



SECURITY

Cisco ASA

All-in-One Firewall, IPS, Anti-X, and VPN
Adaptive Security Appliance
Second Edition

Identify, mitigate, and respond to network attacks

Cisco ASA: All-in-One Firewall, IPS, Anti-X, and VPN Adaptive Security Appliance, Second Edition

Jazib Frahim, Omar Santos

Copyright © 2010 Cisco Systems, Inc.

Published by:

Cisco Press

800 East 96th Street

Indianapolis, IN 46240 USA

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without written permission from the publisher, except for the inclusion of brief quotations in a review.

Printed in the United States of America

First Printing December 2009

Library of Congress Cataloging-in-Publication data is on file.

ISBN-13: 978-1-58705-819-6

ISBN-10: 1-58705-819-7

Warning and Disclaimer

This book is designed to provide information about Cisco ASA. Every effort has been made to make this book as complete and as accurate as possible, but no warranty or fitness is implied.

The information is provided on an “as is” basis. The authors, Cisco Press, and Cisco Systems, Inc., shall have neither liability nor responsibility to any person or entity with respect to any loss or damages arising from the information contained in this book or from the use of the discs or programs that may accompany it.

The opinions expressed in this book belong to the author and are not necessarily those of Cisco Systems, Inc.

Trademark Acknowledgments

All terms mentioned in this book that are known to be trademarks or service marks have been appropriately capitalized. Cisco Press or Cisco Systems, Inc., cannot attest to the accuracy of this information. Use of a term in this book should not be regarded as affecting the validity of any trademark or service mark.

Corporate and Government Sales

The publisher offers excellent discounts on this book when ordered in quantity for bulk purchases or special sales, which may include electronic versions and/or custom covers and content particular to your business, training goals, marketing focus, and branding interests. For more information, please contact: U.S.

Corporate and Government Sales

1-800-382-3419

corpsales@pearsontechgroup.com

For sales outside the United States please contact:

International Sales

international@pearsoned.com

Feedback Information

At Cisco Press, our goal is to create in-depth technical books of the highest quality and value. Each book is crafted with care and precision, undergoing rigorous development that involves the unique expertise of members from the professional technical community.

Readers' feedback is a natural continuation of this process. If you have any comments regarding how we could improve the quality of this book, or otherwise alter it to better suit your needs, you can contact us through email at feedback@ciscopress.com. Please make sure to include the book title and ISBN in your message.

We greatly appreciate your assistance.

Publisher: Paul Boger

Business Operation Manager, Cisco Press: Anand Sundaram

Associate Publisher: Dave Dusthimer

Manager Global Certification: Erik Ullanderson

Executive Editor: Brett Bartow

Technical Editors: Randy Ivener, Jay Johnston

Managing Editor: Patrick Kanouse

Development Editors: Kimberley Debus, Dayna Isley

Project Editor: Seth Kerney

Copy Editor: Margo Catts

Book and Cover Designer: Louisa Adair

Editorial Assistant: Vanessa Evans

Composition: Mark Shirar

Indexer: Ken Johnson

Proofreaders: Water Crest Publishing, Inc., Apostrophe Editing Services



Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

CCDE, CCENT, Cisco Eos, Cisco HealthPresence, the Cisco logo, Cisco Lumin, Cisco Nexus, Cisco StadiumVision, Cisco TelePresence, Cisco WebEx, DCE and Welcome to the Human Network are trademarks. Changing the Way We Work, Live, Play and Learn and Cisco Store are service marks and Access Registrar, Airont, AsyncOS, Bringing the Meeting To You, Catalyst, CCDA, CCDP, CCEM, CCFP, CCNA, CCNP, CCSP, CCVP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, EtherFast, EtherSwitch, Event Center, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS, iPhone, iQuick Study, IronPort, the IronPort logo, LightStream, Linksys, MediaTone, MeetingPlace, MeetingPlace Chime Sound, MGX, Networkers, Networking Academy, Network Registrar, PCNow, PIX, PowerPanel, ProConnect, ScriptShare, SenderBase, SMARTnet, Spectrum Expert, StackWise, The Fastest Way to Increase Your Internet Quotient, TransPath, WebEx, and the WebEx logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0812R)

Introduction

Network security has always been a challenge for many organizations that cannot deploy separate devices to provide firewall, intrusion prevention, and virtual private network (VPN) services. The Cisco ASA is a high-performance, multifunction security appliance that offers firewall, IPS, network antivirus, and VPN services. The Cisco ASA delivers these features through improved network integration, resiliency, and scalability.

This book is an insider's guide to planning, implementing, configuring, and troubleshooting the Cisco Adaptive Security Appliances. It delivers expert guidance from senior Cisco network security consulting engineers. It demonstrates how adaptive identification and mitigation services on the Cisco ASA provide a sophisticated network security solution to small, medium, and large organizations. This book brings together expert guidance for virtually every challenge you will face—from building basic network security policies to advanced VPN and IPS implementations.

Who Should Read This Book?

This book serves as a guide for any network professional who manages network security or installs and configures firewalls, VPN devices, or intrusion detection/prevention systems. It encompasses topics from an introductory level to advanced topics on security and VPNs. The requirements of the reader include a basic knowledge of TCP/IP and networking.

How This Book Is Organized

This book has five parts, which provide a Cisco ASA product introduction and then focus on firewall features, intrusion prevention, content security, and VPNs. Each part includes many sample configurations, accompanied by in-depth analyses of design scenarios. Your learning is further enhanced by a discussion of a set of debugs included in each technology. Ground-breaking features, such as SSL VPN and virtual and Layer 2 firewalls, are discussed extensively.

The core chapters, Chapters 2 through 12, cover the following topics:

- Part I, “Product Overview,” includes the following chapters:
 - Chapter 1, “Introduction to Security Technologies”—This chapter provides an overview of different technologies that are supported by the Cisco ASA and widely used by today's network security professionals.
 - Chapter 2, “Cisco ASA Product and Solution Overview”—This chapter describes how the Cisco ASA incorporates features from each of these products, integrating comprehensive firewall, intrusion detection and prevention, and VPN technologies in a cost-effective, single-box format. Additionally, it provides a hardware overview of the Cisco ASA, including detailed technical specifications and installation guidelines. It also covers an overview of the Adaptive Inspection and Prevention Security Services Module (AIP-SSM) and Content Security and Control Security Services Module (CSC-SSM).

- Chapter 3, “Initial Setup and System Maintenance”—A comprehensive list of initial setup tasks and system maintenance procedures is included in this chapter. These tasks and procedures are intended to be used by network professionals who will be installing, configuring, and managing the Cisco ASA.
- Part II, “Firewall Technology,” includes the following chapters:
 - Chapter 4, “Controlling Network Access”—The Cisco ASA can protect one or more networks from intruders. Connections between these networks can be carefully controlled by advanced firewall capabilities, enabling you to ensure that all traffic from and to the protected networks passes only through the firewall based on the organization’s security policy. This chapter shows you how to implement your organization’s security policy, using the features the Cisco ASA provides.
 - Chapter 5, “IP Routing”—This chapter covers the different routing capabilities of the Cisco ASA.
 - Chapter 6, “Authentication, Authorization, and Accounting (AAA)”—The Cisco ASA supports a wide range of AAA features. This chapter provides guidelines on how to configure AAA services by defining a list of authentication methods applied to various implementations.
 - Chapter 7, “Application Inspection”—The Cisco ASA stateful application inspection helps to secure the use of applications and services in your network. This chapter describes how to use and configure application inspection.
 - Chapter 8, “Virtualization”—The Cisco ASA virtual firewall feature introduces the concept of operating multiple instances of firewalls (contexts) within the same hardware platform. This chapter shows how to configure and troubleshoot each of these security contexts.
 - Chapter 9, “Transparent Firewalls”—This chapter introduces the transparent (Layer 2) firewall model within the Cisco ASA. It explains how users can configure the Cisco ASA in transparent single mode and multiple mode while accommodating their security needs.
 - Chapter 10, “Failover and Redundancy”—This chapter discusses the different redundancy and failover mechanisms that the Cisco ASA provides. It includes not only the overview and configuration, but also detailed troubleshooting procedures.
 - Chapter 11, “Quality of Service”—QoS is a network feature that lets you give priority to certain types of traffic. This chapter covers how to configure and troubleshoot QoS in the Cisco ASA.
- Part III, “Intrusion Prevention System (IPS) Solutions,” includes the following chapters:
 - Chapter 12, “Configuring and Troubleshooting Intrusion Prevention System (IPS)”—Intrusion detection and prevention systems provide a level of protection beyond the firewall by securing the network against internal and external

attacks and threats. This chapter describes the integration of Intrusion Prevention System (IPS) features within the Cisco ASA and expert guidance on how to configure the AIP-SSM IPS software. Troubleshooting scenarios are also included to enhance learning.

- Chapter 13, “Tuning and Monitoring IPS”—This chapter covers the IPS tuning process, as well as best practices on how to monitor IPS events.
- Part IV, “Content Security,” includes the following chapters:
 - Chapter 14, “Configuring Cisco Content Security and Control Security Services Module”—The Content Security and Control Security Services Module (CSC-SSM) is used to detect and take action on viruses, worms, Trojans, and other security threats. It supports the inspection of SMTP, POP3, HTTP, and FTP network traffic. This chapter provides configuration and troubleshooting guidelines to successfully deploy the CSC-SSM within your organization.
 - Chapter 15, “Monitoring and Troubleshooting the Cisco Content Security and Control Security Services Module”—This chapter provides best practices and methodologies used while monitoring the CSC-SSM and troubleshooting any problems you may encounter.
- Part V, “Virtual Private Network (VPN) Solutions,” includes the following chapters:
 - Chapter 16, “Site-to-Site IPsec VPNs”—The Cisco ASA supports IPsec VPN features that enable you to connect networks in different geographic locations. This chapter provides configuration and troubleshooting guidelines to successfully deploy site-to-site IPsec VPNs.
 - Chapter 17, “IPsec Remote-Access VPNs”—This chapter discusses two IPsec remote-access VPN solutions (Cisco IPsec and L2TP over IPsec) that are supported on the Cisco ASA. A large number of sample configurations and troubleshooting scenarios are provided.
 - Chapter 18, “Public Key Infrastructure (PKI)”—This chapter starts by introducing PKI concepts. It then covers the configuration and troubleshooting of PKI in the Cisco ASA.
 - Chapter 19, “Clientless Remote-Access SSL VPNs”—This chapter provides details about the Clientless SSL VPN functionality in Cisco ASA. This chapter covers the Cisco Secure Desktop (CSD) solution in detail and also discusses the Host Scan feature that is used to collect posture information about end-workstations. The dynamic access policy (DAP) feature, its usage, and detailed configuration examples are also provided. To reinforce learning, many different deployment scenarios are presented along with their configurations.
 - Chapter 20, “Client-Based Remote-Access SSL VPNs”— This chapter provides details about the AnyConnect SSL VPN functionality in Cisco ASA.

Initial Setup and System Maintenance

This chapter covers the following topics:

- Accessing the Cisco ASA appliances
- Managing licenses
- Initial setup
- IP version 6
- Setting up the system clock
- Configuration management
- Remote system management
- System maintenance
- System monitoring

Cisco Adaptive Security Appliance (ASA) can be set up in a number of ways to adapt to any network topology. However, proper planning is essential for successful implementations of the security features that Cisco ASA offers. This chapter guides you through the initial configuration of the security appliance and shows ways to monitor the system's health and status.

Accessing the Cisco ASA Appliances

Cisco ASA provides two types of user interfaces:

- **Command-line interface (CLI)**—The CLI provides non-graphical access to the Cisco ASA. The CLI can be accessed from a console, Telnet, or Secure Shell (SSH) session. Telnet and SSH are discussed later in the chapter, under “Remote System Management.”

- **Graphical user interface (GUI) via ASDM**—Cisco Adaptive Security Device Manager (ASDM) provides an easy-to-navigate and simple graphical interface to set up and manage the different features that Cisco Adaptive Security Appliance (ASA) provides. It is bundled with a variety of administration and monitoring tools to check the health of the appliance and the traffic traversing through it. ASDM access requires IP connectivity between the ASDM client and the security appliance. If you have a new security appliance, you can assign the initial IP address via the CLI and then establish a GUI ASDM connection.

Establishing a Console Connection

A new security appliance, by default, has no configuration and thus it does not have IP addresses assigned to any of its interfaces. To access the CLI, you need a successful connection to the console port of the security appliance. The console port is a serial asynchronous port with the settings listed in Table 3-1.

You can connect the console port on the security appliance to a serial port on a PC by using a flat rolled console cable, with a DB9 serial adapter on one end and a RJ-45 port on the other. The DB9 side of the cable goes to the serial port of a PC, and the RJ-45 end of the cable goes to the console port of the security appliance, as illustrated in Figure 3-1.

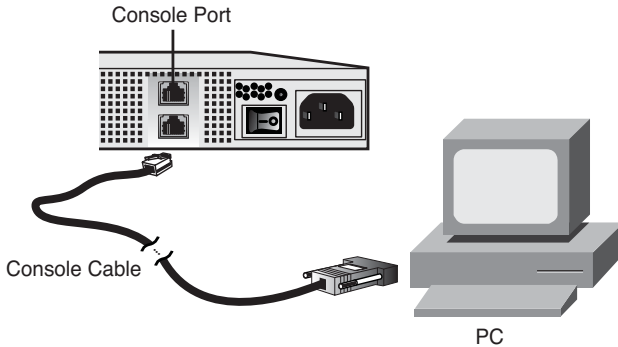


Figure 3-1 Console Port Connectivity from a Computer

After connecting the console cable to the security appliance and the computer, launch terminal-emulation software, such as HyperTerminal or TeraTerm, to send and receive output. You can launch HyperTerminal by navigating to **Start > Programs > Accessories > Communications > HyperTerminal** on a Windows-based PC. The initial configuration window of HyperTerminal is shown in Figure 3-2. In the Connection Description dialog box, enter a connection name to identify this session as a unique connection. A connection name of **Console Connection to the Cisco ASA** is specified in Figure 3-2. You can choose an icon to associate with the connection entry. After filling out the connection name and selecting an icon, click **OK** to proceed.



Figure 3-2 *Initial Configuration of HyperTerminal*

Specify the connection type in the Connect To window. Because the console port uses an asynchronous serial connection, the HyperTerminal setting must use a COM port. As illustrated in Figure 3-3, COM3 is being set up for the serial connection to the security appliance. After you are finished, click **OK** to proceed to the next configuration window.



Figure 3-3 *Setting HyperTerminal Connection Type*

Table 3-1 *Console Port Settings*

Parameters	Value
Baud rate	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	Hardware

The last window is used to configure port properties, such as the baud rate and flow control. Figure 3-4 shows HyperTerminal set up with the values listed in Table 3-1. After configuring the port settings, click **OK** to complete the configuration setup.

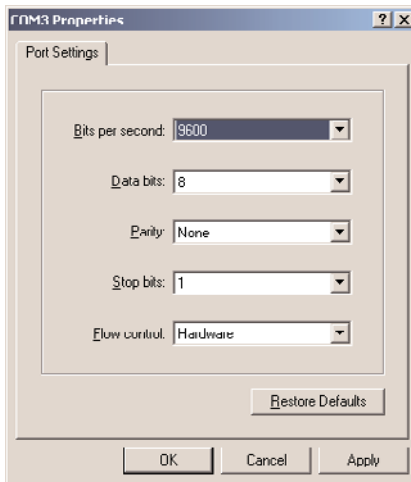


Figure 3-4 Setting HyperTerminal Port Specification

The HyperTerminal application is ready to transmit and receive data from the security appliance. If you press **Enter** a couple of times, you should see a `ciscoasa>` prompt in the HyperTerminal window.

The next section describes how to use the CLI after establishing a successful console connection.

Command-Line Interface

After a successful console connection, the security appliance is ready to accept your commands. The Cisco ASA contains a command set structure similar to that of a Cisco IOS router and offers the following access modes:

- User mode, also known as user access mode
- Privileged mode
- Configuration mode
- Sub-configuration mode
- ROMMON mode

User mode, shown as the hostname with a `>` sign, is the first mode of access available when you log in to the security appliance. This mode offers a limited set of commands that

are useful in obtaining basic information about the security appliance. One of the important commands in this mode is **enable**, which prompts a user to specify a password to log in to privileged mode.

Privileged mode, shown as the hostname with a # sign, gives full access to a user after a successful logon. This mode also allows execution of all the commands that are available in user mode. The security appliance offers a rich set of monitoring and troubleshooting commands to check the health of different processes and features in the security appliance. One of the important commands in this mode is **configure terminal**, which places a user in configuration mode.

Note The security appliance enables you to restrict the commands a user can run by implementing command authorization. This is covered in Chapter 6, “Authentication, Authorization, and Accounting (AAA) Services.”

Configuration mode, displayed as the host name with a (config)# prompt, allows a user to enable or disable a feature, set up security and networking components, and tweak the default parameters. This mode not only enables the user to configure the security appliance, but also allows the use of all the commands that are available in the user and privileged modes. A user may enter into the sub-configuration mode of different features from this mode.

Sub-configuration mode, displayed as the hostname with a (config-xx)# prompt, lets a user configure specific networking or security features on the security appliance. The xx is replaced by the process/feature keyword that is being configured on the security appliance. For example, if a user is setting up specific parameters on an interface, the prompt changes to (config-if)#. Sub-configuration mode enables the user to execute all the configuration mode commands as well as the user and privileged mode commands.

In Example 3-1, a user logs in to privileged mode from user access mode by typing the **enable** command. The security appliance prompts a user to specify a password to gain privileged mode access. If the security appliance has the default configuration, it uses a null (no) password to grant access. After logging in to privileged mode, the user types **configure terminal** to access configuration mode. The user enters into interface sub-configuration mode by typing the **interface GigabitEthernet0/0** command. To go back to the previous mode, the user can enter **exit** or **quit**, as shown in Example 3-1.

Example 3-1 Accessing the Privileged and Configuration Modes

```
ciscoasa> enable
Password: <cr>
ciscoasa# configure terminal
ciscoasa(config)# interface GigabitEthernet0/0
ciscoasa(config-if)# exit
ciscoasa(config)# exit
ciscoasa#
```

Tip In the preceding example, the administrator of the security appliance typed **exit** twice to return to the privileged mode prompt. Optionally, you can type **end** to return to privileged mode from any configuration mode.

Like a Cisco IOS router, the security appliance also allows you to press the Tab key to complete a partial command. For example, to enter a **show** command, type **sho** and press the Tab key. The security appliance displays the complete **show** command on the screen.

The security appliance allows you to abbreviate commands and keywords to the number of characters that identify a distinct abbreviation. For example, you can abbreviate the **enable** command as **en**.

All the supported options and arguments of a command are displayed when you type **?** after the command. For example, you can type **show ?** to see all the options that are supported under the **show** command.

The security appliance also provides a brief description and command syntax when you type **help** followed by the command. For example, when you type **help reload**, the security appliance shows the command syntax for **reload**, a description, and the supported arguments.

The security appliance uses *ROMMON mode (Read-Only-Memory Monitor mode)* when it does not find a bootable image or when an administrator forces it to enter into that mode. In ROMMON mode, you can use a TFTP server to load a system image into the security appliance. ROMMON mode is also used to recover the system password, discussed later in this chapter under “Image Recovery Using ROMMON.”

Managing Licenses

As mentioned in Chapter 2, “Cisco ASA Product and Solution Overview,” the security appliance controls the security and networking features through the use of a license key. You can obtain the information of the currently installed license key by issuing the **show version** command. This command also displays other system information, such as:

- The current version and the location of the system image
- The ASDM version, if installed
- The security appliance uptime
- The security appliance hardware model number, including the memory and flash information
- The physical interface and the associated IRQs (Interrupt Requests)
- The current features that are active on the security appliance
- The license information

- The security appliance's serial number
- Configuration register setting
- Information about last configuration modification

Example 3-2 shows the output of **show version**, which has a VPN Plus–based license key installed.

Example 3-2 *Output of show version*

```
Chicago> show version
Cisco Adaptive Security Appliance Software Version 8.2(1)
Device Manager Version 6.2(1)

Compiled on Tue 05-May-09 22:45 by builders
System image file is "disk0:/asa821-k8.bin"
Config file at boot was "startup-config"

Chicago up 31 days 4 hours

Hardware: ASA5520, 512 MB RAM, CPU Pentium 4 Celeron 2000 MHz
Internal ATA Compact Flash, 64MB
BIOS Flash M50FW016 @ 0xffe00000, 2048KB

Encryption hardware device : Cisco ASA-55x0 on-board accelerator (revision 0x0)
      Boot microcode      : &#x263B;CN1000-MC-BOOT-2.00
      SSL/IKE microcode: ♥CNLite-MC-SSLm-PLUS-2.03
      IPSec microcode   : &#x263A;CNlite-MC-IPSECm-MAIN-2.04

0: Ext: GigabitEthernet0/0 : address is 000f.f775.4b54, irq 9
1: Ext: GigabitEthernet0/1 : address is 000f.f775.4b55, irq 9
2: Ext: GigabitEthernet0/2 : address is 000f.f775.4b56, irq 9
3: Ext: GigabitEthernet0/3 : address is 000f.f775.4b57, irq 9
4: Ext: Management0/0      : address is 000f.f775.4b53, irq 11
5: Int: Internal-Data0/0   : address is 0000.0001.0002, irq 11
6: Int: Internal-Control0/0 : address is 0000.0001.0001, irq 5

Licensed features for this platform:
Maximum Physical Interfaces : Unlimited
Maximum VLANs              : 150
Inside Hosts                : Unlimited
Failover                    : Active/Active
VPN-DES                     : Enabled
VPN-3DES-AES                : Enabled
Security Contexts           : 10
GTP/GPRS                    : Enabled
```

```

SSL VPN Peers           : 2
Total VPN Peers        : 750
Shared License         : Disabled
AnyConnect for Mobile  : Disabled
AnyConnect for Linksys phone : Disabled
AnyConnect Essentials  : Disabled
Advanced Endpoint Assessment : Disabled
UC Phone Proxy Sessions : 2
Total UC Proxy Sessions : 2
Botnet Traffic Filter   : Disabled

```

```
This platform has an ASA 5520 VPN Plus license.
```

```
Serial Number: JAB00000001
```

```
Running Activation Key: 0x00000001 0x00000001 0x00000001 0x00000001 0x00000001
```

```
Configuration register is 0x1
```

```
Configuration last modified by cisco at 20:45:09.870 UTC Mon Jul 20 2009
```

In Example 3-2, the security appliance is running a system image of 8.2(1) with the ASDM image of 6.2(1). The hardware model is ASA5520, running the Plus license. The serial number and the license activation key are masked to protect this system's identity. The configuration register is set to 0x1, which instructs the security appliance to load the image from flash. The configuration register is discussed later in the "Password Recovery Process" section.

You can change the installed license key by using the **activation-key** command followed by the five-tuple key, as shown in Example 3-3. After the new activation key is entered, the security appliance shows the features set activated by the new license key. In this example, a VPN premium license key is installed.

Example 3-3 *Changing the Activation Key*

```
Chicago# activation-key 0x11223344 0x55667788 0x9900aabb 0xccddeeff 0x01234567
```

```
Licensed features for this platform:
```

```

Maximum Physical Interfaces : Unlimited
Maximum VLANs               : 100
Inside Hosts                 : Unlimited
Failover                     : Active/Active
VPN-DES                      : Enabled
VPN-3DES-AES                 : Enabled
Security Contexts           : 50
GTP/GPRS                     : Disabled
VPN Peers                    : 5000

```

```
This machine has a VPN Premium license.
```

Both running and flash activation keys were updated with the requested key.

Note Feature-specific activation keys are discussed in their respective chapters. For example, Chapter 19 discusses the license model for SSL VPN tunnels.

Initial Setup

If you are setting up a new security appliance, it must be configured from the CLI first. You cannot use ASDM until the security appliance is configured with the appropriate IP addresses and it has IP connectivity to ASDM client machine.

Initial Setup via CLI

When the security appliance is booted with no configuration, it offers a setup menu that enables you to configure the initial parameters such as the device name and the IP address. You can choose to go through the initial setup menu for quick configuration.

In Example 3-4, a security appliance prompts users to specify whether they wish to go through the interactive menu to preconfigure the device. If a user types **no**, the interactive menu is not shown and the security appliance shows the **ciscoasa>** prompt. If a user types **yes**, the default option, the security appliance walks the user through the configuration of ten parameters. The security appliance shows the default values in brackets ([]) before prompting the user to accept or change them. To accept the default input, press Enter. After going through the initial setup menu, the security appliance displays the summary of the new configuration before prompting the user to accept or reject it.

Example 3-4 Initial Setup Menu

```
Pre-configure Firewall now through interactive prompts [yes]? yes
Firewall Mode [Routed]:
Enable password [<use current password>]: C1$c0123
Allow password recovery [yes]?
Clock (UTC):
  Year [2009]:
  Month [Jul]: Nov
  Day [21]:
  Time [01:08:57]: 21:27:00
Inside IP address: 192.168.10.1
Inside network mask: 255.255.255.0
Host name: Chicago
Domain name: securemeinc.com
IP address of host running Device Manager: 192.168.10.77
```

```

The following configuration will be used:
Enable password: cisco123
Allow password recovery: yes
Clock (UTC): 21:27:00 Nov 21 2009
Firewall Mode: Routed
Inside IP address: 192.168.10.1
Inside network mask: 255.255.255.0
Host name: Chicago
Domain name: securemeinc.com
IP address of host running Device Manager: 192.168.10.77

Use this configuration and write to flash? yes
INFO: Security level for "inside" set to 100 by default.
WARNING: http server is not yet enabled to allow ASDM access.
Cryptochecksum: e15ea3e4 a499e6cf e84f5b82 1994bde0

1809 bytes copied in 3.490 secs (621 bytes/sec)
Type help or '?' for a list of available commands.
Chicago>

```

Table 3-2 lists all the parameters that can be configured in the initial setup menu. It also provides a brief description of each parameter, along with the default and configured values.

You can define the initial parameters and features by using either the CLI commands or the ASDM. They are discussed throughout this chapter. The next section discusses how to configure a device name from the ASDM.

Tip You can rerun the interactive setup process by using the **setup** command in configuration mode.

Initial Setup of ASDM

Before you can access the ASDM graphical console, you must install the ASDM software image on the local flash of the security appliance. The ASDM console can manage a local security appliance only. Therefore, if you need to manage multiple security appliances, the ASDM software must be installed on all the Cisco ASAs. However, a single workstation can launch multiple instances of ASDM clients to manage the different appliances. Optionally, you can leverage Cisco Security Manager (CSM) to configure multiple appliances simultaneously.

Table 3-2 *Initial Setup Parameters and Their Values*

Parameter	Description	Default Value	Configured Value
Enable password	Specifies the enable password	None	C1\$c0123
Firewall mode	Sets up the security appliance as a Layer 2 (Transparent) or Layer 3 (Routed) firewall	Routed	Routed
Inside IP address	Specifies the IP address on the inside interface	None	192.168.10.1
Inside subnet mask	Specifies the subnet mask on the inside interface	None	255.255.255.0
Host name	Sets the hostname on the device	ciscoasa	Chicago
Domain name	Sets the domain name on the device	None	securemeinc.com
IP address of host running Device Manager	Specifies the IP address of the host machine responsible for managing the Cisco ASA	None	192.168.10.77
Clock	Sets up the current time on the Cisco ASA	varies	9:27 PM November 21 st 2009
Save configuration	Prompts the user if configuration needs to be saved	Yes	Yes
Allow password recovery	Prompts the user if password recovery is allowed	Yes	Yes

Note This book focuses on setting up Cisco ASA through ASDM and the CLI. Configuring ASA through CSM is beyond the scope of this book.

Uploading ASDM

You can use the **dir** command to determine whether the ASDM software is installed. If the security appliance does not have the ASDM software, your first step is to upload the image from an external file server, using the one of the supported protocols. The appliance needs to be set up for basic configuration, such as the interface names, security levels, IP addresses, and proper routes, discussed later in this chapter. After setting up basic information, use the **copy** command to transfer the image file, as shown in Example 3-5, where an ASDM file, named **asdm-621.bin**, is being copied from a TFTP server located at

192.168.10.10. Verify the content of the local flash after the file is successfully uploaded. Copying images is discussed later in this chapter.

Example 3-5 *Uploading the ASDM Image to the Local Flash*

```
Chicago# copy tftp flash
Address or name of remote host []? 192.168.10.10
Source filename []? asdm-621.bin
Destination filename [asdm-621.bin]? asdm-621.bin

Accessing tftp://192.168.10.10/asdm-621.bin...!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
! Output omitted for brevity.
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Writing file disk0:/asdm-621.bin...
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
! Output omitted for brevity.
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
6889764 bytes copied in 161.420 secs (36500 bytes/sec)
Chicago# dir
Directory of disk0:/
1260  -rw-  14524416   16:47:34 May 13 2009  asa821-k8.bin
2511  -rw-  6889764    17:38:14 May 13 2009  asdm-621.bin

62881792 bytes total (46723072 bytes free)
```

Setting Up the Appliance

When the ASDM file is accessed, the Cisco ASA loads the first ASDM image that it finds from the local flash. If multiple ASDM images exist in the flash, use the **asdm image** command and specify the location of the ASDM image you want to load. This ensures that the appliance always loads the specified image when ASDM is launched. In Example 3-6, the appliance is set up to use **asdm-621.bin** as the ASDM image file.

Example 3-6 *Specifying the ASDM Location*

```
Chicago(config)# asdm image disk0:/asdm-621.bin
```

The security appliance uses the Secure Socket Layer (SSL) protocol to communicate with the client. Consequently, the security appliance acts as a web server to process the requests from the clients. You must enable the web server on the appliance by using the **http server enable** command.

The security appliance discards the incoming requests until the ASDM client’s IP address is in the trusted network to access the HTTP engine. In Example 3-7, the administrator enables the HTTP engine and sets up the appliance to trust the **192.168.10.0/24** network connected toward the **inside** interface.

Example 3-7 *Enabling the HTTP Server*

```
Chicago(config)# http server enable
Chicago(config)# http 192.168.10.0 255.255.255.0 inside
```

Note The SSL VPN implementation on the appliance also requires you to run the HTTP server on the appliance. Starting from version 8.0, you can set up the security appliance to terminate both the SSL VPN as well as the ASDM sessions on the same interface, using the default port of 443. Use `https://<ASAipaddress>/admin` to access the GUI for admin and management purposes. This is discussed in Chapter 19.

Accessing ASDM

ASDM's interface can be accessed from any workstation whose IP address is in the trusted network list. Before you establish the secure connection to the appliance, verify that IP connectivity exists between the workstation and the Cisco ASA.

To establish an SSL connection, launch a browser and point the URL to the appliance's IP address. In Figure 3-5, the administrator accesses ASDM by entering `https://192.168.10.1/admin` as the URL. The URL is redirected to `https://192.168.10.1/admin/public/index.html`.

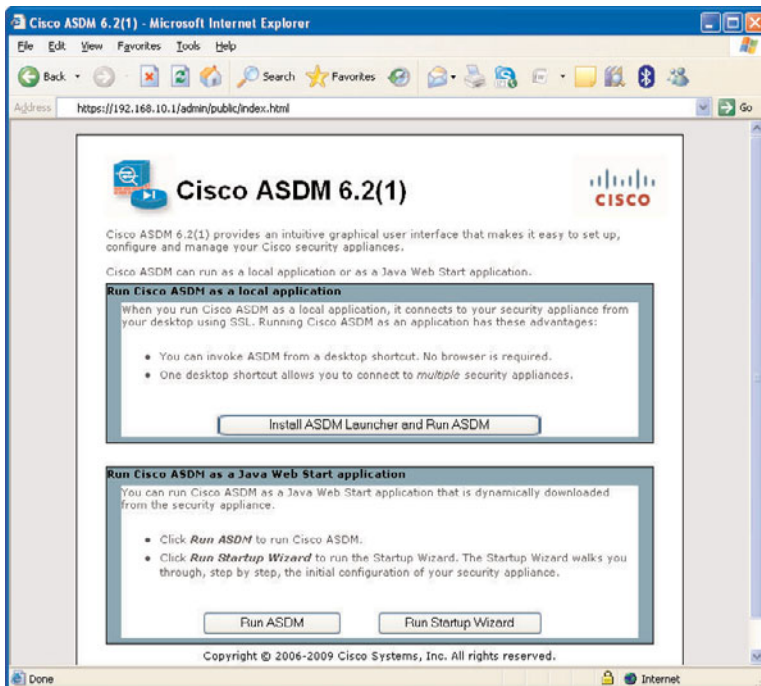


Figure 3-5 *Accessing the ASDM URL*

Note ASDM requires Sun Java plug-in 1.4(2), 1.5.0, or 6.0 installed on the web browser. The supported operating systems include Microsoft Windows Vista, 2003 Server, XP, 2000 Service Pack 4, Macintosh OS X, Red Hat Desktop, and Enterprise version 4.

The new security appliance presents its self-signed certificate to the workstation so that a secure connection can be established. If the certificate is accepted, the security appliance prompts the user to present authentication credentials. If the ASDM authentication or enable password is not set up, there is no default username or password. If enable password is defined, there is no default username and you must use enable password as the login password. If user authentication is enabled on the security appliance through use of the **aaa authentication http console** command, then those login credentials must be provided. After a successful user authentication, the appliance presents two ways to launch ASDM:

- **Run ASDM as Java web start application**—The security appliance launches ASDM in the client's browser as a Java applet. This option is not feasible if a firewall that filters out Java applets exists between the client and the security appliance.
- **Run ASDM as a local application**—The security appliance offers a setup utility called `asdm-launcher.msi`, which can be saved to the workstation's local hard drive.

Note ASDM as a local application feature is currently supported on Windows-based operating systems.

When the ASDM application is launched, it prompts for the IP address of the security appliance to which you are trying to connect, as well as the user authentication credentials. Figure 3-6 illustrates this, where an SSL connection is being made to an appliance located at 192.168.10.1. If you have an enable password configured, specify it under Password and leave the Username blank to log in to ASDM.

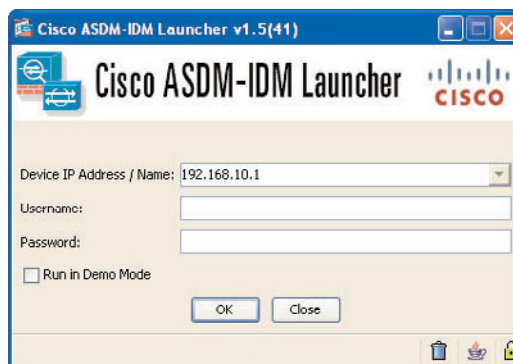


Figure 3-6 *Launching ASDM*

Note If you are running version 8.2(1) on the security appliance, make sure that you use version 6.2(1) of ASDM. For more information about ASDM, consult <http://www.cisco.com/go/asdm>.

If the user authentication is successful, ASDM checks the current version of the installer application and downloads a new copy if necessary. It loads the current configuration from the security appliance and displays it in the GUI, as shown in Figure 3-7.

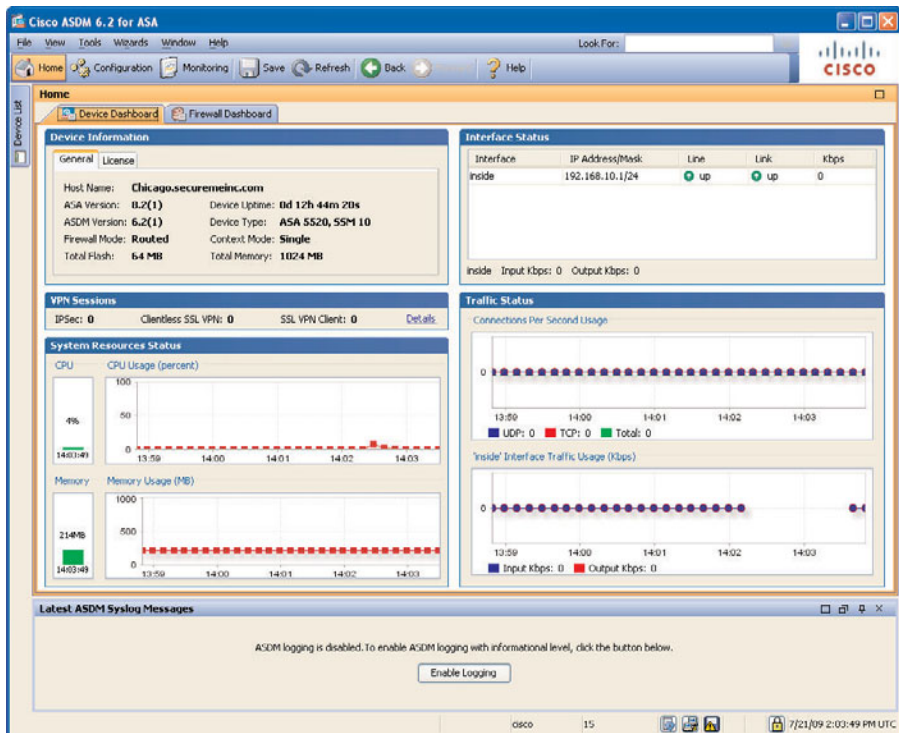


Figure 3-7 Initial ASDM Screen

Tip ASDM logs debug and error messages into a file to troubleshoot any application-related issues. The name of the file is `asdm-log-[timestamp].txt`, and it is located at `user_home_directory\asdm\log`. For example, `C:\Documents and Settings\user\asdm\log`.

ASDM divides the initial screen, also known as the Home screen, into the following six sections:

- **Device Information**—Displays the hardware and software information of the security appliance, such as the current version of operating system and the device type. If

the License tab is selected, ASDM shows the features that are enabled on the security appliance.

- **VPN Sessions**—Displays the number of active IPsec, clientless, and AnyConnect SSL VPN tunnels
- **System Resources Status**— Provides the current status of CPU and memory usage on the appliance.
- **Interface Status**—Displays the interface name and the assigned IP address. It also shows the link information of the currently configured interfaces and the rate of traffic passing through them.
- **Traffic Status**—Provides information about the number of active TCP and UDP connections and the traffic rate passing through the outside interface.
- **Latest ASDM Syslog Messages**—Shows the latest ASDM syslog messages that are generated by the security appliance. Syslogging is disabled by default and needs to be enabled for log monitoring. When enabled, the security appliance sends the messages to the ASDM client. This is discussed later in the chapter, in the “System Logging” section.

The statistics on the Home screen are refreshed every 10 seconds and show the information for the last 5 minutes.

ASDM shows three additional tabs on the home screen. They include

- **Firewall Dashboard Tab**—The Firewall Dashboard tab presents statistical information about the traffic passing through your security appliance. This includes the number of connections, NAT translations, dropped packets, attacks, and top usage statistics.
- **Content Security Tab**—The Content Security tab displays information about the Content Security and Control (CSC) SSM. This pane appears only if a CSC SSM is installed in the adaptive security appliance.
- **IPS Tab**—The Intrusion Prevention System tab displays information about the IPS module, if present.

Functional Screens of ASDM

In addition to the Home screen, the ASDM interface comes with the following two functional screens:

- Configuration screen
- Monitoring screen

Configuration Screen

The Configuration screen is useful when the new or existing configuration needs to be modified. On the left side, it contains five to six features icons, depending on the hardware setup of the appliance, as shown in Figure 3-8.

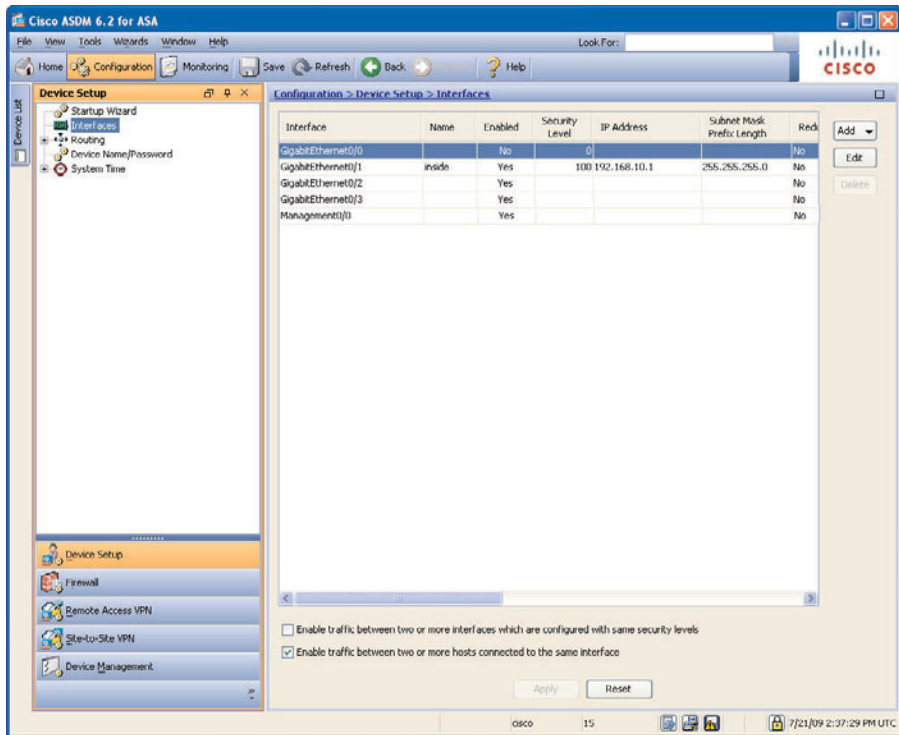


Figure 3-8 Configuration Screen

The Feature icons of the Configuration screen are as follows:

- **Device Setup**—Configures interfaces and sub-interfaces on the security appliance. This panel is discussed in the section “Configuring an Interface,” later in the chapter.
- **Firewall**—Helpful in creating security policies to filter and to translate packets traversing through the appliance. Also enables you to define Failover, QoS, AAA, certificates, and many other firewall-related features.
- **Remote Access VPN**—Sets up the remote access VPN connections such as IPsec, L2TP over IPsec, Clientless SSL VPN, and AnyConnect tunnels.
- **Site-to-site VPN**—Sets up the site-to-site VPN tunnels.
- **IPS**—Sets up policies for the SSM card to monitor and drop unauthorized packets. This icon is not visible if an SSM card is not present.
- **Device Management**—Here, the basic device features can be set up. Most of these features are discussed later in this chapter. Helpful in setting up the basic software features, such as system logging and failover.

Monitoring Screen

The Monitoring screen displays statistics about the hardware and software features of the security appliance. ASDM provides real-time graphs to monitor the appliance's health and status. Figure 3-9 shows the initial Monitoring screen.

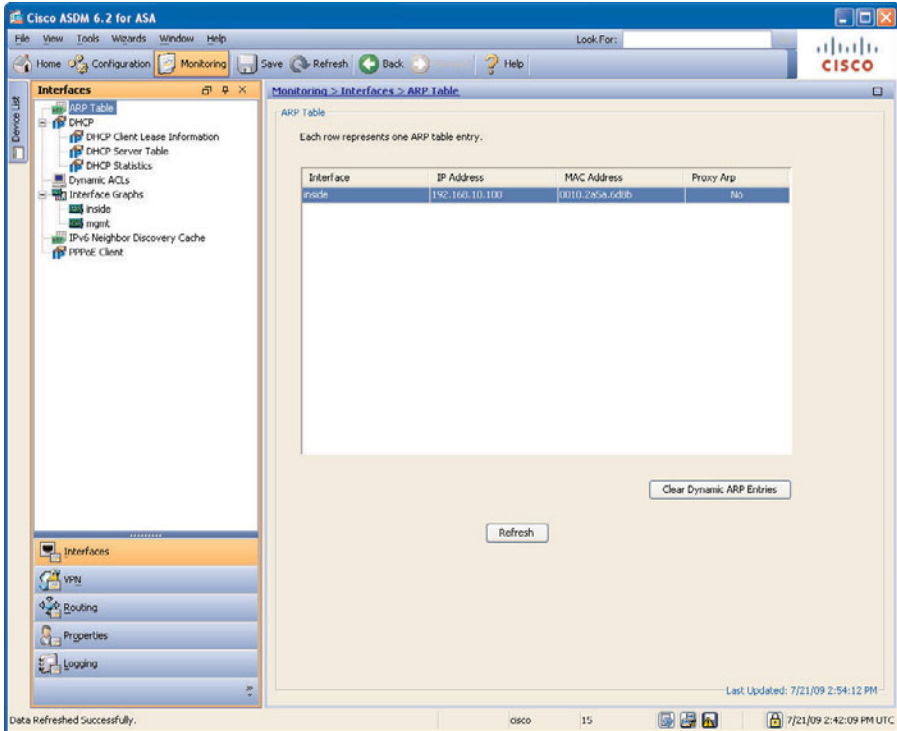


Figure 3-9 *Monitoring Screen*

Similar to the Configuration screen, the Monitoring screen also displays five or six icons, depending on whether or not you have the SSM module installed.

The Features icons of the Monitoring screen are described below:

- **Interfaces**—Monitors interfaces and sub-interfaces by maintaining ARP, DHCP, and dynamic ACLs tables. It also provides a graphical representation of interface utilization and packet throughput.
- **VPN**—Monitors the active VPN connections on the security appliance. It provides graphs and statistical analysis of the site-to-site, IPSec, and SSL VPN-based remote-access tunnels.
- **IPS**—Provides statistical information for the packets going through the IPS engine. This icon is not present if the IPS module is not installed.

- **Routing**—Displays the current routing table and provides information on EIGRP and OSPF neighbors.
- **Properties**—Monitors active administrative sessions such as Telnet, SSH, and ASDM. It also provides graphical information about CPU, memory, and blocks utilization. Provides graphical information about the active translations and UDP/TCP connections. It provides graphical information of the IP audit, WCCP, CRL, and DNS Cache features
- **Logging**—Displays log messages as live events. It also shows log messages from the buffer space.
- **Trend Micro Content Security**—ASDM enables you to monitor the CSC SSM statistics, as well as CSC SSM-related features such as types of threats detected by the module, live event logs for real-time monitoring, and resource utilization graphs.

Note If you use ASDM as the primary mode of configuring a security appliance, it is highly recommended that you enable the Preview Command Before Sending Them to the Device option in ASDM. This way, before the commands are pushed to the ASA, ASDM shows them to you for verification. You can enable this feature on ASDM under **Tools > Preferences** and selecting **Preview commands before sending them to the device**.

Device Setup

After you have connectivity to the security appliance, either via CLI or ASDM, you are ready to start configuring the device. This section guides you to configure the security appliance for basic setup.

Setting Up Device Name and Passwords

The default device name—also known as the hostname—of a security appliance is `ciscoasa`. It is highly recommended that you set a unique device name to identify the security appliance on the network. Additionally, networking devices usually belong to a network domain. A domain name appends the unqualified hostnames with the configured domain name. For example, if the security appliance tries to reach a host, `secweb`, by its hostname and the configured domain name on the security appliance is `securemeinc.com`, then the fully qualified domain name (FQDN) will be `secweb.securemeinc.com`.

In a new security appliance, you can configure the Telnet and enable password. The Telnet password is used to authenticate remote sessions either via the Telnet or SSH protocol, discussed later in this chapter. By default, the Telnet password is `cisco`. For the SSH sessions, the default username is `pix`. The enable password, on the other hand, gives you access to the privileged exec mode if you are on the user mode. The enable password is also used for ASDM user authentication. There is no enable password by default.

Note If you have user authentication configured for Telnet and/or SSH access, the security appliance does not use the Telnet/enable passwords for those sessions.

To configure the hostname, domain name, and the Telnet/enable passwords via ASDM, navigate to **Configuration > Device Setup > Device Name/Password** and specify the new settings. As shown in Figure 3-10, the hostname is **Chicago** and the domain name is **securemeinc.com**. If you want to configure a new Telnet and/or enable password, select the appropriate change the Telnet and/or enable password option and specify the current and the new passwords. In Figure 3-10, both passwords are set to **C1\$c0123** (masked).

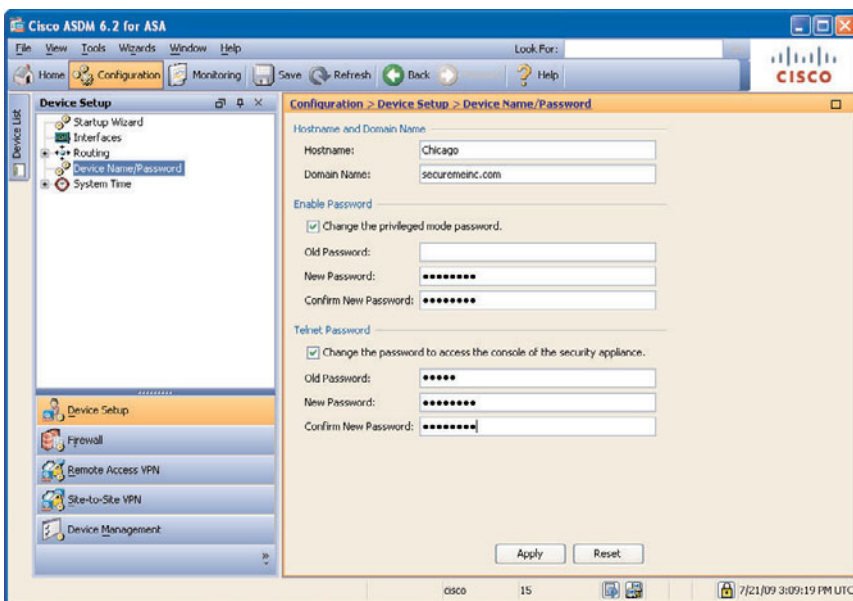


Figure 3-10 Configuring Hostname, Domain Name, and Local Passwords

If you prefer to use the CLI, Example 3-8 shows the identical configuration of Figure 3-10. The hostname is changed using the **hostname** command, the domain name is changed using the **domain-name** command, and the Telnet and enable passwords are changed using the **passwd** and **enable password** commands, respectively.

Example 3-8 Setting Up the Hostname, Domain Name, and Passwords

```
ciscoasa# configure terminal
ciscoasa(config)# hostname Chicago
Chicago(config)# domain-name securemeinc.com
Chicago(config)# passwd C1$c0123
Chicago(config)# enable password C1$c0123
```

Index

SYMBOLS

? (question mark), displaying command help in CIPS CLI, 626

A

AAA (authentication, authorization, accounting)

accounting, 311-313, 340

RADIUS, 341

TACACS+, 343

authentication, 311-312

administrative sessions, 325-336

ASDM connections, 329

AuthenticationApp (CIPS), 623

authentication servers, 318-325

client authentication, 822, 846

EIGRP, 285, 300

firewall sessions, 330-336

HTTP Form protocol, 318

Individual User

Authentication, IPsec

remote-access VPN, 841

interactive client authentication, IPsec remote-access VPN, 840

Kerberos and Active Directory, 318

LDAP, 318

OSPF, 262-267, 279

RADIUS, 314

RIP, 244, 251

SDI, 316-317

serial console connections, 329

SSH connections, 327-328

SSO authentication, 318

TACACS+, 316

Telnet connections, 325, 327

troubleshooting administrative connections, 344-347

user authentication, 810-812, 822, 847, 943-946, 1038-1040, 1061

Windows NT, 317

authorization, 311-313, 336-337

command authorization, 338-339

- downloadable ACL*, 339
 - TACACS+, 338
- DAP configurations, 1007-1009
- abbreviating commands**, 54
- ABR (Area Border Routers)**, 252
- absolute function (time-based ACL)**, 168
- access policies (ASDM), DAP configurations**, 1011
 - Access Method tab, 1016-1017
 - Action tab, 1012
 - Bookmarks tab, 1016
 - Functions tab, 1014
 - Network ACL tab, 1012
 - Port Forwarding Lists tab, 1015
 - Web-Type ACL tab, 1013
- accounting**, 311-313, 340
 - RADIUS, 341
 - TACACS+, 343
- ACE (access control entries)**, 142-143
 - IPv6 ACL, 158
 - object grouping, 159
 - ACL*, 164-166
 - ICMP-type groups*, 160
 - network-based groups*, 160
 - protocol-based groups*, 160
 - service-based groups*, 160
 - syntax/description of, 148-149
 - thru-traffic filtering via
 - ASDM*, 152-154
 - CLI*, 147, 150
- ACL (access control lists)**
 - downloadable ACL, 170-172, 339
 - encryption ACL, 747
 - EtherType ACL, 145, 497
 - extended ACL, 145, 151
 - configuring for transparent firewalls*, 488
 - SMTF deployment*, 497
 - feature comparison table, 146
 - ICMP filtering, 172
 - interface ACL, configuring for transparent firewalls, 487-489
 - IPv6 ACL, 145, 157-158
 - monitoring, 193-197
 - NAT integration, 223-224
 - object grouping, 159, 164-166
 - configuring object types*, 160-162
 - ICMP-type groups*, 160
 - network-based groups*, 160
 - protocol-based groups*, 160
 - service-based groups*, 160
 - packet filtering, 2-3, 142-152
 - QoS packet classification, 586
 - standard ACL, 144, 166
 - time-based ACL, 167-170
 - traffic filtering, inbound traffic, 185-189
 - web-type ACL, 146, 970-973
- Action attribute (ASDM)**, 153, 156, 220
- action rules**, QoS configuration via ASDM
 - traffic policing, 594
 - traffic prioritization, 593
 - traffic shaping, 595
- Action tab (ASDM), DAP configurations**, 1012
- active appliances (failover)**, 521
- Active Directory, Kerberos authentication**, 318
- Active/Active failovers**, 528
 - asymmetric routing, 529-531, 547

- configuring, 540
 - assigning failover group memberships, 545-546*
 - assigning failover interface IP addresses, 542*
 - assigning interface IP addresses, 546*
 - designating primary appliances, 542*
 - enabling failover globally, 548*
 - enabling stateful failover, 542-543*
 - secondary appliance failovers, 548*
 - selecting failover links, 541*
 - setting failover keys, 542*
 - setting up asymmetric routing, 547*
 - setting up failover groups, 543-544*
- failover MAC addresses, specifying, 553-554
- multiple security context deployments
 - ASDM configurations, 564-566*
 - CLI configurations, 566-568*
- Active/Standby failovers, 527-528**
 - configuring
 - assigning failover IP addresses, 535-537*
 - designating primary appliances, 538*
 - enabling failover globally, 539*
 - enabling stateful failover (optional), 538-539*
 - secondary appliance failovers, 540*
 - selecting failover links, 534-535*
 - setting failover keys (optional), 537*
 - failover MAC addresses, specifying, 552-553
 - single mode deployments
 - ASDM configurations, 561-562*
 - CLI configurations, 562-564*
- ActiveX**
 - filtering, 173-175
 - SSL VPN support, 930
- AD (anomaly detection), configuring for AIP-SSM, 666-669**
- address pools, ASDM configurations**
 - IPSec remote-access VPN, 823
 - L2TP over IPSec remote-access VPN, 847
- address translation, 199**
 - bypassing
 - identity NAT, 218*
 - NAT exemption, 219-221*
 - configuring, 206-216
 - interface security levels, 203
 - ISN randomization, 204
 - monitoring, 229-230
 - NAT
 - ACL integration, 223-224*
 - bidirectional NAT, 201*
 - DNS doctoring, 225-228*
 - dynamic NAT, 209-211*
 - exemptions, 219-221*
 - identity NAT, 218*
 - inside NAT, 200, 207-208*
 - order of operation, 222*
 - policy NAT, 216*
 - static NAT, 207*
 - packet flow sequences, 204
 - PAT, 202
 - dynamic PAT, 214-215*
 - policy PAT, 216*
 - static PAT, 212-214*
 - TCP interception, 205-206

admin context (security contexts), 418-419

configuring, 435-436

*ASDM configuration using non-shared interfaces, 446-447**ASDM configuration using shared interfaces, 458*

MMTF deployments, 505-506

administrative connections, troubleshooting, 344-347**administrative privileges, SSL VPN, 931, 1034****administrative sessions**

ASDM connections, 330

authentication

*ASDM connections, 329**serial console connections, 329**SSH connections, 327-328**Telnet connections, 325-327*

SSH, 328

administrator accounts (AIP-SSM), 632**administrator black list data, configuring for Cisco ASA Botnet Traffic Filter feature, 670-672****Advanced Endpoint Assessment (Host Scan), 1000**

AntiSpyware Host Scan, 1003

Antivirus Host Scan, 1002

Firewall Host Scan, 1003

AES (Advanced Encryption Standard), 737**AIP-SSM (Advanced Inspection and Prevention Security Services Module), 615**

AD, configuring, 666-669

AIP-SSM-10, 41-43

AIP-SSM-20, 41-43

AIP-SSM-40, 41-43

backup configuration files, creating, 647-648

blocking, configuring, 659-662

CIPS CLI*initializing from, 626, 629-631**logging into AIP-SSM from, 625-626*

CLI statistics, displaying, 684-687

configuration information, displaying, 645-646

CS-MARS*adding in, 682**tuning with, 683*

CSA integration, 662-666

events

*clearing, 650**displaying, 648-649***IP Logging feature***automatic logging, 657-658**configuring, 656**manual logging, 658-659*

IPS tuning, 677-681

management interface port, 616-617

trusted hosts, adding, 636-637

upgrading

*one-time upgrades, 638-639**scheduled upgrades, 639, 642-643*

user accounts

*adding/deleting, 633-635**administrator account, 632**operator account, 632**passwords, changing, 635-636**service account, 633**viewer account, 633***Alarm Channel Module, 622**

- allocate interfaces (security contexts),
user context, 433
- Analysis Engine Configuration
Module, 622
- anomaly-based analysis
 - IDS, 11-12
 - NetFlow, 12
 - profile-based detection, 11
 - protocol-based detection, 11
- Anti-spam Content Scanning (CSC
SSM), 704-706
- Anti-spam Email Reputation (CSC
SSM), 706-708
- AntiSpyware Host Scan, 1003
- Antivirus Host Scan, 1002
- AnyConnect Essentials licenses, 928,
1028-1030
- AnyConnect Mobile licenses, 928,
1029-1030
- AnyConnect Premium licenses, 928,
1028-1030
- AnyConnect SSL VPN (Secure Socket
Layer Virtual Private Network),
1027
 - configuring, 1041, 1061
 - client configurations, 1055-1059*
 - CSA, 1042
 - defining client attributes,*
1044-1048
 - DNS assignments, 1052*
 - DTLS configurations, 1053-1054*
 - keeping SSL VPN client instal-*
lations, 1053
 - loading AnyConnect packages,*
1042-1043
 - split tunneling, 1049-1051*
 - SVC versus AnyConnect SSL*
VPN, 1040
 - traffic filter configurations,*
1054
 - WINS assignments, 1052*
- deploying, 1059
 - enabling address translation*
for Internet access, 1062
 - registry checks, 1061*
 - user authentication, 1061*
- monitoring, 1063
- Standalone mode, 1042
- troubleshooting
 - connectivity issues, 1064-1065*
 - SSL negotiations, 1063*
- VPN client versus, 1028
- Web-enabled mode, 1041
- application inspection, 350
 - class-maps, 352
 - CTIQBE, 356-358
 - DCERPC, 358
 - DNS, 359-363
 - enabling, 351-353
 - ESMTP, 363-366
 - FTP, 367-369
 - GTP, 369, 373-375
 - H.323, 380-382
 - HTTP, 390-392
 - content-length command, 394*
 - content-type-verification*
command, 394
 - max-header-length command,*
395
 - max-uri-length command, 395*
 - port-misuse command, 396*
 - request-method command,*
396-397
 - strict-http command, 393*
 - transfer-encoding type*
command, 398

- ICMP, 399
- ILS protocol, 399-400
- IM, 400-402
- IPSec pass-through, 403
- MGCP, 404-405
- NetBIOS, 406
- policy-maps, 352
- PPTP, 406
- RSH, 407
- RTSP, 408
- selecting inspection, 353-356
- service-policies, 352-356
- SIP, 408-410
- Skinny (SCCP), 410-411
- SNMP, 411-412
- SQL*Net, 412
- Sun RPC protocol, 407
- TFTP, 412
- UC advanced support
 - Mobility Proxy*, 389
 - phone proxy*, 383-388
 - Presence Federation Proxy*, 390
 - TLS proxy*, 388-389
- WAAS, 413
- XDMCP, 413
- application proxies (proxy servers),
network firewalls, 3**
- arguments, displaying in commands, 54**
- ARP (address resolution protocol)**
 - gratuitous ARP, 552
 - inspection, enabling in transparent firewalls, 492-494
 - packets, transparent firewalls, 488
 - tests (failover interface tests), 524
- ASA (Adaptive Security Appliance)**
 - administrative connections, troubleshooting, 344-347
 - AIP-SSM module, 41-43
 - appliance access
 - CLI*, 49, 52-54
 - establishing console connections*, 50-52
 - GUI via ASDM*, 50
 - Cisco AIP-SSM module, 41-43
 - Cisco ASA 5500 Series IPS Solution, 8
 - Cisco ASA 5505 model, 26-29
 - Cisco ASA 5510 model, 29-33
 - Cisco ASA 5520 model, 34-35
 - Cisco ASA 5540 model, 36
 - Cisco ASA 5550 model, 36-37
 - Cisco ASA 5580-20 model, 38-40
 - Cisco ASA 5580-40 model, 38-42
 - Cisco ASA Botnet Traffic Filter feature
 - configuring*, 670
 - DNS snooping*, 672
 - dynamic database*, 670-672
 - traffic classification*, 672-673
 - commands
 - abbreviating*, 54
 - completing partial command*, 54
 - displaying description of*, 54
 - displaying supported arguments/options*, 54
 - displaying syntax of*, 54
 - configuring, remote-access IPSec VPN clients, 914-916
 - CSC SSM module, 46-47
 - device setup
 - device names/passwords*, 67-68
 - DHCP services*, 76-77
 - interface configuration*, 69-76
 - Gigabit Ethernet modules
 - Cisco ASA 4GE-SSM*, 44

- Cisco ASA 5580 expansion cards, 45*
- initial setup
 - ASDM setups, 58-64*
 - CLI setups, 57-58*
- license keys, 54-56
- ROMMON mode, 54
 - image recovery, 105*
 - password recovery process, 106, 109-111*
- software installation, image upgrades via ASA CLI, 102-104
- ASDM (Active Security Device Manager)**
 - Action attribute, 153, 156, 220
 - AIP-SSM, modifying, 631
 - ASA, 58
 - accessing ASDM, 61-64*
 - appliance access, 50*
 - appliance setup, 60*
 - uploading ASDM, 59*
 - authentication, 329, 335-336
 - certificates, installing, 874-883
 - Configuration screen, 64-65
 - connections, authenticating, 330
 - CSC SSM monitoring, 715-717
 - DAP configurations, 1011
 - Access Method tab, 1016-1017*
 - Action tab, 1012*
 - Bookmarks tab, 1016*
 - Functions tab, 1014*
 - Network ACL tab, 1012*
 - Port Forwarding Lists tab, 1015*
 - Web-Type ACL tab, 1013*
 - Description attribute, 153, 156
 - Destination attribute, 153, 220
 - Enable Logging attribute, 153, 156
 - Enable Rule attribute, 153, 156
 - Ending IP Address attribute, 209
 - failovers
 - Active/Active failover deployments in multiple security contexts, 564-566*
 - configuring Failover Wizard, 548-549*
 - single mode Active/Standby failover deployments, 560-562*
 - Home screen
 - Content Security tab, 64*
 - Device Information section, 63*
 - Firewall Dashboard tab, 64*
 - Interface Status section, 64*
 - IPS tab, 64*
 - Latest ASDM Syslog Messages section, 64*
 - System Resources Status section, 64*
 - Traffic Status section, 64*
 - VPN Sessions section, 64*
 - image upgrades, 101
 - Interface attribute, 152, 156, 209, 220
 - IPSec remote-access VPN configuration, 822-823
 - L2TP over IPSec remote-access VPN configuration, 848
 - address pools, 847*
 - client authentication, 846*
 - client-pushed attributes, 847*
 - IKE policies, 847*
 - remote access clients, 846*
 - selecting tunnel type, 846*
 - user authentication, 847*

Local CA

- configuring, 896-898*

- enrolling users, 901-904*

- logging, 119

- Logging Interval attribute, 154-156

- MMTF deployments (security contexts)

- admin context, 505-506*

- system execution space, 504-505*

- user context, 507-510*

- Monitoring screen, 66

- NAT Exempt Direction attribute, 220

- Netmask attribute, 209

- Original Interface attribute, 207

- Original Port attribute, 213

- Original Source attribute, 207

- packet filtering, 152-154

- Pool ID attribute, 209

- Preview Commands Before Sending Them to the Device option, 67

- Protocol attribute, 213

QoS

- configuring, 589-595*

- deployments, 602-604, 607-608*

- remote-access VPN

- IPSec hairpinning, 856-858*

- load balancing, 851-852*

- Service attribute, 153, 156

- site-to-site IPSec VPN deployments, fully meshed topologies with RRI, 775-783

- SMTF deployments, 498-500

- Source attribute, 153, 156, 220

- Source Service attribute, 153, 156

- Starting IP Address attribute, 209

- Syslog, enabling, 115

- Time Range attribute, 154-156

- Traffic Direction attribute, 153

- traffic filtering

- enabling content filtering via Websense, 190-192*

- filtering inbound traffic via ACL, 186-188*

- Translated Interface attribute, 207

- Translated Port attribute, 213

- Translated Use IP Address attribute, 207

- trusted hosts, adding to AIP-SSM, 636-637

- virtual firewall deployments

- non-shared interfaces, 445-450*

- shared interfaces, 456-462*

- asymmetric routing, Active/Active failovers, 529-531, 547

- Attack Response Controller (CIPS), 622

- authentication, 311-312

- administrative connections, troubleshooting, 344-347

- administrative sessions

- ASDM connections, 329*

- firewall sessions, 330-336*

- serial console connections, 329*

- SSH connections, 327-328*

- Telnet connections, 325-327*

- authentication servers, defining, 318-325

- AuthenticationApp (CIPS), 623

- client authentication

- ASDM configurations, 822, 846*

- IPSec remote-access VPN, 822*

- L2TP over IPSec remote-access VPN, 846*

- EIGRP, 285, 300

- HTTP Form protocol, 318

- Individual User Authentication,
 - IPSec remote-access VPN, 841
- interactive client authentication,
 - IPSec remote-access VPN, 840
- Kerberos, Active Directory, 318
- LDAP, 318
- OSPF, 262-267, 279
- RADIUS, 314
- RIP, 244, 251
- SDI, 316-317
- SSO authentication, 318
- TACACS+, 316
- user authentication
 - AnyConnect SSL VPN*, 1061
 - ASDM configurations*, 822
 - IPSec remote-access VPN*, 810-812, 822
 - L2TP over IPSec remote-access VPN*, 847
 - SSL VPN configurations*, 943-946, 1038-1040
- Windows NT, 317
- authorization, 311-313, 336-337
 - command authorization, 338-339
 - downloadable ACL, 339
 - TACACS+, 338
- automatic logging, configuring on
 - AIP-SSM, 657-658
- AYT (Are you there) messages, 837

B

- backup configuration files, creating
 - for
 - AIP-SSM, 647-648
 - CSC SSM, 724-725
- banner area (SSL VPN logon page),
 - customizing, 951

- base license for CSC SSM, installing, 690
- Basic Host Scan, 999-1000
- bidirectional NAT (Network Address Translation), 201
- blocking configuring on AIP-SSM, 659-662
- bookmarks, SSL VPN configuration, 965
 - bookmark lists, applying to group policies, 969
 - file servers, 967-968
 - SSO servers, 969
 - websites, 966-967
- Bookmarks tab (ASDM), DAP configurations, 1016
- Botnet Traffic Filter feature
 - configuring, 670
 - DNS snooping, 672
 - dynamic databases, 670-672
 - traffic classification, 672-673
- BPDU (bridge protocol data units),
 - transparent firewalls, 488
- broadcast ping tests (failover interface tests), 524
- browsers
 - CSD supported browsers, 983-984
 - SSL VPN support, 930, 1032-1034
- buffer overflows, memory, 11
- buffered logging, 119-121

C

- CA (certificate authority), 871-872.
 - See also* certificates
 - certificates
 - manually importing*, 932-933
 - SSL VPN configurations*, 931-936, 1035

- explained, 871-872
 - Local CA
 - configuring*, 896-901
 - enrolling users*, 901-905
 - caching
 - Cache Cleaner, 982, 996-997
 - URL server responses, 184
 - CDP (Cisco Discovery Protocol)
 - packets, transparent firewalls, 487
 - certificates (digital), 870-871. *See also* CA (certificate authority)
 - chain of trust, 871
 - CRL, 873
 - installing, 883
 - ASDM, 874-882
 - CLI, 884-896
 - IPSec site-to-site tunnels,
 - configuring, 906-910
 - manually importing, 932-933
 - remote-access IPSec VPN clients,
 - accessing, 910-916
 - revoking, 873
 - SSL VPN configurations, 931, 1035
 - applying ID certificates to SSL VPN connections*, 936
 - manually importing CA certificates*, 932-933
 - manually importing ID certificates*, 935-936
 - requesting certificates*, 933-934
 - chain command, 908
 - CIFS (Common Internet File System),
 - troubleshooting clientless SSL VPN, 1024-1025
 - CIPS
 - AD, configuring for AIP-SSM, 666-669
 - Attack Response Controller, 622
 - Authentication App, 623
 - cipsWebserver, 623
 - CLI
 - AIP-SSM, initializing*, 626-631
 - AIP-SSM, logging into*, 625-626
 - command help, displaying*, 626
 - configuration command mode*, 626
 - CtlTransSource, 625
 - EventStore, 624
 - Logger, 624
 - MainApp, 620-621
 - SDEE, 619
 - SensorApp, 621-622
 - service packs, applying, 637-638
 - signatures, customizing, 653-656
 - software version, displaying, 643-644
- Cisco ASA (Adaptive Security Appliance)**
- administrative connections, troubleshooting, 344-347
 - AIP-SSM module, 41-43
 - appliance access
 - CLI, 49, 52-54
 - establishing console connections*, 50-52
 - GUI via ASDM*, 50
 - Cisco AIP-SSM module, 41-43
 - Cisco ASA 5500 Series IPS Solution, 8
 - Cisco ASA 5505 model, 26-29
 - Cisco ASA 5510 model, 29-33
 - Cisco ASA 5520 model, 34-35
 - Cisco ASA 5540 model, 36
 - Cisco ASA 5550 model, 36-37
 - Cisco ASA 5580-20 model, 38-40
 - Cisco ASA 5580-40 model, 38-42

- Cisco ASA Botnet Traffic Filter feature
 - configuring*, 670
 - DNS snooping*, 672
 - dynamic database*, 670-672
 - traffic classification*, 672-673
- commands
 - abbreviating*, 54
 - completing partial command*, 54
 - displaying description of*, 54
 - displaying supported arguments/options*, 54
 - displaying syntax of*, 54
- configuring, remote-access IPsec VPN clients, 914-916
- CSC SSM module, 46-47
- device setup
 - device names/passwords*, 67-68
 - DHCP services*, 76-77
 - interface configuration*, 69-76
- Gigabit Ethernet modules
 - Cisco ASA 4GE-SSM*, 44
 - Cisco ASA 5580 expansion cards*, 45
- initial setup
 - ASDM setups*, 58-64
 - CLI setups*, 57-58
- license keys, 54-56
- ROMMON mode, 54
 - image recovery*, 105
 - password recovery process*, 106, 109-111
- software installation, image upgrades via ASA CLI, 102-104
- Cisco IP Phone Bypass, IPsec remote-access VPN, 842
- Cisco remote-access VPN solution, user authentication, 949, 969, 973
- Cisco SAFE architecture, 678
- Cisco Secure PIX Firewall, cut-through proxy feature, 330-333
 - authentication
 - timeouts*, 335
 - customizing prompts*, 335-336
 - troubleshooting firewall sessions, 347
- class maps
 - application inspection*, 352
 - QoS configurations*, 597-598
- clear configure context command, 439
- clearing AIP-SSM events, 650
- CLI (command-line interface)
 - AIP-SSM, initializing, 626, 629-631
 - ASA
 - appliance access*, 49, 52-54
 - image upgrades*, 102-104
 - parameters table*, 58
 - setup*, 57-58
 - certificates, installing, 883-896
 - command help, displaying, 626
 - configuration command mode, 626
 - Configuration mode, 53
 - failovers
 - Active/Active failover deployments in multiple security contexts*, 566-568
 - single mode Active/Standby failover deployments*, 562-564
 - Local CA
 - configuring*, 899-901
 - enrolling users*, 904-905
 - management access rules, defining, 155
 - MMTF deployments, 510-514

- Privileged mode, 53
- QoS
 - configuring*, 597-600
 - deploying*, 605-606, 609-610
- remote-access VPN
 - IPSec hairpinning*, 858-860
 - load balancing*, 853-855
- site-to-site IPSec VPN deployments
 - fully meshed topologies with RRI*, 784-789
 - single site-to-site tunnel configuration via NAT Traversal*, 772-775
- SMTF deployments, 501-502
- Sub-configuration mode, 53
- traffic filtering
 - filtering inbound traffic via ACL*, 189
 - thru-traffic filtering*, 147-152
 - to-the-box-traffic filtering*, 155
- User mode, 52
- virtual firewall deployments
 - non-shared interfaces*, 451-454
 - shared interfaces*, 462-466
- Client (PAT) mode, Easy VPN, 826
- client authentication
 - IPSec remote-access VPN
 - ASDM configurations*, 822
 - interactive client authentication*, 840
 - L2TP over IPSec remote-access VPN, ASDM configurations, 846
- Client U-turns, 832
- client-based SSL VPN (Secure Socket Layer Virtual Private Network), 1027
 - configuring, 1061
 - client configurations*, 1055-1059
 - CSA, 1042
 - defining client attributes*, 1044-1048
 - DNS assignments, 1052
 - DTLS configurations, 1053-1054
 - keeping SSL VPN client installations*, 1053
 - loading AnyConnect packages*, 1042-1043
 - split tunneling*, 1049-1051
 - SVC versus client-based SSL VPN, 1040
 - traffic filter configurations*, 1054
 - WINS assignments, 1052
 - deploying, 1059
 - enabling address translation for Internet access*, 1062
 - registry checks*, 1061
 - user authentication*, 1061
 - monitoring, 1063
 - Standalone mode, 1042
 - troubleshooting
 - connectivity issues*, 1064-1065
 - SSL negotiations*, 1063
 - VPN client versus, 1028
 - Web-enabled mode, 1041
- client-pushed attributes, ASDM configurations
 - IPSec remote-access VPN, 823
 - L2TP over IPSec remote-access VPN, 847
- client-server plug-ins, clientless SSL VPN configurations, 979
- clientless mode (SSL VPN), 924
 - configuring, 947-949
 - application access*, 973-978

- bookmarks*, 965-969
- client-server plug-ins*, 979
- full customizations*, 960-964
- logon page*, 951-953, 958-962
- logout page*, 957
- port forwarding*, 974-976
- portal customization*, 957-960
- portal page*, 955-956, 960, 963-964
- smart tunnels*, 976-978
- web-type ACL*, 970-973
- deployment scenarios, 1017
 - DAP configuration*, 1020
 - defining clientless connections*, 1019-1020
- interfaces, enabling on, 949
- monitoring, 1021-1023
- troubleshooting
 - CIFS issues*, 1024-1025
 - CSD*, 1025
 - DAP*, 1025-1026
 - SSL negotiations*, 1024
 - website issues*, 1024
- VPN client versus, 924
- clocks (system)**, 84
 - automatic adjustments via NTP, 86
 - clock set command, 920
 - manual adjustments, 84-85
- commands**
 - abbreviating, 54
 - authorization, 338-339
 - configure terminal, 626
 - description of, displaying, 54
 - partial commands, completing, 54
 - Preview Commands Before Sending Them to the Device option (ASDM), 67
 - session, 616
 - setup, 627-631
 - show configuration, 645-646
 - show events, 648-649
 - show module, 616
 - show statistics, 684-687
 - show statistics analysis-engine, 684-685
 - show statistics authentication, 685
 - show statistics event-server, 685
 - show statistics event-store, 686
 - show statistics host, 686-687
 - show statistics logger, 687
 - show version, 643-644
 - supported arguments/options, displaying, 54
 - syntax, displaying, 54
- configuration command mode (CIPS CLI)**, 626
- configuration files, backing up**
 - AIP-SSM, 647-648
 - CSC SSM, 724-725
- configuring**
 - AIP-SSM
 - AD*, 666-669
 - blocking*, 659-662
 - CSA integration*, 662-666
 - IP Logging feature*, 656-659
 - Cisco ASA Botnet Traffic Filter feature
 - DNS snooping*, 672
 - dynamic database*, 670-672
 - traffic classification*, 672-673
- configuration management
 - removing device configuration*, 93-94

- running configurations*, 88-91, 94
- startup configurations*, 92-94
- Configuration mode (CLI), 53
- Configuration screen (ASDM), 64-65
- configuration URL, specifying in security contexts, 434-435
- configure terminal command, 53, 626
- CSC SSM
 - FTP file blocking*, 712-713
 - FTP scanning*, 709-712
 - initial setup*, 690-694
 - mail-based features*, 701-709
 - management interface*, 690
 - syslog*, 718-719
 - web-based features*, 694-701
- security contexts, 429
- transparent firewalls, 484
- connection profiles, site-to-site VPN, 741-743, 753-755
- console logging, 118
- console ports, establishing ASA appliance connections, 50-52
- content area (SSL VPN portal page), customizing, 956
- content filtering, 173
 - ActiveX filtering, 173-175
 - configuring, 174-175
 - Java filtering, 174-175
 - monitoring, 198
 - SMTP Content Filtering (CSC SSM), 708-709
 - Websense, enabling filtering via, 190-192
- Content Security tab (ASDM Home screen), 64
- content-length command, HTTP inspection, 394
- content-type-verification command, HTTP inspection, 394
- copy and paste method, installing certificates from, 877
- copyright area (SSL VPN logon page), customizing, 953
- CoS (class of service). *See* traffic prioritization
- CPP (Centralized Protection Policies), 838
- CPU (central processing units)
 - monitoring, 133-134
 - troubleshooting, 139
- CRL (certificate revocation list), 873
 - configuring options, 893-896
 - retrieval, troubleshooting PKI, 921
- crypto ca authenticate command, 887, 890
- crypto ca crt request command, 895
- crypto ca enroll command, 887-888, 891
- crypto ca import command, 892
- crypto ca server command, 899
- crypto ca server user-db add command, 904
- crypto ca server user-db allow command, 904
- crypto ca server user-db email-otp username command, 905
- crypto ca trustpoint command, 884
- crypto key generate rsa command, 883
- crypto key zeroize rsa command, 884
- crypto maps
 - IPSec remote-access VPN, 816-817
 - site-to-site IPSec VPN, 745-749

CS-MARS (Cisco Secure Monitoring and Response System)

AIP-SSM, 682-683

NetFlow, 12

supported devices and technologies, 681-682

CSA (Cisco Security Agent), 8

AnyConnect SSL VPN clients, 1042

configuring, 662-666

CSC SSM (Content Security and Control Security Services Module), 46-47

backup configuration files, creating, 724-725

base licenses, installing, 690

FTP

*file blocking, 712-713**scanning, 709-712*

initial configuration, 690-694

installation issues, troubleshooting, 722

live security event messages, monitoring, 717

mail-based features

*POP3 support, configuring, 709**SMTP Anti-spam Content Scanning, 704-706**SMTP Anti-spam Email Reputation, 706-708**SMTP Content Filtering, 708-709**SMTP scanning, 701-704*

management interfaces, configuring, 690

monitoring, 715

password recovery, 722-724

re-imaging, 719-721

software upgrades, 726

syslog, configuring, 718-719

troubleshooting tools, 726

*Gather Logs, 733-734**Management Port Console Access Settings, 734**Show System Information, 727-733*

web-based features, 694

*file blocking, 697-698**HTTP scanning, 699-701**URL blocking, 695-697***CSD (Cisco Secure Desktop), 980-981**

AnyConnect SSL VPN registry checks, 1061

architecture, 984

Cache Cleaner, 982, 996-997

configuring

*defining prelogin sequences, 987-998**loading CSD packages, 985*

Host Scan, 998

*Advanced Endpoint Assessment, 1000-1003**Basic Host Scan, 999-1000**Endpoint Assessment, 999, 1002*

requirements

*supported browsers, 983-984**supported operating systems, 983**user privileges, 983*

Secure Desktop (Secure Session), 982, 992-995, 998

Secure Desktop Manager, 982

troubleshooting, 1025

CTIQBE (Computer Telephony Interface Quick Buffer Encoding Inspection), 356-358

CtlTransSource (CIPS), 625
 custom signatures, creating, 651-656
 customer context. *See* user context (security contexts)
 cut-and-paste method, enrollment via CLI, 890-893
 cut-through proxy feature (Cisco Secure PIX Firewall), 330-333
 authentication timeouts, 335
 customizing authentication prompts, 335-336
 troubleshooting firewall sessions, 347

D

DAP (dynamic access policies), 1003
 architecture of, 1004-1005
 clientless SSL VPN configurations, 1020
 configuring, 1006
 defining access policies, 1011-1017
 selecting AAA attributes, 1007-1009
 selecting endpoint attributes, 1009
 sequence of events, 1005
 troubleshooting, 1025-1026
DAPR (dynamic access policy records), 1005
data-passing interface, configuring (ASA device setup), 69-73
date/time
 mismatches, troubleshooting PKI, 917-920
 system clocks
 manual adjustments, 85
 time zones, 84
 time mode (authentication servers), 323
 Time Range attribute (ASDM), 154-156
DCERPC (Distributed Computing Environment Remote Procedure Calls), 358
DCS (Direct Call Signaling), 382
DDoS (Dedicated Denial of Service) attacks, 11-12
debugging
 debug crypto ca command, 917
 debug crypto ca messages command, 920
 debug crypto ca transactions command, 920
 debug crypto isakmp 127 command, 917
 debug logs, 719
 L2F table entries, transparent firewalls, 516
 multicast routing, troubleshooting, 309-310
deep packet inspection, 7
default gateways, setting up in transparent firewalls, 487
deferred scanning (CSC SSM), 711
dense mode (PIM-DM), 302
depletion mode (authentication servers), 323
Description attribute (ASDM), 153, 156
desktops, CSD, 980-981
 AnyConnect SSL VPN registry checks, 1061
 architecture, 984
 Cache Cleaner, 982, 996-997
 configuring, 985-998
 Host Scan, 998-1003

- requirements, 983-984
- Secure Desktop (Secure Session), 982, 992-995, 998
- Secure Desktop Manager, 982
- supported browsers, 983-984
- supported operating systems, 983
- troubleshooting, 1025
- user privileges, 983
- Destination attribute (ASDM), 153, 220**
- device configuration, removing, 93-94**
- Device Information section (ASDM Home screen), 63**
- Device Management icon (ASDM Configuration screen), 65**
- device setup (ASA)**
 - device names/passwords, 67-68
 - DHCP services, 76-77
 - interface configuration
 - data-passing interface, 69-73*
 - management interface, 75-76*
 - routed mode, 70*
 - subinterface, 73-74*
- Device Setup icon (ASDM Configuration screen), 65**
- device-level failovers, 527**
 - Active/Active failovers, 528, 540
 - assigning failover group memberships, 545-546*
 - assigning failover interface IP addresses, 542*
 - assigning interface IP addresses, 546*
 - asymmetric routing, 529-531, 547*
 - designating primary appliances, 542*
 - enabling failover globally, 548*
 - enabling stateful failover, 542-543*
 - multiple security context deployments, 564-568*
 - secondary appliance failovers, 548*
 - selecting failover links, 541*
 - setting failover keys, 542*
 - setting up asymmetric routing, 547*
 - setting up failover groups, 543-544*
 - specifying failover MAC addresses, 553-554*
 - Active/Standby failovers, 527-528, 534
 - assigning failover IP addresses, 535-537*
 - designating primary appliances, 538*
 - enabling failover globally, 539*
 - enabling stateful failover (optional), 538-539*
 - secondary appliance failovers, 540*
 - selecting failover links, 534-535*
 - setting failover keys (optional), 537*
 - single mode deployments, 560-564*
 - specifying failover MAC addresses, 552-553*
- DHCP (Dynamic Host Configuration Protocol) services, ASA device setup (ASA), 76-77**
- Diffie-Hellman exchanges**
 - IPSec, 17
 - PFS, 19

digital certificates, 870-871. *See also*
CA (certificate authority)

chain of trust, 871

CRL, 873

installing, 883

*ASDM, 874-882**CLI, 884-896*IPSec site-to-site tunnels,
configuring, 906-910

manually importing, 932-933

remote-access IPSec VPN clients,
accessing, 910-916

revoking, 873

SSL VPN configurations, 931, 1035

*applying ID certificates to SSL
VPN connections, 936**manually importing CA
certificates, 932-933**manually importing ID
certificates, 935-936**requesting certificates, 933-934***Dijkstra algorithm, 252****disabling**

password recovery process, 109-113

signatures (IPS), 679-680

displayingAIP-SSM configuration information,
645-646

AIP-SSM events, 648-649

CIPS software version, 643-644

OSPF neighbor information, 274

statistics for AIP-SSM, 684-687

**DIT (Directory Information Trees),
318****DMZ (demilitarized zones), firewall
configurations, 6****DNS (Domain Name Servers)**AnyConnect SSL VPN assignments,
1052

application inspection, 359-363

DNS doctoring, 225-226, 228

dns name-server ip-address com-
mand, 895

IPSec remote-access VPN, 821

snooping, configuring for Cisco ASA
Botnet Traffic Filter feature, 672**domain names, ASA device setup, 67-
68****downloadable ACL (access control
lists), 170-172, 339****dropped packets, monitoring, 138-
139****DSCP (Differentiated Services Code
Point), IP DSCP field (QoS packet
classification), 583-586****DTLS (Datagram Transport Layer
Security), AnyConnect SSL VPN
configurations, 1053-1054****DUAL (Diffusing Update Algorithm),
280****dynamic database, configuring for
Cisco ASA Botnet Traffic Filter
feature, 670-672****dynamic NAT (Network Address
Translation), global pools**

configuring, 210-211

defining, 209

mapping to real addresses, 211

**dynamic PAT (Port Address
Translation), 214-215****dynamic routing over VPN, OSPF,
270-272**

E**Easy VPN (Virtual Private Networks)**

Client (PAT) mode, 826

IPSec remote-access VPN*Cisco IP Phone Bypass, 842**hardware-based VPN client configurations, 826-828**Individual User**Authentication, 841**interactive client authentication, 840**LEAP Bypass, 842**software-based VPN client configurations, 824*

NEM, 826, 842

EIGRP (Enhanced Interior Gateway Routing Protocol)

authentication, 285, 300

controlling default information, 291-292

enabling, 280-284

route filtering, 284

route redistribution, 289-291

route summarization, 287

split horizon, 288

static neighbors, defining, 286-287

troubleshooting

*authentication, 300**commands, 292-295**hello intervals, 297-300**hold intervals, 297-300**link failures, 296-297***email**

Anti-spam Email Repudiation (CSC SSM), 706-708

logging, 119

servers, defining, 122

Enable Logging attribute (ASDM), 153, 156**Enable Rule attribute (ASDM), 153, 156****encryption**

ACL, 747

AES, 737

Ending IP Address attribute (ASDM), 209**endpoints**

Endpoint Assessment (Host Scan), 999, 1002

endpoint attributes, DAP configurations, 1009

enrolling

Cisco VPN clients, 911-914

enrollment process, 874

ESMTP (Extended SMTP), application inspection, 363-366**Ethernet, Gigabit Ethernet modules**

Cisco ASA 4GE-SSM, 44

Cisco ASA 5580 expansion cards, 45

EtherType ACL (access control lists), 145, 497**event lists, defining (system logging), 116-117****events (AIP-SSM)**

clearing, 650

displaying, 648-649

EventStore (CIPS), 624**extended ACL (access control lists), 145, 151**

SMTF deployment, 497

transparent firewalls, configuring for, 488

F

failovers

active appliances, 521

conditions that trigger failover, 523

control links, 522

- device-level failovers
 - Active/Active failovers*, 528-531, 540-548, 553-554, 564-568
 - Active/Standby failovers*, 527-528, 534-540, 552-553, 560-564
- Failover Wizard (ASDM), configuring, 548-549
- hardware requirements, 525-526
- interface-level failovers
 - multiple-mode firewalls*, 551
 - redundant interface guidelines*, 531-533
 - single-mode firewalls*, 550
- interfaces
 - monitoring*, 556-557
 - policy configuration*, 554
 - tests*, 523-524
- MAC addresses, specifying
 - Active/Active failovers*, 553-554
 - Active/Standby failovers*, 552-553
- monitoring, 569-572
- software requirements, 525-526
- standby appliances, 521
- stateful failovers, 524-526
 - Active/Active failovers*, 542-543
 - Active/Standby failovers*, 538-539
- stateless failovers, 524
- timers, managing, 555
- troubleshooting, 572-574
- zero-downtime software upgrades, 557-559
- false positives, pattern matching, 10**
- file blocking (CSC SSM), configuring, 697-698**
- file servers**
 - clientless SSL VPN configurations, 967-968
 - defining, 968
- FILENAME, 501**
- filtering**
 - OSPF Type 3 LSA filtering, 268-270
 - packet filtering
 - ACE*, 142-143, 147-157
 - ACL*, 142-152
 - traffic filtering*, 147-158, 185-192
 - PIM neighbors, multicast routing, 307
 - route filtering
 - EIGRP routes*, 284
 - RIP routes*, 246-248
 - traffic filtering
 - AnyConnect SSL VPN configurations*, 1054
 - deployment scenarios*, 185-192
 - IPSec remote-access VPN*, 817-818
 - IPv6 ACL setup*, 157-158
 - packet filtering*, 147-158, 185-192
 - site-to-site IPSec VPN*, 749-750
 - thru-traffic filtering*, 147-154
 - to-the-box-traffic filtering*, 154-156
- firewalls**
 - authentication, 330-333
 - customizing prompts*, 335-336
 - session authentication*, 332
 - timeouts*, 335
 - Cisco Secure PIX Firewall, cut-through proxy feature, 330-336, 347

- deep packet inspection, 7
- developing, 1
- DMZ configurations, 6
- Firewall Dashboard tab (ASDM Home screen), 64
- Firewall Host Scan, configuring, 1003
- Firewall icon (ASDM Configuration screen), 65
- multiple-mode firewalls
 - interface-level redundancy*, 551
 - single-mode firewalls versus*, 419-421
- network firewalls
 - application proxies (proxy servers)*, 3
 - NAT, 3-5
 - packet-filtering*, 2-3
- personal firewalls, 2, 7
- routed firewalls, 471
 - enabling*, 484
 - transparent firewalls versus*, 472-474
- sessions, troubleshooting, 347
- single-mode firewalls
 - interface-level redundancy*, 550
 - multiple-mode firewalls versus*, 419-421
- stateful inspection firewalls, 6
- transparent firewalls, 471
 - configuring*, 482-496
 - MMTF, 477, 496, 502-514
 - monitoring*, 514-516
 - NAT, 479-481
 - restrictions within*, 479-481
 - routed firewalls versus*, 472-474
 - SMTF, 474-476, 496-502
 - troubleshooting*, 516-519
 - VPN, 479
- virtual firewalls, deploying using
 - non-shared interfaces*, 443-454
 - shared interfaces*, 454-466
- VPN client firewalls, IPsec remote-access VPN, 836-838
- Flash logging, 123
- FoIP (Fax over IP), T.38 protocol, 382
- fragmentation (packets), site-to-site IPsec VPN, 767-768
- FTP (File Transfer Protocol)
 - application inspection, 367-369
 - file blocking (CSC SSM), 712-713
 - filtering, 180-182
 - FTP servers, saving security contexts to, 469
 - logging, 124
 - scanning (CSC SSM), 709-712
- full tunnel mode (SSL VPN), 924, 1027
 - configuring, 1041, 1061
 - client configurations*, 1055-1059
 - CSA, 1042
 - defining client attributes*, 1044-1048
 - DNS assignments*, 1052
 - DTLS configurations*, 1053-1054
 - keeping SSL VPN client installations*, 1053
 - loading AnyConnect packages*, 1042-1043
 - split tunneling*, 1049-1051
 - SVC versus full tunnel SSL VPN*, 1040

traffic filter configurations, 1054

WINS assignments, 1052

deploying, 1059

*enabling address translation
for Internet access, 1062*

registry checks, 1061

user authentication, 1061

monitoring, 1063

Standalone mode, 1042

troubleshooting

connectivity issues, 1064-1065

SSL negotiations, 1063

VPN client versus, 1028

Web-enabled mode, 1041

**Functions tab (ASDM), DAP
configurations, 1014**

G

gatekeepers (H.323), 376

gateways

H.323 gateways, 376

tunnel default gateways

IPSec remote-access VPN, 828

site-to-site IPSec VPN, 759-760

**Gather Logs tool (CSC SSM),
733-734**

Gigabit Ethernet modules

Cisco ASA 4GE-SSM, 44

Cisco ASA 5580 expansion cards, 45

**GKRCS (Gatekeeper Routed Control
Signaling), 382**

**global configuration mode (CIPS 5.x),
626**

global pools (dynamic NAT)

configuring, 210-211

defining, 209

mapping to real addresses, 211

**global unicast addresses, IPv6
configuration, 81**

GMP stub mode, 301

**GPRS (General Packet Radio Service),
GTP**

application inspection, 374-375

GTPv0, 369-371

GTPv1, 372-373

**gratuitous ARP (address resolution
protocol), 552**

**GRE (Generic Routing Encapsulation)
Protocol, VPN, 13**

group policies

applying bookmark lists to (clientless
SSL VPN configurations), 969

IPSec remote-access VPN, setting up
group policies, 806

mapping

*port forwarding lists to (client-
less SSL VPN configuration),
976*

*smart tunnel lists to (SSL VPN
configurations), 978*

SSL VPN configurations, 937-941,
1035-1036

GTP (GPRS Tunneling Protocol)

application inspection, 369, 373-375

GTPv0, 369-371

GTPv1, 372-373

**GUI (graphical user interface), ASA
appliance access via ASDM, 50**

H

H.323

application inspection, 380-382

DCS, 382

- gatekeepers, 376
- gateways, 376
- GKRCs, 382
- MCU, 376
- protocol suite, 376-377
- RAS protocol, 378
- RTCP, 377
- T.38 protocol, 382
- terminals, 376
- version compatibility, 378
- hairpinning (IPSec)**
 - IPSec remote-access VPN, 831
 - L2TP over IPSec remote-access VPN
 - ASDM configurations*, 856-858
 - CLI configurations*, 858-860
- hello intervals, troubleshooting in EIGRP, 297-300**
- heuristic scanning, IDS, 11**
- HIPS (host intrusion prevention systems), 8**
- hold intervals, troubleshooting in EIGRP, 297-300**
- Home screen (ASDM)**
 - Content Security tab, 64
 - Device Information section, 63
 - Firewall Dashboard tab, 64
 - Interface Status section, 64
 - IPS tab, 64
 - Latest ASDM Syslog Messages section, 64
 - System Resources Status section, 64
 - Traffic Status section, 64
 - VPN Sessions section, 64
- hop counts, 240**
- host emulators, CSD prelogin sequences, 990-991**
- Host Scan, 998**
 - Advanced Endpoint Assessment, 1000
 - AntiSpyware Host Scan*, 1003
 - Antivirus Host Scan*, 1002
 - configuring*, 1002-1003
 - Firewall Host Scan*, 1003
 - Basic Host Scan, 999-1000
 - Endpoint Assessment, 999, 1002
- hostnames, ASA device setup, 67-68**
- HTTP (Hypertext Transfer Protocol)**
 - application inspection, 390-392
 - content-length command*, 394
 - content-type-verification command*, 394
 - max-header-length command*, 395
 - max-uri-length command*, 395
 - port-misuse command*, 396
 - request-method command*, 396-397
 - strict-http command*, 393
 - transfer-encoding type command*, 398
 - filtering, configuring, 180-182
 - HTTP Form protocol, 318
 - scanning (CSC SSM), 699-701
- HTTPS (HTTP over SSL/TLS)**
 - filtering, configuring, 180-182
 - SSL VPN, 21-22
- HyperTerminal**
 - configuring, 50
 - connection type, setting, 51
 - port specification, setting, 52

ICMP (Internet Control Message Protocol)

filtering, ACL, 172

ICMP-type object groups, 160

inspection, 399

ICSA (International Computer Security Association), 619**ID certificates, manually importing, 935-936****IDCONF (Intrusion Detection Configuration) protocol, 622****identity NAT (Network Address Translation), 218****IDS (intrusion detection systems), 8**

anomaly-based analysis, 11-12

DDoS attacks, 11-12

heuristic scanning, 11

pattern matching

*false positives, 10**signatures, 9**stateful pattern-matching recognition, 10*

protocol analysis, NIDS, 10

IGMP (Internet Group Management Protocol), multicast routing

query timeouts, 304

State Limit feature, 303-304

static group assignments, 302

version of, defining, 304

IKE (Internet Key Exchange) protocol

IPSec, 14, 18

IPSec remote-access VPN, ASDM configurations, 823

L2TP over IPSec remote-access VPN, ASDM configurations, 847

ILS (Internet Locator Service) protocol, inspection, 399-400**IM (Internet Messenger), inspection, 400-402****images**

ROMMON, 54, 105

upgrades

*ASA CLI, 102-104**ASDM, 101***incoming SMTP scanning (CSC SSM), configuring, 701-704****Individual User Authentication, IPSec remote-access VPN, 841****information area (SSL VPN logon page), customizing, 953****initial Cisco ASA setup\, interface configuration, 71****initial CSC SSM configuration, 690-694****initializing AIP-SSM from CIPS CLI, 626, 629-631****inline IPS mode, traffic flow, 617****inside NAT (Network Address Translation), 200, 207-208****inspect dns command, 363****inspection (application), 350**

class-maps, 352

CTIQBE, 356-358

DCERPC, 358

DNS, 359-363

enabling, 351-353

ESMTP, 363-366

FTP, 367-369

GTP, 369, 373-375

H.323, 380-382

HTTP, 390-392

content-length command, 394

- content-type-verification command*, 394
- max-header-length command*, 395
- max-uri-length command*, 395
- port-misuse command*, 396
- request-method command*, 396-397
- strict-http command*, 393
- transfer-encoding type command*, 398
- ICMP, 399
- ILS protocol, 399-400
- IM, 400-402
- IPSec pass-through, 403
- MGCP, 404-405
- NetBIOS, 406
- policy-maps, 352
- PPTP, 406
- RSH, 407
- RTSP, 408
- selective inspection, 353-356
- service-policies, 352-356
- SIP, 408-410
- Skinny (SCCP), 410-411
- SNMP, 411-412
- SQL*Net, 412
- Sun RPC protocol, 407
- TFTP, 412
- UC advanced support
 - Mobility Proxy*, 389
 - phone proxy*, 383-388
 - Presence Federation Proxy*, 390
 - TLS proxy*, 388-389
- WAAS, 413
- XDMCP, 413

installing

- certificates
 - ASDM, 874-883
 - CLI, 883-896
- CSC SSM
 - base licenses*, 690
 - troubleshooting*, 722
- software, 101
 - image recovery*, 105
 - image upgrades*, 101-104

IntelliTrap feature (CSC SSM), 702

- interactive client authentication, IPSec
 - remote-access VPN, 840

interfaces

- ACL, transparent firewalls, 487-489
- configuring (ASA device setup)
 - data-passing interface*, 69-70, 72-73
 - management interface*, 75-76
 - routed mode*, 70
 - subinterface*, 73-74
- failovers
 - multiple-mode firewalls*, 551
 - policy configuration*, 554
 - redundant interface guidelines*, 531-533
 - single-mode firewalls*, 550
- Interface attribute (ASDM), 152, 156, 209, 220
- Interface Status section (ASDM Home screen), 64
- Interfaces icon (ASDM Monitoring screen), 66
- security levels, address translation and, 203
- tests (failover), 523-524

IP addresses

- IPSec remote-access VPN
 - assignments, 812-816
 - transparent firewall configuration, 485
- IP DSCP field (QoS packet classification), 583-586
- IP flow, QoS packet classification, 587
- IP logger statistics, displaying, 687
- IP Logging feature (AIP-SSM)
 - automatic logging, 657-658
 - configuring, 656
 - manual logging, 658-659
- IP multicast routing
 - configuring RP, 306
 - enabling, 302
 - enabling PIM, 305
 - filtering PIM neighbors, 307
 - GMP stub mode, 301
 - IGMP
 - defining IGMP version, 304*
 - limiting IGMP states, 303-304*
 - query timeouts, 304*
 - statically assigning IGMP groups, 302*
 - PIM-SM, 302
 - static multicast routes, 307-308
 - troubleshooting
 - debug commands, 309-310*
 - show commands, 308-309*
- IP Phone Bypass, IPSec remote-access VPN, 842
- IP Precedence field (QoS packet classification), 583
- IP routing
 - EIGRP
 - authentication, 285, 300*

- controlling default information, 291-292*

- defining static neighbors, 286-287*

- enabling, 280-284*

- route filtering, 284*

- route redistribution, 289-291*

- route summarization, 287*

- split horizon, 288*

- troubleshooting, 292-300*

multicast routing

- configuring RP, 306*

- defining IGMP version, 304*

- enabling, 302*

- enabling PIM, 305*

- filtering PIM neighbors, 307*

- GMP stub mode, 301*

- IGMP query timeouts, 304*

- limiting IGMP states, 303-304*

- PIM-SM, 302*

- static multicast routes, 307-308*

- statically assigning IGMP groups, 302*

- troubleshooting, 308-310*

OSPF, 252

- authentication, 262-267, 279*

- dynamic routing over VPN, 270-272*

- enabling, 254-258*

- neighbor command, 270-271*

- NSSA, 268*

- redistribution, 266-267*

- stub areas, 267*

- troubleshooting, 273-279*

- Type 3 LSA filtering, 268-270*

- virtual links, 259-261, 264-267*

- VPN tunneling, 272*

- RIP, 240
 - authentication*, 244, 251
 - configuring*, 241-243
 - redistribution*, 249
 - route filtering*, 246-248
 - troubleshooting*, 250-252
- static routing, 231-232
 - displaying routing tables*
239-240
 - monitoring*, 234-235, 238
- IPS (intrusion prevention systems), 8-9
 - CIPS
 - Attack Response Controller*,
622
 - AuthenticationApp*, 623
 - cipsWebserver*, 623
 - CtlTransSource*, 625
 - EventStore*, 624
 - Logger*, 624
 - MainApp*, 620-621
 - SensorApp*, 621-622
 - Cisco ASA 5500 Series IPS Solution,
8
 - CSA, 8
 - DDoS attacks, 11-12
 - HIPS, 8
 - inline IPS mode, traffic flow, 617
 - IPS icon (ASDM), 65-66
 - IPS tab (ASDM Home screen), 64
 - NIPS, 8
 - promiscuous IPS mode, traffic flow,
618
 - SDEE, 619
 - tuning, 677-681
- IPSec (IP Security)
 - Diffie-Hellman exchanges, 17
 - hairpinning
 - ASDM configurations*, 856-858
 - CLI configurations*, 858-860
 - IPSec remote-access VPN*, 831
 - L2TP over IPSec remote-access
VPN*, 856-860
 - IKE, 14, 18
 - IPSec over TCP, IPSec remote-access
VPN, 831
 - IPSec over UDP, IPSec remote-access
VPN, 830
 - IPSec VPN Wizard, site-to-site IPSec
VPN configuration, 752-753
 - ISAKMP, 14-16
 - pass-through inspection, 403
 - Phase 1 negotiation, 15-17
 - Phase 2 negotiation, 18-20
 - quick mode, 18
 - remote-access VPN, 800, 840-842
 - ASDM configuration*, 822-823
 - assigning IP addresses*, 812-
816
 - bypassing NAT (optional)*, 818
 - configuring user
authentication*, 810-812
 - creating ISAKMP policies*,
803-804
 - crypto maps*, 816-817
 - defining IPSec policies*, 809
 - deployment scenarios*, 849-860
 - DNS (optional)*, 821
 - enabling ISAKMP*, 802-803
 - hardware-based VPN client
configurations*, 826-828
 - IPSec hairpinning*, 831
 - L2TP over IPSec remote-access
VPN versus*, 800
 - load balancing*, 849-855

- monitoring*, 860-864
- setting up group policies*, 806
- setting up tunnel groups*, 808
- software-based VPN client configurations*, 824
- split tunneling (optional)*, 818-819
- traffic filtering (optional)*, 817-818
- transparent tunneling*, 829-831
- troubleshooting*, 865-867
- tunnel default gateways*, 828
- VPN client firewalls*, 836-838
- VPN load balancing*, 833-835
- WINS (optional)*, 821
- site-to-site IPsec VPN, 735
 - bypassing NAT (optional)*, 751
 - Connection Profiles*, 753-755
 - connection types*, 764-765
 - creating ISAKMP policies*, 739-740
 - crypto maps*, 745-749
 - defining IPsec policies*, 743-745
 - enabling ISAKMP*, 739
 - fully meshed topologies with RRI*, 775-789
 - IPsec VPN Wizard*, 752-753
 - keepalives feature (ISAKMP)*, 766
 - management access*, 760
 - monitoring*, 789-792
 - NAT Traversal*, 758-759
 - OSPF updates over IPsec*, 755-756
 - packet fragmentation*, 767-768
 - PFS*, 761
 - Phase 1 mode*, 764
 - preconfiguration checklist*, 736-737
 - RRI*, 757-758, 775-789
 - security association lifetimes*, 763-764
 - setting up tunnel groups*, 741-743
 - single site-to-site tunnel configuration via NAT Traversal*, 769-775
 - traffic filtering (optional)*, 749-750
 - troubleshooting*, 793-798
 - tunnel default gateways*, 759-760
- site-to-site tunnels, configuring with certificates, 906-910
- Transport mode, 20
- Tunnel mode, 20
- VPN, 13-20
- IPv6 (Internet Protocol version 6)**, 78
 - ACL, 145, 157-158
 - configuring
 - global unicast addresses*, 81
 - IP address assignment*, 80-82
 - link-local addresses*, 82
 - site-local addresses*, 82
 - headers, 78-80
 - neighbor reachable time, 83
 - neighbor solicitation messages, 83
 - optional parameter setup, 83
 - router advertisement transmission intervals, 83
- ISAKMP (Internet Security Association and Key Management Protocol)**
 - IPsec, 14-16
 - IPsec remote-access VPN, 802-804

site-to-site IPsec VPN
 creating ISAKMP policies,
 739-740
 enabling ISAKMP, 739
 keepalives feature, 766
 troubleshooting, 795-798

isakmp identity auto command, 907

ISN (Initial Sequence Numbers),
 randomization, 204

J - K

Java filtering, 174-175

keepalives

 AYT messages, 837
 keepalives feature (ISAKMP), site-to-
 site IPsec VPN, 766

Kerberos

 Active Directory authentication, 318
 user authentication, SSL VPN
 configurations, 943, 1038

key pairs, generating in CLI, 883-884

keysize command, 899

keysize server command, 899

keystroke loggers, CSD prelogin
 sequences, 990-991

L

L2F (Layer 2 Forwarding) Protocol

 L2F tables
 aging time, transparent
 firewalls, 496
 clearing tables associated with
 outside interfaces, 519

static L2F tables, adding entries
 to transparent firewalls, 492
 transparent firewalls,
 debugging entries, 516

VPN, 13

L2TP (Layer 2 Tunneling Protocol)

 L2TP over IPsec remote-access VPN,
 843

 ASDM configuration, 846-848,
 856-858

 CLI configuration, IPsec
 hairpinning, 858-860

 IPsec remote-access VPN over,
 800

VPN, 13

Latest ASDM Syslog Messages

 section (ASDM Home screen), 64

LDAP (Lightweight Directory Access
 Protocol), 318

LEAP Bypasses, IPsec remote-access
 VPN, 842

license keys

 changing, 56
 information about, displaying, 54-55

lifetime ca-certificate command, 899

link up/down tests (failover interface
 tests), 523

link-local addresses, IPv6 configura-
 tion, 82

links

 EIGRP link failures, troubleshooting,
 296-297

 virtual links, OSPF,
 259-261, 264-267, 279

live security event messages (CSC
 SSM), monitoring, 717

LLQ (low-latency queue). *See* traffic
 prioritization

load balancing

IPSec remote-access VPN, 833-835

remote-access VPN, 849-855

Local CA (Local Certificate Authority)

configuring via

ASDM, 896-898

CLI, 899-901

enrolling users via

ASDM, 901-904

CLI, 904-905

local disks, saving security contexts to, 468**logging**

AIP-SSM, logging into from CIPS

CLI, 625-626

console logging, 118

debug logs, 719

Flash logging, 123

FTP logging, 124

IP logger statistics, displaying, 687

IP Logging feature (AIP-SSM)

automatic logging, 657-658

configuring, 656

manual logging, 658-659

Logger (CIPS), 624

Logging icon (ASDM Monitoring screen), 67

Logging Interval attribute (ASDM), 154, 156

system logging

ASDM logging, 119

buffered logging, 119-121

console logging, 118

email logging, 119

email servers, 122

enabling, 114-115

event lists, 116-117

logging lists, 120-121

storing logs internally/externally, 123-124

Syslog server logging, 119-122

terminal logging, 119

logon page (SSL VPN), customizing

banner area, 951

copyright area, 953

full customizations, 960-962

information area, 953

logon area, 952

user connection profiles, 958-959

logout page (SSL VPN), customizing, 957**lost passwords, recovering for CSC SSM, 722-724****LSA (link-state advertisements), OSPF Type 3 LSA filtering, 268-270****M****MAC addresses**

failover MAC addresses, specifying

Active/Active failovers, 553-554

Active/Standby failovers, 552-553

packet classification (security contexts), 424

mail-based features (CSC SSM)

POP3 support, 709

STMP Anti-spam Content Scanning, 704-706

STMP Anti-spam Email Reputation, 706-708

STMP Content Filtering, 708-709

STMP scanning, 701-704

- main root CA (certificate authority), 871
- main.log files, accessing, 624
- MainApp (CIPS), 620-621
- management interfaces
 - configuring (ASA device setup), 75-76
 - management interface port (AIP-SSM), 616-617
- Management Port Console Access Settings tool (CSC SSM), 734
- manual logging, configuring on AIP-SSM, 658-659
- master blocking sensors, 622
- match command, selective application inspection, 353-354
- max-header-length command, HTTP inspection, 395
- max-uri-length command, HTTP inspection, 395
- MCU (multipoint control units), H.323, 376
- memory
 - buffer overflows, 11
 - monitoring, 133-134
- message ID tuning (Syslog), 124
- MGCP (Media Gateway Control Protocol), inspection, 404-405
- MMTF (multimode transparent firewalls), 477, 496
 - deploying with security contexts, 502-504
 - ASDM deployments, 504-510
 - CLI deployments, 510-514
 - packet flow, 477
- Mobility Proxy, UC advanced support, 389
- mode-config, 800
- monitoring
 - AnyConnect SSL VPN, 1063
 - clientless SSL VPN, 1021-1023
 - CPU, 133-134
 - CSC SSM, 715-717
 - dropped packets, 138-139
 - failovers, 569-572
 - memory, 133-134
 - Monitoring screen (ASDM), 66
 - QoS, 611-612
 - remote-access VPN, 860-864
 - security contexts, 466-467
 - site-to-site IPsec VPN, 789-792
 - SNMP, 133
 - system monitoring
 - NSEL, 125-128
 - SNMP, 128-133
 - system logging, 113-124
 - transparent firewalls, 514-516
- MPF (Modular Policy Framework), deep packet inspection, 7
- MPLS (Multiprotocol Label Switching)
 - transparent firewalls, 488
 - VPN, 13
- multicast routing (IP)
 - configuring RP, 306
 - enabling, 302
 - enabling PIM, 305
 - filtering PIM neighbors, 307
 - GMP stub mode, 301
 - IGMP
 - defining IGMP version, 304
 - query timeouts, 304
 - statically assigning IGMP groups, 302-304
 - PIM-SM, 302
 - static multicast routes, 307-308

troubleshooting

debug commands, 309-310

show commands, 308-309

multiple mode

firewalls

interface-level redundancy, 551

single-mode firewalls versus,
419-421

packet flow in (security contexts),
424-426

N

N (distinguished names), 318

naming devices, ASA device setup,
67-68

NAS (network access servers), 314

NAT (Network Address Translation),
3

ACL integration, 223-224

bidirectional NAT, 201

DNS doctoring, 225-228

dynamic NAT

configuring global pools,
210-211

defining global pools, 209

*mapping global pools to real
addresses*, 211

exemptions, 219-221

identity NAT, 218

inside NAT, 200, 207-208

IPSec remote-access VPN, bypassing
in, 818

NAT Traversal, site-to-site IPSec
VPN, 758-759, 769-775

order of operation, 222

PAT, 4

policy NAT, 216

site-to-site IPSec VPN, bypassing
NAT, 751

static NAT, 207

static translation, 5

transparent firewalls, 479-481, 491

NAT Exempt Direction attribute
(ASDM), 220

NAT-T (Network Address
Translation-Traversal)

IPSec remote-access VPN, 829-830
VPN, 18

navigation panel (SSL VPN portal
page), customizing, 955-956

neighbor command (OSPF), 270-271

neighbor reachable time (IPv6), 83

neighbor solicitation messages (IPv6),
83

NEM (Network Extension Mode),
Easy VPN, 826, 842

NetBIOS inspection, 406

NetFlow, 12

Netmask attribute (ASDM), 209

network access, controlling

address translation

bypassing, 218-221

configuring, 206-216

interface security levels, 203

ISN randomization, 204

monitoring, 229-230

NAT, 200-201, 207-211,
216-224

packet flow sequences, 204

PAT, 202, 212-216

TCP interception, 205-206

content filtering, 173-175

enabling via Websense,
190-192

monitoring, 198

DNS doctoring, 225-228
 monitoring ACL, 193-197
 packet filtering, 142-146
 traffic filtering, 147-158
 enabling content filtering via Websense, 190-192
 filtering inbound traffic via ACL, 185-189

URL filtering, 175-178
 buffering server responses, 182
 caching server responses, 184
 enabling long URL support, 184
 FTP filtering, 180-182
 HTTP filtering, 180-182
 HTTPS filtering, 180-182

Network ACL tab (ASDM), DAP configurations, 1012

network activity tests (failover interface tests), 524

network firewalls
 application proxies (proxy servers), 3
 NAT, 3
 PAT, 4
 static translation, 5
 packet-filtering, 2-3

network-based object groups, 160

new pin mode, 316

NIDS (Network Intrusion Detection System), 10

NIPS (network intrusion prevention systems), 8

NSEL (NetFlow Secure Event Logging), 125
 NetFlow Collector, defining, 126-127
 NetFlow export policy, defining, 127-128

NSSA (Not-So-Stubby Areas), OSPF,

268

NTP (Network Time Protocol), automatic system clock adjustments, 86

NVRAM (Non-Volatile Random Access Memory), password recovery process, 108-109, 113

O

object grouping, 159
 ACL, 164-166
 ICMP-type groups, 160
 network-based groups, 160
 object types, configuring, 160-162
 protocol-based groups, 160
 service-based groups, 160

one-time upgrades, applying to AIP-SSM, 638-639

operator account (AIP-SSM), 632

options (commands), displaying supported options in, 54

Original Interface attribute (ASDM), 207

Original Port attribute (ASDM), 213

Original Source attribute (ASDM), 207

OSPF (Open Shortest Path First), 252-253
 authentication, 262-267, 279
 dynamic routing over VPN, 270-272
 enabling, 254-258
 neighbor command, 270-271
 NSSA, 268
 redistribution, 266-267
 stub areas, 267
 troubleshooting
 authentication mismatches, 279
 commands, 273-278

mismatched areas, 279

virtual links, 279

Type 3 LSA filtering, 268-270

updates over IPsec, site-to-site IPsec
VPN, 755-756

virtual links, 259-261, 264-267

VPN tunneling, 272

OTP (one-time passwords), 316

**outgoing SMTP scanning (CSC SSM),
configuring, 704**

P

packets

capturing, 136-138, 196

classification

QoS, 583-587

security contexts, 421-422

*shared interface criteria,
422-424*

filtering

ACE, 142-143, 147-154, 158

ACL, 2-3, 142-152

network firewalls, 2-3

*traffic filtering, 147-158,
185-192*

flow

METF, 477

*multiple mode (security
contexts), 424-426*

*sequences, address translation,
204*

SMTF, 474-476

tracing, 136

fragmentation, site-to-site IPsec
VPN, 767-768

troubleshooting

capturing packets, 136-138

*monitoring dropped packets,
138-139*

tracing packet flows, 136

partial commands, completing, 54

passwords

AIP-SSM users, changing passwords
for, 635-636

CSC SSM, recovering on, 722-724

device passwords, ASA device setup,
67-68

OTP, 316

recovery process, 106-109, 113

PAT (Port Address Translation), 202

dynamic PAT, 214-215

network firewalls, 4

PAT mode (Easy VPN), 826

policy PAT, 216

static PAT

configuring, 213-214

port redirection, 212

pattern matching

false positives, 10

IDS, 9-10

signatures, 9

stateful pattern-matching
recognition, 10

peer-id-validate cert command, 908

**periodic function (time-based ACL),
168**

personal firewalls, 2, 7

PFS (Perfect Forward Secrecy)

Diffie-Hellman exchanges, 19

site-to-site IPsec VPN, 761

**phone proxy, UC advanced support,
383-388**

PIM (Protocol Independent Multicast)

multicast routing

- enabling PIM in*, 305
 - filtering PIM neighbors*, 307
- PIM-DM (dense mode), 302
- PIM-SM (sparse mode), 302
- ping tests (broadcast)**, 524
- PKI (public key infrastructure)**, 869
 - CA, 871-872
 - certificates
 - accepting remote-access IPSec VPN clients*, 910-916
 - configuring IPSec site-to-site tunnels*, 906-910
 - explained*, 870-871
 - installing*, 874-896
 - CRL, 873
 - Local CA
 - configuring*, 896-901
 - enrolling users*, 901-905
 - SCEP, 874
 - troubleshooting, 917
 - CRL retrieval*, 921
 - SCEP enrollment*, 920-921
 - time and date mismatch*, 917-920
- plug-ins (client-server), clientless SSL VPN configurations**, 979
- policy maps**
 - application inspection, 352
 - QoS configurations, 598-600
- policy NAT (Network Address Translation)**, 216
- policy PAT (Port Address Translation)**, 216
- Pool ID attribute (ASDM)**, 209
- POP3 support (CSC SSM), configuring**, 709
- port forwarding**
 - Port Forwarding Lists tab (ASDM), DAP configurations, 1015
 - SSL VPN configuration, 974
 - defining port-forwarding lists*, 975
 - mapping port forwarding lists to group policies*, 976
- port redirection (static PAT)**, 212
- port-misuse command, HTTP inspection**, 396
- portal customization, SSL VPN configuration**, 949
 - full customizations, 960-964
 - logon page, 958-962
 - banner area*, 951
 - copyright area*, 953
 - information area*, 953
 - logon area*, 952
 - logout page, 957
 - portal page, 955-956, 960, 963-964
 - user connection profiles, 960
 - user groups, 957-959
- portal page (SSL VPN)**
 - content area, 956
 - customizing, 963-964
 - navigation panel, 955-956
 - title panel, 955
 - toolbar, 955
 - user connection profiles, 960
- PPTP (Point-to-Point Tunneling Protocol)**
 - inspection, 406
 - VPN, 13
- prelogin sequences (CSD)**
 - Cache Cleaner policies*, 996-997
 - CSD policies, assigning*, 990

- host emulators, identifying, 990-991*
- keystroke loggers, identifying, 990-991*
- prelogin policies, 987-989*
- Secure Desktop (Vault) attributes, 992-995, 998*
- Presence Federation Proxy, UC advanced support, 390
- preshared keys, site-to-site IPSec VPN, 795-797
- Preview Commands Before Sending Them to the Device option (ASDM), 67
- priority queues, QoS configurations
 - ASDM, 589
 - CLI, 597
- Privileged mode (CLI), 53
- privileges (user), CSD, 983
- Profile Editor, creating AnyConnect SSL VPN client profiles, 1056
- profile-based detection, IDS, 11
- promiscuous IPS mode, traffic flow, 618
- Properties icon (ASDM Monitoring screen), 67
- protocol analysis (protocol decode-base signatures), NIDS, 10.
 - See also* stateful pattern-matching recognition
- Protocol attribute (ASDM), 213
- protocol-based detection, IDS, 11
- protocol-based object groups, 160
- proxy servers (application proxies), network firewalls, 3

Q

- QIL (Quick IP Lookup), 706
- QoS (Quality of Service), 577
 - ASDM configurations
 - applying action rules, 593-595*
 - defining service policies, 589*
 - priority queues, 589*
 - specifying traffic selection criteria, 590-592*
 - CLI configurations
 - class maps, 597-598*
 - policy maps, 598-600*
 - priority queues, 597*
 - deploying
 - remote-access VPN tunnels, 607-610*
 - VoIP, 600-606*
 - monitoring, 611-612
 - packet classification
 - ACL, 586*
 - IP DSCP field, 583-586*
 - IP flow, 587*
 - IP Precedence field, 583*
 - VPN tunnel groups, 587*
 - packet flow sequence, 582
 - security appliance compatibility, 578
 - traffic policing, 579-580, 594
 - traffic prioritization, 579, 593
 - traffic shaping, 581, 595
 - VPN tunneling, 588
 - remote-access VPN tunnel deployments, 607-610*
 - VPN tunnel groups, 587*
- queries, IGMP query timeouts, 304
- question mark (?), displaying
 - command help in CIPS CLI, 626
- quick mode (IPSec), 18

R

RADIUS, 314

accounting, 341

user authentication

AnyConnect SSL VPN, 1061

defining RADIUS for IPSec authentication, 945-946, 1040

SSL VPN configurations, 943-946, 1038-1040

RAs (registration authorities), 872

RAS (Registration, Admission, and Status) protocol, H.323, 378

RBL (Real-time Blacklist), 706

re-imaging CSC SSM, 719-721

recovering passwords on CSC SSM, 722-724

redistribution (route)

EIGRP, 289-291

OSPF, 266-267

RIP, 249

redundancy

device-level redundancy

Active/Active redundancy, 528-531, 540-548, 553-554, 564-568

Active/Standby redundancy, 527-528, 534-540, 552-553, 560-564

interface-level redundancy

multiple-mode firewalls, 551

redundant interface guidelines, 531-533

single-mode firewalls, 550

registration authorities (RAs), 872

registry checks, 989

remote access clients, ASDM configurations

IPSec remote-access VPN, 822

L2TP over IPSec remote-access VPN, 846

Remote Access VPN icon (ASDM Configuration screen), 65

remote system management

SSH, 98-101

Telnet, 95-97

remote-access VPN (virtual private networks), 13-15

advanced features, 836

IPSec remote-access VPN, 800, 840-842

accepting clients via certificates, 910-916

ASDM configuration, 822-823

assigning IP addresses, 812-816

bypassing NAT (optional), 818

configuring user authentication, 810-812

creating ISAKMP policies, 803-804

crypto maps, 816-817

defining IPSec policies, 809

deployment scenarios, 849-860

DNS (optional), 821

enabling ISAKMP, 802-803

hardware-based VPN client configurations, 826-828

IPSec hairpinning, 831

L2TP over IPSec remote-access VPN versus, 800

load balancing, 849-855

setting up group policies, 806

setting up tunnel groups, 808

- software-based VPN client configurations*, 824
- split tunneling (optional)*, 818-819
- traffic filtering (optional)*, 817-818
- transparent tunneling*, 829-831
- troubleshooting*, 867
- tunnel default gateways*, 828
- VPN client firewalls*, 836-838
- VPN load balancing*, 833-835
- WINS (optional)*, 821
- L2TP over IPsec remote-access VPN, 843
 - ASDM configuration*, 846-848
 - IPsec hairpinning*, 856-860
 - IPsec remote-access VPN over*, 800
 - Windows client configuration*, 848
- monitoring, 860-864
- troubleshooting, 865-867
- tunnels, QoS deployments
 - ASDM configurations*, 607-608
 - CLI configurations*, 609-610
- remote-management protocols, SSH, 99
- request-method command, 396-398
- resource management, security contexts, 439-442
- resource member classes, defining (security contexts), 440-442
- retiring signatures (IPs), 680-681
- reverse proxies, 22-23
- revoking certificates, 873
- RIP (Routing Information Protocol), 240
 - authentication, 244, 251
 - configuring, 241-243
 - redistribution, 249
 - route filtering, 246-248
 - troubleshooting
 - authentication mismatches*, 251
 - blocked multicast/broadcast packets*, 251-252
 - version mismatches*, 250
- ROMMON (Read-Only-Memory Monitor), 54
 - image recovery, 105
 - password recovery process, 106, 109-111
- route filtering
 - EIGRP, 284
 - RIP, 246-248
- route redistribution
 - EIGRP, 289-291
 - OSPF, 266-267
 - RIP, 249
- route summarization, EIGRP, 287
- routed firewalls, 471
 - enabling, 484
 - transparent firewalls versus, 472-474
- routed mode (interface configuration), 70
- router advertisement transmission intervals (IPv6), 83
- routing
 - ABR routers, 252
 - asymmetric routing, Active/Active failovers, 529-531, 547
 - dynamic routing over VPN, OSPF, 270-272
 - EIGRP
 - authentication*, 285, 300
 - controlling default information*, 291-292

- defining static neighbors*, 286-287
 - enabling*, 280-284
 - route filtering*, 284
 - route redistribution*, 289-291
 - route summarization*, 287
 - split horizon*, 288
 - troubleshooting*, 292-300
 - multicast routing
 - configuring RP*, 306
 - defining IGMP version*, 304
 - enabling*, 302
 - enabling PIM*, 305
 - filtering PIM neighbors*, 307
 - GMP stub mode*, 301
 - IGMP query timeouts*, 304
 - limiting IGMP states*, 303-304
 - PIM-SM*, 302
 - static multicast routes*, 307-308
 - statically assigning IGMP groups*, 302
 - troubleshooting*, 308-310
 - OSPF, 252
 - authentication*, 262-267, 279
 - dynamic routing over VPN*, 270-272
 - enabling*, 254-258
 - neighbor command*, 270-271
 - NSSA*, 268
 - redistribution*, 266-267
 - stub areas*, 267
 - troubleshooting*, 273-279
 - Type 3 LSA filtering*, 268-270
 - virtual links*, 259-261, 264-267
 - VPN tunneling*, 272
 - RIP, 240
 - authentication*, 244, 251
 - configuring*, 241-243
 - redistribution*, 249
 - route filtering*, 246-248
 - troubleshooting*, 250-252
 - static routing, 231-233
 - displaying routing tables*, 239-240
 - monitoring*, 234-235, 238
 - Routing icon (ASDM Monitoring screen), 67
 - routing tables, displaying, 239-240
 - RP (rendezvous points), multicast routing, 306
 - RRI (reverse route injection), 272, 757-758, 775-789
 - RSA keys
 - digital certificate requests, 933, 936
 - key pairs, generating in CLI, 883-884
 - RSA SecureID (SDI), 316-317
 - RSH (Remote Shell) inspection, 407
 - RTCP (Real-Time Transport Control Protocol), H.323, 377
 - RTO (retransmission timeouts), 293
 - RTSP (Real-Time Streaming Protocol) inspection, 408
 - running configurations, 88-91, 94
- ## S
-
- SCCP (Simple Client Control Protocol) inspection, 410-411
 - SCEP (Simple Certificate Enrollment Protocol), 874
 - certificates, installing from, 878-883
 - enrollment, troubleshooting PKI, 920-921
 - scheduled upgrades, configuring for AIP-SSM, 639, 642-643

SDEE (Security Device Event Exchange), 619

SDI (SecureID), 316-317

Secure Desktop (Secure Session), 982, 992-995, 998

Secure Desktop Manager, 982

Secure PIX Firewall (Cisco), cut-through proxy feature, 330-333

authentication

customizing prompts, 335-336

timeouts, 335

troubleshooting firewall sessions, 347

secure unit authentication. *See* interactive client authentication

SecureMe

AnyConnect SSL VPN deployments, 1059

clientless SSL VPN deployments, 1017-1020

security

encryption

ACL, 747

AES, 737

firewalls

authentication, 330-336

cut-through proxy feature (Cisco Secure PIX Firewall), 330-336, 347

troubleshooting sessions, 347

live security event messages (CSC SSM), monitoring, 717

passwords, OTP, 316

signatures, customizing, 651-656

security contexts

admin context, 418-419

ASDM configuration using non-shared interfaces, 446-447

ASDM configuration using shared interfaces, 458

configuring, 435-436

MMTF deployments, 505-506

configuring, 417

admin context configuration, 435-436

allocate interfaces, 433

context descriptions, 432

enabling multiple security contexts globally, 427-429

reverting to single-mode firewall, 429

setting up system execution space, 430-432

specifying configuration URL, 434-435

user context configuration, 437

verifying virtual firewall mode, 429

deploying using non-shared interfaces, 443

ASDM configurations, 445-450

CLI configurations, 451-454

deploying using shared interfaces, 454

ASDM configurations, 456-462

CLI configurations, 462-466

managing, 438

MMTF deployments, 502

ASDM deployments, 504-510

CLI deployments, 510-514

monitoring, 466-467

packet classification, 421

non-shared interface criteria, 422

shared interface criteria, 422-424

- packet flow in multiple mode
 - forwarding with shared interfaces*, 425-426
 - forwarding without shared interfaces*, 424
- removing, 438
- resource management, 439
 - defining resource member classes*, 440-442
 - mapping member classes to contexts*, 442
- support for, 417
- system execution space, 418
 - adding user contexts to*, 432
 - ASDM configuration using non-shared interfaces*, 445
 - ASDM configuration using shared interfaces*, 456-457
 - available options table*, 417
 - MMTF deployments*, 504-505
 - monitoring output of*, 466-467
 - setting up*, 430-432
- troubleshooting
 - adding new contexts*, 468
 - connectivity issues with shared security contexts*, 469-470
 - saving contexts on FTP servers*, 469
 - saving contexts to local disks*, 468
- user context, 419
 - adding to system execution space*, 432
 - allocating interfaces*, 433
 - ASDM configuration using non-shared interfaces*, 447-450
 - ASDM configuration using shared interfaces*, 458-462
 - configuring*, 437
 - MMTF deployments*, 507-510
 - verifying number of*, 419-421
 - uses of, 415
- selective application inspection, 353-354
- SensorApp (CIPS), 621-622
- serial console connections, authentication, 329
- service account (AIP-SSM), 633
- Service attribute (ASDM), 153, 156
- service packs, applying to CIPS, 637
- service policies
 - application inspection, 352-356
 - QoS configurations via ASDM, 589
- service-based object groups, 160
- session command, 616
- setup command, 627-631
- Shared Premium licenses, 928-929, 1029-1030
- show clock command, 918
- show commands
 - multicast routing, troubleshooting, 308-309
 - show configuration command, 645-646
 - show crypto ca certificates command, 888, 918
 - show crypto ca crls command, 895
 - show crypto ca server certificate command, 901
 - show crypto ca server command, 900
 - show crypto ca server user-db allowed command, 905
 - show crypto ca server user-db command, 905
 - show crypto ca server user-db enrolled command, 905

- show crypto ca server user-db expired command, 905
- show crypto ca server user-db on-hold command, 905
- show crypto ca server user-db username command, 905
- show crypto key mypubkey rsa command, 884
- show events command, 648-649
- show firewall command, 484
- show module command, 616
- show statistics analysis-engine command, 684-685
- show statistics authentication command, 685
- show statistics command, 684-687
- show statistics event-server command, 685
- show statistics event-store command, 686
- show statistics host command, 686-687
- show statistics logger command, 687
- show version command, 643-644
- Show System Information tool (CSC SSM), 727-733**
- shunning, configuring on AIP-SSM, 659-662**
- signatures**
 - customizing, 651-656
 - disabling, 679-680
 - pattern matching, 9
 - retiring, 680-681
- single-mode firewalls**
 - interface-level redundancy, 550
 - multiple-mode firewalls versus, 419-421
- SIP (Session Initiation Protocol), inspection, 408-410**
- site-local addresses, IPv6 configuration, 82**
- site-to-site IPSec VPN (Virtual Private Networks), 13, 735**
 - configuring
 - bypassing NAT (optional), 751*
 - Connection Profiles, 753-755*
 - creating ISAKMP policies, 739-740*
 - crypto maps, 745-749*
 - defining IPSec policies, 743-745*
 - enabling ISAKMP, 739*
 - IPSec VPN Wizard, 752-753*
 - preconfiguration checklist, 736-737*
 - setting up tunnel groups, 741-743*
 - traffic filtering (optional), 749-750*
 - connection types, 764-765
 - deploying
 - fully meshed topologies with RRI, 775-789*
 - single site-to-site tunnel configuration via NAT Traversal, 769-775*
 - keepalives feature (ISAKMP), 766
 - management access, 760
 - monitoring, 789-792
 - NAT Traversal, 758-759
 - OSPF updates over IPSec, 755-756
 - packet fragmentation, 767-768
 - PFS, 761
 - Phase 1 mode, 764
 - RRI, 757-758, 775-789
 - security association lifetimes, 763-764

- Site-to-Site VPN icon (ASDM Configuration screen), 65
- troubleshooting, 793-794
 - incompatible IPSec transform sets*, 796
 - ISAKMP captures*, 797-798
 - ISAKMP proposal unacceptable*, 795
 - mismatched preshared keys*, 795
 - mismatched proxy identities*, 796-797
- tunnel default gateways, 759-760
- Skinny (SCCP) inspection**, 410-411
- smart tunnels, SSL VPN**
 - configuration, 976-978
- SMTF (single-mode transparent firewalls)**
 - deploying, 496
 - ASDM deployments*, 498-500
 - CLI deployments*, 501-502
 - packet flow, 474-476
- SMTP (Simple Mail Transfer Protocol)**
 - Content Filtering (CSC SSM), configuring, 708-709
 - ESMTP, application inspection, 363-366
 - scanning (CSC SSM)
 - Anti-spam Content Scanning*, 704-706
 - Anti-spam Email Reputation*, 706-708
 - configuring*, 701
 - incoming messages*, 701-704
- SNMP (Simple Network Management Protocol)**, 128
 - configuring, 130-133
 - inspection, 411-412
 - monitoring, 133
- software**
 - installing
 - image recovery via ROMMON*, 105
 - image upgrades via ASA CLI*, 102-104
 - image upgrades via ASDM*, 101
 - SSL VPN software requirements, 930, 1032-1033
 - upgrades, performing on CSC SSM, 726
 - zero-downtime software upgrades (failovers), 557-559
- Source attribute (ASDM)**, 153, 156, 220
- Source Service attribute (ASDM)**, 153, 156
- spam, Anti-spam Content Scanning (CSC SSM)**, 704-706
- sparse mode (PIM-SM)**, 302
- SPF (Shortest Path First) algorithm**, 252
- split horizon, EIGRP**, 288
- split tunneling**
 - AnyConnect SSL VPN, 1049-1051
 - IPSec remote-access VPN, 818-819
- SQL*Net inspection**, 412
- SRTT (smooth round-trip time)**, 293
- SSH (Secure Shell)**, 98-101
 - authentication, 327-328
 - known host list, 637
- SSL VPN (Secure Socket Layer Virtual Private Network)**, 13, 23, 923
 - ActiveX support, 930
 - administrative privileges, 931, 1034
 - AnyConnect SSL VPN, 1027
 - configuring*, 1040-1061
 - deploying*, 1059-1062

- monitoring*, 1063
- Standalone mode*, 1042
- troubleshooting*, 1063-1065
- VPN client versus*, 1028
- Web-enabled mode*, 1041
- ASA feature set, 925, 1031
- ASA placement, 931, 1034
- browser support, 930, 1032-1034
- client-based SSL VPN, 1027
 - configuring*, 1040-1061
 - deploying*, 1059-1062
 - monitoring*, 1063
 - Standalone mode*, 1042
 - troubleshooting*, 1063-1065
 - VPN client versus*, 1028
 - Web-enabled mode*, 1041
- clientless mode
 - configuring*, 947-979
 - deployment scenarios*, 1017-1020
 - enabling on an interface*, 949
 - monitoring*, 1021-1023
 - troubleshooting*, 1024-1026
 - VPN client versus*, 924
- configuring
 - application access*, 973-978
 - bookmarks*, 965-969
 - client-server plug-ins*, 979
 - digital certificate enrollment*, 931-936, 1035
 - enabling clientless SSL VPN on an interface*, 949
 - group policies*, 937-941, 1035-1036
 - logon page customization*, 951-953, 958-962
 - logout page customization*, 957
 - port forwarding*, 974-976
 - portal customization*, 949-964
 - portal page customization*, 955-957, 960, 963-964
 - smart tunnels*, 976-978
 - tunnel policies*, 937, 941-942, 1035-1037
 - user authentication*, 943-946, 1038-1040
 - web-type ACL*, 970-973
- design considerations
 - clientless SSL VPN versus VPN client*, 924
 - implementation scope*, 925, 1031
 - infrastructure planning*, 925, 1031
 - system demands*, 925, 1031
 - user connectivity*, 924-926
- full tunnel mode, 924, 1027
 - configuring*, 1040-1061
 - deploying*, 1059-1062
 - monitoring*, 1063
 - Standalone mode*, 1042
 - troubleshooting*, 1063-1065
 - VPN client versus*, 1028
 - Web-enabled mode*, 1041
- HTTPS, 21-22
- infrastructure requirements, 931, 1034
- licenses, 926
 - AnyConnect Essentials licenses*, 928, 1028-1030
 - AnyConnect Mobile licenses*, 928, 1029-1030
 - AnyConnect Premium licenses*, 928, 1028-1030
 - device associations*, 929

- Shared Premium licenses*, 928-929, 1029-1030
 - VPN Flex licenses*, 929, 1030
- software requirements, 930, 1032-1033
- Sun JRE support, 930
- supported operating systems, 930, 1032-1033
- thin client mode, 924
- user account requirements, 931, 1034
- web folder support, 930
- SSO (single sign-on)**
 - authentication, 318
 - servers, clientless SSL VPN configurations, 969
- Standalone mode (AnyConnect SSL VPN), 1042**
- standard ACL (access control lists), 144, 166**
- standby appliances (failover), 521**
- Starting IP Address attribute (ASDM), 209**
- startup configurations, 92-94**
- State Limit feature (IGMP), 303-304**
- state tables, 6**
- stateful failover, 524-526**
 - Active/Active failovers, 542-543
 - Active/Standby failovers, 538-539
- stateful inspection firewalls, 6**
- stateful links, 525**
- stateful pattern-matching recognition, 10. See also protocol analysis**
- stateless failover, 524**
- static L2F tables, adding entries to transparent firewalls, 492**
- static multicast routing, 307-308**
- static NAT (Network Address Translation), 207**
- static PAT (Port Address Translation)**
 - configuring, 213-214
 - port redirection, 212
- static routing, 231-232**
 - displaying routing tables, 239-240
 - monitoring, 234-235, 238
- static translation, network firewalls, 5**
- statistics, displaying for AIP-SSM, 684-687**
- stealth firewalls. See transparent firewalls**
- storing system logs internally/externally**
 - Flash logging, 123
 - FTP logging, 124
- strict-http command, HTTP inspection, 393**
- stub areas, OSPF, 267**
- stub mode (GMP), 301**
- Sub-configuration mode (CLI), 53**
- subinterface, configuring (ASA device setup), 73-74**
- summarization (route), EIGRP, 287**
- Sun JRE (Java Runtime Environment), SSL VPN support, 930**
- Sun RPC (Remote Procedure Call) protocol inspection, 407**
- SVC (SSL VPN Client), 1040, 1065**
- syntax (commands), displaying, 54**
- Syslog**
 - configuring for CSC SSM, 718-719
 - enabling via ASDM, 115
 - message ID tuning, 124
 - server logging, 119
 - servers, defining, 121-122
- system clocks**
 - automatic adjustments via NTP, 86

- manual adjustments
 - dates/times, 85*
 - time zones, 84*
- system execution space (security contexts), 418**
- ASDM configuration using
 - non-shared interfaces, 445*
 - shared interfaces, 456-457*
- available options table, 417
- MMTF deployments, 504-505
- monitoring output of, 466-467
- setting up, 430-432
- user contexts, adding, 432
- system information, displaying, 54-55**
- system maintenance**
 - password recovery process, 106-113
 - software installation
 - image recovery via ROMMON, 105*
 - image upgrades, 101-104*
- system monitoring**
 - NSEL, 125
 - defining NetFlow Collector, 126-127*
 - defining NetFlow export policy, 127-128*
 - SNMP, 128-133
 - system logging, 113
 - ASDM logging, 119*
 - buffered logging, 119-121*
 - console logging, 118*
 - defining email servers, 122*
 - defining event lists, 116-117*
 - defining Syslog servers, 121-122*
 - email logging, 119*
 - enabling, 114-115*

- setting up logging lists, 120-121*
- storing logs internally/externally, 123-124*
- Syslog message ID tuning, 124*
- Syslog server logging, 119*
- terminal logging, 119*

System Resources Status section (ASDM Home screen), 64

T

T.38 protocol, 382

tables

- routing tables, displaying, 239-240
- state tables, 6

TACACS+, 316

- accounting, 343
- authorization, 338

TCP (Transfer Control Protocol)

- interception, 205-206
- IPSec over UDP, IPSec remote-access VPN, 831

Telnet, 95-97, 325-327

terminals

- H.323, 376
- logging, 119

testing

- ARP tests, 524
- broadcast ping tests, 524
- failover interface tests, 523-524
- link up/down tests, 523
- network activity tests, 524

TFTP (Trivial File Transfer Protocol)

- image recovery, 105
- inspection, 412

thin client mode (SSL VPN), 924

thru-traffic filtering

ASDM, 152-154

CLI

*ACL setup, 147-151**applying ACL to an interface,
151-152***time/date**mismatches, troubleshooting PKI,
917-920

system clocks

*manual adjustments, 85**time zones, 84*time mode (authentication servers),
323Time Range attribute (ASDM),
154-156**time-based ACL (access control lists),
167, 170**

absolute function, 168

periodic function, 168

time-range configuration, 169

**title panel (SSL VPN portal page),
customizing, 955****TLS known host list, 637****TLS proxy, UC advanced support,
388-389****TLS trusted hosts, adding to
AIP-SSM, 637****to-the-box-traffic filtering, 154-156****toolbar (SSL VPN portal page),
customizing, 955****traffic classification, configuring for
Cisco ASA Botnet Traffic Filter
feature, 672-673****Traffic Direction attribute (ASDM),
153****traffic filtering**AnyConnect SSL VPN
configurations, 1054**deployment scenarios***enabling content filtering via
Websense, 190-192**filtering inbound traffic via
ACL, 185-189*

IPSec remote-access VPN, 817-818

IPv6 ACL setup, 157-158

packet filtering, 147-158, 185-192

site-to-site IPSec VPN, 749-750

thru-traffic filtering

*ASDM, 152-154**CLI, 147-152*

to-the-box-traffic filtering, 154-156

traffic policing, 579-580, 594**traffic prioritization, 579, 593****traffic shaping, 581, 595****Traffic Status section (ASDM Home
screen), 64****TransactionSource, 625****transfer-encoding type command,
HTTP inspection, 398****Translated Interface attribute
(ASDM), 207****Translated Port attribute (ASDM),
213****Translated Use IP Address attribute
(ASDM), 207****transparent firewalls, 471**

configuring

*adding static L2F table entries,
492**ARP packets, 488**BPDU, 488**CDP packets, 487**enabling ARP inspection,
492-494**enabling transparent firewalls,
483*

- guidelines for, 482*
- interface ACL, 487-489*
- IP addresses, 485*
- L2F table aging time, 496*
- MPLS, 488*
- NAT, 491*
- setting up default gateways, 487*
- setting up interfaces, 484*
- setting up routes, 486*
- MMTF
 - deploying, 496*
 - deploying with security contexts, 502-514*
 - packet flow, 477*
- monitoring, 514-516
- NAT, 479-481
- restrictions within, 479-481
- routed firewalls versus, 472-474
- SMTPF
 - deploying, 496-502*
 - packet flow, 474-476*
- troubleshooting, 516-519
- VPN, 479
- transparent tunneling, IPsec**
 - remote-access VPN**
 - IPsec over TCP, 831
 - IPsec over UDP, 830
 - NAT-T, 829-830
- Transport mode (IPsec), 20**
- Trend Micro Content Security icon (ASDM Monitoring screen), 67**
- Trend Micro website, 707**
- troubleshooting**
 - administrative connections, authentication, 344-347
 - AnyConnect SSL VPN
 - connectivity issues, 1064-1065*
 - SSL negotiations, 1063*
 - clientless SSL VPN
 - CIFS issues, 1024-1025*
 - CSD, 1025*
 - DAP, 1025-1026*
 - SSL negotiations, 1024*
 - website issues, 1024*
 - CPU, 139
 - CSC SSM
 - installation issues, 722*
 - password recovery, 722-724*
 - CSD, 1025
 - DAP, 1025-1026
 - EIGRP
 - authentication, 300*
 - commands, 292-295*
 - hello intervals, 297-300*
 - hold intervals, 297-300*
 - link failures, 296-297*
 - failovers, 572-574
 - firewall sessions, cut-through proxy feature (Cisco Secure PIX Firewall), 347
 - multicast routing
 - debug commands, 309-310*
 - show commands, 308-309*
 - OSPF
 - authentication mismatches, 279*
 - commands, 273-278*
 - mismatched areas, 279*
 - virtual links, 279*
 - packet issues
 - capturing packets, 136-138*
 - monitoring dropped packets, 138-139*
 - tracing packet flows, 136*

- PKI, 917
 - CRL retrieval*, 921
 - SCEP enrollment*, 920-921
 - time and date mismatch*, 917-920
- remote-access VPN, 865-867
- RIP
 - authentication mismatches*, 251
 - blocked multicast/broadcast packets*, 251-252
 - version mismatches*, 250
- security contexts
 - adding new contexts*, 468
 - connectivity issues with shared security contexts*, 469-470
 - saving contexts on FTP servers*, 469
 - saving contexts to local disks*, 468
- site-to-site IPSec VPN, 793-794
 - incompatible IPSec transform sets*, 796
 - ISAKMP captures*, 797-798
 - ISAKMP proposal unacceptable*, 795
 - mismatched preshared keys*, 795
 - mismatched proxy identities*, 796-797
- transparent firewalls, 516-519
- troubleshooting tools (CSC SSM), 726
 - Gather Logs, 733-734
 - Management Port Console Access Settings, 734
 - Show System Information, 727-733
- trust-point command, 908
- trusted hosts, adding to AIP-SSM, 636-637

- trustpoints, configuring, 884-889
- tuning
 - AIP-SSM with CS-MARS, 683
 - IPS, 677-681
- tunneling
 - default gateways
 - IPSec remote-access VPN*, 828
 - site-to-site IPSec VPN*, 759-760
 - IPSec remote-access VPN
 - ASDM configurations*, 822
 - setting up tunnel groups*, 808
 - L2TP over IPSec remote-access VPN, ASDM configurations, 846
 - split tunneling, IPSec remote-access VPN, 818-819
 - transparent tunneling, IPSec remote-access VPN, 829-831
 - tunnel groups (connection profiles), site-to-site VPN, 741-743
 - Tunnel mode (IPSec), 20
 - tunnel policies, SSL VPN configurations, 937, 941-942, 1035-1037
 - VPN tunneling
 - OSPF, 272
 - QoS, 587-588, 607-610

U

- UC (Unified Communications)
 - advanced support
 - Mobility Proxy, 389
 - phone proxy, 383-388
 - Presence Federation Proxy, 390
 - TLS proxy, 388-389
- UDP (User Datagram Protocol), IPSec over UDP, 830

updates, OSPF updates over IPSec,
755-756

upgrading

AIP-SSM

one-time upgrades, 638-639

scheduled upgrades,
639, 642-643

CSC SSM software, 726

images

ASA CLI, 102-104

ASDM, 101

zero-downtime software upgrades
(failovers), 557-559

URL (uniform resource locators)

blocking (CSC SSM), 695-697

configuration URL, specifying in
security contexts, 434-435

filtering, configuring, 175-177

buffering server responses, 182

caching server responses, 184

defining filtering servers,
178-180

enabling long URL support,
184

FTP filtering, 180-182

HTTP filtering, 180-182

HTTPS filtering, 180-182

Websense, 178-180

user accounts

AIP-SM

adding, 633-635

administrator account, 632

deleting, 633-635

operator account, 632

passwords, changing, 635-636

service account, 633

viewer account, 633

passwords, changing, 635

SSL VPN requirements, 931, 1034

user authentication

AnyConnect SSL VPN, 1061

IPSec remote-access VPN, 810-812

ASDM configurations, 822

Individual User

Authentication, 841

L2TP over IPSec remote-access VPN,
ASDM configurations, 847

SSL VPN configurations, 943-946,
1038-1040

user connectivity

connection profiles, clientless SSL
VPN portal customization, 960

SSL VPN, 924-926

user context (security contexts), 419

allocating interfaces, 433

configuring, 437

ASDM configuration using
non-shared interfaces,
447-450

ASDM configuration using
shared interfaces, 458-462

MMTF deployments, 507-510

system execution space, adding to,
432

verifying number of, 419-421

**user groups, clientless SSL VPN
portal customization, 957-959**

User mode (CLI), 52

user privileges, CSD, 983

V

Vault (Secure Desktop), CSD prelogin
sequences, 992-995, 998

version of CIPS software, displaying,
643-644

- viewer account (AIP-SSM), 633
- Virtual Alarm**, 622
- virtual firewalls, deploying using**
 - non-shared interfaces, 443
 - ASDM configurations*, 445-450
 - CLI configurations*, 451-454
 - shared interfaces, 454
 - ASDM configurations*, 456-462
 - CLI configurations*, 462-466
- virtual links, OSPF**, 259-261, 264-267, 279
- Virtual Sensor**, 622
- VoIP (Voice over Internet Protocol), QoS deployments**, 600
 - ASDM configurations*, 602-604
 - CLI configurations*, 605-606
- VPN (Virtual Private Networks)**, 12
 - dynamic routing over VPN, OSPF, 270-272
 - Easy VPN
 - Client (PAT) mode*, 826
 - IPSec remote-access VPN*, 824-828, 840-842
 - NEM*, 826, 842
 - Flex licenses, 929, 1030
 - GRE, 13
 - IPSec, 13-14
 - Phase 1 negotiation*, 15-17
 - Phase 2 negotiation*, 18-20
 - quick mode*, 18
 - IPSec remote-access VPN, 800, 840-842
 - ASDM configuration*, 822-823
 - assigning IP addresses*, 812-816
 - bypassing NAT (optional)*, 818
 - configuring user authentication*, 810-812
 - creating ISAKMP policies*, 803-804
 - crypto maps*, 816-817
 - defining IPSec policies*, 809
 - deployment scenarios*, 849-860
 - DNS (optional)*, 821
 - enabling ISAKMP*, 802-803
 - hardware-based VPN client configurations*, 826-828
 - IPSec hairpinning*, 831
 - L2TP over IPSec remote-access VPN versus*, 800
 - load balancing*, 833-835, 849-855
 - monitoring*, 860-864
 - setting up group policies*, 806
 - setting up tunnel groups*, 808
 - software-based VPN client configurations*, 824
 - split tunneling (optional)*, 818-819
 - traffic filtering (optional)*, 817-818
 - transparent tunneling*, 829-831
 - troubleshooting*, 865-867
 - tunnel default gateways*, 828
 - VPN client firewalls*, 836-838
 - VPN load balancing*, 833-835
 - WINS (optional)*, 821
 - L2F, 13
 - L2TP, 13
 - L2TP over IPSec remote-access VPN, 843
 - ASDM configuration*, 846-848, 856-858
 - CLI configuration, IPSec hairpinning*, 858-860
 - IPSec remote-access VPN over*, 800

MPLS, 13

NAT-T, 18

PPTP, 13

remote-access VPN, 13-15. *See also*
IPSec remote-access VPN, L2TP
over IPSec remote-access VPN
monitoring, 860-864
troubleshooting, 865-867

site-to-site IPSec VPN, 735
bypassing NAT (optional), 751
Connection Profiles, 753-755
connection types, 764-765
creating ISAKMP policies,
739-740
crypto maps, 745-749
defining IPSec policies,
743-745
enabling ISAKMP, 739
fully meshed topologies with
RRI, 775-789
IPSec VPN Wizard, 752-753
keepalives feature (ISAKMP),
766
management access, 760
monitoring, 789-792
NAT Traversal, 758-759
OSPF updates over IPSec,
755-756
packet fragmentation, 767-768
PFS, 761
Phase 1 mode, 764
preconfiguration checklist,
736-737
RRI, 757-758, 775-789
security association lifetimes,
763-764
setting up tunnel groups,
741-743

*single site-to-site tunnel config-
uration via NAT Traversal*,
769-775

traffic filtering (optional),
749-750

troubleshooting, 793-798

tunnel default gateways,
759-760

site-to-site VPN, 13

SSL, 13

SSL VPN, 21-23

transparent firewalls, 479

tunneling

OSPF, 272

QoS, 587-588, 607-610

VPN clients

accepting via certificates,
910-916

clientless SSL VPN versus, 924

firewalls, IPSec remote-access
VPN, 836-838

VPN icon (ASDM Monitoring
screen), 66

VPN Sessions section (ASDM Home
screen), 64

W

WAAS (Wide Area Application
Services) inspection, 413

watch lists, 663

web folders, SSL VPN support, 930

web-based features (CSC SSM)

configuring, 694

file blocking, 697-698

HTTP scanning, 699-701

URL blocking, 695-697

Web-enabled mode (AnyConnect SSL
VPN), 1041

web-type ACL (access control lists)

defining, 972

SSL VPN configuration, 970-973

Web-Type ACL tab (ASDM), DAP configurations, 1013

webification, SSL VPN, 22**Websense**

content filtering, 190-192

URL filtering, 178-180

websites

clientless SSL VPN

*configuring, 966-967**troubleshooting, 1024*

Trend Micro, 707

Webtype ACL (access control lists), 146**Windows NT authentication, 317****WINS (Windows Internet Name Service)**

AnyConnect SSL VPN assignments, 1052

IPSec remote-access VPN, 821

WINS (Windows Internet Naming Server) servers, defining, 968**wizards**Failover Wizard (ASDM),
configuring, 548-549IPSec VPN Wizard, site-to-site IPSec
VPN, 752-753**zero-day attacks, 12**zero-downtime software upgrades
(failovers), 557-559

zones, 668

X - Y - Z

X.509 standard, 870**XDMCP (X Display Management
Control Protocol) inspection, 413**