

Intel[®] Server System R2000IP Family Service Guide

A Guide for Technically Qualified Assemblers of Intel[®] identified Subassemblies/Products

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Important Safety Instructions

Read all caution and safety statements in this document before performing any of the instructions. See also Intel Server Boards and Server Chassis Safety Information on the Intel® Server Deployment Toolkit 3.0 CD and/or at <http://www.intel.com/support/motherboards/server/sb/cs-010770.htm>.

Wichtige Sicherheitshinweise

Lesen Sie zunächst sämtliche Warnung und Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen. Beachten Sie hierzu auch die Sicherheitshinweise zu Intel-Serverplatinen und Servergehäusen auf der Intel® Server Deployment Toolkit 3.0 CD oder unter <http://www.intel.com/support/motherboards/server/sb/cs-010770.htm>.

Consignes de sécurité

Lisez attention toutes les consignes de sécurité et les mises en garde indiquées dans ce document avant de suivre toute instruction. Consultez Intel Server Boards and Server Chassis Safety Information sur le Intel® Server Deployment Toolkit 3.0 CD ou bien rendez-vous sur le site <http://www.intel.com/support/motherboards/server/sb/cs-010770.htm>.

Instrucciones de seguridad importantes

Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones. Vea Intel Server Boards and Server Chassis Safety Information en el Intel® Server Deployment Toolkit 3.0 CD y/o en <http://www.intel.com/support/motherboards/server/sb/cs-010770.htm>.

重要安全指导

在执行任何指令之前，请阅读本文档中的所有注意事项及安全声明。和/或 <http://www.intel.com/support/motherboards/server/sb/cs-010770.htm> 上的 *Intel® Server Boards and Server Chassis Safety Information*（《Intel 服务器主板与服务器机箱安全信息》）。

Warnings

Heed safety instructions: Before working with your server product, whether you are using this guide or any other resource as a reference, pay close attention to the safety instructions. You must adhere to the assembly instructions in this guide 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 will most likely result in noncompliance 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 the system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before you open the chassis, add, or remove 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 disk 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 your server when handling parts.

ESD and handling boards: 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.

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 you can grip with your fingertips or with a pair of fine needle nosed pliers. If your 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 you use to remove a jumper, or you may bend or break the pins on the board.

Preface

About this Manual

This manual is written for system technicians who are responsible for troubleshooting, upgrading, and repairing this server system. This document provides a brief overview of the features of the server board/chassis, a list of accessories or other components you may need, troubleshooting information, and instructions on how to add and replace components on the Intel® Server System R2000IP family products. For the latest revision of this manual, go to <http://www.intel.com/support>.

Manual Organization

Chapter 1 provides a brief overview of the Intel® Server System R2000IP family. In this chapter, you will find a list of the server system features, and figures of the system and components to help you identify your system components and their locations.

Chapter 2 provides instructions on adding and replacing components. Use this chapter for step-by-step instructions and diagrams for installing or replacing components such as the fan, power supply, and front panel board, among other components.

Chapter 3 provides instructions on using the utilities that are shipped with the board or that may be required to update the system. This includes information for navigating through the BIOS Setup screens, performing a BIOS update, and resetting the password or BIOS defaults.

The back of this manual provides technical specifications, regulatory information, LED Decoder, "getting help" information, and Intel® Server Issue Report Form.

Additional Information and Software

For additional information about this family of products or any of their supported accessories, refer to the following resources available at <http://www.intel.com/support>.

Table 1. Server System References

For this information or software	Use this Document or Software
For in-depth technical information about this product.	<i>Intel® Server System R2000IP Product Family Technical Product Specification</i> <i>Intel® Server Board S2600IP Technical Product Specification</i>
For a quick guide of how to assemble the server system and install components	<i>Intel® Server System R2000IP Product Family Quick Installation User's Guide</i>
For product list and supported Intel spares and accessories	<i>Spares and Accessories List and Configuration Guide</i>
For server configuration guidance and compatibility	Intel® Server Configurator tool http://serverconfigurator.intel.com
For system power budget guidance	Power Budget Tool
For system firmware updates and onboard device drivers and software to manage your Intel® Server System.	Intel® Server Deployment & Management DVD
Product Safety and Regulatory document	<i>Intel Server Products - Product Safety and Regulatory Compliance Document</i>

Table of Contents

Safety Information	iii
Preface	v
1 Server System Features	1
Server System Feature Overview	1
Server System Components	3
Hot Swap Hard Drive Bay and Front Panel Options	3
Front Panel	4
Back Panel	5
Server Board Components	6
Intel® Light-Guided Diagnostics	7
5-volt Stand-by LED	7
Fan Fault LED	7
CPU Fault LED	7
DIMM Fault LEDs	8
System ID LED, System Status LED and POST Code Diagnostic LEDs	9
System Recovery Jumpers	11
Peripheral Devices	12
2 Hardware Installations and Upgrades	17
Before You Begin	17
Tools and Supplies Needed	17
System Reference	17
Cable Routing	17
For system with 8 x 3.5" hard drive bay:	17
For system with 12 x 3.5" hard drive bay:	19
For system with 8 x 2.5" hard drive bay:	20
For system with 16 x 2.5" hard drive bay:	21
For system with 24 x 2.5" hard drive bay:	22
Removing and Installing the Front Bezel	24
Removing the Front Bezel	24
Installing the Front Bezel	24
Removing and Installing the System Cover	25
Removing the System Cover	25
Installing the System Cover	26
Removing and Installing the Air Duct	27
Removing the Air Duct	27
Installing the Air Duct	27
Removing and Installing Processor	28
Removing Processor Heatsink(s)	28
Installing the Processor	28
Installing Processor Heatsink(s)	31
Removing the Processor	31
Installing and Removing Memory	32
Installing Memory	32
Removing Memory	32

Installing a Hot-swap Hard Disk Drive	32
Installing a Hard Disk Drive into 3.5" Hard Drive Carrier	33
For installing 2.5" Hard Disk Drive as option:	34
Installing a Hard Disk Drive into 2.5" Hard Drive Carrier	34
Installing a PCI Add-in Card	36
Installing a PCI Add-in Card.....	36
Installing and Removing a Slimline Optical Drive.....	37
Installing a Slimline Optical Drive.....	38
Removing a Slimline Optical Drive.....	38
Installing Intel® I/O Expansion Module.....	39
Installing Intel® I/O Expansion Module	39
Installing and Removing the Intel® RAID C600 Upgrade Key	41
Installing the Intel® RAID C600 Upgrade Key.....	41
Removing the Intel® RAID C600 Upgrade Key.....	41
Installing and Removing the Intel® Remote Management Module 4.....	41
Installing the Intel® RMM4 Lite.....	41
Install the Intel® RMM4 NIC	42
Removing the Intel® RMM4 Lite.....	43
Removing the Intel® RMM4 NIC.....	43
Installing and Removing the Intel® RAID Smart Battery	43
Installing the Intel® RAID Smart Battery	43
Removing the Intel® RAID Smart Battery	44
Replacing the Power Supply	44
Installing and Removing the Server Board	46
Removing the Server Board.....	46
Installing the Server Board	46
Replacing the Backup Battery	47
Replacing a System Fan	48
Replacing the Backplane.....	49
Replacing the 3.5" Hard Drive Backplane	49
Installing the 3.5" Hard Drive Backplane	50
Replacing the 2.5" Hard Drive Backplane	51
Installing the 2.5" Hard Drive Backplane:	53
Replacing the Intel® RAID Expander RS2CV360/RS2CV240	54
Removing the Intel® RAID Expander	54
Installing the Intel® RAID Expander	55
Installing and Removing the Rack Handles	55
Installing the Rack Handles	55
Removing the Rack Handles	56
Installing and Removing the Storage Front Panel.....	56
Installing the Storage Front Panel.....	56
Removing the Storage Front Panel.....	57
3 BIOS Setup Utilities.....	59
BIOS Setup Operation.....	59
Setup Page Layout	59
Entering BIOS Setup	60
Setup Navigation Keyboard Commands	61
Setup Screen Menu Selection Bar	62
BIOS Setup Utility Screens	62
Map of Screens and Functionality.....	63

Table of Contents

Main Screen (Tab).....	64
Advanced Screen (Tab).....	68
Processor Configuration	71
Power & Performance.....	83
Memory Configuration	84
Memory RAS and Performance Configuration	90
Mass Storage Controller Configuration	92
PCI Configuration	99
NIC Configuration	103
Serial Port Configuration.....	114
USB Configuration.....	116
System Acoustic and Performance Configuration	119
Security Screen (Tab).....	123
Server Management Screen (Tab).....	127
Console Redirection	135
System Information.....	138
BMC LAN Configuration	140
Boot Options Screen (Tab)	151
CDROM Order.....	158
Hard Disk Order.....	159
Floppy Order	160
Network Device Order	161
BEV Device Order	162
Add EFI Boot Option.....	163
Delete EFI Boot Option.....	164
Boot Manager Screen (Tab)	165
Error Manager Screen (Tab).....	166
Save & Exit Screen (Tab)	168
Appendix A: Technical Reference	172
Power Supply Input Voltages.....	172
Power Supply Output Voltages.....	172
System Environmental Limits.....	172
Appendix B: Regulatory and Compliance Information.....	174
Appendix C: Getting Help.....	175
Warranty Information	175
Appendix D: Intel® Server Issue Report Form	176

List of Figures

Figure 1. Intel® Server System R2000IP	1
Figure 2. Intel® Server System R2000IP Components	3
Figure 3. 3.5" Hard Drive Bay - 8 Drive Configuration	3
Figure 4. 3.5" Hard Drive Bay - 12 Drive Configuration	3
Figure 5. 2.5" Hard Drive Bay - 8 Drive Configuration	4
Figure 6. 2.5" Hard Drive Bay - 16 Drive Configuration	4
Figure 7. 2.5" Hard Drive Bay - 24 Drive Configuration	4
Figure 8. Front Panel Options	4
Figure 9. Back Panel Feature Identification.....	5
Figure 10. Server Board Connector and Component Locations	6
Figure 11. Stand by LED, Fan Fault LED and CPU Fault LED Location	8
Figure 12. DIMM Fault LED's Location.....	9
Figure 13. Location of System Status, System ID and POST Code Diagnostic LEDs.....	10
Figure 14. Configuration Jumpers	11
Figure 15. Optional Peripherals (16x2.5-inch hard drive bays as shown)	12
Figure 16. Front view of Front Bezel	13
Figure 17. 8 x 3.5-inch Hard Drive Backplane Components (Front View)	14
Figure 18. 8 x 3.5-inch Hard Drive Backplane Components (Rear View).....	14
Figure 19. 12 x 3.5-inch Hard Drive Backplane Components (Front View)	14
Figure 20. 12 x 3.5-inch Hard Drive Backplane Components (Rear View).....	15
Figure 21. 8 x 2.5-inch Hard Drive Backplane Components (Front View)	15
Figure 22. 8 x 2.5-inch Hard Drive Backplane Components (Rear View).....	15
Figure 23. Internal Intel® RAID Expander Cards Components (Top View).....	16
Figure 24. Cable Routing – 8 x 3.5" HDD.....	18
Figure 25. Cable Routing – 12 x 3.5" HDD	19
Figure 26. Cable Routing – 8 x 2.5" HDD	20
Figure 27. Cable Routing – 16 x 2.5" HDD	22
Figure 28. Cable Routing – 24 x 2.5" HDD	23
Figure 29. Removing the Front Bezel.....	24
Figure 30. Installing the Front Bezel.....	24
Figure 31. Installing the badge to the front bezel.....	25
Figure 32. Removing the badge from the front bezel.....	25
Figure 33. Removing the System Cover.....	26
Figure 34. Installing the System Cover.....	26
Figure 35. Removing the Air Duct	27
Figure 36. Installing the Air Duct	27
Figure 37. Removing Processor Heatsink	28
Figure 38. Installing Processor – Open the Socket Lever.....	29
Figure 39. Installing Processor – Open the Load Plate.....	29
Figure 40. Installing Processor – Install the Processor.....	30
Figure 41. Installing Processor – Remove the Cover.....	30
Figure 42. Installing Processor – Close the Load Plate	30
Figure 43. Installing Processor – Latch the Locking Lever	30
Figure 44. Installing Processor Heatsink	31
Figure 45. Installing Memory	32
Figure 46. Installing Hard Disk Drive – Removing 3.5" HDD carrier	33
Figure 47. Installing Hard Disk Drive – Removing 3.5" HDD interface bracket	33

List of Figures

Figure 48. Installing Hard Disk Drive – Installing 3.5" HDD	33
Figure 49. Installing Hard Disk Drive – Installing 2.5" HDD	34
Figure 50. Installing Hard Disk Drive – Inserting 3.5" HDD assembly	34
Figure 51. Installing Hard Disk Drive – Removing 2.5" HDD carrier	35
Figure 52. Installing Hard Disk Drive – Removing plastic drive blank	35
Figure 53. Installing Hard Disk Drive – Installing 2.5" HDD	35
Figure 54. Installing Hard Disk Drive – Inserting 2.5" HDD assembly	36
Figure 55. Installing a PCI Add-In Card	36
Figure 56. Installing a PCI Add-In Card...Continued 1	37
Figure 57. Installing a PCI Add-In Card...Continued 2	37
Figure 58. Installing the Plastic Guide to the Optical Drive	38
Figure 59. Installing an Optical Drive	38
Figure 60. Removing the Slimline Optical Drive	39
Figure 61. Installing Intel® I/O Expansion Module	39
Figure 62. Installing Intel® I/O Expansion Module...Continued 1	40
Figure 63. Installing Intel® I/O Expansion Module...Continued 2	40
Figure 64. Installing the Intel® RAID C600 Upgrade Key	41
Figure 65. Installing the Intel® RMM4 Lite	42
Figure 66. Installing the Intel® RMM4 NIC	43
Figure 67. Installing the Intel® RAID Smart Battery	44
Figure 68. Removing the Intel® RAID Smart Battery	44
Figure 69. Removing the filler panel	45
Figure 70. Removing the power supply module	45
Figure 71. Installing the power supply module	45
Figure 72. Removing the Server Board	46
Figure 73. Installing the Server Board	47
Figure 74. Replacing the Backup Battery	48
Figure 75. Replacing a system fan	49
Figure 76. Removing 3.5" hard drive backplane – remove the hard drive cage	49
Figure 77. Removing 3.5" hard drive backplane - remove the backplane	50
Figure 78. Installing 3.5" hard drive backplane – install the backplane	50
Figure 79. Installing 3.5" hard drive backplane – install the hard drive cage	51
Figure 80. Installing 3.5" hard drive backplane – install the stiffener and hard drives	51
Figure 81. Removing 2.5" hard drive backplane – remove the stiffener	52
Figure 82. Removing 2.5" hard drive backplane – remove the hard drive cage	52
Figure 83. Removing 2.5" hard drive backplane – remove the backplane	53
Figure 84. Installing 2.5" hard drive backplane – install backplane	53
Figure 85. Installing 2.5" hard drive backplane – install hard drive cage	53
Figure 86. Installing 2.5" hard drive backplane – install the stiffener	54
Figure 87. Removing the Intel® RAID Expander	54
Figure 88. Intalling the Intel® RAID Expander	55
Figure 89. Installing the Rack Handle	55
Figure 90. Removing the Rack Handle	56
Figure 91. Installing the interposer card	56
Figure 92. Installing the storage front panel	57
Figure 93. Installing the storage front panel	57
Figure 94. Installing the interposer card	58
Figure 95. Main Screen	65
Figure 96. Advanced Screen	69
Figure 97. Processor Configuration Screen	73
Figure 98. Power & Performance Screen	83

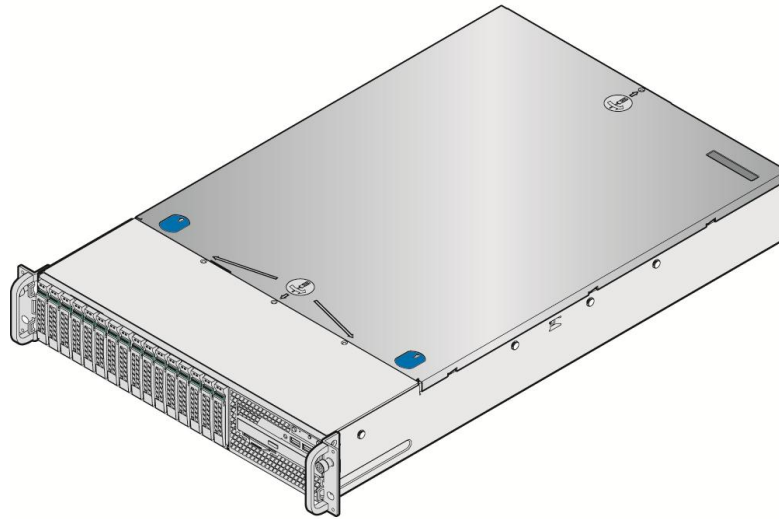
Figure 99. Memory Configuration Screen.....	85
Figure 100. Memory RAS and Performance Configuration Screen.....	90
Figure 101. Mass Storage Controller Configuration Screen.....	93
Figure 102. PCI Configuration Screen.....	100
Figure 103. NIC Configuration Screen	107
Figure 104. Serial Port Configuration Screen	114
Figure 105. USB Configuration Screen	117
Figure 106. System Acoustic and Performance Configuration.....	120
Figure 107. Security Screen.....	124
Figure 108. Server Management Screen.....	129
Figure 109. Console Redirection Screen.....	135
Figure 110. System Information Screen	138
Figure 111. BMC LAN Configuration Screen	143
Figure 112. Boot Options Screen	153
Figure 113. CDROM Order Screen	159
Figure 114. Hard Disk Order Screen	160
Figure 115. Floppy Order Screen.....	161
Figure 116. Network Device Order Screen.....	161
Figure 117. BEV Device Order Screen.....	162
Figure 118. Add EFI Boot Option Screen	163
Figure 119. Delete EFI Boot Option Screen	164
Figure 120. Boot Manager Screen	165
Figure 121. Error Manager Screen.....	167
Figure 122. Save & Exit Screen	168

List of Tables

Table 1. Server System References.....	v
Table 2. Intel® Server System R2000IP Feature Summary	1
Table 3. Hard Disk Drive Options	12
Table 4. BIOS Setup Page Layout	60
Table 5. BIOS Setup: Keyboard Command Bar	61
Table 6. Screen Map	63
Table 7. Power Supply Output Capability	172
Table 8. System Environmental Limits.....	172

1 Server System Features

This chapter briefly describes the main features of the Intel® Server System R2000IP family. This includes illustrations of the products, a list of the server system features, and diagrams showing the location of important components and connections on the server systems.



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Figure 1. Intel® Server System R2000IP

Server System Feature Overview

Table 3 summarizes the features of the the server systems.

Table 2. Intel® Server System R2000IP Feature Summary

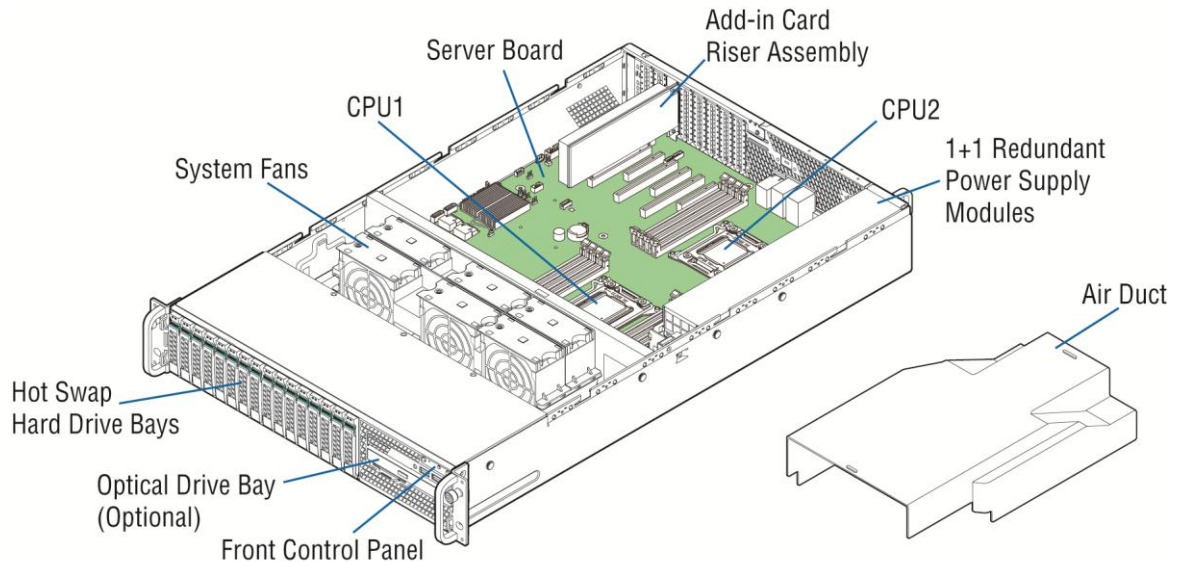
Feature	Description
Processor Support	<ul style="list-style-type: none"> ▪ Support for one or two Intel® Xeon® processors E5-2600 product family with a Thermal Design Power (TDP) of up to 135 W.
Memory	<ul style="list-style-type: none"> ▪ 16 DIMM slots – 2 DIMMs / Channel – 4 memory channels per processor ▪ Unbuffered DDR3 (UDIMM), Registered DDR3 (RDIMM), and Load Reduced DDR3 (LRDIMM) ▪ Memory DDR3 data transfer rates of 800, 1066, 1333 MT/s, and 1600 MT/s ▪ DDR3 standard I/O voltage of 1.5V and DDR3 Low Voltage of 1.35V
Chipset	Intel® C600-A chipset with support for optional Storage Option Select keys
External I/O connections	<ul style="list-style-type: none"> ▪ Video – Back Panel ▪ RJ-45 Serial- A Port ▪ Four RJ-45 Network Interface Connectors supporting 10/100/1000Mb ▪ USB 2.0 connectors - 4 on back panel + 2 on front panel on non-max hard drive SKUs
Internal I/O connectors / headers	<ul style="list-style-type: none"> ▪ Two Type-A USB 2.0 connector ▪ One Serial-B port connector
Optional I/O Module support	<p>The I/O modules utilize a single proprietary on-board connector. An installed I/O module can be supported in addition to standard on-board features and any add-in expansion cards.</p> <ul style="list-style-type: none"> ▪
System Fans	<ul style="list-style-type: none"> ▪ Six managed system fans

Server System Features

Feature	Description
	<ul style="list-style-type: none"> ▪ One power supply fan for each installed power supply module
Video	<ul style="list-style-type: none"> ▪ Integrated 2D Video Controller ▪ 16 MB DDR3 Memory
On-board storage controllers and options	<ul style="list-style-type: none"> ▪ One eUSB 2x5 pin connector to support 2mm low-profile eUSB solid state devices ▪ Two 7-pin single port AHCI SATA connectors capable of supporting up to 6 GB/sec ▪ Two SCU 4-port mini-SAS connectors capable of supporting up to 3 GB/sec SAS/SATA ▪ Intel® Integrated RAID module support (Optional) ▪ Intel® RAID C600 Upgrade Key support providing optional expanded SATA / SAS RAID capabilities
Security	Intel® Trusted Platform Module (TPM) - AXXTPE5 (Accessory Option)
Server Management	<ul style="list-style-type: none"> ▪ Integrated Baseboard Management Controller, IPMI 2.0 compliant ▪ Support for Intel® Server Management Software ▪ Intel® Remote Management Module 4 Lite – Accessory Option ▪ Intel® Remote Management Module 4 Management NIC – Accessory Option
Power Supply Options	<ul style="list-style-type: none"> ▪ Two AC 750 ERPS
Storage Bay Options	<ul style="list-style-type: none"> ▪ 8x – 3.5" SATA/SAS Hot Swap Hard Drive Bays + Optical Drive support ▪ 12x – 3.5" SATA/SAS Hot Swap Hard Drive Bays ▪ 8x – 2.5" SATA/SAS Hot Swap Hard Drive Bays + Optical Drive support ▪ 16x – 2.5" SATA/SAS Hot Swap Hard Drive Bays + Optical Drive support ▪ 24x – 2.5" SATA/SAS Hot Swap Hard Drive Bays
Available Rack Mount Kit Options	<ul style="list-style-type: none"> ▪ Tool-less rack mount rail kit – Intel Product Code – AXXPRAIL ▪ Value rack mount rail kit – Intel Product Code – AXXVRAIL ▪ Cable Management Arm – Intel Product Code – AXX1U2UCMA (*supported with AXXPRAIL only) ▪ 2-post fixed mount bracket kit – Intel Product Code – AXX2POSTBRCKT

Server System Components

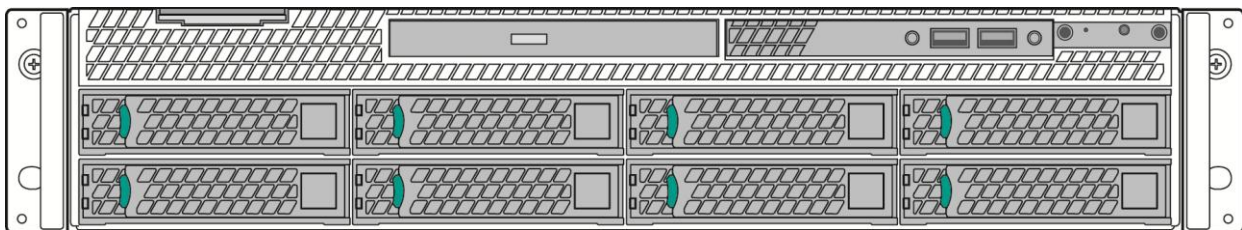
This section helps you identify the components of your server system. If you are near the system, you can also use the *Quick Reference Label* provided on the inside of the chassis cover to assist in identifying components.



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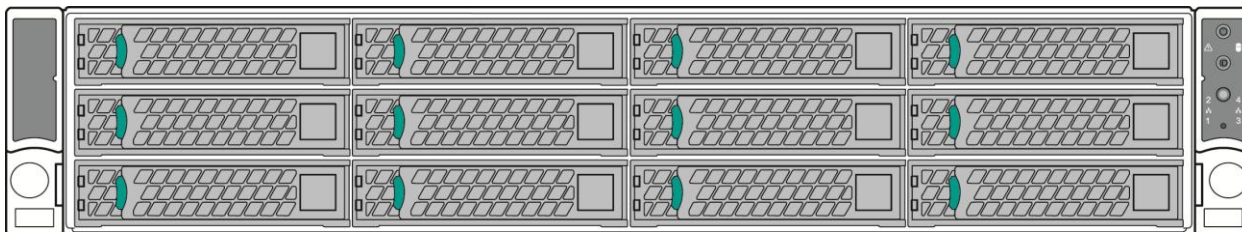
Figure 2. Intel® Server System R2000IP Components

Hot Swap Hard Drive Bay and Front Panel Options



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Figure 3. 3.5" Hard Drive Bay - 8 Drive Configuration



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Figure 4. 3.5" Hard Drive Bay - 12 Drive Configuration

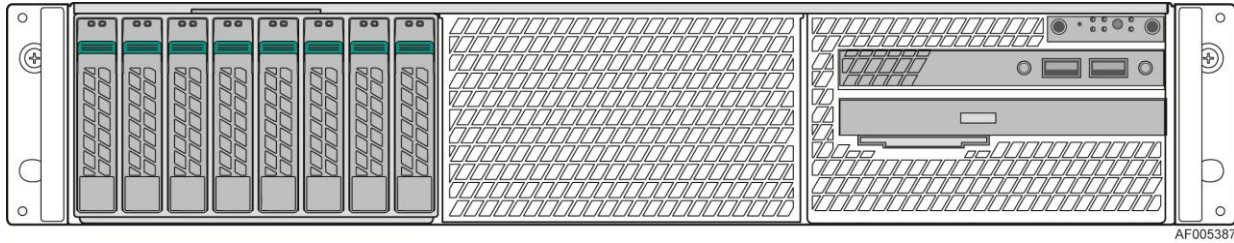


Figure 5. 2.5" Hard Drive Bay - 8 Drive Configuration

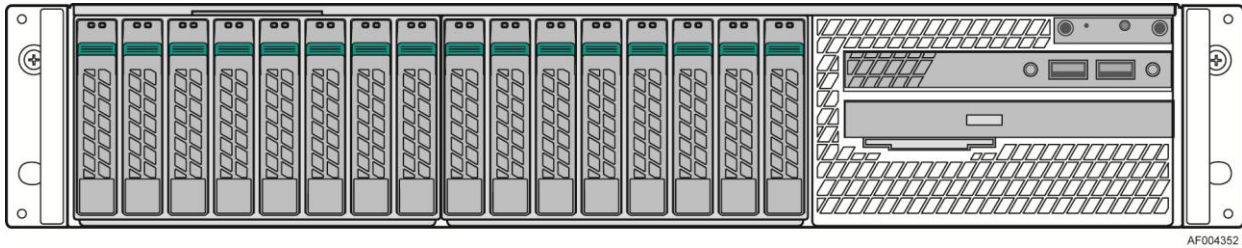
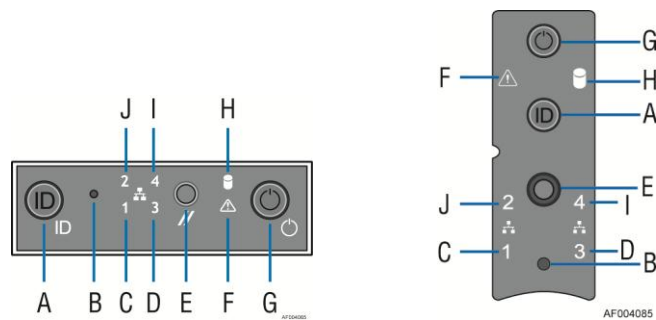


Figure 6. 2.5" Hard Drive Bay - 16 Drive Configuration



Figure 7. 2.5" Hard Drive Bay - 24 Drive Configuration

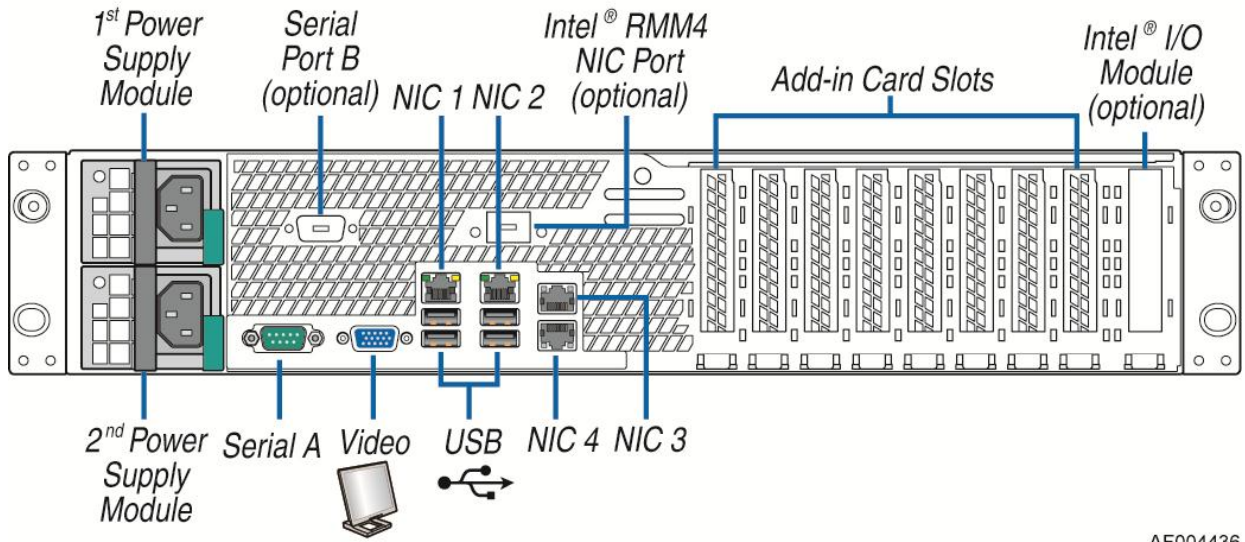
Front Panel



Label	Description	Label	Description
A	System ID Button w/Integrated LED	F	System Status LED
B	NMI Button (recessed, tool required for use)	G	Power Button w/Integrated LED
C	NIC-1 Activity LED	H	Hard Drive Activity LED
D	NIC-3 Activity LED	I	NIC-4 Activity LED
E	System Cold Reset Button	J	NIC-2 Activity LED

Figure 8. Front Panel Options

Back Panel



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Figure 9. Back Panel Feature Identification

Server Board Components

This section helps you identify the components and connectors on the server board.

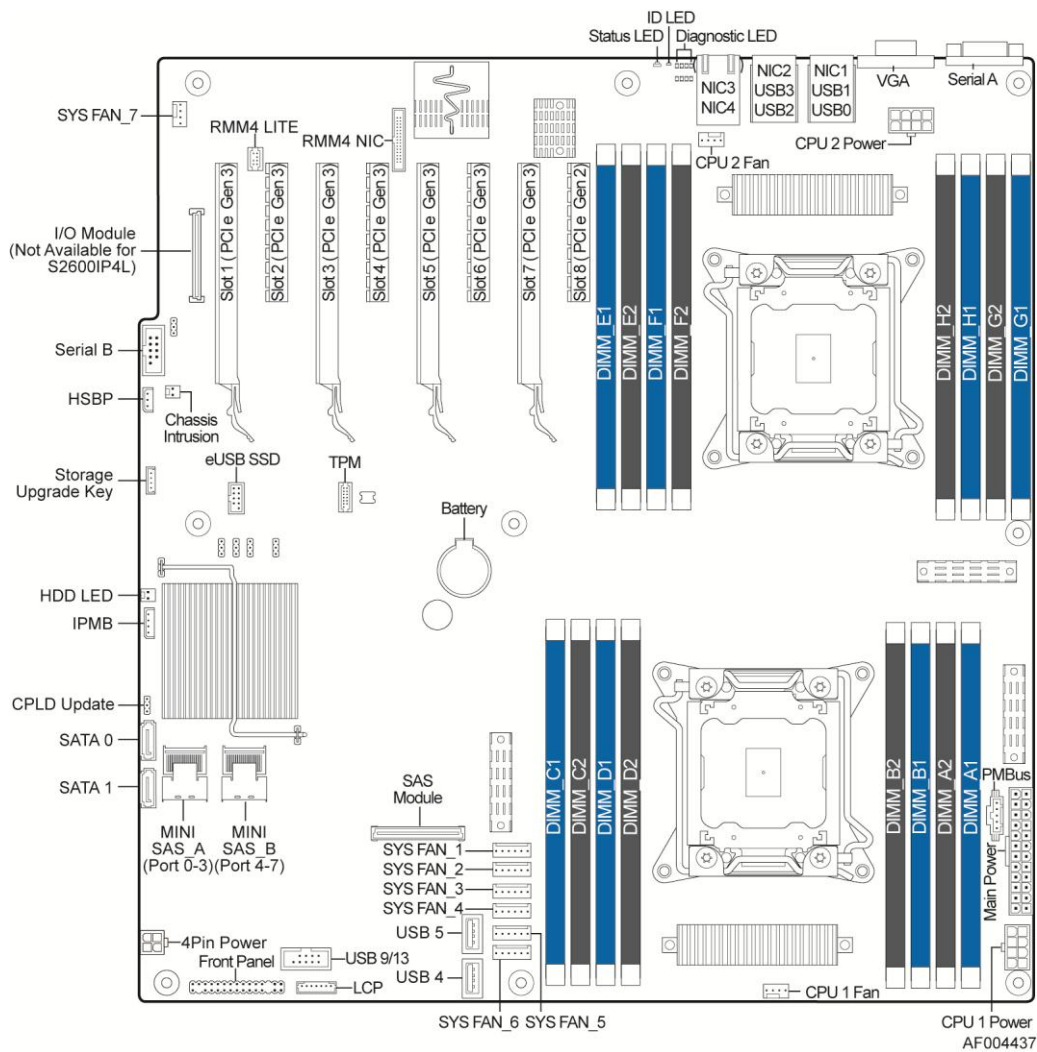


Figure 10. Server Board Connector and Component Locations

Intel® Light-Guided Diagnostics

Both server boards have several onboard diagnostic LEDs to assist in troubleshooting board-level issues. This section provides a description of the location and function of each LED on the server boards.

5-volt Stand-by LED

Several server management features of these server boards require a 5V standby voltage supplied from the power supply. The features and components that require this voltage must be present when the system is “power-down”. The LED is illuminated when AC power is applied to the platform and 5V standby voltage is supplied to the server board by the power supply.

Fan Fault LED

Fan fault LEDs are present for the two CPU fans and the one rear system fan. The fan fault LEDs illuminate when the corresponding fan has fault.

CPU Fault LED

CPU fault LED should correspond to the socket with the failed or disabled CPU. The CPU LEDs illuminate when CPU failure or Disable.

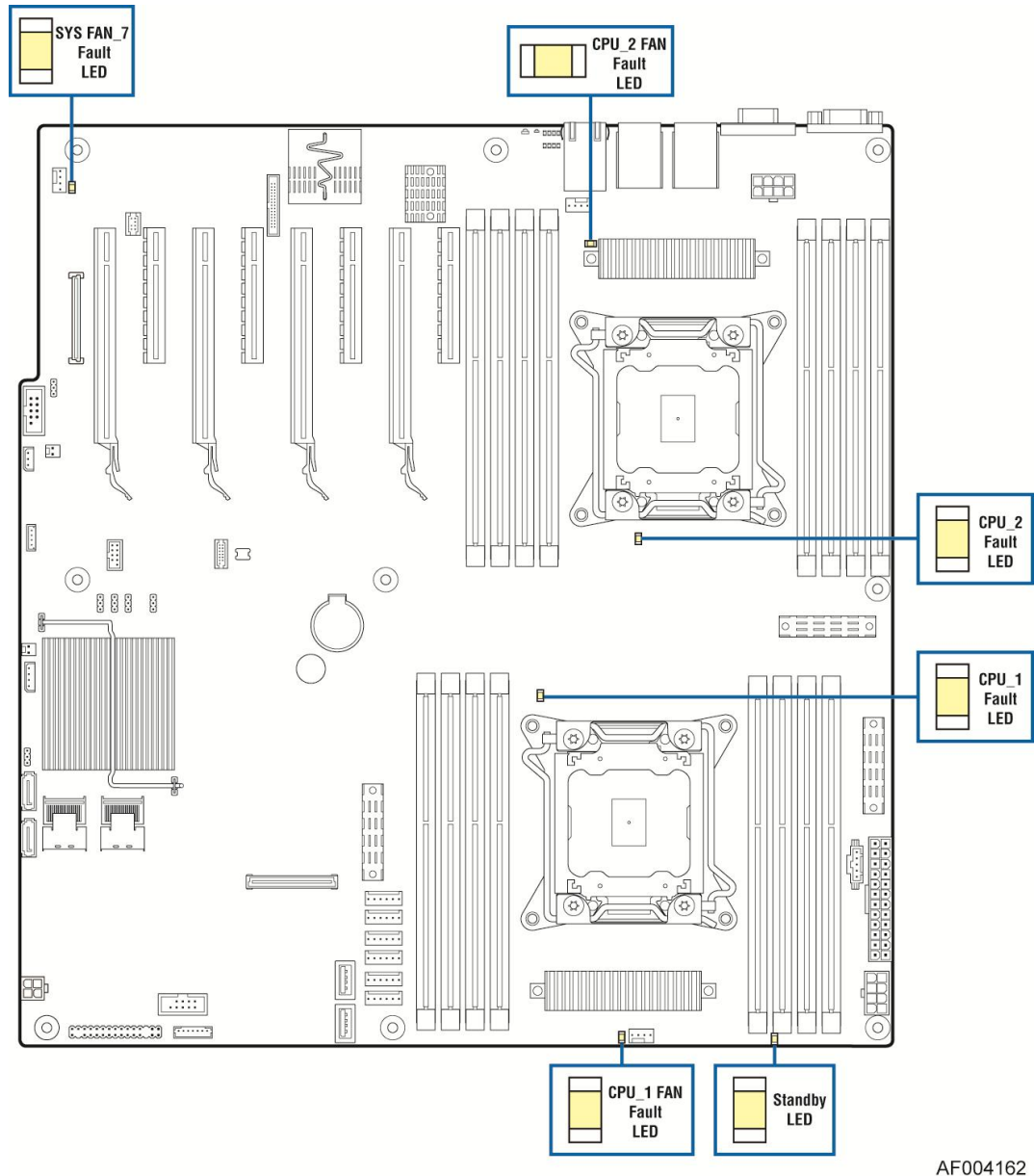
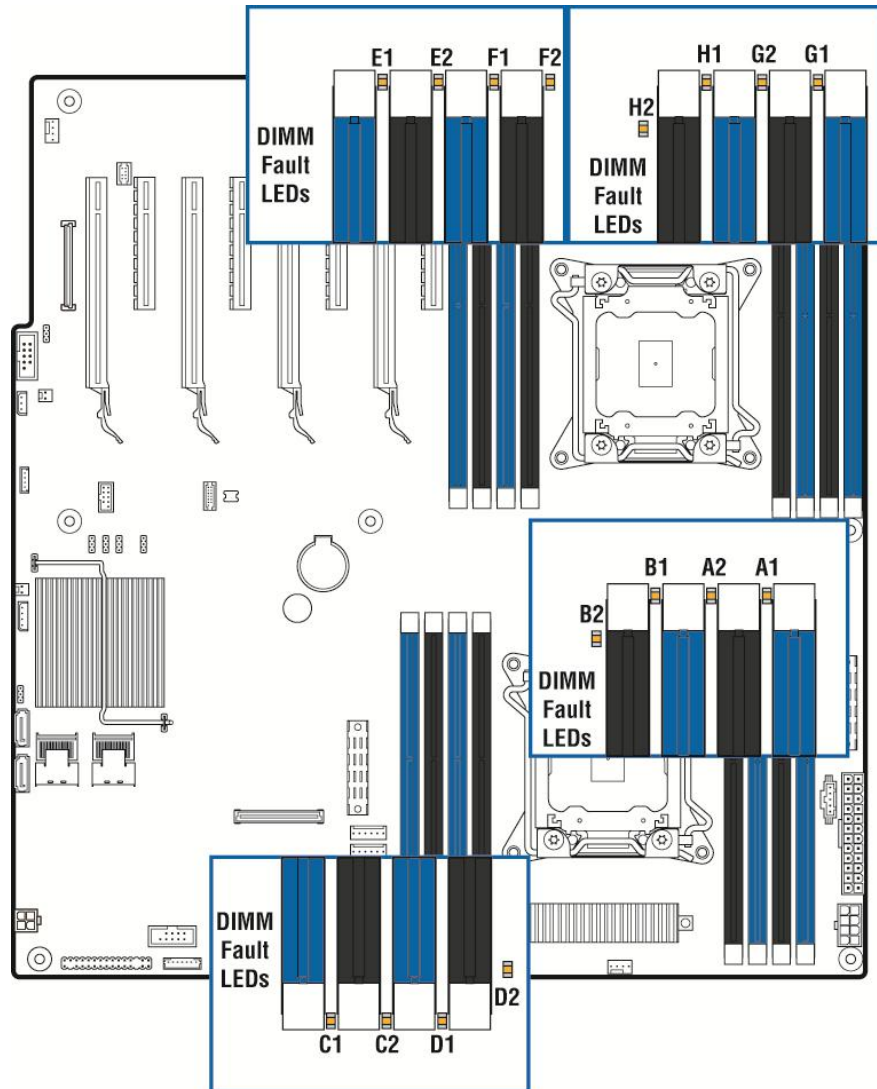


Figure 11. Stand by LED, Fan Fault LED and CPU Fault LED Location

DIMM Fault LEDs

The server board provide memory fault LED for each DIMM socket. These LEDs are located as shown in the following figure. The DIMM fault LED illuminates when the corresponding DIMM slot has memory installed and a memory error occurs.

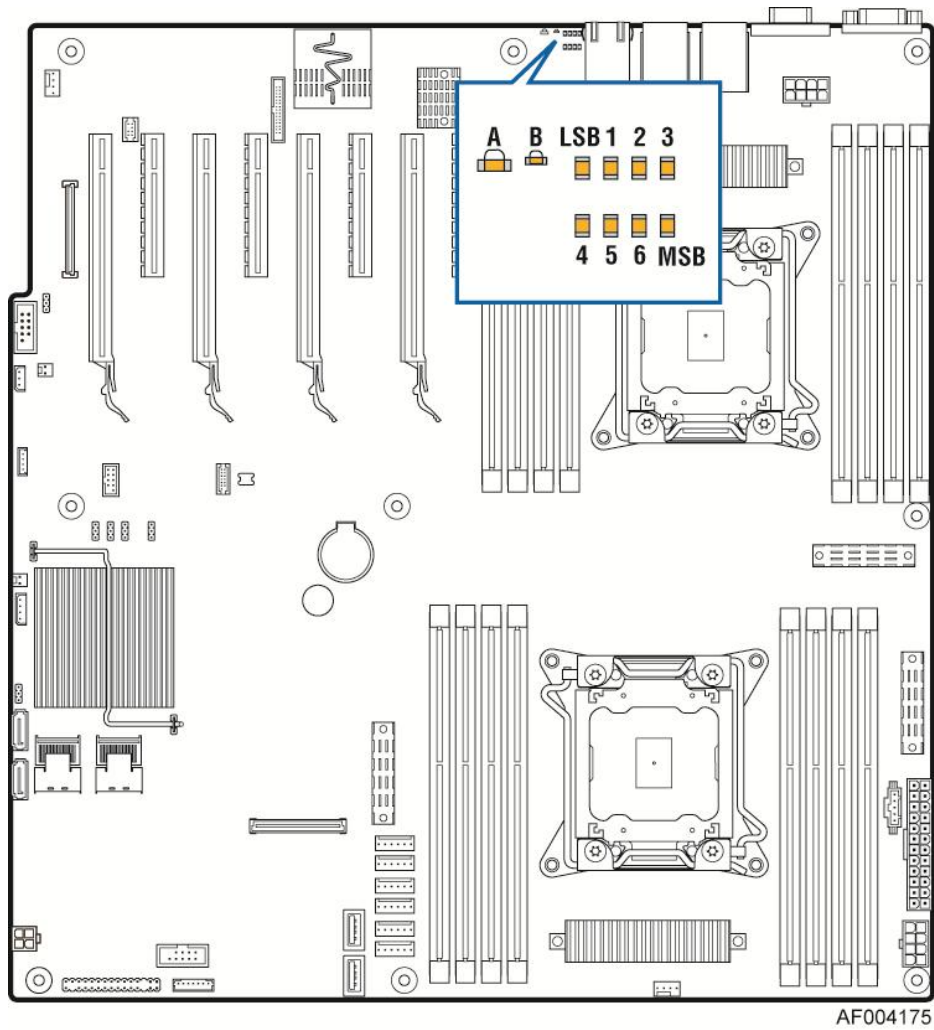


AF004160

Figure 12. DIMM Fault LED's Location

System ID LED, System Status LED and POST Code Diagnostic LEDs

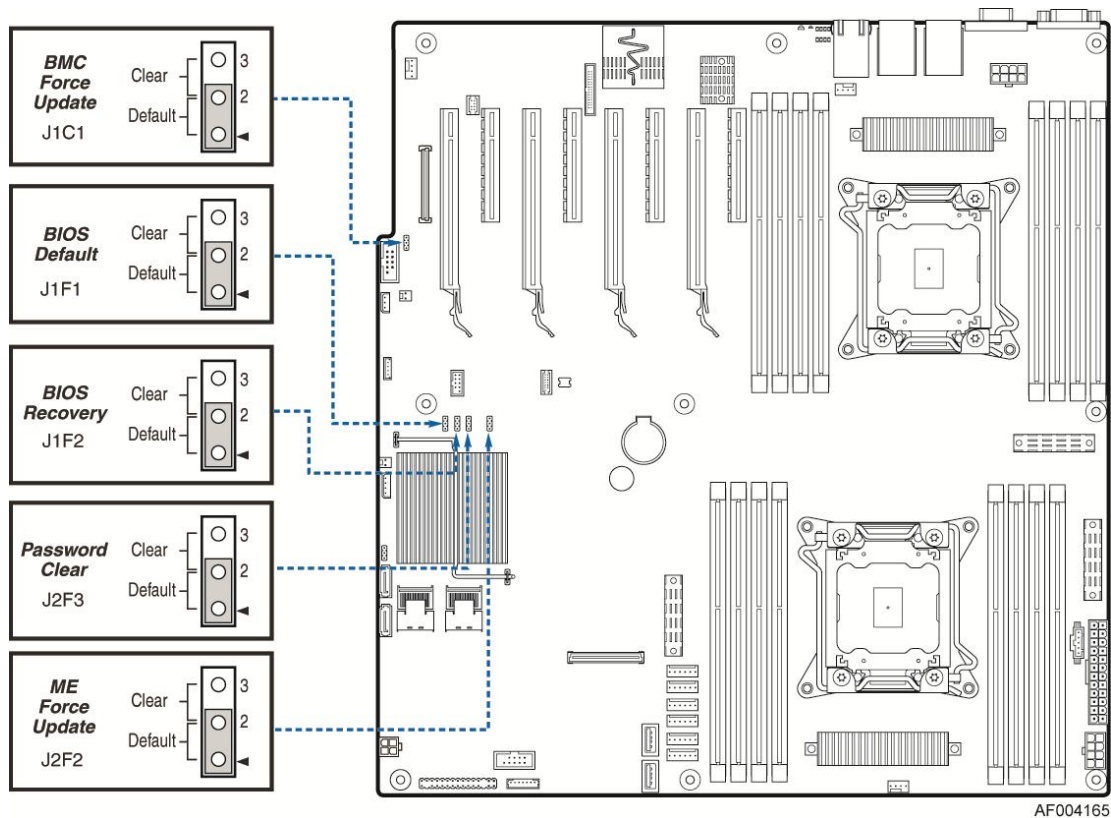
The server boards provide LEDs for system ID, system status and POST code. These LEDs are located in the rear I/O area of the server board as shown in the following figure.



LED Name	Description
A	System Status LED
B	System ID LED
LSB 1 2 3 4 5 6 MSB	Post Code Diagnostic LEDs

Figure 13. Location of System Status, System ID and POST Code Diagnostic LEDs

System Recovery Jumpers

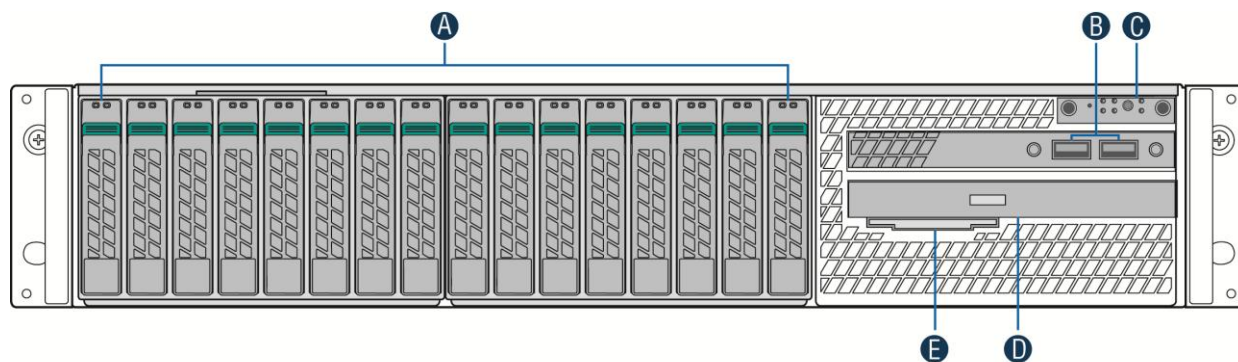


Jumper Name	Jumper Purpose
BMC Force Update (J1C1)	If pins 2-3 are selected, the Integrated BMC Force Update Mode is enabled. These pins should be selected on 1-2 for normal system operation.
BIOS Default (J1F1)	If pins 2-3 are selected, the BIOS settings are cleared on the next reset. These pins should be selected on 1-2 for normal system operation.
BIOS Recover (J1F2)	If pins 2-3 are selected, the system can only boot from EFI-bootable recovery media with the recovery BIOS image. The main system BIOS will not boot. These pins should be selected on 1-2 for normal system operation.
Password Clear (J2F3)	If pins 2-3 are selected, administrator and user passwords are cleared within five to ten seconds after the system is powered on. These pins should be selected on 1-2 for normal system operation.
ME Force Update (J2F2)	If pins 2-3 are selected, the ME Force Update Mode is enabled. These pins should be selected on 1-2 for normal system operation.

Figure 14. Configuration Jumpers

Peripheral Devices

The Intel® Server System R2000IP provides locations and hardware for installing hard drives, CD-ROM drive, or DVD-ROM drive. The following figure shows the available options.



AF005409

A	Hard Disk Drive Bays
B	USB Ports
C	Front Control Panel
D	Slimline Optical Drive Bay
E	System Label Pull-out

Figure 15. Optional Peripherals (16x2.5-inch hard drive bays as shown)

Hard Disk Drive Carriers

The Intel® Server System R2000IP ships with either 3.5-inch or 2.5 inch hard disk drive carrier, and with different maximum number of hard disk drives, see Table 4 for details :

Table 3. Hard Disk Drive Options

Intel® Server System	Supported Hard Drive Type	Maximun Hard Drive Number
R2308IP4LHPC	3.5-inch or 2.5-inch	8
R2312IP4LHPC	3.5-inch or 2.5-inch	12
R2208IP4LHPC	2.5-inch	8
R2216IP4LHPC	2.5-inch	16
R2224IP4LHPC	2.5-inch	24

Note: SAS drives are only supported when proper Intel® RAID C600 Upgrade Key or Intel® Integrated RAID Module is installed.

For instructions on installing hard drives, see “[Installing a Hot-swap Hard Disk Drive](#)”.

Note: Drives can consume up to 17 watts of power each. Drives must be specified to run at a maximum

ambient temperature of 45°C.

Note: The Intel® Server System R2000IP does not support all SAS or Serial ATA (SATA) hard drives. For a web link to a list of supported hard drives, see [“Additional Information and Software”](#).

Slimline Optical Drive Support

The system has support for a single optical drive. The optical drive is NOT hot-swappable. The system power must be turned off to insert or remove the slimline optical drive. For instructions on installing an optical drive, see [“Installing or Removing a Slimline Optical Drive”](#).

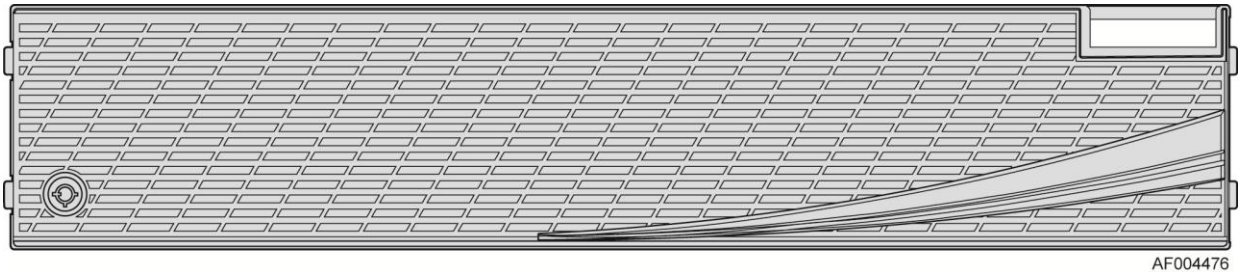
Intel makes the following optical drive accessory kits available for this server system:

- Slimline DVD-ROM Drive: AXXSATADVROM
- Slimline DVD-RW Drive: AXXSATADVDRWROM

Note: For a complete list of supported peripherals, go to <http://serverconfigurator.intel.com>

Bezel

The front bezel is available as optional accessory for the server system:



AF004476

Figure 16. Front view of Front Bezel

Hot-Swap SAS/SATA Backplane

The Hot-Swap SAS/SATA backplane serves as an interface between the mother board and the system drives. The following diagrams show the location for each connector found on the backplane.

8 x 3.5-inch Hard Drive Backplane

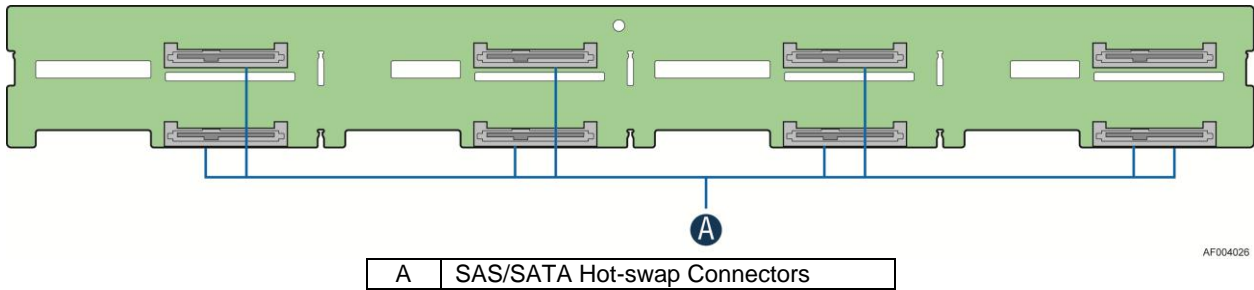


Figure 17. 8 x 3.5-inch Hard Drive Backplane Components (Front View)

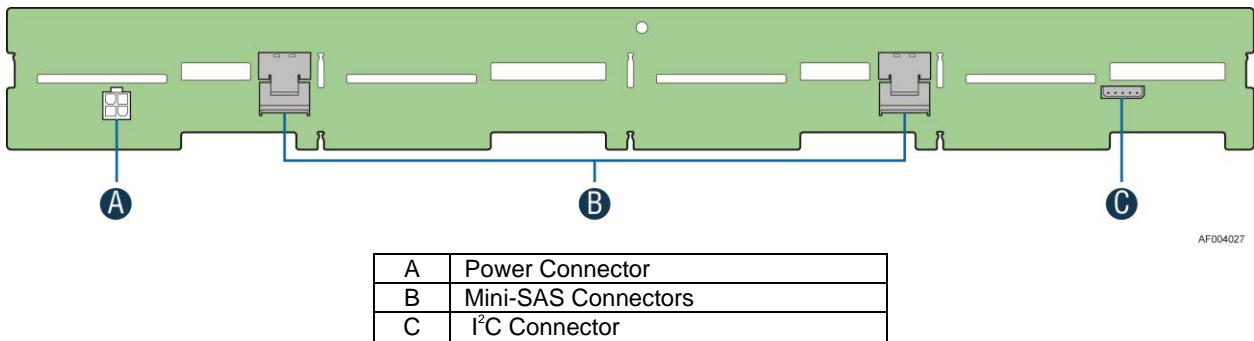


Figure 18. 8 x 3.5-inch Hard Drive Backplane Components (Rear View)

12 x 3.5-inch Hard Drive Backplane

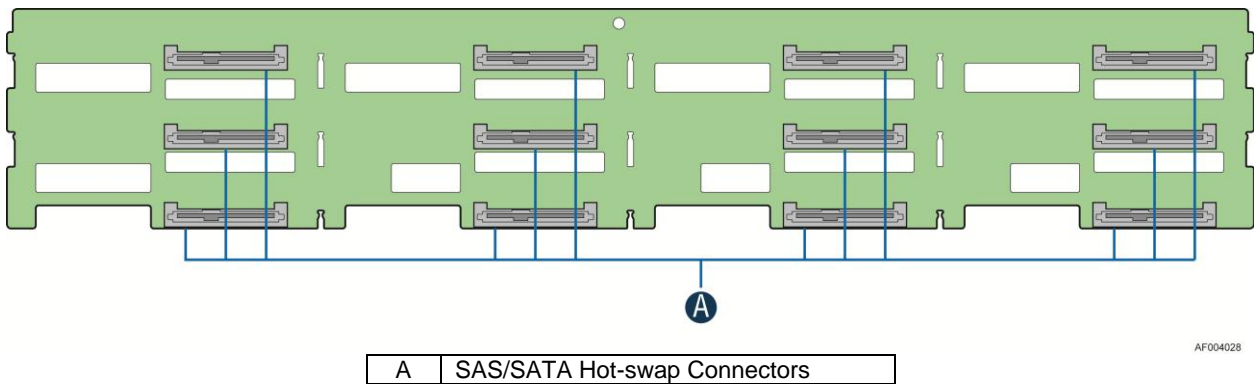


Figure 19. 12 x 3.5-inch Hard Drive Backplane Components (Front View)

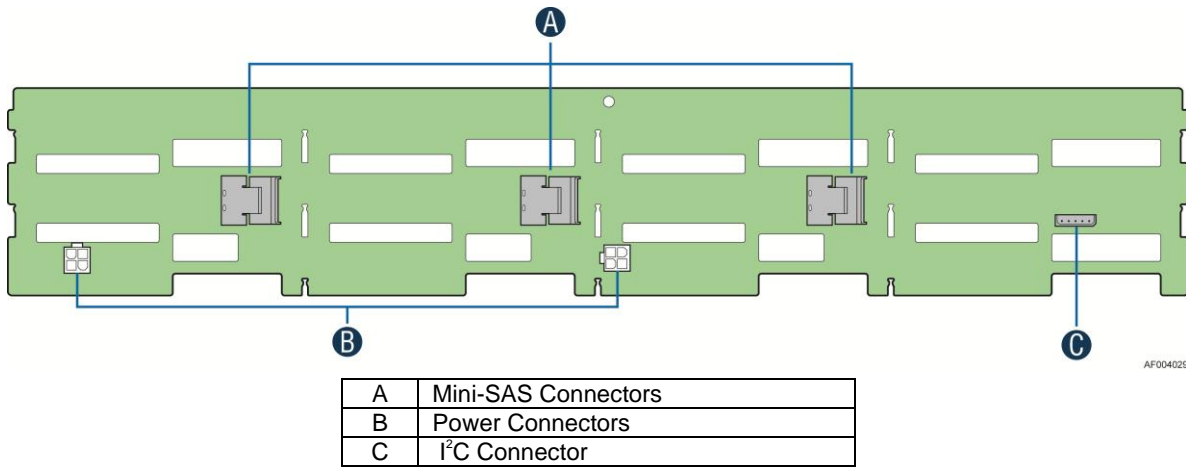


Figure 20. 12 x 3.5-inch Hard Drive Backplane Components (Rear View)

8 x 2.5-inch Hard Drive Backplane

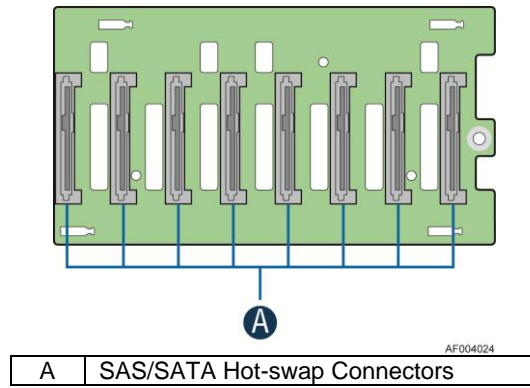


Figure 21. 8 x 2.5-inch Hard Drive Backplane Components (Front View)

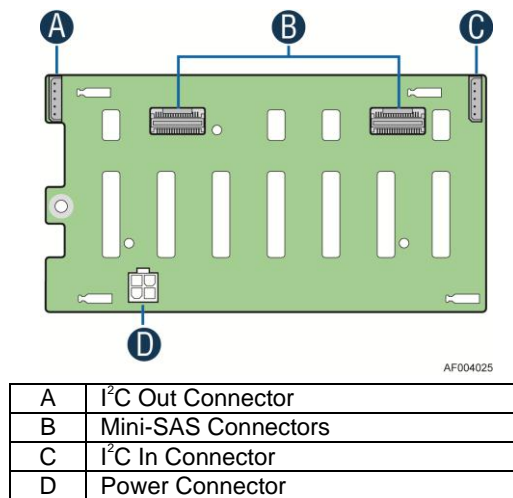
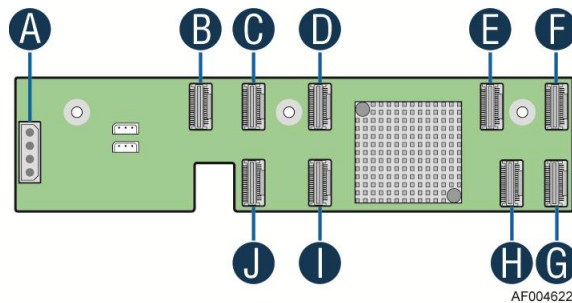


Figure 22. 8 x 2.5-inch Hard Drive Backplane Components (Rear View)

24-Port and 36-Port Internal Intel® RAID Expander Cards

Intel provides two types of internal RAID expander cards: 36 ports and 24 ports.



A	Power Connector
B	Mini-SAS Connector A
C	Mini-SAS Connector B
D	Mini-SAS Connector G (36 port sku only)
E	Mini-SAS Connector H (36 port sku only)
F	Mini-SAS Connector I (36 port sku only)
G	Mini-SAS Connector F
H	Mini-SAS Connector E
I	Mini-SAS Connector D
J	Mini-SAS Connector C

Figure 23. Internal Intel® RAID Expander Cards Components (Top View)

Advanced Management Options

Intel® Remote Management Module 4

The Intel® Remote Management Module 4 plugs into a dedicated connector on the server board and provides additional server management functionality to the server board.

This module provides a dedicated web server for viewing server information and remote control of the system. It also provides Remote KVM Redirection and USB Media Redirection allowing USB devices attached to the remote system to be used on the managed server.

For instructions on installing the Intel® Remote Management Module 4, see [“Installing and Removing the Intel® Remote Management Module 4”](#).

2 Hardware Installations and Upgrades

Before You Begin

Before working with your server product, pay close attention to the “[Safety Information](#)” at the beginning of this manual.

Note: Whenever you service the system, you must first power down the server and unplug all peripheral devices and the power cord.

Tools and Supplies Needed

- Phillips* (cross head) screwdriver (#2 bit)
- Needle nosed pliers
- Anti-static wrist strap and conductive foam pad (recommended)

System Reference

All references to left, right, front, top, and bottom assume the reader is facing the front of the chassis as it would be positioned for normal operation.

Note: The Intel® Server System R2216IP is shown for illustration purposes, server components with the product family are identical.

Cable Routing

When you add or remove components from your server system, make sure your cables are routed correctly before reinstalling the server system cover. Use caution to make sure no cables or wires are pinched and that the airflow from the fans is not blocked. Use the figures below to determine the correct cable routing.

Note: Red lines are for power connection, dot lines are for optional device connection.

For system with 8 x 3.5" hard drive bay:

Note: To activate the port SCU1 (4-7) on the server board, a proper Intel® RAID C600 Upgrade Key must be installed. For instructions, see Intel® RAID C600 Upgrade Key Installation Guide.

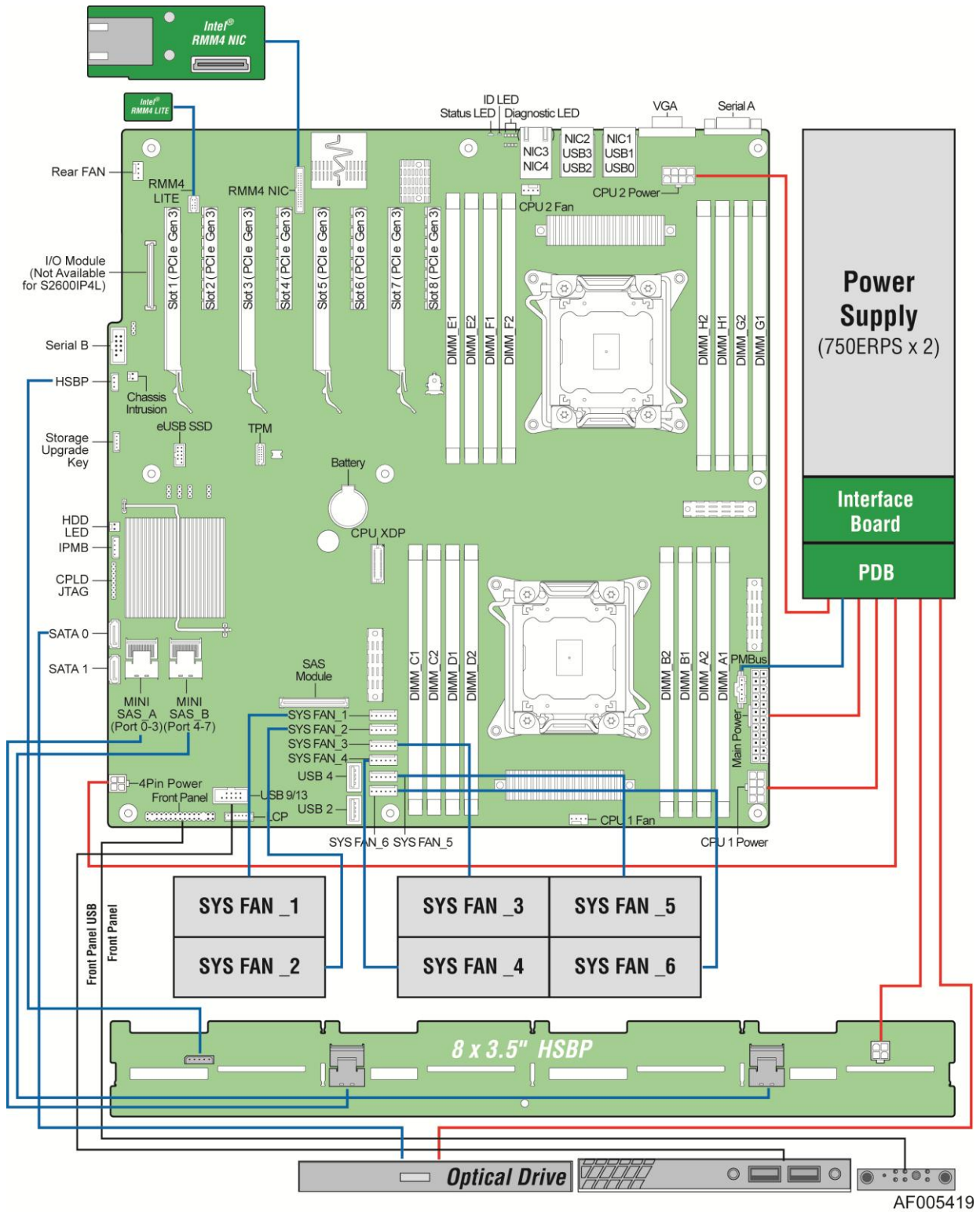


Figure 24. Cable Routing – 8 x 3.5" HDD

For system with 12 x 3.5" hard drive bay:

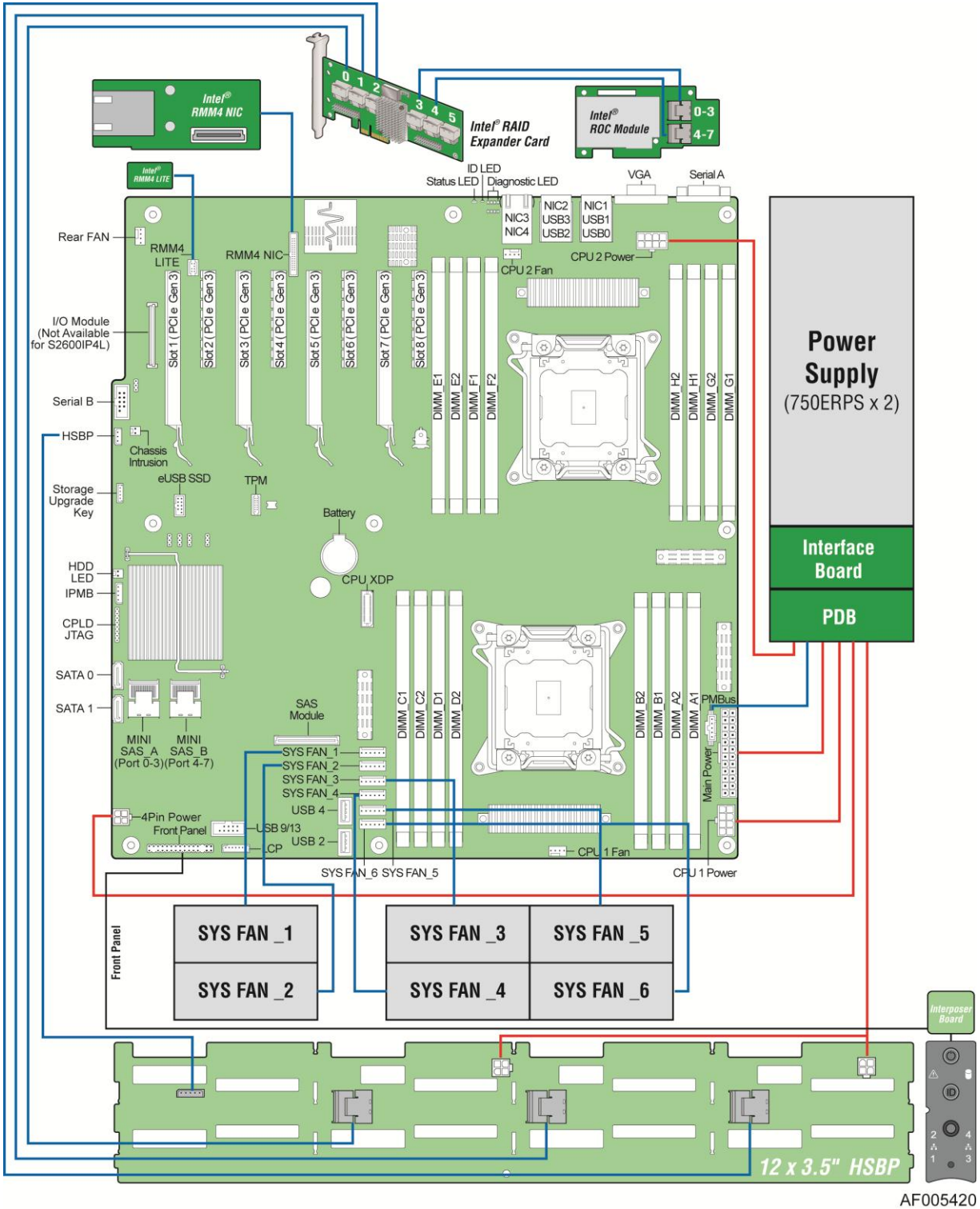
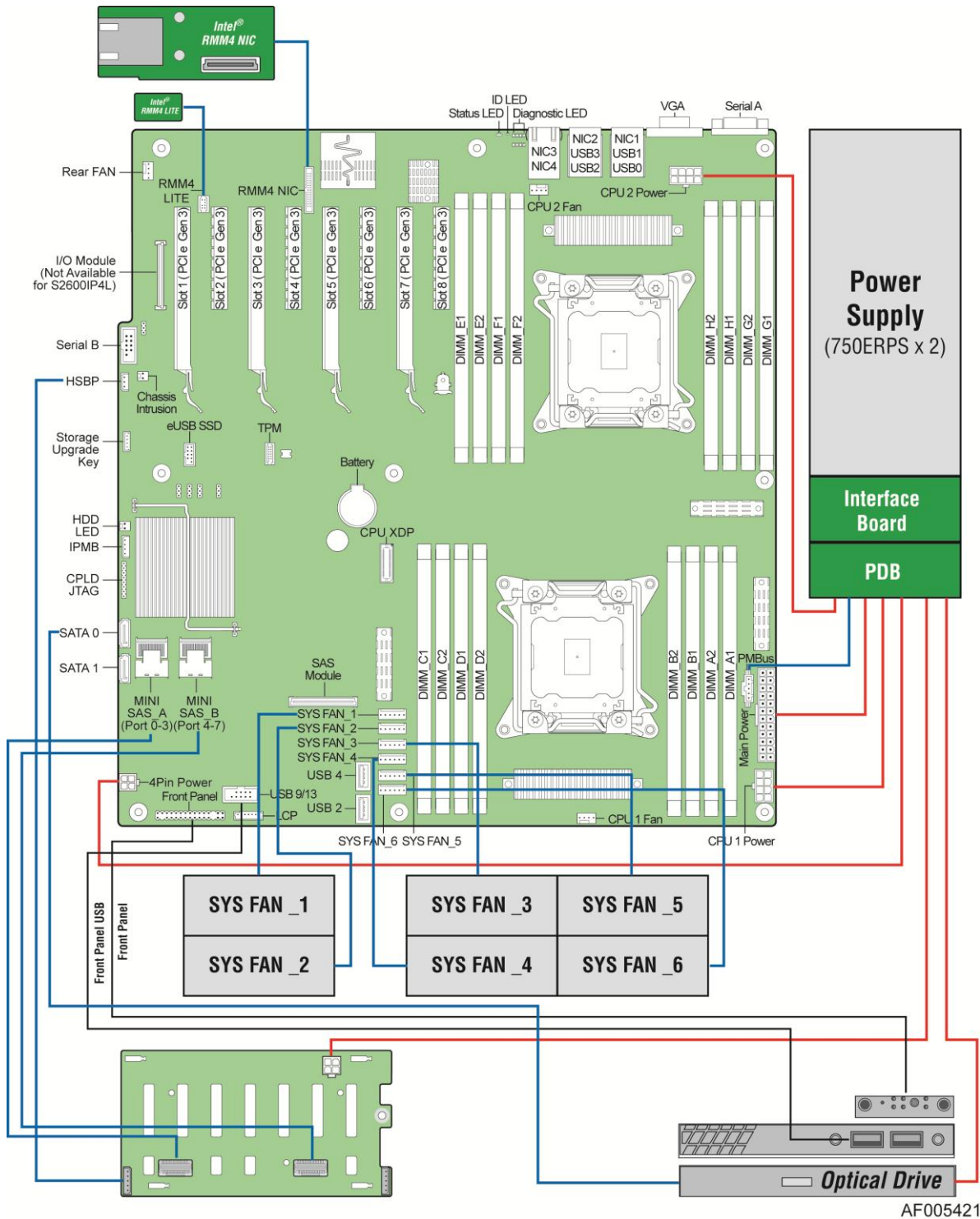


Figure 25. Cable Routing – 12 x 3.5" HDD

For system with 8 x 2.5" hard drive bay:

Note: To activate the port SCU1 (4-7) on the server board, a proper Intel® RAID C600 Upgrade Key must be installed. For instructions, see Intel® RAID C600 Upgrade Key Installation Guide.

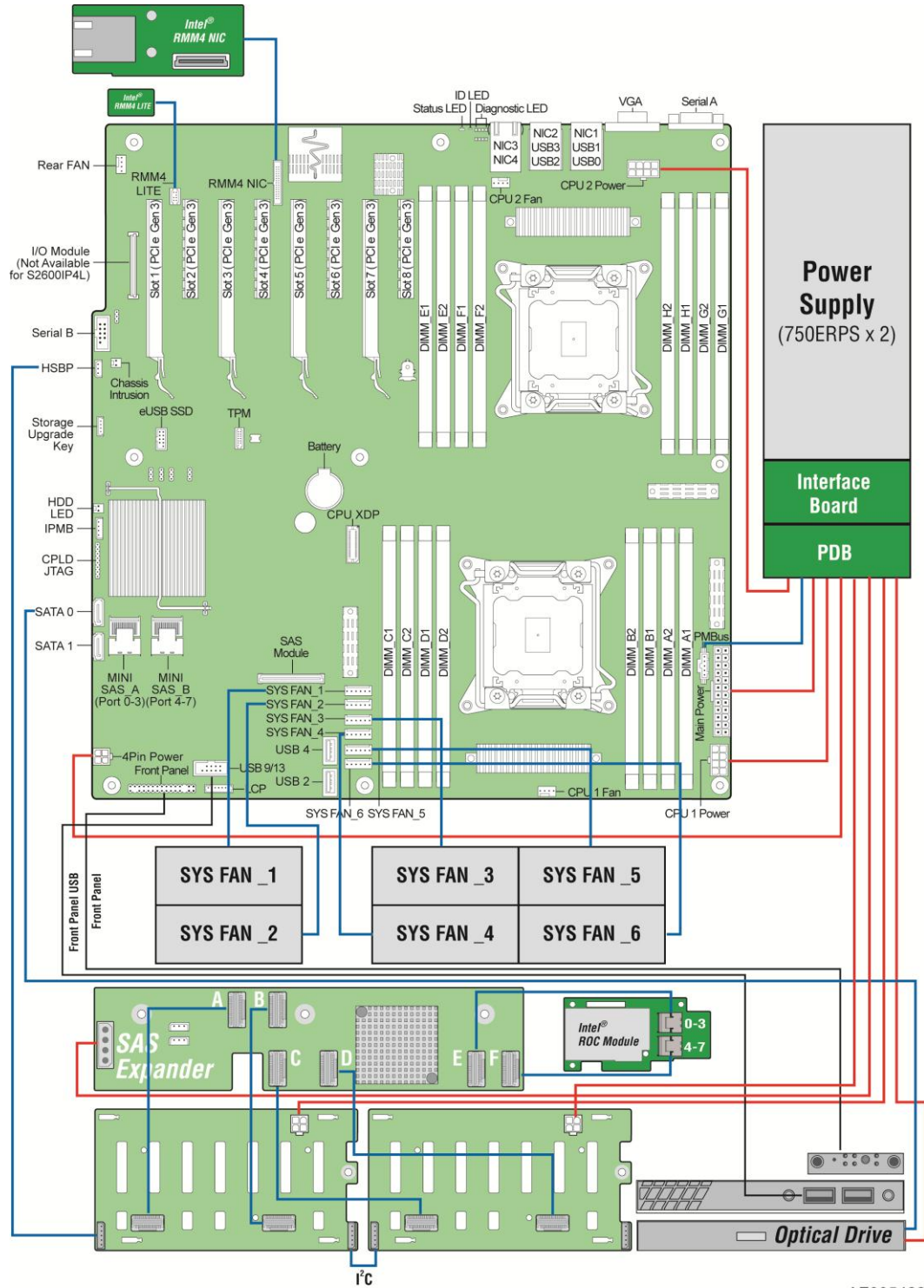


AF005421

Figure 26. Cable Routing – 8 x 2.5" HDD

For system with 16 x 2.5" hard drive bay:

Note: To activate the port SCU1 (4-7) on the server board, a proper Intel® RAID C600 Upgrade Key must be installed. For instructions, see Intel® RAID C600 Upgrade Key Installation Guide.



AF005422

Figure 27. Cable Routing – 16 x 2.5" HDD

For system with 24 x 2.5" hard drive bay:

Note: To activate the port SCU1 (4-7) on the server board, a proper Intel® RAID C600 Upgrade Key must be installed. For instructions, see Intel® RAID C600 Upgrade Key Installation Guide.

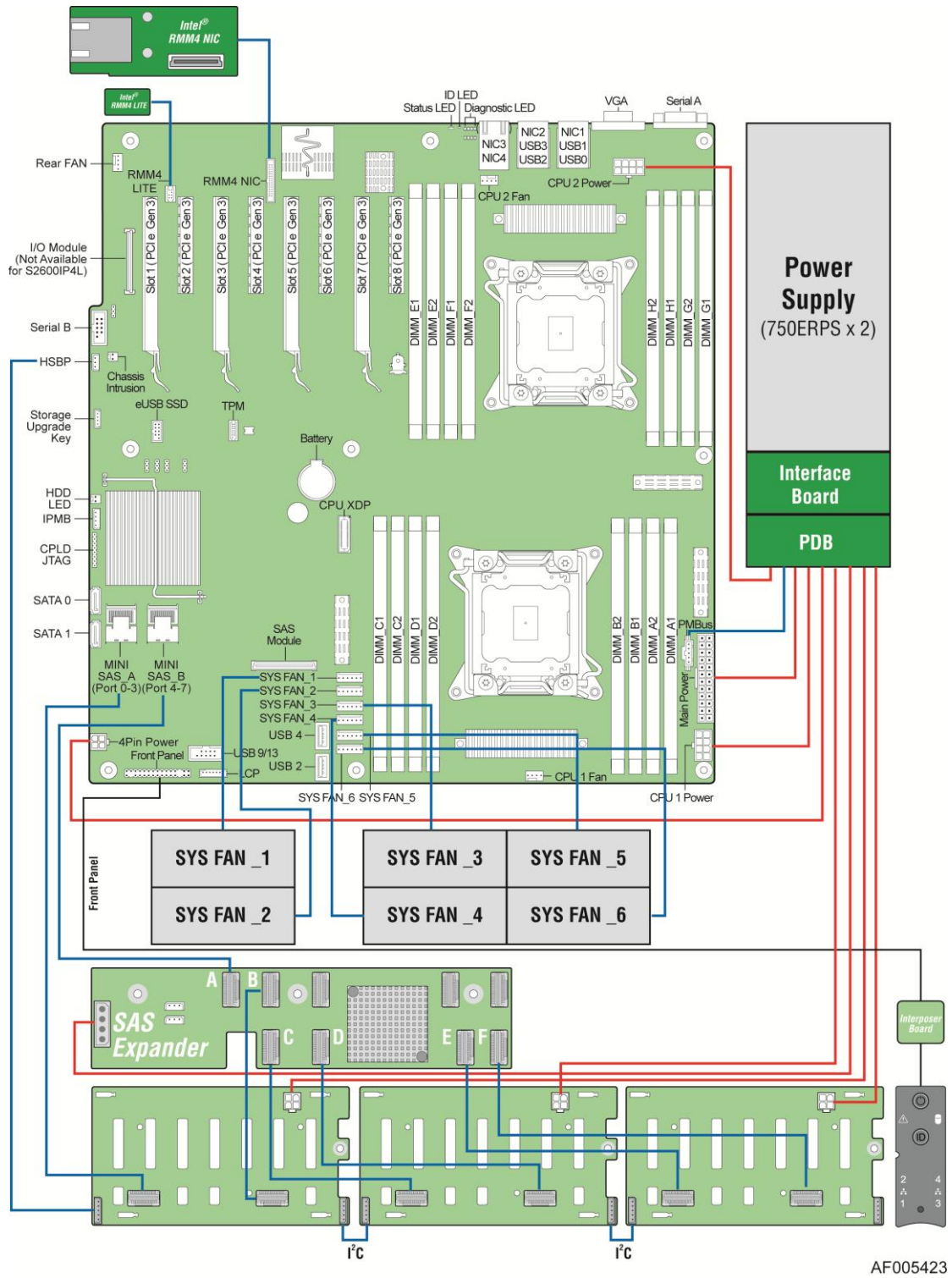


Figure 28. Cable Routing – 24 x 2.5" HDD

Removing and Installing the Front Bezel

Removing the Front Bezel

If your system includes a front bezel, follow these steps to remove the front bezel:

1. Unlock the bezel if it is locked.
2. Remove the left end of front bezel from rack handle (see letter **A**).
3. Rotate the front bezel anticlockwise to release the latches on the right end from the rack handle (see letter **B**).

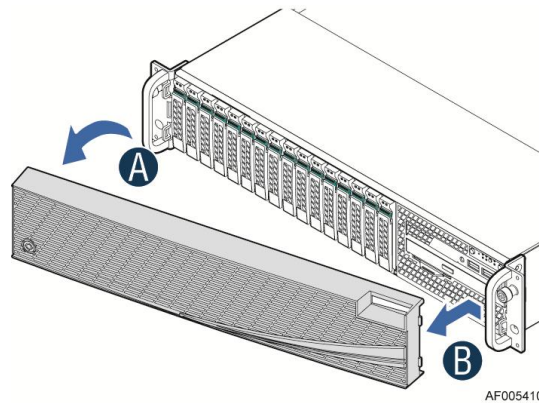


Figure 29. Removing the Front Bezel

Installing the Front Bezel

Note: Before installing the bezel, you must install the rack handles.

1. Lock the right end of the front bezel to the rack handle (see letter **A**).
2. Rotate the front bezel clockwise till the left end clicks into place (see letter **B**).
3. Lock the bezel if needed.

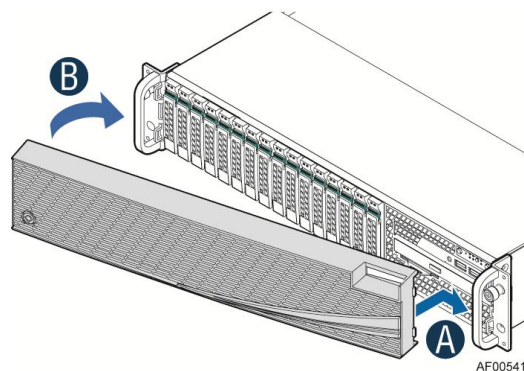


Figure 30. Installing the Front Bezel

Intel also provides an optional plastic badge for customer to use. To install the badge to the bezel, attach the badge onto the bezel until the hooks at the rear of the badge click into the bezel.

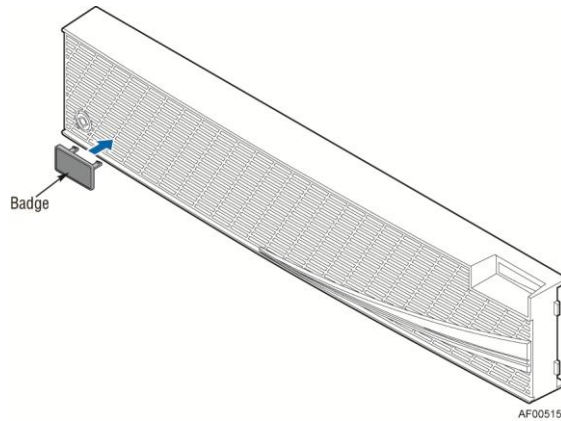


Figure 31. Installing the badge to the front bezel

To remove the badge from the bezel, squeeze the hooks at the rear of the badge to release the badge (see letter **A**) and then remove the badge from the bezel (see letter **B**).

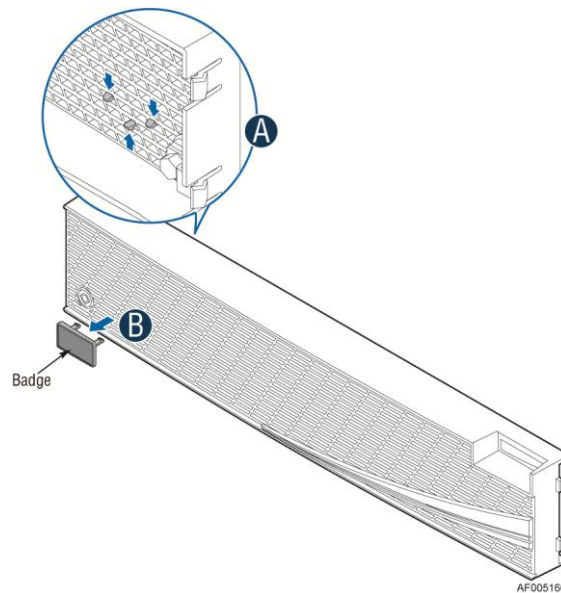


Figure 32. Removing the badge from the front bezel

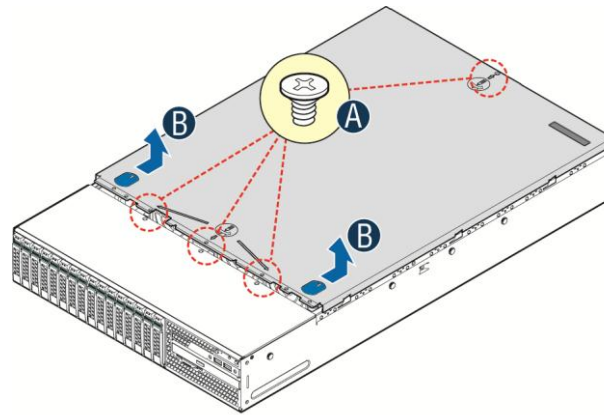
Removing and Installing the System Cover

Removing the System Cover

The server system must be operated with the system cover in place to ensure proper cooling. You will need to remove the top cover to add or replace components inside of the server. Before removing the top cover, power down the server and unplug all peripheral devices and the power cable(s).

Note: A non-skid surface or a stop behind the server system may be needed to prevent the server system from sliding on your work surface.

1. Observe the safety and ESD precautions at the beginning of this book.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Disconnect the power cord.
4. Remove the four screws (see letter **A**).
5. Slide cover back and lift upward (see letter **B**).

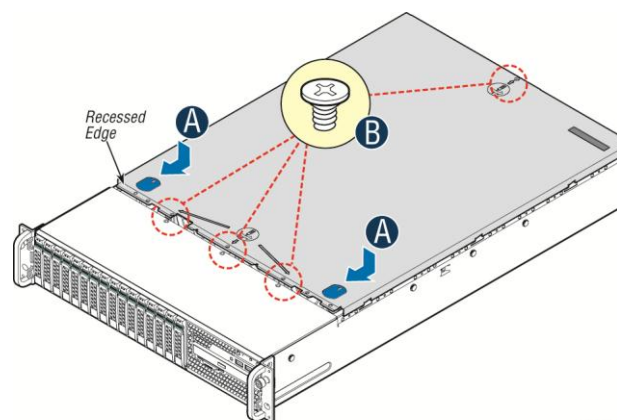


AF005148

Figure 33. Removing the System Cover

Installing the System Cover

1. Place system cover onto the chassis and slide forward to engage recessed edge at front of cover (see letter **A**).
2. Tighten the four screws (see letter **B**).



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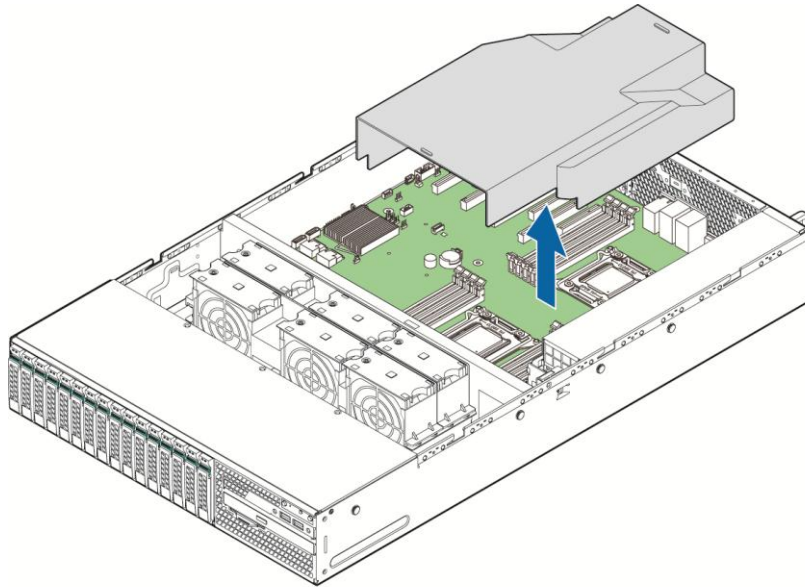
Figure 34. Installing the System Cover

Removing and Installing the Air Duct

Always operate your server system with the air duct in place. The air duct is required for proper airflow within the server system.

Removing the Air Duct

1. Carefully lift upward the air duct from the system

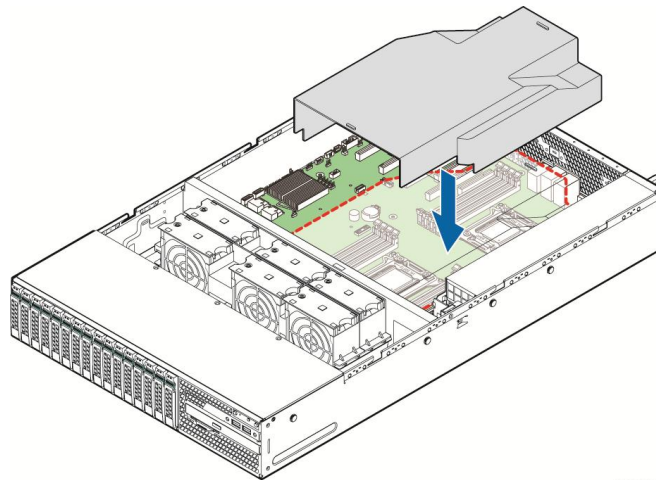


AF004354

Figure 35. Removing the Air Duct

Installing the Air Duct

1. Lower downward the air duct and make sure cover CPU and DIMM slots.



AF004361

Figure 36. Installing the Air Duct

Removing and Installing Processor

The heatsink has thermal interface material (TIM) on the underside of it. Use caution so that you do not damage the thermal interface material. Use gloves to avoid sharp edges.

Removing Processor Heatsink(s)

The heatsink is attached to the server board/processor socket with captive fasteners. Using a #2 Phillips* screwdriver, loosen the four screws located on the heatsink corners in a diagonal manner using the following procedure:

1. Using a #2 Phillips* screwdriver, start with screw 1 and loosen it by giving it two rotations and stop (see letter **A**). (IMPORTANT: Do not fully loosen.)
2. Proceed to screw 2 and loosen it by giving it two rotations and stop (see letter **B**). Similarly, loosen screws 3 and 4. Repeat steps A and B by giving each screw two rotations each time until all screws are loosened.
3. Lift the heatsink straight up (see letter **C**).

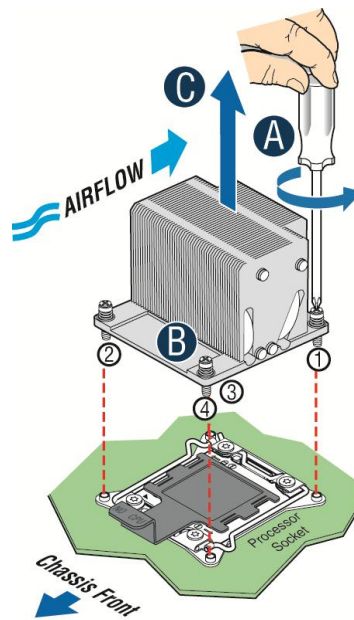


Figure 37. Removing Processor Heatsink

Installing the Processor

Caution: Processor must be appropriate: You may damage the server board if you install a processor that is inappropriate for your server. For a web link to the list of compatible processor(s), see “[Additional Information and Software](#)”.

Caution: ESD and handling processors: Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following: (1) Touch the metal chassis before touching the processor

or server board. Keep part of your body in contact with the metal chassis to dissipate the static charge while handling the processor. (2) Avoid moving around unnecessarily.

Caution: Protective socket cover needs to be removed for proper cooling of the processor; failure to remove the cover could result in damage to the system.

1. Open the Socket Lever. Push down the lever handle on the **OPEN 1st** side and away from the socket to release it (see letter **A**). Repeat the steps to release the lever on the other side (see letter **B**).

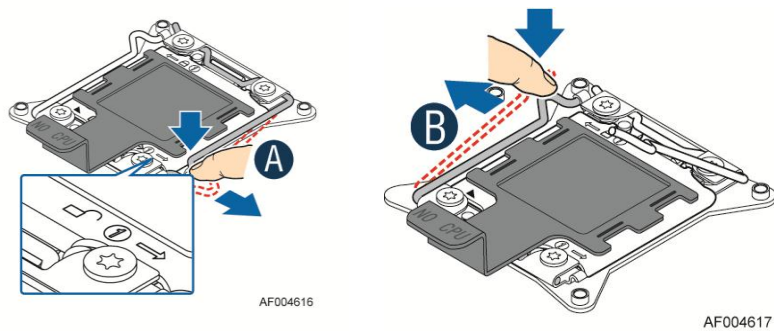


Figure 38. Installing Processor – Open the Socket Lever

2. Open the Load Plate. Press the locking lever slightly to raise the load plate (see letter **A**). Open the load plate all the way (see letter **B**).

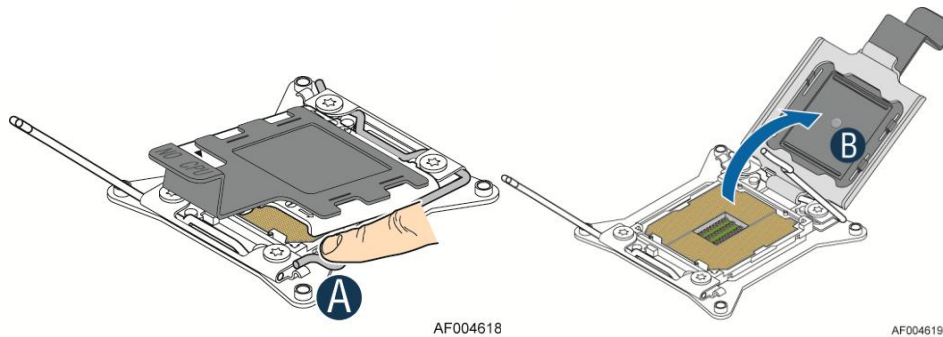


Figure 39. Installing Processor – Open the Load Plate

3. Install the Processor. Take the processor out of the box and remove the protective shipping cover (see letter **A**). Orient the processor with the socket so that the processor cutouts match the four orientation posts on the socket (see letter **B**). Note location of gold key at corner of processor (see letter **C**).

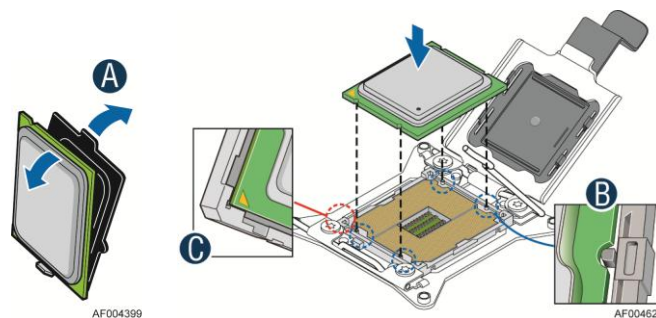


Figure 40. Installing Processor – Install the Processor

Note: The underside of the processor has components that may damage the socket pins if installed improperly. Processor must align correctly with the socket opening before installation. DO NOT DROP processor into socket!

4. Remove the Cover. Press the cover to remove it. Save the protective cover.

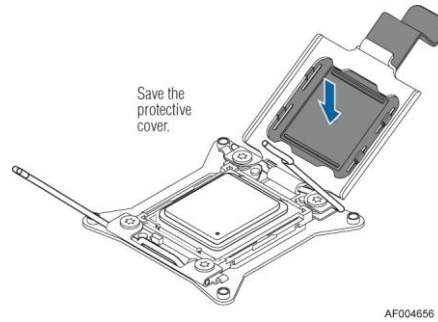


Figure 41. Installing Processor – Remove the Cover

5. Close the Load Plate. Carefully lower the load plate over the processor.

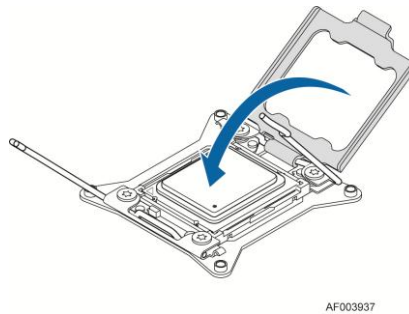


Figure 42. Installing Processor – Close the Load Plate

6. Latch the Locking Lever. Push down on the locking lever on the CLOSE 1st side (see letter **A**). Slide the tip of the lever under the notch in the load plate (see letter **B**). Make sure the load plate tab engages under the socket lever when fully closed. Repeat the steps to latch the locking lever on the other side (see letter **C**). Latch the levers in the order as shown.

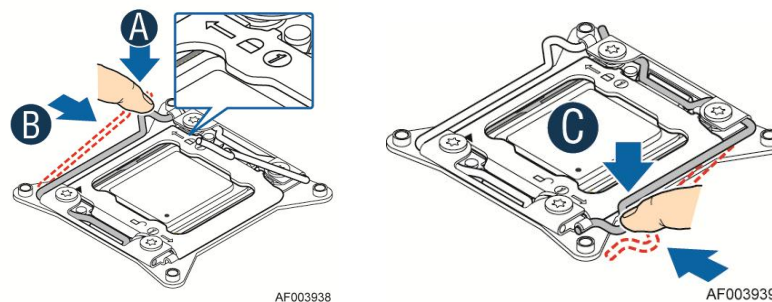


Figure 43. Installing Processor – Latch the Locking Lever

Installing Processor Heatsink(s)

1. Remove the protective film on the TIM if present (see letter **A**).
2. Align heatsink fins to the front and back of the chassis for correct airflow. Airflow goes from front-to-back of chassis (see letter **B**).

Each heatsink has four captive fasteners and should be tightened in a diagonal manner using the following procedure:

3. Using a #2 Phillips* screwdriver, start with screw 1 and engage screw threads by giving it two rotations and stop (see letter **C**). (Do not fully tighten.)
4. Proceed to screw 2 and engage screw threads by giving it two rotations and stop (see letter **D**). Similarly, engage screws 3 and 4.
5. Repeat steps C and D by giving each screw two rotations each time until each screw is lightly tightened up to a maximum of 8 inch-lbs torque (see letter **E**).

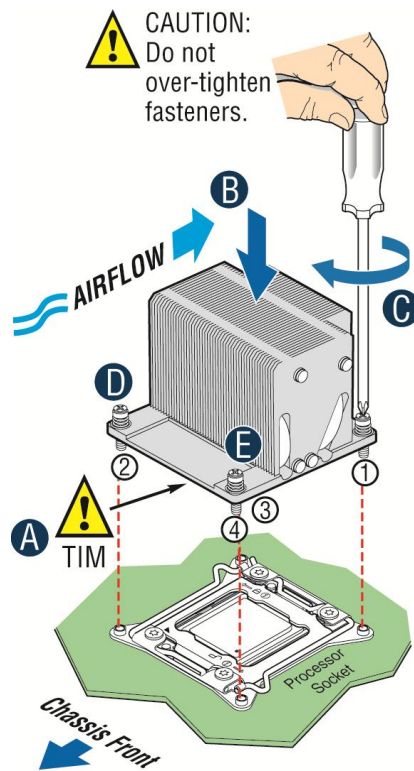


Figure 44. Installing Processor Heatsink

Removing the Processor

1. Remove the processor heatsink, see Figure 37
2. Open the socket lever, see Figure 38.
3. Open the load plate, see Figure 39.

4. Remove the processor.

Installing and Removing Memory

Installing Memory

1. Locate the DIMM sockets. Make sure the clips at either end of the DIMM socket(s) are pushed outward to the open position (see letter **A**).
2. Holding the DIMM by the edges, remove it from its anti-static package. Position the DIMM above the socket. Align the notch on the bottom edge of the DIMM with the key in the DIMM socket (see letter **B**).
3. Insert the bottom edge of the DIMM into the socket (see letter **C**). When the DIMM is inserted, push down on the top edge of the DIMM until the retaining clips snap into place (see letter **D**). Make sure the clips are firmly in place (see letter **E**).

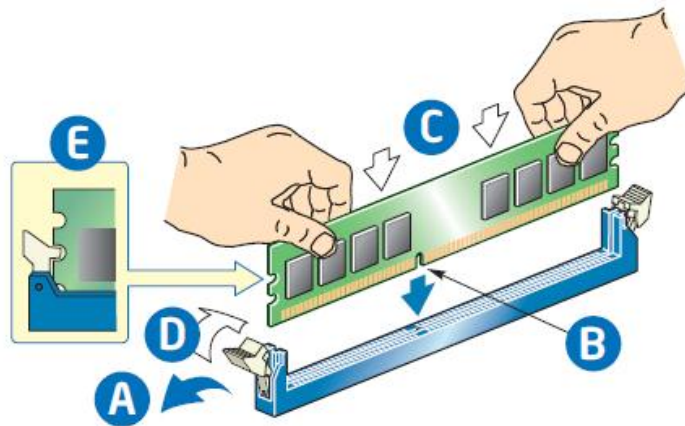


Figure 45. Installing Memory

Removing Memory

1. Locate the DIMM sockets. Gently spread the retaining clips at each end of the socket. The DIMM lifts from the socket.
2. Holding the DIMM by the edges, lift it from the socket, and store it in an anti-static package.

Installing a Hot-swap Hard Disk Drive

Caution: If you don't install all drives, empty drive bays must be occupied by carriers with plastic drive blank provided to maintain proper system cooling.

Installing a Hard Disk Drive into 3.5" Hard Drive Carrier

1. Remove the drive carrier by pressing the green button and opening the lever (see letter **A**). Slide the carrier out (see letter **B**).

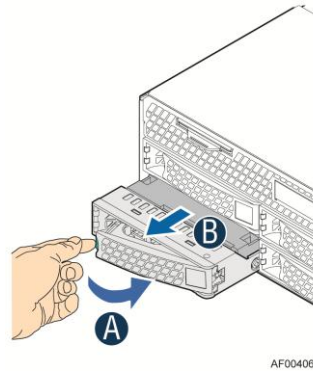


Figure 46. Installing Hard Disk Drive – Removing 3.5" HDD carrier

2. Remove the four screws securing the HDD interface bracket and remove the HDD interface bracket (see letter **C**).

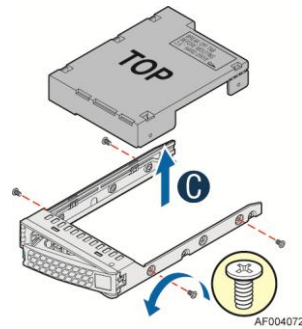


Figure 47. Installing Hard Disk Drive – Removing 3.5" HDD interface bracket

3. Install the hard disk drive using the same four screws as shown. Make sure the connector end of the drive matches the backplane connector (see letter **D**).

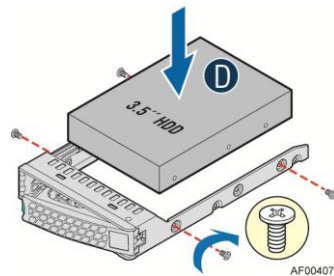


Figure 48. Installing Hard Disk Drive – Installing 3.5" HDD

For installing 2.5” Hard Disk Drive as option:

Break off the tab on the HDD interface bracket (see letter **d1**). Install the HDD interface bracket from top. Secure the bracket with three screws as shown (see letter **d2**). Slide the 2.5" HDD into the bracket to align the screw holes with the right and left rail (see letter **d3**). Secure the hard disk drive using the four screws for 2.5" HDD (see letter **d4**).

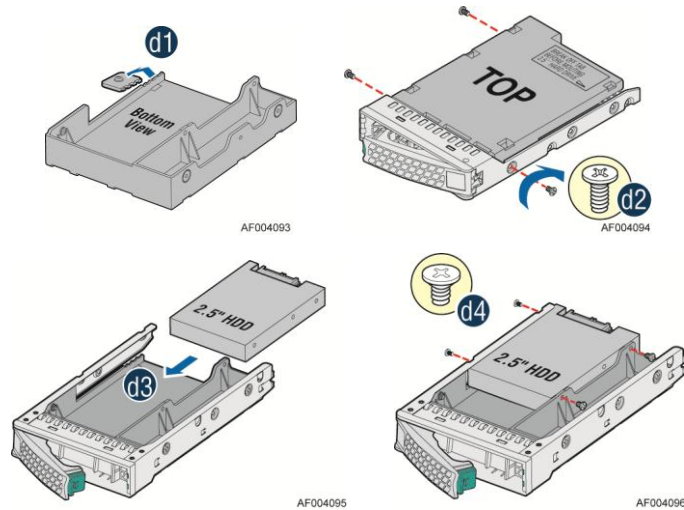


Figure 49. Installing Hard Disk Drive – Installing 2.5" HDD

1. With the lever open, insert the hard disk drive assembly into the chassis (see letter **E**). Push in the lever to lock it into place (see letter **F**).

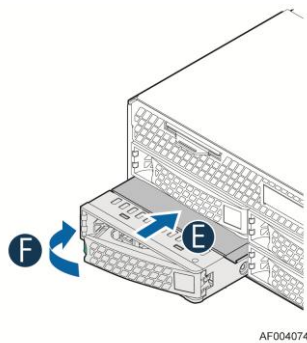


Figure 50. Installing Hard Disk Drive – Inserting 3.5" HDD assembly

Installing a Hard Disk Drive into 2.5” Hard Drive Carrier

1. Remove the drive carrier by pressing the green latch to unlock (see letter **A**). Pull out the black lever and slide the carrier out (see letter **B**).

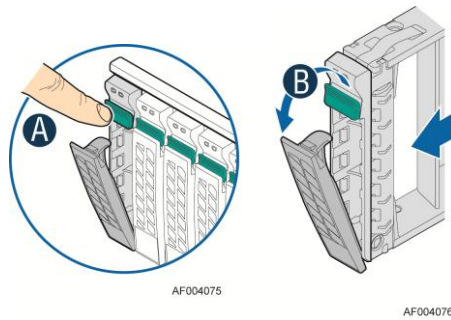


Figure 51. Installing Hard Disk Drive – Removing 2.5" HDD carrier

2. Remove the four screws securing the plastic drive blank from the 2.5" HDD carrier (see letter C). Disengage the plastic drive blank from the HDD carrier. Remove the plastic drive blank from the 2.5" HDD carrier (see letter D).

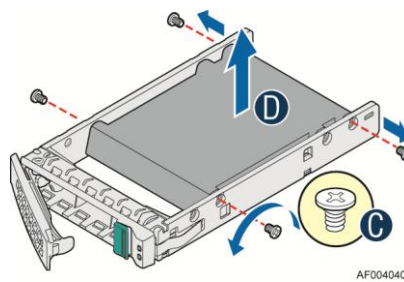


Figure 52. Installing Hard Disk Drive – Removing plastic drive blank

3. Install the hard disk drive using the four screws as shown. Make sure the connector end of the drive matches the backplane connector (see letter E).

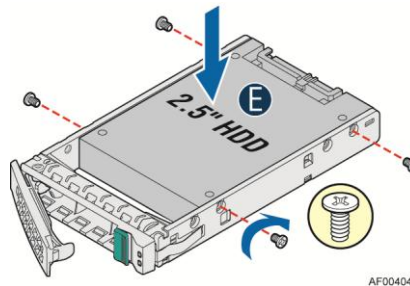
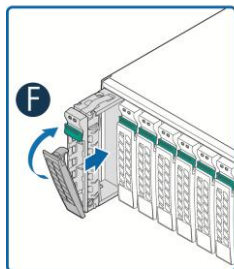


Figure 53. Installing Hard Disk Drive – Installing 2.5" HDD

4. With the lever open, insert the hard disk drive assembly into the chassis, then push in the lever to lock it into place (see letter F).



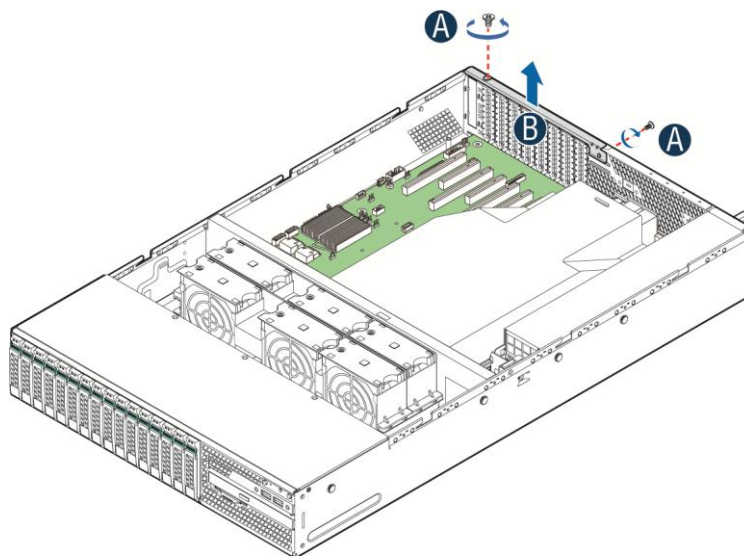
AF004077

Figure 54. Installing Hard Disk Drive – Inserting 2.5" HDD assembly

Installing a PCI Add-in Card

Installing a PCI Add-in Card

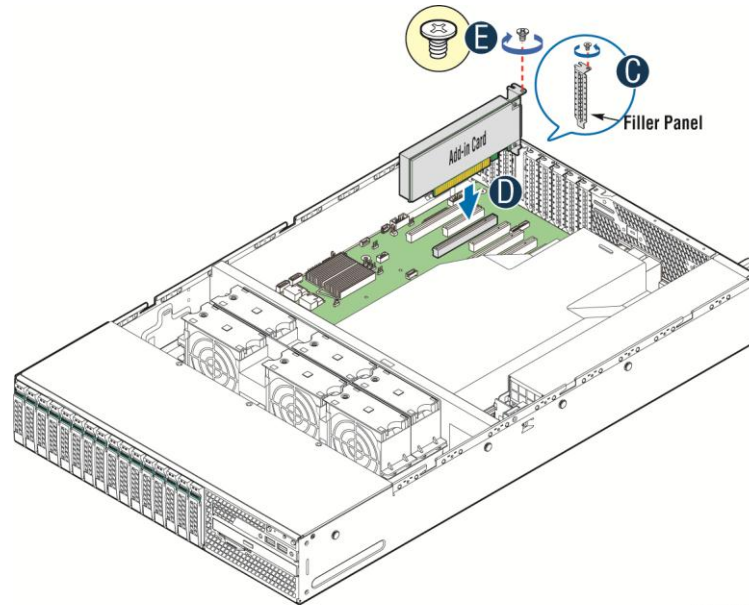
1. Loosen the screws (see letter **A**)
2. Remove the retention device (see letter **B**).



AF004362

Figure 55. Installing a PCI Add-In Card

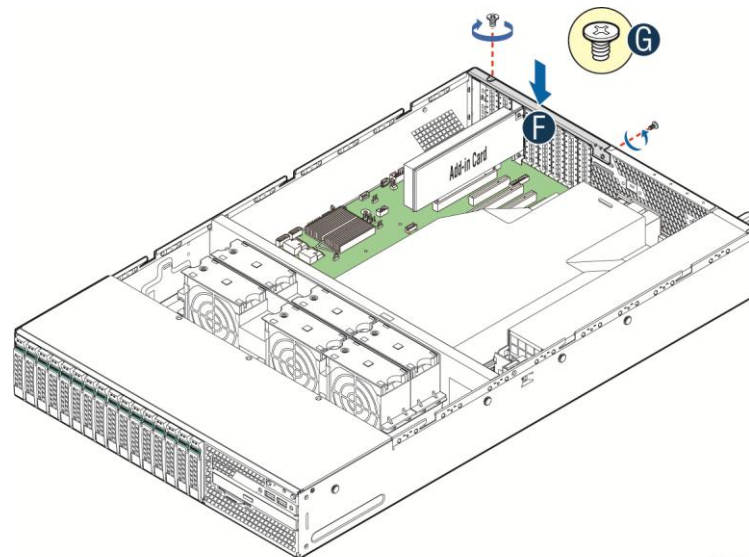
3. Remove the filler panel (see letter **C**).
4. Install the add-in card making sure the connector edge of the add-in card aligns correctly with the slot (see letter **D**).
5. Tighten the screw (see letter **E**)



AF004363

Figure 56. Installing a PCI Add-In Card...Continued 1

6. Tighten the Add-in card screw (see letter **F**).
7. Install the retention device and tighten the screws (see letter **G**).



AF004364

Figure 57. Installing a PCI Add-In Card...Continued 2

Installing and Removing a Slimline Optical Drive

Caution: The slimline optical drive is NOT hot-swappable. Before removing or replacing the drive, you must first take the server out of service, turn off all peripheral devices connected to the system,

turn off the system by pressing the power button, and unplug the power cord from the system or wall outlet.

To maintain proper system cooling, a filler panel must be installed if you do not install a device at this location.

Installing a Slimline Optical Drive

1. Install the plastic guide onto the back of the drive and attach with two screws as shown (see letter **A**).

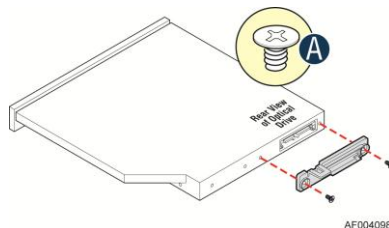


Figure 58. Installing the Plastic Guide to the Optical Drive

2. Insert the optical drive into chassis opening and push all the way until it stops (see letter **B**). Connect the cables as shown (see letter **C**).

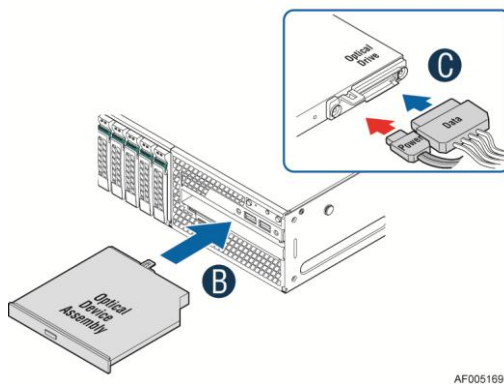


Figure 59. Installing an Optical Drive

Removing a Slimline Optical Drive

1. Remove the cables (see letter **A**).
2. Lift up the blue tab to release the optical drive (see letter **B**).
3. Slide the optical drive out (see letter **C**).

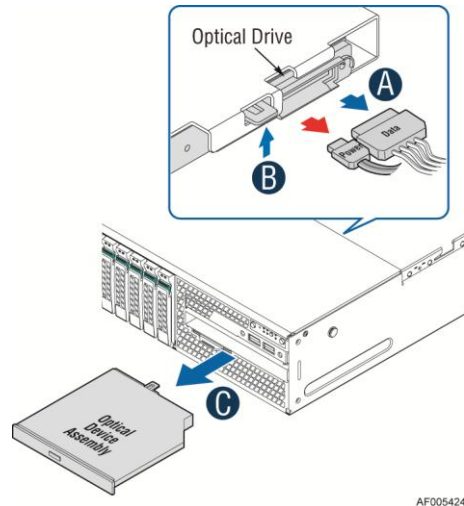


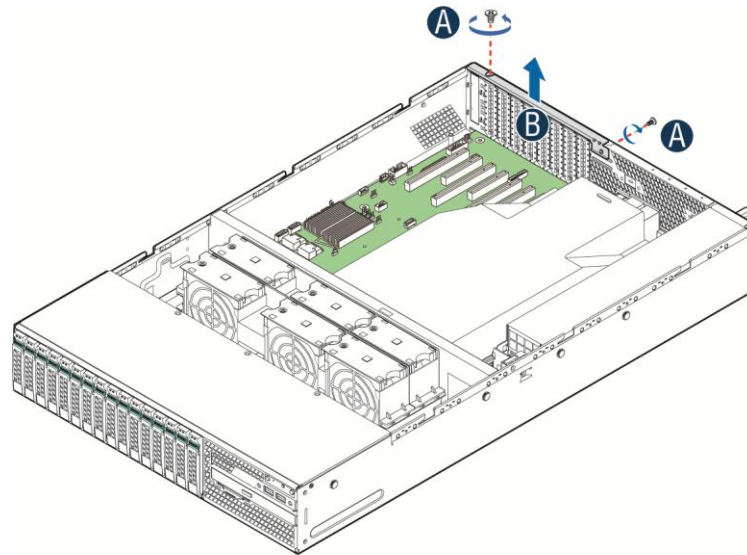
Figure 60. Removing the Slimline Optical Drive

4. If no device will be installed in this location, install a filler panel in this location.

Installing Intel® I/O Expansion Module

Installing Intel® I/O Expansion Module

1. Remove the screws (see letter **A**).
2. Slide the retention device and lift upward (see letter **B**).

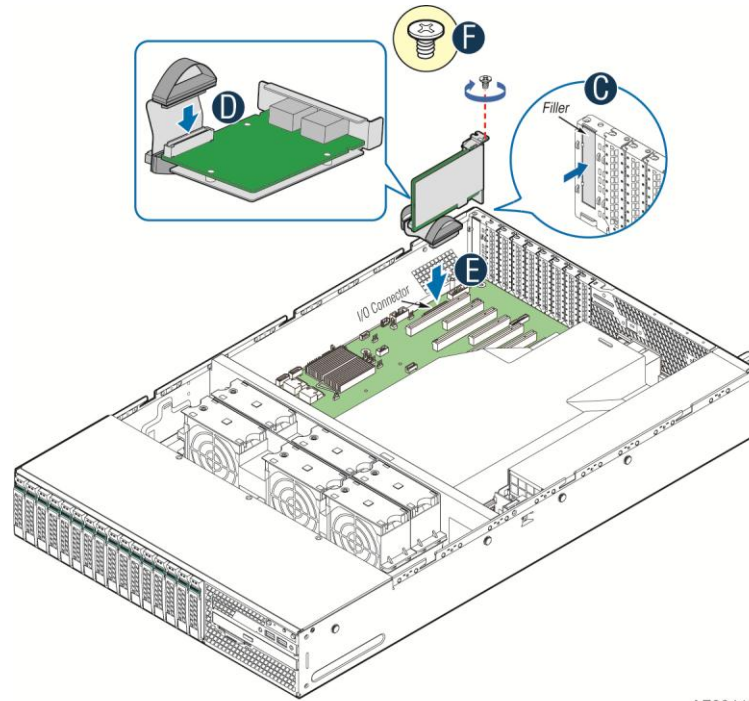


AF004362

Figure 61. Installing Intel® I/O Expansion Module

3. Push out the filler panel from the chassis and remove it (see letter **C**).
4. Connect one end of fex cable to the I/O connector on the I/O module (see letter **D**).

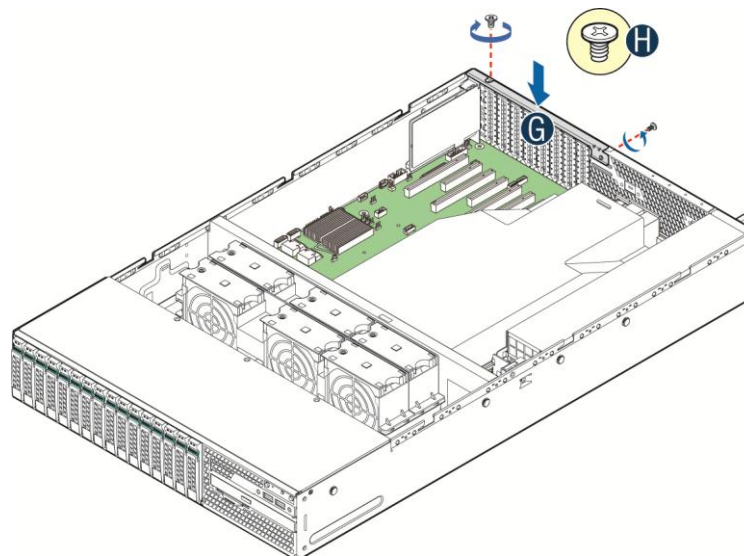
5. Connect the opposite end of the flex cable to the I/O connector on the server board (see letter **E**)
6. Tighten the I/O screw to secure on the chassis (see letter **F**)



AF004425

Figure 62. Installing Intel® I/O Expansion Module...Continued 1

7. Install the retention device (see letter **G**)
8. Tighten the screws (see letter **H**)



AF004426

Figure 63. Installing Intel® I/O Expansion Module...Continued 2

Installing and Removing the Intel® RAID C600 Upgrade Key

Installing the Intel® RAID C600 Upgrade Key

Locate the white 4-pin key header. Carefully pick up the Intel® RAID C600 Upgrade Key. Match the Key and connector orientation and press down to install.

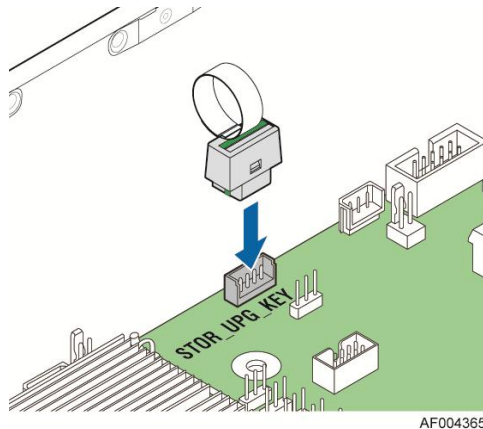


Figure 64. Installing the Intel® RAID C600 Upgrade Key

Removing the Intel® RAID C600 Upgrade Key

Pull up the key to remove it from the mother board.

Installing and Removing the Intel® Remote Management Module 4

Installing the Intel® RMM4 Lite

Locate the RMM4 Lite connector next to Riser Slot 1, carefully pick up the Intel® RMM4 Lite module, match the alignment pin of the module and the connector on server board, then press to install.

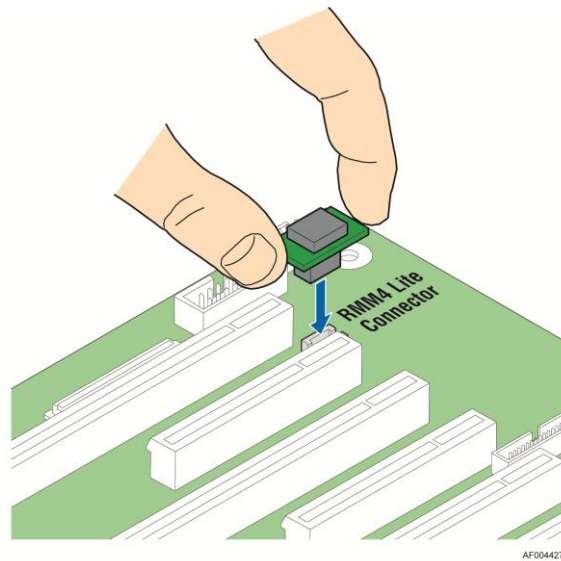


Figure 65. Installing the Intel® RMM4 Lite

Install the Intel® RMM4 NIC

1. Push out and remove the metal cover on the chassis (see letter **A**).
2. Connect one end of the flex cable to the RMM4 connector on the RMM4 NIC module (see letter **B**).
3. Attach the RMM4 module with two screws as shown (see letter **C**).
4. Connect the opposite end of the flex cable to the RMM4 connector on the server board

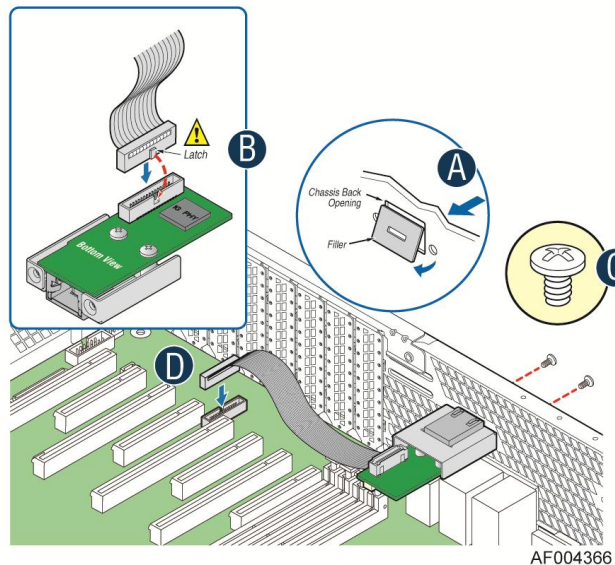


Figure 66. Installing the Intel® RMM4 NIC

Removing the Intel® RMM4 Lite

Pull up the RMM4 Lite module to remove it from the mother board.

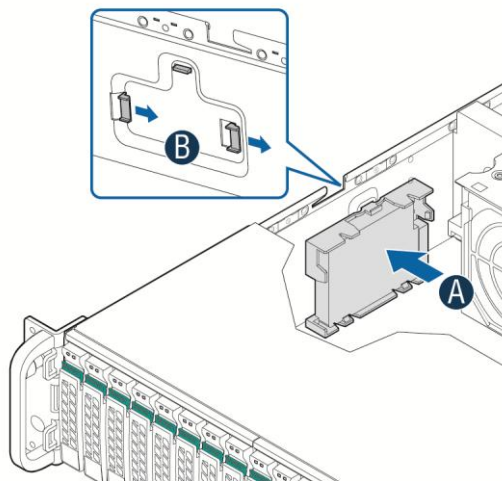
Removing the Intel® RMM4 NIC

Follow reverse order of the Installation step to remove.

Installing and Removing the Intel® RAID Smart Battery

Installing the Intel® RAID Smart Battery

1. Connect the cable between the BBU and the RAID card. For details, see *Intel® RAID Smart Battery User's Guide*.
2. Locate the mounting holes inside the chassis and reposition all cables routed over the fan bulkhead. Position the battery against the side wall and through the opening in the fan bulkhead (see letter **A**).
3. Align the tabs on the plastic battery holder with the mounting holes in the chassis and slide the plastic battery holder toward the front of the system until the tabs engage with the mounting holes (see letter **B**).

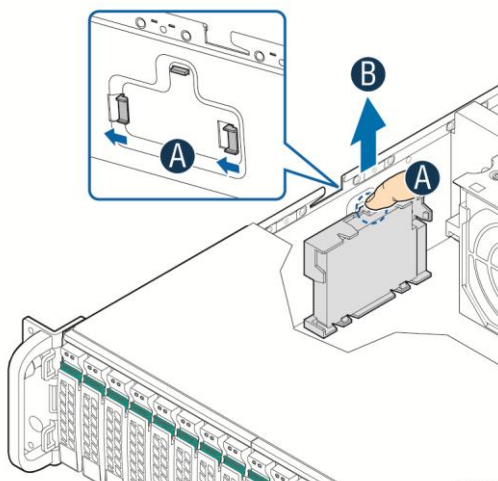


AF004428

Figure 67. Installing the Intel® RAID Smart Battery

Removing the Intel® RAID Smart Battery

1. Slide the plastic battery holder toward the rear of the system and disengage the battery from the server chassis side wall and move it out of the opening in the fan bulkhead (see letter **A**).
2. Lift the battery up to remove it from the server chassis (see letter **B**).



AF005425

Figure 68. Removing the Intel® RAID Smart Battery

Replacing the Power Supply

Caution: The power supply is only hot-swappable if you have a redundant system with two power supplies installed. If you only have one power supply installed, before removing or replacing the power supply, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the power cord from the system or wall outlet.

The power supply can be replaced if it fails. To replace the power supply, follow these steps:

1. Do one of the following:
 - If a filler panel is installed, use the 'finger hole' to remove the filler panel (see letter **A**).

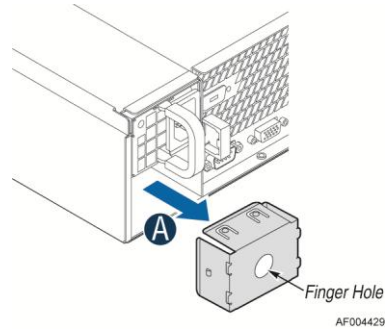


Figure 69. Removing the filler panel

- If a power supply is installed, push the green latch in the direction shown while pulling out of the system by the handle.

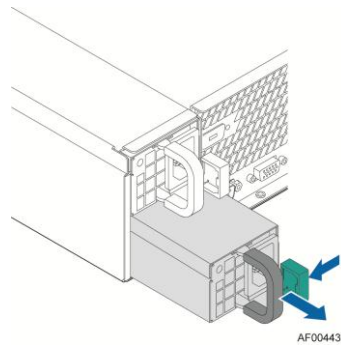


Figure 70. Removing the power supply module

2. Do one of the following:
 - Insert the power supply module into the power supply cage and push all the way until it clicks into place (see letter **B**).

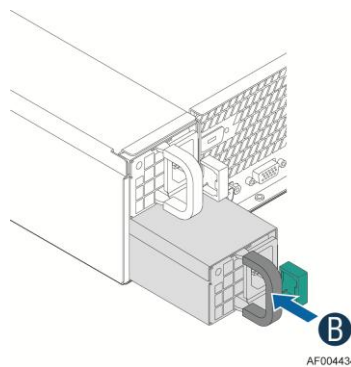
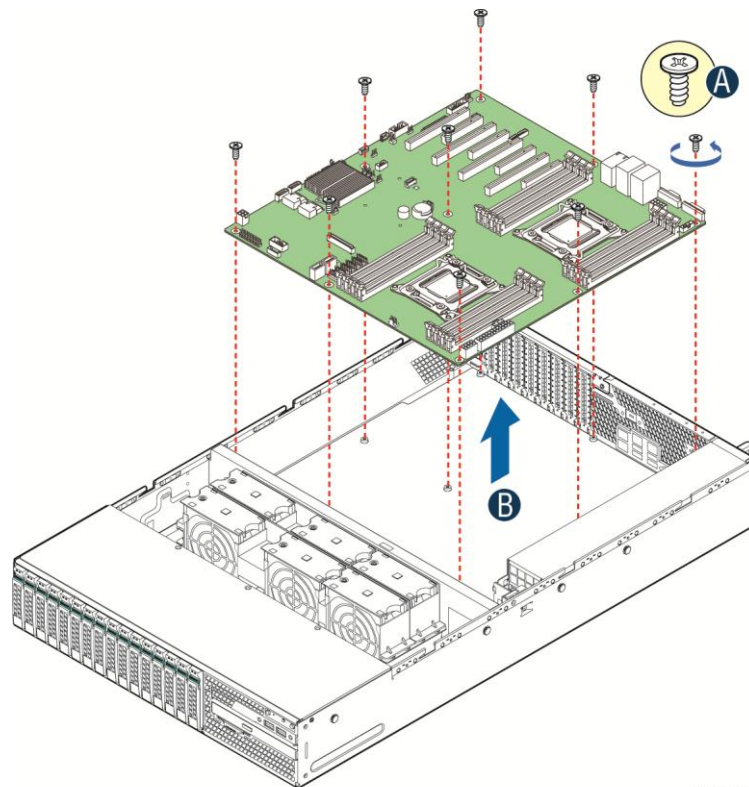


Figure 71. Installing the power supply module

Installing and Removing the Server Board

Removing the Server Board

1. Disconnect all cables from the server board.
2. Remove the air duct.
3. Remove the nine screws from the server board (see letter **A**).
4. Lift the server board from the server system (see letter **B**).

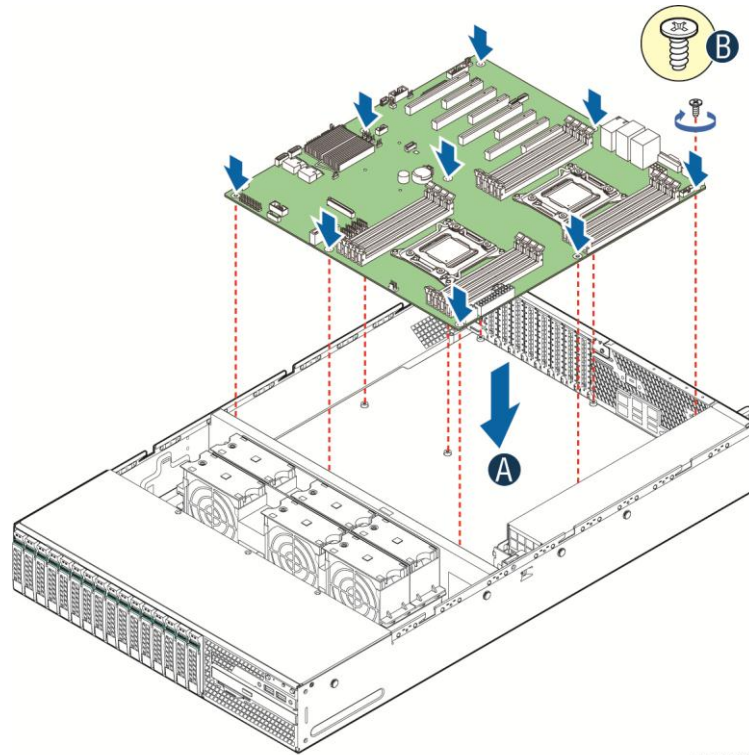


AF005395

Figure 72. Removing the Server Board

Installing the Server Board

1. Place the server board into the server system (see letter **A**).
2. Secure the server board with nine screws (see letter **B**).



AF005396

Figure 73. Installing the Server Board

3. Install the air duct.
4. Connect all power cables to the server board.

Replacing the Backup Battery

The lithium battery on the server board powers the RTC for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.

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

Advarsel: Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

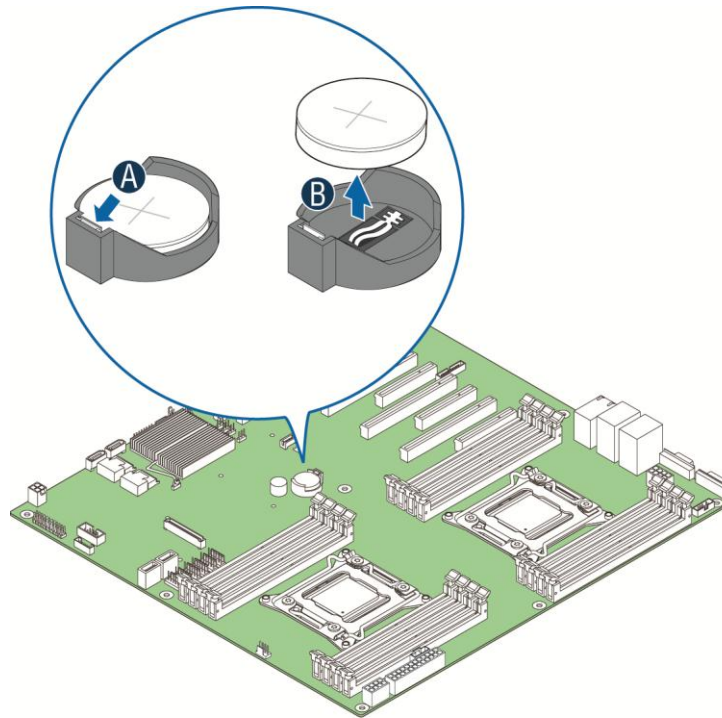
Advarsel: Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

Varning: Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

Varoitus: Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

1. Locate the battery on the server board.

2. Gently press the metal clip as shown to release the battery (see letter **A**).
3. Remove the battery from the plastic socket (see letter **B**).



AF005426

Figure 74. Replacing the Backup Battery

4. Dispose of the battery according to local ordinance.
5. Remove the new lithium battery from its package, and, being careful to observe the correct polarity, insert it in the battery socket.

Note: You will need to run the BIOS Setup to restore the configuration settings to the RTC.

Replacing a System Fan

1. Pull system fan straight up to remove it from the fan holder.
2. Replace the system fan.

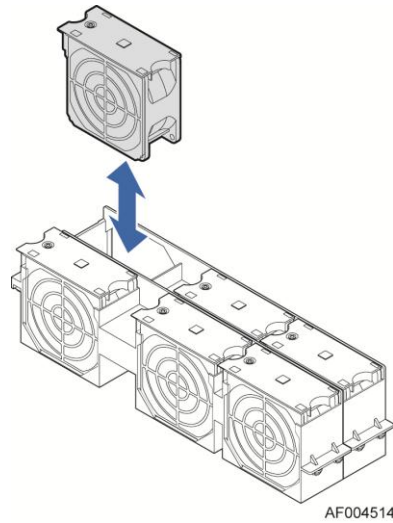


Figure 75. Replacing a system fan

Replacing the Backplane

Replacing the 3.5" Hard Drive Backplane

Removing the 3.5" Hard Drive Backplane:

1. Remove all hot-swap drive carriers, regardless of whether or not a drive is installed in the carrier. Disconnect all cables from the backplane.
2. Remove the six screws to release the hard drive cage (see letter **A**).
3. Slide the hard drive cage out of the server chassis, the clip will fall out automatically (see letter **B**).

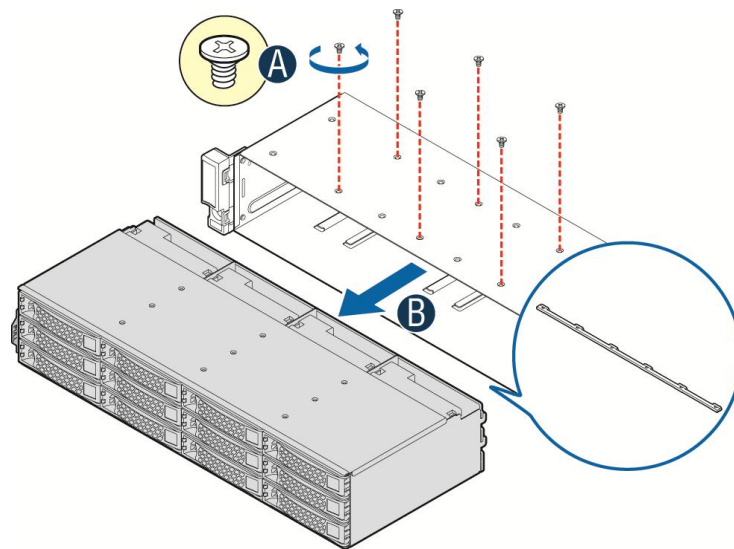
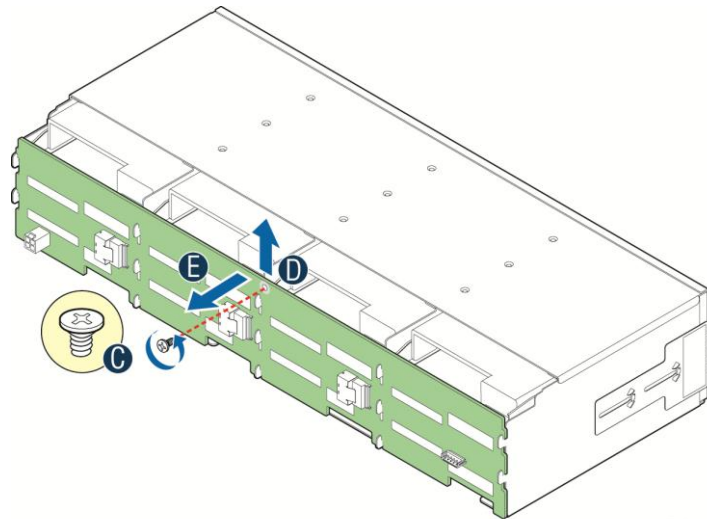


Figure 76. Removing 3.5" hard drive backplane – remove the hard drive cage

4. Remove the screw at the rear of the backplane (see letter **C**).
5. Pull up the backplane (see letter **D**). Remove the backplane from the server chassis (see letter **E**).

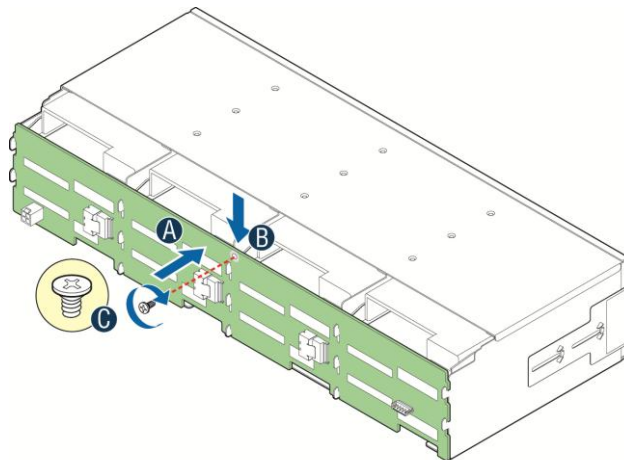


AF004336

Figure 77. Removing 3.5" hard drive backplane - remove the backplane

Installing the 3.5" Hard Drive Backplane

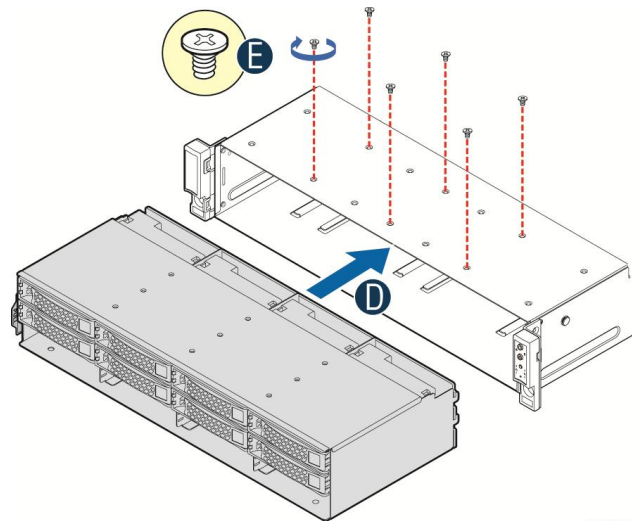
1. Hold the backplane only by the edges. Do not push or pull on any components on the backplane. Position the backplane in place at the front of the server system (see letter **A**).
2. Slide the backplane into the server system guides (see letter **B**).
3. Secure the backplane with the screw (see letter **C**).



AF004337

Figure 78. Installing 3.5" hard drive backplane – install the backplane

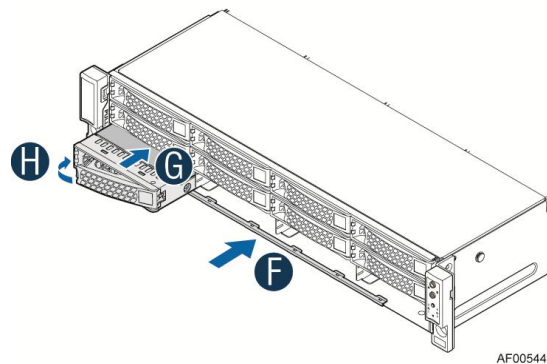
4. Insert the hard drive cage into server chassis (see letter **D**).
5. Secure the hard drive cage with the six screws (see letter **E**).



AF005441

Figure 79. Installing 3.5" hard drive backplane – install the hard drive cage

6. Install the clip to server chassis (see letter **F**).
7. With the lever open, insert the hard disk drive assembly into the chassis (see letter **G**). Push in the lever to lock it into place (see letter **H**). Repeat step G and H to make sure all hard drive assemblies are in place.



AF005442

Figure 80. Installing 3.5" hard drive backplane – install the stiffener and hard drives

8. Connect cables to the backplane.

Replacing the 2.5" Hard Drive Backplane

Removing the 2.5" Hard Drive Backplane:

1. Remove all hot-swap drive carriers, regardless of whether or not a drive is installed in the carrier. Disconnect all cables from the backplane.
2. Remove the six screws to release the stiffener (see letter **A**).
3. Slide the stiffener cage out of the server chassis (see letter **B**).

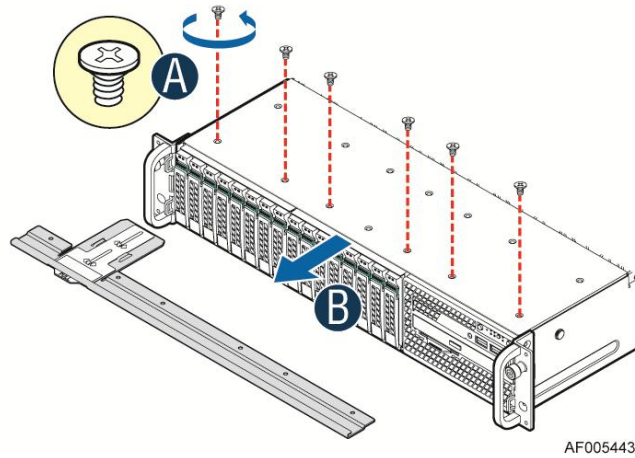


Figure 81. Removing 2.5" hard drive backplane – remove the stiffener

4. Remove the three screws to release the hard drive cage (see letter C).
5. Slide the hard drive cage out of the server chassis (see letter D).

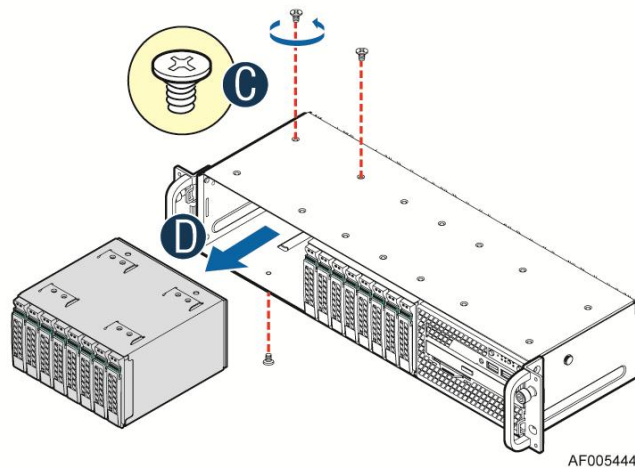


Figure 82. Removing 2.5" hard drive backplane – remove the hard drive cage

6. Remove the screw from the backplane board (see letter E).
7. Hold the backplane board only by the edges and slide the backplane board in the direction shown to release it (see letter F). Remove the backplane board from the four hooks and pull out of the hard drive cage (see letter G).

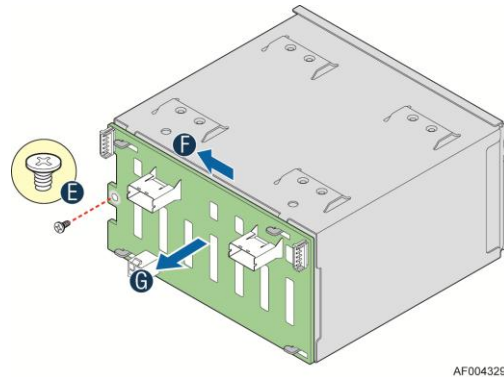


Figure 83. Removing 2.5" hard drive backplane – remove the backplane

Installing the 2.5" Hard Drive Backplane:

1. Align the holes on the backplane board with the four hooks on the hard drive cage (see letter **A**). Slide the backplane board in the direction shown to lock it in place (see letter **B**).
2. Secure the backplane with the screw (see letter **C**).

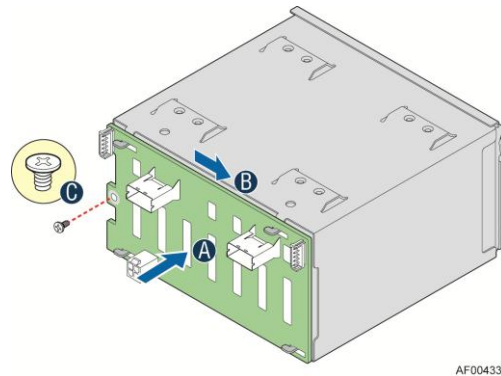


Figure 84. Installing 2.5" hard drive backplane – install backplane

3. Insert the hard drive cage into server chassis (see letter **D**).
4. Secure the hard drive cage with the three screws (see letter **E**).

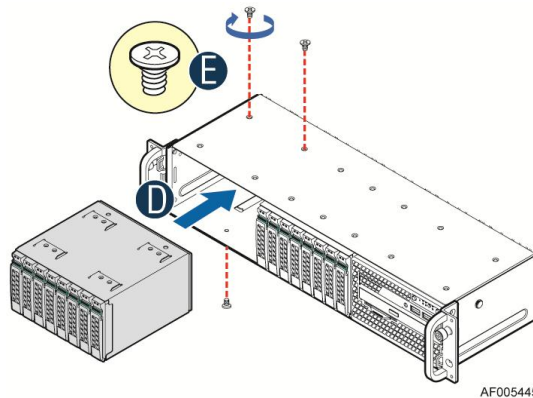


Figure 85. Installing 2.5" hard drive backplane – install hard drive cage

5. Insert the stiffener into server chassis (see letter **F**).
6. Secure the stiffener with the six screws (see letter **G**).

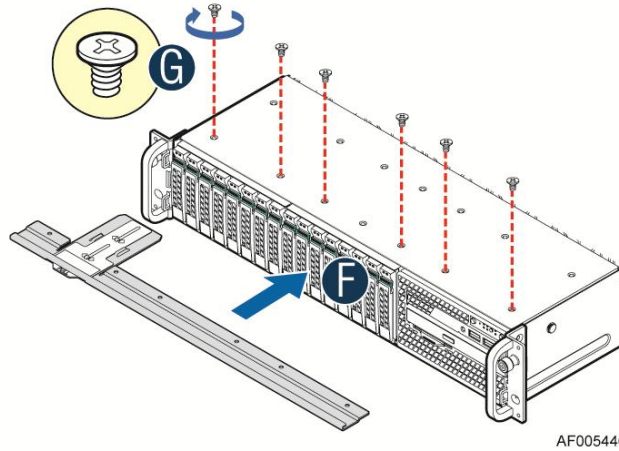


Figure 86. Installing 2.5" hard drive backplane – install the stiffener

7. Connect cables to the backplane. Please refer to “[Cable Routing](#)”.

Replacing the Intel® RAID Expander RS2CV360/RS2CV240

Removing the Intel® RAID Expander

1. Remove the three screws (see letter **A**).
2. Lift up the expander card (see letter **B**).

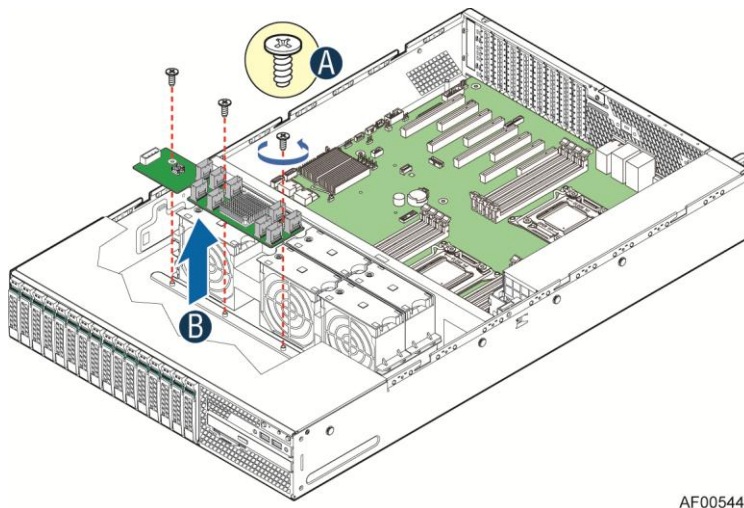
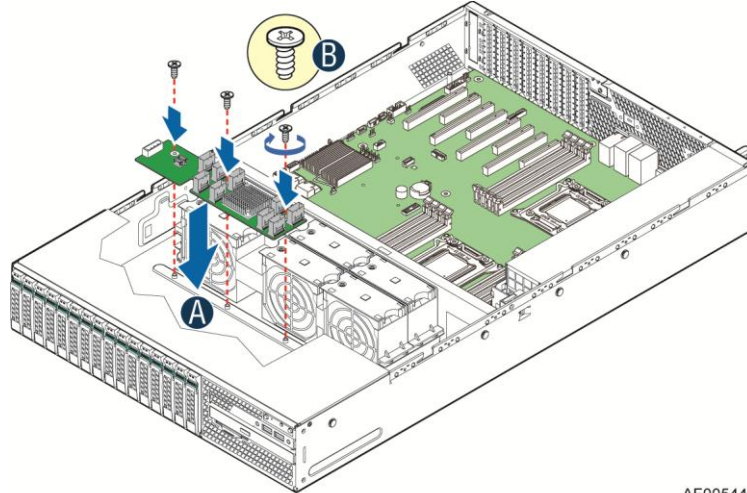


Figure 87. Removing the Intel® RAID Expander

Installing the Intel® RAID Expander

1. Install the expander card, align it with the three screw holes on server chassis (see letter **A**).
2. Secure the three screws (see letter **B**).



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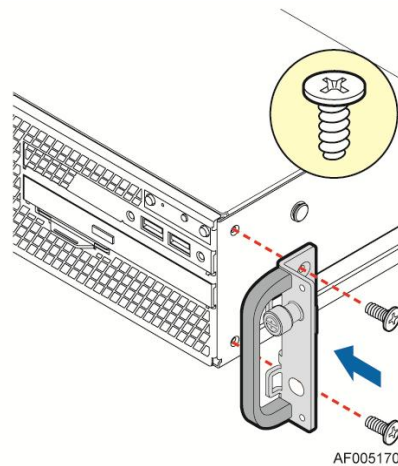
Figure 88. Installing the Intel® RAID Expander

3. Please refer to “[Cable Routing](#)” for connecting the cables to expander card.

Installing and Removing the Rack Handles

Installing the Rack Handles

Align the rack handle with the two holes on the side of the server system and attach the rack handle to the server system with two screws as shown.



AF005170

Figure 89. Installing the Rack Handle

Removing the Rack Handles

Remove the two screws holding the rack handle in place, and remove the rack handle from the server system as shown.

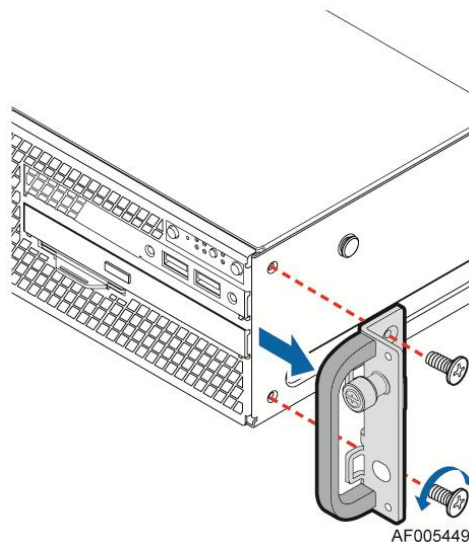


Figure 90. Removing the Rack Handle

Installing and Removing the Storage Front Panel

Installing the Storage Front Panel

1. Align the interposer card with the two holes on the side wall of server chassis (see letter **A**);
2. Fasten the two screws to secure the interposer card (see letter **B**);
3. Connect cables to the interposer card (see letter **C**). See [Cable Routing](#) for more details.

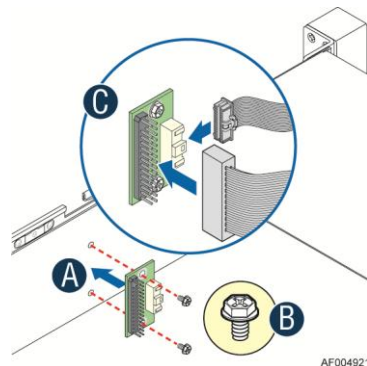


Figure 91. Installing the interposer card

4. Attach the storage front panel to the rack handle on the right side of serve chassis (see letter **D**);
5. Fasten the four screws to secure the storage front panel (see letter **E**).

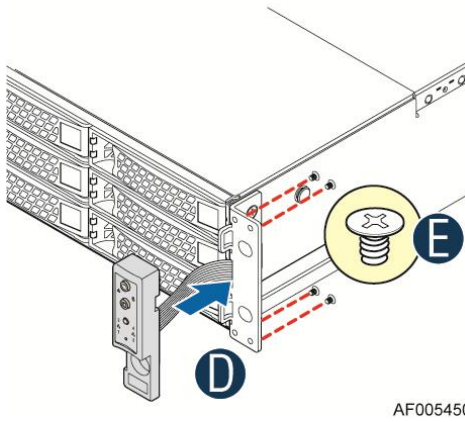


Figure 92. Installing the storage front panel

Removing the Storage Front Panel

1. Remove the four screws to release the storage front panel (see letter **A**).
2. Remove the storage front panel from the rack handle (see letter **B**).

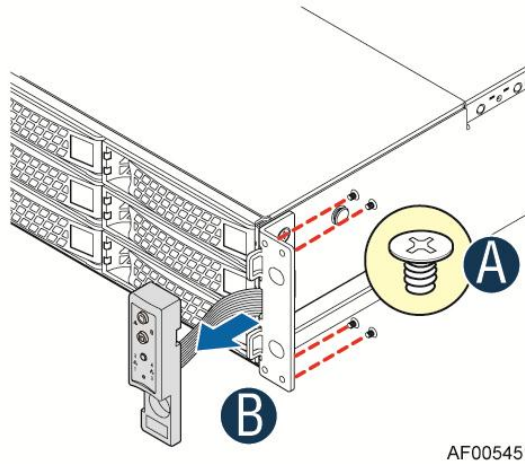


Figure 93. Installing the storage front panel

3. Disconnect all the cables from the interposer card (see letter **C**).
4. Remove the two screws to release the storage front panel (see letter **D**).
5. Remove the storage front panel from the side wall of server chassis (see letter **E**).

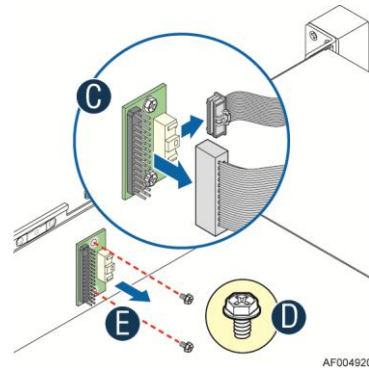


Figure 94. Installing the interposer card

6. Connect the front panel control cable from mother board to the standard front control panel if needed. See [Cable Routing](#) for more details.

3 BIOS Setup Utilities

The BIOS Setup utility is a text-based utility that allows the user to configure the system and view current settings and environment information for the platform devices. The Setup utility controls the platform's built-in devices, the boot manager, and error manager.

The BIOS Setup interface consists of a number of pages or screens. Each page contains information or links to other pages. The advanced tab in Setup displays a list of general categories as links. These links lead to pages containing a specific category's configuration.

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

BIOS Setup Operation

The BIOS Setup Utility has the following features:

- Localization – The Intel® Server Board BIOS is only available in English. However, BIOS Setup uses the Unicode standard and is capable of displaying data and input in Setup fields in all languages currently included in the Unicode standard.
- Console Redirection – BIOS Setup is functional from the Console Redirection over various terminal emulation standards. When Console Redirection is enabled, the POST display out is in purely Text Mode due to Redirection data transfer in a serial port data terminal emulation mode. This may limit some functionality for compatibility, for example, usage of colors or some keys or key sequences or support of pointing devices.
- Setup screens are designed to be displayable in an 80-character x 24-line format in order to work with Console Redirection, although that screen layout should display correctly on any format with longer lines or more lines on the screen.
- Password protection – BIOS Setup may be protected from unauthorized changes by setting an Administrative Password in the Security screen. When an Administrative Password has been set, all selection and data entry fields in Setup (except System Time and Date) are grayed out and cannot be changed unless the Administrative Password has been entered.

Note: if an Administrative Password has not been set, anyone who boots the system to Setup has access to all selection and data entry fields in Setup and can change any of them.

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.

The Setup page is designed to a format of 80 x 24 (24 lines of 80 characters each). The typical display screen in a Legacy mode or in a terminal emulator mode is actually 80 characters by 25 lines, but with “line wrap” enabled (which it usually is) the 25th line cannot be used with the Setup page.

Table 4. BIOS Setup Page Layout

Functional Area	Description
Title (Tab) Bar	<p>The Title Bar is located at the top of the screen and displays “Tabs” with the titles of the top-level pages, or screens that can be selected. Using the left and right arrow keys moves from page to page through the Tabs.</p> <p>When there are more Tabs than can be displayed on the Title (Tab) Bar, they will scroll off to the left or right of the screen and temporarily disappear from the visible Title Bar. Using the arrow keys will scroll them back onto the visible Title Bar. When the arrow keys reach either end of the Title Bar, they will “wrap around” to the other end of the Title Bar.</p> <p>For multi-level hierarchies, this shows only the top-level page above the page which the user is currently viewing. The Page Title gives further information.</p>
Page Title	<p>In a multi-level hierarchy of pages beneath one of the top-level Tabs, the Page Title identifying the specific page which the user is viewing is located in the upper left corner of the page. Using the <ESC> (Escape) key will return the user to the higher level in the hierarchy, until the top-level Tab page is reached.</p>
Setup Item List	<p>The Setup Item List is a set of control entries and informational items. The list is displayed in two columns. For each item in the list:</p> <ul style="list-style-type: none"> ▪ The left column of the list contains Prompt String (or Label String), a character string which identifies the item. The Prompt String may be up to 34 characters long in the 80 x 24 page format. ▪ The right column contains a data field which may be an informational data display, a data input field, or a multiple choice field. Data input or multiple-choice fields are demarcated by square brackets “[...]”. This field may be up to 90 characters long, but only the first 22 characters can be displayed on the 80 x 24 page (24 characters for an informational display-only field). <p>The operator navigates up and down the right hand column through the available input or choice fields.</p> <p>A Setup Item may also represent a selection to open a new screen with a further group of options for specific functionality. In this case, the operator navigates to the desired selection and presses <Enter> to go to the new screen.</p>
Item-Specific Help Area	<p>The Item-specific Help Area is located on the right side of the screen and contains Help Text specific to the highlighted Setup Item. Help information may include the meaning and usage of the item, allowable values, effects of the options, and so on.</p> <p>The Help Area is a 29 character by 11 line section of the 80 x 24 page. The Help Text may have explicit line-breaks within it. When the text is longer than 29 characters, it is also broken to a new line, dividing the text at the last space (blank) character before the 29th character. An unbroken string of more than 29 characters will be arbitrarily wrapped to a new line after the 29th character. Text that extends beyond the end of the 11th line will not be displayed.</p>
Keyboard Command Area	<p>The Keyboard Command Area is located at the bottom right of the screen and continuously displays help for keyboard special keys and navigation keys.</p>

Entering BIOS Setup

To enter the BIOS Setup using a keyboard (or emulated keyboard), press the <F2> function key during boot time when the OEM or Intel Logo Screen or the POST Diagnostic Screen is displayed.

The following instructional message is displayed on the Diagnostic Screen or under the Quiet Boot Logo Screen:

Press <F2> to enter setup, <F6> Boot Menu, <F12> Network Boot

Note: With a USB keyboard, it is important to wait until the BIOS “discovers” the keyboard and beeps – until the USB Controller has been initialized and the USB keyboard activated, key presses will not be read by the system.

When the Setup Utility is entered, the Main screen is displayed initially. However, serious errors cause the system to display the Error Manager screen instead of the Main screen.

It is also possible to cause a boot directly to Setup using an IPMI 2.0 command “Get/Set System Boot Options”. For details on that capability, see the explanation in the IPMI description.

Setup Navigation 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. Each feature is associated with a value field, except those used for informative purposes. Each value field contains configurable parameters. Depending on the security option chosen and in effect by the password, a menu feature’s value may or may not be changed. If a value cannot be changed, its field is made inaccessible and appears grayed out.

Table 5. BIOS Setup: Keyboard Command Bar

Key	Option	Description
<Enter>	Execute Command	The <Enter> key is used to activate submenus when the selected feature is a submenu, or to display a pick list if a selected option has a value field, or to select a subfield for multi-valued features like time and date. If a pick list is displayed, the <Enter> key selects the currently highlighted item, undoes the pick list, and returns the focus to the parent menu.
<Esc>	Exit	The <Esc> key provides a mechanism for backing out of any field. When the <Esc> key is pressed while editing any field or selecting features of a menu, the parent menu is re-entered. When the <Esc> key is pressed in any 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 they were before <Esc> was pressed, without affecting any existing settings. If “Yes” is selected and the <Enter> key is pressed, the 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 effect if a sub-menu or pick list is displayed.
<Tab>	Select Field	The <Tab> key is used to move between fields. For example, <Tab> can be used to move from hours to minutes in the time item in the main menu.
-	Change Value	The minus key on the keypad is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list.

Key	Option	Description
+	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 keyboards, but will have the same effect.
<F9>	Setup Defaults	<p>Pressing the <F9> key causes the following to display:</p> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Load Optimized Defaults?</p> <p>Yes No</p> </div> <p>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.</p>
<F10>	Save and Exit	<p>Pressing the <F10> key causes the following message to display:</p> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Save configuration and reset?</p> <p>Yes No</p> </div> <p>If “Yes” is highlighted and <Enter> is pressed, all changes are saved and the 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.</p>

Setup Screen Menu Selection Bar

The Setup Screen Menu selection bar is located at the top of the BIOS Setup Utility screen. It displays tabs showing the major screen selections available to the user. By using the left and right arrow keys, the user can select the listed screens. Some screen selections are out of the visible menu space, and become available by scrolling to the left or right of the current selections displayed.

BIOS Setup Utility Screens

The following sections describe the screens available in the BIOS Setup utility for the configuration of the server platform.

For each of these screens, there is an image of the screen with a list of Field Descriptions which describe the contents of each item on the screen. Each item on the screen is hyperlinked to the relevant Field Description. Each Field Description is hyperlinked back to the screen image.

These lists follow the following guidelines:

- The text heading for each Field Description is the actual text as displayed on the BIOS Setup screen. This screen text is a hyperlink to it’s corresponding Field Description.
- The text shown in the Option Values and Help Text entries in each Field Description are the actual text and values are displayed on the BIOS Setup screens.
- In the Option Values entries, the text for default values is shown with an underline. These values do not appear underline on the BIOS Setup screen. The underlined text in this document is to serve as a reference to which value is the default value.

- The Help Text entry is the actual text which appears on the screen to accompany the item when the item is the one in focus (active on the screen).
- The Comments entry provides additional information where it may be helpful. This information does not appear on the BIOS Setup screens.
- Information enclosed in angular brackets (< >) in the screen shots identifies text that can vary, depending on the option(s) installed. For example, <Amount of memory installed> is replaced by the actual value for “Total Memory”.
- Information enclosed in square brackets ([]) in the tables identifies areas where the user must 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 in order for the changes to take effect. Alternatively, pressing <ESC> discards the changes and resumes POST to continue to boot the system according to the boot order set from the last boot.

Map of Screens and Functionality

There are a number of screens in the entire Setup collection. They are organized into major categories. Each category has a hierarchy beginning with a top-level screen from which lower-level screens may be selected. Each top-level screen appears as a tab, arranged across the top of the Setup screen image of all top-level screens.














There are more categories than will fit across the top of the screen, so at any given time there will be some categories which will not appear until the user has scrolled across the tabs which are present.

The categories and the screens included in each category are listed below, with links to each of the screens named.

Table 6. Screen Map

Categories (Top Tabs)	2 nd Level Screens	3 rd Level Screens
Main Screen (Tab)		
Advanced Screen (Tab)		
↗	Processor Configuration	
↗	Power & Performance	
↗	Memory Configuration	
	↗	Memory RAS and Performance Configuration
↗	Mass Storage Controller Configuration	
↗	PCI Configuration	
	↗	NIC Configuration

BIOS Setup Utilities

Categories (Top Tabs)	2 nd Level Screens	3 rd Level Screens
	Serial Port Configuration	
	USB Configuration	
	System Acoustic and Performance Configuration	
Security Screen (Tab)		
Server Management Screen (Tab)		
	Console Redirection	
	System Information	
	BMC LAN Configuration	
Boot Options Screen (Tab)		
	CDROM Order	
	Hard Disk Order	
	Floppy Order	
	Network Device Order	
	BEV Device Order	
	Add EFI Boot Option	
	Delete EFI Boot Option	
Boot Manager Screen (Tab)		
Error Manager Screen (Tab)		
Save & Exit Screen (Tab)		

Main Screen (Tab)

The Main Screen is the first screen that appears when the BIOS Setup configuration utility is entered, unless an error has occurred. If an error has occurred, the Error Manager Screen appears.

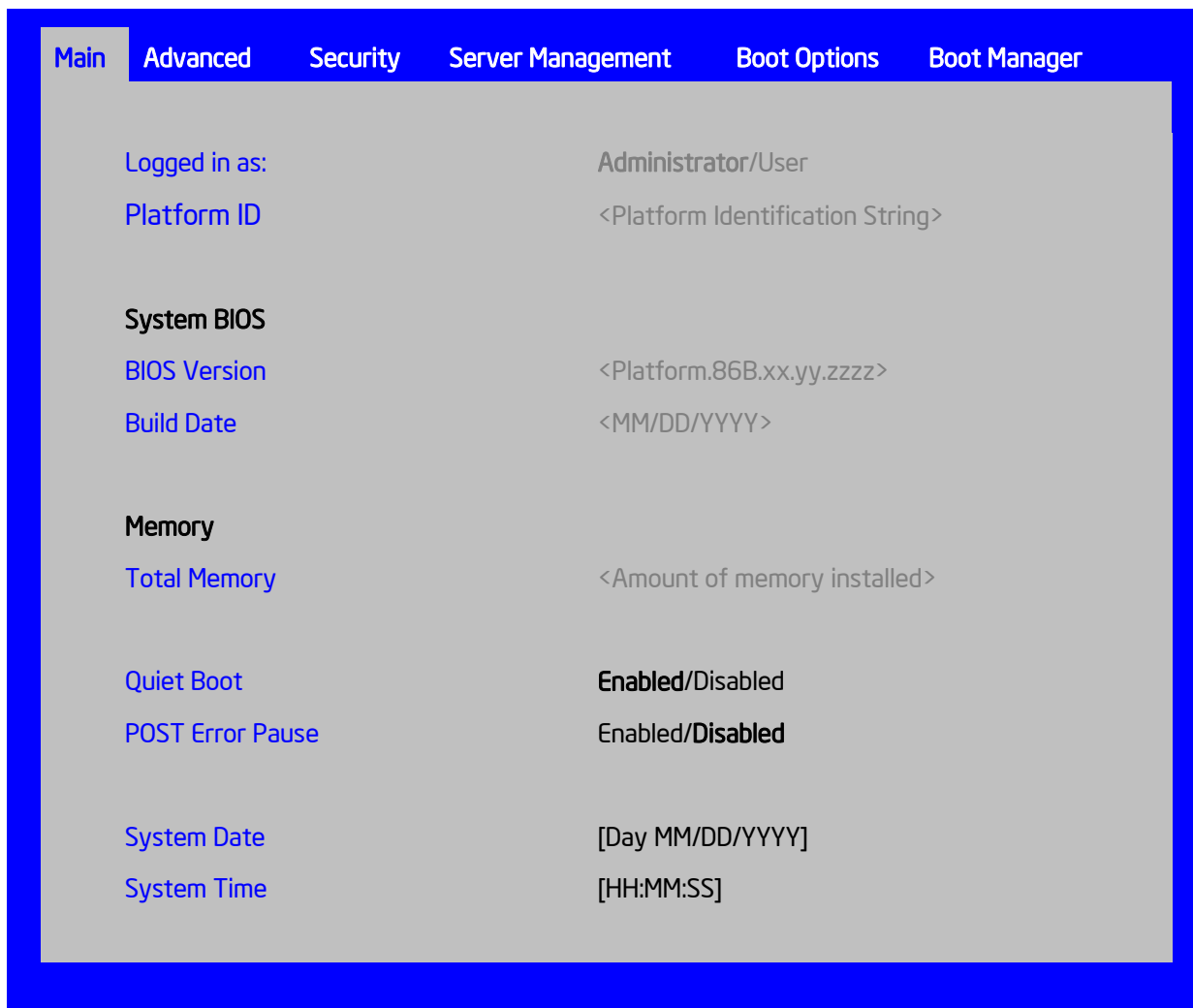


Figure 95. Main Screen

Screen Field Descriptions:

1. Logged in as:

Option Values: <Administrator / User>

Help Text: <None>

Comments: *Information only.* Displays password level that setup is running in: Administrator or User. With no passwords set, Administrator is the default mode.

2. Platform ID

Option Values: < Platform ID >

Help Text: <None>

Comments: Information only. Displays the Platform ID (Board ID) for the board on which the BIOS is executing POST.

The Platform ID is limited to 8 characters, because it is also used in the ACPI Tables which have that limitation. In some cases, this means that the Platform ID is abbreviated from the marketing designation (for example, MFS2600KI is abbreviated to S2600KI).

3. BIOS Version

Option Values: <Current BIOS version ID >

Help Text: <None>

Comments: Information only. The BIOS version displayed uniquely identifies the BIOS that is currently installed and operational on the board. The version information displayed is taken from the BIOS ID String, with the timestamp segment dropped off. The segments displayed are:

Platform:	Identifies that this is the correct platform BIOS
86B:	Identifies this BIOS as being an EPSD Server BIOS
xx:	Major Revision level of the BIOS
yy:	Release Revision level for this BIOS
zzzz:	Release Number for this BIOS

4. Build Date

Option Values: <Date and time when the currently installed BIOS was created (built)>

Help Text: <None>

Comments: Information only. The time and date displayed are taken from the timestamp segment of the BIOS ID String.

5. Total Memory

Option Values: <Amount of memory installed in the system >

Help Text: <None>

Comments: Information only. Displays the total physical memory installed in the system, in MB or GB. The term physical memory indicates the total memory discovered in the form of installed DDR3 DIMMs.

6. Quiet Boot

Option Values: **Enabled**
 Disabled

Help Text:

[Enabled] – Display the logo screen during POST.

[Disabled] – Display the diagnostic screen during POST.

Comments: This field controls whether the full diagnostic information is displayed on the screen during POST. When Console Redirection is enabled, the Quiet Boot setting is disregarded and the text mode Diagnostic Screen is displayed unconditionally.

7. POST Error Pause

Option Values: Enabled
 Disabled

Help Text:

[Enabled] – Go to the Error Manager for critical POST errors.

[Disabled] – Attempt to boot and do not go to the Error Manager for critical POST errors.

Comments: If enabled, the POST Error Pause option takes the system to the error manager to review the errors when major errors occur. Minor and fatal error displays are not affected by this setting.

8. System Date

Option Values: <System Date initially displays the current system calendar date, including the day of the week>

Help Text:

System Date has configurable fields for the current Month, Day, and Year.

The year must be between 2005 and 2099.

Use [Enter] or [Tab] key to select the next field.

Use [+] or [-] key to modify the selected field.

Comments: This field will initially display the current system day of week and date. It may be edited to change the system date. When the System Date is reset by the “BIOS Defaults” jumper, BIOS Recovery Flash Update, or other method, the date will be the earliest date in the allowed range – **Saturday 01/01/2005**.

9. System Time

Option Values: <System Time initially displays the current system time of day, in 24-hour format>

Help Text:

System Time has configurable fields for Hours, Minutes, and Seconds.

Hours are in 24-hour format.

Use the [Enter] or [Tab] key to select the next field.

Use the [+] or [-] key to modify the selected field.

Comments: This field will initially display the current system time (24 hour time). It may be edited to change the system time. When the System Time is reset by the “BIOS Defaults” jumper, BIOS Recovery Flash Update, or other method, the time will be the earliest time of day in the allowed range – **00:00:00** (although the time will be updated beginning from when it is reset early in POST).

Advanced Screen (Tab)

The Advanced screen provides an access point to configure several groups of options. On this screen, the user can select the option group to be configured. Configuration actions are performed on the selected screen, and not directly on the Advanced screen.

This screen is the same for all board series, selecting between the same groups of options, although the options for different boards are not necessarily identical.

To access this screen from the **Main** screen or other top-level “Tab” screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the **Advanced** screen is selected.



Figure 96. Advanced Screen

Screen Field Descriptions:

1. Processor Configuration

Option Values: <None>

Help Text: *View/Configure processor information and settings.*

Comments: *Selection only.* Position to this line and press the <Enter> key to go to the ***Processor Configuration*** group of configuration settings.

2. Power & Performance

Option Values: <None>

Help Text: *View/Configure processor information and settings.*

Comments: *Selection only.* Position to this line and press the <Enter> key to go to the ***Power & Performance*** group of configuration settings.

3. Memory Configuration

Option Values: <None>

Help Text:

View/Configure memory information and settings.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **Memory Configuration** group of configuration settings.

4. Mass Storage Controller Configuration

Option Values: <None>

Help Text:

View/Configure mass storage controller information and settings.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **Mass Storage Controller Configuration** group of configuration settings.

5. PCI Configuration

Option Values: <None>

Help Text:

View/Configure PCI information and settings.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **PCI Configuration** group of configuration settings.

6. Serial Port Configuration

Option Values: <None>

Help Text:

View/Configure serial port information and settings.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **Serial Port Configuration** group of configuration settings.

7. USB Configuration

Option Values: <None>

Help Text:

View/Configure USB information and settings.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **USB Configuration** group of configuration settings.

8. System Acoustic and Performance Configuration

Option Values: <None>

Help Text:

View/Configure system acoustic and performance information and settings.

Comments: Selection only. Position to this line and press the <Enter> key to go to the ***System Acoustic and Performance Configuration*** group of configuration settings.

Processor Configuration

The Processor Configuration screen displays the processor identification and microcode level, core frequency, cache sizes, Intel® QuickPath Interconnect (QPI) information for all processors currently installed. It also allows the user to enable or disable a number of processor options.

To access this screen from the **Main** screen, select **Advanced > Processor Configuration**. To move to another screen, press the <Esc> key to return to the **Advanced** screen, then select the desired screen.

Advanced

Processor Configuration

Processor Socket	CPU 1	CPU 2
Processor ID	<CPUID>*	<CPUID>
Processor Frequency	<Proc Freq>	<Proc Freq>
Microcode Revision	<Rev data>	<Rev data>
L1 Cache RAM	<L1 Cache Size>	<L1 Cache Size>
L2 Cache RAM	<L2 Cache Size>	<L2 Cache Size>
L3 Cache RAM	<L3 Cache Size>	<L3 Cache Size>
Processor 1 Version	<ID string from Processor 1>	
Processor 2 Version	<ID string from Processor 2>	
Current Intel® QPI Link Speed	Slow/Fast	
Intel® QPI Link Frequency	N/A / 6.4 GT/s / 7.2 GT/s / 8.0 GT/s / Unknown GT/s	
Intel® QPI Frequency Select	Auto Max / 6.4 GT/s / 7.2 GT/s / 8.0 GT/s	
Intel® Turbo Boost Technology	Enabled/Disabled	
Enhanced Intel SpeedStep® Tech	Enabled/Disabled	
Processor C3	Enabled/Disabled	
Processor C6	Enabled/Disabled	
Intel® Hyper-Threading Tech	Enabled/Disabled	
Active Processor Cores	All/1/2/3/4/5/6/7	
Execute Disable Bit	Enabled/Disabled	
Intel® Virtualization Technology	Enabled/Disabled	
Intel® VT for Directed I/O	Enabled/Disabled	
Interrupt Remapping	Enabled/Disabled	

Coherency Support	Enabled/Disabled
ATS Support	Enabled/Disabled
Pass-through DMA Support	Enabled/Disabled
Intel(R) TXT	Enabled/Disabled
Enhanced Error Containment Mode	Enabled/Disabled
MLC Streamer	Enabled/Disabled
MLC Spatial Prefetcher	Enabled/Disabled
DCU Data Prefetcher	Enabled/Disabled
DCU Instruction Prefetcher	Enabled/Disabled
Direct Cache Access (DCA)	Enabled/Disabled
SMM Wait Timeout	[20 - 3000ms, 20 is default]

Figure 97. Processor Configuration Screen

Screen Field Descriptions:

1. Processor ID

Option Values: <CPUID>

Help Text: <None>

Comments: *Information only.* Displays the Processor Signature value (from the CPUID instruction) identifying the type of processor and the stepping.

For multi-socket boards, the processor selected as the Bootstrap Processor (BSP) has an asterisk (“*”) displayed beside the Processor ID. “N/A” will be displayed for a processor if not installed.

Board has 2 Processor ID displays, regardless of whether the second CPU socket has a processor installed. If the socket does not have a processor installed, “N/A” will be displayed for the processor data.

2. Processor Frequency

Option Values: <Current Processor Operating Frequency>

Help Text: <None>

Comments: Information only. Displays current operating frequency of the processor.

2 sockets boards have a display column for each socket, showing “N/A” for empty sockets where processors are not installed.

3. Microcode Revision

Option Values: <Microcode Revision Number>

Help Text: <None>

Comments: Information only. Displays Revision Level of the currently loaded processor microcode.

2 sockets boards have a display column for each socket, showing “N/A” for empty sockets where processors are not installed.

4. L1 Cache RAM

Option Values: <L1 cache size>

Help Text: <None>

Comments: Information only. Displays size in KB of the processor L1 Cache. Since L1 cache is not shared between cores, this is shown as the amount of L1 cache per core. There are two types of L1 cache, so this amount is the total of L1 Instruction Cache plus L1 Data Cache for each core.

2 sockets boards have a display column for each socket, showing “N/A” for empty sockets where processors are not installed.

5. L2 Cache RAM

Option Values: <L2 cache size>

Help Text: <None>

Comments: Information only. Displays size in KB of the processor L2 Cache. Since L2 cache is not shared between cores, this is shown as the amount of L2 cache per core.

2 sockets boards have a display column for each socket, showing “N/A” for empty sockets where processors are not installed.

6. L3 Cache RAM

Option Values: <L3 cache size>

Help Text: <None>

Comments: Information only. Displays size in MB of the processor L3 Cache. Since L3 cache is shared between all cores in a processor package, this is shown as the total amount of L3 cache per processor package.

2 sockets boards have a display column for each socket, showing “N/A” for empty sockets where processors are not installed.

7. Processor Version

See following...

8. Processor 1 Version

See following...

9. Processor 2 Version

Option Values: <ID string from processor>

Help Text: <None>

Comments: Information only. Displays Brand ID string read from processor with CPUID instruction.

2 sockets boards have a display line for each socket, showing “N/A” for empty sockets where processors are not installed.

10. Current Intel® QPI Link Speed

Option Values: *Slow*
Fast

Help Text: <None>

Comments: Information only. Displays current Link Speed setting for the QPI Links. Appears only on multi-socket boards.

QPI Link Speed should display as “Slow” only when running at the “Boot Speed” of 50 MT/s, or when a multi-socket board has only one processor installed, so QPI is not functional. It should always be “Fast” when the QPI Link Frequency is in the normal functional range of 6.4 GT/s or above.

11. Intel® QPI Link Frequency

Option Values: N/A
 6.4 GT/s
 7.2 GT/s
 8.0 GT/s
 Unknown GT/s

Help Text: <None>

Comments: *Information only.* Displays current frequency at which the QPI Links are operating. Appears only on multi-socket boards.

When a multi-socket board has only one processor installed, QPI Link Frequency will be shown as “N/A”.

12. Intel® QPI Frequency Select

Option Values: **Auto Max**
 6.4 GT/s
 7.2 GT/s
 8.0 GT/s

Help Text:

Allows for selecting the Intel® QuickPath Interconnect Frequency. Recommended to leave in [Auto Max] so that BIOS can select the highest common Intel® QuickPath Interconnect frequency.

Comments: Lowering the QPI frequency may improve performance per watt for some processing loads and on certain benchmarks. [Auto Max] will give the maximum QPI performance available. Appears only on multi-socket boards.

When a multi-socket board has only one processor installed, this will be grayed out, with the previous value remaining displayed.

Changes in QPI Link Frequency will not take effect until the system reboots, so this will not immediately change the QPI Link Frequency display. Changing QPI Link Frequency does not affect the QPI Link Speed.

13. Intel® Turbo Boost Technology

Option Values: **Enabled**
 Disabled

Help Text:

Intel® Turbo Boost Technology allows the processor to automatically increase its frequency if it is running below power, temperature, and current specifications.

Comments: This option is only visible if all processors installed in the system support Intel® Turbo Boost Technology. In order for this option to be available, Enhanced Intel® SpeedStep® Technology must be **Enabled**.

14. Enhanced Intel SpeedStep® Tech

Option Values: **Enabled**
Disabled

Help Text:

Enhanced Intel SpeedStep® Technology allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production.

Contact your OS vendor regarding OS support of this feature.

Comments: When Disabled, the processor setting reverts to running at Max TDP Core Frequency (rated frequency).

This option is only visible if all processors installed in the system support Enhanced Intel® SpeedStep® Technology. In order for the Intel® Turbo Boost option to be available, Enhanced Intel® SpeedStep® Technology must be **Enabled**.

15. Processor C3

Option Values: Enabled
Disabled

Help Text:

Enable/Disable Processor C3 (ACPI C2/C3) report to OS

Comments: This is normally **Disabled**, but can be **Enabled** for improved performance on certain benchmarks and in certain situations.

16. Processor C6

Option Values: **Enabled**
Disabled

Help Text:

Enable/Disable Processor C6 (ACPI C3) report to OS

Comments: This is normally **Enabled** but can be **Disabled** for improved performance on certain benchmarks and in certain situations.

17. Intel® Hyper-Threading Tech

Option Values: Enabled
Disabled

Help Text:

Intel® Hyper-Threading Technology allows multithreaded software applications to execute threads in parallel within each processor.

Contact your OS vendor regarding OS support of this feature.

Comments: This option is only visible if all processors installed in the system support Intel® Hyper-Threading Technology.

18. Active Processor Cores

Option Values: All
1
2
3
4
5
6
7

Help Text:

Number of cores to enable in each processor package.

Comments: The numbers of cores that appear as selections depends on the number of cores available in the processors installed. Boards may have as many as 8 cores in each of 1, 2, or 4 processors. The same number of cores must be active in each processor package.

This Setup screen should begin with the number of currently-active cores as the number displayed. See note below – this may be different from the number previously set by the user.

Note: *The ME can control the number of active cores independently of the BIOS Setup setting. If the ME disables or enables processor cores, that will override the BIOS setting, and the number selected by BIOS will be disregarded.*

19. Execute Disable Bit

Option Values: **Enabled**
Disabled

Help Text:

Execute Disable Bit can help prevent certain classes of malicious buffer overflow attacks.

Contact your OS vendor regarding OS support of this feature.

Comments: This option is only visible if all processors installed in the system support the Execute Disable Bit. The OS and applications installed must support this feature in order for it to be enabled.

20. Intel® Virtualization Technology

Option Values: Enabled
Disabled

Help Text:

Intel® Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions.

***Note:** A change to this option requires the system to be powered off and then back on before the setting takes effect.*

Comments: This option is only visible if all processors installed in the system support Intel® VT. The software configuration installed on the system must support this feature in order for it to be enabled.

21. Intel® VT for Directed I/O

Option Values: Enabled
Disabled

Help Text:

Enable/Disable Intel® Virtualization Technology for Directed I/O (Intel® VT-d).

Report the I/O device assignment to VMM through DMAR ACPI Tables.

Comments: This option is only visible if all processors installed in the system support Intel® VT-d. The software configuration installed on the system must support this feature in order for it to be enabled.

22. Interrupt Remapping

Option Values: **Enabled**
Disabled

Help Text:

Enable/Disable Intel® VT-d Interrupt Remapping support. For some processors, this option may be "always enabled".

Comments: This option only appears when Intel® Virtualization Technology for Directed I/O is **Enabled**. For some processors this will be enabled unconditionally whenever Intel® VT-d is enabled. In that case, this option will be shown as "Enabled", and grayed out and not changeable.

23. Coherency Support

Option Values: Enabled
Disabled

Help Text:

Enable/Disable Intel® VT-d Coherency support.

Comments: This option only appears when Intel® Virtualization Technology for Directed I/O is **Enabled**.

24. ATS Support

Option Values: **Enabled**
Disabled

Help Text:

Enable/Disable Intel® VT-d Address Translation Services (ATS) support.

Comments: This option only appears when Intel® Virtualization Technology for Directed I/O is **Enabled**.

25. Pass-through DMA Support

Option Values: **Enabled**
Disabled

Help Text:

Enable/Disable Intel® VT-d Pass-through DMA support. For some processors, this option may be "always enabled".

Comments: This option only appears when Intel® Virtualization Technology for Directed I/O is **Enabled**. For some processors this will be enabled unconditionally whenever Intel® VT-d is enabled. In that case, this option will be shown as "Enabled", and grayed out and not changeable.

26. Enhanced Error Containment Mode

Option Values: Enabled

Disabled

Help Text:

Enable Enhanced Error Containment Mode (Data Poisoning) - Erroneous data coming from memory will be poisoned. If disabled (default), will be in Legacy Mode - No data poisoning support available.

Comments: Enhanced Error Containment (Data Poisoning) is not supported by all models of processors, and this option will not appear unless all installed processors support Enhanced Error Containment. This option globally enables or disables both Core and Uncore Data Poisoning, for processors which support them.

27. MLC Streamer

Option Values: **Enabled**

Disabled

Help Text:

MLC Streamer is a speculative prefetch unit within the processor(s).

***Note:** Modifying this setting may affect performance.*

Comments: MLC Streamer is normally **Enabled**, for best efficiency in L2 Cache and Memory Channel use, but disabling it may improve performance for some processing loads and on certain benchmarks.

28. MLC Spatial Prefetcher

Option Values: **Enabled**

Disabled

Help Text:

[Enabled] – Fetches adjacent cache line (128 bytes) when required data is not currently in cache.

[Disabled] – Only fetches cache line with data required by the processor (64 bytes).

Comments: MLC Spatial Prefetcher is normally **Enabled**, for best efficiency in L2 Cache and Memory Channel use, but disabling it may improve performance for some processing loads and on certain benchmarks.

29. DCU Data Prefetcher

Option Values: **Enabled**
Disabled

Help Text:

The next cache line will be prefetched into L1 data cache from L2 or system memory during unused cycles if it sees that the processor core has accessed several bytes sequentially in a cache line as data.

[Disabled] – Only fetches cache line with data required by the processor (64 bytes).

Comments: DCU Data Prefetcher is normally **Enabled**, for best efficiency in L1 Data Cache and Memory Channel use, but disabling it may improve performance for some processing loads and on certain benchmarks.

30. DCU Instruction Prefetcher

Option Values: **Enabled**
Disabled

Help Text:

The next cache line will be prefetched into L1 instruction cache from L2 or system memory during unused cycles if it sees that the processor core has accessed several bytes sequentially in a cache line as data.

Comments: DCU Data Prefetcher is normally **Enabled**, for best efficiency in L1 I Cache and Memory Channel use, but disabling it may improve performance for some processing loads and on certain benchmarks.

31. Direct Cache Access (DCA)

Option Values: **Enabled**
Disabled

Help Text:

Allows processors to increase the I/O performance by placing data from I/O devices directly into the processor cache.

Comments: System performance is usually best with Direct Cache Access Enabled. In certain unusual cases, disabling this may give improved results.

32. SMM Wait Timeout

Option Values: [Entry Field 20 – 3000ms, **20** is default]

Help Text:

Millisecond timeout waiting for BSP and APs to enter SMM. Range is 20ms to 3000ms.

Comments: Amount of time to allow for the SMI Handler to respond to an SMI. If exceeded, BMC generates an SMI Timeout and resets the system.

Note: This field is temporary, and will be removed when no longer required.

Power & Performance

The Power & Performance screen allows the user to specify a profile which is optimized in the direction of either reduced power consumption or increased performance.

To access this screen from the *Main* screen, select *Advanced > Power and Performance*. To move to another screen, press the <Esc> key to return to the *Advanced* screen, then select the desired screen.

There are four possible profiles from which to choose. When a Power and Performance Profile is chosen, that in turn will cause the system to implement a defined list of Setup option settings and internal (non-visible) settings.

There is an explanation displayed on the screen, because of the fact that other settings may be adjusted without specifically notifying the user.

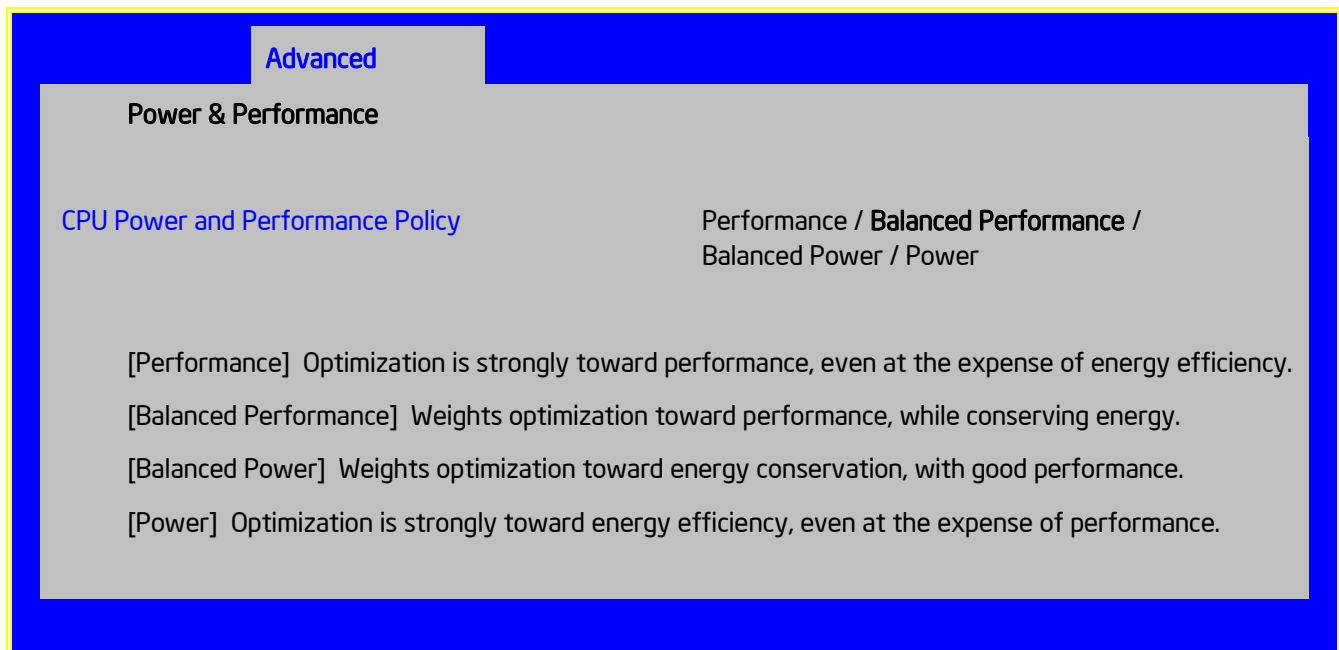


Figure 98. Power & Performance Screen

Screen Field Descriptions:

1. CPU Power and Performance Policy

Option Values: *Performance*

Balanced Performance

Balanced Power

Power

Help Text:

Allows the user to set an overall power and performance policy for the system, and when changed will modify a selected list of options to achieve the policy. These options are still changeable outside of the policy, but do reflect the changes that the policy makes when a new policy is selected.

Comments: Choosing one of these four Power and Performance Profiles implements a number of changes in BIOS settings, both visible settings in the Setup screens and non-visible internal settings.

Memory Configuration

The Memory Configuration screen allows the user to view details about the DDR3 DIMMs that are installed as system memory, and alter BIOS Memory Configuration settings where appropriate.

This screen shows memory system information, has options to select, and allows the user to select the “Configure Memory RAS and Performance” screen for further system memory information and configuration.

This screen differs somewhat between different boards which have different memory configurations. Some boards have one processor socket and fewer DIMMs, while other boards have two sockets or four sockets, more DIMMs, and the boards may have RAS and Performance options if configured for them

To access this screen from the *Main* screen, select *Advanced > Memory Configuration*. To move to another screen, press the <Esc> key to return to the *Advanced* screen, then select the desired screen.

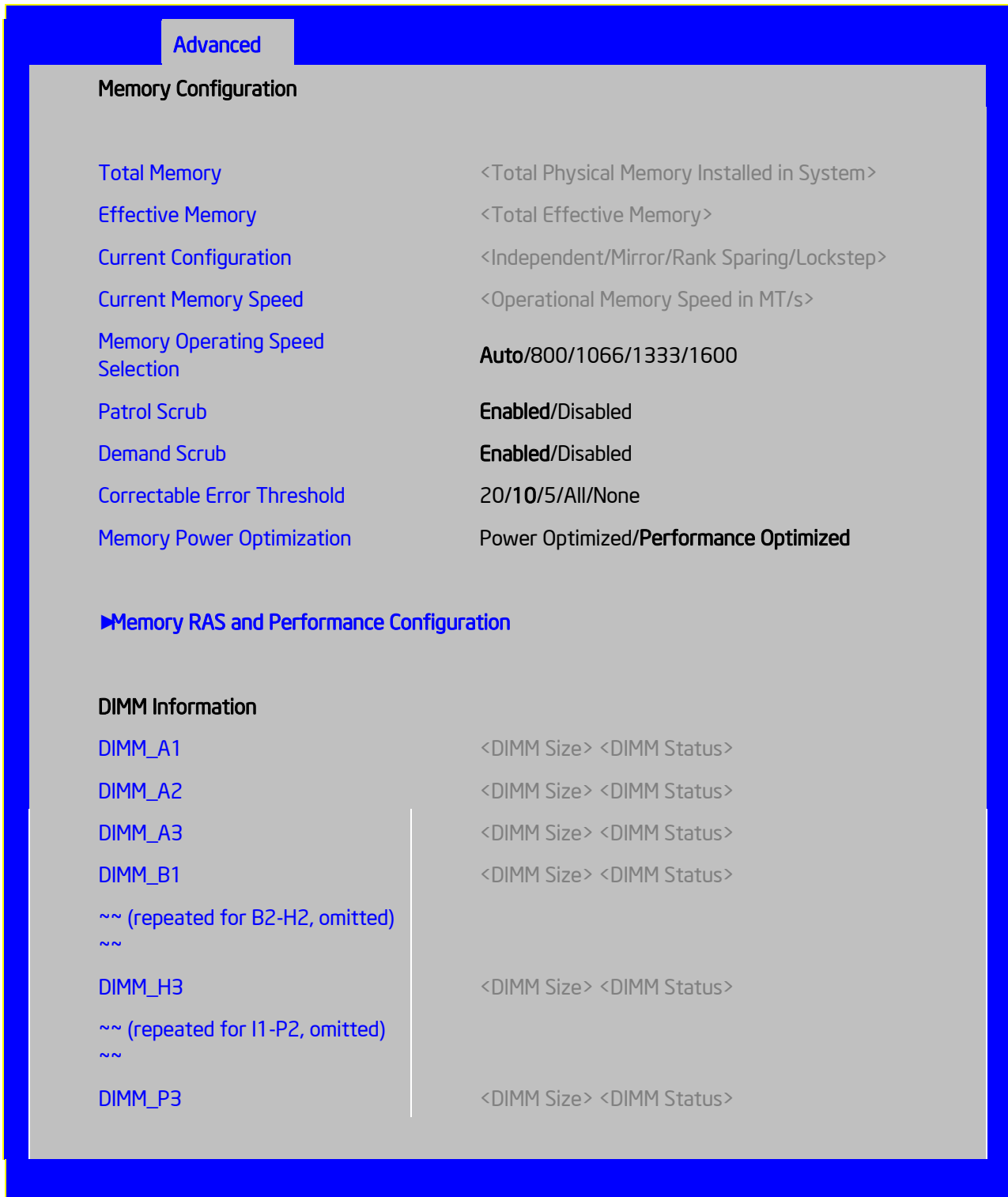


Figure 99. Memory Configuration Screen

Screen Field Descriptions:

1. Total Memory

Option Values: <Total Physical Memory Installed in System>

Help Text: <None>

Comments: Information only. Displays the amount of memory available in the system in the form of installed DDR3 DIMMs, in units of GB.

2. Effective Memory

Option Values: <Total Effective Memory>

Help Text: <None>

Comments: Information only. Displays the amount of memory available to the OS in MB or GB.

The Effective Memory is the Total Physical Memory minus the sum of all memory reserved for internal usage, RAS redundancy and SMRAM.

Note: Some server operating systems do not display the total physical memory installed.

3. Current Configuration

Option Values: *Independent Channel*
Mirror
Rank Sparing
Lockstep

Help Text: <None>

Comments: Information only: Displays one of the following:

- **Independent Channel** – DIMMs are operating in Independent Channel Mode, the default configuration when there is no RAS Mode configured.
- **Mirror** – Mirroring RAS Mode has been configured and is operational.
- **Rank Sparing** – Rank Sparing RAS Mode has been configured and is operational
- **Lockstep** – Lockstep RAS Mode has been configured and is operational

4. Current Memory Speed

Option Values: <Operational Memory Speed in MT/s>

Help Text: <None>

Comments: Information only. Displays the speed in MT/s at which the memory is currently running.

The supported memory speeds are 800 MT/s, 1066 MT/s, 1333 MT/s, and 1600 MT/s. The actual memory speed capability depends on the memory configuration.

5. Memory Operating Speed Selection

Option Values: **Auto**

800
1066
1333
1600

Help Text: *Force specific Memory Operating Speed or use Auto setting.*

Comments: Allows the user to select a specific speed at which memory will operate. Only speeds that are legitimate are available, that is, the user can only specify speeds less than or equal to the auto-selected Memory Operating Speed. The default **Auto** setting will select the highest achievable Memory Operating Speed consistent with the DIMMs and processors installed.

1600 MT/s memory speed is available only on certain models.

6. Patrol Scrub

Option Values: **Enabled**

Disabled

Help Text:

When enabled, performs periodic checks on memory cells and proactively walks through populated memory space, to seek and correct soft ECC errors.

Comments: When enabled, Patrol Scrub is initialized to read through all of memory in a 24-hour period, correcting any Correctable ECC Errors it encounters by writing back the corrected data to memory.

7. Demand Scrub

Option Values: **Enabled**

Disabled

Help Text:

When enabled, executes when an ECC error is encountered during a normal read/write of data and corrects that data.

Comments: When enabled, Demand Scrub automatically corrects a Correctable ECC Error encountered during a fetch from memory by writing back the corrected data to memory.

8. Correctable Error Threshold

Option Values: 20

10
5
All
None

Help Text:

Threshold value for logging Correctable Errors (CE) – Threshold of 10 (default) logs 10th CE, "All" logs every CE and "None" means no CE logging. All and None are not valid with Rank Sparing.

Comments: Specifies how many Correctable Errors must occur before triggering the logging of a SEL Correctable Error Event. Only the first threshold crossing is logged, unless "All" is selected. "All" causes every CE that occurs to be logged. "None" suppresses CE logging completely.

When Rank Sparing RAS Mode is configured, "All" and "None" are not valid, so they will not be presented as choices.

This threshold is applied on a per-rank basis. The Correctable Error occurrences are counted for each memory rank. When any one rank accumulates a CE count equal to the CE Threshold, then a single CE SEL Event is logged, and all further CE logging is suppressed.

Note that the CE counts are subject to a "leaky bucket" mechanism that reduces the count as a function of time, to keep from accumulating counts unnecessarily over the term of a long operational run.

This is also the Correctable Error threshold used when Rank Sparing RAS Mode is configured. When a CE threshold crossing occurs in Rank Sparing Mode on a channel which is in Redundant state, it causes a Sparing Fail Over (SFO) event to occur. That threshold crossing will also be logged as a Correctable Error event if it is the first to occur on the system.

An SFO event causes the rank with the error to be replaced by the spare rank for that channel., and the channel goes to a non-redundant state (with a "Redundancy Degraded" SEL Event logged). There may be an SFO for each channel in the system, although only the first one can be logged as a CE event.

9. Memory Power Optimization

Option Values: Power Optimized

Performance Optimized

Help Text:

Power Optimized enables memory power limiting, Performance Optimized disables it for maximum performance.

Comments: When enabled, the system is configured to allow memory power management by the Node Manager (NM) and Management Engine (ME).

10. Memory RAS and Performance Configuration

Option Values: <None>

Help Text:

Configure memory RAS (Reliability, Availability, and Serviceability) and view current memory performance information and settings.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **Memory RAS and Performance Configuration** group of configuration settings.

11. DIMM_A1

12. DIMM_A2

13. DIMM_A3

14. DIMM_B1

(DIMM_B2 through DIMM_H2 omitted)

15. DIMM_H3

(DIMM_I1 through DIMM_P2 omitted)

16. DIMM_P3

Option Values: <DIMM Size> <DIMM Status>
 Where DIMM Size is:
 Size of DIMM in GB
 Where DIMM Status is:
Installed&Operational
Not Installed
Failed/Disabled

Help Text: <None>

Comments: Information only: Displays the status of each DIMM socket present on the board. There is one line for each DIMM socket present on the board.

For each DIMM socket, the DIMM Status reflects one of the following three possible states:

- ***Installed&Operational*** – There is a DDR3 DIMM installed and operational in this slot.
- ***Not Installed*** – There is no DDR3 DIMM installed in this slot.
- ***Failed/Disabled*** – The DIMM installed in this slot has failed during initialization and/or was disabled during initialization.

For each DIMM that is in the ***Installed&Operational*** state, the DIMM Size in GB of that DIMM is displayed. This is the physical size of the DIMM, regardless of how it is counted in the Effective Memory size.

Note: In “DIMM_XY”, X denotes the Channel Identifier A - P, and Y denotes the DIMM Slot identifier 1 - 3 within the Channel. DIMM_A2 is the DIMM socket on Channel A, Slot 2. Not all boards have the same number of channels and slots – this is dependent on the board features.

S2600 boards can have DIMMs A1, A2, A3 to H1, H2, H3 (max 2 CPU/4 chan/3 DPC)

Memory RAS and Performance Configuration

The Memory RAS and Performance Configuration screen allows the user to customize several memory configuration options, such as whether to use Memory Mirroring or Memory Sparing.

To access this screen from the *Main* screen, select *Advanced* > *Memory Configuration* > *Memory RAS and Performance Configuration*. To move to another screen, press the <Esc> key to return to the *Memory Configuration* screen, if necessary press the <Esc> key again to return to the *Advanced* screen, then select the desired screen.

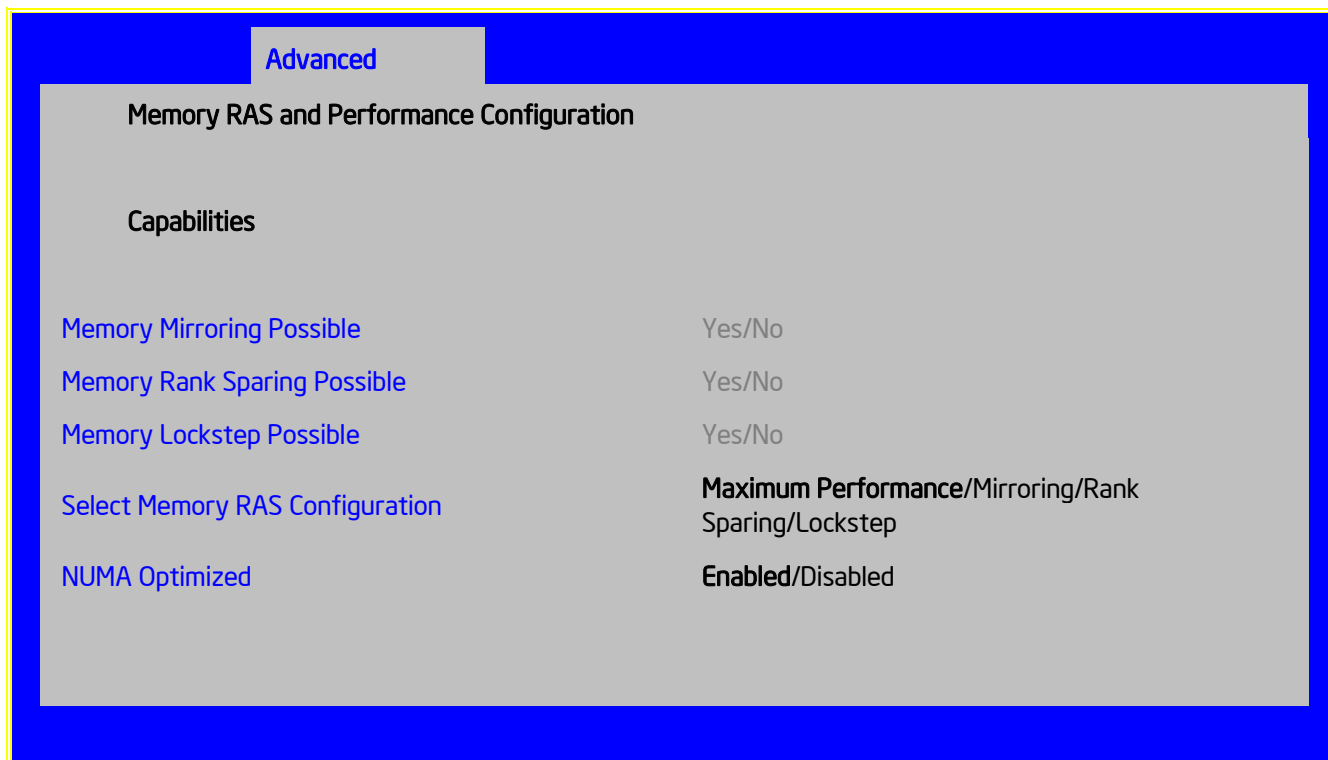


Figure 100. Memory RAS and Performance Configuration Screen

Screen Field Descriptions:

1. Memory Mirroring Possible

Option Values: *Yes*
No

Help Text: <None>

Comments: *Information only.* Displays whether the current DIMM configuration is capable of Memory Mirroring. For Memory Mirroring to be possible, DIMM configurations on all paired channels must be identical between the channel pair (Mirroring Domain). For details about Mirroring configurations.

2. Memory Rank Sparing Possible

Option Values: *Yes*

No

Help Text: *<None>*

Comments: *Information only.* Displays whether the current DIMM configuration is capable of Rank Sparing. For Rank Sparing to be possible, DIMM configurations on all channels must be capable of supporting Rank Sparing.

Note: The Correctable Error Threshold value is also the Sparing Fail Over threshold value. Threshold values of “All” or “None” are not valid for Rank Sparing. If the Correctable Error Threshold is set to either of those values, Rank Spring will not be possible.

3. Memory Lockstep Possible

Option Values: *Yes*

No

Help Text: *<None>*

Comments: *Information only.* Displays whether the current DIMM configuration is capable of Memory Lockstep. For Memory Lockstep to be possible, DIMM configurations on all paired channels must be identical between the channel pair.

4. Select Memory RAS Configuration

Option Values: **Maximum Performance**

Mirroring

Rank Sparing

Lockstep

Help Text:

Allows the user to select the memory RAS Configuration to be applied for the next boot.

Comments: Available modes depend on the current memory population. Modes which are not listed as “possible” should not be available as choices. If the only valid choice is “Maximum Performance”, then this option should be grayed out and unavailable.

Maximum Performance – (default) no RAS, but best memory utilization since full amount of memory is available, operating in Independent Channel Mode.

Mirroring - most reliability by using half of memory as a mirror image, can survive an Uncorrectable ECC Error.

Rank Sparing – offers reliability by reserving spare ranks to replace failing ranks which are generating excessive Correctable ECC Errors.

Lockstep – allows SDDC capability with x8 DIMMs installed. No memory size impact, but does have a performance and power penalty.

Note: Since only RAS Modes which are listed as “possible” are available for selection, it is not possible to select a RAS Mode without first installing an appropriate DIMM configuration.

5. NUMA Optimized

Option Values: ***Enabled***
Disabled

Help Text:

If enabled, BIOS includes ACPI tables that are required for NUMA-aware Operating Systems.

Comments: This option is only present for boards which have two or more processor sockets. When a multi-socket board has only a single processor installed, this option is grayed out and set as Disabled.

When enabled, the SRAT and SLIT ACPI tables are provided that show the locality of systems resources, especially memory, which allows a “NUMA Aware” OS to optimize which processor threads are used by processes which can benefit by having the best access to those resources.

Mass Storage Controller Configuration

The Mass Storage Configuration screen allows the user to configure the Mass Storage controllers that are integrated into the server board on which the BIOS is executing. This includes only onboard Mass Storage controllers. Mass Storage controllers on add-in cards are not included in this screen, nor are other storage mechanisms such as USB-attached storage devices or Network Attached Storage.

There are two types of onboard controller configured in this screen, the AHCI SATA controller and the Storage Control Unit (SCU) with SATA or SAS drive support and RAID support. There are also informational displays of AHCI and SCU controller configuration, and SATA Drive Information when applicable. If the presence of an Intel® Storage Module is detected, the type of Storage Module is displayed as information-only.

To access this screen from the **Main** screen, select **Advanced > Mass Storage Controller Configuration**. To move to another screen, press the <Esc> key to return to the **Advanced** screen, then select the desired screen.

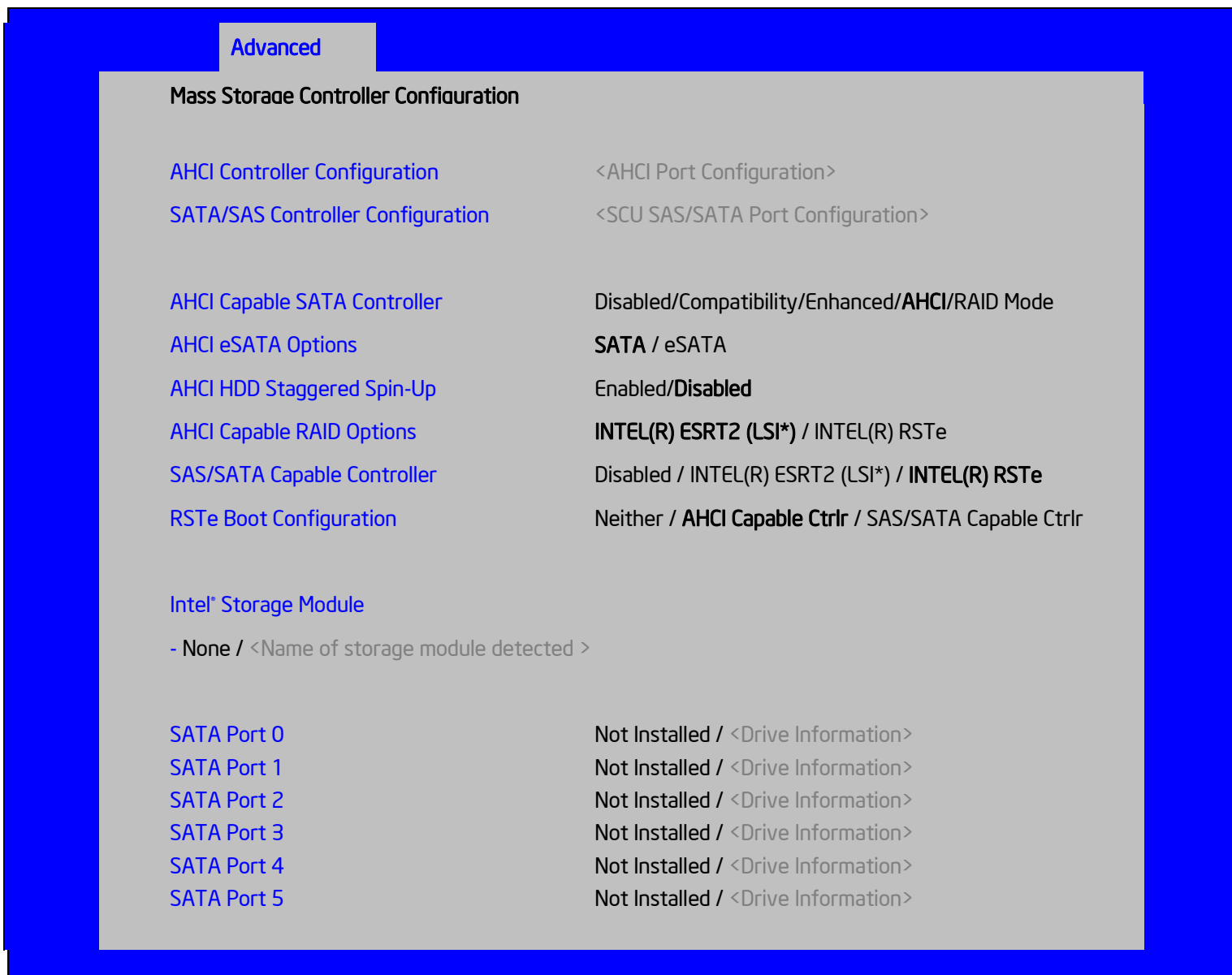


Figure 101. Mass Storage Controller Configuration Screen

Screen Field Descriptions:

1. AHCI Controller Configuration

Option Values: <AHCI Port Configuration>

One of these strings:

*Controller is disabled
2 ports of 6Gb/s SATA
2 ports of 6Gb/s SATA & 4 ports of 3Gb/s SATA*

Help Text: <None>

Comments: *Information only.* This is a display showing which ports are available through the onboard AHCI capable SATA controller, if the controller is enabled.

This information is also displayed during POST in the POST Diagnostic Screen

The number of SATA ports available from the integrated AHCI-capable SATA Controller is dependent on the specific server board installed in the system. Different server board designs expose different SATA port configurations. The Platform ID (Board ID) is displayed in the Main Screen

2. SATA/SAS Controller Configuration

Option Values: <SCU SAS/SATA Port Configuration>

One of these strings:

*Controller is disabled
4 ports in SATA mode
4 ports in SAS mode
8 ports in SATA mode
8 ports in SAS mode*

Help Text: <None>

Comments: *Information only.* This is a display showing the number of ports which are available through the SCU controller, and whether they are configured for SATA or SAS.

This information is also displayed during POST in the POST Diagnostic Screen

Various SATA/SAS Capable Controller configurations require the installation of Intel® RAID C600 Upgrade Keys:

4 port SATA requires no key or AXXRKSATA4R5 key
4 port SAS requires AXXRKSAS4 or AXXRKSAS4R5 key
8 port SATA requires AXXRKSATA8 or AXXRKSATA8R5 key
8 port SAS requires AXXRKSAS8 or AXXRKSAS8R5 key

3. AHCI Capable SATA Controller

Option Values: Disabled

Compatibility
Enhanced
AHCI
RAID Mode

Help Text:

- *Compatibility provides PATA emulation on the SATA device*
- *Enhanced provides Native SATA support*
- *AHCI enables the Advanced Host Controller Interface, which provides Enhanced SATA functionality*
- *RAID Mode provides host based RAID support on the onboard SATA ports*

Comments: This option configures the onboard AHCI-capable SATA controller, which is distinct from the SCU. The number and type of ports it controls differs between board series

If the SATA Controller is *Disabled*, the SATA Ports will not operate. and any installed SATA devices will be unavailable.

Compatibility provides PATA emulation on the SATA device, allowing the use of legacy IDE/PATA drivers. *Enhanced* provides Native SATA support., using native SATA drivers included with the vast majority of current OSes. *AHCI* enables the Advanced Host Controller Interface, which provides Enhanced SATA functionality. plus possible additional functionality (Native Command Queuing, Hot Plug, Staggered Spin Up). It uses AHCI drivers available for the majority of current OSes.

RAID Mode provides host based RAID support on the onboard SATA ports. RAID levels supported and required drivers depend on the RAID stack selected

4. AHCI eSATA Options

Option Values: **SATA**
eSATA

Help Text:

- *SATA mode enables the switchable internal AHCI SATA (port 1)*
- *eSATA mode enables the switchable external AHCI eSATA (port 1)*
- *These modes are mutually exclusive, so SATA port 1 will only be active on one connector, not both*

Comments: In order to use the external eSATA connection, this option must be set to *eSATA*. When the external eSATA connector is selected, it disables the corresponding internal SATA port 1 connector. When set to *SATA*, the internal connector for SATA port 1 is active, and the external eSATA connector is disabled.

This option setting only appears when the SATA Controller is enabled, and only for platforms which support eSATA.

5. AHCI HDD Staggered Spin-Up

Option Values: Enabled

Disabled

Help Text:

If enabled for the AHCI Capable SATA controller, Staggered Spin-Up will be performed on drives attached to it. Otherwise these drives will all spin up at boot.

Comments: This option enables or disables Staggered Spin-up only for disk drives attached to ports on the AHCI Capable SATA Controller. Disk drives attached to SATA/SAS ports on the Storage Control Unit are controlled by a different method for Staggered Spin-Up and this option does not affect them.

This option is only visible when the SATA Controller is enabled and AHCI or RAID has been selected as the operational SATA Mode.

Staggered Spin-Up is needed when there are enough HDDs attached to the system to cause a marked startup power demand surge when all drives start spin-up together. Since the power demand is greatest just as the drive spinning is started, the overall startup power demand can be leveled off by starting up each drive at a slightly different time, so the power demand surges for multiple drives do not coincide and cause too great a power draw.

When Staggered Spin-Up is enabled, it does have a possibility of increasing boot time if there are many HDDs attached, because of the interval between starting drives spinning. However, that is exactly the scenario in which Staggered Spin-Up is most needed, because the more disk drives attached, the greater the startup demand surge.

Setting the external eSATA connector Enabled (when available) does not invalidate the Staggered Spin-Up option, although there may be less need for Staggered Spin-Up in a system configured for eSATA use.

6. AHCI Capable RAID Options

Option Values: **Intel® ESRT2 (LSI*)**
Intel® RSTe

Help Text:

- Intel® ESRT2 (Powered By LSI): Supports RAID 0/1/10 and optional RAID 5 with Intel® RAID C600 Upgrade Keys. Uses Intel ESRT2 drivers (based on LSI* MegaSR).
- Intel® RSTe: Provides pass-through drive support. Also provides host based RAID 0/1/10/5 support. Uses Intel® RSTe iastor drivers.*

Comments: This option only appears when the SATA Controller is enabled, and RAID Mode has been selected as the operational SATA Mode. This setting selects the RAID stack to be used for SATA RAID with the onboard AHCI SATA controller.

If a RAID Volume has not previously been created that is compatible with the RAID stack selected, it will be necessary to Save and Exit and reboot in order to create a RAID Volume.

7. SAS/SATA Capable Controller

Option Values: Disabled

Intel® ESRT2 (LSI*)

Intel® RSTe

Help Text:

- *Intel® ESRT2: Provides host based RAID 0/1/10 and optional RAID 5. Uses Intel® ESRT2 drivers (based on LSI* MegaSR).*

- *Intel® RSTe: Provides pass-through drive support. Also provides host based RAID 0/1/10 support, and RAID 5 (in SATA mode only). Uses Intel® RSTe iastor drivers.*

Comments: This option selects the RAID stack to be used with the SCU. If Disabled is selected, any drives connected to the SCU will not be usable.

Intel® ESRT2 provides host based RAID 0/1/10 and optional RAID 5. For a RAID 5 configuration, this requires one of the Intel® RAID C600 Upgrade Keys AXXRKSATA4R5, AXXRKSATA8R5, AXXRKSAS4R5, or AXXRKSAS8R5. Uses Intel® ESRT2 drivers (based on LSI* MegaSR), and is also supported by Linux MDRAID.

Intel® RSTe provides pass-through drive support and provides host based RAID 0/1/10 support, and RAID 5 (in SATA mode only). Uses Intel RSTe drivers in Windows, and MDRAID stack in Linux. The Intel® RSTe RAID stack is required if it is necessary to provide pass-through support for non-RAID drives, or if support is needed for more than 8 drives.

8. RSTe Boot Configuration

Option Values: Neither

AHCI Capable Ctrlr
SAS/SATA Capable Ctrlr

Help Text:

This selects the device that will support Bootable Drives, whether they are in RAID arrays or individual pass-through SAS/SATA drives. Once selected and set up (if necessary), individual bootable devices will be listed in the Bootable Devices menu display.

Comments: This option appears only when Intel® RSTe has been selected as the operational mode on both the AHCI and SCU controllers. In that case there is a conflict and only one controller can be selected as having bootable drives attached.

Once selected and set up (if necessary), individual bootable logical or physical drives available on the selected controller will be listed in the Bootable Devices menu display.

If only one device selects RSTe, it will be available as a boot device along with any other devices – this option is only necessary to distinguish between which RSTe device runs the Option ROM instance.

BIOS is required to designate the OPROM for the boot device selected here. Two iterations of the OPROM cannot fully load simultaneously, and the version fully loaded will only show devices connected to the given controller, so the OPROM load order is based on BIOS selecting the correct device.

Note: *If RSTe is selected, then only one CONTROLLER can be bootable, so there will be situations where the boot drive *OR* an optical device will be bootable, but not both.*

Please also see the product System Guide for restrictions on expander boot support.

9. Intel® Storage Module

Option Values: **None**

<Name of Storage Module detected>

Names of Storage Modules supported at this time are:

*Intel® Integrated RAID Module
Intel® Integrated RAID Module RMS25PB040
Intel® Integrated RAID Module RMT3PB080
Intel® Integrated RAID Module RMS25CB080
Intel® Integrated RAID Module RMS25CB040
Intel® Integrated RAID Module RMT3CB080
Intel® Integrated RAID Module RMS25JB080
Intel® Integrated RAID Module RMS25JB040
Intel® Integrated RAID Module RMS25KB080
Intel® Integrated RAID Module RMS25KB040*

Help Text: <None>

Comments: *Information only*. If no Intel® Storage Module is detected, then *None* is displayed. This shows the customer the product name of the module installed, which helps in identifying drivers, support, documentation, and so on.

10. SATA Port

(For Port numbers 0-6)

Option Values: **Not Installed**
<Drive Information>

Help Text: <None>

Comments: *Information only*. The Drive Information, when present, will typically consist of the drive model identification and size for the disk drive installed on a particular port.

This Drive Information line is repeated for all 6 SATA Port for the onboard AHCI capable SATA Controller. However, for any given board, only the ports which are physically populated on the board are shown. That is, a board which only implements the two 6 GB/s ports 0 and 1 will only show those two ports in this Drive Information list.

This section for Drive Information does not appear at all when the SCU is set to *Disabled* or the SATA operational mode is *RAID Mode*, nor for any drives attached to the SCU SATA or SAS ports. In these cases the BBS information is not available to display.

PCI Configuration

The PCI Configuration screen allows the user to configure the PCI memory space used for onboard and add-in adapters, configure video options, and configure onboard adapter options.

It also includes a selection option to go to the NIC Configuration screen.

To access this screen from the *Main* screen, select *Advanced > PCI Configuration*. To move to another screen, press the <Esc> key to return to the *Advanced* screen, then select the desired screen.

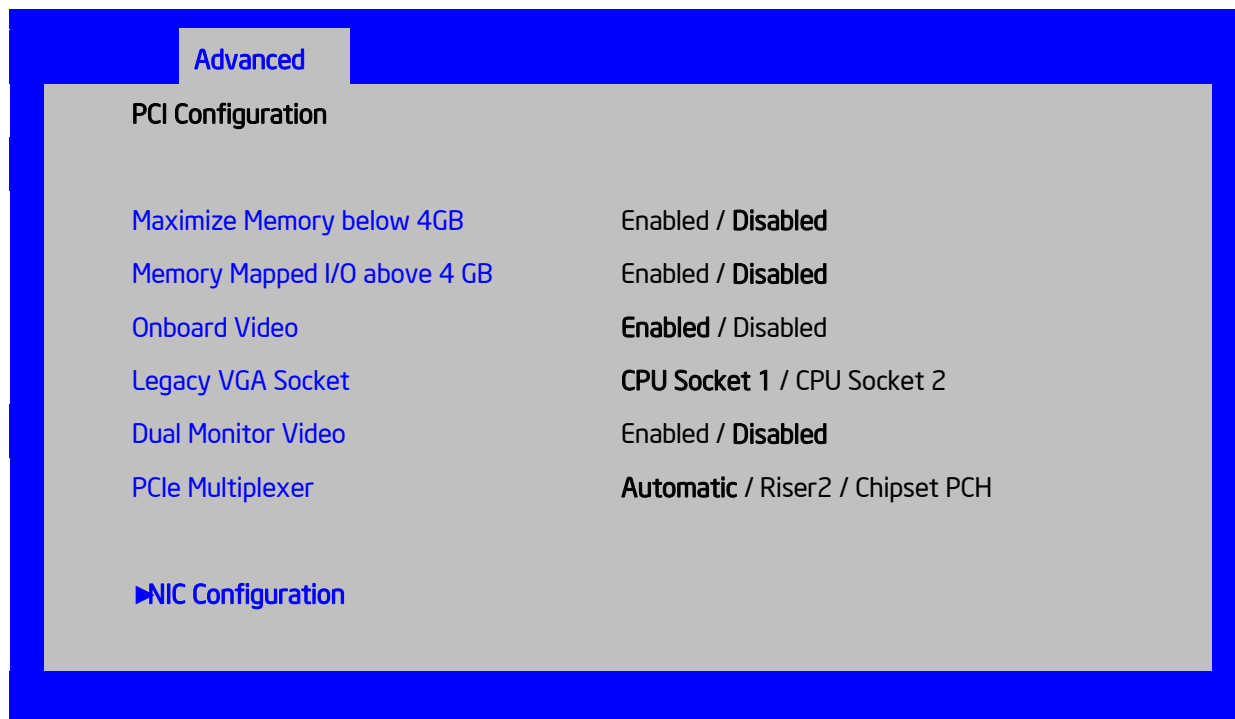


Figure 102. PCI Configuration Screen

Screen Field Descriptions:

1. Maximize Memory below 4GB

Option Values: Enabled

Disabled

Help Text:

BIOS maximizes memory usage below 4GB for an OS without PAE support, depending on the system configuration. Only enable for an OS without PAE support.

Comments: When this option is enabled, BIOS makes as much memory available as possible in the 32-bit (4GB) address space, by limiting the amount of PCI/PCIe Memory Address Space and PCIe Extended Configuration Space. This option should only be enabled for a 32-bit OS without PAE capability or without PAE enabled.

2. Memory Mapped I/O above 4 GB

Option Values: Enabled

Disabled

Help Text:

Enable or disable memory mapped I/O of 64-bit PCI devices to 4 GB or greater address space.

Comments: When enabled, PCI/PCIe Memory Mapped I/O for devices capable of 64-bit addressing is allocated to address space above 4GB, in order to allow larger allocations and avoid impacting address space below 4G.

3. Onboard Video

Option Values: **Enabled**

Disabled

Help Text:

On-board video controller.

Warning: System video is completely disabled if this option is disabled and an add-in video adapter is not installed.

Comments: When disabled, the system requires an add-in video card for the video to be seen. When there is no add-in video card installed, Onboard Video is set to Enabled and grayed out so it cannot be changed.

If there is an add-in video card installed in a PCIe slot connected to CPU Socket 1, and the Legacy VGA Socket option is set to CPU Socket 1, then this Onboard Video option is available to be set.

If there is an add-in video card installed on a PCIe slot connected to CPU Socket 2, and the Legacy VGA Socket option is set to CPU Socket 2, this option is grayed out and unavailable, with a value set to Disabled. This is because the Onboard Video is connected to CPU Socket 1, and is not functional when CPU Socket 2 is the active path for video. When Legacy VGA Socket is set back to CPU Socket 1, this option becomes available again, set to its default value of Enabled.

Note: This option does not appear on some models.

4. Legacy VGA Socket

Option Values: **CPU Socket 1**

CPU Socket 2

Help Text:

Determines whether Legacy VGA video output is enabled for PCIe slots attached to Processor Socket 1 or 2. Socket 1 is the default.

Comments: This option is necessary when using an add-in video card on a PCIe slot attached to CPU Socket 2, due to a limitation of the processor I/O. The Legacy video device can be connected through either socket, but there is a setting that must be set on only one of the two. This option allows the switch to using a video card in a slot connected to CPU Socket 2.

This option does not appear unless the BIOS is running on a board which have one processor installed on CPU Socket 2 and can potentially a video card installed in a PCIe slot connected to CPU Socket 2.

This option is grayed out as unavailable and set to CPU Socket 1 unless there is a processor installed on CPU Socket 2 and a video card installed in a PCIe slot connected to CPU Socket 2. When this option is active and is set to CPU Socket 2, then both Onboard Video and Dual Monitor Video are set to Disabled and grayed out as unavailable. This is because the Onboard Video is a PCIe device connected to CPU Socket 1, and is unavailable when the Legacy VGA Socket is set to Socket 2.

5. Dual Monitor Video

Option Values: Enabled

Disabled

Help Text:

If enabled, both the on-board video controller and an add-in video adapter are enabled for system video. The on-board video controller becomes the primary video device.

Comments: This option must be enabled to use an add-in card as a secondary POST Legacy Video device while also displaying on the Onboard Video device.

If there is no add-in video card in any PCIe slot connected to CPU Socket 1, this options is set to Disabled and grayed out and unavailable.

If the Legacy VGA Socket option is set to CPU Socket 2, this option is grayed out and unavailable, with a value set to Disabled. When Legacy VGA Socket is set back to CPU Socket 1, this option is set to its default value of Disabled, and may become available depending on add-in video card configuration,

Note: *This option does not appear on some models.*

6. NIC Configuration

Option Values: <None>

Help Text:

View/Configure NIC information and settings.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **NIC Configuration** group of configuration settings.

NIC Configuration

The NIC Configuration screen allows the user to configure the NIC controller options for BIOS POST. It also displays the NIC MAC Addresses currently in use. This NIC Configuration screen handles network controllers built in on the baseboard (“onboard”) or installed as an IO Module (IOM). It does not configure or report anything having to do with add-in network adapter cards.

To access this screen from the **Main** screen, select **Advanced > PCI Configuration > NIC Configuration**. To move to another screen, press the <Esc> key to return to the **PCI Configuration** screen, if necessary press the <Esc> key again to return to the **Advanced** screen, then select the desired screen.

There is usually one Onboard NIC built into the baseboard, although in some cases there are two Onboard NICs. There are several possible types of NICs which are incorporated into different boards. When an InfiniBand controller is on the baseboard, it appears as an Onboard NIC.

Most boards in this family also can have an IO Module that installs on the board in a specialized connector. There are boards which can have two IO Modules installed.

To determine what type of NIC is installed on a specific board, or what kinds of IO Modules can be supported on which boards, refer to the Technical Product Specification (TPS) for the board in question.

The descriptive names of the Onboard NIC types are:

- Intel® 82574 Single-Port Gigabit Ethernet Controller
- Intel® I350 Dual-Port Gigabit Ethernet Controller
- Intel® I350 Quad-Port Gigabit Ethernet Controller
- Intel® I540 Dual-Port X540 10 Gigabit RJ-45 Controller
- Mellanox* ConnectX-3* Single-Port InfiniBand FD14 Controller

For boards with only one Onboard NIC, the “Onboard NIC2” entries are not present on the screen. The number of “Port” options which are displayed for each NIC will match the number of ports the Onboard NIC presents.

The IO Modules currently available are:

- Intel® I350 Quad-Port Gigabit Ethernet Module
- Intel® I540 Dual-Port X540 10 Gigabit RJ-45 Module
- Intel® 82599 Dual-Port 10 Gigabit SFP+ Module
- Mellanox* ConnectX-3* Single-Port InfiniBand FD14 Module

For the IO Module entries on the NIC Configuration screen, only entries for modules which are currently installed will appear and only ports which exist on those IO Modules will appear.

If an IO Module which had been installed is no longer installed when the system is booted, all NIC Configuration entries which are specific to that IO Module will be reset to their default values and hidden. If a different IO Module is installed than had been previously installed, the module-specific settings will still be returned to defaults, but not hidden. This will not necessarily affect the Option ROM settings, which depend on the aggregate capabilities of all installed Onboard and IO Module NICs.

For each NIC port which is present on an Onboard NIC or IO Module other than InfiniBand controllers, there will be a port-specific PXE Boot enabling option and a MAC Address display. Onboard NICs and NIC ports also have enable/disable options. IO Modules and the ports on them cannot be disabled by BIOS.

InfiniBand controllers which appear as Onboard NICs or as IO Modules have a slightly different format. They do not have enable/disable options, but they do have a choice of whether to enable loading and executing the embedded Option ROM for the controller, which will cause it to become bootable. For InfiniBand, both a GUID and a MAC Address are displayed. The GUID is used for InfiniBand Fabric operations, and the MAC Address is used when the controller is attached as an Ethernet device.

For non-InfiniBand NICs, there are different OPROMs for different protocols, which are also differentiated by speed, 1 Gb or 10 Gb. For a given protocol/speed, all Ethernet controllers of the same speed use the same Option ROM.

- PXE – there are two separate PXE Option ROMs, one for 1 Gb NICs and another for 10 Gb NICs. The two are independent of each other, but each must be the only Option ROM enabled in its speed class. If 1 GbE PXE is enabled, then the discs OPROM cannot be enabled. If 10 GbE PXE is enabled, then neither discs nor 10 GbE FCoE may be enabled.
- discs – there is only one discs Option ROM for both 1 GbE and 10 GbE NICs. If discs is enabled, then neither PXE nor FCoE OPROMs may be enabled for the 1 GbE or 10 GbE NICs.
- FCoE – there is a 10 GbE FCoE Option ROM that supports the Intel® 82599 NIC. When it is enabled, the discs OPROM and the 10 GbE PXE OPROM must be disabled

Note: These Option ROMs are only in support of onboard NICs and installed IO Modules. They do not support NICs on add-in network cards, even if the NIC on an add-in card is the same type of device as an onboard NIC or IO Module controller.

Only the Option ROMs for which controller capabilities are present are shown in the screen for selection. For example, if there are no 10 GbE NICs installed, then the 10 GbE OPROMs will not appear for selection. If controller capabilities are present, but all controllers with those capabilities are disabled, then the relevant OPROM options will appear, but will be disabled and grayed out and not changeable.

Similarly, when the PXE OPROM of a given speed is disabled, all PXE port enable/disable options using that OPROM will be disabled and grayed out. Conversely, if all ports are disabled for PXE, the PXE OPROM will be disabled and grayed out.

When a NIC Port is disabled, the PXE enable/disable option for it will be disabled and grayed out, and the MAC Address will be blank. When a NIC controller is disabled, all Ports and PXE options

for that controller will become disabled and grayed out and all MAC Addresses for those ports will be blank. Conversely, if all ports for a given controller are disabled, the controller itself will appear as disabled.

Advanced

NIC Configuration

Wake on LAN (PME)	Enabled / Disabled
PXE 1GbE Option ROM	Enabled / Disabled
PXE 10GbE Option ROM	Enabled / Disabled
FCoE 10GbE Option ROM	Enabled / Disabled
discs 1GbE/10GbE Option ROM	Enabled / Disabled
Onboard NIC1 Type	<Onboard NIC Description - Non-InfiniBand>
NIC1 Controller	Enabled / Disabled
NIC1 Port1	Enabled / Disabled
NIC1 Port2	Enabled / Disabled
NIC1 Port3	Enabled / Disabled
NIC1 Port4	Enabled / Disabled
NIC1 Port1 PXE	Enabled / Disabled
NIC1 Port2 PXE	Enabled / Disabled
NIC1 Port3 PXE	Enabled / Disabled
NIC1 Port4 PXE	Enabled / Disabled
NIC1 Port1 MAC Address	<MAC Address display >
NIC1 Port2 MAC Address	<MAC Address display >
NIC1 Port3 MAC Address	<MAC Address display >
NIC1 Port4 MAC Address	<MAC Address display >
Onboard NIC2 Type	<Onboard NIC Description - InfiniBand Only>
NIC2 InfiniBand Option ROM	<u>Enabled</u> / <u>Disabled</u>
NIC2 Port1 GUID	<GUID Display>
NIC2 Port1 MAC Address	<MAC Address display >

Onboard NIC2 Type	<Onboard NIC Description - Non-InfiniBand>
NIC2 Controller	Enabled / Disabled
NIC2 Port1	Enabled / Disabled
NIC2 Port2	Enabled / Disabled
NIC2 Port3	Enabled / Disabled
NIC2 Port4	Enabled / Disabled
NIC2 Port1 PXE	Enabled / Disabled
NIC2 Port2 PXE	Enabled / Disabled
NIC2 Port3 PXE	Enabled / Disabled
NIC2 Port4 PXE	Enabled / Disabled
NIC2 Port1 MAC Address	<MAC Address display >
NIC2 Port2 MAC Address	<MAC Address display >
NIC2 Port3 MAC Address	<MAC Address display >
NIC2 Port4 MAC Address	<MAC Address display >
IO Module 1 Type	<IO Module Description - Non-InfiniBand>
IOM1 Port1 PXE	Enabled / Disabled
IOM1 Port2 PXE	Enabled / Disabled
IOM1 Port3 PXE	Enabled / Disabled
IOM1 Port4 PXE	Enabled / Disabled
IOM1 Port1 MAC Address	<MAC Address display >
IOM1 Port2 MAC Address	<MAC Address display >
IOM1 Port3 MAC Address	<MAC Address display >
IOM1 Port4 MAC Address	<MAC Address display >
IO Module 1 Type	<IO Module Description - InfiniBand Only>
IOM1 InfiniBand Option ROM	Enabled / Disabled
IOM1 Port1 GUID	<GUID Display>
IOM1 Port1 MAC Address	<MAC Address display >
IO Module 2 Type	<IO Module Description - Non-InfiniBand>

IOM2 Port1 PXE	Enabled / Disabled
IOM2 Port2 PXE	Enabled / Disabled
IOM2 Port3 PXE	Enabled / Disabled
IOM2 Port4 PXE	Enabled / Disabled
IOM2 Port1 MAC Address	<MAC Address display >
IOM2 Port2 MAC Address	<MAC Address display >
IOM2 Port3 MAC Address	<MAC Address display >
IOM2 Port4 MAC Address	<MAC Address display >

Figure 103. NIC Configuration Screen

Screen Field Descriptions:

1. Wake on LAN (PME)

Option Values: **Enabled**
Disabled

Help Text:

Enables or disables PCI PME function for Wake on LAN capability from LAN adapters.

Comments: Enables/disables PCI/PCIe PME# signal to generate Power Management Events (PME) and ACPI Table entries required for Wake on LAN (WOL). However, note that this will enable WOL only with an ACPI-capable Operating System which has the WOL function enabled.

2. PXE 1GbE Option ROM

Option Values: **Enabled**
Disabled

Help Text:

Enable/Disable Onboard/IOM NIC PXE Option ROM Load.

Comments: This selection is to enable/disable the 1GbE PXE Option ROM that is used by all Onboard and IO Module 1 GbE controllers.

This option is grayed out and not accessible if the discs Option ROM is enabled. It can co-exist with the 10 GbE PXE Option ROM, the 10 GbE FCoE Option ROM, or with an InfiniBand controller Option ROM.

If the 1GbE PXE Option ROM is disabled, and no other Option ROM is enabled, the system cannot perform a Network Boot and cannot respond for Wake-on-LAN.

This 1GbE PXE option does not appear unless there is a 1 GbE NIC installed in the system as an Onboard or IO Module NIC.

3. PXE 10GbE Option ROM

Option Values: **Enabled**
Disabled

Help Text:

Enable/Disable Onboard/IOM NIC PXE Option ROM Load.

Comments: This selection is to enable/disable the 10GbE PXE Option ROM that is used by all Onboard and IO Module 10 GbE controllers.

This option is grayed out and not accessible if the discs Option ROM is enabled or the 10 GbE FCoE Option ROM is enabled. It can co-exist with the 1 GbE PXE Option ROM or with an InfiniBand controller Option ROM.

If the 10GbE PXE Option ROM is disabled, and no other Option ROM is enabled, the system cannot perform a Network Boot and cannot respond for Wake-on-LAN.

This 10GbE PXE option does not appear unless there is a 10 GbE NIC installed in the system as an Onboard or IO Module NIC.

4. FCoE 10GbE Option ROM

Option Values: Enabled
Disabled

Help Text:

Enable/Disable Onboard/IOM NIC FCoE Option ROM Load.

Comments: This selection is to enable/disable the 10GbE FCoE Option ROM that is used by all Onboard and IO Module 10 GbE controllers capable of FCoE support. At the present time, only the Intel® 82599 10 Gigabit SFP+ NIC supports FCoE for this family of server boards.

This option is grayed out and not accessible if the 10GbE PXE Option ROM is enabled or if the discs Option ROM is enabled. It can co-exist with the 1GbE PXE Option ROM or with an InfiniBand controller Option ROM.

If the FCoE Option ROM is disabled, and no other Option ROM is enabled, the system cannot perform a Network Boot and cannot respond for Wake-on-LAN.

This FCoE option does not appear unless there is a FCoE-capable 10GbE NIC installed in the system as an Onboard or IO Module NIC.

5. discs 1GbE/10GbE Option ROM

Option Values: Enabled

Disabled

Help Text:

Enable/Disable Onboard/IOM NIC discs Option ROM Load.

Comments: This selection is to enable/disable the discs Option ROM that is used by all Onboard and IO Module 1 GbE and 10 GbE controllers.

This option is grayed out and not accessible if the 1 GbE or 10GbE PXE Option ROM is enabled or if the 10 GbE FCoE Option ROM is enabled. It can co-exist with an InfiniBand controller Option ROM.

If the discs Option ROM is disabled, and no other Option ROM is enabled, the system cannot perform a Network Boot and cannot respond for Wake-on-LAN.

This discs option does not appear unless there is an discs-capable NIC installed in the system as an Onboard or IO Module NIC.

6. Onboard NIC1 Type

7. Onboard NIC2 Type

Option Values: <Onboard NIC Description>

One of these strings:

Intel® 82574 Single-Port Gigabit Ethernet Controller

Intel® I350 Dual-Port Gigabit Ethernet Controller

Intel® I350 Quad-Port Gigabit Ethernet Controller

Intel® I540 Dual-Port X540 10 Gigabit RJ-45 Controller

Mellanox ConnectX-3* Single-Port InfiniBand FD14 Controller*

Help Text: <None>

Comments: Information only. This is a display showing which NICs are available as Network Controllers integrated into the baseboard. Each of these Onboard NICs will be followed by a section including a group of options that are specific to the type of NIC, either as an Ethernet controller or an InfiniBand controller.

If a board only has one onboard NIC, the second NIC Type and following options section will not appear. If there is an InfiniBand controller integrated onboard, it will appear as NIC2.

For details about the NIC hardware configuration for a specific board, see the Technical Product Specification for that board.

8. IO Module 1 Type

9. IO Module 2 Type

Option Values: <IO Module Description>

One of these strings:

Intel® I350 Quad-Port Gigabit Ethernet Module
Intel® I540 Dual-Port X540 10 Gigabit RJ-45 Module
Intel® 82599 Dual-Port 10 Gigabit SFP+ Module
Mellanox ConnectX-3* Single-Port InfiniBand FD14 Module*

Help Text: <None>

Comments: *Information only.* This is a display showing which Network Controllers on IO Modules are installed on the baseboard. Each of these IO Module NICs will be followed by a section including a group of options that are specific to the type of NIC, either as an Ethernet controller or an InfiniBand controller.

This descriptive screen image shows an example of an InfiniBand controller as IOM1. In a system with two IO Module connectors, an InfiniBand IO Module might be installed as either IOM1 or IOM2.

Most boards have only one IO Module connector. In any case, an IO Module Type and following options section will only appear when an IO Module is installed, and a second IO Module Type and options section will only appear if there are two IO Modules installed.

For details about the NIC hardware configuration for a specific board, see the Technical Product Specification for that board.

10. NIC1 Controller

11. NIC2 Controller

Option Values: **Enabled**
Disabled

Help Text:

Enable/Disable Onboard Network Controller.

Comments: This will completely disable Onboard Network Controller NIC1 or NIC2, along with all included NIC Ports and their associated options. That controller's NIC Ports, Port PXE options, and Port MAC Address displays will not appear.

This option only appears for onboard Ethernet controllers. It does not appear for onboard InfiniBand controllers.

Ethernet controllers on IO Modules do not have a disabling function that can be controlled by BIOS, so there is no corresponding controller enable/disable option for an IOM Ethernet controller.

For details about the NIC hardware configuration for a specific board, see the Technical Product Specification for that board.

12. NIC2 InfiniBand Option ROM

13. IOM1 InfiniBand Option ROM

14. IOM2 InfiniBand Option ROM

Option Values: Enabled

Disabled

Help Text:

Enable/Disable InfiniBand Controller Option ROM and FlexBoot.

Comments: This option will control whether the associated InfiniBand Controller Option ROM is executed by BIOS during POST. This will also control whether the InfiniBand controller FlexBoot program appears in the list of bootable devices.

This option only appears for Onboard or IO Module InfiniBand controllers. It does not appear for Ethernet controllers.

15. NIC2 Port1 GUID

16. IOM1 Port1 GUID

17. IOM2 Port1 GUID

Option Values: <GUID Display>

Help Text: <None>

Comments: *Information only.* 16 hex digits of the Port1 GUID of the InfiniBand controller for NIC2, IOM1, or IOM2.

18. NIC1 Port1

19. NIC1 Port2

20. NIC1 Port3

21. NIC1 Port4

22. NIC2 Port1

23. NIC2 Port2

24. NIC2 Port3

25. NIC2 Port4

Option Values: **Enabled**
Disabled

Help Text:

Enable/Disable Onboard NIC<n> Port<x>.

Comments: This will enable or disable Port<*x*, *x* = 1-4> of Onboard Network Controller<*n*, *n* = 1-2>, including associated Port PXE options. The NIC<*n*> Port<*x*> PXE option and MAC Address display will not appear when that port is disabled.

The associated port enable/disable options will not appear when NIC<*n*> is disabled.

Only ports which actually exist for a particular NIC will appear in this section. That is, Port1-Port4 will appear for a quad-port NIC, Port1-Port2 will appear for a dual-port NIC, and only Port1 will appear for a single-port NIC.

Network controllers installed on an IO Module do not have a port disabling function that is controlled by BIOS, so there are no corresponding options for IO Module NICs.

For details about the NIC port configuration for a specific board, see the Technical Product Specification for that board.

- 26. NIC1 Port1 PXE
- 27. NIC1 Port2 PXE
- 28. NIC1 Port3 PXE
- 29. NIC1 Port4 PXE
- 30. NIC2 Port1 PXE
- 31. NIC2 Port2 PXE
- 32. NIC2 Port3 PXE
- 33. NIC2 Port4 PXE
- 34. IOM1 Port1 PXE
- 35. IOM1 Port2 PXE
- 36. IOM1 Port3 PXE
- 37. IOM1 Port4 PXE
- 38. IOM2 Port1 PXE
- 39. IOM2 Port2 PXE
- 40. IOM2 Port3 PXE
- 41. IOM2 Port4 PXE

Option Values: **Enabled**
Disabled

Help Text:

Enable/Disable Onboard/IOM NIC Port PXE Boot

Comments: This will enable or disable PXE Boot capability for Port< x , $x = 1-4$ > of Onboard NIC< n , $n = 1-2$ > or IO Module< n , $n = 1-2$ >.

This option will not appear for ports on a NIC which is disabled, or for individual ports when the corresponding NIC Port is disabled.

Only ports which actually exist for a particular NIC or IOM will appear in this section. That is, Port1-Port4 will appear for a quad-port NIC, Port1-Port2 will appear for a dual-port NIC, and only Port1 will appear for a single-port NIC.

The default state of each Port PXE Boot option is *Enabled*, if the corresponding PXE Boot OPROM of the same speed is *Enabled*. If a PXE Boot OPROM for 1 GbE or 10 GbE changes from *Disabled* to *Enabled*, then the Port PXE Boot option becomes *Enabled* for all ports of that speed

If the PXE Boot OPROM for 1 GbE NICs or 10 GbE NICs is disabled, PXE Boot will be disabled and grayed out as unchangeable for all ports on NICs or IO Modules of that same speed.

Conversely, if PXE Boot is disabled for all ports of a given speed, the corresponding PXE Option ROM will be disabled, but not grayed out since it could be selected.

- 42. NIC1 Port1 MAC Address
- 43. NIC1 Port2 MAC Address
- 44. NIC1 Port3 MAC Address
- 45. NIC1 Port4 MAC Address
- 46. NIC2 Port1 MAC Address
- 47. NIC2 Port2 MAC Address
- 48. NIC2 Port3 MAC Address
- 49. NIC2 Port4 MAC Address
- 50. IOM1 Port1 MAC Address
- 51. IOM1 Port2 MAC Address
- 52. IOM1 Port3 MAC Address
- 53. IOM1 Port4 MAC Address
- 54. IOM2 Port1 MAC Address
- 55. IOM2 Port2 MAC Address
- 56. IOM2 Port3 MAC Address
- 57. IOM2 Port4 MAC Address

Option Values: <Mac Address Display>

Help Text: <None>

Comments: *Information only.* 12 hex digits of the MAC address of Port1- Port4 of the Network Controller corresponding to NIC1, NIC2, IOM1, or IOM2.

This display will appear only for ports which actually exist on the corresponding Network Controller. If the Network Controller or port is disabled, the port MAC Address will not appear.

Serial Port Configuration

The Serial Port Configuration screen allows the user to configure the Serial A and Serial B ports. In Legacy ISA nomenclature, these are ports COM1 and COM2 respectively.

To access this screen from the *Main* screen, select *Advanced* > *Serial Port Configuration*. To move to another screen, press the <Esc> key to return to the *Advanced* screen, then select the desired screen.

The primary usage for these serial ports is to enable Serial Console Redirection and Serial Over LAN (SOL) capabilities. Either port can be used for Serial Console Redirection, but SOL is only supported on Serial A.

The exception to this is the W2600CR Workstation, which does not provide a Serial A port. With W2600CR, Serial A will not appear for configuration here, and Serial B will support SOL functionality if required.

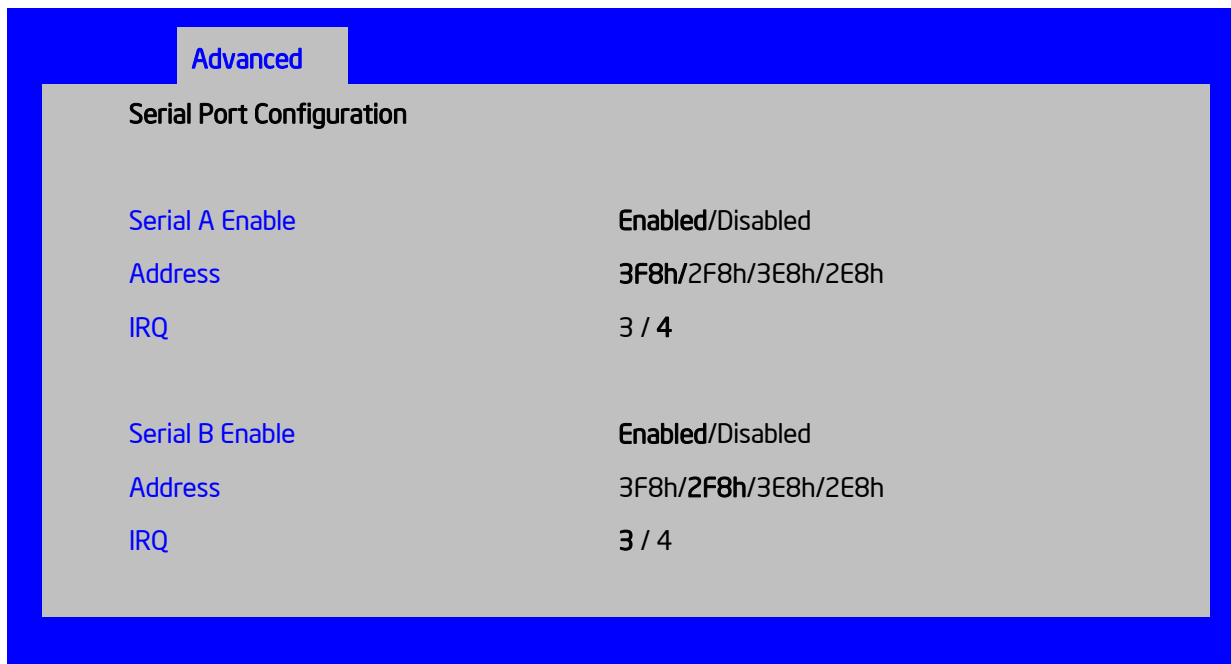


Figure 104. Serial Port Configuration Screen

Screen Field Descriptions:

1. Serial A Enable

Option Values: **Enabled**
 Disabled

Help Text:

Enable or Disable Serial port A.

Comments: Serial Port A can be used for either Serial Over LAN or Serial Console Redirection.

This Setup option should not appear on W2600CR, which does not provide a Serial A port.

2. Address

Option Values: **3F8h**
 2F8h
 3E8h
 2E8h

Help Text:

Select Serial port A base I/O address.

Comments: Legacy I/O port address. This field should not appear when Serial A port enable/disable does not appear.

3. IRQ

Option Values: 3
4

Help Text:

Select Serial port A interrupt request (IRQ) line.

Comments: Legacy IRQ. This field should not appear when Serial A port enable/disable does not appear.

4. Serial B Enable

Option Values: **Enabled**
 Disabled

Help Text:

Enable or Disable Serial port B.

Comments: Serial Port B can be used for Serial Console Redirection. SOL cannot be routed to Serial B except on W2600CR boards, which do not have a Serial A port.

5. Address

Option Values: 3F8h

2F8h

3E8h

2E8h

Help Text:

Select Serial port B base I/O address.

Comments: Legacy I/O port address.

6. IRQ

Option Values: **3**

4

Help Text:

Select Serial port B interrupt request (IRQ) line.

Comments: Legacy IRQ

USB Configuration

The USB Configuration screen allows the user to configure the available USB controller options.

To access this screen from the **Main** screen, select **Advanced > USB Configuration**. To move to another screen, press the <Esc> key to return to the **Advanced** screen, then select the desired screen.

This screen should display all USB Mass Storage devices which have been detected in the system. These include USB-attached Hard Disk Drives (HDDs), Floppy Disk Drives (FDDs), CDROM and DVDROM drives, and USB Flash Memory devices (USB Key, Keyfob, and so on).

Each USB Mass Storage device may be set to allow the media emulation for which it is formatted, or an emulation may be specified. For USB Flash Memory devices in particular, there are some restrictions:

- A USB Key formatted as a CDROM drive will be recognized as an HDD.
- A USB Key formatted without a Partition Table will be forced to FDD emulation.
- A USB Key formatted with one Partition Table, and less than 528 MB in size, will be forced to FDD emulation – otherwise if it is 528 MB or greater in size, it will be forced to HDD emulation.

Note: USB devices can be “hotplugged” during POST, and will be detected and “beeped”. They will be enumerated and displayed on this screen, though they may not be enumerated as bootable devices.

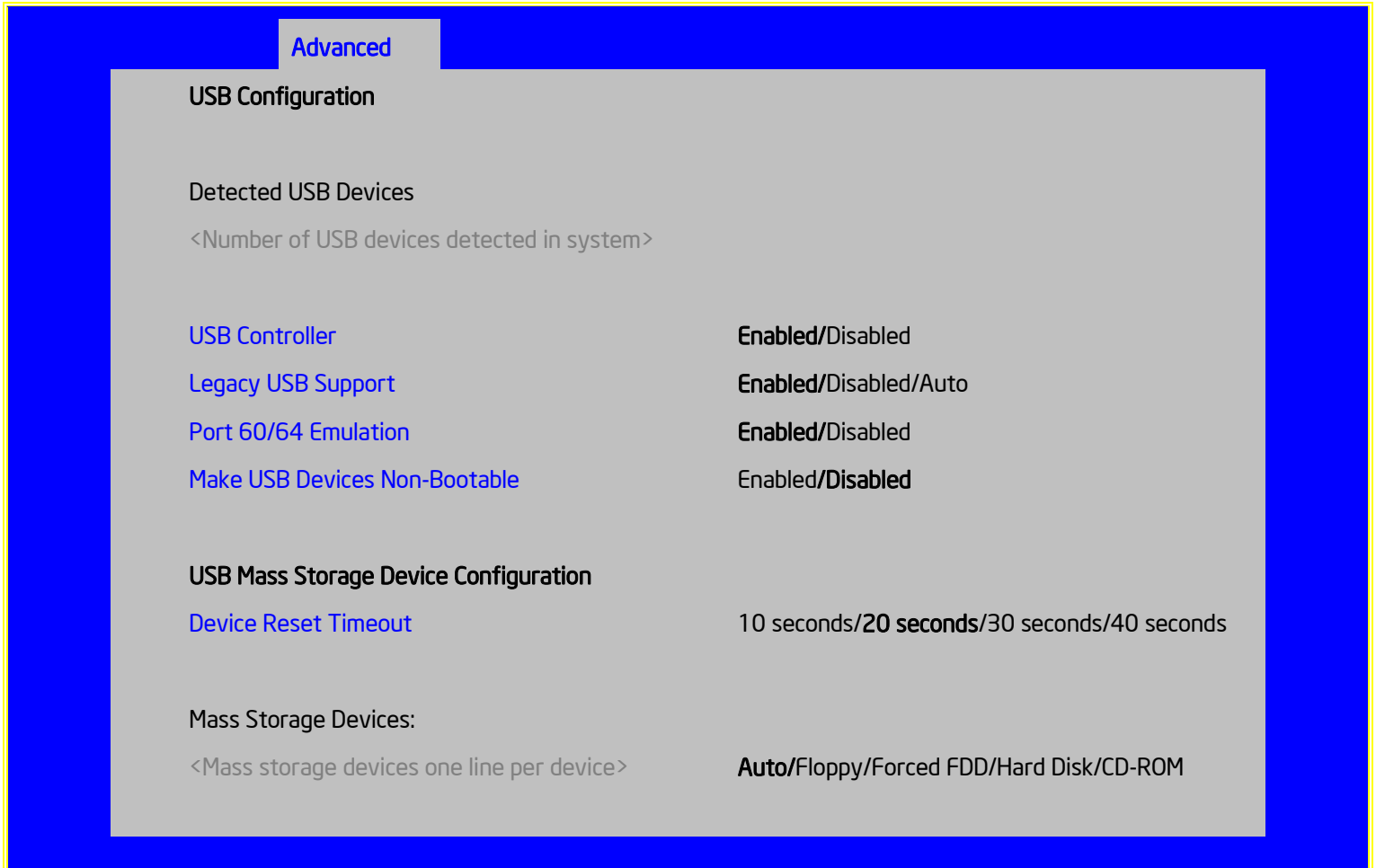


Figure 105. USB Configuration Screen

Screen Field Descriptions:

1. Detected USB Devices

Option Values: <Number of USB devices detected in system>

Help Text: <None>

Comments: *Information only.* Displays the total number of USB devices of all types which have been detected in POST.

2. USB Controller

Option Values: **Enabled**
 Disabled

Help Text:

[Enabled] - All on-board USB controllers are turned on and accessible by the OS.

[Disabled] - All on-board USB controllers are turned off and inaccessible by the OS.

Comments: When the USB controllers are *Disabled*, there is no USB IO available for either POST or the OS. In that case, all following fields on this screen are grayed out and inactive.

3. Legacy USB Support

Option Values: **Enabled**
Disabled
Auto

Help Text:

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. Disable option will only keep USB Keyboard devices available for EFI applications.

Comments: When *Legacy USB Support* is *Disabled*, USB devices are available only through OS drivers.

If the *USB controller* setting is *Disabled*, this field is grayed out and inactive.

4. Port 60/64 Emulation

Option Values: **Enabled**
Disabled

Help Text:

*Enables I/O port 60h/64h emulation support.
This may be needed for legacy USB keyboard support when using an OS that is USB unaware.*

Comments: If the *USB controller* setting is *Disabled*, this field is grayed out and inactive.

5. Make USB Devices Non-Bootable

Option Values: **Enabled**
Disabled

Help Text:

*Exclude USB in Boot Table.
[Enabled]- This will remove all USB Mass Storage devices as Boot options.
[Disabled] - This will allow all USB Mass Storage devices as Boot options.*

Comments: This is a security option. When *Disabled*, the system cannot be booted directly to a USB device of any kind. USB Mass Storage devices may still be used for data storage.

If the *USB controller* setting is *Disabled*, this field is grayed out and inactive.

6. Device Reset Timeout

Option Values: 10 seconds

20 seconds

30 seconds

40 seconds

Help Text:

*USB Mass Storage device Start Unit command timeout.
Setting to a larger value provides more time for a mass storage device to be ready, if needed.*

Comments: If the USB controller setting is Disabled, this field is grayed out and inactive.

7. Mass Storage Devices:

Option Values: **Auto**

Floppy

Forced FDD

Hard Disk

CD-ROM

Help Text:

*[Auto] - USB devices less than 530 MB are emulated as floppies.
[Forced FDD] - HDD formatted drive is emulated as an FDD (for example., ZIP drive).*

Comments: This field is hidden if no USB Mass Storage devices are detected.

This setup screen can show a maximum of eight USB Mass Storage devices on the screen. If more than eight devices are installed in the system, the 'USB Devices Enabled' displays the correct count, but only the first eight devices discovered are displayed in this list.

If the USB controller setting is Disabled, this field is grayed out and inactive.

System Acoustic and Performance Configuration

The System Acoustic and Performance Configuration screen allows the user to configure the thermal control behavior of the system with respect to what parameters are used in the system's Fan Speed Control algorithms.

To access this screen from the *Main* screen, select *Advanced > System Acoustic and Performance Configuration*. To move to another screen, press the <Esc> key to return to the *Advanced* screen, then select the desired screen.

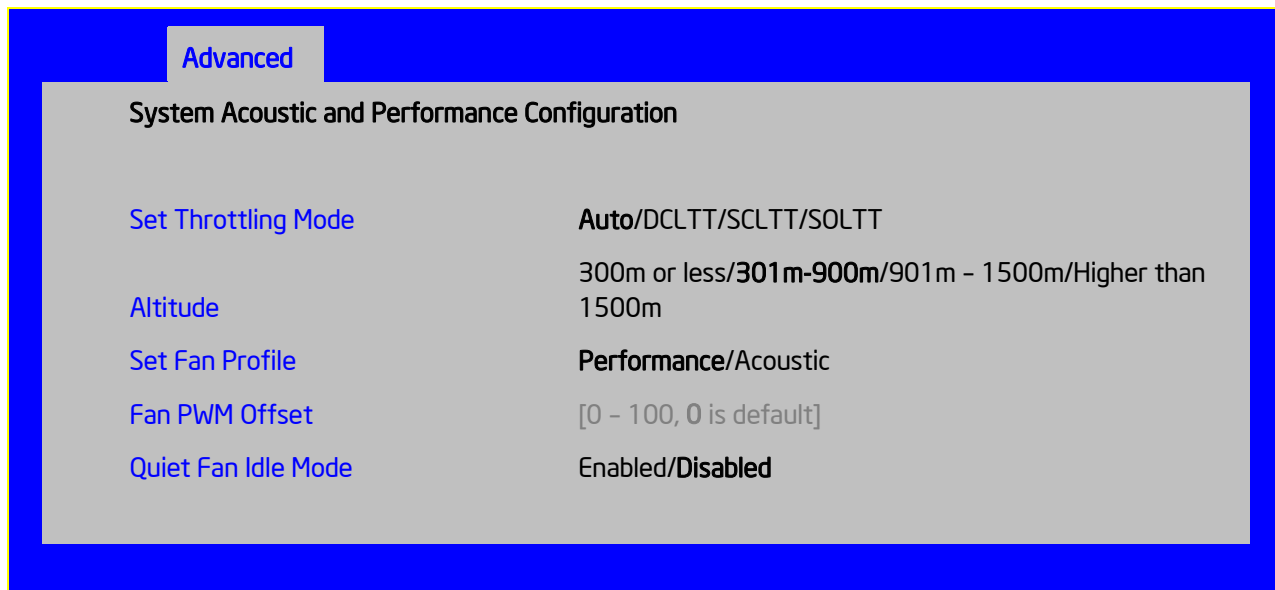


Figure 106. System Acoustic and Performance Configuration

Screen Field Descriptions:

1. Set Throttling Mode

Option Values: **Auto**
 DCLTT
 SCLTT
 SOLTT

Help Text:

Sets Thermal Throttling mode for memory, to control fans and DRAM power as needed to control DIMM temperatures.
[Auto] – BIOS selects mode.
[DCLTT] – Dynamic Closed Loop Thermal Throttling.
[SCLTT] – Static Closed Loop Thermal Throttling.
[SOLTT] – Static Open Loop Thermal Throttling.

Comments: The Thermal Throttling Mode chosen reflects whether the DIMMs have Temperature Sensors (TSOD), and whether the chassis is an Intel chassis for which thermal data are available. Note that this is for thermal throttling only, independent of any controls imposed for the purpose of power limiting.

- ▶ DCLTT is the expected mode for a board in an Intel chassis with inlet and outlet air temperature sensors and TSOD. The firmware can update the offset registers for closed loop during runtime, as BIOS sends the dynamic CLTT offset temperature data.
- ▶ SCLTT would be used with an OEM chassis and DIMMs with TSOD. The firmware does not change the offset registers for closed loop during runtime, although the Management Engine can do so.
- ▶ SOLTT is intended for a system with UDIMMs which do not have TSOD. The thermal control registers are configured during POST, and the firmware does not change them.

2. Altitude

Option Values: 300m or less

301m-900m

901m-1500m

Higher than 1500m

Help Text:

[300m or less](980ft or less) Optimal near sea level.

[301m-900m](980ft-2950ft) Optimal performance setting at moderate elevation.

[901m-1500m](2950ft-4920ft) Optimal performance setting at high elevation.

[Above 1500m](above 4920ft) Optimal performance setting at the highest elevations.

Comments: This option sets an altitude value in order to choose a Fan Profile that is optimized for the air density at the current altitude at which the system is installed.

3. Set Fan Profile

Option Values: **Performance**

Acoustic

Help Text:

[Performance] - Fan control provides primary system cooling before attempting to throttle memory.

[Acoustic] - The system will favor using throttling of memory over boosting fans to cool the system if thermal thresholds are met.

Comments: This option allows the user to choose a Fan Profile that is optimized for maximizing performance or for minimizing acoustic noise.

When *Performance* is selected, the thermal conditions in the system are controlled by raising fan speed when necessary to raise cooling performance. This provides cooling without impacting system performance, but may impact system acoustic performance – fans running faster are typically louder.

When *Acoustic* is selected, then rather than increasing fan speed for additional cooling, the system will attempt first to control thermal conditions by throttling memory to reduce heat production. This regulates the system's thermal condition without changing the acoustic performance, but throttling memory may impact system performance.

4. Fan PWM Offset

Option Values: [Entry Field 0 – 100, 0 is default]

Help Text:

Valid Offset 0 - 100. This number is added to the calculated PWM value to increase Fan Speed.

Comments: This is a percentage by which the calculated fan speed will be increased. The user can apply positive offsets that result in increasing the minimum fan speeds.

5. Quiet Fan Idle Mode

Option Values: Enabled
Disabled

Help Text:

Enabling this option allows the system fans to operate in Quiet 'Fan off' mode while still maintaining sufficient system cooling. In this mode, fan sensors become unavailable and cannot be monitored. There will be limited fan related event generation.

Comments: When enabled, this option allows fans to idle or turn off when sufficient thermal margin is available, decreasing the acoustic noise produced by the system and decreasing system power consumption. Fans will run as needed to maintain thermal control. The actual decrease in fan speed depends on the system thermal loading, which in turn depends on system configuration and workload.

While Quiet Fan Idle Mode is engaged, fan sensors become unavailable and are not monitored by the BMC.

Quiet Fan Idle Mode does not conflict with Fan PWM Offset (above) – they work in concert, with Fan PWM Offset applied to fans in Quiet Fan Idle Mode just as when the fans are operating in “normal mode”. A Fan PWM Offset of zero is necessary for fans to actually stop turning.

Security Screen (Tab)

The Security screen allows the user to enable and set the Administrator and User passwords and to lock out the front panel buttons so they cannot be used. This screen also allows the user to enable and activate the Trusted Platform Module (TPM) security settings on those boards that support TPM.

Note that it is necessary to activate the TPM in order to be able to enable Intel® Trusted Execution Technology (TXT) on boards that support it. Changing the TPM state in Setup will require a Hard Reset for the new state to become effective.

This BIOS supports (but does not require) “Strong Passwords” for security. The “Strong Password” criteria for both Administrator and User passwords require that passwords be between 8 and 14 characters in length, and a password must contain at least one case-sensitive alphabetic character, one numeric character, and one special character. A warning is given when a password is set which does not meet the Strong Password criteria, but the password is accepted.

For further security, the BIOS optionally may require a Power on Password to be entered in early POST in order to boot the system. When Power On Password is enabled, POST is halted soon after power on while the BIOS queries for a Power On Password. Either the Administrator or the User password may be entered for a Power on Password.

To access this screen from the *Main* screen or other top-level “Tab” screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the *Security* screen is selected.

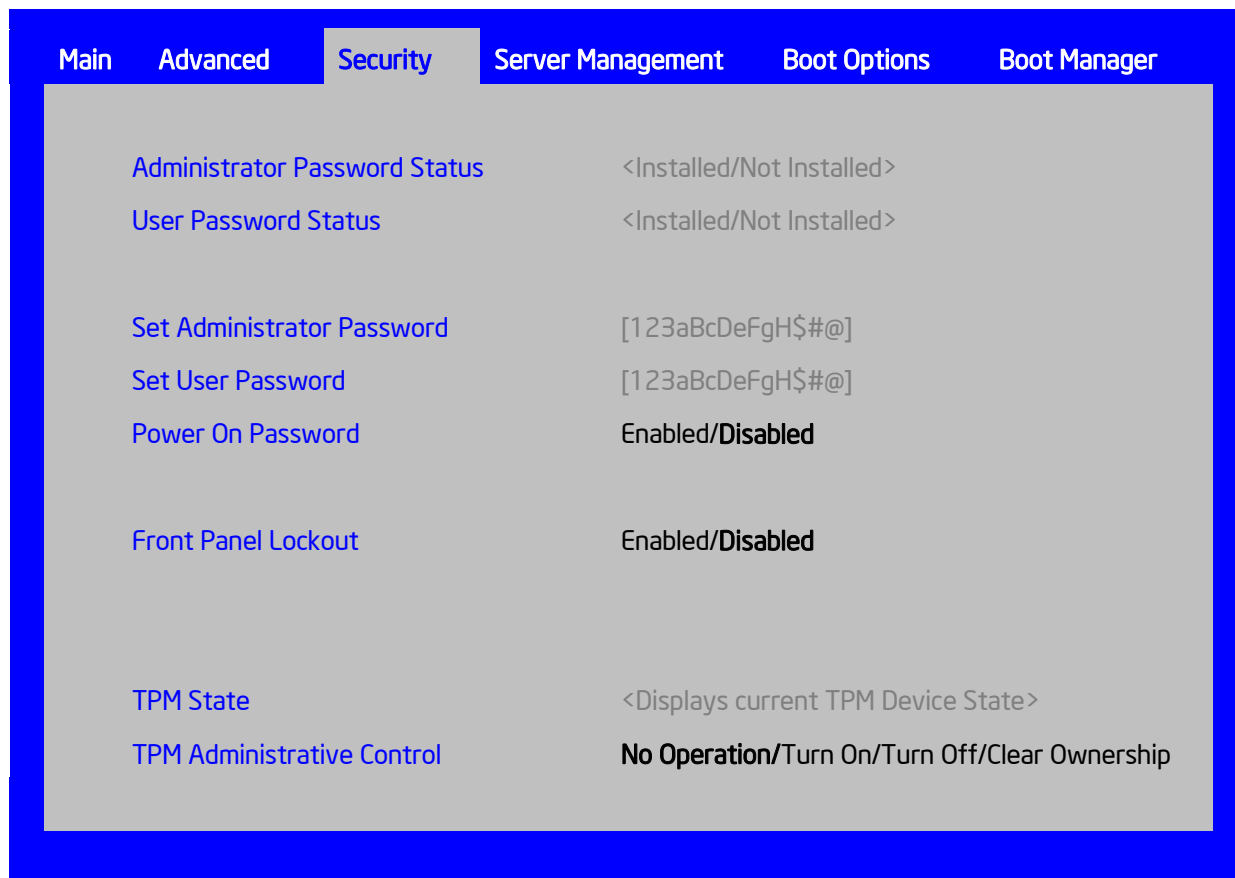


Figure 107. Security Screen

Screen Field Descriptions:

1. Administrator Password Status
 - Option Values: *Installed*
Not Installed
 - Help Text: *<None>*
 - Comments: *Information only.* Indicates the status of the Administrator Password.
2. User Password Status
 - Option Values: *Installed*
Not Installed
 - Help Text: *<None>*
 - Comments: *Information only.* Indicates the status of the User Password.
3. Set Administrator Password

Option Values: [Entry Field – 0-14 characters]

Help Text:

Administrator password is used if Power On Password is enabled and to control change access in BIOS Setup. Length is 1-14 characters. Case sensitive alphabetic, numeric and special characters !@#%&^&()-_+=? are allowed.*

Note: Administrator password must be set in order to use the User account.

Comments: This password controls “change” access to Setup. The Administrator has full access to change settings for any Setup options, including setting the Administrator and User passwords.

When Power On Password protection is enabled, the Administrator password may be used to allow the BIOS to complete POST and boot the system.

Deleting all characters in the password entry field removes a password previously set. Clearing the Administrator Password also clears the User Password.

If invalid characters are present in the password entered, it will not be accepted, and there will be popup error message:

Password entered is not valid. Only case sensitive alphabetic, numeric and special characters !@#%&^&()-_+=? are allowed.*

The Administrator and User passwords must be different. If the password entered is the same as the User password, it will not be accepted, and there will be popup error message:

Password entered is not valid. Administrator and User passwords must be different.

Strong passwords are encouraged, although not mandatory. If a password is entered which does not meet the “Strong Password” criteria, there will be a popup warning message:

Warning – a Strong Password should include at least one each case sensitive alphabetic, numeric, and special character. Length should be 8 to 14 characters.

4. Set User Password

Option Values: [Entry Field – 0-14 characters]

Help Text:

User password is used if Power On Password is enabled and to allow restricted access to BIOS Setup. Length is 1-14 characters. Case sensitive alphabetic, numeric and special characters !@#%&^&()-_+=? are allowed.*

Note: Removing the administrator password also removes the user password.

Comments: The User password is available only if the Administrator Password has been installed. This option protects Setup settings as well as boot choices. The User Password only allows limited access to the Setup options, and no choice of boot devices.

When Power On Password protection is enabled, the User password may be used to allow the BIOS to complete POST and boot the system.

The password format and entry rules and popup error and warning message are the same for the User password as for the Administrator password (see above).

5. Power On Password

Option Values: Enabled
Disabled

Help Text:

Enable Power On Password support. If enabled, password entry is required in order to boot the system.

Comments: When Power On Password security is enabled, the system will halt soon after power on and the BIOS will ask for a password before continuing POST and booting. Either the Administrator or User password may be used.

If an Administrator password has not been set, this option will be grayed out and unavailable. If this option is enabled and the Administrator password is removed, that will also disable this option.

6. Front Panel Lockout

Option Values: Enabled
Disabled

Help Text:

If enabled, locks the power button OFF function and the reset and NMI Diagnostic Interrupt buttons on the system's front panel. If [Enabled] is selected, power off and reset must be controlled by a system management interface, and the NMI Diagnostic Interrupt is not available.

Comments: **Note:** This option does not appear on all boards.

7. TPM State

Option Values: <Displays current TPM Device State>

May be:

Enabled & Activated

Enabled & Deactivated

Disabled & Activated

Disabled & Deactivated

Help Text: <None>

Comments: *Information only.* Shows the current TPM device state.

A **Disabled** TPM device does not execute commands that use the TPM functions and TPM security operations are not available.

An **Enabled & Deactivated** TPM is in the same state as a disabled TPM, except that setting of the TPM ownership is allowed if it is not present already.

An **Enabled & Activated** TPM executes all commands that use the TPM functions and TPM security operations are also available.

Note: This option appears only on boards equipped with a TPM.

8. TPM Administrative Control

Option Values: **No Operation**

Turn On

Turn Off

Clear Ownership

Help Text:

[No Operation] - No changes to current state.

[Turn On] - Enables and activates TPM.

[Turn Off] - Disables and deactivates TPM.

[Clear Ownership] - Removes TPM ownership & returns TPM to factory default state.

Note: setting returns to [No Operation] on every boot.

Comments: Any Administrative Control operation selected will require the system to perform a Hard Reset in order to become effective.

Note: This option appears only on boards equipped with a TPM.

Server Management Screen (Tab)

The Server Management screen allows the user to configure several server management features. This screen also provides an access point to the screens for configuring Console Redirection, displaying system information, and controlling the BMC LAN configuration.

To access this screen from the **Main** screen or other top-level “Tab” screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the **Server Management** screen is selected.

Main	Advanced	Security	Server Management	Boot Options	Boot Manager
			Assert NMI on SERR		Enabled / Disabled
			Assert NMI on PERR		Enabled / Disabled
			Reset on CATERR		Enabled / Disabled
			Reset on ERR2		Enabled / Disabled
			Resume on AC Power Loss		Stay Off / Last State / Power On
			Power Restore Delay		Disabled / Auto / Fixed
			Power Restore Delay Value		[25 - 300s, 25 is default]
			Clear System Event Log		Enabled / Disabled
			FRB-2 Enable		Enabled / Disabled
			OS Boot Watchdog Timer		Enabled / Disabled
			OS Boot Watchdog Timer Policy		Power off / Reset
			OS Boot Watchdog Timer Timeout		5 minutes / 10 minutes / 15 minutes / 20 minutes
			Plug & Play BMC Detection		Enabled / Disabled
			EuP LOT6 Off-Mode		Enabled / Disabled
			Shutdown Policy		Enabled / Disabled
			▶Shutdown Policy		
			<i>Option Values: Enabled Disabled</i>		
			<i>Help Text: Enable/Disable Shutdown Policy.</i>		
			<p>Comments: This option is designed for multiple-node system and to control the policy that BMC should shutdown one node if it detected over-current or over-temperature condition. The BIOS and the BMC will synchronize the policy during the BIOS POST and current value of the BMC will be displayed in BIOS Setup.</p>		

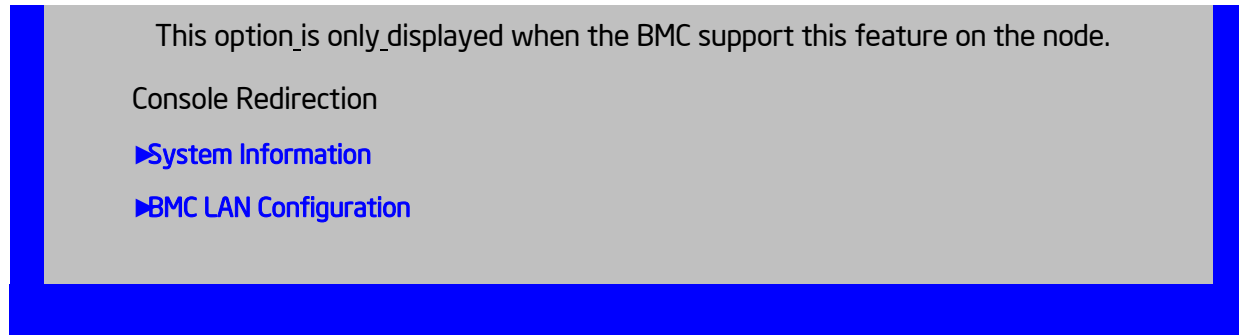


Figure 108. Server Management Screen

Screen Field Descriptions:

1. Assert NMI on SERR

Option Values: **Enabled**
Disabled

Help Text:

On SERR, generate an NMI and log an error.

Note: [Enabled] must be selected for the Assert NMI on PERR setup option to be visible.

Comments: This option allows the system to generate an NMI when an SERR occurs, which is a method Legacy Operating System error handlers may use instead of processing a Machine Check.

2. Assert NMI on PERR

Option Values: **Enabled**
Disabled

Help Text:

On PERR, generate an NMI and log an error.

Note: This option is only active if the Assert NMI on SERR option has [Enabled] selected.

Comments: This option allows the system to generate an NMI when a PERR occurs, which is a method Legacy Operating System error handlers may use instead of processing a Machine Check.

3. Reset on CATERR

Option Values: **Enabled**
Disabled

Help Text:

When enabled system gets reset upon encountering Catastrophic Error (CATERR); when disabled system does not get reset on CATERR.

Comments: This option controls whether the system will be reset when the “Catastrophic Error” CATERR# signal is held asserted, rather than just pulsed to generate an SMI. This indicates that the processor has encountered a fatal hardware error.

Note: If “Reset on CATERR” is Disabled, this can result in a system hang for certain error conditions, possibly with the system unable to update the System Status LED or log an error to the SEL before hanging.

4. Reset on ERR2

Option Values: **Enabled**
Disabled

Help Text:

When enabled system gets reset upon encountering ERR2 (Fatal error); when disabled system does not get reset on ERR2

Comments: This option controls whether the system will be reset if the BMC’s ERR2 Monitor times out, that is, the ERR2 signal has been continuously asserted long enough to indicate that the SMI Handler is not able to service the condition

Note: If “Reset on ERR2” is Disabled, this can result in a system hang for certain error conditions, possibly with the system unable to update the System Status LED or log an error to the SEL before hanging.

5. Resume on AC Power Loss

Option Values: **Stay Off**
Last State
Power On

Help Text:

*System action to take on AC power loss recovery.
[Stay Off] - System stays off.
[Last State] - System returns to the same state before the AC power loss.
[Power On] - System powers on.*

Comments: This option controls the policy that the BMC will follow when AC power is restored after an unexpected power outage. The BMC will either hold DC power off or always turn it on to boot the system, depending on this setting – and in the case of **Last State**, depending on whether the power was on and the system was running before the AC power went off.

When this setting is changed in Setup, the new setting will be sent to the BMC. However, the BMC maintains (“owns”) this Power Restore Policy setting and it can be changed independently with an IPMI command to the BMC. BIOS gets this setting from the BMC early in POST, and also for the Setup Server Management screen.

6. Power Restore Delay

Option Values: **Disabled**

Auto

Fixed

Help Text:

Allows a delay in powering up after a power failure, to reduce peak power requirements. The delay can be fixed or automatic between 25-300 seconds.

Comments: When the AC power resume policy (above) is either **Power On** or **Last State**, this option allows a delay to be taken after AC power is restored before the system actually begins to power up. This delay can be either a fixed time or an “automatic” time, where “automatic” means that the BIOS will select a randomized delay time of 25-300 seconds when it sends the Power Restore Delay setting to the BMC.

This option will be grayed out and unavailable when the AC power resume policy is **Stay Off**.

The Power Restore Delay setting is maintained by BIOS. This setting does not take effect until a reboot is done. Early in POST, the Power Restore Policy is read from the BMC, and if the policy is **Power On** or **Last State**, the delay settings are sent to the BMC.

Bear in mind that even if the Power Restore Delay is **Disabled**, there will still be a delay of about 20 seconds while the BMC itself boots up after AC power is restored.

Note: This Power Restore Delay option applies only to powering on when AC is applied. It has no effect on powering the system up using the Power Button on the Front Panel. A DC power on using the Power Button is not delayed.

The purpose of this delay is to avoid having all systems draw “startup surge” power at the same time. Different systems or racks of systems can be set to different delay times to spread out the startup power draws. Alternatively, all systems can be set to Automatic, and then each system will wait for a random period before powering up.

7. Power Restore Delay Value

Option Values: [Entry Field 25 – 300, **25** is default]

Help Text:

Fixed time period 25-300 seconds for Power Restore Delay.

Comments: When the power restore policy is **Power On** or **Last State**, and the Power Restore Delay selection is **Fixed**, this field allows for specifying how long in seconds that fixed delay will be.

When the Power Restore Delay is **Disabled** or **Auto**, this field will be grayed out and unavailable.

The **Power Restore Delay Value** setting is maintained by BIOS. This setting does not take effect until a reboot is done. Early in POST, the Power Restore Policy is read from the BMC, and if the policy is **Power On** or **Last State**, the delay settings are sent to the BMC. When the **Power Restore Delay** setting is **Fixed**, this delay value is used to provide the length of the delay.

8. Clear System Event Log

Option Values: Enabled
Disabled

Help Text:

*If enabled, clears the System Event Log. All current entries will be lost.
Note: This option is reset to [Disabled] after a reboot.*

Comments: This option sends a message to the BMC to request it to clear the System Event Log. The log will be cleared, and then the “Clear” action itself will be logged as an event. This give the user a time/date for when the log was cleared.

9. FRB-2 Enable

Option Values: **Enabled**
Disabled

Help Text:

*Fault Resilient Boot (FRB).
BIOS programs the BMC watchdog timer for approximately 6 minutes. If BIOS does not complete POST before the timer expires, the BMC will reset the system.*

Comments: This option controls whether the system will be reset if the BMC Watchdog Timer detects what appears to be a hang during POST. When the BMC Watchdog Timer is purposed as an FRB-2 timer, it is initially set to allow 6 minutes for POST to complete.

However, the FRB-2 Timer is suspended during times when some lengthy operations are in progress, like executing Option ROMS, during Setup, and when BIOS is waiting for a password. or for input to the F6 BBS Boot Menu. The FRB-2 Timer is also suspended while POST is paused with the <Pause> key.

10. OS Boot Watchdog Timer

Option Values: Enabled
Disabled

Help Text:

*BIOS programs the watchdog timer with the timeout value selected. If the OS does not complete booting before the timer expires, the BMC will reset the system and an error will be logged.
Requires OS support or Intel Management Software Support.*

Comments: This option controls whether the system will set the BMC Watchdog to detect an apparent to be a hang during OS booting. BIOS sets the timer before starting the OS bootstrap load procedure. If the OS Load Watchdog Timer times out, then presumably the OS failed to boot properly.

If the OS does boot up successfully, it must be aware of the OS Load Watchdog Timer and immediately turn it off before it expires. The OS may turn off the timer, or more often the timer may be repurposed as an OS Watchdog Timer to protect against runtime OS hangs.

Unless the OS does have timer-aware software to support the OS Load Watchdog Timer, the system will be unable to boot successfully with the OS Load Watchdog Timer enabled. When the timer expires without having been reset or turned off, the system will either reset or power off repeatedly.

11. OS Boot Watchdog Timer Policy

Option Values: **Power off**
Reset

Help Text:

If the OS watchdog timer is enabled, this is the system action taken if the watchdog timer expires.

[Reset] - System performs a reset.

[Power Off] - System powers off.

Comments: This option is grayed out and unavailable when the O/S Boot Watchdog Timer is disabled.

12. OS Boot Watchdog Timer Timeout

Option Values: 5 minutes
10 minutes
15 minutes
20 minutes

Help Text:

If the OS watchdog timer is enabled, this is the timeout value BIOS will use to configure the watchdog timer.

Comments: This option is grayed out and unavailable when the O/S Boot Watchdog Timer is disabled.

13. Plug & Play BMC Detection

Option Values: Enabled
Disabled

Help Text:

If enabled, the BMC will be detectable by OSes which support plug and play loading of an IPMI driver. Do not enable this option if your OS does not support this driver.

Comments: This option controls whether the OS Server Management Software will be able to find the BMC and automatically load the correct IPMI support software for it. If your OS does not support Plug & Play for the BMC, you will not have the correct IPMI driver software loaded.

14. EuP LOT6 Off-Mode

Option Values: Enabled
Disabled

Help Text:

Enable/disable Ecodesign EuP LOT6 “Deep Sleep” Off-Mode for near-zero energy use when powered off.

Comments: This option controls whether the system goes into “Deep Sleep” or more conventional S5 “Soft-Off” when powered off. “Deep Sleep” state uses less energy than S5, but S5 can start up faster and can allow a Wake on LAN action (which cannot be done from a Deep Sleep state).

This option will not appear on platforms which do not support EuP LOT6 Off-Mode. For details on which platform do support it

15. Shutdown Policy

Option Values: Enabled
Disabled

Help Text: *Enable/Disable Shutdown Policy.*

Comments: This option is designed for multiple-node system and to control the policy that BMC should shutdown one node if it detected over-current or over-temperature condition. The BIOS and the BMC will synchronize the policy during the BIOS POST and current value of the BMC will be displayed in BIOS Setup.

This option is only displayed when the BMC support this feature on the node.

16. Console Redirection

Option Values: *<None>*

Help Text: *View/Configure Console Redirection information and settings.*

Comments: *Selection only.* Position to this line and press the <Enter> key to go to the ***Console Redirection*** group of configuration settings.

17. System Information

Option Values: *<None>*

Help Text: *View System Information.*

Comments: *Selection only.* Position to this line and press the <Enter> key to go to the ***System Information*** group of configuration settings.

18. BMC LAN Configuration

Option Values: <None>

Help Text: View/Configure BMC LAN and user settings.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **BMC LAN Configuration** group of configuration settings.

Console Redirection

The Console Redirection screen allows the user to enable or disable Console Redirection for Remote System Management, and to configure the connection options for this feature.

To access this screen from the **Main** screen, select **Server Management > Console Redirection**. To move to another screen, press the <Esc> key to return to the **Server Management** screen, then select the desired screen.

When Console Redirection is active, all POST and Setup displays are in Text Mode. The Quiet Boot setting is disregarded, and the Text Mode POST Diagnostic Screen will be displayed regardless of the Quiet Boot setting. This is due to the limitations of Console Redirection, which is based on data terminal emulation using a serial data interface to transfer character data.

Console Redirection can use either of the two Serial Ports provided by the SuperIO in the BMC. However, if Console Redirection is to be coordinated with Serial Over LAN, the user should be aware that SOL is only supported through Serial Port A (except for W200CR, which only has Serial B and supports SOL on Serial B).

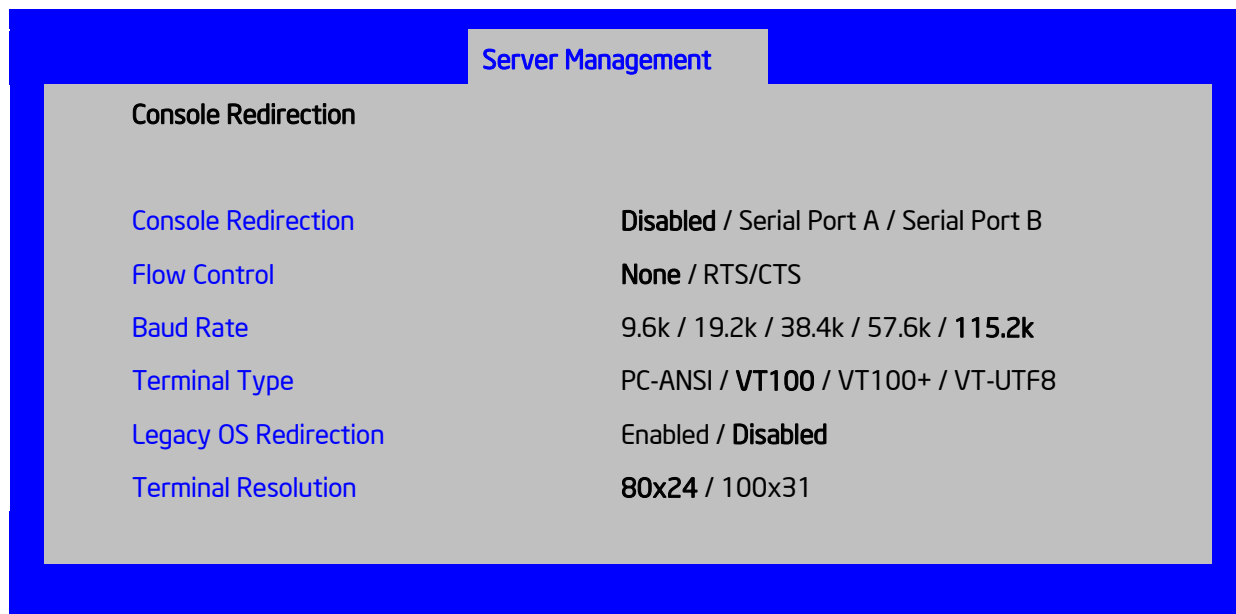


Figure 109. Console Redirection Screen

Screen Field Descriptions:

1. Console Redirection

Option Values: **Disabled**
Serial Port A
Serial Port B

Help Text:

*Console redirection allows a serial port to be used for server management tasks.
[Disabled] - No console redirection.
[Serial Port A] - Configure serial port A for console redirection.
Enabling this option will disable display of the Quiet Boot logo screen during POST.*

Comments: Serial Console Redirection can use either Serial Port A or Serial Port B. If SOL is also going to be configured, note that SOL is only supported through Serial Port A (with the exception of W2600CR, which only has Serial B so supports SOL on Serial B).

When Console Redirection is set to *Disabled*, all other options on this screen will be grayed out and unavailable.

Only Serial Ports which are *Enabled* should be available to choose for Console Redirection. If neither Serial A nor Serial B is set to *Enabled*, then Console Redirection will be forced to *Disabled*, and grayed out as inactive. In that case, all other options on this screen will also be grayed

2. Flow Control

Option Values: **None**
RTS/CTS

Help Text:

*Flow control is the handshake protocol.
This setting must match the remote terminal application.
[None] - Configure for no flow control.
[RTS/CTS] - Configure for hardware flow control.*

Comments: Flow control is necessary only when there is a possibility of data overrun. In that case the Request To Send/Clear to Send (RTS/CTS) hardware handshake is a relatively conservative protocol which can usually be configured at both ends.

When Console Redirection is set to *Disabled*, this option will be grayed out and unavailable.

3. Baud Rate

Option Values: 9.6k
19.2k
38.4k
57.6k
115.2k

Help Text:

Serial port transmission speed. This setting must match the remote terminal application.

Comments: In most modern Server Management applications, serial data transfer is consolidated over an alternative faster medium like LAN, and 115.2k is the speed of choice.

When Console Redirection is set to *Disabled*, this option will be grayed out and unavailable.

4. Terminal Type

Option Values: PC-ANSI

VT100

VT100+

VT-UTF8

Help Text:

Character formatting used for console redirection. This setting must match the remote terminal application.

Comments: The VT100 and VT100+ terminal emulations are essentially the same. VT-UTF8 is a UTF8 encoding of VT100+. PC-ANSI is the native character encoding used by PC-compatible applications and emulators.

When Console Redirection is set to *Disabled*, this option will be grayed out and unavailable.

5. Legacy OS Redirection

Option Values: Enabled

Disabled

Help Text:

This option enables legacy OS redirection (i.e., DOS) on serial port. If it is enabled, the associated serial port is hidden from the legacy OS.

Comments: Operating Systems which are “redirection-aware” implement their own Console Redirection mechanisms. For a Legacy OS which is not “aware”, this option allows the BIOS to handle redirection.

When Console Redirection is set to *Disabled*, this option will be grayed out and unavailable.

6. Terminal Resolution

Option Values: **80x24**

100x31

Help Text:

Remote Terminal Resolution

Comments: This option allows the use of a larger terminal screen area, although it does not change Setup displays to match.

When Console Redirection is set to *Disabled*, this option will be grayed out and unavailable.

System Information

The System Information screen allows the user to view part numbers, serial numbers, and firmware revisions. This is an *Information Only* screen

To access this screen from the *Main* screen, select *Server Management > System Information*. To move to another screen, press the <Esc> key to return to the *Server Management* screen, then select the desired screen.

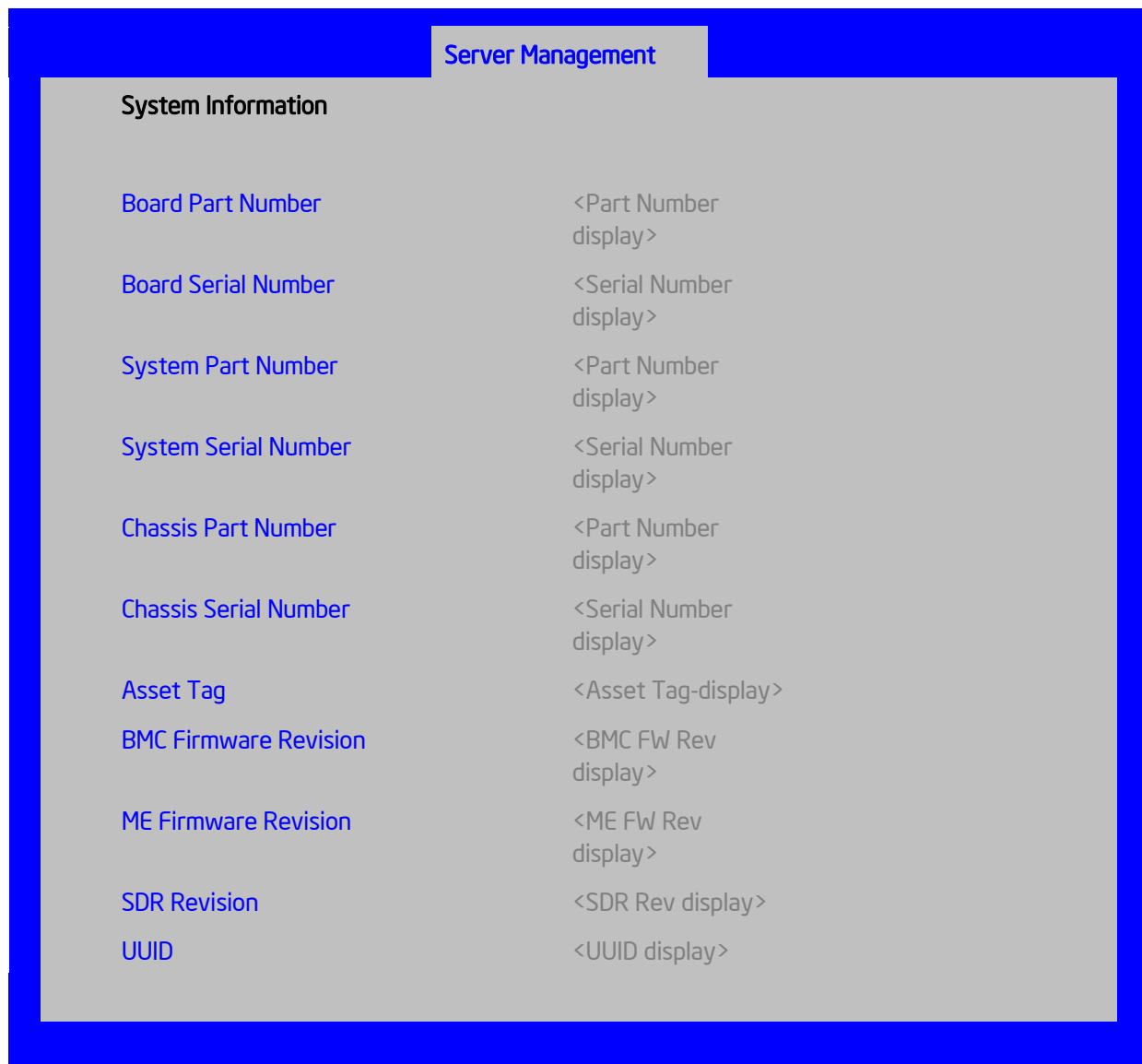


Figure 110. System Information Screen

Screen Field Descriptions:**1. Board Part Number**

Option Values: <Part Number display>

Help Text: <None>

Comments: Information only.**2. Board Serial Number**

Option Values: <Serial Number display>

Help Text: <None>

Comments: Information only.**3. System Part Number**

Option Values: <Part Number display>

Help Text: <None>

Comments: Information only.**4. System Serial Number**

Option Values: <Serial Number display>

Help Text: <None>

Comments: Information only.**5. Chassis Part Number**

Option Values: <Part Number display>

Help Text: <None>

Comments: Information only.**6. Chassis Serial Number**

Option Values: <Serial Number display>

Help Text: <None>

Comments: Information only.**7. Asset Tag**

Option Values: <Asset Tag-display>

Help Text: <None>

Comments: Information only.

8. BMC Firmware Revision

Option Values: <BMC FW Rev display>

Help Text: <None>

Comments: Information only.

9. ME Firmware Revision

Option Values: <ME FW Rev display>

Help Text: <None>

Comments: Information only.

10. SDR Revision

Option Values: <SDR Rev display>

Help Text: <None>

Comments: Information only.

11. UUID

Option Values: <UUID display>

Help Text: <None>

Comments: Information only.

BMC LAN Configuration

To access this screen from the **Main** screen, select **Server Management > System Information**. To move to another screen, press the <Esc> key to return to the **Server Management** screen, then select the desired screen.

The BMC configuration screen allows the user to configure the BMC Baseboard LAN channel and an Intel® RMM4 LAN channel, and to manage BMC User settings for up to five BMC Users.

An Intel® RMM4 Management Module may be installed in the server system.

If the Management Module is installed, it may also have a Dedicated Server Management NIC Module (DMN) installed with it. In that case, the LAN settings for the Intel®RMM4 with Dedicated Server Management NIC may be configured.

When there is no Management Module installed in the system, or there is an Intel® RMM4-Lite without a DMN installed, the LAN settings specific to the Intel® RMM4 are grayed out and not available.

This screen has a choice of IPv4 or IPv6 addressing. When IPv6 is disabled, only the IPv4 addressing options appear. When IPv6 is enabled, the IPv4 options are grayed out and unavailable, and there is an additional section active for IPv6-addressing. This is true for both the Baseboard LAN configuration and the Intel® RMM4 with Dedicated Server Management NIC Module.

IP addresses for either IPv4 or IPv6 addressing can be assigned by static IP addresses manually typed in, or by dynamic IP addresses supplied by a Dynamic Host Configuration Protocol (DHCP) server. IPv6 addressing can also be provided by “stateless autoconfiguration” which does not require a DHCP server.

The BMC LAN Configuration screen is unusual in that the LAN Configuration parameters are maintained by the BMC itself, so this screen is just a User Interface to the BMC configuration. As such, the initial values of the LAN options shown on the screen are acquired from the BMC when this screen is initially accessed by a user. Any values changed by the user are communicated back to the BMC when a “Save Changes” or “Save Changes and Exit” action is performed. If a “Discard Changes” or “Discard Changes and Exit” action is performed instead, any accumulated changes from this screen will be disregarded and lost.

Server Management

BMC LAN Configuration

Baseboard LAN configuration

IP Source	Static/Dynamic
IP Address	[0.0.0.0]
Subnet Mask	[0.0.0.0]
Gateway IP	[0.0.0.0]

Baseboard LAN IPv6 configuration

IPv6	Enabled/Disabled
IPv6 Source	Static/Dynamic/Auto
IPv6 Address	[0000.0000.0000.0000.0000.0000.0000.0000]
Gateway IPv6	[0000.0000.0000.0000.0000.0000.0000.0000]
IPv6 Prefix Length	[0 - 128, 64 is default]

Intel(R) RMM4 LAN configuration

Intel® RMM4	<Not Present/Intel(R) RMM4-Lite/Intel(R) RMM4 + DMN>
IP Source	Static/Dynamic
IP Address	[0.0.0.0]
Subnet Mask	[0.0.0.0]
Gateway IP	[0.0.0.0]

Intel(R) RMM4 LAN IPv6 configuration

IPv6 Source	Static/Dynamic/Auto
IPv6 Address	[0000.0000.0000.0000.0000.0000.0000.0000]
Gateway IPv6	[0000.0000.0000.0000.0000.0000.0000.0000]
IPv6 Prefix Length	[0 - 128, 64 is default]

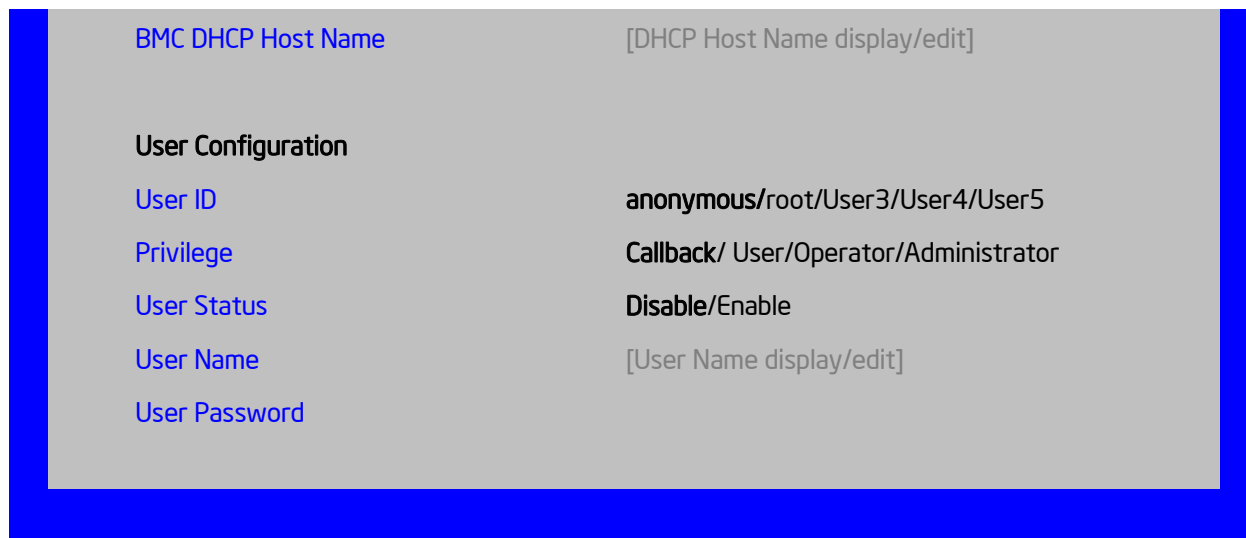


Figure 111. BMC LAN Configuration Screen

Screen Field Descriptions:

1. IP Source

Option Values: Static

Dynamic

Help Text:

Select BMC IP Source: If [Static], IP parameters may be edited. If [Dynamic], these fields are display-only and IP address is acquired automatically (DHCP).

Comments: This specifies the IP Source for IPv4 addressing for the Baseboard LAN. There is a separate IP Source field for the Intel® RMM4 LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC, and its setting determines whether the other Baseboard LAN IPv4 addressing fields are display-only (when **Dynamic**) or can be edited (when **Static**).

When IPv6 addressing is enabled, this field is grayed out and inactive.

2. IP Address

Option Values: [Entry Field 0.0.0.0, **0.0.0.0** is default]

Help Text:

View/Edit IP Address. Press <Enter> to edit.

Comments: This specifies the IPv4 Address for the Baseboard LAN. There is a separate IPv4 Address field for the Intel® RMM4 LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IP Source** determines whether this field is display-only (when **Dynamic**) or can be edited (when **Static**).

When IPv6 addressing is enabled, this field is grayed out and inactive.

3. Subnet Mask

Option Values: [Entry Field 0.0.0.0, **0.0.0.0** is default]

Help Text:

View/Edit Subnet Mask. Press <Enter> to edit.

Comments: This specifies the IPv4 addressing Subnet Mask for the Baseboard LAN. There is a separate IPv4 Subnet Mask field for the Intel® RMM4 LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IP Source** determines whether this field is display-only (when **Dynamic**) or can be edited (when **Static**).

When IPv6 addressing is enabled, this field is grayed out and inactive.

4. Gateway IP

Option Values: [Entry Field 0.0.0.0, **0.0.0.0** is default]

Help Text:

View/Edit Gateway IP. Press <Enter> to edit.

Comments: This specifies the IPv4 addressing Gateway IP for the Baseboard LAN. There is a separate IPv4 Gateway IP field for the Intel® RMM4 LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IP Source** determines whether this field is display-only (when **Dynamic**) or can be edited (when **Static**).

When IPv6 addressing is enabled, this field is grayed out and inactive.

5. IPv6

Option Values: Enabled
Disabled

Help Text:

Option to Enable/Disable IPv6 addressing and any IPv6 network traffic on these channels.

Comments: The initial value for this field is acquired from the BMC. It may be changed in order to switch between IPv4 and IPv6 addressing technologies.

When this option is set to **Disabled**, all other IPv6 fields will not be visible for the Baseboard LAN and Intel® RMM4 DMN (if installed). When IPv6 addressing is **Enabled**, all IPv6 fields for the Baseboard LAN and Intel® RMM4 DMN will become visible, and all IPv4 fields will be grayed out and inactive.

6. IPv6 Source

Option Values: Static

Dynamic

Auto

Help Text:

Select BMC IPv6 source: If [Static], IPv6 parameters may be edited. If [Dynamic], these fields are display-only and IPv6 address is acquired automatically (DHCP). If [Auto], these fields are display-only and IPv6 address is acquired using ICMPv6 router / neighbor discovery.

Comments: This specifies the IP Source for IPv6 addressing for the Baseboard LAN configuration. There is a separate IPv6 Source field for the Intel® RMM4 LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is **Enabled**, the initial value for this field is acquired from the BMC, and its setting determines whether the other Baseboard LAN IPv6 addressing fields are display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

7. IPv6 Address

Option Values: [Entry Field 0000.0000.0000.0000.0000.0000.0000.0000, **0000.0000.0000.0000.0000.0000.0000.0000** is default]

Help Text:

View/Edit IPv6 address. Press <Enter> to edit. IPv6 addresses consist of 8 hexadecimal 4 digit numbers separated by colons.

Comments: This specifies the IPv6 Address for the Baseboard LAN. There is a separate IPv6 Address field for the Intel® RMM4 LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IPv6 Source** determines whether this field is display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

8. Gateway IPv6

Option Values: [Entry Field 0000.0000.0000.0000.0000.0000.0000.0000,
0000.0000.0000.0000.0000.0000.0000.0000 is default]

Help Text:

View/Edit Gateway IPv6 address. Press <Enter> to edit. Gateway IPv6 addresses consist of 8 hexadecimal 4 digit numbers separated by colons.

Comments: This specifies the Gateway IPv6 Address for the Baseboard LAN. There is a separate Gateway IPv6 Address field for the Intel® RMM4 LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IPv6 Source** determines whether this field is display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

9. IPv6 Prefix Length

Option Values: [Entry Field 0 – 128, **64** is default]

Help Text:

View/Edit IPv6 Prefix Length from zero to 128 (default 64). Press <Enter> to edit.

Comments: This specifies the IPv6 Prefix Length for the Baseboard LAN. There is a separate IPv6 Prefix Length field for the Intel® RMM4 LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IPv6 Source** determines whether this field is display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

10. Intel® RMM4

Option Values: *Not Present*

Intel® RMM4-Lite

Intel® RMM4 + DMN

Help Text: <None>

Comments: Information only. Displays whether an Intel® RMM4 component is currently installed. This information may come from querying the BMC.

Intel® RMM4-Lite is the Management Module without the Dedicated Server Management NIC Module. When this is present, or if the Management Module is **Not Present** at all, the fields for Intel® RMM4 LAN Configuration will not be visible.

When an **Intel® RMM4 + DMN** is installed, the options for **Intel® RMM4 LAN Configuration** will be visible. When **IPv6** is **Disabled**, the IPv4 configuration fields will be visible and the IPv6 configuration fields will not be visible. When **IPv6** is **Enabled**, the IPv4 fields will be grayed out and inactive, while the IPv6 Configuration fields will be visible.

In either case, the Intel® RMM4 section **IP Source** or **IPv6 Source** will determine whether the IPv4 or IPv6 address fields are display-only or can be edited.

11. IP Source

Option Values: Static
Dynamic

Help Text:

Select RMM4 IP source: If [Static], IP parameters may be edited. If [Dynamic], these fields are display-only and IP address is acquired automatically (DHCP).

Comments: This specifies the IP Source for IPv4 addressing for the Intel® RMM4 DMN LAN connection. There is a separate IP Source field for the Baseboard LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC, and its setting determines whether the other Intel® RMM4 DMN LAN IPv4 addressing fields are display-only (when **Dynamic**) or can be edited (when **Static**).

When IPv6 addressing is enabled, this field is grayed out and inactive.

12. IP Address

Option Values: [Entry Field 0.0.0.0, **0.0.0.0** is default]

Help Text:

View/Edit IP Address. Press <Enter> to edit.

Comments: This specifies the IPv4 Address for the Intel® RMM4 DMN LAN. There is a separate IPv4 Address field for the Baseboard LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IP Source** determines whether this field is display-only (when **Dynamic**) or can be edited (when **Static**).

When IPv6 addressing is enabled, this field is grayed out and inactive.

13. Subnet Mask

Option Values: [Entry Field 0.0.0.0, **0.0.0.0** is default]

Help Text:

View/Edit Subnet Mask. Press <Enter> to edit.

Comments: This specifies the IPv4 addressing Subnet Mask for the Intel® RMM4 DMN LAN. There is a separate IPv4 Subnet Mask field for the Baseboard LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IP Source** determines whether this field is display-only (when **Dynamic**) or can be edited (when **Static**).

When IPv6 addressing is enabled, this field is grayed out and inactive.

14. Gateway IP

Option Values: [Entry Field 0.0.0.0, **0.0.0.0** is default]

Help Text:

View/Edit Gateway IP. Press <Enter> to edit.

Comments: This specifies the IPv4 addressing Gateway IP for the Intel® RMM4 DMN LAN. There is a separate IPv4 Gateway IP field for the Baseboard LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IP Source** determines whether this field is display-only (when **Dynamic**) or can be edited (when **Static**).

When IPv6 addressing is enabled, this field is grayed out and inactive.

15. IPv6 Source

Option Values: Static

Dynamic

Auto

Help Text:

Select Intel® RMM4 IPv6 source: If [Static], IPv6 parameters may be edited. If [Dynamic], these fields are display-only and IPv6 address is acquired automatically (DHCP). If [Auto], these fields are display-only and IPv6 address is acquired using ICMPv6 router / neighbor discovery.

Comments: This specifies the IP Source for IPv6 addressing for the Intel® RMM4 DMN LAN configuration. There is a separate IPv6 Source field for the Baseboard LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is **Enabled**, the initial value for this field is acquired from the BMC, and its setting determines whether the other Intel® RMM4 DMN LAN IPv6 addressing fields are display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

16. IPv6 Address

Option Values: [Entry Field 0000.0000.0000.0000.0000.0000.0000.0000,
0000.0000.0000.0000.0000.0000.0000.0000 is default]

Help Text:

View/Edit IPv6 address. Press <Enter> to edit. IPv6 addresses consist of 8 hexadecimal 4 digit numbers separated by colons.

Comments: This specifies the IPv6 Address for the Intel® RMM4 DMN LAN. There is a separate IPv6 Address field for the Baseboard LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IPv6 Source** determines whether this field is display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

17. Gateway IPv6

Option Values: [Entry Field 0000.0000.0000.0000.0000.0000.0000.0000,
0000.0000.0000.0000.0000.0000.0000.0000 is default]

Help Text:

View/Edit Gateway IPv6 address. Press <Enter> to edit. Gateway IPv6 addresses consists of 8 hexadecimal 4 digit numbers separated by colons.

Comments: This specifies the Gateway IPv6 Address for the Intel® RMM4 DMN LAN. There is a separate Gateway IPv6 Address field for the Baseboard LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IPv6 Source** determines whether this field is display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

18. IPv6 Prefix Length

Option Values: [Entry Field 0 – 128, 64 is default]

Help Text:

View/Edit IPv6 Prefix Length from zero to 128 (default 64). Press <Enter> to edit.

Comments: This specifies the IPv6 Prefix Length for the Intel® RMM4 DMN LAN. There is a separate IPv6 Prefix Length field for the Baseboard LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IPv6 Source** determines whether this field is display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

19. BMC DHCP Host Name

Option Values: [Entry Field, 2-63 characters]

Help Text:

View/Edit BMC DHCP host name. Press <Enter> to edit. Host name should start with an alphabetic, remaining can be alphanumeric characters. Host name length may be from 2 to 63 characters.

Comments: This field is active and may be edited whenever at least one of the **IP Source** or **IPv6 Source** options is set to **Dynamic**. This is the name of the DHCP Host from which dynamically assigned IPv4 or IPv6 addressing parameters are acquired.

The initial value for this field is supplied from the BMC, if there is a DHCP Host available. The user can edit the existing Ho or enter a different DHCP Host Name.

If none of the **IP/IPv6 Source** fields is set to **Dynamic**, then this **BMC DHCP Host Name** field will be grayed out and inactive.

20. User ID

Option Values: **anonymous**

root
User3
User4
User5

Help Text:

Select the User ID to configure: User1 (anonymous), User2 (root), and User3/4/5 are supported.

Comments: These 5 User IDs are fixed choices and cannot be changed. The BMC supports 15 User IDs natively, but only the first 5 are supported through this interface.

21. Privilege

Option Values: Callback

User
Operator
Administrator

Help Text:

View/Select user privilege. User2 (root) privilege is "Administrator" and cannot be changed.

Comments: The level of privilege that is assigned for a User ID affects which functions that user may perform.

22. User Status

Option Values: Enabled
Disabled

Help Text:

Enable / Disable LAN access for selected user. Also enables/disables SOL, KVM, and media redirection.

Comments: Note that status setting is **Disabled** by default until set to **Enabled**.

23. User Name

Option Values: [Entry Field, 4 - 15 characters]

Help Text:

Press <Enter> to edit User Name. User Name is a string of 4 to 15 alphanumeric characters, and must begin with an alphabetic character. User Name cannot be changed for User1 (anonymous) and User2 (root).

Comments: User Name can only be edited for users other than “anonymous” and “root”. Those two User Names may not be changed.

24. User Password

Option Values: [Popup Entry Field, 0 - 15 characters]

Help Text:

Press <Enter> key to enter password. Maximum length is 15 characters. Any ASCII printable characters can be used: case-sensitive alphabetic, numeric, and special characters.

***Note: Password entered will override any previously set password.*

Comments: This field will not indicate whether there is a password set already. There is no display - just press <Enter> for a popup with an entry field to enter a new password. Any new password entered will override the previous password, if there was one.

Boot Options Screen (Tab)

The Boot Options screen displays all bootable media encountered during POST, and allows the user to configure the desired order in which boot devices are to be tried.

To access this screen from the **Main** screen or other top-level “Tab” screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the **Boot Options** screen is selected.

The first boot device in the specified Boot Order which is present and is bootable during POST will be used to boot the system, and will continue to be used to reboot the system until the boot device configuration has changed (that is, which boot devices are present), or until the system has been powered down and booted in a “cold” power-on boot.

Note: USB devices can be “hotplugged” during POST, and will be detected and “beeped”. They will be enumerated and displayed on the USB Configuration Setup screen. However, they may not be enumerated as bootable devices, depending on when in POST they were hotplugged. If they were recognized before the enumeration of bootable devices, they will appear as Boot Devices if appropriate. If they were recognized after Boot Device enumeration, they will not appear as a bootable device for the Boot Options screen, the Boot Manager screen, or the F6 Boot Menu.

There are two main types of boot order control, Legacy Boot and EFI Optimized boot. These are mutually exclusive – when EFI Optimized Boot is enabled, Legacy Boot (the default) is disabled. Within Legacy Boot operation, there are two further methods of ordering boot devices, Dynamic Boot Order and Static Boot Order.

The default for Boot Order control is Legacy Boot, with Dynamic Boot Order. If all types of bootable devices are installed in the system, then the default Boot Order is as follows:

- CD/DVD-ROM
- Floppy Disk Drive
- Hard Disk Drive
- PXE Network Device
- BEV (Boot Entry Vector) Device
- EFI Shell and EFI Boot paths

In this default Boot Order, a USB device may appear in any of several Device Classes, due to the flexibility of USB connections and USB emulation of various types of devices.

Note: A USB Key (USB Flash Drive) can be formatted to emulate either a Floppy Drive or a Hard Drive and will appear in that Boot Device Class. However, although it can be formatted as a CDROM Drive, it will not be detected as such. It will be treated as a Hard Disk and will appear in the list of available Hard Drives.



Figure 112. Boot Options Screen

Screen Field Descriptions:

1. System Boot Timeout

Option Values: *[Entry Field 0 – 65535, 0 is default]*

Help Text:

The number of seconds BIOS will pause at the end of POST to allow the user to press the [F2] key for entering the BIOS Setup utility.

Valid values are 0-65535. Zero is the default. A value of 65535 causes the system to go to the Boot Manager menu and wait for user input for every system boot.

Comments: After entering the desired timeout, press the <Enter> key to register that timeout value to the system. These settings are in seconds. The timeout value entered will take effect on the next boot.

This timeout value is independent of the FRB2 setting for BIOS boot failure protection. The FBR2 countdown will be suspended during the time that the Boot Timeout countdown is active.

Also, if the <Pause> key is pressed during the time that the Boot Timeout is active, the Boot Timeout countdown will be suspended until the Pause state has been dismissed and normal POST processing has resumed.

2. Boot Option #1
3. Boot Option #2
4. Boot Option <#n>

Option Values: *<Available Boot Device #n>*

Help Text:

Set system boot order by selecting the boot option for this position.

Comments: When the Boot order has been chosen, it will take effect on the next boot. The system will go down the list and boot from the first device on the list which is available and bootable.

This establishes the Boot Order only with respect to the normal boot path. This order has no effect on the Boot Manager selection list or the <F6> BIOS Boot Menu popup, both of which simply list all bootable devices available in the order in which they were detected. Whether or not a potential Boot Device is in this list has no bearing on the presence or order of Boot Devices shown for Boot Manager or the BIOS Boot Menu.

5. CDROM Order

Option Values: <None>

Help Text:

Set the order of the legacy devices in this group.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **CDROM Order** screen. This option appears when one or more bootable CDROM drives are available in the system. This includes USB CDROM devices, but not USB Keys formatted for CRDOM emulation, which are seen as Hard Disk drives.

6. Hard Disk Order

Option Values: <None>

Help Text:

Set the order of the legacy devices in this group.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **Hard Disk Order** screen. This option appears when one or more bootable Hard Disk drives are available in the system. This includes USB Hard Disk devices and USB Keys formatted for Hard Disk or CRDOM emulation.

7. Floppy Order

Option Values: <None>

Help Text:

Set the order of the legacy devices in this group.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **Floppy Order** screen.

This option appears when one or more bootable Floppy Disk drives are available in the system. This includes USB Floppy Disk devices and USB Keys formatted for Floppy Disk emulation.

8. Network Device Order

Option Values: <None>

Help Text:

Set the order of the legacy devices in this group.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **Network Device Order** screen.

This option appears when one or more bootable Network Devices are available in the system.

9. BEV Device Order

Option Values: <None>

Help Text:

Set the order of the legacy devices in this group.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **BEV Device Order** screen.

This option appears when one or more bootable BEV Devices are available in the system.

10. Add EFI Boot Option

Option Values: <None>

Help Text:

Add a new EFI boot option to the boot order.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **Add EFI Boot Option** screen.

This option is only displayed if an EFI bootable device is available to the system.

11. Delete EFI Boot Option

Option Values: <None>

Help Text:

Remove an EFI boot option from the boot order.

Comments: Selection only. Position to this line and press the <Enter> key to go to the **Delete EFI Boot Option** screen.

This option is only displayed if an EFI boot path is included in the Boot Order.

12. EFI Optimized Boot

Option Values: Enabled
Disabled

Help Text:

If enabled, the BIOS only loads modules required for booting EFI-aware Operating Systems.

Comments: If this option is enabled, the system will not boot successfully to a non-EFI-aware OS.

13. Use Legacy Video for EFI OS

Option Values: Enabled
Disabled

Help Text:

If enabled, the BIOS uses the legacy video ROM instead of the EFI video ROM.

Comments: This option appears only when EFI Optimized Boot is enabled.

14. Boot Option Retry

Option Values: Enabled
Disabled

Help Text:

If enabled, this continually retries non-EFI-based boot options without waiting for user input.

Comments: This option is intended to keep retrying for cases where the boot devices could possibly be slow to initially respond, for example, if the device were “asleep” and did not wake quickly enough. However, if none of the devices in the Boot Order ever responds, the BIOS will continue to reboot indefinitely.

15. USB Boot Priority

Option Values: Enabled
Disabled

Help Text:

If enabled, newly discovered USB devices are moved to the top of their boot device category.

If disabled, newly discovered USB devices are moved to the bottom of their boot device category.

Comments: This option enables or disables the “USB Reorder” functionality. USB Boot Priority, if enabled, is intended for the case where a user wants to be able to plug in a USB device and immediately boot to it, for example in case of a maintenance or System Administration operation. If a User Password is installed, USB Boot Priority action is suspended when a User Password is installed.

16. Static Boot Order

Option Values: Enabled
Disabled

Help Text:

*[Disabled] - Devices removed from the system are deleted from Boot Order Tables.
[Enabled] - Devices removed have positions in Boot Order Tables retained for later reinsertion.*

Comments: When the option changes to “Enabled” from “Disabled”, it will enable Static Boot Order (SBO) from the next boot onward, and also the current Boot Order will be stored as the SBO template.

When the option changes from “Enabled” to “Disabled”, this will disable SBO and the SBO template will be cleared.

Otherwise it will retain the current Enabled/Disabled state.

17. Reset Static Boot Order

Option Values: Yes
No Action

Help Text:

[Yes] Take snapshot of current boot order to save as Static Boot Order Template.

Comments: This option will allow you to save the Boot Order list as the Static Boot Order template without disabling and re-enabling the Static Boot Order option.

Select Yes to snapshot the current Boot Options list into the Static Boot Options list on the next boot. After saving Static Boot Options list, this option will change back to NoAction automatically.

This option is available only when the Static Boot Order option is Enabled. Otherwise it will be grayed out and unavailable.

CDROM Order

The CDROM Order screen allows the user to control the order in which BIOS attempts to boot from the CDROM drives installed in the system. This screen is only available when there is at least one CDROM device available in the system configuration.

***Note:** A USB attached CDROM device will appear in this section. However, a USB Key formatted as a CRDOM device will not – it will be detected as a Hard Disk device and will be included in the Hard Disk Order Screen.*

To access this screen from the **Main** screen, select **Boot Options > CDROM Order**. To move to another screen, press the <Esc> key to return to the **Boot Options** screen, then select the desired screen.

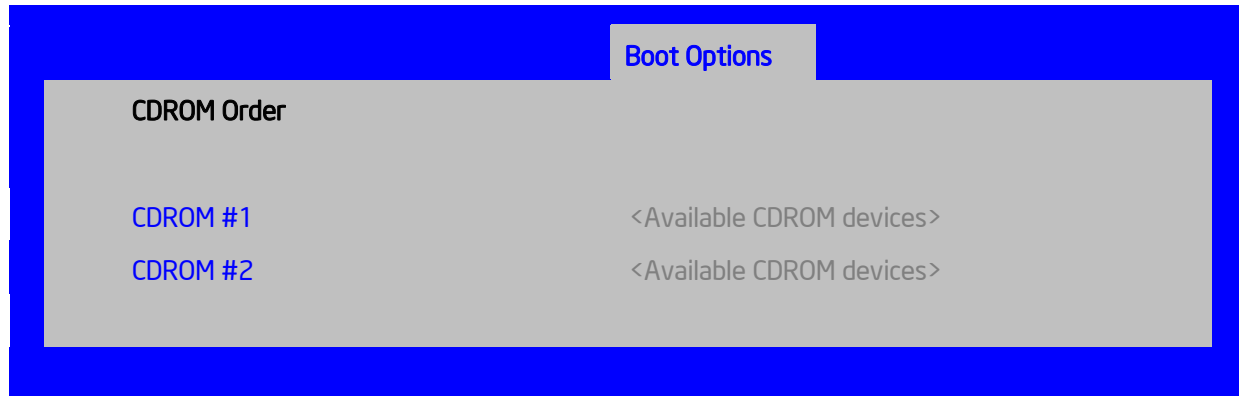


Figure 113. CDROM Order Screen

Screen Field Descriptions:

1. CDROM #1
2. CDROM #2

Option Values: <Available CDROM devices>

Help Text:

Set system boot order by selecting the boot option for this position.

Comments: Choose the order of booting among CDROM devices by choosing which available CDROM device should be in each position in the order.

Hard Disk Order

The Hard Disk Order screen allows the user to control the order in which BIOS attempts to boot from the hard disk drives installed in the system. This screen is only available when there is at least one hard disk device available in the system configuration. Note that a USB attached Hard Disk drive or a USB Key device formatted as a hard disk will appear in this section.

To access this screen from the **Main** screen, select **Boot Options > Hard Disk Order**. To move to another screen, press the <Esc> key to return to the **Boot Options** screen, then select the desired screen.

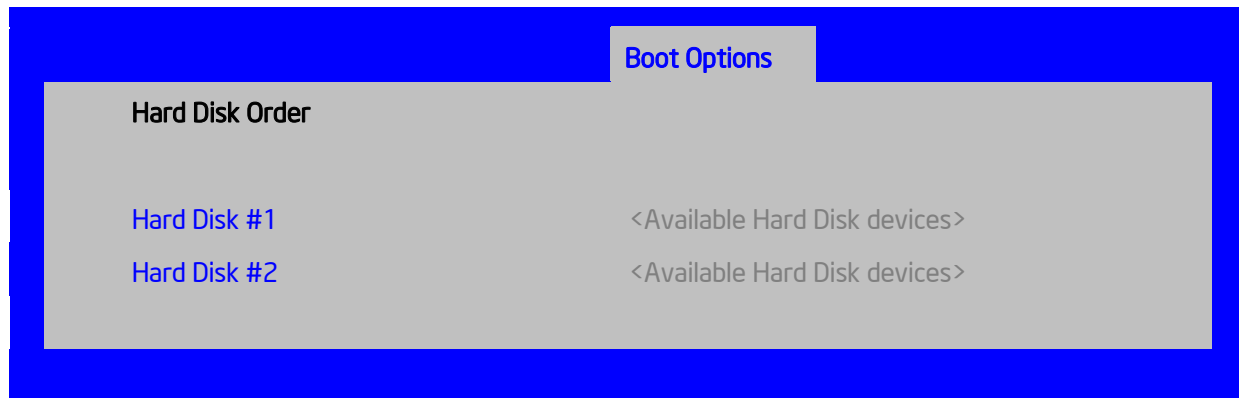


Figure 114. Hard Disk Order Screen

Screen Field Descriptions:

1. Hard Disk #1
2. Hard Disk #2

Option Values: <Available Hard Disk devices>

Help Text:

Set system boot order by selecting the boot option for this position.

Comments: Choose the order of booting among Hard Disk devices by choosing which available Hard Disk device should be in each position in the order.

Floppy Order

The Floppy Order screen allows the user to control the order in which BIOS attempts to boot from the Floppy Disk drives installed in the system. This screen is only available when there is at least one Floppy Disk (diskette) device available in the system configuration. Note that a USB attached diskette drive or a USB Key device formatted as a diskette drive will appear in this section.

To access this screen from the **Main** screen, select **Boot Options > Floppy Order**. To move to another screen, press the <Esc> key to return to the **Boot Options** screen, then select the desired screen.

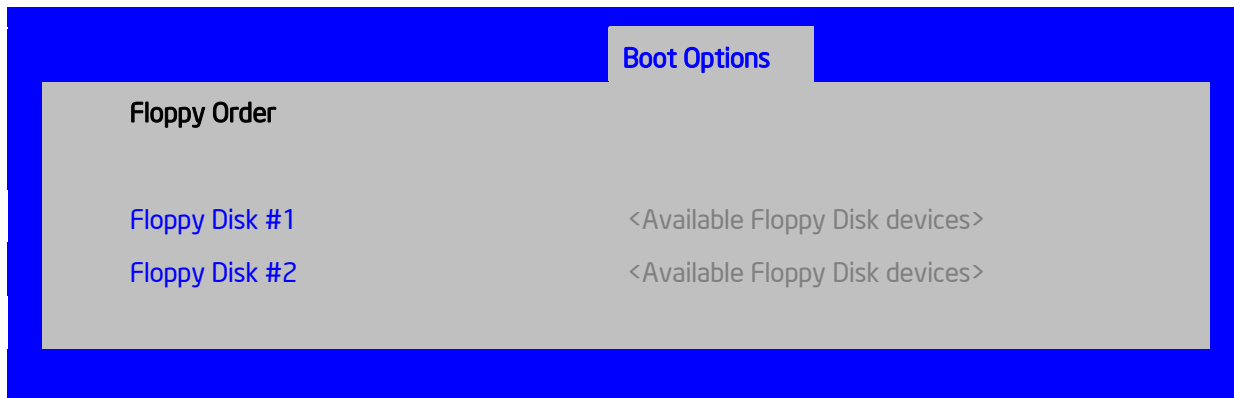


Figure 115. Floppy Order Screen

Screen Field Descriptions:

1. Floppy Disk #1
2. Floppy Disk #2

Option Values: <Available Floppy Disk devices>

Help Text:

Set system boot order by selecting the boot option for this position.

Comments: Choose the order of booting among Floppy Disk devices by choosing which available Floppy Disk device should be in each position in the order.

Network Device Order

The Network Device Order screen allows the user to control the order in which BIOS attempts to boot from the network bootable devices installed in the system. This screen is only available when there is at least one network bootable device available in the system configuration.

To access this screen from the *Main* screen, select **Boot Options** > **Network Device Order**. To move to another screen, press the <Esc> key to return to the **Boot Options** screen, then select the desired screen.

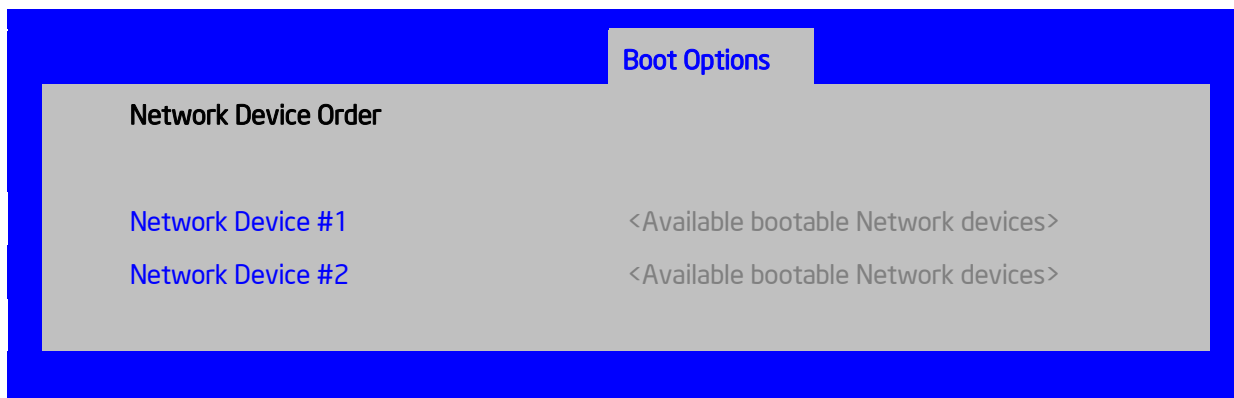


Figure 116. Network Device Order Screen

Screen Field Descriptions:

1. Network Device #1
2. Network Device #2

Option Values: <Available Network Devices>

Help Text:

Set system boot order by selecting the boot option for this position.

Comments: Choose the order of booting among Network Devices by choosing which available Network Device should be in each position in the order.

BEV Device Order

The BEV Device Order screen allows the user to control the order in which BIOS attempts to boot from the BEV Devices installed in the system. This screen is only available when there is at least one BEV device available in the system configuration.

To access this screen from the *Main* screen, select *Boot Options* > *BEV Device Order*. To move to another screen, press the <Esc> key to return to the *Boot Options* screen, then select the desired screen.

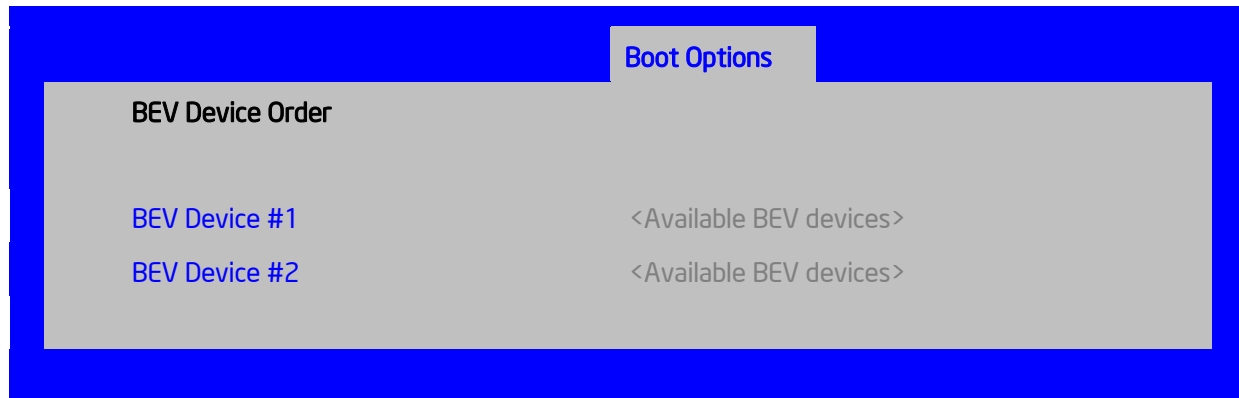


Figure 117. BEV Device Order Screen

Screen Field Descriptions:

1. BEV Device #1
2. BEV Device #2

Option Values: <Available BEV Devices>

Help Text:

Set system boot order by selecting the boot option for this position.

Comments: Choose the order of booting among BEV Devices by choosing which available BEV Device should be in each position in the order.

Add EFI Boot Option

The Add EFI Boot Option screen allows the user to add an EFI boot option to the boot order. This screen is only available when there is at least one EFI bootable device present in the system configuration. The “Internal EFI Shell” Boot Option is permanent and cannot be added or deleted.

To access this screen from the *Main* screen, select **Boot Options > Add EFI Boot Option**. To move to another screen, press the <Esc> key to return to the **Boot Options** screen, then select the desired screen.

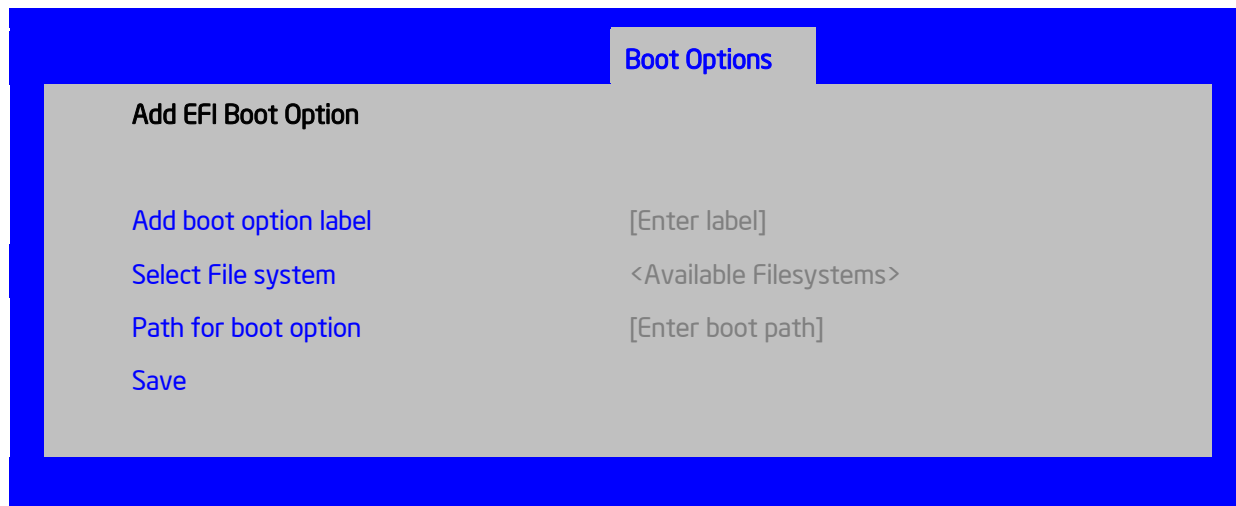


Figure 118. Add EFI Boot Option Screen

Screen Field Descriptions:

1. Add boot option label

Option Values: [Enter label]

Help Text:

Create the label for the new boot option.

Comments: This label becomes an abbreviation for this Boot Path.

2. Select File system

Option Values: <Available Filesystems>

Help Text:

Select one filesystem from this list.

Comments: Choose the filesystem on which this boot path resides.

3. Path for boot option

Option Values: [Enter Boot Path]

Help Text:

Enter the path to the boot option in the format \path\filename.efi.

Comments: This will be the Boot Path, residing on the filesystem chosen, which will be entered into the Boot Order with the Label entered above.

4. Save

Option Values: <None>

Help Text:

Save the boot option.

Comments: Selection only. This will save the new Boot Option into the Boot Order.

Delete EFI Boot Option

The Delete EFI Boot Option screen allows the user to remove an EFI boot option from the boot order. The “Internal EFI Shell” Boot Option will not be listed, since it is permanent and cannot be added or deleted.

To access this screen from the **Main** screen, select **Boot Options > Delete EFI Boot Option**. To move to another screen, press the <Esc> key to return to the **Boot Options** screen, then select the desired screen.



Figure 119. Delete EFI Boot Option Screen

Screen Field Descriptions:

1. Delete Boot Option

Option Values: <Available EFI Boot Options>

Help Text:

Select one to delete.

Comments: This will not allow a user to delete the EFI Shell.

Boot Manager Screen (Tab)

The Boot Manager screen allows the user to view a list of devices available for booting, and to select a boot device for immediately booting the system. There is no predetermined order for listing bootable devices. They are simply listed in order of discovery.

Regardless of whether any other bootable devices are available, the “Internal EFI Shell” will always be available,

Note that this list is ***not*** in order according to the system Boot Option order. Reordering Boot Devices or even removing them from the Boot Order completely has no effect on the Boot Manager.

To access this screen from the ***Main*** screen or other top-level “Tab” screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the ***Boot Manager*** screen is selected.

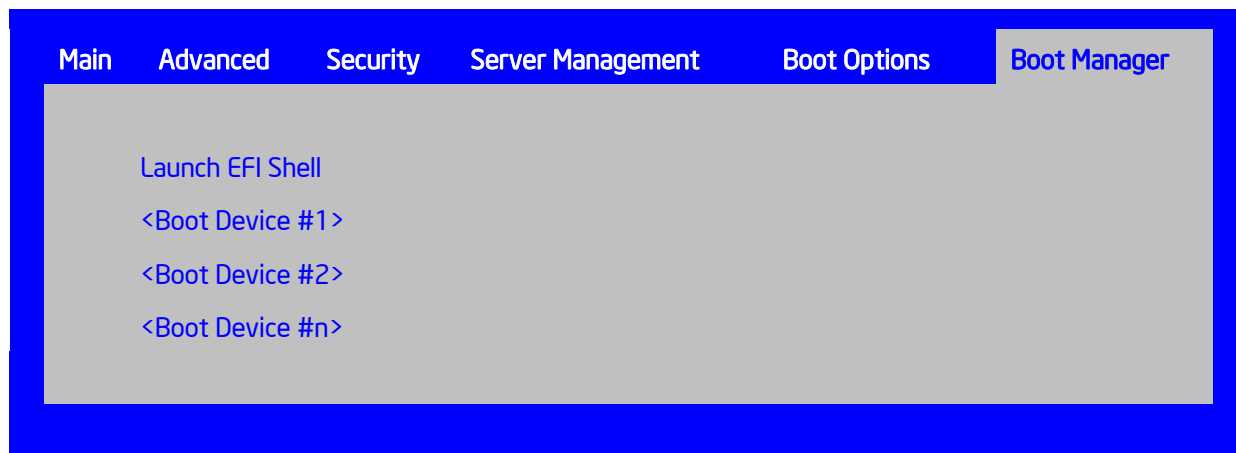


Figure 120. Boot Manager Screen

Screen Field Descriptions:

1. Launch EFI Shell

Option Values: <None>

Help Text:

Select this option to boot now.

***Note:** This list is not the system boot option order. Use the Boot Options menu to view and configure the system boot option order.*

Comments: The EFI Shell will always be present in the list of bootable devices.

2. <Boot Device #1>

3. <Boot Device #2>

4. <Boot Device #n>

Option Values: <None>

Help Text:

Select this option to boot now.

***Note:** This list is not the system boot option order. Use the Boot Options menu to view and configure the system boot option order.*

Comments: These are names of bootable devices discovered in the system. The system user can choose any of them from which to initiate a one-time boot – that is, booting from any device in this list will not permanently affect the defined system Boot Order.

These bootable devices are not displayed in any specified order, particularly not in the system Boot Order established by the Boot Options screen. This is just a list of bootable devices in the order in which they were enumerated.

Error Manager Screen (Tab)

The Error Manager screen displays any POST Error Codes encountered during BIOS POST, along with an explanation of the meaning of the Error Code in the form of a Help Text. This is an *Information Only* screen.

To access this screen from the *Main* screen or other top-level “Tab” screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the *Error Manager* screen is selected.



Figure 121. Error Manager Screen

Screen Field Descriptions:

1. ERROR CODE

Option Values: <POST Error Code>

Help Text: <N/A>

Comments: This is a POST Error Code – a BIOS-originated error that occurred during POST initialization.

2. SEVERITY

Option Values: Minor

Major
Fatal

Help Text: <N/A>

Comments: Each POST Error Code has a Severity associated with it. Refer to the list of POST Error Codes to determine the Severity – Fatal, Major, Minor

3. INSTANCE

Option Values: <Depends on error code>

Help Text: <N/A>

Comments: Where applicable, this field shows a value indicating which one of a group of components was responsible for generating the POST Error Code that is being reported.

4. DESCRIPTION

Option Values: <N/A>

Help Text: <Description of POST Error Code>

Comments: This is a description of the meaning of the POST Error Code that is being reported. This text actually appears in the screen space that is usually reserved for “Help” messages.

Save & Exit Screen (Tab)

The Save &Exit screen allows the user to choose whether to save or discard the configuration changes made on other Setup screens. It also allows the user to restore the BIOS settings to the factory defaults or to save or restore them to a set of user-defined default values. If Load Default Values is selected, the factory default settings (noted in bold in the Setup screen images) are applied. If Load User Default Values is selected, the system is restored to previously saved User Default Values. To access this screen from the *Main* screen or other top-level “Tab” screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the *Exit* screen is selected.

Note that there is a Legal Disclaimer footnote at the bottom of the Save & Exit screen:

*Certain brands and names may be claimed as the property of others.

This is reference to any instance in the Setup screens where names belonging to other companies may appear. For example “LSI*” appears in Setup in the context of Mass Storage RAID options.

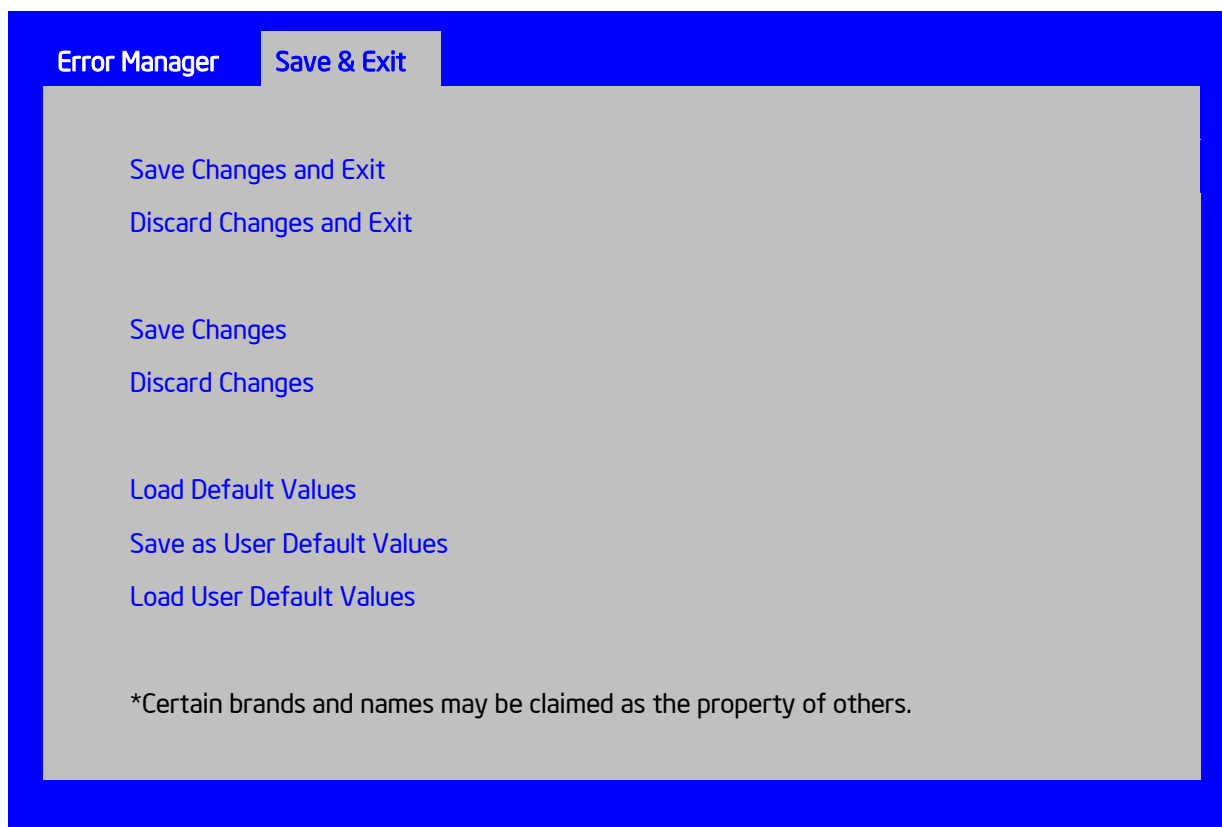


Figure 122. Save & Exit Screen

Screen Field Descriptions:**1. Save Changes and Exit**

Option Values: <None>

Help Text:

*Exit BIOS Setup Utility after saving changes. The system will reboot if required.
The [F10] key can also be used.*

Comments: Selection only. Position to this line and press the <Enter> key to exit Setup with any changes in BIOS settings saved. If there have been no changes made in the settings, the BIOS will resume executing POST.

If changes have been made in BIOS settings, a confirmation pop-up will appear. If the “Save Changes & Exit” action is positively confirmed,, any persistent changes will applied and saved to the BIOS settings in NVRAM storage, then the system will reboot if necessary (which is normally the case). If the “Save Changes & Exit” action is not confirmed, BIOS will resume executing Setup.

The <F10 > function key may also be used from anyplace in Setup to initiate a “Save Changes & Exit” action.

2. Discard Changes and Exit

Option Values: <None>

Help Text:

*Exit BIOS Setup Utility without saving changes.
The [Esc] key can also be used.*

Comments: Selection only. Position to this line and press the <Enter> key to exit Setup without saving any changes in BIOS settings. If there have been no changes made in the settings, the BIOS will resume executing POST.

If changes have been made in BIOS settings, a confirmation pop-up will appear. If the “Discard Changes & Exit” action is positively confirmed,, all pending changes will be discarded and BIOS will resume executing POST. If the “Discard Changes & Exit” action is not confirmed, BIOS will resume executing Setup without discarding any changes.

The <Esc > key may also be used in Setup to initiate a “Discard Changes & Exit” action.

3. Save Changes

Option Values: <None>

Help Text:

Save Changes made so far to any of the setup options.

Comments: Selection only. Position to this line and press the <Enter> key to save any pending changes in BIOS settings. If there have been no changes made in the settings,

Also, the user should be aware that most changes require a reboot to become active. If changes have been made and saved, without exiting Setup, the system should be rebooted later even if no additional changes are made.

4. Discard Changes

Option Values: <None>

Help Text:

Discard Changes made so far to any of the setup options.

Comments: Selection only. Position to this line and press the <Enter> key to discard any pending unsaved changes in BIOS settings. If there have been no changes made in the settings, the BIOS will resume executing POST.

If changes have been made in BIOS settings and not yet saved, a confirmation pop-up will appear. If the “Discard Changes” action is positively confirmed, all pending changes will be discarded and BIOS will resume executing POST. If the “Discard Changes” action is not confirmed, BIOS will resume executing Setup without discarding pending changes.

5. Load Default Values

Option Values: <None>

Help Text:

Load Defaults Values for all the setup options.

Comments: Selection only. Position to this line and press the <Enter> key to load default values for all BIOS settings. These are the initial factory settings (“failsafe” settings) for all BIOS parameters.

There will be a confirmation pop-up to verify that the user really meant to take this action.

After initializing all BIOS settings to default values, the BIOS will resume executing Setup, so the user may made additional changes in the BIOS settings if necessary (for example, Boot Order) before doing a “Save Changes and Exit” with a reboot to make the default settings take effect, including any changes made after loading the defaults.

The <F9> function key may also be used from anyplace in Setup to initiate a “Load Default Values” action.

6. Save as User Default Values

Option Values: <None>

Help Text:

Save the changes made so far as User Default Values.

Comments: *Selection only.* Position to this line and press the <Enter> key to save the current state of the settings for all BIOS parameters as a customized set of “User Default Values”.

These are a user-determined set of BIOS default settings that can be used as an alternative instead of the initial factory settings (“failsafe” settings) for all BIOS parameters.

By changing the BIOS settings to values that the user prefers to have for defaults, and then using this operation to save them as “User Default Values”, that version of BIOS settings can be restored at any time by using the following “Load User Default Values” operation.

There will be a confirmation popup to verify that the user really intended to take this action.

Loading the “factory default” values with F9 or the “Load Default Values” – or by any other means – does not affect the User Default Values. They remain set to whatever values they were saved as.

7. Load User Default Values

Option Values: <None>

Help Text:

Load the User Default Values to all the setup options.

Comments: *Selection only.* Position to this line and press the <Enter> key to load User Default Values for all BIOS settings. These are user-customized BIOS default settings for all BIOS parameters, previously established by doing a “Save User Defaults” action (see above).

There will be a confirmation popup to verify that the user really intended to take this action.

Appendix A: Technical Reference

Power Supply Input Voltages

750W power supply module

- 100 - 127 V at 50/60 Hz 8.2 A
- 200 - 240 V at 50/60 Hz 4.4 A

Power Supply Output Voltages

The following table lists the total wattage available from the power subsystem for each voltage. For information about calculating the power usage for your configuration, please use the Power Budget Tool.

Table 7. Power Supply Output Capability

Voltage	Maximum Current
12V	62.0A
12VSB	2.1A

System Environmental Limits

Table 8. System Environmental Limits

Parameter		Limits
Temperature		
	Operating	10° C to 35° C ¹ (50° F to 95° F) with the maximum rate of change not to exceed 10°C per hour
	Non-Operating	-40° C to 70° C (-40° F to 158° F)
Humidity		
	Non-Operating	50% to 90%, non-condensing with a maximum wet bulb of 28° C (at temperatures from 25° C to 35° C)
Shock		
	Operating	Half sine, 2g , 11 mSec
	Unpackaged	Trapezoidal, 25g , velocity change is based on packaged weight
	Packaged	<ul style="list-style-type: none"> ▪ Product Weight: ≥ 40 to < 80 ▪ Non-palletized Free Fall Height = 18 inches ▪ Palletized (single product) Free Fall Height = NA
Vibration		

Parameter		Limits			
	Unpackaged	5 Hz to 500 Hz 2.20 g RMS random			
	Packaged	5 Hz to 500 Hz 1.09 g RMS random			
AC-DC					
	Voltage	90 Hz to 132 V and 180 V to 264 V			
	Frequency	47 Hz to 63 Hz			
	Source Interrupt	No loss of data for power line drop-out of 12 mSec			
	Surge Non-operating and operating	Unidirectional			
	Line to earth Only	AC Leads	2.0 kV		
		I/O Leads	1.0 kV		
		DC Leads	0.5 kV		
ESD					
	Air Discharged	12.0 kV			
	Contact Discharge	8.0 kV			
Acoustics Sound Power Measured					
	Power in Watts	<300 W	≥300 W	≥600 W	≥1000 W
	Servers/Rack Mount BA	7.0	7.0	7.0	7.0

Note:

- Intel Corporation server boards contain a number of high-density VLSI and power delivery components that need adequate airflow to cool. Intel ensures through its own chassis development and testing that when Intel® server building blocks are used together, the fully integrated system will meet the intended thermal requirements of these components. It is the responsibility of the system integrator who chooses not to use Intel® developed server building blocks to consult vendor datasheets and operating parameters to determine the amount of airflow required for their specific application and environmental conditions. Intel Corporation cannot be held responsible, if components fail or the server board does not operate correctly when used outside any of its published operating or non-operating limits.

**DISCLAIMER NOTE**

Intel® ensures the unpackaged server board and system meet the shock requirement mentioned above through its own chassis development and system configuration. It is the responsibility of the system integrator to determine the proper shock level of the board and system if the system integrator chooses different system configuration or different chassis. Intel Corporation cannot be held responsible if components fail or the server board does not operate correctly when used outside any of its published operating or non-operating limits.

Appendix B: Regulatory and Compliance Information

Please refer to the Server Products Regulatory and Safety document for the product regulatory compliance reference. The document can be downloaded from <http://www.intel.com/support/server>.

Appendix C: Getting Help

If you encounter an issue with your server system, follow these steps to obtain support:

1. Visit the following Intel support web page:
<http://www.intel.com/support/>
This web page provides 24x7 support when you need it to get the latest and most complete technical support information on all Intel Enterprise Server and Storage Platforms. Information available at the support site includes:
 - Latest BIOS, firmware, drivers and utilities
 - Product documentation, installation and quick start guides
 - Full product specifications, technical advisories and errata
 - Compatibility documentation for memory, hardware add-in cards, chassis support matrix and operating systems
 - Server and chassis accessory parts list for ordering upgrades or spare parts
 - A searchable knowledgebase to search for product information throughout the support site
2. If you are still unable to obtain a solution to your issue, send an email to Intel's technical support center using the online form available at <http://www.intel.com/support/feedback.htm?group=server>.
3. Lastly, you can contact an Intel support representative using one of the support phone numbers available at <http://www.intel.com/support/feedback.htm?group=server> (charges may apply). Intel customer support suggests filling out the issue report form available at “[Intel® Server Issue Report Form](#)” to better service the issue.

Intel also offers Channel Program members around-the-clock 24x7 technical phone support on Intel® server boards, server chassis, server RAID controller cards, and Intel® Server Management at <http://www.intel.com/reseller/>.

Note: You will need to log in to the Reseller site to obtain the 24x7 number.

Warranty Information

To obtain warranty information, visit the following Intel web site:

<http://www.intel.com/support/warranty>

Appendix D: Intel® Server Issue Report Form

Issue Report Form (Rev 3.6)

Note: Filling out this form completely is required for any escalation.

Customer Contact Information:

Customer Support Case#:

Intel® Server Board or System:

(Example: S2600IP, R2000IP)

Server Chassis:

(Example P4000M. If third-party chassis used, indicate make and model.)

Base Board Information: (some information maybe found by accessing BIOS and going through the Server Management menu -> System Information)

Baseboard PBA/TA/AA # (Example: 123456-789):

- can be found on the white sticker label on the baseboard.

System BIOS Version:

Intel® Remote Management Module Firmware Version (if applicable):

BMC Version:

FRU/SDR Version:

Has the latest BIOS been tried? (Yes/No):

Has the latest BMC been tried? (Yes/No):

Has the latest RMM Firmware been tried? (Yes/No):

Has the latest FRU/SDR been tried? (Yes/No):

Processor information:

	Type	Speed	sSpec	Thermal Solution
Processor 1				
Processor 2				

Thermal solution (Heat sink) examples:

(1U, Passive w/air ducting, and so on)

Memory:

Manufacturer	Part Number	DRAM Part Number	On Intel tested list?

Add-in adapters (Example: NICs, Management Adapters, Serial Expansion Cards, PCI-Express* Adapters, RAID Controllers, SCSI Controllers, and so on):

Type	Slot	Manufacturer	Model	Firmware

Other third part hardware (Example: Example: KVM, Chassis, and so on):

Description/Use	Manufacturer	Model	Firmware

Storage Devices (Example: SCSI, SATA, SAS, USB, Tape, and so on):

Manufacturer	Model	Type	Size	Firmware	In Hot Swap Bay?

Operating System Information (Example: RedHat* Enterprise Linux, Microsoft* Windows* Server 2003, Service pack 1, OEM CD):

Manufacturer:

Version:

Language version (English, Arabic, Chinese (Simplified)):

Service Pack Level or Kernel Revision:

Distribution (OEM/Retail):

Intel® RAID Controller: (Example SRCU42E)

RAID controller part number (PBA number):

RAID controller firmware version:

Has the latest RAID firmware been tried? (Yes/No):

RAID driver version:

Has the latest RAID driver been tried? (Yes/No):

RAID volumes configuration (disks and RAID level):

RAID volume use (Boot device/Data Volume):

Is BBU (Battery Backup Unit) installed? (Yes/No):

BBU part number:

Detailed description of issue:

Troubleshooting tried:

Steps to replicate the issue:

Issue impact statements:

Do you have any potential Intel system, or component purchases that this issue is holding up? If yes, please provide a brief description below.

Do you have systems already purchased that are not being delivered to your customers because of this issue? If yes, please provide a brief description below.

Have you returned systems or components to your place of purchase because of this issue? If yes, please provide a brief description below.

*All other brands and names are property of their respective owners.