Installing Modules in Avaya Virtual Services Platform 9000

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NN46250-301
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Chapter 1: Introduction

Purpose

This document describes the conceptual and procedural information for module installation on Avaya Virtual Services Platform 9000. This document also specifies initial preparation, processes, technical specifications, and safety requirements.

Related resources

Documentation

See *Documentation Reference for Avaya Virtual Services Platform 9000,* NN46250-100 for a list of the documentation for this product.

Training

Ongoing product training is available. For more information or to register, you can access the website at http://avaya-learning.com/.

Course code	Course title
4D00010E	Knowledge Access: ACIS - Avaya ERS 8000 and VSP 9000 Implementation
5D00040E	Knowledge Access: ACSS - Avaya VSP 9000 Support

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Procedure

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  - In **Search**, type `Avaya Mentor Videos` to see a list of the available videos.
  - In **Search**, type the product name. On the Search Results page, select **Video** in the **Content Type** column on the left.
- To find the Avaya Mentor videos on YouTube, go to www.youtube.com/AvayaMentor and perform one of the following actions:
  - Enter a key word or key words in the Search Channel to search for a specific product or topic.
  - Scroll down Playlists, and click the name of a topic to see the available list of videos posted on the website.

Note:

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Searching a documentation collection

On the Avaya Support website, you can download the documentation library for a specific product and software release to perform searches across an entire document collection. For example, you can perform a single, simultaneous search across the collection to quickly find all occurrences of a particular feature. Use this procedure to perform an index search of your documentation collection.

Before you begin

- Download the documentation collection zip file to your local computer.
- You must have Adobe Acrobat or Adobe Reader installed on your computer.

Procedure

1. Extract the document collection zip file into a folder.
2. Navigate to the folder that contains the extracted files and open the file named <*product_name_release*>.pdx.
3. In the Search dialog box, select the option **In the index named <*product_name_release*>.pdx**.
4. Enter a search word or phrase.
5. Select any of the following to narrow your search:
   - Whole Words Only
   - Case-Sensitive
   - Include Bookmarks
   - Include Comments
6. Click **Search**.

   The search results show the number of documents and instances found. You can sort the search results by Relevance Ranking, Date Modified, Filename, or Location. The default is Relevance Ranking.

Chapter 2: New in this release

The following sections describe what is new in *Installing Modules in Avaya Virtual Services Platform 9000,* NN46250-301, for Release 4.0.

Features

See the following sections for information about feature-related changes.

9012QQ-2 I/O module

Release 4.0.1 introduces a second generation 9012QQ-2 Input/Output (I/O) module. The 9012QQ-2 module is a 12-port 40–gigabit-per-second (Gbps) module that supports the 40GBASE-R QSFP+ transceivers. You can use second generation I/O modules in first generation mode or second generation mode.

For more information about the 9012QQ-2 I/O module, see:

- 9012QQ-2 module on page 16.
- 9012QQ-2 module specifications on page 119.

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9048XS-2 I/O module

Release 4.0 introduces a second generation 9048XS-2 Input/Output (I/O) module.

The 9048XS-2 module is a 48–port 10 Gigabit-per-second (Gbps) module that supports: 10GBASE-ER/EW, 10GBASE-ER CWDM DDI, 10GBASE-ZR, 10 GBASE-SR/SW, 10GBASE-LRM, 10GBASE-LR/LW, 10GBASE-ER/EW CWDM, 10GBASE-ZR/ZW, 10GBASE-ZR CWDM DDI, 10GBASE-CX DAC SFP+ transceivers and 1000BASE-BX-U-40 and 1000BASE-BX-D-40 SFP transceivers.

For more information, see:

- First and second generation modules and modes on page 12.
- 9048XS-2 module on page 13.
- 9090SF module on page 32.
- 9095SF module on page 35.
- Temperature alarms on page 41.
- Temperature alarms on page 52.
- Port density of the modules on page 117.

- 9048XS-2 module specifications on page 120.
- 9090SF module specifications on page 124.
- 9095SF module specifications on page 124.
- Required cables on page 125.
- Hot swapping a module for the VSP 9010 on page 79.
- Hot swapping a module for the VSP 9012 on page 105.
- VSP 9010 module installation time requirements on page 63.
- VSP 9012 module installation time requirements on page 86.
- Port density of the modules on page 117.

9012FCHS cooling module

Information is updated for the 9012FCHS high-speed cooling module for use with second generation modules on the Virtual Services Platform 9012.

- First and second generation modules and modes on page 12.
- 9048XS-2 module on page 13.
- Airflow in the Virtual Services Platform 9012 on page 49.

Hot swapping a CP module

Information is updated on hot swapping of CP modules for the Virtual Services Platform 9010 and the Virtual Services Platform 9012, which use a single CP module. For more information, see:

- Hot swapping a module for the VSP 9010 on page 79.
- Hot swapping a module for the VSP 9012 on page 105.

Replacing the compact flash

Release 4.0 adds information on proper replacement of the compact flash on VSP 9000. For more information see, Replacing the compact flash on the VSP 9000 on page 111.

show sys-info

Release 4.0 updates the output for the **`show sys-info`** command. For more information, see:

- Temperature alarms on page 41.
- Temperature alarms on page 52.

Other changes

See the following sections for other changes to the documentation.

Document title

Release 4.0 updates the document title to *Administering Avaya Virtual Services Platform 9000*, NN46250–301, from *Avaya Virtual Services Platform 9000 Installation – Modules*, NN46250–301.

Regulatory information

Regulatory information is removed from this document because the content exists in a separate regulatory document. For more information, see *Regulatory Reference for Avaya Virtual Services Platform 9000,* NN46250-112 (700509061).

Chapter 3: Module fundamentals

The Avaya Virtual Services Platform 9000 modules provide a full complement of core routing and switching capabilities. Use this section to help you understand and use each module.

First and second generation modules and modes

First generation and second generation modules operate in any I/O module slot in both Virtual Services Platform 9010 and Virtual Services Platform 9012.

The following table identifies the first generation and second generation module types and shows the various support configurations for each mode.

Chassis mode	Modules	Supported on both VSP 9010 and VSP 9012	High speed cooling module support
First generation mode	First generation modules: • 9024XL • 9048GB • 9048GT Second generation modules: • 9048XS-2 • 9012QQ-2	• Supports all first generation modules and second generation modules. • Switch Fabric (SF) modules: - First generation modules: require a minimum of three SF modules. - Second generation modules: require a minimum of five SF modules.	• First generation modules on VSP 9010: use the 9012FC cooling module. The 9012FCHS is not required on the VSP 9010. • First generation modules on VSP 9012: use the 9012FC cooling modules or the 9012FCHS cooling modules. **Note:** Second generation modules running in first generation mode on the VSP 9012 still require the 9012FCHS cooling module.
Second generation mode	Second generation modules: • 9048XS-2 • 9012QQ-2	• Supports only second generation modules. • Requires a minimum of five SF modules. • Achieves enhanced scaling capabilities for FIB routes.	• Second generation modules on VSP 9010: use the 9012FC cooling module. The 9012FCHS is not required on the VSP 9010.

Chassis mode	Modules	Supported on both VSP 9010 and VSP 9012	High speed cooling module support
			• Second generation modules on VSP 9012: require the 9012FCHS cooling modules.

Note:

- If you install a second generation module in Virtual Services Platform 9010 or Virtual Services Platform 9012, you must have a minimum of five SF modules installed. Populate slots SF1 and SF4, and use any other slots for the remaining three SF modules.
- If you install a first generation module in Virtual Services Platform 9010 or Virtual Services Platform 9012, you must have a minimum of three SF modules installed. Populate slots SF1 and SF4, and use any other slot for the remaining SF module.
- If you install a second generation module in Virtual Services Platform 9012, you must also install the 9012FCHS cooling modules. After you insert a second generation module into Virtual Services Platform 9012, the system checks which cooling modules are in use, and if the system does not use the 9012FCHS cooling modules, the second generation modules remain offline.

First generation mode configuration

Virtual Services Platform 9000 with first generation modules are based on 3 x 48Gbps Network Processing Unit (NPU). If you want to use both first generation and second generation modules, you must use the default parameter **`gen1`** with the **`boot config linecard-compatibility-mode {gen1|gen2}`** command, which configures the system to first generation (gen1). After you configure the device for first generation modules, the system reboots in first generation (gen1) mode.

Second generation mode configuration

Virtual Services Platform 9000 with second generation modules is a fully-featured high performance high-end platform based on 3 x 160Gbps NPUs per I/O module. If you want to use only second generation modules and achieve full scaling capability, you must use the default parameter **`gen2`** with the **`boot config linecard-compatibility-mode {gen1|gen2}`** command, which configures the system to second generation (gen2). The system reboots in second generation mode and disables all first generation modules.

For more information, see *Configuring Ethernet Modules on Avaya Virtual Services Platform 9000,* NN46250-508.

9048XS-2 module

The second generation 9048XS-2 Input/Output (I/O) module is a 10 Gigabit per second (Gbps) module that provides 48 10GBASE-R, small form factor pluggable plus (SFP+) ports.

The 9048XS-2 module supports the following:

- 9600-byte frames

- 10GBASE-R SFP+ and 1000BASE-X SFP transceivers
- 10 GE LAN mode
- 2 GB of memory

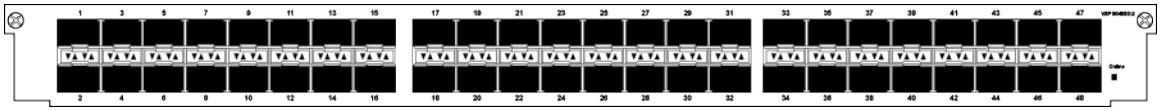


Figure 1: 9048XS-2 module

Each SFP+ connector has 20 pins. For more information about supported SFP and SFP+ transceivers, see *Installing Transceivers and Optical Components on Avaya Virtual Services Platform 9000,* NN46250-305.

If you install at least five SF modules, the 9048XS-2 module is oversubscribed 2:1 with regards to line rate over 48 ports. The 9048XS-2 doubles the 10 G port density and triples the maximum throughput to 360 Mpps (240 Gbps – for full-duplex) when the chassis is equipped with five SF modules.

The 9048XS-2 modules leverage the 9090SF and 9095SF fabric capabilities and increase the platform performance from 60 10 GE line rate ports to 240 10 GE line rate ports, as well as increasing the 10 GE density from 240 ports to 480 ports, while still maintaining full feature capabilities.

Linecard-compatibility-mode

You can use the 9048XS-2 module in first generation or second generation linecard-compatibility-mode; however, if you want the system to configure the maximum routes to one million, you must configure the **`boot config linecard-compatibility-mode {gen1|gen2}`** command to second generation (gen2). After you configure the boot config linecard-compatibility-mode to second generation, the VSP 9000 chassis does not support first generation modules. For more information, see *Configuring Ethernet Modules on Avaya Virtual Services Platform 9000,* NN46250-508.

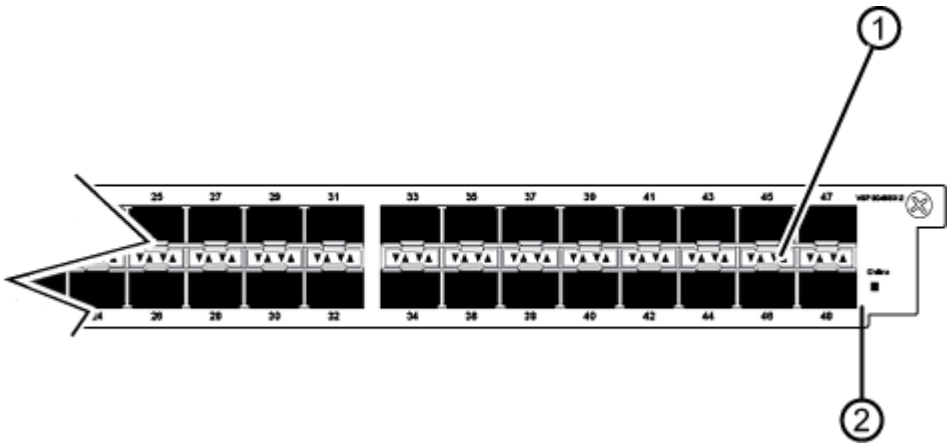
Considerations

Consider the following when you use the 9048XS-2 second generation module:

- If you configure Virtual Services Platform 9010 or Virtual Services Platform 9012 in second generation mode, the chassis supports only second generation modules.
- If you install second generation modules with Virtual Services Platform 9012 in first generation or second generation mode, you must use the 9012FCHS cooling module. If you insert a second generation module into Virtual Services Platform 9012, the system checks which cooling modules are in use, and if the system does not use the 9012FCHS cooling module, the second generation modules remain offline.
- If you install a second generation module in Virtual Services Platform 9010 or Virtual Services Platform 9012, you must have a minimum of five Switch Fabric (SF) modules installed. Populate slots SF1 and SF4, and use any other slots for the remaining three SF modules.
- The 9048XS-2 module does not support Lossless Ethernet in the current release.

9048XS-2 module LEDs

The following figure shows the location of the 9048XS-2 module LEDs.



The following table describes the preceding 9048XS-2 module.

Table 1: 9048XS-2 module LEDs

Number	Type
1	Port LEDs.
2	Module LED.

The following table describes the 9048XS-2 module LEDs.

Table 2: 9048XS-2 module LEDs

Type	Label	Color, State	Meaning
Port	Port number	Off	The port is connected but has no link and no SFP+.
		Amber/Steady	Local fault
		Amber/Blinking/Slow	Remote fault
		Green/Blinking/Slow	The port is administratively disabled.
		Green/Blinking/Fast	The port is transmitting or receiving data. The rate of blink indicates the level of activity on the link.
		Green/Steady	The port is connected, has link, but no data.
Module	Online	Off	The module power is off.
		Amber/Steady	The module is running diagnostics and starting.
		Amber/Blinking/Slow	The module is initializing the software.
		Amber/Blinking/Medium	The module is starting the application.
		Amber/Blinking/Fast	Image synchronization is complete.
		Green/Blinking/Medium	The module has completed its power-on self-test and software initialization.

Type	Label	Color, State	Meaning
		Green/Steady	The module is functioning normally.
		Red/Blinking/Fast	The module has exceeded the alarm threshold temperature. The cooling system now runs at full speed.
		Red/Steady	The module is faulty and not functioning. Replace the module.

9012QQ-2 module

The second generation 9012QQ-2 Input/Output (I/O) module is a 12-port 40 Gigabits per second (Gbps) module. The 9012QQ-2 module supports the 40GBASE-R QSFP+ transceivers.

The 9012QQ-2 module supports the following:

- Maximum throughput of 357 Million packets per second (Mpps) with 64 Byte packets
- standard management information base (MIB), 802.3ba
- Contention ratio of 2:1
- 80Gbps of bi-directional traffic per slice, with 240Gbps, assuming five Switch Fabric Modules installed

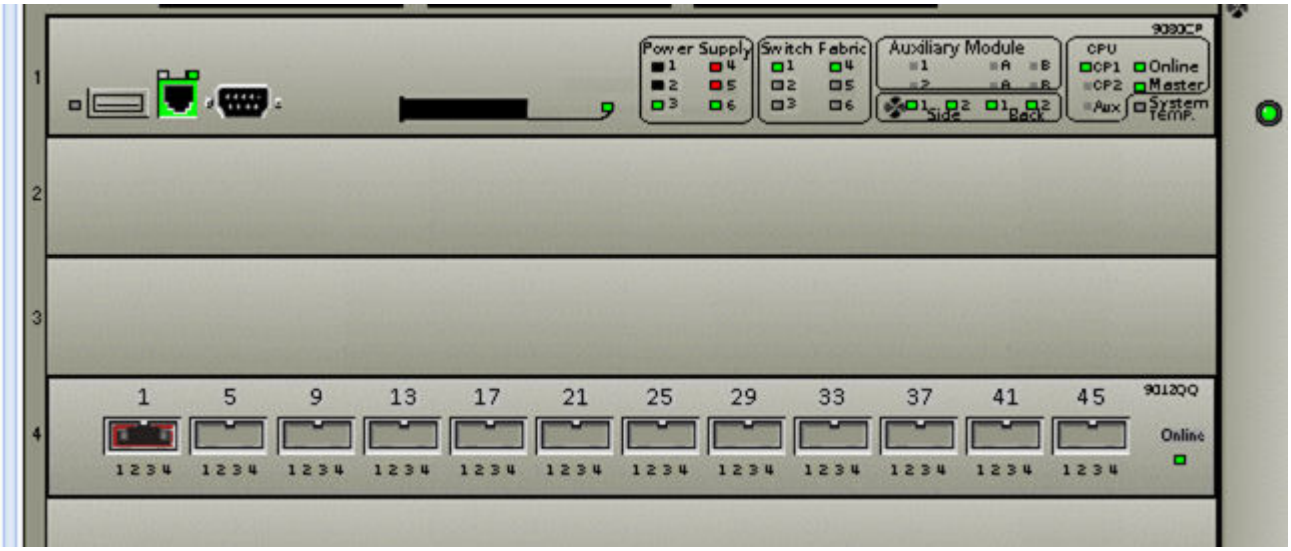


Figure 2: 9012QQ-2 module

Linecard-compatibility-mode

You can use the 9012QQ-2 module in first generation or second generation linecard-compatibility-mode; however, if you want the system to configure the maximum routes to one million, you must configure the **`boot config linecard-compatibility-mode {gen1|gen2}`** command to second generation (gen2). After you configure the boot config linecard-compatibility-mode to second

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generation, the VSP 9000 chassis does not support first generation modules. For more information, see *Configuring Ethernet Modules on Avaya Virtual Services Platform 9000,* NN46250-508.

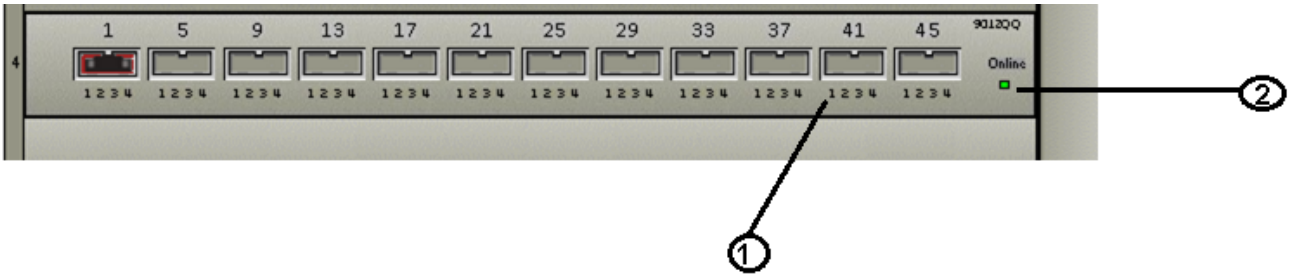
Considerations

Consider the following when you use the 9012QQ-2 module:

- You must have a minimum of five Switch Fabric modules installed, if you install the 9012QQ-2 module on the Virtual Services Platform 9012.
- The Virtual Services Platform 9012 requires the High-Speed Front Cooling Modules be installed before you install the 9012QQ-2 module.
- The 9012QQ-2 module does not support Lossless Ethernet in the current release.

9012QQ-2 module LEDs

The following figure shows the location of the 9012QQ-2 module LEDs.



The following table describes the preceding 9012QQ-2 module.

Number	Type
1	Port LEDs. LED 1 on each port is the only port LED that indicates the port state.
2	Module LEDs

The following table describes the 9012QQ–2 module LEDs.

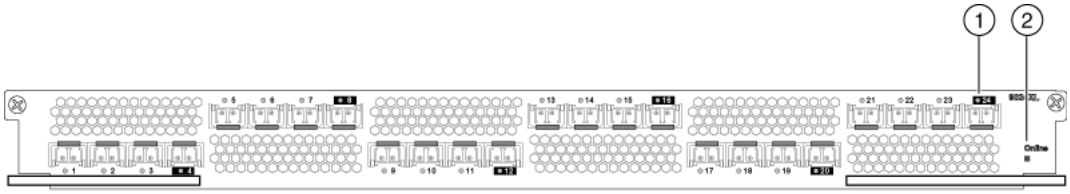
Table 3: 9048XS-2 module LEDs

Type	Label	Color, State	Meaning
Port	Port number	Off	The port is connected but has no link and no SFP+.
		Amber/Steady	Local fault
		Amber/Blinking/Slow	Remote fault
		Green/Blinking/Slow	The port is administratively disabled.
		Green/Blinking/Fast	The port is transmitting or receiving data. The rate of blink indicates the level of activity on the link.
		Green/Steady	The port is connected, has link, but no data.
Module	Online	Off	The module power is off.

Type	Label	Color, State	Meaning
		Amber/Steady	The module is running diagnostics and starting.
		Amber/Blinking/Slow	The module is initializing the software.
		Amber/Blinking/Medium	The module is starting the application.
		Amber/Blinking/Fast	Image synchronization is complete.
		Green/Blinking/Medium	The module has completed its power-on self-test and software initialization.
		Green/Steady	The module is functioning normally.
		Red/Blinking/Fast	The module has exceeded the alarm threshold temperature. The cooling system now runs at full speed.
		Red/Steady	The module is faulty and not functioning. Replace the module.

9024XL module

The 9024XL module provides 24 10GBASE-X, small form factor pluggable plus (SFP+) ports (see the following figure). Each SFP+ connector has 20 pins. For more information about supported SFP and SFP+ transceivers, see *Installing Transceivers and Optical Components on Avaya Virtual Services Platform 9000,* NN46250-305.



1 - Port Status LED
2 - Module online LED

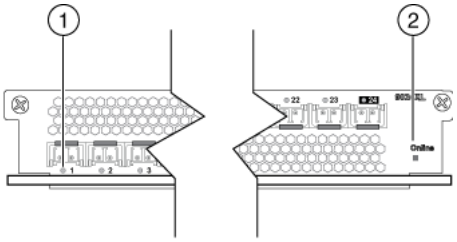
Figure 3: 9024XL module

If you install at least four SF modules, the 9024XL module has a 3.5:1 oversubscribed line rate over 24 ports; 6 ports can provide full line rate if you do not use the other ports. The 9024XL module has six clusters with four ports each (delimited by the black square around the port number). You can pick any one port out of the four in each of the six clusters of four ports to form the six ports, which can provide full line rate for the attached interfaces.

On the 9024XL module, ports support 9600-byte frames. The 9024XL module uses the SFP+ transceivers but also supports the SFP transceivers.

The 9024XL module supports a 10GE LAN mode.

The following figure shows the location of the 9024XL module LEDs.



1 - Port status LED
2 - Module online LED

Figure 4: 9024XL module LEDs

The following table describes the 9024XL module LEDs.

Table 4: 9024XL module LED description

Type	Label	Color, State	Meaning
Port	Port number	Off	The port is connected but has no link and no SFP+.
		Amber/Steady	Local fault
		Amber/Blinking/Slow	Remote fault
		Green/Blinking/Slow	The port is administratively disabled.
		Green/Blinking/Fast	The port is transmitting or receiving data. The rate of blink indicates the level of activity on the link.
		Green/Steady	The port is connected, has link, but no data.
Module	Online	Off	The module power is off.
		Amber/Steady	The module is running diagnostics and starting.
		Amber/Blinking/Slow	The module is initializing the software.
		Amber/Blinking/Medium	The module is starting the application.
		Amber/Blinking/Fast	Image synchronization is complete.
		Green/Blinking/Medium	The module has completed its power-on self-test and software initialization.
		Green/Steady	The module is functioning normally.
		Red/Blinking/Fast	The module has exceeded the alarm threshold temperature. The cooling system now runs at full speed.
		Red/Steady	The module is faulty and not functioning. Replace the module.

Using the VSP 9024XL Ventilation Cover for VSP 9010

Use the following information to ensure proper airflow in your chassis. The 9024XL module has six sets of SFP+ cages through the front panel with ventilation above or below each set of SFP+ cages.

About this task

Virtual Services Platform 9012:

When you install the 9024XL module in the Virtual Services Platform 9012 chassis, you must remove the ventilation cover.

The Virtual Services Platform 9012 draws cool air from front to back and from left to right. When the 9024XL module is in the Virtual Services Platform 9012, the open front perforations allow for additional air movement.

Virtual Services Platform 9010:

When you install the 9024XL module in the Virtual Services Platform 9010 it is best to cover the front perforations for improved airflow.

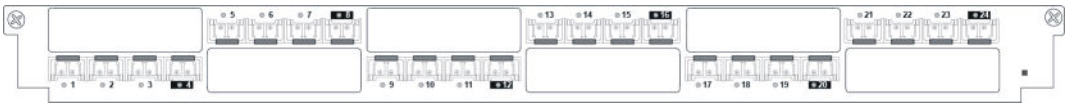
When you install a 9024XL module in the Virtual Services Platform 9010, attach the VSP 9024XL Ventilation Cover for VSP 9010 to the open sections at the front of the module. The ventilation cover attaches over the front of the module to direct hot air from the module into the hot aisle, and ensure the modules and chassis remain cool. The Virtual Services Platform 9010 draws cool air from front to back.

If you do not attach the ventilation cover to the front of the 9024XL module in the Virtual Services Platform 9010, hot air from the modules can be exhausted into the cool aisle in the room.

The Virtual Services Platform 9010 ships with eight covers, which is enough for eight modules. If you need replacement ventilation covers, you can order a new cover using order code EC1411016-E6.

Procedure

1. Remove the paper backing from the sticker.
2. Align the adhesive side of the sticker with the module faceplate so that the vents are covered and the ports are exposed.
3. Firmly press the sticker over each vent location to ensure full adherence.
4. Grasp the tab on one end of the sticker and slowly pull in the opposite direction to leave only the six ventilation covers in place.



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9048GB module

The 9048GB module supports up to 48 SFPs with 24 ports in each slice and 12 ports in each lane. On the 9048GB module, ports support 9600 byte frames.

The 9048GB module has a data transfer capability of 100/1000 Mb/s for each port. For more information about supported SFP, see *Installing Transceivers and Optical Components on Avaya Virtual Services Platform 9000,* NN46250-305. The following figure shows the 9048GB module.

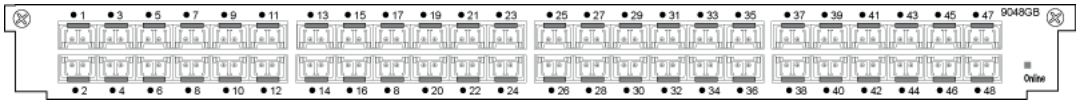


Figure 5: 9048GB module

The following figure shows the location of 9048GB module LEDs.

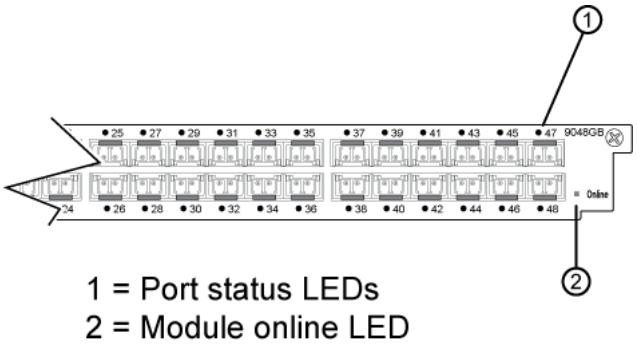


Figure 6: 9048GB module LEDs

The following table describes the 9048GB module LEDs.

Table 5: 9048GB module LED description

Type	Label	Color, State	Meaning
Port	Port number	Off	The port is connected but has no link and no SFP.
		Amber/Steady	Local fault
		Amber/Blinking/Slow	Remote fault
		Green/Blinking/Slow	The port is administratively disabled.
		Green/Blinking/Fast	The port is transmitting or receiving data. The rate of blink indicates the level of activity on the link.
		Green/Steady	The port is connected, has a link, but no data.
Module	Online	Off	The module power is off.
		Amber/Steady	The module is running diagnostics and starting.
		Amber/Blinking/Slow	The module is initializing the software.

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Type	Label	Color, State	Meaning
		Amber/Blinking/Medium	The module is starting the application.
		Amber/Blinking/Fast	Image synchronization is complete.
		Green/Blinking/Medium	The module has completed its power-on self-test and software initialization.
		Green/Steady	The module is functioning normally.
		Red/Blinking/Fast	The module has exceeded the alarm threshold temperature. The cooling system now runs at full speed.
		Red/Steady	The module is faulty and not functioning. Replace the module.

9048GT module

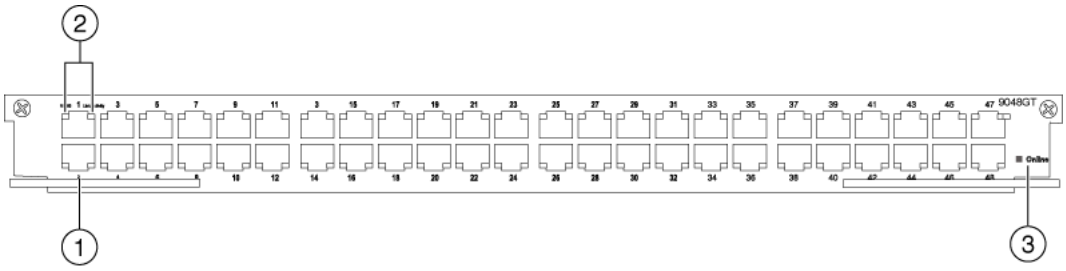
The 9048GT module provides 48 10/100/1000BASE-TX ports that use 8 pin module (RJ-45) connectors.

Each port operates either at 10 Mb/s, 100 Mb/s, or 1000 Mb/s (1 Gb/s) and supports the IEEE 802.3-2002. Distances of up to 100 meters are obtainable with category 5 unshielded twisted pair (UTP) cable. This module supports 1000BASE-T 802.3ab.

On the 9048GT module, ports support 9600-byte frames.

The 9048GT module ports support the IEEE 802.3 1998 Clause 28 Auto-Negotiation standard. Each port can operate in full- or half-duplex mode. When a port connects to another device that also supports the IEEE 802.3 1998 Clause 28 Auto-Negotiation standard, the two devices negotiate the highest possible data rate and the duplex mode of operation. The 9048GT module further supports Custom Auto-Negotiation Advertisements (CANA).

The following figure shows the 9048GT module and the location of the module LEDs.



1 - 10/100/1000Base-T port
2 - Port LEDs: 10/100/1000 (speed) Link/Activity
3 - Module online LED

Figure 7: 9048GT module LEDs

The following table describes the 9048GT module LEDs.

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Table 6: 9048GT module LED description

Type	Label	Color, State	Meaning
Port	Speed	Off	The port operates at 10 Mb/s.
		Green/Blinking/Medium	The port operates at 100 Mb/s.
		Green/Steady	The port operates at 1000 Mb/s.
	Link and activity	Off	The port has no link.
		Amber/steady	The port has a local fault.
		Amber/blinking/slow	The port has a remote fault.
		Green/slow	The port is administratively disabled.
		Green/blinking	The rate of blinking indicates the rate of activity.
		Green/steady	The link is active but not receiving or transmitting.
Module	Online	Off	The module power is off.
		Amber/Steady	The module is running diagnostics and starting.
		Amber/Blinking/Slow	The module is initializing the software.
		Amber/Blinking/Medium	The module is starting the application.
		Amber/Blinking/Fast	Image synchronization is complete.
		Green/Blinking/Medium	The module has completed its power-on self-test and software initialization.
		Green/Steady	The module is functioning normally.
		Red/Blinking/Fast	The module has exceeded the alarm threshold temperature. The cooling system now runs at full speed.
		Red/Steady	The module is faulty and not functioning. Replace the module.

When you disable auto-negotiation on a port, the port defaults to a particular speed, even if no link connection exists.

9080CP module

The 9080CP Control Processor (CP) module performs the following tasks:

- Runs all high level protocols, for example, Border Gateway Protocol (BGP) and Open Shortest Path First (OSPF)
- Distributes routing updates
- Manages and configures the I/O and Switch Fabric (SF) modules
- Maintains and monitors the health of the chassis

- Displays and monitors the LEDs for the modules installed in the back of the chassis
- Provides operations, administration, and management interface (OA&M) for the system operator

Important:

- The CP modules in the VSP 9010 chassis must use a minimum software version of Release 3.4.
- The 9080CP module architecture provides redundancy when you use two CP modules in a system.
- An external Compact Flash card is mandatory when you install the CP module. The CP module includes a 2 GB Compact Flash card. To order another Compact Flash card, use the order code EC1411010-E6.

Install the CP modules in slots CP1 and CP2. If you use only one CP module, install it in CP1. CP1 is the master CPU, by default. If you use two CP modules, CP2 is the standby CPU. You can change the master CPU configuration through ACLI or Enterprise Device Manager (EDM).

Interfaces

The 9080CP module provides the following interfaces:

- Universal Serial Bus (USB) type A (primary)
- Management: The management port is an Ethernet port that uses an RJ-45 connector. It supports 10/100/1000 auto-negotiation.
- Console port: The console port is a serial port that uses an RS232 DB9 male connector.
- Compact Flash: The Compact Flash interface provides additional storage above the 2 GB of internal flash on the CP module.



Figure 8: 9080CP module

Compact flash and boot flash

Each CP module contains an internal compact flash and a boot flash. The CP module uses the 2 GB internal flash to store configuration files, software releases, log files, and core dumps. The boot flash does not contain a file system; it ensures the module starts by itself after it receives power.

Avaya recommends that you use the Compact Flash card for logging and core dumps. The CP module was designed to use the external Compact Flash card for this purpose.

The CP module includes a recessed reset switch. Insert a small item, for example, a paperclip, into the hole to reset the module.

9080CP module LEDs

The following figure shows the location of the CP module LEDs and features for the Virtual Services Platform 9012. For more information about using the CP module in the Virtual Services Platform 9010, see 9080CP module LEDs for the Virtual Services Platform 9010 on page 28.

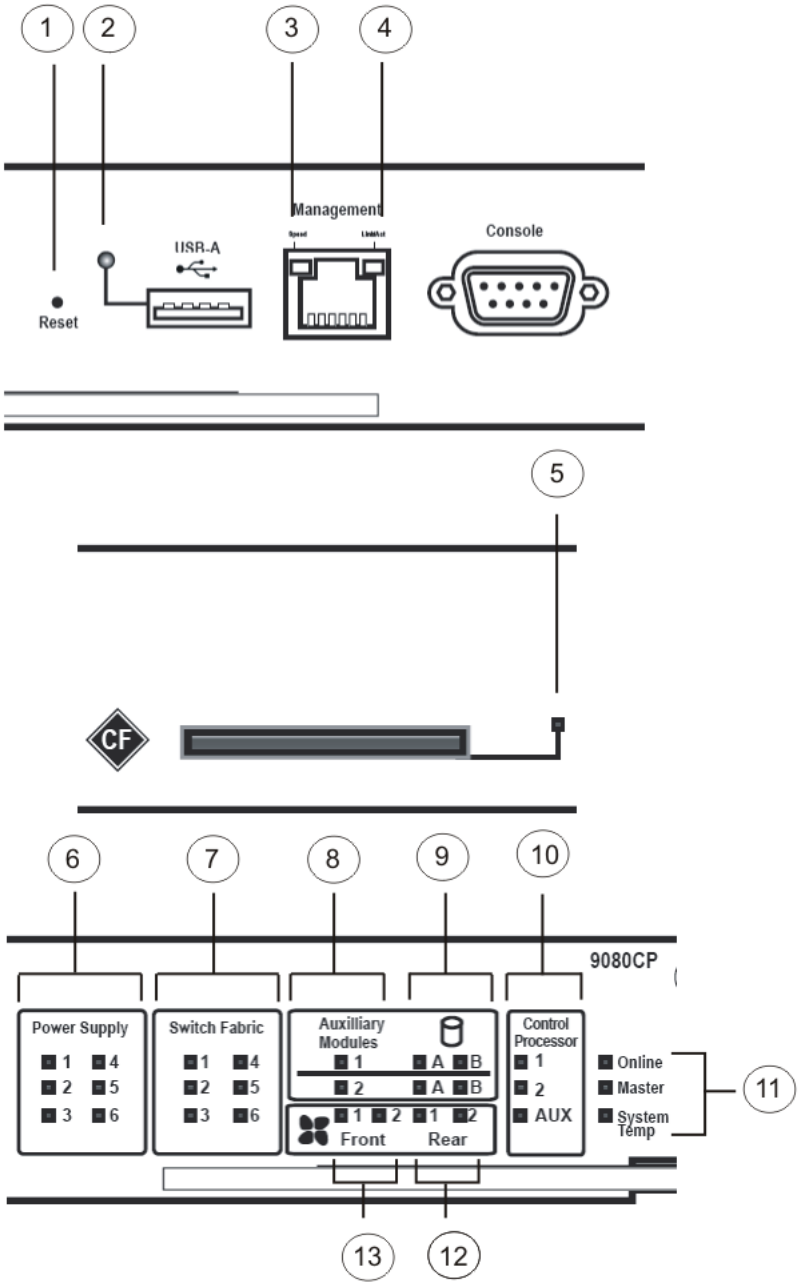


Figure 9: 9080CP module LEDs for the Virtual Services Platform 9012

The following table identifies the CP module LEDs for the Virtual Services Platform 9012.

Table 7: 9080CP module LEDs for the Virtual Services Platform 9012

Number	Description
1	Recessed reset switch
2	USB port LED

Number	Description
3	Management port speed LED
4	Management port link and activity LED
5	Compact Flash status LED
6	Power supply status LEDs
7	Switch Fabric status LEDs
8	Auxiliary module status LEDs
9	Auxiliary module storage LEDs
10	Control Processor and auxiliary module status LEDs
11	CP module and system LEDs
12	9012RC SF cooling module LEDs
13	9012FC or 9012FCHS I/O cooling module LEDs

VSP 9012 and the VSP 9010 pluggable devices

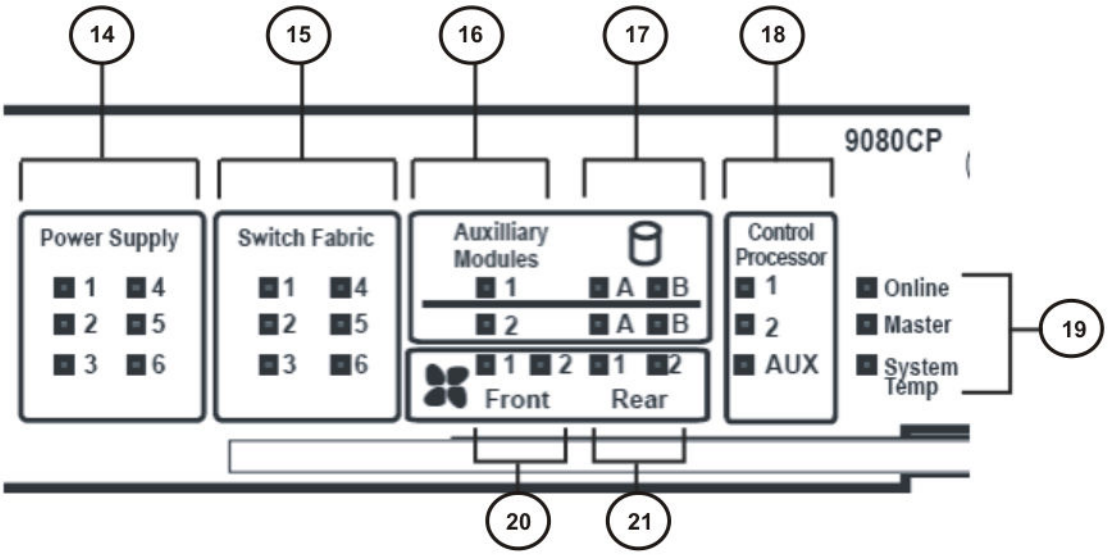
The 9080CP module LEDs map differently dependent on the chassis because the Virtual Services Platform 9012 and the Virtual Services Platform 9010 support a different number of pluggable devices.

Table 8: Pluggable devices for each chassis

Device	VSP 9012	VSP 9010
I/O modules	10	8
Power supplies	6	8
Auxiliary modules	2	0
Front cooling modules	2	2
Back cooling modules	2	0

The 9080CP module LEDs for the Virtual Services Platform 9010

Software on the 9080CP module automatically determines whether you have installed the 9080CP module into the Virtual Services Platform 9010 or the Virtual Services Platform 9012. You do not have to update the configuration.


14
15
16
17
18
9080CP
Power Supply
1 4
2 5
3 6
Switch Fabric
1 4
2 5
3 6
Auxilliary Modules
1 A B
2 A B
1 2 1 2
Front Rear
Control Processor
1
2
AUX
Online
Master
System Temp
19
20
21

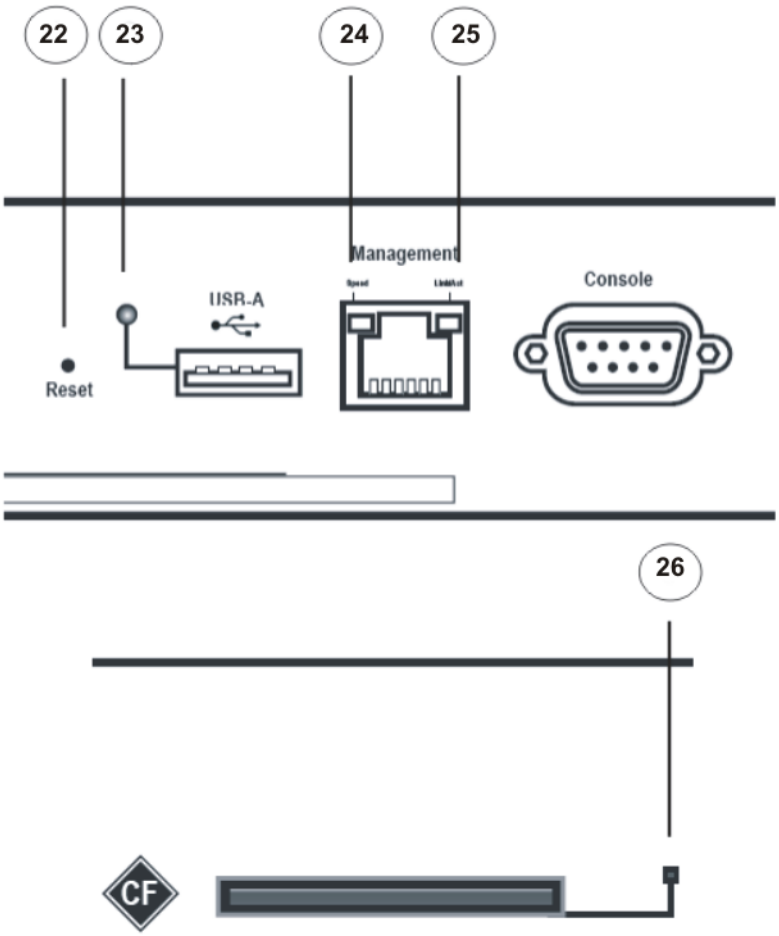


Figure 10: 9080CP module LEDs for the Virtual Services Platform 9010

The following table identifies the CP module LEDs for the Virtual Services Platform 9010.

Table 9: 9080CP module LEDs for the Virtual Services Platform 9010

Number	Description
14	Power supply status LEDs for power supplies 1 to 6. • 1 — Power supply 1 • 2 — Power supply 2 • 3 — Power supply 3 • 4 — Power supply 4 • 5 — Power supply 5

Number	Description
	• 6 — Power supply 6
15	9095 Switch Fabric status LEDs
16	Other two power supply status LEDs: • Auxiliary module 1 — Power supply 7 • Auxiliary module 2 — Power supply 8
17	Not used.
18	Control Processor and auxiliary module status LEDs
19	CP module and system LEDs
20	Cooling module LEDs: • 1 — upper front of VSP 9010 • 2 — lower front of VSP 9010
21	Not used.
22	Recessed reset switch
23	USB port LED
24	Management port speed LED
25	Management port link and activity LED
26	Compact Flash status LED

LED significance

The LED color and state are the same for the 9080CP module in the Virtual Services Platform 9010 and the Virtual Services Platform 9012. The following table describes the LEDs for the USB, management, and Compact Flash ports for the Virtual Services Platform 9012 and the Virtual Services Platform 9010.

Table 10: 9080CP port LED description

Label	Color/state	Description
USB	Off	A USB device is not inserted.
	Green/blinking/medium	The system is writing to or reading from the device.
	Green/steady	The device is available.
Speed	Off	The port operates at 10 Mb/s.
	Green/blinking/medium	The port operates at 100 Mb/s.
	Green/steady	The port operates at 1000 Mb/s.
Link/Act.	Off	The port does not have a link.
	Amber/steady	The port experiences a local fault.
	Amber/blinking/slow	The port experiences a remote fault.
	Green/blinking (intermittent/fast)	The port has link activity. The rate of blinking indicates the level of activity on the link.

Label	Color/state	Description
	Green/steady	The link is active but not passing traffic.
Compact Flash	Off	A Compact Flash card is not inserted.
	Green/blinking/medium	The system is writing to or reading from the card.
	Green/steady	The card is available.

The following table describes the LEDs for the power supply modules, Switch Fabric modules, and Control Processor modules. For the Virtual Services Platform 9012, the auxiliary module slots are reserved for future releases. For the Virtual Services Platform 9010, auxiliary module slots 1 and 2 represent power supplies 7 and 8 respectively.

Table 11: 9080CP modules LED description

Label	Color/State	Description
Module slot number	Off	The module is not installed.
	Amber/steady	The module is starting. For a power supply module, this state indicates redundant power is taking over.
	Green/steady	The module is installed.
	Red	The module is not operational. Replace the module.
Auxiliary module slot number **Note:** The Virtual Services Platform 9010 uses auxiliary module slot 1 and 2 for power supply 7 and 8 respectively. The Virtual Services Platform 9012 does not use these slots.	Off	The module is not installed.
	Amber/steady	The module is starting. For a power supply module, this state indicates redundant power is taking over.
	Green/steady	The module is installed.
	Red/steady	The module is not operational. Replace the module.

The following table describes the CP module and system LEDs.

Table 12: 9080CP module and system LED description

Label	Color/State	Description
Online	Amber/steady	This state is the default state.
	Amber/blinking/slow	The module is initializing the software.
	Amber/blinking/medium	The module is starting the application.
	Amber/blinking/fast	The module has completed image synchronization.
	Green/blinking/medium	The module is communicating with I/O modules.
	Green/steady	The module is connected and functioning normally.
	Red/steady	The module is not functioning.
Master	Off	The CP module is not the master but is in cold standby mode (online LED green).
	Amber/steady	The CP module transitions control from the local system to the overall system.
	Green/blinking/medium	The CP module is not the master but is in hot standby mode (online LED green).
	Green/steady	The CP module is the master.
System temp	Off	The power is off.
	Amber/steady	The system is starting.
	Green/steady	The temperature is normal for system operation.
	Red/steady	The system has exceeded the maximum operating temperature. You can configure the system to shutdown after x minutes or continue to operate. After x minutes, the CP module turns off the overheating module to prevent damage to the module.

The following table describes the cooling module LEDs.

Table 13: 9080CP cooling module LED description

Label	Color/State	Description
Module slot number	Off	The specified cooling module is not present in the chassis.
	Amber/steady	One or more fans in the cooling module have failed and the remaining fans have increased speed to continue to cool the chassis.
	Green/steady	The specified cooling module operates normally.

Label	Color/State	Description
	Red/steady	An excessive number of fans in the cooling module have failed. Replace the cooling module.

You can install a second CP module for redundancy.

The USB port provides access to removable media, through which images and configuration files can be read or written. You can use the USB port for storing software images. The USB can be accessed when you connect to the switch through the console, in-band or out-of-band management. You can remove the USB mass storage device by following the standard procedure for the removal of external devices. For more information on removal of USB mass storage device, see Removing external storage devices from the CP module on page 109. Sudden removal of the USB device can cause data loss or can damage the hardware.

Use the console port and management port for out-of-band management. Use a DB-9 connector for the console port and use RJ-45 for the management port. Use the external Compact Flash card for log files and to save configurations.

9090SF module

Install the Switch Fabric (SF) module vertically in one of the six right most slots at the back of the Avaya Virtual Services Platform 9012. The SF module provides a back-end switching solution in the midplane chassis.

Note:

Only the Virtual Services Platform 9012 supports the 9090SF module. The Virtual Services Platform 9010 uses the 9095SF module.

The following figure shows the 9090SF module.

Figure 11: 9090SF module



1 - SF module LED

Each SF module connects to 10 I/O module slots and 2 CP module slots simultaneously. You can install a maximum of 6 SF modules in each chassis in an N + 1 configuration with redundancy.

Note:

- If you install a second generation module in Virtual Services Platform 9012, you must have a minimum of five SF modules installed. Populate slots SF1 and SF4, and use any other slots for the remaining three SF modules.
- If you install a first generation module in Virtual Services Platform 9012, you must have a minimum of three SF modules installed. Populate slots SF1 and SF4, and use any other slot for the remaining SF module.

The SF module slots are numbered from right to left. The slot location determines the module function.

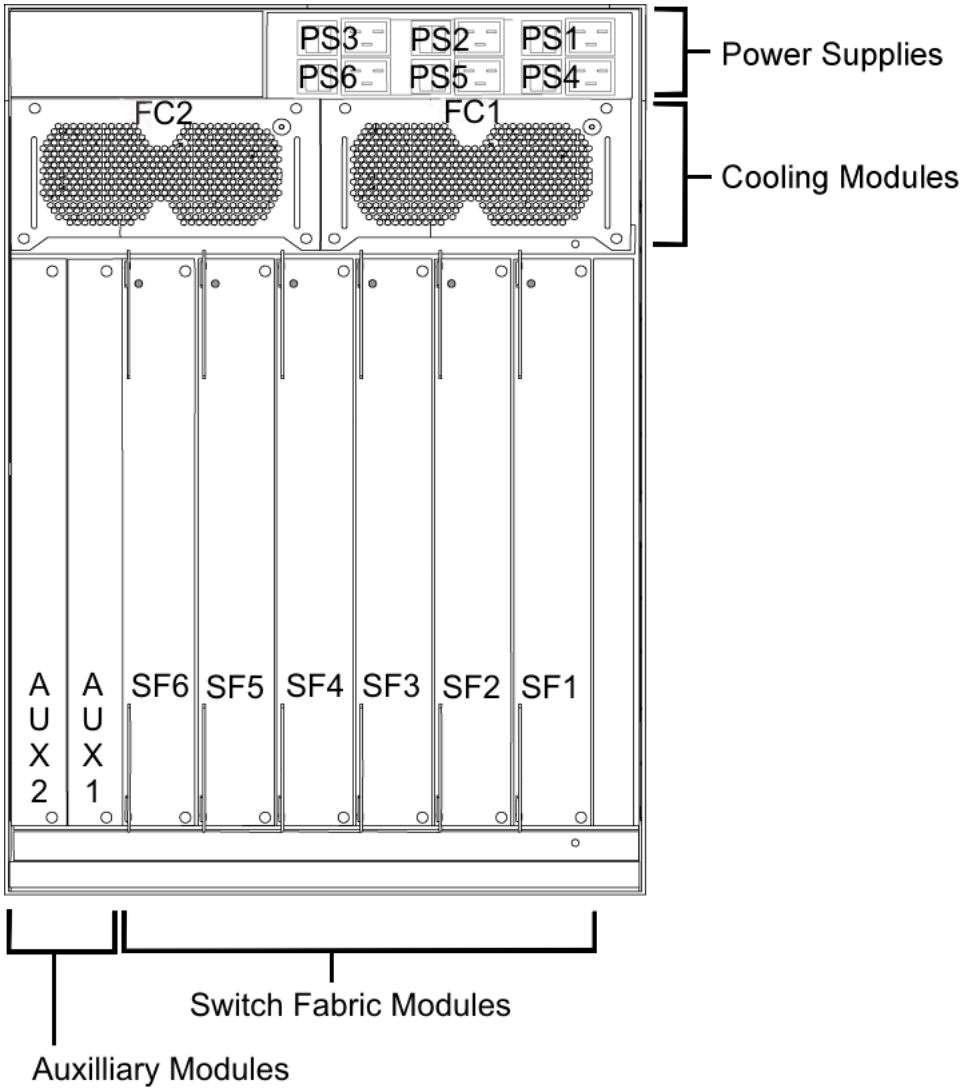


Figure 12: Virtual Services Platform 9012 SF slots

Slots SF1 and SF4 provide the arbitration and scheduling for traffic (and therefore, bandwidth management) from the I/O modules. The remaining slots provide additional bandwidth. Avaya recommends that you populate another two SF slots to provide additional bandwidth. Each chassis has slots for five operational SF modules plus one hot backup.

If you do not install an SF module in either SF1 or SF4, or if the modules are not operational, all ports on the I/O modules shut down. No data can pass through the system without an SF module in one of these two slots. You can access the system only through the console port on the CP module. After you bring a nonoperational SF module online in either SF1 or SF4, the system automatically resets to ensure it initializes correctly and to provide predictable behavior.

Important:

Avaya recommends that you install SF modules in both slot SF1 and slot SF4 to provide redundancy. You must have a functioning SF module in at least one of these slots for proper operation of the I/O modules.

The following table describes the SF module LED.

Table 14: 9090SF module LED description

Label	Color, State	Meaning
Online	Off	The module power is off.
	Amber/steady	The module is running diagnostics and is starting. The module is administratively turned off. Do not remove the module from the system.
	Amber/blinking/slow	The module is initializing the software.
	Amber/blinking/medium	The module is starting the application.
	Amber/blinking/fast	The module has completed image synchronization.
	Green/steady	The module has completed the power-on self-test and software initialization. The module is functioning normally.
	Red/blinking/fast	The module has exceeded the alarm threshold temperature. The cooling system now runs at full speed.
	Red/steady	The module is faulty and not functioning. Replace the module.

9095SF module

Install the 9095 Switch Fabric (SF) module horizontally in one of the six slots at the back of the Avaya Virtual Services Platform 9010. The 9095SF module provides a back-end switching solution in the midplane chassis.

Note:

Only the Virtual Services Platform 9010 supports the 9095SF module. The Virtual Services Platform 9012 uses the 9090SF module.

The following figure shows the 9095SF module.

1 – SF module LED

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Figure 13: 9095SF module

You must install an SF module in either SF1 or SF4 for proper I/O module operation, but Avaya recommends that you install an SF module in both slots SF1 and SF4 for redundancy.

Note:

- If you install a second generation module in Virtual Services Platform 9010, you must have a minimum of five SF modules installed. Populate slots SF1 and SF4, and use any other slots for the remaining three SF modules.
- If you install a first generation module in Virtual Services Platform 9010, you must have a minimum of three SF modules installed. Populate slots SF1 and SF4, and use any other slot for the remaining SF module.

Each 9095SF module connects to eight different I/O module slots and two CP module slots simultaneously. You can install a maximum of six SF modules in each Virtual Services Platform 9010, in a 5 + 1 redundancy configuration.

The 9095SF module slots are numbered from bottom to top. The slot location determines the module function.

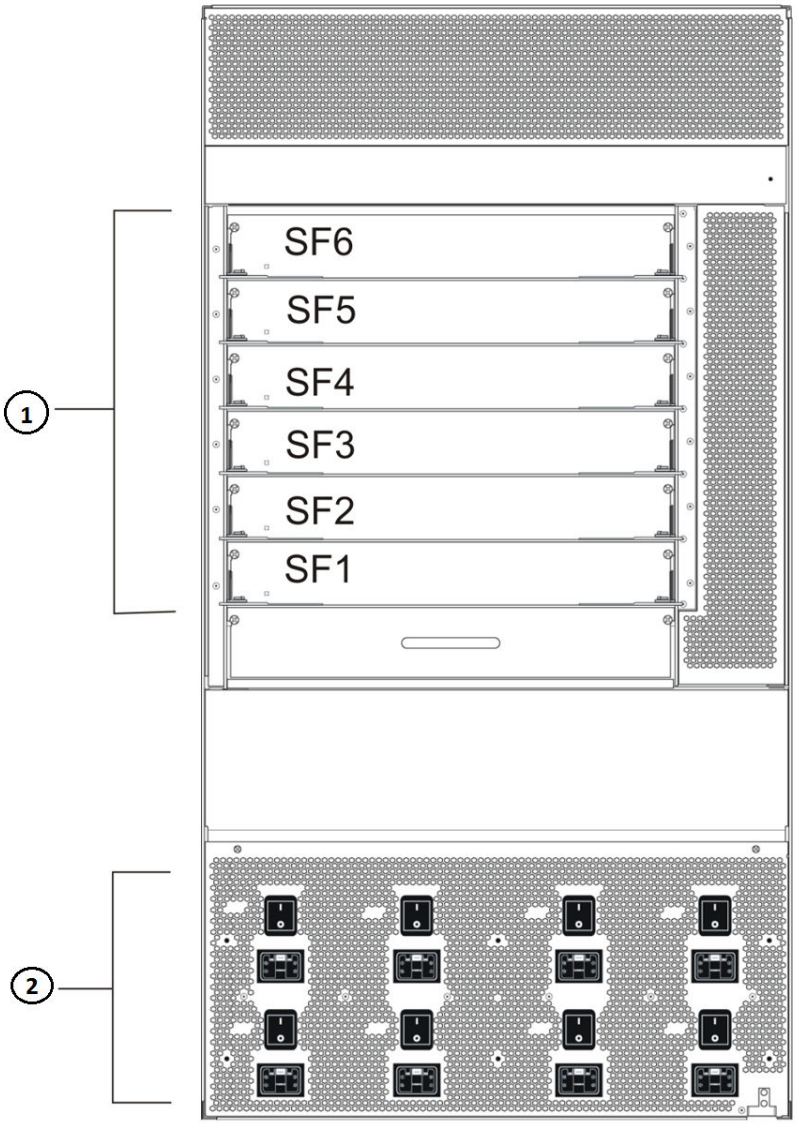


Figure 14: 9095SF module slot locations

Slots SF1 and SF4 provide the arbitration and scheduling of traffic, and therefore, bandwidth management, from the I/O modules. The remaining slots provide additional bandwidth. Avaya recommends that you populate another two SF slots to provide additional bandwidth. Each chassis has slots for five operational 9095SF modules plus one hot backup.

If you do not install an SF module in either SF1 or SF4, or if the modules are not operational, all ports on the I/O modules shut down. No data can pass through the system without an SF module in one of these two slots. You can access the system only through the console port on the CP module. After you bring a nonoperational SF module online in either SF1 or SF4, the system automatically resets to ensure it initializes correctly and to provide predictable behavior.

Important:

Avaya recommends that you install SF modules in both slot SF1 and slot SF4 to provide redundancy. You must have a functioning SF module in at least one of these slots for proper operation of the I/O modules.

The following table describes the SF module LED.

Table 15: 9095SF module LED description

Label	Color, State	Description
Online	Off	The module power is off.
	Amber/steady	The module is running diagnostics and is starting. The module is administratively turned off. Do not remove the module from the system.
	Amber/blinking/slow	The module is initializing the software. Do not remove the module from the system.
	Amber/blinking/medium	The module is starting the application. Do not remove the module from the system.
	Amber/blinking/fast	The module has completed image synchronization. Do not remove the module from the system.
	Green/steady	The module has completed the power-on self-test and software initialization. The module is functioning normally. Do not remove the module from the system.
	Red/blinking/fast	The module has exceeded the alarm threshold temperature. The cooling system now runs at full speed.
	Red/steady	The module is faulty and not functioning. Replace the module.

Module removal and services behavior considerations

After you remove or replace a module in the chassis, you can expect the following results:

- If you replace a module with a different type of module, the system discards the configuration of the old ports, and the new ports are added to the default VLAN.
- If you remove an I/O module from an operating switch, and replace it with the same type of module, the system restores the configuration.
- If you save the configuration, turn off the switch, replace a module with a different type of module, and turn the system on again. The system discards the configuration of the old ports and adds new ports to either the default VLAN or an unassigned VLAN.

The ability of the switch to load configuration files for modules depends on whether the module is present in the chassis. By design, configuration files do not completely load if the module is not installed.

If you start the Virtual Services Platform 9000 without the modules and want to completely load the configuration files, there are two methods you can use. You can install the module, and then restart. Or, you can install the module, and source, and then save the configuration file, which avoids a restart.

Protecting modules

Virtual Services Platform 9000 modules are larger and heavier than Ethernet Routing Switch 8000 series modules.

Handle the modules used in Virtual Services Platform 9000 with care. Take the following items into consideration when you handle modules:

- To prevent damage from electrostatic discharge, always wear an antistatic wrist strap connected to an ESD jack when you connect cables or you perform maintenance on this device.
- Always place the modules on appropriate antistatic material.
- Support the module from underneath with two hands. Do not touch components or connector pins with your hand, or damage can result.
- Damage to a module can occur if you bump the module into another object, including other modules installed in a chassis. Be careful not to bump module connectors against the action levers of an adjacent module. Damage to connectors can result. Use both hands to support modules.
- Visually inspect the connectors for damage before you insert the module. If you insert a module with damaged connectors you will damage the midplane.
- Check the clearance between the insertion lever and the gasket on adjacent modules during insertion or extraction.
- Do not stack modules one on top of the other when you move them.
- Do not leave slots open. Fill all slots with modules or filler modules to maintain safety compliance, proper cooling, and EMI containment.
- Do not over tighten screws. Tighten until snug. Do not use a power tool to tighten screws.

VSP 9010 airflow and temperature alarms

This section provides information on temperature alarms and airflow for the Virtual Services Platform 9010.

Airflow in the Virtual Services Platform 9010

Cool air enters the Virtual Services Platform 9010 through an air inlet vent below the cooling modules. The fans in the cooling modules draw the cool air in, and push it up and over the CP, I/O, and SF modules. The hot air exhaust is at the rear of the chassis.

The power supplies include their own fans for cooling. The power supplies draw cool air in at the front of the chassis, and hot air exits at the rear.

Looking at the rear of the AC chassis, the hot air exhaust for the CP and I/O modules is at the top. The hot air exhaust for the SF modules is to the right of the SF module slots.

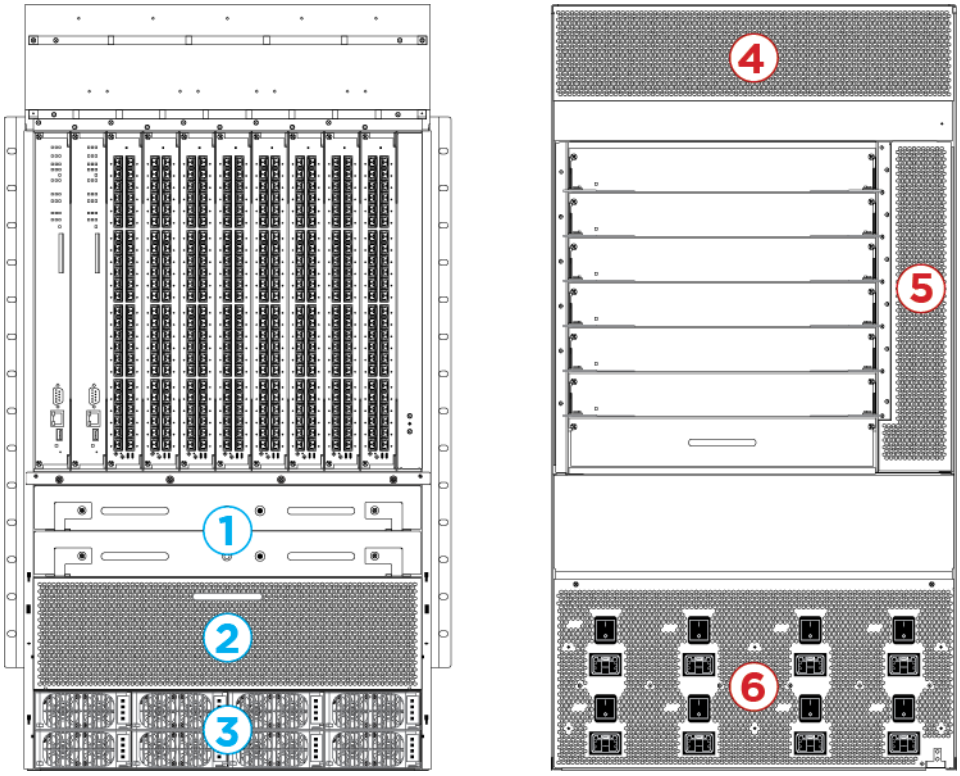


Figure 15: Front-to-back cooling in the Virtual Services Platform 9010

The following table identifies the numbered areas in the preceding figure.

Table 16: Airflow in the Virtual Services Platform 9010

Diagram	Description
1	Cooling modules installed at the front of the chassis.
2	Cool air inlet at the front of the chassis.
3	Power supply air inlet.
4	Hot air exhaust for the CP and I/O modules at the rear of the chassis.
5	Hot air exhaust for the SF modules at the rear of the chassis.

Diagram	Description
6	Hot air exhaust for the power supplies at the rear of the chassis.

Temperature alarms

The system monitors the temperature on the modules. If a module exceeds the alarm threshold temperature by one degree, the system initiates an SNMP trap and the module online LED displays as blinking red.

After the temperature of the module exceeds the alarm threshold temperature, the system logs the temperatures of all sensors each time the temperature increases by one degree or decreases by two degrees within a 30-second polling period. The module online LED returns to green when all module temperatures are below the threshold.

The system shuts down the module when the module exceeds the shutdown threshold temperature by one degree.

Virtual Services Platform 9010 temperature threshold quick reference

Use the information in the following table as a quick reference for temperature thresholds on the Virtual Services Platform 9010.

Note:

The I/O module alarm threshold and shutdown threshold temperatures differ for the Virtual Services Platform 9010 and the Virtual Services Platform 9012.

Table 17: Alarm threshold and shutdown threshold temperatures for VSP 9010 modules

Modules on the VSP 9010	Module LED color	Alarm threshold	Shutdown threshold
CP and SF modules	Blinking red	54 °C At 55 °C, the system triggers the alarm when the module exceeds the alarm threshold by one degree.	59 °C At 60 °C, the system shuts down the module when the module exceeds the shutdown threshold by one degree.
	Green	Alarm clears after the temperatures of the modules are at 53 °C.	—
First generation I/O module sensors in first generation mode			
Inlet and outlet sensors	Blinking red	69 °C At 70 °C, the system triggers the alarm when the module exceeds the alarm threshold by one degree.	74 °C At 75 °C, the system shuts down the module when the module exceeds the shutdown threshold by one degree.

Modules on the VSP 9010	Module LED color	Alarm threshold	Shutdown threshold
	Green	Alarm clears after the temperatures of the modules are at 68 °C.	—
Second generation I/O module sensors			
Inlet and outlet sensors	Blinking red	79 °C At 80 °C, the system triggers the alarm when the module exceeds the alarm threshold by one degree.	84 °C At 85 °C, the system shuts down the module when the module exceeds the shutdown threshold by one degree.
	Green	Alarm clears after the temperatures of the modules are at 78 °C.	—
Field Programmable Gate Array (FPGA) sensors	Blinking red	90 °C At 91 °C, the system triggers the alarm when the module exceeds the alarm threshold by one degree.	95 °C At 96 °C, the system shuts down the module when the module exceeds the shutdown threshold by one degree.
	Green	Alarm clears after the temperatures of the modules are at 89 °C.	—
Fabric Adapter (FA) sensors	Blinking red	100 °C At 101 °C, the system triggers the alarm when the module exceeds the alarm threshold by one degree.	105 °C At 106 °C, the system shuts down the module when the module exceeds the shutdown threshold by one degree.
	Green	Alarm clears after the temperatures of the modules are at 99 °C.	—

Bringing the module online

If a module shuts down due to heat, you must intervene to bring the slot back online. After you correct the temperature issue and the heat condition clears, you must bring the module back online. The module does not go online again unless you re-enable the module. After CP, SF, or I/O modules shut down, use the **`sys power slot {slot[-slot][,...]}`** command to bring the module back online.

Fan speed

The cooling module fan speed increases as the temperature reading of the sensors increases. The cooling module fan speed decreases as the temperature reading of the sensors decreases.

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System temperature information

Each of the zones correspond to temperature sensors on the modules. For instance, the I/O module has five temperature zones. Zones 1, 2, and 3 are inlet air sensors and 4 and 5 are outlet air sensors. The SF module has two temperature sensors and the CP module has four temperature sensors. The alarm threshold is the temperature the zone can reach before the device moves from normal to alarm mode. If the module exceeds the shutdown threshold by one degree it causes the module to shut down.

The zone alarm is triggered after one of the following events occurs:

- A module alarm is triggered.
- Module alarms are cleared.

Heat sensor locations for first generation and second generation I/O modules

The following figure shows the baseboard component of a first generation I/O module on the left and the PIM component of a first generation I/O module on the right.

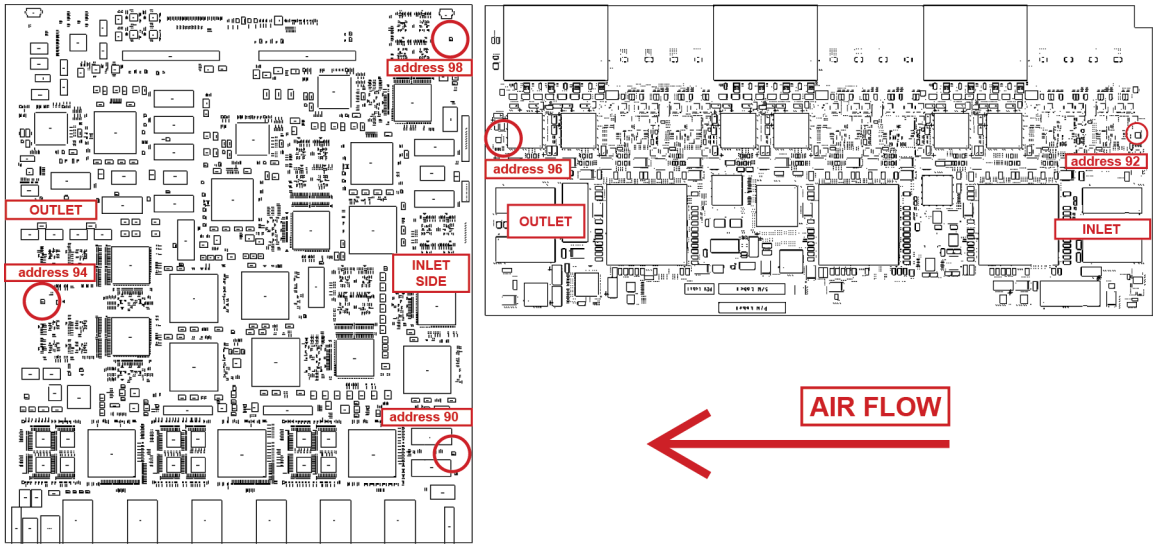
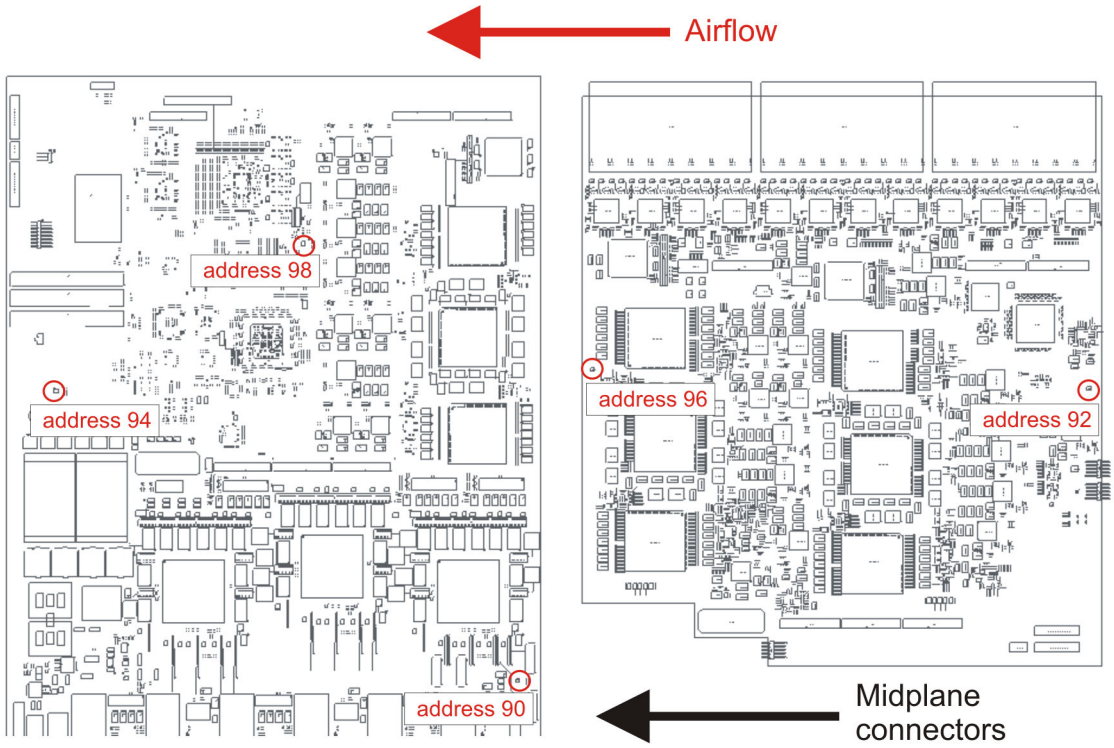


Figure 16: Heat sensor locations in a first generation I/O module

The following figure shows the baseboard component of a second generation I/O module on the left and the PIM component of a second generation I/O module on the right.

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Use the following table to understand the heat sensors in the preceding I/O modules for first generation and second generation modules.

Table 18: Zone to heat sensor mapping for first generation .and second generation I/O modules

Zones	Heat sensors
zone 1	address 90
zone 2	address 92
zone 3	address 98
zone 4	address 94
zone 5	address 96

The system monitors the temperature every 30 seconds and displays the temperature on all the modules with the following command: **`show sys-info temperature`**

Note:

The I/O module alarm threshold and shutdown threshold temperatures differ for the Virtual Services Platform 9010 and the Virtual Services Platform 9012.

The following example shows command output for both first and second generation I/O modules.

```
Switch:1#show sys-info temperature

Temperature Info :

Slot Zone-1 Zone-2 Zone-3 Zone-4 Zone-5  Highest  Lowest    Alarm     Shutdown
     Temp   Temp   Temp   Temp   Temp    Temp     Temp      Threshold Threshold
```


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```
1      36      32      --      32      31      36      31      54      59
2      40      32      --      32      31      40      31      54      59
3      37      39      32      45      48      48      32      69      74
4      32      31      38      35      43      43      31      79      84
6      31      30      37      36      43      43      30      79      84
7      31      31      41      38      49      49      31      79      84
8      33      31      38      38      49      49      31      79      84
9      37      38      35      54      50      54      35      69      74
10     34      34      31      48      50      50      31      69      74
SF1    32      --      --      38      --      38      32      54      59
SF2    30      --      --      37      --      37      30      54      59
SF3    32      --      --      38      --      38      32      54      59
SF4    32      --      --      39      --      39      32      54      59
SF5    34      --      --      41      --      41      34      54      59
SF6    33      --      --      40      --      40      33      54      59
```

The following example displays additional command output that appears for second generation I/O modules.

```
Extended Temperature Zones :

                     Sensor Temperatures

Slot Zone    Slice-1      Slice-2      Slice-3    Highest  Lowest    Alarm     Shutdown
               1   2   3   1   2   3   1   2   3      Temp    Temp  Threshold  Threshold
 4   FPGA     49  45  51  50  51  52  44  51  52        52      44     90         95
 4   FA       39  --  --  48  --  --  71  --  --        71      39    100        105
 6   FPGA     52  53  56  50  52  57  50  49  51        57      49     90         95
 6   FA       39  --  --  49  --  --  62  --  --        62      39    100        105
 7   FPGA     47  51  52  55  56  55  52  59  58        59      47     90         95
 7   FA       42  --  --  50  --  --  66  --  --        66      42    100        105
 8   FPGA     67  51  52  55  53  52  55  57  61        67      51     90         95
 8   FA       39  --  --  50  --  --  72  --  --        72      39    100        105
```

The following table describes the output for the **`show sys-info temperature`**.

Table 19: sh

Value	Description
Temperature Info	
Zones 1 through 3	Specifies the inlet sensors on the module.
Zones 4 and 5	Specifies the outlet sensors on the module.
Highest Temp	Specifies the highest temperature reached on the slot.
Lowest Temp	Specifies the lowest temperature reached on the slot.
Alarm Threshold	Specifies the temperature, when exceeded by one degree, that causes the system to initiate an SNMP trap and causes the module online LED to display as blinking and red.
Shutdown Threshold	Specifies the temperature, when exceeded by one degree, that causes the system to shutdown the module by removing power from the slot.
Extended Temperature Zones This information applies only to second generation modules.	

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Value	Description
FPGA	Specifies the temperature of the FPGA sensors. A value of -- indicates that this sensor is not available on this slot.
FA	Specifies the temperature of the FA sensor, located on the slice. A value of -- indicates that this sensor is not available on this slot.
Slice-1 through Slice–3	Specifies temperature information for sensors on each slice. Sensors provide temperature information for various datapath components.
Highest Temp	Specifies the highest temperature of all the FPGA or FA sensors located on this I/O module.
Lowest Temp	Specifies the lowest temperature of all the FPGA or FA sensors located on this I/O module.
Alarm Threshold	Specifies the FPGA or FA temperature, when exceeded by one degree, that causes an alarm.
Shutdown Threshold	Specifies the FPGA or FA temperature, when exceeded by one degree, that causes the system to shutdown the module by removing power from the slot.

Virtual Services Platform 9010 show sys-info output

On the Virtual Services Platform 9010, you can see the zone alarm information under the Fan Trays Info section of the command output for the **`show sys-info`** command. The following output displays on a Virtual Services Platform 9010 without a second generation module:

```
Fan Trays Info :

   Zone Info :
      FRONT zone :

        Mode : NORMAL
        Mode Status : Normal
        Highest Temperature : 37 C
        Extended Zone :
          FPGA Highest Temperature : --
          FA Highest Temperature : --
      REAR zone :
        Mode : NORMAL
        Mode Status : Normal
        Highest Temperature : 0 C

   Fan Info :
          Tray   CardType           Serial#            Part#
         FAN 1     9010CM                       EC1411012-E6
         FAN 2     9010CM                       EC1411012-E6

          Zone       Tray     Unit      Status
         FRONT      FAN 1        1          OK
         FRONT      FAN 1        2          OK
         FRONT      FAN 1        3          OK
         FRONT      FAN 1        4          OK
         FRONT      FAN 2        1          OK
         FRONT      FAN 2        2          OK
```


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```
        FRONT      FAN 2        3          OK
        FRONT      FAN 2        4          OK
```

The following output displays on a Virtual Services Platform 9010 with a second generation module:

```
Fan Trays Info :

   Zone Info :

      FRONT zone :
        Mode : NORMAL
        Mode Status : Normal
        Highest Temperature : 53 C
        Extended Zone :
          FPGA Highest Temperature : 67 C
          FA Highest Temperature : 72 C
      REAR zone :
        Mode : NORMAL
        Mode Status : Normal
        Highest Temperature : 0 C

   Fan Info :
          Tray   CardType           Serial#            Part#
         FAN 1     9010CM    LBNNTMC29Y004F     EC1411012-E6
         FAN 2     9010CM    LBNNTMC29Y0043     EC1411012-E6

          Zone       Tray     Unit      Status
         FRONT      FAN 1        1          OK
         FRONT      FAN 1        2          OK
         FRONT      FAN 1        3          OK
         FRONT      FAN 1        4          OK
         FRONT      FAN 2        1          OK

         FRONT      FAN 2        2          OK
         FRONT      FAN 2        3          OK
         FRONT      FAN 2        4          OK
```

Use the data in the following table to understand the output for the **`show sys-info`** command on the Virtual Services Platform 9010.

Value		Description
FRONT zone: For the 9010 module, the front zone consists of two fan trays with four fans in each tray, which cool the CP and I/O modules.	Mode:	Each zone operates in either normal mode or alarm mode.
	Mode Status:	Normal Mode – All the fans are healthy and no temperatures exceed the warning threshold. Alarm Mode – Indicates fan or fan tray failures or temperature exceed the warning threshold.
	Highest Temperature	Specifies the highest temperature reached in the front zone.
	Extended Zone:	

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Value		Description
	FPGA Highest Temperature	This information applies only to second generation modules. Specifies the temperature of the FPGA sensors. A value of -- indicates that this sensor is not available on this slot.
	FA Highest Temperature	This information applies only to second generation modules. Specifies the temperature of the FA sensor, located on the slice. A value of -- indicates that this sensor is not available on this slot.
REAR zone: For Virtual Services Platform 9010, no rear fan controllers exist. **Note:** For VSP 9012, rear fan controllers exist and the output displays different values.	Mode:	For VSP 9010, no rear fan zone exists, as a result, Mode always displays as NORMAL.
	Mode Status:	For VSP 9010, no rear fan zone exists, as a result, the Mode Status always displays as Normal.
	Highest Temperature	For VSP 9010, no rear fan zone exists, as a result, the temperature always reports as 0 C.
Fan Info:	FAN 1	Specifies the module type under card type.
	FAN 2	Specifies the module type under card type.
	FRONT FAN 1 Unit 1	Specifies the status of a fan in the first cooling module.
	FRONT FAN 1 Unit 2	Specifies the status of a fan in the first cooling module.
	FRONT FAN 1 Unit 3	Specifies the status of a fan in the first cooling module.
	FRONT FAN 1 Unit 4	Specifies the status of a fan in the first cooling module.
	FRONT FAN 2 Unit 1	Specifies the status of a fan in the second cooling module.
	FRONT FAN 2 Unit 2	Specifies the status of a fan in the second cooling module.
	FRONT FAN 2 Unit 3	Specifies the status of a fan in the second cooling module.
	FRONT FAN 2 Unit 4	Specifies the status of a fan in the second cooling module.

VSP 9012 airflow and temperature alarms

This section provides information on temperature alarms and airflow for the Virtual Services Platform 9012.

Airflow in the Virtual Services Platform 9012

Airflow in the Virtual Services Platform 9012 is from left-to-right (as viewed from the front) for I/O modules and front-to-back for switch fabric cards and power supplies.

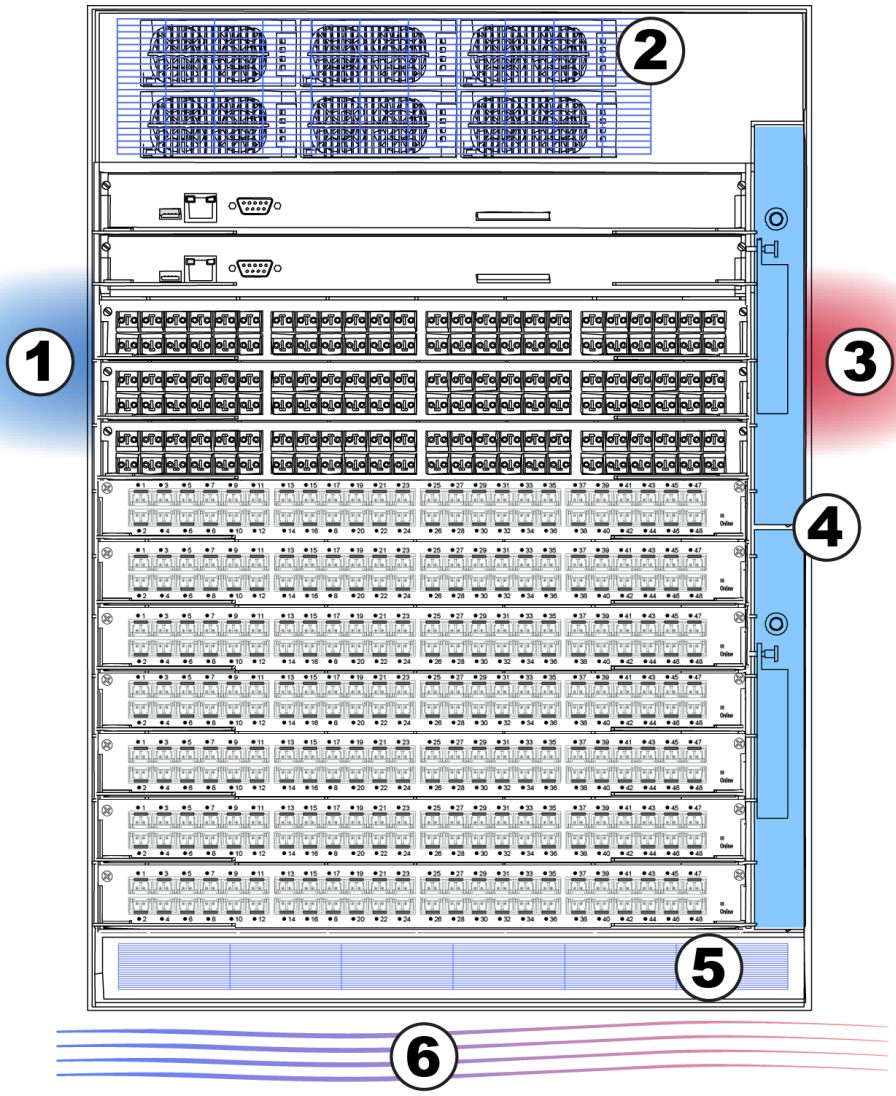


Figure 17: Front of the Virtual Services Platform 9012

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Table 20: Front of the Virtual Services Platform 9012

Diagram	Description
1	I/O module air inlet
2	Power supply fan air inlet
3	I/O module air exhaust
4	9012FC or 9012FCHS cooling modules
5	Switch Fabric module air inlet
6	Airflow – left to right

Left-to-right cooling

Airflow moves from left to right to cool the Control Processor and I/O modules. You require either two 9012FC cooling modules or two 9012FCHS cooling modules (for use with second generation modules in second generation mode or first generation modules in first generation mode) on the front right side of the Virtual Services Platform 9012. The 9012 cooling modules provide air movement and have an adjustable fan speed that depends on the system temperature.

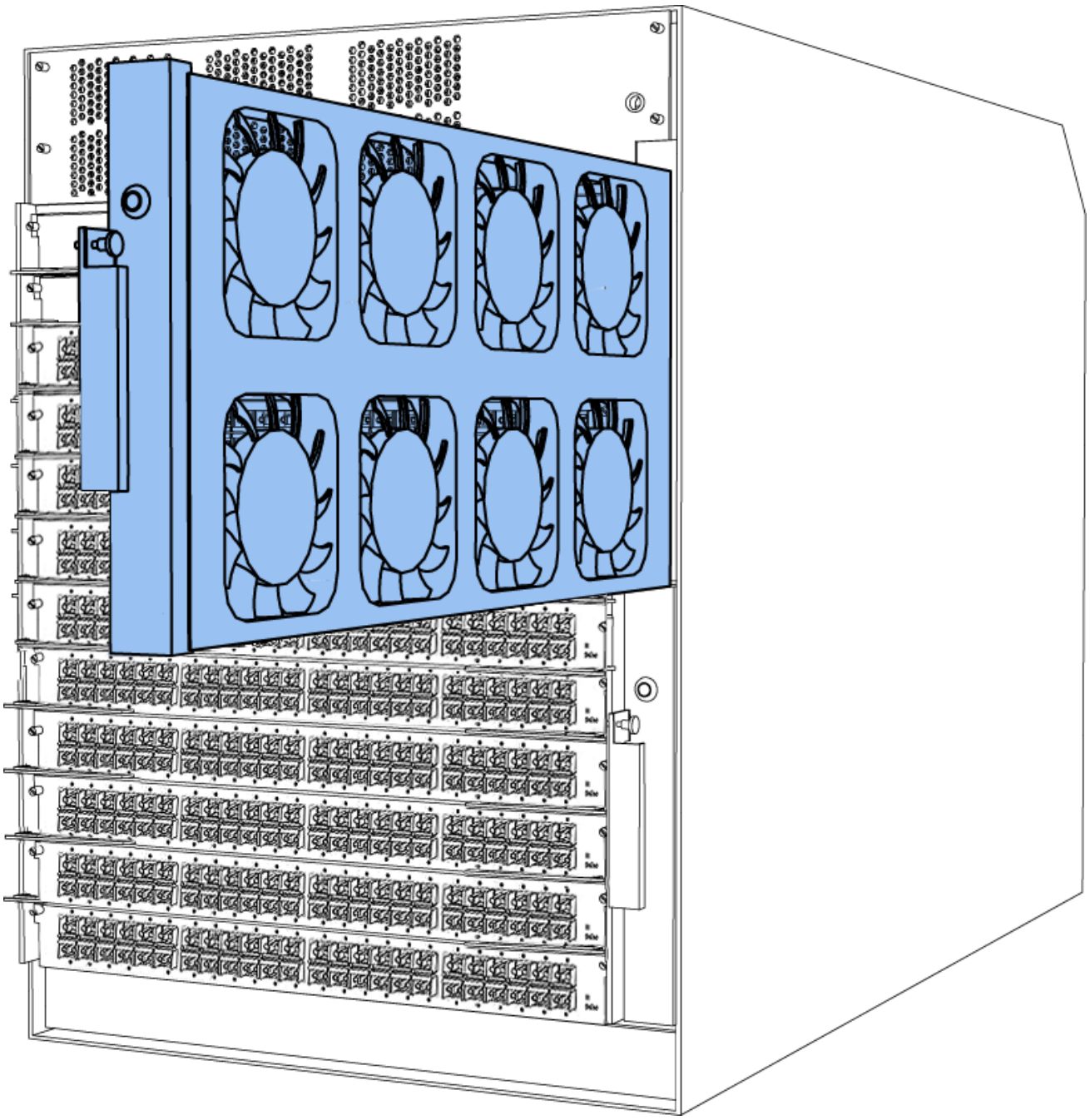


Figure 18: 9012 cooling module

Each 9012FC cooling module or 9012FCHS cooling module has eight fans. The platform polls all I/O module and CP module sensors, and adjusts the 9012 fan speed accordingly.

Front-to-back cooling

Airflow moves from front-to-back to cool the Switch Fabric and auxiliary modules. Two 9012RC cooling modules, at the top back of the Virtual Services Platform 9012, provide the air movement and have adjustable fan speed that depends on system temperature.

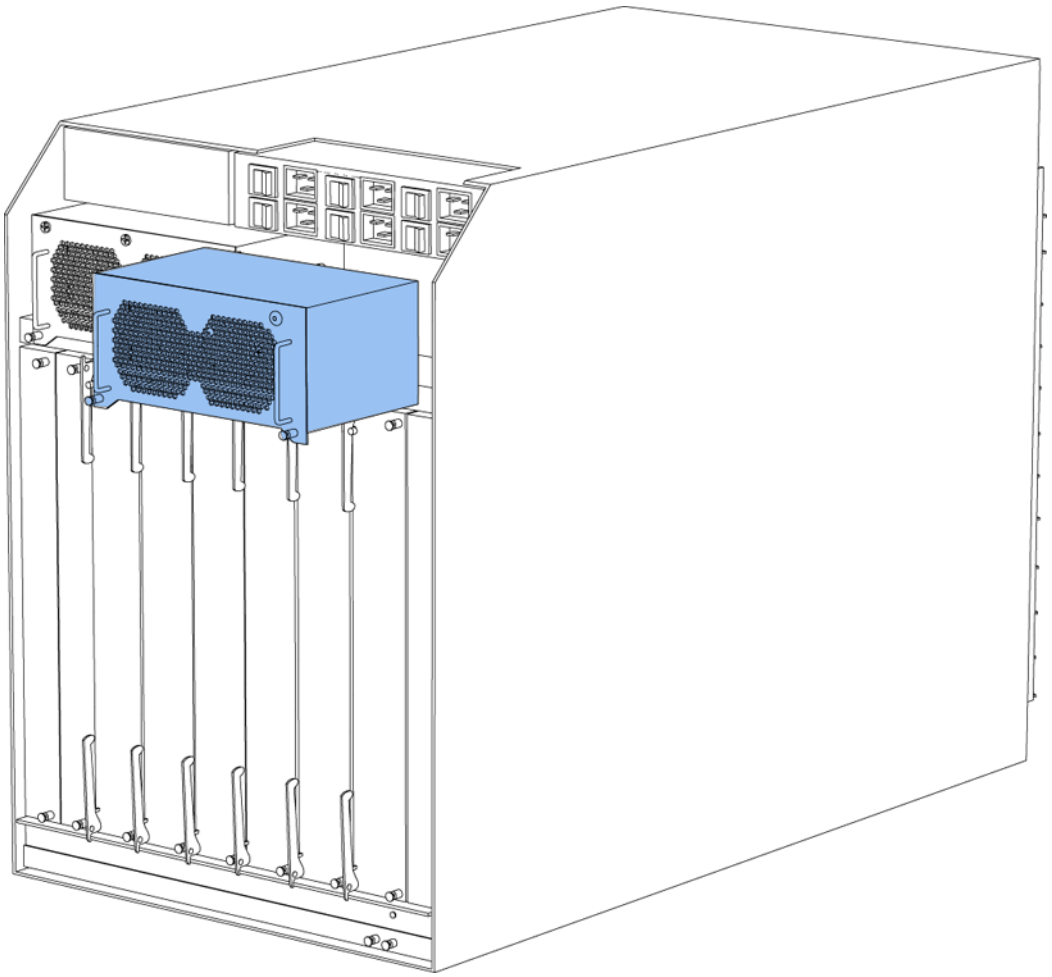


Figure 19: 9012RC cooling module

In the Virtual Services Platform 9012, two fans exist in each 9012RC cooling module and pull air from front-to-back. The platform polls all Switch Fabric module sensors and adjusts the 9012RC fan speed accordingly.

Note:

Do not place the Virtual Services Platform 9012 directly against a wall, equipment, or other obstruction. Avaya recommends 36 inches (91 centimeters) of free space in both the front and back of the machine, and 6 inches (15.2 centimeters) on each side extra. Depending on the circumstances, increase the free space at the side to allow for more airflow or cool airflow into the Virtual Services Platform 9012.

Temperature alarms

The system monitors the temperature on the modules. If a module exceeds the alarm threshold temperature by one degree, the system initiates an SNMP trap and the module online LED displays as blinking red.

After the temperature of the module exceeds the alarm threshold temperature, the system logs the temperatures of all sensors each time the temperature increases by one degree or decreases by two degrees within a 30-second polling period. The module online LED returns to green when all module temperatures are below the threshold.

The system shuts down the module when the module exceeds the shutdown threshold temperature by one degree.

Virtual Services Platform 9012 temperature threshold quick reference

Use the information in the following table as a quick reference for temperature thresholds on the Virtual Services Platform 9012.

Note:

The I/O module alarm threshold and shutdown threshold temperatures differ for the Virtual Services Platform 9010 and the Virtual Services Platform 9012.

Table 21: Alarm threshold and shutdown threshold temperatures for VSP 9012 modules

Modules on the VSP 9012	Module LED color	Alarm threshold	Shutdown threshold
CP and SF modules	Blinking red	54 °C At 55 °C, the system triggers the alarm when the module exceeds the alarm threshold by one degree.	59 °C At 60 °C, the system shuts down the module when the module exceeds the shutdown threshold by one degree.
	Green	Alarm clears after the temperatures of the modules are at 53 °C.	—
First generation I/O module sensors in first generation mode			
Inlet and outlet sensors	Blinking red	59 °C At 60 °C, the system triggers the alarm when the module exceeds the alarm threshold by one degree.	64 °C At 65 °C, the system shuts down the module when the module exceeds the shutdown threshold by one degree.
	Green	Alarm clears after the temperatures of the modules are at 58 °C.	—
Second generation I/O module sensors			
Inlet and outlet sensors	Blinking red	69 °C At 70 °C, the system triggers the alarm when the module exceeds the alarm threshold by one degree.	74 °C At 75 °C, the system shuts down the module when the module exceeds the shutdown threshold by one degree.

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Modules on the VSP 9012	Module LED color	Alarm threshold	Shutdown threshold
	Green	Alarm clears after the temperatures of the modules are at 68 °C.	—
Field Programmable Gate Array (FPGA) sensors	Blinking red	90 °C At 91 °C, the system triggers the alarm when the module exceeds the alarm threshold by one degree.	95 °C At 96 °C, the system shuts down the module when the module exceeds the shutdown threshold by one degree.
	Green	Alarm clears after the temperatures of the modules are at 89 °C.	—
Fabric Adapter (FA) sensors	Blinking red	100 °C At 101 °C, the system triggers the alarm when the module exceeds the alarm threshold by one degree.	105 °C At 106 °C, the system shuts down the module when the module exceeds the shutdown threshold by one degree.
	Green	Alarm clears after the temperatures of the modules are at 99 °C.	—

Bringing the module online

If a module shuts down due to heat, you must intervene to bring the slot back online. After you correct the temperature issue and the heat condition clears, you must bring the module back online. The module does not go online again unless you re-enable the module. After CP, SF, or I/O modules shut down, use the **`sys power slot {slot[-slot][,...]}`** command to bring the module back online.

Fan speed

The cooling module fan speed increases as the temperature reading of the sensors increases. The cooling module fan speed decreases as the temperature reading of the sensors decreases.

System temperature information

Each of the zones correspond to temperature sensors on the modules. For instance, the I/O module has five temperature zones. Zones 1, 2, and 3 are inlet air sensors and 4 and 5 are outlet air sensors. The SF module has two temperature sensors and the CP module has four temperature sensors. The alarm threshold is the temperature the zone can reach before the device moves from normal to alarm mode. If the module exceeds the shutdown threshold by one degree it causes the module to shut down.

The zone alarm is triggered after one of the following events occurs:

- A module alarm is triggered.
- Module alarms are cleared.

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Heat sensor locations for first generation and second generation I/O modules

The following figure shows the baseboard component of a first generation I/O module on the left and the PIM component of a first generation I/O module on the right.

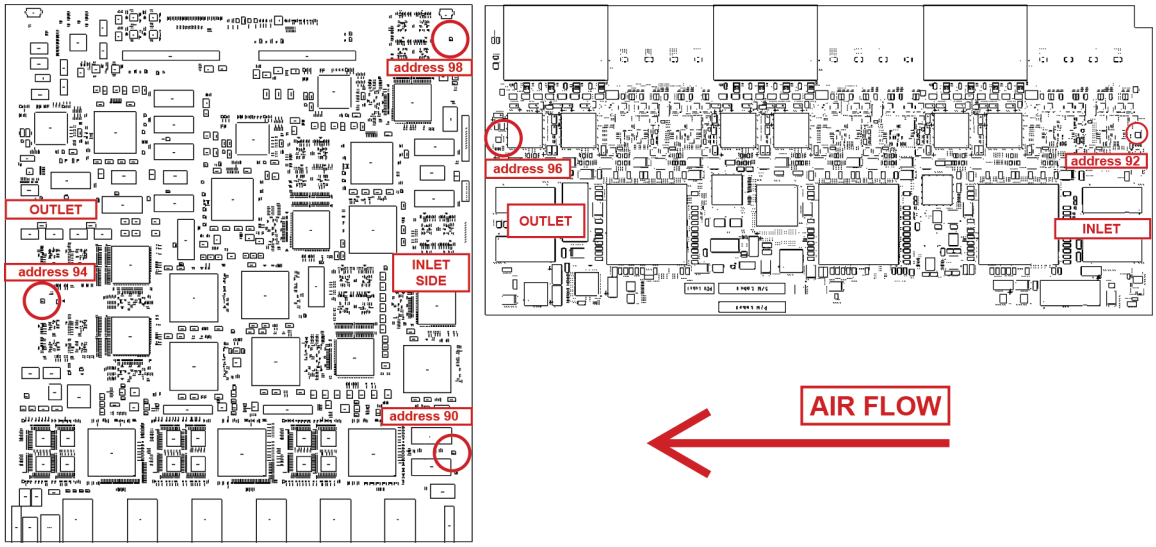


Figure 20: Heat sensor locations in a first generation I/O module

The following figure shows the baseboard component of a second generation I/O module on the left and the PIM component of a second generation I/O module on the right.

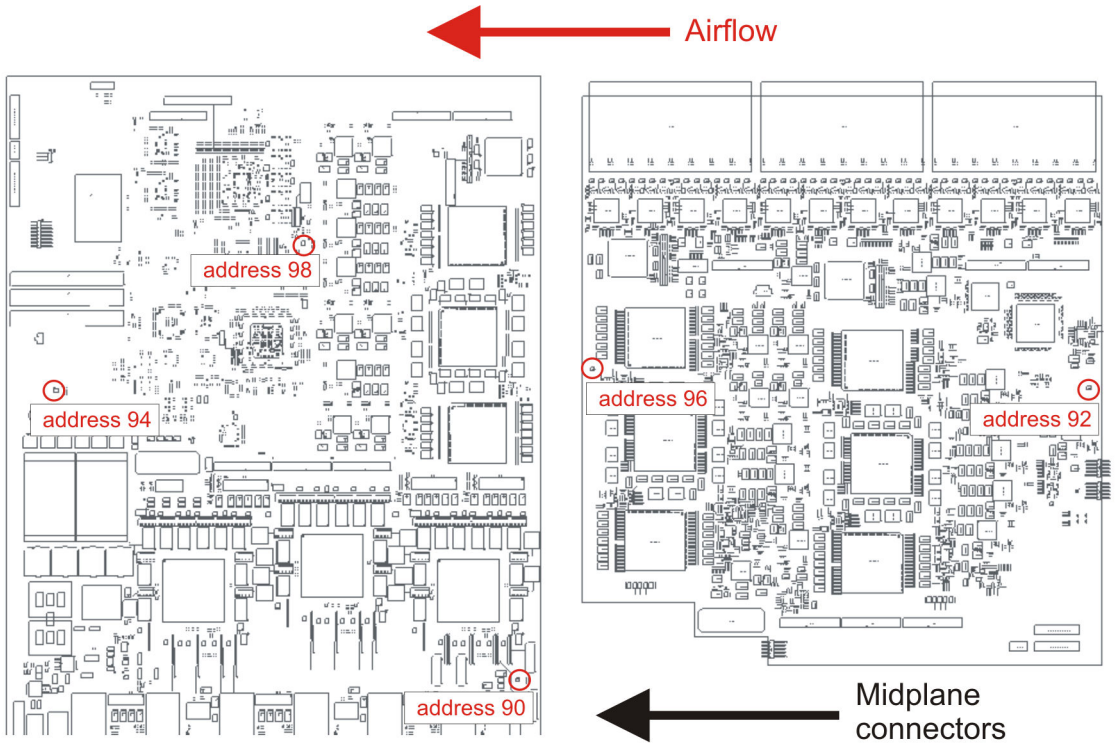


Figure 21: Heat sensor locations in a second generation I/O module

Use the following table to understand the heat sensors in the preceding I/O modules for first generation and second generation modules.

Table 22: Zone to heat sensor mapping for first generation .and second generation I/O modules

Zones	Heat sensors
zone 1	address 90
zone 2	address 92
zone 3	address 98
zone 4	address 94
zone 5	address 96

The system monitors the temperature every 30 seconds and displays the temperature on all the modules with the following command: **`show sys-info temperature`**

Note:

The I/O module alarm threshold and shutdown threshold temperatures differ for the Virtual Services Platform 9010 and the Virtual Services Platform 9012.

The following example shows command output for both first and second generation I/O modules.

```
Switch:1#show sys-info temperature

Temperature Info :

Slot Zone-1 Zone-2 Zone-3 Zone-4 Zone-5  Highest  Lowest Alarm      Shutdown
     Temp   Temp   Temp   Temp   Temp    Temp     Temp   Threshold  Threshold
1     37     25     --     31     24       37      24     54         59
2     34     25     --     30     23       34      23     54         59
4     33     29     39     36     45       45      29     69         74
8     35     30     38     36     43       43      30     69         74
10    34     34     41     38     47       47      34     69         74
12    35     29     34     35     30       35      29     59         64
SF1   33     --     --     40     --       40      33     54         59
SF2   32     --     --     36     --       36      32     54         59
SF3   30     --     --     31     --       31      30     54         59
SF4   29     --     --     31     --       31      29     54         59
SF5   31     --     --     36     --       36      31     54         59
```

The following example displays additional command output that appears for second generation I/O modules.

```
Extended Temperature Zones :

                    Sensor Temperatures

Slot  Zone    Slice-1     Slice-2     Slice-3    Highest  Lowest  Alarm     Shutdown
              1   2   3   1   2   3   1   2   3  Temp     Temp    Threshold Threshold
4     FPGA    56  51  56  56  55  59  54  47  62  62       47      90         95
4     FA      41  --  --  49  --  --  66  --  --  66       41      100        105
8     FPGA    58  53  57  55  55  51  53  51  51  58       51      90         95
8     FA      37  --  --  53  --  --  70  --  --  70       37      100        105
10    FPGA    53  51  51  55  57  59  57  57  53  59       51      90         95
10    FA      41  --  --  49  --  --  64  --  --  64       41      100        105
```

The following table describes the output for the **`show sys-info temperature`** command.

Comments? infodev@avaya.com

Value	Description
Temperature Info	
Zones 1 through 3	Specifies the inlet sensors on the module.
Zones 4 and 5	Specifies the outlet sensors on the module.
Highest Temp	Specifies the highest temperature reached on the slot.
Lowest Temp	Specifies the lowest temperature reached on the slot.
Alarm Threshold	Specifies the temperature, when exceeded by one degree, that causes the system to initiate an SNMP trap and causes the module online LED to display as blinking and red.
Shutdown Threshold	Specifies the temperature, when exceeded by one degree, that causes the system to shutdown the module by removing power from the slot.
Extended Temperature Zones This information applies only to second generation modules.	
FPGA	Specifies the temperature of the FPGA sensors. A value of -- indicates that this sensor is not available on this slot.
fa	Specifies the temperature of the FA sensor, located on the slice. A value of -- indicates that this sensor is not available on this slot.
Slice-1 through Slice–3	Specifies temperature information for sensors on each slice. Sensors provide temperature information for various datapath components.
Highest Temp	Specifies the highest temperature of all the FPGA or FA sensors located on this I/O module.
Lowest Temp	Specifies the lowest temperature of all the FPGA or FA sensors located on this I/O module.
Alarm Threshold	Specifies the FPGA or FA temperature, when exceeded by one degree, that causes an alarm.
Shutdown Threshold	Specifies the FPGA or FA temperature, when exceeded by one degree, that causes the system to shutdown the module by removing power from the slot.

Virtual Services Platform 9012 show sys-info output

On the Virtual Services Platform 9012, you can see the zone alarm information under the Fan Trays Info section of the command output for the **`show sys-info`** command. The following output displays on a Virtual Services Platform 9012 without a second generation module:

```
Fan Trays Info :

   Zone Info :
```


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```
     FRONT zone :
       Mode : NORMAL
       Mode Status : Normal
       Highest Temperature : 33 C
       Extended Zone :
         FPGA Highest Temperature : --
         FA Highest Temperature : --
     REAR zone :
       Mode : NORMAL
       Mode Status : Normal
       Highest Temperature : 31 C

  Fan Info :
         Tray   CardType           Serial#            Part#
     IO-FAN 1     9012FC
     IO-FAN 2     9012FC
     SF-FAN 1     9012RC
     SF-FAN 2     9012RC

         Zone       Tray     Unit      Status
        FRONT   IO-FAN 1        1          OK
        FRONT   IO-FAN 1        2          OK
        FRONT   IO-FAN 1        3          OK

        FRONT   IO-FAN 1        4          OK
        FRONT   IO-FAN 1        5          OK
        FRONT   IO-FAN 1        6          OK
        FRONT   IO-FAN 1        7          OK
        FRONT   IO-FAN 1        8          OK
        FRONT   IO-FAN 2        1          OK
        FRONT   IO-FAN 2        2          OK
        FRONT   IO-FAN 2        3          OK
        FRONT   IO-FAN 2        4          OK
        FRONT   IO-FAN 2        5          OK
        FRONT   IO-FAN 2        6          OK
        FRONT   IO-FAN 2        7          OK
        FRONT   IO-FAN 2        8          OK
         REAR   SF-FAN 1        1          OK
         REAR   SF-FAN 1        2          OK
         REAR   SF-FAN 2        1          OK
         REAR   SF-FAN 2        2          OK
```

The following output displays on a Virtual Services Platform 9012 with a second generation module:

```
Fan Trays Info :

   Zone Info :

      FRONT zone :
        Mode : NORMAL
        Mode Status : Normal
        Highest Temperature : 49 C
        Extended Zone :
          FPGA Highest Temperature : 62 C
          FA Highest Temperature : 70 C
      REAR zone :
        Mode : NORMAL
        Mode Status : Normal
        Highest Temperature : 40 C

   Fan Info :
          Tray   CardType           Serial#            Part#
      IO-FAN 1   9012FCHS    LBNNTMRJ000172     EC1411004-E6
      IO-FAN 2   9012FCHS    LBNNTMRJ00015T     EC1411004-E6
```

```
SF-FAN 1      9012RC    LBNNTMRJ000049     EC1411002-E6
SF-FAN 2      9012RC    LBNNTMRJ000046     EC1411002-E6

    Zone        Tray      Unit      Status
   FRONT    IO-FAN 1         1          OK
   FRONT    IO-FAN 1         2          OK
   FRONT    IO-FAN 1         3          OK

   FRONT    IO-FAN 1         4          OK
   FRONT    IO-FAN 1         5          OK
   FRONT    IO-FAN 1         6          OK
   FRONT    IO-FAN 1         7          OK
   FRONT    IO-FAN 1         8          OK
   FRONT    IO-FAN 2         1          OK
   FRONT    IO-FAN 2         2          OK
   FRONT    IO-FAN 2         3          OK
   FRONT    IO-FAN 2         4          OK
   FRONT    IO-FAN 2         5          OK
   FRONT    IO-FAN 2         6          OK
   FRONT    IO-FAN 2         7          OK
   FRONT    IO-FAN 2         8          OK
    REAR    SF-FAN 1         1          OK
    REAR    SF-FAN 1         2          OK
    REAR    SF-FAN 2         1          OK
    REAR    SF-FAN 2         2          OK
```

Use the data in the following table to understand the output for the **`show sys-info`** command on the Virtual Services Platform 9012.

Value		Description
FRONT zone: For the VSP 9012, the front zone consists of two fan trays with eight fans in each tray, which cool the CP and I/O modules.	Mode:	Each zone operates in either normal mode or alarm mode.
	Mode Status:	Normal Mode – All the fans are healthy and no temperatures exceed the warning threshold. Alarm Mode – Indicates fan or fan tray failures or temperature exceed the warning threshold.
	Highest Temperature	Specifies the highest temperature reached in the front zone.
	Extended Zone:	
	FPGA Highest Temperature	This information applies only to second generation modules. Specifies the temperature of the FPGA sensors. A value of -- indicates that this sensor is not available on this slot.
	FA Highest Temperature	This information applies only to second generation modules. Specifies the temperature of the FA sensor, located on the slice. A value of -- indicates that this sensor is not available on this slot.

Value		Description
REAR zone: For the VSP 9012, the rear zone consists of two fan trays with two fans in each tray, which cool the SF modules.	Mode:	Each zone operates in either normal mode or alarm mode.
	Mode Status:	Normal Mode – All the fans are healthy and no temperatures exceed the warning threshold. Alarm Mode – Indicates fan or fan tray failures or temperature exceed the warning threshold.
	Highest Temperature	Specifies the highest temperature reached in the front zone.
Fan Info:	IO-FAN 1	Specifies the module type.
	IO-FAN 2	Specifies the module type.
	SF-FAN 1	Specifies the module type.
	SF-FAN 2	Specifies the module type.
	FRONT IO-FAN 1 (1-8)	Specifies the status of each of the fans in the first cooling module.
	FRONT IO-FAN 2 (1-8)	Specifies the status of each of the fans in the first cooling module.
	REAR SF-FAN 1 (1-2)	Specifies the status of each of the fans in the rear cooling module.
	REAR SF-FAN 2 (1-2)	Specifies the status of each of the fans in the rear cooling module.

Chapter 4: Module installation and connection for the VSP 9010

Install and connect Avaya Virtual Services Platform 9000 modules to provide communications interfaces for switching and routing operations.

The Virtual Services Platform 9000 modules are sensitive to static electricity. Static discharge from your clothing or other fixtures around you, even at levels that do not create a spark, can cause damage to hardware.

In the Virtual Services Platform 9010, install CP modules vertically in slots CP1 and CP2 and I/O modules vertically in slots I/O3 to I/O10 at the front of the Virtual Services Platform 9010. Install SF modules horizontally at the back of the Virtual Services Platform 9010.

Electrostatic alert:

ELECTROSTATIC ALERT

ESD can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

Electrostatic discharge (ESD) can damage hardware. Follow the procedures in this section to protect your equipment from damage.

To prevent electrostatic discharge damage when you work with the Virtual Services Platform 9000, place each module on a grounded antistatic mat until you can install it. If you do not have an antistatic mat, wear a discharge leash or wrist strap to free yourself of static before you touch a module. An antistatic wrist strap is shipped with the Virtual Services Platform 9000. You can also free yourself of static by touching the metal Virtual Services Platform 9010 before you handle the module.

Warning:

Risk of equipment damage

Do not touch components or connector pins with your hand, or damage can result. When you handle modules, do not touch components on the circuit boards; always handle modules by their edges. Store unused modules in protective packaging.

Warning:

Modules are heavy

Damage to a module can occur if you bump the module into another object, including other modules installed in a chassis. Use both hands to support modules.

Note:

You can remove multiple modules, and insert the new modules. After you install a first generation module or multiple modules, the device can take up to 15 minutes to upgrade the software on the module or modules to match the system. After you install a second generation module or multiple modules, the device can take up to 25 minutes to upgrade the software on the module or modules to match the system. Each module can take a different amount of time to upgrade.

Always place the modules on appropriate antistatic material.

Support the module from underneath with two hands. Do not touch the top of the module. Do not touch the pins or electrical connections.

Do not leave slots open. Fill all slots with modules or filler modules to maintain safety compliance, proper cooling, and EMI containment.

Do not over tighten screws. Tighten until snug. Do not use a power tool to tighten screws.

Be careful not to bump the connectors of a module against the ejector levers of an adjacent module. Damage to connectors may result.

Visually inspect the connectors for damage before you insert the module. If you insert a module with damaged connectors you will damage the midplane.

This task flow shows you the sequence of procedures you perform to install and connect modules.

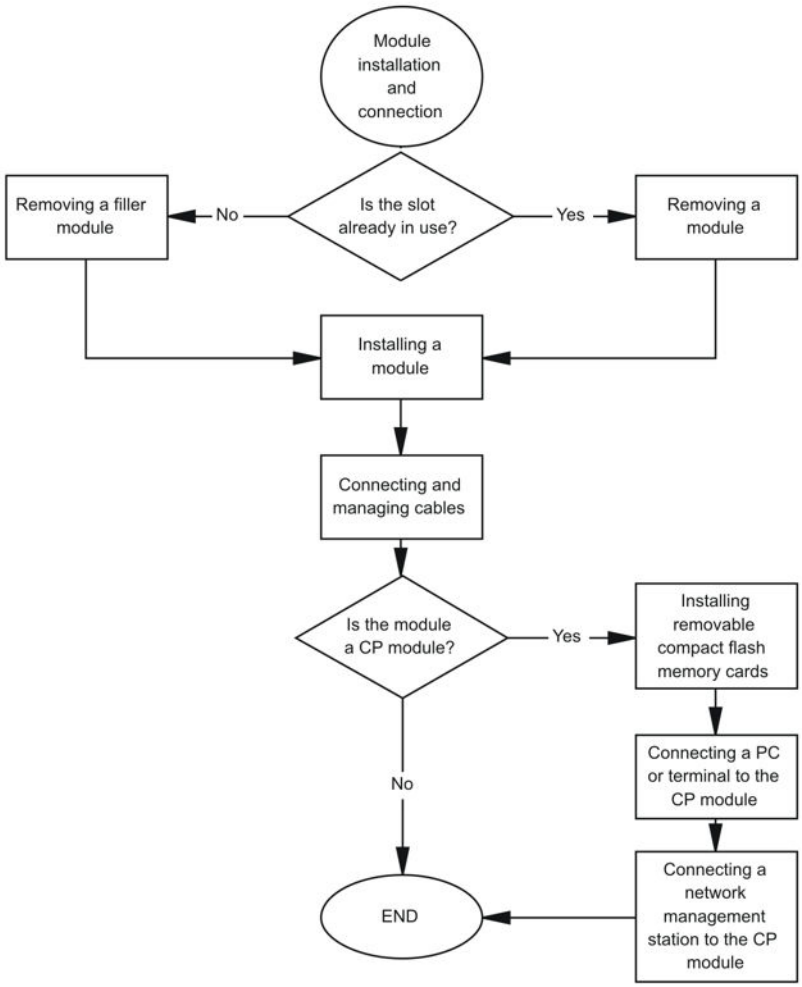


Figure 22: Module installation and connection procedures

VSP 9010 module installation time requirements

The following table lists the procedures you perform to install the Virtual Services Platform 9010 chassis modules, and the estimated time you need to complete each procedure. Not all procedures are required for every system. The preceding time requirements assume that you have already disconnected the cables. Removal and installation times will take longer with the cables still attached.

Table 23: VSP 9010 module installation procedures and time requirements

Procedure	Time requirement
Removing a filler module	1 minute

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Procedure	Time requirement
Installing a filler module	1 minute
Removing a module	1 minute
Installing a module	1 minute
Installing multiple modules	After you install a first generation module or multiple modules, the device can take up to 15 minutes to upgrade the software on the module or modules to match the system. After you install a second generation module or multiple modules, the device can take up to 25 minutes to upgrade the software on the module or modules to match the system. Each module can take a different amount of time to upgrade.

Removing a filler module for the VSP 9010

Remove a filler module to install a new module or to clean the module slot. Avaya ships the Virtual Services Platform 9010 with filler modules in each empty module slot. The filler modules for the CP module and the I/O modules are vertically installed in the front of the Virtual Services Platform 9010. The filler modules for the SF modules are installed horizontally in the back of the Virtual Services Platform 9010.

Avaya ships the Virtual Services Platform 9010 with the following unpopulated slots:

- CP 1
- I/O 3
- SF 1
- SF 4

The unpopulated slots represent the minimum number of slots to make the system viable. Avaya ships the remaining slots with filler modules.

Before you begin

Acquire the following items:

- Phillips #2 screwdriver
- Antistatic wrist strap

About this task

Remove the filler modules from the front of the Virtual Services Platform 9010 to install an I/O or CP module into the Virtual Services Platform 9000.

Remove the filler module from the back of the Virtual Services Platform 9010 to install the SF module into the Virtual Services Platform 9000.

Warning:

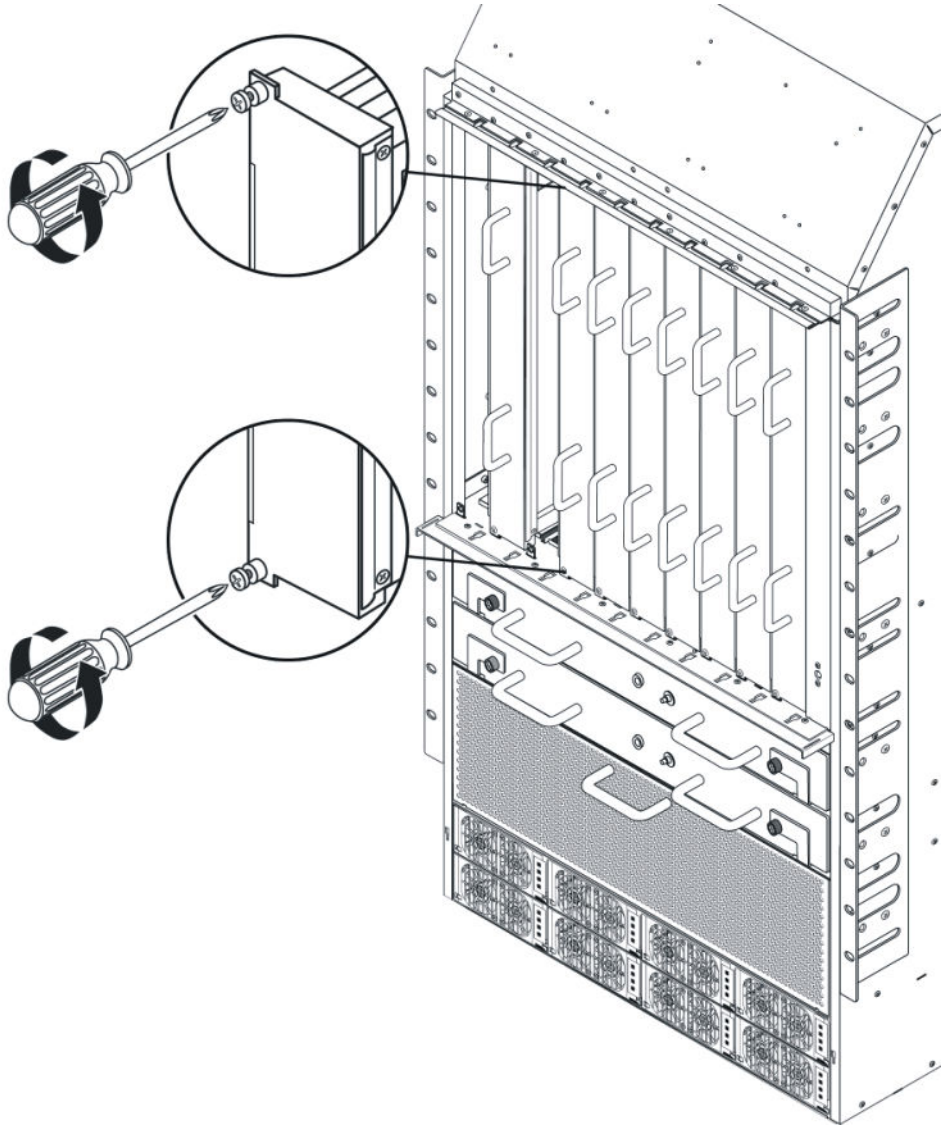
Risk of electromagnetic interference

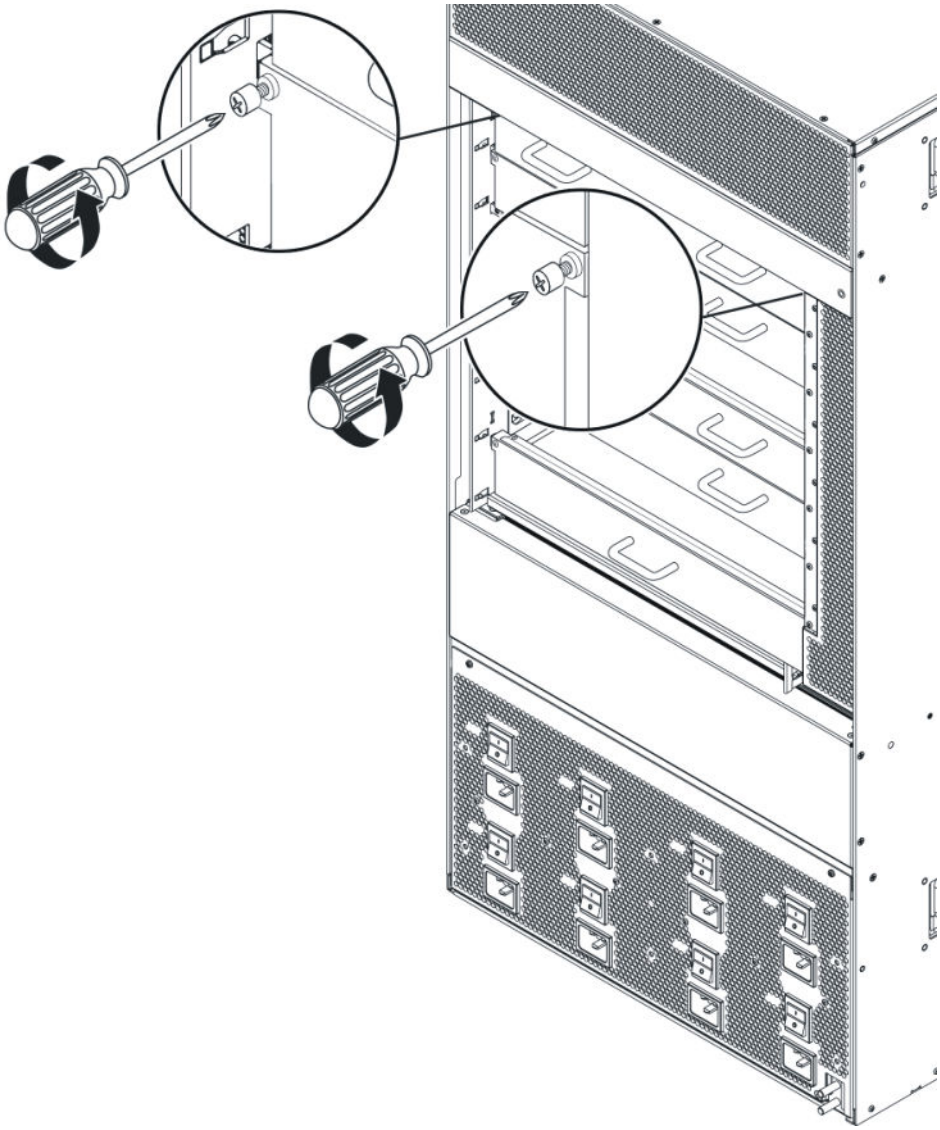
Do not operate the Virtual Services Platform 9000 with an empty module slot. If you need to replace a failed module, and you do not have a replacement module, leave the failed module installed, or install a filler module.

Operating the switch with an empty module slot can cause electromagnetic interference to other equipment in the area. Improper equipment cooling can also result.

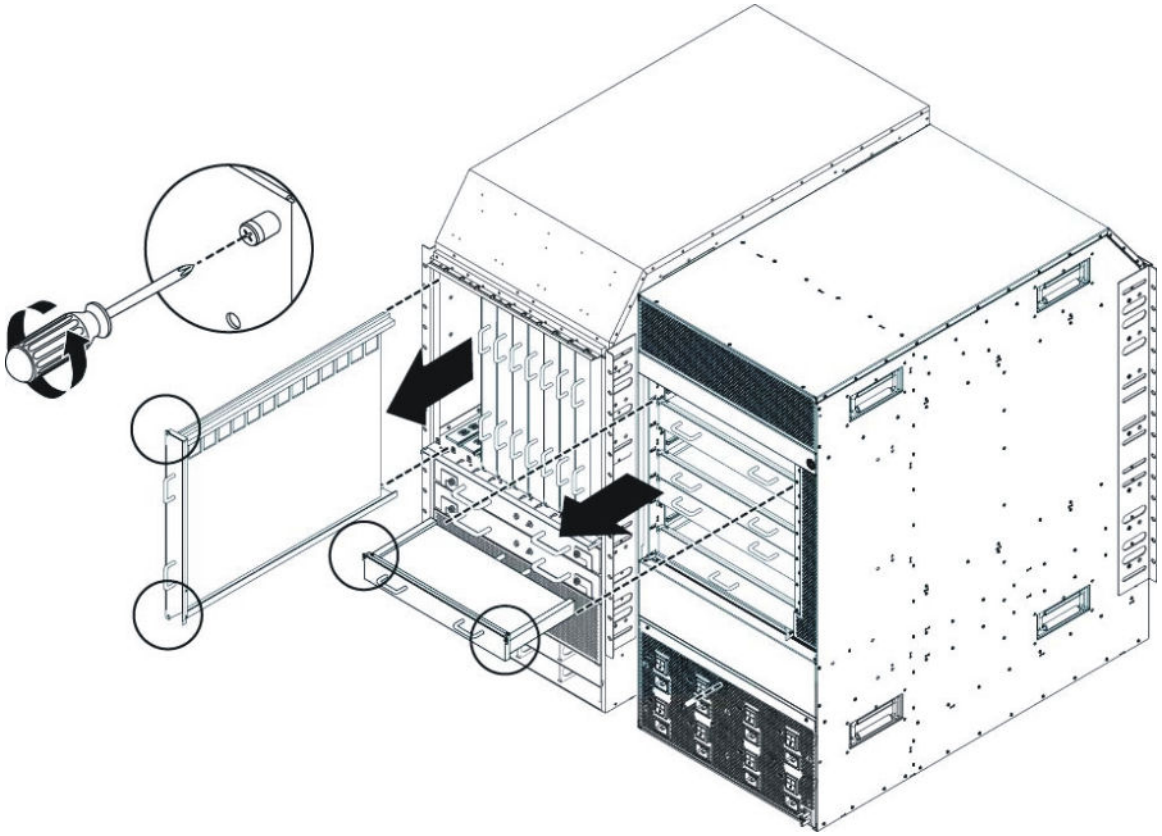
Procedure

1. Use a Phillips screwdriver and turn counter clockwise to loosen the two captive screws that fasten the filler module to the Virtual Services Platform 9010.





2. Grasp the two handles on the front filler module or the one handle on the back filler module.



3. Pull the filler module away from the slot.

Installing a filler module for the VSP 9010

If you plan to remove a module from the Virtual Services Platform 9010 without immediately replacing it, you must install a filler module in the slot to maintain proper airflow and cooling. Always populate unused module slots with filler modules.

The filler modules for the CP module and the I/O modules are vertically installed in the front of the Virtual Services Platform 9010. The filler modules for SF modules are horizontally installed in the back of the Virtual Services Platform 9010.

Avaya ships the Virtual Services Platform 9010 with the following unpopulated slots:

- CP 1
- I/O 3
- SF 1
- SF 4

The unpopulated slots represent the minimum number of slots to make the system viable. Avaya ships the remaining slots with filler modules.

The filler module resembles a module and is installed in the empty module slot.

Before you begin

Acquire the following items:

- Phillips #2 screwdriver
- Antistatic wrist strap

About this task

Warning:

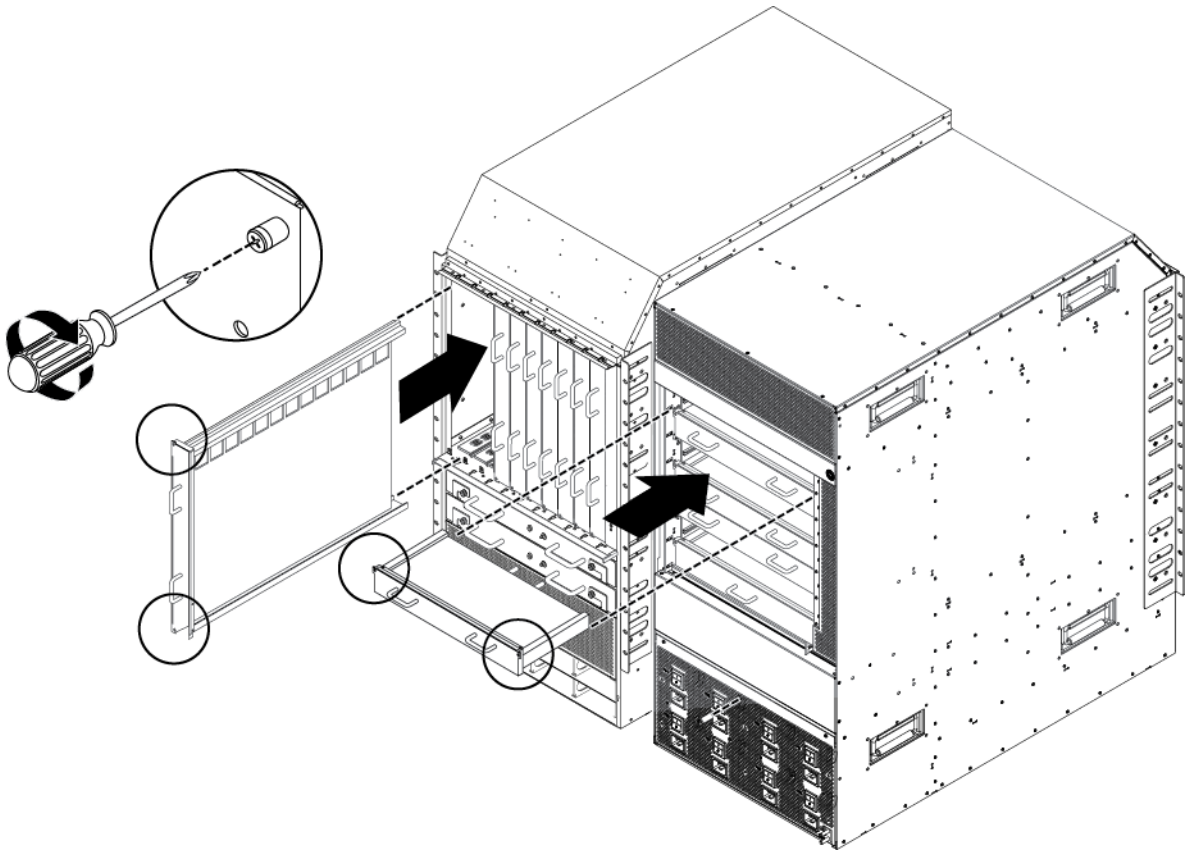
Risk of electromagnetic interference

Do not operate the Virtual Services Platform 9000 with an empty module slot. If you need to replace a failed module, and you do not have a replacement module, leave the failed module installed, or install a filler module.

Operating the switch with an empty module slot can cause electromagnetic interference to other equipment in the area. Improper equipment cooling can also result.

Procedure

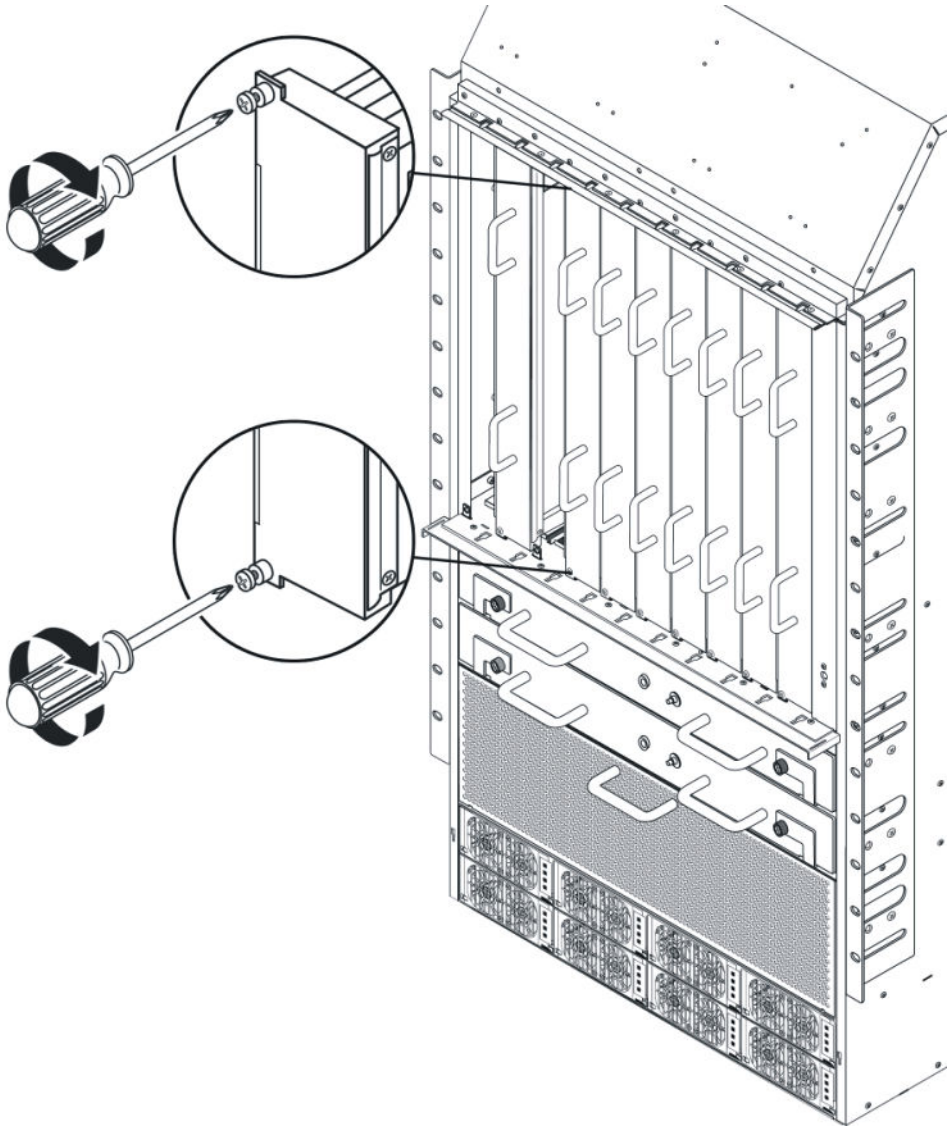
1. Locate the slot where you want to install the filler module.
2. Insert the filler module into the slot.



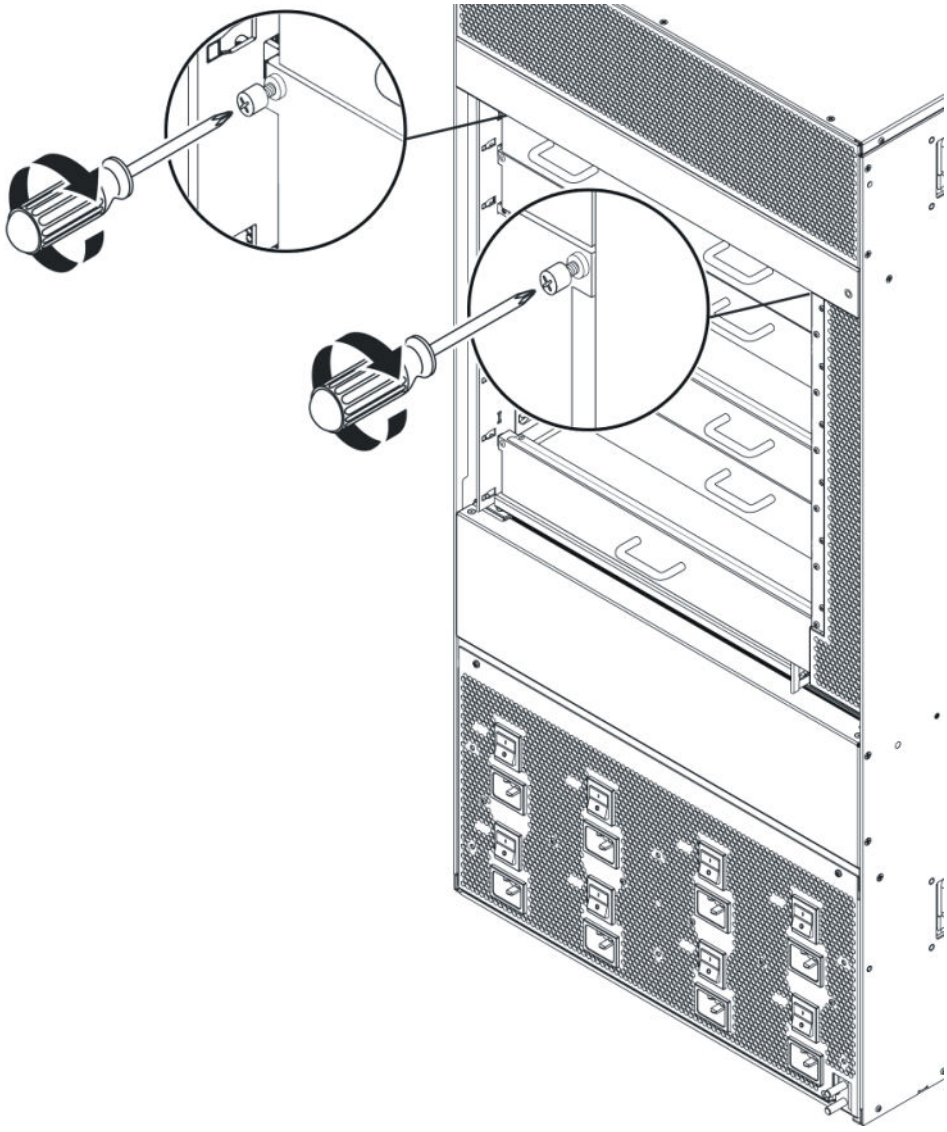
Comments? infodev@avaya.com

3. Use the two handles on the front filler module or the one handle on the back filler module to seat the module midplane connectors.

4. Use a Phillips screwdriver to tighten the two captive screws.



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Removing a module for the VSP 9010

Remove a module to install another module. The CP modules and the I/O modules are vertically installed in the front of the Virtual Services Platform 9010. The SF modules are installed horizontally in the back of the Virtual Services Platform 9010.

Before you begin

- Before you remove the Control Processor (CP) module, back up your configuration. Ensure that you install at least one CP module in the chassis, otherwise the switch does not operate.
- Ensure that traffic is not traversing the module. Disable the module before you remove it.

Acquire the following items:

- Phillips #2 screwdriver
- Antistatic wrist strap

About this task

Danger:

Risk of eye injury by laser

Fiber optic equipment can emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume that fiber optic cables are connected to a light source.

Electrostatic alert:

ELECTROSTATIC ALERT

ESD can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

Modules are heavy. Use both hands to insert the module. Ensure that the module connects with the back module connector.

Protect the interface connectors during handling and as you install modules into the Virtual Services Platform 9010.

Warning:

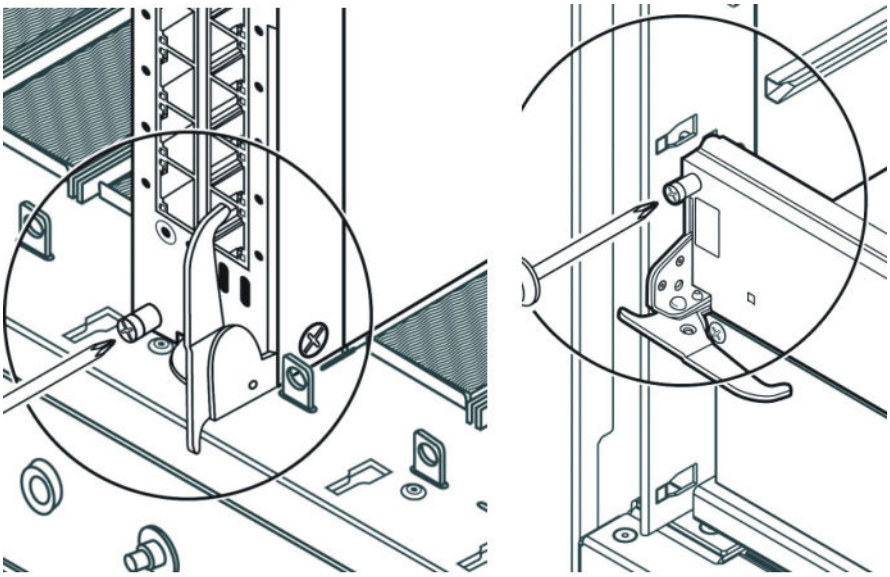
Risk of electromagnetic interference

Do not operate the Virtual Services Platform 9000 with an empty module slot. If you need to replace a failed module, and you do not have a replacement module, leave the failed module installed, or install a filler module.

Operating the switch with an empty module slot can cause electromagnetic interference to other equipment in the area. Improper equipment cooling can also result.

Procedure

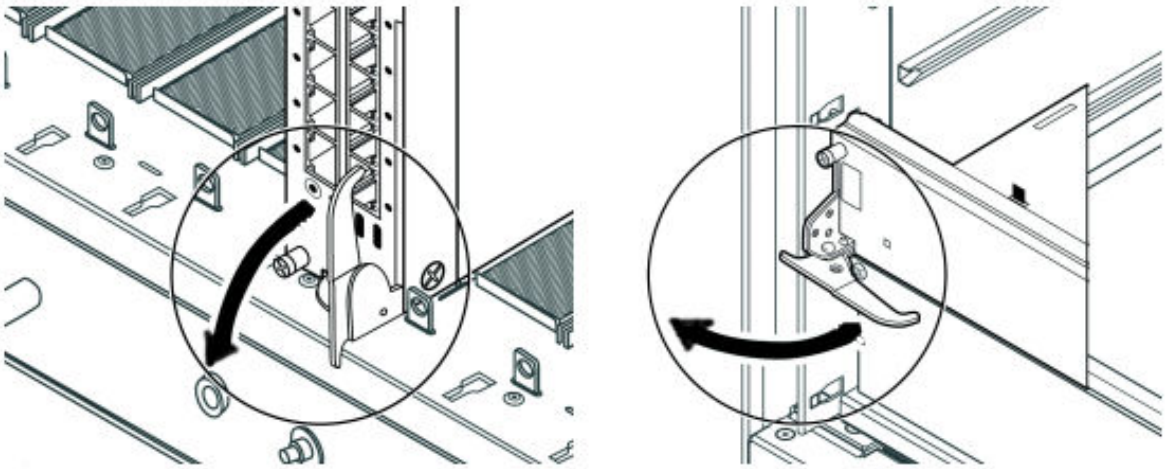
1. Disconnect cables attached to the ports on the module.
2. Use a Phillips screwdriver to loosen the two captive screws that secure the module to the Virtual Services Platform 9010.



3. Rotate the insert or extract levers to eject the module from the Virtual Services Platform 9010.

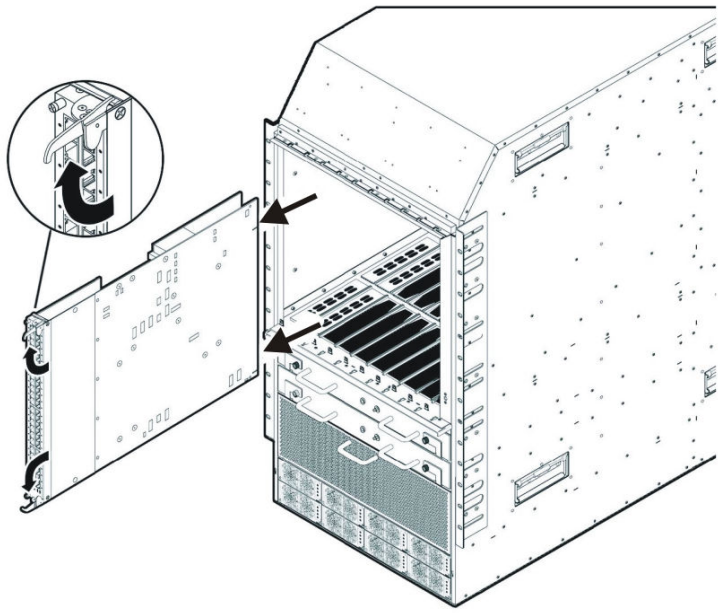
Note:

Check the clearance between the insertion lever and the gasket on adjacent modules during insertion or extraction.

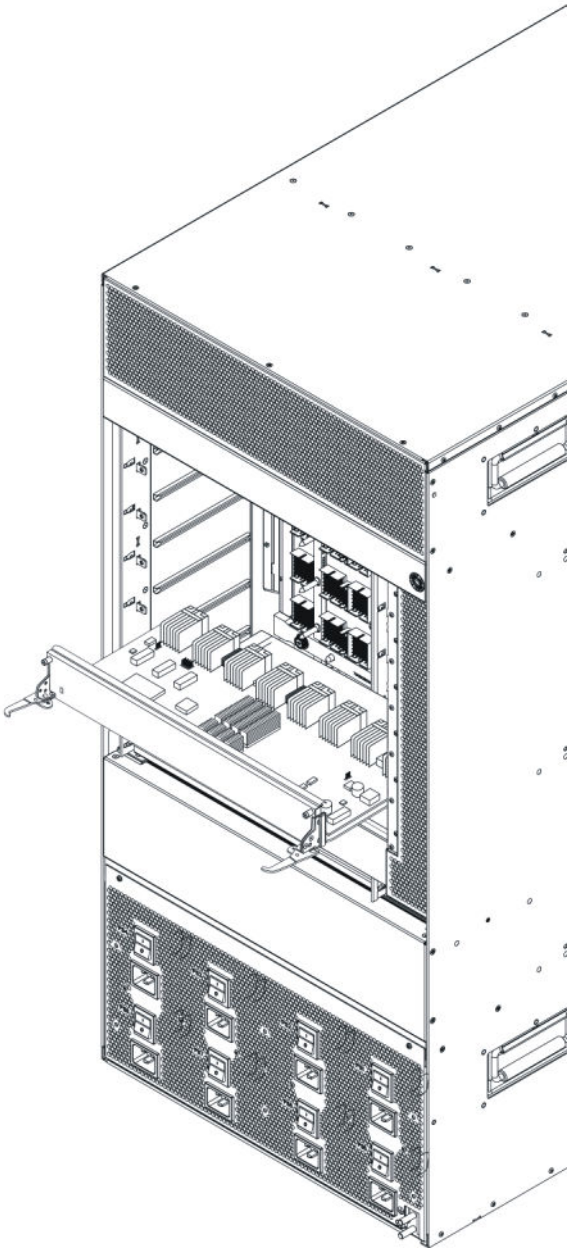


4. Slide the module out of the Virtual Services Platform 9010.

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Comments? infodev@avaya.com



Do not operate a chassis without either a filler module or a module installed in a slot.

Installing a module for the VSP 9010

Install a module to replace an existing module or to add new capability to the Avaya Virtual Services Platform 9010.

The CP module, SF module, and I/O modules use the same installation method; the difference is the Virtual Services Platform 9010 slot location. Install CP modules vertically in slots CP1 and CP2 and I/O modules vertically in slots I/O3 to I/O10 at the front of the Virtual Services Platform 9010. Install SF modules horizontally at the back of the Virtual Services Platform 9010.

Before you begin

Acquire the following items:

- Phillips #2 screwdriver
- Antistatic wrist strap

About this task

Danger:

Risk of eye injury by laser

Fiber optic equipment can emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume that fiber optic cables are connected to a light source.

Electrostatic alert:

ELECTROSTATIC ALERT

ESD can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

Modules are heavy. Use both hands to insert the module. Ensure that the module connects with the back module connector.

Protect the interface connectors during handling, and as you install modules into the Virtual Services Platform 9010.

Warning:

Risk of electromagnetic interference

Do not operate the Virtual Services Platform 9000 with an empty module slot. If you need to replace a failed module, and you do not have a replacement module, leave the failed module installed, or install a filler module.

Operating the switch with an empty module slot can cause electromagnetic interference to other equipment in the area. Improper equipment cooling can also result.

If you have the optional external Flash card media for your CPU module, you must install it prior to power on of the chassis and CPU modules.

You must have a minimum of three Switch Fabric modules installed for proper operation of the Virtual Services Platform 9010.

Procedure

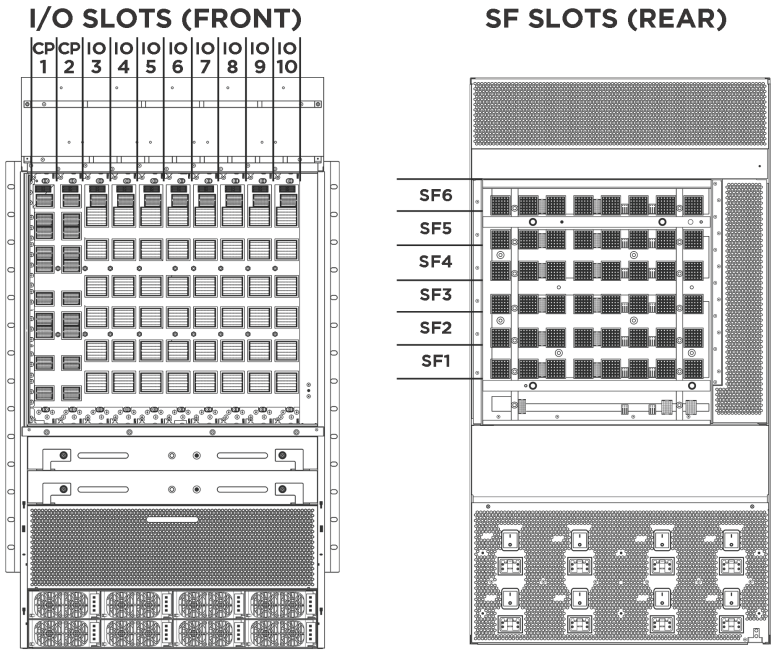
1. Locate the slot where you want to install the CP module, the SF module, or the I/O module. When installing the SF modules, for proper operation you must populate slots SF1 and SF4, and then populate the rest of the slots. The following illustration displays slot numbering information.

Note:

To help with module installation for the CP and I/O modules, install a filler module in a slot to the right of where you want to install the CP module or I/O module.

To help with module installation for the SF modules, install the filler module below where you want to install the SF module.

In this case, the filler modules help align the CP, I/O and SF modules with the guide rails during installation.



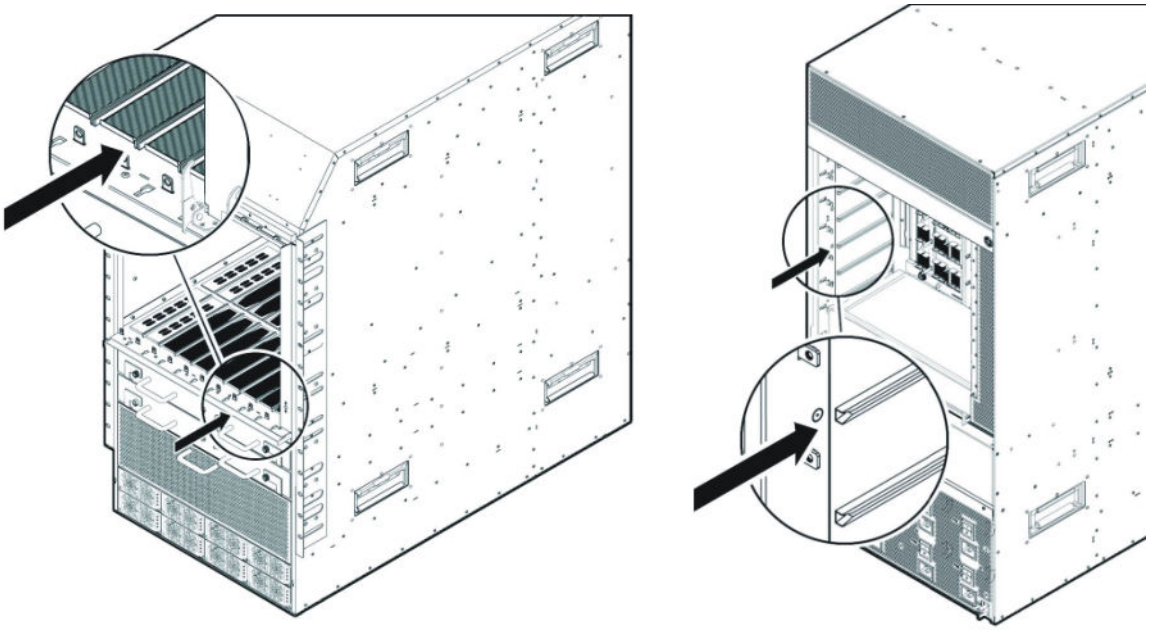
2. Align the module metal baseplate with the guide rails on either side of the opening for horizontal modules or the guide rails at the top and bottom of the opening for vertical modules.

Note:

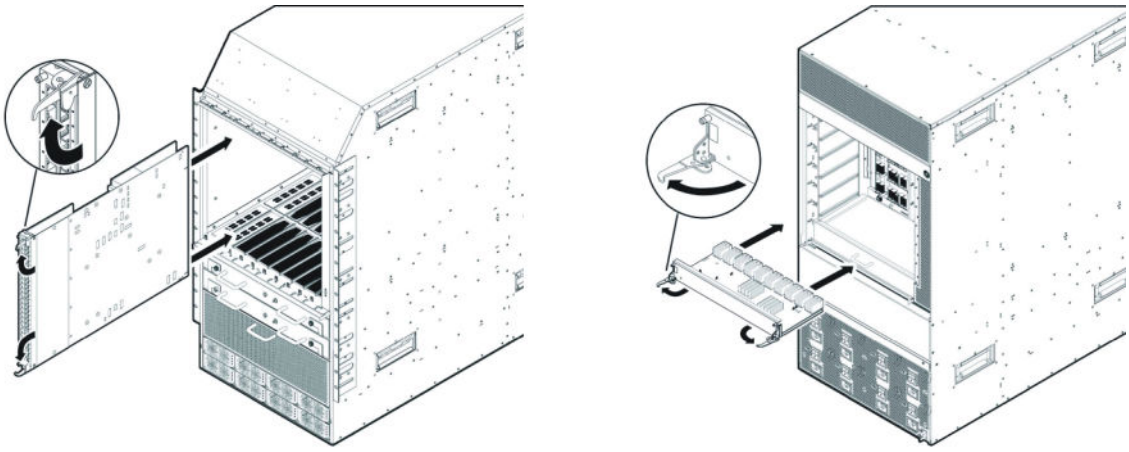
Check the clearance between the insertion lever and the gasket on adjacent modules during insertion or extraction.

Note:

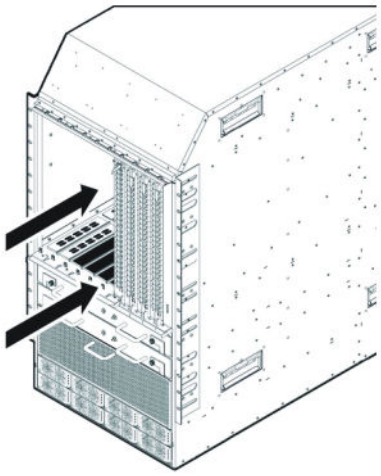
The component side of I/O modules and CP modules faces the left side of the chassis, if you view the chassis from the front.

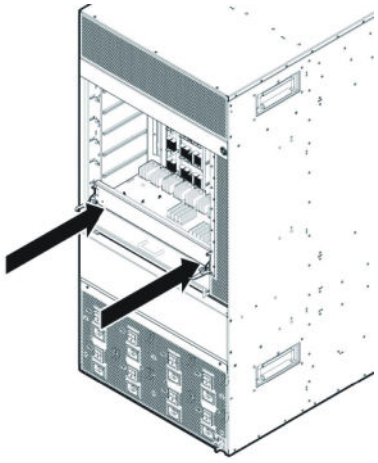


3. Before you fully insert the module into the slot, rotate the action levers away from the module until they form a 90° angle with the front of the module. Carefully slide the module partway into the slot.

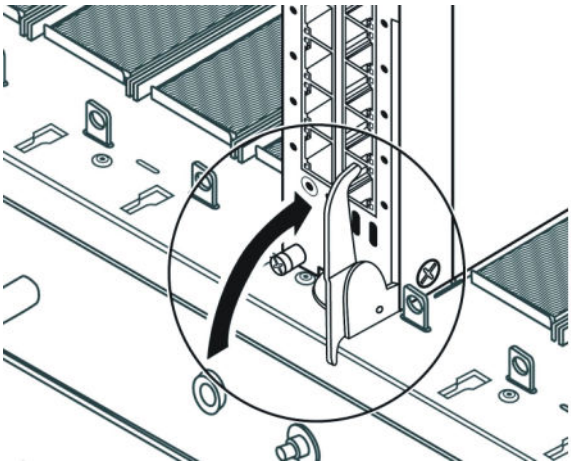


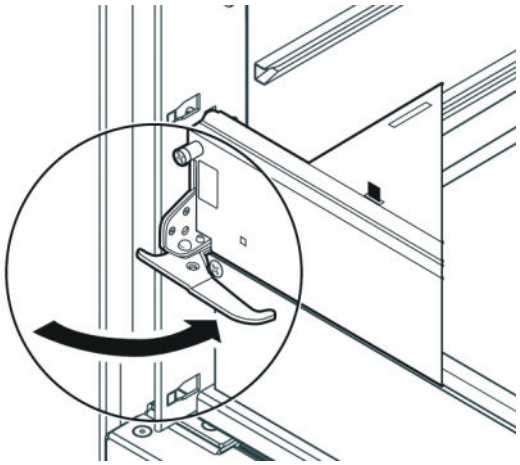
4. Gently seat the module interface connectors by pressing on the outside edges of the module near the action levers.



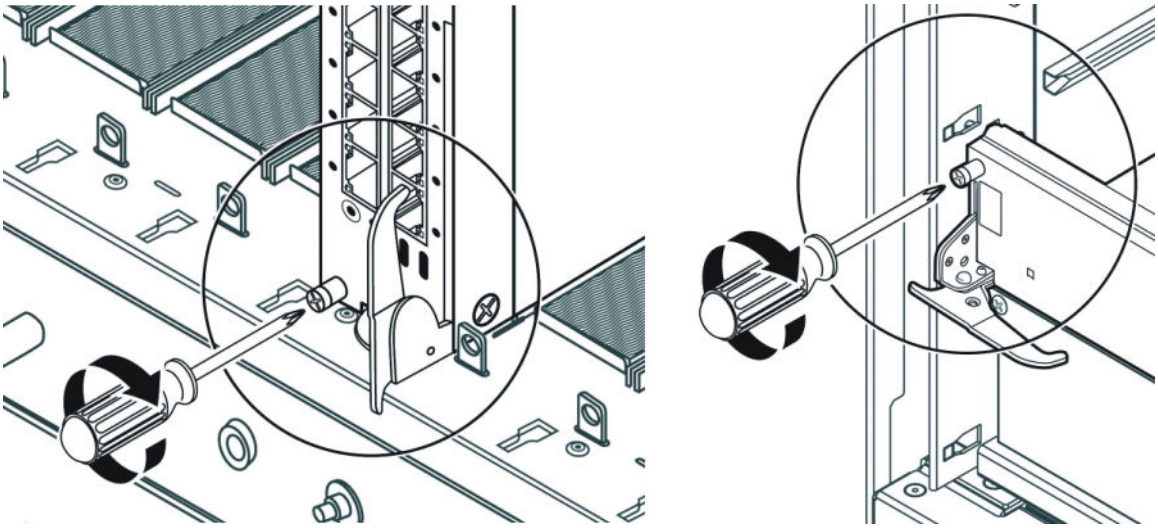


5. Continue seating the module by rotating the action levers until the levers are parallel with the front face panel and the module is fully seated.





6. Turn both screws by hand until they catch, before you tighten the screws, which allows the module to move a little to catch the screws. Use a Phillips screwdriver to tighten the screws until snug. Do not overtighten. Do not use a power tool to tighten screws.



Hot swapping a module for the VSP 9010

The CP, I/O, SF, cooling and power modules can be hot swapped without service interruption.

You can remove multiple modules, and insert the new modules. After you install a first generation module or multiple modules, the device can take up to 15 minutes to upgrade the software on the module or modules to match the system. After you install a second generation module or multiple modules, the device can take up to 25 minutes to upgrade the software on the module or modules to match the system. Each module can take a different amount of time to upgrade.

Before you begin

Acquire the following items:

- Phillips #2 screwdriver
- Antistatic wrist strap

About this task

Take note of the following considerations when hot swapping these modules:

- If no redundant power exists and you pull out a power module, one or more modules can automatically be powered down to ensure the Virtual Services Platform 9010 runs within the available power budget.
- **Warning:**

  You can remove and reinsert cooling modules. Prolonged running without a cooling module can cause one or more modules to overheat and cause the device to automatically shut the modules down.
- Avaya recommends you power down CP, I/O, and SF modules prior to removal because:
  - CP modules can corrupt files on the internal or external flash file systems due to partial writes if you do not power down the CP modules first before you remove the modules.

Comments? infodev@avaya.com

  - I/O and SF modules can lose inflight packets if you remove them when active.
- When you remove a CP, I/O, or SF module, you must wait 15 seconds before you remove another module or reinsert a module. The reason for this waiting period is:
  - The Virtual Services Platform 9010 can reconfigure the fabric links on all modules. The Virtual Services Platform 9010 needs to have enough time to reconfigure the fabric. If the Virtual Services Platform 9010 does not have enough time, data loss can happen.
  - The module needs to fully power down. This can take several seconds. If you reinsert a module too quickly, some parts on the module cannot be properly reset.
- Do not insert or remove modules while you upgrade or downgrade. If you remove or insert modules during these times, the device can abort or rollback the up or downgrade.
- Do not insert or remove modules during the power up sequence. If you remove or insert modules during the power up sequence, doing so can cause a delay in booting the Virtual Services Platform 9010. Only insert or remove modules when the Virtual Services Platform 9010 is fully booted.
- Master CP modules cannot be powered down. To remove a master CP, first switch over to the standby CP with the ACLI command **`sys action cpu-switchover`**. If no standby CP exists, use the **`sys shutdown`** command to power down a single CP chassis. After you use the **`sys shutdown`** command, you must remove and replace the CP module or the chassis does not boot.

Perform this procedure to hot swap a module.

You can use this procedure to upgrade to the latest modules.

Caution:

Risk of traffic loss or corruption

Do not hot swap or insert modules in a switch while the switch starts. If you do, the switch cannot recognize the module, which causes module initialization failure.

Electrostatic alert:

ELECTROSTATIC ALERT

ESD can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

Procedure

1. Connect to the primary CP.
2. Enter Global Configuration mode:

   ```
   enable
   configure terminal
   ```

3. Avaya recommends that you power down the module to avoid possible packet loss:

   ```
   no sys power slot {slot[-slot][,...]}
   ```


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4. Confirm that the module is powered down. The online LED of the module is off if the module is powered down. You can verify that the module is powered down by using the following command:

   ```
   show sys power slot
   ```

5. Remove the module.
6. Insert the new module and restore power:

   ```
   sys power slot {slot[-slot][,...]}
   ```

7. Confirm that the new module is operational:

   ```
   show sys power slot
   ```

   The online LED of the module illuminates.

8. Confirm that traffic is traversing the module as normal.

Variable definitions

Use the data in the following table to use the **sys power** and **no sys power** commands.

Variable	Value
slot *{slot[-slot][,...]}*	Identifies the slot. Valid slots are 1–12, and SF1–SF6.

Connecting and managing cables for the VSP 9010

Use cable management brackets to keep groups of cable clusters fastened and out of the way, but accessible for maintenance.

Before you begin

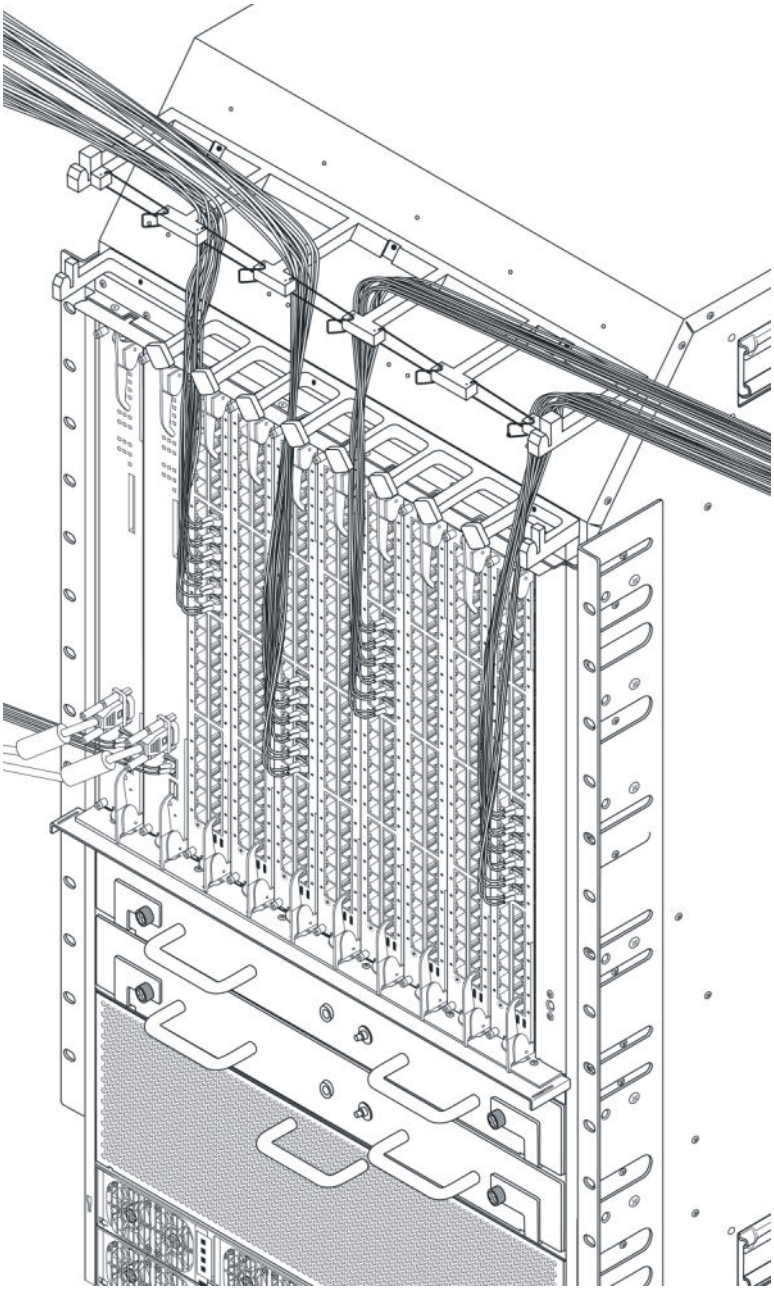
- Remove the cable bracket cover to ensure brackets are easier to access.

About this task

To facilitate module installation and removal, connect, label, and bundle the cables for each module together.

Procedure

1. Connect the appropriate cable to the module.
2. Route the cable up to the appropriate cable management bracket and channel.



3. Route the cable to the termination panel, loosely fastening it with Velcro straps or sheet fiber along the path.
4. Fasten the connector to the termination panel end of the cable.

   If you use cables manufactured by Avaya, the connectors are already fastened to predetermined lengths of cable.
5. Label the unconnected end of the cable with the node identifier (from site records) and the shelf, cage, slot, and port number.

6. After you connect all the transmitting cables from the same module to the termination panel, use Velcro straps or sheet fiber wrapped around the cables to manage them.

Chapter 5: Module installation and connection for the VSP 9012

Install and connect Avaya Virtual Services Platform 9000 modules to provide communications interfaces for switching and routing operations.

About this task

For the Virtual Services Platform 9012, install CP modules horizontally in slots CP1 and CP2 and IO modules in slots IO12 to IO3 at the front of the Virtual Services Platform 9012. Install SF modules vertically at the back of the Virtual Services Platform 9012.

The Virtual Services Platform 9000 modules are sensitive to static electricity. Static discharge from your clothing or other fixtures around you, even at levels that do not create a spark, can cause damage to hardware.

Electrostatic alert:

ELECTROSTATIC ALERT

ESD can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

Electrostatic discharge (ESD) can damage hardware. Follow the procedures in this section to protect your equipment from damage.

To prevent electrostatic discharge damage when you work with the Virtual Services Platform 9000, place each module on a grounded antistatic mat until you can install it. If you do not have an antistatic mat, wear a discharge leash or wrist strap to free yourself of static before you touch a module. An antistatic wrist strap is shipped with the Virtual Services Platform 9000. You can also free yourself of static by touching the metal Virtual Services Platform 9012 before you handle the module.

Warning:

Risk of equipment damage

Do not touch components or connector pins with your hand, or damage can result. When you handle modules, do not touch components on the circuit boards; always handle module by their edges. Store unused modules in protective packaging.

Warning:

Modules are heavy

Damage to a module can occur if you bump the module into another object, including other modules installed in a chassis. Use both hands to support modules.

Note:

You can remove multiple modules, and insert the new modules. After you install a first generation module or multiple modules, the device can take up to 15 minutes to upgrade the software on the module or modules to match the system. After you install a second generation module or multiple modules, the device can take up to 25 minutes to upgrade the software on the module or modules to match the system. Each module can take a different amount of time to upgrade.

Always place the modules on appropriate antistatic material.

Support the module from underneath with two hands. Do not touch the top of the module. Do not touch the pins or electrical connections.

Do not leave slots open. Fill all slots with modules or filler modules to maintain safety compliance, proper cooling, and EMI containment.

Do not over tighten screws. Tighten until snug. Do not use a power tool to tighten screws.

Be careful not to bump the connectors of a module against the ejector levers of an adjacent module. Damage to connectors can result.

Visually inspect the connectors for damage before you insert the module. If you insert a module with damaged connectors you will damage the midplane.

This task flow shows you the sequence of procedures you perform to install and connect modules.

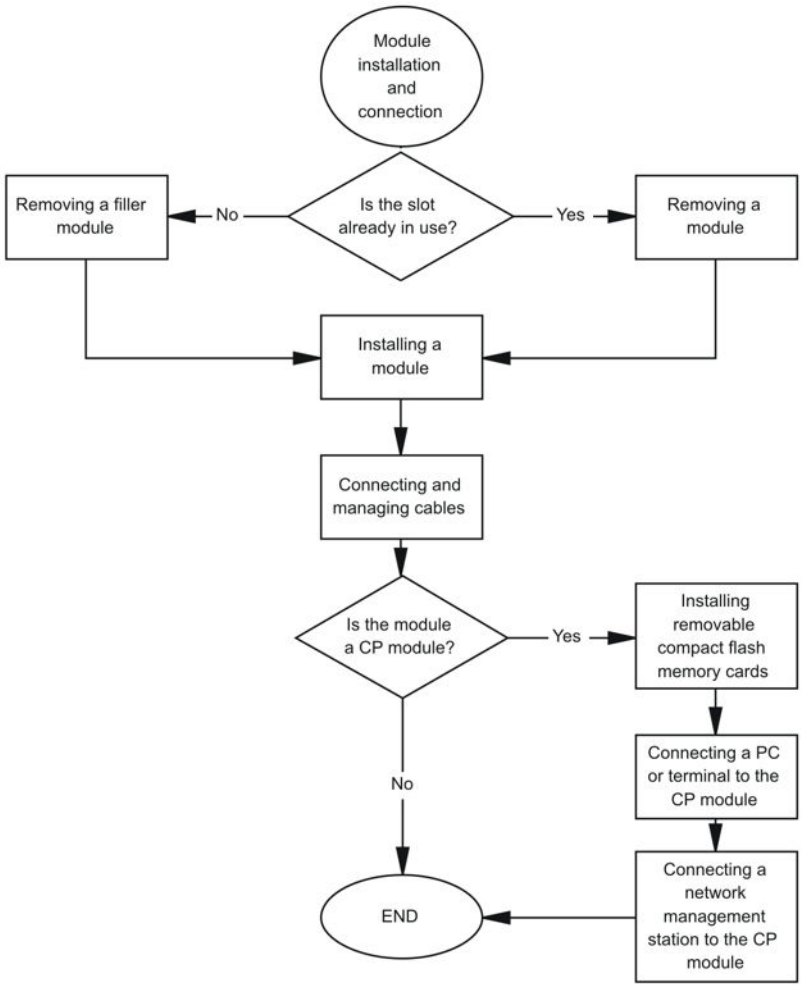


Figure 23: Module installation and connection procedures

VSP 9012 module installation time requirements

The following table lists the procedures you perform to install the Virtual Services Platform 9012 modules, and the estimated time you need to complete each procedure. Not all procedures are required for every system.

The preceding time requirements assume that you have already disconnected the cables. Removal and installation times will take longer with the cables still attached.

Table 24: VSP 9012 module installation procedures and time requirements

Procedure	Time requirement
Removing a filler module	1 minute
Installing a filler module	1 minute
Removing a module	1 minute
Installing a module	1 minute
Installing multiple modules	After you install a first generation module or multiple modules, the device can take up to 15 minutes to upgrade the software on the module or modules to match the system. After you install a second generation module or multiple modules, the device can take up to 25 minutes to upgrade the software on the module or modules to match the system. Each module can take a different amount of time to upgrade.

Removing a filler module for the VSP 9012

Remove a filler module to install a new module or to clean the module slot. Avaya ships the Virtual Services Platform 9012 with filler modules in each empty module slot.

The CP filler modules and the I/O filler modules are installed horizontally in the front of the Virtual Services Platform 9012. The SF modules are installed vertically in the back of the Virtual Services Platform 9012.

Avaya ships the Virtual Services Platform 9012 with the following unpopulated slots:

- CP 1
- I/O 12
- SF 1
- SF 4

The unpopulated slots represent the minimum number of slots to make the system viable. Avaya ships the remaining slots with filler modules.

Before you begin

Acquire the following items:

- Phillips #2 screwdriver
- Antistatic wrist strap

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About this task

Remove the filler modules from the front of the Virtual Services Platform 9012 to install an I/O or a CP module into the Virtual Services Platform 9000.

Remove the filler module from the back of the Virtual Services Platform 9012 to install the SF module into the Virtual Services Platform 9000.

Warning:

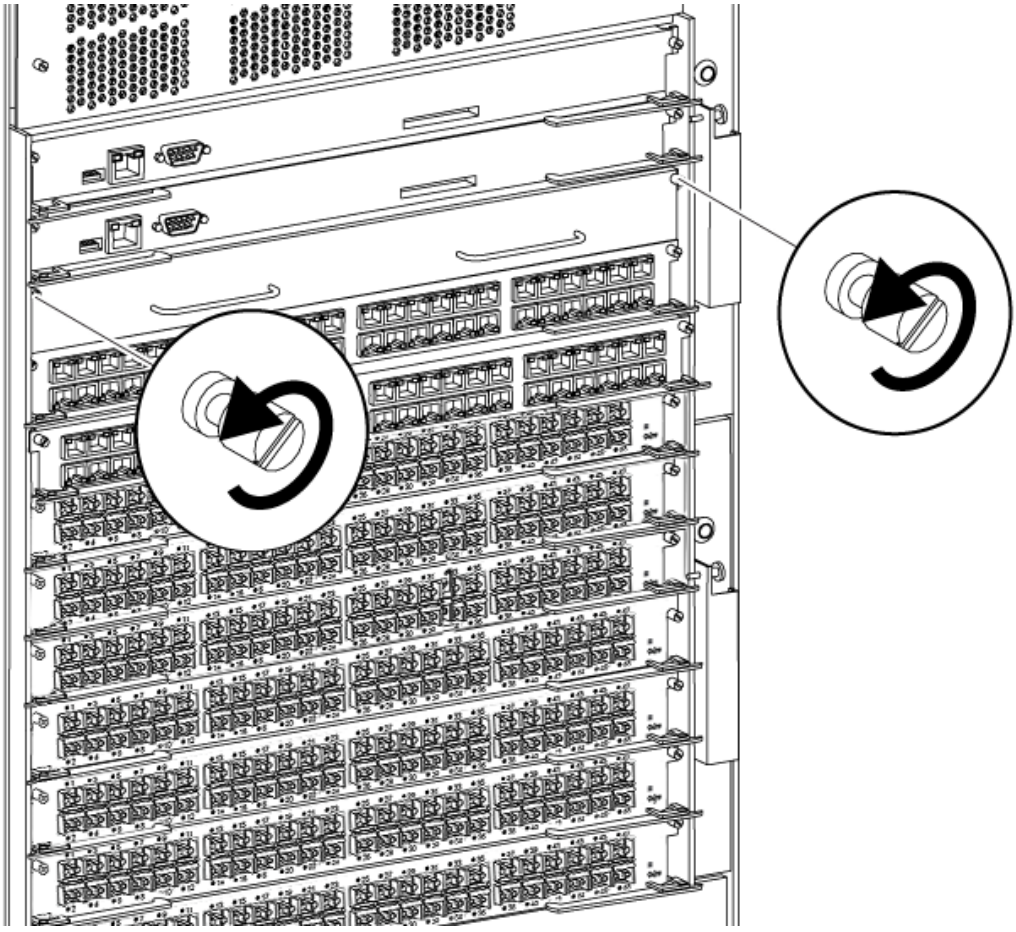
Risk of electromagnetic interference

Do not operate the Virtual Services Platform 9000 with an empty module slot. If you need to replace a failed module and you do not have a replacement module, leave the failed module installed, or install a filler module.

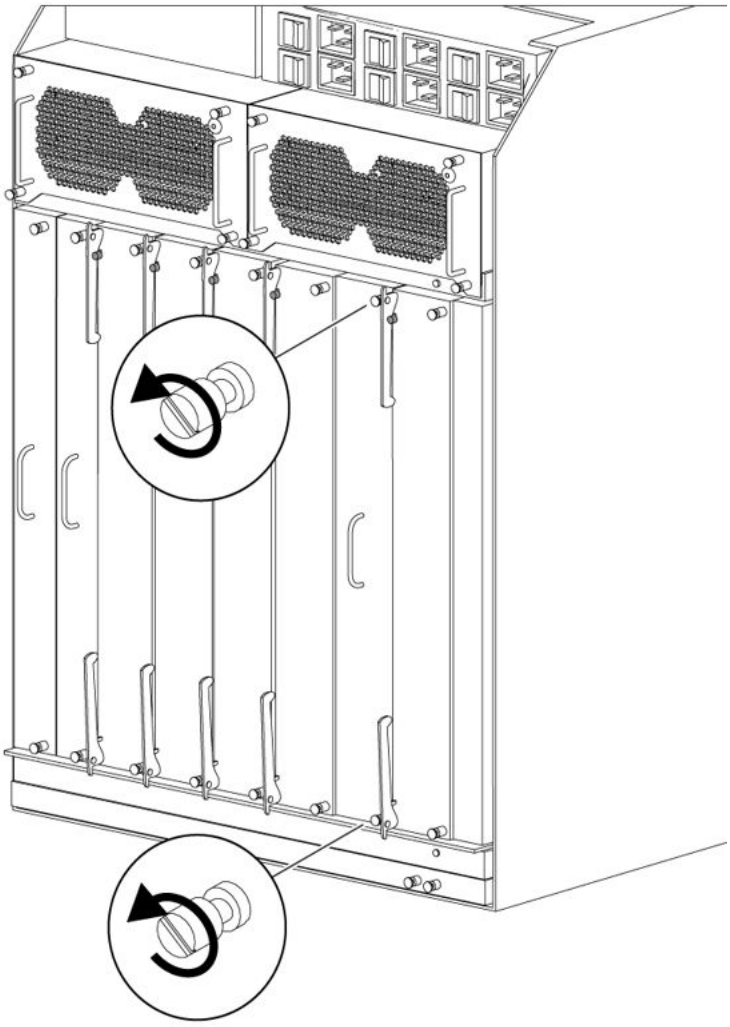
Operating the switch with an empty module slot can cause electromagnetic interference to other equipment in the area. Improper equipment cooling can also result.

Procedure

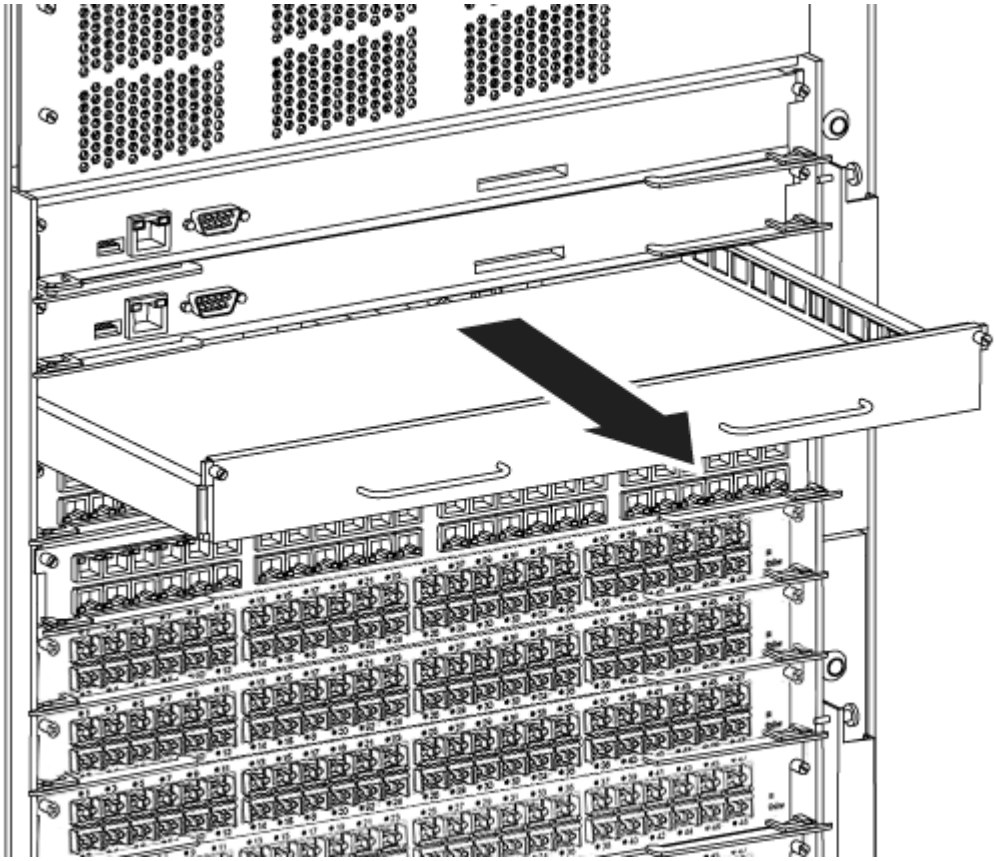
1. Use a Phillips screwdriver to loosen the two captive screws that fasten the filler module to the Virtual Services Platform 9012.



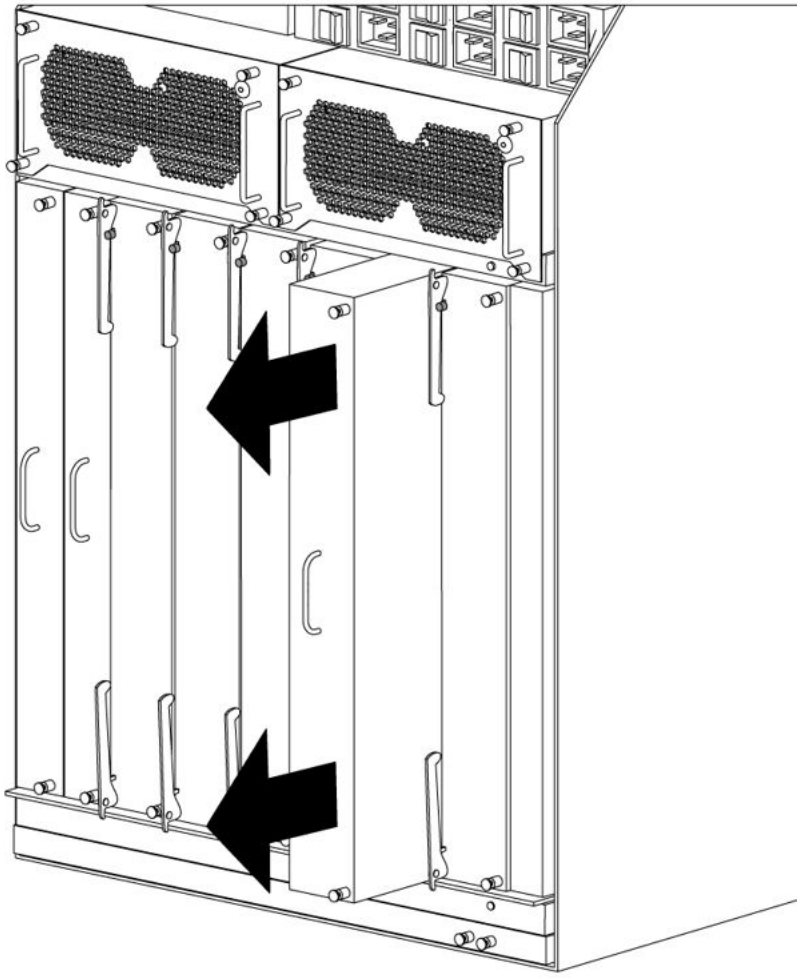
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2. Grasp the two handles on the front filler module or the one handle on the back filler module.
3. Pull the filler module away from the slot.



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Installing a filler module for the VSP 9012

If you plan to remove a module from the Virtual Services Platform 9012 without immediately replacing it, you must install a filler module in the slot to maintain proper airflow and cooling. Always cover unused module slots with filler modules.

The CP filler modules and the I/O filler modules are installed horizontally in the front of the Virtual Services Platform 9012. The SF modules are installed vertically in the back of the Virtual Services Platform 9012.

Avaya ships the Virtual Services Platform 9012 with the following unpopulated slots:

- CP 1
- I/O 12

- SF 1
- SF 4

The unpopulated slots represent the minimum numbers of slots to make the system viable. Avaya ships the remaining slots with filler modules.

The filler module resembles a module and is installed in the empty module slot.

Before you begin

Acquire the following items:

- Phillips #2 screwdriver
- Antistatic wrist strap

About this task

Warning:

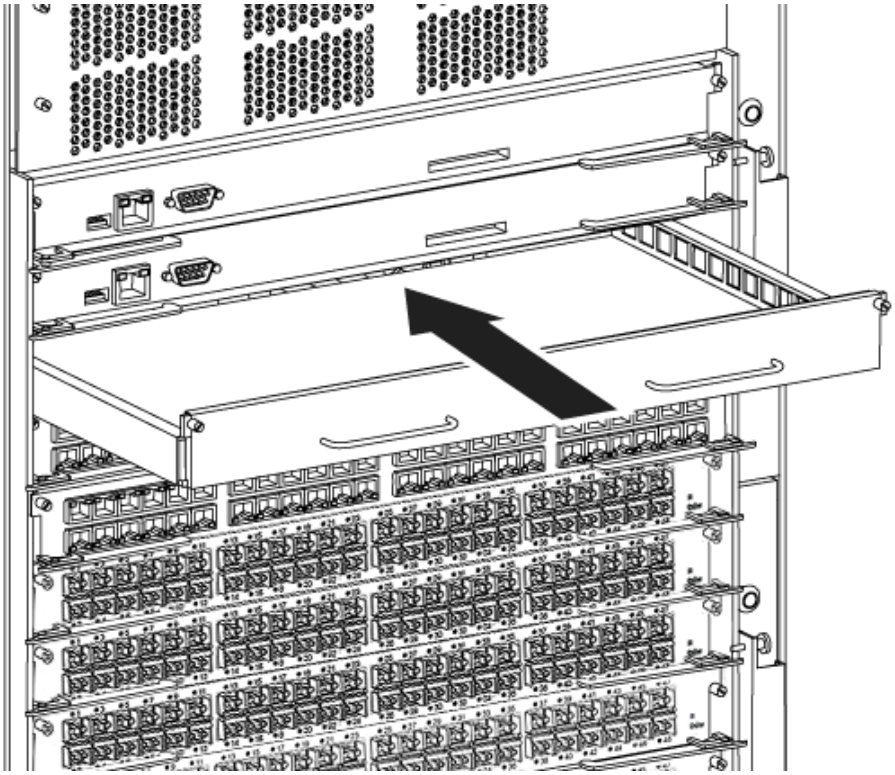
Risk of electromagnetic interference

Do not operate the Virtual Services Platform 9000 with an empty module slot. If you need to replace a failed module and you do not have a replacement module, leave the failed module installed, or install a filler module.

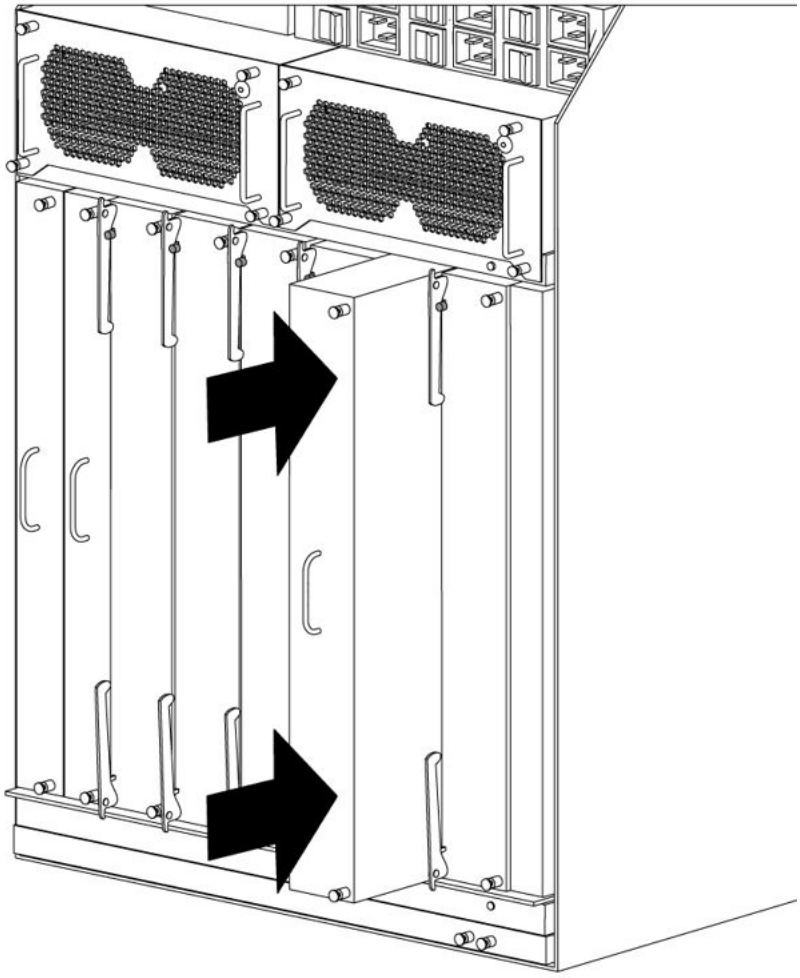
Operating the switch with an empty module slot can cause electromagnetic interference to other equipment in the area. Improper equipment cooling can also result.

Procedure

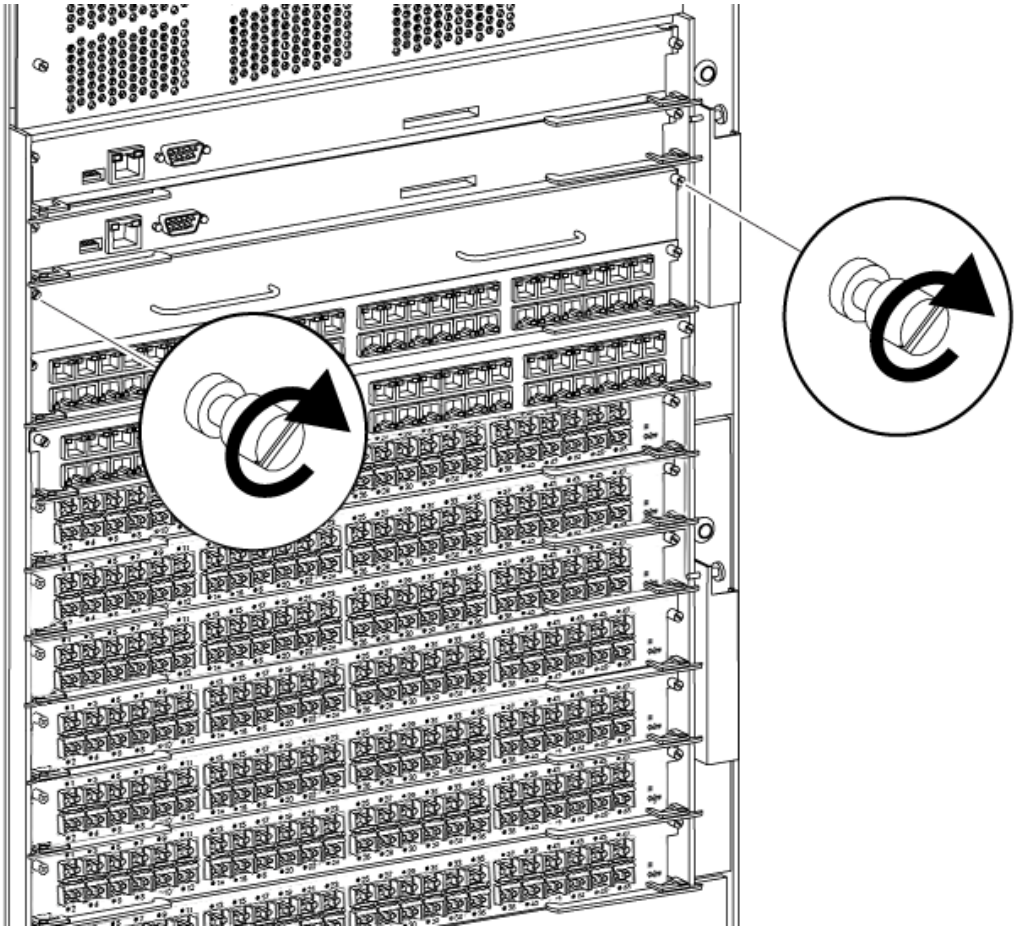
1. Locate the slot where you want to install the filler module.
2. Insert the filler module into the slot.



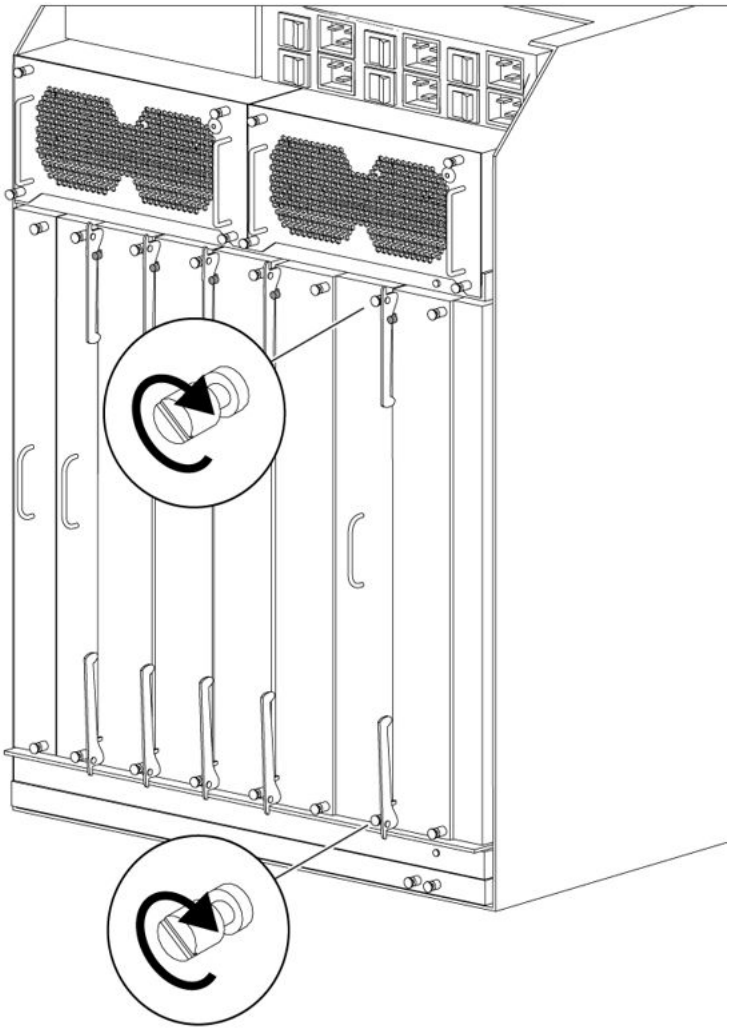
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3. Use the two handles on the front filler module or the one handle on the back filler module to seat the module midplane connectors.
4. Use a Phillips screwdriver to tighten the two screws.



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Removing a module for the VSP 9012

Remove a module to install another module. The CP modules and the I/O modules are installed horizontally in the front of the Virtual Services Platform 9012. The SF modules are installed vertically in the back of the Virtual Services Platform 9012.

Before you begin

- Before you remove the Control Processor (CP) module, back up your configuration. Ensure that you install at least one CP module in the chassis, otherwise the switch does not operate.
- Ensure that traffic is not traversing the module. Disable the module before you remove it.

Acquire the following items:

- Phillips #2 screwdriver

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- Antistatic wrist strap

About this task

Danger:

Risk of eye injury by laser

Fiber optic equipment can emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume that fiber optic cables are connected to a light source.

Electrostatic alert:

ELECTROSTATIC ALERT

ESD can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

Modules are heavy. Use both hands to insert the module. Ensure that the module connects with the back module connector.

Protect the interface connectors during handling and as you install modules into the Virtual Services Platform 9012.

Warning:

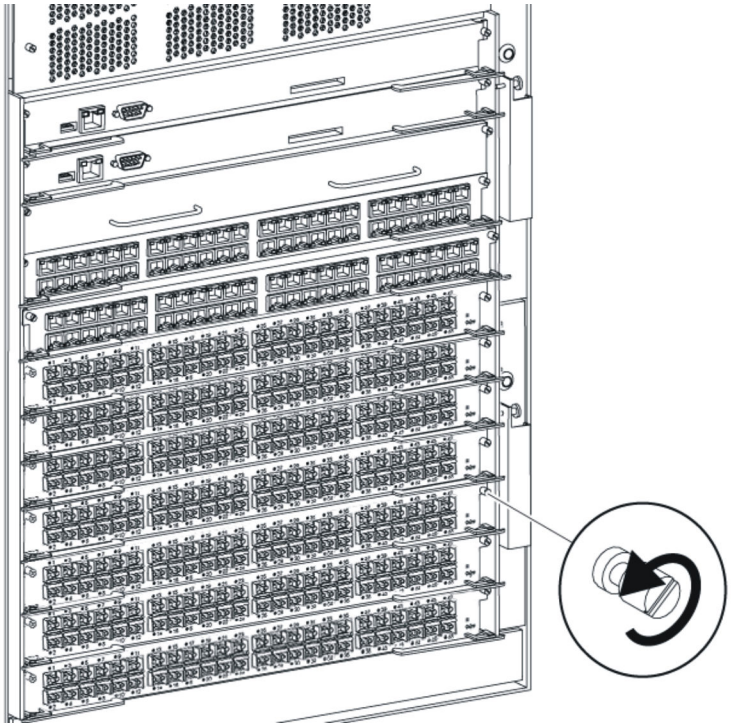
Risk of electromagnetic interference

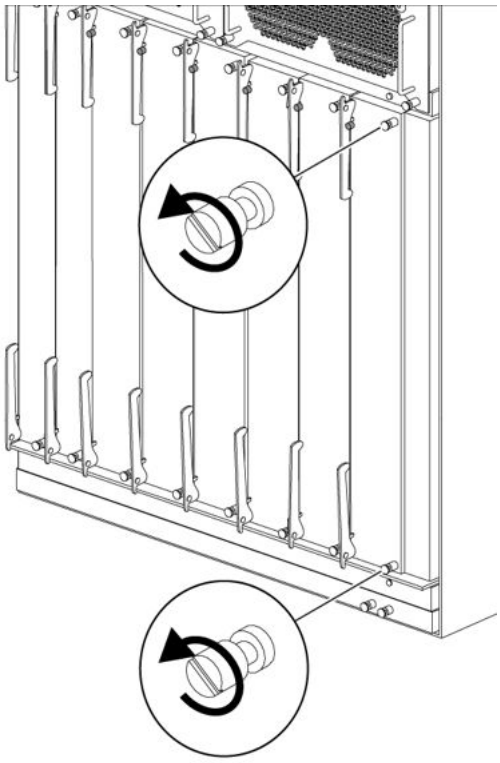
Do not operate the Virtual Services Platform 9000 with an empty module slot. If you need to replace a failed module and you do not have a replacement module, leave the failed module installed, or install a filler module.

Operating the switch with an empty module slot can cause electromagnetic interference to other equipment in the area. Improper equipment cooling can also result.

Procedure

1. Disconnect cables attached to the ports on the module.
2. Use a Phillips screwdriver to loosen the two captive screws that secure the module to the Virtual Services Platform 9012.

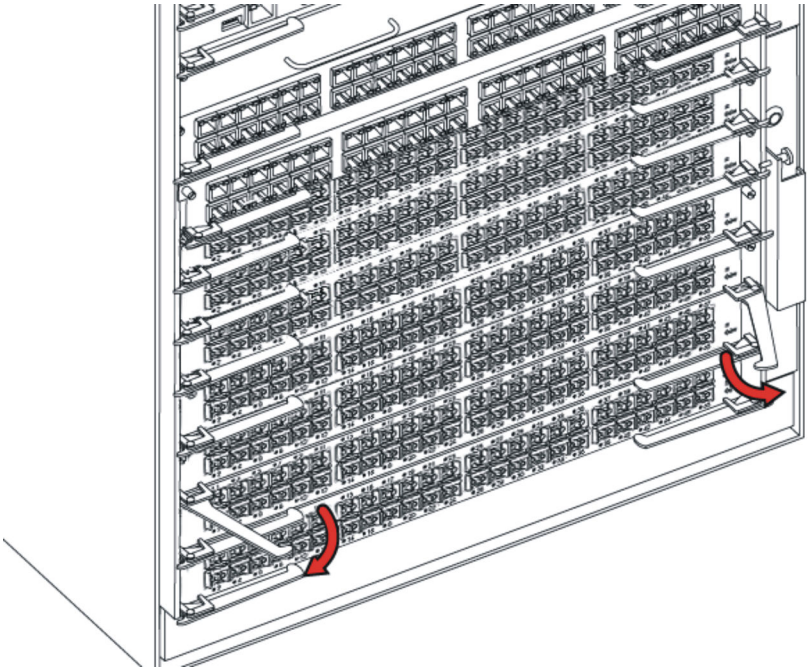


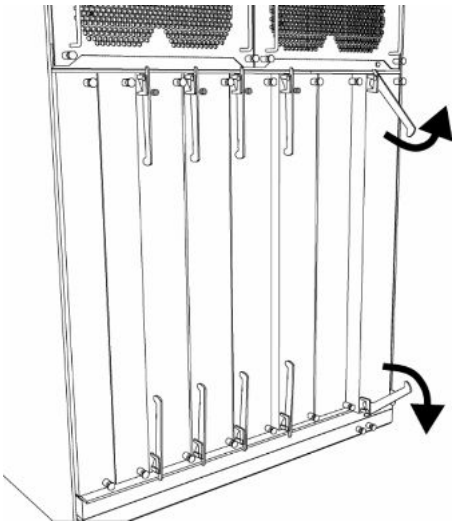


3. Rotate the insert or extract levers to eject the module from the Virtual Services Platform 9012 as shown in the following figures.

Note:

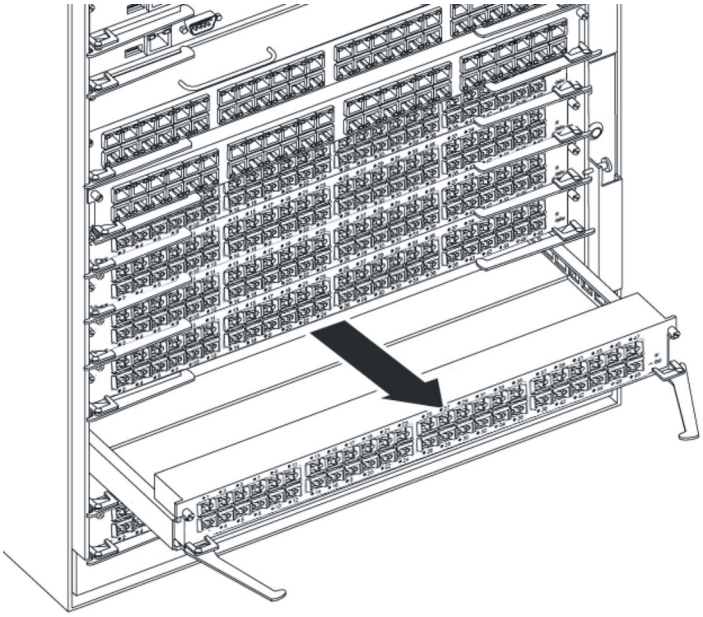
Check the clearance between the insertion lever and the gasket on adjacent modules during insertion or extraction.

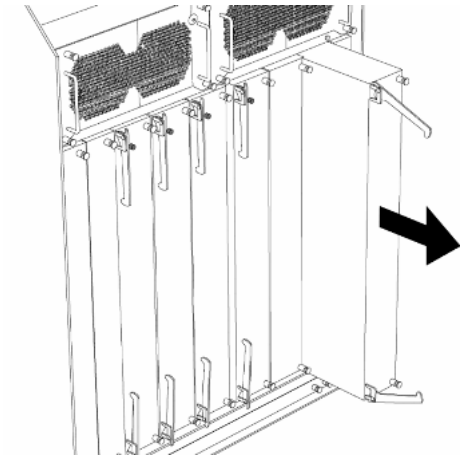




4. Slide the module out of the Virtual Services Platform 9012 as shown in the following figures.

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Do not operate a chassis without either a filler module or a module installed in a slot.

Installing a module for the VSP 9012

Install a module to replace an existing module or to add new capability to the Avaya Virtual Services Platform 9000.

The CP module, SF module, and I/O modules use the same installation method; the difference is the Virtual Services Platform 9012 slot location. Install CP modules horizontally in slots CP1 and CP2 and I/O modules in slots I/O12 to I/O3 at the front of the Virtual Services Platform 9012. Install SF modules vertically at the back of the Virtual Services Platform 9012.

Do not operate the Avaya Virtual Services Platform 9000 with an empty module slot, except during module replacement. Do not forget to populate the slot with a filler module, if you do not replace the slot with an active module. Never leave the slot empty, except during module replacement.

Before you begin

Acquire the following items:

- Phillips #2 screwdriver
- Antistatic wrist strap

About this task

Danger:

Risk of eye injury by laser

Fiber optic equipment can emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume that fiber optic cables are connected to a light source.

Electrostatic alert:

ELECTROSTATIC ALERT

ESD can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

Modules are heavy. Use both hands to insert the module. Ensure that the module connects with the back module connector.

Protect the interface connectors during handling and as you install modules into the Virtual Services Platform 9012.

Warning:

Risk of electromagnetic interference

Do not operate the Virtual Services Platform 9000 with an empty module slot. If you need to replace a failed module, and you do not have a replacement module, leave the failed module installed, or install a filler module.

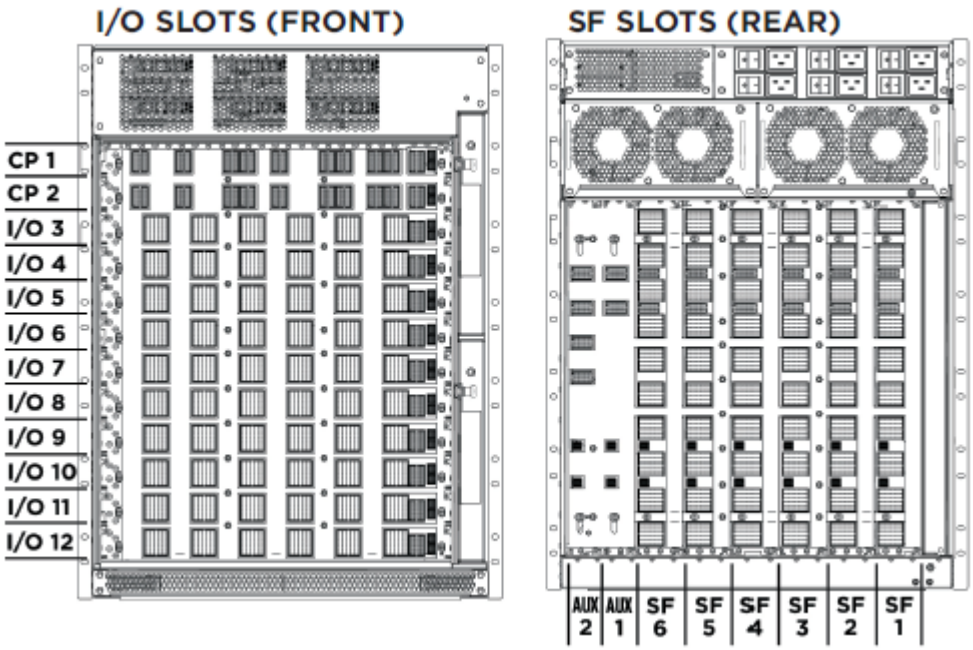
Operating the switch with an empty module slot can cause electromagnetic interference to other equipment in the area. Improper equipment cooling can also result.

If you have the optional external Flash card media for your CPU module, you must install it prior to power on of the Chassis and CPU modules.

You must have a minimum of three Switch Fabric modules installed for proper operation of the Virtual Services Platform 9000.

Procedure

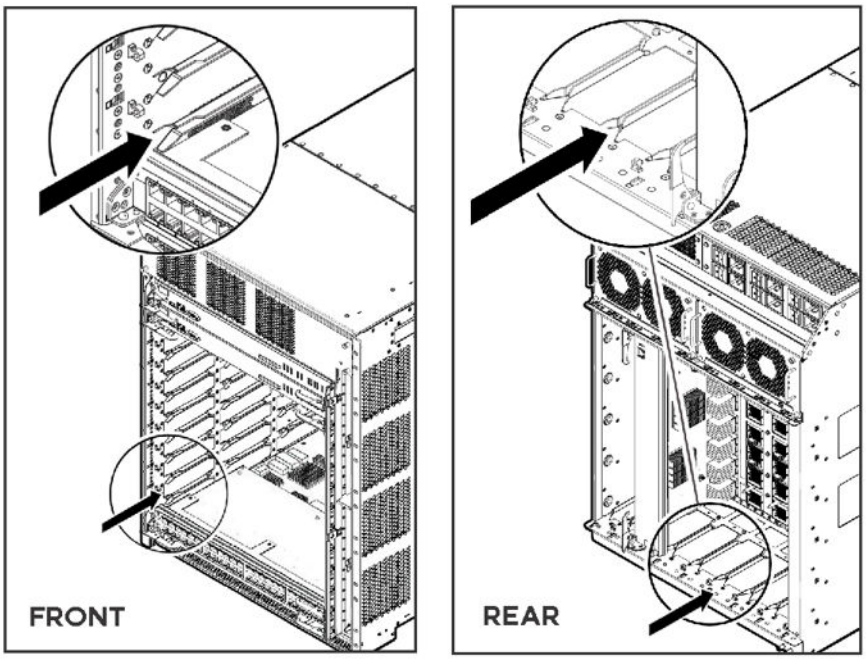
1. Locate the slot where you want to install the module. Install I/O modules starting at the bottom. When installing the Switch Fabric modules, for proper operation you must populate slots SF4 and SF1, and then populate the rest of the slots. The following illustration displays slot numbering.



2. Align the module base-plate with the guide rails on either side of the opening for horizontal modules or the guide rails at the top and bottom of the opening for vertical modules.

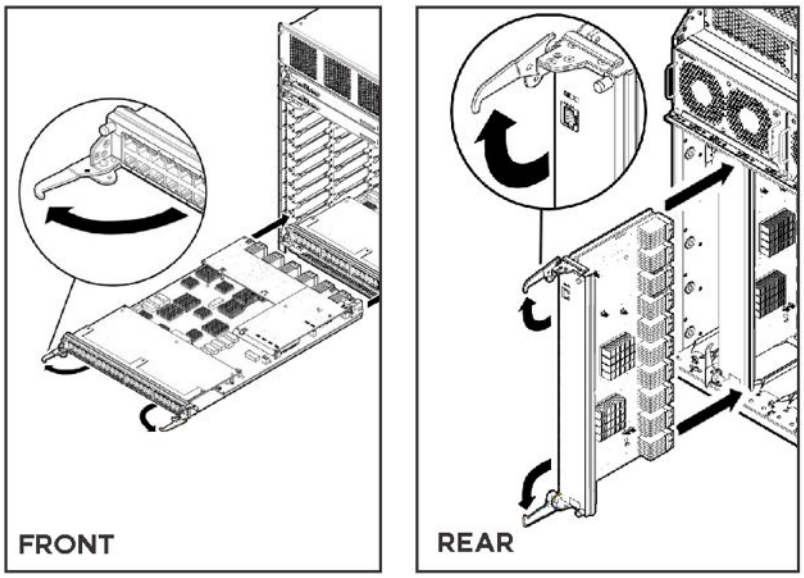
Note:

Check the clearance between the insertion lever and the gasket on adjacent modules during insertion or extraction.

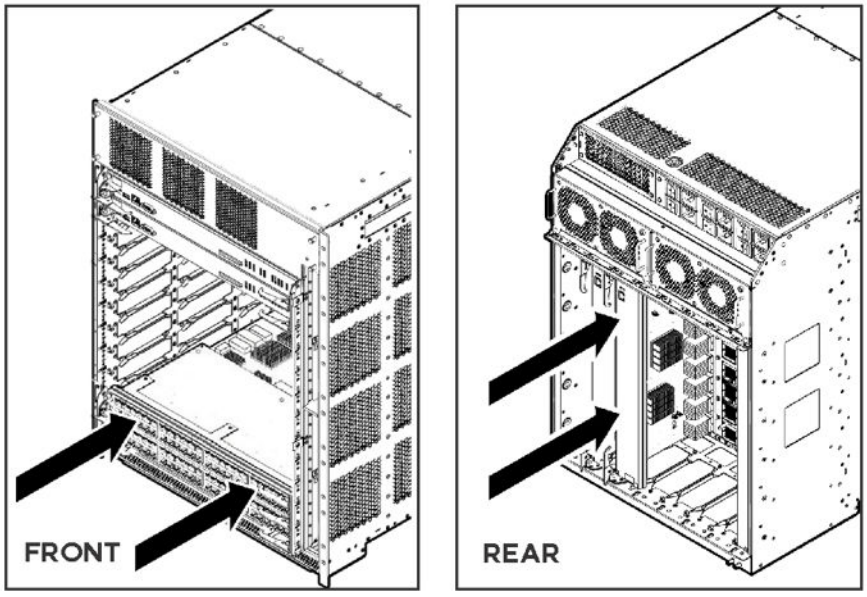


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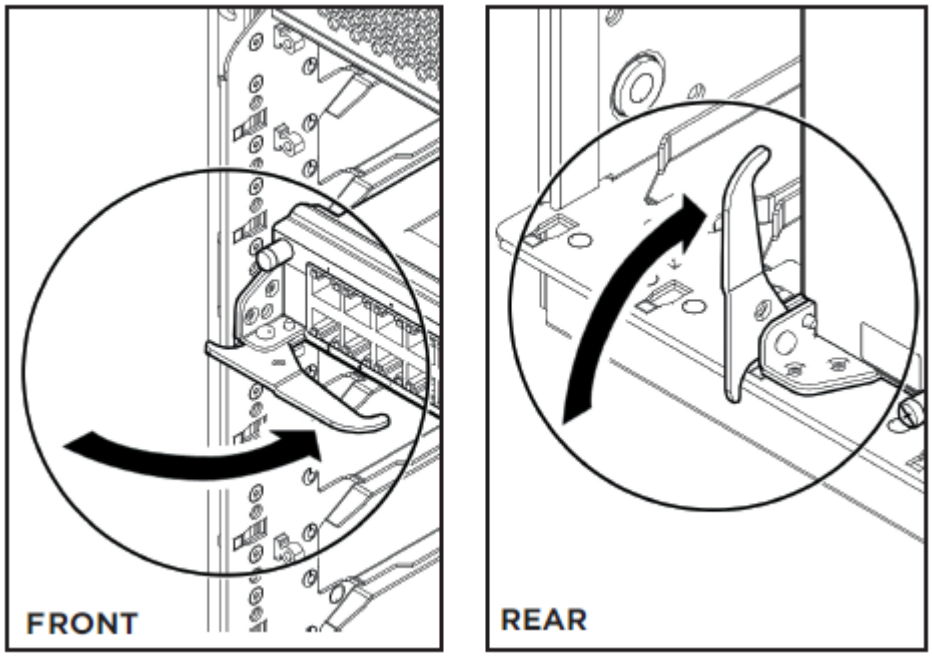
3. Before you fully insert the module into the slot, rotate the action levers away from the module until they form a 90° angle with the front of the module. Carefully slide the module partway into the slot.



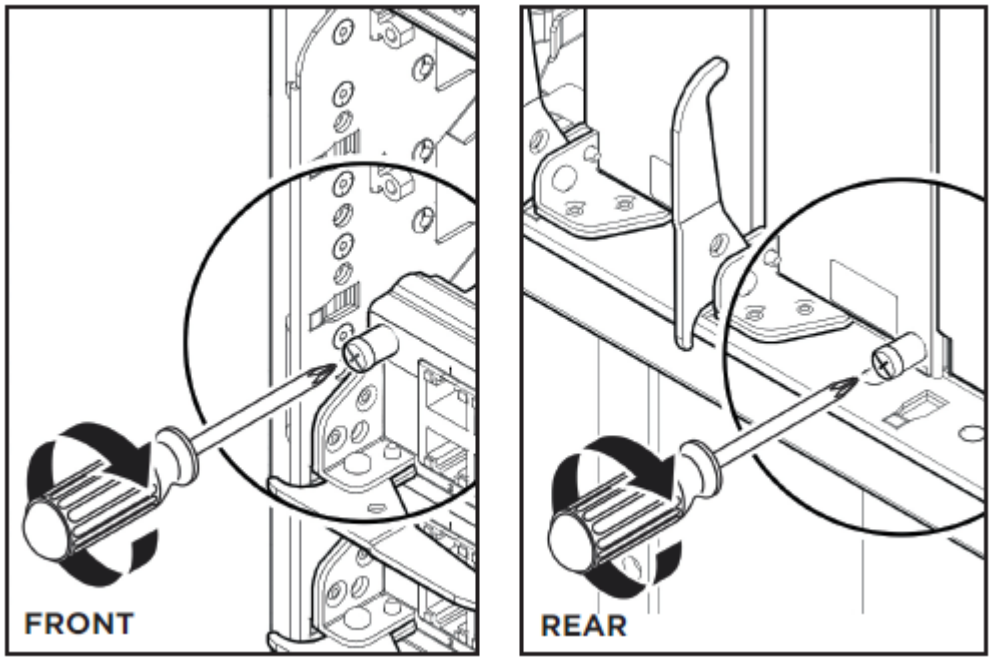
4. Gently seat the module interface connectors by pressing on the outside edges of the module near the action levers.



5. Continue seating the module by rotating the action levers until the levers are parallel with the front face panel and the module is fully seated.



6. Turn both screws by hand until they catch, before you tighten the screws, which allows the module to move a little to catch the screws. Use a Phillips screwdriver to tighten the screws until snug. Do not overtighten. Do not use a power tool to tighten screws.



Hot swapping a module for the VSP 9012

The CP, I/O, SF, cooling and power modules can be hot swapped without service interruption.

You can remove multiple modules, and insert the new modules. After you install a first generation module or multiple modules, the device can take up to 15 minutes to upgrade the software on the module or modules to match the system. After you install a second generation module or multiple modules, the device can take up to 25 minutes to upgrade the software on the module or modules to match the system. Each module can take a different amount of time to upgrade.

Before you begin

Acquire the following items:

- Phillips #2 screwdriver
- Antistatic wrist strap

About this task

Take note of the following considerations when hot swapping these modules:

- If no redundant power exists and a power module is pulled out, one or more modules can be automatically powered down to ensure the Virtual Services Platform 9012 runs within the available power budget.
- **Warning:**

  You can remove and reinsert cooling modules. Prolonged running without a cooling module can cause one or more modules to overheat and for the device to automatically shut the modules down.
- Avaya recommends you power down CP, I/O, and SF modules prior to removal because:
  - CP modules can corrupt files on the internal or external flash file systems due to partial writes if you do not power down the CP modules first before you remove the modules.
  - IO and SF modules can lose inflight packets when they are removed when active.
- When you remove a CP, I/O, or SF module, you must wait 15 seconds before you remove another module or reinsert a module. The reason for this waiting period is:
  - The Virtual Services Platform 9012 can reconfigure the fabric links on all modules. The Virtual Services Platform 9012 needs to have enough time to reconfigure the fabric. If the Virtual Services Platform 9012 does not have enough time to reconfigure the fabric, data loss can happen.
  - The module needs to fully power down. This can take several seconds. If reinserted too quickly, some parts on the module cannot be properly reset.
- Do not insert or remove modules while you upgrade or downgrade. If you remove or insert modules during these times the up or downgrade can abort or rollback.
- Do not insert or remove modules during the power up sequence. If you remove or insert modules during the power up sequence, doing so can cause a delay in booting the Virtual Services Platform 9012. Only insert or remove modules when the Virtual Services Platform 9012 is fully booted.
- Master CP modules cannot be powered down. To remove a master CP, first switch over to the standby CP with the ACLI command **`sys action cpu-switchover`**. If no standby CP

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exists, use the **sys shutdown** command to power down a single CP chassis. After you use the **sys shutdown** command, you must remove and replace the CP module or the chassis does not boot.

Perform this procedure to hot swap a module.

You can use this procedure to upgrade to the latest modules.

Caution:

Risk of traffic loss or corruption

Do not hot swap or insert modules in a switch while the switch starts. If you do, the switch cannot recognize the module, which causes module initialization failure.

Electrostatic alert:

ELECTROSTATIC ALERT

ESD can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

Procedure

1. Connect to the primary CP.
2. Enter Global Configuration mode:

   ```
   enable
   configure terminal
   ```

3. Avaya recommends that you power down the module to avoid possible packet loss:

   ```
   no sys power slot {slot[-slot][,...]}
   ```

4. If you powered down the module, confirm that the module is powered down. The online LED of the module is off if the module is powered down. You can verify that the module is powered down by using the following command:

   ```
   show sys power slot
   ```

5. Remove the module.
6. Insert the new module.

   The Virtual Services Platform 9012 automatically enables the new module.

7. Confirm that the new module is operational:

   ```
   show sys power slot
   ```

   The online LED of the module illuminates.

8. Confirm that traffic is traversing the module as normal.

Variable definitions

Use the data in the following table to use the **sys power** and **no sys power** commands.

Variable	Value
slot *{slot[-slot][,...]}*	Identifies the slot. Valid slots are 1–12 and SF1–SF6.

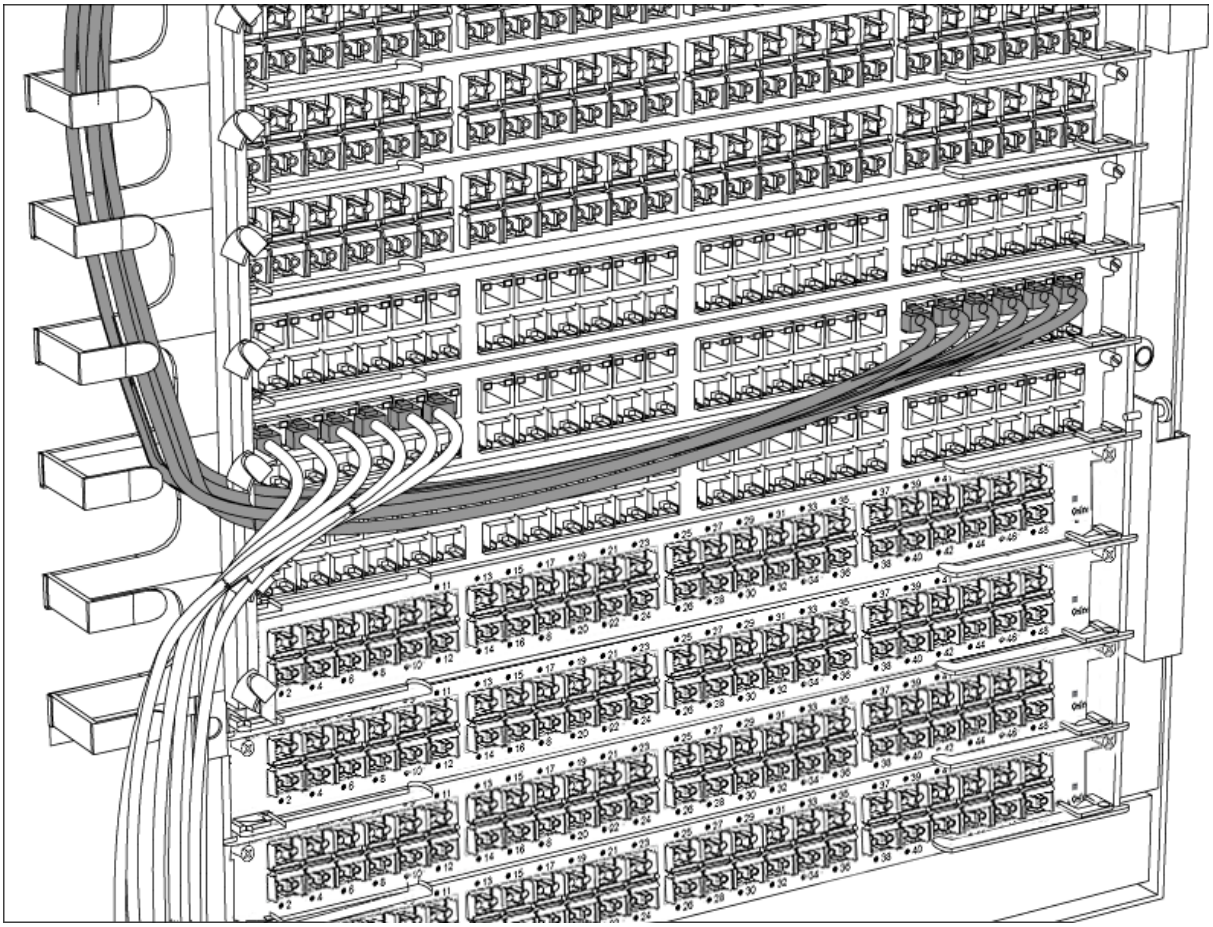
Connecting and managing cables for the VSP 9012

About this task

Use cable management brackets to keep groups of cable clusters fastened and out of the way, but accessible for maintenance. To facilitate module installation and removal, connect, label, and bundle the cables for each module together.

Procedure

1. Connect the appropriate cable to the module.
2. Route the cable up to the appropriate cable management bracket and channel as shown in the following figure.



3. Route the cable to the termination panel, loosely fastening it with Velcro straps or sheet fiber along the path.
4. Fasten the connector to the termination panel end of the cable.

   If you use cables manufactured by Avaya, the connectors are already fastened to predetermined lengths of cable.
5. Label the unconnected end of the cable with the node identifier (from site records) and the shelf, cage, slot, and port number.
6. After you connect all the transmitting cables from the same module to the termination panel, use Velcro straps or sheet fiber wrapped around the cables to manage them.

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Chapter 6: CP module installation and connection

Use the following procedures to install and connect the CP module to the Virtual Services Platform 9010 or the Virtual Services Platform 9012.

Note:

The Virtual Services Platform 9010 requires the CP module to have a minimum baseline of Release 3.4. You cannot plug and play a CP module if the CP module has a software version previous to Release 3.4.

Installing removable compact flash memory cards

About this task

Install an external Compact Flash memory card in a CP module to provide alternative storage media to save configuration parameters.

Procedure

1. Position the card with the label facing up and the insert arrow pointing toward the card receptacle.
2. Insert the card into the card receptacle.
3. Gently push in the card until it fits tightly in place.

Removing external storage devices from the CP module

Perform this procedure to safely remove the USB and the external Compact Flash devices from the CP module. You must perform this procedure to prevent data loss or hardware damage.

Important:

Do not unplug the storage device without first performing this procedure.

You must use the appropriate stop command to unmount the device before you physically remove it from the CP module.

Before you begin

Several system tools use the external Compact Flash as the default storage location. Check the following features before you remove the card:

- Packet Capture (PCAP)
- logging
- debug or trace

The Virtual Services Platform 9000 stop command does not succeed if the specified device is in use. Common uses that impede the proper execution of the stop command are:

- USB or external Compact Flash file access is in progress (move, copy, read, or write) to or from the USB, or the external Compact Flash.

  Discontinue operations or wait for access completion before you use the stop command.

- The ACLI session current working directory is configured for the device you need to remove.

  Change the current working directory to internal Compact Flash, which is the default.

- Logging is enabled to the external Compact Flash, which is the default.

  Use the **`show logging config`** command to verify the current storage location. If the location is the external Compact Flash card that you need to remove, use the **`no logging logToExtFlash`** command to log to the internal Compact Flash.

- PCAP is enabled.

  Disable PCAP, which requires the external Compact Flash. Use the **`show pcap`** command to verify if PCAP is enabled. To disable PCAP, use the **`no pcap enable`** command.

- Debugging features are enabled.

  The debug-config file and trace-logging flags must be disabled, which is the default. Use the **`show boot config flags`** command to verify the status. Use the **`no boot config flags debug-config file`** or the **`no boot config flags trace-logging`** command to disable these flags.

About this task

Note:

Use the Avaya Compact Flash device (EC1411010-E6) with the Virtual Services Platform 9000 because the Avaya Compact Flash is validated for proper operation on the Virtual Services Platform 9000. Do not use other Compact Flash devices because they are not verified for Virtual Services Platform 9000 compatibility, and can result in loss of access to the Compact Flash device.

Procedure

1. Enter Privileged EXEC mode:

   ```
   enable
   ```


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2. Remove a USB device:
    a. Unmount the USB device:

       ```
       usb-stop
       ```

    b. Wait for the response that indicates it is safe to remove the device.
    c. Physically remove the device.
3. Remove an external Compact Flash device:
    a. Unmount the external flash device:

       ```
       extflash-stop
       ```

    b. Wait for the response that indicates it is safe to remove the device.
    c. Physically remove the device.

Example

Unmount and remove the USB:

```
VSP-9012:1>enable
VSP-9012:1#usb-stop
It is now safe to remove the USB device.
VSP-9012:1#extflash-stop
It is now safe to remove the external Compact Flash device.
```

Next steps

No restrictions or requirements exist before you can reinsert a USB or external Compact Flash device. You can insert these devices at any time and Virtual Services Platform 9000 automatically recognizes them. The devices are accessible within seconds after insertion.

After you insert the external Compact Flash, enable logging to the external Compact Flash with the **`logging logToExtFlash`** command.

Additionally, you can enable the following features as required:

- PCAP
- debug-config file or trace-logging flags

Replacing the compact flash on the VSP 9000

The VSP 9000 2 GB Compact Flash (EC1411010-E6) is for the 9080 CP module on the VSP 9000 switch. Make sure you use the correct compact flash part number for your CP module.

For more information on any of the commands in this procedure, see *ACLI Commands Reference for Avaya Virtual Services Platform 9000,* NN46250-104.

Before you begin

- You must have one empty 4 GB USB Flash drive.
- You must upgrade to Release 3.0.2.0 or later to use the **`backup`** and **`restore`** commands.

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Procedure

1. Insert the USB drive into the CP module.
2. On the CP console connection, perform the following actions:
   a. Log in using the `rwa` account.
   b. At the prompt, enter `enable`.
3. Use the following command to format the USB drive:

   ```
   dos-format /usb
   ```

   Enter `y` after the system prompt if you are sure you want to format.
4. Copy the external flash on the CP module to the USB drive at /usb/extflash:

   ```
   backup extflash
   ```

   If the external flash is used for logging, the system automatically disables logging to the external flash.

   ```
   Warning: External flash is being used for logging right now.
          Backup/Restore extflash is not allowed. Please use the following
          CLI command in the global configuration mode to disable the
          logging to extflash, then try again.
   Command: no logging logToExtFlash
   Execute Command: no logging logToExtFlash
   LoggingToPcmcia 0 LoggingToIntflash 1
   ```
5. Enter `y` at the following prompt:

   ```
   Warning: Command will back up all data from /extflash to /usb/extflash. It will
   take a few minutes and may cause high CPU utilization.
   Are you sure you want to continue? (y/n) ? y
   ```
6. After the backup is complete, a prompt appears to stop the USB. Enter `y`:

   ```
   Do you want to stop the usb? (y/n) ? y
   /bin/umount /usb >& /dev/console
   It is now safe to remove the USB device.
   Logging to Extflash stopped
   Logging to Intflash started
   ```
7. Use the following command to gracefully stop operation of the external flash:

   ```
   extflash-stop
   ```

   ```
   It is now safe to remove the external Compact Flash device.
   ```
8. Replace the compact flash card.

   If the switch runs a release prior to Release 3.2, you must reboot the switch after you insert the new compact flash card before the switch can detect the new card.
9. Format the compact flash:

   ```
   dos-format /extflash
   ```
10. Restore the data on the USB drive to the compact flash:

    ```
    restore extflash
    ```


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Connecting a PC or terminal to the CP module

Before you begin

- You require a serial console cable with an RS232 DB9 male connector.

About this task

To establish a local session with the Avaya Virtual Services Platform 9000, connect a PC or a VT-100 terminal to the console port on the CP. This local connection provides communication with the system during initial commissioning.

Procedure

1. Turn on the PC terminal.
2. Configure the terminal or a communications port on the PC using the parameters in the following table.

   See the PC or terminal user manual for instructions.

Parameter	Value
Baud rate	9600
Data bits	8
Stop bits	1
Parity	None

3. Insert the male DB9 connector of the serial cable into the console port on the CP module.
4. Attach the female DB9 connector of the cable to the serial communications port on the PC or terminal.
5. Start a communication session using a serial communication program.

Job aid

The following table provides the console port pinout.

Table 25: Console port pinout

Pin number	Direction	Signal
1	In	DCD (Data Carrier Detect)
2	In	RX (Receive Data)
3	Out	TX (Transmit Data)
4	Out	DTR (Data Terminal Ready)
5	—	GND (Signal Ground)
6	In	DSR (Data Set Ready)
7	Out	RTS (Request To Send)

Pin number	Direction	Signal
8	In	CTS (Clear To Send)
9	In	RI (Ring Indicator)

Connecting a network management station to the CP module

About this task

Use the management port to connect the switch to a network management station for out-of-band management using a Web browser.

Procedure

1. Connect a standard straight-through Ethernet cable to the network management station.

   For 10 Mb/s connections, you can use Category 3, 4, or 5 copper unshielded twisted pair (Ethernet) cable. Use only Category 5 UTP cable to connect ports that operate at 100 Mb/s or 1000 Mb/s.

2. Connect the other end of the cable to the RJ-45 port on the CP module.

Chapter 7: Technical specifications

This section provides technical specifications for the Avaya Virtual Services Platform 9000 modules.

General specifications

The following table lists general specifications applicable to all modules.

Table 26: General module specifications

Supported standards
IEEE Std 802.3ae Clause 45
IEEE Std 802.3/2002
IEEE 802.3 1998 Clause 28
IEEE Std 802.3, 1998 Clause 4 Media Access Control CSMA/CD
IEEE Std 802.3, 1998 Clause 14 10BASE-T
ANSI/IEEE Std 802.3, 1998 Media Access Control (MAC) Bridges
IEEE 802.1Q Virtual Bridged Local Area Networks
IEEE Std 802.3, 1998 Clause 34-42
IEEE 802.3, 1998 Clause 31 (MAC Control)
IEEE Std 802.3ab
IEEE Std 802.3af
IEEE Std 802.3ba

Data rate and encoding
10 Mb/s Manchester encoding
100 Mb/s 4B/ 5B encoding
1000 Mb/s 8B/ 10B encoding
10 Gb/s 64/ 66B encoding

The following table provides module environmental, addressing, and performance specifications.

Table 27: Module specifications

Environmental specifications	
Operating temperature	0–40°C (32–104°F)
Storage temperature	– 25–70°C (– 13–158°F)
Operating humidity	0-95%
Storage humidity	92.5%
Operating altitude	0–3000m (0–10000ft)
Free fall or drop	ISO 4180-s, NSTA 1A (check)
Vibration	IEC 68-2-6/34 (check)
Shock or bump	IEC 68-2-27/29

Performance specifications (64-byte packets)	
Routing and switching forwarding rates	Refer to specifications for each module
Latency	Minimum 10 microseconds

Address database size	
Address table size:	
Addressing:	48-bit MAC address
	32-bit IPv4 address
Frame length:	64– 1518 bytes (IEEE 802.1Q Untagged)
	64–1522 bytes (IEEE 802.1Q Tagged)

The following table describes electromagnetic interference specifications.

Table 28: Electromagnetic interference specifications

Electromagnetic emissions	
Meets requirements of:	
United States:	FCC CFR47 Part 15, Subpart B, Class A
Canada:	ICES-003, Issue-4, Class A
Australia/New Zealand:	AS/NZS CISPR 22:2006, Class A
Japan:	VCCI-V3/97.04, Class A
Europe:	EN 55022:2006/ A1:2007 Class A EN 61000-3-2:2006 EN 61000-3-3:1995:A1:2001/A2:2005 EN 300 386 v1.3.3
Electromagnetic susceptibility:	EN55024:1998/A1:2001/A2:2003/CISPR 24:1997

The following table describes safety agency approvals.

Table 29: Safety agency approvals

Safety agency approvals	
Global basis for certification:	IEC 60950-1 with national deviations

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Safety agency approvals	
United States:	UL60950-1
Canada:	CSA 22.2 No. 60950-1
Australia/New Zealand:	AS/NZS 60950-1
Europe:	EN60950-1 (CE Marking)

Port density of the modules

Use the following information to understand the port density support for each module.

Port Density is limited for longer reach ports in the 9048XS-2 I/O module. For 10GBASE-ER/EW, 10GBASE-ZR/ZW, 10GBASE-ER CWDM, and 10GBASE-ZR CWDM the maximum number of ports is 12 in the 9048XS-2 I/O module. You can still fill other ports with 10GBASE-LR/LW, or shorter reach ports. The placement of the 12 ports is restricted to certain locations, essentially a checkerboard pattern. See the ports highlighted in green in the following diagram for the 12 ports to use in the checkerboard pattern.

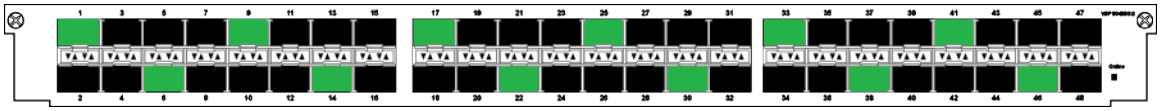


Figure 24: 12 ports to use in the 9048XS-2 for longer reach ports

The following table provides port density information for each module.

Table 30: Port density for Avaya Virtual Services Platform 9000 I/O modules

Module type	Port type	Maximum number of ports for each module
9048GB	1000BASE-T	Supports full 48 1000Base-T SFPs
	1000BASE-SX DDI	Supports full 48 1000Base-SX DDI SFPs
	1000BASE-LX DDI	Supports full 48 1000Base-LX DDI SFPs
	1000BASE-ZX DDI	Supports full 48 1000Base-ZX DDI SFPs
	1000BASE-BX DDI	Supports full 48 1000Base-BX DDI SFPs
	1000BASE-EX DDI	Supports full 48 1000Base-EX DDI SFPs
	CWDM	Supports full 48 CWDM 40km and 70km SFPs
9048GT	10BASE-T/100BASE-TX/ 1000BASE-T	Supports full 48 ports of category-3, category-5, category-5+, and category-6 unshielded twisted pair cable
9024XL	10GBASE-SR/SW	Supports full 24 10GBASE-SR SFP+
	10GBASE-LRM	Supports full 24 10GBASE-LRM SFP+
	10GBASE-LR/LW	Supports full 24 10GBASE-LR SFP+
	10GBASE-ER/EW	Supports full 24 10GBASE-ER SFP+.

Module type	Port type	Maximum number of ports for each module
	10GBASE-ZR/ZW	Supports full 24 10GBASE-ZR/ZW SFP+.
	10GBASE-CX	Supports full 24 10GBASE-CX SFP+.
	1000BASE-SX DDI	Supports full 24 1000Base-SX DDI SFPs
	1000BASE-LX DDI	Supports full 24 1000Base-LX DDI SFPs
	1000BASE-XD DDI	Supports full 24 1000Base-XD DDI SFPs
	1000BASE-ZX DDI	Supports full 24 1000Base-ZX DDI SFPs
	1000BASE-BX-U-10	Supports full 24 1000Base-BX DDI SFPs
	1000BASE-BX-D-10	Supports full 24 1000Base-BX DDI SFPs
	1000BASE-BX-U-40	Supports full 24 1000Base-BX DDI SFPs
	1000BASE-BX-D-40	Supports full 24 1000Base-BX DDI SFPs
	1000BASE-EX DDI	Supports full 24 1000Base-EX DDI SFPs
	1000BASE DDI CWDM	Supports full 24 CWDM 40km and 70km SFPs.
	1000BASE-T	Supports full 24 1000Base-T SFPs.
9048XS-2	10GBASE-CX Direct Attach Cable (DAC)	Supports full 48 10GBASE-SR SFP+.
	10GBASE-ER/EW	Supports up to 12 10GBASE-ER SFP+.
	10GBASE-ER CWDM DDI	Supports up to 12 10GBASE-ER SFP+.
	10GBASE-LR/LW	Supports full 48 10GBASE-LR SFP+.
	10GBASE-LRM	Supports full 48 10GBASE-LRM SFP+.
	10GBASE-SR/SW	Supports full 48 10GBASE-SR SFP+.
	10GBASE-ZR/ZW	Supports up to 12 10GBASE-ZR SFP+.
	10GBASE-ZR CWDM DDI	Supports up to 12 10GBASE-ZR SFP+.
	1000BASE-T	Supported using CU SFPs only. Only 1G mode supported.
	1000BASE-SX DDI	Supports full 48 1000Base-SX DDI SFPs.
	1000BASE-LX DDI	Supports full 48 1000Base-LX DDI SFPs.
	1000BASE-XD DDI	Supports full 48 1000Base-XD DDI SFPs.
	1000BASE-ZX DDI	Supports full 48 1000Base-ZX DDI SFPs.
	1000BASE-BX-U-10	Supports full 48 1000Base-BX DDI SFPs.
	1000BASE-BX-D-10	Supports full 48 1000Base-BX DDI SFPs.
	1000BASE-BX-U-40	Supports full 48 1000Base-BX DDI SFPs.
	1000BASE-BX-D-40	Supports full 48 1000Base-BX DDI SFPs.
	1000BASE-EX DDI	Supports full 48 1000Base-EX DDI SFPs.
	1000BASE DDI CWDM	Supports full 48 CWDM 40km and 70km SFPs.
9012QQ-2	40GBASE-SR4/4x10GBASE-SR QSFP+	Supports full 12 40GBase up to 150m

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Module type	Port type	Maximum number of ports for each module
	40GBASE-LR4 QSFP+ Transceiver, Duplex LC connector	Supports full 12 40GBase up to 10km
	40GBASE-QSFP+ Direct Attach Cable	Supports full 12 40GBase, 1m
	QSFP+ to QSFP+ 40G, 1m Passive Flexi-DAC (TAA)	Supports full 12 40GBase, 1m
	QSFP+ to QSFP+ DAC, 40G, 2 meter Passive DAC	Supports full 12 40GBase, 2m
	40GBASE-QSFP+ Direct Attach Cable	Supports full 12 40GBase, 3m
	QSFP+ to QSFP+ 40G, 3m Passive Flexi-DAC (TAA)	Supports full 12 40GBase, 3m
	40GBASE-QSFP+ Direct Attach Cable	Supports full 12 40GBase, 5m
	QSFP+ to QSFP+ 40G, Passive DAC	Supports full 12 40GBase, 0.5m
	QSFP+ to QSFP+ 40G, Passive Flexi-DAC (TAA)	Supports full 12 40GBase, 0.5m

9012QQ-2 module specifications

The following table describes the second generation 9012QQ–2 I/O module specifications.

Table 31: 9048XS-2 module specifications

Physical specifications	
Height:	1.625 in. (4.13 cm)
Width:	15.5 in. (39.37 cm)
Depth:	24.0 in. (60.96 cm)
Weight:	16.5 pounds (7.48kg)

Electrical specifications	
Power consumption	600 W, with short-reach QSFP+ Transceivers
Thermal rating:	2,048 BTU/hr
MTBF rating	150,000 hours (17.11 years)
Connector type	QSFP+
Performance specifications	
Maximum throughput	357Mpps with 64 Byte packets when chassis is equipped with 5 SF modules.

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9048XS-2 module specifications

The following table describes the second generation 9048XS-2 I/O module specifications.

Table 32: 9048XS-2 module specifications

Physical specifications	
Height:	1.625 in. (4.13 cm)
Width:	15.5 in. (39.37 cm)
Depth:	24.0 in. (60.96 cm)
Weight:	17 lb (7.71 kg)

Electrical specifications	
Power consumption	600 W, with short range SFP+
Thermal rating:	2048 BTU/hr
MTBF rating	150,000 hours (17.11 years)
Connector type	SFP+
Performance specifications	
Maximum throughput	360 Mpps (240 Gbps – for full duplex) when chassis is equipped with 5 SF modules.

9024XL module specifications

The following table describes the 9024XL module specifications.

Table 33: 9024XL module specifications

Physical specifications	
Height:	1.625 in. (4.13 cm)
Width:	15.5 in. (39.37 cm)
Depth:	24.0 in. (60.96 cm)
Weight:	14.5 lb (6.58 kg)

Electrical specifications	
Power consumption	575 W, with short range SFP+
Thermal rating:	1962 BTU/hr
MTBF rating	209 908 hours (23.94 years)
Connector type	SFP+
Performance specifications	
Maximum throughput	105 Mpps (70 Gbps/140 Gbps – for full duplex) when chassis is equipped with 5 SF modules.

9048GB module specifications

The following table describes the 9048GB module specifications.

Table 34: 9048GB module specifications

Physical specifications	
Height:	1.625 in. (4.13 cm)
Width:	15.5 in. (39.37 cm)
Depth:	24.0 in. (60.96 cm)
Weight:	13.5 lb (6.12 kg)

Electrical specifications	
Power consumption	340 W, with short range SFP
Thermal rating:	1160 BTU/hr
MTBF rating	267 953 hours (30.55 years)
Connector type	SFP
Performance specifications	
Maximum throughput	70 Mpps (46 Gbps/92 Gbps – for full duplex) when chassis is equipped with 5 SF modules.

9048GT module specifications

The following table lists specifications for the 9048GT module.

Table 35: 9048GT module specifications

Physical specifications	
Height:	1.625 in. (4.13 cm)
Width:	15.5 in. (39.37 cm)
Depth:	24.0 in. (60.96 cm)
Weight:	14.0 lb (6.35 kg)

Electrical specifications	
Power consumption	350 W
Thermal rating:	1194 BTU/hr
MTBF rating	278 629 hours (31.77 years)
Connector type	RJ-45
Performance specifications	
Maximum throughput	70 Mpps (46 Gbps/92 Gbps – for full duplex) when chassis is equipped with 5 SF modules.

9048GT port connectors

The ports on the 9048GT module are RJ-45 ports (see the following figure).

Table 36: Pin assignments: 9048GT module

Connector	Pin number	Signal
	1	Bidirectional Data A + (BI_DA+)
	2	Bidirectional Data A – (BI_DA–)
	3	Bidirectional Data B + (BI_DB+)
	4	Bidirectional Data C + (BI_DC+)
	5	Bidirectional Data C – (BI_DC–)
	6	Bidirectional Data B – (BI_DB–)
	7	Bidirectional Data D + (BI_DD+)
	8	Bidirectional Data D – (BI_DD–)

9080CP module specifications

The following table describes the 9080CP module specifications.

Note:

The CP modules in the VSP 9010 chassis must use a minimum software version of Release 3.4.

Table 37: 9080CP module specifications

Physical specifications	
Height:	1.625 in. (4.13 cm)
Width:	15.5 in. (39.37 cm)
Depth:	24.0 in. (60.96 cm)
Weight:	10.5 lb (4.76 kg)
Electrical specifications	
Power consumption:	80 W
Thermal rating:	273 BTU/hr
MTBF rating	777 001 hours (88.60 years)
Connector types	
Ethernet Management port:	RJ-45 connector wired as MDI
Console port:	DB-9 connector

9080CP management port

The management port is a 10/100/1000 Mb/s Ethernet port implemented on an RJ-45 connector wired as an MDI connection. See the following table.

Table 38: Pin assignments: 9080CP module management port

Connector	Pin number	Signal
	1	Output transmit data + (TX+)
	2	Output transmit data - (TX-)
	3	Input receive data + (RX+)
	6	Input receive data - (RX-)
	4, 5, 7, 8	Not used

9080CP console port

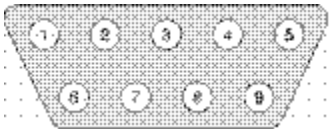
The console serial port is a male DB-9/RS232 connector. This port operates as a data terminal equipment (DTE) device. Default settings for this port are:

- 9600 bits/s
- 8 data bits
- no parity
- 1 stop bit

Connection to TX and RX signals and GND is sufficient for the console serial port to fully function. The console port does not support inbound flow control; that is, the port does not toggle control lines to indicate an input buffer full condition.

The following table lists the pin assignments for the console port.

Table 39: Pin assignments: Console port for DB-9 RS-232 Male DTE (interface)

Connector	Pin number	Signal
	1	Data Carrier Detect (DCD)
	2	Receive Data (RXD)
	3	Transmit Data (TXD)
	4	Data Terminal Ready (DTR)
	5	Ground (GND)
	6	Data Set Ready (DSR)
	7	Request to Send (RTS)
	8	Clear to Send (CTS)
	9	Ring Indicator

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9090SF module specifications

The following table describes the 9090SF specifications.

Note:

Only the Virtual Services Platform 9012 supports the 9090SF module. The Virtual Services Platform 9010 uses the 9095SF module.

Table 40: 9090SF specifications

Physical specifications	
Height:	15.75 in. (40.01 cm)
Width:	2.25 in. (5.72 cm)
Depth:	8.5 in. (21.59 cm)
Weight:	4.5 lb (2.04 kg)
Electrical specifications	
Power consumption	70 W (slots SF1 and SF4) 50 W (slots SF2, SF3, SF5, and SF6)
Thermal rating:	239 BTU/hr (slots SF1 and SF4) 170 BTU/hr (slots SF2, SF3, SF5, and SF6)
MTBF rating	1 447 178 hours (165.02 years)
Performance specifications	
Maximum throughput	Provides 240 Gb/s throughput for each 9048XS-2 when chassis is equipped with 5 SF modules. Provides 70 Gb/s throughput for each 9024XL when chassis is equipped with 5 SF modules. Provides 46 Gb/s throughput for each 9048GT or 9048GB when chassis is equipped with 5 SF modules.

9095SF module specifications

The following table describes the 9095SF specifications.

Note:

Only the Virtual Services Platform 9010 supports the 9095SF module. The Virtual Services Platform 9012 supports the 9090SF module.

Table 41: 9095SF specifications

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Physical specifications	
Height:	2.15 in. (5.46 cm)
Width: card cage	13.2 in. (33.52 cm)
Width: SF circuit pack tray	13.19 in. (33.50 cm)
Depth:	7.5 in. (19.05 cm)
Weight:	4.0 lb (1.8 kg)

Electrical specifications	
Power consumption	70 W (slots SF1 and SF4) 50 W (slots SF2, SF3, SF5, and SF6)
Thermal rating:	239 BTU/hr (slots SF1 and SF4) 170 BTU/hr (slots SF2, SF3, SF5, and SF6)
MTBF rating	1 447 178 hours (165.02 years)

Performance specifications	
Maximum throughput	Provides 240 Gb/s throughput for each 9048XS-2 when chassis is equipped with 5 SF modules. Provides 70 Gb/s throughput for each 9024XL when chassis is equipped with 5 SF modules. Provides 46 Gb/s throughput for each 9048GT or 9048GB when chassis is equipped with 5 SF modules.

Required cables

The following table lists the cable requirements for the Avaya Virtual Services Platform 9000 modules. For SFP and SFP+ cable types and cable lengths, see *Installing Transceivers and Optical Components on Avaya Virtual Services Platform 9000,* NN46250-305.

Table 42: Connectors and cables for Virtual Services Platform 9000

Module	Connector	Recommended cable type	Maximum cable length
9048XS-2	Duplex LC	Depends on the SFP+ model	Depends on the SFP+ model
9024XL	Duplex LC	Depends on the SFP+ model	Depends on the SFP+ model
9048GT	RJ-45	EIA CAT 5 or 6 UTP	328 ft (100 m)
9048GB	Duplex LC or RJ-45	Depends on SFP model	Depends on SFP model
Control Processor	RJ-45 ethernet Management port	Straight-through Ethernet cable: EIA CAT 3, 4, or 5 UTP for 10 Mb/s operation; EIA CAT 5 or 6 UTP required for 100 Mb/s operation, EIA CAT 6 required for 1000 Mb/s	328 ft (100 m)

Module	Connector	Recommended cable type	Maximum cable length
	DB-9 serial port	RS-232	

Chapter 8: Translations of safety messages

This section contains translations of precautionary notices that you must read and follow for safe operation of the Avaya Virtual Services Platform 9000.

Class A electromagnetic interference warning statement

Warning:

Risk of electromagnetic interference

This device is a Class A product. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users are required to take appropriate measures necessary to correct the interference at their own expense.

Warning:

AVERTISSEMENT

Le périphérique est un produit de Classe A. Le fonctionnement de cet équipement dans une zone résidentielle risque de causer des interférences nuisibles, auquel cas l'utilisateur devra y remédier à ses propres frais.

Warning:

WARNUNG

Dies ist ein Gerät der Klasse A. Bei Einsatz des Geräts in Wohngebieten kann es Störungen des Radio- und Fernsehempfangs verursachen. In diesem Fall muss der Benutzer alle notwendigen Maßnahmen ergreifen, die möglicherweise nötig sind, um die Störungen auf eigene Rechnung zu beheben.

Warning:

ADVERTENCIA

Este es un producto clase A. El uso de este equipo en áreas residenciales puede causar interferencias nocivas, en cuyo caso, se requerirá que los usuarios tomen cualquier medida necesaria para corregir la interferencia por cuenta propia.

Warning:

AVISO

Este dispositivo é um produto Classe A. Operar este equipamento em uma área residencial provavelmente causará interferência prejudicial; neste caso, espera-se que os usuários tomem as medidas necessárias para corrigir a interferência por sua própria conta.

Warning:

AVVISO

Questo dispositivo è un prodotto di Classe A. Il funzionamento di questo apparecchio in aree residenziali potrebbe causare interferenze dannose, nel cui caso agli utenti verrà richiesto di adottare tutte le misure necessarie per porre rimedio alle interferenze a proprie spese.

Electromagnetic interference warning statement

Warning:

Risk of electromagnetic interference

Do not operate the Virtual Services Platform 9000 with an empty module slot. If you need to replace a failed module and you do not have a replacement module, leave the failed module installed or install a filler module.

Operating the switch with an empty module slot can cause electromagnetic interference to other equipment in the area. Improper equipment cooling can also result.

Warning:

AVERTISSEMENT

Risques d'interférences électromagnétiques

N'utilisez pas le Virtual Services Platform 9000 si l'emplacement du module est vide. Ne retirez pas un module, même défectueux, si vous ne disposez pas d'un module de remplacement. Laissez le module défectueux en place ou installez un panneau de remplissage.

Toute utilisation de l'interrupteur lorsque l'emplacement du module est vide risque de provoquer des interférences électromagnétiques avec le matériel situé à proximité. Une mauvaise ventilation de l'appareil est également susceptible de provoquer des interférences.

Warning:

WARNUNG

Risiko von Elektromagnetischen Störungen

Nehmen Sie Virtual Services Platform 9000 niemals mit einem unbestückten Modulsteckplatz in Betrieb. Wenn Sie ein defektes Modul ersetzen müssen, ohne ein Ersatzmodul zur Hand zu haben, lassen Sie das defekte Modul installiert, oder installieren Sie eine Aussparungsabdeckung.

Wird das Vermittlungssystem mit einem unbestückten Modulsteckplatz betrieben, kann dies elektromagnetische Störungen verursachen, die sich auch auf andere Geräte in der Umgebung auswirken.

Außerdem kann eine unzureichende Gerätekühlung die Folge sein.

Warning:

ADVERTENCIA

Riesgo de interferencia electromagnética

Riesgo de interferencia electromagnética No opere Virtual Services Platform 9000 si existe una ranura de módulo vacía. Si necesita reemplazar un módulo defectuoso y no cuenta con uno de repuesto, deje el módulo en su lugar o instale un panel de relleno. El funcionamiento del conmutador con una ranura de módulo vacía puede ocasionar interferencias electromagnéticas en otros equipos del área. Asimismo, es posible que los equipos se enfríen inadecuadamente.

Warning:

AVISO

Risco de interferência eletromagnética

Não opere o insira o Virtual Services Platform 9000 com um slot de módulos vazio. Se for preciso substituir um módulo com defeito e você não tiver um módulo de substituição, deixe o módulo com defeito instalado ou instale um painel de preenchimento.

Trabalhar no comutador com um slot de módulos vazio pode causar interferência eletromagnética a outro equipamento na área. O resfriamento inadequado do equipamento também pode resultar uma interferência.

Warning:

AVVISO

Rischio di interferenza elettromagnetica

Non utilizzare il Virtual Services Platform 9000 con un alloggiamento modulo vuoto. Se è necessario sostituire un modulo guasto ma non si dispone di un modulo per la sostituzione, lasciare installato quello guasto o installare un pannello di riempimento.

L'uso dell'interruttore con l'alloggiamento modulo vuoto può provocare un'interferenza elettromagnetica su altri apparecchi presenti nella zona, oltre che un inadeguato raffreddamento dell'apparecchio stesso.

Electrostatic discharge caution statement

Electrostatic alert:

ELECTROSTATIC ALERT

Comments? infodev@avaya.com

ESD can damage electronic circuits. Do not touch electronic hardware unless you wear a grounding wrist strap or other static-dissipating device.

Electrostatic alert:

ELEKTROSTATIKWARNUNG

Elektronische Schaltkreise können durch elektrostatische Entladung beschädigt werden. Berühren Sie elektronische Hardware nur, wenn Sie ein Erdungsarmband oder ein anderes Statik ableitendes Medium tragen.

Electrostatic alert:

ALERTA DE ELECTROESTÁTICA

Una descarga electroestática puede dañar los circuitos eléctrónicos. No toque el hardware electrónico a no ser que utilicé una muñequera antiestática u otro dispositivo disipador de estática.

Electrostatic alert:

ALERTA CONCERNANT LES DÉCHARGES ÉLECTROSTATIQUES

Une décharge électrostatique (DES) peut endommager les circuits électroniques. Ne touchez pas le matériel électronique, à moins de mettre à votre poignet une bande de mise à la masse ou autre dispositif dissipant l'électricité statique.

Electrostatic alert:

ALERTA DE ELETROSTÁTICA

ESD pode danificar circuitos eletrônicos. Não toque em equipamentos eletrônicos a menos que esteja utilizando pulseira de aterramento ou outro dispositivo para dissipação de energia estática.

Electrostatic alert:

AVVISO ELETTROSTATICO

Le scariche elettrostatiche (ESD) possono danneggiare i circuiti elettronici. Non toccare i componenti elettronici senza aver prima indossato un braccialetto antistatico o un altro dispositivo in grado di dissipare l'energia statica.

Laser eye safety danger statement

Danger:

Risk of eye injury by laser

Comments? infodev@avaya.com

Fiber optic equipment can emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume that fiber optic cables are connected to a light source.

Danger:

DANGER

Risques de blessure oculaire par lumière laser

L'équipement de fibres optiques peut émettre une lumière laser ou infrarouge nuisible à vos yeux. Ne regardez jamais en direction de fibres optiques ou d'un port connecteur. Supposez toujours que les câbles de fibres optiques sont connectés à une source de lumière.

Danger:

GEFAHR

Risiko einer Augenverletzung durch Laser

Risiko einer Augenverletzung durch Laser Glasfasergeräte können Laserstrahlen oder ultraviolettes Licht aussenden, das Ihre Augen verletzen kann. Schauen Sie nie direkt in einen Glasfaserleiter oder Verbindungsanschluss. Gehen Sie immer davon aus, dass Glasfaserkabel mit einer Lichtquelle verbunden sind.

Danger:

PELIGRO

Riesgo de lesión en los ojos por láser

El equipo de fibra óptica puede emitir una luz láser o infrarroja que dañe sus ojos. Nunca mire un puerto de fibra óptica o conector. Siempre asuma que los cables de fibra óptica están conectados a una fuente de luz.

Danger:

PERIGO

O laser pode causar ferimentos no olho

O equipamento de fibra ótica pode emitir laser ou luz infravermelha que pode causar danos a sua vista. Nunca olhe para dentro da fibra ótica ou da porta do conector. Tenha sempre em mente que os cabos de fibra ótica estão ligados a uma fonte de luz.

Danger:

PERICOLO

Rischio di ustioni agli occhi dovute al laser

Le apparecchiature con fibre ottiche possono emettere raggi laser o infrarossi in grado di provocare ferite agli occhi. Non guardare mai all'interno di una porta di connessione o una fibra ottica. Tenere sempre presente che i cavi a fibra ottica sono collegati a una sorgente luminosa.

Glossary

bandwidth	A measure of transmission capacity for a particular pathway, expressed in megabits per second (Mb/s).
Compact Flash	Offers flash memory in a small form factor.
Control Processor (CP) module	The Control Processor module runs all high level protocols (BGP, OSPF) and distributes the results (routing updates) to the rest of the system. The CP manages and configures the IO and Switch Fabric modules, and maintains and monitors the health of the chassis.
cooling module (9010CM)	The cooling module is a hot swappable fan tray used to cool the Control Processor, I/O, and Switch Fabric modules in the Virtual Services Platform 9010. Two cooling modules are installed horizontally in the front of the chassis.
Custom AutoNegotiation Advertisement (CANA)	An enhancement of the IEEE 802.3 autonegotiation process on the 10/100/1000 copper ports. Custom AutoNegotiation Advertisement offers improved control over the autonegotiation process. The system advertises all port capabilities that include, for tri-speed ports, 10 Mb/s, 100 Mb/s, 1000 Mb/s speeds, and duplex and half-duplex modes of operation. This advertisement results in autonegotiation between the local and remote end that settles on the highest common denominator. Custom AutoNegotiation Advertisement can advertise a user-defined subset of the capabilities that settle on a lower or particular capability.
Data Communications Equipment (DCE)	A network device (such as a modem) that establishes, maintains, and terminates a session.
database description (DD) packets	Exchanged when a link is initially established between neighboring routers that synchronizes their link state databases. The Open Shortest Path First (OSPF) protocol uses DD packets.
Electromagnetic Interference (EMI)	Electromagnetic radiation released from an electronic device that disrupts the operation or performance of another device.
I/O cooling module (9012FC)	The I/O cooling module is a hot swappable fan tray used to cool the I/O and CP modules in the Virtual Services Platform 9012.

I/O cooling module (9012FCHS)	The I/O cooling module is a hot swappable fan tray used to cool second generation I/O modules in the Virtual Services Platform 9000.
I/O module	An I/O module is a module that provides network connectivity for various media (sometimes called Layer 0) and protocol types. I/O modules are also called Ethernet modules.
light emitting diode (LED)	A semiconductor diode that emits light when a current passes through it.
NonVolatile Random Access Memory (NVRAM)	Random Access Memory that retains its contents after electrical power turns off.
operation, administration, and maintenance (OA&M)	All the tasks necessary for providing, maintaining, or modifying switching system services.
packet loss	Expressed as a percentage of packets dropped over a specified interval. Keep packet loss to a minimum to deliver effective IP telephony and IP video services.
small form-factor pluggable (SFP)	A hot-swappable input and output enhancement component used with Avaya products to allow gigabit Ethernet ports to link with other gigabit Ethernet ports over various media types.
small form-factor pluggable plus (SFP +)	SFP+ transceivers are similar to SFPs in physical appearance but SFP+ transceivers provide Ethernet at 10 gigabits per second (Gbps).
Switch Fabric (SF) cooling module (9012RC)	The SF cooling module is a hot swappable fan tray used to cool the Switch Fabric (SF) modules in the Virtual Services Platform 9012.
Switch Fabric (SF) module	The Switch Fabric module connects to all I/O and Control Processor modules. You can install 6 SF modules in Virtual Services Platform 9000, using 5 SF modules plus 1 as a hot backup. The SF modules comprise a data path and a control path, and provide a back end switching solution in the midplane chassis.
unshielded twisted pair (UTP)	A cable with one or more pairs of twisted insulated copper conductors bound in a single plastic sheath.

Comments? infodev@avaya.com