Contents

Introduction

This document describes how to allow the Cisco VPN Client or the Cisco AnyConnect Secure Mobility Client to **only** access their local LAN while tunneled into a Cisco Adaptive Security Appliance (ASA) 5500 Series or the ASA 5500-X Series. This configuration allows Cisco VPN Clients or the Cisco AnyConnect Secure Mobility Client secure access to corporate resources via IPsec, Secure Sockets Layer (SSL), or Internet Key Exchange Version 2 (IKEv2) and still gives the client the ability to carry out activities such as printing where the client is located. If it is permitted, traffic destined for the Internet is still tunneled to the ASA.

> **Note**: This is not a configuration for split tunneling, where the client has unencrypted access to the Internet while connected to the ASA or PIX. Refer to PIX/ASA 7.x: Allow Split Tunneling for VPN Clients on the ASA Configuration Example for information on how to configure split tunneling on the ASA.

Prerequisites

Requirements

This document assumes that a functional remote access VPN configuration already exists on the ASA.

Refer to PIX/ASA 7.x as a Remote VPN Server using ASDM Configuration Example for the Cisco VPN Client if one is not already configured.

Refer to [ASA 8.x VPN Access with the AnyConnect SSL VPN Client Configuration Example]() for the Cisco AnyConnect Secure Mobility Client if one is not already configured.

Components Used

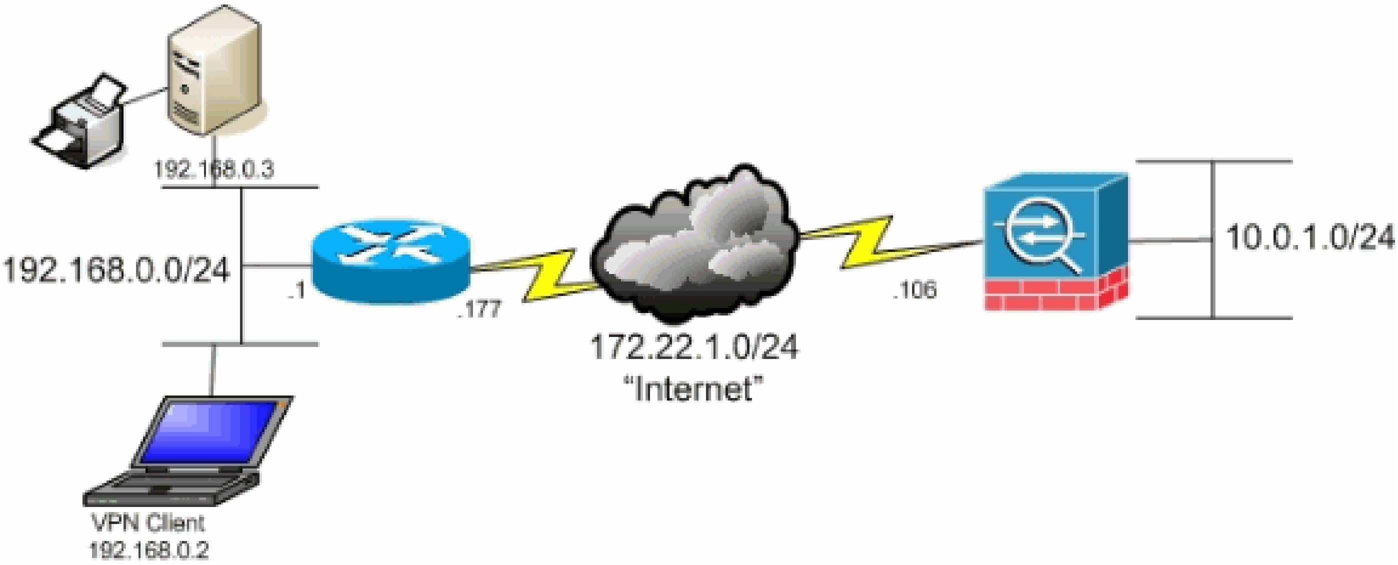
The information in this document is based on these software and hardware versions:

- Cisco ASA 5500 Series Version 9(2)1
- Cisco Adaptive Security Device Manager (ASDM) Version 7.1(6)
- Cisco VPN Client Version 5.0.07.0440
- Cisco AnyConnect Secure Mobility Client Version 3.1.05152

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Network Diagram

The client is located on a typical Small Office / Home Office (SOHO) network and connects across the Internet to the main office.



Background Information

Unlike a classic split tunneling scenario in which all Internet traffic is sent unencrypted, when you enable local LAN access for VPN clients, it permits those clients to communicate unencrypted with only devices on the network on which they are located. For example, a client that is allowed local LAN access while connected to the ASA from home is able to print to its own printer but not to access the Internet without first sending the traffic over the tunnel.

An access list is used in order to allow local LAN access in much the same way that split tunneling is configured on the ASA. However, instead of defining which networks *should be* encrypted, the access list in this case defines which networks *should not be* encrypted. Also, unlike the split tunneling scenario, the actual networks in the list do not need to be known. Instead, the ASA supplies a default network of 0.0.0.0/255.255.255.255, which is understood to mean the local LAN of the client.

Note: When the client is connected and configured for local LAN access, you *cannot print or browse by name* on the local LAN. However, you can browse or print by IP address. See the Troubleshoot section of this document for more information as well as workarounds for this situation.

Configure Local LAN Access for VPN Clients or the AnyConnect Secure Mobility Client

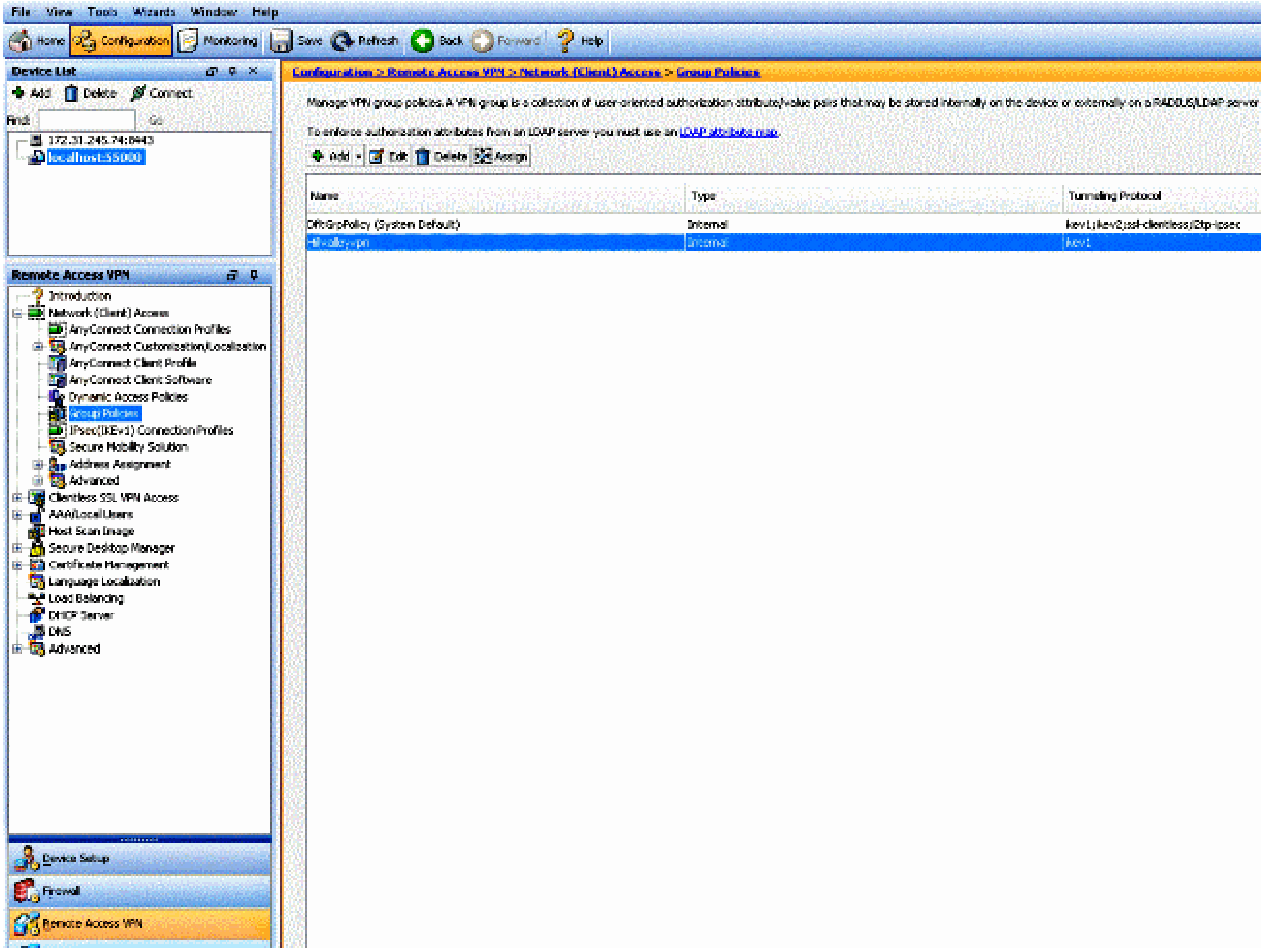
Complete these tasks in order to allow Cisco VPN Clients or Cisco AnyConnect Secure Mobility Clients access to their local LAN while connected to the ASA:

- Configure the ASA via the ASDM or Configure the ASA via the CLI
- Configure the Cisco AnyConnect Secure Mobility Client

Configure the ASA via the ASDM

Complete these steps in the ASDM in order to allow VPN Clients to have local LAN access while connected to the ASA:

1. Choose **Configuration > Remote Access VPN > Network (Client) Access > Group Policy** and select the Group Policy in which you wish to enable local LAN access. Then click **Edit**.

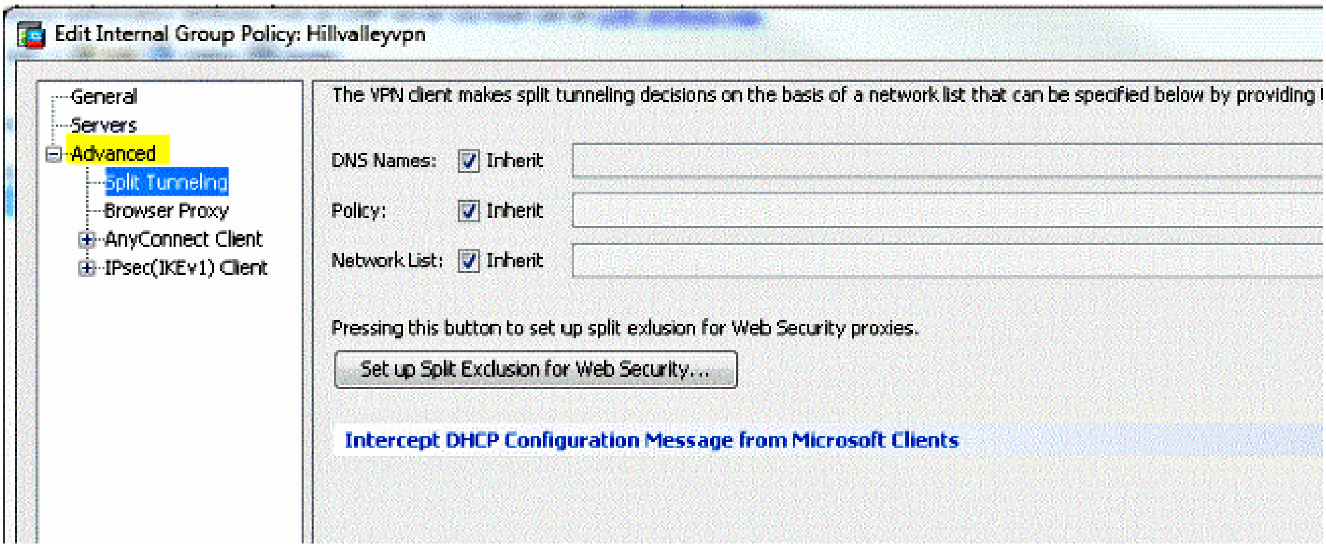


Manage VPN group policies. A VPN group is a collection of user-oriented authorization attribute/value pairs that may be stored internally on the device or externally on a RADIUS/LDAP server

To enforce authorization attributes from an LDAP server you must use an LDAP attribute map.

Name	Type	Tunneling Protocol
DfltGrpPolicy (System Default)	Internal	ikev1;ikev2;ssl-clientless;l2tp-ipsec
Hillvalley-vpn	Internal	ikev1

2. Go to **Advanced > Split Tunneling**.



Edit Internal Group Policy: Hillvalleyvpn

- General
- Servers
- Advanced
  - Split Tunneling
  - Browser Proxy
  - AnyConnect Client
  - IPsec(IKEv1) Client

The VPN client makes split tunneling decisions on the basis of a network list that can be specified below by providing

DNS Names: ☑ Inherit

Policy: ☑ Inherit

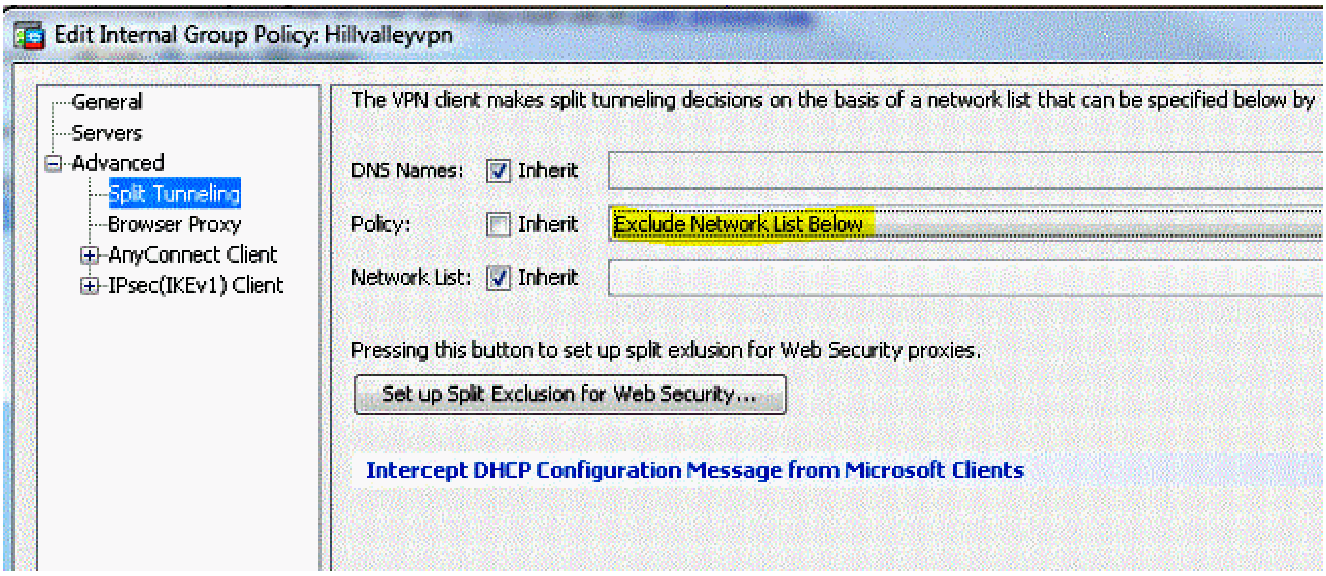
Network List: ☑ Inherit

Pressing this button to set up split exlusion for Web Security proxies.

Set up Split Exclusion for Web Security...

Intercept DHCP Configuration Message from Microsoft Clients

3. Uncheck the **Inherit** box for Policy and choose **Exclude Network List Below**.



Edit Internal Group Policy: Hillvalleyvpn

- General
- Servers
- Advanced
  - Split Tunneling
  - Browser Proxy
  - AnyConnect Client
  - IPsec(IKEv1) Client

The VPN client makes split tunneling decisions on the basis of a network list that can be specified below by

DNS Names: ☑ Inherit

Policy: □ Inherit Exclude Network List Below

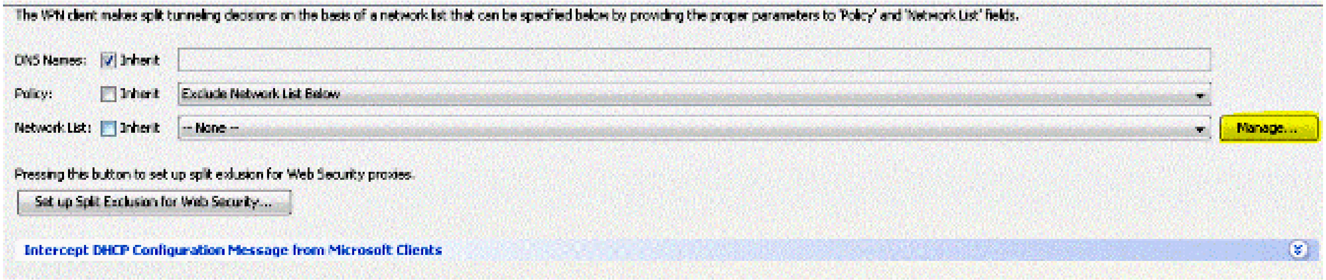
Network List: ☑ Inherit

Pressing this button to set up split exlusion for Web Security proxies.

Set up Split Exclusion for Web Security...

Intercept DHCP Configuration Message from Microsoft Clients

4. Uncheck the **Inherit** box for Network List and then click **Manage** in order to launch the Access Control List (ACL) Manager.



The VPN client makes split tunneling decisions on the basis of a network list that can be specified below by providing the proper parameters to 'Policy' and 'Network List' fields.

DNS Names: ☑ Inherit

Policy: □ Inherit Exclude Network List Below

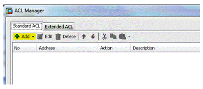
Network List: □ Inherit -- None -- Manage...

Pressing this button to set up split exlusion for Web Security proxies.

Set up Split Exclusion for Web Security...

Intercept DHCP Configuration Message from Microsoft Clients

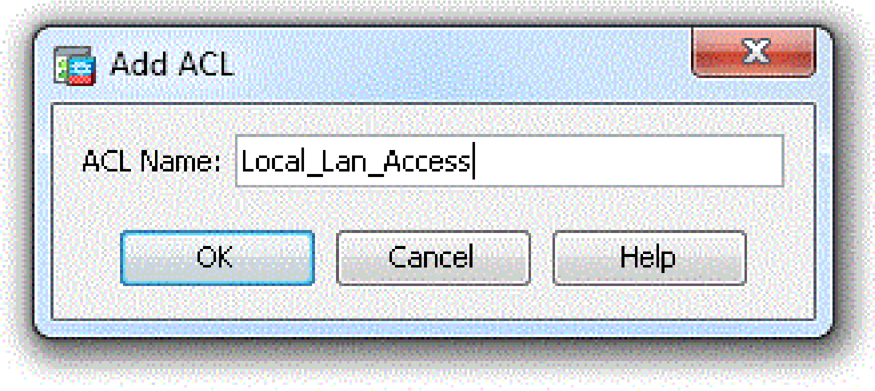
5. Within the ACL Manager, choose **Add > Add ACL...** in order to create a new access list.



ACL Manager

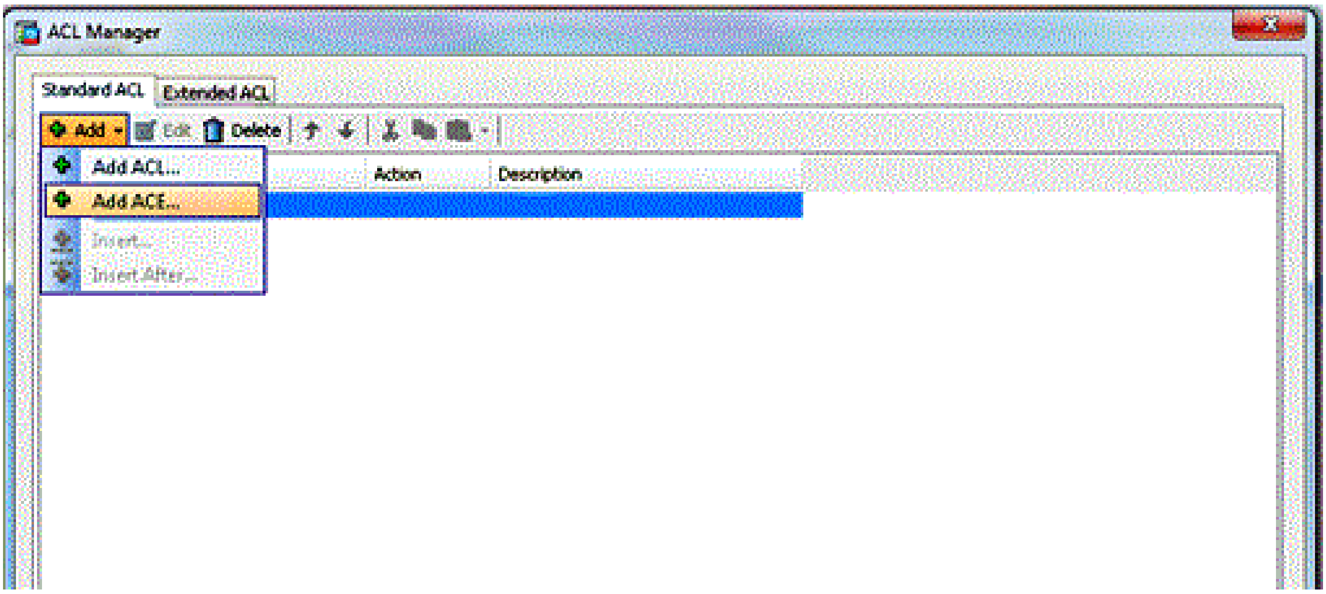
No	Address	Action	Description

6. Provide a name for the ACL and click **OK**.



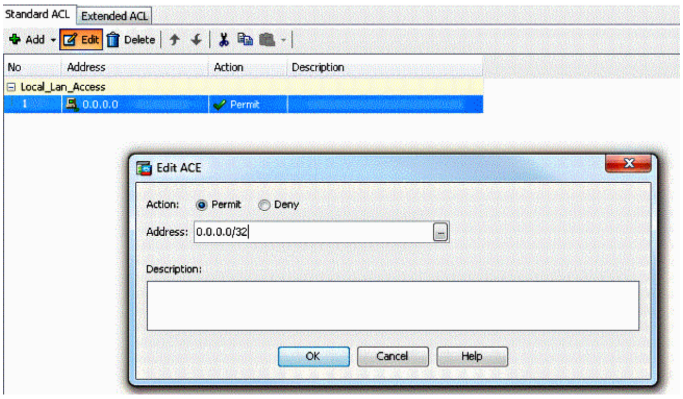
ACL Name: Local_Lan_Access

7. Once the ACL is created, choose **Add > Add ACE...** in order to add an Access Control Entry (ACE).



8. Define the ACE that corresponds to the local LAN of the client.

Choose **Permit**.Choose an IP Address of **0.0.0.0**Choose a Netmask of **/32**.*(Optional)* Provide a description.Click **OK**.



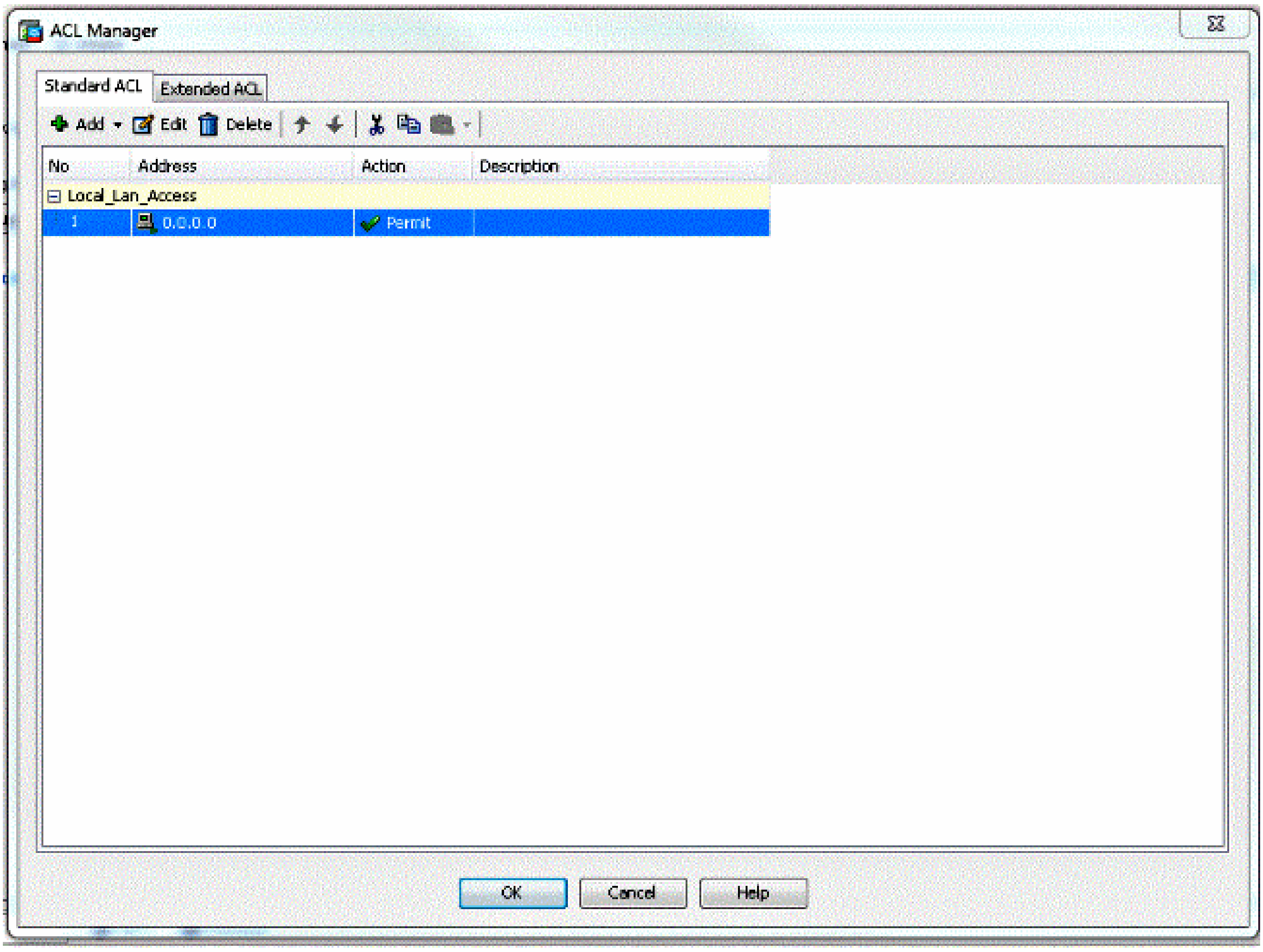
No	Address	Action	Description
Local_Lan_Access			
1	0.0.0.0	Permit	

Action: ● Permit ○ Deny

Address: 0.0.0.0/32

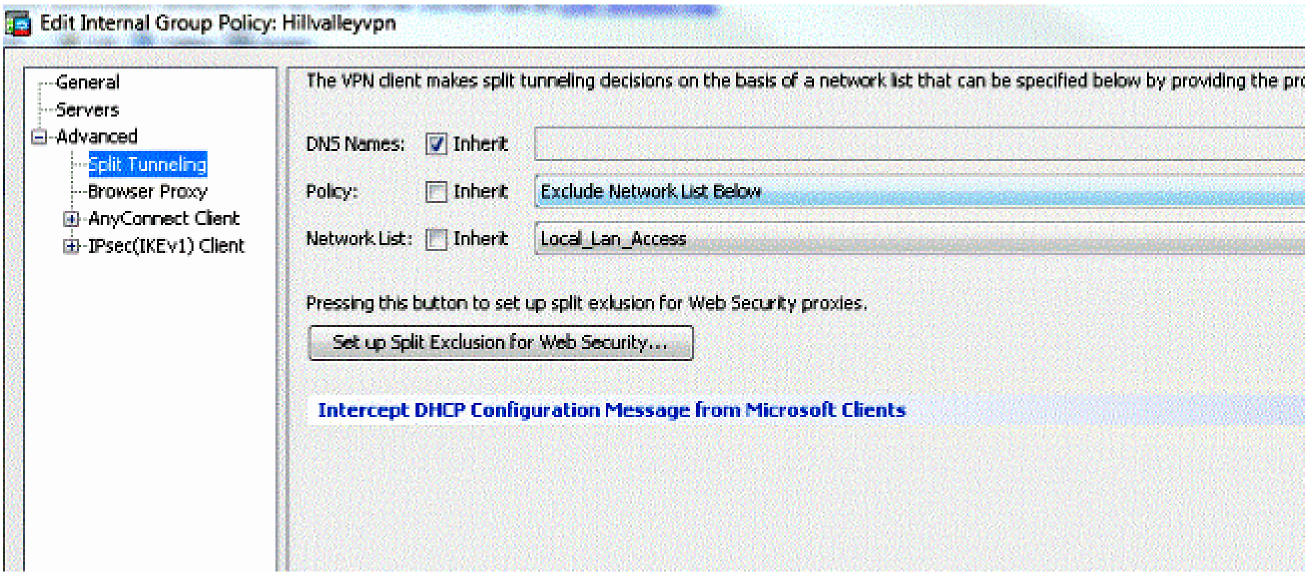
Description:

9. Click **OK** in order to exit the ACL Manager.



No	Address	Action	Description
⊟ Local_Lan_Access			
1	0.0.0.0	✓ Permit	

10. Be sure that the ACL you just created is selected for the Split Tunnel Network List.


Edit Internal Group Policy: Hillvalleyvpn
General
Servers
Advanced
Split Tunneling
Browser Proxy
AnyConnect Client
IPsec(IKEv1) Client
Set up Split Exclusion for Web Security...
Intercept DHCP Configuration Message from Microsoft Clients

The VPN client makes split tunneling decisions on the basis of a network list that can be specified below by providing the pro

DNS Names: ☑ Inherit

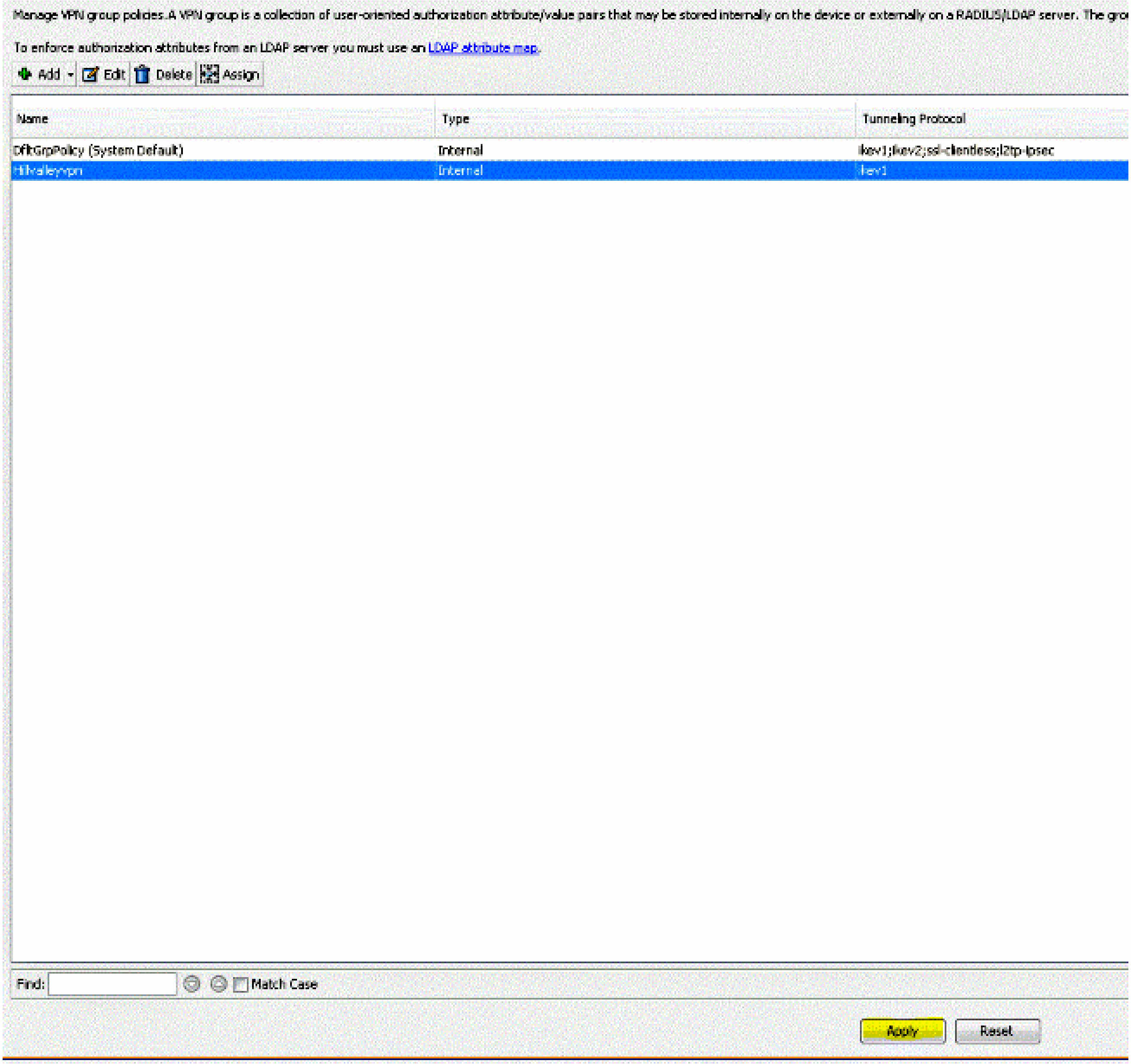
Policy: □ Inherit Exclude Network List Below

Network List: □ Inherit Local_Lan_Access

Pressing this button to set up split exlusion for Web Security proxies.

11. Click **OK** in order to return to the Group Policy configuration.

12. Click **Apply** and then **Send** (if required) in order to send the commands to the ASA.



Manage VPN group policies.A VPN group is a collection of user-oriented authorization attribute/value pairs that may be stored internally on the device or externally on a RADIUS/LDAP server. The gro

To enforce authorization attributes from an LDAP server you must use an LDAP attribute map.

Name	Type	Tunneling Protocol
DfltGrpPolicy (System Default)	Internal	ikev1;ikev2;ssl-clientless;l2tp-ipsec
Hillvalleyvpn	Internal	ikev1

Configure the ASA via the CLI

Rather than use the ASDM, you can complete these steps in the ASA CLI in order to allow VPN Clients to have local LAN access while connected to the ASA:

1. Enter configuration mode.

```
ciscoasa>enable
Password:
ciscoasa#configure terminal
ciscoasa(config)#
```

2. Create the access list in order to allow local LAN access.

```
ciscoasa(config)#access-list Local_LAN_Access remark Client Local LAN Access
ciscoasa(config)#access-list Local_LAN_Access standard permit host 0.0.0.0
```

Caution: Due to changes in the ACL syntax between ASA software versions 8.x to 9.x, this

ACL is no longer permited and admins will see this error message when they try to configure it:

```
rtpvpnoutbound6(config)# access-list test standard permit host
0.0.0.0
ERROR: invalid IP address
```

The only thing that is allowed is:

```
rtpvpnoutbound6(config)# access-list test standard permit any4
```

This is a known issue and has been addressed by Cisco bug ID CSCut3131. Upgrade to a version with the fix for this bug in order to be able to configure local LAN access.

3. Enter the Group Policy configuration mode for the policy that you wish to modify.

```
ciscoasa(config)#group-policy hillvalleyvpn attributes
ciscoasa(config-group-policy)#
```

4. Specify the split tunnel policy. In this case, the policy is **excludespecified**.

```
ciscoasa(config-group-policy)#split-tunnel-policy excludespecified
```

5. Specify the split tunnel access list. In this case, the list is **Local_LAN_Access**.

```
ciscoasa(config-group-policy)#split-tunnel-network-list value Local_LAN_Access
```

6. Issue this command:

```
ciscoasa(config)#tunnel-group hillvalleyvpn general-attributes
```

7. Associate the group policy with the tunnel group

```
ciscoasa(config-tunnel-ipsec)# default-group-policy hillvalleyvpn
```

8. Exit the two configuration modes.

```
ciscoasa(config-group-policy)#exit
ciscoasa(config)#exit
ciscoasa#
```

9. Save the configuration to non-volatile RAM (NVRAM) and press **Enter** when prompted to specify the source filename.

```
ciscoasa#copy running-config startup-config

Source filename [running-config]?
Cryptochecksum: 93bb3217 0f60bfa4 c36bbb29 75cf714a

3847 bytes copied in 3.470 secs (1282 bytes/sec)
ciscoasa#
```

Configure the Cisco AnyConnect Secure Mobility Client

In order to configure the Cisco AnyConnect Secure Mobility Client, refer to the Establish the SSL VPN Connection with SVC section of **ASA 8.x : Allow Split Tunneling for AnyConnect VPN Client on the ASA Configuration Example**.

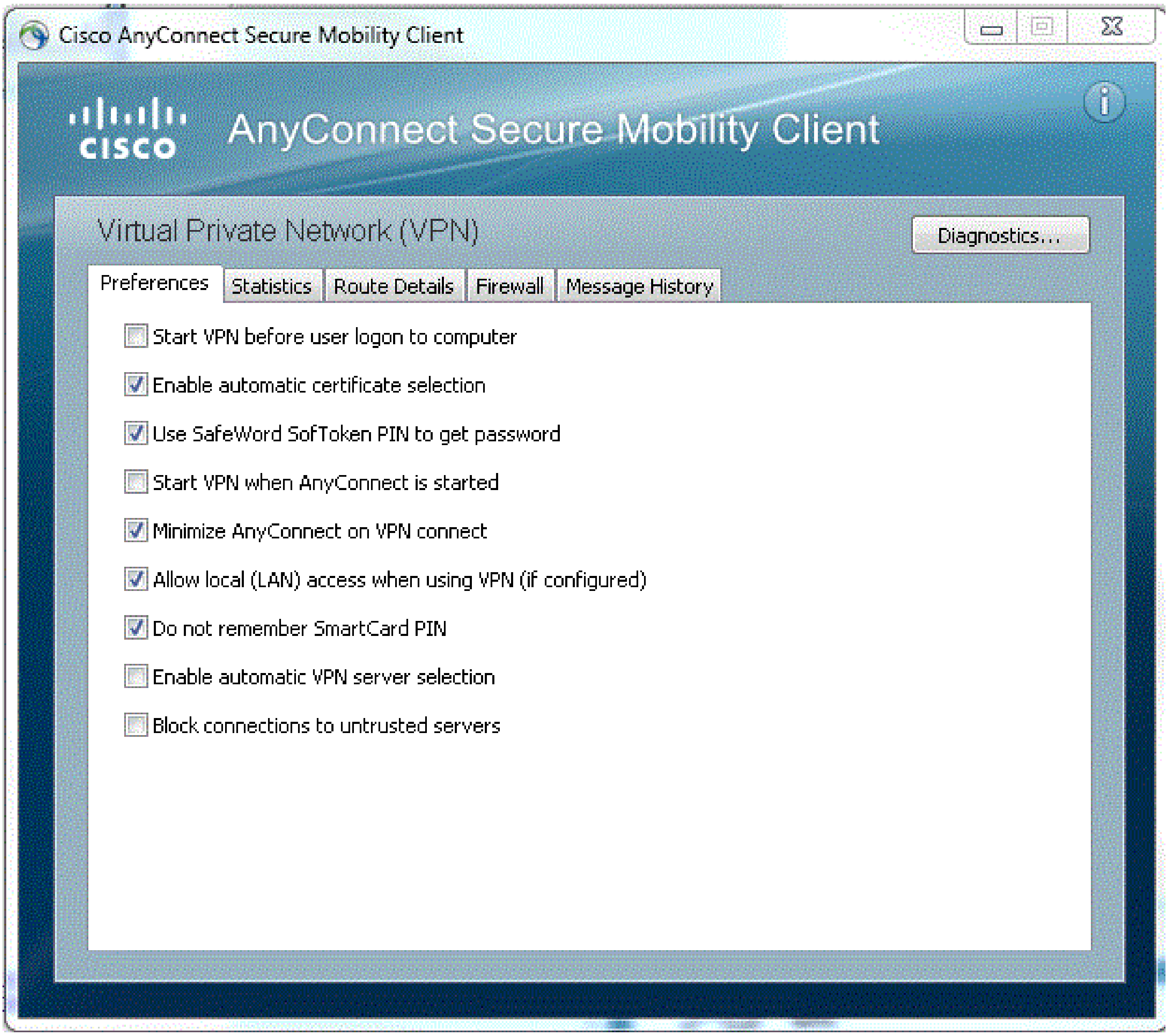
Split-exclude tunneling requires that you enable **AllowLocalLanAccess** in the AnyConnect Client. All split-exclude tunneling is regarded as local LAN access. In order to use the exclude feature of split-tunneling, you must enable the **AllowLocalLanAccess** preference in the **AnyConnect VPN**

Client preferences. By default, local LAN access is disabled.

In order to allow local LAN access, and therefore split-exclude tunneling, a network administrator can enable it in the profile or users can enable it in their preferences settings (see the image in the next section). In order to allow local LAN access, a user selects the **Allow Local LAN access** check box if split-tunneling is enabled on the secure gateway and is configured with the **split-tunnel-policy exclude specified** policy. In addition, you can configure the VPN Client Profile if local LAN access is allowed with **<LocalLanAccess UserControllable="true">true</LocalLanAccess>**.

User Preferences

Here are the selections you should make in the Preferences tab on the Cisco AnyConnect Secure Mobility Client in order to allow local LAN access.


Cisco AnyConnect Secure Mobility Client
cisco
AnyConnect Secure Mobility Client
Virtual Private Network (VPN)
Diagnostics...
Preferences
Statistics
Route Details
Firewall
Message History

□ Start VPN before user logon to computer

☑ Enable automatic certificate selection

☑ Use SafeWord SofToken PIN to get password

□ Start VPN when AnyConnect is started

☑ Minimize AnyConnect on VPN connect

☑ Allow local (LAN) access when using VPN (if configured)

☑ Do not remember SmartCard PIN

□ Enable automatic VPN server selection

□ Block connections to untrusted servers

XML Profile Example

Here is an example of how to configure the VPN Client Profile with XML.

```
ciscoasa#copy running-config startup-config

Source filename [running-config]?
Cryptochecksum: 93bb3217 0f60bfa4 c36bbb29 75cf714a

3847 bytes copied in 3.470 secs (1282 bytes/sec)
ciscoasa#
```

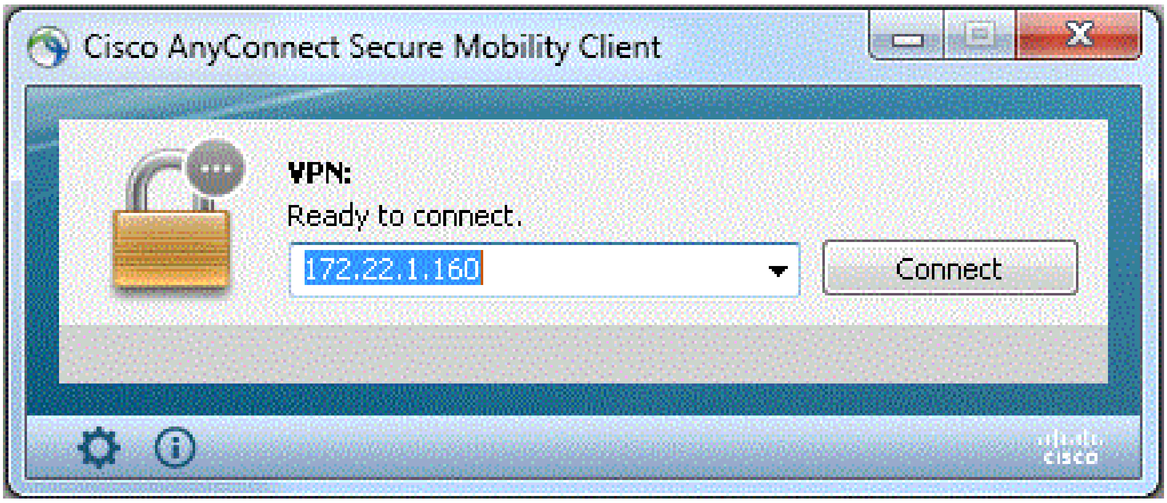
Verify

Complete the steps in these sections in order to verify your configuration.

- View the DART
- Test Local LAN Access with Ping

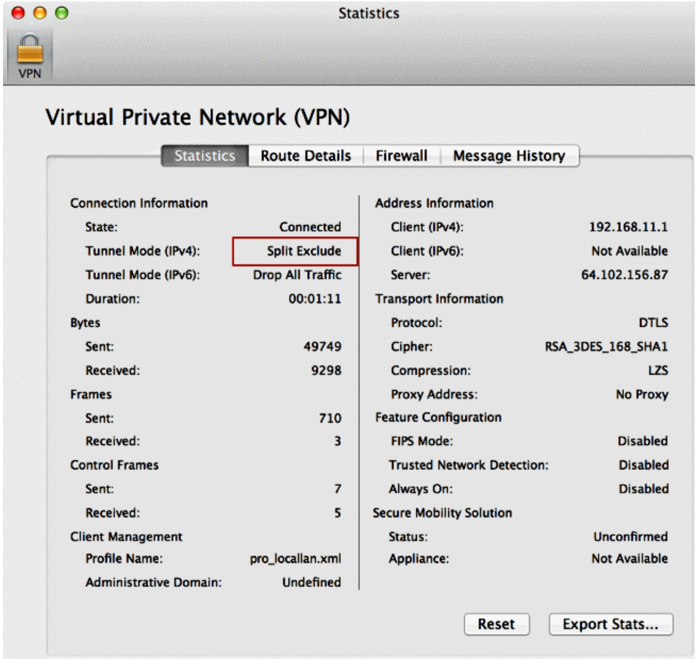
Connect your Cisco AnyConnect Secure Mobility Client to the ASA in order to verify your configuration.

1. Choose your connection entry from the server list and click **Connect**.



VPN:
Ready to connect.
172.22.1.160

2. Choose **Advanced Window for All Components > Statistics...** in order to display the Tunnel Mode.



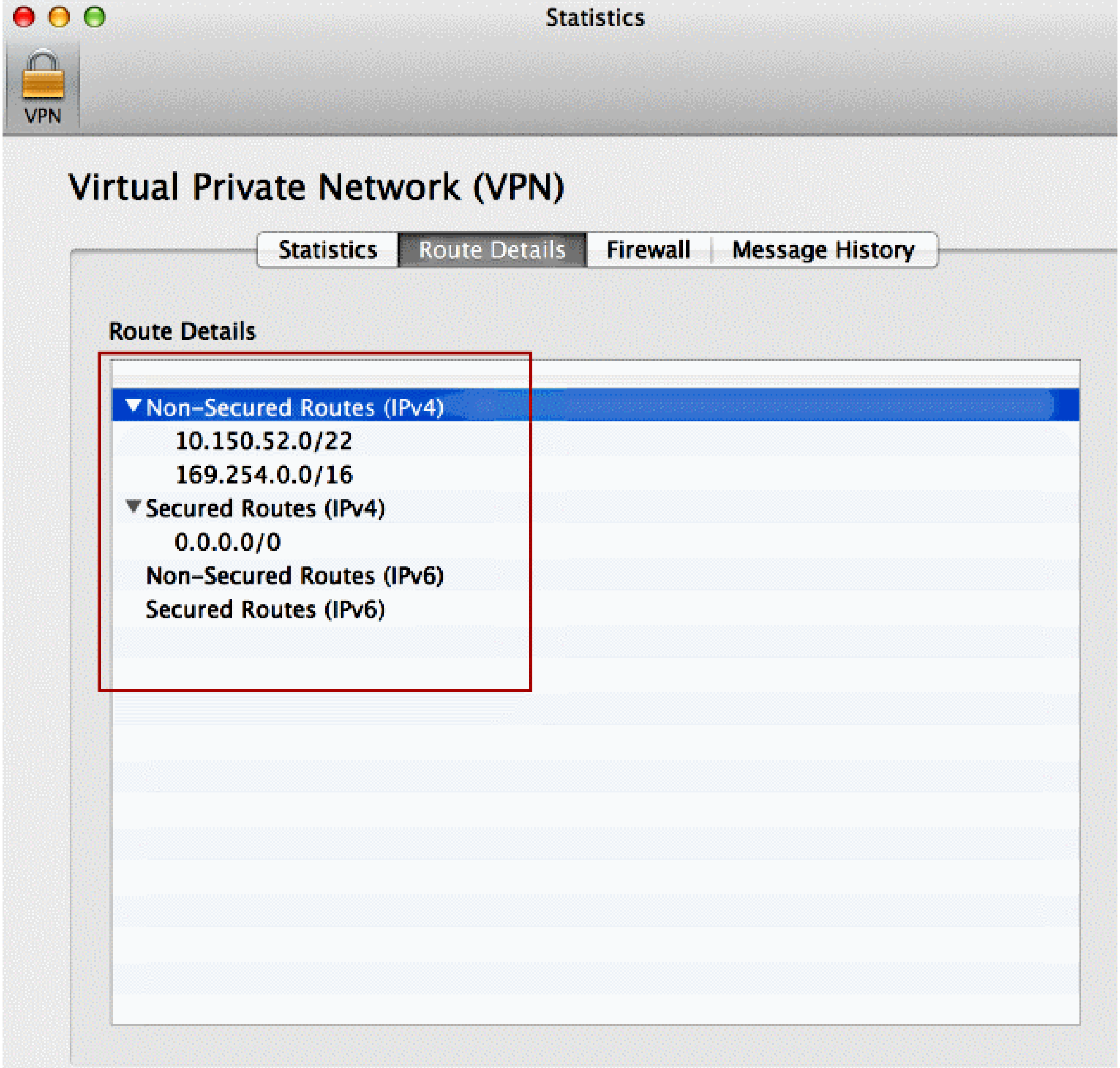
Virtual Private Network (VPN)

Connection Information
State: Connected
Tunnel Mode (IPv4): Split Exclude
Tunnel Mode (IPv6): Drop All Traffic
Duration: 00:01:11
Bytes
Sent: 49749
Received: 9298
Frames
Sent: 710
Received: 3
Control Frames
Sent: 7
Received: 5
Client Management
Profile Name: pro_locallan.xml
Administrative Domain: Undefined

Address Information
Client (IPv4): 192.168.11.1
Client (IPv6): Not Available
Server: 64.102.156.87
Transport Information
Protocol: DTLS
Cipher: RSA_3DES_168_SHA1
Compression: LZS
Proxy Address: No Proxy
Feature Configuration
FIPS Mode: Disabled
Trusted Network Detection: Disabled
Always On: Disabled
Secure Mobility Solution
Status: Unconfirmed
Appliance: Not Available

3. Click the **Route Details** tab in order to see the routes to which the Cisco AnyConnect Secure Mobility Client still has local access.

   In this example, the client is allowed local LAN access to 10.150.52.0/22 and 169.254.0.0/16 while all other traffic is encrypted and sent across the tunnel.



▼Non-Secured Routes (IPv4)
10.150.52.0/22
169.254.0.0/16
▼Secured Routes (IPv4)
0.0.0.0/0
Non-Secured Routes (IPv6)
Secured Routes (IPv6)

Cisco AnyConnect Secure Mobility Client

When you examine the AnyConnect logs from the Diagnostics and Reporting Tool (DART) bundle, you can determine whether or not the parameter that allows local LAN access is set.

```
ciscoasa#copy running-config startup-config

Source filename [running-config]?
Cryptochecksum: 93bb3217 0f60bfa4 c36bbb29 75cf714a

3847 bytes copied in 3.470 secs (1282 bytes/sec)
ciscoasa#
```

Test Local LAN Access with Ping

An additional way to test that the VPN Client still has local LAN access while tunneled to the VPN headend is to use the **ping** command at the Microsoft Windows command line. Here is an example where the local LAN of the client is 192.168.0.0/24 and another host is present on the network with an IP address of 192.168.0.3.

```
C:\>ping 192.168.0.3
Pinging 192.168.0.3 with 32 bytes of data&colon;

Reply from 192.168.0.3: bytes=32 time<1ms TTL=255
Reply from 192.168.0.3: bytes=32 time<1ms TTL=255
Reply from 192.168.0.3: bytes=32 time<1ms TTL=255
Reply from 192.168.0.3: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.0.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Troubleshoot

This section provides information you can use in order to troubleshoot your configuration.

Unable to Print or Browse by Name

When the VPN Client is connected and configured for local LAN access, you *cannot print or browse by name* on the local LAN. There are two options available in order to work around this situation:

- Browse or print by IP address.

  In order to browse, instead of the syntax **\\sharename**, use the syntax **\\x.x.x.x** where *x.x.x.x* is the IP address of the host computer.

  In order to print, change the properties for the network printer in order to use an IP address instead of a name. For example, instead of the syntax **\\sharename\printername**, use **\\x.x.x.x\printername**, where *x.x.x.x* is an IP address.
- Create or modify the VPN Client LMHOSTS file. An LMHOSTS file on a Microsoft Windows PC allows you to create static mappings between hostnames and IP addresses. For example, an LMHOSTS file might look like this:

  ```
  C:\>ping 192.168.0.3
  Pinging 192.168.0.3 with 32 bytes of data&colon;

  Reply from 192.168.0.3: bytes=32 time<1ms TTL=255
  Reply from 192.168.0.3: bytes=32 time<1ms TTL=255
  Reply from 192.168.0.3: bytes=32 time<1ms TTL=255
  Reply from 192.168.0.3: bytes=32 time<1ms TTL=255

  Ping statistics for 192.168.0.3:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
  Minimum = 0ms, Maximum = 0ms, Average = 0ms
  ```

In Microsoft Windows XP Professional Edition, the LMHOSTS file is located in **%SystemRoot%\System32\Drivers\Etc**. Refer to your Microsoft documentation or Microsoft knowledge base Article 314108 for more information.

Related Information

- **PIX/ASA 7.x as a Remote VPN Server using ASDM Configuration Example**
- **SSL VPN Client (SVC) on IOS with SDM Configuration Example**
- **Cisco ASA 5500 Series Adaptive Security Appliances**
- **Technical Support & Documentation - Cisco Systems**