



Cisco AnyConnect Secure Mobility Client Administrator Guide, Release 3.1

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APPENDIX B

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About this Guide

This guide describes how to install the Cisco AnyConnect Secure Mobility client image onto the central-site ASA, configure AnyConnect for deployment to remote user computers, configure connection profiles and group policies on ASDM for AnyConnect, install AnyConnect onto mobile devices, and monitor and troubleshoot AnyConnect connections.

Throughout this guide, the term “ASA” applies to all models in the Cisco ASA 5500 series (ASA 5505 and higher).

Audience

- This guide is for administrators who perform any of the following tasks:
- Manage network security
 - Install and configure ASAs
 - Configure VPNs

Conventions

This document uses the following conventions:

Convention	Indication
bold font	Commands and keywords and user-entered text appear in bold font .
<i>italic font</i>	Document titles, new or emphasized terms, and arguments for which you supply values are in <i>italic font</i> .
[]	Elements in square brackets are optional.
{ x y z }	Required alternative keywords are grouped in braces and separated by vertical bars.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
<code>courier font</code>	Terminal sessions and information the system displays appear in <code>courier font</code> .
< >	Nonprinting characters such as passwords are in angle brackets.

[]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

**Note**

Means *reader take note*.

**Tip**

Means *the following information will help you solve a problem*.

**Caution**

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

**Timesaver**

Means *the described action saves time*. You can save time by performing the action described in the paragraph.

Related Documents

- [AnyConnect Secure Mobility Client 3.0 Release Notes](#)
- [AnyConnect Secure Mobility Client Features, Licenses, and OSs, Release 2.5](#)
- [Cisco ASA 5500 Series Adaptive Security Appliances Release Notes](#)
- [Cisco ASA 5500 Series Adaptive Security Appliances Install and Upgrade Guides](#)
- [Cisco ASA 5500 Series Adaptive Security Appliances Configuration Guides](#)
- [Cisco ASA 5500 Series Adaptive Security Appliances Command References](#)
- [Cisco ASA 5500 Series Adaptive Security Appliances Error and System Messages](#)
- [Cisco Adaptive Security Device Manager Release Notes](#)
- [Cisco Adaptive Security Device Manager Configuration Guides](#)
- [Online help for ASDM](#)
- [Cisco Secure Desktop Release Notes](#)
- [Cisco Secure Desktop Configuration Guides](#)
- For Open Source License information for this product, go to http://www.cisco.com/en/US/products/ps6120/products_licensing_information_listing.html.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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Introduction to the AnyConnect Secure Mobility Client

The Cisco AnyConnect Secure Mobility client is the next-generation VPN client, providing remote users with secure IPsec (IKEv2) or SSL VPN connections to the Cisco 5500 Series Adaptive Security Appliance (ASA). AnyConnect provides end users with a connectivity experience that is intelligent, seamless and always-on, with secure mobility across today's proliferating managed and unmanaged mobile devices.

Deployable from the ASA or from Enterprise Software Deployment Systems

AnyConnect can be deployed to remote users from the ASA or using enterprise software deployment systems. When deployed from the ASA, remote users make an initial SSL connection to the ASA by entering the IP address or DNS name in their browser of an ASA configured to accept clientless SSL VPN connections. The ASA presents a login screen in the browser window, and if the user satisfies the login and authentication, downloads the client that matches the computer operating system. After downloading, the client installs and configures itself and establishes an IPsec (IKEv2) or SSL connection to the ASA.

Customizable and Translatable

You can customize the AnyConnect to display your own corporate image to remote users. You can rebrand AnyConnect by replacing our default GUI components, deploy a transform you create for more extensive rebranding, or deploy your own client GUI that uses the AnyConnect API. You can also translate messages displayed by AnyConnect or the installer program in the language preferred by the remote user.

Easily Configured

Using ASDM, you can easily configure AnyConnect features in the client profile—an XML file that provides basic information about connection setup, as well as advanced features such as Start Before Logon (SBL). For some features, you also need to configure the ASA. The ASA deploys the profile during AnyConnect installation and updates.

Additional Supported Modules

The Cisco AnyConnect Secure Mobility client, Version 3.1, integrates these modules into the AnyConnect client package:

- **AnyConnect Network Access Manager**—(Formerly called the Cisco Secure Services Client) This module provides the detection and selection of the optimal Layer 2 access network and performs device authentication for access to both wired and wireless networks.
- **AnyConnect Posture Assessment**—Provides the AnyConnect Secure Mobility Client the ability to identify the operating system, antivirus, antispyware, and firewall software installed on the host prior to creating a remote access connection to the ASA. Based on this prelogin evaluation, you can control which hosts are allowed to create a remote access connection to the security appliance. The Host Scan application is delivered with the posture module and is the application that gathers this information.
- **AnyConnect Telemetry**—Sends information about the origin of malicious content detected by the antivirus software to the web filtering infrastructure of the Cisco IronPort Web Security Appliance (WSA), which uses this data to provide better URL filtering rules.
- **AnyConnect Web Security**—Routes HTTP traffic to the ScanSafe Web Security scanning proxy server for content analysis, detection of malware, and administration of acceptable use policies.
- **AnyConnect Diagnostic and Reporting Tool (DART)**—Captures a snapshot of system logs and other diagnostic information and creates a .zip file on your desktop so you can conveniently send troubleshooting information to Cisco TAC.
- **AnyConnect Start Before Logon (SBL)**—Starts AnyConnect before the Windows dialog box appears and forces the user to connect to the enterprise infrastructure over a VPN connection before logging on to Windows by starting AnyConnect before the Windows login dialog box appears.
- **AnyConnect Customer Experience Feedback**—This feature provides Cisco with client information that gives us insight into the user experience statistics, the basis of crash incidents, and so on, so that software quality and user experience are further improved.

This chapter includes the following sections:

- [AnyConnect License Options, page 1-2](#)
- [Standalone and WebLaunch Options, page 1-6](#)
- [Configuration and Deployment Overview, page 1-7](#)
- [AnyConnect Secure Mobility Feature Configuration Guidelines, page 1-7](#)
- [API, page 1-8](#)

AnyConnect License Options

Overview

The AnyConnect Secure Mobility client requires license activation to support VPN sessions and web security. The license(s) required depend on the AnyConnect VPN Client and Secure Mobility features that will be used, and the number of sessions you want to support. One or more of the following AnyConnect licenses may be required for your deployment:

License	Description	Applied to:
AnyConnect Essentials	Supports basic AnyConnect features for SSL and IPSec VPN connections. This license specifies the maximum number of remote access sessions supported at a time.	Cisco ASA 8.0(x) or later.
AnyConnect Premium	Supports all basic AnyConnect Essentials features plus Premium AnyConnect client features such as browser-based VPN access, and Cisco Secure Desktop, and Host Scan/Posture module functions. This license specifies the maximum number of remote access sessions supported at a time, this license type can also be shared.	Cisco ASA 8.0(x) or later.
AnyConnect Mobile	Supports AnyConnect mobile access to the security appliance. It is available as an addition to, and requires, either an AnyConnect Essentials or an AnyConnect Premium license.	Cisco ASA 8.0(x) or later.
AnyConnect Flex	A flex license provides business continuity support for all licensed features.	Cisco ASA 8.0(x) or later
Advanced Endpoint Assessment	Enables advanced endpoint assessment capabilities such as auto-remediation. Requires an activated AnyConnect Premium license.	Cisco ASA
Cisco Secure Mobility for AnyConnect	Supports web security features provided by the Cisco IronPort Web Security Appliance (WSA). The license name depends on the AnyConnect license activated on the ASA, Essentials or Premium. A Cisco IronPort Web Security Appliance license is also required.	Cisco WSA 7.0 or later.
Cisco Secure Mobility for Cisco Cloud Web Security	Supports security features provided with the AnyConnect Web Security module allowing roaming users to be protected by Cisco Cloud Web Security (ScanSafe). This license is required in addition to Cisco Cloud Web Security Web Filtering and/or Cisco Cloud Web Security Malware Scanning license.	.

AnyConnect Essentials and Premium Licenses

- You can activate either an AnyConnect Essentials license or an AnyConnect Premium license on a Cisco ASA 8.0(x) or later, but you cannot activate both licenses together. Some features require later versions of the ASA, as indicated in the Features Table. Choose the license you will activate based on the AnyConnect Secure Mobility features you will use.
- In addition to AnyConnect connectivity, an AnyConnect Essentials activated on the ASA supports sessions established using Cisco's legacy VPN Client, and full tunneling access to enterprise applications. Clientless VPN access and Cisco Secure Desktop are not available with an AnyConnect Essentials license.
- An ASA activated with an AnyConnect Premium license supports all access allowed by the AnyConnect Essentials license plus the following AnyConnect premium features:
 - Clientless VPN access: Allows a remote user to use a browser to establish a VPN session, and lets specific applications use the browser to access that session.
 - Cisco Secure Desktop: For both browser-based and AnyConnect sessions.
 - Post Log-in Always-on VPN: Always-on establishes a VPN session automatically after the user logs in to a computer. For more information, see [Always-on VPN](#). This feature also includes a Connect Failure policy and Captive Portal Hotspot Detection and Remediation.

**Note**

Always-on can also be enabled by activating a Cisco Secure Mobility for AnyConnect license on the WSA with an AnyConnect Essentials license on the ASA.

- Endpoint assessment: Ensures that your choice of antivirus software versions, antispyware versions, associated update definitions, firewall software versions, and corporate property verification checks comply with policies to qualify a session to be granted access to the VPN.
Endpoint remediation requires an Advanced Endpoint Assessment License in addition to the AnyConnect Premium License as described below.
- Quarantine: Using Dynamic Access Policies to quarantine non-compliant AnyConnect users. User can be notified with a custom message.
- Neither the AnyConnect Essentials or Premium license is required for:
 - The Network Access Manager module. It is licensed without charge for use with Cisco wireless access points, wireless LAN controllers, switches, and RADIUS servers. A current SmartNet contract is required on the related Cisco equipment.
 - The DART module and Customer Feedback function.

AnyConnect Mobile License

The activation of an AnyConnect Mobile license on the ASA supports mobile access but does not provide support for AnyConnect features. It is available as an option with either an AnyConnect Essentials or an AnyConnect Premium license.

AnyConnect 3.1 does not currently support mobile devices, this license will need to be activated on the ASA if you expect connectivity from Android or Apple iOS devices running older versions of AnyConnect.

AnyConnect Flex License

An AnyConnect Flex license provides business continuity support for licensed features only. Business continuity increases the number of licensed remote access VPN sessions to prepare for temporary spikes in usage during cataclysmic events such as pandemics. Each Flex license is ASA-specific and provides support for sixty days. The count can consist of both contiguous and noncontiguous days.

Advanced Endpoint Assessment License

An Advanced Endpoint Assessment license must be activated in conjunction with an AnyConnect Premium license. It allows the initiation of endpoint remediation.

Endpoint remediation is initiated when a connection has been disallowed by Dynamic Access Policies (DAPs) on the ASA. Endpoint remediation attempts to remediate various aspects of antivirus, antispyware and personal firewall protection on the endpoint, only if that software allows a separate application to initiate remediation. If the endpoint remediation is successful, DAP will allow a subsequent connection.

Cisco Secure Mobility for AnyConnect License

A Cisco Secure Mobility for AnyConnect license activated on the WSA provides services for browser-based SSL sessions and AnyConnect VPN sessions such as:

- Malware defense.
- Acceptable use policy enforcement.
- Data leakage prevention for the web.
- Protecting endpoints from websites found to be unsafe by granting or denying all HTTP and HTTPS requests.
- Providing administrator access to Internet usage reports for all VPN sessions.

The Cisco Secure Mobility for AnyConnect license must be activated as follows:

- A Cisco Secure Mobility for AnyConnect Premium license activation on the WSA requires activation of either an AnyConnect Premium or an AnyConnect Essentials license on the ASA.
- A Cisco Secure Mobility for AnyConnect Essentials license activation on the WSA requires activation of an AnyConnect Essentials license on the ASA. You cannot use a Cisco Secure Mobility for AnyConnect Essentials license activated on a WSA in combination with an AnyConnect Premium license activated on an ASA.



Note Post Log-in Always-on VPN, a Premium feature, can be enabled by activating a Cisco Secure Mobility for AnyConnect license on the WSA with an AnyConnect Essentials license on the ASA.

- The Cisco Secure Mobility for AnyConnect license activated on the WSA must match or exceed the number of VPN sessions supported by the AnyConnect license activated on the ASA.

This Cisco Secure Mobility license for AnyConnect, Premium or Essentials, is in addition to the activated Cisco IronPort Web Security Appliance license.

For more information, see the [Cisco IronPort Web Security Appliances Introduction](#).

Combining AnyConnect Licenses

Sessions License	License Option	Basic Access	Mobile Access	Client-less Access	Post Log-in Always-on VPN	Malware Defense, Acceptable Use Policy Enforcement, and Data Leakage Prevention on the Web	Endpoint Assessment	Endpoint Remediation
AnyConnect Essentials	(base license)	✓						
+	AnyConnect Mobile	✓	✓					
+	Cisco Secure Mobility for AnyConnect Essentials	✓	✓		✓	✓		
+	AnyConnect Flex ¹	✓	✓		✓	✓		
AnyConnect Premium SSL VPN Edition	(base license)	✓		✓	✓		✓	
+	AnyConnect Mobile	✓	✓	✓	✓		✓	
+	Cisco Secure Mobility for AnyConnect Premium	✓	✓	✓	✓	✓	✓	
+	Advanced Endpoint Assessment	✓	✓	✓	✓	✓	✓	✓
+	AnyConnect Flex ¹	✓	✓	✓	✓	✓	✓	✓

1. A flex license provides business continuity support for mobile access, malware defense, acceptable use policy enforcement, data leakage prevention on the web, and endpoint remediation features only if those features are licensed.

Standalone and WebLaunch Options

The user can use AnyConnect in the following modes:

- Standalone mode—Lets the user establish an AnyConnect connection without using a web browser. If you have permanently installed AnyConnect on the user's PC, the user can run in standalone mode. In standalone mode, a user opens AnyConnect just like any other application and enters the username and password credentials into the fields of the AnyConnect GUI. Depending on how you

configure the system, the user might also be required to select a group. When the connection is established, the ASA checks the version of AnyConnect on the user's PC and, if necessary, the client downloads the latest version.

- **WebLaunch mode**—Lets the user enter the URL of the ASA in the Address or Location field of a browser using the HTTPS protocol. The user then enters the username and password information on a Logon screen, selects the group, and clicks **Submit**. If you have specified a banner, that information appears, and the user acknowledges the banner by clicking **Continue**.

The portal window appears. To start AnyConnect, the user clicks **Start AnyConnect** on the main pane. A series of documentary windows appears. When the Connection Established dialog box appears, the connection is working, and the user can proceed with online activities.

If you configure the ASA to deploy the AnyConnect package, you ensure that the ASA is the single point of enforcement as to which versions of AnyConnect can establish a session, even if you deploy AnyConnect with an enterprise software deployment system. When you load an AnyConnect package on the ASA, you enforce a policy to which only versions as new as the one loaded on the ASA can connect. AnyConnect upgrades itself when it connects to the ASA. Alternatively, you can deploy a local policy file that specifies whether the client bypasses the client downloader, eliminating the requirement for the client package file on the ASA. However, other features such as weblaunch and automatic updates are disabled.

Configuration and Deployment Overview

Use the AnyConnect Profile editor to configure the AnyConnect features in the profile file; then configure the ASA to download this file along with AnyConnect client automatically when users make a VPN connection to the ASA with a browser. The profile file drives the display in the user interface and defines the names and addresses of host computers. By creating and assigning different profiles to group policies configured on the ASA, you can differentiate access to these features. Following assignment to the respective group policies, the ASA automatically pushes the profile assigned to the user upon connection setup.

Profiles provide basic information about connection setup, and users cannot manage or modify them. The profile is an XML file that lets you identify the secure gateway (ASA) hosts that you want to make accessible. In addition, the profile conveys additional connection attributes and constraints on a user. For some features, you can specify some settings in the profile as user controllable. The AnyConnect GUI displays controls for these settings to the end user.

If a user has a single profile file, this profile contains all the hosts needed by a user, and additional settings as needed. In some cases, you might want to provide more than one profile for a given user. For example, someone who works from multiple locations might need more than one profile. Be aware, however, that some of the profile settings, such as Start Before Login, control the connection experience at a global level. Other settings, such as those unique to a particular host, depend on the host selected.

Alternatively, you can use an enterprise software deployment system to install the profile file and client as an application on computers for later access.

AnyConnect Secure Mobility Feature Configuration Guidelines

AnyConnect Secure Mobility is a set of features you can configure to optimize the security of the VPN endpoints. To configure all of the AnyConnect secure mobility client options, refer to the following sections:

-
- Step 1** Go to the section “Configuring WSA Support of the AnyConnect Secure Mobility Solution” on page 17 of the [Cisco AnyConnect Secure Mobility Solution Guide](#) as a guide to configuring a WSA to support AnyConnect.
- Step 2** Use the AnyConnect Profile Editor to configure the following features:
- [Trusted Network Detection, page 3-22](#)
 - [Always-on VPN, page 3-24](#)
 - [Disconnect Button for Always-on VPN, page 3-29](#)
 - [Connect Failure Policy for Always-on VPN, page 3-31](#)
 - [Captive Portal Hotspot Detection and Remediation, page 3-33](#)
 - [Configuring Certificate Enrollment using SCEP, page 3-42](#)
-

API

Use the Application Programming Interface (API) if you want to automate a VPN connection with AnyConnect from another application, including the following:

- Preferences
- Set tunnel-group method

The API package contains documentation, source files, and library files to support a C++ interface for AnyConnect. You can use libraries and example programs for building AnyConnect on Windows, Linux, and Mac OS X. The API package includes project files (Makefiles) for the Windows platform. For other platforms, a platform-specific script shows how to compile the example code. You can link your application (GUI, CLI, or embedded application) with these files and libraries.

The API supports only the VPN functionality of the client. It does not support the optional AnyConnect modules, such as the Network Access Manager, Web Security, and telemetry.

AnyConnect Accessibility

AnyConnect provides functionality for users that allows them to access buttons on the window without using a mouse.

The following navigation shortcuts assist visually impaired or blind attendants to use the application.

Keystroke	Action
Alt	Moves focus to the browser menu bar.
Enter	Chooses the item with focus.
Alt+arrow keys	Moves between browser menus.
Alt+underlined letter	Takes you to the menu.
Spacebar	Toggles control; for example, checks and unchecks a check box.
Tab	Moves focus to the next item in the tab order or to next control group.
Shift+Tab	Moves focus to the previous item or group in the tab order.

Keystroke	Action
Arrow keys	Moves among controls within a group.
Home	Moves to the top of the window if more than one screenful of information exists. Moves to the beginning of a line of user-entered text.
End	Moves to the end of a line of user-entered text. Moves to the bottom of the window if more than one screenful of information exists.
Page Up	Scrolls up one screen.
Page Down	Scrolls down one screen.



Deploying the AnyConnect Secure Mobility Client

You can deploy the Cisco AnyConnect Secure Mobility client to remote users from the ASA or by using enterprise software management systems (SMS). These two pre-deploy or web-deploy scenarios are explained in this chapter.

The VPN tunnel is initiated by either the standalone launch, where the AnyConnect client starts the downloader process based on the VPN API components, or the web launch, where the ActiveX/Java components launch the downloader process from a clientless portal through a web browser.

This chapter contains a description of all AnyConnect package filenames:

- For Windows, we provide a standard Windows installer file (.msi) for each module. These files are installed with a Windows utility called msixec. To reduce the file size of the installer particularly for web-deploy scenarios, we also may offer self-extracting .exe files which contain these .msi files.
- For Mac OS X, we provide disk images that contain OS X standard .pkg (or .mpkg) installers which are installed with the OS X installer utility.
- For Linux, we provide .tgz files which are GZIP compressed Tar archive files. The archive contains installation files and an install script that copies files to the proper location.

In addition to the core AnyConnect VPN client that provides SSL and IPsec (IKEv2) secure VPN connections to the ASA, version 3.1 has the following modules:

- Network Access Manager
- Posture Assessment
- Telemetry
- Web Security
- AnyConnect Diagnostic and Reporting Tool (DART)
- Start Before Logon (SBL)

Introduction to the AnyConnect Client Profiles

Cisco AnyConnect Secure Mobility client features are enabled in the AnyConnect profiles. These profiles contain configuration settings for the core client VPN functionality and for the optional client modules Network Access Manager, posture, telemetry, and Web Security. The ASA deploys the profiles during AnyConnect installation and updates. Users cannot manage or modify profiles.

Profiles are created using the AnyConnect profile editors, which are GUI-based configuration tools launched from ASDM. There are also standalone versions of the profile editors for Windows that you can use as an alternative to the profile editors integrated with ASDM. If you are predeploying the client, you can use the standalone profile editors to create profiles for the VPN service and other modules that you deploy to computers using your software management system.

Complete installation of the profile editor also provides standalone editors for Network Access Manager, Web Security, Telemetry, Customer Experience Feedback Module, and the AnyConnect client local policy.

**Note**

Cisco recommends that you use the profile editor rather than manually editing the client profile XML files, for reasons of security.

You can configure the ASA to deploy profiles globally for all AnyConnect users or to users based on their group policy. Usually, a user has a single profile file for each AnyConnect module installed. In some cases, you might want to provide more than one VPN profile for a user. Someone who works from multiple locations might need more than one VPN profile. Be aware that some of the profile settings, such as Start Before Logon, control the connection experience at a global level. Other settings are unique to a particular group policy and depend on which group policies were downloaded to the client.

**Note**

When multiple servers are available to a connection profile, AnyConnect merges the server lists in the profiles and displays all servers in a drop-list. When the user chooses a server, AnyConnect uses the profile that server appears in. However, once connected, it uses the profile configured on that ASA.

Some profile settings are stored locally on the user's computer in a user preferences file or a global preferences file. The user file has information the AnyConnect client needs to display user-controllable settings in the Preferences tab of the client GUI and information about the last connection, such as the user, the group, and the host.

During web deploy, the downloader copies the AnyConnect profiles configured on an ASA to the proper place on the end user's device. Now during pre-deploy, you can place the profiles in specifically named directories co-located with the .msi files, and the installer automatically copies those to the proper locations when it runs.

The global file has information about user-controllable settings so that you can apply those settings before login (since there is no user). For example, the client needs to know if Start Before Logon and/or AutoConnect On Start are enabled before login. For information about filenames and paths for each operating system, see [Table 2-12, Profile Locations for All Operating Systems](#). For more information about creating client profiles, see these sections:

- [Creating and Editing an AnyConnect Client Profile Using the Integrated AnyConnect Profile Editor, page 2-2](#)
- [Using Standalone AnyConnect Profile Editor, page 2-34](#)

Creating and Editing an AnyConnect Client Profile Using the Integrated AnyConnect Profile Editor

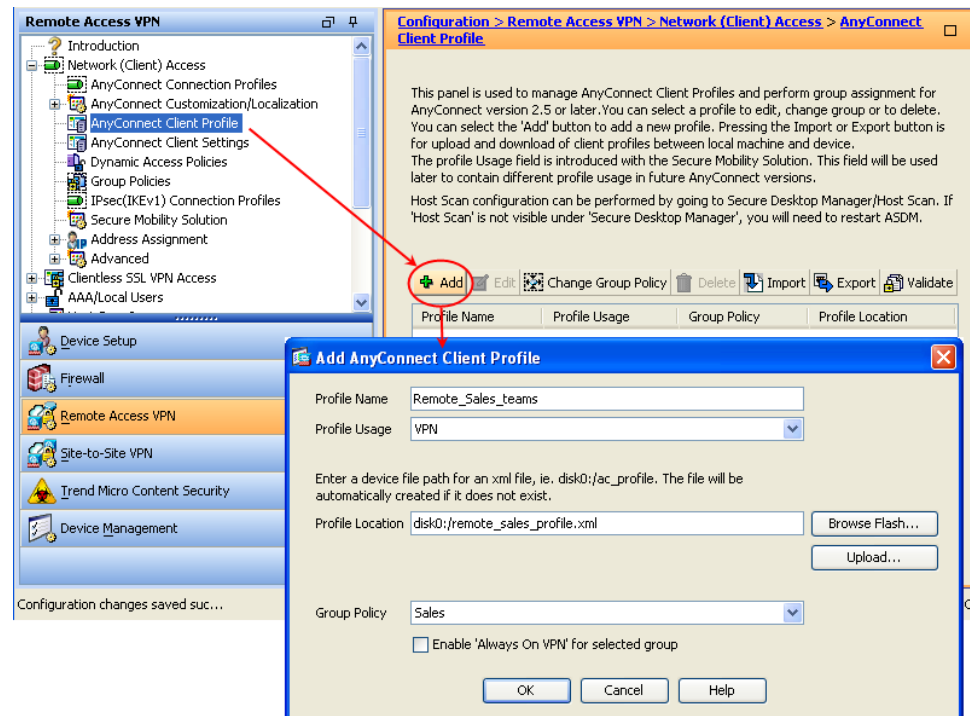
This section describes how to launch the profile editor from ASDM and create a new profile.

The Cisco AnyConnect Secure Mobility client software package contains the profile editor, for all operating systems. ASDM activates the profile editor when you load the AnyConnect client image on the ASA.

If you load multiple AnyConnect packages, ASDM activates the client profile editor from the newest AnyConnect package. This approach ensures that the editor displays the features for the newest AnyConnect loaded, as well as the older clients.

- Step 1** If you have not already done so, load an AnyConnect client image on the ASA.
See [Configuring the ASA to Download AnyConnect](#), page 2-13.
- Step 2** Go to **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**. The AnyConnect Client Profile pane opens. Click **Add**. The Add AnyConnect Client Profile window opens.

Figure 2-1 Adding an AnyConnect Profile



- Step 3** Specify a name for the profile. Unless you specify a different value for Profile Location, ASDM creates the client profile file on the ASA flash memory with the same name.
- Step 4** In the Profile Usage field, identify the type of client profile you are creating: AnyConnect VPN Profile, Network Access Manager Service Profile, Web Security Service Profile, Telemetry Service Profile, or Customer Experience Feedback Profile.
- Step 5** Choose a group policy (optional). The ASA applies this profile to all AnyConnect users in the group policy.
- Step 6** Click **OK**. ASDM creates the profile, and the profile appears in the table of profiles.
- Step 7** Select the profile you just created from the table of profiles. Click **Edit**. The profile editor displays.
- Step 8** Enable AnyConnect features in the panes of the profile editor. When you finish, click **OK**.
- Step 9** Click **Apply** and then click **Save**.

Step 10 Close ASDM and relaunch it.

Deploying AnyConnect Client Profiles

- [Deploying AnyConnect Client Profiles from the ASA, page 2-4](#)
- [Deploying Client Profiles Created by the Standalone Profile Editor, page 2-5](#)

Deploying AnyConnect Client Profiles from the ASA

Follow these steps to configure the ASA to deploy a profile with AnyConnect:

Step 1 Create a client profile using the [“Creating and Editing an AnyConnect Client Profile Using the Integrated AnyConnect Profile Editor”](#) section on page 2-2.

Step 2 Use the profile editor integrated with ASDM to create client profiles for the modules you want to install. See these chapters for instructions on configuring various client profiles:

- [Chapter 3, “Configuring VPN Access”](#)



Note

You must include the ASA in the VPN profile server list for the client GUI to display all user controllable settings on the first connection. Otherwise, filters are not applied. For example, if you create a certificate match and the certificate properly matches the criteria, but the ASA is not a host entry in that profile, the match is ignored. For more information, see the [“Configuring a Server List”](#) section on page 3-57.

- [Chapter 4, “Configuring Network Access Manager”](#)
- [Chapter 6, “Configuring Web Security”](#)
- [Chapter 7, “Configuring AnyConnect Telemetry to the WSA”](#)
- [Chapter 8, “Using Cisco AnyConnect Customer Experience Feedback Module”](#)
- [AnyConnect Local Policy Parameters and Values](#) in [Chapter 9, “NGE, FIPS and Additional Security”](#)

Step 3 Associate a client profile with a group policy. In ASDM, go to **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**.

Step 4 Select the client profile you want to associate with a group and click **Change Group Policy**.

Step 5 In the **Change Group Policy for Profile *policy name*** window, select the group policy from the Available Group Policies field and click the right arrow to move it to the Selected Group Policies field.

Step 6 Click **OK**.

Step 7 In the AnyConnect Client Profile page, click **Apply**.

Step 8 Click **Save**.

Step 9 When you have finished with the configuration, click **OK**.

Deploying Client Profiles Created by the Standalone Profile Editor

See [Using an SMS to Predeploy AnyConnect Modules, page 2-23](#) for instructions on deploying the client profiles you created using the standalone profile editor. See [Using Standalone AnyConnect Profile Editor, page 2-34](#) for instructions on installing and using the Standalone AnyConnect Profile Editor.

Web Deploying AnyConnect

The Cisco AnyConnect Secure Mobility client, version 3.1, integrates modules into the AnyConnect client package. If you are using the ASA to deploy AnyConnect, the ASA can also deploy all the optional modules. In web deploy scenarios, installs and upgrades are performed automatically by the AnyConnect downloader from packages deployed on ASA headends. In this scenario, the downloader is launched by an already installed AnyConnect client (standalone) or by ActiveX/Java components (web launch).

When deployed from the ASA, remote users make an initial SSL connection to the ASA. In their browser, they enter the IP address or DNS name of an ASA configured to accept clientless SSL VPN connections. The ASA presents a login screen in the browser window, and if the user satisfies the login and authentication, downloads the client that matches their computer's operating system. After downloading, the client installs and configures itself and establishes an IPsec (IKEv2) or SSL connection to the ASA.

- [AnyConnect File Packages for ASA Deployment, page 2-7](#)
- [Ensuring Successful AnyConnect Installation, page 2-7](#)
- [Configuring the ASA to Download AnyConnect, page 2-13](#)
- [Enabling Modules for Additional Features, page 2-17](#)
- [Modifying Installer Behavior When Web Deploying, page 2-13](#)

Requirements

Web Deployment uses code-signing for verification. The root certificate for AnyConnect's code signing certificate is issued by VeriSign, and has the Common Name of: "VeriSign Class 3 Public Primary Certification Authority - G5".

The availability and proper configuration of this certificate varies by the client's operating system.

Windows

The Trusted Root Certification Authorities certificate store must have the VeriSign root CA certificate for AnyConnect's code signing certificate installed and trusted for software makers. This certificate is normally installed by Microsoft's operating system update, and should require no user or administrator action.

OS X

The System Keychain must have the VeriSign root CA certificate for AnyConnect's code signing certificate installed and trusted for software makers. This is normally installed by Apple's operating system update, and should not require user or administrator action.

Linux

The PEM certificate file store must have the Verisign root CA certificate installed and trusted for software makers. The Verisign root CA certificate is stored in the PEM certificate file store when AnyConnect is installed, starting with AnyConnect version 3.0.3, and is located at `/opt/.cisco/certificates/ca`.

If the certificate is not in the store, then Web Deployment on Linux requires that:

Step 1 Firefox is installed

Step 2 The trust settings of the Verisign Class 3 Public Primary Certification Authority - G5 root certificate authority include trust for identifying software makers.

Modern versions of Firefox contain this Verisign root CA certificate. After the AnyConnect client is installed, no additional user or administrator action is required. This requirement for the Firefox certificate store does not apply to pre-deploy (manual) installation of the 3.1 AnyConnect client on Linux.

If the certificate and trust are not correct, Web Deployment fails to install the client, and the AnyConnect web portal displays a link for users to manually download and install the client. Users can either edit the trust settings in their Firefox browser, and try again, or simply download the client and install it themselves. During installation, the client configures the PEM store with the Verisign root, verifies the code signing certificate, and configures the Verisign root. When AnyConnect launches, it uses the Verisign root in the PEM store for code signing verification.

To set trust in Firefox for Linux web deployment

1. In the Firefox tool bar, select **Edit->Preferences**.
2. Select the **Advance** tab, then choose the **Encryption** sub-tab.
3. Choose **View Certificates**, and then select the **Authorities** tab.
4. Scroll down and select **Verisign Class 3 Public Primary Certification Authority - G5**.
5. Click **Edit Trust**, and check **This certificate can identify software makers**.

Limitations

- If your ASA has only the default internal flash memory size or the default DRAM size (for cache memory), you could have problems storing and loading multiple AnyConnect client packages on the ASA. Even if you have enough space on flash to hold the package files, the ASA could run out of cache memory when it unzips and loads the client images. For more information about the ASA memory requirements when deploying AnyConnect, and possibly upgrading the ASA memory, see the latest release notes for the Cisco ASA 5500 Series.
- If you are upgrading legacy clients or optional modules, the following occurs:
 - All previous versions of the core client are upgraded and all VPN configurations are retained.
 - Cisco SSC 5.x is upgraded to the Network Access Manager module, retaining all SSC configurations for use with the Network Access Manager and removing SSC 5.x.
 - Host scan files used by Cisco Secure Desktop are upgraded, and the two can coexist.
 - Cisco IPsec VPN client is not upgraded or removed; however, the two can coexist.
 - ScanSafe Web Security functionality is not upgraded and cannot coexist. You must uninstall AnyWhere+.

AnyConnect File Packages for ASA Deployment

Table 2-1 shows the AnyConnect file package names for deploying AnyConnect with the ASA:

Table 2-1 *AnyConnect Package Filenames for ASA Deployment*

OS	AnyConnect 3.1 Web-Deploy Package Name Loaded onto ASA
Windows	anyconnect-win-(ver)-k9.pkg
Mac	anyconnect-macosx-i386-(ver)-k9.pkg
Linux (32-bit)	anyconnect-linux-(ver)-k9.pkg
Linux (64-bit)	anyconnect-linux-64-(ver)-k9.pkg

Ensuring Successful AnyConnect Installation

To ensure the AnyConnect Secure Mobility Client installs successfully on user computers, review the following sections:

- [Exempting AnyConnect Traffic from Network Address Translation \(NAT\), page 2-7](#)
- [Configuring the ASA for DES-Only SSL Encryption Not Recommended, page 2-12](#)
- [Connecting with Mobile Broadband Cards, page 2-12](#)
- [Disabling Group Policy Settings, page 2-13](#)

Exempting AnyConnect Traffic from Network Address Translation (NAT)

If you have configured your ASA to perform network address translation (NAT), you must exempt your AnyConnect client traffic from being translated so that the AnyConnect clients, internal networks, and corporate resources on a DMZ can originate network connections to each other. Failing to exempt the AnyConnect client traffic from being translated prevents the AnyConnect clients and other corporate resources from communicating.

“Identity NAT” (also known as “NAT exemption”) allows an address to be translated to itself, which effectively bypasses NAT. Identity NAT can be applied between two address pools, an address pool and a subnetwork, or two subnetworks.

This procedure illustrates how you would configure identity NAT between these hypothetical network objects in our example network topology: Engineering VPN address pool, Sales VPN address pool, inside network, a DMZ network, and the Internet. Each Identity NAT configuration requires one NAT rule.

Table 2-2 *Network Addressing for Configuring Identity NAT for VPN Clients*

Network or Address Pool	Network or address pool name	Range of addresses
Inside network	inside-network	10.50.50.0 - 10.50.50.255
Engineering VPN address pool	Engineering-VPN	10.60.60.1 - 10.60.60.254

Network or Address Pool	Network or address pool name	Range of addresses
Sales VPN address pool	Sales-VPN	10.70.70.1 - 10.70.70.254
DMZ network	DMZ-network	192.168.1.0 - 192.168.1.255

Step 1 Log into the ASDM and select **Configuration > Firewall > NAT Rules**.

Step 2 Create a NAT rule so that the hosts in the Engineering VPN address pool can reach the hosts in the Sales VPN address pool. In the NAT Rules pane, select **Add > Add NAT Rule Before “Network Object” NAT rules** so that the ASA evaluates this rule before other rules in the Unified NAT table. See [Figure 2-2 on page 2-8](#) for an example of the Add NAT rule dialog box.



Note In ASA software version 8.3, NAT rule evaluation is applied on a top-down, first match basis. Once the ASA matches a packet to a particular NAT rule, it does not perform any further evaluation. It is important that you place the most specific NAT rules at the top of the Unified NAT table so that the ASA does not prematurely match them to broader NAT rules.

Figure 2-2 Add NAT Rule Dialog Box

- a. In the **Match criteria: Original Packet** area, configure these fields:
 - Source Interface: Any
 - Destination Interface: Any
 - Source Address: Click the Source Address browse button and create the network object that represents the Engineering VPN address pool. Define the object type as a **Range** of addresses. Do not add an automatic address translation rule. See [Figure 2-3](#) for an example.
 - Destination Address: Click the Destination Address browse button and create the network object that represents the Sales VPN address pool. Define the object type as a **Range** of addresses. Do not add an automatic address translation rule.

Figure 2-3 Create Network Object for a VPN Address Pool

- b. In the **Action Translated Packet** area, configure these fields:
 - Source NAT Type: Static
 - Source Address: Original
 - Destination Address: Original
 - Service: Original
- c. In the **Options** area, configure these fields:
 - Check **Enable rule**.
 - Uncheck or leave empty the **Translate DNS replies that match this rule**.
 - Direction: Both
 - Description: Add a Description for this rule.
- d. Click **OK**.
- e. Click **Apply**. Your rule should look like rule 1 in the [Unified NAT Table](#) in [Figure 2-5 on page 2-12](#).

CLI example:

```
nat source static Engineering-VPN Engineering-VPN destination static Sales-VPN
Sales-VPN
```

- f. Click **Send**.

Step 3

When the ASA is performing NAT, in order for two hosts in the same VPN pool to connect to each other, or for those hosts to reach the Internet through the VPN tunnel, you must enable the **Enable traffic between two or more hosts connected to the same interface** option. To do this, in ASDM, select **Configuration > Device Setup > Interfaces**. At the bottom of the Interface panel, check **Enable traffic between two or more hosts connected to the same interface** and click **Apply**.

CLI example:

```
same-security-traffic permit inter-interface
```

- Step 4** Create a NAT rule so that the hosts in the Engineering VPN address pool can reach other hosts in the Engineering VPN address pool. Create this rule just as you created the rule in [Step 2](#) except that you specify the Engineering VPN address pool as both the Source address and the Destination Address in the **Match criteria: Original Packet** area.
- Step 5** Create a NAT rule so that the Engineering VPN remote access clients can reach the “inside” network. In the NAT Rules pane, select **Add > Add NAT Rule Before “Network Object” NAT rules** so that this rule is processed before other rules.
- a. In the **Match criteria: Original Packet** area configure these fields:
- Source Interface: Any
 - Destination Interface: Any
 - Source Address: Click the Source Address browse button and create a network object that represents the inside network. Define the object type as a **Network** of addresses. Do not add an automatic address translation rule.
 - Destination Address: Click the Destination Address browse button and select the network object that represents the Engineering VPN address pool.

Figure 2-4 Add inside-network object

The screenshot shows the 'Add Network Object' dialog box. The 'Name' field is 'inside-network', 'Type' is 'Network', 'IP Address' is '10.50.50.0', 'Netmask' is '255.255.255.0', and 'Description' is 'inside network'. The 'NAT' section is expanded, showing 'Add Automatic Address Translation Rules' is unchecked, 'Type' is 'Static', and 'Translated Addr' is empty. The 'Advanced...' button is also visible.

- b. In the **Action: Translated Packet** area, configure these fields:
- Source NAT Type: Static
 - Source Address: Original
 - Destination Address: Original
 - Service: Original
- c. In the **Options** area, configure these fields:
- Check **Enable rule**.
 - Uncheck or leave empty the **Translate DNS replies that match this rule**.
 - Direction: Both

- Description: Add a Description for this rule.
- d. Click **OK**.
- e. Click **Apply**. Your rule should look like rule two in the [Unified NAT Table](#) in [Figure 2-5 on page 2-12](#).

CLI example

```
nat source static inside-network inside-network destination static Engineering-VPN
Engineering-VPN
```

Step 6 Create a new rule, following the method in [Step 5](#), to configure identity NAT for the connection between the Engineering VPN address pool and the DMZ network. Use the DMZ network as the Source Address and use the Engineering VPN address pool as the Destination address.

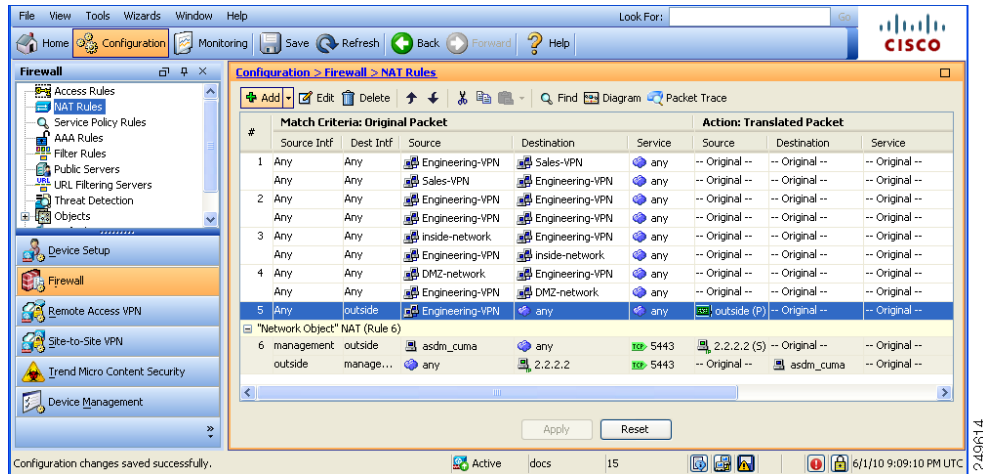
Step 7 Create a new NAT rule to allow the Engineering VPN address pool to access the Internet through the tunnel. In this case, you do not want to use identity NAT because you want to change the source address from a private address to an Internet routable address. To create this rule, follow this procedure:

- a. In the NAT Rules pane, select **Add > Add NAT Rule Before “Network Object” NAT rules** so that this rule will be processed before other rules.
- b. In the **Match criteria: Original Packet** area configure these fields:
 - Source Interface: Any
 - Destination Interface: Any. This field will be automatically populated with “outside” after you select outside as the Source Address in the **Action: Translated Packet** area.
 - Source Address: Click the Source Address browse button and select the network object that represents the Engineering VPN address pool.
 - Destination Address: Any.
- c. In the **Action: Translated Packet** area, configure these fields:
 - Source NAT Type: Dynamic PAT (Hide)
 - Source Address: Click the Source Address browse button and select the **outside** interface.
 - Destination Address: Original
 - Service: Original
- d. In the **Options** area, configure these fields:
 - Check **Enable rule**.
 - Uncheck or leave empty the **Translate DNS replies that match this rule**.
 - Direction: Both
 - Description: Add a Description for this rule.
- e. Click **OK**.
- f. Click **Apply**. Your rule should look like rule five in the [Unified NAT Table](#) in [Figure 2-5 on page 2-12](#).

CLI example:

```
nat (any,outside) source dynamic Engineering-VPN interface
```

Figure 2-5 Unified NAT Table



- Step 8** After you have configured the Engineering VPN Address pool to reach itself, the Sales VPN address pool, the inside network, the DMZ network, and the Internet, you must repeat this process for the Sales VPN address pool. Use identity NAT to exempt the Sales VPN address pool traffic from undergoing network address translation between itself, the inside network, the DMZ network, and the Internet.
- Step 9** From the **File** menu on the ASA, select **Save Running Configuration to Flash** to implement your identity NAT rules.

Configuring the ASA for DES-Only SSL Encryption Not Recommended

By default, Windows Vista and Windows 7 do not support DES SSL encryption. If you configure DES-only on the ASA, the AnyConnect connection fails. Because configuring these operating systems for DES is difficult, we do not recommend that you configure the ASA for only DES SSL encryption.

Connecting with Mobile Broadband Cards

Some 3G or 4G cards require configuration steps before connecting to AnyConnect. For example, the Verizon Access Managers has three settings:

- modem manually connect
- modem auto connect except when roaming
- lan adapter auto connect

If you choose **lan adapter auto connect**, you can set the preference to NDIS mode. NDIS is an always on connection where you can stay connected even when the VZAccess Manager is closed. The VZAccess Manager shows an auto-connect LAN adapter as the device connection preference when it is ready for AnyConnect installation. When an AnyConnect interface is detected, the 3G manager drops the interface and allows the AnyConnect connection.

When you move to a higher priority connection, wired networks are the highest priority, followed by wi-fi, and then mobile broadband, AnyConnect will make the new connection before breaking the old one.

Disabling Group Policy Settings

When installing AnyConnect onto Windows 7 or Windows Vista, you must disable either the AlwaysInstallElevated or Windows User Account Control (UAC) group policy setting.

Modifying Installer Behavior When Web Deploying

In Windows, you can modify how the property table is interpreted by the installer utility msixexec using a transform. On the ASA, you upload transform files (.mst), and the downloader applies them to the .msi when it performs the installation (such as msixexec /package vpn.msi TRANSFORMS=hello.mst).

No standard way to customize .pkg behavior is provided for Mac OS X. To allow implementation of required customizations, we created an ACTransforms.xml, positioned with the installer and read when the installer runs. The XML file has this format:

```
<ACTransforms>
<PropertyName1>Value</PropertyName1>
<PropertyName2>Value</PropertyName2>
</ACTransforms>
```

We do not support any installer modifications for Linux.

Configuring the ASA to Download AnyConnect

Prerequisites

- Review the procedures in the “[Ensuring Successful AnyConnect Installation](#)” section on page 2-7 and perform the ones that are applicable to your enterprise.
- As you enable features on AnyConnect, it must update the modules on the VPN endpoints to use the new features. To minimize download time, AnyConnect requests downloads (from the ASA) only of modules that it needs for each feature that it supports. Determine which AnyConnect packages you want to deploy.

Detailed Steps

-
Step 1	Download the latest Cisco AnyConnect Secure Mobility client package from the Cisco AnyConnect Software Download webpage. See the “ AnyConnect File Packages for ASA Deployment ” section on page 2-7 for a list of AnyConnect file packages.
Step 2	Specify the Cisco AnyConnect Secure Mobility client package file as a client image. In ASDM, navigate to Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Software . The AnyConnect Client Software panel displays listing client files identified as AnyConnect images.
Step 3	(Optional). The Customer Experience Feedback module is enabled by default. This feedback module provides us with a look at what features and modules customers use and have enabled. The collection of this client information gives us insight into the user experience so that Cisco can continue to improve the quality, reliability, performance, and user experience of AnyConnect. If you want to disable this feature, browse to Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Customization/Localization > Customized Installer Transforms in ASDM. If you choose Import , you can download our sample transform or create your own which sets the DISABLE_CUSTOMER_EXPERIENCE_FEEDBACK installer property.

- Step 4** To add an AnyConnect image, click **Add**.
- Click **Browse Flash** to select an AnyConnect image you have already uploaded to the ASA.
 - Click **Upload** to browse to an AnyConnect image you have stored locally on your computer.
- Step 5** Click **OK** or **Upload**.
- Step 6** Click **Apply**.
-

Configure a Method of Address Assignment

You can use DHCP and/or user-assigned addressing. You can also create a local IP address pool and assign the pool to a connection profile. This guide uses the popular address pools method as an example.

-
- Step 1** In ASDM, navigate to **Configuration > Remote Access VPN > Network (Client) Access > Address Assignment > Address Pools**. Enter address pool information in the Add window.
- Step 2** Navigate to **Configuration > Remote Access VPN > Network (Client) Access < AnyConnect Connection Profiles** and click the **Enable Cisco AnyConnect VPN Client access on the interfaces selected in the table below** check box.
- Step 3** Under Connection Profiles, click **Edit** to assign AnyConnect the address pool in a connection profile.
- Step 4** In the Edit AnyConnect Connection Profile window, select from the client or client IPV6 address pools.
- Step 5** Click **Add** in the Select Address Pools window to assign address pools to the interface.
- Step 6** You must specify which client is permitted as a VPN tunneling protocol for a group policy. Navigate to **Configuration > Remote Access VPN > Network (Client) Access > Group Policies**. The Group Policies panel displays.
- Step 7** Click **Edit** and choose SSL VPN as the tunneling protocol.
-

Prompting Remote Users to Download AnyConnect

By default, the ASA does not download AnyConnect when the remote user initially connects using the browser. After users authenticate, the default clientless portal page displays a Start AnyConnect Client drawer that users can select to download AnyConnect. Alternatively, you can configure the ASA to immediately download AnyConnect without displaying the clientless portal page.

You can also configure the ASA to prompt remote users, providing a configured time period within which they can choose to download AnyConnect or go to the clientless portal page.

You can configure this feature for a group policy or user. To change these login settings, follow this procedure:

-
- Step 1** In ASDM, go to **Configuration > Remote Access VPN > Network (Client) Access > Group Policies**. Select a group policy and click **Edit**. The Edit Internal Group Policy window displays.
- Step 2** In the navigation pane, choose **Advanced > AnyConnect Client > Login Settings**. The Post Login settings display. Uncheck the **Inherit** check box, if necessary, and select a Post Login setting.

If you choose to prompt users, specify a timeout period and select a default action to take when that period expires in the Default Post Login Selection area.

Step 3 Click **OK** and be sure to apply your changes to the group policy.

Figure 2-6 shows the prompt displayed to remote users if you choose **Prompt user to choose and Download AnyConnect Client**:

Figure 2-6 *Post Login Prompt Displayed to Remote Users*



Step 4 Click **Save**.

User Control Over Upgrade

You can force the user to accept a client update, or allow them to defer the update until later.

- **Auto Update** - When enabled on the VPN profile, forces the user to accept the update. You can also configure AutoUpdate so the user can disable it, although this could result in the client never getting any updates.

Auto Update is described in [Chapter 3, “AnyConnect VPN Profile Editor Parameter Descriptions”](#)

- **Deferred Update** - When a client update is available, AnyConnect opens a dialog asking the user if they would like to update, or to defer the update.

Deferred Update is enabled by adding all the custom attributes to the ASA, and then referencing and configuring those attributes the group policies. Deferred update is supported by all Windows, Linux and OS X.

Deferred Update Custom Attributes

The following attributes and values configure Deferred Update.

Requirements

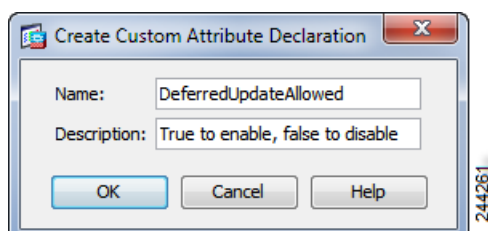
- You must add and configure all custom attributes.
- Custom attribute values are case sensitive.

Custom Attribute *	Valid Values	Default Value	Notes
DeferredUpdateAllowed	true false	false	True enables deferred update. If deferred update is disabled (false), the settings below are ignored.
DeferredUpdateMinimumVersion	x.y.z	0.0.0	Minimum version of AnyConnect that must be installed for updates to be deferrable. The minimum version check applies to all modules enabled on the headend. If any enabled module (including VPN) is not installed or does not meet the minimum version, then the connection is not eligible for deferred update. If this attribute is not specified, then a deferral prompt is displayed (or auto-dismissed) regardless of the version installed on the endpoint.
DeferredUpdateDismissTimeout	0-300 (seconds)	150 seconds	Number of seconds that the deferred upgrade prompt is displayed before being dismissed automatically. This attribute only applies when a deferred update prompt is to be displayed (the minimum version attribute is evaluated first). If this attribute is missing, then the auto-dismiss feature is disabled, and a dialog is displayed (if required) until the user responds. Setting this attribute to zero allows automatic deferral or upgrade to be forced based on: - The installed version and the value of DeferredUpdateMinimumVersion. - The value of DeferredUpdateDismissResponse.
DeferredUpdateDismissResponse	defer update	update	Action to take when DeferredUpdateDismissTimeout occurs.

Step 1 Connect to the ASDM, and select **Configuration > Remote Access VPN > Network (Client) Access > Advanced > AnyConnect Custom Attributes**.

Step 2 Click **Add**, and create a custom attribute for Deferred Update, for example:

Figure 2-7 Adding a Custom Attribute to the ASA

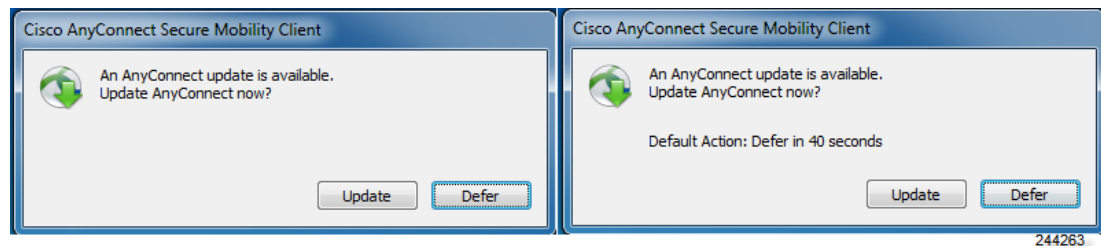


- Step 3** Click **Apply**, and then **Save**. You may want to repeat this step to define the test of the custom attributes.
- Step 4** Select **Configuration>Network(Client) Access > Group Policies**.
- Step 5** To edit the group policy you want to configure for Deferred Update, select **Advanced > AnyConnect Client > Custom Attributes**.
- Step 6** Click **Add**.
- Step 7** Select **Declared Attribute Name**, choose an attribute to configure, and configure it.
- Step 8** Add the rest of the Deferred Upgrade custom attributes to the policy, and configure them, using the information in [Table 2-2 on page 2-17](#).

Deferred Update GUI

The following figure shows the UI that the user sees when an update is available, and Deferred Update is configured. The right part of the figure shows the UI when **DeferredUpdateDismissTimeout** is configured.

Figure 2-8 *Deferred Update UI*



Enabling Modules for Additional Features

As you enable features on AnyConnect, it must update the modules on the VPN endpoints to use the new features. To minimize download time, AnyConnect requests downloads (from the ASA) only of modules that it needs for each feature that it supports.

To enable new features, you must specify the new module names as part of the group-policy or username configuration. To enable module download for a group policy, follow this procedure:

- Step 1** In ASDM, go to **Configuration > Remote Access VPN > Network (Client) Access > Group Policies**. Choose a group policy and click **Edit**. The Edit Internal Group Policy window displays.
- Step 2** In the navigation pane, select **Advanced > AnyConnect Client**. At **Client Profiles to Download**, click **Add** and choose the desired profiles name which displays the associated profile usage. The profile usages appear as any of the following:
- AnyConnect DART—Downloading DART allows you to collect data useful for troubleshooting AnyConnect installation and collection problems.
 - AnyConnect Network Access Manager—This module provides the detection and selection of the optimal Layer 2 access network and performs device authentication for access to both wired and wireless networks.

- AnyConnect SBL—The Start Before Logon (SBL) module forces the user to connect to the enterprise infrastructure before logging on to Windows by starting AnyConnect before the Windows login dialog box appears. Refer to the [“Configuring Start Before Logon” section on page 3-13](#) for reasons you might want to enable SBL.
- AnyConnect Web Security—Routes HTTP traffic to the ScanSafe Web Security scanning proxy server for content analysis, detection of malware, and administration of acceptable use policies.
- AnyConnect Telemetry—The telemetry module sends information about the origin of malicious content to the web filtering infrastructure of the Cisco IronPort Web Security Appliance (WSA).
- AnyConnect Posture—Provides the AnyConnect Secure Mobility Client the ability to identify the operating system, antivirus, antispysware, and firewall software installed on the host prior to creating a remote access connection to the ASA. Based on this prelogin evaluation, you can control which hosts are allowed to create a remote access connection to the security appliance. The Host Scan application is delivered with the posture module and is the application that gathers this information.
- AnyConnect Customer Experience Feedback—This feature provides us with client information that gives us insight into the user experience statistics, the basis of crash incidents, and so on, so that software quality and user experience are further improved.

Step 3 Click **Apply** and save your changes to the group policy.



Note

If you choose Start Before Logon, you must also enable this feature in the AnyConnect client profile. See [Chapter 3, “Configuring VPN Access”](#) for details.

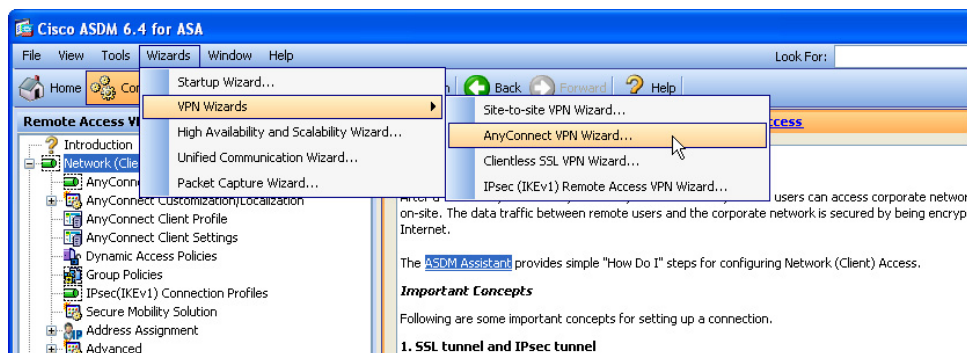
Enabling IPsec IKEv2 Connections

This section provides a procedure for enabling IPsec IKEv2 connections on the ASA.

After loading an AnyConnect client package on the ASA, configure the ASA for IPsec IKEv2 connections by following these steps:

Step 1 Run the AnyConnect VPN Wizard. Choose **Wizards > VPN Wizards > AnyConnect VPN Wizard** ([Figure 2-9](#)). Follow the wizard steps to create a basic VPN connection for IPsec IKEv2 connections.

Figure 2-9 AnyConnect VPN Wizard



- Step 2** Edit the Server List entry of the VPN profile using the profile editor. In ASDM, go to **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**
- Step 3** Click **Edit** and choose **Server List** from the AnyConnect Client Profile Editor window.
- Step 4** Highlight the server you want to edit, click **Edit**, and choose the primary protocol.
- Step 5** Associate the VPN profile with the group policy to be used. Go to **Configuration > Remote Access VPN > Network (Client) Access > Group Policies**. Edit a group policy and navigate to **Advanced > AnyConnect Client**.
- Step 6** At Client Profiles to Download, click **Add** and choose the profile usage.

Predeploying an IKEv2-Enabled Client Profile

If you are predeploying the client using a software management system, you must predeploy the IKEv2-enabled client profile also. Follow these steps:

- Step 1** Extract the .ISO using Winzip or 7-zip, or a similar utility.
- Step 2** Browse to this folder:
anyconnect-win-3.1.0xxx-pre-deploy-k9\Profiles\vpn
- Step 3** Copy the IKEv2/IPSec VPN profile that you created using the profile editor (ASDM version or standalone version) to this folder.
- Step 4** Run Setup.exe to run the installer and uncheck *Select all* and check *AnyConnect VPN Module* only.

Predeploying the Client Profile with a Virtual CD Mount Software

You can also predeploy the client profile using a virtual CD mount software, such as SlySoft or PowerISO. Follow these steps:

- Step 1** Mount the .ISO with a virtual CD mount software.
- Step 2** After installing the software, deploy the profile to the appropriate folder as show in [Table 2-3](#):

Table 2-3 Paths to Deploy the Client

OS	Directory Path
Windows 7 and Vista	C:\ProgramData\Cisco\Cisco AnyConnect Secure Mobility Client\Profile\
Windows XP	C:\Document and Settings\All Users\Application Data\Cisco\Cisco AnyConnect Secure Mobility Client\Profile
Mac OS X and Linux	/opt/cisco/anyconnect/profile/

Other Predeployment Tips

If you are using the MSI installer, the MSI picks any profile that has been placed in the client profile (Profiles\vpn folder) and places it in the appropriate folder during installation.

If you are predeploying the profile manually after the installation, copy the profile manually or use a SMS, such as Altiris, to deploy the profile to the appropriate folder.

Weblaunching the Client

To Weblaunch the AnyConnect client, instruct users to log in and download the AnyConnect client by entering the URL of the ASA in the their browser using the following format:

```
https://<asa>
```

Where <asa> is the IP address or FQDN of the ASA. If you use an IP address, use the Public IPv4 or the Global IPv6 address of the secure gateway. Use of the link-local secure gateway address is not supported.

Predeploying AnyConnect

If you use an SMS to deliver and install the AnyConnect software to the endpoint before the endpoint connects to the ASA, we refer to this as “predeployment.” If you use predeployment, you must pay special attention to the installation order and other details.

- [Predeployment Package File Information, page 2-20](#)
- [Predeploying to Windows Computers, page 2-21](#)
- [Predeploying to Linux and Mac OS X Computers, page 2-27](#)
- [AnyConnect File Information, page 2-30](#)

Limitations

If you are upgrading legacy clients or optional modules, the following occurs:

- All previous versions of the core client are upgraded and all VPN configurations are retained.
- Cisco SSC 5.x is upgraded to the Network Access Manager module, retaining all SSC configurations for use with the Network Access Manager and removing SSC 5.x.
- Host scan files used by Cisco Secure Desktop are upgraded, and the two can coexist.
- Cisco IPsec VPN client is not upgraded or removed; however, the two can coexist.
- ScanSafe Web Security functionality is not upgraded and cannot coexist. You must uninstall AnyWhere+.

Predeployment Package File Information

The core AnyConnect VPN client and the optional modules (such as SBL, AnyConnect Diagnostic Reporting Tool, and so on) are installed and updated by their own installation file or program. For AnyConnect version 3.1, Windows desktop installation files are contained in an ISO image (*.iso). For all other platforms, you can distribute the individual installation files in the same way you did for AnyConnect version 2.5 and earlier, separately at your discretion using your methodology.

OS	AnyConnect 3.1 Predeploy Package Name
Windows	anyconnect-win-<version>-k9.iso
Mac OS X	anyconnect-macosx-i386-<version>-k9.dmg

OS	AnyConnect 3.1 Predeploy Package Name
Linux (32-bit)	anyconnect-linux-<version>-k9.tar.gz
Linux (64-bit)	anyconnect-linux-64-<version>-k9.tar.gz

Predeploying to Windows Computers

The AnyConnect 3.1 predeploy installation for Windows computers (desktops, not mobile) is distributed in an ISO image. The ISO package file contains the *Install Utility*, a selector menu program to launch the individual component installers, and the MSIs for the core and optional AnyConnect modules.

The following sections describe how to predeploy to Windows computers:

- [Using the ISO File, page 2-21](#)
- [Guidelines and Limitations, page 2-22](#)
- [Using the Install Utility for Predeployment, page 2-22](#)
- [Using an SMS to Predeploy AnyConnect Modules, page 2-23](#)
- [Modifying Installer Behavior During Pre-deploy, page 2-27](#)

Using the ISO File

The predeployment package is bundled in an ISO package file that contains the programs and executable files to deploy to user computers. When you deploy the ISO package file, the setup program (setup.exe) runs and deploys the Install Utility menu, a convenient GUI that lets users choose which AnyConnect modules to install.

If you prefer, you can break out the individual installers from the ISO image and distribute them manually. Each installer in the predeploy package can run individually. When you start the .msi installer for the AnyConnect core client, the administrator must accept an End User License Agreement (EULA). The order you deploy the files is very important. See [Using an SMS to Predeploy AnyConnect Modules](#) for more information.

File	Purpose
GUI.ico	The AnyConnect icon image.
Setup.exe	Launches the Install Utility (setup.hta).
anyconnect-dart-win-<version>-k9.msi	MSI installer file for the DART optional module.
anyconnect-gina-win-<version>-pre-deploy-k9.msi	MSI installer file for the SBL optional module.
anyconnect-nam-win-<version>.msi	MSI installer file for the Network Access Manager optional module.
anyconnect-posture-win-<version>-pre-deploy-k9.msi	MSI installer file for the posture optional module.
anyconnect-telemetry-win-<version>-pre-deploy-k9.msi	MSI installer file for the telemetry optional module.
anyconnect-websecurity-win-<version>-pre-deploy-k9.msi	MSI installer file for the Web Security optional module.
anyconnect-win-<version>-pre-deploy-k9.msi	MSI installer file for the AnyConnect core client.
autorun.inf	The Setup Information file for setup.exe.

File	Purpose
cues_bg.jpg	A background image for the Install Utility GUI.
setup.hta	Install Utility HTML Application (HTA). You can customize this program.
update.txt	A text file listing the AnyConnect version number.

Guidelines and Limitations

Resetting the System MTU

With a Windows installer option, you can choose to reset the MTU of all adapters. Each MSI installer supports a common property (RESET_ADAPTER_MTU) which, when set to 1, causes the installer to reset all Windows network adapter MTU settings to their default value. You must reboot for the changes to take effect. Only the VPN installer has this option. You set the command line parameter as follows: `msiexec/package anyconnect-win-ver-pre-deploy-k9.msi/passive RESET_ADAPTER_MTU=1`.

Turning on ActiveX Control

The AnyConnect pre-deploy VPN package previously installed the VPN WebLaunch ActiveX control by default. Starting in AnyConnect 3.1, installation of the VPN ActiveX control is turned off by default. This change was made to favor the most secure configuration as the default behavior.

When pre-deploying AnyConnect Client and Optional Modules, if you require the VPN ActiveX control to be installed with AnyConnect, you must use the `NOINSTALLACTIVEX=0` option with `msiexec` or a transform.

Using the Install Utility for Predeployment

With the Install Utility, users select the items they want to install. By default, the check boxes for all the components are checked. If acceptable, the user can click the Install button and agree to the components listed in the Selections To Install dialog box. The program determines what components to install based upon their selection.

The Install Utility is an HTML Application (HTA) named *setup.hta* that is packaged in the ISO package file. You are free to make any changes you want to this program. Customize the utility as you prefer.

Each installer runs silently. If an installer requires that the user reboot the computer, the user is informed after the final installer runs. The Install Utility does not initiate the reboot.

If you deploy the core client plus one or more optional modules, you must apply the lockdown property to each of the installers. This operation is one way only and cannot be removed unless you re-install the product.

This option is available for the VPN installer, Network Access Manager installer, and Web Security installer.

Using an SMS to Predeploy AnyConnect Modules

When predeploying AnyConnect modules, administrators need to copy the predeployment module to the endpoint along with its corresponding client profile, if the module requires one. For this type of predeployment, you do not need to have a VPN client installed, and some modules can run in standalone mode.



Note If you are using Network Access Manager, you should choose the **Hide icon and notifications** option to hide the Microsoft *Network* icon when predeploying Windows. By default, the icon is in *Only show notifications* mode, which alerts you to changes and updates.

These modules require an AnyConnect client profile:

- AnyConnect VPN Module
- AnyConnect Telemetry Module
- AnyConnect Network Access Manager Module
- AnyConnect Web Security Module

These features do not require an AnyConnect client profile:

- AnyConnect VPN Start Before Login
- AnyConnect Diagnostic and Reporting Tool
- AnyConnect Posture Module
- AnyConnect Customer Experience Feedback Module

The predeployment modules need to be installed in the order described in the [“Using an SMS to Predeploy AnyConnect Modules”](#) section on page 2-23.

Requirements

:When installing AnyConnect onto Windows 7 or Windows Vista, you must disable either the AlwaysInstallElevated or Windows User Account Control (UAC) group policy setting.

Detailed Steps

-
- Step 1** Download **anyconnect-win-<version>-pre-deploy-k9.iso** from cisco.com.
- Step 2** Extract the contents of the .iso file using Winzip or 7-zip or a similar utility.
- Step 3** For those modules that require a client profile, use the profile editor integrated with ASDM or the standalone profile editor to create a client profile for the modules you want to install. See these chapters for instructions on configuring various client profiles:
- [Chapter 3, “Configuring VPN Access”](#)
 - [Chapter 4, “Configuring Network Access Manager”](#)
 - [Chapter 6, “Configuring Web Security”](#)
 - [Chapter 7, “Configuring AnyConnect Telemetry to the WSA”](#)
 - [Chapter 8, “Using Cisco AnyConnect Customer Experience Feedback Module”](#)
 - [Chapter 9, “NGE, FIPS and Additional Security”](#)

- Step 4** Once you have created the client profile, copy it to the appropriate directory you extracted from the .iso file:
- Profiles\vpn
 - Profiles\nam
 - Profiles\websecurity
 - Profiles\telemetry
- Step 5** See [“Using the ISO File” section on page 2-21](#), to identify the packages designed for predeploying your AnyConnect modules.
-  **Note** When installing AnyConnect onto Windows 7 or Windows Vista, you must disable either the AlwaysInstallElevated or Windows User Account Control (UAC) group policy setting.
- Step 6** Using a software management system, deploy the predeployment software packages and the **Profiles** directory containing the client profiles to the endpoints.
- Step 7** Use the procedures described in [“Packaging the MSI Files for Enterprise Software Deployment Systems” section on page 2-25](#) to install the AnyConnect modules in the order defined in the [“Using an SMS to Predeploy AnyConnect Modules” section on page 2-23](#).

Installing AnyConnect Modules for Windows (Recommended Order)

If you prefer, you can break out the individual installers from the ISO image and distribute them manually. Each installer in the predeploy package can run individually. Use a compressed file utility to view and extract the files in the .iso file.

If you distribute files manually, you must address the dependencies between the selected components. The core client MSI contains all VPN functional components and the common components needed for use by the optional modules. These installers check for the existence of the same version of the core client before proceeding to install.

Prerequisite

The installers for the optional modules require that the same version of AnyConnect 3.1 core client be installed. If they do not match, the optional module does not install, and the installer notifies the user of the mismatch. If you use the Install Utility, the modules in the package are built and packaged together, and the versions always match.

Detailed Steps

- Step 1** Install the AnyConnect core client module, which installs the GUI and VPN capability (both SSL and IPsec).
- Step 2** Install the AnyConnect Diagnostic and Reporting Tool (DART) module, which provides useful diagnostic information about the AnyConnect core client installation.
- Step 3** Install the SBL, Network Access Manager, Web Security, or posture modules in any order.
- Step 4** Install the telemetry module, which requires the posture module.

**Note**

Individual installers for optional modules check the version of the installed core VPN client before installing. The versions of the core and optional modules must match. If they do not match, the optional module does not install, and the installer notifies the user of the mismatch. If you use the Install Utility, the modules in the package are built and packaged together, and the versions always match.

Uninstalling AnyConnect Modules for Windows (Recommended Order)

Detailed Steps

- Step 1** Uninstall the telemetry module.
 - Step 2** Uninstall Network Access Manager, Web Security, Posture, or SBL, in any order.
 - Step 3** Uninstall the AnyConnect core client.
 - Step 4** Uninstall DART.
- DART information is valuable should the uninstall processes fail.

**Note**

By design, some XML files remain after uninstalling AnyConnect.

Packaging the MSI Files for Enterprise Software Deployment Systems

This section provides information you need to deploy the AnyConnect client and optional modules using an enterprise software deployment system, including the MSI install command line calls and the locations to deploy profiles:

- [MSI Install Command Line Calls, page 2-25](#)
- [Windows Lockdown Option, page 2-26](#)
- [Locations to Deploy the AnyConnect Profiles, page 2-32](#)
- [Hiding AnyConnect from Add/Remove Program List, page 2-26](#)

MSI Install Command Line Calls

Module Installed	Command and Log File
AnyConnect core client No VPN capability. Use when installing standalone Network Access Manager or Web Security modules.	msiexec /package anyconnect-win-ver-pre-deploy-k9.msi /norestart /passive PRE_DEPLOY_DISABLE_VPN=1 /lvx* anyconnect-win-<version>-pre-deploy-k9-install-datetimestamp.log
AnyConnect core client With VPN capability.	msiexec /package anyconnect-win-ver-pre-deploy-k9.msi /norestart /passive /lvx* anyconnect-win-<version>-pre-deploy-k9-install-datetimestamp.log
Customer Experience Feedback	msiexec /package anyconnect-win-ver-pre-deploy-k9.msi /norestart /passive DISABLE_CUSTOMER_EXPERIENCE_FEEDBACK=1 /lvx* anyconnect-win-<version>-pre-deploy-k9-install-datetimestamp.log

Module Installed	Command and Log File
Diagnostic and Reporting Tool (DART)	msiexec /package anyconnect-dart-win-ver-k9.msi /norestart /passive /lvx* anyconnect-dart-<version>-pre-deploy-k9-install-datetimestamp.log
SBL	msiexec /package anyconnect-gina-win-ver-k9.msi /norestart /passive /lvx* anyconnect-gina-<version>-pre-deploy-k9-install-datetimestamp.log
Network Access Manager	msiexec /package anyconnect-nam-win-ver-k9.msi /norestart /passive /lvx* anyconnect-nam-<version>-pre-deploy-k9-install-datetimestamp.log
Web Security	msiexec /package anyconnect-websecurity-win-ver-pre-deploy-k9.msi /norestart/passive /lvx* anyconnect-websecurity-<version>-pre-deploy-k9-install-datetimestamp.log
Posture	msiexec /package anyconnect-posture-win-ver-pre-deploy-k9.msi /norestart/passive /lvx* anyconnect-posture-<version>-pre-deploy-k9-install-datetimestamp.log
Telemetry	msiexec /package anyconnect-telemetry-win-ver-pre-deploy-k9.msi /norestart /passive /lvx* anyconnect-telemetry-<version>-pre-deploy-k9-install-datetimestamp.log

Windows Lockdown Option

Cisco recommends that end users are given limited rights on the device hosting the AnyConnect Secure Mobility client. If an end user warrants additional rights, installers can provide a lockdown capability that prevents users and local administrators from switching off or stopping those Windows services established as locked down on the endpoint. It is still possible to stop the services from the command prompt with the service password.

Each MSI installer supports a common property (LOCKDOWN) which, when set to a non-zero value, prevents the Windows service(s) associated with that installer from being controlled by users or local administrators on the endpoint device. We recommend that you use the sample transform provided at the time of install to set this property and apply the transform to each MSI installer that you want to have locked down. The lockdown option is also a checkbox within the ISO Install Utility.

Hiding AnyConnect from Add/Remove Program List

You can hide the installed AnyConnect modules from users that view the Windows Add/Remove Programs list. If you launch any installer using ARPSYSTEMCOMPONENT=1, the module does not appear in the Windows Add/Remove Programs list.

We recommend that you use the sample transform we provide to set this property, applying the transform to each MSI installer for each module you want to hide.

Instructing Users to Install Network Access Manager and Web Security as Stand-Alone Applications

You can deploy the AnyConnect modules Network Access Manager and Web Security as standalone applications on a user computer using the command in the MSI Install Command Line Calls table above.



Note

The client reads all the VPN client profiles. If any of the profiles has <ServiceDisable> set to true, the VPN is disabled.

Detailed Steps

- Step 1** If you deploy the Install Utility to users, instruct them to check:
AnyConnect Network Access Manager **and/or** *AnyConnect Web Security Module*.
- Step 2** Instruct users to uncheck Cisco AnyConnect VPN Module.
Doing so disables the VPN functionality of the core client, and the Install Utility installs Network Access Manager and Web Security as standalone applications with no VPN functionality.
- Step 3** Run the installers for the optional modules, which can use the AnyConnect GUI without the VPN service.
1. A pop-up dialog box confirms the selection of the standalone Network Access Manager and/or the standalone Web Security Module.
 2. When the user clicks OK, the Install Utility invokes the AnyConnect 3.1 core installer with a setting of `PRE_DEPLOY_DISABLE_VPN=1`.
 3. The Install Utility removes any existing VPN profiles and then installs `VPNDisable_ServiceProfile.xml`.
 4. The Install Utility invokes the Network Access Manager installer and/or the Web Security installer.
 5. AnyConnect 3.1 Network Access Manager and/or Web Security Module is enabled without VPN service on the computer.



Note If a previous installation of Network Access Manager did not exist on the computer, the user must reboot the computer to complete the Network Access Manager installation. Also, if the installation is an upgrade that required upgrading some of the system files, the user must reboot.

Modifying Installer Behavior During Pre-deploy

You can use the command line to specify installer properties and to control normal installation behavior. A command such as `msiexec /package vpn.msi SOME_PROPERTY=1` passes the installer parameter to `msiexec`. You can pass multiple properties on the same command line.

In Windows, you can also modify how the property table is interpreted by the installer utility `msiexec` using a transform. On the ASA, you upload transform files (`.mst`), and the downloader applies them to the `.msi` when it performs the installation (such as `msiexec /package vpn.msi TRANSFORMS=hello.mst`).

Predeploying to Linux and Mac OS X Computers

The following sections contain information specific to predeploying to Linux and Mac OS X computers, and contains the following sections:

- [Modifying Installer Behavior, page 2-28](#)
- [Disabling Customer Experience Feedback Module, page 2-28](#)
- [Installing Modules for Linux and Mac OS X \(Recommended Order\), page 2-28](#)
- [Uninstalling Modules for Linux and Mac OS X \(Recommended Order\), page 2-29](#)
- [Restricting Applications on System, page 2-29](#)

- [Verifying Server Certificates with Firefox, page 2-29](#)

Modifying Installer Behavior

No standard way to customize .pkg behavior is provided for Mac OS X. To allow implementation of required customizations, we created an ACTtransforms.xml, positioned with the installer and read when the installer runs. You must place the file in a specific location relative to the installer. The installer searches in this order to see if a modification is found:

1. in a “Profile” directory in the same directory as the .pkg installer file
2. in a “Profile” directory in the root of a mounted disk image volume
3. in a “Profile” directory in the same directory as the .dmg file

The XML file has this format:

```
<ACTtransforms>
<PropertyName1>Value</PropertyName1>
<PropertyName2>Value</PropertyName2>
</ACTtransforms>
```

For example, the OS X ACTtransforms.xml property is *DisableVPN* to create a “standalone” deployment of the Network Access Manager or Web Security.

We do not support any installer modifications for Linux.

Disabling Customer Experience Feedback Module

The Customer Experience Feedback module is enabled by default. This feedback module provides us with a look at what features and modules customers use and have enabled. The collection of this client information gives us insight into the user experience so that Cisco can continue to improve the quality, reliability, performance, and user experience of AnyConnect. With Mac OS X, if you want to disable this feature by not installing program binaries, the OS X ACTtransforms.xml property is *DisableCustomerExperienceFeedback*.



Note

You must convert the dmg from read-only to read-write using Disk Utility or `hdiutil convert anyconnect-macosx-i386-ver-k9.dmg -format UDRW -o anyconnect-macosx-i386-ver-k9-rw.dmg`.

Installing Modules for Linux and Mac OS X (Recommended Order)

You can break out the individual installers for Linux and Mac and distribute them manually. Each installer in the predeploy package can run individually. Use a compressed file utility to view and extract the files in the tar.gz or .dmg file.

Requirement

To operate correctly with Mac OS X, AnyConnect requires a minimum display resolution of 1024 by 640 pixels.

Detailed Steps

-
Step 1	Install the AnyConnect core client module, which installs the GUI and VPN capability (both SSL and IPsec).
Step 2	Install the DART module, which provides useful diagnostic information about the AnyConnect core client installation.
Step 3	Install the posture module.

Uninstalling Modules for Linux and Mac OS X (Recommended Order)

Detailed Steps

-
Step 1	Uninstall the posture module.
Step 2	Uninstall the AnyConnect core client.
Step 3	Uninstall DART.
- DART information is valuable should the uninstall processes fail.

Restricting Applications on System

Mac OS X 10.8 introduces a new feature called Gatekeeper that restricts which applications are allowed to run on the system. You can choose to permit applications downloaded from:

- Mac App Store
- Mac App Store and identified developers
- Anywhere

The default setting is Mac App Store and identified developers (signed applications). AnyConnect release 3.1 is a signed application, but it is not signed using an Apple certificate. This means that you must either select the Anywhere setting or use Control-click to bypass the selected setting to install and run AnyConnect from a pre-deploy installation. Users who web deploy or who already have AnyConnect installed are not impacted. For further information see:

<http://www.apple.com/macosx/mountain-lion/security.html>.

Verifying Server Certificates with Firefox

After you have AnyConnect installed on a Linux device and before you attempt an AnyConnect connection for the first time, open up a Firefox browser. AnyConnect uses Firefox to verify the server certificates. When you open Firefox, the profile is created, and without it, the server certificates cannot be verified as trusted.

If you opt to not use Firefox, you must configure the local policy to exclude the Firefox certificate store, which also requires configuration of the PEM store.

AnyConnect File Information

This section provides information about the location of AnyConnect files on the user computer in the following sections:

- [Filename of Modules on the Endpoint Computer, page 2-30](#)
- [User Preferences Files Installed on the Local Computer, page 2-34](#)
- [Locations to Deploy the AnyConnect Profiles, page 2-32](#)

Filename of Modules on the Endpoint Computer

[Table 2-4](#) shows the AnyConnect filenames on the endpoint computer for each operating system type when you predeploy or ASA-deploy the client:

Table 2-4 AnyConnect Core Filenames for ASA or Predeployment

AnyConnect 3.1 Core	Web-Deploy Installer (Downloaded)	Predeploy Installer
Windows	anyconnect-win-(ver)-web-deploy-k9.exe	anyconnect-win-(ver)-pre-deploy-k9.msi
Mac	anyconnectsetup.dmg	anyconnect-macosx-i386-(ver)-k9.dmg
Linux	anyconnectsetup.sh	anyconnect-linux-(ver)-k9.tar.gz (32-bit) anyconnect-linux-64-(ver)-k9.tar.gz (64-bit)

[Table 2-5](#) shows the DART filenames on the endpoint computer for each operating system type when you predeploy or ASA-deploy the client. Before release 3.0.3050, the DART component was a separate download (a .dmg, .sh, or .msi file) for web deploy. With release 3.0.3050 or later, the DART component is included in the .pkg file.

Table 2-5 DART Package Filenames for ASA or Predeployment

DART	Web-Deploy Filenames and Packages (Downloaded)	Pre-Deploy Installer
Windows	<i>Release 3.0.3050 or later:</i> anyconnect-win-(ver)-k9.pkg	anyconnect-win-(ver)-pre-deploy-k9.iso
	<i>Before release 3.0.3050:</i> anyconnect-dart-win-(ver)-k9.msi*	anyconnect-dart-win-(ver)-k9.msi*
Mac	<i>Release 3.0.3050 or later:</i> anyconnect-macosx-i386-(ver)-k9.pkg	anyconnect-macosx-i386-(ver)-k9.dmg
	<i>Before release 3.0.3050:</i> anyconnect-dartsetup.dmg	anyconnect-dart-macosx-i386-(ver)-k9.dmg
Linux	<i>Release 3.0.3050 or later:</i> anyconnect-linux-(ver)-k9.pkg (32-bit) anyconnect-linux-64-(ver)-k9.pkg (64-bit)	anyconnect-predeploy-linux-(ver)-k9.tar.gz (32-bit) anyconnect-predeploy-linux-64-(ver)-k9.tar.gz (64-bit)
	<i>Before release 3.0.3050:</i> anyconnect-dartsetup.sh	anyconnect-dart-linux-(ver)-k9.tar.gz

* The web-deploy and predeployment packages are contained in an ISO image (*.iso). The ISO image file contains the programs and MSI installer files to deploy to user computers.

Table 2-6 shows the SBL filenames on the endpoint computer when you predeploy or ASA-deploy the client to a Windows computer:

Table 2-6 Start Before Logon Package Filename for ASA or Predeployment

SBL (Gina)	Web-Deploy Installer (Downloaded)	Predeploy Installer
Windows	anyconnect-gina-win-(ver)-web-deploy-k9.exe	anyconnect-gina-win-(ver)-pre-deploy-k9.msi

Table 2-7 shows the Network Access Manager filenames on the endpoint computer when you predeploy or ASA-deploy the client to a Windows computer:

Table 2-7 Network Access Manager Filename for ASA or Predeployment

Network Access Manager	Web-Deploy Installer (Downloaded)	Predeploy Installer
Windows	anyconnect-nam-win-(ver)-k9.msi	anyconnect-nam-win-(ver)-k9.msi

Table 2-8 shows the posture module filenames on the endpoint computer for each operating system type when you predeploy or ASA-deploy the client:

Table 2-8 *Posture Module Filenames for ASA or Predeployment*

Posture	Web-Deploy Installer (Downloaded)	Predeploy Installer
Windows	anyconnect-posture-win-(ver)-web-deploy-k9.msi	anyconnect-posture-win-(ver)-pre-deploy-k9.msi
Mac	anyconnect-posturesetup.dmg	anyconnect-posture-macosx-i386-(ver)-k9.dmg
Linux	anyconnect-posturesetup.sh	anyconnect-posture-linux-(ver)-k9.tar.gz
Linux-64	anyconnect-posturesetup.sh	anyconnect-posture-linux-(ver)-k9.tar.gz

Table 2-9 shows the telemetry module filenames on the endpoint computer for Windows when you predeploy or ASA-deploy the client:

Table 2-9 *Telemetry Filename for ASA or Predeployment*

Telemetry	Web-Deploy Installer (Downloaded)	Predeploy Installer
Windows	anyconnect-telemetry-win-(ver)-web-deploy-k9.exe Dependent upon installation of anyconnect-posture-win-(ver)-web-deploy-k9.msi	anyconnect-telemetry-win-(ver)-pre-deploy-k9.msi Dependent upon installation of anyconnect-posture-win-(ver)-pre-deploy-k9.msi.

Table 2-10 shows the Web Security module filenames on the endpoint computer for Windows when you predeploy or ASA-deploy the client:

Table 2-10 *Web Security Filename for ASA or Predeployment*

Web Security	Web-Deploy Installer (Downloaded)	Predeploy Installer
Windows	anyconnect-websecurity-win-(ver)-web-deploy-k9.exe	anyconnect-websecurity-win-(ver)-pre-deploy-k9.msi

Locations to Deploy the AnyConnect Profiles

Table 2-11 shows the profile-related files AnyConnect downloads on the local computer and their purpose:

Table 2-11 *Profile Files on the Endpoint*

File	Description
anyfilename.xml	AnyConnect profile. This file specifies the features and attribute values configured for a particular user type.
AnyConnectProfile.tmpl	Example client profile provided with the AnyConnect software.
AnyConnectProfile.xsd	Defines the XML schema format. AnyConnect uses this file to validate the profile.

Table 2-12 shows the locations of the AnyConnect profiles for all operating systems:

Table 2-12 Profile Locations for All Operating Systems

Operating System	Module	Location
Windows XP	Core client with VPN	%ALLUSERSPROFILE%\Application Data\Cisco\Cisco AnyConnect Secure Mobility Client\Profile
	Network Access Manager	%ALLUSERSPROFILE%\Application Data\Cisco\Cisco AnyConnect Secure Mobility Client\NetworkAccessManager\newConfigFiles
	Telemetry	%ALLUSERSPROFILE%\Application Data\Cisco\Cisco AnyConnect Secure Mobility Client\Telemetry
	Web Security	%ALLUSERSPROFILE%\Application Data\Cisco\Cisco AnyConnect Secure Mobility Client\Web Security
	Customer Experience Feedback	%ALLUSERSPROFILE%\Application Data\Cisco\Cisco AnyConnect Secure Mobility Client\CustomerExperienceFeedback
Windows Vista	Core client with VPN	%ProgramData%\Cisco\Cisco AnyConnect Secure Mobility Client\Profile
	Network Access Manager	%ProgramData%\Cisco\Cisco AnyConnect Secure Mobility Client\NetworkAccessManager\newConfigFiles
	Telemetry	%ProgramData%\Cisco\Cisco AnyConnect Secure Mobility Client\Telemetry
	Web Security	%ProgramData%\Cisco\Cisco AnyConnect Secure Mobility Client\Web Security
	Customer Experience Feedback	%ProgramData%\Cisco\Cisco AnyConnect Secure Mobility Client\CustomerExperienceFeedback
Windows 7	Core client with VPN	%ProgramData%\Cisco\Cisco AnyConnect Secure Mobility Client\Profile
	Network Access Manager	%ProgramData%\Cisco\Cisco AnyConnect Secure Mobility Client\NetworkAccessManager\newConfigFiles
	Telemetry	%ProgramData%\Cisco\Cisco AnyConnect Secure Mobility Client\Telemetry
	Web Security	%ProgramData%\Cisco\Cisco AnyConnect Secure Mobility Client\Web Security
	Customer Experience Feedback	%ProgramData%\Cisco\Cisco AnyConnect Secure Mobility Client\CustomerExperienceFeedback
Mac OS X	All other modules	/opt/cisco/anyconnect/profile

Operating System	Module	Location
	Customer Experience Feedback	/opt/cisco/anyconnect/CustomerExperienceFeedback
Linux	All modules	/opt/cisco/anyconnect/profile

User Preferences Files Installed on the Local Computer

Some profile settings are stored locally on the user computer in a user preferences file or a global preferences file. The user file has information the client needs to display user-controllable settings in the Preferences tab of the client GUI and information about the last connection, such as the user, the group, and the host.

The global file has information about user-controllable settings to be able to apply those settings before login (since there is no user). For example, the client needs to know if Start Before Logon and/or AutoConnect On Start are enabled before login.

Table 2-13 shows the filenames and installed paths for preferences files on the client computer:

Table 2-13 User Preferences Files and Installed Paths

Operating System	Type	File and Path
Windows Vista Windows 7	User	C:\Users\username\AppData\Local\Cisco\Cisco AnyConnect VPN Client\preferences.xml
	Global	C:\ProgramData\Cisco\Cisco AnyConnect VPN Client\preferences_global.xml
Windows XP	User	C:\Documents and Settings\username\Local Settings\ApplicationData\Cisco\Cisco AnyConnect VPN Client\preferences.xml
	Global	C:\Documents and Settings\AllUsers\Application Data\Cisco\Cisco AnyConnect VPN Client\preferences_global.xml
Mac OS X	User	/Users/username/.anyconnect
	Global	/opt/cisco/anyconnect/.anyconnect_global
Linux	User	/home/username/.anyconnect
	Global	/opt/cisco/anyconnect/.anyconnect_global

Using Standalone AnyConnect Profile Editor

The standalone AnyConnect profile editor allows administrators to configure client profiles for the VPN, Network Access Manager, Web Security, Telemetry and Customer Experience Feedback modules for the AnyConnect Secure Mobility Client. These profiles can be distributed with predeployment kits for the VPN, Network Access Manager, Web Security, and Customer Experience Feedback modules.

System Requirements for Standalone Profile Editor

Supported Operating Systems

Standalone Profile Editor is only supported on Windows.

Java Requirement

This application requires JRE 1.6. If it is not installed, the MSI installer will automatically install it.

Browser Requirement

The help files in this application are supported by Firefox and Internet Explorer. They have not been tested in other browsers.

Required Hard Drive Space

The Cisco AnyConnect Profile Editor application requires less than five megabytes of hard drive space. JRE 1.6 requires less than 100 megabytes of hard drive space.

Installing the Standalone AnyConnect Profile Editor

The standalone AnyConnect profile editor is distributed as a windows executable file (.exe) separately from the AnyConnect ISO and .pkg files and has this file naming convention:
anyconnect-profileeditor-win-*<version>*-k9.exe.

To install the standalone profile editor, follow this procedure:

-
Step 1	Download the anyconnect-profileeditor-win-<i><version></i>-k9.exe from Cisco.com.
Step 2	Double-click anyconnect-profileeditor-win-<i><version></i>-k9.exe to launch the installation wizard.
Step 3	At the Welcome screen, click Next .
Step 4	At the Choose Setup Type window click one of these buttons and click Next : • Typical - Installs only the Network Access Manager profile editor automatically. • Custom - Allows you to choose any of these profile editors to install: Network Access Manager Profile Editor, Web Security Profile Editor, Customer Experience Feedback Profile Editor, and VPN Profile Editor. • Complete - Automatically installs the Network Access Manager Profile Editor, Web Security Profile Editor, Customer Experience Feedback Profile Editor, Telemetry, VPN Local Policy Editor, and VPN Profile Editor.
Step 5	If you clicked Typical or Complete in the previous step, skip to Step 6 . If you clicked Custom in the previous step, click the icon for the standalone profile editor you want to install and select Will be installed on local hard drive or click Entire Feature will be unavailable to prevent the standalone profile editor from being installed. Click Next .
Step 6	At the Ready to Install screen, click Install . The Installing Cisco AnyConnect Profile Editor screen displays the progress of the installation.

- Step 7** At the Completing the Cisco AnyConnect Profile Editor Setup Wizard, click **Finish**.
- The standalone AnyConnect profile editor is installed in the **C:\Program Files\Cisco\Cisco AnyConnect Profile Editor** directory.
 - You can launch the VPN, Network Access Manager, and Web Security profile editors by selecting **Start > All Programs > Cisco > Cisco AnyConnect Profile Editor** and then clicking the standalone profile editor you want from the submenu or by clicking the appropriate profile editor shortcut icon installed on the desktop.
-

Modifying the Standalone AnyConnect Profile Editor Installation

You can modify the standalone Cisco AnyConnect Profile Editor installation to install or remove the VPN, Network Access Manager, Web Security, Telemetry or Customer Experience Feedback profile editors by following this procedure:

- Step 1** Open the Windows control panel and click **Add or Remove Programs**.
- Step 2** Select the Cisco AnyConnect Profile Editor and click **Change**.
- Step 3** Click **Next**.
- Step 4** Click **Modify**.
- Step 5** Edit the list of profile editors you want to install or remove and click **Next**.
- Step 6** Click **Install**.
- Step 7** Click **Finish**.
-

Uninstalling the Standalone AnyConnect Profile Editor

- Step 1** Open the Windows control panel and click **Add or Remove Programs**.
- Step 2** Select the Cisco AnyConnect Profile Editor and click **Remove**.
- Step 3** Click **Yes** to confirm you want to uninstall Cisco AnyConnect Profile Editor.
-



Note

Note that JRE 1.6 is not uninstalled automatically when uninstalling the standalone profile editor. You will need to uninstall it separately.

Creating a Client Profile Using the Standalone Profile Editor

- Step 1** Launch the VPN, Network Access Manager, Web Security, or Customer Experience Feedback profile editor by double-clicking the shortcut icon on the desktop or by navigating **Start > All Programs > Cisco > Cisco AnyConnect Profile Editor** and selecting the VPN, Network Access Manager, Web Security, or Customer Experience Feedback profile editor from the submenu.

- Step 2** Follow the instructions for creating client profiles in these chapters of the AnyConnect Administrator Guide.
- [Chapter 3, “Configuring VPN Access”](#)
 - [Chapter 4, “Configuring Network Access Manager”](#)
 - [Chapter 6, “Configuring Web Security”](#)
 - Chapter 7, “Configuring Telemetry to the WSA”
 - Chapter 8, “Using Customer Experience Feedback Module”
 - [AnyConnect Local Policy Parameters and Values](#) in [Chapter 9, “NGE, FIPS and Additional Security”](#)
- Step 3** Select **File > Save** to save the client profile. Each panel of the profile editor displays the path and file name of the client profile.
-

Editing a Client Profile Using the Standalone Profile Editor

- Step 1** Launch the desired profile editor by double-clicking the shortcut icon on the desktop or by navigating **Start > All Programs > Cisco > Cisco AnyConnect Profile Editor** and selecting the desired profile editor from the submenu.

- Step 2** Select **File > Open** and navigate to the client profile XML file you want to edit.



Note If you mistakenly try to open a client profile of one kind of feature, such as Web Security, using the profile editor of another feature, such as VPN, you receive a **Schema Validation failed** message and you will not be able to edit the profile.

- Step 3** Make your changes to the profile and select **File > Save** to save your changes.



Note If you inadvertently try to edit the same client profile in two instances of the same kind of profile editor, the last edits made to the client profile are saved.



Configuring VPN Access

The following sections describe the Cisco AnyConnect Secure Mobility client VPN profile and features, and how to configure them:

- [Configuring IP Addresses for AnyConnect Clients, page 3-2](#)
- [Creating and Editing an AnyConnect Profile, page 3-9](#)
- [Deploying the AnyConnect Profile, page 3-12](#)
- [Configuring VPN Load Balancing, page 3-12](#)
- [Configuring Start Before Logon, page 3-13](#)
- [Trusted Network Detection, page 3-22](#)
- [Always-on VPN, page 3-24](#)
- [Connect Failure Policy for Always-on VPN, page 3-31](#)
- [Captive Portal Hotspot Detection and Remediation, page 3-33](#)
- [Configuring Split Tunneling, page 3-39](#)
- [Configuring DNS and WINS Servers for AnyConnect, page 3-39](#)
- [Split DNS, page 3-39](#)
- [Configuring Certificate Enrollment using SCEP, page 3-42](#)
- [Configuring Certificate Expiration Notice, page 3-48](#)
- [Configuring Certificate Matching, page 3-52](#)
- [Prompting Users to Select Authentication Certificate, page 3-56](#)
- [Configuring a Server List, page 3-57](#)
- [Configuring a Backup Server List, page 3-61](#)
- [Configuring Connect On Start-up, page 3-61](#)
- [Configuring Auto Reconnect, page 3-62](#)
- [Proxy Connections, page 3-63](#)
- [Optimal Gateway Selection, page 3-65](#)
- [Writing and Deploying Scripts, page 3-67](#)
- [Authentication Timeout Control, page 3-71](#)
- [Proxy Support, page 3-72](#)
- [Using a Windows RDP Session to Launch a VPN Session, page 3-74](#)

- [AnyConnect over L2TP or PPTP, page 3-75](#)
- [AnyConnect VPN Profile Editor Parameter Descriptions, page 3-77](#)

Configuring IP Addresses for AnyConnect Clients

IP addresses make internetwork connections possible. They are like telephone numbers: both the sender and receiver must have an assigned number to connect. But with VPNs, there are actually two sets of addresses: the first set connects client and server on the public network. Once that connection is made, the second set connects client and server through the VPN tunnel.

In ASA address management, you configure the IP addresses that the client uses to connect to the private network. IP addresses assigned to other resources on your private network are part of your network administration responsibilities, not part of VPN management. In this section, the IP addresses we refer to are available in your private network addressing scheme for client VPN.

This section includes the following topics:

- [IP Address Assignment Policies, page 3-2](#)
- [Internal IP Address Pools, page 3-3](#)
- [Assigning an IP Address to an AnyConnect Connection, page 3-4](#)

IP Address Assignment Policies

- **Use authentication server** — Retrieve addresses from an external authentication, authorization, and accounting server on a per-user basis. If you are using an authentication server that has IP addresses configured, we recommend using this method. You can configure AAA servers in the Configuration > AAA Setup pane. This method is available for IPv4 and IPv6 assignment policies.
- **Use DHCP** — Obtain IP addresses from a DHCP server. To use DHCP, configure the server in the Configuration > Remote Access VPN > DHCP Server pane. This method is available for IPv4 assignment policies.
- **Use an internal address pool** — Internally configured address pools are the easiest method of address pool assignment. If you use this method, configure the IP address pools in Configuration > Remote Access VPN > Network (Client) Access > Address Assignment > Address Pools pane. This method is available for IPv4 and IPv6 assignment policies.
 - Allow the reuse of an IP address so many minutes after it is released—Delays the reuse of an IP address after its return to the address pool. Adding a delay helps to prevent problems firewalls can experience when an IP address is reassigned quickly. By default, this is unchecked, meaning the ASA does not impose a delay. If you want one, check the box and enter the number of minutes in the range 1 - 480 to delay IP address reassignment. This configurable element is available for IPv4 assignment policies.

Configuring IPv4 and IPv6 Address Assignments using ASDM

-
Step 1	Select Configuration > Remote Access VPN > Network (Client) Access > Address Assignment > Assignment Policy
Step 2	In the IPv4 Policy area, check the address assignment method to enabled it or uncheck the address assignment method to disable it. These methods are enabled by default:

- Use Authentication server. Enables the use of an Authentication Authorization and Accounting (AAA) server you have configured to provide IP addresses.
- Use DHCP. Enables the use of a Dynamic Host Configuration Protocol (DHCP) server you have configured to provide IP addresses.
- Use internal address pools: Enables the use of a local address pool configured on the ASA.

If you enable **Use internal address pools**, you can also enable the reuse of an IPv4 address after it has been released. You can specify a range of minutes from 0 to 480 after which the IP v4 address can be reused.

Step 3 In the IPv6 Policy area, check the address assignment method to enable it or uncheck the address assignment method to disable it. These methods are enabled by default:

- Use Authentication server. Enables the use of an Authentication Authorization and Accounting (AAA) server you have configured to provide IP addresses.
- Use internal address pools: Enables the use of a local address pool configured on the ASA.

Step 4 Click **Apply**.

Step 5 Click **OK**.

Internal IP Address Pools

To configure IPv4 or IPv6 address pools to use for VPN remote access tunnels, open ASDM and select **Configuration > Remote Access VPN > Network (Client) Access > Address Management > Address Pools > Add/Edit IP Pool**.

To delete an address pool, open ASDM and select **Configuration > Remote Access VPN > Network (Client) Access > Address Management > Address Pools**. Select the address pool you want to delete and click **Delete**.

The ASA uses address pools based on the connection profile or group policy for the connection. The order in which you specify the pools is important. If you configure more than one address pool for a connection profile or group policy, the ASA uses them in the order in which you added them to the ASA.

If you assign addresses from a non-local subnet, we suggest that you add pools that fall on subnet boundaries to make adding routes for these networks easier.



Note

The ASA's outside interface addresses, for both IPv4 and IPv6, cannot overlap with the private side address space as defined by address pools.

Configuring Local IPv4 Address Pools Using ASDM

The IP Pool area shows each configured address pool by name with their IP address range, for example: 10.10.147.100 to 10.10.147.177. If no pools exist, the area is empty. The ASA uses these pools in the order listed: if all addresses in the first pool have been assigned, it uses the next pool, and so on.

If you assign addresses from a non-local subnet, we suggest that you add pools that fall on subnet boundaries to make adding routes for these networks easier.

Step 1 Select **Configuration > Remote Access VPN > Network (Client) Access > Address Assignment > Address Pools**.

- Step 2** To add an IPv4 address, click **Add > IPv4 Address pool**. To edit an existing address pool, select the address pool in the address pool table and click **Edit**.
- Step 3** In the Add/Edit IP Pool dialog box, enter this information:
- **Pool Name**—Enter the name of the address pool. It can be up to 64 characters
 - **Starting Address**—Enter the first IP address available in each configured pool. Use dotted decimal notation, for example: 10.10.147.100.
 - **Ending Address**—Enter the last IP address available in each configured pool. User dotted decimal notation, for example: 10.10.147.177.
 - **Subnet Mask**—Identifies the subnet on which this IP address pool resides.
- Step 4** Click **OK**.
- Step 5** Click **Apply**.
-

Configuring Local IPv6 Address Pools Using ASDM

The IP Pool area shows each configured address pool by name with a starting IP address range, the address prefix, and the number of addresses configurable in the pool. If no pools exist, the area is empty. The ASA uses these pools in the order listed: if all addresses in the first pool have been assigned, it uses the next pool, and so on.

If you assign addresses from a non-local subnet, we suggest that you add pools that fall on subnet boundaries to make adding routes for these networks easier.

- Step 1** **Select Configuration > Remote Access VPN > Network (Client) Access > Address Assignment > Address Pools.**
- Step 2** To add an IPv6 address, click **Add > IPv6 Address pool**. To edit an existing address pool, select the address pool in the address pool table and click **Edit**.
- Step 3** In the Add/Edit IP Pool dialog box enter this information:
- **Name**—Displays the name of each configured address pool.
 - **Starting IP Address**—Enter the first IP address available in the configured pool. For example: 2001:DB8::1.
 - **Prefix Length**— Enter the IP address prefix length in bits. For example 32 represents /32 in CIDR notation. The prefix length defines the subnet on which the pool of IP addresses resides.
 - **Number of Addresses**—Identifies the number of IPv6 addresses, starting at the Starting IP Address, there are in the pool.
- Step 4** Click **OK**.
- Step 5** Click **Apply**.
-

Assigning an IP Address to an AnyConnect Connection

Use one of these methods to assign an IP address to a VPN connection:

- [Assigning IP Addresses using Internal Address Pools, page 3-5](#)—An internal pool is associated with a group policy and configured on the ASA. These addresses can be IPv4 or IPv6.
- [Assigning IP Addresses Using DHCP, page 3-5](#)—Associating a DHCP server with a group policy that is configured on the ASA. These addresses can only be IPv4.
- [Assigning IP Addresses to a Local User, page 3-6](#)—Assigning an IP address to a user configured on the ASA. These addresses can be IPv4 or IPv6.

Assigning IP Addresses using Internal Address Pools

The Add or Edit Group Policy dialog box lets you specify address pools, tunneling protocols, filters, connection settings, and servers for the internal Network (Client) Access group policy being added or modified. For each of the fields on this dialog box, checking the Inherit check box lets the corresponding setting take its value from the default group policy. Inherit is the default value for all the attributes in this dialog box.

You can configure both IPv4 and IPv6 address pools for the same group policy. If both versions of IP addresses are configured in the same group policy, clients configured for IPv4 will get an IPv4 address, clients configured for IPv6 will get an IPv6 address, and clients configured for both IPv4 and IPv6 addresses will get both an IPv4 and an IPv6 address.

-
Step 1	Connect to the ASA using ASDM and select Configuration > Remote Access VPN > Network (Client) Access > Group Policies .
Step 2	Create a new group policy or the group policy you want to configure with an internal address pool and click Edit . The General attributes pane is selected by default in the group policy dialog.
Step 3	Use the Address Pools field to specify an IPv4 address pool for this group policy. Click Select to add or edit an IPv4 address pool. See Configuring Local IPv4 Address Pools Using ASDM, page 3-3 for more information.
Step 4	Use the IPv6 Address Pools field to specify an IPv6 address pools to use for this group policy. Click Select to add or edit a IPv6 address pool. See Configuring Local IPv6 Address Pools Using ASDM, page 3-4 .
Step 5	Click OK .
Step 6	Click Apply .
-

Assigning IP Addresses Using DHCP

To assign IPv4 addresses using a DHCP server, configure the IP address Assignment policy to use DHCP follow the instructions below. You cannot assign IPv6 addresses to AnyConnect clients using a DHCP server.

-
Step 1	Connect to the ASA using ASDM.
Step 2	Select Configuration > Remote Access VPN > Network (Client) Access > Address Assignment > Assignment Policy .
Step 3	Click Use DHCP .
Step 4	Click Apply .

- Step 5** Configure your DHCP servers by selecting **Configuration > Remote Access VPN > DHCP Server**.
-

Assigning IP Addresses to a Local User

ASA administrators can create accounts for individual users on the ASA. These accounts can be configured to use a group policy or they can have many of the same VPN attributes found in group policies configured specifically in the local user policy. These individual users can also have some AnyConnect attributes defined for their account.

This section describes how to configure all the attributes of a local user.

Prerequisites

This procedure describes how to edit an existing user. To add a user select **Configuration > Remote Access VPN > AAA/Local Users > Local Users** and click **Add**. For more information see “Adding a User Account to the Local Database” in Chapter 42, Configuring AAA Servers and the Local Database in the *Cisco ASA 5500 Configuration Guide Using ASDM*.

Guidelines

By default, the **Inherit** check box is checked for each setting on the Edit User Account screen, which means that the user account inherits the value of that setting from the default group policy, DfltGrpPolicy.

To override each setting, uncheck the **Inherit** check box, and enter a new value. The detailed steps that follow describe each of the settings on the Edit User Account screen.

Detailed Steps

-
- Step 1** Start ASDM and select **Configuration > Remote Access VPN > AAA/Local Users > Local Users**.
- Step 2** Select the user you want to configure and click **Edit**.
The Edit User Account screen opens.
- Step 3** In the left pane, click **VPN Policy**.
- Step 4** Specify a group policy for the user. The user policy will inherit the attributes of this group policy. If there are other fields on this screen that are set to **Inherit** the configuration from the Default Group Policy, the attributes specified in this group policy will take precedence over those in the Default Group Policy.
- Step 5** Specify which tunneling protocols are available for the user, or whether the value is inherited from the group policy. Check the desired **Tunneling Protocols** check boxes to choose the VPN tunneling protocols that are available for use. Only the selected protocols are available for use. The choices are as follows:
- Clientless SSL VPN (VPN via SSL/TLS) uses a web browser to establish a secure remote-access tunnel to a VPN Concentrator; requires neither a software nor hardware client. Clientless SSL VPN can provide easy access to a broad range of enterprise resources, including corporate websites, web-enabled applications, NT/AD file shares (web-enabled), e-mail, and other TCP-based applications from almost any computer that can reach HTTPS Internet sites.
 - The SSL VPN Client lets users connect after downloading the Cisco AnyConnect Client application. Users use a clientless SSL VPN connection to download this application the first time. Client updates then occur automatically as needed whenever the user connects.

- IPsec IKEv1—IP Security Protocol. Regarded as the most secure protocol, IPsec provides the most complete architecture for VPN tunnels. Both Site-to-Site (peer-to-peer) connections and Cisco VPN client-to-LAN connections can use IPsec IKEv1.
- IPsec IKEv2—IPsec IKEv2-Supported by the AnyConnect Secure Mobility Client. AnyConnect connections using IPsec with IKEv2 can make use of the same feature set available to SSL VPN Connections.
- L2TP over IPsec allows remote users with VPN clients provided with several common PC and mobile PC operating systems to establish secure connections over the public IP network to the ASA and private corporate networks.



Note If no protocol is selected, an error message appears.

Step 6 Specify which filter (IPv4 or IPv6) to use, or whether to inherit the value from the group policy. Filters consist of rules that determine whether to allow or reject tunneled data packets coming through the ASA, based on criteria such as source address, destination address, and protocol. To configure filters and rules, choose **Configuration > Remote Access VPN > Network (Client) Access > Group Policies > Add/Edit > General > More Options > Filter**.

Click **Manage** to display the ACL Manager pane, on which you can add, edit, and delete ACLs and ACEs.

Step 7 Specify whether to inherit the Connection Profile (tunnel group) lock or to use the selected tunnel group lock, if any. Selecting a specific lock restricts users to remote access through this group only. Tunnel Group Lock restricts users by checking if the group configured in the VPN client is the same as the users assigned group. If it is not, the ASA prevents the user from connecting. If the Inherit check box is not checked, the default value is None.

Step 8 Specify whether to inherit the Store Password on Client System setting from the group. Uncheck the **Inherit** check box to activate the Yes and No radio buttons. Click **Yes** to store the logon password on the client system (potentially a less-secure option). Click **No** (the default) to require the user to enter the password with each connection. For maximum security, we recommend that you *not allow* password storage.

Step 9 Specify an Access Hours policy to apply to this user, create a new access hours policy for the user, or leave the Inherit box checked. The default value is Inherit, or, if the Inherit check box is not checked, the default value is Unrestricted.

Click **Manage** to open the Add Time Range dialog box, in which you can specify a new set of access hours.

Step 10 Specify the number of simultaneous logons by the user. The Simultaneous logons parameter specifies the maximum number of simultaneous logons allowed for this user. The default value is 3. The minimum value is 0, which disables logon and prevents user access.



Note While there is no maximum limit, allowing several simultaneous connections could compromise security and affect performance.

Step 11 Specify the **maximum connection time** for the user connection time in minutes. At the end of this time, the system terminates the connection. The minimum is 1 minute, and the maximum is 2147483647 minutes (over 4000 years). To allow unlimited connection time, check the **Unlimited** check box (the default).

- Step 12** Specify the Idle Timeout for the user in minutes. If there is no communication activity on the connection by this user in this period, the system terminates the connection. The minimum time is 1 minute, and the maximum time is 10080 minutes. This value does not apply to users of clientless SSL VPN connections.
- Step 13** Configure the Session Alert Interval. If you uncheck the Inherit check box, the Default checkbox is checked automatically. This sets the session alert interval to 30 minutes. If you want to specify a new value, uncheck the Default check box and specify a session alert interval from 1 to 30 minutes in the minutes box.
- Step 14** Configure the Idle Alert Interval. If you uncheck the Inherit check box, the Default checkbox is checked automatically. This sets the idle alert interval to 30 minutes. If you want to specify a new value, uncheck the Default check box and specify a session alert interval from 1 to 30 minutes in the minutes box.
- Step 15** To set a dedicated IPv4 address for this user, enter an IPv4 address and subnet mask in the Dedicated IPv4 Address (Optional) area.
- Step 16** To set a dedicated IPv6 address for this user, enter an IPv6 address with an IPv6 prefix in the Dedicated IPv6 Address (Optional) field. The IPv6 prefix indicates the subnet on which the IPv6 address resides.
- Step 17** To configure clientless SSL settings, in the left pane, click **Clientless SSL VPN**. To override each setting, uncheck the **Inherit** check box, and enter a new value.
- Step 18** Click **Apply**.
The changes are saved to the running configuration.
-

Configuring IPv4 or IPv6 Traffic to Bypass the VPN

The Client Bypass Protocol feature allows you to configure how the AnyConnect client manages IPv4 traffic when the ASA is expecting only IPv6 traffic or how AnyConnect manages IPv6 traffic when the ASA is only expecting IPv4 traffic.

When the AnyConnect client makes a VPN connection to the ASA, the ASA could assign the client an IPv4, IPv6, or both an IPv4 and IPv6 address.

If Client Bypass Protocol is enabled for one IP protocol and an address pool is not configured for that protocol (in other words, no IP address for that protocol was pushed to client from the ASA) any IP traffic using that protocol will not be sent through the VPN tunnel, it will be sent from the AnyConnect client in the clear.

On the other hand, if Client Bypass Protocol is disabled, and an address pool is not configured for that protocol, the client will drop all traffic for that IP protocol once the VPN tunnel is established.

For example, assume that the ASA assigns only an IPv4 address to an AnyConnect connection and the endpoint is dual stacked. When the endpoint attempts to reach an IPv6 address, if Client Bypass Protocol is disabled, the IPv6 traffic is dropped and if Client Bypass Protocol is enabled, the IPv6 traffic is sent from the client in the clear.

You configure the Client Bypass Protocol on the ASA for group policies.

-
- Step 1** Connect to the ASA using ASDM.
- Step 2** Select **Configuration > Remote Access VPN > Network (Client) Access > Group Policies**.
- Step 3** Select a group policy and click **Edit**.
- Step 4** Select **Advanced > AnyConnect**.

- Step 5** Next to **Client Bypass Protocol**, uncheck **Inherit** if this is a group policy other than the default group policy.
- Step 6** Choose one of these options:
- Click **Disable** to drop IP traffic for which the ASA did not assign an address.
 - Click **Enable** to send that IP traffic in the clear.
- Step 7** Click **OK**.
- Step 8** Click **Apply**.
-

Creating and Editing an AnyConnect Profile

This section describes how to launch the profile editor from ASDM and create a new profile.

The Cisco AnyConnect Secure Mobility client software package, version 2.5 and later (all operating systems) contains the profile editor. ASDM activates the profile editor when you load the AnyConnect software package on the ASA as an SSL VPN client image.

If you load multiple AnyConnect packages, ASDM loads the profile editor from the newest AnyConnect package. This approach ensures that the editor displays the features for the newest AnyConnect loaded, as well as the older clients.



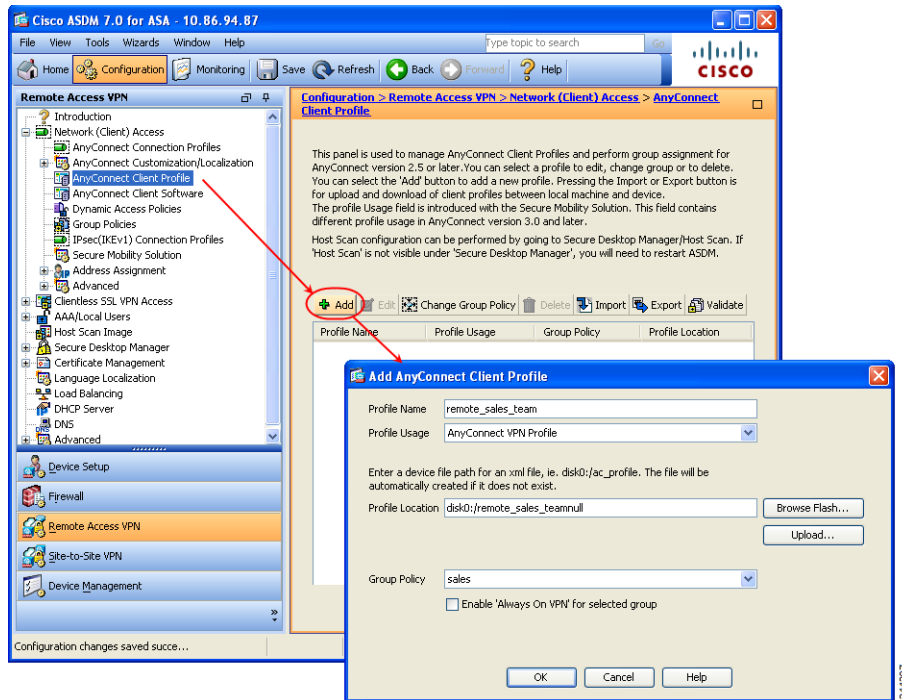
Note

If you manually deploy the VPN profile, you must also upload the profile to the ASA. When the client system connects, AnyConnect verifies that the profile on the client matches the profile on the ASA.

If you have disabled profile updates, and the profile on the ASA is different from the client, then the manually deployed profile won't work.

To activate the profile editor in ASDM, follow these steps:

-
- Step 1** Load the AnyConnect software package as an AnyConnect Client image. If you have not done this already, see [Chapter 2, “Configuring the ASA to Download AnyConnect”](#).
- Step 2** Select **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**. The AnyConnect Client Profile pane opens.
- Step 3** Click **Add**. The Add AnyConnect Client Profile window opens ([Figure 3-1](#)).

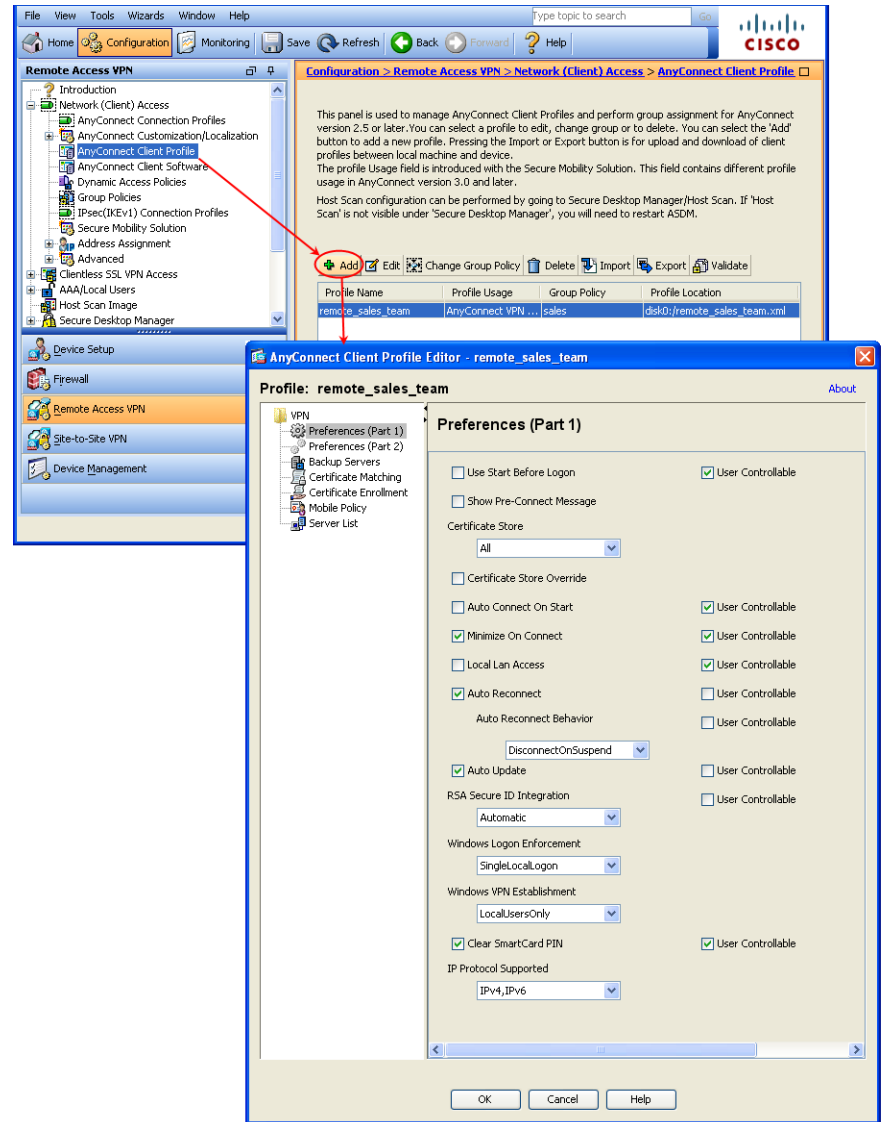
Figure 3-1 Adding an AnyConnect Profile

- Step 4** Specify a name for the profile. Unless you specify a different value for Profile Location, ASDM creates an XML file on the ASA flash memory with the same name.



Note When specifying a name, avoid the inclusion of the .xml extension. If you name the profile example.xml, ASDM adds an .xml extension automatically and changes the name to example.xml.xml. Even if you change the name back to example.xml in the Profile Location field on the ASA, the name returns to example.xml.xml when you connect with AnyConnect by remote access. If the profile name is not recognized by AnyConnect (because of the duplicate .xml extension), IKEv2 connections may fail.

- Step 5** Choose a group policy (optional). The ASA applies this profile to all AnyConnect users in the group policy.
- Step 6** Click **OK**. ASDM creates the profile, and the profile appears in the table of profiles.
- Step 7** Select the profile you just created from the table of profiles. Click **Edit**. The profile editor displays as shown in [Figure 3-2](#). Enable AnyConnect features in the panes of the profile editor. When you finish, click **OK**.

Figure 3-2 *Editing a Profile*

Deploying the AnyConnect Profile

**Note**

You must include the ASA in the host list in the profile so the client GUI displays all the user controllable settings on the initial VPN connection. If you do not add the ASA address or FQDN as a host entry in the profile, then filters do not apply for the session. For example, if you create a certificate match and the certificate properly matches the criteria, but you do not add the ASA as a host entry in that profile, the certificate match is ignored. For more information about adding host entries to the profile, see [Configuring a Server List, page 3-57](#).

-
- Step 1** Associate a client profile with a group policy. Select **Configuration > Remote Access VPN > Network (Client) Access > Group Policies**.
- Step 2** Add a new group policy or select a group policy from the group policies table and click **Edit**.
- Step 3** Select **Advanced > AnyConnect Client**.
- Step 4** Uncheck **Inherit** and select an AnyConnect profile to download using the Select AnyConnect Client Profile dialog box.
- Step 5** When you have finished with the configuration, click **OK** and then **Apply**.
-

Configuring VPN Load Balancing

Configuring load balancing for AnyConnect clients is documented fully in “Configuring Load Balancing,” in Chapter 67, Configuring IKE, Load Balancing, and NAC in *Cisco ASA 5500 Series Configuration Guide using ASDM, 6.4 and 6.6*.

In addition to the guidelines defined there, be aware of these guidelines:

- Clients with IPv6 addresses can make AnyConnect connections through the ASA cluster’s public-facing IPv6 address or through a Global Site Selector (GSS) server. Similarly, clients with IPv6 addresses can make AnyConnect VPN connections through the ASA cluster’s public-facing IPv4 address or through a GSS server. Either type of connection can be load-balanced within the ASA cluster.

**Note**

Connections may fail if the DNS Time-To-Live (TTL) for entries in the GSS DNS Server are less than the time it takes AnyConnect to fully connect. We recommend setting a DNS TTL of at least 300 seconds (five minutes).

For clients with IPv6 addresses to successfully connect to the ASA’s public-facing IPv4 address, a device that can perform network address translation from IPv6 to IPv4 needs to be in the network.

- When performing certificate verification for load balancing with AnyConnect, and the connection is redirected by an IP address, the client does all name checking through this IP address. The customer needs to make sure that this IP address is listed in the certificates common name or the **subject alt name**. If the IP address is not present in these fields, then the certificate will be deemed untrusted.

- Following the guidelines defined in RFC 2818, if a **subject alt name** is included in the certificate, we only use the **subject alt name** for name checks and we ignore the common name. Make sure that the IP address of the server presenting the certificate is defined in the **subject alt name** of the certificate.

For a standalone ASA, the IP address is the IP of that ASA. In a clustering situation, it depends on the certificate configuration. If the cluster uses one certificate, then it would be the IP of the cluster, and the certificate would contain Subject Alternative Name extensions that have each ASA's IP and FQDN. If the cluster uses multiple certificates, then it should once again be the IP address of the ASA.

Configuring Start Before Logon

Start Before Logon (SBL) allows a user to establish their VPN connection to the enterprise infrastructure before logging on to Windows.

Windows logon forces the user to connect to the enterprise infrastructure over a VPN connection before logging on to Windows by starting AnyConnect before the Windows logon dialog box appears. After authenticating to the ASA, the Windows logon dialog appears, and the user logs in as usual. SBL is only available for Windows and lets you control the use of logon scripts, password caching, mapping network drives to local drives, and more.



Note AnyConnect does not support SBL for Windows XP x64 (64-bit) Edition.

Reasons you might consider enabling SBL for your users include:

- The user's computer is joined to an Active Directory infrastructure.
- The user cannot have cached credentials on the computer (the group policy disallows cached credentials).
- The user must run logon scripts that execute from a network resource or need access to a network resource.
- A user has network-mapped drives that require authentication with the Microsoft Active Directory infrastructure.
- Networking components (such as MS NAP/CS NAC) exist that might require connection to the infrastructure.

To enable the SBL feature, you must make changes to the AnyConnect profile and enable the ASA to download an AnyConnect module for SBL.

The only configuration necessary for SBL is enabling the feature. Network administrators handle the processing that goes on before logon based upon the requirements of their situation. Logon scripts can be assigned to a domain or to individual users. Generally, the administrators of the domain have batch files or the like defined with users or groups in Microsoft Active Directory. As soon as the user logs on, the logon script executes.

SBL creates a network that is equivalent to being on the local corporate LAN. For example, with SBL enabled, since the user has access to the local infrastructure, the logon scripts that would normally run when a user is in the office would also be available to the remote user. This includes domain logon scripts, group policy objects and other Active Directory functionality that normally occurs when a user logs on to their system.

In another example, a system might be configured to not allow cached credentials to be used to log on to the computer. In this scenario, users must be able to communicate with a domain controller on the corporate network for their credentials to be validated before gaining access to the computer.

SBL requires a network connection to be present at the time it is invoked. In some cases, this might not be possible, because a wireless connection might depend on credentials of the user to connect to the wireless infrastructure. Since SBL mode precedes the credential phase of a logon, a connection would not be available in this scenario. In this case, the wireless connection needs to be configured to cache the credentials across logon, or another wireless authentication needs to be configured, for SBL to work. If the Network Access Manager is installed, you must deploy machine connection to ensure that an appropriate connection is available. For more information, see [Chapter 4, “Configuring Network Access Manager”](#).

AnyConnect is not compatible with fast user switching.

This section covers the following topics:

- [Installing Start Before Logon Components \(Windows Only\)](#), page 3-14
- [Configuring Start Before Logon \(PLAP\) on Windows 7 and Vista Systems](#), page 3-17

Installing Start Before Logon Components (Windows Only)

The Start Before Logon components must be installed *after* the core client has been installed. Additionally, the Start Before Logon components require that the core client software is installed. If you are pre-deploying AnyConnect and the Start Before Logon components using the MSI files (for example, you are at a big company that has its own software deployment—Altiris, Active Directory, or SMS), then you must get the order right. The order of the installation is handled automatically when the administrator loads AnyConnect if it is web deployed or web updated.

**Note**

AnyConnect cannot be started by third-party Start Before Logon applications.

Start Before Logon Differences Between Windows Versions

The procedures for enabling SBL differ slightly on Windows 7 and Vista systems. Pre-Vista systems use a component called VPNGINA (which stands for virtual private network graphical identification and authentication) to implement SBL. Windows 7 and Vista systems use a component called PLAP to implement SBL.

In AnyConnect, the Windows 7 or Vista SBL feature is known as the Pre-Login Access Provider (PLAP), which is a connectable credential provider. This feature lets network administrators perform specific tasks, such as collecting credentials or connecting to network resources, before logon. PLAP provides SBL functions on Windows 7 and Vista. PLAP supports 32-bit and 64-bit versions of the operating system with `vpnplap.dll` and `vpnplap64.dll`, respectively. The PLAP function supports Windows 7 and Vista x86 and x64 versions.

**Note**

In this section, VPNGINA refers to the Start Before Logon feature for pre-Vista platforms, and PLAP refers to the Start Before Logon feature for Windows 7 and Vista systems.

A GINA is activated when a user presses the Ctrl+Alt+Del key combination. With PLAP, the Ctrl+Alt+Del key combination opens a window where the user can choose either to log in to the system or to activate any Network Connections (PLAP components) using the Network Connect button in the lower-right corner of the window.

The sections that immediately follow describe the settings and procedures for both VPNGINA and PLAP SBL. For a complete description of enabling and using the SBL feature (PLAP) on a Windows 7 or Vista platform, see the [“Configuring Start Before Logon \(PLAP\) on Windows 7 and Vista Systems”](#) section on page 3-17.

Enabling SBL in the AnyConnect Profile

To enable SBL in the AnyConnect profile, follow these steps:

- Step 1** Launch the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile”](#) section on page 3-9).
- Step 2** Go to the Preferences pane and check **Use Start Before Logon**.
- Step 3** (Optional) To give the remote user control over using SBL, check **User Controllable**.



Note The user must reboot the remote computer before SBL takes effect.

Enabling SBL on the Security Appliance

To minimize download time, AnyConnect requests downloads (from the ASA) only of core modules that it needs for each feature that it supports. To enable SBL, you must specify the SBL module name in group policy on the ASA. Follow this procedure:

- Step 1** Go to **Configuration > Remote Access VPN > Network (Client) Access > Group Policies**.
- Step 2** Select a group policy and click **Edit**.
- Step 3** Select **Advanced > AnyConnect Client** in the left navigation pane. AnyConnect Client settings display.
- Step 4** Uncheck **Inherit** for the Optional Client Module for Download setting.
- Step 5** Select the **AnyConnect SBL** module in the drop-down list.

Troubleshooting SBL

Use the following procedure if you encounter a problem with SBL:

- Step 1** Ensure that the AnyConnect profile is loaded on the ASA, ready to be deployed.
- Step 2** Delete prior profiles (search for them on the hard drive to find the location, *.xml).
- Step 3** Using Windows Add/Remove Programs, uninstall the SBL Components. Reboot the computer and retest.
- Step 4** Clear the user's AnyConnect log in the Event Viewer and retest.

- Step 5** Browse back to the security appliance to install AnyConnect again.
- Step 6** Reboot once. On the next reboot, you should be prompted with the Start Before Logon prompt.
- Step 7** Collect a DART bundle and send it to your AnyConnect Administrator. See [“Using DART to Gather Troubleshooting Information”](#) section on page 13-4.

Step 8 If you see the following error, delete the user's AnyConnect profile:

```
Description: Unable to parse the profile C:\Documents and Settings\All
Users\Application Data\Cisco\Cisco AnyConnect Secure Mobility
Client\Profile\VABaseProfile.xml. Host data not available.
```

Step 9 Go back to the .tmpl file, save a copy as an .xml file, and use that XML file as the default profile.

Configuring Start Before Logon (PLAP) on Windows 7 and Vista Systems

As on the other Windows platforms, the Start Before Logon (SBL) feature starts a VPN connection before the user logs in to Windows. This ensures users connect to their corporate infrastructure before logging on to their computers. Microsoft Windows 7 and Vista use different mechanisms than Windows XP, so the SBL feature on Windows 7 and Vista uses a different mechanism as well.

The SBL AnyConnect feature is known as the Pre-Login Access Provider (PLAP), which is a connectable credential provider. This feature lets programmatic network administrators perform specific tasks, such as collecting credentials or connecting to network resources, before logon. PLAP provides SBL functions on Windows 7 and Vista. PLAP supports 32-bit and 64-bit versions of the operating system with vpnplap.dll and vpnplap64.dll, respectively. The PLAP function supports x86 and x64.



Note

In this section, VPNGINA refers to the Start Before Logon feature for Windows XP, and PLAP refers to the Start Before Logon feature for Windows 7 and Vista.

Installing PLAP

The vpnplap.dll and vpnplap64.dll components are part of the existing GINA installation package, so you can load a single, add-on SBL package on the security appliance, which then installs the appropriate component for the target platform. PLAP is an optional feature. The installer software detects the underlying operating system and places the appropriate DLL in the system directory. For systems before Windows 7 and Vista, the installer installs the vpngina.dll component on 32-bit versions of the operating system. On Windows 7 or Vista, or the Windows 2008 server, the installer determines whether the 32-bit or 64-bit version of the operating system is in use and installs the appropriate PLAP component.



Note

If you uninstall AnyConnect while leaving the VPNGINA or PLAP component installed, the VPNGINA or PLAP component is disabled and not visible to the remote user.

Once installed, PLAP is not active until you modify the user profile <profile.xml> file to activate SBL. See the [“Enabling SBL in the AnyConnect Profile” section on page 3-15](#). After activation, the user invokes the Network Connect component by clicking **Switch User**, then the **Network Connect** icon in the lower, right part of the screen.



Note

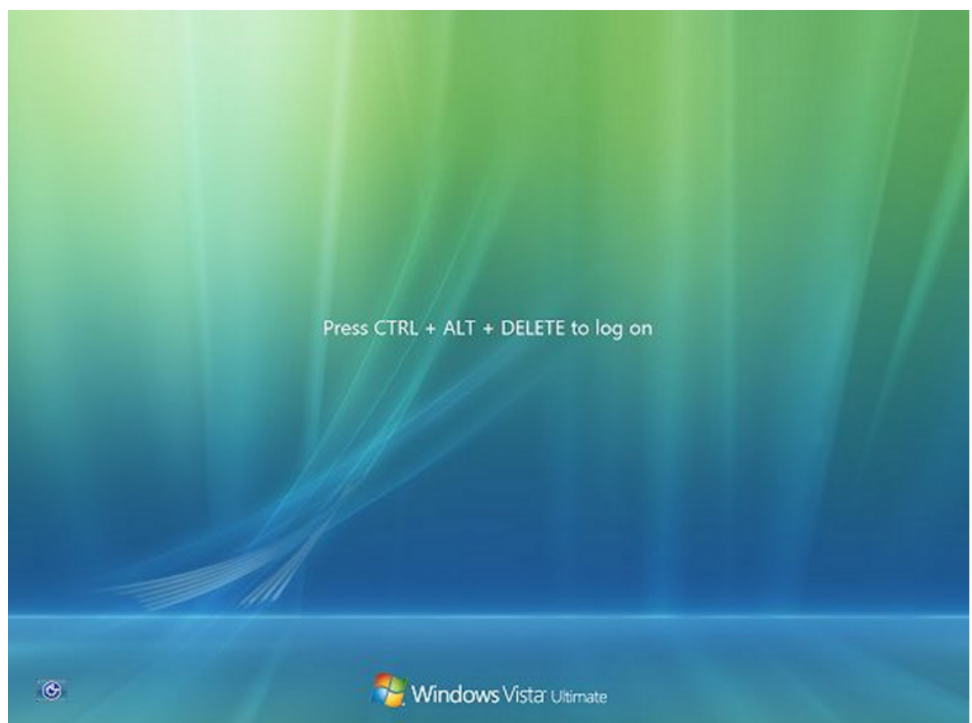
If the user mistakenly minimizes the user interface, the user can restore it by pressing the **Alt+Tab** key combination.

Logging on to a Windows 7 or Windows Vista PC using PLAP

Users can log on to Windows 7 or Windows Vista with PLAP enabled by following these steps, which are Microsoft requirements. The examples screens are for Windows Vista:

- Step 1** At the Windows start window, users press the **Ctrl+Alt+Delete** key combination (Figure 3-3).

Figure 3-3 Example Logon Window Showing the Network Connect Button



The Vista logon window appears with a Switch User button. (Figure 3-4).

Figure 3-4 Example Logon Window with Switch User Button



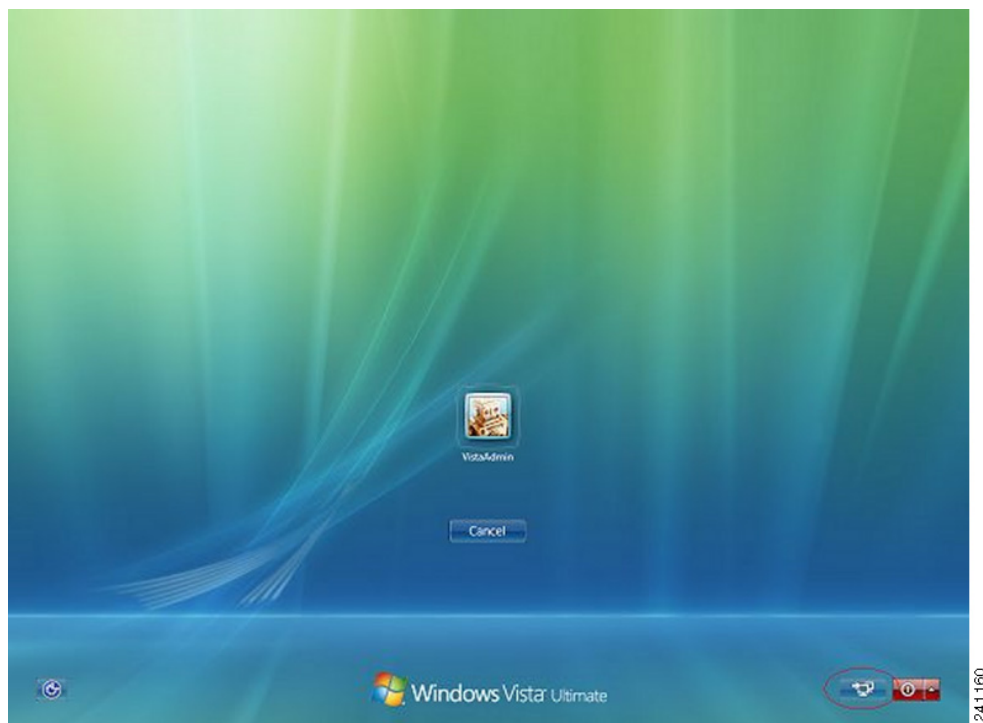
Step 2 The user clicks **Switch User** (circled in red in this figure). The Vista Network Connect window displays. The network logon icon is circled in red.



Note

If the user is already connected through an AnyConnect connection and clicks **Switch User**, that VPN connection remains. If the user clicks **Network Connect**, the original VPN connection terminates. If the user clicks **Cancel**, the VPN connection terminates.

Figure 3-5 Example Network Connect Window



Step 3 The user clicks the **Network Connect** button in the lower-right corner of the window to launch AnyConnect. The AnyConnect logon window opens.

Step 4 The user uses this GUI to log in as usual.



Note

This example assumes AnyConnect is the only installed connection provider. If there are multiple providers installed, the user must select the one to use from the items displayed on this window.

Step 5 When the user connects, the user sees a screen similar to the Vista Network Connect window, except that it has the Microsoft Disconnect button in the lower-right corner (Figure 3-5). This button is the only indication that the connection was successful.

Figure 3-6 Example Disconnect Window



The user clicks the icon associated with their logon. In this example, the user clicks **VistaAdmin** to complete logging onto the computer.



Caution

Once the connection is established, the user has an unlimited time to log on. If the user forgets to log on after connecting, the VPN session continues indefinitely.

Disconnecting from AnyConnect Using PLAP

After successfully establishing a VPN session, the PLAP component returns to the original window, this time with a Disconnect button displayed in the lower-right corner of the window (circled in [Figure 3-6](#)).

When the user clicks **Disconnect**, the VPN tunnel disconnects.

In addition to explicitly disconnecting in response to the **Disconnect** button, the tunnel also disconnects in the following situations:

- When a user logs on to a PC using PLAP but then presses **Cancel**.
- When the PC is shut down before the user logs on to the system.

This behavior is a function of the Windows Vista PLAP architecture, not AnyConnect.

Trusted Network Detection

Trusted Network Detection (TND) gives you the ability to have AnyConnect automatically disconnect a VPN connection when the user is inside the corporate network (the *trusted* network) and start the VPN connection when the user is outside the corporate network (the *untrusted* network). This feature encourages greater security awareness by initiating a VPN connection when the user is outside the trusted network.

**Note**

For the equivalent feature for the Web Security module, see [Secure Trusted Network Detection, page 6-27](#).

If AnyConnect is also running Start Before Logon (SBL), and the user moves into the trusted network, the SBL window displayed on the computer automatically closes.

TND does not interfere with the ability of the user to manually establish a VPN connection. It does not disconnect a VPN connection that the user starts manually in the trusted network. TND only disconnects the VPN session if the user first connects in an untrusted network and moves into a trusted network. For example, TND disconnects the VPN session if the user makes a VPN connection at home and then moves into the corporate office.

Because the TND feature controls the AnyConnect GUI and automatically starts connections, the GUI should run at all times. If the user exits the GUI, TND does not automatically start the VPN connection.

You configure TND in the AnyConnect VPN Client profile. No changes are required to the ASA configuration.

Trusted Network Detection Requirements

Trusted Network Detection (TND) is supported on computers running the Microsoft Windows and Mac OS X operating systems supported by this release of AnyConnect.

Trusted Network Detection with or without Always-On configured is supported on IPv6 and IPv4 VPN connections to the ASA over IPv4 and IPv6 networks.

Configuring Trusted Network Detection

To configure TND in the client profile, follow these steps:

- Step 1** Launch the Profile Editor from ASDM (see the [““Creating and Editing an AnyConnect Profile” section on page 3-9](#)).
- Step 2** Go to the **Preferences (Part 2)** pane.
- Step 3** Check **Automatic VPN Policy**.



Note Automatic VPN Policy does not prevent users from manually controlling a VPN connection.

- Step 4** Select a **Trusted Network Policy**—the action the client takes when the user is inside the corporate network (the trusted network). The options are:
- **Disconnect**—The client terminates the VPN connection in the trusted network.
 - **Connect**—The client starts a VPN connection in the trusted network.
 - **Do Nothing**—The client takes no action in the trusted network. Setting both the Trusted Network Policy and Untrusted Network Policy to *Do Nothing* disables Trusted Network Detection (TND).
 - **Pause**—AnyConnect suspends the VPN session (instead of disconnecting) it if a user enters a network configured as trusted after establishing a VPN session outside the trusted network. When the user goes outside the trusted network again, AnyConnect resumes the session. This feature is for the user's convenience because it eliminates the need to establish a new VPN session after leaving a trusted network.
- Step 5** Select an **Untrusted Network Policy**—the action the client takes when the user is outside the corporate network. The options are:
- **Connect**—The client starts a VPN connection upon the detection of an untrusted network.
 - **Do Nothing**—The client starts a VPN connection upon the detection of an untrusted network. This option disables always-on VPN. Setting both the Trusted Network Policy and Untrusted Network Policy to *Do Nothing* disables Trusted Network Detection.
- Step 6** Specify **Trusted DNS Domains**—Specify the DNS suffixes (a string separated by commas) that a network interface may have when the client is in the trusted network. You can assign multiple DNS suffixes if you add them to the split-dns list and specify a default domain on the ASA. See [Table 3-1](#) for more examples of DNS suffix matching.
- The AnyConnect client builds the DNS suffix list in the following order:
- the domain passed by the head end
 - the split-DNS suffix list passed by the head end
 - the public interface's DNS suffixes, if configured. If not, the primary and connection-specific suffixes, along with the parent suffixes of the primary DNS suffix (if the corresponding box is checked in the Advanced TCP/IP Settings)
- Step 7** Specify **Trusted DNS Servers**—All DNS server addresses (a string separated by commas) that a network interface may have when the client is in the trusted network. For example: 203.0.113.1,2001:DB8::1. Wildcards (*) are not supported for DNS server addresses.



Note You can configure either TrustedDNSDomains, TrustedDNSServers, or both. If you configure TrustedDNSServers, be sure to enter all your DNS servers, so your site(s) will all be part of the Trusted Network.

An active interface will be considered as an In-Trusted-Network if it matches ALL the rules in the VPN profile.

Table 3-1 DNS Suffix Matching Examples

To Match this DNS Suffix:	Use this Value for TrustedDNSDomains:
example.com (only)	*example.com
example.com AND anyconnect.cisco.com	*.example.com OR example.com, anyconnect.example.com
asa.example.com AND example.cisco.com	*.example.com OR asa.example.com, anyconnect.example.com

Wildcards (*) are supported for DNS suffixes.

TND and Users with Multiple Profiles Connecting to Multiple Security Appliances

Multiple profiles on a user computer may present problems if the user alternates connecting to a security appliance that has TND enabled and to one that does not. If the user has connected to a TND-enabled security appliance in the past, that user has received a TND-enabled profile. If the user reboots the computer when out of the trusted network, the GUI of the TND-enabled client displays and attempts to connect to the security appliance it was last connected to, which could be the one that does not have TND enabled.

If the client connects to the TND-enabled security appliance, and the user wishes to connect to the non-TND ASA, the user must manually disconnect and then connect to the non-TND security appliance. Consider these problems before enabling TND when the user may be connecting to security appliances with and without TND.

The following workarounds will help you prevent this problem:

- Enable TND in the client profiles loaded on *all* the ASAs on your corporate network.
- Create *one profile* listing all the ASAs in the host entry section, and load that profile on *all* your ASAs.
- If users do not need to have multiple, different profiles, use the same profiles name for the profiles on *all* the ASAs. Each ASA overrides the existing profile.

Always-on VPN

You can configure AnyConnect to establish a VPN session automatically after the user logs in to a computer. The VPN session remains open until the user logs out of the computer, or the session timer or idle session timer expires. The group policy assigned to the session specifies these timer values. If AnyConnect loses the connection with the ASA, the ASA and the client retain the resources assigned to the session until one of these timers expire. AnyConnect continually attempts to reestablish the connection to reactivate the session if it is still open; otherwise, it continually attempts to establish a new VPN session.

**Note**

If always-on is enabled, but the user does not log on, AnyConnect does not establish the VPN connection. AnyConnect starts the VPN connection only post-login.

(Post logon) *always-on VPN* enforces corporate policies to protect the computer from security threats by preventing access to Internet resources when the computer is not in a trusted network.

**Caution**

Always-on VPN does not support connecting through a proxy.

When AnyConnect detects always-on VPN in the profile, it protects the endpoint by deleting all other AnyConnect profiles and ignores any public proxies configured to connect to the ASA.

To enhance the protection against threats, we recommend the following additional protective measures if you configure always-on VPN:

- Pre-deploy a profile configured with always-on VPN to the endpoints to limit connectivity to the pre-defined ASAs. Predeployment prevents contact with a rogue server.
- Restrict administrator rights so that users cannot terminate processes. A PC user with admin rights can bypass an always-on VPN policy by stopping the agent. If you want to ensure fully-secure always-on VPN, you must deny local admin rights to users.
- Restrict access to the following folders or the Cisco sub-folders on Windows computers:
 - For Windows XP users: C:\Document and Settings\All Users
 - For Windows Vista and Windows 7 users: C:\ProgramData

Users with limited or standard privileges may sometimes have write access to their program data folders. They could use this access to delete the AnyConnect profile file and thereby circumvent the always-on feature.

- Predeploy a group policy object (GPO) for Windows users to prevent users with limited rights from terminating the GUI. Predeploy equivalent measures for Mac OS users.

Always-on VPN Requirements

Support for always-on VPN requires one of the following licenses:

- AnyConnect Premium (SSL VPN Edition)
- Cisco AnyConnect Secure Mobility

You can use a Cisco AnyConnect Secure Mobility license to provide support for always-on VPN in combination with either an AnyConnect Essentials or an AnyConnect Premium license.

Always-on VPN requires a valid server certificate configured on the ASA; otherwise, it fails and logs an event indicating the certificate is invalid.

Ensure your server certificates can pass strict mode if you configure always-on VPN.

Always-on VPN supports computers running the Microsoft Windows and Mac OS X operating systems supported by this release.

To prevent the download of an always-on VPN profile that locks a VPN connection to a rogue server, the AnyConnect client requires a valid, trusted server certificate to connect to a secure gateway.

**Tip**

We strongly recommend purchasing a digital certificate from a certificate authority (CA) and enrolling it on the secure gateways.

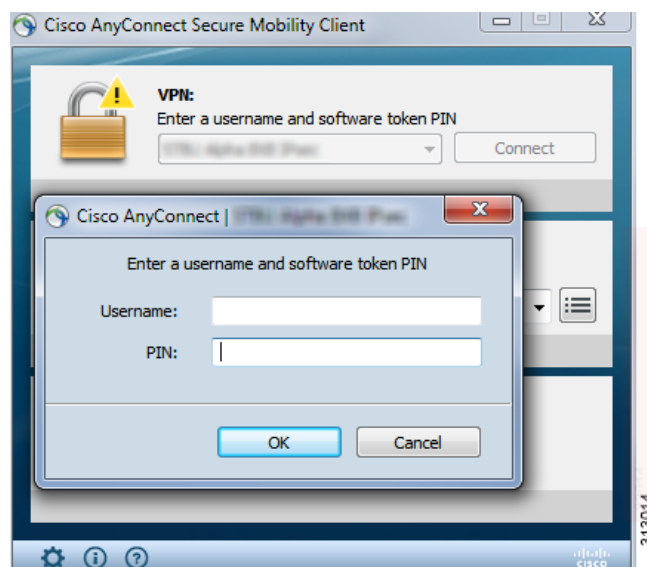
If you generate a self-signed certificate, users connecting receive a certificate warning. They can respond by configuring the browser to trust that certificate to avoid subsequent warnings.

**Note**

We do not recommend using a self-signed certificate because of the possibility a user could inadvertently configure a browser to trust a certificate on a rogue server and because of the inconvenience to users of having to respond to a security warning when connecting to your secure gateways.

ASDM provides an **Enroll ASA SSL VPN with Entrust** button on the **Configuration > Remote Access VPN > Certificate Management > Identity Certificates** panel to facilitate enrollment of a public certificate to resolve this issue on an ASA. The **Add** button on this panel lets you import a public certificate from a file or generate a self-signed certificate:

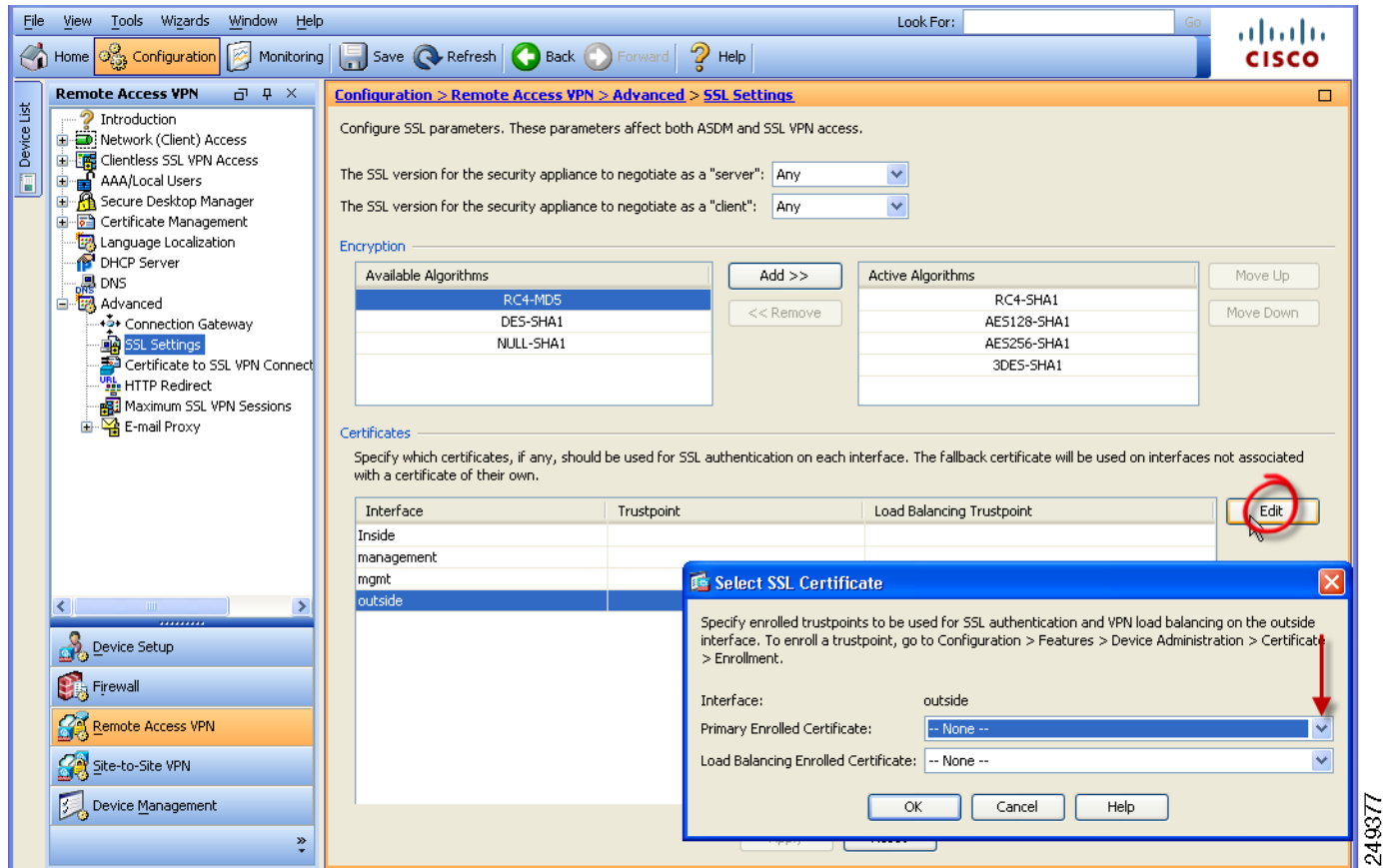
Figure 3-7 Add Identity Certificate dialog

**Note**

These instructions are intended only as a guideline for configuring certificates. For details, click the ASDM **Help** button, or see the ASDM or CLI guide for the secure gateway you are configuring.

Use the **Advanced** button to specify the domain name and IP address of the outside interface if you are generating a self-signed interface.

Following the enrollment of a certificate, assign it to the outside interface. To do so, choose **Configuration > Remote Access VPN > Advanced > SSL Settings**, edit the “outside” entry in the Certificates area, and select the certificate from the Primary Enrolled Certificate drop-down list.

Figure 3-8 Assigning a Certificate to the Outside Interface (ASDM 6.3 Example)

Add the certificate to all the secure gateways and associate it with the IP address of the outside interfaces.

Adding Load-Balancing Backup Cluster Members to the Server List

Always-on VPN affects the load balancing of AnyConnect VPN sessions. With always-on VPN disabled, when the client connects to a master device within a load balancing cluster, the client complies with a redirection from the master device to any of the backup cluster members. With always-on enabled, the client does not comply with a redirection from the master device unless the address of the backup cluster member is specified in the server list of the client profile. Therefore, be sure to add any backup cluster members to the server list.

To specify the addresses of backup cluster members in the client profile, use ASDM to add a load-balancing backup server list by following these steps:

- Step 1** Launch the Profile Editor from ASDM (see the “[Creating and Editing an AnyConnect Profile](#)” section on page 3-9).
- Step 2** Go to the **Server List** pane.
- Step 3** Choose a server that is a master device of a load-balancing cluster and click **Edit**.
- Step 4** Enter an FQDN or IP address of any load-balancing cluster member.

Configuring Always-on VPN

To configure AnyConnect to establish a VPN session automatically only when it detects that the computer is in an untrusted network,

-
- Step 1** Configure TND (see [Configuring Trusted Network Detection, page 3-22](#)).
- Step 2** Check **Always On**.
-

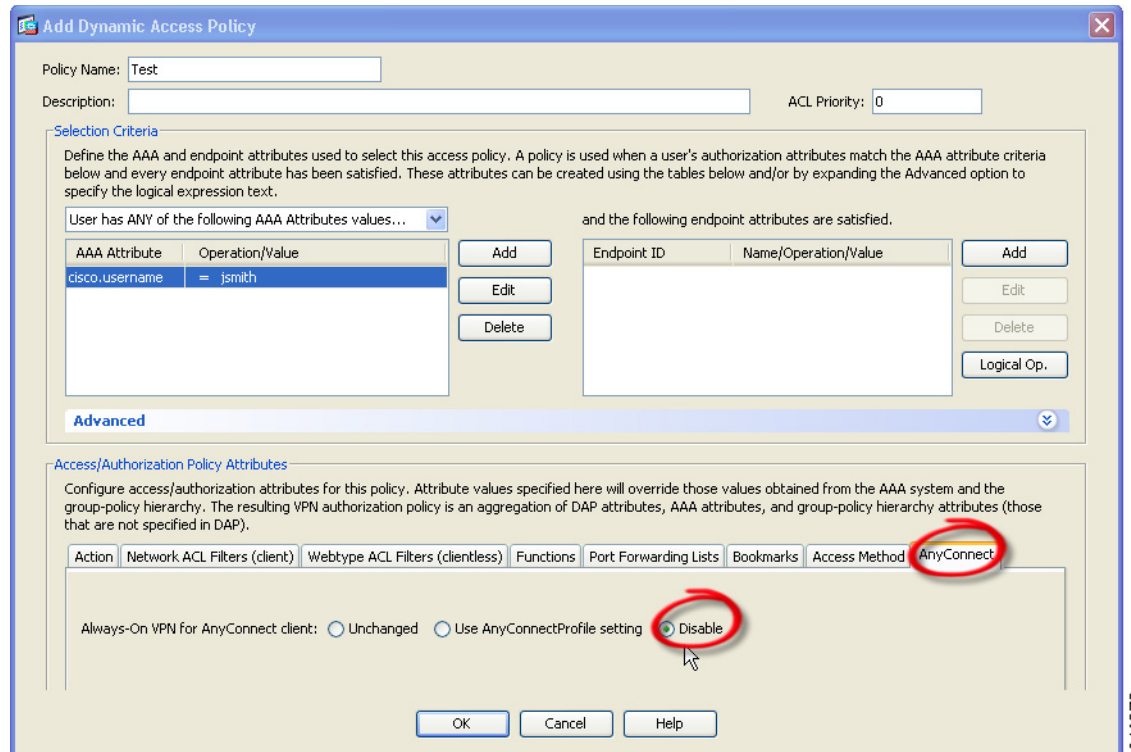
Configuring a Policy to Exempt Users from Always-on VPN

By default, always-on VPN is disabled. You can configure exemptions to override an always-on policy. For example, you might want to let certain individuals establish VPN sessions with other companies or exempt the always-on VPN policy for noncorporate assets.

You can set the always-on VPN parameter in group policies and dynamic access policies to override the always-on policy. Doing so lets you specify exceptions according to the matching criteria used to assign the policy. If an AnyConnect policy enables always-on VPN and a dynamic access policy or group policy disables it, the client retains the disable setting for the current and future VPN sessions as long as its criteria match the dynamic access policy or group policy on the establishment of each new session.

The following procedure configures a dynamic access policy that uses AAA or endpoint criteria to match sessions to noncorporate assets, as follows:

-
- Step 1** Choose **Configuration > Remote Access VPN > Network (Client) Access > Dynamic Access Policies > Add** or **Edit**.

Figure 3-9 Exempting Users from Always-on VPN

- Step 2** Configure criteria to exempt users from always-on VPN. For example, use the Selection Criteria area to specify AAA attributes to match user login IDs.
- Step 3** Click the **AnyConnect** tab on the bottom half of the Add or Edit Dynamic Access Policy window.
- Step 4** Click **Disable** next to “Always-On for AnyConnect VPN” client.

If a Cisco AnyConnect Secure Mobility client policy enables always-on VPN and a dynamic access policy or group policy disables it, the client retains the disable setting for the current and future VPN sessions as long as its criteria match the dynamic access policy or group policy on the establishment of each new session.

Disconnect Button for Always-on VPN

AnyConnect supports a Disconnect button for always-on VPN sessions. If you enable it, AnyConnect displays a Disconnect button upon the establishment of a VPN session. Users of always-on VPN sessions may want to click Disconnect so they can choose an alternative secure gateway for reasons such as the following:

- Performance issues with the current VPN session.
- Reconnection issues following the interruption of a VPN session.

The Disconnect button locks all interfaces to prevent data from leaking out and to protect the computer from internet access except for establishing a VPN session.

**Caution**

Disabling the Disconnect button can at times hinder or prevent VPN access.

If the user clicks Disconnect during an always-on VPN session, AnyConnect locks all interfaces to prevent data from leaking out and protects the computer from internet access except for that required to establish a new VPN session. AnyConnect locks all interfaces, regardless of the connect failure policy.

**Caution**

The Disconnect locks all interfaces to prevent data from leaking out and to protect the computer from internet access except for establishing a VPN session. For the reasons noted above, disabling the Disconnect button can at times hinder or prevent VPN access.

Disconnect Button Requirements

The requirements for the disconnect option for always-on VPN match those in the [“Always-on VPN Requirements” section on page 3-25](#).

Enabling and Disabling the Disconnect Button

By default, the profile editor enables the Disconnect button when you enable always-on VPN. You can view and change the Disconnect button setting, as follows:

-
Step 1	Launch the Profile Editor from ASDM (see the “Creating and Editing an AnyConnect Profile” section on page 3-9).
Step 2	Go to the Preferences (Part 2) pane.
Step 3	Check or uncheck Allow VPN Disconnect .
-

Connect Failure Policy for Always-on VPN

The connect failure policy determines whether the computer can access the internet if always-on VPN is enabled and AnyConnect cannot establish a VPN session (for example, when a secure gateway is unreachable). The fail-close policy disables network connectivity—except for VPN access. The fail-open policy permits network connectivity. Regardless of the connect failure policy, AnyConnect continues to try to establish the VPN connection. The following table explains the fail open and fail close policies:

Always-on VPN Connect Policy	Scenario	Advantage	Trade-off
Fail open	AnyConnect fails to establish or reestablish a VPN session. This failure could occur if the secure gateway is unavailable, or if AnyConnect does not detect the presence of a captive portal (often found in airports, coffee shops and hotels).	Grants full network access, letting users continue to perform tasks where access to the Internet or other local network resources is needed.	Security and protection are not available until the VPN session is established. Therefore, the endpoint device may get infected with web-based malware or sensitive data may leak.
Fail close	Same as above except that this option is primarily for exceptionally secure organizations where security persistence is a greater concern than always-available network access.	The endpoint is protected from web-based malware and sensitive data leakage at all times because all network access is prevented except for local resources such as printers and tethered devices permitted by split tunneling.	Until the VPN session is established, this option prevents all network access except for local resources such as printers and tethered devices. It can halt productivity if users require Internet access outside the VPN and a secure gateway is inaccessible.



Caution

A connect failure closed policy prevents network access if AnyConnect fails to establish a VPN session. AnyConnect detects most captive portals, described in the [“Captive Portal Hotspot Detection and Remediation” section on page 3-33](#); however, if it cannot detect a [captive portal](#), the connect failure closed policy prevents all network connectivity. Use extreme caution when implementing a connect failure closed policy.

If you deploy a closed connection policy, we highly recommend that you follow a phased approach. For example, first deploy always-on VPN with a connect failure open policy and survey users for the frequency with which AnyConnect does not connect seamlessly. Then deploy a small pilot deployment of a connect failure closed policy among early-adopter users and solicit their feedback. Expand the pilot program gradually while continuing to solicit feedback before considering a full deployment. As you deploy a connect failure closed policy, be sure to educate the VPN users about the network access limitation as well as the advantages of a connect failure closed policy.

Connect Failure Policy Requirements

Support for the connect failure policy feature requires one of the following licenses:

- AnyConnect Premium (SSL VPN Edition)
- Cisco AnyConnect Secure Mobility

You can use a Cisco AnyConnect Secure Mobility license to provide support for the connect failure policy in combination with either an AnyConnect Essentials or an AnyConnect Premium license.

The connect failure policy supports only computers running Microsoft Windows 7, Vista, or XP and Mac OS X 10.6 and 10.7.

Configuring a Connect Failure Policy

By default, the connect failure policy prevents Internet access if always-on VPN is configured and the VPN is unreachable. To configure a connect failure policy,

Step 1 Configure TND (see [Configuring Trusted Network Detection, page 3-22](#)).

Step 2 Check **Always On**.

Step 3 Set the Connect Failure Policy parameter to one of the following settings:

- **Closed**—(Default) Restricts network access when the secure gateway is unreachable. AnyConnect does this by enabling packet filters that block all traffic from the endpoint that is not bound for a secure gateway to which the computer is allowed to connect.

The fail-closed policy prevents captive portal remediation (described in the next sections) unless you specifically enable it as part of the policy. The restricted state permits the application of the local resource rules imposed by the most recent VPN session if *Apply Last VPN Local Resources* is enabled in the client profile. For example, these rules could determine access to active sync and local printing. The network is unblocked and open during an AnyConnect software upgrade when Always-On is enabled. The purpose of the Closed setting is to help protect corporate assets from network threats when resources in the private network that protect the endpoint are not available.

- **Open**—This setting permits network access by browsers and other applications when the client cannot connect to the ASA. An open connect failure policy does not apply if you enable the Disconnect button and the user clicks **Disconnect**.
-

Captive Portal Hotspot Detection and Remediation

Many facilities that offer Wi-Fi and wired access, such as airports, coffee shops, and hotels, require the user to pay before obtaining access, agree to abide by an acceptable use policy, or both. These facilities use a technique called *captive portal* to prevent applications from connecting until the user opens a browser and accepts the conditions for access.

The following sections describe the captive portal detection and remediation features.

Captive Portal Remediation Requirements

Support for both captive portal detection and remediation requires one of the following licenses:

- AnyConnect Premium (SSL VPN Edition)
- Cisco AnyConnect Secure Mobility

You can use a Cisco AnyConnect Secure Mobility license to provide support for captive portal detection and remediation in combination with either an AnyConnect Essentials or an AnyConnect Premium license.

Captive portal detection and remediation is supported on the Microsoft Windows and Mac OS X operating systems supported by this release of AnyConnect.

Captive Portal Hotspot Detection

AnyConnect displays the “Unable to contact *VPN server*” message on the GUI if it cannot connect, regardless of the cause. *VPN server* specifies the secure gateway. If always-on is enabled, and a captive portal is not present, the client continues to attempt to connect to the VPN and updates the status message accordingly.

If always-on VPN is enabled, the connect failure policy is closed, captive portal remediation is disabled, and AnyConnect detects the presence of a captive portal, the AnyConnect GUI displays the following message once per connection and once per reconnect:

```
The service provider in your current location is restricting access to the Internet.  
The AnyConnect protection settings must be lowered for you to log on with the service  
provider. Your current enterprise security policy does not allow this.
```

If AnyConnect detects the presence of a captive portal and the AnyConnect configuration differs from that described above, the AnyConnect GUI displays the following message once per connection and once per reconnect:

```
The service provider in your current location is restricting access to the Internet.  
You need to log on with the service provider before you can establish a VPN session.  
You can try this by visiting any website with your browser.
```

Captive portal detection is enabled by default, and is non-configurable.

AnyConnect does not modify any browser configuration settings during Captive Portal detection.

Captive Portal Hotspot Remediation

Captive portal remediation is the process of satisfying the requirements of a captive portal hotspot to obtain network access.

AnyConnect does not remediate the captive portal, it relies on the end user to perform the remediation.

The end user performs the captive portal remediation by meeting the requirements of the provider of the hotspot. These requirements could be paying a fee to access the network, signing an acceptable use policy, both, or some other requirement defined by the provider.

Captive portal remediation needs to be explicitly allowed in an AnyConnect VPN Client profile if AnyConnect Always-on is enabled and the Connect failure policy is set to **Closed**. If Always-on is enabled and the Connect Failure policy is set to **Open**, you don't need to explicitly allow captive portal remediation in an AnyConnect VPN Client profile because the user is not restricted from getting access to the network.

Configuring Support for Captive Portal Hotspot Remediation

You need to enable captive portal remediation in an AnyConnect VPN client policy if the Always-on feature is enabled and the connect failure policy is set to closed. If the connect failure policy is set to open, your users are not restricted from network access, and so, are capable of remediating a captive portal without any other configuration of the AnyConnect VPN client policy.

By default, support for captive portal remediation is disabled. Use this procedure to enable captive portal remediation:

-
- Step 1** Configure a connect failure policy (see [Configuring a Connect Failure Policy, page 3-32](#)).
- Step 2** If you set the connect failure policy to closed, configure the following parameters:
- **Allow Captive Portal Remediation**—Check to let the Cisco AnyConnect Secure Mobility client lift the network access restrictions imposed by the closed connect failure policy. By default, this parameter is unchecked to provide the greatest security; however, you must enable it if you want the client to connect to the VPN if a captive portal is preventing it from doing so.
 - **Remediation Timeout**—Enter the number of minutes that AnyConnect lifts the network access restrictions. The user needs enough time to satisfy the captive portal requirements.
- If always-on VPN is enabled, and the user clicks **Connect**, or a reconnect is in progress, a message window indicates the presence of a captive portal. The user can then open a web browser window to remediate the captive portal.
-

If Users Cannot Access a Captive Portal Page

If users cannot access a captive portal remediation page, ask them to try the following steps until they can remediate:

-
- Step 1** Disable and re-enable the network interface. This action triggers a captive portal detection retry.
- Step 2** Terminate any applications that use HTTP, such as instant messaging programs, e-mail clients, IP phone clients, and all but one browser to perform the remediation. The captive portal may be actively inhibiting DoS attacks by ignoring repetitive attempts to connect, causing them to time out on the client end. The attempt by many applications to make HTTP connections exacerbates this problem.

- Step 3** Retry Step 1.
- Step 4** Restart the computer.
-

False Captive Portal Detection

AnyConnect can falsely assume it is in a captive portal in the following situations.

- If AnyConnect attempts to contact an ASA with a certificate containing an incorrect server name (CN), then the AnyConnect client will think it is in a “captive portal” environment.
To prevent this, make sure the ASA certificate is properly configured. The CN value in the certificate must match the name of the ASA server in the VPN client profile.
- If there is another device on the network before the ASA, and that device responds to the client's attempt to contact an ASA by blocking HTTPS access to the ASA, then the AnyConnect client will think it is in a “captive portal” environment. This situation can occur when a user is on an internal network, and connects through a firewall to connect to the ASA.

If you need to restrict access to the ASA from inside the corporation, configure your firewall such that HTTP and HTTPS traffic to the ASA's address does not return an HTTP status. HTTP/HTTPS access to the ASA should either be allowed or completely blocked (also known as black-holed) to ensure that HTTP/HTTPS requests sent to the ASA will not return an unexpected response.

Client Firewall with Local Printer and Tethered Device Support

When users connect to the ASA, all traffic is tunneled through the connection and users cannot access resources on their local network. This includes printers, cameras, and tethered devices that synchronize with the local computer. Enabling Local LAN Access in the client profile resolves this problem, however it can introduce a security or policy concern for some enterprises because it allows unrestricted access to the local network. You can use the ASA to deploy endpoint OS firewall capabilities to restrict access to particular types of local resources, such as printers and tethered devices.

To do so, enable client firewall rules for specific ports for printing. The client distinguishes between inbound and outbound rules. For printing capabilities, the client opens ports required for outbound connections, but blocks all incoming traffic.

The Client Firewall feature is supported on the Windows, Mac OS X, and Linux operating systems supported by this release.



Note

Be aware that users logged in as administrators have the ability to modify the firewall rules deployed to the client by the ASA. Users with limited privileges cannot modify the rules. For either user, the client reapplies the firewall rules when the connection terminates.

If you configure the client firewall, and the user authenticates to an Active Directory (AD) server, the client still applies the firewall policies from the ASA. However, the rules defined in the AD group policy take precedence over the rules of the client firewall.

The following sections describe procedures on how to do this:

- [Deploying a Client Firewall for Local Printer Support, page 3-36](#)
- [Tethered Devices Support, page 3-38](#)

Usage Notes about Firewall Behavior

The following notes clarify how the AnyConnect client uses the firewall:

- The source IP is not used for firewall rules. The client ignores the source IP information in the firewall rules sent from the ASA. The client determines the source IP depending on whether the rules are public or private. Public rules are applied to all interfaces on the client. Private rules are applied to the Virtual Adapter.
- The ASA supports many protocols for ACL rules. However, the AnyConnect firewall feature supports only TCP, UDP, ICMP, and IP. If the client receives a rule with a different protocol, it treats it as an invalid firewall rule, and then disables split tunneling and uses full tunneling for security reasons.
- Starting in ASA 9.0, the Public Network Rule and Private Network Rule support unified access control lists. These access control lists can be used to define IPv4 and IPv6 traffic in the same rule.

Be aware of the following differences in behavior for each operating system:

- For Windows computers, deny rules take precedence over allow rules in Windows Firewall. If the ASA pushes down an allow rule to the AnyConnect client, but the user has created a custom deny rule, the AnyConnect rule is not enforced.
- On Windows Vista, when a firewall rule is created, Vista takes the port number range as a comma-separated string. The port range can be a maximum of 300 ports. For example, from 1-300 or 5000-5300. If you specify a range greater than 300 ports, the firewall rule is applied only to the first 300 ports.
- Windows users whose firewall service must be started by the AnyConnect client (not started automatically by the system) may experience a noticeable increase in the time it takes to establish a VPN connection.
- On Mac computers, the AnyConnect client applies rules sequentially in the same order the ASA applies them. Global rules should always be last.
- For third-party firewalls, traffic is passed only if both the AnyConnect client firewall and the third-party firewall allow that traffic type. If the third-party firewall blocks a specific traffic type that the AnyConnect client allows, the client blocks the traffic.

Deploying a Client Firewall for Local Printer Support

The ASA supports the AnyConnect client firewall feature with ASA version 8.3(1) or later, and ASDM version 6.3(1) or later. This section describes how to configure the client firewall to allow access to local printers, and how to configure the client profile to use the firewall when the VPN connection fails.

Limitations and Restrictions of the Client Firewall

The following limitations and restrictions apply to using the client firewall to restrict local LAN access:

- Due to limitations of the OS, the client firewall policy on computers running Windows XP is enforced for inbound traffic only. Outbound rules and bidirectional rules are ignored. This would include firewall rules such as 'permit ip any any'.
- Host Scan and some third-party firewalls can interfere with the firewall.

Table 3-2 clarifies what direction of traffic is affected by the source and destination port settings:

Table 3-2 Source and Destination Ports and Traffic Direction Affected

Source Port	Destination Port	Traffic Direction Affected
Specific port number	Specific port number	Inbound and outbound
A range or 'All' (value of 0)	A range or 'All' (value of 0)	Inbound and outbound
Specific port number	A range or 'All' (value of 0)	Inbound only
A range or 'All' (value of 0)	Specific port number	Outbound only

Example ACL Rules for Local Printing

The ACL AnyConnect_Client_Local_Print is provided with ASDM to make it easy to configure the client firewall. When you select that ACL for Public Network Rule in the Client Firewall pane of a group policy, that list contains the following ACEs:

Table 3-3 ACL Rules in AnyConnect_Client_Local_Print

Description	Permission	Interface	Protocol	Source Port	Destination Address	Destination Port
Deny all	Deny	Public	Any	Default ¹	Any	Default
LPD	Allow	Public	TCP	Default	Any	515
IPP	Allow	Public	TCP	Default	Any	631
Printer	Allow	Public	TCP	Default	Any	9100
mDNS	Allow	Public	UDP	Default	224.0.0.251	5353
LLMNR	Allow	Public	UDP	Default	224.0.0.252	5355
NetBios	Allow	Public	TCP	Default	Any	137
NetBios	Allow	Public	UDP	Default	Any	137

1. The port range is 1 to 65535.

**Note**

To enable local printing, you must enable the **Local LAN Access** feature in the client profile. If you do this with the CLI, you must add an ACL rule *allow Any Any*.

Configuring Local Print Support

- Step 1** Enable the AnyConnect client firewall in a group policy. Go to **Configuration > Remote Access VPN > Network (Client) Access > Group Policies**.
- Step 2** Select a group policy and click **Edit**. The Edit Internal Group Policy window displays.
- Step 3** Select **Advanced > AnyConnect Client > Client Firewall**. Click **Manage** for the Private Network Rule.
- Step 4** Create an ACL and specify an ACE using the rules in [Table 3-3](#). Add this ACL as a Public Network Rule.
- Step 5** If you enabled the Automatic VPN Policy always-on and specified a closed policy, in the event of a VPN failure, users have no access to local resources. You can apply the firewall rules in this scenario by going to **Preferences (Cont)** in the profile editor and checking **Apply last local VPN resource rules**.

Tethered Devices Support

To support tethered devices and protect the corporate network, create a standard ACL in the group policy, specifying destination addresses in the range that the tethered devices use. Then specify the ACL for split tunneling as a network list to exclude from tunneled VPN traffic. You must also configure the client profile to use the last VPN local resource rules in case of VPN failure.

Follow these steps:

-
- Step 1** In ASDM, go to **Group Policy > Advanced > Split Tunneling**.
 - Step 2** Uncheck **Inherit** next to the Network List field and click **Manage**. The ACL Manager displays.
 - Step 3** Click the **Extended ACL** tab.
 - Step 4** Click **Add** and then **Add ACL**. Specify a name for the new ACL.
 - Step 5** Choose the new ACL in the table and click **Add** and then **Add ACE**. The Edit ACE window displays.
 - Step 6** For Action, choose the **Permit** radio button.
 - Step 7** In the destination criteria area, specify the IPv4 destination address as 169.254.0.0 or the IPv6 destination address fe80::/64.
 - Step 8** For Service, choose **IP**.
 - Step 9** Click **OK**.
 - Step 10** Click OK to save the ACL.
 - Step 11** In the Split Tunneling pane for the internal group policy, uncheck Inherit for the Policy or IPv6 Policy, depending on the IP address you specified in step 7, and choose **Exclude Network List Below**. For Network List, choose the ACL you created.
 - Step 12** Click **OK**.
 - Step 13** Click **Apply**.
-

New Installation Directory Structure for Mac OS X

In previous releases of AnyConnect, AnyConnect components were installed in the **opt/cisco/vpn** path. In release 3.0.4 or later, AnyConnect components are installed in the **/opt/cisco/anyconnect** path.

ScanCenter Hosted Configuration Support for Web Security Client Profile

The ScanCenter Hosted Configuration for the Web Security Hosted Client Profile gives administrators the ability to provide new Web Security client profiles to Web Security clients. Devices with Web Security can download a new client profile from the cloud (hosted configuration files reside on the ScanCenter server). The only prerequisite for this feature is for the device to have Web Security installed with a valid client profile.

Administrators use the Web Security Profile Editor to create the client profile files and then upload the clear text XML file to a ScanCenter server. This XML file must contain a valid license key from ScanSafe. The Hosted Configuration feature uses the license key when retrieving a new client profile file from the Hosted Configuration (ScanCenter) server. Once the new client profile file is on the server, devices with Web Security automatically poll the server and download the new client profile file, provided that the license in the existing Web Security client profile is the same as a license associated with a client profile on the Hosted server. Once a new client profile has been downloaded, Web Security will not download the same file again until the administrator makes a new client profile file available.

**Note**

Web Security client devices must be pre-installed with a valid client profile file containing a ScanSafe license key before it can use the Hosted Configuration feature.

Configuring DNS and WINS Servers for AnyConnect

DNS Servers and WINS servers are configured in a Network (Client) Access group policy. See [Configuring Server Attributes for an Internal Group Policy](#) in the General VPN Setup chapter of the *Cisco ASA Series VPN ASDM Configuration Guide*.

After making changes to the group policy in ASDM, be sure the group policy is associated with a Connection Profile in **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Connection Profiles > Add/Edit > Group Policy**.

Configuring Split Tunneling

Split tunneling is configured in a Network (Client) Access group policy. See [Configuring Split Tunneling for an Internal Group Policy](#) in the General VPN Setup chapter of the *Cisco ASA Series VPN ASDM Configuration Guide*.

After making changes to the group policy in ASDM, be sure the group policy is associated with a Connection Profile in **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Connection Profiles > Add/Edit > Group Policy**.

Split DNS

When split DNS is configured in the Network (Client) Access group policy, AnyConnect tunnels specific DNS queries to the private DNS server (also configured in the group policy). All other DNS queries go to the DNS resolver on the client operating system, in the clear, for DNS resolution. If split DNS is not configured, AnyConnect tunnels all DNS queries.

Requirements for Split DNS

Split DNS supports standard and update queries (including A, AAAA, NS, TXT, MX, SOA, ANY, SRV, PTR, and CNAME). PTR queries matching any of the tunneled networks are allowed through the tunnel.

AnyConnect split DNS is supported on Windows and Mac OS X platforms.

For Mac OS X, AnyConnect can use true split-DNS for a certain IP protocol only if one of the following conditions is met:

- split-DNS is configured for one IP protocol (such as IPv4), and Client Bypass Protocol is configured for the other IP protocol (such as IPv6) in the group policy (with no address pool configured for the latter IP protocol).
- split-DNS is configured for both IP protocols

Configuring Split DNS

To configure split DNS in the group policy do the following:

1. Configure at least one DNS server:

See [Configuring Server Attributes for an Internal Group Policy](#) in the General VPN Setup chapter of the *Cisco ASA Series VPN ASDM Configuration Guide*.

Ensure the private DNS servers specified do not overlap with the DNS servers configured for the client platform. If they do, name resolution does not function properly and queries may be dropped.

Refer to [Configuring Split Tunneling for an Internal Group Policy](#) in the General VPN Setup chapter of the *Cisco ASA Series VPN ASDM Configuration Guide*, for the remainder of the configuration steps.

2. Configure split-include tunneling:

On the **Configuration > Remote Access VPN > Network (Client) Access > Group Policies > Advanced > Split Tunneling** pane, choose the **Tunnel Network List Below** policy, and specify a **Network List** of addresses to be tunneled.

Split-DNS does not support the Exclude Network List Below split-tunneling policy. You must use the Tunnel Network List Below split-tunneling policy to configure split-DNS.

3. Configure split DNS:

On the **Configuration > Remote Access VPN > Network (Client) Access > Group Policies > Advanced > Split Tunneling** pane, uncheck **Send All DNS lookups through tunnel**, and specifying the names of the domains whose queries will be tunneled in **DNS Names**.

After making changes to the group policy in ASDM, be sure the group policy is associated with a Connection Profile in **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Connection Profiles > Add/Edit > Group Policy**.

Verify Split DNS Using AnyConnect Logs

To verify if split-DNS is enabled, search the AnyConnect logs for an entry containing “Received VPN Session Configuration Settings.” That entry indicates *Split DNS:enabled* when enabled. There are separate log entries for IPv4 and IPv6 split DNS.

Checking Which Domains Use Split DNS

You can use any tool or application that relies on the operating system’s DNS resolver for domain name resolution. For example, you can use a ping or web browser to test the split DNS solution. Other tools such as nslookup or dig circumvent the OS DNS resolver.

To use the client to check which domains are used for split DNS, follow these steps:

-
- Step 1** Run **ipconfig/all** and record the domains listed next to DNS Suffix Search List.

- Step 2** Establish a VPN connection and again check the domains listed next to DNS Suffix Search List. Those extra domains added after establishing the tunnel are the domains used for split DNS.

**Note**

This process assumes that the domains pushed from the ASA do not overlap with the ones already configured on the client host.

Network Roaming

AnyConnect 3.1 supports roaming between IPv4 and IPv6 networks. The AnyConnect client uses the fully qualified domain name (FQDN) of the ASA to maintain the connection to that secure gateway as AnyConnect moves between the two types of networks.

In order to accommodate roaming between NAT46 and NAT64 enabled networks (which typically also involves DNS46 and DNS64 configurations), the client performs name resolution of the ASA FQDN whenever network roaming is detected during the VPN session to determine the ASA IP address to use for re-establishing the VPN session.

In ASA environments using load-balancing, it is not feasible to determine why the profile FQDN cannot be resolved during roaming without setting the FQDN of the ASA. That is because you cannot guarantee that the IP address of the ASA the clients first reach belongs to the ASA of the device they are connected to.

**Note**

The mentioned ASA FQDN is not the profile FQDN used to originally establish the VPN tunnel, it is the ASA device FQDN pushed to client during the tunnel establishment.

Prerequisite

Configuring Network Roaming between IPv4 and IPv6 networks is configured in the group policy on the ASA.

See “Configuring Network (Client) Access Internal Group Policies” in Chapter 73, General VPN Setup in the [ASA Series ASDM Configuration Guide](#) for instructions on how to add or edit an internal group policy.

Configuring Network Roaming Between IPv4 and IPv6 Networks

- Step 1** Launch ASDM and select **Remote Access VPN > Configuration > Network (Client) Access > Group Policies > Group Policies**.
- Step 2** Select the group policy you are going to configure and click **Edit**.
- Step 3** Click **Advanced > AnyConnect** in the Edit Internal Group Policy page.
- Step 4** In the FQDN row, uncheck FQDN and add the FQDN of the ASA in the FQDN text box.

If the above is not set, the ASA pushes the FQDN defined in the Hostname and Domain Name fields on the ASA in this location: **Configuration > Device Setup > Device Name/Password**. The domain name must be filled in to make it an FQDN.

The client only performs name resolution of the ASA if it's sent as an FQDN. Otherwise, AnyConnect uses the IP address(es) determined at the time the tunnel was initiated to re-establish the VPN session.

Step 5 Save changes to the group policy or to the Device Name/Password Device Setup.

Configuring Certificate Enrollment using SCEP

About Certificate Enrollment using SCEP

The AnyConnect Secure Mobility Client can use the Simple Certificate Enrollment Protocol (SCEP) to provision and renew a certificate as part of client authentication. The goal of SCEP is to support the secure issuance of certificates to network devices in a scalable manner, using existing technology.

Certificate enrollment using SCEP is supported by AnyConnect IPsec and SSL VPN connections to the ASA in the following ways:

- **SCEP Proxy:** The ASA acts as a proxy for SCEP requests and responses between the client and the CA.
 - The CA must be accessible to the ASA, not the AnyConnect client, since the client does not access the CA directly.
 - Enrollment is always initiated automatically by the client. No user involvement is necessary.
 - SCEP Proxy is supported in AnyConnect 3.0 and higher.
- **Legacy SCEP:** The AnyConnect client communicates with the CA directly to enroll and obtain a certificate.
 - The CA must be accessible to the AnyConnect client, not the ASA, through an established VPN tunnel or directly on the same network the client is on.
 - Enrollment is initiated automatically by the client and may be initiated manually by the user if configured.
 - Legacy SCEP is supported in AnyConnect 2.4 and higher.

SCEP Proxy Enrollment

The following steps describe the process in which a certificate is obtained and a certificate-based connection is made when AnyConnect and the ASA are configured for SCEP Proxy.

1. The user connects to the ASA headend using a connection profile configured for both certificate and AAA authentication. The ASA requests a certificate and AAA credentials for authentication from the client.
2. The user enters their AAA credentials but a valid certificate is not available. This situation triggers the client to send an automatic SCEP enrollment request after the tunnel has been established using the entered AAA credentials.
3. The ASA forwards the enrollment request to the CA and returns the CA's response to the client.
4. If SCEP enrollment is successful, the client presents a (configurable) message to the user and disconnects the current session. The user can now connect using certificate authentication to an ASA tunnel group.

If SCEP enrollment fails, the client displays a (configurable) message to the user and disconnects the current session. The user should contact their administrator.

SCEP Proxy Notes

- The client automatically renews the certificate before it expires, without user intervention, if the **Certificate Expiration Threshold** field is set in the VPN profile.
- SCEP Proxy enrollment requires the use of SSL for both SSL and IPsec tunnel certificate authentication.

Legacy SCEP Enrollment

The following steps describe the process in which a certificate is obtained and a certificate-based connection is made when AnyConnect is configured for Legacy SCEP.

1. The user initiates a connection to the ASA headend using a tunnel group configured for certificate authentication. The ASA requests a certificate for authentication from the client.
2. A valid certificate is not available on the client, the connection can not be established. This certificate failure indicates that SCEP enrollment needs to occur.
3. The user must then initiate a connection to the ASA headend using a tunnel group configured for AAA authentication only whose address matches the **Automatic SCEP Host** configured in the client profile. The ASA requests the AAA credentials from the client.
4. The client presents a dialog box for the user to enter their AAA credentials.

If the client is configured for manual enrollment and the client knows it needs to initiate SCEP enrollment (see Step 2), a **Get Certificate** button will display on the credentials dialog box. If the client has direct access to the CA on their network, the user will be able to manually obtain a certificate by clicking this button at this time.



Note If access to the CA relies on the VPN tunnel being established, manual enrollment can not be done at this time since there is currently no VPN tunnel established (AAA credentials have not been entered).

5. The user enters their AAA credentials and establishes a VPN connection.
6. The client knows it needs to initiate SCEP enrollment (see Step 2), it initiates an enrollment request to the CA through the established VPN tunnel, and a response is received from the CA.
7. If SCEP enrollment is successful, the client presents a (configurable) message to the user and disconnects the current session. The user can now connect using certificate authentication to an ASA tunnel group.

If SCEP enrollment fails, the client displays a (configurable) message to the user and disconnects the current session. The user should contact their administrator.

8. If the client is configured for manual enrollment and the **Certificate Expiration Threshold** value is met, a **Get Certificate** button will display on a presented tunnel group selection dialog box. The user will be able to manually renew their certificate by clicking this button.

Legacy SCEP Notes

- If you use manual Legacy SCEP enrollment, we recommend you enable CA Password in the client profile. The CA Password is the challenge password or token that is sent to the certificate authority to identify the user.

- If the certificate expires and the client no longer has a valid certificate, the client repeats the Legacy SCEP enrollment process.

SCEP Guidelines and Limitations

- ASA Load balancing is supported with SCEP enrollment.
- Clientless (browser-based) VPN access to the ASA does not support SCEP proxy, but WebLaunch (clientless-initiated AnyConnect) does.
- The ASA does not indicate why an enrollment failed, although it does log the requests received from the client. Connection problems must be debugged on the CA or the client.
- All SCEP-compliant CAs, including IOS CS, Windows Server 2003 CA, and Windows Server 2008 CA are supported.
- The CA must be in auto-grant mode; polling for certificates is not supported.
- Some CA's can be configured to email users an enrollment password, this provides an additional layer of security. The password can also be configured in the AnyConnect client profile, which becomes part of SCEP request that the CA verifies before granting the certificate.

Windows Certificate Warning

When Windows clients first attempt to retrieve a certificate from a certificate authority they may see a warning. When prompted, users must click **Yes**. This allows them to import the root certificate. It does not affect their ability to connect with the client certificate.

Identifying Enrollment Connections to Apply Policies

On the ASA, the `aaa.cisco.sceprequired` attribute can be used to catch the enrollment connections and apply the appropriate policies in the selected DAP record.

Certificate-Only Authentication and Certificate Mapping on the ASA

To support certificate-only authentication in an environment where multiple groups are used, you may provision more than one group-url. Each group-url would contain a different client profile with some piece of customized data that would allow for a group-specific certificate map to be created. For example, the `Department_OU` value of Engineering could be provisioned on the ASA to place the user in this tunnel group when the certificate from this process is presented to the ASA.

Configuring SCEP Proxy Certificate Enrollment

Configuring a VPN Client Profile for SCEP Proxy Enrollment

-
Step 1	Launch the Profile Editor from ASDM, or use the stand-alone VPN Profile Editor (see the Creating and Editing an AnyConnect Profile , page 3-9).
Step 2	In the ASDM, Click Add (or Edit) to create (or edit) an AnyConnect Profile. On the stand-alone editor, open an existing profile or continue to create a new one.

- Step 3** Click **Certificate Enrollment** in the AnyConnect Client Profile tree on the left.
- Step 4** In the **Certificate Enrollment** pane, check **Certificate Enrollment**.
- Step 5** Configure the **Certificate Contents** to be requested in the enrollment certificate. For definitions of the certificate fields, see [AnyConnect Profile Editor, Certificate Enrollment, page 3-85](#).

**Note**

- If you use %machineid%, then Hostscan/Posture must be loaded for the desktop client.
- For mobile clients, at least one certificate field must be specified.

Configuring the ASA to support SCEP Proxy Enrollment

For SCEP Proxy, a single ASA connection profile supports certificate enrollment and the certificate authorized VPN connection.

Prerequisite

Configure a client profile for SCEP Proxy, for example, ac_vpn_scep_proxy. See [Configuring a VPN Client Profile for SCEP Proxy Enrollment, page 3-44](#).

- Step 1** Create a group policy, for example, cert_group. Set the following fields:
- On General, enter the URL to the CA in **SCEP Forwarding URL**.
 - On the Advanced > AnyConnect Client pane, uncheck **Inherit** for **Client Profiles to Download** and specify the client profile configured for SCEP Proxy. For example, specify the ac_vpn_scep_proxy client profile.
- Step 2** Create a connection profile for certificate enrollment and certificate authorized connection, for example, cert_tunnel.
- Authentication: Both (AAA and Certificate)
 - Default Group Policy: cert_group
 - On Advanced > General, check **Enable SCEP Enrollment for this Connection Profile**.
 - On Advanced > GroupAlias/Group URL, create a Group URL containing the group (cert_group) for this connection profile.

Configuring Legacy SCEP Certificate Enrollment

Configuring a VPN Client Profile for Legacy SCEP Enrollment

- Step 1** Launch the Profile Editor from ASDM, or use the stand-alone VPN Profile Editor (see the [Creating and Editing an AnyConnect Profile, page 3-9](#)).
- Step 2** In the ASDM, Click **Add** (or **Edit**) to create (or edit) an AnyConnect Profile. On the stand-alone editor, open an existing profile or continue to create a new one.
- Step 3** Click **Certificate Enrollment** in the AnyConnect Client Profile tree on the left.
- Step 4** In the **Certificate Enrollment** pane, check **Certificate Enrollment**.
- Step 5** Specify an **Automatic SCEP Host** to direct the client to retrieve the certificate.

Enter the FQDN or IP address, and the alias of the connection profile (tunnel group) that is configured for SCEP certificate retrieval. For example, if `asa.cisco.com` is the host name of the ASA and `scep_eng` is the alias of the connection profile, enter `asa.cisco.com/scep-eng`.

When the user initiates the connection, the address chosen or specified must match this value exactly for Legacy SCEP enrollment to succeed. For example, if this field is set to an FQDN, but the user specifies an IP address, SCEP enrollment will fail.

Step 6 Configure the Certificate Authority attributes:



Note Your CA server administrator can provide the CA URL and thumbprint. Retrieve the thumbprint directly from the server, not from a “fingerprint” or “thumbprint” attribute field in an issued certificate.

- a. Specify a CA URL to identify the SCEP CA server. Enter an FQDN or IP Address. For example:
`http://ca01.cisco.com/certsrv/mscep/mscep.dll`.
- b. (Optional) Check **Prompt For Challenge PW** to prompt the user for their username and one-time password.
- c. (Optional) Enter a Thumbprint for the CA certificate. Use SHA1 or MD5 hashes. For example:
`8475B661202E3414D4BB223A464E6AAB8CA123AB`.

Step 7 Configure the **Certificate Contents** to be requested in the enrollment certificate. For definitions of the certificate fields, see [AnyConnect Profile Editor, Certificate Enrollment, page 3-85](#).



Note If you use `%machineid%`, then Hostscan/Posture must be loaded on the client.

Step 8 (Optional) Check **Display Get Certificate Button** to permit users to manually request provisioning or renewal of authentication certificates. The button is visible to users if the certificate authentication fails.

Step 9 (Optional) Enable SCEP for a specific host in the server list. Doing this overrides the SCEP settings in the Certificate Enrollment pane described above.

- a. Click **Server List** in the AnyConnect Client Profile tree on the left to go to the Server List pane.
- b. **Add** or **Edit** a server list entry.
- c. Specify the Automatic SCEP Host and Certificate Authority attributes as described in Steps 5 and 6 above.

Configuring the ASA to support Legacy SCEP Enrollment

For Legacy SCEP on the ASA, a connection profile and group policy must be created for certificate enrollment, and a second connection profile and group policy must be created for the certificate authorized VPN connection.

Prerequisite

Configure a client profile for Legacy SCEP, for example, `ac_vpn__legacy_scep`. See [Configuring a VPN Client Profile for Legacy SCEP Enrollment, page 3-45](#).

Step 1 Create a group policy for enrollment, for example, `cert_enroll_group`. Set the following fields:

- On the Advanced > AnyConnect Client pane, uncheck **Inherit** for **Client Profiles to Download** and specify the client profile configured for Legacy SCEP. For example, specify the ac_vpn_legacy_scep client profile.
- Step 2** Create a second group policy for authorization, for example, cert_auth_group.
- Step 3** Create a connection profile for enrollment, for example, cert_enroll_tunnel. Set the following fields:
- On the Basic pane, set the Authentication Method to AAA.
 - On the Basic pane, set the Default Group Policy to cert_enroll_group.
 - On Advanced > GroupAlias/Group URL, create a Group URL containing the enrollment group (cert_enroll_group) for this connection profile.
 - Do not enable the connection profile on the ASA. It is not necessary to expose the group to users in order for them to have access to it.
- Step 4** Create a connection profile for authorization, for example, cert_auth_tunnel. Set the following fields.
- On the Basic pane, set the Authentication Method to Certificate.
 - On the Basic pane, set the Default Group Policy to cert_auth_group.
 - Do not enable this connection profile on the ASA. It is not necessary to expose the group to users in order for them to access it.
- Step 5** (Optional) On the General pane of each group policy, set **Connection Profile (Tunnel Group) Lock** to the corresponding SCEP connection profile, which restricts traffic to the SCEP-configured connection profile.

Using a Windows 2008 Server Certificate Authority for SCEP

If your Certificate Authority software is running on a Windows 2008 server, you may need to make one of the following configuration changes to the server to support SCEP with AnyConnect.

Disabling the SCEP Password on the Certificate Authority

The following steps describe how to disable the SCEP challenge password, so clients will not need to provide an out-of-band password before SCEP enrollment.

-
- Step 1** On the Certificate Authority server, launch the Registry Editor. You can do this by selecting Start > Run, typing **regedit**, and clicking **OK**.
- Step 2** Navigate to
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Cryptography\MSCEP\EnforcePassword.
If the EnforcePassword key doesn't exist, create it as a new Key.
- Step 3** Edit EnforcePassword, and set it to '0'. If it doesn't exist, create it as a REG-DWORD.
- Step 4** Exit regedit, and reboot the certificate authority server.
-

Setting the SCEP Template on the Certificate Authority

The following steps describe how to create a certificate template, and assign it as the default SCEP template.

-
- Step 1** Launch the Server Manager. You can do this by selecting Start > Admin Tools > Server Manager.

- Step 2** Expand Roles > Certificate Services (or AD Certificate Services).
- Step 3** Navigate to CA Name > Certificate Templates.
- Step 4** Right click Certificate Templates > Manage.
- Step 5** From the Cert Templates Console, right click User template and choose Duplicate
- Step 6** Choose **Windows Server 2008 version** for new template, and click **OK**.
- Step 7** Change the template display name to something descriptive, such as NDES-IPSec-SSL.
- Step 8** Adjust the Validity Period for your site. Most sites choose three or more years to avoid expired certificates.
- Step 9** On the Cryptography tab, set the minimum key size for your deployment. We recommend that you specify a key size of at least **2048**.
- Step 10** On the Subject Name tab, select **Supply in Request**.
- Step 11** On the Extensions tab, set the Application Policies to include at least:
- Client Authentication
 - IP security end system
 - IP security IKE intermediate
 - IP security tunnel termination
 - IP security user
- These values are valid for SSL or IPSec.
- Step 12** Click **Apply**, then **OK** to save new template.
- Step 13** From Server manager > Certificate Services-CA Name, right click Certificate Templates, select New > Certificate Template to Issue, select the new template you created (in this example, NDES-IPSec-SSL), and click **OK**.
- Step 14** Edit the registry. You can do this by selecting Start > Run, regedit, and clicking **OK**.
- Step 15** Navigate to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Cryptography\MSCEP.
- Step 16** Set the value of the following 3 keys to **NDES-IPSec-SSL**.
- EncryptionTemplate
 - GeneralPurposeTemplate
 - SignatureTemplate
- Step 17** 17. Click **Save**, and reboot the certificate authority server.

Configuring Certificate Expiration Notice

Configure AnyConnect to warn users that their authentication certificate is about to expire. The **Certificate Expiration Threshold** setting specifies the number of days before the certificate's expiration date that AnyConnect warns users that their certificate is expiring. AnyConnect warns the user upon each connect until the certificate has actually expired or a new certificate has been acquired.

**Note**

The Certificate Expiration Threshold feature cannot be used with RADIUS.

-
- Step 1** Launch the Profile Editor from ASDM, or use the stand-alone VPN Profile Editor (see the [Creating and Editing an AnyConnect Profile, page 3-9](#)).
- Step 2** In the ASDM, Click **Add** (or **Edit**) to create (or edit) an AnyConnect Profile. On the stand-alone editor, open an existing profile or continue to create a new one.
- Step 3** Click **Certificate Enrollment** in the AnyConnect Client Profile tree on the left.
- Step 4** In the **Certificate Enrollment** pane, check **Certificate Enrollment**.
- Step 5** Specify a **Certificate Expiration Threshold**.
- This is the number of days before the certificate expiration date, that AnyConnect warns users that their certificate is going to expire.
- The default is 0 (no warning displayed). The range is 0-180 days.
- Step 6** Click **OK**.
-

Configuring a Certificate Store

You can configure how AnyConnect locates and handles certificate stores on the client's system. Depending on the platform, this may involve limiting access to a particular store or allowing the use of files instead of browser-based stores. The purpose is to direct AnyConnect to the desired location for Client certificate usage as well as Server certificate verification.

For Windows, you can control which certificate store the client uses for locating certificates. You may want to configure the client to restrict certificate searches to only the user store or only the machine store. For Mac and Linux, you can create a certificate store for PEM-format certificate files.

These certificate store search configurations are stored in the AnyConnect client profile.



Note

You can also configure more certificate store restrictions in the AnyConnect local policy. The AnyConnect local policy is an XML file you deploy using enterprise software deployment systems and is separate from the AnyConnect client profile. The settings in the file restrict the use of the Firefox NSS (Linux and Mac), PEM file, Mac native (keychain) and Windows Internet Explorer native certificate stores. For more information, see [Chapter 8, "Enabling FIPS and Additional Security."](#)

The following sections describe the procedures for configuring certificate stores and controlling their use:

- [Controlling the Certificate Store on Windows, page 3-49](#)
- [Creating a PEM Certificate Store for Mac and Linux, page 3-51](#)

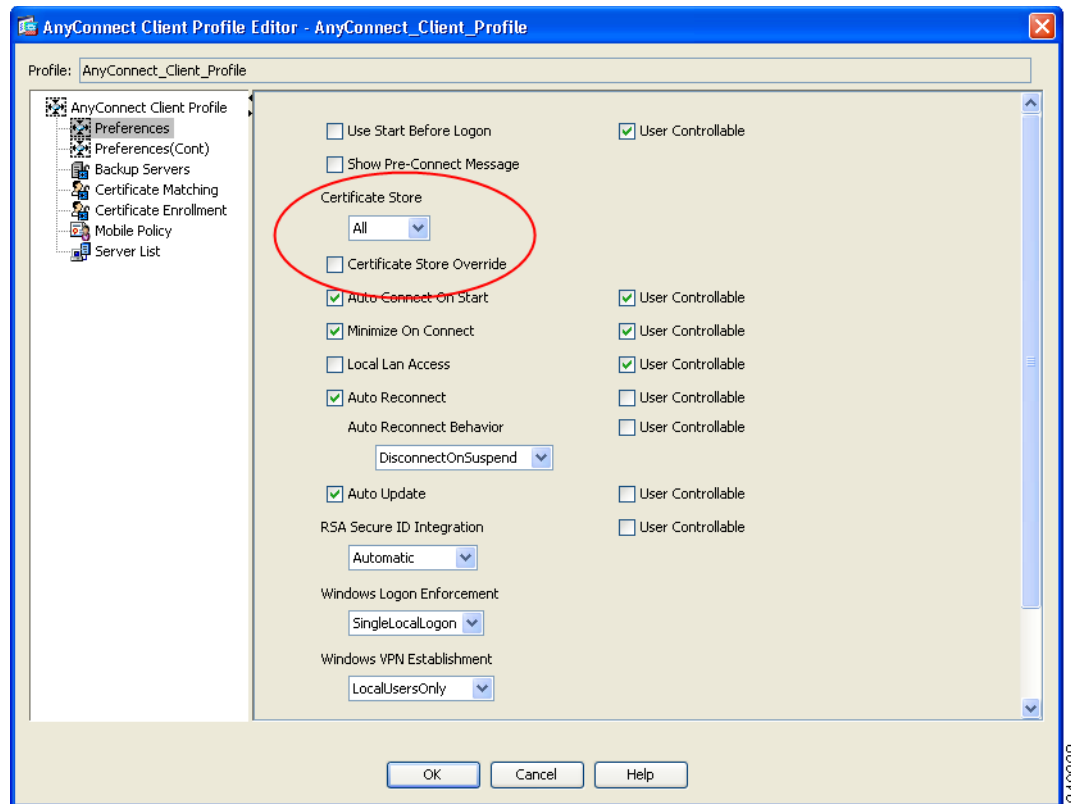
Controlling the Certificate Store on Windows

Windows provides separate certificate stores for the local machine and for the current user. The client profile specifies which certificate store the AnyConnect client searches for certificates.

Users with administrative privileges on the computer have access to both certificate stores. Users without administrative privileges only have access to the user certificate store. Windows XP users usually have administrative privileges, and Windows 7 users usually do not.

In the Preferences (Part 1) pane of Profile Editor, use the **Certificate Store** list box to configure in which certificate store AnyConnect searches for certificates. Use the **Certificate Store Override** checkbox to allow AnyConnect to search the machine certificate store for users with non-administrative privileges.

Figure 3-10 Certificate Store list box and Certificate Store Override check box



Certificate Store has three possible settings:

- All—(default) Search all certificate stores.
- Machine—Search the machine certificate store (the certificate identified with the computer).
- User—Search the user certificate store.

Certificate Store Override has two possible settings:

- checked—Allows AnyConnect to search a computer's machine certificate store even when the user does not have administrative privileges.
- cleared—(default) Does not allow AnyConnect to search the machine certificate store of a user without administrative privileges.

Table 3-4 shows examples of Certificate Store and Certificate Store Override configurations.

Table 3-4 Examples of Certificate Store and Certificate Store Override Configurations

Certificate Store Setting	Certificate Store Override Setting	AnyConnect Action
All	cleared	AnyConnect searches all certificate stores. AnyConnect is not allowed to access the machine store when the user has non-administrative privileges. This is the default setting. This setting is appropriate for the majority of cases. Do not change this setting unless you have a specific reason or scenario requirement to do so.
All	checked	AnyConnect searches all certificate stores. AnyConnect is allowed to access the machine store when the user has non-administrative privileges.
Machine	checked	AnyConnect searches the machine certificate store. AnyConnect is allowed to search the machine store of non-administrative accounts.
Machine	cleared	AnyConnect searches the machine certificate store. AnyConnect is not allowed to search the machine store when the user has non-administrative privileges. Note This configuration might be used when only a limited group of users are allowed to authenticate using a certificate.
User	not applicable	AnyConnect searches in the user certificate store only. The certificate store override is not applicable because non-administrative accounts have access to this certificate store.

Creating a PEM Certificate Store for Mac and Linux

AnyConnect supports certificate authentication using a Privacy Enhanced Mail (PEM) formatted file store. Instead of relying on browsers to verify and sign certificates, the client reads PEM-formatted certificate files from the file system on the remote computer and verifies and signs them.

Restrictions for PEM File Filenames

In order for the client to acquire the appropriate certificates under all circumstances, ensure that your files meet the following requirements:

- All certificate files must end with the extension **.pem**.
- All private key files must end with the extension **.key**.
- A client certificate and its corresponding private key must have the same filename.
For example: client.pem and client.key



Note Instead of keeping copies of the PEM files, you can use soft links to PEM files.

Storing User Certificates

To create the PEM file certificate store, create the paths and folders listed in [Table 5](#). Place the appropriate certificates in these folders:

Table 5 *PEM File Certificate Store Folders and Types of Certificates Stored*

PEM File Certificate Store Folders	Type of Certificates Stored
~/.cisco/certificates/ca ¹	Trusted CA and root certificates
~/.cisco/certificates/client	Client certificates
~/.cisco/certificates/client/private	Private keys

1. ~ is the home directory.

**Note**

The requirements for machine certificates are the same as for PEM file certificates, with the exception of the root directory. For machine certificates, substitute /opt/.cisco for ~/.cisco. Otherwise, the paths, folders, and types of certificates listed in [Table 5](#) apply.

Configuring Certificate Matching

AnyConnect supports the following certificate match types. Some or all these may be used for client certificate matching. Certificate matchings are global criteria that are set in an AnyConnect VPN client profile, in the *Certificate Matching* pane. The criteria are:

- Key Usage
- Extended Key Usage
- Distinguished Name

The profile can contain none or more matching criteria. A certificate must match all specified criteria to be considered a matching certificate.

**Note**

We do not recommend using a self-signed certificate because of the possibility a user could inadvertently configure a browser to trust a certificate on a rogue server and because of the inconvenience to users of having to respond to a security warning when connecting to your secure gateway.

Certificate Key Usage Matching

Certificate Matching Key Usage offers a set of constraints on the broad types of operations that can be performed with a given certificate. The supported set is listed in the *Key Usage* list on the VPN client profile, and includes:

- DECIPHER_ONLY
- ENCIPHER_ONLY
- CRL_SIGN
- KEY_CERT_SIGN

- KEY_AGREEMENT
- DATA_ENCIPHERMENT
- KEY_ENCIPHERMENT
- NON_REPUDIATION
- DIGITAL_SIGNATURE

The profile can contain none or more matching criteria. If one or more criteria are specified, a certificate must match at least one to be considered a matching certificate.

The example in the “[Certificate Matching Example](#)” section on page 3-55 shows how you might configure these attributes.

Extended Certificate Key Usage Matching

This matching allows an administrator to limit the certificates that can be used by the client, based on the *Extended Key Usage* fields in the VPN client profile. [Table 3-6](#) lists the well known set of constraints with their corresponding object identifiers (OIDs).

Table 3-6 **Extended Certificate Key Usage**

Constraint	OID
ServerAuth	1.3.6.1.5.5.7.3.1
ClientAuth	1.3.6.1.5.5.7.3.2
CodeSign	1.3.6.1.5.5.7.3.3
EmailProtect	1.3.6.1.5.5.7.3.4
IPSecEndSystem	1.3.6.1.5.5.7.3.5
IPSecTunnel	1.3.6.1.5.5.7.3.6
IPSecUser	1.3.6.1.5.5.7.3.7
TimeStamp	1.3.6.1.5.5.7.3.8
OCSPSign	1.3.6.1.5.5.7.3.9
DVCS	1.3.6.1.5.5.7.3.10
IKE Intermediate	1.3.6.1.5.5.8.2.2

Custom Extended Match Key

All other OIDs (such as 1.3.6.1.5.5.7.3.11, used in some examples in this document) are considered “custom.” As an administrator, you can add your own OIDs if the OID you want is not in the well known set.

Certificate Distinguished Name Mapping

The client profile Certificate Matching pane's Distinguished Name table contains certificate identifiers that limit the certificates that can be used by the client to those matching the specified criteria and criteria match conditions. When you click the **Add** button, you can add one of the criteria to the list, and set a value or wildcard to match the contents of that criteria. [Table 3-7](#) lists the supported criteria:

Table 3-7 Criteria for Certificate Distinguished Name Mapping

Identifier	Description
CN	SubjectCommonName
SN	SubjectSurName
GN	SubjectGivenName
N	SubjectUnstructName
I	SubjectInitials
GENQ	SubjectGenQualifier
DNQ	SubjectDnQualifier
C	SubjectCountry
L	SubjectCity
SP	SubjectState
ST	SubjectState
O	SubjectCompany
OU	SubjectDept
T	SubjectTitle
EA	SubjectEmailAddr
DC	DomainComponent
ISSUER-CN	IssuerCommonName
ISSUER-SN	IssuerSurName
ISSUER-GN	IssuerGivenName
ISSUER-N	IssuerUnstructName
ISSUER-I	IssuerInitials
ISSUER-GENQ	IssuerGenQualifier
ISSUER-DNQ	IssuerDnQualifier
ISSUER-C	IssuerCountry
ISSUER-L	IssuerCity
ISSUER-SP	IssuerState
ISSUER-ST	IssuerState
ISSUER-O	IssuerCompany
ISSUER-OU	IssuerDept
ISSUER-T	IssuerTitle

Table 3-7 **Criteria for Certificate Distinguished Name Mapping (continued)**

Identifier	Description
CN	SubjectCommonName
ISSUER-EA	IssuerEmailAddr
ISSUER-DC	IssuerDomainComponent

The profile can contain zero or more matching criteria. A certificate must match all specified criteria to be considered a matching certificate. *Distinguished Name* matching offers additional match criteria, including the ability for the administrator to specify that a certificate must or must not have the specified string, as well as whether wild carding for the string should be allowed.

Default Certificate Matching

The client certificate must be a valid, non-expired certificate, to be matched for use by AnyConnect.

If no certificate matching criteria is specified in the *Certificate Matching* pane, AnyConnect implicitly applies the following certificate matching rules:

- Key Usage: DIGITAL_SIGNATURE
- Extended Key Usage: Client Auth (1.3.6.1.5.5.7.3.2)

If any other Key Usage or Extended Key Usage criteria is specified in the client certificate, then the above specifications must also be specified in the client certificate for it to be matched.

Certificate Matching Example



Note

In this and all subsequent examples, the profile values for KeyUsage, ExtendedKeyUsage, and DistinguishedName are just examples. You should configure *only* the Certificate Match criteria that apply to your certificates.

To configure certificate matching in the client profile, follow these steps:

- Step 1** Launch the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile”](#) section on page 3-9).
- Step 2** Go to the **Certificate Matching** pane.
- Step 3** Check the Key Usage and Extended Key Usage settings to choose acceptable client certificates. A certificate must match at least one of the specified key to be selected. For descriptions of these usage settings, see the [“AnyConnect Profile Editor, Certificate Matching”](#) section on page 3-83.
- Step 4** Specify any Custom Extended Match Keys. These should be well-known MIB OID values, such as 1.3.6.1.5.5.7.3.11. You can specify zero or more custom extended match keys. A certificate must match all the specified key(s) to be selected. The key should be in OID form. For example: 1.3.6.1.5.5.7.3.11
- Step 5** Next to the Distinguished Names table, click **Add** to launch the Distinguished Name Entry window:
 - **Name**—A distinguished name.

- **Pattern**—The string to use in the match. The pattern to be matched should include only the portion of the string you want to match. There is no need to include pattern match or regular expression syntax. If entered, this syntax will be considered part of the string to search for.
For example, if a sample string was abc.cisco.com and the intent is to match on cisco.com, the pattern entered should be cisco.com.
- **Operator**—The operator to be used in performing the match.
 - Equal—Equivalent to ==
 - Not Equal—Equivalent to !=
- **Wildcard**—Include wildcard pattern matching. The pattern can be anywhere in the string.
- **Match Case**—Enables case-sensitive match with pattern.

Prompting Users to Select Authentication Certificate

You can configure the AnyConnect to present a list of valid certificates to users and let them choose the certificate with which they want to authenticate the session. This configuration is available only for Windows 7, XP, and Vista. By default, user certificate selection is disabled.



Note

We do not recommend using a self-signed certificate because of the possibility a user could inadvertently configure a browser to trust a certificate on a rogue server and because of the inconvenience to users of having to respond to a security warning when connecting to your secure gateway.

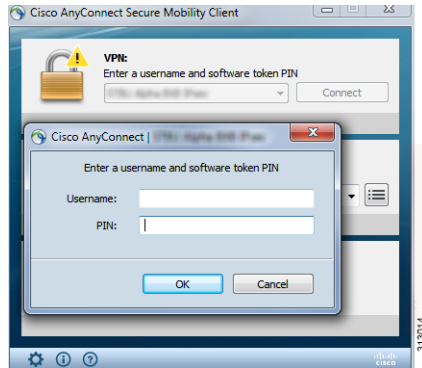
To enable certificate selection, follow these steps in the AnyConnect profile:

- Step 1** Launch the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile” section on page 3-9](#)).
- Step 2** Go to the **Preferences (Part 2)** pane and uncheck **Disable Certificate Selection**. The client now prompts the user to select the authentication certificate.

Users Configuring Automatic Certificate Selection in AnyConnect Preferences

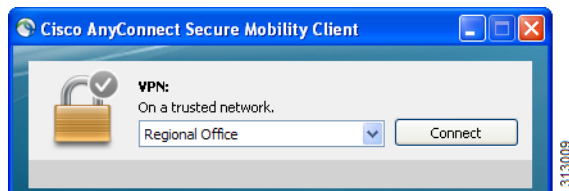
Enabling user certificate selection exposes the Automatic certificate selection checkbox in the AnyConnect Preferences dialog box. Users will be able to turn Automatic certificate selection on and off by checking or unchecking Automatic certificate selection.

[Figure 3-19](#) shows the Automatic Certificate Selection check box the user sees in the Preferences window:

Figure 3-11 Automatic Certificate Selection Check Box

Configuring a Server List

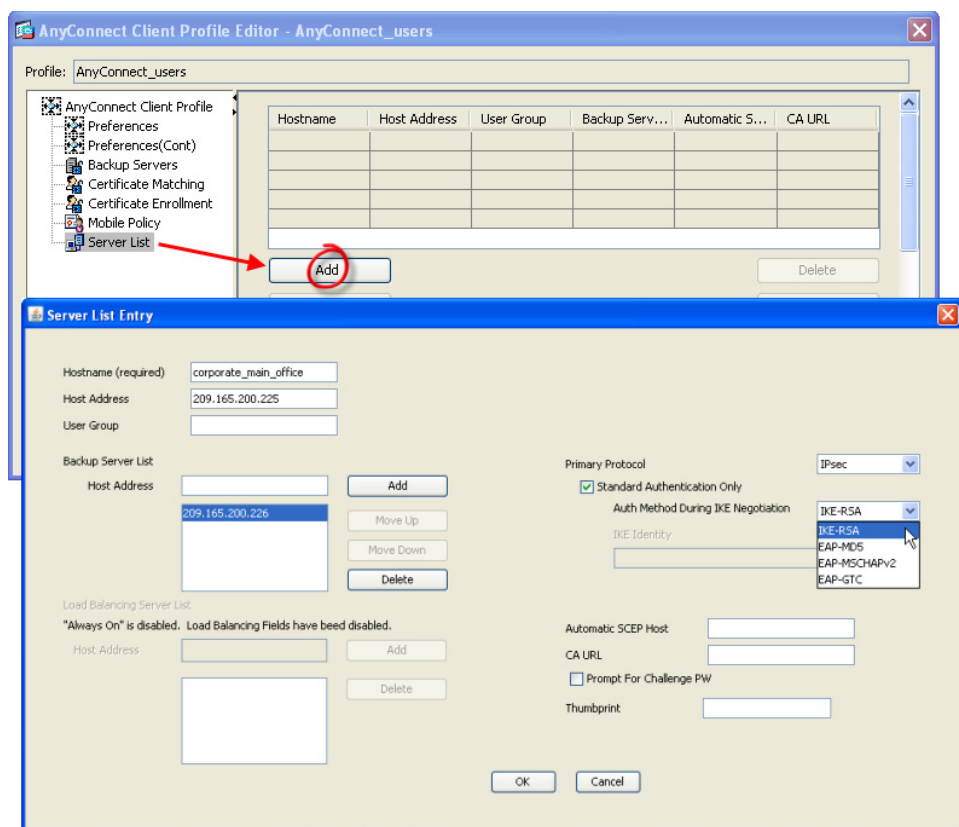
One of the main uses of the profile is to let the user list the connection servers. This server list consists of host name and host address pairs. The host name can be an alias used to refer to the host, an FQDN, or an IP address. The server list displays a list of server hostnames on the AnyConnect GUI in the *Connect to* drop-down list (Figure 3-20). The user can select a server from this list.

Figure 3-12 User GUI with Host Displayed in Connect to Drop-down List

Initially, the host at the top of the list is the default server, and appears first in the GUI drop-down list. If the user selects an alternate server from the list, the client records the choice in the user preferences file on the remote computer, and the selected server becomes the new default server.

To configure a server list, follow this procedure:

- Step 1** Launch the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile”](#) section on page 3-9).
- Step 2** Click **Server List**. The Server List pane opens.
- Step 3** Click **Add**. The Server List Entry window opens (Figure 3-21).

Figure 3-13 Adding a Server List

Step 4 Enter a Hostname. You can enter an alias used to refer to the host, an FQDN, or an IP address.

If you enter an FQDN or an IP address, you do not need to enter a Host Address.

If you enter an IP address, use the Public IPv4 or the Global IPv6 address of the secure gateway. Use of the link-local secure gateway address is not supported.

Step 5 Enter a Host Address, if required.

Step 6 Specify a User Group (optional). The client uses the User Group in conjunction with the Host Address to form a group-based URL.



Note

If you specify the Primary Protocol as IPsec, the User Group must be the exact name of the connection profile (tunnel group). For SSL, the user group is the group-url or group-alias of the connection profile.

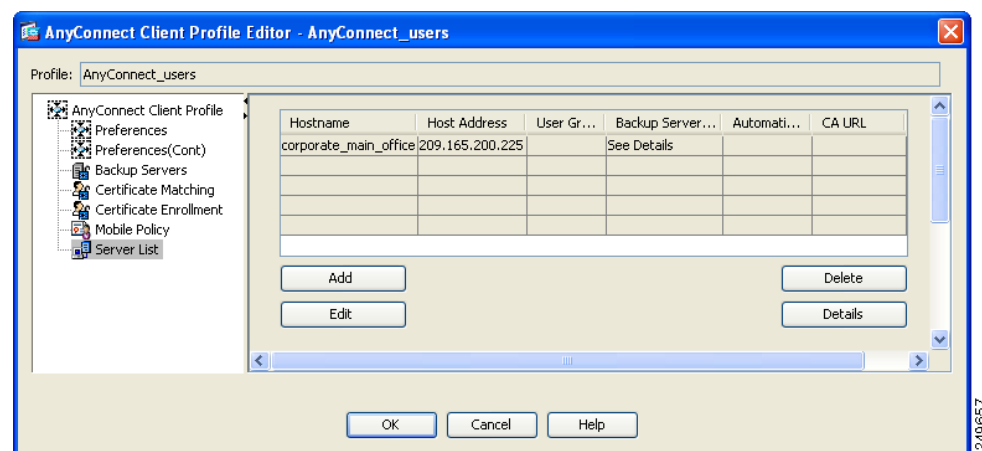
- Step 7** (For AnyConnect release 3.0.1047 or later.) To setup server list settings for mobile devices, check the **Additional mobile-only settings** checkbox and click **Edit**. See Configuring Server List Entries for Mobile Devices for more information.
- Step 8** Add backup servers (optional). If the server in the server list is unavailable, the client attempts to connect to the servers in that server's backup list before resorting to a global backup server list.
- Step 9** Add load balancing backup servers (optional). If the host for this server list entry specifies a load balancing cluster of security appliances, and the always-on feature is enabled, specify the backup devices of the cluster in this list. If you do not, the always-on feature blocks access to backup devices in the load balancing cluster.
- Step 10** Specify the Primary Protocol (optional) for the client to use for this ASA, either SSL or IPsec using IKEv2. The default is SSL. To disable the default authentication method (the proprietary AnyConnect EAP method), check **Standard Authentication Only**, and choose a method from the drop-down list.



Note Changing the authentication method from the proprietary AnyConnect EAP to a standards-based method disables the ability of the ASA to configure session timeout, idle timeout, disconnected timeout, split tunneling, split DNS, MSIE proxy configuration, and other features.

- Step 11** Specify the URL of the SCEP CA server (optional). Enter an FQDN or IP Address. For example, `http://ca01.cisco.com`.
- Step 12** Check **Prompt For Challenge PW** (optional) to enable the user to make certificate requests manually. When the user clicks **Get Certificate**, the client prompts the user for a username and one-time password.
- Step 13** Enter the certificate thumbprint of the CA. Use SHA1 or MD5 hashes. Your CA server administrator can provide the CA URL and thumbprint and should retrieve the thumbprint directly from the server and not from a "fingerprint" or "thumbprint" attribute field in a certificate it issued.
- Step 14** Click **OK**. The new server list entry you configured appears in the server list table (Figure 3-22).

Figure 3-14 A New Server List Entry



Configuring Connections for Mobile Devices

Prerequisites

- Perform steps 1-6 of [Configuring a Server List, page 3-57](#).
- You must be using Profile Editor version 3.0.1047 or later.
- Supported on Apple mobile devices, running Apple iOS version 4.1 or later.

Guidelines

AnyConnect VPN client profiles delivered to mobile devices from the ASA cannot be re-configured or deleted from the mobile device. When users create their own client profiles on their devices for new VPN connections, they will be able to configure, edit, and delete those profiles.

Detailed Steps

-
- Step 1** In the Server List Entry dialog box, check **Additional mobile-only settings** and click **Edit**.
- Step 2** In the **Apple iOS / Android Settings** area, you can configure these attributes for devices running Apple iOS or Android operating systems:
- a. Choose the Certificate Authentication type:
 - **Automatic**—AnyConnect automatically chooses the client certificate with which to authenticate. In this case, AnyConnect views all the installed certificates, disregards those certificates that are out of date, applies the certificate matching criteria defined in VPN client profile, and then authenticates using the certificate that matches the criteria. This happens every time the user attempts to establish a VPN connection.
 - **Manual**—AnyConnect searches for the certificate with which to authenticate just as it does with automatic authentication. In the manual certificate authentication type, however, once AnyConnect finds a certificate that matches the certificate matching criteria defined in the VPN client profile, it assigns that certificate to the connection and it will not search for new certificates when users attempt to establish new VPN connections.
 - **Disabled**—Client Certificate will never be used for authentication.
 - b. If you check the **Make this Server List Entry active when profile is imported** check box, you are defining this server list entry as the default connection once the VPN profile has been downloaded to the device. Only one server list entry can have this designation. The default value is unchecked.
- Step 3** In the Apple iOS Only Settings area, you can configure these attributes for devices running Apple iOS operating systems only:
- a. Configure the **Reconnect when roaming between 3G/Wifi networks** checkbox. The box is checked by default so AnyConnect will attempt to maintain the VPN connection when switching between 3G and Wifi networks. If you uncheck the box, AnyConnect will not attempt to maintain the VPN connection which switching between 3G and Wifi networks.
 - b. Configure the **Connect on Demand** checkbox.

This area allows you to configure the Connect on Demand functionality provided by Apple iOS. You can create lists of rules that will be checked whenever other applications initiate network connections that are resolved using the Domain Name System (DNS).

Connect on Demand can only be checked if the Certificate Authentication field is set to **Manual** or **Automatic**. If the Certificate Authentication field is set to **Disabled**, this checkbox is grayed out. The Connect on Demand rules, defined by the **Match Domain or Host** and the **On Demand Action** fields, can still be configured and saved when the checkbox is grayed out.

- c. In the **Match Domain or Host** field, enter the host names (host.example.com), domain names (.example.com), or partial domains (.internal.example.com) for which you want to create a Connect on Demand rule. Do not enter IP addresses (10.125.84.1) in this field.
- d. In the **On Demand Action** field, specify one of these actions when a user attempts to connect to the domain or host defined in the previous step:
 - Always connect—iOS will always attempt to initiate a VPN connection when rules in this list are matched.
 - Connect if needed—iOS will attempt to initiate a VPN connection when rules in this list are matched only if the system could not resolve the address using DNS.
 - Never connect—iOS will never attempt to initiate a VPN connection when rules in this list are matched. Any rules in this list will take precedence over Always connect or Connect if needed rules.

When Connect On Demand is enabled, the application automatically adds the server address to this list. This prevents a VPN connection from being automatically established if you try accessing the server's clientless portal with a web browser. This rule can be removed if you do not want this behavior.

- e. Once you have created a rule using the **Match Domain or Host** field and the **On Demand Action** field, click **Add**.

The rule is displayed in the rules list below.

Step 4 Click **OK**.

Step 5 Return to step 8 of [Configuring a Server List, page 3-57](#).

Configuring a Backup Server List

You can configure a list of backup servers the client uses in case the user-selected server fails. These servers are specified in the Backup Servers pane of the AnyConnect profile. In some cases, the list might specify host specific overrides. Follow these steps:

- Step 1** Launch the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile” section on page 3-9](#)).
 - Step 2** Go to the **Backup Servers** pane and enter host addresses of the backup servers.
-

Configuring Connect On Start-up

Connect on Start-up automatically establishes a VPN connection with the secure gateway specified by the VPN client profile. Upon connecting, the client replaces the local profile with the one provided by the secure gateway, if the two do not match, and applies the settings of that profile.

By default, Connect on Start-up is **disabled**. When the user launches the AnyConnect client, the GUI displays the settings configured by default as user-controllable. The user must select the name of the secure gateway in the Connect to drop-down list in the GUI and click **Connect**. Upon connecting, the client applies the settings of the client profile provided by the security appliance.

AnyConnect has evolved from having the ability to establish a VPN connection automatically upon the startup of AnyConnect to having that VPN connection be “always-on” by the Post logon Always-on feature. The disabled by default configuration of Connect on Start-up element reflects that evolution. If your enterprise’s deployment uses the Connect on Start-up feature, consider using the Trusted Network Detection feature instead.

Trusted Network Detection (TND) gives you the ability to have AnyConnect automatically disconnect a VPN connection when the user is inside the corporate network (the trusted network) and start the VPN connection when the user is outside the corporate network (the untrusted network). This feature encourages greater security awareness by initiating a VPN connection when the user is outside the trusted network. For information on configuring Trusted Network Detection, see the [“Configuring Trusted Network Detection” section on page 3-22](#).

By default, Connect on Start-up is disabled. To enable it, follow these steps:

-
- Step 1** Launch the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile” section on page 3-9](#)).
 - Step 2** Choose **Preferences** in the navigation pane.
 - Step 3** Check **Connect On Start-up**.
-

Configuring Auto Reconnect

Unlike the IPsec VPN client, AnyConnect can recover from VPN session disruptions and can reestablish a session, regardless of the media used for the initial connection. For example, it can reestablish a session on wired, wireless, or 3G.

You can configure the Auto Reconnect feature to attempt to reestablish a VPN connection if you lose connectivity (the default behavior). You can also define the reconnect behavior during and after *system suspend* or *system resume*. A system suspend is a low-power standby, Windows “hibernation,” or Mac OS or Linux “sleep.” A system resume is a recovery following a system suspend.

-
- Step 1** Launch the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile” section on page 3-9](#)).
 - Step 2** Choose **Preferences (Part 1)** in the navigation pane.
 - Step 3** Check **Auto Reconnect**.



Note If you uncheck *Auto Reconnect*, the client does not attempt to reconnect, regardless of the cause of the disconnection. Cisco highly recommends using the default setting (enabled) for this feature. Disabling this setting can cause interruptions in VPN connectivity over unstable connections.

- Step 4** Choose the Auto Reconnect Behavior (not supported for Linux):

- **Disconnect On Suspend**— AnyConnect releases the resources assigned to the VPN session upon a system suspend and does not attempt to reconnect after the system resume.
 - **Reconnect After Resume**—The client retains resources assigned to the VPN session during a system suspend and attempts to reconnect after the system resume.
-

Proxy Connections

AnyConnect supports VPN sessions through transparent or non-transparent proxy servers. Local, Private and Public proxies are supported, with some restrictions.

Limitations

IPv6 proxies are not supported. This will be added in a future release of AnyConnect for Windows Vista and later.

Local Proxy Connections

A local proxy runs on the same PC as AnyConnect, and is sometimes used as a transparent proxy. Some examples of a transparent proxy service include:

- Acceleration software provided by some wireless data cards
- Network component on some antivirus software, such as Kaspersky

Limitations

- Either an AnyConnect Essentials or an AnyConnect Premium SSL VPN Edition license is required
- Local proxies are only supported on Microsoft Windows:
 - Windows 7 (32-bit and 64-bit)
 - Windows Vista (32-bit and 64-bit)-SP2 or Vista Service Pack 1 with KB952876
 - Windows 8

Guidelines

Local proxies are defined in the AnyConnect VPN client profile. By default, AnyConnect is configured to support local proxy services to establish a VPN session.

Disabling Local Proxy Connections

-
- Step 1** Launch the Profile Editor from ASDM or the stand-alone VPN Profile Editor.
 - Step 2** Choose Preferences (Part 2) in the navigation pane.

Step 3 Uncheck **Allow Local Proxy Connections** near the top of the panel.

Private Proxy Connections

Private proxy servers are used on a corporate network to prevent corporate users from accessing certain Web sites based on corporate usage policies, for example, pornography, gambling, or gaming sites.

Group Policies on the ASA enforce private proxy settings on the Client system when a VPN connection is established. When the Client disconnects, those settings are reverted back to their original values. This allows an administrator to enforce corporate usage policies when VPN users connect to the corporate network.

Limitations

Linux is not supported.

Configuring a Private Proxy Connection

Private proxies are configured in the group policy.

- In the ASA CLI, the command in the group-policy submode is 'msie-proxy'.
- In ASDM, edit a group policy, and configure the proxy server under Advanced > Browser Proxy.

Verifying the Proxy Settings

- For Windows: Find the Proxy settings in the Registry under:
`HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Internet Settings`
- For Mac OSX: Open a Terminal window, and type:
`scutil --proxy`

Public Proxy Connections

Public Proxies are usually used to anonymize web traffic.

Public Proxy servers may also require a username and password, and are referred to as Authenticating Proxy Servers. There are two types of authentication that AnyConnect supports: Basic and NTLM. When the proxy server is configured to require authentication, AnyConnect dialogs manage the authentication process. After successfully authenticating to the Proxy Server, the AnyConnect menu prompts for the ASA username and password.

Limitations

- Only TLS is supported, not DTLS.
- Public Proxies are not supported for Mac and Linux.

Configuring a Public Proxy

When Windows Internet Options are configured to use a public proxy on a client, AnyConnect uses that connection.

-
Step 1	Open Internet Options from Internet Explorer or the Control Panel.
Step 2	Select the Connections Tab, and click the LAN Settings button.
Step 3	Configure the LAN to use a proxy server, and enter the IP address of the Proxy server.
-

Optimal Gateway Selection

Using the Optimal Gateway Selection (OGS) feature, you can minimize latency for Internet traffic without user intervention. With OGS, AnyConnect identifies and selects which secure gateway is best for connection or reconnection. OGS begins upon first connection or upon a reconnection at least four hours after the previous disconnection.

For best performance, users who travel to distant locations connect to a secure gateway nearest their location. Your home and office will get similar results from the same gateway, so no switch of secure gateways will typically occur in this instance. Connection to another secure gateway occurs rarely and only occurs if the performance improvement is at least 20%.

OGS is not a security feature, and it performs no load balancing between secure gateway clusters or within clusters. You can optionally give the end user the ability to enable or disable the feature.

The minimum round trip time (RTT) solution selects the secure gateway with the fastest RTT between the client and all other gateways. The client always reconnects to the last secure gateway if the time elapsed has been less than four hours. Factors such as load and temporary fluctuations of the network connection may affect the selection process, as well as the latency for Internet traffic.

OGS maintains a cache of its RTT results to minimize the number of measurements it must perform in the future. Upon starting AnyConnect with OGS enabled, OGS determines where the user is located by obtaining network information (such as DNS suffix and DNS server IP). The RTT results, along with this location, are stored in the OGS cache. During the next 14 days, the location is determined with this same method whenever AC restarts, and the cache deciphers whether it already has RTT results. A headend is selected based on the cache without needing to re-RRT the headends. At the end of 14 days, the results for this location are removed from the cache, and restarting AC results in a new set of RTTs.

It contacts only the primary servers to determine the optimal one. Once determined, the connection algorithm is as follows:

1. Attempt to connect to the optimal server.
2. If that fails, try the optimal server's backup server list.
3. If that fails, try each remaining server in the OGS selection list, ordered by its selection results.

Refer to the [“AnyConnect Profile Editor, Backup Servers”](#) section on page 3-83 for additional information on backup servers.

Optimal Gateway Selection Requirements

AnyConnect supports Optimal Gateway Select on VPN endpoints running the Windows and Mac OS X operating systems qualified for this release.

This feature is available for IPv4 clients only.

Configuring Optimal Gateway Selection

You control the activation and deactivation of OGS and specify whether end users may control the feature themselves in the AnyConnect profile. Follow these steps to configure OGS using the Profile Editor:

-
- Step 1** Launch the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile” section on page 3-9](#)).
- Step 2** Check the **Enable Optimal Gateway Selection** check box to activate OGS.
- Step 3** Check the **User Controllable** check box to make OGS configurable for the remote user accessing the client GUI.



Note When OGS is enabled, we recommend that you also make the feature user controllable. A user may need the ability to choose a different gateway from the profile if the AnyConnect client is unable to establish a connection to the OGS-selected gateway.

- Step 4** At the Suspension Time Threshold parameter, enter the minimum time (in hours) the VPN must have been suspended before invoking a new gateway-selection calculation. The default is 4 hours.



Note You can configure this threshold value using the Profile Editor. By optimizing this value in combination with the next configurable parameter (Performance Improvement Threshold), you can find the correct balance between selecting the optimal gateway and reducing the number of times to force the re-entering of credentials.

- Step 5** At the Performance Improvement Threshold parameter, enter the percentage of performance improvement that is required before triggering the client to re-connect to another secure gateway following a system resume. The default is 20%.



Note If too many transitions are occurring and users have to re-enter credentials quite frequently, you should increase either or both of these thresholds. Adjust these values for your particular network to find the correct balance between selecting the optimal gateway and reducing the number of times to force the re-entering of credentials.

If OGS is enabled when the client GUI starts, **Automatic Selection** displays in the *VPN: Ready to connect* panel next to the Connect button. You cannot change this selection. OGS automatically chooses the optimal secure gateway and displays the selected gateway on the status bar. You may need to click **Select** to start the connection process.

If you made the feature user controllable, the user can manually override the selected secure gateway with the following steps:

-
- Step 1** If currently connected, click **Disconnect**.
 - Step 2** Click **Advanced**.
 - Step 3** Open the Preferences tab and uncheck **Enable Optimal Gateway Selection**.
 - Step 4** Choose the desired secure gateway.



Note If AAA is being used, end users may have to re-enter their credentials when transitioning to a different secure gateway. The use of certificates eliminates this.

OGS and Sleep Mode

AnyConnect must have an established connection at the time the endpoint is put into sleep or hibernation mode. You must enable the AutoReconnect (ReconnectAfterResume) settings on ASDM's profile editor (Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile). If you make it user controllable here, you can configure it on the AnyConnect Secure Mobility Client Preferences tab before the device is put to sleep. When both of these are set, the device comes out of sleep, and AC automatically runs OGS, using the selected headend for its reconnection attempt.

OGS and Proxy Detection

If automatic proxy detection is configured, you cannot perform OGS. It also does not operate with proxy auto-configuration (PAC) files configured.

Writing and Deploying Scripts

AnyConnect lets you download and run scripts when the following events occur:

- Upon the establishment of a new client VPN session with the security appliance. We refer to a script triggered by this event as an *OnConnect* script because it requires this filename prefix.
- Upon the tear-down of a client VPN session with the security appliance. We refer to a script triggered by this event as an *OnDisconnect* script because it requires this filename prefix.

Thus, the establishment of a new client VPN session initiated by Trusted Network Detection triggers the OnConnect script (assuming the requirements are satisfied to run the script). The reconnection of a persistent VPN session after a network disruption does not trigger the OnConnect script.

Some examples that show how you might want to use this feature include:

- Refreshing the group policy upon VPN connection.
- Mapping a network drive upon VPN connection, and un-mapping it after disconnection.
- Logging on to a service upon VPN connection, and logging out after disconnection.

AnyConnect supports script launching during WebLaunch and standalone launches.

These instructions assume you know how to write scripts and run them from the command line of the targeted endpoint to test them.

**Note**

The AnyConnect software download site provides some example scripts; if you examine them, remember that they are only examples. They may not satisfy the local computer requirements for running them and are unlikely to be usable without customizing them for your network and user needs. Cisco does not support example scripts or customer-written scripts.

This section covers the following topics:

- [Scripting Requirements and Limitations, page 3-68](#)
- [Writing, Testing, and Deploying Scripts, page 3-69](#)
- [Configuring the AnyConnect Profile for Scripting, page 3-70](#)
- [Troubleshooting Scripts, page 3-71](#)

Scripting Requirements and Limitations

Be aware of the following requirements and limitations for scripts:

Number of Scripts Supported

AnyConnect runs only one OnConnect and one OnDisconnect script; however, these scripts may launch other scripts.

File Formats

AnyConnect identifies the OnConnect and onDisconnect script by the filename. It looks for a file whose name begins with OnConnect or OnDisconnect regardless of file extension. The first script encountered with the matching prefix is executed. It recognizes an interpreted script (such as VBS, Perl, or Bash) or an executable.

Script Language

The client does not require the script to be written in a specific language but does require an application that can run the script to be installed on the client computer. Thus, for the client to launch the script, the script must be capable of running from the command line.

Restrictions on Scripts by the Windows Security Environment

On Microsoft Windows, AnyConnect can only launch scripts after the user logs onto Windows and establishes a VPN session. Thus, the restrictions imposed by the user's security environment apply to these scripts; scripts can only execute functions that the user has rights to invoke. AnyConnect hides the cmd window during the execution of a script on Windows, so executing a script to display a message in a .bat file for testing purposes does not work.

Enabling the Script

By default, the client does not launch scripts. Use the AnyConnect profile EnableScripting parameter to enable scripts. The client does not require the presence of scripts if you do so.

Client GUI Termination

Client GUI termination does not necessarily terminate the VPN session; the OnDisconnect script runs after session termination.

Running Scripts on 64-bit Windows

The AnyConnect client is a 32-bit application. When running on a 64-bit Windows version, such as Windows 7 x64 and Windows Vista SP2 x64, when it executes a batch script, it uses the 32-bit version of cmd.exe.

Because the 32-bit cmd.exe lacks some commands that the 64-bit cmd.exe supports, some scripts could stop executing when attempting to run an unsupported command, or run partially and stop. For example, the **msg** command, supported by the 64-bit cmd.exe, may not be understood by the 32-bit version of Windows 7 (found in %WINDIR%\SysWOW64).

Therefore, when you create a script, use commands supported by the 32-bit cmd.exe.

Writing, Testing, and Deploying Scripts

Deploy AnyConnect scripts as follows:

- Step 1** Write and test the script using the operating system type on which it will run when AnyConnect launches.



Note Scripts written on Microsoft Windows computers have different line endings than scripts written on Mac OS and Linux. Therefore, you should write and test the script on the targeted operating system. If a script cannot run properly from the command line on the native operating system, AnyConnect cannot run it properly.

- Step 2** Do one of the following to deploy the scripts:

- Use ASDM to import the script as a binary file to the ASA. Go to **Network (Client) Access > AnyConnect Customization/Localization > Script**.

If you use ASDM version 6.3 or later, the ASA adds the prefix *scripts_* and the prefix *OnConnect* or *OnDisconnect* to your filename to identify the file as a script. When the client connects, the security appliance downloads the script to the proper target directory on the remote computer, removing the *scripts_* prefix and leaving the remaining *OnConnect* or *OnDisconnect* prefix. For example, if you import the script *myscript.bat*, the script appears on the security appliance as *scripts_OnConnect_myscript.bat*. On the remote computer, the script appears as *OnConnect_myscript.bat*.

If you use an ASDM version earlier than 6.3, you must import the scripts with the following prefixes:

- *scripts_OnConnect*
- *scripts_OnDisconnect*

To ensure the scripts run reliably, configure all ASAs to deploy the same scripts. If you want to modify or replace a script, use the same name as the previous version and assign the replacement script to all the ASAs that the users might connect to. When the user connects, the new script overwrites the one with the same name.

- Use an enterprise software deployment system to deploy scripts manually to the VPN endpoints on which you want to run the scripts.

If you use this method, use the script filename prefixes below:

- *OnConnect*
- *OnDisconnect*

Install the scripts in the directory shown in [Table 3-8](#).

Table 3-8 **Required Script Locations**

OS	Directory
Microsoft Windows 7 and Vista	%ALLUSERSPROFILE%\Cisco\Cisco AnyConnect Secure Mobility Client\Script
Microsoft Windows XP	%ALLUSERSPROFILE%\Application Data\Cisco\Cisco AnyConnect Secure Mobility Client\Script
Linux (On Linux, assign execute permissions to the file for User, Group and Other.)	/opt/cisco/anyconnect
Mac OS X	/opt/cisco/anyconnect/script

Configuring the AnyConnect Profile for Scripting

To enable scripting in the client profile, follow these steps:

- Step 1** Launch the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile”](#) section on page 3-9).
- Step 2** Choose **Preferences (Part 2)** in the navigation pane.
- Step 3** Check **Enable Scripting**. The client launches scripts on connecting or disconnecting the VPN connection.
- Step 4** Check **User Controllable** to let users enable or disable the running of On Connect and OnDisconnect scripts.
- Step 5** Check **Terminate Script On Next Event** to enable the client to terminate a running script process if a transition to another scriptable event occurs. For example, the client terminates a running On Connect script if the VPN session ends and terminates a running OnDisconnect script if AnyConnect starts a new VPN session. On Microsoft Windows, the client also terminates any scripts that the On Connect or OnDisconnect script launched, and all their script descendents. On Mac OS and Linux, the client terminates only the On Connect or OnDisconnect script; it does not terminate child scripts.
- Step 6** Check **Enable Post SBL On Connect Script** (enabled by default) to let the client launch the On Connect script (if present) if SBL establishes the VPN session.



Note

Be sure to add the client profile to the ASA group policy to download it to the VPN endpoint.

Troubleshooting Scripts

If a script fails to run, try resolving the problem as follows:

-
Step 1	Make sure the script has an <code>OnConnect</code> or <code>OnDisconnect</code> prefix name. Table 3-8 shows the required scripts directory for each operating system.
Step 2	Try running the script from the command line. The client cannot run the script if it cannot run from the command line. If the script fails to run on the command line, make sure the application that runs the script is installed, and try rewriting the script on that operating system.
Step 3	Make sure the scripts directory on the VPN endpoint contains only one <code>OnConnect</code> and only one <code>OnDisconnect</code> script. If one ASA downloads one <code>OnConnect</code> script and during a subsequent connection a second ASA downloads an <code>OnConnect</code> script with a different filename suffix, the client might run the unwanted script. If the script path contains more than one <code>OnConnect</code> or <code>OnDisconnect</code> script and you are using the ASA to deploy scripts, remove the contents of the scripts directory and re-establish a VPN session. If the script path contains more than one <code>OnConnect</code> or <code>OnDisconnect</code> script and you are using the manual deployment method, remove the unwanted scripts and re-establish a VPN session.
Step 4	If the operating system is Linux, make sure the script file permissions are set to execute.
Step 5	Make sure the client profile has scripting enabled.
-

Authentication Timeout Control

By default, AnyConnect waits up to 12 seconds for an authentication from the secure gateway before terminating the connection attempt. AnyConnect then displays a message indicating the authentication timed out. Use the instructions in the following sections to change the value of this timer.

Authentication Timeout Control Requirements

AnyConnect supports this feature on [all OSs supported by AnyConnect](#).

Support for this feature requires either an AnyConnect Essentials or an AnyConnect Premium SSL VPN Edition license.

Configuring Authentication Timeout

To change the number of seconds AnyConnect waits for an authentication from the secure gateway before terminating the connection attempt, follow these steps:

-
Step 1	Launch the Profile Editor from ASDM (see the “Creating and Editing an AnyConnect Profile” section on page 3-9).
Step 2	Choose Preferences (Part 2) in the navigation pane.
Step 3	Enter a number of seconds in the range 10–120 into the Authentication Timeout Values text box.
-

Proxy Support

The following sections describe how to use the proxy support enhancement features.

Configuring the Client to Ignore Browser Proxy Settings

You can specify a policy in the AnyConnect profile to bypass the Microsoft Internet Explorer proxy configuration settings on the user's PC. It is useful when the proxy configuration prevents the user from establishing a tunnel from outside the corporate network.

**Note**

Connecting through a proxy is not supported with the always-on feature enabled. Therefore, if you enable always-on, configuring the client to ignore proxy settings is unnecessary.

Follow these steps to enable AnyConnect to ignore Internet Explorer proxy settings:

- Step 1** Launch the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile” section on page 3-9](#)).
- Step 2** Go to the **Preferences (Part 2)** pane.
- Step 3** In the Proxy Settings drop-down list, choose **IgnoreProxy**. Ignore Proxy causes the client to ignore all proxy settings. No action is taken against proxies that reach the ASA.

**Note**

AnyConnect does not support Override as a proxy setting.

Private Proxy

You can configure a group policy to download private proxy settings configured in the group policy to the browser after the tunnel is established. The settings return to their original state after the VPN session ends.

Private Proxy Requirements

An AnyConnect Essentials license is the minimum ASA license activation requirement for this feature.

AnyConnect supports this feature on computers running:

- Internet Explorer on Windows
- Safari on Mac OS

Configuring a Group Policy to Download a Private Proxy

To configure the proxy settings, establish an ASDM session with the security appliance and choose **Configuration > Remote Access VPN > Network (Client) Access > Group Policies > Add or Edit > Advanced > Browser Proxy**. ASDM versions earlier than 6.3(1) show this option as **IE Browser Proxy**; however, AnyConnect no longer restricts the configuration of the private proxy to Internet Explorer, regardless of the ASDM version you use.

**Note**

In a Mac environment, the proxy information that is pushed down from the ASA (upon a VPN connection) is not viewed in the browser until you open up a terminal and issue a “scutil --proxy”.

The Do not use proxy parameter, if enabled, removes the proxy settings from the browser for the duration of the session.

Internet Explorer Connections Tab Lockdown

Under certain conditions, AnyConnect hides the Internet Explorer Tools > Internet Options > Connections tab. When exposed, this tab lets the user set proxy information. Hiding this tab prevents the user from intentionally or unintentionally circumventing the tunnel. The tab lockdown is reversed on disconnect, and it is superseded by any administrator-defined policies applied to that tab. The conditions under which this lockdown occurs are either of the following:

- The ASA configuration specifies Connections tab lockdown.
- The ASA configuration specifies a private-side proxy.
- A Windows group policy previously locked down the Connections tab (overriding the **no lockdown** ASA group policy setting).

You can configure the ASA to allow or not allow proxy lockdown, in the group policy. To do this using ASDM, follow this procedure:

-
Step 1	Go to Configuration > Remote Access VPN > Network (Client) Access > Group Policies .
Step 2	Choose a group policy and click Edit . The Edit Internal Group Policy window displays.
Step 3	In the navigation pane, go to Advanced > Browser Proxy . The Proxy Server Policy pane displays.
Step 4	Click Proxy Lockdown to display more proxy settings.
Step 5	Uncheck Inherit and select Yes to enable proxy lockdown and hide the Internet Explorer Connections tab for the duration of the AnyConnect session or select No to disable proxy lockdown and expose the Internet Explorer Connections tab for the duration of the AnyConnect session.
Step 6	Click OK to save the Proxy Server Policy changes.
Step 7	Click Apply to save the Group Policy changes.
-

Proxy Auto-Configuration File Generation for Clientless Support

Some versions of the ASA require extra AnyConnect configuration to continue to allow clientless portal access through a proxy server after establishing an AnyConnect session. AnyConnect uses a proxy auto-configuration (PAC) file to modify the client-side proxy settings to let this occur. AnyConnect generates this file only if the ASA does not specify private-side proxy settings.

Using a Windows RDP Session to Launch a VPN Session

With the Windows Remote Desktop Protocol (RDP), you can allow users to log on to a computer running the Cisco AnyConnect Secure Mobility client and create a VPN connection to a secure gateway from the RDP session. A split tunneling VPN configuration is required for this to function correctly.

By default, a locally logged-in user can establish a VPN connection only when no other local user is logged in. The VPN connection is terminated when the user logs out, and additional local logons during a VPN connection result in the connection being torn down. Remote logons and logoffs during a VPN connection are unrestricted.

**Note**

With this feature, AnyConnect disconnects the VPN connection when the user who established the VPN connection logs out. If the connection is established by a remote user, and that remote user logs off, the VPN connection is terminated.

You can use the following settings for Windows Logon Enforcement:

- **Single Local Logon**—Allows only one local user to be logged on during the entire VPN connection. With this setting, a local user can establish a VPN connection while one or more remote users are logged on to the client PC, but if the VPN connection is configured for all-or-nothing tunneling, then the remote logon is disconnected because of the resulting modifications of the client PC routing table for the VPN connection. If the VPN connection is configured for split-tunneling, the remote logon might or might not be disconnected, depending on the routing configuration for the VPN connection. The SingleLocalLogin setting has no effect on remote user logons from the enterprise network over the VPN connection.
- **SingleLogon**—Allows only one user to be logged on during the entire VPN connection. If more than one user is logged on and has an established VPN connection, either locally or remotely, the connection is not allowed. If a second user logs on, either locally or remotely, the VPN connection is terminated.

**Note**

When you select the SingleLogon setting, no additional logons are allowed during the VPN connection, so a remote logon over the VPN connection is not possible.

The Windows VPN Establishment settings in the client profile specify the behavior of the client when a user who is remotely logged on to a computer running AnyConnect establishes a VPN connection. The possible values are:

- **Local Users Only**—Prevents a remotely logged-on user from establishing a VPN connection. AnyConnect client versions 2.3 and earlier operated in this manner.

- **Allow Remote Users**—Allows remote users to establish a VPN connection. However, if the configured VPN connection routing causes the remote user to become disconnected, the VPN connection terminates to allow the remote user to regain access to the client computer. Remote users must wait 90 seconds after VPN establishment if they want to disconnect their RDP session without causing the VPN session to terminate.

**Note**

On Vista, the Windows VPN Establishment profile setting is not currently enforced during Start Before Logon (SBL). AnyConnect does not determine whether the VPN connection is being established by a remote user before logon; therefore, a remote user can establish a VPN connection via SBL even when the Windows VPN Establishment setting is *Local Users Only*.

To enable an AnyConnect session from a Windows RDP Session, follow these steps:

- Step 1** Start the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile”](#) section on page 3-9).
- Step 2** Go to the **Preferences** pane.
- Step 3** Choose a Windows Logon Enforcement method:
 - **Single Local Logon**—Allows only one local user to be logged on during the entire VPN connection.
 - **Single Logon**—Allows only one user to be logged on during the entire VPN connection.
- Step 4** Choose a Windows VPN Establishment method that specifies the behavior of the client when a user who is remotely logged on establishes a VPN connection:
 - **Local Users Only**—Prevents a remotely logged-on user from establishing a VPN connection.
 - **Allow Remote Users**—Allows remote users to establish a VPN connection.

**Note**

On Vista, the Windows VPN Establishment setting is not currently enforced during Start Before Logon (SBL).

AnyConnect over L2TP or PPTP

ISPs in some countries require support of the L2TP and PPTP tunneling protocols.

To send traffic destined for the secure gateway over a PPP connection, AnyConnect uses the point-to-point adapter generated by the external tunnel. When establishing a VPN tunnel over a PPP connection, the client must exclude traffic destined for the ASA from the tunneled traffic intended for destinations beyond the ASA. To specify whether and how to determine the exclusion route, use the PPP Exclusion setting in the AnyConnect profile. The exclusion route appears as a non-secured route in the Route Details display of the AnyConnect GUI.

The following sections describe how to set up PPP exclusion:

- [Configuring AnyConnect over L2TP or PPTP](#)
- [Instructing Users to Override PPP Exclusion](#)

Configuring AnyConnect over L2TP or PPTP

By default, PPP Exclusion is disabled. To enable PPP exclusion in the profile, follow these steps:

-
- Step 1** Launch the Profile Editor from ASDM (see the [“Creating and Editing an AnyConnect Profile”](#) section on page 3-9).
- Step 2** Go to the **Preferences (Part 2)** pane.
- Step 3** Choose a **PPP Exclusion Method**. Checking **User Controllable** for this field lets users view and change these settings:
- **Automatic**—Enables PPP exclusion. AnyConnect automatically uses the IP address of the PPP server. Instruct users to change the value only if automatic detection fails to get the IP address.
 - **Override**—Also enables PPP exclusion. If automatic detection fails to get the IP address of the PPP server, and the PPPEXclusion UserControllable value is true, instruct users to follow the instructions in the next section to use this setting.
 - **Disabled**—PPP exclusion is not applied.
- Step 4** In the **PPP Exclusion Server IP field**, enter the IP address of the security gateway used for PPP exclusion. Checking **User Controllable** for this field lets users view and change this IP address.
-

Instructing Users to Override PPP Exclusion

If automatic detection does not work, and you configured PPP Exclusion as user controllable, the user can override the settings by editing the AnyConnect preferences file on the local computer. The following procedure describes how to do this:

-
- Step 1** Use an editor such as Notepad to open the preferences XML file.
- This file is on one of the following paths on the user’s computer:
- Windows: %LOCAL_APPDATA%\Cisco\Cisco AnyConnect Secure Mobility Client\preferences.xml. For example,
 - Windows Vista—C:\Users\username\AppData\Local\Cisco\Cisco AnyConnect Secure Mobility Client\preferences.xml
 - Windows XP—C:\Documents and Secure Mobility VPN Client\preferences.xml
 - Mac OS X: /Users/username/.anyconnect
 - Linux: /home/username/.anyconnect
- Step 2** Insert the PPPEXclusion details under <ControllablePreferences>, while specifying the Override value and the IP address of the PPP server. The address must be a well-formed IPv4 address. For example:

```
<AnyConnectPreferences>
<ControllablePreferences>
<PPPEXclusion>Override
<PPPEXclusionServerIP>192.168.22.44</PPPEXclusionServerIP></PPPEXclusion>
</ControllablePreferences>
</AnyConnectPreferences>
```

- Step 3** Save the file.
- Step 4** Exit and restart AnyConnect.
-

AnyConnect VPN Profile Editor Parameter Descriptions

The following section describes all the settings that appear on the various panes of the profile editor.

AnyConnect Profile Editor, Preferences (Part 1)

Use Start Before Logon (Windows Only)—Forces the user to connect to the enterprise infrastructure over a VPN connection before logging on to Windows by starting AnyConnect before the Windows logon dialog box appears. After authenticating, the logon dialog box appears and the user logs in as usual. SBL also lets you control the use of logon scripts, password caching, mapping network drives to local drives, and more.

Show Pre-connect Message—Displays a message to the user before the user makes the first connection attempt. For example, you could remind the user to insert their smartcard into the reader. For information about setting or changing the pre-connect message, see [Changing the Default AnyConnect English Messages, page 12-15](#).

Certificate Store—Controls which certificate store AnyConnect uses for storing and reading certificates. Windows provides separate certificate stores for the local machine and for the current user. The default setting (All) is appropriate for the majority of cases. Do not change this setting unless you have a specific reason or scenario requirement to do so.

- All—(default) Certificates are stored in both stores.
- Machine—Use the machine store.
- User—Use user certificate store.

Certificate Store Override—Allows you to direct AnyConnect to search for certificates in the Windows machine certificate store. This is useful in cases where certificates are located in the machine store, and users do not have administrator privileges on their machine.

Auto Connect on Start—AnyConnect, when started, automatically establishes a VPN connection with the secure gateway specified by the AnyConnect profile, or to the last gateway to which the client connected.

Minimize On Connect—After establishing a VPN connection, the AnyConnect GUI minimizes.

Local LAN Access—Allows the user complete access to the local LAN connected to the remote computer during the VPN session to the ASA.



Note

Enabling Local LAN Access can potentially create a security weakness from the public network through the user computer into the corporate network. Alternatively, you can configure the security appliance (version 8.3(1) or later) to deploy an SSL client firewall that uses the AnyConnect Client Local Print firewall rule included in the default group policy. In order to enable this firewall rule, you also must enable **Automatic VPN Policy, Always On**, and **Allow VPN Disconnect** in this editor, Preferences (Part 2).

Auto Reconnect—AnyConnect attempts to reestablish a VPN connection if you lose connectivity (enabled by default). If you disable Auto Reconnect, it does not attempt to reconnect, regardless of the cause of the disconnection.

Auto Reconnect Behavior:

- **DisconnectOnSuspend** (default)—AnyConnect releases the resources assigned to the VPN session upon a system suspend and does not attempt to reconnect after the system resumes.
- **ReconnectAfterResume**—AnyConnect attempts to reestablish a VPN connection if you lose connectivity.



Note Before AnyConnect 2.3, the default behavior in response to a system suspend was to retain the resources assigned to the VPN session and reestablish the VPN connection after the system resume. To retain that behavior, choose **ReconnectAfterResume** for the Auto Reconnect Behavior.

Auto Update—When checked, enables the automatic update of the client. If you check User Controllable, then the user can override this setting in the client.

RSA Secure ID Integration (Windows only)—Controls how the user interacts with RSA. By default, AnyConnect determines the correct method of RSA interaction (automatic setting).

- **Automatic**—Software or Hardware tokens accepted.
- **Software Token**—Only software tokens accepted.
- **Hardware Token**—Only hardware tokens accepted.

Windows Logon Enforcement—Allows a VPN session to be established from a Remote Desktop Protocol (RDP) session. Split tunneling must be configured in the group policy. AnyConnect disconnects the VPN connection when the user who established the VPN connection logs off. If the connection is established by a remote user, and that remote user logs out, the VPN connection terminates.

- **Single Local Logon**—Allows only one local user to be logged on during the entire VPN connection. A local user can establish a VPN connection while one or more remote users are logged on to the client PC.
- **Single Logon**—Allows only one user to be logged on during the entire VPN connection. If more than one user is logged on, either locally or remotely, when the VPN connection is being established, the connection is not allowed. If a second user logs on, either locally or remotely, during the VPN connection, the VPN connection terminates. No additional logons are allowed during the VPN connection, so a remote logon over the VPN connection is not possible.

Windows VPN Establishment—Determines the behavior of AnyConnect when a user who is remotely logged on to the client PC establishes a VPN connection. The possible values are:

- **Local Users Only**—Prevents a remotely logged-on user from establishing a VPN connection. This is the same functionality as in prior versions of AnyConnect.
- **Allow Remote Users**—Allows remote users to establish a VPN connection. However, if the configured VPN connection routing causes the remote user to become disconnected, the VPN connection terminates to allow the remote user to regain access to the client PC. Remote users must wait 90 seconds after VPN establishment if they want to disconnect their remote logon session without causing the VPN connection to be terminated.

**Note**

On Vista, the Windows VPN Establishment setting is not currently enforced during Start Before Logon (SBL). AnyConnect does not determine whether the VPN connection is being established by a remote user before logon; therefore, a remote user can establish a VPN connection via SBL even when the Windows VPN Establishment setting is Local Users Only.

- **IP Protocol Supported**—For clients with both an IPv4 and IPv6 address attempting to connect to the ASA using AnyConnect, AnyConnect needs to decide which IP protocol to use to initiate the connection. By default AnyConnect initially attempts to connect using IPv4. If that is not successful, AnyConnect attempts to initiate the connection using IPv6.

This field configures the initial IP protocol and order of fallback.

- **IPv4**—Only IPv4 connections can be made to the ASA.
- **IPv6**—Only IPv6 connections can be made to the ASA.
- **IPv4, IPv6**—First, attempt to make an IPv4 connection to the ASA. If the client cannot connect using IPv4 then try to make an IPv6 connection.
- **IPv6, IPv4**—First attempt to make an IPv6 connection to the ASA. If the client cannot connect using IPv6 then try to make an IPv4 connection.

**Note**

The IPv4 to IPv6 and IPv6 to IPv4 protocol failover can also happen during the VPN session. If the primary IP protocol is lost, the VPN session will be re-established via the secondary IP protocol, if possible.

For more detailed configuration information about the client features that appear on this pane, see these sections:

- [Configuring Start Before Logon \(PLAP\) on Windows 7 and Vista Systems, page 3-17](#)
- [Configuring Certificate Expiration Notice, page 3-48](#)
- [Configuring Auto Reconnect, page 3-62](#)
- [Using a Windows RDP Session to Launch a VPN Session, page 3-74](#)

AnyConnect Profile Editor, Preferences (Part 2)

Disable Certificate Selection—Disables automatic certificate selection by the client and prompts the user to select the authentication certificate.

Allow Local Proxy Connections—By default, AnyConnect lets Windows users establish a VPN session through a transparent or non-transparent proxy service on the local PC. Some examples of elements that provide a transparent proxy service include:

- Acceleration software provided by some wireless data cards
- Network component on some antivirus software

Uncheck this parameter if you want to disable support for local proxy connections.

Proxy Settings—Specifies a policy in the AnyConnect profile to bypass the Microsoft Internet Explorer or Mac Safari proxy settings on the remote computer. This is useful when the proxy configuration prevents the user from establishing a tunnel from outside the corporate network. Use in conjunction with the proxy settings on the ASA.

- **Native**—Causes the client to use both the client configured proxy settings and the Internet Explorer configured proxy settings. The native OS proxy settings are used (such as those configured into MSIE in Windows), and proxy settings configured in the global user preferences are pre-pended to these native settings.
- **IgnoreProxy**—Ignores all Microsoft Internet Explorer or Mac Safari proxy settings on the user computer. No action is taken against proxies that reach the ASA.
- **Override** (not supported)

Enable Optimal Gateway Selection—AnyConnect identifies and selects which secure gateway is best for connection or reconnection based on the round trip time (RTT), minimizing latency for Internet traffic without user intervention. **Automatic Selection** displays in the Connect To drop-down list on the Connection tab of the client GUI.

- **Suspension Time Threshold (hours)**—The elapsed time from disconnecting to the current secure gateway to reconnecting to another secure gateway. If users experience too many transitions between gateways, increase this time.
- **Performance Improvement Threshold (%)**—The performance improvement that triggers the client to connect to another secure gateway. The default is 20%.



Note If AAA is used, users may have to re-enter their credentials when transitioning to a different secure gateway. Using certificates eliminates this problem.

Automatic VPN Policy (Windows and Mac only)—Automatically manages when a VPN connection should be started or stopped according to the Trusted Network Policy and Untrusted Network Policy. If disabled, VPN connections can only be started and stopped manually.



Note Automatic VPN Policy does not prevent users from manually controlling a VPN connection.

- **Trusted Network Policy**—AnyConnect automatically disconnects a VPN connection when the user is inside the corporate network (the trusted network).
 - **Disconnect**—Disconnects the VPN connection upon the detection of the trusted network.
 - **Connect**—Initiates a VPN connection upon the detection of the trusted network.
 - **Do Nothing**—Takes no action in the trusted network. Setting both the Trusted Network Policy and Untrusted Network Policy to Do Nothing disables Trusted Network Detection.
 - **Pause**—AnyConnect suspends the VPN session instead of disconnecting it if a user enters a network configured as trusted after establishing a VPN session outside the trusted network. When the user goes outside the trusted network again, AnyConnect resumes the session. This feature is for the user's convenience because it eliminates the need to establish a new VPN session after leaving a trusted network.
- **Untrusted Network Policy**—AnyConnect starts the VPN connection when the user is outside the corporate network (the untrusted network). This feature encourages greater security awareness by initiating a VPN connection when the user is outside the trusted network.
 - **Connect**—Initiates the VPN connection upon the detection of an untrusted network.
 - **Do Nothing**—Initiates the VPN connection upon the detection of an untrusted network. This option disables always-on VPN. Setting both the Trusted Network Policy and Untrusted Network Policy to Do Nothing disables Trusted Network Detection.

- **Trusted DNS Domains**—DNS suffixes (a string separated by commas) that a network interface may have when the client is in the trusted network. For example: *.cisco.com. Wildcards (*) are supported for DNS suffixes.
- **Trusted DNS Servers**—DNS server addresses (a string separated by commas) that a network interface may have when the client is in the trusted network. For example: 192.168.1.2, 2001:DB8::1.
- **Always On**—Determines whether AnyConnect automatically connects to the VPN when the user logs in to a computer running one of the supported Windows or Mac OS X operating systems. Use this feature to enforce corporate policies to protect the computer from security threats by preventing access to Internet resources when it is not in a trusted network. You can set the always-on VPN parameter in group policies and dynamic access policies to override this setting. Doing so lets you specify exceptions according to the matching criteria used to assign the policy. If an AnyConnect policy enables always-on VPN and a dynamic access policy or group policy disables it, the client retains the disable setting for the current and future VPN sessions as long as its criteria match the dynamic access policy or group policy on the establishment of each new session.

After checking **Always On**, you are able to check **Allow VPN Disconnect**.

- **Allow VPN Disconnect**—Determines whether AnyConnect displays a Disconnect button for always-on VPN sessions. Users of always-on VPN sessions may want to click Disconnect so they can choose an alternative secure gateway for reasons such as the following:
 - Performance issues with the current VPN session.
 - Reconnection issues following the interruption of a VPN session.



Caution

The Disconnect locks all interfaces to prevent data from leaking out and to protect the computer from internet access except for establishing a VPN session. For the reasons noted above, disabling the Disconnect button can at times hinder or prevent VPN access.

For more information about this feature, see the [“Disconnect Button for Always-on VPN” section on page 3-29](#).

After enabling **Allow VPN Disconnect**, you will be able to configure **Connect Failure Policy**, **Allow Captive Portal Remediation**, and **Apply Last VPN Local Resource Rules**.

- **Connect Failure Policy**—Determines whether the computer can access the Internet if AnyConnect cannot establish a VPN session (for example, when an ASA is unreachable). This parameter applies only if always-on VPN is enabled.



Caution

A connect failure closed policy prevents network access if AnyConnect fails to establish a VPN session. AnyConnect detects most [captive portals](#); however, if it cannot detect a captive portal, the connect failure closed policy prevents all network connectivity. Be sure to read the [“Connect Failure Policy for Always-on VPN, page 3-31”](#) before configuring a connect failure policy.

- **Closed**—Restricts network access when the VPN is unreachable. The purpose of this setting is to help protect corporate assets from network threats when resources in the private network responsible for protecting the endpoint are unavailable.
- **Open**—Permits network access when the VPN is unreachable.

Connect Failure Policy - If Connect Failure Policy is Closed, then you can configure the next settings.

- **Allow Captive Portal Remediation**—Lets AnyConnect lift the network access restrictions imposed by the closed connect failure policy when the client detects a captive portal (hotspot). Hotels and airports typically use captive portals to require the user to open a browser and satisfy conditions required to permit Internet access. By default, this parameter is unchecked to provide the greatest security; however, you must enable it if you want the client to connect to the VPN if a captive portal is preventing it from doing so.
- **Remediation Timeout**—Number of minutes AnyConnect lifts the network access restrictions. This parameter applies if the Allow Captive Portal Remediation parameter is checked and the client detects a captive portal. Specify enough time to meet typical captive portal requirements (for example, 5 minutes).
- **Apply Last VPN Local Resource Rules**—If the VPN is unreachable, the client applies the last client firewall it received from the ASA, which may include ACLs allowing access to resources on the local LAN.

PPP Exclusion—For a VPN tunnel over a PPP connection, specifies whether and how to determine the exclusion route so the client can exclude traffic destined for the secure gateway from the tunneled traffic intended for destinations beyond the secure gateway. The exclusion route appears as a non-secured route in the Route Details display of the AnyConnect GUI. If you make this feature user controllable, users can read and change the PPP exclusion settings.

- **Automatic**—Enables PPP exclusion. AnyConnect automatically uses the IP address of the PPP server. Instruct users to change the value only if automatic detection fails to get the IP address.
- **Disabled**—PPP exclusion is not applied.
- **Override**—Also enables PPP exclusion. If automatic detection fails to get the IP address of the PPP server, and you configured PPP exclusion as user controllable, instruct users to follow the instructions in the [“Instructing Users to Override PPP Exclusion”](#) section on page 3-76.

PPP Exclusion Server IP—The IP address of the security gateway used for PPP exclusion.

Enable Scripting—Launches OnConnect and OnDisconnect scripts if present on the security appliance flash memory.

- **Terminate Script On Next Event**—Terminates a running script process if a transition to another scriptable event occurs. For example, AnyConnect terminates a running OnConnect script if the VPN session ends, and terminates a running OnDisconnect script if the client starts a new VPN session. On Microsoft Windows, the client also terminates any scripts that the OnConnect or OnDisconnect script launched, and all their script descendents. On Mac OS and Linux, the client terminates only the OnConnect or OnDisconnect script; it does not terminate child scripts.
- **Enable Post SBL On Connect Script**—Launches the OnConnect script if present and SBL establishes the VPN session. (Only supported if VPN endpoint is running Microsoft Windows 7, XP, or Vista).

Retain VPN On Logoff—Determines whether to keep the VPN session when the user logs off a Windows OS.

- **User Enforcement**—Specifies whether to end the VPN session if a different user logs on. This parameter applies only if “Retain VPN On Logoff” is checked and the original user logged off Windows when the VPN session was up.

Authentication Timeout Values—By default, AnyConnect waits up to 12 seconds for an authentication from the secure gateway before terminating the connection attempt. AnyConnect then displays a message indicating the authentication timed out. Enter a number of seconds in the range 10–120.

For more detailed configuration information about the client features that appear on this pane, see these sections:

- [Proxy Connections, page 3-63](#)
- [Configuring the Client to Ignore Browser Proxy Settings, page 3-72](#)
- [Optimal Gateway Selection, page 3-65](#)
- [Configuring Trusted Network Detection, page 3-22](#)
- [Always-on VPN, page 3-24](#)
- [Connect Failure Policy for Always-on VPN, page 3-31](#)
- [Captive Portal Hotspot Detection and Remediation, page 3-33](#)
- [AnyConnect over L2TP or PPTP, page 3-75](#)
- [Authentication Timeout Control, page 3-71](#)

AnyConnect Profile Editor, Backup Servers

You can configure a list of backup servers the client uses in case the user-selected server fails. If the user-selected server fails, the client attempts to connect to the server at the top of the list first, and moves down the list, if necessary.

Host Address—Specifies an IP address or a Fully-Qualified Domain Name (FQDN) to include in the backup server list.

Add—Adds the host address to the backup server list.

Move Up—Moves the selected backup server higher in the list. If the user-selected server fails, the client attempts to connect to the backup server at the top of the list first, and moves down the list, if necessary.

Move Down—Moves the selected backup server down in the list.

Delete—Removes the backup server from the server list.

For more information on configuring backup servers, see the [“Configuring a Backup Server List” section on page 3-61](#)

AnyConnect Profile Editor, Certificate Matching

Enable the definition of various attributes that can be used to refine automatic client certificate selection on this pane.

Key Usage—Use the following Certificate Key attributes for choosing acceptable client certificates:

- **Decipher_Only**—Deciphering data, and that no other bit (except Key_Agreement) is set.
- **Encipher_Only**—Enciphering data, and any other bit (except Key_Agreement) is not set.
- **CRL_Sign**—Verifying the CA signature on a CRL.
- **Key_Cert_Sign**—Verifying the CA signature on a certificate.
- **Key_Agreement**—Key agreement.
- **Data_Encipherment**—Encrypting data other than Key_Encipherment.
- **Key_Encipherment**—Encrypting keys.

- **Non_Repudiation**—Verifying digital signatures protecting against falsely denying some action, other than Key_Cert_Sign or CRL_Sign.
- **Digital_Signature**—Verifying digital signatures other than Non_Repudiation, Key_Cert_Sign or CRL_Sign.

Extended Key Usage—Use these Extended Key Usage settings. The OIDs are included in parentheses ():

- ServerAuth (1.3.6.1.5.5.7.3.1)
- ClientAuth (1.3.6.1.5.5.7.3.2)
- CodeSign (1.3.6.1.5.5.7.3.3)
- EmailProtect (1.3.6.1.5.5.7.3.4)
- IPSecEndSystem (1.3.6.1.5.5.7.3.5)
- IPSecTunnel (1.3.6.1.5.5.7.3.6)
- IPSecUser (1.3.6.1.5.5.7.3.7)
- TimeStamp (1.3.6.1.5.5.7.3.8)
- OCSPSign (1.3.6.1.5.5.7.3.9)
- DVCS (1.3.6.1.5.5.7.3.10)

Custom Extended Match Key (Max 10)—Specifies custom extended match keys, if any (maximum 10). A certificate must match all the specified key(s) you enter. Enter the key in the OID format (for example, 1.3.6.1.5.5.7.3.11).

Distinguished Name (Max 10):—Specifies distinguished names (DNs) for exact match criteria in choosing acceptable client certificates.

Name—The distinguished name (DN) to use for matching:

- CN—Subject Common Name
- C—Subject Country
- DC—Domain Component
- DNQ—Subject Dn Qualifier
- EA—Subject Email Address
- GENQ—Subject Gen Qualifier
- GN—Subject Given Name
- I—Subject Initials
- L—Subject City
- N—Subject Unstruct Name
- O—Subject Company
- OU—Subject Department
- SN—Subject Sur Name
- SP—Subject State
- ST—Subject State
- T—Subject Title
- ISSUER-CN—Issuer Common Name

- ISSUER-DC—Issuer Component
- ISSUER-SN—Issuer Sur Name
- ISSUER-GN—Issuer Given Name
- ISSUER-N—Issuer Unstruct Name
- ISSUER-I—Issuer Initials
- ISSUER-GENQ—Issuer Gen Qualifier
- ISSUER-DNQ—Issuer Dn Qualifier
- ISSUER-C—Issuer Country
- ISSUER-L—Issuer City
- ISSUER-SP—Issuer State
- ISSUER-ST—Issuer State
- ISSUER-O—Issuer Company
- ISSUER-OU—Issuer Department
- ISSUER-T—Issuer Title
- ISSUER-EA—Issuer Email Address

Pattern—Specifies the string to match. The pattern to be matched should include only the portion of the string you want to match. There is no need to include pattern match or regular expression syntax. If entered, this syntax will be considered part of the string to search for.

For example, if a sample string was abc.cisco.com and the intent is to match cisco.com, the pattern entered should be cisco.com.

Wildcard—Enabled includes wildcard pattern matching. With wildcard enabled, the pattern can be anywhere in the string.

Operator—The operator to use when performing matches for this DN.

- Equal—equivalent to ==
- Not Equal—equivalent to !=

Match Case—Check to enable case-sensitive pattern matching.

For more detailed configuration information about the certificate matching, see the [“Configuring Certificate Matching”](#) section on page 3-52.

AnyConnect Profile Editor, Certificate Enrollment

Certificate Enrollment—Enables AnyConnect to use the Simple Certificate Enrollment Protocol (SCEP) to provision and renew a certificate for client authentication.

Certificate Expiration Threshold—The number of days before the certificate expiration date that AnyConnect warns users their certificate is going to expire (not supported by RADIUS password-management). The default is zero (no warning displayed). The range of values is zero to 180 days.

Automatic SCEP Host—For Legacy SECP, specifies the host name and connection profile (tunnel group) of the ASA that has SCEP certificate retrieval configured. Enter a Fully Qualified Domain Name (FQDN) or a connection profile name of the ASA. For example, the hostname *asa.cisco.com* and the connection profile name *scep_eng*.

CA URL—For Legacy SCEP, identifies the SCEP CA server. Enter an FQDN or IP Address of the CA server. For example, *http://ca01.cisco.com*.

- **Prompt For Challenge PW**—Enable this setting to allow the user make certificate requests manually. When the user clicks **Get Certificate**, the client prompts the user for a username and one-time password.
- **Thumbprint**—The certificate thumbprint of the CA. Use SHA1 or MD5 hashes.



Note Your CA server administrator can provide the CA URL and thumbprint and should retrieve the thumbprint directly from the server and not from a “fingerprint” or “thumbprint” attribute field in the issued server certificate.

Certificate Contents—Specifies certificate contents to include in the SCEP enrollment request:

- Name (CN)—Common Name in the certificate.
- Department (OU)—Department name specified in certificate.
- Company (O)—Company name specified in certificate.
- State (ST)—State identifier named in certificate.
- State (SP)—Another state identifier.
- Country (C)—Country identifier named in certificate.
- Email (EA)—Email address. In the following example, Email (EA) is %USER%@cisco.com. %USER% corresponds to the user’s ASA username logon credential.
- Domain (DC)—Domain component. In the following example, Domain (DC) is set to cisco.com.
- SurName (SN)—The family name or last name.
- GivenName (GN)—Generally, the first name.
- UnstructName (N)—Undefined name.
- Initials (I)—The initials of the user.
- Qualifier (GEN)—The generation qualifier of the user. For example, “Jr.” or “III.”
- Qualifier (DN)—A qualifier for the entire DN.
- City (L)—The city identifier.
- Title (T)—The person's title. For example, Ms., Mrs., Mr.
- CA Domain—Used for the SCEP enrollment and is generally the CA domain.
- Key size—The size of the RSA keys generated for the certificate to be enrolled. We recommend using a key size of at least 2048.

Display Get Certificate Button—Enables the AnyConnect GUI to display the Get Certificate button under the following conditions:

- The certificate is set to expire within the period defined by the Certificate Expiration Threshold (not supported with RADIUS)
- The certificate has expired
- No certificate is present
- The certificate fails to match.

For more detailed configuration information about Certificate Enrollment, see the [“Configuring Certificate Enrollment using SCEP”](#) section on page 3-42.

AnyConnect Profile Editor, Mobile Policy

Set parameters for AnyConnect running on Windows Mobile in this pane:

**Note**

AnyConnect version 3.0 and later does not support Windows Mobile devices. See *Cisco AnyConnect Secure Mobility Client Administrator Guide, Release 2.5* for information related to Windows Mobile devices.

- **Device Lock Required**—A Windows Mobile device must be configured with a password or PIN before establishing a VPN connection. This only applies to Windows Mobile devices that use the Microsoft Local Authentication Plug-ins (LAPs).
- **Maximum Timeout Minutes**—The maximum number of minutes that must be configured before the device lock takes effect.
- **Minimum Password Length**—Specifies the minimum number of characters for the device lock password or PIN.
- **Password Complexity**—Specifies the complexity for the required device lock password:
 - alpha—Requires an alphanumeric password.
 - pin—Requires a numeric PIN.
 - strong—Requires a strong alphanumeric password which must contain at least 7 characters, including a minimum of 3 from the set of uppercase, lowercase, numerals, and punctuation characters.

AnyConnect Profile Editor, Server List

You can configure a list of servers that appear in the client GUI. Users can select servers in the list to establish a VPN connection.

Server List Table Columns:

- **Hostname**—The alias used to refer to the host, IP address, or Full-Qualified Domain Name (FQDN).
- **Host Address**—IP address or FQDN of the server.
- **User Group**—Used in conjunction with Host Address to form a group-based URL.
- **Automatic SCEP Host**—The Simple Certificate Enrollment Protocol specified for provisioning and renewing a certificate used for client authentication.
- **CA URL**—The URL this server uses to connect to certificate authority (CA).

Add/Edit—Launches the Server List Entry dialog where you can specify the server parameters.

Delete—Removes the server from the server list.

Details—Displays more details about backup servers or CA URL s for the server.

AnyConnect Profile Editor, Add/Edit Server List

Add a server and its backup server or load balancing backup device in this pane.

Hostname—Enter an alias used to refer to the host, IP address, or Full-Qualified Domain Name (FQDN).

Host Address—Specify an IP address or an FQDN for the server.

**Note**

- If you specify an IP address or FQDN in the Host Address Field, then the entry in the Host Name field becomes a label for the server in the connection drop-down list in the AnyConnect Client tray fly-out.
- If you only specify an FQDN in the Hostname field, and no IP address in the Host Address field, then the FQDN in the Hostname field will be resolved by a DNS server.
- If you enter an IP address, use the Public IPv4 or the Global IPv6 address of the secure gateway. Use of the link-local secure gateway address is not supported.

User Group—Specify a user group. The user group is used in conjunction with Host Address to form a group-based URL.

**Note**

If you specify the Primary Protocol as IPsec, the User Group must be the exact name of the connection profile (tunnel group). For SSL, the user group is the group-url or group-alias of the connection profile.

Backup Server List—You can configure a list of backup servers the client uses in case the user-selected server fails. If the server fails, the client attempts to connect to the server at the top of the list first, and moves down the list, if necessary.

- **Host Address**—Specifies an IP address or an FQDN to include in the backup server list. If the client cannot connect to the host, it attempts to connect to the backup server.
- **Add**—Adds the host address to the backup server list.
- **Move Up**—Moves the selected backup server higher in the list. If the user-selected server fails, the client attempts to connect to the backup server at the top of the list first, and moves down the list, if necessary.
- **Move Down**—Moves the selected backup server down in the list.
- **Delete**—Removes the backup server from the server list.

Load Balancing Server List—If the host for this server list entry is a load balancing cluster of security appliances, and the always-on feature is enabled, specify the backup devices of the cluster in this list. If you do not, the always-on feature blocks access to backup devices in the load balancing cluster.

- **Host Address**—Specifies an IP address or an FQDN of a backup device in a load-balancing cluster.
- **Add**—Adds the address to the load balancing backup server list.
- **Delete**—Removes the load balancing backup server from the list.

Primary Protocol—Specifies the protocol for connecting to this ASA, either SSL or IPsec with IKEv2. The default is SSL.

Standard Authentication Only—By default, the AnyConnect client uses the proprietary AnyConnect EAP authentication method. Check to configure the client to use a standards-based method. However, doing this limits the dynamic download features of the client and disables some features.

**Note**

Changing the authentication method from the proprietary AnyConnect EAP to a standards-based method disables the ability of the ASA to configure session timeout, idle timeout, disconnected timeout, split tunneling, split DNS, MSIE proxy configuration, and other features.

IKE Identity—If you choose a standards-based EAP authentication method, you can enter a group or domain as the client identity in this field. The client sends the string as the ID_GROUP type IDi payload. By default, the string is `*$AnyConnectClient$*`.

CA URL—Specify the URL of the SCEP CA server. Enter an FQDN or IP Address. For example, `http://ca01.cisco.com`.

- **Prompt For Challenge PW**—Enable the user make certificate requests manually. When the user clicks **Get Certificate**, the client prompts the user for a username and one-time password.
- **Thumbprint**—The certificate thumbprint of the CA. Use SHA1 or MD5 hashes.

**Note**

Your CA server administrator can provide the CA URL and thumbprint and should retrieve the thumbprint directly from the server and not from a “fingerprint” or “thumbprint” attribute field in a certificate it issued.

For more detailed configuration information about creating a server list, see the [“Configuring a Server List” section on page 3-57](#).

Configuring AnyConnect Client Connection Timeouts

Use these procedures to terminate or maintain an idle AnyConnect VPN connection.

You can limit how long the ASA keeps an AnyConnect VPN connection available to the user even with no activity. If a VPN session goes idle, you can terminate the connection or re-negotiate the connection.

Terminating an AnyConnect Connection

Terminating an AnyConnect connection requires the user to re-authenticate their endpoint to the secure gateway and create a new VPN connection.

The following configuration parameters terminate the VPN session based on a simple timeout:

- **Default Idle Timeout** - Terminates any user's session when the session is inactive for the specified time. The default value is 30 minutes.

You can only modify default-idle-timeout using the CLI, in webvpn configuration mode. The default is 1800 second. For instructions to configure default-idle-timeout see [Configuring Session Timeouts in Cisco ASA 5500 Series Configuration Guide using the CLI](#).

- **VPN Idle Timeout** - Terminates any user's session when the session is inactive for the specified time. For SSL-VPN only, if vpn-idle-timeout is not configured, then default-idle-timeout is used.

For instructions to configure VPN idle timeout with the ASDM, see [Adding or Editing a Remote Access Internal Group Policy, General Attributes](#) in *Cisco ASA 5500 Series Configuration Guide using ASDM*.

For instructions to configure VPN idle timeout with the CLI, see [Step 4 of Configuring VPN-Specific Attributes](#) in *Cisco ASA 5500 Series Configuration Guide using the CLI*.

Renegotiating and Maintaining the AnyConnect Connection

The following configuration parameters terminate or renegotiate the tunnel, but do not terminate the session:

- Keepalive - The ASA sends keepalive messages at regular intervals. These messages are ignored by the ASA, but are useful in maintaining connections with devices between the client and the ASA.

For instructions to configure Keepalive with the ASDM, see [Configuring AnyConnect VPN Client Connections](#) in *Cisco ASA 5500 Series Configuration Guide using ASDM*.

For instructions to configure Keepalive with the CLI, see [Step 5 of Group-Policy Attributes for AnyConnect Secure Mobility Client Connections](#) in *Cisco ASA 5500 Series Configuration Guide using the CLI*.

- Dead Peer Detection - The ASA and AnyConnect client send "R-U-There" messages. These messages are sent less frequently than IPsec's keepalive messages.
 - If the client does not respond to the ASA's DPD messages, the ASA tries three more times before putting the session into "Waiting to Resume" mode. This mode allows the user to roam networks, or enter sleep mode and later recover the connection. If the user does not reconnect before the default idle timeout occurs, the ASA will terminate the tunnel. The recommended gateway DPD interval is 300 seconds.
 - If the ASA does not respond to the client's DPD messages, the client tries three more times before terminating the tunnel. The recommended client DPD interval is 30 seconds.

You can enable both the ASA (gateway) and the client to send DPD messages, and configure a timeout interval.

For instructions to configure DPD with the ASDM, see [Dead Peer Detection](#) in *Cisco ASA 5500 Series Configuration Guide using ASDM*.

For instructions to configure DPD with the CLI, see [Step 4 of Configuring Group-Policy Attributes for AnyConnect Secure Mobility Client Connections](#) in *Cisco ASA 5500 Series Configuration Guide using the CLI*.

Best Practices

- Set Client DPD to 30 seconds (Group Policy > Advanced > AnyConnect Client > Dead Peer Detection).
- Set Server DPD to 300 seconds (Group Policy > Advanced > AnyConnect Client > Dead Peer Detection).
- Set Rekey, for both SSL and IPsec to 1 hour (Group Policy > Advanced > AnyConnect Client > Key Regeneration).



Configuring Network Access Manager

This chapter provides an overview of the Network Access Manager configuration and provides instructions for adding and configuring user policies and network profiles. This chapter contains these sections:

- [Introduction, page 4-1](#)
- [System Requirements for the Network Access Manager, page 4-4](#)
- [Creating a Network Access Manager Profile, page 4-5](#)
- [Configuring a Network Access Manager Profile, page 4-6](#)

Introduction

The Network Access Manager is client software that provides a secure Layer 2 network in accordance with policies set forth by the enterprise network administrators. The Network Access Manager detects and selects the optimal Layer 2 access network and performs device authentication for access to both wired and wireless networks. The Network Access Manager manages user and device identity and the network access protocols required for secure access. It works intelligently to prevent end users from making connections that are in violation of administrator-defined policies.

The Network Access Manager component of the AnyConnect Secure Mobility Client supports these main features:

- Wired (IEEE 802.3), wireless (IEEE 802.11) and some Mobile Broadband (3G) network adapters on Windows 7. For the complete list of supported adapters, see *Release Notes for Cisco AnyConnect Secure Mobility Client, Release 3.1*.
- Pre-login authentication using Windows machine credentials
- Single sign-on user authentication using Windows logon credentials
- Simplified and easy-to-use IEEE 802.1X configuration
- IEEE MACsec wired encryption and enterprise policy control
- EAP methods:
 - EAP-FAST, PEAP, EAP-TTLS, EAP-TLS, and LEAP (EAP-MD5, EAP-GTC, and EAP-MSCHAPv2 for IEEE 802.3 wired only)
- Inner EAP methods:
 - PEAP—EAP-GTC, EAP-MSCHAPv2, and EAP-TLS

- EAP-TTLS—EAP-MD5 and EAP-MSCHAPv2 and legacy methods (PAP, CHAP, MSCHAP, and MSCHAPv2)
- EAP-FAST—GTC, EAP-MSCHAPv2, and EAP-TLS
- Encryption modes:
 - Static WEP (Open or Shared), dynamic WEP, TKIP, and AES
- Key establishment protocols:
 - WPA, WPA2/802.11i, and CCKM (selectively, depending on the IEEE 802.11 NIC card)



Note The only adapter supported for CCKM is the Cisco CB21AG on Windows XP

- Smartcard provided credentials. AnyConnect supports Smartcards in the following environments:
 - Microsoft CAPI 1.0 and CAPI 2.0 (CNG) on Windows XP, 7 & Vista
 - Windows logon does not support ECDSA certificates, therefore Network Access Manager's Single Sign-On (SSO) does not support ECDSA client certificates.



Note Network Access Manager is not supported on MAC or Linux.

Suite B and FIPS

The following features are FIPS-certified, and any exceptions are listed:

- ACS and ISE doesn't support SuiteB, but FreeRADIUS 2.x + OpenSSL 1.x does. Microsoft NPS 2008 supports Suite-B in part (the NPS's certificate still has to be RSA).
- 802.1X/EAP supports transitional Suite B profile only (as defined in RFC5430); there no support for TLS 1.2.
- MACsec is FIPS-compliant on Windows 7 only.
- Elliptic Curve Diffie-Hellman (ECDH) key exchange for Windows 7 and XP.
- ECDSA client certificates are supported on Windows 7 and Vista only.
- ECDSA CA certificates in OS store are supported on Windows 7 and Vista only
- ECDSA CA certificates in the network profile (PEM encoded) are supported on Windows XP/7/Vista
- Server's ECDSA certificate chain verification is supported on Windows XP/7/Vista

Single Sign On “Single User” Enforcement

Microsoft Windows XP, Windows-7 and Vista allow multiple users to be logged on concurrently, but AnyConnect Network Access Manager restricts network authentication to a single user. AnyConnect Network Access Manager can only be active for one user per desktop/server, regardless of how many users are logged on. Single User login Enforcement implies that only one user can be logged into the system at any one time and that Administrators can't force a logoff of the currently logged in user.

When the Network Access Manager client module is installed on Windows desktops the default behavior is to enforce single user logon. When installed on servers the default behavior is to relax the single user login enforcement. In either case a registry key can be modified or added to change the default behavior.

Single Sign-On Single user enforcement has the following features and restrictions:

- Windows administrators are restricted from forcing logoff of currently logged on users
- RDP to a connected workstation is supported for the same user
- To be considered the same user, credentials must be in the same format. For example, me/mydomain is not the same as me@mydomain.com.
- Smart card users must also have the same PIN to be considered the same user.

Configuring Single Sign-On Single User Enforcement

To change how a Window's workstation or server handles multiple users, change the value of `EnforceSingleLogon` in the registry. Network Access Manager does not add that key to Windows XP, but you can add it, if you wish to change Windows logon access.

On Windows 7, The registry key is **EnforceSingleLogon**, and is in the same registry location as the `OverlayIcon` key:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Authentication\Credential Providers\{B12744B8-5BB7-463a-B85E-BB7627E73002}
```

On Windows XP, The registry key is:

```
HKLM\Software\Microsoft\WindowsNT\CurrentVersion\Winlogon\Notify\acnamssso
```

To configure single or multiple user logon, add a `DWORD` named `EnforceSingleLogon`, and give it a value of 1 or 0.

For both Windows 7 and XP:

- 1 restricts logon to a single user
- 0 allows multiple users logged on

The default configuration for workstations is 1; the default for servers is 0. If you are using single sign on for your workstation or server, you must set the value of `EnforceSingleLogon` to 1 for both the workstation and server.

Guidelines

Windows Network Status Task Tray Icon

Network Access Manager overrides Windows network management. After installing Network Access Manager, the Windows networking icon in the task bar may confuse users, because the user can no longer use the network status icon to connect to networks.

You can remove the Windows network icon from the task bar by setting 'Remove the networking icon' in a Windows group policy. This setting only affects the tray icon, the user can still create native wireless networks using the Control Panel.

Hidden Networks and Network Selection for Windows 7

Network Access Manager only tries to connect to the networks that are configured in the Network Access Manager's network scan list.

On Windows 7, Network Access Manager probes for hidden SSIDs. When the first hidden SSID is found, it stops looking. When multiple hidden networks are configured, Network Access Manager selects the SSID as follows:

- The first administrator-defined hidden corporate network.
- The administrator-defined hidden network.
- The first user-defined hidden network.

We recommend having only one hidden Corporate network at your site, since Network Access Manager can only probe one non-broadcasting SSID at a time.

Networks Defined by Windows

If the user defined networks in Windows before Network Access Manager was installed, then the Windows connection manager may occasionally try to make a connection to that network. This may cause a momentary loss of network connectivity and/or longer initial connection times.

- Turn off Connect Automatically when this network is in range for all Windows-defined networks.
- Delete all the Windows-defined networks.

System Requirements for the Network Access Manager

The Network Access Manager module requires the following:

- ASDM version 6.8

**Note**

The standalone Network Access Manager editor is a supported alternative for configuring a Network Access Manager profile. For security reasons, AnyConnect does not accept Network Access Manager profiles edited outside AnyConnect profile editors.

- The following operating systems support the Network Access Manager:
 - Windows 7 x86 (32-bit) and x64 (64-bit)
 - Windows Vista SP2 x86 (32-bit) and x64 (64-bit)
 - Windows XP x86 SP3 (32-bit)
 - Windows Server 2003 SP2 x86 (32-bit), IPv6 and Suite-B are not supported
 - Windows Server 2008 R2

Licensing and Upgrading Requirements

The AnyConnect Network Access Manager is licensed without charge for use with Cisco wireless access points, wireless LAN controllers, switches, and RADIUS servers. No AnyConnect Essentials or Premium license is required. A current SmartNet contract is required on the related Cisco equipment.

Deploying Network Access Manager

Network Access Manager is deployed as part of AnyConnect. For information about how to install AnyConnect, along with Network Access Manager and other modules, see [“Deploying the AnyConnect Secure Mobility Client” section on page 2-1](#).

Creating a Network Access Manager Profile

Network Access Manager profiles are deployed on the endpoints as part of AnyConnect, so that the Network Access Manager can enforce administratively defined end user requirements and authentication policies, and make the pre-configured network profiles available to end users.

Use the Network Access Manager profile editor to create and configure one or more Network Access Manager profiles. AnyConnect includes the profile editor as part of ASDM, and as a standalone Windows version. Refer to [Chapter 2, “Deploying the AnyConnect Secure Mobility Client”](#) for profile editor requirements and deployment instructions.

**Note**

Until you upload a client image, you will not be able to create a client profile.

Adding a New Profile from ASDM

Follow these steps to add a new Network Access Manager client profile to the ASA from ASDM.

-
- Step 1** Open ASDM and select Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile.
 - Step 2** Click **Add**.
 - Step 3** The Add AnyConnect Client Profile window opens (see [Figure 4-1](#)).

Figure 4-1 Add AnyConnect Client Profile Window

208960

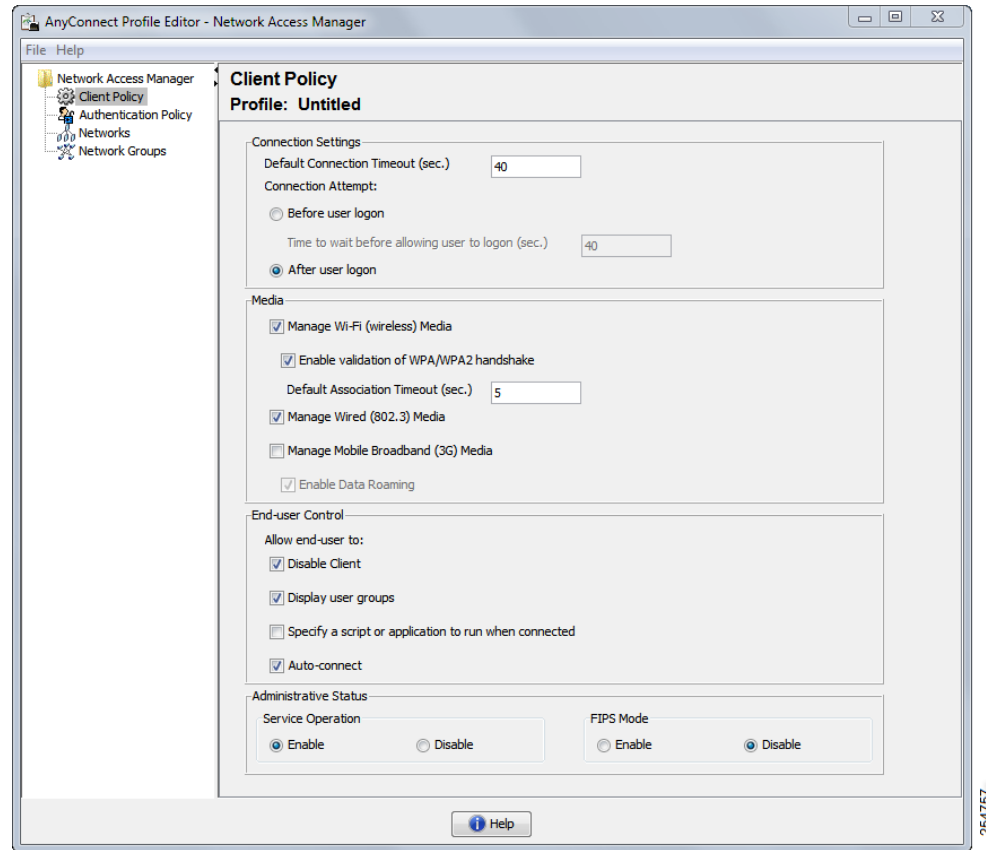
- Step 4** Enter a profile name.
- Step 5** From the Profile Usage drop-down list, choose **Network Access Manager**.
- Step 6** (Optional) In the Profile Location field, click **Browse Flash** and select a device file path for the XML file on the ASA.
- Step 7** (Optional) If you created a Network Access Manager profile with the stand-alone editor, click **Upload** to use that profile definition.
- Step 8** (Optional) Choose an AnyConnect group policy from the drop-down list.
- Step 9** Click **OK**.

Configuring a Network Access Manager Profile

Network Access Manager profiles are configured in the Network Access Manager profile editor, which is available in the ASDM and also as a stand-alone Windows application.

Client Policy Window

The Client Policy window enables you to configure the client policy options (see [Figure 4-2](#)).

Figure 4-2 *Client Policy Window*

Four sections are included:

- **Connection Settings**—Allows you to define whether a network connection is attempted before or after the user logs on.
 - **Default Connection Timeout**—The number of seconds to use as the connection timeout for user-created networks. The default value is 40 seconds.
 - **Before User Logon**—Connect to the network before the user logs on. The user logon types that are supported include user account (Kerberos) authentication, loading of user GPOs, and GPO-based logon script execution.

If you choose Before User Logon, you also get to set Time to Wait Before Allowing a User to Logon:

Time to Wait Before Allowing User to Logon—Specifies the maximum (worst case) number of seconds to wait for the Network Access Manager to make a complete network connection. If a network connection cannot be established within this time, the Windows logon process continues with user log on. The default is 5 seconds.

**Note**

If the Network Access Manager is configured to manage wireless connections, set *Time to wait before allowing user to logon* to 30 seconds or more because of the additional time it may take to establish a wireless connection. You must also account for the time required to obtain an IP address via DHCP. If two or more network profiles are configured, you may want to increase the value to cover two or more connection attempts.

- After User Logon—Specifies that the Network Access Manager will attempt to establish a network connection after the user logs on to Windows.
- Media—Specifies which types of media are controlled by the Network Access Manager client.
 - Manage Wi-Fi (wireless) Media— Enables management of WiFi media and, optionally, validation of WPA/WPA2 handshake.

The IEEE 802.11i Wireless Networking standard specifies that the supplicant, in this case the Network Access Manager, must validate that the access point's RSN IE (Robust Secure Network Information Exchange) that was sent in the IEEE 801.X protocol packet's EAPOL Key data during key derivation matches the access point's RSN IE found in the beacon/probe response frame. If you enable the validation of WPA/WPA2 handshake, you must specify the default association timeout. If you uncheck the enable validation of WPA/WPA2 handshake setting, this validation step is skipped.

**Note**

Some adapters do not consistently provide the access point's RSN IE, so the authentication attempt fails, and the client will not connect.

- Manage Wired (IEEE 802.3) Media—Enables management of wired connections.
- Manage Mobile Broadband (3G) Media - Enables management of Windows 7 Mobile Broadband Adapters, and whether to allow data roaming. This feature is in a beta release state.

**Note**

Cisco TAC does not provide support for beta releases.

- End-user Control—Allows you to configure the following control for users:
 - Disable Client—Allows users to disable and enable the Network Access Manager's management of wired and wireless media using the AnyConnect UI.
 - Display User Groups—Makes user-created groups (created from CSSC 5.x) visible and capable of a connection, even though they do not correspond to administrator-defined groups.
 - Specify a Script or Application To Run When Connected—Allows users to specify a script or application to run when the network connects.

**Note**

The scripting settings are specific to one user-configured network and allow the user to specify a local file (.exe, .bat, or .cmd) to run when that network gets to a connected state. To avoid conflicts, the scripting feature only permits users to configure a script or application for user-defined networks and not for administrator-defined networks. The feature does not allow users to alter administrator networks regarding the running of scripts; therefore, the interface for administrator networks is not available to the user. Also, if you do not allow users to configure a running script, the feature is not seen in the Network Access Manager GUI.

- Auto-connect—If selected, the Network Access Manager automatically connects to a network without a user needing to choose it. The default is automatic connection.
- Administrative Status
 - Service Operation—If you disable the service, clients who use this profile will not be able to connect to establish layer 2 connections.
 - FIPS Mode— Federal Information Processing Standard (FIPS 140-2 Level 1) is a U.S. government standard that specifies security requirements for cryptography modules. If you enable FIPS mode, the Network Access Manager performs cryptographic operations in a way that meets the government requirements. Refer to [Chapter 9, “NGE, FIPS and Additional Security”](#) for additional information.

FIPS is supported by Network Access Manager for MACsec or Wifi, depending on the type of software and hardware, as show in the following table:

Table 4-1 *FIPS support by Network Access Manager*

Media/Operating System	Windows XP/2003	Windows 7/Vista
Wired with MACsec	Not FIPS compliant	FIPS compliant when an Intel HW MACsec capable NIC, or when any non-hardware MACsec is used
WiFi	FIPS compliant when a 3eti driver is installed	Not FIPS compliant

Authentication Policy Window

The Authentication Policy window allows you to create association and authentication network filters, which apply to all network connections. If you do not check any of the association or authentication modes, the user cannot connect to an authenticating wi-fi network. If you choose a subset of the modes, the user can connect to networks for those types only. Select each desired association or authentication mode, or choose Select All.

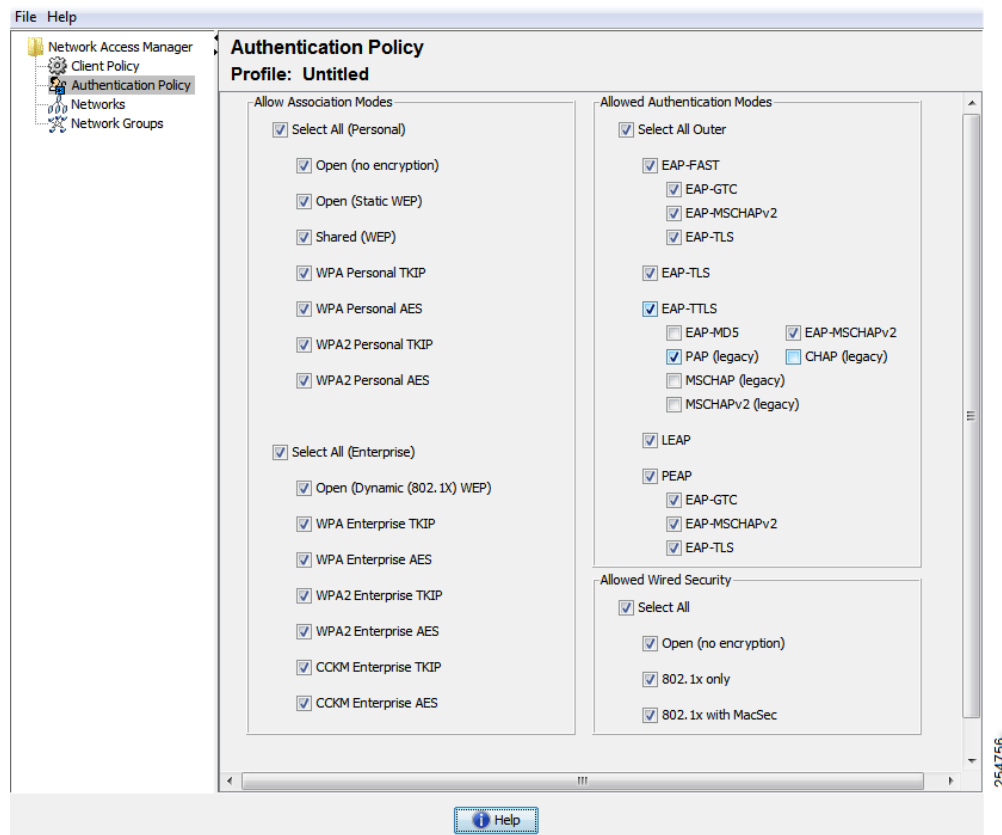
Note that the inner methods can also be restricted to only specific authentication protocols. The inner methods are shown indented under the outer methods (tunneling) in the Allowed Authentication Modes pane.

The mechanism for choosing the authentication protocol is integrated with the current client authentication database. A secure wireless LAN deployment does not require the creation of a new authentication system for users.

The EAP methods available for inner tunneling are based on the inner method credential type and the outer tunneling method. In the following list, each outer tunnel method lists the types of inner methods that are supported for each credential type.

- PEAP
 - Password credentials: EAP-MSCHAPv2 or EAP-GTC
 - Token credentials: EAP-GTC
 - Certificate credentials: EAP-TLS
- EAP-FAST
 - Password credentials: EAP-MSCHAPv2 or EAP-GTC
 - Token credentials: EAP-GTC
 - Certificate credentials: EAP-TLS
- EAP-TTLS
 - Password credentials: EAP-MSCHAPv2, EAP-MD5, PAP (L), CHAP (L), MSCHAP (L), MSCHAP-v2 (Legacy)
 - Token credentials: PAP (Legacy). The default token option that NAM supports is PAP, since challenge/response methods are not well suited for token-based authentication.
 - Certificate credentials: N/A

Figure 4-3 Authentication Policy Window



Networks Window

The Networks window allows you to configure pre-defined networks for your enterprise user. You can either configure networks that are available to all groups, or create groups with specific networks. The Networks window runs a wizard that sometimes adds panes to the existing window, and you advance to more configuration options by clicking **Next**.

A group, fundamentally, is a collection of configured connections (networks). Every configured connection must belong to a group or a member of all groups.

**Note**

For backward compatibility, the administrator-created networks deployed with the Cisco Secure Services Client are treated as hidden networks, which do not broadcast SSIDs. However, user networks are treated as networks which broadcast their SSIDs.

Only administrators can create a new group. If no groups are defined in the configuration, the profile editor creates an auto-generated group. The auto-generated group contains networks that are not assigned to any administrator-defined group. The client attempts to make a network connection using the connections defined in the active group. Depending on the setting of the *Create networks* option in the Network Groups window, end users can add user networks to the active group or delete user networks from the active group.

Networks that are defined are available to all groups at the top of the list. Because you control what networks are in the global Networks, you can specify the enterprise networks that an end user can connect to, even in the presence of user-defined networks. An end user cannot modify or remove administrator-configured networks.

**Note**

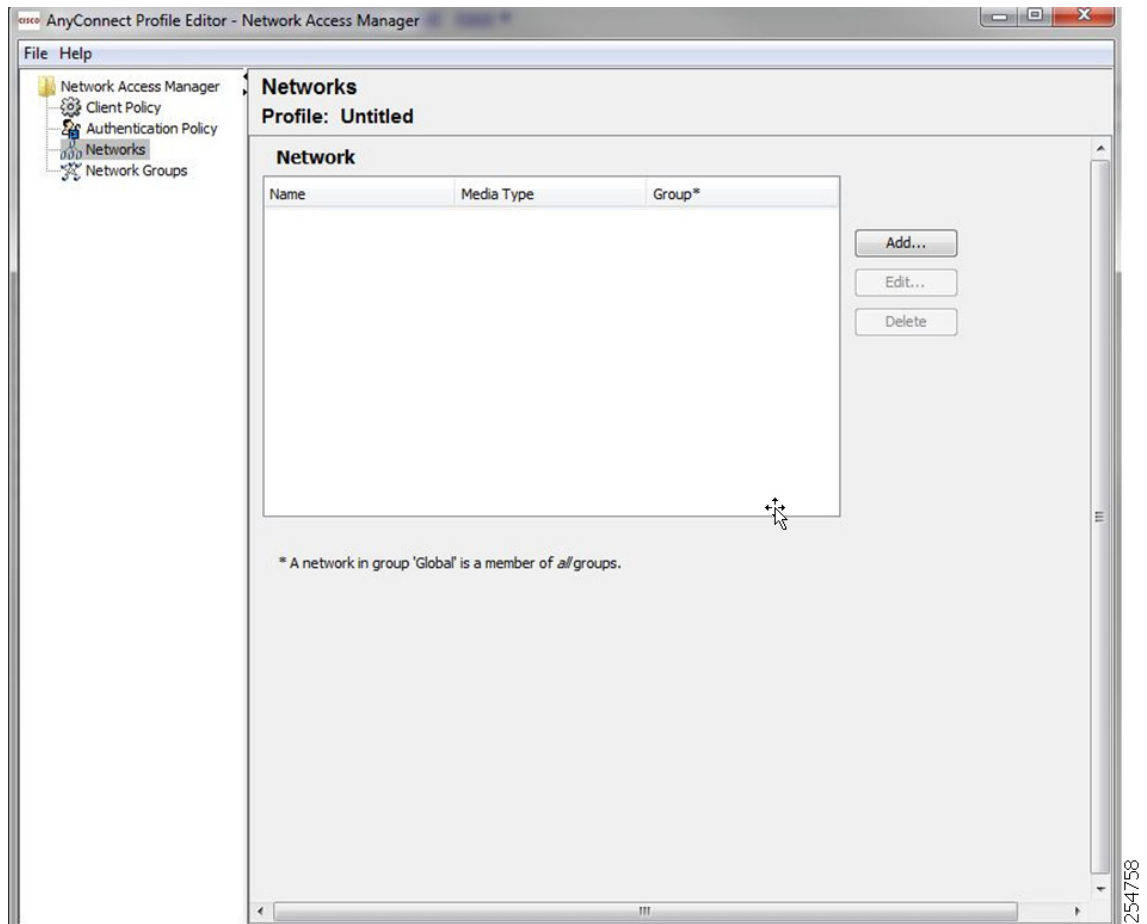
End users may add networks to groups, except for networks in the global Networks section, because these networks exist in all groups, and you can only create them using the profile editor.

It is important to note that a typical end user of an enterprise network does not need knowledge of groups in order to use this client. The active group is the first group in the configuration, but if only one is available, the client is unaware and does not display the active group. However, if more than one group exists, the UI displays a combo box indicating that the active group is selected. Users can then choose from the active group, and the setting persists across reboots. Depending on the setting of the *Create networks* option in the Network Groups window, end users can add or delete their own networks without using groups.

**Note**

A group selection is maintained across reboots and network repairs (done while right clicking on the tray icon and choosing **Network Repair**). When the Network Access Manager is repaired or restarted, the Network Access Manager starts using the previously active group.

When you choose **Networks** from the Network Access Manager menu, the window shown in [Figure 4-4](#) appears.

Figure 4-4 *Networks Window*

Choose from one of the following actions:

- Click **Add** to create a new network. If you choose to create a new network, use the information in the following sections to configure the client profile, starting with the [Networks - Media Type Page](#) section below.
- Choose a network you want to change and click **Edit**.
- Choose a network you want to remove and click **Delete**.

Networks - Media Type Page

The Networks window Media Type page enables you to create or edit a wired or a wireless network. The settings vary depending on whether you choose wired or wireless. [Figure 4-5](#) shows the window that appears if you choose a Wi-Fi network, but this section covers both wired and Wi-Fi options.

Figure 4-5 Media Type Page

Networks
Profile: Untitled

Name:

Group Membership

☒ In group:

☐ In all groups (Global)

Choose Your Network Media

☐ Wired (802.3) Network

Select a wired network if the endstations will be connecting to the network with a traditional ethernet cable.

☒ Wi-Fi (wireless) Network

Select a WiFi network if the endstations will be connecting to the network via a wireless radio connection to an Access Point.

SSID (max 32 chars):

☐ Hidden Network

☐ Corporate Network

Association Timeout (sec)

Common Settings

Script or application on each user's machine to run when connected.

Connection Timeout (sec.)

Media Type
Security

Four sections are included in the first dialog:

- Group Membership—Select which network group or groups this profile should be available to.
- Name - Enter the name that is displayed for this network.
- Network Media—Select Wired or Wi-Fi (wireless). If you choose Wi-Fi, you can also configure the following parameters:
 - At the SSID parameter, enter the SSID (Service Set Identifier) of your wireless network.
 - Choose **Hidden Network** to allow a connection to a network even if it is not broadcasting its SSID.
 - Choose **Corporate Network** to force a connection to a network configured as Corporate first, if a corporate network is in proximity. When Corporate network uses a non-broadcasting (hidden) SSID, and is configured as hidden, NAM will actively probe for hidden SSIDs, and establish the connection when a corporate SSID is in range.
 - Association Timeout—Enter the length of time that Network Access Manager waits for association with a particular wireless network before it re-evaluates the available networks. The default association timeout is 5 seconds.
- Common Settings—
 - Script or application—Enter the path and filename of the file that you want to run on the local system, or browse to a folder and select one. The following rules apply to scripts and applications:

Files with .exe, .bat, or .cmd extensions are accepted.

Users may not alter the script or application defined in an administrator-created network.

You may only specify the path and script or application filename using the profile editor. If the script or application does not exist on a user's machine, an error message appears. The user is informed that the script or application does not exist on their machine and that they need to contact their system administrator.

You must specify the full path of the application that you want to run, unless the application exists in the user's path. If the application exists in the user's path, you can specify only the application or script name.

- **Connection Timeout**—Enter the number of seconds that the Network Access Manager waits for a network connection to be established before it tries to connect to another network (when the connection mode is automatic) or uses another adapter.



Note

Some smartcard authentication systems require almost 60 seconds to complete an authentication. When using a smartcard, you may need to increase the Connection Timeout value, especially if the smartcard may have to try several networks before making a successful connection.

When you have completed configuring networks, click **Next** to display the Security Level pane of the Networks wizard.

Networks - Security Level Page

In the Security Level page of the Networks wizard, choose Open Network, Authentication Network, or (displayed for Wireless Network Media only) Shared Key Network. The configuration flow for each of those network types is different, and are described in the following sections.

- [Configuring Authenticating Network](#)—Recommended for a **secure enterprises**.
- [Configuring Open Network](#)—Not recommended, but can be used to provide guest access through captive portal environment.
- [Configuring Shared Key Network](#)—Recommended for wireless networks such as **small offices** or home offices.

Configuring Authenticating Network

If you chose Authenticating Network in the Security Level section, additional panes appear, which are described below. When you are done configuring settings on this pane, click the **Next** button or select the Connection Type tab to open the Network Connection Type dialog.

802.1X Settings Pane

Adjust the IEEE 802.1X settings according to your network configuration:

- **authPeriod(sec.)**—When authentication begins, this time determines how long the supplicant waits in between authentication messages before it times out and requires the authenticator to initiate authentication again.
- **heldPeriod(sec.)**—When authentication fails, this time defines how long the supplicant waits before another authentication attempt can be made.

- **startPeriod(sec)**—The interval, in seconds, between the retransmission of EAPOL-Start messages if no response to any EAPOL-Start messages is received from the authenticator.
- **maxStart**—The number of times the supplicant will initiate authentication with the authenticator by sending an IEEE 801.X protocol packet, EAPOL Key data, EAPoL-Start before the supplicant assumes there is no authenticator present. When this happens, the supplicant allows data traffic.

**Tip**

You can configure a single authenticating wired connection to work with both open and authenticating networks by carefully setting the **startPeriod** and **maxStart** such that the total time spent trying to initiate authentication is less than the network connection timer ($\text{startPeriod} \times \text{maxStart} < \text{Network Connection Timer}$).

Note: In this scenario, you should increase the network connection timer by $(\text{startPeriod} \times \text{maxStart})$ seconds to give the client enough time to acquire a DHCP address and finish the network connection.

Conversely, administrators who want to allow data traffic if and only after authentication succeeds should make sure that the **startPeriod** and **maxStart** is such that the total time spent trying to initiate authentication is greater than the network connection timer ($\text{startPeriod} \times \text{maxStart} > \text{Network Connection Timer}$).

Security Pane

Only appears for wired networks.

In the Security pane, select values for the following parameters:

- **Key Management**—Use the drop-down list to determine which Key Management Protocol you want to use with your MACsec-enabled wired network.
 - **None**—No key management protocols are used, and no wired encryption is performed.
 - **MKA**—The supplicant attempts to negotiate a MACsec key agreement protocol policies and encryption keys. MACsec is MAC Layer Security, which provides MAC layer encryption over wired networks. The MACsec protocol represents a means to secure MAC level frames with encryption and relies on the MACsec Key Agreement (MKA) Entity to negotiate and distribute the encryption keys.

**Note**

Refer to IEEE-802.1X-Rev for a detailed definition of MACsec Key Agreement and IEEE 802.1AE-2006 for a detailed definition of the MACsec encryption protocol. Additionally, refer to http://www.cisco.com/en/US/prod/collateral/iosswrel/ps6537/ps6586/ps6638/deploy_guide_c17-663760.html for further information about MACsec, including benefits and limitations, functional overview, design considerations, deployment, and troubleshooting.

- **Encryption**
 - **None**—Data traffic is integrity checked but not encrypted.
 - **MACsec: AES-GCM-128**—This option is only available if you chose MKA for Key Management. It causes data traffic to be encrypted using AES-GCM-128.

Port Authentication Exception Policy Pane

Only appears for wired networks.

The Port Authentication Exception Policy allows you to tailor the IEEE 802.1X supplicant's behavior during the authentication process. If port exceptions are not enabled, the supplicant continues its existing behavior and only opens the port upon successfully completing the full configuration (or as described earlier in this section, after the maxStarts number of authentications are initiated without a response from the authenticator). Choose from one of the following options:

- Allow data traffic before authentication—This option allows data traffic prior to an authentication attempt.
- Allow data traffic after authentication even if:
 - EAP Fails—When selected, the supplicant attempts authentication. But if authentication fails, the supplicant allows data traffic despite authentication failure.
 - EAP succeeds but key management fails—When selected, the supplicant attempts to negotiate keys with the key server but allows data traffic if the key negotiation fails for any reason. This setting is only valid when key management is configured. If key management is set to none, the check box is grayed out.

**Note**

MACsec requires ACS version 5.1 or later and a MACsec capable switch. Refer to the [Catalyst 3750-X and 3560-X Switch Software Configuration Guide](#) for ACS or switch configuration.

Association Mode

Only appears for wireless networks.

Choose the association mode, options are :

- WEP
- WAP Enterprise (TKIP)
- WPA Enterprise (AES)
- WPA 2 Enterprise (TKIP)
- WPA 2 Enterprise (AES)
- CCKM (TKIP) - (requires Cisco CB21AG Wireless NIC)
- CCKM (AES) - (requires Cisco CB21AG Wireless NIC)

Configuring Open Network

An open network uses no authentication or encryption. Follow these steps if you want to create an open (non-secure) network.

-
- Step 1** Choose **Open Network** from the Security Level page. This choice provides the least secure network and is recommended for guest access wireless networks.
- Step 2** Click **Next**.
- Step 3** Determine a connection type. Refer to the [Networks - Network Connection Type Pane](#).
-

Clicking **Next** or selecting the Connection Type tab opens the Network Connection Type dialog.

Configuring Shared Key Network

Wi-Fi networks may use a shared key to derive an encryption key for use when encrypting data between end points and network access points. Using a shared key with WPA or WPA2 Personal provides a medium level security class that is suitable for small or home offices.

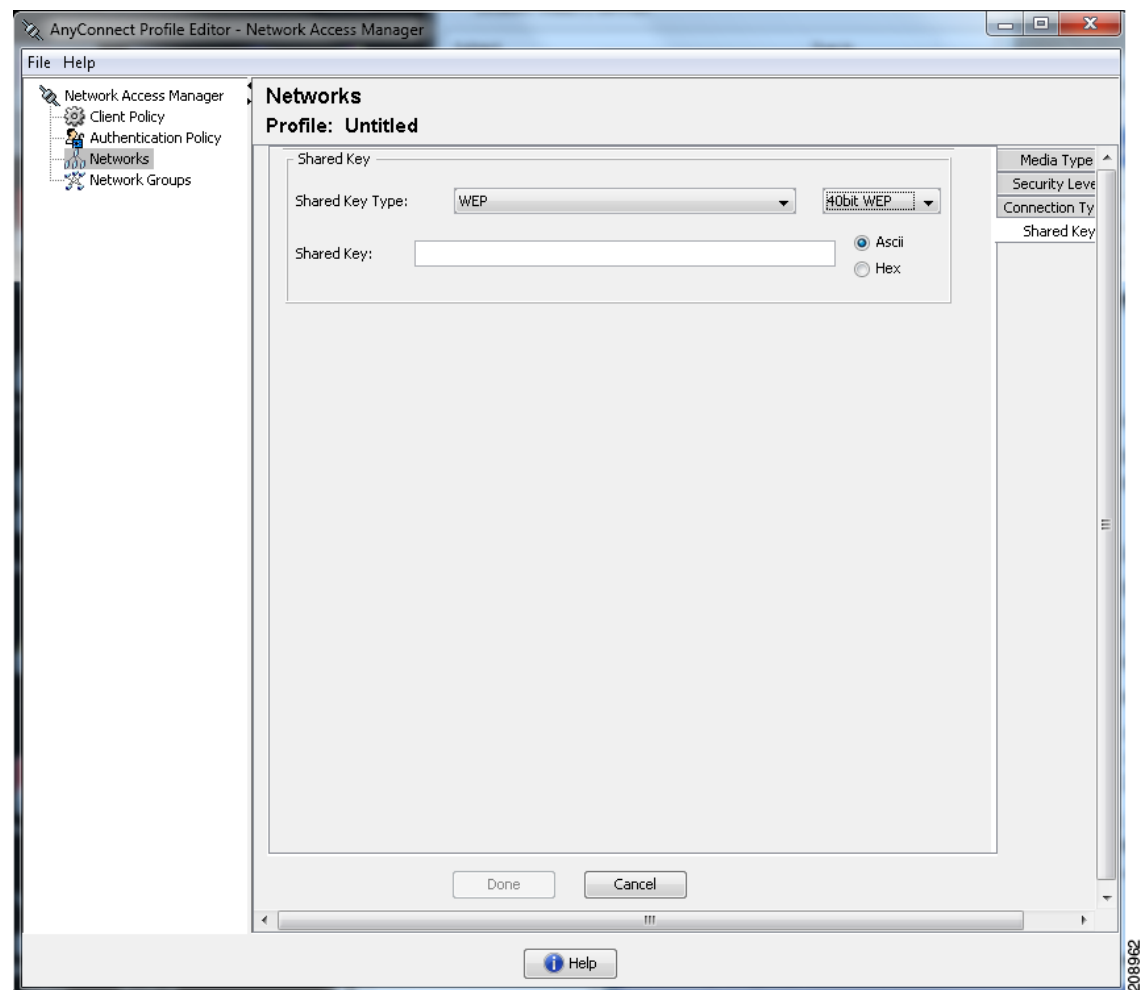


Note Shared key security is not recommended for enterprise wireless networks.

Follow these steps if you want Shared Key Network as your security level.

- Step 1** Choose **Shared Key Network**.
- Step 2** Click **Next** on the Security Level window.
- Step 3** Specify **User Connection** or **Machine Connection**. Refer to the “[Networks - Network Connection Type Pane](#)” section on page 4-18 for more information.
- Step 4** Click **Next**. The Shared Key pane appears (see [Figure 4-6](#)).

Figure 4-6 Shared Key Pane



- Step 5** Shared Key Type—Specify the shared key association mode which determines the shared key type. The choices are as follows:
- WEP—Legacy IEEE 802.11 open-system association with static WEP encryption.
 - Shared—Legacy IEEE 802.11 shared-key association with static WEP encryption.
 - WPA/WPA2-Personal—A Wi-Fi security protocol that derives encryption keys from a passphrase pre-shared key (PSK).
- Step 6** If you chose Legacy IEEE 802.11 WEP or Shared Key, choose 40 bit, 64 bit, 104 bit, or 128 bit. A 40- or 64-bit WEP key must be 5 ASCII characters or 10 hex digits. A 104- or 128-bit WEP key must be 13 ASCII characters or 26 hex digits.
- Step 7** If you chose WPA or WPA2 Personal, choose the type of encryption to use (TKIP/AES) and then enter a shared key. The key must be entered as 8 to 63 ASCII characters or exactly 64 hexadecimal digits. Choose **ASCII** if your shared key consists of ASCII characters. Choose **Hexadecimal** if your shared key includes 64 hexadecimal digits.
- Step 8** Click **Done**. Click **OK**.
-

Networks - Network Connection Type Pane

This section describes the Network Connection Type pane of the Networks window, which follows Security Level in the Network Access Manager profile editor. The pane for an Open Network is shown in [Figure 4-7](#). Choose one of the following connection types:

- Machine Connection—The machine's Windows Active Directory ID is used for authorization. Machine connection is typically used when user credentials are not required for a connection. Choose this option if the end station should log onto the network even when a user is logged off and user credentials are unavailable. This option is typically used for connecting to domains and to get GPOs and other updates from the network before the user has access.



Note VPN start before login (SBL) will fail if no known network is available. But if you configure Network Access Manager for *Before user logon*, and machine connection authorization, the Network Access Manager will ask the user for network information, and the VPN SBL will succeed.

- User Connection—User credentials are used for authorization.
 If *Before user logon* was selected in the Client Policy pane, Network Access Manager gathers the user's credentials after the user enters their logon credentials on the Windows start screen. Network Access Manager establishes the network connection while Windows is starting the user's windows session.
 If *After user logon* was selected in the Client Policy pane, Network Access Manager starts the connection after the user logs on to Windows.
 When the user logs off, the current user network connection is terminated. If there are machine network profiles are available, NAM will reconnect to a machine network.

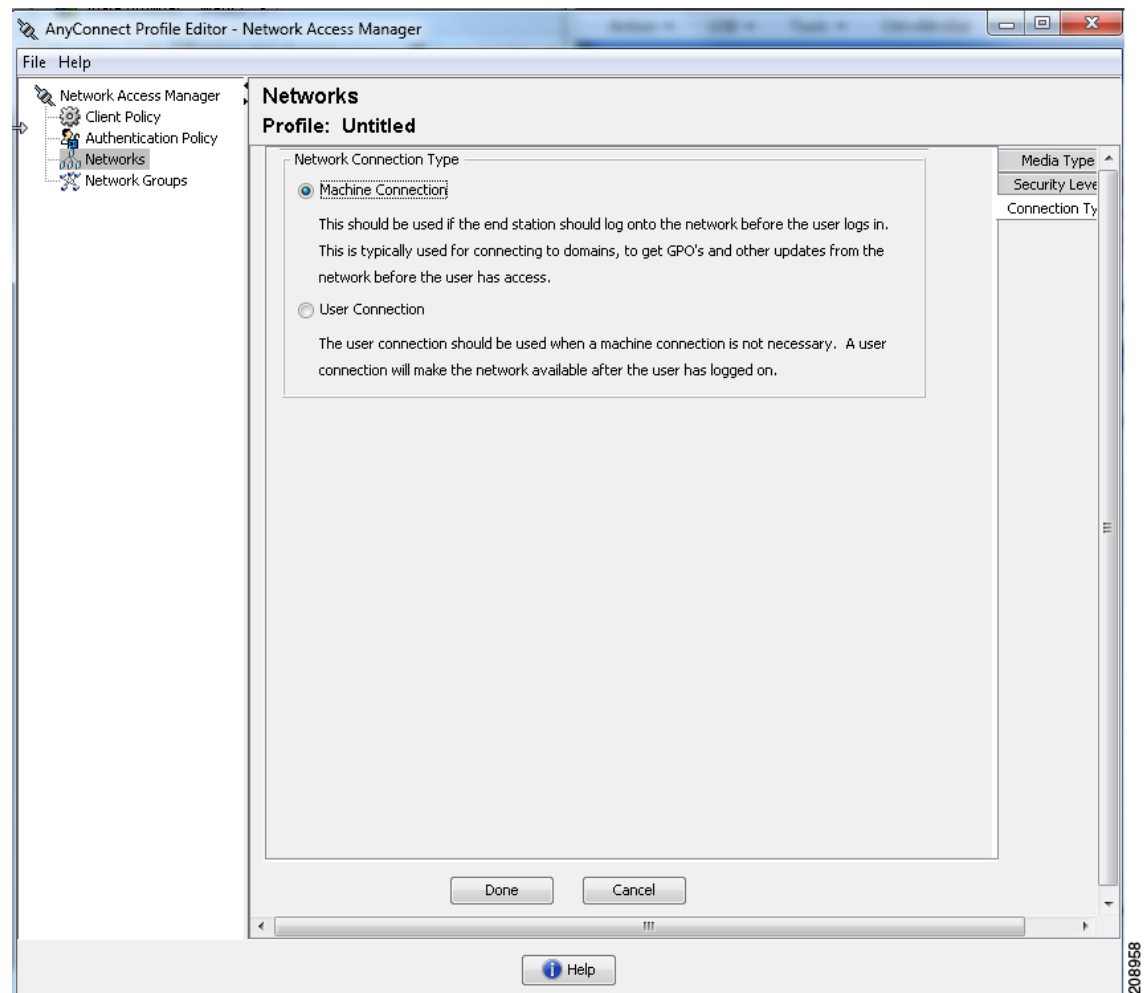
- Machine and User Connection—Only available when configuring an *Authenticating Network*, as selected in the Security Level pane. Machine ID and user credentials are both used, however, the machine part is only valid when a user is not logged onto the PC. The configuration is the same for the two parts, but the authentication type and credentials for machine connection can be different from the authentication type and credentials for the user connection.

Choose this option to keep the PC connected to the network at all times using the Machine Connection when a user is not logged in and using the User Connection when a user has logged in.

When EAP-FAST is configured as the EAP method (in the next pane), EAP chaining is supported. That means that Network Access Manager will verify that the machine and the user are known entities, and managed by the corporation, which is useful for Bring Your Own Device (BYOD).

When you choose the Network Connection Type, additional tabs are displayed in the Networks dialog, which allow you to set EAP methods and credentials for the chosen Network Connection Type.

Figure 4-7 Network Connection Type Pane for Open Networks



Networks - User or Machine Authentication Page

After choosing the Network Connection Type, you chose the authentication method(s) for those connection types. After you select an authentication method, the center of the window adapts to the method you chose, and you are required to provide additional information.

**Note**

If you have enabled MACsec, ensure that you select an EAP method that supports MSK key derivation, such as PEAP, EAP-TLS, or EAP-FAST.

You may have additional configuration in this pane, depending on which EAP Method you chose.

- EAP-GTC—See [Configuring EAP-GTC, page 4-21](#)
- EAP-TLS—See [Configuring EAP-TLS, page 4-22](#).
- EAP-TTLS—See [Configuring EAP-TTLS, page 4-22](#).
- PEAP—See [Configuring PEAP Options, page 4-24](#).
- EAP-FAST—See [Configuring EAP-FAST Settings, page 4-25](#).
- LEAP—See [Configuring LEAP Settings, page 4-27](#)

EAP Overview

EAP is an IETF RFC that addresses the requirements for an authentication protocol to be decoupled from the transport protocol carrying it. This decoupling allows the transport protocols (such as IEEE 802.1X, UDP, or RADIUS) to carry the EAP protocol without changes to the authentication protocol.

The basic EAP protocol is relatively simple and made up of four packet types:

- EAP request—The authenticator sends the request packet to the supplicant. Each request has a type field that indicates what is being requested, such as the supplicant identity and EAP type to use. A sequence number allows the authenticator and the peer to match an EAP response to each EAP request.
- EAP response—The supplicant sends the response packet to the authenticator and uses a sequence number to match the initiating EAP-request. The type of the EAP response generally matches the EAP request, unless the response is a negative (NAK).
- EAP success—The authenticator sends a success packet upon successful authentication to the supplicant.
- EAP failure—The authenticator sends a failure packet to the supplicant if authentication failed.

When EAP is in use in an IEEE 802.1X system, the access point operates in an EAP pass-through mode. In this mode, the access point checks the code, identifier, and length fields and then forwards the EAP packets received from the supplicant to the AAA server. Packets received from the AAA server at the authenticator are forwarded to the supplicant.

Configuring EAP-GTC

EAP-GTC is an EAP authentication method based on simple username and password authentication. Without using the challenge-response method, both username and password are passed in clear text. This method is recommended for either inside a tunneling EAP method (see tunneling EAP methods below) or with a OTP (token).

EAP-GTC does not provide mutual authentication. It only authenticates clients, so a rogue server may potentially obtain users' credentials. If mutual authentication is required, EAP-GTC is used inside tunneling EAP methods, which provide server authentication.

No keying material is provided by EAP-GTC; therefore, you cannot use this method for MACsec. If keying material for further traffic encryption is required, EAP-GTC is used inside tunneling EAP methods, which provides the keying material (and inner and outer EAP methods cryptobinding, if necessary).

You have two password source options:

- Authenticate using a Password—Suitable only for well protected wired environments
- Authenticate using a Token—More secure because of the short lifetime (usually about 10 seconds) of a token code or it is a OTP

**Note**

Neither the Network Access Manager, the authenticator, nor the EAP-GTC protocol can distinguish between password and token code. These options only impact the credential's lifetime within the Network Access Manager. While a password can be remembered until logout or longer, the token code cannot (because the user is prompted for token code with every authentication).

If a password is used for authentication, you can use this protocol for authentication against the database with hashed (or irreversibly encrypted) passwords since it is passed to the authenticator in clear text. We recommend this method if a possibility of a database leak exists.

Configuring EAP-TLS

EAP-Transport Layer Security (EAP-TLS) is an IEEE 802.1X EAP authentication algorithm based on the TLS protocol (RFC 2246). TLS uses mutual authentication based on X.509 digital certificates. The EAP-TLS message exchange provides mutual authentication, cipher suite negotiation, key exchange, verification between the client and the authenticating server, and keying material that can be used for traffic encryption.

The list below provides the main reasons why EAP-TLS client certificates can provide strong authentication for wired and wireless connections:

- Authentication occurs automatically, usually with no intervention by the user.
- No dependency on a user password.
- Digital certificates provide strong authentication protection.
- Message exchange is protected with public key encryption.
- Not susceptible to dictionary attacks.
- The authentication process results in a mutually determined key for data encryption and signing.

EAP-TLS contains two options:

- Validate Server Certificate—Enables server certificate validation.
- Enable Fast Reconnect—Enables TLS session resumption which allows for much faster reauthentication by using abbreviated TLS handshake as long as TLS session data is preserved on both the client and the server.

**Note**

The *Disable when using a Smart Card* option is not available for machine connection authentication.

Configuring EAP-TTLS

EAP-Tunneled Transport Layer Security (EAP-TTLS) is a two-phase protocol that expands the EAP-TLS functionality. Phase 1 conducts a complete TLS session and derives the session keys used in Phase 2 to securely tunnel attributes between the server and the client. You can use the attributes tunneled during Phase 2 to perform additional authentications using a number of different mechanisms.

The Network Access Manager does not support the cryptobinding of the inner and outer methods used during EAP-TTLS authentication. If cryptobinding is required, you must use EAP-FAST. Cryptobinding provides protection from a special class of man-in-the-middle attacks where an attacker hijacks the user's connection without knowing the credentials.

The authentication mechanisms that can be used during Phase 2 include these protocols:

- **PAP (Password Authentication protocol)**—Uses a two-way handshake to provide a simple method for the peer to prove its identity. An ID/Password pair is repeatedly sent by the peer to the authenticator until authentication is acknowledged or failed. If mutual authentication is required, then you must configure EAP-TTLS to validate the server's certificate at Phase 1.

Because a password is passed to the authenticator, you can use this protocol for authentication against a database with hashed (or irreversibly encrypted) passwords. We recommend this method when a possibility of a database leak exists.



Note You can use EAP-TTLS PAP for token and OTP-based authentications.

- **CHAP (Challenge Handshake Authentication Protocol)**—Uses a three-way handshake to verify the identity of the peer. If mutual authentication is required, you should configure EAP-TTLS to validate the server's certificate at Phase 1. Using this challenge-response method, you are required to store clear text passwords in the authenticator's database.
- **MS-CHAP (Microsoft CHAP)**—Uses a three-way handshake to verify the identity of the peer. If mutual authentication is required, you should configure EAP-TTLS to validate the server's certificate at Phase 1. Using this challenge-response method based on the NT-hash of the password, you are required to store either the clear text password or at least NT-hash of the password in the authenticator's database.
- **MS-CHAPv2**—Provides mutual authentication between peers by including a peer challenge in the response packet and an authenticator response in the success packet. The client is authenticated before the server. If the server needs to be authenticated before the client (to prevent dictionary attacks), you should configure EAP-TTLS to validate the server's certificate at Phase 1. Using this challenge-response method based on the NT-hash of the password, you are required to store either the clear text password or at least NT-hash of the password in the authenticator's database.

EAP-TTLS Configuration

- **EAP**—Allows use of these EAP methods:
 - **EAP-MD5 (EAP-Message Digest 5)**—Uses a three-way handshake to verify the peer's identity (similar to CHAP). Using this challenge-response method, you are required to store the clear text password in the authenticator's database.
 - **EAP-MSCHAPv2**—Uses a three-way handshake to verify the identity of the peer. The client is authenticated before the server. If the server needs to be authenticated before the client (such as for the prevention of a dictionary attack), you should configure EAP-TTLS to validate the server's certificate at Phase 1. Using this challenge-response method on the NT-hash of the password, you are required to store either the clear text password or at least the NT-hash of the password in the authenticator's database.
- **EAP-TTLS Settings**
 - **Validate Server Identity**—Enables server certificate validation.
 - **Enable Fast Reconnect**—Enables outer TLS session resumption only, regardless of whether the inner authentication is skipped or is controlled by the authenticator.

**Note**

Disable when using a Smart Card is not available on machine connection authentication.

- Inner Methods—Specifies the inner methods used after the TLS tunnel is created. Only available for Wi-Fi Media Type.

Configuring PEAP Options

Protected EAP (PEAP) is a tunneling TLS-based EAP method. It uses TLS for server authentication before the client authentication for the encrypting of inner authentication methods. The inner authentication occurs inside a trusted cryptographically protected tunnel and supports a variety of different inner authentication methods, including certificates, tokens, and passwords. The Network Access Manager does not support the cryptobinding of the inner and outer methods used during PEAP authentication. If cryptobinding is required, you must use EAP-FAST. Cryptobinding provides protection from a special class of man-in-the-middle attacks where an attacker hijacks the user's connection without knowing the credentials.

PEAP protects the EAP methods by providing these services:

- TLS tunnel creation for the EAP packets
- Message authentication
- Message encryption
- Authentication of server to client

You can use these authentication methods:

- Authenticate using a Password
 - EAP-MSCHAPv2—Uses a three-way handshake to verify the identity of the peer. The client is authenticated before the server. If the server needs to be authenticated before the client (such as for the prevention of a dictionary attack), you must configure PEAP to validate the server's certificate. Using the challenge-response method based on the NT-hash of the password, you are required to store either the clear text password or at least the NT-hash of the password in the authenticator's database.
 - EAP-GTC (EAP Generic Token Card)—Defines an EAP envelope to carry the username and password. If mutual authentication is required, you must configure PEAP to validate the server's certificate. Because the password is passed to the authenticator in clear text, you can use this protocol for authentication against the database with hashed (or irreversibly encrypted) passwords. We recommend this method if a possibility of a database leak exists.
- EAP-TLS, using a Certificate
 - EAP-TLS—Defines an EAP envelope to carry the user certificate. In order to avoid a man-in-the-middle attack (the hijacking of a valid user's connection), we recommend that you do not mix PEAP [EAP-TLS] and EAP-TLS profiles meant for authentication against the same authenticator. You should configure the authenticator accordingly (not enabling both plain and tunneled EAP-TLS).

PEAP Configuration

- PEAP-EAP settings
 - Validate Server Identity—Enables server certificate validation.

- Enable Fast Reconnect—Enables outer TLS session resumption only. The authenticator controls whether or not the inner authentication is skipped.
- Disable when using a Smart Card—Don't use Fast Reconnect when using a smart card for authentication. Smart cards only apply to user connections.
- Authenticate using a Token and EAP GTC—Not available for machine authentication.
- Inner methods based on Credentials Source
 - Authenticate using a password for EAP-MSCHAPv2 and/or EAP-GTC
 - EAP-TLS, authenticate using a Certificate
 - Authenticate using a Token and EAP-GTC—Not available for machine authentication.

**Note**

Before user log on, smart card support is not available on Windows Vista and Windows 7.

Configuring EAP-FAST Settings

EAP-FAST is an IEEE 802.1X authentication type that offers flexible, easy deployment and management. It supports a variety of user and password database types, server-initiated password expiration and change, and a digital certificate (optional).

EAP-FAST was developed for customers who want to deploy an IEEE 802.1X EAP type that does not use certificates and provides protection from dictionary attacks.

As of AnyConnect 3.1, EAP chaining is supported when both machine and user connections are configured. That means that Network Access Manager will verify that the machine and the user are known entities, and managed by the corporation, which is useful for Bring Your Own Device (BYOD). For more information about EAP chaining, see RFC 3748.

EAP-FAST encapsulates TLS messages within EAP and consists of three protocol phases:

1. A provisioning phase that uses Authenticated Diffie-Hellman Protocol (ADHP) to provision the client with a shared secret credential called a Protected Access Credential (PAC).
2. A tunnel establishment phase in which the PAC is used to establish the tunnel.
3. An authentication phase in which the authentication server authenticates the user's credentials (token, username/password, or digital certificate).

Unlike the other two tunneling EAP methods, EAP-FAST provides cryptobinding between inner and outer methods, preventing the special class of the man-in-the-middle attacks where an attacker hijacks a valid user's connection.

EAP-FAST Configuration

- EAP-FAST Settings
 - Validate Server Identity—Enables server certificate validation. Enabling this introduces two extra dialogs in the management utility and adds additional Certificate panes into the Network Access Manager Profile Editor task list.
 - Enable Fast Reconnect—Enables session resumption. The two mechanisms to resume the authentication sessions in EAP-FAST include user authorization PAC, which substitutes the inner authentication, or TLS session resumption, which allows for abbreviated outer TLS handshake. This Enable Fast Reconnect parameter enables or disables both mechanisms. The authenticator decides which one to use.



Note The machine PAC provides abbreviated TLS handshake and eliminates inner authentication. This control is handled by the enable/disable PAC parameter.



Note The *Disable when using a Smart Card* option is only available for user connection authorization.

- Inner methods based on Credentials Source—Enables you to authenticate using a password or certificate.
 - Authenticate using a password for EAP-MSCHAPv2 or EAP-GTC. EAP-MSCHAPv2 provides mutual authentication, but it authenticates the client before authenticating the server. If you want mutual authentication with the server being authenticated first, configure EAP-FAST for authenticated provisioning only, and verify the server's certificate. Using the challenge-response method based on the NT-hash of the password, EAP-MSCHAPv2 requires you to store either the clear text password, or at least the NT-hash of the password, in the authenticator's database. Since the password is passed to the authenticator in clear text within EAP-GTC, you can use this protocol for authentication against the database with hashed (or irreversibly encrypt) exists.

If you are using password-based inner methods, an additional option is available to allow unauthenticated PAC provisioning.

- Authenticate using a certificate—Decide the following criteria for authenticating using a certificate: when requested, send the client certificate in the clear, only send client certificates inside the tunnel, or send client certificate using EAP-TLS in the tunnel.
 - Authenticate Using a Token and EAP-GTC
- Use PACs—You can specify the use of PAC for EAP-FAST authentication. PACs are credentials that are distributed to clients for optimized network authentication.



Note Typically, you use the PAC option because most authentication servers use PACs for EAP-FAST. Before removing this option, verify that your authentication server does not use PACs for EAP-FAST; otherwise, the client's authentication attempts will be unsuccessful. If your authentication server supports authenticated PAC provisioning, we recommend that you disable unauthenticated provisioning. Unauthenticated provisioning does not validate server's certificates, thus allowing rogue authenticators to mount a dictionary attack.

You can manually provide one or more specific PAC files for distribution and authentication by selecting the PAC Files pane and clicking **Add**. You can also highlight a PAC file and click **Remove** to remove a PAC file from the list.

Password protected—If the PAC was exported as password protected, check the **Password Protected** check box and provide the password that matches the one with which PAC is encrypted.

Configuring LEAP Settings

LEAP (Lightweight EAP) supports wireless networks. It is based on the Extensible Authentication Protocol (EAP) framework, and was developed by Cisco to create a protocol that was more secure than WEP.

**Note**

LEAP is subject to dictionary attacks unless you enforce strong passwords and periodically expiring passwords. Cisco recommends that you use EAP-FAST, PEAP or EAP-TLS, whose authentication methods are not susceptible to dictionary attacks. For more information about LEAP security issues, see http://www.cisco.com/en/US/tech/tk722/tk809/technologies_security_notice09186a00801aa80f.html.

LEAP Settings, which are only available for User Authentication:

- Extend user connection beyond log off—For User authentication only, keeps the connection open when the user logs off. If the same user logs back on the network connection will still be active.

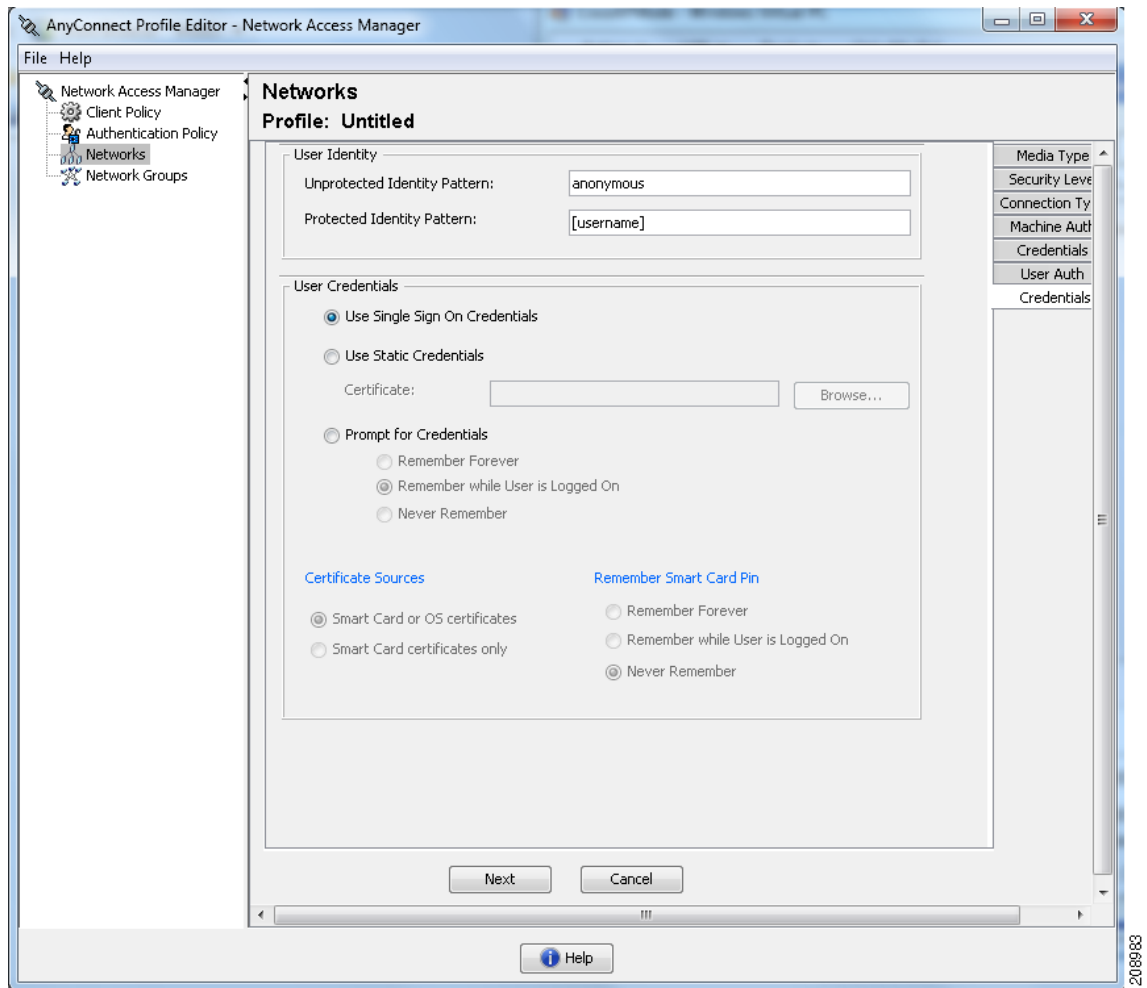
Defining Networks Credentials

On the Networks > Credentials pane, you specify whether to use user and/or machine credentials, and configure trusted server validation rules.

- [Configuring User Credentials](#)
- [Configuring Machine Credentials](#)
- [Configuring Trusted Server Validation Rules](#)

Configuring User Credentials

On the Credentials pane, you can specify the desired credentials to use for authenticating the associated network (see [Figure 4-8](#)).

Figure 4-8 User Credentials Pane for EAP-TLS

Step 1 You must identify a user identity for the Protected Identity Pattern. The Network Access Manager supports the following identity placeholder patterns:

- [username]—Specifies the username. If a user enters username@domain or domain\username, the domain portion is stripped off.
- [raw]—Specifies the username, exactly as entered by the user.
- [domain]—Specifies the domain of the user's PC.

For user connections, when the [username] and [domain] placeholder patterns are used, the following conditions apply:

- If a client certificate is used for authentication, the placeholder values for [username] and [password] are obtained from various X509 certificate properties. The properties are analyzed in the order described below, according to the first match. For example, if the identity is userA@cisco.com (where username=userA and domain=cisco.com) for user authentication and hostA.cisco.com (where username=hostA and domain=cisco.com) for machine authentication, the following properties are analyzed:

User certificate based authentication:

- SubjectAlternativeName: UPN = userA@cisco.com
- Subject = ../CN=userA@cisco.com/...
- Subject = userA@cisco.com
- Subject = ../CN=userA/DC=cisco/DC=com/...
- Subject = userA (no domain)

Machine certificate based authentication:

- SubjectAlternativeName: DNS = hostA.cisco.com
- Subject = ../DC=hostA.cisco.com/...
- Subject = ../CN=hostA.cisco.com/...
- Subject = hostA.cisco.com
- If the credential source is the end user, the placeholder's value is obtained from the information the user enters.
- If the credentials are obtained from the operating system, the placeholder's value is obtained from the logon information.
- If the credentials are static, no placeholders should be used.

Sessions that have yet to be negotiated experience identity request and response in the clear without integrity protection or authentication. These sessions are subject to snooping and packet modification. Typical unprotected identity patterns are as follows:

- anonymous@[domain]—Often used in tunneled methods to hide the user identity when the value is sent in clear text. The real user identity is provided in the inner method as the protected identity.
- [username]@[domain]—For non-tunneled methods



Note Unprotected identity is sent in clear text. If the initial clear text identity request or response is tampered with, the server may discover that it cannot verify the identity once the TLS session is established. For example, the user ID may be invalid or not within the realm handled by the EAP server.

The protected identities present clear text identity in a different way. To protect the userID from snooping, the clear text identity may only provide enough information to enable routing of the authentication request to the correct realm. Typical protected identity patterns are as follows:

- [username]@[domain]
- the actual string to use as the user's identity (no placeholders)

An EAP conversation may involve more than one EAP authentication method, and the identities claimed for each of these authentications may be different (such as machine authentication followed by user authentication). For example, a peer may initially claim the identity of nouser@cisco.com to route the authentication request to the cisco.com EAP server. However, once the TLS session has been negotiated, the peer may claim the identity of johndoe@cisco.com. Thus, even if protection is provided by the user's identity, the destination realm may not necessarily match, unless the conversation terminates at the local authentication server.

Step 2 Provide further user credential information:

- Use Single Sign On Credentials—Obtains the credentials from the operating system's logon information. If logon credentials fail, the Network Access Manager temporarily (until next logon) switches and prompts the user for credentials with the GUI.

- **Use Static Credentials**—Obtains the user credentials from the network profiles that this profile editor provides. If static credentials fail, the Network Access Manager will not use the credentials again until a new configuration is loaded.
- **Prompt for Credentials**—Obtains the credentials from the end user with the AnyConnect GUI as specified here:
 - **Remember Forever**—The credentials are remembered forever. If remembered credentials fail, the user is prompted for the credentials again. Credentials are preserved in the file and encrypted using a local machine password.
 - **Remember while User is Logged On**—The credentials are remembered until the user logs off. If remembered credentials fail, the user is prompted for credentials again.
 - **Never Remember**—The credentials are never remembered. The Network Access Manager prompts the user each time it needs credential information for authentication.

Step 3 Determines which certificate source to use for authentication when certificates are required:

- **Smart Card or OS certificates**—The Network Access Manager uses certificates found in the OS Certificate Stores or on a Smart Card.
- **Smart Card certificates only**— The Network Access Manager only uses certificates found on a Smart Card.

Step 4 At the Remember Smart Card Pin parameter, determine how long the Network Access Manager remembers the PIN used to retrieve the certificate off a smart card. Refer to Step 2 for the available options.

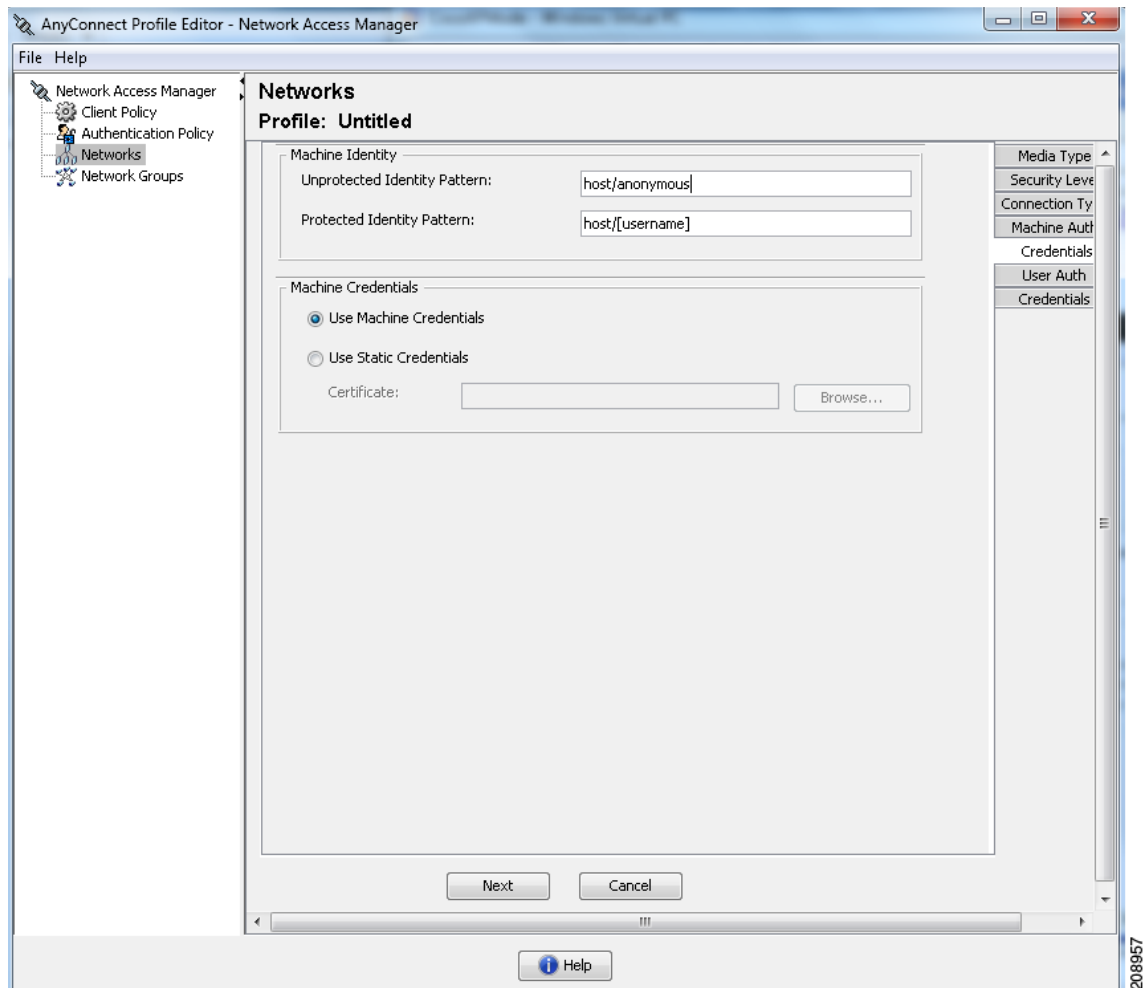


Note The PIN is never preserved longer than a certificate itself.

Some smart cards may take longer than others to connect, depending on the smart card chip and the driver, aka the Cryptographic service provider (CSP) and the Key storage provider (KSP). You may need to increase the connection timeout to give the network enough time to perform the smart card-based authentication.

Configuring Machine Credentials

With the Credentials panel you can specify the desired machine credentials (see [Figure 4-9](#)).

Figure 4-9 Machine Credentials

Step 1 You must a machine identity for the Protected Identity Pattern. The Network Access Manager supports the following identity placeholder patterns:

- [username]—Specifies the username. If a user enters username@domain or domain\username, the domain portion is stripped off.
- [raw]—Specifies the username, exactly as entered by the user.
- [domain]—Specifies the domain of the user's PC.

For machine connections, whenever the [username] and [domain] placeholders are used, these conditions apply:

- If a client certificate is used for authentication, the placeholder values for [username] and [password] are obtained from various X509 certificate properties. The properties are analyzed in the order described below, according to the first match. For example, if the identity is userA@cisco.com (where username=userA and domain=cisco.com) for user authentication and hostA.cisco.com (where username=hostA and domain=cisco.com) for machine authentication, the following properties are analyzed:

User certificate based authentication:

- SubjectAlternativeName: UPN = userA@cisco.com
- Subject = .../CN=userA@cisco.com/...
- Subject = userA@cisco.com
- Subject = .../CN=userA/DC=cisco.com/...
- Subject = userA (no domain)

Machine certificate based authentication:

- SubjectAlternativeName: DNS = hostA.cisco.com
- Subject = .../DC=hostA.cisco.com/...
- Subject = .../CN=hostA.cisco.com/...
- Subject = hostA.cisco.com
- If a client certificate is not used for authentication, the credentials are obtained from the operating system, and the [username] placeholder represents the assigned machine name.

Sessions that have yet to be negotiated experience identity request and response in the clear without integrity protection or authentication. These sessions are subject to snooping and packet modification. Typical unprotected machine identity patterns are as follows:

- host/anonymous@[domain]
- the actual string to send as the machine's identity (no placeholders)

The protected identities present clear text identity in a different way. To protect the userID from snooping, the clear text identity may only provide enough information to enable routing of the authentication request to the correct realm. Typical protected machine identity patterns are as follows:

- host/[username]@[domain]
- the actual string to use as the machine's identity (no placeholders)

An EAP conversation may involve more than one EAP authentication method, and the identities claimed for each of these authentications may be different (such as machine authentication followed by user authentication). For example, a peer may initially claim the identity of nouser@cisco.com to route the authentication request to the cisco.com EAP server. However, once the TLS session has been negotiated, the peer may claim the identity of johndoe@cisco.com. Thus, even if protection is provided by the user's identity, the destination realm may not necessarily match, unless the conversation terminates at the local authentication server.

Step 2 Provide further Machine Credential information:

- Use Machine Credentials—Obtains the credentials from the operating system.
- Use Static Credentials—If you choose to use static credentials, you can specify an actual static password to send in the deployment file. Static credentials do not apply for certificate-based authentication.

Configuring Trusted Server Validation Rules

When the Validate Server Identity option is configured for the EAP method, the Certificate panel is enabled to allow you to configure validation rules for Certificate Server or Authority. The outcome of the validation determines whether the certificate server or the authority are trusted.

To define certificate server validation rules, follow these steps:

-
- Step 1** When the optional settings appear for the **Certificate Field** and the **Match** columns, click the drop-down arrows and highlight the desired settings.
- Step 2** Enter a value in the Value field.
- Step 3** Under Rule, click **Add**.
- Step 4** In the Certificate Trusted Authority portion, choose one of the following options:
- Trust any Root Certificate Authority (CA) Installed on the OS—If chosen, only the local machine or certificate stores are considered for the server's certificate chain validation.
 - Include Root Certificate Authority (CA) Certificates



Note If you choose Include Root Certificate Authority (CA) Certificates, you must click on **Add** to import the CA certificate into the configuration.

Network Groups Window

On the Network Groups window, you assign network connections to particular groups (see [Figure 4-10](#)). Classifying connections into groups provides multiple benefits:

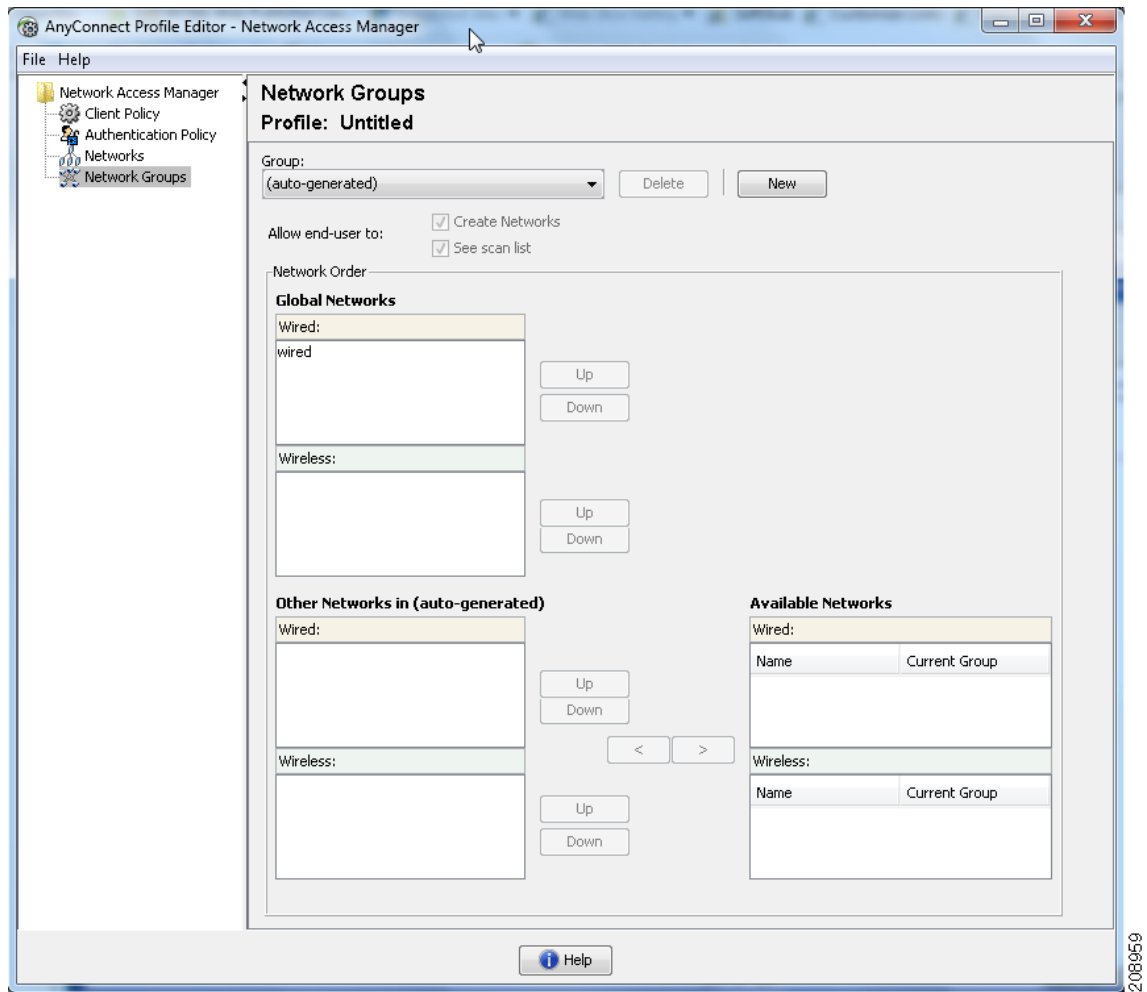
- Improved user experience when attempting to make a connection. When multiple hidden networks are configured, the client walks through the list of hidden networks in the order that they are defined until a successful connection is made. In such instances, groups are used to greatly reduce the amount of time needed to make a connection.
- Easier management of configured connections. This benefit allows you to separate administrator networks from user networks if you want and allows users who have multiple roles in a company (or who often visit the same area) to tailor the networks in a group to make the list of selectable networks more manageable.

Networks defined as part of the distribution package are locked, preventing the user from editing the configuration settings or removing the network profiles.

You can define a network as global. When doing so, it appears in the Global Networks section. This section is split between the wired and wireless network types. You can only perform sort order edits on this type of network.

All non-global networks must exist in a group. There is one group created by default, and the user can delete that group if all networks are global.

Figure 4-10 Network Groups Window



- Step 1** Choose a Group by selecting it in the drop-down list.
- Step 2** Choose **Create networks** to allow the end user to create networks in this group. When deployed, if you uncheck this, the Network Access Manager deletes any user-created networks from this group, which may force the user to re-enter network configuration in another group.
- Step 3** Choose **See scan list** to allow end users to view the scanlist when the group is selected as the active group using the AnyConnect GUI. Alternatively, clear the check box to restrict users from viewing the scan list. For instance, if you want to prevent users from accidentally connecting to nearby devices, you should restrict scan list access.



Note These settings are applied on a per group basis.

- Step 4** Use the **Right** and **Left arrows** to insert and remove a network from the group selected in the Group drop-down list. If a network is moved out of the current group, it is placed into the default group. When the default group is being edited, you cannot move a network from it (using the > button).

**Note**

Within a given network, the display name of each network must be unique; therefore, any one group cannot contain two or more networks with the same display name.

Step 5 Use the **Up and Down arrows** to change the priority order of the networks within a group.



Configuring HostScan

What does HostScan do?

The AnyConnect Posture Module provides the AnyConnect Secure Mobility Client the ability to identify the operating system, antivirus, antispyware, and firewall software installed on the host. The HostScan application, which is among the components delivered by the posture module, is the application that gathers this information.

In the adaptive security appliance (ASA), you can create a policy that evaluates endpoint attributes such as operating system, IP address, registry entries, local certificates, and filenames. Based on the result of the policy's evaluation, you can control which hosts are allowed to create a remote access connection to the security appliance.

What is the history of HostScan

Starting with AnyConnect 3.0, the HostScan package becomes a shared component of the AnyConnect Secure Mobility client and Cisco Secure Desktop (CSD). Previously, the HostScan package was one of several components available only by installing CSD.

Why are we separating HostScan from CSD?

The purpose of separating the HostScan package from CSD is to allow you to update HostScan support charts more frequently than it was possible when they were delivered as part of CSD. The HostScan support charts contain the product name and version information of the antivirus, antispyware, and firewall applications used to assign Dynamic Access Policies (DAPs). We deliver the HostScan application and the HostScan support charts, as well as other components, in the HostScan package.

The standalone HostScan package and the HostScan package delivered with the posture module provide the same functionality. We provide a separate HostScan package so that you can update the HostScan support charts easily.

How is HostScan Delivered to the endpoint?

The HostScan package can now be delivered in one of three ways: with the AnyConnect Posture Module, with CSD, or as a standalone package. There are two types of AnyConnect posture modules: one version is pushed down by the ASA along with the AnyConnect installation and the other is configured as a pre-deployment module. The pre-deployment module can be installed on endpoints before they make their initial connection to the ASA.

Now that HostScan can be delivered separately, why do I need CSD?

In addition to identifying operating system, antivirus, antispyware, and firewall software installed on the endpoint, the host scan package delivers the components to perform an assessment, identify keystroke loggers, and detect host emulation and virtual machines running on the endpoint. Keystroke logger detection, host emulation and virtual machine detection were also features of CSD that are now included in the HostScan package.

Still, the HostScan package is not a replacement for CSD. Customers that want cache cleaning or the Secure Vault will need to install and enable CSD in addition to the HostScan package. See http://www.cisco.com/en/US/products/ps6742/products_installation_and_configuration_guides_list.html to learn about the Secure Vault feature in the CSD Configuration Guides.

How is HostScan Managed?

You can install, uninstall, enable, and disable HostScan using the ASA's Adaptive Security Device Manager (ASDM) or command line interface. You can configure policies using the Secure Desktop Manager tool on the ASDM.

Posture assessment and the AnyConnect telemetry module require HostScan to be installed on the host.

This chapter contains the following sections:

- [HostScan Workflow, page 5-2](#)
- [Features Enabled with the AnyConnect Posture Module, page 5-3](#)
- [AnyConnect Posture Module Dependencies and System Requirements, page 5-11](#)
- [HostScan Packaging, page 5-12](#)
- [Installing and Enabling HostScan on the ASA, page 5-15](#)
- [Deploying the AnyConnect Posture Module and HostScan, page 5-14](#)
- [HostScan and CSD Upgrades and Downgrades, page 5-18](#)
- [Determining the HostScan Image Enabled on the ASA, page 5-18](#)
- [Uninstalling HostScan, page 5-18](#)
- [HostScan Logging, page 5-19](#)
- [Using a BIOS Serial Number in a DAP, page 5-21](#)

HostScan Workflow

HostScan works with the ASA to protect the corporate network as described in the workflow that follows:

1. The remote device attempts to establish an AnyConnect Client session with the ASA.
2. The ASA downloads HostScan to the endpoint ensuring that the ASA and the endpoint are using the same version of HostScan. The version of HostScan on the endpoint could either be upgraded or downgraded to match the version of HostScan on the ASA.
3. The prelogin assessment checks for the following on the endpoint:
 - Operating system
 - Presence or absence of any files you specify.
 - Presence or absence of any registry keys you specify. This check applies only if the computer is running Microsoft Windows.
 - Presence of any digital certificates you specify. This check also applies only if the computer is running Microsoft Windows.
 - IPv4 or IPv6 addresses within a range you specify.
4. As the endpoint undergoes the prelogin assessment, host scan gathers antivirus, firewall, and antispyware version information.
5. One of the following occurs, depending on the result of the prelogin assessment:

- The endpoint attributes do not meet the requirements of the prelogin assessment and the Login Denied message appears on the endpoint. In this case, interaction between the ASA and the endpoint stops.
 - The endpoint attributes meet the requirements of the prelogin assessment. The prelogin assessment assigns a prelogin policy name to the endpoint and reports the name of the prelogin policy to the ASA. In this case, interaction between the ASA and the endpoint continues.
6. HostScan checks for keystroke loggers and host emulation on the remote computer, based on the configuration of the policy the remote computer was assigned after the assessment.
 7. Antivirus, firewall, or antispyware remediation occurs if it is warranted and you have a license for Advanced Endpoint Assessment.
 8. The user logs in.
 9. The ASA typically uses the authentication data gathered in 3. along with any configured endpoint attribute criteria gathered in 4., which can include such values as the policy and HostScan results, to apply a dynamic access policy to the session.
 10. Following the termination of the user session, HostScan terminates, and Cache Cleaner performs its cleanup functions.
-

Features Enabled with the AnyConnect Posture Module

- [Prelogin Assessment](#)
- [Prelogin Policies](#)
- [Keystroke Logger Detection](#)
- [Host Emulation Detection](#)
- [Cache Cleaner](#)
- [HostScan](#)
- [Integration with Dynamic Access Policies](#)

Prelogin Assessment

The assessment runs after the user connects to the ASA, but before the user logs in. This assessment can check the remote device for files, digital certificates, the OS, IP address, and Microsoft Windows registry keys.

Secure Desktop Manager, the administrator interface to HostScan, provides a graphical sequence editor to simplify the configuration of the assessment module.

When configuring the assessment module, the HostScan administrator creates branches of nodes called *sequences*. Each sequence begins with the Start node, followed by an endpoint check. The result of the check determines whether to perform another endpoint check or to terminate the sequence with an end node.

The end node determines whether to display a Login Denied message, assign a policy to the device, or perform a secondary set of checks called a subsequence. A *subsequence* is a continuation of a sequence, typically consisting of more endpoint checks and an end node. This feature is useful to do the following:

- Reuse a sequence of checks in some cases but not others.

- Create a set of conditions that have an overall purpose that you want to document by using the subsequence name.
- Limit the horizontal space occupied by the graphical sequence editor.

Figure 5-1 *Example of a Completed Assessment*



Prelogin Policies

The results of the checks of the assessment configured in the graphical sequence editor, [Figure 5-1](#), determine whether the assessment results in the assignment of a particular policy or a denied remote access connection.

As you create each policy, Secure Desktop Manager adds a menu named after the policy. Each of the policy menus let you assign unique settings to the policy. These settings determine whether Keystroke Logger Detection, Host Emulation Detection, or Cache Cleaner installs on remote devices that match the criteria assigned to the policy. Administrators typically assign these modules to non-corporate computers to prevent access to corporate data and files after the session is over.

For a complete discussion of configuring HostScan and policies, refer to these chapters of the [Cisco Secure Desktop Cisco Secure Desktop Configuration Guide for Cisco ASA 5500 Series Administrators, Release 3.6](#):

- [Configuring HostScan](#)
- [Tutorial: Assigning Criteria to Policies](#)
- [Details: Assigning Criteria to Policies](#)

Figure 5-2 Policies

Keystroke Logger Detection

**Caution**

This section describes a feature that has been deprecated. Cisco stopped developing Keystroke Logger Detection (KSL) on November 20, 2012.

For more information, see the deprecation field notice "[Secure Desktop \(Vault\), Cache Cleaner, Keystroke Logger Detection, and Host Emulation Detection Features Are Deprecated.](#)"

You can configure selected policies to scan for processes or modules that record keystrokes entered by the user, and deny VPN access if a suspected keystroke logging application is present.

By default, keystroke logger detection is disabled for each policy. You can use Secure Desktop Manager to enable or disable keystroke logger detection. You can specify the keystroke loggers that are safe or let the remote user interactively approve the ones that the scan identifies as a condition for running Cache Cleaner or HostScan on the remote computer.

If you enable it, keystroke logger detection downloads with Cache Cleaner or HostScan onto the remote computer. Following the download, keystroke logger detection runs only if the OS is Windows and the user login has administrator privileges.

The associated module runs only if the scan is clear, or only if you assign administrative control to the user and the user approves of the applications the scan identifies.

**Note**

Keystroke logger detection applies to both user mode and kernel mode loggers as long as the end-user is logged in with administrator privileges.

Keystroke logger detection runs only on 32-bit Microsoft Windows OS's. See the [“Keystroke Logger Detection and Host Emulation Detection Supported Operating Systems”](#) section on page 5-6.

Keystroke logger detection may be unable to detect every potentially malicious keystroke logger. It does not detect hardware keystroke logging devices.

Host Emulation Detection



Caution

This section describes a feature that has been deprecated. Cisco stopped developing Host Emulation Detection on November 20, 2012.

For more information, see the deprecation field notice "[Secure Desktop \(Vault\), Cache Cleaner, Keystroke Logger Detection, and Host Emulation Detection Features Are Deprecated.](#)"

Host emulation detection, another feature of policies, determines whether a remote Microsoft Windows operating system is running over virtualization software. You can use Secure Desktop Manager to enable or disable this feature, and deny access if a host emulator is present or report the detection to the user and let the user decide whether to continue or terminate.

By default, host emulation detection is disabled for each policy. If you enable it, it downloads with Secure Desktop, Cache Cleaner, or HostScan onto the remote computer. Following the download, host emulation detection runs first, along with keystroke logger detection if it is configured to do so. The associated module then runs if either of the following conditions are true:

- The host is not running over an emulator (or virtualization software).
- You did not configure it to always deny access, and the user approves of the detected host emulator.

See the [“Keystroke Logger Detection and Host Emulation Detection Supported Operating Systems”](#) section on page 5-6.

Keystroke Logger Detection and Host Emulation Detection Supported Operating Systems

Keystroke Logger Detection runs on the following operating systems:

- Windows 7 x86 (32-bit)
- Windows Vista SP1 and SP2 x86 (32-bit)
- Windows XP SP3 x86 (32-bit)

Host Emulation Detection runs on the following operating systems:

- Windows 7 x86 (32-bit) and x64 (64-bit)
- Windows Vista SP1 and SP2 x86 (32-bit) and x64 (64-bit) Windows XP SP3 x86 (32-bit) and x64 (64-bit)

Cache Cleaner



Caution

This section describes a feature that has been deprecated. Cisco stopped developing Cache Cleaner on November 20, 2012.

For more information, see the deprecation field notice "[Secure Desktop \(Vault\), Cache Cleaner, Keystroke Logger Detection, and Host Emulation Detection Features Are Deprecated.](#)"

Cache cleaner attempts to eliminate the information from the browser cache at the end of a clientless SSL VPN session or after web-launching an AnyConnect Client session. This information includes entered passwords, auto-completed text, files cached by the browser, browser configuration changes made during the session, and cookies. Cache Cleaner is an alternative to Secure Desktop (Vault). It is functionally more limited but has the flexibility to support more operating systems.

Cache Cleaner runs on Microsoft Windows, Apple Mac OS, and Linux. For detailed system requirements, see the [Cisco Secure Desktop Release Notes](#).

This is a typical sequence of events when Cache Cleaner has been deployed and the endpoint attempts to create a clientless SSL VPN connection or attempts to launch AnyConnect using web launch:

-
- Step 1** The endpoint connects to the ASA when the user enters its URL in a browser.
- Step 2** Hostscan performs the assessment.
- Step 3** Assuming that the endpoint passes the assessment, AnyConnect authentication begins. The user may enter a password or use a certificate to authenticate.
- Step 4** For users running Internet Explorer without **Clean the whole cache in addition to the current session cache (IE only)** enabled, or for users running Safari or Firefox, the Cache Cleaner takes a snapshot of the browser's cache approximately one minute after the user authenticates.
- Step 5** As the user works, the browser caches information.
- Step 6** When users logout of the VPN session:
- For users running Internet Explorer with **Clean the whole cache in addition to the current session cache (IE only)** enabled, Cache Cleaner attempts to delete the browser's entire cache.
 - For users running Internet Explorer without **Clean the whole cache in addition to the current session cache (IE only)** enabled, or running Safari or Firefox, Cache Cleaner attempts to delete all of the browser's cache and then Cache Cleaner restores the snapshot it took of the cache.
- To prevent any sensitive information from being restored on the computer, we recommend that you manually clean the browser's cache, after your session and then close the browser.



Note

We recommend that Cache Cleaner be configured with the **Clean the whole cache in addition to the current session cache (IE only)** option enabled.

HostScan

HostScan is a package that installs on the remote device after the user connects to the ASA and before the user logs in. HostScan consists of any combination of the Basic HostScan module, Endpoint Assessment module, and Advanced Endpoint Assessment module based on the configuration set by the CSD administrator. HostScan runs on Microsoft Windows, Apple Mac OS X, and Linux. For detailed requirements, see [System Requirements, page 5-11](#).

The HostScan package is bundled in these software packages:

- Cisco Secure Desktop (CSD). The ASA can deploy the HostScan package to the endpoint if CSD is enabled.
- AnyConnect package. The ASA can deploy the HostScan package to the endpoint if the AnyConnect package is configured as the HostScan package and HostScan is enabled.
- A pre-deployed posture module.

**Note**

If HostScan was installed on the endpoint as part of a pre-deployed posture module but a HostScan package is not enabled on the ASA; when the endpoint connects to the ASA, the HostScan package on the endpoint will not perform endpoint assessment.

Basic HostScan Functionality

HostScan automatically identifies operating systems and service packs on any remote device establishing a Cisco clientless SSL VPN or AnyConnect client session and when CSD or HostScan/CSD is enabled on the ASA.

You can also configure HostScan to inspect the endpoint, for specific processes, files, registry keys, digital certificates, and IP addresses using the Secure Desktop manager. Secure Desktop manager is integrated with Adaptive Security Device Manager (ASDM) on the ASA.

HostScan performs all of these inspections before full tunnel establishment.

After HostScan gathers from the endpoint the operating system and service pack information along with the processes, files, registry keys, digital certificates, and IP addresses you configured it to gather, it sends this information to the ASA where it can be used to distinguish between corporate-owned, personal, and public computers. The information can also be used in assessments. See [Prelogin Assessment, page 5-3](#) for more information.

HostScan also automatically returns the following additional values for evaluation against configured DAP endpoint criteria:

- Microsoft Windows, Mac OS, and Linux builds
- Listening ports active on a connecting host running Microsoft Windows
- CSD components installed on the connecting host
- Microsoft Knowledge Base numbers (KBs)

For more information about DAP and Lua expressions see [Integration with Dynamic Access Policies, page 5-10](#) and Chapter 7, “Using Match Criteria to Configure Dynamic Access Policies” in *Cisco Secure Desktop Configuration Guide for Cisco ASA 5500 Series Administrators*.

Endpoint Assessment

Endpoint Assessment is a HostScan extension that examines the remote computer for a large collection of antivirus and antispyware applications, associated definitions updates, and firewalls. You can use this feature to combine endpoint criteria to satisfy your requirements before the ASA assigns a specific dynamic access policy (DAP) to the session. See Chapter 7, “Using Match Criteria to Configure Dynamic Access Policies” in [Cisco Secure Desktop Configuration Guide for Cisco ASA 5500 Series Administrators](#) for more information on DAPs.

Advanced Endpoint Assessment - Antivirus, Antispyware, and Firewall Remediation

With the purchase of an **Advanced Endpoint Assessment** license installed on the ASA, you can use these advanced features of HostScan:

Remediation

On Windows, Mac OS X, and Linux desktops, Advanced Endpoint Assessment can attempt to initiate remediation of various aspects of antivirus, antispyware and personal firewall protection if that software allows a separate application to initiate remediation.

Antivirus —Advanced Endpoint Assessment can attempt to remediate these components of antivirus software:

- **Force File System Protection** — If the antivirus software is disabled, Advanced Endpoint Assessment can enable it.
- **Force Virus Definitions Update** — If the antivirus definitions have not been updated in the number of days defined by the Advanced Endpoint Assessment configuration, Advanced Endpoint Assessment can attempt to initiate an update of virus definitions.

Antispyware — If the antispyware definitions have not been updated in the number of days defined by the Advanced Endpoint Assessment configuration, Advanced Endpoint Assessment can attempt to initiate an update of antispyware definitions.

Personal Firewall — The Advanced Endpoint Assessment module can attempt to reconfigure firewall settings and rules if they do not meet the requirements defined in the Advanced Endpoint Assessment configuration.

- The firewall can be enabled or disabled.
- Applications can be prevented from running or allowed to run.
- Ports can be blocked or opened.



Note Not all personal firewalls support this feature.

If the end-user disables antivirus or personal firewall, after successfully establishing the VPN connection, our Advanced Endpoint Assessment feature will attempt to re-enable that application within approximately 60 seconds.

HostScan Support Charts

The HostScan support charts contain the product name and version information for the antivirus, antispyware, and firewall applications you use in your dynamic access policies.

In this release of the AnyConnect Secure Mobility Client, the HostScan package can be uploaded separately from Cisco Secure Desktop (CSD). This means you can deploy HostScan functionality without having to install CSD, and you are able to update your HostScan support charts by upgrading to the latest HostScan package.

You can download the HostScan support charts from [cisco.com](http://www.cisco.com/en/US/products/ps10884/products_device_support_tables_list.html), here:

http://www.cisco.com/en/US/products/ps10884/products_device_support_tables_list.html

These support charts can be viewed using Microsoft Excel, Microsoft Excel Viewer, or OpenOffice. Browsers such as Firefox, Chrome, and Safari provide the best download experience.

Configuring Antivirus Applications for HostScan

Before installing the posture module or HostScan package, configure your antivirus software to “white-list” or make security exceptions for the HostScan applications below. Antivirus applications can misinterpret the behavior of these applications as malicious.

- cscan.exe
- ciscod.exe
- cstub.exe

Integration with Dynamic Access Policies

The ASA integrates the HostScan features into dynamic access policies (DAPs). Depending on the configuration, the ASA uses one or more endpoint attribute values in combination with optional AAA attribute values as conditions for assigning a DAP. The HostScan features supported by the endpoint attributes of DAPs include OS detection, policies, basic HostScan results, and endpoint assessment.



Note

In order to enable HostScan features, you must have an AnyConnect Premium license installed on the ASA.

As an administrator, you can specify a single attribute or combine attributes that form the conditions required to assign a DAP to a session. The DAP provides network access at the level that is appropriate for the endpoint AAA attribute value. The ASA applies a DAP when all of its configured endpoint criteria are satisfied.



Note

For a complete discussion about how you configure DAPs on the ASA using ASDM, find the [Adaptive Security Device Manager \(ASDM\) Configuration Guide](#) for your version of ASDM and read the chapter on “Configuring Dynamic Access Policies”.

Difference Between the Posture Module and the Standalone HostScan Package

The AnyConnect Posture Module can be deployed by the ASA to the endpoint, or it can be installed on the endpoint using a pre-deployment kit before the endpoint makes its initial connection to the ASA.

The posture module contains the HostScan package, assessment, keystroke logger detection, host emulation detection, and cache cleaner, as well as a few other modules that the HostScan application requires. Deploying the posture module allows HostScan to run privileged operations even when the user on the endpoint is not an administrator, and it allows other AnyConnect modules to start using HostScan.

The standalone HostScan package delivers the HostScan engine, assessment module, keystroke logger detection and host emulation detection.

AnyConnect Posture Module Dependencies and System Requirements

The AnyConnect posture module contains the HostScan package and other components.

Dependencies

The AnyConnect Secure Mobility Client with the posture module requires these minimum ASA components:

- ASA 8.4
- ASDM 6.4

These AnyConnect features require that you install the posture module.

- HostScan
- SCEP authentication
- AnyConnect Telemetry Module

HostScan, CSD, and AnyConnect Secure Mobility Client Interoperability



Caution

If you deploy HostScan with the AnyConnect Secure Mobility Client, version 3.0.x, the AnyConnect Secure Mobility Client requires HostScan to have the same version number, or a later version number, than itself.

If you have Cisco Secure Desktop (CSD) version 3.5, or earlier, enabled on the ASA and you do not upgrade the HostScan package to match or exceed the version of AnyConnect Secure Mobility Client 3.0.x you are deploying, assessments will fail, and users will be unable to establish a VPN session. This will happen even if the AnyConnect 3.0.x posture module is pre-deployed to the endpoint because the ASA will automatically downgrade the HostScan package on the endpoint to match the HostScan package enabled on the ASA.

AnyConnect 2.5.3005 and earlier is not compatible with any version of HostScan.

System Requirements

The posture module can be installed on any of these platforms:

- Windows XP (x86 and x86 running on x64)

- Windows Vista (x86 and x86 running on x64)
- Windows 7 (x86 and x86 running on x64)
- Mac OS X 10.6, 10.7, 10.8, and 10.9 (32-bit and 32-bit running on 64-bit)
- Red Hat Enterprise Linux 6.x (64-bit) and Red Hat Enterprise Linux 5.x (32-bit and 32-bit running on 64-bit)

**Note**

HostScan is a 32-bit application and requires the core 32-bit libraries to be installed on 64-bit Linux operating systems. HostScan does not provide these 32-bit libraries at the time it is installed. Customers need to install the 32-bit libraries on the endpoints themselves, if they are not already provisioned.

Licensing

These are the AnyConnect licensing requirements:

- An AnyConnect Premium license is required for all features delivered with HostScan including basic HostScan, endpoint assessment, and advanced endpoint assessment.
- The Advanced Endpoint Assessment license is an additional license required for remediation

Entering an Activation Key to Support Advanced Endpoint Assessment

Advanced Endpoint Assessment includes all of the Endpoint Assessment features and lets you configure an attempt to update noncompliant computers to meet version requirements. You can use ASDM to activate a key to support Advanced Endpoint Assessment after acquiring it from Cisco, as follows:

Step 1 Choose **Configuration > Device Management > Licensing > Activation Key**.

Step 2 Enter the key in the **New Activation Key** field.

Step 3 Click **Update Activation Key**.

Step 4 Choose **File > Save Running Configuration to Flash**.

An Advanced Endpoint Assessment entry appears and the Configure button becomes active in the HostScan Extensions area of the **Configuration > Remote Access VPN > Secure Desktop Manager > HostScan** pane, which is accessible only if CSD is enabled.

HostScan Packaging

You can load the HostScan package on to the ASA in one of these ways:

- You can upload it by uploading an AnyConnect Secure Mobility package: **anyconnect-win-version-k9.pkg**
- You can upload it by uploading a Cisco Secure Desktop package: **csd_version-k9.pkg**
- You can upload it as a standalone package: **hostscan-version-k9.pkg**

Table 5-1 HostScan Packages You Load to the ASA

File	Description
anyconnect-win-version-k9.pkg	This package contains all the Cisco AnyConnect Secure Mobility Client features including the <code>hostscan-version-k9.pkg</code> file.
csd_version-k9.pkg	This file contains all Cisco Secure Desktop features including HostScan software as well as the HostScan support charts, secure desktop (Vault), cache cleaner, key stroke logger detection, and host emulation detection.
hostscan-version-k9.pkg	This file contains the HostScan image, HostScan support charts, assessment module, cache cleaner, keystroke logger detection and host emulation detection.

Which HostScan Image Gets Enabled When There is More than One Loaded on the ASA?

The HostScan image is delivered with the HostScan package. It can be deployed to the endpoint from the standalone HostScan package, the full AnyConnect Secure Mobility Client package, and Cisco Secure Desktop. Depending on what licenses you have installed on your ASA, you may have all of these packages loaded on your ASA. In that case, the ASA enables the image that you specified as the HostScan image first and if you have not specified one, the ASA enables the HostScan functionality from Cisco Secure Desktop. See the [“Installing or Upgrading HostScan”](#) section on page 5-16.

If you uninstall the HostScan package, the ASA cannot enable its HostScan image.

These scenarios describe which HostScan package the ASA distributes when it has more than one loaded.

Under These Conditions	The ASA Distributes this Package
You upload a standalone HostScan package to the ASA. You designate it as the HostScan image. You enable CSD/hostscan.	ASA distributes the standalone HostScan package.
You upload a standalone HostScan package on the ASA. You designate it as the HostScan image. You upload a CSD image on the ASA. You enable CSD/hostscan.	ASA distributes the standalone HostScan package.
You upload a HostScan image on the ASA. You do not enable it. You upload a CSD image on the ASA. You enable CSD/hostscan.	The ASA distributes the standalone HostScan image because it was not uninstalled.

Under These Conditions	The ASA Distributes this Package
You upload an AnyConnect Secure Mobility Client package on the ASA. You designate it as the HostScan image.	The ASA distributes the HostScan image from that package.
You upload an AnyConnect Secure Mobility Client package file on the ASA. You do not specify it as the HostScan image. You have also uploaded a HostScan package or a CSD package to the ASA. You enable CSD/hostscan.	The ASA distributes the installed HostScan package or CSD package. The ASA does not distribute the HostScan package associated with that AnyConnect package.

Deploying the AnyConnect Posture Module and HostScan

There are two different deployment scenarios for the posture module and HostScan.

Pre-deployment. Using the pre-deployment method, you install the AnyConnect client and posture module before the endpoint attempts to make a connection to the ASA. The pre-deployment posture module package contains every component, library, and support chart that could be used to gather posture attributes as well as the applications that provide you with the features described in the [“Features Enabled with the AnyConnect Posture Module”](#) section on page 5-3. If you pre-deploy to the endpoint the same version of the AnyConnect client and posture module installed on the ASA, no additional posture module files are pushed down from the ASA when the endpoint connects to the ASA.

Web-deployment. Using the web-deployment method, when the endpoint connects to the ASA, the ASA pushes the AnyConnect client and posture module down to the endpoint. To make the download as fast and efficient as possible, the ASA only downloads the essential posture module files.

When the endpoint connects again, the essential posture module files determine what other libraries or files it needs to perform an endpoint assessment and retrieves those files from the ASA. For example, the posture module may retrieve a HostScan support chart of all Norton anti-virus software because a version of Norton anti-virus is running on the endpoint. After the posture module retrieves the additional files it needs, it performs the endpoint assessment and forwards the attributes to the ASA. Assuming the endpoint attributes are sufficient to satisfy a dynamic access policy (DAP) rule, the ASA allows the endpoint to connect. As a result of satisfying the DAP, the ASA could be configured to push the remainder of the posture module to the endpoint or not.

If you do not want the entire posture module web-deployed to the endpoint, you can perform a limited web-deployment where only one posture file is downloaded to the endpoint, and it requests only the HostScan libraries it needs to perform endpoint assessment. In this scenario, you will have very short download times from the ASA to the endpoint, but you will lose the ability to perform Advanced Endpoint Assessment and perform such tasks as antivirus, antispyware, or firewall remediation tasks.

Pre-Deploying the AnyConnect Posture Module

When you pre-deploy the posture module, you install it on the endpoint before the AnyConnect client makes its initial connection to the ASA.

You need to install the AnyConnect Secure Mobility Client on the endpoint before you install the posture module. See [Chapter 2, “Deploying the AnyConnect Secure Mobility Client”](#) for instructions on installing the AnyConnect Secure Mobility Client and the posture module using web-deployment and pre-deployment methods.

[Table 5-2](#) lists the posture module pre-deployment kits:

Table 5-2 Posture Module Pre-Deployment Kits

File	Description
Windows	anyconnect-posture-win-version-pre-deploy-k9.msi
Linux	anyconnect-linux-version-posture-k9.tar.gz
Mac OS X	anyconnect-macosx-posture-i386-version-i386-k9.dmg

Installing and Enabling HostScan on the ASA

These tasks describe installing and enabling HostScan on the ASA:

- [Downloading the Latest HostScan Engine Update](#)
- [Installing or Upgrading HostScan](#)
- [Enabling or Disabling HostScan on the ASA](#)
- [Uninstalling HostScan](#)
- [Assigning AnyConnect Posture Module to a Group Policy](#)

Downloading the Latest HostScan Engine Update

To download the latest Cisco HostScan Engine Updates, you must be a registered user of Cisco.com.

-
- Step 1** Click this link to reach the software download area for Cisco VPN Client Tools:
<http://www.cisco.com/cisco/software/release.html?mdfid=282414594&flowid=4470&softwareid=282364364&release=Engine%20Updates&relind=AVAILABLE&rellifecycle=&reltype=latest>
- Step 2** Expand **Latest Releases** in the product directory tree.
- Step 3** Click **Engine Updates**.
- Step 4** In the column on the right, find the latest version of **hostscan_3.0.xxxx-k9.pkg** and click **Download Now**.
- Step 5** Enter your cisco.com credentials and click **Login**.
- Step 6** Click **Proceed with Download**.
- Step 7** Read the End User License Agreement and click **Agree**.
- Step 8** Select a download manager option and click the **download** link to proceed with the download.
-

Installing or Upgrading HostScan

Use this procedure to upload, or upgrade, and enable a new HostScan image on the ASA. Use the image to enable HostScan functionality for AnyConnect or upgrade the HostScan support charts for an existing deployment of Cisco Secure Desktop (CSD).

You can specify a standalone HostScan package or an AnyConnect Secure Mobility Client version 3.0 or later package in the field.

If you previously uploaded a CSD image to the ASA, the HostScan image you specify will upgrade or downgrade the existing HostScan files that were delivered with that CSD package.

You do not need to restart the security appliance after you install or upgrade HostScan; however, you must exit and restart Adaptive Security Device Manager (ASDM) to access the Secure Desktop Manager tool in ASDM.



Note

HostScan requires an AnyConnect Secure Mobility Client premium license.

- Step 1** Download the latest version of the HostScan package using [Downloading the Latest HostScan Engine Update, page 5-15](#).



Note

You will need to have an account on Cisco.com and be logged in to download the software.

- Step 2** Open ASDM and choose **Configuration > Remote Access VPN > HostScan Image**. ASDM opens the HostScan Image panel (Figure 5-3).

Figure 5-3 HostScan Image Panel



- Step 3** Click **Upload** to prepare to transfer a copy of the HostScan package from your computer to a drive on the ASA.
- Step 4** In the Upload Image dialog box, click **Browse Local Files** to search for the HostScan package on your local computer.
- Step 5** Select the **hostscan_version.pkg** file or **anyconnect-win-version-k9.pkg** file you downloaded in Step 1 and click **Select**. The path to the file you selected is in the Local File Path field and the Flash File System Path field reflects the destination path of the HostScan package. If your ASA has more than one flash drive, you can edit the Flash File System Path to indicate another flash drive.

- Step 6** Click **Upload File**. ASDM transfers a copy of the file to the flash card. An Information dialog box displays the following message:
- File has been uploaded to flash successfully.
- Step 7** Click **OK**.
- Step 8** In the Use Uploaded Image dialog, click **OK** to use the HostScan package file you just uploaded as the current image.
- Step 9** Check **Enable HostScan/CSD** if it is not already checked.
- Step 10** Click **Apply**.



Note If AnyConnect Essentials is enabled on the ASA, you receive a message that HostScan and CSD will not work with it. You have the choice to **Disable** or **Keep** AnyConnect Essentials.

- Step 11** Click **Save**.

Enabling or Disabling HostScan on the ASA

When you first upload or upgrade a HostScan image using ASDM, you enable the image as part of that procedure. See the [“Installing and Enabling HostScan on the ASA” section on page 5-15](#).

Otherwise, to enable or disable a HostScan image using ASDM, follow this procedure:

- Step 1** Open ASDM and choose **Configuration > Remote Access VPN > HostScan Image**. ASDM opens the HostScan Image panel (Figure 5-3).
- Step 2** Check **Enable HostScan/CSD** to enable HostScan or uncheck **Enable HostScan/CSD** to disable HostScan.
- Step 3** Click **Apply**.
- Step 4** Click **Save**.

Enabling or Disabling CSD on the ASA

Enabling Cisco Secure Desktop (CSD) loads the CSD configuration file and data.xml from the flash device to the running configuration. Disabling CSD does not alter the CSD configuration.

Use ASDM to enable or disable CSD as follows:

- Step 1** Choose **Configuration > Remote Access VPN > Secure Desktop Manager > Setup**. ASDM opens the Setup pane (Figure 5-3).



Note The Secure Desktop Image field displays the image (and version) that is currently installed. The Enable Secure Desktop check box indicates whether CSD is enabled.

- Step 2** Check **Enable Secure Desktop** to enable CSD or uncheck **Enable Secure Desktop** to disable CSD.
- Step 3** Close ASDM. A window displays the following message:
- The configuration has been modified. Do you want to save the running configuration to flash memory?
- Step 4** Click **Save**. ASDM saves the configuration and closes.
-

HostScan and CSD Upgrades and Downgrades

The ASA automatically distributes the enabled HostScan package to the endpoint whether that package is the standalone HostScan package, the package included with AnyConnect Secure Mobility Client, or the package included with Cisco Secure Desktop. If the endpoint has an older version of the HostScan package installed, the package on the endpoint gets upgraded; if the endpoint has a newer version of the HostScan package, the endpoint package gets downgraded.

Determining the HostScan Image Enabled on the ASA

Open ASDM and select **Configuration > Remote Access VPN > HostScan Image**.

If there is a HostScan image designated in the HostScan Image location field, and the Enable HostScan/CSD box is checked, the version of that image is the HostScan version being used by the ASA.

If the HostScan Image field is empty, and the Enable HostScan/CSD box is checked, select **Configuration > Remote Access VPN > Secure Desktop Manager**. The version of CSD in the Secure Desktop Image Location field is the HostScan version being used by the ASA.

Uninstalling HostScan

Uninstalling the HostScan Package

Uninstalling the HostScan package removes it from view on the ASDM interface and prevents the ASA from deploying it even if HostScan or CSD is enabled. Uninstalling HostScan does not delete the HostScan package from the flash drive.

Use this procedure to uninstall HostScan on the security appliance:

-
- Step 1** Open ASDM and select **Configuration > Remote Access VPN > HostScan Image**.
- Step 2** In the HostScan Image pane, click **Uninstall**. ASDM removes the text from the Location text box.
- Step 3** Click **Save**.
-

Uninstalling CSD from the ASA

Uninstalling Cisco Secure Desktop (CSD) **removes the CSD configuration file, data.xml, from the desktop directory on the flash card.** If you want to retain the file, copy it using an alternative name or download it to your workstation before you uninstall CSD.

Use this procedure to uninstall CSD on the security appliance:

-
- Step 1** Open ASDM and choose **Configuration > Remote Access VPN > Secure Desktop Manager > Setup**. ASDM opens the Setup pane (Figure 5-3).
- Step 2** Click **Uninstall**.
A confirmation window displays the following message:
Do you want to delete disk0:/csd_<n>.<n>.*.pkg and all CSD data files?
- Step 3** Click **Yes**.
ASDM removes the text from the Location text box and removes the Secure Desktop Manager menu options below Setup.
- Step 4** Close ASDM. A window displays the following message:
The configuration has been modified. Do you want to save the running configuration to flash memory?
- Step 5** Click **Save**. ASDM saves the configuration and closes.
-

Assigning AnyConnect Posture Module to a Group Policy

-
- Step 1** Open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > Group Policies**.
- Step 2** In the Group Policies panel, click **Add** to create a new group policy or select the group policy to which you want to assign the HostScan package and click **Edit**.
- Step 3** In the Edit Internal Group Policy panel, expand the **Advanced** navigation tree on the left side of the panel and select **AnyConnect Client**.
- Step 4** Uncheck the Optional Client Modules to Download **Inherit** checkbox.
- Step 5** In the Optional Client Modules to Download drop down menu, check the AnyConnect Posture Module and click **OK**.
- Step 6** Click **OK**.
-

HostScan Logging

HostScan logs to the Event Viewer on Windows platforms, and syslog on non-windows platforms. In the Event Viewer all logs will be in their own “Cisco AnyConnect Secure Mobility Client Posture” folder.

This section describes these logging topics:

- Configuring the Logging Level for All Posture Module Components
- Posture Module Log Files and Locations

Configuring the Logging Level for All Posture Module Components

By default, components in the posture module log “Error” severity level events. Use these instructions to change the logging severity level for all components of the posture module.

The posture module installs the cscan.log file in the user’s home folder. The cscan.log file shows only the entries from the last VPN session. Each time the user connects to the ASA, HostScan overwrites the entries in this file with new logging data.

To view or change the posture logging level:

-
- Step 1** From the ASDM interface select **Configuration > Remote Access VPN > Secure Desktop Manager > Global Settings**. The Global Settings panel opens.



- Step 2** Set the **Logging Level** using the Logging Level Definitions in the panel as a guide.

- Step 3** Click **Apply All** to save the changes to the running configuration.
-



Note

If HostScan is disabled for a particular connection profile, HostScan logging does not occur for users of that connection profile.

Posture Module Log Files and Locations

Posture module components output up to three logs based on your operating system, privilege level, and launching mechanism (Web Launch or AnyConnect):

- cstub.log - Captures logging when AnyConnect web launch is used.

- `libcsd.log` - Created by the AnyConnect thread that uses the HostScan API. Debugging entries would be made in this log depending on the logging level configuration.
- `cscan.log` - Created by the scanning executable (`cscan.exe`) and is the main log for posture and HostScan. Debugging entries would be made in this log depending on the logging level configuration.

The posture module puts these log files in the user's home folder. The location is dependent on the operating system and VPN method.

Cisco Technical Assistant Center (TAC) uses these log files to debug problems if the need arises. You will not need to review these files. Should Cisco TAC need them, you will be asked to provide them with a DART Bundle. The DART utility will collect all the necessary AnyConnect configuration and log files and store them in a compressed file which you will then send to TAC. See the [“Using DART to Gather Troubleshooting Information”](#) section on page 13-4 for more information about DART.

Using a BIOS Serial Number in a DAP

HostScan can retrieve the BIOS serial number of a host. You can use a Dynamic Access Policy (DAP) to allow or prevent a VPN connection to the ASA based on that BIOS serial number.

Specifying the BIOS as a DAP Endpoint Attribute

-
Step 1	Log on to ASDM.
Step 2	Select Configuration > Remote Access VPN > Network (Client) Access or Clientless SSL VPN Access > Dynamic Access Policies .
Step 3	In the Configure Dynamic Access Policies panel, click Add or Edit to configure BIOS as a DAP Endpoint Attribute.
Step 4	To the right of the Endpoint ID table, click Add .
Step 5	In the Endpoint Attribute Type field, select Device .
Step 6	Check the BIOS Serial Number checkbox, select = (equals) or != (not equals), and enter the BIOS number in the BIOS Serial Number field.



- Step 7** Click **OK** to save changes in the Endpoint Attribute dialog box.
- Step 8** Click **OK** to save your changes to the Edit Dynamic Access Policy.
- Step 9** Click **Apply** to save your changes to the Dynamic Access Policy.
- Step 10** Click **Save**.
-

How to Obtain BIOS Serial Numbers

These resources explain how to obtain the BIOS Serial number on various endpoints.

- Windows: <http://support.microsoft.com/kb/558124>
- Mac OS X: <http://support.apple.com/kb/ht1529>
- Linux: Use this command:

```
/usr/bin/hal-get-property --udi /org/freedesktop/Hal/devices/computer --key  
system.hardware.serial
```



Configuring Web Security

The AnyConnect Web Security module is an endpoint component that routes HTTP traffic to a Cisco Cloud Web Security scanning proxy where Cisco Cloud Web Security evaluates it.

Cisco Cloud Web Security deconstructs the elements of a Web page so that it can analyze each element simultaneously. For example, if a particular Web page combined HTTP, Flash, and Java elements, separate “scanlets” analyze each of these elements in parallel. Cisco Cloud Web Security then lets through benign or acceptable content and drops malicious or unacceptable content based on a security policy defined in the Cisco ScanCenter management portal. This prevents “over blocking” where an entire Web page is restricted because a minority of the content is unacceptable or “under blocking” where an entire page is permitted while there is still some unacceptable or possibly harmful content that is being delivered with the page. Cisco Cloud Web Security protects users when they are on or off the corporate network.

With many Cisco Cloud Web Security scanning proxies spread around the world, users taking advantage of AnyConnect Web Security are able to route their traffic to the Cisco Cloud Web Security scanning proxy with the fastest response time to minimize latency.

You can configure the Secure Trusted Network Detection feature to identify endpoints that are on the corporate LAN. If this feature is enabled, any network traffic originating from the corporate LAN bypasses Cisco Cloud Web Security scanning proxies. The security of that traffic gets managed by other methods and devices sitting on the corporate LAN rather than Cisco Cloud Web Security.

AnyConnect Web Security features and functions are configured using the AnyConnect Web Security client profile which you edit using AnyConnect’s profile editor.

Cisco ScanCenter is the management portal for Cisco Cloud Web Security. Some of the components created or configured using Cisco ScanCenter are also incorporated in the AnyConnect Web Security client profile.

The following sections describe the AnyConnect Web Security client profile and features, and how to configure them:

- [System Requirements](#)
- [Licensing Requirements](#)
- [Installing the AnyConnect Web Security Module for Use with an ASA](#)
- [Installing the AnyConnect Web Security Module for Use without an ASA](#)
- [Creating an AnyConnect Web Security Client Profile](#)
- [Configuring Cisco Cloud Web Security Scanning Proxies in the Client Profile](#)
- [Excluding Endpoint Traffic from Web Scanning Service](#)
- [Configuring Web Scanning Service Preferences](#)

- [Configuring Authentication and Sending Group Memberships to the Cisco Cloud Web Security Proxy](#)
- [Web Security Client Profile Files](#)
- [Creating a Web Security Client Profile with the Standalone Editor](#)
- [Configuring Split Exclusion Policy for Web Security](#)
- [Configuring Cisco ScanCenter Hosted Configuration Support for Web Security Client Profile](#)
- [Switching off and Enabling the Cisco AnyConnect Web Security Agent](#)

You can begin configuring AnyConnect Web Security by [Creating an AnyConnect Web Security Client Profile](#).

System Requirements

These are the system requirements for AnyConnect Web Security Module:

- [AnyConnect Web Security Module](#)
- [ASA and ASDM Requirements](#)

AnyConnect Web Security Module

Web Security supports the following operating systems:

- Windows XP SP3 x86 (32-bit)
- Windows Vista x86 (32-bit) or x64 (64-bit)
- Windows 7 x86 (32-bit) or x64 (64-bit)
- Mac OS X v10.6 x86 (32-bit) or x64 (64-bit)
- Mac OS X v10.7 x86 (32-bit) or x64 (64-bit)
- Mac OS X v10.8 x64 (64-bit)

ASA and ASDM Requirements

The AnyConnect Secure Mobility Client with the Web security module requires these minimum ASA components:

- ASA 8.4(1)
- ASDM 6.4(0)104

System Limitations

Users running Web Security cannot also run Anywhere Plus. You will need to remove Anywhere Plus before installing Web Security.

Licensing Requirements

These sections describe the licensing requirements for different deployment methods of the AnyConnect Web Security Module:

- [Web Security Deployed as a Standalone Component, page 6-3](#)
- [Web Security Deployed as a Component of AnyConnect, page 6-3](#)

Web Security Deployed as a Standalone Component

You can deploy the Web Security module and benefit from Cisco Cloud Web Security without having to install an ASA and without enabling the VPN capabilities of the AnyConnect Secure Mobility Client.

However, you will need a Cisco Cloud Web Security license and a Cisco Cloud Web Security Secure Mobility license for roaming users deploying AnyConnect.

**Note**

You do not need an AnyConnect Essentials or AnyConnect Premium license to use the AnyConnect Secure Mobility Client with only the Web Security module.

Web Security Deployed as a Component of AnyConnect

AnyConnect License

There are no AnyConnect licenses specific to Web Security. The Web Security module will work with either AnyConnect Essentials or AnyConnect Premium.

Cisco Cloud Web Security Licenses

You need a Secure Mobility for Cisco Cloud Web Security license in addition to Cisco Cloud Web Security Web Filtering and/or Cisco Cloud Web Security Malware Scanning licenses in order for roaming users to be protected by Cisco Cloud Web Security.

User Guideline for Web Security Behavior with IPv6 Web Traffic

Unless an exception for an IPv6 address, domain name, address range, or wildcard is specified, IPv6 web traffic will be sent to the scanning proxy where it will perform a DNS lookup to see if there is an IPv4 address for the URL the user is trying to reach. If the scanning proxy finds an IPv4 address, it will use that for the connection. If it does not find an IPv4 address, the connection will be dropped.

If you want all IPv6 traffic to bypass the scanning proxies, you can add this static exception for all IPv6 traffic `::/0`. This means that IPv6 traffic will not be protected by Web Security.

Installing the AnyConnect Web Security Module for Use with an ASA

The Web Security module requires a client profile when deployed with AnyConnect or when deployed as a standalone module.

-
- Step 1** Create a Web Security client profile by following the [“Creating an AnyConnect Web Security Client Profile”](#) section on page 6-7 procedure.
- Step 2** Read [Chapter 2, “Deploying the AnyConnect Secure Mobility Client”](#) for instructions on installing the Web Security module using web-deployment and pre-deployment methods.
-

Installing the AnyConnect Web Security Module for Use without an ASA

You can deploy the Web Security module as a standalone application to use with Cisco Cloud Web Security without enabling the AnyConnect VPN module and without an ASA. This section includes the following information:

- [Installing the Web Security Module on Windows Using the AnyConnect Installer](#)
- [Installing the Web Security Module on Mac OS X Using the AnyConnect Installer](#)



Note

On computers running Windows, if AnyConnect cannot determine the user ID, the internal IP address will be used as the user ID. For example, this could happen if the enterprise_domains profile entry is not specified. You would then need to use the internal IP address for the purpose of generating reports in Cisco ScanCenter.

On computers running Mac OS X, the Web Security module can report the domain the computer is logged into if the Mac is bound to a domain. If it is not bound to a domain, the Web Security Module can report the IP address of the Mac or the username that is currently logged in.

Installing the Web Security Module on Windows Using the AnyConnect Installer

This procedure explains how to configure the Cisco AnyConnect Secure Mobility Client Web Security module on Windows for use with Cisco Cloud Web Security. In general terms, these are the tasks you will perform:



Note

Refer to chapter 2 for general installation instructions including the enabling of Windows lockdown.

1. Download the Cisco AnyConnect Secure Mobility Client ISO image.
2. Extract the contents of the ISO file.
3. Customize the Web Security Module by installing the Standalone Profile Editor, creating a Web Security profile, and by adding the Web Security profile file to the extracted contents of the ISO file.
4. Install the customized Web Security module.

To configure the Cisco AnyConnect Secure Mobility Client Web Security module on Windows for use with Cisco Cloud Web Security, follow this procedure.

-
- Step 1** Download the Cisco AnyConnect Secure Mobility Client package from the Cisco ScanCenter support area or from Cisco.com.
- Step 2** Create a new directory.
- Step 3** Using an application like WinZip or 7-Zip, extract the contents of the ISO file to the newly created directory.
-  **Note** Do **not** install the Web Security module at this point.
-
- Step 4** Install the Standalone AnyConnect Profile Editor. For further information, see the [“Installing the Standalone AnyConnect Profile Editor”](#) section on page 2-35.
-  **Note** The Web Security profile editor component is not installed by default. You must select it as part of a Custom installation, or select a Complete installation.
-
- Step 5** Start the Web Security profile editor and create a profile by following the [“Creating an AnyConnect Web Security Client Profile”](#) section on page 6-7.
- Step 6** Save the profile as **WebSecurity_ServiceProfile.xml** in a secure location.
- The Web Security profile editor creates an additional obfuscated version of the profile called **WebSecurity_ServiceProfile.wso** and saves it to the same location as you saved the WebSecurity_ServiceProfile.xml file.
- Step 7** Copy the obfuscated version of the Web Security profile, called WebSecurity_ServiceProfile.wso to the **Profiles\websecurity** folder you extracted in [Step 3](#).
- Step 8** Start **Setup.exe** to install the client software.
- Step 9** In the Cisco AnyConnect Secure Mobility Client Install Selector:
- Ensure the **AnyConnect Web Security Module** check box is selected.
 - Ensure the **Cisco AnyConnect VPN Module** is cleared. Doing so switches off the VPN functionality of the core client, and the Install Utility installs the Network Access Manager and Web Security as standalone applications with no VPN functionality.
 - (Optional) Select the **Lock Down Component Services** check box. The lock down component service prevents users from switch off or stopping the Windows Web Security service.
- Step 10** Click **Install Selected** and then click **OK**. When the installation has successfully completed, you will see the Cisco AnyConnect Secure Mobility Client icon in your system tray.
-

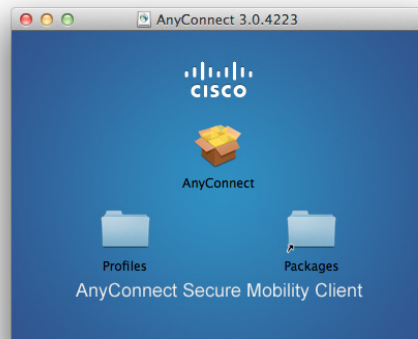
Installing the Web Security Module on Mac OS X Using the AnyConnect Installer

The following procedure explains how to customize the Web Security Module by installing the Standalone Profile Editor, creating a Web Security profile, and adding that Web Security profile to the DMG package.

-
- Step 1** Download the Cisco AnyConnect Secure Mobility Client DMG package from the Cisco ScanCenter support area or from the download area of Cisco.com.

- Step 2** Open the file to access the installer (Figure 6-1). The downloaded image is a read only file.

Figure 6-1 AnyConnect Installer Image



- Step 3** Make the installer image writable by either running the **Disk Utility** or using the **Terminal** application, as follows:

```
Hdiutil convert <source dmg> -format UDRW -o <output dmg>
```

- Step 4** Install the Standalone AnyConnect Profile Editor on a computer running a Windows operating system. For further information, see the [“Installing the Standalone AnyConnect Profile Editor”](#) section on page 2-35.



Note The Web Security profile editor component is not installed by default. You must select it as part of a Custom installation, or select a Complete installation.

- Step 5** Start the Web Security profile editor and create a profile by following the [“Creating an AnyConnect Web Security Client Profile”](#) section on page 6-7.

- Step 6** Save the profile as **WebSecurity_ServiceProfile.xml** in a secure location.

The Web Security profile editor creates an additional obfuscated version of the profile called **WebSecurity_ServiceProfile.wso** and saves it to the same location as you saved the **WebSecurity_ServiceProfile.xml** file.

- Step 7** Copy the **WebSecurity_ServiceProfile.wso** file from the Windows machine to the **AnyConnect 3.x.xxxxx/Profiles/websecurity** Mac OS X installer package.

Alternatively you can also use the **Terminal** application, as follows:

```
Copy WebSecurity_ServiceProfile.wso
cp <path to the wso> \Volumes\AnyConnect <VERSION>\Profiles\websecurity\
```

- Step 8** In the Mac OS X installer, go to the **AnyConnect 3.x.xxxxx/Profiles** directory and open the **ACTransforms.xml** file in TextEdit to edit the file. Set the **<DisableVPN>** element to **True** ensure the VPN functionality is not installed:

```
<ACTransforms>
  <DisableVPN>True</DisableVPN>
</ACTransforms>
```

- Step 9** In the Download area for AnyConnect Secure Mobility Client **3.x.xxxxx** on Cisco.com, find the **VPNDisable_ServiceProfile.xml** file and download it to the computer on which you are going to install AnyConnect Web Security.

- Step 10** Save the **VPNDisable_ServiceProfile.xml** file to the **AnyConnect 3.x.xxxxx/profiles/vpn** directory of the AnyConnect installer.



Note When installing the Web Security module only for AnyConnect 3.x.xxxxx on Mac OS X, the AnyConnect user interface should be set to start automatically on boot-up. This enables AnyConnect to provide the necessary user and group information for the Web Security module. Steps 9 and 10 provide the proper configuration to allow the AnyConnect user interface to start automatically on boot up.

- Step 11** The AnyConnect DMG package is now ready to distribute to your users.

Installing the Web Security Module on Windows Using the Command Line Installation

To install the Web Security module from the command prompt, follow this procedure:

- Step 1** Follow [Step 1 - Step 6](#) in [Installing the Web Security Module on Windows Using the AnyConnect Installer](#).
- Step 2** Install the AnyConnect Secure Mobility Client VPN module with VPN functionality switched off:
- ```
msiexec /package anyconnect-win-<version>-pre-deploy-k9.msi /norestart /passive
PRE_DEPLOY_DISABLE_VPN=1 /lvx* c:\test.log
```
- Step 3** Install the Web Security Module.
- ```
msiexec /package anyconnect-websecurity-win-<version>-pre-deploy-k9.msi /norestart
/passive /lvx* c:\test.log
```
- Step 4** (Optional) Install DART.
- ```
msiexec /package annyconnect-dart-win-<version>-k9.msi /norestart /passive /lvx*
c:\test.log
```
- Step 5** Save a copy of the obfuscated Web Security client profile to the proper Windows folder as defined in [Table 2-12 on page 2-33](#).
- Step 6** Restart the Cisco AnyConnect Web Security Agent windows service using the [“Switching off and Enabling the Cisco AnyConnect Web Security Agent” section on page 6-28](#).



**Note** These commands can also be used for Systems Management Server (SMS) deployment.

## Creating an AnyConnect Web Security Client Profile

To create an AnyConnect Web Security client profile, follow this procedure:

- Step 1** Start the Web Security Profile Editor using one of these methods:

- From ASDM, open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**, and click **Add** to create a client profile.
- In Standalone mode on Windows, select **Start > Programs > Cisco > Cisco AnyConnect Profile Editor > Web Security Profile Editor**.

- Step 2** If you are using the standalone profile editor, give the client profile a **name**.
- Step 3** Click the **Profile Usage** field, and select **Web Security**.
- Step 4** Accept the default Profile Location or click **Browse** to specify an alternate file location.
- Step 5** (Optional) Select a **Group Policy** to attach the client profile or leave the client profile <Unassigned>.
- Step 6** Save the AnyConnect Web Security client profile.
- 

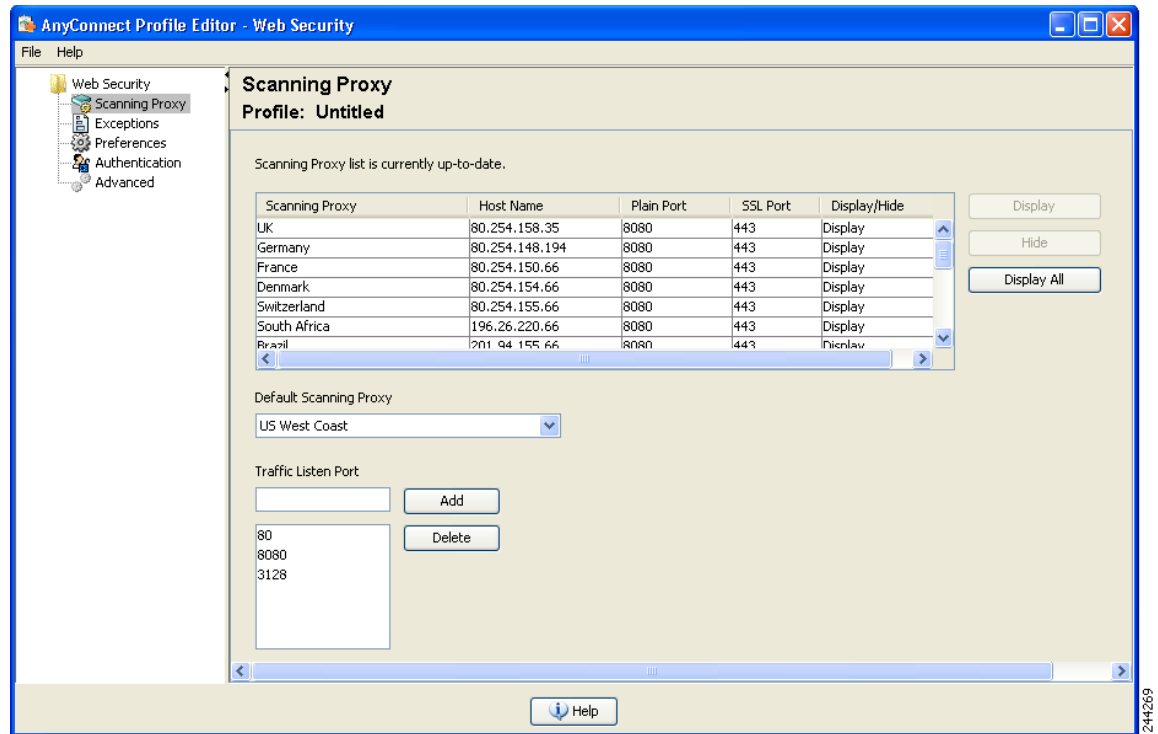
When you have created the AnyConnect Web Security client profile, you will need to configure these aspects of the profile:

- [Configuring Cisco Cloud Web Security Scanning Proxies in the Client Profile, page 6-8](#)
- [Excluding Endpoint Traffic from Web Scanning Service, page 6-12](#)
- [Configuring User Controls and Calculating Fastest Scanning Proxy Response Time, page 6-15](#)
- [Configuring Secure Trusted Network Detection, page 6-16](#)
- [Configuring Authentication and Sending Group Memberships to the Cisco Cloud Web Security Proxy, page 6-17](#)

After you create and save the AnyConnect Web Security client profile, ASDM makes two copies of the XML file; one file is obfuscated and the other is in plain text. To learn more about these files see the [“Web Security Client Profile Files” section on page 6-23](#).

## Configuring Cisco Cloud Web Security Scanning Proxies in the Client Profile

Cisco Cloud Web Security analyzes Web content; it allows benign content to be delivered to your browser and blocks malicious content based on a security policy. A scanning proxy is a Cisco Cloud Web Security proxy server on which Cisco Cloud Web Security analyzes the Web content. The Scanning Proxy panel in the AnyConnect Web Security profile editor defines to which Cisco Cloud Web Security scanning proxies the AnyConnect Web Security module sends Web network traffic.

**Figure 6-2 Web Security Client Profile Scanning Proxy Panel**

Use these procedures to define Cisco Cloud Web Security scanning proxies in an AnyConnect Web Security client profile:

- [Creating an AnyConnect Web Security Client Profile, page 6-7](#)
- [Displaying or Hiding Scanning Proxies from Users, page 6-10](#)
- [Selecting a Default Scanning Proxy, page 6-11](#)
- [Specifying an HTTP\(S\) Traffic Listening Port, page 6-12](#)

## Updating the Scanning Proxy List

The Scanning Proxy list in the Web Security profile editor is not editable. You cannot add or remove Cisco Cloud Web Security scanning proxies from the table in the Web Security profile editor.

After you Start the Web Security profile editor, it updates the scanning proxy list automatically by contacting a Cisco Cloud Web Security website, which maintains the current list of scanning proxies.

When you add or edit an AnyConnect Web Security client profile, the profile editor compares the existing list of Cisco Cloud Web Security scanning proxies to those in the scanning proxy list it downloaded from the <http://www.scansafe.cisco.com/> website. If the list is out of date, you see a message saying “Scanning Proxy list is out of date” and a command button labeled Update List. Click the **Update List** button to update the scanning proxy list with the most recent list of Cisco Cloud Web Security scanning proxies.

When you click **Update List**, the profile editor takes care to maintain as much of your existing configuration as possible. Profile editor preserves your default scanning proxy setting and the display/hide settings for the existing Cisco Cloud Web Security scanning proxies.

## Default Scanning Proxy Settings in a Web Security Client Profile

By default, the profile you create has these Cisco Cloud Web Security scanning proxy attributes:

- The scanning proxy list is populated with all the Cisco Cloud Web Security scanning proxies your users have access to and they are all marked “Display.” See the [“Displaying or Hiding Scanning Proxies from Users” section on page 6-10](#) for more information.
- A default Cisco Cloud Web Security scanning proxy is pre-selected. To configure the default Cisco Cloud Web Security scanning proxy see the [“Selecting a Default Scanning Proxy” section on page 6-11](#).
- The list of ports on which the AnyConnect Web Security module listens for HTTP traffic is provisioned with several ports. See the [“Specifying an HTTP\(S\) Traffic Listening Port” section on page 6-12](#) for more information.

## Displaying or Hiding Scanning Proxies from Users

After users establish a VPN connection to the ASA, the ASA downloads a client profile to the endpoint. The AnyConnect Web Security client profile determines which Cisco Cloud Web Security scanning proxies are displayed to users.

Users interact with the scanning proxies marked “Display” in the scanning proxy list of the AnyConnect Web Security client profile in these ways:

- The Cisco Cloud Web Security scanning proxies are displayed to users in the Advanced settings of the Web Security panel of their Cisco AnyConnect Secure Mobility Client interface.
- The AnyConnect Web Security module tests Cisco Cloud Web Security scanning proxies marked “Display” when ordering scanning proxies by response time.
- Users can choose which Cisco Cloud Web Security scanning proxy they connect to if their profile allows for user control.
- Cisco Cloud Web Security scanning proxies marked “Hide” in the scanning proxy table of the AnyConnect Web Security client profile are not displayed to users or evaluated when ordering scanning proxies by response time. Users cannot connect to the scanning proxies marked “Hide.”

**Note**

For the maximum benefit to roaming users, we recommend you “Display” all Cisco Cloud Web Security scanning proxies to all users.

To hide or display Cisco Cloud Web Security scanning proxies to users, follow this procedure:

- 
- Step 1** Start the Web Security Profile Editor using one of these methods:
- From ASDM, open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**.
  - In Standalone mode on Windows, select **Start > Programs > Cisco > Cisco AnyConnect Profile Editor > Web Security Profile Editor**.
- Step 2** Open the Web Security client profile you wish to edit.
- Step 3** To hide or display Cisco Cloud Web Security scanning proxies:
- **To hide a scanning proxy**, select the scanning proxy you want to hide and click **Hide**.

- **To display a scanning proxy**, select the name of scanning proxy you want to display and click **Display**. Displaying all Cisco Cloud Web Security scanning proxies is the recommended configuration.

**Step 4** Save the AnyConnect Web Security client profile.

---

## Selecting a Default Scanning Proxy

To define a default Cisco Cloud Web Security scanning proxy, follow this procedure:

- 
- Step 1** Start the Web Security Profile Editor using one of these methods:
- From ASDM, open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**.
  - In Standalone mode on Windows, select **Start > Programs > Cisco > Cisco AnyConnect Profile Editor > Web Security Profile Editor**.
- Step 2** Open the Web Security client profile you wish to edit.
- Step 3** Select a default scanning proxy from the **Default Scanning Proxy** field.
- Step 4** Save the AnyConnect Web Security client profile.
- 

## How Users Get Connected to Scanning Proxies

1. When users first connect to the network, they are routed to their default scanning proxy.
2. After that, depending on how their profile is configured, users may choose a scanning proxy or the AnyConnect Web Security module connects them to the scanning proxy with the fastest response time.
  - If their client profile allows user control, users will be able to select a scanning proxy from the Settings tab for the Cisco AnyConnect Secure Mobility Client Web Security tray.
  - If their client profile has the Automatic Scanning Proxy Selection preference enabled, AnyConnect Web Security orders the scanning proxies from fastest to slowest and connects users to the scanning proxy with the fastest response time.
  - If their client profile does not allow for user control but **Automatic Scanning Proxy Selection** is enabled, AnyConnect Web Security will switch users from their default scanning proxy to the scanning proxy with the fastest response time, provided that the response time is significantly faster than the default scanning proxy to which they originally connected.
  - If users start to roam away from their current scanning proxy and **Automatic Scanning Proxy Selection** is configured in their client profile, AnyConnect Web Security could switch users to a new scanning proxy, provided that its response time is significantly faster than their current scanning proxy.

Users will know what scanning proxy they are connected to because AnyConnect Web Security displays the enabled scanning proxy name in the expanded AnyConnect tray icon on Windows, the Advanced Settings tab, and the Advanced Statistics tab of the AnyConnect GUI.

## Specifying an HTTP(S) Traffic Listening Port

The Scan Safe web scanning service analyzes HTTP Web traffic by default and can be configured to filter HTTPS Web traffic. In the Web Security client profile, you can specify the ports on which you want Web Security to “listen” for these types of network traffic.

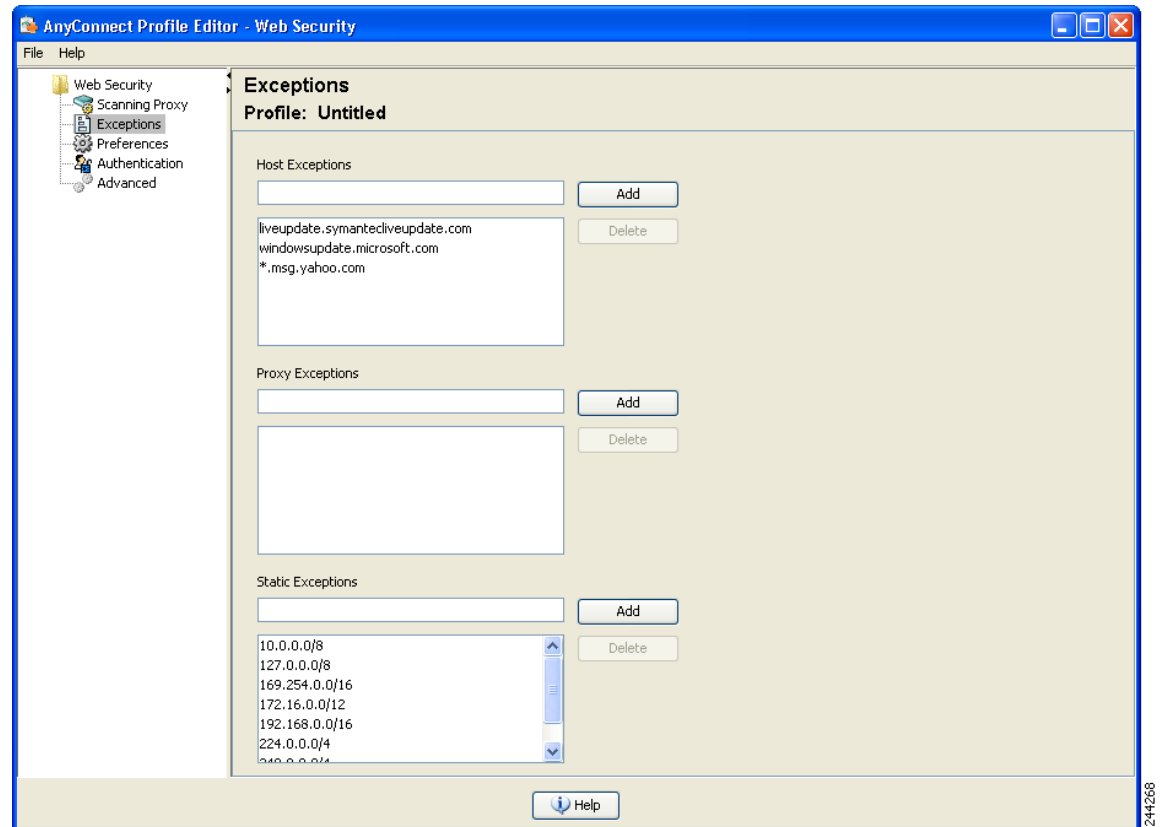
- 
- Step 1** Start the Web Security Profile Editor using one of these methods:
- From ASDM, open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**.
  - In Standalone mode on Windows, select **Start > Programs > Cisco > Cisco AnyConnect Profile Editor > Web Security Profile Editor**.
- Step 2** Open the Web Security client profile you wish to edit.
- Step 3** In the **Traffic Listen Port** field, enter the logical port number you want Web Security module to “listen” to for HTTP or HTTPS traffic or both.
- Step 4** Save the Web Security client profile.
- 

## Excluding Endpoint Traffic from Web Scanning Service

If you do not want network traffic, originating from a particular IP address, to be evaluated by Cisco Cloud Web Security, you can configure an exception for that address in one of these categories:

- [Host Exceptions](#)
- [Proxy Exceptions](#)
- [Static Exceptions](#)

These exclusions are configured in the Exceptions panel of the Web Security profile editor. See Figure 6-3.

**Figure 6-3 Web Security Profile Editor Exceptions Panel**

## Host Exceptions

In the Host Exceptions list, add internal subnets and any public websites you want to bypass the Cisco Cloud Web Security.



### Note

Host exceptions for HTTPS must be in IP format. Host names will not work because in HTTPS communications the host name is encrypted.

See Figure 6-3 for a picture of the Exceptions panel.

You should add any internal subnets you use that are not already included in the default, for example:

```
192.0.2.0/8
```

You should also add any internal or external websites for which you want to enable direct access. For example:

```
update.microsoft.com
*.salesforce.com
*.mycompanydomain.com
```

Also, you must add any public IP addresses you use for intranet services; otherwise, you will not be able to access those intranet servers through Web Security.

You can enter subnets and IP addresses using this syntax:

| Syntax                                                    | Example                                                                                                                                     |
|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Individual IPv4 and IPv6 addresses                        | 80.254.145.118<br>2001:0000:0234:C1AB:0000:00A0:AABC:003F                                                                                   |
| Classless Inter-Domain Routing (CIDR) notation            | 10.0.0.0/8<br>2001:DB8::/48                                                                                                                 |
| Fully Qualified Domain Names                              | windowsupdate.microsoft.com<br>ipv6.google.com<br><b>Note</b> Partial domains are not supported; for example, example.com is not supported. |
| Wildcards in fully qualified domain names or IP addresses | 127.0.0.*<br>*.cisco.com                                                                                                                    |



**Caution**

Do not use wildcards on both sides of a top level domain, for example \*.cisco.\*, as this could include phishing sites.



**Caution**

Do not delete or change any of the default host exception entries.

## Proxy Exceptions

In the Proxy Exceptions area, enter the IP addresses of authorized internal proxies. For example: 192.168.2.250. See Figure 6-3 for a picture of the Exceptions panel.

You can specify IPv4 and IPv6 addresses in the field, but you cannot specify a port number with them. You cannot specify IP addresses using CIDR notation.

Specifying IP addresses prevents Cisco Cloud Web Security from intercepting Web data bound for these servers and tunneling the data through them using SSL. This allows proxy servers to operate without disruption. If you do not add your proxy servers here, they will see Cisco Cloud Web Security traffic as SSL tunnels.

For proxies not on this list, Web Security attempts to tunnel through them using SSL, so if your users are at a different company site that requires a proxy to get out of the network for Internet access, Cisco Cloud Web Security will provide the same level of support as if they were on an open Internet connection.

## Static Exceptions

Add a list of individual IP addresses or IP address ranges in Classless Inter-Domain Routing (CIDR) notation for which traffic should bypass Cisco Cloud Web Security. In the list, include the ingress IP addresses of your VPN gateways. See Figure 6-3.

Private IP addresses described in [RFC 1918](#) are included in the static exception list by default.



**Note**

If you have a Proxy Server that has an IP address in one of the ranges that appear in the static exception list, then you must move that exception to the host exception list. For example, 10.0.0.0/8 appears in the static exception list. If you have a proxy at 10.1.2.3 then you must move 10.0.0.0/8 to the host exception list, otherwise traffic sent to this proxy will bypass Cloud Web Security.

You can specify IPv4 and IPv6 addresses or ranges of addresses using CIDR notation. You cannot specify fully qualified domain names or use wildcards in IP addresses. These are examples of correct syntax:

```
10.10.10.5
192.0.2.0/24
```

**Note**

Make sure to add the IP addresses of your SSL VPN concentrators to the static exclusion list.

### User Guideline for IPv6 Web Traffic

Unless an exception for an IPv6 address, domain name, address range, or wildcard is specified, IPv6 web traffic will be sent to the scanning proxy where it will perform a DNS lookup to see if there is an IPv4 address for the URL the user is trying to reach. If the scanning proxy finds an IPv4 address, it will use that for the connection. If it does not find an IPv4 address, the connection will be dropped.

If you want all IPv6 traffic to bypass the scanning proxies, you can add this static exception for all IPv6 traffic `::/0`. Doing this will make all IPv6 traffic bypass all scanning proxies. This means that IPv6 traffic will not be protected by Web Security.

## Configuring Web Scanning Service Preferences

Use this panel to configure these preferences:

- [Configuring User Controls and Calculating Fastest Scanning Proxy Response Time, page 6-15](#)
- [Configuring Secure Trusted Network Detection, page 6-16](#)

### Configuring User Controls and Calculating Fastest Scanning Proxy Response Time

To allow users to choose the Cisco Cloud Web Security scanning proxy they connect to, follow this procedure:

- Step 1** Start the Web Security Profile Editor using one of these methods:
  - From ASDM, open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**.
  - In Standalone mode on Windows, select **Start > Programs > Cisco > Cisco AnyConnect Profile Editor > Web Security Profile Editor**.
- Step 2** Open the Web Security client profile you wish to edit.
- Step 3** Click **Preferences**.
- Step 4** Select **User Controllable**. (This is the default setting.) User Controllable determines if the User is allowed to change the Automatic Tower Selection and Order Scanning Proxies by Response Time settings in the AnyConnect interface.

**Step 5** Select **Enable Cloud-Hosted Configuration** to enable updating the profile via Cisco ScanCenter. For further information see the [ScanCenter Administrator Guide, Release 5.2](#).

**Step 6** If you would like Web Security to automatically select a scanning proxy, select **Automatic Scanning Proxy Selection**. If you do this, **Order Scanning Proxies by Response Time** is selected automatically.

- If you select **Automatic Scanning Proxy Selection**, Web Security determines which scanning proxy has the fastest response time and automatically connects the user to that scanning proxy.
- If you do not select **Automatic Scanning Proxy Selection**, and you still have **Order Scanning Proxies by Response Time** selected, users will be presented with a list of scanning proxies, to which they can connect, ordered from fastest to slowest response time.
- If you do not select **Automatic Scanning Proxy Selection**, the user is still free to enable this feature from the AnyConnect user interface, but once enabled they will not be able to switch it off again.

**Note**

When you enable Automatic Scanning Proxy Selection, transient communications interruptions and failures can cause the active scanning proxy selection to change automatically. Changing the scanning proxy can sometimes be undesirable, as it can cause unexpected behavior such as returning search results from a scanning proxy in a different country using a different language.

**Step 7** If you selected **Order Scanning Proxies by Response Time**, configure these settings for calculating which scanning proxy has the fastest response time.

- **Test Interval:** The time, in minutes, between running each performance test, two minutes by default. You can switch off the test interval to prevent the test from running by clearing the **Enable Test Interval** check box.
- **Test Inactivity Timeout:** The time, in minutes, after which Web Security suspends the response time test because of user inactivity. Web Security resumes the testing as soon as scanning proxies encounter connection attempts. You should not change this setting unless instructed to do so by customer support.

**Note**

The **Ordering Scanning Proxies by Response Time** test runs continuously, based on the Test Interval time, with these exceptions:

- Secure Trusted Network Detection is enabled and has detected that the machine is on the Corporate LAN.
- The Web Security license key is missing or invalid.
- The user is inactive for a configured amount of time and, as a result, the Test Inactivity Timeout threshold has been met.

**Step 8** Save the Web Security client profile.

## Configuring Secure Trusted Network Detection

The Secure Trusted Network Detection feature detects when an endpoint is on the corporate LAN, either physically or by means of a VPN connection. If the Secure Trusted Network Detection feature is enabled, any network traffic originating from the corporate LAN bypasses Cisco Cloud Web Security scanning proxies. The security of that traffic gets managed by other methods and devices sitting on the corporate LAN rather than Cisco Cloud Web Security.

**Note**

For the equivalent feature for the VPN module, see [Trusted Network Detection, page 3-22](#).

Secure Trusted Network Detection verifies the client is connected to the corporate network using the SHA-256 hash (thumbprint) of an SSL certificate on a server at a known URL (address, IP, or FQDN). The encryption algorithm used by the certificate does not matter but only an SHA-256 hash can be used.

If you choose not to use Secure Trusted Network Detection and you have any proxies on your network, for example Cisco Cloud Web Security Connector, you must add each proxy to the list of proxy exceptions in the Exceptions panel in profile editor. See [Proxy Exceptions, page 6-14](#).

When operating from outside your internal network, Secure Trusted Network Detection makes DNS requests and attempts to contact the HTTPS server you provisioned. Cisco strongly recommends the use of aliasing to ensure that the name and internal structure of your organization are not revealed through these request by a machine being used outside your internal network.

Ensure you have a direct connection to the server where the SSL certificate is hosted and then follow this procedure to configure Web Security's interaction with Secure Trusted Network Detection:

- Step 1** Start the Web Security Profile Editor using one of these methods:
- From ASDM, open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**.
  - In Standalone mode on Windows, select **Start > Programs > Cisco > Cisco AnyConnect Profile Editor > Web Security Profile Editor**.
- Step 2** Open the Web Security client profile you wish to edit.
- Step 3** Click **Preferences** in the Web Security tree pane.
- Step 4** Select **Enable Trusted Network Detection**.
- Step 5** In the **https** box, enter the URL of each Trusted Server you want to add, then click **Add**. The URL may include the port address (default 443). The profile editor attempts to connect to Trusted Server. If this is not possible for some reason, but you know the SHA-256 hash of the server's certificate, you can enter it in the **Certificate hash** box and click **Set**.

**Note**

Trusted servers behind proxies are not supported.

- Step 6** Save the Web Security client profile.

## Configuring Authentication and Sending Group Memberships to the Cisco Cloud Web Security Proxy

- Step 1** Start the Web Security Profile Editor using one of these methods:
- From ASDM, open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**.
  - In Standalone mode on Windows, select **Start > Programs > Cisco > Cisco AnyConnect Profile Editor > Web Security Profile Editor**.
- Step 2** Open the Web Security client profile you wish to edit.

- Step 3** Click **Authentication**. See Figure 6-4 for an illustration of the fields you configure in this procedure.
- Step 4** In the **Proxy Authentication License Key** field, enter the license key that corresponds to the company key, group key, or user key you created in Cisco ScanCenter. If you are going to authenticate users based on their Enterprise domain, enter the company key you created. If you are going to authenticate users based on their Cisco ScanCenter or Active Directory group, enter the group key you created. By default the tag is empty. If it is left empty, Web Security operates in pass-through mode.
- Step 5** Enter a **Service Password**. The default password for Web Security is **websecurity**. You can change this password when customizing the profile. The password must contain only alphanumeric characters (a-z, A-Z, 0-9) and the following special characters as other characters may be mistaken for control characters by the Windows command shell or may have special meaning in XML.

~ @ # \$ % \* - \_ + = { } [ ] : , . ? /

With this password, a user with administrator privileges can stop the Web Security service. Users with or without administrator privileges can start the Web Security service without this password. See the [“The service password used in this procedure is configured in the Authentication panel of the Web Security profile editor.”](#) section on page 6-28 for more information.

- Step 6** You can send the scanning proxy server Enterprise Domain information and Cisco Cloud Web Security or Active Directory group information with every HTTP request. The scanning proxy will apply traffic filtering rules based on what it knows of the user’s domain and group membership.



**Note**

If you want to send the scanning server proxy a custom username and custom group information for a user, or your enterprise does not use Active Directory, skip this step and go to [Step 7](#).

- Click **Enable Enterprise Domains**. In the list, click **All Domains**. When the **All Domains** option is selected, and the machine is on a domain, then whatever domain the user belongs to will be matched and the username and group membership information will be sent to the Cisco Cloud Web Security scanning proxy. This is useful for companies where there is more than one domain present.
- Alternatively, click **Specify Individual Domains**.

Enter each domain name in NetBIOS format then click **Add**. For example the NetBIOS format of **example.cisco.com** is **cisco**. Do not enter domain names using the DNS format: **abc.def.com**.

If you specify a domain name in the Enterprise Domain name field, then Cisco Cloud Web Security identifies the currently logged-in Active Directory user and enumerates that user’s Active Directory groups and that information gets sent to the scanning proxy with every request.

- In the **Use** list, click **Group Include List** or **Group Exclude List** to either include or exclude group information in HTTP requests to the Cisco Cloud Web Security scanning proxy. Values can be any substring of the string to be matched.

**Group Include List.** After selecting **Group Include List**, add the Cisco Cloud Web Security or Active Directory group names to the Group Include list that you want to send to the Cisco Cloud Web Security scanning proxy server with HTTP requests. If a request comes from a user in the specified Enterprise Domain, the HTTP request will be filtered in accordance with the user’s group membership. If the user has no group membership, HTTP requests will be filtered using a default set of filtering rules.

**Group Exclude List.** After selecting **Group Exclude List**, add the Cisco Cloud Web Security or Active Directory group names to the Group Exclude list that you do not want to send to the Cisco Cloud Web Security scanning proxy server with HTTP requests. If the user belong to one of the groups in the Group Exclude List, that group name will not be sent to the scanning proxy server and

the user's HTTP requests will be filtered either by other group memberships or, at the minimum, by a default set of filtering rules defined for users with no Active Directory or Cisco Cloud Web Security group affiliation.

Now go to step 8.

**Step 7** Click **Custom matching and reporting for machines not joined to domains** to send the scanning proxy server custom name.

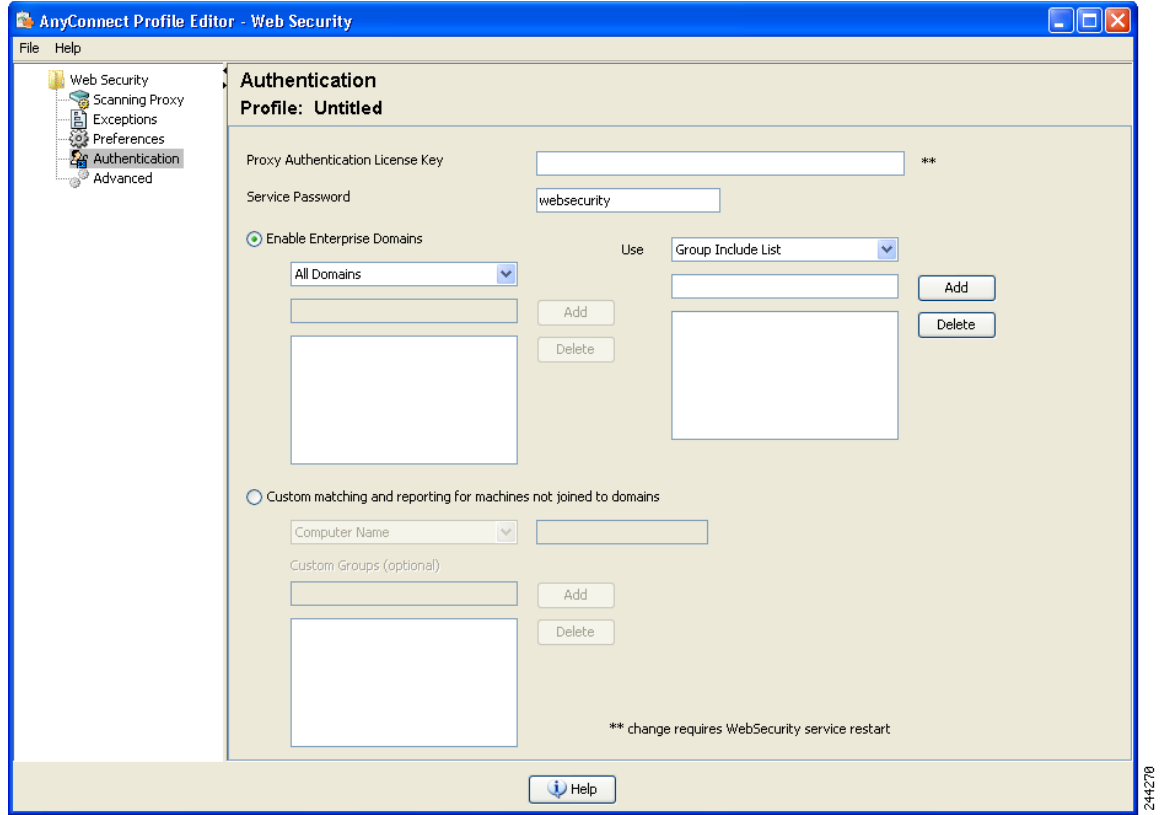
- In the list, click **Computer Name** to use the name of the computer. Alternatively, click **Local User** to use the local user name. Alternatively, click **Custom Name** and enter a custom user name. It could be defined by any string. If you do not enter a string, the IP address of the computer will be sent to the scanning proxy server instead. This username or IP address will be used in any Cisco ScanCenter reports that identify HTTP traffic from the custom user.
- In the **Authentication Group** field, enter a custom group name of up to 256 alphanumeric characters and click **Add**.

When HTTP requests are sent to the scanning proxy server, if a custom group name was sent, and there is a corresponding group name on the scanning proxy server, the HTTP traffic will be filtered by the rules associated with the custom group name. If there is not a corresponding custom group defined on the scanning proxy server, HTTP requests are filtered by the default rules.

If you only configured a custom user name and no custom group, HTTP requests will be filtered by the scanning proxy server default rules.

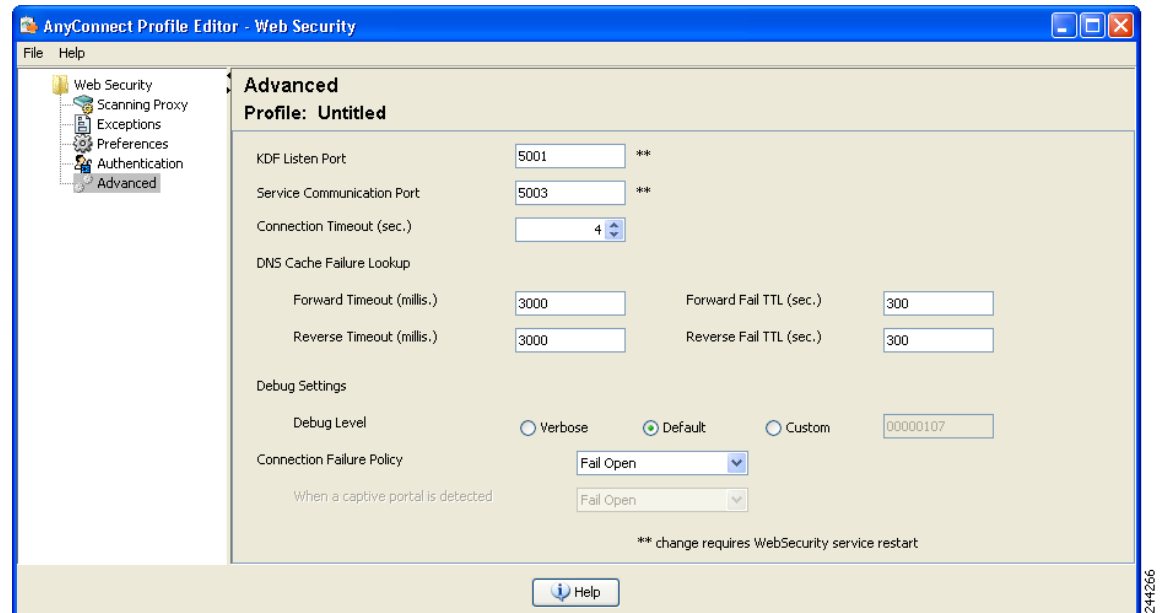
**Step 8** Save the Web Security client profile.

---

**Figure 6-4** Configuring Cisco Cloud Web Security Scanning Proxy Authentication

## Configuring Advanced Web Security Settings

The Advanced panel of a web security client profile exposes several settings that may help Cisco customer support engineers troubleshoot problems. You should not change the setting on this panel unless you are instructed to do so by customer support.

**Figure 6-5 Web Security Client Profile Advanced Panel**

From the Advanced panel in profile editor, you can perform these tasks:

- [Configuring KDF Listening Port, page 6-21](#)
- [Configuring Service Communication Port, page 6-22](#)
- [Configuring Connection Timeout, page 6-22](#)
- [Configuring DNS Cache Failure Lookup, page 6-23](#)
- [Configuring Debug Settings, page 6-23](#)
- [Configuring Fail Behavior, page 6-23](#)

## Configuring KDF Listening Port

The Kernel Driver Framework (KDF) intercepts all connections which use one of the Traffic Listening Ports as their destination port and forwards the traffic to the KDF Listening Port. The web scanning service analyzes all the traffic forwarded to the KDF Listening Port.

You should not change this setting unless instructed to do so by customer support.

- 
- Step 1** Start the Web Security Profile Editor using one of these methods:
- From ASDM, open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**.
  - In Standalone mode on Windows, select **Start > Programs > Cisco > Cisco AnyConnect Profile Editor > Web Security Profile Editor**.
- Step 2** Open the Web Security client profile you wish to edit.
- Step 3** Click **Advanced** in the Web Security tree pane. See Figure 6-5 for an illustration of the **Advanced** panel in the Web Security profile editor.
- Step 4** Specify the KDF Listen Port in the **KDF Listen Port** field.

- Step 5** Save the Web Security client profile.
- 

## Configuring Service Communication Port

The Service Communication Port is the port on which the web scanning service listens for incoming connections from the AnyConnect GUI component, and some other utility components. You should not change this setting unless instructed to do so by customer support.

- 
- Step 1** Start the Web Security Profile Editor using one of these methods:
- From ASDM, open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**.
  - In Standalone mode on Windows, select **Start > Programs > Cisco > Cisco AnyConnect Profile Editor > Web Security Profile Editor**.
- Step 2** Select the Web Security client profile you wish to edit and click **Edit**. Click **Advanced** in the Web Security tree pane. See Figure 6-5 for an illustration of the **Advanced** panel in the Web Security profile editor.
- Step 3** Edit the **Service Communication Port** field.
- Step 4** Save the Web Security client profile.



**Note** If you change the port from the default value of 5300 you must restart the Web Security service and the AnyConnect GUI component.

---

## Configuring Connection Timeout

The connection timeout setting enables you to set the time-out before Web Security tries to go direct to the Internet without using the scanning proxies. If left blank, it will use the default value of four seconds. This allows users to get access to paid network services faster as they will not have to wait so long for the time-out to happen before retrying.

Follow this procedure to configure the Connection Timeout field:

- 
- Step 1** Start the Web Security Profile Editor using one of these methods:
- From ASDM, open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**.
  - In Standalone mode on Windows, select **Start > Programs > Cisco > Cisco AnyConnect Profile Editor > Web Security Profile Editor**.
- Step 2** Open the Web Security client profile you wish to edit.
- Step 3** Click **Advanced** in the Web Security tree pane. See Figure 6-5 for an illustration of the **Advanced** panel in the Web Security profile editor.
- Step 4** Change the **Connection Timeout** field.



**Step 5** Save the Web Security client profile.

---

## Configuring DNS Cache Failure Lookup

In the Advanced panel of profile editor you will see several fields for managing Domain Name Server lookups. These settings have been configured with optimal values for DNS lookups. You should not change this setting unless instructed to do so by customer support.

## Configuring Debug Settings

The Debug Level is a configurable field; however, you should not change this setting unless instructed to do so by customer support.

## Configuring Fail Behavior

In the **Connection Failure Policy** list, select **Fail Close** to block traffic if a connection to the Cisco Cloud Web Security proxy server cannot be established. Alternatively, select **Fail Open** to allow traffic.

In the **When a captive portal is detected** list, select **Fail Open** to allow traffic if a connection to the Cisco Cloud Web Security proxy server cannot be established but a captive portal, such as a Wi-Fi hot spot, is detected. Alternatively, select **Fail Close** to block traffic.



**Note**

If host, proxy, or static exceptions are configured to include the captive portal address then Fail Close will not block traffic.

---

## Web Security Logging

### Windows

All Web Security messages are recorded in the Windows Event Viewer in the **Event Viewer (Local)\Cisco AnyConnect Web Security Module** folder. The events Web Security records in the event viewer are intended to be analyzed by Cisco Technical Assistance Center engineers.

### Mac OS X

You can view Web Security messages from the syslog or console.

## Web Security Client Profile Files

After you create and save the Web Security client profile using the profile editor bundled with AnyConnect, the profile editor makes two copies of the XML file; one file is obfuscated and has the file naming convention *filename.wso*; the other is in plain text and has the file naming convention *filename.wsp*.

After you create and save the Web Security client profile using the standalone profile editor, the plain text version of the client profile has the file naming convention *filename.xml* and the obfuscated file naming convention is *filename.wso*.

Having these two formats allows administrators to perform this special processing if needed:

- Administrators can export the obfuscated Web Security client profile from the ASA and can distribute it to endpoint devices.
- Administrators can edit the plain text Web Security client profile and perform edits that are not supported by the AnyConnect Web Security profile editor. You should not change the plain text version of the Web Security client profile unless instructed to do so by customer support.

## Exporting the Plain Text Web Security Client Profile File

- 
- |               |                                                                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b> | Open ASDM and choose <b>Configuration &gt; Remote Access VPN &gt; Network (Client) Access &gt; AnyConnect Client Profile</b> .                                       |
| <b>Step 2</b> | Select the Web Security client profile you wish to edit and click <b>Export</b> .                                                                                    |
| <b>Step 3</b> | Browse to a local folder in which to save the file. Editing the file name in the Local Path field will save the Web Security client profile with that new file name. |
| <b>Step 4</b> | Click <b>Export</b> . ASDM exports the plain text <i>filename.wsp</i> version of the web security client profile.                                                    |
- 

## Exporting the Plain Text Web Security Client Profile File for DART Bundle

If you need to send a Diagnostic AnyConnect Reporting Tool (DART) bundle to Cisco customer service, you need to send the plain text version of the Web Security client profile file, *filename.wsp* or *filename.xml*, along with the DART bundle. Cisco Customer service will not be able to read the obfuscated version.

To gather the plain text version of the Web Security client profile created by the profile editor on ASDM, use the [Exporting the Plain Text Web Security Client Profile File](#) procedure.

The standalone version of Profile editor creates two versions of the Web Security profile file; one file is obfuscated and has the file naming convention *filename.wso* and the other is in plain text and has the file naming convention *filename.xml*. Gather the plain text version of the file, *filename.xml*.

Before sending the DART bundle to Cisco customer service, add the plain text version of your Web Security client profile to the DART bundle.

## Editing and Importing Plain Text Web Security Client Profile Files from ASDM

When you have exported the plain text Web Security client profile file, you can edit it on your local computer using any plain text or XML editor. Use this procedure to import it.



### Caution

Importing the file **overwrites** the contents of the Web Security client profile you selected.

---

- 
- |               |                                                                                                                                                                 |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b> | Open ASDM and choose <b>Configuration &gt; Remote Access VPN &gt; Network (Client) Access &gt; AnyConnect Client Profile</b> .                                  |
| <b>Step 2</b> | Select the Web Security client profile you wish to edit and click <b>Export</b> .                                                                               |
| <b>Step 3</b> | After making the changes to the <i>filename.wsp</i> file, return to the AnyConnect Client Profile page and select the Profile Name of the file that you edited. |
| <b>Step 4</b> | Click <b>Import</b> .                                                                                                                                           |

- Step 5** Browse to the edited version of the Web Security client profile and click **Import**.
- 

## Exporting the Obfuscated Web Security Client Profile File

- Step 1** Open ASDM and choose **Tools > File Management**.
- Step 2** In the File Management screen click **File Transfer > Between Local PC and Flash** and use the File Transfer dialog to transfer the obfuscated *filename.wso* client profile file to your local computer.
- 

## Creating a Web Security Client Profile with the Standalone Editor

- Step 1** Open the Web Security Standalone Profile Editor by choosing **Start > All Programs > Cisco > Cisco AnyConnect Profile Editor > Web Security Profile Editor**.
- Step 2** Create a Web Security client profile using the [“Creating an AnyConnect Web Security Client Profile” section on page 6-7](#).
- Step 3** Save the Web Security client profile by choosing **File > Save**. The standalone profile editor makes two copies of the XML file; one file is obfuscated and has the file naming convention *filename.wso*; the other is in plain text and has the file naming convention *filename.xml* (equivalent of the *wsp* file generated by the ASDM tool).
- Step 4** Rename or save the obfuscated *filename.wso* client profile file with the name **WebSecurity\_ServiceProfile.wso** to one of these directories:
- For Windows XP users, put the file in this folder:  
**%ALLUSERSPROFILE%\Application Data\Cisco\Cisco AnyConnect Secure Mobility Client\Web Security**
  - For Windows Vista and Windows 7 users, put the file in the this folder:  
**%ALLUSERSPROFILE%\Cisco\Cisco AnyConnect Secure Mobility Client\Web Security**
  - For Mac users, put the file in this folder:  
**/opt/cisco/anyconnect/websecurity**
- Step 5** Restart the Cisco AnyConnect Web Security Agent windows service using the [“Switching off and Enabling the Cisco AnyConnect Web Security Agent” section on page 6-28](#).
- 

## Configuring Split Exclusion Policy for Web Security

### Information about the Split Exclusion Policy

When a user has established a VPN session, all network traffic is sent through the VPN tunnel. However, when AnyConnect users are using web security, the HTTP traffic originating at the endpoint needs to be excluded from the tunnel and sent directly to the Cloud Web Security scanning proxy.

To set up the split tunnel exclusions for traffic meant for the Cloud Web Security scanning proxy, use the **Set up split exclusion for Web Security** button in a group policy.

## Prerequisites

- Web security needs to be configured for use with the AnyConnect client.
- You have created a Group Policy and assigned it a Connection Profile for AnyConnect clients configured with Web Security.

## Detailed Steps

- 
- Step 1** Start an ASDM session for the head end you want to configure and select **Remote Access VPN > Configuration > Group Policies**.
- Step 2** Select the Group Policy you want to configure and click **Edit**.
- Step 3** Select **Advanced > Split Tunneling**.
- Step 4** Click **Set up split exclusion for Web Security**.
- Step 5** Enter a new, or select an existing, access list used for Web Security split exclusion. ASDM will set up the access list for use in the network list.
- Step 6** Click **Create Access List** for a new list or **Update Access List** for an existing list.
- Step 7** Click **OK**.
- 



### Tip

If you use the Secure Trusted Network Detection feature and want to ensure that Web Security and VPN are active at the same time, configure your network so that the HTTPS server is not reachable over the VPN Tunnel. In this way, the Web Security functionality will go into bypass mode, only when the user is on the corporate LAN.

---

## What to do next

When additional scanning proxies are added, update the unified access list you created in this procedure with new information.

# Configuring Cisco ScanCenter Hosted Configuration Support for Web Security Client Profile

Starting in AnyConnect release 3.0.4, the Cisco ScanCenter Hosted Configuration for the Web Security Hosted Client Profile gives administrators the ability to provide new configurations to Web Security clients. This is done by allowing devices with Web Security to download a new Web Security Hosted Client Profile from the cloud (hosted configuration files reside on the Cisco ScanCenter server). The only prerequisite for this feature is for the device to have Web Security installed with a valid client profile. Administrators use the Web Security Profile Editor to create the client profile files and then upload the clear text XML file to a Cisco ScanCenter server. This XML file must contain a valid license key from Cisco Cloud Web Security. The client will retrieve the new config file, at most, eight hours after it is applied to the hosted config server.

The Hosted Configuration feature uses the license key when retrieving a new client profile file from the Hosted Configuration (Cisco ScanCenter) server. Once the new client profile file is on the server, devices with Web Security automatically poll the server and download the new client profile file, provided that the license in the existing Web Security client profile is the same as a license associated with a client profile on the Hosted server. When a new client profile has been downloaded, Web Security will not download the same file again until the administrator makes a new client profile file available.

The process for creating client profile files and making them available for downloading to Web Security devices is as follows:

**Note**

Web Security client devices must be pre-installed with a valid client profile file containing a Cisco Cloud Web Security license key before it can use the Hosted Configuration feature.

- 
- Step 1** Using the Web Security profile editor, create a new client profile for the Web Security device. This client profile must contain the Cisco Cloud Web Security license key. Refer to the [Cisco ScanCenter Administration Guide, Release 5.2](#) for more information about license keys.
- Step 2** Save the client profile file as a clear text XML file. Upload this file to Cisco ScanCenter server. When the file is uploaded, you can make the new client profile available to Web Security clients. For more information on hosted configurations in Cisco Cloud Web Security, refer to [Cisco ScanCenter Administration Guide, Release 5.2](#).
- Step 3** The new client profile can be uploaded and applied via the Cisco ScanCenter for the company, provided that the Hosted Configuration feature has been enabled for the company. A hosted client profile is associated with a license. This means that if there are different licenses in use (for example, different group license keys), each license can have its own client profile associated with it. This allows the administrator to push down a different client profile to different users, depending on which license they have been configured to use. The administrator can store various configurations per license and set a default client profile for clients to download. It is then possible to switch to one of the other revisions of configurations stored in the Hosted Configuration area of Cisco ScanCenter by selecting that client profile as the default. Only one client profile can be associated with a license which means that if there are more than one revision associated with the license that only one can be the default.

**Note**

The restart Web Security agent service option is available only to users who have necessary rights to restart the service.

## Secure Trusted Network Detection

The Secure Trusted Network Detection feature detects when an endpoint is on the corporate LAN, either physically or through a VPN connection. If the Secure Trusted Network Detection feature is enabled, any network traffic originating from the corporate LAN bypasses Cisco Cloud Web Security scanning proxies. The security of that traffic gets managed by other methods and devices sitting on the corporate LAN rather than Cisco Cloud Web Security.

If you choose not to use Secure Trusted Network Detection and you have any proxies on your network, for example Cisco Cloud Web Security Connector, you must add each proxy to the list of proxy exceptions in the Exceptions panel in profile editor. See [Proxy Exceptions, page 6-14](#) for more information.

Configuring Secure Trusted Network Detection is also required for some third-party solutions, such as data loss prevention (DLP) appliances, which requires traffic to be unaffected by Web Security.

## Switching off and Enabling the Cisco AnyConnect Web Security Agent

An administrator can switch off and enable the Cisco AnyConnect Web Security Agent's ability to intercept web traffic by executing the following steps:

### Switching Off and Enabling Filters using Windows

The service password used in this procedure is configured in the Authentication panel of the Web Security profile editor.

- 
- Step 1** Open a command prompt window.
- Step 2** Change to the `%PROGRAMFILES%\Cisco\Cisco AnyConnect Secure Mobility Client` folder.
- Step 3** Switch filtering on or off:
- To enable filtering, enter `acwebsecagent.exe -enablesvc`
  - To switch off filtering, enter `acwebsecagent.exe -disablesvc -servicepassword`
- 

### Switching Filters On and Off Using Mac OS X

The service password used in this procedure is configured in the Authentication panel of the Web Security profile editor.

- 
- Step 1** Launch the Terminal application.
- Step 2** Change to the `/opt/cisco/anyconnect/bin` folder.
- Step 3** Switch off or enable filtering:
- To enable filtering, enter `./acwebsecagent -enablesvc`
  - To switch off filtering, enter `./acwebsecagent -disablesvc -servicepassword`



# Configuring AnyConnect Telemetry to the WSA

The AnyConnect telemetry module for AnyConnect Secure Mobility Client sends information about the origin of malicious content to the web filtering infrastructure of the Cisco IronPort Web Security Appliance (WSA). The web filtering infrastructure uses this data to strengthen its web security scanning algorithms, improve the accuracy of the URL categories and web reputation database, and ultimately provide better URL filtering rules.

The AnyConnect telemetry module performs these functions:

- Monitors the arrival of content on the endpoint.
- Identifies and records the origin of any content received by the endpoint whenever possible.
- Reports detection of malicious content, and its origin to Cisco's Threat Operations Center.
- Checks the ASA every 24 hours for an updated Host Scan image. If there is an updated Host Scan image available, it pulls down the image to the endpoint.



## Note

When Customer Experience Feedback Module is installed and enabled, the feedback module sends telemetry reports along with customer feedback data to our customer feedback server. If the feedback module is not enabled, the telemetry module sends its reports to the Cisco IronPort Web Security Appliance (WSA).

These are the topics covered in this chapter:

- [System Requirements](#)
- [Installing the AnyConnect Telemetry Module](#)
- [AnyConnect Telemetry Module Interoperability](#)
- [Telemetry Activity History Repository](#)
- [Telemetry Reports](#)
- [Configuring the Telemetry Client Profile](#)
- [Configuration Profile Hierarchy](#)

## System Requirements

The AnyConnect telemetry module, hereafter “telemetry module,” is available for this release of AnyConnect Secure Mobility Client running on these platforms:

- Windows 7 (x86 (32-bit) and x64 (64-bit))

- Windows Vista with SP2 (x86 (32-bit) and x64 (64-bit))
- Windows XP SP3 (x86 (32-bit) and x64 (64-bit))

The telemetry module can only perform URL origin-tracing for browsers that use **wininit.dll**, such as Internet Explorer 7 and Internet Explorer 8. If you download a file using a browser which does not use **wininit.dll**, such as Firefox or Chrome, we can only identify the browser used to download the file but not the URL from which the file was downloaded.

The telemetry module requires that an antivirus application, [which the AnyConnect posture module supports](#), be installed on the endpoint.

**Note**

The AnyConnect posture module contains the same Host Scan image as the one delivered with CSD. The list of antivirus, antispysware, and firewall applications supported by Host Scan is the same for AnyConnect and CSD.

## ASA and ASDM Requirements

The AnyConnect Secure Mobility Client with the telemetry module requires these minimum ASA components:

- ASA 8.4
- ASDM is 6.3.1

## AnyConnect Secure Mobility Client Module Requirements

The telemetry module is an add-on of AnyConnect Secure Mobility Client, and it requires these modules to be installed on the endpoint in this order:

1. AnyConnect VPN Module
2. AnyConnect Posture Module
3. AnyConnect Telemetry Module

## Requirements for Cisco IronPort Web Security Appliance Interoperability

You can only enable the telemetry feature if you are using the AnyConnect Secure Mobility solution with the Cisco IronPort Web Security Appliance (WSA) which requires a WSA Secure Mobility Solution license. The minimum required version of the WSA is 7.1.

The AnyConnect Telemetry functionality requires the Secure Mobility Solution to be properly configured. If you have not done so already, see the [Cisco AnyConnect Secure Mobility Solution Guide](#) for an explanation of how to configure the ASA to work properly with the WSA.

## Enable SenderBase on Cisco IronPort Web Security Appliance

The telemetry module sends virus attack incident and activity information to the WSA so that it can be forwarded to the Threat Operations Center and aggregated with other threat information. The WSA must have SenderBase network participation enabled in Standard mode for this to happen.



This is an outline of the procedure to enable the SenderBase Security Service. Consult your WSA documentation for a full description of the SenderBase Security Service.

1. Use a web browser to log into the WSA administrator GUI.
2. Select **Security Services > SenderBase**.
3. If SenderBase network participation is disabled, click **Enable**, and then click **Edit Global Settings** to configure the participation level. Cisco recommends Standard (full) participation.



**Note** For more information on the difference between Limited and Standard participation levels, see the *IronPort AsyncOS for Web User Guide*.

4. Submit and commit your changes.

## Installing the AnyConnect Telemetry Module

You need to install the AnyConnect Secure Mobility Client and AnyConnect posture module on the endpoint before you install the telemetry module. See [Chapter 2, “Deploying the AnyConnect Secure Mobility Client”](#) for instructions on installing the telemetry module using web-deployment and pre-deployment methods. If you would like to read just the basics about deploying the telemetry module, see [Quick-Deploy of the AnyConnect Telemetry Module](#).

Once you install the telemetry module, it immediately begins to record the actions of any new processes that start; however, the telemetry module cannot record the actions of processes that were running on the computer before you installed it.

After you install the telemetry module, it does not track processes of Windows Explorer (explorer.exe), including file copies and renames, until the user logs out and logs back in. In addition, the telemetry module cannot record the actions of other processes that start before the user logs in until after the user reboots the computer.



**Note** Though it is not a requirement, we highly recommend that you reboot the endpoint after you install the telemetry module.

## Quick-Deploy of the AnyConnect Telemetry Module

Here is a summary of the procedure you need to perform to deploy the telemetry module with AnyConnect. This procedure assumes that you have already configured group policies and connection profiles for your AnyConnect VPN users. To deploy the AnyConnect telemetry module, use the following procedure.

- Step 1** Download the AnyConnect Windows package from Cisco.com. The file has this naming convention: anyconnect-win-*<version>*-k9.pkg.
- Step 2** Upload the AnyConnect Windows package to the ASA:
  - a. Launch ASDM and select - **Configuration > Remote Access VPN > Network(Client) Access > AnyConnect Client Settings**.
  - b. Click **Add**.

- c. **Upload** the AnyConnect Windows package to ASDM. When prompted, click **OK**, to use the AnyConnect package as your new current image.
- d. Click **OK**. Click **Apply**.
- e. Restart **ASDM**.

**Step 3** Designate the AnyConnect package as the Host Scan package and enable Host Scan:

- a. In ASDM select **Configuration > Remote Access VPN > Host Scan Image**.
- b. Click **Browse Flash** and select the anyconnect-win-*<version>*-k9.pkg you uploaded in the previous step as the Host Scan Image.
- c. Check **Enable Host Scan/CSD**.
- d. Click **Apply**.
- e. Restart **ASDM**.



---

**Note** This step also results in enabling Host Scan for Clientless SSL VPN Access.

---

**Step 4** Configure a group policy to deploy telemetry as an optional module:

- a. In ASDM select **Configuration > Remote Access VPN > Network(Client) Access > Group Policies**, select the group policy you want to edit and click **Edit**.
- b. Select **Advanced > AnyConnect Client**.
- c. Uncheck the Optional Client Modules to Download **Inherit** check box. From the drop down box, select **AnyConnect Telemetry** and **AnyConnect Posture**.
- d. Click **OK**. Click **Apply**. Click **Save**.

**Step 5** Configure a connection profile to specify the group policy you just configured.

- a. In ASDM select **Configuration > Remote Access VPN > Network(Client) Access > AnyConnect Connection Profiles** and select the connection profile you want to configure for telemetry. Click **Edit**. The **Basic** configuration panel opens automatically.
- b. In the Default Group Policy area, choose the group policy, from the previous step, that you configured to deploy telemetry.
- c. Click **OK**. Click **Apply**. Click **Save**.

**Step 6** Create a telemetry client profile and enable telemetry:

- a. In ASDM select **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profiles**.
- b. Click **Add** to create a telemetry profile. Give the profile a name and select Telemetry in the Profile Usage field.
- c. In the Group Policy field, select the group policy you created to deploy telemetry as an optional module. Click **OK**.
- d. From the list of Profile Names, select the telemetry client profile you just created and click **Edit**.
- e. Click **Enable Service** in the Telemetry Policy panel and accept all the default values for the telemetry client profile.
- f. Click **OK**. Click **Apply**. Click **Save**.

**Step 7** Enable the Secure Mobility Solution:

- a. In ASDM select **Configuration > Remote Access VPN > Network (Client) Access > Secure Mobility Solution**.
  - b. In the Service Setup area, check **Enable Mobile User Security Service**.
  - c. Click **Apply**. Click **Save**.
- 

## AnyConnect Telemetry Module Interoperability

This section describes the telemetry module's interaction with other AnyConnect Secure Mobility client components:

- [AnyConnect VPN Module](#)
- [AnyConnect Posture Module](#)
- [Third-Party Antivirus Software](#)

### AnyConnect VPN Module

The AnyConnect VPN module interacts with the telemetry module in these ways:

- AnyConnect's VPN service process loads and initializes the telemetry module at service starting time along with all other plug-in modules.
- The AnyConnect VPN module provides session state and AnyConnect Secure Mobility (ACSM) state information when the states have changed.
- The AnyConnect VPN module provides the XML of the secure mobility service status response from the WSA in order to get the telemetry settings from WSA.

Other than this, the telemetry module has little interaction with the VPN module and runs independently until the VPN module shuts it down or until the VPN process terminates.

### AnyConnect Posture Module

The AnyConnect posture module, hereafter "posture module," contains the Host Scan image. The Host Scan image passes virus detection information from the Host Scan-compatible antivirus software to the telemetry module. Host Scan can also pass system posture information to the AnyConnect telemetry module if it is needed for the telemetry report.

The telemetry module checks the ASA for an updated Host Scan image every 24 hours. If there is an updated Host Scan image installed on the ASA, the telemetry module pulls down the image and installs the update to the endpoint automatically.

### Third-Party Antivirus Software

The AnyConnect telemetry module needs a Host Scan-compliant antivirus application to detect viruses and malware. Host Scan checks the antivirus application's threat log periodically and forwards the virus detection incidents to the telemetry module.

The threat log of the antivirus application should always be enabled, otherwise Host Scan cannot trigger telemetry reporting.

## Telemetry Activity History Repository

The telemetry activity history repository is a directory on the endpoint in which the telemetry module stores activity files. This is the location of the activity history repository:

```
%ALLUSERSPROFILE%\Application Data\Cisco\Cisco AnyConnect Secure Mobility
Client\Telemetry\data\
```

The telemetry module intercepts system operations, user operations, and API function calls, which it can use to identify the origin of the content coming into the endpoint. It aggregates this information into application activities, such as the download of a file from a URL by Internet Explorer (iexplorer.exe) or the copying of a file from a removable device by Windows Explorer (explorer.exe).

The telemetry module gathers this activity and records it in the activity.dat file. The activity.dat file is the activity history file.

When the activity.dat file reaches the size of approximately 1MB, the telemetry module saves the current activity.dat file as a new file named with the timestamp of when it was saved; for example, 20110114111312430.dat. The telemetry module then creates a new activity.dat file where it continues to store the latest activity history.

When the activity history repository reaches a certain size, the telemetry module deletes the oldest activity history files. The activity history repository size is governed by the **Maximum History Log** variable configured in the Telemetry Profile. When activity history files reach a certain age, the telemetry module deletes them from the activity history repository. Activity history file age is defined by the **Maximum History (Days)** variable configured in the Telemetry Profile. See [“Configuring the Telemetry Client Profile” section on page 7-9](#) for instructions on how to configure these variables.



### Note

The telemetry module receives its activity information from Windows functions such as wininit.dll and Kerel32.dll. If a browser or an email application does not use these functions, the telemetry module does not receive any activity data. This is why the telemetry module does not receive activity history from such browsers as Firefox and Chrome.



### Note

URLs stored in the activity history repository are considered sensitive information. The telemetry module encrypts these URLs to prevent unauthorized access. See the [“URL Encryption” section on page 7-8](#) for more information.



### Note

When Customer Experience Feedback Module is installed and enabled, the feedback module sends telemetry reports along with customer feedback data to our customer feedback server. If the feedback module is not enabled, the telemetry module sends its reports to the Cisco IronPort Web Security Appliance (WSA).

# Telemetry Reports

Telemetry reports contain information about viruses identified by local antivirus software and the action the antivirus software took to protect the endpoint from the virus. The telemetry module encrypts the reports and sends them to the WSA which forwards them to the Cisco Threat Operations Center (TOC). The TOC combines these reports with others and produces new URL filter and malware filter engine updates which it distributes to all WSAs.

Each telemetry report has an incident section followed by one or more activity sections. The incident section contains information about the malware, the local antivirus application, the action it took to defend against the malware, and system information about the endpoint. The activity sections contain information about the activities leading to the incident and possible origins of the virus.

When the endpoint is connected to the ASA through a virtual private network, the telemetry module sends the report to the WSA, by way of the ASA, immediately. After the telemetry module sends the reports to the WSA, it deletes the local copy.

If the endpoint is not connected to the ASA by a VPN, the telemetry module stores the reports on the endpoint here:

```
%ALLUSERSPROFILE%\Application Data\Cisco\Cisco AnyConnect Secure Mobility
Client\Telemetry\reports\
```

The Telemetry report filenames use the naming convention: **YYYYMMDDHHSSmmm.trt** which reflects the year, month, day, hour, minute, second, and hundredths of a second at which the report was created.



## Note

URLs stored in the telemetry reports are considered sensitive information. The telemetry module encrypts these URLs to prevent unauthorized access. See the “[URL Encryption](#)” section on page 7-8 for more information.

## Possible Transference of Personal Information by Telemetry Module

The Telemetry incident reports contain the name of the malware and also the location of the malware detected on the local system. This location, the directory path, often contains the user ID of the person who downloaded the malware. For example, if Jonathan Doe downloaded “malware.txt,” the directory name that could be included in the telemetry report might be “C:\Documents and Settings\jdoe\Local Settings\Temp\Cookies\jdoe@malware[1].txt”.



## Note

If you agree to the Cisco End User License Agreement and install the telemetry module, you consent to Cisco's collection, use, processing and storage of personal information and non-personal information. This personal information and non-personal information is transferred to Cisco, including the transfer of such information to the United States and/or another country outside the European Economic Area, so Cisco can determine how users are interacting with our products and for the purpose of providing you technical networking support and improving our products and services. Cisco may share this information with select third parties in an anonymous aggregated form. None of this personal information and non-personal information will be used to identify or contact you, and use of the personal information and non-personal information shall be subject to Cisco's Privacy Statement, available at <http://www.cisco.com/web/siteassets/legal/privacy.html>. You may withdraw this consent to collection, usage, processing and storage of personal information and non-personal information at any time either by turning the telemetry module off or by uninstalling the telemetry module.

## Telemetry Workflow

These steps provide an example of how the telemetry module gathers information and reports it to the WSA.

1. A user visits a web site, **<http://www.unabashedevil.com>**, and downloads a compressed file, **myriad\_evils.zip**. The telemetry module records both activities and stores them in activity.dat.
2. Sometime later, the user extracts the content, **evil\_virus.exe**, from the compressed file. The telemetry module records this activity and stores it in activity.dat.
3. A Host Scan-compliant antivirus application identifies a virus in **evil\_virus.exe** and deletes the file. The antivirus application activity prompts the telemetry module to create a report on the incident.
4. The telemetry module now works backwards through the information in the activity.dat file to determine the origin of the virus. From the antivirus application incident, the telemetry module determines that **evil\_virus.exe** was a virus and it was deleted by the antivirus application. From the activity.dat file, the telemetry module determines that **evil\_virus.exe** was extracted from **myriad\_evils.zip**, which was downloaded from **<http://www.unabashedevil.com>**.

All this information is combined in a report.

5. The telemetry module forwards the telemetry report to the WSA.
    - If the endpoint is connected to the ASA through a virtual private network, the telemetry module sends the report immediately to the WSA, and it deletes the local copy of the report.
    - If the endpoint is not connected to the ASA through a VPN, the telemetry module saves the report in the report repository and sends it to the WSA at its next opportunity.
    - If the endpoint has the Customer Experience Feedback Module installed and enabled, the telemetry reports are sent by that module.
  6. If the WSA enables SenderBase Network Participation, it forwards the report to the Threat Operations Center which analyzes the information along with data from other sources. The WSA receives signature updates to its URL categories and web reputation databases that have incorporated the information from multiple sources, including the telemetry data. With these new signature updates and depending on the different policies configured on the WSA, users are blocked from accessing **<http://www.unabashedevil.com>** and prevented from downloading **myriad\_evils.zip**.
- 

## URL Encryption

URLs stored in the Activity History Repository and Telemetry Report Repository are considered sensitive information. The telemetry module encrypts these URLs to prevent unauthorized access.

The telemetry module treats URLs as either “internal” or “external.” An example of an internal URL might be your company’s intranet home page. An example of an external URL would be any URL that you can access on the Internet.

All domains and IP addresses configured on the WSA to be excluded from SenderBase Network Participation are defined as internal URLs by the telemetry module. If you do not exclude any domains or IP addresses from Senderbase Network Participation, the telemetry module treats all URLs as external.

Both internal and external URLs are included in the telemetry report in encrypted form and sent to the WSA.

All internal URLs specified in Telemetry reports, and in the activity history repository, are encrypted using the symmetric AES key for internal URLs. All external URLs specified in Telemetry reports, and in the activity history repository, are encrypted using the symmetric AES key for external URLs. These symmetric AES keys are randomly generated at the beginning of each VPN session or when the telemetry service starts.

The AES key used for encrypting internal URLs is encrypted with your company's public key, and sent along with AES encrypted internal URLs in the telemetry report. You can specify your public key in the telemetry profile in the Custom Certificates area. Your public key could be any X.509 public key certificate in PEM-format provided by your company.

The AES key used for encrypting external URLs is encrypted with Cisco's public key and your company's public key. Both encrypted versions of the AES key are sent along with AES encrypted external URLs in the telemetry report. Cisco's public key is one of Cisco's public certificates and it is delivered with the telemetry module. You are not able to change Cisco's public key using the ASDM or ASA.

As a result, you can decrypt internal URLs with your company's private key. You can decrypt external URLs with Cisco's private key or your company's private key. This allows the Cisco Threat Operations Center to examine external URLs because it has Cisco's private key but it cannot decrypt your internal URLs because it does not have your company's private key.

Finally, the WSA SenderBase Participation Level determines how much of the URL gets encrypted and reported:

- **Standard.** The entire URL is encrypted with Cisco's public key and reported.
- **Limited.** The URI portion of the URL is encrypted with your private key and then the resulting URL is completely encrypted with Cisco's public key.

For example, when telemetry reports on the URL

`https://www.internetdocs.example.com/Doc?docid=a1b2c3d4e5f6g7h8=en`, the

**Doc?docid=a1b2c3d4e5f6g7h8=en** portion is encrypted with your private key. Depending on the private key used, the resulting URL might look something like the following string:

`https://www.internetdocs.example.com/93a68d78c787d8f6sa7d09s1455623`

This string is encrypted with Cisco's public key and reported. The result is that Cisco's Threat Operations Center would only be able to decrypt the domain name in the URL.

## Telemetry Report Encryption

When the telemetry module is ready to send a new telemetry report to the WSA, it encrypts the report based on the configured shared secret between the endpoint, ASA, and WSA. The telemetry module then posts the encrypted report by sending a HTTP POST request to the WSA which aggregates the data and sends it to the Threat Operations Center using SenderBase Network Participation. If the POST request is successful, the telemetry module deletes the report from the local report repository.

## Configuring the Telemetry Client Profile

- 
- |               |                                                                                                                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b> | Open ASDM and select Configuration > Remote Access VPN > Configuration > Network (Client) Access > AnyConnect Client Profile. |
| <b>Step 2</b> | Click <b>Add</b> to create a client profile.                                                                                  |
| <b>Step 3</b> | Give the client profile a <b>name</b> .                                                                                       |

- Step 4** Click the **Profile Usage** field and select **Telemetry**.
- Step 5** Accept the default Profile Location or click **Browse** to specify an alternate file location.
- Step 6** (Optional) Select a **Group Policy** to attach the client profile or leave the client profile <Unassigned>.
- Step 7** On the AnyConnect Client Profile page, select the telemetry profile you just created and click **Edit**. You can now edit your telemetry profile in the telemetry profile editor screen.
- Step 8** Check the **Enable Service** checkbox to enable telemetry.
- Step 9** In the **Maximum History Log (MB)** field, specify the maximum size of activity history repository.
- Range of values: 2-1,000 MB.
  - Default value: 100 MB.
- Step 10** In the **Maximum History (Days)** field, specify the maximum number of days to retain activity history.
- Range of values: 1-1,000 days.
  - Default value: 180 days
- Step 11** In the **Antivirus Check Interval (secs)** field, specify the interval at which the telemetry module prompts the posture module to check for new antivirus threat log information.
- Range of values: 5-300 seconds.
  - Default value: 60 seconds
- Step 12** In the **Retry Send Attempts** field, specify the number of times the telemetry module attempts to send telemetry reports to the WSA if the initial attempt fails.
- Range of values: 0-10
  - Default value: 2
- Step 13** In the **Administrator Defined Exceptions** field, specify an application's executable file whose behavior you want to exclude from telemetry reports. You can add the executable files in two ways:
- In the **Administration Defined Exceptions** text box, enter the file name, or the full path to the file, that you want to exclude from telemetry reporting and click **Add**. For example:  
**trusted.exe**  
**C:\Program Files\trusted.exe**  
 If you specify just the file name, the behavior of that file will **not** be tracked in whatever directory it resides. If you add the full directory path and file name, the behavior of the file will **not** be tracked when it is in the directory you specify.
  - Click the **Browse** button and select the local file you want to exempt from telemetry reporting. When you browse to add the file, the telemetry profile editor enters the full path to the file. The telemetry module will look for this file, at the end of this path, on all endpoints that use this telemetry profile. The path and filename must be correct for all users of this telemetry profile, not just the administrator.
- In both cases the file is listed in the **Administration Defined Exceptions** list box.
- Step 14** In the **Custom Certificate Select from file** field, click **Browse** to locate a Privacy Enhanced Mail (.pem) type certificate to generate a profile which includes the your certificate in XML form.
- Step 15** Click **OK**.
- Step 16** Click **Apply**.
-



# Configuration Profile Hierarchy

There are three client profile resources that govern telemetry behavior. The files act in an order of precedence.

**Table 7-1**      **Telemetry Client Profile Files**

| File name                                                                                    | Location                                                                                                                                                | Description and Precedence                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| actsettings.xml                                                                              | Installed on the endpoint here:<br>%ALLUSERSPROFILE%\Application Data<br>\Cisco\Cisco AnyConnect Secure Mobility Client<br>\Telemetry                   | File contains the base configuration for Telemetry.                                                                                                                                                                       |
| <i>telemetry_profile.tsp</i><br>The name of this file is specified by the ASA administrator. | Stored on the ASA. Its location is specified on this screen:<br>Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile | Telemetry client profile file. It is created and stored on the ASA.<br>All elements defined in this message overwrite those in the actsettings.xml file.                                                                  |
| Telemetry profile message sent by WSA                                                        | Not applicable. This is not a file.                                                                                                                     | There is no XML file on the WSA, but the WSA sends the message in XML format when replying to the status query request.<br>All elements defined in this message overwrite those in the <i>telemetry_profile.tsp</i> file. |





# Using Cisco AnyConnect Customer Experience Feedback Module



**Note**

THIS FEATURE IS ENABLED BY DEFAULT.

Cisco has created a customer experience feedback component which provides us with a look at what features and modules customers use and have enabled. The collection of this client information gives us insight into the user experience so that Cisco can continue to improve the quality, reliability, performance, and user experience of AnyConnect.

All data is collected anonymously and does not contain personally identifiable data. The data is also securely sent. You can refer to the End User License Agreement or the Privacy Policy from the About Menu for further information. From the [Cisco Online Privacy Statement Highlights](#) page you can access the [AnyConnect Secure Mobility Client Supplement](#) which details the collection and use of information.

The three types of data collected for customer experience feedback include:

- Usability data—See the privacy policy for details. This data is collected and sent once every month.
- Web threat data—If the Telemetry module is installed and enabled, you can use the customer experience feedback module to transport telemetry's collected data. This data is sent whenever a threat is reported. Refer to the [Chapter 7, “Configuring AnyConnect Telemetry to the WSA”](#) for further details about the Telemetry module.
- Crash reports—Crash dump files generated by AnyConnect are checked every 24 hours, collected, and sent to the customer experience feedback server.

The major components in the customer experience feedback modules are as follows:

- Feedback Module—AnyConnect software component that collects the information and periodically sends it to the server.
- Cisco Feedback Server—Cisco-owned cloud infrastructure that collects the customer experience feedback data and stores it in temporary storage as raw format.

## ASA and ASDM Requirements

The AnyConnect Secure Mobility Client with the customer experience feedback module requires these minimum ASA components:

- ASA 8.4(1)
- ASDM 7.0

# Configuring Customer Experience Feedback Module

AnyConnect Customer Experience Feedback Module is enabled by default. Administrators can choose to opt out of the feedback and do so by setting up a profile with the recommended settings. End users must abide by the setting established by the administrators.

## Requirements

The customer experience feedback module is supported on Windows and Mac OS X.

## Detailed Steps

- Step 1** To launch the profile editor from ASDM and create a new profile, follow the steps in the [“Creating and Editing an AnyConnect Client Profile Using the Integrated AnyConnect Profile Editor”](#) section on [page 2-2](#). After you have used the profile editor integrated with ASDM to create client profiles for the customer feedback module, continue to Step 2.
- Step 2** Open ASDM and choose **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Client Profile**.
- Step 3** Choose the AnyConnect Customer Experience Feedback client profile you created and click **Edit**. The Customer Experience Feedback profile editor opens.
- Step 4** The default is for the customer experience feedback module to be enabled. If you do not want to participate in providing feedback, you must disable this item. This disabling can occur any time after installation and is the preferred method for opting out of the customer feedback experience.



**Note** If customer experience feedback is enabled, Cisco Web Security Appliance (WSA) is not used, because the device using the customer experience feedback module takes over the telemetry role. When customer experience feedback is disabled, telemetry data is sent to the WSA.

- Step 5** The default is to include a crash report. Administrators must clear the checkbox if they do not want to collect crash reports generated by AnyConnect.
- Step 6** Cisco recommends that administrators enter a customer key or ID of their choice. This key attaches the data to your organization if you would like to allow Cisco to identify information specifically from your organization; otherwise, Cisco is not capable of grouping reports by organization.

## Disabling During Installation

You can also remove the customer experience feedback module altogether during installation.

- For web-deploy
  - See the [“Configuring the ASA to Download AnyConnect”](#) section on [page 2-13](#).
- For Windows pre-deploy
  - See the [“Using an SMS to Predeploy AnyConnect Modules”](#) section on [page 2-23](#).
- For Linux or Mac pre-deploy
  - See the [“Predeploying to Linux and Mac OS X Computers”](#) section on [page 2-27](#).

**Note**

This process is not the preferred option for disabling the customer experience feedback module. See [Step 4](#) above for the preferred method.





## NGE, FIPS and Additional Security

Next Generation Encryption (NGE) introduces new algorithms for encryption, authentication, digital signatures, and key exchange to meet escalating security and performance requirements. The National Institute of Standards and Technology (NIST) specified a set of cryptographic algorithms that devices must support to meet U.S. federal standards for cryptographic strength. RFC 6379 defines the Suite B cryptography suites. Because the collective set of algorithms defined as NIST Suite B are becoming a standard, the AnyConnect IPsec VPN (IKEv2 only), PKI, 802.1X, and EAP subsystems now support them. AnyConnect 3.1 uses CiscoSSL 0.9.8r.1.3 FIPS certified implementation of the Suite B ciphers. (AnyConnect 3.1 does not offer support for TLS/DTLS, SRTP, and SSH Suite B.) Cisco's implementation of Suite B specifications are FIPS-certified, and throughout AnyConnect and ASDM configuration, NGE features are referred to as FIPS.

The AnyConnect VPN component can connect to one of two VPN head ends:

- ASA
- IOS

No client side configuration is required for this feature.

AnyConnect components negotiate and use NGE based on the Adaptive Security Appliance (ASA) configuration. The AnyConnect client's Statistics panel (under the Transport Information heading) shows the name of the cipher being used.

The following sections are included in this chapter:

- [Information About NGE and AnyConnect, page 9-1](#)
- [Enabling FIPS for the AnyConnect Core VPN Client, page 9-4](#)
- [Configuring your Update Policy, page 9-8](#)
- [AnyConnect Local Policy Parameters and Values, page 9-11](#)
- [Enabling FIPS for the Network Access Manager, page 9-14](#)

## Information About NGE and AnyConnect

Next Generation Encryption (NGE) for AnyConnect 3.1 VPN and Network Access Manager includes the following functionality:

- AES-GCM support (128-, 192-, and 256-bit keys) for symmetric encryption and integrity
  - (Network Access Manager) 802.1AE (MACsec) for wired traffic encryption in software (Windows 7)
  - (VPN) IKEv2 payload encryption and authentication (AES-GCM only)

- (VPN) ESP packet encryption and authentication
- SHA-2 (SHA with 256/384/512 bits) support for hashing
  - (Network Access Manager) Ability to use certificates with SHA-2 in TLS-based EAP methods
  - (VPN) IKEv2 payload authentication (Windows Vista or later and Mac OS X 10.6 or later)
  - (VPN) ESP packet authentication (Windows Vista or later and Mac OS X 10.6 or later)
- ECDH support for key exchange
  - (Network Access Manager) Ability to use ECDHE in TLS-based EAP methods (Windows 7 and Windows XP)
  - (VPN) Groups 19, 20, and 21 IKEv2 key exchange and IKEv2 PFS
- ECDSA support (256-, 384-, 521-bit elliptic curves) for digital signature, asymmetric encryption, and authentication
  - (Network Access Manager) Ability to use certificates with ECDSA in TLS-based EAP methods (Only Windows 7 and Vista is supported for client certificates. Only Windows 7 is supported for smart cards.)
  - (VPN) IKEv2 user authentication and server certificate verification

**Note**

On Linux, AnyConnect can use both the Firefox certificate store or the AnyConnect file certificate store. For ECDSA certificates, only the AnyConnect file store is supported. To add certificates to a file store, see [Creating a PEM Certificate Store for Mac and Linux](#).

- New crypto algorithms for IPsecV3 VPN. AnyConnect 3.1 supports the algorithms required by IPsecV3 except for NULL encryption. IPsecV3 also specifies that Extended Sequence Numbers (ESN) must be supported, but AnyConnect 3.1 does not support ESN.
- Other cipher suite dependencies between algorithms promote support for the following in AnyConnect 3.1:
  - Diffie-Hellman Groups 14 and 24 for IKEv2.
  - RSA certificates with 4096 bit keys for DTLS and IKEv2.

## Requirements

- Combined-mode encryption algorithms, where both encryption and integrity are performed in one operation, are supported only on SMP ASA gateways with hardware crypto acceleration (such as 5585 and 5515-X). AES-GCM is the combined-mode encryption algorithm that Cisco supports.

**Note**

An IKEv2 policy can only include a normal- or a combined-mode encryption algorithm, but not both types. When a combined-mode algorithm is configured in the IKEv2 policy, all normal-mode algorithms are disabled, so the only valid integrity algorithm is NULL.

The IKEv2 IPsec proposals use a different model and can specify both normal- and combined-mode encryption algorithms in the same proposal. With this usage, you are required to configure integrity algorithms for both, which leaves a non-NULL integrity algorithm configured with AES-GCM encryption.



- NGE requires an AnyConnect premium license for IKEv2 remote access connections using NIST Suite B algorithms. Suite B algorithm usage for other connections or purposes (such as PKI) has no limitations. License checks are performed for remote access connections. If you receive a message that you are attempting to use an NIST Suite B crypto algorithm without an AnyConnect premium license, you have the option to either install the premium license or reconfigure the crypto settings to an appropriate level.
- IPsec connections require server certificates that contain Key Usage attributes of Digital Signature and Key Encipherment, as well as an Enhanced Key Usage attribute of Server Authentication or IKE Intermediate. Note that IPsec server certificates not containing a Key Usage will be considered invalid for all Key Usages, and similarly an IPsec server certificate not containing an Enhanced Key Usage will be considered invalid for all Enhanced Key Usages.

## Guidelines and Limitations

This section includes the guidelines and limitations for this feature.

- Suite B is available only for IKEv2/IPsec.
- No EAP methods support SHA-2 except in TLS-based EAP when validating certificates signed using SHA-2.
- TLS v1.2 handshaking is not supported in AnyConnect 3.1.
- TLS v1.2 certificate authentication is not supported in AnyConnect 3.1.
- ECDSA certificates are supported on Windows Vista or later, Mac OS X 10.6 or later, Red Hat Enterprise Linux 6.x (32-bit) or 6.4 (64-bit), and Ubuntu 9.x, 10.x, and 11.x (32-bit) and Ubuntu 12.4 and 12.10 (64-bit). ECDSA smart cards are supported only on Windows 7.
- ECDSA certificates must have a Digest strength equal or greater than the Curve strength. For example, an EC-384 key must use SHA2-384 or greater.
- Suite B profiles may require certain policy properties in the certificates; however, these requirements are enforced on the ASA and not by AnyConnect.
- Because ASA does not support ECDSA certificates for SSL VPN, you should not use such certificates for SSL VPN.
- When the ASA is configured with a different server certificate for SSL and IPsec, use trusted certificates. A Posture Assessment, WebLaunch, or Downloader failure can occur if using Suite B (ECDSA) untrusted certificates having different IPsec and SSL certificates.
- Because AES-GCM is computationally intensive algorithms, you may experience a lower overall data rate when using these algorithms. Some new Intel processors contain special instructions specifically introduced to improve the performance of AES-GCM. AnyConnect 3.1 automatically detects whether the processor on which it is running supports these new instructions. If so, AnyConnect uses the new instructions to significantly improve VPN data rates as compared to those processors that do not have the special instructions. See <http://ark.intel.com/search/advanced/?s=t&AESTech=true> for a list of processors that support the new instructions. For more information see <http://software.intel.com/en-us/articles/intel-carry-less-multiplication-instruction-and-its-usage-for-computing-the-gcm-mode/>.
- IPsec connections perform name verification on server certificates. The following rules are applied in IPsec name verification:

- If a Subject Alternative Name extension is present with relevant attributes, name verification only uses the Subject Alternative Name. Relevant attributes include DNS Name attributes for all certificates, and also include IP address attributes, if the connection is being performed to an IP address.
- If a Subject Alternative Name extension is not present, or is present but contains no relevant attributes, name verification uses any Common Name attributes found in the Subject of the certificate.
- If a certificate uses a wildcard for the purposes of name verification, the wildcard must be in the first (left-most) subdomain only, and additionally must be the last (right-most) character in the subdomain. Any wildcard entry not in compliance is ignored for the purposes of name verification.

## About AnyConnect Modules with NGE

The FIPS-certified features for AnyConnect are licensed for the ASA on a per-model basis. The following AnyConnect client modules have their own FIPS configuration and requirements:

- AnyConnect core VPN client—FIPS compliance is enabled by a FIPS-mode parameter in the local policy file on the user computer. The XML file *AnyConnectLocalPolicy* contains security settings, but it is not deployed by the ASA. It must be installed manually, or deployed using an enterprise software deployment system. You must purchase a FIPS license for each ASA the client connects to.
- AnyConnect Network Access Manager—FIPS support in Network Access Manager is enabled by a FIPS-mode parameter in *AnyConnectLocalPolicy.xml* on the user computer, and a FIPS-mode parameter in a Network Access Manager group policy.

FIPS for Network Access Manager is supported on Windows 7/Vista and Windows XP. Windows XP requires a 3eTI FIPS validated Cryptographic Kernel Library (CKL) from 3e Technologies International, with supported drivers that integrate with the Network Access Manager. Order the FIPS 3eTI CKL supported driver installer from Cisco (shipped on a CD) using part number AIR-SSCFIPS-DRV. For information about the drivers and supported chipsets, see *Release Notes for 3eTI Cryptographic Client Software Model 3e-010F-3-IA* on the AnyConnect software download page.

## Enabling FIPS for the AnyConnect Core VPN Client

You enable FIPS compliance for the core AnyConnect Security Mobility Client in the local policy file on the user computer. This file is an XML file containing security settings, and is not deployed by the ASA. The file must be installed manually or deployed to a user computer using an enterprise software deployment system. You must purchase a FIPS license for the ASA the client connects to.

AnyConnect Local Policy parameters reside in the XML file *AnyConnectLocalPolicy.xml*. This file is not deployed by the ASA. You must deploy this file using corporate software deployment systems, change the file manually on a user computer, or include it in a pre-deployed AnyConnect installer. If you do make changes to an existing local policy file on a user's system, that system should be rebooted.

Other parameters in the AnyConnect Local Policy increase security by forbidding remote updates to prevent Man-in-the-Middle attacks and by preventing non-administrator or non-root users from modifying client settings.

This section shows how to enable FIPS mode and additional security for the AnyConnect core VPN client and covers the following topics:

- [Enabling FIPS for Windows Clients Using an MST File, page 9-5](#)
- [Enabling FIPS and other Local Policy Parameters in an MST File, page 9-5](#)
- [Enabling FIPS and Other Parameters with the Enable FIPS Tool, page 9-5](#)
- [Changing Local Policy Parameters Manually in the Local Policy, page 9-7](#)
- [Avoiding Endpoint Problems from AnyConnect FIPS Registry Changes, page 9-7](#)
- [AnyConnect Local Policy Parameters and Values, page 9-11](#)

## Enabling FIPS for Windows Clients Using an MST File

For Windows installations, you can apply the Cisco MST file to the standard MSI installation file to enable FIPS in the AnyConnect Local Policy. This MST only enables FIPS and does not change other parameters. The installation generates an AnyConnect Local Policy file with FIPS enabled. Update the user's system after running this utility.

For information about where you can download the AnyConnect MST, see the licensing information you received for the FIPS client.

## Enabling FIPS and other Local Policy Parameters in an MST File

You can create an MST file to change any local policy parameters. The MST parameter names correspond to the parameters in AnyConnect Local Policy file (AnyConnectLocalPolicy.xml). See [AnyConnect Local Policy Parameters and Values](#) for the descriptions and values you can set for these parameters:

- LOCAL\_POLICY\_BYPASS\_DOWNLOADER
- LOCAL\_POLICY\_FIPS\_MODE
- LOCAL\_POLICY\_RESTRICT\_PREFERENCE\_CACHING
- LOCAL\_POLICY\_RESTRICT\_TUNNEL\_PROTOCOLS
- LOCAL\_POLICY\_RESTRICT\_WEB\_LAUNCH
- LOCAL\_POLICY\_STRICT\_CERTIFICATE\_TRUST



### Note

AnyConnect installation does not automatically overwrite an existing local policy file on the user computer. You must delete the existing policy file on user computers first, so the client installer can create a new policy file.

Any changes to the local policy file require the system to be rebooted.

## Enabling FIPS and Other Parameters with the Enable FIPS Tool

For all operating systems, you can use Cisco's Enable FIPS tool to create an AnyConnect Local Policy file with FIPS enabled. The Enable FIPS tool is a command line tool that runs on Windows using administrator privileges or as a root user for Linux and Mac.

For information about where you can download the Enable FIPS tool, see the licensing information you received for the FIPS client.

Table 9-1 shows the policy settings you can specify and the arguments and syntax to use. The behavior for the argument values is the same behavior specified for the parameters in the AnyConnect Local Policy file in [AnyConnect Local Policy Parameters and Values](#).

You run the Enable FIPS tool by entering the command **EnableFIPS** <arguments> from the command line of the computer. The following usage notes apply to the Enable FIPS tool:

- If you do not supply any arguments, the tool enables FIPS and restarts the vpnagent service (Windows) or the vpnagent daemon (Mac and Linux).
- Separate multiple arguments with spaces.

The following example shows the Enable FIPS tool command, run on a Windows computer:

```
EnableFIPS rwl=false sct=true bd=true fm=false
```

The next example shows the command, run on a Linux or Mac computer:

```
./EnableFIPS rwl=false sct=true bd=true fm=false
```

Table 9-1 shows the policy settings and the arguments for the Enable FIPS tool. Descriptions of the policy settings is provided in [AnyConnect Local Policy Parameters and Values](#), page 9-11.

**Table 9-1 Policy Settings and Arguments for the Enable FIPS Tool**

| Policy Setting                                        | Argument and Syntax                                                               |
|-------------------------------------------------------|-----------------------------------------------------------------------------------|
| FIPS mode                                             | <b>fm</b> =[true   false]                                                         |
| Bypass downloader                                     | <b>bd</b> =[true   false]                                                         |
| Restrict weblaunch                                    | <b>rwl</b> =[true   false]                                                        |
| Strict certificate trust                              | <b>sct</b> =[true   false]                                                        |
| Restrict preferences caching                          | <b>rpc</b> =[Credentials   Thumbprints   CredentialsAndThumbprints   All   false] |
| Exclude FireFox NSS certificate store (Linux and Mac) | <b>efn</b> =[true   false]                                                        |
| Exclude PEM file certificate store (Linux and Mac)    | <b>epf</b> =[true   false]                                                        |
| Exclude Mac native certificate store (Mac only)       | <b>emn</b> =[true   false]                                                        |

## Changing Local Policy Parameters Manually in the Local Policy

To change AnyConnect Local Policy parameters manually, follow this procedure:

- Step 1** Retrieve a copy of the AnyConnect Local Policy file (AnyConnectLocalPolicy.xml) from a client installation. The following table shows the installation path for each operating system.

**Table 9-2** Operating System and AnyConnect Local Policy File Installation Path

| Operating System | Installation Path                                                                                  |
|------------------|----------------------------------------------------------------------------------------------------|
| Windows 7        | C:\ProgramData\Cisco\Cisco AnyConnect Secure Mobility Client                                       |
| Windows Vista    | C:\ProgramData\Cisco\Cisco AnyConnect Secure Mobility Client                                       |
| Windows XP       | C:\Documents and Settings\All Users\Application Data\Cisco\Cisco AnyConnect Secure Mobility Client |
| Windows Mobile   | %PROGRAMFILES%\Cisco AnyConnect VPN Client <sup>1</sup>                                            |
| Linux            | /opt/cisco/anyconnect                                                                              |
| Mac OS X         | /opt/cisco/anyconnect                                                                              |

1. AnyConnect 3.0+ does not support Windows Mobile. This path is of the local policy file for AnyConnect 2.5.

- Step 2** Edit the parameter settings. You can either edit the AnyConnectLocalPolicy file manually, or use the VPN Local Policy editor, which is distributed with the AnyConnect Profile Editor installer. The parameters are described in [AnyConnect Local Policy Parameters and Values, page 9-11](#).
- Step 3** Save the file as *AnyConnectLocalPolicy.xml* and deploy the file to remote computers using a corporate software deployment system.
- Step 4** Reboot the remote computers so the changes to the local policy file will take effect.

## Avoiding Endpoint Problems from AnyConnect FIPS Registry Changes

Enabling FIPS for the core AnyConnect client has system-wide consequences on the endpoint device. AnyConnect changes Windows registry settings on the endpoint. Other components of the endpoint may detect that AnyConnect has enabled FIPS and started using cryptography. For example, the Microsoft Terminal Services client Remote Desktop Protocol (RDP) will not work, because RDP requires that servers use FIPS compliant cryptography.

To avoid these problems, you can temporarily disable FIPS encryption in the Windows Local System Cryptography settings by changing the parameter *Use FIPS compliant algorithms for encryption, hashing, and signing* to **Disabled**.

Be aware that rebooting the endpoint device changes this setting back to enabled.

[Table 9-3](#) shows the Windows registry changes performed by AnyConnect that you should be aware of:

**Table 9-3** Windows Registry Key Changes Performed When Enabling AnyConnect FIPS

| Windows Version         | Registry Key                                                     | Action Taken                                                                                                                                          |
|-------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Windows XP and Later    | HKLM\System\CurrentControlSet\Control\Lsa                        | FIPSAAlgorithmPolicy changed from 0 to 1.                                                                                                             |
| Windows Vista and Later | HKLM\System\CurrentControlSet\Control\Lsa\FIPSAAlgorithmPolicy   | Enabled changed from 0 to 1.                                                                                                                          |
|                         | HKCU\Software\Microsoft\Windows\CurrentVersion\Internet Settings | SecureProtocols setting changed to TLSV1 by performing a bit-wise “or” of 0x080 with the original setting.                                            |
|                         | HKLM\Software\Policies\Microsoft\Windows\CurrentVersion\Internet | SecureProtocols setting changed to TLSV1 by performing a bit-wise “or” of 0x080 with the original setting.<br><br>This sets TLSv1 for a group policy. |

## Configuring your Update Policy

### Update Policy Overview

AnyConnect software and profile updates occur when they are available and allowed by the client upon connecting to a headend. Configuring the headend for AnyConnect updates makes them available, the Update Policy settings in the VPN Local Policy file determine if they are allowed.

By default, the Update Policy settings allow software and profile updates from any headend. Set the Update Policy parameters to restrict this as follows:

- Allow, or authorize, specific headends to update all AnyConnect software and profiles by specifying them in the **Server Name** list.

The headend server name can be an FQDN or an IP Address. They can also be wild cards, for example: \*.example.com.

See [Authorized Server Update Behavior](#) below for a full description of how the update occurs.

- For all other unspecified, or unauthorized headends:
  - Allow or disallow software updates of the VPN core module and other optional modules using the **Allow Software Updates From Any Server** option.
  - Allow or disallow VPN Profile updates using the **Allow VPN Profile Updates From Any Server** option.
  - Allow or disallow other service module profile updates using the **Allow Service Profile Updates From Any Server** option.

See [Unauthorized Server Update Behavior](#) below for a full description of how the update occurs.

### Authorized Server Update Behavior

When connecting to an authorized headend, one identified in the **Server Name** list, the other Update Policy parameters do not apply and the following occurs:

- The version of the AnyConnect package on the headend is compared to the version on the client to determine if the software should be updated.

- If the version of the AnyConnect package is older than the version on the client, no software updates occur.
  - If the version of the AnyConnect package is the same as the version on the client, only software modules configured for download on the headend and not present on the client are downloaded and installed.
  - If the version of the AnyConnect package is newer than the version on the client, software modules configured for download on the headend, as well as software modules already installed on the client, are downloaded and installed.
- The VPN profile and each service profile on the headend is compared to that profile on the client to determine if it should be updated:
  - If the profile on the headend is the same as the profile on the client, it is not updated.
  - If the profile on the headend is different than the profile on the client, it is downloaded.

## Unauthorized Server Update Behavior

When connecting to an unauthorized headend, the **Allow ... Updates From Any Server** options are used to determine how AnyConnect is updated as follows:

- **Allow Software Updates From Any Server:**
  - If this option is checked, software updates are allowed for this unauthorized ASA. Updates are based on version comparisons as described above for authorized headends.
  - If this option is not checked, software updates do not occur. In addition, VPN connection attempts will terminate if updates, based on version comparisons, should have occurred.
- **Allow VPN Profile Updates From Any Server:**
  - If this option is checked, the VPN profile is updated if the VPN profile on the headend is different than the one on the client.
  - If this option is not checked, the VPN profile is not updated. In addition, VPN connection attempts will terminate if the VPN profile update, based on differentiation, should have occurred.
- **Allow Service Profile Updates From Any Server:**
  - If this option is checked, each service profile is updated if the profile on the headend is different than the one on the client.
  - If this option is not checked, the service profiles are not updated.

## Update Policy Guidelines

- Enable remote users to connect to a headend using its IP address by listing that server's IP address in the authorized **Server Name** list. If the user attempts to connect using the IP address but the headend is listed as an FQDN, the attempt is treated as connecting to an unauthorized domain.
- Software updates include downloading customizations, localizations, and transforms. When software updates are disallowed these items will not be downloaded.
- Downloading a VPN profile with Always-On enabled deletes all other VPN profiles on the client. Consider this when deciding whether to allow or disallow VPN profiles updates from unauthorized, or non-corporate, headends.

- If no VPN profile is downloaded to the client due to your installation and update policy, the following features are unavailable:

|                            |                            |
|----------------------------|----------------------------|
| Service Disable            | Untrusted Network Policy   |
| Certificate Store Override | Trusted DNS Domains        |
| Show Pre-connect Message   | Trusted DNS Servers        |
| Local LAN Access           | Always-On                  |
| Start Before Logon         | Captive Portal Remediation |
| Local proxy connections    | Scripting                  |
| PPP Exclusion              | Retain VPN on Logoff       |
| Automatic VPN Policy       | Device Lock Required       |
| Trusted Network Policy     | Automatic Server Selection |

- The downloader creates a separate text log (UpdateHistory.log) that records the download history. This log includes the time of the updates, the ASA that updated the client, the modules updated, and what version was installed before and after the upgrade. This log file is stored here:

%AllUsers%\Application Data\Cisco\Cisco AnyConnect Secure Mobility Client\Logs directory.

## Update Policy Example

This example shows the client update behavior when the AnyConnect version on the client differs from various ASA headends.

Given the following Update Policy in the VPN Local Policy XML file:

```
<?xml version="1.0" encoding="UTF-8"?>
<AnyConnectLocalPolicy acversion="2.4.140"
 xmlns=http://schemas.xmlsoap.org/encoding/
 xmlns:xsi=http://www.w3.org/2001/XMLSchema-instance
 xsi:schemaLocation="http://schemas.xmlsoap.org/encoding/ AnyConnectLocalPolicy.xsd">
 <FipsMode>false</FipsMode>
 <BypassDownloader>false</BypassDownloader><RestrictWebLaunch>false</RestrictWebLaunch>
 <StrictCertificateTrust>false</StrictCertificateTrust>
 <RestrictPreferenceCaching>false</RestrictPreferenceCaching>
 <RestrictTunnelProtocols>false</RestrictTunnelProtocols>
 <UpdatePolicy>
 <AllowSoftwareUpdatesFromAnyServer>true</AllowSoftwareUpdatesFromAnyServer>
 <AllowVPNProfileUpdatesFromAnyServer>false</AllowVPNProfileUpdatesFromAnyServer>
 <AllowServiceProfileUpdatesFromAnyServer>false</AllowServiceProfileUpdatesFromAnyServer>
 <AuthorizedServerList>
 <ServerName>seattle.example.com</ServerName>
 <ServerName>newyork.example.com</ServerName>
 </AuthorizedServerList>
 </UpdatePolicy>
</AnyConnectLocalPolicy>
```



With the following ASA headend configuration:

| ASA Headend         | AnyConnect Package Loaded | Modules to Download                       |
|---------------------|---------------------------|-------------------------------------------|
| seattle.example.com | Version 3.0.0350          | VPN, Network Access Manager, Web Security |
| newyork.example.com | Version 3.0.0351          | VPN, Network Access Manager               |
| raleigh.example.com | Version 3.0.0352          | VPN, Posture                              |

The following update sequence is possible when the client is currently running AnyConnect VPN and Network Access Manager modules version 3.0.0350:

- The client connects to seattle.example.com, an authorized server configured with the same version of AnyConnect. The Web Security software module will be downloaded and installed, as well as the Web Security profile if available. If the VPN and Network Access Manager profiles are available for download and different than the ones on the client they will also be downloaded.
- The client then connects to newyork.example.com, an authorized ASA configured with a newer version of AnyConnect. The VPN, Network Access Manager, and Web Security modules will be downloaded and installed. Profiles that are available for download and different than the ones on the client will also be downloaded.
- The client then connects to raleigh.example.com, an unauthorized ASA. Since software updates are allowed, the VPN, Network Access Manager, Web Security, and Posture modules are all upgraded to 3.0.0352. Because the VPN profile and service profile updates are not allowed, they are not downloaded. If the VPN profile could have been updated (based on it being different) the connection will terminate.

## AnyConnect Local Policy Parameters and Values

The following parameters are elements in the VPN Local Policy Editor and in the AnyConnectLocalPolicy.xml file. XML elements are shown in brackets <>.



### Note

If you manually edit the file, and omit a policy parameter, that feature resorts to default behavior.

### <acversion>

Specifies the minimum version of the AnyConnect client capable of interpreting all of the parameters in this file. If a client running a version of AnyConnect that is older than this version reads the file, it issues an event log warning.

The format is acversion="<version number>".

### Fips Mode

<FipsMode>

Enables FIPS mode for the client. This forces the client to only use algorithms and protocols approved by the FIPS standard.

### Bypass Downloader

<BypassDownloader>

When selected, disables the launch of the VPNDownloader.exe module, which is responsible for detecting the presence of and updating the local versions of dynamic content. The client does not check for dynamic content present on the ASA, including translations, customizations, optional modules, and core software updates.

When Bypass Downloader is selected, one of two things happens when that client connects to an ASA:

- If the VPN client profile on the ASA is different than the one on the client, the client aborts the connection attempt.
- If there is no VPN client profile on the ASA, the client makes the VPN connection, but it uses its hard-coded VPN client profile settings.


**Note**

If you configure VPN client profiles on the ASA, they must be installed on the client before the client connects to an ASA with BypassDownloader set to *true*. Because the profile can contain an administrator defined policy, the BypassDownloader *true* setting is only recommended if you do not rely on the ASA to centrally manage client profiles.

**Restrict Web Launch**

<RestrictWebLaunch>

Prevents users from using a non-FIPS-compliant browser to initiate WebLaunch. It does this by preventing the client from obtaining the security cookie that is used to initiate an AnyConnect tunnel. The client displays an informative message to the user.

**Strict Certificate Trust**

<StrictCertificateTrust>

If selected, when authenticating remote security gateways, AnyConnect disallows any certificate that it cannot verify. Instead of prompting the user to accept these certificates, the client fails to connect to security gateways using self-signed certificates, and displays the following message:

Local policy prohibits the acceptance of untrusted server certificates. A connection will not be established.

If not selected, the client prompts the user to accept the certificate, which is the default behavior, and is consistent with previous versions of AnyConnect.


**Note**

We strongly recommend you enable Strict Certificate Trust for the AnyConnect client for the following reasons:

- With the increase in targeted exploits, enabling Strict Certificate Trust in the local policy helps prevent “man in the middle” attacks when users are connecting from untrusted networks such as public-access networks.
- Even if you use fully verifiable and trusted certificates, the AnyConnect client, by default, allows end users to accept unverifiable certificates. If your end users are subjected to a man-in-the-middle attack, they may be prompted to accept a malicious certificate. To remove this decision from your end users, enable Strict Certificate Trust.

**RestrictPreferenceCaching**

<RestrictPreferenceCaching>

By design, AnyConnect does not cache sensitive information to disk. Enabling this parameter extends this policy to any type of user information stored in the AnyConnect preferences.

- *Credentials*—The user name and second user name are not cached.
- *Thumbprints*—The client and server certificate thumbprints are not cached.
- *CredentialsAndThumbprints*—Certificate thumbprints and user names are not cached.
- *All*—No automatic preferences are cached.
- *false*—All preferences are written to disk (default—behavior consistent with AnyConnect 2.3 and earlier).

#### **Exclude Pem File Cert Store (Linux and Mac)**

<ExcludePemFileCertStore>

Prevents the client from using the PEM file certificate store to verify server certificates and search for client certificates.

The store uses FIPS-capable OpenSSL and has information about where to obtain certificates for client certificate authentication. Permitting the PEM file certificate store ensures remote users are using a FIPS-compliant certificate store.

#### **Exclude Mac Native CertStore (Mac only)**

<ExcludeMacNativeCertStore>

Prevents the client from using the Mac native (keychain) certificate store to verify server certificates and search for client certificates.

#### **Exclude Firefox NSS Cert Store (Linux and Mac)**

<ExcludeFirefoxNSSCertStore>

Prevents the client from using the Firefox NSS certificate store to verify server certificates and search for client certificates.

The store has information about where to obtain certificates for client certificate authentication.

#### **Update Policy**

<UpdatePolicy>

This section allows you to control which ASAs the client can get software or profile updates from.

For more information about how the software and profile update settings affect client updates, see [Configuring your Update Policy, page 9-8](#)

- Allow Software Update From Any Server

<AllowSoftwareUpdatesFromAnyServer>

Allow or disallow software updates of the VPN core module and other optional modules from unauthorized servers, ones not listed in the Server Name list.

- Allow VPN Policy Update From Any Server

<AllowVPNProfileUpdatesFromAnyServer>

Allow or disallow VPN Profile updates from unauthorized servers, ones not listed in the Server Name list.

- Allow Service Profile Updates From Any Server

<AllowServiceProfileUpdatesFromAnyServer>

Allow or disallow other service module profile updates from unauthorized servers, ones not listed in the Server Name list.

- Server Name

<ServerName>

Specify authorized servers in this list. These headends are allowed full updates of all AnyConnect software and profiles upon VPN connectivity. ServerName can be an FQDN, IP address, domain name, or wildcard with domain name.

## Local Policy File Example

```
<?xml version="1.0" encoding="UTF-8"?>
<AnyConnectLocalPolicy xmlns="http://schemas.xmlsoap.org/encoding/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://schemas.xmlsoap.org/encoding/ AnyConnectLocalPolicy.xsd"
acversion="3.0.0592">
 <FipsMode>true</FipsMode>
 <BypassDownloader>true</BypassDownloader>
 <RestrictWebLaunch>true</RestrictWebLaunch>
 <StrictCertificateTrust>true</StrictCertificateTrust>
 <RestrictTunnelProtocols>IPSec</RestrictTunnelProtocols>
 <RestrictPreferenceCaching>Credentials</RestrictPreferenceCaching>
 <ExcludePemFileCertStore>true</ExcludePemFileCertStore>
 <ExcludeWinNativeCertStore>true</ExcludeWinNativeCertStore>
 <ExcludeMacNativeCertStore>true</ExcludeMacNativeCertStore>
 <ExcludeFirefoxNSSCertStore>true</ExcludeFirefoxNSSCertStore>
 <UpdatePolicy>
 <AllowSoftwareUpdatesFromAnyServer>true</AllowSoftwareUpdatesFromAnyServer>
 <AllowVPNProfileUpdatesFromAnyServer>true</AllowVPNProfileUpdatesFromAnyServer>
 <AuthorizedServerList>
 <ServerName>asa.one</ServerName>
 <ServerName>asa.two</ServerName>
 </AuthorizedServerList>
 </UpdatePolicy>
</AnyConnectLocalPolicy>
```

## Enabling FIPS for the Network Access Manager

FIPS compliance for Network Access Manager is supported by enabling FIPS mode in the AnyConnect Network Access Manager client profile and enabling FIPS mode in the local policy. Windows XP also requires that you deploy the 3eTI FIPS Certified Crypto Kernel Library (CKL) to user computers connecting to FIPS networks.

With the Network Access Manager configured for FIPS compliance, users can still connect to non-FIPS networks. But when the user chooses to connect to a FIPS-compliant network, the Network Access Manager uses the 3eTI FIPS CKL and displays the FIPS compliance status (if the registry key *FIPSAAlgorithmPolicy* is non-zero) in the Network Access Manager pane of the AnyConnect GUI.

This chapter describes how to enable FIPS compliance for the Network Access Manager and contains the following sections:

- [Enforcing FIPS Mode in the Network Access Manager, page 9-15](#)
- [Installing the 3eTI Driver, page 9-15](#)
- [Obtaining the 3eTI Driver Installer Software, page 9-27](#)

## Enforcing FIPS Mode in the Network Access Manager

You can force enterprise employees to only connect to FIPS-compliant networks by restricting the allowed association and encryption modes, and the authentication methods, in the Network Access Manager configuration section of the AnyConnect profile.

The Network Access Manager FIPS compliance requires FIPS-approved AES encryption modes including WPA2 Personal (WPA2-PSK) and WPA2 Enterprise (802.1X).

The Network Access Manager FIPS support includes EAP methods EAP-TLS, EAP-TTLS, PEAP, EAP-FAST and LEAP.

The Network Access Manager enables you to enable both FIPS-compliant WLAN profiles as well as optional non-compliant configurations, such as access to Wi-Fi hotspots with client VPN security. As the administrator, you are responsible for naming the profile appropriately to indicate whether the network is FIPS enabled.

A fully FIPS-compliant client requires three components:

- the Network Access Manager module
- A FIPS-compliant local policy file
- For Windows XP only, 3eTI FIPS certified Crypto Kernel Library (CKL) with supported NIC adapter drivers

You enable FIPS mode in the local policy file with the Network Access Manager Profile Editor. Refer to the [“Client Policy Window” section on page 4-6](#) for more information.

## Installing the 3eTI Driver

This section provides instructions for installing the 3eTI FIPS validated Cryptographic Kernel Library (CKL) with supported drivers that integrate with Network Access Manager to provide a complete FIPS solution.

For Windows XP systems, the Network Access Manager Log Packager utility collects logs of the 3eTI packets.

### Important Notes

1. The 3eTI CKL driver installer is designed to allow only one 3eTI wireless driver to be installed on a system at any given time. A previous driver must be un-installed prior to installing a different type of driver. For a driver of the same type, uninstalling the previous driver is not necessary because the next installation just updates the existing driver.
2. When the hardware is present and installed in the system, the installer updates the corresponding OEM wireless NIC adapter driver with the 3eTI modified driver that supports the 3eTI CKL.

### 3eTI CKL Driver Installer Overview

The 3eTI CKL driver installer can be started using one of these methods:

- Double-clicking the .exe file—can only be used for normal driver installations in which the NIC adapter is installed in the PC before the installer is run.
- Using the installer command without command-line options—can be used only for normal driver installations.

- Using the installer command with command-line options—can be used for normal and pre-installed driver installations.

When you start the driver installer by double-clicking the .exe file or using the run command without command-line options, the installer performs these operations:

- Detects and installs the 3eTI CKL with a supported NIC adapter driver for FIPS operation.
- If multiple NIC adapters are detected that support the 3eTI CKL, the installer prompts the user for adapter selection.
- If a compatible NIC adapter is not found on the PC, the installer aborts the installation and displays this error message:

*The installer cannot auto-detect a NIC chipset to provide FIPS support. To enforce a pre-installation, you are required to run the installer using the command line. For instructions or further assistance, please contact your network administrator.*


**Note**

Pre-installation scenarios are best supported with command-line options that allow you to specify specific installation options. Pre-installations are typically preformed by you, the network administrator, and not a novice user.

## Installer Command and Command-Line Options

The installer supports the following command and command-line options:

**3eTI-drv-installer.exe -s -auto Type= XXXX**

| <b>-s</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Used to perform a silent installation without prompting the user.                                                                                                                                                                                                                                                     |            |             |           |                                              |          |                                                             |          |                                                                     |         |                                                                                  |       |                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|-----------|----------------------------------------------|----------|-------------------------------------------------------------|----------|---------------------------------------------------------------------|---------|----------------------------------------------------------------------------------|-------|------------------------------------------------------------------------|
| <b>-auto</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Used to perform an intelligent installation, where the installer determines the supported NIC adapter in the PC and installs the appropriate driver. This causes the installer to perform the same operations as entering the command without command line options.                                                   |            |             |           |                                              |          |                                                             |          |                                                                     |         |                                                                                  |       |                                                                        |
| <b>Type=XXXX</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Used to specify the NIC adapter chipset for a pre-installation or a normal installation.<br><i>Pre-installation</i> means that the driver is installed before the specified NIC adapter is installed in the PC.<br><i>Normal installation</i> means that the NIC adapter is installed before the driver is installed. |            |             |           |                                              |          |                                                             |          |                                                                     |         |                                                                                  |       |                                                                        |
| <table> <tr> <th>XXXX Value</th><th>Description</th></tr> <tr> <td>Intel3945</td><td>Specifies drivers for the Intel3945 chipset.</td></tr> <tr> <td>Centrino</td><td>Specifies drivers for Intel 2100, I2200, and 2915 chipsets.</td></tr> <tr> <td>Broadcom</td><td>Specifies drivers for Broadcom chipsets supported by the Installer.</td></tr> <tr> <td>Atheros</td><td>Specifies drivers for the Atheros 5001, 5004, 5005, AR5211, and AR5212 chipsets.</td></tr> <tr> <td>Cisco</td><td>Specifies drivers for the Cisco AIR-CB21 card with an Atheros chipset.</td></tr> </table> |                                                                                                                                                                                                                                                                                                                       | XXXX Value | Description | Intel3945 | Specifies drivers for the Intel3945 chipset. | Centrino | Specifies drivers for Intel 2100, I2200, and 2915 chipsets. | Broadcom | Specifies drivers for Broadcom chipsets supported by the Installer. | Atheros | Specifies drivers for the Atheros 5001, 5004, 5005, AR5211, and AR5212 chipsets. | Cisco | Specifies drivers for the Cisco AIR-CB21 card with an Atheros chipset. |
| XXXX Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Description                                                                                                                                                                                                                                                                                                           |            |             |           |                                              |          |                                                             |          |                                                                     |         |                                                                                  |       |                                                                        |
| Intel3945                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Specifies drivers for the Intel3945 chipset.                                                                                                                                                                                                                                                                          |            |             |           |                                              |          |                                                             |          |                                                                     |         |                                                                                  |       |                                                                        |
| Centrino                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Specifies drivers for Intel 2100, I2200, and 2915 chipsets.                                                                                                                                                                                                                                                           |            |             |           |                                              |          |                                                             |          |                                                                     |         |                                                                                  |       |                                                                        |
| Broadcom                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Specifies drivers for Broadcom chipsets supported by the Installer.                                                                                                                                                                                                                                                   |            |             |           |                                              |          |                                                             |          |                                                                     |         |                                                                                  |       |                                                                        |
| Atheros                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Specifies drivers for the Atheros 5001, 5004, 5005, AR5211, and AR5212 chipsets.                                                                                                                                                                                                                                      |            |             |           |                                              |          |                                                             |          |                                                                     |         |                                                                                  |       |                                                                        |
| Cisco                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Specifies drivers for the Cisco AIR-CB21 card with an Atheros chipset.                                                                                                                                                                                                                                                |            |             |           |                                              |          |                                                             |          |                                                                     |         |                                                                                  |       |                                                                        |

**Note**

When using `-s` for silent installation, you must also specify `-auto` or `Type=XXXX` or both `-auto` and `Type=XXXX`.

Examples:

- Using `-auto` in conjunction with `-s`:
  - Performs an intelligent installation by automatically detecting the NIC adapter that is installed.
  - Performs a silent installation without prompting the user.
  - If multiple NIC adapters are detected, selects any supported chipset.
- Using `-auto` in conjunction with `Type=XXXX`:
  - Attempts to Install the driver for the NIC adapter chipset specified by `Type=XXXX`.
  - If the detected NIC adapters do not support the specified chipset, installs a driver for any NIC adapter with a supported chipset.
- Using `3eTI-drv-installer.exe Type=Intel3945 -auto -s`:
  - Attempts to install a driver for the Intel3945 chipset without prompting the user.
  - If a NIC adapter with the Intel3945 chipset is not detected, silently installs a driver for any other detected NIC adapter with a supported chipset.
  - If a NIC adapter with a supported chipset is not detected, does not pre-install any driver.
- Using `3eTI-drv-installer.exe Type=Intel3945 -s`:
  - Attempts to install a driver for the Intel3945 chipset without prompting the user.
  - If a supported NIC adapter chipset is not detected, performs a pre-install by installing the specified chipset driver.

## Running the Installer without Using Command-Line Options

To perform a normal installation with the NIC adapter installed in the PC, follow these instructions:

**Step 1**

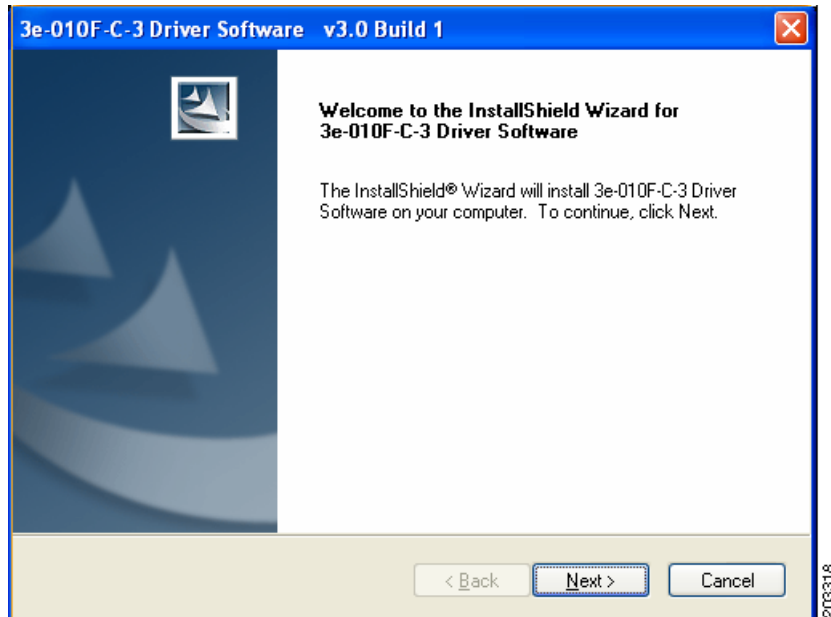
Start the installer by following one of these steps:

- a. Use Windows Explorer to locate the **3eTI-drv-installer.exe** file on your PC and double-click the filename.
- b. Click **Start > Run** and enter this installer run command:

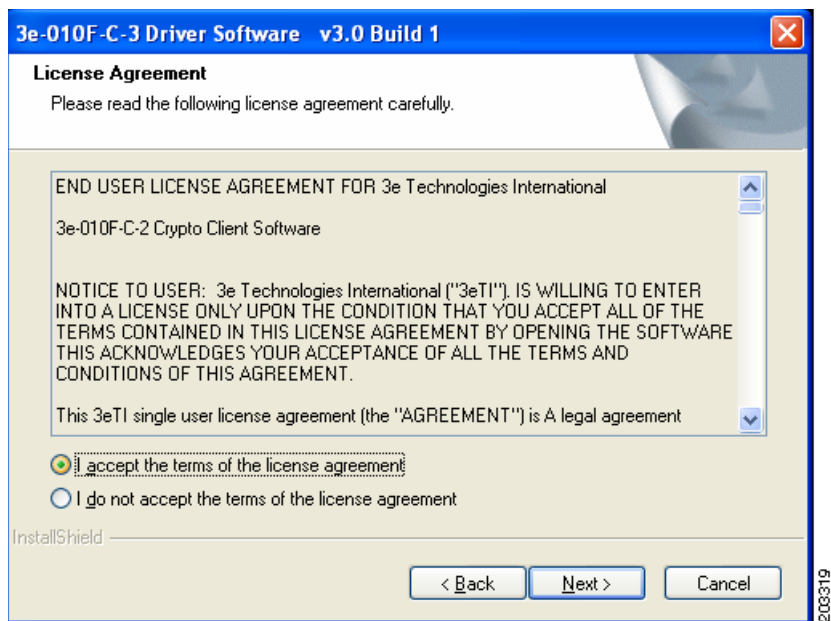
*path* / **3eTI-drv-installer.exe**

Where *path* is the directory path to the installer file.

The Driver Welcome window appears ([Figure 9-1](#)).

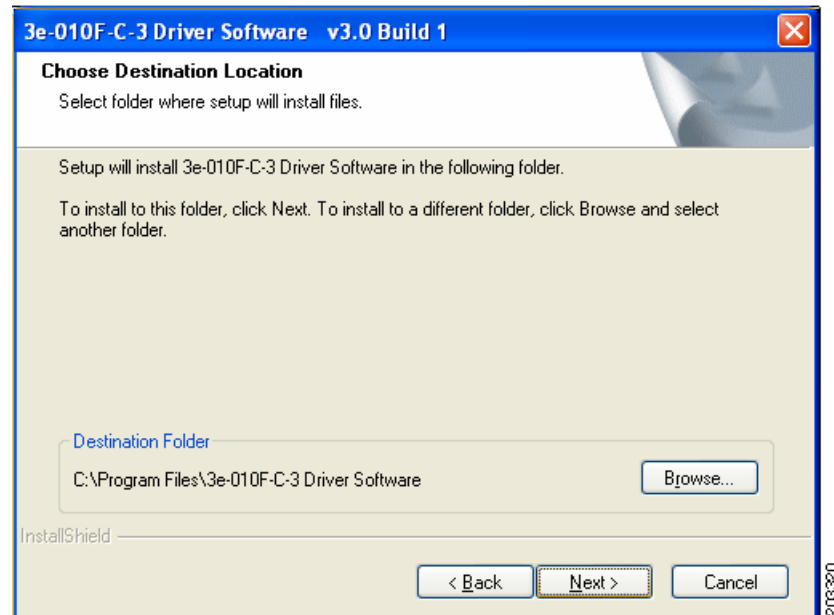
**Figure 9-1** *Driver Welcome Window*

**Step 2** Click **Next** and the license agreement appears (see [Figure 9-2](#)).

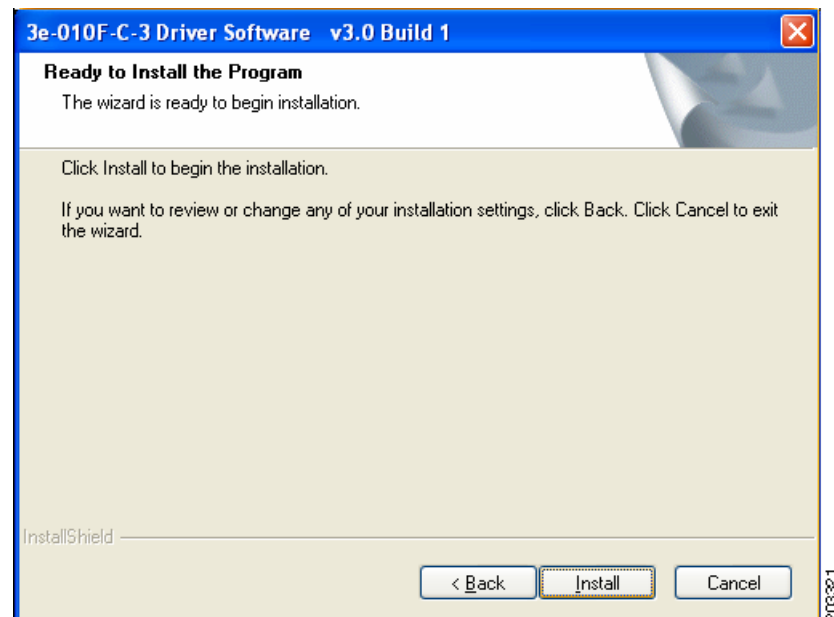
**Figure 9-2** *License Agreement*

**Step 3** Read and accept the license agreement and click **Next**. The Destination Location Window opens [Figure 9-3](#).

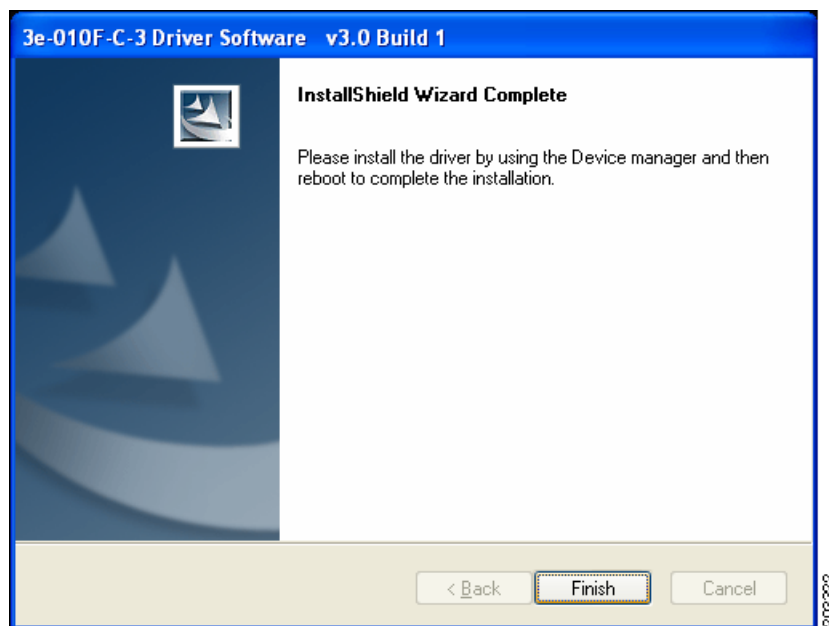


**Figure 9-3** *Destination Location Window*

- Step 4** Accept the driver software default destination folder or click **Browse** to locate the desired folder.
- Step 5** Click **Next**. The Ready to Install window opens (Figure 9-4).

**Figure 9-4** *Ready to Install Window*

- Step 6** Click **Install** to start the installation process. When the installation completes, the Wizard Complete window opens, (Figure 9-5).

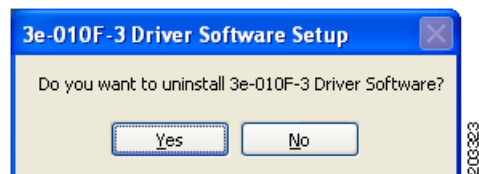
**Figure 9-5 Wizard Complete Window**

**Step 7** Click **Finish**.

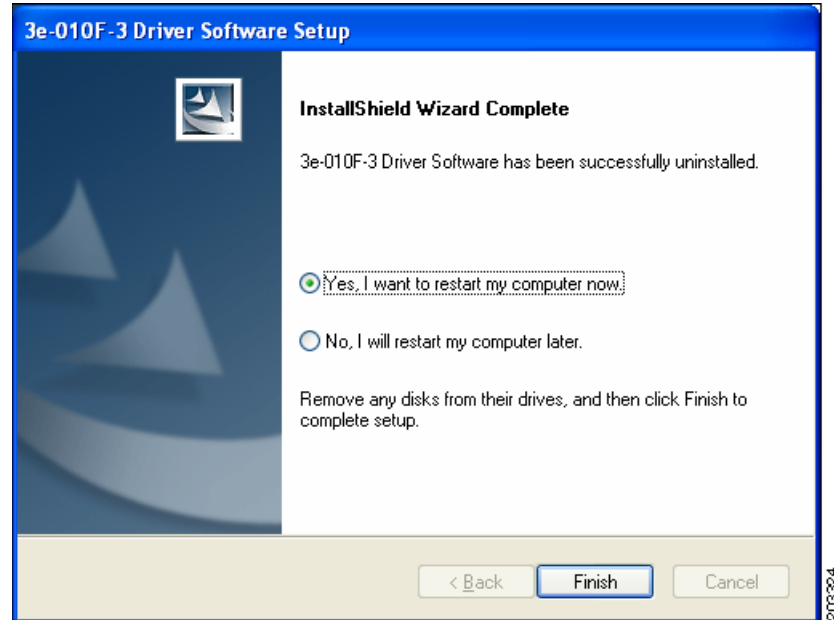
## Uninstalling Previous 3eTI Driver Software

To uninstall previous 3eTI driver software, follow these steps:

- Step 1** To uninstall the previous 3eTI driver software, click **Start > Settings > Control Panel > Add or Remove Programs**.
- Step 2** Choose the 3eTI driver software, such as 3e-010F-3 and click **Remove**.  
The Uninstall Driver Software window opens (see [Figure 9-6](#)).

**Figure 9-6 Uninstall Driver Software Pop-Up**

- Step 3** Click **Yes** to uninstall the driver software.  
The Restart Computer window opens, [Figure 9-7](#).

**Figure 9-7 Restart Computer Now Window**

**Step 4** Check **Yes** to restart your computer.

**Step 5** Click **Finish**.

Your PC reboots to completely remove the driver software.

## Silent Driver Installation for Enterprise Deployment

To run the installer using a silent mode, follow these steps:

**Step 1** Run the installer by entering this command:

```
path / 3eTI-drv-installer.exe -s Type=XXXX
```

Where:

*path* is the directory path to the installer file.

-s indicates silent installation.

**Type= XXXX** specifies the chipset, such as Centrino, Intel3945, or Cisco (see the [“Installer Command and Command-Line Options”](#) section on page 9-16).

A pop-up status window appears indicating that the driver installation is in progress and then disappears when the installation completes.

## Installing the Driver without a Previously Installed Network Adapter

To install the 3eTI driver on a PC without an installed NIC adapter, follow these steps:

- 
- Step 1** Start the installer by clicking **Start > Run** and enter this installer run command:

*path* / **3eTI-drv-installer.exe** **Type = XXXX**

Where:

*path* is the directory path to the installer file.

**Type=XXXX** specifies the chipset, such as Centrino, Intel3945, or Cisco (see the [“Installer Command and Command-Line Options”](#) section on page 9-16).

Figure 9-1 appears.

- Step 2** Perform [Step 2](#) through [Step 7](#) in the [“Running the Installer without Using Command-Line Options”](#) section on page 9-17.
- Step 3** When the driver installation is complete, insert or install the NIC adapter in the PC.
- 

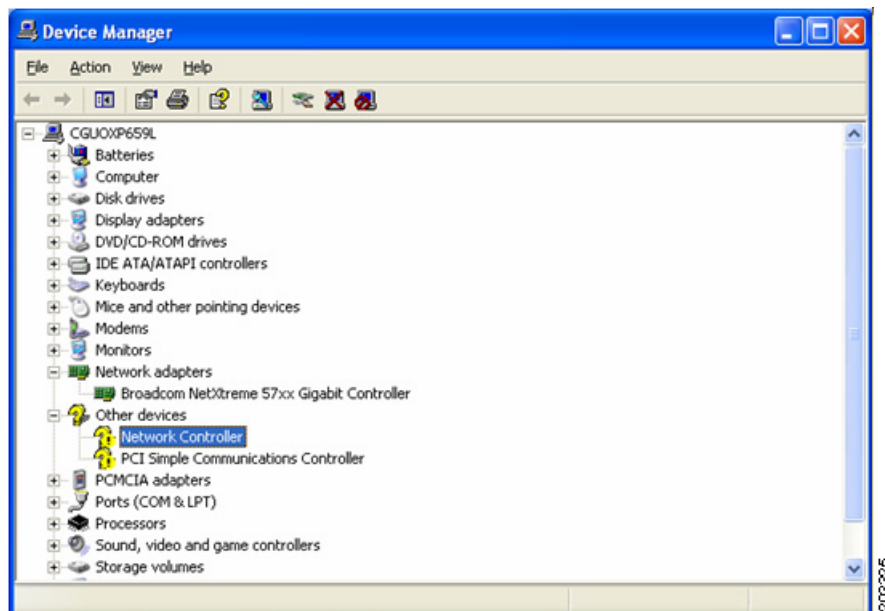
## Manually Upgrading the 3eTI Driver Software

Manual upgrade instructions are provided to help troubleshoot driver installation problems. This is not expected to be a part of an enterprise-wide deployment.

Follow these steps to manually upgrade the 3eTI driver software using the Windows Device Manager:

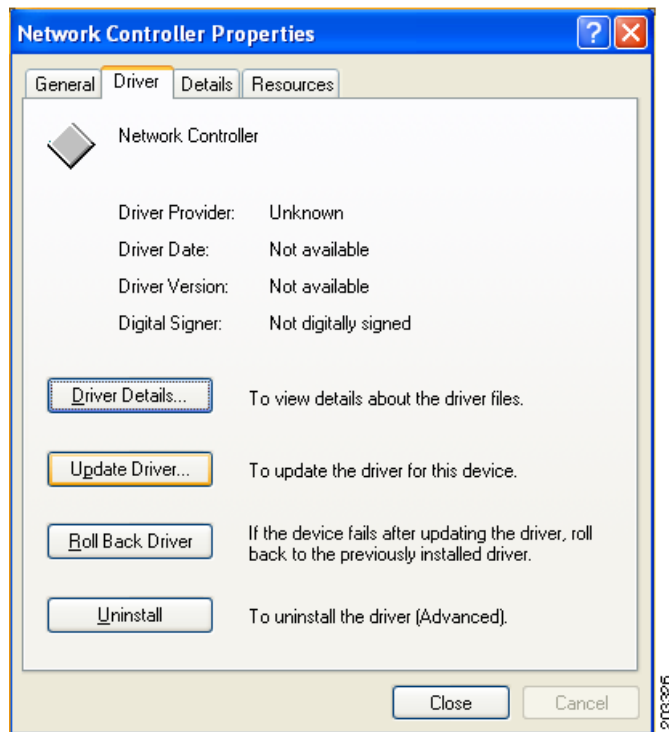
- 
- Step 1** Right-click the **My Computer** icon on your desktop and choose **Properties**.
- Step 2** Click **Hardware** on the System Properties window, click **Device Manager**.
- The Windows Device Manager window opens, [Figure 9-8](#).

**Figure 9-8** *Windows Device Manager Window*



- Step 3** If your Network Adapter is installed or inserted and the driver software is not installed, the device will be listed under Other devices and shown with a yellow question mark. Right-click on your network adapter and choose **Properties**. The Network Controller Properties window opens, [Figure 9-9](#).

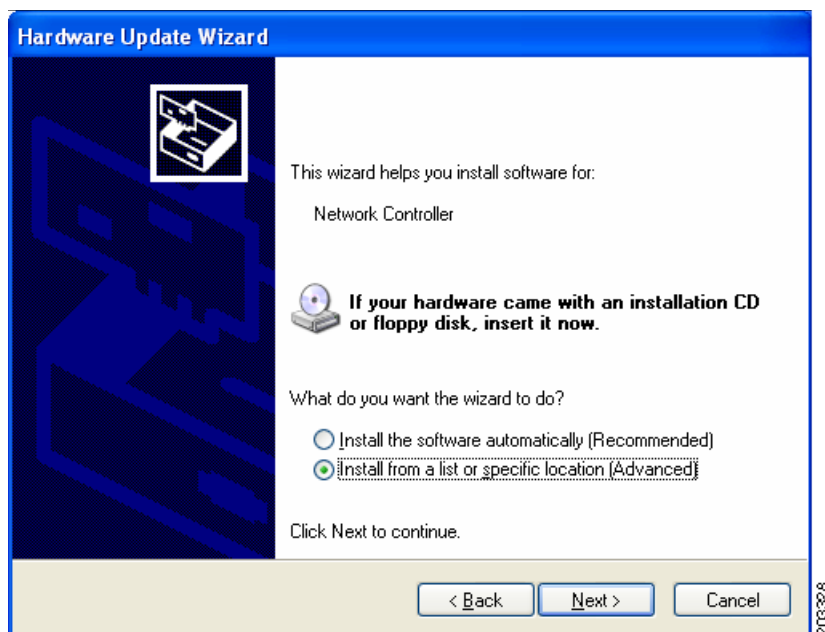
**Figure 9-9** Network Controller Properties Window



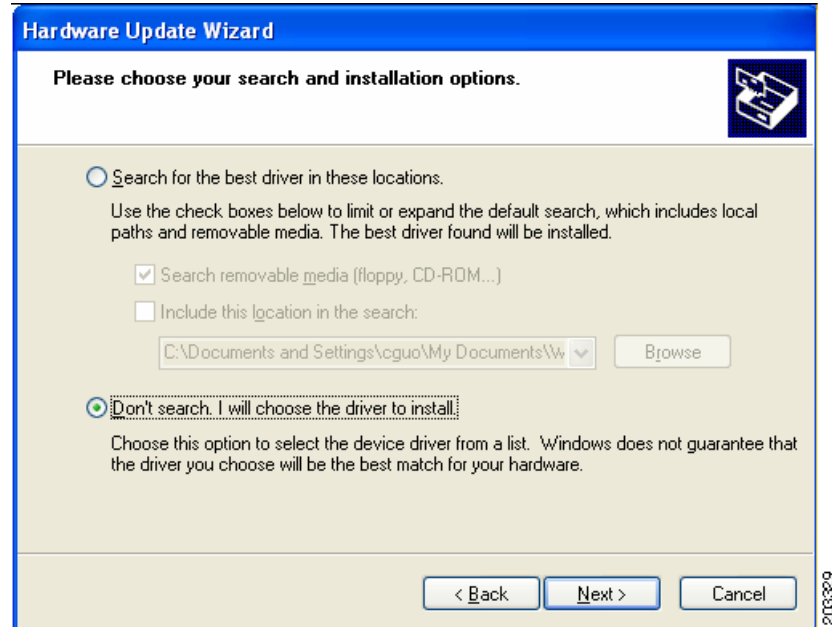
- Step 4** Click **Driver > Update Driver**.  
The Windows Hardware Update Wizard window opens, [Figure 9-10](#).

**Figure 9-10** Windows Hardware Update Wizard Window

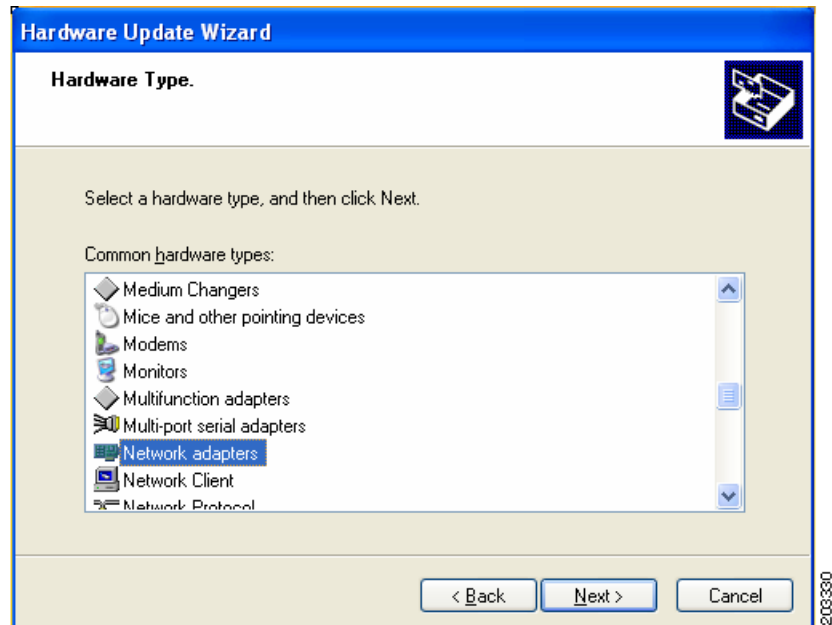
- Step 5** Click **No** to prevent Windows from searching for the driver software and click **Next**. The Hardware Update wizard continues, [Figure 9-11](#).

**Figure 9-11** Installation CD or Floppy Disk Option Window

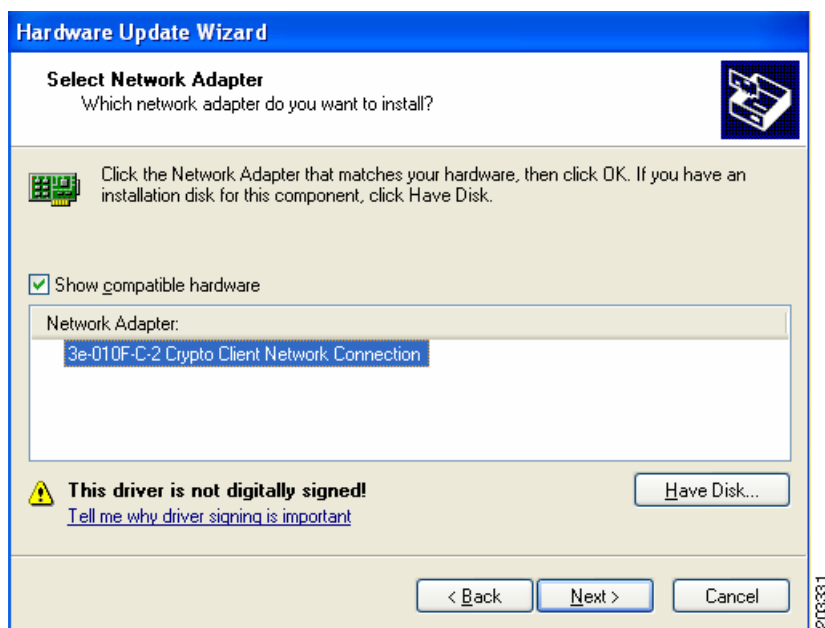
- Step 6** Check **Install from a list or specific location (Advanced)** and click **Next**. The Search and Installation Options window opens, [Figure 9-12](#).

**Figure 9-12 Search and Installation Options Window**

- Step 7** Check **Don't search. I will choose the driver to install** and click **Next**.  
The Windows Hardware Type window opens, [Figure 9-13](#).

**Figure 9-13 Windows Hardware Type Window**

- Step 8** Choose **Network adapter** and click **Next**.  
**Step 9** The Select Network Adapter window opens, [Figure 9-14](#).

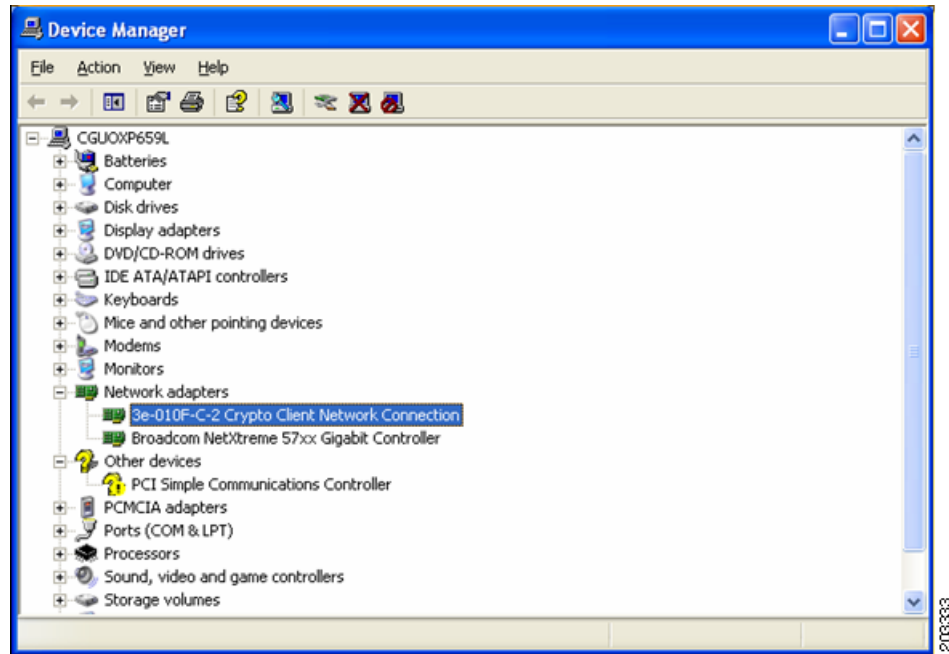
**Figure 9-14** *Select Network Adapter Window*

- Step 10** Choose the 3eTI network connection and click **Next**.  
The Installation Complete window opens, [Figure 9-15](#).

**Figure 9-15** *Installation Complete Window*

- Step 11** The hardware driver installation is complete. Click **Finish**.  
The Device Manager window reappears (see [Figure 9-16](#)).



**Figure 9-16** Updated Windows Device Manager Window

- Step 12** To verify that the driver is installed properly, right click on the 3eTI network connection and choose **Properties**. Ensure that the adapter properties window indicates **This device is working properly** under the Device status.

## Obtaining the 3eTI Driver Installer Software

The FIPS 3eTI CKL supported driver installer cannot be downloaded from the Cisco Software Center and must be ordered from Cisco. A non-expiring license for the driver installer can be ordered from Cisco using this product number: AIR-SSCFIPS-DRV

The ordered 3eTI CKL supported driver installer software is shipped to you on a product CD.





## Interoperability Guidelines and Requirements

---

This chapter provides the following instructions:

- [Using Quarantine to Restrict Non-Compliant Clients, page 10-1](#)
- [Using Microsoft Active Directory to Add the Security Appliance to the List of Internet Explorer Trusted Sites for Domain Users, page 10-2](#)
- [Configuring CSA Interoperability with AnyConnect and Cisco Secure Desktop, page 10-3](#)
- [Port Information for AnyConnect and the Legacy VPN Client, page 10-4](#)
- [Differences in Client Split Tunneling Behavior for Traffic within the Subnet, page 10-4](#)

### Using Quarantine to Restrict Non-Compliant Clients

Through the use of quarantine, you can restrict a particular client that is attempting to initiate a VPN connection. The ASA applies restricted ACLs to a session to form a restricted group, based on the dynamic access policies configured in Configuration > Remote Access VPN > Network (Client) Access or Clientless SSL VPN Access > Dynamic Access Policies. When an endpoint is not compliant with an administratively defined policy, the user can still access services for remediation (such as updating an antivirus application), but restrictions are placed upon the user. After the remediation occurs, the user can reconnect, which invokes a new posture assessment. If this assessment passes, the user connects without any restrictions.

### Quarantine Requirements

Quarantine requires an AnyConnect Premium license activated on the adaptive security appliance. The advanced endpoint assessment remediates endpoints that do not comply with dynamic policy requirements for antivirus, antispware, and firewall applications, and any associated application definition file requirements. Advanced endpoint assessment is a Cisco Secure Desktop Host Scan feature, so AnyConnect supports quarantine on all OSs supported by AnyConnect.

ASA Release 8.3(1) or later features dynamic access policies and group policies that support a user message to display on the AnyConnect GUI when the user is first notified of the quarantine. Other quarantine messages (such as “Quarantined - Remediation Required” and “To attempt a normal connection, please reconnect”) are reported, but these messages cannot be defined by the administrator to show the users. Quarantine does not require the ASA upgrade; only the user message requires it.

If you upgrade the ASA software, we recommend that you also upgrade ASDM to Release 6.3(1) or later so that you can use it to configure the new features.

AnyConnect supports quarantine on all OSs supported by AnyConnect. The client supports the quarantine user message on Windows 7, Vista, XP and Mac OS and Linux.

## Configuring Quarantine

To configure quarantine:

- 
- Step 1** (Optional) Choose **Configuration > Remote Access VPN > Secure Desktop Manager > Host Scan > Advanced Endpoint Assessment** if you want to configure Host Scan to remediate noncompliant computers.
  - Step 2** Choose **> Remote Access VPN > Network (Client) Access > Dynamic Access Policies**, click **Add**, create a DAP that uses endpoint attributes that identify noncompliant computers, click the **Action** tab, and click **Quarantine**.
  - Step 3** (Optional) Enter a message to display for the user in a quarantined session.
- 

Use the ASDM help if you need more information with configuring dynamic access policies.

## Using Microsoft Active Directory to Add the Security Appliance to the List of Internet Explorer Trusted Sites for Domain Users

An Active Directory Domain Administrator can push a group policy to domain users that adds the security appliance to the list of trusted sites in Internet Explorer. Note that this differs from the procedure to add the security appliance to the list of trusted sites by individual users. This procedure applies only to Internet Explorer on Windows machines that are managed by a domain administrator.

A security appliance uses data that is stored in filtering tables to evaluate and match URL request attributes such as domain names and IP address path segments with locally maintained database records. If a match occurs, access policy settings determine an action to block or monitor the traffic. If no match occurs, processing continues.



### Note

Adding a security appliance to the list of trusted sites for Internet Explorer is required for those running Windows Vista or Windows 7 who want to use WebLaunch.

To create a policy to add the Security Appliance to the Trusted Sites security zone in Internet Explorer by Group Policy using Active Directory, perform the following steps:

- 
- Step 1** Log on as a member of the Domain Admins group.
  - Step 2** Open the Active Directory Users and Computers MMC snap-in.
  - Step 3** Right-click the Domain or Organizational Unit where you want to create the Group Policy Object and click **Properties**.
  - Step 4** Select the **Group Policy** tab and click **New**.

- Step 5** Type a name for the new Group Policy Object and press **Enter**.
- Step 6** To prevent this new policy from being applied to some users or groups, click **Properties**. Select the **Security** tab. Add the user or group that you want to *prevent* from having this policy, then clear the **Read** and the **Apply Group Policy** check boxes in the Allow column. Click **OK**.
- Step 7** Click **Edit** and choose **User Configuration > Windows Settings > Internet Explorer Maintenance > Security**.
- Step 8** Right-click **Security Zones and Content Ratings** in the right-hand pane, then click **Properties**.
- Step 9** Select **Import the current security zones and privacy settings**. If prompted, click **Continue**.
- Step 10** Click **Modify Settings**, select **Trusted Sites**, and click **Sites**.
- Step 11** Type the URL for the Security Appliance that you want to add to the list of Trusted Sites and click **Add**. The format can contain a hostname (<https://vpn.mycompany.com>) or IP address (<https://192.168.1.100>). It can be an exact match (<https://vpn.mycompany.com>) or a wildcard ([https://\\*.mycompany.com](https://*.mycompany.com)).
- Step 12** Click **Close** and click **OK** continually until all dialog boxes close.
- Step 13** Allow sufficient time for the policy to propagate throughout the domain or forest.
- Step 14** Click **OK** in the Internet Options window.
- 

## Configuring CSA Interoperability with AnyConnect and Cisco Secure Desktop

If your remote users have Cisco Security Agent (CSA) installed, you must import CSA policies to the remote users to enable AnyConnect and Cisco Secure Desktop to interoperate with the ASA.

To do this, follow these steps:

- Step 1** Retrieve the CSA policies for AnyConnect and Cisco Secure Desktop. You can get the files from:
- The CD shipped with the ASA.
  - The software download page for the ASA 5500 Series Adaptive Security Appliance at <http://www.cisco.com/cgi-bin/tablebuild.pl/asa>.
- The filenames are AnyConnect-CSA.zip and CSD-for-CSA-updates.zip.
- Step 2** Extract the .export files from the .zip package files.
- Step 3** Choose the correct version of the .export file to import. The Version 5.2 export files work for CSA Versions 5.2 and higher. The 5.x export files are for CSA Versions 5.0 and 5.1.
- Step 4** Import the file using the Maintenance > Export/Import tab on the CSA Management Center.
- Step 5** Attach the new rule module to your VPN policy and generate rules.
- For more information, see the CSA document *Using Management Center for Cisco Security Agents 5.2*. Specific information about exporting policies is located in the section *Exporting and Importing Configurations*.
-

## Port Information for AnyConnect and the Legacy VPN Client

Table 10-1 and Table 10-2 provide port information that may help you migrate users from the legacy Cisco VPN client to the Cisco AnyConnect Secure Mobility client:

**Table 10-1** Ports Used by the AnyConnect Client

| Protocol        | Cisco AnyConnect Client Port                      |
|-----------------|---------------------------------------------------|
| TLS (SSL)       | TCP 443                                           |
| SSL Redirection | TCP 80 (optional)                                 |
| DTLS            | UDP 443 (optional, but <i>highly</i> recommended) |
| IPsec/IKEv2     | UDP 500, UDP 4500                                 |

**Table 10-2** Ports Used by the Cisco VPN (IPsec) Client

| Protocol   | Cisco VPN Client (IPsec) Port |
|------------|-------------------------------|
| IPsec/NATT | UDP 500, UDP 4500             |
| IPsec/NATT | UDP 500, UDP 4500             |
| IPsec/TCP  | TCP (configurable)            |
| IPsec/UDP  | UDP 500, UDP X (configurable) |

## Differences in Client Split Tunneling Behavior for Traffic within the Subnet

The AnyConnect client and the legacy Cisco VPN client (the IPsec/IKEv1 client) behave differently when passing traffic to sites within the same subnet as the IP address assigned by the ASA. With AnyConnect, the client passes traffic to all sites specified in the split tunneling policy you configured, and to all sites that fall within the same subnet as the IP address assigned by the ASA. For example, if the IP address assigned by the ASA is 10.1.1.1 with a mask of 255.0.0.0, the endpoint device passes all traffic destined to 10.0.0.0/8, regardless of the split tunneling policy.

By contrast, the legacy Cisco VPN client only passes traffic to addresses specified by the split-tunneling policy, regardless of the subnet assigned to the client.

Therefore, use a netmask for the assigned IP address that properly references the expected local subnet.



## Managing VPN Authentication

This chapter explains how to manage VPN authentication for users using the Cisco AnyConnect Secure Mobility client, and includes these subjects and tasks:

- [Configuring Certificate-only Authentication, page 11-1](#)
- [AnyConnect Smart Card Support, page 11-2](#)
- [Avoiding SHA 2 Certificate Validation Failure, page 11-2](#)
- [SDI Token \(SoftID\) Integration, page 11-4](#)
- [Comparing Native SDI with RADIUS SDI, page 11-4](#)
- [Using SDI Authentication, page 11-5](#)
- [Ensuring RADIUS/SDI Proxy Compatibility with AnyConnect, page 11-9](#)

## Configuring Certificate-only Authentication

You can specify whether you want users to authenticate using AAA with a username and password or using a digital certificate (or both). When you configure certificate-only authentication, users can connect with a digital certificate and are not required to provide a user ID and password.



### Note

Certificate-only authentication requires the correct configuration of the Extended Key Usage (EKU) attributes in the digital certificates, regardless of tunnel protocol (IKEV2 or SSL). The ASA ID certificate must have the EKU attribute set to `server-authentication`.

You can configure certificate-only authentication in connection profiles. To enable this setting, follow this procedure:

- Step 1** Go to **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Connection Profiles**. Select a connection profile and click **Edit**. The Edit AnyConnect Connection Profile window opens.
- Step 2** If it is not already, click the **Basic** node of the navigation tree on the left pane of the window. In the right pane of the window, in the **Authentication** area, enable the method **Certificate**.
- Step 3** Click **OK**.
- Step 4** (Optional) You can specify which certificates, if any, you want to use for SSL authentication on each interface. If you do not specify a certificate for a particular interface, the fallback certificate will be used.

To do this, go to **Configuration > Remote Access VPN > AnyConnect Connection Profiles**. In the **Access Interfaces** area in the right pane, select the interface for which you want to specify a certificate, and then click **Device Certificate**.

**Step 5** In the Specify Device Certificate dialog, click the **Device Certificate** field to choose a certificate or click **Manage** to add a certificate you want to use for authentication connections to the interface you have chosen.

**Step 6** Click **OK** and apply your changes.



**Note**

- To configure in which certificate store the AnyConnect client searches for the authentication certificate, see the “[Configuring Certificate Expiration Notice](#)” section on page 3-48. You will also find information on configuring certificate restrictions for Linux and Mac OS X operating systems.
- The certificate used to authenticate the client to the secure gateway must be valid and trusted (signed by a CA). A self-signed client certificate will not be accepted.

## AnyConnect Smart Card Support

AnyConnect supports smart cards in the following environments:

- Microsoft CAPI 1.0 and CAPI 2.0 on Windows XP, 7 & Vista
- Keychain via Token on Mac OS X, 10.4 and higher



**Note**

AnyConnect does not support Smart cards on Linux or PKCS #11 devices.

## Avoiding SHA 2 Certificate Validation Failure

The AnyConnect client relies on the Windows Cryptographic Service Provider (CSP) of the certificate for hashing and signing of data required during the IKEv2 authentication phase of the IPsec/IKEv2 VPN connection. If the CSP does not support SHA 2 algorithms, and the ASA is configured for the pseudo-random function (PRF) SHA256, SHA384, or SHA512, and the connection profile (tunnel-group) is configured for certificate, or certificate *and* AAA authentication, certificate authentication fails. The user receives the message *Certificate Validation Failure*.

This failure occurs for Windows only, for certificates that belong to CSPs that do not support SHA 2-type algorithms. Other supported OSs do not experience this problem.

To avoid this problem you can configure the PRF in the IKEv2 policy on the ASA to **md5** or **sha** (SHA 1).

Alternatively, you can modify the certificate CSP value for native CSPs that we know work:

- For Windows XP—Microsoft Enhanced RSA and AES Cryptographic Provider (Prototype)
- For Windows 7 and Vista—Microsoft Enhanced RSA and AES Cryptographic Provider



**Caution**

Do not apply this workaround to SmartCards certificates. The CSP names must not be changed. Instead, contact the SmartCard provider for an updated CSP that supports SHA 2 algorithms.



**Caution**

Performing the following workaround actions could corrupt the user certificate if you perform them incorrectly. Use extra caution when specifying changes to the certificate.

You can use the Microsoft Certutil.exe utility to modify the certificate CSP values. Certutil is a command-line utility for managing a Windows CA, and is available in the Microsoft Windows Server 2003 Administration Tools Pack. You can download the Tools Pack at this URL:

<http://www.microsoft.com/downloads/en/details.aspx?FamilyID=c16ae515-c8f4-47ef-a1e4-a8dcba8ff8e3&displaylang=en>

Follow this procedure to run Certutil.exe and change the Certificate CSP values:

**Step 1** Open a command window on the endpoint computer.

**Step 2** View the certificates in the user store along with their current CSP value using the following command:

```
certutil -store -user My
```

The following example shows the certificate contents displayed by this command:

```
===== Certificate 0 =====
Serial Number: 3b3be91200020000854b
Issuer: CN=cert-issuer, OU=Boston Sales, O=Example Company, L=San Jose,
S=CA, C=US, E=csmith@example.com
NotBefore: 2/16/2011 10:18 AM
NotAfter: 5/20/2024 8:34 AM
Subject: CN=Carol Smith, OU=Sales Department, O=Example Company, L=San Jose, S=C
A, C=US, E=csmith@example.com
Non-root Certificate
Template:
Cert Hash(sha1): 86 27 37 1b e6 77 5f aa 8e ad e6 20 a3 14 73 b4 ee 7f 89 26
Key Container = {F62E9BE8-B32F-4700-9199-67CCC86455FB}
Unique container name: 46ab1403b52c6305cb226edd5276360f_c50140b9-ffef-4600-ada
6-d09eb97a30f1
Provider = Microsoft Enhanced RSA and AES Cryptographic Provider
Signature test passed
```

**Step 3** Identify the <CN> attribute in the certificate. In the example, the CN is *Carol Smith*. You need this information for the next step.

**Step 4** Modify the certificate CSP using the following command. The example below uses the subject <CN> value to select the certificate to modify. You can also use other attributes.

On Windows Vista and Windows 7, use this command:

```
certutil -csp "Microsoft Enhanced RSA and AES Cryptographic Provider" -f -repairstore
-user My <CN> carol smith
```

On Windows XP, use this command:

```
certutil -csp "Microsoft Enhanced RSA and AES Cryptographic Provider (Prototype)" -f
-repairstore -user My <CN> carol smith
```

**Step 5** Repeat step 2 and verify the new CSP value appears for the certificate.

## SDI Token (SoftID) Integration

AnyConnect integrates support for RSA SecurID client software versions 1.1 and later running on Windows 7 x86 (32-bit) and x64 (64-bit), Vista x86 and x64, and XP x86.

RSA SecurID software authenticators reduce the number of items a user has to manage for safe and secure access to corporate assets. RSA SecurID Software Tokens residing on a remote device generate a random one-time-use passcode that changes every 60 seconds. The term SDI stands for Security Dynamics, Inc. technology, which refers to this one-time password generation technology that uses hardware and software tokens.

The RSA SecureIDIntegration profile setting has three possible values:

- **Automatic**—The client first attempts one method, and if it fails, the other method is tried. The default is to treat the user input as a token passcode (**HardwareToken**), and if that fails, treat it as a software token pin (**SoftwareToken**). When authentication is successful, the successful method is set as the new SDI Token Type and cached in the user preferences file. For the next authentication attempt, the SDI Token Type defines which method is attempted first. Generally, the token used for the current authentication attempt is the same token used in the last successful authentication attempt. However, when the username or group selection is changed, it reverts to attempting the default method first, as shown in the input field label.



**Note** The SDI Token Type only has meaning for the automatic setting. You can ignore logs of the SKI Token Type when the authentication mode is not automatic. **HardwareToken** as the default avoids triggering next token mode.

- **SoftwareToken**—The client always interprets the user input as a software token PIN, and the input field label is “PIN:”.
- **HardwareToken**—The client always interprets the user input as a token passcode, and the input field label is “Passcode:”.



**Note**

AnyConnect does not support token selection from multiple tokens imported into the RSA Software Token client software. Instead, the client uses the default selected via the RSA SecurID Software Token GUI.

## Comparing Native SDI with RADIUS SDI

The network administrator can configure the secure gateway to allow SDI authentication in either of the following modes:

- *Native SDI* refers to the native ability in the secure gateway to communicate directly with the SDI server for handling SDI authentication.
- *RADIUS SDI* refers to the process of the secure gateway performing SDI authentication using a RADIUS SDI proxy, which communicates with the SDI server.

In releases 2.1 and higher, except for one case (described later), Native SDI and RADIUS SDI appear identical to the remote user. Because the SDI messages are configurable on the SDI server, the message text (see [on page 11-12](#)) on the ASA must match the message text on the SDI server. Otherwise, the prompts displayed to the remote client user might not be appropriate for the action required during authentication. AnyConnect might fail to respond and authentication might fail.

RADIUS SDI challenges, with minor exceptions, essentially mirror native SDI exchanges. Since both ultimately communicate with the SDI server, the information needed from the client and the order in which that information is requested is the same. Except where noted, the remainder of this section deals with native SDI.

When a remote user using RADIUS SDI authentication connects to the ASA with AnyConnect and attempts to authenticate using an RSA SecurID token, the ASA communicates with the RADIUS server, which in turn, communicates with the SDI server about the authentication.

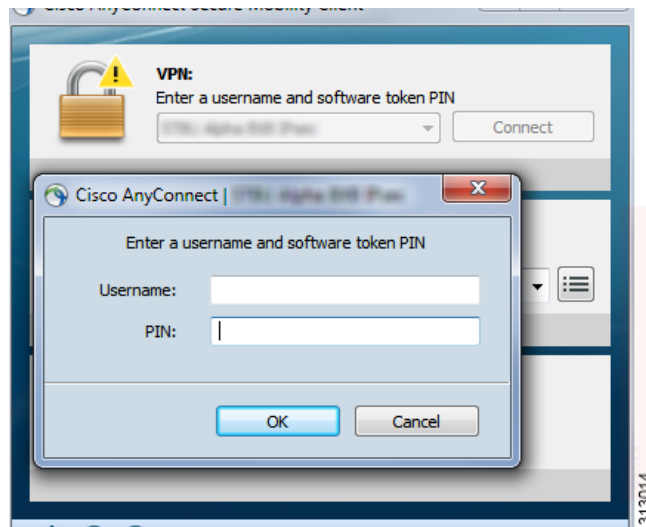
For more information about configuring the ASA to ensure AnyConnect compatibility, see the [“Ensuring RADIUS/SDI Proxy Compatibility with AnyConnect”](#) section on page 11-9.

## Using SDI Authentication

The login (challenge) dialog box matches the type of authentication configured for the tunnel group to which the user belongs. The input fields of the login dialog box clearly indicate what kind of input is required for authentication.

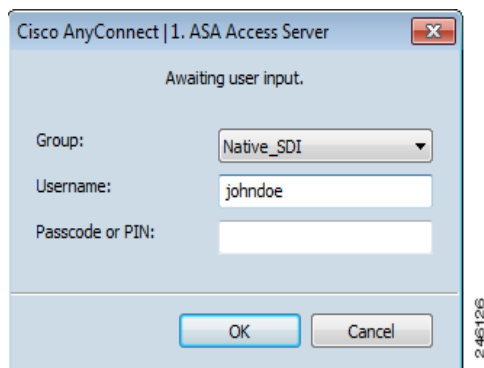
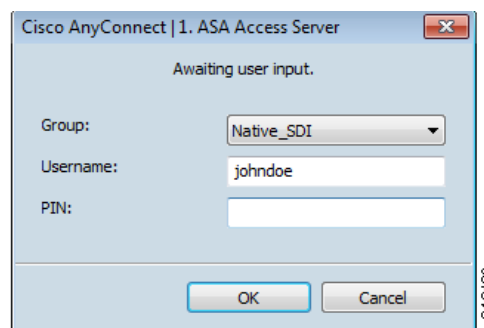
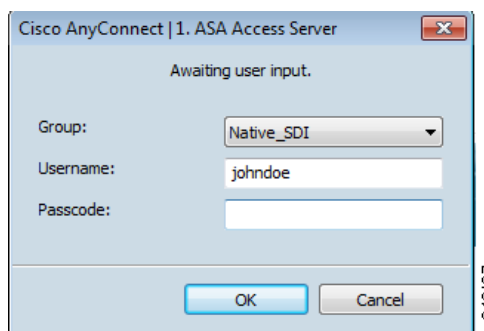
Typically, users make an AnyConnect connection by clicking the AnyConnect icon in the tools tray, selecting the connection profile with which they wish to connect, and then entering the appropriate credentials in the authentication dialog box. Users who rely on username/password authentication see a dialog box like that in [Figure 11-1](#).

**Figure 11-1** Username/Password Authentication Login Dialog Box



For SDI authentication, the remote user enters a PIN (Personal Identification Number) into the AnyConnect software interface and receives an RSA SecurID passcode. After the user enters the passcode into the secured application, the RSA Authentication Manager validates the passcode and allows the user to gain access.

Users who use RSA SecurID hardware or software tokens see input fields indicating whether the user should enter a passcode or a PIN, a PIN, or a passcode and the status line at the bottom of the dialog box provides further information about the requirements. The user enters a software token PIN or passcode directly into the AnyConnect user interface. See [Figure 11-2](#), [Figure 11-3](#), and [Figure 11-4](#).

**Figure 11-2** *Passcode or Pin Dialog Box***Figure 11-3** *PIN Dialog Box***Figure 11-4** *Passcode Dialog Box*

The appearance of the initial login dialog box depends on the secure gateway settings: the user can access the secure gateway either through the main login page, the main index URL, a tunnel-group login page, or a tunnel group URL (URL/tunnel-group). To access the secure gateway via the main login page, the “Allow user to select connection” check box must be set in the Network (Client) Access AnyConnect Connection Profiles page. In either case, the secure gateway sends the client a login page. The main login page contains a drop-down list in which the user selects a tunnel group; the tunnel-group login page does not, since the tunnel-group is specified in the URL.

In the case of a main login page (with a drop-down list of connection profiles or tunnel groups), the authentication type of the default tunnel group determines the initial setting for the password input field label. For example, if the default tunnel group uses SDI authentication, the field label is “Passcode;” but

if the default tunnel group uses NTLM authentication, the field label is “Password.” In Release 2.1 and later, the field label is not dynamically updated with the user selection of a different tunnel group. For a tunnel-group login page, the field label matches the tunnel-group requirements.

The client supports input of RSA SecurID Software Token PINs in the password input field. If the RSA SecurID Software Token software is installed and the tunnel-group authentication type is SDI, the field label is “Passcode” and the status bar states “Enter a username and passcode or software token PIN.” If a PIN is used, subsequent consecutive logins for the same tunnel group and username have the field label “PIN.” The client retrieves the passcode from the RSA SecurID Software Token DLL using the entered PIN. With each successful authentication, the client saves the tunnel group, the username, and authentication type, and the saved tunnel group becomes the new default tunnel group.

AnyConnect accepts passcodes for any SDI authentication. Even when the password input label is “PIN,” the user may still enter a passcode as instructed by the status bar. The client sends the passcode to the secure gateway as is. If a passcode is used, subsequent consecutive logins for the same tunnel group and username have the field label “Passcode.”

## Categories of SDI Authentication Exchanges

All SDI authentication exchanges fall into one of the following categories:

- Normal SDI Authentication Login
- Normal login challenge
- New user mode
- New PIN mode
- Clear PIN mode
- Next Token Code mode

### Normal SDI Authentication Login

A normal login challenge is always the first challenge. The SDI authentication user must provide a user name and token passcode (or PIN, in the case of a software token) in the username and passcode or PIN fields, respectively. The client returns the information to the secure gateway (central-site device), and the secure gateway verifies the authentication with the authentication server (SDI or SDI via RADIUS proxy).

If the authentication server accepts the authentication request, the secure gateway sends a success page back to the client, and the authentication exchange is complete.

If the passcode is not accepted, the authentication fails, and the secure gateway sends a new login challenge page, along with an error message. If the passcode failure threshold on the SDI server has been reached, then the SDI server places the token into next token code mode. See the [““Next Passcode” and “Next Token Code” Challenges” section on page 11-9](#).

### New User, Clear PIN, and New PIN Modes

The PIN can be cleared only on the SDI server and only by the network administrator.

In the New User, Clear PIN, and New PIN modes, AnyConnect caches the user-created PIN or system-assigned PIN for later use in the “next passcode” login challenge.

Clear PIN mode and New User mode are identical from the point of view of the remote user and are both treated the same by the secure gateway. In both cases, the remote user either must enter a new PIN or be assigned a new PIN by the SDI server. The only difference is in the user response to the initial challenge.

For New PIN mode, the existing PIN is used to generate the passcode, as it would be in any normal challenge. For Clear PIN mode, no PIN is used at all for hardware tokens, with the user entering just a token code. A PIN of eight consecutive zeros (00000000) is used to generate a passcode for RSA software tokens. In either case, the SDI server administrator must inform the user of what, if any, PIN value to use.

Adding a new user to an SDI server has the same result as clearing the PIN of an existing user. In both cases, the user must either provide a new PIN or be assigned a new PIN by the SDI server. In these modes, for hardware tokens, the user enters just a token code from the RSA device. In either case, the SDI server administrator must inform the user of what, if any, PIN value to use.

## Getting a New PIN

If there is no current PIN, the SDI server requires that one of the following conditions be met, depending on how the system is configured:

- The user can choose whether to create a PIN or have the system assign it.
- The user must create a new PIN.
- The system must assign a new PIN to the user.

By default, the system simply assigns a PIN.

If the SDI server is configured to allow the remote user to choose whether to create a PIN or have the system assign a PIN, the login screen presents a drop-down list showing the options. The status line provides a prompt message. In either case, the user must remember the new PIN for future login authentications.

## Creating a New PIN

If the user chooses to create a new PIN and clicks **Continue** (Figure 11-5), AnyConnect presents a dialog box on which to enter that PIN (Figure 11-6). The PIN must be a number from 4 to 8 digits long.

**Figure 11-5** User Choose to Create a PIN

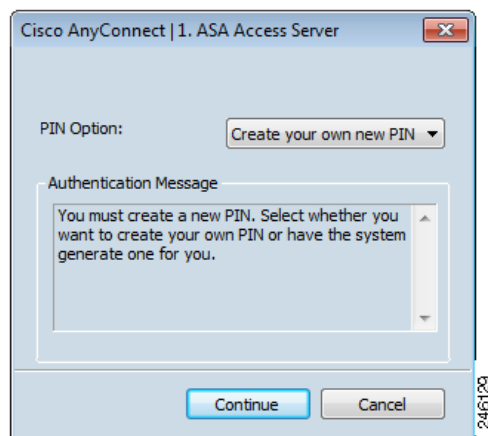
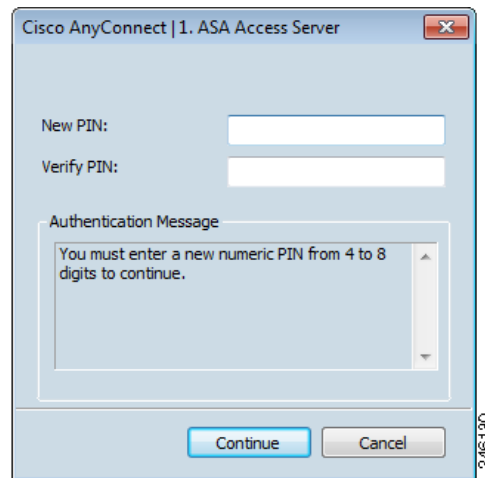


**Figure 11-6**      **Creating a New PIN**

For a user-created PIN, after entering and confirming the new PIN, the user clicks **Continue**. Because the PIN is a type of password, anything the user enters into these input fields is displayed as asterisks. With RADIUS proxy, the PIN confirmation is a separate challenge, subsequent to the original dialog box. The client sends the new PIN to the secure gateway, and the secure gateway continues with a “next passcode” challenge.

For a system-assigned PIN, if the SDI server accepts the passcode that the user enters on the login page, then the secure gateway sends the client the system-assigned PIN. The user must click **Continue**. The client sends a response back to the secure gateway, indicating that the user has seen the new PIN, and the system continues with a “next passcode” challenge.

In both cases, the user must remember the PIN for subsequent login authentications.

## “Next Passcode” and “Next Token Code” Challenges

For a “next passcode” challenge, the client uses the PIN value cached during the creation or assignment of a new PIN to retrieve the next passcode from the RSA SecurID Software Token DLL and return it to the secure gateway without prompting the user. Similarly, in the case of a “next Token Code” challenge for a software token, the client retrieves the next Token Code from the RSA SecurID Software Token DLL.

## Ensuring RADIUS/SDI Proxy Compatibility with AnyConnect

This section describes procedures to ensure that AnyConnect using RSA SecureID Software tokens can properly respond to user prompts delivered to the client through a RADIUS server proxying to an SDI server or servers. This section contains the following topics:

- [AnyConnect and RADIUS/SDI Server Interaction](#)
- [Configuring the Security Appliance to Support RADIUS/SDI Messages](#)

## AnyConnect and RADIUS/SDI Server Interaction

When a remote user connects to the ASA with AnyConnect and attempts to authenticate using an RSA SecurID token, the ASA communicates with the RADIUS server, which in turn, communicates with the SDI server about the authentication.

During authentication, the RADIUS server presents access challenge messages to the ASA. Within these challenge messages are reply messages containing text from the SDI server. The message text is different when the ASA is communicating directly with an SDI server from when communicating through the RADIUS proxy. Therefore, in order to appear as a native SDI server to AnyConnect, the ASA must interpret the messages from the RADIUS server.

Also, because the SDI messages are configurable on the SDI server, the message text on the ASA must match (in whole or in part) the message text on the SDI server. Otherwise, the prompts displayed to the remote client user may not be appropriate for the action required during authentication. AnyConnect might fail to respond and authentication might fail.

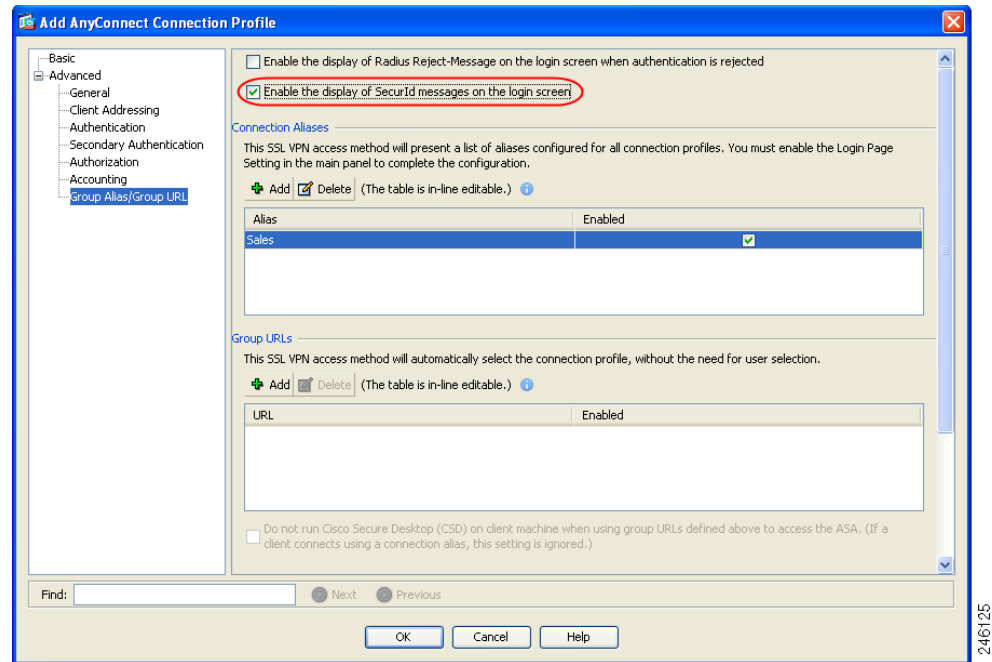
## Configuring the Security Appliance to Support RADIUS/SDI Messages

The following section describes the steps to configure the ASA to interpret SDI-specific RADIUS reply messages and prompt the AnyConnect user for the appropriate action.

Configure a connection profile (tunnel group) to forward RADIUS reply messages in a manner that simulates direct communication with an SDI server. Users authenticating to the SDI server must connect over this connection profile.

- 
- Step 1** Go to **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Connection Profiles**.
  - Step 2** Select the connection profile you want to configure to interpret SDI-specific RADIUS reply messages and click **Edit**.
  - Step 3** In the **Edit AnyConnect Connection Profile** window, expand the Advanced node in the navigation pane on the left and select **Group Alias / Group URL**.
  - Step 4** Check **Enable the display of SecurID messages on the login screen**.
  - Step 5** Click **OK**.
  - Step 6** Choose **Configuration > Remote Access VPN > AAA/Local Users > AAA Server Groups**.
  - Step 7** Click **Add** to Add a AAA Server group.
  - Step 8** Configure the AAA server group in the Edit AAA Server Group dialog and click **OK**.
  - Step 9** In the **AAA Server Groups** area, select the AAA server group you just created and then click **Add** in the **Servers in the Selected Group** area.
  - Step 10** In the **SDI Messages** area, expand the **Message Table** area. Double-click a message text field to edit the message. Configure the RADIUS reply message text on the ASA to match (in whole or in part) the message text sent by the RADIUS server.
  - Step 11** Click **OK**. Click **Apply**. Click **Save**.



**Figure 11-7** Add/Edit AnyConnect Connection Profile Screen

The default message text used by the ASA is the default message text used by Cisco Secure Access Control Server (ACS). If you are using Cisco Secure ACS, and it is using the default message text, you do not need to configure the message text on the ASA. Otherwise, configure the messages to ensure the message text matches.

Table 11-1 shows the message code, the default RADIUS reply message text, and the function of each message. Because the security appliance searches for strings in the order in which they appear in the table, you must ensure that the string you use for the message text is not a subset of another string.

For example, “new PIN” is a subset of the default message text for both new-pin-sup and next-ccode-and-reauth. If you configure new-pin-sup as “new PIN,” when the security appliance receives “new PIN with the next card code” from the RADIUS server, it will match the text to the new-pin-sup code instead of the next-ccode-and-reauth code.

**Table 11-1** *SDI Opcodes, Default Message Text, and Message Function*

| <b>Message Code</b>   | <b>Default RADIUS Reply Message Text</b> | <b>Function</b>                                                                                                                                   |
|-----------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| next-code             | Enter Next PASSCODE                      | Indicates the user must enter the NEXT tokencode without the PIN.                                                                                 |
| new-pin-sup           | Please remember your new PIN             | Indicates the new system PIN has been supplied and displays that PIN for the user.                                                                |
| new-pin-meth          | Do you want to enter your own pin        | Requests from the user which new PIN method to use to create a new PIN.                                                                           |
| new-pin-req           | Enter your new Alpha-Numerical PIN       | Indicates a user-generated PIN and requests that the user enter the PIN.                                                                          |
| new-pin-reenter       | Reenter PIN:                             | Used internally by the ASA for user-supplied PIN confirmation. The client confirms the PIN without prompting the user.                            |
| new-pin-sys-ok        | New PIN Accepted                         | Indicates the user-supplied PIN was accepted.                                                                                                     |
| next-ccode-and-reauth | new PIN with the next card code          | Follows a PIN operation and indicates the user must wait for the next tokencode and to enter both the new PIN and next tokencode to authenticate. |
| ready-for-sys-pin     | ACCEPT A SYSTEM GENERATED PIN            | Used internally by the ASA to indicate the user is ready for the system-generated PIN.                                                            |



# Customizing and Localizing the AnyConnect Client and Installer

---

You can customize the Cisco AnyConnect Secure Mobility client to display your own corporate image to remote users, including clients running on Windows, Linux, and Mac OS X computers.

You can localize (translate) the client and all optional modules for different languages. You can also localize the installer program for the core VPN client.

This chapter contains procedures for customizing and localizing in the following sections:

- [Customizing AnyConnect, page 12-1](#)
- [Creating and Uploading an AnyConnect Client Help File, page 12-14](#)
- [Changing the Default AnyConnect English Messages, page 12-15](#)
- [Localizing the AnyConnect Client GUI and Installer, page 12-18](#)

## Customizing AnyConnect

You can customize AnyConnect client to display your own corporate image to remote users, including clients running on Windows, Linux, and Mac OS X computers. You can use one of three methods to customize the client:

- Rebrand the client by importing individual client GUI components, such as the corporate logo and icons, to the ASA which deploys them to remote computers with the installer. See [Replacing Individual GUI Components with your Custom Components, page 12-2](#).
- Import a transform (Windows only. See [Customizing the GUI with a Transform, page 12-4.y](#)) that you create for more extensive rebranding. The ASA deploys it with the installer.
- Import your own program (Windows and Linux only) that provides its own GUI or CLI and uses the AnyConnect API. See [Deploying Executables That Use the Client API, page 12-6](#).



### Note

The Network Access Manager and Web Security do not support the AnyConnect API. If you deploy Web Security or the Network Access Manager, you must deploy the core AnyConnect client.

You can also customize the AnyConnect installer, for both Web Deploy and Pre-deploy.

## What Can Be Customized?

The AnyConnect client and installer can be customized.

### Installer

#### Windows Predeploy

- Predeploy - The predeploy installer can be modified by creating transforms or using msixexec.
- ISO - In the ISO image, setup.hta is HTML, which can be edited, but since the ISO is for administrators, customization is not explicitly supported.
- Uninstaller - The uninstall prompt is not customizable.

#### OSX Predeploy

- OSX supports localization. The strings used by the installer come from Mac installer application, instead of from our installer.

#### Linux Predeploy

- The installer is a shell script, so customization does not apply.

#### Web Deploy

- Web deployment uses browser web launch provided by the clientless SSL portal. The clientless SSL portal can be customized, but not the AnyConnect parts of the portal. For example, the Start Anyconnect button can't be customized.

### AnyConnect UI

- Downloader - some status messages are not customizable, for example:
  - Status messages, when updating
  - Untrusted server
  - Deferred updateNote that all messages are localizable when they are displayed in the UI.
- AnyConnect Dialog/UI
  - Messages can be customized by creating or updating PO or MO files.
  - UI components can be customized by replacing images and text with ASDM.

## Replacing Individual GUI Components with your Custom Components

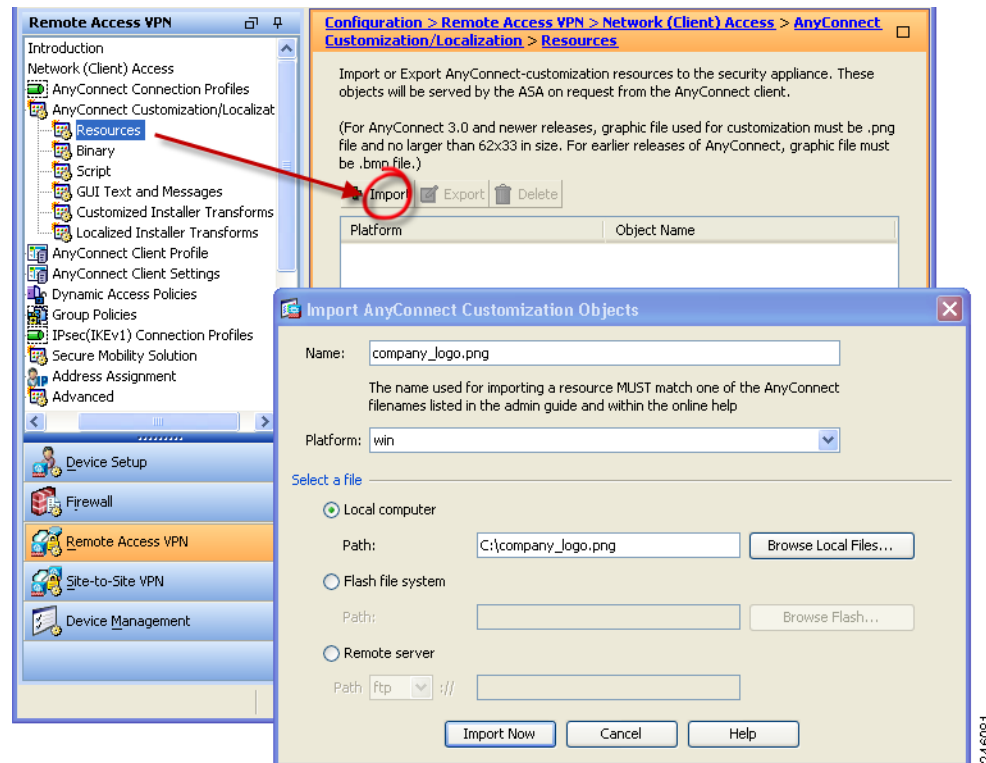
You can customize AnyConnect by importing your own custom files to the security appliance, which deploys the new files with the client. [Table 12-2](#), [Table 12-3](#), and [Table 12-4](#) contain sample images of the original GUI icons and information about their sizes.

To import and deploy your custom files with the client, follow this procedure:

**Step 1** Go to **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Customization/Localization > Resources**.

Click **Import**. The Import AnyConnect Customization Object window displays (Figure 12-1).

**Figure 12-1** Importing a Customization Object



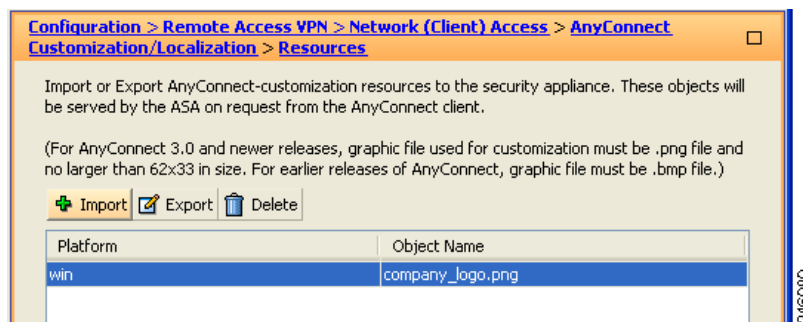
**Step 2** Enter the Name of the file to import. See Table 12-2, Table 12-3, and Table 12-4 for the filenames of all the GUI components that you can replace.



**Note**

The filenames of your custom components must match the filenames used by the AnyConnect GUI, which are different for each operating system and are case sensitive for Mac and Linux. For example, if you want to replace the corporate logo for Windows clients, you must import your corporate logo as *company\_logo.png*. If you import it as a different filename, the AnyConnect installer does not change the component. However, if you deploy your own executable to customize the GUI, the executable can call resource files using any filename.

**Step 3** Select a platform and specify the file to import. Click **Import Now**. The file now appears in the table (Figure 12-2).

**Figure 12-2** The Imported File Displays in the Table**Note**

If you import an image as a resource file (such as company\_logo.bmp), the image you import customizes AnyConnect until you reimport another image using the same filename. For example, if you replace company\_logo.bmp with a custom image, and then delete the image, the client continues to display your image until you import a new image (or the original Cisco logo image) using the same filename.

## Customizing the GUI with a Transform

You can perform more extensive customizing of the AnyConnect GUI (Windows only) by creating your own transform that deploys with the client installer program. You import the transform to the ASA, which deploys it with the installer program.

To create an MSI transform, you can download and install the free database editor from Microsoft, named Orca. With this tool, you can modify existing installations and even add new files. The Orca tool is part of the Microsoft Windows Installer Software Development Kit (SDK) which is included in the Microsoft Windows SDK. The following link leads to the bundle containing the Orca program:

[http://msdn.microsoft.com/library/default.asp?url=/library/en-us/msi/setup/orca\\_exe.asp](http://msdn.microsoft.com/library/default.asp?url=/library/en-us/msi/setup/orca_exe.asp).

After you install the SDK, the Orca MSI is located here:

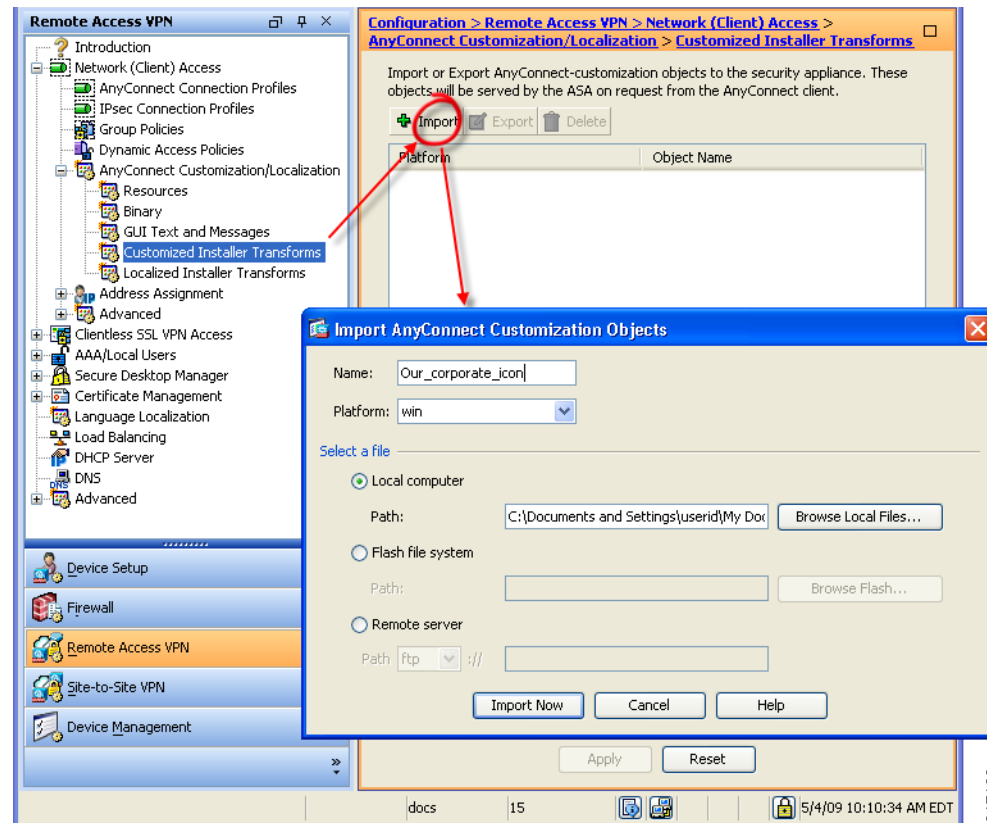
C:\Program Files\Microsoft SDK SP1\Microsoft Platform SDK\Bin\Orca.msi.

Install the Orca software, then access the Orca program from your Start > All Programs menu.

To import your transform, follow these steps:

- Step 1** Go to **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Customization/Localization > Customized Installer Transforms**. Click **Import**. The Import AnyConnect Customization Objects windows displays (Figure 12-3).

**Figure 12-3 Importing a Customizing Transform**

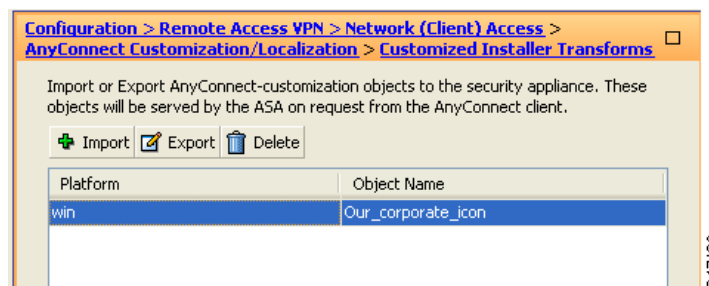


- Step 2** Enter the Name of the file to import. Unlike the names of other customizing objects, the name is not significant to the ASA and is for your own convenience.
- Step 3** Select a platform and specify the file to import. Click **Import Now**. The file now appears in the table (Figure 12-4).



**Note** Windows is the only valid choice for applying a transform.

**Figure 12-4 The Customizing Transform Appears in the Table**



## Sample Transform

While offering a tutorial on creating transforms is beyond the scope of this document, we provide the text below as representative of some entries in a transform. These entries replace *company\_logo.bmp* with a local copy and install the custom profile *MyProfile.xml*.

```
DATA CHANGE - Component Component ComponentId
+ MyProfile.xml {39057042-16A2-4034-87C0-8330104D8180}

Directory_ Attributes Condition KeyPath
Profile_DIR 0 MyProfile.xml

DATA CHANGE - FeatureComponents Feature_ Component_
+ MainFeature MyProfile.xml

DATA CHANGE - File File Component_ FileName FileSize Version Language Attributes Sequence
+ MyProfile.xml MyProfile.xml MyProf~1.xml|MyProfile.xml 601 8192 35
<> company_logo.bmp 37302{39430} 8192{0}

DATA CHANGE - Media DiskId LastSequence DiskPrompt Cabinet VolumeLabel Source
+ 2 35
```

## Deploying Executables That Use the Client API

For Windows, Linux, or Mac computers, you can deploy your own User Interface (UI), by using the AnyConnect API. You replace the AnyConnect GUI or the AnyConnect CLI by replacing the client binary files.

You must distribute your custom UI, and manage AnyConnect software updates.

The following AnyConnect features are not compatible with custom AnyConnect UIs:

- AnyConnect software deployment from ASA. If you update the version of the AnyConnect package on the ASA, the end user's clients may be updated, which would replace your custom UI. You must manage distributing AnyConnect software and your custom client. Although the ASDM Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Customization/Localization > Binary dialog allows you to upload binaries to replace the AnyConnect client, that function is not supported.
- Network Access Manager and Web Security. If you deploy Web Security or the Network Access Manager, you must use the Cisco AnyConnect Secure Mobility Client GUI.
- Start Before Logon is not supported.

The following table lists the filenames of the client executable files for the different operating systems.

**Table 12-1** *Filenames of Client Executables*

| Client OS | Client GUI File            | Client CLI File |
|-----------|----------------------------|-----------------|
| Windows   | vpnui.exe                  | vpncli.exe      |
| Linux     | vpnui                      | vpn             |
| Mac       | Not supported <sup>1</sup> | vpn             |

1. Not supported by ASA deployment. However, you can deploy an executable for the Mac that replaces the client GUI using other means, such as Altiris Agent.



Your executable can call any resource files that you import to the ASA, such as logo images (see [Figure 12-1](#)). Unlike replacing the pre-defined GUI components, when you deploy your own executable, you can use any filenames for your resource files.

## Information for Creating your Custom Icons and Logos

The tables that follow list the files you can replace for each operating system supported by AnyConnect. The images in the tables are used by AnyConnect VPN Client, Network Access Manager and Web Security modules.

AnyConnect version 3.1 adds two more UI dialogs, one to state network connection status, and one to allow a user to update a password for a network connection.

### Recommended Image Format for AnyConnect 3.0 and Later

For AnyConnect 3.0 and later, we recommend you use Portable Network Graphics (PNG) images for the following reasons:

- PNG images have smaller file sizes than other image formats and use less disk space.
- PNG images support transparency natively.
- The AnyConnect 3.0 and later GUI provides a title adjacent to the logo image in the Advanced window and the tray flyout. Therefore, any title you provided with your image for the earlier client may confuse the user.

### For Windows

All files for Windows in [Table 12-2](#) are located in:

%PROGRAMFILES%\Cisco\Cisco AnyConnect Secure Mobility Client\res\

**Note**

%PROGRAMFILES% refers to the environment variable by the same name. In most Windows installation, this is C:\Program Files.

Table 12-2 lists the files you can replace and the client GUI area affected:

**Table 12-2**      *AnyConnect for Windows—Icon Files*

| Filename and Description in Windows Installation                                                                                                                                                                                                                                           | Image Size (pixels, l x h) and Type |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <p>about.png</p> <p>The About button in the upper right corner of the Advanced dialog.</p> <p>The size is not adjustable.</p>                                                                             | <p>24 x 24</p> <p>PNG</p>           |
| <p>about_hover.png</p> <p>The About button in the upper right corner of the Advanced dialog.</p> <p>The size is not adjustable.</p>                                                                       | <p>24 x 24</p> <p>PNG</p>           |
| <p>app_logo.png</p> <p>128 X 128 is the maximum size. If your custom file is not that size, it is resized to 128 X 128 in the application. If it is not in the same ratio, it is stretched.</p>         | <p>128 X 128</p> <p>PNG</p>         |
| <p>attention.ico</p> <p>System tray icon alerting the user to a condition requiring attention or interaction. For example, a dialog about the user credentials.</p> <p>The size is not adjustable.</p>  | <p>16 x 16</p> <p>ICO</p>           |

**Table 12-2**      *AnyConnect for Windows—Icon Files (continued)*

| Filename and Description in Windows Installation                                                                                                                                                                                                                                                                                                                               | Image Size (pixels, l x h) and Type |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <p>company_logo.png</p> <p>The company logo displayed in the top left corner of the tray flyout and Advanced dialog.</p> <p>97x58 is the maximum size. If your custom file is not that size, it is resized to 97x58 in the application. If it is not in the same ratio, it is stretched.</p>  | <p>97 x 58 (maximum)<br/>PNG</p>    |
| <p>company_logo_alt.png</p> <p>The company logo displayed in the bottom right corner of the About dialog.</p> <p>97x58 is the maximum size. If your custom file is not that size, it is resized to 97x58 in the application. If it is not in the same ratio, it is stretched.</p>            | <p>97 X 58<br/>PNG</p>              |
| <p>cues_bg.jpg</p> <p>The background image for the tray flyout, Advanced window, and About dialog.</p> <p>Because images are not stretched, using a replacement image that is too small results in black space.</p> <p>I</p>                                                                | <p>1260 x 1024<br/>JPEG</p>         |
| <p>error.ico</p> <p>System tray icon alerting the user that something is critically wrong with one or more components.</p> <p>The size is not adjustable.</p>                                                                                                                               | <p>16 x 16<br/>ICO</p>              |

**Table 12-2**      *AnyConnect for Windows—Icon Files (continued)*

| Filename and Description in Windows Installation                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Image Size (pixels, l x h) and Type |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <p>neutral.ico</p> <p>System tray icon indicating client components are operating correctly.</p> <p>The size is not adjustable.</p>                                                                                                                                                                                                                                                                                           | <p>16 x 16</p> <p>ICO</p>           |
| <p>transition_1.ico</p> <p>System tray icon that displays along with transition_2.ico and transition_3.ico indicating one or more client components are in transition between states (for example, when the VPN is connecting or when Network Access Manager is connecting). The three icon files display in succession, appearing to be a single icon bouncing from left to right.</p> <p>The size is not adjustable.</p>    | <p>16 x 16</p> <p>PNG</p>           |
| <p>transition_2.ico</p> <p>System tray icon that displays along with transition_1.ico and transition_3.ico indicating one or more client components are in transition between states (for example, when the VPN is connecting or when Network Access Manager is connecting). The three icon files display in succession, appearing to be a single icon bouncing from left to right.</p> <p>The size is not adjustable.</p>  | <p>16 x 16</p> <p>PNG</p>           |

**Table 12-2**      *AnyConnect for Windows—Icon Files (continued)*

| Filename and Description in Windows Installation                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Image Size (pixels, l x h) and Type |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <p>transition_3.ico</p> <p>System tray icon that displays along with transition_1.ico and transition_2.ico indicating one or more client components are in transition between states (for example, when the VPN is connecting or when the Network Access Manager is connecting). The three icon files display in succession, appearing to be a single icon bouncing from left to right.</p> <p>The size is not adjustable.</p>  | <p>16 x 16</p> <p>PNG</p>           |
| <p>vpn_connected.ico</p> <p>System tray icon indicating the VPN is connected.</p> <p>The size is not adjustable.</p>                                                                                                                                                                                                                                                                                                            | <p>16 x 16</p> <p>ICO</p>           |

## For Linux

All files for Linux are located in:

/opt/cisco/anyconnect/pixmaps/

Table 12-3 lists the files that you can replace and the client GUI area affected.

**Table 12-3**      *AnyConnect for Linux—Icon Files*

| Filename and Description in Linux Installation                                                                                                                                                                                                       | Image Size (pixels, l x h) and Type |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| company-logo.png<br>Corporate logo that appears on each tab of the user interface.<br>For AnyConnect 3.0 and later, use PNG images no bigger than 62x33 pixels.<br> | 142 x 92<br>PNG                     |
| cvc-about.png<br>Icon that appears on the About tab.<br>                                                                                                          | 16 x 16<br>PNG                      |
| cvc-connect.png<br>Icon that appears next to the Connect button, and on the Connection tab.<br>                                                                   | 16 x 16<br>PNG                      |
| cvc-disconnect.png<br>Icon that appears next to the Disconnect button.<br>                                                                                        | 16 x 16<br>PNG                      |
| cvc-info.png<br>Icon that appears on the Statistics tab.<br>                                                                                                      | 16 x 16<br>PNG                      |
| systray_connected.png<br>Tray icon that displays when the client is connected.<br>                                                                                | 16 x 16<br>PNG                      |

**Table 12-3**      *AnyConnect for Linux—Icon Files*

| Filename and Description in Linux Installation                                                                                                                              | Image Size (pixels, l x h) and Type |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| systray_notconnected.png<br>Tray icon that displays when the client is not connected.<br>  | 16 x 16<br>PNG                      |
| systray_disconnecting.png<br>Tray icon that displays when the client is disconnecting.<br> | 16 x 16<br>PNG                      |
| systray_quarantined.png<br>Tray icon that displays when the client is quarantined.<br>     | 16x16<br>PNG                        |
| systray_reconnecting.png<br>Tray icon that displays when the client is reconnecting.<br> | 16 x 16<br>PNG                      |
| vpnui48.png<br>Main program icon.<br>                                                    | 48 x 48<br>PNG                      |

## For Mac OS X

All files for OS X are located in:

/Applications/Cisco AnyConnect Secure Mobility Client/Contents/Resources

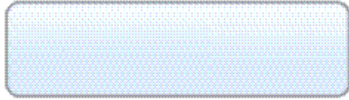


### Note

You will find the Resources folder by going to **Applications > Cisco**, clicking on **Cisco AnyConnect Secure Mobility Client**, and then choosing **Show Package Contents**.

Table 12-4 lists the files that you can replace and the client GUI area affected.

**Table 12-4**      *AnyConnect for Mac OS X—Icon Files*

| Filename in Mac OS X Installation                                                                                                                                                                     | Image Size (pixels, l x h) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| bubble.png<br>Notification bubble that appears when the client connects or disconnects.<br>                          | 142 x 92<br>PNG            |
| logo.png<br>Logo icon that appears on main screen in the top right corner.<br>                                       | 50 x 33<br>PNG             |
| vpngui.icns<br>Mac OS X icon file format that is used for all icon services, such as Dock, Sheets, and Finder.<br> | 128 x 128<br>PNG           |
| Mac OS X status icon.<br>                                                                                          | 16 X 16<br>PNG             |

## Creating and Uploading an AnyConnect Client Help File

To provide AnyConnect users with help, create an HTML file with instructions about your site, and load it on the ASA. When users connect with AnyConnect, AnyConnect downloads the help file, and displays the help icon on the AnyConnect user interface. When the user clicks the help icon, the browser opens the help file.

- 
- Step 1** Create an HTML file named **help\_AnyConnect.html**.
- Step 2** Log on to the ASA using ASDM and select: **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Customization/Localization > Binary**
- Step 3** Import the **help\_AnyConnect.xxx** file. The supported formats are: PDF, HTML, HTM, and MHT formats.



- Step 4** On a PC, bring up AnyConnect and connect to your ASA. The help file will be downloaded to the client PC.
- Step 5** You should see that the help icon was added to the UI automatically.
- Step 6** Click the help icon, and the help file opens in the browser.

If the help icon does not appear, check the help directory to see if the AnyConnect downloader was able to retrieve the help file.

The “help\_” part of the filename is removed by the downloader, so you should see AnyConnect.html in one of the following directories, depending on the operating system:

- Windows 7 and Vista - C:\ProgramData\Cisco\Cisco AnyConnect Secure Mobility Client\Help
  - Windows XP - C:\Documents and Settings\All Users\Application Data\Cisco\Cisco AnyConnect Secure Mobility Client\Help
  - Mac OS - /opt/cisco/anyconnect/help
- 

## Changing the Default AnyConnect English Messages

You can make changes to the English messages displayed on the AnyConnect GUI by opening (adding or editing) the English translation table, and changing message text for one or more message IDs. After you open the message file, you can edit it by:

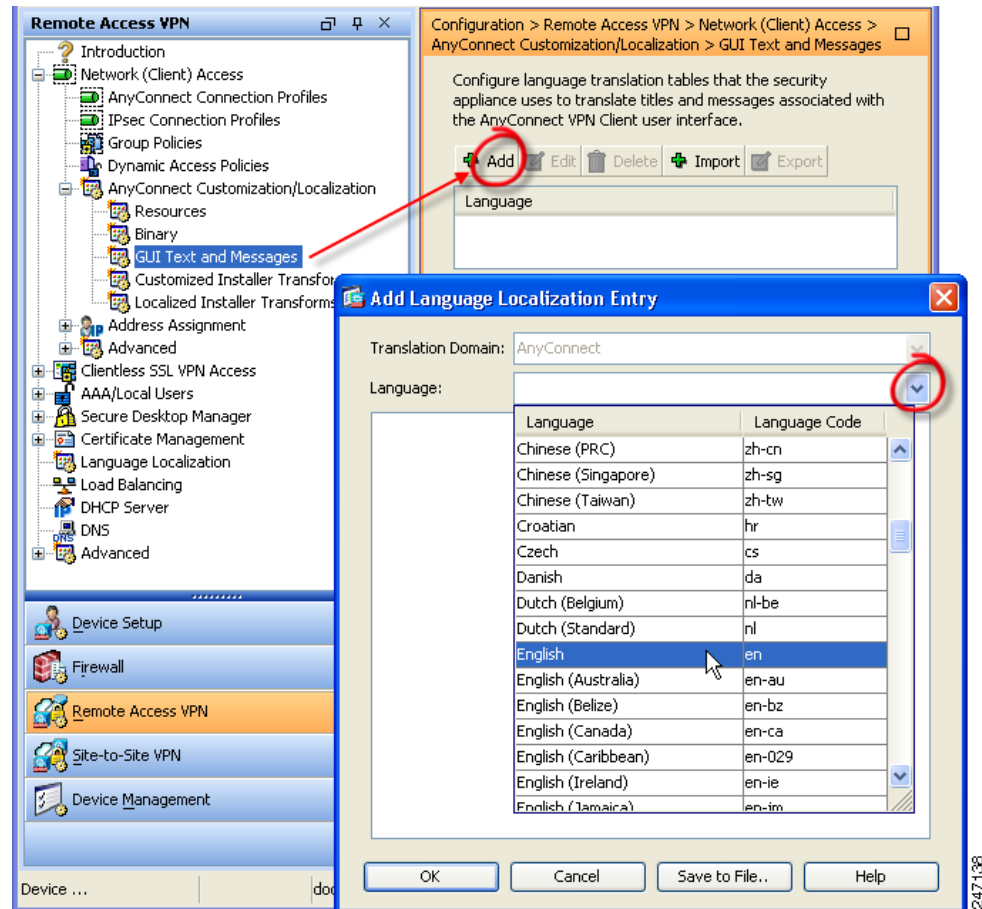
- Typing your changes into the text in the open dialog.
- Copying the text in the open dialog to a text editor, making your changes, and pasting the text back into the dialog.
- Exporting the message file by clicking Save to File, editing the file, and importing it into the ASDM.

Note that the English translation table is also available under the Localization menu (Configuration > Remote Access VPN > Language Localization). Localization is described in [Localizing the AnyConnect Client GUI and Installer, page 12-18](#).

The following procedure describes how to change the default English messages by editing the dialog:

- Step 1** Go to **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Customization/Localization > GUI Text and Messages**. Click **Add**. The Add Language Localization Entry window displays (Figure 12-5).

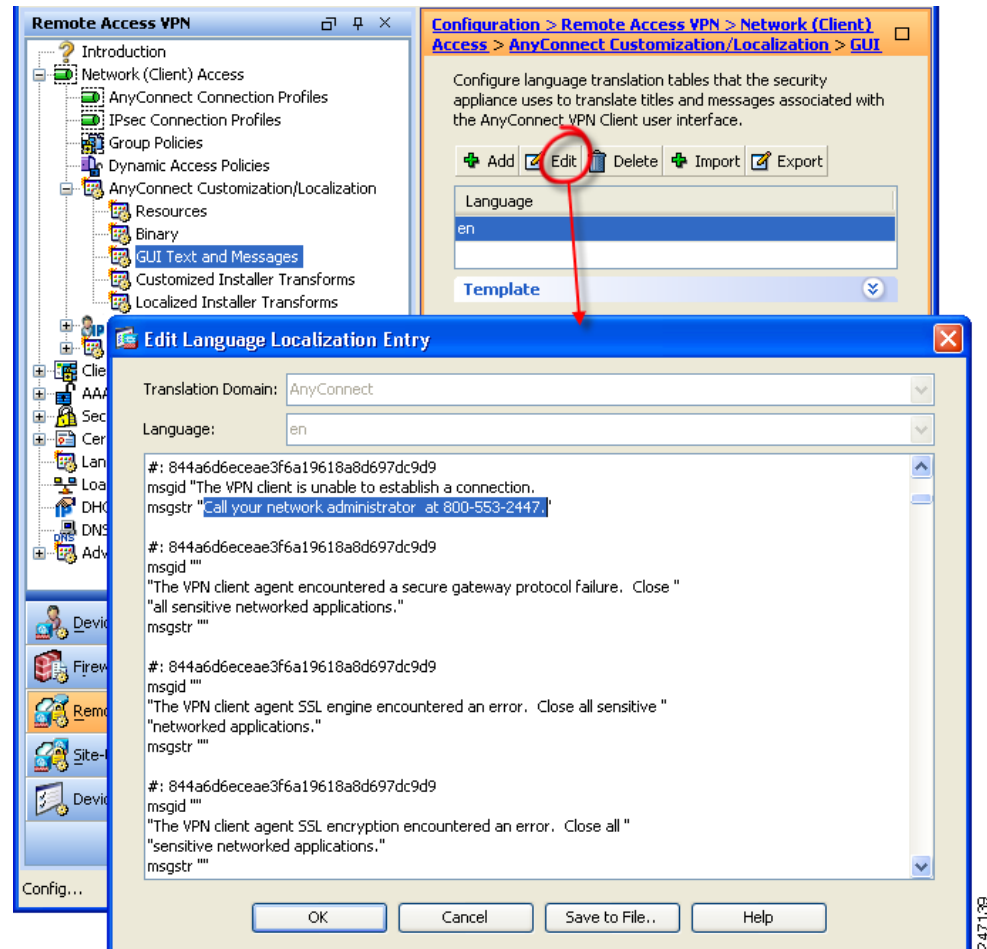
**Figure 12-5 Adding an English Translation Table**



- Step 2** Click the Language drop-list and specify the language as *English (en)*. The translation table for English displays in the list of languages in the pane.
- Step 3** Click **Edit** to begin editing the messages. The Edit Language Localization Entry window displays (Figure 12-6). The text between the quotes of msgid is the default English text displayed by the client and *must not* be changed. The msgstr string contains text the client uses to replace the default text in msgid. Insert your own text between the quotes of the msgstr.

In the example below, we insert “Call your network administrator at 800-553-2447.”

**Figure 12-6** Editing the Message Text



- Step 4** Click **OK** and then **Apply** in the GUI Text and Messages pane to save your changes.

# Localizing the AnyConnect Client GUI and Installer

You can localize (translate) the client and all optional modules for different languages. You can also localize the installer program for the core VPN client that provides VPN service. The following sections contain information and procedures for configuring this feature:

- [Localizing the AnyConnect GUI, page 12-18](#)
- [Localizing the AnyConnect Installer Screens, page 12-29](#)
- [Using Tools to Create Message Catalogs for Enterprise Deployment, page 12-31](#)
- [Merging a Newer Translation Template with your Translation Table, page 12-32](#)

## Localizing the AnyConnect GUI

The security appliance uses translation tables to translate user messages displayed by AnyConnect. The translation tables are text files with strings of translated message text.

The AnyConnect package file for Windows contains an English language template for AnyConnect messages. The ASA automatically imports this file when you load the client image. This file contains the latest changes to message strings in the AnyConnect software. You can use it to create new translation tables for other languages, or you can import one of the following translation tables available on [www.cisco.com](http://www.cisco.com), see [Importing Available Translation Tables to the ASA](#):

- Japanese
- French Canadian
- German
- Chinese
- Korean
- Spanish (Latin American)
- Czech
- Polish

The following sections contain procedures for translating GUI text and messages if the desired languages is not available or if you wish to further customize imported translation tables:

- [Translating using the ASDM Translation Table Editor, page 12-21](#). Using this method you can make changes to the message file by opening (adding or editing) the file, and changing message text for one or more message IDs. After you open the message file, you can edit it by:
  - Typing your changes into the text in the open dialog.
  - Copying the text in the open dialog to a text editor, making your changes, and pasting the text back into the dialog.
- [Translating by Exporting the Translation Table for Editing, page 12-26](#). Using this method you can export the message file by clicking Save to File, edit the file, and import it back into the ASDM.

After you update the translation table on the ASA, the updated messages are not applied until the client is restarted and makes another successful connection.

**Note**

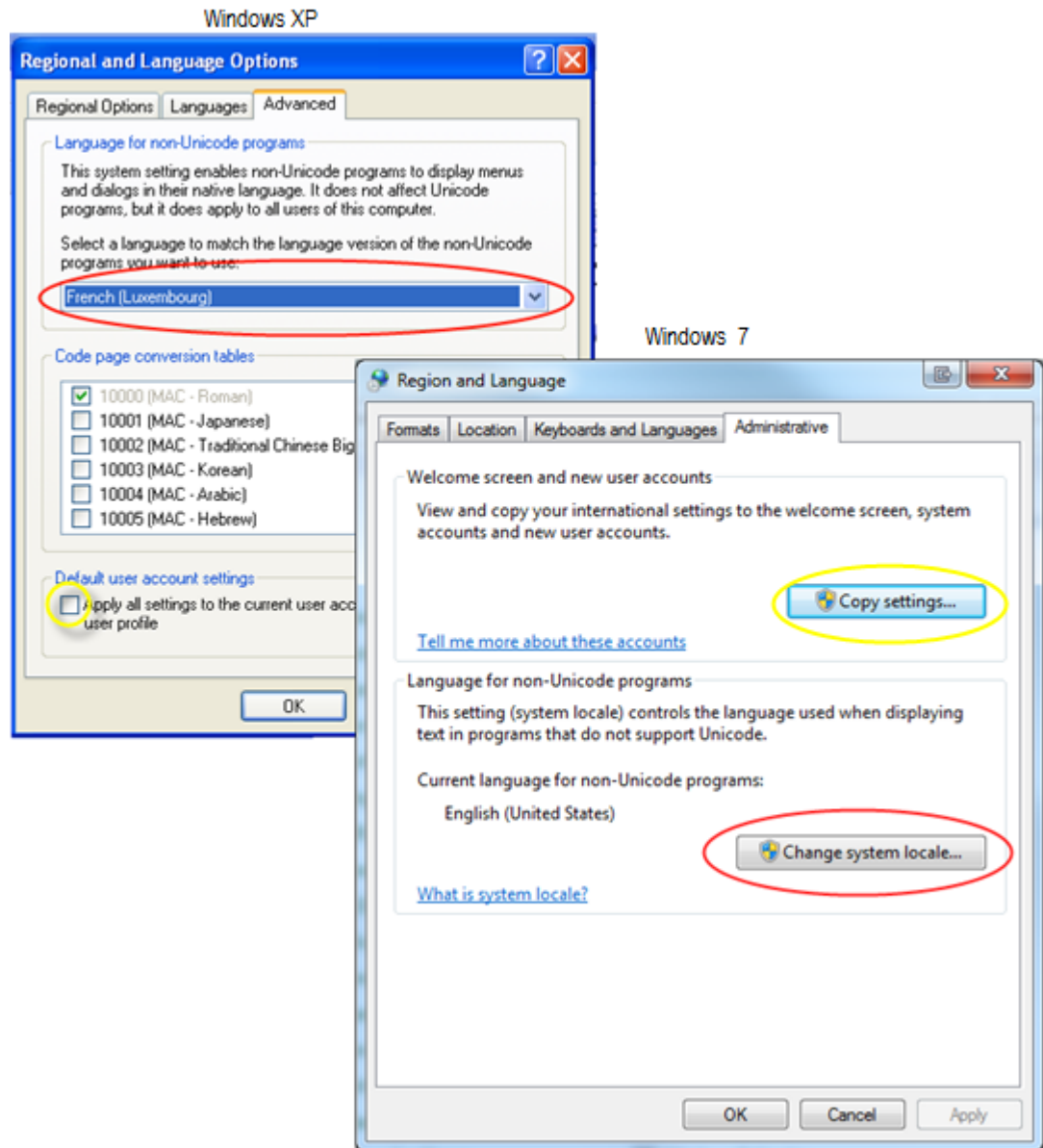
If you are not deploying the client from the ASA, and are using a corporate software deployment system such as Altiris Agent, you can manually convert the AnyConnect translation table (anyconnect.po) to a .mo file using a catalog utility such as Gettext and install the .mo file to the proper folder on the client computer. See the [“Using Tools to Create Message Catalogs for Enterprise Deployment”](#) section on [page 12-31](#) for more information.

## Specifying the AnyConnect Client Platform’s System Locale

When the remote user connects to the ASA and downloads the client, AnyConnect detects the preferred language of the computer and applies the appropriate translation table by detecting the specified system locale.

To view or change the specified system locale on a Windows client platform:

- 
- Step 1** Navigate to the **Control Panel > Region and Languages** dialog box. If you are viewing your Control Panel by Category, choose **Clock, Language, and Region > Change display language**. Examples of the Windows XP and 7 dialogs are shown:



- Step 2** Specify the language/locale setting, using the options circled in red for your version of Windows.
- Step 3** Specify that these setting should be used as the default for all user accounts, using the options circled in yellow for your version of Windows.
- Step 4** If your deployment is using Web Security, [restart the Web Security agent](#), to pick up the new translations.

**Note**

If a location is not specified, AnyConnect will default to just the language. For example, if the “fr-ca” directory is not found, AnyConnect will check for the “fr” directory. You do not need to change the display language, location, or keyboard to see the translations.

## Importing Available Translation Tables to the ASA

- 
- Step 1** Download the desired translation table from [www.cisco.com](http://www.cisco.com).
- Step 2** On the ASA, go to **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Customization/Localization > GUI Text and Messages**
- Step 3** Click **Import**. The Import Language Localization Entry window displays.
- Step 4** Choose the appropriate **Language** from the drop-down list.
- Step 5** Specify where the translation table will be imported from.
- Step 6** Click **Import Now**. This translation table will be deployed to AnyConnect clients with this preferred language. Localization will be applied after AnyConnect restarts and connects.

**Note**

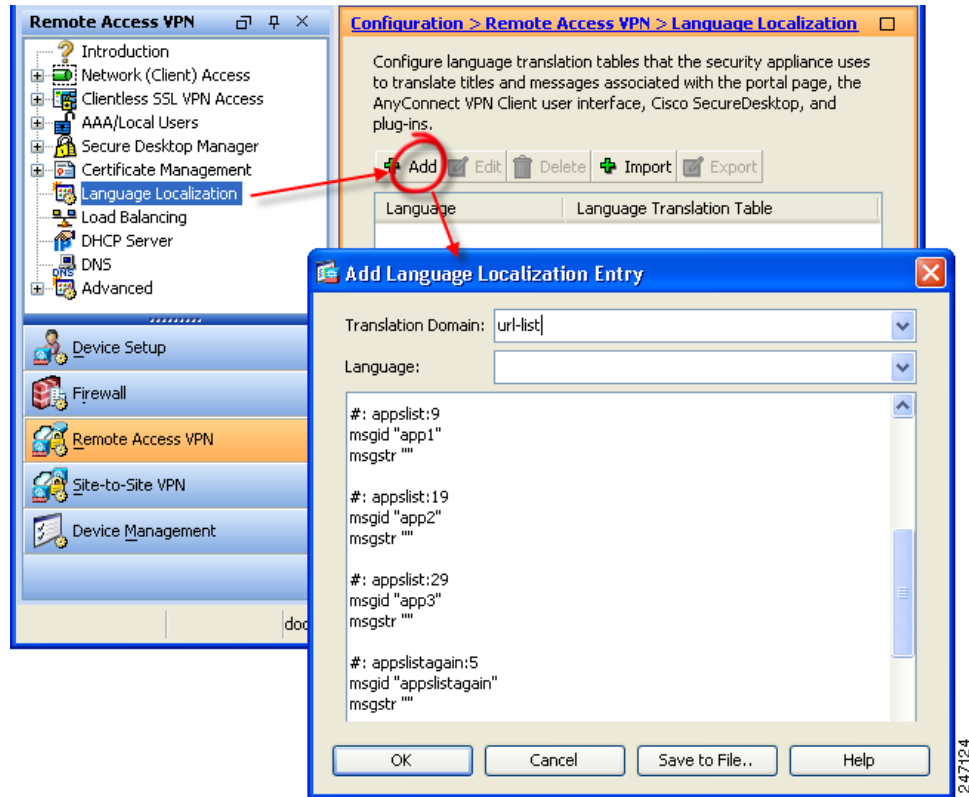
The Cisco Secure Desktop translation table, must also be imported onto the ASA for Host Scan messages to be localized, even if Cisco Secure Desktop is not being used.

---

## Translating using the ASDM Translation Table Editor

The following procedure describes how to localize the AnyConnect GUI using ASDM:

- 
- Step 1** Go to **Configuration > Remote Access VPN > Language Localization**. Click **Add**. The Add Language Localization Entry window displays ([Figure 12-7](#)).

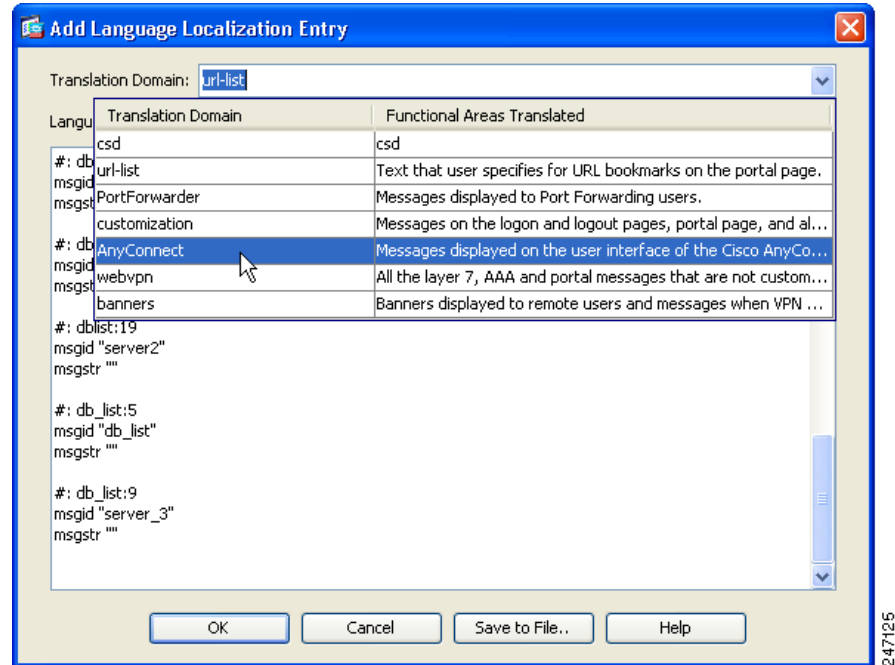
**Figure 12-7** Language Localization Pane

247124



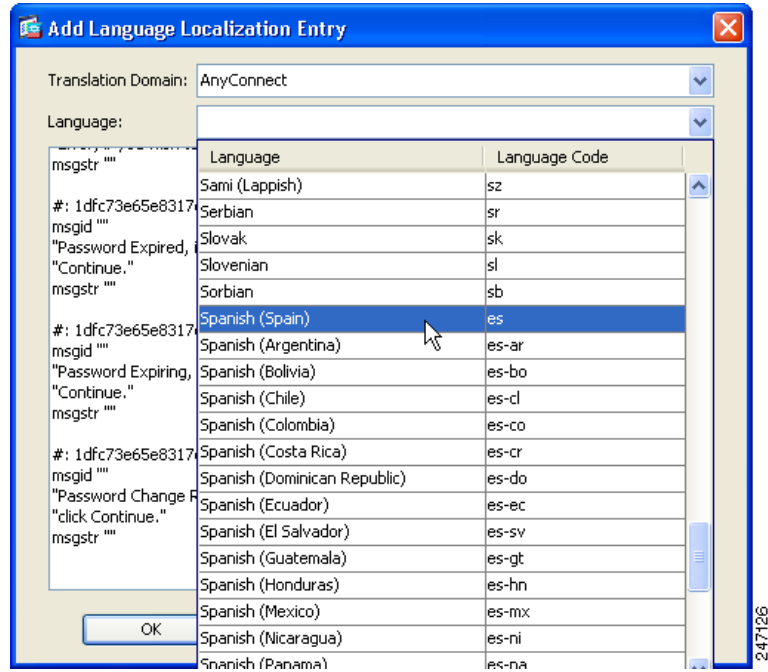
- Step 2** Click the **Translation Domain** drop-list and choose **AnyConnect** (Figure 12-8). This choice ensures that only the messages relating to the AnyConnect GUI appear for editing purposes.

**Figure 12-8** Translation Domain



- Step 3** Specify a language for this translation table (Figure 12-9). ASDM tags this table with the standard abbreviations recognized for languages by Windows and browsers (for example, *es* for Spanish).

**Figure 12-9** Choosing a Language

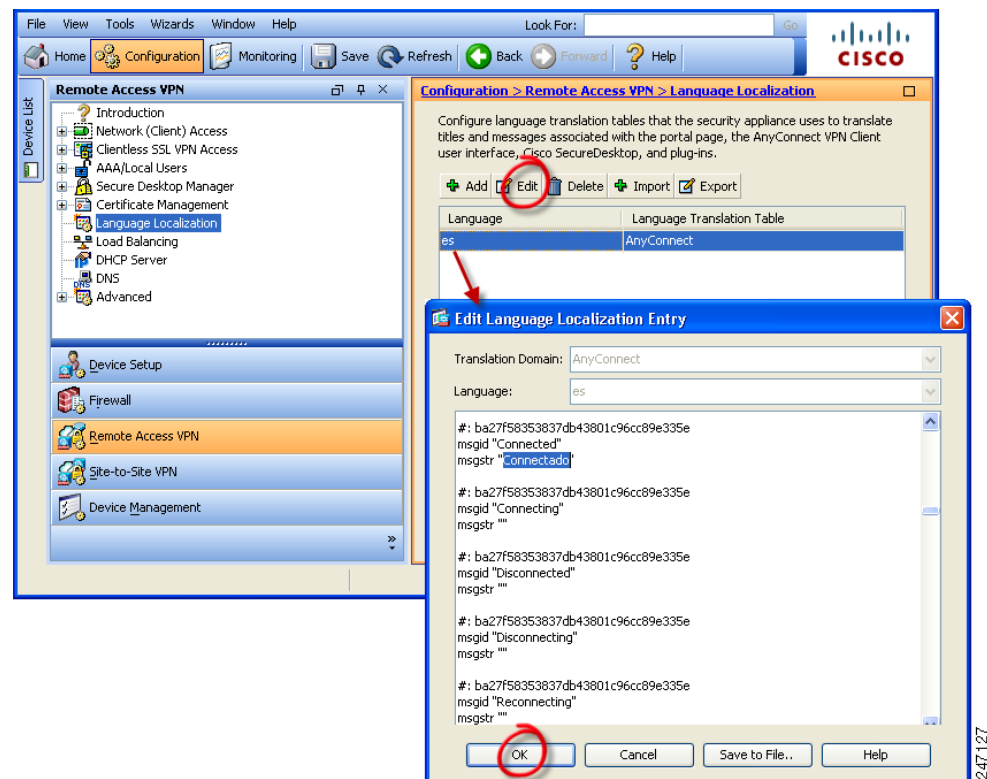


**Step 4** The translation table now displays in the list of languages in the pane (*es* in our example). However, it has no translated messages. To begin adding translated text, click **Edit**. The Edit Language Localization Entry window displays (Figure 12-10).

Add your translated text between the quotes of the message strings (msgstr). In the example below, we inserted *Connectado*, the Spanish word for *Connected*, between the quotes of its message string.

Be sure to click **OK** and then **Apply** in the Language Localization pane to save your changes.

**Figure 12-10** Editing the Translation Table



## Translating by Exporting the Translation Table for Editing

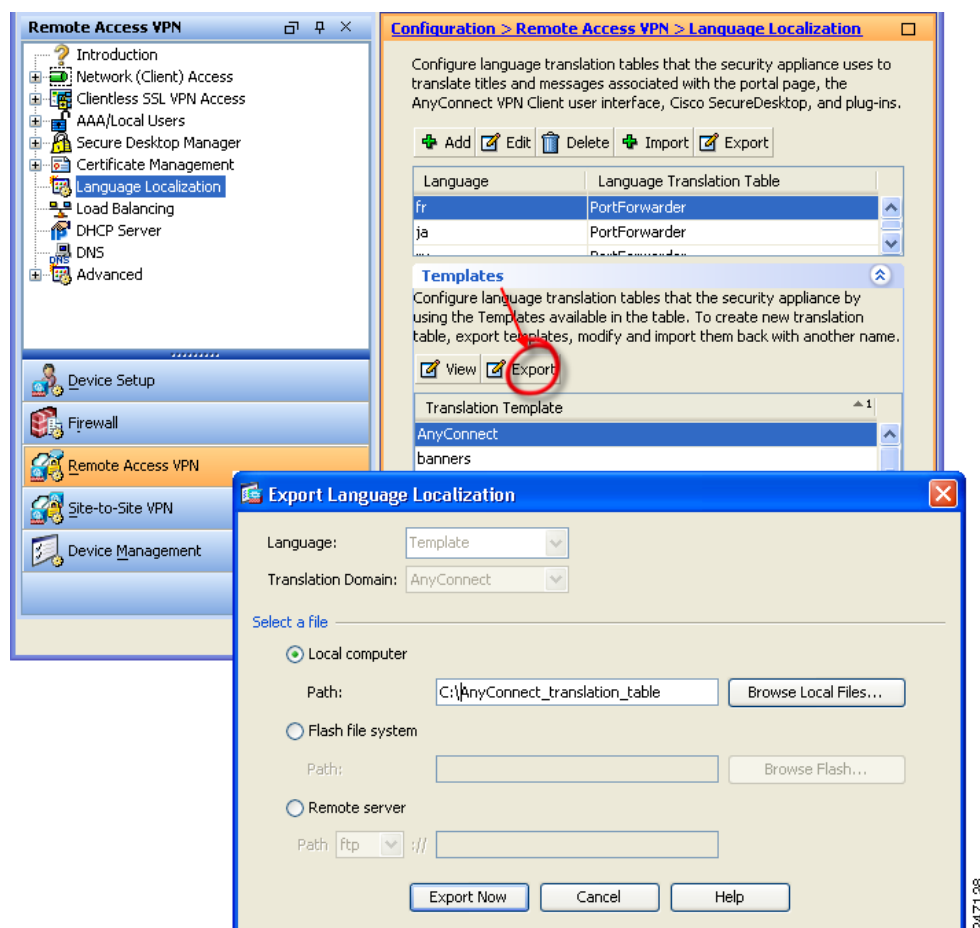
This procedure shows you how to export the AnyConnect translation template to a remote computer, where you can edit the table using a text editor, or using third-party tools such as Gettext or Poedit.

Gettext utilities from The GNU Project is available for Windows and runs in the command window. See the GNU website at [gnu.org](http://gnu.org) for more information. You can also use a GUI-based utility that uses Gettext, such as Poedit. This software is available at [poedit.net](http://poedit.net).

**Step 1** Export the AnyConnect translation template.

Go to **Configuration > Remote Access VPN > Language Localization**. The language localization pane displays (Figure 12-11). Click the **Templates** link to display a table of available templates. Select the *AnyConnect* template and click **Export**. The Export Language Localization window displays.

**Figure 12-11** Exporting a Translation Template



**Step 2** Choose a destination to export to and provide a filename. In Figure 12-11, we export to a local computer with the filename *AnyConnect\_translation\_table*.

**Step 3** Edit the translation table.

The following example shows a portion of the AnyConnect template. The end of this output includes a message ID field (msgid) and a message string field (msgstr) for the message *Connected*, which appears on the AnyConnect GUI when the client establishes a VPN connection (the complete template contains many pairs of message fields):

```
SOME DESCRIPTIVE TITLE.
Copyright (C) YEAR THE PACKAGE'S COPYRIGHT HOLDER
This file is distributed under the same license as the PACKAGE package.
FIRST AUTHOR <EMAIL@ADDRESS>, YEAR.
#
#, fuzzy
msgid ""
msgstr ""
"Project-Id-Version: PACKAGE VERSION\n"
"Report-Msgid-Bugs-To: \n"
"POT-Creation-Date: 2006-11-01 16:39-0700\n"
"PO-Revision-Date: YEAR-MO-DA HO:MI+ZONE\n"
"Last-Translator: FULL NAME <EMAIL@ADDRESS>\n"
"Language-Team: LANGUAGE <LL@li.org>\n"
"MIME-Version: 1.0\n"
"Content-Type: text/plain; charset=CHARSET\n"
"Content-Transfer-Encoding: 8bit\n"

msgid "Connected"
msgstr ""
```

The msgid contains the default translation. The msgstr that follows msgid provides the translation. To create a translation, enter the translated text between the quotes of the msgstr string. For example, to translate the message “Connected” with a Spanish translation, insert the Spanish text between the quotes:

```
msgid "Connected"
msgstr "Conectado"
```

Be sure to save the file.

**Step 4** Import the translation template as a new translation table for a specific language.

Go to **Configuration > Remote Access VPN > Language Localization**. The language localization pane displays (Figure 12-12). Click **Import**. The Import Language Localization window displays.

**Step 5** Click the **Language** drop-list to choose the language (and the industry-recognized abbreviations) for this translation table. If you enter the abbreviation manually, be sure to use an abbreviation recognized by browsers and operating systems.

**Step 6** Specify the Translation Domain as *AnyConnect*, choose a destination to import from, and provide a filename. Click **Import Now**. A message displays saying you successfully imported the table.

Be sure to click **Apply** to save your changes.

In [Figure 12-11](#), we specify the language as *Spanish (es)* and import the same file we exported in [Step 1](#) (AnyConnect\_translation\_table). [Figure 12-13](#) shows the new translation table for Spanish in the list of Languages for AnyConnect.

**Figure 12-12 Importing a Translation Template as a New Translation Table**

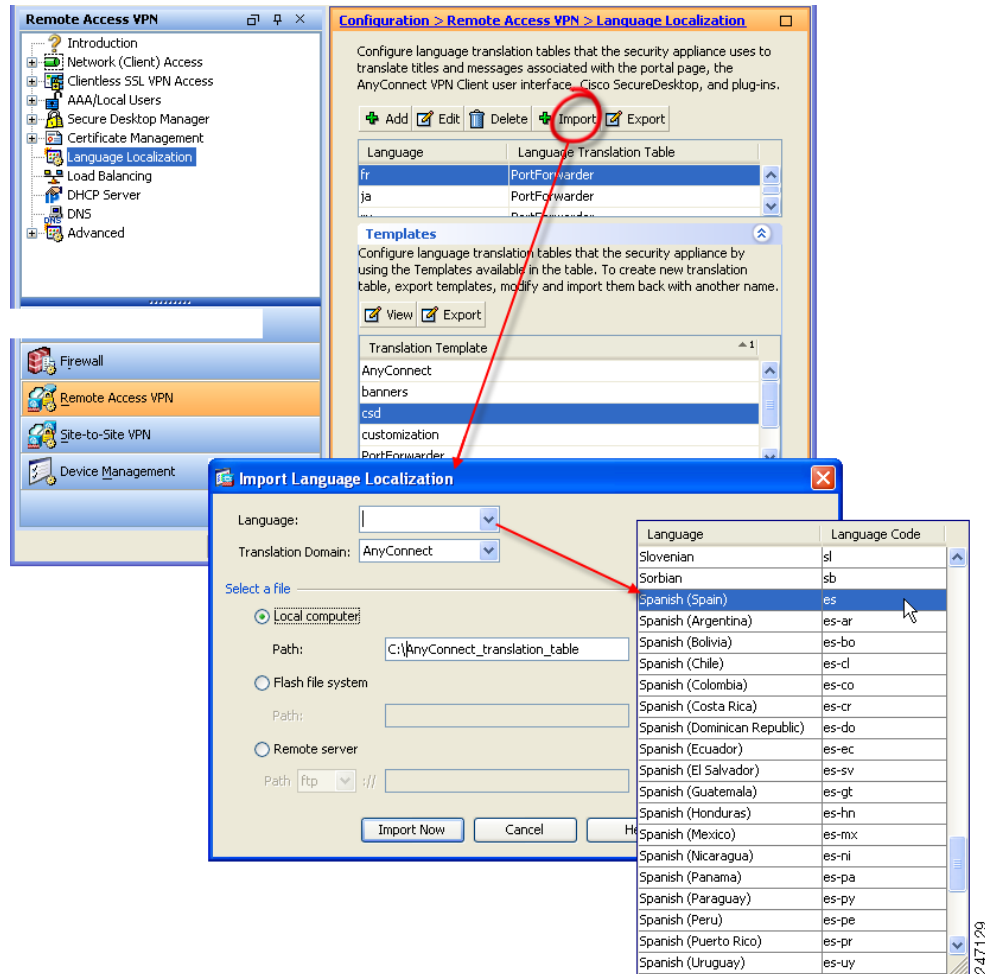
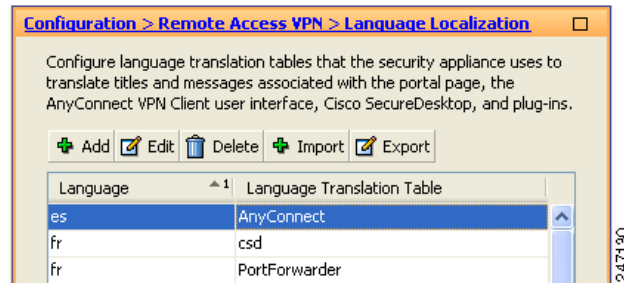


**Figure 12-13** *New Language Displayed in Language Table*

## Localizing the AnyConnect Installer Screens

As with the AnyConnect GUI, you can translate messages displayed by the client installer program which installs the VPN service. The ASA uses a transform to translate the messages displayed by the installer. The transform alters the installation but leaves the original security-signed MSI intact. These transforms only translate the installer screens and do not translate the client GUI screens.



### Note

Every release of AnyConnect includes a localized transform that administrators can upload to the ASA whenever they upload AnyConnect packages with new software. If you are using our localization transform, make sure to update them with the latest release from CCO whenever you upload a new AnyConnect package.

Each language has its own transform. You can edit a transform with a transform editor such as Orca and make changes to the message strings. Then you import the transform to the ASA. When the user downloads the client, the client detects the preferred language of the computer (the locale specified during installation of the operating system) and applies the appropriate transform.

We currently offer transforms for 30 languages. These transforms are available in the following .zip file on the AnyConnect software download page at cisco.com:

anyconnect-win-<VERSION>-web-deploy-k9-lang.zip

In this file, <VERSION> is the version of AnyConnect release (e.g. 3.1.xxxxx).

The package contains the transforms (.mst files) for the available translations. If you need to provide a language to remote users that is not one of the 30 languages we provide, you can create your own transform and import it to the ASA as a new language. With Orca, the database editor from Microsoft, you can modify existing installations and new files. Orca is part of the Microsoft Windows Installer Software Development Kit (SDK) which is included in the Microsoft Windows SDK. The following link leads to the bundle containing the Orca program:

[http://msdn.microsoft.com/library/default.asp?url=/library/en-us/msi/setup/orca\\_exe.asp](http://msdn.microsoft.com/library/default.asp?url=/library/en-us/msi/setup/orca_exe.asp).

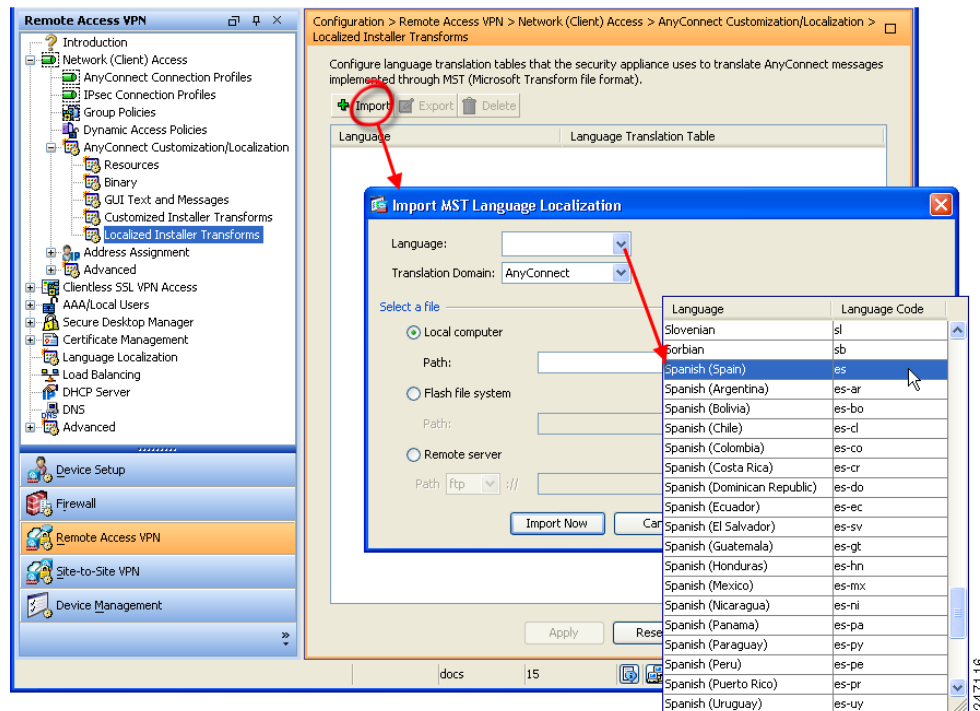
After you install the SDK, the Orca MSI is located here:

C:\Program Files\Microsoft SDK SP1\Microsoft Platform SDK\Bin\Orca.msi.

The following procedure shows how to import a transform to the ASA using ASDM:

- Step 1** Import a Transform. Go to **Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Customization/Localization > Localized Installer Transforms**. Click **Import**. The Import MST Language Localization window opens (Figure 12-14):

**Figure 12-14** Importing a Transform to Translate the Installer Program



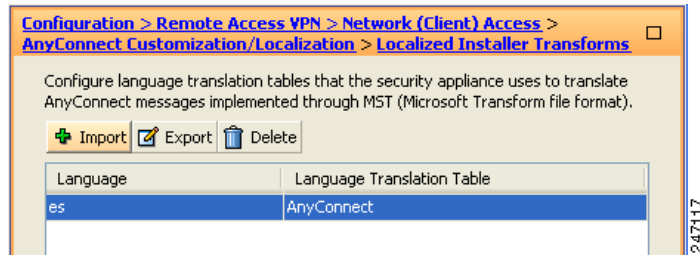
- Step 2** Click the **Language** drop-list to choose a language (and the industry-recognized abbreviation) for this transform. If you enter the abbreviation manually, be sure to use an abbreviation recognized by browsers and operating systems.



**Step 3** Click **Import Now**. A message displays saying you successfully imported the table. Be sure to click **Apply** to save your changes.

In Figure 12-14, we specify the language as *Spanish* (es). Figure 12-15 shows the new transform for Spanish in the list of Languages for AnyConnect.

**Figure 12-15 Imported Transform Displays in the Table**



## Using Tools to Create Message Catalogs for Enterprise Deployment

If you are not deploying the client with the ASA, and are using an enterprise software deployment system such as Altiris Agent, you can manually convert the AnyConnect translation table to a message catalog using a utility such as Gettext. After converting the table from a .po file to a .mo file, you then place the file in the proper folder on the client computer.

Gettext is a utility from The GNU Project and runs in the command window. See the GNU website at [gnu.org](http://gnu.org) for more information. You can also use a GUI-based utility that uses Gettext, such as Poedit. This software is available at [poedit.net](http://poedit.net).

## AnyConnect Message Template Directories

AnyConnect message templates are located in these folders listed below.



**Note**

The **\l10n** directory is part of each directory path listed below. The directory name is spelled: lower case l (“el”), one, zero, lower case n.

Windows 7 and Windows Vista

```
<DriveLetter>:\Program Data\Cisco\Cisco AnyConnect Secure Mobility
Client\l10n\<LANGUAGE-CODE>\LC_MESSAGES
for example
```

```
<DriveLetter>:\Program Data\Cisco\Cisco AnyConnect Secure Mobility
Client\l10n\en-us\LC_MESSAGES
```

Windows XP:

```
%ALLUSERSPROFILE%\Application Data\Cisco\Cisco AnyConnect Secure
Mobility Client\l10n\<LANGUAGE-CODE>\LC_MESSAGES
```

Mac OS X and Linux:

```
/opt/cisco/anyconnect/l10n/<LANGUAGE-CODE>/LC_MESSAGES
```

## Creating Message Catalogs

The following procedure creates a message catalog using Gettext:

- 
- Step 1** Download the Gettext utilities from <http://www.gnu.org/software/gettext/> and install Gettext on a computer you use for administration (not a remote user computer).
  - Step 2** Retrieve a copy of the AnyConnect message template *AnyConnect.po* on a computer with AnyConnect installed.
  - Step 3** Edit the AnyConnect.po file (use notepad.exe or any plain text editor) to change strings as desired.
  - Step 4** Run the Gettext message file compiler to create the .mo file from the .po file:  

```
msgfmt -o AnyConnect.mo AnyConnect.po
```
  - Step 5** Place a copy of the .mo file in the correct message template directory on the user's computer. See [AnyConnect Message Template Directories](#) for more information.
- 

## Merging a Newer Translation Template with your Translation Table

Occasionally, we add new messages displayed to AnyConnect users that provide helpful information about the client connection. To enable translation of these new messages, we create new message strings and include them in the translation template packaged with the latest client image. Therefore, if you upgrade to the latest available client, you also receive the template with the new messages. However, if you have created translation tables based on the template included with the previous client, the new messages *are not* automatically displayed to remote users. You must merge the latest template with your translation table to ensure your translation table has these new messages.

You can use convenient third party tools to perform the merge. Gettext utilities from The GNU Project is available for Windows and runs in the command window. See the GNU website at [gnu.org](http://gnu.org) for more information. You can also use a GUI-based utility that uses Gettext, such as Poedit. This software is available at [poedit.net](http://poedit.net). Both methods are covered in the procedure below.

- 
- Step 1** Export the latest AnyConnect Translation Template from **Remote Access VPN > Language Localization > Templates**. Export the template with the filename as *AnyConnect.pot*. This filename ensures that the msgmerge.exe program recognizes the file as a message catalog template.




---

**Note** This step assumes you have already loaded the latest AnyConnect image package to the ASA. The template is not available for export until you do.

---

- Step 2** Merge the AnyConnect Template and Translation Table.  
 If you are using the Gettext utilities for Windows, open a command prompt window and run the following command. The command merges the AnyConnect translation table (.po) and the template (.pot), creating the new *AnyConnect\_merged.po* file:

```
msgmerge -o AnyConnect_merged.po AnyConnect.po AnyConnect.pot
```

The following example shows the results of the command:

```
C:\Program Files\GnuWin32\bin> msgmerge -o AnyConnect_merged.po AnyConnect.po
AnyConnect.pot
..... done.
```

If you are using Poedit, first open the AnyConnect.po file; go to **File > Open > <AnyConnect.po>**.

Then merge it with the template; go to **Catalog > Update** from POT file <AnyConnect.pot>.

Poedit displays an Update Summary window with both new and obsolete strings. Save the file, which we will import in the next step.

- Step 3** Import the Merged Translation Table to **Remote Access VPN > Language Localization**. Click **Import**, specify a language, and select **AnyConnect** as the Translation Domain. Specify the file to import as *AnyConnect\_merged.po*.
-





# Managing, Monitoring, and Troubleshooting AnyConnect Sessions

---

This chapter explains these subjects and tasks:

- [Disconnecting All VPN Sessions, page 13-1](#)
- [Disconnecting Individual VPN Sessions, page 13-2](#)
- [Viewing Detailed Statistical Information, page 13-2](#)
- [Resolving VPN Connection Issues, page 13-2](#)
- [Using DART to Gather Troubleshooting Information, page 13-4](#)
- [Installing the AnyConnect Client, page 13-10](#)
- [Installing the Log Files, page 13-10](#)
- [Problems Disconnecting AnyConnect or Establishing Initial Connection, page 13-11](#)
- [Problems Passing Traffic, page 13-13](#)
- [Problems with AnyConnect Crashing, page 13-14](#)
- [Problems Connecting to the VPN Service, page 13-14](#)
- [Responding to Security Alert in Microsoft Internet Explorer, page 13-15](#)
- [Responding to “Certified by an Unknown Authority” Alert, page 13-16](#)
- [Obtaining the Computer System Information, page 13-16](#)
- [Conflicts with Third-Party Applications, page 13-17](#)

## Disconnecting All VPN Sessions

To log off all SSL VPN sessions, including Cisco AnyConnect Secure Mobility client sessions, use the **vpn-sessiondb logoff anyconnect** command in global configuration mode:

**vpn-sessiondb logoff anyconnect**

In response, the system asks you to confirm that you want to log off the VPN sessions. To confirm press **Enter** or type **y**. Entering any other key cancels the logging off.

The following example logs off all SSL VPN sessions:

```
hostname# vpn-sessiondb logoff anyconnect
INFO: Number of sessions of type "svc" logged off : 1
Do you want to logoff the VPN session(s)? [confirm]
```

```
INFO: Number of sessions logged off : 6
hostname#
```

## Disconnecting Individual VPN Sessions

You can log off individual sessions using either the **name** option or the **index** option:

**vpn-sessiondb logoff name** *name*

**vpn-sessiondb logoff index** *index*

For example, to log off the user named tester, enter the following command:

```
hostname# vpn-sessiondb logoff name tester
Do you want to logoff the VPN session(s)? [confirm]
INFO: Number of sessions with name "tester" logged off : 1
hostname#
```

You can find both the username and the index number (established by the order of the client images) in the output of the **show vpn-sessiondb anyconnect** command.

The following example terminates that session using the **name** option of the **vpn-sessiondb logoff** command:

```
hostname# vpn-sessiondb logoff name testuser
INFO: Number of sessions with name "testuser" logged off : 1
```

## Viewing Detailed Statistical Information

You or the user can view statistical information for a current AnyConnect session. On Windows navigate to **Advanced Window > VPN drawer > Statistics**. Alternatively, on Linux click the **Details** button on the user GUI.

This opens the Statistics Details dialog. On the Statistics tab in this window, you can reset the statistics, export the statistics, and gather files for the purpose of troubleshooting.

The options available in this window depend on the packages that are loaded on the client computer. If an option is not available, its button is not active and a “(Not Installed)” indicator appears next to the option name in the dialog box. The options are as follows:

- Clicking **Reset** resets the connection information to zero. AnyConnect immediately begins collecting new data.
- Clicking **Export Stats...** saves the connection statistics to a text file for later analysis and debugging.
- Clicking **Troubleshoot...** Launches the AnyConnect Diagnostics and Reporting Tool (DART) wizard which bundles specified log files and diagnostic information that can be used for analyzing and debugging the client connection. See the [“Using DART to Gather Troubleshooting Information” section on page 13-4](#) for information about the DART package.

## Resolving VPN Connection Issues

Use the following sections to resolve VPN connection issues.

## Adjusting the MTU Size

Many consumer-grade end user terminating devices (for example, a home router) do not properly handle the creation or assembly of IP fragments, particularly UDP. Because DTLS is a UDP-based protocol, it is sometimes necessary to reduce the MTU to prevent fragmentation. The MTU parameter sets the maximum size of the packet to be transmitted over the tunnel for the client and ASA. If a VPN user is experiencing a significant amount of lost packets, or if an application such as Microsoft Outlook is not functioning over the tunnel, it might indicate a fragmentation issue. Lowering the MTU for that user or group of users may resolve the problem.

To adjust the Maximum Transmission Unit size (from 256 to 1406 bytes) for SSL VPN connections established by AnyConnect,

---

**Step 1** From the ASDM interface, select **Configuration > Remote Access VPN > Network (Client) Access > Group Policies > Add or Edit**.

The Edit Internal Group Policy dialog box opens.

**Step 2** Select **Advanced > SSL VPN Client**.

**Step 3** Uncheck the **Inherit** check box and specify the appropriate value in the MTU field.

The default size for this command in the default group policy is 1406. The MTU size is adjusted automatically based on the MTU of the interface that the connection uses, minus the IP/UDP/DTLS overhead.

This setting affects only AnyConnect connections established in SSL and those established in SSL with DTLS.

---

## Optimal MTU (OMTU)

Use the Optimal MTU (OMTU) function to find the largest endpoint MTU at which the client can successfully pass DTLS packets. Implement OMTU by sending a DPD packet that is padded to the maximum MTU. If a correct echo of the payload is received back from the head end, the MTU size is accepted. Otherwise, the MTU is reduced and the probe is sent again until the minimum MTU allowed for the protocol is reached.

**Note**

---

Using OMTU does not interfere with the existing tunnel DPD function.

---

To use this feature, DPD on the ASA must be enabled. This feature does not work with IPsec, since DPD is based on the standards implementation that does not allow padding.

## Using DART to Gather Troubleshooting Information

DART is the AnyConnect Diagnostics and Reporting Tool that you can use to collect data useful for troubleshooting AnyConnect installation and connection problems. DART supports Windows 7, Windows Vista, and Windows XP, Mac OS X v10.6, v10.7, and v10.8, and Red Hat Enterprise Linux 5.x (32-bit) or 6.x (64-bit).

The DART wizard runs on the computer that runs AnyConnect. DART assembles the logs, status, and diagnostic information for Cisco Technical Assistance Center (TAC) analysis. DART does not require administrator privileges.

DART does not rely on any component of the AnyConnect software to run, though you can launch DART from AnyConnect, and DART does collect the AnyConnect log file, if it is available.

DART is currently available as a standalone installation, or the administrator can push this application to the client computer as part of the AnyConnect dynamic download infrastructure. Once installed, the end user can start the DART wizard from the Cisco folder available through the Start button.



### Note

DART bundles cannot be unzipped by Achieve Utility on Mac OS X v10.6.

## Getting the DART Software

You can install DART on the client using either the web-deployment or pre-deployment method of AnyConnect.

Any version of DART works with any version of AnyConnect; the version numbers of each are no longer synchronized.

[Table 13-1](#) provides the AnyConnect downloads (both files and packages) containing DART for the pre-deploy and web deploy (downloaded) installer. Before release 3.0.3050, the DART component was a separate download (a .dmg, .sh, or .msi file) for web deploy. With release 3.0.3050 or later, the DART component is included in the .pkg file.

**Table 13-1 DART File or Package Filenames for ASA or Pre-Deployment**

| DART     | Web-Deploy Filenames and Packages (Downloaded)                           | Pre-Deploy Installer                       |
|----------|--------------------------------------------------------------------------|--------------------------------------------|
| Windows  | <i>Release 3.0.3050 or later:</i><br>anyconnect-win-(ver)-k9.pkg         | anyconnect-win-(ver)-pre-deploy-k9.iso     |
|          | <i>Before release 3.0.3050:</i><br>anyconnect-dart-win-(ver)-k9.msi*     | anyconnect-dart-win-(ver)-k9.msi*          |
| Mac OS X | <i>Release 3.0.3050 or later:</i><br>anyconnect-macosx-i386-(ver)-k9.pkg | anyconnect-macosx-i386-(ver)-k9.dmg        |
|          | <i>Before release 3.0.3050:</i><br>anyconnect-dartsetup.dmg              | anyconnect-dart-macosx-i386-(ver)-k9.dmg   |
| Linux    | <i>Release 3.0.3050 or later:</i><br>anyconnect-linux-(ver)-k9.pkg       | anyconnect-predeploy-linux-(ver)-k9.tar.gz |
|          | <i>Before release 3.0.3050:</i><br>anyconnect-dartsetup.sh               | anyconnect-dart-linux-(ver)-k9.tar.gz      |



**Table 13-1 DART File or Package Filenames for ASA or Pre-Deployment**

| DART     | Web-Deploy Filenames and Packages (Downloaded)                 | Pre-Deploy Installer                          |
|----------|----------------------------------------------------------------|-----------------------------------------------|
| Linux-64 | Release 3.0.3050 or later:<br>anyconnect-linux-64-(ver)-k9.pkg | anyconnect-predeploy-linux-64-(ver)-k9.tar.gz |
|          | Before release 3.0.3050:<br>anyconnect-dartsetup.sh            | anyconnect-dart-linux-64-(ver)-k9.tar.gz      |

\*The web-deploy and predeployment packages are contained in an ISO image (\*.iso). The ISO image file contains the programs and MSI installer files to deploy to user computers. Refer to the [“Predeployment Package File Information”](#) section on page 2-20 for more information about the .iso image and its contents.

## Installing DART

The administrator can include DART as part of the AnyConnect installation.

When AnyConnect downloads to a computer running Windows, a new version of DART, if available, downloads along with it. When a new version of the AnyConnect downloads as part of an automatic upgrade, it includes a new version of DART if there is one.



### Note

If the **dart** keyword is not present in the group-policy configuration (configured through the **anyconnect modules** command or the corresponding ASDM dialog), then the AnyConnect download does not install DART, even if it is present in the package.

## Installing DART with AnyConnect

This procedure downloads DART to the remote-user’s machine the next time the user connects.

- Step 1** Load the AnyConnect package containing DART to the ASA, just as you would any other Cisco software package.
- Step 2** After installing the AnyConnect .pkg file containing DART on the security appliance, you must specify DART in a group policy, in order for it to be installed with AnyConnect. You can do this using ASDM or the CLI, as follows:
- If using ASDM:
- Begin by clicking **Configuration** and then click **Remote Access VPN > Network (Client) Access > Group Policies**.
  - Add a new group policy or edit an existing group policy. In the group policy dialog box, expand **Advanced** and click **SSL VPN Client**.
  - In the SSL VPN Client dialog box, uncheck **Inherit** for the **Optional Client Modules to Download** option. Select the **dart** module in the option’s drop-down list.
  - If the version of ASDM that you are using does not have the DART option checkbox, enter the keyword **dart** in the field. If you want to enable both DART and Start Before Logon, enter both **dart** and **vpngina** in that field, in either order, separated by a comma.

Click **OK** and then click **Apply**.

If using CLI, use the **anyconnect modules value dart** command.



#### Note

If you later change to **anyconnect modules none** or if you remove the DART selection in the **Optional Client Modules to Download** field, DART remains installed. The security appliance cannot cause DART to be uninstalled. However, you can remove DART by using the Windows Add/Remove Programs in the Control Panel. If you do remove DART in this way, then it is reinstalled automatically when the user reconnects using AnyConnect. When the user connects, DART is upgraded automatically when an AnyConnect package with a higher version of DART is uploaded and configured on the ASA.

To run DART, see the [“Running DART on Windows” section on page 13-7](#).

## Manually Installing DART on a Windows Device

Follow these steps to install DART on a Windows device.

- Step 1** Store **anyconnect-dart-win-(ver)-k9.msi** locally. If you are installing with release 3.0.3050 or later, this DART component is included with the **anyconnect-win-(ver)-k9.pkg** download.
- Step 2** Double-click the **anyconnect-dart-win-(ver)-k9.msi** file to launch the **DART Setup Wizard**.
- Step 3** Click **Next** at the Welcome screen.
- Step 4** Select **I accept the terms in the License Agreement** to accept the end user license agreement and click **Next**.
- Step 5** Click **Install** to install DART. The installation wizard installs **DartOffline.exe** in the <System Drive>\Program Files\Cisco\Cisco DART directory.
- Step 6** Click **Finish** to complete the installation.

To run DART, see the [“Running DART on Windows” section on page 13-7](#).

## Manually Installing DART on a Linux Device

Follow these steps to install DART on a Linux device.

- Step 1** Store **anyconnect-dart-linux-(ver)-k9.tar.gz** locally. If you are installing with release 3.0.3050 or later, this DART component is included with the **anyconnect-linux-(ver)-k9.pkg** download.
- Step 2** From a terminal, extract the tar.gz file using the **tar -zxvf <path to tar.gz file including the file name>** command.
- Step 3** From a terminal, navigate to the extracted folder and run **dart\_install.sh** using the **sudo ./dart\_install.sh** command.
- Step 4** Accept the license agreement and wait for the installation to finish.



#### Note

You can only uninstall DART using **/opt/cisco/anyconnect/dart/dart\_uninstall.sh**.

## Manually Installing DART on a Mac OS X Device

Follow these steps to install DART on a Mac OS X device.

- 
- Step 1** Store anyconnect-dart-macosx-i386-(ver)-k0.dmg locally. If you are installing with release 3.0.3050 or later, this DART component is included with the anyconnect-macosx-i386-(ver)-k9.pkg download.
- Step 2** When the download finishes, the .dmg file is automatically mounted to the desktop, and the DART install wizard starts automatically. To start the install wizard manually, go to the download folder, double click the downloaded .dmg file to mount it to the desktop, and double click dart.pkg from the mounted device. The install wizard displays a “This package will run a program to determine if the software can be installed” message.
- Step 3** Click **Continue**. The license agreement displays on the wizard.
- Step 4** Click **Continue** and **Accept** to agree to the license agreement.
- Step 5** You are prompted to change the install location. Make the necessary changes and click **Continue**.
- Step 6** You must enter the administrator credentials for the installation to begin. Click **Continue** after entering the credentials. The installation begins.
- Step 7** Wait for the installation to complete and click **Cancel** to exit the program.



**Note**

You can only uninstall DART using `/opt/cisco/anyconnect/bin/dart_uninstall.sh`.

---

## Running DART on Windows

To run the DART wizard and create a DART bundle for Windows, follow these steps:

- 
- Step 1** Launch the AnyConnect GUI if you are running on a Windows device.
- Step 2** Click the **Statistics** tab and then click the **Details** button at the bottom of the dialog box. This opens the Statistics Details dialog box.
- Step 3** Click **Troubleshoot** at the bottom of the Statistics Details window.
- Step 4** Click **Next** at the Welcome screen. This brings you to the Bundle Creation Option dialog box.
- Step 5** In the Bundle Creation Options area, select **Default** or **Custom**.
- The **Default** option includes the typical log files and diagnostic information, such as the AnyConnect and Cisco Secure Desktop log files, general information about the computer, and a summary of what DART did and did not do.
- By selecting **Default**, and then clicking **Next** at the bottom of the dialog box, DART immediately begins creating the bundle. The default name for the bundle is DARTBundle.zip, and it is saved to the local desktop.
- If you choose **Custom**, the DART wizard will present you with more dialog boxes, after you click **Next**, so that you can specify what files you want to include in the bundle and where to store the bundle.

**Tip**

By selecting **Custom**, you could accept the default files to include in the bundle and then only specify a different storage location for the file.

- Step 6** If you want to encrypt the DART bundle, in the **Encryption Option** area check **Enable Bundle Encryption**; then, enter a password in the **Encryption Password** field. Optionally, select **Mask Password** and the password you enter in the **Encryption Password** and **Reenter Password** fields will be masked with astericks (\*).
- Step 7** Click **Next**. If you selected **Default**, DART starts creating the bundle. If you selected **Custom**, the wizard continues to the next step.
- Step 8** In the **Log File Selection** dialog box, select the log files and preference files to include in the bundle. You have an option to include the Network Access Manager, Telemetry, Posture, and Web Security logs. Click **Restore Default** if you want to revert to the default list of files typically collected by DART. Click **Next**.
- Step 9** In the Diagnostic Information Selection dialog box, select the diagnostic information to include in the bundle. Click **Restore Default** if you want to revert to the default list of files typically collected by DART. Click **Next**.
- Step 10** In the Comments and Target Bundle Location dialog box, configure these fields:
- In the **Comments** area, enter any comments you would like included with the bundle. DART stores these comments in a comments.txt file included with the bundle.
  - In the **Target Bundle Location** field, browse for a location in which to store the bundle.
- Click **Next**.
- Step 11** In the Summary dialog box, review your customizations and click **Next** to create the bundle or click **Back** to make customization changes.
- Step 12** Click **Finish** after DART finishes creating the bundle.

**Tip**

In some instances, customers have reported that DART has run for more than a few minutes. If DART seems to be taking a long time to gather the default list of files, click **Cancel** and then re-run the wizard choosing to create a **Custom** DART bundle and only select the files you need.

## Running DART on Linux or Mac OS X

To run the DART wizard and create a DART bundle for Linux or Mac, follow these steps:

- Step 1** For a Linux device, you will launch DART from ->Applications -> Internet-> Cisco DART or /opt/cisco/anyconnect/dart/dartui.
- For a Mac device, you will launch DART from ->Applications ->Cisco -> Cisco DART.
- Step 2** Click the **Statistics** tab and then click the **Details** button at the bottom of the dialog box. This opens the Statistics Details dialog box.
- Step 3** In the Bundle Creation Options area, select **Default** or **Custom**.

- The **Default** option includes the typical log files and diagnostic information, such as the AnyConnect and Cisco Secure Desktop log files, general information about the computer, and a summary of what DART did and did not do.

By selecting **Default**, and then clicking **Next** at the bottom of the dialog box, DART immediately begins creating the bundle. The default name for the bundle is DARTBundle.zip, and it is saved to the local desktop.



**Note** Default is the only option for Mac OS X. You cannot customize which files to include in the bundle.

- If you choose **Custom**, the DART wizard will present you with more dialog boxes, after you click **Next**, so that you can specify what files you want to include in the bundle and where to store the bundle.



**Tip**

By selecting **Custom**, you could accept the default files to include in the bundle and then only specify a different storage location for the file.

- Step 4** Click **Next**. If you selected **Default**, DART starts creating the bundle. If you selected **Custom**, the wizard continues to the next step.
- Step 5** In the **Log File Selection** dialog box, select the log files and preference files to include in the bundle. You have an option to include the Network Access Manager, Telemetry, Posture, and Web Security logs. Click **Restore Default** if you want to revert to the default list of files typically collected by DART. Click **Next**.
- Step 6** In the Diagnostic Information Selection dialog box, select the diagnostic information to include in the bundle. Click **Restore Default** if you want to revert to the default list of files typically collected by DART. Click **Next**.
- Step 7** In the Comments and Target Bundle Location dialog box, configure these fields:
- In the **Comments** area, enter any comments you would like to be included with the bundle. DART stores these comments in a comments.txt file included with the bundle.
  - In the **Target Bundle Location** field, browse for a location in which to store the bundle.
- Click **Next**.
- Step 8** If you want to encrypt the DART bundle, in the **Encryption Option** area check **Enable Bundle Encryption**; then, enter a password in the **Encryption Password** field. Optionally, select **Mask Password** and the password you enter in the **Encryption Password** and **Reenter Password** fields will be masked with astericks (\*).



**Note** Masking the password is not an option for Mac OS X operating systems.

- Step 9** Click **Finish** to close the wizard.



**Tip**

In some instances, customers have reported that DART has run for more than a few minutes. If DART seems to be taking a long time to gather the default list of files, click **Cancel** and then re-run the wizard choosing to create a **Custom** DART bundle and only select the files you need.

## Installing the AnyConnect Client

If you configure the AnyConnect images with the **anyconnect image xyz** command, you must issue the **anyconnect enable** command. Without issuing this command, AnyConnect does not function as expected, and **show webvpn anyconnect** states that the “SSL VPN client is not enabled,” instead of listing the installed AnyConnect packages.

## Installing the Log Files

The log files are retained in the following files:

- \Windows\setupapi.log — Windows XP and Windows 2000
- \Windows\Inf\setupapi.app.log — Windows 7 and Windows Vista
- \Windows\Inf\setupapi.dev.log — Windows 7 and Windows Vista

**Note**

In Windows 7 and Windows Vista, you must make the hidden files visible.

If registry information is missing from the setupapi.log file, enable verbose logging on a Windows XP-based computer. Follow these steps to enable verbose logging on a Windows XP-based computer:

**Note**

Serious problems could result if the registry is modified incorrectly. For added protection, back up the registry before you modify it.

- 
- Step 1** Click **Start > Run**.
- Step 2** Type **regedit** in the Open field and click **OK**.
- Step 3** Locate and double click **LogLevel** in the HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\CurrentVersion\Setup registry subkey.
- Step 4** Choose **Hexadecimal** on the Base pane of the Edit DWORD Value window.
- Step 5** Type **0x2000FFFF** in the Value data box.
- Step 6** Click **OK**.

**Note**

When you enable verbose logging, the size of the Setupapi.log file grows to approximately 4 megabytes (MB). Follow these steps again to reset the registry value but instead set the DWORD value (in Step 5) to 0.

---

## Web Install of Log Files

If this is an initial web deployment install, the log file is located in the per-user temp directory:

%TEMP%\anyconnect-win-3.X.xxxx-k9-install-yyyyyyyyyyyyyyyy.log.

If an upgrade was pushed from the optimal gateway, the log file is in the following location:

%WINDIR%\TEMP\anyconnect-win-3.X.xxxxx-k9-install-yyyyyyyyyyyyyy.log.

Obtain the most recent file for the version of the client you want to install. The *xxx* varies depending on the version, and the *yyyyyyyyyyyyyy* specifies the date and time of the install.

## Standalone Install of Log Files

To turn on MSI logging and capture logs of the install, run the following:

```
MSIExec.exe/i anyconnect-win-3X.xxxx-pre-deploy-k9.msi/lv* c:\AnyConnect.log
```

where *anyconnect-win-3X.xxxx-pre-deploy-k9.msi* is the full name of the actual msi file that you want to install.

The log appears in the following locations:

- \Documents and Settings\<username>\Local Settings\Temp —on Windows XP and Windows 2000.
- \Users\<username>\AppData\Local\Temp —on Windows 7 and Windows Vista.
- \Windows\Temp —if an automatic upgrade

If you intend to use standalone only (or you do not want ActiveX control installed on your system), perform one of the following:



**Note** Without these actions, you may receive a Cisco AnyConnect VPN Error 1722 indicating a problem with the Windows Installer package.

- Create an MSI transform to set the ActiveX property to disabled (NOINSTALLACTIVEX=1):

```
MISExec /i anyconnect-win-x.x.xxxxx-pre-deploy-k9.msi NOINSTALLACTIVEX=1
```

- Perform a quiet install without a reboot:

```
msiexec /quiet /i "anyconnect-gina-x.x.xxxxx-pre-deploy-k9.msi" REBOOT=ReallySuppress
msiexec /quiet /norestart /i "anyconnect-gina-x.x.xxxxx-pre-deploy-k9.msi"
```

- Perform a quiet uninstall without a reboot:

```
msiexec /quiet /x "anyconnect-gina-x.x.xxxxx-pre-deploy-k9.msi" REBOOT=ReallySuppress
```



**Note** The value of *x.x.xxxxx* depends on the version being installed.

## Problems Disconnecting AnyConnect or Establishing Initial Connection

If you experience problems disconnecting the AnyConnect client or establishing an initial connection, follow these suggestions:

1. Obtain the config file from the ASA to look for signs of a connection failure:
  - From the ASA console, type **write net x.x.x.x:ASA-Config.txt**, where *x.x.x.x* is the IP address of the TFTP server on the network.
  - From the ASA console, type **show running-config**. Cut and paste the config into a text editor and save.

2. View the ASA event logs.
  - a. At the ASA console, add the following lines to look at the ssl, webvpn, anyconnect, and auth events:
 

```
config terminal
logging enable
logging timestamp
logging class auth console debugging
logging class webvpn console debugging
logging class ssl console debugging
logging class anyconnect console debugging
```
  - b. Attempt an AnyConnect client connection, and when the connect error occurs, cut and paste the log information from the console into a text editor and save.
  - c. Type **no logging enable** to disable logging.
3. On the client computer, get the Cisco AnyConnect VPN client log from the Windows Event Viewer.
  - a. Choose **Start > Run** and type **eventvwr.msc /s**.
  - b. Locate the **Cisco AnyConnect VPN Client** in the Applications and Services Logs (of Windows Vista and Win7) and choose **Save Log File As...**
  - c. Assign a filename like AnyConnectClientLog.evt. You must use the .evt file format.
4. Attach the vpnagent.exe process to the Windows Diagnostic Debug Utility if you are having problems with disconnecting or closing the AnyConnect GUI. Refer to the WinDbg documentation for additional information.
5. If a conflict with the IPv6/IPv4 IP address assignment is identified, obtain sniffer traces and add additional routing debugs to the registry of the client computer being used. These conflicts may appear in the AnyConnect event logs as follows:

```
Function: CRouteMgr:modifyRoutingTable Return code: 0xFE06000E File: .\VpnMgr.cpp
Line:1122
Description: ROUTEMGR_ERROR_ROUTE_TABLE_VERIFICATION_FAILED.
Termination reason code 27: Unable to successfully verify all routing table
modifications are correct.
```

```
Function: CChangeRouteTable::VerifyRouteTable Return code: 0xFE070007
File: .\RouteMgr.cpp Line: 615 Description: ROUTETABLE_ERROR_NOT_INITIALIZED
```

Route debugging can be enabled on a one-time basis for a connection by adding a specific registry entry (Windows) or file (Linux and Mac OS X) prior to making the VPN connection.

On 32-bit Windows: the DWORD registry value must be:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Cisco\Cisco AnyConnect Secure Mobility
Client\DebugRoutesEnabled
```

On 64-bit Windows the DWORD registry value must be:

```
HKEY_LOCAL_MACHINE\Software\WOW6432node\Cisco\Cisco AnyConnect Secure Mobility
Client\DebugRoutesEnabled
```

On Linux or Mac OS X, create a file in the followin path using the **sudo touch** command:

```
/opt/cisco/anyconnect/debugroutes
```



**Note**

The key or file is deleted when the tunnel connection is started. The value of the key or contents of the file are not important as the existence of the key or file is sufficient to enable debugging.

When a tunnel connection is started and this key or file is found, two route debug text files are created in the system temp directory (usually C:\Windows\Temp on Windows and /tmp on Mac or Linux). The two files (debug\_routechangesv4.txt4 and debug\_routechangesv6.txt) are overwritten if they already exist.

## Problems Passing Traffic

If the AnyConnect client cannot send data to the private network once connected, follow these suggestions:

1. Obtain the output of the `show vpn-sessiondb detail anyconnect filter name <username>` command. If the output specifies Filter Name: XXXXX, get the output for the `show access-list XXXXX` command as well. Verify that the ACL is not blocking the intended traffic flow.
2. Obtain the DART file or the output from AnyConnect VPN Client > Statistics > Details > Export (AnyConnect-ExportedStats.txt). Observe the statistics, interfaces, and routing table.
3. Check the ASA config file for NAT statements. If NAT is enabled, you must exempt data returning to the client from network address translation. For example, to NAT exempt the IP addresses from the AnyConnect pool, the following code would be used:

```
access-list in_nat0_out extended permit ip any 10.136.246.0 255.255.255.0
ip local pool IPPool1 10.136.246.1-10.136.246.254 mask 255.252.0.0
nat (inside) 0 access-list in_nat0_out
```

4. Verify whether the tunneled default gateway is enabled for the setup. The traditional default gateway is the gateway of last resort for non-decrypted traffic:

```
route outside 0.0.83.145.50.1
route inside 0 0 10.0.4.2 tunneled
```

If a VPN client needs to access a resource that is not in the routing table of the VPN gateway, packets are routed by the standard default gateway. The VPN gateway does not need to have the whole internal routing table. If you use a tunneled keyword, the route handles decrypted traffic coming from IPsec/SSL VPN connection. Standard traffic routes to 83.145.50.1 as a last resort, while traffic coming from the VPN routes to 10.0.4.2 and is decrypted.

5. Collect a text dump of `ipconfig /all` and a route print output before and after establishing a tunnel with AnyConnect.
6. Perform a network packet capture on the client or enable a capture on the ASA.

**Note**

If some applications (such as Microsoft Outlook) do not operate with the tunnel, ping a known device in the network with a scaling set of pings to see what size gets accepted (for example, `ping -l 500`, `ping -l 1000`, `ping -l 1500`, and `ping -l 2000`). The ping results provide clues to the fragmentation issues in the network. Then you can configure a special group for users who might experience fragmentation and set the `anyconnect mtu` for this group to 1200. You can also copy the Set MTU.exe utility from the old IPsec client and force the physical adapter MTU to 1300. Upon reboot, see if you notice a difference.

## Problems with AnyConnect Crashing

When a crash in the UI occurs, the results are written to the %temp% directory (such as C:\DOCUME~1\jsmith\LOCALS~1\Temp). If you receive a “The System has recovered from a serious error” message after a reboot, gather the .log and .dmp generated files from C:\Documents and Settings\All Users\Application Data\Microsoft\Dr Watson or a similar application. Either copy them or follow the steps below to back up the files.

- 
- Step 1** Run the Microsoft utility called Dr. Watson (Drwtsn32.exe) from the Start > Run menu.
- Step 2** Configure the following and click **OK**:
- ```

Number of Instructions : 25
Number of Errors to Save : 25
Crash Dump Type : Mini
Dump Symbol Table : Checked
Dump All Thread Contexts : Checked
Append to Existing Log File : Checked
Visual Notification : Checked
Create Crash Dump File : Checked
  
```
- Step 3** On the client computer, get the Cisco AnyConnect VPN client log from the Windows Event Viewer by entering **eventvwr.msc /s** at the Start > Run menu.
- Step 4** Locate the **Cisco AnyConnect VPN Client** in the Applications and Services Logs (of Windows Vista and Win7) and choose **Save Log File As...** Assign a filename such as AnyConnectClientLog.evt in the .evt file format.
- Step 5** If a driver crash occurs in VPNVA.sys, check for any intermediate drivers that are bound to the Cisco AnyConnect Virtual Adapter and uncheck them.
- Step 6** If a driver crash occurs in vpnagent.exe, attach the vpnagent.exe process to the debugging tools for Windows. After the tools are installed, perform the following:
- Create a directory called c:\vpnagent.
 - Look at the Process tab in the Task Manager and determine the PID of the process in vpnagent.exe.
 - Open a command prompt and change to the directory where you installed the debugging tools. By default, the debugging tools for Windows are located in C:\Program Files\Debugging Tools.
 - Type **cscript vpnagent4.vbs -crash -p PID -o c:\vpnagent -nodumponfirst**, where *PID* is the number determined in Step b.

Let the open window run in minimized state. You cannot log off of the system while you are monitoring.
 - When the crash occurs, collect the contents of c:\vpnagent in a zip file.
 - Use **!analyze -v** to further diagnose the crashdmp file.

Problems Connecting to the VPN Service

If you receive an “Unable to Proceed, Cannot Connect to the VPN Service” message, the VPN service for AnyConnect is not running. Most likely, the VPN agent exited unexpectedly. To troubleshoot whether another application conflicted with the service, follow these steps:

-
- Step 1** Check the services under the Windows Administration Tools to ensure that the Cisco AnyConnect VPN Agent is *not* running. If it is running and the error message still appears, another VPN application on the workstation may need disabled or even uninstalled, rebooted, and retested.
- Step 2** Try to start the Cisco AnyConnect VPN Agent. This determines if the conflict is with the initialization of the server at boot-up or with another running service (because the service failed to start).
- Step 3** Check the AnyConnect logs in the Event Viewer for any messages stating that the service was unable to start. Notice the time stamps of the manual restart from Step 2, as well as when the workstation was booted up.
- Step 4** Check the System and Application logs in the Event Viewer for the same general time stamps of any messages of conflict.
- Step 5** If the logs indicate a failure starting the service, look for other information messages around the same time stamp which indicate one of the following:
- a missing file—reinstall the AnyConnect client from a standalone MSI installation to rule out a missing file.
 - a delay in another dependent service—disable startup activities to speed up the workstation's boot time
 - a conflict with another application or service—determine whether another service is listening on the same port as the port the vpnagent is using or if some HIDS software is blocking our software from listening on a port

If the logs do not point directly to a cause, use the trial and error method to identify the conflict. When the most likely candidates are identified, disable those services (such as VPN products, HIDS software, spybot cleaners, sniffers, antivirus software, and so on) from the Services panel. After rebooting, if the VPN Agent service still fails to start, start turning off services that were not installed by a default installation of the operating system.

Responding to Security Alert in Microsoft Internet Explorer

A security alert window may appear when you establish a Microsoft Internet Explorer connection to an ASA that is not recognized as a trusted site. In response to this alert, install a self-signed certificate as a trusted root certificate on a client. The upper half of the Security Alert window shows the following text:

Information you exchange with this site cannot be viewed or changed by others. However, there is a problem with the site's security certificate. The security certificate was issued by a company you have not chosen to trust. View the certificate to determine whether you want to trust the certifying authority.



Note

We do not recommend using a self-signed certificate because of the possibility that a user could inadvertently configure a browser to trust a certificate on a rogue server and because of the inconvenience to users of having to respond to a security warning when connecting to your secure gateway.

Detailed Steps

-
- Step 1** Click **View Certificate** in the Security Alert window.
- Step 2** Click **Install Certificate**.
- Step 3** Click **Next**.

- Step 4** Select **Place all certificates in the following store**.
- Step 5** Click **Browse**.
- Step 6** In the drop-down list, choose **Trusted Root Certification Authorities**.
- Step 7** Click **Next**.
- Step 8** Click **Finish**.
- Step 9** At the Security Warning window prompt, click **Yes**. The Certificate Import Wizard window indicates the import is successful.
- Step 10** Click **OK** to close this window.
- Step 11** Click **OK** to close the Certificate window.
- Step 12** Click **Yes** to close the Security Alert window. The ASA window opens, signifying the certificate is trusted.

Responding to “Certified by an Unknown Authority” Alert

A “Web Site Certified by an Unknown Authority” alert window may appear when you establish a Netscape, Mozilla, or Firefox connection to an ASA that is not recognized as a trusted site. In response to this alert, install a self-signed certificate as a trusted root certificate on a client. The upper half of the Security Alert window shows the following text:

Unable to verify the identity of <Hostname_or_IP_address> as a trusted site.



Note

We do not recommend using a self-signed certificate because of the possibility that a user could inadvertently configure a browser to trust a certificate on a rogue server and because of the inconvenience to users of having to respond to a security warning when connecting to your secure gateway.

Detailed Steps

- Step 1** Click **Examine Certificate** in the “Web Site Certified by an Unknown Authority” window. The Certificate Viewer window opens.
- Step 2** Click the **Accept this certificate permanently** option.
- Step 3** Click **OK**. The ASA window opens, signifying the certificate is trusted.

Obtaining the Computer System Information

Type the following and wait about two minutes to obtain the computer’s system info:

- **winmsd /nfo c:\msinfo.nfo** — on Windows XP or 2K
- **msinfo32 /nfo c:\msinfo.nfo** —on Vista

Obtaining a Systeminfo File Dump

On Windows XP or Vista, type the following at a command prompt to obtain a systeminfo file dump:

```
systeminfo >> c:\sysinfo.txt
```

Checking the Registry File

An entry in the SetupAPI log file as below indicates a file cannot be found:

```
E122 Device install failed. Error 2: The system cannot find the file specified.  
E154 Class installer failed. Error 2: The system cannot find the file specified.
```

Make sure the

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\RunOnce registry key exists. Without this registry key, all inf install packages are forbidden.

Conflicts with Third-Party Applications

Some third-party applications prohibit the installation of AnyConnect's Virtual Adapter drivers. This can result in blue screens and a failure to update the routing table. Using the DART tool (described in the [“Using DART to Gather Troubleshooting Information”](#) section on page 13-4), you can gather a customer's operating system environment. Based upon this diagnosis, Cisco has identified the following conflicts with third-party applications and can recommend the following resolutions.

Adobe and Apple—Bonjour Printing Service

- Adobe Creative Suite 3
- Bonjour Printing Service
- iTunes

Symptom Unable to successfully verify the IP forwarding table.

Possible Cause The AnyConnect event logs indicate a failure to identify the IP forwarding table and indicate the following entries in the routing table:

```
Destination 169.254.0.0  
Netmask 255.255.0.0  
Gateway 10.64.128.162  
Interface 10.64.128.162  
Metric 29
```

Recommended Action Disable the Bonjour Printing Service by typing **net stop “bonjour service”** at the command prompt. A new version of mDNSResponder (1.0.5.11) has been produced by Apple. To resolve this issue, a new version of Bonjour is bundled with iTunes and made available as a separate download from the Apple web site.

AT&T Communications Manager Versions 6.2 and 6.7

Symptom A failure to connect or pass traffic occurs when a customer has an AT&T Sierra Wireless 875 card on several computers. Versions 6.2 to 6.7 seem to conflict with AnyConnect.

Possible Cause CSTP transport failure indicates that the transport layer is compromised by the AnyConnect Virtual Adapter.

Recommended Action Follow these steps to correct the problem:

1. Disable acceleration on the Aircard.
2. Launch AT&T communication manager > Tools > Settings > Acceleration > Startup.
3. Type **manual**.
4. Click **Stop**.

AT&T Global Dialer

Symptom The client operating system sometimes experiences a blue screen, which causes the creation of a mini dump file.

Possible Cause The AT&T Dialer intermediate driver failed to handle pending packets correctly and caused the operating system to crash. Other NIC card drivers (such as Broadcom) do not exhibit this problem.

Recommended Action Upgrade to the latest 7.6.2 AT&T Global Network Client.

Citrix Advanced Gateway Client Version 2.2.1

Symptom The following error may occur when disconnecting the AnyConnect session:

```
VPN Agent Service has encountered a problem and needs to close. We are sorry for the inconvenience.
```

Possible Cause During the freeing of memory, the crash occurs as a result of the Citrix CtxLsp.dll, which gets loaded into every process using Winsock.

Recommended Action Remove the Citrix Advanced Gateway Client until Citrix can resolve this generic problem with CtxLsp.dll.

Firewall Conflicts

Third-party firewalls can interfere with the firewall function configured on the ASA group policy.

Juniper Odyssey Client

Symptom When wireless suppression is enabled, the wireless connection drops if a wired connection is introduced. With wireless suppression disabled, the wireless operates as expected.

Possible Cause The Odyssey Client should not manage the network adapter.

Recommended Action Configure the Odyssey Client with the steps below:

1. In Network Connections, copy the name of the adapter as it appears in its connection properties. If you edit the registry, perform a backup before making any changes and use caution as serious problems can occur if modified incorrectly.
2. Open the registry and go to HKEY_LOCAL_MACHINE\SOFTWARE\Funk Software, Inc.\odyssey\client\configuration\options\adapterType\virtual.
3. Create a new string value under virtual. Copy the name of the adapter from Network properties into the registry portion. The additional registry settings, once saved, are ported over when a customer MSI is created and are pushed down to other clients.

Kaspersky AV Workstation 6.x

Symptom When Kaspersky 6.0.3 is installed (even if disabled), AnyConnect connections to the ASA fail right after CSTP state = CONNECTED. The following message appears:

```
SVC message: t/s=3/16: Failed to fully establish a connection to the secure gateway (proxy authentication, handshake, bad cert, etc.).
```

Possible Cause A known incompatibility exists between Kaspersky AV Workstation 6.x and AnyConnect.

Recommended Action Uninstall Kaspersky and refer to their forums for additional updates.

McAfee Firewall 5

Symptom A UDP DTLS connection cannot be established.

Possible Cause McAfee Firewall defaults to blocking incoming IP fragments and thus blocking DTLS if fragmented.

Recommended Action In the McAfee Firewall central console, choose **Advanced Tasks > Advanced options and Logging** and uncheck the **Block incoming fragments automatically** check box in McAfee Firewall.

Microsoft Internet Explorer 8

Symptom You cannot install AnyConnect from the WebVPN portal when using Internet Explorer 8 with Windows XP SP3.

Possible Cause The browser crashes with the installation.

Recommended Action As recommended by Microsoft, remove MSJVM. Refer to Microsoft Knowledge Based Article KB826878.

Microsoft Routing and Remote Access Server

Symptom When AnyConnect attempts to establish a connection to the host device, the following termination error is returned to the event log:

```
Termination reason code 29 [Routing and Remote Access service is running]
The Windows service "Routing and Remote Access" is incompatible with the Cisco
AnyConnect VPN Client.
```

Possible Cause RRAS and AnyConnect conflict over the routing table. With RRAS, the computer acts as an Ethernet router and therefore modifies the routing table the same way as AnyConnect does. The two cannot run together since AnyConnect depends on the routing table to properly direct traffic.

Recommended Action Disable the RRAS service.

Microsoft Windows Updates

Symptom The following message is encountered when trying to establish a VPN connection:

```
The VPN client driver has encountered an error.
```

Possible Cause A recent Microsoft update to the certclass.inf file has occurred. The following error appears in the C:\WINDOWS\setupapi.log:

```
#W239 The driver signing class list "C:\WINDOWS\INF\certclass.inf" was missing or
invalid. Error 0xfffffbf8: Unknown Error. Assuming all device classes are subject
to driver signing policy.
```

Recommended Action Check which updates have recently been installed by entering **C:\>systeminfo** at the command prompt or checking the C:\WINDOWS\WindowsUpdate.log. To attempt a repair, use the following steps:

1. Open a command prompt as an admin.
2. Enter **net stop CryptSvc**.
3. Analyze the database to verify its validity by entering **esentutl /g %systemroot%\System32\catroot2\F750E6C3-38EE-11D1-85E5-00C04FC295EE\catdb** or rename the following directory: %/WINDIR%\system32\catroot2 to catroot2_old.
4. When prompted, choose **OK** to attempt the repair. Exit the command prompt and reboot.

Even though the steps taken above may indicate that the catalog is not corrupt, the key file(s) may still have been overwritten with an unsigned one. If the failure still occurs, open a case with Microsoft to determine why the driver signing database is being corrupted.

Microsoft Windows XP Service Pack 3

Symptom You cannot install the AnyConnect client. The following error message appears:

This application has failed to start because dot3api.dll was not found.
Re-installing the application may fix this problem.

Possible Cause The missing dot3api.dll file is a known issue.

Recommended Action Reinstall regsvr32 dot3api.dll and reboot the operating system.

OpenVPN Client

Symptom An error indicates that the version of TUN is already installed on this system and is incompatible with the AnyConnect client.

Possible Cause The Mac OS X Shimo VPN Client can cause this.

Recommended Action Uninstall the Viscosity OpenVPN Client.

Load Balancers

Symptom The connection fails due to lack of credentials.

Possible Cause While the browser may cache the DNS results, additional applications such as the port forwarder and smart tunnels may not. If you log into X.4 and the DNS resolver is set to use x.15, the PF applet or smart tunnel application resolves the DNS and connects to X.15. Since no sessions were established, the connection fails due to lack of credentials.

Recommended Action The third-party load balancer has no insight into the load on the ASA devices. Because the load balance functionality in the ASA is intelligent enough to evenly distribute the VPN load across the devices, we recommend using the internal ASA load balancing.

Wave EMBASSY Trust Suite

Symptom The AnyConnect client fails to download and produces the following error message:

"Cisco AnyConnect VPN Client Downloader has encountered a problem and needs to close."

Possible Cause If you gather the mdmp file, the decode of the crash mdmp file indicates that a third-party dll is resident.

Recommended Action Upload the patch update to version 1.2.1.38 to resolve all dll issues.

Layered Service Provider (LSP) Modules and NOD32 AV

Symptom When AnyConnect attempts to establish a connection, it authenticates successfully and builds the ssl session, but then the AnyConnect client crashes in the vpndownloader.

Possible Cause The LSP component imon.dll has incompatibility issues.

Recommended Action Remove the Internet Monitor component in version 2.7 and upgrade to version 3.0 of ESET NOD32 AV.

LSP Symptom 2 Conflict

Symptom If an LSP module is present on the client, a Winsock catalog conflict may occur.

Possible Cause An Intel Mobile Bandwidth LSP Module such as impbw.dll may have caused a fault on the Intel code.

Recommended Action Uninstall the LSP module.

LSP Slow Data Throughput Symptom 3 Conflict

Symptom Slow data throughput may occur with the use of NOD32 V4.0.

Possible Cause The conflict involves Cisco AnyConnect and NOD32 Antivirus 4.0.468 x64 using Windows 7.

Recommended Action Go to **Protocol Filtering > SSL** in the Advanced Setup and enable SSL protocol scanning. Now go to **Web access protection > HTTP, HTTPS** and check **Do not use HTTPS protocol checking**. When the setting is enabled, go back to **Protocol filtering > SSL** and disable **SSL protocol scanning**.

EVDO Wireless Cards and Venturi Driver

Symptom A client disconnect occurred and produced the following in the event log:

```
%ASA-5-722037: Group <Group-Name> User <User-Name> IP <IP-Address> SVC closing
connection: DPD failure.
```

Possible Cause Check the Application, System, and AnyConnect event logs for a relating disconnect event and determine if a NIC card reset was applied at the same time.

Recommended Action Ensure that the Venturi driver is up to date. Disable **Use Rules Engine** in the 6.7 version of the AT&T Communications Manager.

DSL Routers Fail to Negotiate

Symptom DTLS traffic was failing even though it was successfully negotiated.

Possible Cause The DSL routers were blocking return DTLS traffic. No settings on the Air Link would allow a stable DTLS connection.

Recommended Action Connecting to a Linksys router with factory settings allowed a stable DTLS session and no interruption in pings. Add a rule to allow DTLS return traffic.

CheckPoint (and other Third-Party Software such as Kaspersky)

Symptom The AnyConnect log indicates a failure to fully establish a connection to the secure gateway.

Possible Cause The client logs indicate multiple occurrences of `NETINTERFACE_ERROR_INTERFACE_NOT_AVAILABLE`. These errors occur when the client is attempting to retrieve operating system information on the computer's network interface used to make the SSL connection to the secure gateway.

Recommended Action If you are uninstalling the Integrity Agent and then installing AnyConnect, enable TCP/IP. If you disable SmartDefense on Integrity agent installation, TCP/IP is checked. If third-party software is intercepting or otherwise blocking the operating system API calls while retrieving network interface information, check for any suspect AV, FW, AS, and such. Confirm that only one instance of the AnyConnect adapter appears in the Device Manager. If there is only one instance, authenticate with AnyConnect, and after 5 seconds, manually enable the adapter from the Device Manager. If any suspect drivers have been enabled within the AnyConnect adapter, disable them by unchecking them in the Cisco AnyConnect VPN Client Connection window.

Performance Issues with Virtual Machine Network Service Drivers

Symptom When using AnyConnect on some client computers, performance issues have resulted.

Possible Cause The virtual machine network driver virtualizes a physical network card or connection. When binding other Virtual Machine Network Services to the Cisco AnyConnect VPN Client Connection network adapter, performance issues occurred. The client device became infected with some malware and introduces a delay around `SSL_write()`.

Recommended Action Uncheck the binding for all IM devices within the AnyConnect virtual adapter. The application `dsagent.exe` resides in `C:\Windows\System\dsagent`. Although it does not appear in the process list, you can see it by opening sockets with TCPview (sysinternals). When you terminate this process, normal operation of AnyConnect results.

Kaspersky AntiVirus and Telemetry Module

Symptom When the Telemetry module is installed, AnyConnect may delete the main executable of the Kaspersky AntiVirus 8 suite (avp.exe).

Possible Cause Using Windows 7 64-bit German language with AnyConnect 3.0.5080 or later and Kaspersky AV 8 causes conflict.

Recommended Action Remove the Telemetry module.



VPN XML Reference

If you are using AnyConnect 3.1, 3.0, or 2.5 and ASDM 6.3(1) or later, you will not need this reference. You will create and edit client profiles using the profile editor launched from ASDM or the standalone Profile Editor which is downloadable from Cisco.com. See [“Introduction to the AnyConnect Client Profiles” section on page 2-1](#) for more information.

Use this appendix only if you are not upgrading ASDM to 6.3(1) or later. AnyConnect 2.5 supports a profile editor that you can access to configure AnyConnect features. However, you can access it only with ASDM 6.3(1) or later. Earlier AnyConnect versions provided a standalone profile editor that you could install on Windows, but it was undocumented and unsupported and is no longer available as a standalone editor. We strongly recommend upgrading to ASDM because it is much easier to create, edit, and manage profiles directly with the AnyConnect profile editor than it is edit them with a conventional editor. The new profile editor is documented and supports and comes with its own online help. The minimum ASA software release supported by ASDM 6.3(1) with AnyConnect 2.5 is ASA 8.0(2). However, we recommend upgrading to ASA 8.3(1) or later to take full advantage of the new client features.

Read *Chapter 3, Configuring AnyConnect Client Features* for familiarity with the AnyConnect profile and features. This appendix provides an alternative to this chapter.

The following sections briefly describe each client feature and provide XML tag names, options, descriptions, and example code. AnyConnect uses the default value if the profile does not specify one. Consider case when entering all profile tags and the specific options within each value. You must match the upper or lowercase values presented in this chapter to avoid error conditions.



Note

Do not cut and paste the examples from this document. Doing so introduces line breaks that can break your XML. Instead, open the profile template file in a text editor such as Notepad or Wordpad.

- [Local Proxy Connections, page A-2](#)
- [Optimal Gateway Selection \(OGS\), page A-2](#)
- [Trusted Network Detection, page A-3](#)
- [Always-on VPN and Subordinate Features, page A-4](#)
- [Always-on VPN With Load Balancing, page A-6](#)
- [Certificate Store on Windows, page A-7](#)
- [Restricting Certificate Store Use, page A-8](#)
- [SCEP Protocol to Provision and Renew Certificates, page A-8](#)
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- [Backup Server List Parameters](#), page A-15
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- [Other AnyConnect Profile Settings](#), page A-23

Local Proxy Connections

Table A-1 shows the tag name, options, and descriptions to configure support for local proxy connections.

Table A-1 Local Proxy Connection Settings

XML Tag Name	Options	Description
AllowLocalProxyConnections	true (default)	Enables local proxy connections.
	false	Disables local proxy connections.

Example: Disable Local Proxy Connections

Refer to the following example to disable AnyConnect support for local proxy connections:

```
<ClientInitialization>
<AllowLocalProxyConnections>false</AllowLocalProxyConnections>
</ClientInitialization>
```

Optimal Gateway Selection (OGS)

Table A-2 shows the tag names, options, and descriptions to configure OGS.

Table A-2 OGS Settings

XML Tag Name	Options	Description
EnableAutomaticServerSelection	true	Enables OGS by default.
	false	Disables OGS by default.
EnableAutomaticServerSelection UserControllable	true	Allows the user to enable or disable OGS in client preferences.*
	false	Reverts to the default where automatic server selection is not user-controllable.

Table A-2 OGS Settings

XML Tag Name	Options	Description
AutoServerSelectionImprovement	Integer. The default is 20 percent.	Percentage of performance improvement to trigger the client to connect to another secure gateway.
AutoServerSelectionSuspendTime	Integer. The default is 4 hours.	Specifies the elapsed time (in hours) since disconnecting from the current secure gateway and reconnecting to another secure gateway.

* When OGS is enabled, we recommend that you also make the feature user-controllable.

Example:OGS

Refer to the following example to configure OGS:

```
<ClientInitialization>
  <EnableAutomaticServerSelection UserControllable="true">
    true
    <AutoServerSelectionImprovement>20</AutoServerSelectionImprovement>
    <AutoServerSelectionSuspendTime>4</AutoServerSelectionSuspendTime>
  </EnableAutomaticServerSelection>
</ClientInitialization>
```

Trusted Network Detection

Table A-3 shows the tag names, options, and descriptions to configure trusted network detection.

Table A-3 Trusted Network Detection Settings

XML Tag Name	Options	Description
AutomaticVPNPolicy	true	Enables TND. Automatically manages when a VPN connection should be started or stopped according to the <i>TrustedNetworkPolicy</i> and <i>UntrustedNetworkPolicy</i> parameters.
	false	Disables TND. VPN connections can only be started and stopped manually.
TrustedNetworkPolicy	Disconnect	Disconnects the VPN connection in the trusted network.
	Connect	Initiates a VPN connection (if none exists) in the trusted network.
	DoNothing	Takes no action in a trusted network.
	Pause	Suspends the VPN session instead of disconnecting it if a user enters a network configured as trusted after establishing a VPN session outside the trusted network. When the user goes outside the trusted network again, AnyConnect resumes the session. This feature is for the user's convenience because it eliminates the need to establish a new VPN session after leaving a trusted network.
UntrustedNetworkPolicy	Connect	Initiates a VPN connection upon the detection of an untrusted network.
	DoNothing	Initiates a VPN connection upon the detection of an untrusted network. This option is incompatible with always-on VPN. Setting both the Trusted Network Policy and Untrusted Network Policy to Do Nothing disables Trusted Network Detection.

Table A-3 *Trusted Network Detection Settings (continued)*

XML Tag Name	Options	Description
TrustedDNSDomains	String	A list of DNS suffixes (a string separated by commas) that a network interface may have when the client is in the trusted network. The following is an example of a TrustedDNSDomain string: *.cisco.com Wildcards (*) are supported for DNS suffixes.
TrustedDNSServers	String	A list of DNS server addresses (a string separated by commas) that a network interface may have when the client is in the trusted network. The following is an example of a TrustedDNSServers string: 161.44.124.*,64.102.6.247 Wildcards (*) are supported for DNS server addresses.

Example:Trusted Network Detection

Refer to the following example to configure trusted network detection. In the example, the client is configured to automatically disconnect the VPN connection when in the trusted network and to initiate the VPN connection in the untrusted network:

```
<AutomaticVPNPolicy>true
  <TrustedDNSDomains>*.cisco.com</TrustedDNSDomains>
  <TrustedDNSServers>161.44.124.*,64.102.6.247</TrustedDNSServers>
  <TrustedNetworkPolicy>Disconnect</TrustedNetworkPolicy>
  <UntrustedNetworkPolicy>Connect</UntrustedNetworkPolicy>
</AutomaticVPNPolicy>
```

Always-on VPN and Subordinate Features

If you choose always-on VPN, the fail-open policy permits network connectivity, and the fail-close policy disables network connectivity.

Table A-4 shows the tag names, options, and descriptions to configure always-on VPN.

Table A-4 *Always-on VPN Settings*

XML Tag Name	Options	Description
AutomaticVPNPolicy	true	Enables automatic VPN policy.
	false	Disables automatic VPN policy.
TrustedDNSDomains	string	Specifies possible DNS suffixes that a network interface may have when in a trusted network.
TrustedDNSServers	string	Specifies DNS server addresses that a network interface may have when the client is in a trusted network.
TrustedNetworkPolicy	disconnect	Disconnects from the VPN upon detection of a trusted network.
	connect	Connects to the VPN upon detection of a trusted network.
	donothing	Do not connect to the VPN or disconnect from the VPN upon detection of a trusted network.

Table A-4 *Always-on VPN Settings (continued)*

XML Tag Name	Options	Description
UntrustedNetworkPolicy	connect	Disconnects from the VPN upon detection of an untrusted network.
	disconnect	Connects to the VPN upon detection of an untrusted network.
	donothing	Do not connect to the VPN or disconnect from the VPN upon detection of an untrusted network.
AlwaysOn	true	Enables always-on VPN.
	false	Disables always-on VPN.
ConnectFailurePolicy	open	Does not restrict network access when AnyConnect cannot establish a VPN session (for example, when an adaptive security appliance is unreachable).
	closed	Restricts network access when the VPN is unreachable. The restricted state permits access only to secure gateways to which the computer is allowed to connect.
AllowCaptivePortalRemediation	true	Relaxes the network restrictions imposed by a closed connect failure policy for the number of minutes specified by the CaptivePortalRemediationTimeout tag so that the user can remediate a captive portal.
	false	Enforces the network restrictions imposed by a closed connect failure policy even if AnyConnect detects a captive portal.
CaptivePortalRemediationTimeout	Integer	The number of minutes AnyConnect lifts the network access restrictions.
ApplyLastVPNLocalResourceRules	true	Applies the last client firewall it received from the security appliance, which may include ACLs allowing access to resources on the local LAN.
	false	Does not apply the last client firewall received from the security appliance.
AllowVPNDisconnect	true	Displays a Disconnect button to provide users with the option to disconnect an always-on VPN session. Users might want to do so to select an alternative secure gateway before reconnecting.
	false	Does not display a Disconnect button. This option prevents the use of the AnyConnect GUI to disconnect from the VPN.

**Caution**

A connect failure closed policy prevents network access if AnyConnect fails to establish a VPN session. It is primarily for exceptionally secure organizations where security persistence is a greater concern than always-available network access. It prevents all network access except for local resources such as printers and tethered devices permitted by split tunneling and limited by ACLs. It can halt productivity if users require Internet access beyond the VPN if a secure gateway is unavailable. AnyConnect detects most captive portals (described in [Captive Portal Hotspot Detection, page 3-33](#)). If it cannot detect a captive portal, a connect failure closed policy prevents all network connectivity.

If you deploy a closed connection policy, we highly recommend that you follow a phased approach. For example, first deploy always-on VPN with a connect failure open policy and survey users for the frequency with which AnyConnect does not connect seamlessly. Then deploy a small pilot deployment of a connect failure closed policy among early-adopter users and solicit their feedback. Expand the pilot

program gradually while continuing to solicit feedback before considering a full deployment. As you deploy a connect failure closed policy, be sure to educate the VPN users about the network access limitation as well as the advantages of a connect failure closed policy.

Always-On VPN—XML Example

If you are using a release of ASDM that is earlier than 6.3(1), use the following example to edit the AnyConnect XML profile manually. This always-on VPN example does the following:

- Enables the Disconnect button (AllowVPNDISconnect) to let users establish a VPN session with another secure gateway.
- Specifies the connect failure policy is closed.
- Relaxes network restrictions imposed by the connect failure policy for five minutes to remediate a captive portal.
- Applies the ACL rules assigned during the last VPN session.

```
<ClientInitialization>
  <AutomaticVPNPolicy>true
    <TrustedDNSDomains>example.com</TrustedDNSDomains>
    <TrustedDNSServers>1.1.1.1</TrustedDNSServers>
    <TrustedNetworkPolicy>Disconnect</TrustedNetworkPolicy>
    <UntrustedNetworkPolicy>Connect</UntrustedNetworkPolicy>
    <AlwaysOn>true
      <AllowVPNDISconnect>true</AllowVPNDISconnect>
      <ConnectFailurePolicy>Closed
        <AllowCaptivePortalRemediation>true
          <CaptivePortalRemediationTimeout>5</CaptivePortalRemediationTimeout>
        </AllowCaptivePortalRemediation>
        <ApplyLastVPNLocalResourceRules>true</ApplyLastVPNLocalResourceRules>
      </ConnectFailurePolicy>
    </AlwaysOn>
  </AutomaticVPNPolicy>
</ClientInitialization>
```

Always-on VPN With Load Balancing

Table A-5 shows the tag names, options, and descriptions to configure always-on VPN with load balancing.

Table A-5 Using Always-on VPN With Load Balancing Settings

XML Tag Name	Options	Description
LoadBalancingServerList	FQDN or IP address	Specify the backup devices of the cluster. Without this option, AnyConnect blocks access to backup devices in the load balancing cluster if always-on VPN is enabled.

Example: Always-on VPN With Load Balancing

```
<ServerList>
  <!--
    This is the data needed to attempt a connection to a specific
    host.
  -->
  <HostEntry>
```

```

<HostName>ASA</HostName>
<HostAddress>10.86.95.249</HostAddress>
<LoadBalancingServerList>
  <!--
    Can be a FQDN or IP address.
  -->
  <HostAddress>loadbalancing1.domain.com</HostAddress>
  <HostAddress>loadbalancing2.domain.com</HostAddress>
  <HostAddress>11.24.116.172</HostAddress>
</LoadBalancingServerList>
</HostEntry>
</ServerList>

```

Start Before Logon

Table A-6 shows the tag names, options, and descriptions to configure start before logon.

Table A-6 Start Before Logon Settings

XML Tag Name	Options	Description
UseStartBeforeLogon	true	Enables start before logon.
	false	Disables start before logon.
UseStartBeforeLogon UserControllable	true	Makes SBL user controllable.
	false	Reverts to the default where SBL is not user-controllable.

Example:Start Before Logon

Refer to the following example to configure SBL:

```

<ClientInitialization>
<UseStartBeforeLogon>true</UseStartBeforeLogon>
</ClientInitialization>

```

Certificate Store on Windows

Table A-7 shows the tag name, options, and descriptions to configure certificate store.

Table A-7 Certificate Store Settings

XML Tag Name	Options	Description
CertificateStore	All	(Default) Directs the AnyConnect client to use all certificate stores for locating certificates.
	Machine	Directs the AnyConnect client to restrict certificate lookup to the Windows local machine certificate store.
	User	Directs the AnyConnect client to restrict certificate lookup to the local user certificate stores.

Example:Certificate Store

Refer to the following example to configure certificate store:

```

<CertificateStore>Machine</CertificateStore>

```

Restricting Certificate Store Use

Table A-8 shows the tag names, options, and descriptions to restrict certificate store use.

Table A-8 *Restricting Certificate Store Settings*

XML Tag Name	Options	Description
ExcludeFirefoxNSSCertStore (Linux and Mac)	true	Excludes the Firefox NSS certificate store.
	false	Permits the Firefox NSS certificate store (default).
ExcludePemFileCertStore (Linux and Mac)	true	Excludes the PEM file certificate store.
	false	Permits the PEM file certificate store (default).
ExcludeMacNativeCertStore (Mac only)	true	Excludes the Mac native certificate store.
	false	Permits the Mac native certificate store (default).
ExcludeWinNativeCertStore (Windows only, currently not supported)	true	Excludes the Windows Internet Explorer certificate store.
	false	Permits the Windows Internet Explorer certificate store (default).

SCEP Protocol to Provision and Renew Certificates

Table A-9 shows the tag names, options, and descriptions to configure SCEP protocols to provision and renew certificates.

Table A-9 *SCEP Protocol Settings*

XML Tag Name	Options	Description
CertificateEnrollment		Starting tag for certificate enrollment.
CertificateExpirationThreshold	number of days	Specifies when AnyConnect should warn users that their certificate is going to expire.
AutomaticSCEPHost	fully qualified domain name of the ASA/group-alias	The host attempts automatic certificate retrieval if this attribute specifies the ASA host name and connection profile (tunnel group) for which SCEP certificate retrieval is configured.
	IP address of the ASA/group-alias	
CAURL	fully qualified domain name	
	IP address of CA server	
CertificateSCEP		Defines how the contents of the certificate will be requested.
CADomain		Domain of the certificate authority.
Name_CN		Common Name in the certificate.
Department_OU		Department name specified in certificate.
Company_O		Company name specified in certificate.
State_ST		State identifier named in certificate.
Country_C		Country identifier named in certificate.
Email_EA		Email address.

Table A-9 **SCEP Protocol Settings (continued)**

Domain_DC		Domain component.
SurName (SN)		The family name or last name.
GivenName (GN)		Generally, the first name.
UnstructName (N)		Undefined name.
Initials (I)		The initials of the user.
Qualifier (GEN)		The generation qualifier of the user. For example, "Jr." or "III."
Qualifier (DN)		A qualifier for the entire DN.
City (L)		The city identifier.
Title (T)		The person's title. For example, Ms., Mrs., Mr.
CA Domain		Used for the SCEP enrollment and is generally the CA domain.
Key Size		The size of the RSA keys generated for the certificate to be enrolled.
DisplayGetCertButton	true	Permits users to manually request provisioning or renewal of authentication certificates. Typically, these users will be able to reach the certificate authority without first needing to create a VPN tunnel.
	false	Does not permit users to manually request provisioning or renewal of authentication certificates.
ServerList		Starting tag for the server list. The server list is presented to users when they first launch AnyConnect. Users can choose which ASA to log into.
HostEntry		Starting tag for configuring an ASA.
HostName		Host name of the ASA.
HostAddress		Fully qualified domain name of the ASA.

Example:SCEP Protocols

Refer to the following example to configure SCEP elements in user profiles:

```

<AnyConnectProfile>
  <ClientInitialization>
    <CertificateEnrollment>
      <CertificateExpirationThreshold>14</CertificateExpirationThreshold>
      <AutomaticSCEPHost>asa.cisco.com/scep_eng</AutomaticSCEPHost>
      <CAURL_PromptForChallengePW="true"
Thumbprint="8475B661202E3414D4BB223A464E6AAB8CA123AB">http://ca01.cisco.com</CAURL>
      <CertificateSCEP>
        <CADomain>cisco.com</CADomain>
        <Name_CN>%USER%</Name_CN>
        <Department_OU>Engineering</Department_OU>
        <Company_O>Cisco Systems</Company_O>
        <State_ST>Colorado</State_ST>
        <Country_C>US</Country_C>
        <Email_EA>%USER%@cisco.com</Email_EA>
        <Domain_DC>cisco.com</Domain_DC>
        <DisplayGetCertButton>>false</DisplayGetCertButton>
      </CertificateSCEP>
    </CertificateEnrollment>
  </ClientInitialization>
</AnyConnectProfile>

```

```

    </CertificateEnrollment>
  </ClientInitialization>
  <ServerList>
    <HostEntry>
      <HostName>ABC-ASA</HostName>
      <HostAddress>ABC-asa-cluster.cisco.com</HostAddress>
    </HostEntry>
    <HostEntry>
      <HostName>Certificate Enroll</HostName>
      <HostAddress>ourasa.cisco.com</HostAddress>
      <AutomaticSCEPHost>ourasa.cisco.com/scep_eng</AutomaticSCEPHost>
      <CAURL PromptForChallengePW="false"
Thumbprint="8475B655202E3414D4BB223A464E6AAB8CA123AB">http://ca02.cisco.com</CAURL>
    </HostEntry>
  </ServerList>
</AnyConnectProfile>

```

Certificate Matching



Note

If no certificate matching criteria is specified, AnyConnect applies the following certificate matching rules:

- Key Usage: Digital_Signature
- Extended Key Usage: Client Auth

If any criteria matching specifications are made in the profile, neither of these matching rules are applied unless they are specifically listed in the profile.

Table A-10 shows the tag names, options, and descriptions to configure certificate matching.

Table A-10 **Certificate Matching**

XML Tag Name	Options	Description
CertificateExpirationThreshold		Specifies the number of days prior to the certificate's expiration date. Users are warned that their certificate is expiring.
CertificateMatch	n/a	Defines preferences that refine client certificate selection. Include only if certificates are used as part of authentication. Only those CertificateMatch subsections (KeyUsage, ExtendedKeyUsage and DistinguishedName) that are needed to uniquely identify a user certificate should be included in the profile.
KeyUsage	n/a	Group identifier, subordinate to CertificateMatch. Use these attributes to specify acceptable client certificates.

Table A-10 Certificate Matching (continued)

XML Tag Name	Options	Description
MatchKey	Decipher_Only Encipher_Only CRL_Sign Key_Cert_Sign Key_Agreement Data_Encipherment Key_Encipherment Non_Repudiation Digital_Signature	Within the KeyUsage group, MatchKey attributes specify attributes that can be used for choosing acceptable client certificates. Specify one or more match keys. A certificate must match at least one of the specified key to be selected.
ExtendedKeyUsage	n/a	Group identifier, subordinate to CertificateMatch. Use these attributes to choose acceptable client certificates.
ExtendedMatchKey	ClientAuth ServerAuth CodeSign EmailProtect IPSecEndSystem IPSecUsers Timestamp OCSPSigns DVCS	Within the ExtendedKeyUsage group, ExtendedMatchKey specifies attributes that can be used for choosing acceptable client certificates. Specify zero or more extended match keys. A certificate must match all of the specified key(s) to be selected.
CustomExtendedMatchKey	Well-known MIB OID values, such as 1.3.6.1.5.5.7.3.11	Within the ExtendedKeyUsage group, you can specify zero or more custom extended match keys. A certificate must match all of the specified key(s) to be selected. The key should be in OID form (for example, 1.3.6.1.5.5.7.3.11).
DistinguishedName	n/a	Group identifier. Within the DistinguishedName group, Certificate Distinguished Name matching lets you specify match criteria for choosing acceptable client certificates.

Table A-10 Certificate Matching (continued)

XML Tag Name	Options	Description
DistinguishedNameDefinition	Bold text indicates default value. - Wildcard: “Enabled” “Disabled” - Operator: “Equal” (==) “NotEqual” (!=) - MatchCase: “Enabled” “Disabled”	DistinguishedNameDefinition specifies a set of operators used to define a single Distinguished Name attribute to be used in matching. The Operator specifies the operation to use in performing the match. MatchCase specifies whether the pattern matching is case sensitive.

Table A-10 Certificate Matching (continued)

XML Tag Name	Options	Description
Name	CN DC SN GN N I GENQ DNQ C L SP ST O OU T EA ISSUER-CN ISSUER-DC ISSUER-SN ISSUER-GN ISSUER-N ISSUER-I ISSUER-GENQ ISSUER-DNQ ISSUER-C ISSUER-L ISSUER-SP ISSUER-ST ISSUER-O ISSUER-OU ISSUER-T ISSUER-EA	A DistinguishedName attribute to be used in matching. You can specify up to 10 attributes.

Table A-10 Certificate Matching (continued)

XML Tag Name	Options	Description
Pattern	A string (1-30 characters) enclosed in double quotes. With wildcards enabled, the pattern can be anywhere in the string.	Specifies the string (pattern) to use in the match. Wildcard pattern matching is disabled by default for this definition.

Example: Certificate Matching

Refer to the following example to enable the attributes that you can use to refine client certificate selections:

**Note**

In this example, the profile options for KeyUsage, ExtendedKeyUsage, and DistinguishedName are just examples. You should configure *only* the CertificateMatch criteria that apply to your certificates.

```

<CertificateMatch>
  <!--
    Specifies Certificate Key attributes that can be used for choosing
    acceptable client certificates.
  -->
  <KeyUsage>
    <MatchKey>Non_Repudiation</MatchKey>
    <MatchKey>Digital_Signature</MatchKey>
  </KeyUsage>
  <!--
    Specifies Certificate Extended Key attributes that can be used for
    choosing acceptable client certificates.
  -->
  <ExtendedKeyUsage>
    <ExtendedMatchKey>ClientAuth</ExtendedMatchKey>
    <ExtendedMatchKey>ServerAuth</ExtendedMatchKey>
    <CustomExtendedMatchKey>1.3.6.1.5.5.7.3.11</CustomExtendedMatchKey>
  </ExtendedKeyUsage>
  <!--
    Certificate Distinguished Name matching allows for exact
    match criteria in the choosing of acceptable client
    certificates.
  -->
  <DistinguishedName>
    <DistinguishedNameDefinition Operator="Equal" Wildcard="Enabled">
      <Name>CN</Name>
      <Pattern>ASASecurity</Pattern>
    </DistinguishedNameDefinition>
    <DistinguishedNameDefinition Operator="Equal" Wildcard="Disabled">
      <Name>L</Name>
      <Pattern>Boulder</Pattern>
    </DistinguishedNameDefinition>
  </DistinguishedName>
</CertificateMatch>

```

Automatic Certificate Selection

Table A-11 shows the tag names, options, and descriptions to configure automatic certificate selection.

Table A-11 Automatic Certificate Selection Settings

XML Tag Name	Options	Description
AutomaticCertSelection	true	Allows AnyConnect to automatically select the authentication certificate.
	false	Prompts the user to select the authentication certificate.

Example:AutomaticCertSelection

Refer to the following example to configure the client profile with AutomaticCertSelection:

```
<AnyConnectProfile>
  <ClientInitialization>
    <AutomaticCertSelection>false</AutomaticCertSelection>
  </ClientInitialization>
</AnyConnectProfile>
```

Backup Server List Parameters

Table A-12 shows the tag names, options, and descriptions to configure backup server list.

Table A-12 Backup Server List Settings

XML Tag Name	Options	Description
BackupServerList	n/a	Determines the group identifier.
HostAddress	An IP address or a Full-Qualified Domain Name (FQDN)	Specifies a host address to include in the backup server list.

Example:Backup Server List

Refer to the following example to configure backup server list parameters:

```
<BackupServerList>
  <HostAddress>bos</HostAddress>
  <HostAddress>bos.example.com</HostAddress>
</BackupServerList>
```

Windows Mobile Policy



Note

- This configuration merely validates the policy that is already present; it does not change it.
- AnyConnect version 3.0 and later does not support Windows Mobile devices. See *Cisco AnyConnect Secure Mobility Client Administrator Guide, Release 2.5* for information related to Windows Mobile devices.

XML Tag Name	Options	Description
MobilePolicy	n/a	Determines the group identifier.
DeviceLockRequired	n/a	Group identifier. Within the MobilePolicy group, DeviceLockRequired indicates that a Windows Mobile device must be configured with a password or PIN prior to establishing a VPN connection. This configuration is valid only on Windows Mobile devices that use the Microsoft Default Local Authentication Provider (LAP). Note The AnyConnect client supports Mobile Device Lock on Windows Mobile 5.0, WM5AKU2+, and Windows Mobile 6.0, but not on Windows Mobile 6.1.
MaximumTimeoutMinutes	Any non-negative integer	Within the DeviceLockRequired group, this parameter, when set to a non-negative number, specifies the maximum number of minutes that must be configured before device lock takes effect.
MinimumPasswordLength	Any non-negative integer	Within the DeviceLockRequired group, when set to a non-negative number, this parameter specifies that any PIN/password used for device locking must have at least the specified number of characters. This setting must be pushed down to the mobile device by synchronizing with an Exchange server before it can be enforced. (WM5AKU2+)
PasswordComplexity	"alpha"-Requires an alphanumeric password. "pin"-Requires a numeric PIN. "strong"-Requires a strong alphanumeric password, defined by Microsoft as containing at least 7 characters, including at least 3 from the set of uppercase, lowercase, numerals, and punctuation.	When present, checks for the password subtypes listed in the column to the left. This setting must be pushed down to the mobile device by synchronizing with an Exchange server before it can be enforced. (WM5AKU2+)

Example: Windows Mobile Policy

Refer to the following example to configure a Windows Mobile policy using XML:

```

<MobilePolicy>
  <DeviceLockRequired>
    MaximumTimeoutMinutes="60"
    MinimumPasswordLength="4"
    PasswordComplexity="pin"
  </DeviceLockRequired>
</MobilePolicy>

```

Auto Connect On Start

Table A-13 shows the tag names, options, and descriptions to configure auto connect on start.

Table A-13 Auto Connect On Start Settings

XML Tag Name	Options	Description
AutoConnectOnStart	true	Starts the auto connect settings.
	false	Returns to the default auto connect settings.
AutoConnectOnStart UserControllable	true	Inserts user control attributes.
	false	Removes user control attributes.

Example:Auto Connect On Start

Refer to the following example to configure auto connect on start:

```
<AutoConnectOnStart>
true
</AutoConnectOnStart>
```

Auto Reconnect

Table A-14 shows the tag names, options, and descriptions to configure auto reconnect.

Table A-14 Auto Reconnect Settings

XML Tag Name	Options	Description
AutoReconnect	true	Client retains resources assigned to the VPN session if it is disrupted and attempts to reconnect.
	false	Client releases resources assigned to the VPN session if it is interrupted and does not attempt to reconnect.
AutoReconnectBehavior	DisconnectOnSuspend	AnyConnect releases the resources assigned to the VPN session upon a system suspend and does not attempt to reconnect after the system resume.
	ReconnectAfterResume	Client retains resources assigned to the VPN session during a system suspend. The client attempts to reconnect after the system resume.

Example:Auto Reconnect

Refer to the following example to configure AnyConnect VPN reconnect behavior in the client initialization section:

```
<AutoReconnect UserControllable="true">true
<AutoReconnectBehavior
UserControllable="true">ReconnectAfterResume</AutoReconnectBehavior>
</AutoReconnect>
```

Server List

Table A-15 shows the tag names, options, and descriptions to configure server list.

Table A-15 *Server List Settings*

XML Tag Name	Options	Description
ServerList	n/a	Specifies a group identifier.
HostEntry	n/a	Group identifier, subordinate to ServerList. This is the data needed to attempt a connection to a specific host.
HostName	An alias used to refer to the host, FQDN, or IP address. If this is an FQDN or IP address, a HostAddress is not required.	Within the HostEntry group, the HostName parameter specifies a name of a host in the server list.
HostAddress	An IP address or Full-Qualified Domain Name (FQDN) used to refer to the host. If HostName is an FQDN or IP address, a HostAddress is not required.	Group identifier, subordinate to CertificateMatch. Use these attributes to choose acceptable client certificates.
PrimaryProtocol	SSL or IPsec	The encryption protocol for the VPN tunnel, either SSL (default) or IPsec with IKEv2. For IPsec, the client uses the proprietary AnyConnect EAP authentication method by default.
StandardAuthenticationOnly	n/a	Use the StandardAuthenticationOnly parameter to change the authentication method from the default proprietary AnyConnect EAP authentication method to a standards-based method. Be aware that doing this limits the dynamic download features of the client and disables some features and disables the ability of the ASA to configure session timeout, idle timeout, disconnected timeout, split tunneling, split DNS, MSIE proxy configuration, and other features.
AuthMethodDuringIKENegotiation	IKE-RSA, EAP-MD5, EAP-MSCHAPv2, EAP-GTC	Specifies the authentication method for standard-based authentication.

Table A-15 **Server List Settings**

XML Tag Name	Options	Description
IKEIdentity	An alpha-numeric string.	If you choose a standards-based EAP authentication method, you can enter a group or domain as the client identity in this field. The client sends the string as the ID_GROUP type IDi payload. By default, the string is <code>*\$AnyConnectClient\$*</code>. The string must not contain any terminators (for example, null or CR).
UserGroup	The connection profile (tunnel group) to use when connecting to the specified host. This parameter is optional.	If present, used in conjunction with HostAddress to form a Group-based URL. If you specify the Primary Protocol as IPsec, the User Group must be the exact name of the connection profile (tunnel group). For SSL, the user group is the group-url or group-alias of the connection profile. Note Group-based URL support requires ASA version 8.0.3 or later.

Example:Server List

Refer to the following example to configure a server list:

```

<ServerList>
  <HostEntry>
    <HostName>ASA-01</HostName>
    <HostAddress>cvc-asa01.cisco.com
    </HostAddress>
  </HostEntry>
  <HostEntry>
    <HostName>ASA-02</HostName>
    <HostAddress>cvc-asa02.cisco.com
    </HostAddress>
    <UserGroup>StandardUser</UserGroup>
    <BackupServerList>
      <HostAddress>cvc-asa03.cisco.com
      </HostAddress>
    </BackupServerList>
  </HostEntry>
</ServerList>

```

Scripting

Table A-16 shows the tag names, options, and descriptions to configure scripting.

Table A-16 **Scripting Settings**

XML Tag Name	Options	Description
EnableScripting	true	Launches OnConnect and OnDisconnect scripts if present.
	false	(Default) Does not launch scripts.

Table A-16 **Scripting Settings (continued)**

XML Tag Name	Options	Description
UserControllable	true	Lets users enable or disable the running of OnConnect and OnDisconnect scripts.
	false	(Default) Prevents users from controlling the scripting feature.
TerminateScriptOnNextEvent	true	Terminates a running script process if a transition to another scriptable event occurs. For example, AnyConnect terminates a running OnConnect script if the VPN session ends and terminates a running OnDisconnect script if AnyConnect starts a new VPN session. On Microsoft Windows, AnyConnect also terminates any scripts that the OnConnect or OnDisconnect script launched, as well as all their script descendents. On Mac OS and Linux, AnyConnect terminates only the OnConnect or OnDisconnect script; it does not terminate child scripts.
	false	(Default) Does not terminate a script process if a transition to another scriptable event occurs.
EnablePostSBLOnConnectScript	true	Prevents launching of the OnConnect script if SBL establishes the VPN session.
	false	(Default) When SBL establishes the VPN session, launches the OnConnect script, if present.

Example:Scripting

Refer to the following example to configure scripting:

```
<ClientInitialization>

<EnableScripting>true</EnableScripting>

</ClientInitialization>
```

This example enables scripting and overrides the default options for the other scripting parameters:

```
<ClientInitialization>

<EnableScripting UserControllable="true">true
  <TerminateScriptOnNextEvent>true</TerminateScriptOnNextEvent>
  <EnablePostSBLOnConnectScript>false</EnablePostSBLOnConnectScript>
</EnableScripting>

</ClientInitialization>
```

Authentication Timeout Control

By default, AnyConnect waits up to 12 seconds for an authentication from the secure gateway before terminating the connection attempt. AnyConnect then displays a message indicating the authentication timed out.

[Table A-17](#) shows the tag name, options, and descriptions to change the authentication timer.

Table A-17 **Authentication Timeout Control**

XML Tag Name	Options	Description
AuthenticationTimeout	Integer in the range 10–120	Enter a number of seconds to change this timer.

Example:Authentication Timeout Control

The following example changes the authentication timeout to 20 seconds:

```
<ClientInitialization>
  <AuthenticationTimeout>20</AuthenticationTimeout>
</ClientInitialization>
```

Ignore Proxy

Table A-18 shows the tag name, options, and descriptions to configure ignore proxy.

Table A-18 *Ignore Proxy Settings*

XML Tag Name	Options	Description
ProxySettings	IgnoreProxy	Enables ignore proxy.
	native	Not supported.
	override	Not supported.

Example:Ignore Proxy

Refer to the following example to configure ignore proxy in the client initialization section:

```
<ProxySettings>IgnoreProxy</ProxySettings>
```

Allow AnyConnect Session from an RDP Session for Windows Users

Table A-19 shows the tag names, options, and descriptions to configure an RDP session.

Table A-19 *Allow AnyConnect Session from an RDP Session*

XML Tag Name	Options	Description
WindowsLogonEnforcement	SingleLocalLogon	Allows only one local user to be logged on during the entire VPN connection. With this setting, a local user can establish a VPN connection while one or more remote users are logged on to the client PC. If the VPN connection is configured for all-or-nothing tunneling, then the remote logon is disconnected because of the resulting modifications of the client PC routing table for the VPN connection. If the VPN connection is configured for split-tunneling, the remote logon might or might not be disconnected, depending on the routing configuration for the VPN connection. The SingleLocalLogin setting has no effect on remote user logons from the enterprise network over the VPN connection.
	SingleLogon	Allows only one user to be logged on during the entire VPN connection. If more than one user is logged on, either locally or remotely, when the VPN connection is being established, the connection is not allowed. If a second user logs on, either locally or remotely, during the VPN connection, the VPN connection is terminated.

Table A-19 Allow AnyConnect Session from an RDP Session

XML Tag Name	Options	Description
WindowsVPNEstablishment	LocalUsersOnly	Prevents a remotely logged-on user from establishing a VPN connection. This is the same functionality as in prior versions of the AnyConnect client.
	AllowRemoteUsers	Allows remote users to establish a VPN connection. However, if the configured VPN connection routing causes the remote user to become disconnected, the VPN connection is terminated to allow the remote user to regain access to the client PC.

Example: Allow AnyConnect Session from an RDP Session for Windows Users

Refer to the following example to configure AnyConnect sessions from an RDP session:

```
<WindowsLogonEnforcement>SingleLocalLogon</WindowsLogonEnforcement>

<WindowsVPNEstablishment>LocalUsersOnly</WindowsVPNEstablishment>
```

AnyConnect over L2TP or PPTP

[Table A-20](#) shows the tag names, options, and descriptions to configure AnyConnect over L2TP or PPTP.

Table A-20 AnyConnect Over L2TP or PPTP

XML Tag Name	Options	Description
PPPExclusion	automatic	Enables PPP exclusion. AnyConnect automatically uses the IP address of the PPP server. Instruct users to change the value only if automatic detection fails to get the IP address.
	override	Also enables PPP exclusion. If automatic detection fails to get the IP address of the PPP server, and the PPPExclusion UserControllable value is true, follow the steps in “Instructing Users to Override PPP Exclusion” section on page 3-76 .
	disabled	PPP exclusion is not applied.
PPPExclusionServerIP	true	Uses the IP address of the PPP server.
	false	Does not use the IP address of the PPP server.
PPPExclusion UserControllable=	true	Lets users read and change the PPP exclusion settings.
	false	Prevents users from viewing and changing the PPP exclusion settings.

Example: AnyConnect Over L2TP or PPTP

Refer to the following example to configure AnyConnect over L2TP or PPTP:

```
<ClientInitialization>
  <PPPExclusion UserControllable="true">Automatic
    <PPPExclusionServerIP UserControllable="true">127.0.0.1</PPPExclusionServerIP>
  </PPPExclusion>
</ClientInitialization>
<ServerList>
  <HostEntry>
    <HostName>DomainNameofASA</HostName>
```

```

        <HostAddress>IPaddressOfASA</HostAddress>
    </HostEntry>
</ServerList>
</AnyConnectProfile>

```

Other AnyConnect Profile Settings

Table A-21 shows other parameters you can insert into the ClientInitialization section.

Table A-21 Other AnyConnect Profile Settings

XML Tag Name	Options	Description
CertificateStoreOverride	true	Allows an administrator to direct AnyConnect to search for certificates in the Windows machine certificate store. This tag becomes useful when certificates are located in this store and users do not have administrator privileges on their device. You must have a pre-deployed profile with this option enabled in order to connect with Windows 7 or VISTA using machine certificate. If this profile does not exist on a Windows 7 or VISTA device prior to connection, the certificate is not accessible in the machine store, and the connection fails.
	false	(Default) AnyConnect will not search for certificates in the Windows machine certificate store.
ShowPreConnectMessage	true	Enables an administrator to have a one-time message displayed prior to a users first connection attempt. For example, the message can remind users to insert their smart card into its reader. The message appears in the AnyConnect message catalog and is localized.
	false	(Default) No message displayed prior to a users first connection attempt.
MinimizeOnConnect	true	(Default) Controls AnyConnect GUI behavior when a VPN tunnel is established. By default, the GUI is minimized when the VPN tunnel is established.
	false	No control over AnyConnect GUI behavior.
LocalLanAccess	true	Allows the user to accept or reject Local LAN access when enabled for remote clients on the Secure Gateway.
	false	(Default) Disallows Local LAN access.
AutoUpdate	true	(Default) Installs new packages automatically.
	false	Does not install new packages.
RSA SecurID Integration	automatic	(Default) Allows the administrator to control how the user interacts with RSA. By default, AnyConnect determines the correct method of RSA interaction. An administrator can lock down the RSA or give control to the user.
	software token	
	hardware token	
RetainVPNOnLogoff	true	Keeps the VPN session when the user logs off a Windows operating system.
	false	(Default) Stops the VPN session when the user logs off a Windows operating system.

Table A-21 *Other AnyConnect Profile Settings*

XML Tag Name	Options	Description
UserEnforcement	AnyUser	Continues the VPN session even if a different user logs on. This value applies only if the RetainVPNPNLogoff is true and the original users logged off Windows when the VPN session was up.
	SameUserOnly	Ends the VPN session when a different user logs on.



Telemetry XML Reference

This appendix describes the XML elements used in a Telemetry client profile. Use this appendix as a reference, if you are troubleshooting a Telemetry client profile, or you have not yet upgraded to ASDM 6.4(1) and do not have use of the AnyConnect profile editor tool.

If you have upgraded to ASDM 6.4(1), we strongly recommend that you use the AnyConnect profile editor to create and maintain AnyConnect client profiles rather than editing the profile files with a plain text or XML editor. The AnyConnect profile editor comes with its own online help.

Read [Configuring AnyConnect Telemetry to the WSA, page 7-1](#) for familiarity with the AnyConnect Telemetry module, client profile, and features. [Table B-1](#) provides XML tag names, options, descriptions, and example code used to configure the AnyConnect telemetry client profile. AnyConnect uses the default value if the profile does not specify one.

The `actsettings.xml` file provides the default telemetry client profile settings. The parameters in the `telemetry_profile.tsp` file supersede those specified in the `actsettings.xml` file. See using the [“Configuring the Telemetry Client Profile” section on page 7-9](#) for more information about the `telemetry_profile.tsp` file.

The telemetry client profile parameters sent by the WSA in response to the service status request supersede the parameters specified in the `telemetry_profile.tsp` file. The telemetry module stores the WSA settings in the endpoint’s registry. The telemetry module updates the registry when it receives new settings from the WSA. This allows the telemetry module to use the same settings when no VPN session is active.



Note

The parameters sent by the WSA, in response to the service status request, are configured on WSA releases 7.1 or later.



Caution

Do not cut and paste the examples from this document. Doing so introduces line breaks that can break your XML. Instead, open the profile template file in a text editor such as Notepad or Wordpad.

Table B-1 Telemetry Parameters Defined in XML Configuration Files

Element name	Description	Range	Default Value	Specified by Profile Editor on ASDM	Specified by the WSA
Telemetry	Parent element for all telemetry module elements				
ServiceDisable	Enables or disables telemetry service	false true	false Telemetry is enabled by default after editing and saving the telemetry profile.	Yes	No
MaxHistLog	Maximum size of the activity history repository	2-1000 (MB)	100	Yes	No
MaxHistDays	Maximum number of days to retain activity history.	1-1000 (days)	180	Yes	No
AvCheckInterval	Interval for checking new antivirus notification	5-300 (seconds)	60	Yes	No
PostRetries	Number of retransmitting attempts if report posting or service check fails	0-10 (times)	2	Yes	No
NewKeyInterval	Interval of changing Internal and External AES keys (0 indicates only changing at service starting time)	0-24 (hours)	0	Yes	No
ExemptFromHooking	Contains a list of <AppName> elements that contain application filenames, or paths to application filenames, that will be exempted from telemetry reporting	None - unlimited	none	Yes	No
AppName	Contains an application filename, or a path to an application filename, that will be exempted from telemetry reporting Child element of <ExemptFromHooking>	none-256 (Bytes)	none	No	
CiscoCert	Cisco's certificate with the public key to encrypt External AES keys	None-4 (KB)	None	No	No

Element name	Description	Range	Default Value	Specified by Profile Editor on ASDM	Specified by the WSA
CustCert	Your certificate with the public key to encrypt internal AES keys and also to encrypt external AES keys This must be a PEM certificate type.	None-4 (KB)	None	Yes	No
MaxPayload	Maximum payload length of report posting request	1024 - 65535 (KB)	10240 KB	No	Yes
ServiceHost	Name of AnyConnect Secure Mobility service portal	None-1 (KB)	mus.cisco.com	No	No
ServiceProxy	Proxy server name and port for posting report with formatting of “proxy:port”	None-1 (KB)	none	No	No
OptIn	AnyConnect Secure Mobility /Telemetry feature enabled	Yes or No	No	No	Yes
ServiceName	Specifies the AnyConnect Secure Mobility service name	None-1 (KB)	TelemetryReport	No	No
RelativeURL	Relative URL of AnyConnect Secure Mobility service for report posting	None-1 (KB)	TelemetryReport	No	Yes
DetailLevel	Level of reporting URL details (Standard indicates full URL. Limited indicates store hostname and domain name of every path component.)	Standard or Limited	Limited	No	Yes
ExcludedDomain	Contains a list of <Domain> elements that specify domain names of internal URLs	None - unlimited	none	No	Yes
Domain	Contains an internal URL that is exempt from telemetry reporting. For example: cisco.com . Child element of <ExcludedDomain>	none-1 (KB)	none	No	Yes

Element name	Description	Range	Default Value	Specified by Profile Editor on ASDM	Specified by the WSA
DebugLevel	Log message detail levels 0 – error only 1 – warnings 2 – states 3 – information 4 – debug 5 – all	0-5	1	No	No
ACTuserDebugLevel	Debug levels for hooking DLL (actuser.dll) 0 – No Log 1 – Debug Log	0-1	0	No	no

Example: AnyConnect Telemetry Client Profile

Refer to the following example to configure AnyConnect Telemetry:

```
<?xml version="1.0" encoding="UTF-8"?>
<Telemetry>
  <ServiceDisable>false</ServiceDisable>
  <MaxHistLog>100</MaxHistLog>
  <MaxHistDays>180</MaxHistDays>
  <AvCheckInterval>60</AvCheckInterval>
  <PostRetries>2</PostRetries>
  <ExemptFromHooking>
    <AppName>C:\Program Files\Cisco\CSAgent\bin\okclient.exe</AppName>
  </ExemptFromHooking>
  <CustCert>
    -----BEGIN RSA PRIVATE KEY-----
    MIICXQIBAAKBIQDO5BLnIfNvuctLkunNIIlNNqB8AYW2X1CQ2UBd0IfJVjquf22
    p1UoOUmPx1KqA2zWdqfUzVUqUQUcdZuVw+kWkXOMLVz71NLpEjmU1PAOoqLeqoUe
    NY3IzKInvLizUQA6oOb8kvCP1N7n7mvjqC6wwvqjJaQCUYbL2/c/4qbIKQIDAQAB
    AoIAqIQTjtc7M1qv2222d0EpQoYtax8ywIqV/q3XQ4U2pOm7wULqLxIU+yIIj/dx
    qT6ZIE80jLInU12W7n1/7vCtylEIqzxKIwJAIOZf+q58KotInzPyIYITAAYU27Tf
    qnoICOolwZYiDeXUCA7CWJXLm27oDqF501I+ImaUIeqyOUc8cZoUUUXtIQJBAM2J
    WlDVI2mxxiIfq2ZtbUdpJzbtwmEmPENBEn8PqkqZndY1xdWW3JIuaIl7qQwwO2I
    cDbUyM/mtVNvdMDKCjmcQQDTaJUkvB0LED51JIO3KmU8LIQq+4Mamej+qFIZVYiy
    cFKfI+U0wqfIo4LILzP78OW4E20meaWqmza7VLC4aUUF
    -----END RSA PRIVATE KEY-----
  </CustCert>
</Telemetry>
```