

# Intel® Server System H2000WP Family Service Guide

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**A Guide for Technically Qualified Assemblers of Intel® Identified Subassemblies/Products**

Order Number: G53237-005

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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

This manual is written for system technicians who are responsible for troubleshooting, upgrading, and repairing this server system. This document provides a brief overview of the features of the server board/chassis, a list of accessories or other components you may need, troubleshooting information, and instructions on how to add and replace components on the Intel® Server System H2000WP family products. For the latest revision of this manual, go to [http://www.intel.com/p/en\\_US/support](http://www.intel.com/p/en_US/support).

**Table 1. Intel® Server System H2000WP family product list**

Product Code	Description
Intel® Server Chassis H2312xxJR	Supports 4 node trays (Computer Module) with 12 x 3.5" hard drive bay, 2 x 1200W CRPS
Intel® Server Chassis H2216xxJR	Supports 4 node trays (Computer Module) with 16 x 2.5" hard drive bay, 2 x 1200W CRPS
Intel® Server Chassis H2312xxKR	Supports 4 node trays (Computer Module) with 12 x 3.5" hard drive bay, 2 x 1600W CRPS
Intel® Server Chassis H2216xxKR	Supports 4 node trays (Computer Module) with 16 x 2.5" hard drive bay, 2 x 1600W CRPS
Intel® Computer Module HNS2600WP	Computer Module with base boardS2600WP
Intel® Computer Module HNS2600WPQ	Computer Module with base boardS2600WPQ
Intel® Computer Module HNS2600WPF	Computer Module with base boardS2600WPF

## Manual Organization

Chapter 1 provides a brief overview of the Intel® Server System H2000WP family. In this chapter, you will find a list of the server system features, and figures of the system and components to help you identify your system components and their locations.

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

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

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

## Additional Information and Software

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

**Table 2. Server System References**

## Preface

For this information or software	Use this Document or Software
For in-depth technical information about this product.	<i>Intel® Server System H2000WP Family Technical Product Specification</i> See the section on the web page titled, “Architecture/Specifications”.
For installation of supported spares and accessories	<i>Intel® Server System H2000WP Family Quick Installation User’s Guide</i> See the section on the web page titled, “System Integration/User Guides/Compatibility”.
For a list of supported Intel spares and accessories	<i>Spares and Configuration Guide</i> See the section on the web page titled, “Documents & Guides”.
For server configuration guidance and compatibility	Intel® Server Configurator tool To be provided later.
For system power budget guidance	Power Budget Analysis Tool To be provided later.
For software to manage your Intel® Server System.	Intel Server Management Software See the section on the web page titled, “Software/Code”.
For system firmware updates and onboard device drivers	Intel Deployment Assistant DVD Firmware and Drivers See the section on the web page titled, “Software/Code”.
Product Safety and Regulatory document	<i>Intel Server Products - Product Safety and Regulatory Compliance Document</i> See the section on the web page titled, “Regulations/Certification/Compliance”.

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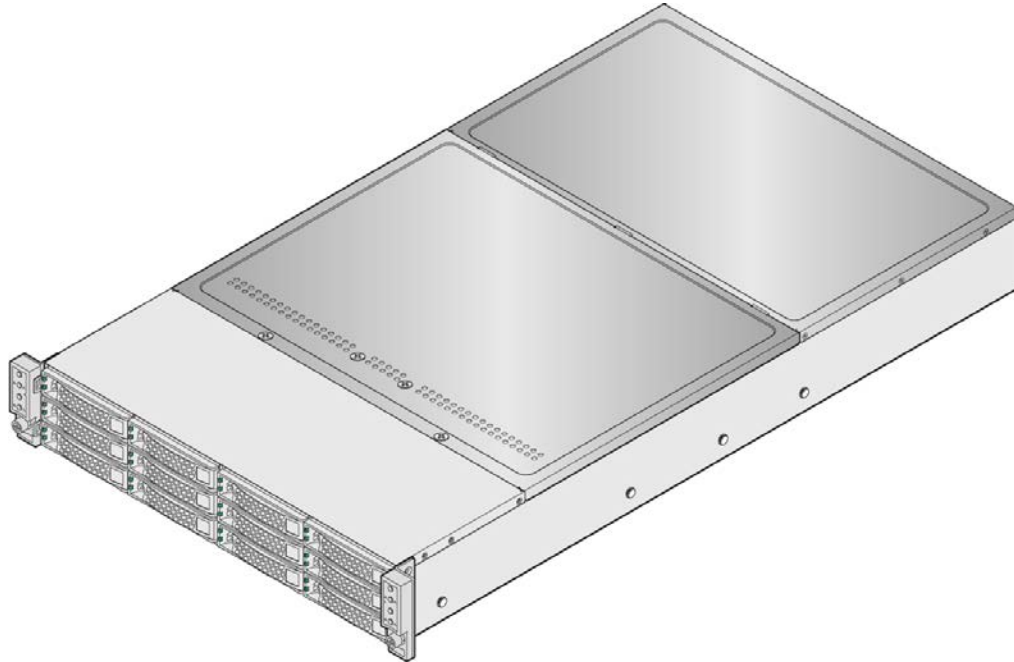
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# 1 Server System Features

This chapter briefly describes the main features of the Intel® Server System H2000WP family. This includes illustrations of the products, a list of the server system features, and diagrams showing the location of important components and connections on the server systems.



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**Figure 1. Intel® Server System H2000WP Family (H2312WP as demonstrated)**

## Server System Feature Overview

Table 3 summarizes the features of the server systems.

**Table 3. Intel® Server System H2000WP Feature Summary**

Feature		Description
Dimensions	H2312WP	<ul style="list-style-type: none"> <li>3.46 inches (87.9 mm) height</li> <li>17.24 inches (438.0 mm) wide (top cover and emboss for Front Panel cable is not included)</li> <li>30.35 inches (771 mm) deep (depth of handle and HDD carrier is not included)</li> <li>84 pounds (38kg) –roughly maximum system weight</li> </ul>
	H2216WP	<ul style="list-style-type: none"> <li>3.46 inches (87.9 mm) height</li> <li>17.24 inches (438.0 mm) wide (top cover and emboss for Front Panel cable is not included)</li> <li>28.86 inches (733 mm) deep (depth of handle and HDD carrier is not included)</li> <li>71 pounds (32kg) –roughly maximum system weight</li> </ul>
Compute Node Processor Support		<ul style="list-style-type: none"> <li>Support for one or two Intel® Xeon® processors E5-2600 and E5-2600V2 product family with a Thermal Design Power (TDP) of up to 135 W.</li> </ul>
Compute Node		<ul style="list-style-type: none"> <li>16 DIMM slots – 2 DIMMs/Channel – 4 memory channels per processor</li> </ul>

## Server System Features

Feature	Description
Memory	<ul style="list-style-type: none"> <li>▪ Unbuffered ECC or Registered DDR3 DIMMs</li> <li>▪ Memory DDR3 data transfer rates of 800, 1066, 1333 MT/s, 1600 MT/s and 1866 MT/s (1 DPC only)</li> <li>▪ DDR3 standard I/O voltage of 1.5V (all speed) and DDR3 Low Voltage of 1.35V (1333MT/s or below).</li> </ul>
Chipset on each Compute Node	Intel® C600-A chipset with support for optional Storage Upgrade Keys
Compute Node External I/O connections	<ul style="list-style-type: none"> <li>▪ DB-15 Video connectors</li> <li>▪ Two RJ-45 Network Interface for 10/100/1000 LAN</li> <li>▪ One stacked two port USB 2.0 (Port 0/1) connectors</li> <li>▪ One dedicated 1GbE management port on rIOM carrier(Optional)</li> <li>▪ One InfiniBand* QDR QSFP port (Board SKU: S2600WPQ)</li> <li>▪ One InfiniBand* FDR QSFP port (Board SKU: S2600WPF).</li> </ul>
Compute Node Internal I/O connectors/headers	<ul style="list-style-type: none"> <li>▪ Bridge Slot to extend board I/O <ul style="list-style-type: none"> <li>- SCU0 (Four SAS 3Gb/s ports) to backplane</li> <li>- Front control panel signals</li> <li>- One SATA(Port 0) 6Gb/s port for DOM</li> </ul> </li> <li>▪ One Type-A USB 2.0 connector (USB port 2)</li> <li>▪ One 2x7pin header for system FAN module</li> <li>▪ One DH-10 serial Port A connector</li> <li>▪ One SATA 6Gb/s (Port 1)</li> <li>▪ One 2x4 pin header for Intel® RMM4 Lite</li> <li>▪ One 1x4 pin header for Storage Upgrade Key</li> </ul>
Available I/O Module Options (Sold Separately)	<p>The following I/O modules utilize a single proprietary on-board connector. An installed I/O module can be supported in addition to standard on-board features and any add-in expansion cards.</p> <ul style="list-style-type: none"> <li>▪ Quad Port Intel® I350 GbE I/O Module</li> <li>▪ Dual Port Intel® X540 10GbE I/O Module</li> <li>▪ Dual Port Intel®82599 10GbE I/O Module</li> <li>▪ QDR InfiniBand* ConnectX® I/O Module</li> <li>▪ FDR InfiniBand* ConnectX® I/O Module</li> </ul>
System Fans by each Compute Node	<ul style="list-style-type: none"> <li>▪ Three sets of dual rotor managed system fans</li> <li>▪ One internal power supply fan for each installed power supply unit</li> </ul>
Compute Node Riser Cards	<p>S2600WPQ and S2600WPF: Four PCIe Gen III x16 riser slots</p> <ul style="list-style-type: none"> <li>▪ Riser slot 1 support PCIe Gen III x16 Riser with LP PCIe add-in card</li> <li>▪ Riser slot 2 supports PCIe Gen III x 16 Riser or x 8 Riser (for Intel® rIOM and RMM4 NIC port)</li> <li>▪ Riser slot 3 and Riser slot 4 support PCIe Gen III x16 Risers. (Intel® server system H2000WP does not provide Riser cards for slot 3 and 4 with bridge board covered)</li> </ul> <p>S2600WP: Three PCIe Gen III x16 riser slots and one PCIe Gen III x(16+8) riser slots</p> <ul style="list-style-type: none"> <li>▪ Riser slot 1 support PCIe Gen III x16 Riser with LP PCIe add-in card</li> <li>▪ Riser slot 2 supports PCIe Gen III x 16 Riser or x 8 Riser (for Intel® rIOM and RMM4 NIC port) plus an additional discrete x8 Riser.</li> <li>▪ Riser slot 3 and Riser slot 4 support PCIe Gen III x16 Risers. (Intel® server system H2000WP does not provide Riser cards for slot 3 and 4 with bridge board covered)</li> </ul>

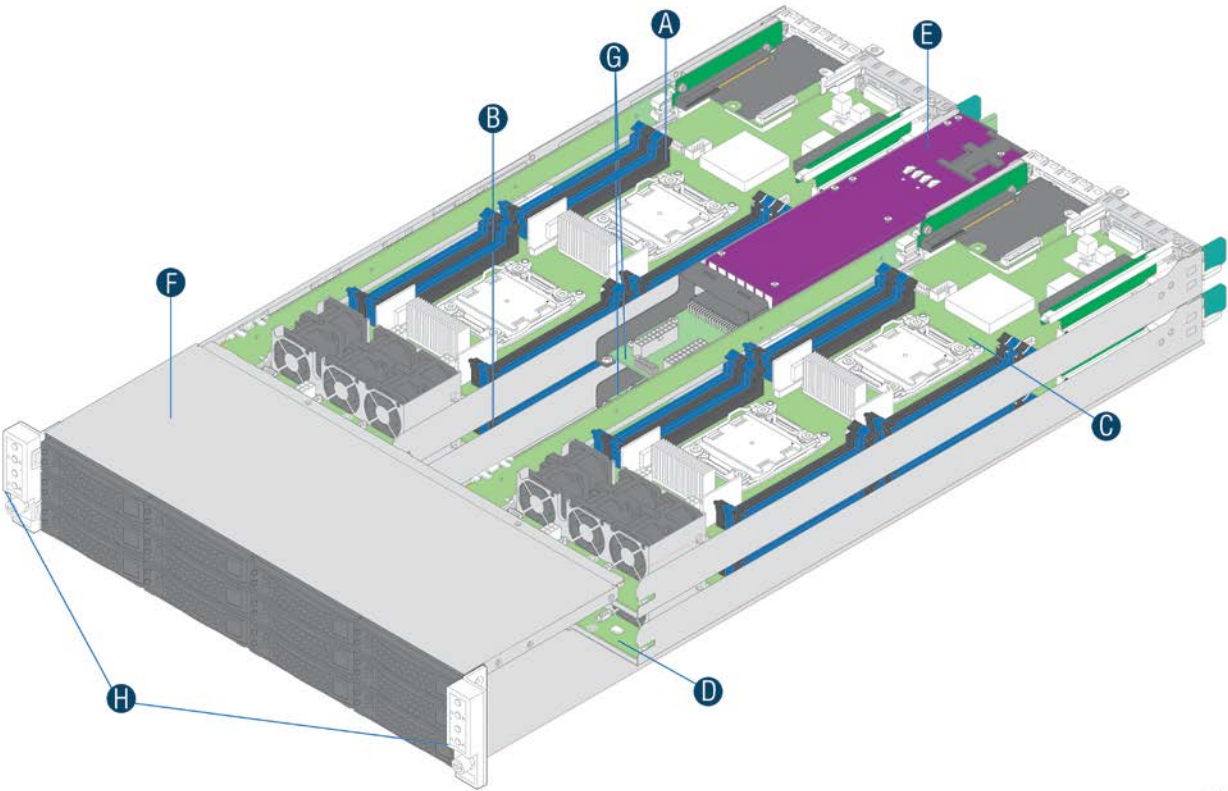


Feature	Description
Node Video	<ul style="list-style-type: none"> <li>Integrated 2D Video Controller</li> <li>128 MB DDR3 Memory</li> </ul>
Node On-board storage controllers and options	<ul style="list-style-type: none"> <li>Two single port SATA connectors (on baseboard and bridge board) capable of supporting up to 6 GB/sec</li> <li>SCU0 4-port up to 3 GB/sec SAS or 6 GB/sec SATA through bridge board</li> <li>Intel® RAID C600 Upgrade Key support providing optional expanded SATA/SAS RAID capabilities</li> </ul>
Server Management	<ul style="list-style-type: none"> <li>Onboard ServerEngines* LLC Pilot III* Controller</li> <li>Support for Intel® Remote Management Module 4 Lite solutions</li> <li>Intel® Light-Guided Diagnostics on field replaceable units</li> <li>Support for Intel® System Management Software</li> <li>Support for Intel® Intelligent Power Node Manager (Need PMBus-compliant power supply).</li> </ul>
Power Supply Options	<ul style="list-style-type: none"> <li>1200w AC Common Redundant Power Supply (CRPS), 80 plus Platinum with PFC, supporting CRPS configuration. Chassis SKU: H2312WPJR, H2216WPJR, H2312WPQJR, H2216WPQJR</li> <li>1600w AC Common Redundant Power Supply (CRPS), 80 plus Platinum with PFC, supporting CRPS configuration. Chassis SKU: H2312WPQR, H2216WPQR, H2312WPQKR, H2216WPQKR</li> </ul>
Storage Bay Options	<ul style="list-style-type: none"> <li>12x 3.5-inch SATA/SAS HDD bays (SKU: H2312WP serial)</li> <li>16x 2.5-inch SATA/SAS HDD bays (SKU: H2216WP serial)</li> </ul>
Available Rack Mount Kit Options	<ul style="list-style-type: none"> <li>Basic slide rail kit (AXXELVRAIL), bundled with system package</li> </ul>

## Server System Components

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

The H2000WP family has four compute nodes in the chassis. The whole system view is as below (with top cover removed).



A	Compute Node 3 Tray	E	Common Redundant Power Supply
B	Compute Node 1 Tray	F	HDD bays with Hot Swap Backplane
C	Compute Node 4 Tray	G	Upper and Lower Power Distribution Boards
D	Compute Node 2 Tray	H	Front Control Panel

Figure 2. Intel® Server System H2000WP Overview (H2312WP as demonstrated)

There are two configurations of hard disk drives for H2000WP family.

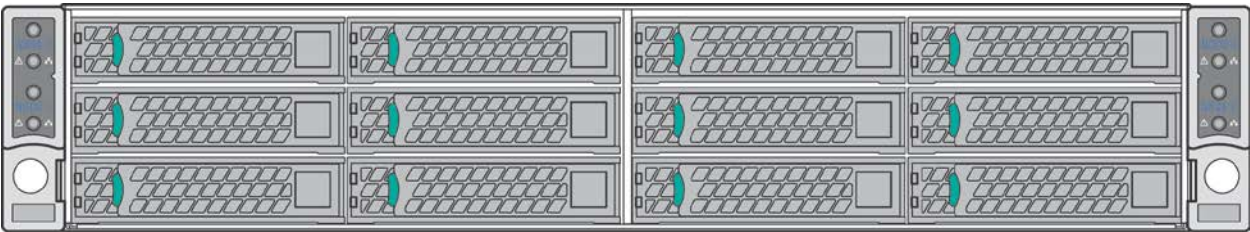


Figure 3. Front View of Intel® Server System H2312WP with 12x3.5" HDD bays

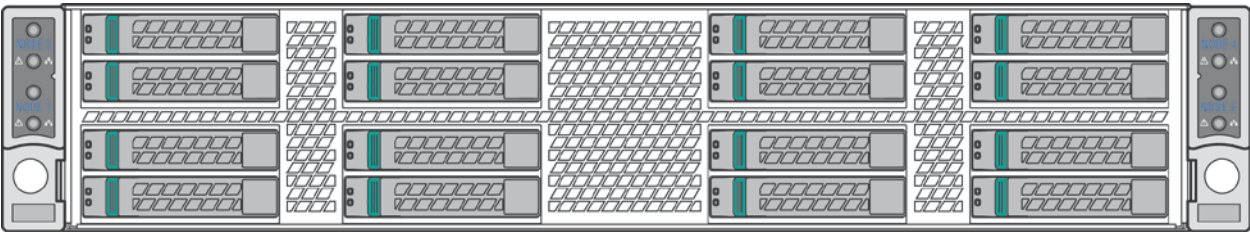
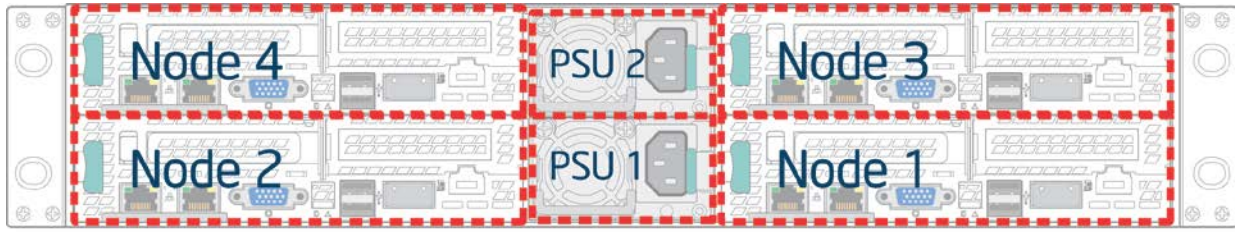


Figure 4. Front View of Intel® Server System H2216WP with 16x2.5" HDD bays

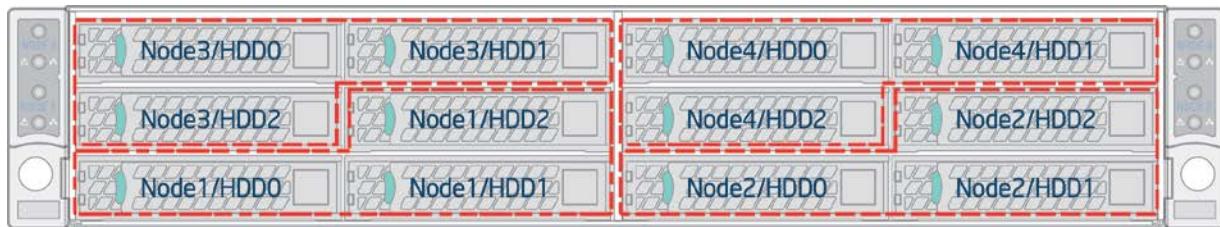
The Compute Node in the chassis has dedicated numbering by position.



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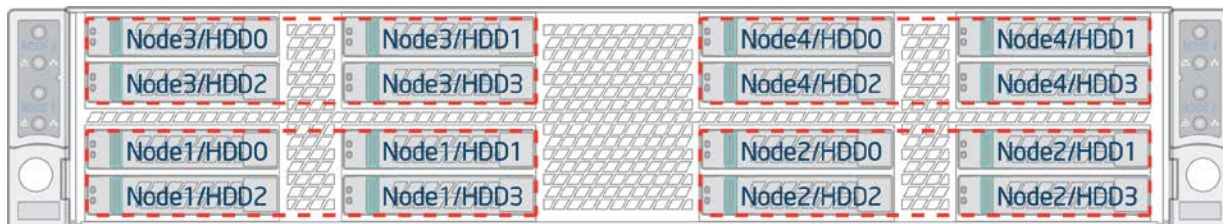
**Figure 5. Rear View of Intel® Server System H2000WP with Compute Node Numbering**

Each Compute Node has dedicated Hard Disk Drive array based on backplane controller design. Below are schemes for HDD array in correspondent to Compute Node.



AF004511

**Figure 6. HDD array scheme on Intel® Server System H2312WP**



AF004512

**Figure 7. HDD array scheme on Intel® Server System H2216WP**

## Front Panel

The system contains two sets of control panels on left and right rack handles. Each control panel contains two sets of control button and LEDs for each Compute Node. Below is the scheme of control panel.

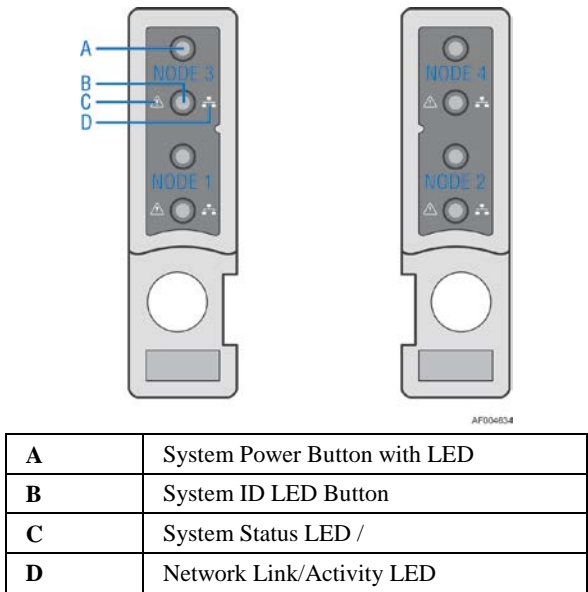


Figure 8. Front Panel Options

Back Panel

Compute Node back panel scheme is as below:

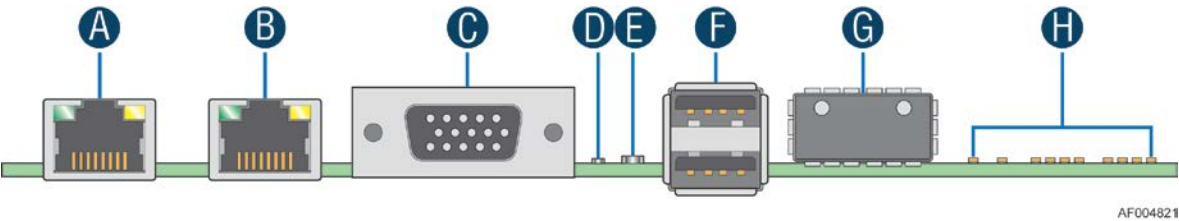
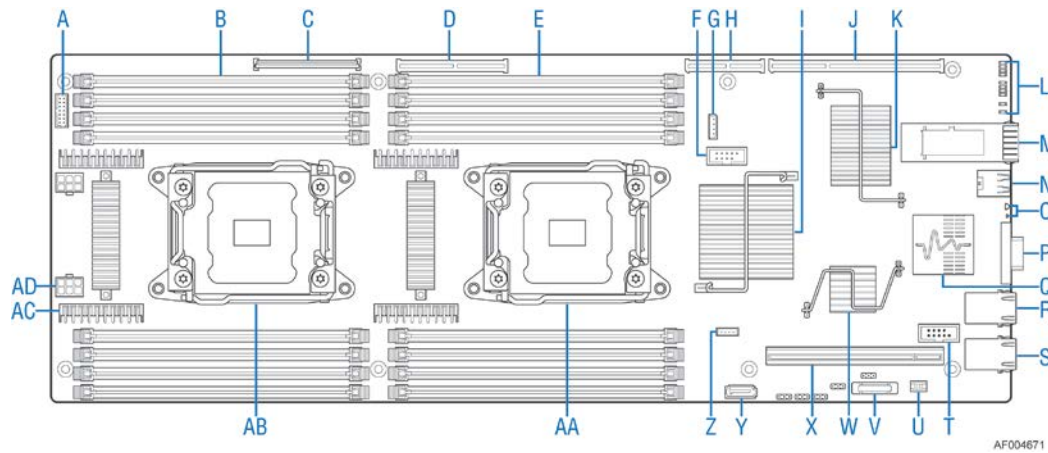


Figure 9. Back Panel Feature Identification per Compute Node

## Server Board Components

This section helps you identify the components and connectors on the server board in each Compute Node.

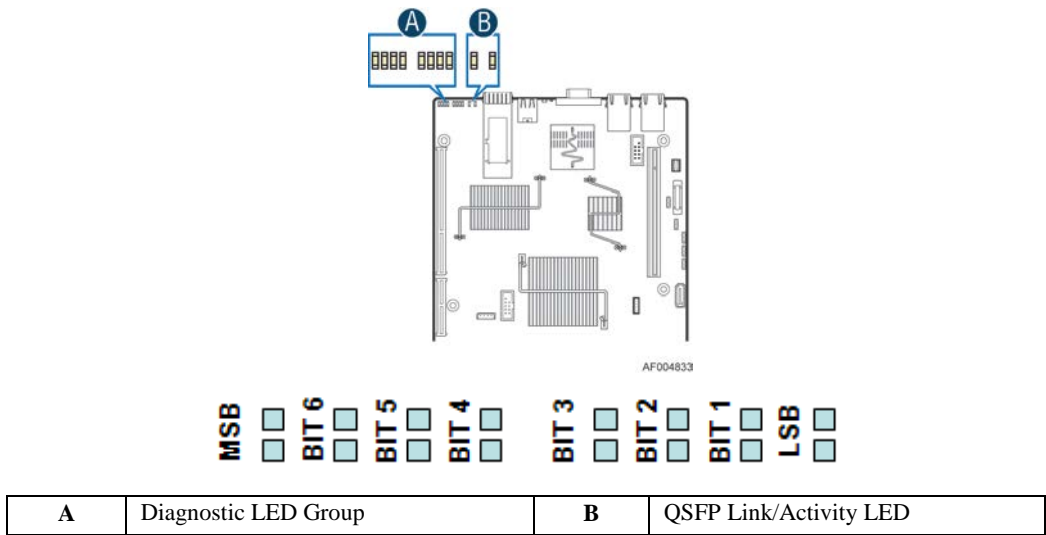


<b>A</b>	2x7 fan control connector	<b>I</b>	PCH C600-A	<b>Q</b>	Dual port 1GbE NIC chip	<b>Y</b>	SATA port 1
<b>B</b>	CPU2 DIMM (8 total)	<b>J</b>	Riser Slot 2 , (PCIe Gen3x16)	<b>R</b>	NIC port 2	<b>Z</b>	Storage Upgrade key
<b>C</b>	Riser Slot 4 (PCIe Gen3x16)	<b>K</b>	InfiniBand* QDR/FDR	<b>S</b>	NIC Port 1	<b>AA</b>	CPU 1
<b>D</b>	Riser Slot 3 (PCIe Gen3x16)	<b>L</b>	Diagnostic LED and InfiniBand* Status LED	<b>T</b>	Serial Port A	<b>AB</b>	CPU 2
<b>E</b>	CPU1 DIMM (8 total)	<b>M</b>	QSFP port	<b>U</b>	RMM4 lite	<b>AC</b>	VRS (4 total)
<b>F</b>	2x5 USB	<b>N</b>	USB x2	<b>V</b>	CMOS battery	<b>AD</b>	2x3 PWR connector (2 total)
<b>G</b>	IPMB connector	<b>O</b>	Status and ID LED	<b>W</b>	Integrated BMC		
<b>H</b>	Bridge board connector	<b>P</b>	VGA out	<b>X</b>	Riser Slot 1 (PCIe Gen3x16)		

**Figure 10. Server Board S2600WPQ Connector and Component Locations**



# Intel® Light-Guided Diagnostics



**Figure 11. Intel® Light-Guided Diagnostic LEDs - Server Board**

The server system contains the following diagnostic LEDs, each providing the following functions:

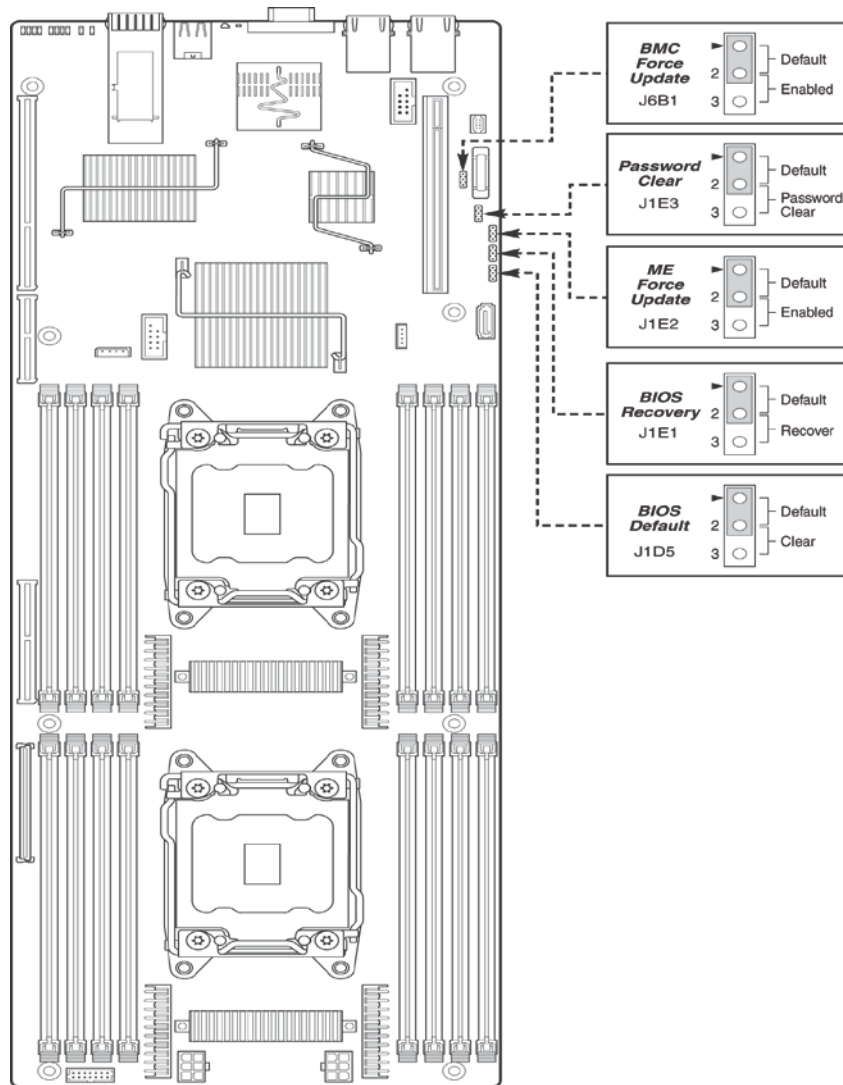
Section A – POST Code Diagnostic LEDs on the server board change color or state (off, green, red, and amber) according to the POST sequence.

Section B – Link and Activity LEDs for QSFP InfiniBand\* and 10GbE.

D in Figure 9 - The System Identification LED on the front and back panel helps identify the server from among several servers. The ID LED is off by default, and blue when activated by button or software.

E in Figure 9 - The System Status LED on the front and back panels shows the overall health of the system (green, blinking green, blinking amber, amber, off).

## System Jumpers



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Jumper Name	Jumper Position	Mode of Operation	Note
J6B1: BMC Force Update jumper	1-2	Normal	Normal mode
	2-3	Update	BMC in force update mode
J1E2: ME Force Update	1-2	Normal	Normal mode
	2-3	Update	ME in force update mode
J1E3: Password Clear	1-2	Normal	Normal mode, password in protection
	2-3	Clear Password	BIOS password is cleared
J1E1: BIOS Recovery Mode	1-2	Normal	Normal mode
	2-3	Recovery	BIOS in recovery mode
J1D5: BIOS Default	1-2	Normal	Normal mode
	2-3	Clear BIOS Settings	BIOS settings are reset to factory default

**Figure 12. Configuration Jumpers**

## Hard Disk Drive Carriers

The Intel® Server System JF ships in two different basic SKUs, and with different maximum number of hard disk drives, see below table for details:

**Table 4. Hard Disk Drive Options**

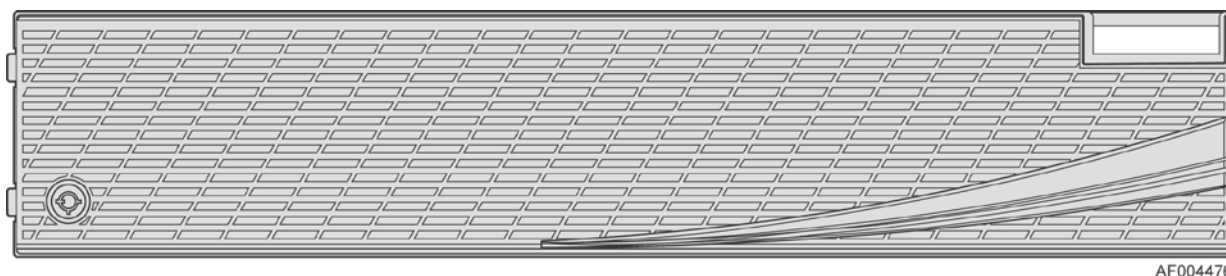
Intel® Server System	Supported Hard Drive Type	Maximum Hard Drive Number
H2312WP/ H2312WPQ	3.5" or 2.5"	12
H2216WP/H2216WPQ	2.5"	16

**Note:**

1. SAS drives are only supported when proper Intel® RAID C600 Upgrade Key is installed.
2. Drives can consume up to 17 watts of power each. Drives must be specified to run at a maximum ambient temperature of 45°C.
3. The Intel® Server System H2000WP does not support all types of SAS or Serial ATA (SATA) hard drives. For a web link to a list of supported hard drives, see [Additional Information and Software](#) on page v.

## Bezel

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

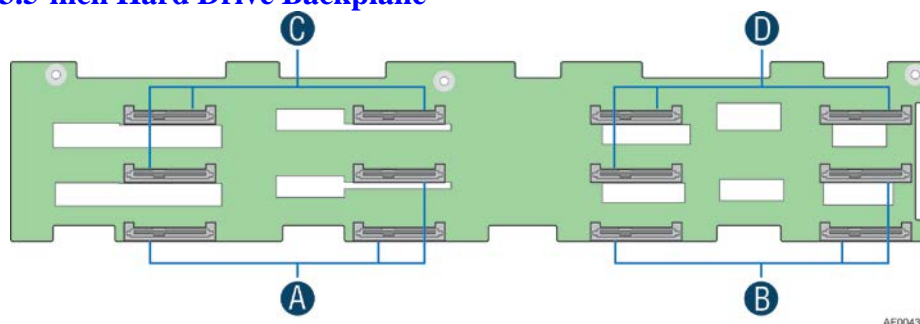


**Figure 13. Front view of System Bezel**

## Hot-Swap SAS/SATA Backplane

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

### 12 x 3.5-inch Hard Drive Backplane

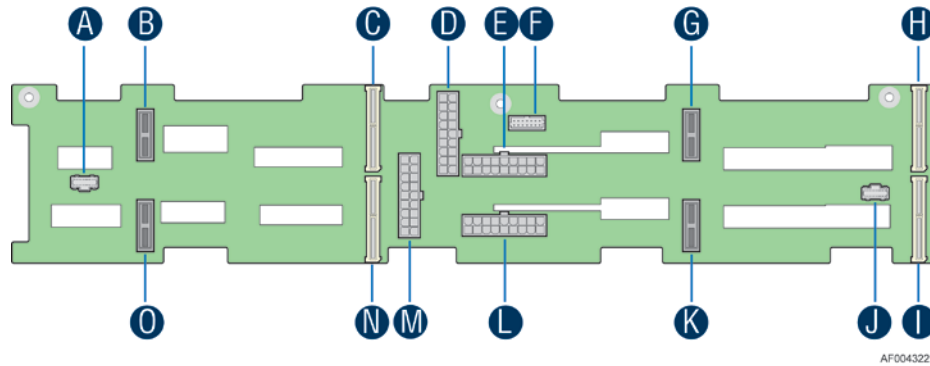


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<b>A</b>	SATA/SAS connectors for Node 1
<b>B</b>	SATA/SAS connectors for Node 2
<b>C</b>	SATA/SAS connectors for Node 3
<b>D</b>	SATA/SAS connectors for Node 4

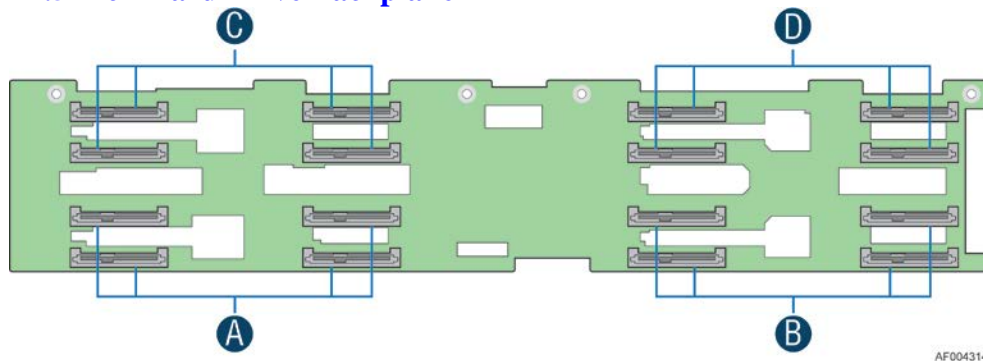
**Figure 14. 12 x 3.5-inch Hard Drive Backplane Components (Front View)**



<b>A</b>	20-pin Front Panel cable connector for Node 2, 4
<b>B</b>	2-Blade Compute Node Power connector for Node 4
<b>C</b>	2x40 pin Bridge Board connector for Node 4
<b>D</b>	2x9 pin Power supply input connector
<b>E</b>	2x9 pin Power supply input connector
<b>F</b>	2x7 pin Power Control cable connector
<b>G</b>	2-Blade Compute Node Power connector for Node 3
<b>H</b>	2x40 pin Bridge Board connector for Node 3
<b>I</b>	2x40 pin Bridge Board connector for Node 1
<b>J</b>	20-pin Front Panel cable connector for Node 1, 3
<b>K</b>	2Blade Compute Node Power connector for Node 1
<b>L</b>	2x9 pin Power supply input connector
<b>M</b>	2x9 pin Power supply input connector
<b>N</b>	2x40 pin Bridge Board connector for Node 2
<b>O</b>	2-Blade Compute Node Power connector for Node 2

**Figure 15. 12 x 3.5-inch Hard Drive Backplane Components (Rear View)**

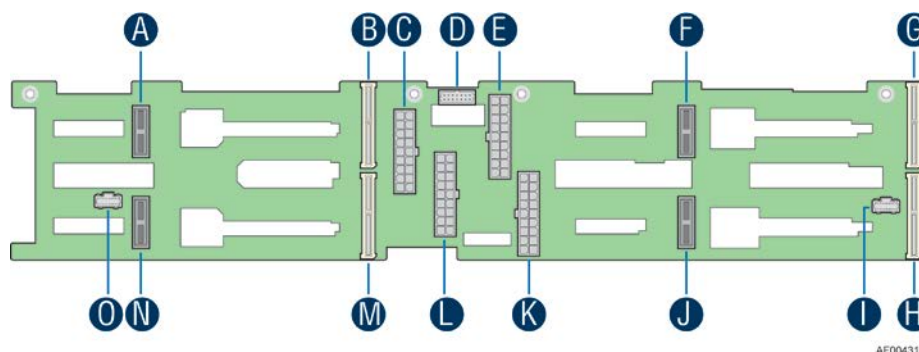
### 16 x 2.5-inch Hard Drive Backplane



<b>A</b>	SATA/SAS connectors for Node 1
<b>B</b>	SATA/SAS connectors for Node 2

<b>C</b>	SATA/SAS connectors for Node 3
<b>D</b>	SATA/SAS connectors for Node 4

Figure 16. 16 x 2.5-inch Hard Drive Backplane Components (Front View)



<b>A</b>	2Blade Compute Node Power connector for Node 4
<b>B</b>	2x40 pin Bridge Board connector for Node 4
<b>C</b>	2x9 pin Power supply input connector
<b>D</b>	2x7 pin Power Control cable connector
<b>E</b>	2x9 pin Power supply input connector
<b>F</b>	2Blade Compute Node Power connector for Node 3
<b>G</b>	2x40 pin Bridge Board connector for Node 3
<b>H</b>	2x40 pin Bridge Board connector for Node 1
<b>I</b>	20-pin Front Panel cable connector for Node 1, 3
<b>J</b>	2Blade Compute Node Power connector for Node 1
<b>K</b>	2x9 pin Power supply input connector
<b>L</b>	2x9 pin Power supply input connector
<b>M</b>	2x40 pin Bridge Board connector for Node 2
<b>N</b>	2Blade Compute Node Power connector for Node 2
<b>O</b>	20-pin Front Panel cable connector for Node 2, 4

Figure 17. 16 x 2.5-inch Hard Drive Backplane Components (Rear View)

## Advanced Management Options

### Intel® Remote Management Module 4 Lite

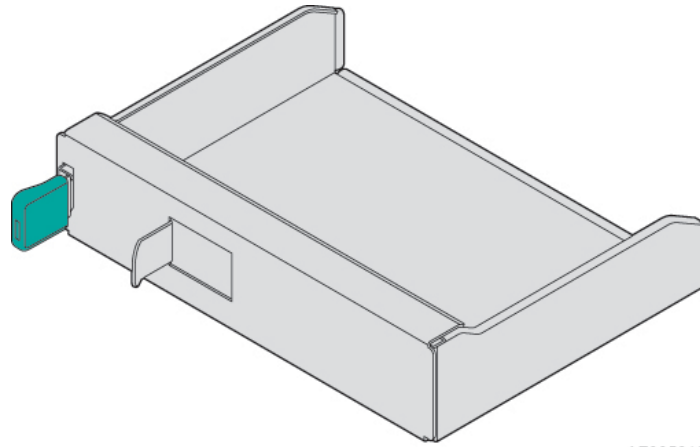
The Intel® Remote Management Module 4 Lite plugs into a dedicated connector on the server board and provides additional server management functionality to the Compute Node.

This module, together with dedicated management port on IOM carrier sitting on Slot2 riser provides a dedicated web server for viewing server information and remote control of the system. It also provides Remote KVM Redirection and USB Media Redirection allowing USB devices attached to the remote system to be used on the managed server.

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

## Dummy Tray Cover

The Dummy tray cover is shipped together with chassis. It must be removed before installing computing node tray, or it must be restored if the compute node tray is empty.



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**Figure 18: Dummy Tray Cover**

## 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 on page iii](#) at the beginning of this manual.

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

### 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.

***Note:** The Intel® Server System H2000WP is shown for illustration purposes; server components with the product family are identical.*

### Cable Routing

The Intel® Server System H2000WP family is a high density system, containing four identical Compute Nodes inside. There are a few cables for chassis internal routing. Each Compute Node is installed in tray and can be hot swapped without any impact to other nodes.

When you add or remove components from Compute Node tray, make sure your cables are routed correctly before plug in the node tray back to chassis. 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.

## For cable connection inside Node tray

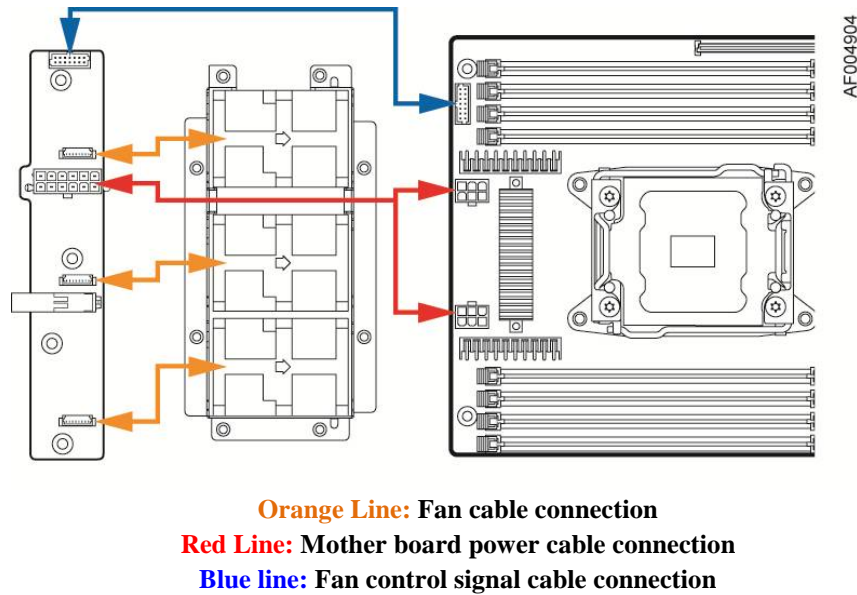


Figure 19. Cable Routing inside Node tray

## Removing and Installing the Front Bezel

### Removing the Front Bezel

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

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

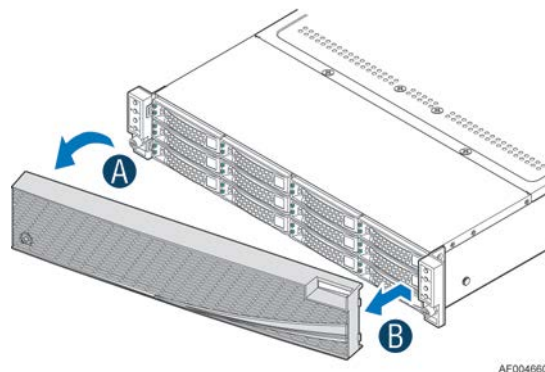


Figure 20. Removing the Front Bezel

### Installing the Front Bezel

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

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

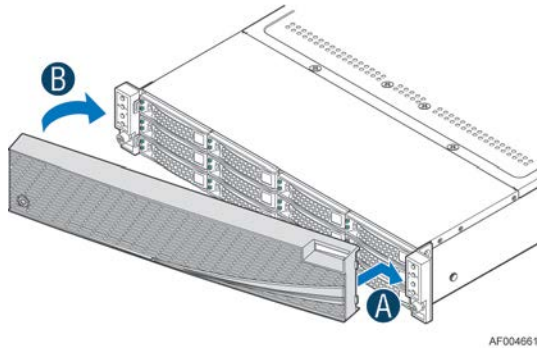


Figure 21. Installing the Front Bezel

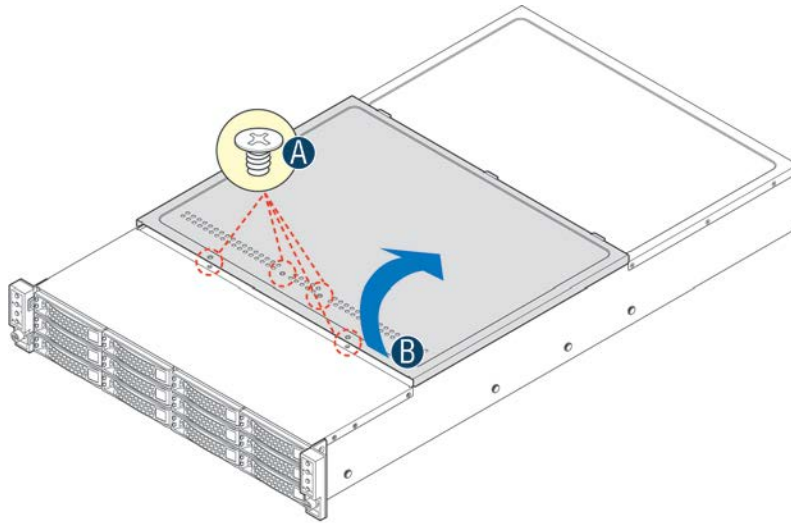
## Removing and Installing the System Top Cover

### Removing the System Top Cover

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

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

1. Observe the safety and ESD precautions at the beginning of this book.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Disconnect the power cord.
4. Remove the screws (see letter **A**).
5. Lift upwards from B edge (see letter **B**).

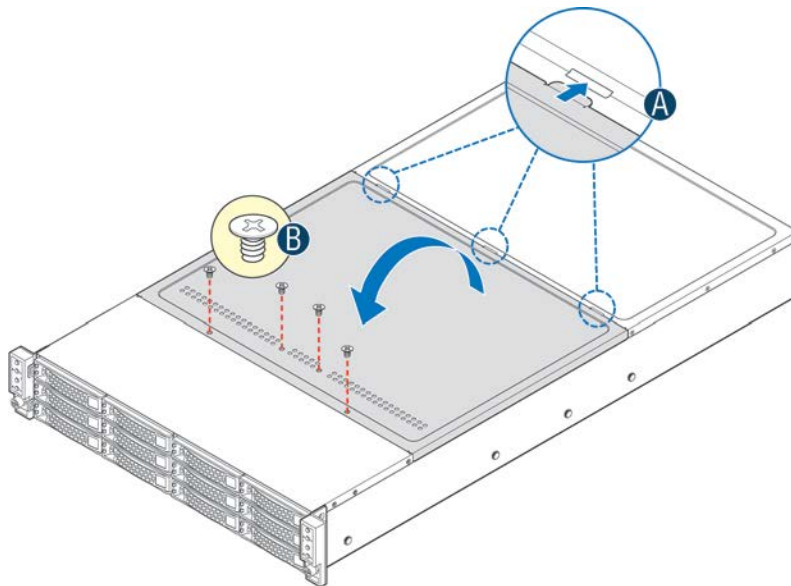


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**Figure 22. Removing the System Top Cover**

## Installing the System Cover

1. Place system cover onto the chassis and engage recessed edge at rear of cover (see letter **A**).
2. Put down the cover from B edge and tighten the screw at front (see letter **B**).



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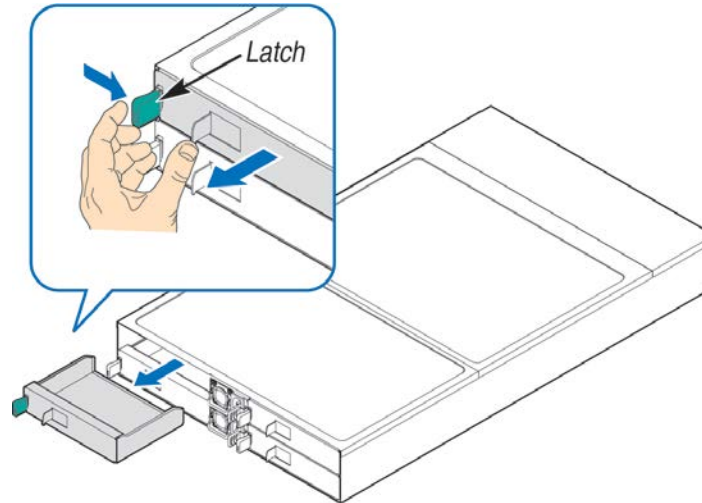
**Figure 23. Installing the System Cover**

## Removing and Installing the Compute Node Tray

Each Compute Node tray is identical in the chassis. They are designed for either “cold” or “hot” swappable. The Node Tray can only be plugged from rear chassis.

## Removing the Node Tray

1. Carefully push in the latch on the left hand of Node Tray.
2. Pull the handle with the Node Tray while still press the latch.

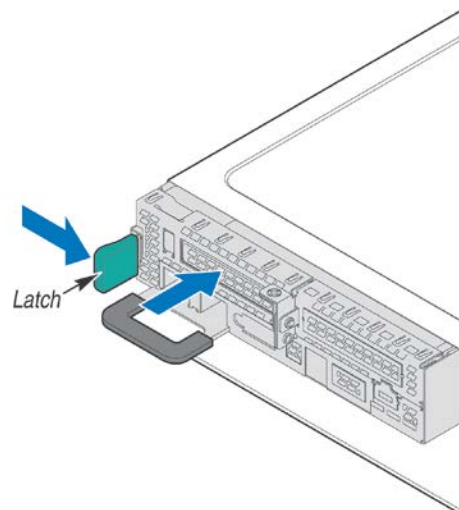


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Figure 24. Pulling out the Node Tray

## Installing the Node Tray

1. Align and slide in the Node Tray to the chassis rail.
2. Push the Node Tray along the rail until the latch locks in position with a “tick”.



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Figure 25. Installing the Node Tray

## Removing and Installing the Redundant Power Supply Unit

The system equipped with two CRPS for redundancy. Each of them can be hot swappable.



## Removing the Power Supply Unit

1. Carefully push in the latch on the right hand of PSU.
2. Pull the handle with the PSU while still press the latch.

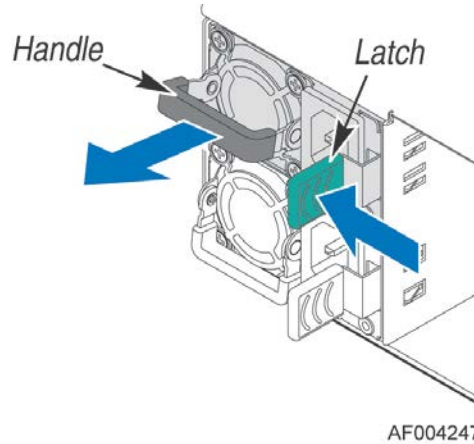


Figure 26. Removing the PSU

## Installing the Power Supply Unit

1. Align and slide in the PSU to the power cage rail.
2. Push the PSU along the rail until the latch locks in position with a “tick” sound.

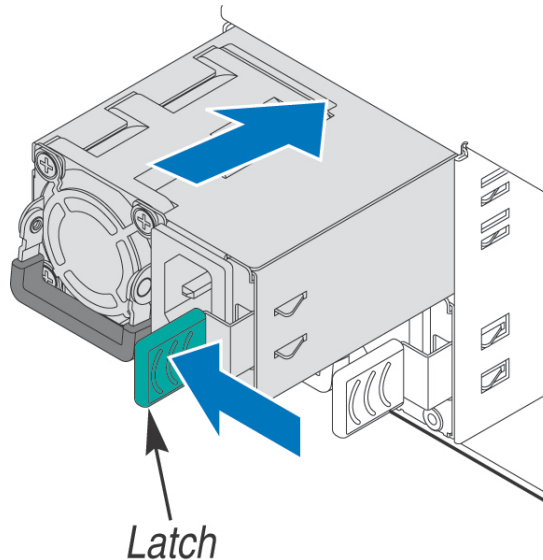


Figure 27. Installing the PSU

## Removing and Installing the Node Tray Air Duct

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

## Removing the Air Duct

1. Press and hold both left and right side of rear air duct (see letter **A**).
2. Slowly lift the rear end of air duct (see letter **B**).
3. Rotate the airduct more than 45 degrees and pull out.

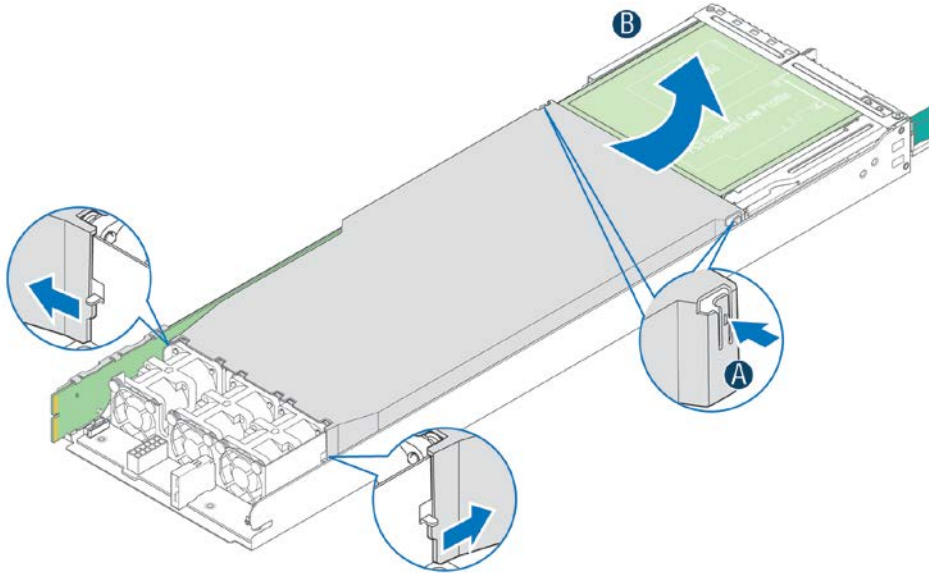
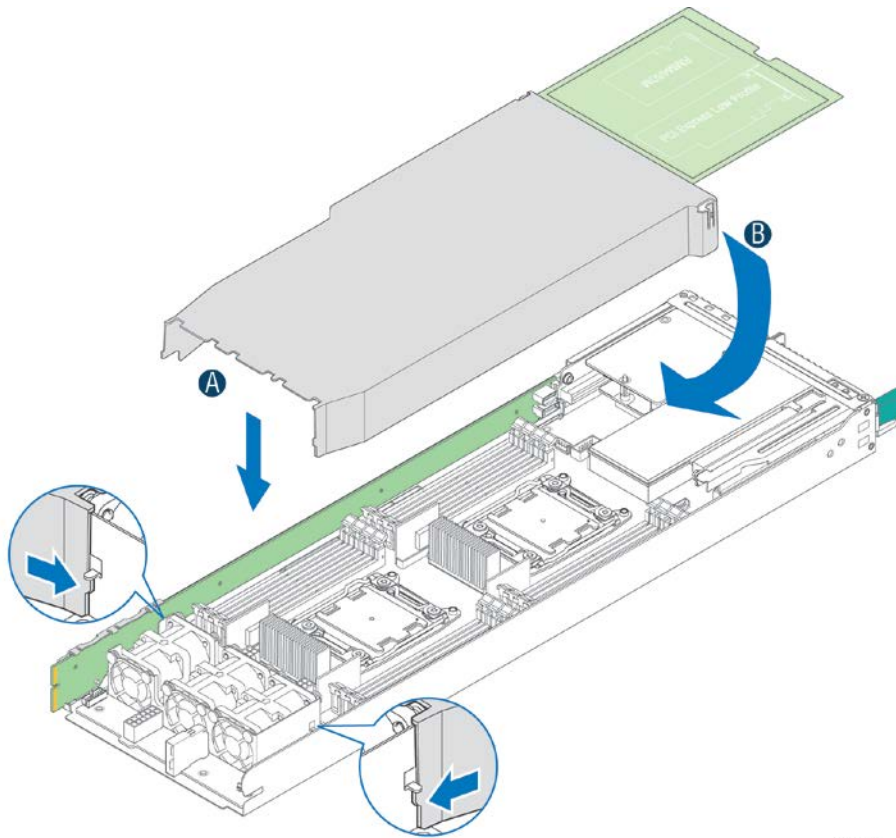


Figure 28. Removing the Air Duct

## Installing the Air Duct

1. Align the front end of air duct to chassis fixture (see letter **A**).
2. Lower down the rear end of the air duct to fix with a “tick” sound (see letter **B**).

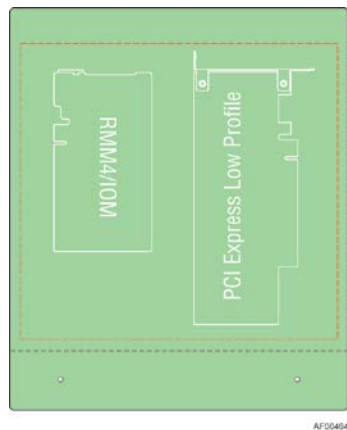


AF005063

**Figure 29. Installing the Air Duct**

## Transparent Mylar Installation

In case IOM carrier on slot2 or PCIe add-in card on riser slot 1 is installed, the transparent Mylar\* attached to the air duct must be installed in between add-in card and rear IO bracket for isolation.



AF004844

**Figure 30. Transparent Isolation Film for Air Duct**

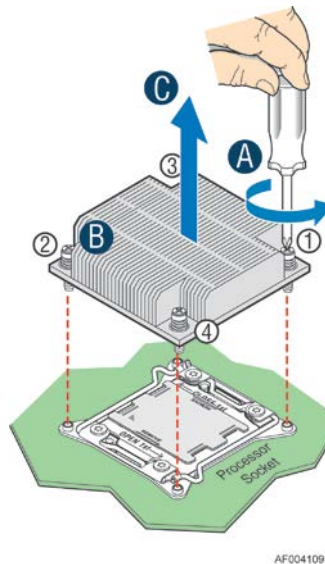
## Removing and Installing Processor

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

### Removing Processor Heatsink(s)

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

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



**Figure 31. Removing Processor Heatsink**

### Installing the Processor

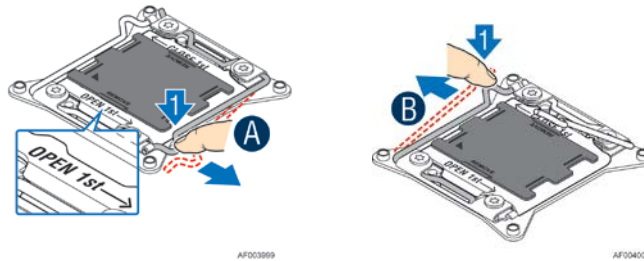
**Caution:** Processor must be appropriate: You may damage the server board if you install a processor that is inappropriate for your server. For a web link to the list of compatible processor(s), see [Additional Information and Software](#) on page vi.

**Caution:** ESD and handling processors: Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following:

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

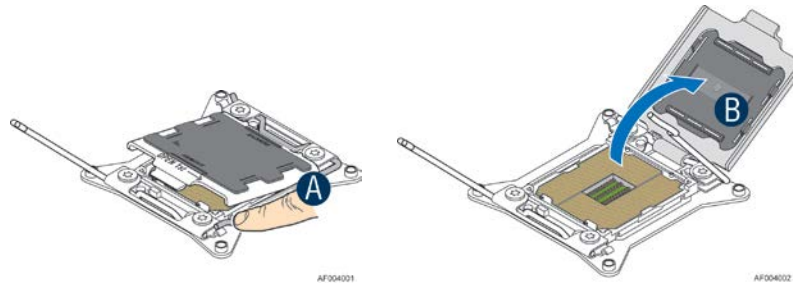
**Caution:** Protective socket cover needs to be removed for proper cooling of the processor; failure to remove the cover could result in damage to the system.

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



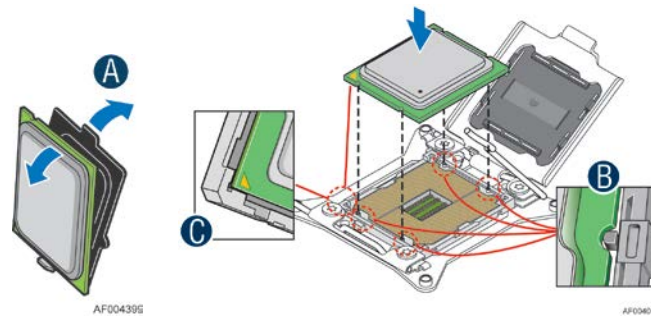
**Figure 32. Installing Processor – Open the Socket Lever**

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 33. Installing Processor – Open the Load Plate**

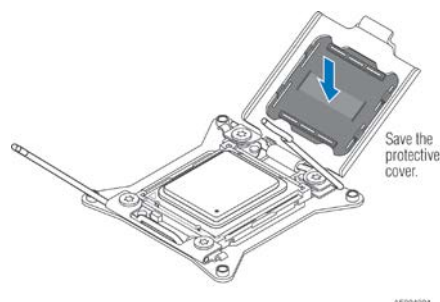
3. Install the Processor. Take the processor out of the box and remove the protective shipping cover (see letter **A**). Orient the processor with the socket so that the processor cutouts match the four orientation posts on the socket (see letter **B**). Note location of gold key at corner of processor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



**Figure 34. Installing Processor – Install the Processor**

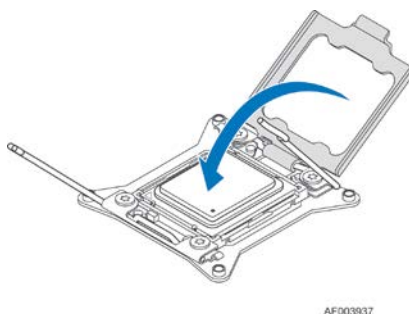
**Note:** The underside of the processor has components that may damage the socket pins if installed improperly. Processor must align correctly with the socket opening before installation. **DO NOT DROP** processor into the socket!

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



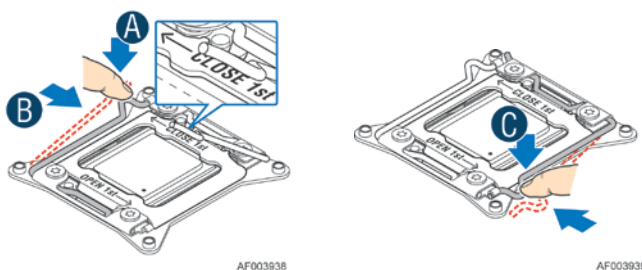
**Figure 35. Installing Processor – Remove the Cover**

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



**Figure 36. 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 37. Installing Processor – Latch the Locking Lever**

## Installing Processor Heatsink(s)

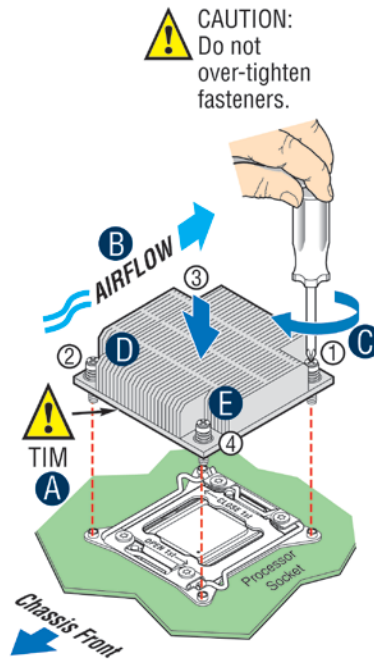
**Note:** The processor heatsink for CPU1 and CPU2 are different. FXXCA84X106HS is for CPU1, while FXXEA84X106HS is for CPU2. Mislocating the heatsink will cause serious thermal damage!

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

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

3. Using a #2 Phillips\* screwdriver, start with screw 1 and engage screw threads by giving it two rotations and stop (see letter C). (Do not fully tighten.)

4. Proceed to screw 2 and engage screw threads by giving it two rotations and stop (see letter **D**). Similarly, engage screws 3 and 4.
5. Repeat steps C and D by giving each screw two rotations each time until each screw is lightly tightened up to a maximum of 8 inch-lbs torque (see letter **E**).



AF004110

**Figure 38. Installing Processor Heatsink**

## Removing the Processor

1. Remove the processor heatsink, see Figure 31.
2. Open the socket lever, see Figure 32.
3. Open the load plate, see Figure 33.
4. Remove the processor.

## Installing and Removing Memory

### Installing Memory

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



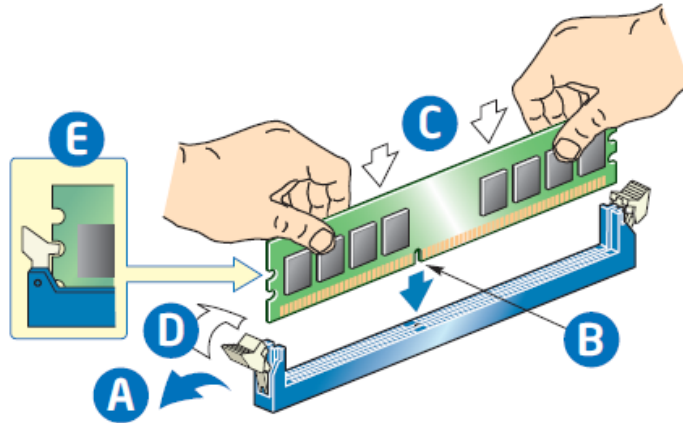


Figure 39. Installing Memory

## Removing Memory

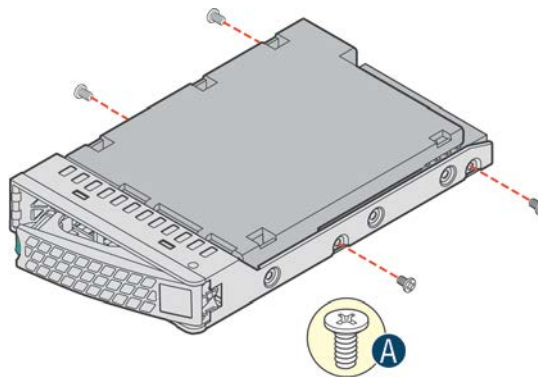
1. Locate the DIMM sockets. Gently spread the retaining clips at each end of the socket. The DIMM lifts from the socket.
2. Holding the DIMM by the edges, lift it from the socket, and store it in an anti-static package.

## Installing and Removing Hot-swap Hard Drive

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

### Installing a Hard Disk Drive into 3.5" Hard Drive Carrier

1. Remove the four screws securing the HDD interface bracket and install 3.5" HDD with screws shown in letter **A**.

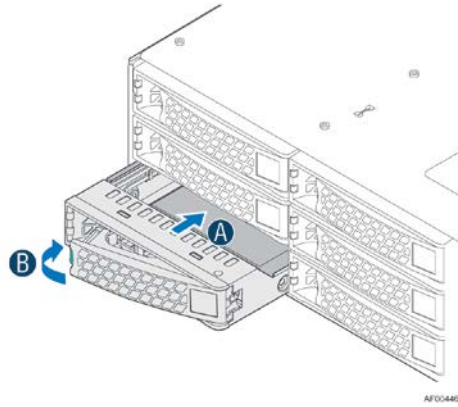


AF004461

Figure 40. Installing Hard Disk Drive – installing 3.5" HDD to carrier

2. 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**).

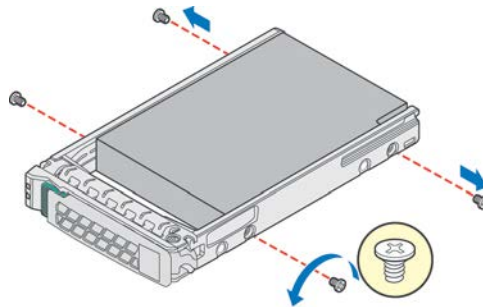




**Figure 41. Installing Hard Disk Drive – Inserting 3.5" HDD assembly**

## Installing a Hard Disk Drive into 2.5" Hard Drive Carrier

1. Remove the four screws securing the plastic drive blank from the 2.5" HDD carrier and install the 2.5" HDD with screws shown in below drawing.



**Figure 42. Installing Hard Disk Drive – Installing 2.5" HDD to Carrier**

2. With the lever open, insert the hard disk drive assembly into the chassis and push in the lever to lock it into place (See letter **F**).

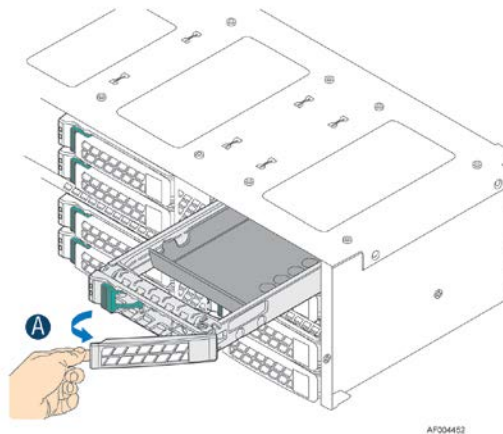


Figure 43. Installing Hard Disk Drive – Inserting 2.5" HDD Assembly

## Installing and Removing the PCIe Riser Assembly On Riser Slot 1

### Installing the PCI Riser Assembly and add-in card

1. Install the riser to bracket by fastening screws in letter **A**

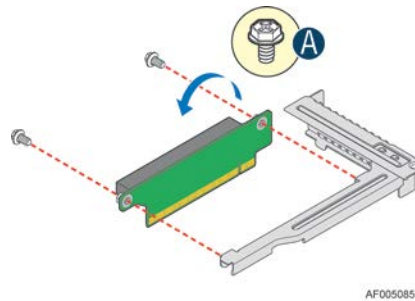


Figure 44. Assembly Riser with Bracket

2. Plug in the PCIe add-in card to slot on riser (letter **C**) and fix the card bracket to assembly rear panel (letter **B**).

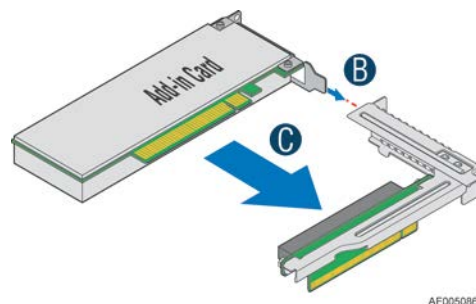
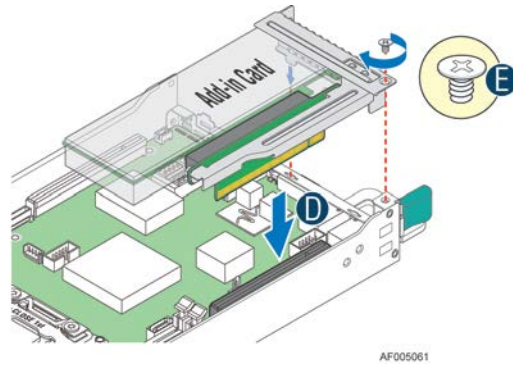


Figure 45. Installing Riser 1 Assembly

3. Plug in the assembly to riser slot on baseboard (see letter **D**) and fasten the screw (letter **E**).

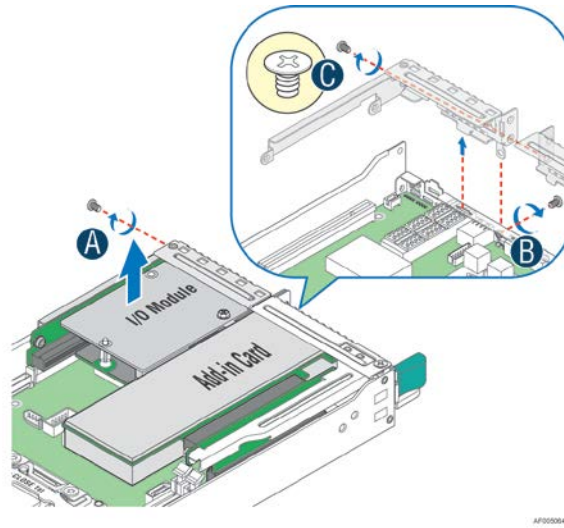


**Figure 46. Installing a PCI Adapter to PCI Riser 1 Assembly**

## Removing a PCI Add-in Card

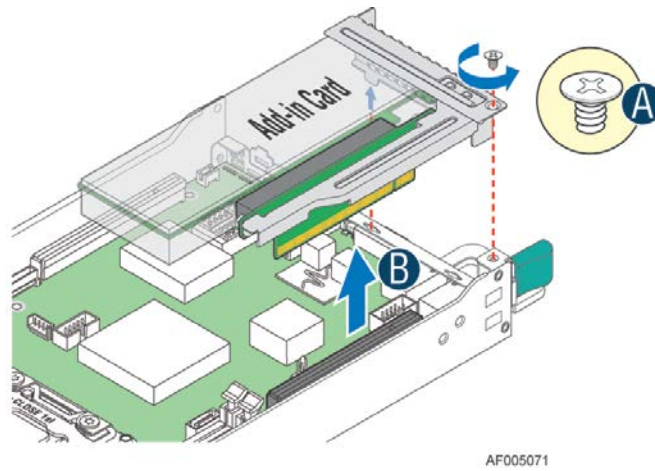
You must remove the IOM carrier assembly together with PCIe add-in card riser assembly.

1. Remove IOM carrier assembly (letter **A**) by loosening the screws (letter **B** and **C**).



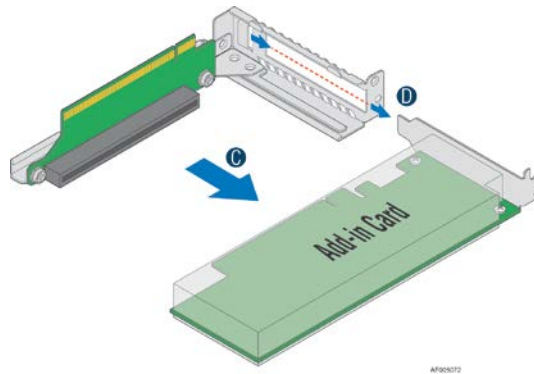
**Figure 47. Removing IOM assembly**

2. Remove PCIe riser assembly (letter **B**) by loosening the screw (letter **A**)



**Figure 48. Removing PCIe add-in card assembly**

3. Remove PCIe add-in card from slot (letter C) and bracket (letter D).



**Figure 49. Removing PCIe add-in card from riser slot**

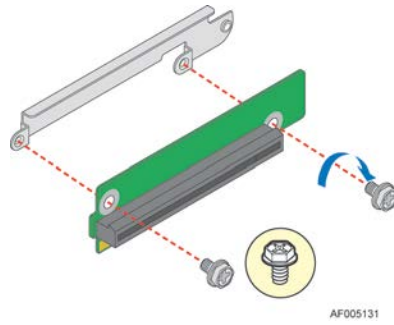
*Note: Make sure that all empty add-in card slots have filler panels installed.*

## On Riser Slot 2

### Installing IOM riser and carrier assembly

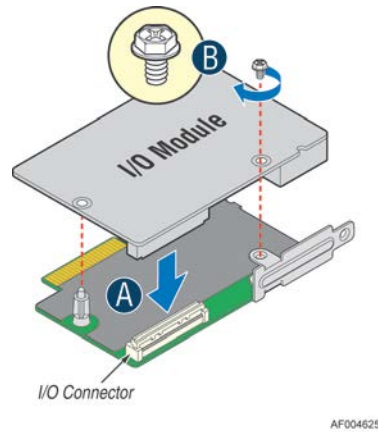
The IOM riser and carrier assembly are provided as optional accessory. This assembly provides the support to Intel® RMM4 dedicated NIC port and IO module.

1. Install the riser to bracket by fastening screws in below drawings.



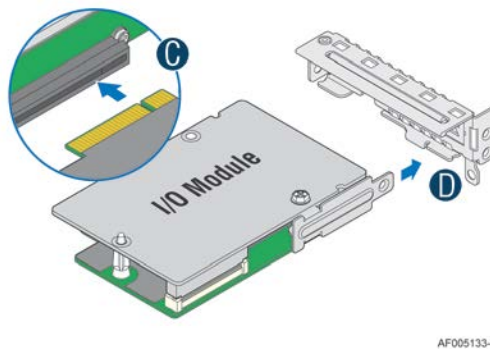
**Figure 50. Installing the Riser to Bracket**

2. Install IO module to IOM carrier using screw in letter **B**.



**Figure 51. Installing IO Module**

3. Install the whole bracket to IOM riser slot indicated by letter **C**. Then install rear panel indicated by letter **D**.



**Figure 52. Installing Assembly to Riser**

4. Fastening the assembly to chassis (letter F) with three screws in letter **E** and **G**.

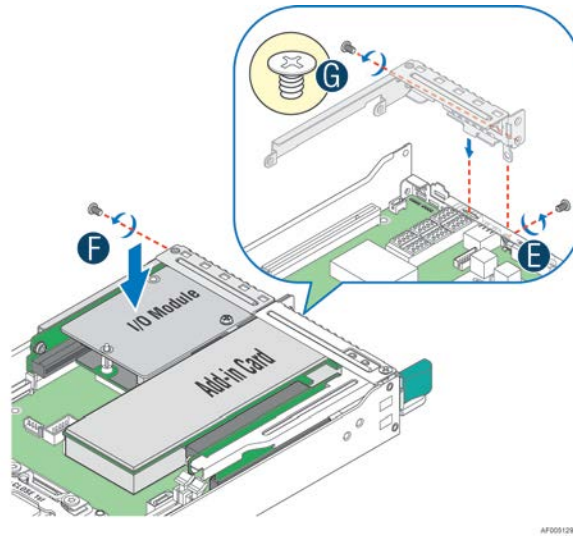


Figure 53. Fastening the Assembly in Chassis

## Removing IO module

1. Removing screws marked as letter **B** and **C**. Remove IOM assembly from chassis (letter **A**).

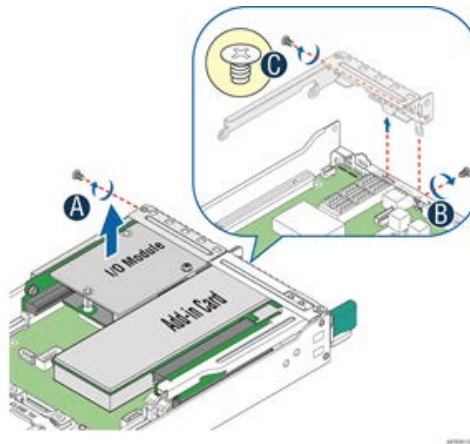
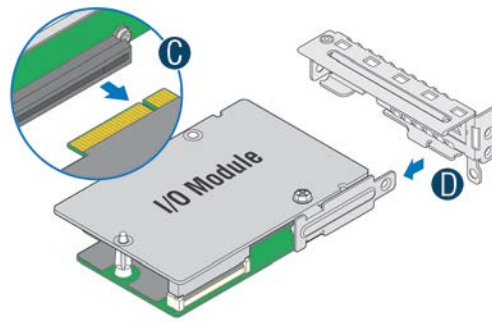


Figure 54. Unscrewing IOM Assembly

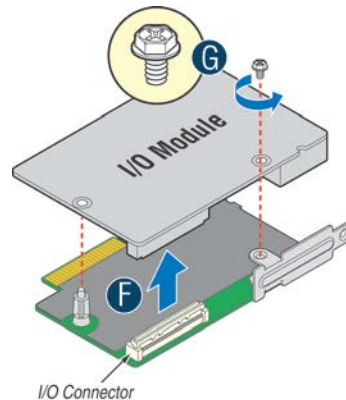
2. Remove the IO module carrier from the riser as letter **D** and bracket as letter **E**.



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**Figure 55. Removing IOM Assembly from Chassis**

3. Release screw in letter **G**, and remove IO module from assembly as letter **F**.



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**Figure 56. Removing IO Module from Assembly**

## Installing and Removing the Intel® Remote Management Module 4 Lite

### Installing the Intel® RMM4 Lite

Locate the RMM4 Lite connector next to RISER SLOT\_2, carefully pick up the Intel® RMM4 Lite module, match the alignment pin of the module and the connector on server board, and press to install.

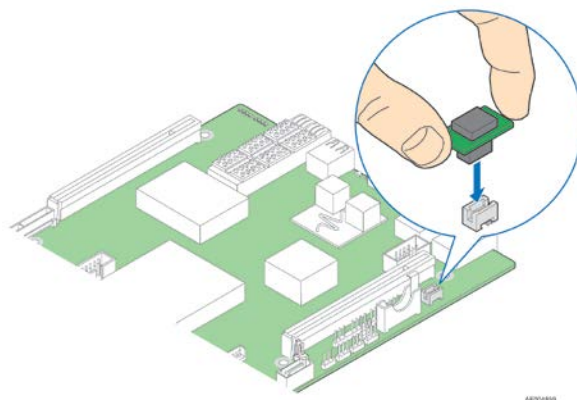


Figure 57. Installing the Intel® RMM4 Lite

## Installing the Intel® Storage Upgrade Key

### Installing the Intel® Storage Upgrade Key

The server board supports various Intel® Storage Upgrade Keys for different storage configuration. Below is the list of supported Storage Upgrade Key.

Table 5. Intel® RAID C600-A Storage Upgrade Key Options for S2600WP

Intel® RAID C600 Upgrade Key Options (Intel Product Codes)	Key Color	Description
Default – No option key installed	N/A	4 Port SATA with Intel® ESRT2 RAID 0,1,10 and Intel® RSTe RAID 0,1,5,10
RKSATA4R5	Black	4 Port SATA with Intel® ESRT2 RAID 0,1, 5, 10 and Intel® RSTe RAID 0,1,5,10
RKSAS4	Green	4 Port SAS with Intel® ESRT2 RAID 0,1, 10 and Intel® RSTe RAID 0,1,10
RKSAS4R5	Yellow	4 Port SAS with Intel® ESRT2 RAID 0,1, 5, 10 and Intel® RSTe RAID 0,1,10



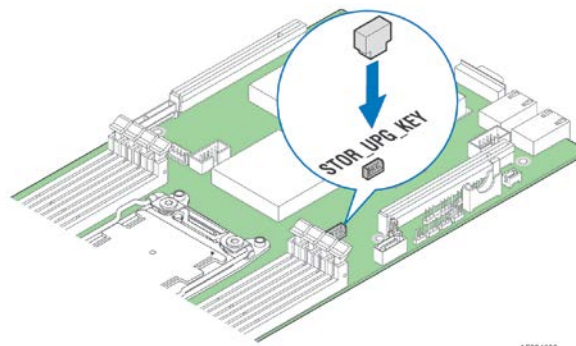


Figure 58. Installing the Intel® Storage Upgrade Key

## Installing and Removing the Bridge Board

### Removing the Bridge Board

1. Release the fixing screws (letter **A**) on the bridge board.
2. Straightly lift up bridge board to remove from the server board.

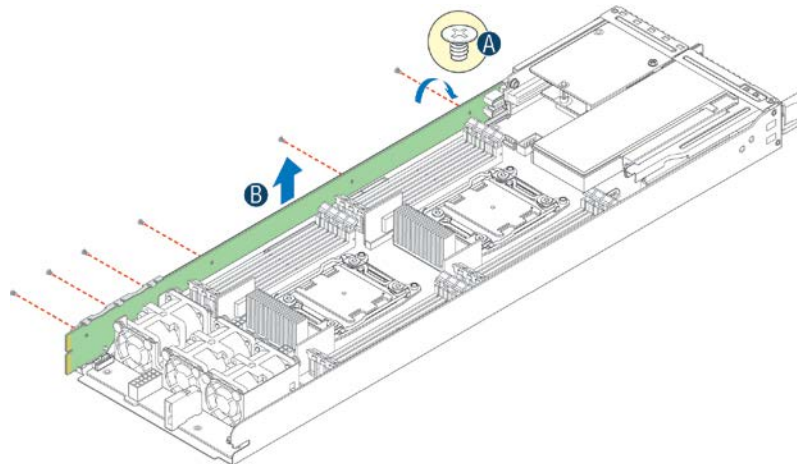


Figure 59. Removing the bridge board

### Installing the Bridge Board

1. Attach the plastic holder to the front end of bridge board (letter **A**).
2. Plug the rear end of bridge board to the slot on base board (letter **B**).
3. Secure the bridge board with screws (see letter **C**) to the tray side wall.

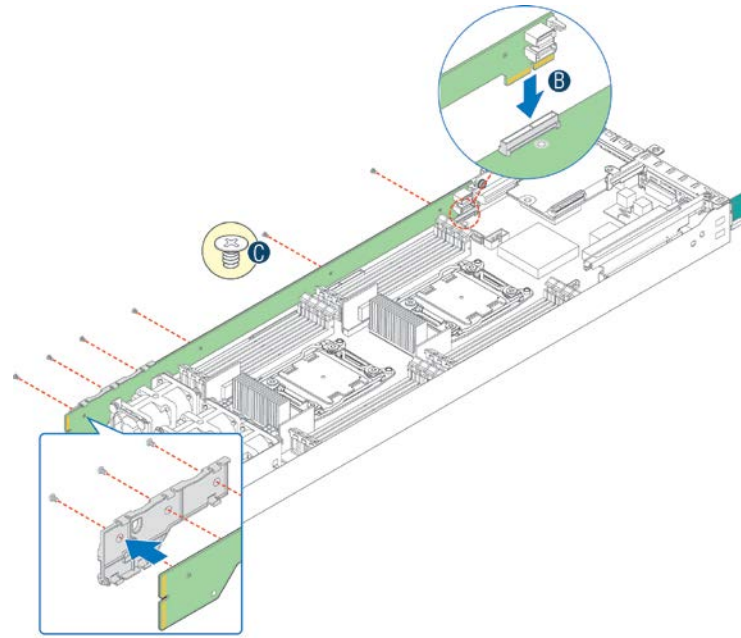
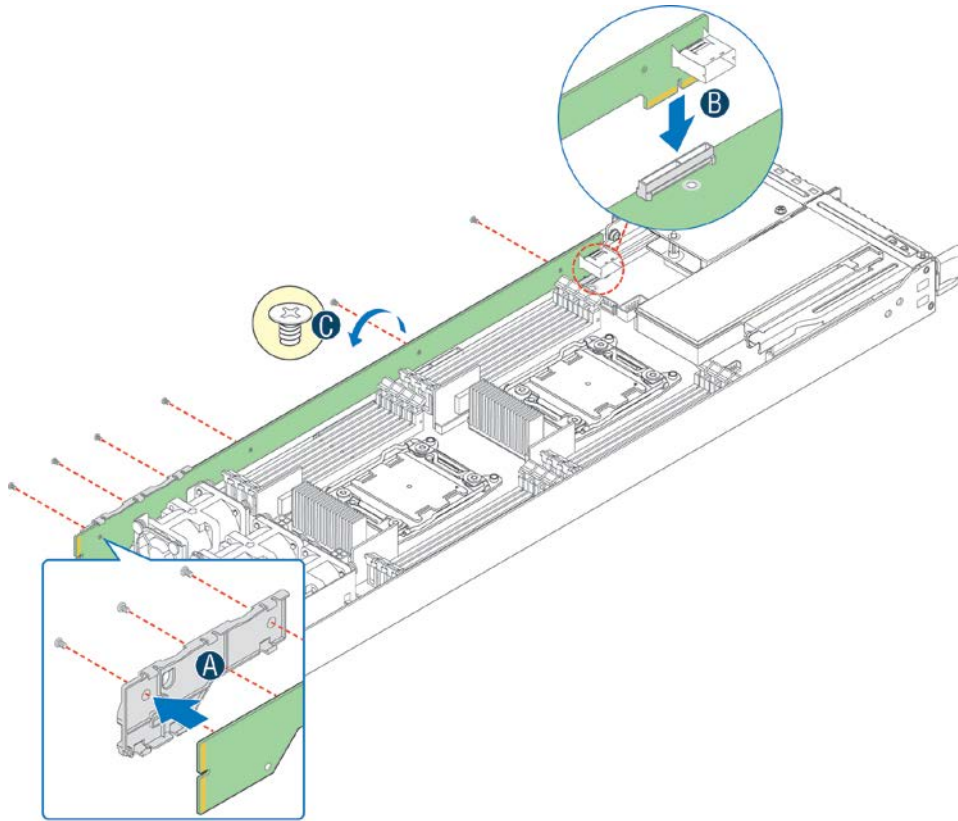


Figure 60. Installing the Bridge Board

## Installing SAS 6G Solution Option 1

### Replacing Node Bridge Board

1. Remove pre-installed bridge board from node tray, see Figure 59.
2. Plug in the card edge of spare bridge board to bridge slot, see letter **B** of [Figure 61. Installing Spare Bridge Board](#).
3. Align the plastic clip at the front of the board, see letter **A**.
4. Fasten the bridge board with six screws, see letter **C**.

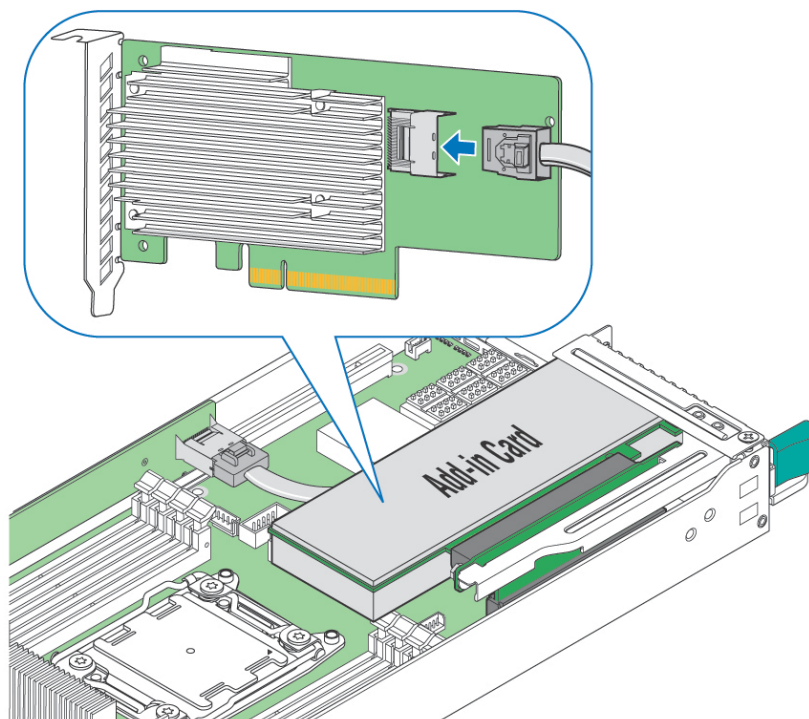


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**Figure 61. Installing Spare Bridge Board**

## **Connecting Mini SAS Cable between Bridge Board and RAID/SAS Controller**

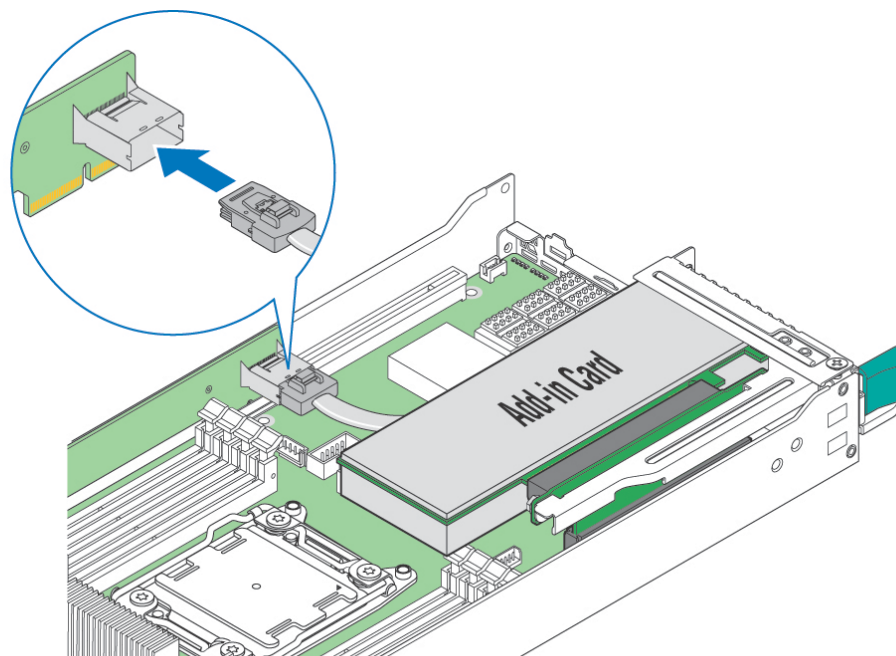
1. Use designated MiniSAS cable shipped with Spare Bridge Board.
2. Plug in Mini SAS cable to the RAID/SAS Controller Card firstly.



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**Figure 62. Connecting Mini SAS Cable to RAID/SAS Controller**

3. Then plug in MiniSAS cable to the Mini SAS port on the bridge board.



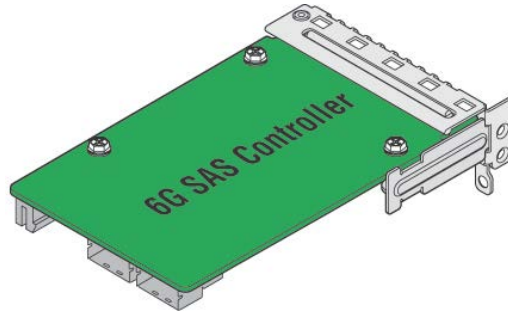
AF005671

**Figure 63. Connecting Mini SAS Cable to Bridge Board**

## Installing SAS 6G solution Option 2

### Replacing Node Bridge Board

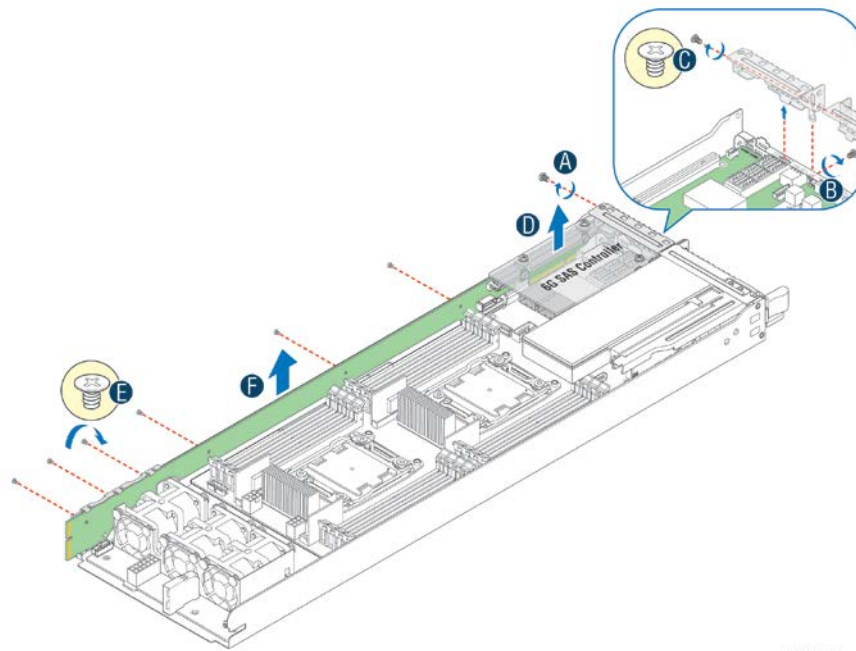
1. The SAS controller module is provided as assembly with the bracket.



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**Figure 64. SAS Controller Assembly**

2. Remove pre-installed bridge board from node tray.
3. Remove rear panel bracket. See letters A, B, C of the figure below.



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**Figure 65. Removing the bridge board and rear bracket**

4. Align the plastic clip at the front of the board. See letter A of the figure below.
5. Plug in the bridge board to bridge slot on baseboard. See letter B of the figure below.
6. Fasten the screws located at A and C.
7. Fix the SAS controller module to bridge board and riser slot 2 on baseboard (see letters D and E).
8. Fasten screws at F, G, and H to fix the rear bracket.

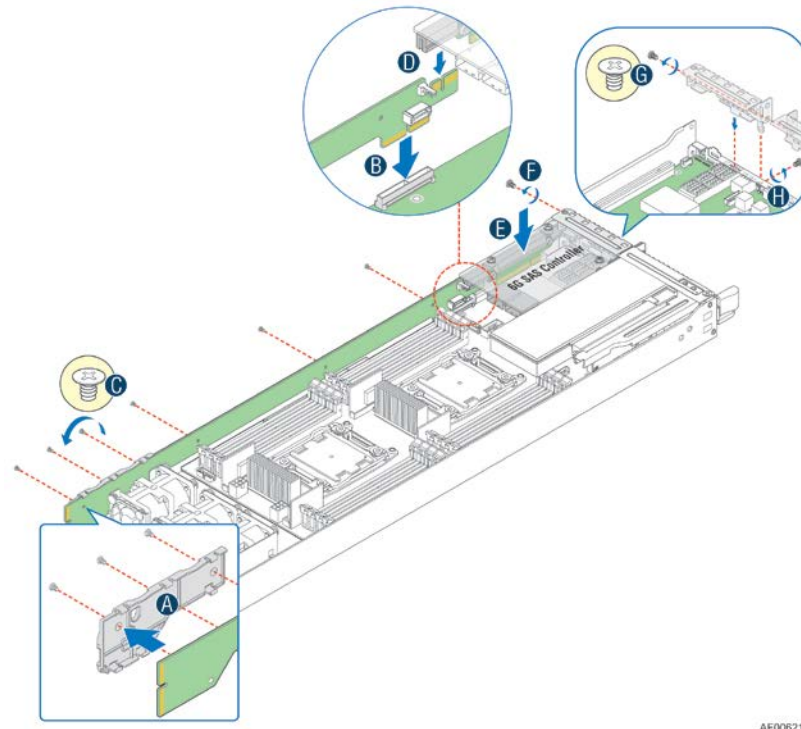
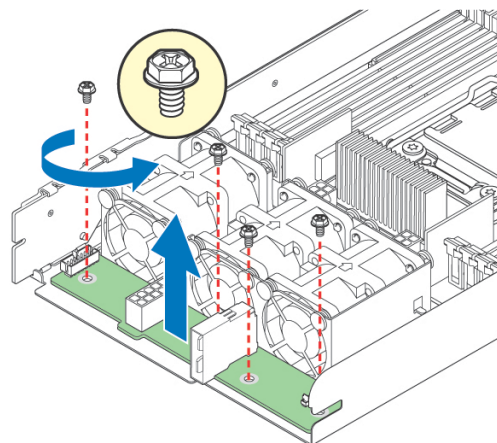


Figure 66. Installing the SAS module and rear bracket

## Installing and Removing the Node Power Docking Board

### Removing the NPD Board

1. Disconnect all cables from the NPD board.
2. Remove the four screws to release the NPD board from tray base.
3. Straightly lift up the NPD board to remove from the tray base.



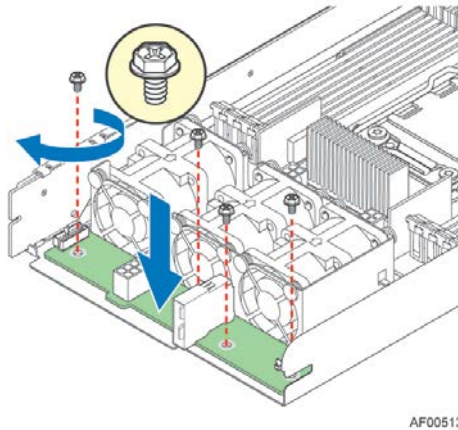
AF004906



**Figure 67. Removing the NPD board**

## Installing the NPD Board

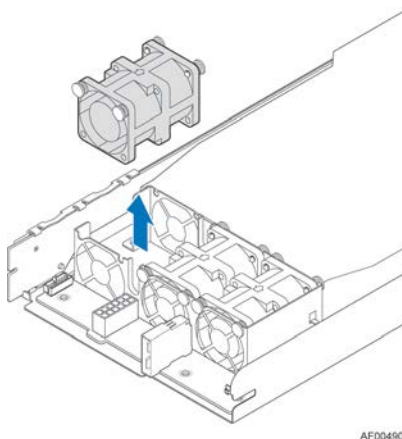
1. Place the NPD board into the tray base.
2. Secure the NPD board with four screws.
3. Connect all cables between NPD board and server board.

**Figure 68. Installing the NPD board**

## Installing and Removing the Fan set in node tray

### Removing the Fan set

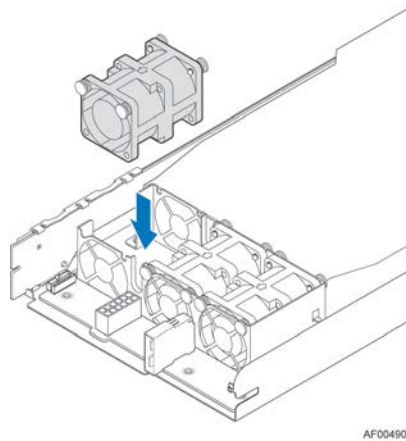
1. Disconnect Fan cable from the NPD board.
2. Remove Fan set from dock.



**Figure 69. Removing the Node Fan Set**

## Installing the Fan set

1. Place the Fan set into dock.
2. Connect the Fan set cable to connector on NPD board.

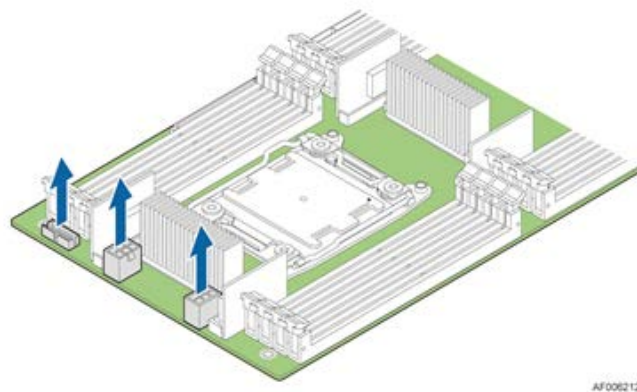


**Figure 70. Installing the Server Board**

## Replace Server Board

### Removing Server Board

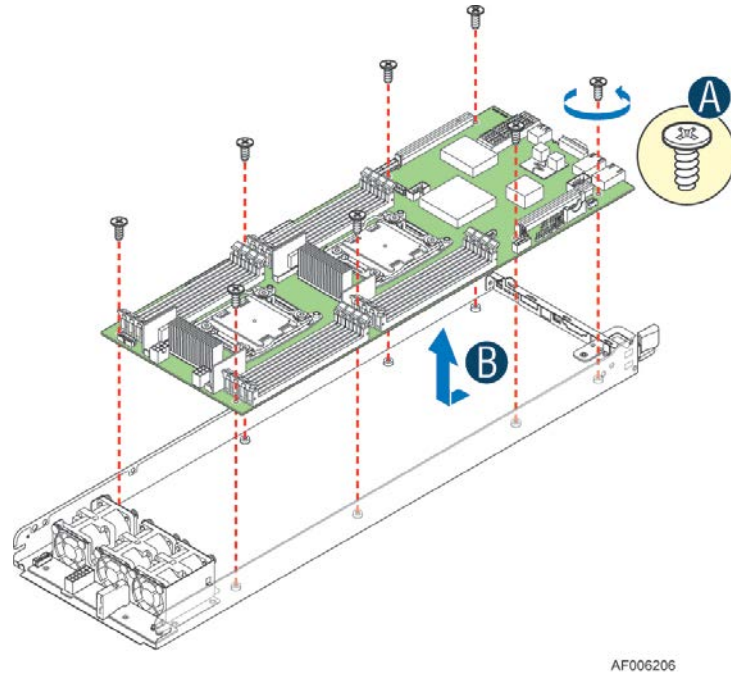
1. Plug out the Computer Node Tray, See Figure 24. Pulling out the Node Tray
2. Remove Air Duct, See Figure 28
3. Remove Processors and Memory DIMMs is there are any
4. Remove Bridge Board, See Figure 59
5. Remove PCIe Riser on Slot 1, See Figure 45
6. Remove IO Module carrier on Slot 2 if there is any, See Figure 47
7. Disconnect Cables from Server Board.



**Figure 71. Removing cable connections from server board**



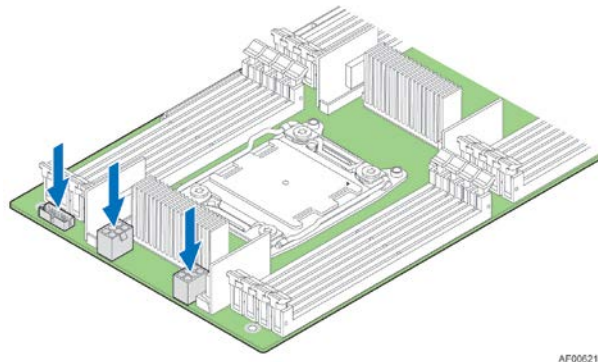
8. Use Screw Driver to remove eight screws from server board and lift up the board



**Figure 72: Removing server board**

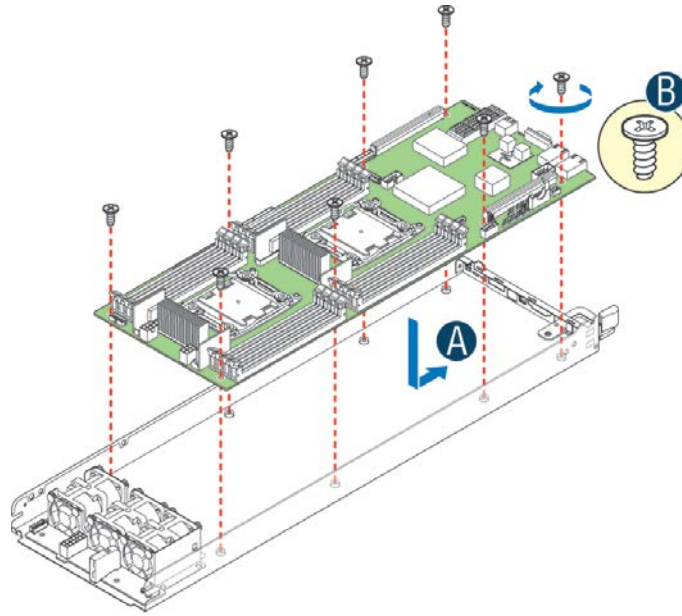
## Installing Server Board

1. Put server board in node tray and fix the screws



**Figure 73: Inserting cable connector to server board**

2. Reconnect all cable connection to server board



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Figure 74: Installing server board

3. Restore bridge board connections, See Figure 60
4. Restore PCIe Riser assembly on Slot 1, See Figure 45
5. Restore I/O Module carrier on Slot 2 if there is any, See Figure 51
6. Install processors and memory DIMMs if there are any
7. Install the Air Duct, See Figure 29
8. Plug in the computer node back to chassis

## Replacing the Backup Battery

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

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

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

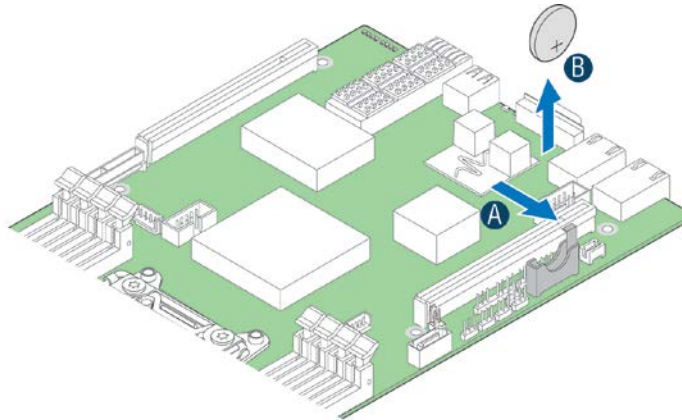
**Advarsel:** Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

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

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

1. Locate the battery on the server board.

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



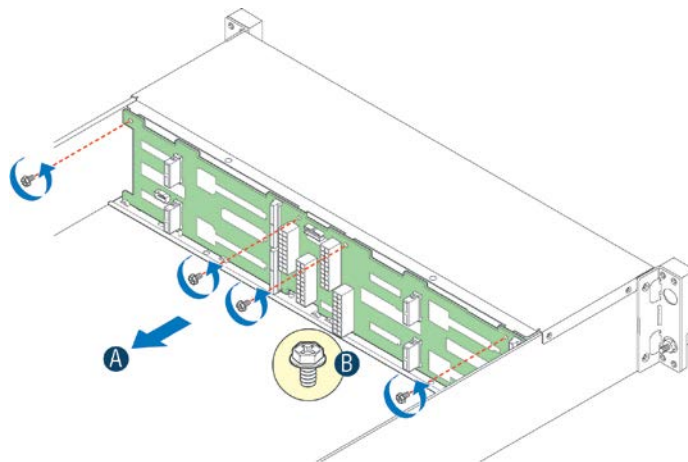
AF004858

**Figure 75. Replacing the Backup Battery**

## Installing and Removing the 2.5" Backplane Board

### Removing the 2.5" Backplane board

1. Disconnect all cables from the backplane board.
2. Remove the four screws to release the backplane board from chassis.
3. Straightly lift up the backplane board to remove from the chassis holder.

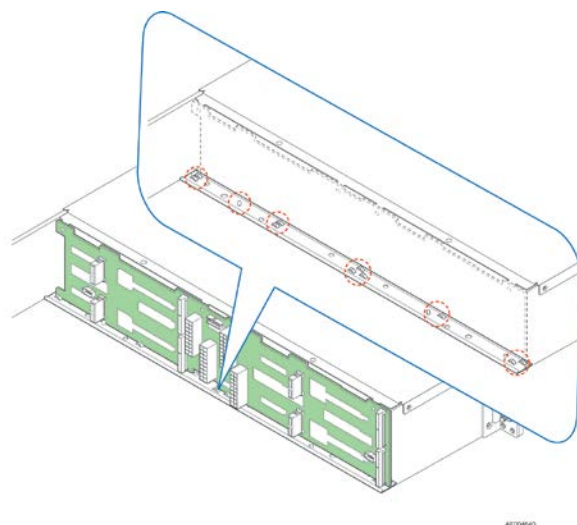


AF004891

**Figure 76. Removing the 2.5" Backplane Board**

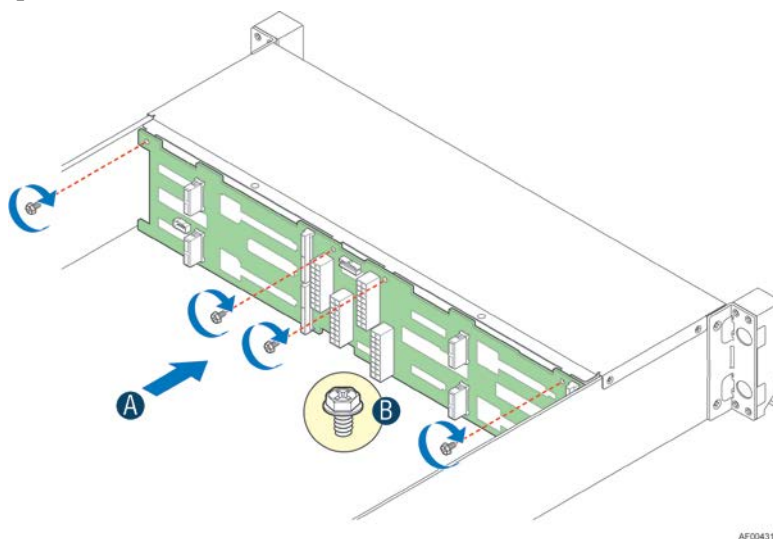
### Installing the 2.5" Backplane board

1. Place the backplane board into the clamps on chassis base.



**Figure 77. Align the Backplane to the Clamps on the Chassis Base**

2. Secure the backplane board with four screws (see letter **B**).



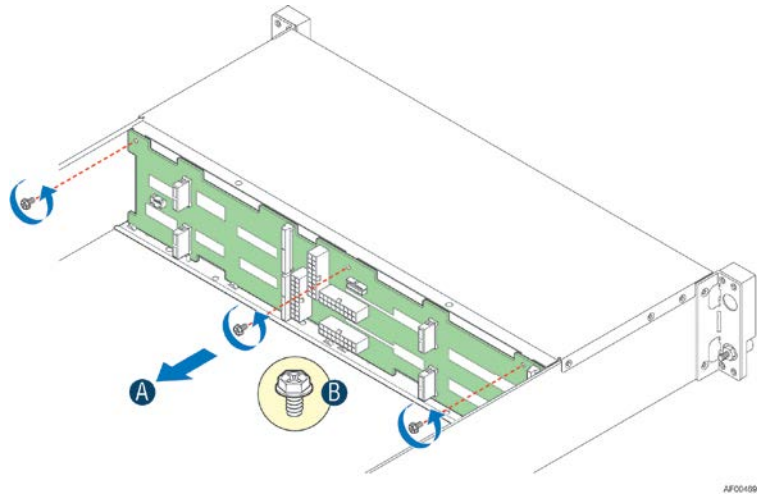
**Figure 78. Installing the 2.5" Backplane Board**

3. Reconnect all cables to the backplane.

## Installing and Removing the 3.5" Backplane Board

### Removing the 3.5" Backplane board

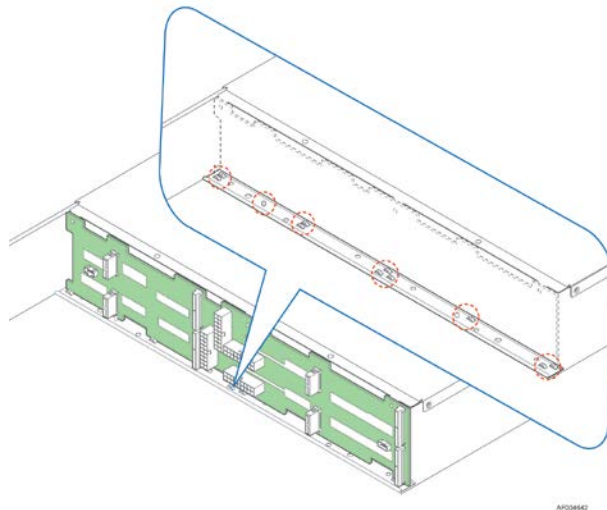
1. Disconnect all cables from the backplane board.
2. Remove the three screws to release the backplane board from chassis.
3. Straightly lift up the backplane board to remove from the chassis holder.



**Figure 79. Removing the 3.5" Backplane Board**

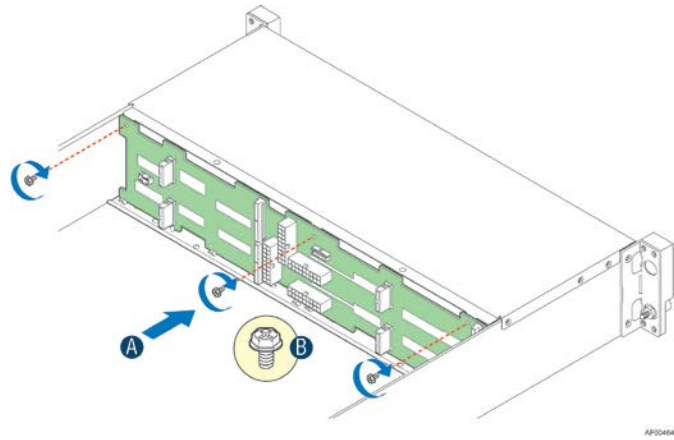
## Installing the 3.5" Backplane board

1. Place the backplane board into the clamps on chassis base.



**Figure 80. Align the Backplane to the Clamps on the Chassis Base**

2. Secure the backplane board with three screws (see letter **B**).



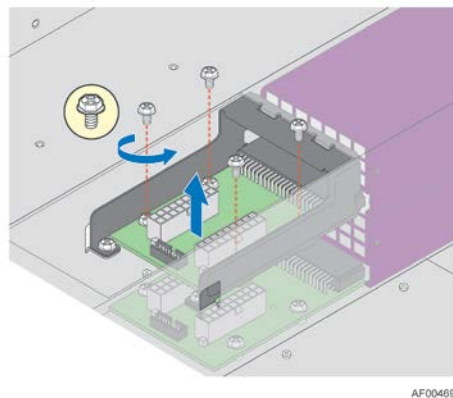
**Figure 81. Installing the 3.5" Backplane Board**

3. Reconnect all cables to the backplane.

## Installing and Removing the Power Distribution Board

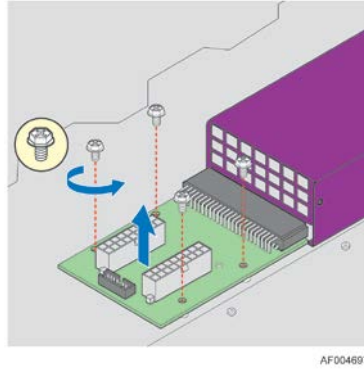
### Removing the PDB

1. Remove top cover and power supply units from chassis.
2. Remove power cables and PMBus cable between PDB and backplane.
3. Release the four screws of upper PDB board and remove it.



**Figure 82. Removing the upper PDB**

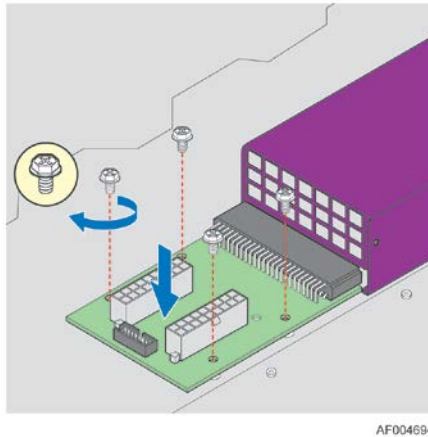
4. Release the four screws of lower PDB board and remove it.



**Figure 83. Removing the lower PDB**

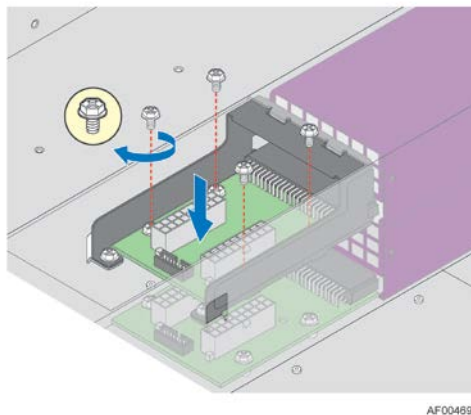
## Installing the PDB

1. Remove top cover and power supply units from chassis.
2. Install the lower PDB first and secure with four screws.



**Figure 84. Installing the lower PDB**

3. Connect the power cables and PMBus cable to lower PDB.
4. Install the upper PDB and secure with four screws.



**Figure 85. Installing the upper PDB**

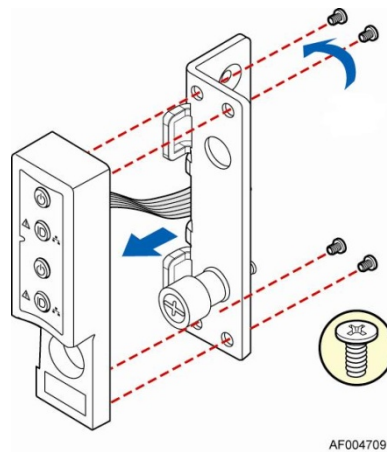


5. Connect power cables and PMBus cable to upper PDB.
6. Close top cover and install power supply units.

## Replacing the Front Control Panel board

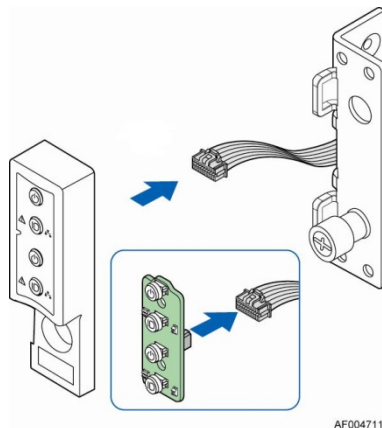
### Removing the Front Control Panel

1. Loosen and remove the four screws out the back of handle. Be careful of the control panel cable on the back.



**Figure 86. Removing FP Assembly from Rack Handle**

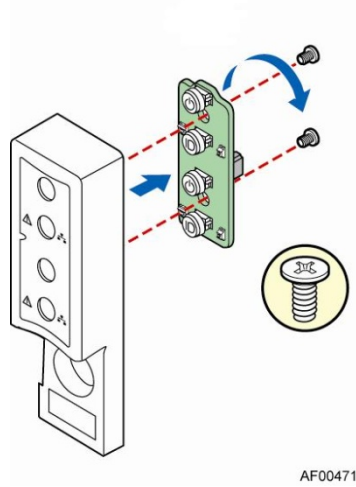
2. Disconnect the cable from the control panel board.



**Figure 87. Disconnecting Control Panel Cable**

3. Loosen and remove the two screws from the back of control panel board, so the board can be removed.

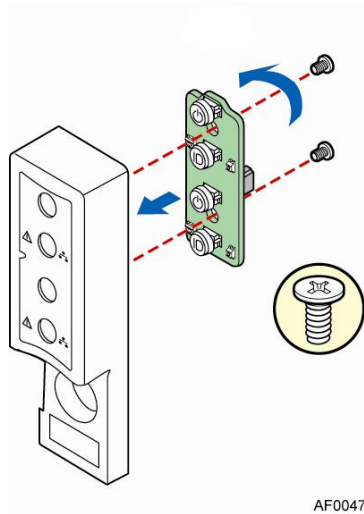




**Figure 88. Removing Control Panel Board**

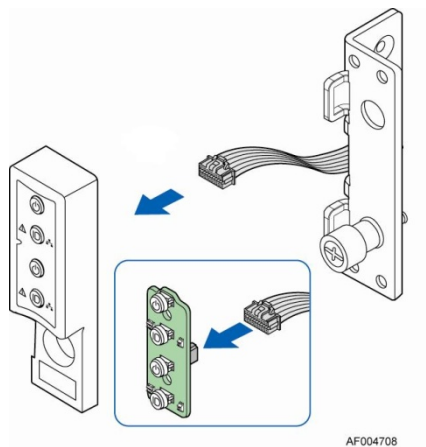
## Installing Front Control Panel Board

1. Install front control panel board to the panel shell.



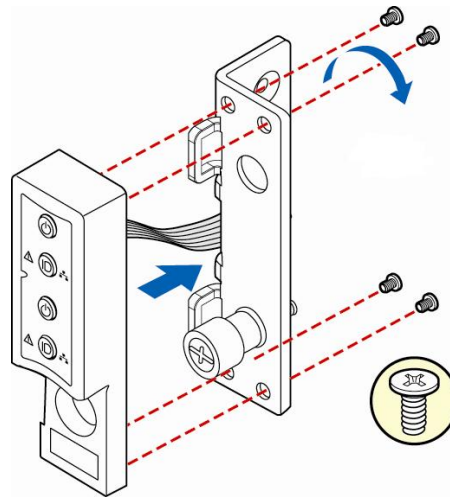
**Figure 89. Installing Control Panel Board**

2. Connect the cable to the front panel board.



**Figure 90. Connecting Cable to Front Panel Board**

3. Install front control panel assembly to chassis handle.



AF004710

**Figure 91. Installing Control Panel Assembly to Rack Handle**

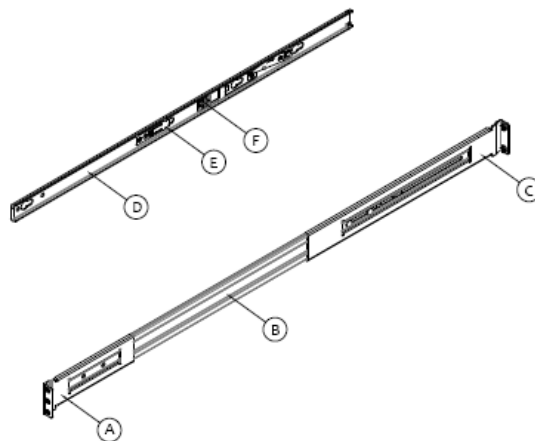
## Rack Mounting the Chassis

### Mounting the Chassis to Rack

The slide rail kit, which is bundled with Intel® Server System H2000WP family, is packed in the same shipping box together with the chassis. Following are the steps to install chassis to rack:

1. Preparation before slide installation.

#### RACK INSTALLATION – REMOVE INNER MEMBER FROM SLIDES



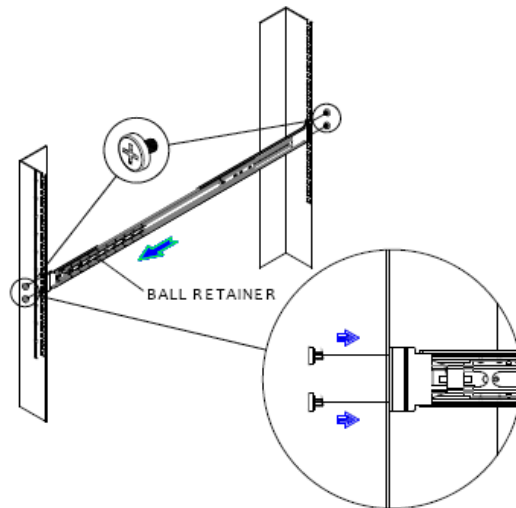
Slides components:  
A - front bracket; B - outer member;  
C - rear bracket; D - inner member;  
E - safety locking pin; F - release button.

Pull release button to remove inner member from slides.

**Figure 92. Removing Inner Member from Slides**

2. Install slides to rack.

## RACK INSTALLATION – INSTALL SLIDES TO RACK

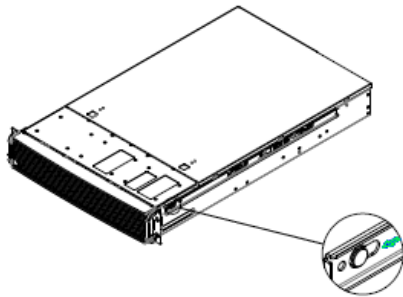


Align brackets to desired vertical position on rack and insert fasteners.  
Move ball retainer to the front of slides.

**Figure 93. Installing Slides to the Rack**

3. Install inner members to chassis.

## CHASSIS INSTALLATION – INSTALL INNER MEMBER TO CHASSIS

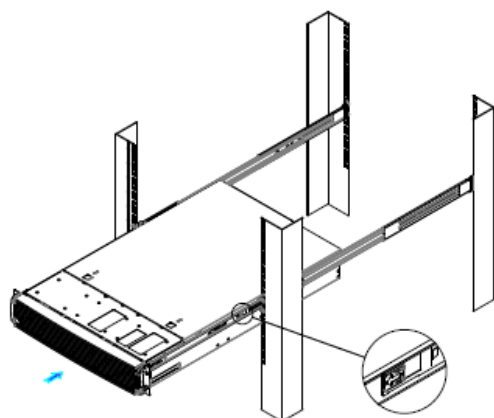


Align inner member key holes to standoffs on chassis, move inner member following the direction in left pictures.

**Figure 94. Installing Inner Member to the Chassis**

4. Install chassis to fixed slides.

## CHASSIS INSTALLATION – INSTALL CHASSIS TO FIXED SLIDES



Pull the release button in the inner member to release the lock and allow the chassis to close.

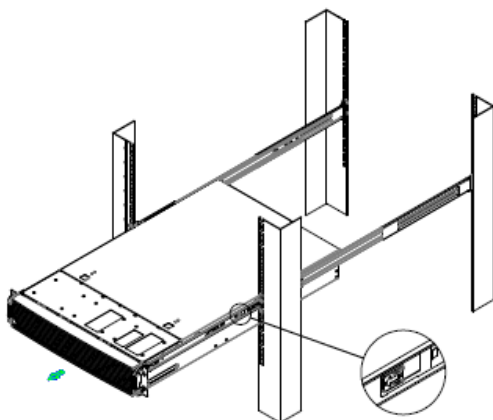
Figure 95. Installing the Chassis to Rack

## Removing the Chassis from Rack

Following the below steps to remove the chassis from Rack.

1. Extend slides.

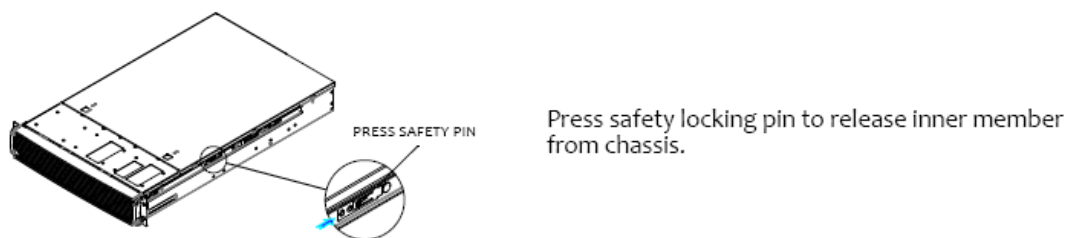
## CHASSIS REMOVAL – EXTEND SLIDES



Fully extend the slides until it is in the locked position, pull the release button to release lock and disconnect inner member from slides.

Figure 96. Extending Slides to Remove the Chassis

2. Remove Inner Member from Chassis

**CHASSIS REMOVAL – REMOVE INNER MEMBER FROM CHASSIS**

**Figure 97. Removing the Inner Member from the Chassis**

## 3 Server Utilities

### Using the BIOS Setup Utility

This section describes the BIOS Setup Utility options, which is used to change server configuration defaults. You can run BIOS Setup with or without an operating system being present.

#### Starting 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 is displayed. The following message is displayed on the diagnostics screen and under the Quiet Boot logo screen:

Press <F2> to enter setup

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

#### 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 6. 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;"> Load Optimized Defaults?  Yes    No </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;"> Save configuration and reset?  Yes    No </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 its 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.

**Table 7. 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	
⌂	Memory Configuration	
	⌂	Memory RAS and Performance Configuration
⌂	Mass Storage Controller Configuration	
⌂	PCI Configuration	
⌂	Serial Port Configuration	
⌂	USB Configuration	
⌂	System Acoustic and Performance Configuration	



Categories (Top Tabs)	2 <sup>nd</sup> Level Screens	3 <sup>rd</sup> Level Screens
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)		
Exit Screen (Tab)		

## Appendix A: Technical Reference

### Power Supply Input Voltages

Table 8. CRPS Input Voltage

Parameter	Min	Rated	Max	Start up VAC	Power Off VAC
110V <sub>AC</sub>	90 V <sub>rms</sub>	100-127 V <sub>rms</sub>	140 V <sub>rms</sub>	85 V <sub>AC</sub> ± 4V <sub>AC</sub>	70V <sub>AC</sub> ± 5V <sub>AC</sub>
220V <sub>AC</sub>	180 V <sub>rms</sub>	200-240 V <sub>rms</sub>	264 V <sub>rms</sub>		
Frequency	47 Hz	50/60 Hz	63 Hz		

### Power Supply Output Voltages

Table 9. CRPS Output Voltage

Parameter	Min	Nom	Max	Unit	Tolerance
+12VSTB	+11.40V	+12.000V	+12.60V	V <sub>rms</sub>	±5%
+12V	+11.40V	+12.000V	+12.60V	V <sub>rms</sub>	±5%

### System Environmental Specifications

The following table defines the system level operating and non-operating environmental limits.

Table 10. System Environmental Limits Summary

Parameter	Limits
Operating Temperature	+10°C to +35°C with the maximum rate of change not to exceed 10°C per hour
Non-Operating Temperature	-40°C to +70°C
Non-Operating Humidity	90%, non-condensing at 35°C
Acoustic noise	Sound power: - 3.5" HDD SKU: 6.9BA at idle and 7.4BA at active mode; - 2.5" HDD SKU: 6.5BA at idle and 7.07BA at active mode.
Shock, operating	Half sine, 2 g peak, 11 milliseconds
Shock, unpackaged	Trapezoidal, 25 g, velocity change 136 inches/second (40 lbs to < 80 lbs)
Shock, packaged	Non-palletized free fall in height 24 inches (40 lbs to < 80 lbs)
Vibration, unpackaged	5 Hz to 500 Hz, 2.20 g RMS random
ESD	+/- 12 KV except I/O port +/- 8 KV per Intel® Environmental test specification

Parameter	Limits
System Cooling Requirement in BTU/Hr	1200 Watt Max – 4095 BTU/hour 1600 Watt Max – 5459 BTU/hour

## 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/p/en\\_US/support/server/](http://www.intel.com/p/en_US/support/server/).

# Appendix C: LED Decoder

During the system boot process, the BIOS executes a number of platform configuration processes, each of which is assigned a specific hex POST code number. As each configuration routine is started, the BIOS displays the POST code to the POST Code.

Diagnostic LEDs found on the back edge of the server board. To assist in troubleshooting a system hang during the POST process, the Diagnostic LEDs can be used to identify the last POST process to be executed.

Each POST code is represented by the eight amber Diagnostic LEDs. The POST codes are divided into two nibbles, an upper nibble and a lower nibble. The upper nibble bits are represented by Diagnostic LEDs #4, #5, #6, #7. The lower nibble bits are represented by Diagnostics LEDs #0, #1, #2 and #3. If the bit is set in the upper and lower nibbles, then the corresponding LED is lit. If the bit is clear, then the corresponding LED is off.

The Diagnostic LED #7 is labeled as "MSB", and the Diagnostic LED #0 is labeled as "LSB".

In the following example, the BIOS sends a value of ACh to the diagnostic LED decoder.

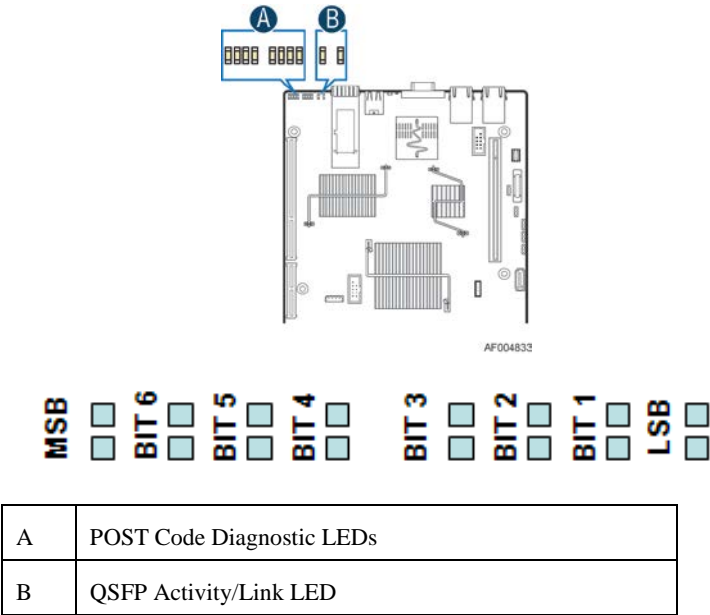


Figure 98. Diagnostic LED Placement Diagram

The LEDs are decoded as follows:

Table 11. POST Progress Code LED Example

LEDs	Upper Nibble LEDs				Lower Nibble LEDs			
	MSB							LSB
	LED #7	LED #6	LED #5	LED #4	LED #3	LED #2	LED #1	LED #0
	8h	4h	2h	1h	8h	4h	2h	1h

Status	ON	OFF	ON	OFF	ON	ON	OFF	OFF
Results	1	0	1	0	1	1	0	0
Ah					Ch			

- Upper nibble bits = 1010b = Ah;
- Lower nibble bits = 1100b = Ch;

The two are concatenated as Ach.

**Table 12. MRC Fatal Error Codes**

Error Code	Fatal Error Code Explanation (with MRC Internal Minor Code)
0xE8	<u>No Usable Memory Error:</u> 01h = No memory was detected via SPD read, or invalid config that causes no operable memory. 02h = Memory DIMMs on all channels of all sockets are disabled due to hardware memtest error. 03h = No memory installed. All channels are disabled.
0xE9	<u>Memory is locked by Intel® Trusted Execution Technology and is inaccessible.</u>
0xEA	<u>DDR3 Channel Training Error:</u> 01h = Error on read DQ/DQS (Data/Data Strobe) init 02h = Error on Receive Enable 03h = Error on Write Leveling 04h = Error on write DQ/DQS (Data/Data Strobe)
0xEB	<u>Memory Test Failure:</u> 01h = Software memtest failure. 02h = Hardware memtest failed. 03h = Hardware Memtest failure in Lockstep Channel mode requiring a channel to be disabled. <i>This is a fatal error which requires a reset and calling MRC with a different RAS mode to retry.</i>
0xED	<u>DIMM Configuration/Population Error:</u> 01h = Different DIMM types (UDIMM, RDIMM, LRDIMM) are detected installed in the system. 02h = Violation of DIMM population rules. 03h = The 3rd DIMM slot can not be populated when QR DIMMs are installed. 04h = UDIMMs are not supported in the 3rd DIMM slot. 05h = Unsupported DIMM Voltage.
0xEF	<u>Indicates a CLTT table structure error.</u>

Table 13. MRC Progress Codes

Progress Code	Main Sequence	Subsequences/Subfunctions
0xB0	Detect DIMM population	—n/a—
0xB1	Set DDR3 frequency	—n/a—
0xB2	Gather remaining SPD data	—n/a—
0xB3	Program registers on the memory controller level	—n/a—
0xB4	Evaluate RAS modes and save rank information	—n/a—
0xB5	Program registers on the channel level	—n/a—
0xB6	Perform the JEDEC defined initialization sequence	—n/a—
0xB7	Train DDR3 ranks	—n/a—
0x01	⇓	Read DQ/DQS training
0x02	⇓	Receive Enable training
0x03	⇓	Write Leveling training
0x04	⇓	Write DQ/DQS training
0x05	⇓	DDR channel training done
0xB8	Initialize CLTT/OLTT	—n/a—
0xB9	Hardware memory test and init	—n/a—
0xBA	Execute software memory init	—n/a—
0xBB	Program memory map and interleaving	—n/a—
0xBC	Program RAS configuration	—n/a—
0xBF	MRC is done	—n/a—

**Table 14. POST Progress Codes**

Progress Code	Description
<b>SEC Phase</b>	
0x01	First POST code after CPU reset
0x02	Microcode load begin
0x03	CRAM initialization begin
0x04	Pei Cache When Disabled
0x05	SEC Core At Power On Begin
0x06	Early CPU initialization during Sec Phase
0x07	Early SB initialization during Sec Phase
0x08	Early NB initialization during Sec Phase
0x09	End Of Sec Phase
0x0E	Microcode Not Found
0x0F	Microcode Not Loaded
<b>PEI Phase</b>	
0x10	PEI Core
0x11	CPU PEIM
0x15	NB PEIM
0x19	SB PEIM
<b>MRC Progress Codes</b> <i>At this point the MRC Progress Code sequence is executed  See <a href="#">Table 13</a>.</i>	
0x31	Memory Installed
0x32	CPU PEIM (CPU Init)
0x33	CPU PEIM (Cache Init)
0x34	CPU PEIM (BSP Select)
0x35	CPU PEIM (AP Init)



Progress Code	Description
0x36	CPU PEIM (CPU SMM Init)
0x4F	Dxe IPL started
<b>DXE Phase</b>	
0x60	DXE Core started
0x61	DXE NVRAM Init
0x62	SB RUN Init
0x63	DXE CPU Init
0x68	DXE PCI Host Bridge Init
0x69	DXE NB Init
0x6A	DXE NB SMM Init
0x70	DXE SB Init
0x71	DXE SB SMM Init
0x72	DXE SB devices Init
0x78	DXE ACPI Init
0x79	DXE CSM Init
0x90	DXE BDS Started
0x91	DXE BDS connect drivers
0x92	DXE PCI Bus begin
0x93	DXE PCI Bus HPC Init
0x94	DXE PCI Bus enumeration
0x95	DXE PCI Bus resource requested
0x96	DXE PCI Bus assign resource
0x97	DXE CON_OUT connect
0x98	DXE CON_IN connect
0x99	DXE SIO Init
0x9A	DXE USB start

Progress Code	Description
0x9B	DXE USB reset
0x9C	DXE USB detect
0x9D	DXE USB enable
0xA1	DXE IDE begin
0xA2	DXE IDE reset
0xA3	DXE IDE detect
0xA4	DXE IDE enable
0xA5	DXE SCSI begin
0xA6	DXE SCSI reset
0xA7	DXE SCSI detect
0xA8	DXE SCSI enable
0xA9	DXE verifying SETUP password
0xAB	DXE SETUP start
0xAC	DXE SETUP input wait
0xAD	DXE Ready to Boot
0xAE	DXE Legacy Boot
0xAF	DXE Exit Boot Services
0xB0	RT Set Virtual Address Map Begin
0xB1	RT Set Virtual Address Map End
0xB2	DXE Legacy Option ROM init
0xB3	DXE Reset system
0xB4	DXE USB Hot plug
0xB5	DXE PCI BUS Hot plug
0xB6	DXE NVRAM cleanup
0xB7	DXE Configuration Reset
0x00	INT19

Progress Code	Description
<b>S3 Resume</b>	
0xE0	S3 Resume PEIM (S3 started)
0xE1	S3 Resume PEIM (S3 boot script)
0xE2	S3 Resume PEIM (S3 Video Repost)
0xE3	S3 Resume PEIM (S3 OS wake)
<b>BIOS Recovery</b>	
0xF0	PEIM which detected forced Recovery condition
0xF1	PEIM which detected User Recovery condition
0xF2	Recovery PEIM (Recovery started)
0xF3	Recovery PEIM (Capsule found)
0xF4	Recovery PEIM (Capsule loaded)

## Appendix D: 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 at [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://supportmail.intel.com/scripts-emf/welcome.aspx>.
3. Lastly, you can contact an Intel support representative using one of the support phone numbers available at [http://www.intel.com/p/en\\_US/support/contact/phone](http://www.intel.com/p/en_US/support/contact/phone) (charges may apply). Intel customer support suggests filling out the issue report form available *Appendix E: Intel® Server Issue Report Form* to better service the issue.

Intel also offers Channel Program members around-the-clock 24x7 technical phone support on Intel® server boards, server chassis, server RAID controller cards, and Intel® Server Management at <http://www.intel.com/reseller/>.

**Note:** You will need to log in to the Reseller site to obtain the 24x7 number.

## Warranty Information

To obtain warranty information, visit the following Intel web site:

<http://www.intel.com/support/motherboards/server/sb/cs-010807.htm>.

# Appendix E: Intel® Server Issue Report Form

## Issue Report Form (Rev 3.6)

*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: S2600WP, H2216WP/H2312WP)

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### Server Chassis:

(Example H2000WP. If third-party chassis used, indicate make and model.)

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### Base Board Information: (some information may be found by accessing BIOS & 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):

Intel® Management Module BMC Revision (if applicable):

BMC/mBMC 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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### Processor information:

	Type	Speed	Spec	Thermal Solution
Processor 1				
Processor 2				

## Appendix E: Intel® Server Issue Report Form

	Type	Speed	Spec	Thermal Solution
Processor 3				
Processor 4				

Thermal solution (Heat sink) examples:  
(1U, Passive w/air ducting, Active w/fan, 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

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**Other third part hardware (Example: Example: KVM, Chassis, and so on):**

Description/Use	Manufacturer	Model	Firmware

---

**Storage Devices (Example: SCSI, SATA, SAS, USB, Tape, and so on):**

Manufacturer	Model	Type	Size	Firmware	In Hot Swap Bay?

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

Manufacturer:

Version:

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

Service Pack Level or Kernel Revision:

Distribution (OEM/Retail):

**Intel® RAID Controller: (Example SRCU42E)**

RAID controller part number (PBA number):

RAID controller firmware version:

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

RAID driver version:

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

RAID volumes configuration (disks &amp; RAID level):

RAID volume use (Boot device/Data Volume):

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

BBU part number:

**Detailed description of issue:**

**Troubleshooting tried:**

**Steps to replicate the issue:**



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**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.