Intel® Server System R2600SR Product Family

Setup and Service Guide

A guide providing initial setup instructions and procedures to insert and extract system components.

Rev 1.1

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Intel® Server Products and Solutions

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Document Revision History

Date	Revision	Changes
February 2018	1.0	Initial release.
March 2018	1.1	Added replacement instructions for the PCIe* I/O Risers and for the Power Distribution Module.

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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.

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.

Changing switches on a jumper block: A Dual In-line Package (DIP) switch is a manual electric switch that is packaged with others in a group within a switch block. DIP switches are an alternative to jumper blocks and their main advantage is that they are quicker to change and there are no parts to lose. Use the tip of a mechanical pencil with the lead retracted, a fine tipped screwdriver, or other fine tipped object to slide the switch on or off. Take care to keep the tool used on the switch and not let it slip off and touch any part of the server board otherwise, personal injury or equipment damage can result.

Slide / Rail mounted equipment is not to be used as a shelf or a work space

Electrostatic Discharge (ESD)

Electrostatic discharge can cause damage to your computer or the components within it. ESD can occur without the user feeling a shock while working inside the system chassis or while improperly handling electronic devices like processors, memory or other storage devices, and add-in cards.

Intel recommends the following steps be taken when performing any procedures described within this document or while performing service to any computer system.

- Where available, all system integration and/or service should be performed at a properly equipped ESD workstation
- Wear ESD protective gear like a grounded antistatic wrist strap, sole grounders, and/or conductive shoes
- Wear an anti-static smock or gown to cover any clothing that may generate an electrostatic charge
- Remove all jewelry

- Disconnect all power cables and cords attached to the server before performing any integration or service
- Touch any unpainted metal surface of the chassis before performing any integration or service
- Hold all circuit boards and other electronic components by their edges only

After removing electronic devices from the system or from their protective packaging, place them component side up on to a grounded anti-static surface or conductive foam pad. Do not place electronic devices on to the outside of any protective packaging

This product is not intended to be the sole source for any critical data and the user must maintain a verified backup. Failure to do so or to comply with other user notices in the product user guide and specification documents may result in loss of or access to data.

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1. Introduction

1.1 The Intel® Server System R2600SR Product Family

The Intel® Server System R2600SR product family features density-optimized, rack-mount, 2U, 4-node server systems designed to support a variety of workloads, from high performance computing (HPC) environments to hyper converged infrastructure to software-defined infrastructure. Each system within the Intel® Server System R2600SR product family includes four (4) independent and preconfigured compute nodes, allowing for a power-on ready installation for any supported operating system environment.

1.2 About This Document

This Intel® Server System R2600SR Product Family Setup and Service Guide is written for system integrators and service technicians responsible for system setup, server and system upgrades, and repair.

This document is divided into two (2) major sections. The first begins in Chapter 2 and provides detailed instructions on preparing a new system for use and future maintenance. It offers guidance through the identification of system components and software utilities and provides reference diagrams used to identify all key physical features of the system. The second begins in Chapter 3 and focuses on system service. It provides detailed instructions for the replacement of components by breaking the procedures in two parts: 1) removal of a failed component, and 2) installation of a new component.

For the latest revision of this document, go to http://www.intel.com/support

1.3 Document Organization

The organization of the Intel® Server System R2600SR Setup and Service Guide is as follows:

Introduction Chapter 1 The Introduction chapter provides a high-level overview of the Intel® Server System R2600SR Product Family and the Setup and Service Guide structure and contents.

System Overview and Setup Chapter 2 The System Overview and Setup chapter has these subsections:

System Components Quick Reference Section 2.1 Detailed views of system components.

System Installation into a Rack Section 2.2 Instructions on preparing to set up a system in a rack.

System Configuration Section 2.3 Instructions on how to complete initial setup of the server system by updating the system software and accessing the BIOS Setup utility to configure various system settings.

System Firmware Update Section 2.4 Information and instructions on how to update the server system to the latest firmware available to guarantee best performance.

System Service Chapter 3 Instructions for replacing system components considered as field replaceable units (FRUs).

System Service Chapter 3 The System Service chapter has these subsections with instructions for replacing system components considered as field replaceable units (FRUs):

Compute Node Service: Common Procedures Section 3.1 Procedures for servicing compute nodes.

Replacing the Air Baffle Section 3.2 Instructions on how to remove and replace the air baffle.

Replacing the CMOS Battery Section 3.3 Instructions on how to remove and replace the CMOS battery.

Replacing the Processor Heat Sink Module Section 3.4 Instructions on how to remove and replace the Processor Heat Sink Module.

Supporting and Populating the Memory Module Section 3.5 Instructions on supporting and populating the Dual Inline Memory Module (DIMM).

Replacing the DIMMs **Section 3.6** Instructions for replacing the Dual Inline Memory Module (DIMM).

Replacing the Drive Carrier **Section 3.7** Instructions for replacing the Drive Carrier.

Replacing the Drive Backplane **Section 3.8** Instructions for replacing the Drive Backplane.

Replacing the KVM Module **Section 3.9** Instructions for replacing the KVM Module.

Replacing the Server Board **Section 3.10** Instructions for replacing the Server Board.

Updating Configuration After System Update **Section 3.11** Instructions for replacing the Configuration.

Replacing System Fans **Section 3.12** Instructions for replacing the System Fans.

Replacing the Power Supply Unit (PSU) **Section 3.13** Instructions for replacing the PSU.

Replacing the System Management Module (SMM) **Section 3.14** Instructions for replacing the SMM.

Replacing the External I/O Module (EIOM) **Section 3.15** Instructions for replacing the EIOM.

Replacing the PCIe* Add-in Card **Section 3.16** Instructions for replacing the PCIe* Add-in Card.

Getting Help **Appendix A**

Glossary **Appendix B**

1.4 Resource Information and Software

For additional information about the Intel® Server System R2600SR product family products or any of their supported accessories, refer to the following resources available at: http://www.intel.com/support

Table 1. Server system references

For this Information or Software	Use this Document or Software
In-depth technical information about this product family	• Intel® Server System R2600SR Product Family Technical Product Specification • Intel® Server System BIOS Setup Utility Guide • Product Safety and Regulatory Compliance - Intel® Xeon® processor Scalable Family
System integration instructions and service guidance	• Intel® Server System R2600SR Product Family Setup and Service Guide
Server configuration guidance and compatibility	• Intel® S2600SR Product Family Configuration Guide
System firmware updates, onboard device drivers, and software to manage the Intel® Server System	http://downloadcenter.intel.com/.

The server system has support for software utilities which can be used to configure system parameters and aid in troubleshooting system issues. Download all available utilities from: http://downloadcenter.intel.com/.

2. System Overview and Setup

This chapter provides service personnel the information necessary to set up the Intel® Server System R2600SR L9 system. Illustrations identify and locate the system features and procedures to install the system in a rack environment and configure the system, including updating and backing up firmware. The system comes fully assembled, with all components necessary to be fully functional at first power-on. Once the system is physically set up in the operating environment and updated to the latest available firmware version, its initial configuration can begin. Configuration includes setting up user and administrator accounts, designating network settings for local and remote connectivity, and backing up the system.

Please refer to Section 1.4 for a list of the documents available for this product family.

This chapter provides instructions for removing and installing system components considered as field replaceable (field-replaceable units, or FRUs). The Intel® Server System R2600SR product family features a modular design, allowing for serviceability at the compute node level without having to power off the entire system. Except for the system fans, components common to all compute nodes (EIOM, SMM and PSUs) in the system can only be serviced after the system has been powered off and AC power cords have been disconnected from the server system.

Before Setting Up or Servicing the Intel® Server System R2600SR

Before working with this server product, observe the safety and ESD precautions found in the Warnings section at the beginning of this manual.

System Directional Reference

All references to left, right, front, top, and bottom assume the reader is facing the front of the chassis.

Instruction Format

Each procedure described in this section follows an illustration-first format. This gives the reader the option to follow a quicker path to system integration by first seeing an illustration of the intended procedure. If necessary, the user can follow the step-by-step instructions that accompany each illustration.

Tools and Supplies Needed

Before setting up, configuring, and backing up (integrating) the Intel® Server System R2600SR:

1. Observe the safety and ESD precautions found in the Warnings section in this manual.
2. Gather the tools and supplies needed for setting up the physical system. These include:
   - Anti-static wrist strap and conductive foam pad (recommended)
   - Phillips* (cross head) screwdriver (#1 and #2 bits)
   - Torx 30 screwdriver
3. Follow the procedures in the order specified.

System Integration Advisory: It is highly recommended the system integration process defined in this chapter be performed in the order specified. This assures that critical system components are properly installed and provides recommended cable routing. Deviating from the prescribed process can result in improper system assembly, a longer integration process, and a less-than-desirable system appearance.

2.1 System Component Quick Reference

Each Intel® Server System R2600SR product family system includes four independent, preconfigured compute nodes to allow for a power-on ready solution with no additional integration. Users interact with the system from the front, where the compute nodes are located, and the back, where the system fans, power, and connectivity area are located. This L9 system's modular design allows service personnel to do most service procedures without having to remove the system chassis from the rack.

System Reference Note: References to left, right, front, top, and bottom assume one faces the chassis front.

2.1.1 System Front View

The Intel® Server System R2600SR product family system's four compute nodes are removable from the front without power down to allow for high availability operation. The illustration shows the disposition of the compute nodes in the system as well as other features.

Figure 1. System front view

2.1.2 System Back View

The system back view provides access to the connectivity, power, and networking. The connectivity area in the Intel® Server System R2600SR product family system includes four Intel® Omni-Path Host Fabric Interface Adapter Add-in Cards for high-speed interconnection on server clusters installed in the PCIe* add-in slots, 10GbE ports, two for each compute node in the system, and a dedicated hot-swap System Management Module (SMM). The system supports two redundant hot-swap power supplies (PSUs). The illustration shows the location of these features.

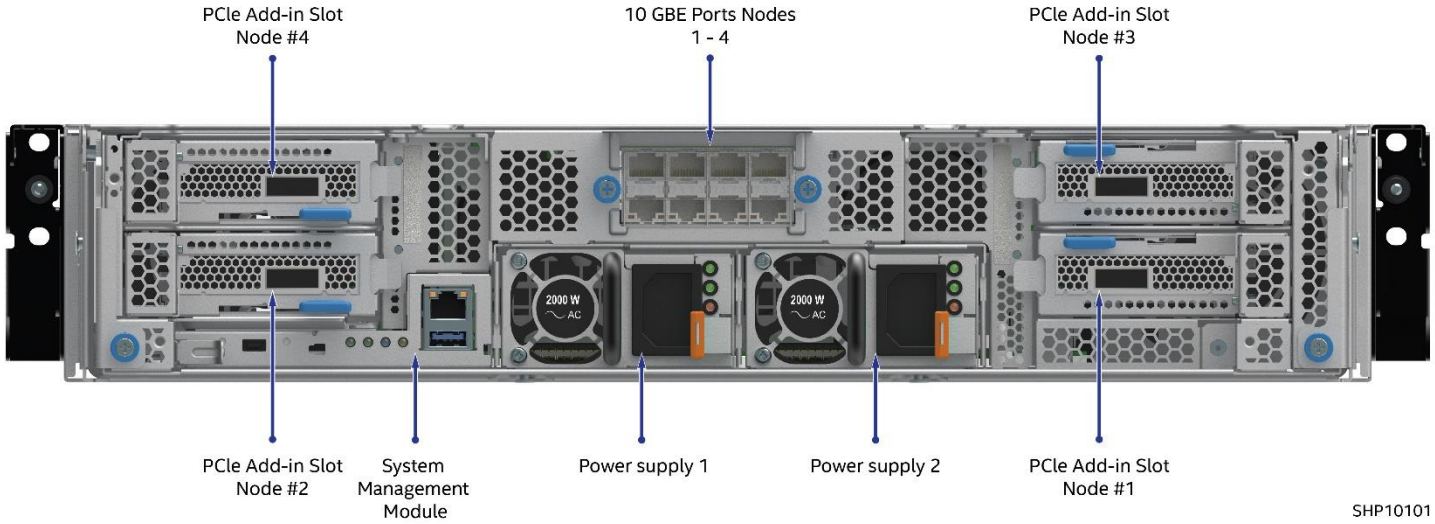

Figure 2. System back view

2.1.3 Compute Node View

Each compute node offers local manageability through a front panel, Keyboard/Video/Mouse (KVM) Module, and USB 3.0 and 3.1 ports. It also supports a pullout tab for identification and/or network information.

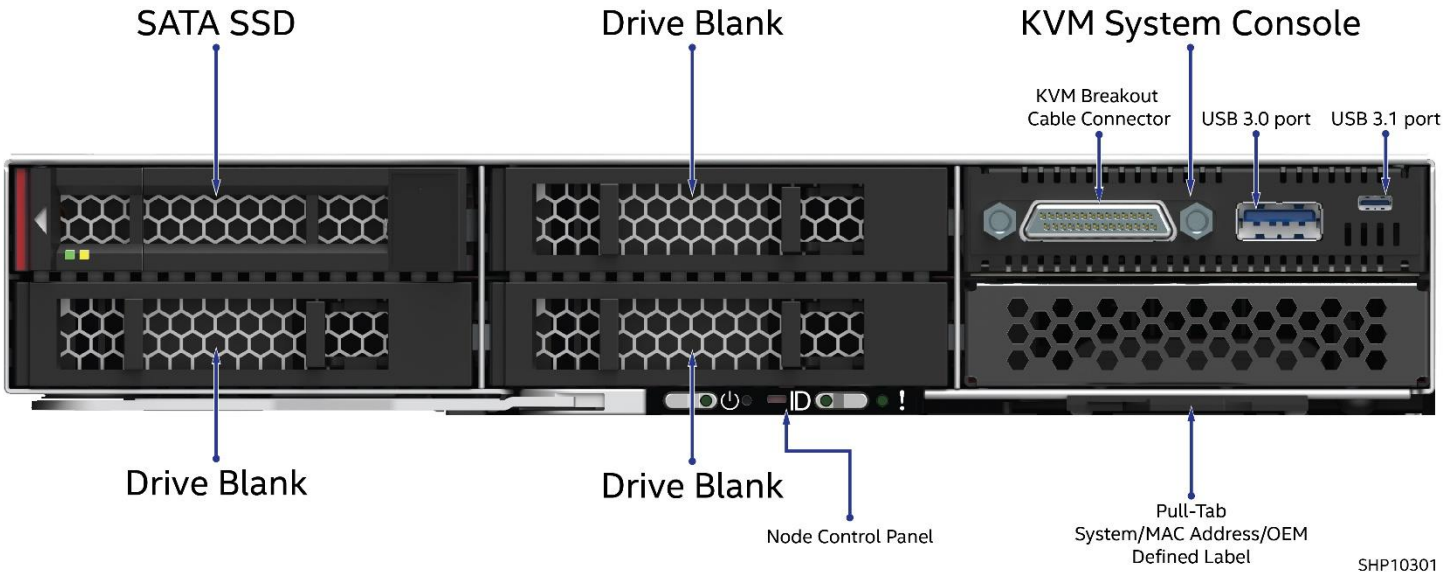

Figure 3. Compute node detail view

2.1.3.1 Server Board Feature Identification

The illustration shows the main features of the server board.

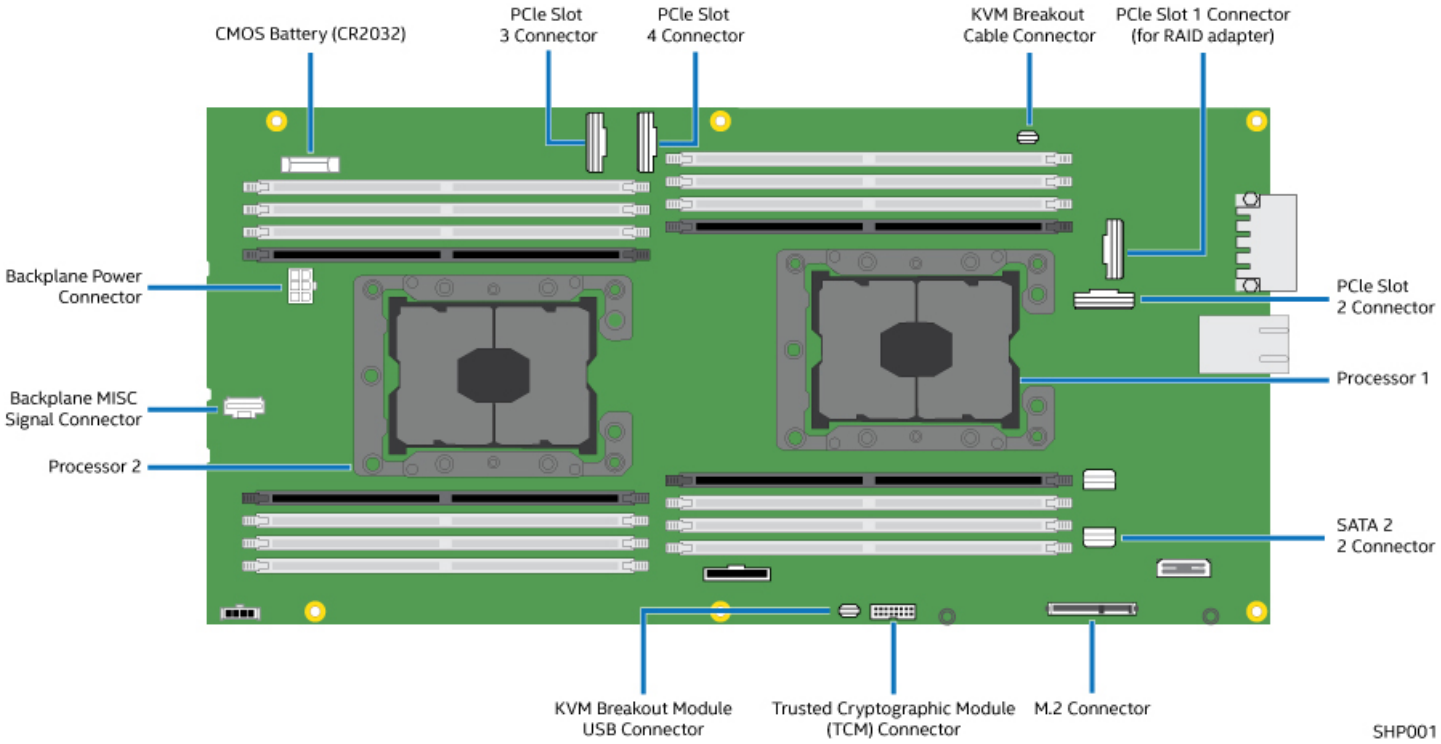

Figure 4. Server board feature identification

2.1.3.2 Server Board Switches

The following illustration shows the location and description of the switches on the server board.

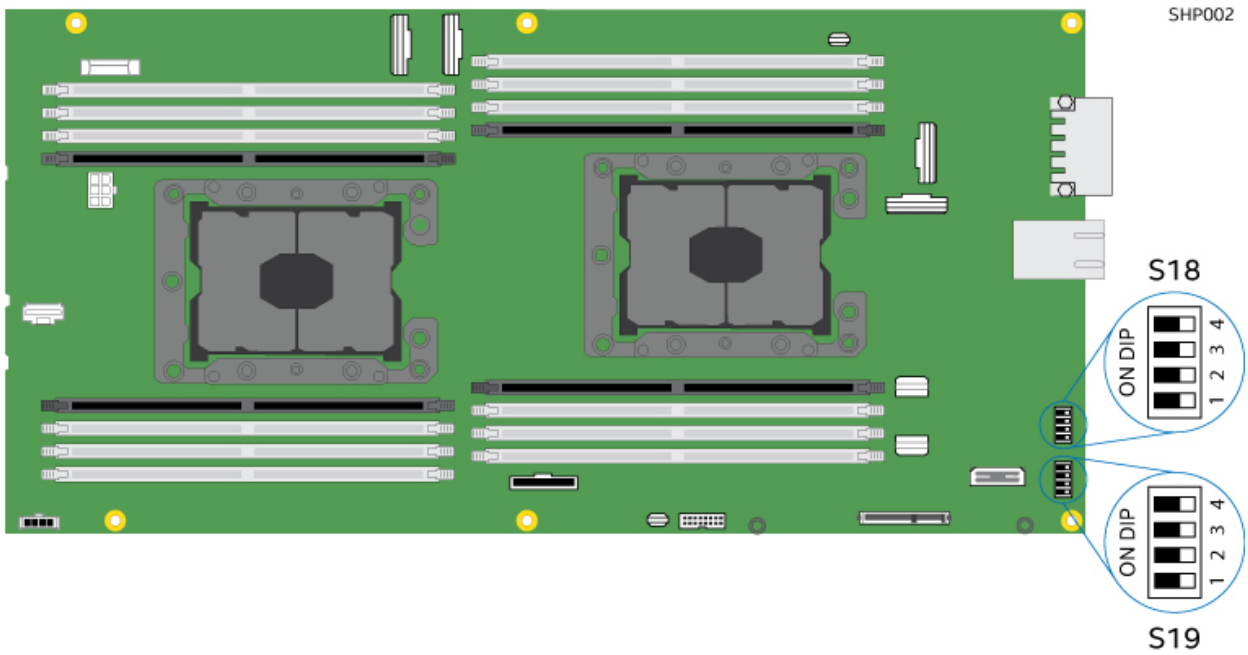

Figure 5. Switch block location on the server board

Important: If a clear protective sticker covers the switch blocks, remove and discard it to allow access to the switches. Any system board switch or jumper block not shown in this document's illustrations is not used with this system.

The table describes the switch functions on the server board.

Table 2. Switch functions and definitions

Switch Block	Switch Number	Switch Name	Usage Description	
			Open	Closed
S18	2	BMC boot backup	Normal operation (default)	The compute node will boot by using a backup of the BMC firmware.
	3	BMC force update	Normal operation (default)	Enables BMC force update
	4	TPM physical presence	Normal operation (default)	Indicates a physical presence to the system TPM
S19	1	System UEFI backup	Normal operation (default)	Enables system BIOS backup
	2	Password override jumper	Normal operation (default)	Overrides the power-on password
	3	CMOS clear jumper	Normal operation (default)	Clears the real-time clock (RTC) registry

2.2 System Installation into a Rack

A focus of setting up the server system is to install the system into a rack. Before doing this, however, install the rack kit.

The illustrations in this subsection display all items needed to install the system into a rack. These items are included with the system.

Note: If any items are missing or damaged, contact Intel Customer Support.

The slide box of the rack kit includes these parts:

- 1x - Right slide
- 1x - Left slide
- 2x - M5 screws
- 2x – Washers

These parts appear in the illustration below.

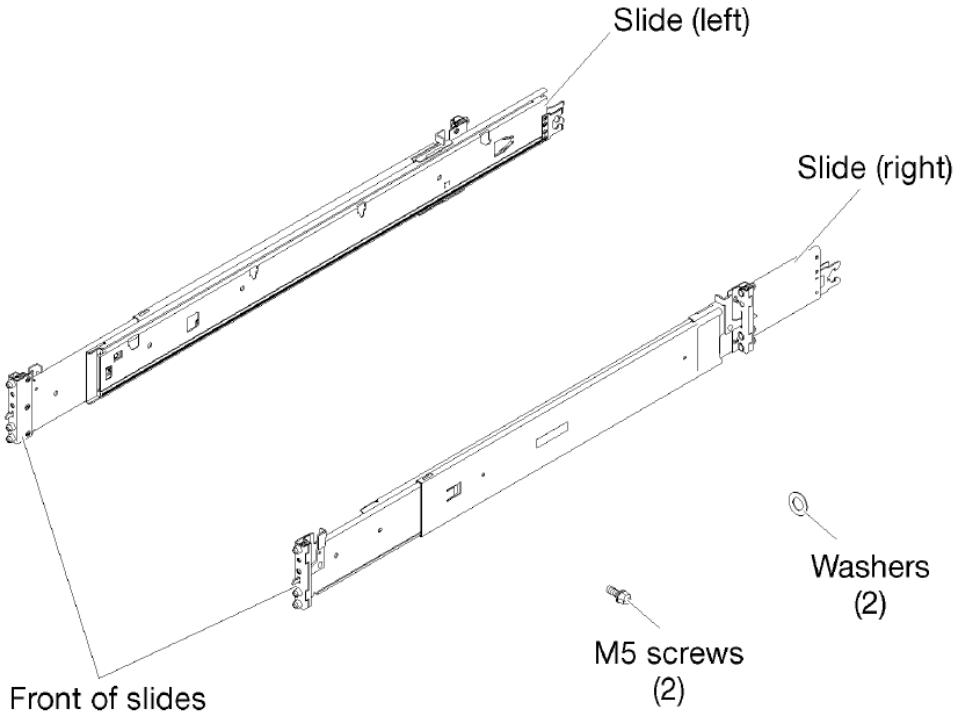

Figure 6. Slide box contents

2.2.1 Installing the Rail Kit

To install the rail kit, complete the steps below:

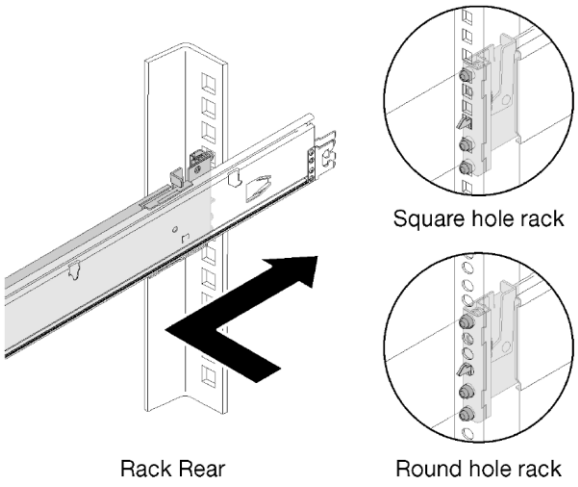

Figure 7. Installing the rear rail

Note: The holes on the front and rear of the rack may be either square or round.

1. Select the first slide rail to be installed.
2. Make sure the slide rail is shortened (compressed) to the shortest position.
3. While standing in front of the rack cabinet, line up the pins on the rear of the slide rail with the flange holes at the rear of the rack.
4. Push the slide rail so that the pins and the latch snap into place.

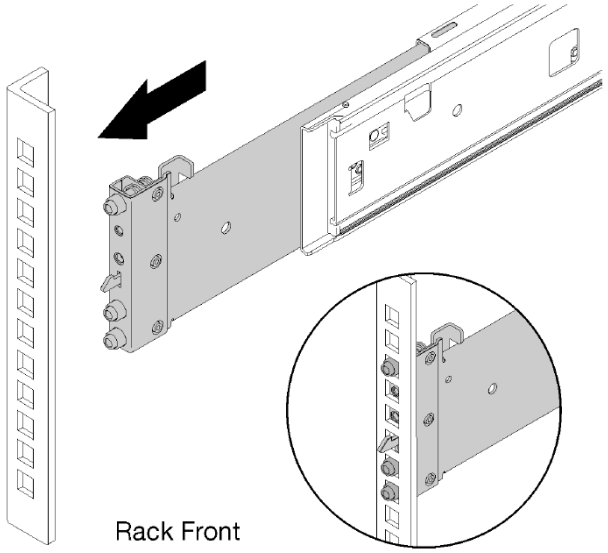

Figure 8. Installing the front rail

5. Pull the slide forward: insert the pins and the latch into the EIA flange holes at the front of the rack.
6. Repeat the process for the rail on the opposite side of the rack.

2.2.2 Installing the System onto the Rail Kit

After the rail kit has been installed and secured into place, the system may be installed onto the rails.

CAUTION: Prior to installing the system onto the rails, remove all compute nodes from the front of the system and the shuttle assembly from the rear of the system.

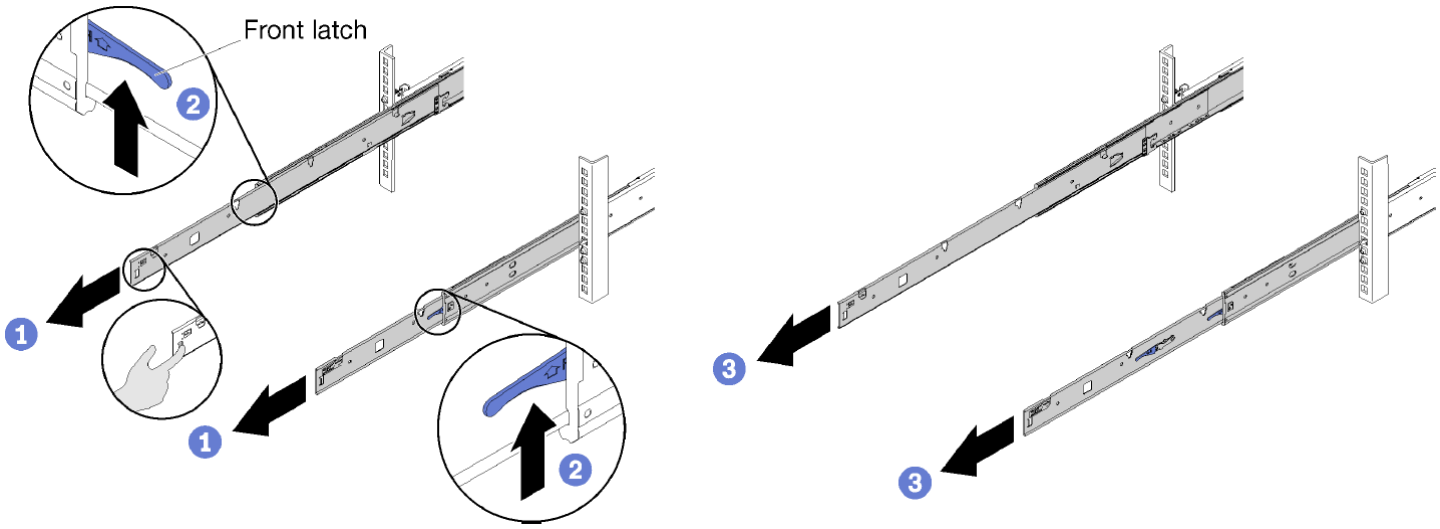

Figure 9. Extending the rail slides

1. Pull the rails forward until they both click into place (see Number 1).
2. Push up the front latches (see Number 2).
3. Pull the slides all the way out (see Number 3).

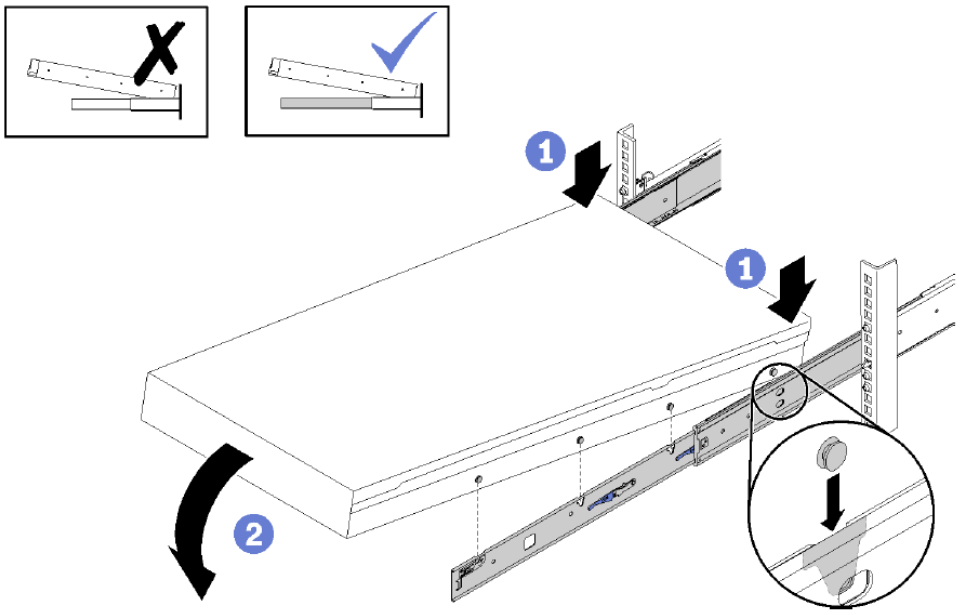

Figure 10. Installing the system chassis on the slide rails

4. Tilt and lower the system chassis; then, push the slides towards it and make sure the farthest nailheads go into the slots on the slides (see Number 1).
5. Slowly lower the system chassis down and make sure the other three nailheads slip into the slots (see Number 2).

Attention: The slides must be fully extended to successfully install the system chassis.

2.2.3 Sliding the System Chassis into the Rack

After the system is successfully installed and secured onto the rails, move it back into the rack into its operational position.

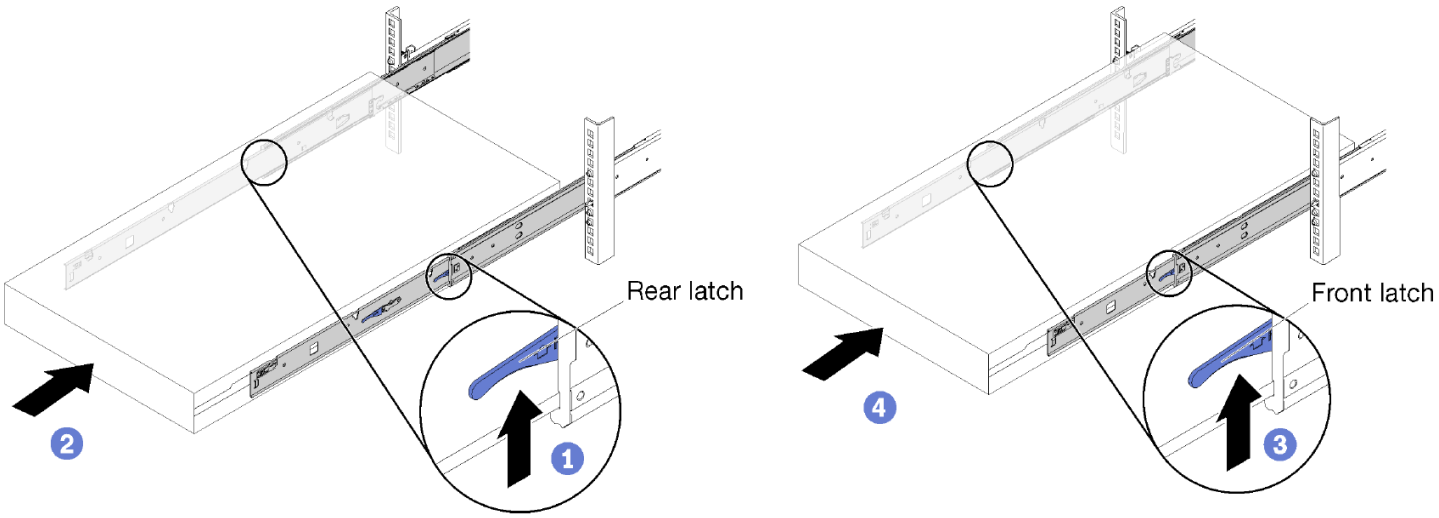

Figure 11. Sliding the system chassis into the rack

1. Push up the rear latches on the slide rails (see Number 1).
2. Push the system chassis until the slide rails click into place (see Number 2).
3. Push up the front latches on the rails (see Number 3).
4. Push the system all the way back into the rack (see Number 4).

2.3 System Configuration and Management

After installing the system into a rack, install and configure the firmware.

A number of different tool options are available to install and configure firmware and manage the system.

Brief descriptions of available tools are listed below. For more information, please see the Intel® Server System R2600SR Product Family System Management Module User's Guide.

BMC Provisioning Manager

The BMC Provisioning Manager provides a Graphical User Interface (GUI) to configure the system. The text-based interface to the system configuration (the Setup Utility) is also available. UEFI settings for the system can also be configured from the BMC Provisioning Manager.

Note: From the BMC Provisioning Manager, select a button to restart the system to access the text-based interface. In addition, the text-based interface may be selected as the default interface by pressing F1.

OneCLI

OneCLI is a collection of system management tools that use a command line interface program to manage firmware, hardware, and operating systems. OneCLI is comprised of individual application modules that are easily updated. Both in-band and out-of-band firmware updates are supported.

BMC Web Interface

The management processor for the system (i.e., BMC Provisioning Manager) may be configured through the BMC Web interface or through the OneCLI (Command Line Interface).

If installing an update for a specific system, use the BMC interface for that system.

Note: Before performing an in-band update through Windows or Linux, install the operating system driver and enable the Ethernet over the USB (or LAN over USB) interface. Before updating firmware through the BMC, download and install the latest device drivers for the OS (operating system).

2.3.1 Setting Up the BMC Network Connection

The Integrated BMC needs to be configured in order to be connected to a network. Depending upon how the network connection is implemented, a static IP address may also be required.

The procedure for setting the network connection depends on whether or not a video connection exists for the system.

- If a monitor is attached to the system, use the BMC local console to set the network connection.
- If no monitor is attached to the system, set the network connection through the BMC interface. Connect via Ethernet cable to the BMC dedicated port on the SMM.

Note: Modify the IP settings on the computer connected to the SMM so they are on the same network as the system default settings to ensure connectivity.

The default IPv4 address and the IPv6 Link Local Address (LLA) are provided on the Network Access label affixed on the pullout information tab of each compute node.

Important: The BMC is set initially with a user name of USERID and password of PASSW0RD (with a zero, not the letter O). This default user setting has supervisor access. Change this user name and password during initial configuration for enhanced security.

Complete the following steps to connect the BMC to the network:

1. Start the system.
2. When <F1> Setup appears, press F1.
3. Specify how the BMC will connect to the network.
   a. If choosing a static IP connection, specify an IPv4 or IPv6 address available on the network.
   b. If choosing a DHCP connection, make sure the MAC address for the system has been configured in the DHCP server.
4. Click OK to continue configuring the system.

2.3.2 Setting Up the System Management Module (SMM) Network Connection

The SMM web interface can be accessed through an Ethernet connection (10/100/1000 Mbit) by establishing a session with the SMM.

Connecting to the SMM for the first time may require a change of the Internet protocol properties on the client computer.

To log into the SMM web interface, complete the following steps:

1. By default, the SMM network is disabled. Enable the SMM network by issuing the enable IPMI command below to the BMC Controller. The <XCC IP> is the XCC IP address:

   Enable

   ```
   ipmitool -I lanplus -H <XCC's IP> -U USERID -P PASSW0RD raw 0x3A 0xF1 0x01
   ```

2. The following two commands can also be used to either query or disable the SMM network.

   Query

   ```
   ipmitool -I lanplus -H <XCC's IP> -U USERID -P PASSW0RD raw 0x3A 0xF1 0x00
   ```

   Disable

   ```
   ipmitool -I lanplus -H <XCC's IP> -U USERID -P PASSW0RD raw 0x3A 0xF1 0x02
   ```

The table below references details of the individual codes within the IPMI commands listed above.

Table 3. Individual IPMI command code details

Net Function = 0x3A			
Code	**Command**	**Request, Response Data**	**Description**
0xF1	**SMM network control**	Request: • Byte 1: Request type – 0x00 = Query SMM network status – 0x01 = Enable – 0x02 = Disable Response: • Byte 1 – Completion Code • Byte 2 – SMM network status (for Query request only)	This setting is used to set SMM network status which value is disabled as default. The BMC Controller command supports the system chassis and compute node only.

3. Point the browser to the SMM web interface URL defined by the system administrator during initial system configuration.
4. The out-of-factory default network settings are applied at the first use of the SMM (in this order):
   a. The SMM should use DHCP first. If the SMM cannot acquire an IP address from a DHCP server in 2 minutes, it will use a static IP address.
   b. The default static IP address is: 192.168.70.100
   c. Using Hyper Text Transfer Protocol Secure (HTTPS). (For example, https://192.168.70.100)
   d. IPv4 enabled with static IP = 192.168.70.100
   e. IPv6 enabled with local link address (LLA) IP. To calculate LLA IP, do the following:
      1) Split the MAC address of the SMM (39-A7-94-07-CB-D0) into two parts. Insert FF-FE in the middle. (For example, 39-A7-94-FF-FE-07-CB-D0)
      2) Convert the two hexadecimal digits at the left end of the string to binary. (For example, 00111001-A7-94-FF-FE-07-CB-D0)
      3) Invert the value for bit 1 of the first byte. (For example, 00111011-A7-94-FF-FE-07-CB-D0)
      4) Convert the binary digits at the left end of the string back to hexadecimal
      5) Combine the hexadecimal digit pairs into 4-digit groups. (For example, 3BA7-94FF-FE07-CBD0)
      6) Replace dash (-) separators with colon (:) separators. (For example, 3BA7:94FF:FE07:CBD0)
      7) Add FE80:: to the left of the string. (For example, FE80::3BA7:94FF:FE07:CBD0)
5. Type user ID and password assigned by a system administrator.
   Default ID: USERID
   Password: PASSW0RD (**Note:** The sixth character of PASSW0RD is the number zero).
6. Click **Log in**.
7. Change the password for the first login default
   a. The password complexity rules are:
      - Must be at least 10 characters in length
      - Must contain at least one number (0 through 9)
      - Must contain at least two of the following three categories:
      – An uppercase letter (A through Z)
      – A lowercase letter (a through z)
      – A non-alphabetic characters such as !@#$%^*-_+=().:`|?"\
8. Use the new password to log in.

2.4 System Firmware Update and Backup

The system includes a software stack to operate which includes a BIOS, BMC firmware, ME firmware, and FRU and SDR data. A default software stack is loaded during the system manufacturing process; however, it may not be the latest available. For best operation and system reliability, it is highly recommended that the software stack be updated to the latest available version.

The latest version of the system software stack can be downloaded at: http://downloadcenter.intel.com

For information and action steps, please see the Intel® Server System R2600SR Product Family System Management Module User's Guide.

2.4.1 Backing Up the System Configuration

After setting up the system or making changes to the configuration, it is recommended to make a complete backup of the system configuration.

For detailed information and procedures, please see the Intel® Server System R2600SR Product Family System Management Module User's Guide.

3. System Service

This chapter provides instructions for removing and installing system components considered field replaceable (field-replaceable units, or FRUs). The Intel® Server System R2600SR product family features a modular design, allowing for serviceability at the compute node level without having to power off the entire system. Except for the system fans, components common to all compute nodes (EIOM, SMM and PSUs) in the system can only be serviced after the system has been powered off and AC power cords have been disconnected from the server system.

Before Working with This Server Product

Before working with this server product, observe the safety and ESD precautions found in the Warnings section at the beginning of this manual.

System Directional Reference

All references to left, right, front, top, and bottom assume the reader is facing the front of the chassis.

Instruction Format

Each procedure described in this section follows an illustration-first format. This gives the reader the option to follow a quicker path to system integration by first seeing an illustration of the intended procedure. If necessary, the reader can follow the step-by-step instructions that accompany each illustration.

Tools and Supplies Needed

Before setting up, configuring, and backing up (integrating) the Intel® Server System R2600SR:

1. Observe the safety and ESD precautions found in the Warnings section in this manual.
2. Gather the tools and supplies needed for setting up the physical system. These include:
   - Anti-static wrist strap and conductive foam pad (recommended)
   - Phillips* (cross head) screwdriver (#1 and #2 bits)
   - Torx 30 screwdriver
3. Follow the procedures in the order specified.

System Integration Advisory: It is highly recommended the system integration process defined in this chapter be performed in the order specified. This assures that critical system components are properly installed and provides recommended cable routing. Deviating from the prescribed process can result in improper system assembly, a longer integration process, and a less-than-desirable system appearance.

3.1 Compute Node Service: Common Procedures

This section contains procedures to remove and install a compute node and its components. The procedures described here are for common service scenarios and include the following components:

- Compute Node Top Cover
- Air Baffle
- Processor Heat Sink Module (PHM), including the processor
- Memory Module (DIMM)
- Drive Carrier and Solid State Drive (SSD)

3.1.1 Removing the Compute Node

The compute node must be removed before servicing any component except the drive carrier and SSD in order to give access to that component.

When removing a compute node, make note of the node bay number. Some configuration information and update options are established according to node bay number. One way to track the node is via the serial number. The serial number is located on the pullout tab for the each node.

Note: Reinstalling a compute node into a node bay other than from which it was removed can have unintended consequences, including requiring the compute node to be reconfigured.

To remove the compute node, follow these steps:

1. Turn off the compute node to be serviced.

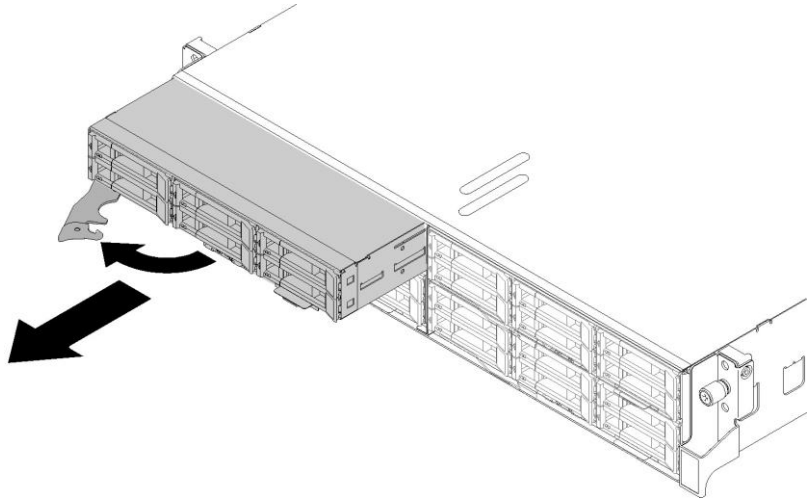

Figure 12. Removing the compute node

2. Release and rotate the locking lever to the left.
3. Slide the node out about 12 inches/300 mm; then grip the node with both hands and remove it from the system chassis.
4. Install either a node bay filler or another compute node in the node bay within 1 minute to ensure the integrity of system cooling.

Attention: To maintain proper system cooling, do not operate the system without a compute node or node bay filler installed in each node bay.

3.1.2 Installing the Compute Node

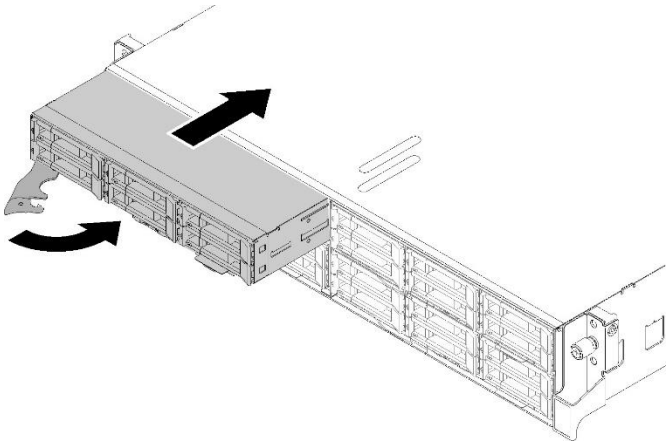

Figure 13. Installing the compute node

1. Make sure that the locking lever on the compute node is turned all the way left.
2. Slide the compute node into the node bay until it stops.
3. Secure the compute node by turning the locking lever all the way to the right until it clicks into place.
4. Check the power LED to ensure it transitions between fast blink and slow blink to indicate the node is ready to be powered on.

The time required for a compute node to initialize varies by system configuration. The power LED flashes rapidly during initialization; the power button on the compute node does not respond until the power LED flashes slowly, indicating the initialization process is complete.

Note: If the node configuration has been changed or a different configuration is being installed, configure the compute node through the <F1> BIOS Setup utility.

3.1.3 Removing the Compute Node Cover

Before removing the compute node cover, perform these steps:

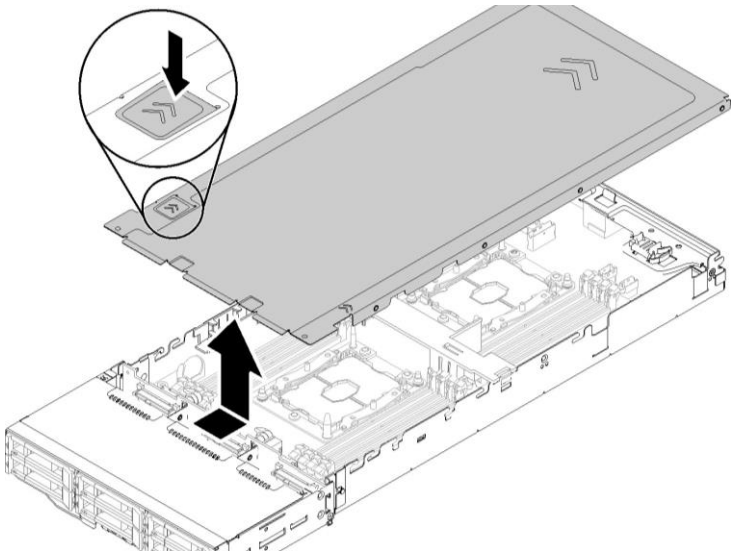

Figure 14. Removing the compute node cover

1. Remove the compute node from the system. (see Section 0)
2. Push the cover release latch on the top of the node cover.
3. Slide the cover toward the rear of the node until the cover has disengaged from the node, then lift the cover up and away from the node.

3.1.4 Installing the Compute Node Cover

Once repair or upgrade work is completed on the inside of the compute node, re-install the compute node cover. To re-install the compute node cover, follow these steps:

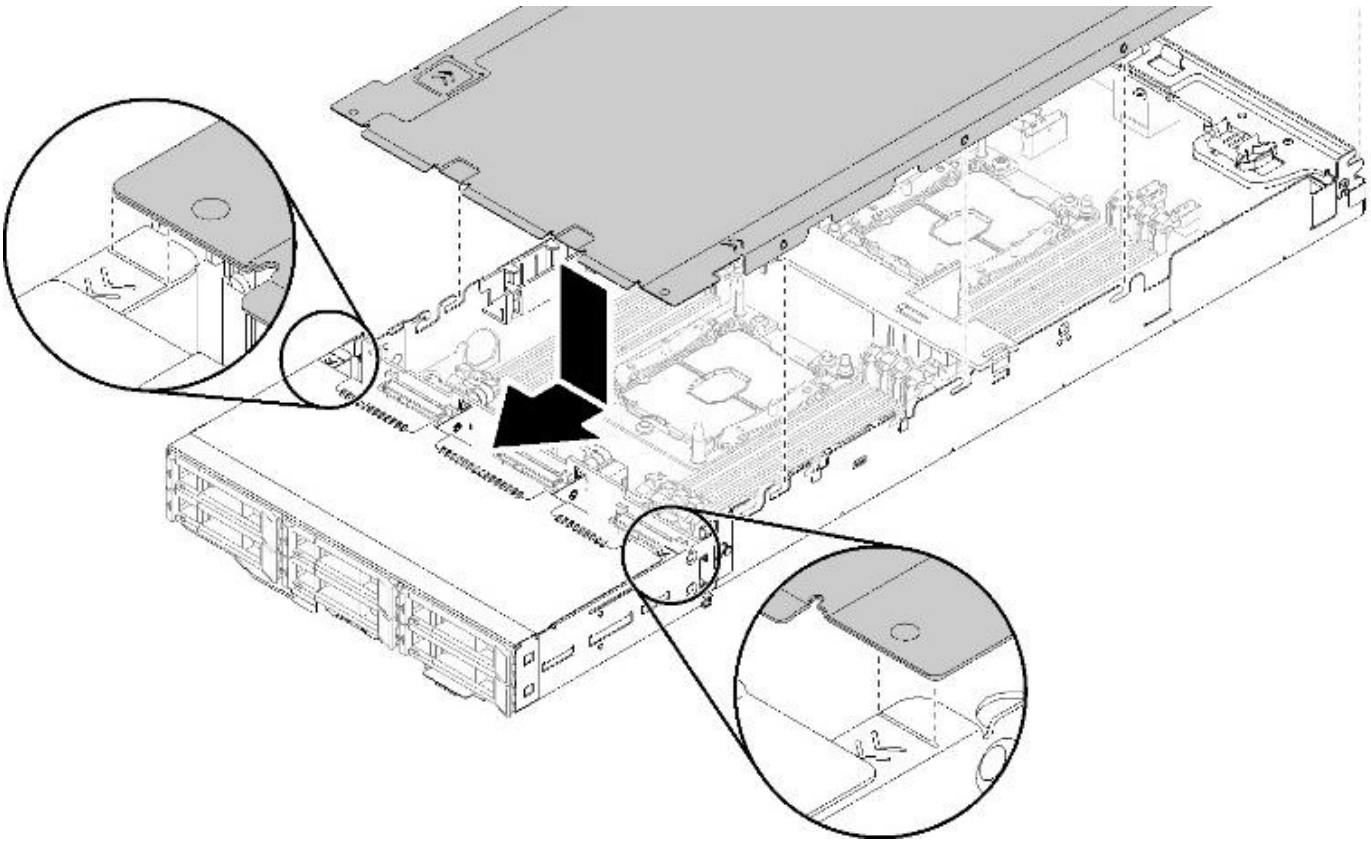

Figure 15. Installing the compute node cover

1. Make sure that all internal cables are correctly routed.
2. Align the cover pins with the notches in the node side walls, then lower the cover on top of the node.
3. Slide the cover forward towards the front of the node until the cover latches in place.

Note: Before sliding the cover forward, make sure that all the tabs on the front, rear, and side of the cover engage the side walls correctly.

3.2 Replacing the Air Baffle

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

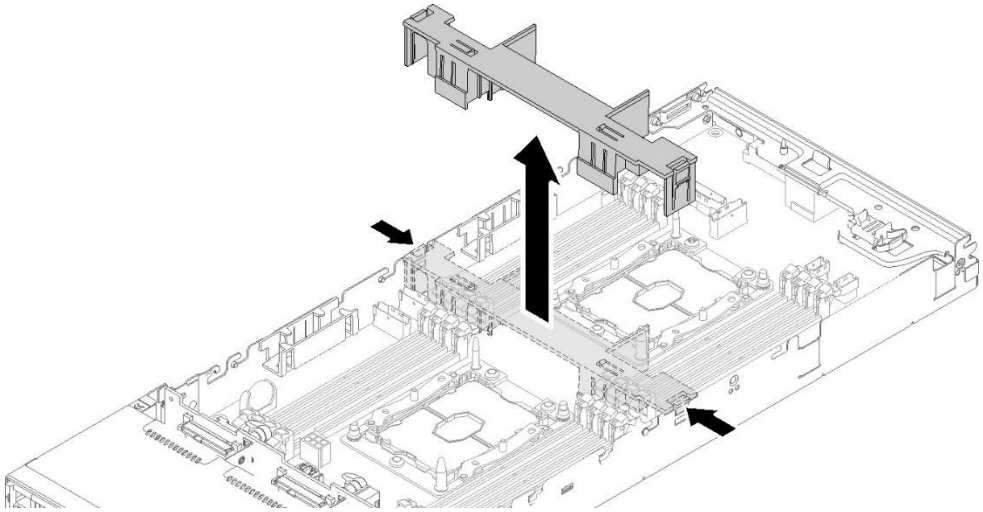

Figure 16. Removing the air baffle

The air baffle is removed for access to the node DIMMs and midplane cables.

1. Remove the compute node (see Section 3.1.1).
2. Remove the compute node cover (see Section 3.1.3).
3. Slightly push in on the release latches located at the left and right ends of the air baffle and attached to the sides of the node.
4. Lift the air baffle up and out of the compute node.

3.2.1 Installing the Air Baffle

Reinstall the air baffle when repair or upgrade work is completed in the compute node. The air baffle is required for proper airflow within the server system.

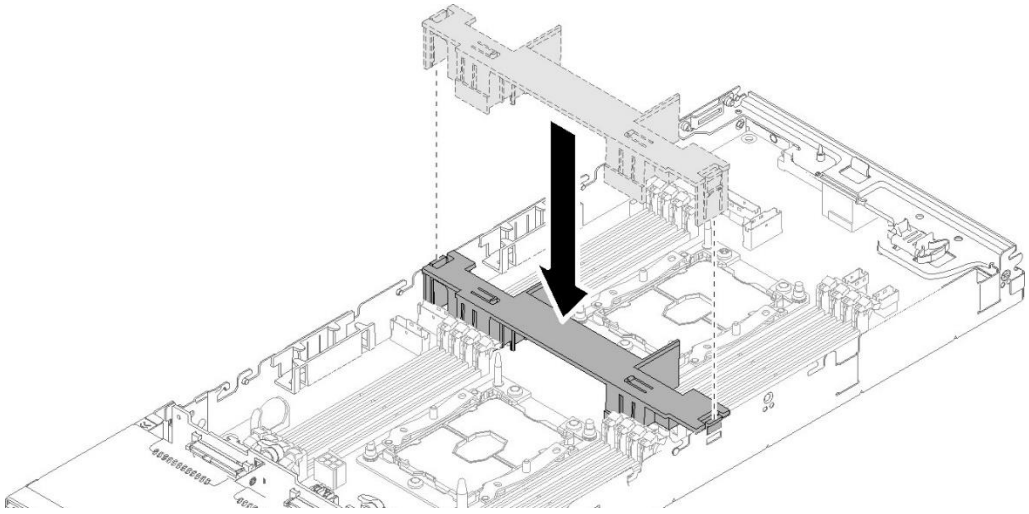

Figure 17. Installing the air baffle

1. Align the air baffle latches with the baffle slots on both sides of the chassis.
2. Lower the air baffle straight down into the node. Press the air baffle down until it is securely seated and the latches lock into place.

3.3 Replacing the CMOS Battery

The battery on the compute node powers the node's Real Time Clock (RTC) for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and may lose stored server settings and system clock and date settings.

Battery Specification:

- Lithium
- 3V
- Coin type, CR2032

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.

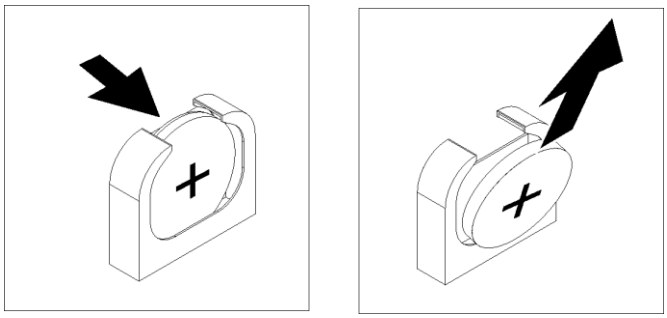

Figure 18. Removing the CMOS battery

To replace this battery, complete the following steps:

1. Remove the compute node to be serviced (see Section 0).
2. Remove the compute node cover (see Section 3.1.3).
3. Use a fingernail to press the top of the battery clip away from the battery. The battery pops up when it is released.
4. Use thumb and index finger to lift the battery up and out of the socket.

Attention: Do not lift the battery by using excessive force. Failing to remove the battery properly may damage the socket on the system board. Any damage to the socket may require replacing the system board.

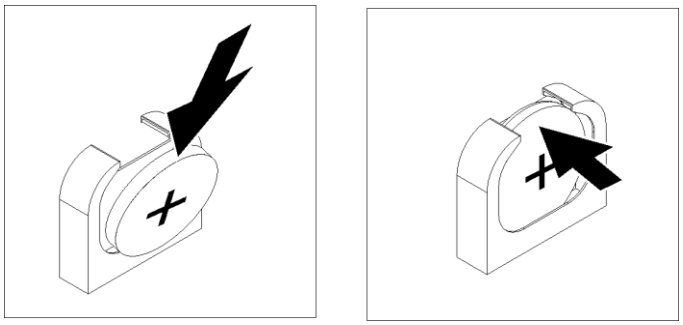

Figure 19. Installing the CMOS battery

5. Follow any special handling and installation instructions that come with the replacement battery.
6. Position the battery next to the socket and tilt the battery so that it can inserted into the socket bottom first, positive side towards the outside edge of the board.
7. Slide the battery into place and gently press the battery down and to the right into the socket until it clicks securely into place.
8. Reinstall the compute node cover (see Section 3.2.4).
9. Reinstall the compute node (see Section 3.2.2).
10. Check the power LED to make sure it transitions between fast blink and slow blink to indicate the node is ready to be powered on.

Note: After replacing the CMOS battery, the node must be reconfigured and the system date and time reset.

3.4 Replacing the Processor Heat Sink Module (PHM)

This generation of Intel® Server Systems requires that the processor be attached to the heat sink prior to its installation onto the server board. The processor/heat sink assembly is referred to as the Processor Heat Sink Module, or PHM.

3.4.1 Removing the Processor Heat Sink Module (PHM)

The following tools are required to remove the PHM.

- T-30 Torx screwdriver
- Flat head screwdriver
- Adequate ESD protective gear (wrist strap, ESD mat)

Note: The heat sink, processor, and processor retainer may differ than those shown in the illustrations.

Complete these steps prior to remove the PHM:

1. Remove the compute node to be serviced (see Section 3.1.1).
2. Remove the compute node cover (see Section 3.1.3).
3. Remove the air baffle (see Section 3.3).

WARNING: Processor heat sinks can become extremely hot during system operation. Before attempting to remove a processor from a server board, allow the processor heat sink to fully cool. Failing to follow the indicated disassembly sequence may cause damage.

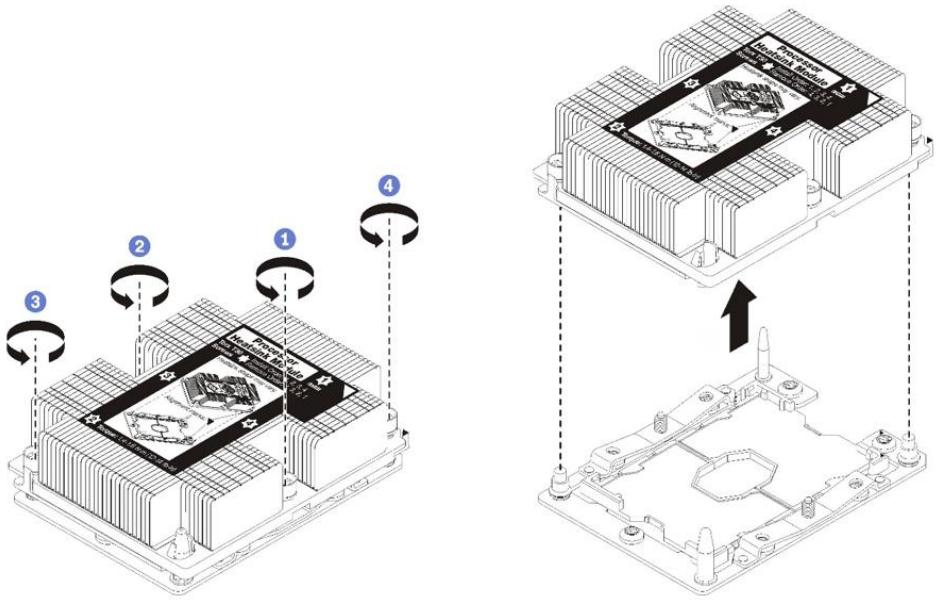

Figure 20. Removing a PHM

1. Fully loosen the Torx T30 captive fasteners on the PHM in the removal sequence shown on the heat sink label (see Numbers 1-4).
2. Lift the PHM straight up and away from the processor socket.

Note: Each processor socket must always contains a socket cover or a PHM. When removing or installing a PHM, protect empty processor sockets with a socket covers. Do not touch the processor socket or contacts as they are fragile and easily damaged. Contaminants such as oil from skin can cause connection failures. Remove and install only one PHM at a time. If the system board supports multiple processors, start with the first processor socket.

3.4.2 Separating the Processor and Processor Clip from the Heat Sink

Once the PHM has been removed from the server board, the processor can be removed from the PHM. Follow these steps to remove the processor.

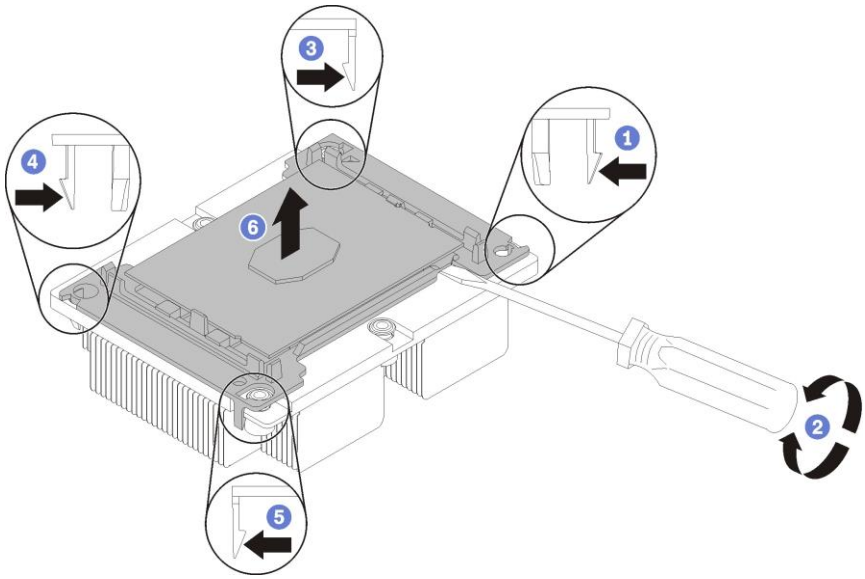

Figure 21. Separating the processor and carrier from the heat sink

1. With the heat sink facing down, place the PHM onto a flat non-conductive surface.
2. Press the retaining clip at the corner of the processor clip (see Numbers 1, 3, 4 and 5) closest to the pry point (see Number 2) to release it.
3. Insert the head of a flat head screw driver in-between the heat sink and the processor clip assembly (see Number 2) and gently twist until the bond between the heat sink and the processor is broken.
4. Release the remaining retaining clips.
5. Lift the processor and retainer straight up and away from the heat sink (see Number 6).

3.4.3 Separating the Processor from the Processor Clip

If the heat sink is being replaced, replace the processor clip. Follow these steps to remove the processor from the processor clip.

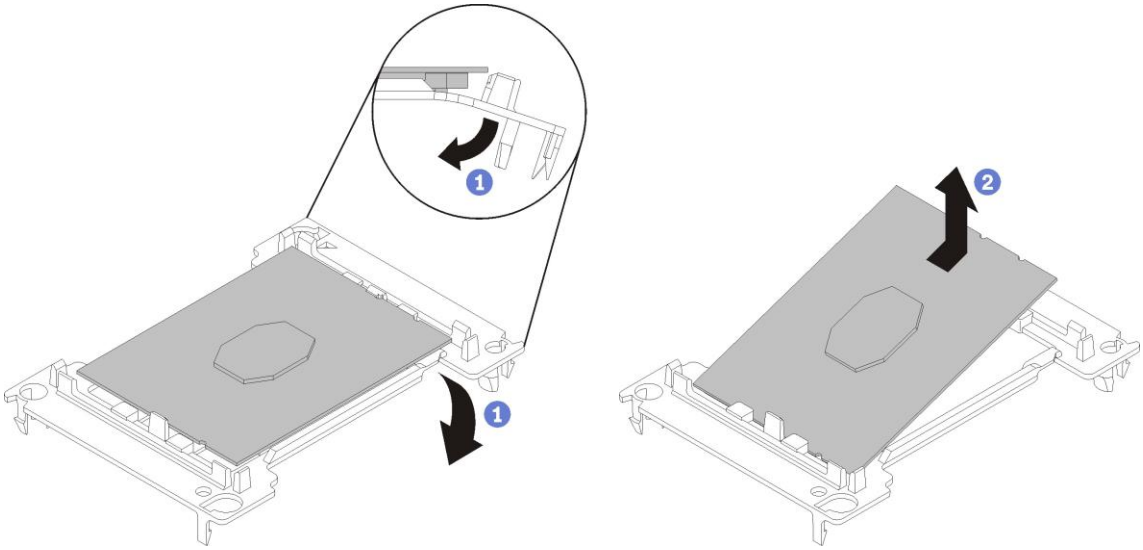

Figure 22. Separating the processor from the processor clip

1. With the processor contact-side up, flex the ends of the processor clip down and away from the processor to release the retaining clips (see Number 1).
2. Remove the processor from the processor clip (see Number 2).
3. Discard the old processor clip.

3.4.4 Installing a Processor on the Processor Clip

The processor must be installed onto a processor clip before it is installed as part of the PHM. Follow these steps to attach a processor clip to the processor.

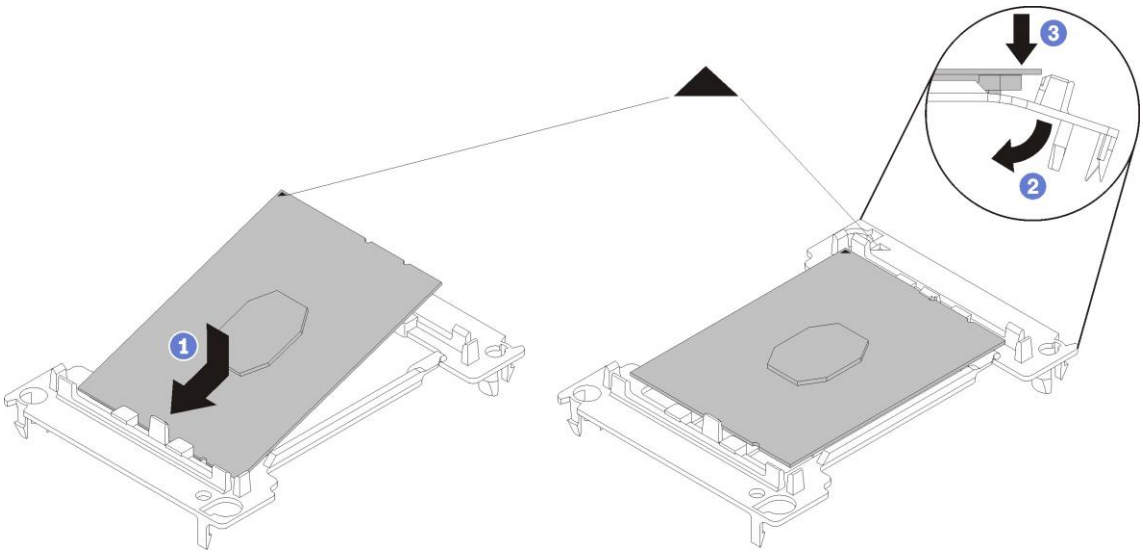

Figure 23. Installing a processor onto a processor clip

1. Position the processor on the new processor clip so that the triangular marks align; then insert the unmarked end of the processor into the processor clip (see Number 1).
2. Holding the inserted end of the processor in place, flex the opposite end of the processor clip down and away from the processor until the processor can be pressed under the clip on the processor clip (see Number 2).
3. To prevent the processor from falling out of the processor clip after it is inserted, keep the processor contact-side up and hold the processor-processor clip assembly by the sides of the clip.
4. If there is any old thermal interface material (TIM) on the processor, gently clean the top of the processor using an alcohol cleaning pad.
5. If the new processor is a replacement, remove the processor identification label from the heat sink and replace it with the new label that comes with the replacement processor.
6. Apply new thermal interface material (TIM) (thermal pad) to the top of the new processor.
   a. Carefully place the processor and processor clip on a flat surface processor contact-side down.

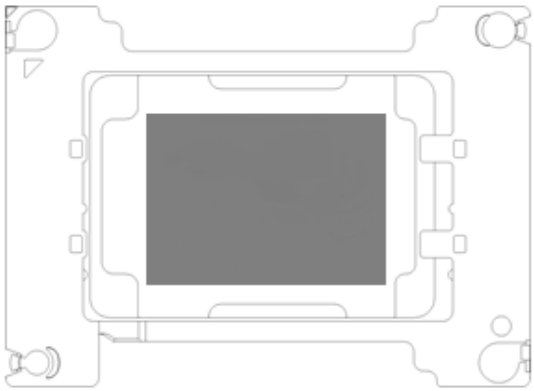

Figure 24. Applying TIM

Note: Use only an appropriate TIM when replacing the processor such as: PCM45F (70x47x0.25) by Honeywell International, Inc., Honeywell P/N: 099079. This link provides a demonstration of the application of the TIM: https://www.intel.com/content/www/us/en/support/articles/000025195/processors/intel-xeon-processors.html

7. If replacing a heat sink, remove the processor identification label from the old heat sink and place it in the same location on the new heat sink. The label is on the side of the heat sink closest to the triangular alignment mark.
8. If unable to remove the label and place it on the new heat sink or if the label is damaged during transfer, use a permanent marker to write the processor serial number from the processor identification label on the new heat sink in the same location as the label would be placed.

3.4.5 Assembling the Processor Heat Sink Module (PHM)

Once the processor and processor clip have been assembled, they can be combined with the heat sink to create the PHM. Complete the following steps to assemble the PHM.

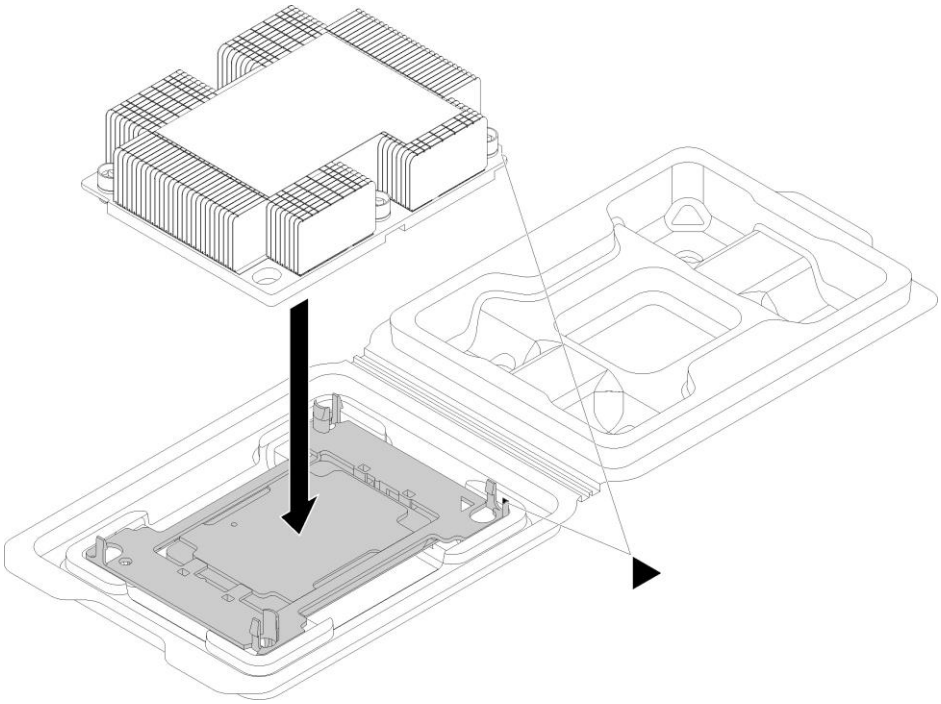

Figure 130. Assembling a PHM in the shipping tray

Notes:
If replacing a processor, install the heat sink onto the processor and processor clip while the processor and processor clip are in the shipping tray.
If replacing a heat sink, remove the heat sink from its shipping tray and place the processor and processor clip in the opposite half of the heat sink shipping tray with the processor contact-side down. To prevent the processor from falling out of the processor clip, hold the processor clip assembly by its sides with the processor contact-side up until it is turned over to fit in the shipping tray.

1. Do one of the following:
   a. Align the triangular marks on the processor carrier and the heat sink or
   b. Align the triangular mark on the processor clip with the notched corner of the heat sink.
2. Insert the processor clips into the holes on the heat sink.
3. Press the processor clip into place until the clips at all four corners securely engage.

3.4.6 Installing the Processor Heat Sink Module (PHM)

PHMs are keyed for the socket in which they can be installed and their orientation within that socket.

Note: Before installing a new PHM or replacement processor, update the system firmware to the latest level. See Section 2.4 for reference.

The following tools are required to install the PHM.

- T-30 Torx screwdriver
- Adequate ESD protective gear (wrist strap, ESD mat)

Note: The heat sink, processor, and processor retainer may differ than those shown in the illustrations.

1. Remove the processor socket cover if one is installed on the processor socket by grasping the cover by the half-circles at each end and lifting it from the compute node board.

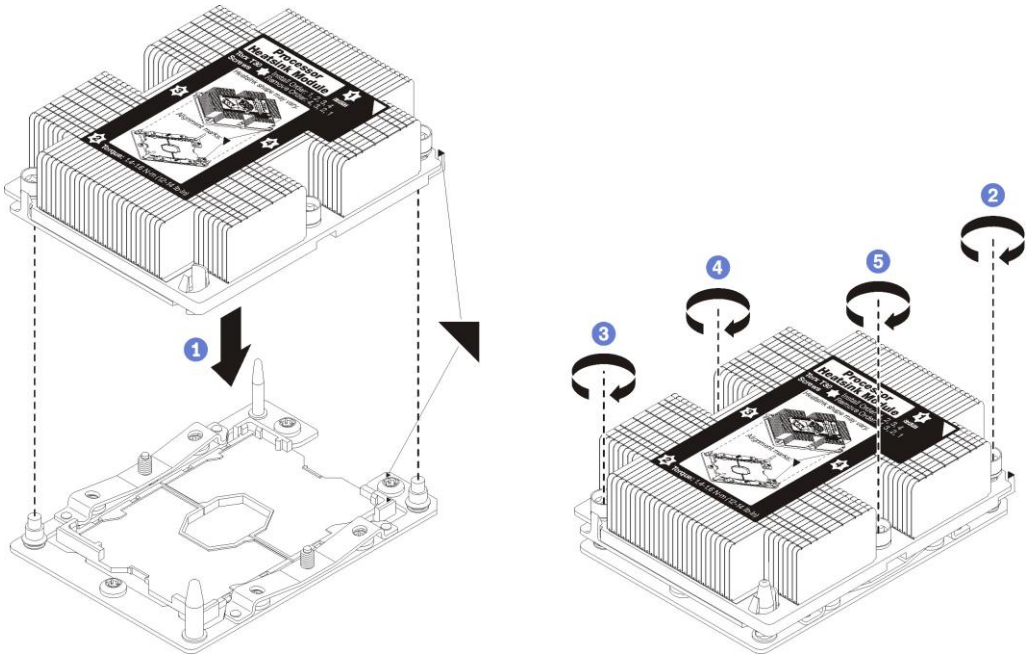

Figure 25. Installing a PHM

2. Install the processor heat sink module (PHM) on the system board.
   a. Align the triangular marks and guide pins on the processor socket with the PHM, then insert the PHM into the processor socket (see Number 1).
   b. Using a T30 Torx bit screwdriver, securely tighten (12 in-lb) each fastener in the sequence shown on the label located on the top of the heat sink (see Numbers 2-5).

Note: A PHM can only be fastened down if correctly installed. An improperly installed PHM cannot be fastened down. An improperly installed PHM does not sit level with the processor socket assembly.

3.5 Supporting and Populating the Memory Module (DIMM)

The server board is capable of supporting 16 DIMMs (8 DIMMs per processor). However, to support the processors in this system with a TDP of 200W or 205W, larger CPU heat sinks are used to support the increased thermals of these processors. As a result, two (2) DIMM connectors from each processor are rendered unusable due to Processor Heat Sink Module (PHM) interference.

Components Required:

DIMM connectors identified in white below are supported in the configurations listed below. Black DIMM connectors are not supported.

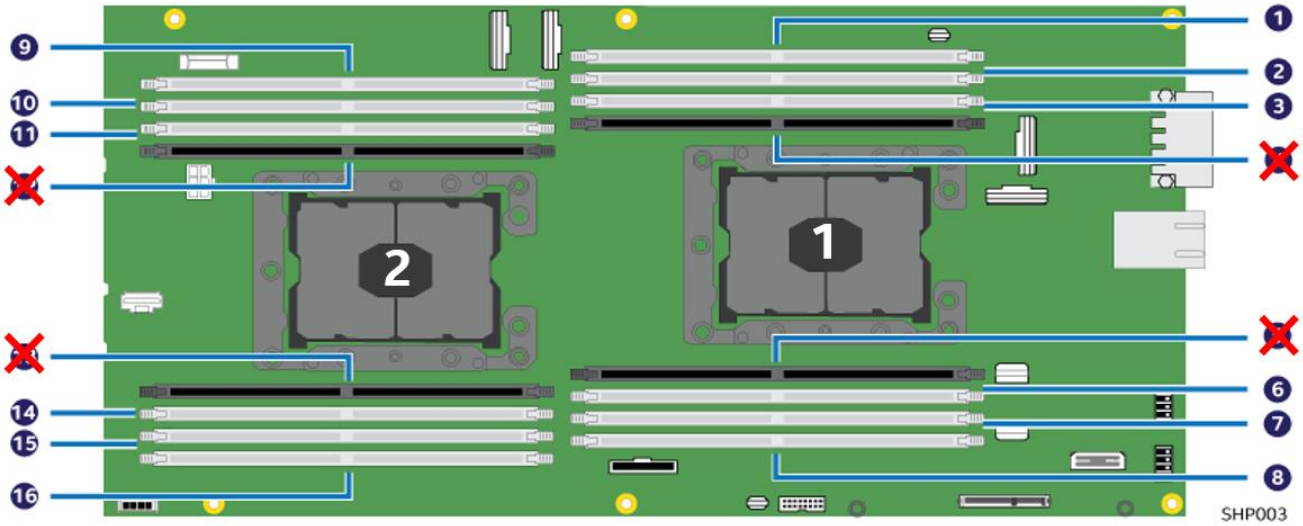

Figure 26. DIMM slot identification

3.5.1 General Memory Population Rules:

Each compute node has support for the following memory configuration modes:

- Independent Memory Mode (Default Normal Mode)
- Memory Mirroring Mode
- Memory Rank Sparing Mode

3.5.2 DIMM Installation Order

DIMMs must be installed in a certain order according to the memory mode configuration of the nodes.

By default, the compute node supports the Independent Memory Mode when DIMMs are installed in the following order: 6, 14, 3, 11, 7, 15, 2, 10, 8, 16, 1, and 9.

Memory Mirroring and Memory Rank Sparing modes are supported only when the compute node has the proper memory configuration installed and one of the memory modes is enabled in BIOS Setup.

In order to support a Memory Mirroring Mode, identical DIMMs must be installed in the following population sets: (6, 7, 8), (14, 15, 16), (1, 2, 3), (9, 10, 11).

In order to support a Memory Rank Sparing Mode, DIMMs must be installed in the following population order: 6, 14, 3, 11, 7, 15, 2, 10, 8, 16, 1, and 9.

When DIMMS are installed or removed, the node configuration information changes. The system indicates this change by displaying a message that the memory configuration has changed once the node is restarted.

Note: Use the F1 Setup utility to view configuration information.

3.5.3 DIMM Replacement Recommendations

When installing and replacing DIMMs, follow the guidelines below:

- Install higher capacity (ranked) DIMMs first, following the population sequence for the memory mode being used.
- Do not mix RDIMMs, LRDIMMs and 3DS DIMMs in the same node.
- Do not mix size and speed of DIMMs installed in DIMM connectors 1 and 3. The size and speed of the DIMMs in connectors 1 and 3 must match each other. However, they do not have to be the same size and speed as the DIMMs installed in connectors 2 and 4.
- Use compatible DIMMs from various manufacturers in the same pair.
- The maximum operating speed of the node is determined by the slowest DIMM in the node.

3.6 Replacing DIMMs

Use the following procedure to replace a DIMM.

3.6.1 Preparing to Remove a DIMM

Before removing a DIMM, complete the following steps:

1. Remove the compute node to be serviced (see Section 3.1.1).
2. Remove the compute node cover (see Section 3.1.3).
3. Remove the air baffle (see Section 3.3).
4. Locate the DIMM connector to be serviced. Ensure that the retaining clips of adjacent slots are closed.

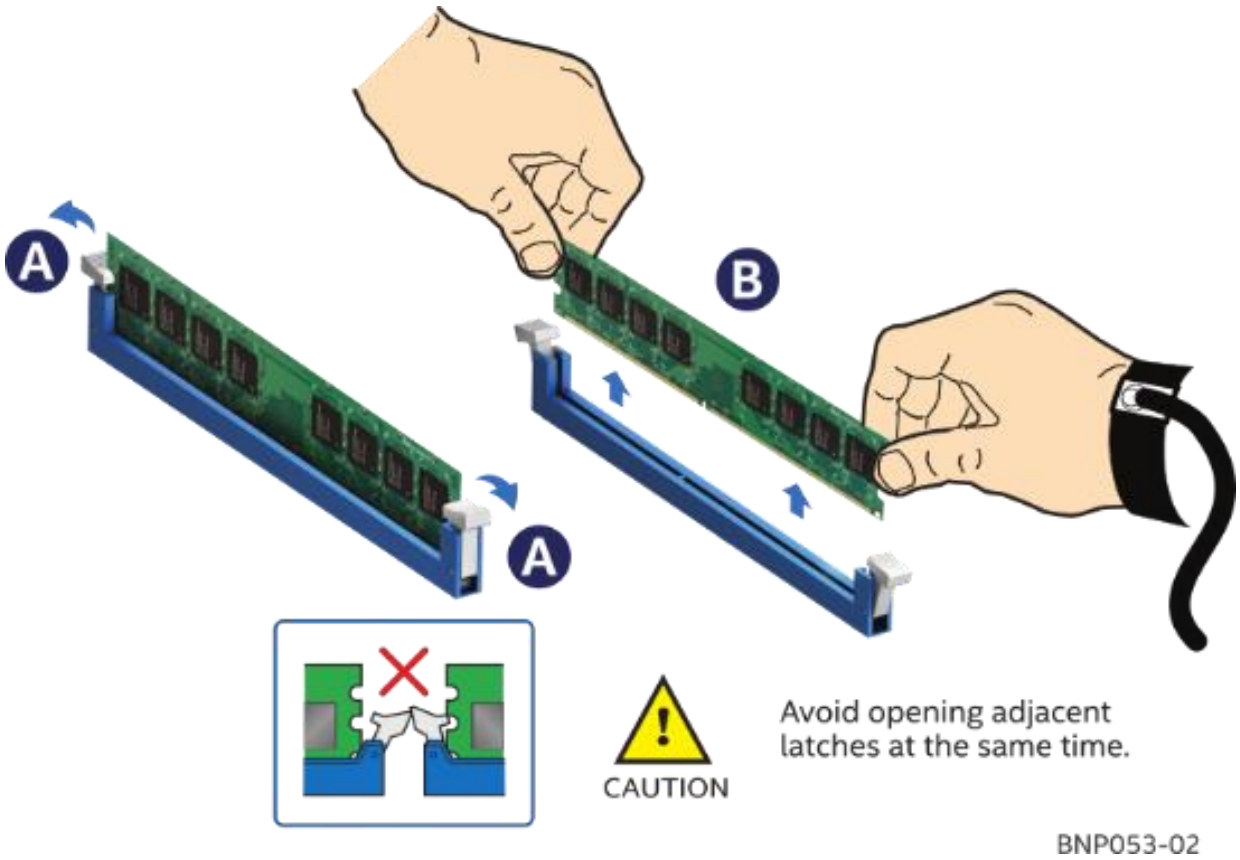

Figure 27. Removing a DIMM

3.6.2 Removing a DIMM

To remove a DIMM, complete the following steps:

1. Open the locking latches at either end of the selected DIMM connector (see Letter A). The DIMM will be unseated from the connector.
2. Holding the DIMM by its edges, lift it up and away from the DIMM connector (see Letter B).

3.6.3 Installing a DIMM

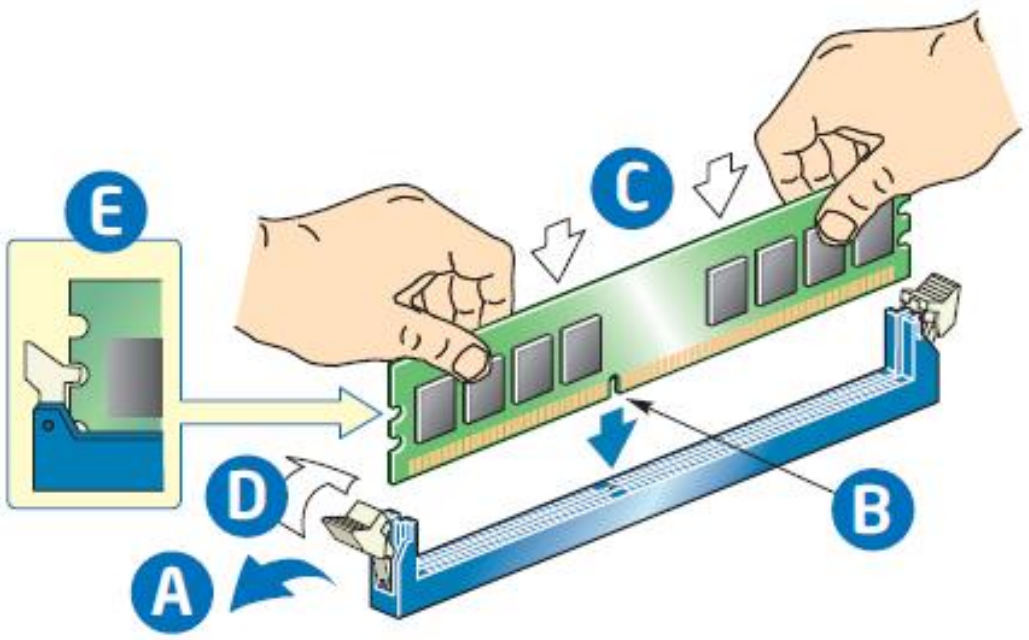

Figure 28. Installing a DIMM

To install a replacement DIMM, complete the following steps:

1. Locate the DIMM connector. Make sure the clips at either end of the DIMM connector(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.
3. Position the DIMM above the connector.
4. Align the notch on the bottom edge of the DIMM with the key in the DIMM connector (see Letter B).
5. Insert the bottom edge of the DIMM into the connector (see Letter C).
6. Once the DIMM is inserted, push down firmly and evenly on the top edge of the DIMM until the retaining clips snap into place (see Letter D).
7. Make sure the clips are firmly locked into place (see Letter E).

3.7 Replacing the Drive Carrier

Each compute node within the system is pre-populated with an SSD installed in a drive carrier. The single SSD in its pre-populated drive bay is the only drive supported in this system.

3.7.1 Extracting the Drive Carrier

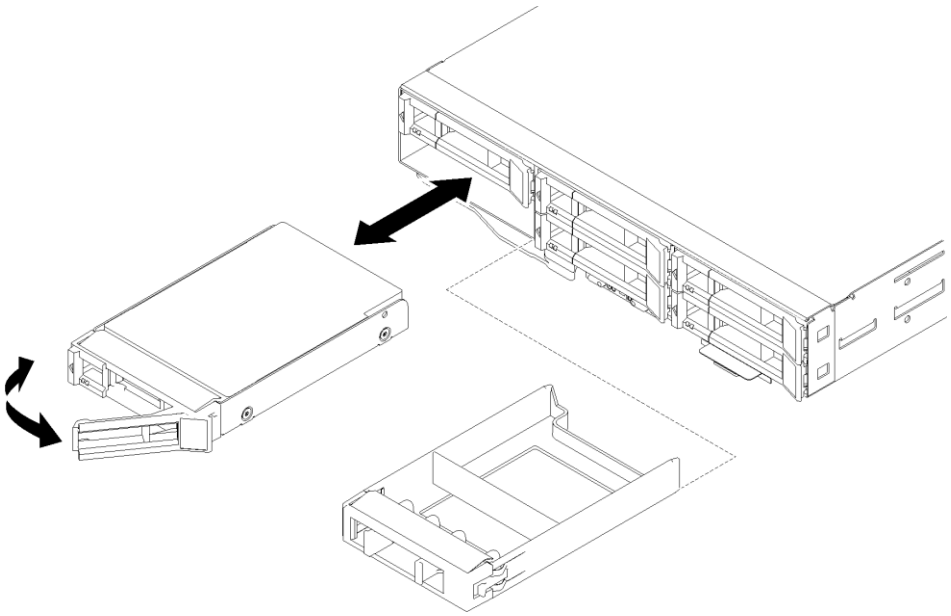

Figure 29. Extracting the drive carrier

To extract (remove) a drive carrier, complete the following steps:

1. Pressing the button on the carrier face plate to release the locking lever.
2. Using the lever, pull the carrier straight out and away from the drive bay.

3.7.2 Installing the Drive Carrier

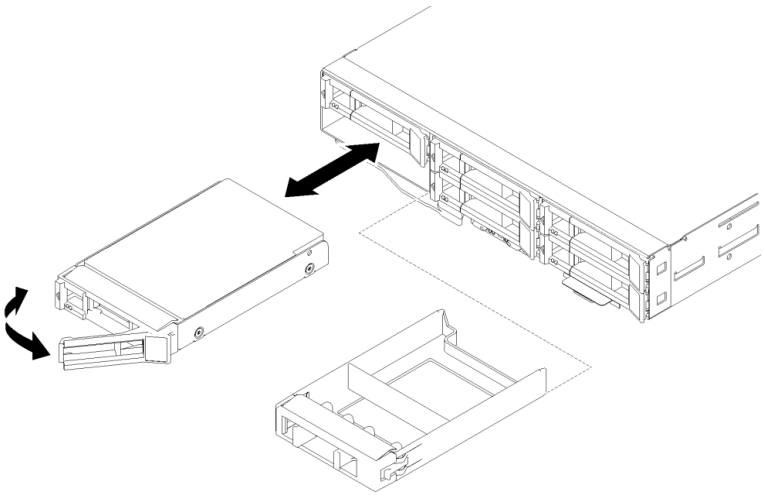

Figure 30. Installing a drive carrier

To install a drive carrier, complete the following steps:

1. Align the drive carrier with the open drive bay.
2. With the locking lever in the open position, insert the drive carrier into the drive bay and push forward until the drive makes contact with the backplane.
3. Close the drive carrier locking lever until it locks into place to complete the installation.

3.8 Replacing the Drive Backplane

The drive backplane is located in the compute node between the rear of the drive bays and the back edge of the server board.

3.8.1 Removing the Drive Backplane

Note: The drive backplane actually in the system may differ from those shown below.

Before removing the drive backplane, complete the following steps:

1. Remove the compute node to be serviced (see Section 0).
2. Remove the compute node cover (see Section 3.1.3).
3. Pull the drives (or drive fillers) part of the way out of the node to disengage them from the drive backplane (see Section 3.7.1).

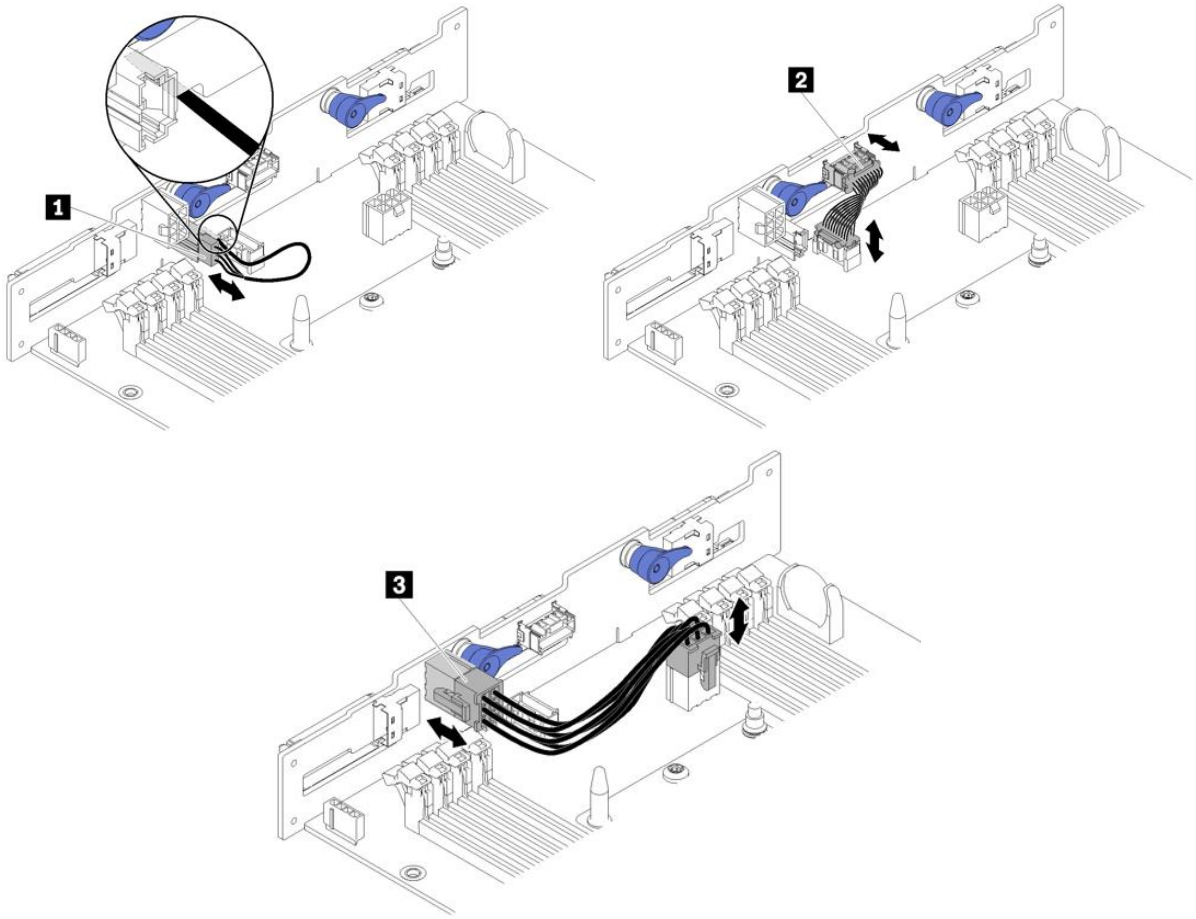

Figure 31. Drive backplane cable reference

4. Disconnect the ambient sensor, SAS/SATA, and power cables (see Numbers 1, 2 and 3 respectively) from the backplane.

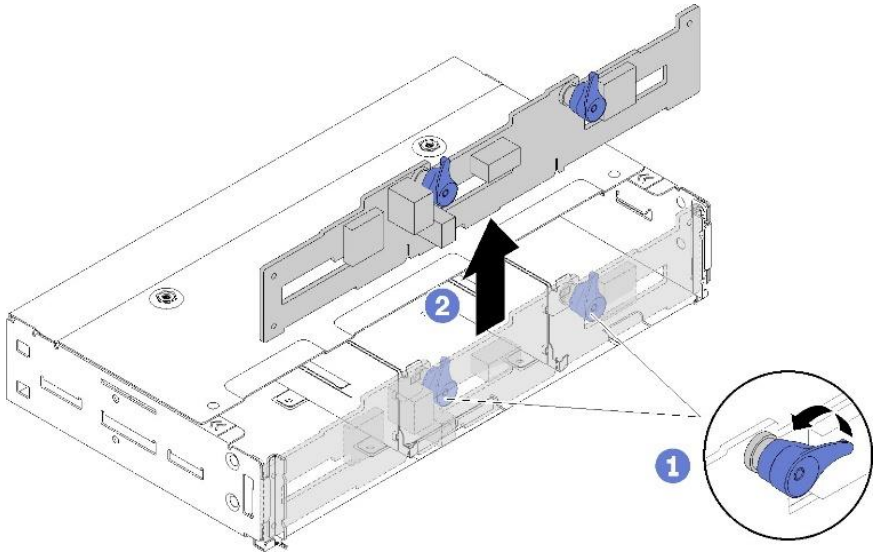

Figure 32. Removing the drive backplane

5. Turn the two (2) latches to the release position (see Number 1) and lift the backplane to disengage and remove the backplane from the node by lifting straight up and out (see Number 2).

3.8.2 Installing the Drive Backplane

To install the drive backplane, do the following:

1. Connect the ambient sensor cable (see Figure 31).
2. Align the backplane with the backplane slots in the side walls of the node (see Number 1).
3. Lower the backplane into the slots in the chassis and push the two latches down parallel to the baseboard (see Number 2).

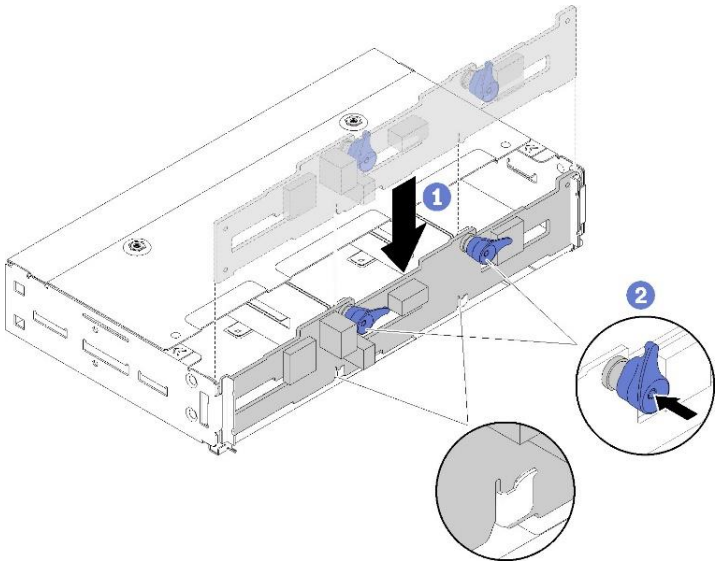

Figure 33. Installing the drive backplane

Note: Make sure the ambient sensor cable is routed through the slot on the bottom backplane.

4. Connect the SAS/SATA and power cables to the backplane (see Figure 31).

3.9 Replacing the Keyboard/Video/Mouse (KVM) Module

Installed within the front panel of each compute node (Figure 1, top row, right) is a Keyboard/Video/Mouse (KVM) Module, which provides support for one USB 3.0 Port and one KVM Breakout Cable (1 per system). When attached to the KVM module, the KVM cable supports one serial port, two USB 2.0 ports, and one VGA port. The combination of the KVM module and cable allows connection of a keyboard, monitor and mouse for local console support of an individual compute module.

Figure 34. KVM module

3.9.1 Removing the KVM Module

Complete the following steps to remove a KVM module:

1. Turn off the corresponding compute node with the KVM module to be removed.
2. Remove the compute node (see Section 3.2.1).
3. Remove the compute node cover (see Section 3.2.3).
4. Remove the air baffle (see Section 3.3).

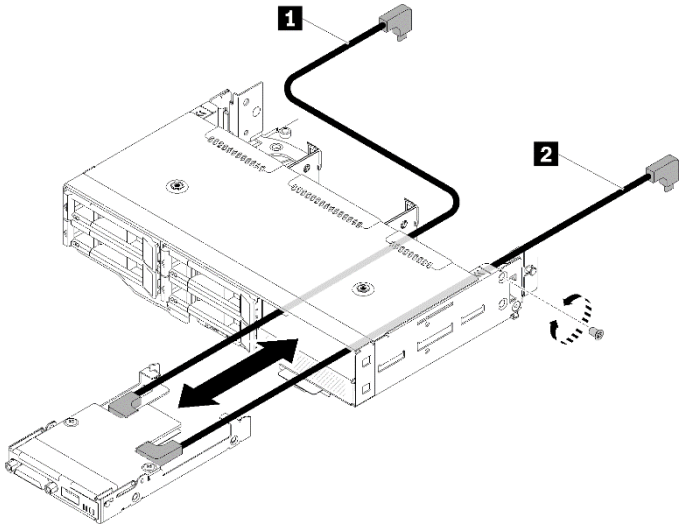

Figure 35. Removing the KVM module

5. Loosen the retaining screw on the right side of the compute node.
6. Disconnect the long (see Number 1) and short (see Number 2) signal cables from the system board.
7. Push the KVM module from the back side of the compute node and slide it out of the node.

Note: Be careful when routing the cables through the openings in the backplane or the drive bay.

3.9.2 Replacing the KVM Module

Complete the following steps to install a KVM module:

1. Turn off the corresponding compute node with the KVM module to be removed.
2. Remove the compute node (see Section 3.2.1).
3. Remove the compute node cover (see Section 3.2.3).
4. Remove the air baffle (see Section 3.3).

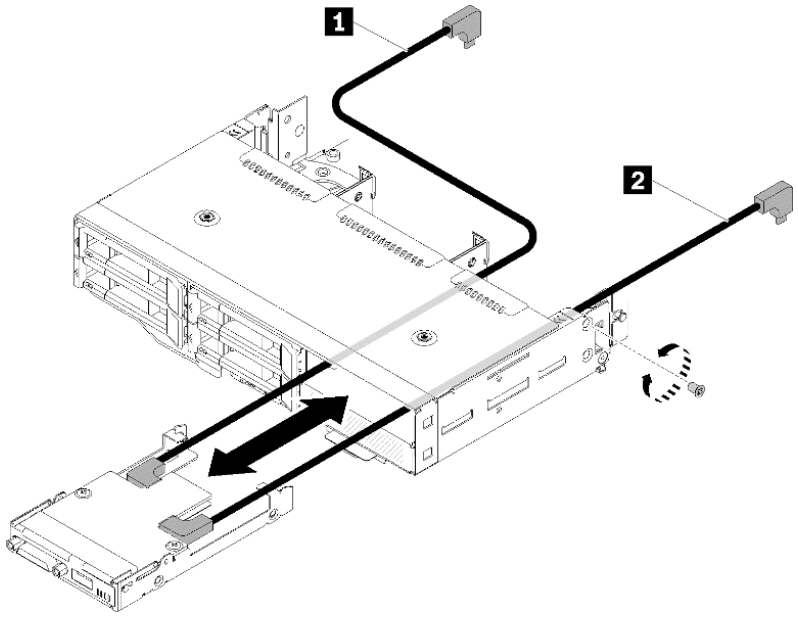

Figure 36. Installing the KVM module

5. Connect required cables to the new KVM module.
6. Carefully route cables through the drive bay and the drive backplane.

Note: When routing the cables through the drive bay and drive backplane, be sure that the USB connectors on the KVM module are to the right to ensure the correct installation (see Figure 37).

Figure 37. KVM module

7. Insert the KVM module into the compute node.
8. Install and fasten the retaining screw on the right side of the compute node.

3.9.2.1 Attaching the KVM Cable

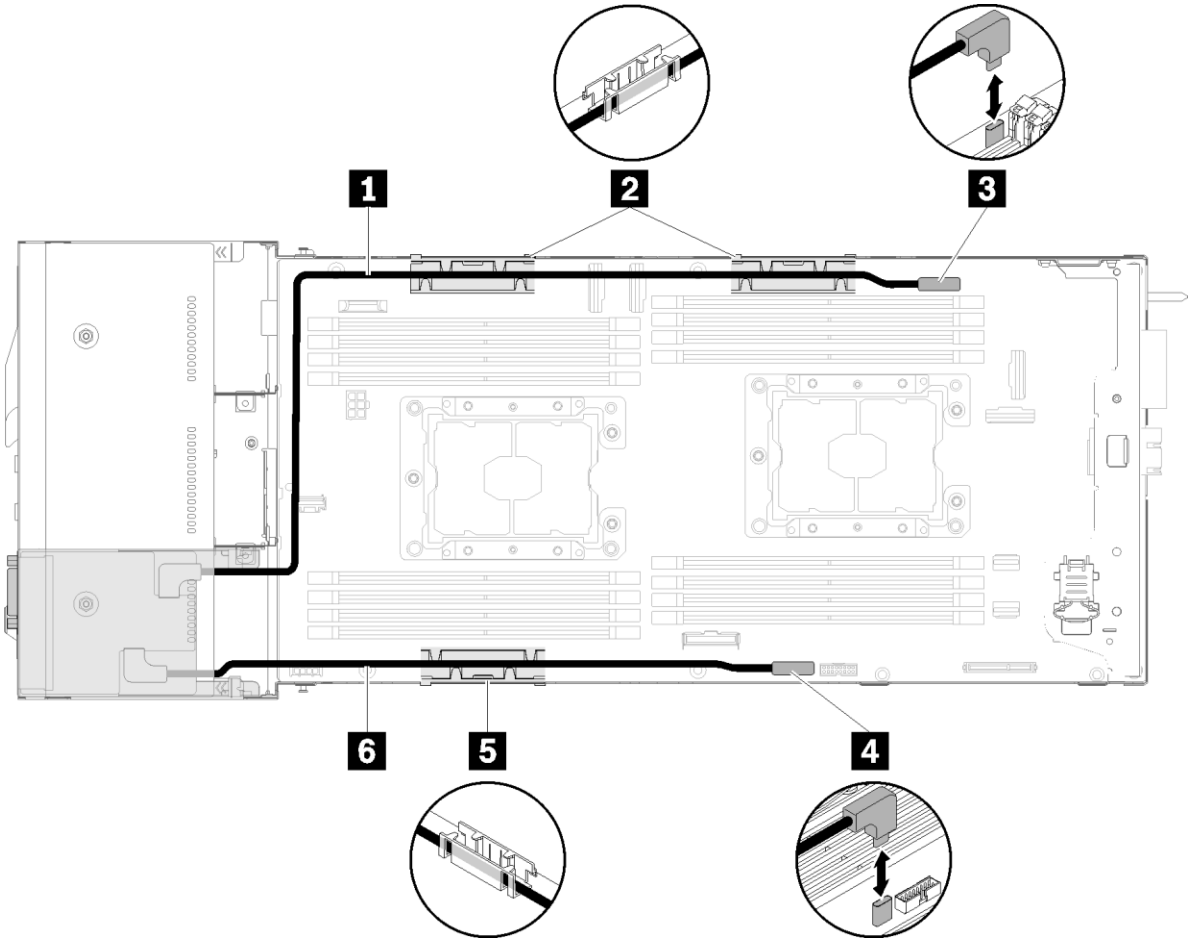

Figure 38. KVM cable routing

Once the KVM module has been replaced, attach the KVM Breakout cable to attach the KVM module cable to the KVM module, follow these steps:

1. Connect cables to connectors as shown in Figure 38.
   a. Long signal cable (see Number 1) to the connector (see Number 3).
   b. Short signal cable (see Number 6) to the connector (see Number 4).
2. Route both cables through the respective internal cable management baskets (see Numbers 2 and 5).

3.10 Replacing the Server Board (Compute Node Tray Assembly)

The server board field replaceable unit (FRU) consists of the compute node sheet metal tray with cover and the server board (compute node tray assembly). Replacing the server board consists of removing all components of the compute node and returning the server board and compute node tray with cover.

3.10.1 Preparing to Remove the Compute Node Tray Assembly

Complete the following steps to prepare the compute node for replacement of the compute node tray assembly.

- Back up all compute node settings, including the settings for any options installed in the compute node.
- Before replacing the tray, update the compute node with the latest firmware or restore the pre-existing firmware. Make sure a copy of the latest or pre-existing firmware is on hand before proceeding (see Section 2.4). For updating the UUID and the DMI/SMBIOS data, see Section 3.12.1).

3.10.2 Removing the Compute Node Tray Assembly

Follow these steps to remove the compute node tray assembly:

1. Turn off the corresponding compute node that has the server board to be replaced.
2. Remove the compute node (see Section 3.11).
3. Remove the compute node cover (see Section 3.1.3).
4. Remove any of the following components if installed on the compute node:
   - Air Baffle (see Section 3.2)
   - Dual Inline Memory Modules (DIMMs) (see Section 3.5)
   - KVM Module (see Section 3.9)
   - Solid State Drive (SSD) (see Section 3.7)
   - Drive Backplane (see Section 3.8)
   - Complementary Metal-Oxide Semiconductor (CMOS) Battery (see Section 3.3)
   - Processor Heat Sink Module (see Section 3.4)

3.10.3 Installing the Compute Node Tray Assembly

Follow these steps to install the compute node tray assembly:

Note: The components are re-installed in the reverse order in which they were removed.

---

1. Re-install any components removed from the compute node being replaced:
   - Processor Heat Sink Module (see Section 3.4.6)
   - Complementary Metal-Oxide Semiconductor (CMOS) Battery (see Section 3.3)
   - Drive Backplane (see Section 3.8.2)
   - Solid State Drive (SSD) (see Section 3.7.2)
   - KVM Module (see Section 3.9.2)
   - Memory Modules (DIMMs) (see Section 3.5)
   - Air Baffle (see Section 3.2.1)
2. Reinstall the compute node cover (see Section 3.1.4).
3. Reinstall the compute node (see Section 3.1.2).
4. Update the Universal Unique Identifier (UUID). (see Section 3.11.1).
5. Update the SMBIOS/DMI information. (see Section 3.11.2).
6. Enable the Trusted Platform Module (TPM). (see Section 3.11.3).

3.11 Updating the System Configuration after System Board Replacement

After a system board has been replaced, complete the steps in the sections below to update the system configuration.

3.11.1 Updating the Universal Unique Identifier (UUID)

The Universal Unique Identifier (UUID) must be updated when the system board is replaced. Two methods may be used to update the UUID.

3.11.1.1 BMC Provisioning Manager

Use the BMC Provisioning Manager to update the UUID for the system. Follow these steps:

1. Start the system and press F1 to display the BMC Provisioning Manager System Setup interface.
2. From the System Summary page, click **Update VPD**.
3. Update the UUID.

3.11.1.2 OneCLI

OneCLI is an on-line tool that supports a number of different operating systems.

To download OneCLI, complete the following steps:

1. Download and install OneCLI.
   a. Go to http://downloadcenter.intel.com/ and navigate to the support page for the server.
   b. Click **Drivers & Software**.
   c. Navigate to the version of OneCLI for the operating system and download the package.
2. Make sure that the correct version is downloaded for the operating system installed on the system.
3. Follow the steps below to update UUID using OneCLI. OneCLI sets the UUID in the BMC Controller.
4. Select one of the following methods to access the BMC Controller and set the UUID:
   a. Online from the target system, such as LAN or keyboard console style (KCS) access
   b. Remote access to the target system (LAN-based)
   c. Bootable medium containing ASU (LAN or KCS, depending upon the bootable media)
5. Follow the steps below to set the UUID using One CLI.
   a. Copy and unpack the OneCLI package, which also includes other required files, to the solution.
   b. Make sure that to unpack the OneCLI and the required files to the same directory.
   c. After installing OneCLI, use the following command syntax to set the UUID:

      `onecli config set SYSTEM_PROD_DATA.SysInfoUUID <uuid_value> [access_method]` where:

      `<uuid_value>`

      Up to 16-byte hexadecimal value assigned by customer.

      `[access_method]`

      Select the access method from one of the following:

      Online authenticated LAN access, type the command:

      `[--imm imm_user_id:imm_password@imm_internal_ip]` where:

      `imm_internal_ip`

      The BMC (Lenovo XClarity Controller) internal LAN/USB IP address. The default value is 169.254.95.118.

      `imm_user_id`

      The BMC Controller account (1 of 12 accounts). The default value is USERID.

`imm_password`

The BMC Controller account password (1 of 12 accounts). The default value is PASSW0RD (with a zero 0 not an O).

Note: If none of these parameters is selected, OneCLI uses the default values. When the default values are used and OneCLI is unable to access the BMC Controller using the online authenticated LAN access method, OneCLI automatically uses the unauthenticated KCS access method.

Example that does not use the user ID and password default values:

```
onecli config set SYSTEM_PROD_DATA.SYsInfoUUID <uuid_value> --user
<user_id>
--password <password>
```

Example that uses the user ID and password default values:

```
onecli config set SYSTEM_PROD_DATA.SysInfoUUID <uuid_value>
```

- Online KCS access (unauthenticated and user restricted):

Do not specify a value for `access_method` when using this access method. Example:

```
onecli config set SYSTEM_PROD_DATA.SysInfoUUID <uuid_value>
```

Note: The KCS access method uses the IPMI/KCS interface, which requires that the IPMI driver be installed.

- Remote LAN access, type the command:

Note: When using the remote LAN access method to access the BMC Controller using the LAN from a client, the host and the imm_external_ip address are required parameters.

`[--imm imm_user_id:imm_password@imm_externaln _ip]` where:

`imm_external_ip`

The external BMC Controller LAN IP address. There is no default value. This parameter isrequired.

`imm_user_id`

The BMC Controller account (1 of 12 accounts). The default value is USERID.

`imm_password`

The BMC Controller account password (1 of 12 accounts). The default value is PASSW0RD (with a zero 0 not an O).

Example that does not use the user ID and password default values:

```
onecli config set SYSTEM_PROD_DATA.SYsInfoUUID <uuid_value> [--imm
imm_user_id:imm_password@imm_internal_ip]
```

Example that does use the user ID and password default values:

```
onecli config set SYSTEM_PROD_DATA.SysInfoUUID <uuid_value>
```

d. Restart the BMC Controller.
e. Restart the solution.

3.11.2 Updating Desk Management Interface/System Management BIOS (DMI/SMBIOS) Data

The Desktop Management Interface (DMI) along with the System Management BIOS (SMBIOS) must be updated when the system board is replaced. Two methods may be used to update the DMI/SMBIOS data.

3.11.2.1 Baseboard Management Controller (BMC) Provisioning Manager

Use the BMC Provisioning Manager to update the asset tag for the system:

1. Start the system. Press F1 to display the BMC Provisioning Manager System Setup interface.
2. From the System Summary page, click **Update VPD**.
3. Update the asset tag information.
4. Restart the system.

3.11.2.2 One CLI

OneCLI is an on-line tool that supports a number of various operating systems.

To download OneCLI, complete the following steps:

1. Download and install OneCLI.
   a. Go to http://downloadcenter.intel.com/ and navigate to the support page for the server.
   b. Click **Drivers & Software**.
   c. Navigate to the version of OneCLI for the operating system and download the package.
2. Make sure that the correct version is downloaded for the operating system installed on the system.
3. Follow the steps below to update UUID using OneCLI. OneCLI sets the UUID in the BMC Controller.
4. Select one of the following methods to access the BMC Controller and set the UUID:
   a. Online from the target system, such as LAN or keyboard console style (KCS) access
   b. Remote access to the target system (LAN-based)
   c. Bootable medium containing ASU (LAN or KCS, depending upon the bootable media)
5. Follow the steps below to set the UUID using One CLI.
   a. Copy and unpack the OneCLI package, which also includes other required files, to the solution.
   b. Make sure that to unpack the OneCLI and the required files to the same directory. In addition to the application executable, the following files are required:

      • For Windows-based operating systems:

      ```
      ibm_rndis_server_os.inf

      device.cat
      ```

      • For Linux-based operating systems:

      ```
      cdc_interface.sh
      ```

   c. After installing OneCLI, use the following command syntax to set the DMI:

      ```
      onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model>
      [access_method] onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum
      <s/n> [access_method]

      onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag>

      [access_method]
      ```

      where:

      `<m/t_model>`

      The solution machine type and model number. Type `mtm xxxxyyy`, where `xxxx` is the machine type and `yyy` is the solution model number.

<s/n>

The serial number on the solution. Type sn zzzzzzz, where zzzzzzz is the serial number.

<asset_method>

The solution asset tag number. Type asset aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa,

where

aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa is the asset tag number.

[access_method]

The access method that selected to use from the following methods:

- Online authenticated LAN access, type the command:

```
 [--imm imm_user_id:imm_ password@imm_internal_ip]
```

where:

imm_internal_ip

The BMC Controller internal LAN/USB IP address. The default value is 169.254.95.118.

imm_user_id

The BMC account (1 of 12 accounts). The default value is USERID.

imm_password

The BMC account password (1 of 12 accounts). The default value is PASSW0RD (with a zero 0 not an O).

Note: If none of these parameters is selected, OneCLI use the default values. When the default values are used and OneCLI is unable to access the BMC Controller using the online authenticated LAN access method, OneCLI automatically uses the unauthenticated KCS access method.

Examples that use the user ID and password default values:

```
onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model> onecli
config set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n>
onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag>
```

- Online KCS access (unauthenticated and user restricted):

Do not specify a value for access_method when using this access method.

Note: The KCS access method uses the IPMI/KCS interface, which requires that the IPMI driver be installed.

The following commands are examples of not using the user ID and password default values:

```
onecli config set SYSTEM_PROD_DATA.SysInfoProdName
<m/t_model> onecli config set
SYSTEM_PROD_DATA.SysInfoSerialNum <s/n>
onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag>
```

- Remote LAN access, type the command:

Note: When using the remote LAN access method to access the BMC Controller using the LAN from a client, the host and the imm_external_ip address are required parameters.

`[--imm imm_user_id:imm_password@imm_externaln _ip]` where:

`imm_external_ip`

The external BMC (Lenovo XClarity Controller) LAN IP address. There is no default value. This parameter is required.

`imm_user_id`

The BMC account (1 of 12 accounts). The default value is USERID.

`imm_password`

The BMC Controller account password (1 of 12 accounts). The default value is PASSW0RD (with a zero 0 not an O).

Example that do use the user ID and password default values:

```
onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model> --
host <imm_ip> onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum
<s/n> --host <imm_ip>

onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag> --host
<imm_ip>
```

d. Restart the solution.

3.11.3 Enabling the Trusted Platform Module (TPM)

The system supports Trusted Platform Module (TPM), Version 1.2 or Version 2.0. TPM must be enabled prior to system use to ensure system security.

Trusted Cryptographic Module (TCM) is not supported.

Note: For customers in the People's Republic of China, TPM and TCM are not supported.

When a compute node tray assembly is replaced, check to be sure that the TPM policy is set correctly.

CAUTION: Setting the TPM policy incorrectly can render the compute node baseboard inoperable.

3.11.4 Setting the TPM Policy

By default, a replacement system board is shipped with the TPM policy set to **undefined**. Modify this setting to match the setting that was in place for the system board being replaced.

Set the TPM policy from the BMC Provisioning Manager by following these steps:

1. Enter the BMC Provisioning Manager (see Section 2.3).
   a. If the Power-on Administrator Password is required, enter the password.
2. From the System Summary page, click **Update VPD**.
3. Set the policy to one of these settings:
   - **TCM enabled - China only**. Customers should not select this option as TCM is not supported.
   - **TPM enabled - ROW**. Customers outside of the People's Republic of China should choose this setting.
   - **Permanently disabled**. Customers in the People's Republic of China should use this setting.

Note: Although the setting "undefined" is available as a policy setting, use it only for shipping the replacement server board.

3.11.5 Asserting TPM Physical Presence

Before asserting TPM Physical Presence, enable the Physical Presence Policy. By default, the Physical Presence Policy is enabled with a timeout of 30 minutes.

- If the TPM Physical Presence Policy is enabled, assert TPM Physical Presence through the BMC or hardware jumpers on the system board.
- If the TPM Physical Presence Policy has been disabled, set the hardware TPM Physical Presence jumper on the system board to assert Physical Presence. Enable the Physical Presence Policy using F1 (UEFI Settings).

3.11.5.1 Asserting TPM Physical Presence through the BMC

Complete the following steps to assert TPM Physical Presence through the BMC:

1. Log in to the BMC interface.
2. Click **BMC Configuration → Security** and verify that Physical Presence is set to **assert**.

3.11.5.2 Asserting TPM Physical Presence through the Hardware

Hardware Physical Presence is also asserted through the use of a jumper on the system board. For more information about asserting hardware Physical Presence through the use of a jumper, see Section 2.1.3.2.

3.11.6 Setting the TPM Version

Before the TPM version is set, TPM Physical Presence must be asserted. Set the TPM version through these steps:

1. Download and install OneCLI.
   a. Go to http://downloadcenter.intel.com/ and navigate to the support page for the server.
   b. Click **Drivers & Software**.
   c. Navigate to the version of OneCLI for the operating system and download the package.
2. Run one of the following commands to set the TPM version:

3.11.6.1 Using OneCli to Set the TPM version to Version 2.0

```
OneCli.exe config set TPMVersion.TPMVersion "Update to TPM2.0 compliant" -v -
override -host<ip_address>
        --user <userid> --password <password>
```

3.11.6.2 Using OneCli to Set the TPM version to Version 1.2

```
OneCli.exe config set TPMVersion.TPMVersion "Update to TPM1.2 compliant" -v -
override -host<ip_address>
        --user <userid> --password <password>
```

where:

<userid>:<password> are the credentials used to access the BMC of the server. The default user ID is USERID, and the default password is PASSW0RD (zero, not an uppercase o)

<ip_address> is the IP address of the BMC.

Alternatively, use the following Advanced Settings Utility (ASU) commands:

3.11.6.3 Using the Advanced Settings Utility (ASU) Commands to Set the TPM version to Version 2.0

```
asu64 set TPMVersion.TPMVersion "Update to TPM2.0 compliant" -host <ip_address>
        --user  <userid>  --password  <password> --override
```

3.11.6.4 Using the Advanced Settings Utility (ASU) Commands to Set the TPM version to Version 1.2

```
asu64 set TPMVersion.TPMVersion "Update to TPM1.2 compliant" -host <ip_address>
        --user  <userid>  --password  <password> --override
```

where:

<userid> and *<password>* are the credentials used in the BMC of the server. The default user ID is USERID and the default password is PASSW0RD (zero, not an uppercase O)

<ip_address> is the IP address of the BMC.

Note: The TPM version can be changed from 1.2 to 2.0 and back again. However, the toggle between versions can only be accomplished a maximum of 128 times.

3.11.7 Enabling UEFI Secure Boot

Optionally, UEFI Secure Boot can be enabled.

Physical Presence must be asserted to enable UEFI Secure Boot. (see Section 3.12.4).

There are two methods available to enable UEFI Secure Boot: the BMC Provisioning Manager and One Cli.

3.11.7.1 BMC Provisioning Manager

To enable UEFI Secure Boot from the BMC Provisioning Manager follow the steps below:

1. Start the system, and, when prompted, press F1 to display the BMC Provisioning Manager.
2. If the power-on Administrator password is required, enter the password.
3. From the UEFI Setup page, click **System Settings → Security → Secure Boot**.
4. Enable Secure Boot and save the settings.

3.11.7.2 One CLI

OneCLI is an on line too that supports a number of various operating systems.

To download OneCLI, complete the following steps:

1. Download and install OneCLI.
   a. Go to http://downloadcenter.intel.com/ and navigate to the support page for the server.
   b. Click **Drivers & Software**.
2. Navigate to the version of OneCLI for the operating system and download the package.
3. Make sure that the correct version is downloaded for the operating system installed on the system.
4. Follow the steps below to update UUID using OneCLI. To enable UEFI Secure Boot using OneCLI, follow the steps below.
   a. Run the following command to enable Secure Boot:

```
OneCli.exe  config  set  SecureBootConfiguration.SecureBootSetting  Enabled
--override

--imm  <userid>:<password>@<ip_address>
```

where:

<userid> and *<password>* are the credentials used in the BMC of the server. The default user ID is

USERID and the default password is PASSW0RD (zero, not an uppercase o)

<ip_address> is the IP address of the BMC.

b. Alternatively, the following Advanced Settings Utility (ASU) commands can be used:

To enable secure boot:

```
asu64.exe set SecureBootConfiguration.SecureBootis Enabled -v --
override --host <ip_address>
          --user <userid> --password <password>
```

To disable secure boot:

```
asu64.exe set SecureBootConfiguration.SecureBootis Disabled -v --
override --host <ip_address>
          --user <userid> --password <password>
```

To read the secure boot setting:

```
asu64.exe show SecureBootConfiguration.SecureBootis -v --override --
host <ip_address>
           --user <userid> --password <password>
```

where:

<userid> and *<password>* are the credentials used in the BMC of the server. The default user ID is USERID and the default password is PASSW0RD (zero, not an uppercase o)

<ip_address> is the IP address of the BMC.

3.12 Replacing System Fans

The system includes five hot-swap fans which are used to cool all components.

The five system fans have the following specifications:

- Three 60mm x 60mm x 56mm hot-swap fans
- Two 80mm x 80mm x 80mm hot-swap fans

CAUTION: To minimize possible performance degradation and other thermal-related issues, replace a system fan as quickly as possible while the system is operational. System fans operate at very high speeds. Keep all tools and fingers away from all system fans when swapping out a defective fan. Components within an operational system can get very hot. Avoid touching any components within the system while swapping out a defective system fan.

3.12.1 Removing the System Fan

Before removing a system fan, remove the system fan cover by completing the following steps:

1. Slide the system forward out of the rack.

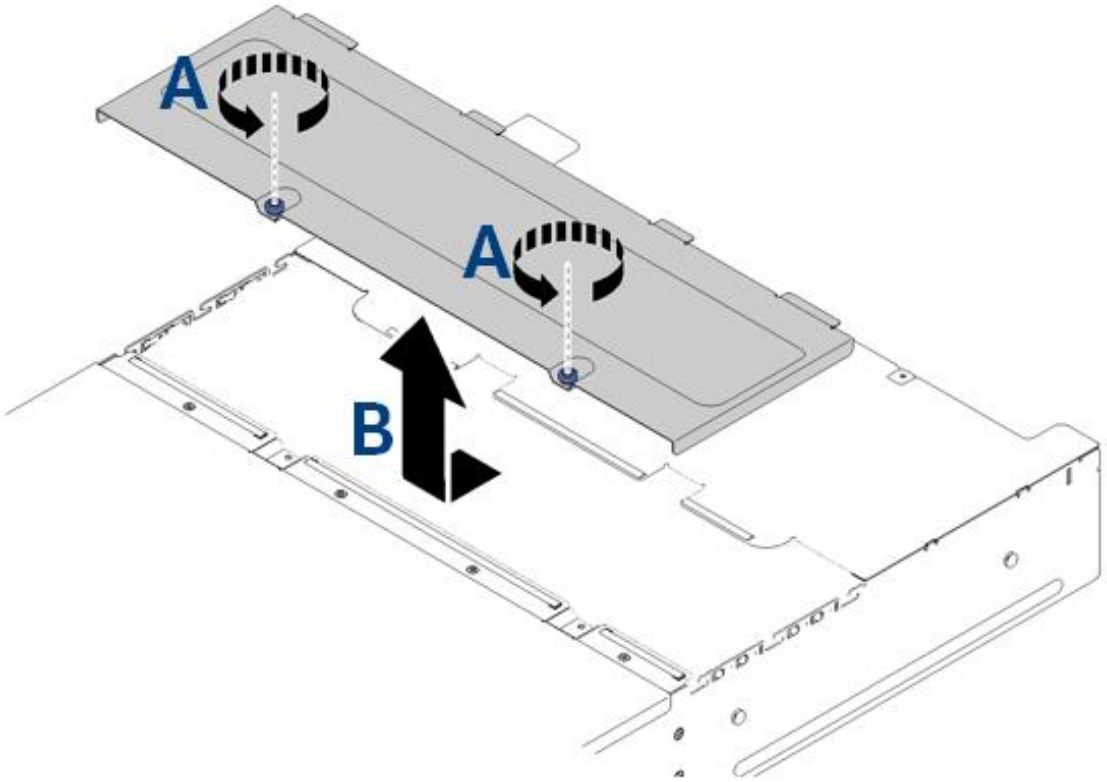

Figure 39. Removing the system fan cover

2. Locate the two thumbscrews securing the system fan cover and turn them counterclockwise (see Letter A).
3. Push the fan cover slightly towards the front side of the system chassis, then lift the cover up (see Letter B).
4. Identify the system fan to be replaced. Identify the system fan to be replaced. The location for fan fault LEDs is shown in Figure 40. The LED lights up when a fan fails.

Each system fan has a fan fault indicator LED. The following illustration shows the locations of fan fault LEDs. A lighted LED indicates a fan issue or failure.

1. 80x80x80mm fan LEDs.
2. 60x60x56mm fan LEDs.

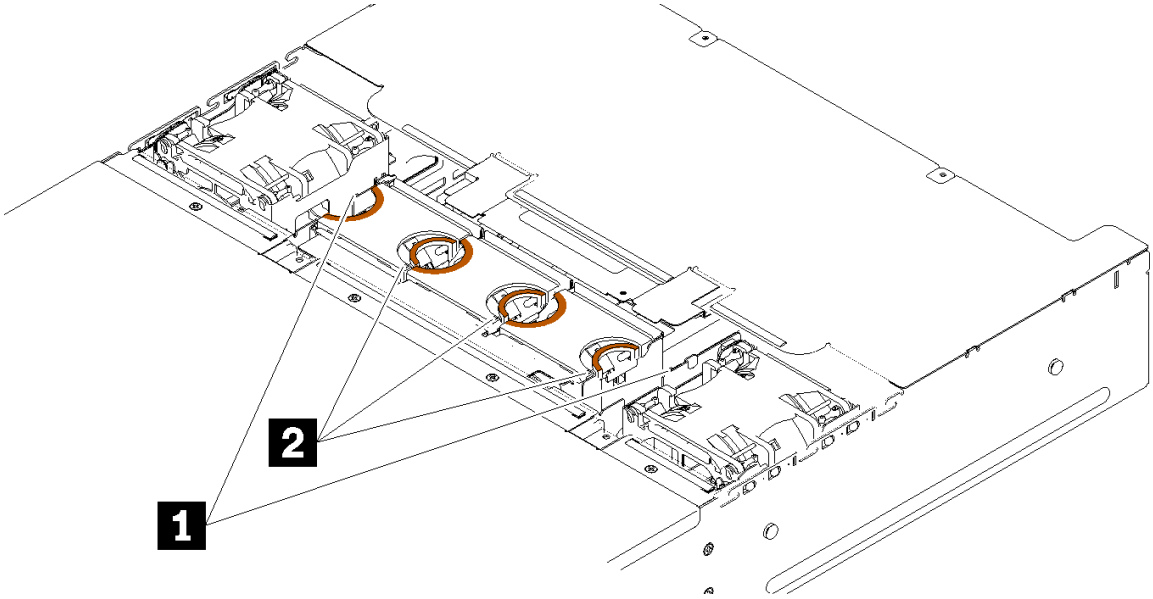

Figure 40. Fan fault LEDs

3.12.2 Removing a Failed Fan

Remove a 60x60x56mm fan through these steps:

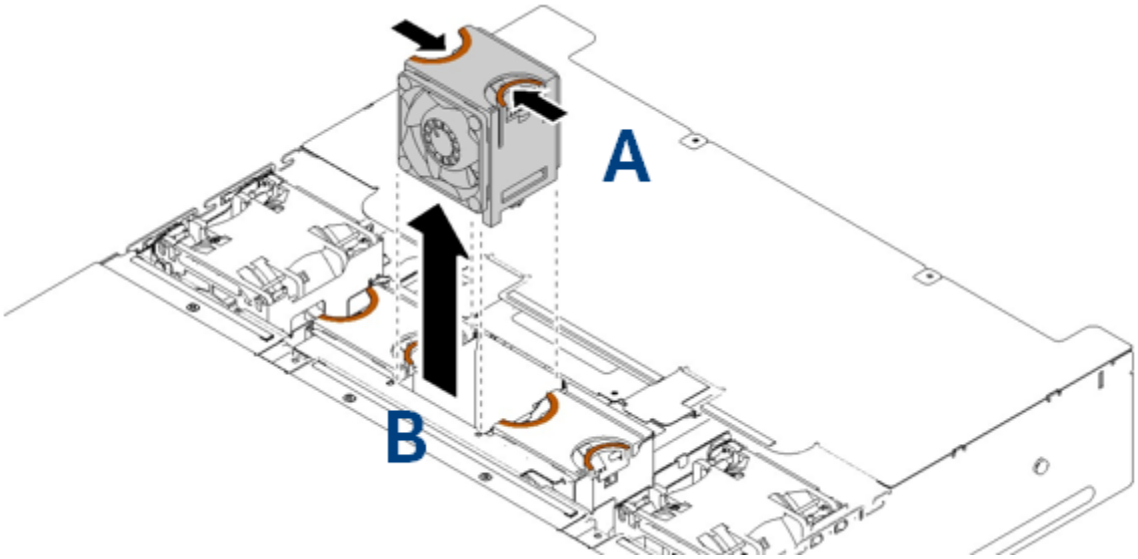

Figure 41. Removing the 60x60x56mm fan

1. Squeeze the fan release latches together (see Letter A).
2. Lift the fan up and out of the fan bay (see Letter B).

Remove an 80x80x80mm fan through these steps:

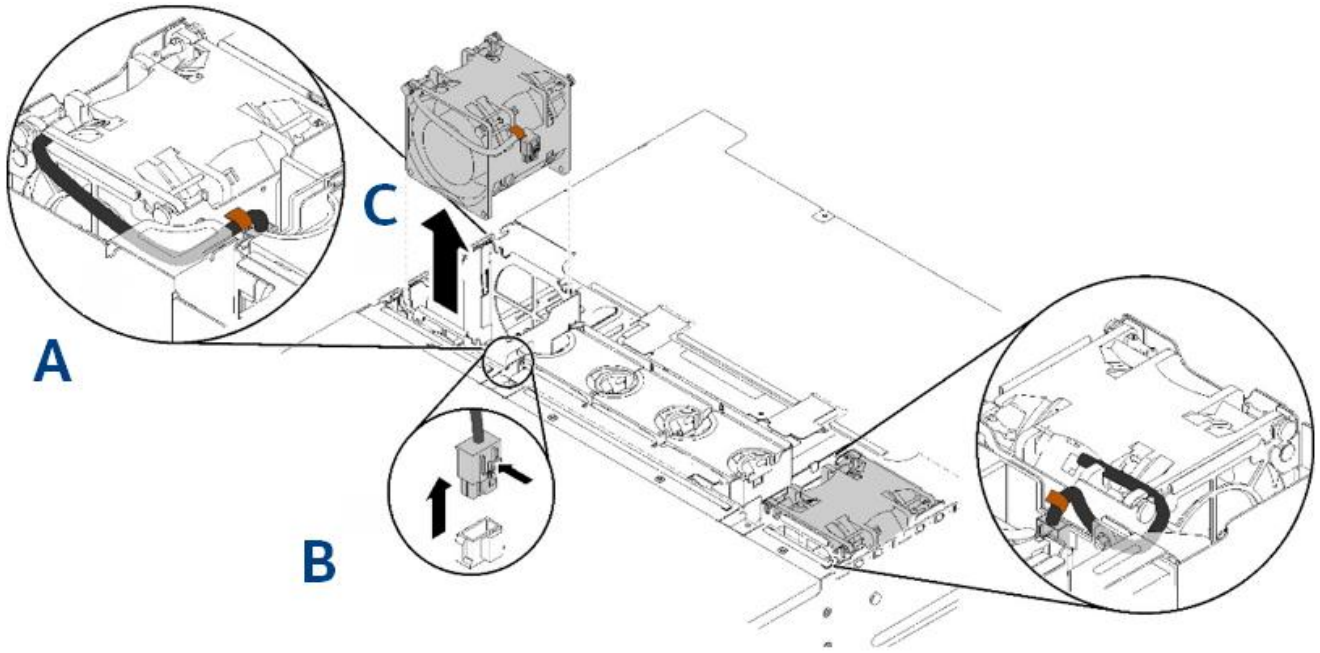

Figure 42. Removing the 80x80x80mm^2 fan

1. Carefully pull the cable out from underneath the sheet metal flange (see Letter A).
2. Disconnect the cable by depressing the lock tab and pulling straight up (see Letter B).
3. Grasp the fan by the semi-circular tabs at the center top of the fan and lift it up and out of the fan bay (see Letter C).

3.12.3 Installing a System Fan

Install a 60x60x56mm fan by completing the following steps.

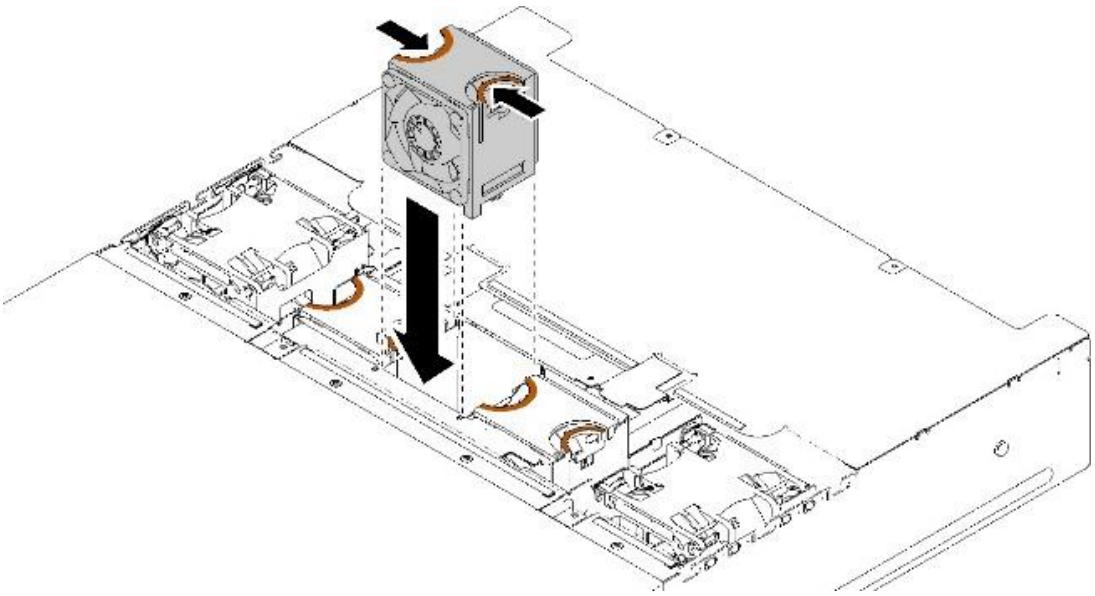

Figure 43. Installing the 60x60x56mm fan

1. Ensure the airflow arrow on the fan label on the top of the fan is pointed towards the rear of the system.
2. Position the fan over the socket to receive the fan and lower the fan into the socket.
3. Push the fan assembly downward until the locking tab clicks into place.

Install an 80x80x80mm fan by completing the following steps.

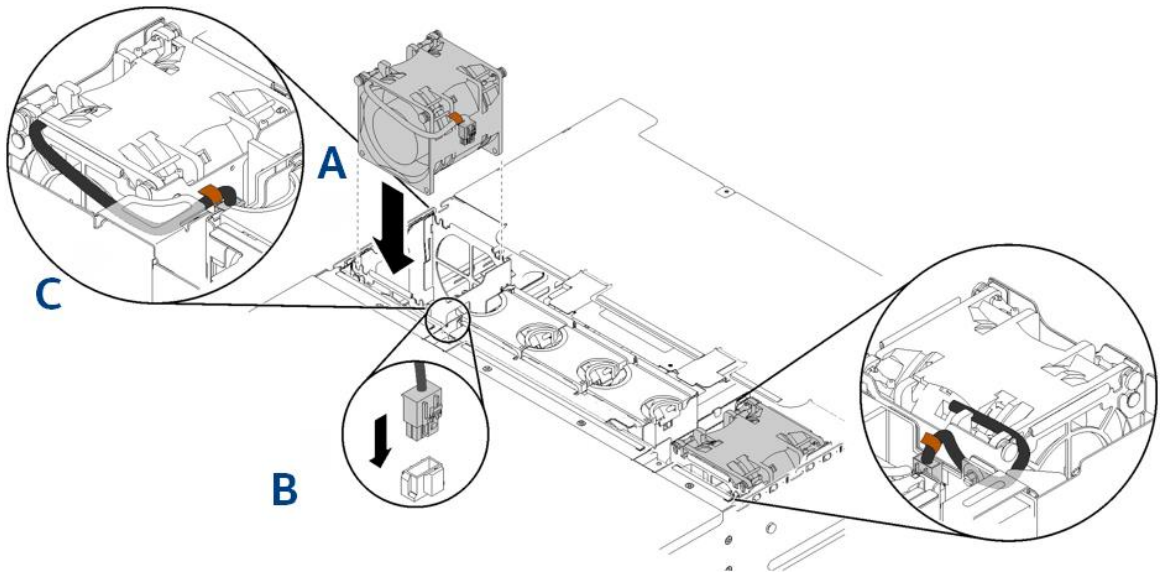

Figure 44. Installing a 80x80x80mm fan

1. Ensure the airflow arrow on the fan label on the top of the fan is pointed towards the rear of the system. Position the fan over the socket to receive the fan and lower the fan into the socket.
2. Lower the fan into the socket, and push it downward until it clicks into place (see Letter A).
3. Connect the power cable by pushing the connector into the socket until the locking tab clicks (see Letter B).
4. Carefully route the cable underneath the flange and make sure the cable is routed through the notch in the circuit board (see Letter C).

3.12.4 Installing the System Fan Cover

Once a system fan has been replaced, re-install the system fan cover.

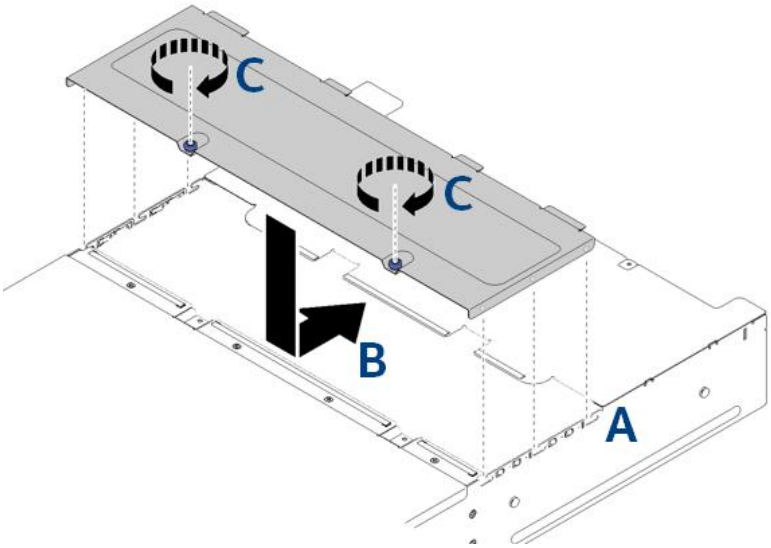

Figure 45. Installing a system fan cover installation

Re-install the system fan cover by completing the following steps:

1. Orient the cover so that the posts on the inside of the cover slide into the slots on the enclosure (see Letter A).
2. Slide the fan cover forward to the closed position until it clicks into place (see Letter B).
3. Turn the thumbscrews clockwise (see Letter C).

3.13 Replacing the Power Supply Unit (PSU)

The system includes two hot-swap Power Supply Units (PSUs).

The two system PSUs have the following specifications:

- 2000 watt AC, auto-ranging from 200 – 240 Volts AC only
- Power redundancy support
- 80 PLUS Platinum
- Each PSU has its own cooling fan

CAUTION: To minimize possible performance degradation and other power and thermal-related issues, replace a system PSU as quickly as possible while the system is operational.

3.13.1 Removing the PSU

Remove a PSU by completing the following steps:

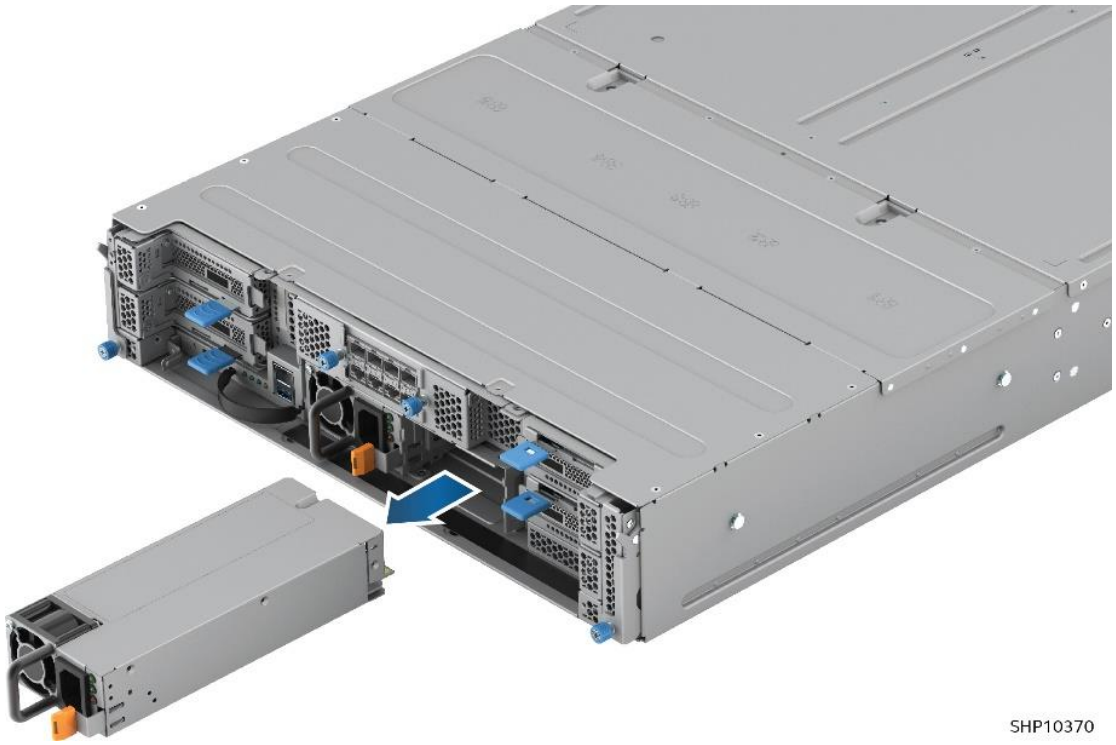

Figure 46. Removing a PSU

1. Disconnect the power cord from the connector on the back of the PSU.
2. Press and hold the orange release tab on the PSU to the left.
3. Grasp the handle and pull the PSU straight out of the Power Supply Bay.

3.13.2 Installing a PSU

Install a PSU by completing the following steps:

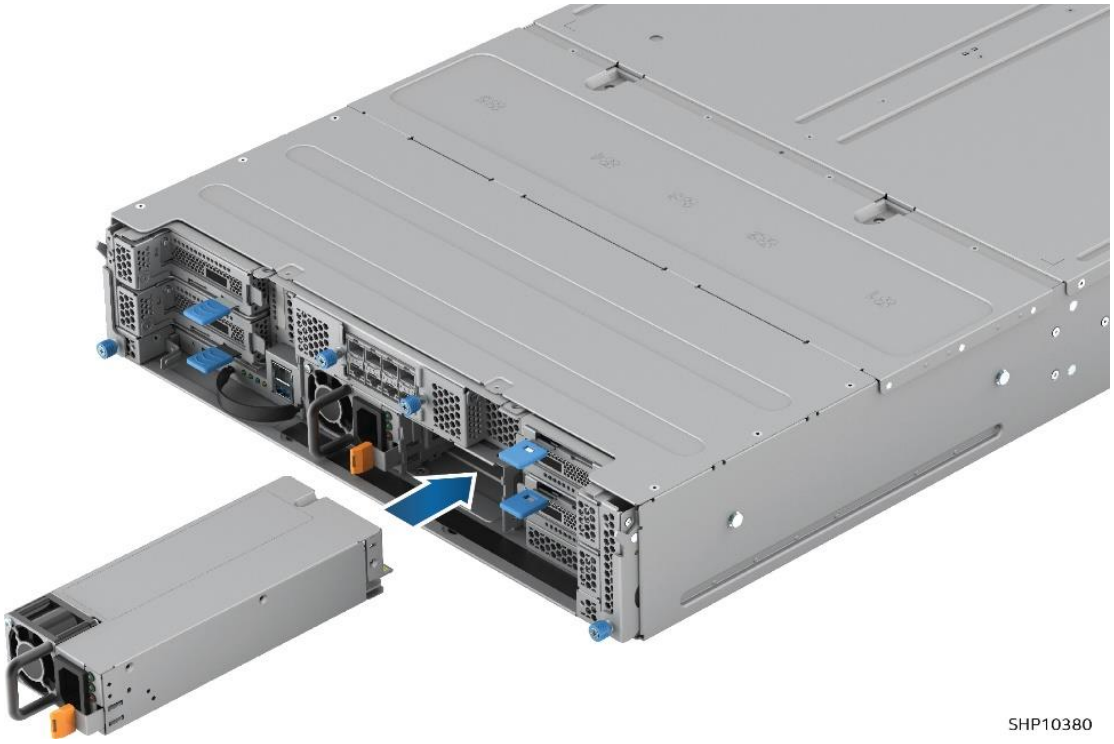

Figure 47. Installing a PSU

1. Align the PSU with the Power Supply Bay.
2. Slide the PSU into the bay until it locks into place.

3.14 Replacing the System Management Module (SMM)

Each system supports one (1) System Management Module (SMM) installed in the lower left rear of the system. The SMM controls management and reporting for system features and components.

3.14.1 Removing the SMM

Before replacing the SMM, it is highly recommended that system settings be backed up in order to migrate them to the new SMM.

To migrate current system settings and the system PDM VPD onto the new SMM, complete the following steps:

1. Ensure successful completion of the SMM setting backup, the system VPD backup, and the PDM VPD backup procedures as detailed in the Intel® Server System R2600SR System Management Module (SMM) User's Guide.

Note: Use a FAT32-formatted USB flash drive with at least 1GB empty space to back up SMM settings from the SMM for installation onto the new SMM for settings restore.

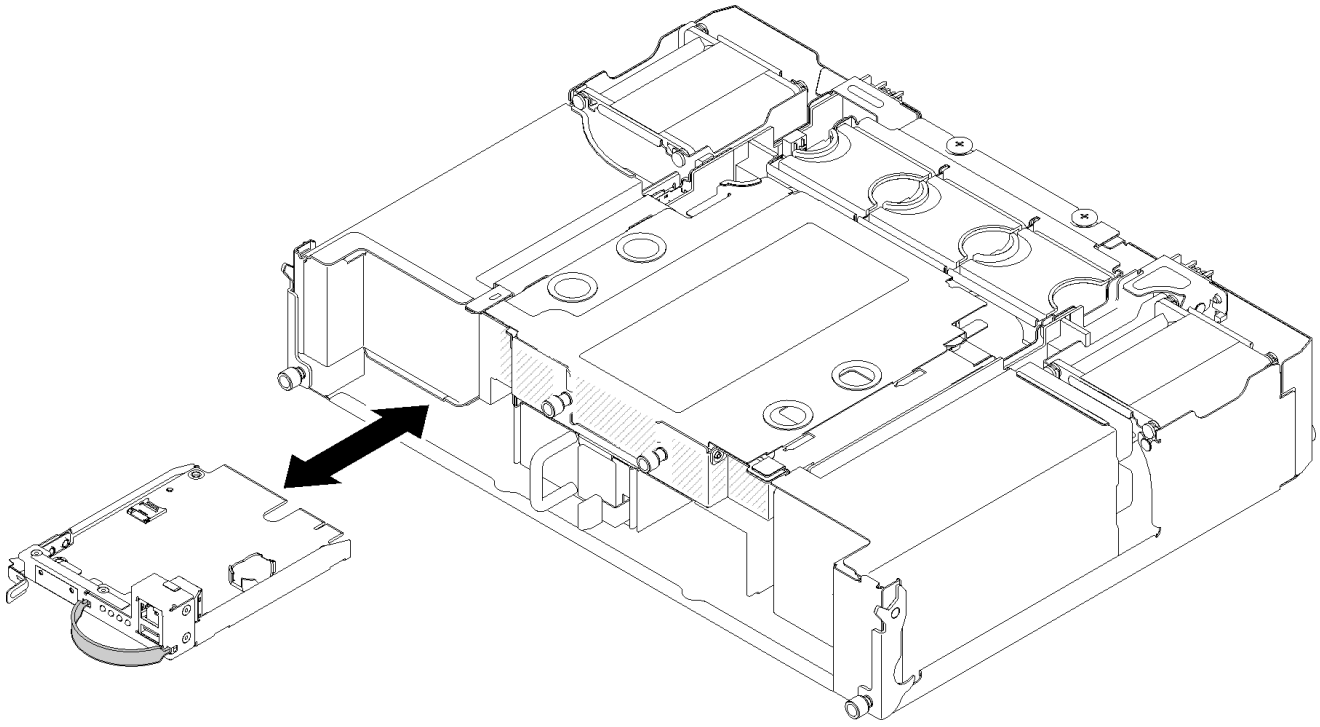

Figure 48. Removing the SMM

2. Pull the silver release latch to the right with thumb and grasp the strap using fingers of the same hand.
3. Firmly pull the SMM assembly out of the system (see Figure 39).

3.14.2 Installing the SMM

Do these steps to install/reinstall an SMM. After replacement, it is recommended to migrate backed-up system settings to the SMM.

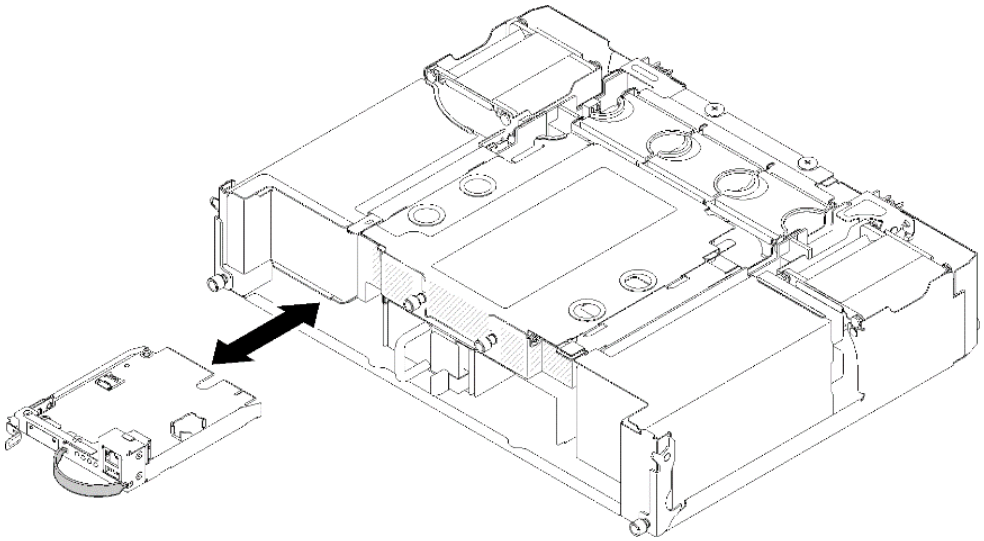

Figure 49. Installing the SMM

1. Grasp the SMM assembly by the metal tray and align it with the SMM bay.
2. Slide the SMM assembly into the SMM bay until it clicks/locks into place (see Figure 49).

Note: For information on system and PDM VPD backup, restoring, migrating, and updating, see the Intel® Server System R2600SR System Management Module (SMM) User's Guide.

3.14.3 Replacing the SMM Battery

The SMM battery powers the system RTC up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and stored server settings and system clock and date settings may be lost.

Battery Types:

- Lithium
- 3V
- Coin type, CR2032

Contact the Intel 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.

To replace the SMM battery, complete the following steps:

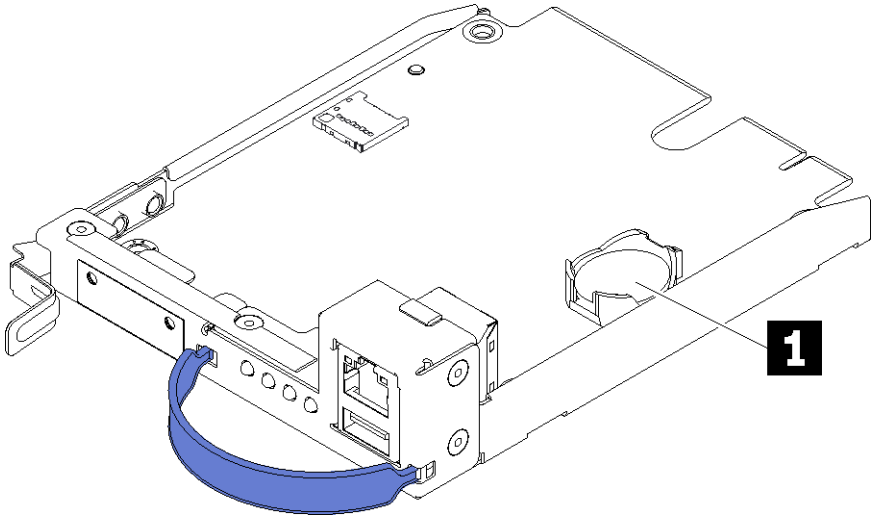

Figure 50. SMM battery location

1. Locate the SMM battery (see Number 1).

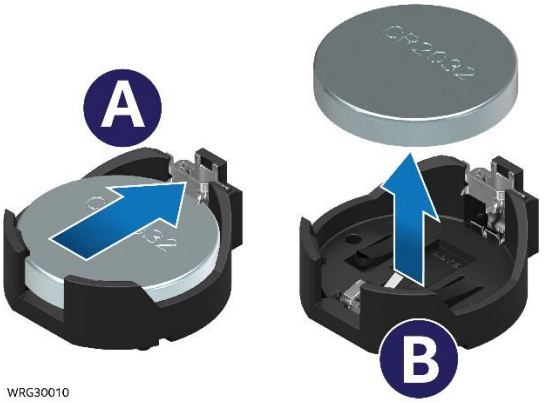

Figure 51. Replacing the SMM battery

2. Using a fingernail, depress the battery retaining clip (see Letter A). The battery should pop free.
3. Lift the battery up from the socket (see Letter B).
4. Position the battery over the socket and tilt the battery so that it can inserted into the socket, positive side up.
5. Slide the battery into place and gently press the battery down into the socket until it clicks into place.

Note: Avoid lifting the battery with excessive force. Failing to remove the battery properly may damage the socket on the SMM assembly. Any damage to the socket may require replacing the SMM assembly.
After replacing the battery, the system time settings must be reconfigured.
Dispose of the battery as required by local ordinances or regulations.
Follow any special handling and installation instructions that come with the replacement battery.

3.15 Replacing the External I/O Module (EIOM)

Each compute node has two dedicated 10 GB ports routed to the 8-port Ethernet I/O Module (EIOM) at the rear of the system. The ports are connected to the integrated Intel® Ethernet Connection X722 Controller.

3.15.1 Removing the System Shuttle

In order to remove the EIOM from the system, the system shuttle must be removed. Perform the following steps to remove the system shuttle:

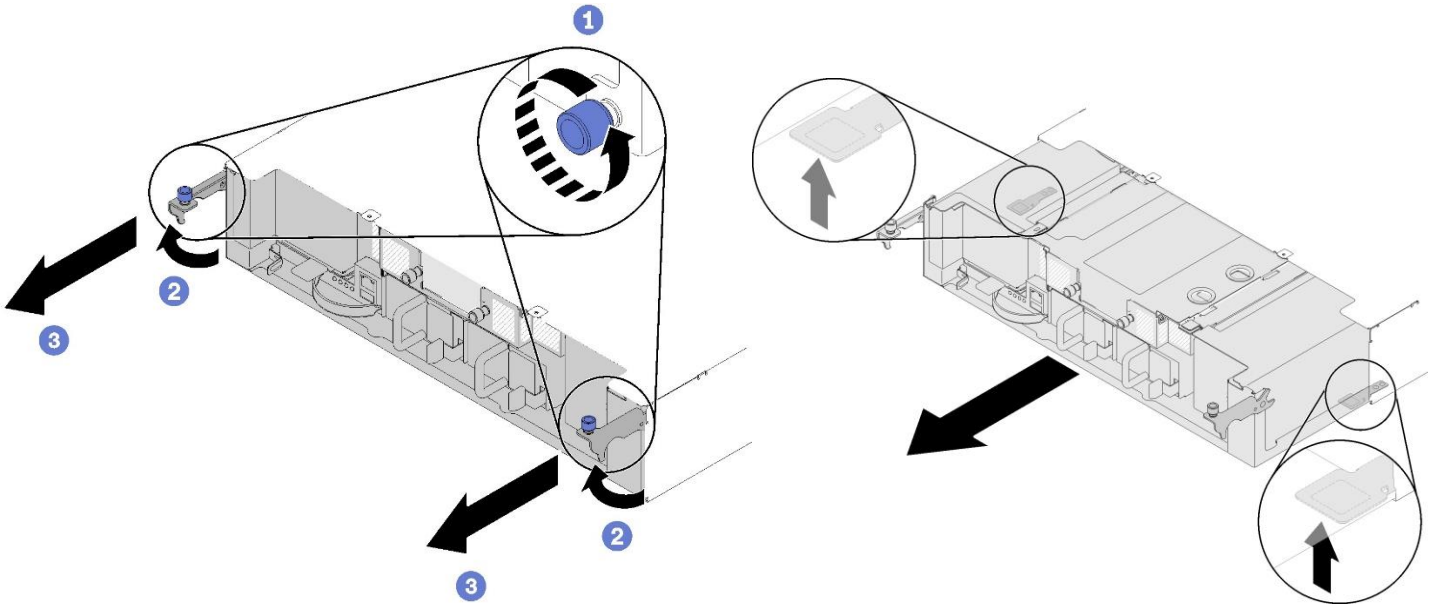

Figure 52. Removing the system shuttle

1. Turn off all compute nodes and peripheral devices through the web console. Remove all power cords.
2. Disengage all compute nodes from the system chassis by releasing and rotating the front handle in each node (see Section 3.2.1).
3. Disconnect the power cords and all external cables from the rear side of the system.
   a. If a cable management arm is installed, remove it.
4. Turn the two thumbscrews securing the system shuttle counterclockwise and lift the handles up (see Number 1).
5. Pull the handles up and firmly slide the shuttle approximately halfway out until it stops (see Number 2).
6. Push up on the two release latches located on each side of the bottom of the shuttle and finish removing the shuttle (see Number 3).

3.15.2 Removing the EIOM

Remove the EIOM by completing the following steps:

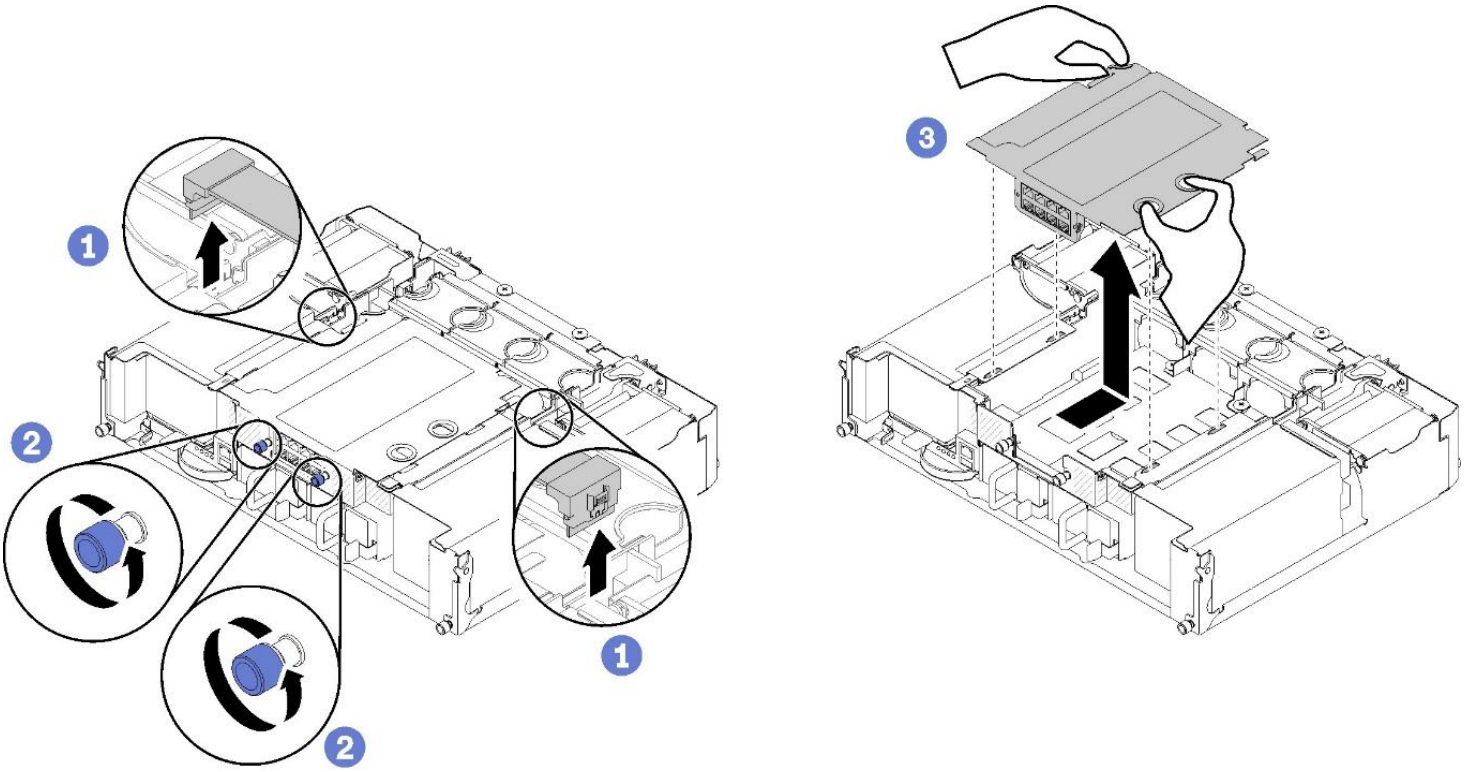

Figure 53. Removing the EIOM

1. With the system shuttle on a stable work surface, disconnect the two cables from the EIOM by depressing the connector lock and pulling straight up (see Number 1).
2. Turn the thumbscrews counterclockwise (see Number 2).
3. Grasp and push the EIOM slightly towards the front side of the system shuttle (away from the back of the shuttle).
4. Lift the EIOM up to remove it from the system shuttle (see Number 3).

3.15.3 Installing the EIOM

Install the EIOM by completing the following steps:

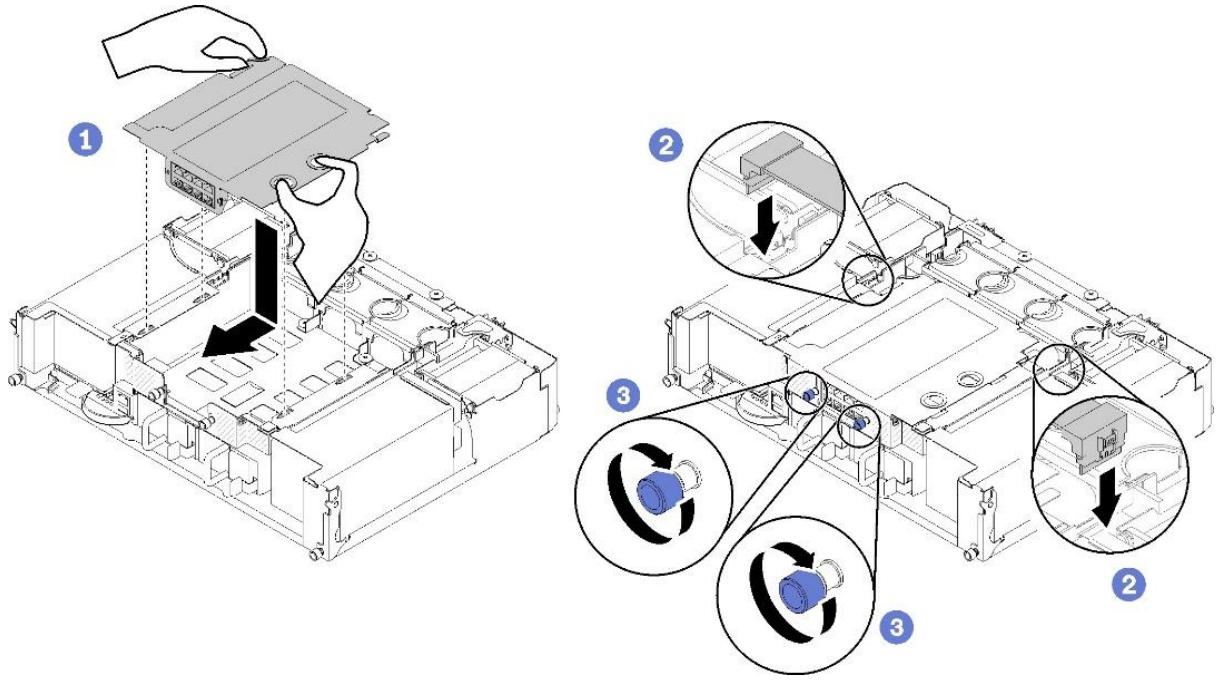

Figure 54. Installing the EIOM

1. Grasp the EIOM and align the four EIOM tabs with the slots in the system shuttle and lower the EIOM into the slots. Pull the EIOM slightly towards the rear side of the system shuttle (see Number 1).
2. Connect required cables to the EIOM by aligning the connectors and pressing down until the connectors lock into place (see Number 2).
3. Turn the thumbscrews clockwise to secure the EIOM (see Number 3).

3.15.4 Installing the System Shuttle

After installing the EIOM, reinstall the system shuttle.

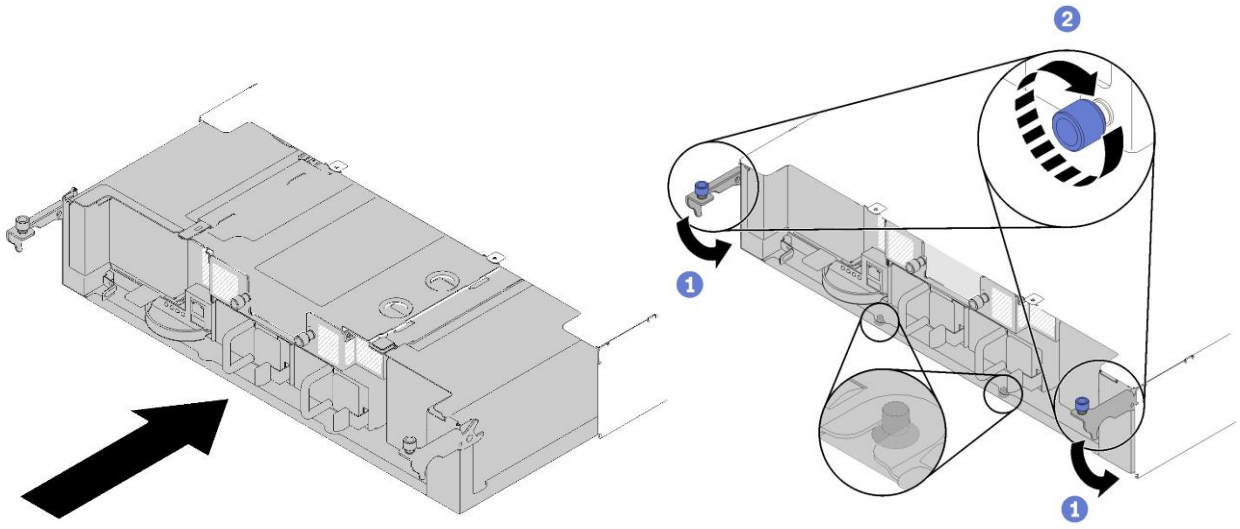

Figure 55. Reinstalling the system shuttle

1. Align the system shuttle with rails and pins
2. Slide the system shuttle into the system chassis.

Note: Make sure the pins on the system shuttle are fully seated in the system chassis slots.

3. Push the handles down and turn the thumbscrews clockwise (see Number 1).
4. If the cable management arm was removed, re-install it.
5. Reconnect the power cords and any cables that were removed.
6. Push all compute nodes back into the enclosure (see Section 3.2.2).

3.16 Replacing the PCIe* Add-in Card

The add-in cards in the system are installed in a PCIe* cassette in the rear of the system. In order to replace an add-in card, the PCIe cassette assembly must be removed and disassembled. The PCIe cassette is reused to install the new add-in card.

3.16.1 Preparing to Remove a PCIe* Add-in Card

Before removing a PCIe* Add-in Card, perform the following procedure:

1. Turn off the compute node to which the add-in card is connected.
2. Locate the add-in card on the rear side of the system.
3. Disconnect any cables attached to the add-in card.

Figure 56. PCIe* Add-in Card location, system rear

3.16.2 Removing the PCIe* Add-in Card

To remove an add-in card, first remove the PCIe* cassette assembly.

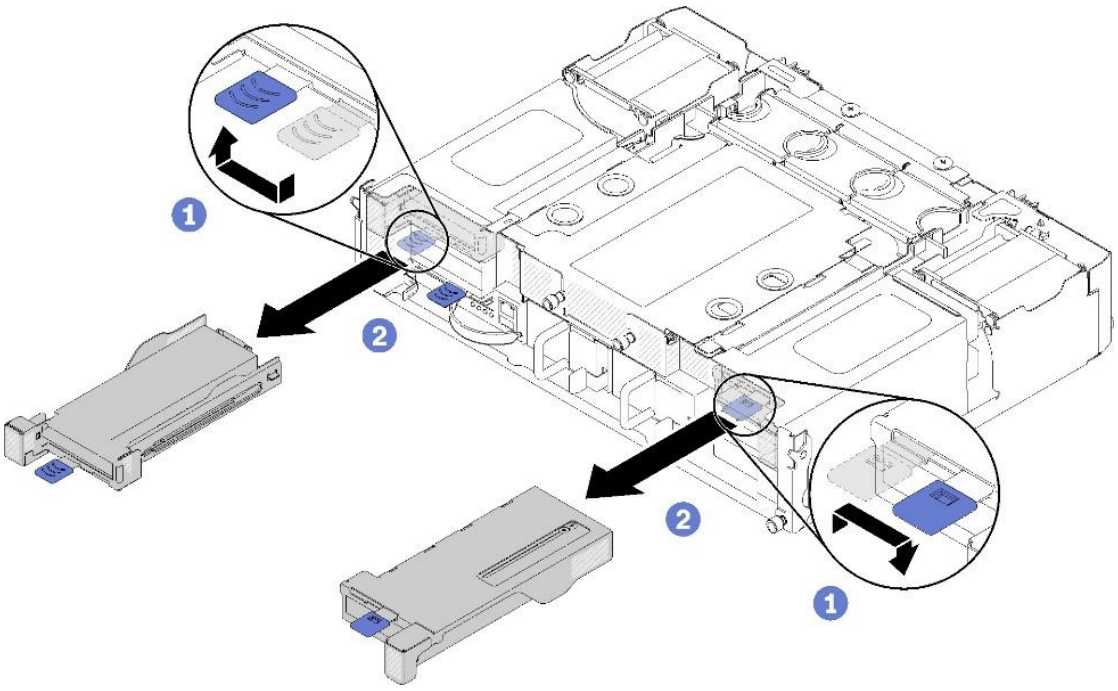

Figure 57. Removing the PCIe* cassette assembly

Remove the PCIe cassette assembly and add-in card by completing the following steps:

1. Remove the PCIe cassette assembly by sliding the release latch to the open position (see Number 1).
2. Slide the cassette out of the shuttle (see Number 2).

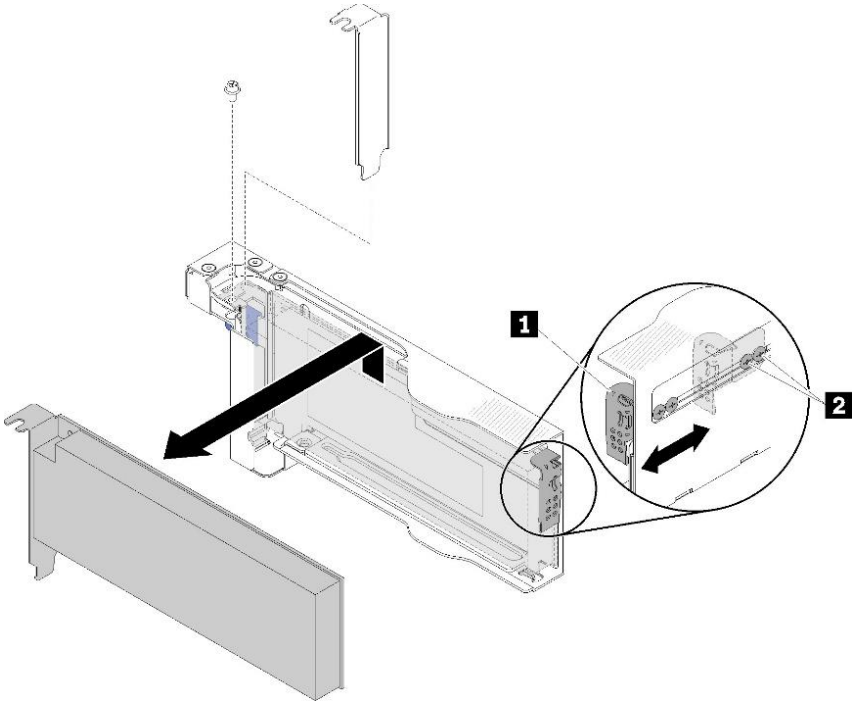

Figure 58. Removing the add-in card from the PCIe* cassette assembly

3. Remove the add-in card from the PCIe cassette assembly.

4. Remove the retaining screw (see Number 1).
5. Loosen the rear bracket retaining screws (see Number 2).
6. Slide the rear bracket away from the add-in card and carefully remove it from the cassette.

3.16.3 Installing the PCIe* Add-in Card

Install the add-in card into the cassette by completing the following steps:

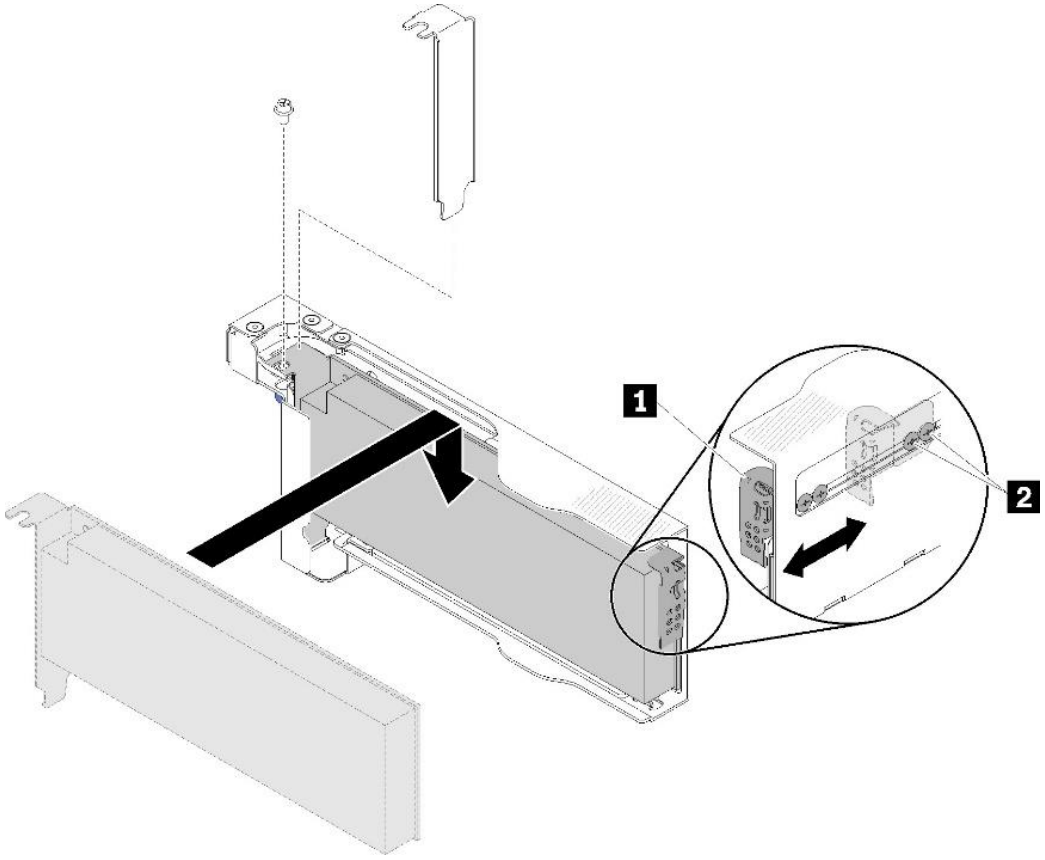

Figure 59. Installing the add-in card into the PCIe* cassette assembly

1. Carefully insert the add-in card into the adapter cassette.
2. Loosen bracket screws for about 1/4 turn to adjust the adapter bracket to secure the add-in card according to length; then tighten bracket screws (see Number 2).
3. Fasten the screw to secure the add-in card to the cassette (see Number 1).

3.16.4 Reinstalling the PCIe* Add-in Card Cassette

Reinstall the add-in card cassette into the system chassis by completing the following steps:

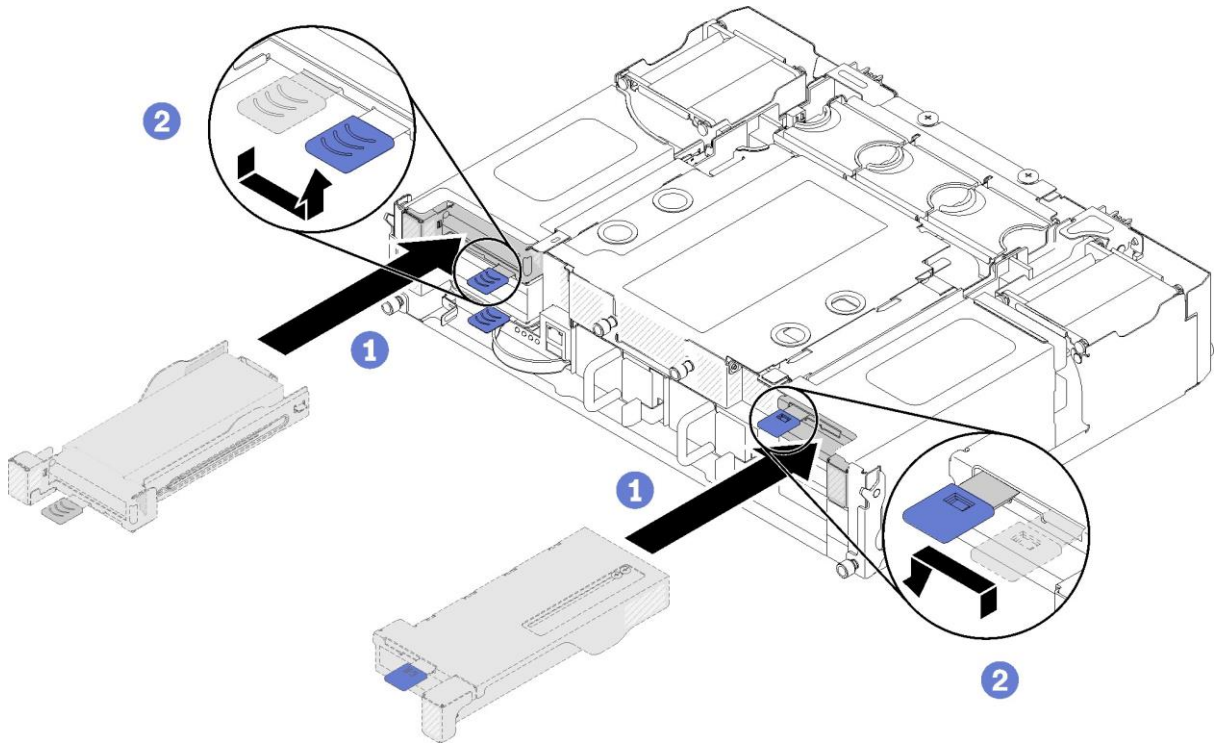

Figure 60. Reinstalling the PCIe* cassette

1. Ensure the cassette release latch is in the open position.
2. Carefully align the PCIe* cassette assembly with the guides on the shuttle.
3. Slide the cassette assembly into the shuttle until it is fully seated (see Number 1).
4. Slide the release latch to the closed and locked position (see Number 2).

3.17 Replacing the PCIe* I/O Risers (PIORs), Left and Right

The PCIe* I/O risers (PIORs), both left and right, are installed in the shuttle assembly in the rear of the system. In order to replace a PIOR, the shuttle assembly must be partially disassembled. The instructions that follow detail the procedure to remove and replace both the left and right PIORs.

3.17.1 Preparing to Remove a PIOR

Before removing a PIOR, perform the following procedure:

1. Turn off all compute nodes and peripheral devices.
2. Disengage all compute nodes from the chassis (see Section 3.1.1).
3. Disconnect the power cords and all external cables from the rear of the chassis.
4. Remove the shuttle from the chassis (see Section 3.15.1).
5. Remove the EIOM assembly from the shuttle (see Section 3.15.2).
6. Remove all PCIe* Add-in Cards (see Section 3.16.2)

3.17.2 Removing the PIOR, Left

Complete the following steps to remove the PIOR on the left side of the shuttle.

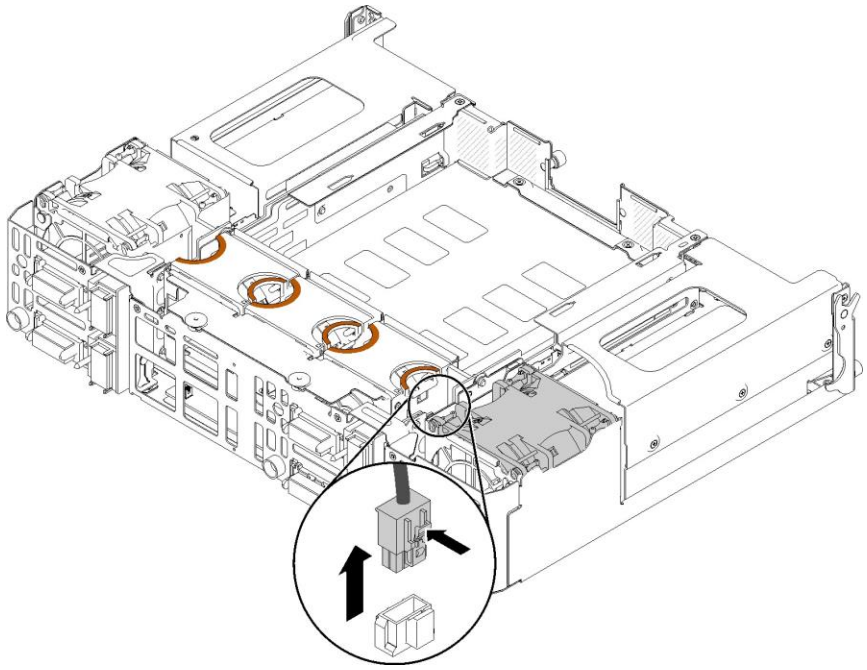

Figure 61. Fan cable disconnection from the PIOR, left

1. Disconnect the fan cable from the PIOR, left.

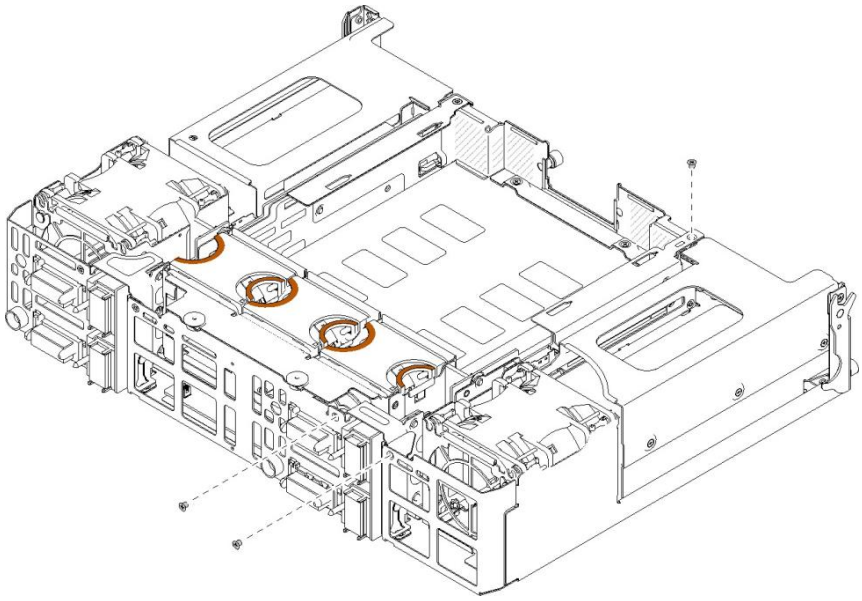

Figure 62. Screw removal

2. Remove the three screws that secure the PIOR, left to the shuttle.

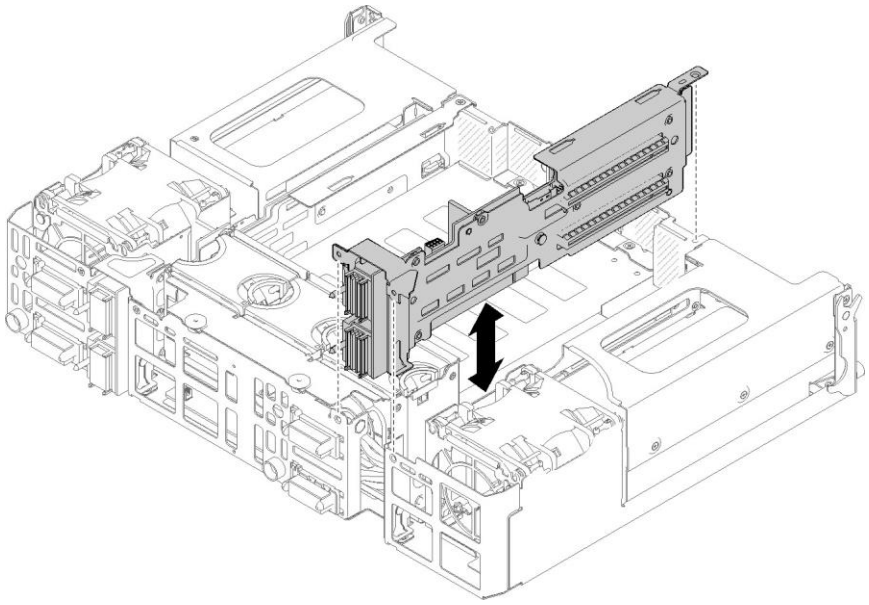

Figure 63. PIOR, left removal

3. Grasp the sheet metal that the PIOR is mounted to and lift the assembly straight up to remove it from the shuttle.

3.17.3 Removing the PIOR, Right

Complete the following steps to remove the PIOR on the right side of the shuttle.

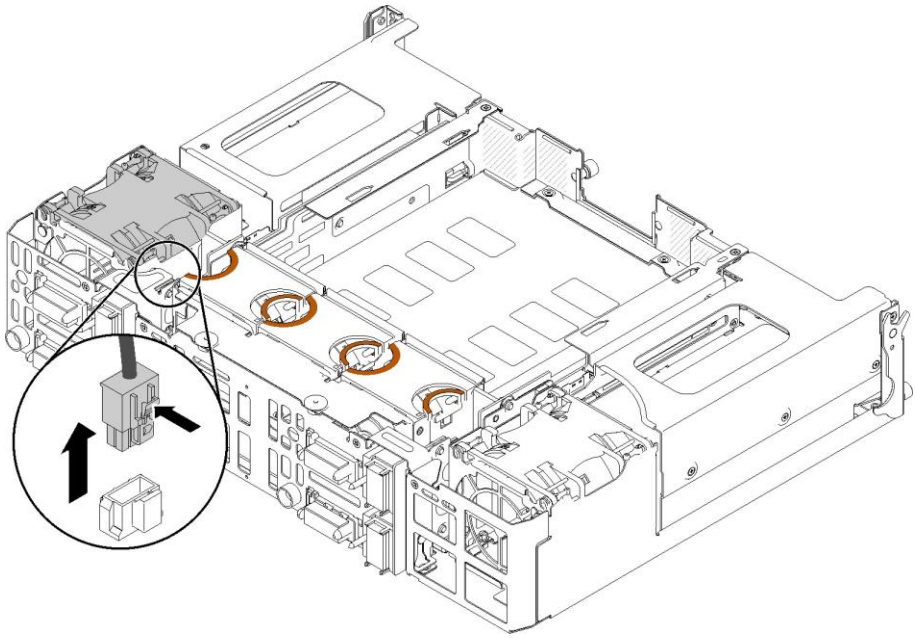

Figure 64. Fan cable disconnection from the PIOR, right

1. Disconnect the fan cable from the PIOR, right.

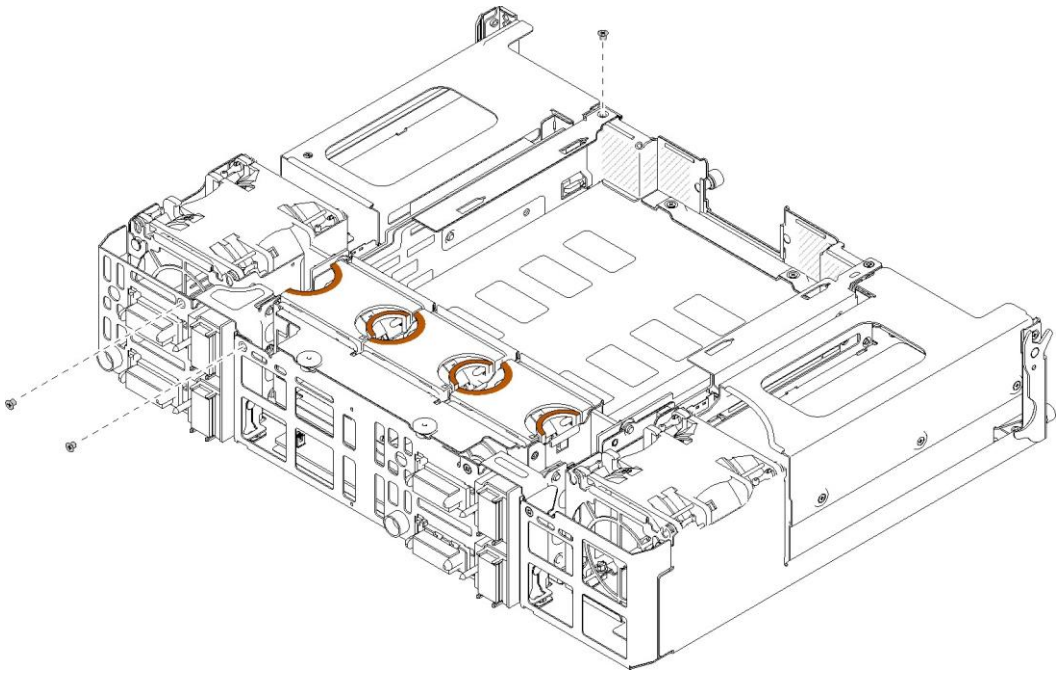

Figure 65. Screw removal

2. Remove the three screws that secure the PIOR, right to the shuttle.

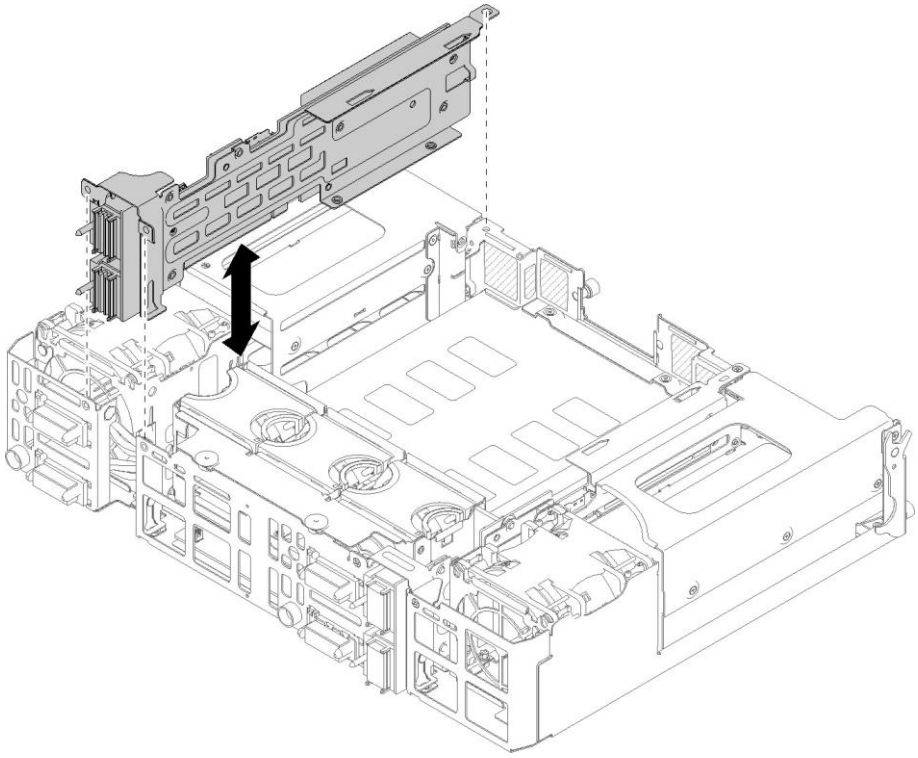

Figure 66. PIOR, right removal

3. Grasp the sheet metal that the PIOR is mounted to and lift the assembly straight up to remove it from the shuttle.

3.17.4 Installing the PIOR, Left

Complete the following steps to install the PIOR into the left side of the shuttle.

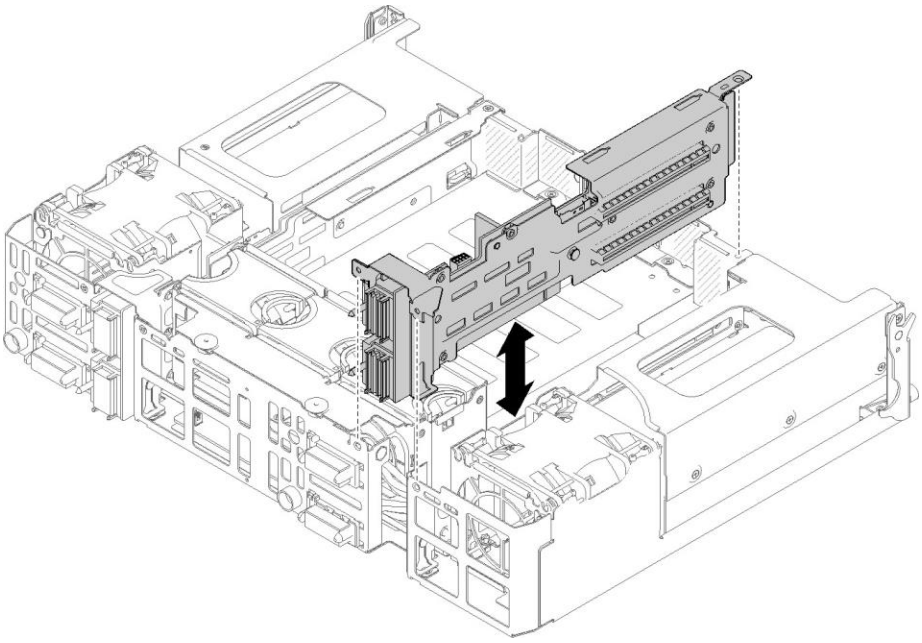

Figure 67. PIOR, left installation

1. Align the PIOR, left to the slot on the shuttle as illustrated in Figure 68 and lower it until it is securely seated in the shuttle.

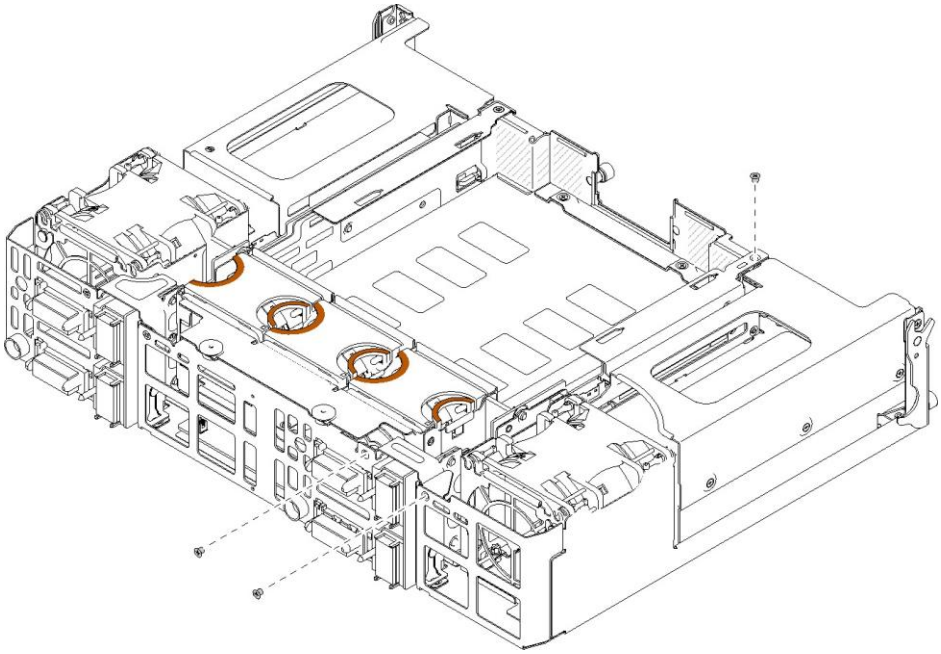

Figure 68. Securing the PIOR, left with screws

2. Secure the PIOR, left with three screws as illustrated in Figure 69.

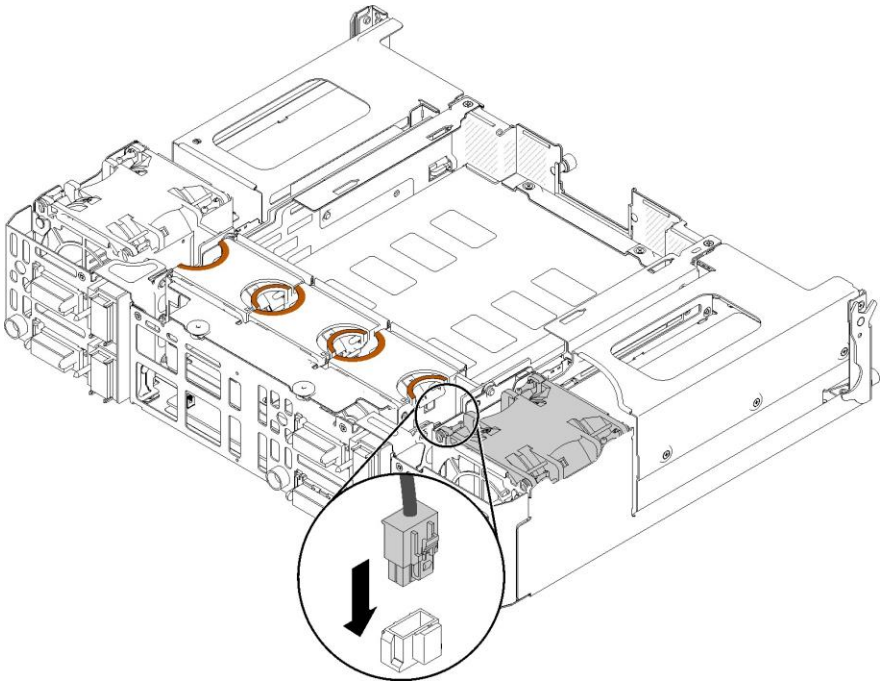

Figure 69. Fan cable connection to the PIOR, left

3. Reconnect the fan cable to the PIOR, left.

3.17.5 Installing the PIOR, Right

Complete the following steps to install the PIOR into the right side of the shuttle.

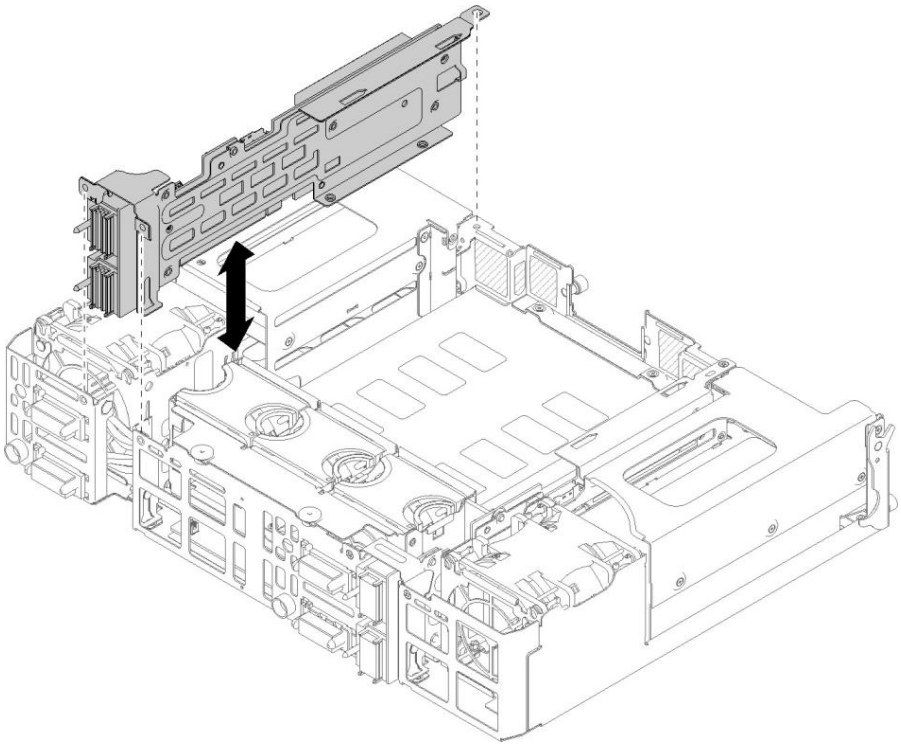

Figure 70. PIOR, right installation

1. Align the PIOR, right to the slot on the shuttle as illustrated in Figure 71 and lower it until it is securely seated in the shuttle.

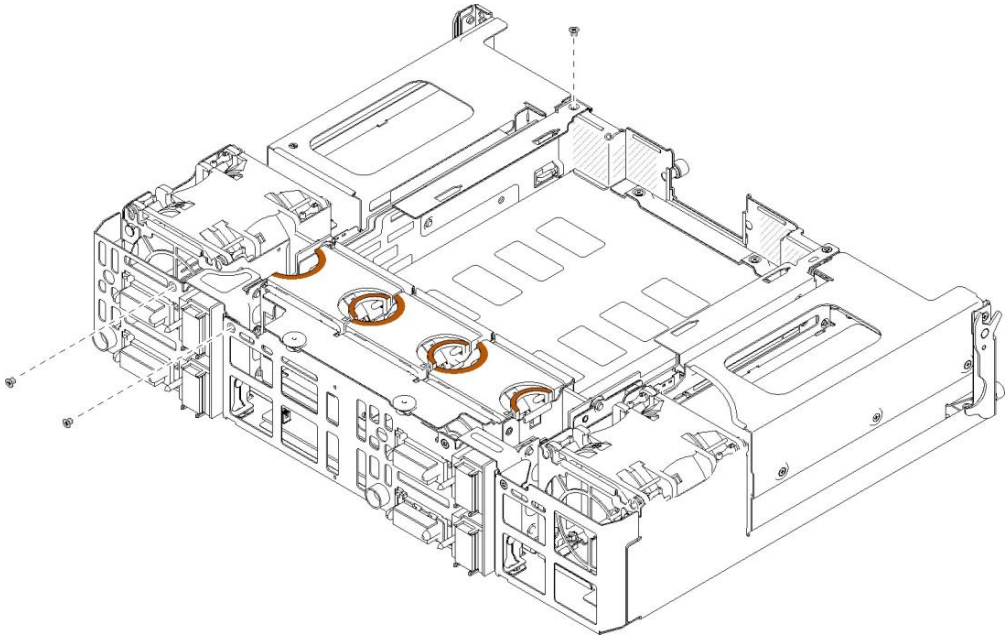

Figure 71. Securing the PIOR, right with screws

2. Secure the PIOR, right with three screws as illustrated in Figure 72.

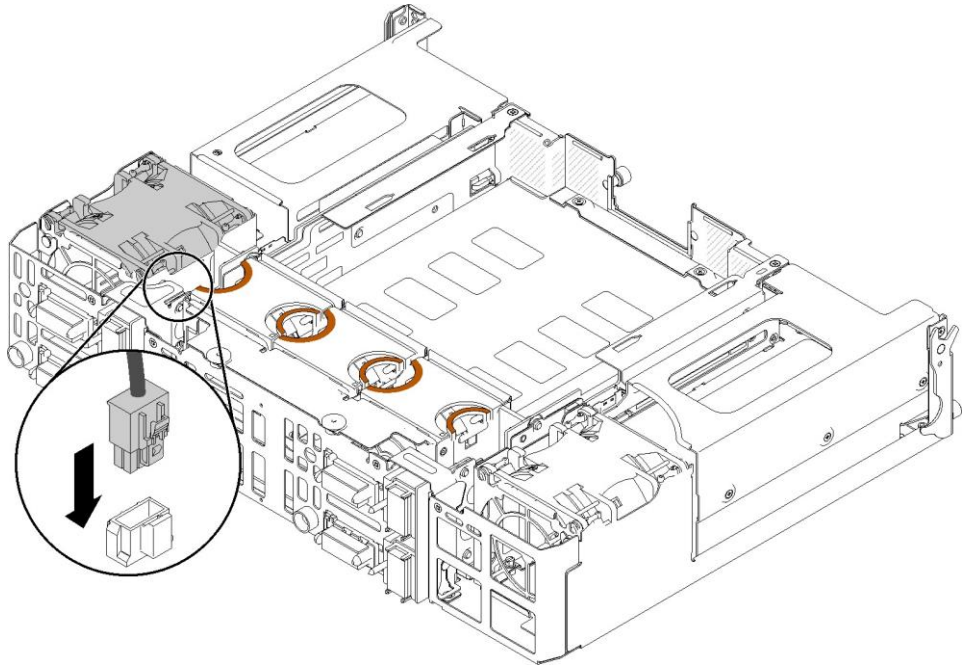

Figure 72. Fan cable connection to the PIOR, right

3. Reconnect the fan cable to the PIOR, right.

3.17.6 After Replacing a PIOR

After replacing a PIOR, complete the following steps to reinstall the shuttle and return the system to service.

1. Reinstall all the PCIe* add-in cards that were removed (see Section 3.16.5).
2. Reinstall the EIOM into the shuttle (see Section 3.15.3).
3. Reinstall the shuttle into the chassis (see Section 3.15.4).
4. Reconnect the power cords and any cables that were removed.
5. Reinstall the compute nodes into the chassis (see Section 3.1.2).
6. Power on all the compute nodes.

3.18 Replacing the Power Distribution Module (PDM)

The Power Distribution Module (PDM) field replaceable unit (FRU) consists of the shuttle sheet metal cage, four empty PCIe* cassettes, and a printed circuit board mounted under the system fans in the system shuttle assembly. Replacing the PDM consists of removing all components of the shuttle and returning the PDM board, empty PCIe cassettes, and shuttle cage.

3.18.1 Preparing to Remove the PDM

Before removing the PDM, perform the following procedure:

1. Turn off all compute nodes and peripheral devices.
2. Disengage all compute nodes from the chassis (see Section 3.1.1).
3. Disconnect the power cords and all external cables from the rear of the chassis.
4. Remove the shuttle from the chassis (see Section 3.15.1).

3.18.2 Removing the PDM

Follow these steps to remove the PDM:

1. Remove the power supply units (see Section 3.13.1)
2. Remove the PCIe* Add-in Cards in cassette (see Section 3.16.2)
3. Remove the PCIe Add-in Cards from the PCIe* Add-in Card cassettes (see Section 3.16.3)
4. Remove the SMM (see Section 3.14.1)
5. Remove the EIOM (see Section 3.15.2)
6. Remove the system fans (see Section 3.12.3)
7. Remove PIOR, Left and PIOR, Right (see Section 3.17.2 and 3.17.3)
8. Reinstall the empty PCIe Add-in Card cassettes (see Section 3.16.5)

3.18.3 Installing the PDM

Follow these steps to install the PDM, the shuttle components and the shuttle back into the system chassis and return the system to service:

1. Remove the empty PCIe* add-in card cassettes (see Section 3.16.2)
2. Install PIOR, Left and PIOR, Right (see Section 3.17.4 and 3.17.5)
3. Install the system fans (see Section 3.12.4)
4. Install the EIOM (see Section 3.15.3)
5. Install the SMM (see Section 3.14.2)
6. Install the PCIe Add-in Cards into the PCIe add-in card cassettes (see Section 3.16.4)
7. Install the PCIe Add-in Card cassettes (see Section 3.16.5)
8. Install the power supply units (see Section 3.13.2)
9. Reinstall the shuttle into the chassis (see Section 3.15.4).
10. Reconnect the power cords and any cables that were removed.
11. Reinstall the compute nodes into the chassis (see Section 3.1.2).
12. Power on all the compute nodes.

Note: When returning the PDM FRU for replacement the FRU components are the PDM board, empty PCIe* cassettes, and shuttle cage with brackets.

Appendix A. Getting Help

When encountering an issue with a server system, follow these steps to obtain support:

1. Visit the following Intel support web page: http://www.intel.com/support/

   This web page provides 24x7 support for 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, and chassis support matrix and operating systems

   — Server and chassis accessory parts list for ordering upgrades or spare parts

   — A searchable knowledge base to search for product information throughout the support site

2. For further questions, send an email to Intel's technical support center using the online form available at: http://www.intel.com/p/en_US/support/contactsupport.

3. Lastly, contact an Intel support representative using one of the support phone numbers available at: http://www.intel.com/support/feedback.htm?group=server (charges may apply).

   Intel 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: Log in to the Intel Reseller site to obtain the 24x7 number.

Warranty Information

To obtain warranty information, visit this Intel web site: http://www.intel.com/p/en_US/support/warranty.

Appendix B. Glossary

Term	Definition
AP	Application Processor
BEL	Named after Alexander Graham Bell, a logarithmic unit expressing magnitude of change in level of power, voltage, current, or sound intensity. A decibel (dB), 1/10 bel (B), measures relative power.
BMC	Baseboard Management Controller. Controls communications between the microprocessor and peripheral devices, such as keyboard, video controller, and miscellaneous functions, such as system messages. Provides basic read/write capability and usually kept as firmware (ROM-based). The system BIOS on the motherboard of a computer boots and controls the system. BIOS on a host adapter acts as an extension of the system BIOS and is stored on a flash memory chip.
BIOS	Basic Input/Output System
CA	Certificate Authority
Intel® CLI	Intel® Command Line Interface
CMM	Chassis Management Module
CMOS	Complementary Metal-Oxide Semiconductor
CPU	Central Processing Unit
DDR	Double-Data Rate
DDR4	Double-Data Rate 4. See also DDR.
DHCP	Dynamic Host Configuration Protocol
DIMM	Dual In-line Memory Module (This plug-in memory module has signal and power pins on both sides of the internal printed circuit board (front and back)).
DMI	Desktop Management Interface
DOM	Disk on Module
EFI	Extensible Firmware Interface. See also EDK.
EIOM	Ethernet I/O Module
EMI	Electromagnetic Interference
ESD	Electrostatic Discharge
FP	Front Panel
FRU	Field-Replaceable Unit
FW	Firmware
GB	Gigabyte
GBE	Gigabyte Ethernet
GUI	Graphical User Interface
GUID	Globally Unique Identifier
HPC	High Performance Computing
IDE	Integrated Drive Electronics, a disk interface standard
IFT	Intel Fabric Through
IMM	Integrated Management Module
IOM	I/O Module
IP	Internet Protocol
IPL	Initial Program Load
ISA	Instruction Set Architecture
ISTA	International Safe Transit Association
IVR	Integrated Voltage Regulator
KVM	Keyboard/Video/Mouse (Attachment mimics those devices and connects them to a remote I/O user)

LAN	Local Area Network
LED	Light-Emitting Diode
LLA	Local Link Address (i.e. IPv6 Link)
LRDIMM	Load-Reduced DIMM (memory modules have buffer registers for both address and data between SDRAM modules and the system's memory controller). See also DIMM.
MAC	Media Access Control
MB	Megabyte
MM	Millimeter
NIC	Network Interface Card
NM	Node Manager
OEM	Original Equipment Manufacturer
OFU	One-Boot Flash Update Utility
OS	Operating System
PCI	Peripheral Component Interconnect (or PCI Local Bus Standard – also called "Conventional PCI"). A local bus system designed to increase data transfers without slowing down the central processing unit (CPU).
PCIe*	Peripheral Component Interconnect Express* (an updated form of PCI offering better throughput and error management). See also PCI.
PCT	Platform Confidence Test
PDM	Power Distribution Module.
PHM	Processor Heat Sink Module
PIOR	PCIe* I/O Riser
POST	Power-on Self-Test (BIOS activity from the time the system is at Power On until the Operating System boot begins.)
PSU	Power Supply Unit
RAM	Random Access Memory. Usually synonymous with main memory.
RDIMM	Registered DIMM (also called Buffered DIMM). (Memory modules have an address buffer register between the SDRAM modules and the system's memory controller.) See also DIMM.
ROM	Read-Only Memory
RTC	Real-Time Clock
SAS	Serial Attached SCSI (High-speed serial data version of SCSI). See also SCSI.
SATA	Serial ATA (High-speed serial data version of the disk ATA interface). See also ATA.
SCA	Single Connector Attachment
SDR	Sensor Data Record
SEC	Security (Component of Intel® Platform Innovation Framework for EFI architecture).
SEL	System Event Log
SMB	Server Message Block
SMBIOS	System Management BIOS. See also BIOS.
SMM	System Management Module
SOL	Serial-over-LAN
SSD	Solid State Device
SUP	System Update Package
TCM	Trusted Cryptographic Module
TDP	Thermal Design Power
TIM	Thermal Interface Material
TPM	Trusted Platform Module
TPS	Technical Product Specification
UEFI	Unified Extensible Firmware Interface

USB	Universal Serial Bus (standard serial expansion bus meant for connecting peripherals)
UUID	Unique Universal Identifier
VID	Voltage Identification
VPD	Vital Product Data
XCC	BMC Controller