



Installation — Chassis

Avaya Virtual Services Platform 9000

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Chapter 1: Regulatory information and safety precautions

Read the information in this section to learn about regulatory conformities and compliances.

International Regulatory Statements of Conformity

This is to certify that the Avaya Virtual Services Platform 9000 chassis and components installed within the chassis were evaluated to the international regulatory standards for electromagnetic compliance (EMC) and safety and were found to have met the requirements for the following international standards:

- EMC—Electromagnetic Emissions—CISPR 22, Class A
- EMC—Electromagnetic Immunity—CISPR 24
- Electrical Safety—IEC 60950, with CB member national deviations

Further, the equipment has been certified as compliant with the national standards as detailed in the following sections.

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National Electromagnetic Compliance (EMC) Statements of Compliance

FCC Statement (USA only)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the Federal Communications Commission (FCC) rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures may be necessary to correct the interference at their own expense.

ICES Statement (Canada only)

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (Virtual Services Platform 9000 chassis and installed components) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique (Virtual Services Platform 9000 chassis) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

CE Marking Statement (Europe only)

EN 55022 Statements

This is to certify that the Virtual Services Platform 9000 chassis and components installed within the chassis are shielded against the generation of radio interference in accordance with the application of Council Directive 2004/108/EC. Conformity is declared by the application of EN 55022 Class A (CISPR 22).

Caution:

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.

EN 55024 Statement

This is to certify that the Virtual Services Platform 9000 chassis is shielded against the susceptibility to radio interference in accordance with the application of Council Directive 2004/108/EC. Conformity is declared by the application of EN 55024 (CISPR 24).

EN 300386 Statement

The Virtual Services Platform 9000 chassis complies with the requirements of EN 300386 V1.3.3 for emissions and for immunity for a Class A device intended for use in either Telecommunications centre or locations other than telecommunications centres given the performance criteria as specified by the manufacturer.

EC Declaration of Conformity

This product conforms to the provisions of the R&TTE Directive 1999/5/EC.

European Union and European Free Trade Association (EFTA) Notice



All products labeled with the CE marking comply with R&TTE Directive (1999/5/EEC) which includes the Electromagnetic Compliance (EMC) Directive (2004/108/EC) and the Low Voltage Directive (2006/95/EC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (ENs). The equivalent international standards are listed in parenthesis.

- EN 55022 (CISPR 22)–Electromagnetic Interference
- EN 55024 (IEC 61000-4-2, -3, -4, -5, -6, -8, -11)–Electromagnetic Immunity
- EN 61000-3-2 (IEC 610000-3-2)–Power Line Harmonics
- EN 61000-3-3 (IEC 610000-3-3)–Power Line Flicker

VCCI Statement (Japan/Nippon only)

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) for information technology equipment. If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

BSMI statement (Taiwan only)

BSMI statement (Taiwan only)

This is a Class A product based on the standard of the Bureau of Standards, Metrology and Inspection (BSMI) CNS 13438 Class A and CNS 14336-1.

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Chinese EMI and safety warnings

Voltage:

Risk of injury by electric shock

Before working on this equipment, be aware of good safety practices and the hazards involved with electrical circuits. Use only power cords that have a good grounding path. Ensure that the switch is properly grounded before powering on the unit.

電壓警告:

觸電受傷的危險性

在此設備上進行作業之前，要認知到良好的安全行為和涉及電子電路可能的危害。使用的電源線需有接地路徑。確保供電給設備之前，有適當的接地。

Warning:

Disconnecting the power cord is the only way to turn off power to this device. Always connect the power cord in a location that can be reached quickly and safely in case of emergency.

⚠ 警告使用者:

斷開電源線，是關閉該設備電源的唯一方法。始終確保連接電源線的位置，在緊急情況下，是可以快速且安全抵達的一個位置。

⚠ Electrostatic alert:

Risk of equipment damage

To prevent damage from electrostatic discharge, always wear an antistatic wrist strap connected to an ESD jack when connecting cables or performing maintenance on this device.

⚠ 靜電提醒：

設備損壞的風險

為了防止靜電放電的破壞，在此設備上連接纜線或執行維護時，始終戴上防靜電腕帶並連接到ESD插孔。

KCC Notice (Republic of Korea only)

This device has been approved for use in Business applications only per the Class A requirements of the Republic of Korea Communications Commission (KCC). This device may not be sold for use in a non-business application.

For Class A:

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National Safety Statements of Compliance

CE Marking Statement (Europe only)

EN 60 950 Statement

This is to certify that the Virtual Services Platform 9000 chassis and components installed within the chassis are in compliance with the requirements of EN 60 950 in accordance with the Low Voltage Directive. Additional national differences for all European Union countries

have been evaluated for compliance. Some components installed within the Virtual Services Platform 9000 chassis may use a nickel-metal hydride (NiMH) and/or lithium-ion battery. The NiMH and lithium-ion batteries are long-life batteries, and it is very possible that you will never need to replace them. However, should you need to replace them, refer to the individual component manual for directions on replacement and disposal of the battery.

Denan Statement (Japan/Nippon only)



警告

本製品を安全にご使用頂くため、以下のことにご注意ください。

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Información NOM (únicamente para México)

La información siguiente se proporciona en el dispositivo o en los dispositivos descritos en este documento, en cumplimiento con los requisitos de la Norma Oficial Mexicana (NOM):

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Importador:	Avaya Communication de México SA de CV Av. Presidente Masarik 111 Piso 6 Col Chapultepec Morales Deleg. Miguel Hidalgo México D.F. 11570
Embarcar a:	Model 9006AC: 100-120 VCA, 47–63 Hz, 13.3 A (100 VCA) - 11.2 A (120 VCA) max. por fuente de poder 200-240 VCA, 47–63 Hz, 11.8 A (200 VCA) – 9.9 A (240 VCA) max. por fuente de poder

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Input:	Model 9006AC: 100-120 VAC, 47–63 Hz, 13.3 A (100 VAC) - 11.2 A (120 VAC) maximum for each power supply 200-240 VAC, 47–63 Hz, 11.8 A (200 VAC) – 9.9 A (240 VAC) maximum for each power supply

National Environmental Statement of Compliance

The WEEE Directive 2002/96/EC and RoHS (Restriction of Hazardous Substances) Directive 2002/95/EC set collection, recycling and recovery targets for various categories of electrical products and their waste.

Restriction on Hazardous Substances Directive Compliance Statement

The Restriction on Hazardous Substances Directive (RoHS) (2002/95/EC), which accompanies the WEEE Directive, bans the use of heavy metals and brominated flame-retardants in the manufacture of electrical and electronic equipment. Specifically, restricted materials under the RoHS Directive are Lead (including solder used in PCB's), Cadmium, Mercury, Hexavalent Chromium, and Bromine.

Avaya declares compliance with the European Union (EU) RoHS Directive (2002/95/EC) in that Lead, which is a restricted hazardous substance, is used only in accordance to the exemption(s) to Article 4(1), item 7 granted by the European Union (EU) RoHS Directive (2002/95/EC) in the Annex—"lead in solders for network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunication".

WEEE Directive Compliance Statement



This product at end of life is subject to separate collection and treatment in the EU Member States, Norway, and Switzerland and therefore is marked with the symbol shown at the left. Treatment applied at end of life of these products in these countries shall comply with the applicable national laws implementing Directive 2002/96/EC on Waste of Electrical and Electronic Equipment (WEEE).

Avaya declares compliance with the European Union (EU) WSEEE Directive (2002/96/EC).

Safety Messages

This section describes the different precautionary notices used in the Avaya Virtual Services Platform 9000 documentation. This section also contains precautionary notices that you must read for safe operation of Avaya Virtual Services Platform 9000.

Notices

Notice paragraphs alert you about issues that require your attention. The following sections describe the types of notices. For a list of safety messages used in a document and their translations, see the Translations of safety messages chapter.

Attention Notice

 **Important:**

An attention notice provides important information regarding the installation and operation of Avaya products.

Caution ESD Notice

 **Electrostatic alert:**

ESD

ESD notices provide information about how to avoid discharge of static electricity and subsequent damage to Avaya products.

 Electrostatic alert:**ESD (décharge électrostatique)**

La mention ESD fournit des informations sur les moyens de prévenir une décharge électrostatique et d'éviter d'endommager les produits Avaya.

 Electrostatic alert:**ACHTUNG ESD**

ESD-Hinweise bieten Information dazu, wie man die Entladung von statischer Elektrizität und Folgeschäden an Avaya-Produkten verhindert.

 Electrostatic alert:**PRECAUCIÓN ESD (Descarga electrostática)**

El aviso de ESD brinda información acerca de cómo evitar una descarga de electricidad estática y el daño posterior a los productos Avaya.

 Electrostatic alert:**CUIDADO ESD**

Os avisos do ESD oferecem informações sobre como evitar descarga de eletricidade estática e os conseqüentes danos aos produtos da Avaya.

 Electrostatic alert:**ATTENZIONE ESD**

Le indicazioni ESD forniscono informazioni per evitare scariche di elettricità statica e i danni correlati per i prodotti Avaya.

Caution Notice** Caution:**

Caution notices provide information about how to avoid possible service disruption or damage to Avaya products.

 Caution:**ATTENTION**

La mention Attention fournit des informations sur les moyens de prévenir une perturbation possible du service et d'éviter d'endommager les produits Avaya.

 Caution:**ACHTUNG**

Achtungshinweise bieten Informationen dazu, wie man mögliche Dienstunterbrechungen oder Schäden an Avaya-Produkten verhindert.

 **Caution:**

PRECAUCIÓN

Los avisos de Precaución brindan información acerca de cómo evitar posibles interrupciones del servicio o el daño a los productos Avaya.

 **Caution:**

CUIDADO

Os avisos de cuidado oferecem informações sobre como evitar possíveis interrupções do serviço ou danos aos produtos da Avaya.

 **Caution:**

ATTENZIONE

Le indicazioni di attenzione forniscono informazioni per evitare possibili interruzioni del servizio o danni ai prodotti Avaya.

Warning Notice

 **Warning:**

Warning notices provide information about how to avoid personal injury when working with Avaya products.

 **Warning:**

AVERTISSEMENT

La mention Avertissement fournit des informations sur les moyens de prévenir les risques de blessure lors de la manipulation de produits Avaya.

 **Warning:**

WARNUNG

Warnhinweise bieten Informationen dazu, wie man Personenschäden bei der Arbeit mit Avaya-Produkten verhindert.

 **Warning:**

ADVERTENCIA

Los avisos de Advertencia brindan información acerca de cómo prevenir las lesiones a personas al trabajar con productos Avaya.

 Warning:**AVISO**

Os avisos oferecem informações sobre como evitar ferimentos ao trabalhar com os produtos da Avaya.

 Warning:**AVVISO**

Le indicazioni di avviso forniscono informazioni per evitare danni alle persone durante l'utilizzo dei prodotti Avaya.

Danger High Voltage Notice** Voltage:**

Danger—High Voltage notices provide information about how to avoid a situation or condition that can cause serious personal injury or death from high voltage or electric shock.

 Voltage:

La mention Danger—Tension élevée fournit des informations sur les moyens de prévenir une situation ou une condition qui pourrait entraîner un risque de blessure grave ou mortelle à la suite d'une tension élevée ou d'un choc électrique.

 Voltage:**GEFAHR**

Hinweise mit „Vorsicht – Hochspannung“ bieten Informationen dazu, wie man Situationen oder Umstände verhindert, die zu schweren Personenschäden oder Tod durch Hochspannung oder Stromschlag führen können.

 Voltage:**PELIGRO**

Los avisos de Peligro-Alto voltaje brindan información acerca de cómo evitar una situación o condición que cause graves lesiones a personas o la muerte, a causa de una electrocución o de una descarga de alto voltaje.

 Voltage:**PERIGO**

Avisos de Perigo—Alta Tensão oferecem informações sobre como evitar uma situação ou condição que possa causar graves ferimentos ou morte devido a alta tensão ou choques elétricos.

 **Voltage:**
PERICOLO

Le indicazioni Pericolo—Alta tensione forniscono informazioni per evitare situazioni o condizioni che potrebbero causare gravi danni alle persone o il decesso a causa dell'alta tensione o di scosse elettriche.

Danger Notice

 **Danger:**

Danger notices provide information about how to avoid a situation or condition that can cause serious personal injury or death.

 **Danger:**

La mention Danger fournit des informations sur les moyens de prévenir une situation ou une condition qui pourrait entraîner un risque de blessure grave ou mortelle.

 **Danger:**
GEFAHR

Gefahrenhinweise stellen Informationen darüber bereit, wie man Situationen oder Umständen verhindert, die zu schweren Personenschäden oder Tod führen können.

 **Danger:**
PELIGRO

Los avisos de Peligro brindan información acerca de cómo evitar una situación o condición que pueda causar lesiones personales graves o la muerte.

 **Danger:**
PERIGO

Avisos de perigo oferecem informações sobre como evitar uma situação ou condição que possa causar graves ferimentos ou morte.

 **Danger:**
PERICOLO

Le indicazioni di pericolo forniscono informazioni per evitare situazioni o condizioni che potrebbero causare gravi danni alle persone o il decesso.

Chapter 2: Introduction

Purpose

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

Related resources

Documentation

See *Avaya Virtual Services Platform 9000 Documentation Roadmap*, 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

Avaya Mentor videos

Avaya Mentor is an Avaya-run channel on YouTube that includes technical content on how to install, configure, and troubleshoot Avaya products.

Go to <http://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 site.

Support

Visit the Avaya Support website at <http://support.avaya.com> for the most up-to-date documentation, product notices, and knowledge articles. You can also search for release notes, downloads, and resolutions to issues. Use the online service request system to create a service request. Chat with live agents to get answers to questions, or request an agent to connect you to a support team if an issue requires additional expertise.

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 3: New in this release

The following sections describe what is new in *Avaya Virtual Services Platform 9000 Installation — Chassis*, NN46250-304 for Release 3.4.

Features

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

Temperature alarms

Release 3.4 updates alarm threshold temperatures and shutdown threshold temperatures. Release 3.4 also adds additional information on heat sensor locations on the modules and a fresh output for the `show sys-info` command for the VSP 9010 chassis.

- For more information on temperature alarms for VSP 9010, see [Temperature alarms](#) on page 31.
- For more information on temperature alarms for VSP 9012, see [Temperature alarms](#) on page 70.

Virtual Services Platform 9010 AC chassis

Release 3.4 adds support for a 10-slot AC chassis, the Virtual Services Platform 9010 AC. For more information, see the following sections:

- [Virtual Services Platform 9010 chassis fundamentals](#) on page 25
- [Virtual Services Platform 9010 chassis installation](#) on page 41
- [VSP 9010 chassis specifications](#) on page 107
- [Part numbers](#) on page 113

Other changes

See the following sections for information about changes that are not feature-related.

Chapter reorganization

The chapters are reorganized to group conceptual and procedural information together by chassis model.

New introduction chapter

The Introduction chapter replaces the Purpose of this document and Customer service chapters.

Safety messages

[Translations of safety messages](#) on page 115 is updated to include a message about multiple power cords.

Chapter 4: Virtual Services Platform 9010 chassis

This chapter provides information to install the Virtual Services Platform 9010 chassis.

Virtual Services Platform 9010 chassis fundamentals

The Avaya Virtual Services Platform 9010 chassis consists of a sheet metal enclosure, a midplane, cooling modules, and power supplies. The number of power supplies needed depends on the specific hardware configuration and redundancy needs.

! Important:

The 9080CP module in a Virtual Services Platform 9010 AC chassis must run software Release 3.4 or later. You cannot plug and play a 9080CP module from a Virtual Services Platform 9012 chassis to a Virtual Services Platform 9010 AC chassis if the Virtual Services Platform 9012 runs a software version earlier than Release 3.4. For more information about hardware and software compatibility, see *Avaya Virtual Services Platform 9000 Release Notes*, NN46250–401.

Virtual Services Platform 9010 chassis introduction

This section provides an introduction to the chassis layout.

The front of the Virtual Services Platform 9010 chassis has two vertical slots for Control Processor (CP) modules and eight vertical slots for I/O modules. Slots are numbered from left to right.

The front of the chassis also provides two bays for cooling modules and eight bays for power supplies. The following figure shows the front view of the chassis.

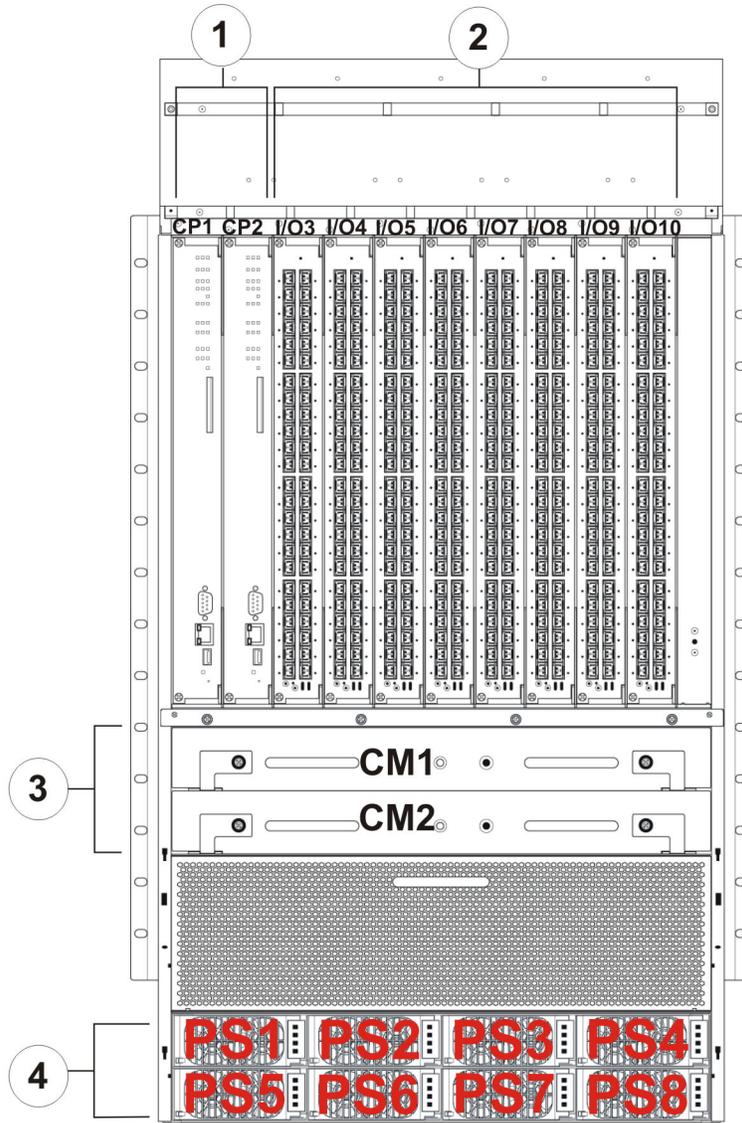


Figure 1: VSP 9010 chassis front view

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

Table 1: Figure notes for VSP 9010 chassis front view

Number	Component
1	CP modules
2	I/O modules
3	Cooling modules
4	Power supplies

In the rear, the chassis has six horizontal slots for Switch Fabric (SF) modules. The rear slot numbering increases from bottom to top.

The rear of the AC-input chassis provides eight separate power inlets, and eight power switches that connect the main power to the corresponding power supply bays.

The following figure shows the rear view of the AC-input chassis.

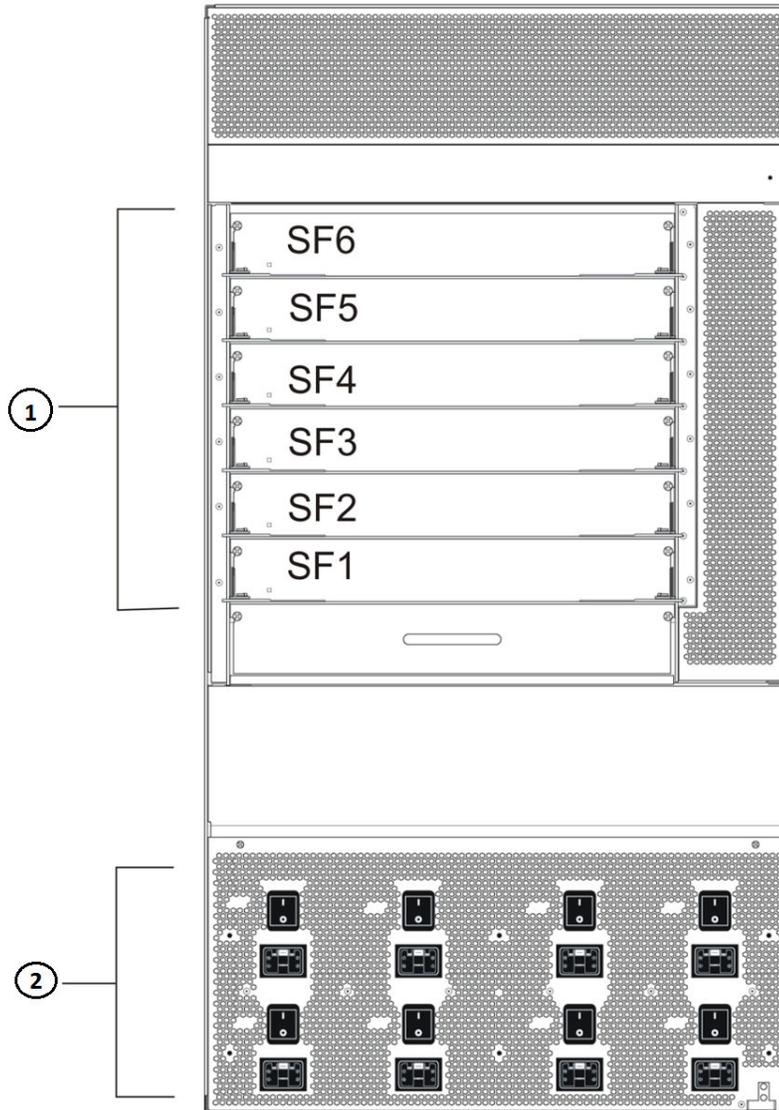


Figure 2: VSP 9010 AC chassis rear view

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

Table 2: Figure notes for VSP 9010 AC chassis rear view

Number	Component
1	SF modules
2	AC power inlet panel

The ground bonding location is at the bottom right of the chassis rear.

Power supplies

The Virtual Services Platform 9010 chassis is available in an AC power version.

For the AC chassis you can use a 2,000 W AC power supply. You can wire these supplies to 120 VAC or 240 VAC source. You must order appropriate power cords to make this connection at the rear of the chassis.

The Virtual Services Platform 9010 has eight power supply bays for population of up to eight power supplies. You must install filler panels in unpopulated power supply bays. The filler panels assure that proper air flow is available for the installed power supplies. The chassis ships with six filler panels installed; power supply bays 1 and 5 are unpopulated.

Install the power supplies in the front of the chassis, and connect the power cords at the rear of the chassis.

Consider the total power consumption to ensure proper system performance. The total input power consumption of the components, modules and cooling modules, must not exceed the output power rating of the installed power supplies. For more information about the power consumption of each module, see [Component input power](#) on page 106.

If the chassis operates in a redundant power configuration, you can upgrade or replace power supplies while the chassis remains in operation.

For more information about power supply installation, see *Avaya Virtual Services Platform 9000 Installation — AC Power Supply*, NN46250-303.

Power supply and power inlet locations

You can install up to eight power supplies at the bottom front of the chassis. Ensure you power all supplies in a chassis from different circuits at the same voltage source.

In the front of the chassis, power supply bays are numbered increasing from left to right, so 1, 2, 3, and 4 on the first row, and then 5, 6, 7, and 8 on the second row.

The individual AC power switches and inlet connectors at the back of the Virtual Services Platform 9010AC chassis are numbered decreasing left to right, so 4, 3, 2, and 1 on the first row, and then 8, 7, 6, and 5 on the second row.

Power supply redundancy

The Virtual Services Platform 9010 supports multiple power supplies for custom power redundancy configurations. Two typical configurations are $n + 1$ or $n + n$, where n is the number of required power supplies to power the chassis and modules.

An $n + 1$ redundant configuration provides power in the event of a single power supply failure, single circuit breaker trip, or knocked-out power cord.

An $n + n$ redundant configuration provides power in the event of a loss of a single power phase in the building. Balance the line side voltage source between building phases.

Use $n + n$ redundancy to ensure redundancy in the event that an external failure occurs, for example, an entire power feed within the building fails. To ensure $n + n$ redundancy, you must install power supplies to provide twice the power requirements of your hardware configuration.

Important:

The system reserves the following power requirements:

- 80 Watts (W) each for the primary and secondary Control Processor (CP) modules
- 70 W each for the Switch Fabric (SF) modules located in slots 1 and 4
- 1,900 W for a pair of 9010CM cooling modules that operate at full speed

Power feed redundancy

Avaya recommends that you use two separate power feeds for the power supplies.

The power supplies in the Virtual Services Platform 9010 chassis are divided in two shelves. Each shelf consists of four independent power source and filter circuits. The eight circuits are independent and you can configure either building phase to any circuit.

If you use $n + n$ redundancy and plug four power supplies in to power feed "A", and the remaining four power supplies in to power feed "B", this configuration gives you power feed redundancy.

Ensure that each AC power circuit connects to a dedicated breaker.

Cooling modules

The Virtual Services Platform 9010 uses two cooling modules. Install the two cooling modules at the front of the chassis, below the CP and I/O modules. Each cooling module includes four fans.

Virtual Services Platform 9010 uses two cooling modules to create airflow redundancy. In the case of a single fan failure, or full failure of a cooling module, the other cooling module fans blow cooling air through the failing fans to continue cooling installed modules.

Warning:

If the upper cooling module fails, leave it in place until you can install a replacement cooling module. Do not remove the top cooling module and leave that slot empty. The chassis will

depressurize with a significant loss in cooling capacity of the fans. Damage to equipment can result.

Do not partially remove the fans and leave them in the chassis. This action results in the blockage of airflow, causing significant loss in the cooling module air volume.

You must either fully seat a cooling module and lock it into the slot, or completely remove it from the chassis slot.

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.

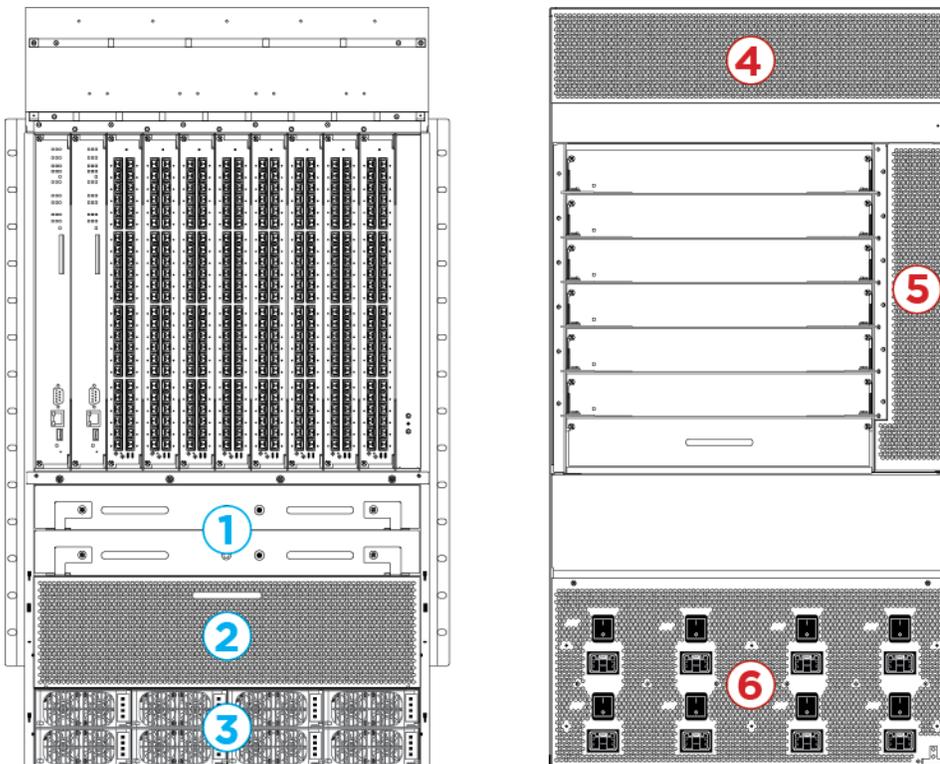


Figure 3: Front-to-back cooling in the Virtual Services Platform 9010

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

Table 3: 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.
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.

CP and SF modules

If a CP or SF module reaches 55 degrees Celsius (°C), which is one degree more than the alarm threshold of 54 °C, the system initiates an SNMP trap and the module online LED displays as blinking and red. The CP and SF module alarms clear after the temperature of the CP and SF modules fall to 53 °C. The CP and SF modules shut down by removing power from the slot at 60 °C, which is one degree more than the shutdown threshold of 59 °C.

I/O modules on the Virtual Services Platform 9010

On the Virtual Services Platform 9010, if an I/O module reaches 70°C, which is one degree more than the alarm threshold of 69 °C, the system initiates an SNMP trap and the module online LED displays as blinking and red. The I/O module shuts down by removing power from the slot at 75°C, which is one degree more than the shutdown threshold of 74°C.

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.

Modules on the VSP 9010	Module LED color	Alarm threshold temperature	Shutdown threshold temperature
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.	
I/O module on the Virtual Services Platform 9010	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.
	Green	Alarm clears after the temperatures of the modules are at 61 °C.	

Bringing the module online

After the system shuts down a module, 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.

Heat sensor locations

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

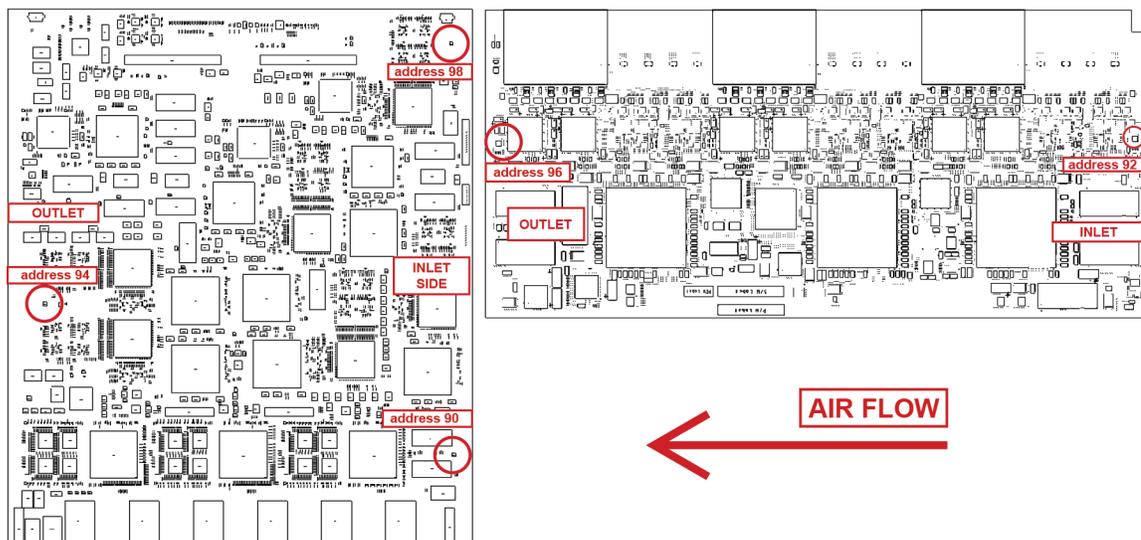


Figure 4: Heat sensor locations in the I/O module

Use the following table to understand the heat sensors in the preceding I/O module.

Table 4: Zone to heat sensor mapping

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.

```
Virtual Services Platform-9010:1(config)#show sys-info temperature
```

```
Temperature Info :
```

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

	Temp	Threshold	Threshold						
1	30	29	--	31	25	31	25	54	59
4	29	26	30	32	25	32	25	62	67
SF1	29	--	--	24	--	29	24	54	59
SF4	28	--	--	24	--	28	24	54	59

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

Value	Description
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.

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.

Fan Trays Info :

```

Zone Info :
  FRONT zone :
    Mode : NORMAL
    Mode Status : Normal
    Highest Temperature : 50 C
  REAR zone :
    Mode : NORMAL
    Mode Status : Normal
    Highest Temperature : 0 C

Fan Info :

      Tray      CardType      Serial#      Part#
  FAN 1      9010CM      LBNTTMC29Y004Y      EC1411012-E6
  FAN 2      9010CM      LBNTTMC29Y004H      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.
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.

	Value	Description
	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.

Switch Fabric modules

The Virtual Services Platform 9010 chassis uses the 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. Install a third SF module in one of the remaining slots.

You must install a minimum of three SF modules in the Virtual Services Platform 9010 chassis for proper operation, but Avaya recommends that you install a minimum of four SF modules for redundancy.

Each SF 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 chassis, in a 5 + 1 redundancy configuration.

The SF module slot numbers increment from bottom to top when you view the chassis from the rear. The slot location determines the module function. Slots SF1 and SF4 provide the arbitration and traffic scheduling, and therefore, bandwidth management, from the I/O modules, and provide redundancy when both slots are populated. The other slots provide additional bandwidth.

Bandwidth requirements depend on your hardware configuration.

Control Processor module

The 9080CP module performs the following tasks:

- runs all high level protocols, for example Border Gateway Protocol (BGP) and Open Shortest Path First (OSPF)
- distributes the routing update
- manages and configures the I/O and SF modules
- maintains and monitors the health of the chassis
- displays the status of the modules installed at the back of the chassis using LEDs

You can hot swap the external storage devices (compact flash memory card or the USB devices). Any sudden removal of external storage devices can cause data loss or damage the hardware. For more information on the removal of external storage devices, see [Removing external storage devices from the CP module](#) on page 101.

For more information about how to install CP modules, see *Avaya Virtual Services Platform 9000 Installation — Modules*, NN46250-301.

Important:

The 9080CP module in a Virtual Services Platform 9010 AC chassis must run software Release 3.4 or later. You cannot plug and play a 9080CP module from a Virtual Services Platform 9012 chassis to a Virtual Services Platform 9010 AC chassis if the Virtual Services Platform 9012 runs a software version earlier than Release 3.4. For more information about hardware and software compatibility, see *Avaya Virtual Services Platform 9000 Release Notes*, NN46250-401.

Site requirements

Ensure that the installation site meets the requirements described in this section. For more information about environmental and electrical requirements, see [Technical specifications](#) on page 105.

General requirements

Plan ahead to have three people present to lift the chassis. The chassis weighs in excess of 141 lb (64 kg). Always use a mechanical lift when one is available.

Each power supply must operate from a dedicated branch circuit. For n+n redundancy, you must connect half the branch circuits on one power feed, and the other half of the branch circuits on a separate power feed. In addition to power supply redundancy, this configuration also provides power feed redundancy.

The power supplies in the Virtual Services Platform 9010 chassis are divided in two shelves. Each shelf consists of four independent power source and filter circuits. The eight circuits are independent and you can configure either building phase to any circuit.

Space requirements

The installation site must provide sufficient free space around the chassis to ensure proper ventilation and service access.

You can install up to two Virtual Services Platform 9010 chassis in a single rack.

Important:

Install chassis units from the bottom up to ensure racks do not become top heavy and fall over.

For proper ventilation and module replacement, you must ensure a minimum of 36 inches of free space in both the front and back of the chassis. Create a cool aisle at the front of the chassis and a hot aisle at the rear of the chassis. Air inlet temperature to each chassis must be within the specified range.

Hardware requirements

This section includes information about the hardware that ships with the Virtual Services Platform 9010 chassis.

Shipped assembly Virtual Services Platform 9010 AC chassis hardware

In addition to the Virtual Services Platform 9010 AC chassis, your shipping container includes several hardware accessories. Verify that the items in the shipping container match those on the shipment packing list.

Use the following table as a checklist when you verify the contents of the shipping container. For more information about ordering replacement parts, see [Part numbers](#) on page 113.

Table 5: VSP 9010 AC chassis shipping accessories

Check	Accessory	Usage
	VSP 9010 AC chassis	
	Eight I/O and CP filler modules	You must install filler modules in unused slots.
	Four SF filler modules	You must install filler modules in unused slots.
	Six power supply filler panels	You must install filler panels in unused bays. Power supply bays 1 and 5 ship unpopulated.
	Eight power cord retainers	Use to prevent the accidental removal of power cords.

Check	Accessory	Usage
	Two cooling modules	
	One DB9 to DB9 connector	
	One chassis cover panel kit	The cover panel kit includes the cable management cover with two mounting brackets and screws, and the air inlet cover with mounting bracket.
	Screws and hardware:	The hardware required to mount the chassis in a rack depends on your rack type.
	Phillips-head screws Clip nuts	Mount the chassis to a rack rail. Use the clip nuts, if necessary.
	Phillips-head screws Hex nuts	Mount the installation shelf to a rack rail. If the rack does not use threaded rail holes, you must use the supplied clip nuts with the clip nut screws.
	Installation shelf	Mount the chassis in an equipment rack.
	Grounding kit hardware	Connect the chassis to the ground of the rack.

The following figure illustrates the accessories in the chassis shipping container.

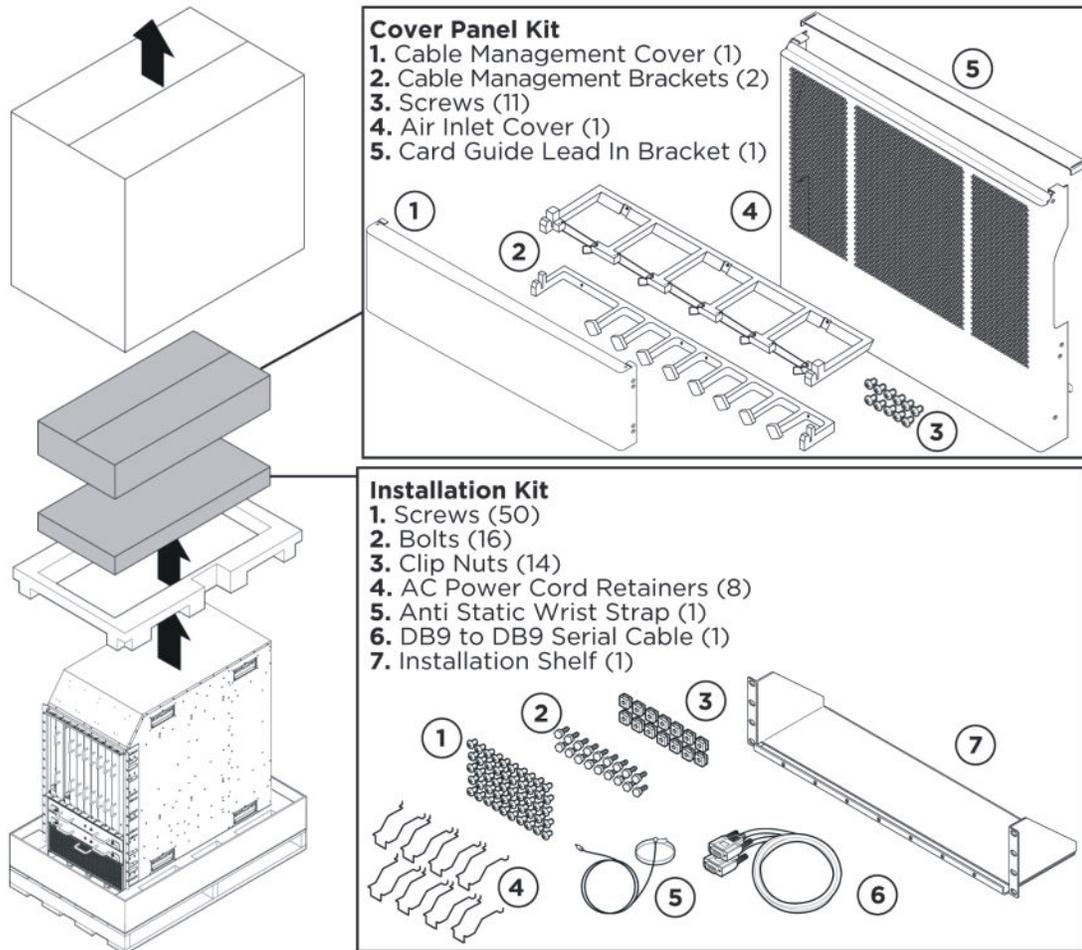


Figure 5: Accessories of the chassis shipping container

Other equipment

You require items not included in the chassis accessory package. Before you install the hardware, ensure that you obtain all the cables, tools, and other equipment you need.

Requirement	Description
PC, laptop, VT100 console, or equivalent	You can attach these items to the chassis to configure startup options or monitor the results of startup diagnostics.
Rack mounting hardware	The hardware to mount the chassis in an equipment rack depends on your rack type. Install the device in a standard EIA-310D 19-inch or ETSI 600–millimeter (mm) rack. The chassis fits in a standard 19-inch rack using the mounting brackets that ship with the unit. To install the chassis in an ETSI 600–mm rack, you must provide mounting brackets to adapt the chassis to the rack.

Requirement	Description
Phillips screwdriver	You need a Phillips screwdriver to install the chassis in a standard rail-type equipment rack if you use Avaya-supplied screws.
Cables	The chassis accessory package does not include the cables required for your network configuration.

Rack mount

You can install a maximum of two Virtual Services Platform 9010 chassis in a standard 19 inch wide, 7 foot tall rack.

 **Important:**

Install chassis units from the bottom up to ensure racks do not become top heavy, and fall over.

Virtual Services Platform 9010 chassis installation

This section provides the procedures to install the Virtual Services Platform 9010 chassis.

Before you begin

- Inspect all items for shipping damage. If you find damaged items, do not install the chassis. Call the Avaya Technical Solutions Center in your area.
- Verify that the items in the shipping container match those on the shipment packing list.
- Verify that you have all other required hardware.

 **Warning:**

The procedures in this section must be performed by trained service personnel only.

Chassis installation time requirements

The following table lists the procedures you perform to install the Virtual Services Platform 9010 chassis, and the estimated time you need to complete each procedure. All systems do not require every procedure.

Table 6: VSP 9010 installation procedures and time requirements

Procedure	Time requirement
Reducing the chassis weight	5 minutes
Securing the chassis in a flush-mount configuration	12–30 minutes
Securing the chassis in a mid-mount configuration	12–30 minutes
Grounding the chassis	12 minutes

Unpacking the shipping container

Remove the equipment in the shipping container. In addition to the chassis, the shipping container includes an installation kit and a cover panel kit.

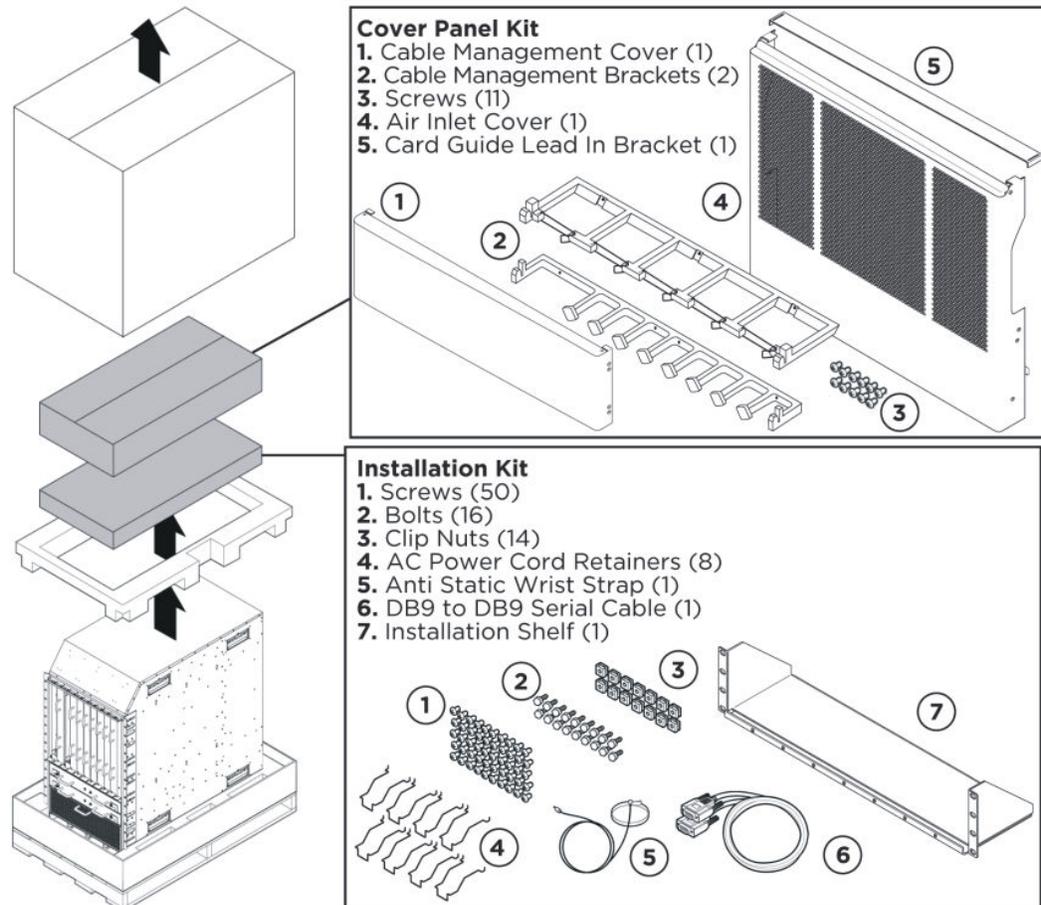
About this task

The installation kit includes extra screws and bolts to support a variety of installation options. You do not need to use all of the hardware provided.

If the installation kit does not contain all of the components, contact Avaya Support.

Procedure

Unpack the shipping container for the AC chassis.



Installing the installation shelf

The installation shelf is an optional item used for installation of the chassis in a rack. You can mount a chassis on top of another Virtual Services Platform 9000 chassis instead of using the installation shelf.

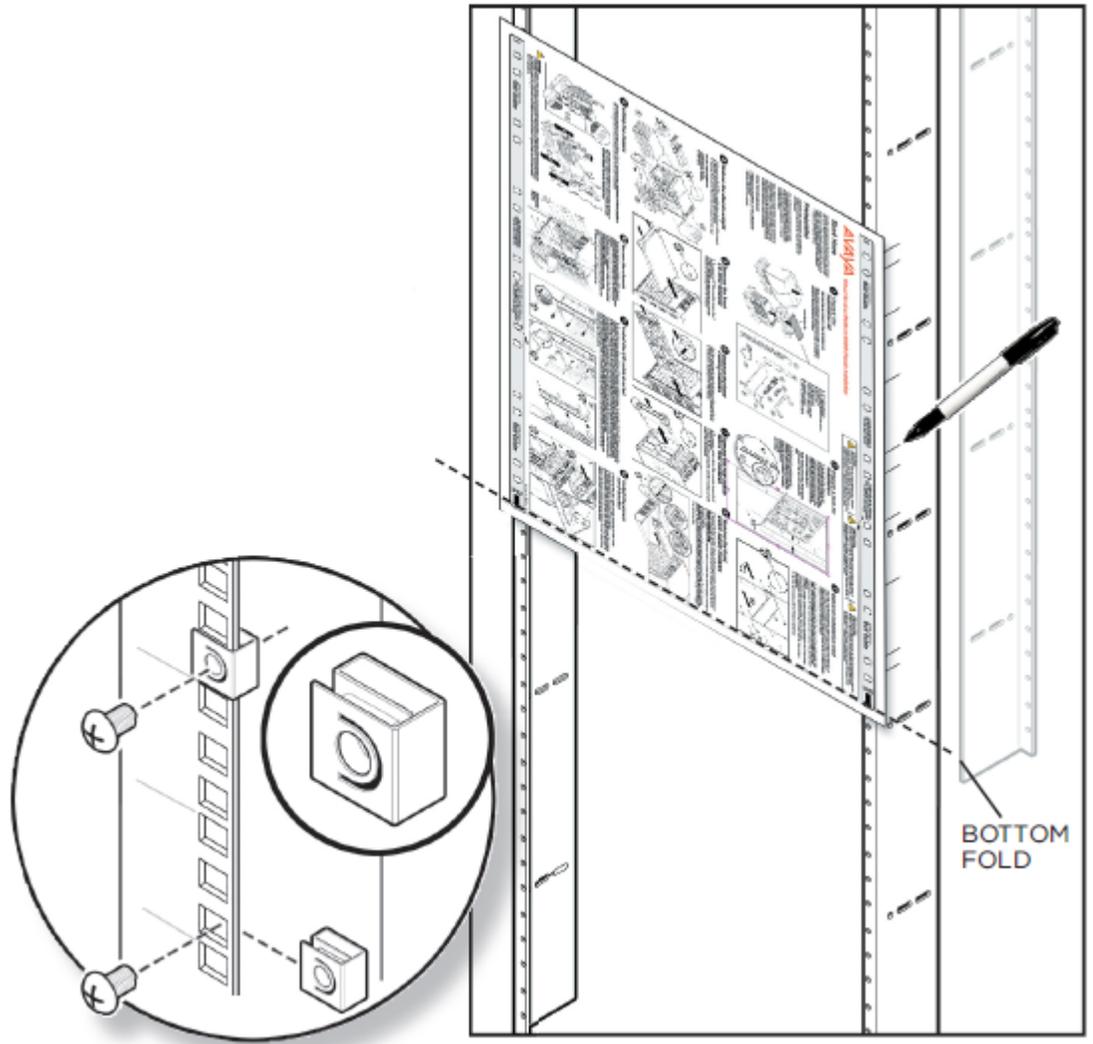
Procedure

1. Use the rail guides provided at the top and bottom of the installation poster to identify where you want the chassis bottom to rest, and then mark that location and the location of the rail guide holes on the front of the rack. Start at the bottom of the rack and install subsequent chassis above it.

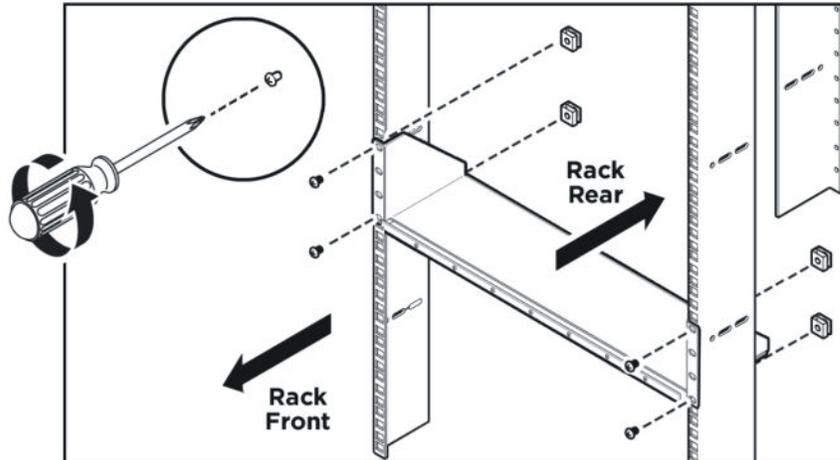
*** Note:**

Fold or trim off the margins of the poster to help mark the rack.

2. If the holes in the vertical supports require clip nuts, insert a clip nut in each of the 14 locations where you mark the holes. Avaya includes clip nuts. If necessary, use the clip nuts for your specific rack model.



3. Place the installation shelf at the mark on the rack, inside the rails. Hold the installation shelf in position, and then align the mounting rail with the two holes on each side of the vertical rack support.
4. Insert a Phillips screw through each installation shelf mounting hole and into the corresponding hole in the rack.
5. If using hex nuts, add a nut to each screw, and then tighten using a hex wrench.
6. Tighten each screw with a Phillips screwdriver.



Reducing the chassis weight

Reduce the chassis weight to make the chassis easier to lift, and to reduce the risk of personal injury or equipment damage.

Remove the filler modules from the front and rear of the chassis.

Remove the two cooling modules from the front of the chassis.

About this task

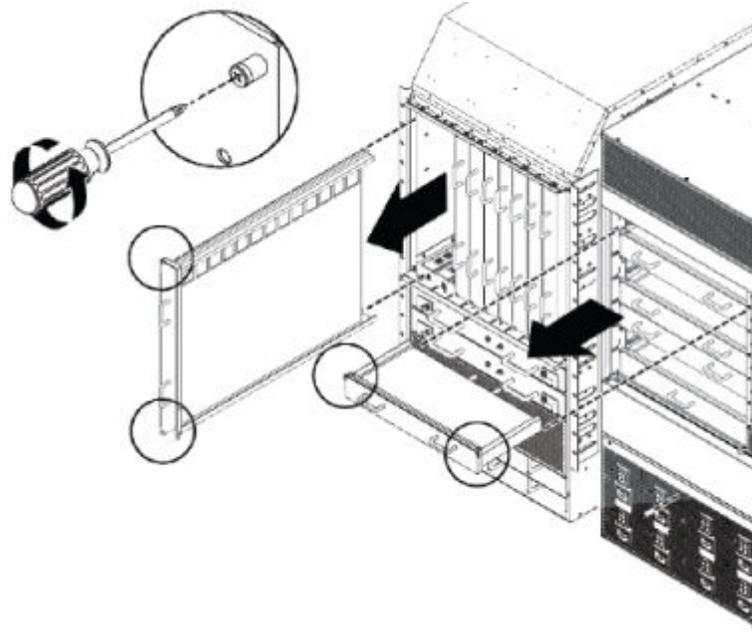
⚠ Important:

Do not install additional components before you mount the chassis in the rack.

All unused slots must contain filler modules. If you remove filler modules to reduce the chassis weight, ensure you reinstall them after you complete the chassis installation.

Procedure

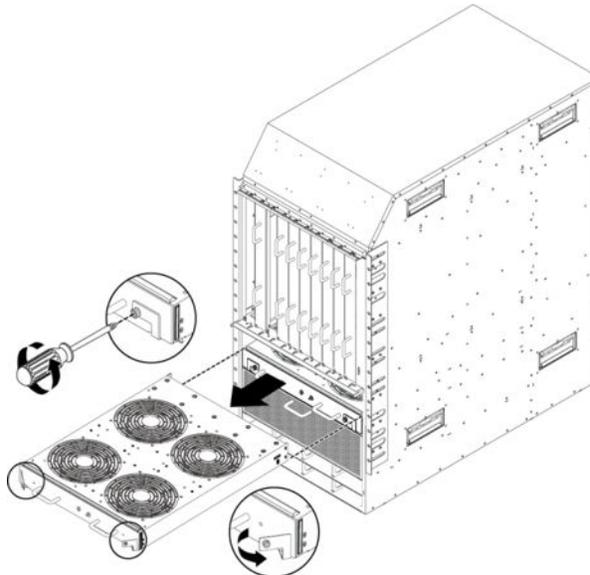
1. To unseat the filler module, loosen the two captive screws, grasp the two handles, and gently pull the module out and away from the chassis.



2. To unseat the cooling module, loosen the two captive screws, rotate the tabs to release the cooling module, and then grasp the two handles to gently pull the module out and away from the chassis.

⚠ Caution:

The cooling module is heavy. Use both hands to support the weight of the module.



Lifting the chassis

The Virtual Services Platform 9010 weighs in excess of 141 lb (64 kg). Each chassis requires a minimum of three people to lift. Always use a mechanical lift when one is available.

Use the handles that swing out from the top and bottom of the chassis sides to lift the chassis. To use the handles, swing the handle up and out from the chassis. From the rear, lift the chassis from the bottom only.

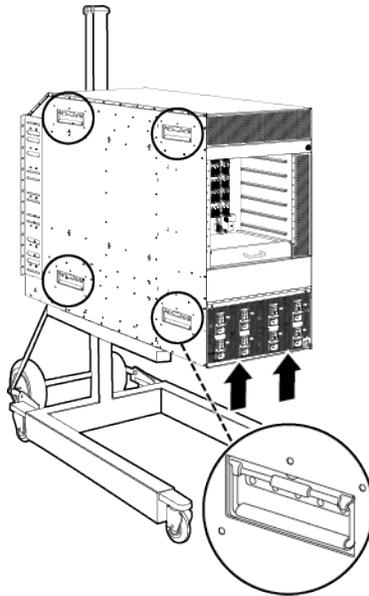
Before you begin

Important:

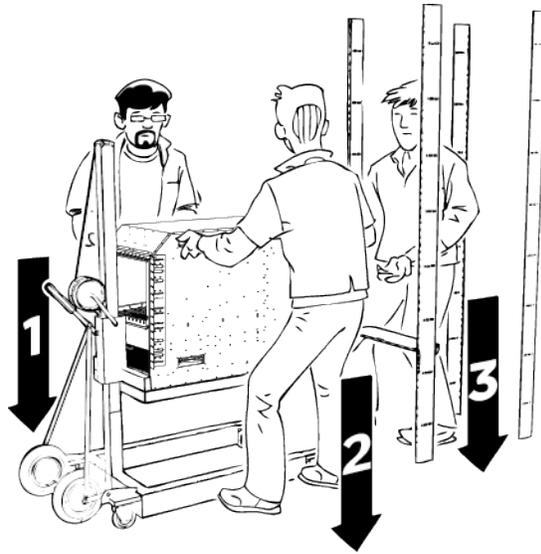
Reduce the weight of the chassis as much as possible before you lift it. Always use a mechanical lift when one is available. Ensure you have at least three people to lift the chassis. Use two people to lift the chassis at the sides and a third person to support the chassis from behind the rack, as you position the chassis on the shelf and hold it in place. Take care to lift the chassis from the bottom.

Procedure

1. Use the recessed handles at the top and bottom of the chassis sides to lift the chassis. To use the handles, swing the handle up and out from the chassis.



2. From the rear of the chassis, lift the chassis from the bottom only.

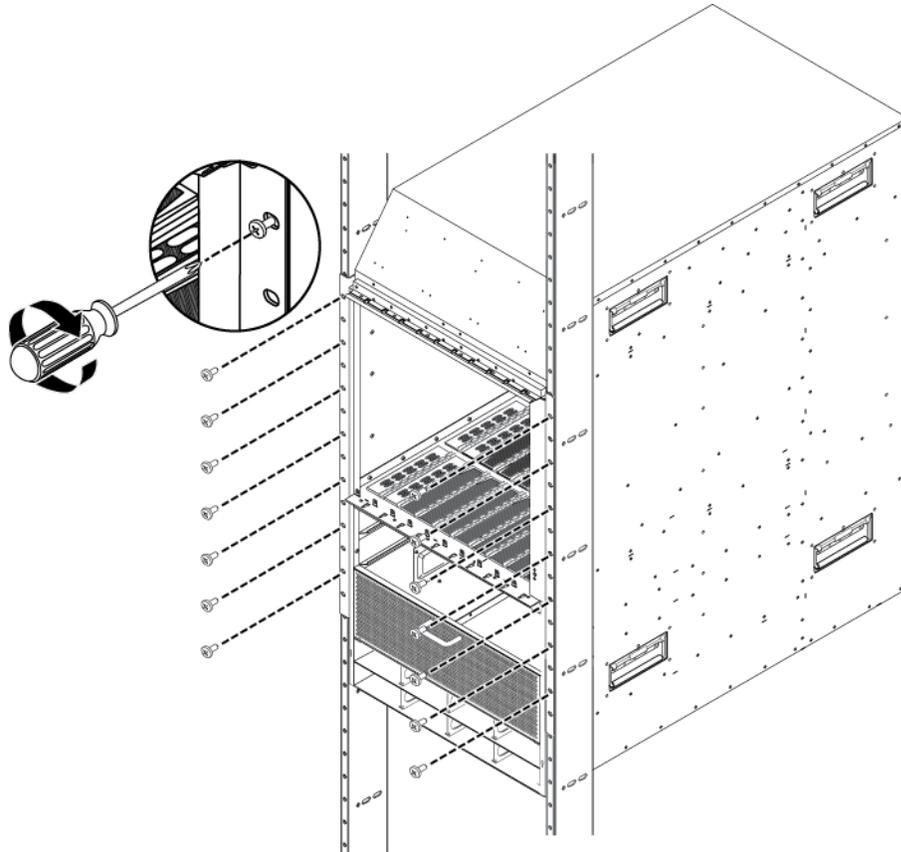


Securing the chassis in a flush-mount configuration

Mount the Virtual Services Platform 9010 in a standard two-post or four-post equipment rack. This procedure aligns the chassis front with the rack.

Procedure

1. Hold the chassis in position and align the flanged end of the chassis mounting bracket with the holes on either side of the vertical rack support.
2. Ensure that the hole pairs on either side of the rack vertical supports match horizontally.
3. Insert a Phillips screw through each hole on the mounting bracket in the screw positions in the flange and rack.
4. Tighten each screw with a Phillips screwdriver.



Securing the chassis in a mid-mount configuration

Mount the Virtual Services Platform 9010 chassis in a standard two-post or four-post equipment rack in a mid-mount configuration. You must remove the mounting brackets, and then install them at the midmount location of the chassis.

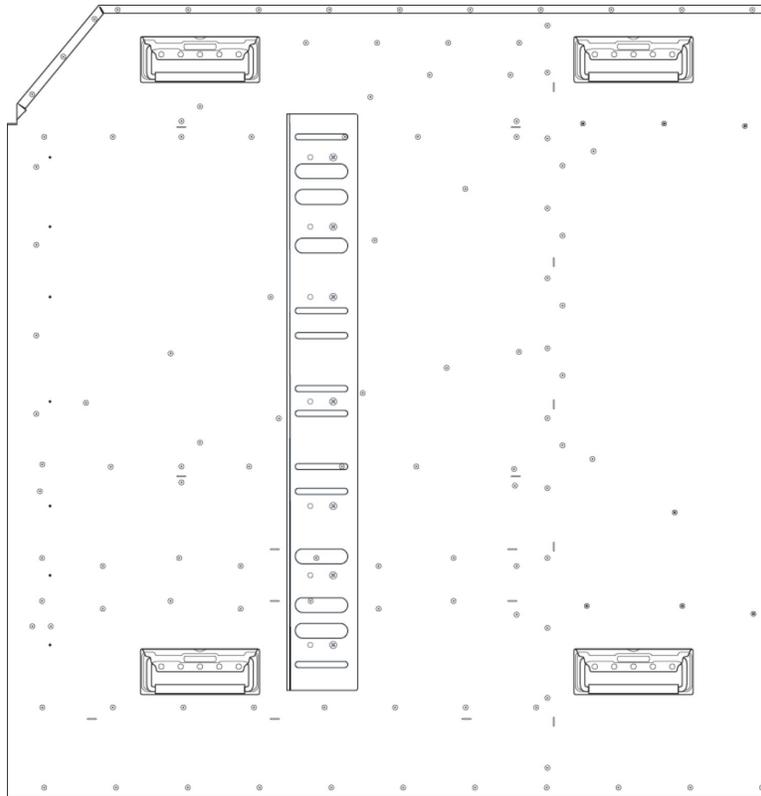
About this task

The default configuration is a flush-mount configuration. The rack mounting brackets for the flush-mount configuration are installed at the factory before the chassis ships.

Select the configuration that best meets your floor plan, room layout, or rack style requirements.

Procedure

1. Remove the mounting brackets attached to the front of the chassis sides.
2. Align the holes on the mid-mount bracket with the holes in the mid-mount location on the chassis side.



3. Insert a Phillips screw through each hole on the mounting bracket and chassis.
4. Use a Phillips screwdriver to tighten the screws.
5. Hold the chassis in position and align the flanged end of the mounting bracket with the holes on either side of the rack support.
6. Ensure that the holes on either side of the rack supports match horizontally.
7. Insert a Phillips screw through each hole on the mounting bracket in the screw positions in the flange and rack.
8. Use a Phillips screwdriver to tighten the screws.

Attaching the cable management

Use this procedure to attach the cable management brackets and cable management cover to the top of the Virtual Services Platform 9010 chassis.

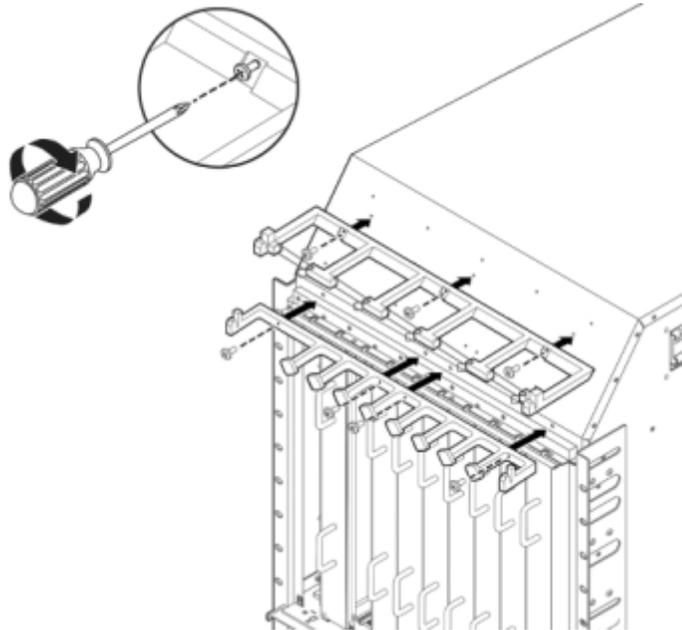
The cable management includes wire bales that swing out for dressing cables. The wire bales swing back in place to latch and retain the cables. The top cover is placed over the cable management.

Before you begin

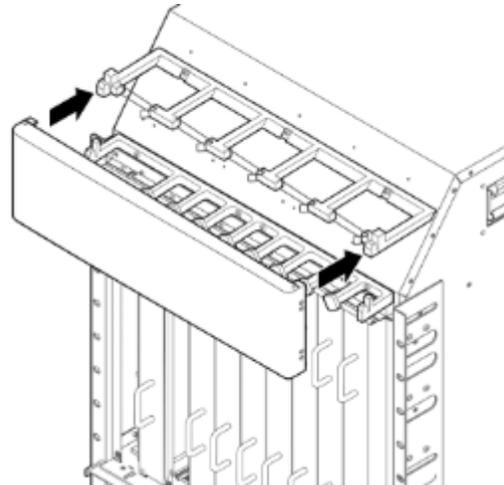
- Secure the chassis in the rack. Do not attach the cable management cover before you mount the chassis in a rack.

Procedure

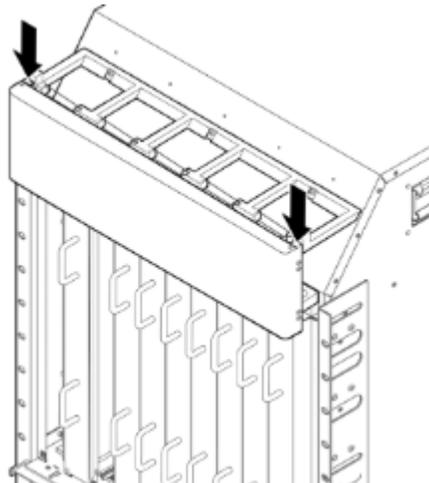
1. Align the holes in the upper cable management bracket to the holes on the top of the chassis front.
2. Use the screws to attach the bracket to the chassis.
3. Align the holes in the lower cable management bracket to the holes on the top of the chassis front.
4. Use the screws to attach the bracket to the chassis.



5. Align the tabs of each side of the cable management cover with the slots on the brackets.



6. Lower the cover into place.



Attaching the air inlet cover

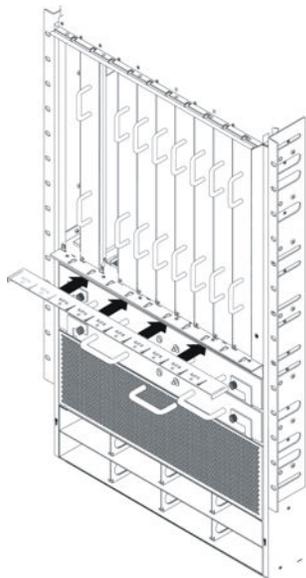
Attach the air inlet cover to maintain proper cooling airflow in the chassis.

Before you begin

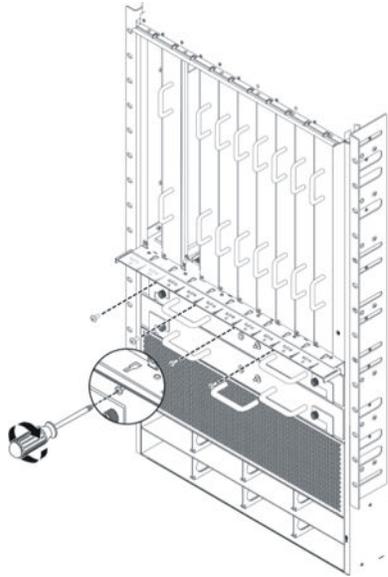
- Secure the chassis in the rack. Do not attach this cover before you mount the chassis in a rack.

Procedure

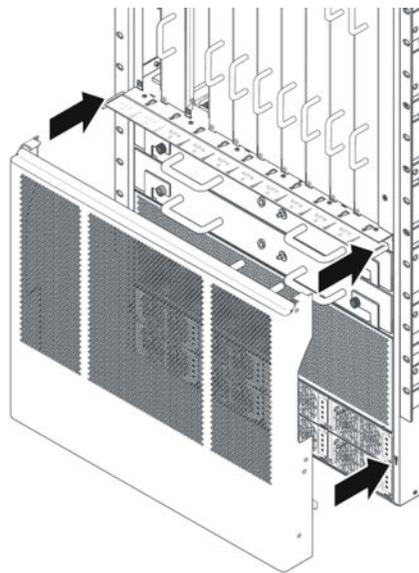
1. Align the holes in the card guide lead in bracket with the holes in the chassis.



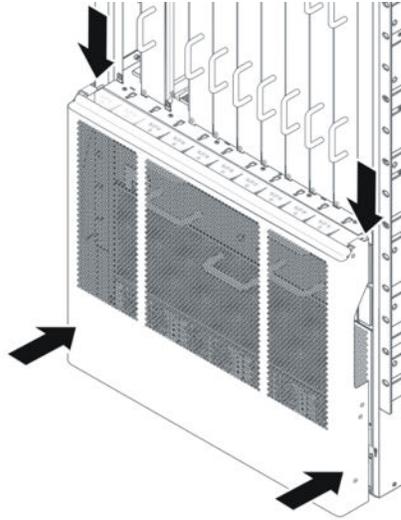
2. Use the screws to attach the bracket to the chassis.



3. Align the hooks on the cover with the slots on the mounting bracket and with the keyholes on the chassis.



4. Insert the hooks into the slots and keyholes to secure the cover to the chassis.

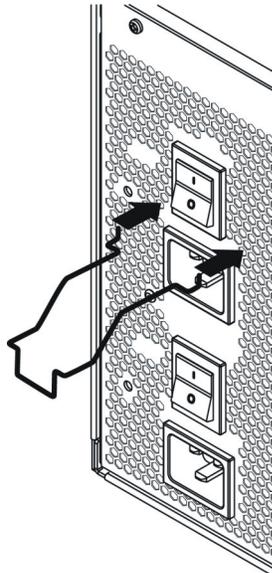


Attaching the AC power cord retainer

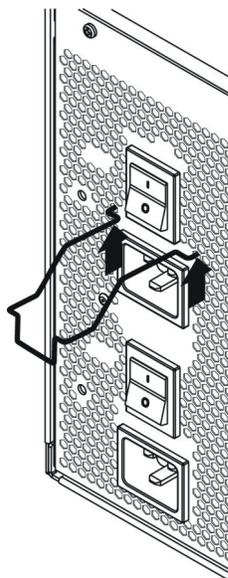
Attach the power cord retainer to support the power cords at the back of the AC chassis.

Procedure

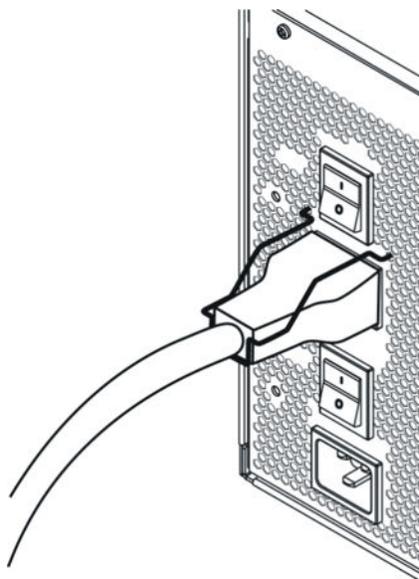
1. Insert the L-shaped ends of the retainer into the holes on each side of the power switch.



2. Push the L-shaped ends up to fully engage the retainer.



3. Place the power cord in the notch of the retainer.



Grounding the chassis

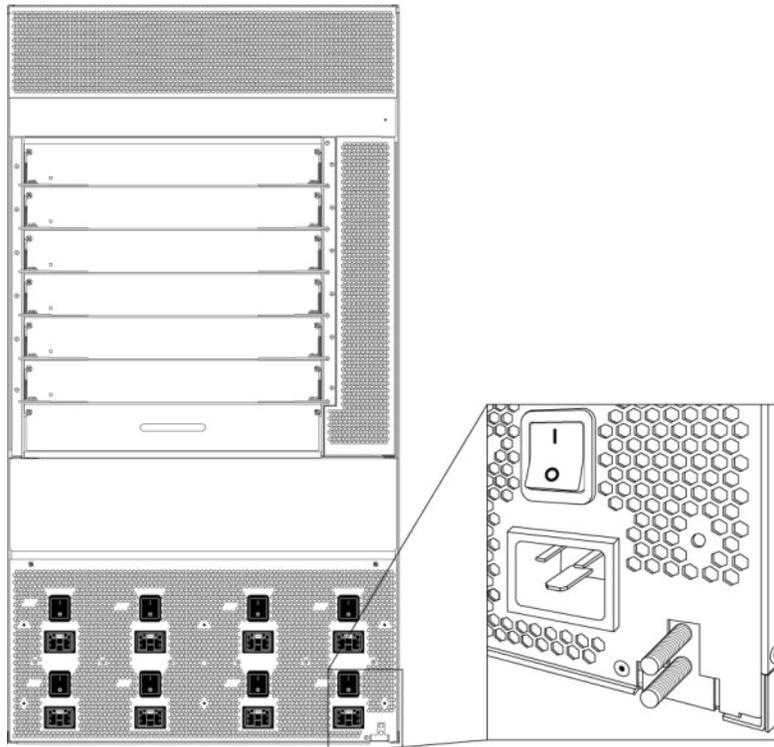
Ground the chassis before you install power supplies or connect power and network cables to the system.

Before you begin

- Ensure you have a two-hole cable lug that fits over the grounding studs.
- Ensure you have a nut and a locking washer for the grounding stud.
- Ensure you have a 6-AWG green and yellow ground wire long enough to connect to the ground point.
- Ensure you have a 1/4 inch (6 mm) socket or nut driver.

Procedure

1. Crimp the two hole lug onto the ground wire.
2. Attach the chassis ground cable to the grounding studs on the chassis. As shown in the following figure, the grounding studs are located on the bottom right of the chassis rear.

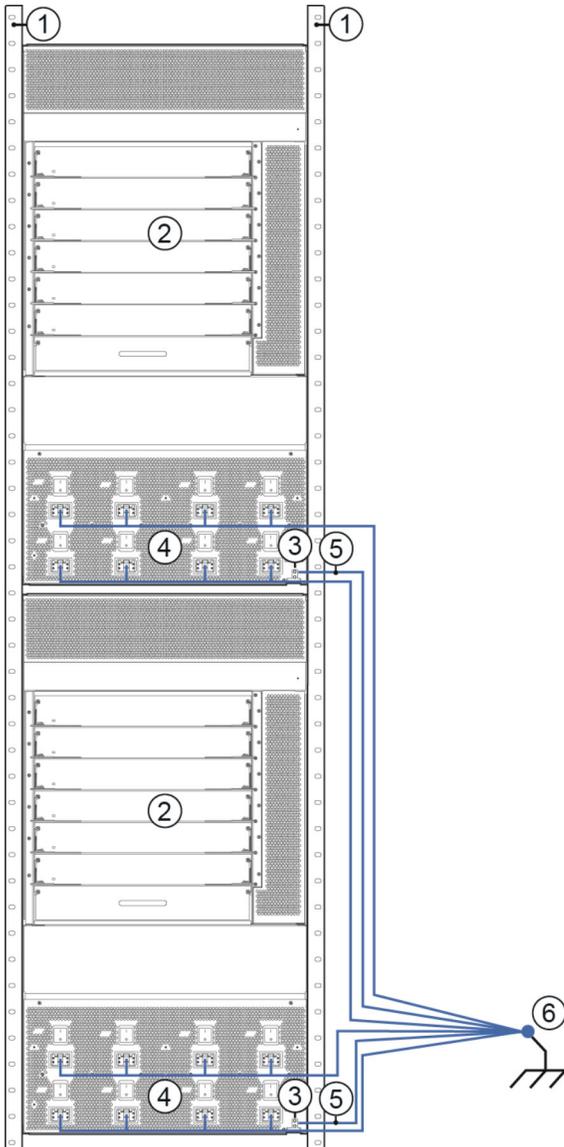


3. Bond the chassis ground cable to the single point ground window.

Job aid

The following figure shows an example of how to attach the chassis ground cable to the rack grounding strip.

Figure 6: Rack grounding strip example



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

Item	Description
1	Equipment rack
2	Cabinet frame
3	Chassis frame ground studs
4	AC power inlets
5	#6 AWG green/yellow ground wire (not provided)
6	Single point ground

The following figure shows the ESD ground strap input location on the front of the chassis.

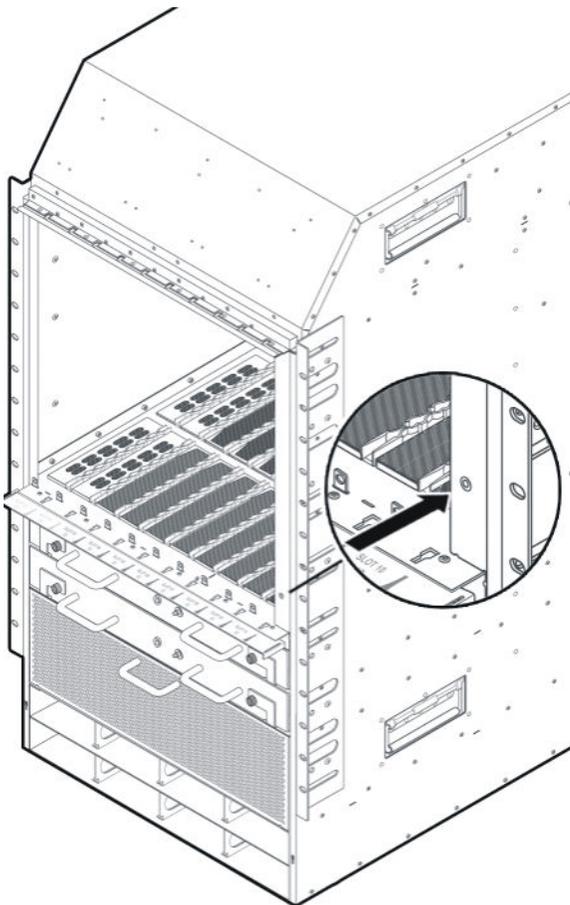


Figure 7: ESD ground strap input (front)

The following figure shows the ESD ground strap input location on the rear of the chassis.

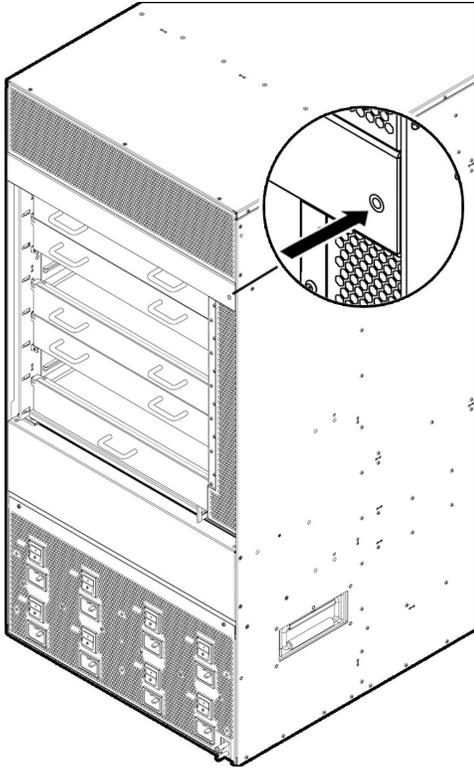


Figure 8: ESD ground strap input (rear)

Successful installation verification

In a normal power-up sequence, the LEDs light as follows:

- After you apply power to the switch, the corresponding power supply power LEDs and cooling module LED lights amber.
- After the CP module starts to boot, the Online LED for each I/O module lights amber.
- Each I/O module initiates a self-test, during which the port and module LEDs display various patterns to indicate the progress of the self-test.
- Upon successful completion of the self-test, within 5 to 15 minutes after you apply power, depending on the module type, the I/O module Online LED transitions from amber to green.

If the LEDs on the modules light in this sequence, your installation is successful. Contact your network administrator to verify that the Avaya Virtual Services Platform 9000 connects to the network.

If the LEDs do not light in this sequence, contact your local Avaya Technical Solutions Center.

Chapter 5: Virtual Services Platform 9012 chassis

This chapter provides information to install the Virtual Services Platform 9012 chassis.

Virtual Services Platform 9012 chassis fundamentals

The Avaya Virtual Services Platform 9012 chassis consists of a sheet metal enclosure, a midplane, cooling modules, and power supplies. The number of power supplies needed depends on the specific hardware configuration and redundancy needs.

Virtual Services Platform 9012 chassis introduction

The front of the Virtual Services Platform 9012 chassis has ten slots for I/O modules and two slots for Control Processor (CP) modules. Slots are numbered from top to bottom. The front of the Virtual Services Platform 9012 chassis also has two bays for cooling modules and six bays for AC power supplies. The following figure shows the front view of the chassis.

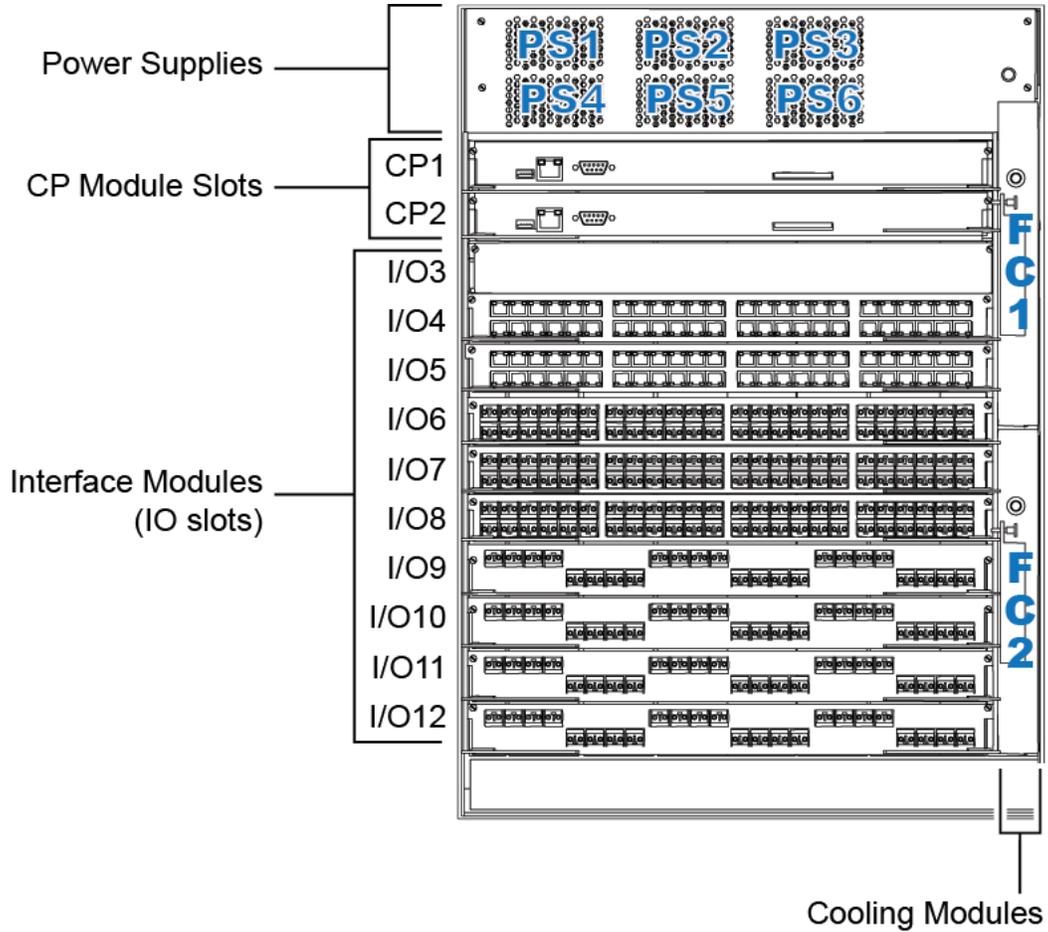


Figure 9: VSP 9012 chassis front view

In the rear, the chassis has six slots for Switch Fabric (SF) modules and two auxiliary slots for future use. Rear slots are numbered from right to left. The rear also has two bays for cooling modules. Six separate IEC 60320-C20 AC power inlets and six power switches exist, which connect the main AC power to their corresponding power supply bays. The following figure shows the rear view of the chassis. The ground bonding location is in the bottom right part of the chassis.

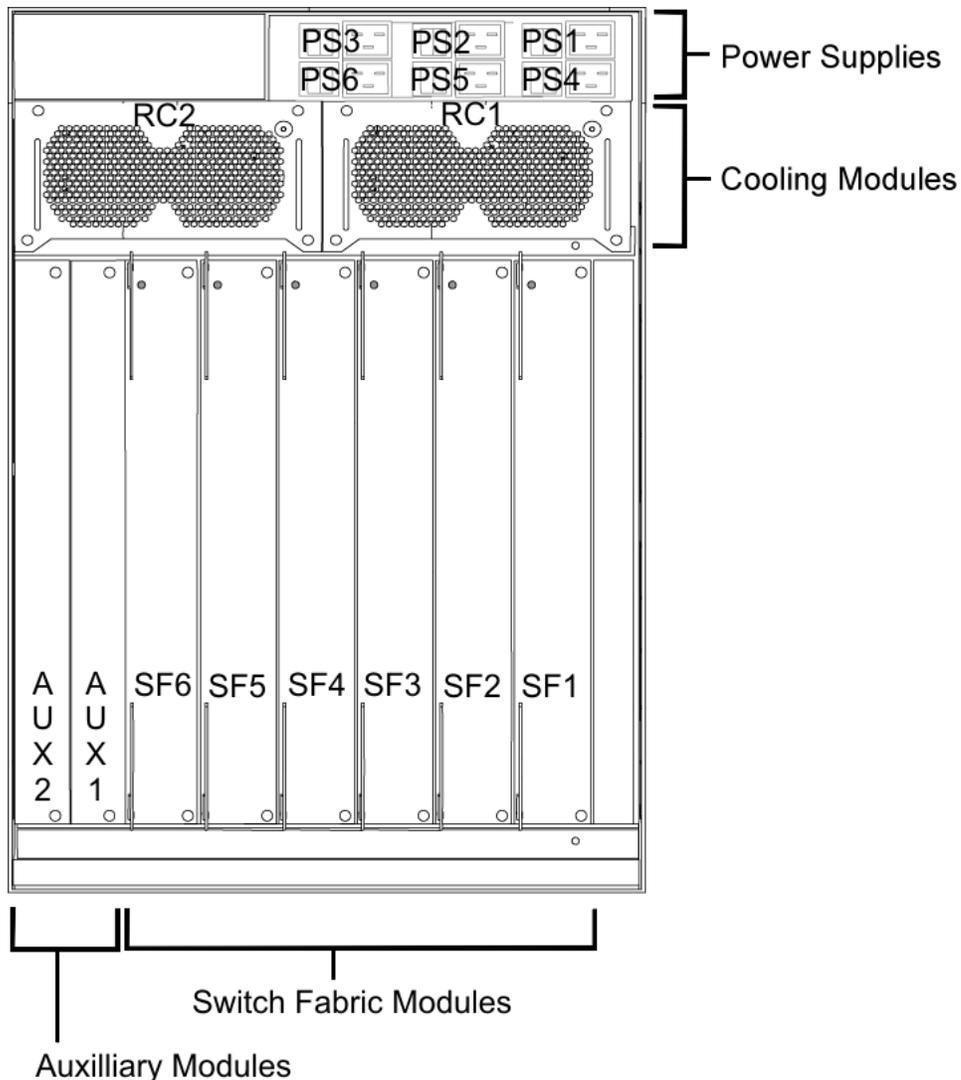


Figure 10: VSP 9012 chassis rear view

Power supplies

This section describes the AC power supplies, the power inlets and how to plan for feed and power supply redundancy.

AC power supplies

The Virtual Services Platform 9012 chassis has six bays for AC power supply installation. Install the power supplies in the front of the chassis and plug the power plugs in the corresponding power inlets at the back of the chassis. The Virtual Services Platform 9012 chassis does not support DC-input power supplies.

To configure a Virtual Services Platform 9012 system, consider the total power consumption to ensure proper system performance. The total input power consumption of the components (modules and cooling modules) must not exceed the output power rating of the power supply.

For more information about the power consumption of each module, see [Component input power](#) on page 106.

When the Virtual Services Platform 9012 operates in a redundant power configuration, you can upgrade or replace power supplies while the chassis remains in operation.

For more information about power supply installation, see *Avaya Virtual Services Platform 9000 Installation — AC Power Supply*, NN46250-303.

Power supply and power inlet locations

In the front of the chassis, the power supply bays are numbered increasing from left to right, so 1, 2, and 3 on the first row, and 4, 5, and 6 on the second row.

The power inlets in the back of chassis are numbered decreasing from left to right, so 3, 2, and 1 on the first row, and 6, 5, and 4 on the second row (as viewed from the back).

For more information about grounding the Virtual Services Platform 9012 and related precautions, see [Grounding the chassis](#) on page 95.

Power supply redundancy

The Virtual Services Platform 9012 supports multiple power supplies for custom power redundancy configurations. Two typical configurations are $n + 1$ or $n + n$, where n is the number of required power supplies to power the chassis and modules.

You can configure the Virtual Services Platform 9012 for $n + n$ redundancy by means of distributing an "A" power feed to the "A" power shelf, which comprises of AC power supplies 1, 2, and 3, and a "B" power feed to the "B" power shelf, which comprises of AC power supplies 4, 5, and 6. Apply this power configuration protection against simultaneous power supply and individual power feed failure.

Use $n + n$ redundancy to ensure internal redundancy in the event of a power supply failure. Install an additional power supply, which is additional to what you require to power your hardware configuration, to provide $n + n$ redundancy. If two separate power feeds are not available at the site power distribution, you can only configure the system for $n + n$ redundancy.

Use $n + n$ redundancy to ensure redundancy in the event that an external failure occurs, for example, an entire power feed within the building fails. To ensure $n + n$ redundancy, you must install power supplies to provide twice the power requirements of your hardware configuration.

Important:

The system reserves the following power requirements:

- 80 Watts (W) each for the primary and secondary Control Processor (CP) modules
- 70 W each for the Switch Fabric (SF) modules located in slots 1 and 4
- 150 W each for the two IO fan trays
- 65 W each for the two SF fan trays

See [Component input power](#) on page 106 for information on power consumption.

Power feed redundancy

Avaya recommends that you use two separate power feeds to plug the AC power supplies.

The power supplies in the 9012 chassis are divided in two shelves. The top shelf (shelf "A") consists of power supplies 1, 2, and 3, while the bottom shelf (shelf "B") consists of power supplies 4, 5, and 6.

If you use n + n redundancy and plug the power supplies from the top shelf in power feed "A", and the power supplies from the bottom shelf in power feed "B", this gives you power feed redundancy.

Each shelf can provide 3600 W (at 100-120 VAC) or 6000 to 9825 W (at 200-240 VAC), depending on the AC power supplies you install. Ensure that each power supply connects to a dedicated breaker.

Switch Fabric module

You must install a minimum of three SF modules in the chassis. Avaya recommends that you install a minimum of four SF modules for redundancy. You must install an SF module in slots SF1 and SF4; install a third SF module in one of the remaining slots.

Each SF module connects to the ten different I/O module slots and the two CP module slots simultaneously. You can install a maximum of six SF modules in each chassis in a 5 + 1 redundancy configuration.

The SF module slot numbers increment from right to left when you view the chassis from the rear. The slot location determines the module function. Slots 1 and 4 provide the arbitration and scheduling for traffic (and therefore, bandwidth management) from the I/O modules and provide redundancy when both slots are populated. The other slots provide additional bandwidth.

Important:

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

Bandwidth is dependent on your hardware configuration.

The Virtual Services Platform 9012 chassis can use the 9090SF module.

Control Processor module

The 9080CP module performs the following tasks:

- runs all high level protocols, for example Border Gateway Protocol (BGP) and Open Shortest Path First (OSPF)
- distributes the routing update
- manages and configures the I/O and SF modules
- maintains and monitors the health of the chassis
- displays the status of the modules installed at the back of the chassis using LEDs

You can hot swap the external storage devices (compact flash memory card or the USB devices). Any sudden removal of external storage devices can cause data loss or damage the hardware. For more information on the removal of external storage devices, see [Removing external storage devices from the CP module](#) on page 101.

For more information about how to install CP modules, see *Avaya Virtual Services Platform 9000 Installation — Modules*, NN46250-301.

Important:

The 9080CP module in a Virtual Services Platform 9010 AC chassis must run software Release 3.4 or later. You cannot plug and play a 9080CP module from a Virtual Services Platform 9012 chassis to a Virtual Services Platform 9010 AC chassis if the Virtual Services Platform 9012 runs a software version earlier than Release 3.4. For more information about hardware and software compatibility, see *Avaya Virtual Services Platform 9000 Release Notes*, NN46250-401.

Cooling modules

The Virtual Services Platform 9012 chassis uses four cooling modules. Two cooling modules at the front of the chassis cool the CP and I/O modules. Two cooling modules at the back of the chassis cool the SF modules.

You install the cooling modules for the I/O and CP modules at the front of the chassis. The cooling modules plug into the midplane. The cooling air flows from left to right, as viewed from the front. A green LED indicates correct fan operation.

You install the cooling modules for the SF modules at the back of the chassis. The cooling air flows from front to back to cool the SF and auxiliary modules.

See *Avaya Virtual Services Platform 9000 Installation — Cooling Modules*, NN46250-302, for information about how to install cooling modules.

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.

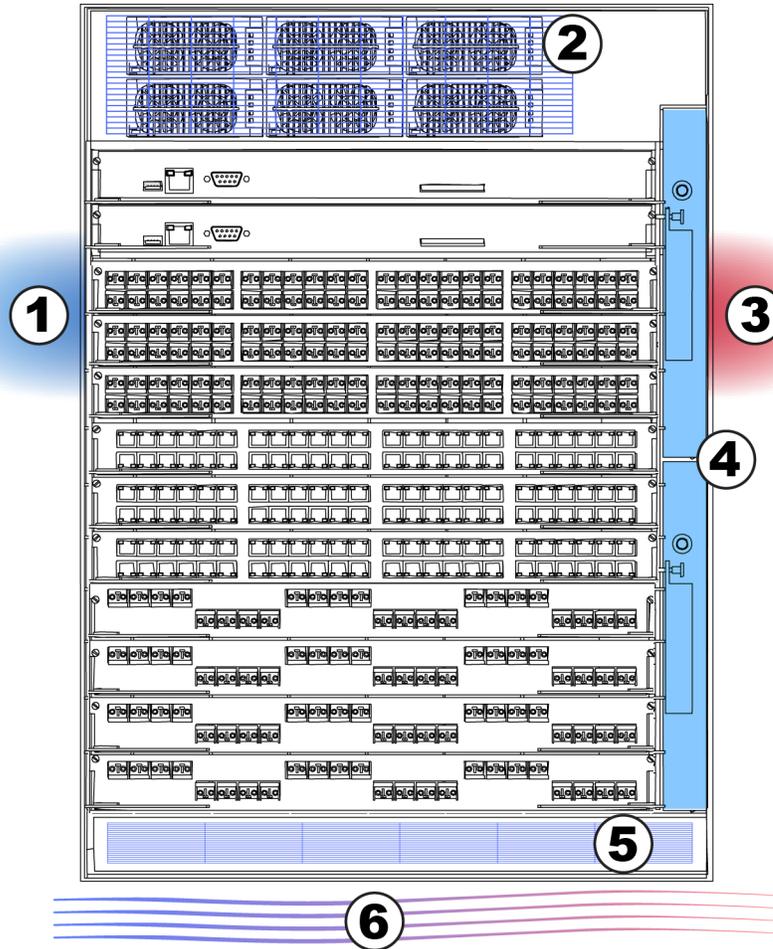


Figure 11: Front of the Virtual Services Platform 9012

Table 7: 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 cooling modules
5	Switch Fabric module air inlet

Diagram	Description
6	Airflow – left to right

Left-to-right cooling

Airflow moves from left to right to cool the Control Processor and I/O modules. Two 9012FC cooling modules, on the front right side of the Virtual Services Platform 9012, provide this air movement and have adjustable fan speed that depends on the system temperature.

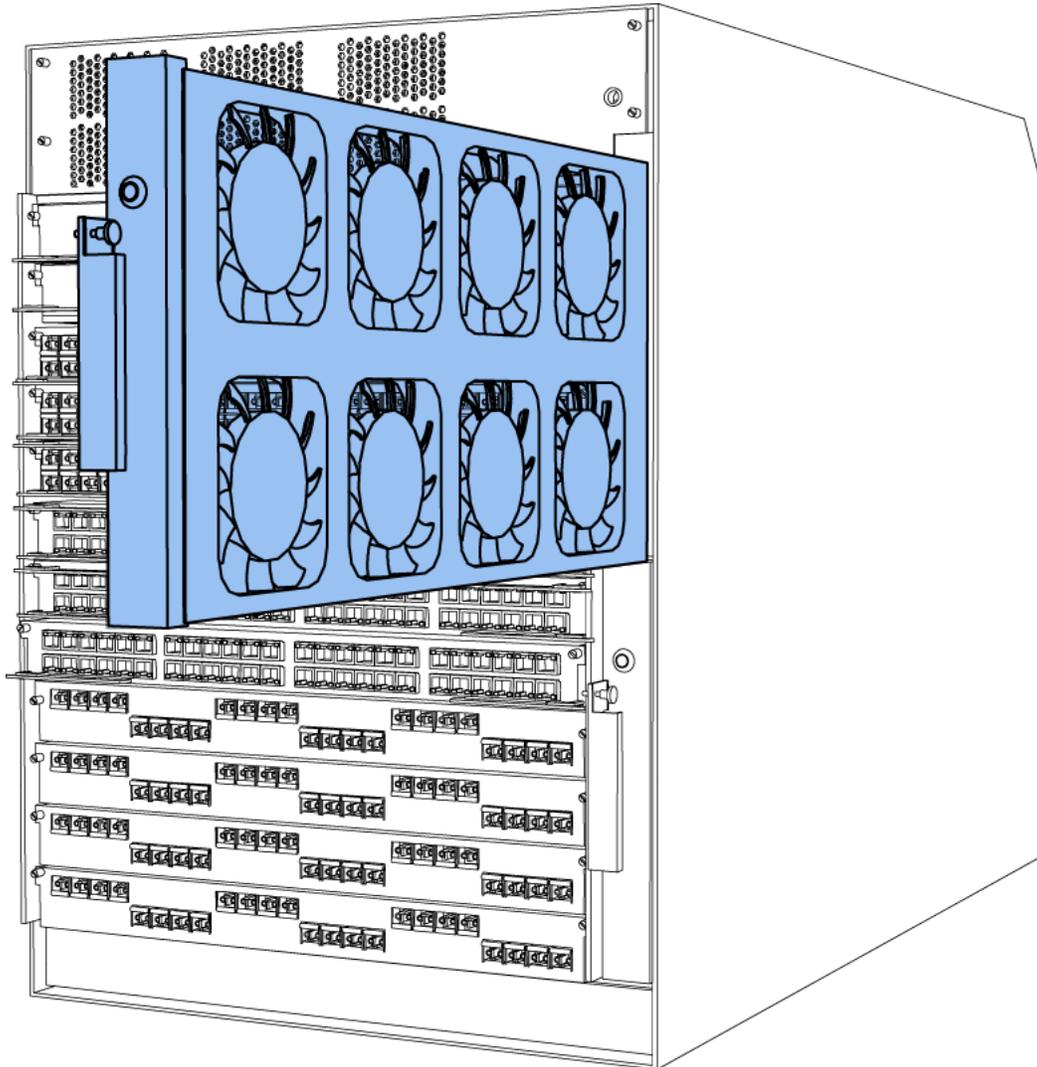


Figure 12: 9012FC cooling module

Each 9012FC cooling module has eight fans. The platform polls all I/O module and CP module sensors and adjusts the 9012FC 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.

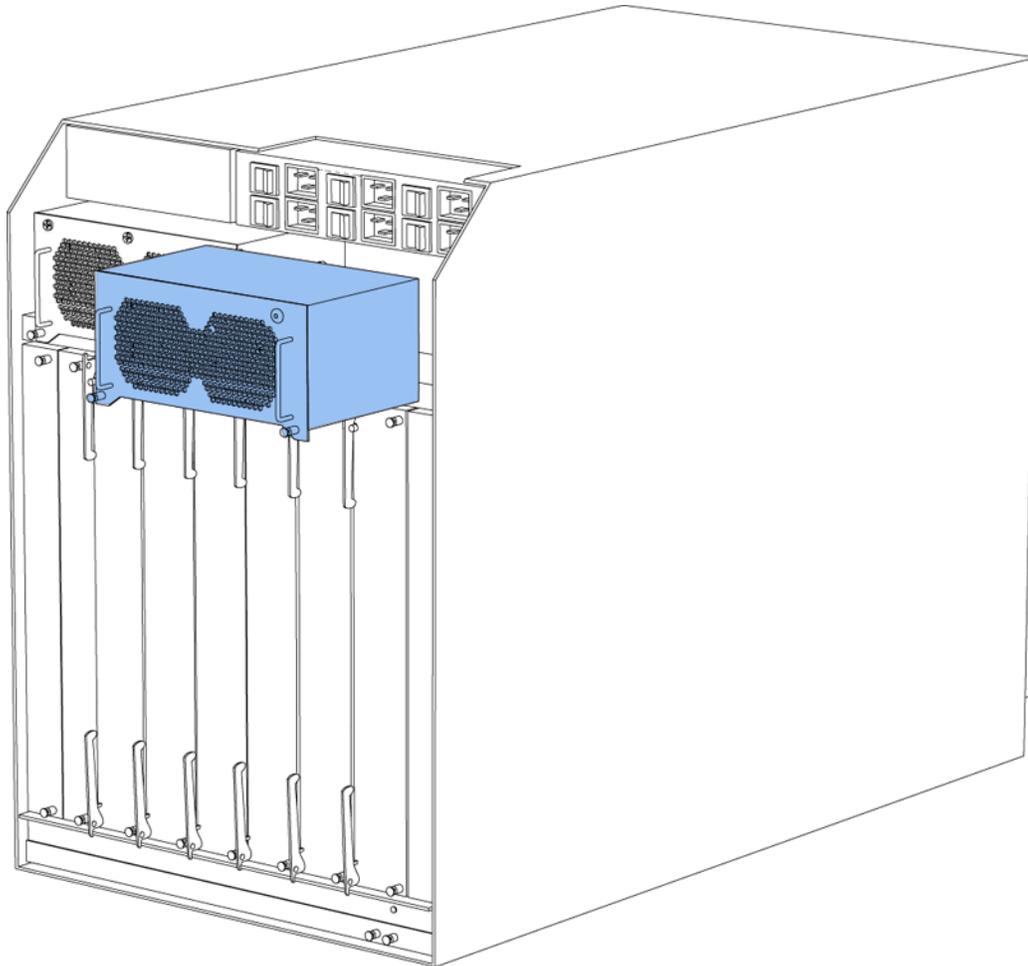


Figure 13: 9012RC cooling module

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.

CP and SF modules

If a CP or SF module reaches 55 degrees Celsius (°C), which is one degree more than the alarm threshold of 54 °C, the system initiates an SNMP trap and the module online LED displays as blinking and red. The CP and SF module alarms clear after the temperature of the CP and SF modules fall to 53 °C. The CP and SF modules shut down by removing power from the slot at 60 °C, which is one degree more than the shutdown threshold of 59 °C.

I/O modules on the Virtual Services Platform 9012

On the Virtual Services Platform 9012, if an I/O module reaches 60 °C, which is one degree more than the alarm threshold of 59 °C, the system initiates an SNMP trap and the module online LED displays as blinking and red. The module alarm clears after the I/O module temperature falls to 58 °C. The I/O module shuts down by removing power from the slot at 65 °C, which is one degree more than the shutdown threshold of 64 °C.

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.

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 on the VSP 9012	Module LED color	Alarm threshold	Shutdown threshold
		modules are at 53 °C.	
I/O module	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.	

Bringing the module online

After the system shuts down a module, 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.

Heat sensor locations

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

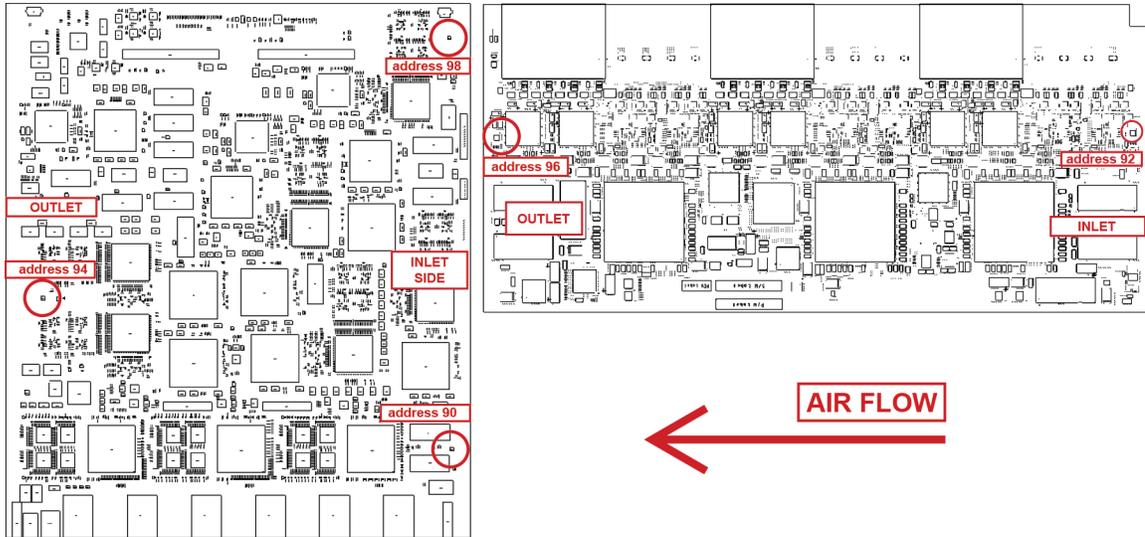


Figure 14: Heat sensor locations in the I/O module

Use the following table to understand the heat sensors in the preceding I/O module.

Table 8: Zone to heat sensor mapping

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.

```
Virtual Services Platform-9012:1(config)#show sys-info temperature
```

Temperature Info :

Slot	Zone-1 Temp	Zone-2 Temp	Zone-3 Temp	Zone-4 Temp	Zone-5 Temp	Highest Temp	Lowest Temp	Alarm Threshold	Shutdown Threshold
1	30	29	--	31	25	31	25	54	59
4	29	26	30	32	25	32	25	59	64
SF1	29	--	--	24	--	29	24	54	59
SF4	28	--	--	24	--	28	24	54	59

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

Value	Description
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.

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.

Fan Trays Info :

Zone Info :

```

FRONT zone :
  Mode : NORMAL
  Mode Status : Normal
  Highest Temperature : 31 C
REAR zone :
  Mode : NORMAL
  Mode Status : Normal
  Highest Temperature : 29 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

--More-- (q = quit)
    
```

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.
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.

Value		Description
	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.

Virtual Services Platform 9012 placement in the rack

If you place each Virtual Services Platform 9012 in a row from left to right, the chassis to the left discharges hot air into the cool intake of the chassis to the right.

To optimize airflow, stagger each chassis in racks and add a baffle that redirects hot air discharged by a chassis from the side to the hot aisle at the back.

 **Note:**

Before setting up your data center plan airflow of cool air into each chassis.

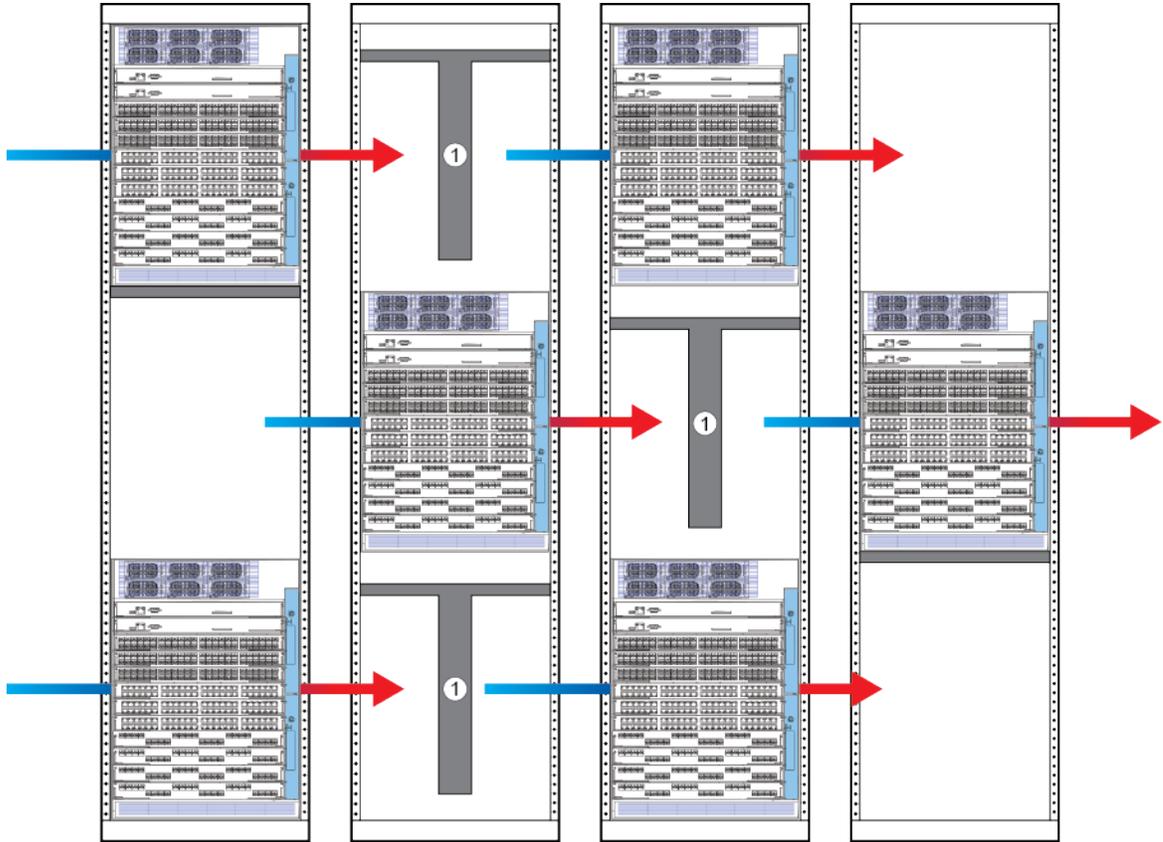


Figure 15: Arrangement of VSP 9012 in rack to optimize airflow

Data center floor plan

Typically a data center optimizes airflow through the creation of hot aisles and cold aisles.

The cold aisles can have a raised floor, which consists of tiles with perforations to allow cold air to enter the devices.

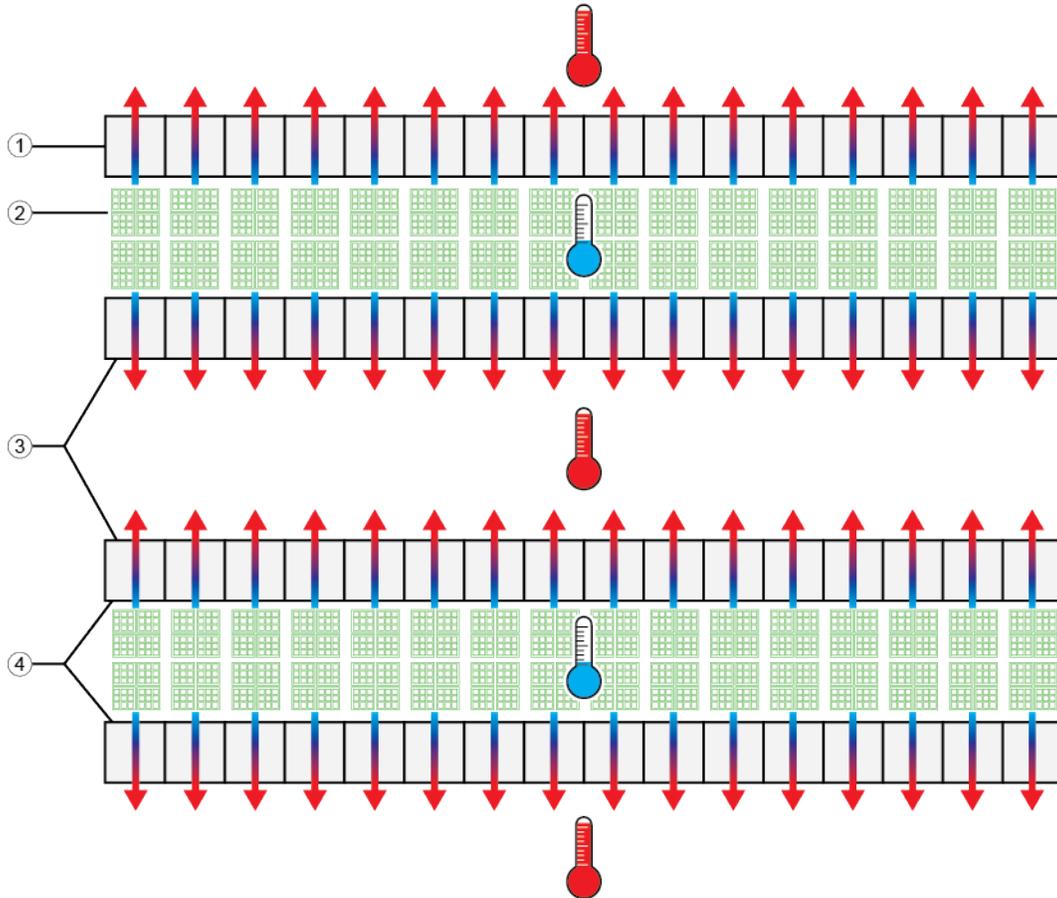


Figure 16: Data center floor plan of hot and cold aisles

The following table describes the layout of the data center in the preceding figure.

Table 9: Data center layout

Diagram	Description
1	Chassis racks
2	Cold aisle floor tiles in a raised floor
3	Back of chassis
4	Front of chassis

In a data center configuration, the front of the equipment faces the cold aisle, while the rear of the equipment faces the hot aisle. The chassis take in cold air from the cold aisle and discharge hot air into the hot aisle.

Each Virtual Services Platform 9012 chassis takes in cold air from the left and discharges hot air to the right. The Virtual Services Platform 9010 chassis takes in cold air from the front and discharges hot air from the back.

The typical data center layout works well for front-to-back cooling, but not as well for side-to-side cooling.

In this typical setup, if you place each Virtual Services Platform 9012 chassis in a row from left to right, the chassis to the left discharges hot air into the cool intake of the chassis to the right. This installation does not optimize cool airflow.

Optimizing cooling in a data center

To optimize left-to-right cooling, perform the following tasks:

- Increase the space between each Virtual Services Platform 9012 chassis
- Relocate the cooling floor tiles to improve cool air movement into the side of the Virtual Services Platform 9012 chassis
- Add baffles to redirect the hot air discharged from the Virtual Services Platform 9012 chassis from the right side to the hot aisle at the back

For instance, in the following diagram the hot and cold aisles remain, but now space exists between some of the Virtual Services Platform 9012 chassis. Baffles are added to redirect air from the side to the back of the chassis into the hot aisles. Cooling floor tiles are relocated near the cool air intake to improve cooling.

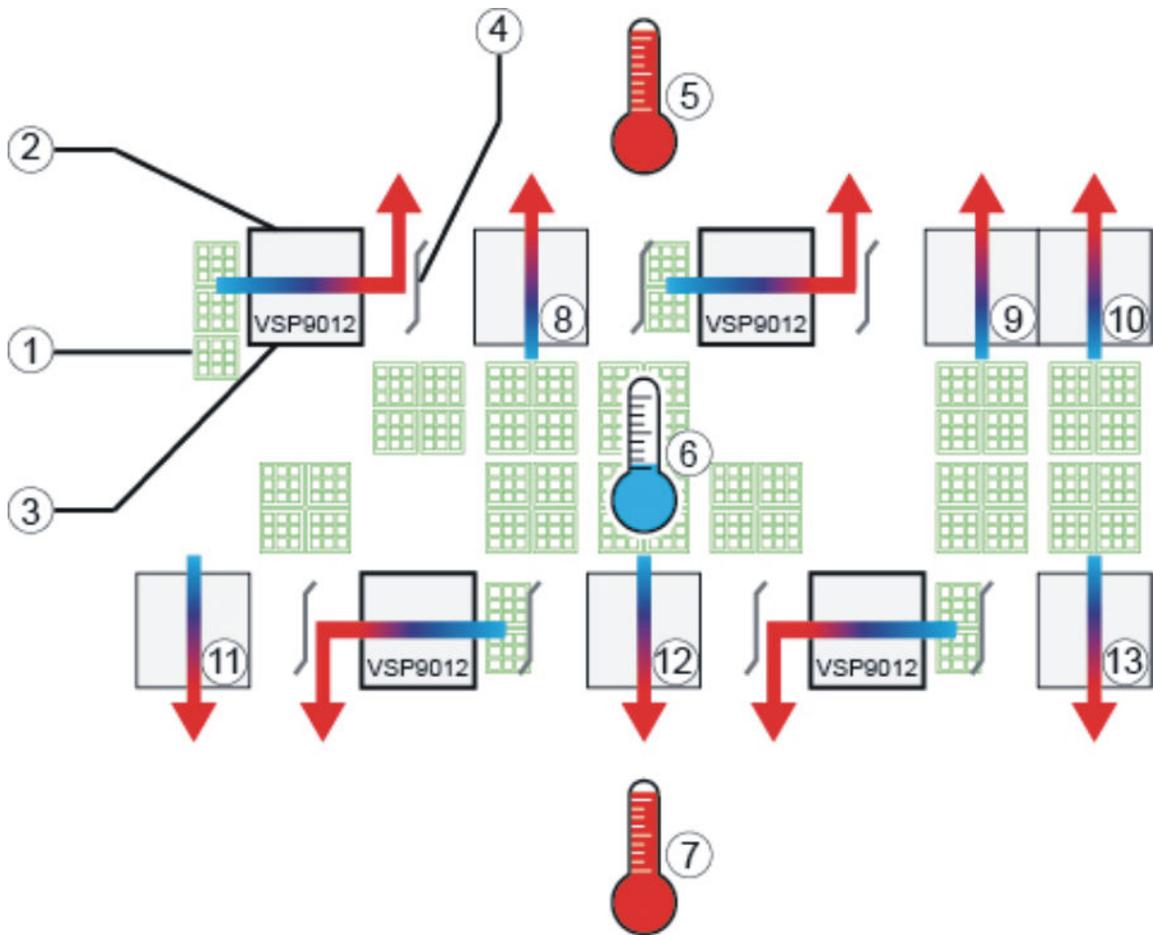


Figure 17: Data center with optimized cooling

Table 10: Data center with optimized cooling

Diagram	Description
1	Cooling floor tiles
2	Back of VSP 9012 chassis
3	Front of VSP 9012 chassis
4	Baffle
5, 7	Hot aisles
6	Cold aisle
8 to 13	Other equipment, front to back cooling

Other cooling considerations

This table offers suggestions for other cooling considerations.

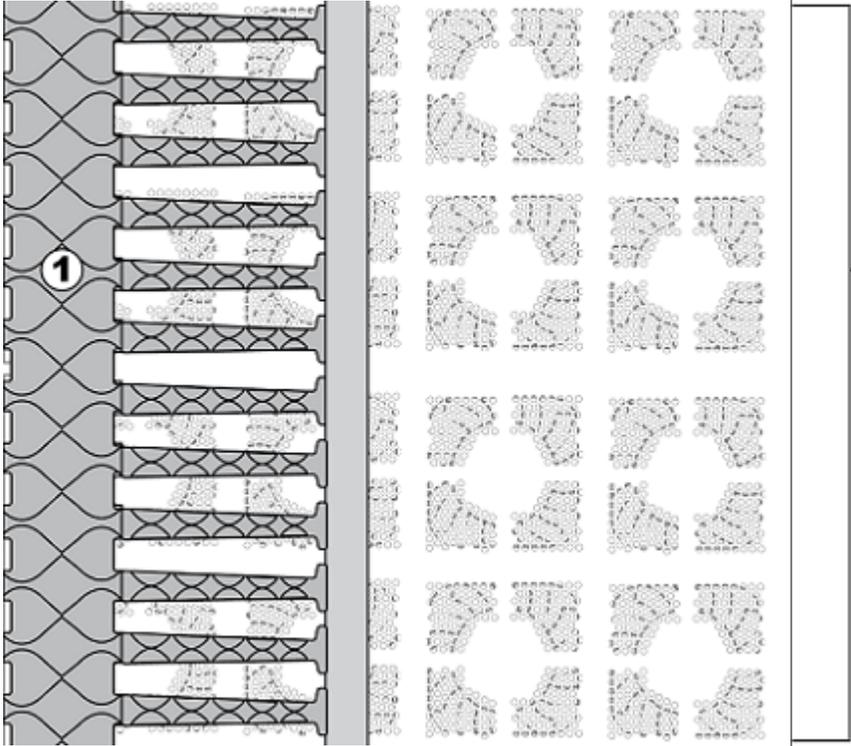
Situation	Considerations
Raised floors versus non-raised floors for cooling	If you do not have raised floors for cooling you need to ensure air is injected into the cool intake at the left side. You can add extra stand alone fans to ensure air enters the chassis.
Adjacent equipment	Consider hot airflow from other pieces of equipment in the vicinity of the Virtual Services Platform 9012. Computers, Telecommunications, and other equipment located above and below the Virtual Services Platform 9012 can discharge hot air onto the chassis.
Blocked cooling modules	<p>Placement of the Virtual Services Platform 9012 near walls or placement of exterior items for cable management can decrease the capacity of the cooling modules. For instance, the following diagram shows how cable management blocks two out of four fans in a row. As a result, the cooling module can only offer 50 per cent of the cooling airflow.</p>  <p>The diagram illustrates a cooling module with a mesh front panel. A vertical cable management structure, labeled with a circled '1', is positioned in front of the fans, blocking two of the four fans in each row. A bracket, labeled with a circled '2', indicates the remaining two active fans in each row.</p>

Figure 18: Cable management cooling modules

Situation	Considerations							
	<table border="1"> <thead> <tr> <th data-bbox="570 264 922 306">Diagram</th> <th data-bbox="922 264 1273 306">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="570 306 922 390">1</td> <td data-bbox="922 306 1273 390">Cable management blocking fans</td> </tr> <tr> <td data-bbox="570 390 922 443">2</td> <td data-bbox="922 390 1273 443">Fans</td> </tr> </tbody> </table>		Diagram	Description	1	Cable management blocking fans	2	Fans
Diagram	Description							
1	Cable management blocking fans							
2	Fans							
Clearance	Do not place the Virtual Services Platform 9012 chassis 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. However, dependent on circumstances, increase the space at the side of the Virtual Services Platform 9012 to improve airflow.							

Site requirements

Ensure that the installation site meets the space requirements described in this section. For more information about environmental and electrical requirements, see [Technical specifications](#) on page 105.

The installation site must provide sufficient free space around the chassis to ensure proper ventilation and service access.

You can install up to three Virtual Services Platform 9012 chassis in a single rack. Although no space requirement exists between units, leave enough room between units to remove and replace modules.

Important:

Install chassis units from the bottom up to ensure racks do not become top heavy and fall over.

Plan ahead to have three people present to lift the chassis. The chassis weighs in excess of 160 lb (73 kg) and requires a minimum of three people to lift. Always use a mechanical lift when one is available.

Use the following guidelines to plan front and rear access:

- For proper ventilation, Avaya recommends 36 inches (in.) (91 centimeters [cm]) of free space in both the front and the back of the machine, and also 6 in. (15.2 cm) on each side.
- Air inlet temperature to each chassis must be within the specified range.

! Important:

To ensure efficient cooling, both the air intake (left side of the chassis) and air exhaust (right side of the chassis) require a minimum of 6 inches (152.4 mm) of distance from any adjacent equipment that can either obstruct air flow or provide preheated air to the intake side.

Each power supply must operate from a dedicated branch circuit. For n + n redundancy, you must connect half the branch circuits on one power feed, and the other half of the branch circuits on a separate power feed. In addition to power supply redundancy, this configuration also provides power feed redundancy.

Hardware requirements

This section includes information about the hardware that ships with the VSP 9012 chassis.

Shipped assembly Virtual Services Platform 9012 chassis hardware

In addition to the Virtual Services Platform 9012 chassis, your shipping container includes several hardware accessories. Verify that the items in the shipping container match those on the shipment packing list.

Use the following table as a checklist when you verify the contents of the shipping container. For more information about ordering replacement parts, see [Part numbers](#) on page 113 .

Table 11: 9012 chassis shipping accessories

Check	Accessory	Usage
	VSP 9012 chassis	
	Ten I/O and Control Processor (CP) filler panels	Filler panels must be installed in unused slots.
	Four Switch Fabric (SF) filler panels	Filler panels must be installed in unused slots.
	Two Auxiliary card filler panels	Filler panels must be installed in unused slots.
	Regulatory label	
	Two SF fan trays	
	Two IO fan trays	
	One DB9 to DB9 connector	
	One accessory kit	
	One cable manager assembly	
	One generic label accessory kit	
	Screws and hardware:	The hardware required to mount the chassis in a rack depends on your rack type.

Check	Accessory	Usage
	12 Phillips-head screws 12 clip nuts	Mount the chassis to a rack rail. Use the clip nuts, if necessary.
	4 Phillips-head screws 4 hex nuts	Mount the installation shelf to a rack rail.
	4 pan-head screws	Install the cable management bracket.
	Installation shelf	Mount the Virtual Services Platform 9000 chassis in an equipment rack.
	One left front cable management bracket	Manage network interface cables.
	Grounding kit hardware	Connects the chassis to the ground of the rack.

The following figure illustrates the accessories in the chassis shipping container.

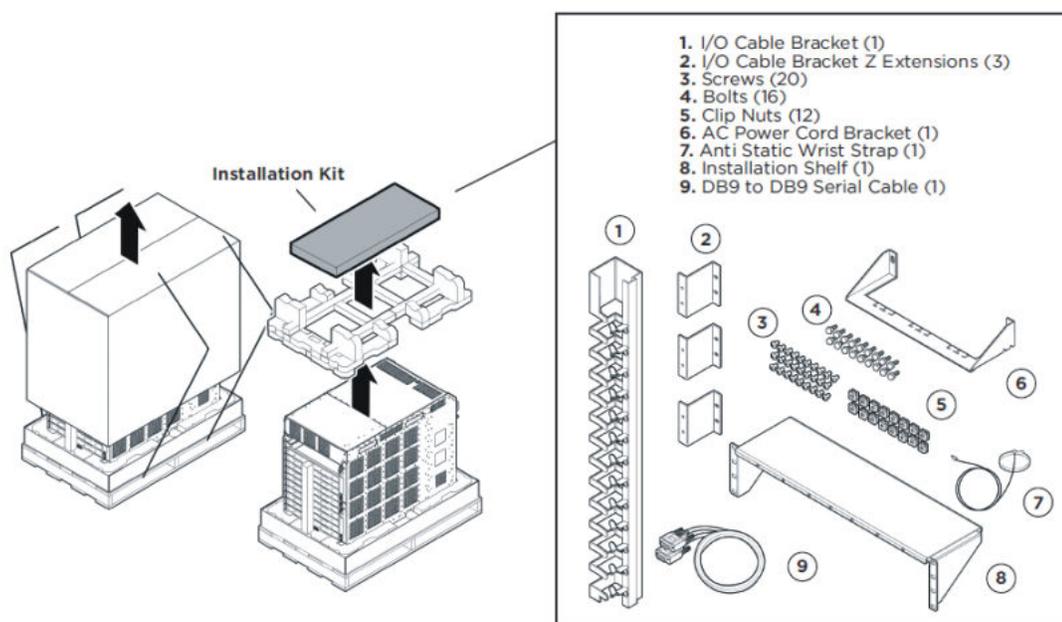


Figure 19: Accessories of the chassis shipping container

Other equipment

You require items not included in the Virtual Services Platform 9012 chassis accessory package. The following sections describe these items. Before you install the Virtual Services Platform 9012 hardware, ensure that you obtain all the cables, tools, and other equipment you need.

To configure startup options and to monitor the results of startup diagnostics, you can attach a PC, laptop, VT100 console or equivalent, such as a PC terminal emulator.

The hardware required to mount the Avaya Virtual Services Platform 9012 chassis in an equipment rack depends on your equipment rack type.

You need a Phillips screwdriver to install the Virtual Services Platform 9012 chassis in a standard rail-type equipment rack if using Avaya-supplied screws.

Install the device in standard EIA-310D 19-inch racks and ETSI 600-millimeter (mm) racks. The chassis fits a standard 19-inch rack using the mounting brackets that ship with the unit. To install the chassis in an ETSI 600-mm rack, you must provide mounting brackets to adapt the chassis to the rack.

If the rack does not use threaded rail holes, you must use the supplied clip nuts with the clip nut screws.

Avaya does not include the cables required for your network configuration in the Virtual Services Platform 9012 chassis accessory package.

Rack mount

You can install a maximum of three Virtual Services Platform 9012 chassis in a standard 19 in. wide 7 ft. tall rack.

 **Important:**

Install chassis units from the bottom up to ensure racks do not become top heavy, and fall over.

Virtual Services Platform 9012 chassis installation

This section describes how to install the Virtual Services Platform 9012 chassis.

Before you begin

Before you begin the installation of the Virtual Services Platform 9012 chassis, ensure you complete the following actions:

- Inspect all items for shipping damage. If you find items that are damaged, do not install the chassis. Call the Avaya Technical Solutions Center in your area.
- Verify that the items in the shipping container match those on the shipment packing list.
- Verify that you have all other required hardware.

About this task

 **Warning:**

Only trained service personnel must perform the procedures in this section.

Chassis installation time requirements

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

Table 12: VSP 9012 installation procedures and time requirements

Procedure	Time requirement
Reducing the chassis weight	5 minutes
Attaching the mounting brackets	5 minutes
Mounting the chassis in a two-post rack	12–30 minutes
Installing the cable management brackets	5 minutes
Grounding the chassis	12 minutes

Unpacking the installation kit

Unpack the installation kit and remove the included equipment.

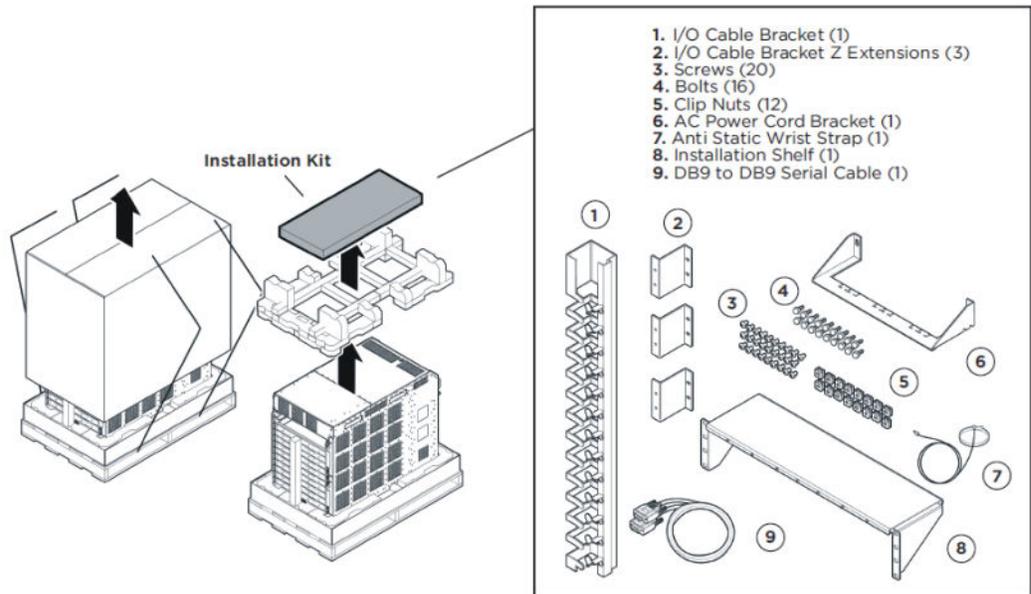
About this task

Extra screws and bolts are included to support a variety of installation options. You do not need to use all of the hardware provided.

If the installation kit does not contain all of the components, contact Avaya Support.

Procedure

Unpack the installation kit:



Installing the installation shelf

The installation shelf is an optional item used for installation of the chassis in a rack. You can mount a chassis on top of another Virtual Services Platform 9000 chassis instead of using the installation shelf.

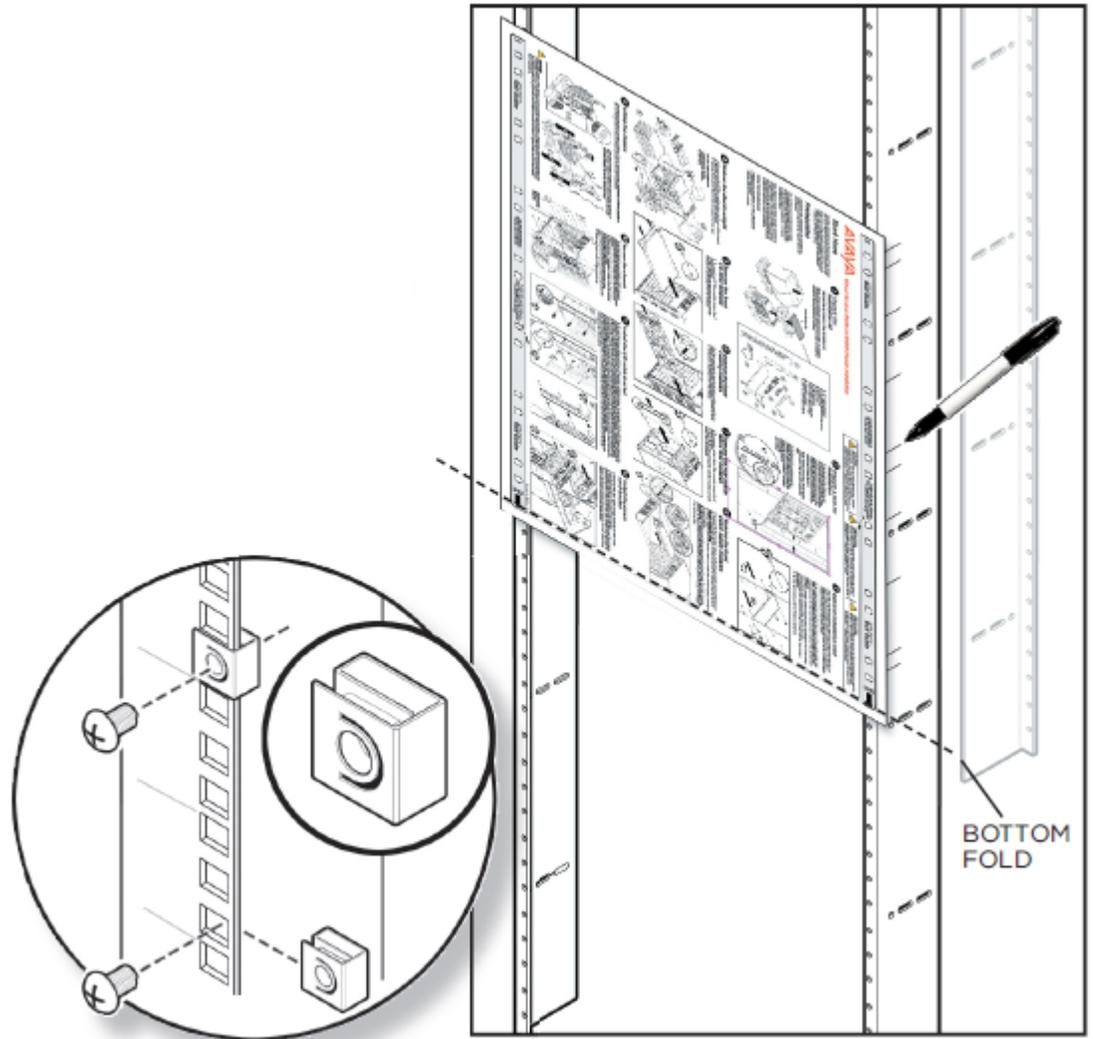
Procedure

1. Use the rail guides provided at the top and bottom of the installation poster to identify where you want the chassis bottom to rest, and then mark that location and the location of the rail guide holes on the front of the rack. Start at the bottom of the rack and install subsequent chassis above it.

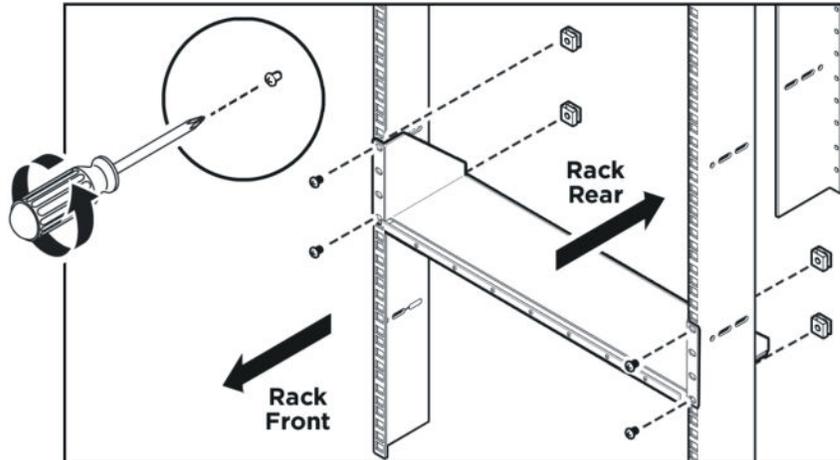
*** Note:**

Fold or trim off the margins of the poster to help mark the rack.

2. If the holes in the vertical supports require clip nuts, insert a clip nut in each of the 14 locations where you mark the holes. Avaya includes clip nuts. If necessary, use the clip nuts for your specific rack model.



3. Place the installation shelf at the mark on the rack, inside the rails. Hold the installation shelf in position, and then align the mounting rail with the two holes on each side of the vertical rack support.
4. Insert a Phillips screw through each installation shelf mounting hole and into the corresponding hole in the rack.
5. If using hex nuts, add a nut to each screw, and then tighten using a hex wrench.
6. Tighten each screw with a Phillips screwdriver.

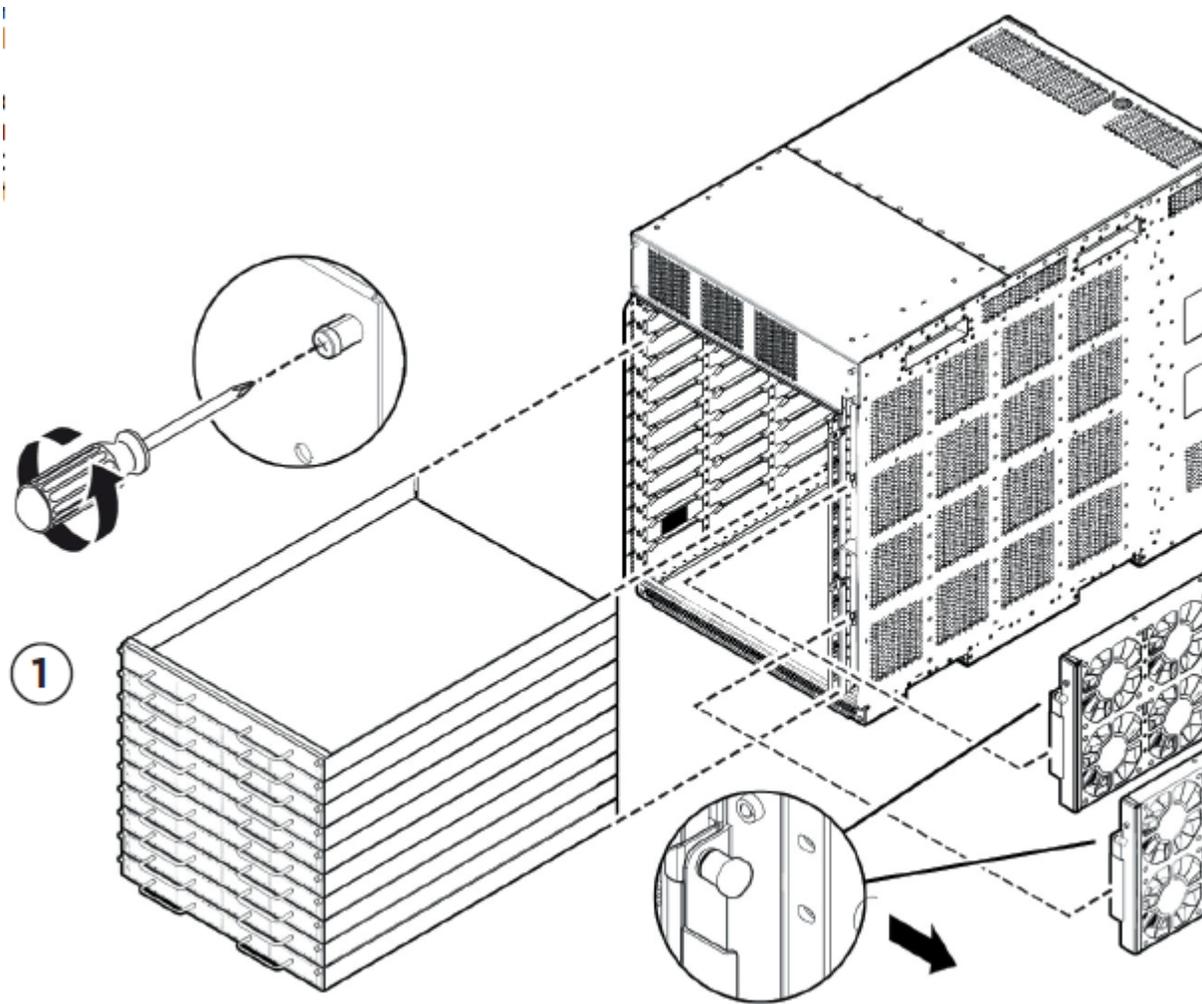


Reducing the chassis weight

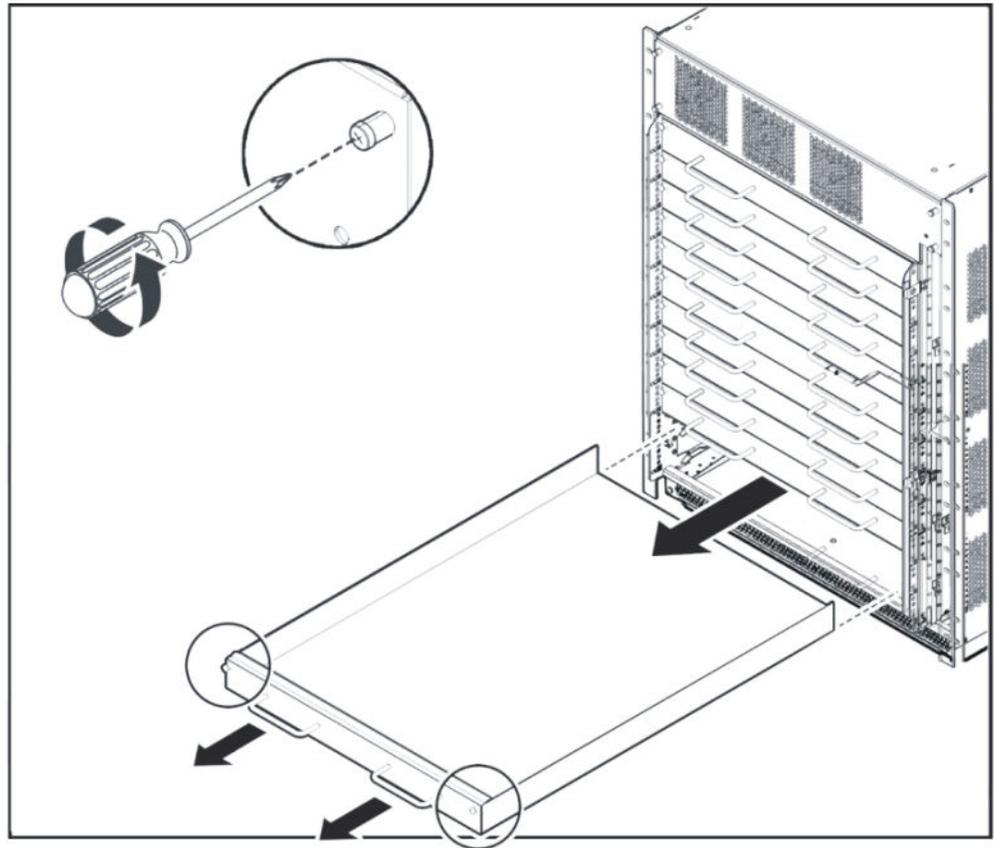
Reduce the chassis weight to make the chassis easier to lift and to reduce the risk of personal injury or equipment damage.

Procedure

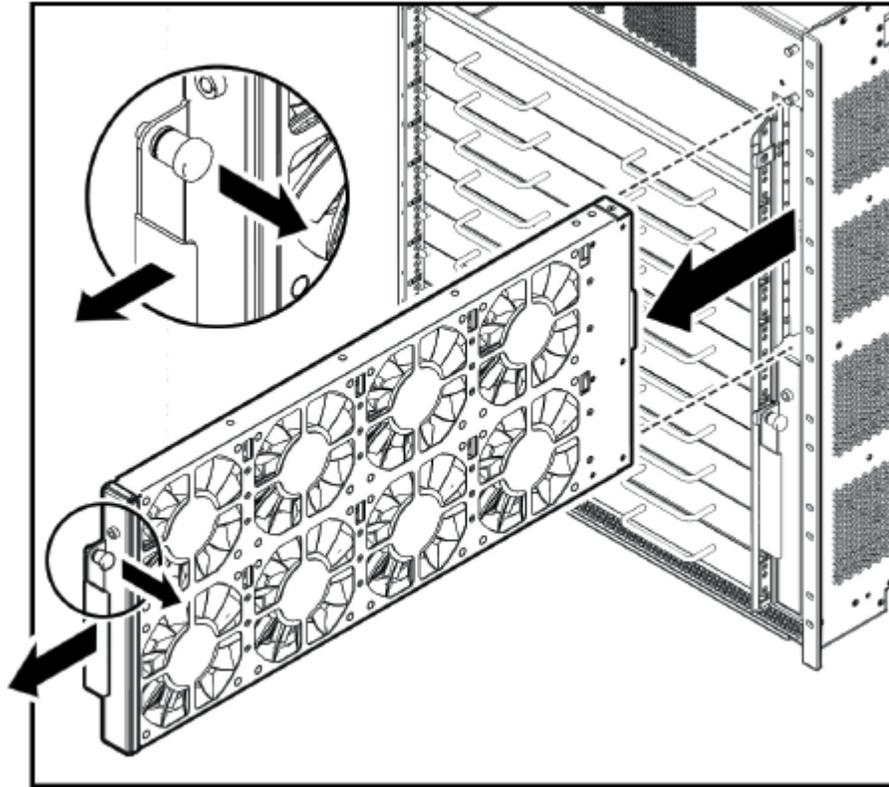
1. Remove the 10 I/O filler modules from the front of the chassis.
2. Remove the two cooling modules from the front of the chassis.



3. Unseat the I/O filler module by loosening the 2 captive screws, grasping the two handles, and gently pulling the module out and away from the chassis.



4. Remove the cooling modules by pulling the retaining pin that holds it in place while gently pulling the handle on the module to move it out and away from the chassis.



! Important:

Do not install additional components before mounting the chassis in the rack.

All unused slots must contain filler modules. Ensure filler modules removed to reduce the chassis weight are reinstalled after chassis installation.

Lifting the Virtual Services Platform 9012

The Virtual Services Platform 9012 weighs in excess of 160 lb (73 kg). Each chassis requires a minimum of three people to lift. Always use a mechanical lift when one is available.

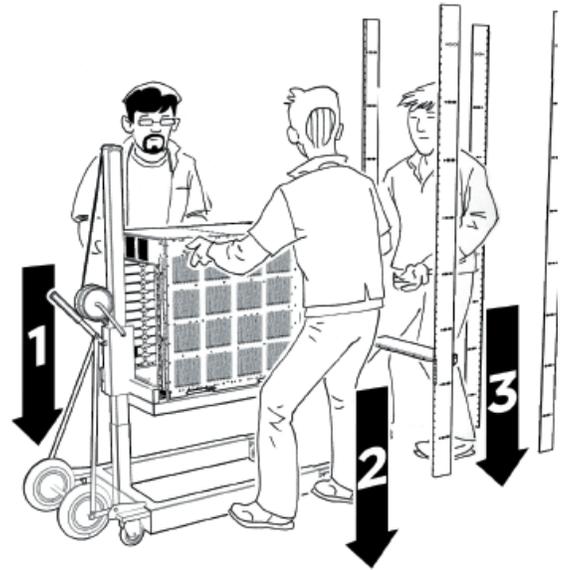
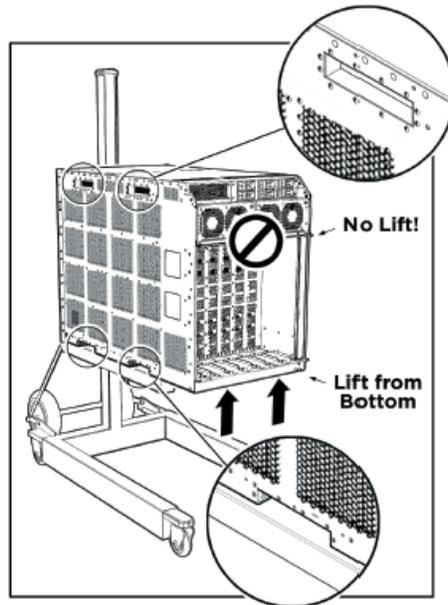
Before you begin

! Important:

Reduce the weight of the chassis as much as possible before you lift it. Always use a mechanical lift when one is available. Ensure you have at least three people to lift the chassis. Use a third person to support the chassis from behind the rack, as you position the chassis on the shelf and hold it in place. Take care to lift the chassis from the bottom.

Procedure

Use the recessed handles at the top and bottom of the Virtual Services Platform 9012 sides to lift the chassis. From the rear of the Virtual Services Platform 9012, lift the chassis from the bottom only.

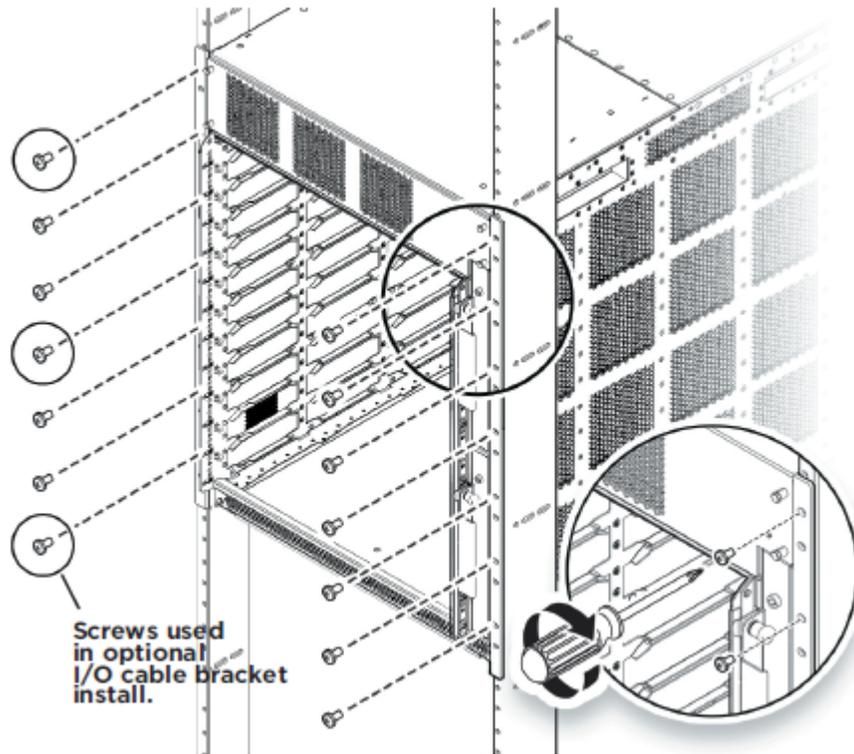


Securing the chassis

Mount the Virtual Services Platform 9012 chassis in a standard two-post or four-post equipment rack.

Procedure

1. Hold the chassis in position and align the flanged end of the chassis mounting bracket with the holes on either side of the vertical rack support.
2. Ensure that the 7 hole pairs on either side of the rack vertical supports match horizontally.
3. Insert 4 Phillips screws through each hole on the mounting bracket in the 7 screw positions in the flange and rack. If you plan to install the optional I/O cable bracket, do not insert screws into the top (1st), middle (4th) and bottom (7th) screw positions of the left side flange and rack.
4. Tighten each screw with a Phillips screwdriver.



Assembling and installing cable management brackets

Use this procedure to install the I/O and power cable brackets. Use these brackets to keep cable clusters fastened and out of the way but still accessible for maintenance.

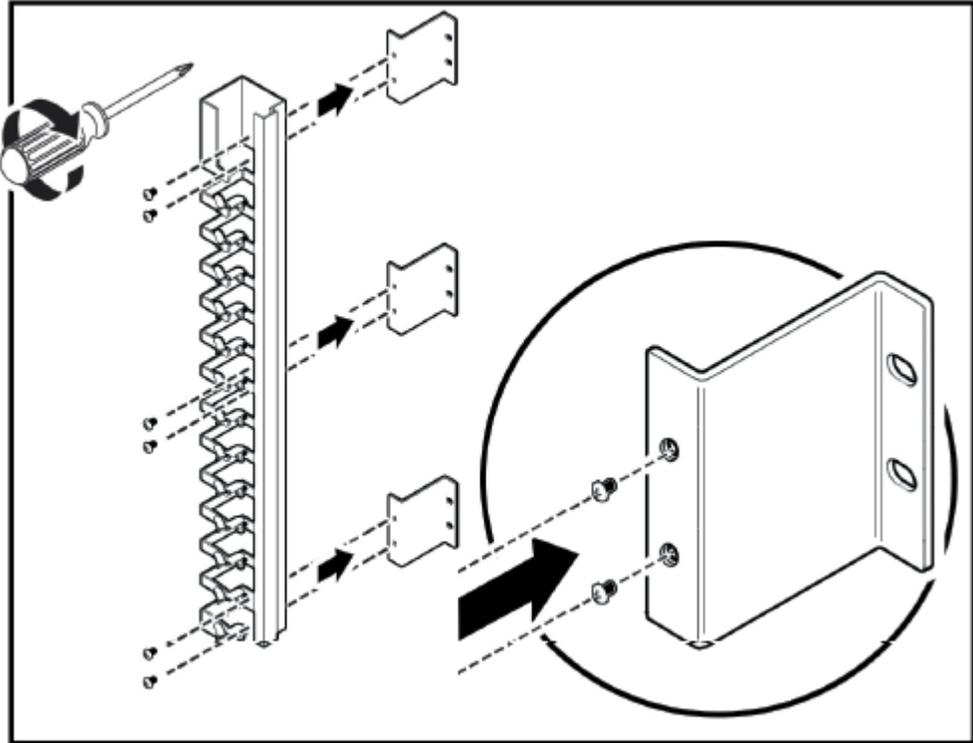
About this task

⚠ Important:

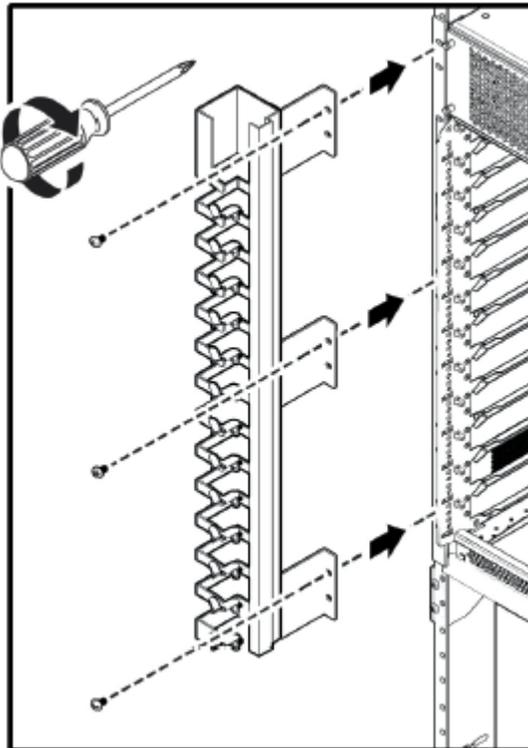
Do not attach any cables until after the bracket installation.

Procedure

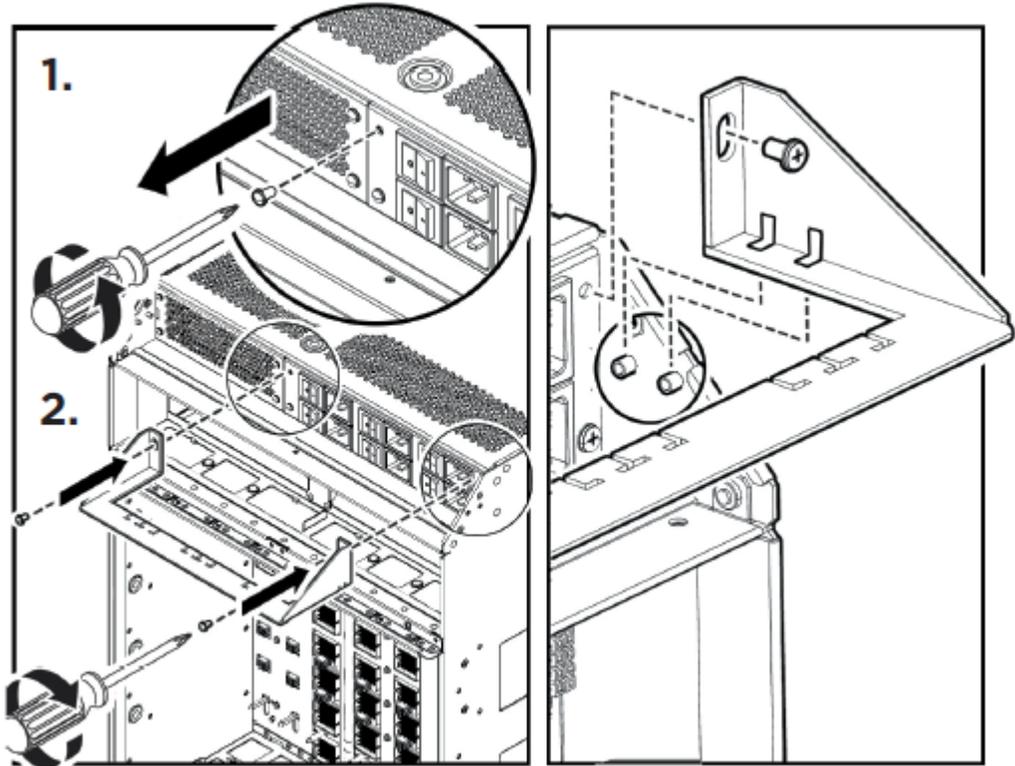
1. Attach the three Z brackets to the vertical cable bracket as shown below using 6 of the screws provided. Nuts are not required since the Z brackets are already threaded on one side for connection to the I/O cable bracket using screws alone.



2. Use 3 Phillips screws to fasten the I/O cable management assembly to the top, middle and bottom screw positions of the left flange and rail.



3. Remove the two upper screws from the power cable receptacle panel on the rear of the chassis.
4. Position the power cable bracket notches over the chassis positioning studs and reuse the two screws you removed to fasten the power cable bracket as shown. Do not attach any cables until after the bracket installation.



Grounding the chassis

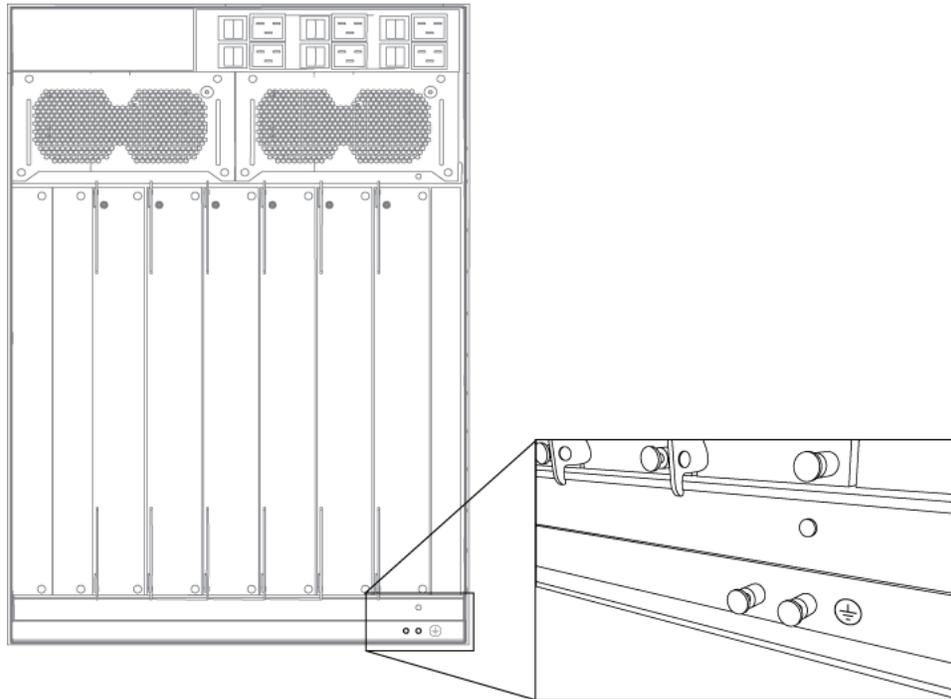
Ground the chassis before you install power supplies or connect power and network cables to the system.

Before you begin

- Ensure you have a two-hole cable lug that fits over the grounding studs.
- Ensure you have a nut and a locking washer for the grounding stud.
- Ensure you have a 6-AWG green and yellow grounding wire long enough to connect to the ground point.
- Ensure you have a 1/4 inch (6 mm) socket or nut driver.

Procedure

1. Crimp the two hole lug onto the ground wire.
2. Attach the chassis ground cable to the grounding studs on the chassis. As shown in the following figure, the studs are located on the bottom right part of the back of the chassis.



3. Bond the chassis ground cable to the single point ground window.

Job aid

The following figure shows an example of how to attach the chassis ground cable to the rack grounding strip.

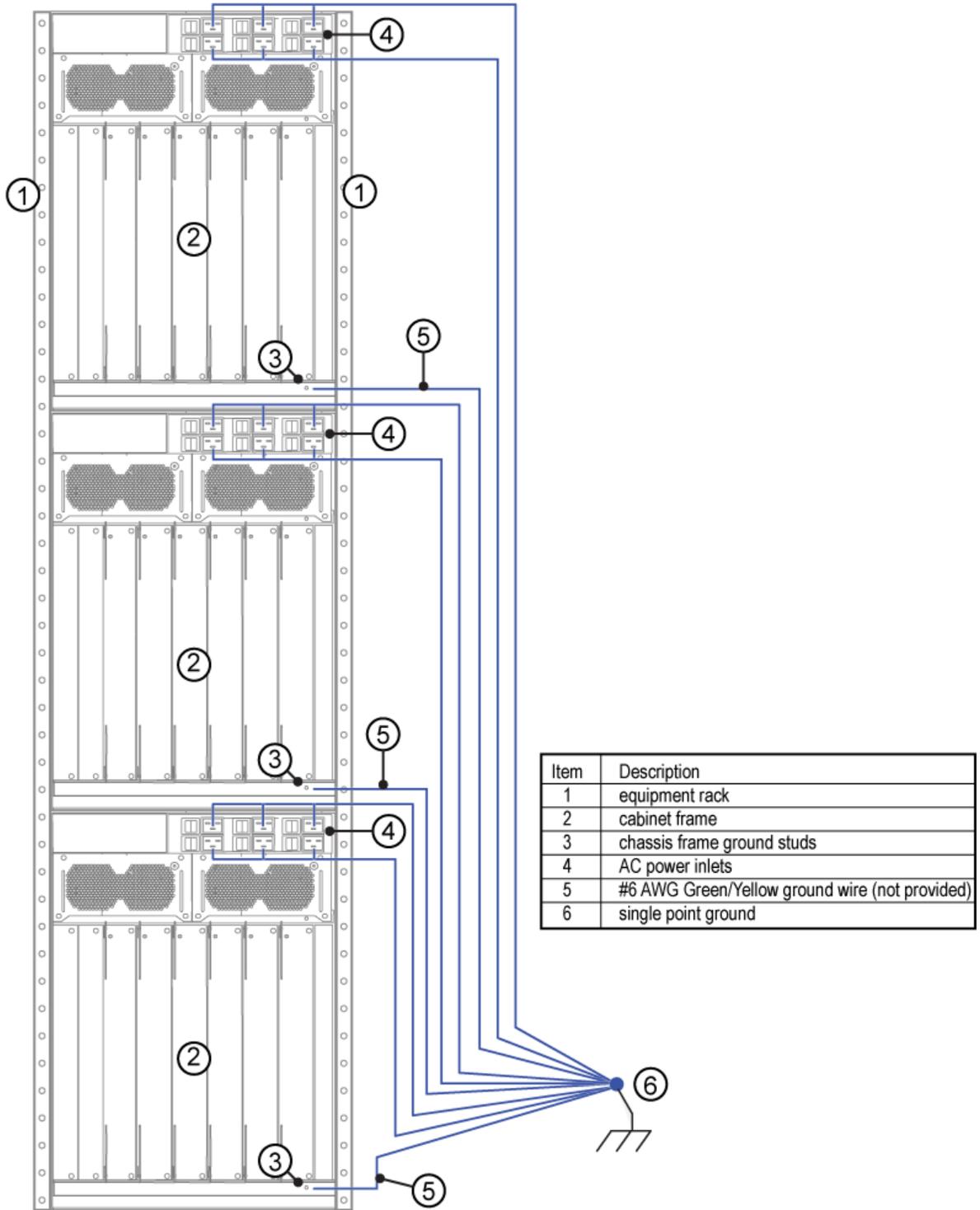
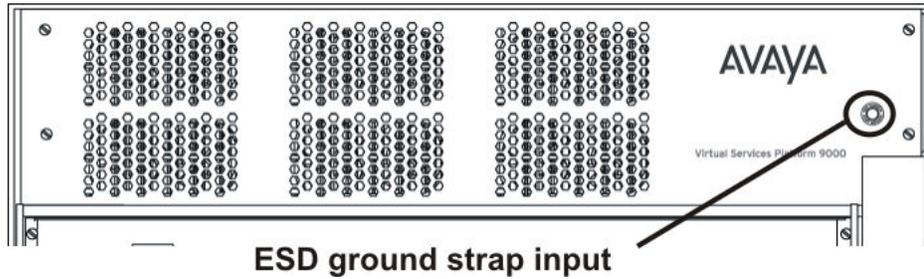


Figure 20: Rack grounding strip example

The following figure shows the ESD ground strap input location on the front of the chassis. Two ESD ground strap input locations also exist on the rear of the chassis.



Successful installation verification

In a normal power-up sequence, the LEDs light as follows:

- After you apply power to the switch, the corresponding power supply power LEDs and cooling module LED lights amber.
- After the CP module starts to boot, the Online LED for each I/O module lights amber.
- Each I/O module initiates a self-test, during which the port and module LEDs display various patterns to indicate the progress of the self-test.
- Upon successful completion of the self-test, within 5 to 15 minutes after you apply power, depending on the module type, the I/O module Online LED transitions from amber to green.

If the LEDs on the modules light in this sequence, your installation is successful. Contact your network administrator to verify that the Avaya Virtual Services Platform 9000 connects to the network.

If the LEDs do not light in this sequence, contact your local Avaya Technical Solutions Center.

Chapter 6: Chassis operations

About this task

This section describes some of the routine tasks you perform to operate the Avaya Virtual Services Platform 9000.

Determining the minimum number of power supplies

Determine the minimum number of power supplies required to ensure enough power exists to operate the installed components. You can install a maximum of six power supplies in the Virtual Services Platform 9012 chassis or eight in the Virtual Services Platform 9010 chassis.

Before you begin

- For more information about the power requirements for each module, see [Component input power](#) on page 106.

Important:

About this task

To determine how many power supplies you need, you can also download *ERS 8000 / VSP 9000 Power Supply Calculator*, NN48500–519 from the **System Management & Planning** section of the Virtual Services Platform 9000 product documentation at <https://support.avaya.com>.

Procedure

1. Add the total input power consumption for all components (modules and cooling module assemblies).
2. See the output power rating of the power supply based on the input connection.

Important:

If either the individual or the combined power requirements for the components exceed the power supply rating, you need to add at least one additional power supply to your configuration.

3. Consider your redundant power supply needs.
-

Powering up the system

Connect the power supplies and power up the system to start the Avaya Virtual Services Platform 9000.

Before you begin

- For more information about how to install an AC power supply, see *Avaya Virtual Services Platform 9000 Installation — AC Power Supply*, NN46250-303.

 **Caution:**

The AC power switches are double pole. The 9006AC power supply incorporates double pole and neutral fusing.

Procedure

1. Determine power subsystem operating configuration based on module load requirements and power redundancy needs.
2. Install the required power supplies in the power shelf bays.
3. Ensure the power switches are in the off position.
4. Determine the appropriate power cord based on the power supply operating power and site requirements.
5. Connect the power cords to the power inlets and the power outlets.
6. For each power supply, turn the corresponding power switch to the on position.
If your chassis contains multiple power supplies, you can turn on the power supplies simultaneously or one at a time. If you wait too long to turn on the additional power supplies, one or more of the power supplies could stay or enter current limit based on the system load condition until you power on a sufficient number of power supplies to guarantee the system powers on.
7. Verify the power LEDs on each power supply illuminates green, and that the service and fault LEDs are not illuminated.
8. Verify the cooling module LED on the CP modules illuminate green.
9. Verify that air flows from the cooling modules out through the vents of the chassis, and that the power supply fans are operational.
The cooling module LED can illuminate red while the fans power to operational speed.
10. If the power supply LEDs remain off indicating loss of power, the service or fault LEDs are illuminated and you cannot feel air flow from the chassis vents, or from each power supply, turn the power switch to the off position to diagnose the problem, or replace the failed power supply.

If the problem persists, contact the Avaya Technical Solutions Center.

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.

Removing external storage devices from the CP module

Perform this procedure to safely remove USB and 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 USB or 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 VSP 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`
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

```
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

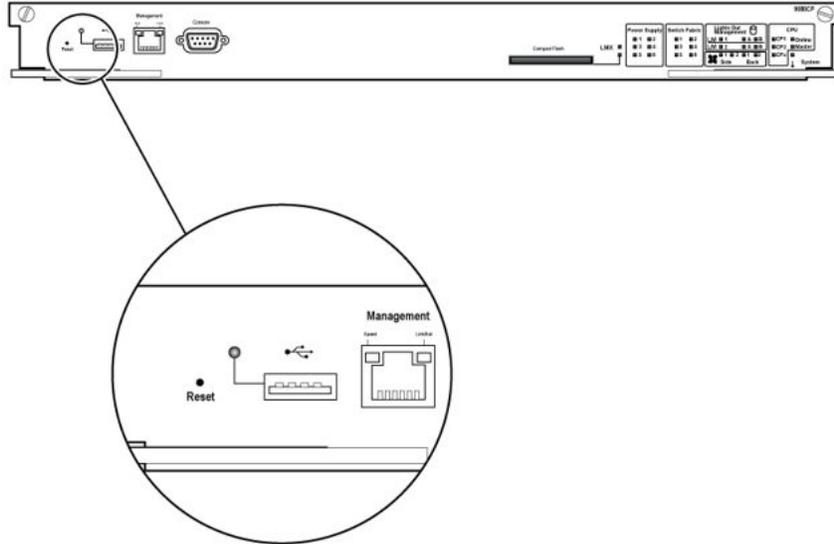
Resetting the Avaya Virtual Services Platform 9000

Reset the Avaya Virtual Services Platform 9000 to restart the hardware without cycling power.

Procedure

On the CP module, press Reset.

The following figure shows the location of the recessed Reset button.



Chapter 7: Technical specifications

This section provides specifications for the Avaya Virtual Services Platform 9000 chassis models and components.

9006AC specifications

This section provides the input and output power specifications for the 9006AC power supply.

AC input power specifications

The following table describes the technical specifications for AC input power for the 9006AC power supply.

Table 13: Input power specifications

Parameter	Specification at input voltage 90-140 VAC	Specification at input voltage 185-275 VAC
Input current	13.3 A (100 VAC) - 11.2 A (120 VAC)	11.8 A (200 VAC) – 9.9 A (240 VAC)
Operating frequency range	47–63 Hz	47–63 Hz
Input volt-ampere (VA)	1445 VA	2325 VA
Efficiency	85% minimum, 90% typical	88% minimum, 93% typical
Input power consumption	1,416 W	2,277 W
Heat dissipation (thermal output)	724 British Thermal Unit (BTU)/hour	933 BTU/hour
Hold-up time (See note 1.)	25 ms	20 ms

Note 1: Measurement starts at zero crossing of the AC voltage. Measurement made at full load and voltage is allowed to decay to 44 VDC.

DC output power specifications

The following table describes the technical specifications for the DC output power for the 9006AC power supply.

Table 14: Output power specifications

Parameter	Specification at input voltage 90–140 VAC	Specification at input voltage 185–275 VAC
Maximum main output power	1,200 W	2,000 W
Maximum main output current	22 A	37 A
Auxiliary output voltage / power	5 VDC / 3.75 W	5 VDC / 3.75 W
Output voltage set-point	54 VDC	54 VDC
Mean time between failures (See note 1.)	400,000 hours	400,000 hours
Note 1: Per telcordia SR-332, 25 C, full load, method 1, case III		

Component input power

The following table provides input power specifications for the Virtual Services Platform 9000 components.

! Important:

The system reserves the following power requirements:

- 80 watts (W) each for the primary and secondary Control Processor (CP) modules
- 70 W each for the Switch Fabric (SF) modules located in slots 1 and 4 (both 9090SF and 9095SF)
- 150 W each for the two IO cooling modules (Virtual Services Platform 9012 chassis only)
- 65 W each for the two SF cooling modules (Virtual Services Platform 9012 chassis only)
- 1,900 W for a pair of 9010CM cooling modules that operate at full speed (Virtual Services Platform 9010 chassis only)

Table 15: Component input power

Component	Total input power (watts)	Thermal output rating (BTU/hour)
9080CP Central Processor Module	80	273
9090SF Switch Fabric Module, slots 1 and 4.	70	239

Component	Total input power (watts)	Thermal output rating (BTU/hour)
9090SF Switch Fabric Module, slots 2, 3, 5, and 6.	50	170
9095SF Switch Fabric Module, slots 1 and 4.	70	239
9095SF Switch Fabric Module, slots 2, 3, 5, and 6.	50	170
9012FC Side cooling module (Maximum fan speed)	150	512
9012RC Fabric cooling module (Maximum fan speed)	65	222
9010CM cooling module (Maximum fan speed)	1,900 W for a pair of cooling modules	6, 483
9048GT I/O module	350	1,194
9048GB I/O module	340	1,160
9024XL I/O module	575	1,962

Power supply selection

Power management identifies the available power in the chassis, called the power budget, and determines if enough power is available to operate the installed components. For more information about the power management feature and configuration instructions, see *Avaya Virtual Services Platform 9000 Administration*, NN46250-600.

VSP 9010 chassis specifications

This section provides physical, environmental, and electrical specifications for the Virtual Services Platform 9010 chassis.

Physical specifications

The following physical specifications apply to the chassis.

Table 16: VSP 9010 chassis physical specifications

Parameter		Specification
Height		36.1 in. (915 mm)
Rack units (RU)		21
Width		17.19 in. (436.6 mm)
Depth		33.75 in. (857.85 mm)
Weight	Chassis and midplane	141 lb (64 kg)
	Chassis and midplane, and cooling modules	181 lb (82 kg)

Network Equipment Building Standard

The Virtual Services Platform 9010 chassis does not comply with Network Equipment Building Standard (NEBS) Level 3 as specified in SR3580.

Environmental specifications

The following environmental specifications apply to the chassis.

Table 17: VSP 9010 chassis environmental specifications

Parameter	Specification
Operating temperature (room or ambient temperature)	32°F to 104°F (0°C to 40°C)  Note: With 9024XL modules with serial numbers starting with LBNNTMC9xxxxxx, the operating temperature is 0-38°C.
Storage temperature	14°F to 140°F (– 10°C to 60°C)
Operating humidity	85%
Storage humidity	90%
Operating altitude	10,000 feet (3,048 meters)
Storage altitude	10,000 feet (3,048 meters)

International regulatory requirements

The Virtual Services Platform 9010 chassis conforms to the following international regulatory requirements.

Electromagnetic emissions:

The Virtual Services Platform 9010 chassis conforms to the following electromagnetic emissions standards.

Table 18: VSP 9010 chassis electromagnetic emissions

Parameter	Specification
United States	FCC CFR47 Part 15, Subpart B, Class A
Canada	ICES-003, Issue-4, Class A
Europe	EN 55022:2006/ A1:2007 Class A; EN 61000-3-2/A14, EN 300 386 v1.3.3, EN55024:1998/A1:2001/A2:2003, EN 61000-3-3:1995:A1:2001/A2:2005
Australia/New Zealand	AS/NZS CISPR 22:2006, Class A
Japan	VCCI-V3/97.04, Class A

Electromagnetic immunity:

The Virtual Services Platform 9010 chassis conforms to the following electromagnetic immunity standards.

Table 19: 9010 chassis electromagnetic immunity

Parameter	Specification
Global basis for certification	CISPR 24:1997
Europe	EN 55024:1998

Safety agency certification:

The Virtual Services Platform 9010 chassis conforms to the following safety agency standards.

Table 20: VSP 9010 chassis safety agency certification

Parameter	Specification
Global basis for certification	IEC 60950-1 current edition with all CB member deviations
US	ULIEC 60950-1
Canada	CSA 22.2 No. IEC 60950-1
Europe	ENIEC 60950-1 (CE Marking)
Australia/New Zealand	AS/NZS IEC 60950-1
Mexico	NOM
Korea	MIC

VSP 9012 chassis specifications

This section provides physical, environmental, and electrical specifications for the Virtual Services Platform 9012 chassis.

Physical specifications

The following physical specifications apply to the chassis.

Table 21: VSP 9012 chassis physical specifications

Parameter		Specification
Height		24.375 in. (61.91 cm)
Rack units (RU)		14
Width		17.5 in. (44.45 cm)
Depth		32.5 in. (82.55 cm) plus cable management system
Weight	Chassis and midplane	160 lb (73 kg)
	Chassis and midplane, and cooling modules	183 lb (83 kg)

Network Equipment Building Standard

The Virtual Services Platform 9012 chassis does not comply with Network Equipment Building Standard (NEBS) Level 3 as specified in SR3580.

Environmental specifications

The following environmental specifications apply to the chassis.

Table 22: VSP 9012 chassis environmental specifications

Parameter	Specification
Operating temperature (room or ambient temperature)	0°C to 40°C (32°F to 104°F)
Storage temperature	– 25°C to 70°C (– 13°F to 158°F)
Operating humidity	10% to 90%
Storage humidity	0 to 90%
Operating altitude	0 ft to 10 000 ft
Storage altitude	0 ft to 10 000 ft

International regulatory requirements

The Virtual Services Platform 9012 chassis conforms to the following international regulatory requirements.

Electromagnetic emissions:

The Virtual Services Platform 9012 chassis conforms to the following electromagnetic emissions standards.

Table 23: VSP 9012 chassis electromagnetic emissions

Parameter	Specification
United States	FCC CFR47 Part 15, Subpart B, Class A
Canada	ICES-003, Issue-4, Class A
Europe	EN 55022:2006/ A1:2007 Class A; EN 61000-3-2/A14, EN 300 386 v1.3.3, EN55024:1998/A1:2001/A2:2003, EN 61000-3-3:1995:A1:2001/A2:2005
Australia/New Zealand	AS/NZS CISPR 22:2006, Class A
Japan	VCCI-V3/97.04, Class A

Electromagnetic immunity:

The Virtual Services Platform 9012 chassis conforms to the following electromagnetic immunity standards.

Table 24: VSP 9012 chassis electromagnetic immunity

Parameter	Specification
Global basis for certification	CISPR 24:1997
Europe	EN 55024:1998

Safety agency certification:

The Virtual Services Platform 9012 chassis conforms to the following safety agency standards.

Table 25: VSP 9012 chassis safety agency certification

Parameter	Specification
Global basis for certification	IEC 60950-1 current edition with all CB member deviations
US	ULIEC 60950-1
Canada	CSA 22.2 No. IEC 60950-1
Europe	ENIEC 60950-1 (CE Marking)

Technical specifications

Parameter	Specification
Australia/New Zealand	AS/NZS IEC 60950-1
Mexico	NOM

Chapter 8: Part numbers

The following table lists the Avaya Virtual Services Platform 9000 part numbers associated with the hardware.

Products can be ordered with European Union Environmental Directive (EUED) Restriction of Hazardous Substances (RoHS) (EUED RoHS) compliancy. EUED RoHS compliant products are designated with -E5 or -E6 (for example EC1405A01-E6).

Table 26: Part numbers

Part number	Item
EC1402001-E6	Shipped assembly VSP 9012 12-slot chassis
EC1402002-E6	Shipped assembly VSP 9010 10-slot chassis (AC-input)
EC1404001-E6	9024XL 24 SFP+ module
EC1404002-E6	9048GB 48 SFP module
EC1404003-E6	9048GT 48 10/100/1000 module
EC1404006-E6	9090SF Switch Fabric module for the VSP 9012 chassis
EC1404007-E6	9080CP CP module
EC1404009-E6	9095SF Switch Fabric module for the VSP 9010 chassis
EC1405A01-E6	9006AC power supply
EC1411001-E6	9012FC Side cooling module for the VSP 9012 chassis
EC1411002-E6	9012RC Fabric cooling module for the VSP 9012 chassis
EC1411006-E6	Spare front module filler module for the VSP 9012 chassis and VSP 9010 chassis
EC1411007-E6	Spare Switch Fabric filler module for the VSP 9012 chassis
EC1411009-E6	Spare auxiliary module filler module for the VSP 9012 chassis
EC1411010-E6	2GB Compact Flash memory card for 9080CP module
EC1411012-E6	9010CM Cooling module for the VSP 9010 chassis
EC1411013-E6	Spare Switch Fabric filler module for the VSP 9010 chassis
EC1411014-E6	Spare power supply filler panel for the VSP 9010 chassis
EC1411015-E6	Spare 9010 Chassis Cover Panel Kit. Includes the cable management cover and air inlet cover.
EC1411016-E6	VSP 9024XL Ventilation-Cover for VSP 9010 chassis.

Part numbers

Chapter 9: 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 caution statement

 **Caution:**

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.

 **Caution:**

ATTENTION

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.

 **Caution:**

ACHTUNG

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.

 **Caution:**

PRECAUCIÓN

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.

 **Caution:**
CUIDADO

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.

 **Caution:**
ATTENZIONE

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.

Electrostatic discharge caution statement

 **Electrostatic alert:**
ESD

To prevent damage from electrostatic discharge, always wear an antistatic wrist strap connected to an electrostatic discharge (ESD) jack when performing maintenance on this product. Ensure that the wrist strap makes contact with your skin.

 **Electrostatic alert:**
ATTENTION

ESD (décharge électrostatique)

Pour prévenir tout dommage dû à une décharge électrostatique, vous devez toujours porter un bracelet antistatique connecté à une prise pour décharge électrostatique (ESD) lors de l'exécution d'opérations de maintenance sur ce produit. Assurez-vous que le bracelet antistatique est en contact avec votre peau.

 **Electrostatic alert:**
ACHTUNG

ESD

Um Schäden durch elektrostatische Entladung zu verhindern, tragen Sie bei der Instandhaltung dieses Produkts immer ein antistatisches Band am Handgelenk, das mit

einer ESD-Buchse verbunden ist. Stellen Sie sicher, dass das Band am Handgelenk Kontakt zur Haut hat.

 **Electrostatic alert:**

PRECAUCIÓN

ESD (Descarga electrostática)

Para prevenir el daño producido por una descarga electrostática, use siempre una pulsera antiestática conectada a un enchufe de descarga electrostática (ESD) al realizar el mantenimiento de este producto. Asegúrese de que la pulsera antiestática haga contacto con su piel.

 **Electrostatic alert:**

CUIDADO

ESD

Para evitar danos com descarga eletrostática, sempre use uma pulseira antiestática que esteja conectada a uma tomada de descarga eletrostática (ESD) quando estiver realizando a manutenção deste produto. Certifique-se de que a pulseira esteja em contato com sua pele.

 **Electrostatic alert:**

ATTENZIONE

ESD

Per evitare danni derivanti da scariche elettrostatiche, indossare sempre un polsino antistatico collegato a una presa di scarico elettrostatico (ESD) durante la manutenzione del prodotto. Accertarsi che il polsino sia a contatto con la pelle.

Laser eye safety warning statement

 **Warning:**

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.

 **Warning:**

AVERTISSEMENT

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.

 **Warning:**

WARNUNG

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.

 **Warning:**

ADVERTENCIA

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.

 **Warning:**

AVISO

O laser pode causar ferimentos no olho

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

 **Warning:**

AVVISO

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.

Lifting 9012 chassis warning statement

 **Warning:**

Risk of personal injury

It requires three people to lift the Virtual Services Platform 9000 chassis. To make the chassis lighter, remove the modules and power supplies before you lift it.

 **Warning:**

AVERTISSEMENT

Risques de blessure corporelle

Trois personnes sont nécessaires pour soulever le châssis VSP. Pour alléger le châssis, retirez les modules et les alimentations avant de le soulever.

 **Warning:**

WARNUNG

Verletzungsrisiko

Es sind 3 Personen notwendig, um das Chassis des VSP anzuheben. Entfernen Sie vor dem Anheben die Module und die Netzteile, um so das Gewicht des Chassis zu reduzieren.

 **Warning:**

ADVERTENCIA

Riesgo de lesiones

Se necesitan tres personas para levantar el chasis de VSP. Para alivianar el peso, retire los módulos y las fuentes de alimentación antes de levantarlo.

 **Warning:**

AVISO

Risco de ferimento

Para erguer o chassi VSP, são necessárias três pessoas. Para erguer o chassi, remova os módulos e as fontes de alimentação antes de erguê-lo.

 **Warning:**

AVVISO

Rischio di lesioni personali

Per sollevare lo chassis VSP, sono necessarie tre persone. Per alleggerire lo chassis, rimuovere i moduli e gli alimentatori prima di sollevarlo.

Electric shock multiple cord danger statement

 **Voltage:**

Risk of injury by electric shock

This unit has more than one power supply cord. Disconnect all power supply cords before servicing to avoid electric shock.

 **Voltage:**

Risques de blessure par choc électrique

Cet appareil comporte plus d'un cordon d'alimentation. Afin de prévenir les chocs électriques. Debrancher les cordons d'alimentation avant de faire le dépannage.

 **Voltage:**

Gefahr eines Stromschlags

Dieses Gerät verfügt mehr als ein Netzkabel. Ziehen Sie zur Vermeidung eines Stromschlags vor der Wartung alle Netzkabel ab.

 **Voltage:**

Rischio di infortuni elettrici

Questa unità è munita di più cavi di alimentazione. Per evitare scosse elettriche, scollegare tutti i cavi di alimentazione prima di eseguire la manutenzione.

 **Voltage:**

Risco de ferimentos por choque elétrico

Esta unidade tem mais de um cabo de alimentação. Desconecte todos os cabos de alimentação antes da manutenção para evitar choque elétrico.

 **Voltage:**

Riesgo de sufrir descargas eléctricas

Esta unidad tiene más de un cable de suministro de alimentación. Desconecte todos los cables de suministro de alimentación antes de realizar el servicio para evitar descargas eléctricas.

Glossary

cable assembly	An optical-fiber cable with connectors installed on one or both ends. The cable assembly interconnects the cabling system with opto-electronic equipment at either end of the system. Cable assemblies with connectors only on one end are called pigtailed. Cable assemblies with connectors on both ends are called jumpers or patch cords.
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.
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 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.
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 gigabit per second (Gb/s).
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.

