ProSafe Wireless-N VPN Firewall SRXN3205 Reference Manual

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1.0, July 2008

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Product and Publication Details

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About This Manual

The *NETGEAR® ProSafe™ Wireless-N VPN Firewall Reference Manual* describes how to configure and troubleshoot a ProSafe Wireless-N VPN Firewall. The information in this manual is intended for readers with intermediate computer and networking skills.

Conventions, Formats, and Scope

The conventions, formats, and scope of this manual are described in the following paragraphs:

- **Typographical Conventions.** This manual uses the following typographical conventions:

Italic	Emphasis, books, CDs, file and server names, extensions
Bold	User input, IP addresses, GUI screen text
`Fixed`	Command prompt, CLI text, code
italic	URL links

- **Formats.** This manual uses the following formats to highlight special messages:

➡	**Note:** This format is used to highlight information of importance or special interest.

💡	**Tip:** This format is used to highlight a procedure that will save time or resources.

⚠	**Warning:** Ignoring this type of note may result in a malfunction or damage to the equipment.

Danger: This is a safety warning. Failure to take heed of this notice may result in personal injury or death.

- **Scope.** This manual is written for the router according to these specifications:

Product Version	ProSafe Wireless-N VPN Firewall
Manual Publication Date	July 2008

For more information about network, Internet, firewall, and VPN technologies, see the links to the NETGEAR website in Appendix B, “Related Documents.”.

Note: Product updates are available on the NETGEAR, Inc. website at *http://kbserver.netgear.com/products/SRXN3205.asp*.

How to Use This Manual

The HTML version of this manual includes the following:

- Buttons, > and <, for browsing forwards or backwards through the manual one page at a time
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Tip: If your printer supports printing two pages on a single sheet of paper, you can save paper and printer ink by selecting this feature.

Revision History

Part Number	Version Number	Date	Description
202-10416-01	1.0	July 2008	First publication

Chapter 1
Introduction

The SRXN3205 ProSafe Wireless-N VPN Firewall connects your wired local area network (LAN) and your wireless LAN clients to the Internet (Wide Area Network) through an external broadband access device such as a cable modem or DSL modem. As a complete security solution, the SRXN3205 incorporates a powerful and flexible firewall to safeguard your networks, while providing advanced IPsec and SSL VPN technologies for secure wired and wireless connections.

The ProSafe Wireless-N VPN Firewall is the basic building block of a wireless LAN infrastructure. It provides connectivity between Ethernet wired networks and radio-equipped wireless notebook systems, desktop systems, print servers, and other devices.

The SRXN3205 provides wireless connectivity to multiple wireless network devices within a fixed range or area of coverage—interacting with a wireless network interface card (NIC) via an antenna. Typically, an individual in-building access point provides a maximum connectivity area of about a 500 foot radius. Consequently, the ProSafe Wireless-N VPN Firewall can support a small group of users in a range of several hundred feet. Most access points can handle between 10 to 30 users simultaneously.

The ProSafe Wireless-N VPN Firewall acts as a bridge between the wired LAN and wireless clients. Connecting multiple VPN firewalls via a wired Ethernet backbone can further lengthen the wireless network coverage. As a mobile computing device moves out of the range of one access point, it moves into the range of another. As a result, wireless clients can freely roam from one Access Point to another and still maintain seamless connection to the network.

The auto-sensing capability of the ProSafe Wireless-N VPN Firewall allows packet transmission at up to 300 Mbps, or at reduced speeds to compensate for distance or electromagnetic interference.

The Gigabit Ethernet LAN ports and WAN port ensure extremely high data transfer speeds.

The SRXN3205 is a plug-and-play device that can be installed and configured within minutes.

This chapter contains the following sections:

- "Key Firewall Features"
- "Wireless Networking Features"
- "Maintenance and Support"
- "Package Contents"

- "Front Panel Features"
- "Rear Panel Features"
- "Default IP Address, Login Name, and Password Location"
- "Qualified Web Browsers"

Key Firewall Features

The VPN firewall portion provides the following key features:

- A single 10/100/1000 Mbps Gigabit Ethernet WAN port for your Internet connection.
- Built-in four-port 10/100/1000 Mbps Gigabit Ethernet LAN switch for extremely fast data transfer between local network resources and all of the wireless clients.
- Advanced IPsec and SSL VPN support
- Advanced stateful packet inspection (SPI) firewall with multi-NAT support
- Easy, web-based setup for installation and management
- Front panel LEDs for easy monitoring of status and activity
- Flash memory for firmware upgrade
- AC-DC power adapter for low current draw

A Powerful, True Firewall with Content Filtering

Unlike simple Internet sharing NAT routers, the SRXN3205 is a true firewall, using stateful packet inspection (SPI) to defend against hacker attacks. Its firewall features include:

- Automatically detects and thwarts denial of service (DoS) attacks such as Ping of Death and SYN Flood.
- Blocks unwanted traffic from the Internet to your LAN.
- Blocks access from your LAN to Internet locations or services that you specify as off-limits.
- Prevents objectionable content from reaching your PCs. You can control access to Internet content by screening for Web services, Web addresses, and keywords within Web addresses. You can configure the firewall to log and report attempts to access objectionable Internet sites.
- Permits scheduling of firewall policies by day and time.

- Logs security events such as blocked incoming traffic, port scans, attacks, and administrator logins. You can configure the firewall to email the log to you at specified intervals. You can also configure the firewall to send immediate alert messages to your email address or email pager whenever a significant event occurs.

Autosensing Ethernet Connections with Auto Uplink

With its internal 5-port 10/100/1000 Mbps switch and 10/100/1000 WAN port, the SRXN3205 can connect to either a 10 Mbps standard Ethernet network, a 100 Mbps Fast Ethernet network, or a 1000 Mbps Gigabit Ethernet network. The five LAN and WAN interfaces are autosensing and capable of full-duplex or half-duplex operation.

The SRXN3205 incorporates Auto Uplink™ technology. Each Ethernet port will automatically sense whether the Ethernet cable plugged into the port should have a "normal" connection such as to a PC or an "uplink" connection such as to a switch or hub. That port will then configure itself to the correct configuration. This feature eliminates the need to worry about crossover cables, as Auto Uplink will accommodate either type of cable to make the right connection.

Extensive Protocol Support

The VPN firewall supports the Transmission Control Protocol/Internet Protocol (TCP/IP) and Routing Information Protocol (RIP). For further information about TCP/IP, refer to "Internet Configuration Requirements" on page C-4.

- **IP Address Sharing by NAT**. The VPN firewall allows many networked PCs to share an Internet account using only a single IP address, which may be statically or dynamically assigned by your Internet service provider (ISP). This technique, known as NAT, allows the use of an inexpensive single-user ISP account.
- **Automatic Configuration of (Wired & Wireless) PCs by DHCP**. The VPN firewall dynamically assigns network configuration information, including IP, gateway, and domain name server (DNS) addresses, to PCs on the LAN and Wireless LAN using the Dynamic Host Configuration Protocol (DHCP). This feature greatly simplifies configuration of PCs on your local network.
- **DNS Proxy**. When DHCP is enabled and no DNS addresses are specified, the firewall provides its own address as a DNS server to the attached PCs. The firewall obtains actual DNS addresses from the ISP during connection setup and forwards DNS requests from the LAN.
- **PPP over Ethernet (PPPoE)**. PPPoE is a protocol for connecting remote hosts to the Internet over a DSL connection by simulating a dial-up connection. This feature eliminates the need to run a login program such as EnterNet or WinPOET on your PC.
- **Quality of Service (QoS)** support for traffic prioritization.

Advanced VPN Support for Both IPsec and SSL

The VPN firewall supports IPsec and SSL virtual private network (VPN) connections.

- IPsec VPN delivers full network access between a central office and branch offices, or between a central office and telecommuters. Remote access by telecommuters requires the installation of VPN client software on the remote computer.
  - IPsec VPN with broad protocol support for secure connection to other IPsec gateways and clients.
  - Bundled with the single-user license of the NETGEAR ProSafe VPN Client software (VPN01L)
  - Supports up to 5 (max) IPsec VPN tunnels (alternately, 4 IPsec VPN tunnels concurrently with 4 SSL VPN sessions, or 5 IPsec VPN tunnels concurrently with 3 SSL VPN sessions). The total number of concurrent tunnels and sessions is not to exceed eight.
- SSL VPN provides remote access for mobile users to selected corporate resources without requiring a pre-installed VPN client on their computers.
  - Uses the familiar Secure Sockets Layer (SSL) protocol, commonly used for e-commerce transactions, to provide client-free access with customizable user portals and support for a wide variety of user repositories.
  - Browser based, platform-independent, remote access through a number of popular browsers, such as Microsoft Internet Explorer or Apple Safari.
  - Provides granular access to corporate resources based upon user type or group membership.
  - Supports up to 5 (max) SSL VPN sessions (alternately, 4 SSL VPN sessions concurrently with 4 IPsec VPN tunnels, or 3 SSL VPN sessions concurrently with 5 IPsec VPN tunnels).

Wireless Networking Features

- **Dual Band Selection.** The SRXN3205 allows you to configure one of two bands; choose between the 2.4 GHz band or the 5 GHz band.

The choice of band is reflected in protocol standard supported, as well as the administration screens displayed to you. For example, if you choose to enable the 2.4 GHz band, only 802.11b/g/n protocols are supported. In addition, in the administration screens, the configuration options for 802.11a/n protocols are greyed out. On the other hand, if you enable the 5 GHz band, the 802.11 a/n protocols are support and the 802.11b/g/n protocol support is disabled. In this case, the configuration options for 802.11b/g/n protocols are greyed out.

- Multiple operating modes:
  - **Wireless Access Point.** Operates as a standard 802.11a/b/g/n access point.
  - **Point-to-Point Bridge.** In this mode, the SRXN3205 only communicates with another bridge-mode wireless station or access point. Network authentication should be used to protect this communication.
  - **Point-to-Multi-Point Bridge.** Select this only if this SRXN3205 is the “Master” for a group of bridge-mode wireless stations. The other bridge-mode wireless stations send all traffic to this “Master”, and do not communicate directly with each other. Network Authentication should be used to protect this traffic.
  - **Wireless Repeater.** In this mode, SRXN3205 does not function as an access point. It communicates with only repeater-mode, point-to-point-bridge-mode, and point-to-multi-point-bridge-mode wireless stations. Network authentication should be used to protect this communication.
- **Hotspot Settings.** You can allow all HTTP (TCP, port 80) requests to be captured and redirected to the URL you specify.
- **Upgradeable Firmware.** Firmware is stored in a flash memory and can be upgraded easily, using only your Web browser, and can be also upgraded remotely. In addition to using Web browser to do so, command-line interface can also be used.
- **Rogue AP Detection.** The Rogue AP filtering feature ensures that unknown APs ae not given access to any part of the LAN.
- **Access Control.** The Access Control MAC address filtering feature can ensure that only trusted wireless stations can use the SRXN3205 to gain access to your LAN.
- **Security Profiles.** When using multiple BSSIDs, you can configure unique security settings (encryption, SSID, etc.) for each BSSID.
- **Hidden Mode.** The SSID is not broadcast, assuring only clients configured with the correct SSID can connect.
- **Secure Telnet Command Line Interface.** The Telnet command line interface enables direct access over the serial port and easy scripting of the configuration of multiple SRXN3205 across an extensive network via the Ethernet interface. An SSH client is required.

- **Configuration Backup.** Configuration settings can be backed up to a file and restored.
- **Secure and Economical Operation.** Adjustable power output allows more secure or economical operation.
- **Power over Ethernet.** Power can be supplied to the SRXN3205 over the Ethernet port from any 802.3af compliant mid-span or end-span source. Please refer to the Appendix for a list of compliant Netgear PoE switches. ?????
- **Autosensing Ethernet Connection with Auto Uplink Interface.** Connects to 10/100/1000 Mbps IEEE 802.3 Ethernet networks.
- **LED Indicators.** Power, test, LAN speed, LAN activity, and wireless activity for each radio mode are easily identified.
- **Wireless Multimedia (WMM) Support.** WMM is a subset of the 802.11e standard. WMM allows wireless traffic to have a range of priorities, depending on the kind of data. Time-dependent information, like video or audio, has a higher priority than normal traffic. For WMM to function correctly, Wireless clients must also support WMM.
- **Quality of Service (QoS) Support.** You can configure parameters that affect traffic flowing from the security router to the client station and traffic flowing from the client station to the security router. The QoS feature allows you to prioritize traffic, such as voice and video traffic, so that packets do not get dropped.
- **VLAN Security Profiles.** Each Security Profile is automatically allocated a VLAN ID as each Security Profile is modified.

Easy Installation and Management

You can install, configure, and operate the ProSafe Wireless-N VPN Firewall within minutes after connecting it to the network. The following features simplify installation and management tasks:

- **Browser-Based Management.** Browser-based configuration allows you to easily configure your VPN firewall and Wireless access from almost any type of personal computer, such as Windows, Macintosh, or Linux. A user-friendly Setup Wizard is provided and online help documentation is built into the browser-based Web Management Interface.
- **Auto Detection of ISP**. The VPN firewall automatically senses the type of Internet connection, asking you only for the information required for your type of ISP account.

- **VPN Wizard.** The VPN firewall includes the NETGEAR VPN Wizard to easily configure IPsec VPN tunnels according to the recommendations of the Virtual Private Network Consortium (VPNC) to ensure the IPsec VPN tunnels are interoperable with other VPNC-compliant VPN firewalls and clients.
- **SNMP.** The VPN firewall supports the Simple Network Management Protocol (SNMP) to let you monitor and manage log resources from an SNMP-compliant system manager. The SNMP system configuration lets you change the system variables for MIB2.
- **Diagnostic Functions**. The VPN firewall incorporates built-in diagnostic functions such as Ping, Trace Route, DNS lookup, and remote reboot.
- **Remote Management**. The firewall allows you to login to the Web Management Interface from a remote location on the Internet. For security, you can limit remote management access to a specified remote IP address or range of addresses.
- **Visual monitoring**. The VPN firewall's front panel LEDs provide an easy way to monitor its status and activity.

Maintenance and Support

NETGEAR offers the following features to help you maximize your use of the VPN firewall:

- Flash memory for firmware upgrade.
- Free technical support seven days a week, 24 hours a day, according to the terms identified in the Warranty and Support information card provided with your product.

Compatible and Related NETGEAR Products

For a list of compatible products from other manufacturers, see the Wireless Ethernet Compatibility Alliance Web site (WECA, see *http://www.wi-fi.net*).

The following NETGEAR products work with the VPN firewall:

- FS108P - ProSafe 8 Port 10/100 Switch with 4 Port PoE
- FS116P ProSafe 16 Port 10/100 Desktop Switch with 8 Port PoE
- FS726TP - ProSafe 24 Port 10/100 Smart Switch with 2 Gigabit Ports and 12 Port PoE
- FS728TP - ProSafe 24+4 10/100 Smart Switch with full PoE
- FS752TPS - ProSafe 48 Port 10/100 Stackable Smart Switch with 4 Gigabit Ports and 24 Port PoE
- FSM7328PS - ProSafe 24-port 10/100 L3 Managed Stackable Switch with 24 PoE Ports

- FSM7352PS - ProSafe 48 Port 10/100 L3 Managed Stackable Switch with 4 Gigabit Ports and 48 Port PoE
- GS724TP - ProSafe 24-Port GE PoE Smart Switch
- GS748TP - ProSafe 48-Port GE PoE Smart Switch
- WNDA3100 - RangeMax Dual Band Wireless-N USB 2.0 Adapter
- WN121T RangeMax NEXT Wireless-N USB 2.0 Adapter
- WN111 - RangeMax Next Wireless-N USB Adapter
- WN511B RangeMax NEXT Wireless-N Notebook Adapter
- WN311B RangeMax NEXT Wireless-N PCI Adapter
- WAG511 ProSafe 108 Mbps Dual Band PC Card
- WAG311 ProSafe 108 Mbps Dual Band PCI Card
- WG311T 802.11g 108 Mbps Wireless PCI Card
- WG511T 802.11g 108 Mbps Wireless CardBus Adapter
- WG511 802.11g 54 Mbps Wireless CardBus Adapter
- WG111 801.11g 54 Mbps Wireless USB Adapter
- WPN111 - RangeMax Wireless USB 2.0 Adapter

System Requirements

Before installing the SRXN3205, ensure your system meets the following requirements:

- A 10/100/1000 Mbps Local Area Network device such as a hub or switch
- The Category 5 UTP straight through Ethernet cable with RJ-45 connector included in the package, or one like it
- A 100-240 V, 50-60 Hz AC power source
- A Web browser for configuration, such as, Microsoft Internet Explorer 5.0 or above, or Mozilla 3.0 or above
- At least one computer to act as the host PC with the TCP/IP protocol installed.
- At least one computer to act as the wireless client with the TCP/IP protocol and a 802.11a/b/g/n or 802.11a/b/g/n-compliant wireless device installed, such as, a NETGEAR WG511 Wireless Adapter.

Package Contents

The product package should contain the following items:

- ProSafe Wireless-N VPN Firewall
- Rubber feet (4) with adhesive backing
- One AC-DC power adpater (12V, 1.5A) with cord (approximately 6 ft, or 183 cm)
- Three dual-band antennas (SMA connectors): 2 dipole (long); 1 patch (square)
- One Straight through Category 5 (Cat5) Ethernet cable.
- *Installation Guide, SRXN3205 ProSafe Wireless-N VPN Firewall* .
- *Resource CD*, including:
  - Application Notes and other helpful information.
  - ProSafe VPN Client Software – one user license.
- Warranty and Support Information Card.

If any of the parts are incorrect, missing, or damaged, contact your NETGEAR dealer. Keep the carton, including the original packing materials, in case you need to return the firewall for repair.

Front Panel Features

The ProSafe Wireless-N VPN Firewall front panel shown below includes two groups of RJ-45 connectors and a column of status indicator light-emitting diodes (LEDs), including Power, Test, and Band lights:

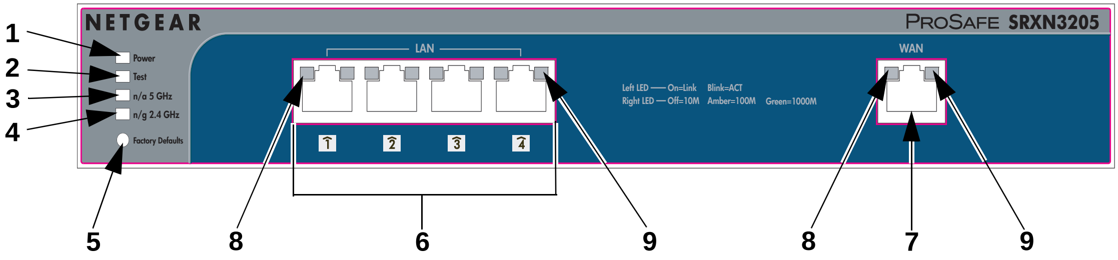


Figure 1-1New Photo

The column of status indicator light-emitting diodes (LEDs) on the left and the RJ-45 LEDs are described in Table 1-1., “LED Descriptions”.

1. Factory Defaults button. (5)
   Using a sharp object, press and hold this button for about ten seconds until the front panel TEST light flashes to reset the VPN firewall to factory default settings. All configuration settings will be lost and the default password will be restored.
2. LAN Ethernet ports. (6)
   Four switched N-way automatic speed negotiating, Auto MDI/MDIX, Gigabit Ethernet ports with RJ-45 connectors.
3. WAN Ethernet port. (7)
   One independent N-way automatic speed negotiating, Auto MDI/MDIX, Gigabit Ethernet port with a RJ-45 connector.

The function of each LED is described in the following table:

Table 1-1. LED Descriptions

Item	LED	Activity	Description
1	**PWR (Power)**	On (Green) Off	Power is supplied to the VPN firewall. Power is not supplied to the VPN firewall.
2	**TEST**	On (Amber) Blinking (Amber) Off	Test mode: The system is initializing (On) or the initialization has failed (Blinking). Writing to Flash memory (during upgrading or resetting to defaults). The system has booted successfully.
3	**n/a 5 GHz**		Wireless LAN 802.11n/a Link Activity Indicator (5 GHz)
		Off	Indicates WLAN 802.11n/a (5GHz) mode is disabled.
		Blink (Green)	Indicates Wireless data traffic in 5GHz modes.
4	**n/g 2.4 GHz**		Wireless LAN 802.b/g/n Link Activity Indicator (2.4 GHz) (Default)
		Off	Indicates WLAN 802.11b/g/n (2.4 GHz) mode is disabled.
		Blink (Green)	Indicates Wireless data traffic in 2.4 GHz modes
6	**LAN Ports**		
7	**WAN Port**		
8	**LINK/ACT (Link and Activity)**	On (Green) Blinking (Green) Off	The WAN/LAN port has detected a link with a connected Ethernet device. Data is being transmitted or received by the WAN/LAN port. The WAN/LAN port has no link.
9	**SPEED**	On (Green) On (Amber) Off	The WAN/LAN port is operating at 1,000 Mbps. The WAN/LAN port is operating at 100 Mbps. The WAN/LAN port is operating at 10 Mbps.

Rear Panel Features

The rear panel of the ProSafe Wireless-N VPN Firewall includes three SMA dual-band antenna connectors (2 dipole (long); 1 patch (square) and AC-DC power adapter jack.

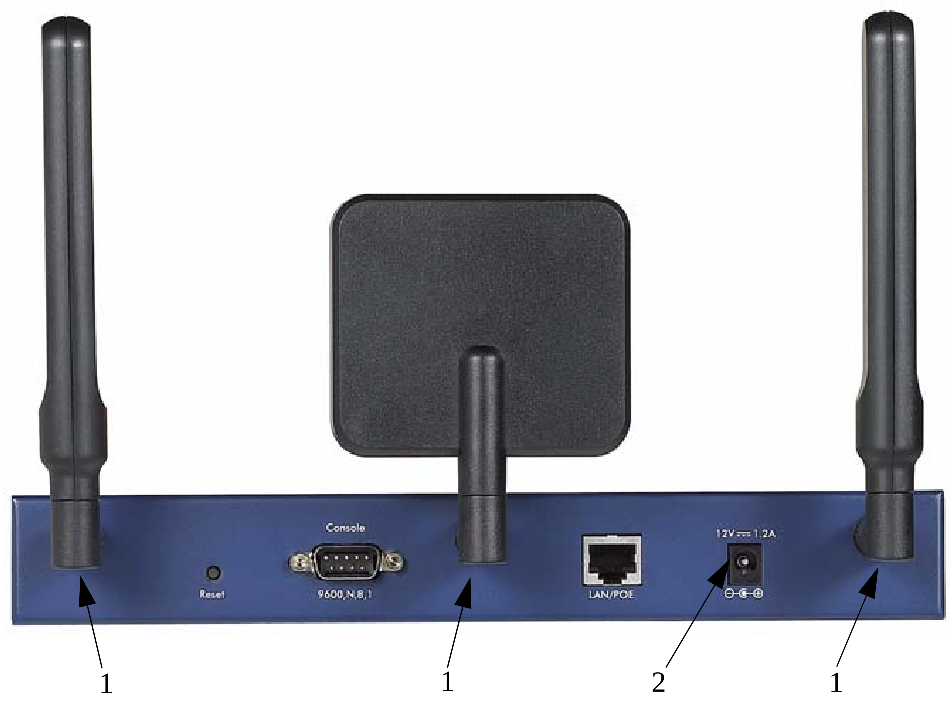


Figure 1-2 New Photo

The SRXN3205 rear panel functions are described below:

1. Left, Middle, and Right Detachable (SMA) Antennas (1)

   The SRXN3205 provides three SMA connectors for the detachable antennas (two dipole and one patch). For the best performance, attach the patch antenna to the middle connector and attach the dipole antennas to the two connectors on both corners. The three antennas can be positioned horizontally or vertically for the best coverage.

2. DC Power Jack (2)

   This jack connects to the SRXN3205 12V 1.5A AC-DC power adapter.

Default IP Address, Login Name, and Password Location

Check the label on the bottom of the SRXN3205's enclosure if you need a reminder of the following factory default information:

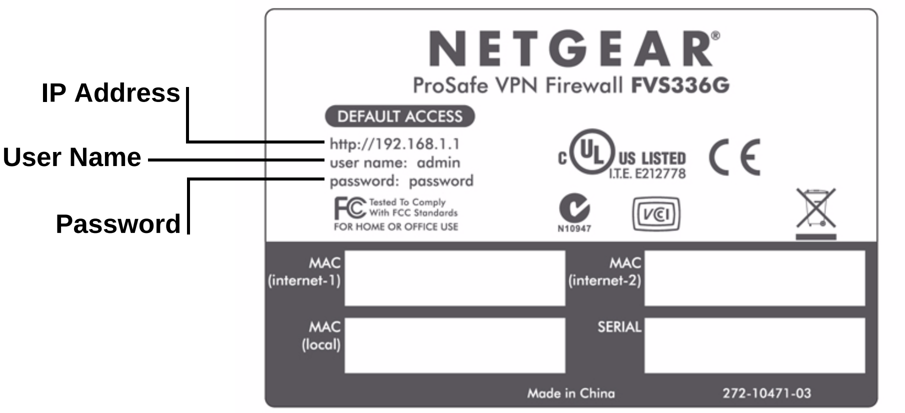


Figure 1-3New Drawing

Qualified Web Browsers

To configure the ProSafe Wireless-N VPN Firewall, an administrator must use Internet Explorer 5.1 or higher, Apple Safari 1.2 or higher, or Mozilla Firefox l.x Web browser with JavaScript, cookies, and SSL enabled.

Although these web browsers are qualified for use with the VPN firewall's Web Management Interface for configuring the VPN firewall, SSL VPN users should choose a browser that supports JavaScript, Java, cookies, SSL, and ActiveX to take advantage of the full suite of applications. Note that Java is only required for the SSL VPN portal, not the Web Management Interface.

Chapter 2
Connecting to the Internet (WAN)

The initial Internet configuration of the SRXN3205 ProSafe Wireless-N VPN Firewall is described in this chapter.

This chapter contains the following sections:

- "Understanding the Connection Steps"
- "Logging into the VPN Firewall"
- "Navigating the Menus"
- "Configuring the Internet Connection (WAN)"
- "Configuring Dynamic DNS (Optional)"
- "Configuring the Advanced WAN Options (Optional)"

Understanding the Connection Steps

Typically, six steps are required to complete the basic Internet connection of your firewall.

1. **Connect the firewall physically to your network**. Connect the cables and restart your network according to the instructions in the installation guide. See the *Installation Guide, SRXN3205 ProSafe Wireless-N VPN Firewall* for complete steps. A PDF of the *Installation Guide* is on the NETGEAR web site at: *http://kbserver.netgear.com*.
2. **Log in to the VPN Firewall**. After logging in, you are ready to set up and configure your firewall. You can also change your password and enable remote management at this time. See "Logging into the VPN Firewall" on page 2-2.
3. **Configure the Internet connections to your ISP(s)**. During this phase, you will connect to your ISPs. You can also program the WAN traffic meters at this time if desired. See "Configuring the Internet Connection (WAN)" on page 2-4.
4. **Configure dynamic DNS on the WAN port (optional)**. Configure your fully qualified domain names during this phase (if required). See "Configuring Dynamic DNS (Optional)" on page 2-12.

5. **Configure the WAN options (optional)**. Optionally, you can enable the WAN port to respond to a ping, and you can change the factory default MTU size and port speed. However, these are advanced features and changing them is not usually required. See "Configuring the Advanced WAN Options (Optional)" on page 2-14.

Each of these tasks is detailed separately in this chapter. The configuration of firewall, VPN, and Wireless features are described in later chapters.

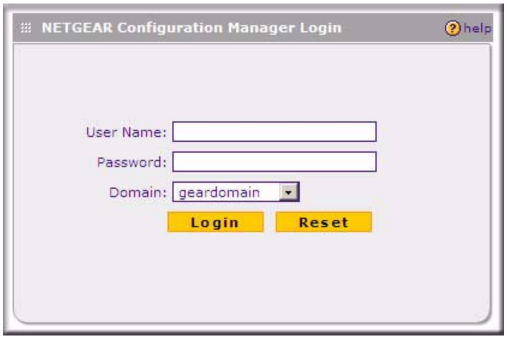
Logging into the VPN Firewall

To connect to the VPN firewall, your computer needs to be configured to obtain an IP address automatically from the VPN firewall by DHCP. For instructions on how to configure your computer for DHCP, refer to the link in Appendix B, "Related Documents.

To connect and log in to the firewall follow these steps:

1. Start any of the qualified browsers, as detailed in "Qualified Web Browsers" on page 1-12.
2. Enter **https://192.168.1.1** in the address field.

   The Manager login features appear in the browser.



NETGEAR Configuration Manager Login

User Name:

Password:

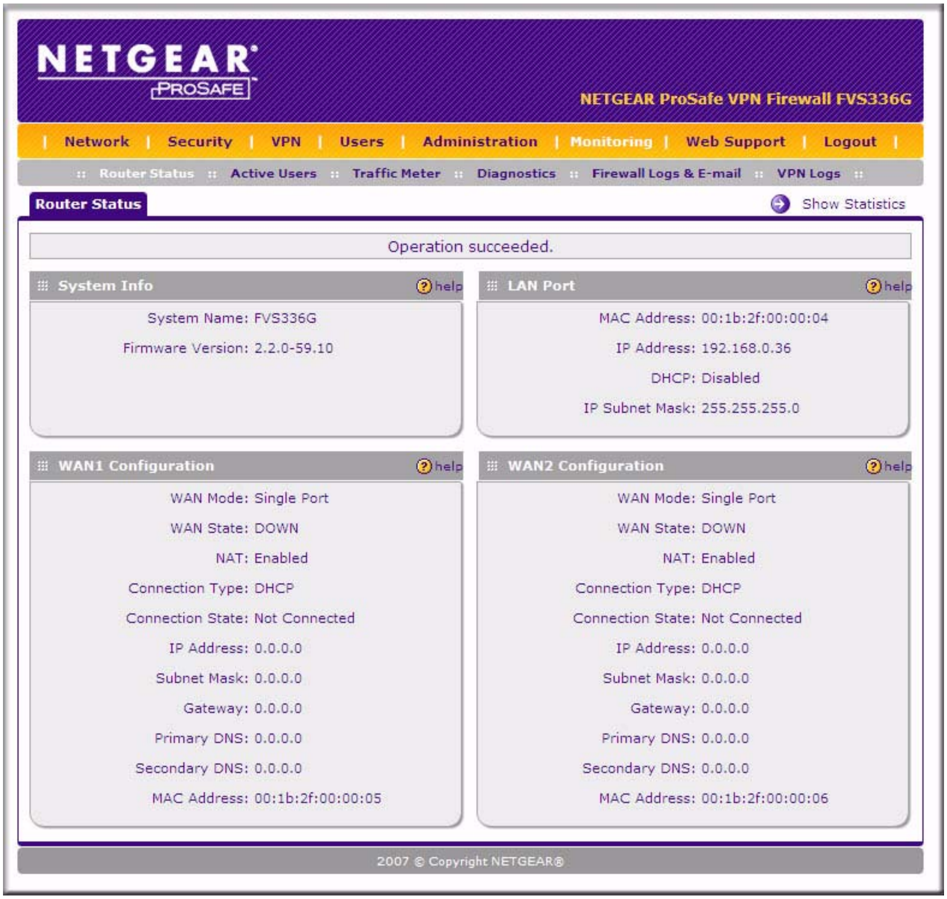
Domain: geardomain

Figure 2-1 OK

3. In the User field, type **admin** in lower case.

   Use all lower case letters since both login fields are case sensitive.
4. In the Password field, type **password** in lower case.
5. Click **Login.**

The Web Configuration Manager appears, displaying the Router Status menu as the default.


NETGEAR PROSAFE
NETGEAR ProSafe VPN Firewall FVS336G
| Network | Security | VPN | Users | Administration | Monitoring | Web Support | Logout |
:: Router Status :: Active Users :: Traffic Meter :: Diagnostics :: Firewall Logs & E-mail :: VPN Logs ::
Router Status
Show Statistics
help
2007 © Copyright NETGEAR®

Operation succeeded.

System Info

System Name: FVS336G

Firmware Version: 2.2.0-59.10

LAN Port

MAC Address: 00:1b:2f:00:00:04

IP Address: 192.168.0.36

DHCP: Disabled

IP Subnet Mask: 255.255.255.0

WAN1 Configuration

WAN Mode: Single Port

WAN State: DOWN

NAT: Enabled

Connection Type: DHCP

Connection State: Not Connected

IP Address: 0.0.0.0

Subnet Mask: 0.0.0.0

Gateway: 0.0.0.0

Primary DNS: 0.0.0.0

Secondary DNS: 0.0.0.0

MAC Address: 00:1b:2f:00:00:05

WAN2 Configuration

WAN Mode: Single Port

WAN State: DOWN

NAT: Enabled

Connection Type: DHCP

Connection State: Not Connected

IP Address: 0.0.0.0

Subnet Mask: 0.0.0.0

Gateway: 0.0.0.0

Primary DNS: 0.0.0.0

Secondary DNS: 0.0.0.0

MAC Address: 00:1b:2f:00:00:06

Figure 2-2 new screen shot

Navigating the Menus

The Web Configuration Manager menus are organized in a layered structure of main categories and submenus:

- **Main menu**. The horizontal orange bar near the top of the page is the main menu, containing the primary configuration categories. Clicking on a primary category changes the contents of the submenu bar.

- **Submenu**. The horizontal grey bar immediately below the main menu is the submenu, containing subcategories of the currently selected primary category.
- **Tab**. Immediately below the submenu bar, at the top of the menu active window, are one or more tabs, further subdividing the currently selected subcategory if necessary.
- **Option arrow**. To the right of the tabs on some menus are one or more blue dots with an arrow in the center. Clicking an option arrow brings up either a popup window or an advanced option menu.

> **Tip:** In the instructions in this guide, we may refer to a menu using the notation primary > subcategory, such as Network Configuration > WAN Settings. In this example, Network Configuration is the selected primary category (in the main menu) and WAN Settings is the selected subcategory (in the submenu).

You can now proceed to the first configuration task, configuring the firewall's Internet connections.

Configuring the Internet Connection (WAN)

To set up your firewall for secure Internet connections, you configure the WAN port. The Web Configuration Manager offers two connection configuration options:

- Automatic detection and configuration of the network connection.
- Manual configuration of the network connection.

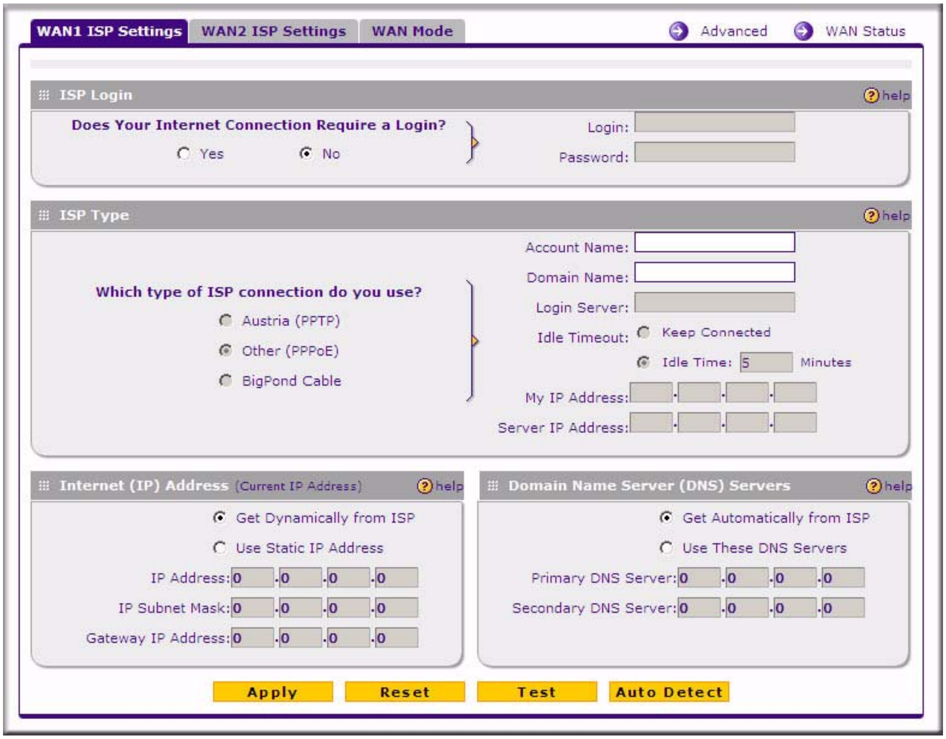
Each option is detailed in the following sections.

Automatically Detecting and Connecting

To automatically configure the WAN port for connection to the Internet:

1. Select **Network Configuration** > **WAN Settings** from the menu/submenu.

The WAN tabs appear on screen with the WAN ISP Settings tab in view.



ISP Login

Does Your Internet Connection Require a Login? ○ Yes ● No

Login:

Password:

ISP Type

Which type of ISP connection do you use?

○ Austria (PPTP)

● Other (PPPoE)

○ BigPond Cable

Account Name:

Domain Name:

Login Server:

Idle Timeout: ○ Keep Connected

● Idle Time: 5 Minutes

My IP Address:

Server IP Address:

Internet (IP) Address (Current IP Address)

● Get Dynamically from ISP

○ Use Static IP Address

IP Address: 0 .0 .0 .0

IP Subnet Mask: 0 .0 .0 .0

Gateway IP Address: 0 .0 .0 .0

Domain Name Server (DNS) Servers

● Get Automatically from ISP

○ Use These DNS Servers

Primary DNS Server: 0 .0 .0 .0

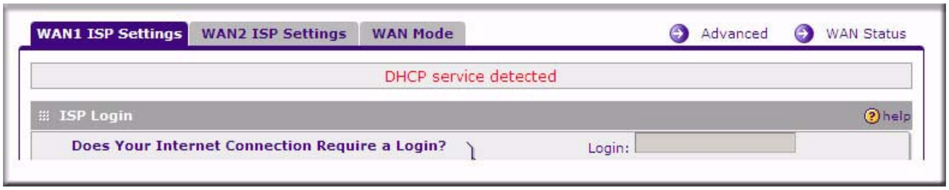
Secondary DNS Server: 0 .0 .0 .0

Figure 2-3 New screen shot

2. Click **Auto Detect** at the bottom of the menu.

   Auto Detect will probe the WAN port for a range of connection methods and suggest one that your ISP appears to support.

   a. If Auto Detect is successful, a status bar at the top of the menu will display the results:.



DHCP service detected

ISP Login

Does Your Internet Connection Require a Login?

Login:

Figure 2-4 New screen shot

b. If Auto Detect senses a connection method that requires input from you, it will prompt you for the information. All methods with the required settings are detailed in the following table.

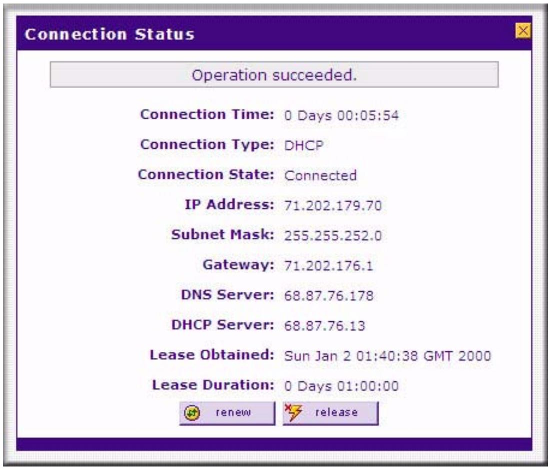
Table 2-1. Internet connection methods

Connection Method	Data Required
DHCP (Dynamic IP)	No data is required.
PPPoE	Login (Username, Password); Account Name, Domain Name (sometimes required).
PPTP	Login (Username, Password), Local IP address, and PPTP Server IP address; Account Name (sometimes required).
Fixed (Static) IP	Static IP address, Subnet, and Gateway IP; DNS Server IP addresses.

c. If Auto Detect does not find a connection, you will be prompted to (1) check the physical connection between your firewall and the cable or DSL line, or to (2) check your firewall's MAC address (For more information, see "Configuring the WAN Mode (Required for Dual WAN)" on page 2-11 and "Troubleshooting the ISP Connection" on page 12-4).

3. To verify the connection, click the **WAN Status** option arrow at the top right of the screen.

A popup window appears, displaying the connection status of the WAN port.



Operation succeeded.

Connection Time: 0 Days 00:05:54
Connection Type: DHCP
Connection State: Connected
IP Address: 71.202.179.70
Subnet Mask: 255.255.252.0
Gateway: 71.202.176.1
DNS Server: 68.87.76.178
DHCP Server: 68.87.76.13
Lease Obtained: Sun Jan 2 01:40:38 GMT 2000
Lease Duration: 0 Days 01:00:00

Figure 2-5 New screen shot

The WAN Status window should show a valid IP address and gateway. If the configuration was not successful, skip ahead to "Manually Configuring the Internet Connection" following this section, or see "Troubleshooting the ISP Connection" on page 12-4.

Note: If the configuration process was successful, you are connected to the Internet through the WAN port.

4. If your WAN ISP configuration was successful, you can test the internet connection, or skip ahead to..........
5. Click **Test** to evaluate your entries.

   The firewall will attempt to connect to the NETGEAR Web site. If a successful connection is made, NETGEAR's Web site appears.

If your WAN ISP configuration was successful, you can skip ahead to "Configuring the WAN Mode (Required for Dual WAN)" on page 2-11.

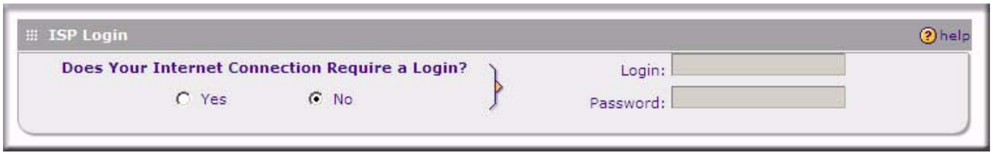
If the automatic WAN ISP configurations failed, you can attempt a manual configuration as described in the following section, or see "Troubleshooting the ISP Connection" on page 12-4.

Manually Configuring the Internet Connection

Unless your ISP automatically assigns your configuration automatically via DHCP, you will need to obtain configuration parameters from your ISP in order to manually establish an Internet connection. The necessary parameters for various connection types are listed in Table 2-1.

To manually configure your **WAN ISP Settings:**

1. Select **Network Configuration> WAN ISP Settings** and enter the following:
2. In the **ISP Login** options, choose one of these options:
   - If your ISP requires an initial login to establish an Internet connection, click **Yes** (this is the default).
   - If a login is not required, click **No** and ignore the Login and Password fields.



Does Your Internet Connection Require a Login?

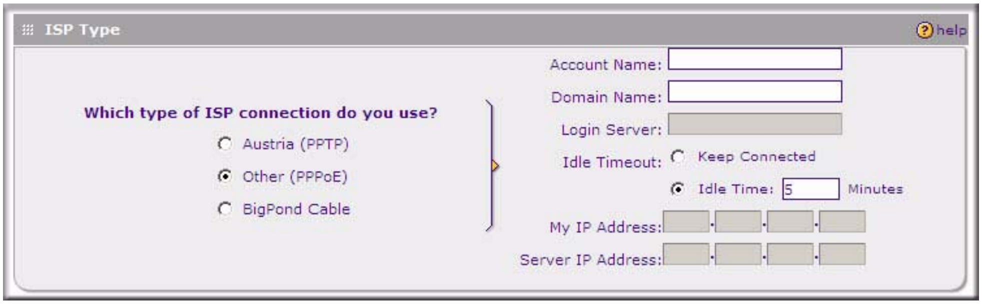
○ Yes ● No

Login:

Password:

Figure 2-6 OK

3. If you clicked **Yes**, enter the ISP-provided Login and Password information.
4. In the ISP Type options, select the type of ISP connection you use from the three listed options. (By default, “Other (PPPoE)” is selected, as shown below.



ISP Type

Which type of ISP connection do you use?

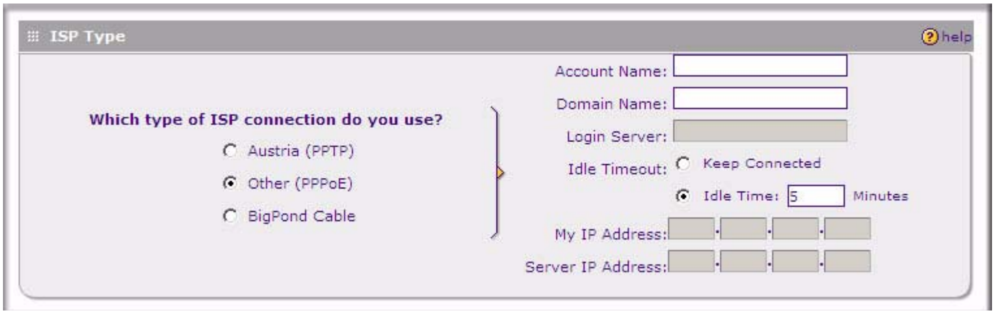
○ Austria (PPTP)
● Other (PPPoE)
○ BigPond Cable

Account Name:
Domain Name:
Login Server:
Idle Timeout: ○ Keep Connected
● Idle Time: 5 Minutes
My IP Address:
Server IP Address:

Figure 2-7 New screen shot

(If your connection is PPPoE, PPTP or BigPond Cable, your ISP will require an initial login.)

5. If you have installed login software such as WinPoET or Enternet, then your connection type is PPPoE. If your ISP uses PPPoE as a login protocol:
   a. Select **Other (PPPoE)**.



ISP Type

Which type of ISP connection do you use?

○ Austria (PPTP)
● Other (PPPoE)
○ BigPond Cable

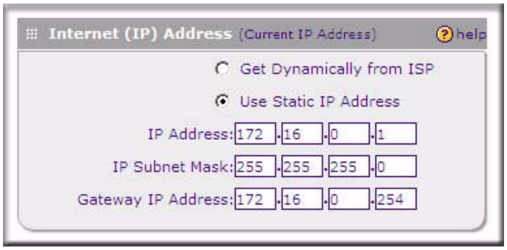
Account Name:
Domain Name:
Login Server:
Idle Timeout: ○ Keep Connected
● Idle Time: 5 Minutes
My IP Address:
Server IP Address:

Figure 2-8 New screen shot

   b. Configure the following fields:
      - **Account Name**. Valid account name for the PPPoE connection
      - **Domain Name.** Name of your ISP’s domain or your domain name if your ISP has assigned one. In most cases, you may leave this field blank.
      - **Idle Timeout.** Select Keep Connected, to keep the connection always on. To logout after the connection is idle for a period of time, click Idle Time and in the timeout field enter the number of minutes to wait before disconnecting.

6. If your ISP is Austria Telecom or any other ISP that uses PPTP as a login protocol:
   a. Select **Austria (PPTP)**.
   b. Configure the following fields:
      - **Account Name** (also known as Host Name or System Name)**.** Enter the valid account name for the PPTP connection (usually your e-mail name as assigned by your ISP). Some ISPs require entering your full email address here.
      - **Domain Name.** Your domain name or workgroup name assigned by your ISP, or your ISPs domain name. You may leave this field blank.
      - **Idle Timeout.** Check the Keep Connected radio box to keep the connection always on. To logout after the connection is idle for a period of time, click Idle Time and enter the number of minutes to wait before disconnecting in the timeout field. This is useful if your ISP charges you based on the amount of time you have logged in.
      - **My IP Address.** IP address assigned by the ISP to make the connection with the ISP server.
      - **Server IP Address.** IP address of the PPTP server.
7. If your ISP is Telstra BigPond Cable:
   a. Select **BigPond Cable**.
   b. Configure the Login Server and Idle Timeout fields.

      The Login Server is the IP address of the local BigPond Login Server in your area.
8. Review the Internet (IP) Address options.



Internet (IP) Address (Current IP Address)

○ Get Dynamically from ISP

● Use Static IP Address

IP Address: 172 . 16 . 0 . 1

IP Subnet Mask: 255 . 255 . 255 . 0

Gateway IP Address: 172 . 16 . 0 . 254

Figure 2-9

These options are inactive if BigPond Cable is selected???.

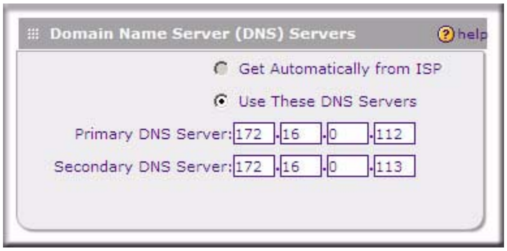
9. If your ISP has assigned a fixed (static) IP address, select **Use Static IP Address**, and configure the following fields:

- **IP Address.** Enter the Static IP address assigned to you, that identifies the firewall to your ISP.
- **Subnet Mask.** Enter the mask provided by the ISP or your network administrator.
- **Gateway IP Address.** Enter the IP address of the ISP's gateway, provided by the ISP or your network administrator.

10. If your ISP has not assigned a static IP address, click **Get dynamically from ISP**. The text fields will be inactivated.

    The ISP will automatically assign an IP address to the firewall using DHCP network protocol.

11. Review the Domain Name Server (DNS) Servers options.



Domain Name Server (DNS) Servers

○ Get Automatically from ISP

● Use These DNS Servers

Primary DNS Server: 172 . 16 . 0 . 112

Secondary DNS Server: 172 . 16 . 0 . 113

Figure 2-10 OK

- If your ISP has not assigned any Domain Name Servers (DNS) addresses, click **Get dynamically from ISP**.
- If your ISP (or your IT department) has assigned DNS addresses, click **Use these DNS Servers** and enter the DNS server IP addresses provided to you in the fields.

12. Click **Apply** to save any changes to the WAN ISP Settings. (Or click **Reset** to discard any changes and revert to the previous settings.)

13. Click **Test** to evaluate your entries.

    The firewall will attempt to connect to the NETGEAR Web site. If a successful connection is made, NETGEAR's Web site appears.

When you are finished, click Logout or proceed to additional setup and management tasks.

Configuring the WAN Mode

To access the WAN Mode, click on **Network Configuration > WAN Settings** and select the WAN Mode tab.

The WAN mode page allows you to configure how your firewall uses the external Internet connection. This screen gives you two choices for accessing the external Internet connection.

- **Network Address Translation (NAT)**. This technique allows several computers on a LAN to share the same Internet connection (IP address) while using private IP address on the LAN, which are hidden from the Internet.
- **Classical Routing**. This method allows the firewall to perform the routing, but requires separate valid static Internet IP address for each PC on your LAN.

Network Address Translation

Network Address Translation (NAT) allows all PCs on your LAN to share a single public Internet IP address. From the Internet, there is only a single device (the firewall) and a single IP address. PCs on your LAN can use any private IP address range, and these IP addresses are not visible from the Internet.

- The firewall uses NAT to select the correct PC (on your LAN) to receive any incoming data.
- If you only have a single public Internet IP address, you MUST use NAT. (the default setting).
- If your ISP has provided you with multiple public IP addresses, you can use one address as the primary shared address for Internet access by your PCs, and you can map incoming traffic on the other public IP addresses to specific PCs on your LAN. This one-to-one inbound mapping is configured using an inbound firewall rule.

Classical Routing

In classical routing mode, the firewall performs routing, but without NAT. To gain Internet access, each PC on your LAN must have a valid static Internet IP address.

If your ISP has allocated a number of static IP addresses to you, and you have assigned one of these addresses to each PC, you can choose classical routing. Or, you can use classical routing for routing private IP addresses within a campus environment.

To learn the status of the WAN port, you can view the Router Status page (see “Monitoring VPN Tunnel Connection Status” on page 11-15) or look at the LEDs on the front panel (see “Front Panel Features” on page 1-9).

Configuring Dynamic DNS (Optional)

Dynamic DNS (DDNS) is an Internet service that allows routers with varying public IP addresses to be located using Internet domain names. To use DDNS, you must setup an account with a DDNS provider such as DynDNS.org, TZO.com or Iego.net. Links to DynDNS, TZO and Iego are provided for your convenience as Tabbed menus xxx to the **Dynamic DNS** configuration screen. The firewall firmware includes software that notifies dynamic DNS servers of changes in the WAN IP address, so that the services running on this network can be accessed by others on the Internet.

If your network has a permanently assigned IP address, you can register a domain name and have that name linked with your IP address by public Domain Name Servers (DNS). However, if your Internet account uses a dynamically assigned IP address, you will not know in advance what your IP address will be, and the address can change frequently—hence, the need for a commercial DDNS service, which allows you to register an extension to its domain, and restores DNS requests for the resulting FQDN to your frequently-changing IP address.

After you have configured your account information in the firewall, whenever your ISP-assigned IP address changes, your firewall will automatically contact your DDNS service provider, log in to your account, and register your new IP address.

{{{

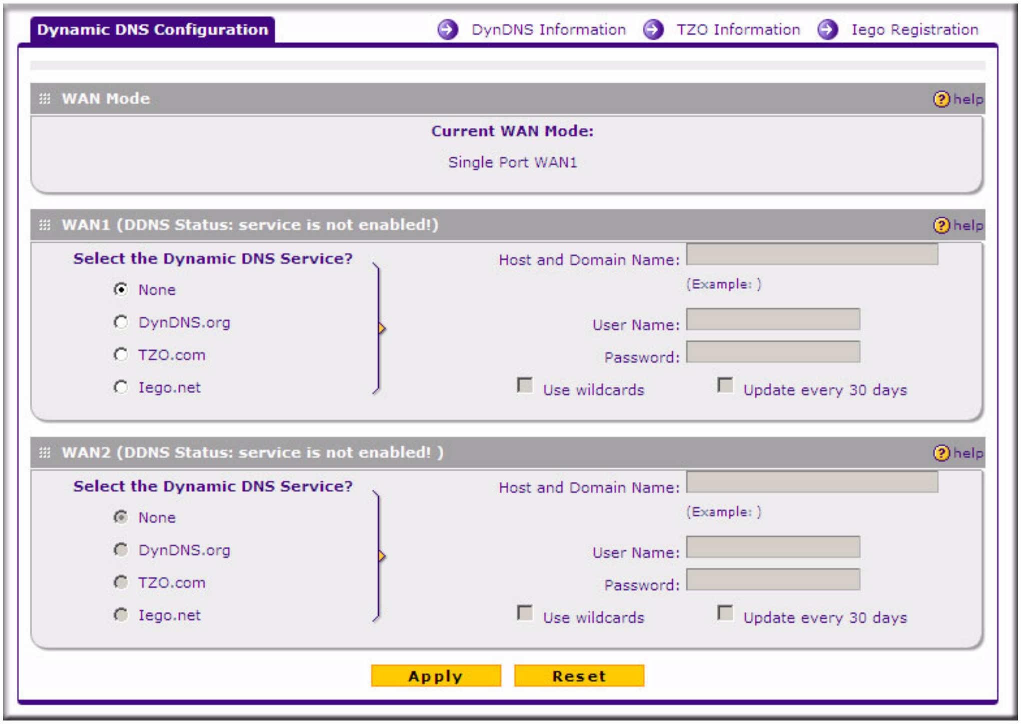
- For auto-rollover mode, you will need a fully qualified domain name (FQDN) to implement features such as exposed hosts and virtual private networks regardless of whether you have a fixed or dynamic IP address.
- For load balancing mode, you may still need a fully qualified domain name (FQDN) either for convenience or if you have a dynamic IP address. }}}}}

➡	**Note:** If your ISP assigns a private WAN IP address such as 192.168.x.x or 10.x.x.x, the dynamic DNS service will not work because private addresses will not be routed on the Internet.

To configure Dynamic DNS:

1. Select **Network Configuration** > **Dynamic DNS** from the main/submenu.

   The Dynamic DNS screen displays.



WAN Mode

Current WAN Mode:
Single Port WAN1

WAN1 (DDNS Status: service is not enabled!)

Select the Dynamic DNS Service?

- ● None
- ○ DynDNS.org
- ○ TZO.com
- ○ Iego.net

Host and Domain Name:
(Example:)
User Name:
Password:
□ Use wildcards
□ Update every 30 days

WAN2 (DDNS Status: service is not enabled!)

Select the Dynamic DNS Service?

- ● None
- ○ DynDNS.org
- ○ TZO.com
- ○ Iego.net

Host and Domain Name:
(Example:)
User Name:
Password:
□ Use wildcards
□ Update every 30 days

Figure 2-11 Need new screenshots (3)

The **Current WAN Mode** section reports the currently configured WAN mode. Only those options that match the configured WAN Mode will be accessible.

2. Select the Dynamic DNS Service you will use. {{{Need 3 new Screenshots and descriptions}}}

   The fields corresponding to the selection you have chosen will be activated. Each DDNS service provider requires its own parameters.

3. Access the Web site of one of the DDNS service providers and set up an account. Links to three DDNS providers are in the tab header.

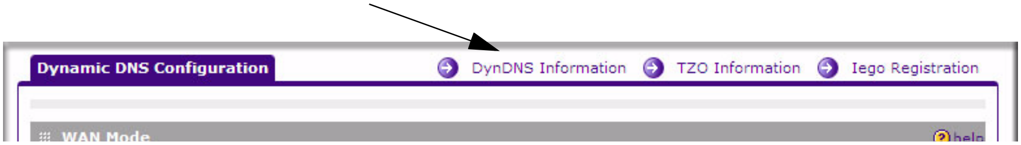


Figure 2-12 Need new screen shots (3)

4. After registering for your account, return to the **Dynamic DNS** menu and fill in the required fields for the DDNS service you selected:

   a. In the Host and Domain Name field, enter the entire FQDN name that your dynamic DNS service provider gave you (for example: <*yourname*>.dyndns.org).

   b. Enter the User Name, User email Address, or Account Name requested by the DDNS Service to identify you when logging into your DDNS account.

   c. Enter the Password, or User Key, for your DDNS account.

   d. If your dynamic DNS provider allows the use of wildcards in resolving your URL, check **Use wildcards** to activate this feature.

      For example, the wildcard feature will cause **anything.yourhost.dyndns.org** to be aliased to the same IP address as **yourhost.dyndns.org**

   e. If your dynamic DNS provider requires you to renew your account monthly, check **Update every 30 days** to have the firewall renew the account automatically.

5. Click **Apply** to save your configuration.

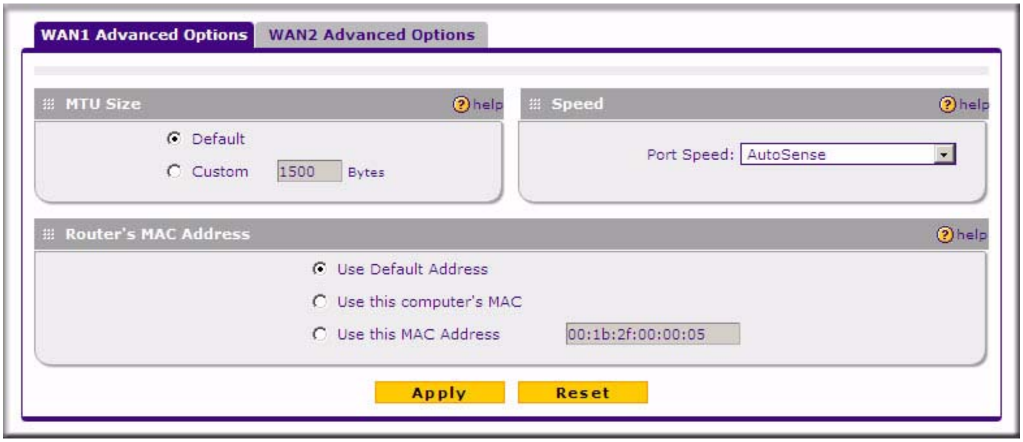
Configuring the Advanced WAN Options (Optional)

To configure the Advanced WAN options:

1. Select **Network Configuration > WAN Settings** from the main/submenu.

   The WAN ISP Settings screen displays.

2. Click the **Advanced** link to the right of the tabs. The **WAN Advanced Options** tab is displayed.



● Default
○ Custom 1500 Bytes

Port Speed: AutoSense

● Use Default Address
○ Use this computer's MAC
○ Use this MAC Address 00:1b:2f:00:00:05

Figure 2-13 Need new screenshot

3. Edit the default information you want to change.

   a. **MTU Size**. The normal MTU (Maximum Transmit Unit) value for most Ethernet networks is 1500 Bytes, or 1492 Bytes for PPPoE connections. For some ISPs, you may need to reduce the MTU. This is rarely required, and should not be done unless you are sure it is necessary for your ISP connection.

   b. **Port Speed**. In most cases, your firewall can automatically determine the connection speed of the WAN port. If you cannot establish an Internet connection and the WAN Link or Speed LED blinks continuously, you may need to manually select the port speed. AutoSense is the default.

      If you know the Ethernet port speed that your broadband modem supports, select it; otherwise, select 10M. Use the half-duplex settings unless you are sure your broadband modem supports full duplex.

   c. **Router's MAC Address**. Each computer or router on your network has a unique 32-bit local Ethernet address. This is also referred to as the computer's MAC (Media Access Control) address. The default is **Use default address**. However, if your ISP requires MAC authentication, then select either of these options:

      - Use this Computer's MAC address to have the firewall use the MAC address of the computer you are now using, or
      - Use This MAC Address to manually type in the MAC address that your ISP expects.

The format for the MAC address is 01:23:45:67:89:AB (numbers 0-9 and either uppercase or lowercase letters A-F). If you select **Use This MAC Address** and then type in a MAC address, your entry will be overwritten.

4. Click **Apply** to save your changes.

Additional WAN Related Configuration

- If you want the ability to manage the firewall remotely, enable remote management at this time (see "Enabling Remote Management Access" on page 9-10). If you enable remote management, we strongly recommend that you change your password (see "Changing Passwords and Administrator Settings" on page 9-8).
- At this point, you can set up the traffic meter for the WAN, if desired. See "Enabling the Traffic Meter" on page 11-1.

Chapter 3
LAN Configuration

This chapter describes how to configure the advanced LAN features of your ProSafe Wireless-N VPN Firewall.

This chapter contains the following sections:

Using the VPN Firewall as a DHCP Server

By default, the VPN Firewall will function as a DHCP (Dynamic Host Configuration Protocol) server, allowing it to assign IP, DNS server, WINS Server, and default gateway addresses to all computers connected to the LAN. The assigned default gateway address is the LAN address of the VPN Firewall. IP addresses will be assigned to the attached PCs from a pool of addresses specified in this menu. Each pool address is tested before it is assigned to avoid duplicate addresses on the LAN.

For most applications, the default DHCP and TCP/IP settings of the VPN Firewall are satisfactory. See the link to "Preparing a Computer for Network Access" in Appendix B, "Related Documents" for an explanation of DHCP and information about how to assign IP addresses for your network.

If another device on your network will be the DHCP server, or if you will manually configure the network settings of all of your computers, clear the **Enable DHCP server** radio box by clicking the **Disable DHCP Server** radio box. Otherwise, leave it checked.

Specify the pool of IP addresses to be assigned by setting the Starting IP Address and Ending IP Address. These addresses should be part of the same IP address subnet as the VPN Firewall's LAN IP address. Using the default addressing scheme, you would define a range between 192.168.1.2

and 192.168.1.100, although you may wish to save part of the range for devices with fixed addresses.

The VPN Firewall will deliver the following parameters to any LAN device that requests DHCP:

- An IP Address from the range you have defined.
- Subnet Mask
- Gateway IP Address (the VPN Firewall’s LAN IP address).
- Primary DNS Server (the VPN Firewall’s LAN IP address or a user-specified DNS server IP address in the LAN Setup menu).
- Secondary DNS Server (if you entered a secondary DNS server IP address in the LAN Setup menu).
- WINS Server (if you entered a WINS server IP address in the LAN Setup menu).
- Lease Time (date obtained and duration of lease).

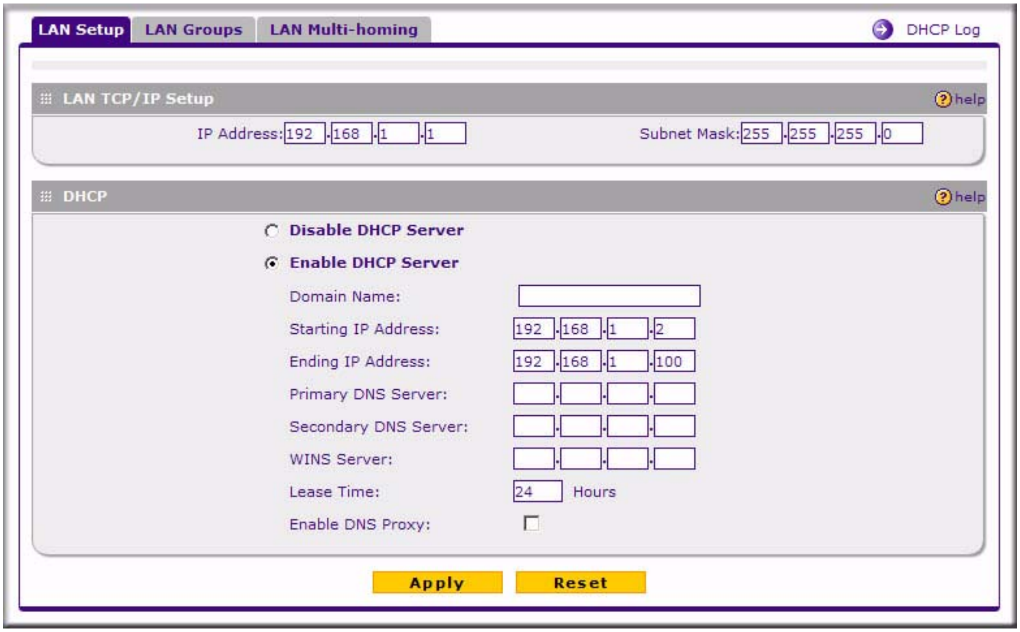
Configuring the LAN Setup Options

The **LAN Setup** menu allows configuration of LAN IP services such as DHCP and allows you to configure a secondary or “multi-home” LAN IP setup on the LAN. The default values are suitable for most users and situations. These are advanced settings usually configured by a network administrator.

To modify your LAN setup, follow these steps:

1. Select **Network Configuration > LAN Settings** from the main/sub-menu.

   The LAN Settings tabs (LAN Setup, LAN Groups, and LAN Multi-homing) are displayed with LAN Setup as the default tab.



LAN TCP/IP Setup

IP Address: 192 . 168 . 1 . 1

Subnet Mask: 255 . 255 . 255 . 0

DHCP

○ Disable DHCP Server

● Enable DHCP Server

Domain Name:	
Starting IP Address:	192 . 168 . 1 . 2
Ending IP Address:	192 . 168 . 1 . 100
Primary DNS Server:	. . .
Secondary DNS Server:	. . .
WINS Server:	. . .
Lease Time:	24 Hours
Enable DNS Proxy:	□

Figure 3-1OK

2. In the LAN TCP/IP Setup section, configure the following settings:
   - **IP Address**. The LAN address of your VPN Firewall (factory default: **192.168.1.1**).

> **Note:** If you change the LAN IP address of the firewall while connected through the browser, you will be disconnected. You must then open a new connection to the new IP address and log in again. For example, if you change the default IP address 192.168.1.1 to 10.0.0.1, you must now enter **https://10.0.0.1** in your browser to reconnect to the Web Configuration Manager.

   - **IP Subnet Mask**. The subnet mask specifies the network number portion of an IP address. Your VPN Firewall will automatically calculate the subnet mask based on the IP address that you assign. Unless you are implementing subnetting, use 255.255.255.0 as the subnet mask.

3. In the DHCP section, leave the DNCP enabled, or select **Disable DHCP Server.**
   - The VPN Firewall will function as a DHCP server (default), providing TCP/IP configuration settings for all the computers connected to the VPN Firewall's LAN.

- If another device on your network will be the DHCP server, or if you will manually configure all devices, click **Disable DHCP Server**.

If the DHCP server is enabled, enter the following parameters:

- **Domain Name.** (Optional) The DHCP will assign the entered domain to its DHCP clients.
- **Starting IP Address**. Specifies the first of the contiguous addresses in the IP address pool. Any new DHCP client joining the LAN will be assigned an IP address between this address and the Ending IP Address. The IP address 192.168.1.2 is the default start address.
- **Ending IP Address**. Specifies the last of the contiguous addresses in the IP address pool. The IP address 192.168.1.100 is the default ending address.

> ➡ **Note:** The Starting and Ending DHCP addresses should be in the same subnet as the LAN IP address of the VPN Firewall (the IP Address configured in the **LAN TCP/IP Setup** section).

- **Primary DNS Server**. (Optional) If an IP address is specified, the VPN Firewall will provide this address as the primary DNS server IP address. If no address is specified, the VPN Firewall will provide its own LAN IP address as the primary DNS server IP address.
- **Secondary DNS Server**. (Optional) If an IP address is specified, the VPN Firewall will provide this address as the secondary DNS server IP address.
- **WINS Server**. (Optional) Specifies the IP address of a local Windows NetBios Server if one is present in your network.
- **Lease Time**. Specifies the duration for which a DHCP-provided IP address will be leased to a client.
- **Enable DNS Proxy**. When DNS proxy is enabled (default), the DHCP server will provide the SRXN3205 LAN IP address as the DNS server for address name resolution. If this box is unchecked, the DHCP server will provide the ISP's DNS server IP addresses. The VPN Firewall will still service DNS requests sent to its LAN IP address unless you disable DNS Proxy in the DHCP settings (see "Attack Checks" on page 5-10).

4. Click **Apply** to save your settings.

> ➡ **Note:** Once you have completed the LAN setup, all outbound traffic is allowed and all inbound traffic is discarded. To change these default traffic rules, refer to Chapter 5, "Firewall Security and Content Filtering.

Managing Groups and Hosts (LAN Groups)

The **Known PCs and Devices** table in the **LAN Groups** menu contains a list of all known PCs and network devices that are assigned dynamic IP addresses by the VPN Firewall, or have been discovered by other means. Collectively, these entries make up the LAN Groups Database.

The LAN Groups Database is updated by these methods:

- **DHCP Client Requests**. By default, the DHCP server in this VPN Firewall is enabled, and will accept and respond to DHCP client requests from PCs and other network devices. These requests also generate an entry in the LAN Groups Database. Because of this, leaving the DHCP server feature (LAN Setup tab) enabled is strongly recommended.
- **Scanning the Network**. The local network is scanned using ARP requests. The ARP scan will detect active devices that are not DHCP clients. However, sometimes the name of the PC or device cannot be accurately determined, and will appear in the database as Unknown.
- **Manual Entry**. You can manually enter information about a network device.

Some advantages of the LAN Groups Database are:

- Generally, you do not need to enter IP addresses or MAC addresses. Instead, you can just select the desired PC or device.
- No need to reserve an IP address for a PC in the DHCP server. All IP address assignments made by the DHCP server will be maintained until the PC or device is removed from the database, either by expiry (inactive for a long time) or by you.
- No need to use a fixed IP on PCs. Because the address allocated by the DHCP server will never change, you don't need to assign a fixed IP to a PC to ensure it always has the same IP address.
- MAC level control over PCs. The LAN Groups Database uses the MAC address to identify each PC or device. So changing a PC’s IP address does not affect any restrictions on that PC.
- Group and individual control over PCs.
  - You can assign PCs to Groups and apply restrictions to each Group using the Firewall Rules screen (see “Using Rules & Services to Block or Allow Traffic” on page 5-2).
  - You can also select the Groups to be covered by the Block Sites feature (see “Setting Block Sites (Content Filtering)” on page 5-21).
  - If necessary, you can also create Firewall Rules to apply to a single PC (see “Enabling Source MAC Filtering (Address Filter)” on page 5-24). Because the MAC address is used to identify each PC, users cannot avoid these restrictions by changing the IP address.

- A computer is identified by its MAC address—not its IP address. Hence, changing a computer’s IP address does not affect any restrictions applied to that PC.

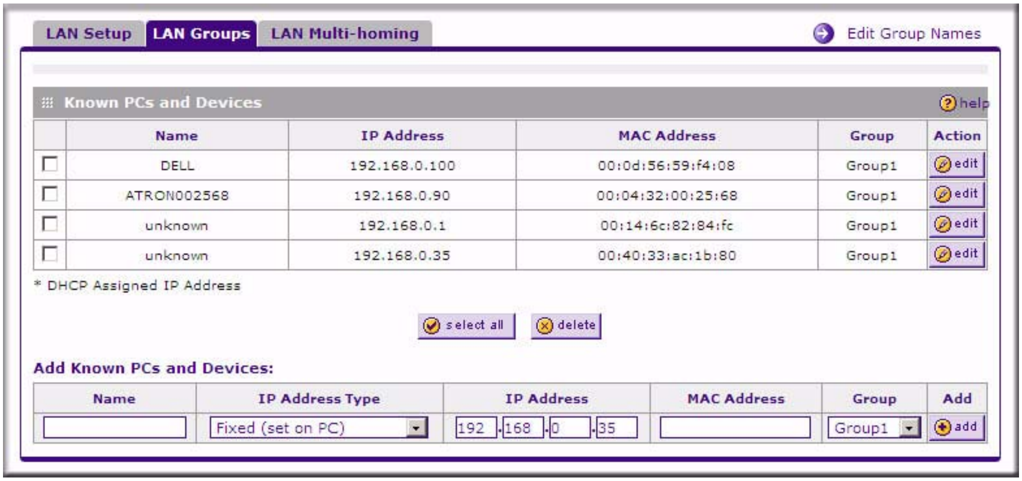
Viewing the LAN Groups Database

To view the LAN Groups Database, follow these steps:

1. Select **Network Configuration** > **LAN Settings** from the main/sub-menu.

   The LAN Setup tab displays.

2. Click the **LAN Groups** tab and the LAN Groups tab displays.



Known PCs and Devices

	Name	IP Address	MAC Address	Group	Action
□	DELL	192.168.0.100	00:0d:56:59:f4:08	Group1	edit
□	ATRON002568	192.168.0.90	00:04:32:00:25:68	Group1	edit
□	unknown	192.168.0.1	00:14:6c:82:84:fc	Group1	edit
□	unknown	192.168.0.35	00:40:33:ac:1b:80	Group1	edit

* DHCP Assigned IP Address

Add Known PCs and Devices:

Name	IP Address Type	IP Address	MAC Address	Group	Add
	Fixed (set on PC)	192.168.0.35		Group1	add

Figure 3-2 Ok

The **Known PCs and Devices** table lists the entries in the LAN Groups Database. For each computer or device, the following fields are displayed:

- **Name**. The name of the PC or device. For computers that do not support the NetBIOS protocol, this will be listed as “Unknown” (you can edit the entry manually to add a meaningful name). If the computer was assigned an IP address by the DHCP server, then the Name will be appended by an asterisk.
- **IP Address**. The current IP address of the computer. For DHCP clients of the VPN Firewall, this IP address will not change. If a computer is assigned a static IP addresses, you will need to update this entry manually if the IP address on the computer has been changed.
- **MAC Address**. The MAC address of the PC’s network interface.

- **Group**. Each PC or device can be assigned to a single group. By default, a computer is assigned to Group 1, unless a different group is chosen from the Group pull-down menu.
- **Action**. Allows modification of the selected entry by clicking **Edit**.

Adding Devices to the LAN Groups Database

To add devices manually to the LAN Groups Database, follow these steps:

1. In the **Add Known PCs and Devices** section, make the following entries:

- **Name**. Enter the name of the PC or device.
- **IP Address Type**. From the pull-down menu, choose how this device receives its IP address. The choices are:
  - **Fixed (Set on PC)**. The IP address is statically assigned on the computer.
  - **Reserved (DHCP Client)**. Directs the VPN Firewall's DHCP server to always assign the specified IP address to this client during the DHCP negotiation.

> **Note:** When assigning a Reserved IP address to a client, the IP address selected must be outside the range of addresses allocated to the DHCP server pool.

- **IP Address.** Enter the IP address that this computer or device is assigned in the IP Address field. If the IP Address Type is Reserved (DHCP Client), the VPN Firewall will reserve the IP address for the associated MAC address.
- **MAC Address.** Enter the MAC address of the computer's network interface in the MAC Address field. The MAC address format is six colon-separated pairs of hexadecimal characters (0-9 and A-F), such as 01:23:45:67:89:AB.
- **Group.** From the pull-down menu, select the LAN Group to which the computer will be assigned. (Group 1 is the default group.)

2. Click **Add.** The device will be added to the **Known PCs and Devices** table.

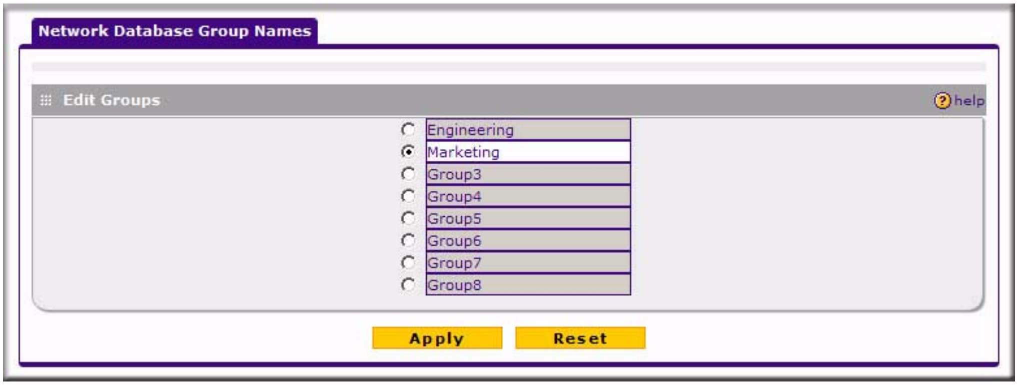
Changing Group Names in the LAN Groups Database

By default, the LAN Groups are named Group1 through Group8. You can rename these group names to be more descriptive, such as Engineering or Marketing.

To edit the names of any of the eight available groups:

1. From the **LAN Groups** tab, click the **Edit Group Names** link to the right of the tabs.

   The **Network Database Group Names** tab appears.



○ Engineering
● Marketing
○ Group3
○ Group4
○ Group5
○ Group6
○ Group7
○ Group8

Figure 3-3OK

2. Select the radio button next to any group name to make that name active for editing.
3. Type a new name in the field.
4. Click **Apply** to save your setting, each time you change a name in the field. {{Possible bug}}
5. Select and edit other group names if desired.
6. Click **Apply** to save each field change.

Configuring DHCP Address Reservation

A computer (or device) will always receive the same IP address, if you specify a reserved IP address for the computer (or device) on the LAN (based on the MAC address of the device), each time it accesses the VPN Firewall's DHCP server. Reserved IP addresses should be assigned to servers or access points that require permanent IP address settings. The Reserved IP address that you select must be outside of the DHCP Server pool.

To reserve an IP address, manually enter the device in the **LAN Groups** tab, specifying **Reserved (DHCP Client)**, as described in "Adding Devices to the LAN Groups Database" on page 3-7.

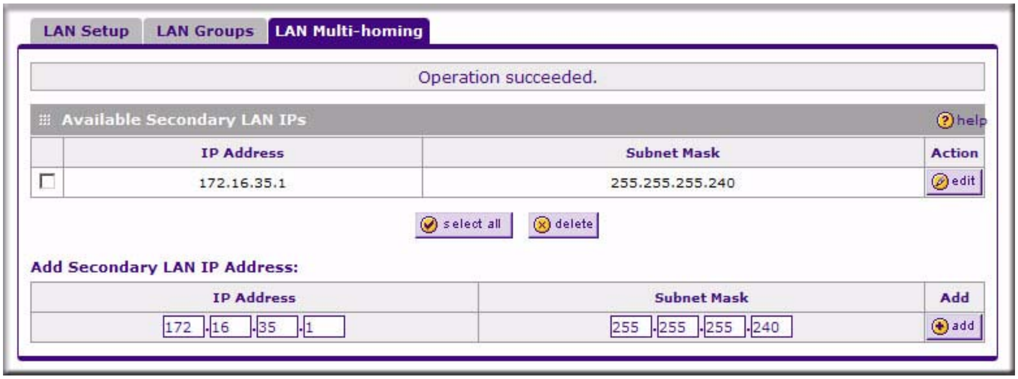
➡	**Note:** The reserved address will not be assigned until the next time the PC contacts the VPN Firewall's DHCP server. Reboot the PC or access its IP configuration and force a DHCP release and renew.

Configuring Multi Home LAN IP Addresses

If you have computers on your LAN using different IP address ranges (for example, 172.16.2.0 or 10.0.0.0), you can add “aliases” to the LAN port, giving computers on those networks access to the Internet through the VPN Firewall. This allows the VPN Firewall to act as a gateway to additional logical subnets on your LAN. You can assign the VPN Firewall an IP address on each additional logical subnet.

To add a secondary LAN IP address, follow these steps:

1. Select **Network Configuration > LAN Setup** from the main/sub-menu.
2. Click the **LAN Multi-homing** tab and the LAN Multi-homing screen displays.



Operation succeeded.

Available Secondary LAN IPs

	IP Address	Subnet Mask	Action
□	172.16.35.1	255.255.255.240	edit

Add Secondary LAN IP Address:

IP Address	Subnet Mask	Add
172 . 16 . 35 . 1	255 . 255 . 255 . 240	add

Figure 3-4OK

The **Available Secondary LAN IPs** table lists the secondary LAN IP addresses added to the VPN Firewall.

- **IP Address**. The “alias,” an additional IP address hosted by the LAN port of the VPN Firewall. This address will be the gateway for computers on the secondary subnet.
- **Subnet Mask**. The IPv4 subnet mask that defines the range of the secondary subnet.

3. In the **Add Secondary LAN IP Address** section, enter the additional IP address and subnet mask to be assigned to the LAN port of the VPN Firewall.

4. Click **Add.** The new Secondary LAN IP address will appear in the **Available Secondary LAN IPs** table.

Note: IP addresses on these secondary subnets cannot be configured in the DHCP server. The hosts on the secondary subnets must be manually configured with IP addresses, gateway IP addresses, and DNS server IP addresses.

Tip: The secondary LAN IP address will be assigned to the LAN interface of the VPN Firewall and can be used as a gateway by computers on the secondary subnet.

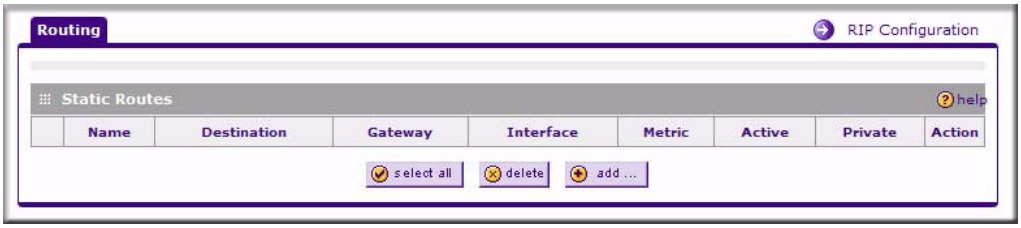
Configuring Static Routes

Static Routes provide additional routing information to your VPN Firewall. Under normal circumstances, the VPN Firewall has adequate routing information after it has been configured for Internet access, and you do not need to configure additional static routes. You should configure static routes only for unusual cases such as multiple firewalls or multiple IP subnets located on your network.

To add or edit a static route:

1. Select **Network Configuration** > **Routing** from the main/sub-menu.

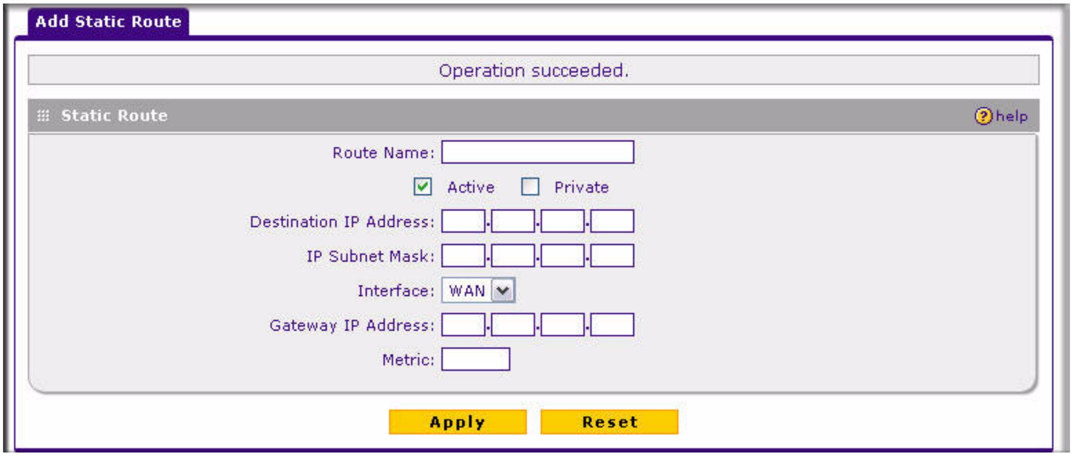
   The Routing screen displays.



	Name	Destination	Gateway	Interface	Metric	Active	Private	Action

Figure 3-5OK

2. Click **Add** and the **Add Static Route** tab is displayed.



Add Static Route

Operation succeeded.

Static Route

Route Name:

☑ Active □ Private

Destination IP Address:

IP Subnet Mask:

Interface: WAN

Gateway IP Address:

Metric:

Figure 3-6 Replaced

3. Enter a route name for this static route in the **Route Name** field (for identification and management).
4. Select **Active** to make this route effective.
5. Select **Private** if you want to limit access to the LAN only.

   The static route will not be advertised in RIP.
6. Enter the **Destination IP Address** to the host or network where the route leads.
7. Enter the **IP Subnet Mask** for this destination.

   If the destination is a single host, enter 255.255.255.255.
8. Enter the **Interface** which is the physical network interface (WAN or LAN) through which this route is accessible.
9. Enter the **Gateway IP Address** through which the destination host or network can be reached.

   This must be a firewall on the same LAN segment as the firewall.
10. Enter the **Metric** priority for this route.

    If multiple routes to the same destination exits, the route with the lowest metric is chosen (value must be between 1 and 15).
11. Click **Apply** to save your settings.

    The new static route will be added to the Static Route table.

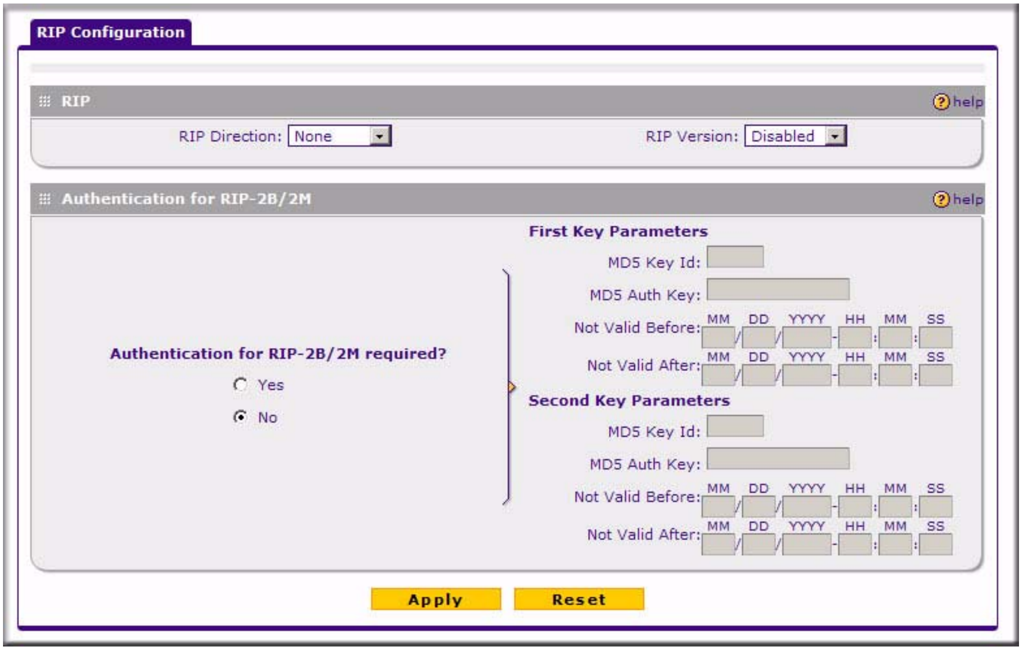
Configuring Routing Information Protocol (RIP)

RIP (Routing Information Protocol, RFC 2453) is an Interior Gateway Protocol (IGP) that is commonly used in internal networks (LANs). It allows a router to exchange its routing information automatically with other routers, and allows it to dynamically adjust its routing tables and adapt to changes in the network. RIP is disabled by default.

To configure RIP parameters:

1. Select **Network Configuration > Routing** from the main/sub-menu.
2. Click the **RIP Configuration** link to the right of the tab.

   The RIP Configuration menu displays.



RIP Direction: None

RIP Version: Disabled

Authentication for RIP-2B/2M required? ○ Yes ● No

RIP Configuration
RIP
help
Authentication for RIP-2B/2M
help
First Key Parameters
MD5 Key Id:
MD5 Auth Key:
Not Valid Before: MM DD YYYY HH MM SS
Not Valid After: MM DD YYYY HH MM SS
Second Key Parameters
MD5 Key Id:
MD5 Auth Key:
Not Valid Before: MM DD YYYY HH MM SS
Not Valid After: MM DD YYYY HH MM SS
Apply
Reset

Figure 3-7OK

3. From the **RIP Direction** pull-down menu, choose the direction in which the VPN Firewall will send and receive RIP packets. The choices are:

   - **None**. The VPN Firewall neither broadcasts its route table nor does it accept any RIP packets from other routers. This effectively disables RIP.

- **In Only**. The VPN Firewall accepts RIP information from other routers, but does not broadcast its routing table.
- **Out Only**. The VPN Firewall broadcasts its routing table periodically but does not accept RIP information from other routers.
- **Both**. The VPN Firewall broadcasts its routing table and also processes RIP information received from other routers.

4. From the **RIP Version** pull-down menu, choose the version from the following options:
   - **Disabled**. The default section disables RIP versions.
   - **RIP-1**. A class-based routing that does not include subnet information. This is the most commonly supported version.
   - **RIP-2**. This includes all the functionality of RIPv1 plus it supports subnet information. Though the data is sent in RIP-2 format for both RIP-2B and RIP-2M, the modes in which packets are sent are different.
     - **RIP-2B**. Sends the routing data in RIP-2 format and uses subnet broadcasting.
     - **RIP-2M**. Sends the routing data in RIP-2 format and uses multicasting.
5. **Authentication for RIP2B/2M required?**

   If you selected RIP-2B or RIP-2M, check the **Yes** feature, and input the **First Key Parameters** and **Second Key Parameters,** MD-5 keys to authenticate between VPN Firewalls.
6. Click **Add** to save your settings.

Chapter 4
Wireless Configuration

This chapter describes how to set up your ProSafe Wireless-N VPN Firewall SRXN3205 for wireless connectivity to your LAN. This basic configuration will enable computers with 802.11b/g/n or 802.11a/n wireless adapters to do such things as connect to the Internet, or access printers and files on your LAN.

➡	**Note:** Indoors, computers can connect over 802.11b/g/n or 802.11a/g/n wireless networks at ranges of several hundred feet or more. This distance can allow for others outside your area to access your network. It is important to take appropriate steps to secure your network from unauthorized access. The VPN Firewall provides highly effective security features which are covered in detail in "SSID and WEP/WPA Settings Setup Form" on page 4-14. Deploy the security features appropriate to your needs.

You need to prepare these four things before you can establish a connection through your wireless VPN Firewall:

- The VPN Firewall connected to your LAN through the WAN port to a device such as a hub, switch, router, or Cable/DSL gateway.
- A correctly setup ProSafe Wireless-N VPN Firewall for wireless access
- One or more computers with properly configured 802.11b/g/n or 802.11a/n wireless adapters.
- A location for the SRXN3205 that conforms to the "Wireless Equipment Placement and Range Guidelines".

You will use the following topics to set up your ProSafe Wireless-N VPN Firewall for use as a wireless VPN Firewall:

- "Basic Wireless Setup (No Security)" on page 4-4
- "Completing Wireless Setup (No Security)" on page 4-8
- "Wireless Security Types and Settings" on page 4-13
- "Advanced Wireless Settings" on page 4-27
- "Wireless Equipment Placement and Range Guidelines" on page 4-2

Wireless Equipment Placement and Range Guidelines

The operating distance or range of your wireless connection can vary significantly based on the physical placement of the VPN Firewall. The latency, data throughput performance, and notebook power consumption of wireless adapters also vary depending on your configuration choices.

Note: Failure to follow these guidelines can result in significant performance degradation or inability to wirelessly connect to the SRXN3205. For complete performance specifications, see Appendix A, “Default Settings and Technical Specifications.”

For best results, place your VPN Firewall:

- Near the center of the area in which your PCs will operate.
- In an elevated location such as a high shelf where the wirelessly connected PCs have line-of-sight access (even if through walls).
- Away from sources of interference, such as PCs, microwaves, and 2.4 GHz cordless phones.
- Away from large metal surfaces.

Putting the antenna in a vertical position provides best side-to-side coverage. Putting the antenna in a horizontal position provides best up-and-down coverage.

If you are using multiple access points for 11b/bg/ng, it is better if adjacent access points use different radio frequency Channels to reduce interference. The recommended Channel spacing between adjacent access points is 5 Channels (for example, use Channels 1 and 6, or 6 and 11). For 11a/na, the 6 Channel spacing is not needed.

The time it takes to establish a wireless connection can vary depending on both your security settings and placement. Some types of security connections can take slightly longer to establish and can consume more battery power on a notebook computer.

Understanding SRXN3205 Wireless Security Options

Your wireless data transmissions can be received well beyond your walls by anyone with a compatible adapter. For this reason, use the security features of your wireless equipment. The VPN Firewall provides highly effective security features which are covered in detail in this chapter. Deploy the security features appropriate to your needs.

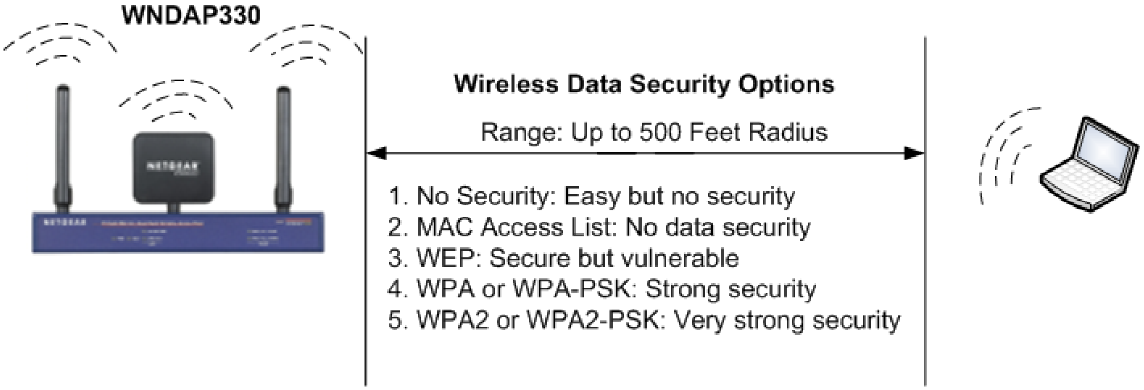

WNDAP330
Wireless Data Security Options
Range: Up to 500 Feet Radius
1. No Security: Easy but no security
2. MAC Access List: No data security
3. WEP: Secure but vulnerable
4. WPA or WPA-PSK: Strong security
5. WPA2 or WPA2-PSK: Very strong security

Figure 4-1Need new photo/picture

There are several ways you can enhance the security of your wireless network:

- **Restrict Access Based on MAC address.** You can restrict access to only trusted PCs so that unknown PCs cannot wirelessly connect to the SRXN3205. MAC address filtering adds an obstacle against unwanted access to your network, but the data broadcast over the wireless link is fully exposed.
- **Turn Off the Broadcast of the Wireless Network Name (SSID).** If you disable broadcast of the SSID, only devices that have the correct SSID can connect. This nullifies the wireless network “discovery” feature of some products such as Windows XP, but the data is still fully exposed to a determined snoop using specialized test equipment like wireless sniffers.
- **Use WEP.** Wired Equivalent Privacy (WEP) data encryption provides data security. WEP open authentication and WEP data encryption will block all but the most determined eavesdropper.
- **Use WPA or WPA-PSK.** Wi-Fi Protected Access (WPA) data encryption provides data security. The very strong authentication along with dynamic per frame rekeying of WPA make it virtually impossible to compromise. Because this is a new standard, wireless device driver and software availability may be limited.

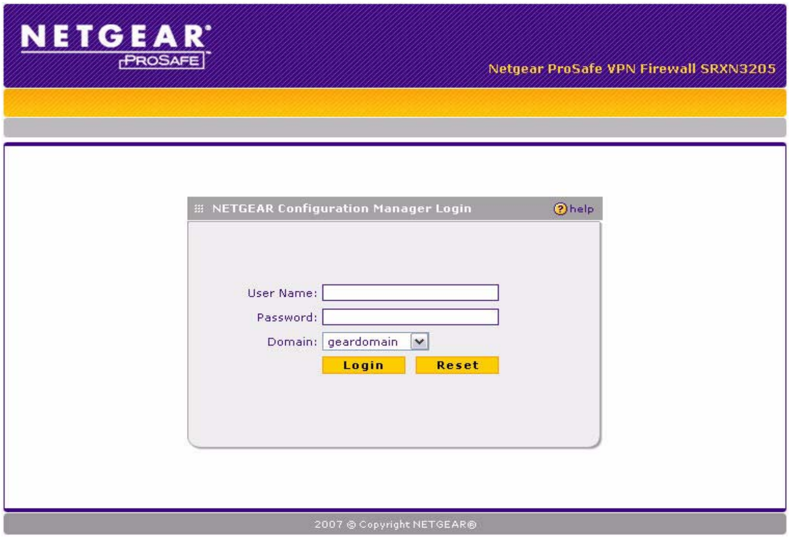
> **Note:** WEP and TKIP provide only legacy rates of operation. So, AES is the recommended solution to use the 11n rates and speed.

Basic Wireless Setup (No Security)

Configuring Basic Wireless Setup (No Security)

To configure the SRXN3205 for basic Wireless access, follow these simple steps:

1. Connect to the SRXN3205 by opening your browser and entering **http://192.168.1.1** in the address field. The SRXN3205 login screen will appear.
2. Enter **admin** for the user name and **password** for the password, both in lower case letters as shown in Figure 4-2.


NETGEAR
PROSAFE
Netgear ProSafe VPN Firewall SRXN3205
NETGEAR Configuration Manager Login
help
User Name:
Password:
Login
Reset
2007 © Copyright NETGEAR®

Domain: geardomain

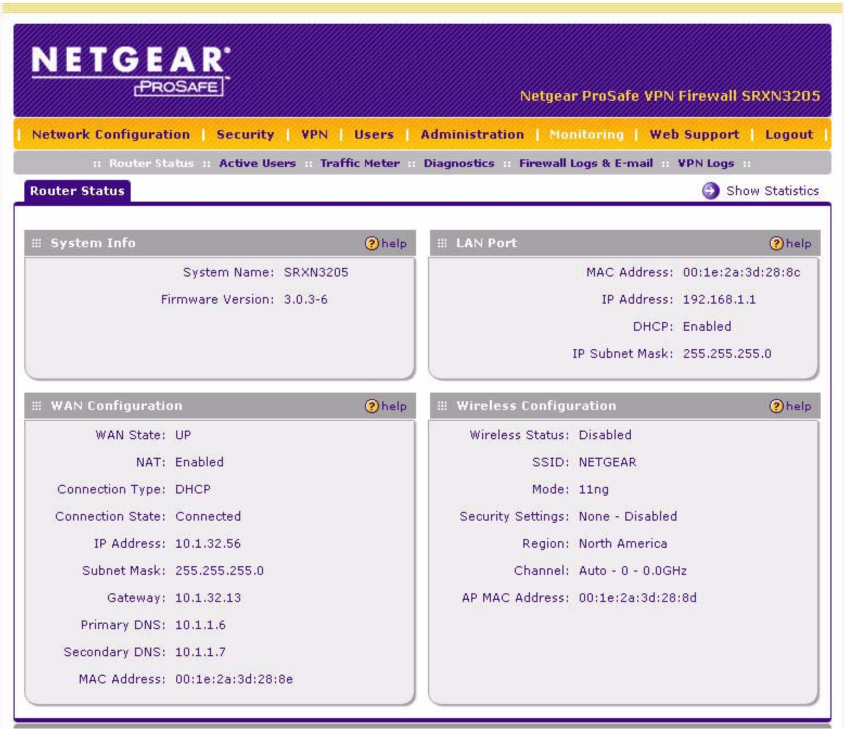
Figure 4-2

3. Click **Login**.

   The main menu of the SRXN3205 displays with the default opening screen, Router Status, as shown in Figure 4-3.

   - The Router Status screen provides System Info (model number and firmware version), LAN Port status, WAN Configuration status, and Wireless configuration status.
   - When the VPN Firewall is connected to the Internet, select Documentation under the Web Support tab, to view the VPN Firewall documentation.
   - On the top-right of the screen, select Logout to exit the SRXN3205 setup screens.

- You will automatically be logged out of the VPN Firewall after 5 minutes of no activity.


NETGEAR
PROSAFE
Netgear ProSafe VPN Firewall SRXN3205
| Network Configuration | Security | VPN | Users | Administration | Monitoring | Web Support | Logout |
:: Router Status :: Active Users :: Traffic Meter :: Diagnostics :: Firewall Logs & E-mail :: VPN Logs ::
Router Status
Show Statistics
help

System Info

System Name: SRXN3205
Firmware Version: 3.0.3-6

LAN Port

MAC Address: 00:1e:2a:3d:28:8c
IP Address: 192.168.1.1
DHCP: Enabled
IP Subnet Mask: 255.255.255.0

WAN Configuration

WAN State: UP
NAT: Enabled
Connection Type: DHCP
Connection State: Connected
IP Address: 10.1.32.56
Subnet Mask: 255.255.255.0
Gateway: 10.1.32.13
Primary DNS: 10.1.1.6
Secondary DNS: 10.1.1.7
MAC Address: 00:1e:2a:3d:28:8e

Wireless Configuration

Wireless Status: Disabled
SSID: NETGEAR
Mode: 11ng
Security Settings: None - Disabled
Region: North America
Channel: Auto - 0 - 0.0GHz
AP MAC Address: 00:1e:2a:3d:28:8d

Figure 4-3

4. Select **Network Configuration** from the main menu (orange menu bar).

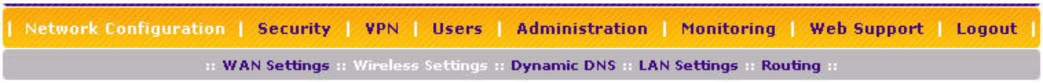
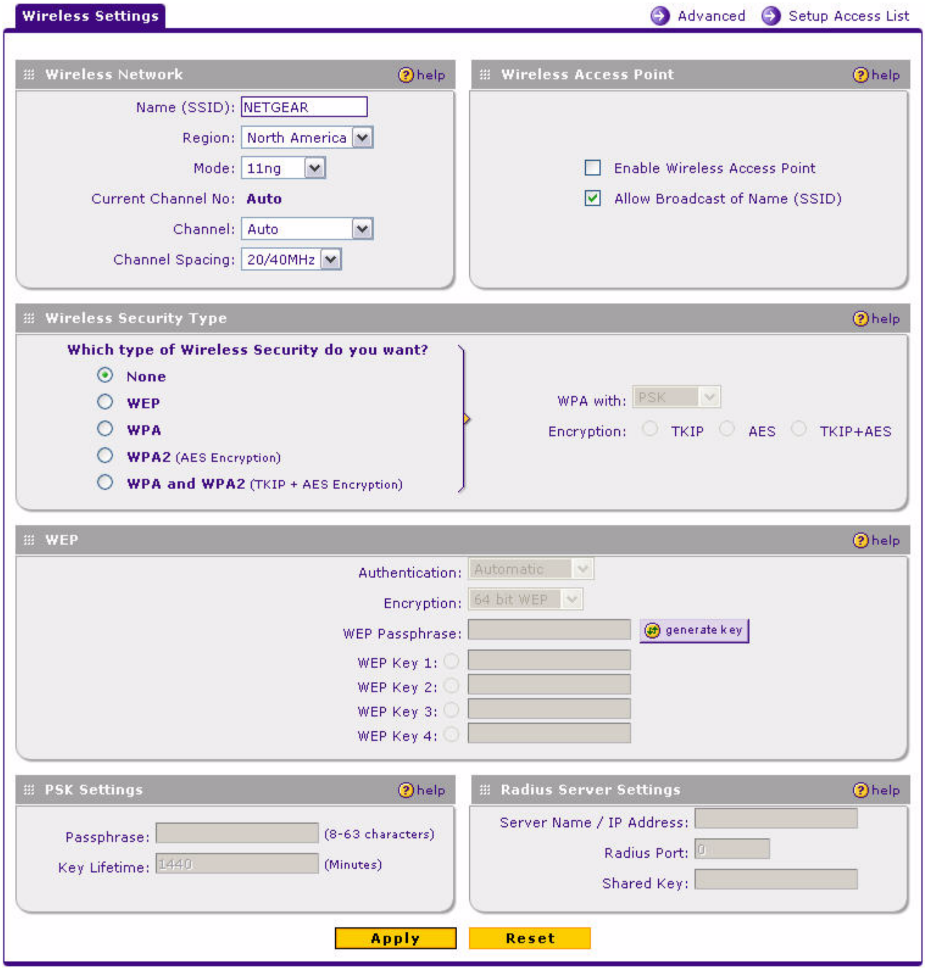

| Network Configuration | Security | VPN | Users | Administration | Monitoring | Web Support | Logout |
:: WAN Settings :: Wireless Settings :: Dynamic DNS :: LAN Settings :: Routing ::

Figure 4-4

5. Select **Wireless Settings** in the submenu (gray menu bar below the orange menu bar).

The default Wireless Settings screen displays as shown in Figure 4-6. Use this screen to setup your wireless connectivity requirements.



Wireless Settings

Advanced Setup Access List

Wireless Network help

Name (SSID): NETGEAR

Region: North America

Mode: 11ng

Current Channel No: **Auto**

Channel: Auto

Channel Spacing: 20/40MHz

Wireless Access Point help

□ Enable Wireless Access Point

☑ Allow Broadcast of Name (SSID)

Wireless Security Type help

Which type of Wireless Security do you want?

● **None**

○ **WEP**

○ **WPA**

○ **WPA2** (AES Encryption)

○ **WPA and WPA2** (TKIP + AES Encryption)

WPA with: PSK

Encryption: ○ TKIP ○ AES ○ TKIP+AES

WEP help

Authentication: Automatic

Encryption: 64 bit WEP

WEP Passphrase: generate key

WEP Key 1: ○

WEP Key 2: ○

WEP Key 3: ○

WEP Key 4: ○

PSK Settings help

Passphrase: (8-63 characters)

Key Lifetime: 1440 (Minutes)

Radius Server Settings help

Server Name / IP Address:

Radius Port: 0

Shared Key:

Apply Reset

Figure 4-5

6. Click **Enable Wireless Access Point** on the right side of the screen.

7. If you want your SSID (network name) broadcast, leave the default setting as is.

If you disable **Allow Broadcast of Name (SSID)**, only devices that have the correct SSID can connect. This nullifies the wireless network “discovery” feature of some products such as Windows XP, but the data is still fully exposed to a determined snoop using specialized test equipment like wireless sniffers. The default is enabled.

8. Type your network name in the **Name (SSID)** field on the upper left side of the screen.
9. From the **Region** pull-down menu, select the region where the SRXN3205 will be used (the default Region is North America).

> **Note:** If your country or region is not listed, please check with Netgear Support.

10. Select your wireless **Mode** setting from the pulldown menu or accept the default (11ng) setting.

    The selection are 802.11[a only, b only, g only, g and b, 11ng, or 11a].

    (When you change the Mode setting and Click **Apply**, the SRXN3205 will reboot to accept the change. This is a bug??)
11. Leave the other settings in the upper left portion of the screen at the defaults.
12. Leave **None** selected as the Wireless Security Type for the basic wireless test.
13. Click **Apply** at the bottom of the Wireless Settings screen.

    If the settings were accepted, a message appears in the center of the screen, *Operation succeeded.*

Testing Basic Wireless Access (No Security)

1. Prepare a PC as the wireless PC Client with a wireless Ethernet adapter installed.

   If this PC is already part of your network, record its TCP/IP configuration settings for use later.
2. Configure the Client PC to obtain its IP *and* DNS addresses automatically using the internal DHCP server (DHCP is the default firewall setting).
3. Using this Client PC, try to access a file or a printer on the LAN connected to the SRXN3205.

   If you have not set up the basic wireless settings mentioned earlier to SRXN3205 with the Host PC, this test will not give satisfactory results. Go to the "Configuring Basic Wireless Setup (No Security)"and set up the SRXN3205 for basic wireless access with no security.

Completing Wireless Setup (No Security)

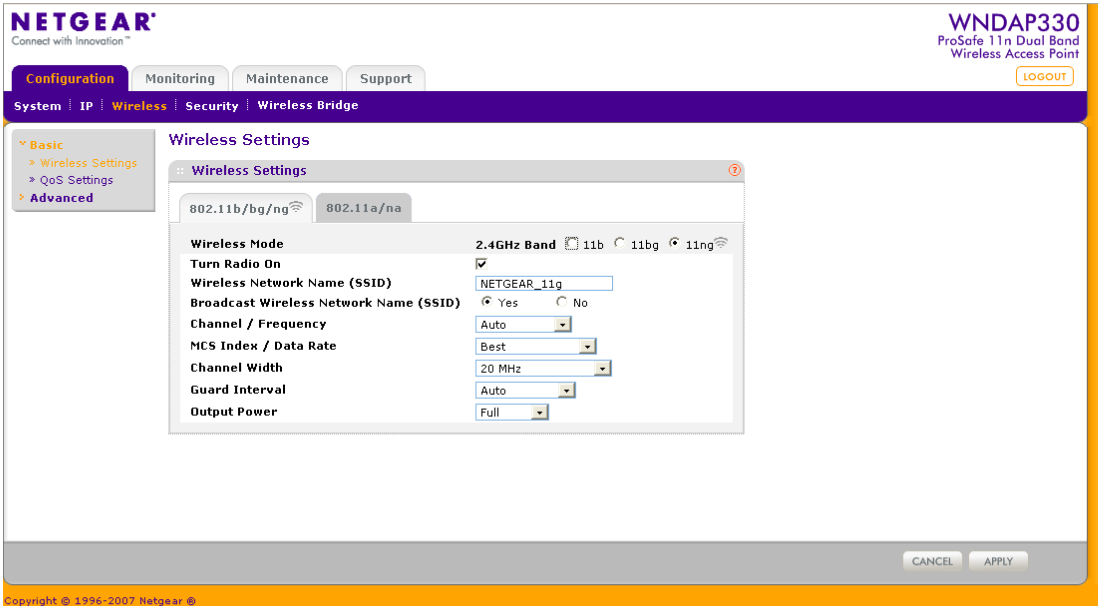
The purpose of setting your wireless settings in stages, without the security settings, is to eliminate any possible errors in setting up your wireless settings before adding the more complicated security settings. This method will greatly aid you in discovering where the errors in your security settings are by removing doubts about your wireless settings.

Configuring 802.11b/g/n Wireless Settings

To configure the 802.11 b/g/n wireless settings of your VPN Firewall:

1. Select **Network Configuration** > **Wireless Settings** from main/submenu.

   The Wireless Settings screen of your VPN Firewall will display, as shown in Figure 4-6 below.



Wireless Settings

Wireless Settings

802.11b/bg/ng | 802.11a/na

Wireless Mode	2.4GHz Band □ 11b ○ 11bg ● 11ng
Turn Radio On	☑
Wireless Network Name (SSID)	NETGEAR_11g
Broadcast Wireless Network Name (SSID)	● Yes ○ No
Channel / Frequency	Auto
MCS Index / Data Rate	Best
Channel Width	20 MHz
Guard Interval	Auto
Output Power	Full

Figure 4-6 need new screenshot

2. Configure the Wireless LAN settings based on the following field descriptions:

   - **Mode**. Select the desired wireless operating mode. The default is 11ng. The options are:

  - **b** only – All 802.11b wireless stations can be used. (The 802.11g wireless stations can still be used if they can operate in 802.11b mode.)

    > **Note:** If you select this option and if other settings on this screen are disabled, then you must select the Turn Radio On radio button to enable available options on this screen.

  - **g only** – All 802.11g wireless stations can be used.
  - **11ng** – All 11b, 11g, and 11ng wireless stations can be used. This is the default. If you select this option, then one additional option, Channel Spacing, is displayed.

- **Channel (& Frequency)**. This is set to Auto by default, or select a channel and frequency from the pull-down menu to use on your wireless LAN.

  The Auto option intelligently picks a channel & frequency with least interference. The wireless channel in use will be between 1 to 11 for US and Canada, 1 to 13 for Europe and Australia.

  It is not necessary to change the wireless channel unless you experience interference (shown by lost connections and/or slow data transfers). If this happens, you may need to experiment with different channels to see which is the best. See the article on “Wireless Channels” available on the NETGEAR website. A link to this article and other articles of interest can be found in Appendix B, “Related Documents.”

  When selecting or changing channels, some points to bear in mind:

  - Access points use a fixed channel and you can select the channel used. This allows you to choose a channel, which provides the least interference and best performance. In the USA and Canada, 11 channels are available
  - If using multiple access points, it is better if adjacent access points use different channels to reduce interference. The recommended channel spacing between adjacent access points is 5 channels (for example, use channels 1 and 6, or 6 and 11).
  - Wireless stations normally scan all channels, looking for an access point. If more than one access point can be used, the one with the strongest signal is used. This can only happen when the various access points are using the same SSID.

- **Channel Spacing.** From the pull-down menu, select the desired channel spacing.
  - 20 MHz - This is the static, legacy mode. It gives the least throughput.
  - 20/40 MHz - This is the dynamic, compatibility mode. Legacy clients can connect to 20 MHz and 11n clients can connect to 40 MHz.

- 40 MHz - This is the static, high-throughput mode. Legacy clients will not be able to connect in this mode.

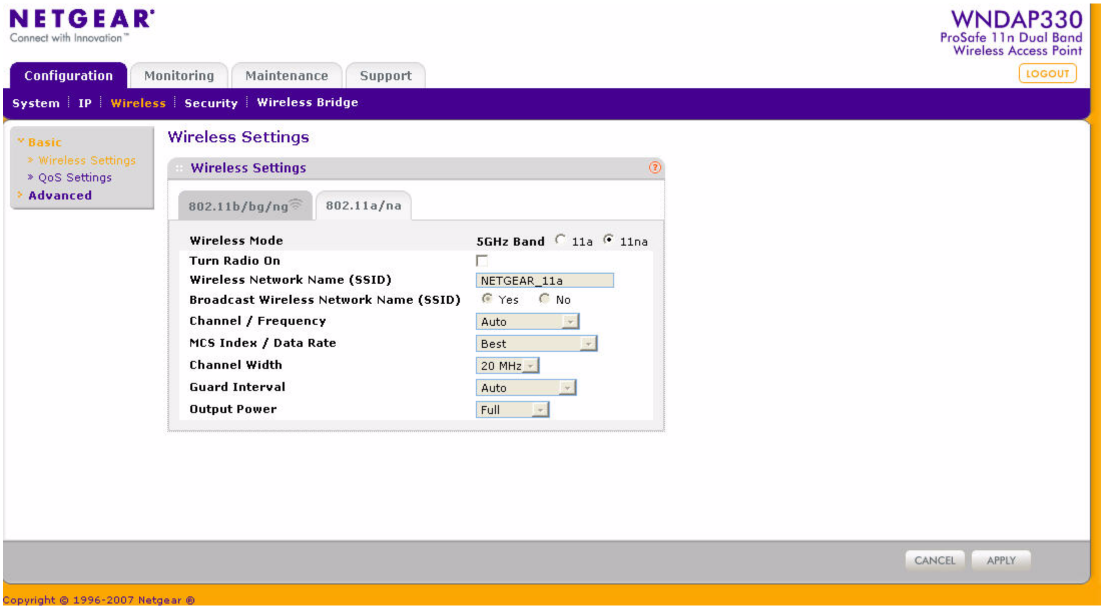
3. Click **Apply** to save your 802.11b/g/n wireless settings.

Configuring 802.11a/n Wireless Settings

To configure the 802.11.a/n wireless settings of your VPN Firewall:

1. From main menu, select Network Configuration and then Wireless Settings.

The Wireless Settings screen of your VPN Firewall will display, as shown in Figure 4-7 below.



Wireless Settings

Wireless Mode	5GHz Band ○ 11a ● 11na
Turn Radio On	□
Wireless Network Name (SSID)	NETGEAR_11a
Broadcast Wireless Network Name (SSID)	● Yes ○ No
Channel / Frequency	Auto
MCS Index / Data Rate	Best
Channel Width	20 MHz
Guard Interval	Auto
Output Power	Full

Figure 4-7

2. Configure the Wireless LAN settings based on the following field descriptions:

- **Mode**. Select the desired wireless operating mode. Only 802.11a/n wireless stations can be selected from this menu. The default is 11na. The options are:
  – **a only** – All 802.11a wireless stations can be used.
  – **11na** – All 802.11a and 802.11na wireless stations can be used.
- **Channel (& Frequency)**. This is set to Auto by default, or select a channel & frequency from the pull-down menu to use for your wireless LAN.

The Auto option intelligently picks a channel & frequency with least interference. The wireless channel in use will be between 1 to 11 for US and Canada, 1 to 13 for Europe and Australia. If you select Auto for channel & frequency, then the only available Channel Width is Dynamic 20/40MHz.

It is not necessary to change the wireless channel unless you experience interference (shown by lost connections and/or slow data transfers). If this happens, you may need to experiment with different channels to see which is the best. See the article on "Wireless Channels" available on the NETGEAR website. A link to this article and other articles of interest can be found in Appendix B, "Related Documents."

- When selecting or changing channels, some points to bear in mind:
  – Access points use a fixed channel and you can select the channel used. This allows you to choose a channel, which provides the least interference and best performance. In the USA and Canada, 13 channels are available.
  – If using multiple access points, it is better if adjacent access points use different channels to reduce interference. The recommended channel spacing between adjacent access points is 8 channels (for example, use channels 36 and 44, or 44 and 52).
  – In "Infrastructure" mode, wireless stations normally scan all channels, looking for an access point. If more than one access point can be used, the one with the strongest signal is used. This can only occur when the various access points are using the same SSID.
- **Channel Spacing.** From the pull-down menu, select the desired channel spacing.
  - 20 MHz - This is the static, legacy mode. It gives the least throughput.
  - 20/40 MHz - This is the dynamic, compatibility mode. Legacy clients can connect to 20 MHz and 11n clients can connect to 40 MHz.
  - 40 MHz - This is the static, high-throughput mode. Legacy clients will not be able to connect in this mode.

3. Click **Apply** to save your 802.11a/n wireless settings.

Testing Wireless Connectivity (No Security)

Follow the instructions below to test wireless connectivity. Once you have established wireless connectivity, you can enable security settings appropriate to your needs.

1. From your Web browser, log in to the SRXN3205 using its default address of **http://192.168.1.1**.

2. Use the default user name of **admin** and default password of **password**— or use a new LAN address and password if you have set them up.
3. Select **Network Configuration** > **Wireless Settings** from main/submenu.
4. In the **Wireless Settings e**nsure the Auto (default) is set for the Channel feature.

   This feature selects a channel that has the least interference. It should not be necessary to change the wireless channel unless you notice interference problems or are near another wireless access point. Select a channel that is not being used by any other wireless networks within several hundred feet of your VPN Firewall.

   ➡ **Note:** The SSID of any Client PC must match the SSID you configured in the VPN Firewall. If these do not match, you will not get a wireless connection to the SRXN3205.

5. Record the name used for SSID and then Disable the **Allow Broadcast of Name (SSID).**

   ➡ **Note:** If you are configuring the SRXN3205 from a wireless computer and you change the SSID or channel settings, you will lose your wireless connection when you click Apply. You must then change the wireless settings of your computer to match the new settings.

6. Click **Apply** to save any changes
7. Prepare PC(s) as the wireless PC Client(s) with wireless Ethernet adapters installed.
8. Configure the Client PCs to obtain the IP *and* DNS addresses automatically using the internal DHCP server (DHCP is the default firewall setting).
9. Configure the wireless adapters of your Client PCs to have the same SSID you configured in the SRXN3205.
10. Using this Client PCs, verify these PCs have a wireless link by trying to access a file or a printer on the LAN connected to the SRXN3205.
11. Once you have verified wireless connectivity to the SRXN3205, you can configure the wireless security functions. Refer to "Wireless Security Types and Settings" on page 4-13.

Wireless Security Types and Settings

Configure the Wireless Security Types based on the level of security you need using one of the following methods and print out the form provided to aid you in making your slections:

- Print out the "SSID and WEP/WPA Settings Setup Form" on page 4-14
- To configure WEP encryption for Open Systems or Shared Key, see "Configuring WEP" on page 4-16.
- To configure WPA-PSK, see "Configuring WPA-PSK" on page 4-18.
- To configure WPA2-PSK, see "Configuring WPA2-PSK" on page 4-19.
- To configure WPA-PSK and WPA2-PSK, see "Configuring WPA-PSK and WPA2-PSK" on page 4-20.
- To configure WPA with RADIUS, see "Configuring WPA with RADIUS" on page 4-21.
- To configure WPA2 with RADIUS, see "Configuring WPA2 with RADIUS" on page 4-22.
- To configure WPA and WPA2 with RADIUS, see "Configuring WPA and WPA2 with RADIUS" on page 4-23

Use the Wireless Security Type section in the Wireless Settings menu to select the desired security method, but the balance of the security settings are set in the following main menus:

- Go to "Firewall Security and Content Filtering" in Chapter 5 for the **Security** menu settings
- Go to "Virtual Private Networking Using IPsec" in Chapter 6 for the **VPN IPsec** tunnel settings
- Go to "Virtual Private Networking Using SSL" in Chapter 7 for the **VPN SSL** tunnel settings
- Go to "Managing Users, Authentication, and Certificates" in Chapter 8 for the **Users** menu
- Go to "Firewall and Network Management" in Chapter 9 for the **Administration** menu

SSID and WEP/WPA Settings Setup Form

802.11b/g/n Configuration

For a new wireless network, print or copy this form and fill in the configuration parameters. For an existing wireless network, the person who set it up or is responsible for the network will be able to provide this information. Be sure to set the Regulatory Domain correctly as the first step.

- **SSID*:*** The Service Set Identification (SSID) requires the identity or name of the wireless local area network. **NETGEAR** is the default SRXN3205 SSID. However, you may customize it by using up to 32 alphanumeric characters. Write your customized SSID on the line below.

  ____

  Note: The SSID in the VPN Firewall is the SSID you configure in the wireless adapter card. All wireless nodes in the same network must be configured with the same SSID:

- **Authentication:**

  Circle one: Automatic, Open System, or Shared Key. (Choose Shared Key for more security.)

  Note: If you select shared key, the other devices in the network will not connect unless they are set to Shared Key as well and have the same keys in the same positions as those in the SRXN3205.

- **WEP Encryption Keys.**

  Circle one: 64, 128, or 152 bits. (Enter all four 802.11a/n keys for the Key Size chosen.)

  Key 1: ____________________________________

  Key 2: ____________________________________

  Key 3: ____________________________________

  Key 4: ____________________________________

- **WPA-PSK (Preshared Key)**

  Record the WPA-PSK key. Key: ____________________________________

- **WPA RADIUS Settings.** For WPA, record the following settings for the primary and secondary RADIUS servers:

  Server Name/IP Address: Primary __________________ (Secondary __________________ ?)

  RADIUS Port: ____________________________________

  Shared Key: ____________________________________

802.11a/n Configuration

For a new wireless network, print or copy this form and fill in the configuration parameters. For an existing wireless network, the person who set up or is responsible for the network will be able to provide this information. Be sure to set the Regulatory Domain correctly as the first step.

- **SSID*:*** The Service Set Identification (SSID) requires the identity or name of the wireless local area network. **NETGEAR** is the default SRXN3205 SSID. However, you may customize it by using up to 32 alphanumeric characters. Write your customized SSID on the line below.

  ____

  Note: The SSID in the VPN Firewall is the SSID you configure in the wireless adapter card. All wireless nodes in the same network must be configured with the same SSID:

- **Authentication**

  Circle one: Automatic, Open System, or Shared Key. Choose Shared Key for more security.

  Note: If you select shared key, the other devices in the network will not connect unless they are set to Shared Key as well and have the same keys in the same positions as those in the SRXN3205.

- **WEP Encryption Keys**

  Circle one: 64, 128, or 152 bits. (Enter all four 802.11b/g/n keys for the Key Size chosen.)

  Key 1: ____________________________________

  Key 2: ____________________________________

  Key 3: ____________________________________

  Key 4: ____________________________________

- **WPA-PSK (Preshared Key)**

  Record the WPA-PSK key. Key: ____________________________________

- **WPA RADIUS Settings.** For WPA, record the following settings for the primary and secondary RADIUS servers:

  Server Name/IP Address: Primary _________________ (Secondary __________________ ?)

  RADIUS Port: ____________________________________

  Shared Key: ____________________________________

Use the procedures described in the following sections to configure the SRXN3205. Store this information in a safe place.

Configuring WEP

To configure WEP data encryption in the Wireless Settings menu:

1. Click the **WEP** radio button on the left to enable WEP data encryption.

When you select the WEP data encryption, only the feature selections for WEP are made active on screen, while the other options and features remain grayed out.

2. In the Authentication drop-down menu, choose Automatic, Open System, or Shared Key authentication.

3. In the Encryption drop-down menu, select the encryption strength: 64 bit WEP, 128 bit WEP, or 152 bit WEP.

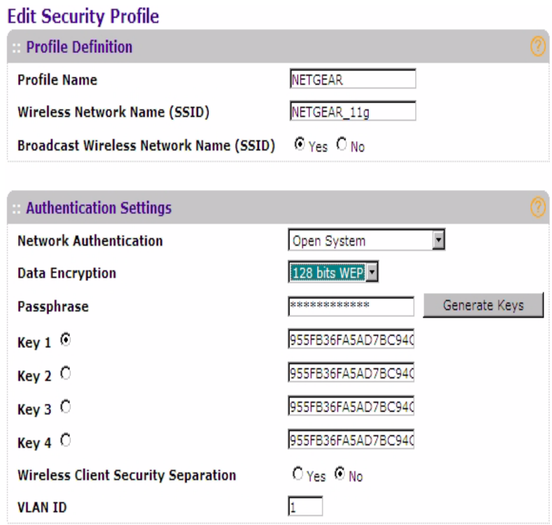
4. Enter a value in the **WEP Passphrase** text box to automatically program the four data encryption keys. You can also program the four keys manually.

These values must be identical on all PCS and VPN Firewalls in your network.

- Automatically – Enter a word or group of printable characters in the form of 10 digits for 64-bit, 26 digits for 128-bit, or xx digits for 152-bit, in any combination of 0-9, a-f, or A-F characters.
  - Select which of the four keys will be the default by clicking on the **Radio button** next to the key. Data transmissions are always encrypted using the default key.
  - When done, click the **Generate** button and the four key boxes will be automatically populated with key values.
- Manually – Enter the number of hexadecimal digits appropriate to the encryption strength for each of the four keys:
  - The number should be 10 digits for 64-bit, 26 digits for 128-bit, or xx digits for 152-bit, in any combination of 0-9, a-f, or A-F characters.
  - Select which of the four keys will be the default by clicking on the **Radio** button next to the key. Data transmissions are always encrypted using the default key.

See the document “Wireless Communications” for a full explanation of each of these options, as defined by the IEEE 802.11 wireless communication standard. A link to this document on the NETGEAR website is in Appendix B, “Related Documents.”

5. Click **Apply** to save your settings.



Edit Security Profile

:: Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11g
Broadcast Wireless Network Name (SSID)	● Yes ○ No

:: Authentication Settings

Network Authentication	Open System
Data Encryption	128 bits WEP
Passphrase	************* Generate Keys
Key 1 ●	955FB36FA5AD7BC94C
Key 2 ○	955FB36FA5AD7BC94C
Key 3 ○	955FB36FA5AD7BC94C
Key 4 ○	955FB36FA5AD7BC94C
Wireless Client Security Separation	○ Yes ● No
VLAN ID	1

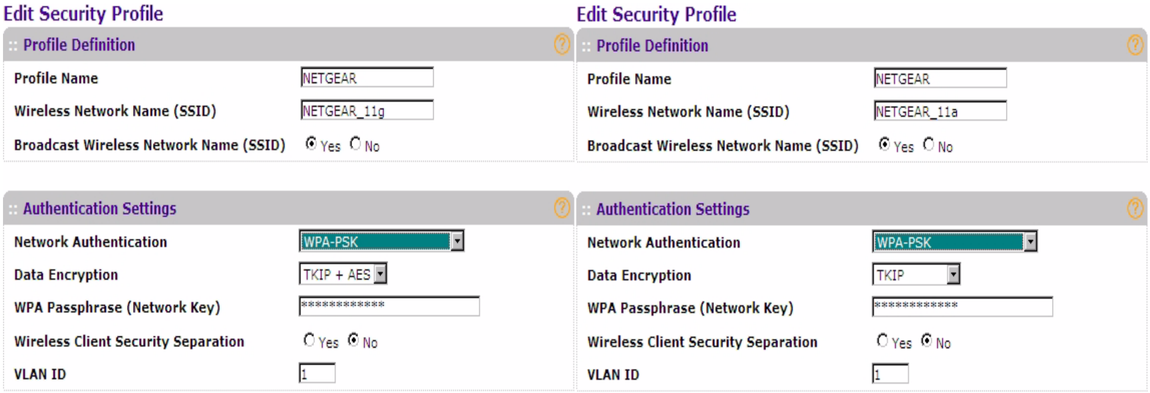
Figure 4-8

6.

Note: If you use a wireless computer to configure WEP settings, you will be disconnected when you click Apply. Reconfigure your wireless adapter to match the new settings or access the VPN Firewall from a wired computer to make any further changes.

Configuring WPA-PSK

Not all wireless adapters support WPA. Furthermore, client software is required on the client. Windows XP and Windows 2000 with Service Pack 3 or above include the client software that supports WPA. Nevertheless, the wireless adapter hardware and driver must also support WPA. Consult the product document for your wireless adapter and WPA client software for instructions on configuring WPA settings.



Edit Security Profile

:: Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11g
Broadcast Wireless Network Name (SSID)	● Yes ○ No

:: Authentication Settings

Network Authentication	WPA-PSK
Data Encryption	TKIP + AES
WPA Passphrase (Network Key)	************
Wireless Client Security Separation	○ Yes ● No
VLAN ID	1

Edit Security Profile

:: Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11a
Broadcast Wireless Network Name (SSID)	● Yes ○ No

:: Authentication Settings

Network Authentication	WPA-PSK
Data Encryption	TKIP
WPA Passphrase (Network Key)	************
Wireless Client Security Separation	○ Yes ● No
VLAN ID	1

Figure 4-9

To configure WPA-PSK in the Wireless Settings menu:

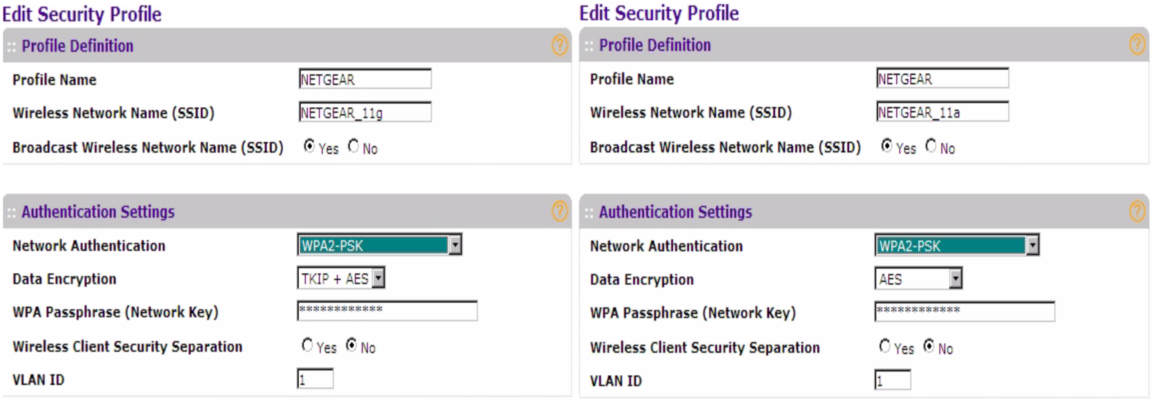
1. Click the **WPA** radio button on the left to enable WPA data encryption.

   When you select the WPA data encryption, only the feature selections for WPA are made active on screen, while the other options and features remain grayed out.

2. Select **PSK** from the WPA with drop-down menu on the right.
3. Click on the **TKIP** radio button for Encryption on the right.
4. In the PSK Settings section, enter text in the **Passphrase** text box (Network Key) with 8-63 characters.
5. Enter a value for **Key Lifetime** text box in minutes.
6. Click **Apply** to save your settings.

Configuring WPA2-PSK

Not all wireless adapters support WPA2. Furthermore, client software is required on the client. Ensure your client card supports WPA2. Consult the product document for your wireless adapter and WPA2 client software for instructions on configuring WPA2 settings.



Edit Security Profile

:: Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11g
Broadcast Wireless Network Name (SSID)	● Yes ○ No

:: Authentication Settings

Network Authentication	WPA2-PSK
Data Encryption	TKIP + AES
WPA Passphrase (Network Key)	*************
Wireless Client Security Separation	○ Yes ● No
VLAN ID	1

Edit Security Profile

:: Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11a
Broadcast Wireless Network Name (SSID)	● Yes ○ No

:: Authentication Settings

Network Authentication	WPA2-PSK
Data Encryption	AES
WPA Passphrase (Network Key)	*************
Wireless Client Security Separation	○ Yes ● No
VLAN ID	1

Figure 4-10

To configure WPA2-PSK in the Wireless Settings menu:

1. Click the **WPA2** radio button on the left to enable WPA2 data encryption.

   When you select the WPA2 data encryption, only the feature selections for WPA2 are made active on screen, while the other options and features remain grayed out.

2. Select **PSK** from the WPA with drop-down menu on the right.
3. Click on the **AES** radio button for Encryption on the right.

   AES is the default encryption.

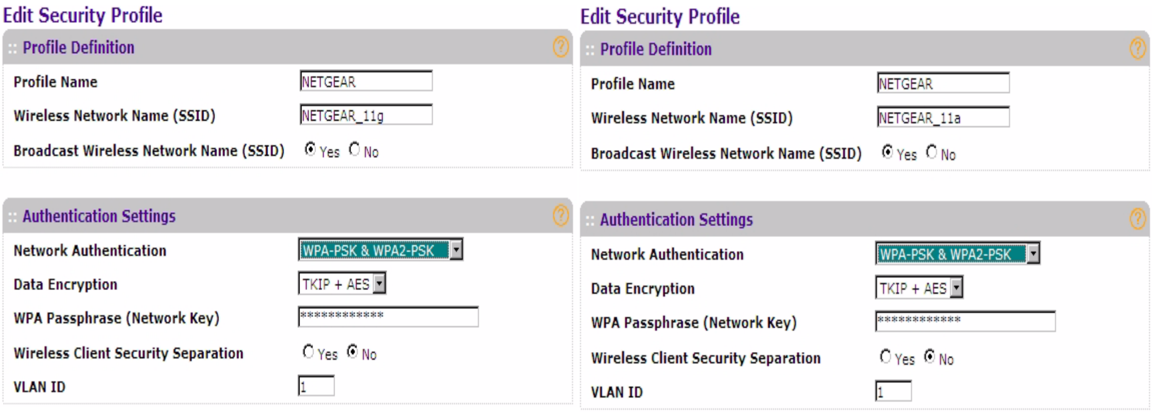
4. In the PSK Settings section, enter text in the **Passphrase** text box (Network Key) with 8-63 characters.
5. Enter a value for **Key Lifetime** text box in minutes.
6. Click **Apply** to save your settings.

Configuring WPA-PSK and WPA2-PSK

Not all wireless adapters support WPA and WPA2. Client software is required on the client:

- Windows XP and Windows 2000 with Service Pack 3 or above do include the client software that supports WPA. The wireless adapter hardware and driver must also support WPA.
- Service Pack 3 does not include the client software that supports WPA2. Make sure your client card supports WPA2. The wireless adapter hardware and driver must also support WPA2.

Consult the product documentation for your wireless adapter; WPA client software for instructions on configuring WPA settings; and WPA2 client software for instructions on configuring WPA2 settings.



Edit Security Profile

:: Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11g
Broadcast Wireless Network Name (SSID)	● Yes ○ No

:: Authentication Settings

Network Authentication	WPA-PSK & WPA2-PSK
Data Encryption	TKIP + AES
WPA Passphrase (Network Key)	************
Wireless Client Security Separation	○ Yes ● No
VLAN ID	1

Edit Security Profile

:: Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11a
Broadcast Wireless Network Name (SSID)	● Yes ○ No

:: Authentication Settings

Network Authentication	WPA-PSK & WPA2-PSK
Data Encryption	TKIP + AES
WPA Passphrase (Network Key)	************
Wireless Client Security Separation	○ Yes ● No
VLAN ID	1

Figure 4-11

To configure WPA-PSK and WPA2-PSK in the Wireless Settings menu:

1. Click the **WPA-PSK and WPA2-PSK** radio button on the left to enable WPA-PSK and WPA2-PSK data encryption.

   When you select the WPA-PSK and WPA2-PSK data encryption, only the feature selections for WPA-PSK and WPA2-PSK are made active on screen, while the other options and features remain grayed out.

2. Select **PSK** from the WPA with drop-down menu on the right.
3. Click on the **TKIP + AES** radio button for Encryption on the right.

   TKIP + AES is the default encryption.

4. In the PSK Settings section, enter text in the **Passphrase** text box (Network Key) with 8-63 characters.
5. Enter a value for **Key Lifetime** text box in minutes.
6. Click **Apply** to save your settings.

Configuring WPA with RADIUS

Not all wireless adapters support WPA. Furthermore, client software is required on the client. Windows XP and Windows 2000 with Service Pack 3 or above do include the client software that supports WPA. Nevertheless, the wireless adapter hardware and driver must also support WPA. Consult the product document for your wireless adapter and WPA client software for instructions on configuring WPA settings.

To configure WPA with RADIUS in the Wireless Settings menu:

1. Click the **WPA** radio button on the left to enable WPA data encryption.

   When you select the WPA data encryption, only the feature selections for WPA and RADIUS are made active on screen, while the other options and features remain grayed out.

2. Select **RADIUS** from the WPA with drop-down menu on the right.

   PSK is the default WPA and the RADIUS Server Settings are highlighted.

3. Click on the **TKIP** radio button for Encryption on the right.

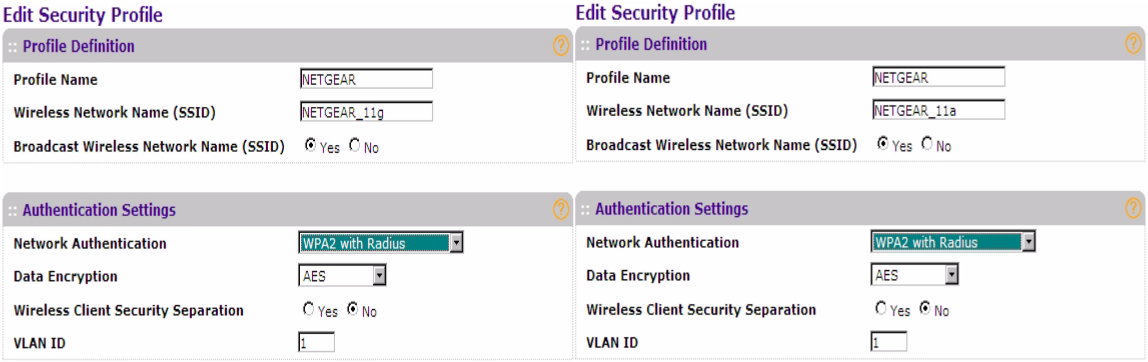
   TKIP is the default WPA encryption.

4. Enter the RADIUS Server Settings:
   - The Server Name, IP Address, RADIUS Port (number), and Shared Key are required for communication with the RADIUS Server.
     – **Server Name.** The
     – **IP Address.** The IP address of the RADIUS Server. The default is 0.0.0.0.
     – **RADIUS Port.** The port number of the RADIUS Server. The default is 1812.
     – **Shared Key.** This is shared between the VPN firewall and the RADIUS Server while authenticating the supplicant (wireless client).

5. Click **Apply** to save your settings.

Configuring WPA2 with RADIUS

Not all wireless adapters support WPA2. Furthermore, client software is required on the client. Make sure your client card supports WPA2. Consult the product document for your wireless adapter and WPA2 client software for instructions on configuring WPA2 settings.



Edit Security Profile

:: Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11g
Broadcast Wireless Network Name (SSID)	● Yes ○ No

:: Authentication Settings

Network Authentication	WPA2 with Radius
Data Encryption	AES
Wireless Client Security Separation	○ Yes ● No
VLAN ID	1

Edit Security Profile

:: Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11a
Broadcast Wireless Network Name (SSID)	● Yes ○ No

:: Authentication Settings

Network Authentication	WPA2 with Radius
Data Encryption	AES
Wireless Client Security Separation	○ Yes ● No
VLAN ID	1

Figure 4-12

To configure WPA2 with RADIUS in the Wireless Settings menu:

1. Click the **WPA2** radio button on the left to enable WPA2 data encryption.

   When you select the WPA2 data encryption, only the feature selections for WPA2 and RADIUS are made active on screen, while the other options and features remain grayed out.

2. Select **RADIUS** from the WPA with drop-down menu on the right.

   PSK is the default WPA and the RADIUS Server Settings are highlighted.

3. Click on the **AES** radio button for Encryption on the right.

   AES is the default WPA encryption.

4. Enter the RADIUS Server Settings:

   - The Server Name, IP Address, RADIUS Port (number), and Shared Key are required for communication with the RADIUS Server.
     – **Server Name.** The
     – **IP Address.** The IP address of the RADIUS Server. The default is 0.0.0.0.
     – **RADIUS Port.** The port number of the RADIUS Server. The default is 1812.
     – **Shared Key.** This is shared between the VPN firewall and the RADIUS Server while authenticating the supplicant (wireless client).

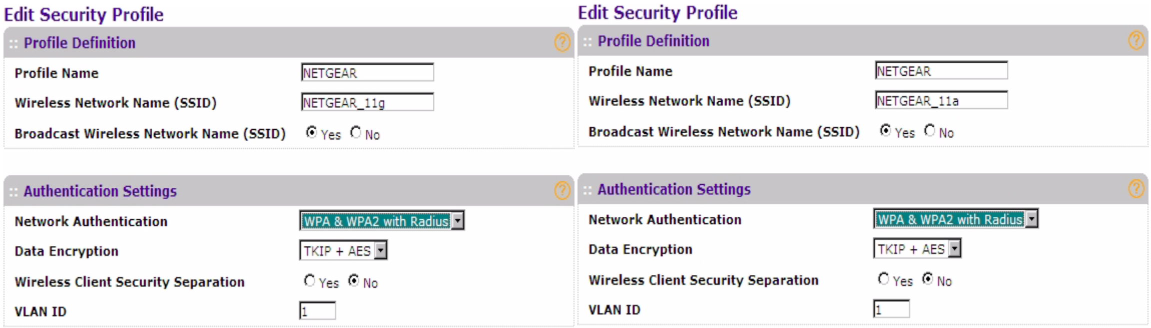
5. Click **Apply** to save your settings.

Configuring WPA and WPA2 with RADIUS

Not all wireless adapters support WPA and WPA2. Client software is required on the client:

- Windows XP and Windows 2000 with Service Pack 3, or above, do include the client software that supports WPA. The wireless adapter hardware and driver must also support WPA.
- Service Pack 3 does not include the client software that supports WPA2. Make sure your client card supports WPA2. The wireless adapter hardware and driver must also support WPA2.

Consult the product documentation for your wireless adapter; WPA client software for instructions on configuring WPA settings; and WPA2 client software for instructions on configuring WPA2 settings.



Edit Security Profile

:: Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11g
Broadcast Wireless Network Name (SSID)	● Yes ○ No

:: Authentication Settings

Network Authentication	WPA & WPA2 with Radius
Data Encryption	TKIP + AES
Wireless Client Security Separation	○ Yes ● No
VLAN ID	1

Edit Security Profile

:: Profile Definition

Profile Name	NETGEAR
Wireless Network Name (SSID)	NETGEAR_11a
Broadcast Wireless Network Name (SSID)	● Yes ○ No

:: Authentication Settings

Network Authentication	WPA & WPA2 with Radius
Data Encryption	TKIP + AES
Wireless Client Security Separation	○ Yes ● No
VLAN ID	1

Figure 4-13

To configure WPA and WPA2 with RADIUS in the Wireless Settings menu:

1. Click the WPA and **WPA2** radio button on the left to enable WPA and WPA2 data encryption.

   When you select the WPA and WPA2 data encryption, only the feature selections for WPA and WPA2 with RADIUS are made active on screen, while the other options and features remain grayed out.

2. Select **RADIUS** from the WPA with drop-down menu on the right.

   PSK is the default WPA and the RADIUS Server Settings are highlighted.

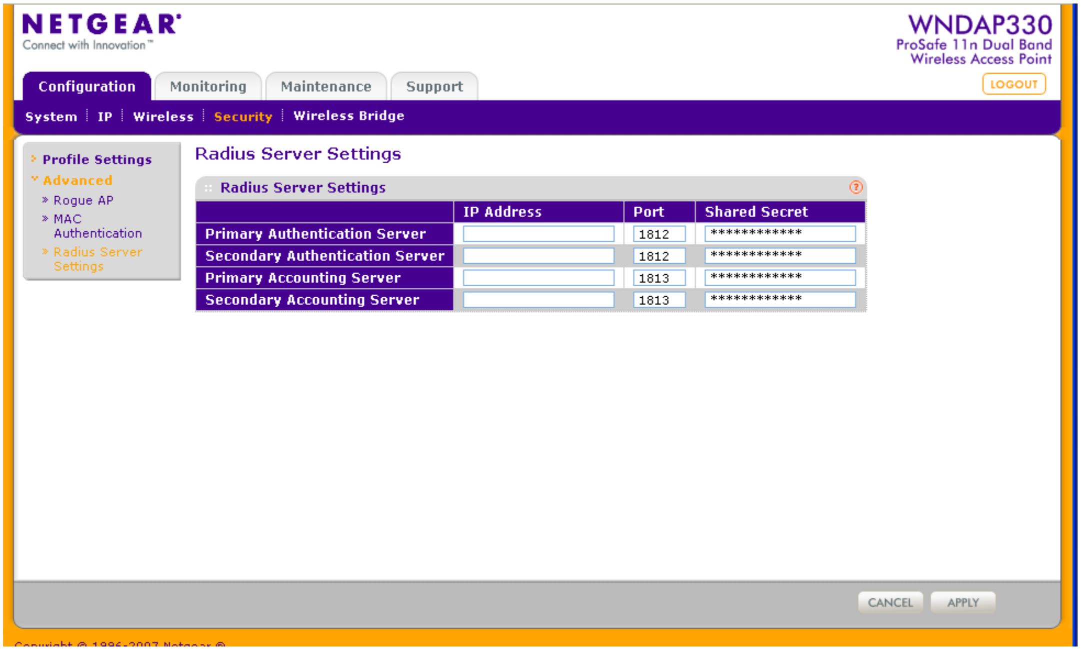
3. Click on the **TKIP+AES** radio button for Encryption on the right.

   TKIP+AES is the default WPA encryption.

4. Enter the RADIUS Server Settings:

- The Server Name, IP Address, RADIUS Port (number), and Shared Key are required for communication with the RADIUS Server.
  - **Server Name.** The
  - **IP Address.** The IP address of the RADIUS Server. The default is 0.0.0.0.
  - **RADIUS Port.** The port number of the RADIUS Server. The default is 1812.
  - **Shared Key.** This is shared between the VPN firewall and the RADIUS Server while authenticating the supplicant (wireless client).

5. Click **Apply** to save your settings.



Radius Server Settings

Radius Server Settings

	IP Address	Port	Shared Secret
Primary Authentication Server		1812	************
Secondary Authentication Server		1812	************
Primary Accounting Server		1813	************
Secondary Accounting Server		1813	************

Figure 4-14Need new screen shot

Verifying Wireless Connectivity (Security)

Using a Client PC with an 802.11b/g/n or 802.11a/n wireless adapter with the correct wireless and security settings for connection to the SRXN3205 (SSID, WEP/WPA, MAC ACL, etc.), verify connectivity by using a browser such as Mozilla Firefox, Netscape, or Internet Explorer to browse the Internet, or check for file and printer access on your network.

The SSID of any wireless access adapters must match the SSID configured in the ProSafe Wireless-N VPN Firewall. If they do not match, no wireless connection will be made.

➡ **Note:** If you are unable to connect, see Chapter 5, “Troubleshooting and Debugging.”

Deploying the VPN Firewall

Once you deploy your firewall in its final locaion, retest the SRXN3205 to ensure it is still operating properly.

To deploy the VPN Firewall:

1. Disconnect the SRXN3205 and position it where it will be deployed.

The best location is elevated, such as, on the top of a cubicle or wall mounted at the center of your wireless coverage area, and within line of sight of all the mobile devices.

2. Position all the antennas for the best coverage in your situation.

➡ **Note:** Refer to the antenna positioning information in “Wireless Equipment Placement and Range Guidelines” on page 4-2 earlier in this chapter.

3. Connect an Ethernet cable from the WAN connection on your VPN Firewall to a LAN port on your router, switch, or hub.

4. Connect Ethernet cable(s) from the LAN ports on your VPN Firewall to a LAN port on ????your router, switch, or hub.

> **Note:** By default, SRXN3205 is set with the DHCP client Enabled. If your network uses dynamic IP addresses, you must change this setting. To connect to the SRXN3205 after the DHCP server on your network assigns it a new IP address, enter the VPN Firewall name into your Web browser. The default VPN Firewall name is netgearxxxxxx, where xxxxxx represents the last 6 bytes of the MAC address. The default name is printed on the bottom label of the SRXN3205.

5. Connect the power adapter to the SRXN3205 and plug the power adapter in to a AC power outlet. The PWR, Test, LAN, WAN, and Wireless LAN LEDs should light up.
6. Verify you still have wireless connections to the SRXN3205.
7. If you want to fine tune the overall performance of the Wireless Settings for your environment, refer to "Advanced Wireless Settings" on page 4-27.

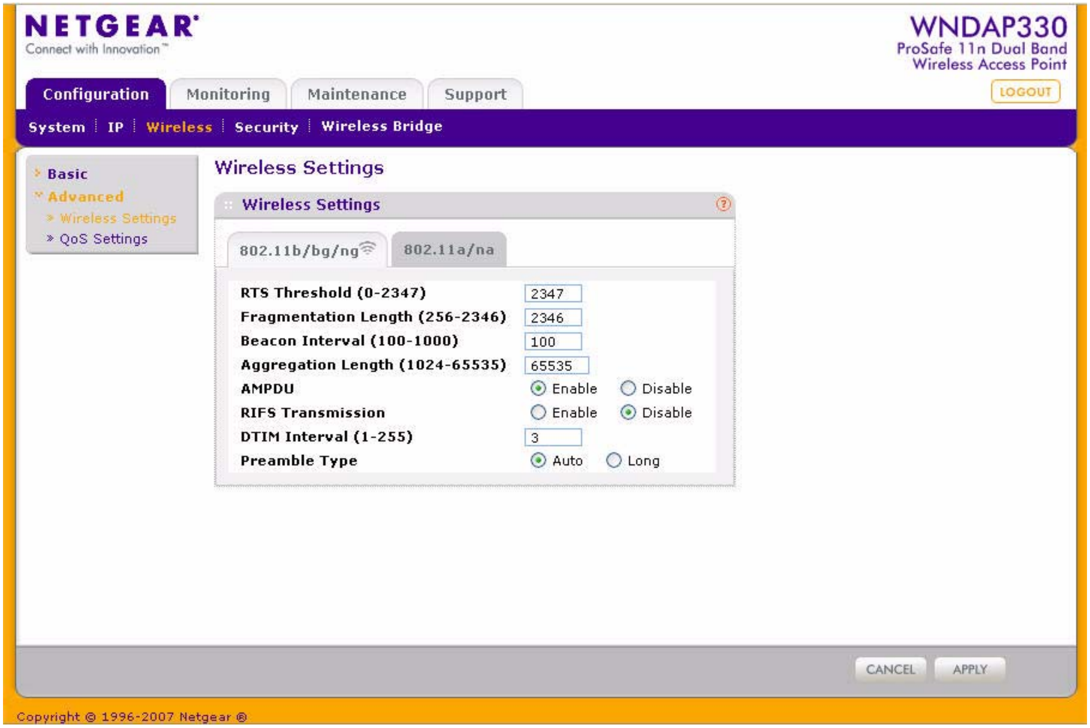
Advanced Wireless Settings

Configuring Advanced Wireless Settings

The Advanced screen of the Wireless Settings menu is used to configure and enable various wireless LAN parameters for all of the 802.11a/n and 802.11b/g/n modes. The default wireless LAN parameters usually work well. However, you can use these settings to fine tune the overall performance of your Wireless Settings for your environment. The Advanced menu in the Wireless Settings tab is used to configure the Wireless LAN parameters.

To configure Advanced Wireless Options:

1. Select **Network Configuration** > **Wireless Settings** from main/submenu.
2. Select **Advanced** on the right side of the menu.
3. The Advanced Wireless Options screen displays, as shown in Figure 4-15.,



RTS Threshold (0-2347) 2347
Fragmentation Length (256-2346) 2346
Beacon Interval (100-1000) 100
Aggregation Length (1024-65535) 65535
AMPDU ● Enable ○ Disable
RIFS Transmission ○ Enable ● Disable
DTIM Interval (1-255) 3
Preamble Type ● Auto ○ Long

Figure 4-15Need New screenshot

4. Enter the appropriate information in the fields described below:

- **RTS Threshold (256 - 2346)**: Request to Send Threshold. The packet size that is used to determine if it should use the CSMA/CD (Carrier Sense Multiple Access with Collision Detection) mechanism or the CSMA/CA mechanism for packet transmission. With the CSMA/CD transmission mechanism, the transmitting station sends out the actual packet as soon as it has waited for the silence period. With the CSMA/CA transmission mechanism, the transmitting station sends out an RTS packet to the receiving station, and waits for the receiving station to send back a CTS (Clear to Send) packet before sending the actual packet data. The default is 2346.
- **Fragmentation Length (256 - 2346)**: This is the maximum packet size used for fragmentation. Packets larger than the size programmed in this field will be fragmented. The Fragment Threshold value must be larger than the RTS Threshold value. The default is 2346.
- **Beacon Interval (20 - 1000)**: The Beacon Interval. Specifies the interval time between 100ms and 1000ms for each beacon transmission, which allows the access point to synchronize the wireless network. The default is 100.
- **Preamble Mode:** A long transmit preamble may provide a more reliable connection or a slightly longer range. A short transmit preamble gives better performance. The Automatic settings automatically handles both long and short preambles. The default is Automatic.

5. Click **Apply** to enable the Advanced Wireless Options.

Restricting Wireless Access by MAC Address

The optional enabling of the Access Control List lets you block the wireless access privileges of any specified stations through the VPN Firewall. When you enable access control, the SRXN3205 only accepts connections from wireless clients on the selected access control list. This provides an additional layer of security.

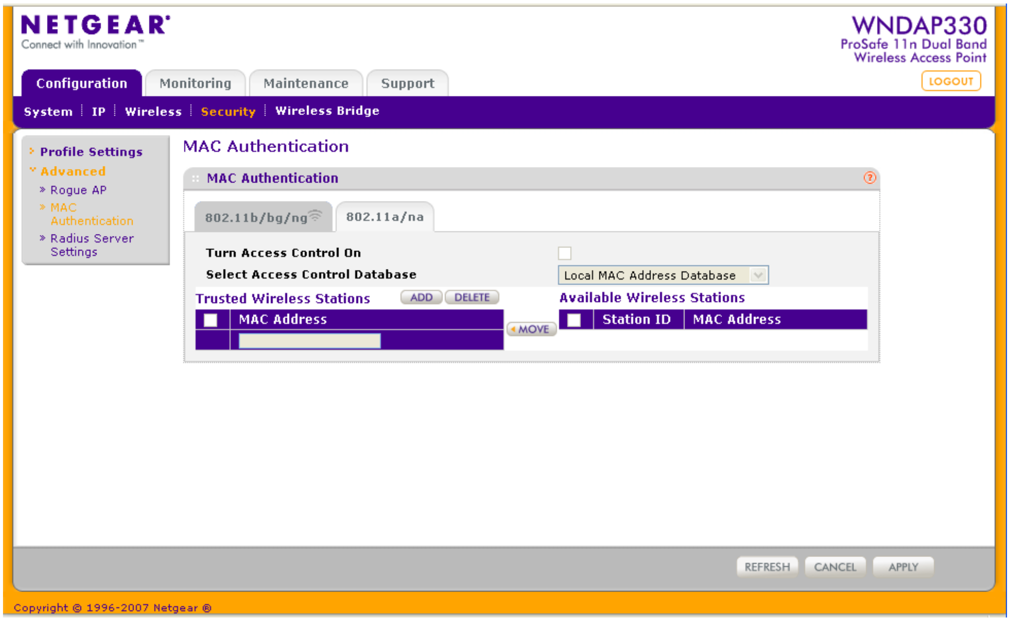
Note: If configuring the SRXN3205 from a wireless computer whose MAC address is not in the access control list, if you select Turn Access Control On, you will lose your wireless connection when you click **Apply**. You must then access the VPN Firewall from a wired computer or from a wireless computer that is on the access control list to make any further changes.

To restrict access based on MAC addresses:

1. Click the **Network Configurations > Wireless Settings** in the main/submenu.

2. Click the **Setup Access List** to the right of the screen.

   The Access Control List tab and Available Wireless Stations tab appear on screen with the Access Control List tab selected.



MAC Authentication

MAC Authentication

Turn Access Control On □

Select Access Control Database: Local MAC Address Database

Trusted Wireless Stations

□	MAC Address

Available Wireless Stations

□	Station ID	MAC Address

Figure 4-16need new screen

3. Click the radio button for **Yes** in the ACL Enable section to turn on the Access Control List feature.

   The Trusted Wireless Stations table will show any wireless stations you enter. If you have not entered any wireless stations to the list, it will be empty. The ACL (Access Control List) does not need to be enabled to add or delete MAC address to the list.

4. Click **Apply** to save the state (enabled or disabled) of the ACL (Access Control List).

   Select the stations from the list of **Available Wireless Stations** found in your area, or enter the MAC address of a station to add a new station manually.

5. To add a MAC address to the Trusted Wireless Station list, type in the MAC address in the Add New Trusted Station Manually section, in the form of xx:xx:xx:xx:xx:xx to the text box.

   You can usually find the MAC address printed on the bottom of the wireless adapter.

6. Click the **Add** button to the right when you have completed typing.

   Now, only devices on this list will be allowed to wirelessly connect to the SRXN3205.

7. Repeat these steps for each additional device you want to add to the list.

8. To delete an existing entry, click the **check box** to the left of the entry and then click the **delete** button.

9. To view the clients currently connected, click the **Available Wireless Stations** tab.

   This list auto-populates whether the ACL is enabled or disable and lists the MAC addresses found within range of this wireless VPN firewall.

Chapter 5
Firewall Security and Content Filtering

This chapter describes how to set up your firewall and use the content filtering features of the SRXN3205 VPN firewall to protect your network.

This chapter contains the following sections:

- "About Firewall Security and Content Filtering"
- "Using Rules & Services to Block or Allow Traffic"
- "Setting Schedules to Block or Allow Traffic"
- "Setting Block Sites (Content Filtering)"
- "Enabling Source MAC Filtering (Address Filter)"
- "Enabling Port Triggering"
- "Bandwidth Profile"
- "UPnP (Universal Plug and Play)"
- "E-Mail Notifications of Event Logs and Alerts"
- "Administrator Tips"

About Firewall Security and Content Filtering

The ProSafe Wireless-N VPN Firewall provides you with Web content filtering options, plus browsing activity reporting and instant alerts via e-mail. Network administrators can establish restricted access policies based on time-of-day, Web addresses, and Web address keywords. You can also block Internet access by applications and services, such as chat or games.

A firewall is a special category of router that protects one network (the "trusted" network, such as your LAN) from another (the untrusted network, such as the Internet), while allowing communication between the two. You can further segment keyword blocking to certain known groups (see "Managing Groups and Hosts (LAN Groups)" on page 3-5 to set up LAN Groups).

A firewall incorporates the functions of a NAT (Network Address Translation) router, while adding features for dealing with a hacker intrusion or attack, and for controlling the types of traffic that can flow between the two networks. Unlike simple Internet sharing NAT routers, a firewall uses a process called stateful packet inspection to protect your network from attacks and intrusions. NAT performs a very limited stateful inspection in that it considers whether the incoming packet is in response to an outgoing request, but true Stateful Packet Inspection goes far beyond NAT.

Using Rules & Services to Block or Allow Traffic

Firewall rules and services are used to block or allow specific traffic passing through from one side to the other. Inbound rules (WAN to LAN) restrict access by outsiders to private resources, selectively allowing only specific outside users to access specific resources. Outbound rules (LAN to WAN) determine what outside resources local users can have access to.

A firewall has two default rules, one for inbound traffic and one for outbound traffic. The default rules of the SRXN3205 are:

- **Inbound**. Block all access from outside except responses to requests from the LAN side.
- **Outbound**. Allow all access from the LAN side to the outside.

User-defined firewall rules for blocking or allowing traffic on the firewall can be applied to inbound or outbound traffic.

Services-Based Rules

The rules to block traffic are based on the traffic's category of service.

- **Outbound Rules (service blocking)**. Outbound traffic is normally allowed unless the firewall is configured to disallow it.
- **Inbound Rules (port forwarding)**. Inbound traffic is normally blocked by the firewall unless the traffic is in response to a request from the LAN side. The firewall can be configured to allow this otherwise blocked traffic.
- **Customized Services**. Additional services can be added to the list of services in the factory default list. These added services can then have rules defined for them to either allow or block that traffic (see "Adding Customized Services" on page 5-17.

- **Quality of Service (QoS) priorities**. Each service at its own native priority that impacts its quality of performance and tolerance for jitter or delays. You can change this QoS priority if desired to change the traffic mix through the system (see "Setting Quality of Service (QoS) Priorities" on page 5-19).

Outbound Rules (Service Blocking)

The SRXN3205 allows you to block the use of certain Internet services by PCs on your network. This is called service blocking or port filtering.

Note: See "Enabling Source MAC Filtering (Address Filter)" on page 5-24 for yet another way to block outbound traffic from selected PCs that would otherwise be allowed by the firewall.

Table 5-1. Outbound Rules

Item	Description
Service Name	Select the desired Service or application to be covered by this rule. If the desired service or application does not appear in the list, you must define it using the Services menu (see "Adding Customized Services" on page 5-17).
Action (Filter)	Select the desired action for outgoing connections covered by this rule: • BLOCK always • BLOCK by schedule, otherwise Allow • ALLOW always • ALLOW by schedule, otherwise Block **Note**: Any outbound traffic which is not blocked by rules you create will be allowed by the Default rule. ALLOW rules are only useful if the traffic is already covered by a BLOCK rule. That is, you wish to allow a subset of traffic that is currently blocked by another rule.
Action (Select Schedule)	Select the desired time schedule (Schedule1, Schedule2, or Schedule3) that will be used by this rule. • This drop down menu gets activated only when "BLOCK by schedule, otherwise Allow" or "ALLOW by schedule, otherwise Block" is selected as Action. • Use schedule page to configure the time schedules (see "Setting Schedules to Block or Allow Traffic" on page 5-20).

Table 5-1. Outbound Rules (continued)

Item	Description
LAN users	These settings determine which computers on your network are affected by this rule. Select the desired options: • Any – All PCs and devices on your LAN. • Single address – Enter the required address and the rule will be applied to that particular PC. • Address range – If this option is selected, you must enter the start and finish fields. • Groups – Select the Group to which this rule will apply. Use the LAN Groups screen (under Network Configuration) to assign PCs to Groups. See "Managing Groups and Hosts (LAN Groups)" on page 3-5.
WAN Users	These settings determine which Internet locations are covered by the rule, based on their IP address. Select the desired option: • Any – All Internet IP address are covered by this rule. • Single address – Enter the required address in the start field. • Address range – If this option is selected, you must enter the start and end fields.
QoS Priority	This setting determines the priority of a service which, in turn, determines the quality of that service for the traffic passing through the firewall. By default, the priority shown is that of the selected service. The user can change it accordingly. If the user does not make a selection (leaves it as Normal-Service), then the native priority of the service will be applied to the policy. See "Setting Quality of Service (QoS) Priorities" on page 5-19.
Log	This determines whether packets covered by this rule are logged. Select the desired action: • Always – always log traffic considered by this rule, whether it matches or not. This is useful when debugging your rules. • Never – never log traffic considered by this rule, whether it matches or not.

Inbound Rules (Port Forwarding)

When the SRXN3205 uses Network Address Translation (NAT), your network presents only one IP address to the Internet and outside users cannot directly address any of your local computers. However, by defining an inbound rule you can make a local server (for example, a Web server or game server) visible and available to the Internet. The rule tells the firewall to direct inbound traffic for a particular service to one local server based on the destination port number. This is also known as port forwarding.

Whether or not DHCP is enabled, how the PCs will access the server's LAN address impacts the Inbound Rules. For example:

- If your external IP address is assigned dynamically by your ISP (DHCP enabled), the IP address may change periodically as the DHCP lease expires. Consider using **Dyamic DNS** (under Network Configuration) so that external users can always find your network (see "Configuring Dynamic DNS (Optional)" on page 2-11.
- If the IP address of the local server PC is assigned by DHCP, it may change when the PC is rebooted. To avoid this, use the Reserved IP address feature in the **LAN Groups** menu (under Network Configuration) to keep the PC's IP address constant (see "Configuring DHCP Address Reservation" on page 3-9.
- Local PCs must access the local server using the server's local LAN address. Attempts by local PCs to access the server using the external WAN IP address will fail.

Note: See "Enabling Port Triggering" on page 5-28 for yet another way to allow certain types of inbound traffic that would otherwise be blocked by the firewall.

Table 5-2. Inbound Rules

Item	Description
Service	Select the desired Service or application to be covered by this rule. If the desired service or application does not appear in the list, you must define it using the Services menu (see "Adding Customized Services" on page 5-17).
Action (Filter)	Select the desired action for packets covered by this rule: • BLOCK always • BLOCK by schedule, otherwise Allow • ALLOW always • ALLOW by schedule, otherwise Block **Note**: Any inbound traffic which is not allowed by rules you create will be blocked by the Default rule.
Schedule	Select the desired time schedule (Schedule1, Schedule2, or Schedule3) that will be used by this rule (see "Setting Schedules to Block or Allow Traffic" on page 5-20). • This drop down menu gets activated only when "BLOCK by schedule, otherwise Allow" or "ALLOW by schedule, otherwise Block" is selected as Action. • Use schedule page to configure the time schedules.
Send to LAN Server	This LAN address determines which computer on your network is hosting this service rule. (You can also translate this address to a port number.)
Translate to Port Number	Check the "Translate to Port Number" and enter a port number if you want to assign the LAN Server to a different service port number. Inbound traffic to the service port will have the destination port number modified to the port number configured here.

Table 5-2. Inbound Rules (continued)

Item	Description
WAN Users	These settings determine which Internet locations are covered by the rule, based on their IP addresses. Select the desired option: • Any – All Internet IP address are covered by this rule. • Single address – Enter the required address in the start field. • Address range – If this option is selected, you must enter the start and end fields.
WAN Destination IP Address	This setting determines the destination IP address applicable to incoming traffic. This is the public IP address that will map to the internal LAN server; it can either be the address of the WAN1 or WAN2 ports or another public IP address**.**
Log	This determines whether packets covered by this rule are logged. Select the desired action: • Always – Always log traffic considered by this rule, whether it matches or not. This is useful when debugging your rules. • Never – Never log traffic considered by this rule, whether it matches or not.

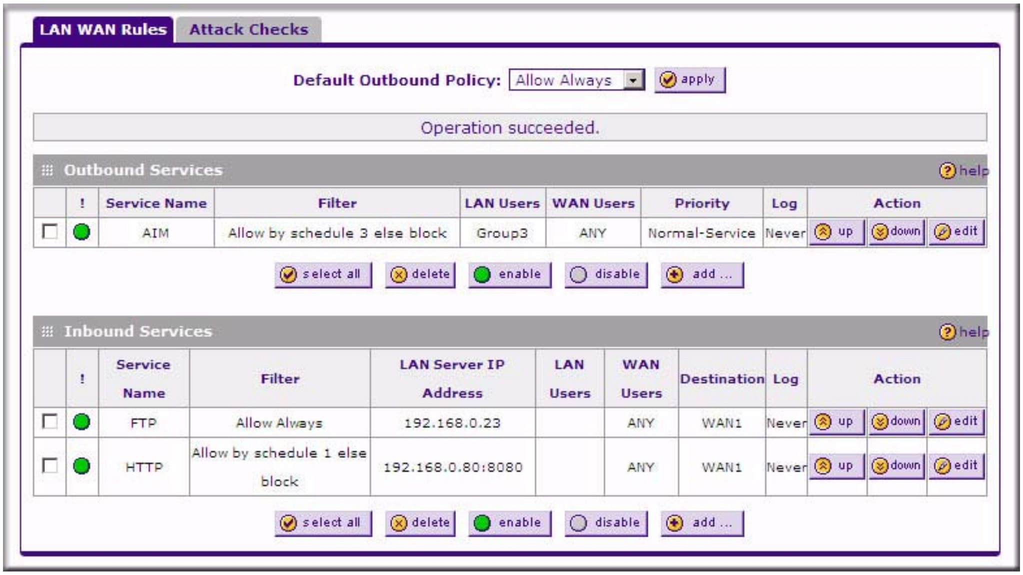
Note: Some residential broadband ISP accounts do not allow you to run any server processes (such as a Web or FTP server) from your location. Your ISP may periodically check for servers and may suspend your account if it discovers any active services at your location. If you are unsure, refer to the Acceptable Use Policy of your ISP.

Remember that allowing inbound services opens holes in your firewall. Only enable those ports that are necessary for your network. It is also advisable to turn on the server application security and invoke the user password or privilege levels, if provided.

Viewing the Firewall Rules

To view the firewall rules:

1. Select **Security** > **Firewall** from the main/sub-menu. The LAN WAN Rules tab appears:



Default Outbound Policy: Allow Always

Operation succeeded.

Outbound Services

	!	Service Name	Filter	LAN Users	WAN Users	Priority	Log	Action
□	●	AIM	Allow by schedule 3 else block	Group3	ANY	Normal-Service	Never	up down edit

Inbound Services

	!	Service Name	Filter	LAN Server IP Address	LAN Users	WAN Users	Destination	Log	Action
□	●	FTP	Allow Always	192.168.0.23		ANY	WAN1	Never	up down edit
□	●	HTTP	Allow by schedule 1 else block	192.168.0.80:8080		ANY	WAN1	Never	up down edit

Figure 5-1need new screenshot

Order of Precedence for Rules

As you define new rules, they are added to the tables in the Rules menu as the last item in the list, as shown in Figure 5-1. For any traffic attempting to pass through the firewall, the packet information is subjected to the rules in the order shown in the Rules Table, beginning at the top and proceeding to the bottom, before applying the default rule. In some cases, the order of precedence of two or more rules may be important in determining the disposition of a packet. For example, you should place the most strict rules at the top (those with the most specific services or addresses). The **Up** and **Down** buttons allow you to relocate a defined rule to a new position in the table.

Setting the Default Outbound Policy

The Default Outbound Policy is to allow all traffic to the Internet to pass through. Firewall rules can then be applied to block specific types of traffic from going out from the LAN to the Internet (Outbound). The default policy of Allow Always can be changed to block all outbound traffic which then allows you to enable only specific services to pass through the firewall.

To change the Default Outbound Policy, follow these steps:

1. Click the LAN WAN Rules tab, shown in Figure 5-1.
2. Change the **Default Outbound Policy** by choosing Block Always from the drop-down menu.
3. Click **Apply**.

Creating a LAN WAN Outbound Services Rule

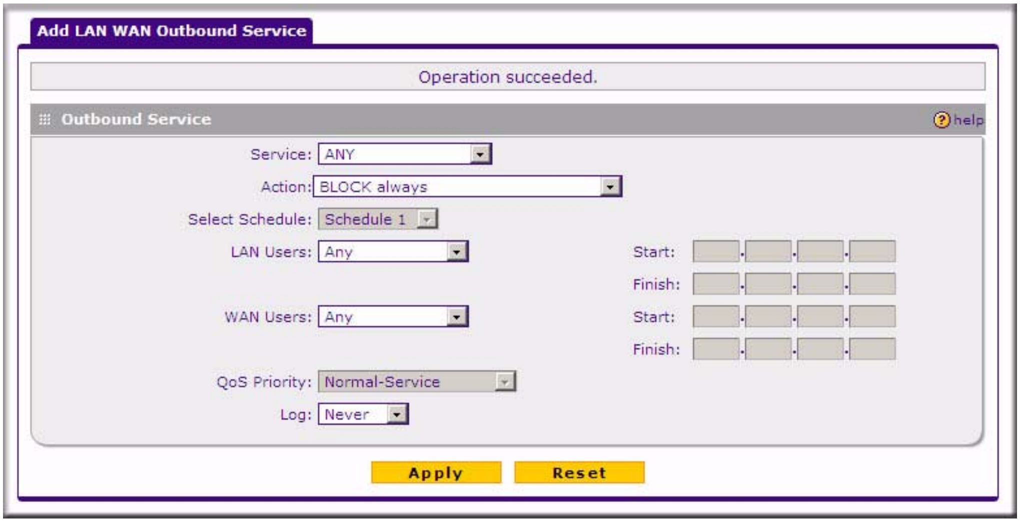
An outbound rule will block or allow the selected application from an internal IP LAN address to an external WAN IP address according to the schedule created in the Schedule menu.

You can also tailor these rules to your specific needs (see "Administrator Tips" on page 5-33).

> **Note:** This feature is for Advanced Administrators only! Incorrect configuration will cause serious problems.

To create a new outbound service rule in the LAN WAN Rules tab:

1. Click **Add** under the Outbound Services Table. The **Add LAN WAN Outbound Service** screen is displayed.



Service: ANY
Action: BLOCK always
Select Schedule: Schedule 1
LAN Users: Any
Start: . . .
Finish: . . .
WAN Users: Any
Start: . . .
Finish: . . .
QoS Priority: Normal-Service
Log: Never

Figure 5-2 Need new screenshot

2. Configure the parameters based on the descriptions in Table 5-1 on page 5-3.

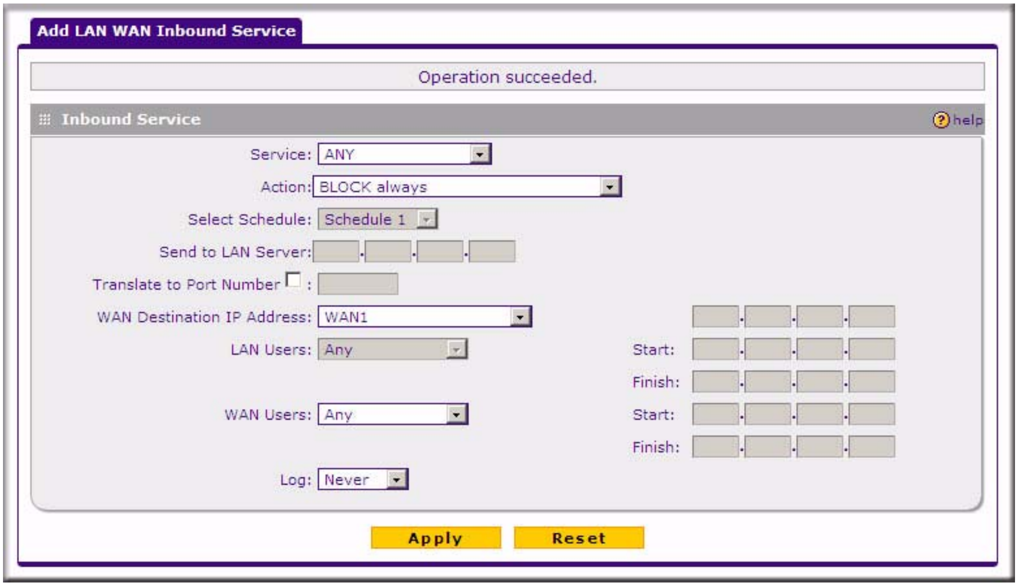
3. Click **Apply** to save your changes and reset the fields on this screen. The new rule will be listed on the **Outbound Services** table.

Creating a LAN WAN Inbound Services Rule

This Inbound Services Rules table lists all existing rules for inbound traffic. If you have not defined any rules, no rules will be listed. By default, all inbound traffic is blocked. Remember that allowing inbound services opens holes in your firewall. Only enable those ports that are necessary for your network.

To create a new inbound service rule in the LAN WAN Rules tab:

1. Click **Add** under the Inbound Services Table. The **Add LAN WAN Inbound Service** screen is displayed.



Add LAN WAN Inbound Service

Operation succeeded.

Inbound Service

Service: ANY

Action: BLOCK always

Select Schedule: Schedule 1

Send to LAN Server: . . .

Translate to Port Number □ :

WAN Destination IP Address: WAN1

LAN Users: Any — Start: . . . — Finish: . . .

WAN Users: Any — Start: . . . — Finish: . . .

Log: Never

Figure 5-3 Need news creenshot

2. Configure the parameters based on the descriptions in Table 5-2 on page 5-5.

3. Click **Apply** to save your changes and reset the fields on this screen. The new rule will be listed on the **Inbound Services** table.

Modifying Rules

To make changes to an existing outbound or inbound service rule:

1. In the **Action** column adjacent to the rule, do the following:
   - Click **Edit** to make any changes to the rule definition of an existing rule. The Outbound Service screen is displayed containing the data for the selected rule.
   - Click **Up** to move the rule up one position in the table rank.
   - Click **Down** to move the rule down one position in the table rank.
2. Check the radio box adjacent to the rule, then do the following:
   - Click **Disable** to disable the rule. The “!” Status icon will change from green to grey, indicating that the rule is disabled. (By default, when a rule is added to the table it is automatically enabled.)
   - Click **Delete** to delete the rule.
3. Click **Select All** to choose all rules.

Attack Checks

This screen allows you to specify whether or not the firewall should be protected against common attacks in the LAN and WAN networks. The various types of attack checks are listed on the **Attack Checks** screen and defined below:

- **WAN Security Checks**
  - **Respond To Ping On Internet Ports**. To allow the firewall to respond to a Ping request from the Internet, click this check box. Ping can be used as a diagnostic tool. You shouldn't check this box unless you have a specific reason to do so.
  - **Enable Stealth Mode**. In stealth mode, the firewall will not respond to port scans from the WAN, thus making it less susceptible to discovery and attacks.
  - **Block TCP Flood**. A SYN flood is a form of denial of service attack in which an attacker sends a succession of SYN requests to a target system. When the system responds, the attacker doesn’t complete the connection, thus saturating the server with half-open connections. No legitimate connections can then be made.

    When blocking is enabled, the firewall will limit the lifetime of partial connections and will be protected from a SYN flood attack.
- **LAN Security Checks**
  - **Block UDP flood.** A UDP flood is a form of denial of service attack that can be initiated when one machine sends a large number of UDP packets to random ports on a remote host. As a result, the distant host will (1) check for the application listening at that port, (2)

see that no application is listening at that port, and (3) reply with an ICMP Destination Unreachable packet.

When the victimized system is flooded, it is forced to send many ICMP packets, eventually making it unreachable by other clients. The attacker may also spoof the IP address of the UDP packets, ensuring that the excessive ICMP return packets do not reach him, thus making the attacker's network location anonymous.

If flood checking is enabled, the firewall will not accept more than 20 simultaneous, active UDP connections from a single computer on the LAN.

- **Disable Ping Reply on LAN Ports**. To prevent the firewall from responding to Ping requests from the LAN, click this checkbox.

- **VPN Pass through.** When the firewall is in NAT mode, all packets going to the Remote VPN Gateway are first filtered through NAT and then encrypted per the VPN policy.

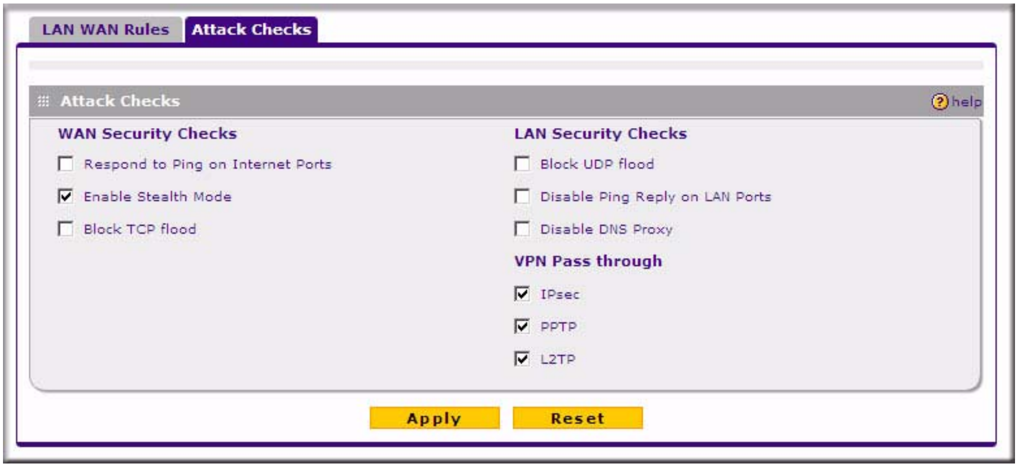
  For example, if a VPN Client or Gateway on the LAN side of this firewall wants to connect to another VPN endpoint on the WAN (placing this firewall between two VPN end points), encrypted packets are sent to this firewall. Since this firewall filters the encrypted packets through NAT, the packets become invalid unless VPN pass through is enabled.

  When VPN pass through is enabled, the VPN tunnel will pass the VPN traffic without any filtering. Tunnels can be:

  - IPsec
  - PPTP
  - L2TP

To enable the appropriate Attack Checks for your environment:

1. Select **Security > Firewall** from the main/submenu.
2. Click the **Attack Checks** tab and the Attack Checks screen displays.



Attack Checks

WAN Security Checks

- □ Respond to Ping on Internet Ports
- ☑ Enable Stealth Mode
- □ Block TCP flood

LAN Security Checks

- □ Block UDP flood
- □ Disable Ping Reply on LAN Ports
- □ Disable DNS Proxy

VPN Pass through

- ☑ IPsec
- ☑ PPTP
- ☑ L2TP

Figure 5-4need new screenshot

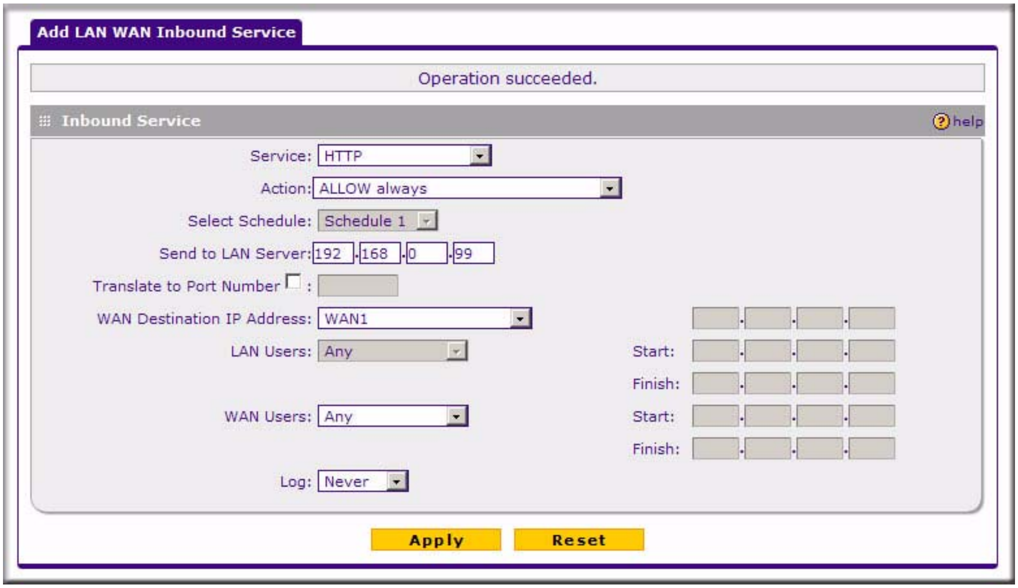
3. Select the Attack Checks you wish to initiate.
4. Click **Apply** to save your settings

Inbound Rules Examples

LAN WAN Inbound Rule: Hosting A Local Public Web Server

If you host a public Web server on your local network, you can define a rule to allow inbound Web (HTTP) requests from any outside IP address to the IP address of your Web server at any time of day.

In the example shown in Figure 5-5, unrestricted access is provided from the Internet to the local Web server at LAN IP address 192.168.0.99.


Add LAN WAN Inbound Service

Operation succeeded.

Inbound Service

Service: HTTP

Action: ALLOW always

Select Schedule: Schedule 1

Send to LAN Server: 192 . 168 . 0 . 99

Translate to Port Number □ :

WAN Destination IP Address: WAN1

LAN Users: Any

WAN Users: Any

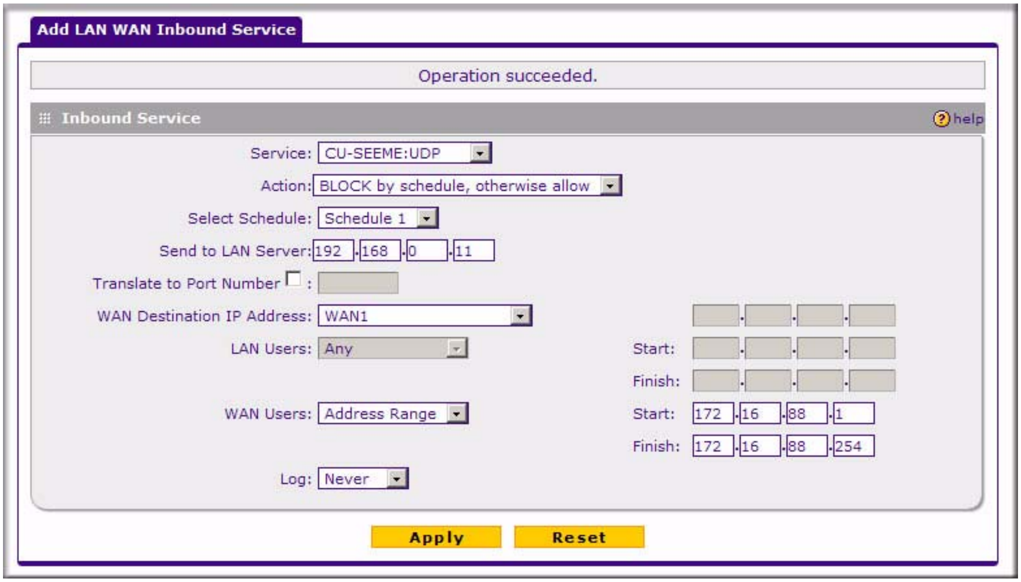
Log: Never

Figure 5-5need new screenshot

LAN WAN Inbound Rule: Allowing Videoconference from Restricted Addresses

If you want to allow incoming videoconferencing to be initiated from a restricted range of outside IP addresses, such as from a branch office, you can create an inbound rule.

In the example shown in Figure 5-6, CU-SeeMe connections are allowed to a local host only from a specified range of external IP addresses. Connections are blocked during the period specified by Schedule 1.



Operation succeeded.

Service: CU-SEEME:UDP

Action: BLOCK by schedule, otherwise allow

Select Schedule: Schedule 1

Send to LAN Server: 192.168.0.11

Translate to Port Number □ :

WAN Destination IP Address: WAN1

LAN Users: Any

WAN Users: Address Range — Start: 172.16.88.1 Finish: 172.16.88.254

Log: Never

Figure 5-6 Need new screenshot

LAN WAN Inbound Rule: Setting Up One-to-One NAT Mapping

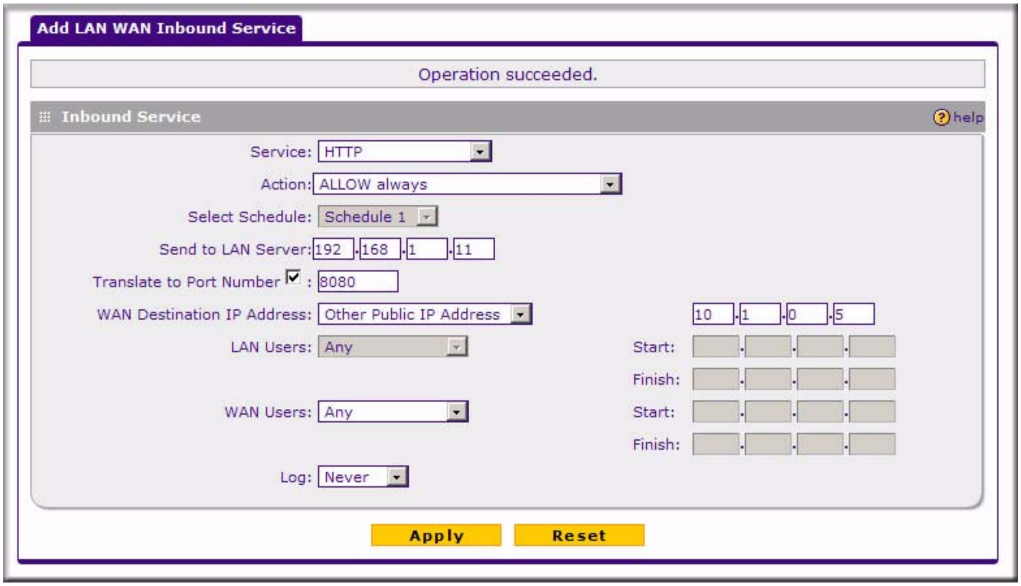
If you arrange with your ISP to have more than one public IP address for your use, you can use the additional public IP addresses to map to servers on your LAN. One of these public IP addresses will be used as the primary IP address of the firewall. This address will be used to provide Internet access to your LAN PCs through NAT. The other addresses are available to map to your servers.

In the example shown in Figure 5-7, we have configured multi-NAT to support multiple public IP addresses on one WAN interface. The inbound rule instructs the firewall to host an additional public IP address (10.1.0.5) and to associate this address with the Web server on the LAN (at 192.168.0.2). We also instruct the firewall to translate the incoming HTTP port number (port 80) to a different port number (port 8080).

The following addressing scheme is used in this example:

- firewall SRXN3205
  - WAN primary public IP address: 10.1.0.1
  - WAN additional public IP address: 10.1.0.5
  - LAN IP address 192.168.1.1
- Web server PC on the firewall’s LAN

- LAN IP address: 192.168.1.11
- Port number for Web service: 8080



Add LAN WAN Inbound Service

Operation succeeded.

Inbound Service

Service: HTTP

Action: ALLOW always

Select Schedule: Schedule 1

Send to LAN Server: 192.168.1.11

Translate to Port Number ☑ : 8080

WAN Destination IP Address: Other Public IP Address 10.1.0.5

LAN Users: Any

Start:

Finish:

WAN Users: Any

Start:

Finish:

Log: Never

Figure 5-7need new screenshot

To test the connection from a PC on the WAN side, type **http://10.1.0.5.** The home page of the Web server should appear.

LAN WAN Inbound Rule: Specifying an Exposed Host

Specifying an exposed host allows you to set up a computer or server that is available to anyone on the Internet for services that you have not yet defined.

To expose one of the PCs on your LAN as this host:

1. Create an inbound rule that allows all protocols.
2. Place the new rule *below* all other inbound rules.

➡	**Note:** For security, NETGEAR strongly recommends that you avoid creating an exposed host. When a computer on your LAN is designated as the exposed host, it loses much of the protection of the firewall and is exposed to many exploits from the Internet. If compromised, the computer can be used to attack your network.

Outbound Rules Example

Outbound rules let you prevent users from using applications such as Instant Messenger, Real Audio, or other non-essential services.

LAN WAN Outbound Rule: Blocking Instant Messenger

To block Instant Messenger usage by employees during working hours, you can create an outbound rule to block that application from any internal IP address to any external address according to the schedule that you have created in the Schedule menu. You can also have the firewall log any attempt to use Instant Messenger during that blocked period.

Ebabling Session Limits

This page allows you to specify total number sessions per user (IP) allowed across the router.

Session limiting is disabled by default. When enabling session limiting you can give the maximum number of sessions per IP either in percentage of maximum sessions or absolute number of maximum sessions. If you want to give the maximum number of sessions per IP in percentage check "yes" radio button otherwise check "No" radio button. The percentage is computed on the total connection capacity of the device. "User Limit" specifies the maximum number of sessions that should be allowed via router from a single source machine (i.e. session limiting is per machine based) as percentage of total connection capacity . Note that some protocols like ftp, rstp create two sessions per connection which should be considered when configuring session limiting. The label

"Total Number of Packets Dropped due to Session Limit:" shows total number of packets dropped when session limit is reached

Session TimeOut

This table displays the TCP, UDP and ICMP Timeout values. Default Timeout values are 1200 seconds for Tcp,180 seconds for Udp and 8 seconds for Icmp. Timeout values can also be configured with user defined values. The maximum value for timeout is 43200 seconds.

Click Apply to save the settings.

Click Reset to discard any changes and revert to the previous settings.

-

Figure 5-8 Need screenshot

Adding Customized Services

Services are functions performed by server computers at the request of client computers. For example, Web servers serve Web pages, time servers serve time and date information, and game hosts serve data about other players' moves. When a computer on the Internet sends a request for service to a server computer, the requested service is identified by a service or port number. This number appears as the destination port number in the transmitted IP packets. For example, a packet that is sent with destination port number 80 is an HTTP (Web server) request.

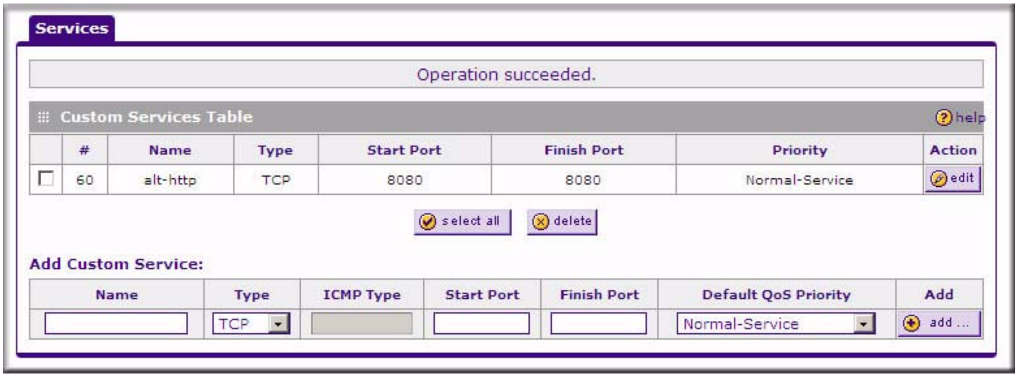
The service numbers for many common protocols are defined by the Internet Engineering Task Force (IETF) and published in RFC1700, "Assigned Numbers." Service numbers for other applications are typically chosen from the range 1024 to 65535 by the authors of the application.

Although the SRXN3205 already holds a list of many service port numbers, you are not limited to these choices. Use the Services screen to add additional services and applications to the list for use in defining firewall rules. The Services menu shows a list of services that you have defined, as shown in Figure 5-9.

To define a new service, first you must determine which port number or range of numbers is used by the application. This information can usually be determined by contacting the publisher of the application or from user groups or newsgroups. When you have the port number information, you can enter it on the **Services** screen.

To add a custom service:

1. Select **Security** > **Services** from the main/submenu and the Services screen displays.



Operation succeeded.

Custom Services Table

	#	Name	Type	Start Port	Finish Port	Priority	Action
□	60	alt-http	TCP	8080	8080	Normal-Service	edit

Add Custom Service:

Name	Type	ICMP Type	Start Port	Finish Port	Default QoS Priority	Add
	TCP				Normal-Service	add ...

Figure 5-9OK

2. In the **Add Custom Services** section, enter a descriptive name for the service (this name is for your convenience).
3. Select the Layer 3 transport protocol of the service: TCP, UDP, or ICMP.
4. Enter the first TCP or UDP port of the range that the service uses.
5. Enter the last port of the range that the service uses. If the service only uses a single port number, enter the same number in both fields.
6. Click **Add**. The new custom service will be added to the Custom Services Table.

Modifying a Service

To edit the parameters of an existing service:

1. In the Custom Services Table, click the **Edit** button adjacent to the service you want to edit. The **Edit Service** screen is displayed.
2. Modify the parameters you wish to change.
3. Click **Apply** to confirm your changes. The modified service is displayed in the Custom Services Table.

Setting Quality of Service (QoS) Priorities

The Quality of Service (QoS) Priorities setting determines the priority of a service, which in turn, determines the quality of that service for the traffic passing through the firewall. The user can change this priority:

- On the **Services** screen in the Custom Services Table for customized services (see Figure 5-9) [**Security** > **Services**].
- On the **LAN WAN Outbound Services** screen (see Figure 5-2) [**Security** > **Firewall** > **LAN WAN Rules** and click **Add** to the Outbound Services].

The QoS priority definition for a service determines the queue that is used for the traffic passing through the firewall. A priority is assigned to IP packets using this service. Priorities are defined by the “Type of Service (ToS) in the Internet Protocol Suite” standards, RFC 1349. A ToS priority for traffic passing through the VPN firewall is one of the following:

- **Normal-Service.** No special priority given to the traffic. The IP packets for services with this priority are marked with a ToS value of 0.
- **Minimize-Cost.** Used when data has to be transferred over a link that has a lower “cost”. The IP packets for services with this priority are marked with a ToS value of 1.
- **Maximize-Reliability.** Used when data needs to travel to the destination over a reliable link and with little or no retransmission. The IP packets for services with this priority are marked with a ToS value of 2.
- **Maximize-Throughput.** Used when the volume of data transferred during an interval is important even if the latency over the link is high. The IP packets for services with this priority are marked with a ToS value of 4.
- **Minimize-Delay.** Used when the time required (latency) for the packet to reach the destination must be low. The IP packets for services with this priority are marked with a ToS value of 8.

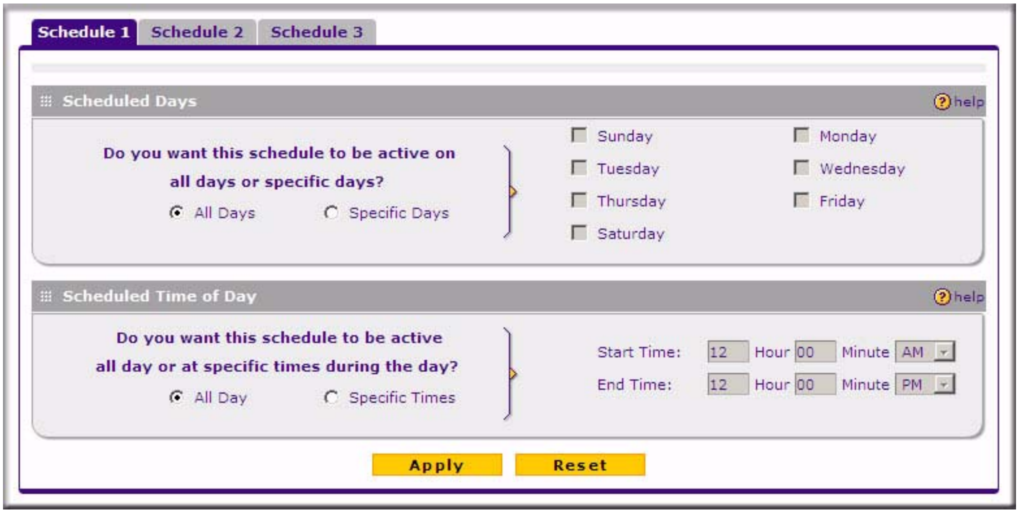
Setting Schedules to Block or Allow Traffic

If you enabled Content Filtering in the Block Sites menu, or if you defined an outbound or inbound rule to use a schedule, you can set up a schedule for when blocking occurs or when access is restricted. The firewall allows you to specify when blocking will be enforced by configuring one of the Schedules—Schedule 1, Schedule 2 or Schedule 3.

To invoke rules and block keywords or Internet domains based on a schedule:

1. Select **Security** > **Schedule** from the main/submenu.

   The Schedule 1 screen displays as the default selection, along with tabs for Schedules 2 and 3.



Scheduled Days

Do you want this schedule to be active on all days or specific days?

● All Days ○ Specific Days

□ Sunday □ Monday
□ Tuesday □ Wednesday
□ Thursday □ Friday
□ Saturday

Scheduled Time of Day

Do you want this schedule to be active all day or at specific times during the day?

● All Day ○ Specific Times

Start Time: 12 Hour 00 Minute AM
End Time: 12 Hour 00 Minute PM

Figure 5-10OK

2. Select either All Days or Specific Days.

   If you chose Specific Days, select each day the schedule will be in effect.

3. For the time of day, select either All Day or Specific Times.

   If you chose Specific Times, enter the Start Time and End Time (Hour, Minute, AM/PM) to gate access during the selected days.

4. Click **Apply** to save your settings to **Schedule 1.**

Repeat this procedure to set schedules for **Schedule 2** and **Schedule 3.**

Setting Block Sites (Content Filtering)

To restrict internal LAN users from access to certain sites on the Internet, you can use the VPN firewall's Content Filtering and Web Components filtering. By default, these features are disabled; all requested traffic from any Web site is allowed. If you enable one or more of these features and users try to access a blocked site, they will see a "Blocked by NETGEAR" message.

Several types of blocking are available:

- **Web Components blocking**. You can block the following Web component types: Proxy, Java, ActiveX, and Cookies. Even sites on the Trusted Domains list will be subject to Web Components blocking when the blocking of a particular Web component is enabled.
- **Keyword Blocking (Domain Name Blocking)**. You can specify up to 32 words to block. If any of these words appear in the Web site name (URL) or in a newsgroup name, the web site or newsgroup will be blocked by the VPN firewall.

  You can apply the keywords to one or more groups. Requests from the PCs in the groups will be blocked where keyword blocking has been enabled. Blocking does not occur for the PCs in the groups where keyword blocking has been disabled.

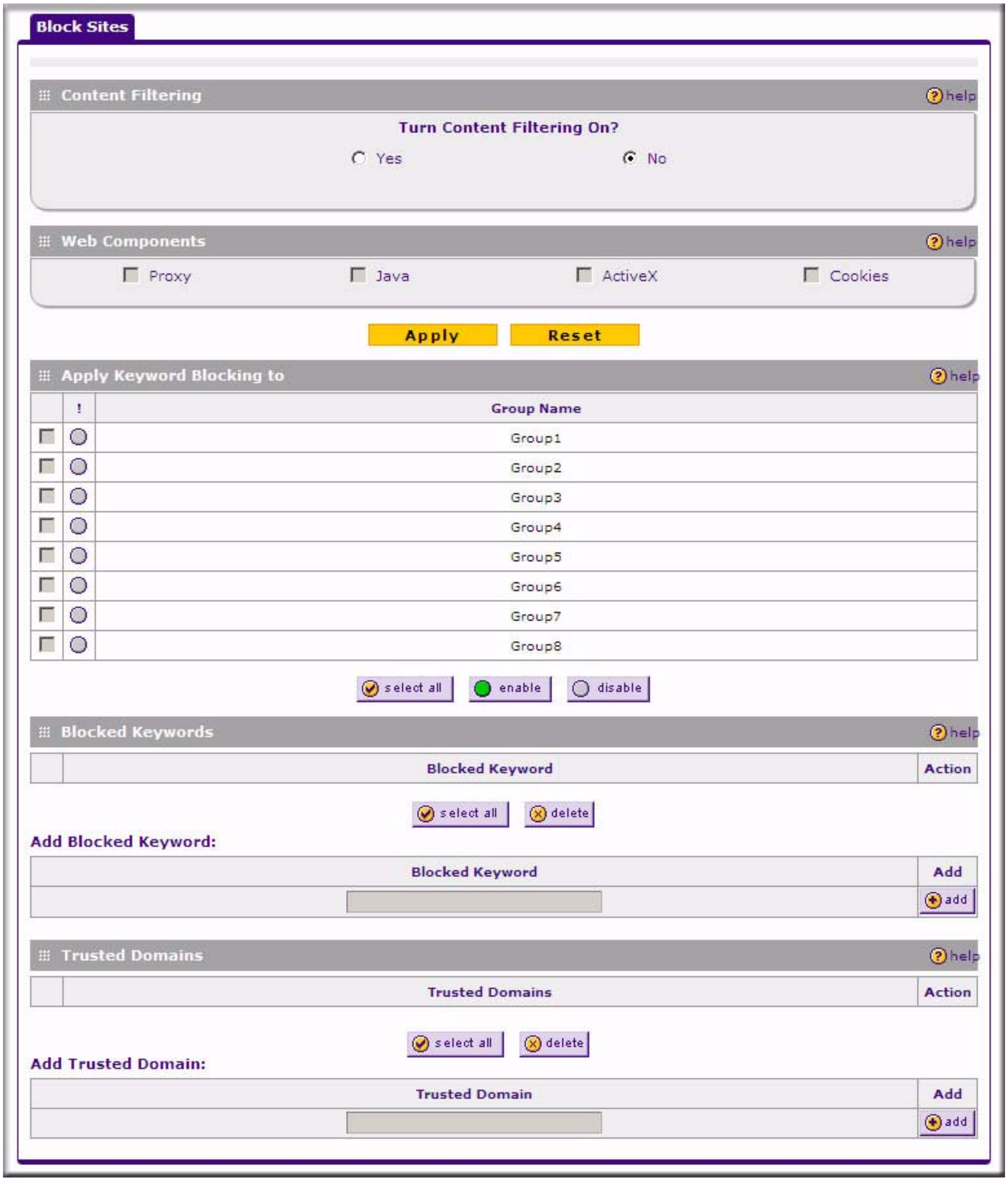
  You can bypass Keyword blocking for trusted domains by adding the exact matching domain to the list of Trusted Domains. Access to the domains or keywords on this list by PCs in the groups where keyword blocking has been enabled, will be allowed to pass without any blocking.

Keyword application examples:

- If the keyword "XXX" is specified, the URL <http://www.badstuff.com/xxx.html> is blocked, as is the newsgroup alt.pictures.XXX.
- If the keyword ".com" is specified, only Web sites with other domain suffixes (such as .edu or .gov) can be viewed.
- If you wish to block all Internet browsing access, enter the keyword ".".

To enable Content Filtering:

1. Select **Security > Block Sites** from the main/submenu and the **Block Sites** screen is displayed.



Content Filtering

Turn Content Filtering On?

○ Yes ● No

Web Components

□ Proxy □ Java □ ActiveX □ Cookies

Apply Keyword Blocking to

	!	Group Name
□	○	Group1
□	○	Group2
□	○	Group3
□	○	Group4
□	○	Group5
□	○	Group6
□	○	Group7
□	○	Group8

Blocked Keywords

	Blocked Keyword	Action

Add Blocked Keyword:

Blocked Keyword	Add
	add

Trusted Domains

	Trusted Domains	Action

Add Trusted Domain:

Trusted Domain	Add
	add

Figure 5-11OK

2. Select **Yes** to enable Content Filtering.
3. Click **Apply** to activate the menu controls.

4. Select any Web Components you wish to block.

    Proxy, Java, ActiveX, or Cookies

5. Select the groups to which Keyword Blocking will apply, then click **Enable** to activate Keyword blocking (or disable to deactivate Keyword Blocking).

6. Enter your list of blocked Keywords or Domain Names in the **Blocked Keyword** fields and click **Add** after each entry**.**

    The Keyword or Domain name will be added to the **Blocked Keywords** table. You can also edit an entry by clicking **Edit** in the Action column adjacent to the entry.

7. Enter a list of Trusted Domains in the **Trusted Domains** fields, and click **Add** after each entry**.**

    The Trusted Domain will appear in the **Trusted Domains** table. You can also edit any entry by clicking **Edit** in the Action column adjacent to the entry.

8. Click **Apply** to save your settings.

Enabling Source MAC Filtering (Address Filter)

In the Address Filter submenu, the Source MAC Filter tab allows you to block traffic coming from certain known machines or devices.

- By default, the source MAC address filter is disabled. Traffic received from any MAC address is allowed.
- When source MAC address filtering is enabled, traffic will be dropped from any computers or devices whose MAC addresses are listed in the **Blocked MAC Addresses** table.

> ➡ **Note:** For additional ways of restricting outbound traffic, see "Outbound Rules (Service Blocking)" on page 5-3

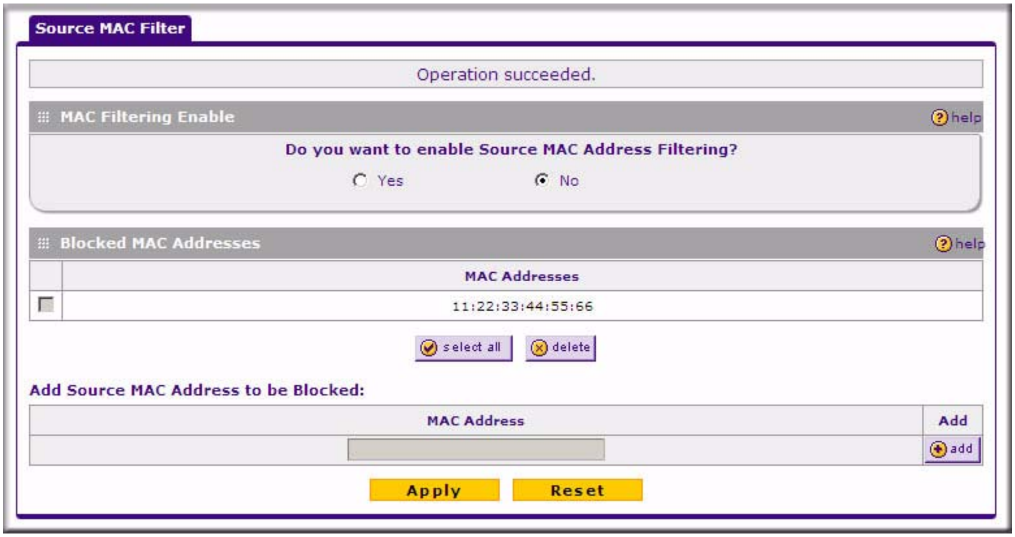
To enable MAC filtering and add MAC addresses for blocking:

1. Select **Security** > **Address Filter** from the main/submenu.

   The Source MAC Filter screen displays.

2. Click the **Yes** radio button to enable Source MAC Filtering.
3. Select the desired Policy for MAC Addresses listed below.

   Block and Permit the rest, or Permit and Block the rest.



Operation succeeded.

MAC Filtering Enable

Do you want to enable Source MAC Address Filtering?

○ Yes ● No

Blocked MAC Addresses

	MAC Addresses
□	11:22:33:44:55:66

Add Source MAC Address to be Blocked:

MAC Address	Add
	add

Figure 5-12 Need new screenshot

4. Enter your list of source MAC addresses to be blocked in the **MAC Address** field in the form 01:23:45:67:89:AB, using colon-separated hexadecimal characters (0-9, A-F).

5. Click the **Add** icon**.**

   The MAC address is added to the **MAC Addresses** table where it will be blocked.

6. Click **Apply** to save your settings.

To remove an entry from the table, select the MAC address entry and click **Delete**.

IP/MAC Binding Tab

The IP/MAC Binding feature allows the VPN firewall to bind IP to MAC address and vice-versa. Some PCs or decvies are configured with static (fixed) addresses. To prevent users from changing static IP addresses, the VPN firewall needs to enable IP/MAC Binding.

If VPN firewall detects packets with matching IP addresses but inconsistent MAC addresses or vice-versa, it will drop such packets. If users have enabled the logging option for IP/MAC Binding on their PCs or devices, these packets will be logged before being droped. The VPN firewall displays the total count of dropped packets, which violated either IP to MAC Binding, or MAC to IP Binding.

To enable IP/MAC Binding and add IP and MAC address for binding:

1. Select **Security** > **Address Filter** from the main/submenu.

The Source MAC Filter screen displays as the default with the IP/MAC Binding tab shown.

2. Click the **IP/MAC Binding** tab to view the options available.
3. Click the **Yes** radio button to enable Source MAC Filtering.

IP/MAC Bind Table

This table lists the currently defined IP/MAC Bind rules:

– Name: Displays the user-defined name for this rule.

– MAC Addresses: Displays the MAC Addresses for this rule.

– IP Addresses: Displays the IP Addresses for this rule.

– Log Dropped Packets: Displays logging option for this rule.

To remove an entry from the table, select the IP/MAC Bind entry and click Delete. To edit an entry, click Edit adjacent to the entry.

Add IP/MAC Bind Rule

– Name: Specify easily identifiable name for this rule.

– MAC Address: Specify the MAC Address for this rule.

– IP Addresses: Specify the IP Address for this rule.

– Log Dropped Packets: Specify Logging option for this rule.

Edit IP/MAC Bind Rule

The following fields of an existing IP/MAC Bind rule can be modified:

– MAC Address: Specify the MAC Address for this rule.

– IP Addresses: Specify the IP Address for this rule.

– Log Dropped Packets: Specify Logging option for this rule.

Click Apply to save the settings when you are done changing them.

Click Reset to discard any changes and revert to the previous settings.

-

Figure 5-13 Need screenshot

Example: If three computers are on the LAN with the following setup:

Host1 -- MAC address(00:01:02:03:04:05) & IP address(192.168.10.10)

Host2 -- MAC address(00:01:02:03:04:06) & IP address(192.168.10.11)

Host3 -- MAC address(00:01:02:03:04:07) & IP address(192.168.10.12)

All the above host entries are added in IP/MAC Binding table. The scenario for the above hosts are as such:

Host1 -- Matching IP & MAC address in IP/MAC Table.

Host2 -- Matching IP but inconsistent MAC address in IP/MAC Table.

Host3 -- Matching MAC but inconsistent IP address in IP/MAC Table.

The router will block the traffic coming from Host2 & Host3 but allow the traffic coming from Host1 to any external network. Total count of dropped packets will be displayed.

Enabling Port Triggering

Port triggering allows some applications running on a LAN network to be available to external applications that would otherwise be partially blocked by the firewall. Using this feature requires the port numbers used by the application.

Once configured, port triggering operates as follows:

1. A PC makes an outgoing connection using a port number defined in the Port Triggering table.
2. The firewall records this connection, opens the additional INCOMING port or ports associated with this entry in the Port Triggering table, and associates them with the PC.
3. The remote system receives the PC’s request and responds using the different port numbers that you have now opened.
4. The VPN firewall matches the response to the previous request, and forwards the response to the PC.

Without Port Triggering, this response would be treated as a new connection request rather than a response. As such, it would be handled in accordance with the inbound service rules.

Note these restrictions with Port Triggering:

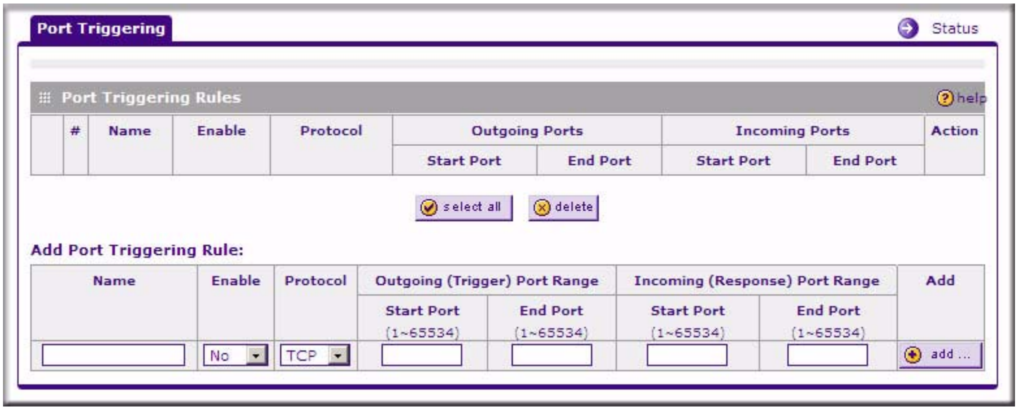
- Only one PC can use a port triggering application at any time.
- After a PC has finished using a port triggering application, there is a time-out period before the application can be used by another PC. This is required because the VPN firewall cannot be sure when the application has terminated.

➡	**Note:** For additional ways of allowing inbound traffic, see “Inbound Rules (Port Forwarding)” on page 5-4.

To add a port triggering rule:

1. Select Security from the main menu and Port Triggering from the submenu.

The **Port Triggering** screen is displayed.



Port Triggering Rules

	#	Name	Enable	Protocol	Outgoing Ports		Incoming Ports		Action
					Start Port	End Port	Start Port	End Port	

Add Port Triggering Rule:

Name	Enable	Protocol	Outgoing (Trigger) Port Range		Incoming (Response) Port Range		Add
			Start Port (1~65534)	End Port (1~65534)	Start Port (1~65534)	End Port (1~65534)	
	No	TCP					add ...

Figure 5-14OK

2. Enter a user-defined name for this rule in the **Name** field.
3. From the **Enable** pull-down menu, indicate if the rule is enabled or disabled.
4. From the **Protocol** pull-down menu, choose either TCP or UDP transport protocol.
5. In the **Outgoing (Trigger) Port Range** fields:
   a. Enter the **Start Port** range (1 - 65534).
   b. Enter the **End Port** range (1 - 65534).
6. In the **Incoming (Response) Port Range** fields:
   a. Enter the **Start Port** range (1 - 65534).
   b. Enter the **End Port** range (1 - 65534).
7. Click **Add.** The port triggering rule is added to the **Port Triggering Rules** table.

To check the status of the port triggering rules, click the **Status** option arrow to the right of the tab on the **Port Triggering** screen.

Bandwidth Profile

The Bandwidth profile sets the limits on the bandwidth of internet link and determines the limits on the data traffic sent to or received from your host. Bandwidth Limiting, by providing limits on the outgoing/incoming traffic, prevents the LAN users for consuming all the bandwidth of internet link. Bandwidth Limiting for outbound traffic is set up on WAN interface, while limits for inbound traffic are set up on the LAN interface for all WAN modes.

Example: When a new connection is established on the VPN firewall, the firewall rules are search for a corresponding rule limit to the connection. If the rule has a bandwidth profile setting, then the firewall will create a bandwidth class in the kernel. If multiple connections correspond to the same firewall rule, these will share the same class.

An exception occurs when an individual type bandwidth profile has classes set per source IP. The "source IP" is the source IP of the first packet of the connection. For the outbound rules, the source IP will be on the LAN side IP and for inbound rules the source IP will be on the WAN-side IP. This class will be deleted when all the connections using the class expire.

1. To access the Bandwidth Profile tab, click **Security > Bandwidth Profile** in the main/ submenu.

   The Bandwidth Profile tab appears on screen with a table titled, List of Bandwidth Profiles.

   - List of Bandwidth Profile Table - This table lists the currently defined bandwidth profiles.
     - Name: Displays the user-defined name for this bandwidth profile.
     - Bandwidth Range: Displays the range for bandwidth profile.
     - Type: Displays the type for bandwidth profile.
     - Direction: Displays direction of inbound or outbound traffic.

Figure 5-15 Need screenshot

2. To add a Bandwidth Profile to the table, click the **Add** button.

   The Add Bandwidth Profile screen displays.

3. Type a value for each parameter text box to create a new bandwidth profile.
   - Profile Name: Specify an easily identifiable name for the profile.
   - Minimum Bandwidth: Specify the minimum bandwidth value in Kbps for the profile.
   - Maximum Bandwidth: Specify the maximum bandwidth value in Kbps for the profile.
   - Type: Select profile type, Group or Individual.
     - Direction: Select Inbound Traffic or Outbound Traffic.

Figure 5-16 Need screenshot

4. If you decide not to enter a new profile once you started a new profile, click **Bandwidth Profile** in the submenu to return to the List of Bandwidth Profiles table.
5. Click **Apply** to save your settings and accept the new bandwidth profile.
6. You can edit any existing profile by clicking **Edit** in the Action column.
7. If you change your mind while creating a new bandwidth profile, click **Reset** to discard any changes and revert to the previous settings.

UPnP (Universal Plug and Play)

The UPnP (Universal Plug and Play) feature allows the VPN Firewall to automatically discover and configure the devices when it searches over LAN and WAN.

1. To access the UPnP tab, click **Security > UPnP** in the main/submenu.

   The UPnP tab appears on screen with various options to select.

2. To enable the UPnP feature, click the **Yes** radio button or **No** to disable it.

- No is the default and the VPN firewall will not automatically configure devices.
- If Yes is selected it activates the two text boxes to the right.

3. Fill in the two text boxes to the right.

- Advertisement Period: Type in the text box (in minutes), how often you want the firewall to broadcast its UPnP information to all devices within range.
- Advertisement Time to Live: Type in the text box (in hops), how many steps (hops) each UPnP packet is allowed to propagate before being discarded.

  Small values will limit the UPnP broadcast range.

Figure 5-17 Need screenshot

4. Click **Reset** to revert to the previous settings.

5. Click **Apply** to save changes.

6. To view the contents of the UPnP Portmap Table, click **Refresh** to refresh the table and search for any new UPnP devices.

The UPnP Portmap Table shows the IP addresses and other settings of UPnP devices that have accessed this wireless VPN firewall.

- Active: A Yes or No indicats if the UPnP device port that established a connection is currently active.
- Protocol: Indicates the network protocol (i.e. HTTP, FTP, etc.) used by the device to connect to the VPN firewall.
- Int. Port (Internal Port): Indicates if any internal ports are opened by the UPnP device.
- Ext. Port (External Port): Indicates if any external ports are opened by the UPnP device.
- IP Address: List the IP address of the UPnP device accessing the VPN firewall.

E-Mail Notifications of Event Logs and Alerts

The Firewall Logs can be configured to log and then e-mail denial of access, general attack information, and other information to a specified e-mail address. For example, your VPN firewall will log security-related events such as: accepted and dropped packets on different segments of your LAN; denied incoming and outgoing service requests; hacker probes and login attempts; and other general information based on the settings you input on the **Firewall Logs & E-mail** menu. In addition, if you have set up Content Filtering on the Block Sites screen (see "Setting Block Sites (Content Filtering)" on page 5-21), a log will be generated when someone on your network tries to access a blocked site.

To configure e-mail or syslog notification, or to view the logs, see "Activating Notification of Events and Alerts" on page 11-4.

Administrator Tips

Consider the following operational items:

1. As an option, you can enable remote management if you have to manage distant sites from a central location (see "Enabling Remote Management Access" on page 9-10).
2. Although rules are the basic way of managing the traffic through your system (see "Using Rules & Services to Block or Allow Traffic" on page 5-2), you can further refine your control with the following optional features of the firewall:
   - Groups and hosts (see "Managing Groups and Hosts (LAN Groups)" on page 3-5)
   - Services (see "Services-Based Rules" on page 5-2)
   - Schedules (see "Setting Schedules to Block or Allow Traffic" on page 5-20)
   - Block sites (see "Setting Block Sites (Content Filtering)" on page 5-21)
   - Source MAC filtering (see "Enabling Source MAC Filtering (Address Filter)" on page 5-24)
   - Port triggering (see "Enabling Port Triggering" on page 5-28)

Chapter 6
Virtual Private Networking Using IPsec

This chapter describes how to use the IPsec virtual private networking (VPN) features of the ProSafe Wireless-N VPN Firewall to provide secure, encrypted communications between your local network and a remote network or computer.

This chapter contains the following sections:

- "Configuring an IPsec VPN Connection using the VPN Wizard"
- "Managing VPN Tunnel Policies"
- "Creating a VPN Client Connection: VPN Client to SRXN3205"
- "Manually Assigning IP Addresses to Remote Users (ModeConfig)"
- "Extended Authentication (XAUTH) Configuration"

Tip: When configuring VPN for a WAN port network, use the VPN Wizard to configure the basic parameters and then edit the VPN and IKE Policy menus for the specific VPN application, if necessary.

Configuring an IPsec VPN Connection using the VPN Wizard

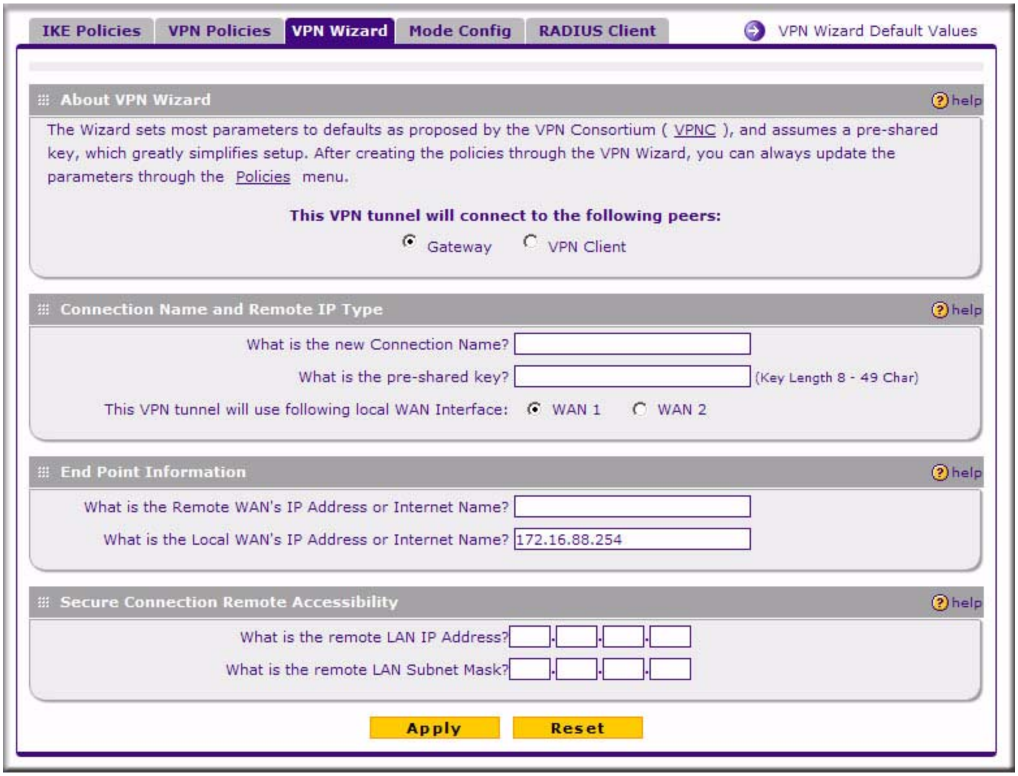
Configuring a VPN tunnel connection requires that all settings and parameters on both sides of the VPN tunnel match or mirror each other precisely, which can be a daunting task. The VPN Wizard efficiently guides you through the setup procedure with a series of questions that will determine the IPsec keys and VPN policies it sets up. The VPN Wizard will also set the parameters for the network connection: Security Association, traffic selectors, authentication algorithm, and encryption. The parameters used by the VPN wizard are based on the recommendations of the VPN Consortium (VPNC), an organization that promotes multi-vendor VPN interoperability.

Creating a VPN Tunnel to a Gateway

You can configure multiple gateway VPN tunnel policies through the VPN Wizard. You can also set up multiple remote VPN client policies through the VPN Wizard. A remote client policy can support up to 200 clients.

To set up a gateway VPN Tunnel using the VPN Wizard:

1. Select **VPN > IPsec VPN** from the main/submenu.
2. Click the **VPN Wizard** tab and the VPN Wizard screen displays.



About VPN Wizard

The Wizard sets most parameters to defaults as proposed by the VPN Consortium (VPNC), and assumes a pre-shared key, which greatly simplifies setup. After creating the policies through the VPN Wizard, you can always update the parameters through the Policies menu.

This VPN tunnel will connect to the following peers:

● Gateway ○ VPN Client

Connection Name and Remote IP Type

What is the new Connection Name?

What is the pre-shared key? (Key Length 8 - 49 Char)

This VPN tunnel will use following local WAN Interface: ● WAN 1 ○ WAN 2

End Point Information

What is the Remote WAN's IP Address or Internet Name?

What is the Local WAN's IP Address or Internet Name? 172.16.88.254

Secure Connection Remote Accessibility

What is the remote LAN IP Address? . . .

What is the remote LAN Subnet Mask? . . .

Figure 6-1 Need new screenshot

1. Select **Gateway** as your **VPN tunnel connection**.

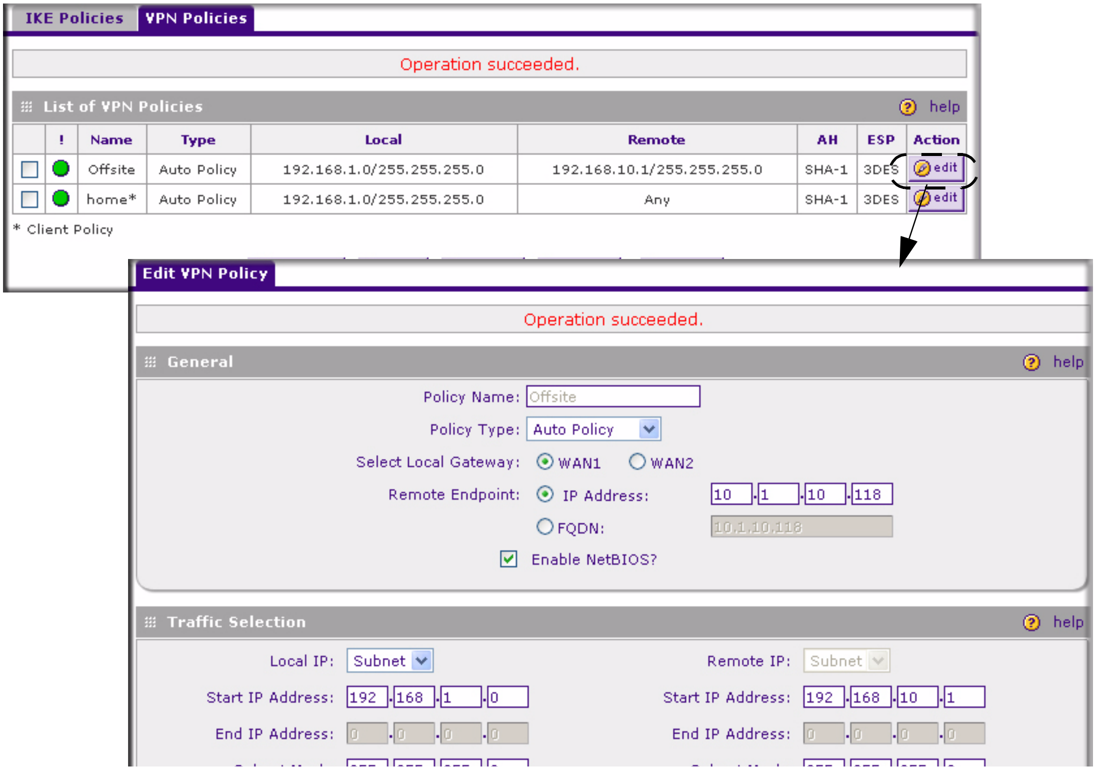
   The wizard needs to know whether you are planning to connect to a remote gateway or setting up the connection for a remote client PC to establish a secure connection to this device.

2. Create a **Connection Name**. Enter an appropriate name for the connection. This name is not supplied to the remote VPN endpoint. It is used to help you manage the VPN settings.
3. Enter a **Pre-shared Key**. The key must be entered both here and on the remote VPN gateway, or the remote VPN client. This key should be minimum of 8 characters and should not exceed 49 characters. This method does not require using a CA (Certificate Authority).
4. {{Select which **WAN interface** (WAN1 or WAN2) will act as this endpoint of the VPN tunnel.}}}
5. Enter the **Remote WAN IP Address or Internet Name** of the gateway to which you want to connect.
   - Both the remote WAN address and your local WAN address are required. When choosing these addresses, follow the guidelines in Table 7-1 above.
   - The remote WAN IP address must be a public address or the Internet name of the remote gateway. The *Internet name* is the Fully Qualified Domain Name (FQDN) as registered in a Dynamic DNS service. Both local and remote endpoints should be defined as either IP addresses or Internet Names (FQDN). A combination of IP address and Internet Name is not permissible.
6. Enter the **Local WAN IP Address or Internet Name** of your gateway, the SRXN3205.

   The Local WAN IP address is used in the IKE negotiation phase. The WAN IP address assigned by your ISP may display automatically. You can modify the address to use your FQDN. An FQDN is required if the WAN Mode you selected is auto-rollover.
7. Enter the **Remote LAN IP Address and Subnet Mask** of the remote gateway.

   The information entered here must match the Local LAN IP and Subnet Mask of the remote gateway; otherwise the secure tunnel will fail to connect. The IP address range used on the remote LAN must be different from the IP address range used on the local LAN.
8. Click the **VPN Wizard Default Values** option arrow at the top right of the screen to view the recommended VPNC parameters that will be used for additional settings configured by the Wizard.
9. Click **Apply** to save your settings.

   The **VPN Policies** screen is displayed showing the new policy as enabled.
10. Click **Edit** in the **Action** column adjacent to the policy to confirm your policy settings.



Operation succeeded.

List of VPN Policies

	!	Name	Type	Local	Remote	AH	ESP	Action
☐	●	Offsite	Auto Policy	192.168.1.0/255.255.255.0	192.168.10.1/255.255.255.0	SHA-1	3DES	edit
☐	●	home*	Auto Policy	192.168.1.0/255.255.255.0	Any	SHA-1	3DES	edit

* Client Policy

Operation succeeded.

General

Policy Name: Offsite

Policy Type: Auto Policy

Select Local Gateway: ● WAN1 ○ WAN2

Remote Endpoint: ● IP Address: 10.1.10.118

○ FQDN: 10.1.10.118

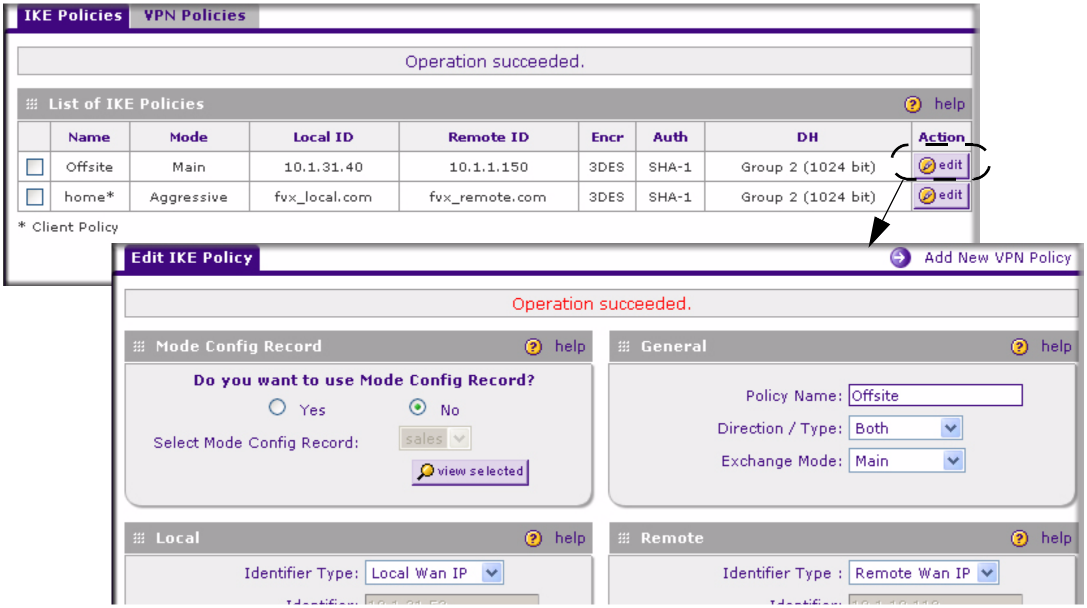
☑ Enable NetBIOS?

Traffic Selection

Local IP:	Subnet	Remote IP:	Subnet
Start IP Address:	192.168.1.0	Start IP Address:	192.168.10.1
End IP Address:	0.0.0.0	End IP Address:	0.0.0.0

Figure 6-2need new screenshot

You can also view the status of your IKE Policies by clicking the **IKE Policies** tab. The **IKE Policies screen** is displayed. Then view or edit the parameters of the new policy by clicking **Edit** in the **Action** column adjacent to the policy. The **Edit IKE Policy** screen will display.



IKE Policies | VPN Policies

Operation succeeded.

List of IKE Policies

	Name	Mode	Local ID	Remote ID	Encr	Auth	DH	Action
□	Offsite	Main	10.1.31.40	10.1.1.150	3DES	SHA-1	Group 2 (1024 bit)	edit
□	home*	Aggressive	fvx_local.com	fvx_remote.com	3DES	SHA-1	Group 2 (1024 bit)	edit

* Client Policy

Edit IKE Policy

Add New VPN Policy

Operation succeeded.

Mode Config Record

Do you want to use Mode Config Record?

○ Yes ● No

Select Mode Config Record: sales

view selected

General

Policy Name: Offsite

Direction / Type: Both

Exchange Mode: Main

Local

Identifier Type: Local Wan IP

Remote

Identifier Type : Remote Wan IP

Figure 6-3OK

Creating a VPN Tunnel Connection to a VPN Client

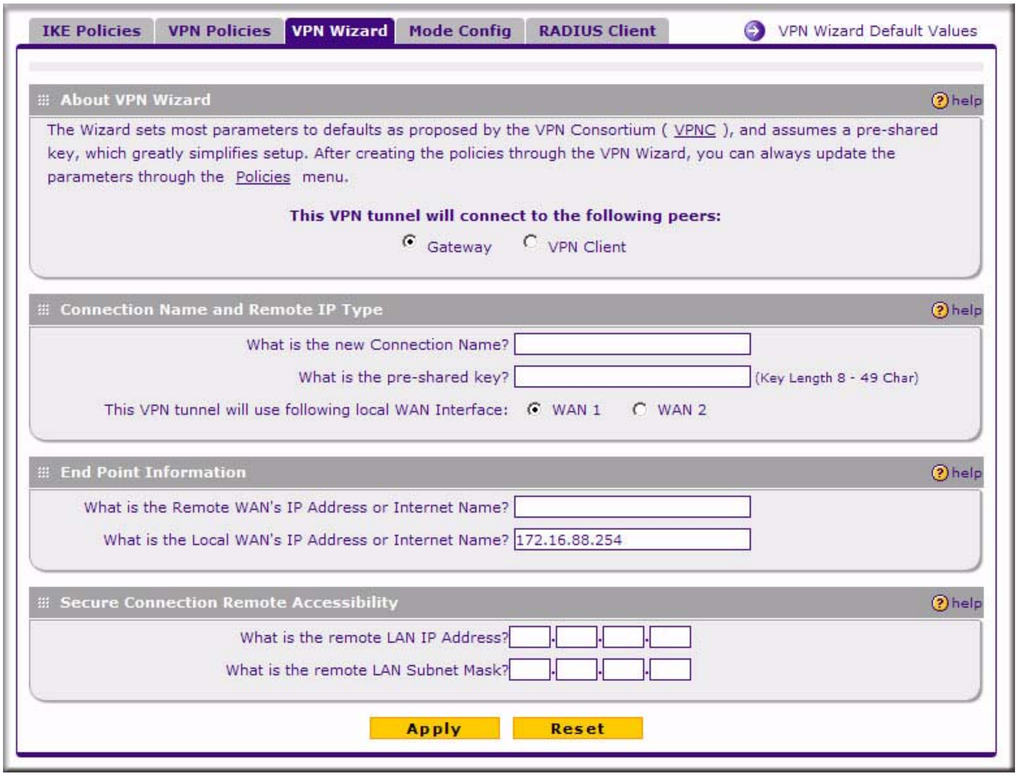
You can set up multiple remote VPN Client policies through the VPN Wizard by changing the default End Point Information settings created for each policy by the wizard. A remote client policy can support up to 200 clients. The remote clients must configure the “Local Identity” field in the policy as “PolicyName<*X*>.fvs_remote.com”, where *X* stands for a number from 1 to 25.

As an example, if the client-type policy on the firewall is configured with “home” as the policy name, and if two users are required to connect using this policy, then the “Local Identity” in their policy should be configured as “home1.fvs_remote.com” and “home2.fvs_remote.com,” respectively.

To configure the VPN client:

1. Select VPN from the main menu and VPN Wizard from the submenu.

The **VPN Wizard** screen displays.



About VPN Wizard

The Wizard sets most parameters to defaults as proposed by the VPN Consortium (VPNC), and assumes a pre-shared key, which greatly simplifies setup. After creating the policies through the VPN Wizard, you can always update the parameters through the Policies menu.

This VPN tunnel will connect to the following peers:

● Gateway ○ VPN Client

Connection Name and Remote IP Type

What is the new Connection Name?

What is the pre-shared key? (Key Length 8 - 49 Char)

This VPN tunnel will use following local WAN Interface: ● WAN 1 ○ WAN 2

End Point Information

What is the Remote WAN's IP Address or Internet Name?

What is the Local WAN's IP Address or Internet Name? 172.16.88.254

Secure Connection Remote Accessibility

What is the remote LAN IP Address?

What is the remote LAN Subnet Mask?

Figure 6-4 New screenshot

2. Select **VPN Client** as your **VPN tunnel connection**.

   The wizard needs to know whether you are planning to connect to a remote gateway or setting up the connection for a remote client PC to establish a secure connection to this device.

3. Create a **Connection Name**.

   Enter an appropriate name for the connection. This name is not supplied to the remote VPN client. It is used to help you manage the VPN settings.

4. Enter a **Pre-shared Key**.

   The key must be entered both here and on the remote VPN gateway, or the remote VPN Client. This key length should be minimum 8 characters and should not exceed 49 characters. This method does not require using a CA (Certificate Authority).

5. {{Select the **WAN interface** to act as this endpoint of the VPN tunnel.}}

6. Enter the public **Remote WAN IP** address of the gateway to which you want to connect.

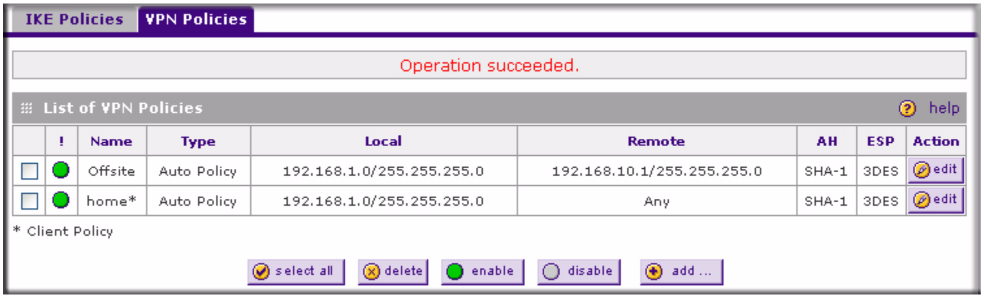
Alternatively, you can provide the Internet name of the gateway. The Internet name is the Fully Qualified Domain Name (FQDN); for example, vpn.netgear.com.

7. Enter the **Local WAN IP Address** or Internet name.

   Both local and remote ends should be defined as either IP addresses or Internet Names (FQDN). A combination of IP address and Internet Name is not permissible.

8. Click **Apply**.

   The **VPN Policies** screen is displayed showing that the Client policy "home" has been added and enabled.



Operation succeeded.

List of VPN Policies

	!	Name	Type	Local	Remote	AH	ESP	Action
□	●	Offsite	Auto Policy	192.168.1.0/255.255.255.0	192.168.10.1/255.255.255.0	SHA-1	3DES	edit
□	●	home*	Auto Policy	192.168.1.0/255.255.255.0	Any	SHA-1	3DES	edit

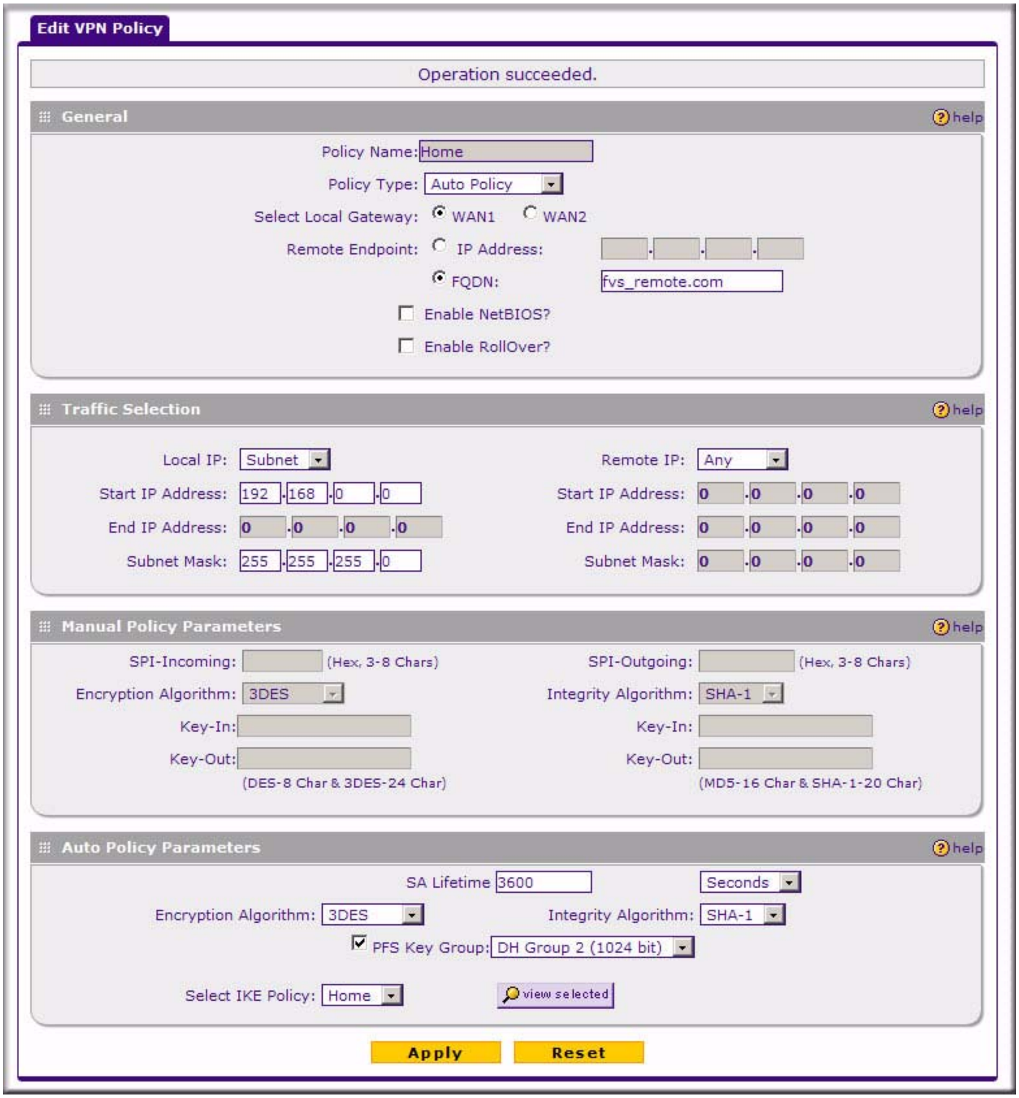
* Client Policy

Figure 6-5

To view the "home" policy:

1. Click **Edit** in the **Action** column adjacent to the "home" policy to view the "home" policy parameters.

   The **Edit VPN Policy** screen is displayed. It should not be necessary to make any changes.



Edit VPN Policy

Operation succeeded.

General

Policy Name: Home

Policy Type: Auto Policy

Select Local Gateway: ● WAN1 ○ WAN2

Remote Endpoint: ○ IP Address: . . .

● FQDN: fvs_remote.com

□ Enable NetBIOS?

□ Enable RollOver?

Traffic Selection

Local IP: Subnet

Start IP Address: 192 . 168 . 0 . 0

End IP Address: 0 . 0 . 0 . 0

Subnet Mask: 255 . 255 . 255 . 0

Remote IP: Any

Start IP Address: 0 . 0 . 0 . 0

End IP Address: 0 . 0 . 0 . 0

Subnet Mask: 0 . 0 . 0 . 0

Manual Policy Parameters

SPI-Incoming: (Hex, 3-8 Chars)

Encryption Algorithm: 3DES

Key-In:

Key-Out:

(DES-8 Char & 3DES-24 Char)

SPI-Outgoing: (Hex, 3-8 Chars)

Integrity Algorithm: SHA-1

Key-In:

Key-Out:

(MD5-16 Char & SHA-1-20 Char)

Auto Policy Parameters

SA Lifetime 3600 Seconds

Encryption Algorithm: 3DES

Integrity Algorithm: SHA-1

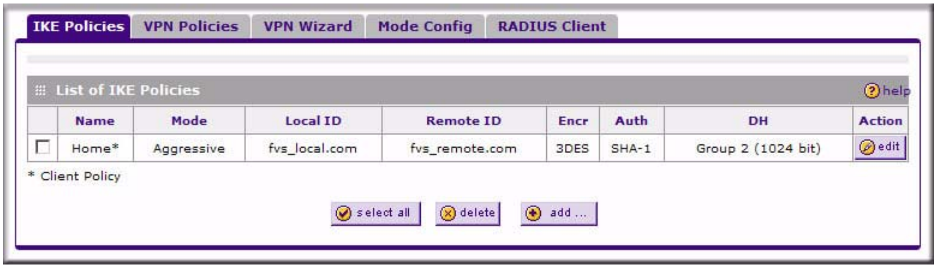
☑ PFS Key Group: DH Group 2 (1024 bit)

Select IKE Policy: Home

Figure 6-6 Need new screenshot

2. You can also view the status of your IKE Policies by clicking the **IKE Policies** tab.

The **IKE Policies** screen displays.



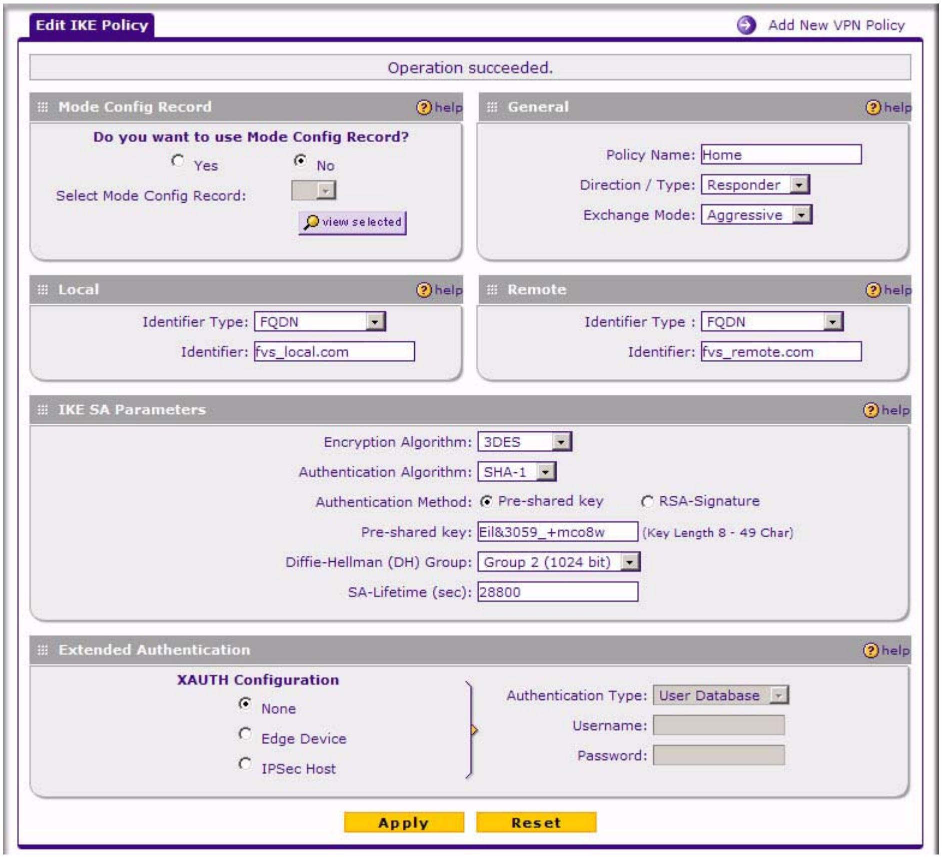
List of IKE Policies

	Name	Mode	Local ID	Remote ID	Encr	Auth	DH	Action
□	Home*	Aggressive	fvs_local.com	fvs_remote.com	3DES	SHA-1	Group 2 (1024 bit)	edit

* Client Policy

Figure 6-7

3. To see the detailed settings of the IKE Policy, click the **Edit** button next to the policy. The **Edit IKE Policy** tab is displayed



Operation succeeded.

Mode Config Record

Do you want to use Mode Config Record?

○ Yes ● No

Select Mode Config Record:

General

Policy Name: Home

Direction / Type: Responder

Exchange Mode: Aggressive

Local

Identifier Type: FQDN

Identifier: fvs_local.com

Remote

Identifier Type : FQDN

Identifier: fvs_remote.com

IKE SA Parameters

Encryption Algorithm: 3DES

Authentication Algorithm: SHA-1

Authentication Method: ● Pre-shared key ○ RSA-Signature

Pre-shared key: Eil&3059_+mco8w (Key Length 8 - 49 Char)

Diffie-Hellman (DH) Group: Group 2 (1024 bit)

SA-Lifetime (sec): 28800

Extended Authentication

XAUTH Configuration

● None

○ Edge Device

○ IPSec Host

Authentication Type: User Database

Username:

Password:

Figure 6-8OK

Managing VPN Tunnel Policies

After you use the VPN Wizard to set up a VPN tunnel, a VPN policy and an IKE policy are stored in separate policy tables. The name you selected as the VPN tunnel connection name during Wizard setup identifies both the VPN policy and IKE policy. You can edit existing policies, or add new VPN and IKE policies directly in the policy tables.

About IKE

The IKE (Internet Key Exchange) protocol performs negotiations between the two VPN gateways, and provides automatic management of the keys used in IPsec. It is important to remember the:

- “Auto” generated VPN policies must use the IKE negotiation protocol.
- “Manual” generated VPN policies cannot use the IKE negotiation protocol.

Managing IKE Policies

IKE Policies are activated when the following occur:

1. The VPN policy selector determines that some traffic matches an existing VPN policy. If the VPN policy is of type “Auto”, then the **Auto Policy Parameters** defined in the VPN policy are accessed which specify which IKE Policy to use.
2. If the VPN Policy is a “Manual” policy, then the **Manual Policy Parameters** defined in the VPN policy are accessed and the first matching IKE policy is used to start negotiations with the remote VPN gateway.
   - If negotiations fail, the next matching IKE policy is used.
   - If none of the matching IKE policies are acceptable to the remote VPN gateway, then a VPN tunnel cannot be established.
3. An IKE session is established, using the SA (Security Association) parameters specified in a matching IKE Policy:
   - Keys and other parameters are exchanged.
   - An IPsec SA (Security Association) is established, using the parameters in the VPN policy.

   The VPN tunnel is then available for data transfer.

About the IKE Policy Table

When you use the VPN Wizard to set up a VPN tunnel, an IKE policy is established and populated in the List of IKE Policies and is given the same name as the new VPN connection name. You can also edit exiting policies or add new IKE policies directly on the List of IKE Policies. Each policy contains the following data:

- **Policy Name**. Uniquely identifies each IKE policy. The name is chosen by you and used for the purpose of managing your policies; it is not supplied to the remote VPN Server.
- **Direction / Type**.
  - Both
  - Initiator
  - Responder
- **Exchange Mode**. Two modes are available: either Main or Aggressive.
  - Main Mode is slower but more secure.
  - Aggressive mode is faster but less secure. (If specifying either a FQDN or a User FQDN name as the Local ID/Remote ID, aggressive mode is automatically selected.)
- **Mode Config Record**
  - Yes
  - No
- **Local ID**. The IKE/ISAKMP identify of this device. (The remote VPN must have this value as their “Remote ID”.)
- **Remote ID**. The IKE/ISAKMP identify of the remote VPN gateway. (The remote VPN must have this value as its Local ID.)
- **IKE SA Parameters**
  - **Encryption Algorithm**. This algorithm is used for the IKE SA. The default setting using the VPN Wizard is 3DES. (This setting must match the Remote VPN.)
  - **Authentication Algorithm**. This algorithm is used for the IKE SA. The default setting using the VPN Wizard is SHA1. (This setting must match the Remote VPN.)
  - Authenticaton Method
  - Pre-sharerd Key

- Diffie-Hellman (DH) Group. This method is used when exchanging keys. The DH group sets the number of bits. The VPN Wizard default setting is Group 2. (This setting must match the remote VPN.)
- SA-Lifetime (sec)
- Enable Dead Peer Detection, if yes
  - Detection Period
  - Reconnect after failure count

- **Extended Authenticaton**. The XAUTH Configuration
  - None
  - Edge Device
  - IPSec Host

  To gain a more complete understanding of the encryption, authentication and DH algorithm technologies, see Appendix B, “Related Documents” for a link to the NETGEAR website.

VPN Policy

You can create two types of VPN policies. When using the VPN Wizard to create a VPN policy, only the Auto method is available.

- **Manual**. All settings (including the keys) for the VPN tunnel are manually input at each end (both VPN Endpoints). No third party server or organization is involved.
- **Auto**. Some parameters for the VPN tunnel are generated automatically by using the IKE (Internet Key Exchange) protocol to perform negotiations between the two VPN Endpoints (the Local ID Endpoint and the Remote ID Endpoint).

In addition, a Certificate Authority (CA) can also be used to perform authentication (see “Managing Certificates” on page 8-9). To use a CA, each VPN gateway must have a certificate from the CA. For each certificate, there is both a public key and a private key. The public key is freely distributed, and is used to encrypt data. The receiver then uses its private key to decrypt the data (without the private key, decryption is impossible). The use of certificates for authentication reduces the amount of data entry required on each VPN endpoint.

Managing VPN Policies

The VPN Policies screen allows you to add additional policies—either Auto or Manual—and to manage the VPN policies already created. You can edit policies, enable or disable policies, or delete them entirely. The rules for VPN policy use are:

1. Traffic covered by a policy will automatically be sent via a VPN tunnel.
2. When traffic is covered by two or more policies, the first matching policy will be used. (In this situation, the order of the policies is important. However, if you have only one policy for each remote VPN Endpoint, then the policy order is not important.)
3. The VPN tunnel is created according to the parameters in the SA (Security Association).
4. The remote VPN Endpoint must have a matching SA, or it will refuse the connection.

VPN Policy Table

Only one Client Policy may configured at a time (noted by an "*" next to the policy name). The Policy Table contains the following fields:

- **! (Status)**. Indicates whether the policy is enabled (green circle) or disabled (grey circle). To Enable or Disable a Policy, check the radio box adjacent to the circle and click **Enable** or **Disable**, as required.
- **Name**. Each policy is given a unique name (the Connection Name when using the VPN Wizard).
- **Type**. The Type is "Auto" or "Manual" as described previously (Auto is used during VPN Wizard configuration).
- **Local**. IP address (either a single address, range of address or subnet address) on your local LAN. Traffic must be from (or to) these addresses to be covered by this policy. (The Subnet address is supplied as the default IP address when using the VPN Wizard).
- **Remote**. IP address or address range of the remote network. Traffic must be to (or from) these addresses to be covered by this policy. (The VPN Wizard default requires the remote LAN IP address and subnet mask).
- **Auth**. Authentication Algorithm used for the VPN tunnel. The default setting using the VPN Wizard is SHA1. (This setting must match the Remote VPN.)
- **Encr**. Encryption algorithm used for the VPN tunnel. The default setting using the VPN Wizard is 3DES. (This setting must match the Remote VPN.)
- **Action**. Allows you to access individual policies to make any changes or modifications.

VPN Tunnel Connection Status

Recent VPN tunnel activity is shown on the **IPsec Connection Status** screen (accessed by selecting **VPN** from the main menu and **Connection Status** from the submenu).You can set a Poll Interval (in seconds) to check the connection status of all active IKE Policies to obtain the latest

VPN tunnel activity. The Active IPsec (SA)s table also lists current data for each active IPsec SA (Security Association):

- **Policy Name**. The name of the VPN policy associated with this SA.
- **Endpoint**. The IP address on the remote VPN Endpoint.
- **Tx (KBytes)**. The amount of data transmitted over this SA.
- **Tx (Packets)**. The number of packets transmitted over this SA.
- **State**. The current state of the SA. Phase 1 is “Authentication phase” and Phase 2 is “Key Exchange phase”.
- **Action**. Allows you to terminate or build the SA (connection), if required.

Creating a VPN Client Connection: VPN Client to SRXN3205

This section describes how to configure a VPN connection between a Windows PC and the SRXN3205 firewall.

Using the SRXN3205's VPN Wizard, we will create a single set of VPN client policies (IKE and VPN) that will allow up to 200 remote PCs to connect from locations in which their IP addresses are unknown in advance. The PCs may be directly connected to the Internet or may be behind NAT routers. If more PCs are to be connected, an additional policy or policies must be created.

Each PC will use Netgear's ProSafe VPN Client software. Since the PC's IP address is assumed to be unknown, the PC must always be the initiator of the connection.

This procedure was developed and tested using:

- Netgear SRXN3205 ProSafe Wireless-N VPN Firewall
- Netgear ProSafe VPN Client
- NAT router: Netgear FR114P

Configuring the SRXN3205

1. Start/open the VPN Wizard.
2. Select the **VPN Client** radio button for type of VPN connection.
3. Give the client connection a name, such as “home”.
4. Enter a value for the pre-shared key.

5. {{Check either the WAN1 or WAN2 radio box to select the WAN interface tunnel.}}}
6. Enter the remote WAN's IP Address or Internet Name and then enter the local WAN's IP Address or Internet Name. In this example, we are using their FQDNs. (Both the local and remote addresses must be of the same type—either both must be FQDN or both must be an IP address.)
7. Click **Apply** to create the "home" VPN Client. The **VPN Policies** screen is displayed showing the VPN Client policy as enabled.
8. Click the **IKE Policies** tab to display the **IKE Policies** table and click **Edit** adjacent to the "home" policy to view the "home" policy details.

   You can augment user authentication security by enabling the XAUTH server by selecting the **Edge Device** radio box and then adding users to the user database (see "Extended Authentication (XAUTH) Configuration" on page 6-22 and "User Database Configuration" on page 6-24, respectively). As an alternative to the local user database, you can also choose a RADIUS server.

Configuring the VPN Client

From a PC with the Netgear Prosafe VPN Client installed, you can configure a VPN client policy to connect to the SRXN3205.

To configure your VPN client:

1. Right-click on the VPN client icon in your Windows toolbar and choose **Security Policy Editor**.
2. In the upper left of the Policy Editor window, click the New Document icon to open a New Connection.Give the New Connection a name, such as **`to_FVG`**.
3. From the **ID Type** pull-down menu, choose **IP Subnet**.
4. Enter the LAN IP **Subnet Address** and **Subnet Mask** of the SRXN3205 LAN. Check the **Connect using** radio box and choose **Secure Gateway Tunnel** from the pull-down menu.
5. From the first **ID Type** pull-down menus, choose **Domain Name** and enter the FQDN address of the SRXN3205.
6. From the second **ID Type** pull-down menu, choose **Gateway IP Address** and enter the WAN IP Gateway address of the SRXN3205.
7. In the left frame, click **My Identity**.
8. From the **Select Certificate** pull-down menu, choose **None**.
9. From the ID Type pull-down menu, choose **Domain Name.**

The value entered under Domain Name will be of the form “<*name*><*XY*>.fvg_remote.com”, where each user must use a different variation on the Domain Name entered here. The <*name*> is the policy name used in the SRXN3205 configuration. In this example, it is “home”. X and Y are an arbitrary pair of numbers chosen for each user.

Note: X may not be zero!

In this example, we have entered **home11.fvg_remote.com**. Up to 200 user variations can be served by one policy.

10. Leave **Virtual Adapter** disabled, and click your computer’s Network Adapter. Your current IP address will appear.

5. Before leaving the My Identity menu, click **Pre-Shared Key**.
6. Click **Enter Key** and then enter your preshared key, and click **OK**. This key will be shared by all users of the SRXN3205 policy “home”.
7. In the left frame, click **Security Policy.**
8. For the **Phase 1 Negotiation Mode**, check the **Aggressive Mode** radio box.
9. **PFS** should be disabled, and **Enable Replay Detection** should be enabled.
10. In the left frame, expand **Authentication (Phase 1)** and choose **Proposal 1**. The Proposal 1 fields should mirror those in the following figure. No changes should be necessary.
11. In the left frame, expand **Key Exchange (Phase 2)** and choose **Proposal 1**. The fields in this proposal should also mirror those in the following figure. No changes should be necessary.
12. In the upper left of the window, click the disk icon to save the policy.

Testing the Connection

1. From your PC, right-click on the VPN client icon in your Windows toolbar and choose **Connect...**, then **My Connections\to_FVG**.

   Within 30 seconds you should receive the message “Successfully connected to My Connections\to_FVG” and the VPN client icon in the toolbar should say On:

2. For additional status and troubleshooting information, right-click on the VPN client icon Logs and Connection Status screens in the SRXN3205.

Manually Assigning IP Addresses to Remote Users (ModeConfig)

To simply the process of connecting remote VPN clients to the SRXN3205, the ModeConfig module can be used to assign IP addresses to remote users, including a network access IP address, subnet mask, and name server addresses from the firewall. Remote users are given IP addresses available in secured network space so that remote users appear as seamless extensions of the network.

In the following example, we configured the firewall using ModeConfig, and then configured a PC running ProSafe VPN Client software using these IP addresses.

- NETGEAR SRXN3205 ProSafe Wireless-N VPN Firewall
  - WAN IP address: 172.21.4.1
  - LAN IP address/subnet: 192.168.2.1/255.255.255.0
- NETGEAR ProSafe VPN Client software IP address: 192.168.1.2

Mode Config Operation

After IKE Phase 1 is complete, the VPN connection initiator (remote user/client) asks for IP configuration parameters such as IP address, subnet mask and name server addresses. The Mode Config module will allocate an IP address from the configured IP address pool and will activate a temporary IPsec policy using the template security proposal information configured in the Mode Config record.

➡	**Note:** After configuring a Mode Config record, you must go to the IKE Policies menu and configure an IKE policy using the newly-created Mode Config record as the Remote Host Configuration Record. The VPN Policies menu does not need to be edited.

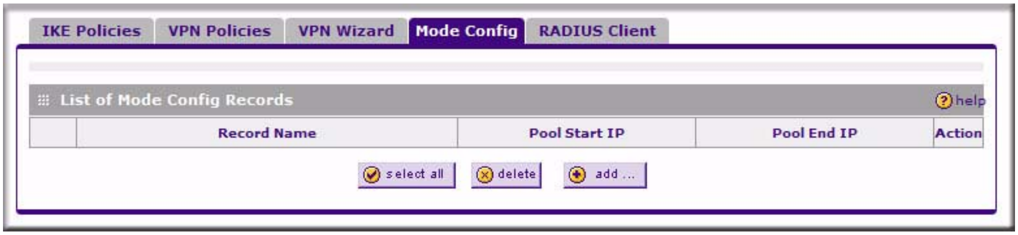
Configuring the VPN Firewall

Two menus must be configured—the Mode Config menu and the IKE Policies menu.

To configure the Mode Config menu:

1. Click **VPN** in the main menu.
2. Click **IPsec VPN** in the submenu.

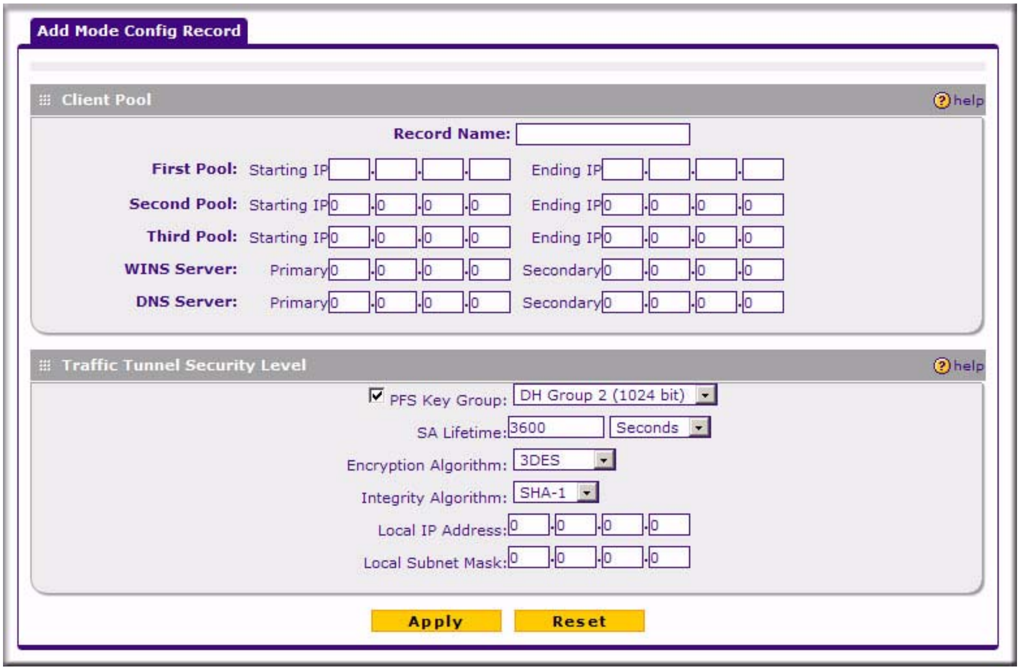
3. Click the **Mode Config** tab. The Mode Config tab is displayed..



	Record Name	Pool Start IP	Pool End IP	Action

Figure 6-9OK

4. Click **Add.** The **Add Mode Config Record** screen is displayed



Record Name:

First Pool: Starting IP . . . Ending IP . . .

Second Pool: Starting IP 0 . 0 . 0 . 0 Ending IP 0 . 0 . 0 . 0

Third Pool: Starting IP 0 . 0 . 0 . 0 Ending IP 0 . 0 . 0 . 0

WINS Server: Primary 0 . 0 . 0 . 0 Secondary 0 . 0 . 0 . 0

DNS Server: Primary 0 . 0 . 0 . 0 Secondary 0 . 0 . 0 . 0

☑ PFS Key Group: DH Group 2 (1024 bit)

SA Lifetime: 3600 Seconds

Encryption Algorithm: 3DES

Integrity Algorithm: SHA-1

Local IP Address: 0 . 0 . 0 . 0

Local Subnet Mask: 0 . 0 . 0 . 0

Figure 6-10OK

5. Enter a descriptive **Record Name** such as “Sales”.

6. Assign at least one range of IP Pool addresses in the First IP Pool field to give to remote VPN clients.

Note: The IP Pool should not be within your local network IP addresses. Use a different range of private IP addresses such as 172.20.xx.xx.

7. If you have a WINS Server on your local network, enter its IP address.

8. Enter one or two DNS Server IP addresses to be used by remote VPN clients.

9. If you enable Perfect Forward Secrecy (PFS), choose DH Group 1 or 2. This setting must match exactly the configuration of the remote VPN client,

10. Specify the Local IP Subnet to which the remote client will have access. Typically, this is your firewall's LAN subnet, such as 192.168.2.1/255.255.255.0. (If not specified, it will default to the LAN subnet of the firewall.)

11. Specify the VPN policy settings. These settings must match the configuration of the remote VPN client. Recommended settings are:

- SA Lifetime: 3600 seconds
- Encryption Algorithm: 3DES
- Authentication Algorithm: SHA-1

12. Click **Apply**.

The new record should appear in the VPN Remote Host Mode Config Table. (where is this located????)

Next, you must configure an IKE Policy:

1. On the main menu, click **VPN**. The **IKE Policies** screen is displayed showing the current policies in the **List of IKE Policies** Table. (See Figure 6-7 on page 6-9.)

2. Click **Add** to configure a new IKE Policy. The **Add IKE Policy** screen is displayed.(See Figure 6-8 on page 6-9.)

3. Enable **Mode Config** by checking the **Yes** radio box and selecting the Mode Config record you just created from the pull-down menu. (You can view the parameters of the selected record by clicking the **View selected** radio box.)

Mode Config works only in Aggressive Mode, and Aggressive Mode requires that both ends of the tunnel be defined by an FQDN.

4. In the **General** section:

  - **a.** Enter a descriptive name in the Policy Name Field such as “salesperson”. This name will be used as part of the remote identifier in the VPN client configuration.
  - **b.** Set Direction/Type to Responder.
  - **c.** The Exchange Mode will automatically be set to Aggressive.

5. For Local information:

  - **a.** Select Fully Qualified Domain Name for the Local Identity Type.
  - **b.** Enter an identifier in the Remote Identity Data field that is not used by any other IKE policies. This identifier will be used as part of the local identifier in the VPN client configuration.

6. Specify the IKE SA parameters. These settings must be matched in the configuration of the remote VPN client. Recommended settings are:

  - Encryption Algorithm: 3DES
  - Authentication Algorithm: SHA-1
  - Diffie-Hellman: Group 2
  - SA Lifetime: 3600 seconds

7. Enter a Pre-Shared Key that will also be configured in the VPN client.

8. XAUTH is disabled by default. To enable XAUTH, choose one of the following:

  - **Edge Device** to use this firewall as a VPN concentrator where one or more gateway tunnels terminate. (If selected, you must specify the **Authentication Type** to be used in verifying credentials of the remote VPN gateways.)
  - **IPsec Host** if you want this gateway to be authenticated by the remote gateway. Enter a Username and Password to be associated with the IKE policy. When this option is chosen, you will need to specify the user name and password to be used in authenticating this gateway (by the remote gateway).

9. If Edge Device was enabled, choose the **Authentication Type** from the pull down menu which will be used to verify account information: User Database, RADIUS-CHAP or RADIUS-PAP. Users must be added through the User Database screen (see “Creating a New User Account” on page 8-4 or “RADIUS Client Configuration” on page 6-24).

> **Note:** If RADIUS-PAP is selected, the firewall will first check the User Database to see if the user credentials are available. If the user account is not present, the firewall will then connect to the RADIUS server.

10. Click **Apply.** The new policy will appear in the IKE Policies Table.

Configuring the ProSafe VPN Client for ModeConfig

From a client PC running NETGEAR ProSafe VPN Client software, configure the remote VPN client connection.

To configure the client PC:

1. Right-click the VPN client icon in the Windows toolbar. In the upper left of the Policy Editor window, click the New Policy editor icon.
   - **a.** Give the connection a descriptive name such as “modecfg_test”. (This name will only be used internally).
   - **b.** From the ID Type pull-down menu, choose IP Subnet.
   - **c.** Enter the IP Subnet and Mask of the firewall (this is the LAN network IP address of the gateway).
   - **d.** Check the Connect using radio button and choose Secure Gateway Tunnel from the pull-down menu.
   - **e.** From the ID Type pull-down menu, choose Domain name and enter the FQDN of the firewall; in this example it is “local_id.com”.
   - **f.** Choose Gateway IP Address from the second pull-down menu and enter the WAN IP address of the firewall; in this example it is “172.21.4.1”.
2. From the left side of the menu, click My Identity and enter the following information:
   - **a.** Click **Pre-Shared Key** and enter the key you configured in the SRXN3205 IKE menu.
   - **b.** From the Select Certificate pull-down menu, choose None.
   - **c.** From the ID Type pull-down menu, choose Domain Name and create an identifier based on the name of the IKE policy you created; for example “salesperson11.remote_id.com”.
   - **d.** Under Virtual Adapter pull-down menu, choose Preferred. The Internal Network IP Address should be 0.0.0.0.

     Note: If no box is displayed for Internal Network IP Address, go to Options/ Global Policy Settings, and check the box for “Allow to Specify Internal Network Address.”

   - **e.** Select your Internet Interface adapter from the Name pull-down menu.
3. On the left-side of the menu, choose Security Policy.

- **a.** Under Security Policy, Phase 1 Negotiation Mode, check the Aggressive Mode radio button.
- **b.** Check the Enable Perfect Forward Secrecy (PFS) radio button, and choose the Diffie-Hellman Group 2 from the PFS Key Group pull-down menu.
- **c.** Enable Replay Detection should be checked.

4. Click on Authentication (Phase 1) on the left-side of the menu and choose Proposal 1. Enter the Authentication values to match those in the firewall ModeConfig Record menu.

5. Click on Key Exchange (Phase 2) on the left-side of the menu and choose Proposal 1. Enter the values to match your configuration of the firewall ModeConfig Record menu. (The SA Lifetime can be longer, such as 8 hours [28800 seconds]

6. Click the Save icon to save the Security Policy and close the VPN ProSafe VPN client.

To test the connection:

1. Right-click on the VPN client icon in the Windows toolbar and click Connect. The connection policy you configured will appear; in this case “My Connections\modecfg_test”.

2. Click on the connection. Within 30 seconds the message “Successfully connected to MyConnections/modecfg_test is displayed and the VPN client icon in the toolbar will read “On”.

3. From the client PC, ping a computer on the firewall LAN.

Extended Authentication (XAUTH) Configuration

When connecting many VPN clients to a firewall, an administrator may want a unique user authentication method beyond relying on a single common preshared key for all clients. Although the administrator could configure a unique VPN policy for each user, it is more convenient for the firewall to authenticate users from a stored list of user accounts. XAUTH provides the mechanism for requesting individual authentication information from the user, and a local User Database or an external authentication server, such as a RADIUS server, provides a method for storing the authentication information centrally in the local network.

XAUTH can be enabled when adding or editing an IKE Policy. Two types of XAUTH are available:

- **Edge Device.** If this is selected, the firewall is used as a VPN concentrator where one or more gateway tunnels terminate. If this option is chosen, you must specify the authentication type to be used in verifying credentials of the remote VPN gateways: User Database, RADIUS-PAP, or RADIUS-CHAP.

- **IPsec Host.** If you want authentication by the remote gateway, enter a User Name and Password to be associated with this IKE policy. If this option is chosen, the remote gateway must specify the user name and password used for authenticating this gateway.

Note: If a RADIUS-PAP server is enabled for authentication, XAUTH will first check the local User Database for the user credentials. If the user account is not present, the firewall will then connect to a RADIUS server.

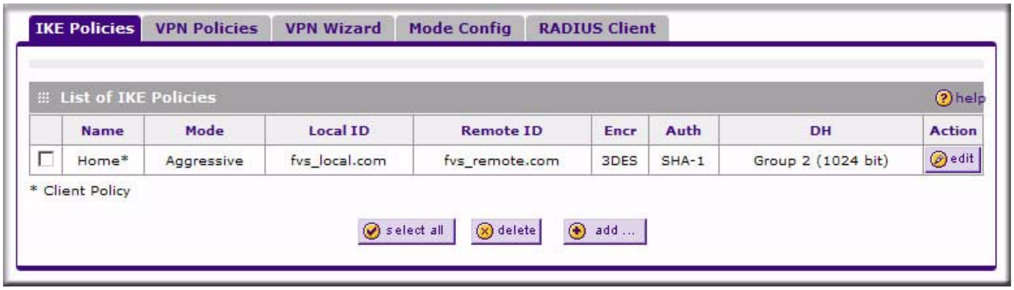
Configuring XAUTH for VPN Clients

Once the XAUTH has been enabled, you must establish user accounts in the User Database to be authenticated against XAUTH, or you must enable a RADIUS-CHAP or RADIUS-PAP server.

Note: If you are modifying an existing IKE Policy to add **XAUTH**, if it is in use by a VPN policy, the VPN policy must be disabled before you can modify the IKE Policy.

To enable and configure XAUTH:

1. Select **VPN** > **IPsec VPN** from the main/submenu.
2. Click the **IKE Policies** tab and the IKE Policies screen displays.



	Name	Mode	Local ID	Remote ID	Encr	Auth	DH	Action
□	Home*	Aggressive	fvs_local.com	fvs_remote.com	3DES	SHA-1	Group 2 (1024 bit)	edit

* Client Policy

Figure 6-11

3. You can add **XAUTH** to an existing IKE Policy by clicking **Edit** adjacent to the policy to be modified or you can create a new IKE Policy incorporating **XAUTH** by clicking **Add.**
4. In the **Extended Authentication** section check the **Edge Device** radio box to use this firewall as a VPN concentrator where one or more gateway tunnels terminate. You then must specify the authentication type to be used in verifying credentials of the remote VPN gateways. (Either the User Database or RADIUS Client must be configured when XAUTH is enabled.)

5. In the **Extended Authentication** section, choose the **Authentication Type** from the pull-down menu which will be used to verify user account information. Select
   - **Edge Device** to use this firewall as a VPN concentrator where one or more gateway tunnels terminate. When this option is chosen, you will need to specify the authentication type to be used in verifying credentials of the remote VPN gateways.
     - **User Database** to verify against the firewall's user database. Users must be added through the User Database screen (see "User Database Configuration" on page 6-24).
     - **RADIUS–CHAP** or **RADIUS–PAP** (depending on the authentication mode accepted by the RADIUS server) to add a RADIUS server. If RADIUS–PAP is selected, the firewall will first check in the user database to see if the user credentials are available. If the user account is not present, the firewall will then connect to the RADIUS server (see "RADIUS Client Configuration" on page 6-24).
   - **IPsec Host** if you want to be authenticated by the remote gateway. In the adjacent **Username** and **Password** fields, type in the information user name and password associated with the IKE policy for authenticating this gateway (by the remote gateway).
6. Click **Apply** to save your settings.

User Database Configuration

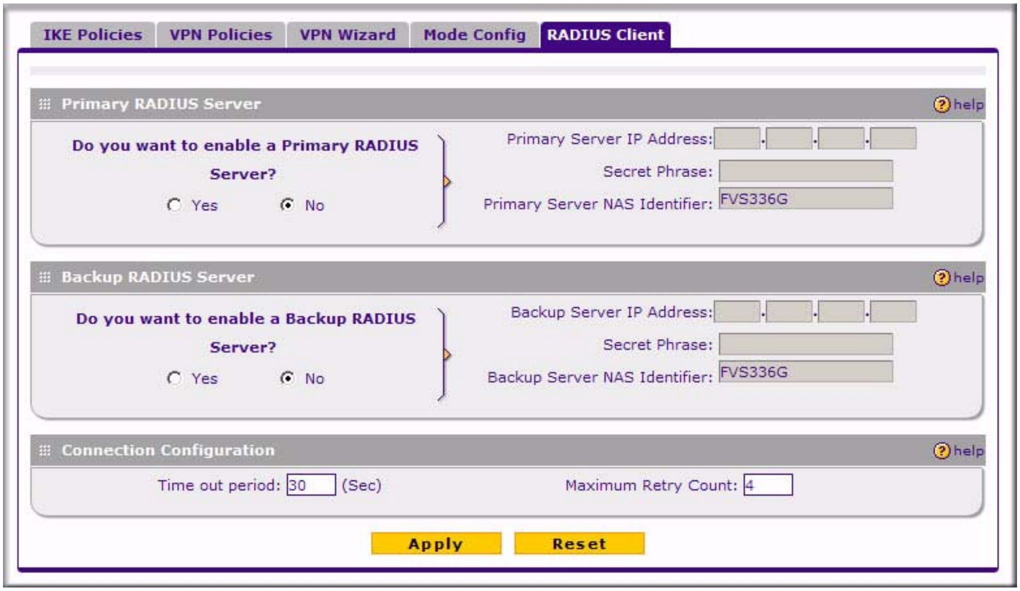
When XAUTH is enabled as an Edge Device, users must be authenticated either by a local User Database account or by an external RADIUS server. Whether or not you use a RADIUS server, you may want some users to be authenticated locally. These users must be added to the List of Users table, as described in "Creating a New User Account" on page 8-4.

RADIUS Client Configuration

RADIUS (Remote Authentication Dial In User Service, RFC 2865) is a protocol for managing Authentication, Authorization, and Accounting (AAA) of multiple users in a network. A RADIUS server will store a database of user information, and can validate a user at the request of a gateway or server in the network when a user requests access to network resources. During the establishment of a VPN connection, the VPN gateway can interrupt the process with an XAUTH request. At that point, the remote user must provide authentication information such as a username/password or some encrypted response using his username/password information. The gateway will try to verify this information, first against a local User Database (if RADIUS-PAP is enabled) and then by relaying the information to a central authentication server such as a RADIUS server.

To configure the Primary RADIUS Server:

1. Select **VPN** > **IPsec VPN** from the main/submenu.
2. Click the **RADIUS Client** tab and the RADIUS Client screen displays.



Primary RADIUS Server

Do you want to enable a Primary RADIUS Server?

○ Yes ● No

Primary Server IP Address: ___.___.___.___

Secret Phrase:

Primary Server NAS Identifier: FVS336G

Backup RADIUS Server

Do you want to enable a Backup RADIUS Server?

○ Yes ● No

Backup Server IP Address: ___.___.___.___

Secret Phrase:

Backup Server NAS Identifier: FVS336G

Connection Configuration

Time out period: 30 (Sec)

Maximum Retry Count: 4

Figure 6-12 Need new sceenshot

3. To activate (enable) the Primary RADIUS server, click the **Yes** radio button. The primary server options become active.
4. Configure the following entries:
   - **Primary RADIUS Server IP address**. The IP address of the RADIUS server.
   - **Secret Phrase**. Transactions between the client and the RADIUS server are authenticated using a shared secret phrase, so the same Secret Phrase must be configured on both client and server.
   - **Primary Server NAS Identifier** (Network Access Server). This Identifier MUST be present in a RADIUS request. Ensure the NAS Identifier is configured identically on both client and server.

The SRXN3205 is acting as a NAS (Network Access Server), allowing network access to external users after verifying their authentication information. In a RADIUS transaction, the NAS must provide some NAS Identifier information to the RADIUS Server. Depending on the configuration of the RADIUS Server, the SRXN3205's IP address may be sufficient as an identifier, or the server may require a name, which you would enter here. This name would also be configured on the RADIUS server, although in some cases it should be left blank on the RADIUS server.

5. Enable a Backup RADIUS Server (if required).
6. Set the **Time Out Period**, in seconds, that the firewall should wait for a response from the RADIUS server.
7. Set the **Maximum Retry Count.** This is the number of tries the firewall will make to the RADIUS server before giving up.
8. Click **Apply** to save the settings.

➡	**Note:** Selection of the Authentication Protocol, usually PAP or CHAP, is configured on the individual IKE policy screens.

Chapter 7
Virtual Private Networking Using SSL

The SRXN3205 ProSafe Wireless-N VPN Firewall provides a hardware-based SSL VPN solution designed specifically to provide remote access for mobile users to their corporate resources, bypassing the need for a pre-installed VPN client on their computers. Using the familiar Secure Sockets Layer (SSL) protocol, commonly used for e-commerce transactions, the SRXN3205 can authenticate itself to an SSL-enabled client, such as a standard web browser. Once the authentication and negotiation of encryption information is completed, the server and client can establish an encrypted connection. With support for 10 concurrent sessions, users can easily access the remote network for a customizable, secure, user portal experience from virtually any available platform.

This chapter contains the following sections:

- "Understanding the Portal Options"
- "Planning for SSL VPN"
- "Creating the Portal Layout"
- "Configuring Domains, Groups, and Users"
- "Configuring Applications for Port Forwarding"
- "Configuring the SSL VPN Client"
- "Using Network Resource Objects to Simplify Policies"
- "Configuring User, Group, and Global Policies"

Understanding the Portal Options

The SRXN3205's SSL VPN portal can provide two levels of SSL service to the remote user:

- VPN Tunnel

  The SRXN3205 can provide the full network connectivity of a VPN tunnel using the remote user's browser in the place of a traditional IPsec VPN client. The SSL capability of the user's browser provides authentication and encryption, establishing a secure connection to the firewall. Upon successful connection, an ActiveX-based SSL VPN client is downloaded to the remote PC that will allow the remote user to virtually join the corporate network. The SSL VPN Client provides a PPP (point-to-point) connection between the client and the firewall, and a virtual network interface is created on the user's PC. The firewall will assign the PC an IP address and DNS server IP addresses, allowing the remote PC to access network resources in the same manner as if it were connected directly to the corporate network, subject to any policy restrictions configured by the administrator.

- Port Forwarding

  Like VPN Tunnel, Port Forwarding is a web-based client that installs transparently and then creates a virtual, encrypted tunnel to the remote network. However, Port Forwarding differs from VPN Tunnel in several ways. For example, Port Forwarding:

  – Only supports TCP connections, not UDP or other IP protocols.

  – Detects and reroutes individual data streams on the user's PC to the Port Forwarding connection rather than opening up a full tunnel to the corporate network.

  – Offers more fine grained management than VPN Tunnel. The administrator defines individual applications and resources that will be available to remote users.

The SSL VPN portal can present the remote user with one or both of these SSL service levels, depending on the configuration by the administrator.

Planning for SSL VPN

To set up and activate SSL VPN connections, you will perform these basic steps in this order:

1. Edit the existing SSL Portal or create a new one.

   When remote users log in to the SSL firewall, they see a portal page that you can customize to present the resources and functions that you choose to make available.

2. Create one or more authentication domains for authentication of SSL VPN users.

   When remote users log in to the SSL firewall, they must specify a domain to which their login account belongs. The domain determines the authentication method to be used and the portal layout that will be presented, which in turn determines the network resources to which they will have access. Because you must assign a portal layout when creating a domain, the domain is created after you have created the portal layout.

3. Create one or more groups for your SSL VPN users.

When you define the SSL VPN policies that determine network resource access for your SSL VPN users, you can define global policies, group policies, or individual policies. Because you must assign an authentication domain when creating a group, the group is created after you have created the domain.

4. Create one or more SSL VPN user accounts.

Because you must assign a group when creating a SSL VPN user account, the user account is created after you have created the group.

5. For port forwarding, declare the servers and services.

Create a list of servers and services that can be made available through user, group, or global policies. You can also associate fully qualified domain names with these servers. The firewall will resolve the names to the servers using the list you have created.

6. For VPN tunnel service, configure the virtual network adapter.

In the VPN tunnel option, the firewall creates a virtual network adapter on the remote PC that will function as if it were on the local network. Configure the portal's SSL VPN Client to define a pool of local IP addresses to be issued to remote clients, as well as DNS addresses. Declare static routes or grant full access to the local network, subject to additional policies.

7. For simplifying policies, define network resource objects.

Network resource objects are groups of IP addresses, IP address ranges, and services. By defining resource objects, you can more quickly create and configure network policies.

8. Configure the policies.

Policies determine access to network resources and addresses for individual users, groups, or everyone.

Creating the Portal Layout

The SSL VPN Portal Layouts menu allows you to create a custom page that remote users will see when they log into the portal. Because the page is completely customizable, it provides an ideal way to communicate remote access instructions, support information, technical contact info, or VPN-related news updates to remote users. The page is also well-suited as a starting page for restricted users; if mobile users or business partners are only permitted to access a few resources, the page you create will present only the resources relevant to these users.

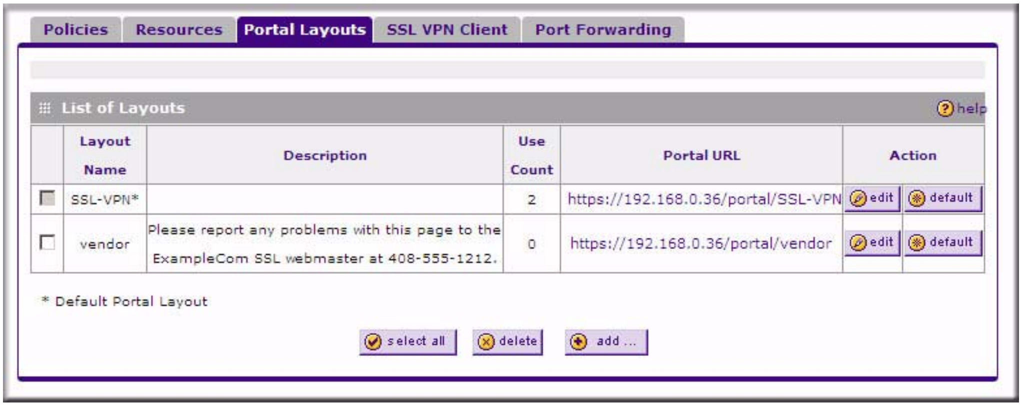
Portal Layouts are applied by selecting from available portal layouts in the configuration of a Domain. When you have completed your Portal Layout, you can apply the Portal Layout to one or more authentication domains (see XREF to apply a Portal Layout to a Domain). You can also make the new portal the default portal for the SSL VPN gateway by selecting the default radio button adjacent to the portal layout name.

Note: The default portal address is **https://<*IP_Address*>/portal/SSL-VPN**.
The domain **geardomain** is attached to the SSL-VPN portal.

The firewall administrator may define individual layouts for the SSL VPN portal. The layout configuration includes the menu layout, theme, portal pages to display, and web cache control options. The default portal layout is the SSL-VPN portal. You can add additional portal layouts. You can also make any portal the default portal for the SSL firewall by clicking the default button in the Action column of the List of Layouts, to the right of the desired portal layout.

To create a New Portal Layout:

1. Select VPN > SSL VPN from the main/submenu, and then select the Portal Layouts tab. The Portal Layouts screen displays.

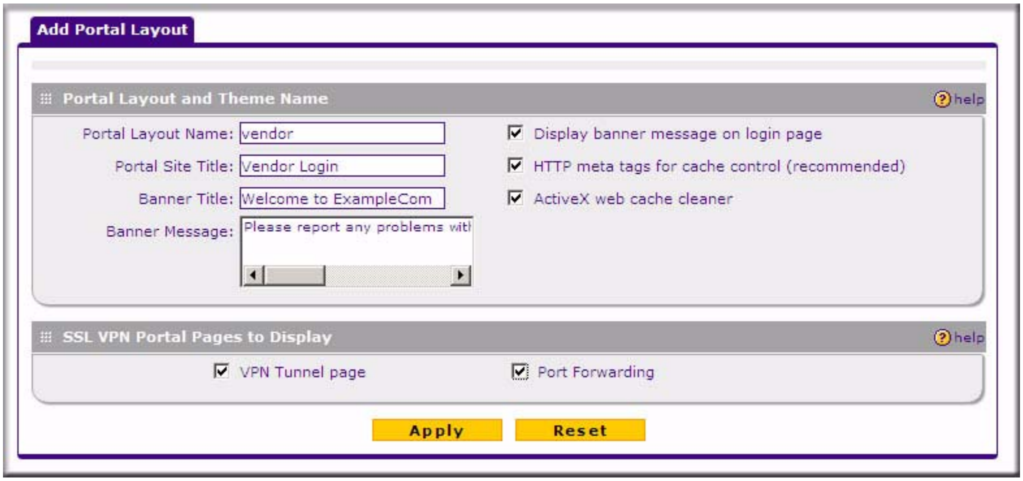


	Layout Name	Description	Use Count	Portal URL	Action	
□	SSL-VPN*		2	https://192.168.0.36/portal/SSL-VPN	edit	default
□	vendor	Please report any problems with this page to the ExampleCom SSL webmaster at 408-555-1212.	0	https://192.168.0.36/portal/vendor	edit	default

* Default Portal Layout

Figure 7-1OK

2. Click **Add**. The Add Portal Layout screen is displayed.



Portal Layout and Theme Name

Portal Layout Name: vendor

Portal Site Title: Vendor Login

Banner Title: Welcome to ExampleCom

Banner Message: Please report any problems wit

☑ Display banner message on login page

☑ HTTP meta tags for cache control (recommended)

☑ ActiveX web cache cleaner

SSL VPN Portal Pages to Display

☑ VPN Tunnel page ☑ Port Forwarding

Figure 7-2OK

3. In the **Portal Layout and Theme Name** section of the menu, configure the following entries:

   a. Enter a descriptive name for the portal layout in the **Portal Layout Name** field. This name will be part of the path of the SSL VPN portal URL.

   > **Note:** Custom portals are accessed at a different URL than the default portal. For example, if your SSL VPN portal is hosted at **https://vpn.company.com**, and you created a portal layout named “sales”, then users will be able to access the sub-site at **https://vpn.company.com/portal/sales**.

   Only alphanumeric characters, hyphen (-), and underscore (_) are accepted for the Portal Layout Name. If you enter other types of characters or spaces, the layout name will be truncated before the first non-alphanumeric character. Note that unlike most other URLs, this name is case sensitive.

   b. In the **Portal Site Title** field, enter a title that will appear at the top of the user’s web browser window.

   c. To display a banner message to users before they log in to the portal, enter the banner title text in the **Banner Title** field. Also enter the banner message text in the **Banner Message** text area. Enter a plain text message or include HTML and JavaScript tags. The maximum length of the login page message is 4096 characters. Select the **Display banner message**