 4095. ● VLAN Priority: The priority for VLAN configuration. ■ Value ranges from 1 to 7. ■ 7 is the highest priority for VLAN.
Save	To save the entries.
Reset	To Reset the modified changes.

Procedure:

1. Select the **LAN Interface** from the drop down list.
2. Check **Enable** to enable the LAN Settings.
3. In IPv4 Configuration, enable **Use DHCP to Obtain an IP address automatically** to dynamically configure IPv4 address using DHCP.
4. If the field is disabled, enter the **IPv4 Address**, **Subnet Mask** and **Default Gateway** in the respective fields.
5. In IPv6 Configuration, if you wish to enable the IPv6 settings, check **Enable**.

6. If the IPv6 setting is enabled, enable or disable the option **Use DHCP for obtaining the IP address automatically**.
7. If the field is disabled, enter the **IPv6 Address, Subnet Prefix length** and **Default Gateway** in the given field.
8. In VLAN Configuration, if you wish to enable the VLAN settings, check **Enable**.
9. Enter the **VLAN ID** in the specified field.
10. Enter the **VLAN Priority** in the specified field.
11. Click **Save** to save the entries.
12. Click **Reset** if you want to reset the modified changes.

PEF

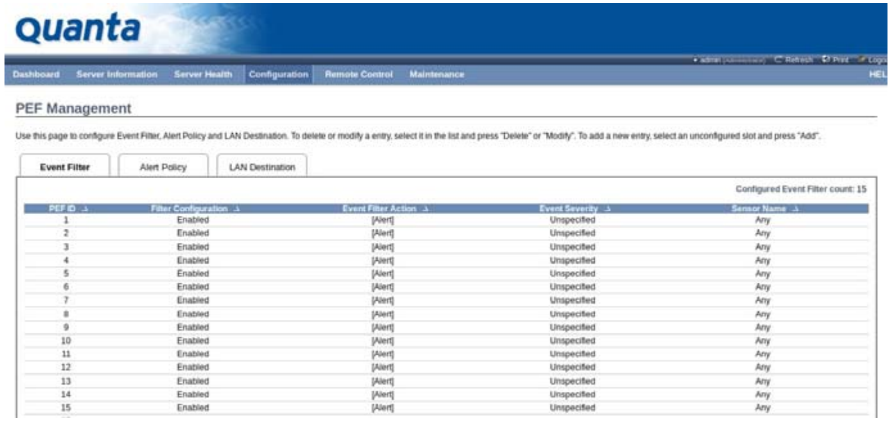
Platform Event Filtering (PEF) provides a mechanism for configuring the BMC to take selected actions on event messages that it receives or has internally generated. These actions include operations such as system power-off, system reset, as well as triggering the generation of an alert. The PEF Management is used to configure the following features:

- Event Filter
- Alert Policy
- LAN Destination

To open PEF Management Settings page, click **Configurations > PEF** from the main menu. A sample screenshot of PEF Management Settings Page is shown in the screen shot below along with an explanation of each of the tabs.

Event Filter Tab

A PEF implementation is recommended to provide at least 16 entries in the event filter table. A subset of these entries should be pre-configured for common system failure events, such as over-temperature, power system failure, fan failure events, etc. Remaining entries can be made available for 'OEM' or System Management Software configured events. Note that individual entries can be tagged as being reserved for system use - so this ratio of pre-configured entries to run-time configurable entries can be reallocated if necessary.



PEF Management

Use this page to configure Event Filter, Alert Policy and LAN Destination. To delete or modify a entry, select it in the list and press "Delete" or "Modify". To add a new entry, select an unconfigured slot and press "Add".

Configured Event Filter count: 15

PEF ID	Filter Configuration	Event Filter Action	Event Severity	Sensor Name
1	Enabled	[Alert]	Unspecified	Any
2	Enabled	[Alert]	Unspecified	Any
3	Enabled	[Alert]	Unspecified	Any
4	Enabled	[Alert]	Unspecified	Any
5	Enabled	[Alert]	Unspecified	Any
6	Enabled	[Alert]	Unspecified	Any
7	Enabled	[Alert]	Unspecified	Any
8	Enabled	[Alert]	Unspecified	Any
9	Enabled	[Alert]	Unspecified	Any
10	Enabled	[Alert]	Unspecified	Any
11	Enabled	[Alert]	Unspecified	Any
12	Enabled	[Alert]	Unspecified	Any
13	Enabled	[Alert]	Unspecified	Any
14	Enabled	[Alert]	Unspecified	Any
15	Enabled	[Alert]	Unspecified	Any

PEF Management – Event Filter

The fields of PEF Management – Event Filter Tab are explained below.

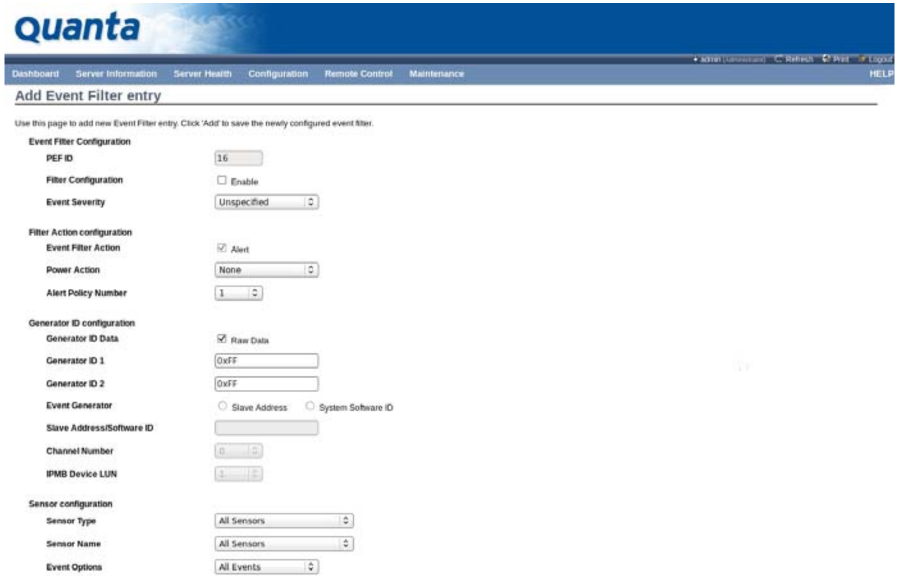
This page contains the list of configured PEF’s.

PET Management - Event Filter

ITEM	DESCRIPTION
PEF ID	This field displays the ID for the newly configured PEF entry (read-only).
Filter configuration	Check box to enable the PEF settings.
Event Filter Action	Check box to enable PEF Alert action. This is a mandatory field.
Event Severity	To choose any one of the Event severity from the list.
Sensor Name	To choose the particular sensor from the sensor list.
Add	To add the new event filter entry and return to Event filter list.
Modify	To modify the existing entries.
Cancel	To cancel the modification and return to Event filter list.

Procedure:

1. Click the **Event Filter** Tab to configure the event filters in the available slots
2. To Add an Event Filter entry, select a free slot and click **Add** to open the Add event Filter entry Page. A sample screenshot of Add Event Filter Page is in seen the screenshot below.



Add Event Filter entry

Use this page to add new Event Filter entry. Click 'Add' to save the newly configured event filter.

Event Filter Configuration

PEF ID	16
Filter Configuration	□ Enable
Event Severity	Unspecified

Filter Action configuration

Event Filter Action	☑ Alert
Power Action	None
Alert Policy Number	1

Generator ID configuration

Generator ID Data	☑ Raw Data
Generator ID 1	0xFF
Generator ID 2	0xFF
Event Generator	○ Slave Address ○ System Software ID
Slave Address/Software ID	
Channel Number	0
IPMB Device LUN	1

Sensor configuration

Sensor Type	All Sensors
Sensor Name	All Sensors
Event Options	All Events

Add Event Filter Entry Page

3. In the Event Filter Configuration section,
   - PEF ID displays the ID for configured PEF entry (read-only).
   - In filter configuration, check the box to enable the PEF settings.
   - In Event Severity, select any one of the Event severity from the list.
4. In the Filter Action configuration section,

- Event Filter Action is a mandatory field and checked by default, which enable PEF Alert action (read-only).
- Select any one of the Power action either Power down, Power reset or Power cycle from the drop down list
- Choose any one of the configured alert policy number from the drop down list.

Note:

Alert Policy has to be configured - under **Configuration > PEF > Alert Policy**.

5. In the Generator ID configuration section,
    - Check Generator ID Data option to fill the Generator ID with raw data.
    - Generator ID 1 field is used to give raw generator ID1 data value.
    - Generator ID 2 field is used to give raw generator ID2 data value.

Note:

In RAW data field, to specify hexadecimal value prefix with '0x'.

- In the Event Generator section, choose the event generator as Slave Address - if event was generated from IPMB.Otherwise as System Software ID - if event was generated from system software.
- In the Slave Address/Software ID field, specify corresponding I2C Slave Address or System Software ID.
- Choose the particular channel number that event message was received over. Or choose '0' if the event message was received via the system interface, primary IPMB, or internally generated by the BMC.
- Choose the corresponding IPMB device LUN if event generated by IPMB.

6. In the Sensor configuration section,
    - Select the s type of sensor that will trigger the event filter action.
    - In the sensor name field, choose the particular sensor from the sensor list.
    - Choose event option to be either All Events or Sensor Specific Events.
7. In the Event Data configuration section,
    - Event Trigger field is used to give Event/Reading type value.

Note:

Value ranges from 1 to 255.

- Event Data 1 AND Mask field is used to indicate wildcarded or compared bits.

Note:
Value ranges from 0 to 255.

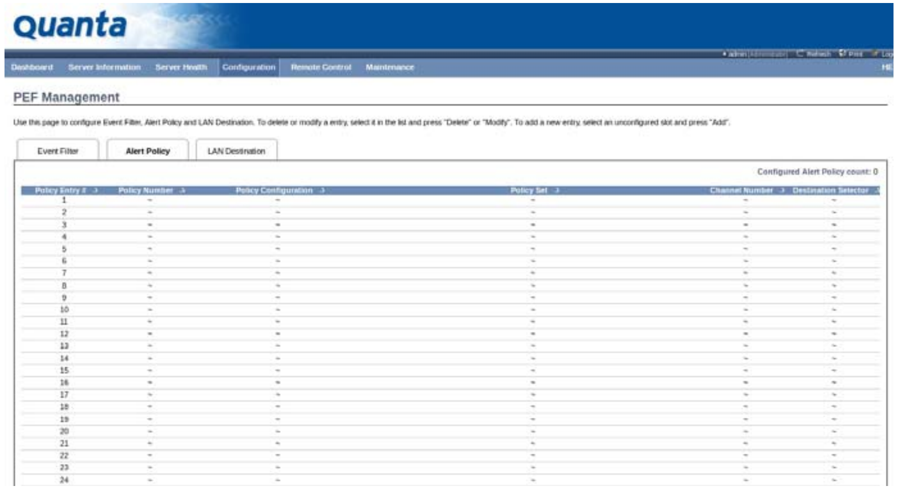
- Event Data 1 Compare 1 & Event Data 1 Compare 2 field is used to indicate whether each bit position's comparison is an exact comparison or not.

Note:
Value ranges from 0 to 255.

8. In the Event Data 2 configuration section,
   - Event Data 2 AND Mask field is similar to Event Data 1 AND Mask.
   - Event Data 2 Compare 1 & Event Data 2 Compare 2 fields are similar to Event Data 1 Compare 1 and Event Data 1 Compare 2 respectively.
9. In the Event Data 3 configuration section,
   - Event Data 3 AND Mask field is similar to Event Data 1 AND Mask.
   - Event Data 3 Compare 1 & Event Data 3 Compare 2 fields are similar to Event Data 1 Compare 1 and Event Data 1 Compare 2 respectively.
10. Click **Modify** to accept the modification and return to Event filter list.
11. Click **Reset** to reset the modification done.
12. Click on Cancel to cancel the modification and return to Event filter list.
13. In the Event filter list, click **Modify** to modify the existing filter.
14. In the Event filter list, click **Delete** to delete the existing filter.

Alert Policy Tab

This page is used to configure the Alert Policy and LAN destination. You can add, delete or modify an entry in this page.



PEF Management

Use this page to configure Event Filter, Alert Policy and LAN Destination. To delete or modify a entry, select it in the list and press "Delete" or "Modify". To add a new entry, select an unconfigured slot and press "Add".

Configured Alert Policy count: 0

Policy Entry #	Policy Number	Policy Configuration	Policy Set	Channel Number	Destination Selector
1	~	~	~	~	~
2	~	~	~	~	~
3	~	~	~	~	~
4	~	~	~	~	~
5	~	~	~	~	~
6	~	~	~	~	~
7	~	~	~	~	~
8	~	~	~	~	~
9	~	~	~	~	~
10	~	~	~	~	~
11	~	~	~	~	~
12	~	~	~	~	~
13	~	~	~	~	~
14	~	~	~	~	~
15	~	~	~	~	~
16	~	~	~	~	~
17	~	~	~	~	~
18	~	~	~	~	~
19	~	~	~	~	~
20	~	~	~	~	~
21	~	~	~	~	~
22	~	~	~	~	~
23	~	~	~	~	~
24	~	~	~	~	~

PEF Management – Alert Policy

The fields of the PEF Management – Alert Policy Tab are explained below.

PEF Management - Alert Policy

ITEM	DESCRIPTION
Policy Entry #	Displays Policy entry number for the newly configured entry (read-only).
Policy Number	Displays the Policy number of the configuration.
Policy Configuration	To enable or disable the policy settings.
Policy Set	To choose any one of the Policy set values from the list. ● 0: Always send alert to this destination. ● 1: If alert to previous destination was successful, do not send alert to this destination. Proceed to ESMS Functional Specification For SI v0.11 next entry in this policy set. ● 2: If alert to previous destination was successful, do not send alert to this destination. Do not process any more entries in this policy set. ● 3: If alert to previous destination was successful, do not send alert to this destination. Proceed to next entry in this policy set that is to a different channel. ● 4: If alert to previous destination was successful, do not send alert to this destination. Proceed to next entry in this policy set that is to a different destination type.
Channel Number	To choose a particular channel from the available channel list.

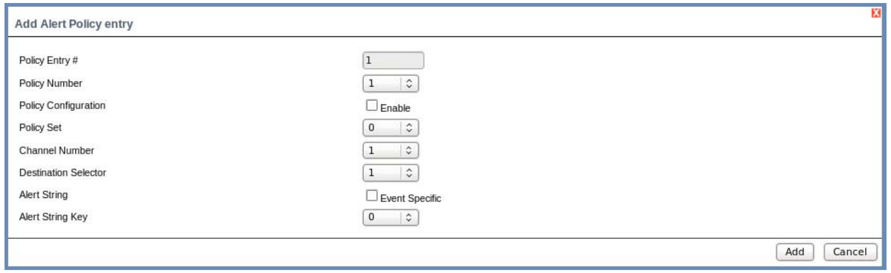
PEF Management - Alert Policy (Continued)

ITEM	DESCRIPTION
Destination Selector	To choose a particular destination from the configured destination list. **Note:** LAN Destination has to be configured - under **Configuration > PEF > LAN Destination**.
Add	To save the new alert policy and return to Alert Policy list.
Modify	To modify the existing entries.
Cancel	To cancel the modification and return to Alert Policy list.

Procedure:

1. In the Alert Policy Tab, select the slot for which you have to configure the Alert policy. That is, In the **Event Filter Entry Page**, if you have chosen Alert Policy number as 4, you have to configure the 4th slot (the slot with Policy Number 4) in the Alert Policy Tab.

2. Select the slot and click **Add** to open the **Add Alert Policy Entry Page** as shown in the screenshot below.



Add Alert Policy entry

Policy Entry #	1
Policy Number	1
Policy Configuration	□ Enable
Policy Set	0
Channel Number	1
Destination Selector	1
Alert String	□ Event Specific
Alert String Key	0

Add Alert Policy Entry Page

3. **Policy Entry #** is a read only field.
4. Select the **Policy Number** from the list.
5. In the **Policy Configuration** field, check **Enable** if you wish to enable the policy settings.
6. In the **Policy Set** field, choose any of the Policy set from the list.
7. In the **Channel Number** field, choose particular channel from the available channel list.
8. In the **Destination Selector** field, choose particular destination from the configured destination list.

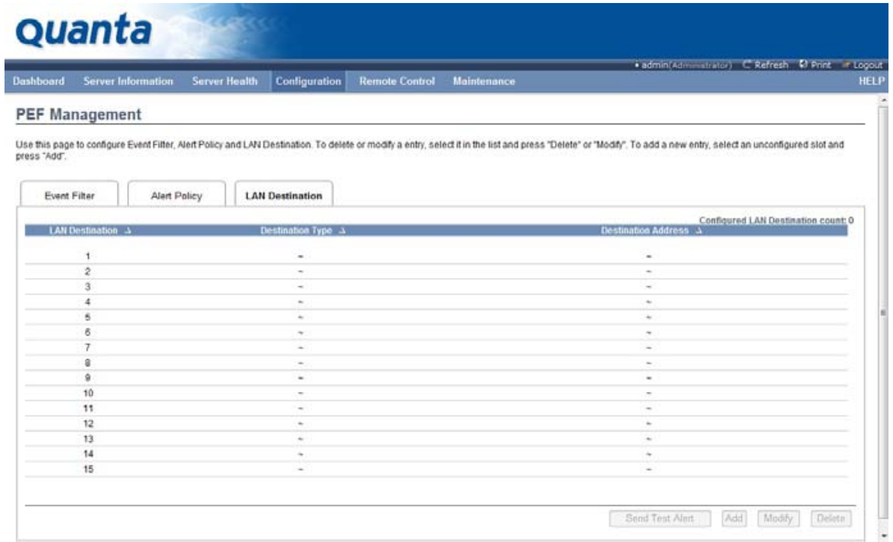
Note:

LAN Destination has to be configured under **Configuration > PEF > LAN Destination**. That is if you select the number 4 for destination selector in Alert Policy Entry page, then you have to configure the 4th slot (LAN Destination Number 4) in the LAN Destination tab.

9. In the **Alert String** field, enable the check box if the Alert policy entry is Event Specific.
10. In the **Alert String Key** field, choose any one value that is used to look up the Alert String to send for this Alert Policy entry.
11. Click **Add** to save the new alert policy and return to Alert Policy list.
12. Click **Cancel** to cancel the modification and return to Alert Policy list.
13. In the Alert Policy list, to modify a configuration, select the slot to be modified and click **Modify**.
14. In the Modify Alert Policy Entry Page, make the necessary changes and click **Modify**.
15. In the Alert Policy list, to delete a configuration, select the slot and click **Delete**.

PEF Management LAN Destination Page

This page is used to configure the Event filter, Alert Policy and LAN destination. A sample screenshot of PEF Management LAN Destination Page is given below.



PEF Management

Use this page to configure Event Filter, Alert Policy and LAN Destination. To delete or modify a entry, select it in the list and press "Delete" or "Modify". To add a new entry, select an unconfigured slot and press "Add".

Configured LAN Destination count: 0

LAN Destination	Destination Type	Destination Address
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-

PEF Management LAN Destination

The fields of PEF Management – LAN Destination Tab are explained below.

PEF Management - LAN Destination

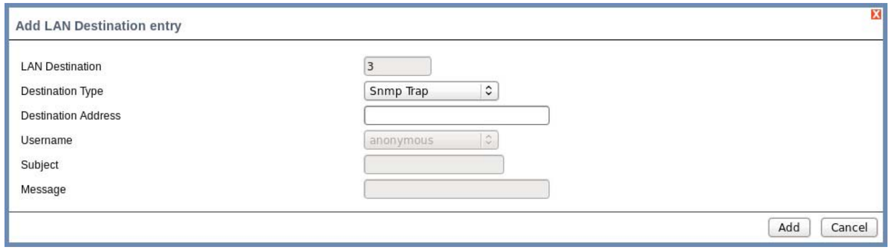
ITEM	DESCRIPTION
LAN Destination	Displays Destination number for the newly configured entry (read-only).

PEF Management - LAN Destination (Continued)

ITEM	DESCRIPTION
Destination Type	Destination type can be either an SNMP Trap or an Email alert. For Email alerts, the 3 fields - destination Email address, subject and body of the message needs to be filled. The SMTP server information also has to be added - under **Configuration > SMTP**. For SNMP Trap, only the destination IP address has to be filled.
Destination Address	If Destination type is SNMP Trap, then enter the IP address of the system that will receive the alert. Destination address will support the following: ● IPv4 address format. ● IPv6 address format. If Destination type is Email Alert, then give the email address that will receive the email.
Subject & Message	These fields must be configured if email alert is chosen as destination type. An email will be sent to the configured email address in case of any severity events with a subject specified in subject field and will contain the message field's content as the email body.
Add	To save the new LAN destination and return to LAN destination list.
Cancel	To cancel the modification and return to LAN destination list.

Procedure:

1. In the **LAN Destination Tab**, choose the slot to be configured. This should be the same slot that you have selected in the Alert Policy Entry- Destination Selector field. That is if you have chosen the Destination Selector as 4 in the Alert Policy Entry page of Alert Policy Tab, then you have to configure the 4th slot of LAN Destination Page.
2. Select the slot and click **Add**. This opens the **Add LAN Destination entry**.



Add LAN Destination entry

LAN Destination	3
Destination Type	Snmp Trap
Destination Address	
Username	anonymous
Subject	
Message	

Add LAN Destination entry Page

3. In the **LAN Destination** field, the destination for the newly configured entry is displayed and this is a read only field.
4. In the **Destination Type** field, select the one of the types.
5. In the **Destination Address** field, enter the destination address.

Note:
If Destination type is Email Alert, then give the email address that will receive the email.

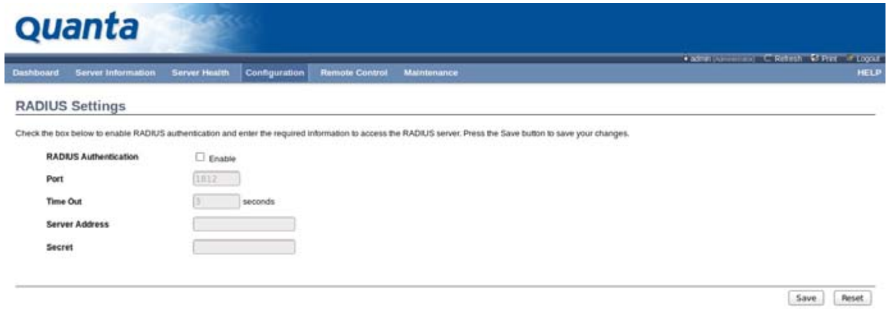
6. Select the **User Name** from the list of users.
7. In the **Subject** field, enter the subject.
8. In the **Message** field, enter the message.
9. Click **Add** to save the new LAN destination and return to LAN destination list.
10. Click **Cancel** to cancel the modification and return to LAN destination list.
11. In the LAN Destination Tab, to modify a configuration, select the row to be modified and click **Modify**.
12. In the Modify LAN Destination Entry page, make the necessary changes and click **Modify**.
13. In the LAN Destination Tab, to delete a configuration, select the slot and click **Delete**.

RADIUS

RADIUS is a modular, high performance and feature-rich RADIUS suite including server, clients, development libraries and numerous additional RADIUS related utilities.

This page is used to set the RADIUS Authentication.

To open RADIUS Settings page, click Configuration > RADIUS from the main menu. A sample screenshot of RADIUS Settings Page is shown in the screenshot below.



RADIUS Settings

Check the box below to enable RADIUS authentication and enter the required information to access the RADIUS server. Press the Save button to save your changes.

RADIUS Authentication □ Enable

Port 1812

Time Out 3 seconds

Server Address

Secret

RADIUS Settings Page

The fields of RADIUS Settings Page are explained below.

RADIUS Settings Page

ITEM	DESCRIPTION
RADIUS Authentication	Option to enable RADIUS authentication.
Port	The RADIUS Port number. **Note:** Default Port is 1812.

RADIUS Settings Page (Continued)

ITEM	DESCRIPTION
Time Out	The Time out value in seconds. **Note:** ● Default Timeout value is 3seconds. ● Timeout value ranges from 3 to 300.
Server Address	The IP address of RADIUS server. **Note:** ● IP Address made of 4 numbers separated by dots as in "xxx.xxx.xxx.xxx". ● Each Number ranges from 0 to 255. ● First Number must not be 0.
Secret	The Authentication Secret for RADIUS server. **Note:** ● This field will not allow more than 31 characters. ● Secret must be at least 4 characters long. ● White space is not allowed.
Save	To save the settings.
Reset	To reset the modified changes.

Procedure:

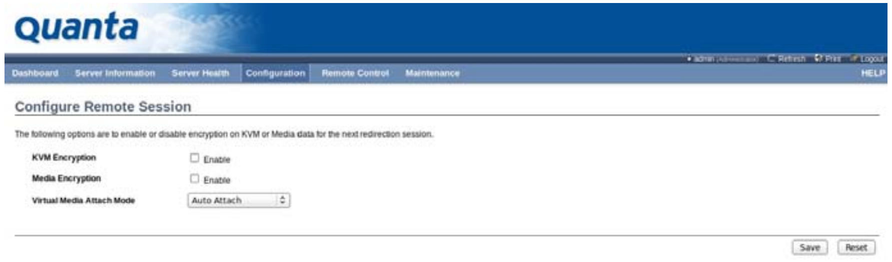
1. Enable the **RADIUS Authentication** checkbox to authenticate the RADIUS.

2. Enter the port number in the **Port Number** field.
3. Enter the time out value in seconds in the **Time out** field.
4. Enter the address of the server in the **Server Address** field.
5. Enter the authentication secret for RADIUS Server in the **Secret** field.
6. Click **Save** to save the entered details.
7. Click **Reset** to reset the entered details.

Remote Session

Use this page to configure virtual media configuration settings for the next redirection session. Encryption is disabled by default.

To open Remote Session page, click **Configuration > Remote Session** from the main menu. A sample screenshot of Remote Session Page is shown in the screenshot below.



Configure Remote Session

The following options are to enable or disable encryption on KVM or Media data for the next redirection session.

KVM Encryption □ Enable

Media Encryption □ Enable

Virtual Media Attach Mode: Auto Attach

Remote Session

The fields of Remote Session Settings Page are explained below.

Remote Session Settings Page

ITEM	DESCRIPTION
KVM Encryption	Enable/Disable encryption on KVM data for the next redirection session.
Media Encryption	Enable/Disable encryption on Media data for the next redirection session.
Virtual Media Attach Mode	Two types of VM attach mode are available: ● Attach: Immediately attaches Virtual Media to the server upon bootup. ● Auto Attach: Attaches Virtual Media to the server only when a virtual media session is started.
Save	To save the current changes. **Note:** It will automatically close the existing remote redirection either KVM or Virtual media sessions, if any.
Reset	To reset the modified changes.

Procedure:

1. In **KVM encryption**, check or uncheck the option **Enable**.
2. In **Media Encryption**, check or uncheck the option **Enable**.

3. In **Virtual media Attach mode**, select **Auto Attach** or **Attach** from the dropdown list as required.
4. Click **Save** to save the entries.
5. Click **Reset** to reset the entries

Note:

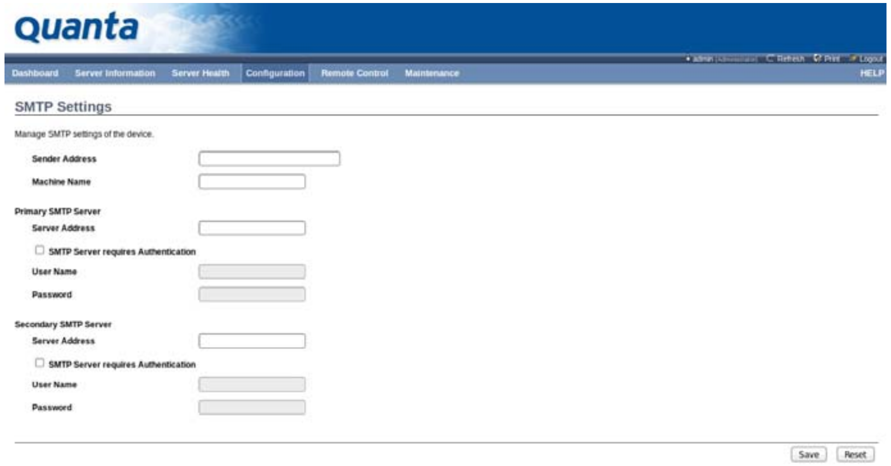
- If we choose more than one virtual CDROMs, then the RHEL5 host displays only one CDROM in the "Computer" window. When we redirect second CDROM, the second CDROM device will appear in "Computer" window.
- If we choose more than 2 virtual Hard disks, then the RHEL5 host displays only two hard disks in "Computer" window. When we redirect third hard disk, the third hard disk will appear in "Computer" window.

SMTP

Simple Mail Transfer Protocol (SMTP) is an Internet standard for electronic mail (e-mail) transmission across Internet Protocol (IP) networks.

Using Web GUI, you can configure the SMTP settings of the device.

To open SMTP Settings page, click **Configuration > SMTP** from the main menu. A sample screenshot of SMTP Settings Page is shown in the screenshot below.



SMTP Settings

Manage SMTP settings of the device.

Sender Address

Machine Name

Primary SMTP Server

Server Address

□ SMTP Server requires Authentication

User Name

Password

Secondary SMTP Server

Server Address

□ SMTP Server requires Authentication

User Name

Password

SMTP Settings Page

The fields of SMTP Settings Page are explained below.

SMTP Settings Page

ITEM	DESCRIPTION
LAN Channel Number	Displays the list of LAN channels available.
Sender Address	The 'Sender Address' valid on the SMTP Server.
Machine Name	The 'Machine Name' of the SMTP Server. ● Machine Name is a string of maximum 15 alpha-numeric characters. ● Space, special characters are not allowed.

SMTP Settings Page (Continued)

ITEM	DESCRIPTION
Primary SMTP Server	Lists the Primary SMTP Server configuration.
Server Address	The 'IP address' of the SMTP Server. It is a mandatory field. **Note:** ● IP Address made of 4 numbers separated by dots as in "xxx.xxx. xxx.xxx". ● Each Number ranges from 0 to 255. ● First Number must not be 0. ● Supports IPv4 Address format and IPv6 Address format.
SMTP Server requires Authentication	To enable/disable SMTP Authentication. **Note:** SMTP Server Authentication Types supported are: ● CRAM-MD5 ● LOGIN ● PLAIN If the SMTP server does not support any one of the above authentication types, the user will get an error message stating, "Authentication type is not supported by SMTP Server"

SMTP Settings Page (Continued)

ITEM	DESCRIPTION
Username	The username to access SMTP Accounts. **Note:** ● User Name can be of length 4 to 64 alphanumeric characters. ● It must start with an alphabet. ● Special characters ','(comma), ':'(colon), ';'(semicolon), ' '(space) and '\'(backslash) are not allowed.
Password	The password for the SMTP User Account. **Note:** ● Password must be at least 4 characters long. ● White space is not allowed. ● This field will not allow more than 64 characters.
Secondary SMTP Server	It lists the Secondary SMTP Server configuration. It is an optional field. If the Primary SMTP server is not working fine, then it tries with Secondary SMTP Server configuration.
Save	To save the new SMTP server configuration.
Reset	To reset the modified changes.

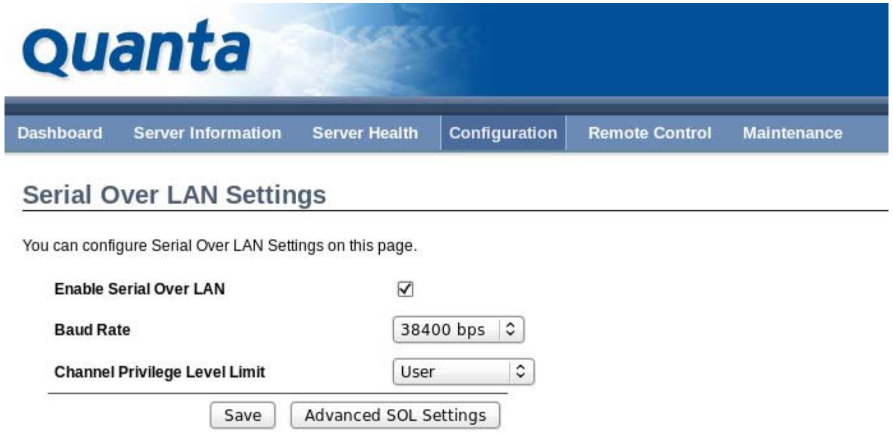
Procedure:

1. Select the **LAN Channel Number** from the dropdown list.

2. Enter the **Sender Address** in the specified field.
3. Enter the **Machine Name** in the specified field.
4. In Primary SMTP Server, enter the **Server Address** in the specified field.
5. Enable the check box **SMTP Server requires Authentication** if you want to authenticate SMTP Server.
6. Enter your **User name** and **Password** in the respective fields.
7. In Secondary SMTP Server, enter the **Server Address** in the specific field.
8. Enable the check box **SMTP Server requires Authentication** if you want to authenticate SMTP Server.
9. Enter your **User name** and **Password** in the respective fields.
10. Click **Save** to save the entered details.
11. Click **Reset** to update the entered details.

SOL

Here, you can configure the Serial over LAN settings, select or change values for each attribute and click the Save button to save any changes.



Serial Over LAN Settings

You can configure Serial Over LAN Settings on this page.

Enable Serial Over LAN ☑

Baud Rate 38400 bps

Channel Privilege Level Limit User

SOL Settings Page

The fields of SOL Settings Page are explained below.

SOL Settings Page

ITEM	DESCRIPTION
Enable Serial over LAN	Checked=Enabled; Unchecked=Disabled.

SOL Settings Page (Continued)

ITEM	DESCRIPTION
Channel Privilege Level Limit	Select the IPMI Serial over LAN minimum user privilege: ● Administrator ● Operator ● User
Save	Use this button to save your settings.
Advanced SOL Settings	Use this button to go to advanced SOL page.

SSL

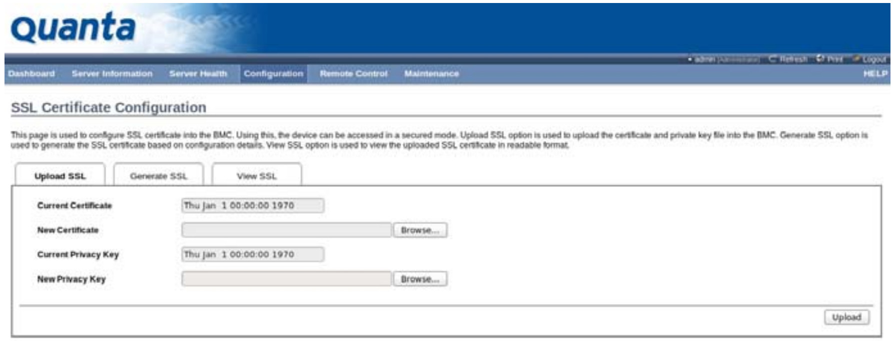
The Secure Socket Layer protocol was created by Netscape to ensure secure transactions between web servers and browsers. The protocol uses a third party, a Certificate Authority (CA), to identify one end or both end of the transactions.

Using Web GUI, configure SSL certificate into the BMC. Using this, the device can be accessed in a secured mode.

To open SSL Certificate Configuration page, click **Configuration > SSL** from the main menu. There are three tabs on this page.

- Upload SSL option is used to upload the certificate and private key file into the BMC.
- Generate SSL option is used to generate the SSL certificate based on configuration details.
- View SSL option is used to view the uploaded SSL certificate in readable format.

A sample screenshot of SSL Management Page is shown in the screenshot below.



SSL Certificate Configuration

This page is used to configure SSL certificate into the BMC. Using this, the device can be accessed in a secured mode. Upload SSL option is used to upload the certificate and private key file into the BMC. Generate SSL option is used to generate the SSL certificate based on configuration details. View SSL option is used to view the uploaded SSL certificate in readable format.

Current Certificate: Thu Jan 1 00:00:00 1970
New Certificate:
Current Privacy Key: Thu Jan 1 00:00:00 1970
New Privacy Key:

SSL Certificate Configuration – Upload SSL

The fields of SSL Certificate Configuration – Upload SSL tab are explained below.

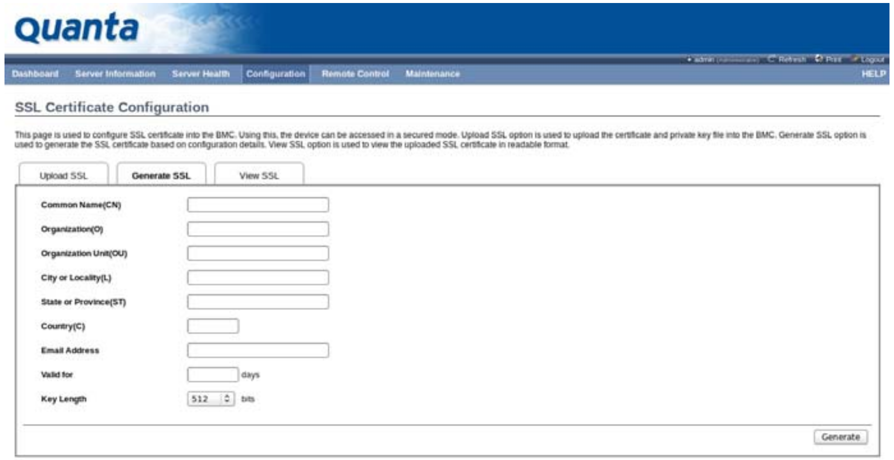
SSL Certificate Configuration - Upload SSL

ITEM	DESCRIPTION
Current Certificate	Current certificate information will be displayed (read-only).
New Certificate	Certificate file should be of pem type

SSL Certificate Configuration - Upload SSL (Continued)

ITEM	DESCRIPTION
Current Privacy Key	Current privacy key information will be displayed (read-only).
New Privacy Key	Privacy key file should be of pem type.
Upload	To upload the SSL certificate and privacy key into the BMC.

Note:
Upon successful upload, HTTPs service will get restarted to use the newly uploaded SSL certificate.



SSL Certificate Configuration

This page is used to configure SSL certificate into the BMC. Using this, the device can be accessed in a secured mode. Upload SSL option is used to upload the certificate and private key file into the BMC. Generate SSL option is used to generate the SSL certificate based on configuration details. View SSL option is used to view the uploaded SSL certificate in readable format.

Upload SSL | Generate SSL | View SSL

Common Name(CN)
Organization(O)
Organization Unit(OU)
City or Locality(L)
State or Province(ST)
Country(C)
Email Address
Valid for days
Key Length 512 bits

Generate

SSL Certificate Configuration – Generate SSL

The fields of SSL Certificate Configuration – Generate SSL tab are explained below.

SSL Certificate Configuration - Generate SSL

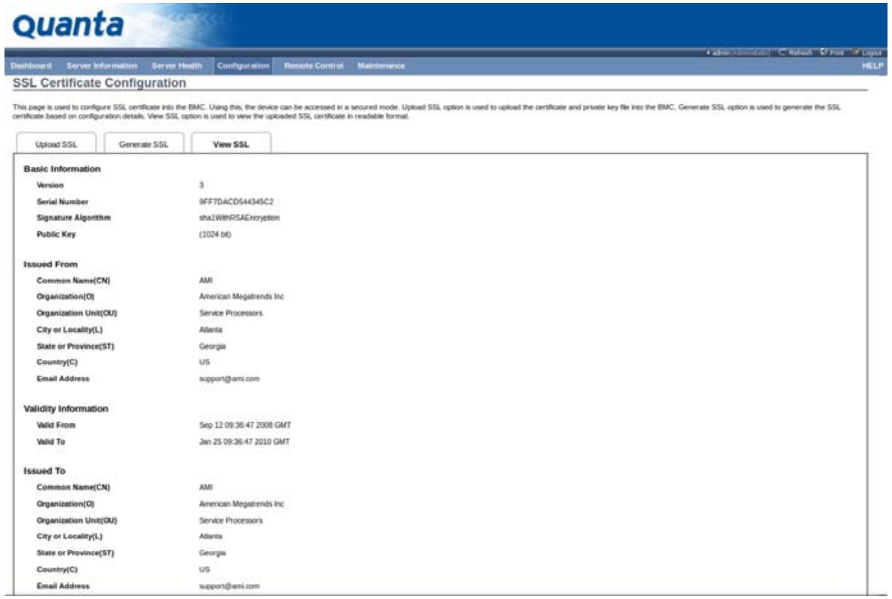
ITEM	DESCRIPTION
Common Name (CN)	Common name for which certificate is to be generated. ● Maximum length of 64 characters. ● Special characters '#' and '$' are not allowed.
Organization (O)	Organization name for which the certificate is to be generated. ● Maximum length of 64 characters. ● Special characters '#' and '$' are not allowed.
Organization Unit (OU)	Over all organization section unit name for which certificate is to be generated. ● Maximum length of 64 characters. ● Special characters '#' and '$' are not allowed.
City or Locality (L)	City or Locality of the organization (mandatory). ● Maximum length of 64 characters. ● Special characters '#' and '$' are not allowed.
State or Province (ST)	State or Province of the organization (mandatory). ● Maximum length of 64 characters. ● Special characters '#' and '$' are not allowed.
Country (C)	Country code of the organization (mandatory). ● Only two characters are allowed. ● Special characters are not allowed.
Email Address	Email Address of the organization (mandatory).

SSL Certificate Configuration - Generate SSL (Continued)

ITEM	DESCRIPTION
Valid for	Validity of the certificate. ● Value ranges from 1 to 3650 days.
Key Length	The key length bit value of the certificate.
Generate	To generate the new SSL certificate.

Note:

HTTPs service will get restarted, to use the newly generated SSL certificate.



SSL Certificate Configuration

This page is used to configure SSL certificate into the BMC. Using this, the device can be accessed in a secured mode. Upload SSL option is used to upload the certificate and private key file into the BMC. Generate SSL option is used to generate the SSL certificate based on configuration details. View SSL option is used to view the uploaded SSL certificate in readable format.

Basic Information

Version	3
Serial Number	9FF7DACD544345C2
Signature Algorithm	sha1WithRSAEncryption
Public Key	(1024 bit)

Issued From

Common Name(CN)	AMI
Organization(O)	American Megatrends Inc
Organization Unit(OU)	Service Processors
City or Locality(L)	Atlanta
State or Province(ST)	Georgia
Country(C)	US
Email Address	support@ami.com

Validity Information

Valid From	Sep 12 09:36:47 2008 GMT
Valid To	Jan 25 09:36:47 2010 GMT

Issued To

Common Name(CN)	AMI
Organization(O)	American Megatrends Inc
Organization Unit(OU)	Service Processors
City or Locality(L)	Atlanta
State or Province(ST)	Georgia
Country(C)	US
Email Address	support@ami.com

SSL Certificate Configuration – View SSL

The fields of SSL Certificate Configuration – View SSL tab are explained below.

SSL Certificate Configuration – View SSL

ITEM	DESCRIPTION
Basic Information	This section displays the basic information about the uploaded SSL certificate. It displays the following fields. ● Version ● Serial Number ● Signature Algorithm ● Public Key
Issued From	This section describes the following Certificate Issuer information ● Common Name (CN) ● Organization (O) ● Organization Unit(OU) ● City or Locality (L) ● State or Province (ST) ● Country (C) ● Email Address
Validity Information	This section displays the validity period of the uploaded certificate. ● Valid From ● Valid To

SSL Certificate Configuration – View SSL (Continued)

ITEM	DESCRIPTION
Issued To	This section display the information about the certificate issuer. ● Common Name (CN ● Organization (O ● Organization Unit (OU ● City or Locality (L ● State or Province (ST ● Country (C ● Email Address

Procedure:

1. Click the Upload SSL Tab, **Browse** the **New Certificate** and **New Privacy** key.
2. Click **Upload** to upload the new certificate and privacy key.
3. In **Generate SSL** tab, enter the following details in the respective fields
    - The **Common Name** for which the certificate is to be generated.
    - The **Name of the Organization** for which the certificate is to be generated.
    - The **Overall Organization Section Unit** name for which certificate to be generated.
    - The **City or Locality** of the organization
    - The **State or Province** of the organization
    - The **Country** of the organization
    - The **email address** of the organization.
    - The number of days the certificate will be valid in the **Valid For** field.
4. Choose the **Key Length** bit value of the certificate
5. Click **Generate** to generate the certificate.
6. Click **View SSL** tab to view the uploaded SSL certificate in user readable format.

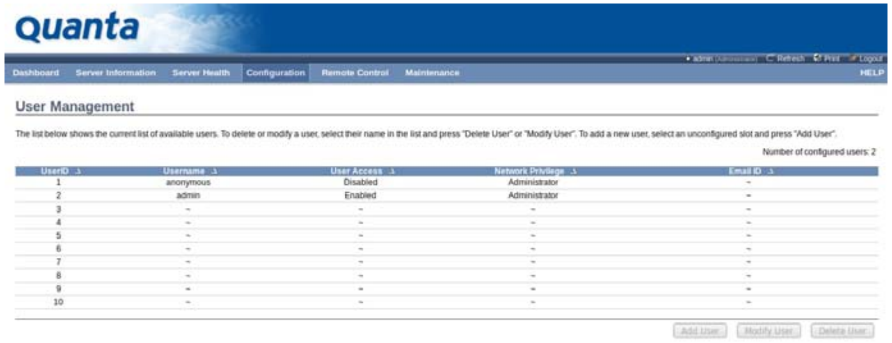
Note:

- Once you Upload/Generate the certificates, only HTTPs service will get restarted.
- You can now access your BMC securely using the following format in your IP Address field from your Internet browser: https://<your BMC's IP address here>
- For example, if your BMC's IP address is 192.168.0.30, enter the following: https://192.168.0.30
- Please note the <s> after <http>.You must accept the certificate before you are able to access your Generic BMC.

User Management

The User Management page allows you to view the current list of user slots for the server. You can add a new user and modify or delete the existing users.

To open User Management page, click **Configuration > Users** from the main menu. A sample screenshot of User Management Page is shown in the screenshot below.



User Management

The list below shows the current list of available users. To delete or modify a user, select their name in the list and press "Delete User" or "Modify User". To add a new user, select an unconfigured slot and press "Add User".

Number of configured users: 2

UserID	Username	User Access	Network Privilege	Email ID
1	anonymous	Disabled	Administrator	~
2	admin	Enabled	Administrator	~
3	~	~	~	~
4	~	~	~	~
5	~	~	~	~
6	~	~	~	~
7	~	~	~	~
8	~	~	~	~
9	~	~	~	~
10	~	~	~	~

User Management

The fields of User Management Page are explained below.

User Management Page

ITEM	DESCRIPTION
User ID	Displays the ID number of the user. **Note:** The list contains a maximum of ten users only.
User Name	Displays the name of the user.
User Access	To enable or disable the access privilege of the user.
Network Privilege	Displays the network access privilege of the user.

User Management Page (Continued)

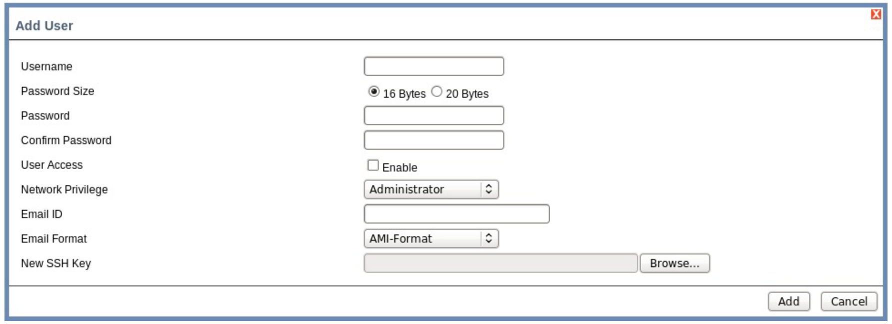
ITEM	DESCRIPTION
SNMP Status	Displays if the SNMP status for the user is enabled or Disabled.
Email ID	Displays email address of the user.
Add User	To add a new user. Modify.
User	To modify an existing user.
Delete User	To delete an existing user.

Procedure:

Note:
The Free slots are denoted by "~" in all columns for the slot.

Add a new user:

1. To add a new user, select a free slot and click **Add User**. This opens the Add User screen as shown in the screenshot below.



Add User

Username	
Password Size	● 16 Bytes ○ 20 Bytes
Password	
Confirm Password	
User Access	□ Enable
Network Privilege	Administrator
Email ID	
Email Format	AMI-Format
New SSH Key	Browse...

Add User Page

2. Enter the name of the user in the **User Name** field.

Note:

- User Name is a string of 4 to 16 alpha-numeric characters.
- It must start with an alphabetical character.
- It is case-sensitive.
- Special characters ','(comma), '.'(period), ':'(colon), ';'(semicolon), ' '(space), '/'(slash), '\'(backslash), '('(left bracket) and ')'(right bracket) are not allowed.

3. In the **Password and Confirm Password** fields, enter and confirm your new password.

Note:

- Password must be at least 8 characters long.
- White space is not allowed.
- This field will not allow more than 20 characters.

4. Enable or Disable the User Access Privilege.
5. In the **Network Privilege** field, enter the network privilege assigned to the user which could be Administrator, Operator, User or No Access.
6. Check the **SNMP Status** check box to enable SNMP access for the user.

Note:

Password field is mandatory, if SNMP Status is enabled.

7. Choose the SNMP Access level option for user from the **SNMP Access** dropdown list. Either it can be Read Only or Read Write.
8. Choose the **Authentication Protocol** to use for SNMP settings from the drop down list.

Note:

Password field is mandatory, if Authentication protocol is changed.

9. Choose the Encryption algorithm to use for SNMP settings from the **Privacy protocol** dropdown list.

10. In the **Email ID** field, enter the email ID of the user. If the user forgets the password, the new password will be mailed to the configured email address.

Note:
SMTP Server must be configured to send emails.

- Email Format: Two types of formats are available:
  - AMI-Format: The subject of this mail format is 'Alert from (your Hostname)'. The mail content shows sensor information, ex: Sensor type and Description.
  - Fixed-Subject Format: This format displays the message according to user's setting. You must set the subject and message for email alert.

11. In the **New SSK Key** field, click Browse and select the SSH key file.

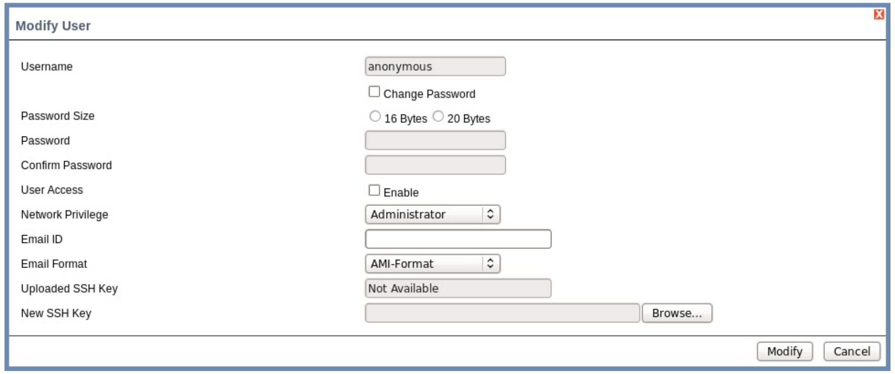
Note:
SSH key file should be of pub type.

12. Click **Add** to save the new user and return to the users list.

13. Click **Cancel** to cancel the modification and return to the users list.

Modify an existing user:

14. Select an existing user from the list and click **Modify User**. This opens the Add User screen as shown in the screenshot below.



Modify User

Username	anonymous
	☐ Change Password
Password Size	○ 16 Bytes ○ 20 Bytes
Password	
Confirm Password	
User Access	☐ Enable
Network Privilege	Administrator
Email ID	
Email Format	AMI-Format
Uploaded SSH Key	Not Available
New SSH Key	Browse...

Modify User Page

15. Edit the required fields.

16. To change the password, enable the **Change Password** option.

17. After editing the changes, click **Modify** to return to the users list page.

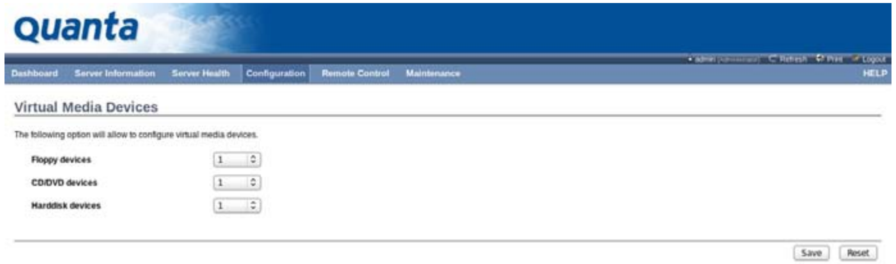
Delete an existing User

18. To delete an existing user, select the user from the list and click **Delete User**.

Virtual Media

This page to configure Virtual Media device settings. If you change the configuration of the virtual media in this page, it shows the appropriate device in the JViewer Vmedia dialog. For example, if you select two floppy devices in Configure Virtual Media page, then in JViewer > Vmedia, you can view two floppy device panel.

To open Virtual Media page, click **Configuration > Virtual Media** from the main menu. A sample screenshot of User Management Page is shown in the screenshot below.



Virtual Media Devices

The following option will allow to configure virtual media devices.

Floppy devices: 1

CD/DVD devices: 1

Harddisk devices: 1

Configure Virtual Media Devices

The following fields are displayed in this page.

Configure Virtual Media Devices

ITEM	DESCRIPTION
Floppy devices	The number of floppy devices that support for Virtual Media redirection.

Configure Virtual Media Devices (Continued)

ITEM	DESCRIPTION
CD/DVD devices	The number of CD/DVD devices that support for Virtual Media redirection.
Hard disk devices	The number of hard disk devices that support for Virtual Media redirection.
Local Media Support	To enable or disable the local media support for Virtual Media redirection.
Save	To save the configured settings.
Reset	To reset the previously-saved values.

Procedure:

1. Select the number of Floppy devices, CD/DVD devices and Hard disk devices from the dropdown list.

Note:
Maximum of two devices can be added in Floppy, CD/DVD and Hard disk drives.

2. Enable the **Local Media Support** if needed.
3. Click **Save** to save the changes made else click Reset to reset the previously saved values.

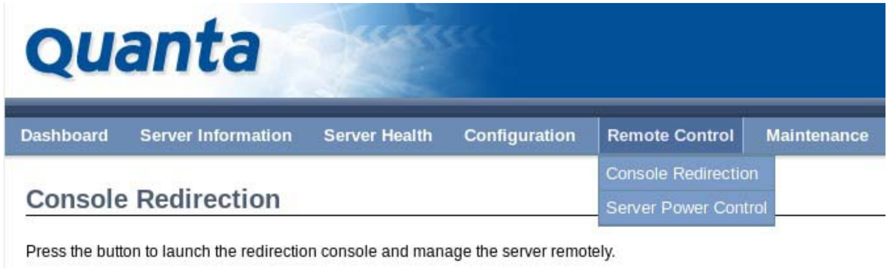
Note:
If there are two device panels for each device, and when you click the Connect button, then the redirected device panel will be disabled.

Remote Control

The Remote Control consists of the following menu items.

- Console Redirection
- Server Power Control

A sample screenshot of the Remote Control menu is given below.



Console Redirection

Press the button to launch the redirection console and manage the server remotely.

Remote Control Menu

A detailed description of the menu items are given ahead

Console Redirection

The remote console application, which is started using the WebGUI, allows you to control your server's operating system remotely, using the screen, mouse, and keyboard, and to redirect local CD/DVD, Floppy diskette and Hard disk/USB thumb drives as if they were connected directly to the server.

List of Supported Client Operating Systems

- WinXP
- W2K3 - 32 bit
- W2K3 - 64 bit
- RHEL 4 - 32 bit
- RHEL 4 - 64 bit
- RHEL 5.4 - 32 bit
- RHEL 5.4 - 64 bit
- RHEL 6.0 - 64 bit
- RHEL 6.0 - 32 bit
- Ubuntu 9.10 LTS - 32
- Ubuntu 9.10 LTS - 64
- Ubuntu 8.10 -32
- Ubuntu 8.10 -64
- OpenSuse 11.2 -32
- OpenSuse 11.2 -64
- FC 9 - 32
- FC 9 - 64
- FC 10 - 32
- FC 10 - 64

- FC 12 - 32
- FC 12 - 64
- FC 13 - 32
- FC 13 - 64
- FC 14 - 32
- FC 14 - 64
- MAC -32
- MAC-64

List of Supported Host OS

- RHEL 5
- RHEL 6
- W2K3
- W2K8
- RHEL 4
- OpenSuse 11.2
- OpenSuse 10.x
- Ubuntu 8.10
- Ubuntu 9.10
- Ubuntu 11.04

Browser Settings

For Launching the KVM, pop-up block should be disabled. For Internet explorer, enable the download file options from the settings.

Java Console

This is an OS independent plug-in which can be used in Windows as well as Linux with the help of JRE. JRE should be installed in the client’s system. You can install JRE from the following link.

http://www.java.com/en/download/manual.jsp

Procedure:

The Java Console can be launched in two ways:

1. Open the Dashboard Page and in Remote control section, click Launch for Java Console.
2. Open **Remote Control > Console Redirection** Page and click **Java Console**.

This will download the **.jnlp** file from the BMC.

To open the .jnlp file, use the appropriate JRE version (Javaws)

The Console Redirection window opens when the downloading is done.

The Console Redirection main menu consists of the following menu items.

- Video
- Keyboard
- Mouse
- Options
- Media
- Keyboard Layout
- Video Record
- Power
- Active Users
- Help

A detailed explanation of these menu items are given below.

Video

This menu contains the following sub menu items.

Video

ITEM	DESCRIPTION
Pause redirection	This option is used for pausing Console Redirection.

Video (Continued)

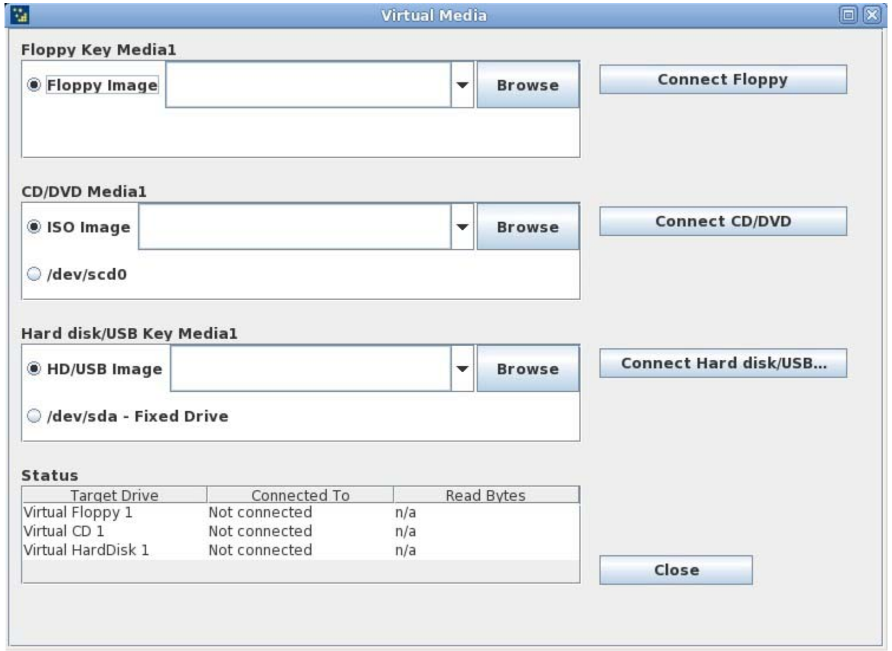
ITEM	DESCRIPTION
Resume Redirection	This option is used to resume the Console Redirection when the session is paused.
Refresh Video	This option can be used to update the display shown in the Console Redirection window.
Turn Off Host display	If you enable this option, the server display will be blank but you can view the screen in Console Redirection. If you disable this option, the display will be back in the server screen.
Full Screen	This option is used to view the Console Redirection in full screen mode (Maximize). This menu is enabled only when both the client and host resolution are same.
Exit	This option is used to exit the console redirection screen.

Keyboard

This menu contains the following sub menu items.

Keyboard

ITEM	DESCRIPTION
Hold Right Ctrl Key	This menu item can be used to act as the right-side <CTRL> key when in Console Redirection.
Hold Right Alt Key	This menu item can be used to act as the right-side <ALT> key when in Console Redirection.
Hold Left Ctrl Key	This menu item can be used to act as the left-side <CTRL> key when in Console Redirection.
Hold Left Alt Key	This menu item can be used to act as the left-side <ALT> key when in Console Redirection.
Left Windows Key	This menu item can be used to act as the left-side <WIN> key when in Console Redirection. You can also decide how the key should be pressed: Hold Down or Press and Release.
Right Windows Key	This menu item can be used to act as the right-side <WIN> key when in Console Redirection. You can also decide how the key should be pressed: Hold Down or Press and Release.
Alt+Ctrl+Del	This menu item can be used to act as if you depressed the <CTRL>, <ALT> and <DEL> keys down simultaneously on the server that you are redirecting.



Target Drive	Connected To	Read Bytes
Virtual Floppy 1	Not connected	n/a
Virtual CD 1	Not connected	n/a
Virtual HardDisk 1	Not connected	n/a

Virtual Media

Virtual Media

ITEM	DESCRIPTION
Floppy Key Media	This menu item can be used to start or stop the redirection of a physical floppy drive and floppy image types such as **.img*. **Note:** Floppy Redirection is not an available feature on all versions of the BMC.

Virtual Media (Continued)

ITEM	DESCRIPTION
CD/DVD Media	This menu item can be used to start or stop the redirection of a physical DVD/CD-ROM drive and cd image types such as iso.
Hard disc/USB Key Media	This menu item can be used to start or stop the redirection of a Hard Disk/USB key image and USB key image such as **.img*. **Note:** ● For windows client, if the logical drive of the physical drive is dismount then the logical device is redirected with Read/Write Permission else it is redirected with Read permission only. ● For MAC client, External USB Hard disk redirection is only supported. ● For Linux client, fixed hard drive is redirected only as Read Mode. It is not Write mode supported. ● For USB key image redirection, support FAT 16, FAT 32 and NTFS.

Keyboard Layout

Keyboard Layout

ITEM	DESCRIPTION
Auto Detect	This option is used to detect keyboard layout automatically. The languages supported automatically are English – US, French – France, Spanish – Spain, German- Germany, Japanese-Japan. If the client and host languages are same, then for all the languages other than English mentioned above, you must select this option to avoid typo errors.
Soft Keyboard	This option allows you to select the keyboard layout. It will show the dialog as similar to onscreen keyboard. If the client and host languages are different, then for all the languages other than English mentioned above, you must select the appropriate language in the list shown in JViewer and use the soft keyboard to avoid typo errors. **Note:** Soft keyboard is applicable only for JViewer Application not for other application in the client system.

Video Record

Note:

This option is available only when you launch the Java Console.

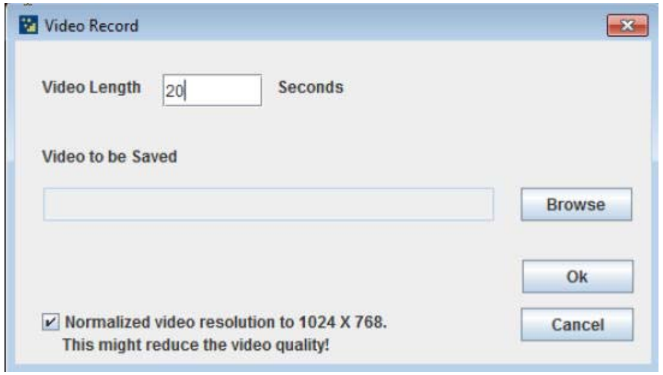
Video Record

ITEM	DESCRIPTION
Important	To view this menu option you must download the Java Media FrameWork (JMF). It can be downloaded from the link http://www.oracle.com/technetwork/java/javase/download-142937.html
Start Record	This option is to start recording the screen.
Stop Record	This option is used to stop the recording.
Settings	To set the settings for video recording.

Procedure:

Note:
Before you start recording, you have to enter the settings.

1. Click **Video Record > Settings** to open the settings page as shown in the screenshot below.



Video Length 20 Seconds

Video to be Saved

☑ Normalized video resolution to 1024 X 768.
This might reduce the video quality!

Video Record Settings Page

2. Enter the **Video Length** in seconds.
3. **Browse** and enter the location where you want the video to be saved.
4. Enable the option **Normalized video resolution to 1024X768**.
5. Click **OK** to save the entries and return to the Console Redirection screen.
6. Click **Cancel** if you don’t wish to save the entries.
7. In the Console Redirection window, click **Video Record > Start Record**.
8. Record the process.
9. To stop the recording, click **Video Record > Stop Record**.

Power

The power option is to perform any power cycle operation. Click on the required option to perform the **following operation.**
Reset Server: To reboot the system without powering off (warm boot).

Power

ITEM	DESCRIPTION
Power Off Server - Immediate	To immediately power off the server.
Power Off Server - Orderly Shutdown	To initiate operating system shutdown prior to the shutdown.
Power On Server	To power on the server.
Power Cycle Server	To first power off, and then reboot the system (cold boot).

Active Users

Click this option to displays the active users and their system IP address.

Help

Jviewer: Displays the copyright and version information

Quick Buttons

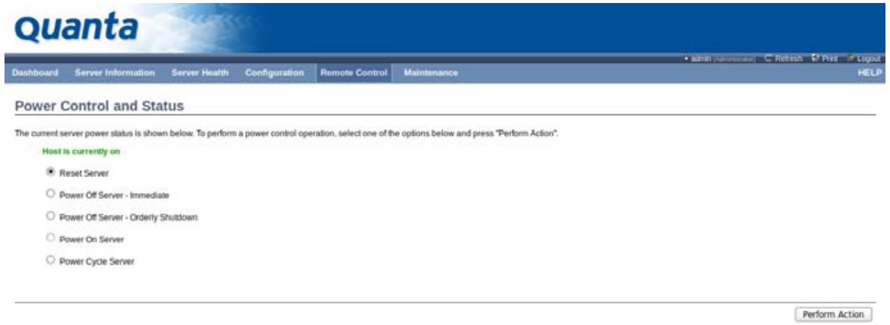
The lower right of Console Redirection windows displays all the quick buttons. These quick buttons helps you to perform these functions by just clicking them.

Note:
This option is available only when you launch the Java Console. Server Power Control.

Server Power Control

This page allows you to view and control the power of your server.

To open Power Control and Status page, click **Remote Control > Server Power Control** from the main menu. A sample screenshot of Power Control and Status page is shown in the screenshot below.



Power Control and Status

The current server power status is shown below. To perform a power control operation, select one of the options below and press "Perform Action".

Host is currently on

● Reset Server
○ Power Off Server - Immediate
○ Power Off Server - Orderly Shutdown
○ Power On Server
○ Power Cycle Server

Power Control and Status Page

The various options of Power Control are given below.

Server Power Control

ITEM	DESCRIPTION
Reset Server	This option will reboot the system without powering off (warm boot).
Power Off Server – Immediate	This option will immediately power off the server.
Power Off Server – Orderly Shutdown	This option will initiate operating system shutdown prior to the shutdown.
Power On Server	This option will power on the server.
Power Cycle Server	This option will first power off, and then reboot the system (cold boot).

Server Power Control (Continued)

ITEM	DESCRIPTION
Perform Action	Click this option to perform the selected operation.

Procedure:

Select an action and click Perform Action to proceed with the selected action.

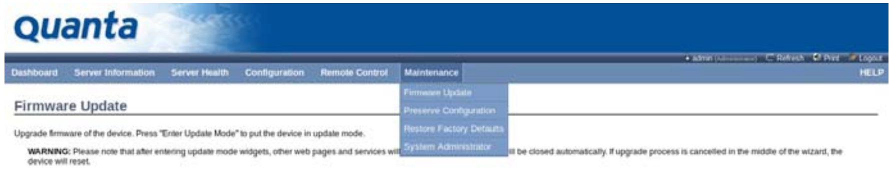
Note:
You will be asked to confirm your choice. Upon confirmation, the command will be executed and you will be informed of the status.

Maintenance Group

This group of pages allows you to do maintenance tasks on the device. The menu contains the following items:

- Firmware Update
- Preserve Configuration
- Restore Factory Defaults

- System Administrator



Firmware Update

Upgrade firmware of the device. Press "Enter Update Mode" to put the device in update mode.

WARNING: Please note that after entering update mode widgets, other web pages and services wil ll be closed automatically. If upgrade process is cancelled in the middle of the wizard, the device will reset.

Maintenance Menu

Firmware Update

This wizard takes you through the process of firmware up gradation. A reset of the box will automatically follow if the upgrade is completed or cancelled. An option to preserve configuration will be presented. Enable it, if you wish to preserve configured settings through the upgrade.

WARNING!

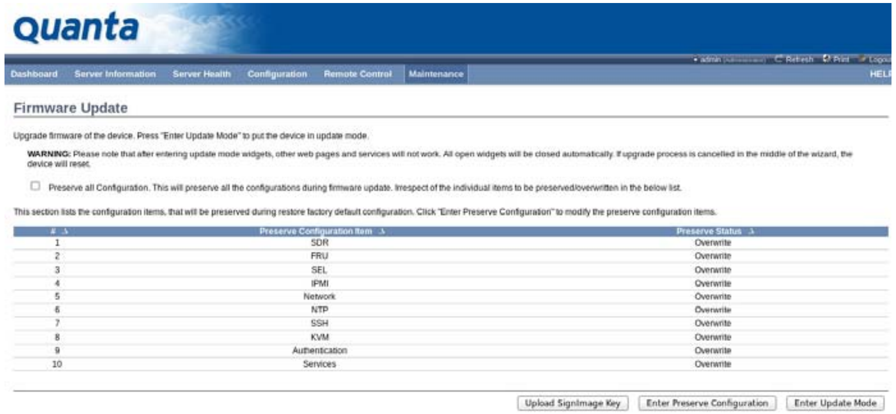
Please note that after entering update mode widgets, other web pages and services will not work. All open widgets will be closed automatically. If upgrade process is cancelled in the middle of the wizard, the device will be reset.

Note:

The firmware upgrade process is a crucial operation. Make sure that the chances of a power or connectivity loss are minimal when performing this operation.

Once you enter into Update Mode and choose to cancel the firmware flash operation, the BMC card must be reset. This means that you must close the Internet browser and log back onto the BMC card before you can perform any other types of operations.

To open Firmware Update page, click **Maintenance > Firmware Update** from the main menu. A sample screenshot of Firmware Update Page is shown in the screenshot below.



Firmware Update

Upgrade firmware of the device. Press "Enter Update Mode" to put the device in update mode.

WARNING: Please note that after entering update mode widgets, other web pages and services will not work. All open widgets will be closed automatically. If upgrade process is cancelled in the middle of the wizard, the device will reset.

□ Preserve all Configuration. This will preserve all the configurations during firmware update. Irrespect of the individual items to be preserved/overwritten in the below list.

This section lists the configuration items, that will be preserved during restore factory default configuration. Click "Enter Preserve Configuration" to modify the preserve configuration items.

#	Preserve Configuration Item	Preserve Status
1	SDR	Overwrite
2	FRU	Overwrite
3	SEL	Overwrite
4	IPMI	Overwrite
5	Network	Overwrite
6	NTP	Overwrite
7	SSH	Overwrite
8	KVM	Overwrite
9	Authentication	Overwrite
10	Services	Overwrite

Firmware Update Page

Procedure:

Click **Enter Update Mode** to upgrade the current device firmware. As below step by step:

1. Closing all active client requests.
2. Preparing device for firmware upgrade.
3. Uploading firmware image.
4. Verifying firmware image.
5. Flashing firmware image.
6. Resetting Device.

Note:
You can now follow the instructions presented in the subsequent pages to successfully update the card's firmware. The device will reset if update is canceled. The device will also reset upon successful completion of firmware update.

Preserve Configuration

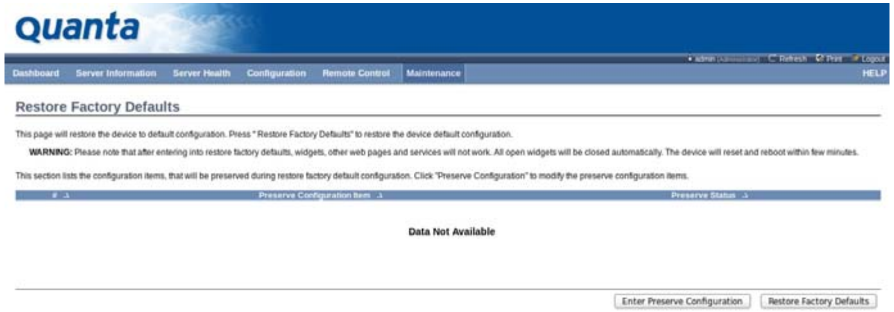
This page allows the user to configure the preserve configuration items, which will be used by the Restore factory defaults to preserve the existing configuration without overwriting with default configuration.

Restore Factory Defaults

This option is used to restore the factory defaults of the device firmware.

WARNING!
Please note that after entering restore factory widgets, other web pages and services will not work. All open widgets will be closed automatically. The device will reset and reboot within a few minutes.

To open Restore Factory Defaults page, click **Maintenance > Restore Factory Defaults** from the main menu. A sample screenshot of Restore Factory Defaults Page is shown in the screenshot below.



Restore Factory Defaults

This page will restore the device to default configuration. Press " Restore Factory Defaults" to restore the device default configuration.

WARNING: Please note that after entering into restore factory defaults, widgets, other web pages and services will not work. All open widgets will be closed automatically. The device will reset and reboot within few minutes.

This section lists the configuration items, that will be preserved during restore factory default configuration. Click "Preserve Configuration" to modify the preserve configuration items.

#	Preserve Configuration Item	Preserve Status

Data Not Available

Restore Factory Defaults Page

Procedure:

Click Restore Factory to restore the factory defaults of the device firmware.

Log Out

To log out of the Web GUI, click the logout link on the top right corner of the screen.

User Privilege

User Privilege

WEB GUI PRIVILEGE LIST	PRIVILEGE ASSOCIATION BETWEEN IPMI AND WEB GUI			
	ADMINISTRATOR	OPERATOR	USER	OEM
login BMC from Web GUI, SSH	O	O	X	O
configure BMC from Web GUI	O	X	X	X
configure users from Web GUI	O	X	X	X
clear logs from Web GUI	O	X	X	X
execute server power control from Web GUI	O	X	X	X
virtual KVM redirection	O	X	X	X
virtual media	O	X	X	X
View Users	O	O	X	X
View DNS	O	O	X	X
View Network	O	O	X	X
View PEF	O	O	X	X

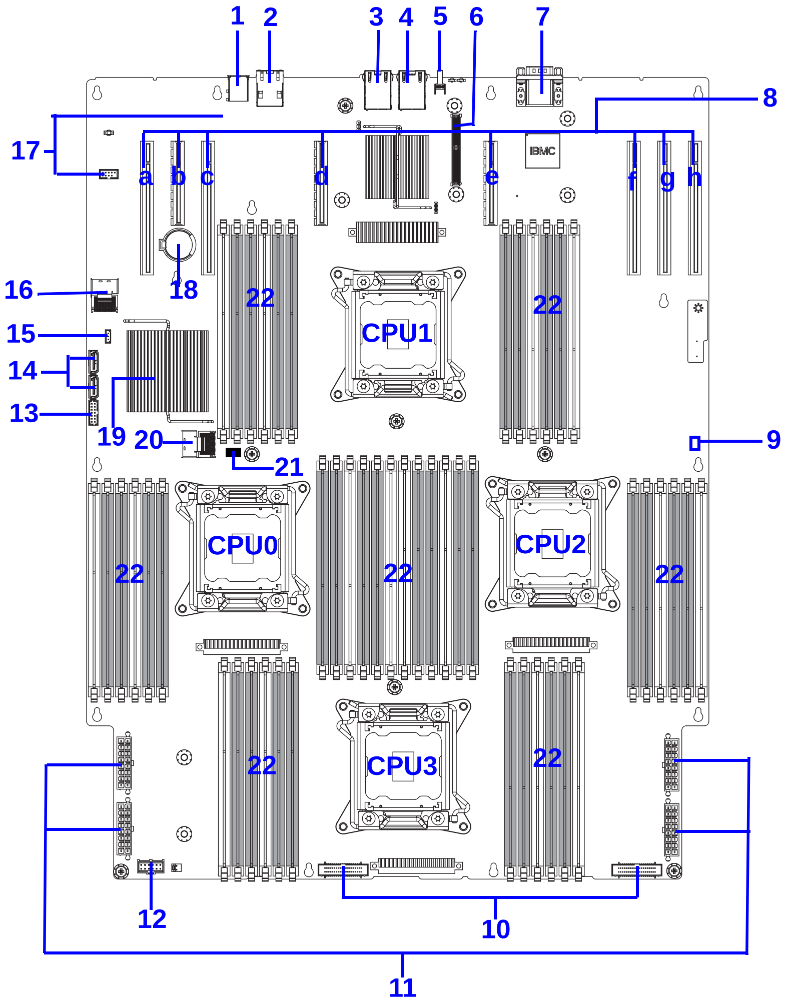
Connectors and Jumpers

Chapter 5

5.1. Mainboard Connectors and Jumpers

Connectors and Jumpers

This section provides information on basic connectors and jumpers on system mainboard.



Mainboard Connectors and Jumpers

Mainboard Connector and Jumper Locations

LOCATION	CONNECTOR AND JUMPERS
1	External USB
2	Management Port
3	LAN1 Port
4	LAN2 Port
5	ID Button
6	PCIe Mezzanine Slot
7	Serial Port
8	PCIe Expansion Slots x8 in order a to h
9	XDP JTAG Access to CPU1
10	Fan Control Connectors x2
11	PDB Power Connectors x4
12	Sideband Connector
13	USB Connector
14	On-Board SATA Connectors x2
15	J1D1 Password Clear Jumper, J1D2 ME Firmware Update Jumper, J1D3 BIOS Recovery Mode Jumper, J1D4 RTC Reset Jumper. **Note:** See table *Mainboard Jumpers* for details on jumpers.
16	Mini SAS Connector (HDD 4 to 7)
17	Internal USB Headers x2s

Mainboard Connector and Jumper Locations (Continued)

LOCATION	CONNECTOR AND JUMPERS
18	Mainboard Battery
19	PCH / Heatsink
20	Mini SAS Connector (HDD 0 to 3)
21	J3E1 XDP X8 / X4 Mode Jumper
22	Memory Slots x48

Mainboard Jumpers

LOCATION	JUMPER POSITIONS	FUNCTION	DEFAULT SETTING
CMOS CLEAR			
J1D4	1-2	Normal RTC RST	V
	2-3	CLR RTC Registers	
PASSWORD CLEAR			
J1D1	1-2	Normal Operation	V
	2-3	Clear Passwords	
ME FIRMWARE UPDATE JUMPER			
J1D2	1-2	Normal Mode	V
		ME IN Force Update Mode	

Mainboard Jumpers (Continued)

LOCATION	JUMPER POSITIONS	FUNCTION	DEFAULT SETTING
BIOS RECOVERY JUMPER			
J1D3	1-2	Normal (system)	V
	2-3	Reset BIOS to Deafult Settings	
XDP X8/X4 MODE			
J3E1	1-2	X4 Mode	V
	2-3	X8 Mode	
XDP JTAG PASS TO CPU1			
J9E1	1-2	Normal Mode	V
	2-3	Force JTAG bypass of CPU1	

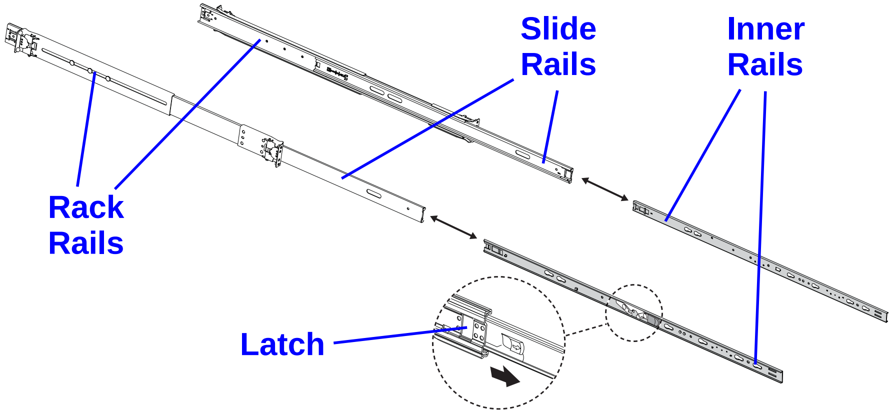
Rail Kit Assembly

Chapter 6

6.1. Installation and Configuration

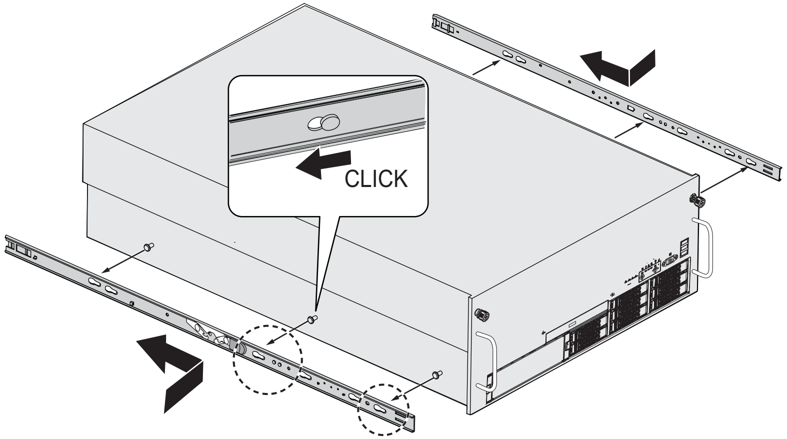
Installing the Rails

1. Press the latch and remove the inner rail.



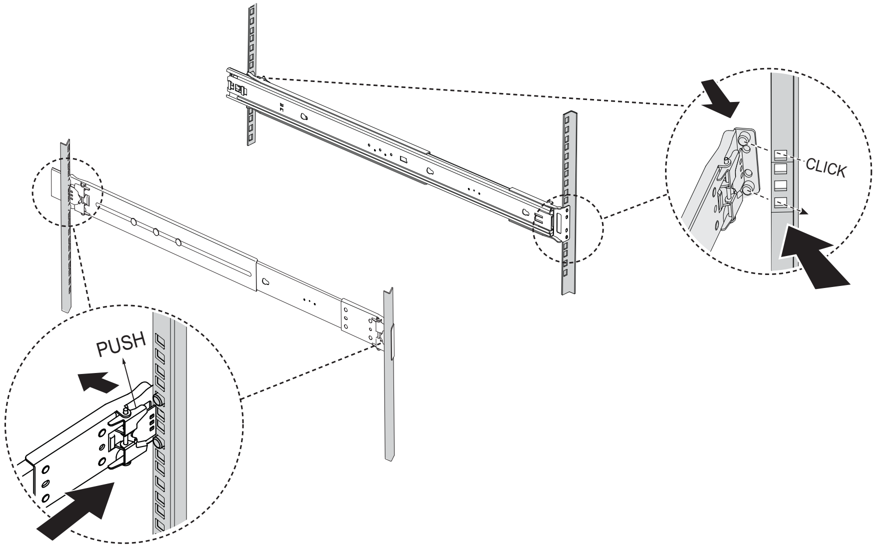
Removing the Inner Rail

2. Slide the inner rails onto the chassis.



Securing the Inner Rails

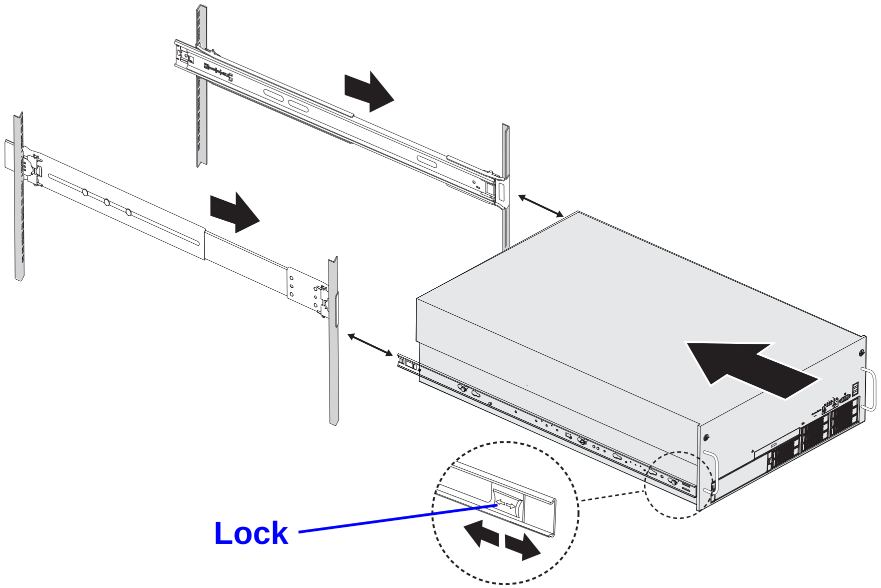
3. Secure the rack rails to the rack.



Securing the Rack Rails

4. Align the slide rail with the inner rail.

5. Release the lock on the inner rail and slide the server into the rack.



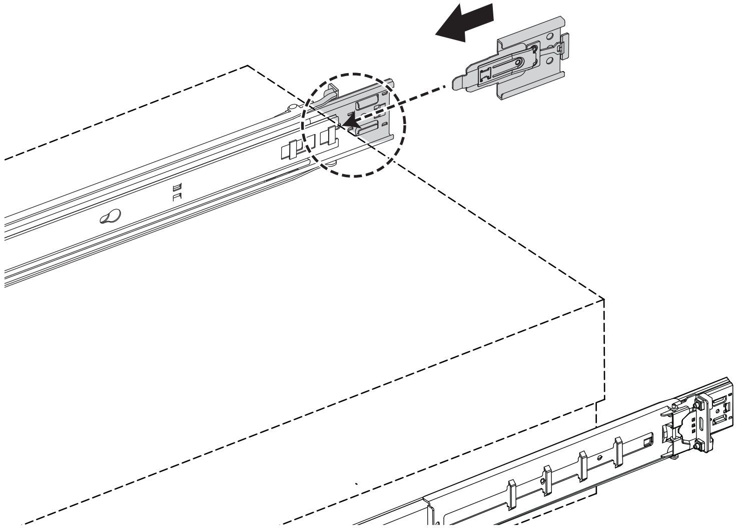
Inserting the Server

6. Secure the server to the rack with the captive screws.

Installing the Cable Management Arm (CMA)

Note:
In these steps, left means left when looking at the server from the front.

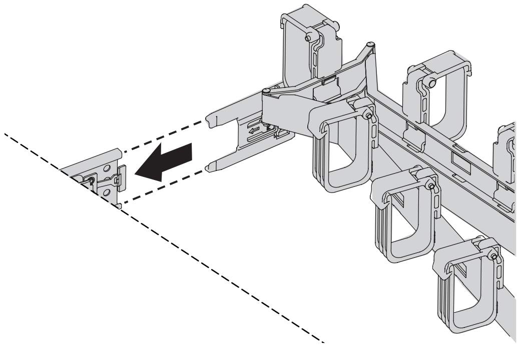
1. Insert the CMA extension into the left outer rail.



Inserting the CMA Extension

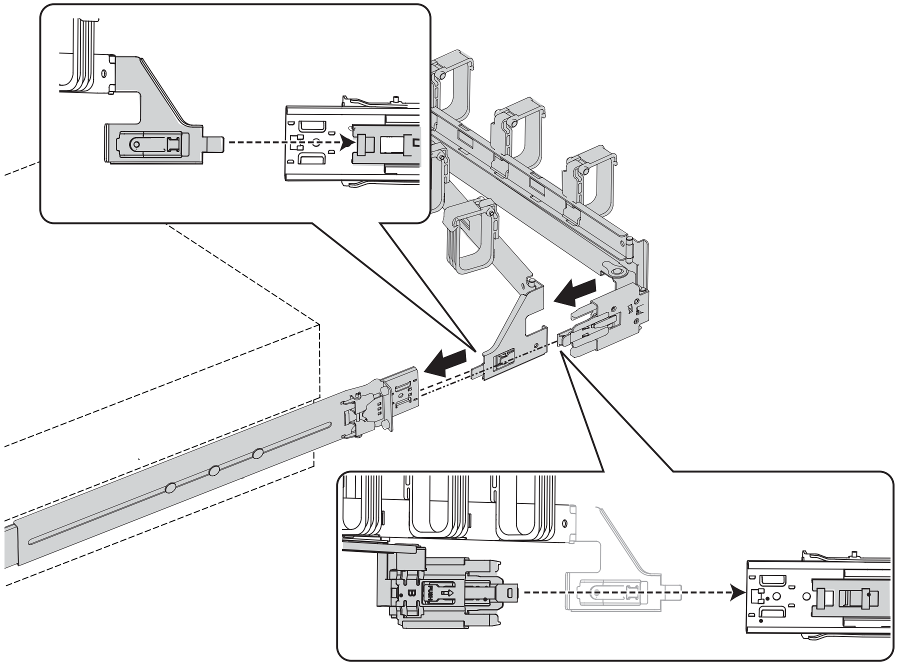
2. Insert the CMA connector of the inner arm of the CMA into the right inner slide rail.

3. Insert the CMA connector of the outer arm of the cable management arm into the right outer rail.



Inserting the CMA Connector

4. Insert the connector of the CMA into the CMA extension placed in the left outer rail in step 1.

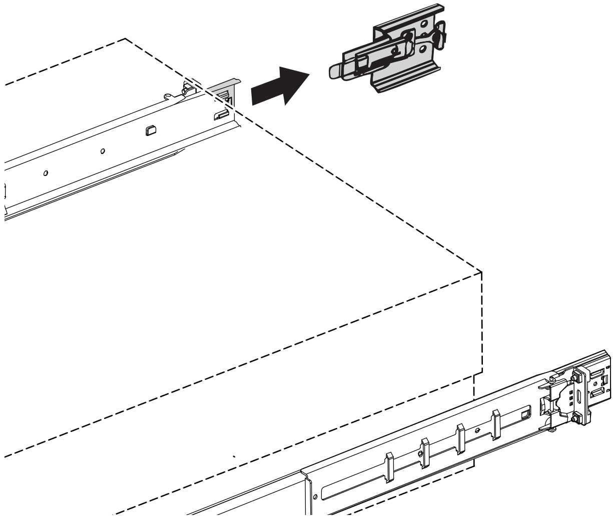


Inserting the CMA into the Extension

Removing the Cable Management Arm (CMA)

Note:
In these steps, left means left when looking at the server from the front.

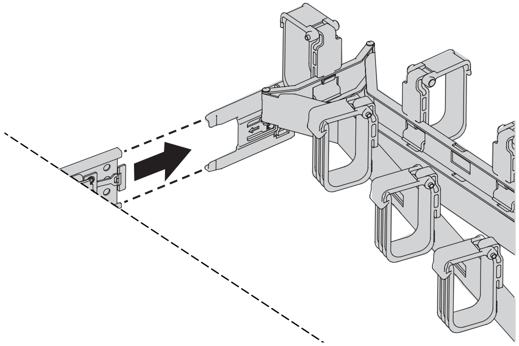
1. Press the latch to remove the CMA from the cable management extension on the left outer rail.



Removing the CMA Extension

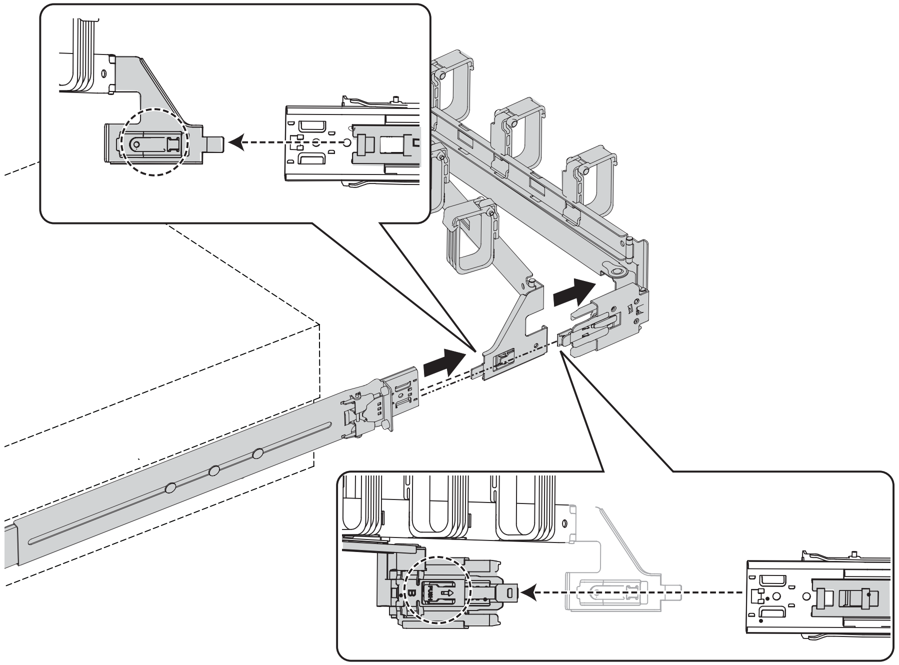
2. Press the latch to remove the CMA connector of the outer arm of the CMA from the right outer rail.

3. Press the latch to remove the CMA connector of the inner arm of the CMA from the right inner rail.



Removing the CMA Connector

4. Press the latch to remove the CMA extension from the left outer rail.



Removing the CMA Extension

Troubleshooting

Chapter 7

7.1. Troubleshooting

System does not Boot after initial installation:

- *Power Cord Not Plugged In*
- *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*

System does not Boot after Initial Installation

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.

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.

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.QuantaQCT.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.

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 problem still persists, try replacing the monitor or test the monitor on a different AC outlet/different system.

Power Supply, Chassis and Fan Issues

- Ensure that the chassis and power supply is appropriate for system requirement. (*Power Sub-System* on page 1-11).
- Ensure that the chassis and power supply is appropriate for system requirement. (*Power Sub-System* on page 1-11).
- 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.

Cable Issues

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

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.

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.

System does not boot after Configuration Changes

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.

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 software manufacturer for assistance

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 http://www.QuantaQCT.com for the BIOS update.

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 reporting 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.

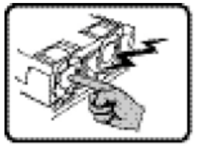
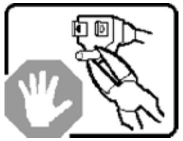
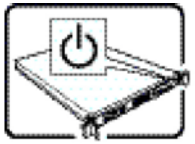
Troubleshooting External Connections

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.

Installation and Assembly Safety Instructions

Chapter 8

8.1. Installation Assembly Safety Instructions

	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.

WARNING!

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.

Safety Information

Chapter 9

9.1. 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.

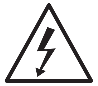
Your server should be integrated and serviced only by technically qualified persons.

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.

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.

CAUTION	Indicates the presence of a hazard that may cause minor personal injury or property damage if the CAUTION is ignored.
WARNING	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.
 WARNING: Safe handling of this system requires TWO people.	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.

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.

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.

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.

Power and Electrical Warnings

CAUTION!

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.

CAUTION!

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.

CAUTION!

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.

CAUTION!

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.

CAUTION!

When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing it from the server.

CAUTION!

When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing it from the server.

Power Cord Warnings

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

CAUTION!

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.

CAUTION!

The power cord must have safety ground pin or contact that is suitable for the electrical outlet.

CAUTION!

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.

CAUTION!

The power supply cord(s) must be plugged into socket-outlet(s) that is /are provided with a suitable earth ground.

System Access Warnings

CAUTION!

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.

CAUTION!

If the server has been running, any installed processor(s) and heat sink(s) may be hot.

CAUTION!

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).

CAUTION!

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.

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 multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of 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).

Electrostatic Discharge (ESD)

CAUTION!

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 wrapper. Do not slide board over any surface.

Other Hazards

Battery Replacement

CAUTION!

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.

CAUTION!

Dispose of batteries according to local ordinances and regulations.

CAUTION!

Do not attempt to recharge a battery.

CAUTION!

Do not attempt to disassemble, puncture, or otherwise damage a battery.

Cooling and Airflow

CAUTION!

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.

Laser Peripherals or Devices

CAUTION!

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.

Regulatory and Compliance Information

Chapter 10

10.1. Electromagnetic Compatibility Notices

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.

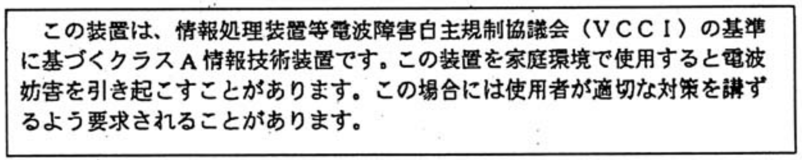
Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

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.

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.

VCCI (Japan)



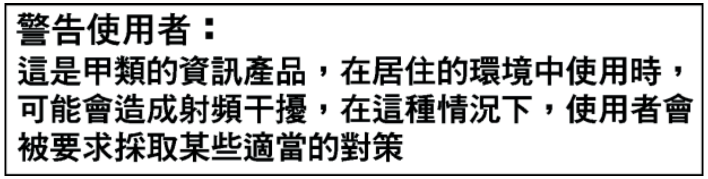
この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

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.

BSMI (Taiwan)

The BSMI Certification Marking and EMC warning is located on the outside rear area of the product



警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策

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: http://www.QuantaQCT.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.

Restriction of Hazardous Substances (RoHS) Compliance

Quanta® Computer 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

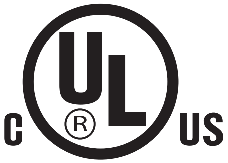
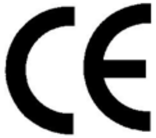
End of Life / Product Recycling

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.

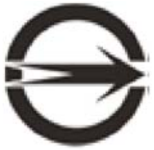
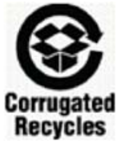
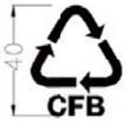
10.2. Product Regulatory Compliance Markings

This product is marked with the following product certification markings:

Product Regulatory Compliance Markings

REGULATORY COMPLIANCE	REGION	MARKING
cULus Listing Marks	USA / Canada	
CE Mark	Europe	
FCC Marking (Class A)	USA	This device complies with Part 15 of the FCC Rules. Operation of this device 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.

Product Regulatory Compliance Markings (Continued)

VCCI Marking (Class A)	Japan	この装置は、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。VCCI-A
BSMI Certification Number & Class A Warning	Taiwan	 R43039 警告使用者： 這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策
ICES	Canada	This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.
Recycling Package Mark	Other than China	 
GOST R Marking	Russia