

# Intel<sup>®</sup> Server System P4000IP and Intel<sup>®</sup> Workstation System P4000CR Family Service Guide

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**A Guide for Technically Qualified Assemblers of Intel<sup>®</sup> identified  
Subassemblies/Products**

Order Number: G61542-002

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# Safety Information

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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

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## About this Manual

Thank you for purchasing and using the Intel® Server System P4000IP and Intel® Workstation System W4000CR family products.

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 board system, 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 P4000IP and Intel® Workstation System W4000CR family. For the latest version of this manual, refer to [http://www.intel.com/p/en\\_US/support](http://www.intel.com/p/en_US/support).

## Manual Organization

Chapter 1 provides a brief overview of the Intel® Server System P4000IP and Intel® Workstation System W4000CR family. In this chapter, you will find a list of the server system features, photos of the product, and product diagrams to help you identify 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, front panel board, and battery, among other components.

Chapter 3 provides technical reference information on cable routing, power supply specifications, and system environment requirements.

At the back of this document, you will find appendices on safety, “Getting Help”, and warranty information.

## Product Contents, Order Options, and Accessories

The Intel® Server System P4304CR2LFJN , P4304CR2LFJNL , P4304CR2LFGN , P4304CR2LFKN , P4216IP4LHJC , P4208IP4LHGC , P4308IP4LHJCL , P4308IP4LHJC , P4308IP4LHGC , P4224IP4LHKC , P4216IP4LHKC , P4308IP4LHKC are compatible with the following Intel® Server Boards and workstation Boards:

- Intel® Server Board S2600IP(L)
- Intel® Workstation Board W2600CR(L)

### **Your Intel® Workstation System P4304CR2LFJN (L) ships with the following items:**

- One Intel® Workstation Board W2600CR(L)
- One CRPS 1200W power supply, installed in the chassis
- One fixed system CPU zone fan, installed in the chassis
- One fixed system PCI zone fan, installed in the chassis
- Four fixed HDD carrier tray, installed in the chassis
- Front panel, installed in the chassis
- Front Bezel for fixed hard drive, EMI (Electro-Magnetic Interference) shield, 5.25” bay filler
- Pre-routing cables
- Two heatsinks

**Your Intel® Workstation System P4304CR2LFGN ships with the following items:**

- One Intel® Workstation Board W2600CR
- One CRPS 750W power supply, installed in the chassis
- One fixed system CPU zone fan, installed in the chassis
- One fixed system PCI zone fan, installed in the chassis
- Four fixed HDD carrier tray, installed in the chassis
- Front panel, installed in the chassis
- Front Bezel for fixed hard drive, EMI shield, 5.25" bay filler
- Pre-routing cables
- Two heatsinks

**Your Intel® Workstation System P4304CR2LFKN ships with the following items:**

- One Intel® Workstation Board W2600CR
- One CRPS 1600W power supply, installed in the chassis
- One fixed system CPU zone fan, installed in the chassis
- One fixed system PCI zone fan, installed in the chassis
- Four fixed HDD carrier tray, installed in the chassis
- Front panel, installed in the chassis
- Front Bezel for fixed hard drive, EMI shield, 5.25" bay filler
- Pre-routing cables
- Two heatsinks

**Your Intel® Server System P4216IP4LHJC ships with the following items:**

- One Intel® Server Board S2600IP
- Two CRPS 1200W power supply, installed in the chassis
- Five hot-swap redundant system fans, installed in the chassis
- 16\*2.5" hot-swap HDD cage with sixteen 2.5 HDD carrier, installed in the chassis
- Front panel, installed in the chassis
- Front Bezel for hot-swap hard drive, EMI shield, 5.25" bay filler
- Pre-routing cables
- Two heatsinks

**Your Intel® Server System P4208IP4LHGC ships with the following items:**

- One Intel® Server Board S2600IP
- Two CRPS 750W power supply, installed in the chassis
- Five hot-swap redundant system fans, installed in the chassis
- 8\*2.5" hot-swap HDD cage with eight 2.5 HDD carrier, installed in the chassis
- Front panel, installed in the chassis
- Front Bezel for hot-swap hard drive, EMI shield, 5.25" bay filler
- Pre-routing cables
- Two heatsinks

**Your Intel® Server System P4308IP4LHJC (L) ships with the following items:**

- One Intel® Server Board S2600IP(L)
- Two CRPS 1200W power supply, installed in the chassis
- Five hot-swap redundant system fans, installed in the chassis
- 8\*3.5" hot-swap HDD cage with eight 3.5 HDD carrier, installed in the chassis
- Front panel, installed in the chassis
- Front Bezel for hot-swap hard drive, EMI shield, 5.25" bay filler
- Pre-routing cables
- Two heatsinks

**Your Intel® Server System P4308IP4LHGC ships with the following items:**

- One Intel® Server Board S2600IP
- Two CRPS 750W power supply, installed in the chassis
- Five hot-swap redundant system fans, installed in the chassis
- 8\*3.5" hot-swap HDD cage with eight 3.5 HDD carrier, installed in the chassis
- Front panel, installed in the chassis
- Front Bezel for hot-swap hard drive, EMI shield, 5.25" bay filler
- Pre-routing cables
- Two heatsinks

**Your Intel® Server System P4224IP4LHKC ships with the following items:**

- One Intel® Server Board S2600IP
- Two CRPS 1600W power supply, installed in the chassis
- Five hot-swap redundant system fans, installed in the chassis
- 24\*2.5" hot-swap HDD cage with twenty four 2.5 HDD carrier, installed in the chassis
- Front panel, installed in the chassis
- Front Bezel for hot-swap hard drive, EMI shield, 5.25" bay filler
- Pre-routing cables
- Two heatsinks

**Your Intel® Server System P4216IP4LHKC ships with the following items:**

- One Intel® Server Board S2600IP
- Two CRPS 1600W power supply, installed in the chassis
- Five hot-swap redundant system fans, installed in the chassis
- 16\*2.5" hot-swap HDD cage with sixteen 2.5 HDD carrier, installed in the chassis
- Front panel, installed in the chassis
- Front Bezel for hot-swap hard drive, EMI shield, 5.25" bay filler
- Pre-routing cables
- Two heatsinks

**Your Intel® Server System P4308IP4LHKC ships with the following items:**

- One Intel® Server Board S2600IP
- Two CRPS 1600W power supply, installed in the chassis
- Five hot-swap redundant system fans, installed in the chassis



- 8\*3.5" hot-swap HDD cage with eight 3.5 HDD carrier, installed in the chassis
- Front panel, installed in the chassis
- Front Bezel for hot-swap hard drive, EMI shield, 5.25" bay filler
- Pre-routing cables
- Two heatsinks

In addition, you may need or want to purchase one or more of the following accessory items for your server:

- Processors
- Memory DIMMs
- Hard drives
- CD-ROM or DVD-ROM drive
- RAID controller
- Operating System

For information about compatible accessories, memory, processors, and third-party hardware and ordering information for Intel products, see: <http://www.intel.com/support>.

## Additional Information and Software

If you need more information about this product or information about the accessories that you can use with this server chassis, use the following resources. These files are available at: <http://www.intel.com/support>.

Unless otherwise indicated in the following table, once on this web page, type the document or software name in the search field at the left side of the screen and select the option to search "This Product".

<b>For this information or software</b>	<b>Use this Document or Software</b>
For in-depth technical information about this product.	<i>Intel® Server System P4000IP4 and Workstation System P2600CR2 Family Technical Product Specification</i> See the section on the web page titled, "Document and Guides".
If you just received this product and need to install it.	<i>Intel® Server System P4000IP and Workstation P2600CR2 System Family Quick Installation User Guide</i>
Accessories or other Intel® server products.	<i>Spares and Configuration Guide</i>
To quickly and efficiently select compatible components to design a complete system.	Intel® Server Configurator tool
Hardware (peripheral boards, adapter cards, and so on) and operating systems tested with this product.	Tested Hardware and Operating System List
To make sure your system falls within the allowed power budget.	Power Budget Analysis Tool
For software to manage your Intel® server.	Intel Server Management Software
For firmware and drivers.	Firmware and Drivers

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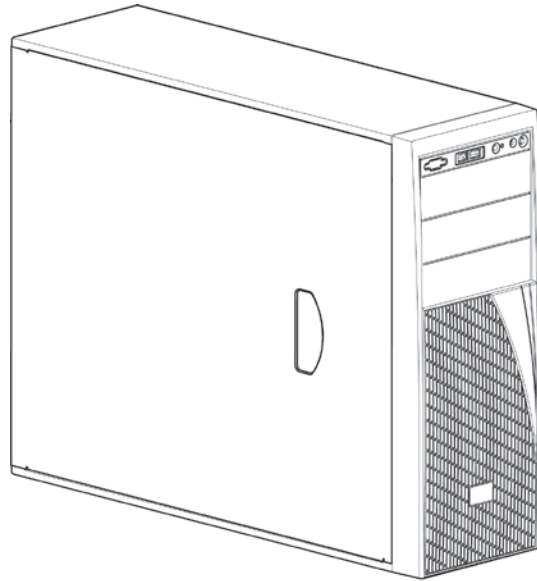
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# 1 Server Chassis Features

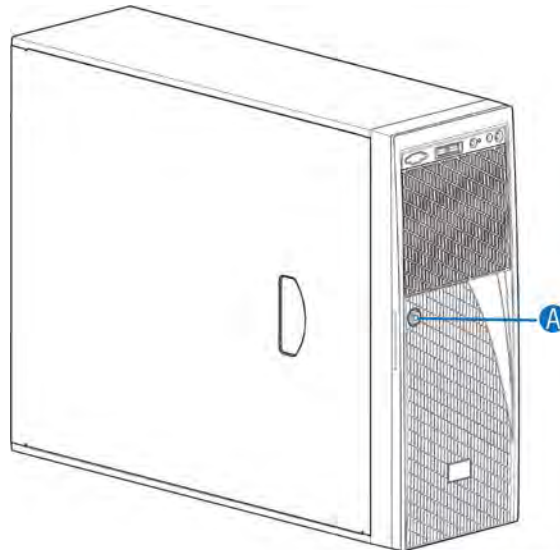
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This chapter briefly describes the main features of the Intel® Server System P4000IP4 and Intel® Server System P4000CR2 family. This chapter provides a list of the server System features, and diagrams showing the location of important components and connections on the server chassis.



AF003898

**Figure 1. Front Closed Chassis View of Fixed HDD Chassis**



AF003899

A. Security Lock

**Figure 2. Front Closed Chassis View of Hot-swap HDD Chassis**

**Table 1. Breakdown of Intel® Server System P4000IP family**

Intel® Server System	Configuration Intel® Server Board
Intel® Server System P4216IP4LHJC	Intel® Server board S2600IP
Intel® Server System P4208IP4LHGC	Intel® Server board S2600IP
Intel® Server System P4308IP4LHJCL	Intel® Server board S2600IP
Intel® Server System P4308IP4LHJC	Intel® Server board S2600IP
Intel® Server System P4308IP4LHGC	Intel® Server board S2600IP
Intel® Server System P4224IP4LHKC	Intel® Server board S2600IP
Intel® Server System P4216IP4LHKC	Intel® Server board S2600IP
Intel® Server System P4308IP4LHKC	Intel® Server board S2600IP

**Table 2. Breakdown of Intel® Workstation System P4000CR family**

Intel® Workstation System	Configuration Intel® Server Board
Intel® Workstation System P4304CR2LFJNL	Intel® Workstation board W2600CR
Intel® Workstation System P4304CR2LFJN	Intel® Workstation board W2600CR
Intel® Workstation System P4304CR2LFGN	Intel® Workstation board W2600CR
Intel® Workstation System P4304CR2LFKN	Intel® Workstation board W2600CR

**Table 3. Intel® Server System P4000IP Hot-Swap 3.5 HDDs configuration base feature**

Feature	P4308IP4LHGC	P4308IP4LHJC(L)	P4308IP4LHKC
Dimensions	<ul style="list-style-type: none"> <li>▪ 438mm high</li> <li>▪ 173mm wide</li> <li>▪ 697mm deep</li> </ul>		
Hard Drives	8*3.5 hot-swap driver cage		
Peripherals	Three multi-mount 5.25" peripheral bays		
Control Panel (dependent on option selected)	<ul style="list-style-type: none"> <li>▪ Front Panel</li> <li>▪ Intel® Local Control Panel (Optional)</li> </ul>		
LEDs and displays (dependent on option selected)	<ul style="list-style-type: none"> <li>▪ With Front Panel                             <ul style="list-style-type: none"> <li>○ NIC1 Activity</li> <li>○ NIC2 Activity</li> <li>○ NIC3 Activity</li> <li>○ NIC4 Activity</li> <li>○ Power/Sleep</li> <li>○ System Status</li> <li>○ System Chassis Identification</li> <li>○ Hard Drive Activity</li> </ul> </li> </ul>		
Power Supply	Two hot-swap 750W common redundant power supply	Two hot-swap 1200W common redundant power supply	Two hot-swap 1600W common redundant power supply
Fans	Five hot-swap system fans		
USB 2.0	<ul style="list-style-type: none"> <li>▪ Two front panel USB ports with Front Panel</li> <li>▪ Four Back panel USB ports</li> </ul>		
Video	One rear panel video port		

**Table 4. Intel® Server System P4000IP Hot-Swap 2.5 HDDs configuration base feature**

Feature	P4208IP4LHGC	P4216IP4LHJC	P4216IP4LHKC	P4224IP4LHKC
Dimensions	<ul style="list-style-type: none"> <li>▪ 438mm high</li> <li>▪ 173mm wide</li> <li>▪ 697mm deep</li> </ul>			
Hard Drives	One 8x2.5" Hot-swap HDD cage support up to 8x2.5" hot-swap HDDs	Two 8x2.5" Hot-swap HDD cage support up to 16x2.5" hot-swap HDDs	Two 8x2.5" Hot-swap HDD cage support up to 16x2.5" hot-swap HDDs	Three 8x2.5" Hot-swap HDD cage support up to 24x2.5" hot-swap HDDs
Peripherals	Three multi-mount 5.25" peripheral bays			One multi-mount 5.25" peripheral bays
Control Panel (dependent on option selected)	<ul style="list-style-type: none"> <li>▪ Front Panel</li> <li>▪ Intel® Local Control Panel (Optional)</li> </ul>			
LEDs and displays (dependent on option selected)	<ul style="list-style-type: none"> <li>▪ With Front Panel <ul style="list-style-type: none"> <li>○ NIC1 Activity</li> <li>○ NIC2 Activity</li> <li>○ NIC3 Activity</li> <li>○ NIC4 Activity</li> <li>○ Power/Sleep</li> <li>○ System Status</li> <li>○ System Chassis Identification</li> <li>○ Hard Drive Activity</li> </ul> </li> </ul>			
Power Supply	Two hot-swap 750W common redundant power supply	Two hot-swap 1200W common redundant power supply	Two hot-swap 1600W common redundant power supply	Two hot-swap 1600W common redundant power supply
Fans	Five hot-swap system fans			
USB 2.0	<ul style="list-style-type: none"> <li>▪ Two front panel USB ports with Front Panel</li> <li>▪ Four Back panel USB ports (depending on server/workstation board)</li> </ul>			
Video	One rear panel video port			

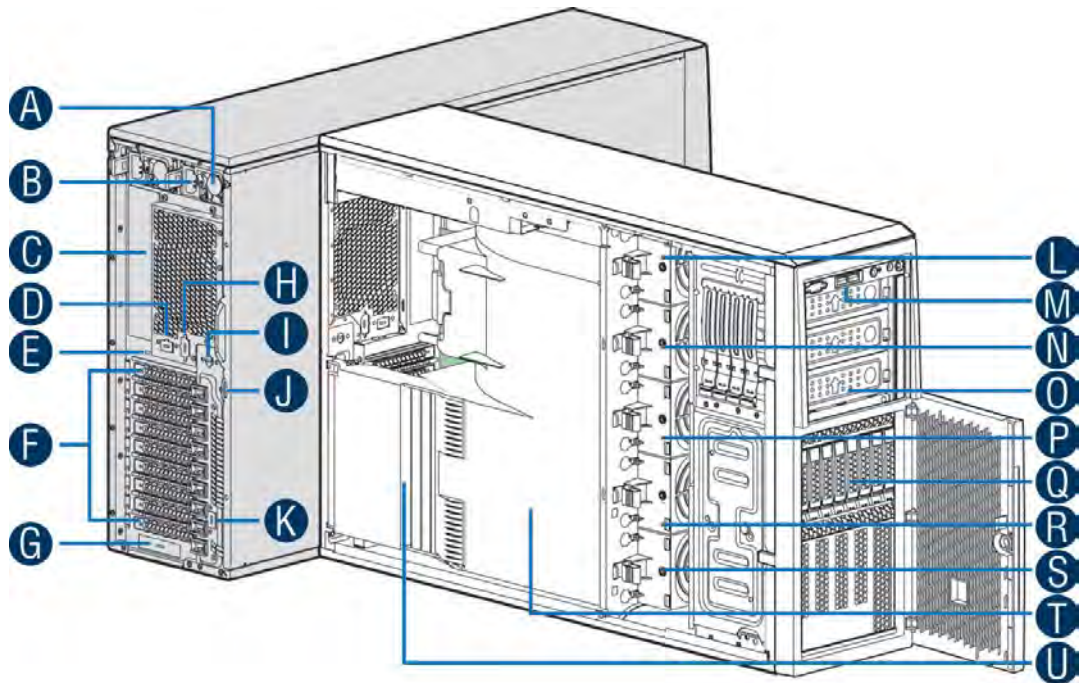
**Table 5. Intel® Workstation System P4000CR Fixed 3.5 HDDs configuration base feature**

Feature	P4304CR2LFGN	P4304CR2LFJN(L)	P4304CR2LFGN
Dimensions	<ul style="list-style-type: none"> <li>▪ 17.2 inches high</li> <li>▪ 6.8 inches wide</li> <li>▪ 25 inches deep (without bezel: 24.5 inches)</li> </ul>		
Hard Drives	Four Fixed 3.5" HDDs tray		
Peripherals	Three multi-mount 5.25 peripheral bays		
Control Panel (dependent on option selected)	<ul style="list-style-type: none"> <li>▪ Front Panel</li> <li>▪ Intel® Local Control Panel (Optional)</li> </ul>		
LEDs and displays (dependent on option selected)	<ul style="list-style-type: none"> <li>▪ With Front Panel <ul style="list-style-type: none"> <li>○ NIC1 Activity</li> <li>○ NIC2 Activity</li> <li>○ NIC3 Activity (no functional)</li> <li>○ NIC4 Activity (no functional)</li> <li>○ Power/Sleep</li> </ul> </li> </ul>		

Feature	P4304CR2LFGN	P4304CR2LFJN(L)	P4304CR2LFKN
	<ul style="list-style-type: none"> <li>○ System Status</li> <li>○ System Chassis Identification</li> <li>○ Hard Drive Activity</li> </ul>		
Power Supply	Two hot-swap 750W common redundant power supply	Two hot-swap 1200W common redundant power supply	Two hot-swap 1600W common redundant power supply
Fans	<ul style="list-style-type: none"> <li>▪ One fixed system CPU zone fan</li> <li>▪ One fixed system PCI zone fan</li> </ul>		
USB 2.0 and USB 3.0	<ul style="list-style-type: none"> <li>▪ Two front panel USB ports with Front Panel</li> <li>▪ Two Back panel USB ports</li> <li>▪ Two Back panel USB 3.0 ports</li> </ul>		
Video	One onboard internal video header		

## Component Identification

### Intel® Server System P4208IP4LHGC View



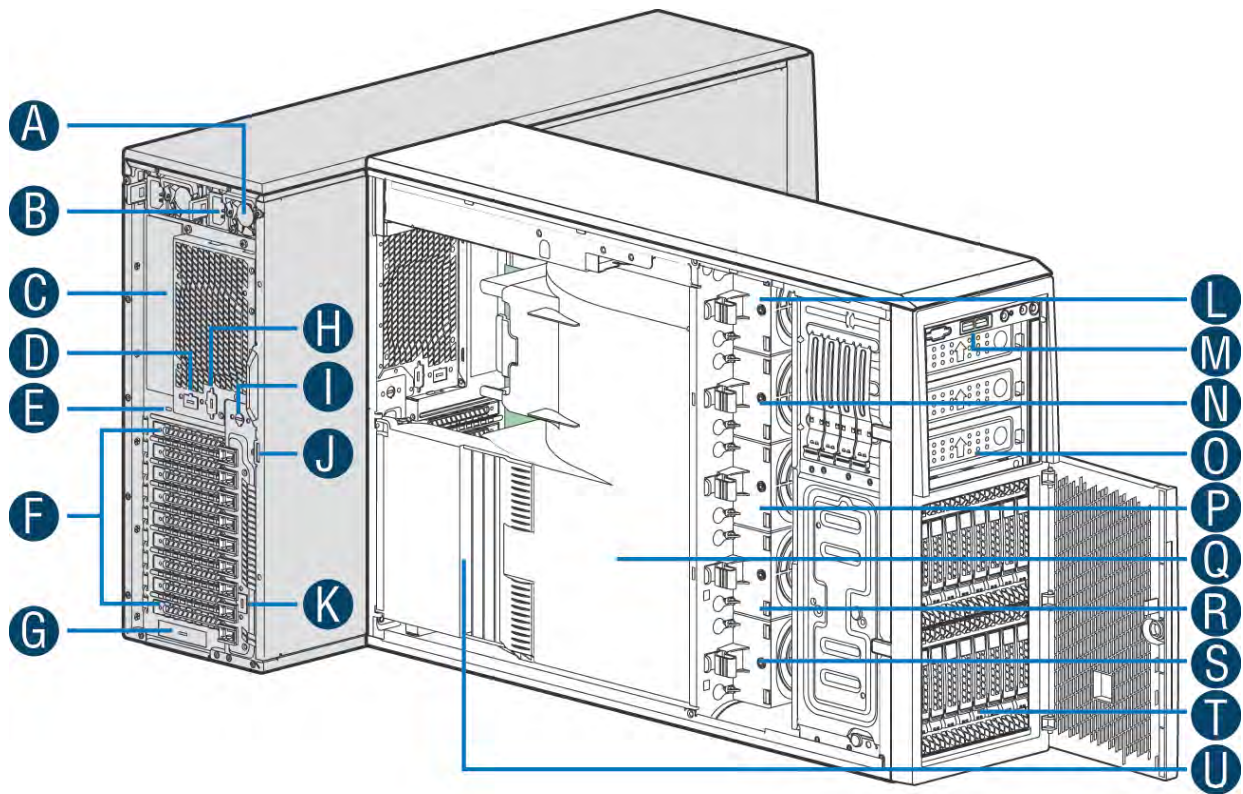
AF005134

- A. 750W CRPS Power supply
- B. AC Input Power connector
- C. I/O ports
- D. Serial port knockout
- E. A Kensington cable lock mounting hole
- F. PCI Add-in card slot covers
- G. IO module slot cover

- H. Alternate knockout
- I. Opening for SPDIF cable
- J. Padlock loop
- K. RMM4 knockout
- L. Hot swap system fan 5
- M. Front panel
- N. Hot swap system fan 4
- O. 5.25" peripheral bays
- P. Hot swap system fan 3
- Q. One 8x2.5" Hot-swap HDD Cage
- R. Hot swap system fan 2
- S. Hot swap system fan 1
- T. Air duct
- U. PCI card retainer

Figure 3. Internal Chassis View of Intel® Server System P4208IP4LHGC

### Intel® Server System P4216IP4LHJC View



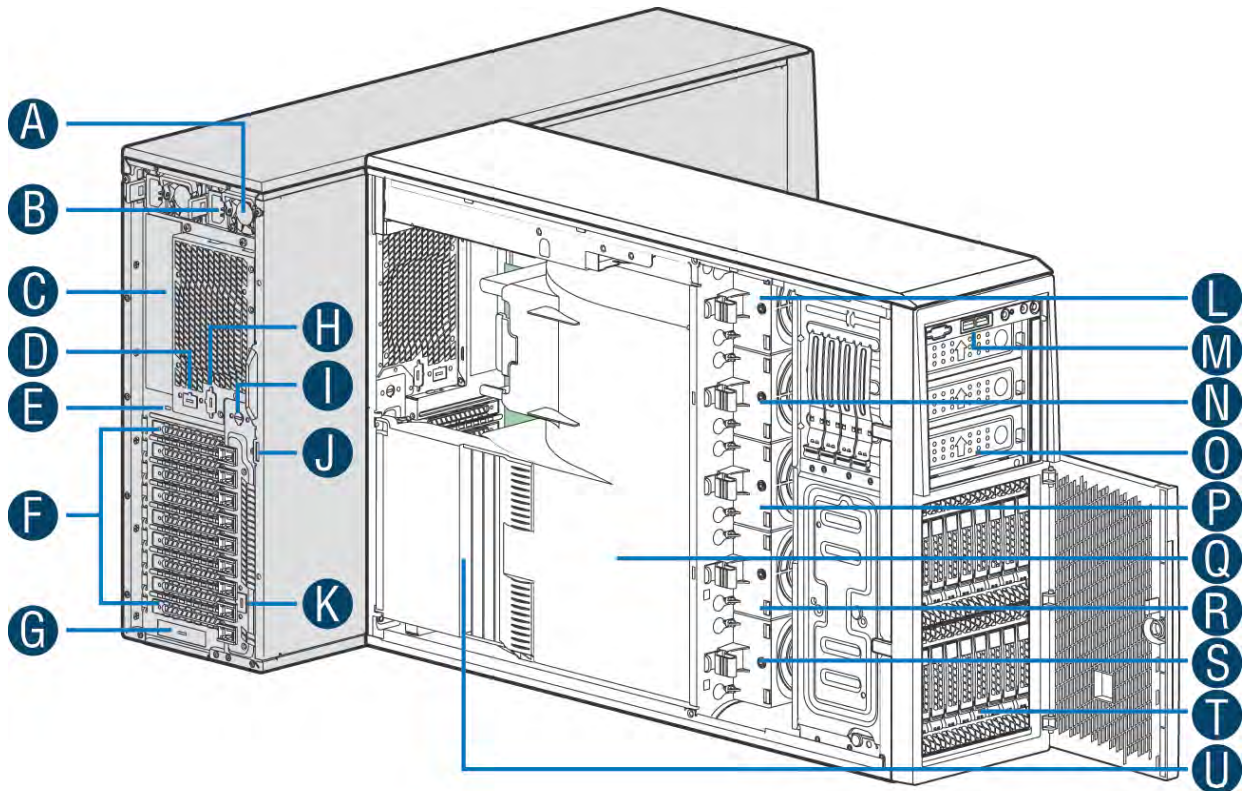
AF004945

- A. 1200W CRPS Power supply
- B. AC Input Power connector
- C. I/O ports
- D. Serial port knockout
- E. A Kensington cable lock mounting hole
- F. PCI Add-in card slot covers
- G. IO module slot cover
- H. Alternate knockout

- I. Opening for SPDIF cable
- J. Padlock loop
- K. RMM4 knockout
- L. Hot swap system fan 5
- M. Front panel
- N. Hot swap system fan 4
- O. 5.25" peripheral bays
- P. Hot swap system fan 3
- Q. Air duct
- R. Hot swap system fan 2
- S. Hot swap system fan 1
- T. Two 8x2.5" Hot-swap HDD Cage
- U. PCI card retainer

Figure 4. Internal Chassis View of Intel® Server System P4216IP4LHJC

### Intel® Server System P4216IP4LHJC View



AF004945

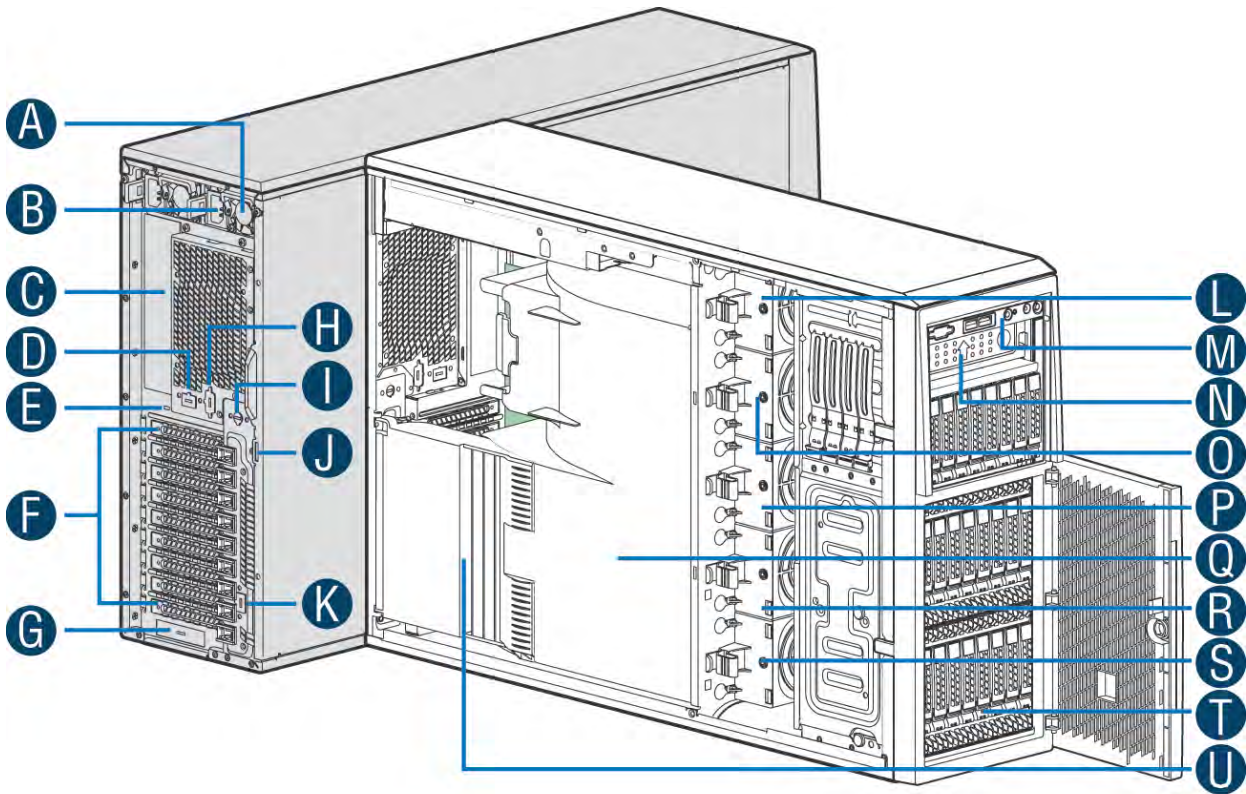
- A. 1600W CRPS Power supply
- B. AC Input Power connector
- C. I/O ports
- D. Serial port knockout
- E. A Kensington cable lock mounting hole
- F. PCI Add-in card slot covers
- G. IO module slot cover
- H. Alternate knockout
- I. Opening for SPDIF cable



- J. Padlock loop
- K. RMM4 knockout
- L. Hot swap system fan 5
- M. Front panel
- N. Hot swap system fan 4
- O. 5.25" peripheral bays
- P. Hot swap system fan 3
- Q. Air duct
- R. Hot swap system fan 2
- S. Hot swap system fan 1
- T. Two 8x2.5" Hot-swap HDD Cage
- U. PCI card retainer

Figure 5. Internal Chassis View of Intel® Server System P4216IP4LHKC

### Intel® Server System P4224IP4LHKC View



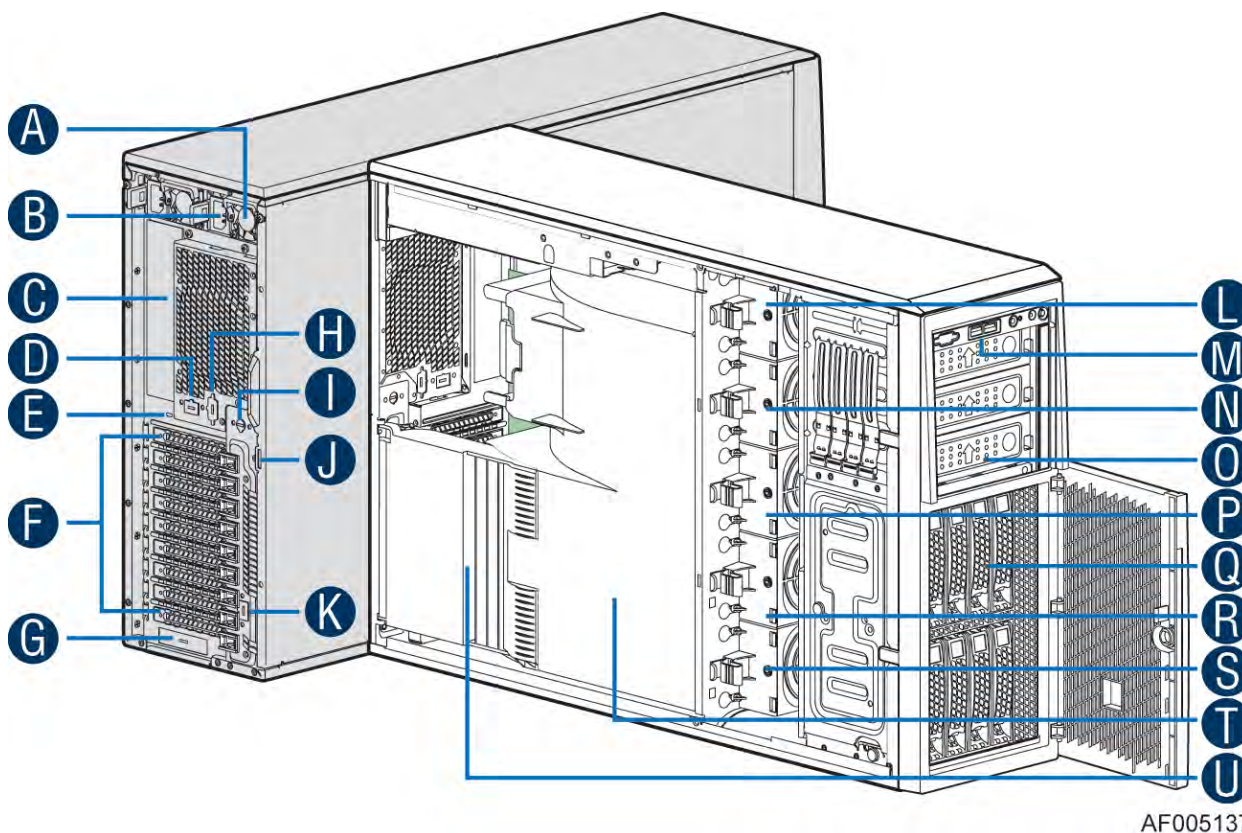
AF005135

- A. 1600W CRPS Power supply
- B. AC Input Power connector
- C. I/O ports
- D. Serial port knockout
- E. A Kensington cable lock mounting hole
- F. PCI Add-in card slot covers
- G. IO module slot cover
- H. Alternate knockout
- I. Opening for SPDIF cable
- J. Padlock loop

- K. RMM4 knockout
- L. Hot swap system fan 5
- M. Front panel
- N. 5.25" peripheral bays
- O. Hot swap system fan 4
- P. Hot swap system fan 3
- Q. Air duct
- R. Hot swap system fan 2
- S. Hot swap system fan 1
- T. Three 8x2.5" Hot-swap HDD Cage
- U. PCI card retainer

Figure 6. Internal Chassis View of Intel® Server System P4224IP4LHKC

### Intel® Server System P4308IP4LHGC View



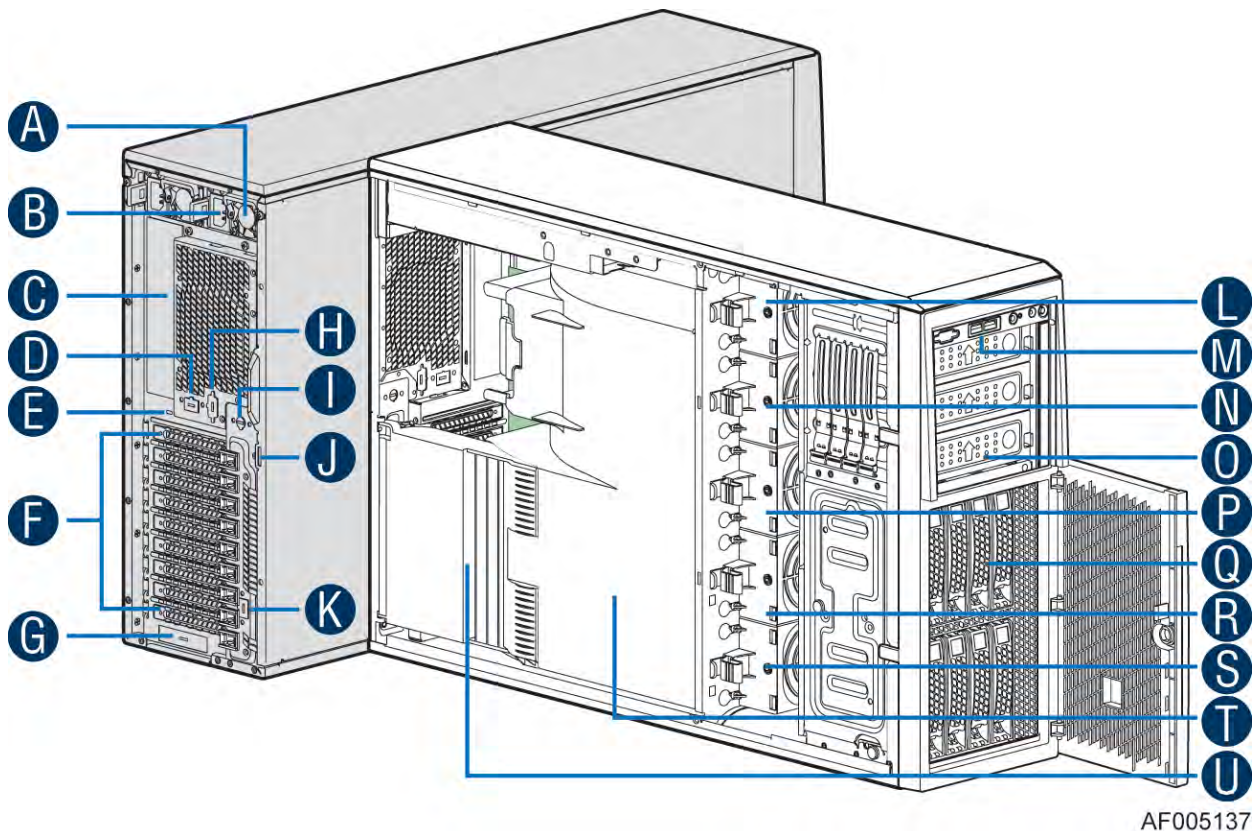
AF005137

- A. 750W CRPS Power supply
- B. AC Input Power connector
- C. I/O ports
- D. Serial port knockout
- E. A Kensington cable lock mounting hole
- F. PCI Add-in card slot covers
- G. IO module slot cover
- H. Alternate knockout

- I. Opening for SPDIF cable
- J. Padlock loop
- K. RMM4 knockout
- L. Hot swap system fan 5
- M. Front panel
- N. Hot swap system fan 4
- O. 5.25" peripheral bays
- P. Hot swap system fan 3
- Q. One 8x3.5" Hot-swap HDD Cage
- R. Hot swap system fan 2
- S. Hot swap system fan 1
- T. Air duct
- U. PCI card retainer

Figure 7. Internal Chassis View of Intel® Server System P4308IP4LHGC

### Intel® Server System P4308IP4LHJC(L) View

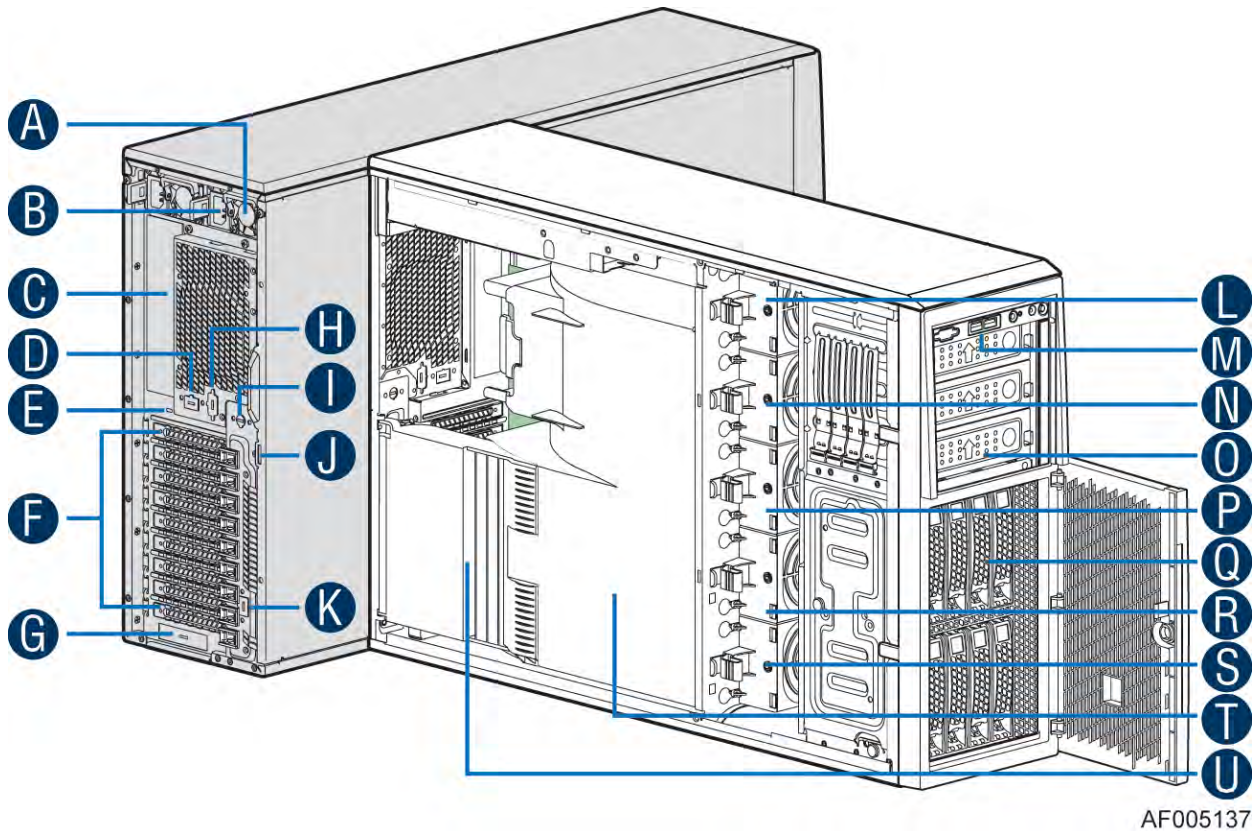


- A. 1200W CRPS Power supply
- B. AC Input Power connector
- C. I/O ports
- D. Serial port knockout
- E. A Kensington cable lock mounting hole
- F. PCI Add-in card slot covers
- G. IO module slot cover
- H. Alternate knockout

- I. Opening for SPDIF cable
- J. Padlock loop
- K. RMM4 knockout
- L. Hot swap system fan 5
- M. Front panel
- N. Hot swap system fan 4
- O. 5.25" peripheral bays
- P. Hot swap system fan 3
- Q. One 8x3.5" Hot-swap HDD Cage
- R. Hot swap system fan 2
- S. Hot swap system fan 1
- T. Air duct
- U. PCI card retainer

Figure 8. Internal Chassis View of Intel® Server System P4308IP4LHJC

### Intel® Server System P4308IP4LHJC View



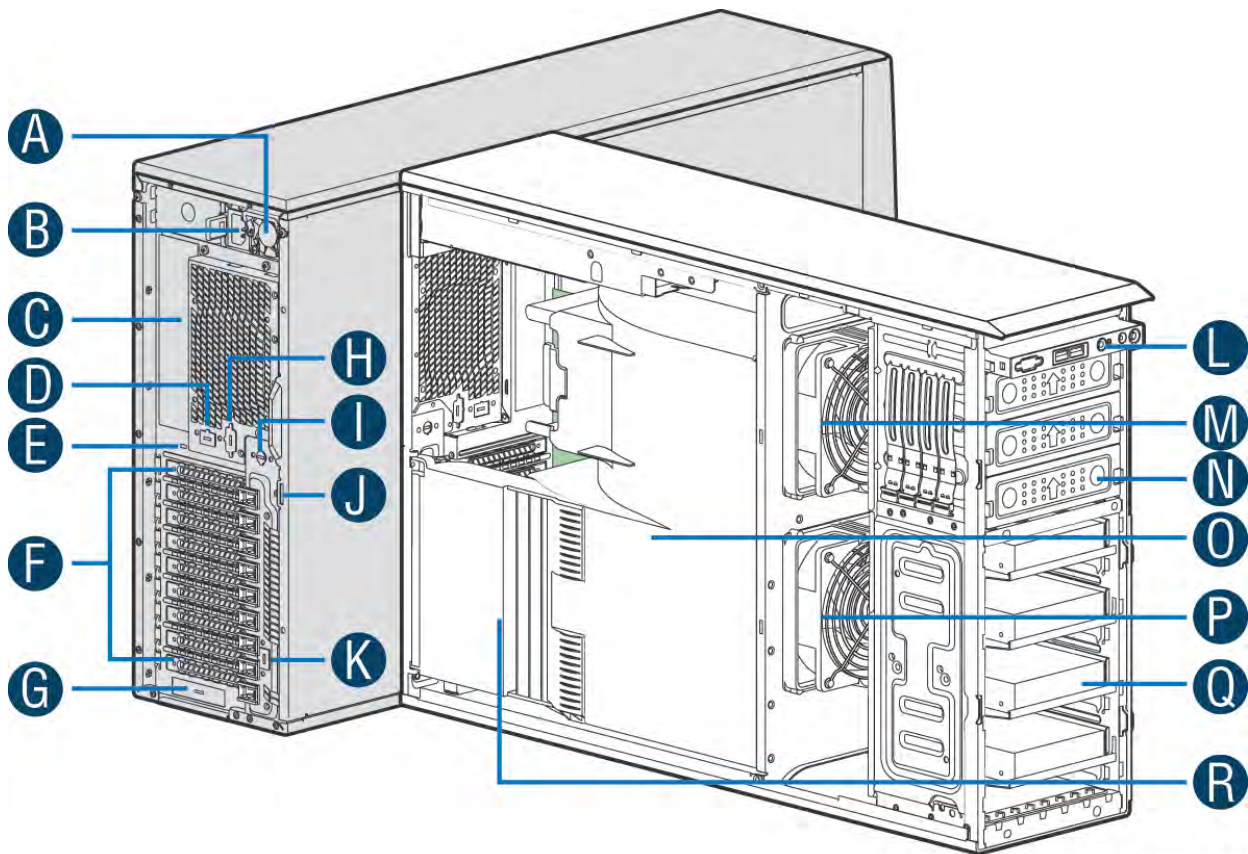
AF005137

- A. 1600W CRPS Power supply
- B. AC Input Power connector
- C. I/O ports
- D. Serial port knockout
- E. A Kensington cable lock mounting hole
- F. PCI Add-in card slot covers
- G. IO module slot cover
- H. Alternate knockout

- I. Opening for SPDIF cable
- J. Padlock loop
- K. RMM4 knockout
- L. Hot swap system fan 5
- M. Front panel
- N. Hot swap system fan 4
- O. 5.25" peripheral bays
- P. Hot swap system fan 3
- Q. One 8x3.5" Hot-swap HDD Cage
- R. Hot swap system fan 2
- S. Hot swap system fan 1
- T. Air duck
- U. PCI card retainer

Figure 9. Internal Chassis View of Intel® Server System P4308IP4LHKC

### Intel® Workstation System P4304CR2LFGN View



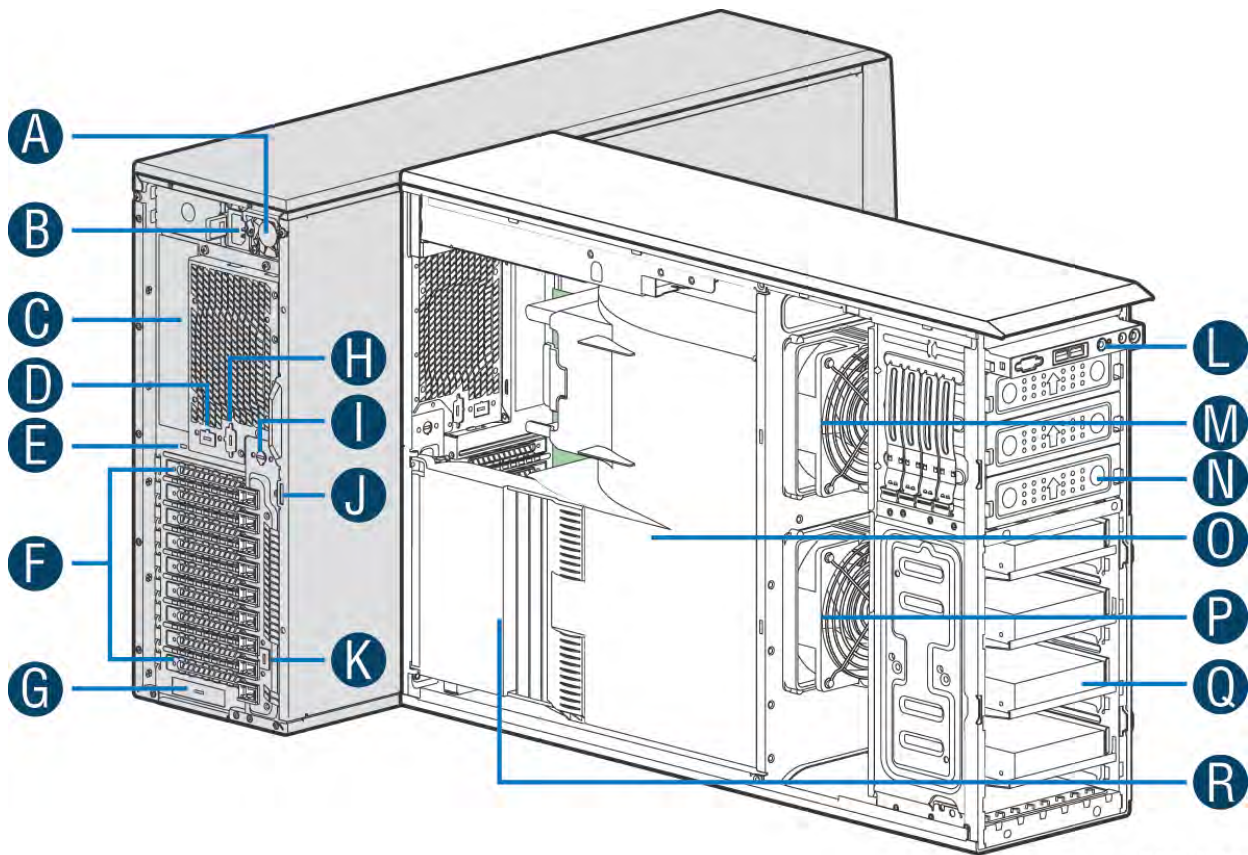
AF004944

- A. 750W CRPS Power supply
- B. AC Input Power connector
- C. I/O ports
- D. Serial port knockout
- E. A Kensington cable lock mounting hole
- F. PCI Add-in card slot covers

- G. IO module slot cover
- H. Alternate knockout
- I. Opening for SPDIF cable
- J. Padlock loop
- K. RMM4 knockout
- L. Front panel
- M. CPU zone system fan(fan 2)
- N. 5.25" peripheral bays
- O. Air duck
- P. PCI zone system fan(fan 1)
- Q. Fixed Hard driver carrier tray
- R. PCI card retainer

Figure 10. Internal Chassis View of Intel® Workstation System P4304CR2LFGN

### Intel® Workstation System P4304CR2LFJN(L) View



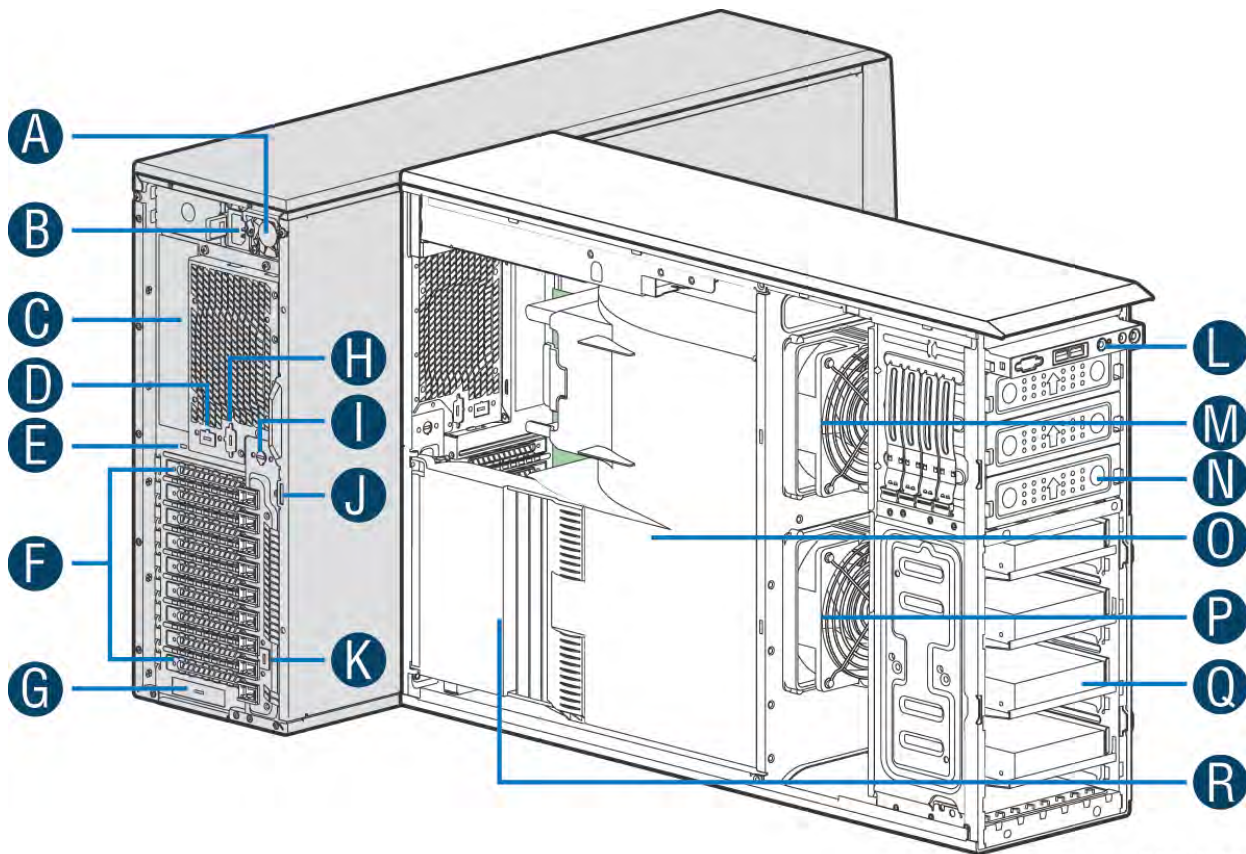
AF004944

- A. 1200W CRPS Power supply
- B. AC Input Power connector
- C. I/O ports
- D. Serial port knockout
- E. A Kensington cable lock mounting hole
- F. PCI Add-in card slot covers
- G. IO module slot cover

- H. Alternate knockout
- I. Opening for SPDIF cable
- J. Padlock loop
- K. RMM4 knockout
- L. Front panel
- M. CPU zone system fan (fan 2)
- N. 5.25" peripheral bays
- O. Air duck
- P. PCI zone system fan (fan 1)
- Q. Fixed Hard driver carrier tray
- R. PCI card retainer

Figure 11. Internal Chassis View of Intel® Workstation System P4304CR2LFJN

### Intel® Workstation System P4304CR2LFKN View



AF004944

- A. 1600W CRPS Power supply
- B. AC Input Power connector
- C. I/O ports
- D. Serial port knockout
- E. A Kensington cable lock mounting hole
- F. PCI Add-in card slot covers
- G. IO module slot cover
- H. Alternate knockout

- I. Opening for SPDIF cable
- J. Padlock loop
- K. RMM4 knockout
- L. Front panel
- M. CPU zone system fan(fan 2)
- N. 5.25" peripheral bays
- O. Air duck
- P. PCI zone system fan(fan 1)
- Q. Fixed Hard driver carrier tray
- R. PCI card retainer

Figure 12. Internal Chassis View of Intel® Workstation System P4304CR2LFKN

## Front Panel

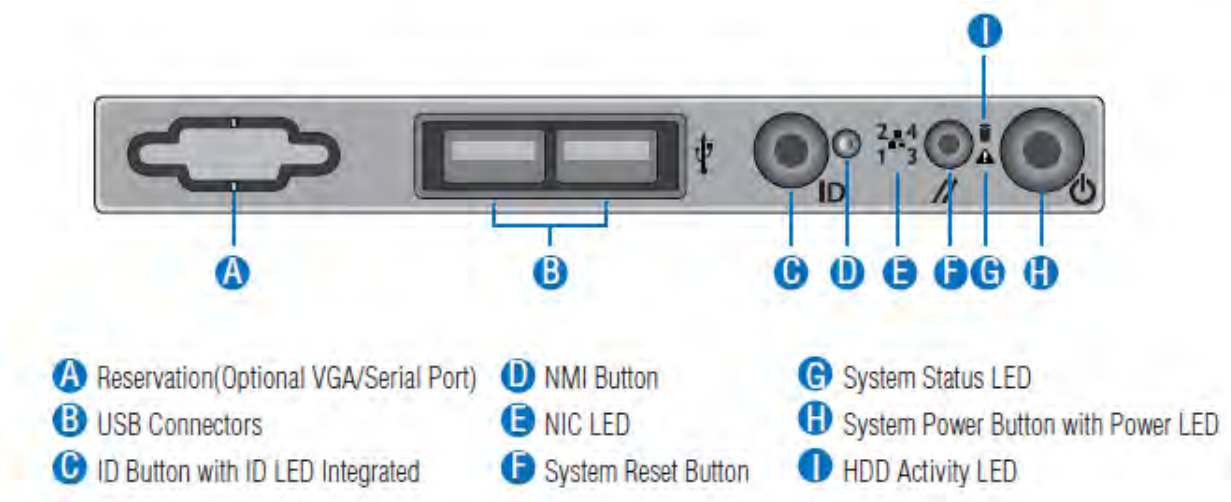


Figure 13. Front Panel Controls and Indicators

Descriptions of the front panel LEDs are listed in the following table. See your server/workstation documentation for functionality of the buttons.

Table 6. Front Panel LED Functionality

LED	Color	Condition	What It Means
Power/Sleep	Green	On	Power on or S0 sleep.
	Green	Blink	S1 sleep or S3 standby only for workstation baseboards.
		Off	Off (also sleep S4/S5 modes).
Status	Green	On	System ready/No alarm.
	Green	Blink	System ready, but degraded: redundancy lost such as PS or fan failure; non-critical temp/voltage threshold; battery failure; or predictive PS failure.
	Amber	On	Critical alarm: Voltage, thermal, or power fault; CPU missing; insufficient power unit redundancy resource offset asserted.
	Amber	Blink	Non-Critical failure: Critical temp/voltage threshold; VDR hot asserted; min number fans not present or failed.



LED	Color	Condition	What It Means
		Off	AC power off: System unplugged. AC power on: System powered off and in standby, no prior degraded/non-critical/critical state.
Global HDD Activity	Green	Blink	HDD access.
		Off	No access and no fault.
LAN 1-4 Activity/Link	Green	On	LAN link
	Green	Blink	LAN access.
		Off	Idle.
Chassis Identification	Blue	On	Front panel chassis ID button pressed.
	Blue	Blink	Unit selected for identification by software.
		Off	No identification.

## / NOTE

*This is dependent on server board support. Not all server boards support all features. For additional details about front panel functions supported for a specific board, refer to the individual server board specifications.*

## Rack-mounted Systems

Your Intel® Server System P4000IP and Intel® Workstation System P4000CR family can be mounted into a rack. Intel® provides a tool-less rail kit and a cable management arm to mount this server chassis into a rack. When installing the chassis into a rack, Intel® recommends you install systems from the bottom of the rack to the top. In other words, install the first system in the rack into the bottom position of the rack, the second system in the second position from the bottom, and so on. Instructions for installing your chassis into a rack are included in the rail kit.

**CAUTION: THE MAXIMUM RECOMMENDED SERVER WEIGHT FOR THE RACK RAILS CAN BE FOUND at <http://www.intel.com/support/motherboards/server/sb/CS-033655.htm>. EXCEEDING THE MAXIMUM RECOMMENDED WEIGHT OR MISALIGNMENT OF THE SERVER MAY RESULT IN FAILURE OF THE RACK RAILS HOLDING THE SERVER. Use of a mechanical assist to install and align server into the rack rails is recommended.**

## 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.

Intel® Server System P4000IP and Intel® Workstation System P4000CR family provide two Intel® Remote Management Module 4 knockout. But please use recommended position close to slot2. For instructions on installing the Intel® Remote Management Module 4, see *Intel® Remote Management Module 4 User Guide*.

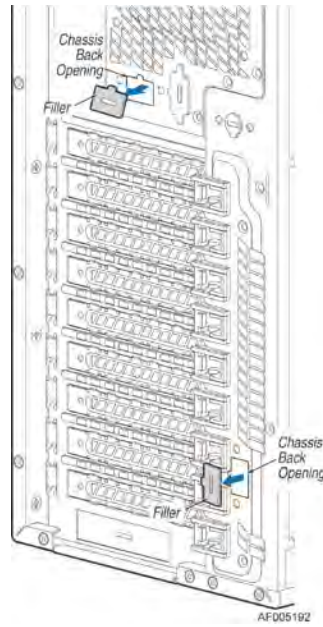


Figure 14. RMM4 knockout

## Mechanical Locks

All configurations of the server chassis can support the installation of a padlock loop at the rear of the chassis.

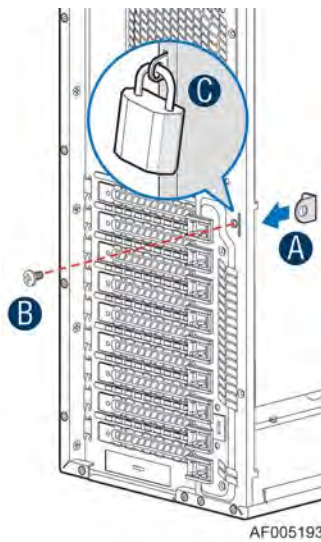


Figure 15. Mechanical Locks

## 2 Hardware Installations and Upgrades

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### Before You Begin

Before working with your server product, pay close attention to the Safety Information

This document provides instructions for adding and replacing chassis components. For instructions on replacing components on the server board, such as the processor and memory DIMMs, see the instructions provided with the server/workstation board.

### Tools and Supplies Needed

- Phillips\* (cross head) screwdriver (#1 bit and #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.

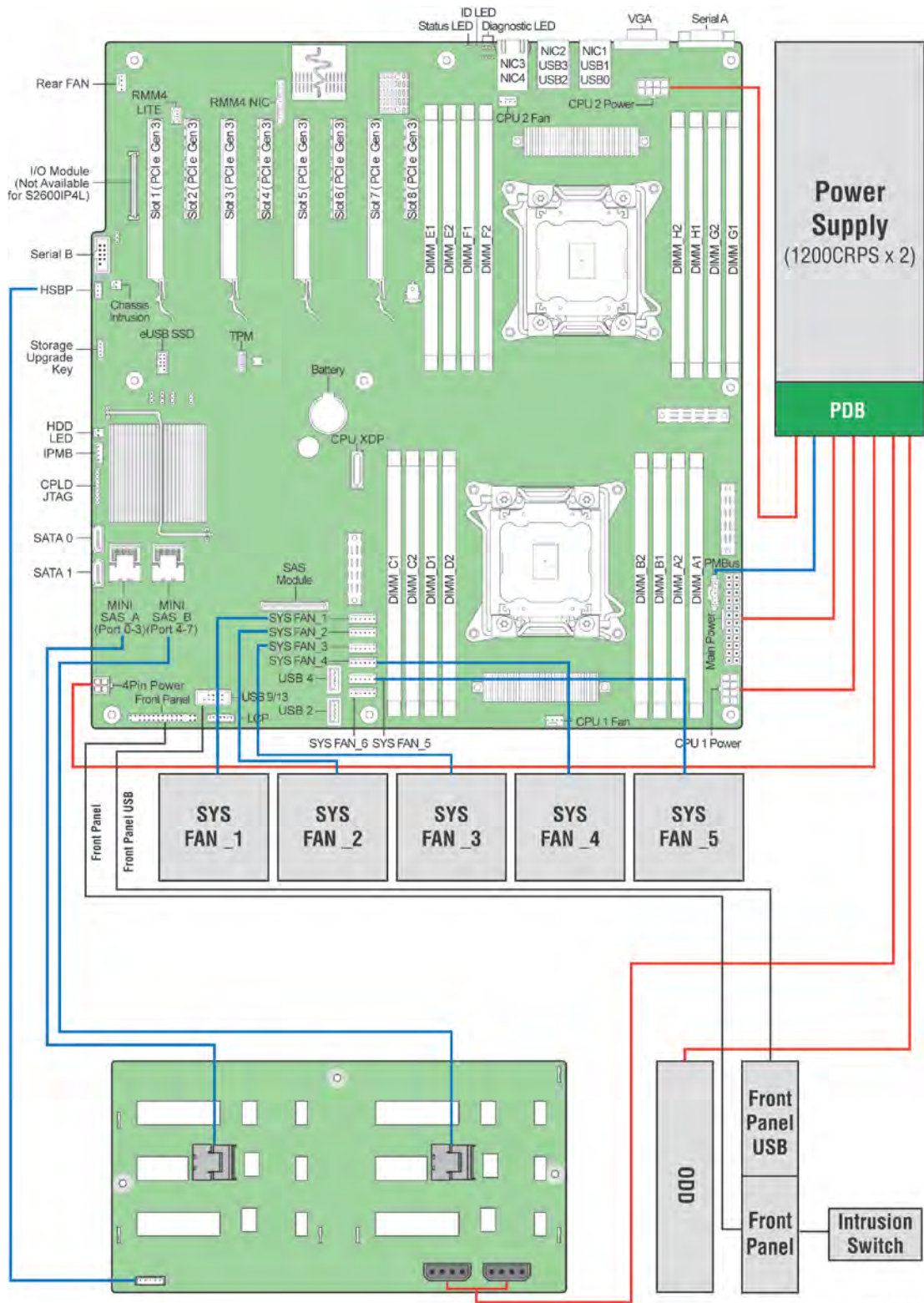
### Cable Routing Recommendations

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**

*To activate the port SATA/SAS 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.*

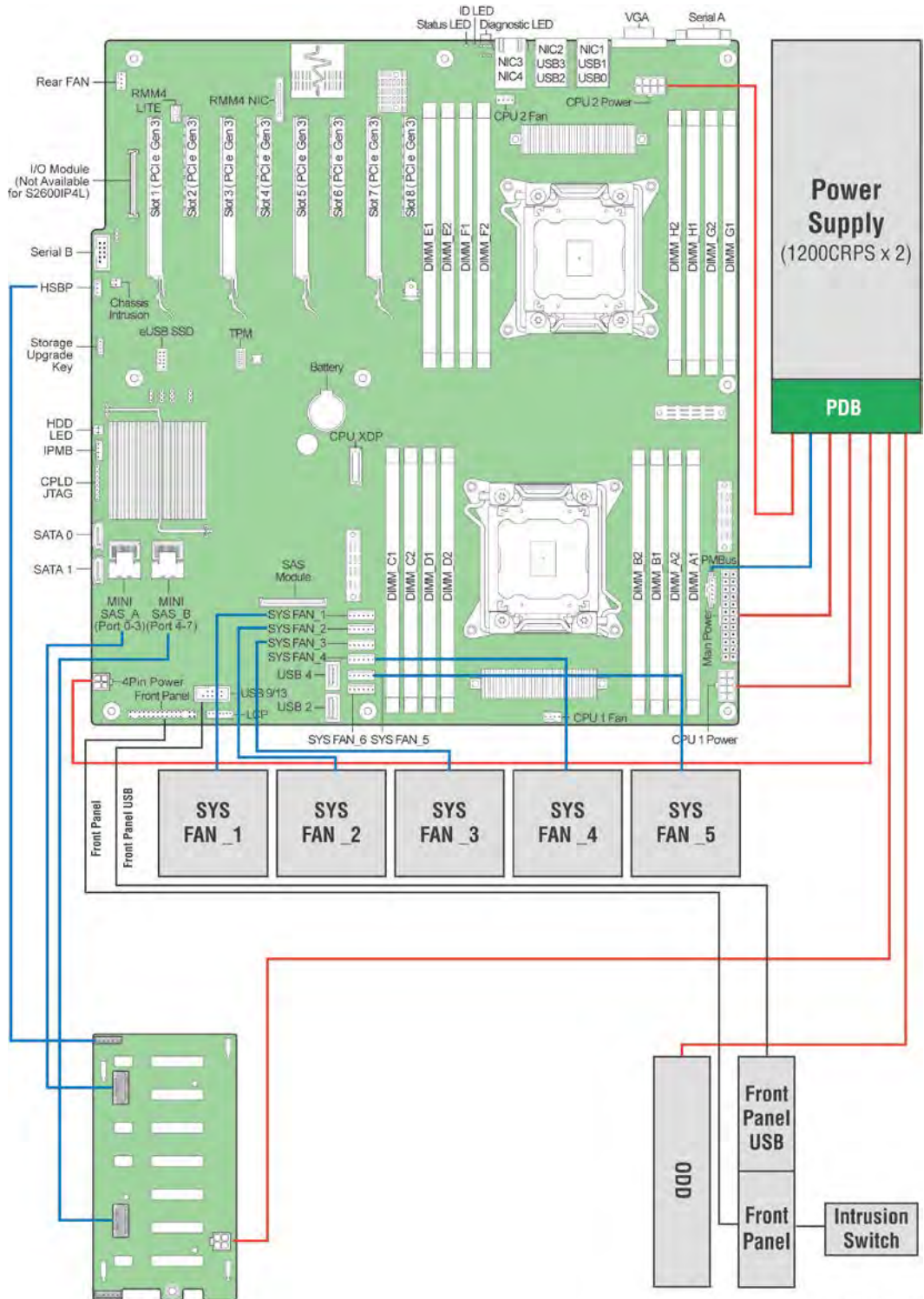
Cable connections for 8 x 3.5 Hot Swap Hard drivers configuration:



AF005559

Figure 16. Cable connections for 8 x 3.5 Hot Swap Hard drivers configuration

Cable routing for 8 x 2.5 Hot Swap Hard drivers configuration:



AF005499

Figure 17. Cable connections for 8 x 2.5 Hot Swap Hard drivers configuration

Cable connections for 16 x 2.5 Hot Swap Hard drivers configuration:

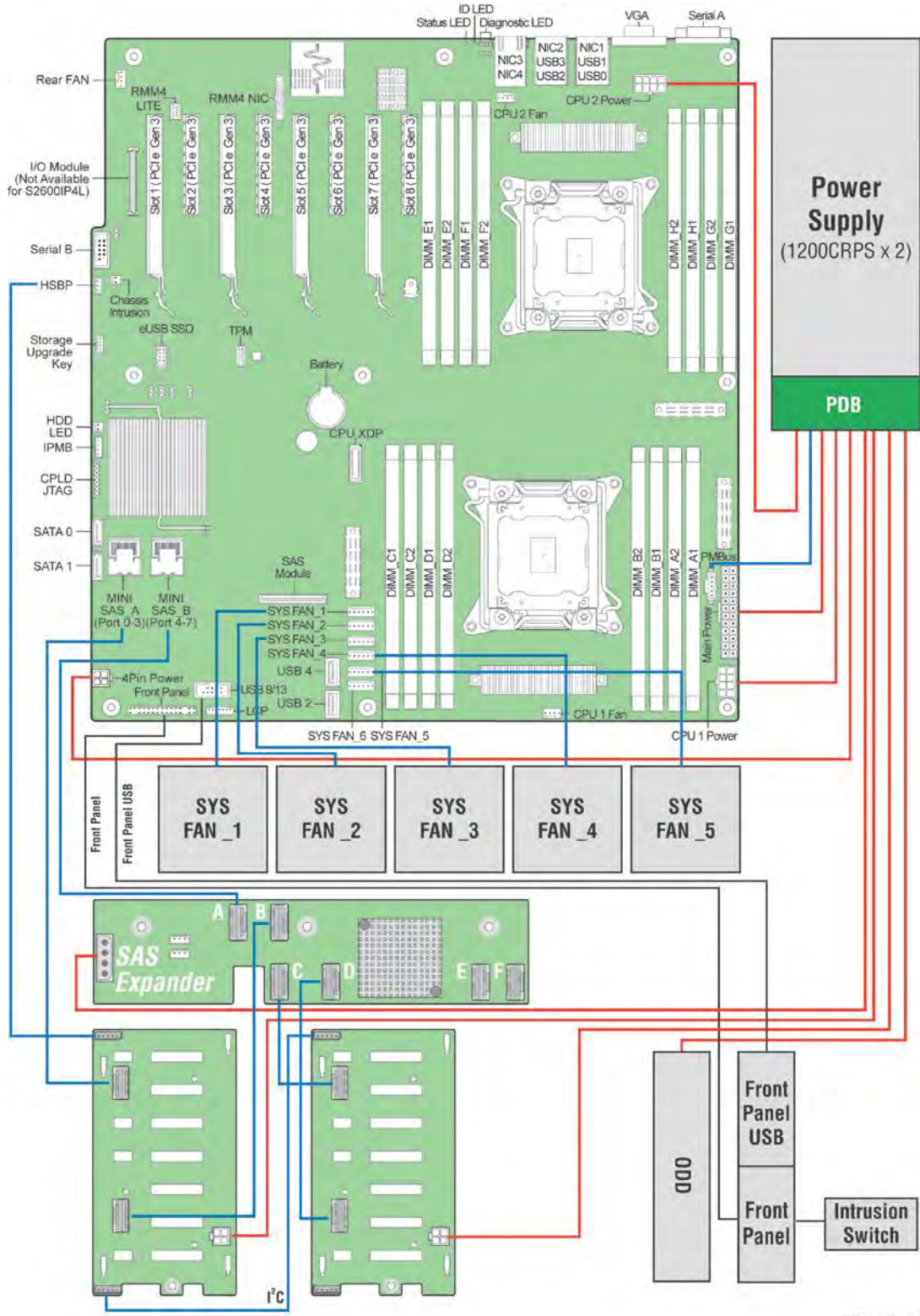


Figure 18. Cable connections for 16 x 2.5 Hot Swap Hard drivers configuration

AF005500

Cable routing for 24 x 2.5 Hot Swap Hard drivers configuration:

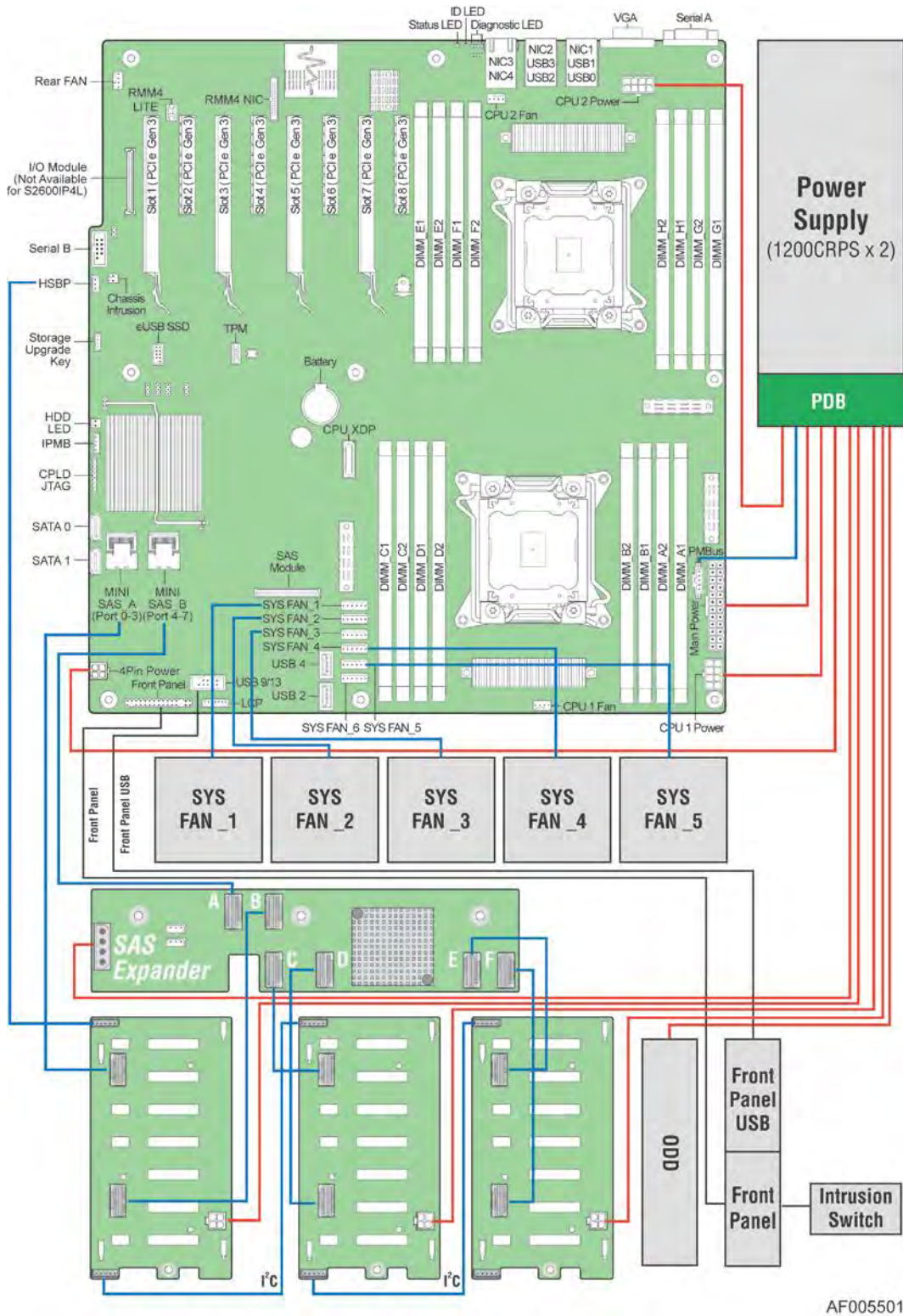


Figure 19. Cable connections for 24 x 2.5 Hot Swap Hard drivers configuration

## Removing and Installing the Chassis Cover

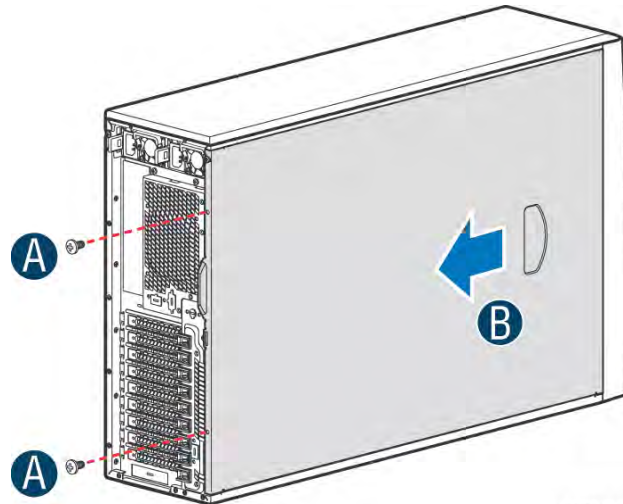
### Removing the Chassis Cover

Intel® Server System P4000IP and Intel® Workstation System P4000CR family must be operated with the top cover in place to ensure proper cooling. You will need to remove the top cover to add or replace components inside the platform. Before removing the top cover, power down the server and unplug all peripheral devices and the AC power cable.

#### / NOTE

*A non-skid surface or a stop behind the chassis may be needed to prevent the chassis 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 AC power cord.
4. Remove the screws (see letter **A**).
5. Slide the side cover back (see letter **B**) and lift the cover outward to remove it.



AF004946

**Figure 20. Removing the Chassis Cover**

### Installing the Chassis Cover

1. Slide the chassis cover on the chassis (see letter **A**).
2. Latch the cover securely to the chassis.
3. Secure the chassis cover with the screws (see letter **B**).



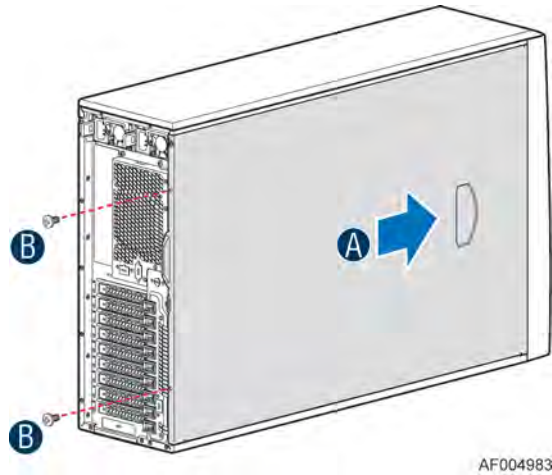


Figure 21. Installing the Chassis Cover

## Removing and Installing the Front Bezel (Pedestal Only)

### Removing the Front Bezel (Pedestal Only)

#### / NOTE

For a rack configuration or chassis on its side, position the chassis hanging over the edge of a table or workbench before removing the bezel.

There are two types of bezel assemblies. One is for fixed HDD configuration and the other is for Hot-swap HDD configuration.

#### CAUTION

Do not rotate the bezel assembly more than 40 degrees or you will damage the bezel assembly.

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see "Removing the Chassis Cover".
4. Release the two plastic tabs on the left side of the bezel assembly to disengage the tabs, and rotate the bezel assembly (see letter **A**) no more than 40 degrees outward.
5. At a 40-degree angle, push the bezel assembly away from the chassis (see letter **B**).
6. If the bezel assembly does not immediately disconnect from the chassis, tap the left-hand side of the bezel assembly to disengage the bezel hooks on the right-hand side of the chassis.

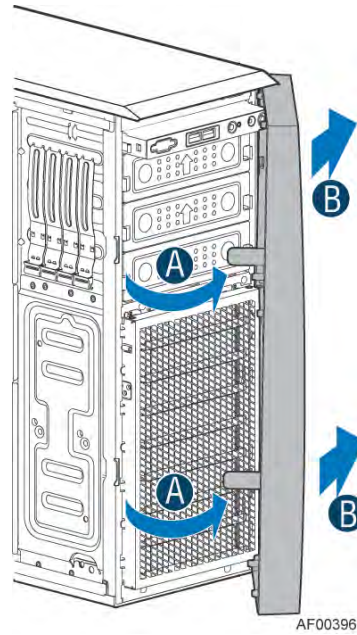


Figure 22. Removing the Front Bezel

## Installing the Front Bezel (Pedestal Only)

1. Fit the right edge of the bezel assembly against the right side of the chassis.
2. Engage the plastic bezel hooks (see letter **A**) into the raised metal slots at the chassis edge.
3. Rotate the bezel assembly toward the chassis.
4. Latch the two plastic tabs (see letter **B**) on the left side of the bezel assembly to the chassis.

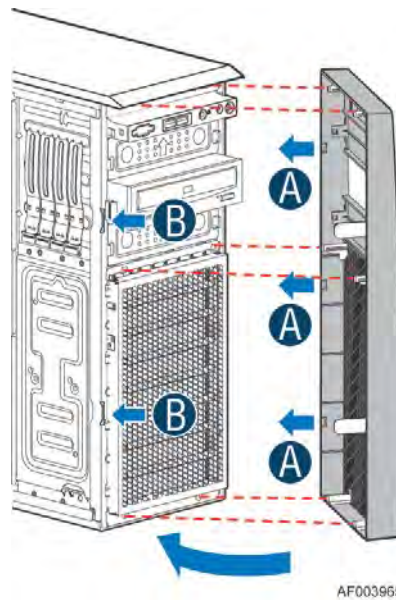
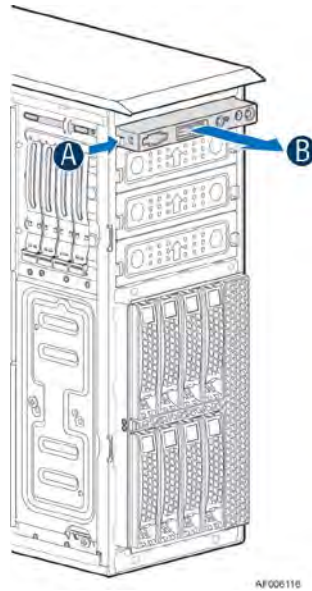


Figure 23. Installing the Front Bezel

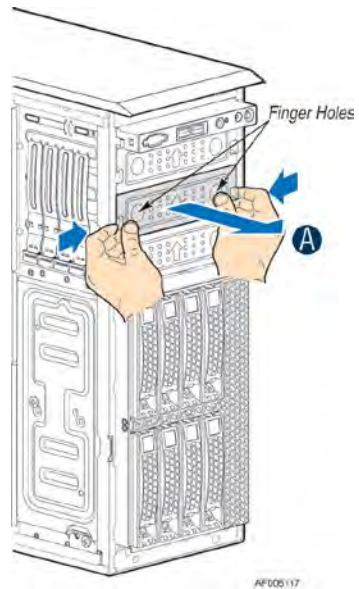
## Converting the Pedestal Chassis to Rack Mount Chassis

1. Remove the front panel module.



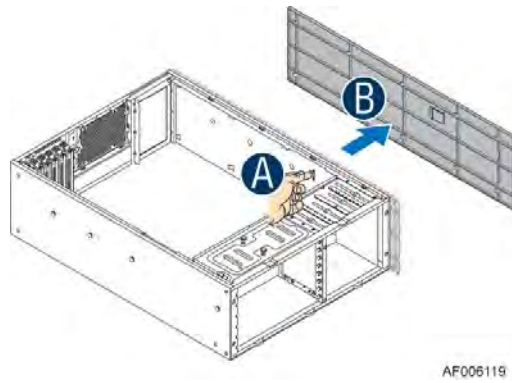
**Figure 24. Removing the Front Panel**

2. Remove the fillers for 5.25" drive slots if required.



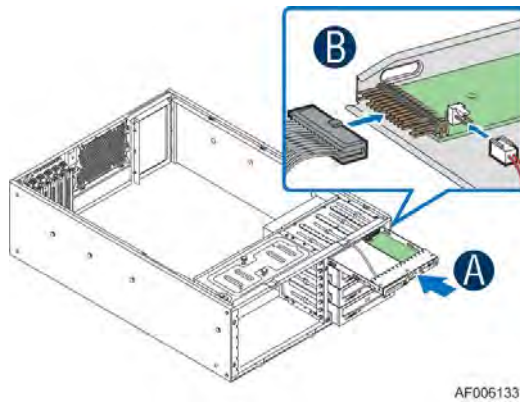
**Figure 25. Removing the Fillers**

3. Remove the cosmetic top board.



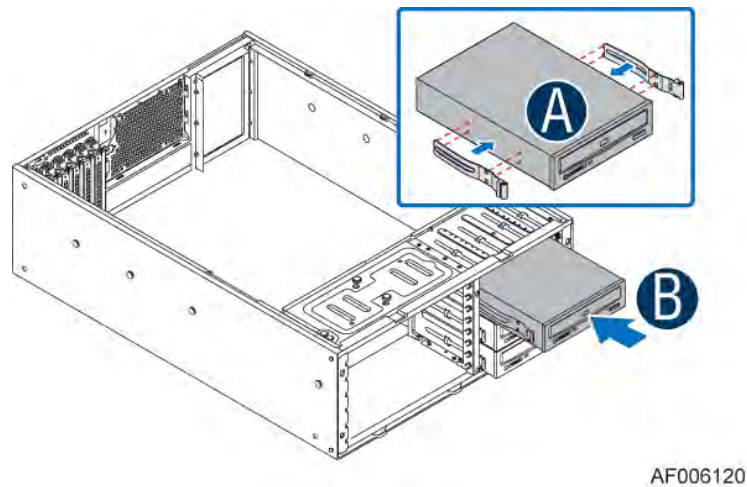
**Figure 26. Removing the Top Board**

4. Install the front panel module.



**Figure 27. Installing the Front Panel**

5. Install the 5.25" drive if required.

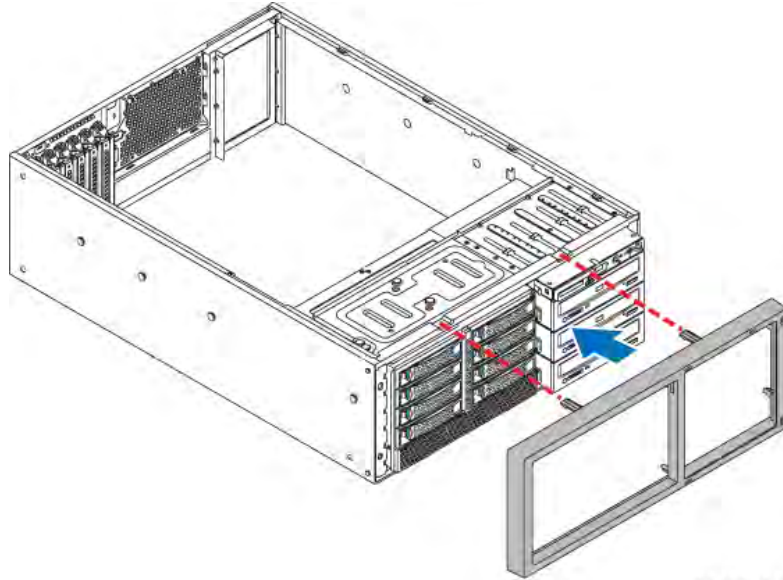


**Figure 28. Installing the Drive (optional)**

6. Install the rack bezel frame.

/ **NOTE**

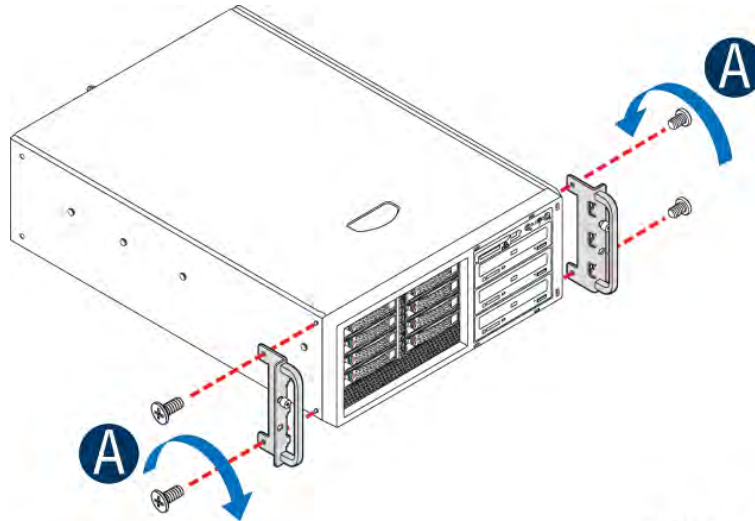
*The rack bezel frame is different from the pedestal bezel frame.*



AF006135

**Figure 29. Installing the Rack Bezel frame**

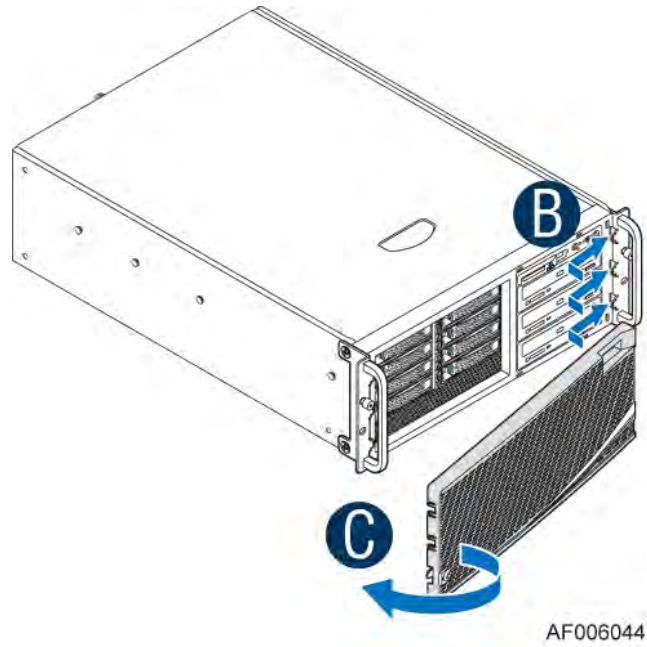
7. Install the rack mount handles.



AF006043

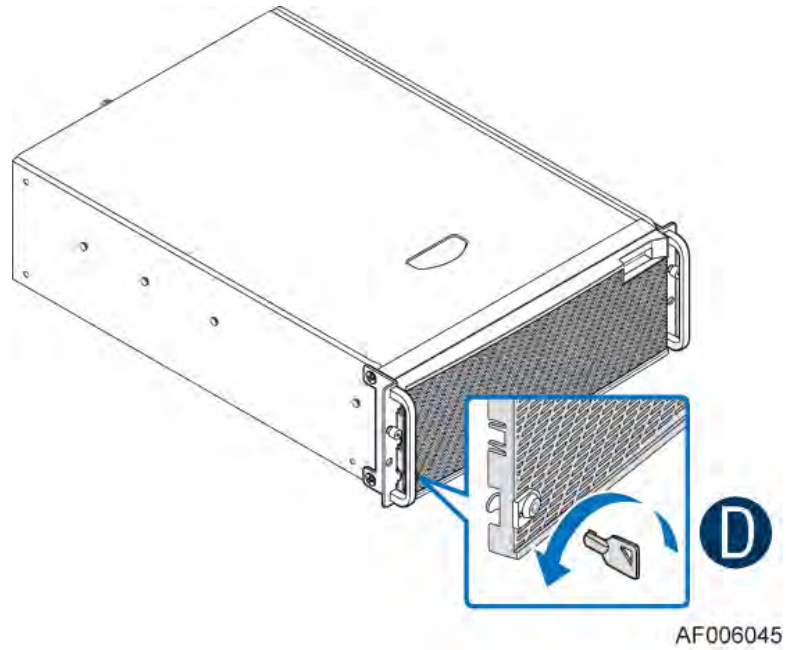
**Figure 30. Installing the Rack Mount handles**

8. Install the rack bezel (optional).



**Figure 31. Installing the Rack Bezel**

9. Lock the front bezel key.



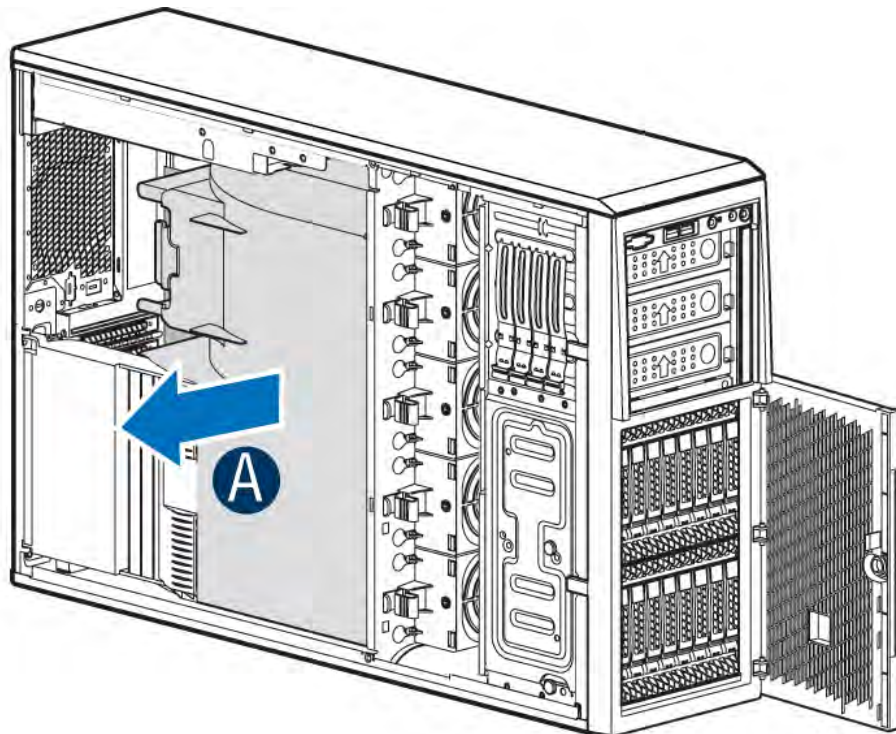
**Figure 32. Locking the Front Bezel key**

## Removing and/or Installing Airduct

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 Airduct

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the airduct by gently lifting it out of the chassis.



AF004947

**Figure 33. Removing the Airduct**

## Installing the Airduct

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Install the airduct by matching the alignment tabs on airduct and the alignment holes on chassis bracket.

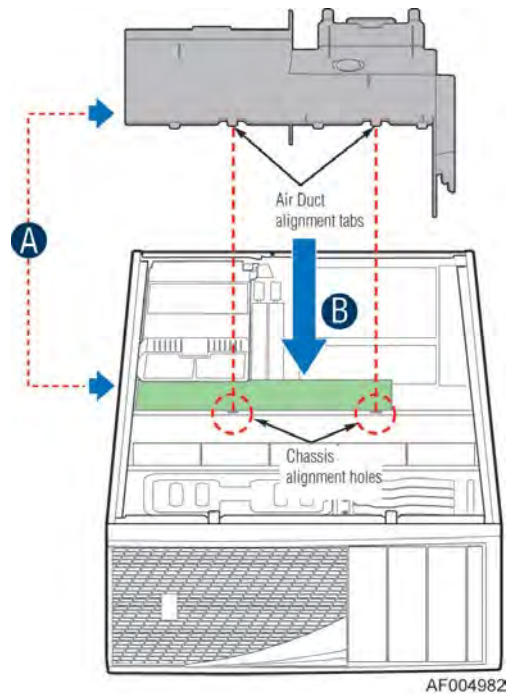


Figure 34. Installing the Airduct

## 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**).

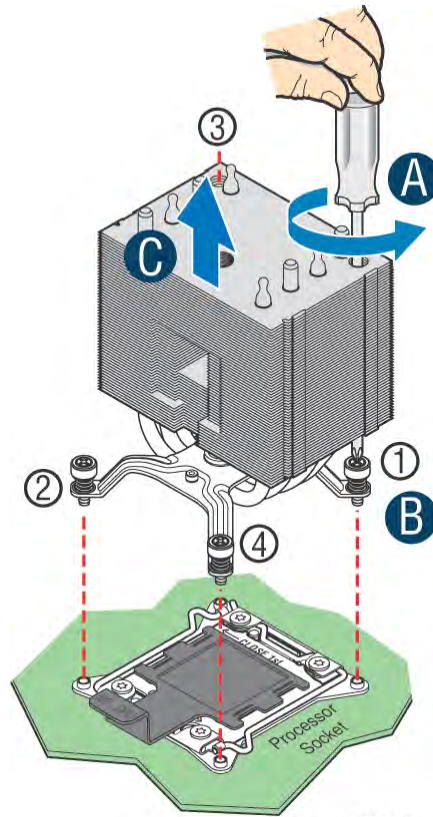


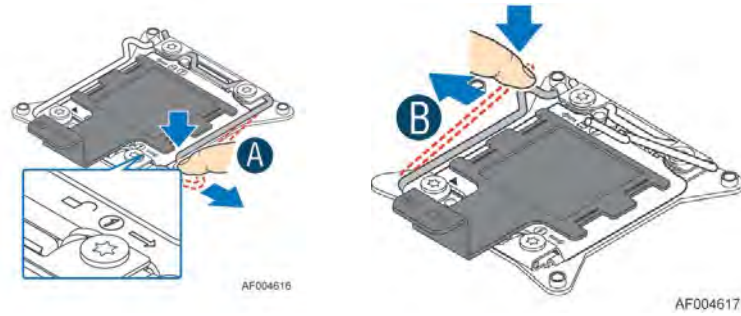
Figure 35. Removing Processor Heatsink

## Installing the Processor



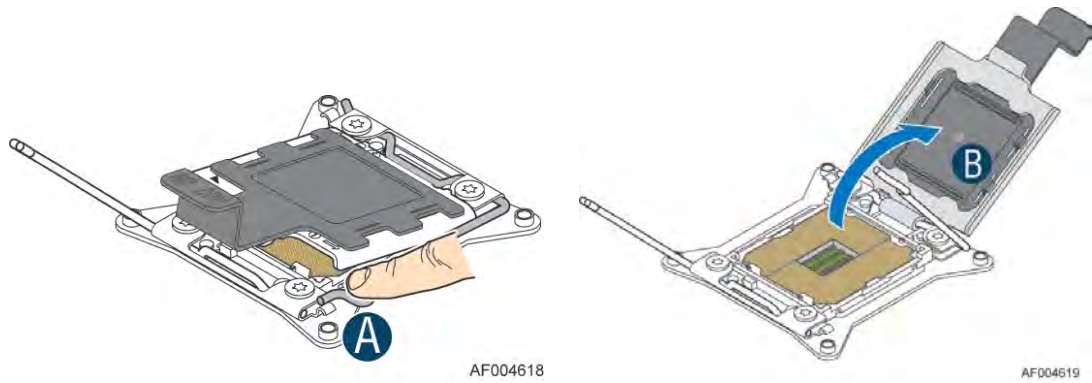
### CAUTION

1. *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”.*
  2. *ESD and handling processors: Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following:*
    - i. *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.*
    - ii. *Avoid moving around unnecessarily.*
  3. *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 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**).



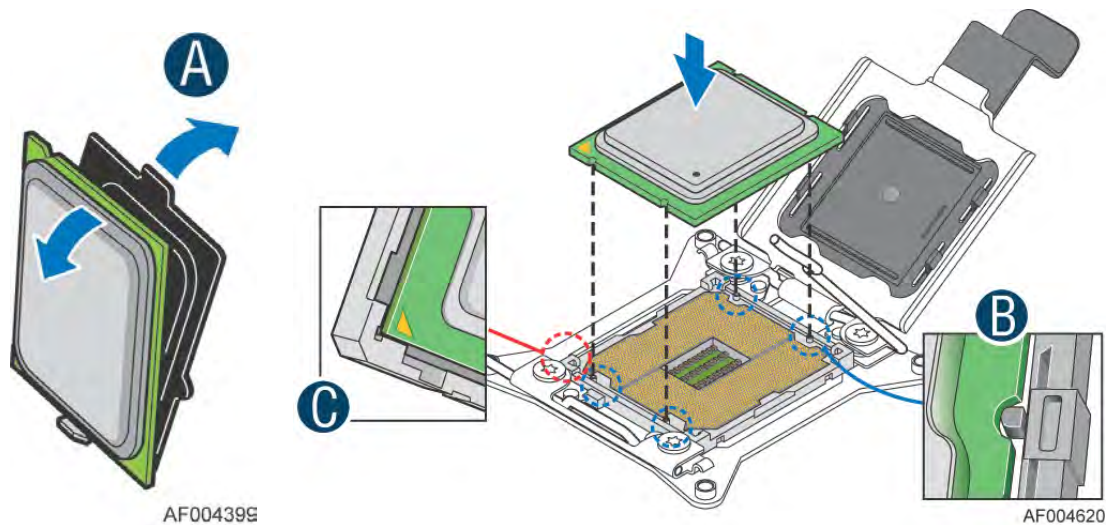
**Figure 36. Installing Processor – Open the Socket Lever**

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 37. 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).

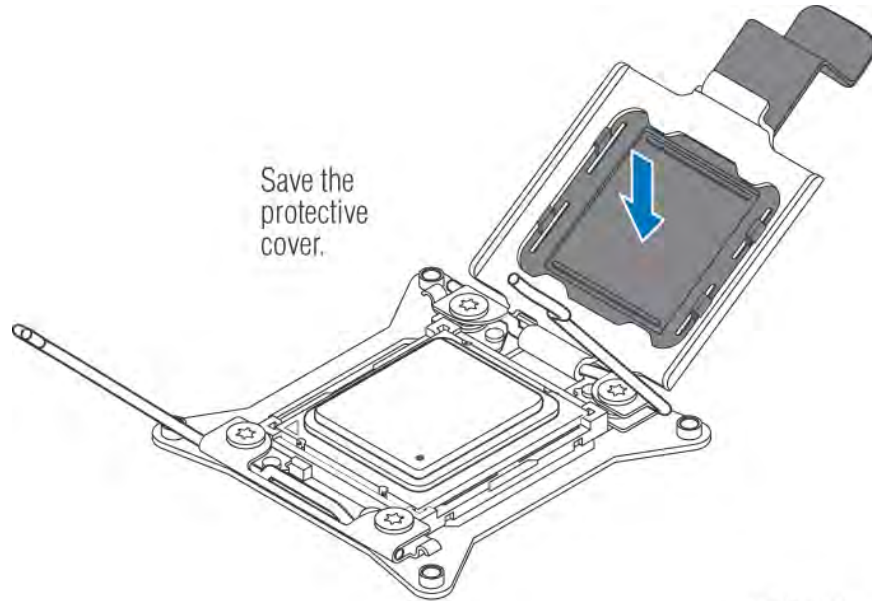


**Figure 38. Installing Processor – Install the Processor**

/ **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!*

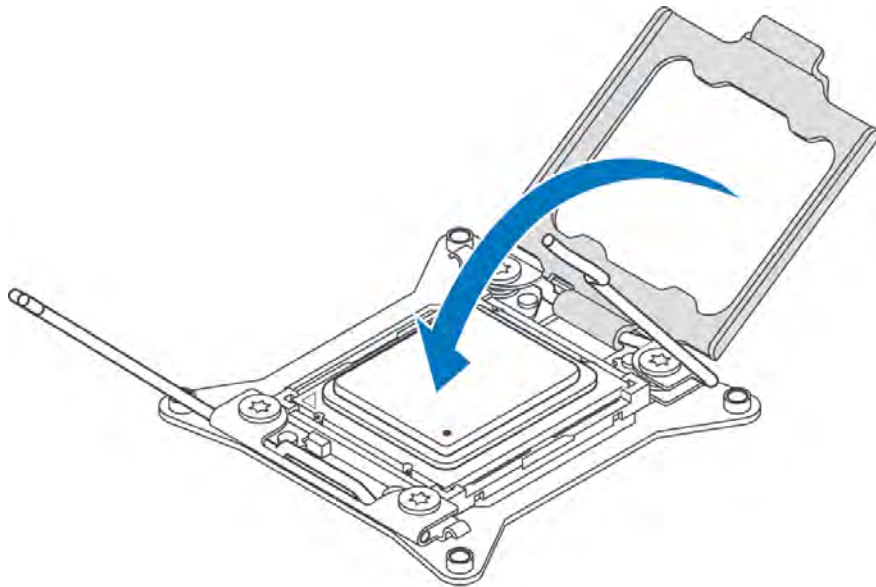
4. Remove the Cover. Press the cover to remove it. Save the protective cover.



AF004656

**Figure 39. Installing Processor – Remove the Cover**

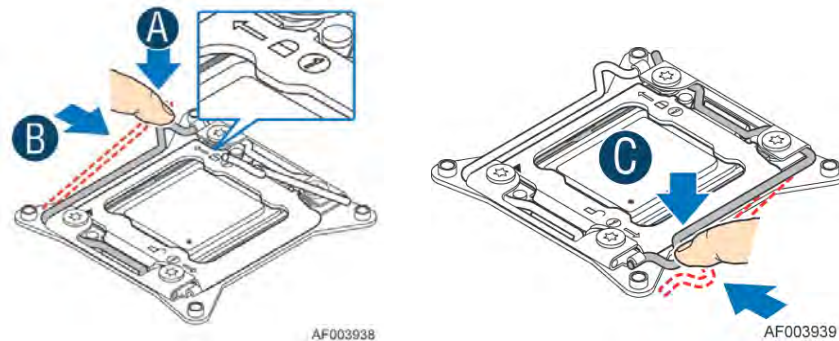
5. Close the Load Plate. Carefully lower the load plate over the processor.



AF003937

**Figure 40. 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 41. Installing Processor – Latch the Locking Lever**

## Installing Processor Heatsink(s)

1. Remove the protective film on the TIM if present.
2. Align heatsink fins to the front and back of the chassis for correct airflow (see letter **A**). Airflow goes from front-to-back of chassis.
3. Each heatsink has four captive fasteners and should be tightened in a diagonal manner using the following procedure:
  - i. Using a #2 Phillips\* screwdriver, start with screw 1 and engage screw threads by giving it two rotations and stop (see letter **B**). (Do not fully tighten.)
  - ii. Proceed to screw 2 and engage screw threads by giving it two rotations and stop. Similarly, engage screws 3 and 4 (see letter **C**).
  - iii. Repeat these steps on each screw with two rotations each time until each screw is lightly tightened up to a maximum of 8 inch-lbs torque.

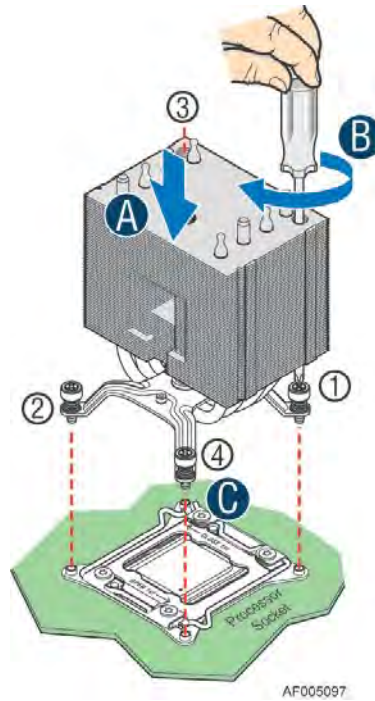


Figure 42. Installing Processor Heatsink

## 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**).

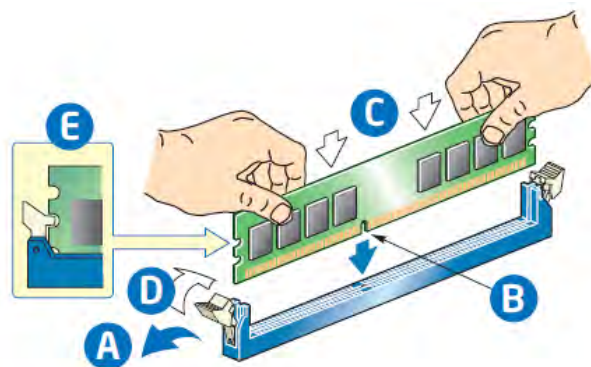


Figure 43. Installing Memory

## 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.

## Replacing a Server/Workstation Board

### / **NOTE**

*The server/workstation board you can install in your chassis depends upon the chassis model.*

To install or remove a server board, do the following:

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel assembly if it is installed. For instructions, see “Removing the Bezel Assembly (Pedestal Only)”.
5. Remove any PCI add-in boards that are present. For instructions, see “Removing PCI Add-in Board(s)”.
6. If installing a server board, refer to the *Service Guide* and/or *Quick Start User's Guide* that shipped with your Intel® server/workstation board for installation instructions. Use the mounting screws, bumpers and standoffs (if necessary) that came with your chassis to secure the server/workstation board to the chassis. Make sure the server/workstation board is properly seated and then tighten the screws firmly, starting with the screws at the center of the server/workstation board. Make cable connections per instructions in the Intel® server/workstation board *Service Guide* and/or *Quick Start User's Guide*.
7. If removing a server board, disconnect all cables connected to the server board.
8. Remove the mounting screws, starting with the screws at the center of the server/workstation board. Remove the server board.
9. If desired, install any PCI Add-in boards. For instructions, see “Installing PCI Addin Board(s)”.
10. Re-install the front bezel assembly. For instructions, see “Installing the Front Bezel (Pedestal Only)”.
11. Re-install the chassis cover. For instructions, see “Installing the Chassis Cover”.
12. Plug all peripheral devices and the AC power cable into the server.
13. Power up the server.

## Replacing the Fixed Fan

### / NOTE

Please pay attention to the fan cable connector color. The fan with blue connector should be installed in fan 2 bracket and the fan with white connector should be installed in fan 1 bracket. The fan numbering is inscribed on the chassis.

This procedure applies only to the Intel® Workstation System P4000CR family with fixed fan configuration.

### Removing the Fixed Fan

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the air duct if the air duct is installed. For instructions, see the *Quick Start User’s Guide* or *Service Guide* provided with your Intel® server/workstation board.
5. Disconnect the appropriate fan power cable from the server board (see letter **A**).

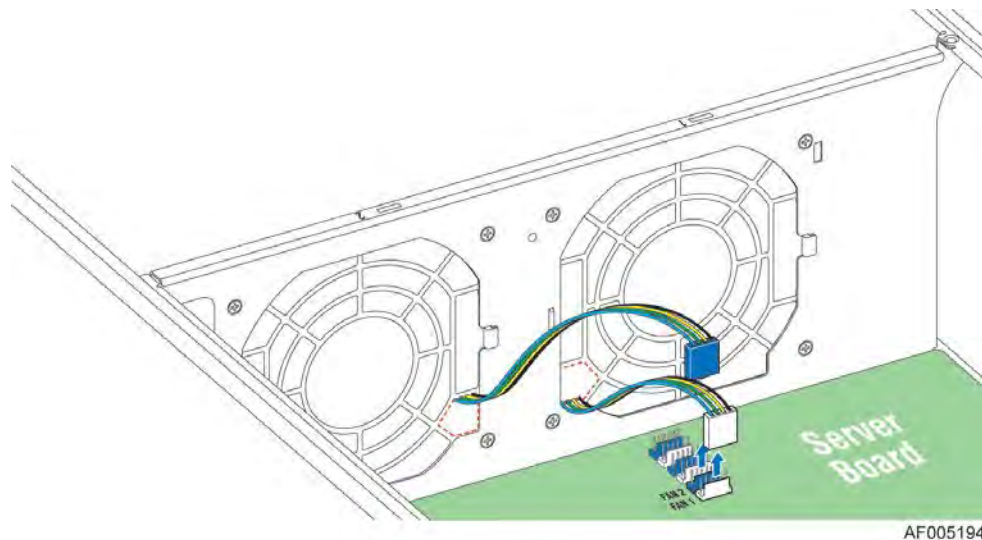
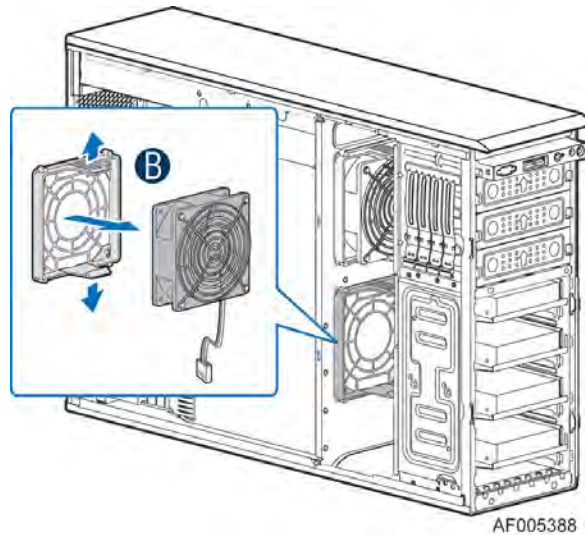


Figure 44. Disconnecting the fan power cable from the server board

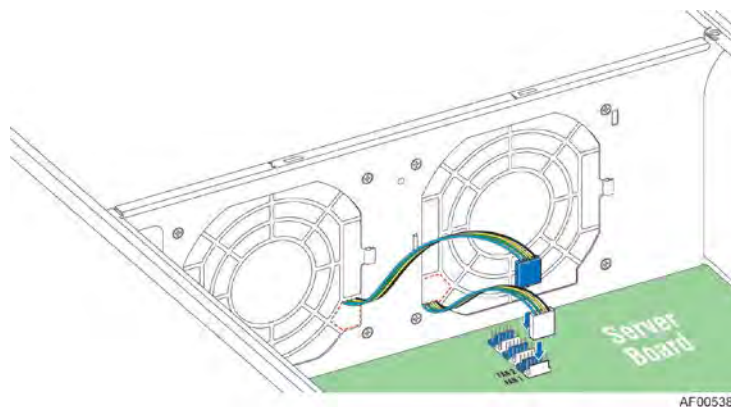
6. Remove system fan by pushing the tabs outward and disengaging from its snap-in bracket (see letter **B**).



**Figure 45. Removing fixed system fan from chassis**

## Installing the Fixed Fan

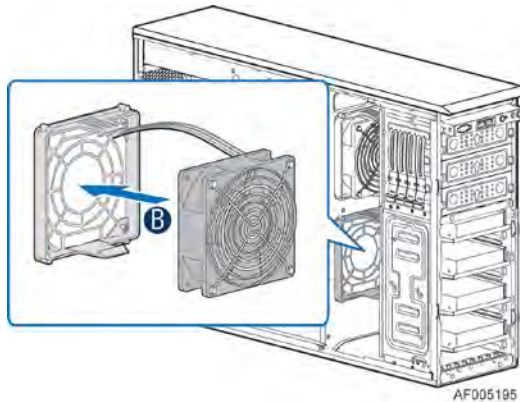
1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the air duct if the air duct is installed. For instructions, see the *Quick Start User’s Guide* or *Service Guide* provided with your Intel® server/workstation board.
5. Insert the fan cable in the fan bracket as shown in figure below (see letter **A**). Pay attention to the fan cable connector color. The fan with blue fan cable connector should be installed in fan 2 bracket; the fan with white fan connector should be installed in fan 1 bracket.



**Figure 46. Inserting the fan cable in the corresponding fan bracket**



6. Install the fixed fan in the corresponding fan bracket (see letter **B**).



**Figure 47. Installing the Fixed Fan**

7. Connect fan power cable to the server/workstation board. See the *Quick Start User's Guide* or *Service Guide* provided with your Intel® server/workstation board for appropriate connection location.

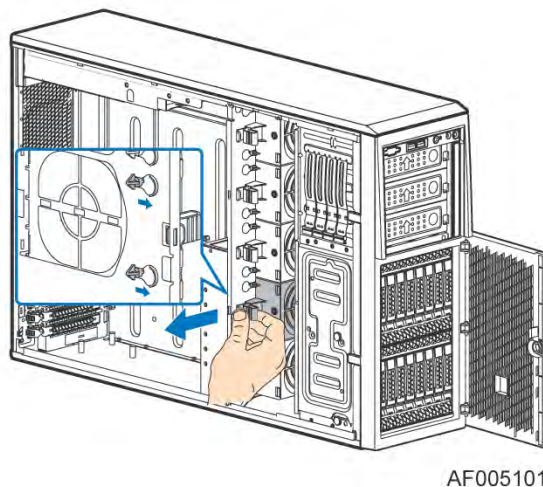
## Removing and Installing the Hot-swap Fan

### / NOTE

*This procedure applies only to the Intel® Server System P400IP family with hot-swap fan configuration.*

### Removing the Hot-swap Fan

1. Observe the safety and ESD precautions at the beginning of this book.
2. Remove the chassis cover. For instructions, see "Removing the Chassis Cover".
3. Press latch on fan and pull on handle to remove hot-swap fan from chassis.



**Figure 48. Removing Hot-swap Fan**

## Installing the Hot-swap Fan

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Insert hot-swap fan into corresponding chassis slot until it clicks into place.

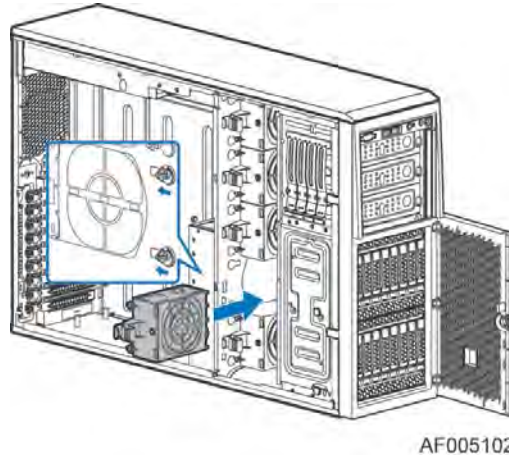


Figure 49. Installing Hot-swap Fan

## Installing and Removing a DVD or CD-ROM Drive

### Installing a DVD or CD-ROM Drive

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel”.
5. Remove an EMI shield (see letter **A**).

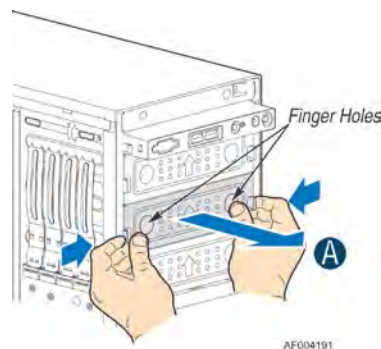
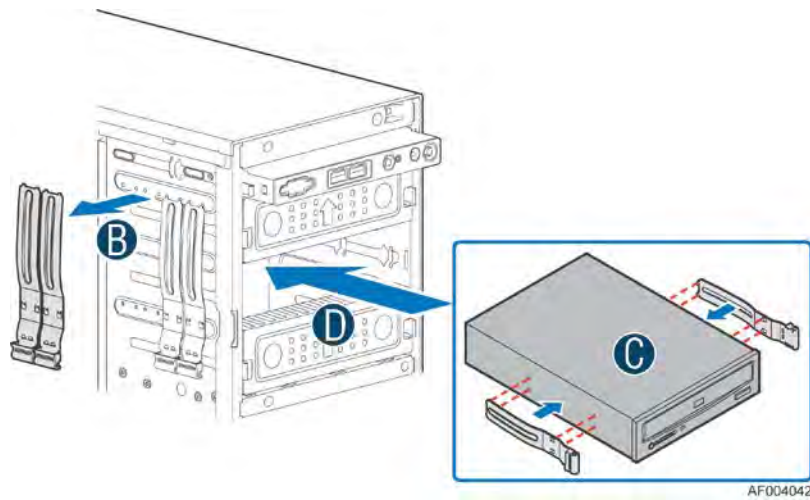


Figure 50. Removing EMI Shield

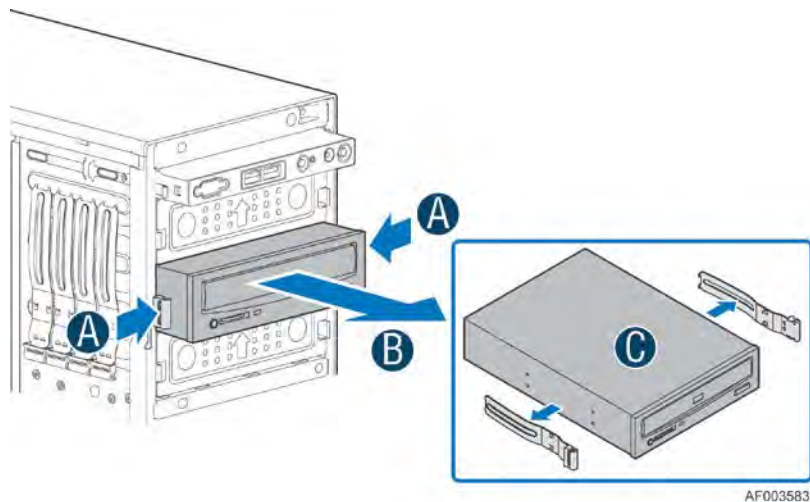
- Get the slides from the chassis side (see letter **B**). Attach slides to the DVD or CD-ROM drive by pressing the slides firmly into the side dimples on the DVD or CD-ROM drives (see letter **C**). Insert the drive/slide assembly into the device bay until the slides lock into place (see letter **D**).



**Figure 51. Installing DVD or CD-ROM Drive**

## Removing a DVD or CD-ROM Drive

- Observe the safety and ESD precautions at the beginning of this book.
- Power down the server and unplug all peripheral devices and the AC power cable.
- Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
- Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel”.
- Disconnect the power and data cables to the DVD/CD-ROM drive.
- Press on the slide release latches (see letter **A** in the following figure) and pull the DVD/CD-ROM drive/slide assembly from the chassis (see letter **B** in the following figure). Remove the slides from the DVD or CD-ROM drive (see letter **C**).



**Figure 52. Removing DVD or CD-ROM Drive**

7. If not replacing with another drive, reinsert an EMI shield into chassis (see the illustration below).

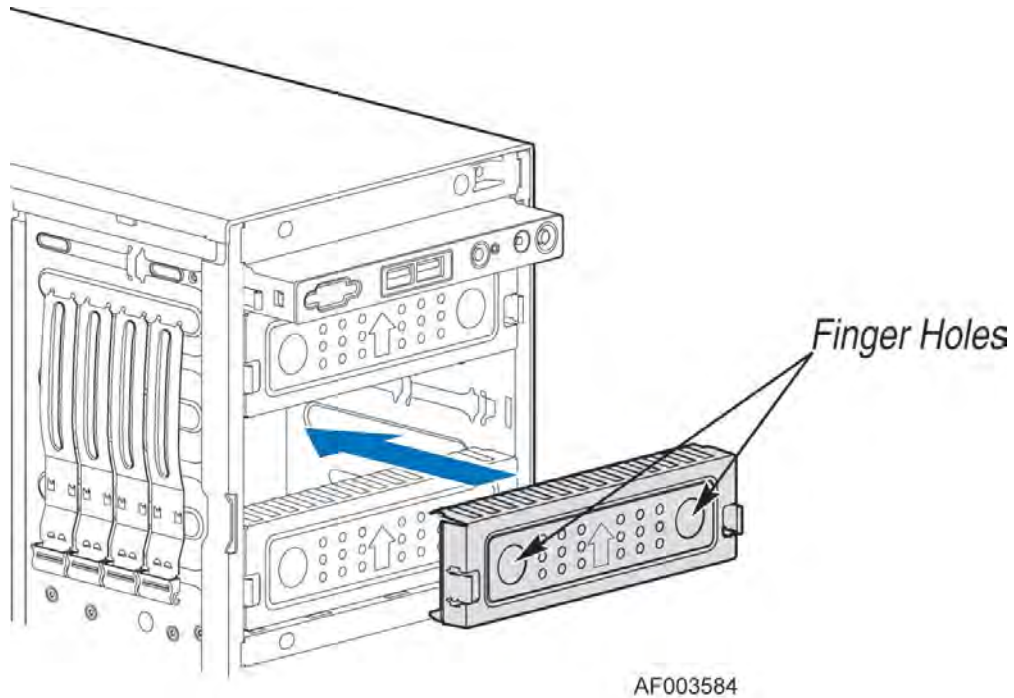


Figure 53. Re-inserting Empty EMI Shield

## Removing and Installing the Fixed HDD EMI Shield

### / NOTE

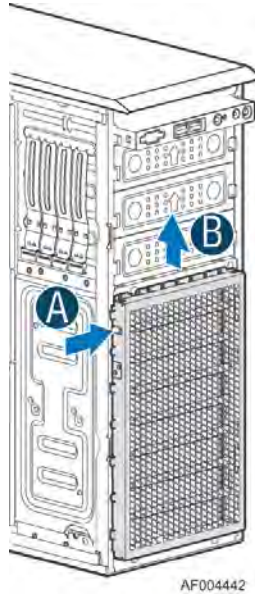
*For a rack configuration or chassis on its side, position the chassis hanging over the edge of a table or workbench before removing the bezel.*

*This procedure applies only to the Intel® Workstation System P4000CR family with fixed HDD configuration.*

### Removing the Fixed HDD EMI Shield

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel. For instructions, see “Removing the front bezel”.

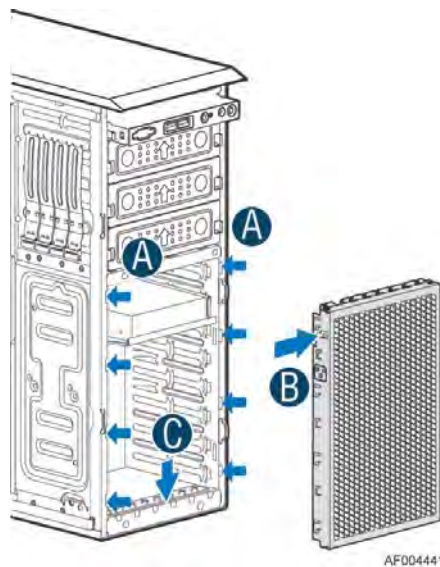
5. Press the clip (see letter **A**) and lift the EMI shield (see letter **B**) and move the EMI shield outward from the chassis.



**Figure 54. Removing the Fixed HDD EMI Shield**

## Installing the Fixed HDD EMI Shield

1. Fit the edges of the EMI Shield against the sides of the chassis (see letter **A**).
2. While pressing the clip (see letter **B**), slide the EMI Shield downwards until the latches on the EMI Shield are engaged with the chassis (see letter **C**).



**Figure 55. Installing the Fixed HDD EMI Shield**

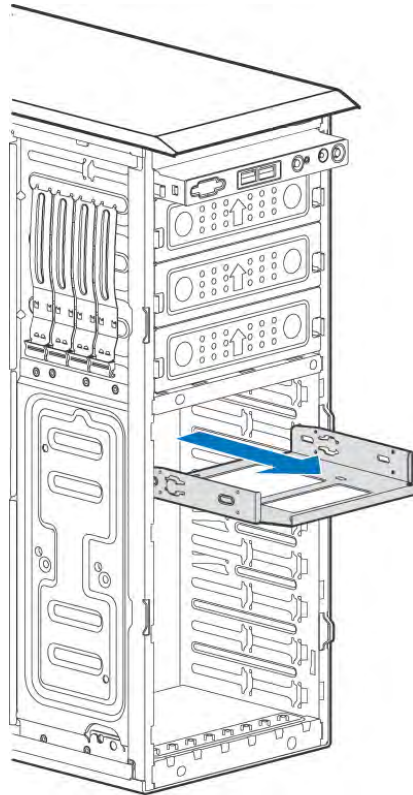
# Installing and Removing Fixed Hard Drive(s)

## / NOTE

*This procedure applies only to the Intel® Workstation System P4000CR family with fixed HDD configuration.*

## Installing Fixed Hard Drive(s)

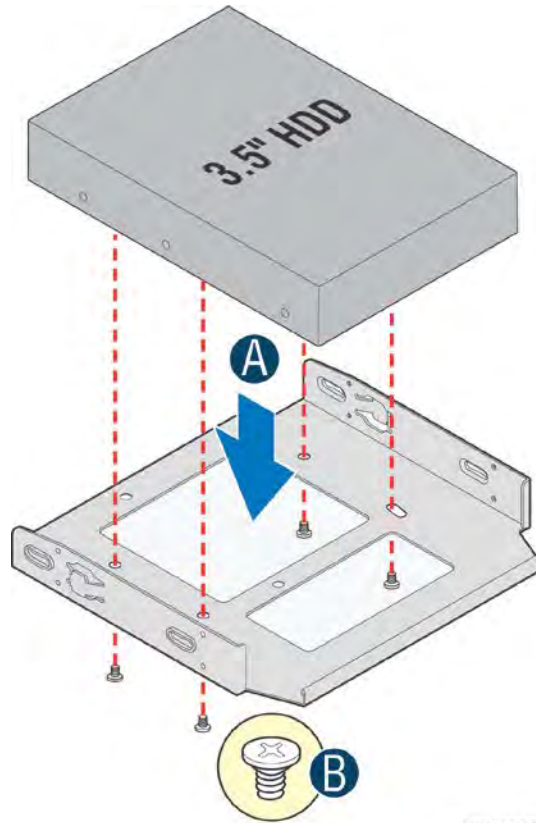
1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel”.
5. Remove the Fixed HDD EMI shield. For instructions, see “Removing the Fixed HDD EMI Shield”.
6. Pull out the HDD carrier tray.



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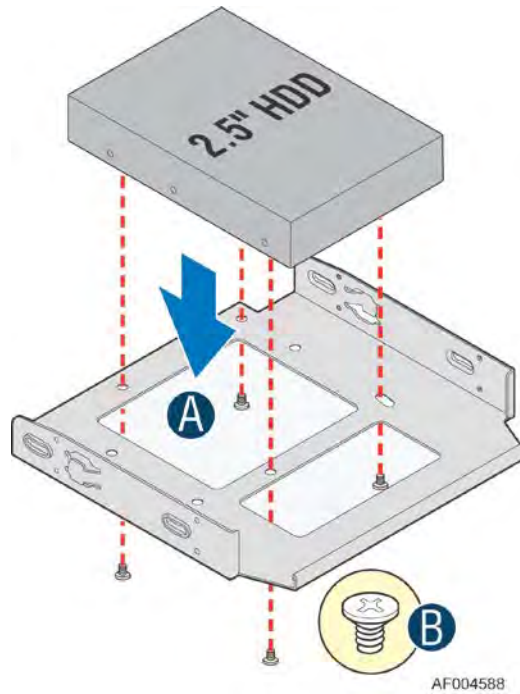
**Figure 56. Removing Fixed Hard Drive**

7. Secure the 3.5" or 2.5" HDD on the HDD carrier tray with screws.



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Figure 57. Securing the 3.5" HDD on Fixed HDD Carrier Tray

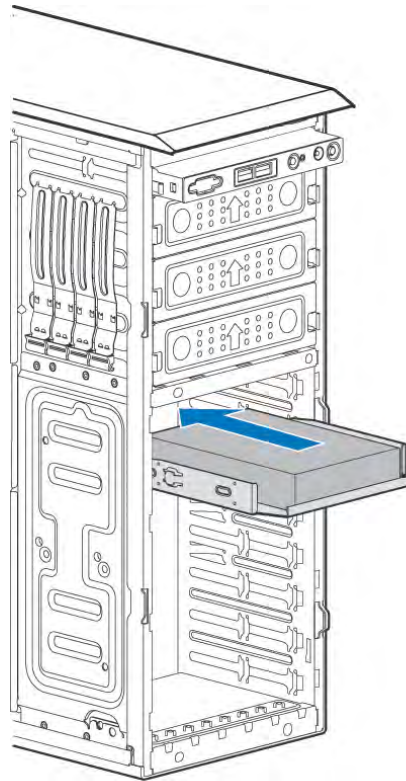


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Figure 58. Securing the 2.5" HDD on Fixed HDD Carrier Tray



8. Insert the HDD carrier tray into the chassis.



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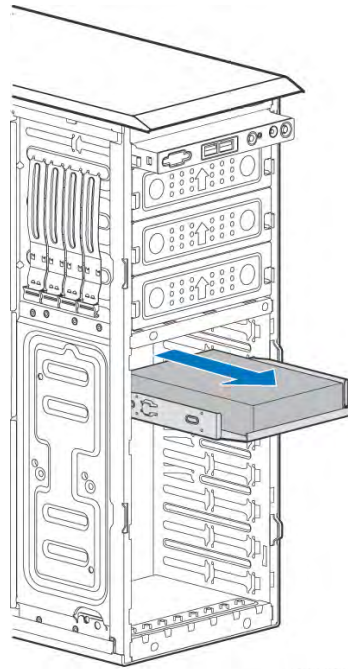
**Figure 59. Inserting the HDD Carrier Tray**

9. Connect power and data cables on HDD.
10. Install the Fixed HDD EMI shield. For instructions, see “Installing the Fixed HDD EMI Shield”.
11. Install the front bezel. For instructions, see “Installing the Front Bezel”.
12. Install the air duct if the air duct is removed. For instructions, see the *Quick Start User's Guide* or *Service Guide* provided with your Intel® server/workstation board.
13. Install the chassis cover. For instructions, see “Installing the Chassis Cover”.
14. Plug all peripheral devices and the AC power cable into the server.
15. Power up the server.

## Removing Fixed Hard Drive(s)

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel”.
5. Remove the Fixed HDD EMI shield. For instructions, see “Removing the Fixed HDD EMI Shield”.
6. Remove power and data cables from the hard drive connectors.

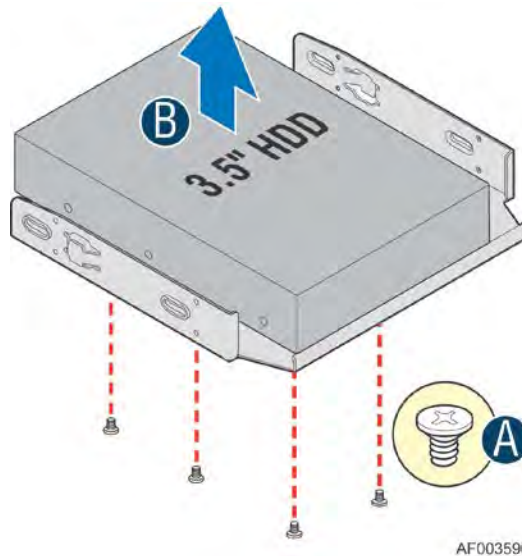
7. Pull out the HDD carrier tray.



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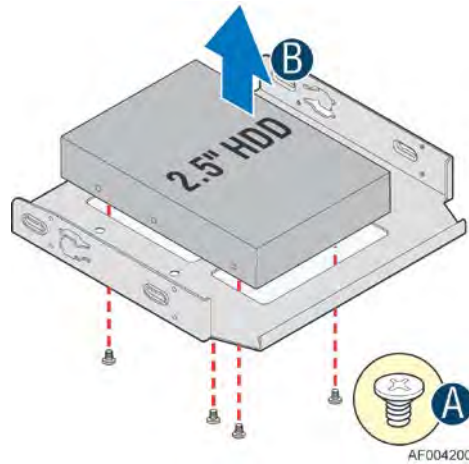
**Figure 60. Removing Fixed Hard Drives**

8. Use screwdriver to release the 3.5" or 2.5" HDD from the carrier tray.



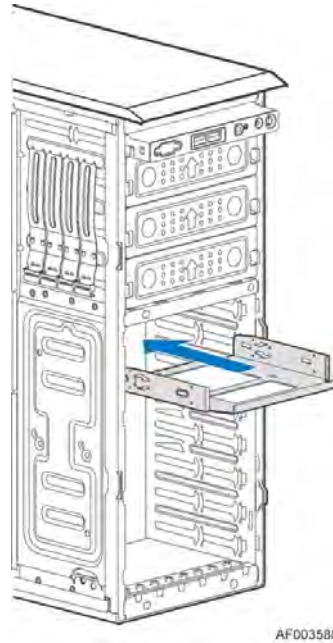
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**Figure 61. Removing the 3.5" HDD from Fixed HDD tray**



**Figure 62. Removing the 2.5" HDD from Fixed HDD tray**

9. Reinstall the HDD carrier tray into chassis.



**Figure 63. Reinstalling the HDD Carrier Tray**

10. Install the Fixed HDD EMI shield. For instructions, see "Installing the Fixed HDD EMI Shield".
11. Install the front bezel. For instructions, see "Installing the Front Bezel".
12. Install the air duct if the air duct is removed. For instructions, see the *Quick Start User's Guide* or *Service Guide* provided with your Intel® server/workstation board.
13. Install the chassis cover. For instructions, see "Installing the Chassis Cover".
14. Plug all peripheral devices and the AC power cable into the server.
15. Power up the server.

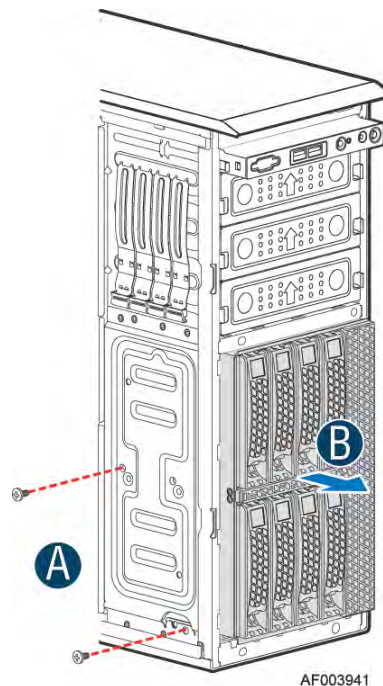
# Removing and Installing 8x3.5" Hot-swap Hard Drive Cage Assembly

## / NOTE

*This procedure applies only to the Intel® Server System P4000IP family with 8x3.5" hot-swap hard disk drive cage configuration.*

## Removing 8x3.5" Hot-swap Hard Drive Cage Assembly

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see "Removing the Chassis Cover".
4. Remove the front bezel if it is installed. For instructions, see "Removing the Front Bezel (Pedestal Only)".
5. Disconnect the power and data cables to the backplane.
6. Use screwdriver to release the hot-swap hard drive cage (see letter **A**) from the chassis and remove the hot-swap hard drive cage (see letter **B**).



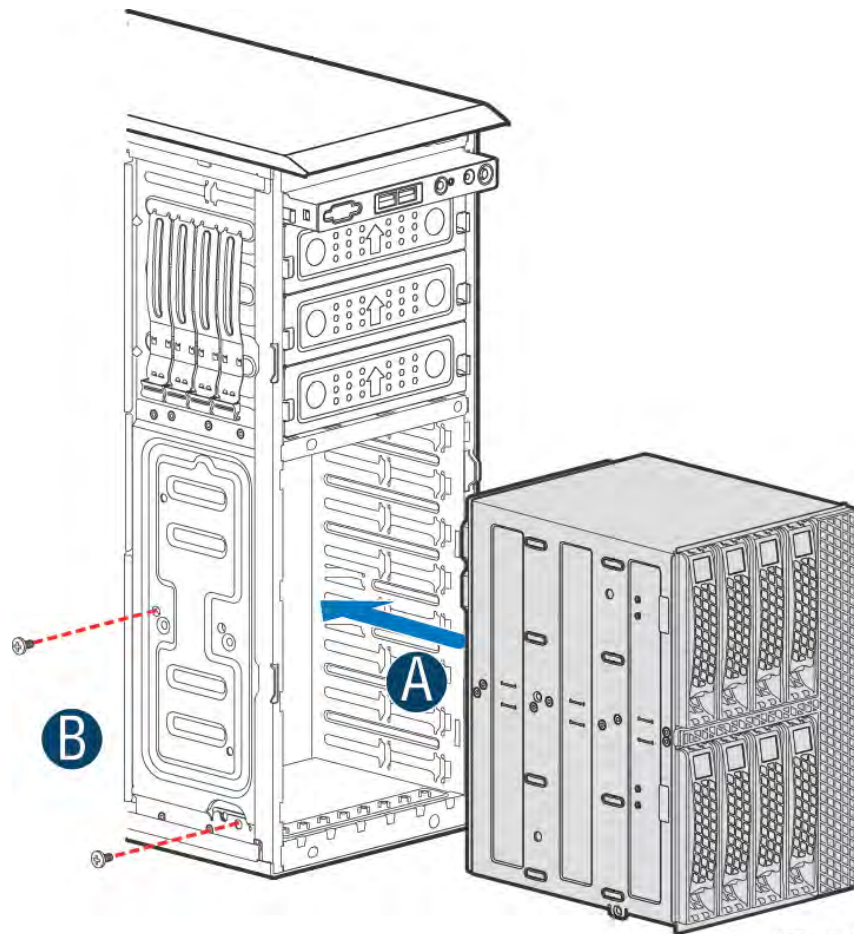
**Figure 64. Removing the 8x3.5" Hot-swap HDD Cage Assembly**

## Installing 8x3.5" Hot-swap Hard Drive Cage Assembly

### CAUTION

*It is critical that you connect the SAS/SATA data cables correctly from the SAS/SATA backplane to your server board or RAID controller card. Failure to do so may result in data loss.*

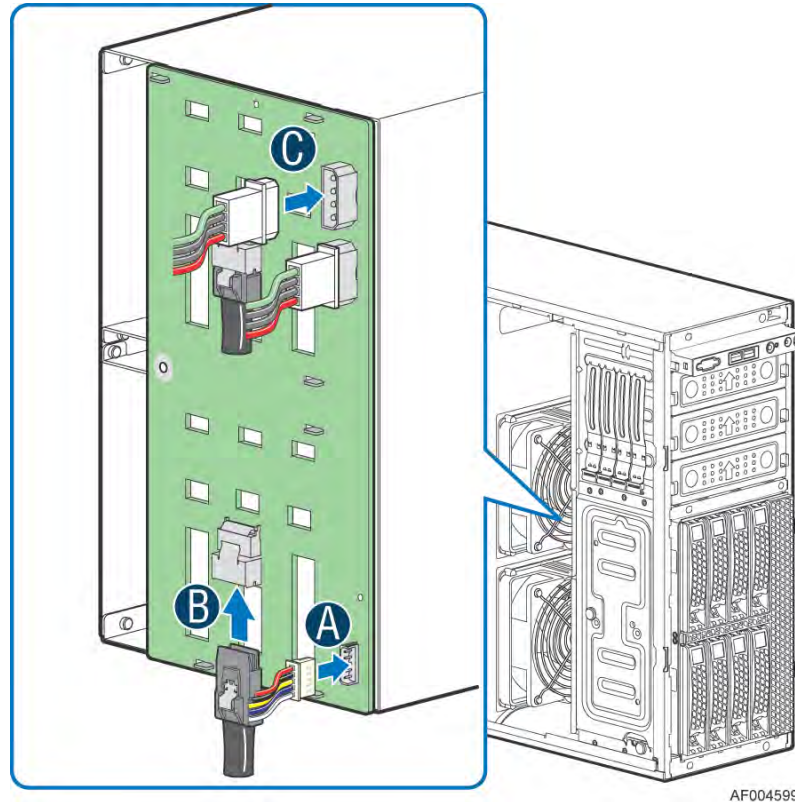
1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see "Removing the Chassis Cover".
4. Remove the front bezel if it is installed. For instructions, see "Removing the Front Bezel (Pedestal Only)".
5. Remove the Fixed HDD EMI Shield and Fixed HDD Tray if they are installed. For instructions, see "Removing the Fixed HDD Tray" and "Removing the Fixed HDD EMI Shield".
6. Install the 8x3.5" Hot-Swap Hard Drive Cage.
  - i. Slide the 8x3.5" Hot-Swap Drive Cage into the slot (see letter **A**).
  - ii. Secure the Hard Drive Cage with the Screw (see letter **B**).



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**Figure 65. Installing the 8x3.5" Hot-Swap Hard Drive Cage Assembly**

7. Make the backplane and server board/RAID controller card cable connections. Refer to the documentation that came with your server board and/or RAID controller card for instructions on connecting backplane cables to your server board or RAID controller card.
  - i. Connect an I<sup>2</sup>C cable (see letter **A**).
  - ii. Connect Mini SAS data cables (see letter **B**).
  - iii. Connect power cable (see letter **C**).



**Figure 66. 8x3.5" Hot Swap Backplane Cable Connections**

8. Install the front bezel. For instructions, see "Installing the Front Bezel (Pedestal Only)".
9. Install the air duct if the air duct is removed. For instructions, see the *Quick Start User's Guide* or *Service Guide* provided with your Intel<sup>®</sup> server/workstation board.
10. Install the chassis cover. For instructions, see "Installing the Chassis Cover".
11. Plug all peripheral devices and the AC power cable into the server.
12. Power up the server.

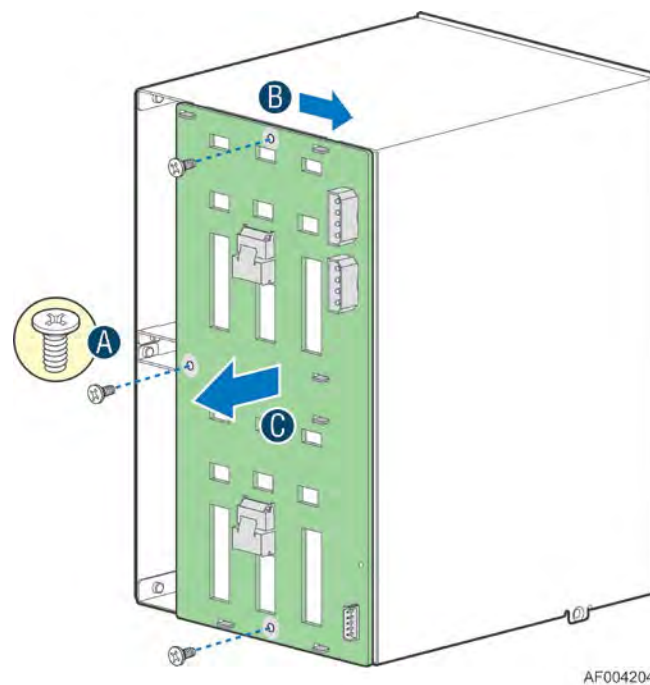
## Removing and Installing 8x3.5" Hot-swap Backplane

### / NOTE

*This procedure applies only to the Intel® Server System P4000IP family with 8x3.5" hot-swap hard disk drive cage configuration.*

### Removing 8x3.5" Hot-swap Backplane

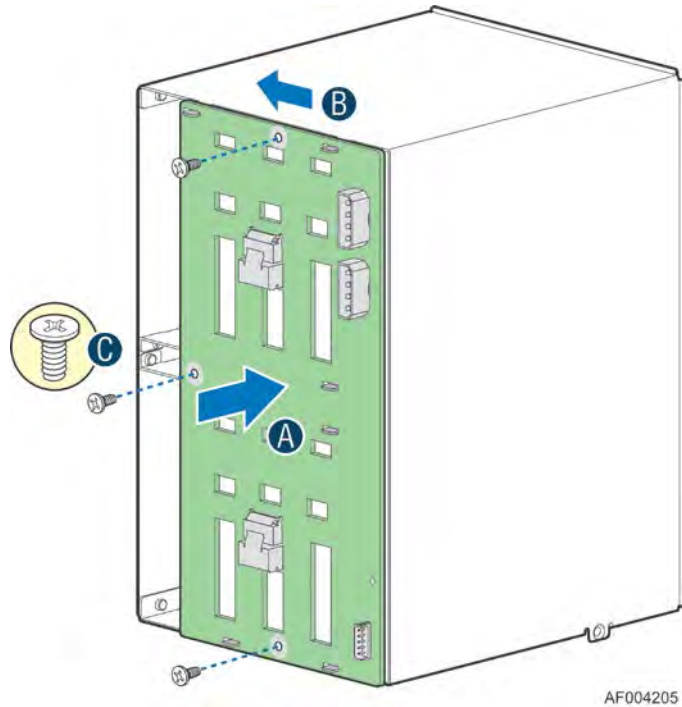
1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see "Removing the Chassis Cover".
4. Remove the front bezel if it is installed. For instructions, see "Removing the Front Bezel (Pedestal Only)".
5. Remove the 8x3.5" Hot-swap Hard drives cage. For instructions, see "Removing 8x3.5" Hot-swap Hard Drive Cage Assembly".
6. Remove all hot-swap drive carriers, regardless of whether or not a drive is installed in the carrier.
7. Remove the screws on the backplane (see letter **A**).
8. Push the backplane (see letter **B**) and remove the backplane from the cage (see letter **C**).



**Figure 67. Removing 8x3.5" Hot-swap Backplane**

## Installing 8x3.5" Hot-swap Backplane

1. Remove all hot-swap drive carriers, regardless of whether or not a drive is installed in the carrier.
2. Attach the backplane to the back side of the hot-swap drive cage, and make sure the hooks on the cage are inserted in the backplane holes (see letter **A**).
3. Push the backplane (see letter **B**) and secure the backplane with the screw (see letter **C**).



**Figure 68. Installing 8x3.5" Hot-swap Backplane**

4. Install the 8x3.5" Hot-swap Hard drives cage. For instructions, see "installing 8x3.5" Hot-swap Hard Drive Cage Assembly".
5. Install the front bezel. For instructions, see "Installing the Front Bezel (Pedestal Only)".
6. Install the air duct if the air duct is removed. For instructions, see the *Quick Start User's Guide* or *Service Guide* provided with your Intel® server/workstation board.
7. Install the chassis cover. For instructions, see "Installing the Chassis Cover".
8. Plug all peripheral devices and the AC power cable into the server.
9. Power up the server.



# Removing and Installing First 8x2.5” Hot-swap Hard Drive Cage Assembly

## / NOTE

*This procedure applies only to the Intel® Server System P4000IP family with 8x2.5” hot-swap hard disk drive cage configuration.*

## Removing 8x2.5” Hot-swap Hard Drive Cage Assembly

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel (Pedestal Only)”.
5. Disconnect the power and data cables to the backplane.
6. Use screwdriver to release the hot-swap hard drive cage (see letter **A**) from the chassis and remove the hot-swap hard drive cage (see letter **B**).

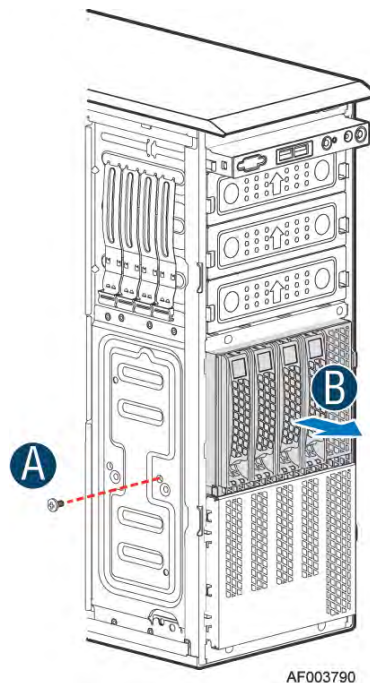


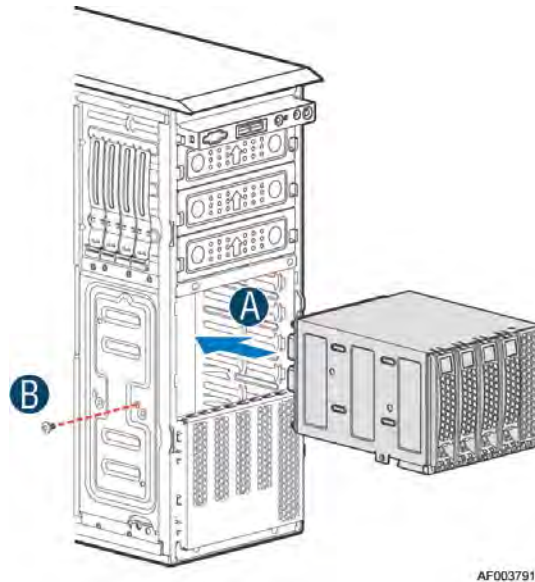
Figure 69. Removing the 8x2.5” HDD Cage Assembly

## Installing first 8x2.5” Hot-swap Hard Drive Cage Assembly

### CAUTION

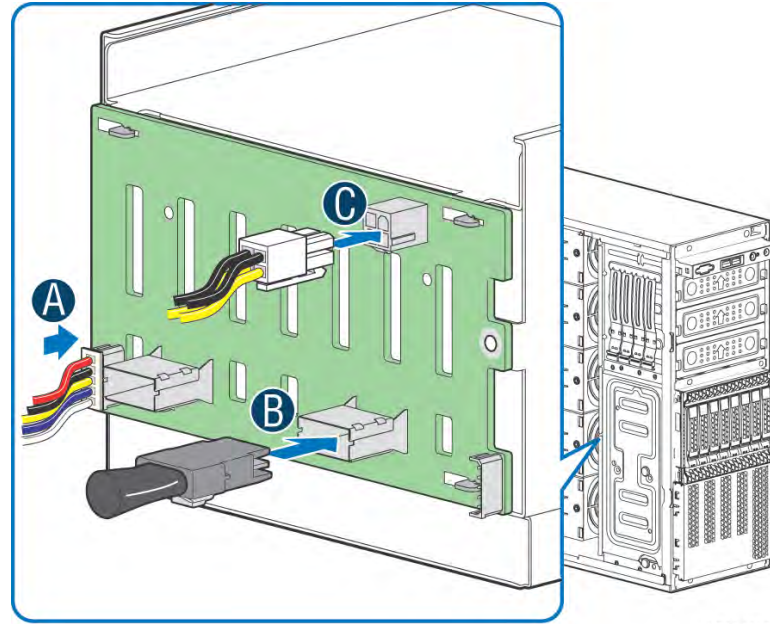
*It is critical that you connect the SAS/SATA data cables correctly from the SAS/SATA backplane to your server board or RAID controller card. Failure to do so may result in data loss.*

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel (Pedestal Only)”.
5. Install the 8x2.5” Hot-Swap Hard Drive Cage.
  - i. Slide the 8x2.5” Hot-Swap Drive Cage into the slot (see letter **A**).
  - ii. Secure the Hard Drive Cage with the Screw (see letter **B**).



**Figure 70. Installing the 8x2.5” Hot-Swap Hard Drive Cage Assembly**

6. Make the backplane and server board/RAID controller card cable connections. Refer to the documentation that came with your server board and/or RAID controller card for instructions on connecting backplane cables to your server board or RAID controller card.
  - i. Connect an I<sup>2</sup>C \_IN cable (see letter **A**).
  - ii. Connect MiniSAS data cables (see letter **B**).
  - iii. Connect power cable (see letter **C**).



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**Figure 71. 8x2.5" Hot Swap Backplane Cable Connections**

7. Install the front bezel. For instructions, see "Installing the Front Bezel (Pedestal Only)".
8. Install the air duct if the air duct is removed. For instructions, see the *Quick Start User's Guide* or *Service Guide* provided with your Intel® server/workstation board.
9. Install the chassis cover. For instructions, see "Installing the Chassis Cover".
10. Plug all peripheral devices and the AC power cable into the server.
11. Power up the server.

## Removing and Installing the Hot-swap HDD EMI Shield

### / NOTE

*This procedure applies only to the Intel® Server System P4000IP family with 8x2.5" hot-swap hard disk drive cage configuration.*

### Removing the Hot-swap HDD EMI Shield

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see "Removing the Chassis Cover".
4. Remove the front bezel. For instructions, see "Removing the front bezel (Pedestal Only)".
5. Remove the 8x2.5" Hot-swap HDD cage. For instructions, see "Removing 8x2.5" Hot-swap Hard Disk Drive Cage with Backplane".

6. Lift the EMI shield (see letter **A**) and move EMI shield outward from the chassis (see letter **B**).

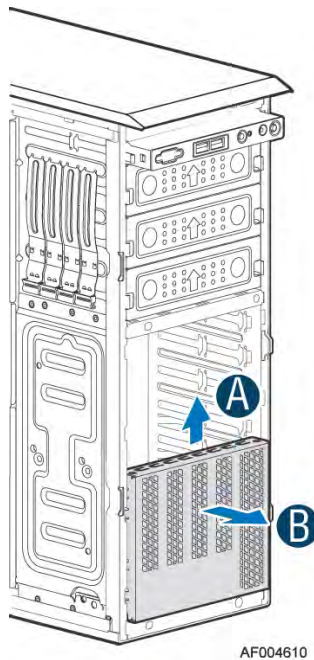


Figure 72. Removing the Hot-swap HDD EMI Shield

## Installing the Hot-swap HDD EMI Shield

1. Fit the edges of the EMI Shield against the sides of the chassis (see letter **A**).
2. While pressing the EMI Shield, slide the EMI Shield downwards until the latches on the EMI Shield are engaged with the chassis (see letter **B**).

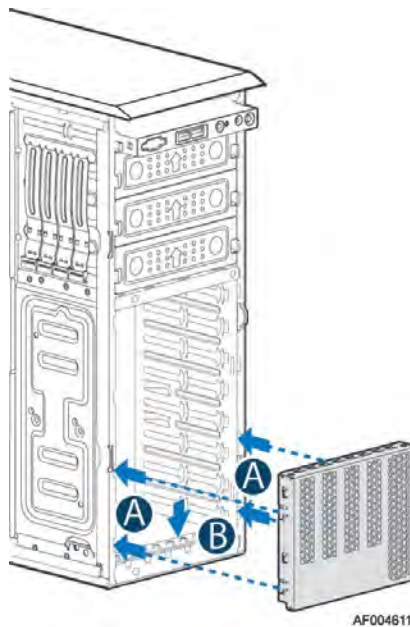


Figure 73. Installing the Hot-swap HDD EMI Shield

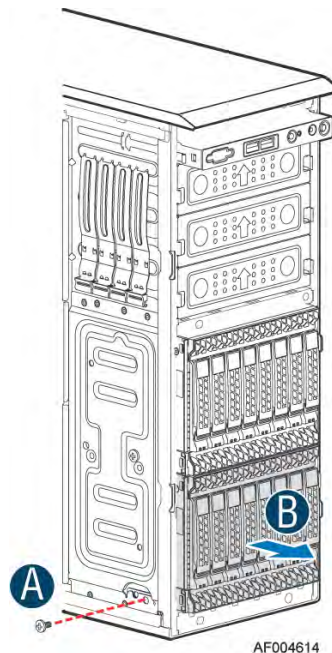
# Removing and Installing Second 8x2.5” Hot-swap Hard Disk Drive Cage Assembly

## / NOTE

*This procedure applies only to the Intel® Server System P4000IP family with 8x2.5” hot-swap hard disk drive cage configuration.*

## Removing Second 8x2.5” Hot-swap Hard Disk Drive Cage Assembly

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel (Pedestal Only)”.
5. Disconnect the power and data cables to the backplane.
6. Use screwdriver to release the hot-swap hard drive cage (see letter **A**) from the chassis and remove the hot-swap hard drive cage (see letter **B**).



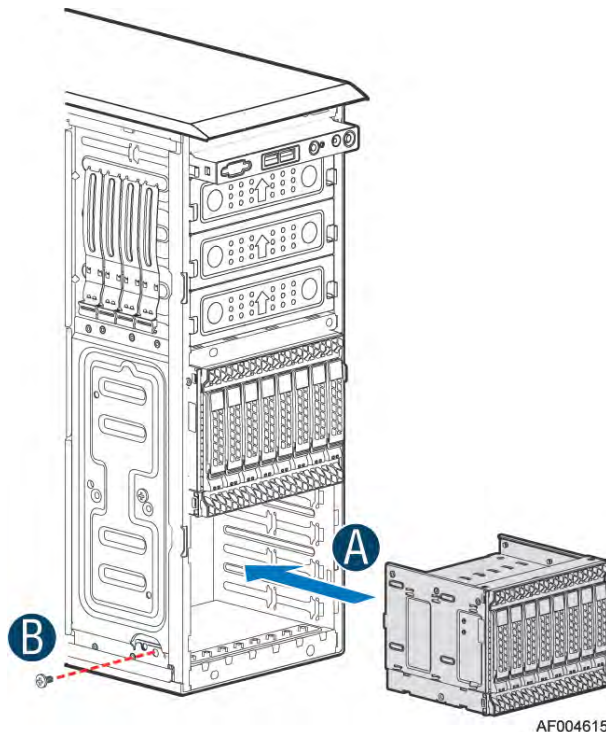
**Figure 74. Removing the bottom 8x2.5” Hot-swap HDD Cage Assembly**

## Installing Bottom 8x2.5” Hot-swap Hard Disk Drive Cage Assembly

### CAUTION

*It is critical that you connect the SAS/SATA data cables correctly from the SAS/SATA backplane to your server board or RAID controller card. Failure to do so may result in data loss.*

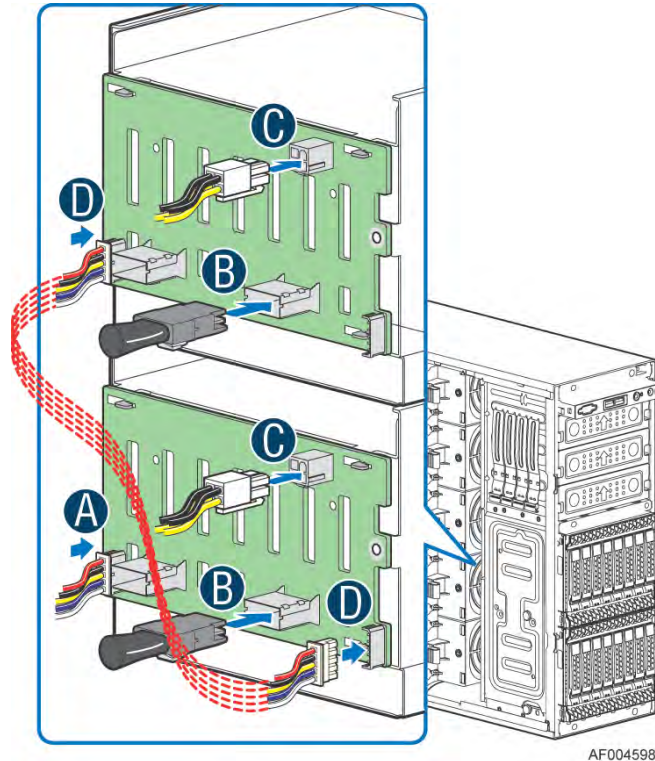
1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel (Pedestal Only)”.
5. Install bottom 8x2.5” Hot-Swap Hard Drive Cage.
  - i. Slide the 8x2.5” Hot-Swap Drive Cage into the slot (see letter **A**).
  - ii. Secure the Hard Drive Cage with the Screw (see letter **B**).



**Figure 75. Installing the Bottom 8x2.5” Hot-swap Hard Drive Cage Assembly**

6. Make the backplane and server board/RAID controller card cable connections. Refer to the documentation that came with your server board and/or RAID controller card for instructions on connecting backplane cables to your server board or RAID controller card.
  - i. Connect an I<sup>2</sup>C cable to the I<sup>2</sup>C \_IN connector of the bottom backplane (see letter **A**).
  - ii. Connect MiniSAS data cables to the Mini SAS connector of the backplane (see letter **B**).

- iii. Connect power cable to the power connector (see letter **C**).
- iv. Connect an I<sup>2</sup>C cable to the I<sup>2</sup>C \_OUT connector of the bottom backplane and the I<sup>2</sup>C \_IN connector of the top backplane (see letter **D**).



**Figure 76. Two 8x2.5" Hot Swap Backplane Cable Connections**

7. Install the front bezel. For instructions, see "Installing the Front Bezel (Pedestal Only)".
8. Install the air duct if the air duct is removed. For instructions, see the *Quick Start User's Guide* or *Service Guide* provided with your Intel<sup>®</sup> server/workstation board.
9. Install the chassis cover. For instructions, see "Installing the Chassis Cover".
10. Plug all peripheral devices and the AC power cable into the server.
11. Power up the server.

## Removing and Installing Third 8x2.5" Hot-swap Hard Disk Drive Cage Assembly

### / **NOTE**

*This procedure applies only to the Intel<sup>®</sup> Server System P4000IP family with 8x2.5" hot-swap hard disk drive cage configuration.*

## Removing Third 8x2.5” Hot-swap Hard Disk Drive Cage Assembly

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel (Pedestal Only)”.
5. Disconnect the power and data cables to the backplane.
6. Use screwdriver to release the hot-swap hard drive cage (see letter **C**) from the chassis and remove the hot-swap hard drive cage (see letter **D**).

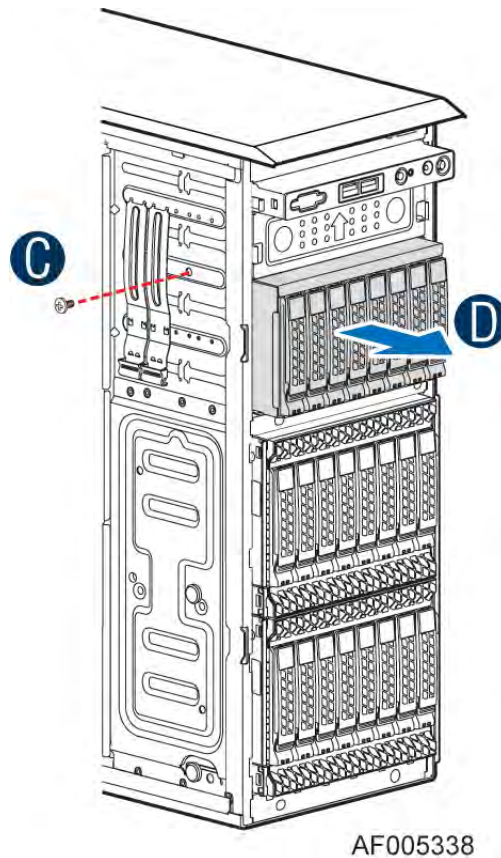


Figure 77. Removing the top 8x2.5” Hot-swap HDD Cage Assembly

## Installing Top 8x2.5” Hot-swap Hard Disk Drive Cage Assembly

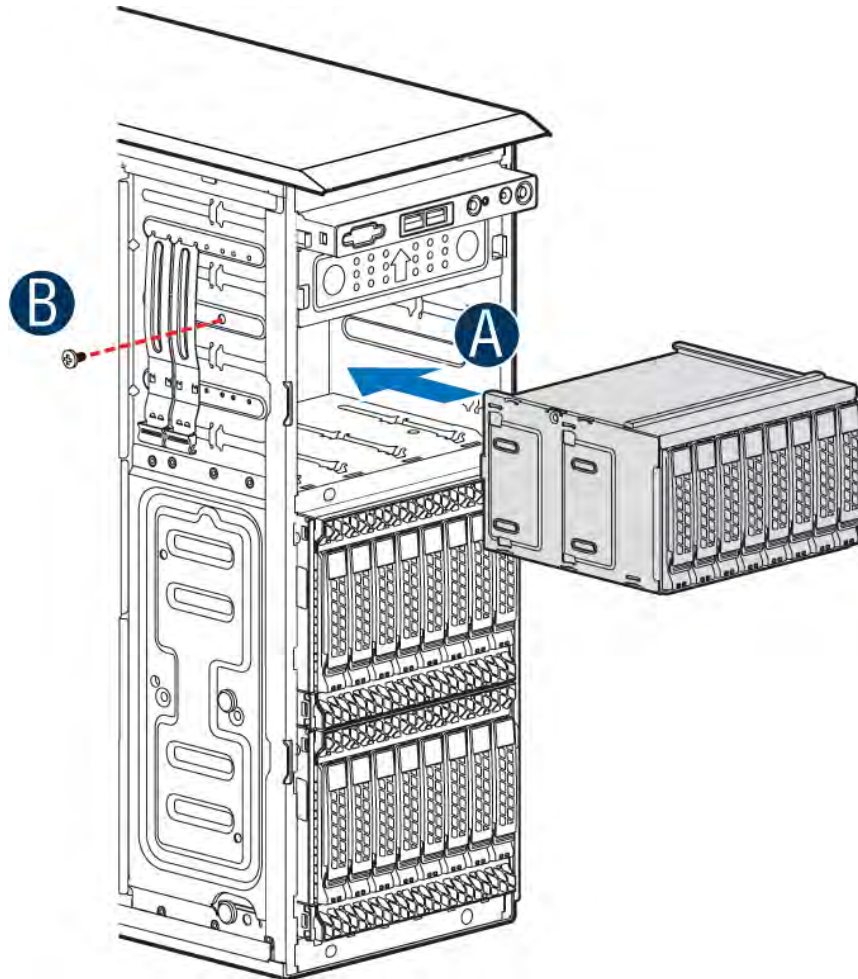


### CAUTION

*It is critical that you connect the SAS/SATA data cables correctly from the SAS/SATA backplane to your server board or RAID controller card. Failure to do so may result in data loss.*



1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel (Pedestal Only)”.
5. Install bottom 8x2.5” Hot-Swap Hard Drive Cage.
6. Slide the 8x2.5” Hot-Swap Drive Cage into the slot (see letter **A**).
7. Secure the Hard Drive Cage with the Screw (see letter **B**).

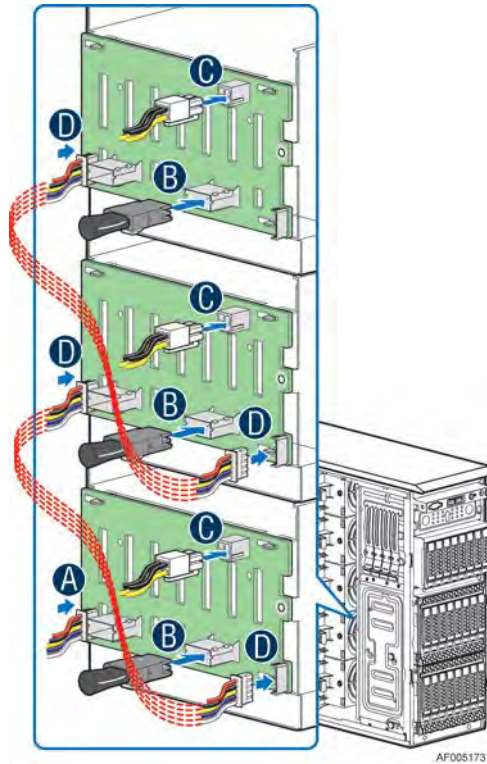


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**Figure 78. Installing the Top 8x2.5” Hot-swap Hard Drive Cage Assembly**

8. Make the backplane and server board/RAID controller card cable connections. Refer to the documentation that came with your server board and/or RAID controller card for instructions on connecting backplane cables to your server board or RAID controller card.
  - i. Connect an I<sup>2</sup>C cable to the I<sup>2</sup>C \_IN connector of the bottom backplane (see letter **A**).
  - ii. Connect MiniSAS data cables to the Mini SAS connector of the backplane (see letter **B**).
  - iii. Connect power cable to the power connector (see letter **C**).

- iv. Connect an I<sup>2</sup>C cable to the I<sup>2</sup>C \_OUT connector of the bottom backplane and the I<sup>2</sup>C \_IN connector of the top backplane (see letter **D**).



**Figure 79. Three 8x2.5” Hot Swap Backplane Cable Connections**

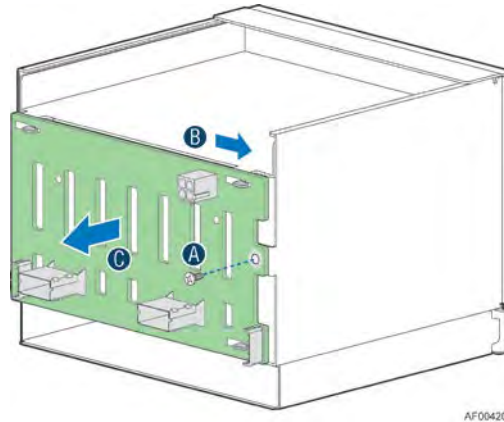
9. Install the front bezel. For instructions, see “Installing the Front Bezel (Pedestal Only)”.
10. Install the air duct if the air duct is removed. For instructions, see the *Quick Start User’s Guide* or *Service Guide* provided with your Intel® server/workstation board.
11. Install the chassis cover. For instructions, see “Installing the Chassis Cover”.
12. Plug all peripheral devices and the AC power cable into the server.
13. Power up the server.

## Removing and Installing 8x2.5” Hot-swap Backplane

### Removing 8x2.5” Hot-swap Backplane

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel (Pedestal Only)”.

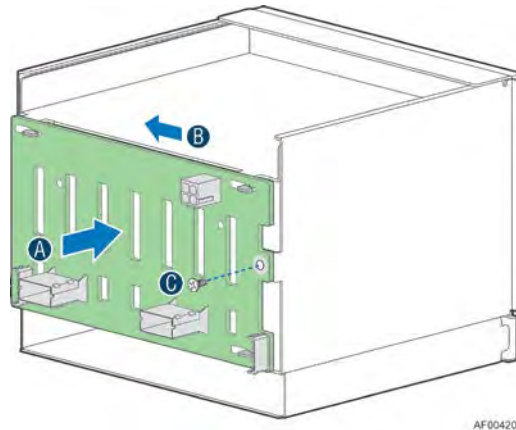
5. Remove the 8x2.5" Hot-swap Hard drives cage. For instructions, see "Removing 8x2.5" Hot-swap Hard Drive Cage Assembly".
6. Remove the screw on the backplane (see letter **A**).
7. Push the backplane (see letter **B**) and remove the backplane from the cage (see letter **C**).



**Figure 80. Removing 8x2.5" Hot-swap Backplane**

## Installing 8x2.5" Hot-swap Backplane

1. Attach the backplane to the back side of the hot-swap drive cage and make sure the hooks on the cage are inserted in the backplane holes (see letter **A**).
2. Push the backplane (see letter **B**) and secure the backplane with the screw (see letter **C**).



**Figure 81. Installing 8x2.5" Hot-swap Backplane**

3. Install the 8x2.5" Hot-swap Hard drives cage. For instructions, see "Installing 8x2.5" Hot-swap Hard Drive Cage Assembly".
4. Install the front bezel. For instructions, see "Installing the Front Bezel (Pedestal Only)".

5. Install the air duct if the air duct is removed. For instructions, see the *Quick Start User's Guide* or *Service Guide* provided with your Intel® server/workstation board.
6. Install the chassis cover. For instructions, see "Installing the Chassis Cover".
7. Plug all peripheral devices and the AC power cable into the server.
8. Power up the server.

## Installing Hot-swap Hard Drive

### Installing Hot-swap Hard Disk Drive into 3.5" Hard Drive Carrier

#### / NOTE

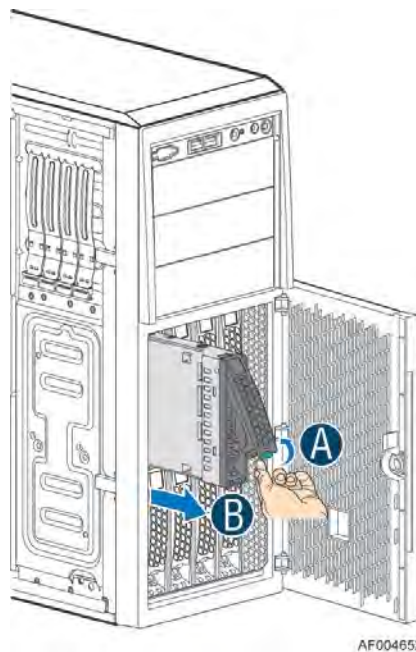
*This procedure applies only to the Intel® Server System P4000IP family with 3.5" hot-swap hard disk drive cage configuration.*



#### CAUTION

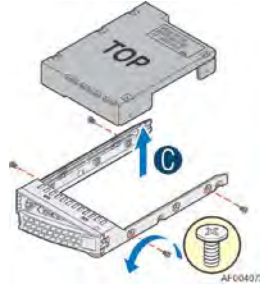
*The 3.5" hard disk drive can be a SSD or SAS and SATA. Refer to your server board or system documentation to determine SSD/SAS/SATA support for your server system.*

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

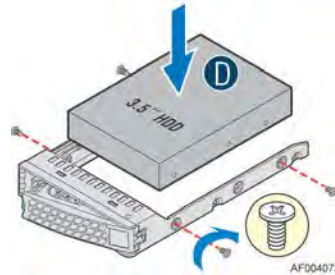


**Figure 82. Installing Hard Disk Drive – Removing 3.5" HDD carrier**

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

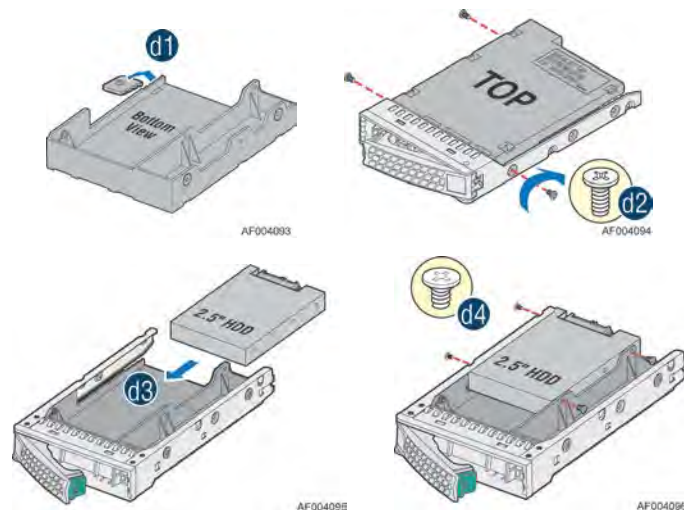
**Figure 83. Installing Hard Disk Drive – Removing 3.5" HDD interface bracket**

- 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 84. Installing Hard Disk Drive – Installing 3.5" HDD**

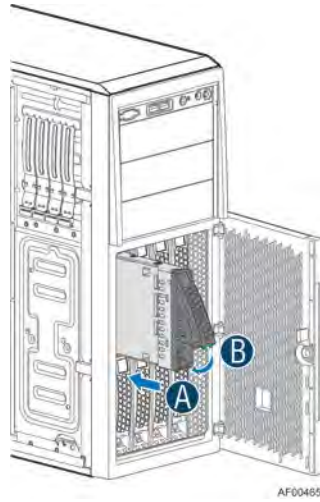
### For installing 2.5" Hard Disk Drive as option:

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 85. Installing Hard Disk Drive – Installing 2.5” HDD**

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



**Figure 86. Installing Hard Disk Drive – Inserting 3.5” HDD assembly**

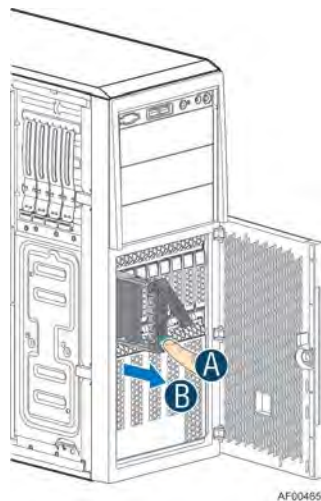
## Installing Hot-swap Hard Disk Drive into 2.5” Hard Drive Carrier



### CAUTION

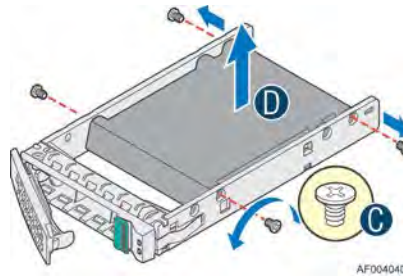
*The 2.5" hard disk drive can be a SSD or SAS and SATA. Refer to your server board or system documentation to determine SSD/SAS/SATA support for your server system.*

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**).

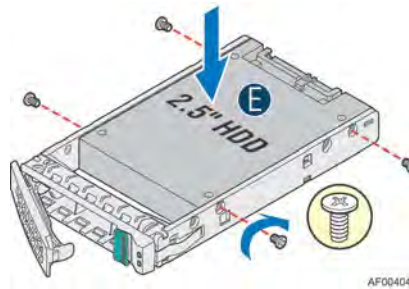


**Figure 87. Installing Hard Disk Drive – Removing 2.5” HDD carrier**

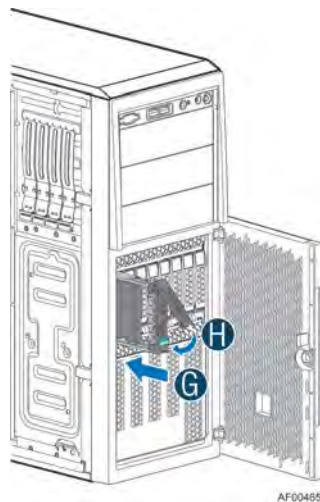
- Remove the four screws securing the plastic drive blank from the 2.5" HDD carrier (see letter **C**). Disengage the plastic drive blank from the HDD carrier. Remove the plastic drive blank from the 2.5" HDD carrier (see letter **D**).

**Figure 88. Installing Hard Disk Drive – Removing plastic drive blank**

- 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 89. Installing Hard Disk Drive – Installing 2.5” HDD**

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

**Figure 90. Installing Hard Disk Drive – Inserting 2.5” HDD assembly**

## Installing PCI Add-in Board(s)

### Installing PCI Add-in Board(s)



#### CAUTION

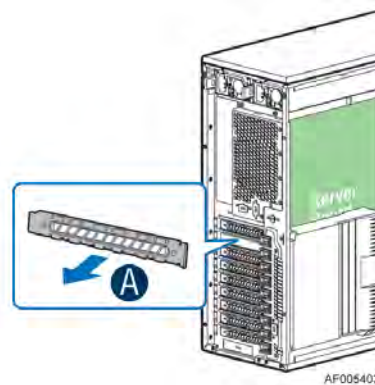
*You may want to install an operating system before installing any add-in boards.*

*Do not overload the server board by installing add-in boards that draw excessive current.*

*Add-in boards can be extremely sensitive to ESD and always require careful handling. After removing the board from its protective wrapper, place it component side up on a grounded, static-free surface. Do not slide the board over any surface.*

*When installing a full-length add-in card, you must install the PCI card retainer for full-length card.*

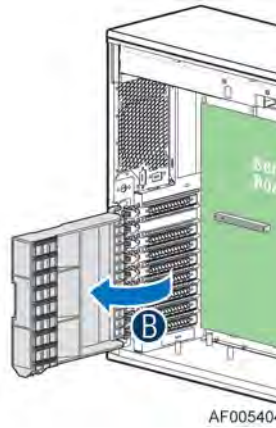
1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the airduct if it is installed.
5. Remove the PCI slot shield (see letter A) by pushing from the shield out from inside the chassis.



**Figure 91. Removing the PCI slot shield**

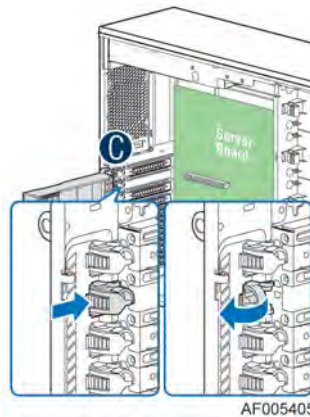


6. Rotate the PCI retainer all the way to open (see letter **B**).



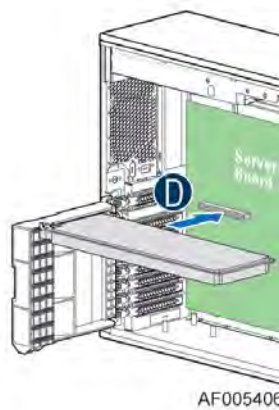
**Figure 92. Rotate the PCI retainer**

7. Press to open the back panel PCI add-in board retention device from inside the chassis (see letter **C**).



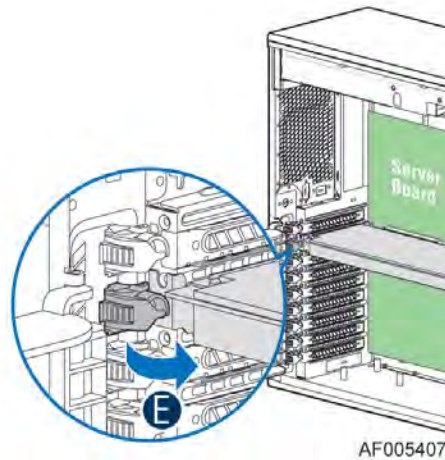
**Figure 93. Installing PCI Add-in Board**

8. While holding the PCI add-in board by its top edge or upper corner. Firmly press the add-in board into expansion slot.



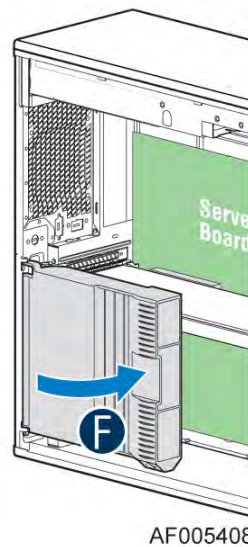
**Figure 94. Installing PCI Add-in Board**

9. Close the PCI add-in board retention device.



**Figure 95. Close the PCI add-in board retention device**

10. Rotate the PCI card retainer until the PCI card retainer is secured by the chassis. Make sure the PCI card is secured into the slot under the PCI card retainer.



**Figure 96. Rotate the PCI card retainer**

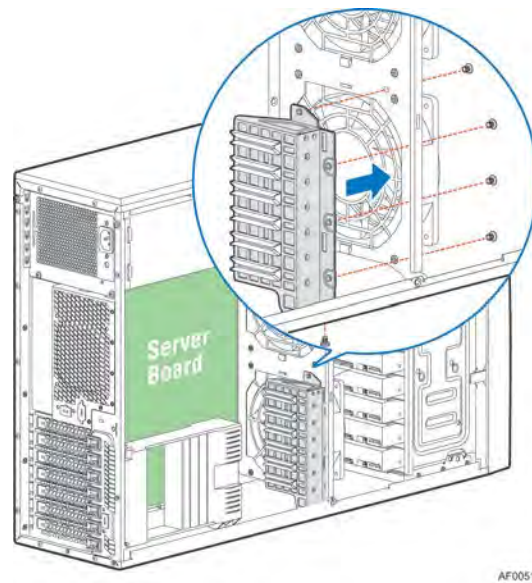
11. Attach cables if necessary.
12. Install the air duct if it is removed. For instructions, see the *Quick Start User's Guide* or *Service Guide* provided with your Intel® server/workstation board.
13. Install the chassis cover. For instructions, see "Installing the Chassis Cover".
14. Plug all peripheral devices and the AC power cable into the server.
15. Power up the server.

## Optional double-width card Fixture

### / NOTE

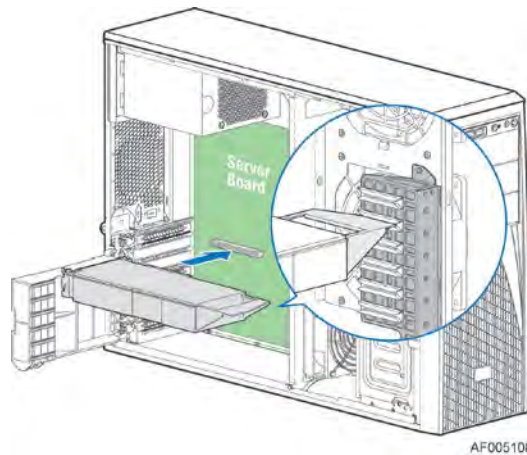
*When full-length double-width PCI card is plugged, PCI Card Retainer is needed to secure the PCI Card.*

A double-width card bracket can help better secure a heavy double-width card; the bracket can be installed on position as shown in the figure below.



**Figure 97. Installing the double-width card fixture**

Users need to design a double-width card extender to make a non-full length double-width card to be full length, in order to take advantage of the double-width card bracket.



**Figure 98. Secure the double-width card**

The following figures show an example of the double-width card bracket:

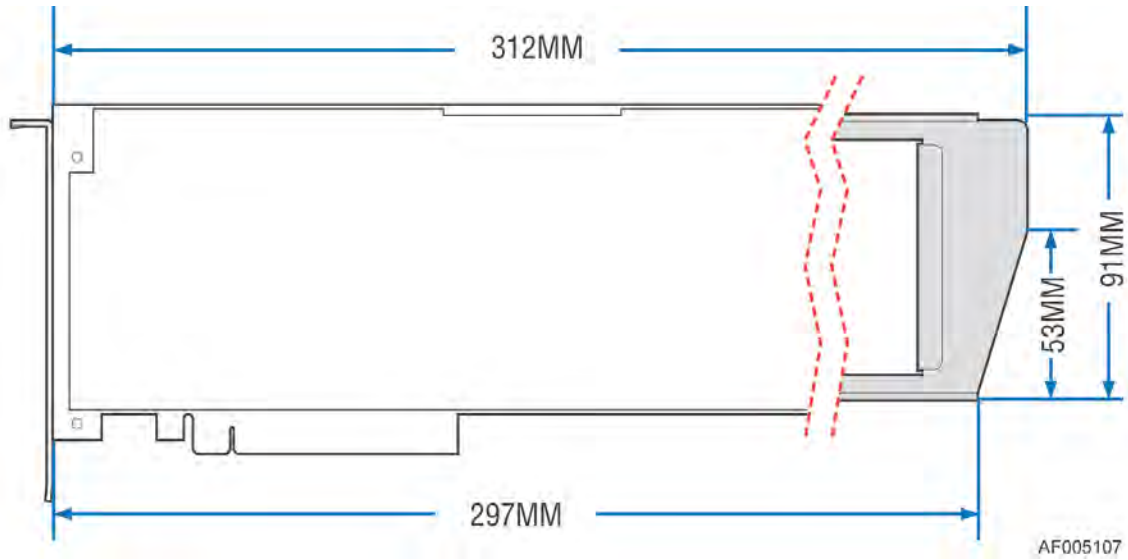


Figure 99. Side View of a double-width Card Extender Example

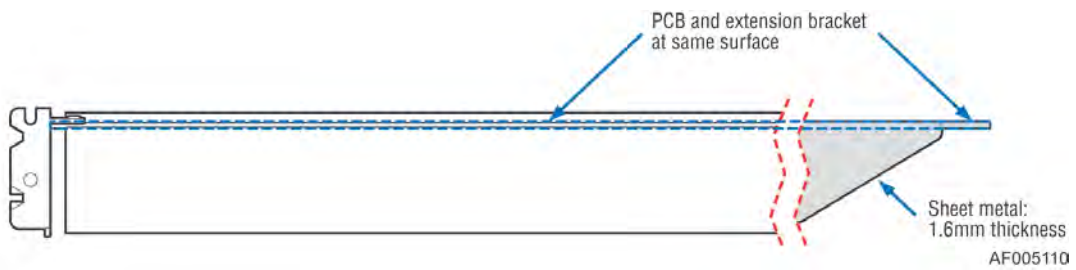


Figure 100. Top View of a double-width Card Extender Example

# Installing and Removing the Intel® RAID C600 Upgrade Key

## Installing the Intel® RAID C600 Upgrade Key

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

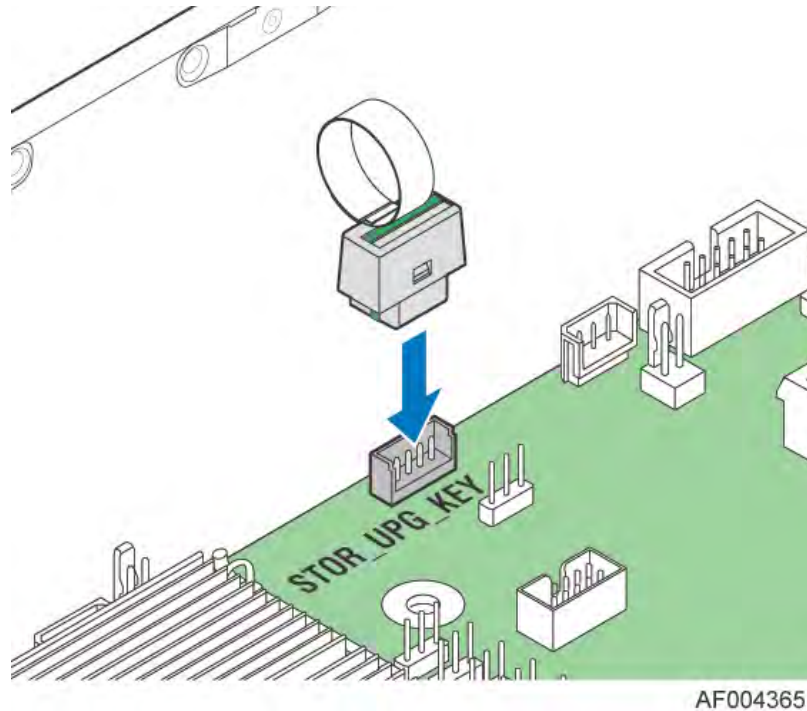


Figure 101. Installing the Intel® RAID C600 Upgrade Key

## Removing the Intel® RAID C600 Upgrade Key

Pull up the key to remove it from the motherboard.

# Installing and Removing the Intel® I/O Expansion Module

## Installing the Intel® I/O Expansion Module

Note: An Intel® I/O Expansion Module Kit (order code: AXXIOMKIT, MM# 920852) needs to be ordered prior to the installation of the Intel® I/O Expansion Kit.

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the chassis I/O Module slot filler. (see letter **A**).
5. Attach cable to the Intel® I/O Expansion Module (see letter **B**).
6. Attache and fix the Intel® I/O Expansion Module to the AXXMIKIT bracket with screws. (see letter **C, D**).
7. Connect the Intel® I/O Expansion Module cable to the board I/O module connector.

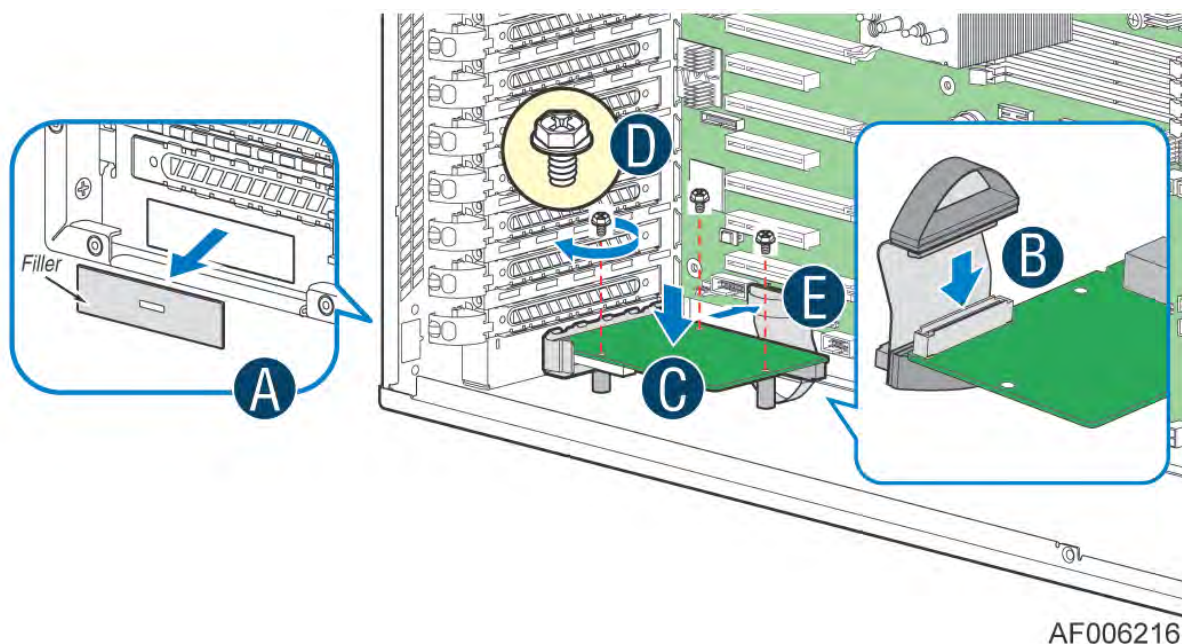


Figure 102. Installing the Intel® I/O Expansion Module

## Removing the Intel® I/O Expansion Module

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the screws. (see letter **A**).

5. Remove the Intel® I/O Expansion Module cable installed on the I/O expansion slot (see letter **B**).
6. Remove the Intel® I/O Expansion Module from the AXXMIOKIT bracket. (see letter **C**).
7. Remove the Intel® I/O Expansion Module cable installed on the I/O Expansion Module (see letter **D**).

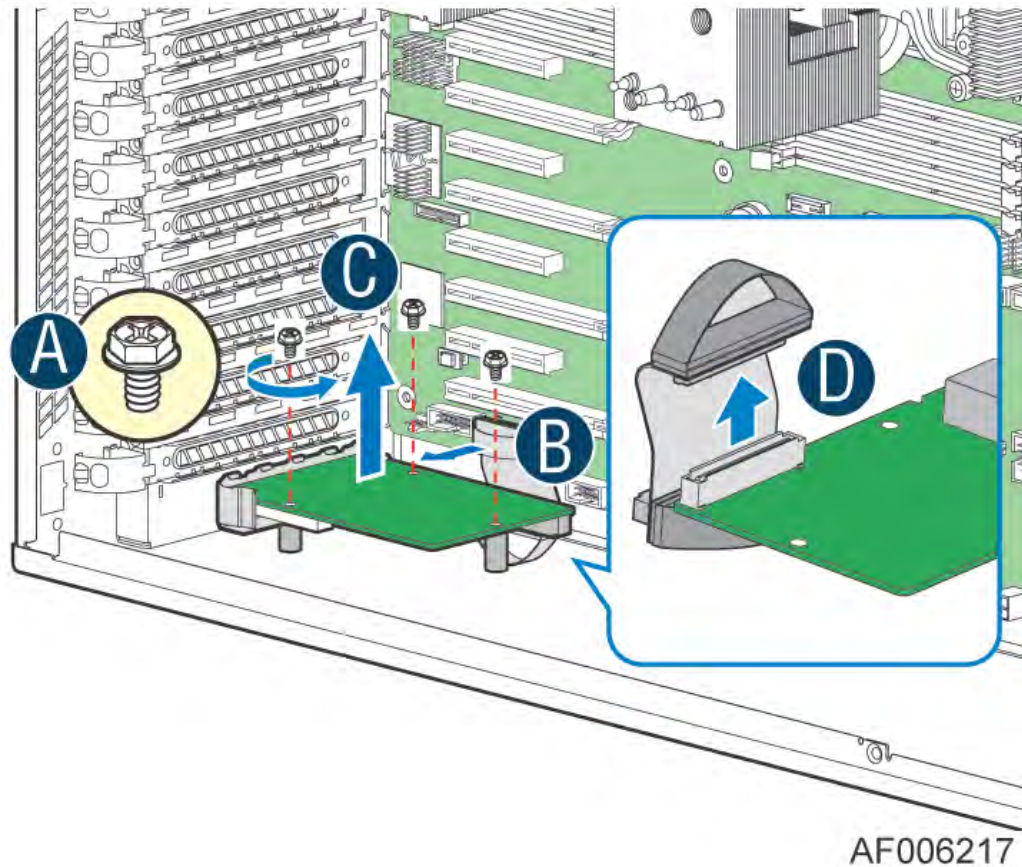
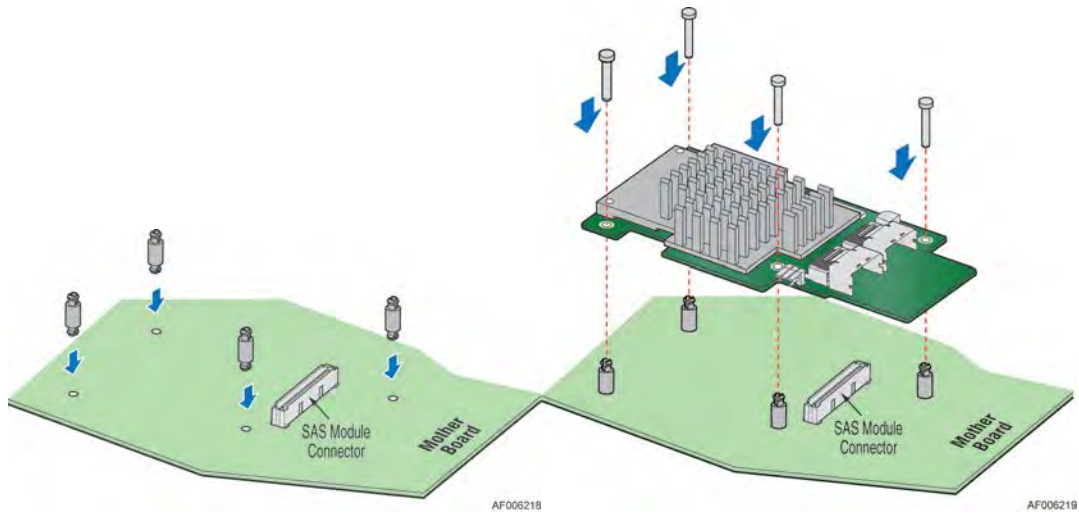


Figure 103. Removing the Intel® I/O Expansion Module

## Installing and Removing the Intel® SAS RAID Module

### Installing the Intel® SAS RAID Module

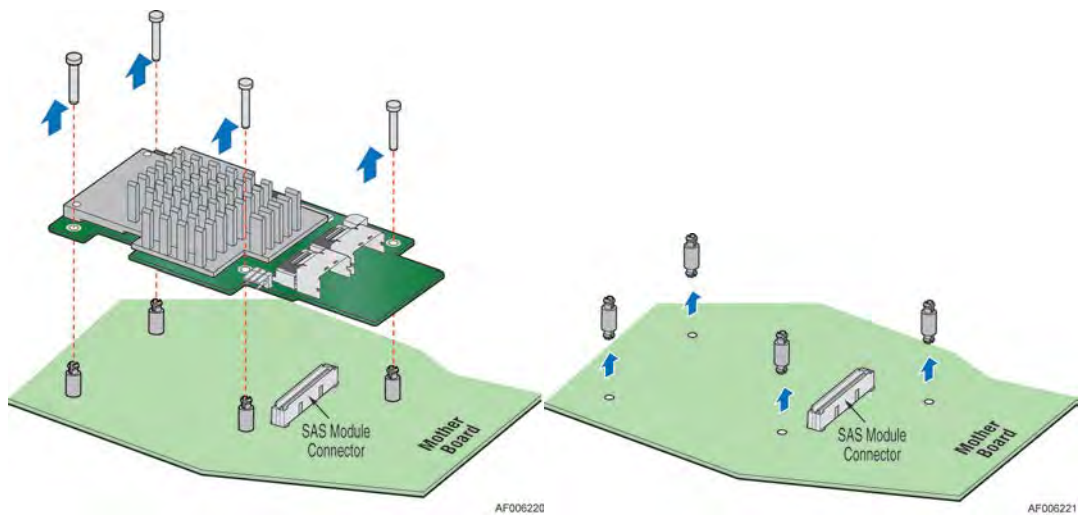
1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Install the stand offs.
5. Install and fix the Intel® SAS RAID module to the board SAS Module connector.



**Figure 104. Installing the Intel® SAS RAID Module**

## Removing the Intel® SAS RAID Module

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the Intel® SAS RAID module from the board SAS module connector.
5. Remove the stand offs.



**Figure 105. Removing the Intel® SAS RAID Module**



# 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 pickup the Intel® RMM4 Lite module, match the alignment pin of the module and the connector on server board, then press to install.

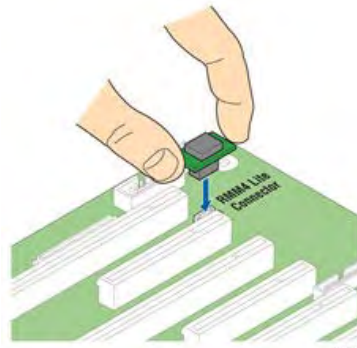


Figure 106. Installing the Intel® RMM4 Lite

## Install the Intel® RMM4 NIC

1. Push out and remove the metal cover on the chassis where the NIC RJ-45 receptacle will align (see letter **A**).
2. Connect the cable to the module (see letter **B**).
3. Secure the module to the chassis with the two screws (see letter **C**).
4. Connect the cable to the server board connector (see letter **D**).

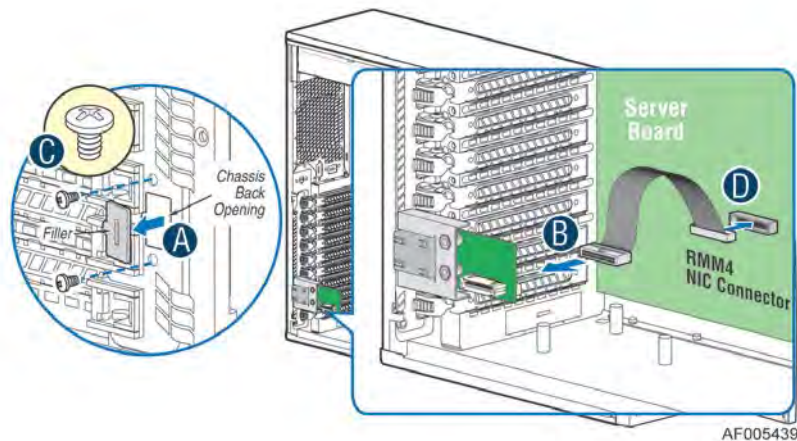


Figure 107. Installing the Intel® RMM4 NIC

## Removing the Intel® RMM4 Lite

Pull up the RMM4 Lite module to remove it from the motherboard.

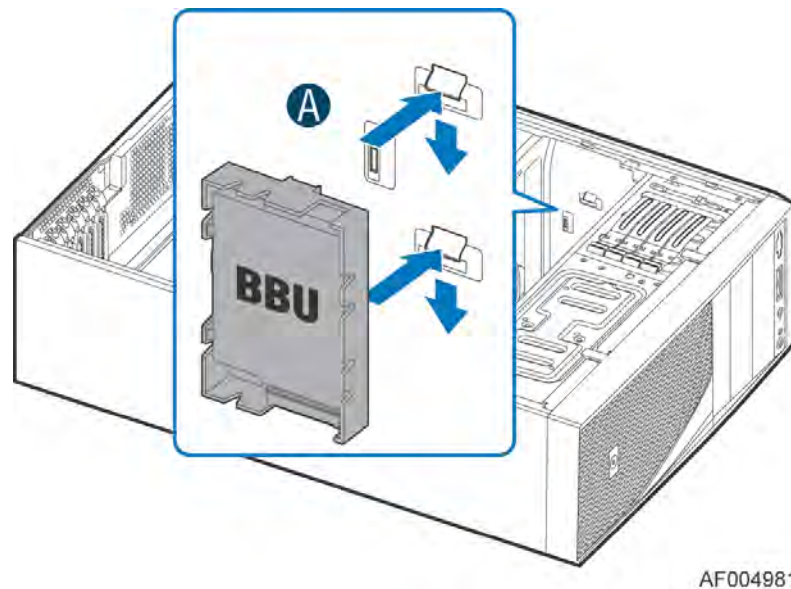
## Removing the Intel® RMM4 NIC

1. Unplug the cable from module and server board.
2. Remove the screws and remove the module from the server chassis.

# 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.
3. Align the tabs on the plastic battery holder with the mounting holes in the chassis and slide the plastic battery holder until the tabs engage with the mounting holes.



AF004981

Figure 108. Installing the Intel® RAID Smart Battery

## Removing the Intel® RAID Smart Battery

1. Pull the tab until the tab is disengaged from the chassis cut.
2. Slide the battery from the server chassis side wall and move it out of the opening in the fan bulkhead.
3. Lift the battery up to remove it from the server chassis.

# Installing an Additional Hot-swap Power Supply Module

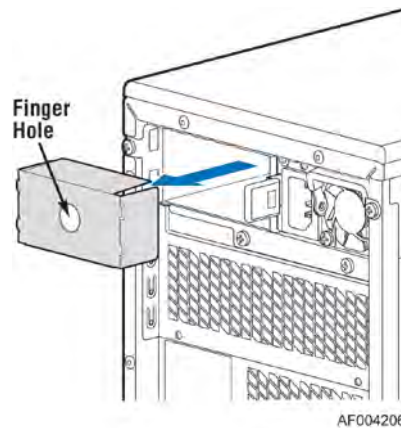
## / NOTE

*This install procedure only applies to a chassis with redundant power supply capability.*

## WARNING

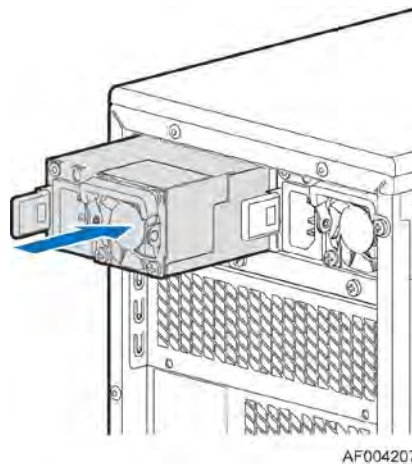
*Hazardous voltage, current, and energy levels are present inside the power supply. There are no user-serviceable parts inside it; servicing should be done by technically qualified personnel.*

1. Observe the safety and ESD precautions at the beginning of this book.
2. Insert finger into finger hole in middle of filler panel and remove the filler panel from chassis.



**Figure 109. Removing Power Supply Filler Panel**

3. Insert the power supply module into the power supply cage and push all the way until it clicks into place.



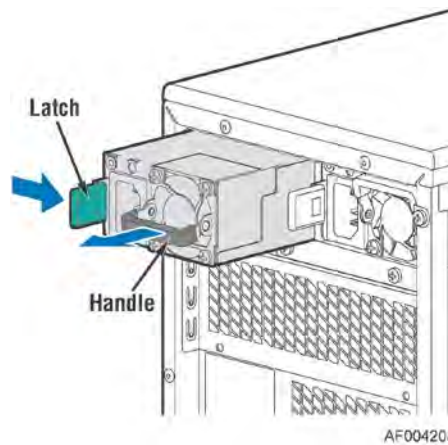
**Figure 110. Installing Additional Hot-swap Power Supply Module**

## Replacing a Hot Swap Power Supply Module

### WARNING

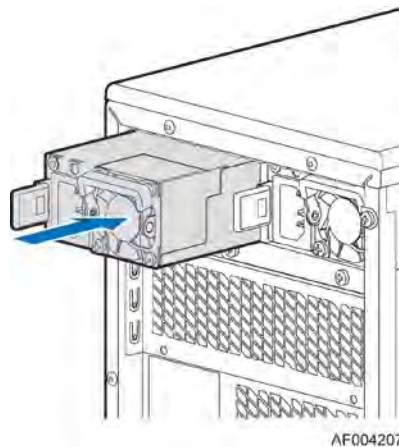
*Hazardous voltage, current, and energy levels are present inside the power supply. There are no user-serviceable parts inside it; servicing should be done by technically qualified personnel.*

1. Observe the safety and ESD precautions at the beginning of this book.
2. Remove power cable from defective power supply.
3. Press the green latch in the direction shown while pulling on handle to remove hot swap power supply from chassis.



**Figure 111. Removing Hot-swap Power Supply Module from Chassis**

4. Insert new power supply module into the power supply cage and push all the way until it clicks into place.



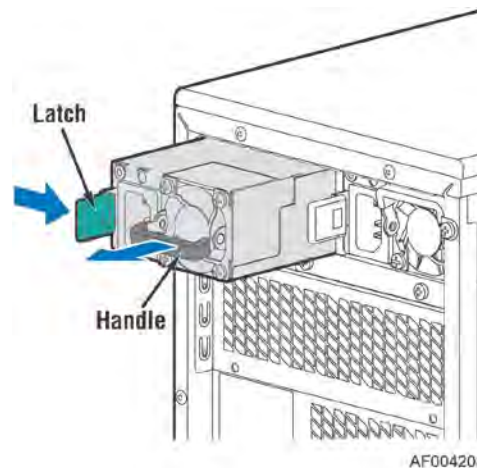
**Figure 112. Installing Hot-swap Power Supply Module into Chassis**

## Replacing the Power Distribution Board

### WARNING

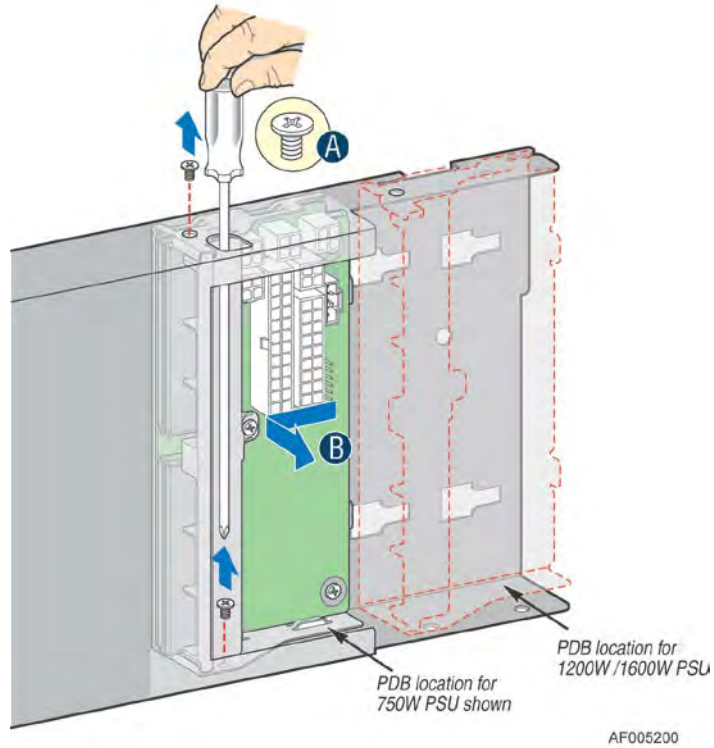
*Hazardous voltage, current, and energy levels are present inside the power supply. There are no user-serviceable parts inside it; servicing should be done by technically qualified personnel.*

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the air duct. For instructions, see the *Quick Start User’s Guide* or *Service Guide* provided with your Intel® server/workstation board.
5. Disconnect all internal power cables from chassis components and server board.
6. If present, press the green latch in the direction shown while pulling on handle to remove power supply from chassis. Repeat this step for the second hot-swap power supply if it is installed.



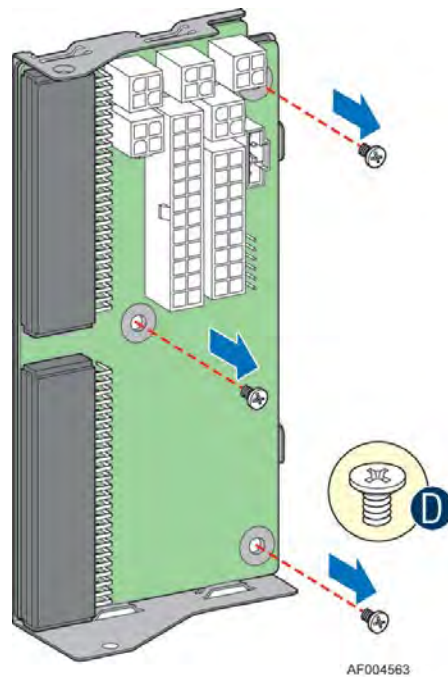
**Figure 113. Removing Hot-swap Power Supply Module from Chassis**

7. Loosen the screws securing the bracket with power distribution board to the chassis (see letter **A**).
8. Push the bracket forward to release the latch which secures the bracket; then pull out the bracket from the chassis (see letter **B**).



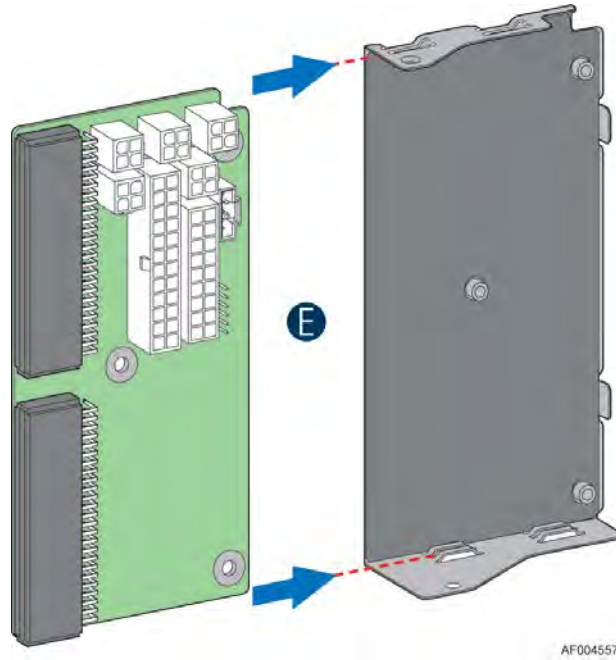
**Figure 114. Remove Power Distribution Board from Chassis**

9. Loosen screws securing the power distribution board to the bracket, and then remove it from the bracket (see letter D).

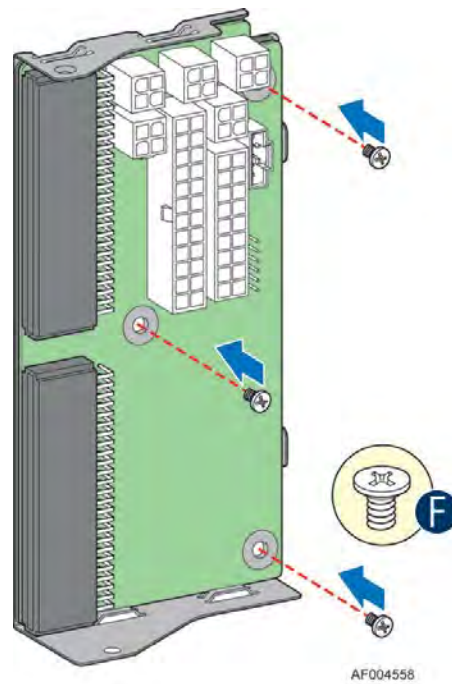


**Figure 115. Removing the Power Distribution Board from Bracket**

- Slide the new power distribution board to the bracket (see letter **E**) and secure the new power distribution board to the bracket using the same screws (see letter **F**).



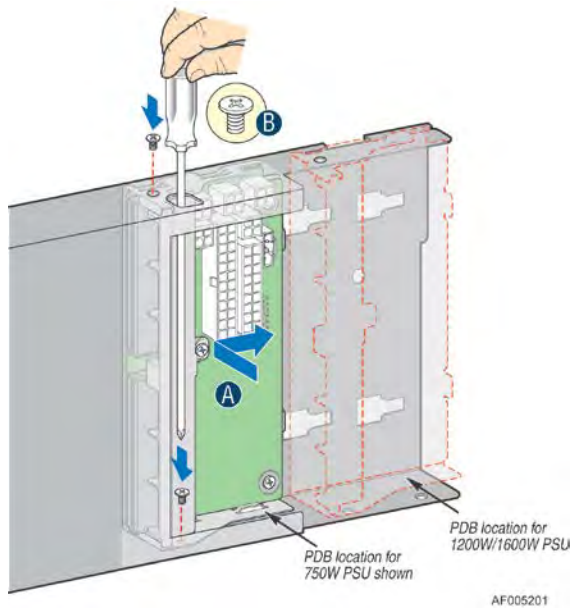
**Figure 116. Sliding the New Power Distribution Board in Bracket**



**Figure 117. Securing the New Power Distribution Board in Bracket**

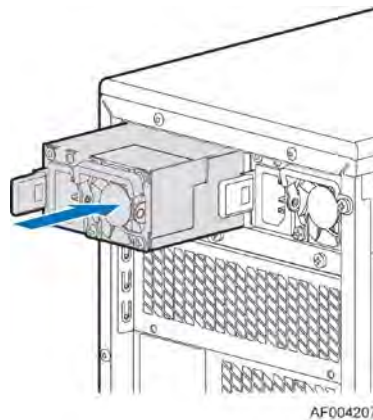
- Slide the bracket with the new power distribution board all the way into the power supply cage.

12. Pull back until the latch on the bracket is engaged with the power supply cage and make sure the screw holes on the bracket is aligned with the screw holes on power supply cage and then secure the bracket with the screws.



**Figure 118. Install the Power Distribution Board into Power Supply Cage**

13. Reconnect the power cables as appropriate.
14. Insert the power supply(ies) into the power supply cage and push all the way until it clicks into place.



**Figure 119. Installing Hot-swap Power Supply Module into Chassis**

15. Reinstall the air duct. For instructions, see the *Quick Start User's Guide* or *Service Guide* provided with your Intel® server/workstation board.
16. Re-install the chassis cover. For instructions, see "Installing the Chassis Cover".
17. Plug all peripheral devices and the AC power cable into the server.
18. Power up the server.



# Removing and Installing the Top Cosmetic Cover

## Removing the Top Cosmetic Cover

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Press the latches under the top cosmetic cover to release the cosmetic cover (see letter **A**) and remove the top cosmetic cover (see letter **B**).

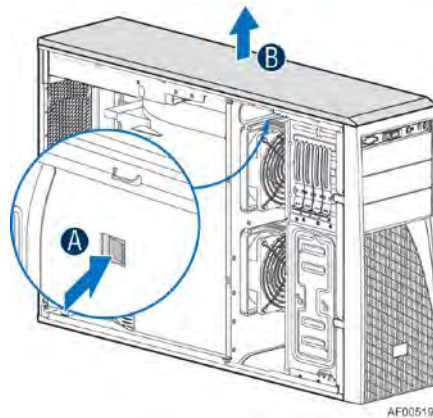


Figure 120. Removing the Top Cosmetic Cover

## Installing the Top Cosmetic Cover

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Attach the top cosmetic cover to the chassis and make sure the edges of the top cosmetic cover fit the sides of the chassis top and then slide the top cosmetic cover forward until the latches on the top cosmetic cover are engaged with the chassis.

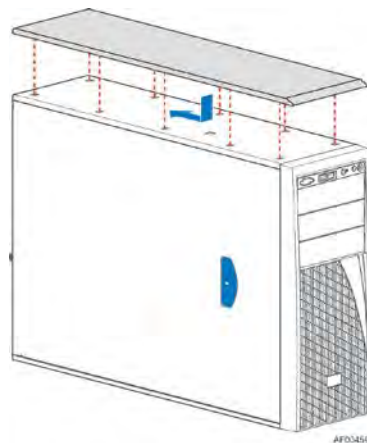
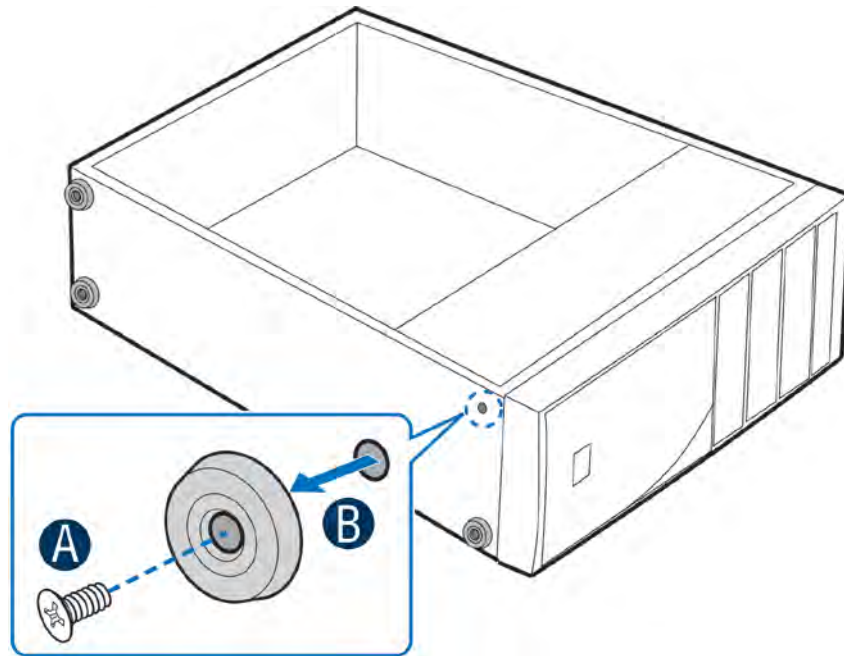


Figure 121. Installing the Top Cosmetic Cover

## Removing and Installing the Chassis Feet

### Removing the Chassis Feet

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Lay the chassis down on its right side.
4. Loosen the screws securing the rubber foot to the chassis and then remove the rubber foot from chassis.



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Figure 122. Removing the Chassis Feet

5. Repeat above steps until all four feet are removed.

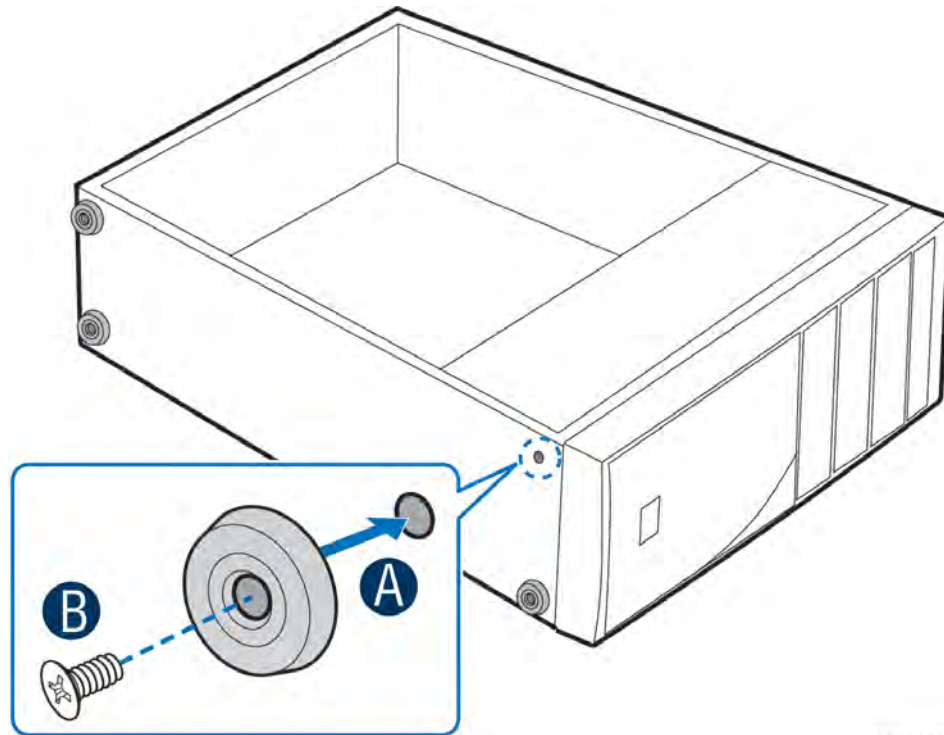
### Installing the Chassis Feet (Pedestal Configuration Only)

#### / NOTE

*Do not install feet on your Intel® Server System P4000IP and Intel® Workstation System P4000CR family if it is to be installed in a rack. Only install feet on a pedestal-configured chassis.*

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Lay the chassis down on its right side.
4. Insert rubber foot into chassis hole (see letter **A**).

5. Secure the foot by inserting screw through the rubber foot (see letter **B**).
6. Repeat the above steps until all four feet are installed.



AF003966

**Figure 123. Installing the Chassis Feet**

7. Put chassis in the upright position.
8. Reconnect all peripheral devices and the AC power cable to the server. Power up the server.

## Removing and Installing the Front Panel Tray

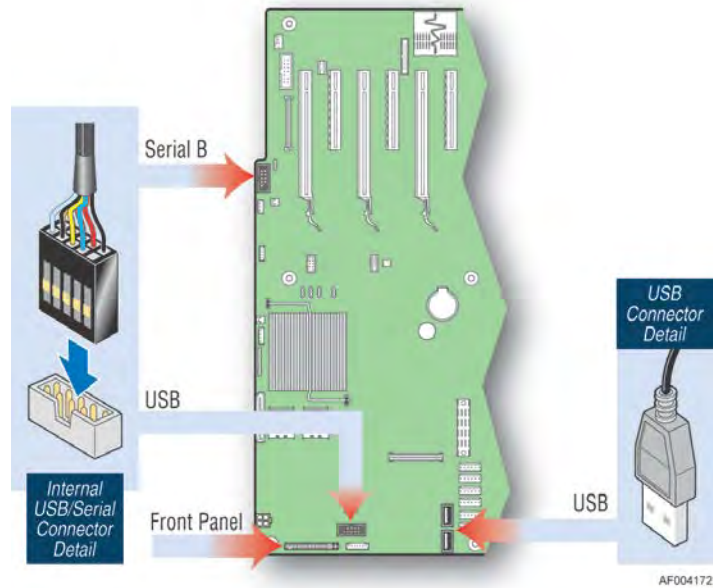
### CAUTION

*The front panel is NOT hot swappable. Before removing or replacing the control panel, 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 AC power cord from the system or wall outlet.*

### Removing the Front Control Panel Tray

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel”.

5. Remove the air duct if it is installed.
6. Disconnect the front panel cable, USB cable from the server board,



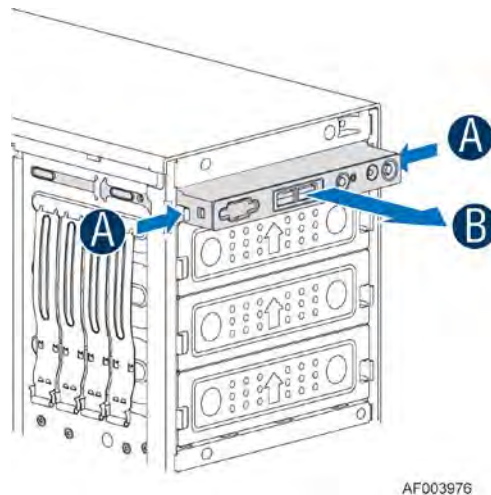
**Figure 124. Disconnecting the Cables from the Server Board**

7. Loosen the front panel cable and USB cable from the wire clip on chassis.
8. Press the latch at the sides of the front panel (see Letter **A**) and carefully slide the front panel out (see Letter **B**).



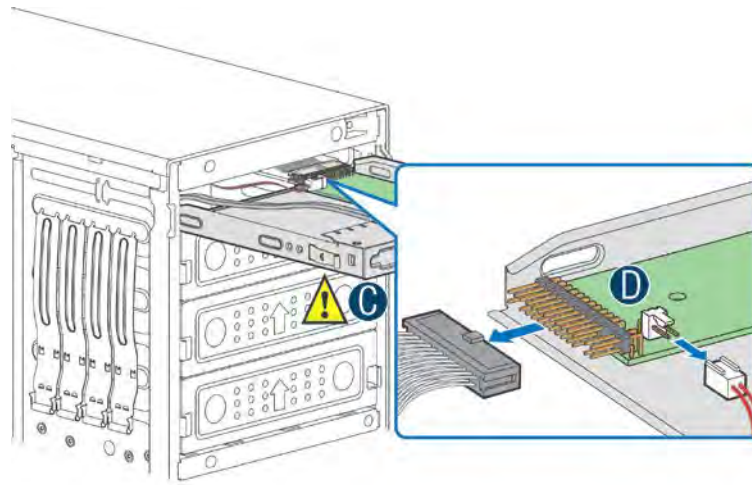
### CAUTION

*Do not slide the front panel out far from the front of the chassis before you disconnect the instruction cable from the front panel board.*



**Figure 125. Sliding the Front Panel Tray out from the Chassis**

9. Slide the front panel out from the front of the chassis to the place (see letter **C**) so that you can reach the front panel cable and instruction cable connectors at the rear of the front panel. Then disconnect the front panel cable and intrusion switch cable from the front panel board (see letter **D**).



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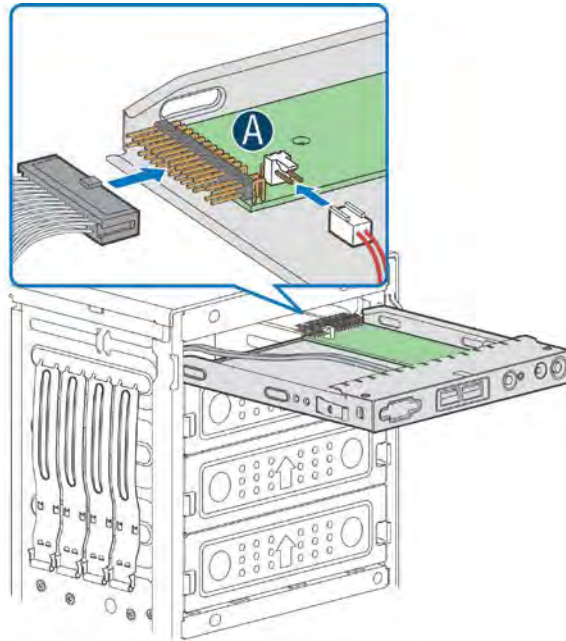
**Figure 126. Disconnecting the Cables from Front Panel Board**

10. Slide the front panel tray out.

## Installing the Front Panel Tray

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel”.
5. Remove the air duct if it is installed.

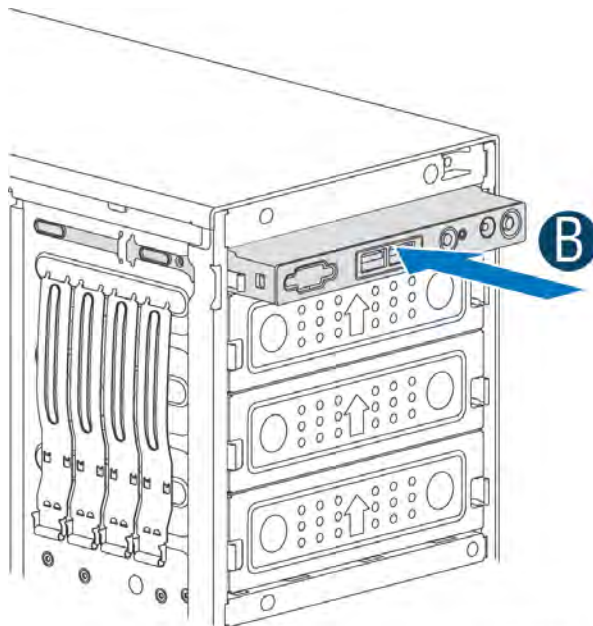
6. Attach the front panel cable and the chassis intrusion cable (see letter A) to the front panel board.



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**Figure 127. Connecting the Cables to the Front Panel Board**

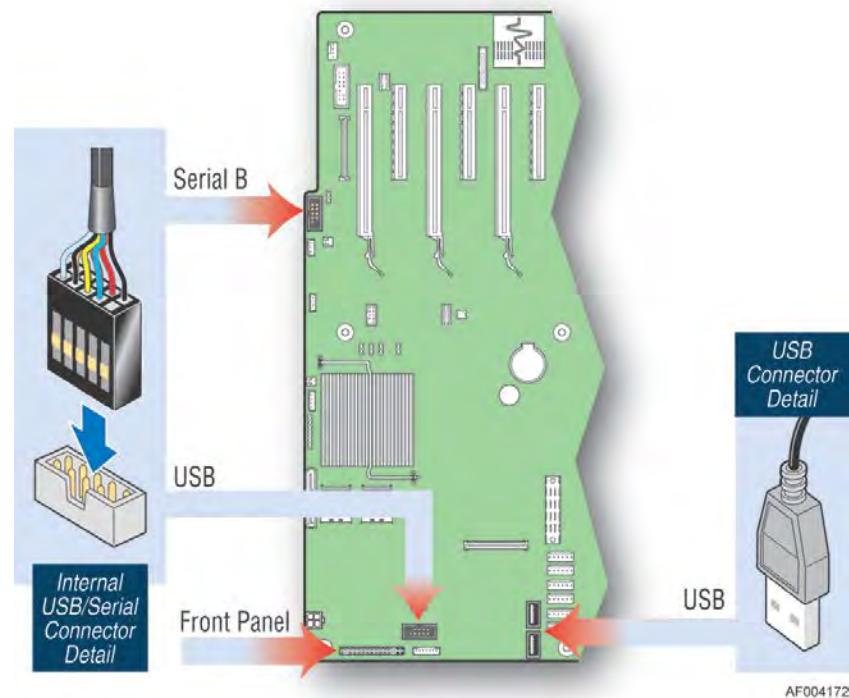
7. Slide the front panel tray in chassis



AF003983

**Figure 128. Installing the Front Panel Tray in Chassis**

8. Connect the front panel, USB cables, and optional serial cable to server board.

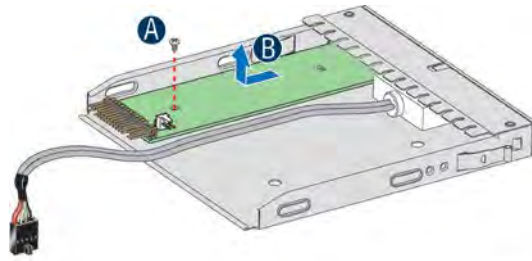


**Figure 129. Connecting the Cables to Server Board the Front Panel Tray in Chassis**

9. Install the front bezel. For instructions, see “Removing and Installing the Front Bezel”.
10. Install the air duct based on board requirement.
11. Install the chassis cover. For instructions, see “Installing the Chassis Cover”.
12. Plug all peripheral devices and the AC power cable into the server.
13. Power up the server.

## Replacing the Front Panel Board

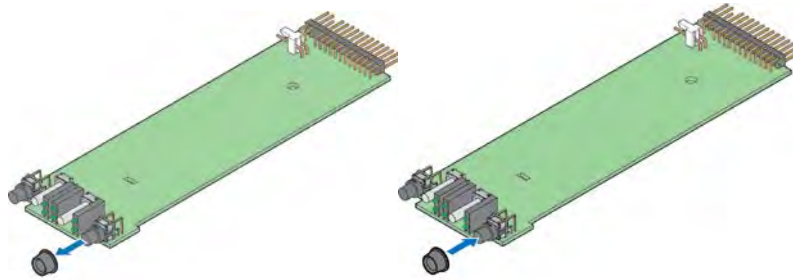
1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the front bezel if it is installed. For instructions, see “Removing the Front Bezel”.
5. Remove the front panel tray if it is installed. For instructions, see “Removing the Front Panel Tray”.
6. Loosen the screw (see letter **A**) securing the front panel board and remove the front panel board (see Letter **B**).



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**Figure 130. Removing the Front Panel Board**

7. Remove the cap on the front panel board power button and install the new cap on the new front panel board power button.

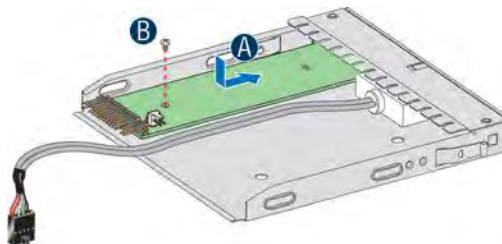


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AF003980

**Figure 131. Removing and Installing the Cap on Front Panel Board**

8. Attach the new front panel board in the front panel tray or LCP (see letter **A**) and secure the new front panel board with the screw (see letter **B**).



AF003981

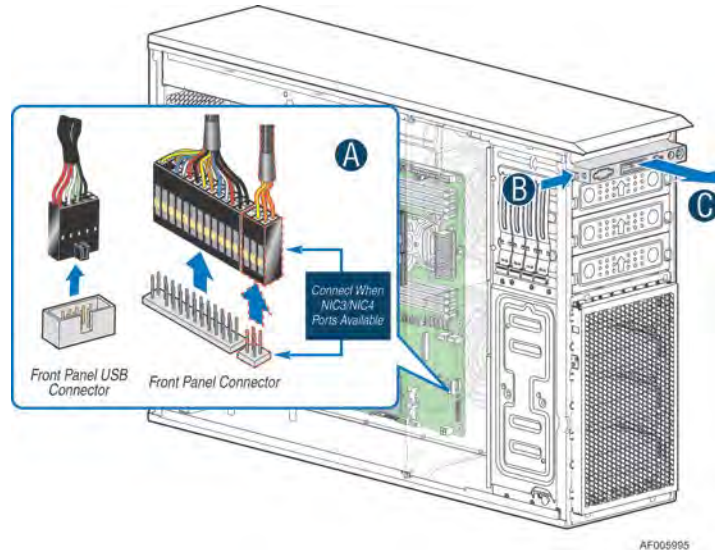
**Figure 132. Installing the New Front Panel Board**

9. Installing the front panel tray or LCP with the front panel board. For instructions, see “Installing the Front Panel Tray” or “Installing Local Control Panel (LCP)”.
10. Install the front bezel. For instructions, see “Removing and Installing the Front Bezel”.
11. Install the air duct based on board requirement.
14. Install the chassis cover. For instructions, see “Installing the Chassis Cover”.
15. Plug all peripheral devices and the AC power cable into the server.
16. Power up the server.



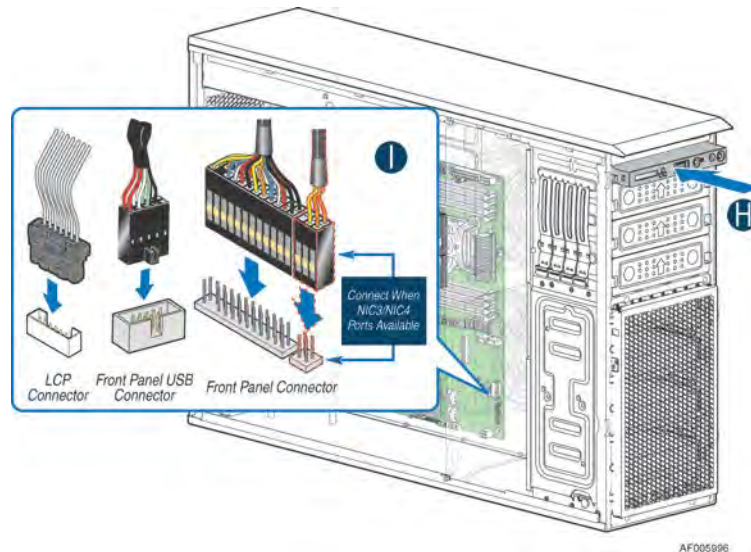
## Installing Local Control Panel (LCP)

1. Remove the front panel cable and USB cable from motherboard (see letter **A**).
2. Slide the front panel tray out from the chassis (see letters **B** and **C**).



**Figure 133. Removing Front Panel Tray out from the Chassis**

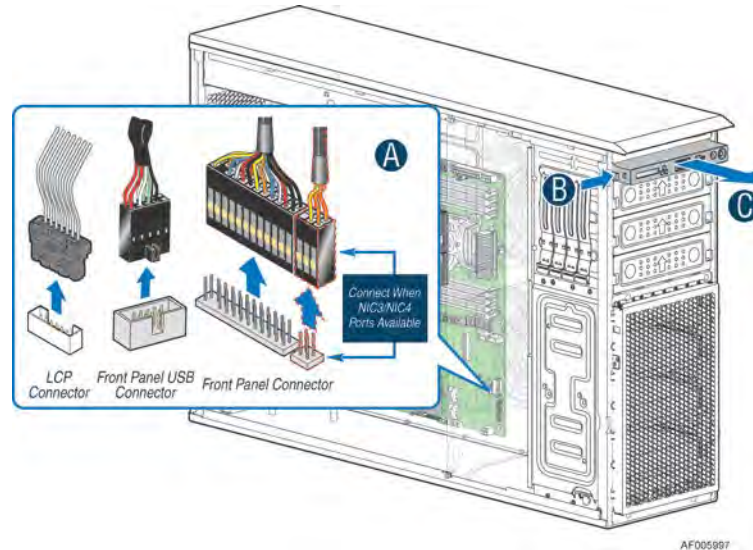
3. Refer “Replacing the front panel board” to remove front panel board from Front panel tray then install LCP with front panel board.
4. Insert the LCP into the chassis (see letter **H**).
5. Connect all cables on related connectors on motherboard (see letter **I**).



**Figure 134. Installing LCP into the Chassis**

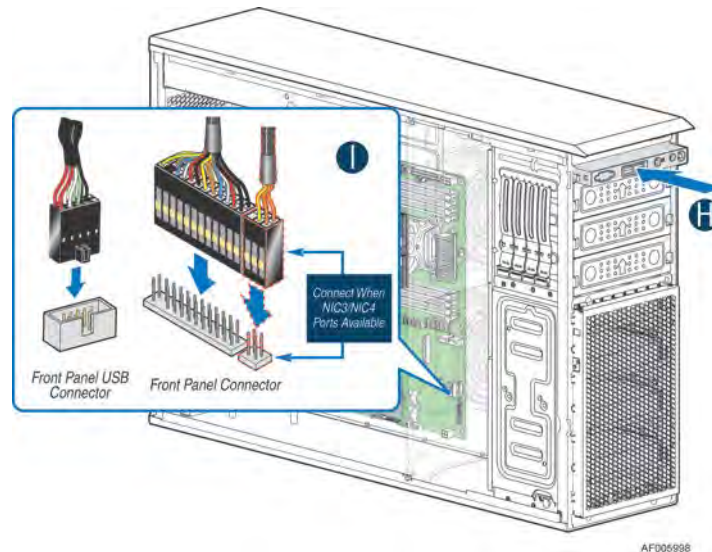
## Removing Local Control Panel (LCP)

1. Disconnect all cables from motherboard (see letter **A**).
2. Slide the LCP out from the chassis (see letters **B** and **C**).



**Figure 135. Removing LCP out from the Chassis**

3. Refer “Replacing the front panel board” to remove front panel board from LCP then install into front panel tray with front panel board.
4. Insert the front panel tray into the chassis (see letter **H**).
5. Connect all cables on related connectors on motherboard (see letter **I**).



**Figure 136. Installing front panel tray into the Chassis**

## Installing Alternate Serial Port

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, see “Removing the Chassis Cover”.
4. Remove the alternate serial port knockout by pressing the knockout from inside the chassis.
5. Install the serial port on the rear panel of the chassis and connect the cable to the Serial B Connector on your motherboard.

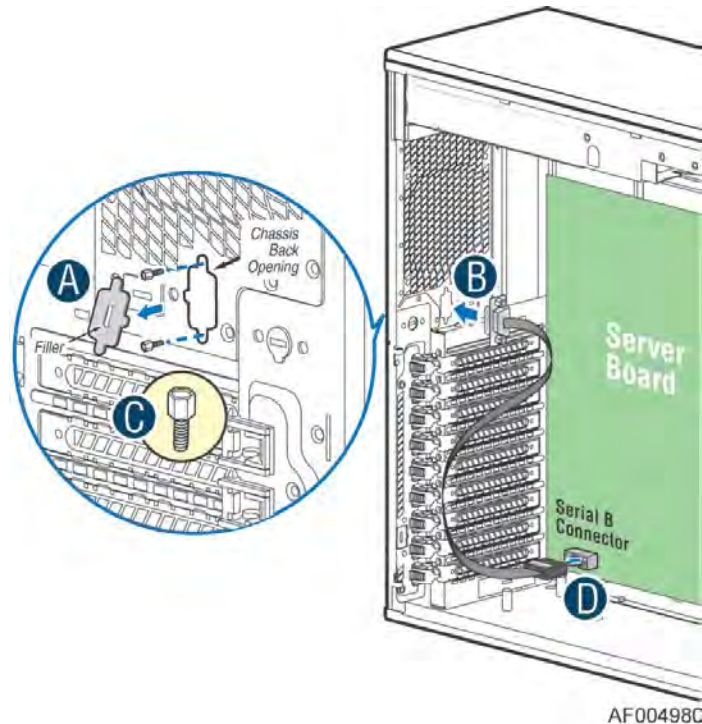


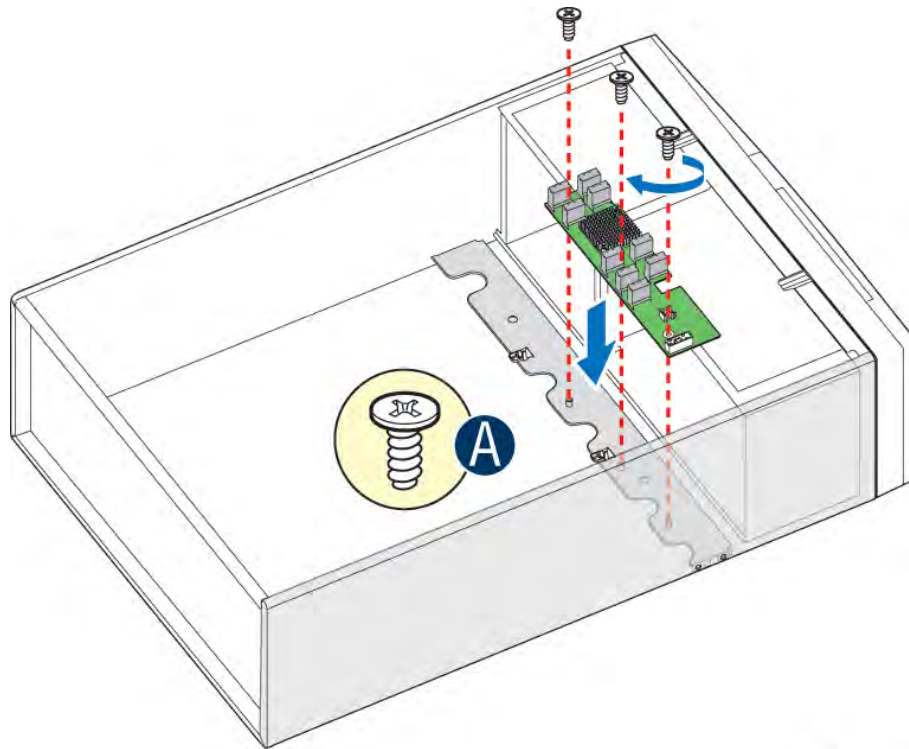
Figure 137. Installing the Alternate Serial Port Knockout

## Installing and/or Removing a Expander card

### Installing the Expander card

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, “Removing the Chassis Cover”.
4. Remove the fans. For instructions, see “Removing the Fixed Fan” or “Removing the Hot-swap Fans”.
5. Remove the Fixed HDDs or Hot swap drive cages. For instructions, see “Remove Fixed Hard Drives”, or “Remove 8x3.5 Hot swap Drive Cage Assemble”, or “Remove 8x2.5 Hot swap Drive Cage Assemble”

6. Locate the expander card bracket in the chassis. Mount the expander card to the bracket with screws.



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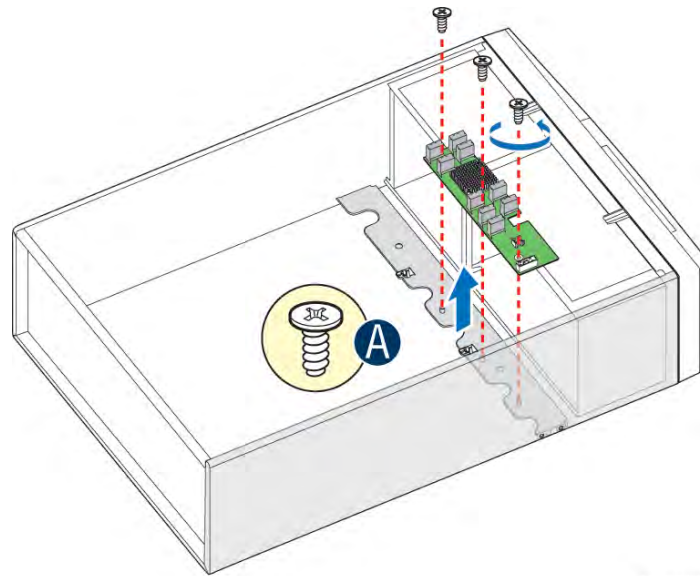
**Figure 138. Installing the Expander Card**

7. Connect the data cable between server board and expander card, and between expander and backplane(s). See documents for your server boards for instructions.
8. Install the Fixed HDDs or Hot swap drive cages. For instructions, see “Install Fixed Hard Drives”, or “Install 8x3.5 Hot swap Drive Cage Assemble”, or “Install 8x2.5 Hot swap Drive Cage Assemble”
9. Install the fans. For instructions, see “Install the Fixed Fan” or “Install the Hot-swap Fans”.
10. Install the chassis cover. For instructions, see “Install the Chassis Cover”.

## Removing the Expander card

1. Observe the safety and ESD precautions at the beginning of this book.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the chassis cover. For instructions, “Removing the Chassis Cover”.
4. Remove the fans. For instructions, see “Removing the Fixed Fan” or “Removing the Hot-swap Fans”.
5. Remove the Fixed HDDs or Hot swap drive cages. For instructions, see “Remove Fixed Hard Drives”, or “Remove 8x3.5 Hot swap Drive Cage Assemble”, or “Remove 8x2.5 Hot swap Drive Cage Assemble”.
6. Unplug all the cables connected to the expander card.

- Remove the expander card from expander card bracket by releasing the securing screws.



AF005046

**Figure 139. Removing the Expander card**

- Install the Fixed HDDs or Hot swap drive cages. For instructions, see “Install Fixed Hard Drives”, or “Install 8x3.5” Hot swap Drive Cage Assemble”, or “Install 8x2.5” Hot swap Drive Cage Assemble”.
- Install the fans. For instructions, see “Install the Fixed Fan” or “Install the Hot-swap Fans”.
- Install the chassis cover. For instructions, see “Install the Chassis Cover”.

## Connecting and Disconnecting Cables to or from Server Workstation Board



### CAUTION

*Use caution when routing cables to ensure that cables do not obstruct fan airflow.*

- See your *Intel® Server/Workstation Board Service Guide* or *Quick Start User's Guide* for cable connection locations.
- If your server has a hot swap power supply, secure the cables (that route toward the server/workstation board) to the chassis.

## Connecting Cables to Server/Workstation Board

- If your server has a hot swap power supply, connect the cables (that route toward the server/workstation board) to the chassis.
- See your *Intel® Server/Workstation Board Service Guide* or *Quick Start User's Guide* for cable connection locations.

## Removing Cables from Server/Workstation Board

1. If your server has a hot swap power supply, remove the cables (that route toward the server/workstation board) to the chassis.
2. See your *Intel® Server/Workstation Board Service Guide* or *Quick Start User's Guide* for cable connection locations.

## 3 BIOS Setup Utilities

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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:

1. 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.
2. Console Redirection – BIOS Setup is functional from 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.
3. 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.
4. 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 25<sup>th</sup> line cannot be used with the Setup page.

**Table 7. 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 &lt;ESC&gt; (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"> <li>▪ 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 <b>34 characters</b> long in the 80 x 24 page format.</li> <li>▪ 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 <b>90 characters</b> long, but only the first <b>22 characters</b> can be displayed on the 80 x 24 page (<b>24 characters</b> for an informational display-only field).</li> </ul> <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 &lt;Enter&gt; 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 <b>29 character by 11 line</b> 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 29<sup>th</sup> character. An unbroken string of more than 29 characters will be arbitrarily wrapped to a new line after the 29<sup>th</sup> character. Text that extends beyond the end of the 11<sup>th</sup> 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 8. 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.

Key	Option	Description
-	Change Value	The minus key on the keypad is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list.
+	Change Value	The plus key on the keypad is used to change the value of the current menu item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code than the plus key on the other keyboards, but will have the same effect.
<F9>	Setup Defaults	<p>Pressing the &lt;F9&gt; 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 &lt;Enter&gt; is pressed, all Setup fields are set to their default values. If “No” is highlighted and &lt;Enter&gt; is pressed, or if the &lt;Esc&gt; key is pressed, the user is returned to where they were before &lt;F9&gt; was pressed without affecting any existing field values.</p>
<F10>	Save and Exit	<p>Pressing the &lt;F10&gt; 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 &lt;Enter&gt; is pressed, all changes are saved and the Setup is exited. If “No” is highlighted and &lt;Enter&gt; is pressed, or the &lt;Esc&gt; key is pressed, the user is returned to where they were before &lt;F10&gt; 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 9. Screen Map**

Categories (Top Tabs)	2 <sup>nd</sup> Level Screens	3 <sup>rd</sup> 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 <sup>nd</sup> Level Screens	3 <sup>rd</sup> 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.

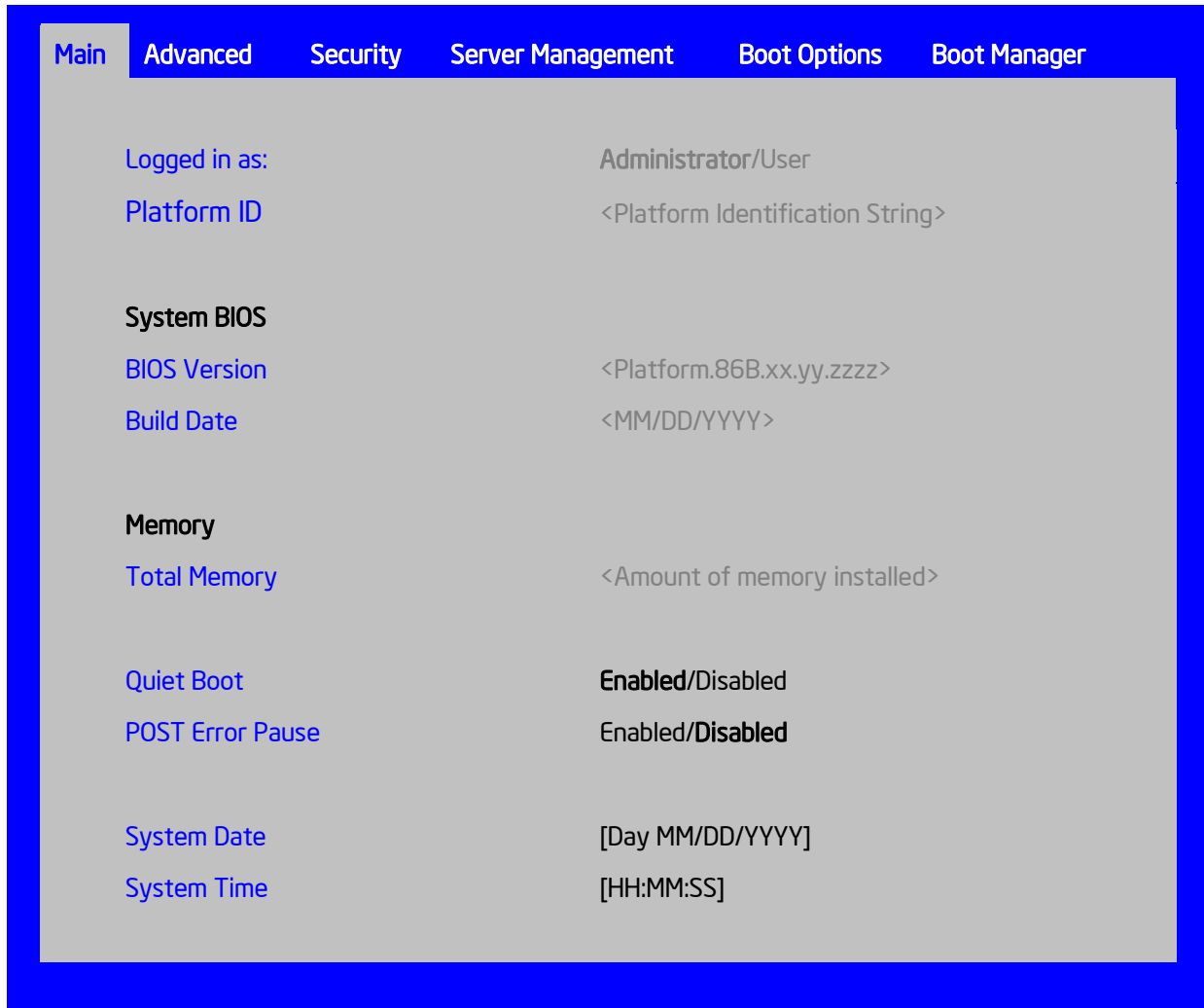


Figure 140. Main Screen

### 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 141. 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	<b>Auto Max</b> / 6.4 GT/s / 7.2 GT/s / 8.0 GT/s	
Intel® Turbo Boost Technology	<b>Enabled/Disabled</b>	
Enhanced Intel® SpeedStep® Tech	<b>Enabled/Disabled</b>	
Processor C3	<b>Enabled/Disabled</b>	
Processor C6	<b>Enabled/Disabled</b>	
Intel® Hyper-Threading Tech	<b>Enabled/Disabled</b>	
Active Processor Cores	<b>All/1/2/3/4/5/6/7</b>	
Execute Disable Bit	<b>Enabled/Disabled</b>	
Intel® Virtualization Technology	<b>Enabled/Disabled</b>	
Intel® VT for Directed I/O	<b>Enabled/Disabled</b>	
Interrupt Remapping	<b>Enabled/Disabled</b>	

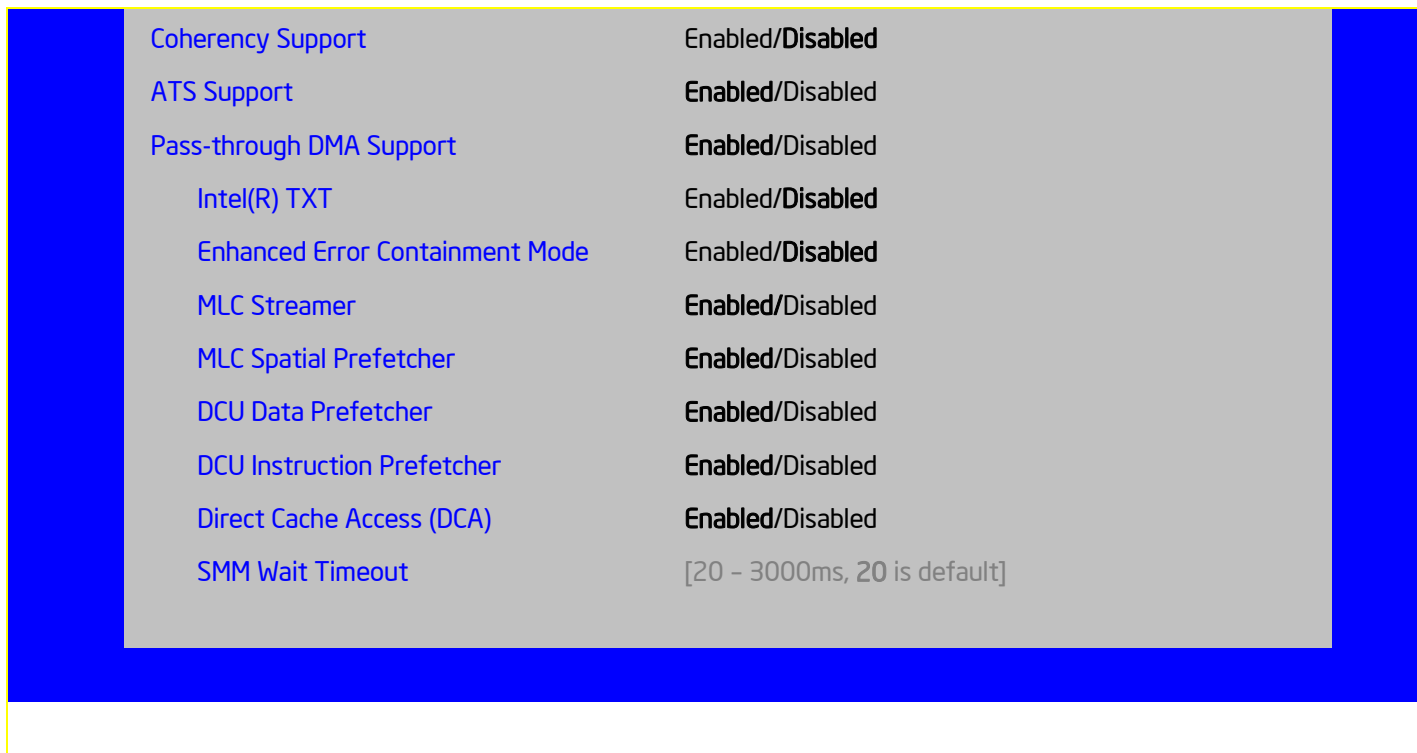


Figure 142. Processor Configuration Screen

**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 two 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 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.

Two 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.

Two 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.

Two 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.

Two 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.

Two 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.

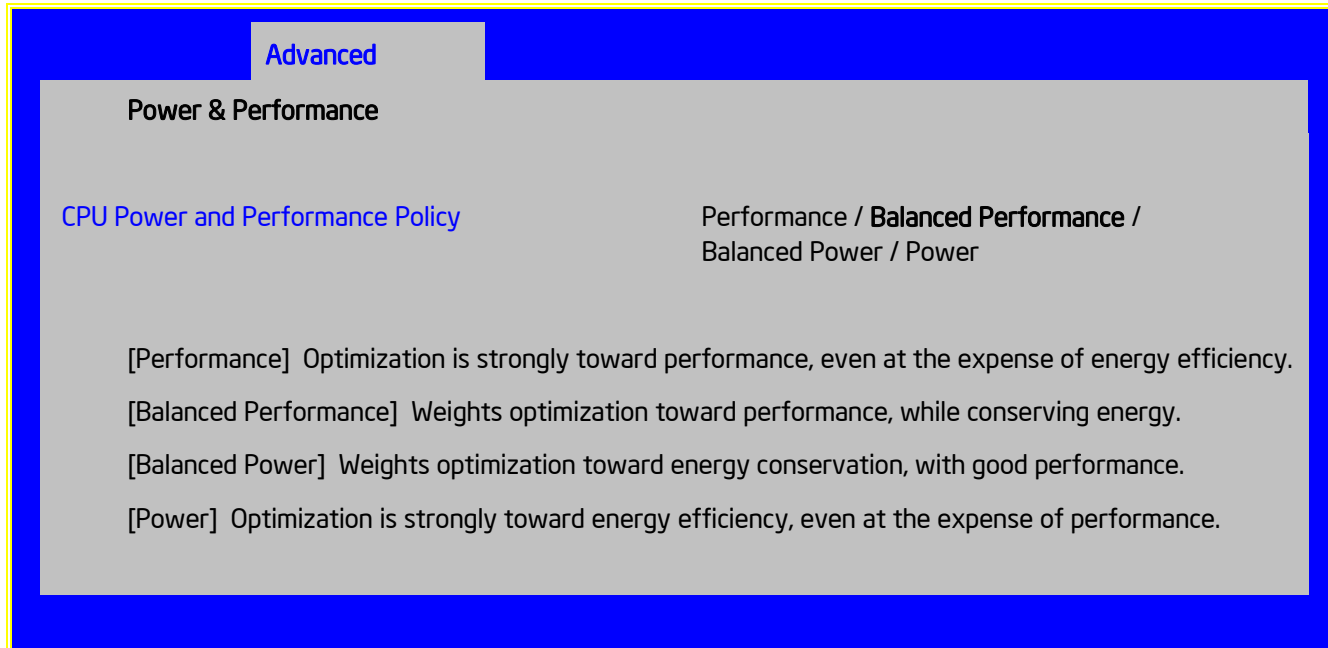


Figure 143. Power & Performance Screen

### 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.



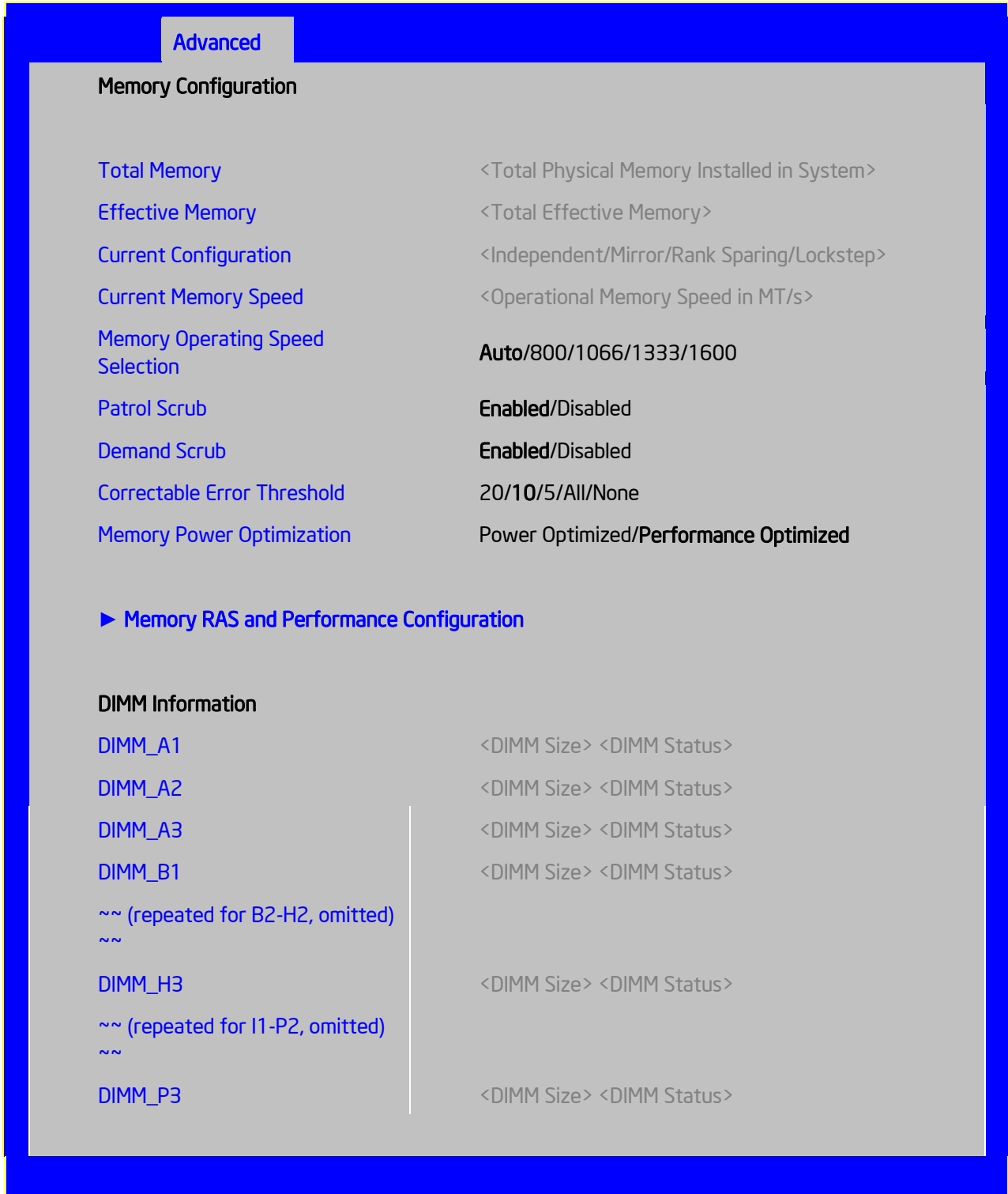


Figure 144. Memory Configuration Screen

**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.

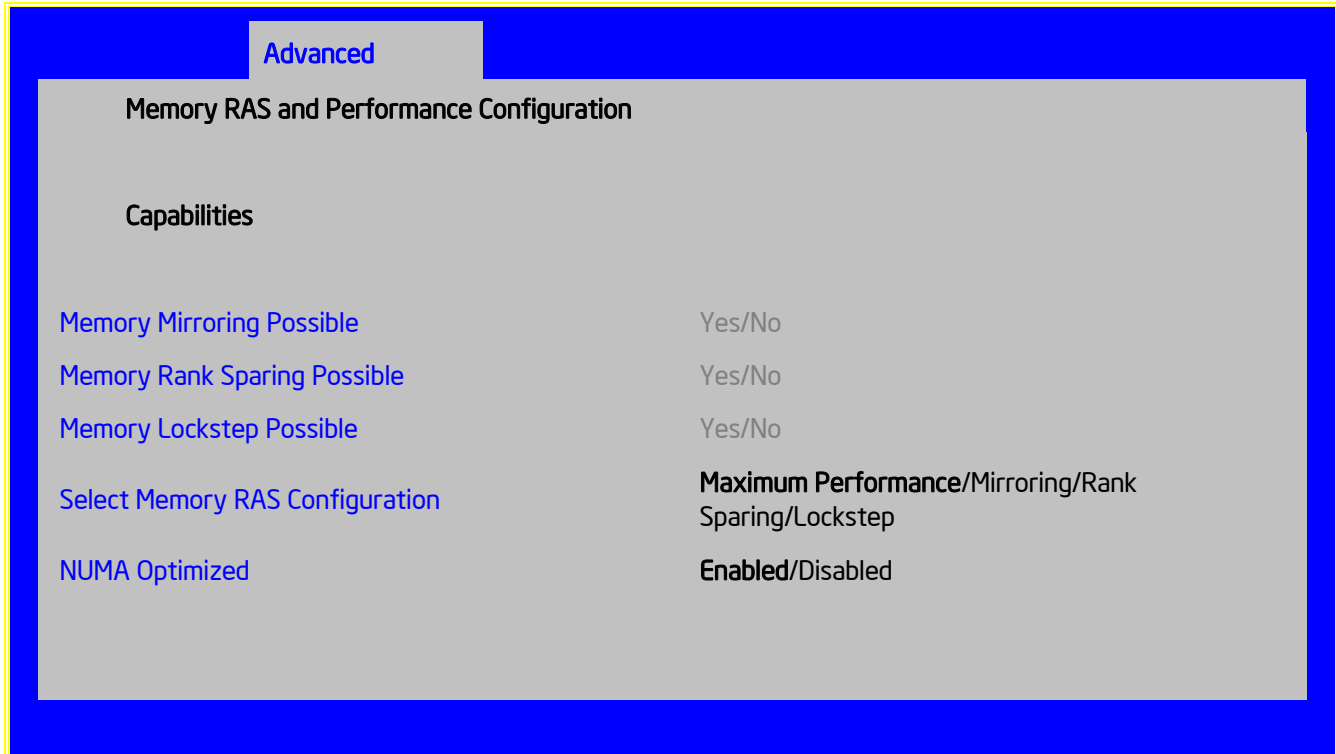


Figure 145. Memory RAS and Performance Configuration Screen

**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.

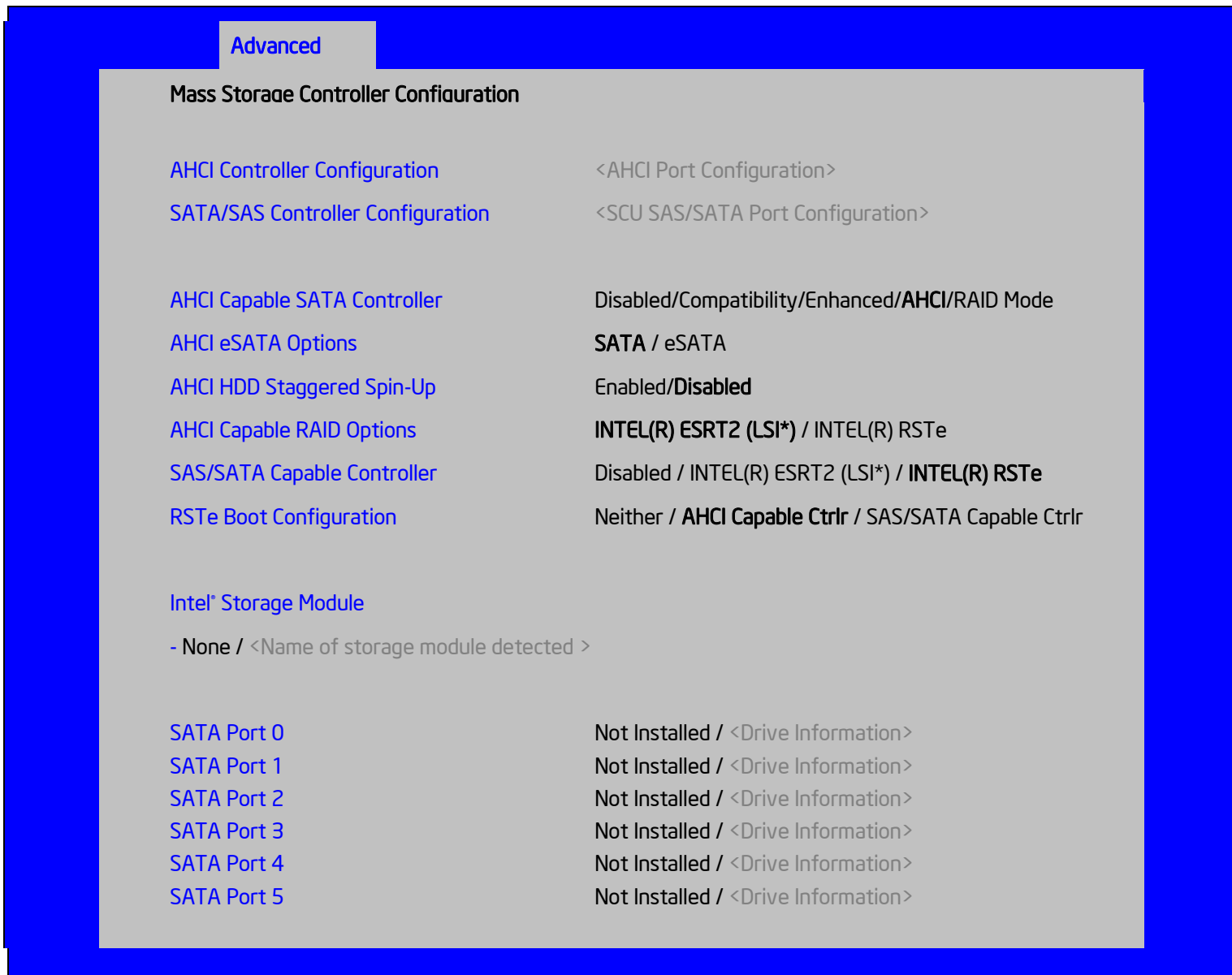


Figure 146. Mass Storage Controller Configuration Screen

**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 eight 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.



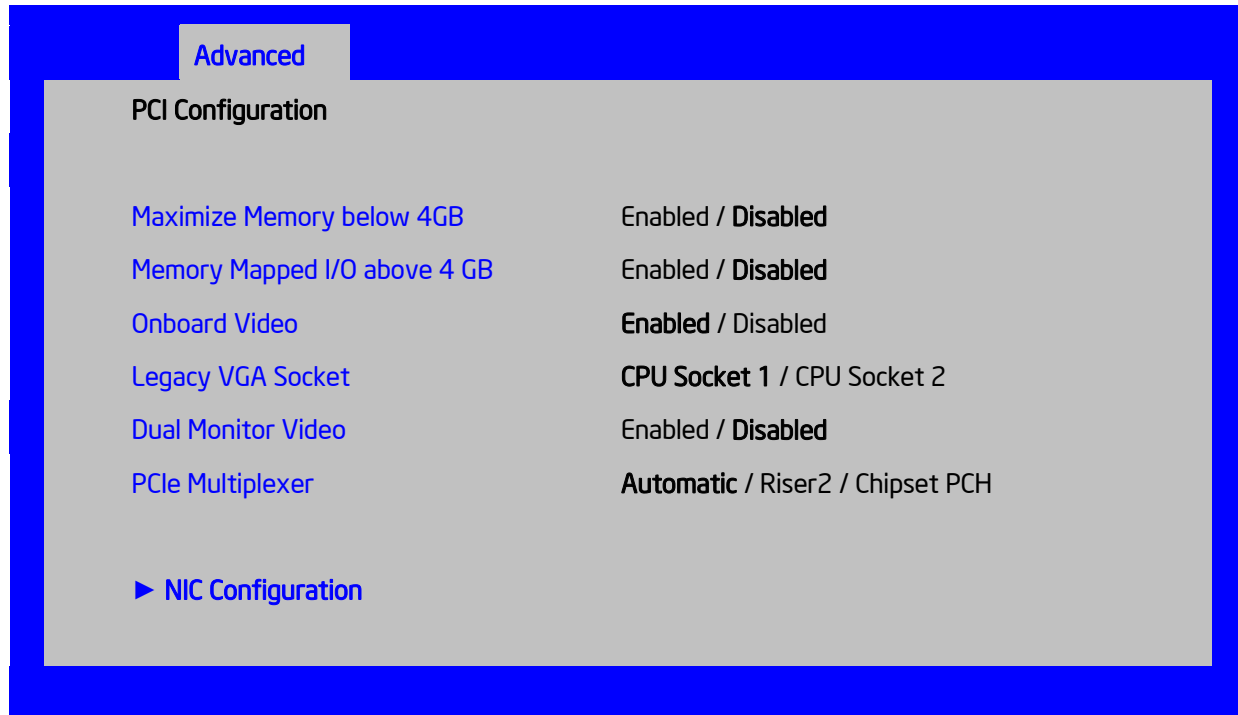


Figure 147. PCI Configuration Screen

**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 IIO. 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 option 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 / <b>Disabled</b>
discs 1GbE/10GbE Option ROM	Enabled / <b>Disabled</b>
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	Enabled / <b>Disabled</b>
NIC2 Port1 GUID	<GUID Display>
NIC2 Port1 MAC Address	<MAC Address display >

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

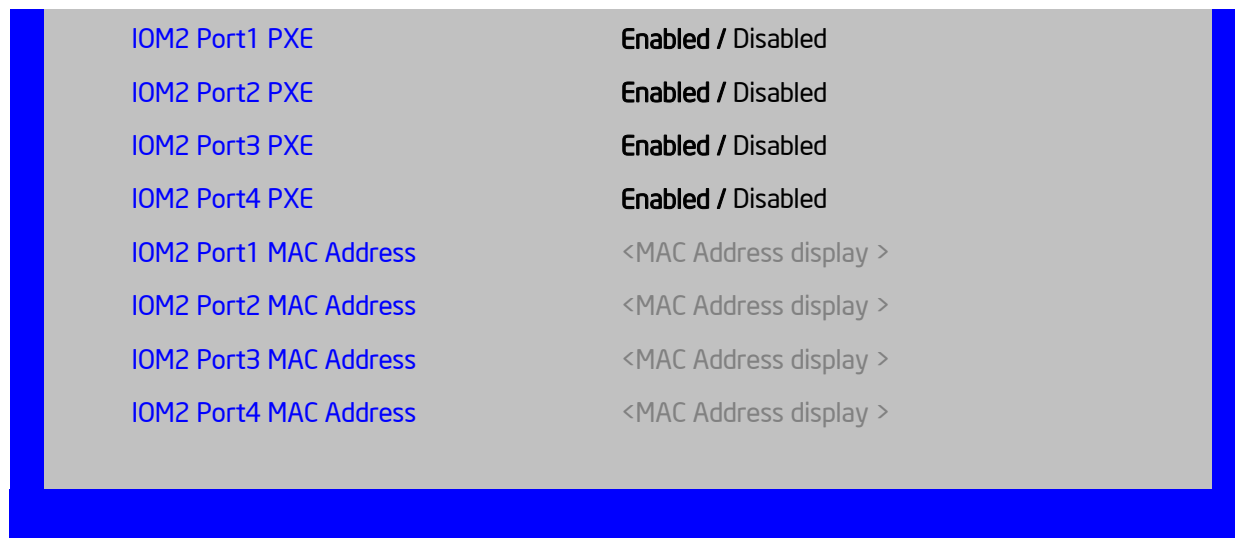


Figure 148. NIC Configuration Screen

**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 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\* ddress 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.

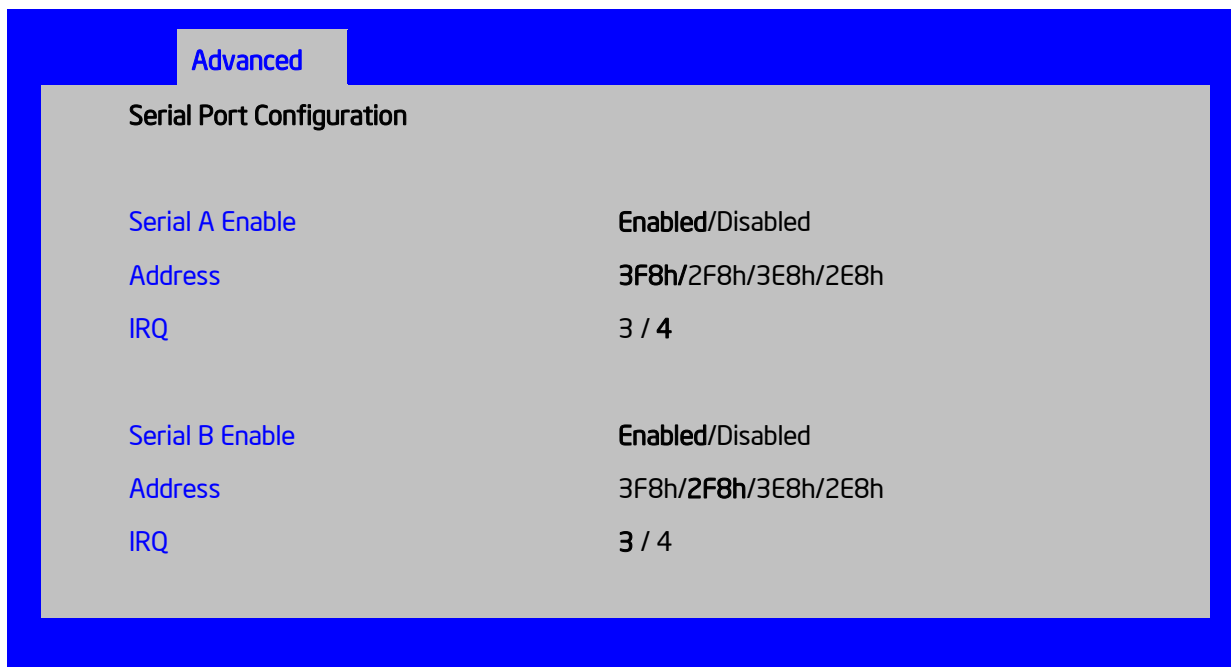


Figure 149. Serial Port Configuration Screen

### 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.*

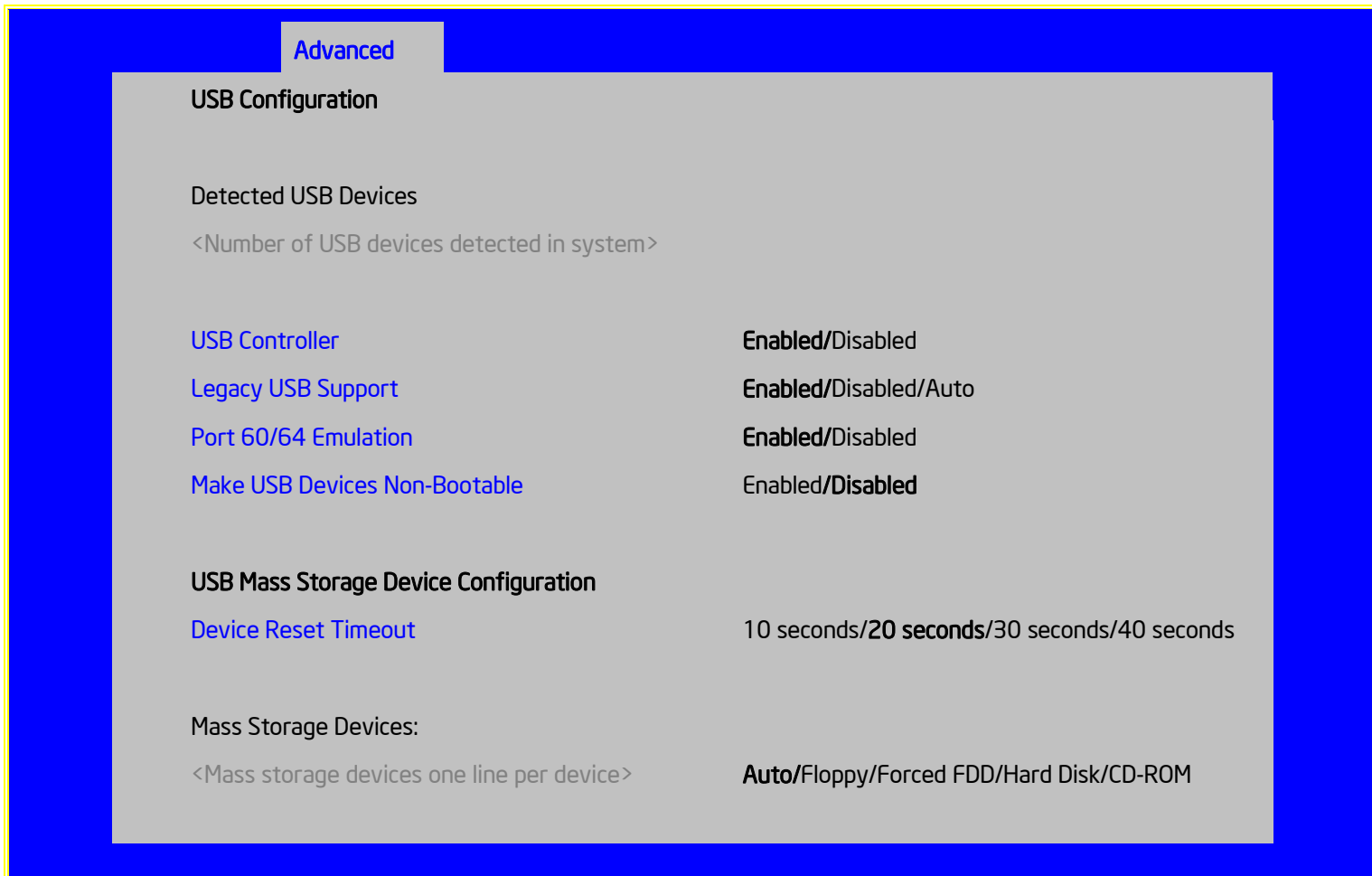


Figure 150. USB Configuration Screen

**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.

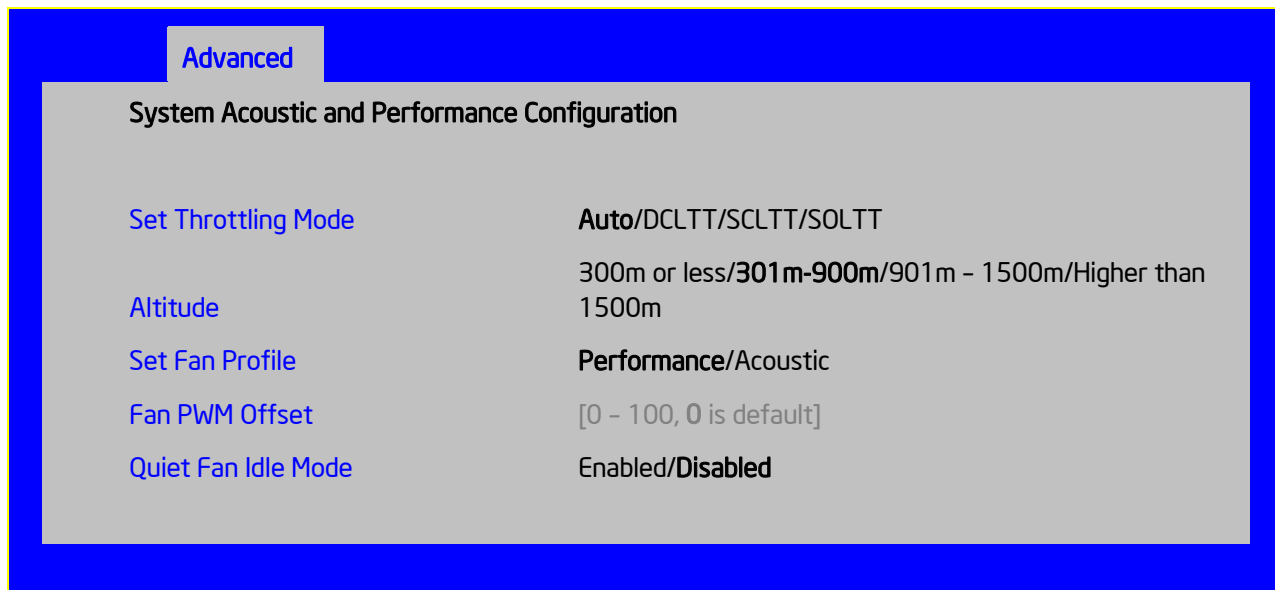


Figure 151. System Acoustic and Performance Configuration

**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.



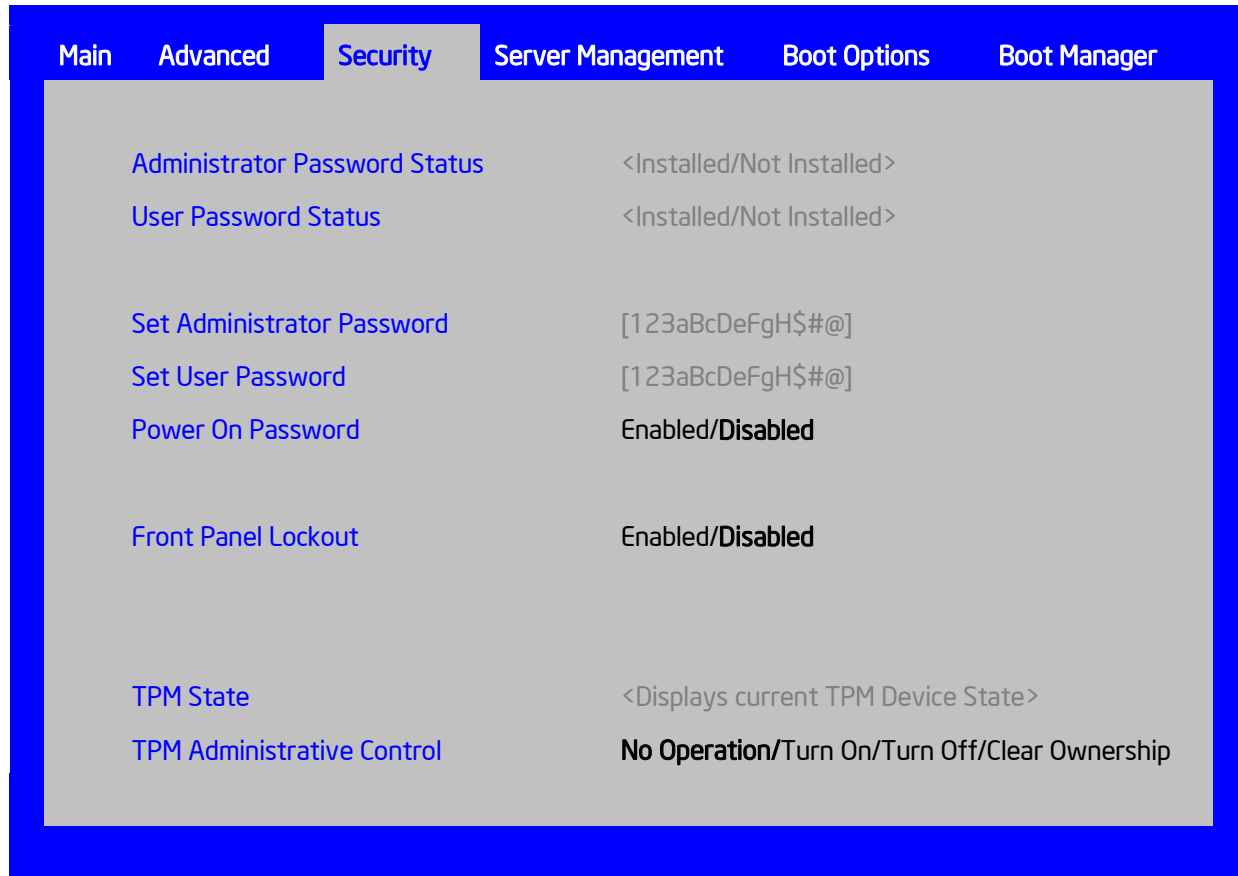


Figure 152. Security Screen

**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 from a system management interface, and the NMI Diagnostic Interrupt is not available.*

*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>		

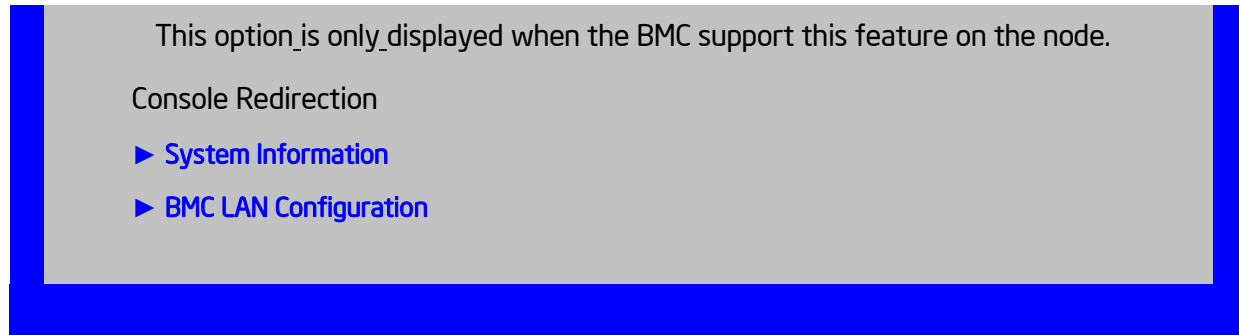


Figure 153. Server Management Screen

**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 gives 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 six 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).

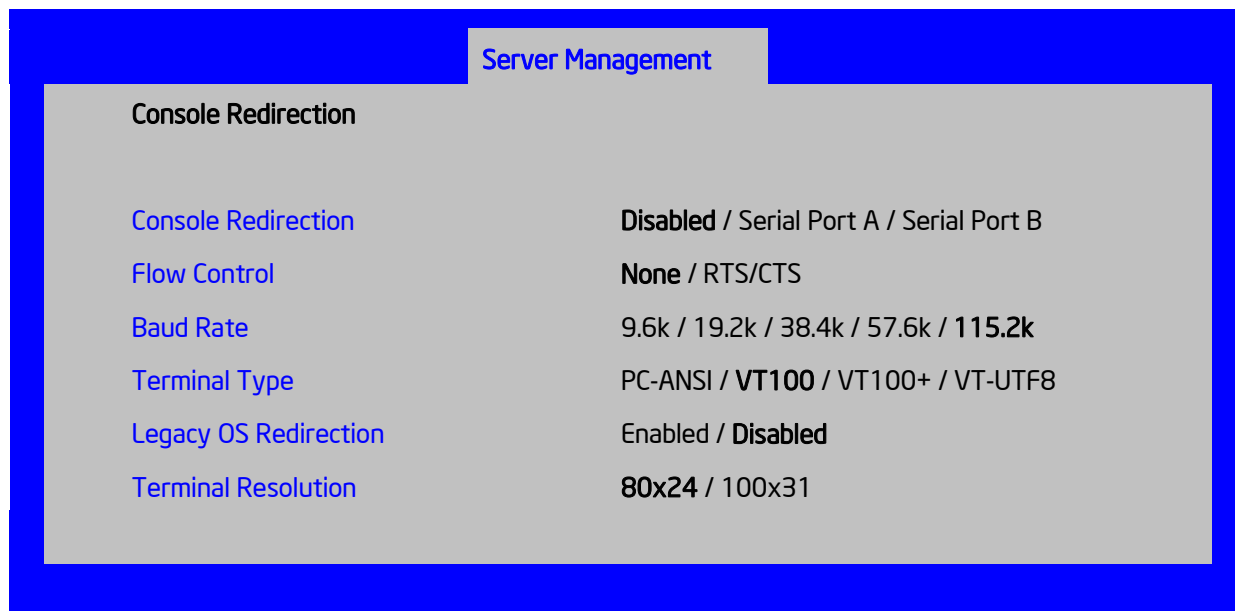


Figure 154. Console Redirection Screen

**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 (that is, 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 155. 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]

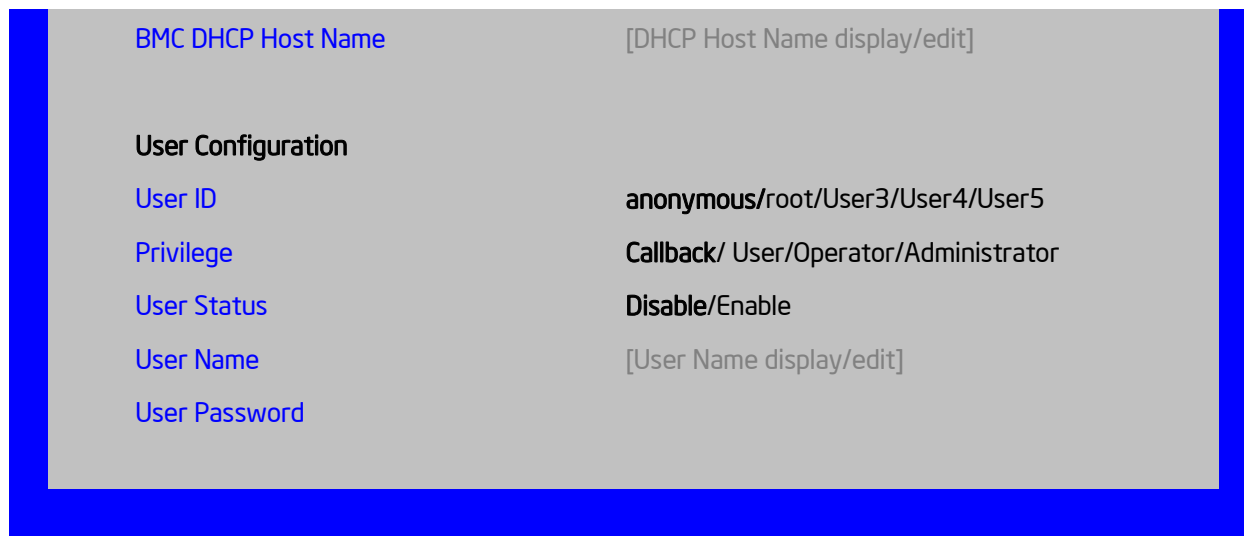


Figure 156. BMC LAN Configuration Screen

**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 Host 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 157. 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 CDROM 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.

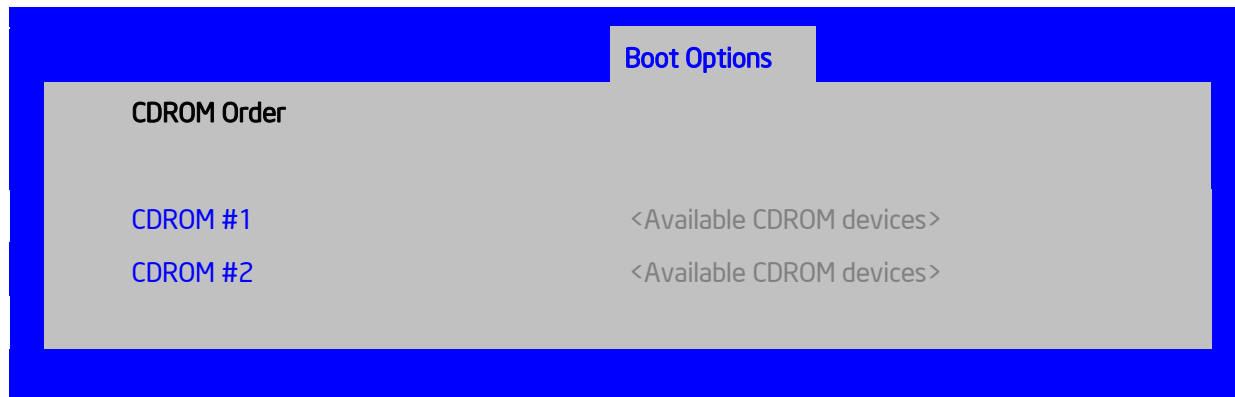


Figure 158. CDROM Order Screen

**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.

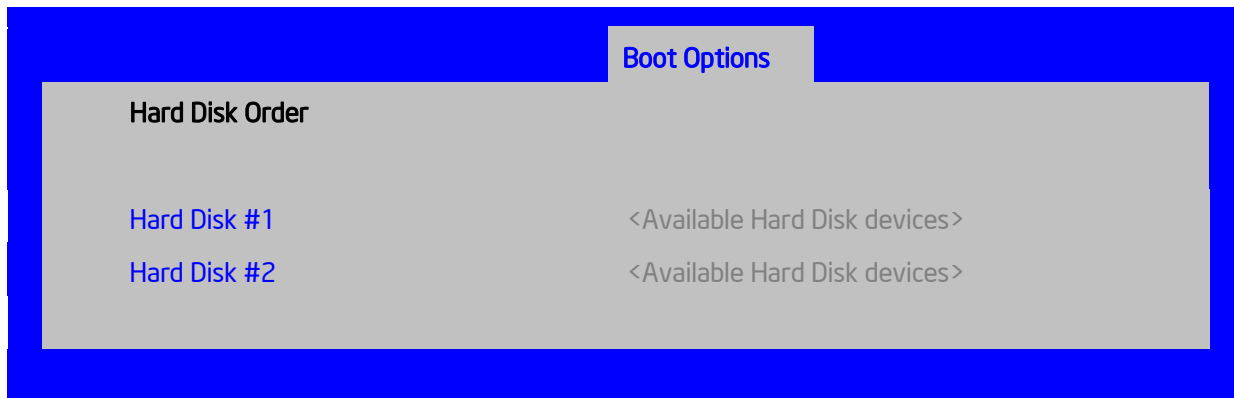


Figure 159. Hard Disk Order Screen

**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.

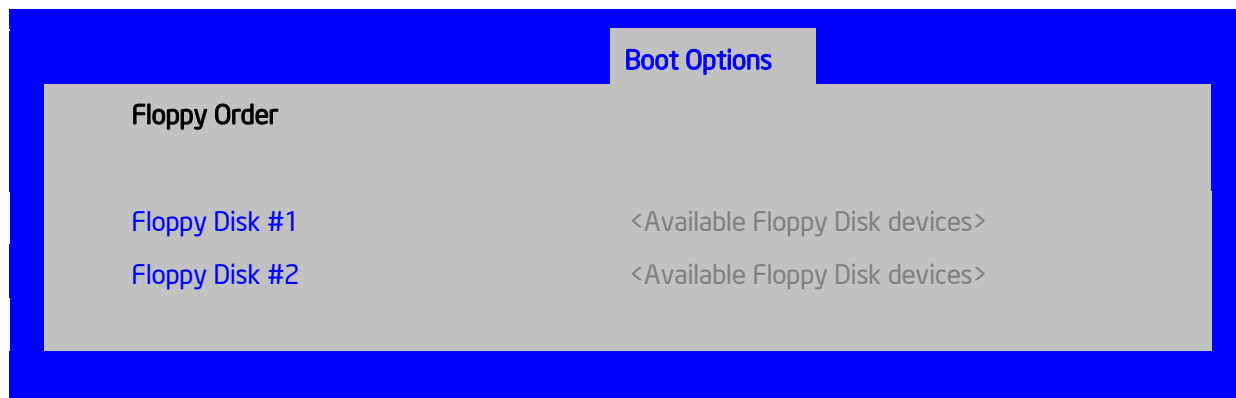


Figure 160. Floppy Order Screen

**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.

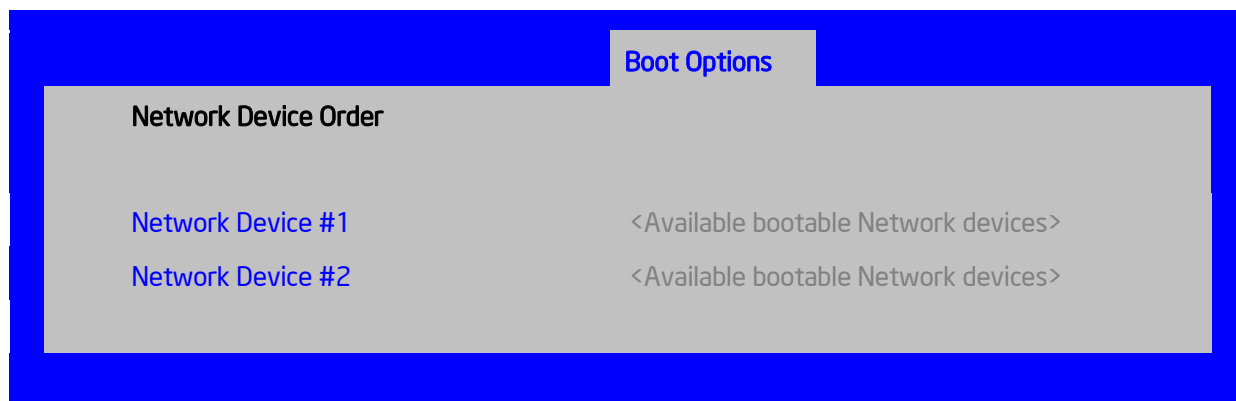


Figure 161. Network Device Order Screen



**Screen Field Descriptions:**

1. Network Device #1
2. Network Device #2

Option Values: <Available Network Devices>

Help Text:

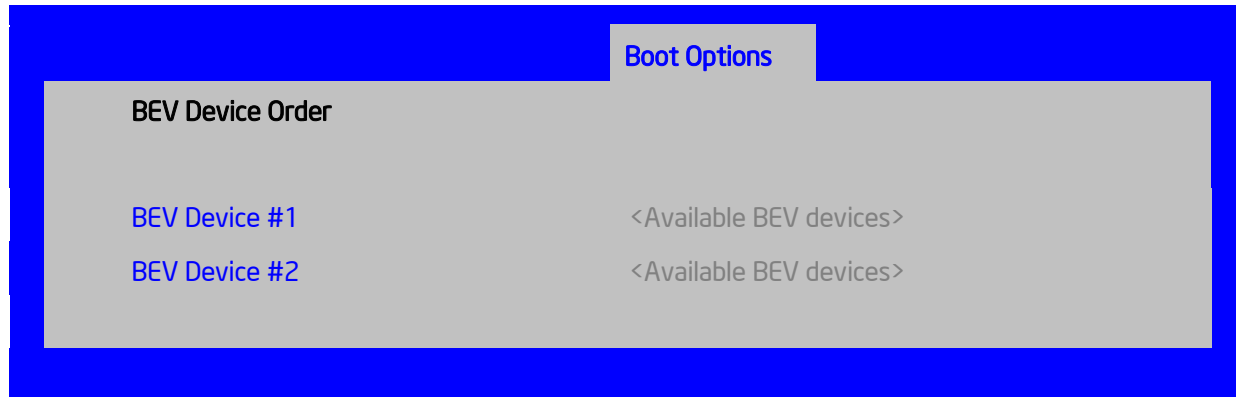
*Set system boot order by selecting the boot option for this position.*

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 162. 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.

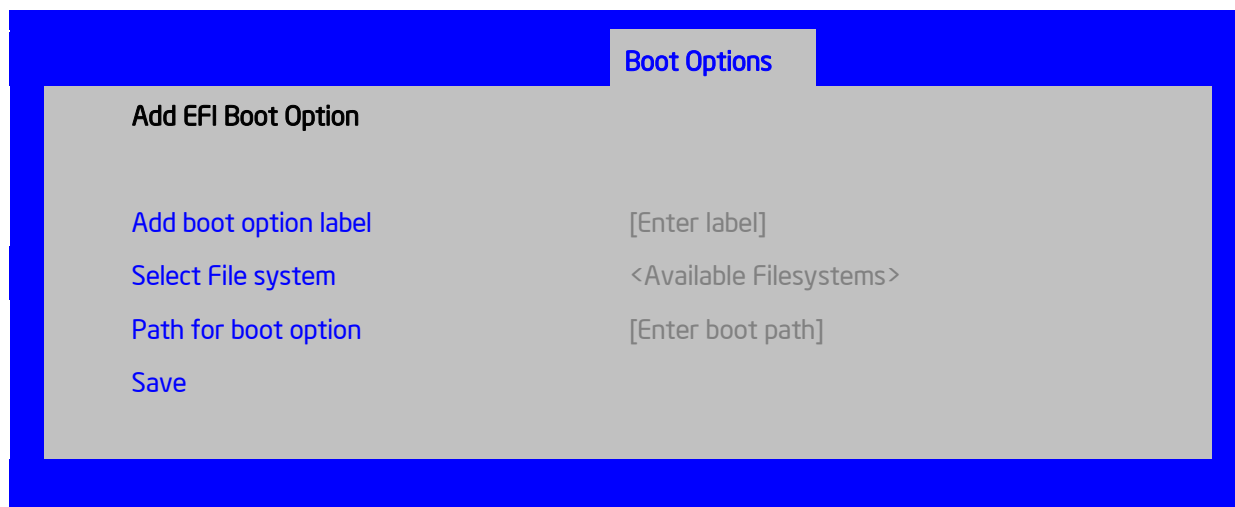


Figure 163. Add EFI Boot Option Screen

### 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 164. 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.

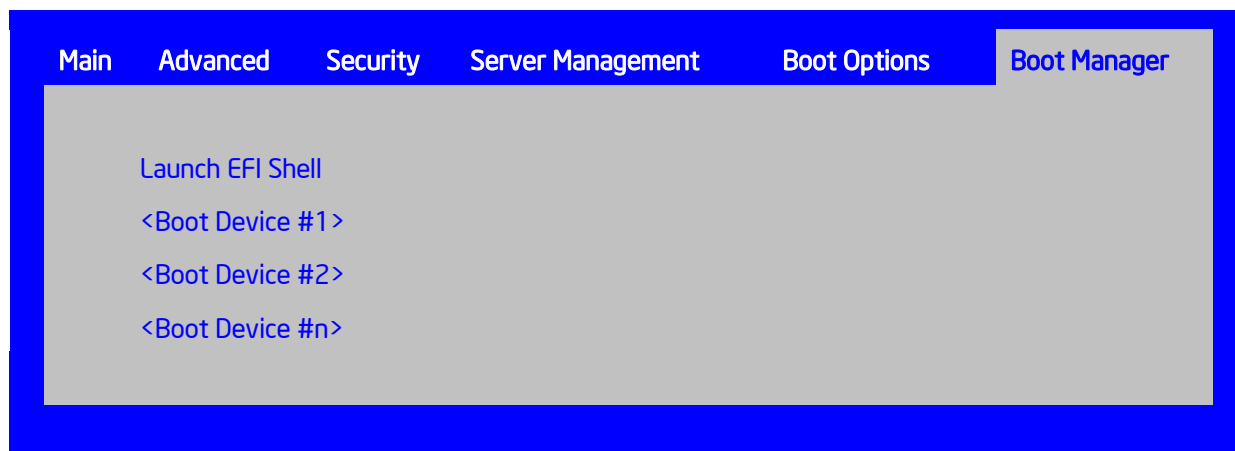


Figure 165. Boot Manager Screen

**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 166. 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.

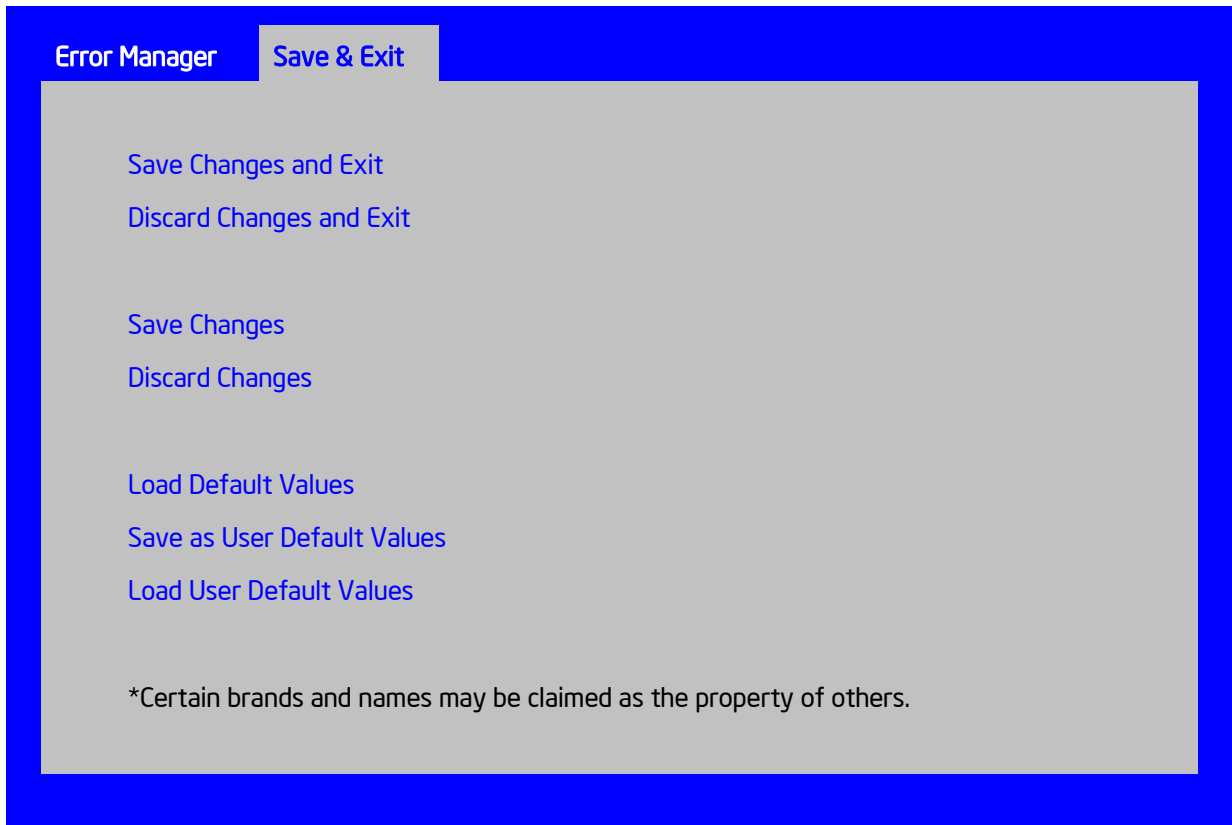


Figure 167. Save & Exit Screen

**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 popup 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 Specification

The power supply specifications for your Intel® Server System P4000IP Intel® Workstation System P4000CR family depend upon the configuration of chassis you purchased. Three power supply configurations are available:

- 750-W hot-swap power supply
- 1200-W hot-swap power supply
- 1600-W hot-swap power supply

### 750-W Hot-swap Power Supply Input/Output Voltage

**Table 10. AC Input Voltage Range for 750 PSU**

PARAMETER	MIN	RATED	V <sub>MAX</sub>	Start up VAC	Power Off VAC
Voltage (110)	90 V <sub>rms</sub>	100-127 V <sub>rms</sub>	140 V <sub>rms</sub>	85VAC +/-4VAC	74VAC +/-5VAC
Voltage (220)	180 V <sub>rms</sub>	200-240 V <sub>rms</sub>	264 V <sub>rms</sub>		
Frequency	47 Hz	50/60	63 Hz		

**Notes:**

1. Maximum input current at low input voltage range shall be measured at 90VAC, at max load.
2. Maximum input current at high input voltage range shall be measured at 180VAC, at max load.
3. This requirement is not to be used for determining agency input current markings.

**Table 11. Over Current Protection for 750 PSU**

Output VOLTAGE	Input voltage range	Over Current Limits
+12V	90 – 264VAC	72A min; 78A max
12VSB	90 – 264VAC	2.5A min; 3.5A max

**Table 12. Over Voltage Protection (OVP) Limits for 750W PSU**

Output voltage	Min (v)	Max (v)
+12V	13.0	14.5
+12VSB	13.0	14.5

### 1200-W Hot-swap Power Supply Input/Output Voltage

**Table 13. AC Input Voltage Range for 1200W PSU**

Parameter	MIN	Rated	V <sub>MAX</sub>	Startup VAC	Power Off VAC
Voltage (110)	90 V <sub>rms</sub>	100-127 V <sub>rms</sub>	140 V <sub>rms</sub>	85VAC +/-4VAC	74VAC +/-5VAC
Voltage (220)	180 V <sub>rms</sub>	200-240 V <sub>rms</sub>	264 V <sub>rms</sub>		
Frequency	47 Hz	50/60	63 Hz		

**Notes:**

1. Maximum input current at low input voltage range shall be measured at 90VAC, at max load.
2. Maximum input current at high input voltage range shall be measured at 180VAC, at max load.
3. This requirement is not to be used for determining agency input current markings.

**Table 14. Over Current Protection for 1200W PSU**

Output Voltage	Input voltage range	Over Current Limits
+12V	90 – 264VAC	140A min; 170A max
12VSB	90 – 264VAC	2.5A min; 3A max

**Table 15. Over Voltage Protection (OVP) Limits for 1200W PSU**

Output Voltage	MIN (V)	MAX (V)
+12V	13.3	14.5
+12VSB	13.3	14.5

## 1600-W Hot-swap Power Supply Input/Output Voltages

**Table 16. AC Input Voltage Range for 1600 PSU**

Parameter	MIN	RATED	V <sub>MAX</sub>	Start up VAC	Power Off VAC
Voltage (110)	90 V <sub>rms</sub>	100-127 V <sub>rms</sub>	140 V <sub>rms</sub>	85VAC +/-4VAC	75VAC +/-5VAC
Voltage (220)	180 V <sub>rms</sub>	200-240 V <sub>rms</sub>	264 V <sub>rms</sub>		
Frequency	47 Hz	50/60	63 Hz		

**Notes:**

1. Maximum input current at low input voltage range shall be measured at 90VAC, at max load.
2. Maximum input current at high input voltage range shall be measured at 180VAC, at max load.
3. This requirement is not to be used for determining agency input current markings.

**Table 17. Over Current Protection for 1600PSU**

Output Voltage	Input voltage range	OVER CURRENT LIMITS
+12V	90 – 264VAC	180A min; 200A max
12VSB	90 – 264VAC	4A min; 5A max

**Table 18. Over Voltage Protection (OVP) Limits for 1600W PSU**

Output Voltage	MIN (V)	MAX (V)
+12V	13.3	14.5
+12VSB	13.3	14.5

## System Environmental Limits

**Table 19. System Environmental Limits**

Parameter		Limits
Temperature		
	Operating	10°C to 35°C <sup>1</sup> (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, <a href="#">2g</a> , 11 mSec
	Unpackaged	Trapezoidal, <a href="#">25g</a> , velocity change is based on packaged weight
	Packaged	<ul style="list-style-type: none"> <li>▪ Product Weight: ≥ 40 to &lt; 80</li> <li>▪ Non-palletized Free Fall Height = 18 inches</li> <li>▪ Palletized (single product) Free Fall Height = NA</li> </ul>
Vibration		
	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

## Appendix A: Technical Reference

Parameter		Limits			
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:**

1. 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

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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/motherboards/server/>.

## Appendix C: Getting Help

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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/p/en\\_US/support/server/](http://www.intel.com/p/en_US/support/server/). 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 “[Appendix D: 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/p/en\\_US/support/warranty](http://www.intel.com/p/en_US/support/warranty).



# Appendix D: Intel® Server Issue Report Form

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## Issue Report Form (Rev 3.6)

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/ **NOTE**

*Filling out this form completely is required for any escalation.*

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**Customer Contact Information:**

Customer Support Case#:

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**Intel® Server Board or System:**

(Example: S2600IP, P4000IP)

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**Server Chassis:**

(Example: P4000L. If third-party chassis used, indicate make and model.)

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**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:

HSC Version:

Has the latest BIOS been tried? (Yes/No):

Has the latest BMC/mBMC been tried? (Yes/No):

Has the latest IMM BMC been tried? (Yes/No):

Has the latest RMM Firmware been tried? (Yes/No):

Has the latest FRU/SDR been tried? (Yes/No):

Has the latest HSC been tried? (Yes/No):

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**Appendix D: Intel® Server Issue Report Form**

**Processor information:**

	Type	Speed	sSpec	Thermal Solution
Processor 1				
Processor 2				

Thermal solution (Heatsink) 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: 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?

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**Operating System Information (Example: RedHat\* Enterprise Linux, Microsoft Windows Server 2003\*, Service pack 1, OEM CD):**

Manufacturer:

Version:

Language version (English, Arabic, and Chinese (Simplified)):

Service Pack Level or Kernel Revision:

Distribution (OEM/Retail):

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**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 & RAID level):

RAID volume use (Boot device/Data Volume):

Is BBU (Battery Backup Unit) installed? (Yes/No):

BBU part number:

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**Detailed description of issue:**

**Troubleshooting tried:**

**Steps to replicate the issue:**

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## Appendix D: Intel® Server Issue Report Form

### 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.