8

VPN

This chapter describes how to configure Virtual Private Networks (VPNs) that allow other sites and remote workers to access your network resources. It includes the following sections:

To access the VPN pages, click **VPN** in the left hand navigation pane.

About VPNs

A VPN provides a secure communication channel (also known as a “tunnel”) between two gateway routers or between a remote PC and a gateway router. The security appliance supports the following VPN solutions:

- **Site-to-Site VPN:** Connects two routers to secure traffic between two sites that are physically separated. See **Configuring a Site-to-Site VPN, page 340**.
- **IPsec Remote Access:** Allows the security appliance to act as a head-end device in remote access VPNs. Your security appliance will be set as an IPsec VPN server and push the security policies to remote VPN clients, so that remote VPN clients have up-to-date policies in place before establishing the VPN connections. The IPsec VPN server can also terminate the VPN connections initiated by remote VPN clients. This flexibility allows mobile and remote users to access critical data and applications on corporate Intranet. See **Configuring IPsec Remote Access, page 355**.
- **Teleworker VPN Client:** Minimizes the configuration requirements at remote locations by allowing the security appliance to work as a Cisco VPN hardware client to receive the security policies over the VPN tunnel from a remote IPsec VPN server. See **Configuring Teleworker VPN Client, page 363**.
- **SSL VPN:** Allows remote users to access the corporate network by using the Cisco AnyConnect Secure Mobility Client software. Remote access is provided through a SSL VPN gateway. See **Configuring SSL VPN, page 372**.
- **L2TP:** Allows remote clients to use a public IP network to secure communicate with private corporate network servers. See **Configuring L2TP Server, page 385**.

NOTE The security appliance can function as an IPsec VPN server or as a Cisco VPN hardware client, but not both simultaneously.

Viewing VPN Status

This section describes how to view information for all VPN sessions. Refer to the following topics:

- **Viewing IPsec VPN Status, page 335**
- **Viewing SSL VPN Status, page 337**

Viewing IPsec VPN Status

Use the IPsec VPN Status page to view the status of all IPsec VPN sessions. This page is automatically updated every 10 seconds. Click **Refresh** to manually refresh the data.

VPN > VPN Status > IPsec VPN Status

Field	Description
Active Sessions To manually terminate an active IPsec VPN session, click the **Disconnect** icon in the **Connect** column. To manually terminate multiple active IPsec VPN sessions, check them and click the **Disconnect** button. If an IPsec VPN session is terminated, you can manually establish the VPN connection by clicking the **Connect** icon in the **Connect** column.	
Name	VPN policy used for an IPsec VPN session.
Status	Connection status for an IPsec VPN session.
VPN Type	VPN connection type for an IPsec VPN session, such as Site-to-Site, IPsec Remote Access, or Teleworker VPN Client.
WAN Interface	WAN port used for an IPsec VPN session.

Field	Description
Remote Gateway	IP address of the remote peer. **NOTE:** For a site-to-site VPN session, it displays the IP address of the remote gateway. For an IPsec VPN session between the Teleworker VPN client and a remote IPsec VPN server, it displays the IP address of the IPsec VPN server. For an IPsec VPN session between the IPsec VPN server and a remote VPN client, it displays the IP address of the remote VPN client.
Local Network	Subnet IP address and netmask of your local network.
Remote Network	Subnet IP address and netmask of the remote network.
Statistics	
Name	VPN policy used for an IPsec VPN session.
VPN Type	VPN connection type for an IPsec VPN session.
WAN Interface	WAN port used for an IPsec VPN session.
Remote Gateway	IP address of the remote peer.
Local Network	Subnet IP address and netmask of your local network.
Remote Network	Subnet IP address and netmask of the remote network.
Tx Bytes	Volume of traffic in kilobytes transmitted from the VPN tunnel.
Rx Bytes	Volume of traffic in kilobytes received from the VPN tunnel.
Tx Packets	Number of IP packets transmitted from the VPN tunnel.
Rx Packets	Number of IP packets received from the VPN tunnel.

Field	Description
Teleworker VPN Client	
If the Teleworker VPN Client feature is enabled and the security appliance is acting as a Cisco VPN hardware client, the following information is displayed.	
Status	Shows if the Teleworker VPN Client feature is enabled or disabled.
Primary DNS	IP address of the primary DNS server.
Secondary DNS	IP address of the secondary DNS server.
Primary WINS	IP address of the primary WINS server.
Secondary WINS	IP address of the secondary WINS server.
Default Domain	Default domain name.
Split Tunnel	IP address and netmask for the specified split subnets.
Split DNS	Domain name for the specified split DNS.
Backup Server 1/2/3	IP address or hostname for the specified backup servers.

Viewing SSL VPN Status

Use the SSL VPN Status page to view information for all active SSL VPN sessions. This page is automatically updated every 10 seconds. Click **Refresh** to manually refresh the data.

VPN > VPN Status > SSL VPN Status

Field	Description
Active Sessions	
To manually terminate an active SSL VPN session, click the **Disconnect** icon in the **Configure** column. To manually terminate multiple active SSL VPN sessions, check them and click the **Disconnect** button.	
Session ID	ID of the SSL VPN session.
User Name	Name of the connected SSL VPN user.

Field	Description
Client IP (Actual)	Actual IP address used by the SSL VPN client.
Client IP (VPN)	Virtual IP address of the SSL VPN client assigned by the SSL VPN gateway.
Connect Time	Amount of time since the SSL VPN user first established the connection.

SSL VPN Statistics

In the **Global Status** area, the global statistic information is displayed. To clear the global statistic information, click **Clear**.

Active Users	Total number of connected SSL VPN users.
In CSTP Frames	Number of CSTP frames received from all clients.
In CSTP Bytes	Total number of bytes in the CSTP frames received from all clients.
In CSTP Data	Number of CSTP data frames received from all clients.
In CSTP Control	Number of CSTP control frames received from all clients.
Out CSTP Frames	Number of CSTP frames sent to all clients.
Out CSTP Bytes	Total number of bytes in the CSTP frames sent to all clients.
Out CSTP Data	Number of CSTP data frames sent to all clients.
Out CSTP Control	Number of CSTP control frames sent to all clients.

In the **Session Statistics** table, the following information for each SSL VPN session is displayed.

To clear the statistic information for a single SSL VPN session, click **Clear** in the **Configure** column. To clear the statistic information for multiple SSL VPN sessions, check them and click **-Clear**.

Session ID	ID of the SSL VPN session.
In CSTP Frames	Number of CSTP frames received from the client.

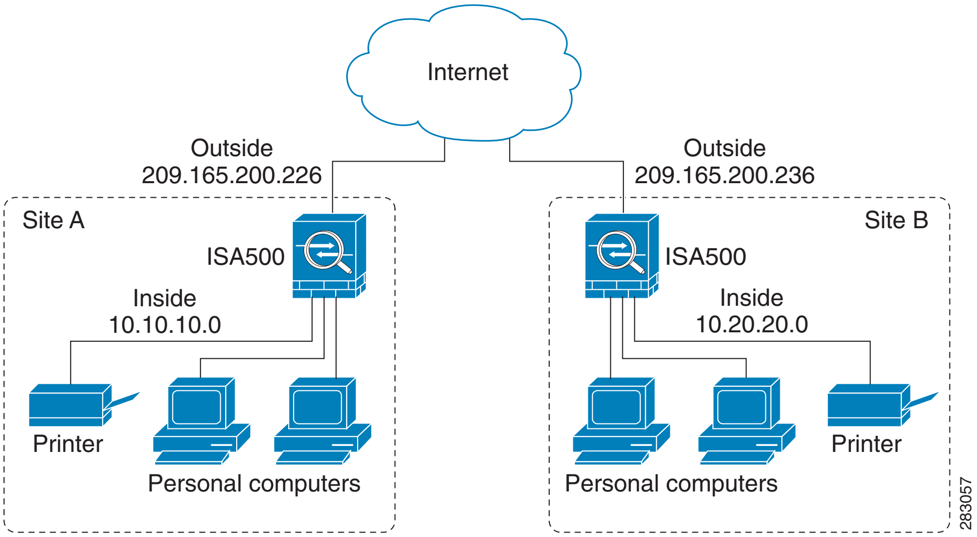
Field	Description
In CSTP Bytes	Total number of bytes in the CSTP frames received from the client.
In CSTP Data	Number of CSTP data frames received from the client.
In CSTP Control	Number of CSTP control frames received from the client.
Out CSTP Frames	Number of CSTP frames sent to the client.
Out CSTP Bytes	Total number of bytes in the CSTP frames sent to the client.
Out CSTP Data	Number of CSTP data frames sent to the client.
Out CSTP Control	Number of CSTP control frames sent to the client.

NOTE CSTP is a Cisco proprietary protocol for SSL VPN tunneling. “In” represents that the packet comes from the client. “Out” represents that the packet is sent to the client. The client is the PC running the Cisco AnyConnect Secure Mobility Client software that connects to the security appliance running the SSL VPN server. A CSTP frame is a packet carrying the CSTP protocol information. There are two major frame types, control frames and data frames. Control frames implement control functions within the protocol. Data frames carry the client data, such as the tunneled payload.

Configuring a Site-to-Site VPN

A site-to-site VPN tunnel connects two routers to secure traffic between two sites that are physically separated.

Figure 3 Site-to-Site VPN



This section describes how to set up the site-to-site VPN tunnels. Refer to the following topics:

- **Configuration Tasks to Establish a Site-to-Site VPN Tunnel, page 341**
- **General Site-to-Site VPN Settings, page 341**
- **Configuring IPsec VPN Policies, page 343**
- **Configuring IKE Policies, page 349**
- **Configuring Transform Sets, page 351**
- **Remote Teleworker Configuration Examples, page 352**

Configuration Tasks to Establish a Site-to-Site VPN Tunnel

To establish a site-to-site VPN tunnel, complete the following configuration tasks:

- Add the subnet IP address objects for your local network and remote network. See **Address Management, page 175**.
- (Optional) Import the certificates for authentication between two peers. Skip this step if you want to use the pre-shared key for authentication. See **Managing Certificates for Authentication, page 418**.
- Enable the site-to-site VPN feature on the security appliance. See **General Site-to-Site VPN Settings, page 341**.
- Configure IKE policies. See **Configuring IKE Policies, page 349**.
- Configure transform policies. See **Configuring Transform Sets, page 351**.
- Configure IPsec VPN policies. See **Configuring IPsec VPN Policies, page 343**.
- (Optional) Check an enabled IPsec VPN policy and click the **Connect** icon to initiate the VPN connection.

  When a site-to-site IPsec VPN policy is in place and enabled, a connection will be triggered by any traffic that matches the policy. In this case, the VPN tunnel will be set up automatically. However, for an IPsec VPN policy in which this router's Remote Network is set to Any (a "site-to-any" tunnel), a connection cannot be set up automatically. Instead you must manually establish the VPN connection by clicking the **Connect** icon.
- View the status and statistic information for all IPsec VPN sessions. See **Viewing IPsec VPN Status, page 335**.

General Site-to-Site VPN Settings

STEP 1 Click **VPN > Site-to-Site > IPsec Policies**.

The IPsec Policies window opens. All existing IPsec VPN policies are listed in the table. The following information is displayed:

- **Name:** The name of the IPsec VPN policy.
- **Enable:** Shows if the IPsec VPN policy is enabled or disabled.
- **Status:** Shows if the IPsec VPN tunnel is connected or disconnected.

- **WAN Interface:** The WAN port that traffic passes through over the IPsec VPN tunnel.
- **Peers:** The IP address of the remote peer.
- **Local:** The local network of the local peer.
- **Remote:** The remote network of the remote peer.
- **IKE:** The IKE policy used for the IPsec VPN policy.
- **Transform:** The transform set used for the IPsec VPN policy.

STEP 2 Click **On** to enable site-to-site VPN, or click **Off** to disable it.

NOTE: Enabling the Site-to-Site VPN feature will disable the Teleworker VPN Client feature.

STEP 3 If you enable site-to-site VPN, perform the following actions:

- To add a new IPsec VPN policy, click **Add**. See **Configuring IPsec VPN Policies, page 343**.
- To edit an existing IPsec VPN policy, click the **Edit** (x) icon.
- To delete an IPsec VPN policy, click the **Delete** (x) icon.
- To delete multiple IPsec VPN policies, check them and click **Delete**.
- To enable an IPsec VPN policy, check the box in the **Enable** column.
- To manually establish a VPN tunnel, click the **Connect** icon for an enabled IPsec VPN policy.
- To manually terminate a VPN connection, click the **Disconnect** icon.
- To refresh the data for site-to-site VPN, click **Refresh**.

STEP 4 Click **Save** to apply your settings.

Configuring IPsec VPN Policies

The IPsec VPN policy is used to establish the VPN connection between two peers. ISA550 and ISA550W support up to 50 IPsec VPN tunnels. ISA570 and ISA570W support up to 100 IPsec VPN tunnels.

NOTE Before you create an IPsec VPN policy, make sure that the IKE and transform policies are configured. Then you can apply the IKE and transform policies to the IPsec VPN policy.

STEP 1 **Click VPN > Site-to-Site > IPsec Policies.**

STEP 2 To add a new IPsec VPN policy, click **Add**.

Other options: To edit an entry, click the **Edit** (pencil) icon. To delete an entry, click the **Delete** (x) icon. To delete multiple entries, check them and click **Delete**.

The IPsec Policies - Add/Edit window opens.

STEP 3 In the **Basic Settings** tab, enter the following information:

- **Description:** Enter the name for the IPsec VPN policy.
- **IPsec Policy Enable:** Click **On** to enable the IPsec VPN policy, or click **Off** to create only the IPsec VPN policy.
- **Remote Type:** Specify the remote peer:
  - **Static IP:** Choose this option if the remote peer uses a static IP address. Enter the IP address of the remote peer in the **Remote Address** field.
  - **Dynamic IP:** Choose this option if the remote peer uses a dynamic IP address.
  - **FQDN (Fully Qualified Domain Name):** Choose this option to use the domain name of the remote network, such as vpn.company.com. Enter the domain name of the remote peer in the **Remote Address** field.

  For the example as illustrated in Figure 3, the remote site, Site B, has a public IP address of 209.165.200.236. You should choose **Static IP** and enter 209.165.200.236 in the **Remote Address** field.

- **Authentication Method:** Choose one of the following authentication methods:
  - **Pre-shared Key:** Uses a simple, password-based key to authenticate. If you choose this option, enter the desired value that the peer device must provide to establish a connection in the **Key** field. The pre-shared key must be entered exactly the same here and on the remote peer.
  - **Certificate:** Uses the digital certificate from a third party Certificate Authority (CA) to authenticate. If you choose this option, select a CA certificate as the local certificate from the **Local Certificate** drop-down list and select a CA certificate as the remote certificate from the **Remote Certificate** drop-down list. The selected remote certificate on the local gateway must be set as the local certificate on the remote peer.

    NOTE: You must have valid CA certificates imported on your security appliance before choosing this option. Go to the Device Management > Certificate Management page to import the CA certificates. See Managing Certificates for Authentication, page 418.
- **WAN Interface:** Choose the WAN port that traffic passes through over the IPsec VPN tunnel.
- **Local Network:** Choose the IP address for the local network. If you want to configure the zone access control settings for site-to-site VPN, choose **Any** for the local network. Then you can control incoming traffic from remote VPN network to the zones over the VPN tunnels.
- **Remote Network:** Choose the IP address of the remote network. You must know the IP address of the remote network before connecting the VPN tunnel.

  For the example as illustrated in **Figure 3**, Site A has a LAN IP address of 10.10.10.0 and Site B has a LAN IP address of 10.20.20.0. When you configure site-to-site VPN on Site A, the local network is 10.10.10.0 and the remote network is 10.20.20.0.

  If the address object that you want is not in the list, choose **Create a new address** to add a new address object or choose **Create a new address group** to add a new address group object. To maintain the address and address group objects, go to the Networking > Address Management page. See Address Management, page 175.

  NOTE: The security appliance can support multiple subnets for establishing the VPN tunnels. You should select an address group object including multiple subnets for local and/or remote networks.

STEP 4 In the **Advanced Settings** tab, enter the following information:

- **PFS Enable:** Click **On** to enable Perfect Forward Secrecy (PFS) to improve security, or click **Off** to disable it. If you enable PFS, a Diffie-Hellman exchange is performed for every phase-2 negotiation. PFS is desired on the keying channel of the VPN connection.

- **DPD Enable:** Click **On** to enable Dead Peer Detection (DPD), or click **Off** to disable it. DPD is a method of detecting a dead Internet Key Exchange (IKE) peer. This method uses IPsec traffic patterns to minimize the number of messages required to confirm the availability of a peer. DPD is used to reclaim the lost resources in case a peer is found dead and it is also used to perform IKE peer failover. If you enable DPD, enter the following information:

  - **Delay Time:** Enter the value of delay time in seconds between consecutive DPD R-U-THERE messages. DPD R-U-THERE messages are sent only when IPsec traffic is idle. The default value is 10 seconds.

  - **Detection Timeout:** Enter the value of detection timeout in seconds. If no response and no traffic over the timeout, declare the peer dead. The default value is 30 seconds.

  - **DPD Action:** Choose one of the following actions over the detection timeout:

    Hold: Traffic from your local network to the remote network can trigger the security appliance to re-initiate the VPN connection over the detection timeout. We recommend that you use Hold when the remote peer uses a static IP address.

    Clean: Terminate the VPN connection over the detection timeout. You must manually re-initiate the VPN connection. We recommend that you use Clean when the remote peer uses dynamic IP address.

    Restart: Re-initiate the VPN connection for three times over the detection timeout.

- **Windows Networking (NetBIOS) Broadcast:** Click **On** to allow access remote network resources by using its NetBIOS name, for example, browsing Windows Neighborhood. NetBIOS broadcasting can resolve a NetBIOS name to a network address. This option allows NetBIOS broadcasts to travel over the VPN tunnel.

- **Access Control:** When the local network is set as Any, you can control incoming traffic from the remote VPN network to the zones. Click **Permit** to permit access, or click **Deny** to deny access. By default, incoming traffic from the remote network to all zones is permitted.

NOTE: The VPN firewall rules that are automatically generated by the zone access control settings will be added to the list of firewall rules with the priority higher than default firewall rules, but lower than custom firewall rules.

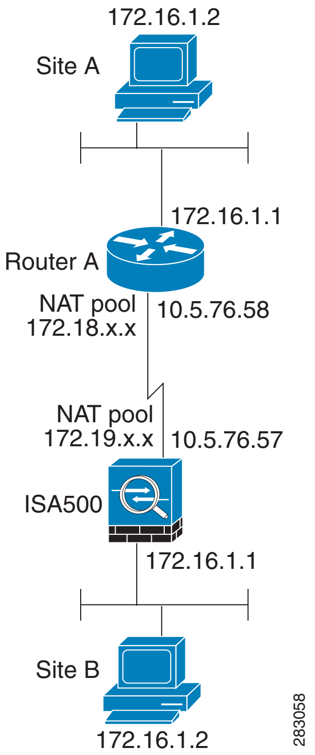
- **Apply NAT Policies:** Click **On** to apply the NAT settings for both the local network and the remote network communicating over the VPN tunnel. This option is particularly useful in cases where both sides of a tunnel use either the same or overlapping subnets.

  - **Translates Local Network:** To translate the local network, select a translated address object for the local network.
  - **Translates Remote Network:** To translate the remote network, select a translated address object for the remote network.

If the address object that you want is not in the list, choose **Create a new address** to add a new address object or choose **Create a new address group** to add a new address group object. To maintain the address or address group objects, go to the Networking > Address Management page. See Address Management, page 175.

Figure 4 shows a networking example that simulates two merging companies with the same IP addressing scheme. Two routers are connected with a VPN tunnel, and the networks behind each router are the same. For one site to access the hosts at the other site, Network Address Translation (NAT) is used on the routers to change both the source and destination addresses to different subnets.

Figure 4 Networking Example that Simulates Two Merging Companies with the Same IP Addressing Scheme



In this example, when the host 172.16.1.2 at Site A accesses the same IP-addressed host at Site B, it connects to a 172.19.1.2 address rather than to the actual 172.16.1.2 address. When the host at Site B to access Site A, it connects to a 172.18.1.2 address. NAT on Router A translates any 172.16.x.x address to look like the matching 172.18.x.x host entry. NAT on the ISA500 changes 172.16.x.x to look like 172.19.x.x.

NOTE: This configuration only allows the two networks to communicate. It does not allow for Internet connectivity. You need additional paths to the Internet for connectivity to locations other than the two sites; in other words, you need to add another router or firewall on each side, with multiple routes configured on the hosts.

- **IKE Policy:** Choose the IKE policy used for the IPsec VPN policy. You can click **IKE Policy Link** to maintain the IKE policies, but save your settings on this page first.
- **Transform:** Choose the transform set used for the IPsec VPN policy. You can click **Transform Link** to maintain the transform policies, but save your settings on this page first.

- **SA-Lifetime:** Enter the lifetime of the IPsec Security Association (SA). The IPsec SA lifetime represents the interval after which the IPsec SA becomes invalid. The IPsec SA is renegotiated after this interval. The default value is 1 hour.

STEP 5 In the **VPN Failover** tab, enter the following information:

- **WAN Failover Enable:** Click **On** to enable WAN Failover for site-to-site VPN, or click **Off** to disable it. If you enable WAN Failover, the backup WAN port ensures that VPN traffic rolls over to the backup link whenever the primary link fails. The security appliance will automatically update the local WAN gateway for the VPN tunnel based on the configurations of the backup WAN link. For this purpose, Dynamic DNS has to be configured because the IP address will change due to failover, or let the remote gateway use dynamic IP address.

  NOTE: To enable WAN Failover for site-to-site VPN, make sure that the secondary WAN port was configured and the WAN redundancy was set as the Failover or Load Balancing mode.

- **Redundant Gateway:** Click **On** to enable Redundant Gateway, or click **Off** to disable it. If you enable Redundant Gateway, when the connection of the remote gateway fails, the backup connection automatically becomes active. A backup policy comes into effect only if the primary policy fails.

  - **Select Backup Policy:** Choose a policy to act as a backup of this policy.

  - **Fallback Time to switch from back-up to primary:** Enter the number of seconds that must pass to confirm that the primary tunnel has recovered from a failure. If the primary tunnel is up for the specified time, the security appliance will switch to the primary tunnel by disabling the backup tunnel. Enter a value in the range 3 to 59 seconds. The default value is 5 seconds.

    NOTE: DPD should be enabled if you want to use the Redundant Gateway feature for IPsec VPN connection.

STEP 6 Click **OK** to save your settings.

STEP 7 When both the Site-to-Site VPN feature and the IPsec VPN policy are enabled, a warning message appears saying “Do you want to make this connection active when the settings are saved?”

- If you want to immediately activate the connection after the settings are saved, click the **Activate Connection** button. After you save your settings, the security appliance will immediately try to initiate the VPN connection. You can check the Status column to view its connection status.

- If you only want to create the IPsec VPN policy and do not want to immediately activate the connection after the settings are saved, click the **Do Not Activate** button. The connection will be triggered by any traffic that matches the IPsec VPN policy and the VPN tunnel will be set up automatically. You can also click the **Connect** icon to manually establish the VPN connection.

STEP 8 Click **Save** to apply your settings.

Configuring IKE Policies

The Internet Key Exchange (IKE) protocol is a negotiation protocol that includes an encryption method to protect data and ensure privacy. It is also an authentication method to verify the identity of devices that are trying to connect to your network.

You can create IKE policies to define the security parameters (such as authentication of the peer, encryption algorithms, and so forth) to be used for a VPN tunnel.

NOTE Up to 16 IKE policies can be configured on the security appliance.

STEP 1 Click **VPN > Site-to-Site > IKE Policies**.

The IKE Policies window opens. The default and custom IKE policies are listed in the table.

STEP 2 To add a new IKE policy, click **Add**.

Other options: To edit an entry, click the **Edit** (pencil) icon. To delete an entry, click the **Delete** (x) icon. To delete multiple entries, check them and click **Delete**. The default IKE policy (DefaultIke) cannot be edited or deleted.

The IKE Policy - Add/Edit window opens.

STEP 3 Enter the following information:

- **Name:** Enter the name for the IKE policy.
- **Encryption:** Choose the algorithm used to negotiate the security association. There are four algorithms supported by the security appliance: ESP_3DES, ESP_AES_128, ESP_AES_192, and ESP_AES_256.
- **Hash:** Specify the authentication algorithm for the VPN header. There are two hash algorithms supported by the security appliance: SHA1 and MD5.

NOTE: Ensure that the authentication algorithm is configured identically on both sides.

- **Authentication:** Specify the authentication method that the security appliance uses to establish the identity of each IPsec peer.
  - **Pre-shared Key:** Uses a simple, password-based key to authenticate. The alpha-numeric key is shared with the IKE peer. Pre-shared keys do not scale well with a growing network but are easier to set up in a small network.
  - **RSA_SIG:** Uses a digital certificate to authenticate. RSA_SIG is a digital certificate with keys generated by the RSA signatures algorithm. In this case, a certificate must be configured in order for the RSA-Signature to work.
- **D-H Group:** Choose the Diffie-Hellman group identifier, which the two IPsec peers use to derive a shared secret without transmitting it to each other. The D-H Group sets the strength of the algorithm in bits. The lower the Diffie-Hellman group number, the less CPU time it requires to be executed. The higher the Diffie-Hellman group number, the greater the security.
  - Group 2 (1024-bit)
  - Group 5 (1536-bit)
  - Group 14 (2048-bit)
- **Lifetime:** Enter the number of seconds for the IKE Security Association (SA) to remain valid. As a general rule, a shorter lifetime provides more secure ISAKMP (Internet Security Association and Key Management Protocol) negotiations (up to a point). However, with shorter lifetimes, the security appliance sets up future IPsec SAs more quickly. The default value is 24 hours.

STEP 4 Click **OK** to save your settings.

STEP 5 Click **Save** to apply your settings.

Configuring Transform Sets

A transform set specifies the algorithms of integrity and encryption that the peer will use to protect data communications. Two peers must use the same algorithm to communicate.

NOTE Up to 16 transform sets can be configured on the security appliance.

STEP 1 Click **VPN > Site-to-Site > Transform Policies**.

The Transform Sets window opens. The default and custom transform sets are listed in the table.

STEP 2 To add a new transform set, click **Add**.

Other options: To edit an entry, click the **Edit** (pencil) icon. To delete an entry, click the **Delete** (x) icon. To delete multiple entries, check them and click **Delete**. The default transform set (DefaultTrans) cannot be edited or deleted.

The Transform Set - Add/Edit window opens.

STEP 3 Enter the following information:

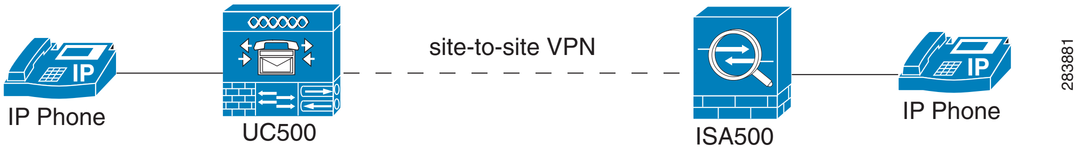
- **Name:** Enter the name for the transform set.
- **Integrity:** Choose the HASH algorithm used to ensure the data integrity. It ensures that a packet comes from where it says it comes from, and that it has not been modified in transit.
  - **ESP_SHA1_HMAC:** Authentication with SHA1 (160-bit).
  - **ESP_MD5_HMAC:** Authentication with MD5 (128-bit). MD5 has a smaller digest and is considered to be slightly faster than SHA1. A successful (but extremely difficult) attack against MD5 has occurred; however, the HMAC variant that IKE uses prevents this attack.
- **Encryption:** Choose the symmetric encryption algorithm that protects data transmission between two IPsec peers. The default is ESP_3DES. The Advanced Encryption Standard supports key lengths of 128, 192, 256 bits.
  - **ESP_3DES:** Encryption with 3DES (168-bit).
  - **ESP_AES_128:** Encryption with AES (128-bit).
  - **ESP_AES_192:** Encryption with AES (192-bit).
  - **ESP_AES_256:** Encryption with AES (256-bit).

STEP 4 Click **OK** to save your settings.

STEP 5 Click **Save** to apply your settings.

Remote Teleworker Configuration Examples

Use Case: You want to establish a site-to-site VPN tunnel between the security appliance and a remote UC500 to provide voice and data services to phones at a remote site.



Solution: When you use Cisco Configuration Assistant (CCA) Multisite Manager (MSM) to configure the site-to-site VPN settings on the UC500, CCA MSM uses the default IKE policy and transform set. In this case, the security appliance must create an IPsec VPN policy as follows to establish the site-to-site VPN tunnel with the UC500.

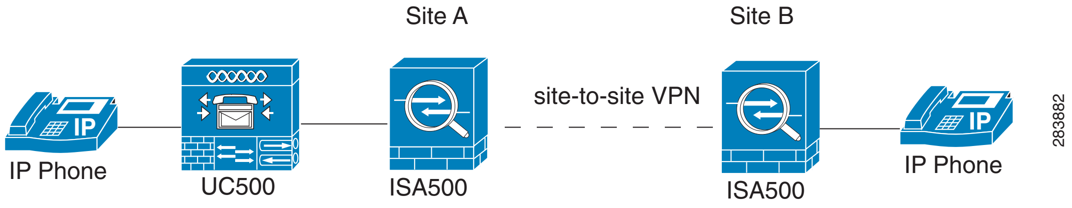
Field	Setting
Remote Network	Choose an address group that includes multiple subnets on the UC500. **NOTE:** By default, three VLANs (192.168.10.0/24, 10.1.1.0/24, and 10.1.10.0/24) are predefined on the UC500.

IKE Policy	Encryption = ESP_3DES
	Hash = SHA1
	D-H Group = Group 2
	NOTE: The default IKE policy used on the UC500 cannot be modified through CCA. The above IKE settings must be configured on the security appliance.

Field	Setting

Transform	Integrity = ESP_SHA1_HMAC
	Encryption = ESP_3DES
	NOTE: The default transform set used on the UC500 cannot be modified through CCA. The above transform settings must be configured on the security appliance.

Use Case: The UC500 device is behind the security appliance. You want to establish a site-to-site VPN tunnel between two security appliances to provide voice and data services to phones at a remote site.



Solution: When you configure the site-to-site VPN on the security appliances, make sure that the local network on the security appliance at Site A is set as “Any” and the remote network on the security appliance at Site B is set as “Any”.

Because the security appliance provides the firewall, Network Address Translation (NAT), and SIP Application Level Gateway (SIP ALG) for your network, you must disable those functions on the UC500. For instructions, refer to the documentation or online Help for the Cisco Configuration Assistant (CCA).

To allow the hosts in non-native subnets of the security appliance to access the Internet over the VPN tunnels, you must manually create advanced NAT rules on your security appliance. Go to the Firewall > NAT > Advanced NAT page to do this. For example, you can create an advanced NAT rule as follows to allow the hosts in the data LAN (10.25.1.0/24) behind the UC500 to access the Internet:

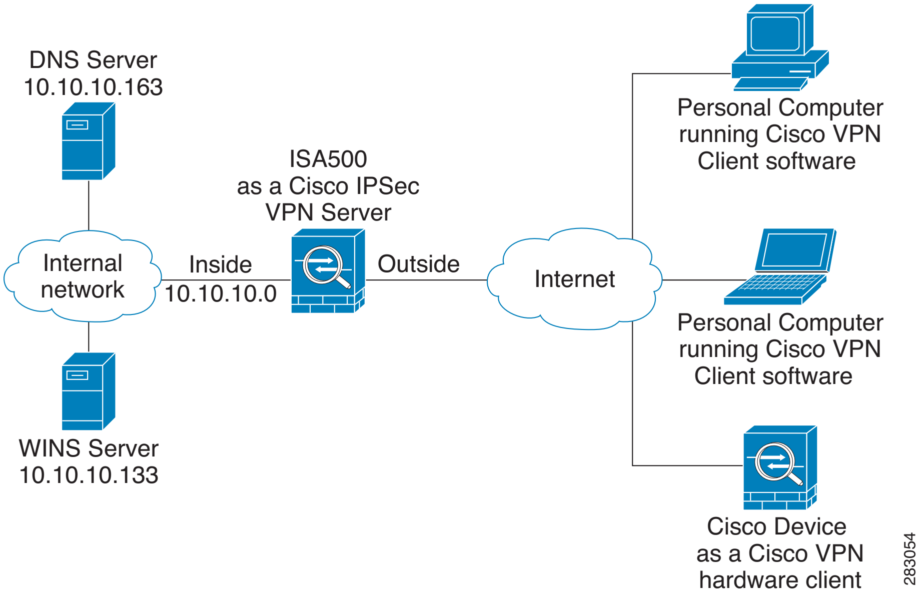
Name	datalan-behinduc500
Enable	On
From	Any
To	WAN1

Original Source Address	uc540-datalan **NOTE:** You can choose the **Create a new address** option from the drop-down list to create an address object for the data LAN (10.25.1.0/24) behind the UC500 and then select it as the original source address.
Original Destination Address	Any
Original Services	Any
Translated Source Address	WAN1_IP
Translated Destination Address	Any
Translated Services	Any

Configuring IPsec Remote Access

The IPsec Remote Access feature introduces server support for the Cisco VPN Client (Release 4.x and 5.x) software clients and the Cisco VPN hardware clients. This feature allows remote users to establish the VPN tunnels to securely access the corporate network resources. Centrally managed IPsec policies are “pushed” to remote VPN clients by the VPN server, minimizing configuration by end users.

Figure 5 IPsec Remote Access with the Cisco VPN Client Software or a Cisco Device as a Cisco VPN Hardware Client



NOTE When the security appliance is acting as an IPsec VPN server, the following IKE policy and transform set are used by default. The IKE policy and transform set used on the security appliance are unconfigurable.

Field	Setting

IKE Policy	Encryption = ESP_AES_256
	Hash = SHA
	Authentication = Pre-shared Key
	D-H Group = Group 2

Field	Setting

Transform	Integrity = SHA
	Encryption = ESP_AES_256

This section describes how to configure the IPsec Remote Access feature. Refer to the following topics:

- **Cisco VPN Client Compatibility, page 356**
- **Enabling IPsec Remote Access, page 357**
- **Configuring IPsec Remote Access Group Policies, page 357**
- **Allowing IPsec Remote VPN Clients to Access the Internet, page 360**

Cisco VPN Client Compatibility

The remote VPN client can be a Cisco device acting as a Cisco VPN hardware client or a PC running the Cisco VPN Client software (Release 4.x or 5.x).

The Cisco VPN Client software is an IPsec client software for Windows, Mac, or Linux users. The Cisco VPN Client software is compatible with the following platforms:

- Windows 7 (32-bit and 64-bit)
- Windows Vista (32-bit and 64-bit)
- Windows XP (32-bit)
- Linux Intel (2.6.x kernel)
- Mac OS X 10.5 and 10.6

You can find the software installers for Cisco VPN Client from the CD that is packed with the device. The CD includes the VPN client packages for Windows, Mac OS X, and Linux. Choose correct VPN client package from the CD to download depending on your operating system.

You can also download the Cisco VPN Client software by using this link:
http://www.cisco.com/cisco/software/navigator.html?mdfid=278875403
Then choose **Cisco VPN Client**.

NOTE You must log in and possess a valid service contract in order to access the Cisco VPN Client software. A 3-year Cisco Small Business Support Service Contract (CON-SBS-SVC2) is required to download the client software from Cisco.com. If you don't have one, contact your partner or reseller, or Cisco Support for more information.

For more information about how to download, install, and configure the Cisco VPN Client software, see this web page: http://www.cisco.com/en/US/products/sw/secursw/ps2308/index.html

Enabling IPsec Remote Access

STEP 1 Click **VPN > IPsec Remote Access**.

STEP 2 Click **On** to enable the IPsec Remote Access feature and hence set the security appliance as an IPsec VPN server, or click **Off** to disable it.

NOTE: Enabling the IPsec Remote Access feature will disable the Teleworker VPN Client feature.

STEP 3 Click **Save** to apply your settings.

Configuring IPsec Remote Access Group Policies

An IPsec Remote Access group policy is used by remote VPN clients to establish the VPN connections.

NOTE Up to 16 IPsec Remote Access group policies can be configured on the security appliance.

STEP 1 Click **VPN > IPsec Remote Access**.

STEP 2 To add an IPsec Remote Access group policy, click **Add**.

Other Options: To edit an entry, click the **Edit** (pencil) icon. To delete an entry, click the **Delete** (x) icon. To delete multiple entries, check them and click **Delete**.

The IPsec Remote Access - Add/Edit window opens.

STEP 3 In the **Basic Settings** tab, enter the following information:

- **Group Name:** Enter the name for the group policy.

- **WAN Interface:** Choose the WAN port that traffic passes through over the VPN tunnel.
- **IKE Authentication Method:** Choose the authentication method.
  - **Pre-shared Key:** Uses a simple, password-based key to authenticate. If you choose this option, enter the desired value that remote VPN clients must provide to establish the VPN connections in the **Password** field. The pre-shared key must be entered exactly the same here and on the remote clients.
  - **Certificate:** Uses the digital certificate from a third party Certificate Authority (CA) to authenticate. If you choose this option, select a CA certificate as the local certificate from the **Local Certificate** drop-down list and select a CA certificate as the remote certificate from the **Peer Certificate** drop-down list for authentication. The selected remote certificate on the IPsec VPN server must be set as the local certificate on remote VPN clients.

    NOTE: You must have valid CA certificates imported on your security appliance before choosing this option. Go to the Device Management > Certificate Management page to import the CA certificates. See Managing Certificates for Authentication, page 418.
- **Mode:** The Cisco VPN hardware client supports NEM (Network Extension Mode) and Client mode. The IPsec Remote Access group policy must be configured with the corresponding mode to allow only the Cisco VPN hardware clients in the same operation mode to be connected. For example, if you choose the Client mode for the group policy, only the Cisco VPN hardware clients in Client mode can be connected by using this group policy. For more information about the operation mode, see **Modes of Operation, page 365**.
  - Choose **Client** for the group policy that is used for both the PC running the Cisco VPN Client software and the Cisco device acting as a Cisco VPN hardware client in Client mode. In Client mode, the IPsec VPN server can assign the IP addresses to the outside interfaces of remote VPN clients. To define the pool range for remote VPN clients, enter the starting and ending IP addresses in the **Start IP** and **End IP** fields.
  - Choose **NEM** for the group policy that is only used for the Cisco device acting as a Cisco VPN hardware client in NEM mode.

- **Client Internet Access:** Check this box to automatically create advanced NAT rules to allow remote VPN clients to access the Internet over the VPN tunnels. If you uncheck this box, you can manually create advanced NAT rules. See **Allowing IPsec Remote VPN Clients to Access the Internet, page 360**.

- **WAN Failover:** Click **On** to enable WAN Failover, or click **Off** to disable it. If you enable WAN Failover, traffic is automatically redirected to the secondary link when the primary link is down.

  NOTE: To enable WAN Failover for IPsec Remote Access, make sure that the secondary WAN port was configured and the WAN redundancy was set as the Load Balancing or Failover mode.

  NOTE: The security appliance will automatically update the local WAN gateway for the VPN tunnel based on the configurations of the backup WAN link. For this purpose, Dynamic DNS has to be configured because the IP address will change due to failover and remote VPN clients must use the domain name of the IPsec VPN server to establish the VPN connections.

STEP 4 In the **Zone Access Control** tab, you can control access from the PC running the Cisco VPN Client software or the private network of the Cisco VPN hardware client to the zones over the VPN tunnels. Click **Permit** to permit access, or click **Deny** to deny access.

NOTE: The VPN firewall rules that are automatically generated by the zone access control settings will be added to the list of firewall rules with the priority higher than the default firewall rules, but lower than the custom firewall rules.

STEP 5 In the **Mode Configuration Settings** tab, enter the following information:

- **Primary DNS Server:** Enter the IP address of the primary DNS server.

- **Secondary DNS Server:** Enter the IP address of the secondary DNS server.

- **Primary WINS Server:** Enter the IP address of the primary WINS server.

- **Secondary WINS Server:** Enter the IP address of the secondary WINS server.

- **Default Domain:** Enter the default domain name that should be pushed to remote VPN clients.

- **Backup Server 1/2/3:** Enter the IP address or hostname for the backup server. You can specify up to three IPsec VPN servers as backup. When the connection to the primary server fails, the VPN clients can attempt to connect to the backup servers. The backup server 1 has the highest priority and the backup server 3 has the lowest priority.

NOTE: The backup servers that you specified on the IPsec VPN server will be sent to remote VPN clients when initiating the VPN connections. The remote VPN clients will cache them.

- **Split Tunnel:** Click **On** to enable the split tunneling feature, or click **Off** to disable it. Split tunneling allows only traffic that is specified by the VPN client routes to corporate resources through the VPN tunnel. If you enable split tunneling, you need to define the split subnets. To add a subnet, enter the IP address and netmask in the **Protected Network** and **Netmask** fields and click **Add**. To delete a subnet, select it from the list and click **Delete**.
- **Split DNS:** Split DNS directs DNS packets in clear text through the VPN tunnel to domains served by the corporate DNS. To add a domain, enter the **Domain name** that should be resolved by your network's DNS server, and then click **Add**. To delete a domain, select it from the list and click **Delete**.

NOTE: To use Split DNS, you must also enable the split tunneling feature and specify the domains. The Split DNS feature supports up to 10 domains.

STEP 6 Click **OK** to save your settings.

STEP 7 Click **Save** to apply your settings.

Allowing IPsec Remote VPN Clients to Access the Internet

Enabling Client Internet Access will automatically create advanced NAT rules to allow remote VPN clients to access the Internet over the VPN tunnels. This section provides an example on manually configuring advanced NAT rules to allow remote VPN clients to access the Internet over the VPN tunnels.

STEP 1 Assuming that you enable the IPsec Remote Access feature and create a group policy as follows:

Field	Setting
Group Name	VPNGroup1
WAN Interface	WAN1
IKE Authentication Method	Pre-shared key

Field	Setting
Mode	Client
Pool Range for Client LAN	Start IP: 192.168.3.2 End IP: 192.168.3.254
Client Internet Access	Disable
WAN Failover	On

NOTE: An address object with the range 192.168.3.2 to 192.168.3.254 called "EZVPN_VPNGroup1" will be automatically created.

STEP 2 If only a single WAN interface is configured, go to the Firewall > NAT > Advanced NAT page to create an advanced NAT rule as follows.

Field	Setting
Name	VPNClient_to_WAN1
Enable	On
From	Any
To	WAN1
Original Source Address	EZVPN_VPNGroup1
Original Destination Address	Any
Original Services	Any
Translated Source Address	WAN1_IP
Translated Destination Address	Any
Translated Services	Any

STEP 3 If two WAN interfaces are configured, go to the Firewall > NAT > Advanced NAT page to create two advanced NAT rules as follows.

Field	Setting
Name	VPNClient_to_WAN1
Enable	On
From	Any
To	WAN1
Original Source Address	EZVPN_VPNGroup1
Original Destination Address	Any
Original Services	Any
Translated Source Address	WAN1_IP
Translated Destination Address	Any
Translated Services	Any

Field	Setting
Name	VPNClient_to_WAN2
Enable	On
From	Any
To	WAN2
Original Source Address	EZVPN_VPNGroup1
Original Destination Address	Any
Original Services	Any
Translated Source Address	WAN2_IP

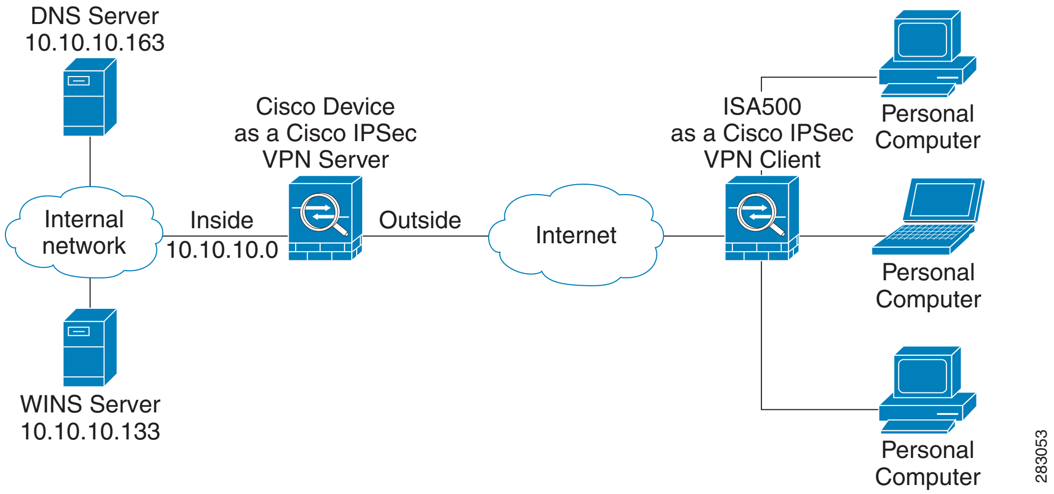
Field	Setting
Translated Destination Address	Any
Translated Services	Any

Configuring Teleworker VPN Client

The Teleworker VPN Client feature minimizes the configuration requirements at remote locations by allowing the security appliance to work as a Cisco VPN hardware client to receive the security policies upon the VPN tunnel from a remote IPsec VPN server.

After the IPsec VPN server has been configured, a VPN connection can be created with minimal configuration on the Teleworker VPN client. When the Teleworker VPN client initiates the VPN connection, the IPsec VPN server pushes the IPsec policies to the Teleworker VPN client and creates the corresponding VPN tunnel. This solution is ideal for remote offices with little IT support or for large Customer Premises Equipment (CPE) deployments where it is impractical to configure multiple remote devices individually.

Figure 6 IPsec Remote Access with an IPsec VPN Server



NOTE When the security appliance is acting as a Cisco VPN hardware client, the following IKE policy and transform set are used by default. The IKE policy and transform set used on the security appliance are unconfigurable.

Field	Setting

IKE Policy	Encryption = ESP_AES_256
	Hash = SHA
	Authentication = Pre-shared Key
	D-H Group = Group 2

Transform Set	Integrity = SHA
	Encryption = ESP_AES_256

This section describes how to configure the Teleworker VPN Client feature. Refer to the following topics:

- **Required IPsec VPN Servers, page 364**
- **Benefits of the Teleworker VPN Client Feature, page 365**
- **Modes of Operation, page 365**
- **General Teleworker VPN Client Settings, page 368**
- **Configuring Teleworker VPN Client Group Policies, page 369**

Required IPsec VPN Servers

The Teleworker VPN Client feature requires that the destination peer is an ISA500 device acting as the IPsec VPN server, or a Cisco IOS router (such as C871, C1801, C1812, C1841, and C2821) or a Cisco ASA5500 platform that supports the IPsec VPN server feature.

The Teleworker VPN Client feature supports configuration of only one destination peer. If your application requires multiple VPN tunnels, you must manually configure the VPN tunnel and Network Address Translation/Peer Address Translation (NAT/PAT) parameters on both client and server.

Benefits of the Teleworker VPN Client Feature

- Allows dynamic configuration of end-user policy, requiring less manual configuration by end users and field technicians, thus reducing errors and further service calls.
- Allows the provider to change equipment and network configurations as needed, with little or no reconfiguration of the end-user equipment.
- Provides for centralized security policy management.
- Enables large-scale deployments with rapid user provisioning.
- Eliminates the need for end users to purchase and configure external VPN devices.
- Eliminates the need for end users to install and configure Cisco VPN Client software on their PCs.
- Offloads the creation and maintenance of the VPN connections from the PC to the router.
- Reduces interoperability problems between the different PC-based software VPN clients, external hardware-based VPN solutions, and other VPN applications.
- Sets up a single IPsec tunnel regardless of the number of multiple subnets that are supported and the size of the split-include list.

Modes of Operation

The Teleworker VPN Client feature sets the security appliance as a Cisco VPN hardware client. The Cisco VPN hardware client supports two operation modes: Client Mode or Network Extension Mode (NEM). The operation mode determines whether the inside hosts relative to the Cisco VPN hardware client are accessible from the corporate network over the VPN tunnel. Specifying the operation mode is mandatory before making a connection because the Cisco VPN hardware client does not have a default mode.

All modes of operation also optionally support split tunneling, which allows secure access to corporate resources through the VPN tunnel while also allowing Internet access through a connection to an Internet Service Provider (ISP) or another service—thereby eliminating the corporate network from the path for web access.

Refer to the following topics:

- **Client Mode, page 366**

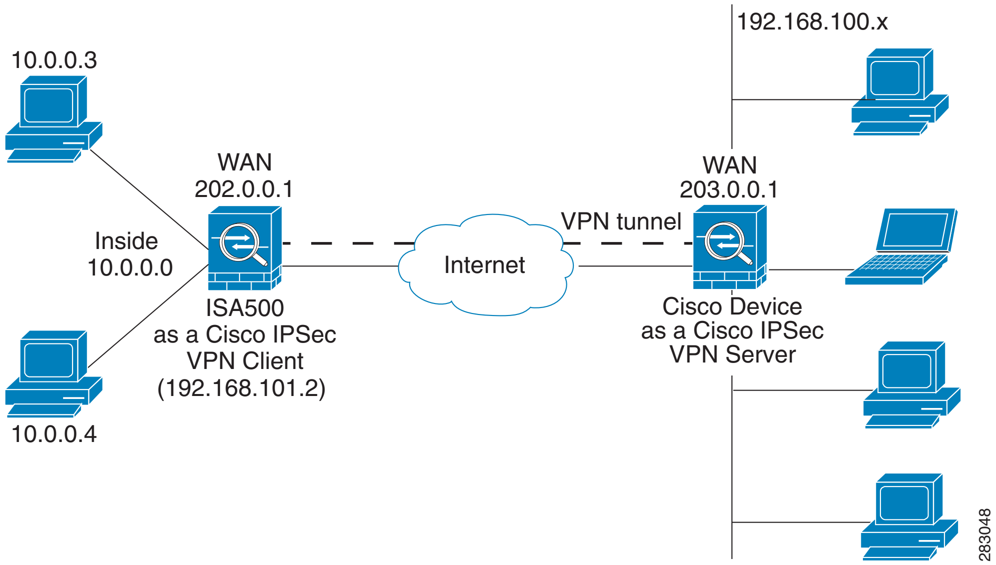
- Network Extension Mode, page 367

Client Mode

Client mode specifies that NAT or PAT be done so that the PCs and other hosts at the remote end of the VPN tunnel form a private network that do not use any IP addresses in the IP address space of the destination server. In Client mode, the outside interface of the Cisco VPN hardware client can be assigned an IP address by the remote server.

Figure 7 illustrates the client mode of operation. In this example, the security appliance provides access to two PCs, which have IP addresses in the 10.0.0.0 private network space. These PCs connect to the Ethernet interface on the security appliance, and the server assigns an IP address 192.168.101.2 to the security appliance. The security appliance performs NAT or PAT translation over the VPN tunnel so that the PCs can access the destination network. When accessing the remote network 192.168.100.x, the hosts 10.0.0.3 and 10.0.04 will be translated to 192.168.101.2, but hosts in the remote network 192.168.100.x cannot access the hosts 10.0.0.3 and 10.0.04.

Figure 7 IPsec VPN Client Connection



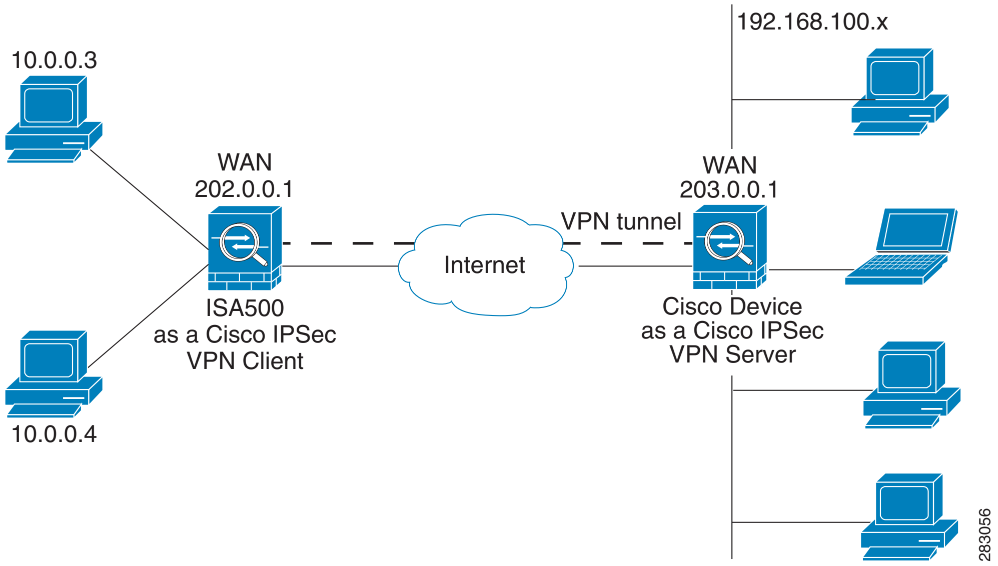
Network Extension Mode

Network Extension Mode (NEM) specifies that the PCs and other hosts at the client end of the VPN tunnel should be given IP addresses that are fully routable and reachable by the destination network over the tunneled network so that they form one logical network. PAT is not used, which allows the client PCs and hosts to have direct access to the PCs and hosts at the destination network. In NEM mode, the Cisco VPN hardware client obtains a private IP address from a local DHCP server or is configured with a static IP address.

Figure 8 illustrates the network extension mode of operation. In this example, the security appliance acts as a Cisco VPN hardware client, connecting to a remote IPsec VPN server. The hosts attached to the security appliance have IP addresses in the 10.0.0.0 private network space. The server does not assign an IP address to the security appliance, and the security appliance does not perform NAT or PAT translation over the VPN tunnel. When accessing the remote network 192.168.100.x, the hosts 10.0.0.3 and 10.0.04 will not be translated, and the hosts in the remote network 192.168.100.x can access the hosts 10.0.0.3 and 10.0.04 directly.

The client hosts are given IP addresses that are fully routable by the destination network over the VPN tunnel. These IP addresses could be either in the same subnet space as the destination network or in separate subnets, assuming that the destination routers are configured to properly route those IP addresses over the VPN tunnel.

Figure 8 IPsec VPN Network Extension Connection



General Teleworker VPN Client Settings

This section describes how to enable the Teleworker VPN Client feature, configure the Auto Initiation Retry settings, and manually connect or disconnect the VPN connections.

STEP 1 Click **VPN > Teleworker VPN Client**.

STEP 2 Enter the following information:

- **Teleworker VPN Client:** Click **On** to enable the Teleworker VPN Client feature and hence set the security appliance as a Cisco VPN hardware client, or click **Off** to disable it.

  NOTE: Enabling the Teleworker VPN Client feature will disable the Site-to-Site VPN and IPsec Remote Access features and terminate their connected VPN sessions.

- **Auto Initiation Retry:** Click **On** to enable the Auto Initiation Retry feature, or click **Off** to disable it.

  When you enable Auto Initiation Retry, the security appliance (set as the Cisco VPN hardware client) first initiates the VPN connection to the primary server. If there is no response from the primary server after the timeout that you set in the **Retry Interval** field, the security appliance then re-initiates the VPN connection to the primary server. This continues for the number of times that you set in the **Retry Limit** field (or until the primary server is connected). If the primary server cannot be connected after the specified number of times, the security appliance tries to re-initiate the VPN connection to the backup servers by following the specified timeout and retry times. If all three backup servers cannot be connected, repeat the re-initiation process again and again until an IPsec VPN server can be connected.

  When you disable Auto Initiation Retry, the security appliance first initiates the VPN connection to the primary server. If there is no response from the primary server in 120 seconds, the security appliance then re-initiates the VPN connection to the backup servers. If all three backup servers cannot be connected, repeat the re-initiation process again and again until an IPsec VPN server can be connected.

- **Retry Interval:** Specify how often, in seconds, that the security appliance re-initiates the VPN connection to the primary server and the back servers. The default value is 120 seconds.

- **Retry Limit:** Enter the number of times that the security appliance will retry a VPN connection initiation. The default value is 2.

STEP 3 Click **Save** to apply your settings.

STEP 4 To manually initiate the VPN connection, click the **Connect** icon in the **Configure** column. By default, the group policy that the Activate Connection on Startup setting is enabled will automatically initiate the VPN connection when the security appliance starts up. Only one VPN connection can be active at a time.

STEP 5 To manually terminate the VPN connection, click the **Disconnect** icon.

Configuring Teleworker VPN Client Group Policies

To be able to complete the configuration of a Teleworker VPN Client group policy, you must have the following information ready.

- IPsec VPN server's IP address or hostname.
- IPsec VPN server's group policy name.
- Pre-shared key or digital certificates for IKE authentication.

NOTE Up to 16 Teleworker VPN Client group policies can be configured on the security appliance. You can create multiple group polices to connect to different VPN servers but only one VPN connection can be active at a time.

STEP 1 Click **VPN > Teleworker VPN Client**.

STEP 2 To add a group policy, click **Add**.

Other Options: To edit an entry, click the **Edit** (pencil) icon. To delete an entry, click the **Delete** (x) icon. To delete multiple entries, check them and click **Delete.**

The Teleworker VPN Client - Add/Edit window opens.

STEP 3 In the **Basic Settings** tab, enter the following information:

- **Description:** Enter the name for the group policy.
- **Server (Remote Address):** Enter the IP address or domain name of the remote IPsec VPN server.
- **Activate Connection on Startup:** Click **On** to automatically initiate the VPN connection when the security appliance starts up, or click **Off** to disable it. Only one VPN connection can be active on startup.

- **IKE Authentication Method:** The VPN client must be properly authenticated before it can access the remote network. Choose one of the following authentication methods:
  - **Pre-shared Key:** Choose this option if the IPsec VPN server uses a simple, password-based key to authenticate and then enter the following information:

    Group Name: Enter the name of the IPsec Remote Access group policy that is defined on the IPsec VPN server. The security appliance will use this group policy to establish the VPN connection with the IPsec VPN server. The IPsec VPN server pushes the security settings over the VPN tunnel to the security appliance.

    Password: Enter the pre-shared key specified in the selected group policy to establish a VPN connection. The pre-shared key must be entered exactly the same here and on the IPsec VPN server.
  - **Certificate:** Choose this option if the IPsec VPN server uses the digital certificate from a third party Certificate Authority (CA) to authenticate. Select a CA certificate as your local certificate from the **Local Certificate** drop-down list and select the CA certificate used on the remote IPsec VPN server as the remote certificate from the **Peer Certificate** drop-down list for authentication.

    NOTE: You must have valid CA certificates imported on your security appliance before choosing this option. Go to the Device Management > Certificate Management page to import the CA certificates. See Managing Certificates for Authentication, page 418.
- **Mode:** The operation mode determines whether the inside hosts relative to the Cisco VPN hardware client are accessible from the corporate network over the VPN tunnel. Specifying an operation mode is mandatory before making a VPN connection because the Cisco VPN hardware client does not have a default mode. For more information about the operation mode, see **Modes of Operation, page 365**.
  - Choose **Client** if you want the PCs and other devices on the security appliance's inside networks to form a private network with private IP addresses. Network Address Translation (NAT) and Port Address Translation (PAT) will be used. Devices outside the LAN will not be able to ping devices on the LAN, or reach them directly.
  - Choose **NEM** (Network Extension Mode) if you want the devices connected to the inside interfaces to have IP addresses that are routable and reachable by the destination network. The devices at both ends of

the connection will form one logical network. PAT will be automatically disabled, allowing the PCs and hosts at both ends of the connection to have direct access to one another.

- **VLAN:** If you choose NEM, specify the VLAN that permits access from and to the private network of the IPsec VPN server.
- **User Name:** Enter the username used by the Teleworker VPN client to establish a VPN connection.
- **User Password:** Enter the password used by the Teleworker VPN client to establish a VPN connection.

STEP 4 In the **Zone Access Control** tab, you can control access from the zones in your network to the remote network if the Teleworker VPN client works in Client mode. Click **Permit** to permit access, or click **Deny** to deny access.

NOTE: The VPN firewall rules that are automatically generated by the zone access control settings will be added to the list of firewall rules with the priority higher than the default firewall rules, but lower than the custom firewall rules.

STEP 5 In the **Advanced Settings** tab, enter the following information.

- **Backup Server 1/2/3:** Enter the IP address or hostname for the backup server. You can specify up to three servers as backup. When the connection to the primary IPsec VPN server fails, the security appliance can initiate the VPN connection to the backup servers. The backup server 1 has the highest priority and the backup server 3 has the lowest priority.

  NOTE: The Teleworker VPN client can get the backup servers from the IPsec VPN server during the tunnel negotiation. The backup servers specified on the IPsec VPN server have higher priority than the back servers specified on the Teleworker VPN client. When the primary connection fails, first try to connect to the backup servers specified on the IPsec VPN server, and then try to connect to the backup servers specified on the Teleworker VPN client.

- **Peer Timeout:** Enter the value of detection timeout in seconds. If no response and no traffic from the primary server or the backup server over the timeout, declare the peer dead. The default value is 120 seconds.

STEP 6 Click **OK** to save your settings.

STEP 7 A warning message appears saying “Do you want to make this connection active when the settings are saved? (Only one connection can be active at a time.)”

- If you want to immediately activate the connection after the settings are saved, click the **Activate Connection** button. When you create multiple Teleworker VPN Client group policies at a time, only one connection can be active after you save your settings. The security appliance will use the group policy that was last created or edited to initiate the VPN connection.
- If you only want to create the Teleworker VPN client group policy and do not want to immediately activate the connection after the settings are saved, click the **Do Not Activate** button. You can click the **Connect** icon to manually establish the VPN connection.

  NOTE: This feature is different from the Active Connection on Startup feature. It is used to activate the connection immediately after the settings are saved, but the Activate Connection on Startup feature is used to activate the connection when the security appliance starts up.

STEP 8 Click **Save** to apply your settings.

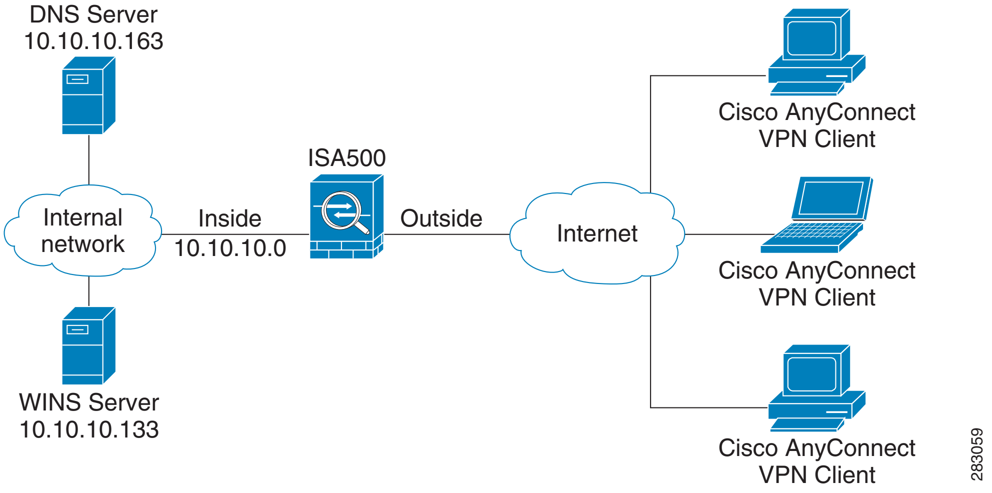
Configuring SSL VPN

SSL VPN is a flexible and secure way to extend network resources to virtually any remote user. The security appliance supports the SSL VPN feature, and interoperates with the Cisco AnyConnect Secure Mobility Client software.

A valid security license is required to support SSLVPN with mobile devices such as smart phones and tablets. For more information, see **Activating Security Services, page 293**.

Figure 9 shows an example of SSL VPN. Users can remotely access the network by using the Cisco AnyConnect Secure Mobility Client software. When the SSL VPN tunnel is established, each user will have an IP address on the internal network.

Figure 9 SSL Remote User Access



This section describes how to configure the SSL VPN feature. Refer to the following topics:

- **Elements of the SSL VPN, page 373**
- **Configuration Tasks to Establish a SSL VPN Tunnel, page 374**
- **Installing Cisco AnyConnect Secure Mobility Client, page 375**
- **Importing Certificates for User Authentication, page 376**
- **Configuring SSL VPN Users, page 376**
- **Configuring SSL VPN Gateway, page 376**
- **Configuring SSL VPN Group Policies, page 379**
- **Accessing SSL VPN Portal, page 382**
- **Allowing SSL VPN Clients to Access the Internet, page 382**

NOTE We do not recommend that you connect a PC or a phone device directly to a WAN port of the security appliance to establish the SSL VPN connection between them.

Elements of the SSL VPN

Several elements work together to support SSL VPN.

- **SSL VPN Users:** Create your SSL VPN users and enable the SSL VPN service for the user groups to which the SSL VPN users belong. Selecting a

SSL VPN group policy can enable the SSL VPN service for a user group. All members of the user group at remote sites can establish the SSL VPN tunnels based on the selected SSL VPN group policy. See **Configuring SSL VPN Users, page 376**.

- **SSL VPN Group Policies:** Create your SSL VPN group policies. The SSL VPN group policy is used to establish the SSL VPN tunnel to access your network resources. See **Configuring SSL VPN Group Policies, page 379**.
- **Cisco AnyConnect Secure Mobility Client:** The Cisco AnyConnect Secure Mobility Client is the next-generation VPN client, providing remote users with secure VPN connections to the SSL VPN gateway. See **Installing Cisco AnyConnect Secure Mobility Client, page 375**.

Configuration Tasks to Establish a SSL VPN Tunnel

You need to complete below configuration tasks to establish the SSL VPN tunnel.

- Download and install the Cisco AnyConnect Secure Mobility Client software on remote user's PC. See **Installing Cisco AnyConnect Secure Mobility Client, page 375**.
- (Optional) Import the certificates to your security appliance used for user authentication. See **Importing Certificates for User Authentication, page 376**.
- Enable the SSL VPN feature and configure the SSL VPN gateway settings. See **Configuring SSL VPN Gateway, page 376**.
- Define the SSL VPN group policies. See **Configuring SSL VPN Group Policies, page 379**.
- Create your SSL VPN users and user groups and specify the SSL VPN group policy for each SSL VPN user group. See **Configuring SSL VPN Users, page 376**.
- Launch the Cisco AnyConnect Secure Mobility Client software on user's PC, enter the address pair "Gateway IP address:Gateway port number" to connect to the remote SSL VPN gateway, and then enter the authentication credentials to establish the SSL VPN connection.
- View information for all active SSL VPN sessions. See **Viewing SSL VPN Status, page 337**.

Installing Cisco AnyConnect Secure Mobility Client

You can set up a PC to run the Cisco AnyConnect Secure Mobility Client software by installing the client software for the appropriate operating system directly on the user's PC. The user starts the Cisco AnyConnect Secure Mobility Client software and provides the authentication credentials to establish the VPN connection.

The security appliance supports the Cisco AnyConnect Secure Mobility Client Release 3.0 (use for SSL only). The Cisco AnyConnect Secure Mobility Client is compatible with the following platforms:

- Windows 7 (32-bit and 64-bit)
- Windows Vista (32-bit and 64-bit)
- Windows XP SP2+ (32-bit and 64-bit)
- Linux Intel (2.6.x kernel)
- Mac OS X 10.5, 10.6.x, and 10.7

You can find the software installers from the CD that is packed with the security appliance. The CD includes AnyConnect packages for Windows, Mac OS X, and Linux. Choose correct AnyConnect package from the CD to download depending on your operating system.

You can also download the Cisco AnyConnect Secure Mobility Client software by going to this site:
http://www.cisco.com/cisco/software/type.html?mdfid=283000185&catid=null

You must log in and possess a valid service contract in order to access the Cisco AnyConnect Secure Mobility Client software. A 3-year Cisco Small Business Support Service Contract (CON-SBS-SVC2) is required to download the client software from Cisco.com. If you don't have one, contact your partner or reseller, or Cisco Support for more information.

For more information about how to download, install, and configure the Cisco AnyConnect Secure Mobility Client software, go to this site:
http://www.cisco.com/en/US/products/ps10884/tsd_products_support_series_home.html

NOTE The Cisco AnyConnect Secure Mobility Client will keep the reconnecting state after the cable of the WAN interface on the server is plugged out and then is plugged in. In this case, you must first stop the client reconnecting, and then manually connect to the SSL VPN server.

Importing Certificates for User Authentication

The SSL VPN gateway holds a CA certificate that is presented to the SSL VPN clients when the SSL VPN clients first connect to the gateway. The purpose of this certificate is to authenticate the server. You can use the default certificate or an imported certificate for authentication. For information on importing the certificates, see **Managing Certificates for Authentication, page 418**.

Configuring SSL VPN Users

ISA550 and ISA550W support 25 SSL VPN users. ISA570 and ISA570W support 50 SSL VPN users. To configure the users and user groups for SSL VPN access, go to the Users > Users and Groups page.

You can assign all SSL VPN users to one user group. However, if you have multiple SSL VPN group policies, you can create multiple user groups and specify different SSL VPN group policies for them. Specifying a SSL VPN group policy for a user group can enable the SSL VPN service for all members of the user group. For complete details, see **Configuring Users and User Groups, page 389**.

According to the user authentication settings specified on the security appliance, the SSL VPN users can be authenticated by the local database or external AAA server (such as Active Directory, LDAP, or RADIUS). For information on configuring the user authentication settings, see **Configuring User Authentication Settings, page 393**.

Configuring SSL VPN Gateway

Use the SSL VPN Configuration page to enable the SSL VPN feature and configure the SSL VPN gateway settings.

STEP 1 Click **VPN > SSL Remote User Access > SSL VPN Configuration**.

The SSL VPN Configuration window opens.

STEP 2 Click **On** to enable the SSL VPN feature and hence set the security appliance as a SSL VPN server, or click **Off** to disable it.

STEP 3 In the **Mandatory Gateway** area, enter the following information:

- **Gateway Interface:** Choose the WAN port that traffic passes through over the SSL VPN tunnels.

- **Gateway Port:** Enter the port number used for the SSL VPN gateway. By default, SSL operates on port 443. However, the SSL VPN gateway should be flexible to operate on a user defined port. The firewall should permit the port to ensure delivery of packets destined for the SSL VPN gateway. The SSL VPN clients need to enter the entire address pair "Gateway IP address: Gateway port number" for connecting purposes.

- **Certificate File:** Choose the default certificate or an imported certificate to authenticate users who try to access your network resource through the SSL VPN tunnels. For information on importing the certificates, see **Managing Certificates for Authentication, page 418**.

- **Client Address Pool:** The SSL VPN gateway has a configurable address pool that is used to allocate IP addresses to remote VPN clients. Enter the IP address pool for all remote clients. The client is assigned an IP address by the SSL VPN gateway.

  NOTE: Configure an IP address range that does not directly overlap with any of addresses on your local network.

- **Client Netmask:** Enter the IP address of the netmask used for SSL VPN clients. The client netmask can only be one of 255.255.255.0, 255.255.255.128, and 255.255.255.192.

  The Client Address Pool is used with the Client Netmask. The following table displays the valid settings for entering the client address pool and the client netmask.

Client Netmask	Client Address Pool
255.255.255.0	x.x.x.0
255.255.255.128	x.x.x.0, or x.x.x.128
255.255.255.192	x.x.x.0, x.x.x.64, x.x.x.128, or x.x.x.192

  If they are set as follows, then the SSL VPN client will get a VPN address whose range is from 10.10.10.1 to 10.10.10.254.

  - Client Address Pool = 10.10.10.0
  - Client Netmask = 255.255.255.0

- **Client Internet Access:** Check this box to automatically create advanced NAT rules to allow SSL VPN clients to access the Internet. If you uncheck this box, you can manually create advanced NAT rules. See **Allowing SSL VPN Clients to Access the Internet, page 382**.

- **Client Domain:** Enter the domain name that should be pushed to SSL VPN clients.
- **Login Banner:** After the users logged in, a configurable login banner is displayed. Enter the message text to display along with the banner.

STEP 4 In the **Optional Gateway** area, enter the following information:

- **Idle Timeout:** Enter the timeout value in seconds that the SSL VPN session can remain idle. The default value is 2100 seconds.
- **Session Timeout:** Enter the timeout value in seconds that a SSL VPN session can remain active. The default value is 0 seconds, which indicates that the SSL VPN session can always be active.
- **Client DPD Timeout:** Dead Peer Detection (DPD) allows detection of dead peers. Enter the DPD timeout that a session will be maintained with a nonresponsive remote client. The default value is 300 seconds.
- **Gateway DPD Timeout:** Enter the DPD timeout that a session will be maintained with a nonresponsive SSL VPN gateway. The default value is 300 seconds.

  NOTE: If the SSL VPN gateway has no response over two or three times of the DPD timeout, the SSL VPN session will be terminated.
- **Keep Alive:** Enter the interval, in seconds, at which the SSL VPN client will send keepalive messages. These messages ensure that the SSL VPN connection remains open, even if the client's maximum idle time is limited by an intermediate device, such as a proxy, firewall or NAT device.
- **Lease Duration:** Enter the amount of time after which the SSL VPN client must send an IP address lease renewal request to the server. The default value is 43200 seconds.
- **Max MTU:** Enter the maximum transmission unit for the session. The default value is 1406 bytes.
- **Rekey Method:** Specify the session rekey method (SSL or New Tunnel). Rekey allows the SSL keys to be renegotiated after the session has been established.
- **Rekey Interval:** Enter the frequency of the rekey in this field. The default value is 3600 seconds.

STEP 5 Click **Save** to apply your settings.

Configuring SSL VPN Group Policies

All members of the SSL VPN user group can establish the SSL VPN tunnels based on the specified SSL VPN group policy to access your network resources.

NOTE Up to 32 SSL VPN group policies can be configured on the security appliance.

STEP 1 Click **VPN > SSL Remote User Access > SSL VPN Group Policies**.

The SSL VPN Group Policies window opens. The default and custom SSL VPN group policies are listed in the table.

STEP 2 To add a new SSL VPN group policy, click **Add**.

Other options: To edit an entry, click the **Edit** (pencil) icon. To delete an entry, click the **Delete** (x) icon. To delete multiple entries, check them and click **Delete**. The default SSL VPN group policy (SSLVPNDefaultPolicy) cannot be deleted.

The SSL VPN Group Policy - Add/Edit window opens.

STEP 3 In the **Basic Settings** tab, enter the following information:

- **Policy Name:** Enter the name for the SSL VPN group policy.
- **Primary DNS:** Enter the IP address of the primary DNS server.
- **Secondary DNS:** Enter the IP address of the secondary DNS server.
- **Primary WINS:** Enter the IP address of the primary WINS server.
- **Secondary WINS:** Enter the IP address of the secondary WINS server.

STEP 4 In the **IE Proxy Settings** tab, enter the following information:

The SSL VPN gateway can specify several Microsoft Internet Explorer (MSIE) proxies for client PCs. If these settings are enabled, IE on the client PC is automatically configured with these settings.

- **IE Proxy Policy:** Choose one of the following IE proxy policies:
  - **None:** Allows the browser to use no proxy settings.
  - **Auto:** Allows the browser to automatically detect the proxy settings.
  - **Bypass-Local:** Allows the browser to bypass the proxy settings that are configured on the remote user.
  - **Disable:** Disables the MSIE proxy settings.

- **Address:** If you choose Bypass-Local or Auto, enter the IP address or domain name of the MSIE proxy server.
- **Port:** Enter the port number of the MSIE proxy server.
- **IE Proxy Exception:** You can specify the exception hosts for IE proxy settings. This option allows the browser not to send traffic for the given hostname or IP address through the proxy. To add an entry, enter the IP address or domain name of an exception host and click **Add**. To delete an entry, select it and click **Delete**.

STEP 5 In the **Split Tunneling Settings** area, enter the following information:

Split tunneling permits specific traffic to be carried outside of the SSL VPN tunnel. Traffic is either included (resolved in tunnel) or excluded (resolved through the ISP or WAN connection). Tunnel resolution configuration is mutually exclusive. An IP address cannot be both included and excluded at the same time.

- **Enable Split Tunneling:** By default, all traffic from the host is directed through the VPN tunnel. Check this box to enable the split tunneling feature so that the VPN tunnel is used only for traffic that is specified by the client routes.
- **Split Selection:** Choose one of the following options:
  - **Include Traffic:** Allows you to add the client routes on the SSL VPN client so that only traffic to the destination networks can be redirected through the VPN tunnel. To add a client route, enter the destination subnet to which a route is added on the SSL VPN client in the **Address** field and the subnet mask for the destination network in the **Netmask** field, and then click **Add**.
  - **Exclude Traffic:** Allows you to exclude the destination networks on the SSL VPN client. Traffic to the destination networks is redirected using the SSL VPN client's native network interface (resolved through the ISP or WAN connection). To add a destination subnet, enter the destination subnet to which a route is excluded on the SSL VPN client in the **Address** field and the subnet mask for the excluded destination in the **Netmask** field, and then click **Add.**

    NOTE: To exclude the destination networks, make sure that the Exclude Local LAN feature is enabled on the Cisco AnyConnect Secure Mobility clients.

  - **Exclude Local LAN:** If you choose Exclude Traffic, check the box to permit remote users to access their local LANs without passing through VPN tunnel, or uncheck the box to deny remote users to access their local LANs without passing through VPN tunnel.

    NOTE: To exclude local LANs, make sure that the Exclude Local LAN feature is enabled on both the SSL VPN server and the AnyConnect clients.

- **Split DNS:** Split DNS can direct DNS packets in clear text over the Internet to domains served through an external DNS (serving your ISP) or through the VPN tunnel to domains served by the corporate DNS.

  For example, a query for a packet destined for corporate.com would go through the VPN tunnel to the DNS that serves the private network, while a query for a packet destined for myfavoritesearch.com would be handled by the ISP's DNS. To use Split DNS, you must also have split tunneling configured.

  To add a domain for tunneling packets to destinations in the private network, enter the IP address or domain name in the field and click **Add**. To delete a domain, select it and click **Delete**.

STEP 6 In the **Zone-based Firewall Settings** area, you can control access from the SSL VPN clients to the zones over the VPN tunnels. Click **Permit** to permit access, or click **Deny** to deny access.

NOTE: The VPN firewall rules that are automatically generated by the zone-based firewall settings will be added to the list of firewall rules with the priority higher than the default firewall rules, but lower than the custom firewall rules.

STEP 7 Click **OK** to save your settings.

STEP 8 Click **Save** to apply your settings.

Accessing SSL VPN Portal

The SSL VPN portal provides a message to remind users to install the Cisco AnyConnect Secure Mobility Client software to connect to the SSL VPN server. You can find the software installers from the CD that is packed with the device or download the software installers from Cisco.com. See **Installing Cisco AnyConnect Secure Mobility Client, page 375**.

You can access the SSL VPN portal via a web browser from the WAN side by using the HTTPS protocol. You must first enable the SSL VPN feature on the security appliance and then enter the entire address pair “Gateway IP address:Gateway port number” in the address bar to access the SSL VPN portal.

Allowing SSL VPN Clients to Access the Internet

Enabling Client Internet Access will automatically create advanced NAT rules to allow SSL VPN clients to access the Internet over SSL VPN tunnels. This section provides an example of manually configuring advanced NAT rules to allow SSL VPN clients to access the Internet over SSL VPN tunnels.

STEP 1 Assuming that you enable the SSL VPN feature and configure the gateway settings as follows.

Field	Setting
Gateway Interface	WAN1
Gateway Port	443
Certificate File	default
Client Address Pool	192.168.200.0
Client Netmask	255.255.255.0

STEP 2 If only a single WAN interface is configured, go to the Firewall > NAT > Advanced NAT page to create an advanced NAT rule as follows.

Field	Setting
Name	SSLVPN_to_WAN1

Field	Setting
Enable	On
From	Any
To	WAN1
Original Source Address	SSLVPN_ADDRESS_POOL
Original Destination Address	Any
Original Services	Any
Translated Source Address	WAN1_IP
Translated Destination Address	Any
Translated Services	Any

STEP 3 If two WAN interfaces are configured and the WAN redundancy is set as the Load Balancing mode, go to the Firewall > NAT > Advanced NAT page to create two advanced NAT rule as follows.

Field	Setting
Name	SSLVPN_to_WAN1
Enable	On
From	Any
To	WAN1
Original Source Address	SSLVPN_ADDRESS_POOL
Original Destination Address	Any
Original Services	Any

Field	Setting
Translated Source Address	WAN1_IP
Translated Destination Address	Any
Translated Services	Any

Field	Setting
Name	SSLVPN_to_WAN2
Enable	On
From	Any
To	WAN2
Original Source Address	SSLVPN_ADDRESS_POOL
Original Destination Address	Any
Original Services	Any
Translated Source Address	WAN2_IP
Translated Destination Address	Any
Translated Services	Any

Configuring L2TP Server

Layer 2 Tunneling Protocol (L2TP) is a VPN tunneling protocol that allows remote clients to use the public IP network to securely communicate with private corporate network servers. L2TP uses PPP over UDP (port 1701) to tunnel the data.

L2TP protocol is based on the client and server model. The security appliance can terminate the L2TP-over-IPsec connections from incoming Microsoft Windows clients.

STEP 1 Click **VPN > L2TP Server**.

STEP 2 Click **On** to enable L2TP server, or click **Off** to disable it.

STEP 3 If you enable L2TP server, enter the following information:

- **Listen WAN Interface:** Choose the WAN interface on which the L2TP server listens to accept the incoming L2TP VPN connection.
- **User Name:** Enter the username that all L2TP clients use to access the L2TP server.
- **Password:** Enter the password that all L2TP clients use to access the L2TP server.

  NOTE: All L2TP clients use the same username and password to log into the L2TP server.
- **MTU:** Enter the MTU size in bytes that can be sent over the network. The valid range is 128 to 1400 bytes. The default value is 1400 bytes.
- **Authentication Method:** Choose either CHAP (Challenge Handshake Authentication Protocol) or PAP (Password Authentication Protocol), or both to authenticate the L2TP clients. Click **On** to enable CHAP or PAP, or click **Off** to disable it.
- **Address Pool:** The L2TP server assigns IP addresses to all L2TP clients. Enter the starting IP address in the **Start IP Address** field and the ending IP address in the **End IP Address** field.
- **DNS1 IP Address:** Enter the IP address of the primary DNS server.
- **DNS2 IP Address:** Optionally, enter the IP address of the secondary DNS server.

- **IPsec:** Click **On** to enable the data encryption over the IPsec VPN tunnel, or click **Off** to disable it.
- **Pre-shared Key:** The data encryption over the VPN tunnel uses a pre-shared key for authentication. If you enable **IPsec**, enter the desired value, which the L2TP client must provide to establish a connection. The pre-shared key must be entered exactly the same here and on the L2TP clients.

STEP 4 Click **Save** to apply your settings.

STEP 5 By default, the firewall denies access from VPN zone to LAN and voice zones. If you want to allow L2TP clients to access your default VLAN, you must go to the Firewall > Access Control > ACL Rules page to manually create a firewall rule as follows:

Field	Setting
From Zone	VPN
To Zone	LAN
Service	Any
Source Address	l2tp_clients **NOTE:** Choose **Create a new address** from the drop-down list to create an address object “l2tp_clients” with the IP address range of L2TP server’s address pool.
Destination Address	DEFAULT_NETWORK
Schedule	Always on
Match Action	Permit

Configuring VPN Passthrough

Use the VPN Passthrough page to configure VPN Passthrough to allow VPN traffic that originates from VPN clients to pass through your security appliance. Use this feature if there are devices behind your security appliance that need the IPSec tunnels to be set up independently, such as connecting to another router on the WAN.

STEP 1 Click **VPN > VPN Passthrough.**

The VPN Passthrough window opens.

STEP 2 Specify the type of traffic that can pass through the security appliance:

- **Layer-2 Tunneling Protocol (L2TP):** Click **On** to allow L2TP tunnels to pass through the security appliance, or click **Off** to disable it.
- **Point-to-Point Tunneling Protocol (PPTP):** Click **On** to allow PPTP tunnels to pass through the security appliance, or click **Off** to disable it.
- **Internet Protocol Security (IPsec):** Click **On** to allow IP security tunnels to pass through the security appliance, or click **Off** to disable it.

STEP 3 Click **Save** to apply your settings.