



GigaVUE-FM Hardware Appliance Guide for GFM-HW1- FM010 and GFM- HW1-FM001-HW

GigaVUE-FM

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Gigamon Inc.
3300 Olcott Street
Santa Clara, CA 95054
408.831.4000

Change Notes

When a document is updated, the document version number on the cover page will indicate a new version and will provide a link to this Change Notes table, which will describe the updates.

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About your system

The GigaVUE-FM Appliance is a 1U, dual socket rack system that supports:

- Two Intel Xeon Scalable Processors
- 16 DIMM slots
- 8 x 2.5-inch drives.
- Two redundant power supply units (PSU)

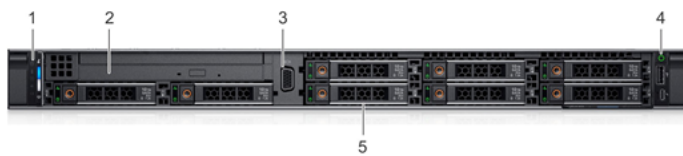
The GigaVUE-FM Appliance has two models which are as follows :


- **GFM-HW1-FM010** - This model includes a ten node license.
- **GFM-HW1-FM001-HW**- This model does not include a ten-node license.

Front View of the System

The front view of the chassis displays the following components.

8 x 2.5-inch drive system



Item	Ports, panels, and slots	Icon	Description
1	Left control panel	N/A	Contains the system health and system ID, status LED, and the iDRAC Quick Sync 2 (wireless) indicator. ● Status LED: Enables you to identify any failed hardware components. There are five status LED's and an overall system health LED (Chassis health and system ID) bar. For more information, see the Status LED indicators section.
2	Optical drive (Not Installed)	N/A	Slot for slim SATA DVD-ROM drive or DVD+/-RW drive.
3	VGA port		Enables you to connect a display device to the system.
4	Right control panel	N/A	Contains the power button, USB port, iDRAC Direct micro port, and the iDRAC Direct status LED.
5	Drive slots	N/A	Enable you to install drives that are supported on your system.

Left Control Panel View





Item	Indicator, button, or connector	Icon	Description
1	Status LED indicators	N/A	Indicate the status of the system.
2	System health and system ID indicator	<i>i</i>	Indicates the system health.

Status LED indicators

NOTE: The indicators display solid amber if any error occurs.




Table 5. Status LED indicators and descriptions

Icon	Description	Condition	Corrective Action
	Drive indicator	The indicator turns solid amber, if there is a drive error.	<ul style="list-style-type: none"> ● Check the System event log to determine if the drive has an error. ● Run the appropriate Online Diagnostics test. Restart the system, and run embedded diagnostics (ePSA). ● If the drives are configured in a RAID array, restart the system, and enter the host adapter configuration utility program.
	Temperature indicator	The indicator turns solid amber, if the system experiences a thermal error (for example, the ambient temperature is out of range or there is a fan failure).	<p>Ensure that none of the following conditions exist:</p> <ul style="list-style-type: none"> ● A cooling fan has been removed or has failed. ● System cover, air shroud, or back filler bracket is removed. ● Ambient temperature is too high. ● External airflow is obstructed.

Icon	Description	Condition	Corrective Action
	Electrical indicator	The indicator turns solid amber, if the system experiences an electrical error (for example, voltage out of range, or a failed power supply unit (PSU) or voltage regulator).	Check the System event log or system messages for the specific issue. If it is due to a problem with the PSU, check the LED on the PSU. Reseat the PSU.
	Memory indicator	The indicator turns solid amber if a memory error occurs.	Check the System event log or system messages for the location of the failed memory. Reseat the memory module.
	PCIe indicator	The indicator turns solid amber, if a PCIe card experiences an error.	Restart the system. Update any required drivers for the PCIe card. Reinstall the card.

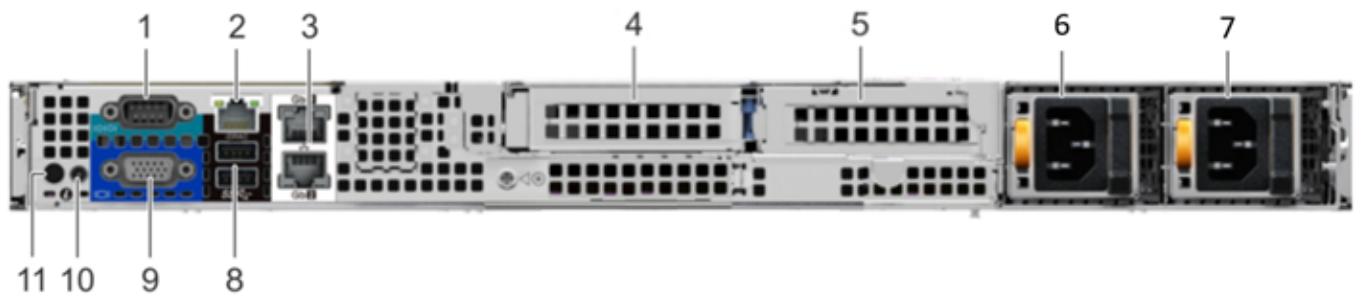
Right Control Panel View




Table 8. Right control panel



Item	Indicator or Button	Icon	Description
1	Power button		Indicates if the system is powered on or off. Press the power button to manually power on or off the system. Press the power button to gracefully shut down an ACPI-compliant operating system.
2	USB port		The USB ports are 4-pin, 2.0- compliant. This port enables you to connect USB devices to the system.
3	iDRAC Direct LED	N/A	The iDRAC Direct LED indicator lights up to indicate that the iDRAC Direct port is actively connected to a device
4	iDRAC Direct port (Micro-AB USB)		The iDRAC Direct (Micro- USB) AB USB) port enables you to access the iDRAC Direct (Micro-AB) features.

Back View of the System

The back view displays the features available on the back of the system.



Item	Ports, panels, or slots	Icon	Description
1	Serial port		Use the serial port to connect a serial device to the system.
2	iDRAC9 dedicated network port	N/A	Use the iDRAC9 dedicated network port to securely access the embedded iDRAC on a separate management network.
3	Ethernet ports (2)		Use the Ethernet ports to connect Local Area Networks (LANs) to the system.
4	Low profile riser right slot	N/A	Use the card slot to connect half-height PCIe expansion card on low profile riser.
5	Low profile riser left slot	N/A	Use the card slot to connect half-height PCIe expansion card on low profile riser.
6	Power supply unit (PSU)	N/A	For more information about the PSU configurations, see the <i>PowerEdge R440 Technical Specs</i> .
7	Power supply unit (PSU)	N/A	For more information about the PSU configurations, see the <i>PowerEdge R440 Technical Specs</i> .
8	USB 3.0 port (2)		Use the USB 3.0 port to connect USB devices to the system. These ports are 4-pin, USB 3.0-compliant.

Item	Ports, panels, or slots	Icon	Description
9	VGA port		Use the VGA port to connect a display to the system.
10	System status indicator cable port	N/A	Enables you to connect the status indicator cable and view system status when the CMA is installed.
11	System identification button		<p>Press the system ID button:</p> <ul style="list-style-type: none"> ● To locate a particular system within a rack. ● To turn the system ID on or off. To reset iDRAC, press and hold the button for more than 15 seconds. <p>NOTE: To reset iDRAC using system ID, ensure that the system ID button is enabled in the iDRAC setup.</p>

LCD Panel

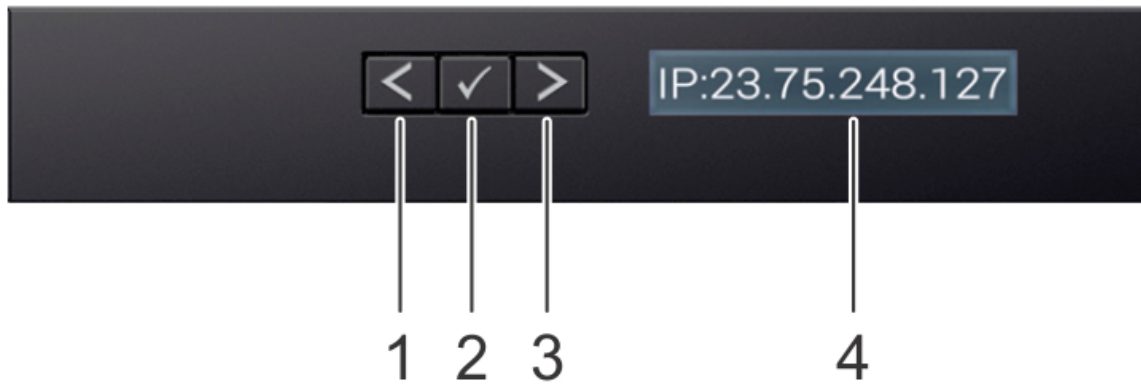
The LCD panel provides system information, status, and error messages to indicate if the system is functioning correctly or requires attention. The LCD panel can also be used to configure or view the system's iDRAC IP address.

The LCD panel is available only on the optional front bezel. The optional front bezel is hot pluggable. The statuses and conditions of the LCD panel are outlined here:

- The LCD backlight is white during normal operating conditions.
- When the system needs attention, the LCD backlight turns amber, and displays an error code followed by descriptive text.

NOTE: If the system is connected to a power source and an error is detected, the LCD turns amber regardless of whether the system is turned on or off.




- When the system turns off and there are no errors, LCD enters the standby mode after five minutes of inactivity. Press any button on the LCD to turn it on.
- If the LCD panel stops responding, remove the bezel and reinstall it.
- The LCD backlight remains off if LCD messaging is turned off using the iDRAC utility, the LCD panel, or other tools.



Item	Button or display	Description
1	Left	Moves the cursor back in one-step increments.
2	Select	Selects the menu item highlighted by the cursor.
3	Right	Moves the cursor forward in one-step increments. During message scrolling: <ul style="list-style-type: none"> ● Press and hold the right button to increase scrolling speed. ● Release the button to stop. The display stops scrolling when the button is released. After 45 seconds of inactivity, the display starts scrolling.
4	LCD display	Displays system information, status, and error messages or iDRAC IP address.

Viewing Home screen

The Home screen displays user-configurable information about the system. This screen is displayed during normal system operation when there are no status messages or errors. When the system turns off and there are no errors, LCD enters the standby mode after five minutes of inactivity. Press any button on the LCD to turn it on.

1. To view the **Home** screen, press one of the three navigation buttons (Select, Left, or Right).
2. To navigate to the **Home** screen from another menu, complete the following steps:
 - a. Press and hold the navigation button until the up arrow  is displayed.
 - b. Navigate to the **Home** icon  using the up arrow .
 - c. Select the **Home** icon.
 - d. On the **Home** screen, press the **Select** button to enter the main menu.

Setup menu

NOTE: When you select an option in the Setup menu, you must confirm the option before proceeding to the next action.

Option	Description
iDRAC	Select DHCP or Static IP to configure the network mode. If Static IP is selected, the available fields are IP, Subnet (Sub), and Gateway (Gtw). Select Setup DNS to enable DNS and to view domain addresses. Two separate DNS entries are available
Set error	Select SEL to view LCD error messages in a format that matches the IPMI description in the SEL. This enables you to match an LCD message with an SEL entry. Select Simple to view LCD error messages in a simplified user-friendly description.
Set home	Select the default information to be displayed on the Home screen. See View menu for the options and option items that can be set as the default on the Home screen.

View menu

NOTE: When you select an option in the View menu, you must confirm the option before proceeding to the next action.

Option	Description
iDRAC	IP Displays the IPv4 or IPv6 addresses for iDRAC9. Addresses include DNS (Primary and Secondary), Gateway, IP, and Subnet (IPv6 does not have Subnet).
MAC	Displays the MAC addresses for iDRAC, iSCSI, or Network devices.
Name	Displays the name of the Host, Model, or User String for the system.
Number	Displays the Asset tag or the Service tag for the system
Power	Displays the power output of the system in BTU/hr or Watts. The display format can be configured in the Set home submenu of the Setup menu.
Temperature	Displays the temperature of the system in Celsius or Fahrenheit. The display format can be configured in the Set home submenu of the Setup menu.

Configuring the GigaVUE-FM Appliance

This section provides the procedures for making the physical connections to the appliance and how to access and configure the GigaVUE-FM application after the appliance is powered up.

Connecting to the Network

After installing the GigaVUE-FM Appliance, you will need to connect to your management switch or switches to access to the GigaVUE-FM application and use iDRAC for managing the appliance remotely.

Prerequisites

- Ethernet cables

Connecting to GigaVUE-FM

1. Locate Ethernet connector 1 on the rear panel and plug in the Ethernet cable. This is used for eth0.
2. Connect the other end of the cable to the management switch.
3. Locate the iDRAC port on the back panel and plug in the second Ethernet cable.
4. Connect the second Ethernet cable to the same management switch. You can connect to a different management switch if you want to access iDRAC from a different subnet.
5. Connect the peripherals to the appliance if you plan to configure the GigaVUE-FM application locally.
6. Power on the appliance manually if you will use the peripherals connected to the appliance to configure the GigaVUE-FM application.
7. Remote power on can be done through iDRAC.

Configuring to the GigaVUE-FM

You can configure the GigaVUE-FM application that is pre-installed on the appliance by connecting peripherals to the appliance and powering it on. Once the appliance is powered on you can log in to GigaVUE-FM and run the configuration jump-start program.

NOTE: The USB ports on the front panel of the GigaVUE-FM Appliance are disabled.

1. Connect the mouse and key board to the USB ports on rear panel.
2. Connect the monitor to the video connector on the rear panel.

NOTE: Use this procedure if you want to configure the GigaVUE-FM application directly from the appliance.

Powering on the Appliance Manually

The following procedure is used to manually power on the appliance. You can also power on the appliance through iDRAC.

1. Remove the front bezel.
2. Press the power button located in the upper-left corner of the front panel.
3. Replace the front bezel.
4. Log.

Logging in to the GigaVUE-FM application from the appliance

1. Power on the appliance. See [Powering on the Appliance Manually](#). The appliance will boot up and load the software. When it is completed, you will see the login screen for GigaVUE-FM.
2. At the login prompt, enter admin.
3. When the system prompts for a password, enter admin123A!!

The system will automatically run the configuration jump-start script the first time you log in.

Accessing the Appliance Remotely

You can manage the GigaVUE-FM appliance remotely through iDRAC. iDRAC is always available where there is power to the system. This allows you to power on/off the host and connect through the Integrated Remote Access Controller UI with a Web browser. Before you can access the appliance remotely, you need the iDRAC IP address.

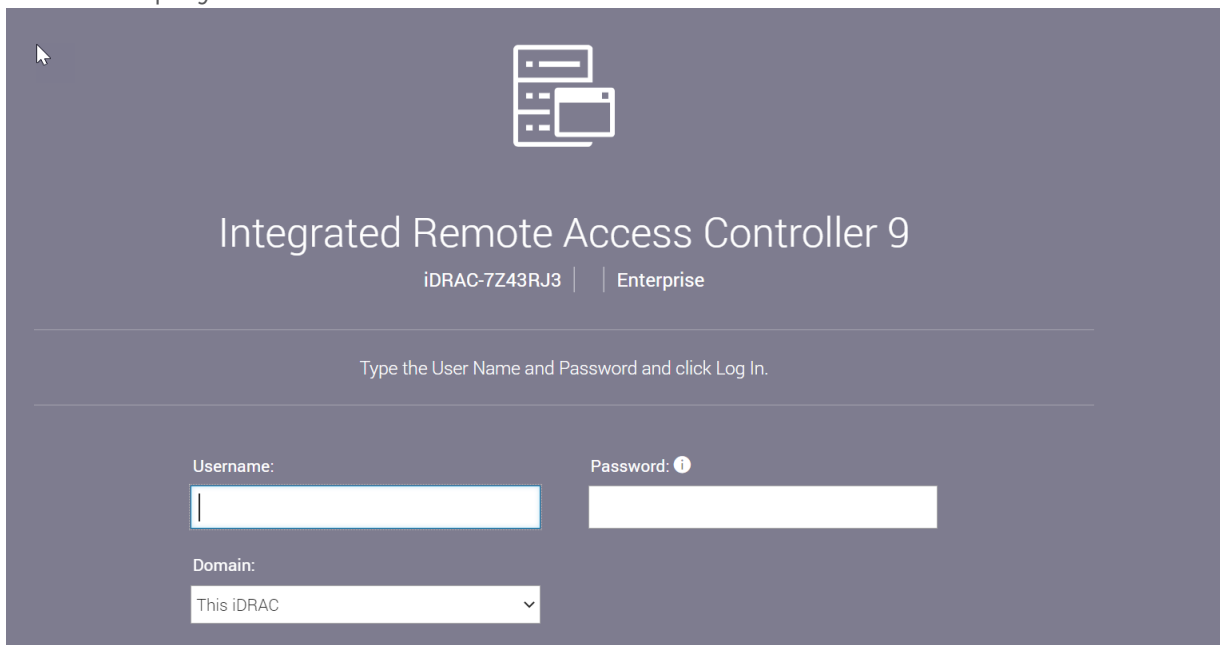
1. Locate the LCD display on the front panel.
2. Click the Select button.
3. When you see the Home icon, click the Right button to select the View menu.
4. Click the Select button to choose the iDRAC menu.

5. Click the Select button to choose IPv4.
6. Record the IPv4 address.

Powering on the Appliance through iDRAC

The following is the procedure for powering on the appliance through the iDRAC connect. This allows you to power on/off the device remotely.

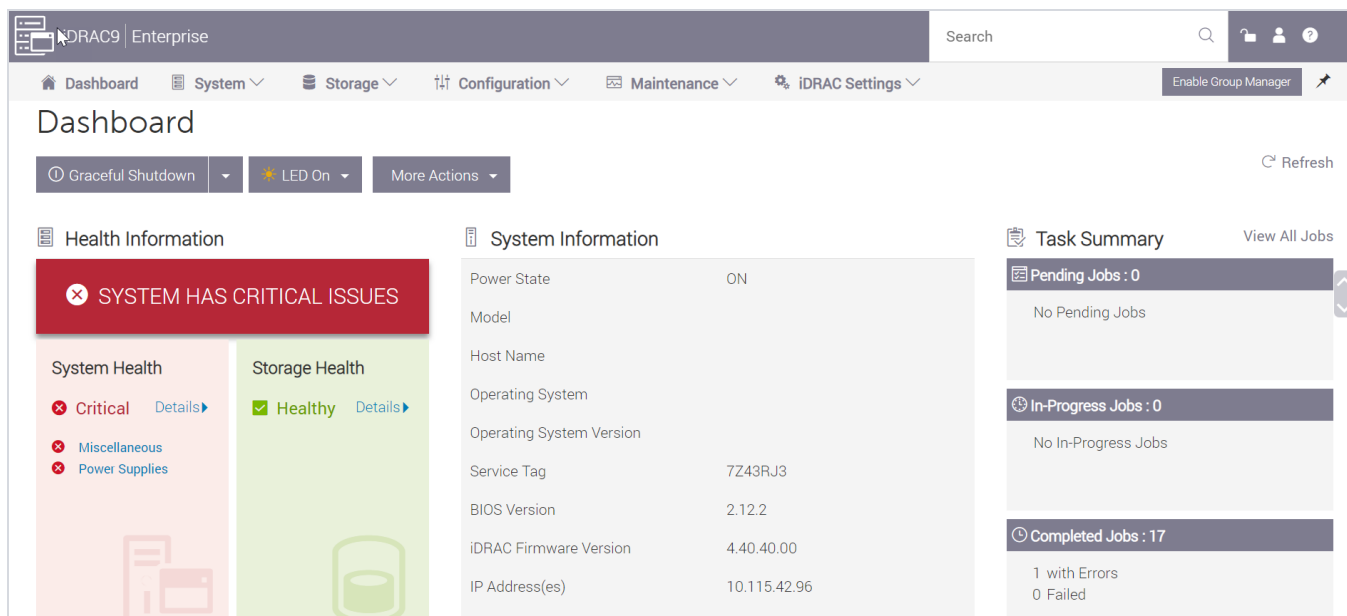
1. Log in to the iDRAC interface.
 - a. Open a Chrome browser and enter the IP address in the URL field. The following screen displays in the browser.



- b. Enter the default username and password (root, admin123A!).
- c. Click Submit.
- a. Enter the default username and password (root, admin123A!).

NOTE: It is highly recommended that you change the default password.

2. The Integrated Remote Access Controller displays.



Running Configuration Jump Start

This section describes the configuration jump-start script that runs the first time you log in to GigaVUE-FM. After running the configuration script, you can log in to the GigaVUE-FM UI from a Web browser or a remote console such as TeraTerm or PuTTY to use the command line interface (CLI) to re-run jump-start or use other CLI commands.

The following are the steps in the configuration jump-start and an explanation of each step.

- **Hostname?**

Provide a unique hostname for GigaVUE-FM. The hostname may contain letters, numbers, periods (.), and hyphens (-), but may not begin with a hyphen. No other special characters are permitted. This will also appear as part of the command line prompt after jump-start completes.

- **Use DHCP on eth0 interface?**

The default for this step in the configuration is no. If you answer yes, GigaVUE-FM acquires the DHCP address from the local server.

- **Primary IP address and masklen?**

Select Yes or No to mask you Primary address.

- **Default gateway?**

Provide the default gateway address for reaching the management domain.

- **Primary DNS server?**

Provide the default gateway address for reaching the management domain.

- **Domain name?**

Enter a domain name to use instead of the IP address to open the GigaVUE-FM login page. For example, fmappliance.com.

- **Admin password?**

This sets the password for the admin user in GigaVUE-FM, which you will use to log in to for the first time. The default is admin123A!. It is highly recommended that you change the default password.

- **Additional Domain Name Server IP addresses?**

Enter the address of any additional name servers required. This must be provided as a set of IP addresses with spaces. For example, 10.10.10.10 11.11.11.11.

- **Additional DNS Domains?**

You can add multiple DNS domains by entering the names configuration with spaces. For example, abc.com def.com.

- **Enable NTP?**

If you respond yes to this option, you will be asked to provide the address of an NTP server and its NTP version number.

When you have completed the steps in the configuration jump-start, you can change any of the configurations by entering the step number. Otherwise, press enter to complete the configuration.

After configuration is complete, you can log in to the GigaVUE-FM application by going to your Web browser and entering the IP address specified during configuration jump-start in the URL field. When the GigaVUE-FM login page opens, enter admin in the user name field and the password you entered in step 7 of the configuration jump-start.

Upgrade GigaVUE-FM

This section describes how to upgrade GigaVUE-FM to the latest revision in either a VMware ESXi host or in Microsoft HyperV environment.



Before you upgrade, read [Important GigaVUE-FM Upgrade Guidance](#) for special guidelines and caveats related to upgrading from specific versions of GigaVUE-FM.

At a high level, the upgrade process involves the following steps:

1. Before starting an upgrade to GigaVUE-FM, get the latest image, upgrade information, and Release Notes from the [Software & Release Notes](#) download page (login required) on the Gigamon Community.
2. Be sure to review the *GigaVUE Release Notes* for the latest release before performing the upgrade.
 - Ensure your environment supports any specified system requirements.
 - Check the minimum memory requirements in the new release as they may change between releases.
3. Once the GigaVUE-FM image is obtained, download it to a server within your environment. This must be a server that your current GigaVUE-FM instance can access to upload it.
4. (**Important**) Save your current configuration using the facilities provided by the hypervisor before upgrading.
5. Verify that the GigaVUE-FM instance time is set correctly to ensure accuracy of the trending data that is captured.
6. Perform the upgrade using either the Command-Line Interface (CLI) or the GigaVUE-FM User Interface (UI).
7. After upgrading your GigaVUE-FM instance, upgrade your GigaVUE-VM deployments. Refer to “*Bulk Upgrading GigaVUE-VM Nodes*” in the *GigaVUE Cloud Suite for VMware—GigaVUE V Series Guide*.

Upgrade Methods:

- [Upgrade GigaVUE-FM from the GigaVUE-FM CLI](#)
- [Upgrade GigaVUE-FM from the UI](#)

Supported Upgrade Paths for GigaVUE-FM

The supported upgrade paths for GigaVUE-FM is as follows:

- 5.8.01 > 5.10.02 > 5.11.xx*
- 5.9.xx > 5.11.xx*

- 5.10.xx > 5.11.xx* or 5.12.xx**
- 5.11.xx > 5.12.xx* or 5.13.xx**
- 5.12.xx > 5.13.xx** or 5.14.xx**
- 5.13.xx > 5.14.xx** or 5.15.xx**
- 5.14.xx > 5.15.xx** or 5.16.xx**
- 5.15.xx > 5.16.xx** or 6.0.xx**
- 5.16.xx > 6.0.xx** or 6.1.xx**
- 6.0.xx > 6.1.xx*

*Password change is mandated for all passwords during upgrade.

**Password change is only mandated if the current password is using the default password.

GigaVUE-FM Upgrade Rules and Notes

- **Best Practice:** Always upgrade your GigaVUE-FM instance before upgrading the GigaVUE-OS nodes. You can upgrade the attached nodes from the device or from GigaVUE-FM. The latter is recommended. Refer to “*Upgrading Software on a GFM-HW1-FM010, GFM-HW1-FM001-HW Node or a Cluster from GigaVUE-FM*” in the *GigaVUE Fabric Management Guide*.
- **If upgrading from GigaVUE-FM versions lower than 5.10.xx:** You cannot directly upgrade your GigaVUE-FM instance to release 5.10.00 from a release prior to 5.8.xx. If your current version of GigaVUE-FM is 5.7.xx or lower and you want to upgrade to software version 6.1.xx, you must first migrate to GigaVUE-FM 5.10.xx and then upgrade to 5.11.xx.

NOTE: For instructions on how to migrate refer to [Migrate GigaVUE-FM](#) in GigaVUE 5.10 Documentation.

- **If upgrading from GigaVUE-FM versions lower than 5.5.00:** While upgrading from any version lower than 5.5.00, an association of more than one VPort to the same GigaSMART group needs to be removed for any existing GTP GigaSMART operation.
- **If upgrading from GigaVUE-FM versions lower than 5.4.00:** Be aware of the minimum memory requirement changes between releases. Earlier releases specified 4GB of memory for the OVA template; whereas versions after 5.4.00 require 8GB and versions after 5.7.00 require 16GB. If the existing virtual or physical hardware running GigaVUE-FM is configured with less memory than required, then increase the amount of memory available to the GigaVUE-FM machine. Refer to GigaVUE-FM Memory and CPU Requirements in the *GigaVUE Release Notes* for additional details.

Important GigaVUE-FM Upgrade Guidance

To upgrade GigaVUE-FM, the recommended procedure is to back up your current configuration and perform the pre-upgrade checks (memory requirements, the maximum number of images) before installing the image. You can upgrade via the GigaVUE-FM GUI or CLI. It is recommended that you plan your upgrade before performing any upgrade steps. Refer [Supported Upgrade Paths for GigaVUE-FM](#) for details on upgrade path.

Best Practice: Before performing an upgrade, in addition to taking a backup of GigaVUE-FM, also take a Sysdump, which provides valuable configuration information that is not captured in the backup. You can use the Sysdump after the upgrade to troubleshoot any upgrade-related issues with your configurations.

GigaVUE-FM Migration Guidance

GigaVUE-FM v5.8.01 introduced several significant changes that included improvements in usability and performance. These changes involved upgrading and replacing databases and changing the underlying operating system. For this reason, when upgrading from any pre-5.8.xx version of FM to version 5.8.xx or above, you must first migrate your existing configurations and data such as audit logs, events, syslogs, and statistics from your current pre-5.8.xx GigaVUE-FM version to GigaVUE-FM v6.1.00.

Special migration steps and supported upgrade paths are provided under [Migrate GigaVUE-FM](#) in the [5.10 Documentation](#). After GigaVUE-FM v5.10.xx, migration is no longer needed when upgrading to future versions. For supported upgrade paths requiring a special migration step, see [Supported GigaVUE-FM Migration and Upgrade Paths](#).

Upgrade GigaVUE-FM from the GigaVUE-FM CLI

The following steps describe how to upgrade an existing GigaVUE-FM deployment to the current release.

1. Verify that only three images are present on the GigaVUE-FM server.
2. Download the new image into GigaVUE-FM using either HTTP, HTTPS, FTP, TFTP, SCP, or SFTP.
3. Install the new image.
4. Change boot partition.
5. Upgrade GigaVUE-VM (Optional).

Notes:

- It is important that you must be a user with `fm_super_admin` role when upgrading the image on the existing GigaVUE-FM.
- GigaVUE-FM backup and restore files use a text based format; binary backups or restore on physical nodes are not supported. For binary backups, you must use the CLI commands rather than GigaVUE-FM. For more information about the CLI commands, refer to the *GigaVUE-OS CLI Reference Guide*.
- In your commands use the actual file names of the image(s) you are fetching, managing, or deploying.

Step 1: Verify that only three images are present on GigaVUE-FM server

1. To begin an upgrade, open a SSH session and log into GigaVUE-FM.
2. Check the number of images currently available for installation with the following command from the GigaVUE-FM CLI:

```
$ fmctl image list
```

Important: If there are three images listed in the **Images available to be installed** section of the **fmctl image** list output, Gigamon recommends you to delete existing older images. GigaVUE-FM will display a warning if you attempt to fetch a fourth image.

3. To delete an existing image from the server use the following command:

```
$ fmctl image delete <Filename>
```

4. Go to [Step 2: Fetch the latest release of GigaVUE-FM](#).

Step 2: Fetch the latest release of GigaVUE-FM

Gigamon provides an FTP site where the new release image file resides. To fetch the latest release, do the following:

1. Locate the image file for the new release.
2. Copy the image to your file server.
3. Use the **fmctl image fetch** command to retrieve the software image from your file server. The CLI shows you the progress of the image fetch with a series of hash marks, returning you to the system prompt when complete.

NOTE: The **image fetch** command supports the use of HTTP, HTTPS, FTP, TFTP, SCP, or SFTP for the transfer of images. The examples are provided to show the syntax only. In your commands, use your actual login credentials and the actual name of the image file you wish to fetch.

- a. The following command uses SCP to retrieve the **gigamon-gigavue-fm-6.1 image** image from the image server with the IP address using login and password.

```
fmctl image fetch <download URI> [<filename>]
```

```
$ fmctl image fetch scp://user:password@<IP address>/gigamon-gigavue-fm-6.1.img
```

- b. The following command uses FTP to retrieve the same image using login and password.

```
$ fmctl image fetch ftp://user:password@<IP address>/gigamon-gigavue-fm-6.1.img
```

- c. The following command uses TFTP to retrieve the same image without using a password but using a DNS server instead of an IP address for the download server.

```
$ fmctl image fetch tftp://myserver.gigamon.com/tftpboot/gigamon-gigavue-fm-6.1.img
```

Specify the base directory when using TFTP.

NOTE: Fetching the image using TFTP is time consuming, due to the size of the image and the inherent slowness of TFTP. For better performance, use SCP or HTTP to fetch the image.

4. Go to [Step 3: Install the latest release of the GigaVUE-FM](#).

Step 3: Install the latest release of the GigaVUE-FM

Use the **image install** command to install the downloaded image file. When running the following command, the process will first verify that the filename used for the image is suitable for installation prior to installing the image. For example, to install the image downloaded in the previous step and provide the location for boot location for installation.

To check current boot location:

```
$ fmctl image show
```

This command lists the current boot partition, which can be 1 or 2. Use 2 if the current partition is 1 and vice e versa.

```
$fmctl image install <Filename> <Boot location>
```

Step 4: Change the boot partition

Set the image you just installed to boot next with the following command. This ensures that at the next boot the latest image will be picked up.

```
$ fmctl image boot next
```

GigaVUE-FM will reboot with the next boot image and GigaVUE-FM will be upgraded.

Step 5: Upgrade GigaVUE-VM (Optional)

After upgrading GigaVUE-FM, you must also upgrade any deployed GigaVUE-VM. Otherwise, maps may not work and the GigaVUE-VM will be unreachable. For information about upgrading GigaVUE-VM, refer to the “*Bulk Upgrading GigaVUE-VM Nodes*” section in the *GigaVUE Cloud Suite for VMware—GigaVUE V Series Guide*.

Upgrade GigaVUE-FM from the UI

This section describes the steps to upgrade GigaVUE-FM from the UI. You can upgrade by using an image that is located on an external image server, or you can use GigaVUE-FM as the image server.

Keep in mind the following rules and notes before you upgrade GigaVUE-FM from the UI:

- When using the GigaVUE-FM UI to upgrade GigaVUE-FM, you can only upgrade to the currently available version or to the next version. You cannot downgrade.
- When using the Firefox browser, clear the cache before upgrading to prevent issues with the browser.
- When upgrading GigaVUE-FM to the latest image file, the upgrade operation will fail if GigaVUE-FM already has three image files. Delete the unused image files before proceeding to download a new image file.

NOTE: You can enable auto-purge of GigaVUE-FM images using an API. Contact Gigamon Technical Support for assistance.

- Starting from software version 5.15.00, subsequent GigaVUE-FM upgrade operation to higher versions deletes the upgraded GigaVUE-FM image file irrespective of the completion status. For example, when upgrading from 5.15.00 to 5.16.00, irrespective of whether the upgrade process fails or succeeds, GigaVUE-FM deletes the 5.16.0.0 image file at the end of the upgrade process.


Upgrade from External Image Server

This section provides the steps for upgrading the GigaVUE-FM from an image stored on an external server. The image can be transferred from the server to the GigaVUE-FM using either SCP or TFTP file protocols.

To upgrade with an image stored on an external image server, do the following:

1. Upload the image to the external image server to make it available to GigaVUE-FM.
To obtain software images, register on the [Gigamon Customer Portal](#) and download the software.
2. Add the image server to GigaVUE-FM. This stores the credentials, image file name, and IP address of the server on GigaVUE-FM.

To add the image server:

- a. On the left navigation pane, click .
- b. Select **System** on the left navigation panel and go to **Images > External Servers**. The External Servers page appears.
- c. Click **Add**. The Add External Server page appears.

- d. On the Images Server page, specify the following:
 - An alias to help identify the image server.
 - The host IP address of the server.
 - The protocol to use for the download: SCP or TFTP.
 - The user name and password if you selected SCP. They are not needed for TFTP.
- e. Click **Save**.

The External Server page displays the newly added external server. From the **Admin** drop-down list in the top right corner of the window, select **Upgrade** to open the FM Image Upgrade page as shown in the following figure.


Software Upgrade

Image File

Select the file server where you have uploaded the image file.

Image Server:

Image File Path: /<image path>/<image name>

To monitor the progress and status of the upgrade, click  “GigaVUE Administration Guide”.

3. On the FM Image Upgrade page, click on the Image Server field and select the server added in [Step 2](#).
4. In the Image File Path, enter the image path and filename on the external file server.
5. Upgrade any deployed GFM-HW1-FM010,GFM-HW1-FM001-HW -VMs.

After upgrading GigaVUE-FM, you must also upgrade any deployed GFM-HW1-FM010,GFM-HW1-FM001-HW -VMs. Otherwise, maps may not work and the GFM-HW1-FM010,GFM-HW1-FM001-HW -VMs will be unreachable. For information about upgrading GFM-HW1-FM010,GFM-HW1-FM001-HW -VM, refer to the “*Bulk Upgrading GigaVUE-VM Nodes*” section in the *GigaVUE Cloud Suite for VMware—GigaVUE V Series Guide*.

Upgrade with GigaVUE-FM as the Image Server

This section provides the steps for upgrading GigaVUE-FM when GigaVUE-FM is used as the file server instead of an external server.


Upgrading from GigaVUE-FM 5.6.01 to 5.7.xx.00 or 5.7.01 via an internal image will not work because internal server storage does not function during the upgrade procedure. Alternatively, you can upgrade using an external image server or the GigaVUE-FM CLI or you can use the GigaVUE-FM internal storage to store the GigaVUE-FM image, and point to it as if it were an external server as follows :

1. Add the GigaVUE-FM 5.7 image under the GigaVUE-FM internal image server (/config/gigamon/imagesRepo).
2. Configure the GigaVUE-FM external server with the GigaVUE-FM IP address.
3. Initiate the upgrade process, select External Image Server, and then specify the path to the GigaVUE-FM Image file that you added in step 1 (/config/gigamon/imagesRepo/fma5700.img).

To upgrade a GigaVUE-FM using internal image files, do the following:

1. Download the images from the Gigamon website and place them where they can be available for uploading to GigaVUE-FM.

To obtain software images, register on the [Gigamon Customer Portal](#) and download the software.

2. Upload the images file to GigaVUE-FM.
 - a. On the left navigation pane, click  and select to **System > Images > Internal Image Files**.
 - b. On the Internal Image File page, click **Upload**.
 - c. Click **Browse** to locate the image file.
 - d. Click **OK** to upload the file. The page displays the progress of the upload.

After the upload completes, you can see the GigaVUE-FM image to use for the upgrade on the Internal Images Files page.

3. Click the **Admin** drop-down list on the top right of the window and select **Upgrade**.
4. On the FM Image Upgrade page, click in the **Image Server** field and select **Internal Image Server**.

Software Upgrade

Image File

Select the file server where you have uploaded the image file.

Image Server:

Version:


Image File:

- From the **Version** drop-down list, select the version to which you are upgrading.

NOTE: You can only upgrade to another instance of the current version or the immediate next version. Downgrading to a lower version is not supported through the UI.

- Click **Upgrade**.

NOTE: When you change the IP address of the GigaVUE-FM instance using the jump-start configuration, the internal database and the in-memory caches of the GigaVUE-FM instance are not updated. The Database continues to have the IP address of the old GigaVUE-FM, and the image upgrade using the internal server option does not work. To fix this, you must restart the GigaVUE-FM instance after upgrade.

On the left navigation pane, click  , to monitor the progress and status of the upgrade and select **Events** on the left navigation pane. Also, email notifications are sent if email notifications have been configured.

After upgrading GigaVUE-FM, you must also upgrade any deployed GigaVUE-VMs. Otherwise, maps may not work and the GigaVUE-VMs will be unreachable. For information about upgrading GigaVUE-VM, refer to the “*Bulk Upgrading GigaVUE-VM Nodes*” section in the *GigaVUE Cloud Suite for VMware—GigaVUE V Series Guide*.

NOTE: If you are using FireFox, clear the cache before upgrading to prevent issues with the browser.

How to Use the Snapshot Feature

Follow the steps below to upgrade to the current release version of GigaVUE-FM using the snapshot feature.



A note about upgrading from very old versions of GigaVUE-FM:

- This procedure is only valid for upgrading from GigaVUE-FM v3.0 and above. For upgrades from pre-3.0 releases, review the GigaVUE-FM v3.0 User's Guide and upgrade to release GigaVUE-FM v3.1.
- You cannot directly upgrade from a pre-3.3 releases to the current release. You can only upgrade from GigaVUE-FM v3.3 or v3.4 release.

1. Prior to upgrading, ensure that the available **memory size is at least 8GB** prior to upgrading to the new GigaVUE-FM release. If the available memory size is less than 8GB, it will cause out of memory issues. Also, at least 2 vCPU are required.
2. When upgrading from v3.1, it's a good idea to use the vSphere client's **Snapshot** feature to record the current state of the GigaVUE-FM virtual machine. Steps to use **Snapshot** feature are as follows:
 - a. Log into the vSphere client and navigate to the Datacenter or Cluster level where the GigaVUE-FM installation is located.
 - b. Right-click the GigaVUE-FM entry in the vSphere client and select the **Take Snapshot** option.

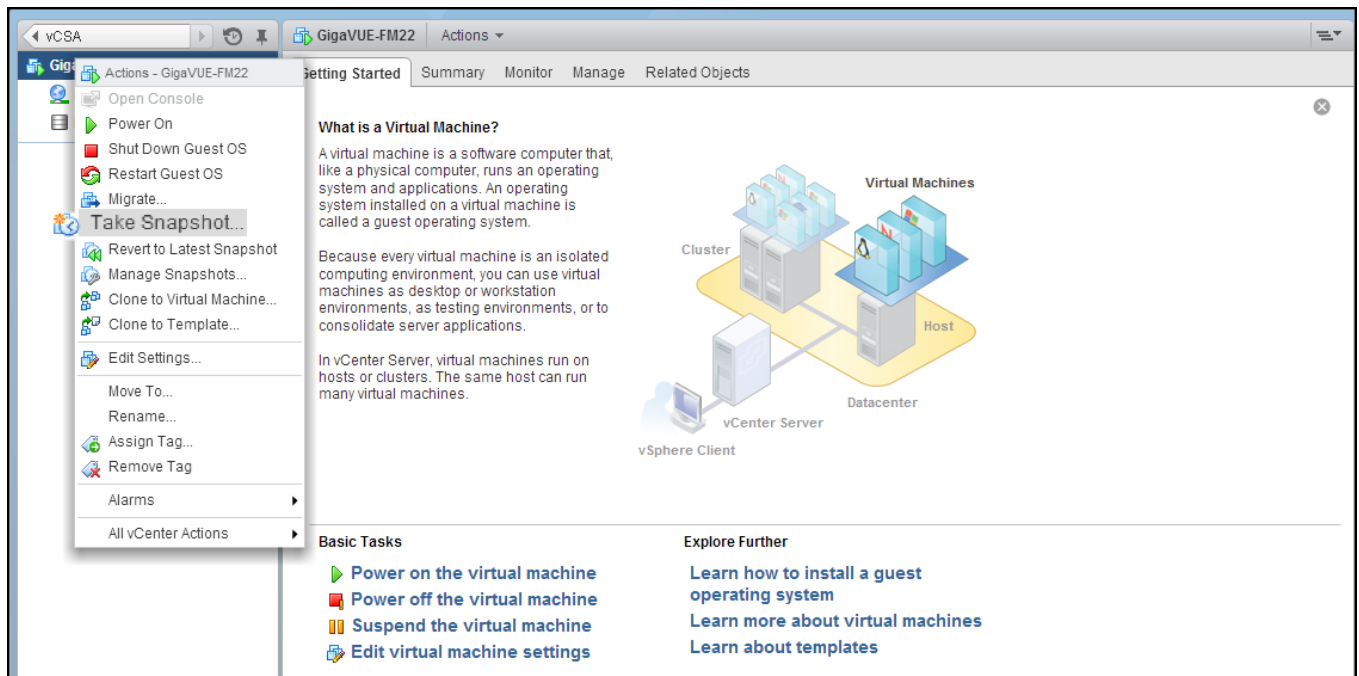


Figure 1 “Take Snapshot” Command to Preserve Current Settings Prior to Upgrade

- c. Follow the system prompts to record a snapshot of GigaVUE-FM’s current state.

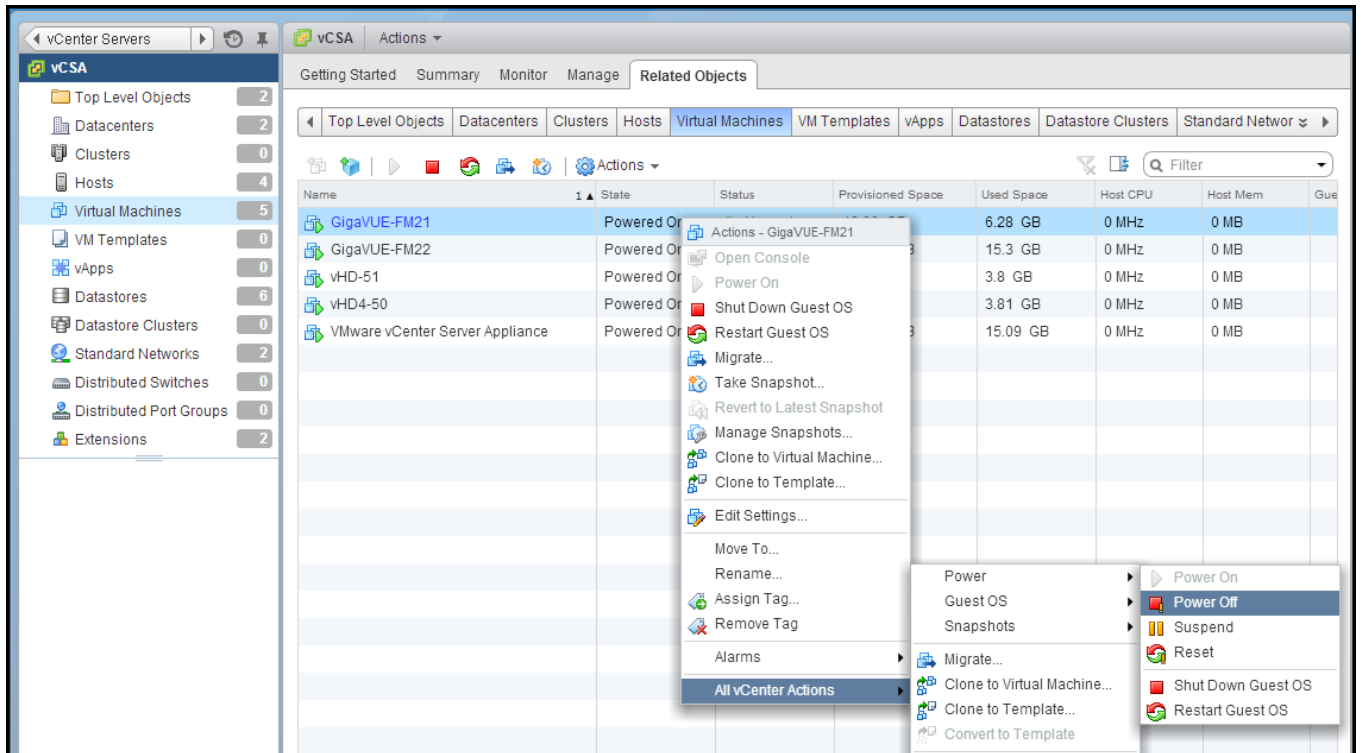


Figure 2 Power Off Command

Installing and Removing System Components

Safety instructions

NOTE: Whenever you need to lift the system, get others to assist you. To avoid injury, do not attempt to lift the system by yourself.

WARNING: Opening or removing the system cover while the system is powered on may expose you to a risk of electric shock.

CAUTION: Do not operate the system without the cover for a duration exceeding five minutes. Operating the system without the system cover can result in component damage.

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

NOTE: It is recommended that you always use an antistatic mat and antistatic strap while working on components inside the system.

CAUTION: To ensure proper operation and cooling, all bays in the system and system fans must be always populated with a component or a blank.

Before working inside your system

1. Follow the safety guidelines listed in Safety instructions.
2. Turn off the system, including all attached peripherals.
3. Disconnect the system from the electrical outlet and disconnect the peripherals.
4. Remove the system cover.

After working inside your system

1. Follow the safety guidelines listed in Safety instructions.
2. Install the system cover.
3. Reconnect the peripherals and connect the system to the electrical outlet.

4. Turn on the attached peripherals and then turn on the system.

Recommended tools

You need the following tools to perform the removal and installation procedures:

- Key to the bezel lock. The key is required only if your system includes a bezel.
- Phillips #1 screwdriver
- Phillips #2 screwdriver
- Torx #T30 screwdriver
- Torx #T8 screwdriver
- Wrist grounding strap

Front Bezel (Optional)

This describes the procedure to install and remove the optional Front Bezel.

Removing the front bezel

The procedure to remove the front bezel with and without the LCD panel is the same.

Follow the safety guidelines listed in [Safety instructions](#).

1. Unlock the bezel by using the bezel key.
2. Press the release button, and pull the left end of the bezel.
3. Unhook the right end, and remove the bezel.

Installing the front bezel

The procedure to install the front bezel with and without the LCD panel is the same.

Follow the safety guidelines listed in [Safety instructions](#).

1. Locate and remove the bezel key.

NOTE: The bezel key is part of the LCD bezel package.

2. Align and insert the tabs on the bezel into the slots on the system.
3. Press the bezel until the button clicks in place.
4. Lock the bezel by using the key.

System cover

This describes the procedure to install and remove the System Cover.

Removing the system cover

- Follow the safety guidelines listed in [Safety instructions](#).
- Turn off the system, including any attached peripherals.
- Disconnect the system from the electrical outlet and disconnect the peripherals.

Follow the below steps to remove the System Cover.

1. Using a 1/4 inch flat head or a Phillips #2 screwdriver, rotate the latch release lock counter clockwise to the unlocked position.
2. Lift the latch till the system cover slides back and the tabs on the system cover disengage from the guide slots on the system.
3. Hold the cover on both sides, and lift the cover away from the system.



Installing the system cover

- Follow the safety guidelines listed in [Safety instructions](#).
- Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.

Follow the below steps to install the System Cover:

1. Align the tabs on the system cover with the guide slots on the system.
2. Push the system cover latch down.

The system cover slides forward, the tabs on the system cover engage with the guide slots on the system and the system cover latch locks into place.

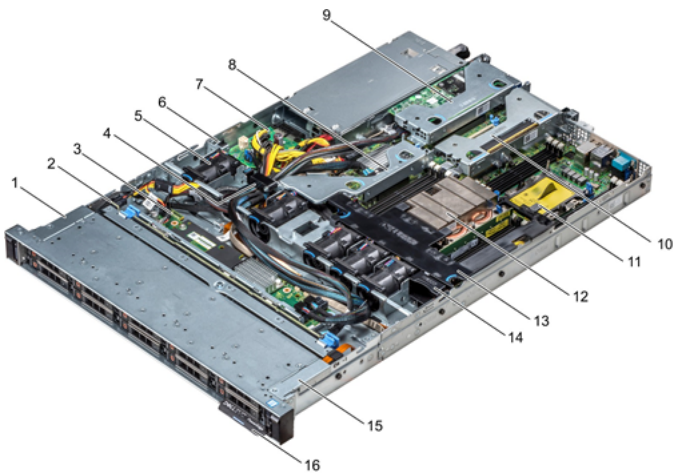
3. Using a 1/4 inch flat head or Phillips #2 screwdriver, rotate the latch release lock clockwise to the locked position.



- Reconnect the peripherals and connect the system to the electrical outlet.
- Turn on the system, including any attached peripherals.

Inside the System

Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Read and follow the safety instructions that are shipped with your product.



1. left control panel cable cover

2. hard drive backplane

3. backplane expander board

4. cabling latch

5. air shroud

6. intrusion switch

7. power interposer board

8. internal expansion riser

9. low profile expansion riser 1

10. low profile expansion riser 2

11. processor blank

12. heat sink

13. air shroud

14. cooling fan blank

15. left control panel cable cover

16. information tag

Backplane Cover

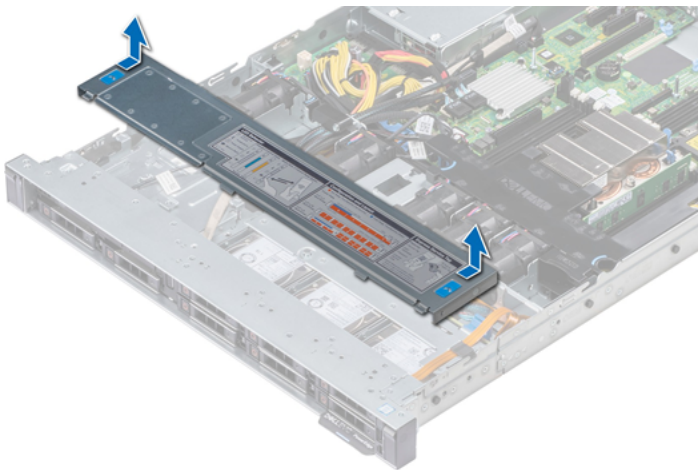
This describes the procedure to install and remove the Backplane Cover.

Removing the backplane cover

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove the system cover.

Follow the below steps to remove the Backplane Cover.

1. Slide the backplane cover in the direction of the arrows marked on the backplane cover.
2. Lift the backplane cover away from the system.

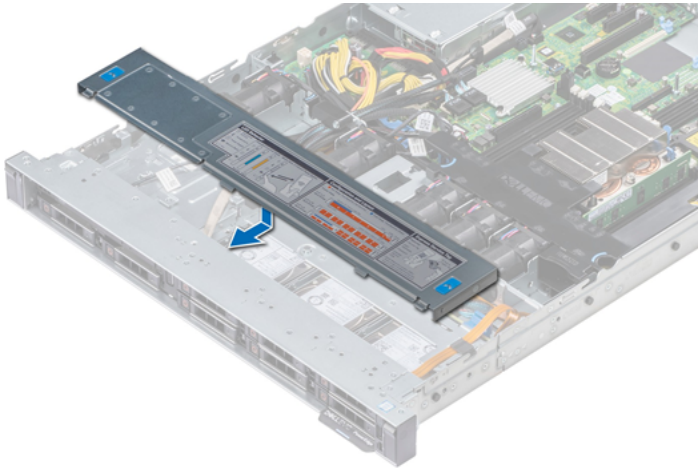


Installing the backplane cover

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Install the system cover.

Follow the below steps to install the Backplane Cover.

1. Align the tabs on the backplane cover with the guide slots on the system.
2. Slide the backplane cover toward the front of the system until the cover locks into place.



Follow the procedure listed in [After working inside your system](#).

Air Shroud

This describes the procedure to install and remove the Air Shroud.

Removing the air shroud

CAUTION: Never operate your system with the air shroud removed. The system may get overheated quickly, resulting in shutdown of the system and loss of data.

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).

Follow the below steps to remove the Air Shroud:

Holding the blue touch points, lift the air shroud away from the system.



- If applicable, install the air shroud.
- Follow the procedure listed in [After working inside your system](#).

Installing the air shroud

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- If applicable, route the cables inside the system along the system wall and secure the cables by using the cable latch.

Follow the below steps to install the Air Shroud:

1. Align the tabs on the air shroud with the slots on the system.
2. Lower the air shroud into the system until it is firmly seated. When firmly seated, the memory socket numbers marked on the air shroud align with the respective memory sockets.



Follow the procedure listed in [After working inside your system](#).

Cooling Fans

This describes the procedure to install and remove the Cooling Fan.

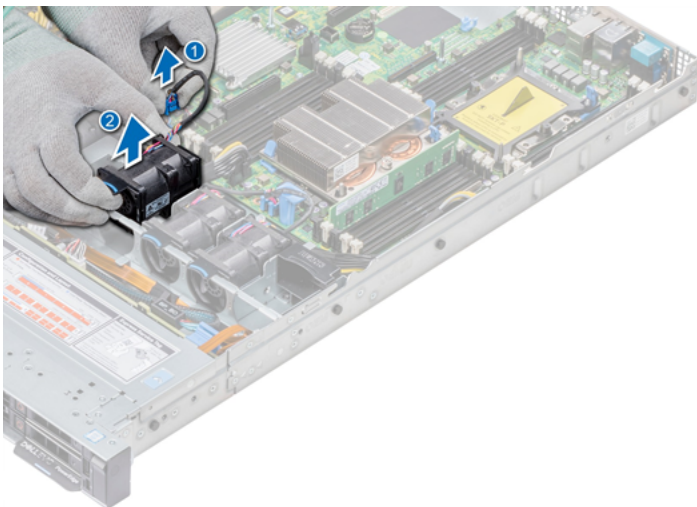
Removing the Cooling Fan

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove the air shroud.
- Remove the internal riser.
- Disconnect the fan cable from the system board.
- Move the cables out of the way to access the cooling fan cable connector on the system board.

Follow the below steps to remove the Cooling Fan:

1. Press the tabs on the side of the cable connector to disconnect the cable from the connector on the system board.

NOTE: Ensure that you disconnect the fan 1 cable from the power interposer board. Ensure that you note the routing of the cables as you remove them from the system board.



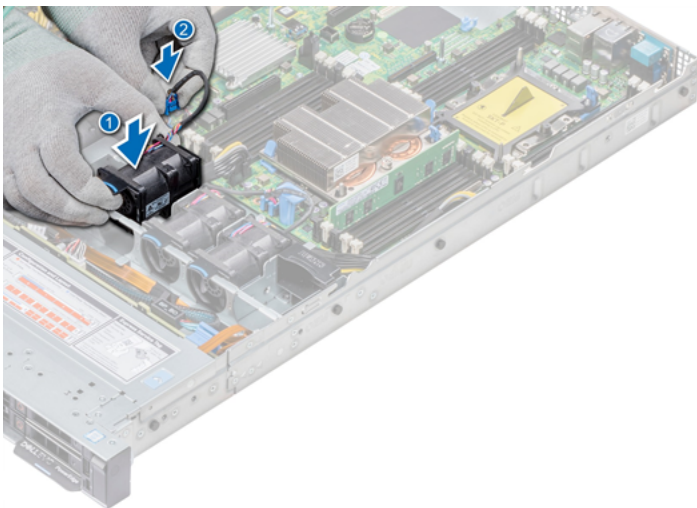
2. Lift the fan out holding the blue touch point.

Installing Cooling Fan

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove the air shroud.
- Remove the internal riser.
- Remove the power cable.
- Move the cables out of the way to access the cooling fan cable connector on the system board.

Follow the below steps to install the Cooling Fan:

1. Holding the blue touch point, place the cooling fan into the cooling fan cage.
2. Route the cooling fan cable and connect it to the connector on the system board.



After installing the Cooling Fan ensure the following:

1. Install the internal riser.
2. Connect the power cable.
3. Ensure all the cables are routed correctly.
4. Install the air shroud.
5. Follow the procedure listed in [After working inside your system](#).

Intrusion Switch

This describes the procedure to install and remove the Intrusion Switch.

Removing the Intrusion Switch

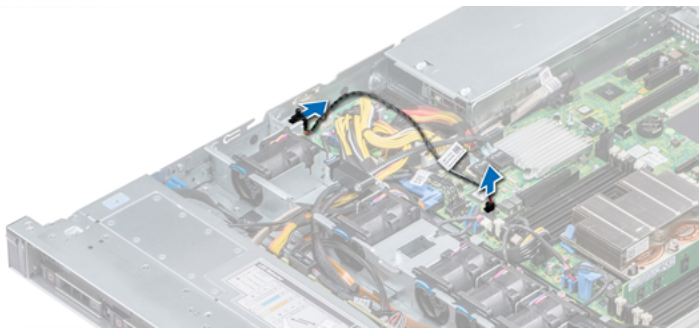
- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove air shroud.
- Remove internal PERC riser.

Follow the below steps to remove the Intrusion Switch:

1. Disconnect the intrusion switch cable connected to the system board.

NOTE: Ensure that you note the routing of the cables as you remove them from the system board.

2. Slide the intrusion switch out of the intrusion switch slot.

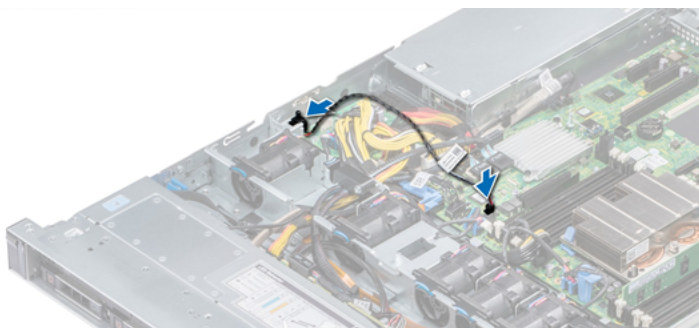


Installing the intrusion switch

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).

Follow the below steps to install the Intrusion Switch:

1. Align the intrusion switch with the intrusion switch slot.



2. Slide the intrusion switch until it is firmly seated in the intrusion switch slot.

3. Connect the intrusion switch cable to the connector on the system board.

After installing the Intrusion Switch ensure the following:

1. Install internal PERC riser.
2. Follow the procedure listed in [After working inside your system](#).

Drives

This describes the procedure to install and remove the Drives.

Removing a Drive Blank

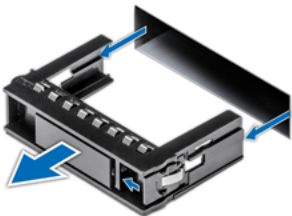
- Follow the safety guidelines listed in [Safety instructions](#).
- If installed, remove the front bezel.

CAUTION: To maintain proper system cooling, drive blanks must be installed in all empty drive slots.

CAUTION: Mixing drive blanks from previous generations of PowerEdge servers is not supported.

Follow the below steps to remove the Drive Blank:

1. Press the release button, and slide the drive blank out of the drive slot.



After removing the Drive Blank ensure the following:

1. Install a drive or Installing the hard drive backplane.

Installing a drive blank

- Follow the safety guidelines listed in [Safety instructions](#).
- If installed, remove the front bezel.

CAUTION: Mixing drive blanks from previous generations of PowerEdge servers is not supported.

Follow the below steps to install the Drive Blank:

1. Insert the drive blank into the drive slot, and push the blank until the release button clicks into place.



After installing the Drive blank If removed, install the Front Bezel.

Removing a Hard Drive

- Follow the safety guidelines listed in [Safety instructions](#).
- If applicable, remove the front bezel.
- Using the management software, prepare the hard drive for removal.

If the hard drive is online, the green activity or fault indicator flashes while the drive is turning off. When the hard drive indicators are off, the hard drive is ready for removal. For more information, see the documentation for the storage controller.

CAUTION: Before attempting to remove or install a hard drive while the system is running, see the documentation for the storage controller card to ensure that the host adapter is configured correctly to support hard drive removal and insertion.

CAUTION: Mixing hard drives from previous generations of PowerEdge servers is not supported.

CAUTION: To prevent data loss, ensure that your operating system supports drive installation. See the documentation supplied with your operating system.

Follow the below steps to remove the Hard Drive:

1. Press the release button to open the hard drive release handle.

2. Holding the handle, slide the hard drive out of the hard drive slot.



After removing the Hard Drive ensure the following:

1. Install a hard drive.
2. If you are not replacing the hard drive immediately, insert a hard drive blank in the empty hard drive slot to maintain proper system cooling.

Installing a Hard Drive

CAUTION: Before attempting to remove or install a hard drive while the system is running, see the documentation for the storage controller card to ensure that the host adapter is configured correctly to support hard drive removal and insertion.

CAUTION: Mixing hard drives from previous generations of PowerEdge servers is not supported.

CAUTION: Combining SAS and SATA hard drives in the same RAID volume is not supported.

CAUTION: When installing a hard drive, ensure that the adjacent drives are fully installed. Inserting a hard drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.

CAUTION: To prevent data loss, ensure that your operating system supports hot-swap drive installation. See the documentation supplied with your operating system.

CAUTION: When a replacement hot swappable drive is installed and the system is powered on, the drive automatically begins to rebuild. Ensure that the replacement drive is blank or contains data that you wish to overwrite. Any data on the replacement drive is immediately lost after the drive is installed.

- Follow the safety guidelines listed in [Safety instructions](#).
- If applicable, remove the hard drive blank.

Follow the below steps to install the Hard Drive:

1. Press the release button on the front of the hard drive carrier to open the release handle.
2. Insert the hard drive carrier into the hard drive slot and slide until the hard drive connects with the backplane.
3. Close the hard drive carrier release handle to lock the hard drive in place.



After installing the Hard Drive if applicable, install the front bezel.

Removing the Drive from the Drive Carrier

CAUTION: Mixing drives from previous generations of PowerEdge servers is not supported.

Follow the below steps to remove the Drive from Drive Carrier:

1. Using a Phillips #1 screwdriver, remove the screws from the slide rails on the drive carrier.
2. Lift the drive out of the drive carrier.



Installing a drive into the drive carrier

CAUTION: Mixing drive carriers from other generations of PowerEdge servers is not supported.

NOTE: When installing a drive into the drive carrier, ensure that the screws are torqued to 4 in-lbs.

Follow the below steps to install the Drive from Drive Carrier:

1. Insert the drive into the drive carrier with the connector end of the drive towards the back of the carrier.
2. Align the screw holes on the drive with the screws holes on the drive carrier. When aligned correctly, the back of the drive is flush with the back of the drive carrier.
3. Using a Phillips #1 screwdriver, secure the drive to the drive carrier with screws.

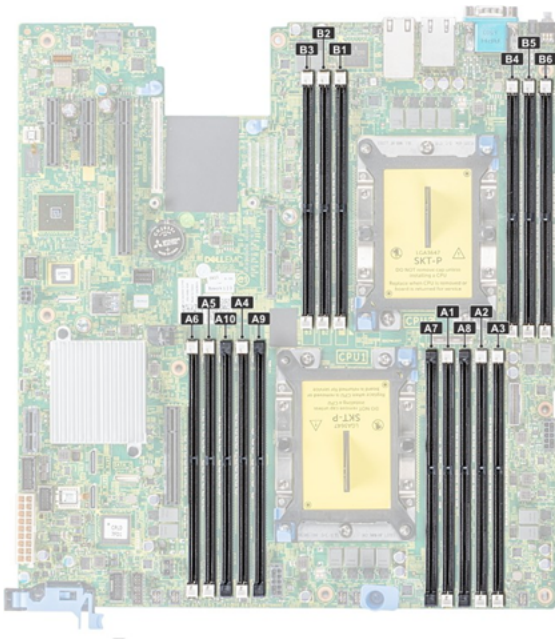


System Memory

System memory guidelines

The PowerEdge systems support DDR4 Registered DIMMs (RDIMMs), and Load Reduced DIMMs (LRDIMMs). System memory holds the instructions that are executed by the processor.

Your system contains 16 memory sockets. Processor 1 supports up to 10 memory sockets and Processor 2 supports up to 6 memory sockets. Six memory channels are allocated to each processor. Processor 1 has four 2 DIMM slots per channel and two 1 DIMM slot per channel, Processor 2 has six 1 DIMM per channel.



Memory channels are organized as follows:

Table 1: Memory channels

Processor	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
Processor 1	Slots A1 and A7	Slots A2 and A8	Slots A3	Slots A4 and A9	Slots A5 and A10	Slots A6
Processor 2	Slots B1	Slots B2	Slots B3	Slots B4	Slots B5	Slots B6

Table 2: Memory population

DIMM Type	DIMMs Populated/ Channel	Voltage	Operating Frequency (in MT/s)	Maximum DIMM Rank/ Channel
RDIMM	1	1.2 V	2666, 2400, 2133, 1866	Dual rank or single rank
	2		2666, 2400, 2133, 1866	Dual rank or single rank
LRDIMM	1	1.2 V	2666, 2400, 2133, 1866	Quad rank
	2		2666, 2400, 2133, 1866	Quad rank

General Memory Module Installation Guidelines

To ensure optimal performance of your system, observe the following general guidelines when configuring your system memory. If your system's memory configurations fail to observe these guidelines, your system might not boot, stop responding during memory configuration, or operate with reduced memory.

- System profile selected (for example, Performance Optimized, or Custom [can be run at high speed or lower])
- Maximum supported DIMM speed of the processors.
- Maximum supported DIMM speed of the processors.
- Maximum supported speed of the DIMMs

NOTE: MT/s indicates DIMM speed in MegaTransfers per second.

The system supports Flexible Memory Configuration, enabling the system to be configured and run in any valid chipset architectural configuration. The following are the recommended guidelines for installing memory modules:

- All DIMMs must be DDR4.
- RDIMMs and LRDIMMs must not be mixed.
- 64 GB LRDIMMs that are DDP (Dual Die Package) LRDIMMs must not be mixed with 128 GB LRDIMMs that are TSV (Through Silicon Via/3DS) LRDIMMs.
- x4 and x8 DRAM based memory modules can be mixed.
- Up to two RDIMMs can be populated per channel regardless of rank count.

- Up to two LRDIMMs can be populated per channel regardless of rank count.
- A maximum of two different ranked DIMMs can be populated in a channel regardless of rank count.
- If memory modules with different speeds are installed, they will operate at the speed of the slowest installed memory module(s).
- Populate memory module sockets only if a processor is installed.
 - For single-processor systems, sockets A1 to A10 are available.
 - For dual-processor systems, sockets A1 to A10 and sockets B1 to B6 are available.
- Populate all the sockets with white release tabs first, followed by the black release tabs.
- When mixing memory modules with different capacities, populate the sockets with memory modules with the highest capacity first.

NOTE: For example, if you want to mix 8 GB and 16 GB memory modules, populate 16 GB memory modules in the sockets with white release tabs and 8 GB memory modules in the sockets with black release tabs.

- Memory modules of different capacities can be mixed provided other memory population rules are followed.

NOTE: For example, 8 GB and 16 GB memory modules can be mixed.

- In a dual-processor configuration, the memory configuration for each processor must be identical.

NOTE: For example, if you populate socket A1 for processor 1, then populate socket B1 for processor 2, and so on.

- Mixing of more than two memory module capacities in one system is not supported.
- Unbalanced memory configurations will result in a performance loss so always populate memory channels identically with identical DIMMs for best performance.
- Populate six identical memory modules per processor (one DIMM per channel) at a time to maximize performance. DIMM population update for Performance Optimized mode with quantity of 4 and 8 DIMMs per processor.
- When the DIMM quantity is 4 per processor, the population is slot 1, 2, 4, 5.
- When the DIMM quantity is 8 per processor, the population is slot 1, 2, 4, 5, 7, 8, 9, 10.

Mode-specific guidelines

The configurations allowed depend on the memory mode selected in the System BIOS.

Memory Operating Mode	Description
Optimizer Mode	The Optimizer Mode if enabled, the DRAM controllers operate independently in the 64-bit mode and provide optimized memory performance.
Mirror Mode	<p>The Mirror Mode if enabled, the system maintains two identical copies of data in memory, and the total available system memory is one half of the total installed physical memory. Half of the installed memory is used to mirror the active memory modules. This feature provides maximum reliability and enables the system to continue running even during a catastrophic memory failure by switching over to the mirrored copy.</p> <p>The installation guidelines to enable Mirror Mode require that the memory modules be identical in size, speed, and technology, and they must be populated in sets of 6 per processor.</p>

Memory Operating Mode	Description
Single Rank Spare Mode	<p>Single Rank Spare Mode allocates one rank per channel as a spare. If excessive correctable errors occur in a rank or channel, while the operating system is running, they are moved to the spare area to prevent errors from causing an uncorrectable failure.</p> <p>Requires two or more ranks to be populated in each channel.</p>
Multi Rank Spare Mode	<p>Multi Rank Spare Mode allocates two ranks per channel as a spare. If excessive correctable errors occur in a rank or channel, while the operating system is running, they are moved to the spare area to prevent errors from causing an uncorrectable failure.</p> <p>Requires three or more ranks to be populated in each channel.</p> <p>With single rank memory sparing enabled, the system memory available to the operating system is reduced by one rank per channel.</p> <p>For example, in a dual-processor configuration with sixteen 16 GB dual-rank memory modules, the available system memory: $16 \text{ GB} \times 16(\text{memory modules}) - 8\text{GB}(1 \text{ rank sparing/channel}) \times 12(\text{channel}) = 256 \text{ GB} - 96 \text{ GB} = 160 \text{ GB}$. For multi rank sparing, in a dual-processor configuration with sixteen 64 GB quad-rank memory modules, the available system memory:</p> <p>$64 \text{ GB} \times 16(\text{memory modules}) - 32 \text{ GB}(2 \text{ rank sparing/channel}) \times 12 (\text{channel}) = 1024 \text{ GB} - 384 \text{ GB} = 640 \text{ GB}$.</p> <p>NOTE: To use memory sparing, this feature must be enabled in the BIOS menu of System Setup.</p> <p>NOTE: Memory sparing does not offer protection against a multi-bit uncorrectable error.</p>
Dell Fault Resilient Mode	<p>The Dell Fault Resilient Mode if enabled, the BIOS creates an area of memory that is fault resilient. This mode can be used by an OS that supports the feature to load critical applications or enables the OS kernel to maximize system availability.</p> <p>This feature is only supported in Gold and Platinum Intel processors.</p> <p>Memory configuration has to be of same size DIMM, speed, and rank.</p>

Optimizer Mode

This mode supports Single Device Data Correction (SDDC) only for memory modules that use x4 device width. It does not impose any specific slot population requirements.

- Dual processor: Populate the slots in round robin sequence starting with processor 1.

NOTE: Processor 1 and processor 2 population should match.

Processor	Configuration	Memory population	Memory population information
Single processor	Optimizer (Independent channel) population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	<ul style="list-style-type: none"> ● Populate in this order, odd amount allowed. ● Odd number of DIMM population is allowed. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>NOTE: NOTE: Odd number of DIMMs will result in unbalanced memory configurations, which in turn will result in performance loss. It is recommended to populate all memory channels identically with identical DIMMs for best performance.</p> </div> <ul style="list-style-type: none"> ● Optimizer population order is not traditional for 4 and 8 DIMM installations of single processor. <ul style="list-style-type: none"> ○ For 4 DIMMs: A1, A2, A4, A5 ○ For 8 DIMMs: A1, A2, A4, A5, A7, A8, A9, A10
	Mirror population order	{1, 2, 3, 4, 5, 6}	Mirroring is supported with 6 DIMM slots per processor.
	Single rank sparing population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Populate in this order, odd amount allowed. Requires two ranks or more per channel.

Processor	Configuration	Memory population	Memory population information
	Multi rank sparing population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Populate in this order, odd amount allowed. Requires three ranks or more per channel.
Dual processor (Populate round robin starting with processor1)	Optimized (Independent channel) population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}...	<ul style="list-style-type: none"> ● Odd amount of DIMM slots per processor allowed. ● Odd number of DIMM population is allowed. <div style="border: 1px solid #ccc; padding: 5px; margin: 5px 0;"> <p>NOTE: NOTE: Odd number of DIMMs will result in unbalanced memory configurations, which in turn will result in performance loss. It is recommended to populate all memory channels identically with identical DIMMs for best performance.</p> </div> <ul style="list-style-type: none"> ● Optimizer population order is not traditional for 8 and 14 DIMM installations of dual processor. <ul style="list-style-type: none"> ○ For 8 DIMMs: A1, A2, A4, A5, B1, B2, B4, B5 ○ For 14 DIMMs: A1, A2, A4, A5, A7, A8, A9, A10, B1, B2, B3, B4, B5, B6

Processor	Configuration	Memory population	Memory population information
	Mirroring population order	A{1, 2, 3, 4, 5, 6}, B{1, 2, 3, 4, 5, 6}	Mirroring is supported with 6 DIMM slots per processor.
	Single rank sparing population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}...	Populate in this order, odd amount per processor allowed. Requires two ranks or more per channel.
	Multi rank sparing population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}...	Populate in this order, odd amount per processor allowed. Requires three ranks or more per channel.

Processors and heat sinks

This describes the procedure to install and remove Processors and Heat Sinks.

WARNING: The heat sink may be hot to touch for some time after the system is powered down. Allow the heat sink to cool before removing it.

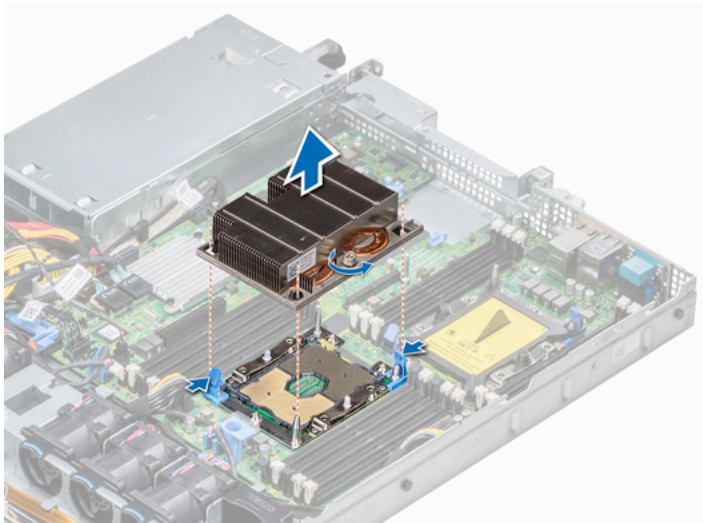
- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- If applicable, remove the air shroud.

Removing Processor and Heat Sink Module

Follow the below steps to remove a Processor and Heat Sink module:

1. Using a Torx #T30 screwdriver, loosen the screws on the heat sink in the order below:
 - a. Loosen the first screw three turns.
 - b. Loosen the second screw completely.
 - c. Return to the first screw and loosen it completely.
2. Pushing both blue retention clips simultaneously, lift the processor and heat sink module (PHM) processor and heat sink module

3. Set the PHM aside with the processor side facing up.



Installing a Processor and Heat Sink Module

CAUTION: Never remove the heat sink from a processor unless you intend to replace the processor. The heat sink is necessary to maintain proper thermal conditions.

- Follow the safety guidelines listed in [Safety instructions](#).
- If installed, remove the processor blank and CPU dust cover.

Follow the below steps to install a Processor and Heat Sink module:

1. Align the pin 1 indicator of the heat sink to the system board and then place the processor and heat sink module (PHM) on the processor socket.

CAUTION: To avoid damaging the fins on the heat sink, do not press down on the heat sink fins.

NOTE: Ensure that the PHM is held parallel to the system board to prevent damaging the components.

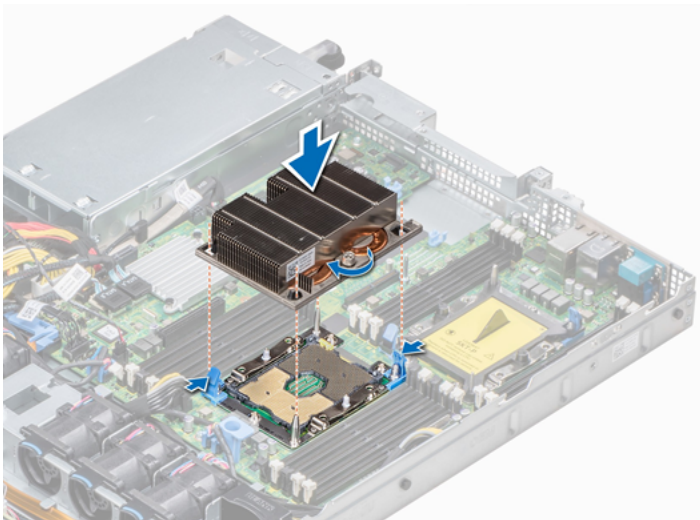
2. Push the blue retention clips inward to allow the heat sink to drop into place.
3. Using the Torx #T30 screwdriver, tighten the screws on the heat sink in the order below:
 - a. Partially tighten the first screw (approximately 3 turns).

- b. Tighten the second screw completely.
- c. Return to the first screw and tighten it completely.

4.If the PHM slips off the blue retention clips when the screws are partially tightened, follow these steps to secure the PHM:

- a. Loosen both the heat sink screws completely.
- b. Lower the PHM on to the blue retention clips, following the procedure described in step 2.
- c. Secure the PHM to the system board, following the replacement instructions listed in this step above.

NOTE: The processor and heat sink module retention screws should not be tightened to more than 0.13 kgf-m (1.35N.m or 12 in-lbf).



After installing the Processor Heat Sink Module follow the procedure listed in [After working inside your system](#).

Removing the Processor from the Processor and Heat Sink Module

NOTE: Only remove the processor from the processor and heat sink module if you are replacing the processor or heat sink. This procedure is not required when replacing a system board.

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).

- Remove the air shroud.
- Remove the processor and heat sink module.

Follow the below steps to remove a Processor from a Processor and Heat Sink module:

1. Place the heat sink with the processor side facing up.
2. Insert a flat blade screwdriver into the release slot marked with a yellow label. Twist (do not pry) the screwdriver to break the thermal paste seal.
3. Push the retaining clips on the processor bracket to unlock the bracket from the heat sink.
4. Lift the bracket and the processor away from the heat sink, and place the processor connector side down on the processor tray.
5. Flex the outer edges of the bracket to release the bracket from the processor.

NOTE: Ensure that the processor and the bracket are placed in the tray after you remove the heat sink.



Installing the Processor into a Processor and Heat Sink Module

- Follow the safety guidelines listed in [Safety instructions](#)

Follow the below steps to install a Processor from a Processor and Heat Sink module:

1. Place the processor in the processor tray.

NOTE: Ensure that the pin 1 indicator on the processor tray is aligned with the pin 1 indicator on the processor.

2. Flex the outer edges of the bracket around the processor ensuring that the processor is locked into the clips on the bracket.

NOTE: Ensure that the pin 1 indicator on the bracket is aligned with the pin 1 indicator on the processor before placing the bracket on the processor.

NOTE: Ensure that the processor and the bracket are placed in the tray before you install the heat sink.

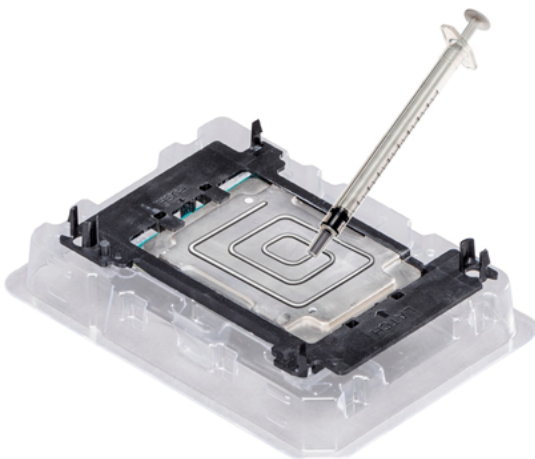


3. If you are using an existing heat sink, remove the thermal grease from the heat sink by using a clean lint-free cloth.

4. Use the thermal grease syringe included with your processor kit to apply the grease in a quadrilateral design on the top of the processor.

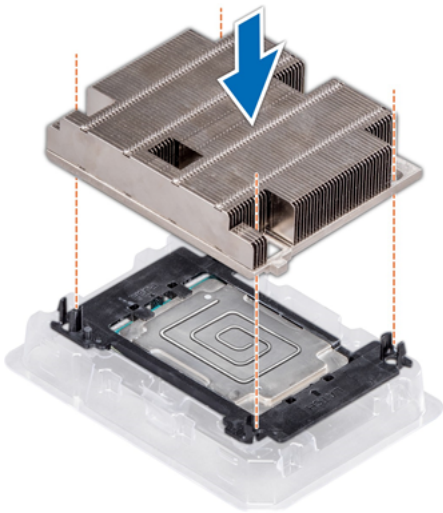
CAUTION: Applying too much thermal grease can result in excess grease coming in contact with and contaminating the processor socket.

NOTE: The thermal grease syringe is intended for single use only. Dispose the syringe after you use it.



5. Place the heat sink on the processor and push down on the base of the heat sink until the bracket locks onto the heat sink.

NOTE: ● Ensure that the two guide pin holes on the bracket match the guide holes on the heat sink. ● Do not press on the heat sink fins. ● Ensure that the pin 1 indicator on the heat sink is aligned with the pin 1 indicator on the bracket before placing the heat sink onto the processor and bracket.



Internal PERC riser

This describes the procedure to install and remove the Internal PERC Riser.

Removing the internal PERC riser

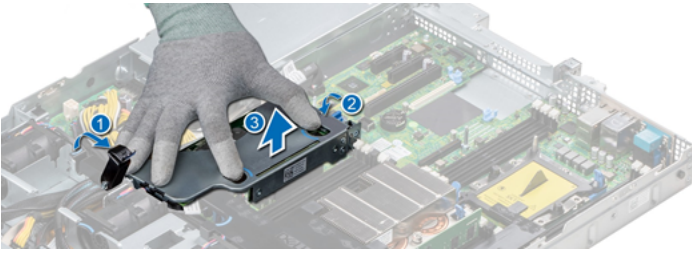
NOTE: The new generation PERC 11 H750, H350, and HBA350i adapters cannot be mixed with the PERC H740P, H730P, H330, HBA330 adapters of the previous generations in one system. For more information, see [Cable routing](#).

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove the air shroud.

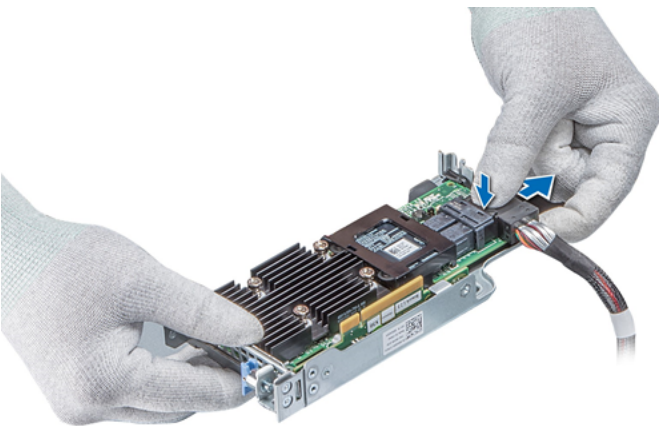
Follow the below steps to remove the Internal PERC Riser:

1. Open the cable guiding latch for easy access.
2. Lower the plunger.
3. Press the cable connector and disconnect the PERC cable from the backplane.

4. Hold the blue touch points and lift the internal PERC riser out of the system.



5. Turn the internal riser so that the PERC card is facing up.
6. Press the cable connector and disconnect the cable that is connected to the internal PERC card



After removing the Internal PERC riser you can do the following :

1. Install the air shroud.
2. Follow the procedure listed in [After working inside your system](#).
3. Install the internal PERC card.

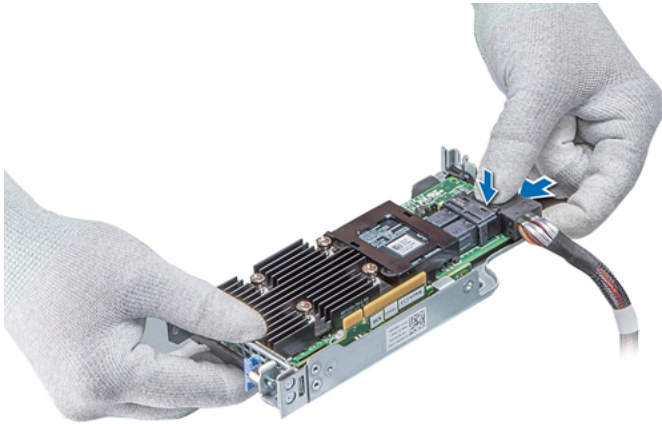
Installing the Internal PERC Riser

NOTE: The new generation PERC 11 H750, H350, and HBA350i adapters cannot be mixed with the PERC H740P, H730P, H330, HBA330 adapters of the previous generations in one system. For more information, see [Cable routing](#).

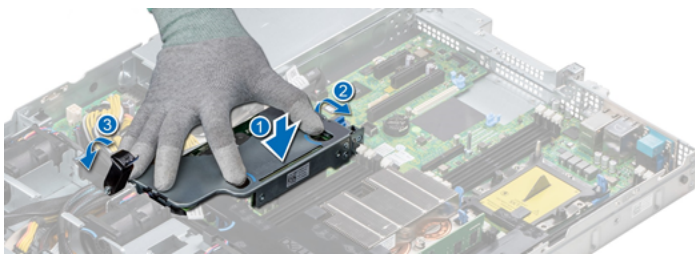
- Follow the safety guidelines listed in [Safety instructions](#).

Follow the below steps to install the Internal PERC Riser:

1. Connect the cable to the internal PERC card.



2. Holding the blue touch points, align the slot on the internal PERC riser to the guide on the system board.
3. Insert the internal riser card's edge connector firmly into the system board connector until the riser is fully seated.
4. Lift the plunger to lock the riser in place.
5. Connect the cables to the backplane and then route the cables to the cable guiding latch to close the latch.



After installing the Internal PERC Riser you could do the following:

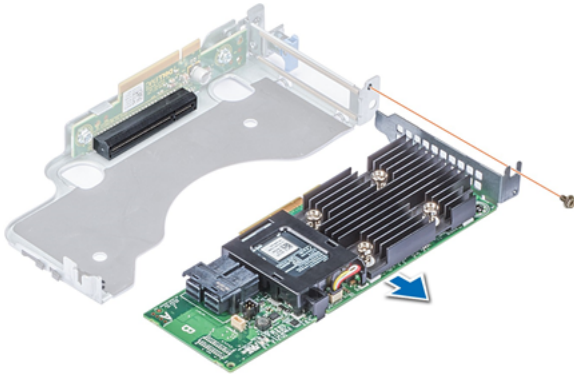
1. Install the air shroud.
2. Follow the procedure listed in [After working inside your system](#).

Removing the PERC card from the internal PERC riser

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove the air shroud.
- Remove the internal PERC riser.

Follow the below steps to remove the PERC card from the Internal PERC Riser:

1. Using a Phillips #2 screwdriver, remove the screw that secures the PERC card to the internal PERC riser.
2. Pull the PERC card out of the connector on the internal PERC riser.



After removing the PERC card from the Internal PERC Riser you could do the following:

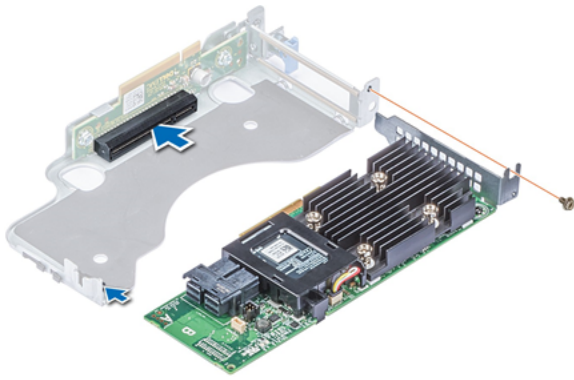
1. Install the PERC card into the internal PERC riser.
2. Replace the air shroud.
3. Follow the procedure listed in [After working inside your system](#).

Installing PERC card into the Internal PERC riser

- Follow the safety guidelines listed in [Safety instructions](#).

Follow the below steps to install the PERC card from the Internal PERC Riser:

1. Insert the PERC card into the internal PERC riser and push the card in.
2. Using a Phillips #2 screwdriver, replace the screw to secure the PERC card on the internal PERC riser.



After installing the PERC card from the Internal PERC Riser you could do the following:

1. Install the internal PERC riser.
2. Install the air shroud.
3. Follow the procedure listed in [After working inside your system](#).

Expansion cards and expansion card risers

NOTE: A System Event Log (SEL) event is logged if an expansion card riser is not supported or missing. It does not prevent your system from turning on. However, if a F1/F2 pause occurs, an error message is displayed.

Expansion Card Installation Guidelines

Depending on your system configuration, the following PCI Express (PCIe) generation 3 expansion cards are supported:

Table 3: Expansion card riser configurations

Expansion card riser	PCIe slots on the riser	Height	Length	Link
LOM riser	Slot 1	Mezz type	Mezz type	x8
Right riser	Slot 2	Low Profile	Half Length	x16
Right riser	Slot 2	Full Height	Half Length	x16
PCIe passive bridge	Slot-integrated	Low Profile	Half Length	x8
Internal riser	Slot-integrated	Low Profile	Half Length	x8
Left riser	Slot 3	Low Profile	Half Length	x16

NOTE: The expansion card slots are not hot-swappable.

The following table provides guidelines for installing expansion cards to ensure proper cooling and mechanical fit. The expansion cards with the highest priority should be installed first using the slot priority indicated. All the other expansion cards should be installed in the card priority and slot priority order.

Table 4: Riser configurations: No riser

Card Type	Slot Priority	Form Factor
PERC9.14G(Foxconn)	Integrated Slot	Low Profile
RAID - PERC9.14G/PERC10 (Internal)/ PERC11 (Dell)	Integrated Slot	Low Profile
Non-RAID - PERC 11 (Internal) (Dell)	Integrated Slot	Low Profile
1 Gb NIC Foxconn	1	OCP

Table 5: Riser configurations: FH (Full Height riser*1)

Card Type	Slot Priority	Form Factor
PERC9.14G (Foxconn)	2	Full Height
PERC9.14G (Foxconn)	Integrated Slot	Low Profile
RAID - PERC9.14G/PERC10 (Internal)/ PERC11 (Dell)	Integrated Slot	Low Profile
Non-RAID - PERC 11 (Internal) (Dell)	Integrated Slot	Low Profile
Non-RAID - PERC 11 (External) (Dell)	2	Full Height
RAID PERC10 (External) (Dell)	2	Full Height
NVMe PCIe SSD (Samsung, Intel)	2	Full Height
1G NICs (Broadcom)	2	Full Height
10G NICs (Broadcom)	2	Full Height
25G NICs (Broadcom)	2	Full Height
1G NICs (Intel)	2	Full Height
10G NICs (Intel)	2	Full Height
25G NICs (Intel)	2	Full Height
40G NICs (Intel)	2	Full Height
FC8 HBA (Emulex)	2	Full Height
FC16 HBA (Emulex)	2	Full Height
InfiniBand HCA FDR (Mellanox)	2	Full Height
10G NICs (Mellanox)	2	Full Height
25G NICs (Mellanox)	2	Full Height
40G NICs (Mellanox)	2	Full Height
100G NICs (Mellanox)	2	Full Height
FC8 HBA (QLogic)	2	Full Height
FC16 HBA (QLogic)	2	Full Height

Card Type	Slot Priority	Form Factor
10G NICs (QLogic)	2	Full Height
25G NICs (QLogic)	2	Full Height
Omni-Path HFI (Intel)	2	Full Height
10G NICs (Solarflare)	2	Full Height
25G NICs (Solarflare)	2	Full Height
1 Gb NIC (Broadcom)	1	OCP
10 Gb NIC (Broadcom)	1	OCP
25 Gb NIC (Broadcom)	1	OCP
HWRAID BOSS	2	Full Height

Table 6: Riser configurations: LP (Low Profile riser*1)

Card Type	Slot Priority	Form Factor
PERC9.14G (Foxconn)	Integrated Slot	Low Profile
HBA: External adapter (Dell)	3	Low Profile
RAID - PERC9.14G/PERC10 (Internal)/ PERC11 (Dell)	Integrated Slot	Low Profile
Non-RAID - PERC 11 (Internal) (Dell)	Integrated Slot	Low Profile
Non-RAID - PERC 11 (External) (Dell)	3	Low Profile
PERC 10 External adapter (Dell)	3	Low Profile
RAID PERC10 (External) (Dell)	3	Low Profile
NVMe PCIe SSD (Samsung, Intel)	3	Low Profile
1G NICs (Broadcom)	3	Low Profile
10G NICs (Broadcom)	3	Low Profile
25G NICs (Broadcom)	3	Low Profile
1G NICs (Intel)	3	Low Profile
10G NICs (Intel)	3	Low Profile
25G NICs (Intel)	3	Low Profile
40G NICs (Intel)	3	Low Profile
FC8 HBA (Emulex)	3	Low Profile
FC16 HBA (Emulex)	3	Low Profile
InfiniBand HCA FDR (Mellanox)	3	Low Profile
10G NICs (Mellanox)	3	Low Profile
25G NICs (Mellanox)	3	Low Profile
40G NICs (Mellanox)	3	Low Profile
100G NICs (Mellanox)	3	Low Profile

Card Type	Slot Priority	Form Factor
FC8 HBA (QLogic)	3	Low Profile
FC16 HBA (QLogic)	3	Low Profile
10G NICs (QLogic)	3	Low Profile
25G NICs (QLogic)	3	Low Profile
Omni-Path HFI (Intel)	3	Low Profile
10G NICs (Solarflare)	3	Low Profile
25G NICs (Solarflare)	3	Low Profile
1 Gb NIC (Broadcom)	1	OCP
10 Gb NIC (Broadcom)	1	OCP
25 Gb NIC (Broadcom)	1	OCP
HWRAID BOSS	3	Low Profile

Table 7: Riser configurations: LP+LP (Low Profile riser*2)

Card Type	Slot Priority	Form Factor
PERC9.14G (Foxconn)	Integrated Slot	Low Profile
HBA: External adapter (Dell)	3, 2	Low Profile
RAID - PERC9.14G/PERC10 (Internal)/ PERC11 (Dell)	Integrated Slot	Low Profile
Non-RAID - PERC 11 (Internal) (Dell)	Integrated Slot	Low Profile
Non-RAID - PERC 11 (External) (Dell)	3, 2	Low Profile
PERC 10 External adapter (Dell)	3, 2	Low Profile
RAID PERC10 (External) (Dell)	3, 2	Low Profile
NVMe PCIe SSD (Samsung, Intel)	3, 2	Low Profile
1G NICs (Broadcom)	3, 2	Low Profile
10G NICs (Broadcom)	3, 2	Low Profile
25G NICs (Broadcom)	3, 2	Low Profile
1G NICs (Intel)	3, 2	Low Profile
10G NICs (Intel)	3, 2	Low Profile
25G NICs (Intel)	3, 2	Low Profile
40G NICs (Intel)	3, 2	Low Profile
FC8 HBA (Emulex)	3, 2	Low Profile
FC16 HBA (Emulex)	3, 2	Low Profile
InfiniBand HCA FDR (Mellanox)	3, 2	Low Profile
10G NICs (Mellanox)	3, 2	Low Profile
25G NICs (Mellanox)	3, 2	Low Profile

Card Type	Slot Priority	Form Factor
40G NICs (Mellanox)	3, 2	Low Profile
100G NICs (Mellanox)	3, 2	Low Profile
FC8 HBA (QLogic)	3, 2	Low Profile
FC16 HBA (QLogic)	3, 2	Low Profile
10G NICs (QLogic)	3, 2	Low Profile
25G NICs (QLogic)	3, 2	Low Profile
Omni-Path HFI (Intel)	3, 2	Low Profile
10G NICs (Solarflare)	3, 2	Low Profile
25G NICs (Solarflare)	3, 2	Low Profile
1 Gb NIC (Broadcom)	1	OCP
10 Gb NIC (Broadcom)	1	OCP
25 Gb NIC (Broadcom)	1	OCP
HWRAID BOSS	3, 2	Low Profile

Table 8: Riser configurations: LP+LP+NVMe Bridge (Low Profile riser*2)

Card Type	Slot Priority	Form Factor
PERC9.14G (Foxconn)	3	Low Profile
HBA: External adapter (Dell)	2	Low Profile
RAID - PERC9.14G/PERC10 (Internal)/ PERC11 (Dell)	3	Low Profile
Non-RAID - PERC 11 (Internal) (Dell)	3	Low Profile
Non-RAID - PERC 11 (External) (Dell)	2	Low Profile
PERC 10 External adapter (Dell)	2	Low Profile
RAID PERC10 (External) (Dell)	2	Low Profile
NVMe PCIe SSD (Samsung, Intel)	2	Low Profile
1G NICs (Broadcom)	2	Low Profile
10G NICs (Broadcom)	2	Low Profile
25G NICs (Broadcom)	2	Low Profile
1G NICs (Intel)	2	Low Profile
10G NICs (Intel)	2	Low Profile
25G NICs (Intel)	2	Low Profile
40G NICs (Intel)	2	Low Profile
FC8 HBA (Emulex)	2	Low Profile
FC16 HBA (Emulex)	2	Low Profile
InfiniBand HCA FDR (Mellanox)	2	Low Profile

Card Type	Slot Priority	Form Factor
10G NICs (Mellanox)	2	Low Profile
25G NICs (Mellanox)	2	Low Profile
40G NICs (Mellanox)	2	Low Profile
100G NICs (Mellanox)	2	Low Profile
FC8 HBA (QLogic)	2	Low Profile
FC16 HBA (QLogic)	2	Low Profile
10G NICs (QLogic)	2	Low Profile
25G NICs (QLogic)	2	Low Profile
Omni-Path HFI (Intel)	2	Low Profile
10G NICs (Solarflare)	2	Low Profile
25G NICs (Solarflare)	2	Low Profile
1 Gb NIC (Broadcom)	1	OCP
10 Gb NIC (Broadcom)	1	OCP
25 Gb NIC (Broadcom)	1	OCP
HWRAID BOSS	2	Low Profile

Expansion bus specifications

The GigaVUE-FM Hardware Appliance system supports PCI express (PCIe) generation three expansion cards, which must be installed on the system board using expansion card risers. The R440 system supports four types of expansion card risers.

- LOM riser - One x8 PCIe Gen 3 for OCP form factor cards - connected to Processor1
- Right riser - One x16 PCIe Gen3 for low-profile half-length cards or One x16 PCIe Gen3 for full height half-length cards - connected to Processor1
- Left riser - One x16 PCIe Gen3 for low-profile half-length cards - connected to Processor2
- Internal riser - One x8 PCIe Gen3 for low-profile half-length cards - connected to Processor1

Table 9: Expansion card riser configurations

Expansion card riser	PCIe slots on the riser	Height	Length	Link
LOM riser	Slot 1	Mezz type	Mezz type	x8
Right riser	Slot 2	Low Profile	Half Length	x16
Right riser	Slot 2	Full Height	Half Length	x16

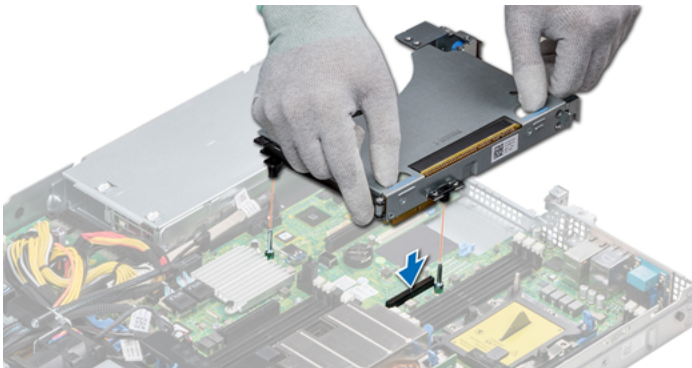
Expansion card riser	PCIe slots on the riser	Height	Length	Link
PCIe passive bridge	Slot-integrated	Low Profile	Half Length	x8
Internal riser	Slot-integrated	Low Profile	Half Length	x8
Left riser	Slot 3	Low Profile	Half Length	x16

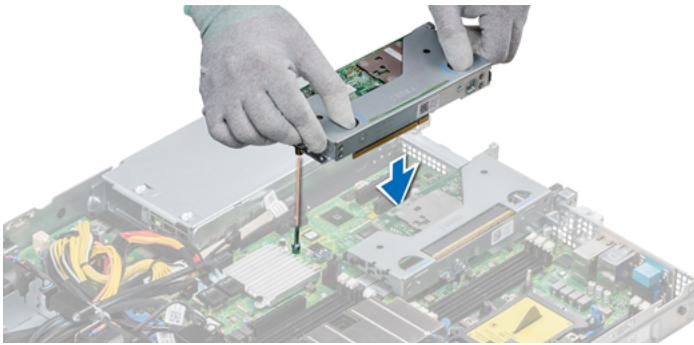
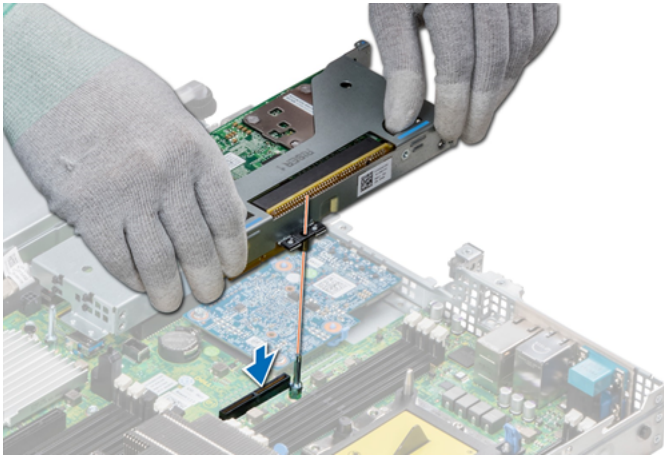
Installing an expansion card riser

- Follow the safety guidelines listed in [Safety instructions](#).

Follow the below steps to install an Expansion Card Riser:

1. If removed, install the expansion cards into the expansion card riser.
2. Holding the touch points, align the slot on the riser with the guide in the system board.
3. Lower the expansion card riser into place until the expansion card riser connector is fully seated in the connector.





After installing the expansion card riser you could do the following:

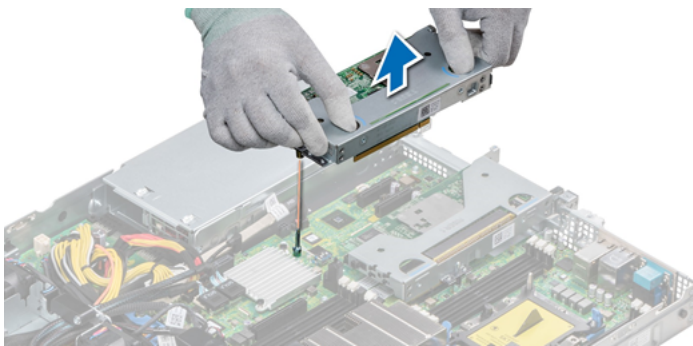
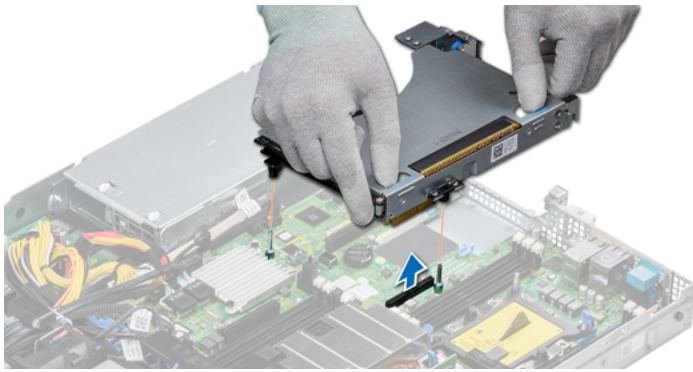
1. Follow the procedure listed in [After working inside your system](#).
2. Install any device drivers required for the card as described in the documentation for the card.

Removing an expansion card riser

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Disconnect any cables connected to the expansion card.

Follow the below steps to remove an Expansion Card Riser:

Hold the touch points, and lift the expansion card riser, from the riser connector, on the system board.

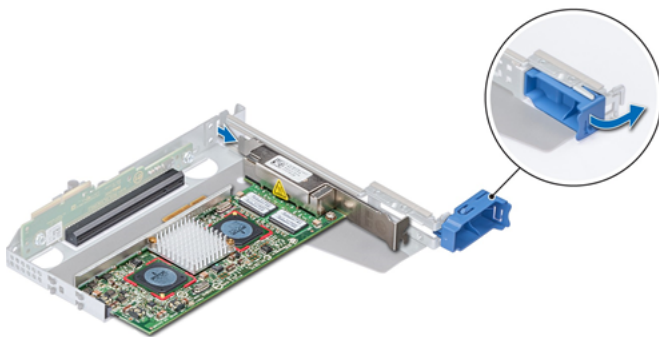
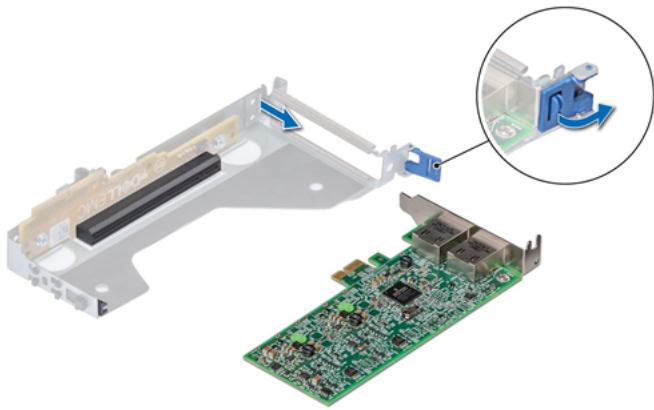


Removing the Expansion card from the Expansion Card Riser

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- If applicable, remove the air shroud.
- Remove the expansion card riser.
- If applicable, disconnect the cables from the expansion card.

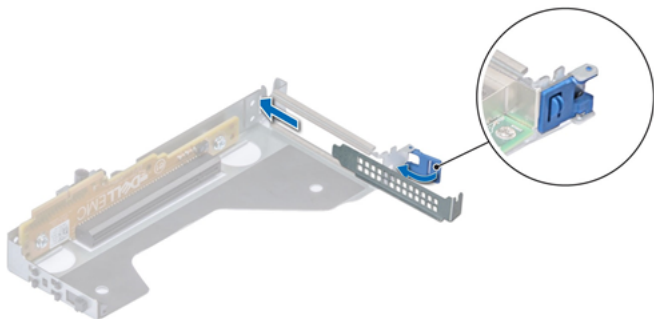
Follow the below steps to remove an Expansion Card from the Expansion Card Riser:

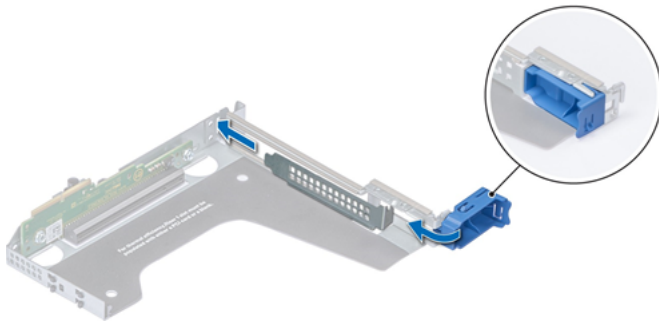
1. Open the PCIe card holder latch.
2. Hold the expansion card by its edges, and pull the card until the card edge connector disengages from the expansion card connector on the riser.



3. Install a filler bracket if you are not replacing the expansion card.

NOTE: You must install a filler bracket over an empty expansion card slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.





Follow the below steps to remove an Expansion Card from Expansion Card Riser:

Install the expansion card riser.

Installing the Expansion Card into the Expansion Card Riser

- Follow the safety guidelines listed in [Safety instructions](#).
- If installing a new expansion card, unpack it and prepare the card for installation.

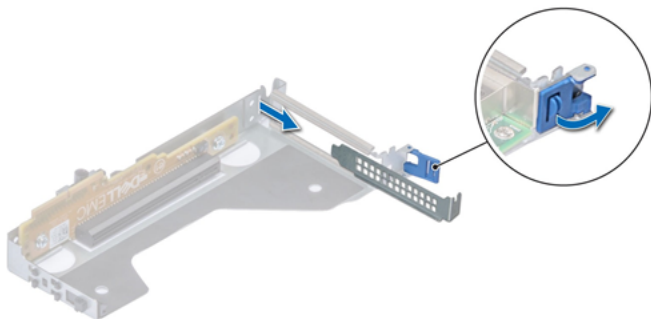
NOTE: For instructions, see the documentation accompanying the card.

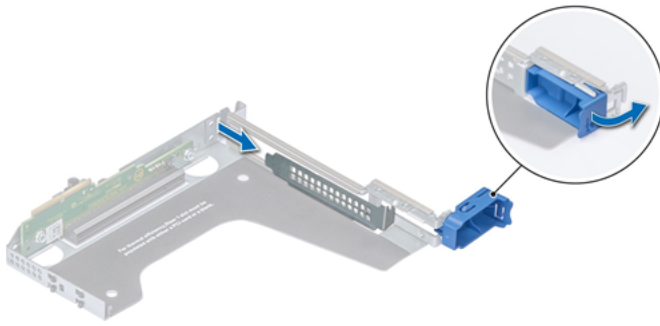
- Remove the expansion card riser.

Follow the below steps to install an Expansion Card from the Expansion Card Riser:

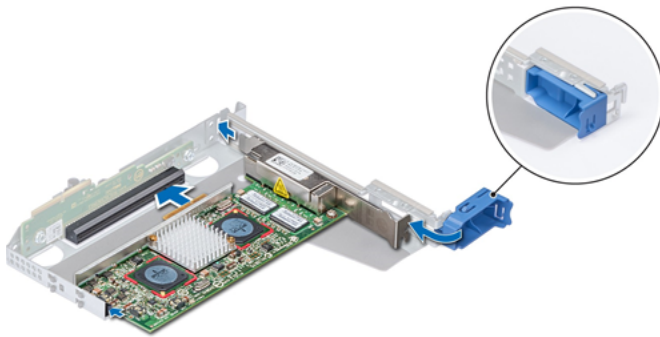
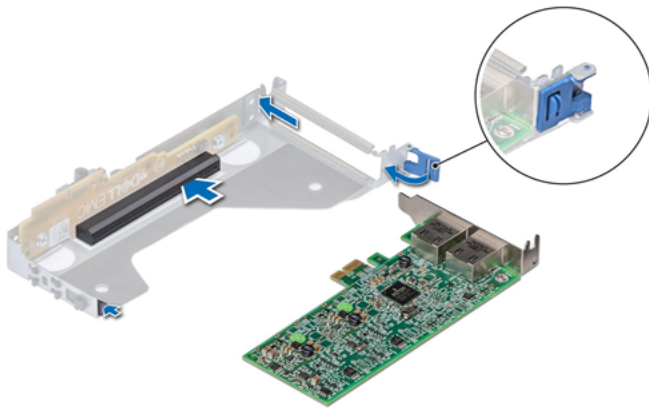
1. Open the PCIe card holder latch.
2. If installed, remove the filler bracket.

NOTE: Store the filler bracket for future use. Filler brackets must be installed in empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.





3. Hold the card by its edges, and align the card edge connector with the expansion card connector on the riser.
4. Insert the card edge connector firmly into the expansion card connector until the card is fully seated.
5. Close the expansion card latch.



Follow the below steps to remove an Expansion Card from Expansion Card Riser:

1. If applicable, connect the cables to the expansion card.
2. Install the expansion card riser
3. If applicable, install the air shroud.

4. Follow the procedure listed in [After working inside your system](#).
5. Install any device drivers required for the card as described in the documentation for the card.

M.2 SSD module

NOTE: The write-protect switch is on the IDSDM or vFlash module.

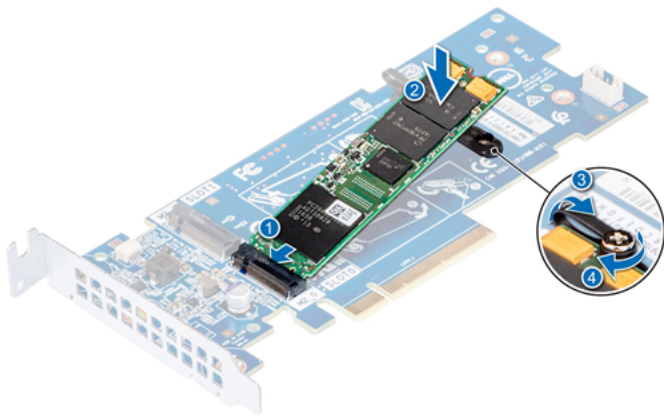
Installing the M.2 SSD module

- Follow the safety guidelines listed in [Safety instructions](#)
- Remove the air shroud.
- Remove the BOSS card.

NOTE: The procedure to remove the BOSS card is similar to the removing an expansion card.

Follow the below steps to install a M.2 SSD module:

1. Connect the M.2 SSD module to the connector on the BOSS card.
2. Place the retention strap on the M.2 SSD module, and tighten the screw to secure the module.



After installing the M.2 SSD module you could do the following:

1. Install the BOSS card.

NOTE: The procedure to install the BOSS card is similar to the removing an expansion card.

2. Install the air shroud.
3. Follow the procedure listed in After working inside your system.

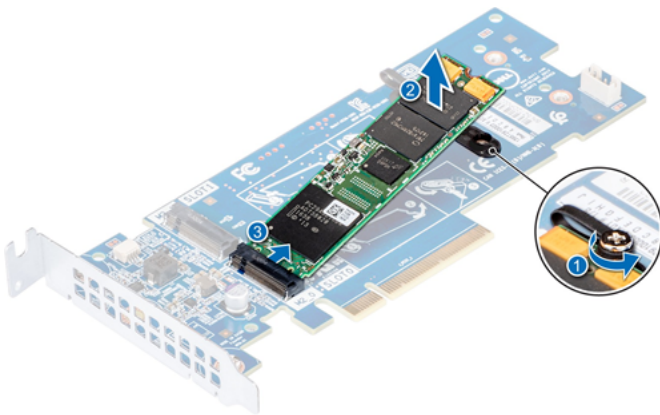
Removing the M.2 SSD module

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in Before working inside your system.
- Remove the air shroud.
- Remove the BOSS card.

NOTE: The procedure to remove the BOSS card is similar to the removing an expansion card.

Follow the below steps to remove a M.2 SSD module:

1. Loosen the screw and lift the retention strap that secures the M.2 SSD module on the BOSS card.
2. Lift the M.2 SSD module and slide it out of the connector on the BOSS card



After removing the M.2 SSD module you could do the following:

1. Replace the M.2 SSD module.

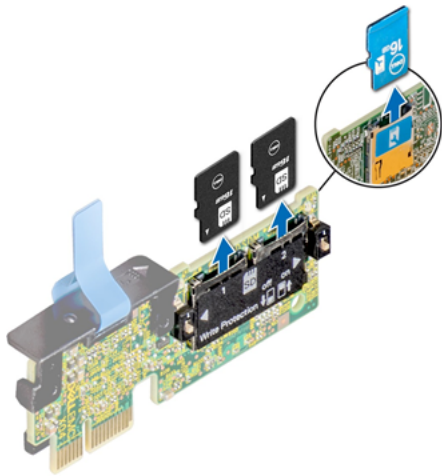
Optional MicroSD or vFlash card

Removing the MicroSD card

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).

Follow the below steps to remove a MicroSD card:

1. Locate the MicroSD card slot on the vFlash/IDSDM module, and press the card to partially release it from the slot. To locate IDSDM/vFlash module, see the System board jumpers and connectors section.
2. Hold the MicroSD card and remove it from the slot.



NOTE: Temporarily label each MicroSD card with its corresponding slot number after removal.

After removing the MicroSD card you could do the following:

1. Follow the procedure listed in [After working inside your system](#).
2. Install a MicroSD card.

Installing the MicroSD card

- Follow the safety guidelines listed in [Safety instructions](#).

NOTE: To use an MicroSD card with your system, ensure that the Internal SD Card Port is enabled in System Setup.

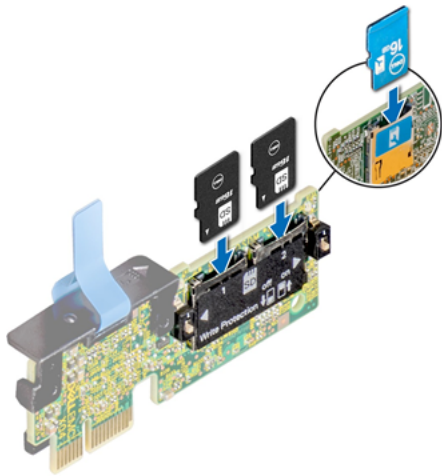
NOTE: If reinstalling, ensure that you install the MicroSD cards into the same slots based on the labels you had marked on the cards during removal.

Follow the below steps to install a MicroSD card:

1. Locate the MicroSD card connector on the IDSDM/vFlash module. Orient the MicroSD card appropriately and insert the contact-pin end of the card into the slot. To locate IDSDM/vFlash, see the System board jumpers and connectors section.

NOTE: The slot is keyed to ensure correct insertion of the card.

2. Press the card into the card slot to lock it into place.



After installing the MicroSD card you could do the following:

1. Follow the procedure listed in [After working inside your system](#).

Optional IDSDM or vFlash module

Removing the Optional IDSDM or vFlash card

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- If you are replacing the IDSDM/vFlash card, remove the MicroSD cards.

NOTE: Temporarily label each MicroSD card with its corresponding slot number after removal.

Follow the below steps to remove a Optional IDSDM or vFlash card:

1. Locate the IDSDM/vFlash connector on the system board.

To locate IDSDM/vFlash connector, see the System board jumpers and connectors section.

2. Holding the pull tab, lift the IDSDM/vFlash card out of the system.



NOTE: There are two dip switches on the IDSDM/vFlash card for write-protection.

After removing the IDSDM/vFlash card you could do the following:

1. Install the optional IDSDM/vFlash card.

Installing optional IDSDM or vFlash card

- Follow the safety guidelines listed in [Safety instructions](#).

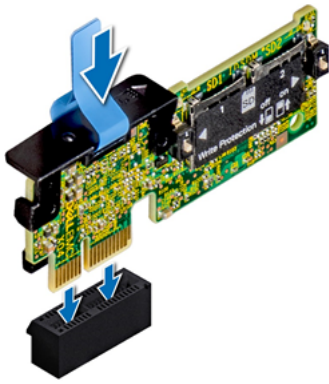
Follow the below steps to install a IDSDM/vFlash card:

1. Locate the IDSDM/vFlash connector on the system board.

NOTE: To locate IDSDM/vFlash connector, see the Jumpers and connectors section.

2. Align the IDSDM/vFlash card with the connector on the system board.

3. Push the IDSDM/vFlash card until it is firmly seated on the system board.



After installing the IDSDM/vFlash card you could do the following:

1. Install the MicroSD cards.

NOTE: Reinstall the MicroSD cards into the same slots based on the labels you had marked on the cards during removal.

2. Follow the procedure listed in [After working inside your system](#) .

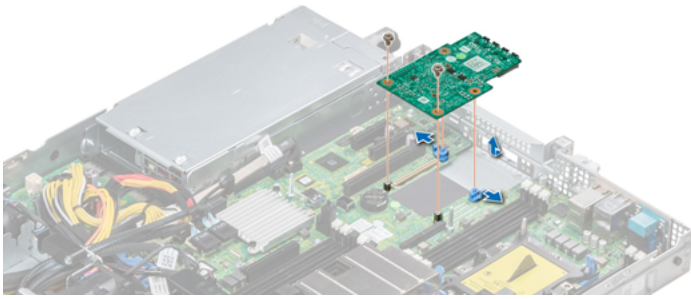
LOM riser card

Removing the LOM riser card

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- If installed, remove the risers.

Follow the below steps to remove the LOM riser card:

1. Using a Phillips #2 screwdriver, loosen the screws that secure the LOM riser card to the system board.
2. Release the two blue side plastic snaps holding the LOM riser card.
3. Hold the LOM riser card by the edges on either side, and lift to remove it from the connector on the system board.
4. Slide the LOM riser card towards the front of the system until the Ethernet connectors or the Small form-factor pluggable (SFP) are clear of the slot in the back of the system.



After removing the LOM riser card you could do the following:

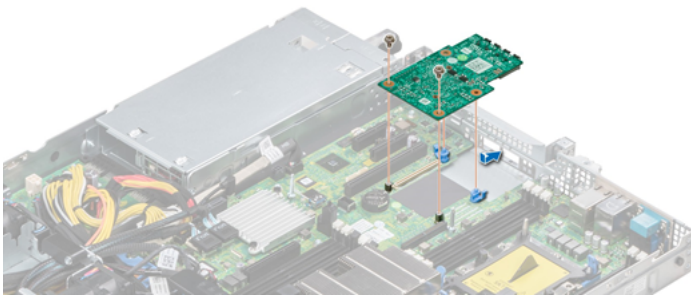
- Install the LOM riser card.

Installing the LOM riser card

- Follow the safety guidelines listed in [Safety instructions](#)

Follow the below steps to install the LOM riser card:

1. Align the connectors on the LOM riser card with the slot on the system.
2. Press the LOM riser card until the card is firmly seated on the system board connector and the two blue plastic snap hold the LOM riser card in place.
3. Using a Phillips #2 screwdriver, replace the screws to secure the LOM riser card to the system board.



After installing the LOM riser card you could do the following:

- If removed, install the risers.
- Follow the procedure listed in [After working inside your system](#).

Hard drive backplane

Hard drive backplane details

Depending on your system configuration, the hard drive backplanes supported in hardware appliance are listed here:

System	Supported hard drives options
GigaVUE-FM Hardware Appliance	2.5-inch (x8) SAS, SATA or Nearline SAS drives



Figure 1 8 x 2.5-inch backplane

1. Release tab
2. SATA_A cable connector
3. backplane signal cable connector
4. backplane
5. SATA_B cable connector
6. backplane power cable connector

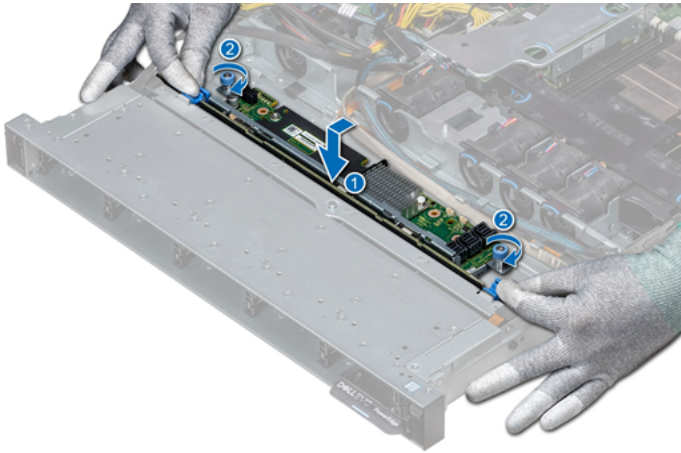
Installing the hard drive backplane

- Follow the safety guidelines listed in [Safety instructions](#).

NOTE: The procedure to install the backplane is similar for all backplane configurations.

Follow the below steps to install the hard drive backplane:

1. Align the slots on the backplane with the hooks on the system.
2. Lower the hard drive backplane until the blue release tabs snap into place.
3. If your backplane has an expander board, then tighten the captive screws to secure the expander board to the system.



After installing the hard drive backplane you could do the following:

- Connect all the cables to the backplane.
- Install all the hard drives.
- Install the backplane cover.
- Install the air shroud.
- Follow the procedure listed in [After working inside your system](#)

Removing the Hard Drive backplane

CAUTION: To prevent damage to the drives and backplane, remove the hard drives from the system before removing the backplane.

CAUTION: Note the number of each hard drive and temporarily label them before you remove the hard drive so that you can replace them in the same location.

NOTE: NOTE: The procedure to remove the backplane is similar for all backplane configurations.

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove the air shroud.
- Remove the backplane cover.

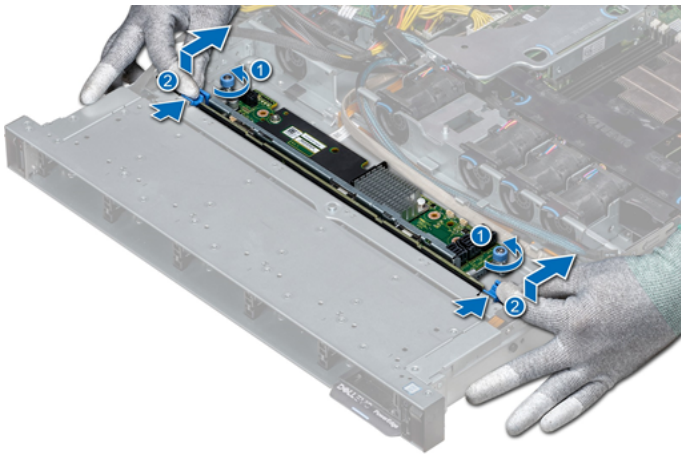
- Remove all hard drives from the hard drive slot.
- Disconnect all the cables from the backplane.

Follow the below steps to remove the hard drive backplane:

1. Press the blue release tabs and lift the backplane to disengage the backplane from the hooks on the system.

2. To remove a backplane with an expander board:

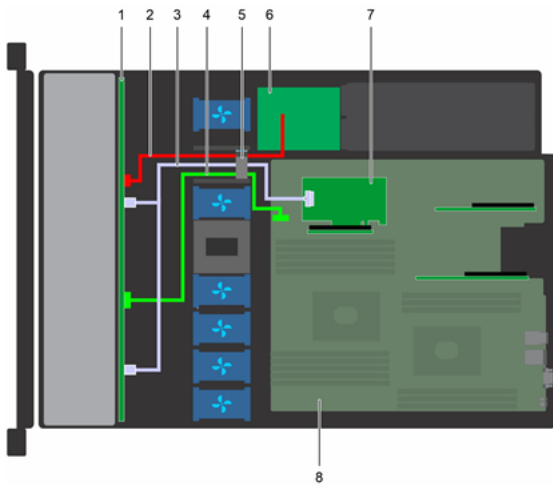
- a. Loosen the captive screws that secure the expander board.
- a. Press the release tabs and lift the backplane to disengage the slots on the backplane from the hooks on the system.



3. Lift the backplane out of the system.

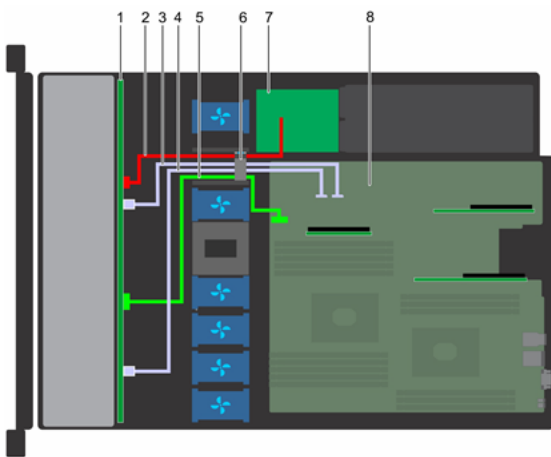
Cable Routing

Cable routing - 8 x 2.5 hard drive backplane with PERC riser



1. Hard drive backplane
2. Backplane power cable
3. SAS cable (SAS_A and SAS_B cable connectors to internal riser)
4. Backplane signal cable
5. Cable routing clip
6. Power interposer board
7. Internal PERC
8. System board

Cable routing - 8 x 2.5 hard drive backplane with onboard SATA.



1. hard drive backplane
2. backplane power cable
3. SATA cable (BP: SATA_B to MB)
4. SATA cable (BP: SATA_A to MB)
5. backplane signal cable
6. cable routing clip
7. power interposer board
8. system board

System Battery

The GigaVUE-FM Hardware Appliance ver 2.0 supports CR 2032 3.0-V lithium coin cell system battery.

Replacing the system battery

WARNING: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. For more information, see the safety information that shipped with your system.

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- If applicable, disconnect the power or data cables from expansion card(s).

Follow the below steps to remove and install the System Battery:

1. Locate the battery socket. For more information, see the [Jumpers and Connectors](#) section.

CAUTION: To avoid damage to the battery connector, you must firmly support the connector while installing or removing a battery.

2. Use a plastic scribe to pry out the system battery.



3. To install a new system battery, hold the battery with the positive side facing up and slide it under the securing tabs.

4. Press the battery into the connector until it snaps into place.



You could do the following after successfully installing the system battery

- If applicable, connect the cables to the expansion card(s).
- Follow the procedure listed in [After working inside your system](#).
- While booting, press F2 to enter the System Setup and ensure that the battery is operating properly.

- Enter the correct time and date in the System Setup Time and Date fields.
- Exit the System Setup.

Optional internal USB memory key

NOTE: To locate the internal USB port on the system board, see the [Jumpers and Connectors](#) section.

Replacing the optional internal USB memory key

CAUTION: To avoid interference with other components in the server, the maximum permissible dimensions of the USB memory key are 15.9 mm wide x 57.15 mm long x 7.9 mm high.

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).

Follow the below steps to replace the optional Internal USB Memory Key:

1. Locate the USB port or USB memory key on the system board. To locate the USB port, see the [Jumpers and connectors](#).
2. If installed, remove the USB memory key from the USB port.
3. Insert the replacement USB memory key into the USB port.

Follow the below steps after replacing the optional Internal USB Memory Key:

1. Follow the procedure listed in [After working inside your system](#).
2. While booting, press F2 to enter System Setup and verify that the system detects the USB memory key.

Optical drive (optional)

Removing the optical drive

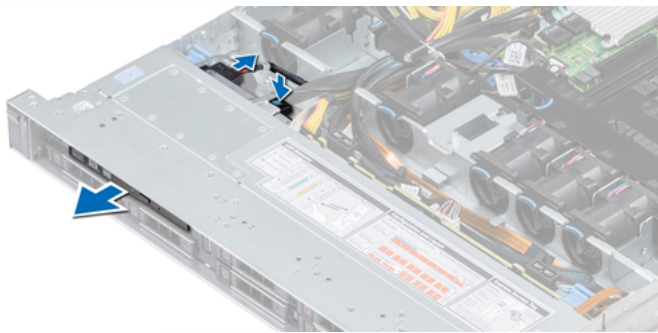
- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).

- If applicable, remove the front bezel.
- Disconnect the power and data cables from the connectors on the optical drive.

NOTE: Ensure that you note the routing of the power and data cable on the side of the system and drive. Route these cables properly when you replace them to prevent them from being pinched or crimped.

Follow the below steps to remove the optional Optical Drive:

1. Press the release tab to release the optical drive.
2. Slide the optical drive out of the system until it is out of the optical drive slot.
3. If you are not adding a new optical drive, install the optical drive blank. The procedure to install the optical drive blank is the same as the optical drive.

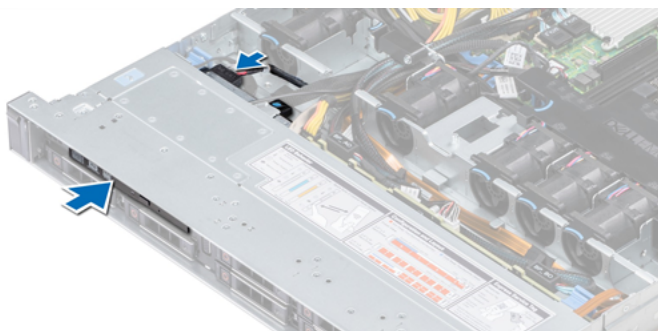


Installing the optical drive

- Follow the safety guidelines listed in [Safety instructions](#).

Follow the below steps to install the optional Optical Drive:

1. Align the optical drive with the optical drive slot on the front of the system.
2. Slide in the optical drive until the release tab snaps into place.



3. Connect the power and data cables to the connector on the optical drive.

NOTE: Route the cable properly to prevent it from being pinched or crimped.

4. Replace the front Bezel.

After installing the Optical Drive follow the procedure listed in [After working inside your system](#)

Power supply units

NOTE: For more information, see the PowerEdge R440 Technical Specs at www.dell.com/poweredgemanuals.

CAUTION: If two PSUs are installed, both the PSUs must have the same type of label. For example,

Extended Power Performance (EPP) label. Mixing PSUs from previous generations of PowerEdge servers is not supported, even if the PSUs have the same power rating. Mixing PSUs will result in mismatch condition or failure to turn the system on.

NOTE: When two identical PSUs are installed, power supply redundancy (1+1 – with redundancy or 2+0 – without redundancy) is configured in system BIOS. In redundant mode, power is supplied to the system equally from both PSUs when Hot Spare is disabled. When Hot Spare is enabled, one of the PSUs is put into the sleep mode when system utilization is low in order to maximize efficiency.

NOTE: If two PSUs are used, they must be of the same maximum output power.

Removing a Power Supply unit blank

- Follow the safety guidelines listed in [Safety instructions](#).

Follow the below steps to remove the Power Supply Unit blank:

If you are installing a second power supply unit, remove the power supply unit blank in the bay by pulling the blank outward.

CAUTION: To ensure proper system cooling, the power supply unit blank must be installed in the second power supply unit bay in a non-redundant configuration. Remove the power supply unit blank only if you are installing a second power supply unit.



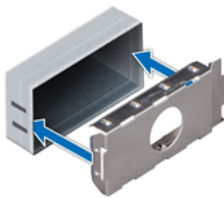
Installing a Power Supply Unit blank

- Follow the safety guidelines listed in [Safety instructions](#).

NOTE: Install the power supply unit (PSU) blank only in the second PSU bay.

Follow the below steps to install the Power Supply Unit blank:

1. Align the PSU blank with the PSU slot and push it into the PSU slot until it clicks into place.



After installing a Power Supply Unit follow the procedure listed in [After working inside your system](#).

Removing a Power Supply Unit

CAUTION: The system needs one power supply unit (PSU) for normal operation. On power-redundant systems, remove and replace only one PSU at a time in a system that is powered on.

- Follow the safety guidelines listed in [Safety instructions](#).
- Disconnect the power cable from the power source and from the PSU you intend to remove, and then remove the cable from the strap on the PSU handle.
- Unlatch and lift the optional cable management arm if it interferes with the PSU removal.

Follow the below steps to remove the Power Supply Unit blank:

1. Press the release latch and slide the PSU out of the system by using the PSU handle.



Installing a Power Supply Unit

- Follow the safety guidelines listed in [Safety instructions](#)
- For systems that support redundant PSU, ensure that both the PSUs are of the same type and have the same maximum output power.

NOTE: The maximum output power (shown in watts) is listed on the PSU label.

Follow the below steps to install the Power Supply Unit :

1. Slide the PSU into the system until the PSU is fully seated and the release latch snaps into place.



1. If you have unlatched the cable management arm, relatch it.
2. Connect the power cable to the PSU, and plug the cable into a power outlet.

CAUTION: When connecting the power cable to the PSU, secure the cable to the PSU with the strap.

NOTE: When installing, hot swapping, or hot adding a new PSU, wait for 15 seconds for the system to recognize the PSU and determine its status. The PSU redundancy may not occur until discovery is complete. Wait until the new PSU is discovered and enabled before you remove the other PSU. The PSU status indicator turns green to signify that the PSU is functioning properly.

Removing a non-redundant cabled AC power supply unit

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove the air shroud
- Disconnect the system from the electrical outlet.
- Disconnect all the cables connected from the PSU to the system board.
- If applicable, remove the expansion card riser.

Follow the below steps to remove a non-redundant cabled AC power supply unit :

1. Using a Phillips #2 screwdriver, remove the screw securing the PSU to the system.
2. Slide the PSU out of the PSU cage.



Installing a non-redundant cabled AC power supply unit

- Follow the safety guidelines listed in [Safety instructions](#).

Follow the below steps to install a non-redundant cabled AC power supply unit :

1. Unpack the new power supply unit (PSU).
2. Slide the new PSU into the PSU cage until the PSU is fully seated.
3. Using a Phillips #2 screwdriver, replace the screw to secure the PSU to the system.



After installing you do the following:

1. Connect the PSU cables to the connectors on the system board.
2. If applicable, install the expansion card riser.
3. Install the air shroud.
4. Follow the procedure listed in [After working inside your system](#).

Power interposer board

Removing power interposer board

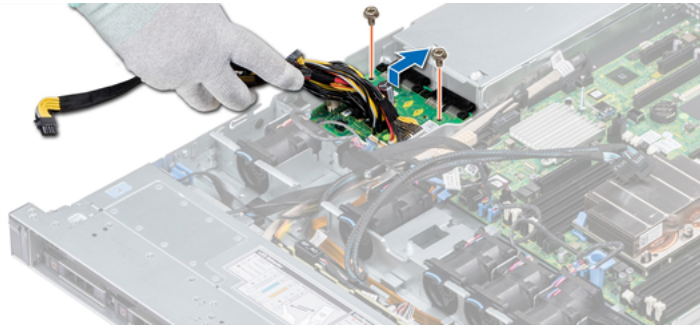
- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove the air shroud
- Disconnect all the cables connected from the PIB to the system board.

NOTE: Ensure that you note the routing of the cables as you remove them from the system board.

- Remove the PSU.

Follow the below steps to remove the Interposer Board:

1. Using a Phillips #2 screwdriver, remove the two screws securing the Power Interposer Board (PIB) to the system.
2. Lift the board and slide it out at an angle to disengage the guide pins on the board.



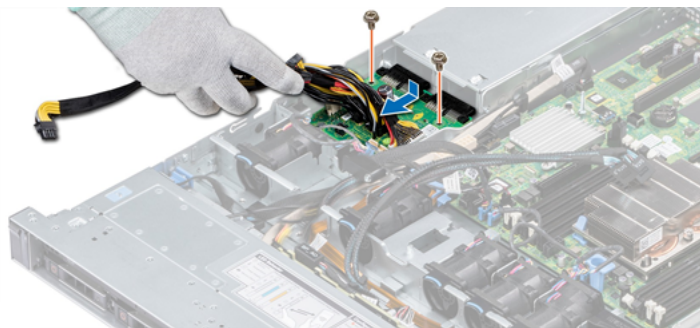
3. Lift the board away from the system.

Installing power interposer board

- Follow the safety guidelines listed in [Safety instructions](#).

Follow the below steps to install the Interposer Board:

1. Align the slots on the PIB with the guides on the system.
2. Using a Phillips #2 screwdriver, replace the two screws to secure the PIB to the system.
3. Route the cables and connect it to the system board.



After installing the Interposer Board you could do the following:

1. Install the PSU.
2. Install the air shroud.
3. Follow the procedure listed in [After working inside your system](#).

Control panel

Removing the left control panel

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove the air shroud.
- Remove the internal PERC riser.

Follow the below steps to remove the left Control Panel:

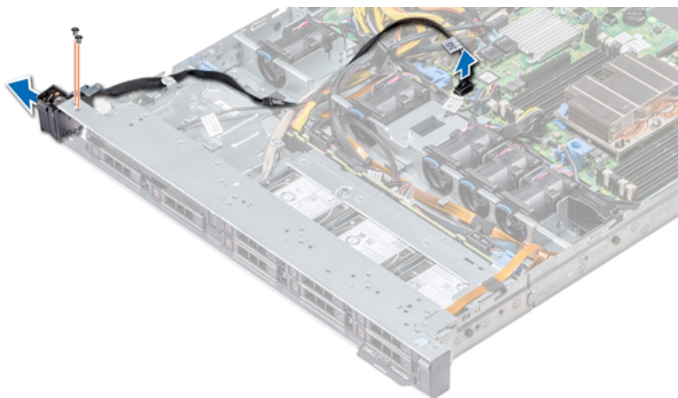
1. Disconnect the control panel cable from the system board connector.

NOTE: Ensure that you note the routing of the cables as you remove them from the system board. You must route the cables properly when you replace them to prevent the cables from being pinched or crimped.

2. Using a Phillips #1 screwdriver, remove the screws that secure the cable cover.



3. Using a Phillips #1 screwdriver, remove the screws that connect the control panel to the system.



4. Holding by the sides, remove the left control panel assembly away from the system.

Installing the left control panel

- Follow the safety guidelines listed in [Safety instructions](#).

Follow the below steps to install the left Control Panel:

1. Route the control panel cable through the side wall of the system.
2. Align the left control panel assembly with the control panel slot on the system and place the assembly in the slot on the system.
3. Connect the control panel cable to the system board connector.
4. Using Phillips #1 screwdriver, install the screws that secure the cable cover to the system.



After installing the left control panel you could do the following:

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Install the air shroud.
3. Install the internal PERC riser.
4. Follow the procedure listed in [Before working inside your system](#).

Removing the Right Control Panel

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove the internal PERC riser.

Follow the below steps to remove the right Control Panel:

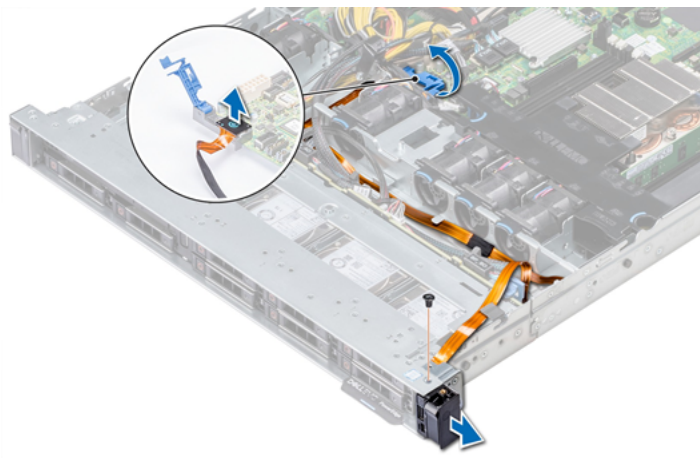
1. Lift the cable latch and disconnect the control panel cable from the connector on the system board.

NOTE: Ensure that you note the routing of the cables as you remove them from the system board. You must route the cables properly when you replace them to prevent the cables from being pinched or crimped.

2. Using a Phillips #1 screwdriver, remove the screws that secure the cable cover to the system.



3. Using a Phillips #1 screwdriver, remove the screw that secures the control panel to the system.



4. Holding the control panel by its sides, remove the control panel away from the system.

Installing the right control panel

- Follow the safety guidelines listed in [Safety instructions](#).

Follow the below steps to install the right Control Panel:

1. Route the control panel cable through the side wall of the system.
2. Align the right control panel with the control panel slot on the system and place the assembly in the slot on the system.

3. Connect the control panel cable to the connector on the system board and lower the cable latch to secure the cable in place.
4. Using a Phillips #1 screwdriver, install the screws that secure the cable cover to the system.



After installing the right control panel you could do the following:

1. Install the internal PERC riser.
2. Follow the procedure listed in [After working inside your system](#).

System Board

Removing the System Board

CAUTION: If you are using the Trusted Platform Module (TPM) with an encryption key, you may be prompted to create a recovery key during program or System Setup. Be sure to create and safely store this recovery key. If you replace this system board, you must supply the recovery key when you restart your system or program before you can access the encrypted data on your hard drives.

CAUTION: Do not attempt to remove the TPM plug-in module from the system board. Once the TPM plug-in module is installed, it is cryptographically bound to that specific system board. Any attempt to remove an installed TPM plug-in module breaks the cryptographic binding, and it cannot be re-installed or installed on another system board.

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- Remove the following:
 - Air shroud
 - All expansion cards and risers

- Internal PERC riser
- IDSDM/vFlash module card
- Internal USB key (if installed)
- Processors and heat sink modules
- Memory modules
- LOM riser card

Follow the below steps to remove the System Board:

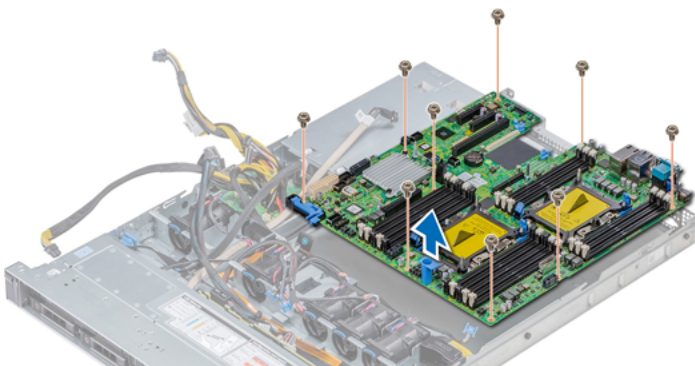
1. Disconnect all cables from the system board.

NOTE: Ensure that you note the routing of the cables as you remove them from the system board.

CAUTION: Take care not to damage the system identification button while removing the system board from the chassis.

CAUTION: Do not lift the system board by holding a memory module, processor, or other components.

2. Using a Phillips #2 screwdriver, remove the screws that secure the system board to the chassis.
3. Hold the system board holder, slightly lift the system board, and then slide it toward the front of the chassis.
4. Using the system board holder, lift the system board out of the chassis.



Installing the System Board

- Follow the safety guidelines listed in [Safety instructions](#).

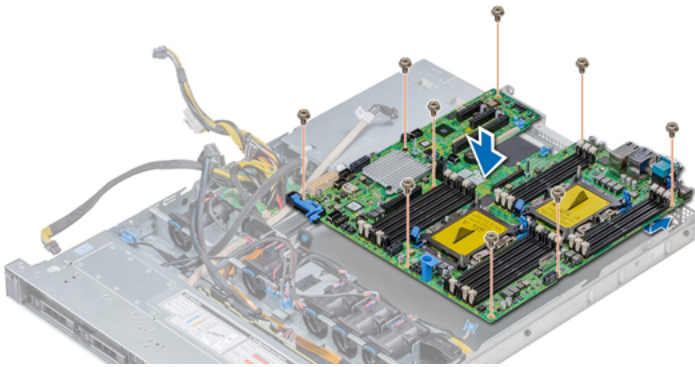
Follow the below steps to install the System Board:

1. Unpack the new system board assembly.

CAUTION: Do not lift the system board by holding a memory module, processor, or other components.

CAUTION: Take care not to damage the system identification button while placing the system board into the chassis.

2. Holding the system board holder, align the connector on the system board with the slots on the back of the chassis and place the system board in place.
3. Using a Phillips #2 screwdriver, replace the screws that secure the system board to the chassis.



After installing the system board you could do the following:

1. Replace the following:
 - a. Install the Trusted Platform Module (TPM).
 - b. Internal PERC riser
 - c. Internal USB key (if applicable)
 - d. USB 3.0 module (if applicable)
 - e. IDSDM/vFlash module card
 - f. All expansion cards and risers
 - g. Processors and heat sink modules
 - h. Processors blanks (if applicable)
 - i. Memory modules

- j. LOM riser card
- k. Air shroud

2. Reconnect all cables to the system board.

NOTE: NOTE: Ensure that the cables inside the system are routed along the chassis wall and secured using the cable securing bracket.

3. Follow the procedure listed in [Before working inside your system](#).

4. Ensure that you:

- a. Use the Easy Restore feature to restore the Service Tag. For more information, see the Restoring the Service Tag by using the Easy Restore feature section.
- b. If the Service Tag is not backed up in the backup flash device, enter the Service Tag manually. For more information, see the Restoring the Service Tag by using the Easy Restore feature section.
- c. Update the BIOS and iDRAC versions.
- d. Re-enable the Trusted Platform Module (TPM). For more information, see the Upgrading the Trusted Platform Module section.

5. Import your new or existing iDRAC Enterprise license.

Restoring the system using Easy Restore

The easy restore feature enables you to restore your service tag, license, UEFI configuration, and the system configuration data after replacing the system board. All data is backed up in a backup flash device automatically. If BIOS detects a new system board, and the service tag in the backup flash device, BIOS prompts the user to restore the backup information.

You can do the following tasks:

- Restore the service tag, license, and diagnostics information, press Y
- Navigate to the Lifecycle Controller based restore options, press N.
- Restore data from a previously created Hardware Server Profile, press F10

NOTE: When the restore process is complete, BIOS prompts to restore the system configuration data.

- To restore the system configuration data, press Y
- To use the default configuration settings, press N

NOTE: NOTE: After the restore process is complete, system reboots.

Manually update the Service Tag

After replacing a system board, if Easy Restore fails, follow this process to manually enter the Service Tag, using System Setup.

If you know the system service tag, use the System Setup menu to enter the service tag. Follow the below steps:

1. Power on the system.
2. To enter the System Setup, press F2.
3. Click Service Tag Settings.
4. Enter the service tag.

NOTE: You can enter the service tag only when the Service Tag field is empty. Ensure that you enter the correct service tag. Once the service tag is entered, it cannot be updated or changed.

5. Click OK.

Entering the system Service Tag by using System Setup

If Easy Restore fails to restore the Service Tag, use System Setup to enter the Service Tag. Follow the below steps:

1. Turn on the system.
2. Press F2 to enter System Setup.
3. Click Service Tag Settings.
4. Enter the Service Tag.

NOTE: You can enter the Service Tag only when the Service Tag field is empty. Ensure that you enter the correct Service Tag. After the Service Tag is entered, it cannot be updated or changed.

5. Click OK.
6. Import your new or existing iDRAC Enterprise license.

Trusted Platform Module

Upgrading the Trusted Platform Module

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).

NOTE:

1. Ensure that your operating system supports the version of the TPM module being installed.
2. Ensure that you download and install the latest BIOS firmware on your system.
3. Ensure that the BIOS is configured to enable UEFI boot mode.

CAUTION: If you are using the Trusted Platform Module (TPM) with an encryption key, you may be prompted to create a recovery key during program or System Setup. Work with the customer to create and safely store this recovery key. When replacing this system board, you must supply the recovery key when you restart your system or program before you can access the encrypted data on your hard drives.

CAUTION: Once the TPM plug-in module is installed, it is cryptographically bound to that specific system board. Any attempt to remove an installed TPM plug-in module breaks the cryptographic binding, the removed TPM cannot be reinstalled or installed on another system board.

Removing the TPM

To remove the TPM follow the below steps:

1. Locate the TPM connector on the system board.
2. Press to hold the module down and remove the screw using the security Torx 8-bit shipped with the TPM module.
3. Slide the TPM module out from its connector.
4. Push the plastic rivet away from the TPM connector and rotate it 90° counterclockwise to release it from the system board.
5. Pull the plastic rivet out of its slot on the system board.

Installing the TPM

To install the TPM follow the below steps:

1. To install the TPM, align the edge connectors on the TPM with the slot on the TPM connector.
2. Insert the TPM into the TPM connector such that the plastic rivet aligns with the slot on the system board.
3. Press the plastic rivet until the rivet snaps into place.



After installing the TPM do the following:

1. Install the system board.
2. Follow the procedure listed in After working inside your system.

Initializing TPM for BitLocker users

- Initialize the TPM.
- The TPM Status changes to Enabled, Activated.

Initializing the TPM 1.2 for TXT users

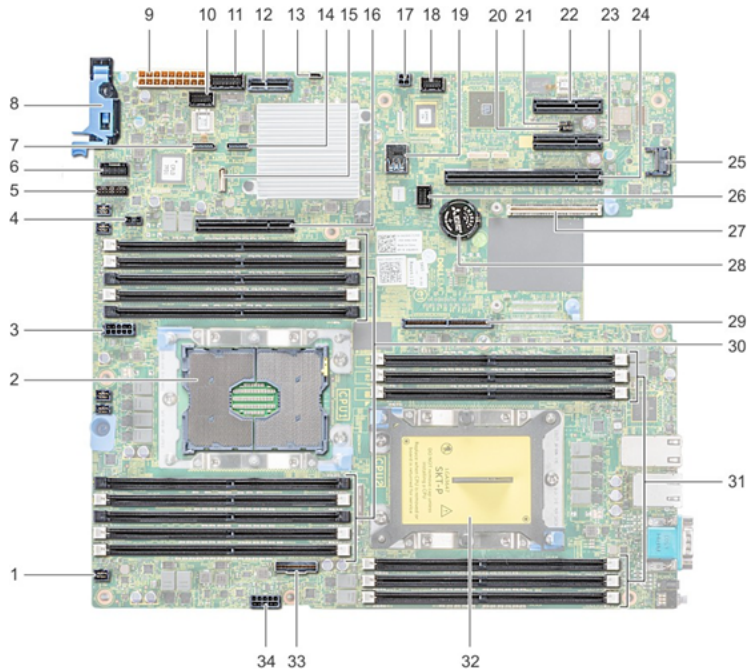
Follow the below steps to initialize the TPM:

1. While booting your system, press F2 to enter System Setup.
2. On the System Setup Main Menu screen, click System BIOS > System Security Settings.
3. From the TPM Security option, select On with Pre-boot Measurements.
4. From the TPM Command option, select Activate.
5. Save the settings.
6. Restart your system.

7. Enter System Setup again.
8. On the System Setup Main Menu screen, click System BIOS > System Security Settings.
9. From the Intel TXT option, select On.

Jumpers and Connectors

This topic provides specific information about the jumpers and switches and describes the connectors on the board in the system. Jumpers on the system board help to disable the system and setup passwords. You must know the connectors on the system board to install components and cables correctly.



Item	Connector	Description
1.	FAN6	Cooling fan 6 connector
2.	CPU1	Processor socket 1
3.	CPU1_PWR_CONN(P2)	CPU1 power connector
4.	J_INTRU	Intrusion switch connector
5.	J_BP_SIG1	Backplane signal connector 1
6.	LFT_CP_CONN	Left control panel connector
7.	J_SATA_B1	Internal SATA B connector
8.	RGT_CP_CONN	Right panel connector
9.	SYS_PWR_CONN(P1)	System power connector
10.	J_PIB_SIG1	Power interposer board signal connector 1
11.	J_PIB_SIG2	Power interposer board signal connector 2
12.	J_ACE	Internal Dual SD Module

Item	Connector	Description
13.	J_CP_USB2	Front USB connector
14.	J_SATA_A1	Internal SATA A connector
15.	J_SATA_C1	Internal SATA C connector
16.	PCIE_G3_X8(CPU1)	Internal PERC controller connector
17.	J_REAR_BP_PWR1	Rear backplane power connector
18.	J_FRONT_VIDEO	VGA connector
19.	INT_USB_3.0	USB connector
20.	NVRAM_CLR	Clear NVRAM
21.	PWRD_EN	Reset BIOS password
22.	SLOT5	PCIe slot 5
23.	SLOT4	PCIe slot 4
24.	SLOT3	PCIe slot 3
25.	J_TPM_MODULE	TPM module connector
26.	J_BP_SIG0	Backplane signal connector
27.	J_MEZZ_A1	LOM riser card connector
28.	BATTERY	Battery connector
29.	PCIE_G3_X16(CPU1)	Riser 1 connector
30.	A6, A5, A10, A4, A9, A7, A1, A8, A2, A3	Memory module sockets
31.	B3, B2, B1, B4, B5, B6	Memory module sockets
32.	CPU2	Processor socket 2
33.	PCIE_A0	NVMe connector
34.	CPU2_PWR_CONN(P3)	CPU2 power connector

System board jumper settings

For information on resetting the password jumper to disable a password, see the Disabling a forgotten password section.

Disabling forgotten password

The software security features of the system include a system password and a setup password. The password jumper enables or disables password features and clears any password(s) currently in use.

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

Follow the below steps to disable forgotten password.

1. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover.
3. Move the jumper on the system board jumper from pins 2 and 4 to pins 4 and 6.
4. Install the system cover.

The existing passwords are not disabled (erased) until the system boots with the jumper on pins 4 and 6. However, before you assign a new system and/or setup password, you must move the jumper back to pins 2 and

NOTE: If you assign a new system and/or setup password with the jumper on pins 4 and 6, the system disables the new password(s) the next time it boots.

5. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
6. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
7. Remove the system cover.
8. Move the jumper on the system board jumper from pins 4 and 6 to pins 2 and 4.
9. Install the system cover.
10. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
11. Assign a new system and/or setup password.

Using System Diagnostics

If you experience a problem with your system, run the system diagnostics before contacting Gigamon for technical assistance. The purpose of running system diagnostics is to test your system hardware without requiring additional equipment or risking data loss. If you are unable to fix the problem yourself, service and support personnel can use the diagnostics results to help you solve the problem.

Embedded System Diagnostics

NOTE: NOTE: The Embedded System Diagnostics is also known as Enhanced Pre-boot System Assessment (ePSA) diagnostics.

The embedded system diagnostics provides a set of options for particular device groups or devices allowing you to:

- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing

When to use the Embedded System Diagnostics

If a major component or device in the system does not operate properly, running the embedded system diagnostics may indicate component failure.

Running the Embedded System Diagnostics from Boot Manager

1. As the system boots, press **<F11>**.
2. Use the up and down arrow keys to select **System Utilities > Launch Diagnostics**.

STEP RESULT: The ePSA Pre-boot System Assessment window is displayed, listing all devices detected in the system. The diagnostics starts executing the tests on all the detected devices.

Running the Embedded System Diagnostics from the Lifecycle Controller

1. As the system boots, press **<F11>**.
2. Select **Hardware Diagnostics ? Run Hardware Diagnostics**.

STEP RESULT: The ePSA Pre-boot System Assessment window is displayed, listing all devices detected in the system. The diagnostics starts executing the tests on all the detected devices.

System diagnostic controls

Menu	Description
Configuration	Displays the configuration and status information of all detected devices.
Results	Displays the results of all tests that are executed.
System health	Provides the current overview of the system performance.
Event log	Displays a time-stamped log of the results of all tests run on the system. This is displayed if at least one event description is recorded.

Getting Help

Contacting Gigamon

Gigamon provides several online and telephone-based support and service options. If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or product catalog.

Availability varies by country and product, and some services may not be available in your area. To contact Gigamon for sales, technical support, or customer-service issues:

1. For support, go to gigamon.com/support-and-services/contact-support.
2. For sales, inside.sales@gigamon.com or +1 408-831-4025

Locating your system Service Tag

Your system is identified by a unique Express Service Code and Service Tag number. The Express Service Code and Service Tag are found on the front of the system by pulling out the information tag. Alternatively, the information may be on a sticker on the chassis of the system. This information is used by Gigamon to route support calls to the appropriate personnel.

Additional Sources of Information

This appendix provides additional sources of information. Refer to the following sections for details:

- [Documentation](#)
- [Documentation Feedback](#)
- [Contact Technical Support](#)
- [Contact Sales](#)
- [The Gigamon Community](#)

Documentation

This table lists all the guides provided for GFM-HW1-FM010,GFM-HW1-FM001-HW software and hardware. The first row provides an All-Documents Zip file that contains all the guides in the set for the release.

NOTE: In the online documentation, view [What's New](#) to access quick links to topics for each of the new features in this Release; view [Documentation Downloads](#) to download all PDFs.

Table 1: Documentation Set for Gigamon Products

GFM-HW1-FM010,GFM-HW1-FM001-HW 6.1 Hardware and Software Guides
<p>DID YOU KNOW? If you keep all PDFs for a release in common folder, you can easily search across the doc set by opening one of the files in Acrobat and choosing Edit > Advanced Search from the menu. This opens an interface that allows you to select a directory and search across all PDFs in a folder.</p>
<p>Hardware</p> <p>how to unpack, assemble, rack-mount, connect, and initially configure ports the respective GFM-HW1-FM010,GFM-HW1-FM001-HW devices; reference information and specifications for the respective GFM-HW1-FM010,GFM-HW1-FM001-HW devices</p>
GigaVUE-HC1 Hardware Installation Guide
GigaVUE-HC2 Hardware Installation Guide
GigaVUE-HC3 Hardware Installation Guide
GigaVUE-HC1-Plus Hardware Installation Guide
GigaVUE-TA25E Hardware Installation Guide
GigaVUE-TA200E Hardware Installation Guide
GigaVUE-TA25 Hardware Installation Guide

GFM-HW1-FM010,GFM-HW1-FM001-HW 6.1 Hardware and Software Guides**GigaVUE-TA200 Hardware Installation Guide****GigaVUE-TA400 Hardware Installation Guide****GigaVUE-TA10 Hardware Installation Guide****GigaVUE-TA40 Hardware Installation Guide****GigaVUE-TA100 Hardware Installation Guide****GigaVUE-TA100-CXP Hardware Installation Guide****GigaVUE-OS Installation Guide for DELL S4112F-ON****G-TAP A Series 2 Installation Guide****GigaVUE M Series Hardware Installation Guide****GigaVUE-FM Hardware Appliance Guide for GFM-HW1-FM010 and and GFM-HW1-FM001-HW****Software Installation and Upgrade Guides****GigaVUE-FM Installation, Migration, and Upgrade Guide****GigaVUE-OS Upgrade Guide****GigaVUE V Series Migration Guide****Fabric Management and Administration Guides****GigaVUE Administration Guide**

covers both GigaVUE-OS and GigaVUE-FM

GigaVUE Fabric Management Guide

how to install, deploy, and operate GigaVUE-FM; how to configure GigaSMART operations; covers both GigaVUE-FM and GigaVUE-OS features

Cloud Guides

how to configure the GigaVUE Cloud Suite components and set up traffic monitoring sessions for the cloud platforms

GigaVUE V Series Applications Guide*GigaVUE V Series Quick Start Guide****GigaVUE Cloud Suite for AWS—GigaVUE V Series 2 Guide****GigaVUE Cloud Suite for Azure—GigaVUE V Series 2 Guide****GigaVUE Cloud Suite for OpenStack—GigaVUE V Series 2 Guide*****GigaVUE Cloud Suite for Nutanix Guide—GigaVUE V Series 2 Guide****GigaVUE Cloud Suite for VMware—GigaVUE V Series Guide**

GFM-HW1-FM010,GFM-HW1-FM001-HW 6.1 Hardware and Software Guides

*GigaVUE Cloud Suite for Third Party Orchestration

GigaVUE Cloud Suite for AnyCloud Guide

Universal Container Tap Guide

Gigamon Containerized Broker Guide

GigaVUE Cloud Suite for AWS–GigaVUE V Series 1 Guide

GigaVUE Cloud Suite for Azure–GigaVUE V Series 1 Guide

GigaVUE Cloud Suite for OpenStack–GigaVUE V Series 1 Guide

GigaVUE Cloud Suite for Nutanix Guide—GigaVUE-VM Guide

GigaVUE Cloud Suite for VMware—GigaVUE-VM Guide

Reference Guides

GigaVUE-OS CLI Reference Guide

library of GigaVUE-OS CLI (Command Line Interface) commands used to configure and operate GigaVUE HC Series and TA Series devices

GigaVUE-OS Cabling Quick Reference Guide

guidelines for the different types of cables used to connect Gigamon devices

GigaVUE-OS Compatibility and Interoperability Matrix

compatibility information and interoperability requirements for Gigamon devices

GigaVUE-FM REST API Reference in GigaVUE-FM User's Guide

samples uses of the GigaVUE-FM Application Program Interfaces (APIs)

Release Notes

GigaVUE-OS, GigaVUE-FM, GigaVUE-VM, G-TAP A Series, and GigaVUE Cloud Suite Release Notes

new features, resolved issues, and known issues in this release ;
important notes regarding installing and upgrading to this release

NOTE: Release Notes are not included in the online documentation.

NOTE: Registered Customers can log in to [My Gigamon](#) to download the Software and Release Notes from the Software & Docs page on to [My Gigamon](#). Refer to [How to Download Software and Release Notes from My Gigamon](#).

In-Product Help

GigaVUE-FM Online Help

how to install, deploy, and operate GigaVUE-FM.

How to Download Software and Release Notes from My Gigamon

Registered Customers can download software and corresponding Release Notes documents from the **Software & Release Notes** page on to [My Gigamon](#). Use the My Gigamon Software & Docs page to download:

- Gigamon Software installation and upgrade images,
- Release Notes for Gigamon Software, or
- Older versions of PDFs (pre-v5.7).

To download release-specific software, release notes, or older PDFs:

1. Log in to [My Gigamon](#)
2. Click on the **Software & Release Notes** link.
3. Use the **Product** and **Release** filters to find documentation for the current release. For example, select Product: "GigaVUE-FM" and Release: "5.6," enter "pdf" in the search box, and then click **GO** to view all PDF documentation for GigaVUE-FM 5.6.xx.

NOTE: My Gigamon is available to registered customers only. Newer documentation PDFs, with the exception of release notes, are all available through the publicly available online documentation.

Documentation Feedback

We are continuously improving our documentation to make it more accessible while maintaining accuracy and ease of use. Your feedback helps us to improve. To provide feedback and report issues in our documentation, send an email to:

documentationfeedback@gigamon.com

Please provide the following information in the email to help us identify and resolve the issue. Copy and paste this form into your email, complete it as able, and send. We will respond as soon as possible.

Documentation Feedback Form		
About You	Your Name	
	Your Role	
	Your Company	

For Online Topics	Online doc link	<i>(URL for where the issue is)</i>
	Topic Heading	<i>(if it's a long topic, please provide the heading of the section where the issue is)</i>
For PDF Topics	Document Title	<i>(shown on the cover page or in page header)</i>
	Product Version	<i>(shown on the cover page)</i>
	Document Version	<i>(shown on the cover page)</i>
	Chapter Heading	<i>(shown in footer)</i>
	PDF page #	<i>(shown in footer)</i>
How can we improve?	Describe the issue	<i>Describe the error or issue in the documentation. (If it helps, attach an image to show the issue.)</i>
	How can we improve the content? Be as specific as possible.	
	Any other comments?	

Contact Technical Support

For information about Technical Support: Go to **Settings**  > **Support** > **Contact Support** in GigaVUE-FM.

You can also refer to <https://www.gigamon.com/support-and-services/contact-support> for Technical Support hours and contact information.

Email Technical Support at support@gigamon.com.

Contact Sales

Use the following information to Gigamon channel partner or Gigamon sales representatives.

Telephone: +1.408.831.4025

Sales: inside.sales@gigamon.com

Partners: www.gigamon.com/partners.html

Premium Support

Email Gigamon at inside.sales@gigamon.com for information on purchasing 24x7 Premium Support. Premium Support entitles you to round-the-clock phone support with a dedicated Support Engineer every day of the week.

The Gigamon Community

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Register today at community.gigamon.com

Questions? Contact our Community team at community@gigamon.com.

Glossary

D

decrypt list

need to decrypt (formerly blacklist)

decryptlist

need to decrypt - CLI Command (formerly blacklist)

drop list

selective forwarding - drop (formerly blacklist)

F

forward list

selective forwarding - forward (formerly whitelist)

L

leader

leader in clustering node relationship (formerly master)

M

member node

follower in clustering node relationship (formerly slave or non-master)

N

no-decrypt list

no need to decrypt (formerly whitelist)

nodecryptlist

no need to decrypt- CLI Command (formerly whitelist)

P

primary source

root timing; transmits sync info to clocks in its network segment (formerly grandmaster)

R

receiver

follower in a bidirectional clock relationship (formerly slave)

S

source

leader in a bidirectional clock relationship (formerly master)