Cisco ASA 5512-X, ASA 5515-X, ASA 5525-X, ASA 5545-X, and ASA 5555-X Hardware Installation Guide

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- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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About This Guide

This guide describes how to install and maintain the Cisco ASA 5500-X series appliances. Information in this guide applies to the following Cisco ASA 5500-X Series models: ASA 5512-X, ASA 5515-X, ASA 5525-X, ASA 5545-X, and ASA 5555-X. References to “Cisco ASA 5500-X Series” and “ASA” apply to all previously listed models unless specifically noted otherwise.

This preface includes the following sections:

Document Conventions

This document uses the following conventions:

Convention	Indication
bold type	Commands and keywords and user-entered text appear in **bold** type.
italic type	Document titles, new or emphasized terms, and arguments for which you supply values are in *italic* type.
[ ]	Elements in square brackets are optional.
{x | y | z }	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	An unquoted set of characters. Do not use quotation marks around the string, or the string will include the quotation marks.
`monospace` type	Terminal sessions and information the system displays appear in `monospace` type.
`monospace bold` type	Commands and keywords and user-entered text appear in **`monospace bold courier`** type.
`monospace italic` type	Arguments for which you supply values are in *`monospace italic`* type.
< >	Non-printing characters such as passwords are presented in angle brackets.
[ ]	Default responses to system prompts are presented in square brackets.
!, #	An exclamation point (!) or a hash sign (#) at the beginning of a line of code indicates a comment line.

Note: Means *reader take note*.

Caution: **Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.**

Installation Warnings

Be sure to read the Regulatory Compliance and Safety Information document (http://www.cisco.com/c/en/us/td/docs/security/asa/hw/regulatory/compliance/asa5500x_rcsi.html) before installing the chassis.

This section presents these important safety warnings:

Power Supply Disconnection Warning

Warning: **Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units.** Statement 12

More than One Power Supply Warning

Warning: **This unit has more than one power supply connection; all connections must be removed completely to completely remove power from the unit.** Statement 102

Jewelry Removal Warning

Warning: Before working on equipment that is connected to a power source, remove jewelry (including rings, necklaces, and watches). Metal objects will heat when connected to power and ground, and can cause serious burns or weld the metal object to the terminals. Statement 43

Wrist Strap Warning

Warning: During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could receive a shock. Statement 94

Work During Lightning Warning

Warning: Do not work on the system, or connect or disconnect cables during periods of lightning. Statement 1001

Installation Instructions Warning

Warning: Read all installation instructions before connecting the system to a power source. Statement 1004

Chassis Warning for Rack-Mounting and Servicing

Warning: To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety: This unit should be mounted at the bottom of the rack if it is the only unit in the rack. When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006

Short-Circuit Protection Warning

Warning: This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. Statement 1045

SELV Circuit Warning

Warning: To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables. Statement 1021

Ground Conductor Warning

Warning: This equipment must be grounded. Never defeat the ground conductor, or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority, or an electrician if you are not certain that suitable grounding is available. Statement 1024

Faceplates and Cover Panels Warning

Warning: Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they restrict electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Statements 1029 and 142

Product Disposal Warning

Warning: Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040

Compliance with Local and National Electrical Codes Warning

Warning: Installation of the equipment must comply with local and national electrical codes. Statement 1074

TN Power Warning

Warning: The device is designed to work with TN power systems. Statement 19

Multiple Power Cords

Warning: This unit has more than one power cord. To reduce the risk of electric shock when servicing a unit, disconnect the power cord of the power strip into which the unit is plugged. Statement 137

Circuit Breaker (15A) Warning

Warning: This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors). Statement 13

48 VDC Power System

Warning: The customer 48-volt power system must provide reinforced insulation between the primary AC power and the 48 VDC output. Statement 128

Grounded Equipment Warning

Warning: This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use. Statement 39

Safety Cover Requirement

Warning: The safety cover is an integral part of the product. Do not operate the unit without the safety cover installed. Operating the unit without the cover in place will invalidate the safety approvals and pose a risk of fire and electrical hazards. Statement 117

Where to Find Safety and Warning Information

For safety and warning information, see the Regulatory Compliance and Safety Information document at the following URL:

http://www.cisco.com/c/en/us/td/docs/security/asa/hw/regulatory/compliance/asa5500x_rcsi.html

This RCSI document describes the international agency compliance and safety information for the Cisco ASA 5500-X series. It also includes translations of the safety warnings used in this guide.

Related Documentation

For a complete list of the Cisco ASA 5500-X series documentation and where to find it, see the documentation roadmap at the following URL:

http://www.cisco.com/en/US/docs/security/asa/roadmap/asaroadmap.html

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business impact you're looking for with the technologies that matter, visit Cisco Services.
- To submit a service request, visit Cisco Support.
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit Cisco Marketplace.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

About the ASA 5500-X

This chapter describes the Cisco ASA 5512-X, 5515-X, 5525-X, 5545-X, and 5555-X models. We recommend that you read this entire guide before beginning any of the procedures contained herein.

Warning: Only trained and qualified personnel should install, replace, or service this equipment. Statement 49

Caution: Read the safety warnings in the Regulatory Compliance and Safety Information document for the Cisco ASA 5500-X (http://www.cisco.com/go/asa5500x-compliance), and follow proper safety procedures when performing any tasks in this guide.

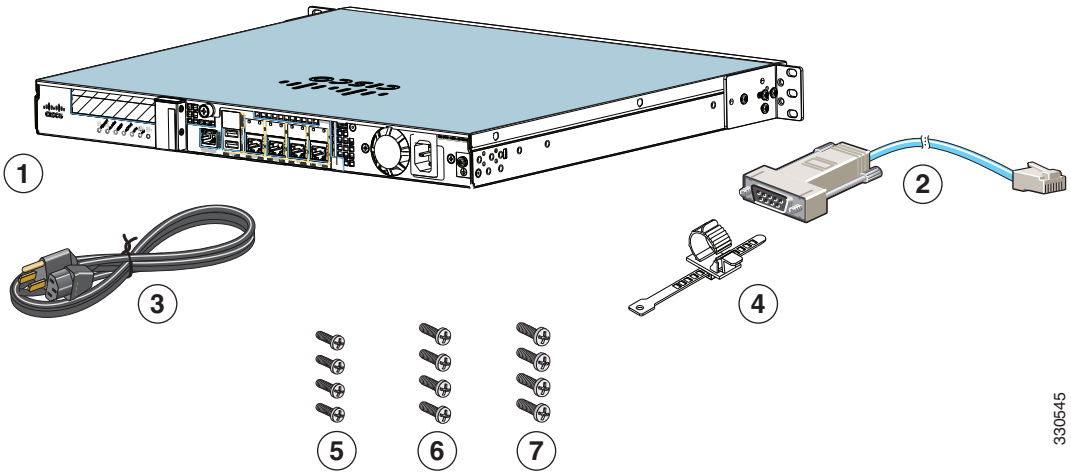
Note: Your ASA 5500-X ships with either ASA or Firepower Threat Defense software preinstalled. To reimage your device, see Reimage the Cisco ASA or Firepower Threat Defense Device.

This chapter includes the following topics:

Package Contents

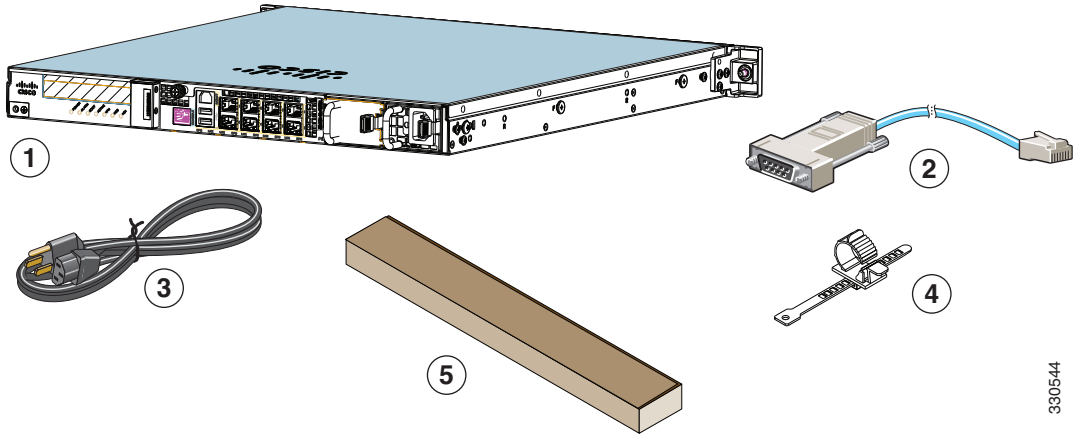
This section lists the package contents of each chassis. Note that contents are subject to change, and your exact contents might contain additional or fewer items.

ASA 5512-X, ASA 5515-X, or ASA 5525-X



1	ASA 5512-X, ASA 5515-X, or ASA 5525-X Chassis	2	Blue Console Cable and Serial PC Terminal Adapter (DB-9 to RJ-45)
3	Power Cord	4	Power Cord Retainer
5	4 10-32 Phillips Screws for rack mounting	6	4 12-24 Phillips Screws for rack mounting
7	4 M6 Phillips Screws for rack mounting		

ASA 5545-X and ASA 5555-X



1	ASA 5545-X or ASA 5555-X Chassis (one power supply shown)	2	Blue Console Cable and Serial PC Terminal Adapter (DB-9 to RJ-45)
3	Power Cord	4	Power Cord Retainer
5	Rack-Mount Bracket Kit		

Internal and External USB Flash Drives

The Cisco ASA 5500-X has internal and (optional) external USB drives.

- Internal USB Drive, page 11

Internal USB Drive

An embedded USB (eUSB) device is used as the internal flash (*disk0*). See Hardware Specifications, page 21 for the size shipped with each model.

External USB Drives (Optional)

The ASA 5500-X supports external USB flash drives for data storage. The ASA 5500-X uses *disk1* as the external USB flash drive identifier. When the ASA is powered on, an inserted USB flash drive is mounted to disk1 and available for you to use. Additionally, the file system commands that are available to disk 0 are also available to disk1, including **copy**, **format**, **delete**, **mkdir**, **pwd**, **cd**, and so on. When you remove the USB flash drive, the system unmounts disk1, and disk1 becomes an invalid file system label that you can no longer access.

If you insert a USB drive with more than one partition, only the first partition is mounted.

USB Online Insertion and Removal

While the ASA back panel has two USB slots, only one is supported for online insertion and removal (OIR), with priority given to the USB drive that was inserted first. For example, based on the time sequence, the first inserted USB flash drive is mounted to disk1, regardless of the slot in which you insert it. When you insert a second USB device, an error message appears on the console to notify you that an extra, unsupported USB flash drive exists. Removing either one of the USB devices does not change the priority that you just established. To change the priority you must safely remove the USB device and begin again to establish the desired priority.

FAT-32 File System

The ASA 5500-X supports only FAT-32-formatted file systems for the eUSB and external USB drives. If you insert an external USB drive that is not in FAT-32 format, the system mounting process fails, and you receive an error message. You can enter the **format disk1:** command to format the partition to FAT 32 and mount the partition to disk1 again; however, data might be lost.

Solid State Drives

You must install a Cisco Solid State Drive (SSD) for use with the some software modules. Only Cisco SSDs are supported. You can install one SSD in the ASA 5512-X, ASA 5515-X, and ASA 5525-X. You can install two SSDs in a RAID 1 configuration in the ASA 5545-X and ASA 5555-X.

Note: When you install an SSD for the first time, you must reload the ASA and then reimage the installed module.

The SSD is hot-swappable. The SSD resides in a carrier, which you install into the drive bay. You can use the SSD with an AC or DC power supply. See Install and Remove a Solid State Drive for a Services Module, page 67 for more information.

Alarm LED

The ASA 5500-X performs autonomous environmental monitoring, polling all external sensors and monitoring operating conditions. In the event of damage to certain internal components, or surpassed temperature thresholds, the system activates an alarm LED to notify you of a critical condition. For example, the alarm LED is activated by firmware in the event of various critical over-voltage and over-temperature conditions, as well as when the ASA has missing or unrecognized internal chip components. When the alarm LED lights, you can find details about the system condition from the system message that appears on the console, or by entering the **show environment** or **show controller pci** CLI commands.

Note: If you remove one of the power-supply modules from an ASA with redundant power supplies—in other words, one with two power supplies installed—the Alarm LED will light. To turn off the light, you must power-cycle the chassis; that is, turn it completely off and then turn it back on. See Power Supply, page 18 for more information about the redundant power-supply configuration. See Remove and Install the Power Supply, page 59 for more information about removing a power supply.

ASA 5500-X I/O Cards

The ASA 5500-X six-port GigabitEthernet interface cards extend the I/O capabilities of the ASA 5525-X, ASA 5545-X, and ASA 5555-X models by providing additional GigabitEthernet ports.

The I/O cards provide the following benefits:

- Segmentation of network traffic into separate security zones
- Fiber-optic cable connectivity for communications over long distances
- Load-sharing of traffic, and protection against link failure, using EtherChannel
- Support for Jumbo Ethernet frames of up to 9000 bytes
- Protection for Active/Active failover, and for full-mesh firewall deployments against cable failure

For information about installing an I/O card in your ASA, see Chapter 6, “Maintenance and Upgrade Procedures for the ASA 5500-X.”

SFP Modules

The ASA uses field-replaceable small form-factor pluggable (SFP) modules to establish Gigabit Ethernet connections.

Use only Cisco-certified SFP modules on the ASA. Each SFP module has an internal serial EEPROM that is encoded with security information. This encoding allows Cisco to identify and validate that the SFP module meets the requirements for the ASA.

For a list of the supported SFP modules, see the product data sheet at the following URL:

http://www.cisco.com/c/en/us/products/collateral/interfaces-modules/gigabit-ethernet-gbic-sfp-modules/product_data_sheet0900aecd8033f885.html

ASA Chassis Panels

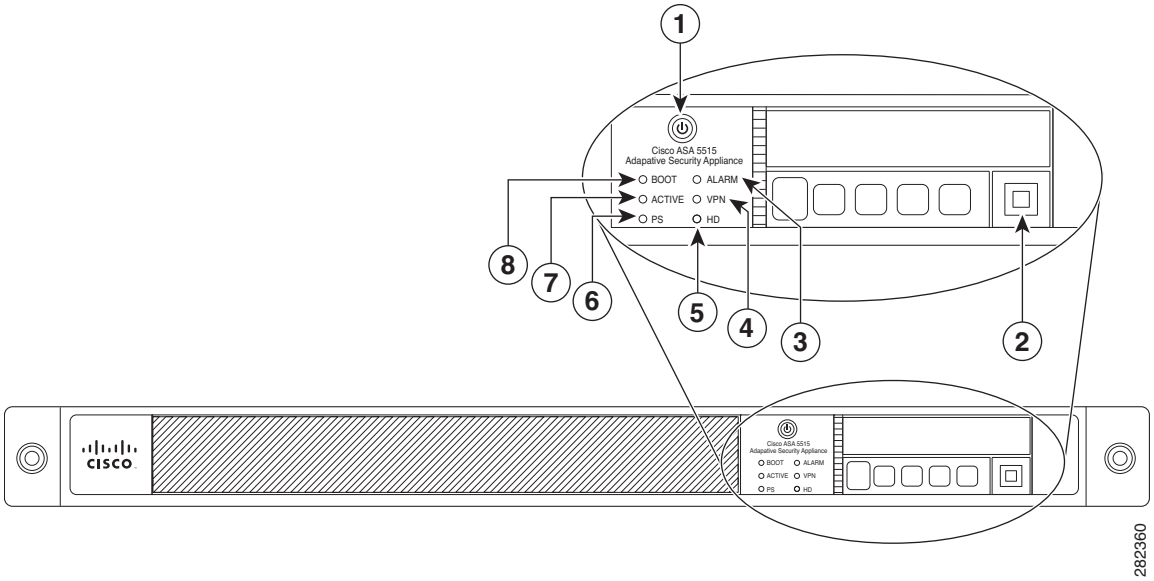
This section describes the front and rear ASA panels, and includes the following topics:

■ Rear Panel Ports, page 17

Front Panel LEDs

Figure 1 shows the front panel LEDs for the ASA 5512-X, ASA 5515-X, and ASA 5525-X models.

Figure 1 Front Panel LEDs for the Cisco ASA 5512-X, ASA 5515-X, and ASA 5525-X

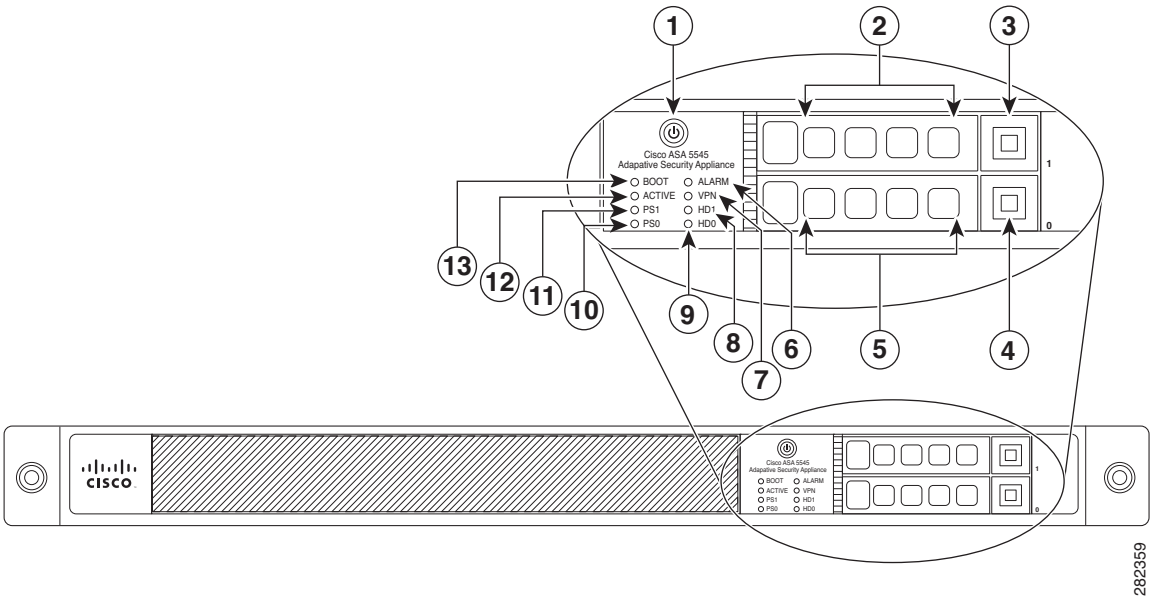


	LED	Description
1	Power button	A soft switch that turns the system on and off. Once pressed, the button stays in the "on" position: ■ On—The power symbol on the button is lit. ■ Off—The power symbol on the button is dark. For information about the power state, see the Power Supply Considerations, page 31.
2	Hard-disk release button	Releases the hard disk from the device.
3	Alarm	System operating status: ■ Off—Normal operating system function. ■ Solid amber—Critical Alarm indicating one or more of the following: – a major failure of a hardware or software component. – an over-temperature condition. – power voltage is outside of the tolerance range. **Note:** May appear red on some devices.
4	VPN	VPN tunnel status: ■ Solid green—VPN tunnel is established. ■ Off—No VPN tunnel established.

5	HD	Hard Disk Drive status: ■ Flashing green—Proportioned to read/write activity. ■ Solid amber—Hard-disk drive failure. ■ Off—No hard-disk drive present.
6	PS	Power supply status
7	Active	Status of the failover pair: ■ Solid green—Failover pair is operating normally. ■ Off—Failover is not operational or this is the secondary unit in the failover pair.
8	Boot	Power-up diagnostics: ■ Flashing green—Power-up diagnostics are running, or system is booting. ■ Solid green—System has passed power-up diagnostics. ■ Off—Power-up diagnostics are not operational.

Figure 2 shows the front panel LEDs for the ASA 5545-X and ASA 5555-X models.

Figure 2 Front Panel LEDs for Cisco ASA 5545-X and ASA 5555-X



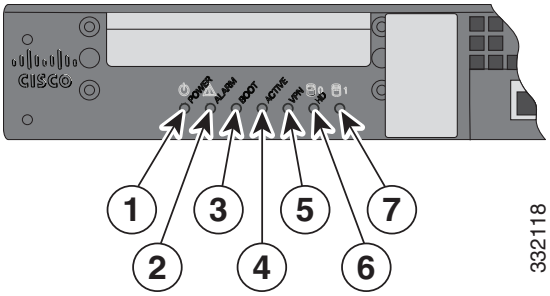
	LED	Description
1	Power button	A soft switch that turns the system on and off. Once pressed, the button stays in the “on” position: ■ On—The power symbol on the button is lit. ■ Off—The power symbol on the button is dark. For information about the power state, see Power Supply Considerations, page 31.
2	Hard-disk slot	Indicates the slot for hard-disk 1.
3	Hard-disk release button	Releases hard-disk 1 from the device.

4	Hard-disk release button	Releases hard-disk 0 from the device.
5	Hard-disk slot	Indicates the slot for hard-disk 0.
6	Alarm	System operating status: ■ Off—Normal operating system function. ■ Solid amber—Critical Alarm indicating one or more of the following: – a major failure of a hardware or software component. – an over-temperature condition. – power voltage is outside of the tolerance range. **Note:** May appear red on some devices.
7	VPN	VPN tunnel status: ■ Solid green—VPN tunnel is established. ■ Off—No VPN tunnel established.
8	HD1	Hard Disk Drive 1 status: ■ Flashing green—Proportioned to read/write activity. ■ Solid amber—Hard-disk drive failure. ■ Off—No hard-disk drive present.
9	HD0	Hard Disk Drive 0 status: ■ Flashing green—Proportioned to read/write activity. ■ Solid amber—Hard-disk drive failure. ■ Off—No hard-disk drive present.
10	PS1	Status of the optional redundant power supply.
11	PS0	Status of the primary power supply that ships with the product.
12	Active	Status of the failover pair: ■ Solid green—Failover pair is operating normally. ■ Off—Failover pair is not operational.
13	Boot	Power-up diagnostics: ■ Flashing green—Power-up diagnostics are running, or system is booting. ■ Solid green—System has passed power-up diagnostics. ■ Off—Power-up diagnostics are not operational.

Rear Panel LEDs

Figure 3 shows the rear panel LEDs for the ASA 5500-X.

Figure 3 Rear Panel LEDs for ASA 5500-X

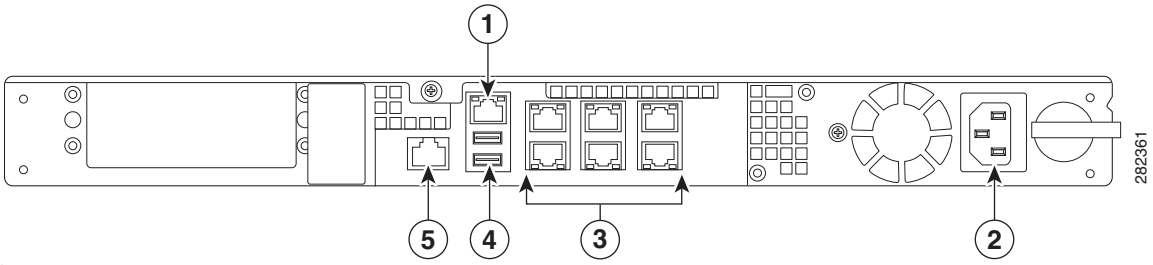


	LED	Description
1	Power	Power supply status: ■ Off—Power supply off. ■ Solid green—Power supply on.
2	Alarm	System operating status: ■ Off—Normal operating system function ■ Solid amber—Critical Alarm indicating one or more of the following: – a major failure of a hardware or software component. – an over-temperature condition. – power voltage is outside of the tolerance range. **Note:** May appear red on some devices.
3	Boot	Power-up diagnostics: ■ Flashing green—Power-up diagnostics are running, or system is booting. ■ Solid green—System has passed power-up diagnostics. ■ Off—Power-up diagnostics are not operational.
4	Active	Status of the failover pair: ■ Solid green—Failover pair is operating normally. ■ Off—Failover pair is not operational.
5	VPN	VPN tunnel status: ■ Solid green—VPN tunnel is established. ■ Off—No VPN tunnel established.
6	HD0	Hard Disk Drive 0 status: ■ Flashing green—Proportioned to read/write activity. ■ Solid amber—Hard-disk drive failure. ■ Off—No hard-disk drive present.
7	HD1	Hard Disk Drive 1 status: ■ Flashing green—Proportioned to read/write activity. ■ Solid amber—Hard-disk drive failure. ■ Off—No hard-disk drive present.

Rear Panel Ports

Figure 4 shows the ports for the ASA 5512-X and ASA 5515-X models.

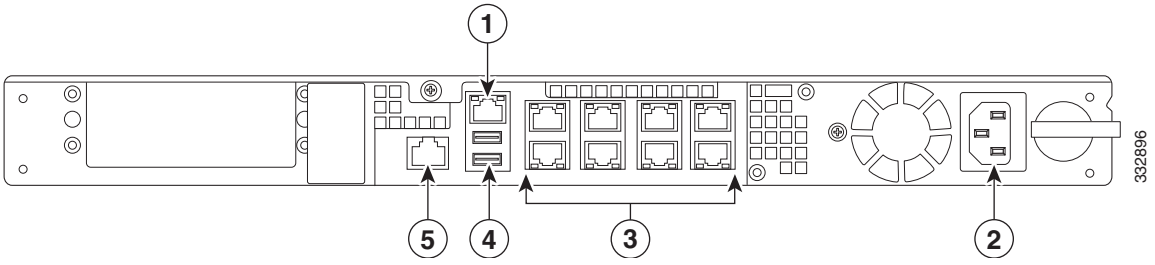
Figure 4 Rear Panel Ports for the ASA 5512-X and ASA 5515-X



	LED	Description
1	Management 0/0 interface	The GigabitEthernet interface that is restricted to management use only. Connect with an RJ-45 cable.
2	Power supply	The chassis power supply.
3	GigabitEthernet data interfaces (0/0 through 0/5)	The 6 on-board data interfaces. Connect with an RJ-45 cable. The top row port numbers are (from left to right) 5, 3, 1. The bottom row port numbers are (from left to right) 4, 2, 0.
4	USB Ports	The two USB standard ports. (See the Internal and External USB Flash Drives, page 10.)
5	Console port	The RS-232 serial console port used to directly connect a computer to the ASA. Connect with an RJ-45 cable.

Figure 5 shows the ports for the ASA 5525-X.

Figure 5 Rear Panel Ports for the ASA 5525-X

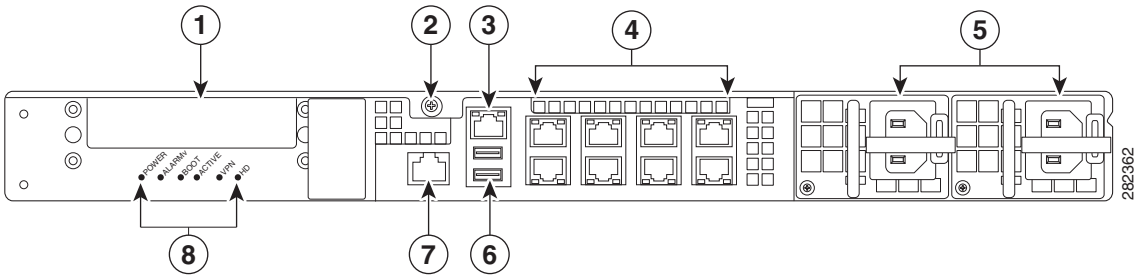


	LED	Description
1	Management 0/0 interface	The GigabitEthernet interface that is restricted to management use only. Connect with an RJ-45 cable.
2	Power supply	The chassis power supply.

3	GigabitEthernet data interfaces (0/0 through 0/7)	The 8 on-board data interfaces. Connect with an RJ-45 cable. The top row port numbers are (from left to right) 7, 5, 3, 1. The bottom row port numbers are (from left to right) 6, 4, 2, 0.
4	USB Ports	The two USB standard ports. (See Internal and External USB Flash Drives, page 10.)
5	Console port	The RS-232 serial console port used to directly connect a computer to the ASA. Connect with an RJ-45 cable.

Figure 6 shows the rear panel ports for the ASA 5545-X and ASA 5555-X.

Figure 6 Rear Panel Ports for the ASA 5545-X and ASA 5555-X



	LED	Description
1	I/O slot	Slot for the optional I/O Card. If you have a fiber-optic I/O card, use SFP modules to connect (not included).
2	Thumbscrew	The screw that tightens and loosens the chassis cover.
3	Management 0/0 interface	The GigabitEthernet interface that is restricted to management use only. Connect with an RJ-45 cable.
4	GigabitEthernet data interfaces (0/0 through 0/7)	The 8 on-board data interfaces. Connect with an RJ-45 cable. The top row port numbers are (from left to right) 7, 5, 3, 1. The bottom row port numbers are (from left to right) 6, 4, 2, 0.
5	Power supplies	Slots for the primary power supply that ships with the device, and the optional redundant power supply.
6	USB ports	The two USB standard ports. (See Internal and External USB Flash Drives, page 10.)
7	Console port	The RS-232 serial console port used to directly connect a computer to the ASA. Connect with an RJ-45 cable.
8	Rear panel LEDs	Rear panel LEDs. (See Figure 3 on page -16 for more information.)

Power Supply

The ASA 5512-X, ASA 5515-X, and ASA 5525-X ship with one fixed fan and one fixed power supply (AC or DC) installed. The ASA 5545-X and ASA 5555-X ship with one power supply (AC or DC) installed.

- Dual Power Supply Support for the ASA 5545-X and ASA 5555-X, page 19
- Power On Guidelines, page 19

Dual Power Supply Support for the ASA 5545-X and ASA 5555-X

You can add an additional power supply, or you can order the ASA 5545-X or ASA 5555-X with two power supplies installed. Having two power supplies installed provides a redundant power option. This configuration ensures that if one power supply fails, the other power supply assumes the full load until the failed power supply is replaced.

To maintain air flow, an empty bay must be covered, or both bays must be populated with power supplies.

If only one power supply is installed, make sure that it is installed in slot 0 (left slot) and that slot 1 (right slot) is covered with a slot cover. If only one power supply is installed, do not remove the power supply unless the chassis has been powered off. Removing the only operational power supply causes an immediate power loss.

Power On Guidelines

The power supply is switched from Standby to ON by way of a system chassis STANDBY/ON switch. Earlier ASAs (V01) require you to turn on the power with the power switch. Newer ASAs (V02) automatically turn on when you plug in the power cable. To determine your version, do one of the following:

- At the CLI prompt, enter the **show inventory** command and look for V01 or V02 in the output.
- On the back of the chassis, look at the VID PID label for V01 or V02.

For the V01 chassis, see the following limitations:

- The ASA requires 50 seconds from the time that AC power is applied before the power state can be updated and stored. This means that any changes to the power state within the first 50 seconds of applying AC power will not be observed if AC power is removed within that time.
- The ASA requires 10 seconds from the time it is placed into standby mode before the power state can be updated and stored. This means any changes to the power state within the first 10 seconds of entering standby mode (including the standby mode itself) will not be observed if AC power is removed within that time.

For the V02 chassis, the above limitations to not apply.

The power supply slot numbers are on the back of the chassis to the left side of each power supply. When facing the back of the chassis, power supply slot 0 (PS0) is to the left and power supply slot 1(PS1) is to the right. By default, a single power supply is installed in slot 0.

AC and DC Support

The ASA supports the following power supplies:

- AC power supply—Provides 400 watt output power with two DC voltage outputs: +12 V and +5 V. The AC power supply operates between 85 and 264 VAC. The AC power supply current shares on the 12 V output and is used in a dual hot-pluggable configuration. The AC power supply consumes a maximum of 471 W of input power.

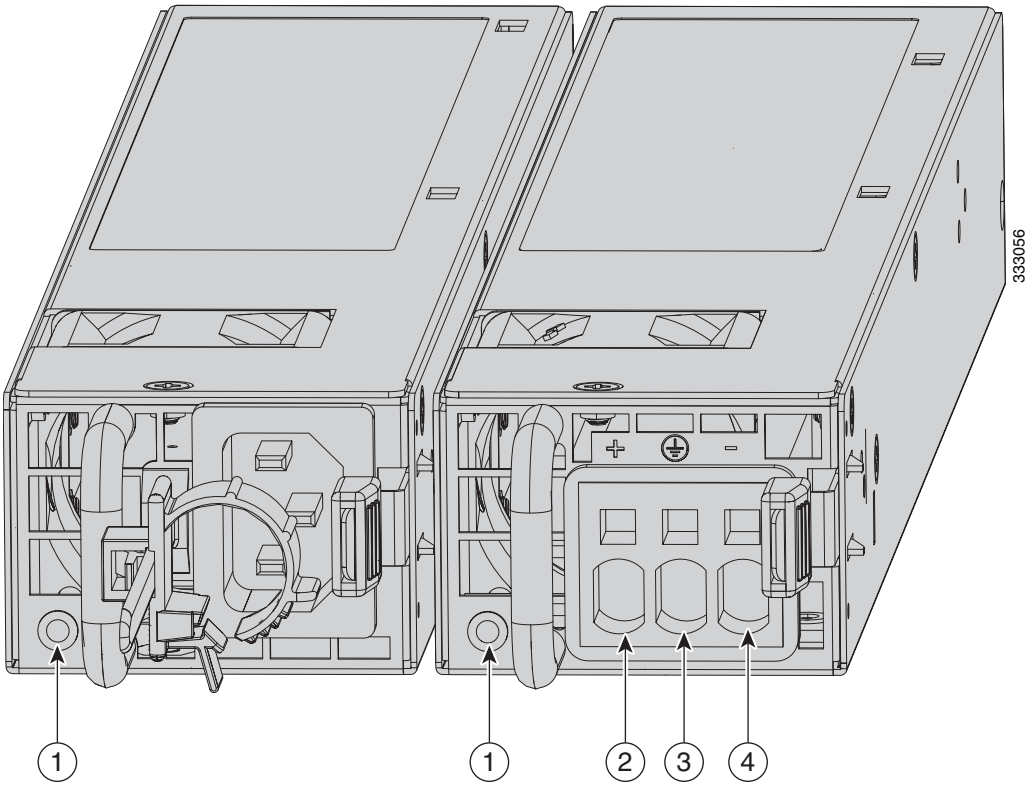
  When the Cisco ASA 5500-X operates on AC power, it supports the ability to restore the previous power state of the system in the event that AC power is lost.
- DC power supply—Provides 400 watt output power with two DC voltage outputs: +12 V and +5.0 V. The power supply operates between –40.5 and –72 VDC. The DC power supply current shares on the 12 V output and is used in a dual hot-pluggable configuration. The DC power supply consumes a maximum of 500 W of input power.

Note: The ASA 5545-X and ASA 5555-X can support two AC or two DC power supplies. Do not mix AC and DC power supply units in the same chassis.

Power Supply Indicators and Connections

Figure 7 shows both the removable AC (on the left) and DC (on the right) power supplies for the ASA 5545-X and ASA 5555-X.

Figure 7 AC Power Supply and DC Power Supply



1	Power supply indicator	**2**	DC power supply positive connection
3	DC power supply neutral connection	**4**	DC power supply negative connection

Table 1 describes the power supply indicator. The function of the indicator is the same for both the AC and DC power supplies.

Table 1 AC and DC Power Supply Indicator

Indicator Color and State	Description
Solid green	Power output is on and within the normal operating range.
Blinking green, at the rate of one blink per second	Input power that is within the normal operating range is being supplied, but the Standby switch is in the Standby position (that is, chassis is not On).
Solid amber	A power-supply critical event has occurred, and the power supply has shut down. The critical event can be temperature, voltage, current, or fan operating outside the normal operating range.
Blinking amber, at the rate of one blink per second	A power-supply warning event has occurred, but the power supply can continue to operate. The warning event can be temperature, voltage, current, or fan operating outside the normal operating range.
Off	The power supply is shut down.

Hardware Specifications

Table 2 contains hardware specifications for the ASA 5500-X series.

Table 2 Hardware Specifications for the Cisco ASA 5500-X Series

	ASA 5512-X	ASA 5515-X	ASA 5525-X	ASA 5545-X	ASA 5555-X
Physical Specifications					
Form-factor	1RU, 19-in	1RU, 19-in	1RU, 19-in	1RU, 19-in	1RU, 19-in
Rack mountable	Yes. Brackets included, slide rails optional	Yes. Brackets included, slide rails optional	Yes. Brackets included, slide rails optional	Yes. Slide rails included.	Yes. Slide rails included.
Dimensions	1.67x16.7x15.6 in 4.24x42.9x39.5 cm	1.67x16.7x15.6 in 4.24x42.9x39.5 cm	1.67x16.7x15.6 in 4.24x42.9x39.5 cm	1.67x16.7x19.1 in 4.24x42.9x48.4 cm	1.67x16.7x19.1 in 4.24x42.9x48.4 cm
Weight—single power supply	13.39 lb.	13.39 lb.	14.92 lb.	16.82 lb.	16.82 lb.
Weight—dual power supply	N/A	N/A	N/A	18.86 lb.	18.86 lb.
Technical Specifications					
DRAM Memory	4 GB	8 GB	8 GB	12 GB	16 GB
Internal Flash	4 GB	8 GB	8 GB	8 GB	8 GB
Power Supply Information					
Power supply	400 W	400W	400W	450W	450W
Redundant power supply available	No	No	No	Yes	Yes
Operating Conditions					
Temperature	-5° C to 40° C (23° F to 104° F)	-5° C to 40° C (23° F to 104° F)	-5° C to 40° C (23° F to 104° F)	-5° C to 40° C (23° F to 104° F)	-5° C to 40° C (23° F to 104° F)
Relative humidity	90%	90%	90%	90%	90%
Altitude	10,000 ft.	10,000 ft.	10,000 ft.	10,000 ft.	10,000 ft.
Non-Operating Conditions					
Temperature	-25° C to 70° C (-13° F to 158° F)	-25° C to 70° C (-13° F to 158° F)	-25° C to 70° C (-13° F to 158° F)	-25° C to 70° C (-13° F to 158° F)	-25° C to 70° C (-13° F to 158° F)
Relative humidity	10% to 90%	10% to 90%	10% to 90%	10% to 90%	10% to 90%
Altitude	15,000 ft.	15,000 ft.	15,000 ft.	15,000 ft.	15,000 ft.

For additional specifications, see the product data sheet at the following URL:

http://www.cisco.com/c/en/us/products/collateral/security/asa-5500-x-series-next-generation-firewalls/data-sheet-c78-729807.html

Power Cord Specifications

Each power supply has a separate power cord. Standard power cords are available for connection to the security appliance.

If you do not order the optional power cord with the system, you are responsible for selecting the appropriate power cord for the product. Using a non-compatible power cord with this product may result in electrical safety hazard. Orders delivered to Argentina, Brazil, and Japan must have the appropriate power cord ordered with the system.

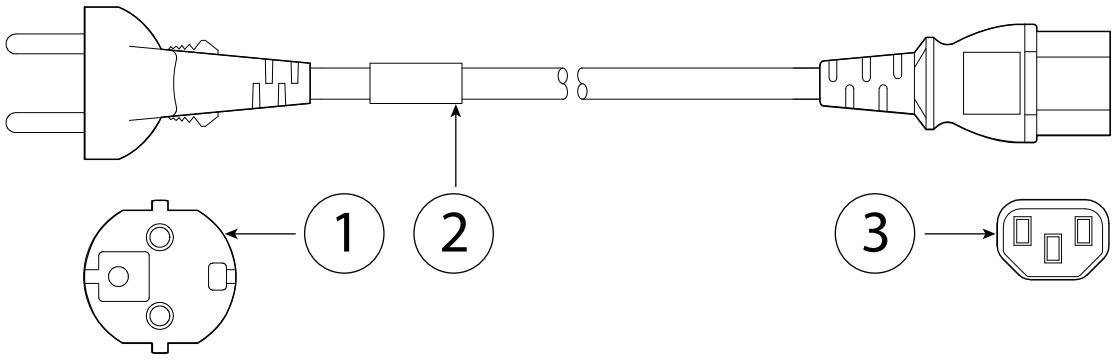
Only the approved power cords provided with the security appliance are supported. The following table lists the supported power cords.

Table 3 Supported Power Cords

Description	Amperage	Voltage	Plug	Connector
CAB-ACE AC Power cord (Europe)	10A	250V	CEE 7 VII	IEC 60320/C13
CAB-AC AC Power cord (North America)	10A	125V	NEMA 5-15P	IEC 60320/C13
CAB-ACA AC power cord (Australia)	10A	250V	A.S. 3112	IEC 60320/C13
CAB-ACI AC power cord (Italy)	10A	250V	CEI23-16-VII	IEC 60320/C13
CAB-ACR AC power cord (Argentina)	10A	250V	IRAM 2073	IEC 60320/C13
CAB-ACS AC power cord (Switzerland)	10A	250V	SEV 1011	IEC 60320/C13
CAB-ACU AC power cord (United Kingdom)	10A	250V	BS1363a/SS145	IEC 60320/C13
CAB-JPN-3PIN Power cord 3PIN (Japan)	12A	125V	JIS C8303	IEC 60320/C13
AIR-PWR-CORD-SA AIR line cord (South America)	10A	250V	SABS 1661	IEC 60320/C13
CAB-ACC Power cord (China)	10A	250V	GB2009.1-2008	IEC 60320/C13
CAB-IND-10A Power cord (India)	10A	250V	IS 6538-1971	IEC 60320/C13
CAB-C13-ACVB AC power cord (Brazil)	10A	250V	NBR 14136	IEC 60320/C13
CAB-AC-C13-KOR AC power cord (Korea)	10A	250V	KSC8305	IEC 60320/C13
CAB-ACTW AC power cord (Taiwan)	10A	250V	CNS10917	IEC 60320/C13

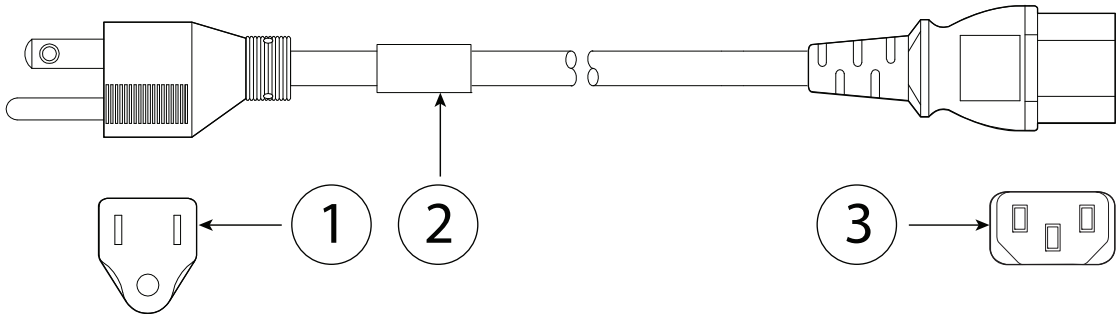
The following illustrations show the cord, connector, and plug for each country listed in Table 3.

Figure 3-8 CAB-ACE (Europe)



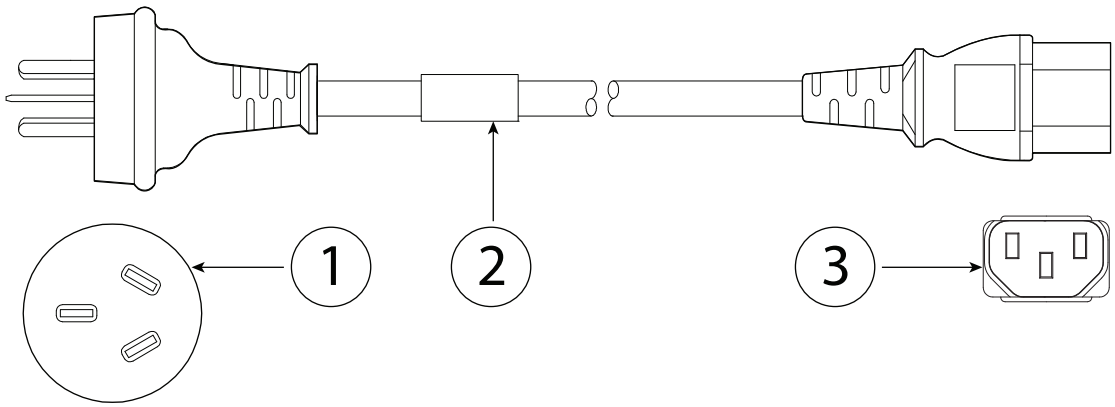
1	Plug: CEE 7 VII	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Figure 3-9 CAB-AC (North America)



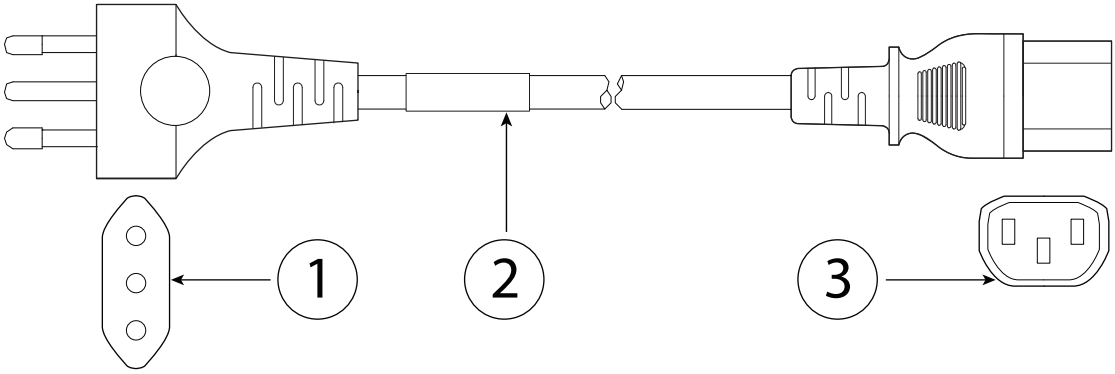
1	Plug: NEMA 5-15P	**2**	Cord set rating: 10A, 125V
3	Connector: IEC 60320/C13		

Figure 3-10 CAB-ACA (Australia)



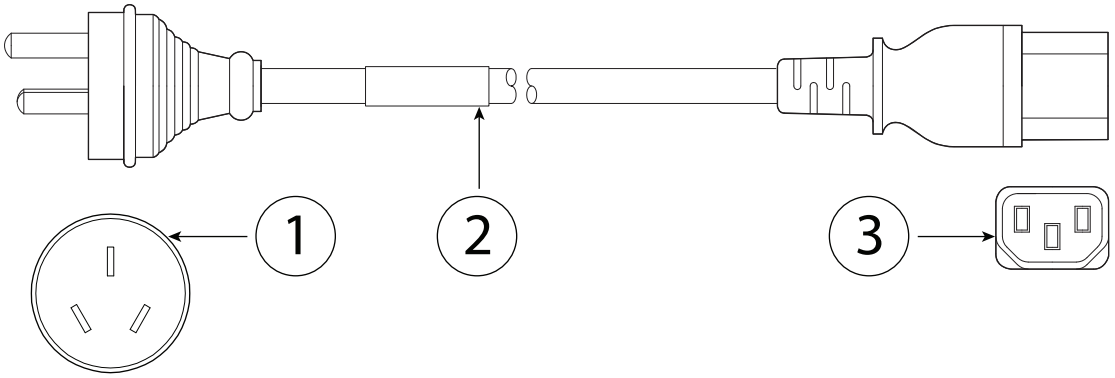
1	Plug: A.S. 3112	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Figure 3-11 CAB-ACI (Italy)



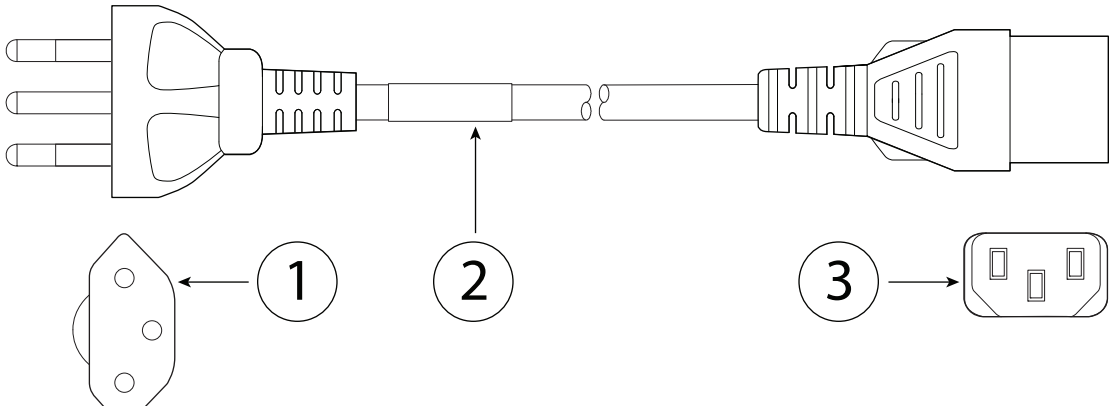
1	Plug: CE123-16-VII	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Figure 3-12 CAB-ACR (Argentina)



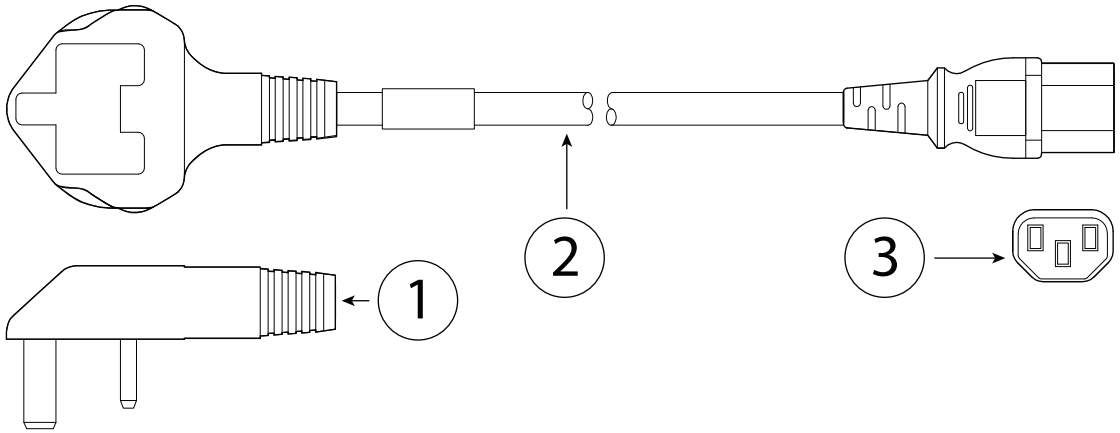
1	Plug: IRAM 2073	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Figure 3-13 CAB-ACS (Switzerland)



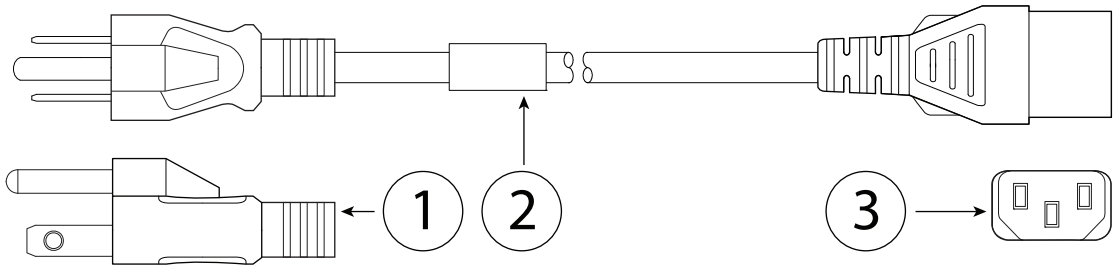
1	Plug: SEV 1011	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Figure 3-14 CAB-ACU (United Kingdom)



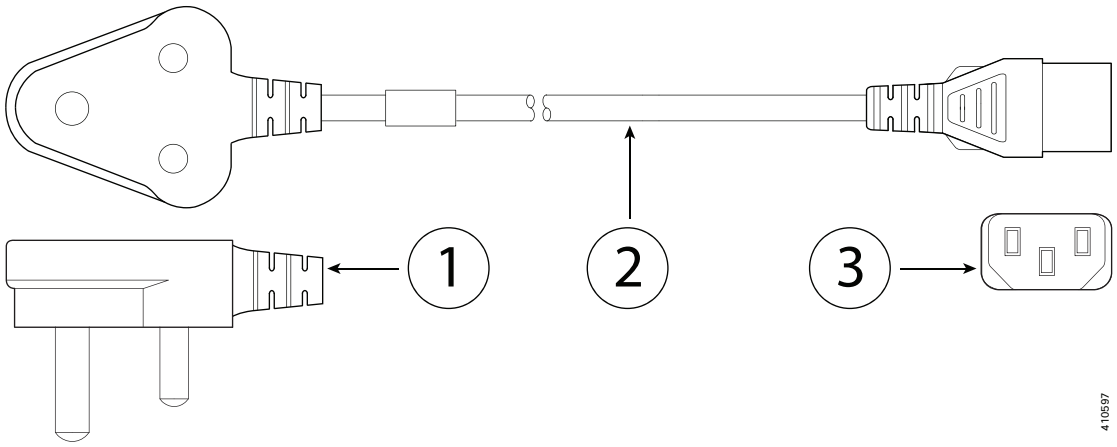
1	Plug: BS1363a/SS145	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Figure 3-15 CAB-JPN-3PIN (Japan)



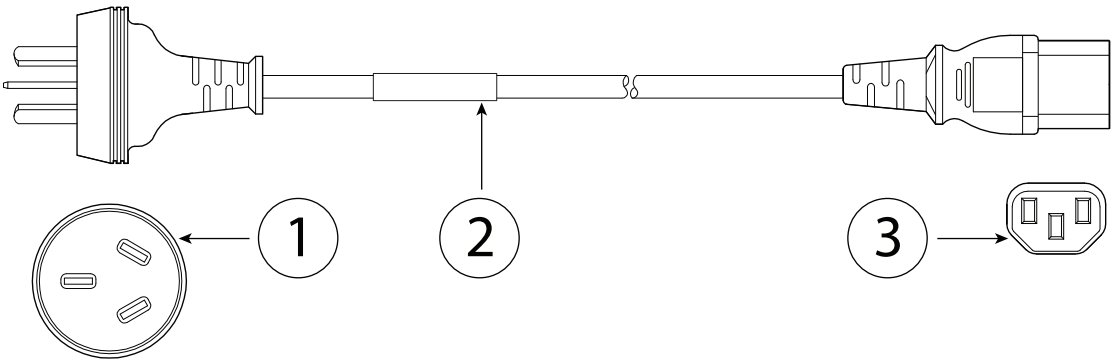
1	Plug: JIS C8303	**2**	Cord set rating: 12A, 125V
3	Connector: IEC 60320/C13		

Figure 3-16 AIR-PWR-CORD-SA (South Africa)



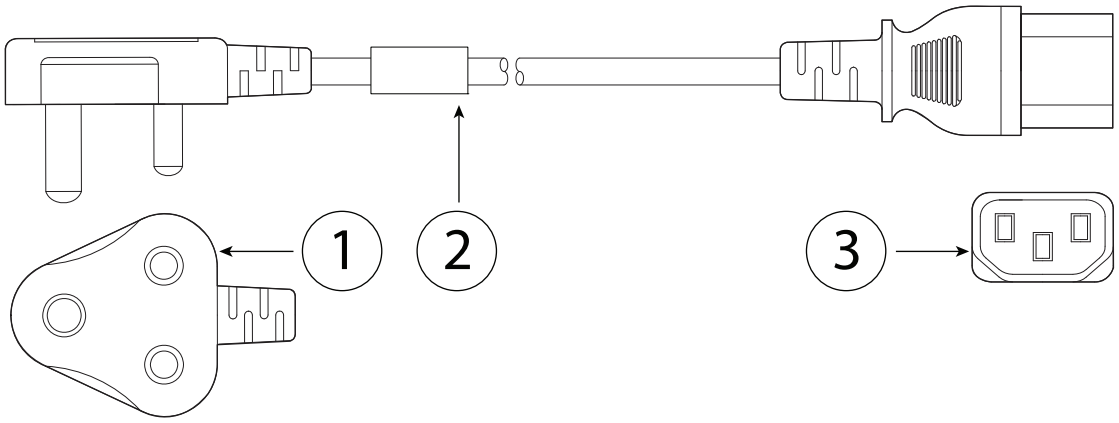
1	Plug: SABS 1661	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Figure 3-17 CAB-ACC (China)



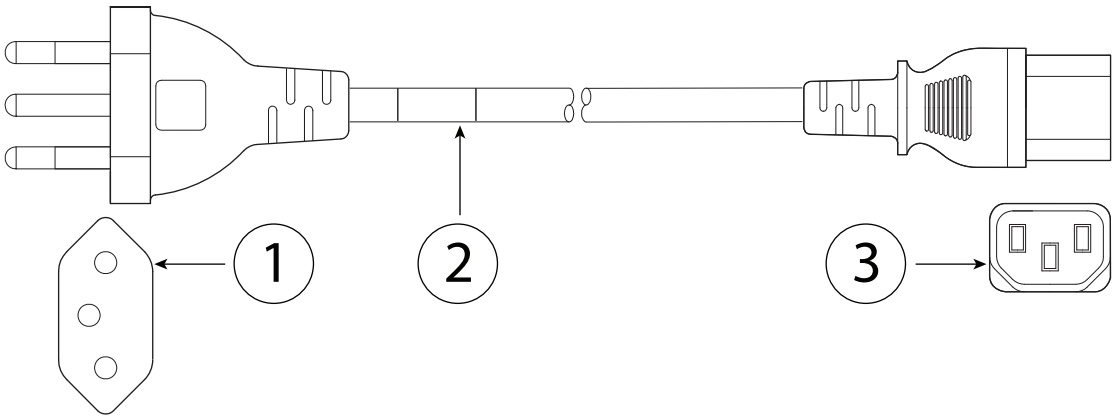
1	Plug: GB2009.1-2008	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Figure 3-18 CAB-IND-10A (India)



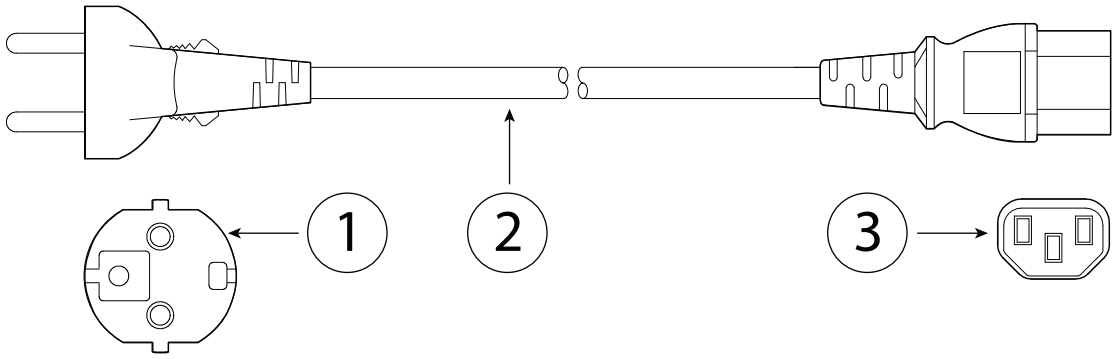
1	Plug: IS 6538-1971	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Figure 3-19 CAB-C13-ACB (Brazil)



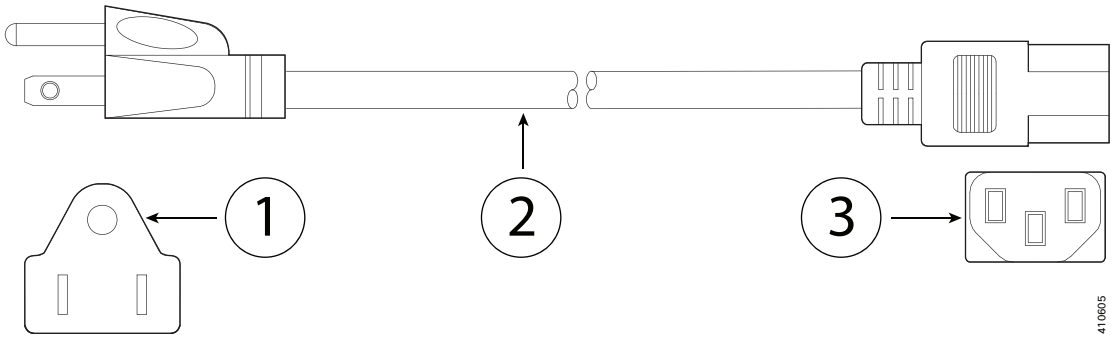
1	Plug: NBR 14136	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Figure 3-20 CAB-AC-C13-KOR (Korea)



1	Plug: KSC8305	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Figure 3-21 CAB-ACTW (Taiwan)



1	Plug: CNS10917	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320/C13		

Preparing for Installation

The information in this guide applies to the following Cisco ASA 5500-X Series models: ASA 5512-X, 5515-X, 5525-X, 5545-X, and 5555-X. This chapter describes the steps to follow before installing new hardware or performing hardware upgrades.

Safety Guidelines

Use the following guidelines and the information in the following sections to help ensure your safety and protect the ASA. The list of guidelines may not address all potentially hazardous situations in your working environment, so be alert and exercise good judgment at all times.

Note: If you need to remove the chassis cover to install a hardware component, such as additional memory or an interface card, doing so does not affect your Cisco warranty. Upgrading the ASA does not require any special tools and does not create any radio frequency leaks.

Observe the following safety guidelines:

- Keep the chassis area clear and dust-free before, during, and after installation.
- Keep tools away from walk areas in which you and others might fall over them.
- Do not wear loose clothing or jewelry, such as earrings, bracelets, or chains that could get caught in the chassis.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Never attempt to lift an object that is too heavy for one person.

Maintaining Safety with Electricity

Warning: Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units. Statement 12

Follow these guidelines when working on equipment powered by electricity:

- Before beginning procedures that require access to the interior of the chassis, locate the emergency power-off switch for the room in which you are working. Then, if an electrical accident occurs, you can act quickly to turn off the power.
- Do not work alone if potentially hazardous conditions exist anywhere in your work space.
- Never assume that power is disconnected from a circuit; always check the circuit.

- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:
  - Use caution; do not become a victim yourself.
  - Disconnect power from the system.
  - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim, and then call for help.
  - Determine whether or not the person needs rescue breathing or external cardiac compressions; then take appropriate action.
- Use the ASA chassis within its marked electrical ratings and product usage instructions.
- Install the ASA in compliance with local and national electrical codes as listed in the Regulatory Compliance and Safety Information document.
- The ASA 5500-X models equipped with AC-input power supplies are shipped with a 3-wire electrical cord with a grounding-type plug that fits into a grounding-type power outlet only. Do not circumvent this safety feature. Equipment grounding should comply with local and national electrical codes.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures.

- Always follow ESD-prevention procedures when removing and replacing components. Ensure that the chassis is electrically connected to an earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the grounding clip to an unpainted surface of the chassis frame to safely ground ESD voltages. To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- For safety, periodically check the resistance value of the anti-static strap, which should be between one and 10 megohms (Mohms).

General Site Requirements

The topics in this section describe the requirements your site must meet for safe installation and operation of your system. Ensure that your site is properly prepared before beginning installation.

- Site Environment, page 30
- Preventive Site Configuration, page 31
- Power Supply Considerations, page 31
- Configuring Equipment Racks, page 33

Site Environment

Place the chassis on a desktop, or mount it in a rack. The location of the chassis and the layout of the equipment rack or wiring room are extremely important for proper system operation. Placing equipment too close together with inadequate ventilation and inaccessible panels can cause system malfunctions and shutdowns. Improper placement can also make it difficult for you to access the chassis for maintenance.

For information about physical specifications, see Hardware Specifications, page 21.

When planning the site layout and equipment locations, keep in mind the precautions described in the next section, Preventive Site Configuration, page 31, to help avoid equipment failures and reduce the possibility of environmentally caused shutdowns. If you are currently experiencing shutdowns or unusually high error rates with your existing equipment, these precautions may help you isolate the cause of failures and prevent future problems.

Preventive Site Configuration

The following precautions will help you plan an acceptable operating environment for the chassis and avoid environmentally caused equipment failures:

- Electrical equipment generates heat. Ambient air temperature might not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Ensure that the room in which you operate your system has adequate air circulation.
- Always follow the ESD-prevention procedures described previously to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.
- Ensure that the chassis cover is secure. The chassis is designed to allow cooling air to flow effectively within it. An open chassis allows air leaks, which may interrupt and redirect the flow of cooling air from the internal components.

Power Supply Considerations

Observe the following considerations:

- Check the power at the site before installing the chassis to ensure that it is “clean” (free of spikes and noise). Install a power conditioner, if necessary, to ensure proper voltages and power levels in the source voltage.
- Install proper grounding for the site to avoid damage from lightning and power surges.
- The ASA chassis does not have a user-selectable operating range. Refer to the label on the chassis for the correct AC-input power requirement.
- Several styles of AC-input power supply cords are available; make sure that you have the correct style for your site.
- Install an uninterruptible power source for your site, if possible.

You also need to provide power to the chassis with the appropriate AC power cord for your location. Table 1 lists the power cords that are used with the AC power supply.

Table 1 AC-Input Power Cord Options

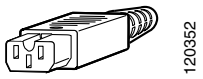
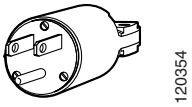
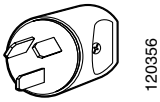
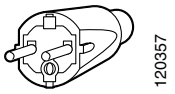
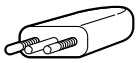
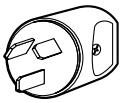
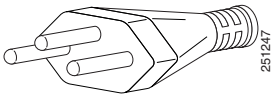
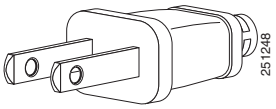
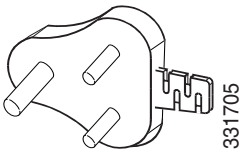
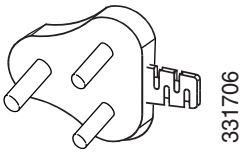
Locale	Part Number	Length	Plug Rating	Plug Type
300 W AC Power Supply			**Chassis Coupler**	 120352
North America	CAB-AC (72-0259)	8.2 ft (2.5 m)	125 VAC, 10 A	 120354
Australia,	CAB-ACA (72-0746-01)	8.2 ft (2.5 m)	250 VAC, 10 A	 120356

Table 1 AC-Input Power Cord Options (continued)

Locale	Part Number	Length	Plug Rating	Plug Type
Europe (except Italy)	CAB-ACE (72-0460)	8.2 ft (2.5 m)	250 VAC, 10 A	 120357
Italy	CAB-ACI 72-0556	8.2 ft (2.5 m)	250 VAC, 10 A	 120358
Singapore United Kingdom	CAB-ACU 72-0557	8.2 ft (2.5 m)	250 VAC, 10 A	 120359
Argentina	CAB-ACR (37-0995-01)	8.2 ft (2.5 m)	250 VAC, 10 A	 120356
Switzerland	CAB-ACS (72-1483-01)	8.2 ft (2.5 m)	250 VAC, 10 A	 251247
Japan	CAB-JPN (72-1925-01)	8.2 ft (2.5 m)	250 VAC, 10 A	 251248
India	CAB-IND-10A (37-0863-01)	8.2 ft (2.5 m)	250 VAC, 10 A	 331705
South Africa	AIR-PWR-CORD-SA (37-0346-01)	8.2 ft (2.5 m)	250 VAC, 10 A	 331706

Configuring Equipment Racks

The following tips help you plan an acceptable equipment rack configuration:

- Enclosed racks must have adequate ventilation. Ensure that the rack is not overly congested because each chassis generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air.
- When mounting a chassis in an open rack, ensure that the rack frame does not block the intake or exhaust ports. If the chassis is installed on slides, check the position of the chassis when it is seated all the way into the rack.
- In an enclosed rack with a ventilation fan in the top, excessive heat generated by equipment near the bottom of the rack can be drawn upward and into the intake ports of the equipment above it in the rack. Ensure that you provide adequate ventilation for equipment at the bottom of the rack.
- Baffles can help to isolate exhaust air from intake air, which also helps to draw cooling air through the chassis. The best placement of the baffles depends on the airflow patterns in the rack. Experiment with different arrangements to position the baffles effectively.

Installing and Connecting the ASA 5500-X

This chapter describes how to rack-mount the ASA and connect the interface cables.

Rack Mount the Chassis

The ASA 5512-X, 5515-X, and 5525-X chassis ship with rack mount brackets installed on the front of the chassis. 5545-X and 5555-X chassis ship with the slide rail mounting system.

Rack Mount Guidelines

Warning: To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety: This unit should be mounted at the bottom of the rack if it is the only unit in the rack.When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006

The following information can help plan equipment rack installation:

- Allow clearance around the rack for maintenance.
- If the rack contains stabilizing devices, install the stabilizers prior to mounting or servicing the unit in the rack.
- When mounting a device in an enclosed rack, ensure adequate ventilation. Do not overcrowd an enclosed rack. Make sure that the rack is not congested, because each unit generates heat.
- When mounting a device in an open rack, make sure that the rack frame does not block the intake or exhaust ports.
- If the rack contains only one unit, mount the unit at the bottom of the rack.
- If the rack is partially filled, load the rack from the bottom to the top, with the heaviest component at the bottom of the rack.

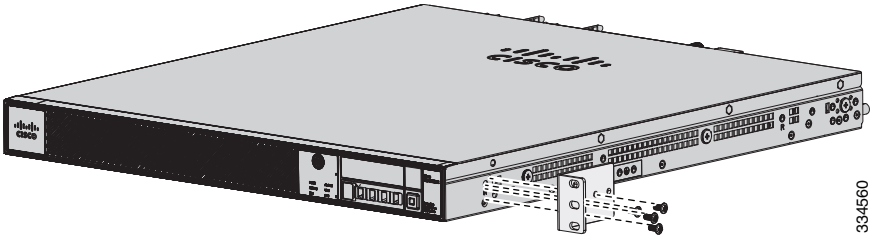
Rack Mount the ASA 5512-X, 5515-X, and 5525-X With Brackets

The ASA 5512-X, 5515-X, and 5525-X chassis ship with rack mount brackets installed on the front of the chassis. If you want to mount the chassis to the back of the rack, you can move the brackets from the front to the back of the chassis.

Procedure

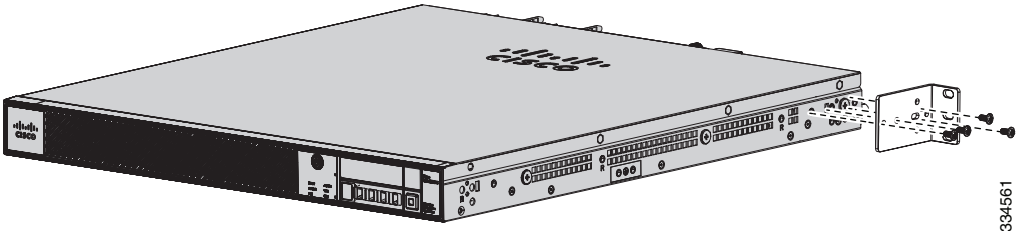
1. (Optional) Move the brackets to the back of the chassis to install it in the back of the rack.
   a. Remove the rack-mount brackets from the chassis as shown in Figure 1.

Figure 1 Removing the Brackets from the Front of the Chassis



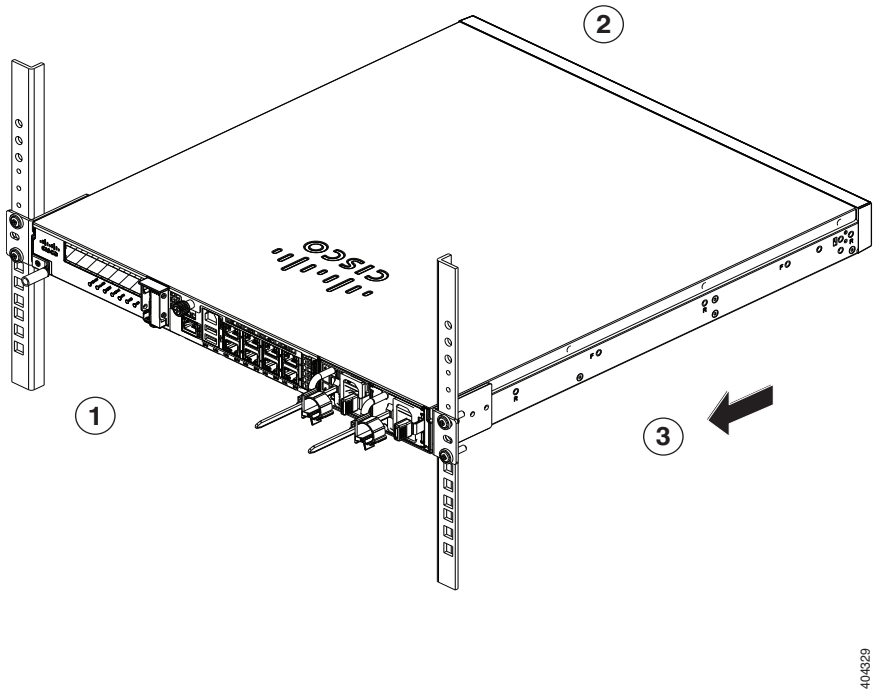
   b. Install the brackets on the back of the chassis by attaching the brackets to the holes in the chassis as shown in Figure 2. After the brackets are secured to the chassis, you can mount it in a rack.

Figure 2 Installing the Brackets on the Back of the Chassis



2. We recommend that you install the chassis with the front bezel facing the cold aisle. (See Figure 3 for an example of air flow from front to back.)

Figure 3 Airflow Direction

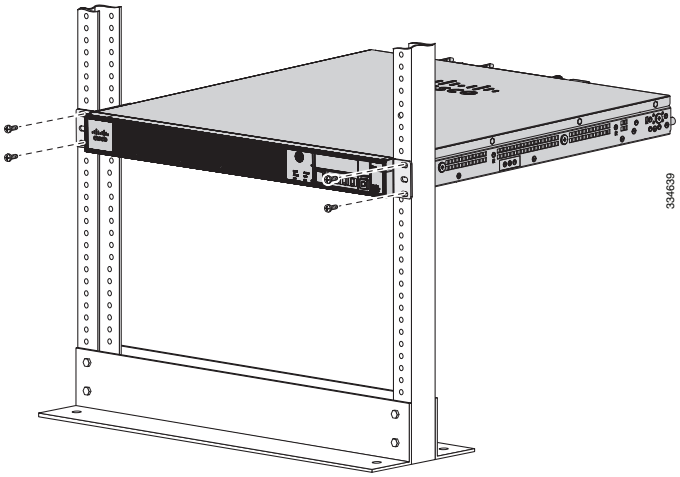


Legend

1	I/O Side
2	Bezel
3	Airflow Direction

3. Attach the chassis to the rack using the supplied screws appropriate for your rack (Figure 4).

Figure 4 Rack-Mounting the Chassis



Rack Mount the ASA 5500-X Chassis with Slide Rail Mounting System

The slide rail mounting system provides a quick, convenient, and secure method for rack mounting the chassis. While the 5545-X and 5555-X chassis ship with the slide rail mounting system and can be mounted using this system only, you can use the slide rail mounting system for any of the other ASA 5500-X series chassis, as well.

Prepare an ASA 5512-X, ASA 5515-X, or ASA 5525-X to Use a Slide Rail Rack Mount System

These instructions show how to prepare an ASA 5512-X, ASA 5515-X, or ASA 5525-X chassis for mounting with the slide rail rack mount system. These chassis models ship with preinstalled fixed rack-mount brackets, which must be replaced with the die-cast brackets that ship in the slide rail rack mount kit.

Procedure

1. From the slide rail rack mount kit, locate the two die-cast brackets, the six screws, and the four shoulder screws that you need to prepare your chassis for installation in the side rail rack.
2. Remove the preinstalled fixed rack-mount bracket on either side of the chassis by removing the three bracket screws that hold each bracket in place. (See Figure 5.)

Figure 5 Remove Preinstalled Screws and Brackets on Either Side of Chassis

3. Install a die-cast bracket to either side of the chassis by aligning and inserting the tab at the end of the bracket into the hole on the chassis and then hinging it into position so that the bracket is flush with the front face plate (bezel) of the chassis. Secure each bracket to the chassis with three screws.
(See Figure 6.)

Figure 6 Install Die-Cast Brackets with Three Screws

4. Install two shoulder screws into the threaded hole locations on either side of the chassis (see Figure 7 for one side), and ensure that they are tight.

Figure 7 Install Two Shoulder Screws on Either Side of the Chassis

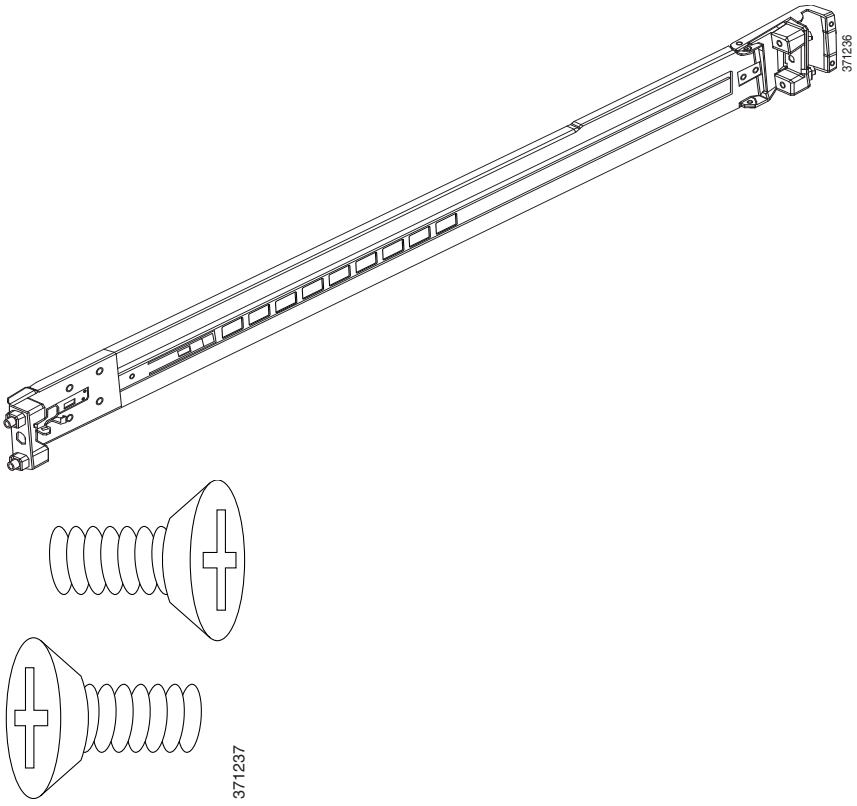
Rack Mount the Chassis with the Slide Rail Mounting System

This section describes how to mount the chassis using the slide rail mounting system.

Although slide rail mounting is preferred, in the case of two-rail racks where the slide rails will not fit, you can use the rack mounting brackets. You must order them separately (ASA-BRACKETS=). Note that there will be a slight bend in the brackets when you attach them. For the procedure for attaching the brackets to the front or back of the chassis, see Rack Mount the ASA 5512-X, 5515-X, and 5525-X With Brackets, page 35.

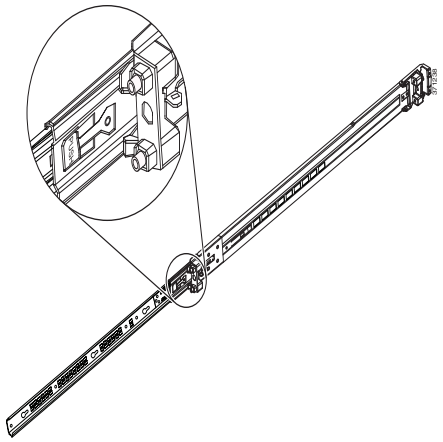
Before You Begin

- Verify the box contents

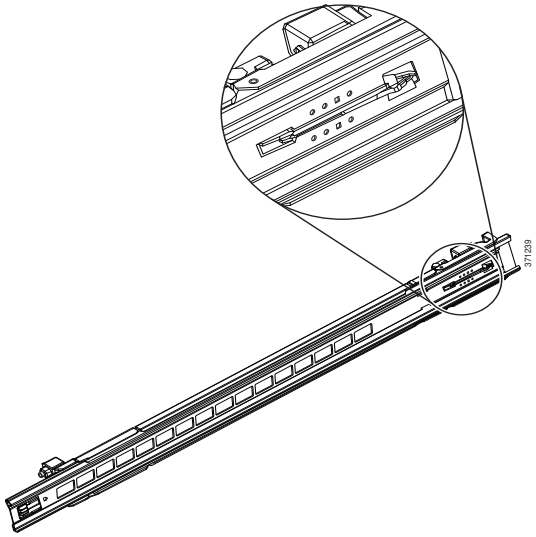


Procedure

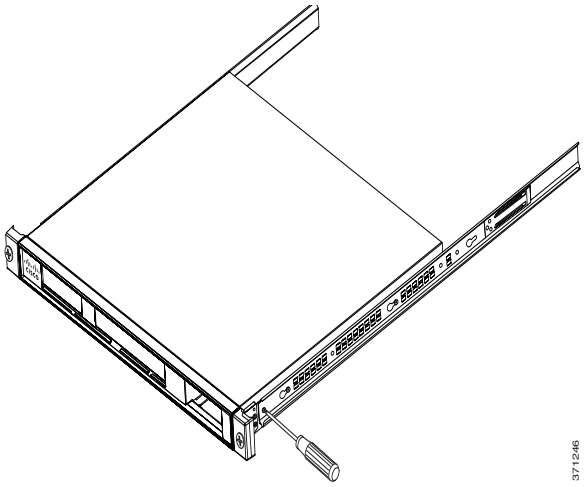
1. Disassemble the slide rail.
   a. Extend the inner slide rail completely from the outer slide rail.



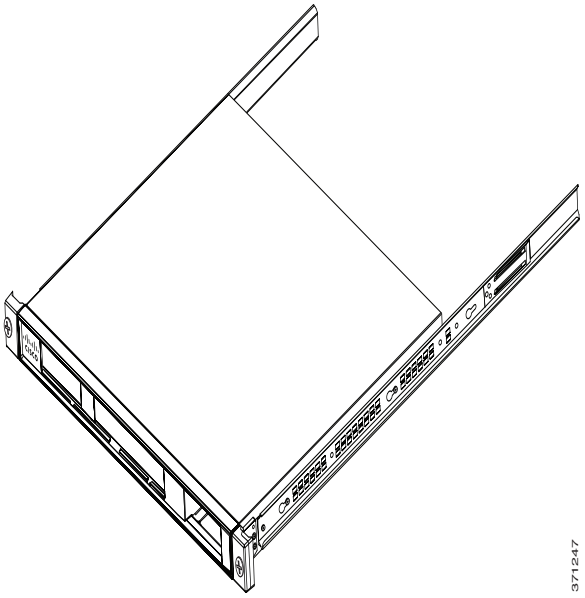
   b. Press the silver latch to retract the middle rail on the outer rail.



   c. Repeat these steps for the other slide rail.
2. Attach the inner rails to the chassis.
   a. Align one of the inner slide rail key holes over the chassis shoulder screw on one side. Slide the inner slide rail forward so that the shoulder screw is securely in place. Use a Phillips screwdriver to secure the inner slide rail with one Phillips screw (B).



b. Secure the other inner slide rail to the chassis by repeating the previous steps on this page.

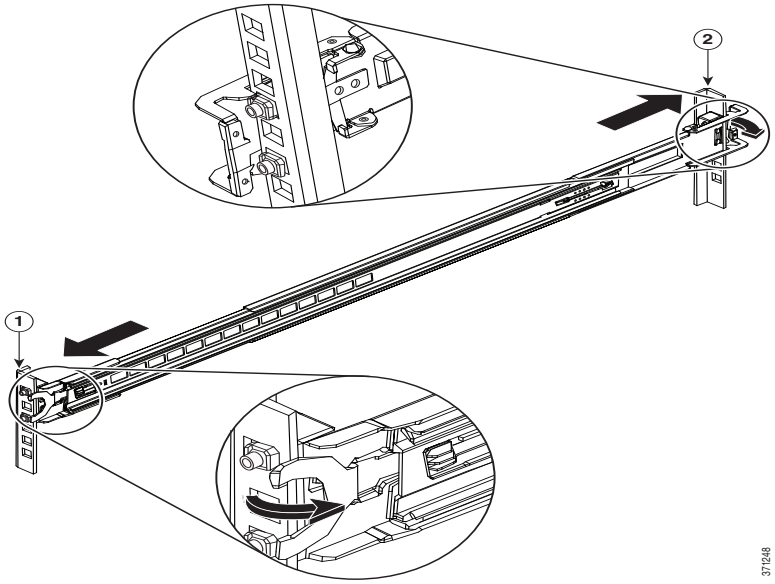


3. (Round and Threaded Hole Racks Only) Customize the slide rails for round hole racks or threaded hole racks.

4. Attach the outer slide rail to the rack.

a. Align the front of the mounting pin on the outer slide rails with the rack upright, push it forward, and click it into place. Align the rear of the outer slide rail with the rack upright, pull the release tab, push the slide rail toward the rack, release the latch, and click it into place.

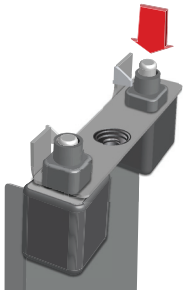
Note: For racks shorter than 24 inches in depth, remove the rear bracket with a Phillips head screwdriver, pull the release tab, and adjust the slide rail to the appropriate length for the rack.



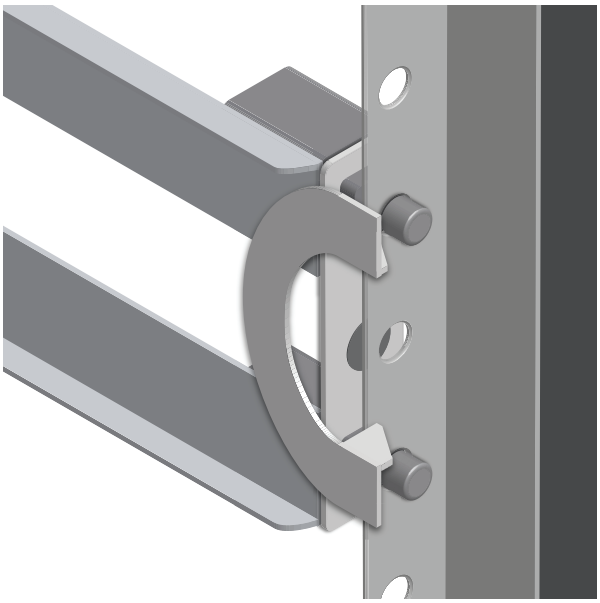
b. Secure the other outer slide rail to the rack by repeating the previous step.

Note: The previous illustration shows a square hole rack. If you are installing in a round hole rack, see the following illustration.

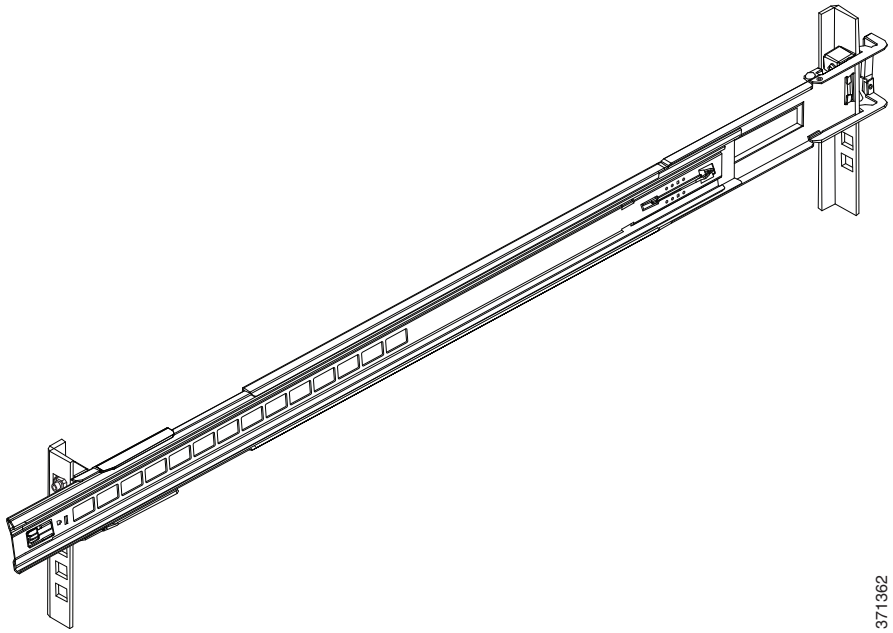
The following illustration shows the casing pulled back on the inner peg. The rail can be installed in three different rack types.



The following illustration shows a rail installed in a threaded rail rack.

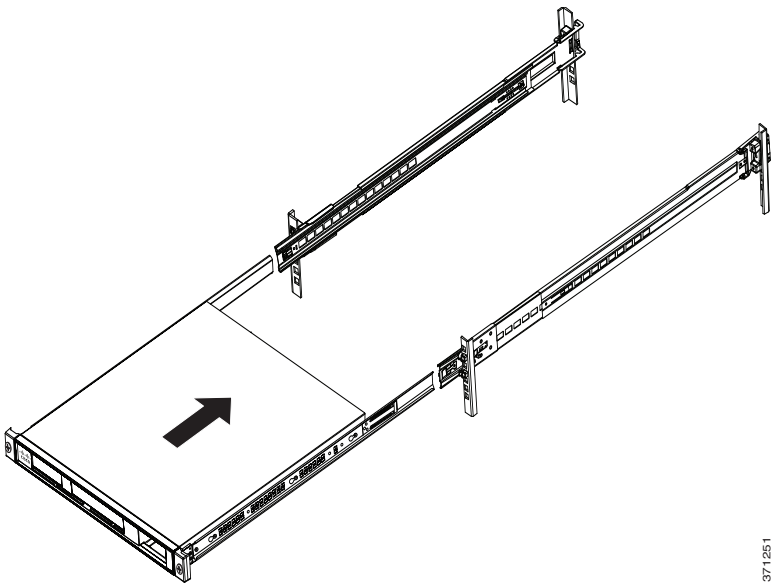


c. Push both inner parts of the outer slide rails forward.

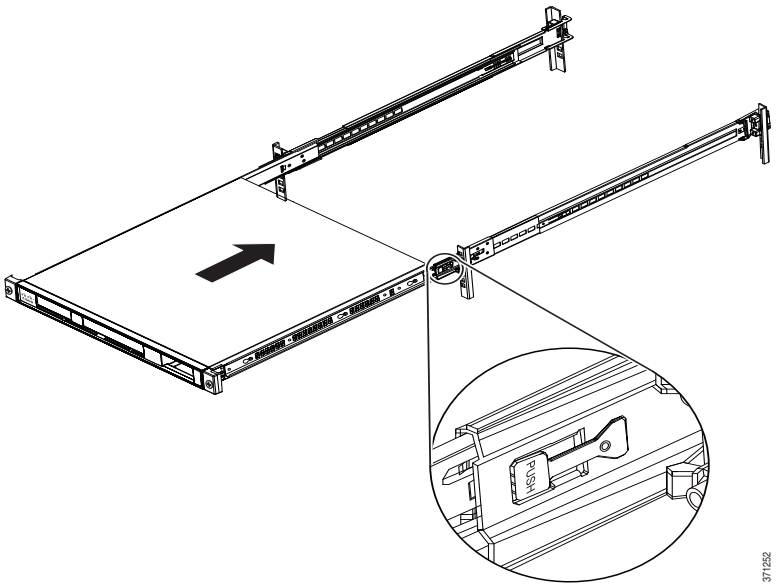


5. Install the chassis.

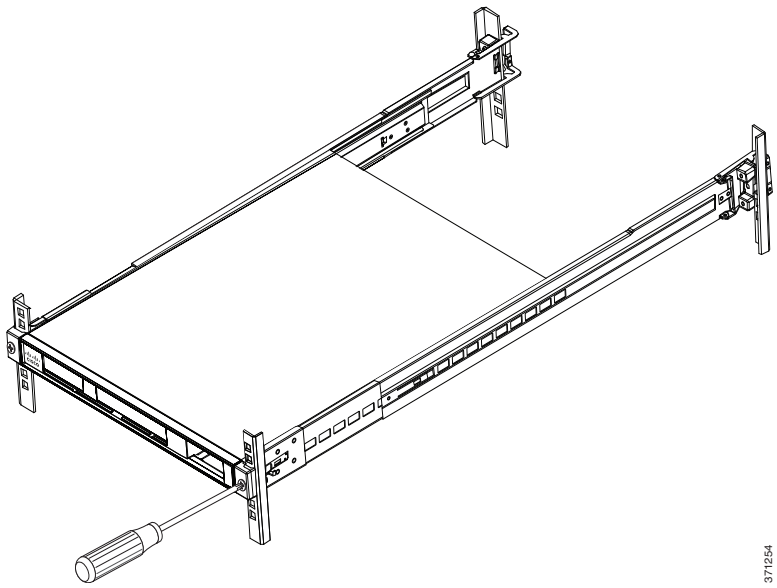
   a. Align the inner slide rails on the unit to the middle outer slide rails. Push the inner slide rails into the middle outer slide rails until they lock into place.



b. Press the side release tabs to unlock the inner slide rail, and push the chassis into the rack.



6. Secure the chassis to the rack with the front captive screws.



Connecting Cables, Turning on Power, and Verifying Connectivity

This section describes how to connect the cables to the chassis and how to turn on the power.

Warning: Only trained and qualified personnel should install, replace, or service this equipment. Statement 49

Caution: Be sure to read the safety warnings in the Regulatory Compliance and Safety information document for the ASA 5500-X and follow proper safety procedures when performing all tasks in this guide. See the RCSI at http://www.cisco.com/go/asa5500x-compliance.

Note: Earlier ASAs (V01) require you to turn on the power with the power switch. Newer ASAs (V02) automatically turn on when you plug in the power cable. To determine your version, do one of the following:

- At the CLI prompt, enter the **show inventory** command and look for V01 or V02 in the output.
- On the back of the chassis, look at the VID PID label for V01 or V02.

For the V01 chassis, see the following limitations:

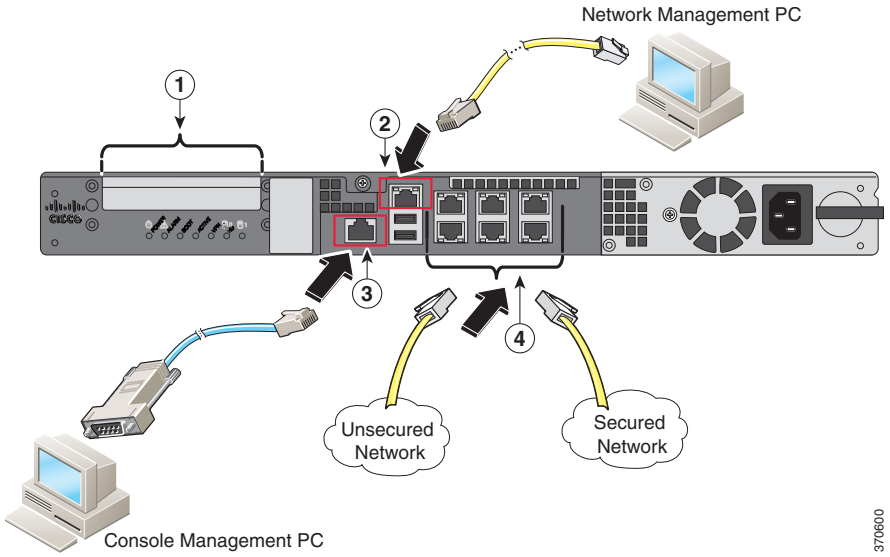
- The ASA requires 50 seconds from the time that AC power is applied before the power state can be updated and stored. This means that any changes to the power state within the first 50 seconds of applying AC power will not be observed if AC power is removed within that time.
- The ASA requires 10 seconds from the time it is placed into standby mode before the power state can be updated and stored. This means any changes to the power state within the first 10 seconds of entering standby mode (including the standby mode itself) will not be observed if AC power is removed within that time.

For the V02 chassis, the above limitations to not apply.

Follow these steps to connect cables, turn on power, and verify connectivity.

Procedure

1. Place the chassis on a flat, stable surface, or in a rack (if you are rack-mounting it.)
2. Connect the interface cables.



1	(Optional) I/O Card. If you have a fiber-optic I/O card, you need to use SFP modules (not included).	2	Management 0/0 interface (RJ-45)
3	Console port (RJ-45)	4	Gigabit Ethernet data interfaces (RJ-45)

a. Management 0/0 interface—For use with ASDM or CLI (with additional configuration). You can connect the management PC directly with an Ethernet cable, or connect the PC and the ASA to the same management network. Make sure the PC is configured to obtain an IP address using DHCP.

Note: You can configure any interface to be a management-only interface using the **management-only** command. You cannot disable management-only mode on the management interface.

b. (Optional) Console port—For use with the CLI. Connect the management PC or terminal server using the included serial console cable. The console cable has a DB-9 connector on one end for the serial port on your computer, and the other end is an RJ-45 connector. If your PC does not have a serial port, you will need to obtain a DB-9-to-USB serial adapter.

c. Gigabit Ethernet data interfaces—For data networks. For the installed network interfaces, use a standard RJ-45 Ethernet cable. For the optional I/O fiber-optic card, use SFP modules. See Install and Remove SFP Modules, page 57.

Note: You can use any unused Gigabit Ethernet interface on the ASA as a failover link. The failover link interface is not configured as a normal networking interface; it should only be used for the failover link. You can connect the failover link by using a dedicated switch with no hosts or routers on the link, or by using an Ethernet cable to link the units directly.

3. Connect the power cord to the ASA, and connect the other end to your power source.
4. For newer ASAs, the power turns on automatically when you plug in the power cable; do not press the power button on the front panel.

   For older ASAs, press the power button.
5. Check the Power LED on the front of the ASA chassis. When it is solid green, the ASA is powered on.
6. Check the Status LED on the front of the ASA chassis. When it is solid green, the ASA has passed power-on diagnostics.
7. See the Cisco ASA 5512-X, ASA 5515-X, ASA 5525-X, ASA 5545-X, and ASA 5555-X Quick Start Guide for further instructions on how to set up your device.

Note: Your ASA 5500-X ships with either ASA or Firepower Threat Defense software preinstalled. To reimage your device, see Reimage the Cisco ASA or Firepower Threat Defense Device.

Maintenance and Upgrade Procedures for the ASA 5500-X

Before performing any of the procedures described in this chapter, be sure to read the *Regulatory Compliance and Safety Information for the Cisco ASA 5500-X Series* document at:

http://www.cisco.com/go/asa5500x-compliance

This chapter includes the following sections:

Remove and Replace the Chassis Cover

This section describes how to remove and replace the chassis cover.

Remove the Chassis Cover

To remove the chassis cover, perform the following steps.

Procedure

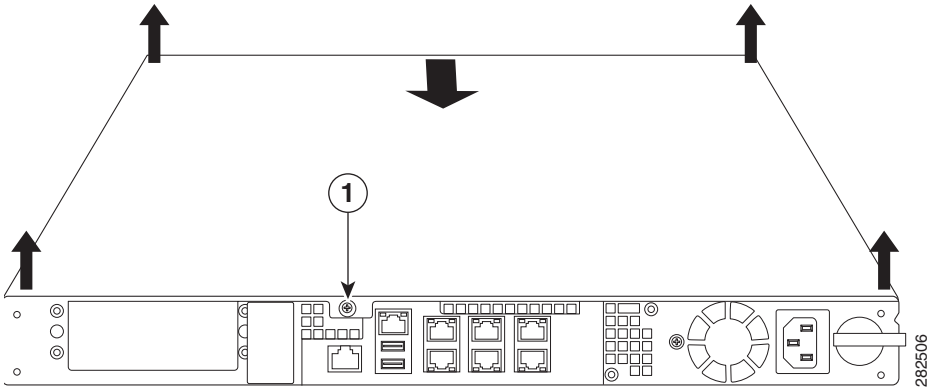
1. Power off the chassis.

Warning: Before working on a system that has an On/Off switch, turn OFF the power and unplug the power cord. Statement 1

2. Turn the thumbscrew on the front of the chassis. See Figure 1. You may need to use a screwdriver if the screw is too tight.

   Note: Removing the chassis cover does not affect your Cisco warranty. Upgrading the ASA does not require any special tools and does not create any radio frequency leaks.

Figure 1 Removing the Chassis Cover



1	Thumbscrew

3. Remove the chassis cover by placing your hand on top of the chassis lid, pressing down firmly, and pushing the cover toward the rear of the chassis. (See Figure 1.)
4. Place the cover in a safe place.

Replace the Chassis Cover

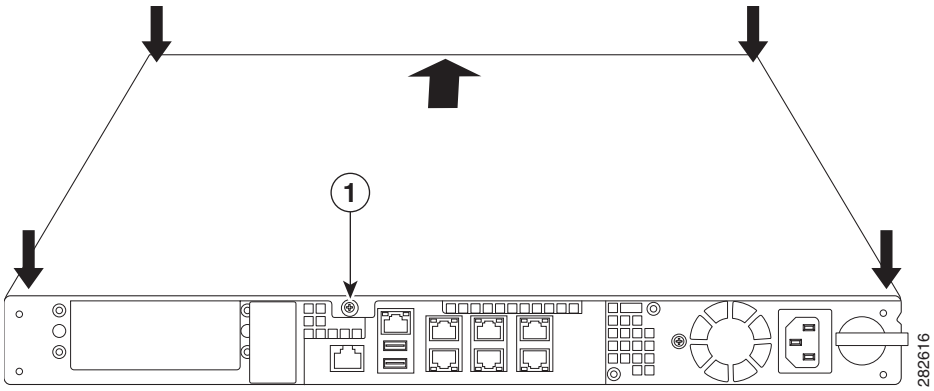
Caution: Do not operate the ASA without the chassis cover installed. The chassis cover protects the internal components, prevents electrical shorts, and provides proper air-flow for cooling the electronic components.

To replace the chassis cover, perform the following steps.

Procedure

1. Place the chassis on a secure surface with the front panel facing you.
2. Lower the front of the chassis cover onto the chassis, slide it forward until it fits into place, and tighten the thumbscrew to secure the chassis cover. (See Figure 2.)

Figure 2 Replacing the Chassis Cover



1	Thumbscrew

3. Re-install the chassis on a rack.
4. Re-install the network interface cables.

5. Power on the chassis.

Install an Expansion I/O Card

You can add or replace an expansion I/O card in the ASA 5500-X series chassis. These cards provide six additional GigabitEthernet copper or small form-factor pluggable (SFP) ports.

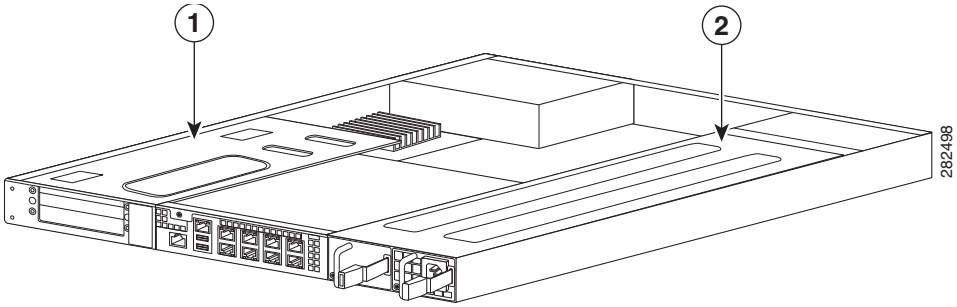
Install an I/O Card in the Cisco ASA 5512-X, 5515-X, and 5525-X Chassis

To remove an existing I/O card and install a new one, perform the following steps.

Procedure

1. Power off the chassis, remove the power cable from the chassis, and remove the chassis from the rack.
2. Locate a grounding strap, and fasten it to your wrist so that it contacts bare skin. Attach the other end to the chassis. See the "Preventing Electrostatic Discharge Damage" section on page -30 for more information.
3. With a Phillips head screwdriver, loosen the captive installation screw on the rear of the chassis.
4. Remove the chassis cover by placing your hand on top of the chassis lid, pressing down firmly, and pushing the cover toward the rear of the chassis.
5. Determine the location of the I/O card. (See Figure 3.) If you are adding a new card to the expansion slot for the first time, go to 9..

Figure 3 I/O Card Location

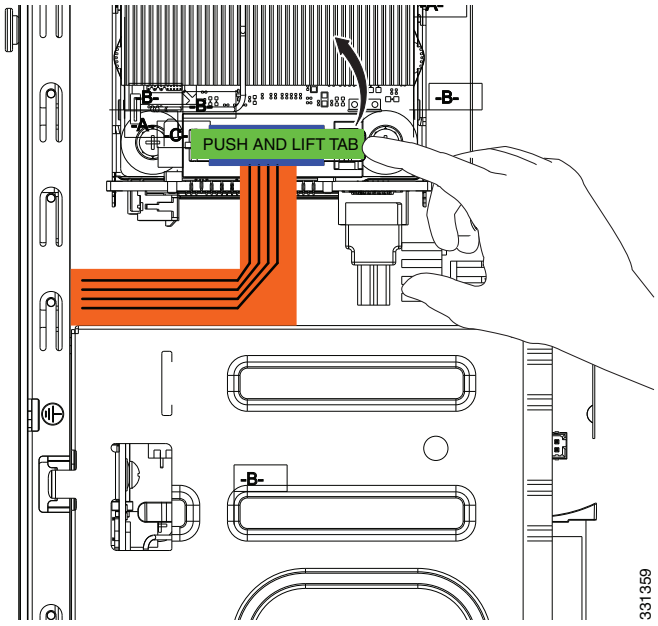


1	I/O Card holder
2	Power supply

Caution: You must disconnect the blue Regex flexible circuit connector from the motherboard before removing the I/O card from the chassis. The copper-colored Regex flexible circuit can break during the I/O card removal or installation process, so handle it with care.

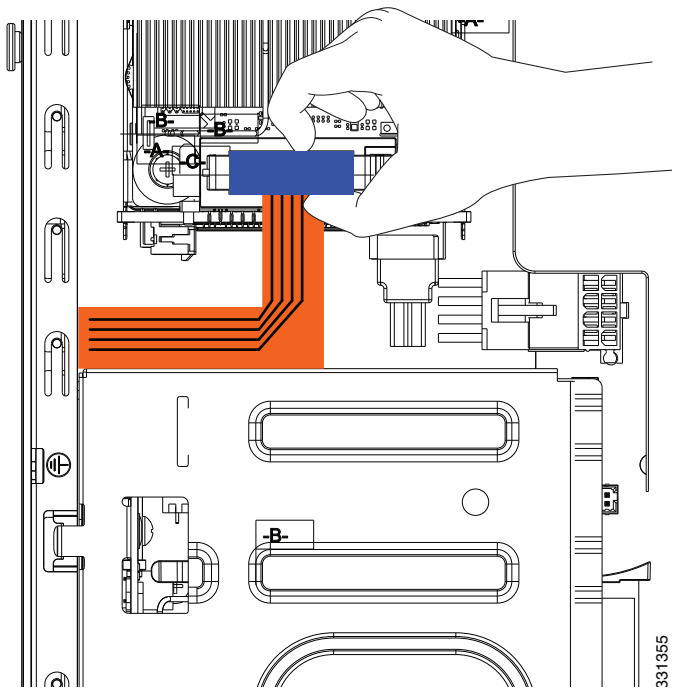
6. To expose the blue connector of the Regex flexible circuit, push down on the center of the green connector clamp, and lift the right end of the clamp to release the lock. (See Figure 4.)

Figure 4 Removing the Connector Clamp



7. Disconnect the blue Regex cable connector from the motherboard by lifting carefully but firmly. (See Figure 5.)

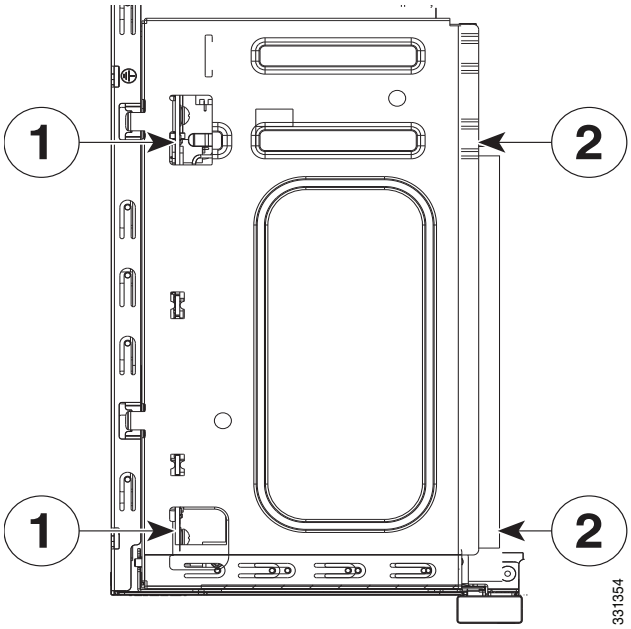
Figure 5 Removing the Regex Cable Connector



8. Lift the I/O card out of the chassis with both hands by placing an index finger into each of the card cover vents and placing your thumbs on the edge of the card cover. (See Figure 6 on page -53.) Use firm upward pressure and a gentle rocking motion, as the card is firmly seated.

Caution: Keep hands clear of all electronics underneath the card cover.

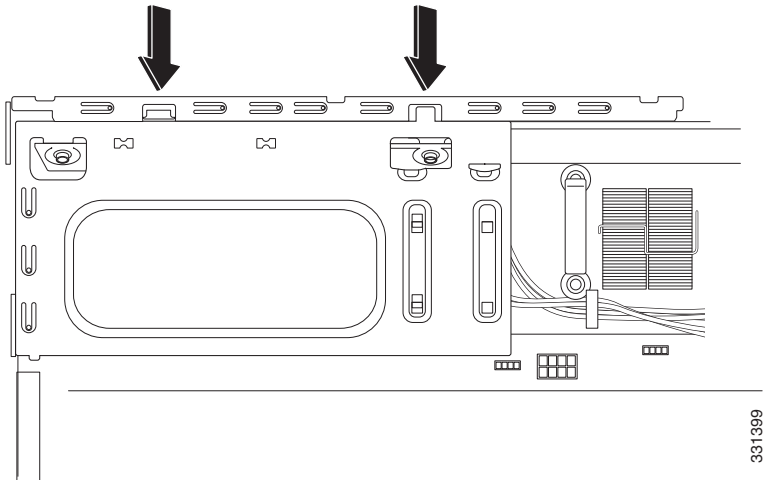
Figure 6 Lift the I/O Card Upward to Release it



1	Index finger placement
2	Thumb placement

9. Insert the new I/O card into the chassis. (See Figure 7.) The I/O card fits properly if the following criteria are met:
   a. The PCIe bus is properly inserted on the motherboard.
   b. The small black plastic guide slides all the way into the chassis.
   c. The two hooks on the assembly plug into the two slots on the edge of the chassis.

Figure 7 Installing the I/O Card



10. Connect the blue connector end of the Regex ribbon cable to the motherboard, and close the green tab.
11. Install the chassis cover, and replace the chassis in the rack.

12. Install the power cable.
13. For newer ASAs, the power turns on automatically when you plug in the power cable; do not press the power button on the front panel.

    For earlier ASAs, press the power button.

    The LEDs will blink when traffic begins to pass.

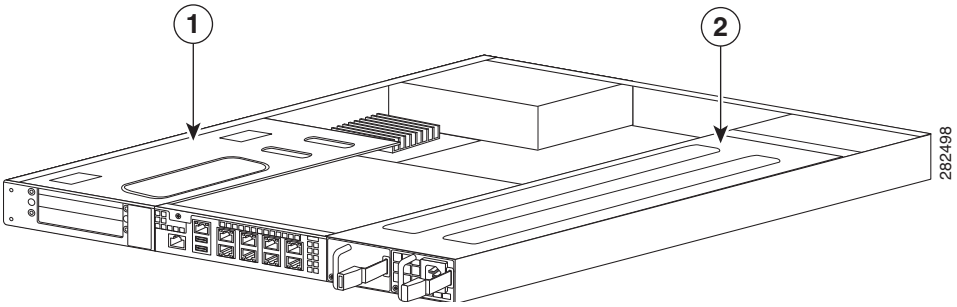
Install an I/O Card in the Cisco ASA 5545-X and 5555-X Chassis

To remove an existing I/O card in an ASA 5545-X or 5555-X chassis, and install a new one, follow these steps.

Procedure

1. Power off the chassis, remove the power cable from the chassis, and remove the chassis from the rack.
2. Locate a grounding strap, and fasten it to your wrist so that it contacts bare skin. Attach the other end to the chassis. See the "Preventing Electrostatic Discharge Damage" section on page -30 for more information.
3. With your fingers, loosen the captive installation screw on the rear of the chassis.
4. Remove the chassis cover by placing your hand on top of the chassis lid, pressing down firmly, and pushing the cover toward the rear of the chassis.
5. Determine the location of the I/O card. (See Figure 8.) If you are adding a new card to the expansion slot for the first time, go to 9..

Figure 8 I/O Card Location

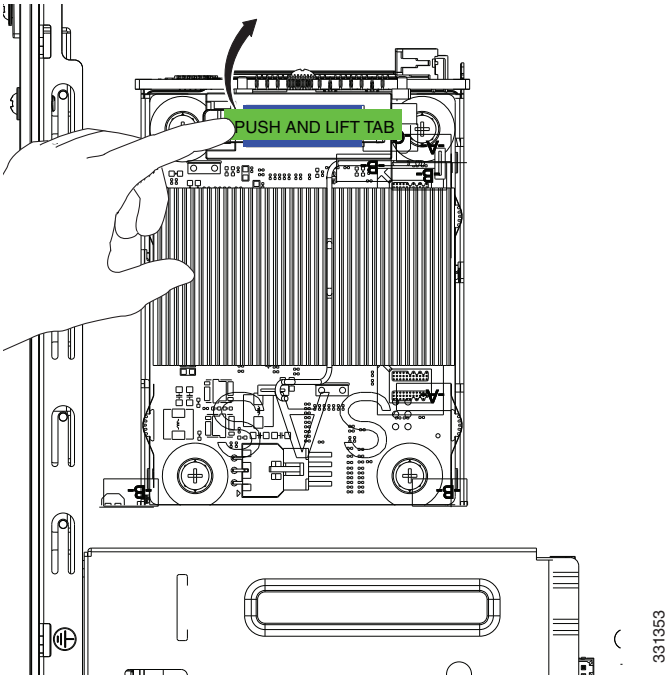


1	I/O Card holder
2	Power supply

Note: You must disconnect the blue Regex flexible circuit connector from the motherboard before removing the I/O card from the chassis. The copper-colored Regex flexible circuit can break during the I/O card removal or installation process, so handle it with care.

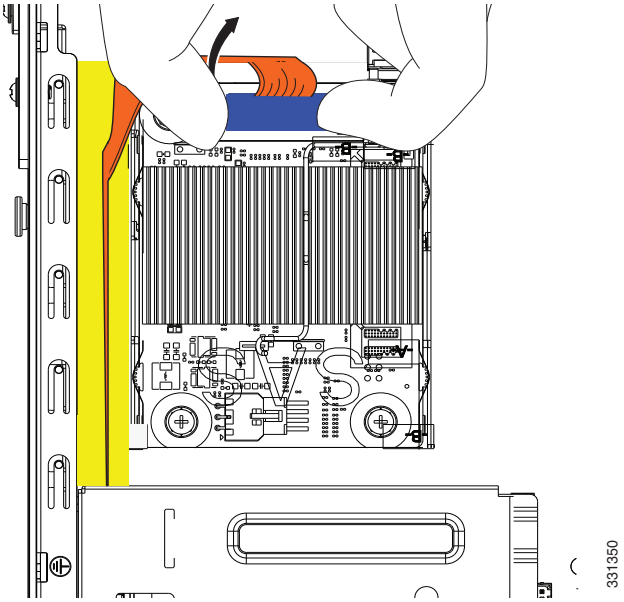
6. To expose the blue connector on the end of the Regex flexible circuit, push down on the center of the green connector clamp, and lift the end of the clamp to release the lock. (See Figure 9.)

Figure 9 Removing the Connector Clamp



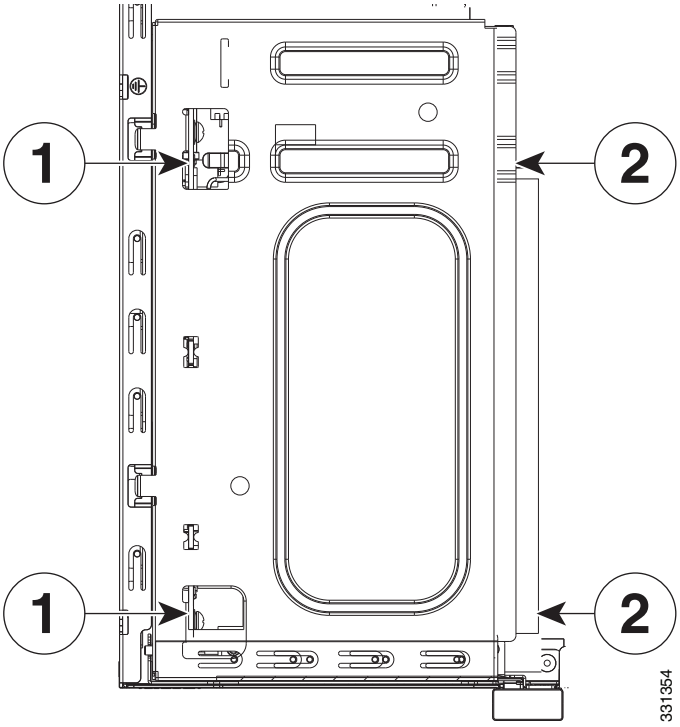
7. Disconnect the blue connector from the board by lifting carefully but firmly. (See Figure 10.)

Figure 10 Removing the Regex Cable Connector



8. Lift the I/O card out of the chassis with both hands by placing an index finger into each of the card cover vents and placing a thumb on the edge of the card cover. (See Figure 11.) Use firm upward pressure and a gentle rocking motion, as the card is firmly seated.

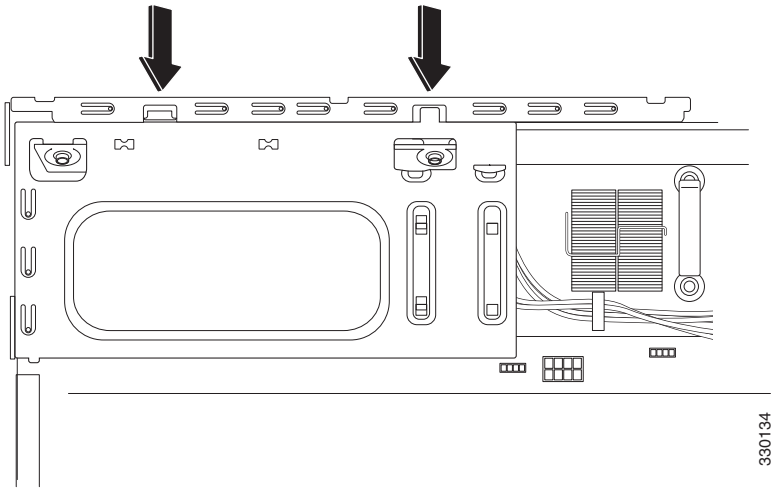
Figure 11 Lift the I/O Card Upward to Release it



1	Index finger placement
2	Thumb placement

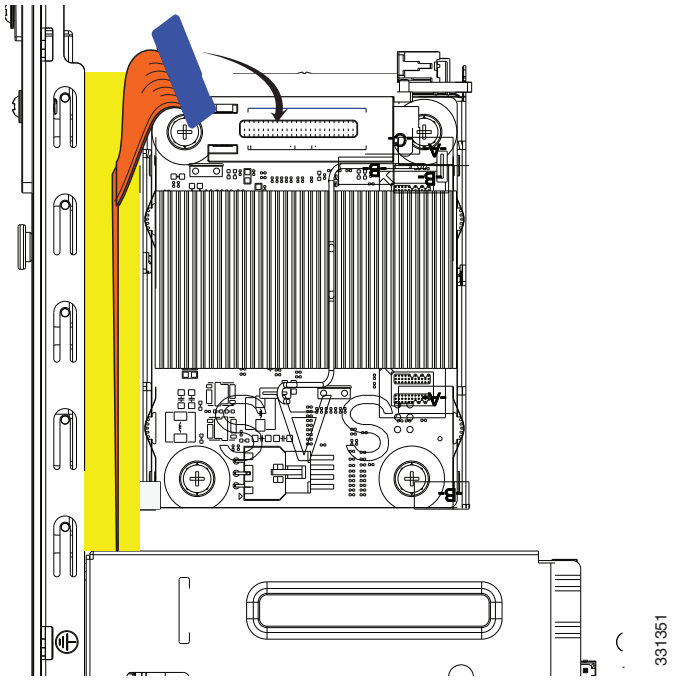
9. Insert the new I/O card into the chassis. (See Figure 12.) The I/O card holder fits properly if the following criteria are met:
   a. The PCIe bus is properly inserted on the motherboard.
   b. The small black plastic guide slides all the way into the chassis.
   c. The two hooks on the assembly plug into the two slots on the edge of the chassis.

Figure 12 Inserting a New I/O Card



10. Carefully feed the flexible Regex circuit into the yellow channel on the chassis side (see Figure 13), and connect the blue Regex cable connector end to the motherboard.

Figure 13 Feeding Regex Flexible Circuit through Channel and Connecting



11. Close the green connector clamp.
12. Install the chassis cover, and replace the chassis in the rack.
13. Install the power cable, and restore power to the chassis. The LEDs will blink when traffic begins to pass.

Install and Remove SFP Modules

The ASA uses a small form-factor pluggable (SFP) module to establish Gigabit Ethernet connections; this module is a hot-swappable input/output device that plugs into available SFP ports.

SFP Module Support

Use only Cisco certified SFP modules on the ASA. Each SFP module has an internal serial EEPROM that is encoded with security information. This encoding provides a way for Cisco to identify and validate that the SFP module meets the requirements for the ASA.

For a list of the supported SFP modules, see the product data sheet at the following URL:

http://www.cisco.com/c/en/us/products/collateral/interfaces-modules/gigabit-ethernet-gbic-sfp-modules/product_data_sheet0900aecd8033f885.html

Caution: Protect your SFP modules by inserting clean dust plugs into the SFPs after the cables are extracted from them. Be sure to clean the optic surfaces of the fiber cables before you plug them back into the optical bores of another SFP module. Avoid getting dust and other contaminants into the optical bores of your SFP modules. The optics do not operate correctly when obstructed with dust.

Warning: Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures. Statement 70

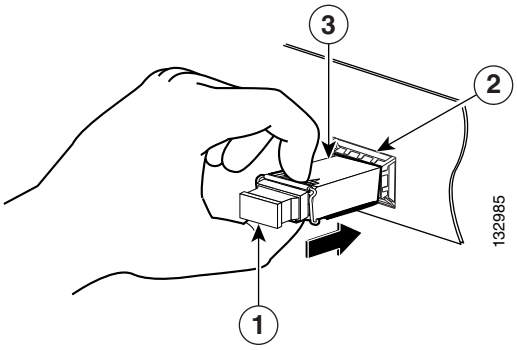
Install an SFP Module

To install an SFP module, perform the following steps.

Procedure

1. Align the SFP module with the port, and slide the SFP module into the port slot until it locks into position, as shown in Figure 14.

Figure 14 Installing an SFP Module



1	Optical port plug	2	SFP port slot
3	SFP module		

2. Remove the optical port plug, and then connect the network cable to the SFP module.

Caution: Do not remove the optical port plugs from the SFP until you are ready to connect the cabling.

3. Connect the other end of the cable to your network.

Remove the SFP Module

SFP modules use various latch designs to secure the SFP modules in the SFP ports. The following list includes the different module design types:

- Mylar Tab Module
- Actuator/Button SFP Module
- Bale-Clasp SFP Module
- Plastic Collar Module

Note: Latch designs are not linked to SFP model or technology types. For information about SFP models and technology types, see the label on the side of your SFP.

To remove the SFP module, perform the following steps.

Procedure

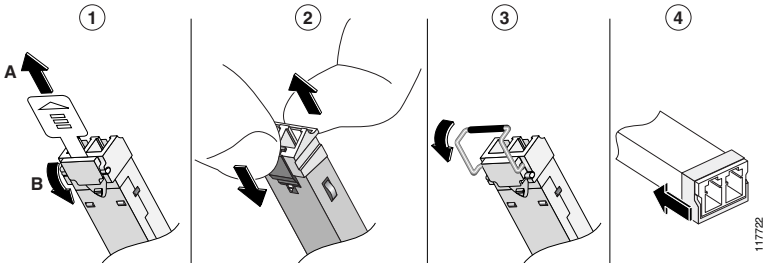
1. Disconnect all cables from the SFP.

Warning: Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures. Statement 70

Caution: Do not pull on the cabling in an attempt to remove the SFP.

2. Disconnect your particular SFP latch, as shown in Figure 15.

Figure 15 Disconnecting SFP Latch Mechanisms



1	Mylar tab	2	Actuator/Button
3	Bale-clasp	4	Plastic collar

3. Grasp the SFP on both sides, and remove it from the port.

Remove and Install the Power Supply

This section describes how to remove and install power supply modules.

Remove and Install the AC Power Supply

Note: This procedure applies only to the chassis with a removable AC power suppl: ASA 5545-X and ASA 5555-X.

If only one power supply is installed, make sure that it is installed in slot 0 (left slot) and that slot 1 (right slot) is covered with a slot cover.

Caution: If you remove a power supply, replace it immediately to prevent disruption of service.

Caution: If the chassis is subjected to environmental overheating, it shuts down and you must manually power cycle it to turn it on again.

Warning: This unit has more than one power supply connection; all connections must be removed completely to completely remove power from the unit. Statement 102

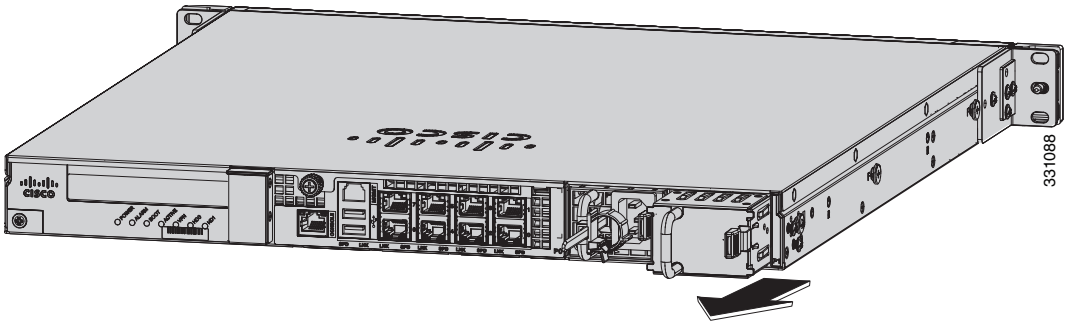
Warning: This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 120 VAC, 20A U.S. (240 VAC, 10A international). Statement 1005

To remove and install an AC power supply, follow these steps.

Procedure

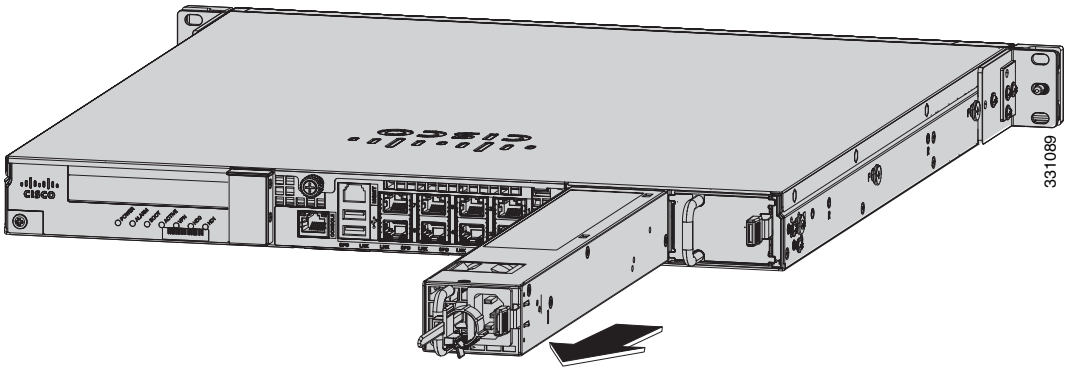
1. If you are adding an additional power supply, from the back of the chassis, push the lever on the slot cover to the left to release it, grasp the handle of the slot cover and pull it away from the chassis. (See Figure 16.) Save the slot cover for future use. Continue with 3..

Figure 16 Removing the Slot Cover



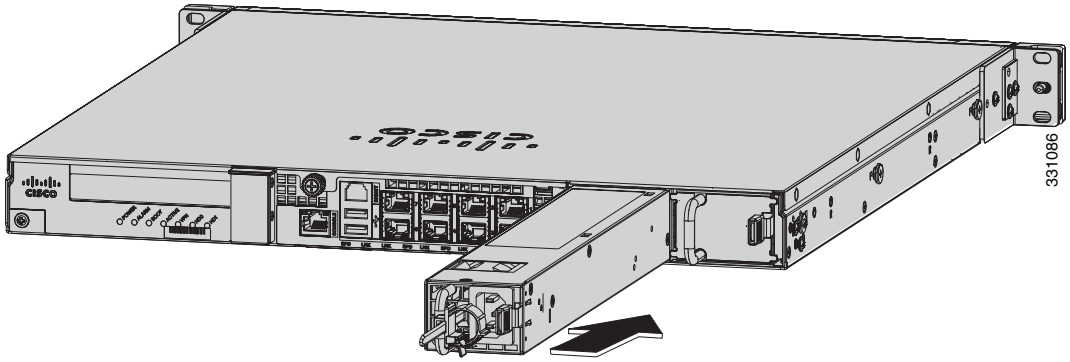
2. If you are replacing a power supply, follow these steps:
   a. Power off the chassis.
   b. From the back panel of the chassis, unplug the power supply cable.
   c. Push the lever on the power supply to the left and remove the power supply by grasping the handle and then pulling the power supply away from the chassis while supporting it from beneath with the other hand. (See Figure 17.)

Figure 17 Removing the AC Power Supply



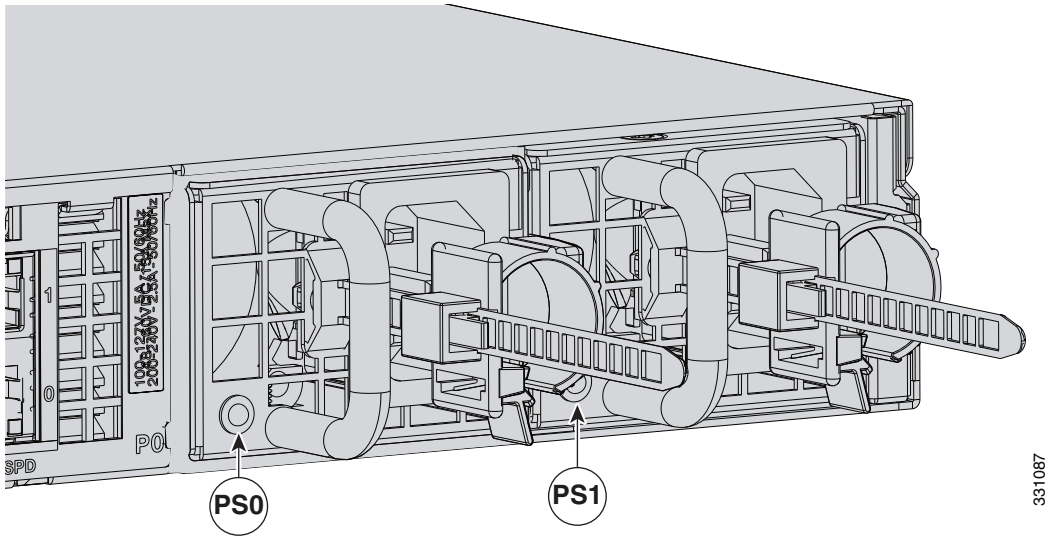
3. Install the new power supply by aligning it with the power supply bay and pushing it into place until it is seated while supporting it from beneath with the other hand. (See Figure 18.)

Figure 18 Installing the AC Power Supply



4. Connect the power cable. If you are installing two power supplies for a redundant configuration, plug each one into a power source (we recommend a UPS).
5. Power on the chassis if you powered it off to replace the only power supply.
6. Check the PS0 and PS1 indicators on the front panel to make sure they are green. On the back panel of the chassis, make sure the power supply indicator on the bottom of each installed power supply is green. (See Figure 19.)

Figure 19 Back Power Supply Indicators



Install the DC Input Power

Warning: The covers are an integral part of the safety design of the product. Do not operate the unit without the covers installed. Statement 1077

Warning: When you install the unit, the ground connection must always be made first and disconnected last. Statement 1046

Warning: Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003

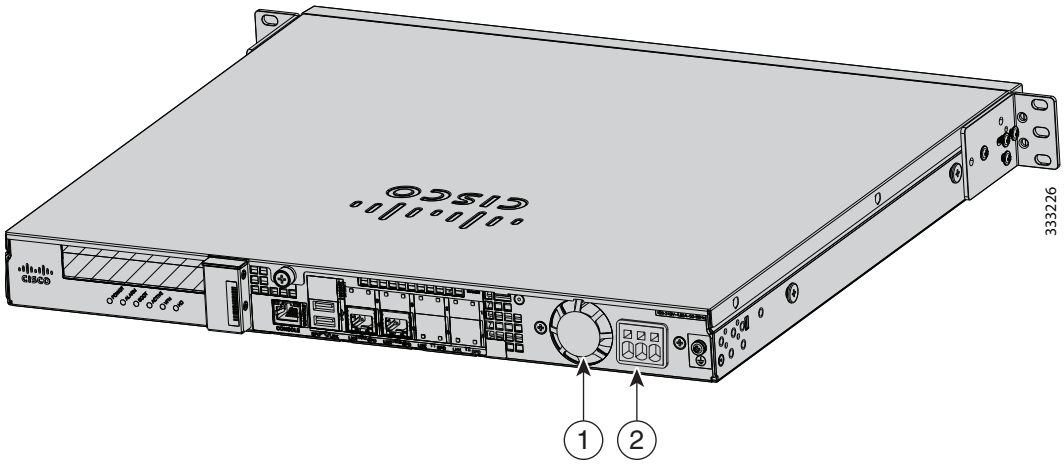
Warning: Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

Warning: This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 80 VAC, 20A. Statement 1005

The ASA ships with either one or two DC power supplies installed in the chassis, depending on the configuration ordered. You must connect the power supply wires. This section describes how to install the DC power supply ground leads and input power leads to the chassis DC input power supply.

Figure 20 shows the back panel of the ASA 5512-X, ASA 5515-X, and ASA 5525-X with the DC power supply.

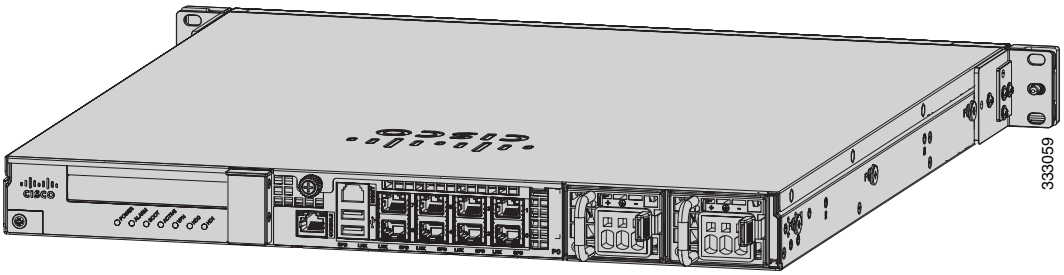
Figure 20 ASA 5512-X, ASA 5515-X, and ASA 5525-X Back Panel



1	Fixed fan	2	Fixed DC power supply

Figure 21 shows the back panel of the ASA 5545-X and ASA 5555-X with two DC power supplies.

Figure 21 ASA 5545-X and ASA 5555-X Back Panel



Before You Begin

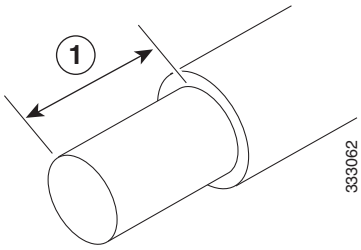
- The color coding of the DC input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground (GND), black is used for -48 V on the negative (-) terminal, and red is used for RTN on the positive (+) terminal. Ensure that the lead color coding you choose for the DC input power supply matches the lead color coding used at the DC power source.
- Make sure that the chassis ground is connected on the chassis before you begin installing the DC power supply. See Preventing Electrostatic Discharge Damage, page 30 for more information.

Procedure

1. Make sure that the chassis ground is connected on the chassis before you begin installing the DC power supply.
2. Turn off the circuit breaker to the power supply.

3. From the front of the chassis, verify that the power switch is in the Standby position.
4. Move the circuit-breaker switch handle to the Off position, and apply tape to hold it in the Off position.
5. Use a 10 gauge wire-stripping tool to strip each of the three wires coming from the DC input power source. Strip the wires to 0.27 inch (7 mm) ± 0.02 inch (0.5 mm). Do not strip more than the recommended length of wire because doing so could leave the wire exposed from the DC power supply connection. (See Figure 22.)

Figure 22 Stripping the DC Input Power Source Wire

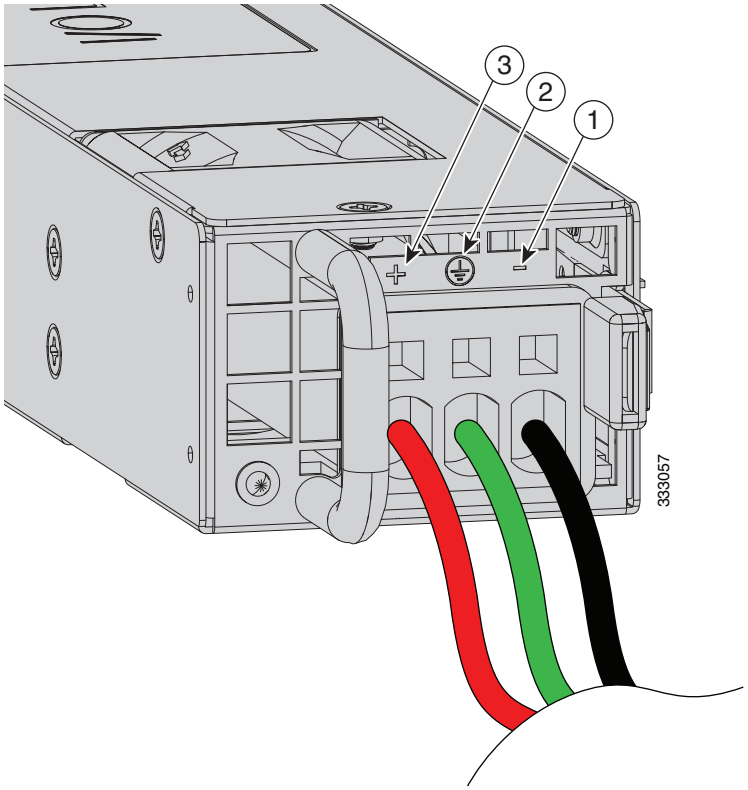


1	We recommend that you strip the wire to 0.27 inch (7 mm).

Warning: An exposed wire lead from a DC input power source can conduct harmful levels of electricity. Be sure that no exposed portion of the DC input power source wire extends from the terminal block plug. Statement 122

6. Identify the positive, negative, and ground feed positions for the DC power supply connection. The recommended wiring sequence is as follows (see Figure 23 on page -64):
   - Ground lead wire (middle)
   - Positive (+) lead wire (left)
   - Negative (-) lead wire (right)

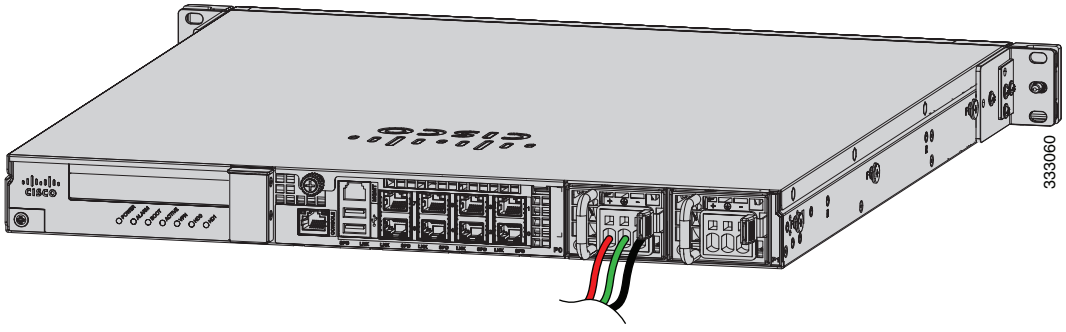
Figure 23 Color-coded Wires



1	Negative (–) lead wire	2	Ground lead wire
3	Positive (+) lead wire		

Figure 24 shows the DC power supply with lead wires.

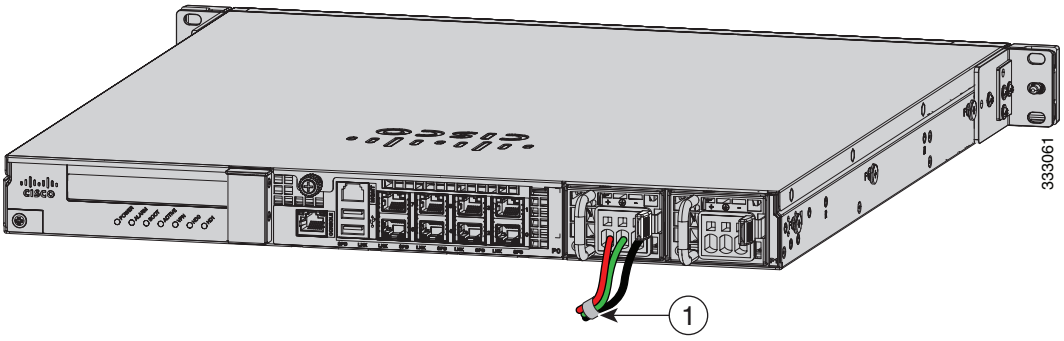
Figure 24 DC Power Supply with Lead Wires



7. Insert the exposed end of one of the ground wires into the inlet on the DC power supply. After you push in the wires, they are held in place with a spring, which makes the physical contact. Make sure that you cannot see any wire lead. Only wires *with insulation* should extend from the DC power supply.
8. Repeat Step 7 for the remaining two DC input power source wires: the positive lead wire and the negative lead wire.

9. Use a tie wrap to secure the wires coming from the power supply to the rack so that the wires cannot be pulled from the power supply by casual contact. Make sure the tie wrap allows for some slack in the ground wire. Figure 25 shows the DC power supply with the wires inserted and the tie wrap secured.

Figure 25 Complete DC Secure Tie Wrap



1	Lead wires secured with a tie wrap

10. Remove the tape (if any) from the circuit breaker switch handle, and move the circuit breaker switch handle to the On position. The power supply indicators light up when power is supplied to the chassis.

Remove and Install the DC Power Supply

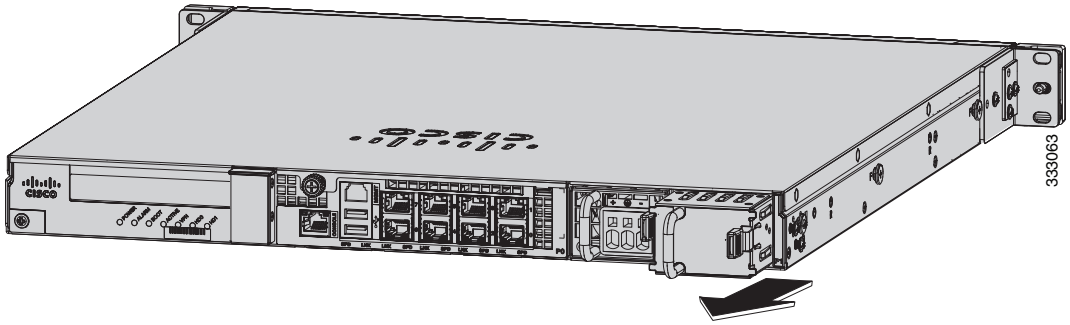
To remove and install a DC power supply, perform the following steps.

This procedure applies only to the chassis with a removable DC power supply: ASA 5545-X and ASA 5555-X.

Procedure

1. Make sure that the chassis ground is connected on the chassis before you begin installing the DC power supply, as described in Preventing Electrostatic Discharge Damage, page 30.
2. Turn off the circuit breaker to the power supply.
3. At the back of the chassis, move the power switch into the Standby position.
4. Move the circuit-breaker switch handle to the Off position, and apply tape to hold it in the Off position.
5. If you are adding an additional power supply, from the back of the chassis, push the lever on the slot cover to the left to release it, grasp the handle of the slot cover, and pull it away from the chassis. (See Figure 26.) Save the slot cover for future use. Continue with 7..

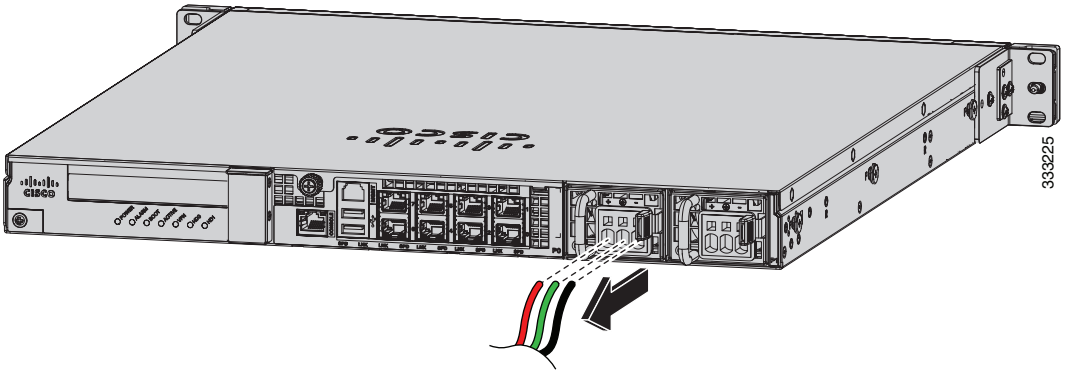
Figure 26 Removing the Slot Cover



6. If you are replacing a power supply, follow these steps:

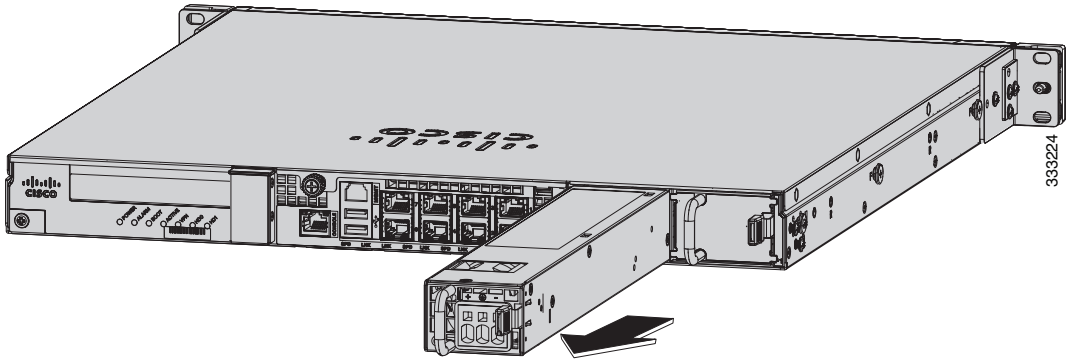
   a. Remove the wires from the DC power supply by inserting a small flat-head screwdriver into the square hole above each wire to relieve the spring pressure, and then gently pull the wire out of the power supply. (See Figure 27.)

Figure 27 Removing the Wires from the DC Power Supply



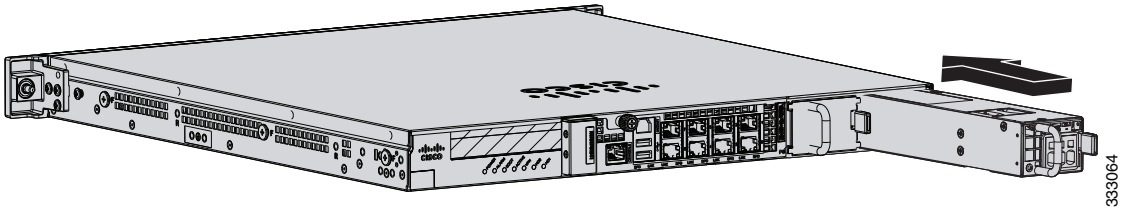
   b. Push the locking lever on the power supply to the left and remove the power supply by grasping the handle and then pulling the power supply out of the chassis while supporting it from beneath with the other hand. (See Figure 28.)

Figure 28 Removing the DC Power Supply



7. Install the new power supply by lining it up with the power supply bay and pushing it into place until it is seated while supporting it from beneath with the other hand. (See Figure 29.)

Figure 29 Installing the DC Power Supply



8. To connect the DC input power source wires, see 5. though 10. in Install the DC Input Power, page 61.

Install and Remove a Solid State Drive for a Services Module

An Solid State Drive (SSD) is required for use with the services modules. You can install one SSD in the ASA 5512-X, ASA 5515-X and ASA 5525-X. You can install 2 SSDs in a RAID 1 configuration in the ASA 5545-X and ASA 5555-X. Only Cisco SSDs are supported.

This section describes how to install and remove the SSD in the ASA 5500-X, and contains the following topics:

Installation Scenarios

Caution: Be sure to replace a failed SSD as soon as possible to avoid data loss. Removal of all SSDs shuts down the module service.

You may need to install, remove, or replace a SSD in your ASA 5500-X under the following conditions:

- If the drive fails in the single-drive models, or both drives fail simultaneously in the dual-drive models, you need to replace the drives. The module shuts down when this happens, so module features are not available as part of the recovery process. You must reload the ASA and then reimage the module.
- If a single drive fails in the dual-drive model, you can hot swap the failed drive. In this case, the module does not shut down and you do not need to reload the ASA.
- If you want to replace a drive that is still functioning, back up and gracefully shut down the module before replacing the drive. You must then reload the ASA and then reimage the module.
- If you are adding the module to an existing ASA for the first time, after you have installed the SSD in the ASA, you must reload the ASA, and then reimage the module.

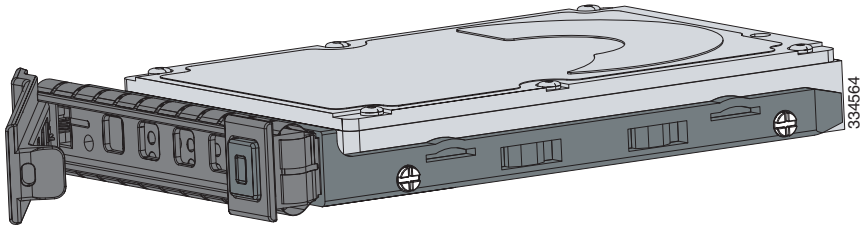
Install and Remove SSDs

The SSD is hot-swappable. The SSD resides in a carrier, which you install into the drive bay. You can use the SSD with an AC or DC power supply.

Note: When you install an SSD for the first time, you must reload the ASA and then reimage the installed module.

Figure 30 shows the SSD in its carrier.

Figure 30 SSD in Carrier

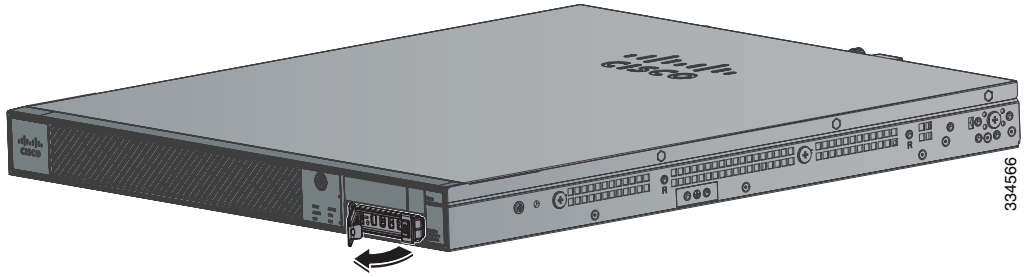


To install and remove SSDs in the ASA 5500-X, follow these steps.

Procedure

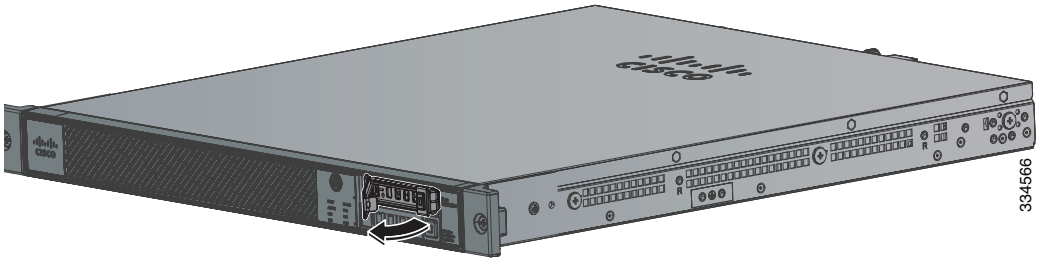
1. To remove the SSD in the ASA 5512-X, 5515-X, or 5525-X, on the front panel of the ASA, press the button on the right side of the bay until the locking lever is released. Pull out the SSD. (See Figure 31.)

Figure 31 Removing the SSD from the ASA 5512/5515/5525-X



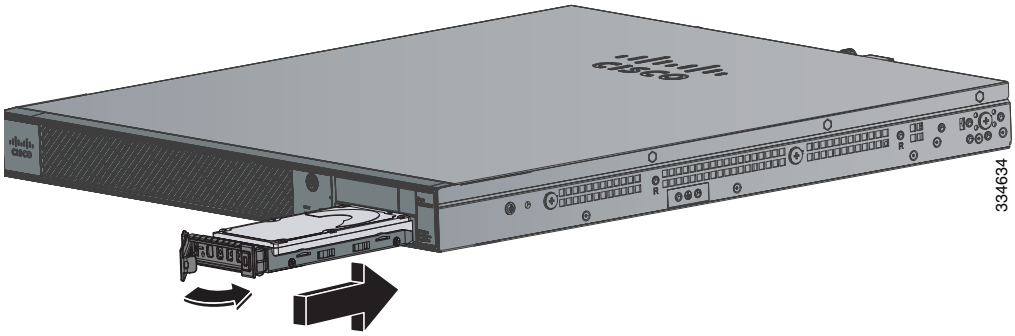
2. To remove one of the SSDs in the ASA 5545-X or 5555-X, do the following:
   a. Log into the ASA CLI through the console or use SSH.
   b. Enter the **show raid** command to confirm if one of the SSDs is faulty and has been removed from the RAID array. Note whether it is HDD1 or HDD0. HDD1 is in the top SSD slot and HDD0 is in the bottom SSD slot. If either of the SSDs is marked as faulty, you must remove that SSD first. Otherwise, remove HDD1 first.
   c. On the front panel of the ASA, press the button on the right side of the bay until the locking lever is released. Pull out the faulty SSD. (See Figure 32.)

Figure 32 Removing an SSD from the ASA 5545-X and ASA 5555-X



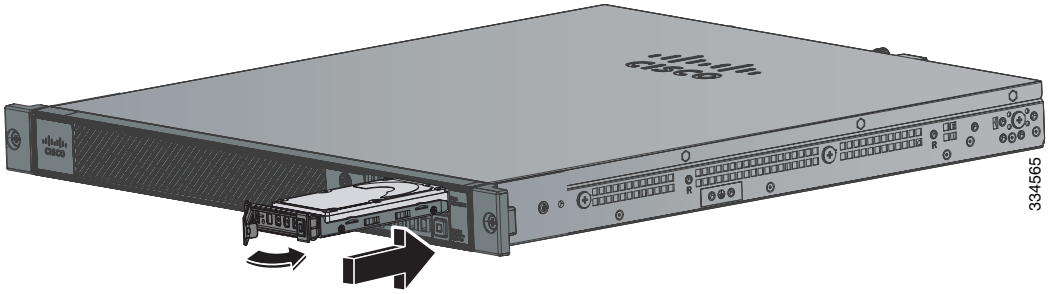
3. To install the SSD on the ASA 5512-X, 5515-X, or 5525-X, on the front panel of the chassis, line up the SSD carrier with the SSD bay and push it in until it is seated. Push the locking lever into place. Proceed to step 5. (See Figure 33.)

Figure 33 Installing an SSD in the ASA 5512/5515/5525-X



4. To install the SSD in the ASA 5545-X or 5555-X, do the following:
   a. On the front panel of the chassis, line up the SSD carrier with the SSD bay and push it in until it is seated. Push the locking lever into place. (See Figure 34.)

Figure 34 Installing an SSD in the ASA 5545-X and ASA 5555-X



b. Log into the ASA CLI.

c. Enter the **show raid** command to confirm that the new SSD has been identified and is starting the rebuild procedure.

d. When the rebuild is complete (you can see the percentage completed in the **show raid** command output), and both SSDs are marked as active, you can replace the other SSD in the chassis if needed.

e. After several minutes, enter the **show raid** command again to verify that the rebuild process is complete and that both SSDs are active.

5. On the front panel of the ASA, make sure the HDD1 (top SSD) and HDD0 (bottom SSD) indicators that pertain to your model are solid green to indicate that the SSDs are now active.

6. If you replaced the SSD in the ASA 5512-X, ASA 5515-X, or ASA 5525-X, or if you replaced both SSDs in the ASA 5545-X or 5555-X, you need to reinstall the module using the appropriate boot image. For more information, refer to the list of ASA-related Quick Start guides on cisco.com: http://www.cisco.com/c/en/us/support/security/asa-5500-series-next-generation-firewalls/products-installation-guides-list.html

   If you replaced only one of the SSDs in the ASA 5545-X and ASA 5555-X, the ASA rebuilds the data on the SSD because it is in RAID1 configuration.

Identifying Cable Pinouts

This chapter describes pinout information for 10/100/1000BaseT ports, console the RJ-45 to DB-9 ports, and the Management 10/100/1000 Ethernet ports.

This chapter includes the following sections:

10/100/1000BaseT Connectors

The ASA supports 10/100/1000BaseT ports. You must use at least a Category 5 cable for 100/1000baseT operations, but a Category 3 cable can be used for 10BaseT operations.

The 10/100/1000BaseT ports use standard RJ-45 connectors and support MDI and MDI-X connectors. Ethernet ports normally use MDI connectors, and Ethernet ports on a hub normally use an MDI-X connector.

Use an Ethernet straight-through cable to connect an MDI to an MDI-X port. Use a cross-over cable to connect an MDI to an MDI port, or an MDI-X to an MDI-X port.

Figure 1 shows the 10BaseT and the 100BaseTX connector (RJ-45).

Figure 1 10/100 Port Pinouts

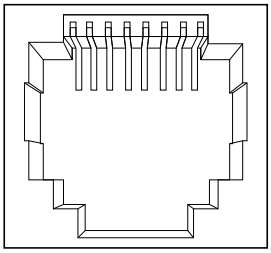
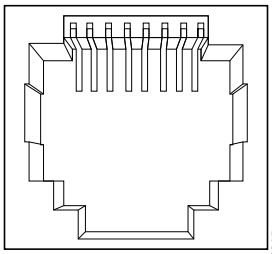
Pin	Label	1 2 3 4 5 6 7 8
1	RD+	
2	RD-	
3	TD+	
4	NC	
5	NC	
6	TD-	
7	NC	
8	NC	

Figure 2 shows the 10BaseT, 100BaseTX, and 1000BASE-T connector (RJ-45).

Figure 2 10/100/1000 Port Pinouts

Pin	Label	1 2 3 4 5 6 7 8
1	TP0+	
2	TP0-	
3	TP1+	
4	TP2+	
5	TP2-	
6	TP1-	
7	TP3+	
8	TP3-	

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Console Port (RJ-45)

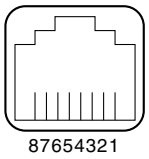
Cisco products use the following types of RJ-45 cables:

- Straight-through
- Crossover

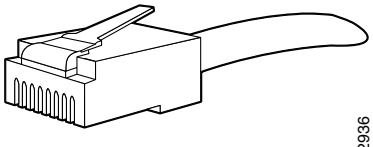
Note: Cisco does not provide these cables, yet they are widely available from other sources.

Figure 3 shows the RJ 45 cable.

Figure 3 RJ-45 Cable



RJ-45 connector



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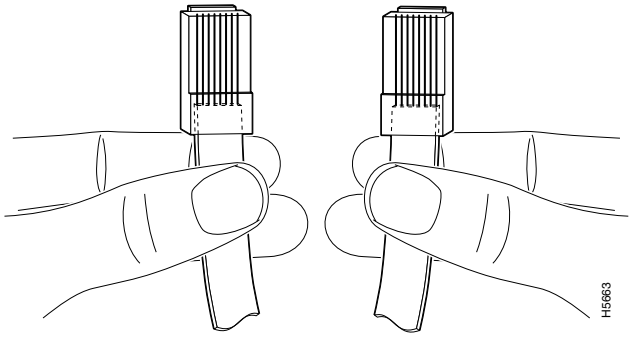
To identify the RJ-45 cable type, hold the two ends of the cable next to each other so that you can see the colored wires inside the ends, as shown in Figure 4.

Figure 4 RJ-45 Cable Identification



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Examine the sequence of colored wires to determine the type of RJ-45 cable, as follows:

- Straight-through—The colored wires are in the same sequence at both ends of the cable.
- Crossover—The first (far left) colored wire at one end of the cable is the third colored wire at the other end of the cable.

Table 1 lists the rolled (console) cable pinouts for RJ-45.

Table 1 RJ-45 Rolled (Console) Cable Pinouts

Signal	Pin	Pin	Pin
-	1	8	-
-	2	7	-
-	3	6	-
-	4	5	-
-	5	4	-
-	6	3	-
-	7	2	-
-	8	1	-

RJ-45 to DB-9

Table 2 lists the cable pinouts for RJ-45 to DB-9 or DB-25.

Table 2 Cable Pinouts for RJ-45 to DB-9 or DB-25

Signal	RJ-45 Pin	DB-9 Pin
RTS	1	7
DTR	2	4
TxD	3	3
GND	4	5
GND	5	5
RxD	6	2
DSR	7	6
CTS	8	8

MGMT 10/100/1000 Ethernet Port

The MGMT 10/100/1000 Ethernet port is an Ethernet port with an RJ-45 connector. You can use a modular, RJ-45, straight-through UTP cable to connect the management port to an external hub, switch, or router.

Table 3 lists the cable pinouts for 10/100/1000BASE-T Management Port Cable Pinouts (MDI). (See Figure 2 for an illustration of the pinouts.)

Table 3 10/100/1000BASE-T Management Port Cable Pinouts (MDI)

Signal	Pin
TP0+	1
TP0-	2
TP1+	3
TP2+	6
TP2-	4

Table 3 10/100/1000BASE-T Management Port Cable Pinouts (MDI)

Signal	Pin
TP1-	5
TP3+	7
TP3-	8

Gigabit and Fibre Channel Ports

Table 4 lists the types of SFP modules and connectors used in the ASA.

Table 4 Types of SFP Modules and Connectors

Port	Compliance	Connector	Fiber Type
Gigabit Ethernet	1000BASE-SX	SW	MMF
	1000BASE-LX	LW	SMF

Table 5 lists the SFP port cabling specifications for the SFP modules and connectors used in the ASA.

Table 5 SFP Port Cabling Specifications

Cisco Product Number	Wavelength (nanometer)	Core Size (micron)	Baud Rate	Cable Distance
GLC-SX-MM=	850	62.5 50.0	1.0625 1.0625	300 m 500 m
GLC-LH-SM=	1300	9.0	1.0625	10 km