



Cisco ASA 5550 Getting Started Guide

Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
<http://www.cisco.com>
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

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APPENDIX A**Obtaining a DES License or a 3DES-AES License A-1**



Before You Begin

Use the following table to find the installation and configuration steps that are required for your implementation of the adaptive security appliance.

To Do This ...	See ...
Install the chassis	Chapter 3, “Installing the Cisco ASA 5550 Security Appliance”
Connect cables to network interfaces	Chapter 4, “Connecting Cables to Network Interfaces”
Perform initial setup of the adaptive security appliance	Chapter 5, “Configuring the Adaptive Security Appliance”
Configure the adaptive security appliance for your implementation	Chapter 6, “Scenario: DMZ Configuration” Chapter 7, “Scenario: Remote-Access VPN Configuration” Chapter 8, “Scenario: Site-to-Site VPN Configuration”
Refine configuration Configure optional and advanced features	Cisco Security Appliance Command Line Configuration Guide Cisco Security Appliance Command Reference Cisco Security Appliance Logging Configuration and System Log Messages





Maximizing Throughput on the ASA 5550 Adaptive Security Appliance

The Cisco ASA 5550 Series Security Appliance is designed to deliver maximum throughput when configured according to the guidelines described in this chapter.

This chapter includes the following sections:

- [Embedded Network Interfaces, page 2-1](#)
- [Balancing Traffic to Maximize Throughput, page 2-2](#)
- [What to Do Next, page 2-5](#)

Embedded Network Interfaces

The adaptive security appliance has two internal buses providing copper Gigabit Ethernet and fiber Gigabit Ethernet connectivity:

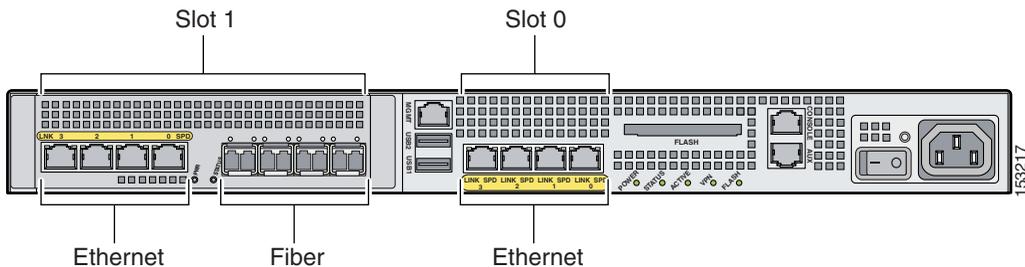
- Slot 0 (corresponding to Bus 0) has four embedded copper Gigabit Ethernet ports
- Slot 1 (corresponding to Bus 1) has four embedded copper Gigabit Ethernet ports and four embedded SFPs that support fiber Gigabit Ethernet connectivity

**Note**

To establish fiber connectivity on the adaptive security appliance, you must order and install SFP modules for each fiber port you want to use. For more information on fiber ports and SFP modules, see the [“Installing SFP Modules”](#) section on page 3-5.

Figure 2-1 shows the embedded ports on the FWSM.

Figure 2-1 Embedded Ports on the ASA 5550

**Note**

Although Slot 1 has four copper Ethernet ports and four fiber Ethernet ports, you can use only four Slot 1 ports at a time. For example, you could use two Slot 1 copper ports and two fiber ports, but you cannot use fiber ports if you are already using all four Slot 1 copper ports.

Balancing Traffic to Maximize Throughput

To maximize traffic throughput, configure the adaptive security appliance so that traffic is distributed equally between the two buses in the device. To achieve this, lay out the network so that all traffic flows through both Bus 0 (Slot 0) and Bus 1 (Slot 1), entering through one bus and exiting through the other.

In [Figure 2-2](#) and [Figure 2-3](#), network traffic is distributed so that all traffic flows through both buses in the device, enabling the adaptive security appliance to deliver maximum throughput.

Figure 2-2 Traffic Evenly Distributed for Maximum Throughput (Copper to Copper)

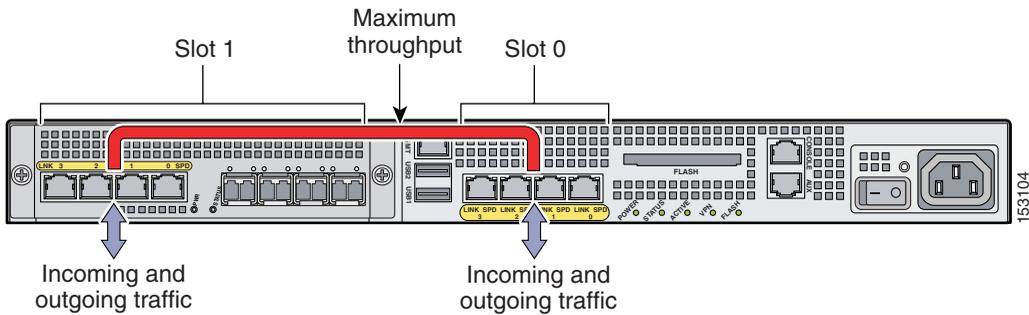


Figure 2-3 Traffic Evenly Distributed for Maximum Throughput (Copper to Fiber)

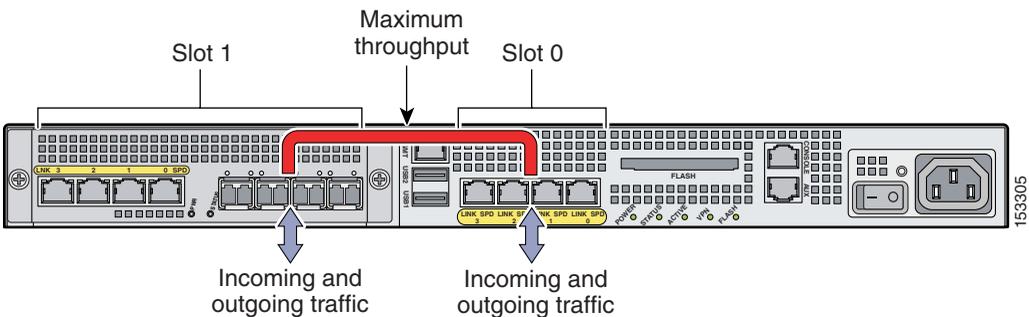
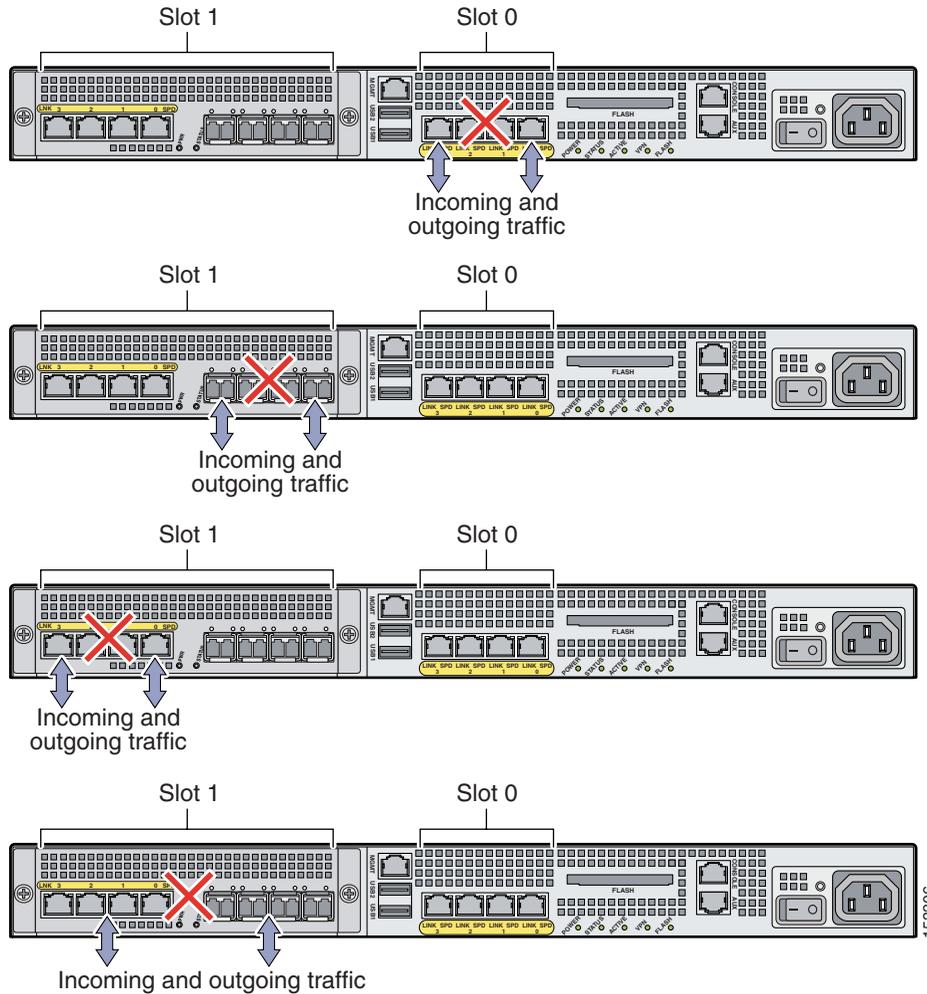


Figure 2-4 illustrates several configurations that do not enable the adaptive security appliance to deliver maximum throughput because network traffic flows through only one bus on the device.

Figure 2-4 Configurations Not Enabling Maximum Throughput



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**Note**

You can use the **show traffic** command to see the traffic throughput over each bus. For more information about using the command, see the *Cisco Security Appliance Command Reference*.

What to Do Next

Continue with [Chapter 3, “Installing the Cisco ASA 5550 Security Appliance.”](#)



Installing the Cisco ASA 5550 Security Appliance



Warning

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



Caution

Read the safety warnings in the *Regulatory Compliance and Safety Information for the Cisco ASA 5500 Series* and follow proper safety procedures when performing these steps.

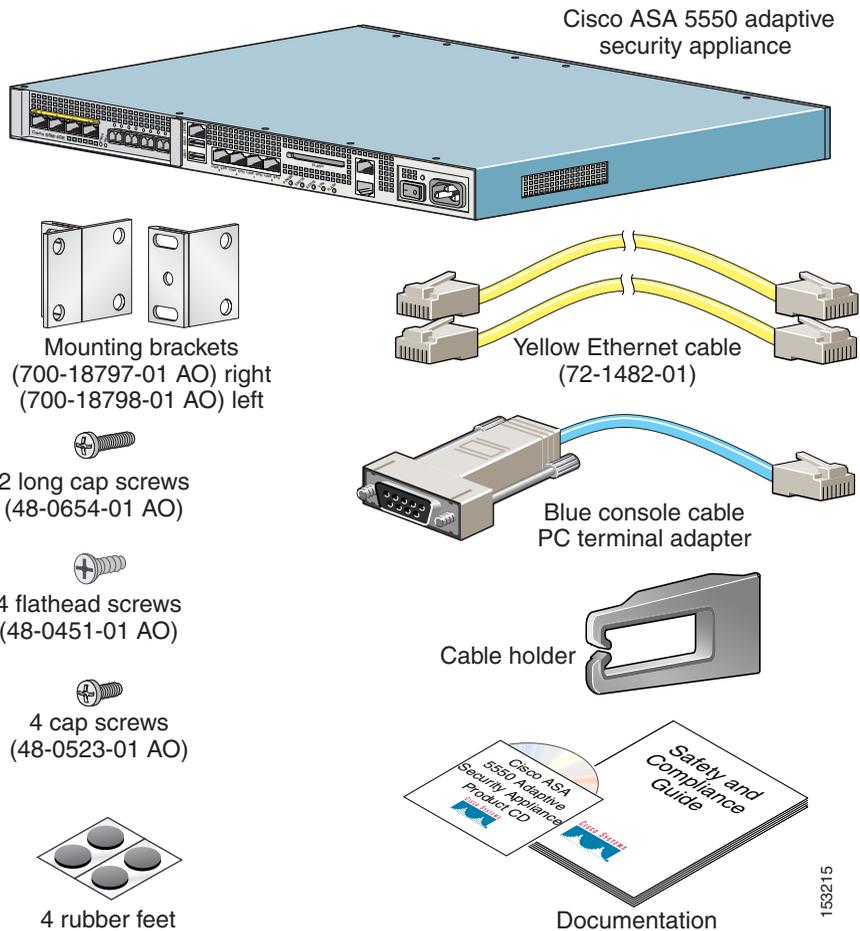
This chapter describes the ASA 5550 adaptive security appliance and rack-mount and installation procedures for the adaptive security appliance. This chapter includes the following sections:

- [Verifying the Package Contents, page 3-2](#)
- [Installing the Chassis, page 3-3](#)
- [Installing SFP Modules, page 3-5](#)
- [Ports and LEDs, page 3-9](#)
- [What to Do Next, page 3-13](#)

Verifying the Package Contents

Verify the contents of the packing box, shown in [Figure 3-1](#), to ensure that you have received all items necessary to install the Cisco ASA 5550.

Figure 3-1 Contents of ASA 5550 Package



Installing the Chassis

This section describes how to rack-mount and install the adaptive security appliance. You can mount the adaptive security appliance in a 19-inch rack (with a 17.5- or 17.75-inch opening).



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.

The following information can help plan equipment rack installation:

- Allow clearance around the rack for maintenance.
- When mounting a device in an enclosed rack ensure adequate ventilation. An enclosed rack should never be overcrowded. 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.
- If the rack contains stabilizing devices, install the stabilizers prior to mounting or servicing the unit in the rack.



Warning

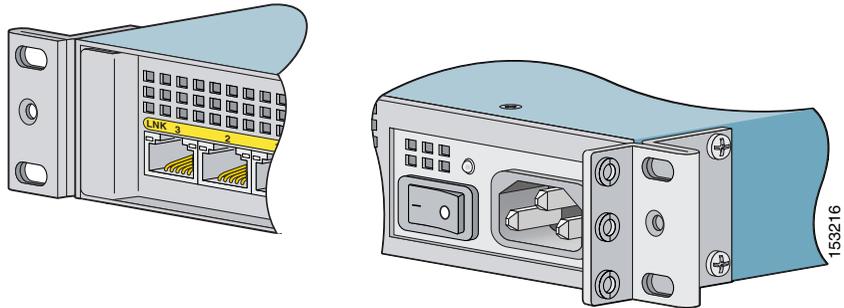
Before performing any of the following procedures, ensure that the power source is off. (AC or DC). To ensure that power is removed from the DC circuit, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

Rack-Mounting the Chassis

To rack-mount the chassis, perform the following steps:

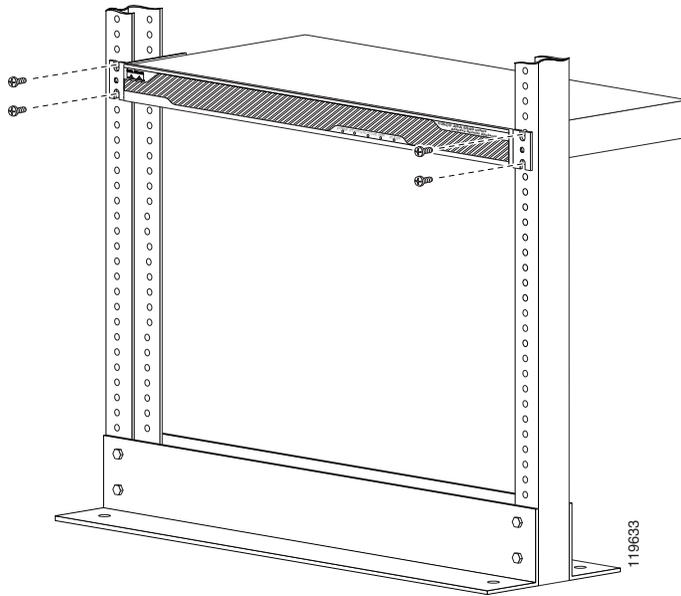
- Step 1** Attach the rack-mount brackets to the chassis using the supplied screws. Attach the brackets to the holes as shown in [Figure 3-2](#). After the brackets are secured to the chassis, you can rack-mount it.

Figure 3-2 *Installing the Right and Left Brackets*



- Step 2** Attach the chassis to the rack using the supplied screws, as shown in [Figure 3-3](#).

Figure 3-3 *Rack-Mounting the Chassis*



To remove the chassis from the rack, remove the screws that attach the chassis to the rack, and then remove the chassis.

Installing SFP Modules

The adaptive security appliance uses a field-replaceable SFP module to establish fiber Gigabit Ethernet connections.

This section describes how to install and remove SFP modules in the adaptive security appliance. This section includes the following topics:

- [SFP Module, page 3-6](#)
- [Installing an SFP Module, page 3-7](#)

SFP Module

The SFP (Small Form-Factor Pluggable) module is a hot-swappable input/output device that plugs into the fiber ports.


Note

If you install an SFP module after the switch has powered on, you must reload the adaptive security appliance to enable the SFP module.

[Table 3-1](#) lists the SFP modules that are supported by the adaptive security appliance.

Table 3-1 Supported SFP Modules

SFP Module	Type of Connection	Cisco Part Number
1000BASE-LX/LH	Fiber	GLC-LH-SM=
1000BASE-SX	Fiber	GLC-SX-MM=

The 1000BASE-LX/LH and 1000BASE-SX SFP modules are used to establish fiber connections. Use fiber cables with LC connectors to connect to an SFP module. The SFP modules support 850 to 1550 nm nominal wavelengths. The cables must not exceed the required cable length for reliable communications.

[Table 3-2](#) lists the cable length requirements.

Table 3-2 Cabling Requirements for Fiber-Optic SFP Modules

SFP Module	62.5/125 micron Multimode 850 nm Fiber	50/125 micron Multimode 850 nm Fiber	62.5/125 micron Multimode 1310 nm Fiber	50/125 micron Multimode 1310 nm Fiber	9/125 micron Single-mode 1310 nm Fiber
LX/LH	—	—	550 m at 500 Mhz-km	550 m at 400 Mhz-km	10 km
SX	275 m at 200 Mhz-km	550 m at 500 Mhz-km	—	—	—

Use only Cisco-certified SFP modules on the adaptive security appliance. 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 adaptive security appliance.

**Note**

Only SFP modules certified by Cisco are supported on the adaptive security appliance.

**Caution**

Protect your SFP modules by inserting clean port 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 work correctly when obstructed with dust.

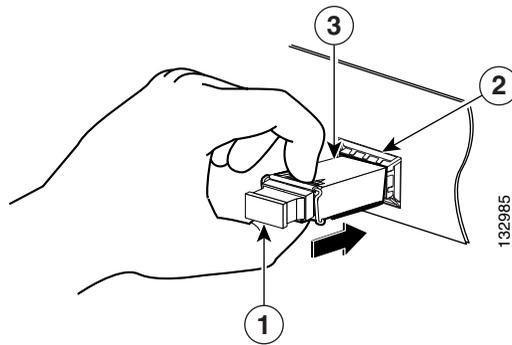
**Warning**

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

Installing an SFP Module

To install an SFP module in a fiber port in Slot 1, perform the following steps:

- Step 1** Line up the SFP module with the port and slide the SFP module into the port slot until it locks into position as shown in [Figure 3-4](#).

Figure 3-4 Installing an SFP Module

1	Port plug	3	SFP module
2	Port slot		

**Caution**

Do not remove the port plugs from the SFP module until you are ready to connect the cables.

Step 2 Remove the port plug; then connect the network cable to the SFP module.

Step 3 Connect the other end of the cable to your network. For more information on connecting the cables, see [Chapter 4, “Connecting Cables to Network Interfaces.”](#)

**Caution**

The latching mechanism used on many SFP modules locks them into place when cables are connected. Do not pull on the cabling in an attempt to remove the SFP module.

Ports and LEDs

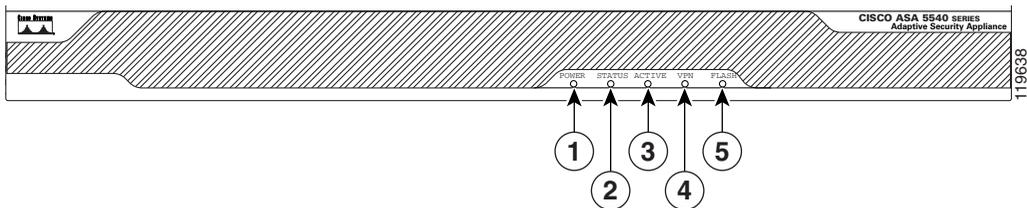
This section describes the front and rear panels. [Figure 3-5](#) shows the front panel LEDs. This section includes the following topics:

- [Front Panel LEDs](#), page 3-9
- [Rear Panel LEDs and Ports in Slot 0](#), page 3-10
- [Ports and LEDs in Slot 1](#), page 3-12

Front Panel LEDs

[Figure 3-5](#) shows the LEDs on the front panel of the adaptive security appliance.

Figure 3-5 Front Panel LEDs

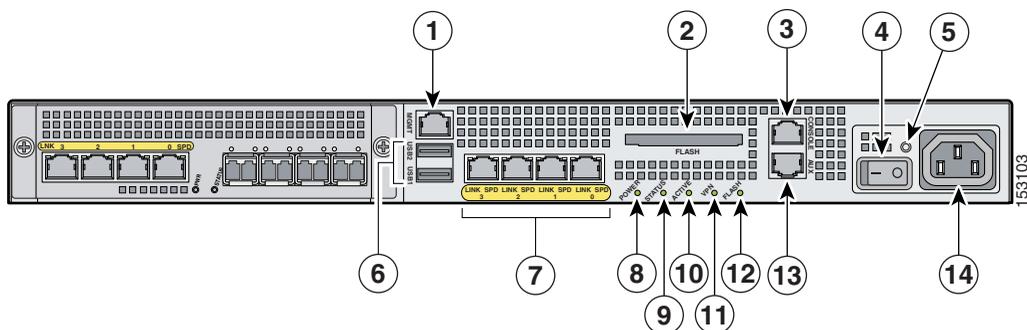


	LED	Color	State	Description
1	Power	Green	On	The system has power.
2	Status	Green	Flashing	The power-up diagnostics are running or the system is booting.
			Solid	The system has passed power-up diagnostics.
			Amber	Solid
3	Active	Green	Flashing	There is network activity.
4	VPN	Green	Solid	VPN tunnel is established.
5	Flash	Green	Solid	The CompactFlash is being accessed.

Rear Panel LEDs and Ports in Slot 0

Figure 3-6 shows the rear panel LEDs and ports in Slot 0.

Figure 3-6 Rear Panel LEDs and Ports on Slot 0 (AC Power Supply Model Shown)



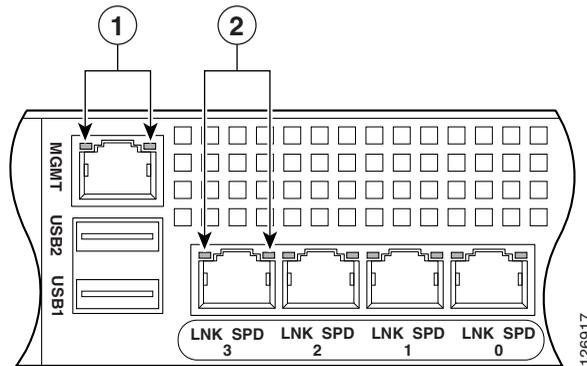
1	Management Port ¹	6	USB 2.0 interfaces ²	11	VPN LED
2	External CompactFlash slot	7	Network interfaces ³	12	Flash LED
3	Serial Console port	8	Power indicator LED	13	AUX port
4	Power switch	9	Status indicator LED	14	Power connector
5	Power indicator LED	10	Active LED		

1. The management 0/0 interface is a Fast Ethernet interface designed for management traffic only.
2. Reserved for future use.
3. GigabitEthernet interfaces, from right to left, GigabitEthernet 0/0, GigabitEthernet 0/1, GigabitEthernet 0/2, and GigabitEthernet 0/3.

For more information on the Management Port, see the **management-only** command in the *Cisco Security Appliance Command Reference*.

Figure 3-7 shows the adaptive security appliance rear panel LEDs.

Figure 3-7 Rear Panel Link and Speed Indicator LEDs



1	MGMT indicator LEDs	2	Network interface LEDs
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Table 3-3 lists the rear MGMT and Network interface LEDs.

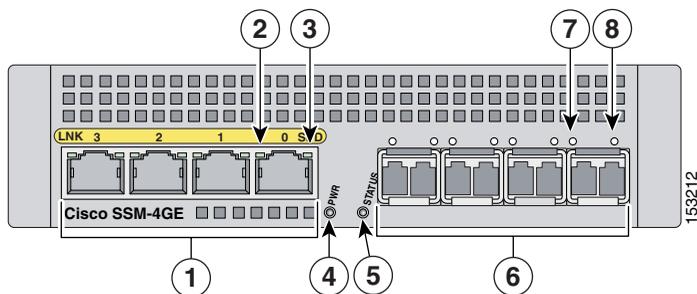
Table 3-3 Link and Speed LEDs

Indicator	Color	Description
Left side	Solid green	Physical link
	Green flashing	Network activity
Right side	Not lit	10 Mbps
	Green	100 Mbps
	Amber	1000 Mbps

Ports and LEDs in Slot 1

Figure 3-8 illustrates the ports and LEDs in Slot 1.

Figure 3-8 Ports and LEDs in Slot 1



1	Copper Ethernet ports	5	Status LED
2	RJ-45 Link LED	6	Fiber Ethernet ports
3	RJ-45 Speed LED	7	SFP Link LED
4	Power LED	8	SFP Speed LED



Note

Figure 3-8 shows SFP modules installed in the fiber Ethernet ports. You must order and install the SFP modules if you want to establish fiber Ethernet connectivity. For more information on fiber ports and SFP modules, see the “Installing SFP Modules” section on page 3-5.

Table 3-4 describes the LEDs in Slot 1.

Table 3-4 LEDs on Bus G1

	LED	Color	State	Description
2, 7	LINK	Green	Solid	There is an Ethernet link.
			Flashing	There is Ethernet activity.

Table 3-4 LEDs on Bus G1 (continued)

	LED	Color	State	Description
3, 8	SPEED	Off	10 MB	There is no network activity.
		Green	100 MB	There is network activity at 100 Mbps.
		Amber	1000 MB (GigE)	There is network activity at 1000 Mbps.
4	POWER	Green	On	The system has power.
5	STATUS	Green	Flashing	The system is booting.
		Green	Solid	The system booted correctly.
		Amber	Solid	The system diagnostics failed.

What to Do Next

Continue with [Chapter 4, “Connecting Cables to Network Interfaces.”](#)



Connecting Cables to Network Interfaces

This chapter describes how to connect the appropriate cables to the Console, Auxiliary, Management, copper Ethernet, and fiber Ethernet ports.

This chapter includes the following sections:

- [Connecting Interface Cables, page 4-1](#)
- [What to Do Next, page 4-7](#)



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 for the Cisco ASA 5500 Series* and follow proper safety procedures when performing these steps.

Connecting Interface Cables

To connect cables to the network interfaces, perform the following steps:

-
- Step 1** Place the chassis on a flat, stable surface, or in a rack (if you are rack-mounting it).
 - Step 2** Connect to the Management port.

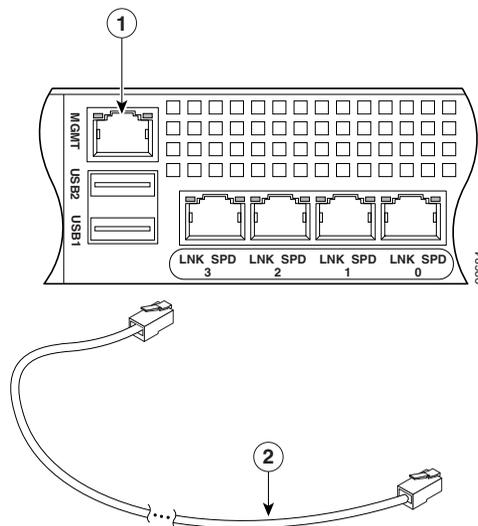
The adaptive security appliance has a dedicated interface for device management that is referred to as the Management0/0 port. The Management0/0 port is a Fast Ethernet interface. This port is similar to the Console port, but the Management0/0 port only accepts incoming traffic to the adaptive security appliance.



Note You can configure any interface to be a management-only interface using the **management-only** command. You can also disable management-only mode on the management interface. For more information about this command, see the **management-only** command in the *Cisco Security Appliance Command Reference*.

- a. Locate an Ethernet cable, which has an RJ-45 connector on each end.
- b. Connect one RJ-45 connector to the Management0/0 port, as shown in [Figure 4-1](#).
- c. Connect the other end of the Ethernet cable to the Ethernet port on your computer or to your management network.

Figure 4-1 Connecting to the Management Port

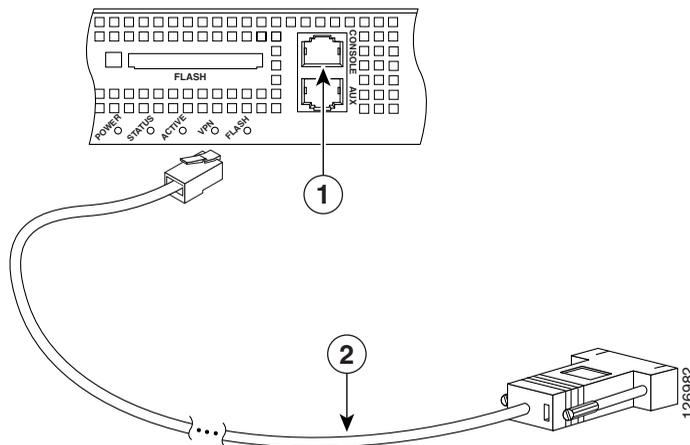


1	Management port	2	RJ-45 to RJ-45 Ethernet cable
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- Step 3** Connect to the Console port.
- a. Before connecting a computer or terminal to any ports, check to determine the baud rate of the serial port. The baud rate must match the default baud rate (9600 baud) of the Console port of the adaptive security appliance.

Set up the terminal as follows: 9600 baud (default), 8 data bits, no parity, 1 stop bits, and Flow Control (FC) = Hardware.
 - b. Locate the serial console cable, which has an RJ-45 connector on one end and a DB-9 connector on the other end for the serial port on your computer.
 - c. Connect the RJ-45 connector to the Console port of the adaptive security appliance as shown in [Figure 4-2](#).
 - d. Connect the DB-9 connector to the console port on your computer.

Figure 4-2 Connecting the Console Cable

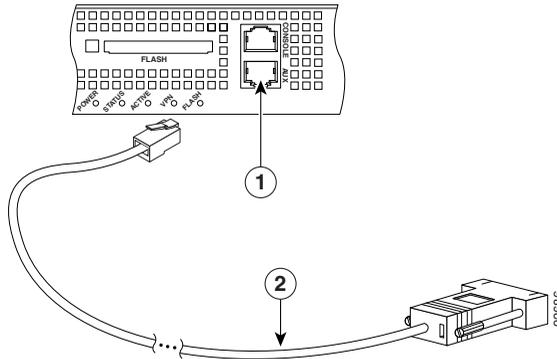


1	RJ-45 Console port	2	RJ-45 to DB-9 console cable
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- Step 4** Connect to the Auxiliary port (labeled AUX).
- a. Locate the serial console cable, which has an RJ-45 connector on one end and a DB-9 connector on the other end for the serial port on your computer.
 - b. Connect the RJ-45 connector of the cable to the Auxiliary port (labeled AUX) on the adaptive security appliance, as shown in [Figure 4-3](#).

- c. Connect the other end of the cable, the DB-9 connector, to the serial port on your computer.

Figure 4-3 Connecting to the AUX Port



1	RJ-45 AUX port	2	RJ-45 to DB-9 console cable
----------	----------------	----------	-----------------------------

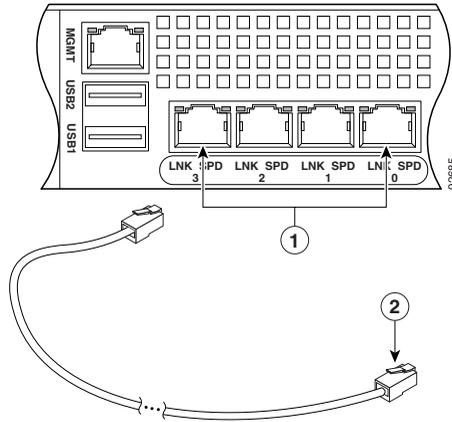
- Step 5** Connect to copper Ethernet ports to be used for network connections. Copper Ethernet ports are available both in Slot 0 and Slot 1.



Note You must use a port in Slot 0 for the inside interface, and a port in Slot 1 for the outside interface.

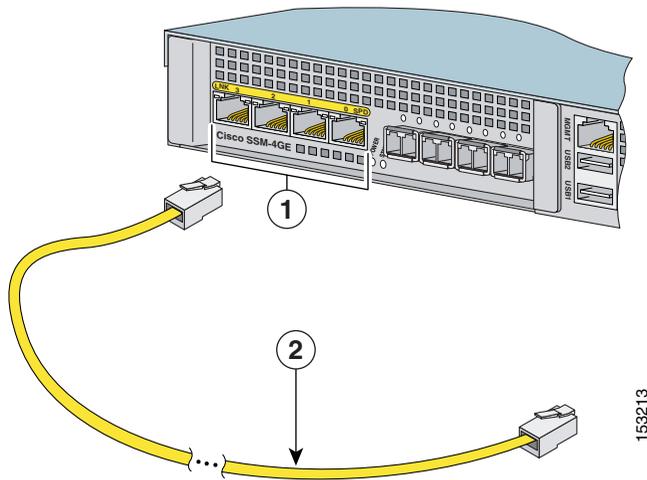
- a. Connect one end of an Ethernet cable to a copper Ethernet port, as shown in [Figure 4-4](#) and [Figure 4-5](#).

Figure 4-4 Connecting to a Copper Ethernet Interface in Slot 0



1	Copper Ethernet ports	2	RJ-45 connector
----------	-----------------------	----------	-----------------

Figure 4-5 Connecting to a Copper Ethernet Interfaces in Slot 1



1	Copper Ethernet ports	2	RJ-45 connector
----------	-----------------------	----------	-----------------

- b. Connect the other end of the Ethernet cable to a network device, such as a router, switch or hub.

Step 6 Connect to fiber Ethernet ports to be used for network connections.

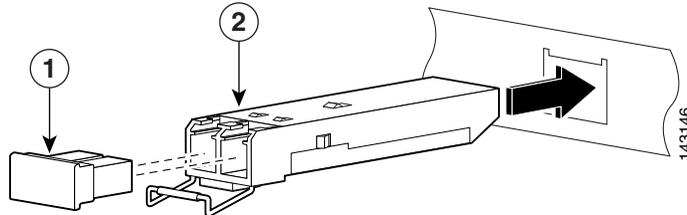


Note Slot 1 contains four copper Ethernet ports and four fiber Ethernet ports. You can use both types of ports, but you can only have a total of four Slot 1 ports in use at a time. For example, you could use two copper Ethernet ports and two fiber Ethernet ports.

For each fiber port you want to use, perform the following steps:

- a. Install the SFP module:
 - Insert and slide the SFP module into the fiber port until you hear a click. The click indicates that the SFP module is locked into the port.
 - Remove the port plug from the installed SFP as shown in [Figure 4-6](#).

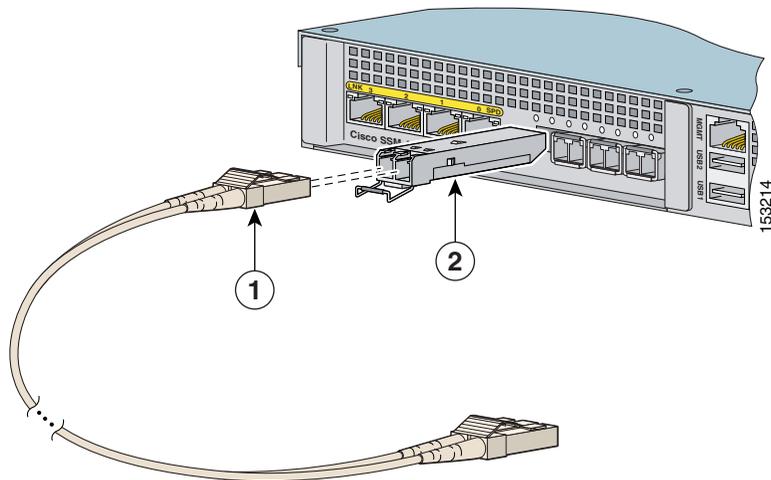
Figure 4-6 Removing the Fiber Port Plug



1	Port plug	2	SFP module
----------	-----------	----------	------------

- b. Connect the LC connector to the SFP module as shown in [Figure 4-7](#).

Figure 4-7 Connecting the LC Connector



1	LC connector	2	SFP module
----------	--------------	----------	------------

- c. Connect the other end of the cable to a network device, such as a router, switch, or hub.

Step 7 Connect the power cord to the adaptive security appliance and plug the other end to the power source.

Step 8 Power on the chassis.

What to Do Next

Continue with [Chapter 5, “Configuring the Adaptive Security Appliance.”](#)



Configuring the Adaptive Security Appliance

This chapter describes the initial configuration of the adaptive security appliance. You can perform the configuration steps using either the browser-based Cisco Adaptive Security Device Manager (ASDM) or the command-line interface (CLI). However, the procedures in this chapter refer to the method using ASDM.



Note

To use ASDM, you must have a DES license or a 3DES-AES license. For more information, see [Appendix A, “Obtaining a DES License or a 3DES-AES License.”](#)

This chapter includes the following sections:

- [About the Factory-Default Configuration, page 5-2](#)
- [About the Adaptive Security Device Manager, page 5-2](#)
- [Using the Startup Wizard, page 5-3](#)
- [Setting the Media Type for Fiber Interfaces, page 5-6](#)
- [What to Do Next, page 5-7](#)

About the Factory-Default Configuration

Cisco adaptive security appliances are shipped with a factory-default configuration that enables quick startup. The factory-default configuration automatically configures an interface for management so you can quickly connect to the device and use ASDM to complete your configuration.

By default, the adaptive security appliance Management interface is configured with a default DHCP address pool. This configuration enables a client on the inside network to obtain a DHCP address from the adaptive security appliance to connect to the appliance. Administrators can then configure and manage the adaptive security appliance using ASDM.

About the Adaptive Security Device Manager



The Adaptive Security Device Manager (ASDM) is a feature-rich graphical interface that enables you to manage and monitor the adaptive security appliance. Its web-based design provides secure access so that you can connect to and manage the adaptive security appliance from any location by using a web browser.

In addition to its complete configuration and management capability, ASDM features intelligent wizards to simplify and accelerate the deployment of the adaptive security appliance.

In addition to the ASDM web configuration tool, you can configure the adaptive security appliance by using the command-line interface. For more information, see the *Cisco Security Appliance Command Line Configuration Guide* and the *Cisco Security Appliance Command Reference*.

Using the Startup Wizard

ASDM includes a Startup Wizard to simplify the initial configuration of your adaptive security appliance. With a few steps, the Startup Wizard enables you to configure the adaptive security appliance so that it allows packets to flow securely between the inside network and the outside network.



Note You must use a port in Slot 0 for the inside interface and a port in Slot 1 for the outside interface.

This section describes how to use the Startup Wizard to set basic configuration parameters. This section includes the following topics:

- [Before Launching the Startup Wizard, page 5-4](#)
- [Running the Startup Wizard, page 5-4](#)

Before Launching the Startup Wizard

Before you launch the Startup Wizard, perform the following steps:

Step 1 Obtain a DES license or a 3DES-AES license.

To run ASDM, you must have a DES license or a 3DES-AES license. If you did not purchase one of these licenses with the adaptive security appliance, see [Appendix A, “Obtaining a DES License or a 3DES-AES License”](#) for information about how to obtain and activate one.

Step 2 Enable Java and Javascript in your web browser.

Step 3 Gather the following information:

- A unique hostname to identify the adaptive security appliance on your network.
 - The IP addresses of your outside interface, inside interface, and any other interfaces to be configured.
 - The IP addresses to use for NAT or PAT configuration.
 - The IP address range for the DHCP server.
-

Running the Startup Wizard

To use the Startup Wizard to set up a basic configuration for the adaptive security appliance, perform the following steps:

Step 1 If you have not already done so, connect to the management port.

- a. Locate an Ethernet cable, which has an RJ-45 connector on each end.
- b. Connect one RJ-45 connector to the Management0/0 port.
- c. Connect the other end of the Ethernet cable to the Ethernet port on your computer or to your management network.
- d. If you connected to your management network, connect a PC for configuring the adaptive security appliance to your management network.

- Step 2** Launch the Startup Wizard.
- On the PC connected to the switch, hub, or management network, launch an Internet browser.
 - In the address field of the browser, enter this URL: **https://192.168.1.1/**.

**Note**

The adaptive security appliance ships with a default IP address of 192.168.1.1. Remember to add the “s” in “**https**” or the connection fails. HTTPS (HTTP over SSL) provides a secure connection between your browser and the adaptive security appliance.

- In the window that requires you to choose the method you want to use to run the ASDM software, choose either to download the ASDM launcher or to run the ASDM software as a Java applet.

Step 3 In the dialog box that requires a username and password, leave both fields empty. Press **Enter**.

Step 4 Click **Yes** to accept the certificates. Click **Yes** for all subsequent authentication and certificate dialog boxes.

ASDM starts.

Step 5 From the Wizards menu, choose Startup Wizard.

Step 6 Follow the instructions in the Startup Wizard to set up your adaptive security appliance.

For information about any field in the Startup Wizard, click **Help** at the bottom of the window.

**Note**

Based on your network security policy, you should also consider configuring the adaptive security appliance to deny all ICMP traffic through the outside interface or any other interface that is necessary. You can configure this access control policy using the **icmp** command. For more information about the **icmp** command, see the [Cisco Security Appliance Command Reference](#).

Setting the Media Type for Fiber Interfaces

If you are using any fiber connections in Slot 1, you must change the media type setting from the default setting to Fiber Connector.

**Note**

Because the default media type setting is for a copper Ethernet port, you do not need to set the media type setting for copper Ethernet ports you use.

To set the media type for fiber interfaces using ASDM, perform the following steps starting from the main ASDM window:

-
- Step 1** In the ASDM window, click **Configuration**.
 - Step 2** In the Features pane, click **Interfaces**.
 - Step 3** Click the **4GE SSM** interface and click **Edit**. The Edit Interface dialog box appears.
 - Step 4** Click **Configure Hardware Properties**. The Hardware Properties dialog box appears.
 - Step 5** From the Media Type drop-down list, choose **Fiber Connector**.
 - Step 6** Click **OK** to return to the Edit Interfaces dialog box, then click **OK** to return to the interfaces configuration dialog box.
 - Step 7** Repeat this procedure for each fiber interface.
-

You can also set the media type from the command line. For more information, see *Configuring Ethernet Settings and Subinterfaces in the Cisco Security Appliance Command Line Configuration Guide*.

What to Do Next

Next, configure the adaptive security appliance for your deployment using one or more of the following chapters:

To Do This ...	See ...
Configure the adaptive security appliance to protect a DMZ web server	Chapter 6, “Scenario: DMZ Configuration”
Configure the adaptive security appliance for remote-access VPN	Chapter 7, “Scenario: Remote-Access VPN Configuration”
Configure the adaptive security appliance for Site-to-Site VPN	Chapter 8, “Scenario: Site-to-Site VPN Configuration”



Scenario: DMZ Configuration

This chapter describes a configuration scenario in which the adaptive security appliance is used to protect network resources located in a demilitarized zone (DMZ). A DMZ is a separate network located in the neutral zone between a private (inside) network and a public (outside) network.

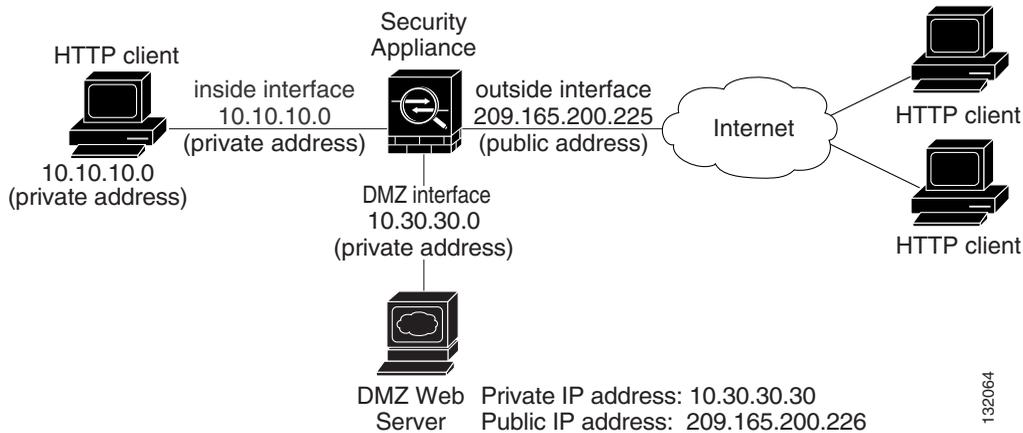
This chapter includes the following sections:

- [Example DMZ Network Topology, page 6-1](#)
- [Configuring the Security Appliance for a DMZ Deployment, page 6-4](#)
- [What to Do Next, page 6-24](#)

Example DMZ Network Topology

The example network topology shown in [Figure 6-1](#) is typical of most DMZ implementations of the adaptive security appliance.

Figure 6-1 Network Layout for DMZ Configuration Scenario

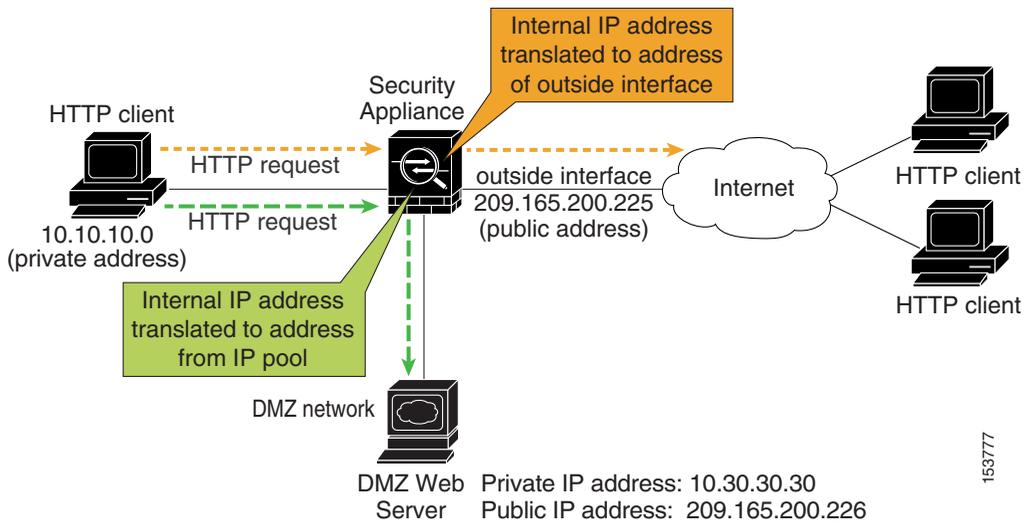


This example scenario has the following characteristics:

- The web server is on the DMZ interface of the adaptive security appliance.
- HTTP clients on the private network can access the web server in the DMZ and can also communicate with devices on the Internet.
- Clients on the Internet are permitted HTTP access to the DMZ web server; all other traffic is denied.
- The network has two routable IP addresses that are publicly available: one for the outside interface of the adaptive security appliance (209.165.200.225), and one for the public IP address of the DMZ web server (209.165.200.226).

Figure 6-2 shows the outgoing traffic flow of HTTP requests from the private network to both the DMZ web server and to the Internet.

Figure 6-2 Outgoing HTTP Traffic Flow from the Private Network



In [Figure 6-2](#), the adaptive security appliance permits HTTP traffic originating from inside clients and destined for both the DMZ web server and devices on the Internet. To permit the traffic through, the adaptive security appliance configuration includes the following:

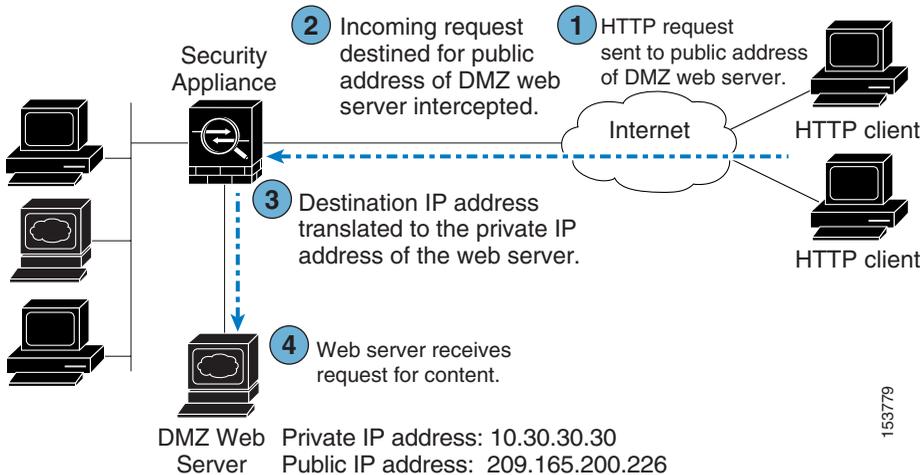
- Access control rules permitting traffic destined for the DMZ web server and for devices on the Internet.
- Address translation rules translating private IP addresses so that the private addresses are not visible to the Internet.

For traffic destined for the DMZ web server, private IP addresses are translated to an address from an IP pool.

For traffic destined for the Internet, private IP addresses are translated to the public IP address of the adaptive security appliance. Outgoing traffic appears to come from this address.

[Figure 6-3](#) shows HTTP requests originating from the Internet and destined for the public IP address of the DMZ web server.

Figure 6-3 Incoming HTTP Traffic Flow From the Internet



To permit incoming traffic to access the DMZ web server, the adaptive security appliance configuration includes the following:

- An address translation rule translating the public IP address of the DMZ web server to the private IP address of the DMZ web server.
- An access control rule permitting incoming HTTP traffic that is destined for the DMZ web server.

The procedures for creating this configuration are detailed in the remainder of this chapter.

Configuring the Security Appliance for a DMZ Deployment

This section describes how to use ASDM to configure the adaptive security appliance for the configuration scenario shown in [Figure 6-1](#). The procedure uses sample parameters based on the scenario.

This configuration procedure assumes that the adaptive security appliance already has interfaces configured for the inside interface, the DMZ interface, and the outside interface. Set up interfaces of the adaptive security appliance by using the Startup Wizard in ASDM. Be sure that the DMZ interface security level is set between 0 and 100. (A common choice is 50.)

For more information about using the Startup Wizard, see [Chapter 5, “Configuring the Adaptive Security Appliance.”](#)

The section includes the following topics:

- [Configuration Requirements, page 6-5](#)
- [Starting ASDM, page 6-6](#)
- [Creating IP Pools for Network Address Translation, page 6-7](#)
- [Configuring NAT for Inside Clients to Communicate with the DMZ Web Server, page 6-12](#)
- [Configuring NAT for Inside Clients to Communicate with Devices on the Internet, page 6-15](#)
- [Configuring an External Identity for the DMZ Web Server, page 6-16](#)
- [Providing Public HTTP Access to the DMZ Web Server, page 6-18](#)

The following sections provide detailed instructions for how to perform each step.

Configuration Requirements

Configuring the adaptive security appliance for this DMZ deployment requires the following configuration tasks:

- For the internal clients to have HTTP access to the DMZ web server, you must create a pool of IP addresses for address translation and identify which clients should use addresses from the pool. To accomplish this task, you should configure the following:
 - A pool of IP addresses for the DMZ interface. In this scenario, the IP pool is 10.30.30.50–10.30.30.60.
 - A dynamic NAT translation rule for the inside interface that specifies which client IP addresses can be assigned an address from the IP pool.

- For the internal clients to have access to HTTP and HTTPS resources on the Internet, you must create a rule that translates the real IP addresses of internal clients to an external address that can be used as the source address.

To accomplish this task, you should configure a PAT translation rule (port address translation rule, sometimes called an interface NAT) for the internal interface that translates internal IP addresses to the external IP address of the adaptive security appliance.

In this scenario, the internal address to be translated is that of a subnet of the private network (10.10.10.0). Addresses from this subnet are translated to the public address of the adaptive security appliance (209.165.200.225).

- For external clients to have HTTP access to the DMZ web server, you must configure an external identity for the DMZ web server and an access rule that permits HTTP requests coming from clients on the Internet. To accomplish this task, you should configure the following:
 - Create a static NAT rule. This rule translates the real IP address of the DMZ web server to a single public IP address. In this scenario, the public address of the web server is 209.165.200.226.
 - Create a security access rule permitting traffic from the Internet if the traffic is an HTTP request destined for the public IP address of the DMZ web server.

Starting ASDM

To run ASDM in a web browser, enter the factory-default IP address in the address field: **https://192.168.1.1/admin/**.



Note Remember to add the “s” in “**https**” or the connection fails. HTTPS (HTTP over SSL) provides a secure connection between your browser and the adaptive security appliance.

The Main ASDM window appears.

The screenshot displays the Cisco ASDM 5.2 interface for a Security Appliance. The main content area is divided into several sections:

- Device Information:** Shows host name "SecurityAppliance1", ASA Version "7.2(0)72", ASDM Version "5.2(0)30", Firewall Mode "Routed", and Total Memory "512 MB".
- Interface Status:** A table showing the status of four interfaces:

Interface	IP Address/Mask	Line	Link	Kbps
dmz	10.30.30.1/24	down	down	0
inside	10.10.10.1/24	down	down	0
management	172.23.62.22/24	up	up	5
outside	209.165.200.225/24	down	down	0
- Traffic Status:** Includes a "Connections Per Second Usage" graph and an "'outside' Interface Traffic Usage (Kbps)" graph. The traffic usage graph shows a message "Interface is down." for the 'outside' interface.

The status bar at the bottom indicates "Device configuration loaded successfully." and shows the user is logged in as <admin> at 5/10/06 1:08:18 AM PDT.

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Creating IP Pools for Network Address Translation

The adaptive security appliance uses Network Address Translation (NAT) and Port Address Translation (PAT) to prevent internal IP addresses from being exposed externally. This procedure describes how to create a pool of IP addresses that the DMZ interface and outside interface can use for address translation.

A single IP pool can contain both NAT and PAT entries, and it can contain entries for more than one interface.

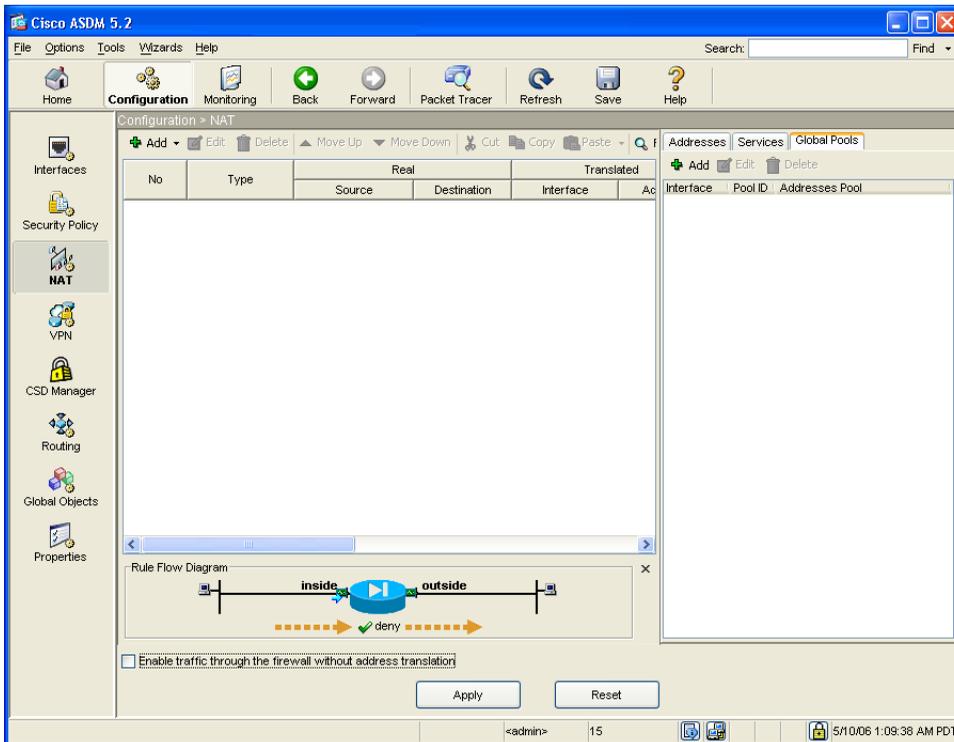
Configuring the Security Appliance for a DMZ Deployment

To configure a pool of IP addresses that can be used for network address translation, perform the following steps:

Step 1 In the ASDM window, click the **Configuration** tool.

a. In the Features pane, click **NAT**.

The NAT Configuration screen appears.



b. In the right pane, click the **Global Pools** tab.

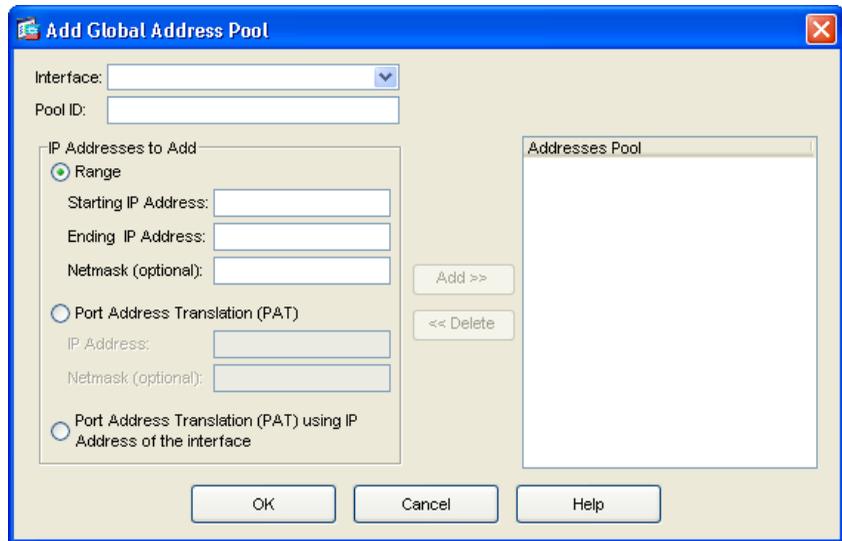
c. Click **Add** to create a new global pool for the DMZ interface.

The Add Global Address Pool dialog box appears.



Note

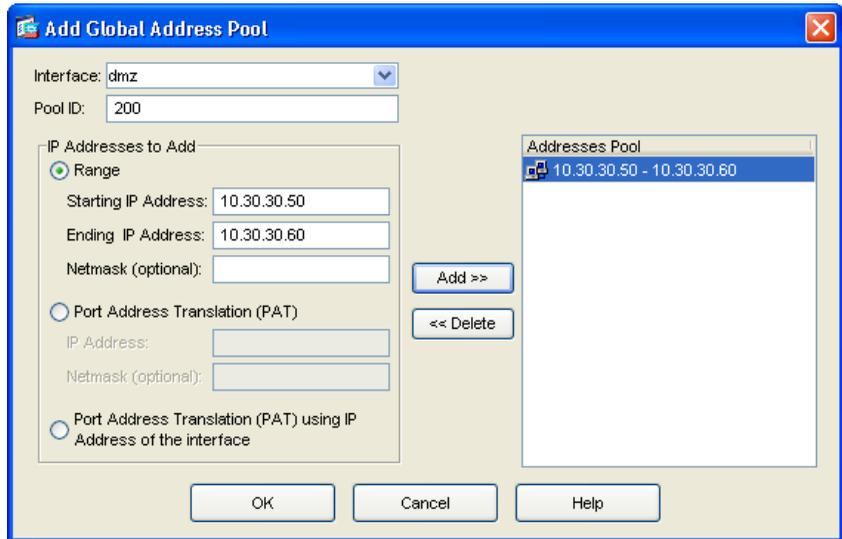
For most configurations, IP pools are added to the less secure, or public, interfaces.



- d. From the Interfaces drop-down list, choose DMZ.
- e. To create a new IP pool, enter a unique Pool ID. In this scenario, the Pool ID is 200.
- f. In the IP Addresses to Add area, specify the range of IP addresses to be used by the DMZ interface:
 - Click the **Range** radio button.
 - Enter the Starting IP address and Ending IP address of the range. In this scenario, the range of IP addresses is 10.30.30.50–10.30.30.60.
 - (Optional) Enter the Netmask for the range of IP addresses.

- g. Click **Add** to add this range of IP addresses to the Address Pool.

The Add Global Pool dialog box configuration should be similar to the following:



- h. Click **OK** to return to the Configuration > NAT window.

Step 2 Add addresses to the IP pool to be used by the outside interface. These addresses are used to translate private IP addresses so that inside clients can communicate securely with clients on the Internet.

In this scenario, there are limited public IP addresses available. Use Port Address Translation (PAT) so that many internal IP addresses can map to the same public IP address, as follows:

- In the right pane of the NAT Configuration screen, click the **Global Pools** tab.
- Under the Global Pools tab, click **Add**.
The Add Global Pool Item dialog box appears.
- From the Interface drop-down list, choose **Outside**.
- Specify a Pool ID for the Outside interface.

You can add these addresses to the same IP pool that contains the address pool used by the DMZ interface (in this scenario, the Pool ID is 200).

- e. Click the **Port Address Translation (PAT) using the IP address of the interface** radio button.

If you select the option Port Address Translation using the IP address of the interface, all traffic initiated from the inside network exits the adaptive security appliance using the IP address of the outside interface. To the devices on the Internet, it appears that all traffic is coming from this one IP address.

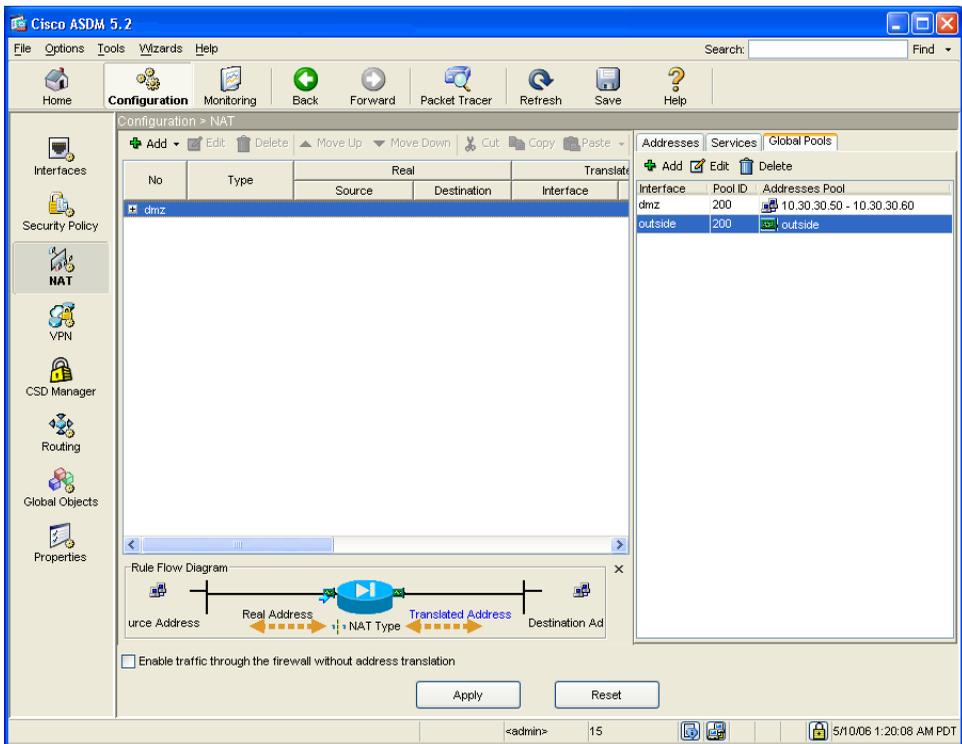
- f. Click the **Add** button to add this new address to the IP pool.

The screenshot shows the 'Add Global Address Pool' dialog box. The 'Interface' dropdown is set to 'outside' and the 'Pool ID' text box contains '200'. Under the 'IP Addresses to Add' section, three radio buttons are present: 'Range', 'Port Address Translation (PAT)', and 'Port Address Translation (PAT) using IP Address of the interface'. The third option is selected. The 'Addresses Pool' list on the right contains one entry, 'outside'. There are 'Add >>' and '<< Delete' buttons between the list and the radio buttons. At the bottom of the dialog are 'OK', 'Cancel', and 'Help' buttons. A vertical ID '153895' is on the right edge.

- g. Click **OK**.

Configuring the Security Appliance for a DMZ Deployment

The displayed configuration should be similar to the following:



Step 3 Confirm that the configuration values are correct.

Step 4 Click **Apply** in the main ASDM window.

Configuring NAT for Inside Clients to Communicate with the DMZ Web Server

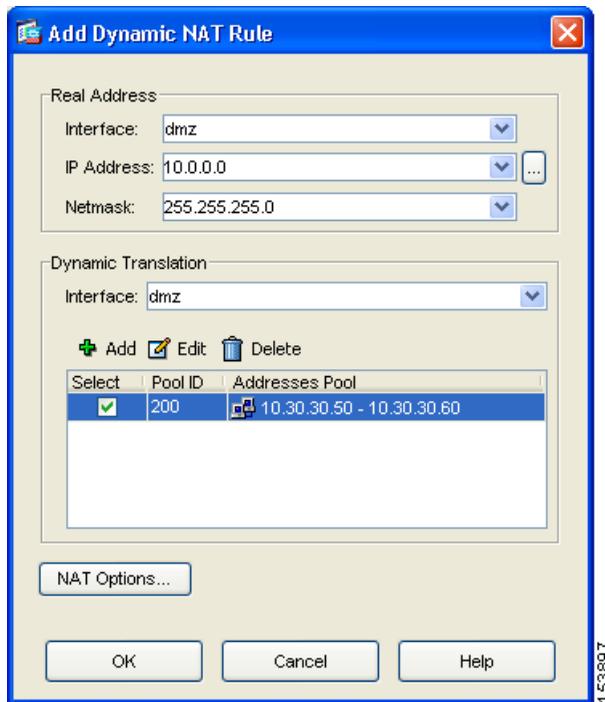
In the previous procedure, you created a pool of IP addresses that could be used by the adaptive security appliance to mask the private IP addresses of inside clients.

In this procedure, you configure a Network Address Translation (NAT) rule that associates IP addresses from this pool with the inside clients so they can communicate securely with the DMZ web server.

To configure NAT between the inside interface and the DMZ interface, perform the following steps starting from the main ASDM window:

-
- Step 1** In the main ASDM window, click the **Configuration** tool.
- Step 2** In the Features pane, click **NAT**.
- Step 3** From the Add drop-down list, choose Add Dynamic NAT Rule.
The Add Dynamic NAT Rule dialog box appears.
- Step 4** In the Real Address area, specify the IP address to be translated. For this scenario, address translation for inside clients is done according to the IP address of the subnet.
- From the Interface drop-down list, choose the Inside interface.
 - Enter the IP address of the client or network. In this scenario, the IP address of the network is 10.10.10.0.
 - From the Netmask drop-down list, choose the Netmask. In this scenario, the netmask is 255.255.255.0.
- Step 5** In the Dynamic Translation area:
- From the Interface drop-down list, choose the DMZ interface.
 - To specify the address pool to be used for this Dynamic NAT rule, check the **Select** check box next to Global Pool ID. In this scenario, the IP pool ID is 200.

In this scenario, the IP pool that we want to use is already created. If it was not already created, you would click **Add** to create a new IP pool.



- c. Click **OK** to add the Dynamic NAT Rule and return to the Configuration > NAT window.

Review the configuration screen to verify that the translation rule appears as you expected.



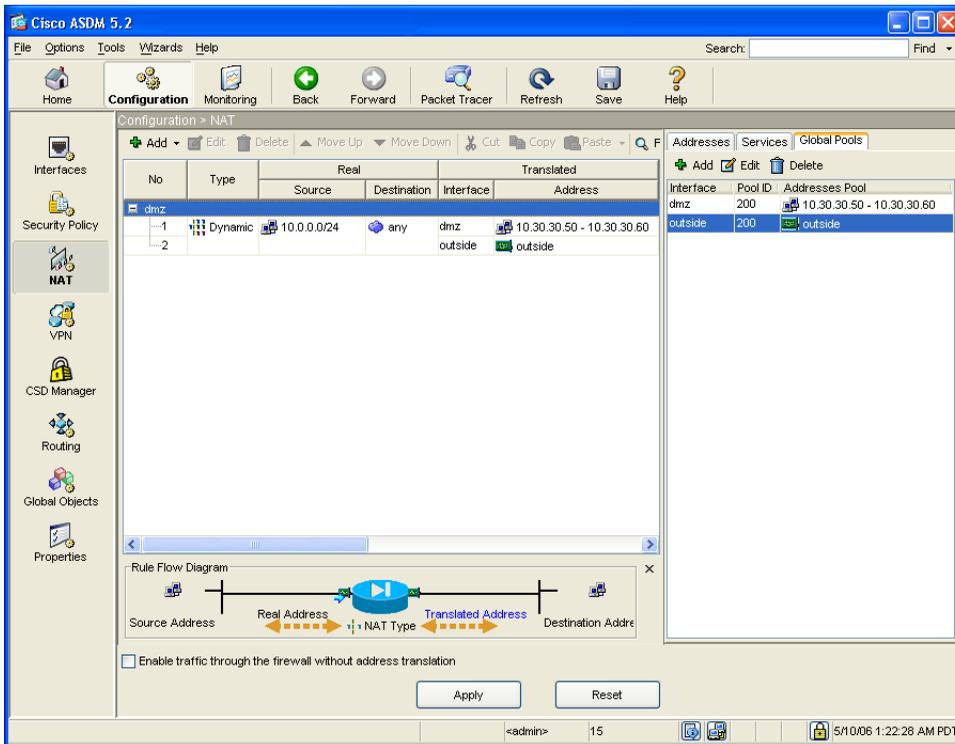
Note

When you click **OK** to create this rule, notice that there are actually two translation rules created:

- A translation rule between the inside and DMZ interfaces to be used when inside clients communicate with the DMZ web server.
- A translation rule between the inside and outside interfaces to be used when inside clients communicate with the Internet.

ASDM is able to create both rules because the addresses to be used for translation are both in the same IP pool.

The displayed configuration should be similar to the following:



Step 6 Click **Apply** to complete the adaptive security appliance configuration changes.

Configuring NAT for Inside Clients to Communicate with Devices on the Internet

In the previous procedure, you configured a Network Address Translation (NAT) rule that associates IP addresses from the IP pool with the inside clients so they can communicate securely with the DMZ web server.

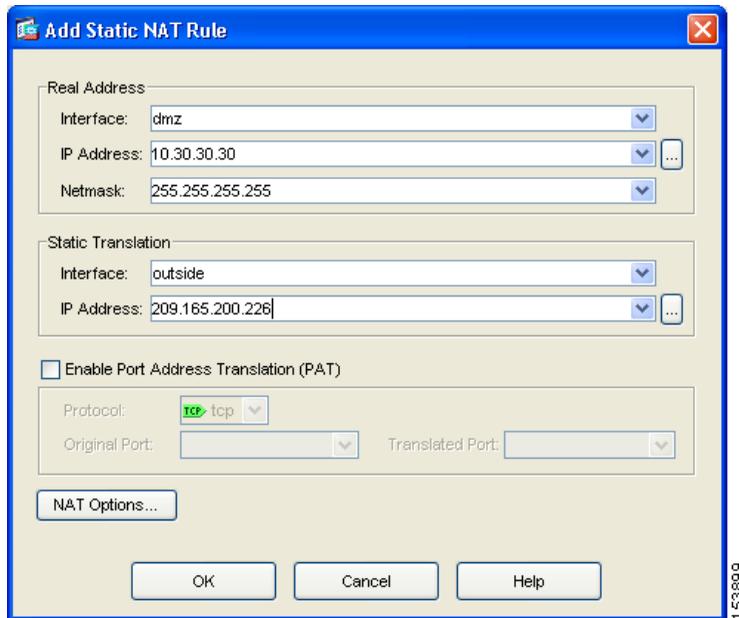
For many configurations you would also need to create a NAT rule between the inside interface and the outside interface to enable inside clients to communicate with the Internet.

However, in this scenario you do not need to create this rule explicitly. The reason is that the IP pool (pool ID 200) contains both types of addresses needed for address translation: the range of IP addresses to be used by the DMZ interface, and the IP address to be used for the outside interface. This enables ASDM to create the second translation rule for you.

Configuring an External Identity for the DMZ Web Server

The DMZ web server needs to be accessible by all hosts on the Internet. This configuration requires translating the private IP address of the DMZ web server to a public IP address, enabling access to outside HTTP clients that are unaware of the adaptive security appliance. To map the real web server IP address (10.30.30.30) statically to a public IP address (209.165.200.226), perform the following steps:

-
- Step 1** In the ASDM window, click the **Configuration** tool.
 - Step 2** In the Features pane, click **NAT**.
 - Step 3** From the Add drop-down list, choose Add Static NAT Rule. The Add Static NAT Rule dialog box appears.
 - Step 4** In the Real Address area, specify the real IP address of the web server:
 - a. From the Interface drop-down list, choose the DMZ interface.
 - b. Enter the real IP address of the DMZ web server. In this scenario, the IP address is 10.30.30.30.
 - c. From the Netmask drop-down list, choose the Netmask 255.255.255.255.



- Step 5** In the Static Translation area, specify the public IP address to be used for the web server:
- a. From the Interface drop-down list, choose Outside.
 - b. From the IP Address drop-down list, choose the public IP address of the DMZ web server.
- In this scenario, the public IP address of the DMZ web server is 209.165.200.226.

- Step 6** Click **OK** to add the rule and return to the list of Address Translation Rules.
- This rule maps the real web server IP address (10.30.30.30) statically to the public IP address of the web server (209.165.200.226).

Configuring the Security Appliance for a DMZ Deployment

The displayed configuration should be similar to the following:

The screenshot displays the Cisco ASDM 5.2 configuration window for NAT. The main configuration area shows a table with the following data:

No	Type	Real		Translated	
		Source	Destination	Interface	Address
1	Static	10.30.30.30	any	outside	209.165.200.226
2	Dynamic	10.0.0.0/24	any	dmz	10.30.30.50 - 10.30.30.60
3	Dynamic	10.0.0.0/24	any	outside	any

Below the table is a Rule Flow Diagram showing traffic flow from the dmz interface to the outside interface. The diagram includes a checkbox labeled "Enable traffic through the firewall without address translation" and "Apply" and "Reset" buttons.

Step 7 Click **Apply** to complete the adaptive security appliance configuration changes.

Providing Public HTTP Access to the DMZ Web Server

By default, the adaptive security appliance denies all traffic coming in from the public network. You must create an access control rule on the adaptive security appliance to permit specific traffic types from the public network to resources in the DMZ. This access control rule specifies the interface of the adaptive security

appliance that processes the traffic, whether the traffic is incoming or outgoing, the origin and destination of the traffic, and the type of traffic protocol and service to be permitted.

In this section, you create an access rule that permits incoming HTTP traffic originating from any host or network on the Internet, if the destination of the traffic is the web server on the DMZ network. All other traffic coming in from the public network is denied.

To configure the access control rule, perform the following steps:

-
- Step 1** In the ASDM window:
- a. Click the **Configuration** tool.
 - b. In the Features pane, click **Security Policy**.
 - c. Click the **Access Rules** tab, and then from the Add pull-down list, choose Add Access Rule.
- The Add Access Rule dialog box appears.

Configuring the Security Appliance for a DMZ Deployment

- Step 2** In the Interface and Action area:
- From the Interface drop-down list, choose Outside.
 - From the Direction drop-down list, choose Incoming.
 - From the Action drop-down list, choose Permit.

- Step 3** In the Source area:
- From the Type drop-down list, choose IP Address.
 - Enter the IP address of the source host or source network. Use 0.0.0.0 to allow traffic originating from any host or network.

Alternatively, if the address of the source host or network is preconfigured, choose the source IP address from the IP Address drop-down list.

- c. Enter the netmask for the source IP address or select one from the Netmask drop-down list.

Step 4 In the Destination area:

- a. In the IP address field, enter the public IP address of the destination host or network, such as a web server. (In this scenario, the public IP address of the DMZ web server is 209.165.200.226.)

Step 5 In the Protocol and Service area, specify the type of traffic that you want to permit through the adaptive security appliance.

- a. From the Protocol drop-down list, choose tcp.
- b. In the Source Port area, click the **Service** radio button, choose “=” (equal to) from the Service drop-down list, and then choose Any from the next drop-down list.
- c. In the Destination Port area, click the **Service** radio button, choose “=” (equal to) from the Service drop-down list, and then choose HTTP/WWW from the next drop-down list.

Configuring the Security Appliance for a DMZ Deployment

At this point, the entries in the Add Access Rule dialog box should be similar to the following:

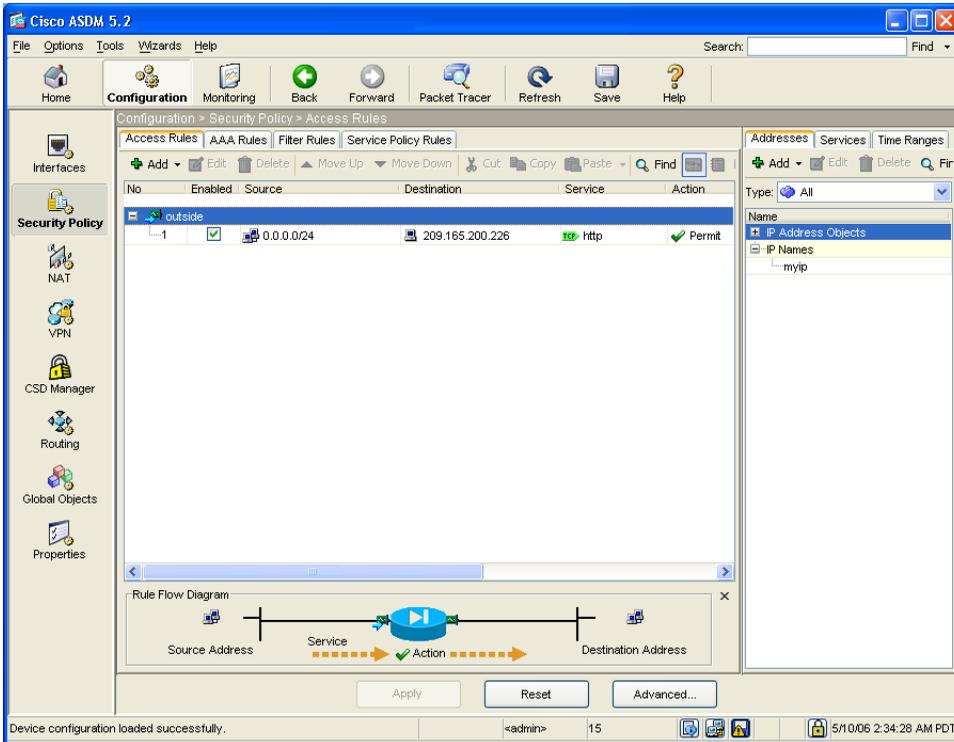
The screenshot shows the 'Add Access Rule' dialog box with the following configuration:

- Interface and Action:** Interface: `outside`, Action: `Permit`
- Direction:** `incoming`
- Source:** Type: `IP Address`, IP Address: `0.0.0.0`, Netmask: `255.255.255.0`
- Destination:** Type: `IP Address`, IP Address: `209.165.200.226`, Netmask: `255.255.255.255`
- Protocol and Service:** Protocol: `tcp`, Destination Port: `http/www`
- Rule Flow Diagram:** Shows traffic from `0.0.0.0/24` passing through the `outside` interface to `209.165.200.226` with a `Permit` action.
- Options:** Logging: `Default`, Syslog Level: `Informational`, Log Interval: `300`

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d. Click **OK**.

Step 6 The displayed configuration should be similar to the following. Verify that the information you entered is accurate.



Step 7 Click **Apply** to save the configuration changes to the configuration that the adaptive security appliance is currently running.

Clients on both the private and public networks can now resolve HTTP requests for content from the DMZ web server, while keeping the private network secure.



Note

Although the destination address specified is the private address of the DMZ web server (10.30.30.30), HTTP traffic from any host on the Internet destined for the public address 209.165.200.226 is permitted through the adaptive security appliance. The address translation (209.165.200.226 to 10.30.30.30) allows the traffic to be permitted. For information about creating the translation rule, see the [“Configuring NAT for Inside Clients to Communicate with the DMZ Web Server”](#) section on page 6-12.

Step 8 If you want the configuration changes to be saved to the startup configuration so that they are applied the next time the device starts, from the File menu, click **Save**.

Alternatively, ASDM prompts you to save the configuration changes permanently when you exit ASDM.

If you do not save the configuration changes, the old configuration takes effect the next time the device starts.

What to Do Next

If you are deploying the adaptive security appliance solely to protect a web server in a DMZ, you have completed the initial configuration. You may want to consider performing some of the following additional steps:

To Do This ...	See ...
Refine configuration and configure optional and advanced features	Cisco Security Appliance Command Line Configuration Guide
Learn about daily operations	Cisco Security Appliance Command Reference Cisco Security Appliance Logging Configuration and System Log Messages

You can configure the adaptive security appliance for more than one application. The following sections provide configuration procedures for other common applications of the adaptive security appliance.

To Do This ...	See ...
Configure a remote-access VPN	Chapter 7, “Scenario: Remote-Access VPN Configuration”
Configure a site-to-site VPN	Chapter 8, “Scenario: Site-to-Site VPN Configuration”



Scenario: Remote-Access VPN Configuration

This chapter describes how to use the adaptive security appliance to accept remote-access IPsec VPN connections. A remote-access VPN enables you to create secure connections, or tunnels, across the Internet, thus providing secure access to off-site users.

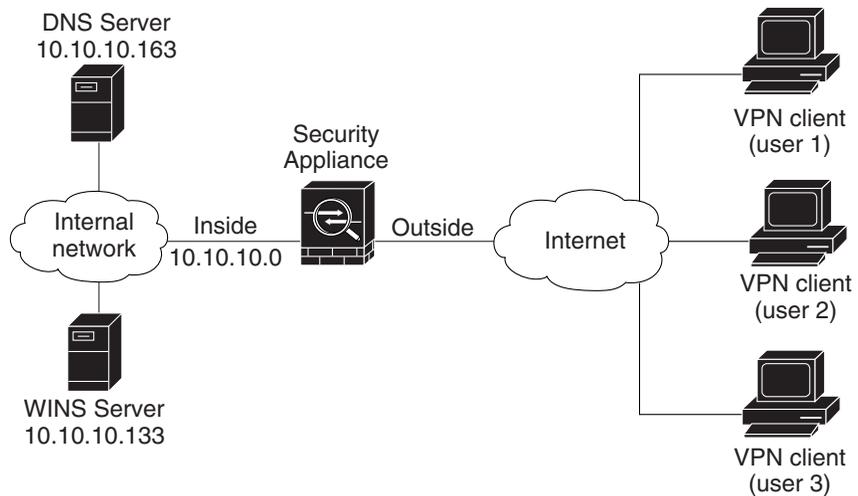
If you are implementing an Easy VPN solution, this chapter describes how to configure the Easy VPN server (sometimes called a headend device).

This chapter includes the following sections:

- [Example IPsec Remote-Access VPN Network Topology, page 7-1](#)
- [Implementing the IPsec Remote-Access VPN Scenario, page 7-2](#)
- [What to Do Next, page 7-18](#)

Example IPsec Remote-Access VPN Network Topology

[Figure 7-1](#) shows an adaptive security appliance configured to accept requests from and establish IPsec connections with VPN clients, such as a Cisco Easy VPN hardware client, over the Internet.

Figure 7-1 Network Layout for Remote Access VPN Scenario

Implementing the IPsec Remote-Access VPN Scenario

This section describes how to configure the adaptive security appliance to accept IPsec VPN connections from remote clients and devices. If you are implementing an Easy VPN solution, this section describes how to configure an Easy VPN server (also known as a headend device).

Values for example configuration settings are taken from the remote-access scenario illustrated in [Figure 7-1](#).

This section includes the following topics:

- [Information to Have Available](#), page 7-3
- [Starting ASDM](#), page 7-4
- [Configuring the ASA 5550 for an IPsec Remote-Access VPN](#), page 7-5
- [Selecting VPN Client Types](#), page 7-6

- [Specifying the VPN Tunnel Group Name and Authentication Method, page 7-7](#)
- [Specifying a User Authentication Method, page 7-8](#)
- [\(Optional\) Configuring User Accounts, page 7-10](#)
- [Configuring Address Pools, page 7-11](#)
- [Configuring Client Attributes, page 7-12](#)
- [Configuring the IKE Policy, page 7-13](#)
- [Configuring IPsec Encryption and Authentication Parameters, page 7-15](#)
- [Specifying Address Translation Exception and Split Tunneling, page 7-16](#)
- [Verifying the Remote-Access VPN Configuration, page 7-17](#)

Information to Have Available

Before you begin configuring the adaptive security appliance to accept remote access IPsec VPN connections, make sure that you have the following information available:

- Range of IP addresses to be used in an IP pool. These addresses are assigned to remote VPN clients as they are successfully connected.
- List of users to be used in creating a local authentication database, unless you are using a AAA server for authentication.
- Networking information to be used by remote clients when connecting to the VPN, including:
 - IP addresses for the primary and secondary DNS servers
 - IP addresses for the primary and secondary WINS servers
 - Default domain name
 - List of IP addresses for local hosts, groups, and networks that should be made accessible to authenticated remote clients

Starting ASDM

To run ASDM in a web browser, enter the factory default IP address in the address field: **https://192.168.1.1/admin/**.



Note

Remember to add the “s” in “**https**” or the connection fails. HTTPS (HTTP over SSL) provides a secure connection between your browser and the adaptive security appliance.

The Main ASDM window appears.

The screenshot displays the Cisco ASDM 5.2 main window. The interface is divided into several sections:

- Device Information:** Shows host name 'SecurityAppliance 1', ASA Version '7.2(0)72', Device Uptime '1d 1h 48m 24s', ASDM Version '5.2(0)30', Device Type 'ASA/PIX', Firewall Mode 'Routed', Context Mode 'Single', Total Flash '64 MB', and Total Memory '512 MB'.
- Interface Status:** A table showing the status of four interfaces:

Interface	IP Address/Mask	Line	Link	Kbps
dmz	10.30.30.1/24	down	down	0
inside	10.10.10.1/24	down	down	0
management	172.23.62.22/24	up	up	5
outside	209.165.200.225/24	down	down	0
- VPN Status:** Shows 0 IKE Tunnels, 0 WebVPN Tunnels, and 0 SVC Tunnels.
- System Resources Status:** Includes CPU Usage (0%) and Memory Usage (68 MB) graphs.
- Traffic Status:** Shows Connections Per Second Usage and 'outside' Interface Traffic Usage (Kbps) graphs. A message indicates 'Interface is down'.

The status bar at the bottom shows 'Device configuration loaded successfully.', the user '`<admin>`', and the time '5/10/06 1:08:18 AM PDT'.

Configuring the ASA 5550 for an IPsec Remote-Access VPN

To begin the process for configuring a remote-access VPN, perform the following steps:

- Step 1** In the main ASDM window, choose **VPN Wizard** from the Wizards drop-down menu. The VPN Wizard Step 1 screen appears.



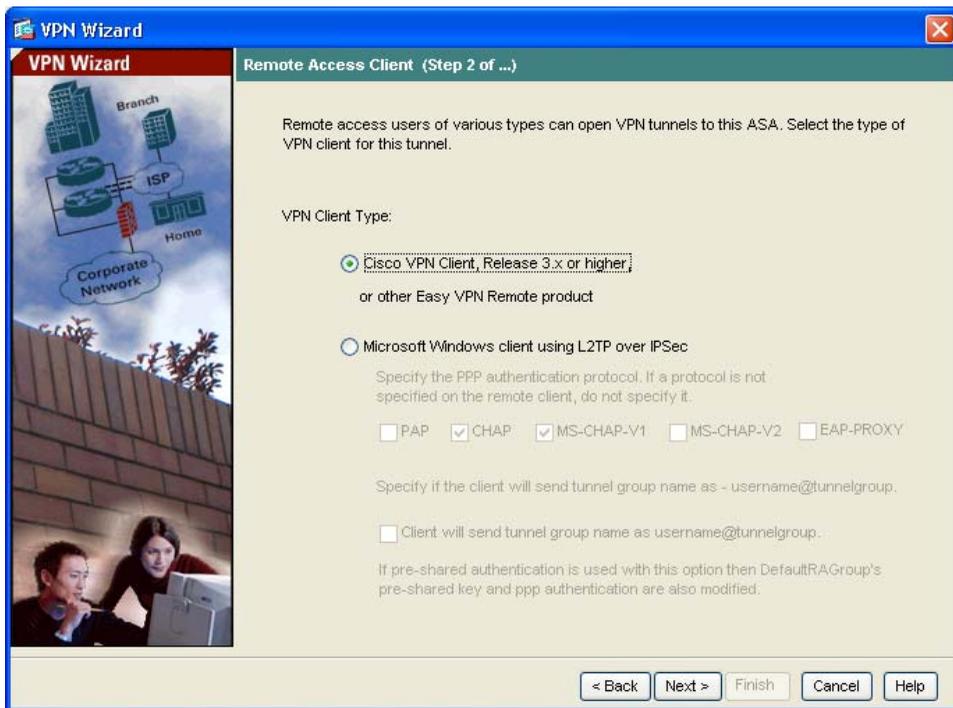
- Step 2** In Step 1 of the VPN Wizard, perform the following steps:
- Click the **Remote Access VPN** radio button.
 - From the drop-down list, choose **Outside** as the enabled interface for the incoming VPN tunnels.
 - Click **Next** to continue.

Selecting VPN Client Types

In Step 2 of the VPN Wizard, perform the following steps:

- Step 1** Specify the type of VPN client that will enable remote users to connect to this adaptive security appliance. For this scenario, click the **Cisco VPN Client** radio button.

You can also use any other Cisco Easy VPN remote product.



- Step 2** Click **Next** to continue.

Specifying the VPN Tunnel Group Name and Authentication Method

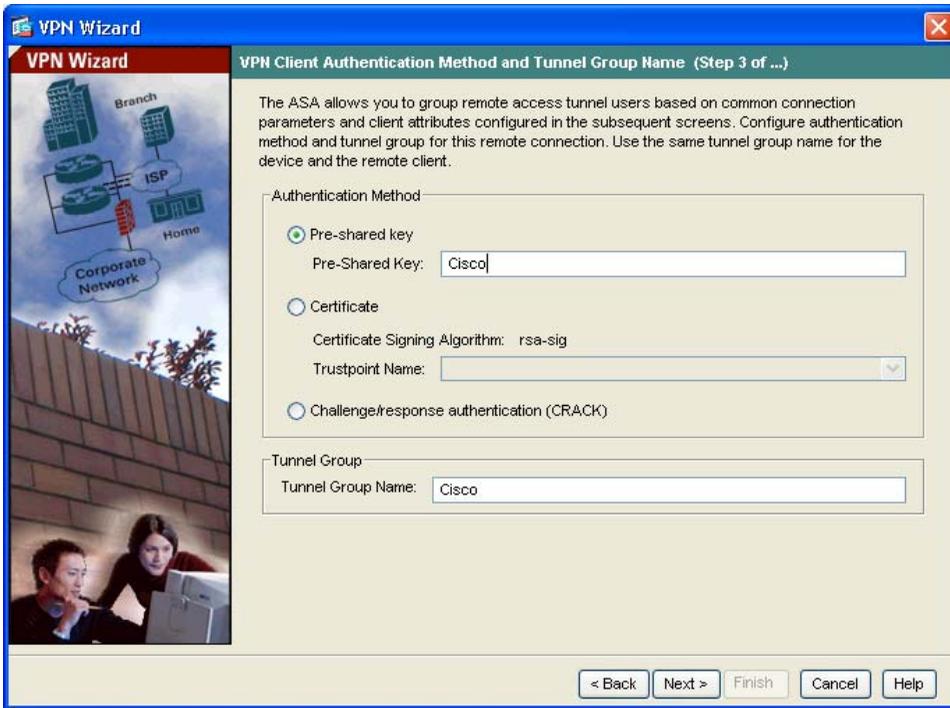
In Step 3 of the VPN Wizard, perform the following steps:

Step 1 Specify the type of authentication that you want to use by performing one of the following steps:

- To use a static preshared key for authentication, click the **Pre-Shared Key** radio button and enter a preshared key (for example, “Cisco”). This key is used for IPsec negotiations between the adaptive security appliances.
- To use digital certificates for authentication, click the **Certificate** radio button, choose the Certificate Signing Algorithm from the drop-down list, and then choose a preconfigured trustpoint name from the drop-down list.

If you want to use digital certificates for authentication but have not yet configured a trustpoint name, you can continue with the Wizard by using one of the other two options. You can revise the authentication configuration later using the standard ASDM screens.

- Click the **Challenge/Response Authentication (CRACK)** radio button to use that method of authentication.



Step 2 Enter a Tunnel Group Name (such as “Cisco”) for the set of users that use common connection parameters and client attributes to connect to this adaptive security appliance.

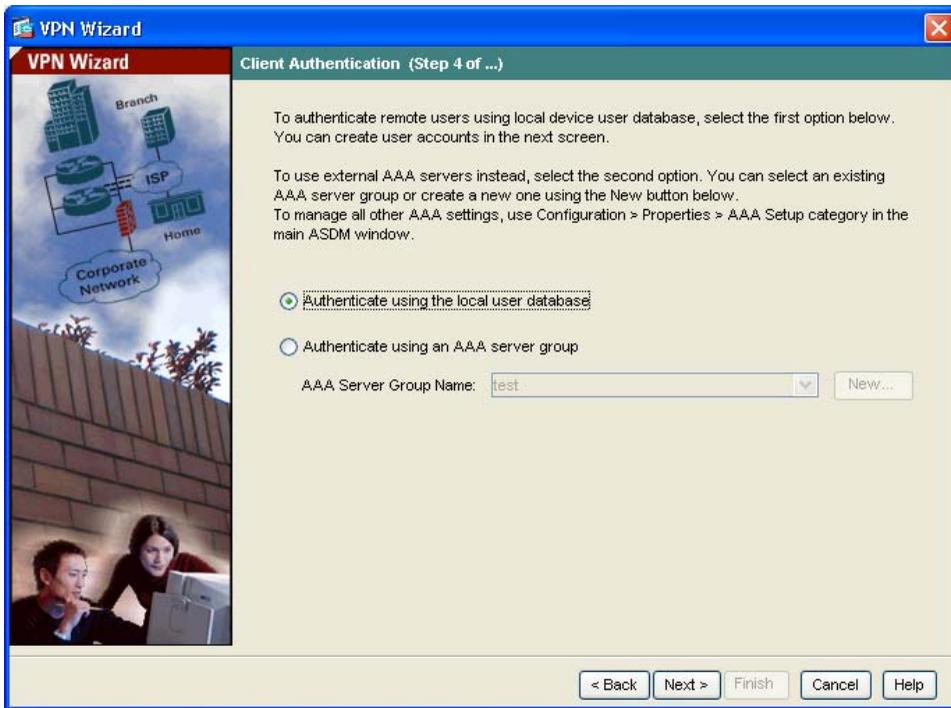
Step 3 Click **Next** to continue.

Specifying a User Authentication Method

Users can be authenticated either by a local authentication database or by using external authentication, authorization, and accounting (AAA) servers (RADIUS, TACACS+, SDI, NT, Kerberos, and LDAP).

In Step 4 of the VPN Wizard, perform the following steps:

- Step 1** If you want to authenticate users by creating a user database on the adaptive security appliance, click the **Authenticate Using the Local User Database** radio button.
- Step 2** If you want to authenticate users with an external AAA server group:
- Click the **Authenticate Using an AAA Server Group** radio button.
 - Choose a preconfigured server group from the drop-down list, or click **New** to add a new server group.



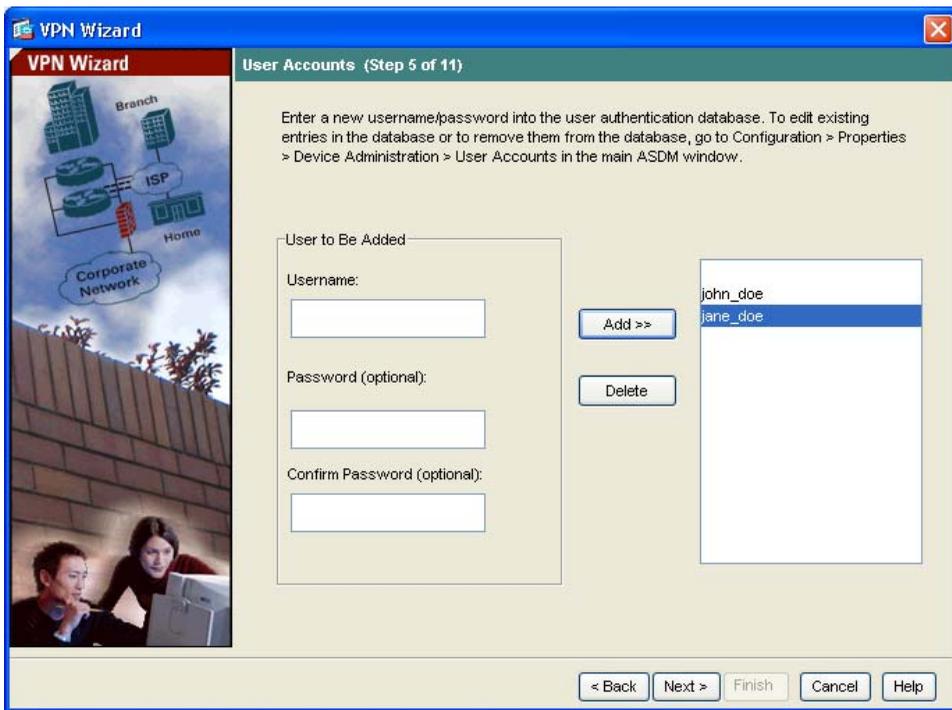
- Step 3** Click **Next** to continue.

(Optional) Configuring User Accounts

If you have chosen to authenticate users with the local user database, you can create new user accounts here. You can also add users later using the ASDM configuration interface.

In Step 5 of the VPN Wizard, perform the following steps:

Step 1 To add a new user, enter a username and password, and then click **Add**.



Step 2 When you have finished adding new users, click **Next** to continue.

Configuring Address Pools

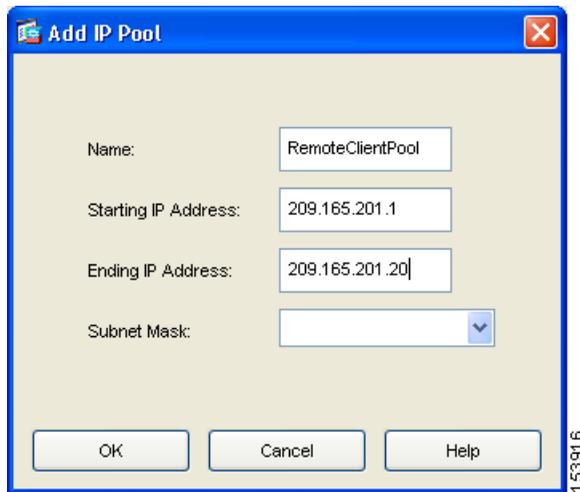
For remote clients to gain access to your network, you must configure a pool of IP addresses that can be assigned to remote VPN clients as they are successfully connected. In this scenario, the pool is configured to use the range of IP addresses 209.165.201.1–209.166.201.20.

In Step 6 of the VPN Wizard, perform the following steps:

Step 1 Enter a pool name or choose a preconfigured pool from the drop-down list.

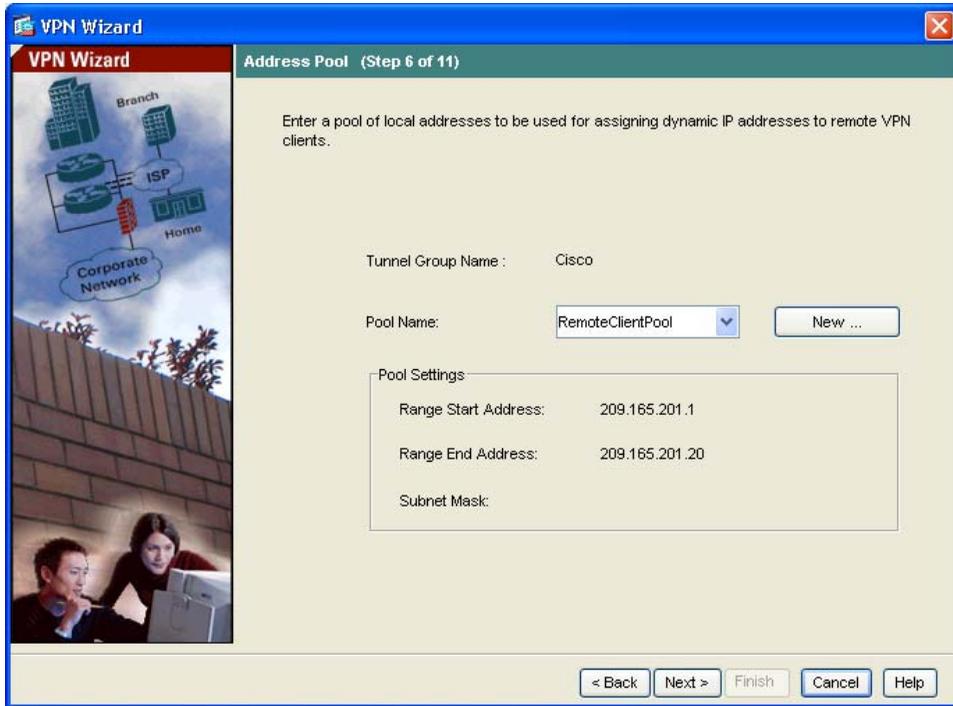
Alternatively, click **New** to create a new address pool.

The Add IP Pool dialog box appears.



Step 2 In the Add IP Pool dialog box:

- a. Enter the Starting IP address and Ending IP address of the range.
- b. (Optional) Enter the Netmask for the range of IP addresses.
- c. Click **OK** to return to Step 6 of the VPN Wizard.



Step 3 Click **Next** to continue.

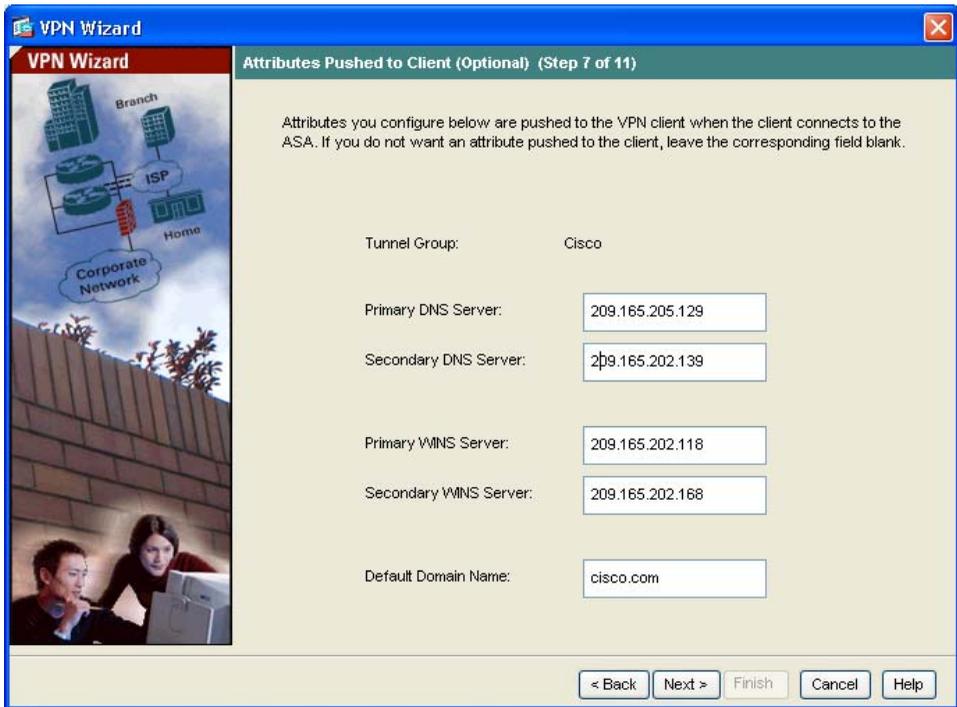
Configuring Client Attributes

To access your network, each remote access client needs basic network configuration information, such as which DNS and WINS servers to use and the default domain name. Rather than configuring each remote client individually, you can provide the client information to ASDM. The adaptive security appliance pushes this information to the remote client or Easy VPN hardware client when a connection is established.

Ensure that you specify the correct values, or remote clients will not be able to use DNS names for resolution or use Windows networking.

In Step 7 of the VPN Wizard, perform the following steps:

- Step 1** Enter the network configuration information to be pushed to remote clients.



- Step 2** Click **Next** to continue.

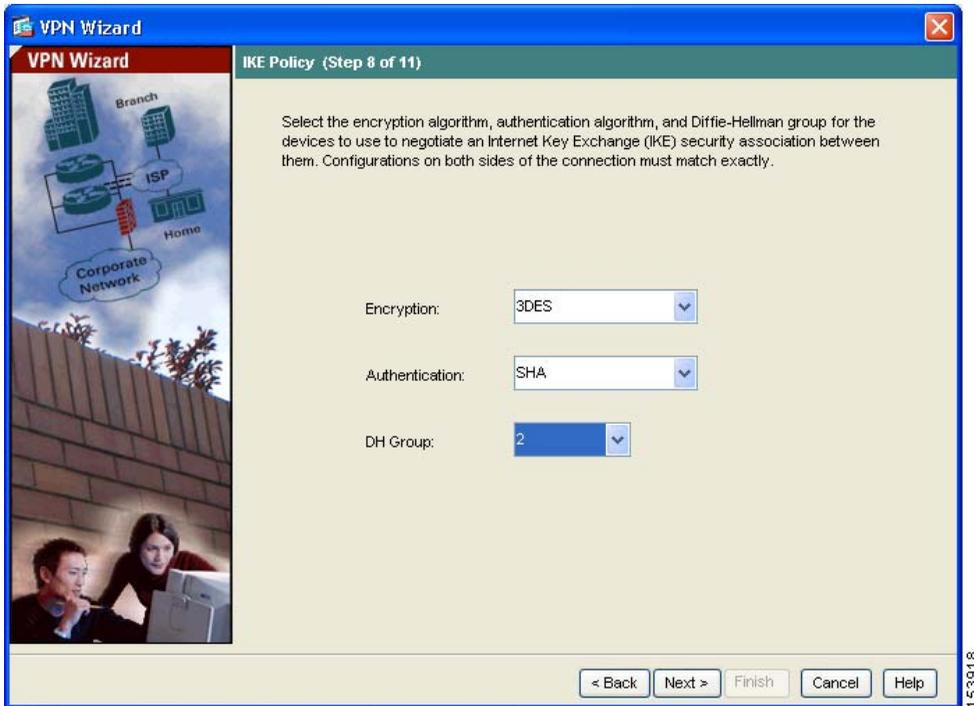
Configuring the IKE Policy

IKE is a negotiation protocol that includes an encryption method to protect data and ensure privacy; it is also an authentication method to ensure the identity of the peers. In most cases, the ASDM default values are sufficient to establish secure VPN tunnels.

■ Implementing the IPsec Remote-Access VPN Scenario

To specify the IKE policy in Step 8 of the VPN Wizard, perform the following steps:

- Step 1** Click the Encryption (DES/3DES/AES), authentication algorithms (MD5/SHA), and the Diffie-Hellman group (1/2/5/7) used by the adaptive security appliance during an IKE security association.

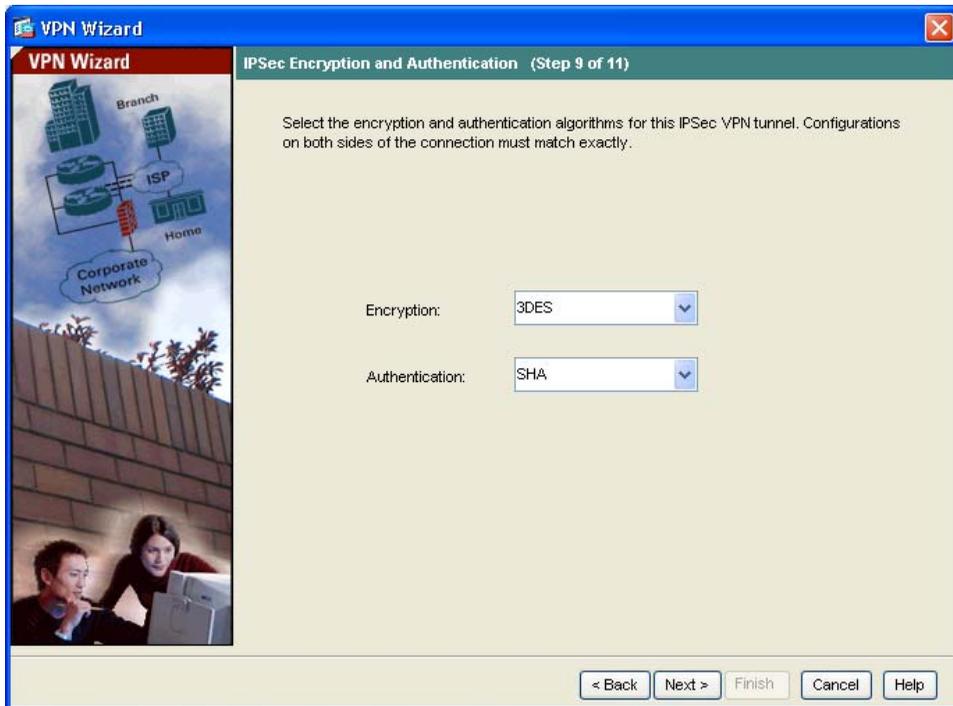


- Step 2** Click **Next** to continue.

Configuring IPsec Encryption and Authentication Parameters

In Step 9 of the VPN Wizard, perform the following steps:

- Step 1** Click the Encryption algorithm (DES/3DES/AES) and authentication algorithm (MD5/SHA).



- Step 2** Click **Next** to continue.

Specifying Address Translation Exception and Split Tunneling

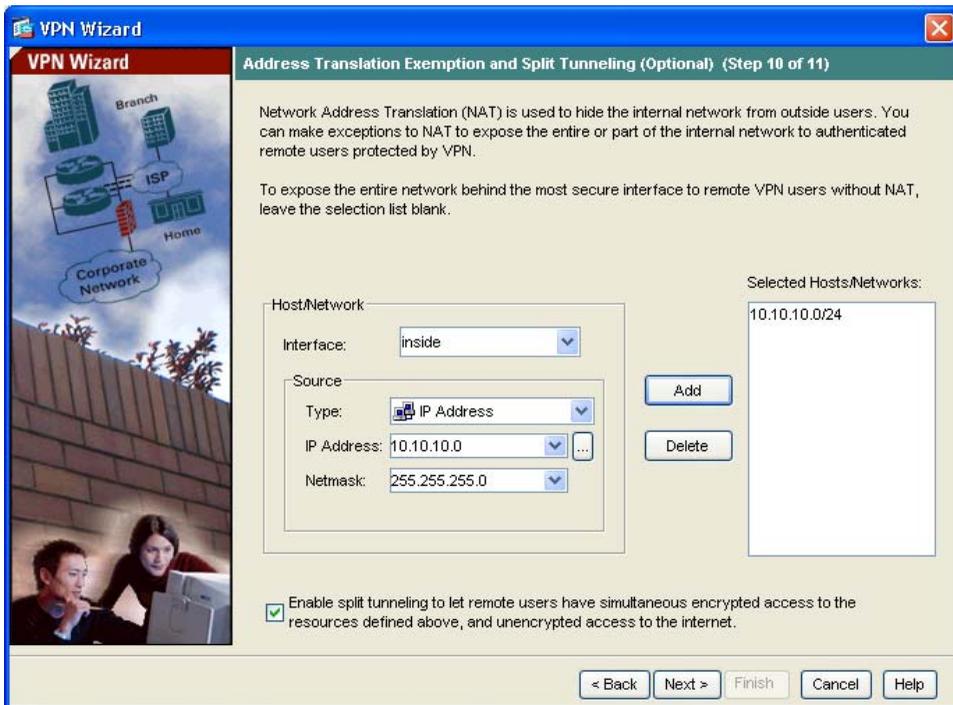
Split tunneling lets a remote-access IPsec client conditionally direct packets over an IPsec tunnel in encrypted form or to a network interface in clear text form.

The adaptive security appliance uses Network Address Translation (NAT) to prevent internal IP addresses from being exposed externally. You can make exceptions to this network protection by identifying local hosts and networks that should be made accessible to authenticated remote users. (In this scenario, the entire inside network 10.10.10.0 is exposed to all remote clients.)

In Step 10 of the VPN Wizard, perform the following steps:

Step 1 Specify hosts, groups, and networks that should be in the list of internal resources made accessible to authenticated remote users.

To add or remove hosts, groups, and networks dynamically from the Selected Hosts/Networks pane, click **Add** or **Delete**, respectively.



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Note Enable split tunneling by checking the **Enable Split Tunneling** check box at the bottom of the screen. Split tunneling allows traffic outside the configured networks to be sent out directly to the Internet instead of over the encrypted VPN tunnel.

Step 2 Click **Next** to continue.

Verifying the Remote-Access VPN Configuration

In Step 11 of the VPN Wizard, review the configuration attributes for the VPN tunnel you just created. The displayed configuration should be similar to the following:



If you are satisfied with the configuration, click **Finish** to apply the changes to the adaptive security appliance.

If you want the configuration changes to be saved to the startup configuration so that they are applied the next time the device starts, from the File menu, click **Save**. Alternatively, ASDM prompts you to save the configuration changes permanently when you exit ASDM.

If you do not save the configuration changes, the old configuration takes effect the next time the device starts.

What to Do Next

If you are deploying the adaptive security appliance solely in a remote-access VPN environment, you have completed the initial configuration. In addition, you may want to consider performing some of the following steps:

To Do This ...	See ...
Refine configuration and configure optional and advanced features	<i>Cisco Security Appliance Command Line Configuration Guide</i>
Learn about daily operations	<i>Cisco Security Appliance Command Reference</i> <i>Cisco Security Appliance Logging Configuration and System Log Messages</i>

You can configure the adaptive security appliance for more than one application. The following sections provide configuration procedures for other common applications of the adaptive security appliance.

To Do This ...	See ...
Configure the adaptive security appliance to protect a Web server in a DMZ	Chapter 6, “Scenario: DMZ Configuration”
Configure a site-to-site VPN	Chapter 8, “Scenario: Site-to-Site VPN Configuration”

What to Do Next



Scenario: Site-to-Site VPN Configuration

This chapter describes how to use the adaptive security appliance to create a site-to-site VPN.

Site-to-site VPN features provided by the adaptive security appliance enable businesses to extend their networks across low-cost public Internet connections to business partners and remote offices worldwide while maintaining their network security. A VPN connection enables you to send data from one location to another over a secure connection, or tunnel, first by authenticating both ends of the connection, and then by automatically encrypting all data sent between the two sites.

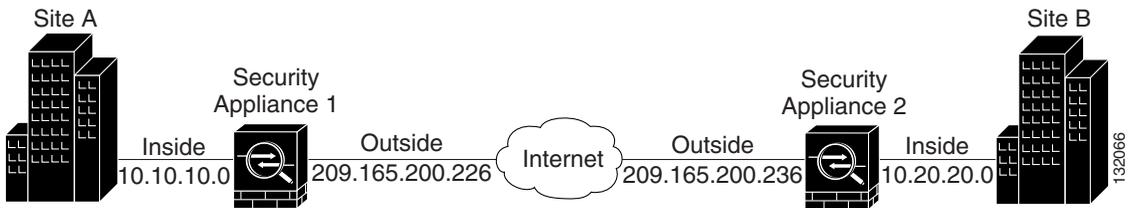
This chapter includes the following sections:

- [Example Site-to-Site VPN Network Topology, page 8-1](#)
- [Implementing the Site-to-Site Scenario, page 8-2](#)
- [Configuring the Other Side of the VPN Connection, page 8-13](#)
- [What to Do Next, page 8-13](#)

Example Site-to-Site VPN Network Topology

[Figure 8-1](#) shows an example VPN tunnel between two adaptive security appliances.

Figure 8-1 Network Layout for Site-to-Site VPN Configuration Scenario



Creating a VPN site-to-site deployment such as the one in [Figure 8-1](#) requires you to configure two adaptive security appliances, one on each side of the connection.

Implementing the Site-to-Site Scenario

This section describes how to configure the adaptive security appliance in a site-to-site VPN deployment, using example parameters from the remote-access scenario shown in [Figure 8-1](#).

This section includes the following sections:

- [Information to Have Available, page 8-2](#)
- [Configuring the Site-to-Site VPN, page 8-3](#)

Information to Have Available

Before you begin the configuration procedure, gather the following information:

- IP address of the remote adaptive security appliance peer
- IP addresses of local hosts and networks permitted to use the tunnel to communicate with resources on the remote site
- IP addresses of remote hosts and networks permitted to use the tunnel to communicate with local resources

Configuring the Site-to-Site VPN

This section describes how to use the ASDM VPN Wizard to configure the adaptive security appliance for a site-to-site VPN.

This section includes the following topics:

- [Starting ASDM, page 8-3](#)
- [Configuring the Security Appliance at the Local Site, page 8-4](#)
- [Providing Information About the Remote VPN Peer, page 8-6](#)
- [Configuring the IKE Policy, page 8-7](#)
- [Configuring IPsec Encryption and Authentication Parameters, page 8-9](#)
- [Specifying Hosts and Networks, page 8-10](#)
- [Viewing VPN Attributes and Completing the Wizard, page 8-11](#)

The following sections provide detailed instructions for how to perform each configuration step.

Starting ASDM

To run ASDM in a web browser, enter the factory default IP address in the address field: **https://192.168.1.1/admin/**.



Note Remember to add the “s” in “**https**” or the connection fails. HTTPS (HTTP over SSL) provides a secure connection between your browser and the adaptive security appliance.

The Main ASDM window appears.

Implementing the Site-to-Site Scenario

The screenshot displays the Cisco ASDM 5.2 web interface. The main content area is divided into several sections:

- Device Information:** Shows details for 'SecurityAppliance1', including Host Name, ASA Version (7.2(0)72), Device Uptime (1d 1h 48m 24s), ASDM Version (5.2(0)30), Device Type (ASA/PIX), Firewall Mode (Routed), Context Mode (Single), Total Flash (64 MB), and Total Memory (512 MB).
- Interface Status:** A table showing the status of four interfaces:

Interface	IP Address/Mask	Line	Link	Kbps
dmz	10.30.30.1/24	down	down	0
inside	10.10.10.1/24	down	down	0
management	172.23.62.22/24	up	up	5
outside	209.165.200.225/24	down	down	0
- VPN Status:** Shows 0 IKE Tunnels, 0 WebVPN Tunnels, and 0 SVC Tunnels.
- System Resources Status:** Includes graphs for CPU Usage (0%), Memory Usage (68 MB), Connections Per Second Usage, and 'outside' Interface Traffic Usage (Kbps). The traffic graph shows 'Interface is down'.

The status bar at the bottom indicates 'Device configuration loaded successfully.' and shows the user is logged in as '<admin>' with 15 sessions. The system time is 5/10/06 1:08:18 AM PDT.

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Configuring the Security Appliance at the Local Site



Note

The adaptive security appliance at the first site is referred to as Security Appliance 1 from this point forward.

To configure the Security Appliance 1, perform the following steps:

- Step 1** In the main ASDM window, choose the VPN Wizard option from the Wizards drop-down menu. ASDM opens the first VPN Wizard screen.

In Step 1 of the VPN Wizard, perform the following steps:

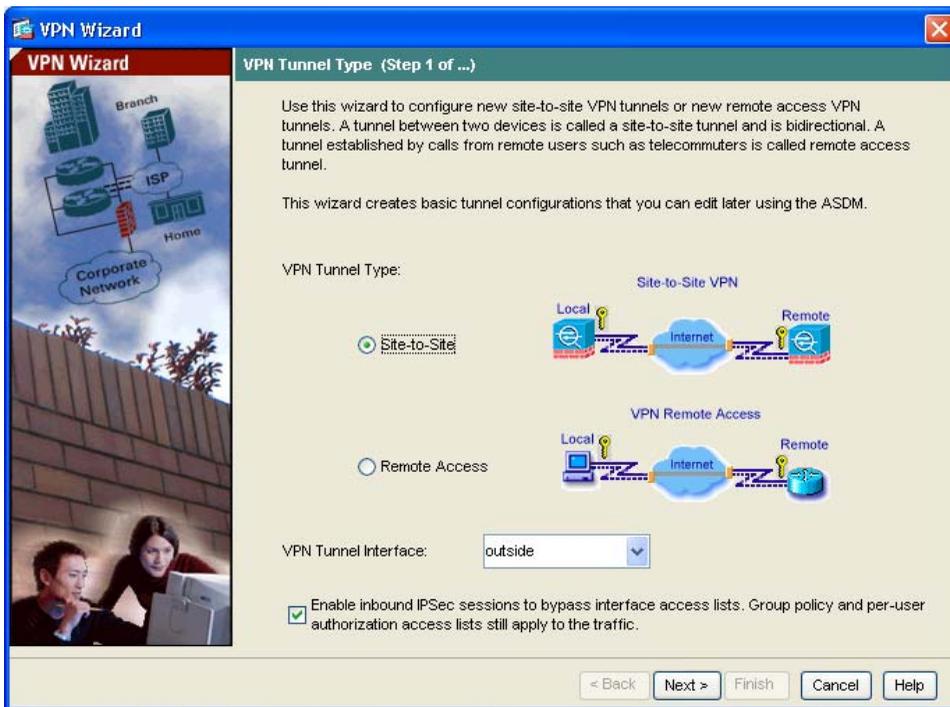
- a. Click the **Site-to-Site VPN** radio button.



Note

The Site-to-Site VPN option connects two IPsec security gateways, which can include adaptive security appliances, VPN concentrators, or other devices that support site-to-site IPsec connectivity.

- b. From the drop-down list, choose **Outside** as the enabled interface for the current VPN tunnel.



- c. Click **Next** to continue.

Providing Information About the Remote VPN Peer

The VPN peer is the system on the other end of the connection that you are configuring, usually at a remote site.

**Note**

In this scenario, the remote VPN peer is referred to as Security Appliance 2 from this point forward.

In Step 2 of the VPN Wizard, perform the following steps:

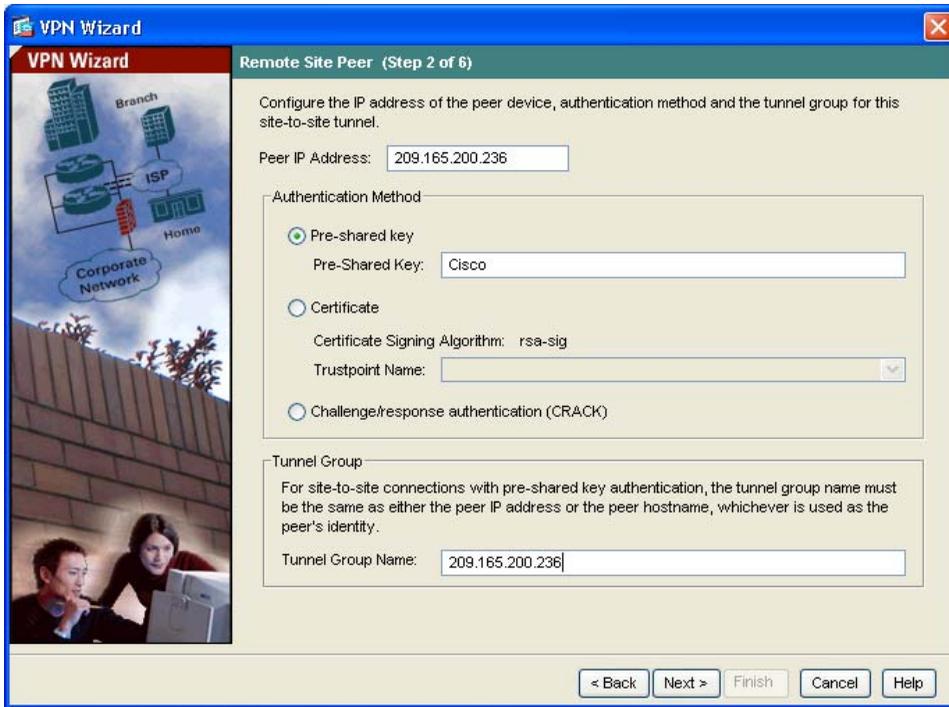
-
- Step 1** Enter the Peer IP Address (the IP address of Security Appliance 2, in this scenario 209.165.200.236) and a Tunnel Group Name (for example “Cisco”).
- Step 2** Specify the type of authentication that you want to use by performing one of the following steps:
- To use a static preshared key for authentication, click the **Pre-Shared Key** radio button and enter a preshared key (for example, “Cisco”). This key is used for IPsec negotiations between the adaptive security appliances.

**Note**

When you configure Security Appliance 2 at the remote site, the VPN peer is Security Appliance 1. Be sure to enter the same preshared key (Cisco) that you use here.

- Click the **Challenge/Response Authentication** radio button to use that method of authentication.
- To use digital certificates for authentication, click the **Certificate** radio button, choose the Certificate Signing Algorithm from the drop-down list, and then choose a preconfigured trustpoint name from the drop-down list.

If you want to use digital certificates for authentication but have not yet configured a trustpoint name, you can continue with the Wizard by using one of the other two options. You can revise the authentication configuration later using the standard ASDM screens.



Step 3 Click **Next** to continue.

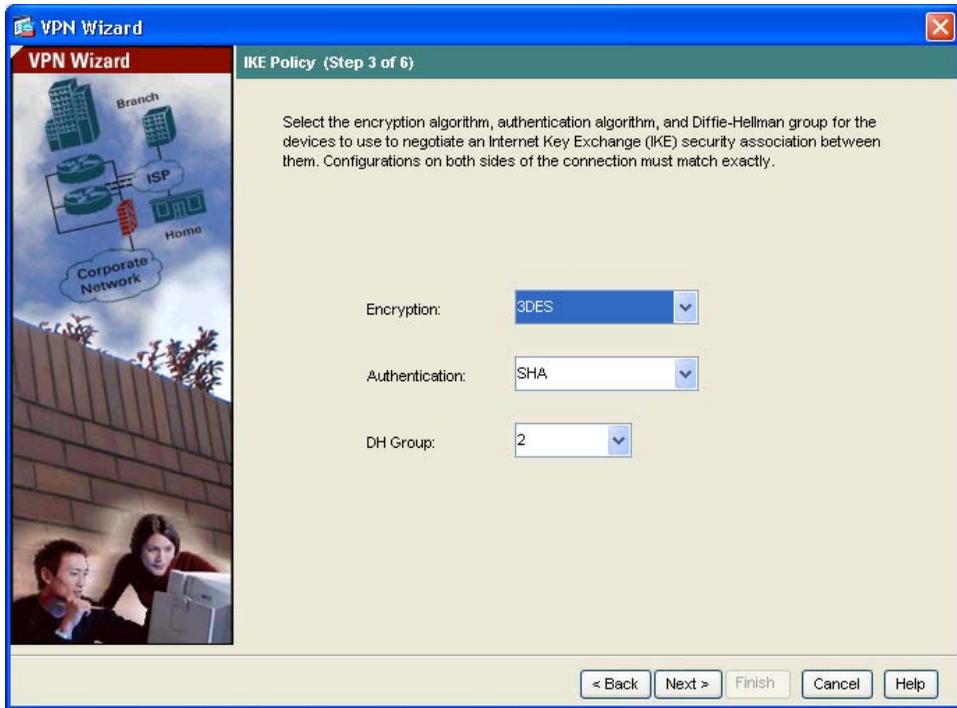
Configuring the IKE Policy

IKE is a negotiation protocol that includes an encryption method to protect data and ensure privacy; it is also an authentication method to ensure the identity of the peers. In most cases, the ASDM default values are sufficient to establish secure VPN tunnels between two peers.

In Step 3 of the VPN Wizard, perform the following steps:

Step 1 Click the Encryption (DES/3DES/AES), authentication algorithms (MD5/SHA), and the Diffie-Hellman group (1/2/5) used by the adaptive security appliance during an IKE security association.

Implementing the Site-to-Site Scenario

**Note**

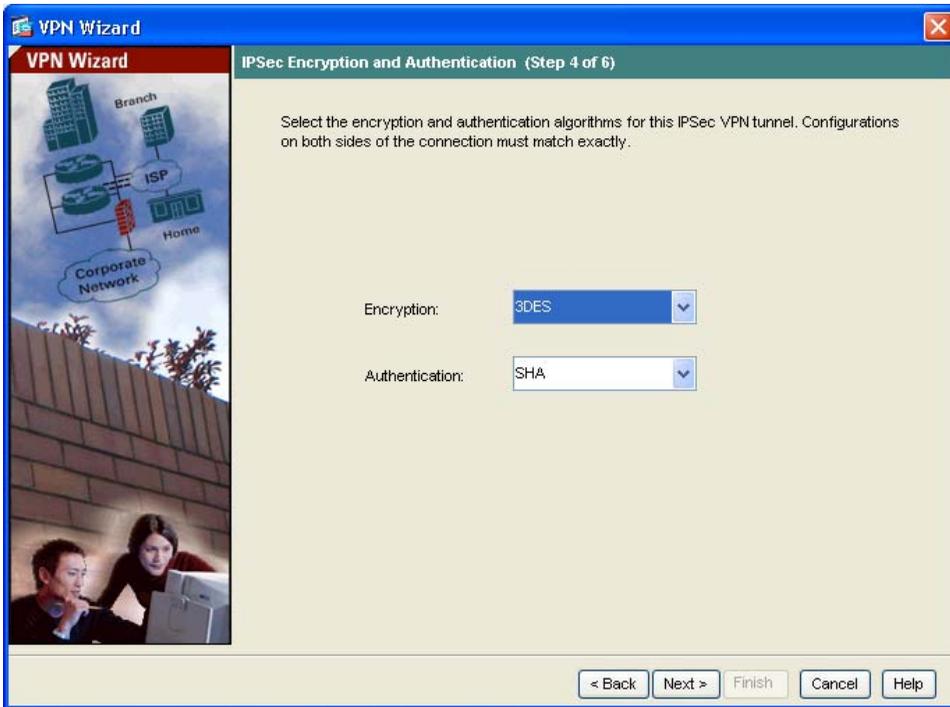
When configuring Security Appliance 2, enter the exact values for each of the options that you chose for Security Appliance 1. Encryption mismatches are a common cause of VPN tunnel failures and can slow down the process.

Step 2 Click **Next** to continue.

Configuring IPsec Encryption and Authentication Parameters

In Step 4 of the VPN Wizard, perform the following steps:

- Step 1** Choose the Encryption algorithm (DES/3DES/AES) and authentication algorithm (MD5/SHA) from the drop-down lists.



- Step 2** Click **Next** to continue.

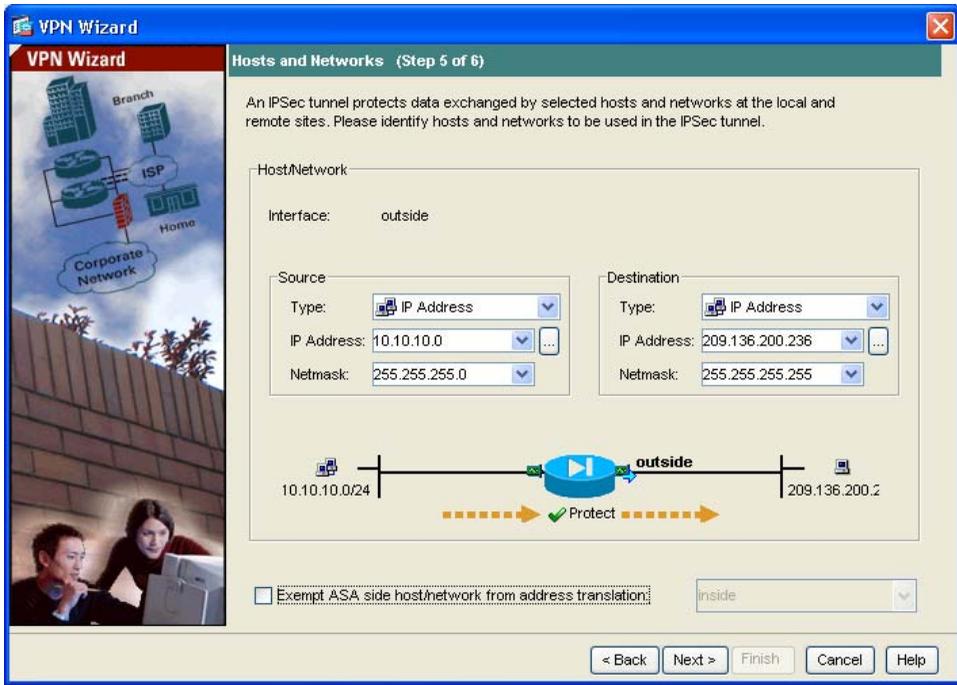
Specifying Hosts and Networks

Identify hosts and networks at the local site that are permitted to use this IPsec tunnel to communicate with the remote-site peer. Add or remove hosts and networks dynamically by clicking **Add** or **Delete**, respectively. In the current scenario, traffic from Network A (10.10.10.0) is encrypted by Security Appliance 1 and transmitted through the VPN tunnel.

In addition, identify hosts and networks at the remote site to be allowed to use this IPsec tunnel to access local hosts and networks. Add or remove hosts and networks dynamically by clicking **Add** or **Delete** respectively. In this scenario, for Security Appliance 1, the remote network is Network B (10.20.20.0), so traffic encrypted from this network is permitted through the tunnel.

In Step 5 of the VPN Wizard, perform the following steps:

-
- Step 1** In the Source area, choose IP Address from the Type drop-down list.
 - Step 2** Enter the local IP address and netmask in the IP Address and Netmask fields.
 - Step 3** In the Destination area, choose IP Address from the Type drop-down list.
 - Step 4** Enter the IP address and Netmask for the remote host or network.

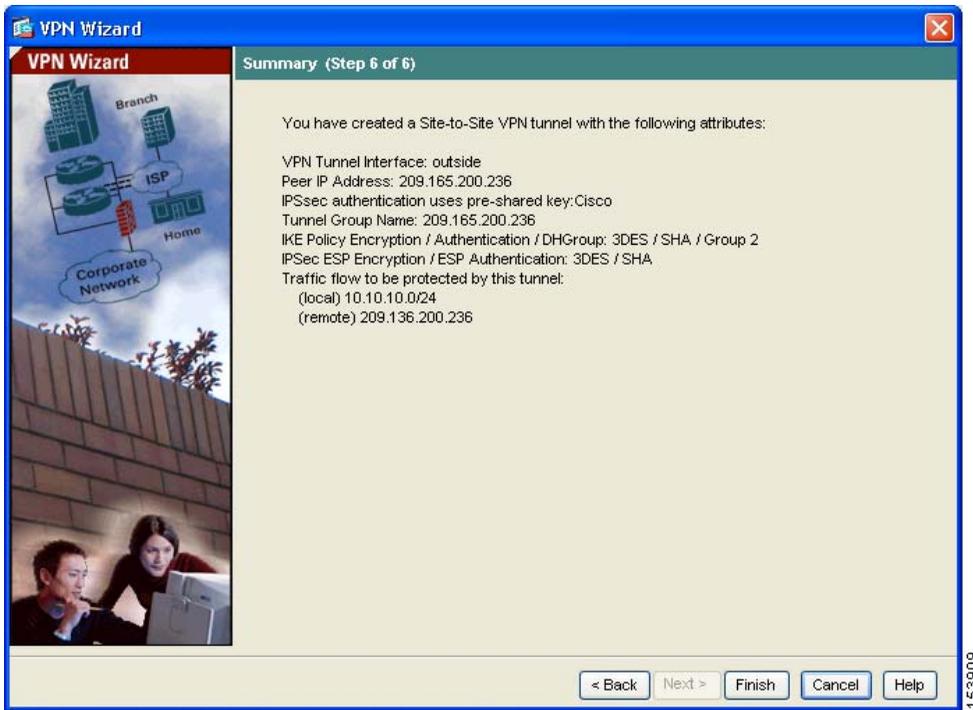


Step 5 Click **Next** to continue.

Viewing VPN Attributes and Completing the Wizard

In Step 6 of the VPN Wizard, review the configuration list for the VPN tunnel you just created. If you are satisfied with the configuration, click **Finish** to apply the changes to the adaptive security appliance.

Implementing the Site-to-Site Scenario



If you want the configuration changes to be saved to the startup configuration so that they are applied the next time the device starts, from the File menu, click **Save**.

Alternatively, ASDM prompts you to save the configuration changes permanently when you exit ASDM.

If you do not save the configuration changes, the old configuration takes effect the next time the device starts.

This concludes the configuration process for Security Appliance 1.

Configuring the Other Side of the VPN Connection

You have just configured the local adaptive security appliance. Now you need to configure the adaptive security appliance at the remote site.

At the remote site, configure the second adaptive security appliance to serve as a VPN peer. Use the procedure you used to configure the local adaptive security appliance, starting with the [“Configuring the Security Appliance at the Local Site”](#) section on page 8-4 and finishing with the [“Viewing VPN Attributes and Completing the Wizard”](#) section on page 8-11.



Note

When configuring Security Appliance 2, enter the exact same values for each of the options that you selected for Security Appliance 1. Mismatches are a common cause of VPN configuration failures.

What to Do Next

If you are deploying the adaptive security appliance solely in a site-to-site VPN environment, you have completed the initial configuration. In addition, you may want to consider performing some of the following steps:

To Do This ...	See ...
Refine configuration and configure optional and advanced features	Cisco Security Appliance Command Line Configuration Guide
Learn about daily operations	Cisco Security Appliance Command Reference Cisco Security Appliance Logging Configuration and System Log Messages

You can configure the adaptive security appliance for more than one application. The following sections provide configuration procedures for other common applications of the adaptive security appliance.

To Do This ...	See ...
Configure the adaptive security appliance to protect a web server in a DMZ	Chapter 6, “Scenario: DMZ Configuration”
Configure a remote-access VPN	Chapter 7, “Scenario: Remote-Access VPN Configuration”



Obtaining a DES License or a 3DES-AES License

The Cisco ASA 5550 adaptive security appliance is available either with a DES or 3DES-AES license that provides encryption technology to enable specific features, such as secure remote management (SSH, ASDM, and so on), site-to-site VPN, and remote access VPN. The license is enabled through an encryption license key.

If you ordered your adaptive security appliance with a DES or 3DES-AES license, the encryption license key comes with the adaptive security appliance.

If you are a registered user of Cisco.com and would like to obtain a 3DES/AES encryption license, go to the following website:

<http://www.cisco.com/go/license>

If you are not a registered user of Cisco.com, go to the following website:

<https://tools.cisco.com/SWIFT/Licensing/RegistrationServlet>

Provide your name, e-mail address, and the serial number for the adaptive security appliance as it appears in the show version command output.



Note

You will receive the new activation key for your adaptive security appliance within two hours of requesting the license upgrade.

For more information on activation key examples or upgrading software, see the *Cisco Security Appliance Command Line Configuration Guide*.

To use the activation key, perform the following steps:

	Command	Purpose
Step 1	hostname# show version	Shows the software release, hardware configuration, license key, and related uptime data.
Step 2	hostname# configure terminal	Enters global configuration mode.
Step 3	hostname(config)# activation-key <i>activation-5-tuple-key</i>	Updates the encryption activation key by replacing the <i>activation-4-tuple-key</i> variable with the activation key obtained with your new license. The <i>activation-5-tuple-key</i> variable is a five-element hexadecimal string with one space between each element. An example is 0xe02888da 0x4ba7bed6 0xf1c123ae 0xffd8624e. The “0x” is optional; all values are assumed to be hexadecimal.
Step 4	hostname(config)# exit	Exits global configuration mode.
Step 5	hostname# copy running-config startup-config	Saves the configuration.
Step 6	hostname# reload	Reboots the adaptive security appliance and reloads the configuration.