ADMINISTRATION GUIDE

Cisco Small Business

RV220W Wireless-N Network Security Firewall

78-19743-01 D0

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Introduction

This introduction provides information to familiarize you with the product features and help you get started using the web-based Configuration Utility.

Refer to these topics:

Product Overview

Thank you for choosing the Cisco Small Business RV220W Wireless-N Network Security Firewall. The Cisco RV220W is an advanced Internet-sharing network solution for your small business needs. It allows multiple computers in your office to share an Internet connection through both wired and wireless connections.

The RV220W Network Security Firewall delivers high-performance, high security, wired and wireless connectivity—to the Internet, other offices, and employees working remotely—to speed file transfers and help improve the productivity of employees in a small office. Hybrid VPN capabilities, supporting both IP Security (IPsec) and Secure Sockets Layer (SSL) VPN, provide flexibility to connect remote offices as if they were physically attached to the network and extend controlled network access to partners and others. Business-class security and optional cloud-based web threat protection help keep the network and business assets safe.

Configuring the RV220W

After connecting your equipment, use the web-based Configuration Utility to configure your RV220W.

The Cisco RV220W tries to automatically detect and configure your Internet settings. However, in some cases you might need to manually configure some settings using the Device Manager. At a minimum, you should change the default administrator name and password, and set up wireless security. See these topics for more information about getting started in the Configuration Utility:

- **Setting Up the Cisco RV220W Using the Setup Wizard**
- **Using the Getting Started Page**
- **Features of the User Interface**
- **Suggested Next Steps**

NOTE For information about installation, see **Appendix A, "Installing the Cisco RV220W."**

Logging In

STEP 1 Connect a PC to a LAN port of the Cisco RV220W. If DHCP is enabled (the default setting), your PC becomes a DHCP client of the RV220W and receives an IP address in the 192.168.1.xxx range.

Note: You may need to configure your PC to obtain its IP address from a DHCP server.

STEP 2 Start a web browser on your PC.

STEP 3 In the Address bar, enter the LAN IP address of the RV220W. (default 192.168.1.1).

Note: If Bonjour is enabled (the default setting), the RV220W advertise its record information to any browsing device attached to its network. As a result, you run Bonjour or FindIT on your PC to automatically discover the RV220W.

The browser may display a message about the site's security certificate. The RV220W uses a self security certificate and this message appears because the RV220W is not known to your PC. You can safely click **Continue** (or the option shown on your particular web browser) to go to the web site.

STEP 4 When the login page appears, enter the user name and password. The default user name is **cisco**. The default password is **cisco**. Passwords are case sensitive.

Note: To prevent unauthorized access, use the *Administration > User Management > Users* page to configure more secure login credentials as soon as possible.

STEP 5 Click **Log In**.

Setting Up the Cisco RV220W Using the Setup Wizard

With the Cisco RV220W powered on and connected to a PC, use the Setup Wizard to configure the network settings.

To use the Setup Wizard:

STEP 1 After logging in to the configuration utility, click **Run Setup Wizard** in the navigation tree.

STEP 2 Follow the on-screen instructions to set up the Cisco RV220W.

The Setup Wizard tries to automatically detect and configure your connection. If it cannot, the Setup Wizard asks you for information about your Internet connection. If you do not have the required information, contact your Internet Service Provider (ISP) to obtain it.

During the setup process, the Setup Wizard asks you to enter a new password. To protect your router from unauthorized access, create a new password that is hard to guess. While you are entering the password, the Setup Wizard provides you with instant feedback regarding the strength of the password.

After the Setup Wizard is done configuring the Cisco RV220W, the **Getting Started** page appears. See **Using the Getting Started Page, page 13** for more information.

Using the Getting Started Page

Use the links on the *Getting Started* page to perform the most common configuration tasks. Click a link to perform a task. After performing a task, be sure to save your new settings. To return to the *Getting Started* page, click **Getting Started** in the navigation tree.

NOTE When you get a new router, be sure to check Cisco.com for firmware updates. Then in the *Quick Access* section of the *Getting Started* page, use the **Update Device Firmware** link to install your new firmware.

The *Getting Started* page includes these sections:

- **Initial Settings—**These links are for common tasks that most users need to perform to configure the Cisco RV220W for the first time. Although the default settings are sufficient for many small businesses, you should use these links to review the settings and make changes as needed.
- **Quick Access—**These links are for common tasks that may be applicable to your network.
- **Device Status—**These links provide access to status information for your network. After configuring your settings, you should use these links to verify the configuration.

The *Other Resources* section includes these links:

- **Support—**Click the link to visit the Cisco RV Series Routers page on Cisco.com. This page provides links to technical documentation, product literature, and other resources.
- **Forums**—Click this link to visit the Cisco Small Business Support Community on Cisco.com.

To prevent the *Getting Started* page from showing when the Device Manager is started, check **Don't show this on start-up**.

Features of the User Interface

- Navigating through the pages

  Use the navigation tree in the left pane to open the configuration pages. Click a menu item on the left panel to expand it. Click the menu names displayed underneath to perform an action or view a sub-menu.

- Saving your changes

  Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. If a page was opened by using an Add or Edit button, you can click **Back** to return to the referring page.

- Viewing the Help files

  To view more information about a configuration page, click the **Help** link near the top right corner of the page.

Suggested Next Steps

Cisco recommends that you change some default settings to provide better security and performance. In addition, you may need to manually configure some settings. A suggested outline of steps follows:

- Change the administrator name and password. See **Users, page 163**.
- Change the idle timeout value. The Device Manager, by default, logs you out after 10 minutes of inactivity. For more information, see **User Management, page 158**.
- Enable remote management, which is a convenience to you when configuring the router, and which is required if you want to enable a VPN. See **User Management, page 158**.
- If your connection is not working, or your Internet service requires a login account and password, see **WAN Settings for IPv4, page 16**.
- If you already have a DHCP server on your network, and you do not want the Cisco RV220W to act as a DHCP server, see **LAN Configuration for IPv4, page 22**.
- Configure your wireless network, especially wireless security. See **Chapter 3, "Configuring the Wireless Network."**
- Configure your Virtual Private Network (VPN).
  - You can quickly set up a Gateway-to-Gateway or Client-to-Gateway VPN by using the *VPN > Basic VPN Setup* page. For more information, see **Basic VPN Setup, page 109**.
  - Alternatively, for a simpler VPN setup, you can enable remote management, configure user accounts, and distribute Cisco QuickVPN to your remote workers. The Cisco QuickVPN software is found on the CD that shipped with your router. Also see **Using Cisco QuickVPN, page 218**.

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Configuring Networking

The *Networking* menu provides access to configuration pages where you can configure your WAN, LAN, and other IPv4 and IPv6 network settings.

Refer to these topics:

- **WAN Settings for IPv4, page 16**
- **LAN Configuration for IPv4, page 22**
- **Routing, page 31**
- **Port Management, page 37**
- **Dynamic DNS, page 38**
- **IPv6, page 39**

WAN Settings for IPv4

Use the *Networking* > *WAN* menu to set up your Internet connection for your IPv4 network.

- **Configuring the IPv4 WAN Settings, page 17**
- **PPPoE Profiles for Point-to-Point Protocol over Ethernet Connections, page 20**

NOTE For instructions on configuring your RV220W for an IPv6 network, see the **"IPv6" section on page 39**.

Configuring the IPv4 WAN Settings

Follow these instructions to configure your Internet connection for your IPv4 network.

NOTE If your service provider requires PPPoE, first configure a PPPoE profile. See **PPPoE Profiles for Point-to-Point Protocol over Ethernet Connections, page 20**.

To open this page: In the navigation tree, choose **Networking > WAN (Internet) > IPv4 WAN (Internet)**.

STEP 1 In the *Internet Connection Type* section, choose the type specified by your service provider. Then enter the required settings for the selected type.

- **Automatic Configuration - DHCP—**Choose this option if your service provider gave you a dynamic DHCP connection to the Internet, or your PC receives its IP address from your cable or DSL modem. This address can change. No additional settings are required for this connection type.
- **Static IP—**Choose this option if your service provider gave you an IP address that does not change. Enter the IP address, mask, default gateway, and DNS server information. The fields are described in the table below this step.
- **PPPoE—**Choose this option if your service provider gave you a Point-to-Point Protocol over Ethernet (PPPoE) connection to the Internet (used mainly with asymmetric DSL). In the PPPoE section, choose a **PPPoE Profile Name**. If you have not yet created PPPoE profiles, click the **Configure Profile** button. For more information, see **PPPoE Profiles for Point-to-Point Protocol over Ethernet Connections, page 20**.
- **PPTP—**Choose this option if your service provider gave you a Point-to-Point Tunneling Protocol (PPTP) connection to the Internet (used in Europe). In the PPTP section, enter your user name, password, and connection type, IP address, and server IP address. Also enable encryption if supported. The fields are described in the table below this step.
- **L2TP—**Choose this option if your service provider gave you a Layer 2 Tunneling Protocol (L2TP) connection to the Internet (used in Europe). In the L2TP section, enter your user name, password, and connection type, IP address, and server IP address. Optionally, enter the secret phrase. The fields are described in the table below this step.

IP Address or My IP Address	Enter the IP address that was assigned to your account.
Subnet Mask	Enter the subnet mask specified by your service provider.
Default Gateway	Enter the IP address of the default gateway specified by your service provider.
Primary DNS Server, Secondary DNS Server	For domain name resolution, enter the IP address of the DNS servers specified by your service provider. The Primary DNS Server is required for a Static IP connection.
User Name	Enter the user name for your Internet account.
Password	Enter the password for your Internet account.
Secret	If required by your service provider, enter the secret phrase used to log in to the server.
MPPE Encryption	If your service provider's PPTP server supports Microsoft Point-to-Point Encryption (MPPE), check the **Enable** box.
Connection Type	Choose the connection type: ▪ **Keep Connected**—The Internet connection is always on. ▪ **Idle Time**—The Internet connection is on only when traffic is present. If the connection is idle—that is, no traffic is occurring—the connection is closed. You might want to choose this if your ISP charges based on the amount of time that you are connected. If you choose this connection type, enter the number of minutes after which the connection shuts off in the **Idle Time** field.
Server IP Address	Enter the IP address of the PPTP or L2TP server specified by your service provider.

STEP 2 In the *MTU Size* section, choose the **MTU Type**. (See **MTU (Maximum Transmission Unit)** in the glossary.)

- **Default—**Unless a change is required by your ISP, Cisco recommends that you use the default setting, 1500 bytes.
- **Custom—**If your ISP requires a custom MTU setting, choose **Custom** and enter the **MTU Size** specified by your provider.

STEP 3 In the *Router MAC Address* section, specify the MAC address source. The RV220W has a unique 48-bit local Ethernet hardware address. In most cases, the RV220W's default MAC address is used to identify your Cisco RV220W to your ISP. However, you can change this setting if required by your ISP.

- **Use Default Address** (recommended).
- **Use this computer's MAC—**Choose this option to assign the MAC address of the computer that you are using to configure the RV220W.
- **Use This MAC—**Choose this option if you want to manually enter a MAC Address that is expected by your ISP. Then enter a **MAC Address** in the format of XX:XX:XX:XX:XX:XX, where X is a number from 0 through 9 or a letter from A through F.

STEP 4 Click **Save** to save your settings, or click **Cancel** to redisplay the page with the current settings.

PPPoE Profiles for Point-to-Point Protocol over Ethernet Connections

If you have a Point-to-Point Protocol over Ethernet (PPPoE) connection to the Internet (used mainly with asymmetric DSL), create a PPPoE profile for your PPPoE connection. You can create multiple profiles, which are useful if you connect to the Internet using different service provider accounts.

- **Managing PPPoE Profiles, page 20**
- **Adding and Editing PPPoE Profile Settings, page 21**

Managing PPPoE Profiles

Use the *Networking > WAN (Internet) > PPPoE Profiles* page to view, add, edit, or delete PPPoE profiles.

To open this page: In the navigation tree, choose **Networking > WAN (Internet) > PPPoE Profiles**.

Perform these tasks:

- To add a profile, click **Add**. Then enter the settings on the *Add/Edit PPPoE Profile Configuration* page. See **Adding and Editing PPPoE Profile Settings, page 21**.
- To edit a profile, check the box and then click **Edit**. Then enter the settings on the *Add/Edit PPPoE Profile Configuration* page. See **Adding and Editing PPPoE Profile Settings, page 21**.
- To delete a profile, check the box and then click **Delete**. To select all profiles, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Adding and Editing PPPoE Profile Settings

Use the *Add/Edit PPPoE Profile Configuration* page to enter the settings for a PPPoE profile.

To open this page: From the *Networking > WAN (Internet) > PPPoE Profiles* page, click **Add** or select a profile and then click **Edit**.

STEP 1 Enter this information:

- **Profile Name—**Enter a descriptive name to identify the profile (for example, "ISPOne").
- **Username—**Enter the user name for accessing your ISP account (for example, *john@ISPname.net*).
- **Password—**Enter the password for accessing your ISP account.
- **Authentication Type—**Choose one of the following options:
  - **Auto-negotiate—**The server sends a configuration request specifying the security algorithm set on it. The RV220W then sends back authentication credentials with the security type sent earlier by the server.
  - **PAP—**The RV220W uses Password Authentication Protocol (PAP) when connecting with the ISP.
  - **CHAP—**The RV220W uses Challenge Handshake Authentication Protocol (CHAP) when connecting with the ISP.
  - **MS-CHAP—**The RV220W uses Microsoft Challenge Handshake Authentication Protocol when connecting with the ISP.
  - **MS-CHAPv2—**The RV220W uses Microsoft Challenge Handshake Authentication Protocol Version 2 when connecting with the ISP.
- **Connection Type—**Choose one of the following options:
  - **Keep Connected—**The Internet connection is always on.
  - **Idle Time—**The Internet connection is on only when traffic is present. If the connection is idle—that is, no traffic is occurring—the connection is closed. You might want to choose this if your ISP charges based on the amount of time that you are connected. If you choose this connection type, enter the number of minutes after which the connection shuts off in the **Idle Time** field.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

LAN Configuration for IPv4

Use the *Network > LAN (Local Network)* menu to set up your IPv4 LAN. This menu includes the following options:

- **IPv4 LAN (Local Network), page 22**
- **VLAN Membership, page 24**
- **Multiple VLAN Subnets, page 26**
- **Static DHCP, page 28**
- **Advanced DHCP Configuration, page 29**
- **DHCP Leased Clients, page 30**
- **Jumbo Frames, page 30**

NOTE For IPv6 LAN configuration, see **Configuring IPv6 LAN Properties, page 41**.

IPv4 LAN (Local Network)

For most applications, the default settings are satisfactory. You can make changes to suit your requirements. For example, you may want to make the following types of changes:

- **DHCP server options:** If you want another PC on your network to be the DHCP server, or if you are manually configuring the network settings of all of your PCs, disable DHCP.
- **DNS server or WINS server:** Instead of using a DNS server, you can use a Windows Internet Naming Service (WINS) server. A WINS server is the equivalent of a DNS server but uses the NetBIOS protocol to resolve hostnames. The RV220W includes the WINS server IP address in the DHCP configuration when acknowledging a DHCP request from a DHCP client. You can also enable a DNS proxy. When enabled, the RV220W then acts as a proxy for all DNS requests and communicates with the ISP's DNS servers. When disabled, all DHCP clients receive the DNS IP addresses of the ISP.

- **IP address range:** If machines on your LAN use different IP address ranges (for example, 172.16.2.0 or 10.0.0.0), you can add aliases to the LAN port to give PCs on those networks access to the Internet. This allows the RV220W to act as a gateway to additional logical subnets on your LAN. You can assign the RV220W an IP address on each additional logical subnet.

To open this page: In the navigation tree, choose **Networking** > **LAN (Local Network)** > **IPv4 LAN (Local Network)**.

STEP 1 In the *Network* section, keep the default **Host Name**, or enter a new name to identify your router. This field allows alpha-numeric characters and the hyphen.

The default host name consists of the word “router” followed by the last 3 bytes of LAN MAC address (in Hex-decimal form). This allows the Cisco FindIT Network Discovery Utility to identify Cisco Small Business devices on the LAN.

STEP 2 In the *LAN (Local Network) Configuration* section, keep the default **IP Address** and **Subnet Mask**, or change them as needed for your network.

Note: If you change the LAN IP address, you will need to use the new IP address to launch the configuration utility. You may need to release and renew the IP address of your PC, if using DHCP, or configure a static IP address in the same subnet as the RV220W.

STEP 3 In the *DHCP* section, choose the **DHCP Mode** and enter the required settings.

Note: If you need to reserve IP addresses for devices on your network, click the **Configure Static DHCP** button. For more information, see **Static DHCP, page 28**.

- **DHCP Server**—Choose this option to allow the Cisco RV220W to dynamically assign IP addresses to devices in the network. By default, the Cisco RV220W functions as a DHCP server to the hosts on the Wireless LAN (WLAN) or LAN network and assigns IP and DNS server addresses. With DHCP enabled, the RV220W's IP address serves as the gateway address to your LAN. The PCs in the LAN are assigned IP addresses from a pool of addresses. Each address is tested before it is assigned to avoid duplicate addresses on the LAN. If you choose this option, enter this information:
  - **Domain Name**—Enter the domain name for your network (optional).
  - **Starting and Ending IP Address**—Enter the first and last of the contiguous addresses in the IP address pool. Any new DHCP client joining the LAN is assigned an IP address in this range. You can save part of the range for PCs with fixed addresses. These addresses should be in the same IP address subnet as the RV220W's LAN IP address.

- **Primary and Secondary DNS Server**—DNS servers map Internet domain names (for example, www.cisco.com) to IP addresses. Enter the server IP addresses in these fields if you want to use different DNS servers than are specified in your WAN settings.
- **Lease time**—Enter the duration (in hours) for which IP addresses are leased to clients.

- **DHCP Relay**—Choose this option to enable the relay gateway to transmit DHCP messages from a DHCP server on another subnet. Then enter the address of the DHCP server in the **Remote DHCP Server** field.
- **None**—Use this to disable DHCP on the Cisco RV220W. If you want another device on your network to be the DHCP server, or if you are manually configuring the network settings of all of your PCs, disable DHCP.

STEP 4 In the **LAN (Local Network) Proxy** section, check **Enable** to enable the Cisco RV220W to act as a proxy for all DNS requests and to communicate with the ISP's DNS servers.

STEP 5 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

VLAN Membership

Use the *Networking > LAN (Local Network) > VLAN Membership* page to enable, create, and manage **VLAN (Virtual LAN)**s. The router is configured with a default VLAN, VLAN 1, and all devices are members.

Up to four new VLANs can be created. The configured VLANs are listed in the *VLAN Membership Table*.

To open this page: Choose **Networking** > **LAN (Local Network)** > **VLAN Membership**.

STEP 1 Check the **VLAN Enable** box to enable the creation and management of additional VLANs. To disable this feature, uncheck the box.

STEP 2 Perform these tasks:

- To add a new VLAN, click **Add Row**. Then enter these settings:
  - **VLAN ID—**Enter a numerical VLAN ID that will be assigned to endpoints in the VLAN membership. The VLAN ID can range from 2 to 4094. VLAN ID 1 is reserved for the default VLAN, which is used for untagged frames received on the interface, and VLAN ID 4092 is reserved and cannot be used. After a new VLAN entry is saved, the VLAN ID cannot be changed.
  - **Description—**Enter a short description to identify this VLAN.
  - **Inter VLAN Routing—**Check the box to enable routing between this and other VLANS, or uncheck the box to disable this feature.
  - **Device Management—**Check the box to enable this feature, or uncheck the box to disable it. This setting determines whether or not clients can access the Cisco RV220W Configuration Utility on this VLAN. To prevent access to this utility from this VLAN, disable this feature.
  - **Port 1-4—**For each of the ports, choose one of the following options:
  - **Tagged**—Used when connecting to switches carrying multiple VLANs.
  - **Untagged**—Access ports connecting to end devices like printers and workstations.
- To change the settings for an existing VLAN, check the box and then click **Edit**. To select all VLANs, check the box in the heading row. Then edit the settings as described above.
- To delete a VLAN, check the box and then click **Delete**. To select all VLANs, check the box in the heading row. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Multiple VLAN Subnets

When you create a VLAN, a subnet is created automatically for the VLAN. You can then further configure the subnet properties, including the IP address, the subnet mask, and the DHCP settings.

- Viewing the Multiple VLAN Subnets Table, page 26
- Entering the Multiple VLAN Subnets Properties, page 26

Viewing the Multiple VLAN Subnets Table

To open this page: In the navigation tree, choose **Networking** > **LAN (Local Network)** > **Multiple VLAN Subnets**.

VLANs are listed in the table. The information includes the IP address, the subnet mask, the DHCP mode (DHCP Server or DHCP Relay), and the DNS Proxy Status (Enabled or Disabled).

To edit the VLAN subnet properties, check the box and then click **Edit**. Then enter the settings on the *Edit Multiple VLAN Subnet* page. See **Entering the Multiple VLAN Subnets Properties, page 26**.

Entering the Multiple VLAN Subnets Properties

To open this page: Choose **Edit** on the *Networking > LAN (Local Network) > Multiple VLAN Subnets* page.

STEP 1 In the *LAN (Local Network) Configuration* section, keep the default **IP Address** and **Subnet Mask**, or change them as needed for your network.

Note: If you change the LAN IP address of VLAN 1, you will need to use the new IP address to launch the configuration utility. You may need to release and renew the IP address of your PC, if using DHCP, or configure a static IP address in the same subnet as the RV220W.

STEP 2 In the *DHCP* section, choose the **DHCP Mode** and enter the required settings.

Note: If you need to reserve IP addresses for devices on your network, click the **Configure Static DHCP** button. For more information, see **Static DHCP, page 28**.

- **DHCP Server**—Choose this option to allow the Cisco RV220W to dynamically assign IP addresses to devices in the VLAN subnet. By default, the Cisco RV220W functions as a DHCP server to the hosts in the subnet. If you choose this option, enter this information:
  - **Domain Name**—Enter the domain name for the VLAN subnet (optional).

- **Starting and Ending IP Address**—Enter the first and last of the contiguous addresses in the IP address pool for this subnet. Any new DHCP client joining the LAN is assigned an IP address in this range. You can save part of the range for PCs with fixed addresses. These addresses should be in the same IP address subnet as the VLAN IP address that you specified above.
- **Primary and Secondary DNS Server**—DNS servers map Internet domain names (for example, www.cisco.com) to IP addresses. Enter the server IP addresses in these fields if you want to use different DNS servers than are specified in your WAN settings.
- **Lease time**—Enter the duration (in hours) for which IP addresses are leased to clients.

▪ **DHCP Relay**—Choose this option to enable the relay gateway to transmit DHCP messages between multiple subnets. Then enter the address of the relay gateway in the **Relay Gateway** field.

▪ **None—**Use this to disable DHCP on the VLAN subnet. If you want another device on your network to be the DHCP server for devices on the VLAN subnet, or if you are manually configuring the network settings of all of your computers, disable DHCP.

STEP 3 In the **LAN (Local Network) Proxy** section, check **Enable** to enable the VLAN subnet to act as a proxy for all DNS requests and to communicate with the ISP's DNS servers.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. If you are connected to the Cisco RV220W by the LAN port that is a member of this VLAN, the system reboots and connects you to the RV220W using its new IP address.

Static DHCP

You can configure a static IP Address and MAC Address for a known computer or device on the LAN network from the LAN Interface menu.

To open this page: In the navigation tree, choose **Networking** > **LAN (Local Network)** > **Static DHCP.** Or from the *Networking > LAN (Local Network) > IPv4 LAN (Local Network)* page, click **Configure Static DHCP**.

STEP 1 Perform one of these tasks:

- To reserve a static IP address for a client, click **Add**. Then enter the settings, as described below.
  - **IP Address—**Enter the IP address of the device. This address should be outside the DHCP address range specified on the *Networking > LAN (Local Network) > IPv4 LAN (Local Network)* page. The DHCP server will serve the reserved IP address only to the device with the corresponding MAC address.
  - **MAC Address—**Enter the MAC address of the device, without punctuation. The punctuation is added automatically, using the following format: XX:XX:XX:XX:XX:XX where X is a number from 0 to 9 (inclusive) or an alphabetical letter between A and F (inclusive).
- To edit an entry, check the box and then click **Edit**. To select all entries, check the box in the heading row. Then enter the settings, as described above.
- To delete an entry, check the box and then click **Delete**. To select all entries, check the box in the heading row.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. After saving or canceling, you can add, edit, or delete other entries.

Advanced DHCP Configuration

You can configure the Cisco RV220W to download a configuration file from a TFTP server by using Option 66, Option 67, and Option 160. You also can associate different client devices with different configuration files. When you reboot the router, it will download the specified files.

To open this page: Choose **Networking** > **LAN (Local Network)** > **Advanced DHCP Configuration**.

STEP 1 In the **Automatic Configuration Download** section, configure automatic download of configuration files:

- Check **Enable** to enable downloading of configuration files. Uncheck the box to disable this feature.
- Choose the **TFTP Server Type**:
  - **Host Name**—Choose this option to identify the server by its host name. Enter the host name of the TFTP server in the TFTP server host name field.
  - **Address**—Choose this option to identify the server by its IP address. Enter the IP address in the TFTP Server IP field.

STEP 2 Click **Save** to enable the downloads, or click **Cancel** to reload the page with the current settings.

Note: The mapping table is available only if you enabled Automatic Configuration Download and saved the settings.

STEP 3 In the **DHCP Client Device vs. Configuration File Mapping Table**, perform these tasks:

- To specify a configuration file for a device that is not listed, click **Add**. Then enter the settings, as described below.
  - **IP Address**—Enter the IP address of the device. This address should be outside the DHCP address range specified on the *Networking > LAN (Local Network) > IPv4 LAN (Local Network)* page. The DHCP server will serve the reserved IP address only to the device with the corresponding MAC address.
  - **MAC Address**—Enter the MAC address of the device, without punctuation. The punctuation is added automatically, using the following format: XX:XX:XX:XX:XX:XX where X is a number from 0 to 9 (inclusive) or an alphabetical letter between A and F (inclusive).

- **Configuration Filename—**Enter the filename of the configuration file to use for the device with the specified MAC address.

- To edit an entry, check the box and then click **Edit**. Then enter the settings, as described above.
- To delete an entry, check the box and then click **Delete**.

STEP 4 Click **Save** to save the settings, or click **Cancel** to reload the page with the current settings. After this step, you can add, edit, or delete other entries.

DHCP Leased Clients

Use the *Networking > LAN (Local Network) > DHCP Leased Client* page to view the endpoints that are receiving IP addresses from the Cisco RV220W's DHCP server.

To open this page: In the navigation tree, choose **Networking** > **LAN (Local Network)** > **DHCP Leased Client**.

The endpoints are listed by IP address and MAC address. You cannot edit this list.

Jumbo Frames

Use the *Jumbo Frames* page to allow devices to send frames within the LAN containing up to 9,000 bytes of data per frame. A standard Ethernet frame contains 1,500 bytes of data.

To open this page: Choose **Networking** > **LAN (Local Network)** > **Jumbo Frames**.

STEP 1 Check the **Enable** box to enable this feature. Uncheck the box to disable it.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Routing

Use the *Networking* > *Routing* menu to configure the following features:

- **Routing Mode, page 31**
- **Routing Table, page 32**
- **Static Routes, page 33**
- **Dynamic Routing, page 35**

Routing Mode

The Cisco RV220W provides two different routing modes: Gateway (NAT) and Router.

To open this page: In the navigation tree, choose **Networking** > **Routing** > **Routing Mode**.

STEP 1 Choose one of the following options:

- **Gateway (NAT)—**If your ISP has assigned you a single IP address, select this option to use **Network Address Translation (NAT)** to allow devices in your private network to share your public IP address.
- **Router—**This routing mode, “classical routing,” is used if your ISP has assigned you multiple IP addresses so that you have an IP address for each endpoint on your network. You must configure either static or dynamic routes if you use this type of routing. See **Static Routes, page 33**, or **Dynamic Routing, page 35**.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Routing Table

Use the *Networking* > *Routing* > *Routing Table* page to view routing information your network.

To open this page: In the navigation tree, choose **Networking** > **Routing** > **Routing Table.**

To display the IPv4 or IPv6 routing table, click the corresponding **Display** button.

IPv4 Routing Information

- **Destination**—Destination host/network IP address for which this route is added.
- **Gateway**—The gateway used for this route.
- **Genmask**—The netmask for the destination network.
- **Flags**—For debugging purpose only; possible flags include:
  - **U**—Route is up.
  - **H**—Target is a host.
  - **G**—Use gateway.
  - **R**—Reinstate route for dynamic routing.
  - **D**—Dynamically installed by daemon or redirect.
  - **M**—Modified from routing daemon or redirect.
  - **A**—Installed by *addrconf.*
  - **C**—Cache entry.
  - **!**—Reject route.
- **Metric**—The distance to the target (usually counted in hops).
- **Ref**—Number of references to this route.
- **Use**—Count of lookups for the route. Depending on the use of -F and -C, this is either route cache misses (-F) or hits (-C).
- **Iface**—Interface to which packets for this route will be sent.

IPv6 Routing Information

- **Destination**—Destination host/network IP address for which this route is added.
- **Next Hop**—IP address of the gateway/router through which the destination host/network can be reached.

Static Routes

You can configure a **static routing** to direct packets to the destination network. Static routes can be used together with dynamic routes. Be careful not to introduce routing loops in your network.

- **Managing Static Routes, page 33**
- **Configuring Static Routes, page 34**

Managing Static Routes

Use the *Networking* > *Routing* > *Static Routes* page to view, add, edit, and delete static routes.

To open this page: In the navigation tree, choose **Networking** > **Routing** > **Static Routes**.

Perform these tasks:

- To add a new route, click **Add**. Then enter the settings on the *Add / Edit Static Route Configuration* page. For more information, see **Configuring Static Routes, page 34**.
- To edit a route, check the box, and then click **Edit**. Then enter the settings on the *Add / Edit Static Route Configuration* page. For more information, see **Configuring Static Routes, page 34**.
- To delete a route, check the box, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise, click **Cancel**.

Configuring Static Routes

Use the *Add / Edit Static Route Configuration* page to configure a static route.

To open this page: From the *Network* > *Routing* > *Static Routes* page, click **Add** or select a route and then click **Edit**.

STEP 1 Enter this information:

- **Route Name—**Enter a name to identify this routing in the *Static Route* table.
- **Active—**If a route is to be immediately active, check **Enable**. If Enable is not checked, the route is added in an inactive state. It will be listed in the routing table, but will not be used by the RV220W. The route can be enabled later. This feature is useful if the network that the route connects to is not available when you add the route. When the network becomes available, the route can be enabled.
- **Private—**Check the **Enable** box to mark this route as private, which means that it will not be shared in a Routing Information Protocol (RIP) broadcast or multicast. Uncheck this box if the route can be shared with other routers when RIP is enabled.
- **Destination IP Address—**Enter the IP address of the destination host or network to which the route leads. For a standard Class C IP domain, the network address is the first three fields of the Destination LAN IP; the last field should be zero.
- **IP subnet mask—**Enter the IPv4 Subnet Mask for the destination host or network. For Class C IP domains, the Subnet Mask is 255.255.255.0.
- **Interface—**Choose the physical network interface through which this route is accessible (**WAN**, **LAN**, or a VLAN you have created).
- **Gateway IP Address—**Enter the IP Address of the gateway through which the destination host or network can be reached. If this router is used to connect your network to the Internet, then your gateway IP is the router's IP address. If you have another router handling your network's Internet connection, enter the IP address of that router instead.
- **Metric—**Enter a value between 2 and 15 to define the priority of the route. If multiple routes to the same destination exist, the route with the lowest metric is chosen.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Network > Routing > Static Routes* page.

Dynamic Routing

Use the *Networking > Routing > Dynamic Routing* page to enable and configure Routing Information Protocol (RIP). RIP is an Interior Gateway Protocol (IGP) that is commonly used in internal networks. When RIP is enabled, the Cisco RV220W can exchange its routing information automatically with other routers and can dynamically adjust its routing tables to adapt to changes in the network.

NOTE RIP is disabled by default on the Cisco RV220W.

To open this page: In the navigation tree, choose **Networking** > **Routing** > **Dynamic Routing**.

STEP 1 In the *RIP Configuration* section, enter these settings:

- **RIP Direction—**Choose one of the following options:
  - **None—**The RV220W neither broadcasts its route table nor does it accept any RIP packets from other routers and RV220Ws. This option disables RIP.
  - **In Only—**The RV220W accepts RIP information from other routers and RV220Ws, but does not broadcast its routing table.
  - **Out Only—**The RV220W broadcasts its routing table periodically but does not accept RIP information from other routers and RV220Ws.
  - **Both—**The RV220W both broadcasts its routing table and also processes RIP information received from other routers and RV220Ws.
- **RIP Version—**Choose one of the following options:
  - **Disabled—**RIP is not used.
  - **RIP-1—**This is a class-based routing version that does not include subnet information. RIP-1 is the most commonly supported version.
  - **RIP-2B—**This version broadcasts data in the entire subnet.
  - **RIP-2M—**This version sends data to multicast addresses.

STEP 2 For RIP v2, in the *Authentication for RIP v2* section, check or uncheck the **Enable** box to enable or disable authentication. This section of the page is available only if you chose In, Out, or Both for the RIP Direction and either RIP-2B or RIP-2M for the RIP Version.

RIP v2 authentication forces authentication of RIP packets before routes are exchanged with other routers. It acts as a security feature because routes are exchanged only with trusted routers in the network. RIP authentication is disabled by default. You can enter two key parameters so that routes can be exchanged with multiple routers and RV220Ws present in the network. The second key also acts as a failsafe when authorization with first key fails.

STEP 3 If you enabled RIP v2 authentication, enter the following first and second key parameters, as described below. This section of the page is available only if you enabled RIP v2 Authentication.

- **MD5 Key ID**—Input the unique MD-5 key ID used to create the Authentication Data for this RIP v2 message.
- **MD5 Authentication Key**—Input the authentication key for this MD5 key. The authentication key is encrypted and sent along with the RIP-V2 message.
- **Not Valid Before**—Enter the start date and time when the authentication key is valid for authentication.
- **Not Valid After**—Enter the end date and time when the authentication key is valid for authentication.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Port Management

The Cisco RV220W has four LAN ports and a dedicated WAN port. You can enable or disable ports, configure the duplex mode, and set the port speed.

To open this page: In the navigation tree, choose **Networking** > **Port Management**.

STEP 1 Update the port settings as needed:

- **Enable—**Check this box to enable a port, or uncheck this box to disable the port. By default, all ports are enabled. The LAN 1 port is always enabled and cannot be disabled.
- **Auto Negotiation—**Check this box to allow the RV220W and network determine the optimal port settings (recommended). Uncheck this box to manually set the duplex mode and speed. Auto Negotiation is enabled by default. This setting is available only when the **Enable** box is checked.
- **Duplex—**If you disabled Auto Negotiation, choose either half- or full-duplex based on the port support. The default is full-duplex for all ports. This setting is available only when the **Auto Negotiation** box is unchecked.
- **Speed—**If you disabled Auto Negotiation, choose one of the following port speeds: **10 Mbps**, **100 Mbps**, or **1000 Mbps**. The default setting is 1000 Mbps for all ports. This setting is available only when the **Auto Negotiation** box is unchecked. You can change the port speed if a network is designed to run at a particular speed, such as 10 Mbps mode. For example, you may want to change the port to 10 Mbps if the endpoint also uses 10 Mbps mode, either by auto-negotiation or manual setting.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Dynamic DNS

Dynamic DNS (DDNS) is an Internet service that allows routers with dynamic public IP addresses to be located by using Internet domain names. To use DDNS, set up an account with a DDNS provider such as DynDNS.com or TZO.com.

When this feature is enabled, and you have an active account with a DDNS provider, the Cisco RV220W notifies DDNS servers of changes in the WAN IP address, so that any public services on your network can be accessed by using the domain name.

To open this page: In the navigation tree, choose **Networking** > **Dynamic DNS**.

STEP 1 Select the Dynamic DNS Service you are using. Selecting **None** disables this service.

STEP 2 Enter the settings for the selected service.

- If you selected DynDNS.com, enter these settings:
  - Specify the complete **Host Name** and **Domain Name** for the DDNS service.
  - Enter the DynDNS account **Username**.
  - Enter the DynDNS account **Password**. Re-enter it in the **Confirm Password** box.
  - Check the **Use Wildcards** box to enable the wildcards feature, which allows all subdomains of your DynDNS Host Name to share the same public IP as the Host Name. You can enable this option here if not done on the DynDNS website.
  - Enter the **Update Period** in hours. This value is the interval at which the router sends updates to the Dynamic DNS Service. The default value is 360 hours.
- If you selected TZO.com, enter these settings:
  - Specify the complete **Host Name** and **Domain Name** for the DDNS service.
  - Enter the **User E-mail Address** for the TZO account.
  - Enter the **User Key** for the TZO account.

- Enter the **Update Period** in hours. This value is the interval at which the router sends updates to the Dynamic DNS Service. The default value is 360 hours.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

IPv6

The IPv6 configuration information for your RV220W is performed in several windows in the Device Manager of the Cisco RV220W. Make sure you enable IPv4 and IPv6 Dual-Stack, configure the WAN, and configure the LAN.

- **IPv6 WAN (Internet), page 40**
- **Configuring IPv6 LAN Properties, page 41**
- **Configuring IPv6 Static Routing, page 43**
- **Configuring IPv6-to-IPv4 Tunneling, page 45**
- **Configuring Router Advertisement, page 46**
- **RADVD Advertisement Prefixes, page 48**

IP Mode

To open this page: In the navigation tree, click **Networking > IPv6 > IP Mode**.

Choose one of the following options:

- **IPv4-only—**Choose this option if your network supports only IPv4 devices and does not require connectivity to IPv6 devices or networks.
- **IPv4 and IPV6 Dual-Stack—**Choose this option if your network supports IPv6 devices or needs to connect to IPv6 devices or networks.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

STEP 5 If you changed the settings, click **OK** to allow the RV220W to reboot.

IPv6 WAN (Internet)

Use the *IPv6 > IPv6 WAN (Internet)* page to configure your Cisco RV220W in an IPv4 and IPv6 Dual-Stack network. Before you can configure your IPv6 WAN settings, you need to enable **IPv4 and IPV6 Dual-Stack** mode on the *IPv6 > IP Mode* page. See the **"Configuring the IPv4 WAN Settings" section on page 17**.

NOTE If your service provider requires PPPoE, first configure a PPPoE profile. See **PPPoE Profiles for Point-to-Point Protocol over Ethernet Connections, page 20**.

To open this page: In the navigation tree, choose *IPv6 > IPv6 WAN (Internet)*.

STEP 1 In the **WAN (Internet) Address (IPv6)** section, choose the connection type specified by your service provider.

- **DHCPv6—**Choose this option if your service provider gave you a dynamic DHCP connection to the Internet, your PC receives its IP address from your cable or DSL modem. This address can change. No additional settings are required for this connection type.
- **Static IP—**Choose this option if your service provider gave you a Static IP connection to the Internet, your Internet Service Provider (ISP) has assigned you an IP address that does not change. Enter the IP address, mask, default gateway, and DNS server information. The fields are described in the table below this step.

STEP 2 If you chose **Static IPv6** as the connection type, enter the **Static IP Address** settings:

- **IPv6 Address—**Enter the IPv6 IP address assigned to your RV220W.
- **IPv6 Prefix Length—**Enter the IPv6 prefix length defined by the ISP. The IPv6 network (subnet) is identified by the initial bits of the address which are called the prefix (for example, in the IP address 2001:0DB8:AC10:FE01::, 2001 is the prefix). All hosts in the network have identical initial bits for their IPv6 address; the number of common initial bits in the network's addresses is set in this field.
- **Default IPv6 Gateway—**Enter the default IPv6 gateway address, or the IP address of the server at the ISP that this RV220W will connect to for accessing the internet.
- **Primary DNS Server, Secondary DNS Server—**Enter the primary and secondary DNS server IP addresses on the ISP's IPv6 network. DNS servers map Internet domain names (for example, www.cisco.com) to IP addresses.

STEP 3 If you chose **DHCPv6** as the connection type, choose the type of address auto-configuration:

- **Stateless Address Auto Configuration**—An ICMPv6 discover message will originate from the RV220W and is used for auto-configuration, rather than the RV220W contacting the DHCP server at the ISP to obtain a leased address.
- **Stateful Address Auto Configuration**—The RV220W connects to the ISP's DHCPv6 server for a leased address.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Configuring IPv6 LAN Properties

Use the *Networking > IPv6 > IPv6 LAN (Local Network)* page to configure your IPv6 LAN. In IPv6 mode, the LAN DHCP server is enabled by default. The DHCPv6 server assigns IPv6 addresses from configured address pools with the IPv6 Prefix Length assigned to the LAN.

To open this page: In the navigation tree, choose **Networking** > **IPv6** > **IPv6 LAN (Local Network)**.

STEP 1 In the *LAN TCP/IP Setup* section, enter these settings:

- **IPv6 Address**—Enter the IP address of the Cisco RV220W. The default IPv6 address for the gateway is fec0::1. You can change this 128-bit IPv6 address based on your network requirements.
- **IPv6 Prefix Length**—Enter number of bits in the IPv6 prefix. The IPv6 network (subnet) is identified by the initial bits of the address, called the prefix. By default, the prefix is 64-bits long. All hosts in the network have the identical initial bits in their IPv6 address; the number of common initial bits is set by the prefix length.

STEP 2 In the *DHCPv6* section, disable or enable the DHCPv6 server. When this feature is enabled, the Cisco RV220W assigns an IP address within the specified range plus additional specified information to any LAN endpoint that requests DHCP-served

addresses. If you disable DHCPv6, proceed to the next step. If you enable DHCPv6, enter these settings:

- Choose the DHCP mode.
  - S**tateless—**If you choose this option, an external IPv6 DHCP server is not required because the IPv6 LAN hosts are auto-configured by the Cisco RV220W. In this case, the Cisco RV220W advertisement daemon (RADVD) must be configured on this device, and ICMPv6 RV220W discovery messages are used by the host for auto-configuration. There are no managed addresses to serve the LAN nodes.
  - **Stateful—**If you choose this option, the IPv6 LAN host will rely on an external DHCPv6 server to provide required configuration settings.
- **Domain Name—**(Optional) Enter the domain name of the DHCPv6 server.
- **Server Preference—**Enter a number to indicate the preference level of this DHCP server. DHCP advertise messages with the highest server preference value are preferred over other DHCP server advertise messages. The range is 0 to 255. The default setting is 255.
- **DNS Servers—**Choose the DNS proxy behavior:
  - **Use DNS Proxy—**If you choose this option, the RV220W acts as a proxy for all DNS requests and communicate with the ISP's DNS servers (as configured in the WAN settings page).
  - **Use DNS from ISP—**If you choose this option, the ISP defines the DNS servers (primary/secondary) for the LAN DHCP client.
  - **Use Below—**If you choose this option, you specify the primary/secondary DNS servers to use. If you chose this option, enter the IP address of the primary and secondary DNS servers.
- **Lease/Rebind Time—**Enter the duration (in seconds) for which IP addresses will be leased to endpoints on the LAN.

STEP 3 In the *IP Address Pool Table*, manage the entries as needed. You can define the IPv6 delegation prefix for a range of IP addresses to be served by the Cisco RV220W's DHCPv6 server. Using a delegation prefix, you can automate the process of informing other networking equipment on the LAN of DHCP information specific for the assigned prefix.

- To add an entry, click **Add**. To edit an entry, check the box and then click **Edit**. Enter the starting IP address, the ending IP address, and the prefix length. The number of common initial bits in the network's addresses is set by the prefix length field.

- To remove an entry, check the box and then click **Delete**.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. After saving or cancelling, you can add, edit, or delete other entries.

Configuring IPv6 Static Routing

You can configure static routes to direct packets to the destination network. A static route is a pre-determined pathway that a packet must travel to reach a specific host or network.

Some ISPs require static routes to build your routing table instead of using dynamic routing protocols. Static routes do not require CPU resources to exchange routing information with a peer router or RV220W.

You can also use static routes to reach peer routers and RV220Ws that do not support dynamic routing protocols. Static routes can be used together with dynamic routes. Be careful not to introduce routing loops in your network.

- **Managing IPv6 Static Routes**
- **Configuring an IPv6 Static Route**

Managing IPv6 Static Routes

Use the *Networking > IPv6 > Routing* page to view, add, edit, or delete static routes.

To open this page: In the navigation tree, choose **Networking** > **IPv6** > **Routing**.

Perform these tasks:

- To add a new route, click **Add**. Then enter the settings on the *Add / Edit Static Route Configuration* page. For more information, see **Configuring an IPv6 Static Route, page 44**.
- To edit a route, check the box, and then click **Edit**. Then enter the settings on the *Add / Edit Static Route Configuration* page. For more information, see **Configuring an IPv6 Static Route, page 44**.
- To delete a route, check the box, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise, click **Cancel**.

Configuring an IPv6 Static Route

Use the *Add / Edit Static Route Configuration* page to configure an IPv6 static route.

To open this page: From the *Networking > IPv6 > Routing* page, click **Add** or select a route and then click **Edit**.

STEP 1 Enter these settings:

- **Route Name—**Enter a descriptive name to identify this route.
- **Active—**If a route is to be immediately active, check the **Enable** box. Otherwise, uncheck the box. When a route is added in an inactive state, it will be listed in the routing table, but will not be used by the Cisco RV220W. The route can be enabled later. This feature is useful if the network that the route connects to is not available when you add the route. When the network becomes available, the route can be enabled.
- **IPv6 Destination—**Enter the IPv6 address of the destination host or network for this route.
- **IPv6 Prefix Length—**Enter the number of prefix bits in the IPv6 address that define the destination subnet.
- **Interface—**Choose the physical network interface through which this route is accessible: **WAN (Internet)**, **6 to 4 Tunnel**, or **LAN (Local Network)**.
- **IPv6 Gateway—**Enter the IP Address of the gateway through which the destination host or network can be reached.
- **Metric—**Specify the priority of the route by choosing a value from 2 to 15. If multiple routes to the same destination exist, the route with the lowest metric is used.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Networking > Routing > Static Routes* page.

Configuring IPv6-to-IPv4 Tunneling

Use the *Networking* > *IPv6* > *Tunneling* page to configure 6-to-4 tunneling, which allows IPv6 packets to be transmitted over an IPv4 network.

To open this page: In the navigation tree, choose **Networking** > **IPv6** > **Tunneling**.

STEP 1 At the top of the page, enter these settings:

- **Automatic Tunneling—**Check the **Enable** box to allows traffic from a LAN IPv6 network to be tunneled through to a WAN IPv4 network, and vice versa. This feature is typically used when an end site or end user wants to connect to the IPv6 Internet using the exiting IPv4 network. Uncheck the box to disable this feature.
- **Remote End Point—**Check the **Enable** box to specify a single IPv4 end point that can be accessed through this tunnel, or otherwise uncheck the box. If you check the box, also enter the **Remote End Point IPv4 Address**.
- Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

STEP 2 In the *IPv6 Tunnel Status Table*, click **Refresh** to see the most recent data for the IPv6 tunnel (if enabled). For each tunnel, the table shows the Tunnel Name, the IPv6 Addresses, and the ISATAP Subnet Prefix.

STEP 3 In the *ISATAP Tunnel Table*, view, add, edit, or delete entries as described below.

- To add an entry, click **Add**. Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) is a method to transmit IPv6 packets between dual-stack nodes over an IPv4 network. The Cisco RV220W is one endpoint (a node) for the tunnel. You must also set a local endpoint, as well as the ISATAP Subnet Prefix that defines the logical ISATAP subnet to configure a tunnel. Enter the settings on the *Add / Edit ISATAP Tunnel Configuration* page. See **Configuring an ISATAP Tunnel, page 46**.
- To edit an entry, check the box and then click **Edit**. Then enter the settings on the *Add / Edit ISATAP Tunnel Configuration* page. See **Configuring an ISATAP Tunnel, page 46**.
- To delete an entry, check the box and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Configuring an ISATAP Tunnel

Use the *Add / Edit ISATAP Tunnel Configuration* page to configure the settings for an ISATAP tunnel. Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) is a method to transmit IPv6 packets between dual-stack nodes over an IPv4 network. The Cisco RV220W is one endpoint (a node) for the tunnel. You must also set a local endpoint, as well as the ISATAP Subnet Prefix that defines the logical ISATAP subnet to configure a tunnel.

To open this page: From the *Networking > IPv6 > 6 to 4 Tunneling* page, click **Add** or select a tunnel and then click **Edit**.

STEP 1 Enter this information:

- **Tunnel Name—**Enter a descriptive name to identify this tunnel.
- **Endpoint Address—**Enter the endpoint address for the tunnel that starts with the Cisco RV220W. If the endpoint is on the IPv4 LAN interface, click **LAN (Local Network)**. If the endpoint is not on the local network, choose **Other IP**, and then specify the **IPv4 address** of the endpoint.
- **ISATAP Subnet Prefix—**Enter the 64-bit subnet prefix that is assigned to the logical ISATAP subnet for this intranet. This setting can be obtained from your ISP or Internet registry, or derived from RFC 4193.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Networking > IPv6 > 6 to 4 Tunneling* page.

Configuring Router Advertisement

Use the *Networking > IPv6 > Router Advertisement* page to enable the **RADVD (Router Advertisement Daemon)** and to enter the key parameters that the router advertises about the local network. These settings are used for address auto-configuration and routing.

To open this page: In the navigation tree, choose **Networking** > **IPv6** > **Router Advertisement**.

STEP 1 Enter these settings:

- **Router Advertisement Status—**Check the **Enable** box to enable this feature, or uncheck the box to disable it. When this feature is enabled, messages are sent by the router periodically and in response to solicitations.

A host uses the information to learn the prefixes and parameters for auto-configuration. Disabling this feature effectively disables auto-configuration, requiring manual configuration of the IPv6 address, subnet prefix, and default gateway on each device.

- **Advertise Mode—**Choose one of the following options:
  - **Unsolicited Multicast—**Select this option to send Router Advertisement messages to all interfaces in the multicast group. If you choose this option, also enter the **Advertise Interval**, which is the interval at which Router Advertisement messages are sent. Enter any value between 10 and 1800 seconds. The default is 30 seconds.
  - **Unicast only—**Select this option to send Router Advertisement messages only to well-known IPv6 addresses.
- **RA Flags—**Choose whether or not to use stateful configuration protocols. When both flags are enabled, hosts obtain addresses and other information through DHCPv6 or other methods (not router advertisements). When both flags are disabled, hosts obtain addresses and other information through router advertisements.
  - **Managed—**When enabled, this flag instructs hosts to use an administered /stateful configuration protocol (DHCPv6) to obtain stateful addresses.
  - **Other—**When enabled, this flag instructs hosts to use an administered/ stateful configuration protocol (DHCPv6) to obtain other, non-address information, such as DNS server addresses.
- **Router Preference—**Choose **Low**, **Medium**, or **High**. This preference metric is useful in a network topology in which multi-homed hosts have access to multiple routers. This metric helps a host to choose an appropriate router. If two routers are reachable, the one with the higher preference will be chosen. These values are ignored by hosts that do not implement router preference. The default setting is High.
- **MTU—**Enter the size of the largest packet that can be sent over the network. The **MTU (Maximum Transmission Unit)** is used in Router Advertisement messages to ensure that all nodes on the network use the same MTU value when the LAN MTU is not well-known. The default setting is 1500 bytes. This is the standard value for Ethernet networks. For PPPoE connections, the standard is 1492 bytes. Unless your ISP requires a different setting, this setting should not be changed.
- **Router Lifetime—**Enter the time in seconds that the Router Advertisement messages will exist on the route. The default is 3600 seconds.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

RADVD Advertisement Prefixes

If you enabled **RADVD (Router Advertisement Daemon)**, you can add RADVD advertisement prefixes to support address auto-configuration by new hosts that connect to your network.

- **Managing Advertisement Prefixes, page 48**
- **Adding and Editing Advertisement Prefixes, page 49**

Managing Advertisement Prefixes

Use the *Networking > IPv6 > Advertisement Prefixes* page to view, add, edit, or delete RADVD advertisement prefixes.

To open this page: In the navigation tree, choose **Networking** > **IPv6** > **Advertisement Prefixes**.

Perform these tasks:

- To add an entry, click **Add**. Then enter the settings on the *Add/Edit Advertisement Configuration* page. See **Adding and Editing Advertisement Prefixes, page 49**.
- To edit an entry, check the box and then click **Edit**. Then enter the settings on the *Add/Edit Advertisement Configuration* page. See **Adding and Editing Advertisement Prefixes, page 49**.
- To delete an entry, check the box and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Adding and Editing Advertisement Prefixes

Use the *Add/Edit Advertisement Configuration* page to enter the settings for an advertisement prefix.

To open this page: From the *Networking > IPv6 > Advertisement Prefixes* page, click **Add** or select an entry and then click **Edit**.

STEP 1 Choose an **IPv6 Prefix Type**. Choose the format for the prefix that precedes the 32-bit IPv4 address.

- **6to4**—Choose this option to advertise a 6to4 prefix. Generally, 6to4 tunneling is used for inter-site communication.

  If you chose **6to4** as the prefix type, enter the **SLA ID**. The Site-Level Aggregation Identifier is the interface ID of the interface on which the advertisements are sent. The default value is 1.

- **Global/Local/ISATAP**—Choose this option to advertise a global, local, or ISATAP prefix. IPv6 global addresses are globally routable, similar to IPv4 public addresses. Your ISP will typically provide you a block of globally routable IPv6 addresses that you could configure for stateless autoconfiguration. Local IPv6 addresses are similar to your IPv4 LAN addresses which are not globally routable.

  If you choose **Global/Local/ISATAP** as the prefix type, enter the following settings:

  - **IPv6 Prefix**—The IPv6 prefix specifies the IPv6 network address.
  - **IPv6 Prefix Length**—The prefix length variable is a decimal value that indicates the number of contiguous, higher-order bits of the address that make up the network portion of the address.

STEP 2 Enter the **Prefix Lifetime**, which is the number of seconds that the requesting router is allowed to use the prefix.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

3

Configuring the Wireless Network

The *Wireless* menu provides access to configuration pages where you can configure your wireless network.

Refer to these topics:

About Wireless Security

Wireless networks are convenient and easy to install. As a result, businesses with high-speed Internet access are adopting them at a rapid pace. Because wireless networking operates by sending information over radio waves, it can be more vulnerable to intruders than a traditional wired network. Like signals from your cellular or cordless phones, signals from your wireless network can also be intercepted. this information will help you to improve your security:

Wireless Security Tips

Since you cannot physically prevent someone from connecting to your wireless network, you need to take some additional steps to keep your network secure:

- Change the default wireless network name or SSID

  Wireless devices have a default wireless network name or Service Set Identifier (SSID) set by the factory. This is the name of your wireless network, and can be up to 32 characters in length.

  You should change the wireless network name to something unique to distinguish your wireless network from other wireless networks that may exist around you, but do not use personal information (such as your Social Security number) because this information may be available for anyone to see when browsing for wireless networks.

  See **Basic Settings, page 53**.

- Change the default password for the Configuration Utility.

  This router has a default password set by the factory. Hackers know these published defaults and may try to use them to access your wireless device and change your network settings. To thwart any unauthorized changes, customize the device's password so it will be hard to guess.

  See **User Management, page 158**.

- Enable MAC address filtering

  Cisco routers and gateways give you the ability to enable Media Access Control (MAC) address filtering. The MAC address is a unique series of numbers and letters assigned to every networking device. With MAC address filtering enabled, wireless network access is provided solely for wireless devices with specific MAC addresses. For example, you can specify the MAC address of each computer in your network so that only those computers can access your wireless network.

  See **MAC Filtering for Wireless Network Access Control, page 58**.

- Enable encryption

  Encryption protects data transmitted over a wireless network. Wi-Fi Protected Access (WPA/WPA2) and Wired Equivalency Privacy (WEP) offer different levels of security for wireless communication. Currently, devices that are Wi-Fi certified are required to support WPA2, but are not required to support WEP.

A network encrypted with WPA/WPA2 is more secure than a network encrypted with WEP, because WPA/WPA2 uses dynamic key encryption. To protect the information as it passes over the airwaves, you should enable the highest level of encryption supported by your network equipment.

WEP is an older encryption standard and may be the only option available on some older devices that do not support WPA.

See **Security Settings for Wireless Networks, page 56**.

- Keep wireless routers, access points, or gateways away from exterior walls and windows.
- Turn wireless routers, access points, or gateways off when they are not being used (for example, at night or during vacations).
- Use strong passphrases that are at least eight characters in length. Combine letters and numbers to avoid using standard words that can be found in the dictionary.

See **Password Rules for Password Complexity, page 156**.

General Network Security Guidelines

Wireless network security is useless if the underlying network is not secure. Cisco recommends that you take the following precautions:

- Password protect all computers on the network and individually password protect sensitive files.
- Change passwords on a regular basis.
- Install anti-virus software and personal firewall software.
- Disable file sharing (peer-to-peer). Some applications may open file sharing without your consent and/or knowledge.

Basic Settings

The Cisco RV220W provides four SSIDs or virtual access points. These networks can be configured and enabled with individual settings. You can set up multiple networks to segment the network traffic, to allow different levels of access, such as guest access, or to allow access for different functions such as accounting, billing, and so on.

NOTE One wireless network, rv220_1, is enabled by default, with SSID Broadcast enabled and no security settings. This configuration allows you to immediately begin using your wireless network. However, you should configure all of your networks with the highest possible security that is supported by your network devices.

Use the *Wireless* > *Basic Settings* page to configure the radio and other basic settings for your wireless network. This page provides access to related pages where you can configure security, MAC filtering, and Wi-Fi Multimedia quality of service values.

To open this page: In the navigation tree, choose **Wireless** > **Basic Settings**.

STEP 1 At the top of the page, enter these settings:

- **Radio—**Click **Enable** to enable the radio, or click **Disable** to disable it. By default, the radio is enabled. Disabling it prevents access to all wireless networks. The settings on this page are available only when **Enable** is selected.
- **Operating Frequency—**Choose a frequency: 2.4GHz or 5GHz.
- **Wireless Network Mode—**Choose one of the options described below. The available options depend on the selected frequency.
  - **B/G-Mixed** (2.4GHz)—Select this mode if you have devices in the network that support 802.11b and 802.11g.
  - **G Only** (2.4GHz)—Select this mode if all devices in the wireless network support 802.11g.
  - **G/N-Mixed** (2.4GHz)—Select this mode if you have devices in the network that support 802.11g and 802.11n.
  - **A Only** (5GHz)—Select this mode if all devices in the wireless network support 802.11a.

- **A/N-Mixed** (5GHz)—Select this mode to allow 802.11n and 802.11a clients to connect to this access point.
- **N Only**— (2.4GHz and 5GHz)Select this mode if all devices in the wireless network can support 802.11n.

- **Channel Bandwidth**—Choose the channel bandwidth. The available options depend on the selected wireless network mode. Choosing **Auto** (if applicable) represents 20/40 MHz.
- **Control Sideband**—This setting defines the sideband which is used for the secondary or extension channel when the access point is operating in 40 Mhz channel width. Choose **lower** or **upper**. The signal components above the carrier frequency constitute the upper sideband (USB) and those below the carrier frequency constitute the lower sideband (LSB).
- **Channel**—Choose the frequency that the radio uses to transmit wireless frames, or choose **Auto** to let the Cisco RV220W determine the best channel based on the environment noise levels for the available channels. The *Current Channel* field displays the currently selected channel and frequency. The default setting is Auto.
- **Default Transmit Power**—Enter a value in dBm that is the default transmitted power level. The default setting is 30.

STEP 2 After modifying the radio settings, click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

STEP 3 Use the *Wireless Basic Setting Table* to view information and to perform these tasks:

- To edit the basic settings for a wireless network, select a network and then click **Edit**. To select all wireless networks, check the box in the heading row. Then enter the settings as described below. After making changes, click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.
  - **Enable SSID**—Check the box to enable the wireless network, or uncheck the box to disable it. One network, rv220_1, is enabled by default.
  - **SSID Name**—Enter a unique name for this wireless network. Include up to 32 characters, using any of the characters on the keyboard. For added security, you should change the default value to a unique name.

- **SSID Broadcast—**Check the box to allow all wireless clients within range to detect this wireless network when they are scanning the local area. Disable this feature if you do not want to make the SSID known. When this feature is disabled, wireless users can connect to this wireless network only if they know the SSID (and provide the required security credentials).
- **VLAN—**Enter the VLAN ID for this wireless network, if you have configured multiple VLANs.
- **Max. Associated Clients—**Enter the maximum number of endpoints that can use this wireless network. The default value is 20. You can change this number if you want to restrict traffic on the network to prevent it from being overloaded, for example.

- To edit the security mode for a wireless network, select a network and then click **Edit Security Mode**. Enter the settings on the *Wireless > Basic Settings > Security Settings* page. See **Security Settings for Wireless Networks, page 56**.
- To restrict access to a wireless network based on MAC addresses, select a network and then click **Edit MAC Filtering**. Enter the settings on the *MAC Filtering* page. See **MAC Filtering for Wireless Network Access Control, page 58**.
- To edit the multimedia settings for a wireless network, select a network and then click **Edit WMM**. Then enter the settings on the *WMM* page. See **Wi-Fi Multimedia and Quality of Service Settings, page 60**.
- To restrict access to a wireless network based on the day and time, select a network and then click **Edit SSID Scheduling**. Then enter the settings on the *SSID Schedule* page. See **SSID Schedule for Network Availability, page 61**.

Security Settings for Wireless Networks

Use the *Wireless > Basic Settings > Security Settings* page to configure security for the selected wireless network. All devices on this network (SSID) must use the same security mode and settings to work correctly. Cisco recommends using the highest level of security that is supported by the devices in your network.

To open this page: From the *Wireless > Basic Settings* page, select a network and then click **Edit Security Mode**.

NOTE To configure a network with WPA Enterprise, WPA2 Enterprise, or WPA2 Enterprise Mixed security mode, you must first add a RADIUS Server configuration. See **Using the Cisco RV220W With a RADIUS Server, page 146**.

STEP 1 If needed, select a different network in the **Select SSID** list.

STEP 2 Enter these settings for the selected network:

- **Wireless Isolation within SSID—**Check **Enable** to prevent clients on this wireless network from accessing devices on other wireless networks. To allow access, click **Disable**.
- **Security—**Choose a security mode:
  - **Disabled—**Any device can connect to the network. **Not recommended.**
  - **Wired Equivalent Privacy (WEP)—** Weak security with a basic encryption method that is not as secure as WPA. WEP may be required if your network devices do not support WPA; however, it is not recommended.
  - **Wi-Fi Protected Access (WPA) Personal—**WPA is part of the wireless security standard (802.11i) standardized by the Wi-Fi Alliance and was intended as an intermediate measure to take the place of WEP while the 802.11i standard was being prepared. It supports TKIP/AES encryption. The personal authentication is the Preshared Key (PSK) that is an alphanumeric passphrase shared with the wireless peer.
  - **WPA Enterprise—**Allows you to use WPA with RADIUS server authentication.
  - **WPA2 Personal—**WPA2 is the implementation of security standard specified in the final 802.11i standard. It supports AES encryption and this option uses PSK based authentication.
  - **WPA2 Personal Mixed—**Allows both WPA and WPA2 clients to connect simultaneously using PSK authentication.

  - **WPA2 Enterprise**—Allows you to use WPA2 with RADIUS server authentication.
  - **WPA2 Enterprise Mixed**—Allows both WPA and WPA2 clients to connect simultaneously using RADIUS authentication.
- **Encryption Type**—An option is chosen automatically, based on the selected security mode.
  - TKIP+AES is used for WPA Personal, WPA Enterprise, WPA2 Personal Mixed, and WPA2 Enterprise Mixed.
  - AES is used for WPA2 Personal and WPA2 Enterprise.

If you chose **WPA Enterprise** or **WPA2 Enterprise Mixed**, no further settings are required. You can save the settings.

STEP 3 If you chose **WPA Personal**, **WPA2 Personal**, or **WPA2 Personal Mixed**, enter these settings:

- **WPA Key**—Enter the pre-shared key for WPA/WPA2 PSK authentication. The clients also need to be configured with the same password. As you type the password, a message indicates the strength. For a stronger password, enter at least eight characters including a variety of character types (numbers, upper- and lowercase letters, and symbols).
- **Unmask Password**—Check the box if you want to see the key as typed. Otherwise, the password is masked.
- **Key Renewal**—Enter the number of seconds after which the Cisco RV120W will generate a new key. These keys are internal keys exchanged between the Cisco RV120W and connected devices. The default value (3600 seconds) is usually adequate unless you are experiencing network problems.

STEP 4 If you chose **WEP**, enter these settings:

- **Authentication**—Choose the option that is supported by your network devices: **Open System** or **Shared Key**. In either case, the client must provide the correct shared key (password) in order to connect to the wireless network.
- **Encryption**—Choose **64-bit** or **128-bit**. 64-bit WEP has a 40-bit key, and 128-bit WEP has a 104-bit key. A larger key provides stronger encryption, because the key is more difficult to crack.

- **WEP passphrase** (Optional)—Enter an alphanumeric phrase (longer than eight characters for optimal security) and click **Generate Key** to generate four unique WEP keys in the WEP Key fields below. Otherwise, you can manually enter one or more keys in the fields.
- **WEP Key 1-4**—If you did not use the WEP Passphrase to generate keys, enter one or more valid keys. Select a key to use as the shared key that devices must have in order to use the wireless network. The length of the key must be 5 ASCII characters (or 10 hexadecimal characters) for 64-bit WEP and 13 ASCII characters (or 26 hexadecimal characters) for 128-bit WEP. Valid hexadecimal characters are "0" to "9" and "A" to "F".

STEP 5 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Wireless > Basic Settings* page.

If you need to configure the settings for another network, select it from the **Select SSID** list, and then repeat this procedure.

MAC Filtering for Wireless Network Access Control

Use the *MAC Filtering* page to permit or deny access to the wireless network based on the MAC (hardware) address of the requesting device. For example, you can enter the MAC addresses of a set of PCs and only allow those PCs to access the network. MAC filtering is configured separately for each virtual access point in the router.

To open this page: From the *Wireless > Basic Settings* page, select a network, and then click **Edit MAC Filtering**.

STEP 1 If needed, select a different network in the **Select SSID** list.

STEP 2 Click **Enable** to enable MAC filtering, or click **Disable** to disable this feature. By default, it is disabled, and a connection is allowed from any client, subject to the security settings. The other fields on the page become available after you enable this feature.

STEP 3 In the **Connection Control** section, choose one of the following options to limit access to the selected network:

- **Block**—Deny connections from the endpoints identified in the *Connection Control List*. Access is allowed from all other clients, subject to the security settings.

- **Allow**—Accept connections only from the endpoints identified in the *Connection Control List*. Access is denied from all other clients.

STEP 4 In the **Connection Control List**, enter the MAC address of each client that is subject to MAC filtering.

Tip: To view a list of current clients, you can click the **Wireless Clients List** button. Any unsaved changes on this page will be abandoned. The *Connected Clients* list displays the MAC address, connection settings, and connection time for all connected clients. To copy an address, use your mouse to select it, then right-click and choose **Copy**. You can click the browser's Back button to return to the Connection Control List, where you can paste the copied address into a MAC address field.

STEP 5 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Wireless > Basic Settings* page.

If you need to configure the settings for another network, select it from the **Select SSID** list, and then repeat this procedure.

Connected Clients

Use the *Connected Clients* page to display information about the clients that are connected to a selected wireless network

To open this page: From the *MAC Filtering* page, click the **Wireless Clients List** button.

The *Connected Clients* list displays the MAC address, connection settings, and connection time for all connected clients.

Tip: To copy an address, use your mouse to select it, then right-click and choose **Copy**. You can click the browser's Back button to return to the Connection Control List, where you can paste the copied address into a MAC address field.

Wi-Fi Multimedia and Quality of Service Settings

Use the *WMM* page to enable Wi-Fi Multimedia (WMM) quality of service features on the selected wireless network. You also can assign different processing priorities to different types of traffic.

To open this page: From the *Wireless > Basic Settings* page, select a network, and then click **Edit WMM**.

STEP 1 If needed, select a different network in the **SSID** list.

STEP 2 To enable WMM, check the **Enable** box. WMM helps in prioritizing wireless traffic according to four access categories:

- Voice (highest priority, 4)
- Video (high priority, 3)
- Best effort (medium priority, 2)
- Background (lowest priority, 1)

STEP 3 In the **DSCP to Queue** table, for each ingress DSCP, you can choose the output queue for the traffic. The Differentiated Services Code Point (DSCP) field identifies the data packet, and the output queue identifies the priority in which the packet is transmitted:

- Voice (4) or Video (3)—High priority queue, minimum delay. Typically used to send time-sensitive data such as video and other streaming media.
- Best Effort (2)—Medium priority queue, medium throughput and delay. Most traditional IP data is sent to this queue.
- Background (1)—Lowest priority queue, high throughput. Bulk data that requires maximum throughput and is not time-sensitive is typically sent to this queue (FTP data, for example).

Note: If you saved changes to the DSCP settings, you can revert to the default values by clicking the **Restore Defaults** button.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Wireless > Basic Settings* page.

If you need to edit the settings for another network, select it from the **SSID** list, and then repeat this procedure.

SSID Schedule for Network Availability

Use the *SSID Schedule* page to set a time period each day when the selected wireless network is available for use.

To open this page: From the *Wireless > Basic Settings* page, select a network, and then click **Edit SSID Scheduling**.

STEP 1 If needed, select a different network in the **Select SSID** list.

STEP 2 Enter these settings:

- **Active Time—**To enable a schedule, check the **enable** box. In this case, if a network is enabled, it is available only between the specified **Start Time** and **Stop Time**. To disable a schedule, uncheck the box. In this case, if a network is enabled, it is always available.
- **Start Time—**Use the lists to specify the time when the network becomes available each day.
- **Stop Time—**Use the lists to specify the time when the network becomes unavailable each day.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Wireless > Basic Settings* page.

If you need to edit the settings for another network, select it in the **SSID** list, and then repeat this procedure.

Advanced Settings

Use the *Wireless > Advanced Settings* page to configure advanced settings for the Cisco RV220W wireless radio.

NOTE The default settings should be sufficient for most small business networks. These settings should be changed only if you are experiencing issues in your environment.

STEP 1 Choose **Wireless** > **Advanced Settings**.

STEP 2 Enter these settings, as needed:

- **Beacon Interval—**Enter a value in milliseconds for the **beacon interval**. The default setting is 100 milliseconds (10 seconds).
- **DTIM interval—**Enter the interval at which the **DTIM (Delivery Traffic Indication Message)** should be sent. The default interval is 2 beacon intervals.
- **Request to Send (RTS) Threshold—**Enter the packet size, in bytes, that requires a Request To Send (RTS)/Clear To Send (CTS) handshake before sending. A low **Request to Send (RTS) Threshold** setting consumes more bandwidth but can help the network to recover from interference or collisions. The default value is 2346, which effectively disables RTS.
- **Fragmentation Threshold—**Enter the frame length, in bytes, that requires packets to be split into two or more frames. It may be helpful to reduce the **Fragmentation Threshold** in areas experiencing interference. However, only minor changes are recommended. Setting the fragmentation threshold too low may result in poor network performance. The default value is 2346, which effectively disables fragmentation.
- **Preamble Mode—**Choose a **Long** or **Short** preamble, depending on the devices in the network. A long preamble is needed for compatibility with the legacy 802.11 systems operating at 1 and 2 Mbps. The default selection is Long.
- **Protection Mode—**Choose whether or not to enable CTS-to-Self Protection. This mechanism is used to minimize collisions among stations in a mixed 802.11b and 802.11g environment. This function boosts the Cisco RV220W's ability to catch all wireless transmissions but severely decreases performance. The default selection is None.

- **Short Retry Limit** and **Long Retry Limit**—Enter the number of seconds that the radio will wait before attempting to retransmit a frame. The limit applies to both long and short frames of a size less than or equal to the RTS threshold.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Wireless Distribution System (WDS)

Use the *Wireless > WDS* page to enable a Wireless Distribution System. A WDS allows a wireless network to be expanded by using multiple access points without requiring a wired backbone to link them. Also manage the WDS peers, which are other access points in the WDS.

You must configure all WDS peers to use the same operating frequency (2.4 or 5 GHz), wireless network mode, channel, and security encryption (none, WEP, WPA, or WPA2) with the exact same WPA password (preshared key) on the first SSID—other SSIDs cannot be used for communicating with WDS peers. RV220W supports up to 3 WDS peers.

To open this page: In the navigation tree, choose **Wireless** > **WDS**.

STEP 1 Check the **Enable** box to enable WDS in the Cisco RV220W. Otherwise, uncheck the box. WDS is disabled by default.

STEP 2 If you enabled WDS and use WPA security mode, enter the **WPA Key**. It must be the same WPA key that is used on the first SSID in the *Wireless Basic Setting* Table on the Wireless > Basic Settings page.

STEP 3 In the **WDS Peers Table**, perform these tasks to manage the WDS peers:

- To add a peer, click **Add**, and then enter the MAC address. Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.
- To delete a peer, check the box and then click **Delete**. To select all peers, check the box in the heading row.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

4

Firewall

The *Firewall* menu provides access to pages where you can configure the firewall properties of the Cisco RV220W.

Refer to these topics:

Cisco RV220W Firewall Features

You can secure your network by creating and applying access rules that the Cisco RV220W uses to selectively block and allow inbound and outbound Internet traffic. You then specify how and to what devices the rules apply. You can configure the following:

- Services or traffic types (examples: web browsing, VoIP, other standard services and also custom services that you define) that the router should allow or block. If you need to add custom services before you begin configuring access rules, see **Custom Services, page 87**.

- Rules for outbound (from your LAN to the Internet) or inbound (from the Internet to your LAN) traffic.
- Schedules as to when the router should apply rules. If you want to use schedules, set them up before you begin configuring your access rules. See **Schedules for Firewall Rules and Port Forwarding Rules, page 89**.
- Keywords (in a domain name or on a URL of a web page) that the router should allow or block.
- MAC addresses of devices whose inbound access to your network the router should block.
- Port triggers that signal the router to allow or block access to specified services as defined by port number.
- Reports and alerts that you want the router to send to you.

You can, for example, establish restricted-access policies based on time-of-day, web addresses, and web address keywords. You can block Internet access by applications and services on the LAN, such as chat rooms or games. You can block just certain groups of PCs on your network from being accessed by the WAN or public network.

Inbound (Internet to LAN) rules restrict access to traffic entering your network, selectively allowing only specific outside users to access specific local resources. By default, all access from the insecure WAN side is blocked from accessing the secure LAN, except in response to requests from the LAN or DMZ. To allow outside devices to access services on the secure LAN, you must create a firewall rule for each service.

If you want to allow incoming traffic, you must make the router's WAN port IP address known to the public. This is called “exposing your host.” How you make your address known depends on how the WAN ports are configured; for the Cisco RV220W, you may use the IP address if a static address is assigned to the WAN port, or if your WAN address is dynamic, a DDNS (Dynamic DNS) name can be used.

Outbound (LAN to Internet) rules restrict access to traffic leaving your network, selectively allowing only specific local users to access specific outside resources. The default outbound rule is to allow access from the secure zone (LAN) to the insecure WAN. To block hosts on the secure LAN from accessing services on the outside (insecure WAN), you must create a firewall rule for each service.

Access Rules

Access Rules allow or prevent specific types of traffic to and from your secure local network (LAN). You can perform these tasks:

- **Setting the Default Outbound Policy and Managing Access Rules, page 66**
- **Adding and Editing Access Rules, page 67**
- **Changing Access Rule Priorities, page 71**

Setting the Default Outbound Policy and Managing Access Rules

Use the *Firewall > Access Rules* page to set a default policy for outbound traffic, and to manage Access Rules for specific types of inbound and outbound traffic that you want to control.

The default outbound policy applies to all outbound traffic that is not covered by a specific Access Rule. For example, you can create Access Rules to restrict outbound instant messaging and video traffic, while your default outbound policy allows all other traffic to the Internet.

NOTE The default *inbound* policy for traffic from the Internet to your secure local network (LAN) is always blocked and cannot be changed. You can create Access Rules to allow specified types of inbound traffic.

To open this page: In the navigation tree, choose **Firewall** > **Access Rules**.

STEP 1 In the *Default Outbound Policy* section, choose whether to allow or block traffic from your LAN to the Internet. This policy applies to all traffic that is not covered by an Access Rule.

STEP 2 Under **Default Outbound Policy**, choose one of the following options:

- **Allow**—Choose this option to permit traffic from your LAN to the Internet.
- **Block**—Choose this option to prevent traffic from your LAN to the Internet.

STEP 3 If you changed the Default Outbound Policy, click **Save** to save your settings. Any unsaved changes will be abandoned if you add or edit Access Rules.

STEP 4 In the *Access Rule Table*, perform these tasks:

- To add a rule, click **Add Rule**. Then enter the settings on the *Add/Edit Access Rule Configuration* page. See **Adding and Editing Access Rules, page 67**.

- To edit a rule, check the box and then click **Edit Rule**. Then enter the settings on the *Add/Edit Access Rule Configuration* page. See **Adding and Editing Access Rules, page 67**.
- To delete a rule, check one or more boxes and then click **Delete**. To select all rules, check the box in the heading row. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.
- To enable a rule, check the box and then click **Enable**. To select all rules, check the box in the heading row.
- To disable a rule, check the box and then click **Disable**. To select all rules, check the box in the heading row.
- To reorder the rules, click **Reorder**. Then change the priorities on the *Access Rules Table (Priorities)* page. See **Changing Access Rule Priorities, page 71**.

Adding and Editing Access Rules

Use the *Add/Edit Access Rule Configuration* page to configure an Access Rule for a specified type of inbound or outbound traffic.

NOTE If you want to configure an access rule that is automatically activated or deactivated for specified days and times, click **Firewall > Advanced Settings > Schedules** to configure a schedule. Then return to this page to add the rule.

To open this page: From the *Firewall > Access Rules* page, click **Add Rule** or select a rule and then click **Edit**.

STEP 1 For all types of rules, enter these settings:

- **Connection Type—**Choose the traffic flow that is covered by this rule:
  - **Inbound WAN (Internet) to LAN (Local Network)—**Traffic from the Internet (WAN) to your network (LAN)
  - **Outbound LAN (Local Network) to WAN (Internet)—**Traffic from your network (LAN) to the Internet (WAN)
- **Action—**Choose one of the following actions:
  - **Always Block—**Always block the selected type of traffic.
  - **Always Allow—**Never block the selected type of traffic.

- **Block by schedule, otherwise allow**—Block the selected type of traffic only during specified days and times. Choose a schedule from the drop-down list. To add a new schedule, click the **Configure Schedules** button.
- **Allow by schedule, otherwise block**—Allow the selected type of traffic only during specified days and times. Choose a schedule from the drop-down list. To add a new schedule, click the **Configure Schedules** button.

- **Service**—Choose the service to allow or block. Choose **Any Traffic** if the rule applies to all applications and services. To add a service that is not in the list, click the **Configure Services** button. After configuring a service, you can use your browser's Back button to return to this page. By default, the list includes the following services:
  - AIM (AOL Instant Messenger)
  - BGP (Border Gateway Control)
  - BOOTP_CLIENT (Bootstrap Protocol client)
  - BOOTP_SERVER (Bootstrap Protocol server)
  - CU-SEEME (videoconferencing) UDP or TCP
  - DNS (Domain Name System), UDP or TCP
  - FINGER
  - FTP (File Transfer Protocol)
  - HTTP (Hyptertext Transfer Protocol)
  - HTTPS (Secure Hypertext Transfer Protocol)
  - ICMP (Internet Control Message Protocol) type 3 through 11 or 13
  - ICQ (chat)
  - IMAP (Internet Message Access Protocol) 2 or 3
  - IRC (Internet Relay Chat)
  - NEWS
  - NFS (Network File System)
  - NNTP (Network News Transfer Protocol)
  - PING
  - POP3 (Post Office Protocol)

- PPTP (Point-to-Point Tunneling Protocol)
- RCMD (command)
- REAL-AUDIO
- REXEC (Remote execution command)
- RLOGIN (Remote login)
- RTELNET (Remote telnet)
- RTSP (Real-Time Streaming Protocol) TCP or UDP
- SFTP (Secure Shell File Transfer Protocol)
- SMTP (Simple Mail Transfer Protocol)
- SNMP (Simple Network Management Protocol) TCP or UDP
- SNMP-TRAPS (TCP or UDP)
- SQL-NET (Structured Query Language)
- SSH (TCP or UDP)
- STRMWORKS
- TACACS (Terminal Access Controller Access-Control System)
- TELNET (command)
- TFTP (Trivial File Transfer Protocol)
- RIP (Routing Information Protocol)
- IKE
- SHTTPD (Simple HTTPD web server)
- IPSEC-UDP-ENCAP (UDP Encapsulation of IPsec packets)
- IDENT protocol
- VDOLIVE (live web video delivery)
- SSH (secure shell)
- SIP-TCP or SIP-UDP

- **Source IP**—Specify the IP address to which the firewall rule applies:
  - **Any**—The rule applies to traffic originating from any IP address.
  - **Single Address**—The rule applies to traffic originating from a single IP address. Enter the address in the **Start** field.
  - **Address Range**—The rule applies to traffic originating from a range of IP addresses. Enter the starting IP address in the **Start** field, and the ending IP address in the **Finish** field.

STEP 2 For inbound rules that allow access to your LAN, enter these additional settings:

- **Send to Local Server (DNAT IP)**—Specify the local IP address of the device that hosts the service. Destination Network Address Translation (DNAT) maps a public IP address (your dedicated WAN address) to the specified private IP address.
- **Use Other WAN (Internet) IP Address**—To associate the specified Local Server with a public IP address other than your dedicated WAN address, check the **Enable** box and then enter the public IP address in the **WAN (Internet) Destination IP** field. The router supports multi-NAT, which allows multiple public IP addresses for a single WAN interface. If your ISP assigns you more than one public IP address, one of these can be used as your primary IP address on the WAN port, and the others can be assigned to servers on the LAN. In this way, the LAN can be accessed from the Internet by multiple public IP addresses.

STEP 3 For outbound rules only, enter these additional settings:

- **Destination IP**—Specify the public IP address to which the firewall rule applies:
  - **Any**—The rule applies to traffic going to any IP address.
  - **Single Address**—The rule applies to traffic going to a single IP address. Enter the address in the **Start** field.
  - **Address Range**—The rule applies to traffic going to a range of IP addresses. Enter the starting IP address in the **Start** field, and the ending IP address in the **Finish** field.
- **Use This SNAT IP Address** (only for rules that Allow access)—To associate the specified Destination IP with a public IP address (your dedicated WAN IP address or another public IP address), check the **Enable** box and then enter the public IP address in the **SNAT IP** field. Secure Network Address Translation (SNAT) maps a public IP address to an IP address on your private network.

STEP 4 For all rules, enable or disable the **Rule Status**. For example, you can configure an inbound rule for a local web server and disable it until your web site is ready to receive traffic.

STEP 5 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Firewall > Access Rules* page.

Changing Access Rule Priorities

Use the *Access Rules (Priority)* page to reorder the rules in the *Access Rules* table. The rules at the top of the table are enforced before the rules at the bottom. For example, you can place generally applicable rules near the bottom of the table and place exceptions to those rules at the top of the table.

To open this page: From the *Firewall > Access Rules* page, click **Reorder**.

STEP 1 From the **Connection Type** drop-down list, choose the type of rule to display:

- **Outbound—**Rules affecting traffic from the LAN (Local Network) to the WAN (Internet).
- **Inbound—**Rules affecting traffic from the WAN (Internet) to the LAN (Local Network).

STEP 2 Check the box for one or more rules that you want to move.

STEP 3 Perform the following tasks:

- **Move the selection to the top of the list—**Click the up-arrow button. If you selected one rule, it will become the first rule in the Priority column. If you selected multiple rules, they will move as a group to the top of the list. For example, if you selected Priority 15 and 20, they would move to Priority 1 and 2, respectively.
- **Move the selection to the bottom of the list—**Click the down-arrow button. If you selected one rule, it will become the last rule in the Priority column. If you selected multiple rules, they will move as a group to the bottom of the list. For example, if you selected Priority 1 and 5 from a list of 20, they would move to Priority 19 and 20, respectively.
- **Move the selection to a specific position within the list:** Identify the insertion point by typing an existing priority number in the white text box. Then click **Move To**. Your selection will be moved immediately below the

specified priority number. For example, if you selected Priority 2 and 10 and entered the number 5 in the white box, they would move to Priority 6 and 7, respectively.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Move other rules, or click **Back** to return to the *Firewall > Access Rules* page.

Attack Prevention

Attacks are malicious security breaches or unintentional network issues that render the Cisco RV220W unusable. Attack prevention allows you to manage WAN security threats such as continual ping requests and discovery via ARP scans. TCP and UDP flood attack prevention can be enabled to manage extreme usage of WAN resources.

As well, certain Denial-of-Service (DoS) attacks can be blocked. These attacks, if uninhibited, can use up processing power and bandwidth and prevent regular network services from running normally. ICMP packet flooding, SYN traffic flooding, and Echo storm thresholds can be configured to temporarily suspend traffic from the offending source.

To open this page: In the navigation tree, choose **Firewall** > **Attack Prevention**.

STEP 1 In the *WAN (Internet) Security Checks* section, check or uncheck the **Enable** box to enable or disable the following security checks:

- **Respond to Ping on WAN (Internet)**—To configure the Cisco RV220W to allow a response to an Internet Control Message Protocol (ICMP) Echo (ping) request on the WAN interface, check this box. This setting is used as a diagnostic tool for connectivity problems. Not enabled by default.
- **Stealth Mode**—If Stealth Mode is enabled, the router will not respond to port scans from the WAN. This feature makes the network less susceptible to discovery and attacks. Enabled by default.
- **Flood**—If this option is enabled, the router will drop all invalid TCP packets. This feature protects the network from a SYN flood attack. Enabled by default.

STEP 2 In the *LAN (Local Network) Security Checks* section, check or uncheck the **Enable** box to enable or disable **Block UDP Flood**. When this option is enabled, the router accepts no more than 25 simultaneous, active UDP connections from a single computer on the LAN. Enabled by default.

STEP 3 In the *ICSA Settings* section, check or uncheck the **Enable** box to enable or disable the following International Computer Security Association requirements:

- **Block Anonymous ICMP Messages—**ICSA requires the firewall to silently block without sending an ICMP notification to the sender. Some protocols, such as MTU Path Discovery, require ICMP notifications. Enable this setting to operate in "stealth" mode. Enabled by default.
- **Block Fragmented Packets—**ICSA requires the firewall to block fragmented packets from ANY to ANY. Enabled by default.
- **Block Multicast Packets—**ICSA requires the firewall to block multicast packets. Enabled by default.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Content Filtering

Use the *Firewall > Content Filtering* page to enable and configure content filtering. For example, you can block potentially risky web components such as ActiveX or Java. You can prevent web access by blocking all URLs, or you can set up trusted domains by specifying websites and identifying allowed URL keywords.

To open this page: In the navigation tree, choose **Firewall > Content Filtering**.

STEP 1 In the *Content Filtering* section, enter these settings:

- **Content Filtering—**To enable Content Filtering, check the **Enable** box. To disable this feature, uncheck the box.
- **Enable Check Referer:** Check the box to enable checking the HTTP referer header for allowed URLs. When enabled, this feature allows a user to access a link on an allowed web page even if the link goes to a different domain.

- **HTTP Ports**—Enter the HTTP ports to which content filtering applies. The default port is 80. If your networking using an external HTTP proxy server which listens on other ports, they can be added here. Multiple ports can be specified in a comma separated list.
- After changing these settings, click **Save** to save your changes and update the other fields on the page. For example, the *Approved URLs Table* becomes available only after you enable Content Filtering.

STEP 2 In the *Web Components* section, check the box for each web component that you want to block. Although many reputable web sites use these components for legitimate purposes, these components can be used by malicious websites to infect computers.

- **Proxy**—A proxy server (or simply, proxy) allows computers to route connections to other computers through the proxy, thus circumventing certain firewall rules. For example, if connections to a specific IP address are blocked by a firewall rule, the requests can be routed through a proxy that is not blocked by the rule, rendering the restriction ineffective. Enabling this feature blocks proxy servers.
- **Java**—Blocks java applets from being downloaded from pages that contain them. Java applets are small programs embedded in web pages that enable dynamic functionality of the page. A malicious applet can be used to compromise or infect computers. Enabling this setting blocks Java applets from being downloaded.
- **ActiveX**—Similar to Java applets, ActiveX controls are installed on a Windows computer while running Internet Explorer. A malicious ActiveX control can be used to compromise or infect computers. Enabling this setting blocks ActiveX applets from being downloaded.
- **Cookies**—Cookies are used to store session information by websites that usually require login. However, several websites use cookies to store tracking information and browsing habits. Enabling this option filters out cookies from being created by a website.

  Note: Many websites require that cookies be accepted in order for the site to be accessed properly. Blocking cookies can cause many websites to not function properly.

STEP 3 In the *Approved URLs List Enable* section, enable the following options:

- **Approved URLs List**—Check the box to allow access to all URLs in the *Approved URLs Table*. Uncheck the box to disable this feature. Users will be allowed to access these web sites even if access would be blocked by other rules such as URL Blocking.

- **Block All URLs by Default:** Check the box to block access to all URLs that are not specifically allowed.

STEP 4 In the *Approved URLs Table*, perform these tasks:

- To add a new entry, click **Add**. Choose **Web site** and enter a full website address, or choose **URL Keyword** and enter key words that are allowed in any website address. For example, if you choose **Web site** and enter *www.cisco.com*, users can always access that specific web site. If you choose **URL Keyword** and enter *cisco*, users can always access any web site whose URL includes that word.
- To edit an entry, check the box and then click **Edit**. To select all entries, check the box in the heading row. Choose the type and enter the website address or keyword, as described above.
- To delete an entry, check the box and then click **Delete**. To select all entries, check the box in the heading row.

STEP 5 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

URL Blocking

Use the *Firewall > URL Blocking* page to block access to websites that contain specified keywords in the URL.

To open this page: In the navigation tree, choose **Firewall** > **URL Blocking**.

STEP 1 In the *Blocked Keywords Table*, perform these tasks:

- To add a new entry, click **Add Row**. Check or uncheck the **Status** box to enable or disable the blocked keyword. Enter the keyword in the **URL** box.
- To edit an entry, check the box and then click **Edit**. To select all entries, check the box in the heading row. Check or uncheck the **Status** box to enable or disable the blocked keyword. Enter the keyword in the **URL** box.
- To delete an entry, check the box and then click **Delete**. To select all entries, check the box in the heading row.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Port Triggering

Port triggering allows devices on the LAN to receive inbound traffic from the Internet. Port triggering waits for an outbound request from the LAN on one of the defined outgoing ports, and then opens an incoming port for that specified type of traffic. Port triggering is a form of dynamic port forwarding while an application is transmitting data over the opened outgoing or incoming ports.

Port triggering opens an incoming port for a specific type of traffic on a defined outgoing port.

Port triggering is more flexible than static port forwarding (available when configuring firewall rules) because a rule does not have to reference a specific LAN IP or IP range. Ports are also not left open when not in use, thereby providing a level of security that port forwarding does not offer.

NOTE Port triggering is not appropriate for servers on the LAN, since there is a dependency on the LAN device making an outgoing connection before incoming ports are opened.

Some applications require that, when external devices connect to them, they receive data on a specific port or range of ports in order to function properly. The router must send all incoming data for that application only on the required port or range of ports. The gateway has a list of common applications and games with corresponding outbound and inbound ports to open. You can also specify a port triggering rule by defining the type of traffic (TCP or UDP) and the range of incoming and outgoing ports to open when enabled.

- **Managing Port Triggering Rules, page 77**
- **Adding and Editing Port Triggering Rules, page 77**

Managing Port Triggering Rules

Use the *Firewall > Port Triggering* page to view, add, edit, and delete your port triggering rules.

To open this page: In the navigation tree, choose **Firewall** > **Port Triggering**.

Perform these tasks:

- To add a port triggering rule, click **Add**. Then enter the settings on the *Add/Edit Port Triggering Rule* page. See **Adding and Editing Port Triggering Rules, page 77**.
- To edit a port triggering rule, check the box and then click **Edit**. Then enter the settings on the *Add/Edit Port Triggering Rule* page. See **Adding and Editing Port Triggering Rules, page 77**.
- To delete a port triggering rule, check the box and then click **Delete**. To select all rules, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Adding and Editing Port Triggering Rules

Use the *Add/Edit Port Triggering Rule* page to enter the settings for a port triggering rule.

To open this page: From the *Firewall > Port Triggering* page, click **Add** or select a rule and then click **Edit**.

STEP 1 At the top of the page, enter these settings:

- **Name—**Enter an easily-identifiable name for this rule.
- **Port Triggering Rule—**Check the **Enable** box to enable the rule., or uncheck the box to disable the rule. For example, you may want to configure a rule and disable it until an internal resource is ready to receive traffic.
- **Protocol—**Select whether the port uses **TCP**, **UDP**, or **Both**.

STEP 2 In the **Outgoing (Trigger) Port Range** section, specify the port number or range of port numbers that will trigger this rule when a connection request from outgoing traffic is made. If the outgoing connection uses only one port, then specify the same port number in the Start Port and End Port fields.

STEP 3 In the **Incoming (Response) Port Range** section, specify the port number or range of port numbers used by the remote system to respond to the request it receives. If the incoming connection uses only one port, then specify the same port number in the Start Port and End Port fields.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Port Forwarding

Port forwarding is used to redirect traffic from the Internet from one port on the WAN to another port on the LAN. The port forwarding rules menu allows selection of a service. Common services are available or you can define a custom service and associated ports to forward.

- **Managing Port Forwarding Rules, page 78**
- **Adding or Editing a Port Forwarding Rule, page 79**

Managing Port Forwarding Rules

Use the *Firewall > Port Forwarding* page to view, add, edit, or delete port forwarding rules.

To open this page: In the navigation tree, choose **Firewall** > **Port Forwarding**.

The Port Forwarding Rule Table lists all the available port forwarding rules for this device and allows you to configure port forwarding rules. The table contains this information:

- **Action**—Whether to block or allow traffic (always or by schedule) that meets these filter rules, and when the rule is applicable.
- **Service**—Service for which this port forwarding rule is applicable.
- **Status**—A port forwarding rule can be disabled if not in use and enabled when needed. The port forwarding rule is disabled if the status is disabled and it is enabled if the status is enabled. Disabling a port forwarding rule does not delete the configuration.
- **Source IP**—The source IP address for traffic from which traffic is forwarded (Any, Single Address or Address Range).

- **Destination IP**—The IP address of the server to which traffic is forwarded.
- **Forward From Port**—From which port traffic will be forwarded.
- **Forward To Port**—To which port traffic will be forwarded.

STEP 1 Perform these tasks:

- To add a rule, click **Add**. Then enter the settings on the *Add / Edit Port Forwarding Configuration* page. See **Adding or Editing a Port Forwarding Rule, page 79**.
- To edit a rule, check the box and then click **Edit**. Then enter the settings on the *Add / Edit Port Forwarding Configuration* page. See **Adding or Editing a Port Forwarding Rule, page 79**.
- To delete a rule, check the box and then click **Delete**. To select all rules, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Adding or Editing a Port Forwarding Rule

Use the *Add / Edit Port Forwarding Configuration* page to configure port forwarding rules.

To open this page: From the *Firewall > Port Forwarding* page, click **Add** or select a rule and then click **Edit**.

STEP 1 Choose the **Action** and **Schedule** (if applicable):

- **Always Block**—Always block the selected type of traffic.
- **Always Allow**—Never block the selected type of traffic.
- **Block by Schedule**—Blocks the selected type of traffic according to a schedule. Choose the schedule from the drop-down list. To add a new schedule, click the **Configure Schedules** button. After configuring a schedule, you can use your browser's Back button to return to this page.
- **Allow by Schedule**—Allows the selected type of traffic according to a schedule. Choose the schedule from the drop-down list. To add a new schedule, click the **Configure Schedules** button. After configuring a schedule, you can use your browser's Back button to return to this page.

STEP 2 Choose the **Service** that is subject to this rule, or click **Configure Services** to add a new service to the list. The following services are included:

AIM (AOL Instant Messenger)	PPTP (Point-to-Point Tunneling Protocol)
BGP (Border Gateway Control)	RCMD (command)
BOOTP_CLIENT (Bootstrap Protocol client)	REAL-AUDIO
BOOTP_SERVER (Bootstrap Protocol server)	REXEC (Remote execution command)
CU-SEEME (videoconferencing) UDP or TCP	RIP (Routing Information Protocol)
DNS (Domain Name System), UDP or TCP	RLOGIN (Remote login)
FINGER	RTELNET (Remote telnet)
FTP (File Transfer Protocol)	RTSP (Real-Time Streaming Protocol) TCP or UDP
HTTP (Hyptertext Transfer Protocol)	SFTP (Secure Shell File Transfer Protocol)
HTTPS (Secure Hypertext Transfer Protocol)	SHTTPD (Simple HTTPD web server)
ICMP (Internet Control Message Protocol) type 3 through 11 or 13	SIP-TCP or SIP-UDP
ICQ (chat)	SMTP (Simple Mail Transfer Protocol)
IDENT protocol	SNMP (Simple Network Management Protocol) TCP or UDP
IKE	SNMP-TRAPS (TCP or UDP)
IMAP (Internet Message Access Protocol) 2 or 3	SQL-NET (Structured Query Language)
IPSEC-UDP-ENCAP (UDP Encapsulation of IPsec packets)	SSH (secure shell)

IRC (Internet Relay Chat)	SSH (TCP or UDP)
NEWS	STRMWORKS
NFS (Network File System)	TACACS (Terminal Access Controller Access-Control System)
NNTP (Network News Transfer Protocol)	TELNET (command)
PING	TFTP (Trivial File Transfer Protocol)
POP3 (Post Office Protocol)	VDOLIVE (live web video delivery)

STEP 3 For all types of rules, select the **Source IP**:

- **Any**—Specifies that the rule being created is for traffic from the given endpoint.
- **Single Address**—Limit to one host. Requires the IP address of the host to which this rule would be applied. If you choose this option, also enter the IP address in the **Start** field.
- **Address Range**—This is used to apply this rule to a group of computers/devices within an IP address range. If you choose this option, enter the starting IP address of the range in the **Start** field and the ending IP address of the range in the **Finish** field.

STEP 4 For rules that *allow* access, configure these settings:

- **Destination IP**—Enter the IP address of the network device that receives the traffic that meets this rule.
- **Forward from Port**—Choose **Same as Incoming Port** if the traffic should be forwarded from the same port number on which it was received. Otherwise, choose **Specify Port** and then enter the port number in the **Port Number** field.
- **Forward to Port**—Choose **Same as Incoming Port** if the traffic should be forwarded to the same port on the receiving server. Otherwise, choose **Specify Port** and then enter the port number in the **Port Number** field.

STEP 5 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Firewall > Port Forwarding* page.

DMZ Host

The Cisco RV220W supports DMZ options. A DMZ is a sub-network that is open to the public but behind the firewall. DMZ allows you to redirect packets going to your WAN port IP address to a particular IP address in your LAN. It is recommended that hosts that must be exposed to the WAN (such as web or email servers) be placed in the DMZ network. Firewall rules can be allowed to permit access to specific services and ports to the DMZ from both the LAN or WAN. In the event of an attack on any of the DMZ nodes, the LAN is not necessarily vulnerable as well.

You must configure a fixed (static) IP address for the endpoint that will be designated as the DMZ host. The DMZ host should be given an IP address in the same subnet as the router's LAN IP address but it cannot be identical to the IP address given to the LAN interface of this gateway.

To open this page: In the navigation tree, choose **Firewall** > **DMZ Host**.

STEP 1 Check the **Enable** box to enable DMZ on the network. Uncheck the box to disable this feature.

STEP 2 Enter the IP address for the endpoint that will receive the redirected packets. This is the DMZ host.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. After enabling a DMZ host, configure firewall rules for the zone. See **Custom Services, page 87**.

Advanced Firewall Settings

Use the *Advanced Settings* menu options to configure the following advanced firewall settings:

- **One-to-One Network Address Translation (NAT), page 83**
- **MAC Address Filtering, page 85**
- **IP/MAC Address Binding, page 86**
- **Custom Services, page 87**
- **Schedules for Firewall Rules and Port Forwarding Rules, page 89**

- Session Settings, page 91
- Internet Group Management Protocol (IGMP), page 92
- SIP ALG, page 93

One-to-One Network Address Translation (NAT)

One-to-one NAT is a mechanism that maps public IP addresses to the private IP addresses of devices that are behind a firewall.

- Managing One-to-One NAT Rules, page 83
- Adding or Editing a One-to-One NAT Rule, page 84

Managing One-to-One NAT Rules

Use the *Firewall* > *Advanced Settings* > *One-to-One NAT* page to view, add, edit, and delete One-to-One NAT Rules.

To open this page: In the navigation tree, choose **Firewall** > **Advanced Settings** > **One-to-One NAT**.

The One-to-One-NAT Rules Table lists the available One-To-One NAT rules that have been configured. It displays the following fields:

- **Private Range Begin**—The starting IP address in the private (LAN) IP address.
- **Public Range Begin**—The starting IP address in the public (WAN) IP address.
- **Range Length**—Range length maps one to one private address to public address up to the given range.
- **Service**—Shows configured services. Services for one-to-one NAT allow you to configure the service to be accepted by the private IP (LAN) address when traffic is sent to the corresponding public IP address. Configured services on private IP addresses in the range are accepted when traffic is available on the corresponding public IP address.

Perform these tasks:

- To add a one-to-one NAT rule, click **Add**. Then enter the settings on the *Add/Edit One-to-One NAT Configuration* page. See Adding or Editing a One-to-One NAT Rule, page 84.

- To edit a one-to-one NAT rule, check the box and then click **Edit**. Then enter the settings on the *Add/Edit One-to-One NAT Configuration* page. See **Adding or Editing a One-to-One NAT Rule, page 84**.
- To delete a one-to-one NAT rule, check the box and then click **Delete**. To select all rules, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Adding or Editing a One-to-One NAT Rule

Use the *Add/Edit One-to-One NAT Configuration* page to map a private IP address or range to a public IP address or range.

To open this page: From the *Firewall > Advanced Settings > One-to-One NAT* page, click **Add** or select a rule and then click **Edit**.

STEP 1 Enter this information:

- **Private Range Begin**—The starting IP address in the private (LAN) IP address.
- **Public Range Begin**—The starting IP address in the public (WAN) IP address.
- **Range Length**—Range length maps one to one private address to public address up to the given range.
- **Service**—Choose the service for which the rule applies.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Firewall > Advanced Settings > One-to-One NAT* page.

MAC Address Filtering

Use the *Firewall* > *Advanced Settings* > *MAC Filtering* page to allow or block traffic from certain known machines or devices. The router uses the MAC address of a computer or device on the network to identify it and permit or deny access. Traffic from a specified MAC address will be filtered depending upon the policy.

NOTE The MAC filtering policy does not override a firewall rule that directs incoming traffic to a host.

To open this page: In the navigation tree, choose **Firewall** > **Advanced Settings** > **MAC Filtering**.

The *MAC Address Table* lists the MAC addresses and descriptions for all devices that are subject to the MAC filtering policy.

STEP 1 In the *MAC Filtering Settings* section, enter these settings:

- **Source MAC Address Filtering—**Check the **Enable** box to enable MAC Address Filtering for this device. Uncheck the box to disable this feature. After changing this setting, click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Enabling this feature makes other fields available.
- **Policy for MAC Addresses Listed Below—**If you enabled MAC filtering, choose one of the following options:
  - **Block and Allow the Rest**—Choose this option to block the traffic from the specified MAC addresses and to allow traffic from all other addresses.
  - **Allow and Block the Rest**—Choose this option to allow the traffic from the specified MAC addresses and to block traffic from all other machines on the LAN side of the router.

    For example, two computers are on the LAN with MAC addresses of 00:01:02:03:04:05 (host1), and 00:01:02:03:04:11 (host2). If the host1 MAC address is added to the MAC filtering list and the “block and allow the rest” policy is chosen, when this computer tries to connect to a website, the router will not allow it to connect. However, host2 is able to connect because its MAC address is not in the list. If the policy is “allow and block the rest,” then host1 is allowed to connect to a website, but host2 is blocked because its URL is not in the list.

STEP 2 In the *MAC Addresses Table*, perform these tasks:

- To add a new entry, click **Add.** Enter the 12-character **MAC Address** without punctuation. The formatting is applied automatically. Optionally, type a **Description** for your reference.
- To delete an entry, check the box and then click **Delete**. To select all entries, check the box in the heading row.

STEP 3 After making changes, click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

IP/MAC Address Binding

Use the *Firewall > Advanced Settings > IP/MAC Binding* page to bind IP addresses to MAC addresses. This feature is useful if you have configured a machine with a static address and want to discourage a user from changing the IP address. If a specified device sends packets using an unexpected IP address, the Cisco RV220W drops the packets.

To open this page: In the navigation tree, choose **Firewall** > **Advanced Settings** > **IP/MAC Binding**.

The *IP/MAC Binding Table* lists the names, MAC addresses, and IP addresses for the currently defined IP/MAC binding rules.

STEP 1 Perform these tasks:

- To add a new entry, click **Add**. Enter these settings:
  - **Name—**Enter a short description for your reference.
  - **MAC Address—**Enter the 12-character MAC address of the device without punctuation. The formatting is applied automatically.
  - **IP Address—**Enter the expected IP address of the specified device.
- To edit an entry, check the box and then click **Edit**. To select all entries, check the box in the heading row. Edit the information, as described above.
- To delete an entry, check the box and then click **Delete**. To select all entries, check the box in the heading row.

STEP 2 After making changes, click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Custom Services

Each firewall rule applies to a specific type of service. Common types of services are pre-configured and can be selected from the *Service* list when you configure an access rule. (See **Adding and Editing Access Rules, page 67**.) As needed, you can add services to the list.

- **Managing Custom Services, page 87**
- **Adding or Editing a Custom Service, page 88**

Managing Custom Services

Use the *Firewall* > *Advanced Settings* > *Custom Services* page to view, add, edit, or delete custom services.

NOTE For a list of pre-configured services, see the *Service* description in the procedure **Adding and Editing Access Rules, page 67**.

To open this page: In the navigation tree, choose **Firewall** > **Advanced Settings** > **Custom Services**.

The *Custom Services Table* lists the details for the custom services that have been defined.

Perform these tasks:

- To add a service, click **Add**. Then enter the settings on the *Add/Edit Custom Services Configuration* page. See **Adding or Editing a Custom Service, page 88**.
- To edit a service, check the box and then click **Edit**. Then enter the settings on the *Add/Edit Custom Services Configuration* page. See **Adding or Editing a Custom Service, page 88**.
- To delete a service, check the box and then click **Delete**. To select all services, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Adding or Editing a Custom Service

Use the *Add/Edit Custom Services Configuration* page to enter the settings for a custom service.

To open this page: From the *Firewall* > *Advanced Settings* > *Custom Services* page, click **Add** or select a service and then click **Edit**.

STEP 1 Enter these settings:

- **Name—**Enter a service name for identification and management purposes.
- **Type—**Choose layer 4 protocol that the service uses (**TCP**, **UDP**, **ICMP**, **ICMPv6**, or **other**).
  - If you chose ICMP or ICMPv6 as the service type, specify the ICMP type by entering its numeric value (from 0 through 40 for ICMP and from 0 through 255 for ICMPv6).
  - If you chose TCP or UDP, enter the first TCP or UDP port of the range that the service uses. In the **Finish Port** field, enter the last TCP or UDP port of the range that the service uses.
  - If you chose **Other**, enter the number of the protocol in the Protocol Number field. (For example, if you are using RDP, enter 27 in the protocol number field.)

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Firewall* > *Advanced Settings* > *Custom Services* page.

Schedules for Firewall Rules and Port Forwarding Rules

You can create schedules to activate firewall access rules and port forwarding rules on specific days or at specific times of the day.

- Managing Schedules, page 89
- Adding or Editing a Schedule, page 90

Managing Schedules

Use the *Firewall* > *Advanced Settings* > *Schedule***s** page to view, add, edit, or delete schedules.

To open this page: In the navigation tree, choose **Firewall** > **Advanced Settings** > **Schedules**.

- To add a schedule, click **Add**. Then enter the settings on the *Add/Edit Schedules Configuration* page. See **Adding or Editing a Schedule, page 90**.
- To edit a schedule, check the box and then click **Edit**. Then enter the settings on the *Add/Edit Schedules Configuration* page. See **Adding or Editing a Schedule, page 90**.
- To delete a schedule, check the box and then click **Delete**. To select all schedules, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Adding or Editing a Schedule

Use the *Add/Edit Schedules Configuration* page to configure a schedule for a firewall access rule or a port forwarding rule.

To open this page: From the *Firewall* > *Advanced Settings* > *Schedule***s** page, click **Add** or select a schedule and then click **Edit**.

STEP 1 Enter these settings:

- **Name—**Enter a unique name to identify the schedule in the *Schedule Table* on the *Firewall* > *Advanced Settings* > *Schedule***s** page.
- **Time—**Choose one of the following options:
  - If this schedule applies to the entire day, check the **All Day** box.
  - If this schedule applies during specified hours of the day, uncheck the **All Day** box. Then enter the **Start Time** and **End Time** by choosing the **Hours**, **Minutes**, and time period (AM or PM). The schedule will become active at the specified start time and will become inactive at the specified end time on the selected day(s).
- **Repeat—**Choose one of the following options:
  - If this schedule applies to all the days of the week, check the **Everyday** box.
  - If this schedule applies only on specified days, uncheck the **Everyday** box. Then check the box for each day when the schedule is active. Uncheck the box for each day when the schedule is inactive.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Firewall* > *Advanced Settings* > *Schedule***s** page.

Session Settings

Use the *Firewall* > *Advanced Settings* > *Session Settings* page to limit the maximum number of unidentified sessions and half-open sessions on the Cisco RV220W. You can also introduce timeouts for TCP and UDP sessions to ensure that Internet traffic is not deviating from expectations in your private network.

To open this page: In the navigation tree, choose **Firewall** > **Advanced Settings** > **Session Settings**.

STEP 1 Enter these settings:

- **Maximum Unidentified Sessions**—Enter the maximum number of unidentified sessions for the ALG identification process. This value can range from 2 through 128. The default is 32 sessions.
- **Maximum Half Open Sessions**—Enter the maximum number of half-open sessions. A half-open session is the session state between receipt of a SYN packet and the SYN/ACK packet. Under normal circumstances, a session is allowed to remain in the half-open state for 10 seconds. The maximum value ranges from 0 through 3,000. The default is 128 sessions.
- **TCP Session Timeout Duration**—Enter the time, in seconds, after which inactive TCP sessions are removed from the session table. Most TCP sessions terminate normally when the RST or FIN flags are detected. This value ranges from 0 through 4,294,967 seconds. The default is 1,800 seconds (30 minutes).
- **UDP Session Timeout Duration**—Enter the time, in seconds, after which inactive UDP sessions are removed from the session table. This value ranges from 0 through 4,294,967 seconds. The default is 120 seconds (2 minutes).
- **Other Session Timeout Duration** (seconds)—Enter the time, in seconds, after which inactive non-TCP/UDP sessions are removed from the session table. This value ranges from 0 through 4,294,967 seconds. The default is 60 seconds.
- **TCP Session Cleanup Latency (seconds)**—Enter the maximum time for a session to remain in the session table after detecting both FIN flags. This value ranges from 0 through 4,294,967 seconds. The default is 10 seconds.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Internet Group Management Protocol (IGMP)

Use the *Firewall* > *Advanced Settings* > *IGMP Configuration* page to enable the IGMP Proxy on the LAN or WAN interface. Internet Group Management Protocol (IGMP) is an exchange protocol for routers. Hosts that want to receive multicast messages need to inform their neighboring routers of their status. In some networks, each node in a network becomes a member of a multicast group and receives multicast packets. In these situations, hosts exchange information with their local routers by using IGMP. Routers use IGMP periodically to check if the known group members are active. IGMP provides a method called dynamic membership by which a host can join or leave a multicast group at any time.

- **Enabling IGMP and Managing the Allowed Networks Table, page 92**
- **Adding or Editing the Allowed Networks, page 93**

Enabling IGMP and Managing the Allowed Networks Table

Use the **Firewall** > **Advanced Settings** > **IGMP Configuration** page to enable or disable the IGMP Proxy and to view, add, edit, or delete the allowed networks.

To open this page: In the navigation tree, choose **Firewall** > **Advanced Settings** > **IGMP Configuration**.

The *Allowed Networks Table* lists all the allowed networks configured for the device and allows several operations on the allowed networks:

- **Network Address—**Enter the IP address of the network.
- **Mask Length—**Enter the number of masked bits, as in CIDR slash notation. Valid values are from 0 to 32.

NOTE By default the device will forward multicast packets which are originating from its immediate WAN network.

STEP 1 In the *IGMP Configuration* section, enter these settings:

- **IGMP Proxy—**Check the **Enable** box to allow IGMP communication between the router and other nodes in the network. Otherwise, uncheck the box.
- **Upstream Interface—**Choose **WAN** or **LAN** to specify the interface on which the IGMP proxy acts as a multicast client.
- After enabling or disabling the proxy, click **Save** to save your settings or click **Cancel** to reload the page with the current settings. Other features become available on the page when IGMP Proxy is enabled.

STEP 2 In the *Allowed Networks Table*, perform these tasks:

- To add a network, click **Add**. Then enter the settings on the *Add/Edit Networks* page. See **Adding or Editing the Allowed Networks, page 93**.
- To edit a network, check the box and then click **Edit**. Then enter the settings on the *Add/Edit Networks* page. See **Adding or Editing the Allowed Networks, page 93**.
- To delete a network, check the box and then click **Delete**. To select all networks, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Adding or Editing the Allowed Networks

Use the *Add/Edit Networks* page to specify the allowed networks for IGMP communications.

To open this page: From the *Firewall > Advanced Settings > IGMP Configuration* page, click **Add** or select a network and then click **Edit**.

STEP 1 Enter these settings:

- **Network Address—**Enter the IP address of the network.
- **Mask Length—**Enter the number of masked bits, as in CIDR slash notation. Valid values are from 0 to 32.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Firewall > Advanced Settings > IGMP Configuration* page.

SIP ALG

Session Initiation Protocol Application-Level Gateway (SIP ALG) can rewrite information within SIP messages (SIP headers and SDP body) to allow signaling and audio traffic between a client on your private network and a SIP endpoint.

To open this page: In the navigation tree, choose **Firewall** > **Advanced Settings** > **SIP ALG**.

STEP 1 Check the **Enable** box to enable SIP ALG support. If disabled, the router will not allow incoming calls to the UAC (User Agent Client) behind the Cisco RV220W.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Firewall Configuration Examples

Example 1: Allow inbound HTTP traffic to the DMZ

In this example, you host a public web server on your local DMZ network. You want to allow inbound HTTP requests from any outside IP address to the IP address of your web server at any time of day.

Create an inbound rule as follows:

Parameter	Value
Connection Type	Inbound
Action	Always Allow
Service	HTTP
Source IP	Any
Send to Local Server (DNAT IP)	192.168.5.2 (web server IP address)
Rule Status	Enabled

Example 2: Allow videoconferencing from range of outside IP addresses.

In this example, you want to allow incoming videoconferencing to be initiated from a restricted range of outside IP addresses (132.177.88.2 - 132.177.88.254), from a branch office.

Create an inbound rule as follows. In the example, CUSeeMe connections are allowed only from a specified range of external IP addresses.

Parameter	Value
Connection Type	Inbound
Action	Always Allow
Service	CU-SEEME:UDP
Source IP	Address Range
Start	132.177.88.2
Finish	134.177.88.254
Send to Local Server (DNAT IP)	192.168.1.11
Rule Status	Enabled

Example 3: Multi-NAT Configuration

In this example, you want to configure multi-NAT to support multiple public IP addresses on one WAN port interface.

Create an inbound rule that configures the firewall to host an additional public IP address. Associate this address with a web server on the DMZ. If you arrange with your ISP to have more than one public IP address for your use, you can use the additional public IP addresses to map to servers on your LAN. One of these public IP addresses is used as the primary IP address of the router. This address is used to provide Internet access to your LAN PCs through NAT. The other addresses are available to map to your DMZ servers.

The following addressing scheme is used to illustrate this procedure:

- WAN IP address: 10.1.0.118
- LAN IP address: 192.168.1.1; subnet 255.255.255.0
- Web server PC in the DMZ, IP address: 192.168.1.2
- Access to Web server: (simulated) public IP address 10.1.0.52

Parameter	Value
Connection Type	Inbound
Action	Always Allow
Service	HTTP
Source IP	Single Address
Start	10.1.0.52
Send to Local Server (DNAT IP)	192.168.1.2 (local IP address of your web server)
Rule Status	Enabled

Example 4: Block traffic by schedule if generated from specific range of machines

In this example, you want to block all HTTP traffic on the weekends if the request originates from a specific group of machines in the LAN having a known range of IP addresses, and anyone coming in through the Network from the WAN (i.e. all remote users).

For this example, use the *Firewall* > *Advanced Settings* > *Schedules* page to add a schedule that is active all day on Saturday and Sunday. For more information, see **Schedules for Firewall Rules and Port Forwarding Rules, page 89**.

Then create the outbound and inbound access rules as shown below.

Create an outbound access rule with the following parameters:

Parameter	Value
Connection Type	Outbound
Action	Block by Schedule
Schedule	Weekend
Service	HTTP
Source IP	Address Range

Parameter	Value
Start	starting IP address
Finish	ending IP address
Destination IP	Any
Rule Status	Enabled

Create an inbound access rule with the following parameters:

Parameter	Value
Connection Type	Inbound
Action	Block by Schedule
Schedule	Weekend
Service	All Traffic
Source IP	Any
Rule Status	Enabled

5

Cisco ProtectLink Web

The optional Cisco ProtectLink Web service provides security for your network. It filters website addresses (URLs) and blocks potentially malicious websites.

Refer to these topics:

- **Getting Started with Cisco ProtectLink Web, page 98**
- **Global Settings for Approved URLs and Clients, page 99**
- **Web Protection, page 101**
- **Updating the ProtectLink License, page 104**

NOTE For more information about this Cisco product, visit the Cisco ProtectLink Web information page at www.cisco.com/en/US/products/ps9953/index.html

Getting Started with Cisco ProtectLink Web

You can purchase, register, and activate the service by using the links on the *Cisco ProtectLink Web* page.

To open this page: In the navigation tree, click **Cisco ProtectLink Web.**

Choose the appropriate option:

- **Learn more about and request Free Trial for Cisco ProtectLink—**Click this link to open the Cisco ProtectLink Security Solutions page on Cisco.com. You can read product information and get a 30-day trial for your RV router.
- **Register ProtectLink services and obtain an Activation Code (AC)—** Click this link if you purchased the product and are ready to register it. When the registration page appears, follow the on-screen instructions to enter your Registration Key and provide the required information. Close the web page when you complete this process. The activation code will

appear on the screen and will be sent to the email address that you provided.

- **Use the Activation Code (AC) to activate ProtectLink services—**Click this link if you registered the product and received an activation code. When the activation page appears, enter your activation code and follow the on-screen instructions to proceed. Close the web page when you complete this process. Refresh the web browser, and now the ProtectLink Web features are available on your router. The *Global Settings* page appears.

NOTE If you replace one router with another router that supports this service, you can use the **Use the Activation Code** link to transfer your license for the ProtectLink service to the new router.

Global Settings for Approved URLs and Clients

After you activate your service, you can use the *Cisco ProtectLink Web > Global Settings* page to configure the approved clients and approved URLs that are free from the restrictions that you establish for website access.

- **Approved Clients, page 99**
- **Approved URLs, page 100**

Approved Clients

Use the *Cisco ProtectLink Web > Global Settings > Approved Clients* page to specify approved clients that are not subject to the restrictions that you configure in Web Protection. Web Protection will not restrict URL requests from these IP addresses.

To open this page: In the navigation tree, choose **Cisco ProtectLink Web > Global Settings > Approved Clients**.

NOTE This page is available only if you activated your Cisco ProtectLink Web service. See **Getting Started with Cisco ProtectLink Web, page 98**.

STEP 1 In the *Approved Clients* section, check the **Enable** box to enable this feature.

STEP 2 In the *Approved Clients Table*, specify the clients that will always have access to all URLs, regardless of Web Protection settings.

- To add an entry, click **Add**. On the *Approved Client IP Configuration* page, enter IP addresses or ranges. To enter non-consecutive IP addresses, type a semi-colon between entries, such as *10.1.1.1;10.1.1.5*. To enter a range of IP addresses, type a hyphen between the first and last address in the range, such as *10.1.1.0-10.1.1.10*. Click **Save** to save your settings.
- To edit an entry, check a box, and then click **Edit**. Enter and save the settings, as described above.
- To delete an entry, check a box, and then click **Delete**. To select all entries in the table, check the box in the heading row and then click **Delete**.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Approved URLs

Use the *Cisco ProtectLink Web > Global Settings > Approved URLs* page to specify approved URLs that the users are always able to access. Web Protection will not restrict access to these domains.

To open this page: In the navigation tree, choose **Cisco ProtectLink Web > Global Settings > Approved Clients**.

NOTE This page is available only if you activated your Cisco ProtectLink Web service. See **Getting Started with Cisco ProtectLink Web, page 98**.

STEP 1 In the *Approved URLs* section, check the **Enable** box to enable this feature. The specified URLs will always be accessible.

STEP 2 In the *Approved URLs Table*, specify the URLs that are always accessible, regardless of Web Protection settings.

- To add an entry, click **Add**. On the *Approved URL Configuration* page. Enter the trusted URL(s) in the box. To enter multiple URLs, type a semi-colon between entries, such as *www.cisco.com;www.google.com; www.mycompany.com*. All pages in the specified domains will be

accessible. Click **Save** to save your changes. If you entered any invalid characters, a message appears. Click **OK** to close the message, and edit your entries. Spaces, commas, and symbols are not allowed.

- To edit an entry, check a box, and then click **Edit**. Enter and save the settings, as described above.
- To delete an entry, check a box, and then click **Delete**. To select all entries in the table, check the box in the heading row and then click **Delete**.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Web Protection

Web Protection includes these features:

- **Overflow Control, page 101**
- **Web Reputation, page 102**
- **URL Filtering, page 103**

Overflow Control

Use the *Cisco ProtectLink Web > Web Protection > Overflow Control* page to control how excess URL requests are handled.

To open this page: In the navigation tree, choose **Cisco ProtectLink Web > Web Protection > Overflow Control**.

NOTE This page is available only if you activated your Cisco ProtectLink Web service. See **Getting Started with Cisco ProtectLink Web, page 98**.

STEP 1 Enter these settings:

- **Temporarily block URL requests:** Users will not be able to access the Internet until the current queue can accommodate more requests. This setting is recommended.

- **Temporarily bypass Cisco ProtectLink URL Filtering for requested URLs:** URL requests will temporarily bypass URL Filtering and Web Reputation. This setting could make your network vulnerable to threats.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Web Reputation

Use the *Cisco ProtectLink Web > Web Protection > Web Reputation* page to enable and configure Web Reputation. When this feature is enabled, Requested URLs are checked against the set security level and the Trend Micro Web Security database in real-time. Only URLs that meet the criteria are accessible.

To open this page: In the navigation tree, choose **Cisco ProtectLink Web > Web Protection > Web Reputation**.

NOTE This page is available only if you activated your Cisco ProtectLink Web service. See **Getting Started with Cisco ProtectLink Web, page 98**.

STEP 1 In the *Web Reputation* section, check the **Enable** box to enable this feature. Uncheck the box to disable it.

STEP 2 In the **Security Level** section, choose one of these options:

- **High—**This option blocks a higher number of potentially malicious websites, but also has a higher incidence of false positives (legitimate sites that are classified as malicious).
- **Medium—**This option blocks most potentially malicious websites, and has a lower incidence of false positives (legitimate sites that are classified as malicious). This setting is recommended.
- **Low:** This option blocks fewer potentially malicious websites, and therefore reduces the risk of false positives.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

URL Filtering

Use the *Cisco ProtectLink Web > Web Protection > URL Filtering* page to control requests to web sites based on categories and the time of request.

To open this page: In the navigation tree, click **Cisco ProtectLink Web > Web Protection > URL Filtering.**

NOTE This page is available only if you activated your Cisco ProtectLink Web service. See **Getting Started with Cisco ProtectLink Web, page 98**.

STEP 1 In the *URL Filtering* section, enter these settings:

- **URL Filtering:** Check the **Enable** box to block access to websites based on pre-defined categories and the time of the request. Uncheck the box to disable this feature.
- **Enable Check Referer:** Check the box to enable checking the HTTP referer header for allowed URLs. When enabled, this feature allows a user to access a link on an allowed web page even if the link goes to a different domain.
- **HTTP Ports—**Enter the HTTP ports to which content filtering applies. The default port is 80. If your networking using an external HTTP proxy server which listens on other ports, they can be added here. Multiple ports can be specified in a comma separated list.

STEP 2 In the *Filtered Categories* table, select the categories and sub-categories for websites that you want to block during Business Hours and Leisure Hours.

Note: The Business Hours and Leisure Hours are defined by the *Business Days* and *Business Times* settings.

- To view sub-categories under a category, click the plus sign (+).
- To block access for all sub-categories within a category, check the box for the category. To disable filtering for a category, uncheck the box.
- To block access for an individual sub-category, check the box. To disable filtering for a sub-category, uncheck the box.
- For each filter that you enable, the *Instances Blocked* column will display the number of times that someone attempted to visit a blocked site. YOu can click **Reset Counters** to reset the counter to zero.

STEP 3 In the *Business Days* and *Business Times* sections, choose days and times to define your Business Hours for the *Filtered Categories* table. The unselected days and times define the Leisure Hours in the table.

- **Business Days:** Check the box for each day when your business is open. Uncheck the box for each day when your business is closed. On the checked days, the Business Hours filters apply. On the unchecked days, the Leisure Hours filters apply.
- **Business Times:** To use the same settings all day, choose **All day (24 hours)**. To specify the hours when your business is open, click **Specify business Hours**. Check the **Morning** box and select the *From* and *To* times. Then check the **Afternoon** box and select the *From* and *To* times. During the selected periods, the Business Hours filters apply. During all other periods, the Leisure Hours filters apply.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Updating the ProtectLink License

You can view your license information and renew your license.

Summary

Use the *Cisco ProtectLink Web > License > Summary* page to view your license information.

To open this page: In the navigation tree, click **Cisco ProtectLink Web > License > Summary**.

NOTE This page is available only if you activated your Cisco ProtectLink Web service. See **Getting Started with Cisco ProtectLink Web, page 98**.

To refresh the license information displayed on this page, click **Update Information**.

The *License Information* section displays the following information:

- **View detailed license online:** To view license information online, click this link. Your web browser opens the *ProtectLink Product Detail* page. You can close that page when you finish reading the information.
- **Status:** The status of your license: *Activated* or *Expired*
- **Platform:** The platform type, Gateway Service.
- **License expires on:** The date and time your license when the license expires (one year after the service was activated)

Renewal

Use the *Cisco ProtectLink Web > License > Renewal* page to view information about renewing your license. Follow the instructions to purchase and register your registration key and to use your activation code to enable Protect Link services on the Cisco RV220W.

To open this page: In the navigation tree, click **Cisco ProtectLink Web > License > Renewal**.

6

Configuring Virtual Private Networks (VPNs) and Security

This chapter explains how to configure virtual private networks for secure access to your network resources.

The following sections are covered:

Configuring VPNs

A VPN provides a secure communication channel ("tunnel") between two gateway routers or a remote worker and a gateway router. You can create different types of VPN tunnels, depending on the needs of your business. Several scenarios are described below. Read these descriptions to understand the options and the steps required to set up your VPN.

- **Site-to-Site Access with Gateway-to-Gateway VPN, page 107**
- **Remote Access with an IPsec Client (Client-to-Gateway VPN), page 107**
- **Remote Access with Clientless SSL VPN, page 108**
- **Remote Access with Cisco QuickVPN, page 109**
- **Remote access using PPTP, page 109**

Site-to-Site Access with Gateway-to-Gateway VPN

A gateway-to-gateway VPN connects two or more routers using an IPsec policy to secure traffic between two sites. Use this type of VPN if you need to connect the network at a branch office to the network at your main office, for example.

1. Use the *Basic VPN Setup* page to create a VPN. Choose Gateway as the peer type, and enter a connection name, pre-shared key, remote gateway, local gateway (should be pre-populated), remote LAN, and local LAN. You will need to configure the corresponding settings on the router at the other site. See **Basic VPN Setup, page 109**.
2. If needed, edit the default settings by using the *Advanced VPN Setup* page. See **Configuring Advanced VPN Parameters, page 111**.

Remote Access with an IPsec Client (Client-to-Gateway VPN)

In this scenario, a remote client, such as a PC running IPsec VPN client software, initiates a VPN tunnel. The IP address of the remote PC client is not necessarily known in advance. The gateway acts as responder. Configure this type of VPN tunnel if you have a teleworkers who need to securely connect to your network from their home offices, for example.

You will need to configure this router with the specific IPsec policies required for the IPsec client. You also will need to install and configure the IPsec client software on the users' computers.

1. Use the *Basic VPN Setup* page to quickly configure the IKE Policy and the VPN Policy by using the standard settings. Choose VPN Client as the peer type, and enter the other basic settings. Note that the users' VPN client software will need to be configured with the same Pre-Shared Key that you enter here. See **Basic VPN Setup, page 109**.
2. To configure the settings required by the VPN client software, use the *Advanced VPN Setup* page to edit the IKE Policy and the VPN Policy. For the required settings, refer to the VPN client documentation. See **Configuring Advanced VPN Parameters, page 111**.
3. Set up the users:
   - If you configured the VPN policy to authenticate from the local database, add the users on the *VPN > IPsec > VPN Users* page. Choose XAUTH as the user protocol. (See **Configuring VPN Users, page 122**).
   - If you configured the VPN policy to authenticate from an external database, configure the connection to the RADIUS server. See **Using the Cisco RV220W With a RADIUS Server, page 146**.

Remote Access with Clientless SSL VPN

SSL VPN is a flexible and secure way to extend network resources to virtually any remote user who has access to the Internet and a Web browser. A benefit is that you do not have to install and maintain VPN client software on the remote computers. Users connect to a portal that enables access to network resources. You can set up different portal layouts to be used by different types of users. You can streamline the setup process by organizing VPN users into domains and groups that share VPN policies.

1. Create SSL VPN users on the *Adminstration > User Management > Users* page. You can assign users to the default SSL VPN group. For more information, see **User Management, page 158**.
2. From a PC on the remote site, open your web browser and attempt to connect to the default portal (https://*<wan_ip_address>*/portal/SSLVPN). For more information on customizing portals and configuring other advance SSL VPN server features, see **SSL VPN Server, page 124**.
3. After connecting to the VPN portal, navigate to the VPN tunnel page and launch the SSL VPN Tunnel client installer/launcher. For information about configuring advanced features, see **SSL VPN Tunnel Client Configuration, page 136**.

NOTE To enable SSL VPN access on this router, you must enable remote management to open the port used for VPN. See **Remote Management, page 157**.

Remote Access with Cisco QuickVPN

For quick setup with basic VPN security settings, distribute Cisco QuickVPN software to your users, who can then securely access your network resources. Use this option if you want to simplify the VPN setup process. You do not have to configure VPN policies. Remote users can connect securely with the Cisco QuickVPN client and an Internet connection.

1. Add the users on the *VPN > IPsec > VPN Users* page. Choose QVPN as the user protocol. See **Configuring VPN Users, page 122**.
2. Instruct users to obtain the free Cisco QuickVPN software from Cisco.com, and install it on their computers. For more information, see **.Appendix B, "Using Cisco QuickVPN."**
   Note: To enable access via Cisco QuickVPN this router, you must enable remote management to open port 443 for SSL. See **Remote Management, page 157**.

Remote access using PPTP

In this scenario, a remote user with a Microsoft computer connects to a PPTP server at your site to access network resources. Use this option to simplify VPN setup. You do not have to configure VPN policies. Remote users can connect by using the PPTP client from a Microsoft computer. There is no need to install a VPN client. However, be aware that security vulnerabilities have been found in this protocol.

Enter the PPTP server settings and add the users on the *VPN > IPsec > VPN Users* page. Choose PPTP as the user protocol. See **Configuring VPN Users, page 122**.

Basic VPN Setup

Use the *Basic VPN Setup* page to create a VPN. This feature acts like a VPN setup wizard to set up a VPN by using a Pre-shared Key (PSK) and default values as proposed by the VPN Consortium (VPNC). To view the settings that are configured through this process, click the **View Default Settings** button. The settings cannot be changed from this page, but can be configured through the *Advanced VPN Setup* page. For more information, see **Configuring Advanced VPN Parameters, page 111**.

To open this page: In the navigation tree, choose **VPN** > **IPsec** > **Basic VPN Setup**.

STEP 1 Choose the type of peer that the VPN tunnel will connect:

- **Gateway—**Connects the Cisco RV220W to a gateway, such as another Cisco RV220W at another site.
- **VPN Client—**Connects the Cisco RV220W to remote clients. The remote clients must run VPN client software.

STEP 2 In the *Connection Name and Remote IP Type* section, enter the following information:

- **New Connection Name—**Enter a name to identify this connection. The connection name is used for management.
- **Pre-Shared Key—**Enter an alpha-numeric key to be used when setting up a connection. Include 8 to 49 characters. The double-quote character is not allowed. Ensure that the VPN client or remote gateway is configured with this key.

STEP 3 In the Endpoint Information section, enter the following information:

- **Remote Gateway Type**—If the peer is a gateway, choose a method for identifying the remote router. You can use either an IP address or a Fully-Qualified Domain Name. You must configure the same type for the remote gateway and the local gateway.
- **Remote WANs IP Address / FQDN**—Enter one of the following options:
  - *For a gateway-to-gateway connection:* If known, enter the remote router's IP address or its domain name (for example, *MyServer.MyDomain.com*). If you do not have that information, keep the default setting, *remote.com*.
  - *For a client-to-gateway connection*: Keep the default setting, *remote.com*, specify a client WAN IP address/FQDN if you want to restrict access only to clients from that site.
- **Local Gateway Type**—Choose a method for identifying this router. You can use either an IP address or a Fully-Qualified Domain Name. If the peer is a gateway, choose the same type that you chose for the Remote Gateway Type above.
- **Local WANs IP Address / FQDN**—Based on the above selection, enter either this router's IP address or its domain name (for example, *MyServer.MyDomain.com*). This field can be left blank if you want to use the same FQDN or IP address that is specified in the WAN configuration. If you do not know the address, keep the default setting, *local.com*.

STEP 4 In the *Secure Connection Remote Accessibility* section, enter the following information:

- **Remote LAN (Local Network) IP Address** *(for a Gateway only)*—Enter the subnet IP address of the remote LAN. A subnet IP address is one that gives the "network number" of the IP range. For example, a network address of 192.168.1.10 with a Subnet Mask of 255.255.255.0 would have a network number or subnet IP address of 192.168.1.0.
- **Remote LAN (Local Network) Subnet Mask** *(for a Gateway only)*—Enter the associated Subnet Mask for the remote LAN.
- **Local LAN (Local Network) IP Address**—Enter the subnet IP address of the local LAN. A subnet IP address is one that gives the "network number" of the IP range. For example, a network address of 192.168.1.10 with a Subnet Mask of 255.255.255.0 would have a network number or subnet IP address of 192.168.1.0.
- **Local LAN (Local Network) Subnet Mask**—Enter the Subnet Mask for the local LAN.

  Note: The IP address range used on the remote LAN must be different from the IP address range used on the local LAN.

STEP 5 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. After you save your settings, the *Advanced VPN Setup* page appears.

Configuring Advanced VPN Parameters

The *Advanced VPN Setup* page allows you to configure advanced VPN parameters, such as IKE and other VPN policies. These policies control how the Cisco RV220W initiates and receives VPN connections with other endpoints.

- **Managing IKE and VPN Policies, page 112**
- **Configuring IKE Policies, page 113**
- **Configuring VPN Policies, page 117**
- **Configuring VPN Users, page 122**

Managing IKE and VPN Policies

Use the *VPN > IPsec > Advanced VPN Setup* page to view, add, edit, and delete IKE and VPN policies.

To open this page: In the navigation tree, choose **VPN** > **IPsec** > **Advanced VPN Setup**.

The tables list the existing policies.

IKE Policies

The Internet Key Exchange (IKE) protocol dynamically exchanges keys between two IPsec hosts. You can create IKE policies to define the security parameters such as authentication of the peer, encryption algorithms, etc. to be used in this process. Be sure to use compatible encryption, authentication, and key-group parameters for the VPN policy.

In the *IKE Policy Table*, perform these tasks:

- To add a policy, click **Add**. Then enter the settings on the *Add/Edit IKE Policy Configuration* page. See **Configuring IKE Policies, page 113**.
- To edit a policy, check the box and then click **Edit**. Then enter the settings on the *Add/Edit IKE Policy Configuration* page. See **Configuring IKE Policies, page 113**.
- To delete a policy, check the box and then click **Delete**. To select all policies, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

VPN Policies

In the *VPN Policy Table*, perform these tasks:

- To add a policy, click **Add**. Then enter the settings on the *Add/Edit VPN Policy Configuration* page. See **Configuring VPN Policies, page 117**. **Note:** To create an Auto VPN Policy, you need to first create an IKE policy and then add the corresponding Auto Policy for that IKE Policy.
- To edit a policy, check the box and then click **Edit**. Then enter the settings on the *Add/Edit VPN Policy Configuration* page. See **Configuring VPN Policies, page 117**.
- To delete a policy, check the box and then click **Delete**. To select all policies, check the box in the heading row, and then click **Delete**. When the

confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

- To enable a policy, check the box and then click **Enable**. To select all policies, check the box in the heading row, and then click **Enable**.
- To enable a policy, check the box and then click **Disable**. To select all policies, check the box in the heading row, and then click **Disable**.

Configuring IKE Policies

Use the *Add / Edit IKE Policy Configuration* page to configure an **IKE (Internet Key Exchange)** Policy. You can create IKE policies to define the security parameters such as authentication of the peer, encryption algorithms, etc. to be used in this process. Be sure to use compatible encryption, authentication, and key-group parameters for the VPN policy.

To open this page: From the *VPN > IPsec > Advanced VPN Setup* page, in the *IKE Policy* table, click **Add** or select an existing policy and click **Edit**.

STEP 1 At the top of the page, enter these settings:

- **Policy Name—**Enter a unique name for the policy for identification and management purposes.
- **Direction/Type—**Choose one of the following connection methods:
  - **Initiator—**The router will initiate the connection to the remote end.
  - **Responder—**The router will wait passively and respond to remote IKE requests.
  - **Both—**The router will work in either Initiator or Responder mode.
- **Exchange Mode—**Choose one of the following options:
  - **Main—**This mode negotiates the tunnel with higher security, but is slower.
  - **Aggressive—**This mode establishes a faster connection, but with lowered security.

  Note: If either the Local or Remote identifier type is not an IP address, then negotiation is only possible in Aggressive Mode. If FQDN, User FQDN or DER ASN1 DN is selected, the router disables Main mode and sets the default to Aggressive mode.

STEP 2 In the *Local* section, enter the **Identifier Type** to specify the Internet Security Association and Key Management Protocol (ISAKMP) identifier for the local router:

- **Local WAN (Internet) IP**
- **FQDN**
- **User-FQDN**
- **DER ASN1 DN**

  If you chose **FQDN**, **User-FQDN**, or **DER ASN1 DN** as the identifier type—Enter the IP address or domain name in the **Identifier** field.

STEP 3 In the *Remote* section, enter the **Identifier Type** to specify the Internet Security Association and Key Management Protocol (ISAKMP) identifier for the remote router:

- **Remote WAN (Internet) IP**
- **FQDN**
- **User FQDN**
- **DER ASN1 DN**

  If you chose **FQDN**, **User-FQDN**, or **DER ASN1 DN** as the identifier type—Enter the IP address or domain name in the **Identifier** field.

STEP 4 In the *IKE SA Parameters* section, enter these settings:

The Security Association (SA) parameters define the strength and mode for negotiating the SA.

- **Encryption Algorithm**—Choose the algorithm used to negotiate the SA:
  - **DES**
  - **3DES**
  - **AES-128**
  - **AES-192**
  - **AES-256**

- **Authentication Algorithm—**Specify the authentication algorithm for the VPN header:
  - **MD5**
  - **SHA-1**
  - **SHA2-256**
  - **SHA2-384**
  - **SHA2-512**

  Ensure that the authentication algorithm is configured identically on both sides.
- **Authentication Method—**Choose one of the following options:
  - **Pre-Shared Key—**Choose this option for a simple password-based key that is shared with the IKE peer. Then enter the key in the space provided. Note that the double-quote character (“) is not supported in the pre-shared key.
  - **RSA-Signature—**Choose this option to disable the pre-shared key text field and use the Active Self Certificate that was uploaded on the *Security > SSL Certificate* page. A certificate must be configured in order for RSA-Signature to work.
- **Diffie-Hellman (DH) Group—**Specify the DH Group algorithm, which is used when exchanging keys. The DH Group sets the strength of the algorithm in bits. Ensure that the DH Group is configured identically on both sides of the IKE policy.
- **SA Lifetime—**Enter the interval, in seconds, after which the Security Association becomes invalid.
- **Dead Peer Detection—**Check the **Enable** box to enable this feature, or uncheck the box to disable it. Dead Peer Detection (DPD) is used to detect whether the peer is alive or not. If peer is detected as dead, the router deletes the IPsec and IKE Security Association. If you enable this feature, also enter these settings:
  - **Detection Period—**Enter the interval, in seconds, between consecutive DPD R-U-THERE messages. DPD R-U-THERE messages are sent only when the IPsec traffic is idle.
  - **Reconnect after Failure Count—**Enter the maximum number of DPD failures allowed before tearing down the connection.

STEP 5 Optionally in the **Extended Authentication** section, enable Extended Authentication (XAUTH). When connecting many VPN clients to a VPN gateway router, XAUTH allows authentication of users with methods in addition to the authentication method mentioned in the IKE SA parameters.

- **XAUTH Type—**Choose one of the following options:
  - **None—**Disables XAUTH.
  - **Edge Device—**Authentication is done by one of the following methods:

    User Database—User accounts created in the router are used to authenticate users. After completing this procedure, enter the users on the *VPN > IPsec > VPN Users* page. See **Configuring VPN Users, page 122**.

    RADIUS-PAP or **RADIUS-CHAP—**Authentication is done by using a RADIUS server and either password authentication protocol (PAP) or challenge handshake authentication protocol (CHAP). After completing this procedure, set up the RADIUS server on the *Security > RADIUS Server* page. See **Using the Cisco RV220W With a RADIUS Server, page 146**.
  - **IPsec Host—**The router is authenticated by a remote gateway with a username and password combination. In this mode, the router acts as a VPN Client of the remote gateway. If you select this option, also enter the **Username** and **Password** for the host.

STEP 6 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *VPN > IPsec > Advanced VPN Setup* page.

Configuring VPN Policies

To open this page: From the *VPN > IPsec > Advanced VPN Setup* page, in the *VPN Policy* table, click **Add** or select an existing policy and click **Edit**.

NOTE To create an Auto VPN Policy, you need to first create an IKE policy and then add the corresponding Auto Policy for that IKE Policy. (See **For an Auto policy type, enter the settings in the Auto Policy Parameters section., page 120**.)

STEP 1 At the top of this page, enter these settings:

- **Policy Name—**Enter a unique name to identify the policy.
- **Policy Type—**Choose one of the following options:
  - **Auto Policy**—Some parameters for the VPN tunnel are generated automatically. This requires using the IKE (Internet Key Exchange) protocol to perform negotiations between the two VPN Endpoints.
  - **Manual Policy**—All settings (including the keys) for the VPN tunnel are manually input for each end point. No third-party server or organization is involved.
- **Remote Endpoint—**Select the type of identifier that you want to provide for the gateway at the remote endpoint: **IP Address** or **FQDN** (Fully Qualified Domain Name). Then enter the identifier in the space provided.
- **NETBIOS—**Check the **Enable** box to allow NetBIOS broadcasts to travel over the VPN tunnel, or uncheck this box to disable NetBIOS broadcasts over the VPN tunnel. For client policies, the NetBIOS feature is available by default.

STEP 2 In the *Local Traffic Selection* and *Remote Traffic Section*, enter these settings:

- **Local/Remote IP**—Select the type of identifier that you want to provide for the endpoint:
  - **Any**—Specifies that the policy is for traffic from the given end point (local or remote). Note that selecting Any for both local and remote end points is not valid.
  - **Single**—Limits the policy to one host. Enter the IP address of the host that will be part of the VPN in Start IP Address field. Then enter the IP address in the **Start Address** field.

- **Range**—Allows computers within an IP address range to connect to the VPN. Enter the Start IP Address and End IP Address in the provided fields. Enter the first IP address of the range in the **Start Address** field. Enter the final IP address of the range in the **End Address** field.
- **Subnet**—Allows an entire subnet to connect to the VPN. Enter the network address in the Start IP Address field, and enter the Subnet Mask in the Subnet Mask field. Enter the subnet's network IP address in the **Start Address** field. Enter the subnet mask, such as 255.255.255.0, in the **Subnet Mask** field. The field automatically displays a default subnet address based on the IP address.

  IMPORTANT: Make sure that you avoid using overlapping subnets for remote or local traffic selectors. Using these subnets would require adding static routes on the router and the hosts to be used.

  For example, a combination to avoid would be:

  Local Traffic Selector: 192.168.1.0/24

  Remote Traffic Selector: 192.168.0.0/16

STEP 3 In the **Split DNS** section, check the **Enable** box to allow the Cisco RV220W to find the DNS server of the remote router without going through the ISP (Internet). Otherwise, uncheck the box to disable this feature. If you enable Split DNS, also enter these settings:

- **Domain Name Server 1**—Enter a Domain Name server IP address to resolve the domain that you enter in the **Domain Name 1** field.
- **Domain Name Server 2**—Optionally, enter a Domain Name server IP address to resolve the domain that you enter in the **Domain Name 2** field.
- **Domain Name 1**—Enter a domain name, which will be queried only using the DNS server configured in the **Domain Name Server 1** field.
- **Domain Name 2**—Enter a domain name, which will be queried only using the DNS server configured in the **Domain Name Server 2** field.

STEP 4 For a Manual policy type, enter the settings in the **Manual Policy Parameters** section. For more information, see **Manual Policy Example, page 121**.

- **SPI-Incoming, SPI-Outgoing**—Enter a hexadecimal value between 3 and 8 characters; for example, 0x1234.
- **Encryption Algorithm**—Select the algorithm used to encrypt the data.

- **Key-In**—Enter the encryption key of the inbound policy. The length of the key depends on the algorithm chosen:
  - DES—8 characters
  - 3DES—24 characters
  - AES-128—16 characters
  - AES-192—24 characters
  - AES-256—32 characters
  - AES-CCM—16 characters
  - AES-GCM—20 characters
- **Key-Out**—Enter the encryption key of the outbound policy. The length of the key depends on the algorithm chosen, as shown above.
- **Integrity Algorithm**—Select the algorithm used to verify the integrity of the data.
- **Key-In**—Enter the integrity key (for ESP with Integrity-mode) for the inbound policy. The length of the key depends on the algorithm chosen:
  - MD5—16 characters
  - SHA-1— 20 characters
  - SHA2-256—32 characters
  - SHA2-384— 48 characters
  - SHA2-512—64 characters
- **Key-Out**—Enter the integrity key (for ESP with Integrity-mode) for the outbound policy. The length of the key depends on the algorithm chosen, as shown above.

STEP 5 For an Auto policy type, enter the settings in the **Auto Policy Parameters** section.

- **SA-Lifetime**—Enter the duration of the Security Association and choose the unit from the drop-down list:
  - **Seconds**—Choose this option to measure the SA Lifetime in seconds. After the specified number of seconds passes, the Security Association is renegotiated. The default value is 3600 seconds. The minimum value is 300 seconds.
  - **Kbytes**—Choose this option to measure the SA Lifetime in kilobytes. After the specified number of kilobytes of data is transferred, the SA is renegotiated. The minimum value is 1920000 KB.

    When configuring a lifetime in kilobytes (also known as lifebytes), be aware that two SAs are created for each policy. One SA applies to inbound traffic, and one SA applies to outbound traffic. Due to differences in the upstream and downstream traffic flows, the SA may expire asymmetrically. For example, if the downstream traffic is very high, the lifebyte for a download stream may expire frequently. The lifebyte of the upload stream may not expire as frequently. It is recommended that the values be reasonably set, to reduce the difference in expiry frequencies of the SAs; otherwise the system may eventually run out of resources as a result of this asymmetry. The lifebyte specifications are generally recommended for advanced users only.
- **Encryption Algorithm**—Select the algorithm used to encrypt the data.
- **Integrity Algorithm**—Select the algorithm used to verify the integrity of the data.
- **PFS Key Group**—Check the **Enable** box to enable Perfect Forward Secrecy (PFS) to improve security. While slower, this protocol helps to prevent eavesdroppers by ensuring that a Diffie-Hellman exchange is performed for every phase-2 negotiation.
- **Select IKE Policy**—Choose the IKE policy that will define the characteristics of phase 1 of the negotiation. To add an IKE policy to the list, click the **IKE Policies** link. See **Configuring Advanced VPN Parameters, page 111**.

STEP 6 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *VPN > IPsec > Advanced VPN Setup* page.

Manual Policy Example

Creating a VPN tunnel between two routers:

```
Router 1: WAN1=10.0.0.1 LAN=192.168.1.1 Subnet=255.255.255.0
Policy Name: manualVPN
Policy Type: Manual Policy
Local Gateway: WAN1
Remote Endpoint: 10.0.0.2
Local IP: Subnet 192.168.1.0 255.255.255.0
Remote IP: Subnet 192.168.2.0 255.255.255.0
SPI-Incoming: 0x1111
Encryption Algorithm: DES
Key-In: 11112222
Key-Out: 33334444
SPI-Outgoing: 0x2222
Integrity Algorithm: MD5
Key-In: 1122334444332211
Key-Out: 5566778888776655
Router 2: WAN1=10.0.0.2 LAN=192.168.2.1 Subnet=255.255.255.0
Policy Name: manualVPN
Policy Type: Manual Policy
Local Gateway: WAN1
Remote Endpoint: 10.0.0.1
Local IP: Subnet 192.168.2.0 255.255.255.0
Remote IP: Subnet 192.168.1.0 255.255.255.0
SPI-Incoming: 0x2222
Encryption Algorithm: DES
Key-In: 33334444
Key-Out: 11112222
SPI-Outgoing: 0x1111
Integrity Algorithm: MD5
Key-In: 5566778888776655
Key-Out: 1122334444332211
```

Configuring VPN Users

Use the *VPN > IPsec > VPN Users* page to configure PPTP Server settings (if applicable) and to add VPN clients for PPTP, XAUTH, and Cisco QuickVPN.

VPN clients must be configured with the same VPN policy parameters used in the VPN tunnel that the client wishes to use: encryption, authentication, lifetime, and PFS key-group. Upon establishing these authentication parameters, the VPN client user database must also be populated with an account to give a user access to the tunnel. The VPN gateway authenticates users in this list when XAUTH is used in an IKE policy.

VPN client software is required to establish a VPN tunnel between the router and remote endpoint. Open source software (such as OpenVPN or Openswan) as well as Microsoft IPsec VPN software can be configured with the required IKE policy parameters to establish an IPsec VPN tunnel. Refer to the client software guide for detailed instructions on setup as well as the router's online help.

To open this page: In the navigation tree, choose **VPN** > **IPsec** > **VPN Users**.

STEP 1 If you are using a Point-to-Point Tunneling Protocol VPN server, enter these settings in the *PPTP Server Configuration* section:

- **PPTP Server—**Check the **Enable** box to enable this feature, or uncheck the box to disable it.
- **Starting IP Address—**Enter the starting IP address of the range of IP addresses for the PPTP VPN tunnel.
- **Ending IP Address—**Enter the ending IP address of the range of IP addresses for the PPTP VPN tunnel. The range can include up to 10 addresses.

  Note: The starting IP of the PPTP client IP range is used as the PPTP server IP of the router and the remaining PPTP client IP address range is used to assign IP address to PPTP clients. If the address range is within a VLAN range, the PPTP clients are members of that VLAN. Access to other VLANs is subject to the inter-VLAN routing settings. For example, if PPTP clients are on VLAN 3, and VLAN 2 prevents inter-VLAN routing, then the PPTP clients are unable to access resources on VLAN 2.

STEP 2 If you checked the *Enable* box for the PPTP Server, save your settings. You can add PPTP users only if you enabled the PPTP Server.

STEP 3 In the *VPN Client Setting Table*, perform these tasks:

- To add a client, click **Add**. Enter these settings:
  - **Enabled—**For PPTP, check the box to activate the user account. Uncheck the box to de-activate the user account. This setting is not applicable to QuickVPN or XAUTH.
  - **Username—**Enter the username for user authentication. For QuickVPN, it must include at least 6 characters.
  - **Password—**Enter the password for user authentication. For QuickVPN, it must include at least 6 characters.
  - **Allow User to Change Password—**Check the box if you want the user to be able to change the password. Otherwise, uncheck the box.
  - **Protocol—**Choose the type of user:

    QuickVPN—The user uses the Cisco QuickVPN client and is authenticated by the VPN server.

    PPTP—The user is authenticated by a PPTP server.

    XAUTH—The user is authenticated by an external authorization server, such as a RADIUS server.
- To edit a client, check the box and then click **Edit**. To select all entries, check the box in the heading row. Then edit the information, as described above.
- To delete a client, check the box and then click **Delete**. To select all entries, check the box in the heading row.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Configuring VPN Passthrough

VPN passthrough allows VPN traffic that originates from VPN clients to pass through the router. For example, if you are not using a VPN that is configured on the Cisco RV220W, but are using a laptop to access a VPN at another site, configuring VPN passthrough allows that connection.

To open this page: In the navigation tree, choose **VPN** > **IPsec** > **VPN Passthrough**.

STEP 1 Choose the type of traffic to allow to pass through the router:

- **IPsec**—Check **Enable** to allow IP security tunnels to pass through the router.
- **PPTP**—Check **Enable** to allow Point-to-Point Tunneling Protocol tunnels to pass through the router.
- **L2TP**—Check **Enable** to allow Layer 2 Tunneling Protocol tunnels to pass through the router.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

SSL VPN Server

SSL VPN is a flexible and secure way to extend network resources to virtually any remote user who has access to the Internet and a web browser. A benefit is that you do not have to install and maintain VPN client software on the remote machines.

Users can remotely access the network by using a web browser and running the SSL VPN tunnel client launcher to establish the tunnel. When the tunnel is established, each VPN user will have an IP address on the internal network, such as 192.168.251.x.

You can use SSL VPN to provide access to internal websites, web-enabled applications, NT/Active Directory and FTP file shares, other resources, and applications.

NOTE To enable SSL VPN access on this router, you must enable remote management to open port 443 for SSL. See **Remote Management, page 157**.
Access Options for SSL VPN, page 125

Access Options for SSL VPN

The remote user can be given different options for SSL service:

- **VPN Tunnel**: The remote user's SSL enabled browser is used in place of a VPN client on the remote host to establish a secure VPN tunnel. A SSL VPN client (Active-X or Java based) is installed in the remote host to allow the client to join the corporate LAN with pre-configured access/policy privileges. At this point a virtual network interface is created on the user's PC and it is assigned an IP address and DNS server address from the Cisco RV220W.

  To create a VPN tunnel, see Elements of SSL VPN, page 126.

- **Port Forwarding**: Port Forwarding service supports TCP connections between the remote user and the Cisco RV220W. A web-based (ActiveX or Java) client is installed on the client machine. The administrator can define the services and applications that are available to remote port forwarding users. Users do not have access to the full LAN.

  To configure port forwarding, see SSL VPN Port Forwarding, page 133.

Security Tips for SSL VPN

To minimize the risks involved with SSL certificates:

- Configure a group policy that consists of all users who need Clientless SSL VPN access and enable it only for that group policy.
- Limit Internet access for Clientless SSL VPN users, for example, by limiting which resources a user can access using a clientless SSL VPN connection. To do this, you could restrict the user from accessing general content on the Internet. Then, you could configure links to specific targets on the internal network that you want users of Clientless SSL VPN to be able to access.

- Educate users. If an SSL-enabled site is not inside the private network, users should not visit this site over a Clientless SSL VPN connection. They should open a separate browser window to visit such sites, and use that browser to view the presented certificate.

Elements of SSL VPN

Several elements work together to support SSL VPN.

- **Users:** Create your VPN users. You can use the default domain and group or configure your own domains and groups. As you create each user record, be sure to select SSL VPN User as the User Type. Instructions are included in the scenario, or for complete details about domains, groups, and users, see **Configuring a User, page 164**.
- **VPN Policies:** The default VPN policies should be sufficient for most purposes. As needed, you can create more complex policies. See **Configuring VPN Policies, page 117**.
- **Port Forwarding:** You can configure port forwarding to allow access to a limited set of resources. For example, you may want the SSL VPN users to access the email service only. See **SSL VPN Policies, page 129**.

Portal Layouts

To access your network via SSL VPN, a user starts a web browser and then enters the URL for an SSL VPN portal. The Cisco RV220W is pre-configured with a portal that you can use for all users. You can modify title, banner heading, banner message, security settings, and access type (VPN tunnel, port forwarding, or both). In addition, you can create additional portal layouts. For example, you could create two portal layouts for two groups that have access to different resources. (You can assign portals to SSL VPN user domains by using the *Administration > User Management > Domains* page. See **Domains, page 158**.)

- **Managing Portal Layouts, page 127**
- **Adding or Editing a Portal Layout, page 127**

Managing Portal Layouts

Use the *VPN > SSL VPN Server > Portal Layouts* page to view, add, edit, and delete portal layouts.

NOTE To enable SSL VPN access on this router, you must enable remote management to open port 443 for SSL. See **Remote Management, page 157**.
Access Options for SSL VPN, page 125

To open this page: Choose **VPN > SSL VPN Server > Portal Layouts**.

The *Layout Table* lists the default SSLVPN portal layout and any custom layouts that you have added.

Perform these tasks:

- To add a layout, click **Add**. Then enter the settings on the *Portal Layout Configuration* page. See **Adding or Editing a Portal Layout, page 127**.
- To edit a layout, check the box and then click **Edit**. Then enter the settings on the *Portal Layout Configuration* page. See **Adding or Editing a Portal Layout, page 127**.
- To choose a different layout for the default SSL layout, check the box and then click **Set Default**.
- To delete a layout, check the box and then click **Delete**. To select all layouts, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.
- To view a portal layout, click the hyperlink in the **Portal URL** column.

Adding or Editing a Portal Layout

Use the *Portal Layout Configuration* page to enter the settings for an SSL VPN portal page that your SSL VPN users see when connecting to the portal URL.

To open this page: From the *VPN > SSL VPN Server > Portal Layouts* page, click **Add** or select a layout and then click **Edit**.

STEP 1 In the **Portal Layout and Theme Name** area, enter this information:

- **Portal Layout Name—**Enter a descriptive name for the portal that is being configured. The name will appear in the URL for the portal. Do not enter spaces or special characters. Only alphanumeric characters, hyphens (‘-’), and underscore (‘_’) characters are allowed for this field.

- **Portal Site Title** (optional)—Enter the title that will appear at the top of the web browser window for the portal.
- **Banner Title** (optional)—Enter one word for the banner title. Spaces and special characters are not allowed.
- **Banner Message** (optional)—Enter the message text to display along with the banner title. For example, enter instructions or information about the resources that the users can access after logging in. Empty space and characters are not allowed.
- **Display Banner Message on Log in Page**—Check the box to show the banner title and banner message on the portal layout.
- **HTTP Meta Tags for Cache Control (recommended):** Check the box to enable this security feature, which is strongly recommended. This feature ensures that the SSL VPN portal pages and other web content cannot be cached. The HTTP meta tags cache control directives prevent out-of-date web pages and data from being stored on the client's web browser cache.
- **ActiveX Web Cache Cleaner:** Check this box to load an ActiveX cache control whenever users login to this SSL VPN portal.

STEP 2 In the **SSL VPN Portal Pages to Display** section, check the box for each SSL VPN Portal page that users can access through this portal.

Any page that is not selected will not be visible from the SSL VPN portal navigation menu. However, users can still access the hidden pages unless SSL VPN access policies are created to prevent access to these pages.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *VPN > SSL VPN Server > Portal Layouts* page.

Note: You will need to complete the following additional tasks:

- Configure your SSL VPN policies on the *VPN > SSL VPN Server > SSL VPN Policies* page. For more information, see **SSL VPN Policies, page 129**.
- Add your SSL VPN users on the *Administration > User Management > Users* page. For more information, see **Users, page 163**.

SSL VPN Policies

SSL VPN Policies give configured SSL users access to services and network resources. A policy applies to a specific network resource, IP address, or IP address range on the LAN, or to other SSL VPN services that are supported by the Cisco RV220W.

About SSL VPN Policies

By default, a global PERMIT policy (not displayed) is preconfigured over all addresses and over all services and ports.

You can create user, group, and global policies. Policies are applied based on the following levels of precedence:

- User-level policies take precedence over Group-level policies.
- Group-level policies take precedence over Global policies.
- When two policies are in conflict, a more specific policy takes precedence over a general policy. For example, a policy for a specific IP address takes precedence over a policy for a range of addresses that includes this IP address.

A policy can be offered to the VPN Tunnel, Port Forwarding, or both.

After you define a policy, it goes into effect immediately.

Managing SSL VPN Policies

Use the *VPN > SSL VPN Server > SSL VPN Policies* page to view, add, edit, or delete SSL VPN policies.

To open this page: In the navigation tree, choose **VPN > SSL VPN Server > SSL VPN Policies**.

The *SSL VPN Policies Table* displays all existing SSL VPN policies. You can create queries to find particular policies.

STEP 1 Optionally, in the *Query* section, choose which policies to display in the *SSL VPN Policies* table.

- **View List of SSL VPN Policies for—**Choose **Global** for all users, **Group** for a particular group, or **User** for a particular user.
- **Available Groups:** If you chose **Group** as the query type, choose a group from this list.
- **Available Users:** If you chose **User** as the query type, choose a name from this list.
- Click **Display** to run the query.

STEP 2 In the *SSL VPN Policies Table*, perform these tasks:

- To add a layout, click **Add**. Then enter the settings on the *SSL VPN Policy Configuration* page. See **Configuring an SSL VPN Policy, page 130**.

  Note: Before you can add a policy that applies to a network resource, you must first add the resource on the *VPN > SSL VPN Server > Resources* page. See **Configuring a Resource, page 132**.
- To edit a layout, check the box and then click **Edit**. Then enter the settings on the *SSL VPN Policy Configuration* page. See **Configuring an SSL VPN Policy, page 130**.
- To delete a layout, check the box and then click **Delete**. To select all layouts, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Configuring an SSL VPN Policy

Use the *SSL VPN Policy Configuration* page to add or edit a VPN policy.

To open this page: From the *VPN > SSL VPN Server > SSL VPN Policies* page, click **Add** or select a policy and then click **Edit**.

STEP 1 In the *Policy For* section, enter this information:

- **Policy For—**Choose the type of policy: Global, Group, or User.
- **Available Groups—**If you choose Group, also choose the group from the list.
- **Available Users—**If you choose User, also choose the user from the list.

STEP 2 In the *SSL VPN Policy* section, enter this information:

- **Apply Policy to—**Choose to apply the policy to a Network Resource, an IP address, an IP network, or All Addresses that are managed by the device. Also complete the fields that are highlighted with white backgrounds.
- **Policy Name—**Enter a name to identify this policy.

  Note: If you create a policy with same name as that of any existing policy, the newly policy overwrites the existing one.
- **IP Address—**If you chose IP Address or Network Resource in the Apply Policy to field, enter the IP address of the device.
- **Mask Length—**If you chose IP Network in the Apply Policy to field, enter the length of the subnet mask.
- **Port Range / Port Number (Begin & End)—**Specify a port or a range of ports to apply the policy to all TCP and UDP traffic with those ports. Leave the fields empty to apply the policy to all traffic.
- **Service—**Choose **VPN Tunnel**, **Port Forwarding**, or **All Services Defined**.
- **Defined Resources—**Choose the services for a particular policy. This option is available only for policies that are applied to a Network Resource.
- **Permission—**Choose either Permit or Deny for this policy.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *VPN > SSL VPN Server > SSL VPN Policies* page.

Resources for SSL VPN

Network resources are services or groups of LAN IP addresses that are used to easily create and configure SSL VPN policies. This shortcut saves time when creating similar policies for multiple remote SSL VPN users.

- **Managing Resources, page 132**
- **Configuring a Resource, page 132**

Managing Resources

Use the *VPN > SSL VPN Server > Resources* page to view, add, edit, and delete resources.

To open this page: In the navigation tree, choose **VPN > SSL VPN Server > Resources**.

Perform these tasks:

- To add a resource, click **Add**. Then enter the settings on the *Resource Configuration* page. See **Configuring a Resource, page 132**.
- To edit a resource, check the box and then click **Edit**. Then enter the settings on the *Resource Configuration* page. See **Configuring a Resource, page 132**.
- To delete a resource, check the box and then click **Delete**. To select all resources, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Configuring a Resource

Use the *Resource Configuration* page to add or edit a resource.

To open this page: From the *VPN > SSL VPN Server > Resources* page, click **Add** or select a resource and then click **Edit**.

STEP 1 Enter this information:

- **Resource Name—**Enter a unique name to identify this resource.
- **Service—**Choose one of the supported SSL VPN services to associate with this resource.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *VPN > SSL VPN Server > Resources* page.

SSL VPN Port Forwarding

Port Forwarding is used when you want to allow access only to a limited set of resources. For example, you may want the SSL VPN users to access the email service only. Port forwarding is different from split and full tunnel modes, which allow access to all ports for a give subnet.

- **Managing Applications and Host Names for Port Forwarding, page 133**
- **Configuring a TCP Application for SSL VPN Port Forwarding, page 134**
- **Configuring Host Name Resolution for Port Forwarding, page 135**

Managing Applications and Host Names for Port Forwarding

Use the *VPN > SSL VPN Server > Port Forwarding* page to view, add, edit, and delete the applications and host names for SSL VPN port forwarding.

To open this page: In the navigation tree, choose *VPN > SSL VPN Server > Port Forwarding*.

In the *Configured Applications for Port Forwarding Table*, perform these tasks:

- To add an entry, click **Add**. Then enter the settings on the *Port Forwarding Application Configuration* page. See **Configuring a TCP Application for SSL VPN Port Forwarding, page 134**.
- To edit a resource, check the box and then click **Edit**. Then enter the settings on the *Port Forwarding Application Configuration* page. See **Configuring a TCP Application for SSL VPN Port Forwarding, page 134**.
- To delete a resource, check the box and then click **Delete**. To select all resources, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

In the *Configured Host Names for Port Forwarding Table*, perform these tasks:

- To add an entry, click **Add**. Then enter the settings on the *Port Forwarding Host Configuration* page. See **Configuring Host Name Resolution for Port Forwarding, page 135**.

- To edit a resource, check the box and then click **Edit**. Then enter the settings on the *Port Forwarding Host Configuration* page. See **Configuring Host Name Resolution for Port Forwarding, page 135**.
- To delete a resource, check the box and then click **Delete**. To select all resources, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Configuring a TCP Application for SSL VPN Port Forwarding

Use the *Port Fowarding Application Configuration* page to add or edit a port forwarding application.

To open this page: From the *VPN > SSL VPN Server > Port Forwarding* page, click **Add** or select an entry in the *Configured Applications for Port Forwarding Table* and click **Edit**.

STEP 1 Click **VPN > SSL VPN Server > Port Forwarding**.

The following table lists some common applications and corresponding TCP port numbers:

TCP Application	Port Number
FTP Data (usually not needed)	20
FTP Control Protocol	21
SMTP (send mail)	25
HTTP (web)	80
POP3 (receive mail)	110
NTP (network time protocol)	123
Citrix	1494
Terminal Services	3389
VNC (virtual network computing)	5900 or 5800

STEP 1 Enter this information:

- **Local Server IP Address—**Enter the IP address of the internal host machine or local server.
- **TCP Port Number—**Enter the port number of the TCP application that enables port forwarding.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *VPN > SSL VPN Server > Port Forwarding* page.

Configuring Host Name Resolution for Port Forwarding

Use the *Port Forwarding Host Configuration* page to configure a hostname (FQDN) for the network server to give users an easy way to connect to the server without having to remember and enter an IP address.

NOTE The local server IP address of the configured hostname must match the IP address of the configured application for port forwarding.

To open this page: From the *VPN > SSL VPN Server > Port Forwarding* page, click **Add** or select an entry in the *Configured Host Names for Port Forwarding Table* and click **Edit**.

STEP 1 Enter this information:

- **Local Server IP Address—**Enter the IP address of the internal host machine or local server.
- **Fully Qualified Domain Name—**Enter the fully qualified domain name for the TCP application.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *VPN > SSL VPN Server > Port Forwarding* page.

SSL VPN Tunnel Client Configuration

An SSL VPN tunnel client provides a point-to-point connection between the browser-side machine and this Cisco RV220W. When a SSL VPN client is launched from the user portal, a “network adapter” with an IP address from the corporate subnet, DNS and WINS settings is automatically created. This feature allows access to services on the private network without any special network configuration on the remote SSL VPN client machine.

SSL VPN Client

Use the *VPN > SSL VPN Client > SSL VPN Client* page to specify the client settings.

To open this page: In the navigation tree, choose **VPN > SSL VPN Client > SSL VPN Client**.

Make sure that the virtual (PPP) interface address of the VPN tunnel client does not conflict with the address of any physical devices on the LAN. The IP address range for the SSL VPN virtual network adapter should be either in a different subnet or non-overlapping range as the corporate LAN.

If the SSL VPN client is assigned an IP address in a different subnet than the corporate network, a client route must be added to allow access to the private LAN through the VPN tunnel. In addition, a static route on the private LAN’s firewall (typically this Cisco RV220W) is needed to forward private traffic through the VPN Firewall to the remote SSL VPN client.

NOTE As in any IPsec tunnel deployment, the two networks that are joined by the tunnel must use different IP address ranges in their subnets.

STEP 1 Enter this information:

- **Enable Split Tunnel Support—**Check this box to enable Split Tunnel Mode Support, or uncheck this box for Full Tunnel Mode Support. With Full Tunnel Mode, all of the traffic from the host is directed through the tunnel. By comparison, with Split-Tunnel Mode, the tunnel is used only for the traffic that is specified by the client routes.

Note: If you enable Split Tunnel Support, you also will need to configure SSL VPN Client Routes. After you complete this procedure, see **Configured Client Routes for Split Tunnel Mode, page 138**.

- **DNS Suffix (Optional)—**Enter the DNS Suffix for this client.
- **Primary DNS Server (Optional)—**Enter the IP address of the primary DNS Server for this client.
- **Secondary DNS Server (Optional)—**Enter the IP address of the secondary DNS Server for this client.
- **Client Address Range Begin—**Enter the first IP address that will be assigned to SSL VPN clients.
- **Client Address Range End—**Enter the last IP address that will be assigned to SSL VPN clients.

  Note: Configure an IP address range that does not directly overlap with any of addresses on your local network. For example, the default range is 192.168.251.1 to 192.168.251.254.

- **LCP Timeout—**Set the value for LCP echo interval used by sslvpn tunnel connections. The effective LCP timeout value is 3 times the value configured. The updated value will be effective only for the new connections and all existing connections will be using old value. Restart the existing sslvpn tunnel connections for the configured lcp timeout value to be effective.

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

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

If you enabled Split Tunnel Support, you will need to configure SSL VPN Client Routes. See **Configured Client Routes for Split Tunnel Mode, page 138**.

Configured Client Routes for Split Tunnel Mode

Client routes are required if you enabled Split Tunnel mode for SSL VPN clients. The Configured Client Routes entries are added by the SSL VPN Client such that only traffic to these destination addresses is redirected through the SSL VPN tunnels, and all other traffic is redirected using the hosts (SSL VPN Clients) native network interface. For example if the SSL VPN Client attempts to access this device's LAN network then in Split Tunnel mode, the user should add the LAN subnet as the Destination Network using this page.

- **Managing Client Routes, page 138**
- **Configuring a Client Route, page 139**

Managing Client Routes

Use the *VPN > SSL VPN Client > Configured Client Routes* page to configure client routes. This feature is available only if you enabled Split Tunnel Support on the *SSL VPN Client* page.

To open this page: In the navigation tree, choose **VPN > SSL VPN Client > Configured Client Routes**.

Perform these tasks:

- To add a route, click **Add**. Then enter the settings on the *SSL VPN Client Route Configuration* page. See **Configuring a Client Route, page 139**.
- To edit a route, check the box and then click **Edit**. Then enter the settings on the *SSL VPN Client Route Configuration* page. See **Configuring a Client Route, page 139**.
- To delete a route, check the box and then click **Delete**. To select all routes, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Configuring a Client Route

Use the *SSL VPN Client Route Configuration* page to enter the IP address and subnet mask for the client route.

To open this page: From the *VPN > SSL VPN Client > Configured Client Routes* page, click **Add** or select a route and then click **Edit**.

STEP 1 Enter this information:

- **Destination Network—**Enter the destination subnet to which a route is added on the SSL VPN Client.
- **Subnet Mask—**Enter the subnet mask for the destination network.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *VPN > SSL VPN Client > Configured Client Routes* page.

Viewing the SSL VPN Client Portal

To view the SSL VPN Client Portal, click **VPN> SSL VPN Client > SSL VPN Client Portal** in the navigation tree.

NOTE Remote users will use the Portal URL to access the VPN portal.

The client portal provides remote access to the corporate network through the following options in the navigation pane:

- **VPN Tunnel—**After the user clicks the link in the navigation pane, the VPN Tunnel information window opens. The user can click the Launcher icon to connect to the remote network.
- **Port Forwarding—**After the user clicks the link in the navigation pane, the Port Forwarding information window opens. The user can click the Launcher icon to connect to the remote servers.
- **Change Password—**The user can click this link to change his or her password.

NOTE

1. The Change Password section is available only for users who belong to the local data base.
2. The administrator can enable or disable certain features.
3. The user must ensure that Java, Java Script, Active-X controls are enabled or allowed in the web browser settings.

7

Configuring Security

The Cisco RV220W provides several security methods, including certificate authentication, RADIUS server support, and 802.1x port-based authentication.

Using SSL Certificates for Authentication

Use the *Security > SSL Certificate* page to generate certificate requests, manage active certificates, and export client certificates for IPsec VPN authentication.

To open this page: In the navigation tree, choose **Security** > **SSL Certificate**.

Digital Certificates are used by this router during the Internet Key Exchange (IKE) authentication phase to authenticate connecting VPN gateways or clients, or to be authenticated by remote entities. You can use the self-signed certificate that ships with the router, or request one from a Certification Authority (CA) such as VeriSign, Thawte, and other organizations.

To request and install a CA certificate:

A CA certificate provides strong assurance of the server's identity and is a requirement for most corporate network VPN solutions. If a CA certificate is required, complete the following tasks:

STEP 1 In the *Self Certificate Requests* table, click **Generate Certificate**. Then enter the information on the *Generate Self Signed Certificate Request* page. For more information, see **Generating a Certificate Request, page 144**.

STEP 2 In the *Self Certificate Requests* table, click **View** to view the CSR. Copy the text and paste into a text file, giving it a *.pem* extension. Send this file to the CA.

STEP 3 After receiving the files from the CA, complete the following tasks:

a. In the *Trusted Certificates (CA Certificate) Table*, click **Upload**, and select the trusted certificate**.** For more information see **Importing a Trusted Certificate from a File, page 143**.

b. In the *Active Self Certificates* table, click **Upload**, and select the signed certificate. For more information see **Importing an Active Self Certificate from a File, page 143**. The signed certificate becomes an "active self-certificate."

More options on this page:

- *Trusted Certificates (CA Certificate) Table*
  When a remote VPN gateway or client presents a digital certificate, the authentication process verifies that the presented certificate is issued by one of the trusted authorities.
  - To delete a trusted certificate, check the box and then click **Delete**. To select multiple certificates, check the box in the heading row.
  - To upload a trusted certificate, click **Upload.** For more information see **Importing a Trusted Certificate from a File, page 143**.
- *Active Self Certificates*
  You can upload signed certificates issued to you by trusted Certification Authorities (CAs). Before establishing a VNP tunnel, a remote IKE server validates this router by using these certificates.
  - To delete an active self certificate, check the box and then click **Delete**. To select multiple certificates, check the box in the heading row.
  - To upload an active self certificate, click **Upload**. Then select and install the file. For more information see **Importing an Active Self Certificate from a File, page 143**.
- *Self Certificate Requests*
  You can create requests to send to CAs.
  - To view a certificate request, click **View**. For more information, see **Viewing a Certificate Request, page 145**.
  - To delete a certificate request, check the box and then click **Delete**. To select multiple certificates, check the box in the heading row.

- To generate a certificate to send to a CA, click **Generate Certificate**. Then enter the information on the *Generate Self Signed Certificate Request* page. For more information, see **Generating a Certificate Request, page 144**.
- To export a certificate request to back up on your computer, click **Export for Admin**. Save the file on your computer.

▪ To export a file that can be downloaded on an endpoint that will connect to the Cisco RV220W as a VPN client, click **Export for Client**.

Importing a Trusted Certificate from a File

Follow this procedure to import a Trusted Certificate. These certificates are used to verify the validity of certificates signed by Certificate Authorities.

To open this page: From the *Security > SSL Certificate* page, *Trusted Certificates (CA Certificate) Table*, click **Upload**.

STEP 1 Click **Browse** to locate the certificate on the computer:

STEP 2 Click **Upload** to install the certificate.

Importing an Active Self Certificate from a File

Follow this procedure to import a Trusted Certificate. These certificates are used to verify the validity of certificates signed by Certificate Authorities.

To open this page: From the *Security > SSL Certificate* page, *Trusted Certificates (CA Certificate) Table*, click **Upload**.

STEP 1 Click **Browse** to locate the certificate on the computer:

STEP 2 Click **Upload** to install the certificate.

Generating a Certificate Request

Generate *Self Signed Certificate Request* page to generate a Certificate Signing Request (CSR) file to submit to a CA.

To open this page: From the *Security > SSL Certificate* page, *Trusted Certificates (CA Certificate) Table*, click **Generate a New Certificate**.

STEP 1 Enter the following information:

- **Name—**Enter a unique name to identify this request, for your reference.
- **Subject—**Use the standard codes to enter the values that are required by your CA. The CN value is mandatory. Other common codes are described below.
  - Example: CN=www.company.com, O=My Company, C=US, S=California, L=Mountain View.
  - Common Name (CN)—Enter the Host + Domain Name, such as company.com or www.company.com.
  - Organization (O)—Enter the company name. If it includes any special characters such as & omit the symbol and either spell it out or omit it.
  - Country Name (C)—Enter the two-letter code for the country, without punctuation for country, for example: US for United Status or CA for Canada.
  - State or Province (S)—Enter the full name of the state or province. Do not abbreviate the state or province name, for example: California
  - Locality or City (L)—Enter the city or town name, for example: Berkeley
  - Organizational Unit (OU): This field is optional; but can be used to help identify certificates registered to an organization. The Organizational Unit (OU) field is the name of the department or organization unit making the request.
- **Hash Algorithm—**Choose the algorithm: **MD5** or SHA-1. The algorithm used to sign the certificate (RSA) is shown. The Signature Algorithm is RSA.
- **Signature Key Length—**Enter the signature key length, or the length of the signature (**512**, **1024**, or **2048**).
- **IP Address—**(Optional) Enter the IP address of the router.
- **Domain Name—**(Optional) Enter the domain name of the router.

- **Email Address—**(Optional) Enter the e-mail address of the company contact that is used when generating the self certificate request.

STEP 2 Click **Save** to save your settings, or click **Cancel** to redisplay the page with the current settings.

STEP 3 After clicking **Save**, click **OK** to generate the certificate, or otherwise click **Cancel**.

A new certificate request is added to the *Self Certificate Requests* table on the *Security > SSL Certificate* page.

Viewing a Certificate Request

Use the *Certificate Request Data* page to view the content of the generated certificate request.

To open this page: From the *Security > SSL Certificate* page, *Self Certificate Requests table*, click **View**.

STEP 1 Select the text with your mouse.

STEP 2 Right-click in the highlighted text, and then click **Copy** on the shortcut menu.

STEP 3 Paste the copied text into a text file, and then save the file with a *.pem* extension.

STEP 4 Send the text file to the CA for signing.

Using the Cisco RV220W With a RADIUS Server

You can use a RADIUS server to maintain a database of user accounts for authenticating users.

Managing RADIUS Server Configurations

Use the *Security > RADIUS Server* page to view, add, edit, and delete RADIUS Server configurations.

To open this page: In the navigation tree, choose **Security > RADIUS Server**.

Perform these tasks:

- To add a server, click **Add**. Then enter the settings on the *Add / Edit RADIUS Server Configuration* page. See **Adding or Editing a RADIUS Server Configuration, page 147**.
- To edit a server, check the box and then click **Edit**. Then enter the settings on the *Add / Edit RADIUS Server Configuration* page. See **Adding or Editing a RADIUS Server Configuration, page 147**.
- To delete a server, check the box and then click **Delete**. To select all servers, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Adding or Editing a RADIUS Server Configuration

Use the *Add / Edit RADIUS Server Configuration* page to configure a RADIUS server to use for authentication.

To open this page: From the *Security > RADIUS Server* page, click **Add** or select a server and then click **Edit**.

STEP 1 Enter this information:

- **Authentication Server IP Address—**Enter the IP address of the authenticating RADIUS Server.
- **Authentication Port—**Enter the port number on which the RADIUS server sends traffic.
- **Secret—**Enter the shared key that allows the Cisco RV220W to authenticate with the RADIUS server. This key must match the key configured on the RADIUS server. The single quote, double quote, and space characters are not allowed in this field.
- **Timeout—**Enter the timeout interval after which the Cisco RV220W re-authenticates with the RADIUS server.
- **Retries—**Enter the number of retries for the Cisco RV220W to re-authenticate with the RADIUS server.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Security > RADIUS Server* page.

Configuring 802.1x Port-Based Authentication

Use the *Security > 802.1x Configuration* page to specify the settings for port-based authentication. A port-based network access control uses the physical access characteristics of IEEE 802 LAN infrastructures in order to provide a means of authenticating and authorizing devices attached to a LAN port that has point-to-point connection characteristics. It also prevents access to that port in cases where the authentication fails. It provides an authentication mechanism to devices trying to connect to a LAN. The Cisco RV220W acts as a supplicant in the 802.1x authentication system.

To open this page: In the navigation tree, choose **Security** > **802.1x Configuration**.

STEP 1 Enter these settings:

- **802.1x—**Check the **Enable** box to configure a port as an 802.1x supplicant.
- **Select LAN (Local Network) Port—**Select the LAN port that should be configured as an 802.1x supplicant.
- **Username—**Enter the username sent by the Cisco RV220W to the authenticator for authentication. The username and password are the credentials sent to the authenticating server (the device running 802.1X in an authenticator role; for example, a Cisco Catalyst switch).
- **Password—**Enter the password sent by the Cisco RV220W to the authenticator for authentication.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

8

Configuring Quality of Service

The RV220W provides configuration for Quality of Service (QoS) features, such as bandwidth profiles, traffic selectors, and traffic meters. It contains the following sections:

WAN QoS Profiles

Use the *QoS > WAN QoS Profiles* page to enable Quality of Service (QoS) features on traffic flowing from the secure network (LAN) to the insecure network (WAN). You also can configure QoS profiles. Profiles are used to limit the bandwidth that is available for different types of traffic. For example, you can ensure that sufficient bandwidth is available for your SIP voice traffic while limiting the amount of bandwidth that is consumed by web browsing.

To open this page: In the navigation tree, choose **QoS** > **WAN QoS Profiles.**

STEP 1 In the *Global Settings* section, enter these settings:

- **WAN QoS—**Check the **Enable** box to enable QoS features, or uncheck the box to disable these features.
- **WAN QoS mode—**Choose one of the following options:
  - **Priority—**This option lets you allocate a percentage of the total WAN (Internet) bandwidth to traffic based on the priority class.
  - **Rate Limit—**This option lets you allocate the minimum bandwidth bandwidth rate for each QoS profile that you add to the *WAN QoS Profile Table*. You can bind these profiles to specified services by using the *QoS > Profile Binding* page.

STEP 2 If you change the QoS mode, a prompt appears. Click **OK** to continue with the new mode, or click **Cancel** to retain the existing settings.

STEP 3 If you enabled WAN QoS, enter these settings in the *Priority Bandwidth Allocation Settings* section:

- If you chose Priority for the WAN QoS mode, allocate a percentage of the Total WAN (Internet) Bandwidth to each priority class:
  - **High Priority—**Enter a value between **61** (default) and **100**.
  - **Medium Priority—**Enter a value between **31** (default) and **60**.
  - **Low Priority—**Enter a value between **10** (default) and **30**.
- **Total WAN (Internet) Bandwidth—**Enter the total WAN bandwidth. (Valid values are from 1 to 100 Mbps).

STEP 4 After changing the Global Settings or Priority Bandwidth Allocation Settings, click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

STEP 5 In the *WAN QoS Profile Table*, perform these tasks if you want to create profiles for Profile Binding:

- To add a new profile, click **Add**. Then enter these settings:
  - **Name—**Enter a descriptive name to identify this profile.
  - **Priority—**Choose the priority class.
  - **Minimum Bandwidth Rate—**If you chose Rate Limit for the WAN QoS mode, enter the minimum bandwidth rate for this profile. (Valid values are from 1 to the total WAN bandwidth in Kbps).
  - **Maximum Bandwidth Rate—**If you chose Rate Limit for the WAN QoS mode, enter the maximum bandwidth rate for this profile. (Valid values are from 100–1000000 Kbps).
- To change the name or priority of an existing profile, check the box and then click **Edit**. To select all profiles, check the box in the heading row. Then edit the settings as described above.
- To delete a profile, check the box and then click **Delete**. To select all profiles, check the box in the heading row. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

- To bind profiles to traffic selectors, click the **Configure Profile Binding** button. See **Profile Binding, page 151**.

Profile Binding

You can associate your WAN QoS profiles with specified services, network devices, VLANs, wireless networks, or Differentiated Services Code Point (DSCP) values. By doing so, you can shape the bandwidth that is available for different use cases and traffic types. By doing so, you can ensure that the highest possible bandwidth is available to high priority user groups or services such as SIP for voice traffic. Likewise, you can limit the bandwidth that is consumed by low priority user groups such as a wireless guest network or services such as HTTP for Internet browsing.

Managing Profile Binding Rules

Use the *QoS > Profile Binding* page to view, add, edit, or delete profile binding rules for your WAN QoS profiles.

To open this page: In the navigation tree, choose **QoS** > **Profile Binding**.

Perform the following tasks:

- To add a new profile binding rule, click **Add**. Then enter the settings on the *Add / Edit Profile Binding Configuration* page. For more information, see **Configuring a Profile Binding Rule, page 152**.
- To edit a profile binding rule, check the box, and then click **Edit**. Then enter the settings on the *Add / Edit Profile Binding Configuration* page. For more information, see **Configuring a Profile Binding Rule, page 152**.
- To delete a profile binding rule, check the box, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise, click **Cancel**.

Configuring a Profile Binding Rule

Use the *Add / Edit Profile Binding Configuration* page to associate a WAN QoS profile with specified services and devices.

To open this page: From the *QoS > Profile Binding* page, click **Add** or select a profile and then click **Edit**.

STEP 1 Enter these settings to associate a profile with a service and a traffic group:

- **Available Profiles—**Choose the WAN QoS profile that will applied to this traffic. To add a profile to the list, click the **Configure Profile** button. (See **WAN QoS Profiles, page 149**.)
- **Service—**Choose **ANY** if this rule applies to all services, or choose a service from the list. You can add services to this list by using the *Firewall > Advanced Settings > Custom Services* page. (See **Custom Services, page 87**.)
- **Traffic Selector Match Type—**Choose one of the following options to identify the traffic group that is subject to this rule:
  - **IP Address Range—**The rule applies to a range of IP addresses. If you choose this option, enter the **Starting IP Address** and **Ending IP Address**.
  - **MAC Address—**The rule applies to a single device. If you choose this option, enter the **MAC Address** of the device.
  - **VLAN—**This rule applies to a specified VLAN. If you choose this option, choose the **VLAN ID**.
  - **DSCP—**This rule applies to traffic with a specified Differentiated Services Code Point (DSCP) value. Differentiated Services or DiffServ is a computer networking architecture that specifies a simple, scalable and coarse-grained mechanism for classifying and managing network traffic and providing QoS guarantees. If you choose this option, enter a **DSCP Value** from 0 to 63.
  - **SSID—**This rule applies to traffic on a specified wireless network. Choose the access point from the **Available SSIDs** list. AP-1 through AP-4 correspond to the first through fourth networks in the Wireless Basic Setting Table on the *Wireless > Basic Settings* page (default IDs rv220_1 through rv220_4).

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

CoS Settings

802.1p defines eight different Classes of Service (CoS). You can map these services to traffic forwarding queues and to DCSP values.

- **CoS Settings for Traffic Forwarding Queues, page 153**
- **CoS to DSCP Remarking, page 154**

CoS Settings for Traffic Forwarding Queues

Use the *QoS > CoS Settings > CoS Settings* page to map CoS priorities to traffic forwarding queues.

To open this page: In the navigation tree, choose **QoS** > **CoS Settings** > **CoS Settings**.

STEP 1 To enable **CoS to Queue** settings, check the **Enable** box. Otherwise, uncheck the box. The *CoS to Traffic Forwarding Queue Mapping Table* is available only when CoS to Queue is enabled.

STEP 2 In the *CoS to Traffic Forwarding Queue Mapping Table*, choose a Traffic Forwarding Queue for each CoS Priority.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. To reload the default settings, click **Restore Default**.

CoS to DSCP Remarking

Use the *QoS > CoS Settings > CoS to DSCP* page to map CoS priorities to Differentiated Services Code Point (DSCP) values. Differentiated Services or DiffServ is a computer networking architecture that specifies a simple, scalable and coarse-grained mechanism for classifying and managing network traffic and providing QoS guarantees.

To open this page: In the navigation tree, choose **QoS** > **CoS Settings** > **COS to DSCP**.

STEP 1 To enable **CoS to DSCP** settings, check the **Enable** box. Otherwise, uncheck the box. The *802.1p Priority* section is available only when CoS to DSCP is enabled.

STEP 2 For each 802.1p Priority, enter a DSCP value. (Valid values are from 0 to 63).

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. To reload the default settings, click **Restore Default**.

9

Administering Your Cisco RV220W

This chapter describes the administration features of the RV220W, including creating users, configuring network management, diagnostics and logging, date and time, and other settings. It contains the following sections:

Password Rules for Password Complexity

Use the *Administration* > *Password Rules* page to enable the Cisco RV220W to enforce complexity requirements for passwords.

To open this page: In the navigation tree, choose **Administration** > **Password Rules**.

STEP 1 To enable Password Rules Enforcement, check the **Enable** box. Uncheck the box to disable this feature. When this feature is enabled, new passwords must meet the requirements that you specify on this page.

STEP 2 In the *Individual Rule Settings* section, enter these settings:

- **Minimal Password Length—**Enter the minimum number of characters for a valid password. You can enter a number from 5 to 64. This setting is required when Password Rules Enforcement is enabled.
- **Minimum Number of Character Classes—**Enter the minimum number of character classes for a valid password. You can enter 3 or 4. This setting is required when Password Rules Enforcement is enabled. The possible classes are listed below.
  - Uppercase letters
  - Lowercase letters
  - Numbers
  - Special characters available on a standard keyboard.
- **The new password must be different than the current one—**Check the **Enable** box to require a new password to be different from the current password. Uncheck the box to disable this requirement.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Remote Management

The primary means to configure the Cisco RV220W is the Configuration Utility. A computer on the LAN can access the configuration utility by using the Cisco RV220W's LAN IP address and HTTP. You can enable remote management to allow access from a device on the WAN or Internet, such as your home computer. To access the Cisco RV220W remotely, you use HTTP over SSL (https).

To support a VPN on this router, you must enable remote management to open the port used for VPN.

To open this page: In the navigation tree, choose **Administration > Remote Management**.

CAUTION When remote management is enabled, the RV220W is accessible to anyone who knows its WAN IP address. Since a malicious WAN user can reconfigure the Cisco RV220W and misuse it in many ways, change the administrator and any guest passwords before continuing. See **Users, page 163**.

STEP 1 To enable **Remote Management**, check the **Enable** box.

STEP 2 Choose one of these methods for granting access:

- **All IP Addresses**—This option allows any IP address to access the Configuration Utility. Change the default password before choosing this option. (See **Users, page 163**.)
- **IP Address Range**—This option allows any IP address in the configured range to access the Configuration Utility. If you choose this option, enter the first address of the range in the **Start of Range** field, and enter the final address of the range in the **End of Range** field.
- **Single IP Address**—This option restricts access to a single IP address (for example, the computer you that use to manage the Cisco RV220W). If you choose this option, enter the **IP Address**.

STEP 3 Enter the **Port Number** to open for the remote connection. The default setting is 443.

STEP 4 If you want to enable Simple Network Management Protocol (SNMP) to remotely manage the Cisco RV220W by using a network management utility, check the **Remote SNMP Enable** box.

STEP 5 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

User Management

Use the *Administration > User Management* menu to add user accounts, configure domains and groups, and add user login policies.

- **Domains, page 158**
- **Groups, page 161**
- **Users, page 163**

NOTE Alternatively, import a CSV file containing the settings for domains, groups, and users. For more information, see **CSV File Import for User Accounts, page 186**.

Domains

Domains and groups are used to streamline the management of SSL VPN user settings. Instead of specifying settings for each user individually, you specify the domain and group settings once and then assign users to groups. Domain settings determine the authentication method and access portal. Later you will assign groups to domains and users to groups. You can create multiple domains and groups to control access for different users. If you choose not to define domains, all users are included in the default domain.

- **Managing Domains, page 159**
- **Configuring a Domain, page 159**

NOTE You can simplify user, group, and domain creation by creating a CSV file and importing it into the Cisco RV220W. See **CSV File Import for User Accounts, page 186**.

Managing Domains

Use the *Administration > User Management > Domains* page to view, add, edit, or delete domains. The default domain (SSLVPN) cannot be modified.

To open this page: In the navigation tree, choose **Administration** > **User Management** > **Domains**.

Perform these tasks:

- To add a domain, click **Add**. Then enter the settings on the *Domains Configuration* page. See **Adding or Editing a Portal Layout, page 127**.
- To edit a domain, check the box and then click **Edit**. Then enter the settings on the *Domains Configuration* page. See **Adding or Editing a Portal Layout, page 127**.
- To delete a domain, check the box and then click **Delete**. To select all domains, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Configuring a Domain

Use the *Domains Configuration* page to enter the settings for a domain.

To open this page: From the *Administration > User Management > Domains* page, click **Add** or select a domain and click **Edit**.

STEP 1 Enter these settings:

- **Domain Name—**Enter a unique name to identify this domain.
- **Authentication Type—**You can use the local user database of the RV220W or use another server for authentication. Choose one of the following options, and then complete the require fields, which are indicated by white backgrounds.
  - Local User Database
  - RADIUS-PAP
  - RADIUS-CHAP
  - RADIUS-MSCHAP
  - RADIUS-MSCHAPv2
  - NT Domain

- Active Directory
- LDAP

- **Select Portal—**Choose the portal that users will use to connect. Only users of domains associated with certain portals can use those portals to log in. A default SSLVPN portal is provided. For information about adding portal layouts, see **Portal Layouts, page 126**.
- **Authentication Server—**For authentication types other than Local User Database, enter the name of the server that is used to authenticate users.
- **Authentication Secret—**If you chose a RADIUS authentication type above, enter the authentication secret for access to the server.
- **Workgroup—**If you chose the NT Domain authentication type, enter the name or ID of the NT workgroup.
- **LDAP Base DN—**If you chose the LDAP authentication type, enter the base domain name.
- **Active Directory Domain—**If you chose the Active Directory authentication type, enter the Active Directory domain name. Users that are registered in the Active Directory database can access the SSL VPN portal using their Active Directory username and password.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click Back to return to the *Administration > User Management > Domains* page.

Groups

A group is a subset of a domain. (See Domains, page 158.) When you create a domain, a default group is created automatically. You can modify the Idle Timeout setting for the group. You can add more groups to a domain to allow different timeout settings for different users in a domain.

Managing Groups for a Domain

Use the *Administration* > *User Management* > *Groups* page to view, add, edit, or delete groups.

To open this page: In the navigation tree, choose **Administration** > **User Management** > **Groups**.

The default group for each domain is indicated by an asterisk.

Perform these tasks:

- To add a group, click **Add**. Then enter the settings on the *Groups Name* page. See Configuring a Group, page 162.
- To edit a group, check the box and then click **Edit**. Then enter the settings on the *Groups Name* page. See Configuring a Group, page 162.
- To delete a group, check the box and then click **Delete**. To select all groups, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Configuring a Group

Use the *Group Name* page to enter the settings for a group.

To open this page: From the *Administration > User Management > Groups* page, click **Add** or select a group and then click **Edit**.

NOTE If you selected the default group of a domain, as indicated by an asterisk in the group name, all settings except the Idle Timeout are inherited from the domain settings and cannot be changed.

STEP 1 Enter these settings:

- **Group Name—**Enter a unique name to identify the group. If you selected the default group of a domain, as indicated by an asterisk in the group name, the name cannot be changed.
- **Domain—**Select the authenticating domain to which the group is attached. If you selected the default group of a domain, as indicated by an asterisk in the group name, the domain cannot be changed.
- **Idle Timeout—**Enter the maximum number of minutes that a user can be idle. When this limit is reached, the user is logged off the VPN.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click Back to return to the *Administration > User Management > Groups* page.

Users

You can create user accounts for access to the Configuration Utility. For SSL VPN management, you can assign users to groups, which are subsets of domains (see **Domains, page 158** and **Groups, page 161**). By default all users are members of the SSLVPN group. You also can configure login policies.

Managing Users

Use the *Administration* > *User Management* > *Users* page to view, add, edit, and delete users.

To open this page: In the navigation tree, choose **Administration** > **User Management** > **Users**.

CAUTION When first configuring your Cisco RV220W, change the default administrator name and password as soon as possible.

Perform these tasks:

- To add a user, click **Add**. Then enter the settings on the *User Configuration* page. See **Configuring a User, page 164**.
- To edit a user, check the box and then click **Edit**. Then enter the settings on the *User Configuration* page. See **Configuring a User, page 164**.
- To set login policies for a user, check the box and then click **Log in Policies**. Then enter the settings on the *User Log in Policies* page. See **User Log in Policies, page 165**.
- To set a user's login policies based on the user's browser, check the box and then click **Policies by Browser**. Then enter the settings on the *User Policy By Client Browser* page. See **User Log in Policies by Client Browser, page 166**.

- To set a user's login policies based on the user's IP address, check the box and then click **Policies by IP**. Then enter the settings on the *User Policy By Source IP Address* page. See **User Log in Policies by IP Address, page 167**.
- To delete a user, check the box and then click **Delete**. To select all users, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**. The default Administrator and Guest user accounts cannot be deleted.

Configuring a User

Use the *User Configuration* page to add or edit a user account.

To open this page: From the *Administration > User Management > Users* page, click **Add** or select a user and then click **Edit**.

STEP 1 Enter the following information:

- **Username—**Enter the username.
- **First Name—**Enter the user's given name.
- **Last Name—**Enter the user's surname.
- **User Type—**Choose one of the options described below. (This setting cannot be changed for the default Administrator and the default Guest.)
  - **SSL VPN User**—An SSL VPN user can log in to the network by using VPN client software.
  - **Administrator**—An administrator user type has access to the Configuration Utility and can read and write configuration data.
  - **Guest**—A guest account has read-only access to the Configuration Utility.
- **Select Group** (available when adding a new user)**—**Select the default group SSLVPN, or choose another group from the list. For more information, see **Groups, page 161**. If you are editing an existing user, this setting cannot be changed.
- **Check to Edit Password** (available when editing an existing user)**—**Check the box if you want to edit the password settings. When the box is checked, the password fields become available.

- **Enter Your Password** (available when editing an existing user)—Enter the existing password.
- **Password** (available when adding a user) or **New Password** (available when editing an existing user—Enter the desired password. When you are, a message indicates the relative strength of the password.
- **Confirm Password**—Enter the new password again to confirm it.

  Note: If Password Rules are enabled, the new password must meet the password complexity requirements. If the requirements are not met, an error message appears after you click the Save button.
- **Idle Timeout**—Enter the maximum number of minutes that a user can be idle. When this limit is reached, the user is logged off.

  Note: For SSL VPN users, the group Idle Timeout overrides the individual user setting.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Administration > User Management > Users* page.

User Log in Policies

Use the *User Log In Policies* page to enable or disable the user's log in privileges and to deny or allow a login from the WAN interface.

To open this page: From the *Administration > User Management > Users* page, select a user then click **Log in Policies**.

The Username cannot be changed on this page.

STEP 1 Enter the following information:

- **Disable Login**—Check this box to prevent this user from logging in to the Configuration Utility, or uncheck this box to allow this user to log in.
- **Deny Login from WAN Interface**—Check this box to prevent this user from logging in from a WAN (Internet) interface, or uncheck this box to allow this user to log in from the WAN. When the box is checked, this user is allowed to log in only from a device on the LAN.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click Back to return to the *Administration > User Management > Users* page.

User Log in Policies by Client Browser

Use the *User Policy By Client Browser* page to specify the web browsers that a user can use when logging in.

To open this page: From the *Administration > User Management > Users* page, select a user then click **Policies By Browser**.

The Username cannot be changed on this page.

STEP 1 At the top of the page, choose the type of policy:

- **Deny Log in from Defined Browsers—**Choose this option to prevent a user from logging on when using a web browser in the *Defined Browsers* list. A log in is allowed from a browser that is not in the list.
- **Allow Log in only from Defined Browsers—**Choose this option to allow a user to log on only when using a web browser in the *Defined Browsers* list.

STEP 2 In the *Defined Browsers* table, perform these tasks:

- To add a browser, click **Add**. Choose a browser from the list, and then click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.
- To delete a browser, check the box and then click **Delete**. To select all browsers, check the box in the heading row, and then click **Delete**. Click **Save** to continue with the deletion, or otherwise click **Cancel**.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

User Log in Policies by IP Address

You can allow or deny access to a user based on his or her IP address.

- **Managing IP Address Login Policies, page 167**
- **Configuring an IP Address Login Policy, page 168**

Managing IP Address Login Policies

Use the *User Policy By Source IP Address* page to choose a policy type and to view, add, edit, and delete IP addresses.

To open this page: From the *Administration > User Management > Users* page, select a user then click **Policies By IP**.

The Username cannot be changed on this page.

STEP 1 At the top of the page, choose the type of policy:

- **Deny Log in from Defined Browsers—**Choose this option to prevent a user from logging on when using an IP address in the *Defined Addresses* list. A log in is allowed from a browser that is not in the list.
- **Allow Log in only from Defined Browsers—**Choose this option to allow a user to log on only when using an IP address in the *Defined Addresses* list.

STEP 2 In the *Defined Addresses* table, perform these tasks:

- To add an address, click **Add**. Then enter the settings on the *Defined Address Configuration* page. See **Configuring an IP Address Login Policy, page 168**.
- To edit an address, check the box and then click **Edit**. Then enter the settings on the *Defined Address Configuration* page. See **Configuring an IP Address Login Policy, page 168**.
- To delete an address, check the box and then click **Delete**. To select all addresses, check the box in the heading row, and then click **Delete**. Click **Save** to continue with the deletion, or otherwise click **Cancel**.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Configuring an IP Address Login Policy

Use the *Defined Address Configuration* page to enter an address that is subject to a login policy.

STEP 1 Enter these settings:

- **Source Address Type—**Choose the type of address.
- **Network Address/IP Address—**Enter the address.
- **Mask Length—**Enter the number of masked bits, as in CIDR slash notation. Valid values are from 0 to 32.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click Back to return to the *Administration > User Management > Users* page.

Network Management (SNMP)

Simple Network Management Protocol (SNMP) lets you monitor and manage your router from an SNMP manager. SNMP provides a remote means to monitor and control network devices, and to manage configurations, statistics collection, performance, and security.

SNMP Users and Trap Settings

If you choose to enable SNMP, configure the user security settings and trap settings.

Managing User Security Settings and Trap Settings

Use the *Administration* > *Network Management* > *SNMP* page to enable SNMP, and manage the user security settings and trap settings.

To open this page: In the navigation tree, choose **Administration** > **Network Management** > **SNMP**.

STEP 1 At the top of the page, check the **Enable** box to enable **SNMP**. Uncheck the box to disable this feature. After changing this setting, click **Save** to save your changes, or click **Cancel** to reload the page with the current settings

STEP 2 In the *SNMPv3 User Table*, to update a user's security settings, check the box and then click **Edit**. Then choose a Security level on the *Add / Edit SNMPv3 User Configuration* page. For more information, see **Configuring the User Security Settings for SNMP, page 170**.

Note: Only the default Administrator and Guest users have SNMP privileges.

STEP 3 In the *Trap Table*, perform these tasks to identify the SNMP agents to which the router will send trap messages (notifications):

- To add an entry, click **Add**. Then enter the settings on the *Add / Edit Trap Configuration* page. See **Configuring SNMP Traps, page 171**.

- To edit an entry, check the box and then click **Edit**. Then enter the settings on the *Add / Edit Trap Configuration* page. See **Configuring SNMP Traps, page 171**.
- To delete an entry, check the box and then click **Delete**. To select all entries, check the box in the heading row, and then click **Delete**. Click **Save** to continue with the deletion, or otherwise click **Cancel**.

Configuring the User Security Settings for SNMP

Use the *Add / Edit SNMPv3 User Configuration* page to configure the SNMPv3 security settings for the default Administrator and Guest users.

To open this page: From the *Administration > Network Management > SNMP* page, select a user and then click **Edit**.

The Username and Access Privilege cannot be changed.

STEP 1 In the **Security Level** field, choose the appropriate settings for your SNMP manager.

- **NoAuthNoPriv**—Doesn't require any Authentication and Privacy.
- **AuthNoPriv**—Submit only the Authentication Algorithm and Password.
- **AuthPriv**—Submit Authentication Algorithm, Authentication Password, Privacy Algorithm, and Privacy Password.

STEP 2 Based on the selected Security Level, complete all available fields:

- **Authentication Algorithm**—Choose an authentication algorithm from the drop down list - MD5 and SHA
- **Authentication Password**—Enter the authentication password for the user.
- **Privacy Algorithm**—Choose a privacy algorithm from the drop down list - DES or AES
- **Privacy Password**—Enter the privacy password for the user.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Administration > Network Management > SNMP* page.

Configuring SNMP Traps

Use the *Add / Edit Trap Configuration* page to identify SNMP agents to which the router will send trap messages (notifications).

To open this page: From the *Administration > Network Management > SNMP* page, in the *Traps Table*, click **Add** or select a trap and then click **Edit**.

STEP 1 Enter these settings:

- **IP Address—**Enter the IP address of the SNMP manager or trap agent.
- **Port—**Enter the SNMP trap port of the IP address to which the trap messages will be sent.
- **SNMP Version—**Choose the SNMP Version: **v1**, **v2c**, or **v3**.
- **Community—**Enter the community string to which the agent belongs. Most agents are configured to listen for traps in the Public community.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings. Click **Back** to return to the *Administration > Network Management > SNMP* page.

SNMP System Information

Use the *Administration > Network Management > SNMP System Information* page to specify reference information for your SNMP Management Information Base (MIB).

To open this page: In the navigation tree, choose **Administration** > **Network Management** > **SNMP System Information**.

STEP 1 Enter the following MIB (Management Information Base) settings:

- **SysContact—**Enter the name of the contact person for this router. Examples: admin, John Doe.
- **SysLocation—**Enter the physical location of this router. Example: Rack #2, 4th Floor.

- **SysName**—This field displays the host name of this router, from the *IPv4 LAN (Local Network)* page. name for identification of this router. If you want to edit the SysName, first save your settings and then click the **Edit** button. Any unsaved changes will be abandoned. On the *IPv4 LAN (Local Network)* page, edit the Host Name, and then save the changes.

STEP 2 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

WAN Traffic Meter

Use the *WAN Traffic Meter* page to enable the traffic meter and traffic limits for the WAN (Internet) interface.

To open this page: In the navigation tree, choose **Administration > WAN Traffic Meter**.

STEP 1 In *WAN Traffic Meter* section, enter the following settings:

- **WAN Traffic Meter—**Check the **Enable** box to enable this feature, or uncheck the box to disable it.
- **Traffic Limit Type—**If you enabled the traffic meter, choose one of the following options:
  - **No Limit**—Choose this option if you do not want to enforce limits for WAN traffic.
  - **Downloads Only**—Choose this option to enforce a limit on traffic coming to the Cisco RV220W from the Internet.
  - **Both Directions**—Choose this option to enforce a limit on traffic coming to the Cisco RV220W from the Internet, and traffic going from the Cisco RV220W to the Internet.

STEP 2 If you configured a Traffic Limit above, enter the following settings:

- **Monthly Limit—**Enter the maximum amount of traffic (in Megabytes). When this limit is reached, additional traffic is subject to the actions that you set in the *When Limit Is Reached* section.

- **Increased This Month's Limit By**—If the monthly traffic limit has been reached and you need to temporarily increase the limit, check this box. Then type the amount of the increase, in megabytes.
- **Traffic Counter**—Choose one of the following options to start the traffic counter:
  - **Restart Now**—Choose this option to start the counter when you click the **Save** button.
  - **Specific Time**—Choose this option to specify the time and the day when the counter will restart each month. To enter the start time, choose the hours (HH) and minutes (MM). Also choose the **Day of Month**.
- **Send E-Mail Report Before Restarting Counter**—Check the box to send an email report containing the traffic meter statistics before the counter is reset. Email is sent by using the email settings that you configure on the *Administration > Logging > Remote Logging* page. See **Remote Logging Configuration, page 180**.
- **When Limit Is Reached**—Choose the action to take when the Monthly Limit is reached:
  - **Block All Traffic**—If you chose Downloads Only for the Traffic Limit Type, all traffic from the WAN is blocked. If you chose Both Directions, all incoming and outgoing traffic is blocked.
  - **Block All Traffic Except E-Mail**—Blocks traffic as described for Block All Traffic, but allows email traffic.
  - **Send Email Alert** (Optional)—Check the **Enable** box to send an email alert when the Monthly Limit has been reached and traffic is being blocked. Configure your email settings on the *Administration > Logging > Remote Logging* page. See **Remote Logging Configuration, page 180**.

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

When the WAN Traffic Meter is enabled, the following statistics appear in the *WAN (Internet) Traffic Statistics)* section of this page.

- **Start Date/Time**—The date and time when the traffic meter was started or reset.
- **Outgoing Traffic Volume**—The volume of traffic, in megabytes, from the LAN (Local Network) to the WAN (Internet).

- **Incoming Traffic Volume**—The volume of traffic, in megabytes, from the WAN (Internet) to the LAN (Local Network).
- **Average per day**—The average volume of traffic, in megabytes, that passed through this interface each day.
- **% of Standard Limit**—The percentage of the configured Monthly Limit that has been consumed so far this month.
- **% of this Month's Limit**—The percentage of the effective limit that has been consumed so far this month. (The effective limit applies if the Monthly Limit was increased by using the *Increase This Month's Limit* field.)

Diagnostics

Cisco provides tools to help you verify network connections and troubleshoot issues.

- **Network Tools, page 174**
- **Capture Packets, page 176**

Network Tools

Use the *Administration* > *Diagnostics* > *Network Tools* page to use diagnostic tools for troubleshooting.

To open this page: In the navigation tree, choose **Administration** > **Diagnostics** > **Network Tools**.

To ping an IP address or domain:

Use the ping tool to check for connectivity between this router and another device.

STEP 1 In the *Ping or Trace an IP Address* section, enter these settings:

- **Ping Through VPN Tunnel**—Optionally, check this box to allow ping traffic to pass through the VPN tunnel. Otherwise, uncheck the box.
- In the *Ping or Trace* section, enter the **IP Address or Domain Name** of the device that you want to ping.

STEP 2 Click **Ping**. Four ICMP echo requests are sent.

The *Command Output* page displays the results.

STEP 3 Click **Back** to return to the *Administration > Diagnostics > Network Tools* page.

To trace the route to an IP address or domain:

Use the traceroute tool to learn about all of the routers between this router and another device.

STEP 1 In the *Ping or Trace an IP Address* section, enter the **IP Address or Domain Name** of the device that you want to reach.

STEP 2 Click **Traceroute**.

The *Command Output* page displays the results. Up to 30 "hops" (intermediate routers) between this router and the destination will be displayed.

STEP 3 Click **Back** to return to the *Administration > Diagnostics > Network Tools* page.

To look up the IP address for a server:

Use the DNS Lookup tool to retrieve the IP address of a web, FTP, mail server or other device by using its domain name. You can use this tool to verify that your DNS Server settings are functional.

STEP 1 In the *Perform a DNS Lookup* section, type the **WAN (Internet) Name**.

STEP 2 Click **Lookup**.

The *Command Output* page displays the results. If the host or domain entry exists, you will see a response with the IP address. A message stating "Unknown Host" indicates that the specified Internet Name does not exist or that your DNS server settings are not functional.

STEP 3 Click **Back** to return to the *Administration > Diagnostics > Network Tools* page.

Capture Packets

Use the *Administration > Diagnostics > Capture Packets* page to capture all packets that pass through the specified interface. You can download the *.cap* file and view it with a utility such as Wireshark.

To open this page: In the navigation tree, click **Administration > Diagnostics > Capture Packets**.

NOTE The packet trace is limited to 1MB of data per capture session. When the capture file size exceeds 1MB, it will be deleted automatically and a new capture file will be created.

STEP 1 To capture packets, click **Packet Trace**.

STEP 2 In the pop-up window, select an interface and then click **Start**. To stop the packet capture, click **Stop**.

STEP 3 Click **Download** to save a copy of the packet capture.

STEP 4 Capture packets for another interface, or close the pop-up window.

Logging

You can configure the Cisco RV220W to log events and send notifications when specified events occur.

- **Logging Policies, page 176**
- **Firewall Logs, page 178**
- **Remote Logging Configuration, page 180**

Logging Policies

You can configure multiple logging policies to collect different sets of data. You can use these policies when viewing the logs on the *View > Logs* page, and when sending files to a Syslog server (see the *Administration > Logging > Remote Logging Configuration* page).

- **Managing Logging Policies, page 177**

- Configuring a Logging Policy, page 177

Managing Logging Policies

Use the *Administration > Logging > Logging Policies* page to view, add, edit, and delete logging policies. A default policy is provided and is enabled for IPsec VPN logs.

To open this page: In the navigation tree, choose **Administration** > **Logging > Logging Policies**.

Perform these tasks:

- To add a new policy, click **Add**. Then enter the settings on the *Add / Edit Logging Policy Configuration* page. For more information, see **Configuring a Logging Policy, page 177**.
- To edit an existing policy, check the box, and then click **Edit**. Then enter the settings on the *Add / Edit Logging Policy Configuration* page. For more information, see **Configuring a Logging Policy, page 177**.
- To delete a policy, check the box, and then click **Delete**. To select all policies, check the box in the heading row, and then click **Delete**. When the confirmation message appears, click **OK** to continue with the deletion, or otherwise click **Cancel**.

Configuring a Logging Policy

Use the *Add / Edit Logging Policy Configuration* page to add or edit a logging policy.

To open this page: From the *Administration > Logging > Logging Policies* page, click **Add** to add a new policy, or select an existing policy and then click **Edit**.

STEP 1 Enter the following settings:

- **Policy Name—**Enter a unique name to identify this policy.
- **IPsec VPN Logs—**Check the **Enable** box to enable these logs, or uncheck the box to disable them.
- For each Severity type in the table, select the type of functionality from which to generate logs: **Kernel**, **System**, or **Local0-wireless**. The severity types are described below.

- **Emergency**—Messages about events, such as an imminent system crash, that make the system unusable. Typically this type of message is broadcast to all users.
- **Alert**—Messages about conditions, such as a corrupted system database, that require immediate corrective action.
- **Critical**—Messages about serious conditions, such as a disk failure.
- **Error**—Messages about conditions that require corrective action but are not critical.
- **Warning**—Warnings about possible issues.
- **Notification**—Messages about normal but significant conditions that may require attention.
- **Information**—Messages that provide information only.
- **Debugging**—Messages that are used to debug programs.

STEP 2 Click **Save** to save your settings, or click **Cancel** to clear your entries. Click **Back** to return to the *Administration > Logging > Logging Policies* page.

Firewall Logs

Use the *Administration > Logging > Firewall Logs* page to specify the firewall events that are logged. You can view the logs on the *Status > View Logs* page, or send the logs to an email account or a Syslog Server. See **Remote Logging Configuration, page 180** and **Viewing Logs, page 202**

To open this page: In the navigation tree, choose **Administration > Logging > Firewall Logs**.

NOTE Enabling logging options may generate a significant volume of log messages and is recommended for debugging purposes only. You should clear the logs when you are finished debugging.

STEP 1 For each log type, check the box to enable logging of the specified packet type. Uncheck the box to disable logging of the specified packet type. See the descriptions of the log types and packet types below.

Log Types

- **Routing Logs:** Logs for these traffic flows: LAN to WAN, WAN to LAN, and WAN to DMZ.
- **System Logs:** Logs for these traffic types: unicast, broadcast, and multicast.
- **Other Event Logs:** Logs for the events described below.
  - **Source MAC Filter**—Check the box to log packets subject to MAC filtering. Uncheck the box to disable MAC filtering logs.
  - **Bandwidth Limit**—Check this box to log packets dropped due to Bandwidth Limiting. Uncheck the box to disable Bandwidth Limit logs.

Packet Types

- **Accepted Packets**—Packets that were successfully transferred. Enabling the logging of Accepted Packets is useful when the Default Outbound Policy is "Block Always" (see the *Firewall > Access Rules* page). For example, if **Accept Packets from LAN to WAN** is checked and there is a firewall rule to allow SSH traffic from the LAN, then whenever a LAN machine tries to make an SSH connection, those packets will be accepted and a message will be logged. (In this example, logging policy applies only if the log option is set to Allow in the firewall access rule configuration.)
- **Dropped Packets**—Packets that were blocked. Enabling the logging of Dropped Packets is useful when the Default Outbound Policy is "Allow Always" (see the *Firewall > Access Rules* page). For example, if **Dropped Packets from LAN to WAN** is checked and there is a firewall rule to block SSH traffic from the LAN, then whenever a LAN machine tries to make an SSH connection, those packets will be dropped and a message will be logged. (In this example, the logging policy applies only if the log option is set to Allow in the firewall access rule configuration.)

STEP 2 Click **Save** to save your settings, or click **Cancel** to clear your entries.

Remote Logging Configuration

Use the *Administration > Logging > Remote Logging Configuration* page to allow the router to send logs to an email address or a Syslog server.

To open this page: In the navigation tree, choose **Administration > Logging > Remote Logging Configuration**.

NOTE The email settings that you configure on this page also are used by the *Send Log* function on the *Status > View Logs* page and the *Send E-Mail Report* function *Administration > WAN Traffic Meter* page. If you want to enable these features without sending all logs via email, choose the **Never** option in the schedule section of this page.

STEP 1 In the *Log Options* section, enter a **Remote Log Identifier** to add to every logged message. If you are using the same email address or Syslog server to receive logs for multiple devices, this prefix helps you to identify the source of the message.

STEP 2 To enable the Cisco RV220W to send emails through your email service, enter the SMTP settings in the *E-Mail Logs Settings* section. The log content is determined by the default logging policy. (See **Logging, page 176**.)

Note: To complete this information, you may need to contact your email administrator or email service provider, or refer to their support documentation. You may need assistance to find settings such as the IP address or name of the outgoing SMTP server, the SMTP port, and the SMTP authentication type. Requirements and restrictions vary. For example, some providers do not allow SMTP email from a free account. Other providers require a user to log on to a new mailbox before it can be used to send emails.

- **E-Mail Logs**—Check the **Enable** box to allow the Cisco RV220W to send logs to an email account. This feature is disabled by default.
- **E-mail Server Address**—Enter the IP address or Internet Name of the outgoing SMTP server for your email service. Example: *smtp.provider.com*. The router will connect to this server to send e-mail logs when required.
- **SMTP Port**—Enter the port to connect to the outgoing SMTP server for your email account. The default setting is 25. Some providers use port 465 or 587.
- **Return E-mail Address**—Enter a valid email address where any replies from the SMTP server can be sent (required for failure messages). Example: *user@provider.net*

- **Send To E-mail Address(1, 2, and 3)**—Enter a valid email address where the logs and alerts will be sent. You can use these fields to enter up to three email addresses. At least one address is required. Example: *user@provider.net*
- **Authentication with SMTP server**—If the SMTP server requires authentication before accepting connections, select either **Login Plain** or **CRAM-MD5** and enter the Username and Password for your account. If your email service does not require authentication, select **None**.
- **Respond to Identd from SMTP Server**—If your service provider uses IDENT request to verify the sender of email messages, check this box to enable the router to respond to these requests.
- To confirm that the email settings are functional, press **Test**.

STEP 3 If you entered email settings above, configure a schedule in the *Send E-Mail Logs By Schedule* section. Emails will be sent only on the specified schedule.

- **Unit**—Select the frequency at which to send the logs: **Never**, **Hourly**, **Daily**, or **Weekly**. If you choose **Never**, email logs are not sent. This option is useful when you do not want to receive logs by e-mail, but want to use the email settings for other email functions.
- **Day**—If you chose Weekly, choose the day of the week when the logs will be sent.
- **Time**—If you chose Daily or Weekly, enter the time of day when the logs will be sent.

STEP 4 If you want to enable the Cisco RV220W to send logs to a Syslog server, enter the settings for up to eight syslog servers in the *Syslog Server* section. The log content is determined by the specified logging policy.

- Check the box to enable the entry.
- **Syslog Server**—Enter the IP address or Internet name of the server.
- **Logging Policy**—From the list, choose a logging policy. The logging policy specifies the information to log. To add a logging policy, use the *Administration > Logging > Logging Policies* page. For more information, see **Logging Policies, page 176**.

STEP 5 Click **Save** to save your settings, or click **Cancel** to clear your entries.

Discovery Settings

Use the Discovery pages to enable these discovery services:

- **Discovery Settings for Bonjour, page 182**
- **UPnP Discovery, page 183**

Discovery Settings for Bonjour

Use the *Administration > Discovery Settings > Discovery - Bonjour* page to enable Bonjour, a service discovery protocol. Bonjour locates network devices such as computers and servers on your LAN. It may be required by network management systems that you use. When this feature is enabled, the router periodically multicasts Bonjour service records to its entire local network to advertise its existence.

After enabling Bonjour on the router, you can choose whether or not to enable Bonjour on each VLAN that you have configured. When enable on a VLAN, Bonjour allows the devices on the VLAN to discover Bonjour services on the router.

In this implementation, Bonjour advertises only these services: '_csco-sb._tcp', '_http._tcp'. Service '_https._tcp' will be advertised if Remote Management is enabled.

NOTE For discovery of Cisco Small Business products, Cisco FindIT Network Discovery Utility works through a simple toolbar in your web browser. This utility discovers Cisco devices in the network and displays basic information, such as serial numbers and IP addresses, to aid in the configuration and deployment. For more information and to download the utility, please visit www.cisco.com/go/findit.

To open this page: In the navigation tree, choose **Administration** > **Discovery Settings** > **Discovery - Bonjour**.

STEP 1 At the top of the page, check the **Enable** box to enable Bonjour on the router. Uncheck the box to disable Bonjour.

STEP 2 In the **Bonjour Interface Control Table**, check or uncheck the **Enable Bonjour** box to enable or disable Bonjour on each VLAN. The VLANs are configured on the *Networking > LAN (Local Network) > VLAN Membership* page. (See **VLAN Membership, page 24**.)

STEP 3 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

UPnP Discovery

Use the *Administration > Discovery Settings > Discovery - UPnP* page to enable Universal Plug and Play (UPnP), configure the UPnP advertisements, and view information about UPnP devices. UPnP allows Windows to automatically configure the router to open and close ports for Internet applications such as gaming and videoconferencing.

To open this page: In the navigation tree, choose **Administration > Discovery Settings > Discovery - UPnP**.

STEP 1 Choose **Administration > Discovery Settings > Discovery - UPnP**.

STEP 2 In the *UPnP Settings* section, enter these settings:

- **UPnP—**Check **Enable** to enable UPnP. Uncheck the box to disable this feature. Other features become available on the page when UPnP is enabled.
- **Advertisement Period—**Enter the interval, in seconds, at which the router will broadcast its UPnP information to all devices within range.
- **Advertisement Time to Live—**Enter the number of seconds that an advertisement is active.

STEP 3 In the **UPnP Interface Control Table**, check or uncheck the **Enable UPnP** box to enable or disable UPnP on each VLAN. UPnP is enabled by default on the default VLAN ID 1. When this feature is enabled, the Cisco RV220W advertises itself to plug-and-play devices on VLAN 1, and these devices can join the network and connect to the Cisco RV220W. The VLANs are configured on the *Networking > LAN (Local Network) > VLAN Membership* page. (See **VLAN Membership, page 24**.)

STEP 4 In the *UPnP Portmap Table*, view information about UPnP devices that have accessed the router. Click **Refresh** to reload the page with the latest data.

- **Active—**Indicates whether or not the port of the UPnP device that established a connection is currently active by displaying Yes or No.
- **Protocol—**The network protocol (i.e. TCP, UDP, etc) that the device is using to connect to the Cisco RV220W.

- **Internal Port—**Indicates which, if any, internal ports are opened by the UPnP device.
- **External Port—**Indicates which, if any, external ports are opened by the UPnP device.
- **IP Address—**The IP address of the UPnP device that is accessing this router.

STEP 5 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Time Settings

Use the *Administration > Time Settings* page to configure the date and time settings for your Cisco RV220W. After choosing your time zone and Daylight Savings Time settings, if applicable, you can enter the time manually or specify a Network Time Protocol (NTP) server to provide the time settings for your network.

To open this page: In the navigation tree, choose **Administration** > **Time Settings**.

The date, time, and time zone appear at the top of the page.

STEP 1 In the *Time Settings* section, enter the following settings:

- **Date/Time—**Select your time zone, relative to Greenwich Mean Time (GMT).
- **Adjust for Daylight Savings Time—**Check **Enable** to adjust the time automatically for daylight Saving Time, if applicable in your region. Then enter these settings:
  - **From—**Enter the date when Daylight Savings Time begins in your region.
  - **To—**Enter the date when Daylight Savings Time ends in your region.
  - **Daylight Savings Offset—**Choose the amount of the adjustment, in minutes. The default setting is to add 60 minutes to the time, in keeping with the common practice to “spring forward” one hour during Daylight Savings Time.
- **Clock Source—**Choose whether to **Use NTP server** to provide your time settings or to **Set Date and Time Manually**. The default option is to use an NTP server.

STEP 2 If you chose to use an NTP server, enter these settings in the *NTP Server Configuration* section:

- **NTP Server Settings—**Choose one of these options:
  - **Default NTP Server—**Choose this option to use a server from a pre-configured list of NTP servers for general use. Then choose a server from the **Default NTP Server** list.
  - **Custom NTP Server—**Choose this option to specify an NTP server that is not included in the default list. Then enter the server address or fully-qualified domain name.

STEP 3 If you chose to set the time manually, choose the year (YYYY), month (MMM), day (DD), hour (HH), minutes (MM), and seconds (SS) in the *Set Time and Date* section.

STEP 4 Click **Save** to save your settings, or click **Cancel** to reload the page with the current settings.

Backing Up or Restoring a Configuration

Use the *Administration > Backup/Restore* page to back up a configuration file for later restoration, to restore a previous backup file, or to copy a configuration file.

The router has two configuration files: the startup and the mirror.

- The Startup file is the configuration file that the router loads when it boots up.
- The Mirror file is the last known valid configuration saved within a 24-hour period. If the Startup configuration file fails for any reason, then the Mirror configuration file is used.

CAUTION During a restore operation, do not try to go online, turn off the router, shut down the PC, or do anything else to the router until the operation is complete. This should take about a minute. When the test light turns off, wait a few more seconds before doing anything with the router.

To open this page: In the navigation tree, choose **Administration** > **Backup/ Restore Settings**.

To restore a startup configuration from a file on your computer:

STEP 1 Click **Browse** to locate and select the *.cfg* file.

STEP 2 Click **Restore**. An alert page displays the status of the restore operation. After the restore, the router restarts automatically with the restored settings.

To back up a configuration file:

STEP 1 Click the appropriate button to back up the Startup Configuration or the Mirror Configuration.

STEP 2 Choose a location where you want to save the file. Tip: Give the file a unique name to identify it if you need to restore it later. Do not change the *.cfg* file extension.

To copy a configuration file:

Click the appropriate button for the operation that you want to perform: **Copy Mirror to Startup** or **Copy Startup to Mirror**.

CSV File Import for User Accounts

You can simplify user, group, and domain creation by creating a CSV file and importing it into the Cisco RV220W.

- **Creating a CSV File**
- **Importing a CSV File**

Creating a CSV File

The Format of the *.csv* file is as follows:

```
"<SSLVPNDomain Code>", "<DomainName>", "<PortalLayoutName>",
"<AuthenticationType>", "<AuthenticationServer>",
```

```
"<AuthenticationRadiusSecret>", "<NTDomainWorkGroup>", "<LDAPBaseDN>",
"<ActiveDirectoryDomain>"
```

Possible Values:

- SSLVPNDomain Code - 5
- Domain Name - String
- PortalLayoutName - String
- AutheticationType - String
- AuthenticationServer - IP Address
- AuthenticationRadiusSecret - String
- NTDomainWorkGroup - String
- LDAPBaseDN - String
- ActiveDirectoryDomain - String

```
"<SSLVPNGroup Code>", "<GroupName>", "<DomainName>", "<GroupTimeOut>"
```

Possible Values:

- SSLVPNGroup Code - 4
- GroupName - String
- DomainName - String
- GroupTimeOut - integer

```
"<SNMPv3USER Code>","<userName>", "<accessType>",
"<securityLevel>","<authAlgo>","<authPassword>","<privAlgo>","<privPassword>
"
```

Possible Values:

- SNMPv3USER Code - 3
- userName - cisco/guest
- accessType - RWUSER/ROUSER
- securityLevel - integer
- authAlgo - MD5 / SHA
- authPassword - String
- privAlgo - DES / AES

- privPassword - String

```
"<PPTPUSER Code>", "<userName>", "<password>"
```

Possible Values:

- PPTPUSER Code: 2
- userName - String
- password - String

```
"<IPSECUSER Code>", "<UserName>", "<Password>", "<UserType>",
"<AllowChangePassword>"
```

Possible Values:

- IPSECUSER Code: 1
- Username - String
- Password - String
- UserType - boolean (0 - Standard Ipsec / 1 - Cisco Quick VPN)
- AllowChangePassword - boolean

```
"<SSLVPNUSER Code>", "<UserName>", "<FirstName>", "<LastName>",
"<GroupName>", "<UserType>", "<UserTimeOut>", "<DenyLogin>",
"<DenyLoginFromWan>", "<LoginFromIP>", "<LoginFromBrowser>", "<Password>"
```

Possible Values:

- SSLVPNUSER Code: 0
- UserName - String
- FirstName - String
- LastName - String
- GroupName - String
- UserType - integer
- UserTimeOut - integer
- DenyLogin - boolean
- DenyLoginFromWan - boolean
- LoginFromIP - boolean
- LoginFromBrowser - boolean

- Password - String

Sample CSV file format:

```
"5","domain1","SSLVPN","radius_pap","14.0.0.1","test","","",""
"4","group2","domain1","30"
"3","cisco","RWUSER","1","SHA","authPassword","AES","privPassword"
"2","p2","pp2"
"1","rrrr","sss","0","1"
"0","user102","sss","dddd","SSLVPN","4","10","0","1","0","0","fail"
```

Importing a CSV File

Use the *Administration > CSV File Import* page to import a CSV file that you created for domains, groups, and users.

To open this page: In the navigation tree, choose **Administration** > **CSV File Import**.

STEP 1 Click **Browse**.

STEP 2 On your computer, locate and select the *.csv* file. Click **Import**.

Firmware Upgrade

Cisco may provide firmware upgrades for the Cisco RV220W. After downloading a firmware file to your computer, use the *Administration > Firmware Upgrade* to select the file and install it.

NOTE For links to firmware and other resources on Cisco.com, see **Appendix D, "Where to Go From Here."**

CAUTION During a firmware upgrade, do not try to go online, turn off the device, shut down the PC, or interrupt the process in any way until the operation is complete. This process takes about a minute, including the reboot process. Interrupting the upgrade process at specific points when the flash is being written to may corrupt the flash memory and render the router unusable.

To open this page: In the navigation tree, choose **Administration** > **Firmware Upgrade**.

The Current Firmware Version appears at the top of the page.

STEP 1 Click **Browse** to locate and select the firmware that you downloaded from Cisco.com.

STEP 2 If you want to abandon your current configuration settings and restore the default settings during the upgrade process, check **Reset all configuration / settings to factory defaults**. Uncheck the box to retain your current configuration settings.

STEP 3 Choose **Start Firmware Upgrade**. After the new firmware image is validated, the new image is written to flash, and the router is automatically rebooted with the new firmware.

After the router reboots and you log in, you can use the *Status > System Summary* page to verify that the new firmware is installed. See **Viewing the System Summary, page 196**.

Rebooting the Cisco RV220W

Use the *Administration > Reboot Router* to reboot the router by using the Configuration Utility.

To open this page: In the navigation tree, choose **Administration** > **Reboot Router**.

Click **Reboot** to proceed.

Restoring the Factory Defaults

Use the *Administration > Restore Factory Defaults* page if you want to abandon your current configuration settings and restore the factory default settings for the Cisco RV220W.

To open this page: In the navigation tree, choose **Administration** > **Restore Factory Defaults**.

Click **Default** to proceed.

NOTE Alternatively, to restore the factory defaults during a firmware upgrade, see **Firmware Upgrade, page 189**.

CAUTION During a restore operation, do not try to go online, turn off the router, shut down the PC, or do anything else to the router until the operation is complete. This should take about a minute. When the test light turns off, wait a few more seconds before doing anything with the router.

10

Viewing the RV220W Status

This chapter describes how to view real-time statistics for the RV220W and contains the following sections:

Viewing the Dashboard

The *Dashboard* page provides you with a view of important router information.

To open this page: In the navigation tree, choose choose **Status** > **Dashboard**.

The **Dashboard** page displays this information:

Panel View

An image of the back panel shows you which ports are in use (colored in green). To show the panel, click **Show Panel View**. To hide the panel, click **Hide Panel View**.

- To view a port's connection information, click the port.
- To refresh the port information, click **Refresh**.
- To close the port information sheet, click **Close**.

Device Information

Host Name	The name of the device. To change the name, click **Edit**. See IPv4 LAN (Local Network), page 22.
Firmware Version	The current software version the device is running.
Serial Number	The serial number of the device.
Users	The number of users who are active, as a fraction of the configured user accounts. For example, 1/3 indicates that 1 user is logged in, and there are 3 configured user accounts.

Resource Utilization

CPU	CPU utilization.
Memory	Memory utilization.
Current Time	The current date, time, and time zone.
System Up Time	The number of days, hours, minutes, and seconds since the last reboot.

Syslog Summary

This summary lists the events that have been logged. Links provide quick access to the *View Logs* page.

Click the **details** link to view the logs. For more information, see **Viewing Logs, page 202**. Click the **manage logging** link to configure logging policies. For more information, see **Logging, page 176**

Emergency	Messages about events, such as an imminent system crash, that make the system unusable. Typically this type of message is broadcast to all users.
Alert	Messages about conditions, such as a corrupted system database, that require immediate corrective action.
Critical	Messages about serious conditions, such as a disk failure.
Error	Messages about conditions that require corrective action but are not critical.
Warning	Warnings about possible issues. Click this link to view the logs. For more information, see **Viewing Logs, page 202**.

LAN (Local Network) Interface

Click the **details** link to view the port statistics. For more information, see **Viewing Port Statistics, page 204**.

MAC Address	The MAC address of the router.
IPv4 Address	The local IP address of the router. To change the IP address, see **Configuring the IPv4 WAN Settings, page 17**.
DHCP Server	The status of the router's DHCP server (enabled or disabled). To configure the DHCP settings, see **Configuring the IPv4 WAN Settings, page 17**.

WAN (Internet) Information

To view the WAN settings, click **details**. For more information see **Viewing Port Statistics, page 204**.

IP Address	The IP address of the router's WAN port. To change the IP address, see **Configuring the IPv4 WAN Settings, page 17**.
State	The state of the Internet connection (up or down).

Wireless Networks

Lists each of the four wireless networks, showing the status (Active or Disabled) and the number of connected users.

To view the router's wireless settings, click **details**. For more information see **Viewing the Wireless Statistics, page 199**.

VPN

Site-to-Site Tunnels	Displays the connected IPSec VPN tunnels. click the link to view the IPsec statistics. For more information, see **Viewing the IPsec Connection Status, page 200**.
PPTP Users	The number of Point-to-Point Tunneling Protocol (PPTP) users. Click the link to view the statistics for the connected users. For more information, see **Viewing the VPN Client Connection Status, page 201**.
QuickVPN Users	The number of QuickVPN users. Click the link to view the statistics for the connected users. For more information, see **Viewing the VPN Client Connection Status, page 201**.
SSL VPN Users	The number of SSL VPN users. Click the link to view the statistics for the connected users. For more information, see **Viewing the SSL VPN Connection Information Status, page 207**.

Viewing the System Summary

Use the *Status > System Summary* page to view a summary of system information.

To open this page: In the navigation tree, choose **Status** > **System Summary**.

Click **Refresh** to obtain the latest information.

The System Summary window displays the following:

- **System Name**—Name of the device.
- **Firmware Version**—Current software version the device is running.
- **Firmware MD5 Checksum**—The message-digest algorithm used to verify the integrity of files.
- **PID VID**—Product ID and vendor ID of the device.
- **Serial Number**—RV220W serial number.

ProtectLink License Info

Contains licensing information for Cisco ProtectLink Web.

LAN Information

- **MAC Address**—Hardware address.
- **IPv4 Address**—Address and subnet mask of the device.
- **IPv6 Address**—Address and subnet mask of the device (shown only if IPv6 is enabled).
- **DHCP Server**—Indicates whether the device's DHCP server is enabled or disabled. If it is enabled, DHCP client machines connected to the LAN port receive their IP address dynamically.
- **DHCP Relay**—Indicates whether the device is acting as a DHCP relay (DHCP relay must be enabled).
- **DHCPv6 Server**—Indicates whether the device's DHCPv6 server is enabled or disabled. If it is enabled, DHCPv6 client machines connected to the LAN port receive their IP address dynamically.

WAN Information (IPv4)

The WAN Information provides the current status of the WAN interfaces. It provides details about WAN interface and also provides actions that can be taken on that particular WAN interface. The actions that can be taken differ with the connection type. If WAN is configured using DHCP, the DHCP release renew options are available, other connection types offer other options. The Dedicated WAN Info displays information about the WAN port.

- **MAC Address**—MAC Address of the WAN port.
- **Connection Time**—Displays the time duration for which the connection is up.
- **Connection Type**—Indicates if the WAN IPv4 address is obtained dynamically through a DHCP server, assigned statically by the user, or obtained through a PPPoE/PPTP/L2TP ISP connection.
- **Connection State**—Indicates if the WAN port is connected to the Internet Service Provider.
- **IP Address**—IP address of the WAN port.
- **Subnet Mask**—Subnet Mask for the WAN port.
- **NAT**—Indicates if the security appliance is in NAT mode (enabled) or routing mode (disabled).
- **Gateway**—Gateway IP address of the WAN port.
- **Primary DNS**—Primary DNS server IP address of the WAN port.
- **Secondary DNS**—Secondary DNS server IP address of the WAN port.
- **NAT (IPv4 Only Mode)**—Indicates if the security appliance is in NAT mode (enabled) or routing mode (disabled).

If connection is DHCP Enabled:

- **DHCP Server**—Indicates the IP address of the DHCP server to which WAN port is connected.
- **Lease Obtained**—Indicates the time at which lease is obtained from the DHCP server.
- **Lease Duration**—Indicates the duration for which the lease would remain active.

Click **Renew** to release the current IP address and obtain a new one, or **Release** to release the current IP address only.

WAN Information (IPv6)

Provides IPv6 WAN information.

- **Connection Time**—Displays the time duration for which the connection is up.
- **Connection Type**—Indicates if the WAN IPv4 address is obtained dynamically through a DHCP server, assigned statically by the user, or obtained through a PPPoE/PPTP/L2TP ISP connection.
- **Connection State**—Indicates if the WAN port is connected to the Internet Service Provider.
- **IP Address**—IP address of the WAN port.
- **Gateway**—Gateway IP address of the WAN port.
- **DNS Server**—DNS server IP address of the WAN port.

Wireless Information

This section displays information about the Wireless Radio settings.

- **Country**—Displays the country for which the radio is configured.
- **Operating Frequency**—Displays the operational frequency band.
- **Wireless Network Mode**—Displays the Wi-Fi mode of the radio (for example, N or N/G,).
- **Channel**—Displays the current channel in use by the radio.

Click **Refresh** to refresh the wireless information.

Available Access Points Table

The table displays the list of Access Points currently enabled in the device. The table also displays information related to the Access Point, such as Security and Encryption methods used by the Access Point.

- **SSID**—This is the Service Set Identifier (SSID) that clients use to connect to the access point that has this profile. It is referenced in the access point tables and statistics.
- **BSSID**—The 48 bit unique identifier of the Basic Service Set (BSS) to which the Access Point belongs.

- **Profile Name**—This is the unique (alphanumeric) identifier of the wireless profile attached to the Access Point.
- **Security**—This field displays the type of wireless security (if any) assigned to this profile.
- **Encryption**—This field displays the encryption type that is assigned to the profile: TKIP, AES, TKIP + AES.
- **Authentication**—This field displays the client authentication method that is configured in the profile: PSK, RADIUS, PSK + RADIUS.

Viewing the Wireless Statistics

Use the *Status* > *Wireless Statistics* page to view the wireless statistics.

To open this page: In the navigation tree, choose **Status** > **Wireless Statistics**.

Click **Refresh** to obtain the latest information.

The Wireless Statistics window shows a cumulative total of relevant wireless statistics for the radio and access points configured on the device. The counters are reset when the device is rebooted.

Radio Statistics

A given radio can have multiple virtual access points configured and active concurrently. This table indicates cumulative statistics for the available radio(s).

- **Packets**—The number of transmitted/received (Tx/Rx) wireless packets reported to the radio, over all configured access points.
- **Bytes**—The number of Tx/Rx bytes of information reported to the radio, over all configured access points.
- **Errors**—The number of Tx/Rx packet errors reported to the radio, over all configured access points.
- **Dropped**—The number of Tx/Rx packets dropped by the radio, over all configured access points.
- **Multicast**—The number of multicast packets sent over this radio.
- **Collisions**—The number of packet collisions reported to the access point.

AP Statistics

This table displays transmit/receive data for a given access point (AP).

- **AP Name**—The name of the AP.
- **Packets**—The number of Tx/Rx wireless packets on the AP.
- **Bytes**—The number of Tx/Rx bytes of information on the AP.
- **Errors**—The number of Tx/Rx packet errors reported to the AP.
- **Dropped**—The number of Tx/Rx packets dropped by the AP.
- **Multicast**—The number of multicast packets sent over this AP.
- **Collisions**—The number of packet collisions reported to the AP.
- **Poll Interval**—Enter a value in seconds for the poll interval. This causes the page to re-read the statistics from the router and refresh the page automatically. To modify the poll interval, click the **Stop** button and then click **Start** to restart automatic refresh.

Viewing the IPsec Connection Status

Use the *Status > IPsec Connection Status* page to view the status of IPsec connections.

To open this page: In the navigation tree, choose **Status** > **IPsec Connection Status**.

Click **Refresh** to obtain the latest information.

This page displays the status of IPSec connections. You can change the status of a connection to either establish or disconnect the configured SAs (Security Associations).

- **Policy Name**—The name of the IKE or VPN policy associated with this SA.
- **Endpoint**—Displays the IP address of the remote VPN gateway or client.
- **Rx KB**—The data received (in KB) over this SA.
- **Tx KB**—The data transmitted (in KB) over this SA.
- **Rx Packets**—The number of IP packets received over this SA.
- **Tx Packets**—The number of IP packets transmitted over this SA.

- **State**—The current status of the SA for IKE policies.

Click **Connect** to establish an inactive SA (connection) or **Drop** to terminate an active SA (connection).

The page refreshes automatically to display the most current status. To change the refresh settings, in the **Poll Interval** field, enter a value in seconds for the poll interval. This causes the page to re-read the statistics from the router and refresh the page automatically. To modify the poll interval, click the **Stop** button and click **Start** to restart automatic refresh.

Viewing the VPN Client Connection Status

Use the *Status > VPN Client Connection Status* page to view the status of the VPN client connections.

To open this page: In the navigation tree, choose **Status** > **VPN Client Connection Status**.

The **VPN Client Connection Status** page displays this information:

Username	The username of the VPN user associated with the QuickVPN or PPTP tunnel.
Remote IP	Displays the IP address of the remote QuickVPN client. This could be a NAT/Public IP if the client is behind the NAT router.
Status	Displays the current status of QuickVPN client. OFFLINE means that QuickVPN tunnel is not initiated/established by the VPN user. ONLINE means that QuickVPN Tunnel, initiated/established by the VPN user, is active.
Start Time	The time of the VPN user establishing a connection.
End Time	The time of the VPN user ending a connection.
Duration	The duration between the VPN user establishing and ending a connection.
Protocol	The protocol the user uses, QuickVPN or PPTP.
Disconnect	Click to disconnect this user.

The page refreshes automatically to display the most current status. To change the refresh settings, in the **Poll Interval** field, enter a value in seconds for the poll interval. This causes the page to re-read the statistics from the router and refresh the page automatically. To modify the poll interval, click the **Stop** button and click **Start** to restart automatic refresh.

Viewing Logs

The *Status > View Logs* page displays the system event log, which can be configured to log login attempts, DHCP server messages, reboots, firewall messages and other information.

To open this page: In the navigation tree, choose **Status** > **View Logs**.

From the **Logging Policy** drop-down list, select the type of log to display.

- Kernel logs are those that are a part of the kernel code (for example, firewall).
- System logs are those that are a part of user-space applications (for example, NTP, Session, DHCP).
- IPSec VPN logs are those related to ipsec negotiations. These are related user space logs. Local0-Wireless are those related to wireless connection and negotiation.

Click **Refresh Logs** to view the entries added after the page was opened. Click **Clear Logs** to delete all entries in the log window.

Click **Send Logs** to e-mail the log messages currently displayed in the log window. Before clicking **Send Log**, ensure that the e-mail address and server information are configured on the **Administration** > **Logging** > **Remote Logging** page.

Viewing Available LAN Hosts

Use the *Status > Available LAN Hosts* page to view a list of all available LAN hosts.

To open this page: In the navigation tree, choose **Status** > **Available LAN Hosts**.

Click **Refresh** to obtain the latest information.

NOTE When you click **Refresh**, it can take up to 1 minute to obtain the latest information.

This page lists all available LAN hosts in the LAN Hosts Table. For every host, the table lists the name, IP address, and MAC address.

Viewing the Port Triggering Status

Use the *Status > Port Triggering* page to view the status of port triggering.

To open this page: In the navigation tree, choose **Status** > **Port Triggering Status**.

Click **Refresh** to obtain the latest information.

This page provides information on the ports that have been opened per the port triggering configuration rules. The ports are opened dynamically whenever traffic that matches the port triggering rules flows through them. The table displays the following fields:

- **LAN IP Address**—Displays the LAN IP address of the device which caused the ports to be opened.
- **Open Ports**—Displays the ports that have been opened so that traffic from WAN destined to the LAN IP address can flow through the router.
- **Time Remaining Seconds**—This field displays the time for which the port will remain open when there is no activity on that port. The time is reset when there is activity on the port.

Click **Refresh** to refresh the current page and obtain the latest statistics.

Viewing Interface Statistics

To view interface statistics, choose **Status** > **Interface Statistics**. Click **Refresh** to obtain the latest information.

The Interface Statistics window displays the data transfer statistics for each interface. The following data is displayed:

- **Interface**—Displays the interface name.
- **Tx Packets**—The number of IP packets going out of the interface.

- **Rx Packets**—The number of packets received by the interface.
- **Collisions**—The number of signal collisions that have occurred on this interface. A collision occurs when the interface tries to send data at the same time as a interface on another router or computer that is connected to this interface.
- **Tx B/s**—The number of bytes going out of the interface per second.
- **Rx B/s**—The number of bytes received by the interface per second.
- **Uptime**—The duration for which the interface has been active. The uptime will be reset to zero when the RV220W or the interface is restarted.

Poll Interval—Enter a value in seconds for the poll interval. This causes the page to re-read the statistics from the RV220W and refresh the page automatically. To modify the poll interval, click the **Stop** button and then **Start** to restart automatic refresh.

Viewing Port Statistics

The **Port Statistics** page displays port statistics.

To view port statistics:

STEP 1 Choose **Status** > **Port Statistics**.

STEP 2 In the **Poll Interval** field, enter the auto-refresh time interval in seconds.

The default value is 10.

STEP 3 To start the display of port statistics, click **Start**.

This page displays the latest port statistics based on the value you enter in the **Poll Interval** field. For example, if you enter a poll interval value of 5, the router refreshes the information on this page every 5 seconds.

This table displays the data transfer statistics for the Dedicated WAN, LAN, and WLAN ports, including the duration for which they were enabled.

The **Port Statistics** page displays this information:

Port	The name of the port.
Status	The status of the port (enabled or disabled).
Operational Mode	The bandwidth the port is operating at.
Packets	The number of received/sent packets per second.
Bytes	The number of received/sent bytes of information per second.
Frames	The number of received/sent frames per second.

Viewing Open Ports

The **View Open Ports** page displays a listing of all open ports.

To view open ports, choose **Status** > **View Open Ports**.

This page displays this information about open ports:

Proto	The protocol (TCP, UDP, and raw) used by the port.
Recv-Q	The number of received bytes in the waiting-for-delivery queue. These bytes have been read from the input stream but are not yet copied by the program using this port.
Send-Q	The number of bytes in the waiting-to-send queue. These bytes are buffered but not yet successfully transmitted to the receiving host.
Local Address	The address and port number of the local end of this socket.
Foreign Address	The address and port number of the remote end of this socket.
State	The state of the port.
PID/Program Name	The process ID (PID) and name of the program using the port (for example, 1654/thttpd, where 1654 is the PID and thttpd is the program's name).

Viewing Active Users

To view the list of active users who are currently logged in to the system, choose **Status** > **Active Users**. Click **Refresh** to obtain the latest information.

The Active Users window displays this information:

- **Username**—Name of the user.
- **Group**—Group to which the user belongs.
- **IP Address**—IP address of the host from which the user accessed the RV220W.

- **Login Time**—Date and time when the user first logged in to the router.

To disconnect a user's VPN session, press the **Disconnect** button.

Viewing the SSL VPN Connection Information Status

To view statistics about the SSL VPN connections, choose **Status** > **SSL VPN Connection Status**.

The SSL VPN Connection Status window displays following information:

- **Username**—Unique identifier for the user.
- **IP Address**—The Internet IP address from which the tunnel was established.

The following are the tunnel-specific fields:

- **Local PPP Interface**—The name of the PPP interface on the RV220W associated with the SSL VPN tunnel. This information may be useful if telnet/console access is available to the user for cross-verification.
- **Peer PPP Interface IP**—The IP address assigned to PPP interface at the remote client side from which the tunnel was established.
- **Tx Packets**—The number of packets transferred by the remote client through the tunnel.
- **Tx Dropped Packets**—The number of packets dropped by the remote client while transferring data through the tunnel.
- **Tx Bytes (KB)**—The total volume of sent traffic (in kilobytes) associated with the tunnel.
- **Rx Packets**—The number of packets received by the remote client through the tunnel.
- **Rx Dropped Packets**—The number of packets dropped by the remote client while receiving data through the tunnel.
- **Rx Bytes (KB)**—The total volume of received traffic (in kilobytes) associated with the tunnel.

NOTE If the tunnel is not established by the user, the tunnel-specific fields will have no values.

You can click **Disconnect** to terminate an active user's session and disconnect the associated SSLVPN tunnel if one is created.

You can also configure the type and duration of the information displayed. In the **Poll Interval** field, enter a value in seconds for the poll interval. This causes the page to re-read the statistics from the RV220W and refresh the page automatically. To modify the poll interval, click the **Stop** button and then click **Start** to restart automatic refresh.

Installing the Cisco RV220W

This appendix provides information about installing the router. See these topics:

Getting to Know the Cisco RV220W

Front Panel

POWER—The Power light is green to indicate the unit is powered on. The light flashes green when the RV220W starts up.

DIAG—If the DIAG light is off, the RV220W is ready. The light blinks red during firmware upgrades.

DMZ—When the DMZ light is green, DMZ is enabled. When the light is off, DMZ is disabled.

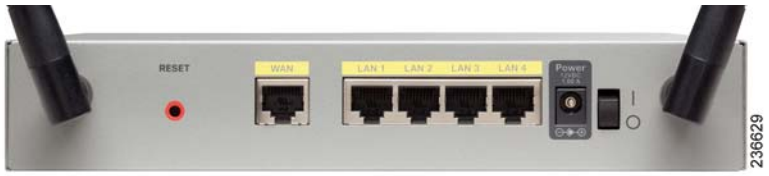
WIRELESS—The Wireless light is green when the wireless module is enabled. The light is off when the wireless module is disabled. The light flashes green when the RV220W is transmitting or receiving data on the wireless module.

LAN—Each of the four LAN (Ethernet) ports of the RV220W has a column in which the lights are displayed. Lights appear in the rows marked 10, 100, and 1000 to identify the type of Ethernet interface that is active on the RV220W. For example, if the light appears next to 100 in the LAN1 column, the RV220W's LAN1 port is using a 100BASE-T connection. If the light appears next to 1000 in the LAN1 column, the RV220W's LAN1 port is using a 1000BASE-T (Gigabit Ethernet) connection.

If the lights are continuously green, the RV220W is connected to a device through the corresponding port (1, 2, 3, or 4). The light for a port flashes green when the RV220W is actively sending or receiving data over that port.

WAN—The WAN (Internet) light is green when the unit is connected to your cable or DSL modem. The light flashes green when the unit is sending or receiving data over the WAN port.

Back Panel



RESET Button—The **RESET** button has two functions:

- If the RV220W has problems connecting to the Internet, press the RESET button for at least 3 seconds but no more than 10 seconds with a paper clip or a pencil tip. This is similar to pressing the reset button on your PC to reboot it.
- If you experience problems with the RV220W and have tried all other troubleshooting measures, press and hold in the RESET button for more than 10 seconds. This reboots the unit and restores the factory defaults. Changes that you have made to the RV220W settings are lost.

WAN Port—The WAN port is connected to your Internet device, such as a cable or DSL modem.

LAN Ports (1-4)—These ports provide a LAN connection to network devices, such as PCs, print servers, or switches.

Power Port—The power port is where you connect the provided power adapter.

Power Switch—Press this button up (toward the line) to turn the device on. Press this button down (toward the circle) to turn the device off.

Mounting the Cisco RV220W

You can place your Cisco RV220W on a desktop or mount it on a wall.

Placement Tips

- **Ambient Temperature**—To prevent the RV220W from overheating, do not operate it in an area that exceeds an ambient temperature of 104°F (40°C).
- **Air Flow**—Be sure that there is adequate air flow around the RV220W.
- **Mechanical Loading**—Be sure that the RV220W is level and stable to avoid any hazardous conditions.

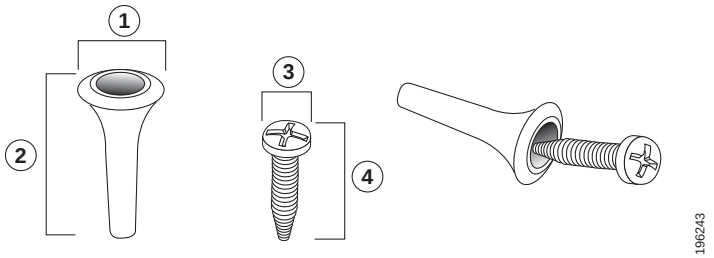
For desktop placement, place the RV220W horizontally on a flat surface so that it sits on its four rubber feet.

Wall Mounting

The RV220W can be wall-mounted. You will need the following (not supplied):

- 2 screws as defined below
- 2 drywall anchors (if installing onto drywall)

The dimensions for these parts are as follows:



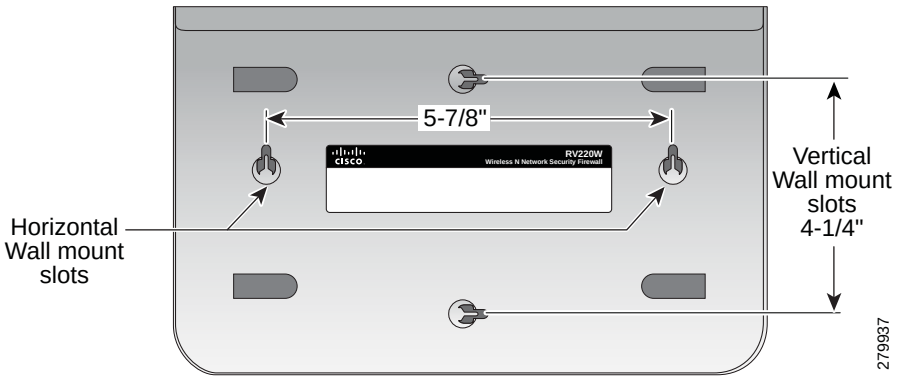
1 0.30 to 0.32 in 7.7 to 8.2 mm **2** 0.86 to 0.88 in 21.8 to 22.3 mm **3** 0.26 to 0.28 in 6.5 to 7.1 mm **4** 0.61 to 0.63 in 15.5 to 16 mm

WARNING Insecure mounting might damage the device or cause injury. Cisco is not responsible for damages incurred by insecure wall-mounting.

To mount the RV220W to the wall:

STEP 1 Determine where you want to mount the RV220W. Verify that the surface is smooth, flat, dry, and sturdy. Take into account the dimensions of the RV220W and allow for 3 inches (76.2 mm) of clearance around it.

STEP 2 For horizontal mounting, drill two pilot holes into the surface 5-7/8 inches (150 mm) apart. For vertical mounting, drill two pilot holes into the surface 4-1/4 inches (108 mm) apart.

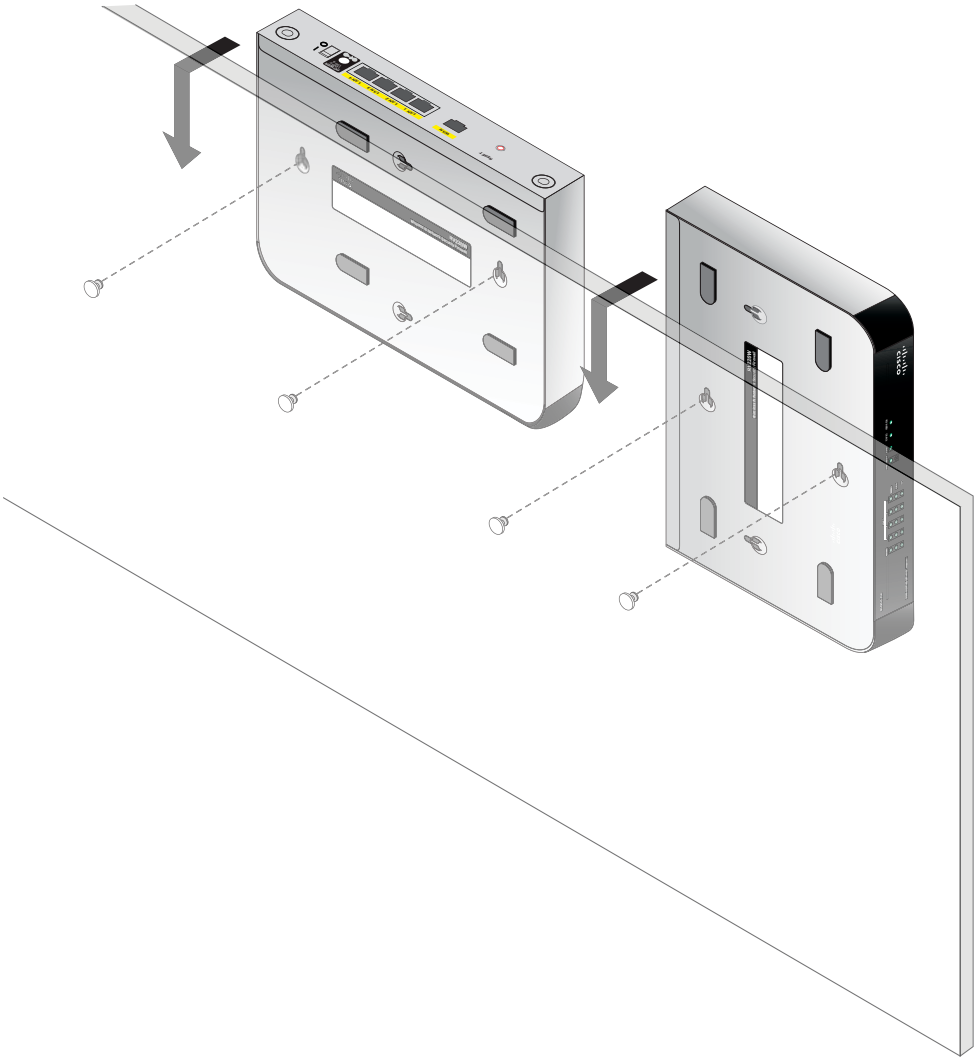


STEP 3 (Optional) If using drywall anchors, hammer into holes.

STEP 4 Insert a screw into each hole in the surface, leaving a gap between the surface and the base of the screw head of at least 0.1 inches (3 mm). Do not mount the screw heads flush with the surface; the screw heads must fit inside the back of the unit.

STEP 5 With the back panel pointing up (if installing horizontally), line up the unit so that the wall-mount slots on the bottom of the unit line up with the two screws.

If installing vertically, hold the left side of the unit pointing up and line up the unit so that the wall-mount slots on the bottom of the unit line up with the two screws.



Attaching the Antennas

The RV220W ships with two removable dual-band antennas.

To attach an external antenna:

STEP 1 Hold the antenna perpendicular to the round screw hole on the back of the unit.

STEP 2 Screw the antenna clockwise until it is firmly secured to the RV220W.

STEP 3 Repeat these steps to secure the second antenna.

STEP 4 Put the antennas in the "V" orientation.

Connecting the Equipment

Before you begin the installation, make sure that you have the following equipment and services:

Required

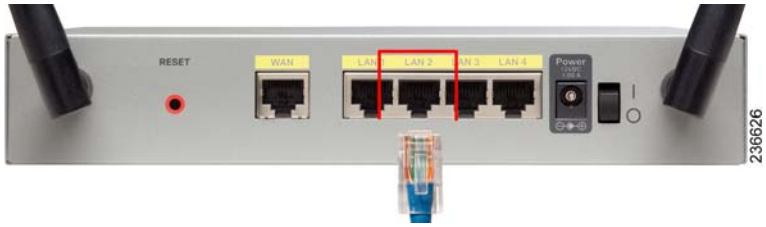
- Functional Internet Connection (Broadband DSL or cable modem).
- Ethernet cable for WAN (Internet) connection.
- PC with functional network adapter (Ethernet connection) to run the Device Manager. The Device Manager is supported on the following web browsers:
  - Microsoft Internet Explorer 6.0 or later
  - Mozilla Firefox 3.0 or later
  - Apple Safari 3.0 or later
- Ethernet cable (provided) to connect the PC to the RV220W for configuration.

Optional

- Uninterruptible Power Supply (UPS) to provide backup power to essential devices (strongly recommended).
- Ethernet cables for LAN interfaces, if you want to connect additional devices.

STEP 1 Connect one end of an Ethernet cable to the WAN port of the RV220W and the other end to the Ethernet port of your cable or DSL modem.

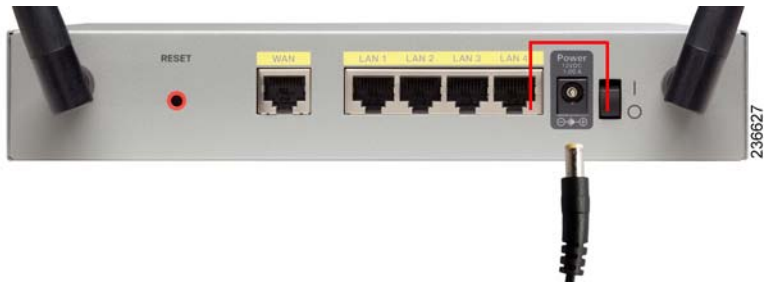
STEP 2 Connect one end of a different Ethernet cable to one of the LAN (Ethernet) ports on the back of the unit. (In this example, the LAN 2 port is used.) Connect the other end to an Ethernet port on the PC that you will use to run the web-based Device Manager.



STEP 3 Power on the cable or DSL modem and wait until the connection is active.

STEP 4 Connect the power adapter to the RV220W Power port.

CAUTION Use only the power adapter (12V, 1A) that is supplied with the unit. Using a different power adapter could damage the unit.



STEP 5 Plug the other end of the adapter into an electrical outlet. You may need to use a specific plug (supplied) for your country.

STEP 6 On the RV220W, push the power button to the on position to turn on the RV220W.

The POWER light on the front panel is green when the power adapter is connected properly and the unit is turned on.

Verifying the Hardware Installation

To verify the hardware installation, complete these tasks:

- Check the LED states, as described in **Getting to Know the Cisco RV220W, page 209**.
- Connect a PC to an available LAN port and verify that you can connect to a website on the Internet, such as www.cisco.com.
- Configure a device to connect to your wireless network and verify the wireless network is functional. See **Connecting to Your Wireless Network, page 217**.

Connecting to Your Wireless Network

To connect a device (such as a PC) to your wireless network, you must configure the wireless connection on the device with the wireless security information you configured using the Device Manager.

The following steps are provided as an example; you may need to configure your device differently. For instructions that are specific to your device, consult the user documentation for your device.

STEP 1 Open the wireless connection settings window or program for your device. Your PC may have special software installed to manage wireless connections, or you may find wireless connections under the Control Panel in the **Network Connections** or **Network and Internet** window. (The location depends on your operating system.)

STEP 2 Enter the network name (SSID) that you chose for your network when you configured the RV220W.

STEP 3 Choose the type of encryption and enter the security key that you chose when setting up the RV220W. If you did not enable security (not recommended), leave these fields blank.

STEP 4 Verify your wireless connection and save your settings.

B

Using Cisco QuickVPN

Overview

This appendix explains how to install and use the Cisco QuickVPN software that can be downloaded from Cisco.com. QuickVPN works with computers running Windows 7, Windows XP, Windows Vista, or Windows 2000. (Computers using other operating systems will have to use third-party VPN software.)

This appendix includes the following sections:

- **Before You Begin, page 218**
- **Installing the Cisco QuickVPN Software, page 219**
- **Using the Cisco QuickVPN Software, page 221**

Before You Begin

Users can use Cisco QuickVPN to connect to this router after Remote Management and user records are enabled. Clients can connect to servers on the RV220W default LAN, but no other subnets.

IMPORTANT: The LANs that are connected by a VPN tunnel cannot use the same LAN IP address range. As a best practice, configure this router with a different IP address than the default LAN IP address (192.168.1.1), which is a common default IP address for consumer and small business routers.

STEP 1 To support a VPN on this router, enable remote management to open the port used for VPN. See **Remote Management, page 157**.

STEP 2 Create user accounts for your QuickVPN users. See **Configuring VPN Users, page 122**. After a user account is created, the credentials can be used by the Quick VPN client.

STEP 3 Optional: If port 443 is configured to be forwarded to a https server in the LAN, selecting port 60443 will improve the tunnel establishment time.

Installing the Cisco QuickVPN Software

NOTE Share the following notes with users:

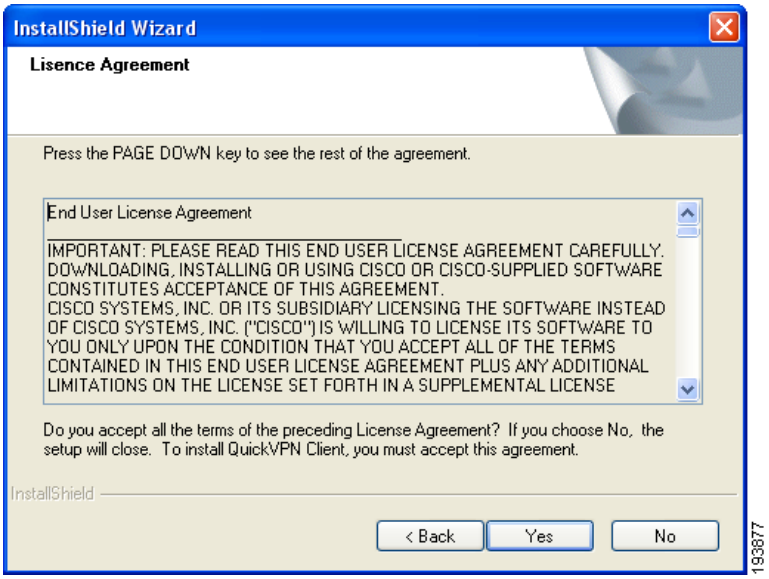
- If Cisco QuickVPN is installed on a computer running Windows 7 or Vista, the Windows Firewall must be enabled.
- Cisco QuickVPN uses several *.exe* programs in the QVPN installation directory. If the *.exe* programs are mistaken as malware, QVPN will not work. It may be necessary to adjust the firewall and anti-virus settings.

Installing from the CD-ROM

STEP 1 Insert the RV220W CD-ROM into your CD-ROM drive. After the Setup Wizard begins, click the **Install QuickVPN** link.

STEP 2 The License Agreement window appears. Click **Yes** to accept the agreement.

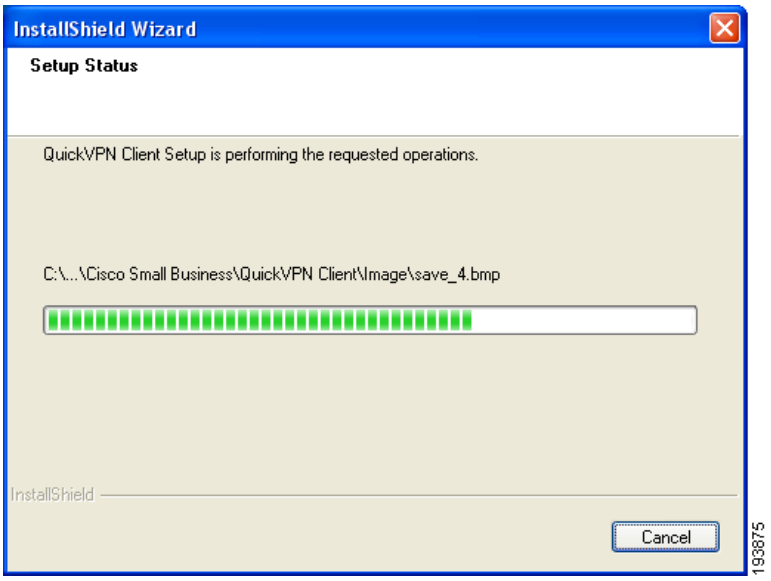
License Agreement



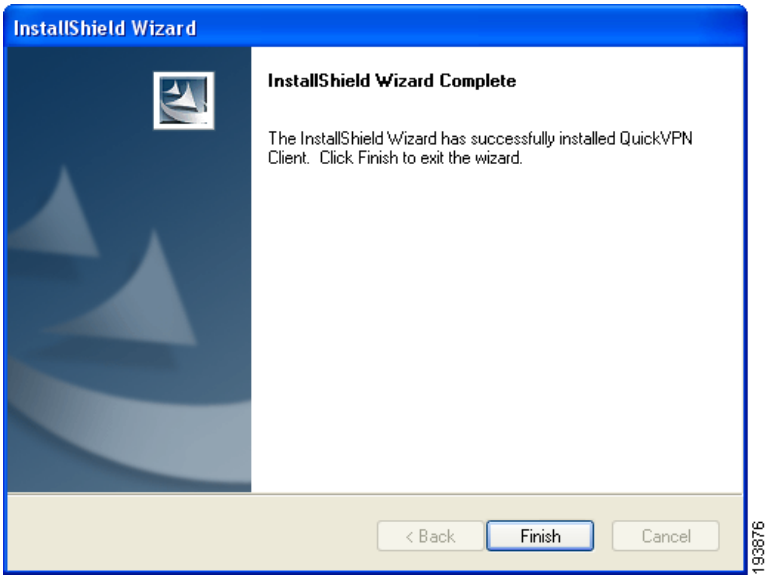
STEP 3 Choose the destination to which you want to copy the files (for example, C:\Cisco Small Business\QuickVPN Client). Click **Browse** and choose a new location if you don't want to use the default location. Click **Next**.

STEP 4 The Setup Wizard copies the files to the chosen location.

Copying Files



Finished Installing Files



STEP 5 Click **Finish** to complete the installation. Proceed to **"Using the Cisco QuickVPN Software," on page 221**.

Downloading and Installing from the Internet

STEP 1 In **Appendix D, "Where to Go From Here,"** go to the Software Downloads link.

STEP 2 Enter RV220W in the search box and find the **QuickVPN** software.

STEP 3 Save the zip file to your PC, and extract the *.exe* file.

STEP 4 Double-click the *.exe* file, and follow the on-screen instructions. Proceed to the next section, **"Using the Cisco QuickVPN Software," on page 221**.

Using the Cisco QuickVPN Software

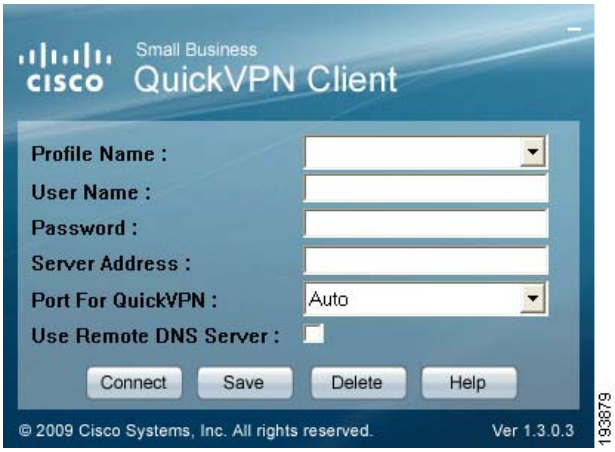
STEP 1 Double-click the Cisco QuickVPN software icon on your desktop or in the system tray.

QuickVPN Desktop Icon

QuickVPN Tray Icon—
No Connection

STEP 2 The QuickVPN Login window appears. In the **Profile Name** field, enter a name for your profile. In the **User Name** and **Password** fields, enter the User Name and Password that were created in **Configuring VPN Users, page 122**. In the **Server Address** field, enter the IP address or domain name of the RV220W. In the **Port For QuickVPN** field, enter the port number that the QuickVPN client will use to communicate with the remote VPN router, or keep the default setting, **Auto**.

QuickVPN Login



NOTE If you check the **Use Remote DNS Server** box, Cisco QuickVPN Client will copy the DNS Server IP address provided by the QuickVPN Server into the TCP/IP property of the computer.

To save this profile, Click **Save** to save your profile. (If there are multiple sites to which you will need to create a tunnel, you can create multiple profiles, but note that only one tunnel can be active at a time.) To delete this profile, click **Delete**. For information, click **Help**.

STEP 3 To begin your QuickVPN connection, click **Connect**. The connection's progress is displayed: *Connecting*, *Provisioning*, *Activating Policy*, and *Verifying Network*.

STEP 4 When your QuickVPN connection is established, the QuickVPN tray icon turns green, and the QuickVPN Status window appears. The window displays the IP address of the remote end of the VPN tunnel, the time and date the VPN tunnel began, and the total length of time the VPN tunnel has been active.

QuickVPN Tray Icon—
Connection

QuickVPN Status

To terminate the VPN tunnel, click **Disconnect**. To change your password, click **Change Password**. For information, click **Help**.

STEP 5 If you clicked **Change Password** and have permission to change your own password, you will see the **Connect Virtual Private Connection** window. Enter your password in the **Old Password** field. Enter your new password in the **New Password** field. Then enter the new password again in the **Confirm New Password** field. Click **OK** to save your new password. Click **Cancel** to cancel your change. For information, click **Help**.

Connect Virtual Private Connection

NOTE You can change your password only if the **Allow User to Change Password** box has been checked for that username. See **Configuring VPN Users, page 122**.

C

Glossary

Term	Definition
beacon interval	The time interval at which beacon frames are transmitted. Beacon frames announce the existence of the wireless network.
DTIM (Delivery Traffic Indication Message)	A DTIM field is a countdown field informing clients of the next window for listening to broadcast and multicast messages. When the Cisco RV220W has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. Its clients hear the beacons and awaken to receive the broadcast and multicast messages.
dynamic routing	Dynamic routing enables the router to adjust automatically to physical changes in the network's layout. Using the dynamic RIP protocol, the router calculates the most efficient route for the network's data packets to travel between the source and the destination. The RIP protocol regularly broadcasts routing information to other routers on the network. It determines the best route based on the fewest number of hops between the source and the destination.

Term	Definition
Fragmentation Threshold	The frame length, in bytes, that requires packets to be fragmented into two or more frames. Setting a lower value can reduce collisions, which occur more often in the transmission of long frames. You may need to use a lower setting in areas where communication is poor or where there is a great deal of radio interference. However, setting the fragmentation threshold too low may result in poor network performance.
IKE (Internet Key Exchange)	The Internet Key Exchange (IKE) protocol dynamically exchanges keys between two IPsec hosts.
MTU (Maximum Transmission Unit)	The largest packet that can be sent over the network.
Network Address Translation (NAT)	Network Address Translation (NAT) is a technique that allows several endpoints on a LAN to share an Internet connection. In this scenario, the computers on the LAN use a "private" IP address range while the WAN port on the router is configured with a single "public" IP address. The router translates the internal private addresses into a public address, hiding internal IP addresses from computers on the Internet.
Preamble Mode	The 802.11b standard requires adding a preamble to every frame before it is transmitted through the air. The traditional long preamble requires 192 µs for transmission. A short preamble requires only 96 µs. A long preamble is needed for compatibility with the legacy 802.11 systems operating at 1 and 2 Mbps.

Term	Definition
RADVD (Router Advertisement Daemon)	RADVD is an open-source software product that uses the Neighbor Discovery Protocol (NDP) to listen for router solicitations in the IPv6 LAN. It responds with router advertisements to support stateless address auto-configuration. When a new host connects to the network, it sends a request for its configuration parameters, and the router responds with a router advertisement packet that contains the network-layer configuration parameters including IPv6 prefixes. The node takes the prefix and extends it to a full 128 bit address by adding an EUID based on its hardware address.
Request to Send (RTS) Threshold	The packet size, in bytes, that requires an RTS/ Clear to Send (CTS) handshake before sending. A low setting can be useful in areas where many client devices are associating with the wireless device, or in areas where the clients are far apart and can detect only the access point but not other clients. Although a low threshold value consumes more bandwidth and reduces the throughput of the packet, frequent RTS packets can help the network to recover from interference or collisions.
Routing Information Protocol (RIP)	This protocol uses use distance vectors to mathematically compare routes to identify the best path to any given destination address. RIP sends routing-update messages at regular intervals and when the network topology changes. Upon receiving a RIP message, a router updates its routing table and transmits the updates to other routers. RIP prevents loops and has features to provide stability despite potentially rapid changes in a network's topology. RIPv2 supports subnet masks, allows more information to be included in RIP packets, and provides a simple authentication mechanism that is not supported by RIP.

Term	Definition
RIPng (RIP next generation)	RIPng is an extension of RIPv2 for support of IPv6. (See the information about RIP in this Glossary.)
static routing	A static route is a pre-determined pathway that a packet must travel to reach a specific host or network. **CAUTION:** Static routing is a powerful feature that should be used by advanced users only. In many cases, it is better to use dynamic routing because it enables the router to automatically adjust to physical changes in the network's layout. Use cases for static routing include the following: ▪ Some ISPs require static routes to build your routing table instead of using dynamic routing protocols. ▪ You can use static routes to reach peer routers that do not support dynamic routing protocols. ▪ If the router is connected to more than one network or there are multiple routers installed on your network, it may be necessary to set up static routes to enable traffic between them. ▪ You can use static routing to allow users in different IP domain to access the Internet through the router.
VLAN (Virtual LAN)	A VLAN is a group of endpoints in a network that are associated by function or other shared characteristics. Unlike LANs, which are usually geographically based, VLANs can group endpoints without regard to the physical location of the equipment or users.

D

Where to Go From Here

Cisco provides a wide range of resources to help you obtain the full benefits of the Cisco Small Business RV220W Wireless-N Network Security Firewall.

Support	
Cisco Small Business Support Community	www.cisco.com/go/smallbizsupport
Online Technical Support and Documentation (Login Required)	www.cisco.com/support
Cisco Small Business Support and Resources	www.cisco.com/go/smallbizhelp
Phone Support Contacts	www.cisco.com/go/sbsc
Downloads and Documentation	
Firmware	www.cisco.com/go/software (Enter the model number to search.)
Open Source Documentation	www.cisco.com/en/US/products/ps9923/prod_release_notes_list.html (See the RV220W links.)
Cisco RV220W Documentation	www.cisco.com/go/smallbizrouters (See the Technical Documentation links.)
Cisco Small Business	
Cisco Partner Central for Small Business (Partner Login Required)	www.cisco.com/web/partners/sell/smb
Cisco Small Business Home	www.cisco.com/smb