3Com® OfficeConnect®

Gigabit VPN Firewall (3CREVF100-73)

User Guide

3Com Corporation

350 Campus Drive

Marlborough, MA USA 01752-3064

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1 Introduction

Welcome to the world of networking with 3Com. In the modern business environment, communication and sharing information is crucial. Computer networks have proved to be one of the fastest modes of communication but, until recently, only large businesses could afford the networking advantage. The OfficeConnect product range from 3Com has changed all this, bringing networks to the small office.

The products that compose the OfficeConnect line give you, the small office user, the same power, flexibility, and protection that has been available only to large corporations. Now, you can network the computers in your office, connect them all to a single Internet outlet, and harness the combined power of all of your computers.

This User Manual will show you how to set up the OfficeConnect Gigabit VPN Firewall, and how to customize its configuration to get the most out of this product.

1.1 OfficeConnect Gigabit VPN Firewall

The OfficeConnect Gigabit VPN Firewall is designed to provide a robust, secure solution for multi-site small businesses. This completely equipped, broadband-capable Virtual Private Network (VPN) firewall prevents unauthorised external access to your network — and by creating Virtual Private Networks (VPNs) — encrypted links to other private networks. The OfficeConnect Gigabit VPN Firewall also provides Denial of Service (DoS) protection and intrusion detection using Stateful Packet Inspection (SPI), web content filtering, logging and reporting.

1.2 System Requirements

In order to use the OfficeConnect Gigabit VPN Firewall for Internet access, you must have the following:

- ADSL or cable modem and the corresponding service up and running, with at least one public Internet address assigned to your WAN
- One or more computers each containing an Ethernet 10Base-T/100Base-T/1000Base-T network interface card (NIC)
- (Optional) An Ethernet switch, if you are connecting the device to more than four computers on an Ethernet network.
- For system configuration using the supplied web-based program: a web browser such as Internet Explorer v5.5 or later.

1.3 Using this Document

1.3.1 Notational conventions

- Acronyms are defined the first time they appear in text and in the glossary (Appendix 25).
- For brevity, the OfficeConnect Gigabit VPN Firewall is sometimes referred to as "the router."
- The terms *LAN* and *network* are used interchangeably to refer to a group of Ethernet-connected computers at one site.

1.3.2 Typographical conventions

- *Italics* are used to identify terms that are defined in the glossary (Chapter 25).
- **Boldface** type text is used for items you select from menus and drop-down lists, and text strings you type when prompted by the program.

1.3.3 Special messages

This document uses the following icons to call your attention to specific instructions or explanations.

Note	*Provides clarification or non-essential information on the current topic.*
Definition	*Explains terms or acronyms that may be unfamiliar to many readers. These terms are also included in the Glossary.*
WARNING	*Provides messages of high importance, including messages relating to personal safety or system integrity.*

2 Getting to Know the OfficeConnect Gigabit VPN Firewall

2.1 Parts List

In addition to this document, your OfficeConnect Gigabit VPN Firewall should come with the following:

- The OfficeConnect Gigabit VPN Firewall
- Power cord
- RJ45-to-DB9 console port cable
- Four rubber feet
- Rack mount kit
- One CD-ROM containing: The 3Com detect program and this user guide.
- One Warranty Flyer
- Release note

2.2 Front Panel

The front panel contains LED indicators that show the status of the unit and the ports for the data connections.

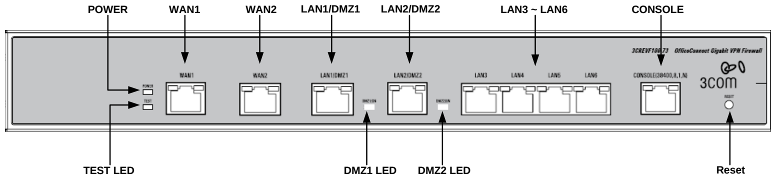


Figure 2.1 Front Panel LEDs

Table 2.1 Front Panel Label and LEDs

Label	Color	Function
POWER	Green	On: Unit is powered on Off: Unit is powered off
STATUS	Amber	(For factory testing only)
Link/Act	Green	Green: Link is established Flashing: Data is transmitted Off: No Link
1000	Green/Amber	Green: Gigabit link Amber: 100M link Off: 10M link or no link
DMZ	Green	Green: This port is used as DMZ port Off: This port is used as LAN port
CONSOLE		RJ-45 serial port for console management
Reset		Resets the device

2.3 Rear Panel

The rear panel contains the AC inlet and power switch. See Figure 2.2 Rear Panel Connections.

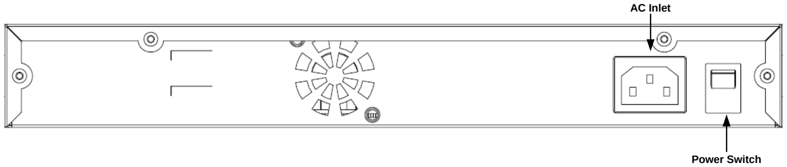


Figure 2.2 Rear Panel Connections

Table 2.2 Rear Panel Labels and LEDs

Label	Function
⏻	Switches the unit on and off
POWER	Connects to the supplied power adapter

2.4 Major Features

2.4.1 Firewall Features

The Firewall as implemented in the OfficeConnect Gigabit VPN Firewall provides the following features to protect your network from being attacked and to prevent your network from being used as the springboard for attacks.

- Address Sharing and Management
- Packet Filtering
- Stateful Packet Inspection
- Defense against Denial of Service Attacks
- Application Content Filtering
- Log and Alert
- Remote Access
- Keyword based Content filtering
- WAN Failover & Load Balancing

2.4.1.1 Address Sharing and Management

The OfficeConnect Gigabit VPN Firewall provides NAT to share a single high-speed Internet connection and to save the cost of multiple connections required for the hosts on the LAN segments connected to the OfficeConnect Gigabit VPN Firewall. This feature conceals network address and prevents them from becoming public. It maps unregistered IP addresses of hosts connected to the LAN with valid ones for Internet access. The OfficeConnect Gigabit VPN Firewall also provides reverse NAT capability, which enables SOHO users to host various services such as e-mail servers, web servers, etc. The NAT rules drive the translation mechanism at the NAT router.

2.4.1.1 ACL (Access Control List)

ACL rule is one of the basic building blocks for network security. Firewall monitors each individual packet, decodes the header information of inbound and outbound traffic and then either blocks the packet from passing or allows it to pass based on the contents of the source address, destination address, source port, destination port, protocol and other criterion, e.g. application filter, Schedules, defined in the ACL rules.

ACL is a very appropriate measure for providing isolation of one subnet from another. It can be used as the first line of defense in the network to block inbound packets of specific types from ever reaching the protected network.

The OfficeConnect Gigabit VPN Firewall's ACL methodology supports:

- Filtering based on destination and source IP address, port number and protocol
- Filter Rule priorities
- Time based filters

- Application specific filters

2.4.1.2 Stateful Packet Inspection

The OfficeConnect Gigabit VPN Firewall uses "stateful packet inspection" that extracts state-related information required for the security decision from the packet and maintains this information for evaluating subsequent connection attempts. It has awareness of application and creates dynamic sessions that allow dynamic connections so that no ports need to be opened other than the required ones. This provides a solution which is highly secure and that offers scalability and extensibility.

2.4.1.3 Defense against DoS Attacks

The OfficeConnect Gigabit VPN Firewall has an Attack Defense Engine that protects internal networks from known types of Internet attacks. It provides automatic protection from Denial of Service (DoS) attacks such as SYN flooding, IP smurfing, LAND, Ping of Death and all re-assembly attacks. It can drop ICMP redirects and IP loose/strict source routing packets. For example, the OfficeConnect Gigabit VPN Firewall provides protection from "WinNuke", a widely used program to remotely crash unprotected Windows systems in the Internet. The OfficeConnect Gigabit VPN Firewall also provides protection from a variety of common Internet attacks such as IP Spoofing, Ping of Death, Land Attack, Reassembly and SYN flooding.

The type of attack protections provided by the OfficeConnect Gigabit VPN Firewall are listed in Table 2.3.

Table 2.3 DoS Attacks

Type of Attack	**Name of Attacks**
Re-assembly attacks	Bonk, Boink, Teardrop (New Tear), Overdrop, Opentear, Syndrop, Jolt
ICMP Attacks	Ping of Death, Smurf, Twinge
Flooders	ICMP Flooder, UDP Flooder, SYN Flooder
Port Scans	TCP XMAS Scan, TCP Null Scan TCP SYN Scan, TCP Stealth Scan
TCP Attacks	TCP sequence number prediction, TCP out-of sequence attacks
Protection with PF Rules	Echo-Chargen, Ascend Kill
Miscellaneous Attacks	IP Spoofing, LAND, Targa, Tentacle MIME Flood, Winnuke, FTP Bounce, IP unaligned time stamp attack

2.4.1.4 Application Command Filtering

The OfficeConnect Gigabit VPN Firewall allows network administrators to block, monitor, and report on network users access to non-business and objectionable content. This high-performance content access control results in increased productivity, lower bandwidth usage and reduced legal liability.

The OfficeConnect Gigabit VPN Firewall has the ability to handle active content filtering on certain application protocols such as HTTP, FTP, SMTP and RPC.

- HTTP – You can define HTTP extension based filtering schemes for blocking
    - ActiveX
    - Java Archive
    - Java Applets
    - URLs based on file extensions.

2.4.1.5 Application Level Gateway (ALG)

Applications such as FTP, games etc., open connections dynamically based on the respective application parameter. To go through the firewall on the OfficeConnect Gigabit VPN Firewall, packets pertaining to an application, require a corresponding *allow* rule. In the absence of such rules, the packets will be dropped by the OfficeConnect Gigabit VPN Firewall. As it is not feasible to create policies for numerous applications dynamically (at the same time without compromising security), intelligence in the form of Application Level Gateways (ALG), is built to parse packets for applications and open dynamic associations. The OfficeConnect Gigabit VPN Firewall provides a number of ALGs for popular applications such as FTP, H.323, RTSP, SIP, etc.

2.4.1.6 Local Content Filtering

A set of keywords that should not appear in the URL (Uniform Resource Locator, e.g. www.yahoo.com) can be defined. Any URL containing one or more of these keywords will be blocked. This is a policy independent feature i.e. it cannot be associated to ACL rules. This feature can be independently enabled or disabled, but works only if firewall is enabled.

2.4.1.7 Log and Alerts

Events in the network, that could be attempts to affect its security, are recorded in the OfficeConnect Gigabit VPN Firewall System log file. Event details are recorded in WELF (WebTrends Enhanced Log Format) format so that statistical tools can be used to generate custom reports. The OfficeConnect Gigabit VPN Firewall can also forward Syslog information to a Syslog server on a private network.

The OfficeConnect Gigabit VPN Firewall supports:

- Alerts sent to the administrator via e-mail.
- Maintains at a minimum, log details such as, time of packet arrival, description of action taken by Firewall and reason for action.
- Supports the UNIX Syslog format.
- Sends log report e-mails as scheduled by the network administrator or by default when the log file is full.
- All the messages are sent in the WELF format.
- ICMP logging to show code and type.

2.4.2 VPN

The introduction of broadband Internet access at an affordable price has attracted a large number of users to use the Internet for business. Large-scale use of a very open public network such as, the Internet comes with a lot of advantages and associated risks. These risks include the lack of confidentiality of data being sent and the authenticity of the identities of the parties involved in the exchange of data. The VPN supported in the OfficeConnect Gigabit VPN Firewall is intended to resolve these issues at an affordable price.

The VPN supported by the OfficeConnect Gigabit VPN Firewall is IPSec compliant. Packets sent via VPN are encrypted to maintain privacy. The encrypted packets are then tunneled through a public network. As a result, tunnel participants enjoy the same security features and facilities that are available only to members of private networks at a reduced cost.

The following table lists the VPN features supported by the OfficeConnect Gigabit VPN Firewall:

Table 2.4 VPN Features of the OfficeConnect Gigabit VPN Firewall

Features
Transport Mode for Client-Client Connectivity

Tunnel Mode for Network-Network Connectivity	
IP Fragmentation and Reassembly	
IPSec	**Support**
Hardware Encryption Algorithm	DES, 3DES, AES
Hardware Authentication Algorithm	MD5, SHA-1
Transforms	ESP, AH
Key Management	IKE , IKEv2
Mode configuration for IKE	Main Mode, Aggressive Mode, Quick Mode

- Site-to-Site VPN connection – Site-to-Site VPN connection is an alternative WAN infrastructure that is used to connect branch offices, home offices, or business partners' sites to all or portions of a company's network.
- Remote Access VPN – Corporations use VPN to establish secure, end-to-end private network connections over a public networking infrastructure. VPN have become the logical solution for remote access connectivity. Deploying a remote access VPN enables corporations to reduce communications expenses by leveraging the local dial-up infrastructure of Internet Service Providers. At the same time, VPNs allow mobile workers, telecommuters and day extenders to take advantage of broadband connectivity.

2.4.3 WAN Failover & Load Balancing

WAN Failover and Load Balancing allows you to designate the one of the assigned interfaces as a backup WAN port. If the primary WAN port is down and/or unavailable, traffic is only routed through the backup WAN port. This allows OfficeConnect Gigabit VPN Firewall to maintain a persistent connection for WAN port traffic by failing over to the backup WAN port.

The primary and secondary WAN ports can also be used in a more dynamic setup, where the administrator can choose a method of dividing outbound traffic flows between the two WAN ports. This feature is referred to as load balancing.

2.4.4 QoS and Bandwidth Management

QoS and Bandwidth Management function allows voice and data traffic to flow through where voice traffic is transmitted in the highest priority. With DiffServ QoS enabled, it guarantees voice packets to have first priority to pass through a DiffServ QoS enabled devices such as router or switch.

2.4.5 Virtual LAN Interfaces (VLAN)

The Virtual Local Area Network (VLAN) feature allows OfficeConnect Gigabit VPN Firewall to be partitioned into non-interacting network domains.

3 Quick Start Guide

This Quick Start Guide provides basic instructions for connecting the OfficeConnect Gigabit VPN Firewall to a computer or a LAN and to the Internet.

- Part 1 provides instructions to set up the hardware.
- Part 2 describes how to configure Internet properties on your computer(s).
- Part 3 shows you how to configure basic settings on the OfficeConnect Gigabit VPN Firewall to get your LAN connected to the Internet.

After setting up and configuring the device, you can follow the instructions on page 18 to verify that it is working properly.

This Quick Start Guide assumes that you have already established ADSL or cable modem service with your Internet service provider (ISP). These instructions provide a basic configuration that should be compatible with your home or small office network setup. Refer to the subsequent chapters for additional configuration instructions.

3.1 Part 1 — Connecting the Hardware

In Part 1, you connect the device to an ADSL or a cable modem (which in turn is connected to a phone jack or a cable outlet), the power outlet, and your computer or network.

WARNING

Before you begin, turn the power off for all devices. *These include your computer(s), your LAN hub/switch (if applicable), and the OfficeConnect Gigabit VPN Firewall.*

WARNING

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

Figure 3.1 illustrates the hardware connections. Please follow the steps that follow for specific instructions.

3.1.1 Step 1. Connect an ADSL or a cable modem.

For the OfficeConnect Gigabit VPN Firewall: Connect one end of the Ethernet cable to the port labeled WAN on the front panel of the device. Connect the other end to the Ethernet port on the ADSL or cable modem.

3.1.2 Step 2. Connect computers or a LAN.

If your LAN has no more than 6 computers, you can use an Ethernet cable to connect computers directly to the built-in switch on the device. Note that you should attach one end of the Ethernet cable to any of the port labeled LAN1 – LAN6 on the front panel of the device and connect the other end to the Ethernet port of a computer.

If your LAN has more than 6 computers, you can attach one end of an Ethernet cable to a hub or a switch (probably an uplink port; please refer to the hub or switch documentations for instructions) and the other to the Ethernet switch port (labeled LAN1 – LAN6) on the OfficeConnect Gigabit VPN Firewall.

Note that either the crossover or straight-through Ethernet cable can be used to connect the built-in switch and computers, hubs or switches as the built-in switch is smart enough to make connections with either type of cables.

3.1.3 Step 3. Attach the power adapter.

Connect the AC power adapter to the POWER connector on the back of the device and plug in the adapter to a wall outlet or a power strip.

3.1.4 Step 4. Turn on the OfficeConnect Gigabit VPN Firewall, the ADSL or cable modem and power up your computers.

Press the Power switch on the rear panel of the OfficeConnect Gigabit VPN Firewall to the ON position. Turn on your ADSL or cable modem. Turn on and boot up your computer(s) and any LAN devices such as hubs or switches.

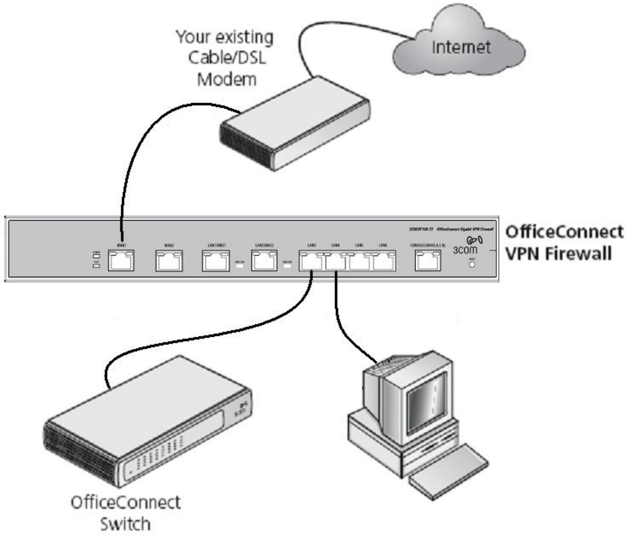


Figure 3.1 Overview of Hardware Connections

You should verify that the LEDs are illuminated as indicated in Table 3.1.

Table 3.1 LED Indicators

This LED:	...should be:
POWER	Solid green to indicate that the device is turned on. If this light is not on, check if the power adapter is attached to the OfficeConnect Gigabit VPN Firewall and if it is plugged into a power source.
LAN1 – LAN6	Solid green to indicate that the device can communicate with your LAN or flashing when the device is sending or receiving data from your LAN computer.
WAN1 – WAN2	Solid green to indicate that the device has successfully established a connection with your ISP or flashing when the device is sending or receiving data from the Internet.

If the LEDs illuminate as expected, the OfficeConnect Gigabit VPN Firewall hardware is working properly.

3.2 Part 2 — Rack Mounting Instructions

The OfficeConnect Gigabit VPN Firewall is 1U high and will fit a 19-inch rack if the rack mount kit is properly installed.

⚠ WARNING

***Elevated Operating Ambient** - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.*

⚠ WARNING

***Reduced Air Flow** - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.*

WARNING

Mechanical Loading *- Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.*

WARNING

Circuit Overloading *- Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.*

WARNING

Reliable Earthing *- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).*

Follow these instructions to install OfficeConnect Gigabit VPN Firewall to your 19-inch rack:

1. Place the unit the right way up on a hard, flat surface with the front facing towards you.
2. Locate a mounting bracket over the mounting holes on one side of the unit, as shown in Figure 3.2 below.
3. Insert the two screws and fully tighten with a suitable screwdriver.
4. Repeat the two previous steps for the other side of the unit.
5. Insert the unit into the 19-inch rack and secure with suitable screws (not provided).
6. Reconnect all cables.

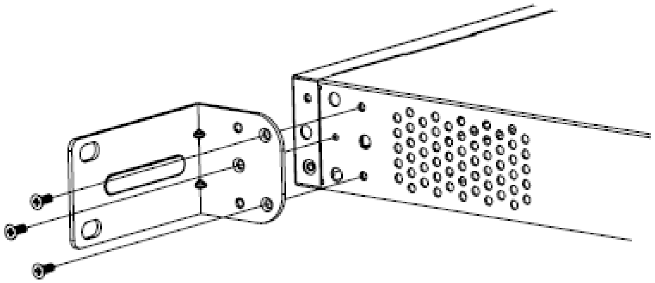


Figure 3.2 Assembling the rack mount kit

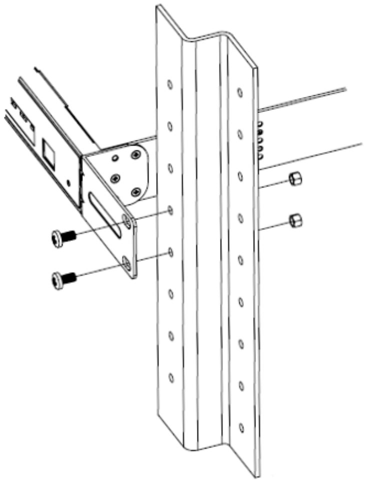


Figure 3.3 Rack Mounting

3.3 Part 3 — Configuring Your Computers

Part 3 of the Quick Start Guide provides instructions for configuring the Internet settings on your computers to work with the OfficeConnect Gigabit VPN Firewall.

3.3.1 Before you begin

By default, the OfficeConnect Gigabit VPN Firewall automatically assigns all required Internet settings to your PCs. You need only to configure the PCs to accept the information when it is assigned.

Note

In some cases, you may want to configure network settings manually to some or all of your computers rather than allow the OfficeConnect Gigabit VPN Firewall to do so. See "Assigning static IP addresses to your PCs" in page 14 for instructions.

- ▶ If you have connected your PC via Ethernet to the OfficeConnect Gigabit VPN Firewall, follow the instructions that correspond to the operating system installed on your PC.

3.3.2 Windows® XP PCs:

1. In the Windows task bar, click the **<Start>** button, and then click **Control Panel**.
2. Double-click the Network Connections icon.
3. In the LAN or High-Speed Internet window, right-click on icon corresponding to your network interface card (NIC) and select **Properties**. (Often this icon is labeled *Local Area Connection*).

   The Local Area Connection dialog box displays with a list of currently installed network items.

4. Ensure that the check box to the left of the item labeled Internet Protocol TCP/IP is checked, and click **<Properties>** button.
5. In the Internet Protocol (TCP/IP) Properties dialog box, click the radio button labeled **Obtain an IP address automatically**. Also click the radio button labeled **Obtain DNS server address automatically**.
6. Click **<OK>** button twice to confirm your changes, and close the Control Panel.

3.3.3 Windows® 2000 PCs:

First, check for the IP protocol and, if necessary, install it:

1. In the Windows task bar, click the **<Start>** button, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Network and Dial-up Connections** icon.
3. In the Network and Dial-up Connections window, right-click the **Local Area Connection** icon, and then select **Properties**.

   The Local Area Connection Properties dialog box displays a list of currently installed network components. If the list includes Internet Protocol (TCP/IP), then the protocol has already been enabled. Skip to step 10.

4. If Internet Protocol (TCP/IP) does not display as an installed component, click **<Install>** button.
5. In the Select Network Component Type dialog box, select **Protocol**, and then click **<Add>** button.
6. Select **Internet Protocol (TCP/IP)** in the Network Protocols list, and then click **<OK>** button.

   You may be prompted to install files from your Windows 2000 installation CD or other media. Follow the instructions to install the files.

7. If prompted, click **<OK>** button to restart your computer with the new settings.

   Next, configure the PCs to accept IP addresses assigned by the OfficeConnect Gigabit VPN Firewall:

8. In the Control Panel, double-click the **Network and Dial-up Connections** icon.
9. In Network and Dial-up Connections window, right-click the **Local Area Connection** icon, and then select **Properties**.

10. In the Local Area Connection Properties dialog box, select **Internet Protocol (TCP/IP)**, and then click **<Properties>** button.
11. In the Internet Protocol (TCP/IP) Properties dialog box, click the radio button labeled **Obtain an IP address automatically**. Also click the radio button labeled **Obtain DNS server address automatically**.
12. Click **<OK>** button twice to confirm and save your changes, and then close the Control Panel.

3.3.4 Windows® 95, 98, and Me PCs

1. In the Windows task bar, click the **<Start>** button, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Network** icon.

   In the Network dialog box, look for an entry started w/ "**TCP/IP** □"

   and the name of your network adapter, and then click **<Properties>** button. You may have to scroll down the list to find this entry. If the list includes such an entry, then the TCP/IP protocol has already been enabled. Skip to step 8.

3. If Internet Protocol (TCP/IP) does not display as an installed component, click **<Add>** button.
4. In the Select Network Component Type dialog box, select **Protocol**, and then click **<Add>** button.
5. Select **Microsoft** in the Manufacturers list box, and then click **TCP/IP** in the Network Protocols list, box and then click **<OK>** button.

   You may be prompted to install files from your Windows 95, 98 or Me installation CD or other media. Follow the instructions to install the files.

6. If prompted, click **<OK>** button to restart your computer with the new settings.

   Next, configure the PCs to accept IP information assigned by the OfficeConnect Gigabit VPN Firewall:

7. In the Control Panel, double-click the Network icon.
8. In the Network dialog box, select an entry started with "**TCP/IP □"** and the name of your network adapter, and then click **<Properties>** button.
9. In the TCP/IP Properties dialog box, click the radio button labeled **Obtain an IP address automatically**.
10. In the TCP/IP Properties dialog box, click the "**Default Gateway**" tab. Enter 192.168.1.1 (the default LAN port IP address of the OfficeConnect Gigabit VPN Firewall) in the "**New gateway**" address field and click **<Add>** button to add the default gateway entry.
11. Click **<OK>** button twice to confirm and save your changes, and then close the Control Panel.
12. If prompted to restart your computer, click **<OK>** button to do so with the new settings.

3.3.5 Windows® NT 4.0 workstations:

First, check for the IP protocol and, if necessary, install it:

1. In the Windows NT task bar, click the **<Start>** button, point to **Settings**, and then click **Control Panel**.
7. In the Control Panel window, double click the **Network** icon.
8. In the Network dialog box, click the **Protocols** tab.

   The Protocols tab displays a list of currently installed network protocols. If the list includes TCP/IP Protocol, then the protocol has already been enabled. Skip to step 14.

9. If TCP/IP does not display as an installed component, click **<Add>** button.
10. In the Select Network Protocol dialog box, select **TCP/IP**, and then click **<OK>** button.

    You may be prompted to install files from your Windows NT installation CD or other media. Follow the instructions to install the files.

After all files are installed, a window displays to inform you that a TCP/IP service called DHCP can be set up to dynamically assign IP information.

11. Click **<Yes>** button to continue, and then click **<OK>** button if prompted to restart your computer.

    Next, configure the PCs to accept IP addresses assigned by the OfficeConnect Gigabit VPN Firewall:

12. Open the Control Panel window, and then double-click the **Network** icon.
13. In the Network dialog box, click the **Protocols** tab.
14. In the Protocols tab, select **TCP/IP**, and then click **<Properties>** button.
15. In the Microsoft TCP/IP Properties dialog box, click the radio button labeled **Obtain an IP address from a DHCP server**.
16. Click **<OK>** button twice to confirm and save your changes, and then close the Control Panel.

3.3.6 Assigning static IP addresses to your PCs

In some cases, you may want to assign IP addresses to some or all of your PCs directly (often called "statically"), rather than allowing the OfficeConnect Gigabit VPN Firewall to assign them. This option may be desirable (but not required) if:

- You have obtained one or more public IP addresses that you want to always associate with specific computers (for example, if you are using a computer as a public web server).
- You maintain different subnets on your LAN.

However, during the first time configuration of your OfficeConnect Gigabit VPN Firewall, you must assign an IP address in the 192.168.1.0 network for your PC, say 192.168.1.2, in order to establish connection between the OfficeConnect Gigabit VPN Firewall and your PC as the default LAN IP on OfficeConnect Gigabit VPN Firewall is pre-configured as 192.168.1.1. Enter 255.255.255.0 for the subnet mask and 192.168.1.1 for the default gateway. These settings may be changed later to reflect your true network environment.

On each PC to which you want to assign static information, follow the instructions on pages 12 through 13 relating only to checking for and/or installing the IP protocol. Once it is installed, continue to follow the instructions for displaying each of the Internet Protocol (TCP/IP) properties. Instead of enabling dynamic assignment of the IP addresses for the computer, DNS server, and default gateway, click the radio buttons that enable you to enter the information manually.

Note

Your PCs must have IP addresses that place them in the same subnet as the OfficeConnect Gigabit VPN Firewall's LAN port. If you manually assign IP information to all your LAN PCs, you can follow the instructions in Chapter 5 to change the LAN port IP address accordingly.

3.4 Part 4 — Quick Configuration of the OfficeConnect Gigabit VPN Firewall

In Part 4, you log into the Configuration Manager on the OfficeConnect Gigabit VPN Firewall and configure basic settings for your Internet connection. Your ISP should provide you with the necessary information to complete this step. Note the intent here is to quickly get the OfficeConnect Gigabit VPN Firewall up and running, instructions are concise. You may refer to corresponding chapters for more details.

3.4.1 Setting Up the OfficeConnect Gigabit VPN Firewall

Follow these instructions to setup the OfficeConnect Gigabit VPN Firewall:

1. Before accessing the Configuration Manager in the OfficeConnect Gigabit VPN Firewall, make sure that the HTTP proxy setting is

disabled in your browser. In IE, click "**Tools**" ➔ "**Internet Options…**" ➔ "**Connections**" tab ➔ "**LAN settings…**" and then uncheck "**Use proxy server for your LAN …**"

2. On any PC connected to one of the four LAN ports on the OfficeConnect Gigabit VPN Firewall, open your Web browser, and type the following URL in the address/location box, and press **<Enter>**:

   http://192.168.1.1

   This is the predefined IP address for the LAN port on the OfficeConnect Gigabit VPN Firewall.

   A login screen displays, as shown in Figure 3.4.

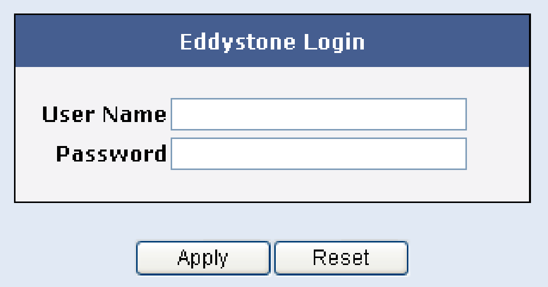


Figure 3.4 Login Screen

If you have problem connecting to the OfficeConnect Gigabit VPN Firewall, you may want to check if your PC is configured to accept IP address assignment from the OfficeConnect Gigabit VPN Firewall. Another method is to set the IP address of your PC to any IP address in the 192.168.1.0 network, such as 192.168.1.2.

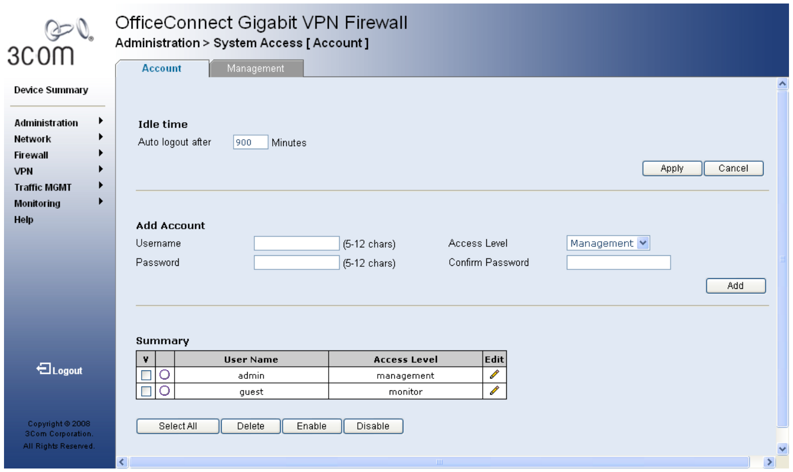
3. Enter your user name and password, and then click Apply to enter the Configuration Manager. The first time you log into this program, use these defaults:

   Default User Name: admin

   Default Password: password

Note

You can change the password at any time.



Idle time

Auto logout after 900 Minutes

Add Account

Username (5-12 chars) Access Level Management

Password (5-12 chars) Confirm Password

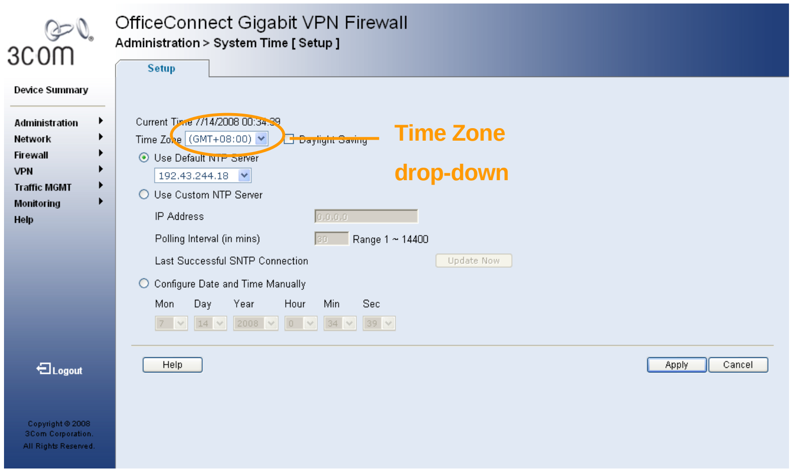
Summary

V		User Name	Access Level	Edit
□	○	admin	management	✎
□	○	guest	monitor	✎

Figure 3.5 System Access Configuration Page

4. Click on Administration ➔ System Access menu to enter Account configuration page as shown in Figure 3.5. Select an appropriate account and change the password in the spaces provided if desired.

   When changing passwords, make sure you enter the existing login password in the Old Password field, enter the new password in New Password field and confirm the new password in Retype New Password field and click Apply button to save the change



OfficeConnect Gigabit VPN Firewall

Administration > System Time [Setup]

Current Time 7/14/2008 00:34:39

Time Zone (GMT+08:00) □ Daylight Saving

● Use Default NTP Server: 192.43.244.18

○ Use Custom NTP Server

IP Address: 0.0.0.0

Polling Interval (in mins): 30 Range 1 ~ 14400

Last Successful SNTP Connection

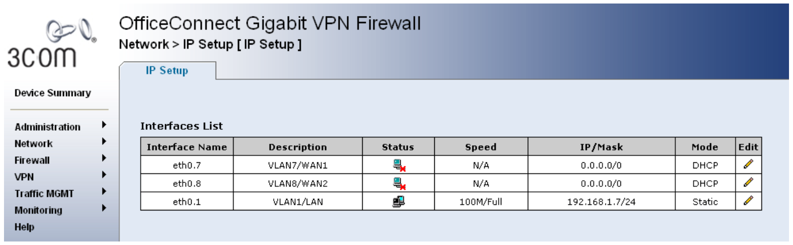
○ Configure Date and Time Manually

Mon	Day	Year	Hour	Min	Sec
7	14	2008	0	34	39

Figure 3.6 System Time Configuration Page

5. Click on Administration ➔ System Time menu and set the time zone for the OfficeConnect Gigabit VPN Firewall by selecting your time zone from the Time Zone drop-down list. Click Apply to save the settings.

6. It is recommended that you keep the default LAN IP settings at this point until after you have completed the rest of the configurations and confirm that your Internet connection is working.

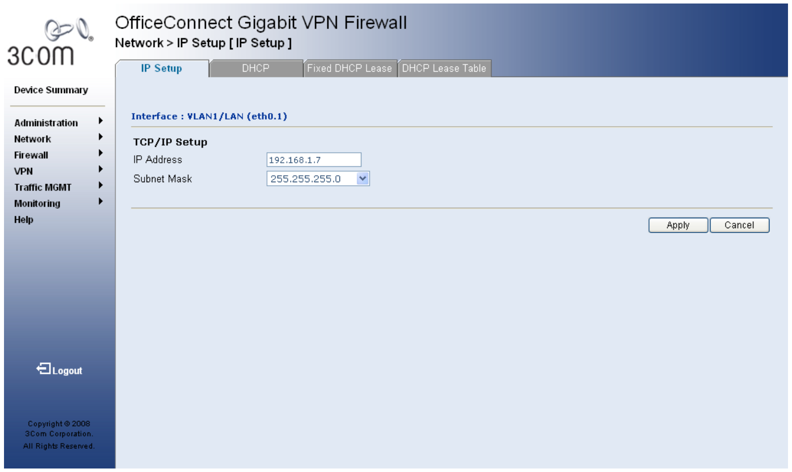


OfficeConnect Gigabit VPN Firewall

Network > IP Setup [IP Setup]

Interfaces List

Interface Name	Description	Status	Speed	IP/Mask	Mode	Edit
eth0.7	VLAN7/WAN1	✗	N/A	0.0.0.0/0	DHCP	✎
eth0.8	VLAN8/WAN2	✗	N/A	0.0.0.0/0	DHCP	✎
eth0.1	VLAN1/LAN	✓	100M/Full	192.168.1.7/24	Static	✎



OfficeConnect Gigabit VPN Firewall

Network > IP Setup [IP Setup]

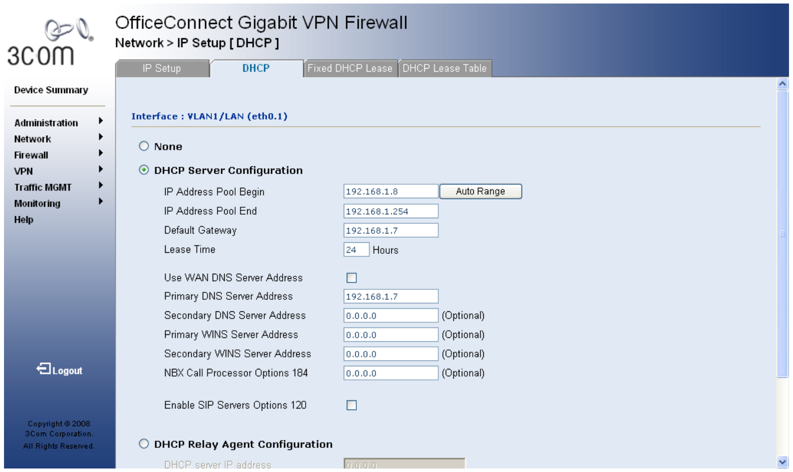
Interface : VLAN1/LAN (eth0.1)

TCP/IP Setup

IP Address: 192.168.1.7

Subnet Mask: 255.255.255.0

Figure 3.7 IP Setup Configuration Page



OfficeConnect Gigabit VPN Firewall

Network > IP Setup [DHCP]

Interface : VLAN1/LAN (eth0.1)

○ None

● DHCP Server Configuration

IP Address Pool Begin: 192.168.1.8

IP Address Pool End: 192.168.1.254

Default Gateway: 192.168.1.7

Lease Time: 24 Hours

Use WAN DNS Server Address □

Primary DNS Server Address: 192.168.1.7

Secondary DNS Server Address: 0.0.0.0 (Optional)

Primary WINS Server Address: 0.0.0.0 (Optional)

Secondary WINS Server Address: 0.0.0.0 (Optional)

NBX Call Processor Options 184: 0.0.0.0 (Optional)

Enable SIP Servers Options 120 □

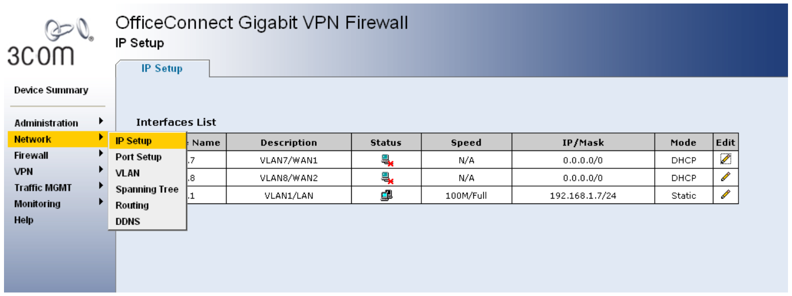
○ DHCP Relay Agent Configuration

DHCP server IP address: 0.0.0.0

Figure 3.8 DHCP Server Configuration Page

7. It is recommended that you keep the default settings for DHCP server until after you have completed the rest of the configurations and confirm that your Internet connection is working.

8. Click on Network ➔ IP Setup to configure the WAN settings for the OfficeConnect Gigabit VPN Firewall.

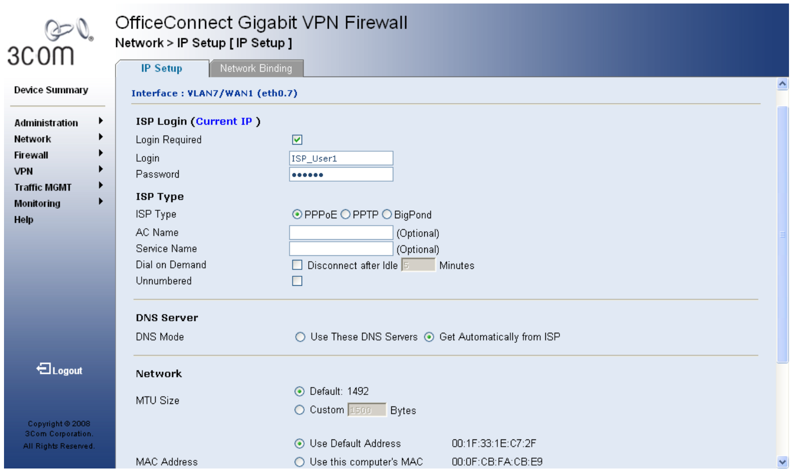


OfficeConnect Gigabit VPN Firewall

IP Setup

Interfaces List

Name	Description	Status	Speed	IP/Mask	Mode	Edit
.7	VLAN7/WAN1		N/A	0.0.0.0/0	DHCP	✎
.8	VLAN8/WAN2		N/A	0.0.0.0/0	DHCP	✎
.1	VLAN1/LAN		100M/Full	192.168.1.7/24	Static	✎



OfficeConnect Gigabit VPN Firewall

Network > IP Setup [IP Setup]

Interface : VLAN7/WAN1 (eth0.7)

ISP Login (Current IP)

Login Required ☑

Login ISP_User1

Password ●●●●●●

ISP Type

ISP Type ● PPPoE ○ PPTP ○ BigPond

AC Name (Optional)

Service Name (Optional)

Dial on Demand □ Disconnect after Idle 5 Minutes

Unnumbered □

DNS Server

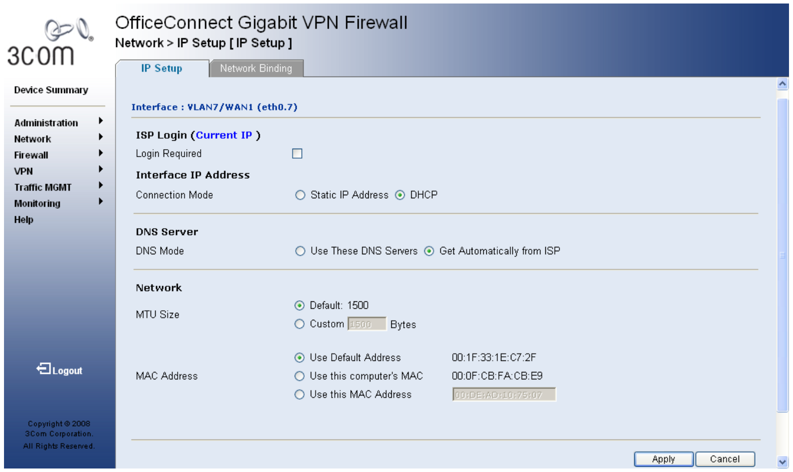
DNS Mode ○ Use These DNS Servers ● Get Automatically from ISP

Network

MTU Size ● Default: 1492 ○ Custom 1500 Bytes

MAC Address ● Use Default Address 00:1F:33:1E:C7:2F ○ Use this computer's MAC 00:0F:CB:FA:CB:E9

Figure 3.9 WAN PPPoE Configuration Page



OfficeConnect Gigabit VPN Firewall

Network > IP Setup [IP Setup]

Interface : VLAN7/WAN1 (eth0.7)

ISP Login (Current IP)

Login Required □

Interface IP Address

Connection Mode ○ Static IP Address ● DHCP

DNS Server

DNS Mode ○ Use These DNS Servers ● Get Automatically from ISP

Network

MTU Size ● Default: 1500 ○ Custom 1500 Bytes

MAC Address ● Use Default Address 00:1F:33:1E:C7:2F ○ Use this computer's MAC 00:0F:CB:FA:CB:E9 ○ Use this MAC Address 00:DE:AD:10:75:07

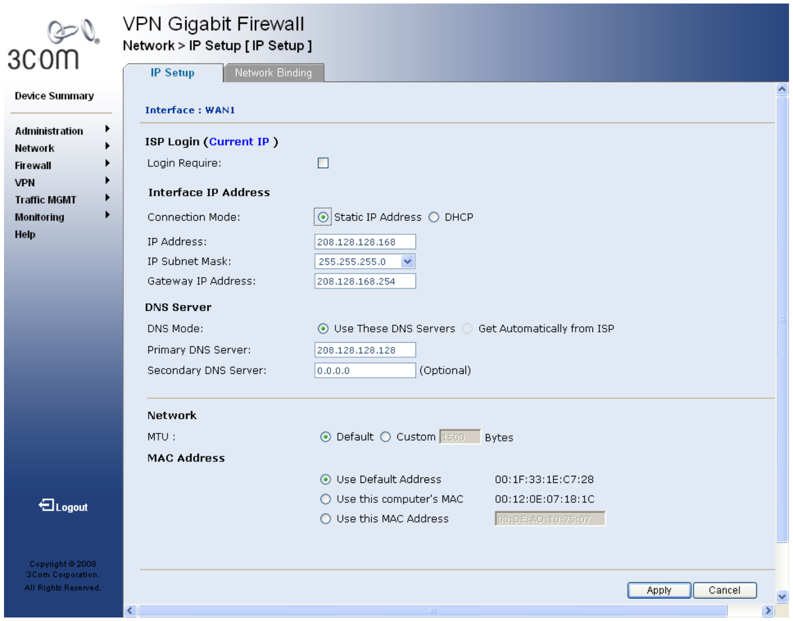
Figure 3.10 WAN Dynamic IP Configuration Page

a) PPPoE Connection Mode (see Figure 3.9)

- Tick the Login Required checkbox.
- Enter the user name and password provided by your ISP.
- Click on the PPPoE radio button.
- AC Name and Service Name are optional. You may leave it empty if your ISP did not provide such information.
- Tick the Disconnect checkbox if you want to disconnect the PPPoE interface after the assigned idle timeout period has elapsed.
- Tick the Unnumbered checkbox to enable the PPP unnumbered function.
- You don't need to enter primary/secondary DNS IP addresses as PPPoE is able to automatically obtain this information for you from your ISP. However, if you prefer to use your favorite DNS servers, you may enter them in the space provided.
- Click on Apply button to save the PPPoE settings.

b) Dynamic IP Connection Mode (see Figure 3.10)

- Select the DHCP radio button to enable the DHCP function.
- You don't need to enter primary/secondary DNS IP addresses as DHCP client is able to automatically obtain this information for you from your ISP. However, if you prefer to use your favorite DNS servers, you may enter them in the space provided.
- If you had previously registered a specific MAC address with your ISP for Internet connections, enter the registered MAC address here and make sure you check the MAC cloning check box.
- Click on Apply button to save the dynamic IP settings.



VPN Gigabit Firewall

Network > IP Setup [IP Setup]

Interface : WAN1

ISP Login (Current IP)

Login Require: □

Interface IP Address

Connection Mode: ● Static IP Address ○ DHCP

IP Address: 208.128.128.168

IP Subnet Mask: 255.255.255.0

Gateway IP Address: 208.128.168.254

DNS Server

DNS Mode: ● Use These DNS Servers ○ Get Automatically from ISP

Primary DNS Server: 208.128.128.128

Secondary DNS Server: 0.0.0.0 (Optional)

Network

MTU : ● Default ○ Custom 1500 Bytes

MAC Address

● Use Default Address 00:1F:33:1E:C7:28

○ Use this computer's MAC 00:12:0E:07:18:1C

○ Use this MAC Address 00:DE:AD:10:75:07

Figure 3.11 WAN Static IP Configuration Page

c) Static IP Connection Mode

- Enter WAN IP address in the IP Address field. This information should be provided by your ISP.
- Enter IP Subnet Mask for the WAN. This information should be provided by your ISP. Typically, it is 255.255.255.0.
- Enter Gateway IP address provided by your ISP in the space provided.
- Enter at lease the primary DNS IP address provided by your ISP. Secondary DNS IP address is optional. Enter it in the space provided if you have such information from your ISP.
- Click Apply to save the static IP settings

You have now completed customizing basic configuration settings. Read the following section to determine if you have access to the Internet.

3.4.2 Testing Your Setup

At this point, the OfficeConnect Gigabit VPN Firewall should enable any computer on your LAN to use the OfficeConnect Gigabit VPN Firewall's ADSL or cable modem connection to access the Internet.

To test the Internet connection, open your web browser, and type the URL of any external website (such as http://www.3com.com). The LED labeled WAN should be blinking rapidly and may appear solid as the device connects to the site. You should also be able to browse the web site through your web browser.

If the LEDs do not illuminate as expected or the web page does not display, see Appendix 20 for troubleshooting suggestions.

3.4.3 Default Router Settings

In addition to handling the DSL connection to your ISP, the OfficeConnect Gigabit VPN Firewall can provide a variety of services to your network. The device is pre-configured with default settings for use with a typical home or small office network.

Table 3.2 lists some of the most important default settings; these and other features are described fully in the subsequent chapters. If you are familiar with network configuration settings, review the settings in Table 3.2 to verify that they meet the needs of your network. Follow the instructions to change them if necessary. If you are unfamiliar with these settings, try using the device without modification, or contact your ISP for assistance.

Before you modifying any settings, review Chapter 4 for general information about accessing and using the Configuration Manager program. We strongly recommend that you contact your ISP prior to changing the default configuration.

Table 3.2 Default Settings Summary

Option	Default Setting	Explanation/Instructions
DHCP (Dynamic Host Configuration Protocol)	DHCP server enabled with the following pool of addresses: 192.168.1.2 through 192.168.1.254	The OfficeConnect Gigabit VPN Firewall maintains a pool of private IP addresses for dynamic assignment to your LAN computers. To use this service, you must have set up your computers to accept IP information dynamically, as described in Part 2 of the Quick Start Guide. See section 5.2 for an explanation of the DHCP service.
LAN Port IP Address	Static IP address: 192.168.1.1 subnet mask: 255.255.255.0	This is the IP address of the LAN port on the OfficeConnect Gigabit VPN Firewall. The LAN port connects the device to your Ethernet network. Typically, you will not need to change this address. See section 5.1 LAN IP Address for instructions.

4 Getting Started with the Configuration Manager

The OfficeConnect Gigabit VPN Firewall includes a preinstalled program called the *Configuration Manager*, which provides an interface to the software installed on the device. It enables you to configure the device settings to meet the needs of your network. You access it through your web browser from any PC connected to the OfficeConnect Gigabit VPN Firewall via the LAN or WAN ports.

This chapter describes the general guides for using the Configuration Manager.

4.1 Log into Configuration Manager

The Configuration Manager program is preinstalled on the OfficeConnect Gigabit VPN Firewall. To access the program, you need the following:

- A computer connected to the LAN or WAN port on the OfficeConnect Gigabit VPN Firewall as described in the Quick Start Guide chapter.
- A web browser installed on the computer. The program is designed to work best with Microsoft Internet Explorer® 5.5, Netscape 7.0.2 or later.

You may access the program from any computer connected to the OfficeConnect Gigabit VPN Firewall via the LAN or WAN ports. However, the instructions provided here are for computers connected via the LAN ports.

1. From a LAN computer, open your web browser, type the following in the web address (or location) box, and press **<Enter>**:

   http://192.168.1.1

   This is the predefined IP address for the LAN port on the OfficeConnect Gigabit VPN Firewall. A login screen displays, as shown in Figure 4.1.

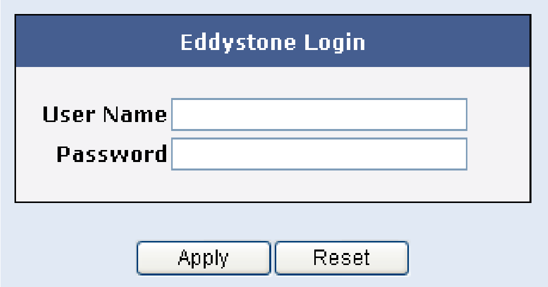


Figure 4.1 Configuration Manager Login Screen

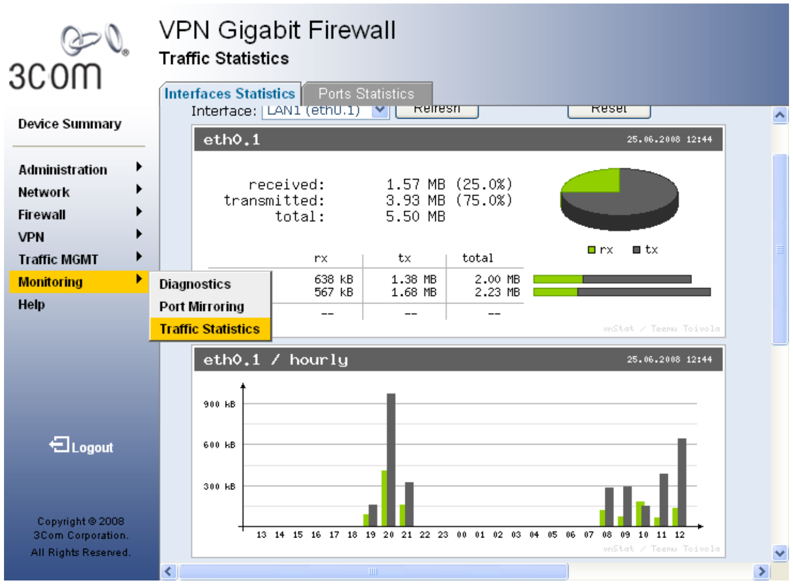
2. Enter your user name and password, and then click Apply.

   The first time you log into the program, use these defaults:

Default User Name:	admin
Default Password:	password

4.2 Functional Layout

Typical Configuration Manager page consists of two separate frames. The left frame, as shown in Figure 4.2, contains all the menus available for device configuration. Related menus are grouped into categories, such as System, Network and etc. You can click on any of these to display a specific configuration page.



```
   received:      1.57 MB (25.0%)
transmitted:      3.93 MB (75.0%)
      total:      5.50 MB

        rx        tx        total
    638 kB   1.38 MB      2.00 MB
    567 kB   1.68 MB      2.23 MB
        --        --           --
```

Figure 4.2 Typical Configuration Manager Page

A separate page displays in the right-hand-side frame for each menu. For example, the configuration page displayed in Figure 4.2 is intended for DHCP configuration.

4.2.1 Commonly Used Buttons and Icons

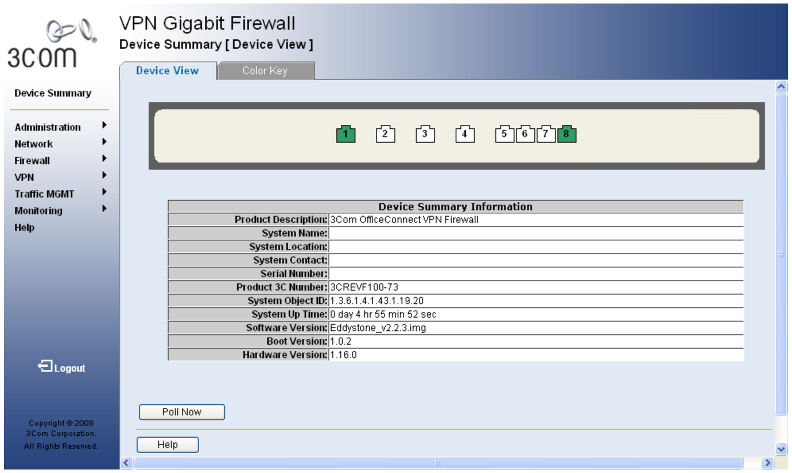
The following buttons or icons are used throughout the application. The following table describes the function for each button or icon.

Table 4.1 Description of Commonly Used Buttons and Icons

Button/Icon	Function
Apply	Stores any changes you have made on the current page.
Reset	Discards any changes you have made and reverts all fields back to the default value.
Add	Adds a new item into the existing configuration, e.g. a static route or a firewall ACL rule and etc.
Delete	Deletes the selected item, e.g. a static route or a firewall ACL rule and etc.
Select All	Selects all items from the existing configuration page.
Enable	Enables a selected item.
Disable	Disables a selected item.
Logout	Logs out from Configuration Manager.

4.3 Overview of System Configuration

To view the overall system status, log into Configuration Manager as administrator, and then click the **Device Summary** menu.



Device Summary Information	
Product Description:	3Com OfficeConnect VPN Firewall
System Name:	
System Location:	
System Contact:	
Serial Number:	
Product 3C Number:	3CREVF100-73
System Object ID:	1.3.6.1.4.1.43.1.19.20
System Up Time:	0 day 4 hr 55 min 52 sec
Software Version:	Eddystone_v2.2.3.img
Boot Version:	1.0.2
Hardware Version:	1.16.0

Figure 4.3 Device Summary Page

5 Configuring LAN Settings

This chapter describes how to configure LAN properties for the LAN interface on the OfficeConnect Gigabit VPN Firewall that communicates with your LAN computers. You'll learn to configure IP address, DHCP and DNS server for your LAN in this chapter.

5.1 LAN IP Address

If you are using the OfficeConnect Gigabit VPN Firewall with multiple PCs on your LAN, you must connect the LAN via the Ethernet ports on the built-in Ethernet switch. You must assign a unique IP address to each device residing on your LAN. The LAN IP address identifies the OfficeConnect Gigabit VPN Firewall as a node on your network; that is, its IP address must be in the same subnet as the PCs on your LAN. The default LAN IP for the OfficeConnect Gigabit VPN Firewall is 192.168.1.1.

Definition

*A **network node** can be thought of as any interface where a device connects to the network, such as the OfficeConnect Gigabit VPN Firewall's LAN port and the network interface cards on your PCs. See Appendix 18 for an explanation of subnets.*

You can change the default to reflect the set of IP addresses that you want to use with your network.

Note

*The OfficeConnect Gigabit VPN Firewall itself can function as a DHCP server for your LAN computers, as described in section 5.2.3 Configuring DHCP Server, **but not for its own LAN port**.*

5.1.1 LAN IP Configuration Parameters

Table 5.1describes the configuration parameters available for LAN IP configuration.

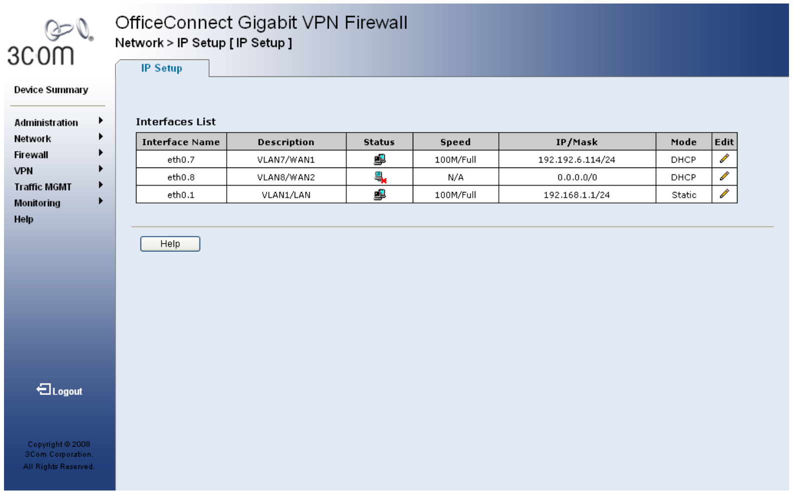
Table 5.1 LAN IP Configuration Parameters

Setting	Description
IP Address	The LAN IP address of the OfficeConnect Gigabit VPN Firewall. This IP is used by your computers to identify the OfficeConnect Gigabit VPN Firewall's LAN port. Note that the public IP address assigned to you by your ISP **is not** your LAN IP address. The public IP address identifies the WAN port on the OfficeConnect Gigabit VPN Firewall to the Internet.
Subnet Mask	The LAN subnet mask identifies which parts of the LAN IP Address refer to your network as a whole and which parts refer specifically to nodes on the network. Your device is preconfigured with a default subnet mask of 255.255.255.0.

5.1.2 Configuring the LAN IP Address

Follow these steps to change the default LAN IP address.

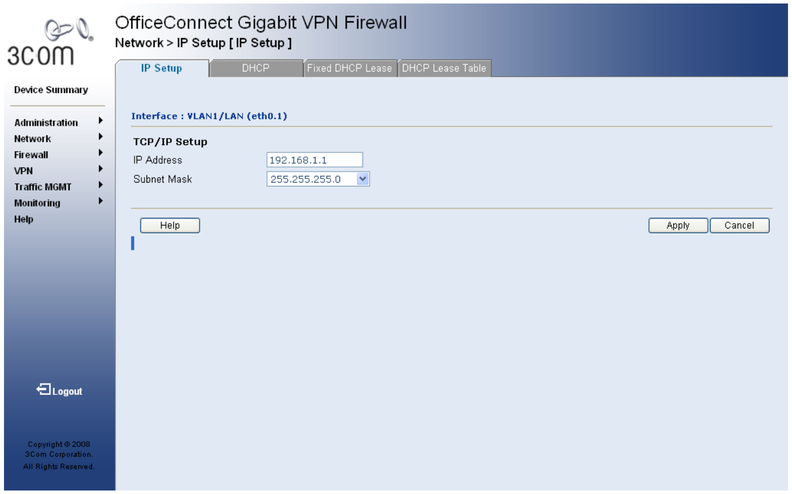
1. Log into Configuration Manager as administrator, and then click Network > IP Setup menu to display the Interface List Table as shown in Figure 5.1.
2. Click on the ✎ icon of the VLAN1/LAN entry to be modified in the Interface List Table.



Interfaces List

Interface Name	Description	Status	Speed	IP/Mask	Mode	Edit
eth0.7	VLAN7/WAN1		100M/Full	192.192.6.114/24	DHCP	
eth0.8	VLAN8/WAN2		N/A	0.0.0.0/0	DHCP	
eth0.1	VLAN1/LAN		100M/Full	192.168.1.1/24	Static	

Figure 5.1 Interface List



Interface : VLAN1/LAN (eth0.1)

TCP/IP Setup

IP Address: 192.168.1.1

Subnet Mask: 255.255.255.0

Figure 5.2 IP Setup Configuration Page

3. In the IP Setup configuration page, enter a LAN IP address and subnet mask for the OfficeConnect Gigabit VPN Firewall in the space provided.

4. Click Apply to save the LAN IP address.

   If you were using an Ethernet connection for the current session, and changed the IP address, the connection will be terminated.

5. Reconfigure your PCs, if necessary, so that their IP addresses place them in the same subnet as the new IP address of the LAN port. See the Quick Start Guide chapter, "Part 3 — Configuring Your Computers," for instructions.

6. Log into Configuration Manager by typing the new IP address in your Web browser's address/location box.

5.2 DHCP (Dynamic Host Control Protocol)

5.2.1 What is DHCP?

DHCP is a protocol that enables network administrators to centrally manage the assignment and distribution of IP information to computers on a network.

When you enable DHCP on a network, you allow a device — such as the OfficeConnect Gigabit VPN Firewall — to assign temporary IP addresses to your computers whenever they connect to your network. The assigning device is called a *DHCP server*, and the receiving device is a *DHCP client*.

Note

If you followed the Quick Start Guide instructions, you either configured each LAN PC with an IP address, or you specified that it will receive IP information dynamically (automatically). If you chose to have the information assigned dynamically, then you configured your PCs as DHCP clients that will accept IP addresses assigned from a DCHP server such as the OfficeConnect Gigabit VPN Firewall.

The DHCP server draws from a defined pool of IP addresses and "leases" them for a specified amount of time to your computers when they request an Internet session. It monitors, collects, and redistributes the addresses as needed.

On a DHCP-enabled network, the IP information is assigned *dynamically* rather than *statically.* A DHCP client can be assigned a different address from the pool each time it reconnects to the network.

5.2.2 Why use DHCP?

DHCP allows you to manage and distribute IP addresses throughout your network from the OfficeConnect Gigabit VPN Firewall. Without DHCP, you would have to configure each computer separately with IP address and related information. DHCP is commonly used with large networks and those that are frequently expanded or otherwise updated.

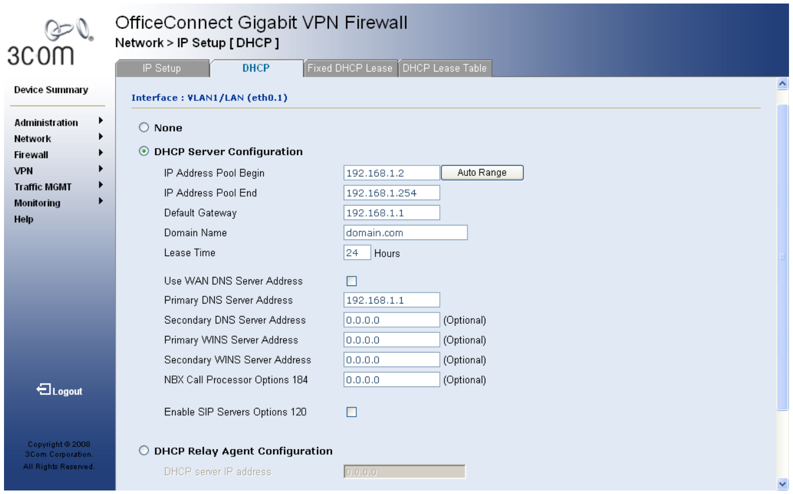
5.2.3 Configuring DHCP Server

Note

By default, the OfficeConnect Gigabit VPN Firewall is configured as a DHCP server on the LAN side, with a predefined IP address pool of 192.168.1.10 through 192.168.1.42 (subnet mask 255.255.255.0). To change this range of addresses, follow the procedures described in this section.

First, you must configure your PCs to accept DHCP information assigned by a DHCP server:

1. Log into Configuration Manager as administrator, click the LAN menu, and then click the **DHCP** submenu. The DHCP Configuration page displays as shown in Figure 5.3:



Interface : VLAN1/LAN (eth0.1)

○ None

● DHCP Server Configuration

IP Address Pool Begin 192.168.1.2

IP Address Pool End 192.168.1.254

Default Gateway 192.168.1.1

Domain Name domain.com

Lease Time 24 Hours

Use WAN DNS Server Address □

Primary DNS Server Address 192.168.1.1

Secondary DNS Server Address 0.0.0.0 (Optional)

Primary WINS Server Address 0.0.0.0 (Optional)

Secondary WINS Server Address 0.0.0.0 (Optional)

NBX Call Processor Options 184 0.0.0.0 (Optional)

Enable SIP Servers Options 120 □

○ DHCP Relay Agent Configuration

DHCP server IP address 0.0.0.0

Figure 5.3 DHCP Configuration Page

2. Enter the information for the *IP Address Pool (Begin/End Address*), Sub*net Mask*, *Lease Time* and *Default Gateway IP Address,* fields; others, such as *Primary/Secondary DNS Server IP Address* and *Primary/Secondary WINS Server IP Address* are optional. However, it is recommended that you enter the primary DNS server IP address in the space provided. You may enter the LAN IP or your ISP's DNS IP in the primary DNS Server IP Address field. Table 5.2 describes the DHCP configuration parameters in detail.

Table 5.2 DHCP Configuration Parameters

Field	Description
IP Address Pool Begin/End	Specify the lowest and highest addresses in the DHCP address pool.
Subnet Mask	Enter the subnet mask to be used for the DHCP address pool.
Lease Time	The amount of time the assigned

Field	Description
	address will be used by a device connected on the LAN.
Default Gateway IP Address	The address of the default gateway for computers that receive IP addresses from this pool. The default gateway is the device that the DHCP client computers first contacted to communicate with the Internet. Typically, it is the OfficeConnect Gigabit VPN Firewall's LAN port IP address.
Primary/Secondary DNS Server IP Address	The IP address of the *Domain Name System* server to be used by computers that receive IP addresses from this pool. The DNS server translates common Internet names that you type into your web browser into their equivalent numeric IP addresses. Typically, the server(s) are located with your ISP. However, you may enter LAN IP address of the OfficeConnect Gigabit VPN Firewall as it will serve as DNS proxy for the LAN computers and forward the DNS request from the LAN to DNS servers and relay the results back to the LAN computers. Note that both the primary and secondary DNS servers are optional.
Primary/Secondary WINS Server IP Address (optional)	The IP address of the WINS servers to be used by computers that receive IP addresses from the DHCP IP address pool. You don't need to enter this information unless your network has WINS servers.
NBX Call Processor Options 184	If you have a 3Com NBX Call Processor on your network, please enter its IP address in this field.
Enable SIP Servers Options 120	To enable the SIP Servers Options 120, please ensure that the enable checkbox is ticked.
SIP Server Encoding type	If the type of SIP server address is FQDN, please click on FQDN radio button; otherwise, click on IP Address button.
Primary SIP Address	The IP address or fully qualified domain name of the Primary SIP Address.
Secondary SIP Address	The IP address or fully qualified domain name of the Secondary SIP Address.

3. Click Apply to save the DHCP server configurations.

5.2.4 Viewing Current DHCP Address Assignments

When the OfficeConnect Gigabit VPN Firewall functions as a DHCP server for your LAN, it keeps a record of any addresses it has leased to your computers. To view a table of all current IP address assignments, just go to the DHCP Server Configuration page. A page displays similar to that shown in Figure 5.3; the bottom half of the same page shows the existing DHCP address assignments.

The DHCP Server Address Table lists any IP addresses that are currently leased to LAN devices. For each leased address, the table lists the following information:

Table 5.3 DHCP Address Assignment

Field	Description
MAC Address	A hardware ID of the device that leases an IP address from the DHCP server.
Assigned IP Address	The address that has been leased from the pool.
IP Address Expired on	The time when the leased address is to be terminated.

5.3 Configuring Fixed DHCP Leases

Fixed DHCP Leases are IP addresses assigned to hosts requiring permanent IP settings. To configuring fixed DHCP Leases, you can follow one of the following methods:

- **Manually enter fixed DHCP entry**: You can manually enter information about a network device.
- **Import discovered LAN hosts as fixed DHCP entries**: 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.

5.3.1 Manually add a Fixed DHCP Lease.

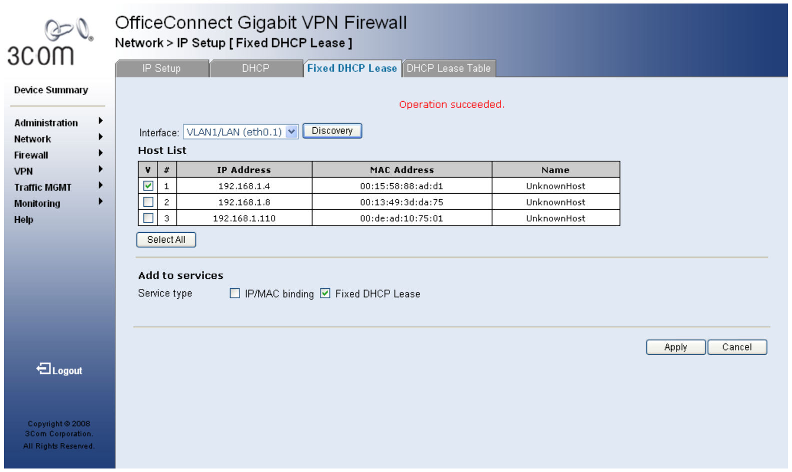
To add a fixed DHCP Lease, follow these steps:

1. Enter the name of the PC or device.
2. Enter the IP address of the PC or device. The DHCP Server will permanently reserve the IP address for the specified device.
3. Enter the MAC address of the PC or device. Please note that the MAC address format is six colon-separated pairs of hexadecimal characters (0-9 and A-F), such as 00:0D:31:45:17:1B.
4. Click Add button to add the new entry.

5.3.2 Import Discovered LAN Hosts as Fixed DHCP Entries

The following steps show you how to configure multiple DHCP entries by importing discovered LAN hosts.

1. Click "Import from Host Discovery" button. The host discovery configuration page will be shown as Figure 5.4.
2. Select an appropriate interface from the Interface drop-down list.
3. Click "Discovery" button to start the LAN host discovery.
4. The Host List table displays all discovered LAN hosts.
5. Click on the check box in front of the LAN host to be selected. Or click "Select All" button to select all discovered entries.
6. Click on the check box of "Fixed DHCP Lease" and then click Apply to save the settings.



Operation succeeded.

Interface: VLAN1/LAN (eth0.1)

Host List

V	#	IP Address	MAC Address	Name
☑	1	192.168.1.4	00:15:58:88:ad:d1	UnknownHost
□	2	192.168.1.8	00:13:49:3d:da:75	UnknownHost
□	3	192.168.1.110	00:de:ad:10:75:01	UnknownHost

Add to services

Service type □ IP/MAC binding ☑ Fixed DHCP Lease

Figure 5.4 Host Discovery Configuration Page

5.4 DNS

5.4.1 About DNS

Domain Name System (DNS) servers map the user-friendly domain names that users type into their Web browsers (e.g., "yahoo.com") to the equivalent numerical IP addresses that are used for Internet routing.

When a PC user types a domain name into a browser, the PC must first send a request to a DNS server to obtain the equivalent IP address. The DNS server will attempt to look up the domain name in its own database, and will communicate with higher-level DNS servers when the name cannot be found locally. When the address is found, it is sent back to the requesting PC and is referenced in IP packets for the remainder of the communication.

5.4.2 Assigning DNS Addresses

Multiple DNS addresses are useful to provide alternatives when one of the servers is down or is encountering heavy traffic. ISPs typically provide primary and secondary DNS addresses, and may provide additional addresses. Your LAN PCs learn these DNS addresses in one of the following ways:

- **Statically:** If your ISP provides you with their DNS server addresses, you can assign them to each PC by modifying the PCs' IP properties.
- **Dynamically from a DHCP pool:** You can configure the DHCP Server the OfficeConnect Gigabit VPN Firewall and create an address pool that specify the DNS addresses to be distributed to the PCs. Refer to the section Configuring DHCP Server on page 27 for instructions on creating DHCP address pools.

In either case, you can specify the actual addresses of the ISP's DNS servers (on the PC or in the DHCP pool), or you can specify the address of the LAN port on the OfficeConnect Gigabit VPN Firewall (e.g., 192.168.1.1). When you specify the LAN port IP address, the device performs *DNS relay*, as described in the following section.

Note

If you specify the actual DNS addresses on the PCs or in the DHCP pool, the DNS relay feature is not used.

5.4.3 Configuring DNS Relay

When you specify the device's LAN port IP address as the DNS address, then the OfficeConnect Gigabit VPN Firewall automatically performs “DNS relay”; i.e., because the device itself is not a DNS server, it forwards domain name lookup requests from the LAN PCs to a DNS server at the ISP. It then relays the DNS server’s response to the PC.

When performing DNS relay, the OfficeConnect Gigabit VPN Firewall must maintain the IP addresses of the DNS servers it contacts. It can learn these addresses in either or both of the following ways:

- **Learned through PPPoE or Dynamic IP Connection:** If the OfficeConnect Gigabit VPN Firewall uses a PPPoE (see section 8.2.2 Configuring PPPoE for WAN) or Dynamic IP (see section 8.4.2 Configuring Dynamic IP for WAN) connection to the ISP, the primary and secondary DNS addresses can be learned via the PPPoE protocol. Using this option provides the advantage that you will not need to reconfigure the PCs or the OfficeConnect Gigabit VPN Firewall if the ISP changes their DNS addresses.
- **Configured on the OfficeConnect Gigabit VPN Firewall:** You can also specify the ISP's DNS addresses in the WAN Configuration page as shown in

Follow these steps to configure DNS relay:

1. Enter LAN IP in the DNS Server IP Address field in DHCP configuration page as shown in Figure 5.3.
2. Configure the LAN PCs to use the IP addresses assigned by the DHCP server on the OfficeConnect Gigabit VPN Firewall, or enter the OfficeConnect Gigabit VPN Firewall's LAN IP address as their DNS server address manually for each PC on your LAN.

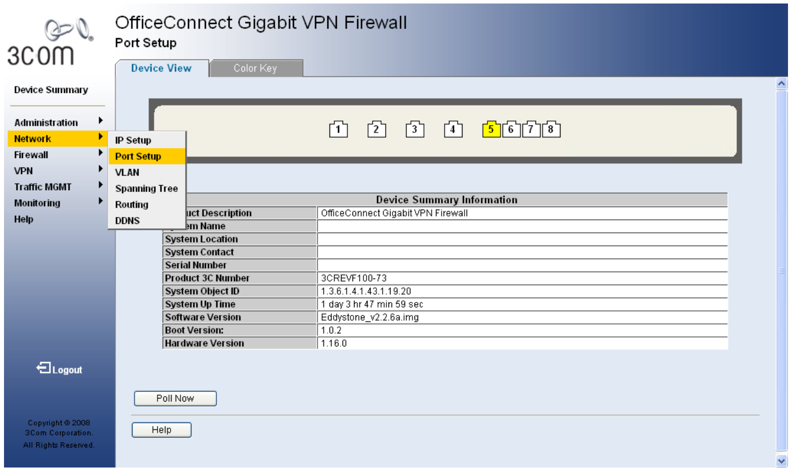
Note

DNS addresses that are assigned to LAN PCs prior to enabling DNS relay will remain in effect until the PC is rebooted. DNS relay will only take effect when a PC's DNS address is the LAN IP address.

Similarly, if after enabling DNS relay, you specify a DNS address (other than the LAN IP address) in a DHCP pool or statically on a PC, then that address will be used instead of the DNS relay address.

5.5 Configuring the Port Settings

This page allows you to enable/disable a specific port, change the port speed or enable/disable DMZ ports. Follow these steps to configure the port settings:

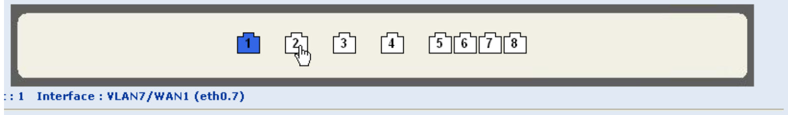


Device Summary Information	
uct Description	OfficeConnect Gigabit VPN Firewall
em Name	
System Location	
System Contact	
Serial Number	
Product 3C Number	3CREVF100-73
System Object ID	1.3.6.1.4.1.43.1.19.20
System Up Time	1 day 3 hr 47 min 59 sec
Software Version	Eddystone_v2.2.6a.img
Boot Version:	1.0.2
Hardware Version	1.16.0

Figure 5.5 Port Setup Configuration Page

To configure the port settings, click "Network" in the main menu and then click "Port Setup" sub-menu. See Figure 5.5 Port Setup Configuration Page.

1. Move the mouse cursor to the desired port icon and then click on the icon to configure the selected port. See Figure 5.6 Port Selection.



: 1 Interface : VLAN7/WAN1 (eth0.7)

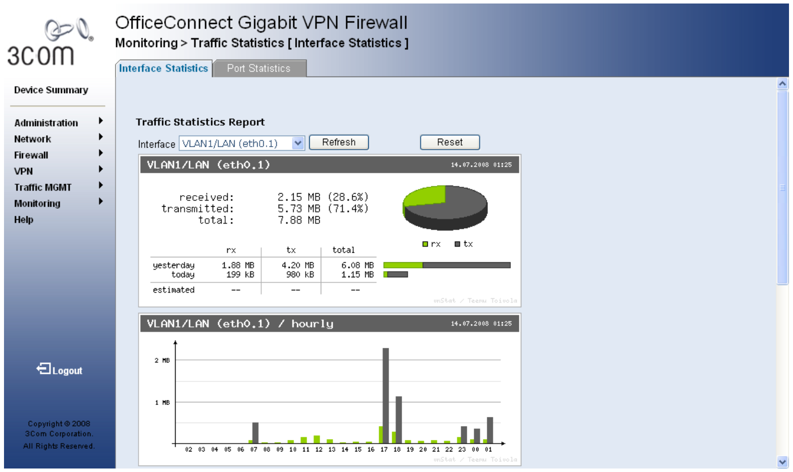
Figure 5.6 Port Selection

2. If the selected port is Port 3 or Port 4, you should be able to change the mode of selected port to LAN port or DMZ port. Select the port type from the drop-down list. Once the DMZ port is enabled, the corresponding DMZ interface will be activated as well and you should be able to configure the DMZ interface in the IP Setup configuration page.
3. To enable the selected port, please keep the Enable check box checked. Otherwise, please click on the Enable check box to disable the selected port.
4. To change the selected port speed, please select a value from the Speed drop-down list.
5. Click. Apply to save the settings you made.

5.6 Viewing LAN Statistics

You can view statistics of your LAN traffic on the OfficeConnect Gigabit VPN Firewall. You will not typically need to view this data, but you may find it helpful when working with your ISP to diagnose network and Internet data transmission problems.

To view LAN IP statistics, click Traffic Statistics in the Monitoring submenu and select VLAN/LAN (eth0.1) from the interface drop down button. Figure 5.7 shows the LAN Statistics page:



OfficeConnect Gigabit VPN Firewall

Monitoring > Traffic Statistics [Interface Statistics]

Traffic Statistics Report

Interface: VLAN1/LAN (eth0.1)

```
VLAN1/LAN (eth0.1)                              14.07.2008 01:25

     received:        2.15 MB (28.6%)
  transmitted:        5.73 MB (71.4%)
        total:        7.88 MB

                   rx    |     tx    |   total
 yesterday      1.88 MB  |  4.20 MB  |  6.08 MB
     today       199 kB  |   980 kB  |  1.15 MB
 estimated         --    |     --    |     --
```

Figure 5.7 LAN Statistics Page

6 Configuring VLAN Settings

6.1 VLAN Overview

VLANs are logical subgroups with a Local Area Network (LAN) which combine user stations and network devices into a single unit, regardless of the physical LAN segment to which they are attached. VLANs allow network traffic to flow more efficiently within subgroups. VLANs use software to reduce the amount of time it takes for network changes, additions, and moves to be implemented. VLANs restrict traffic within the VLAN.

VLANs have no minimum number of ports, and can be created per unit, per device, or through any other logical connection combination, since they are software-based and not defined by physical attributes.

VLANs function at Layer 2. Since VLANs isolate traffic within the VLAN, a Layer 3 router working at a protocol level is required to allow traffic flow between VLANs. Layer 3 routers identify segments and coordinate with VLANs. VLANs are Broadcast and Multicast domains. Broadcast and Multicast traffic is transmitted only in the VLAN in which the traffic is generated.

VLAN tagging provides a method of transferring VLAN information between VLAN groups. VLAN1is the default VLAN. All ports are untagged members of VLAN1 by default. If any port becomes an untagged member of a different VLAN, then the port is removed from untagged membership of VLAN1. For example: If port 24 is made an untagged member of VLAN 5, the port will no longer be a member of VLAN1. However, if the port is made an tagged member of VLAN5, it still remains untagged in VLAN1.

A port can only be an untagged member of one VLAN. By default it is untagged member of VLAN1. The system cannot remove its untagged membership from the present VLAN directly, it has to add the port as one of the untagged membership in a new VLAN.

There is no restriction on tagged membership. A port can be a tagged member of any number of multiple VLANs.

6.2 VLAN Configuration Parameters

Table 6.1 describes the configuration parameters available for VLAN configuration.

Table 6.1 VLAN Configuration Parameters

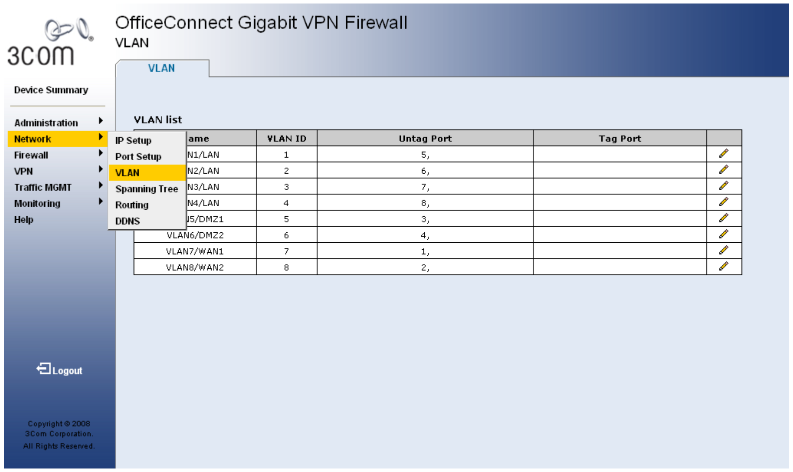
Setting	Description
VLAN ID	Specifies the VLAN ID to which the port is assigned.
Tag Port	Specifies a physical port to be a tagged member of a VLAN.
Untag Port	Specifies a physical port to be a untagged member of a VLAN.

6.3 Configuring the VLAN settings

Follow these steps to change the VLAN settings.

1. Log into Configuration Manager as administrator, and then click the Network menu.

   When the submenus of Network menu displays, clicks VLAN submenu to display the VLAN configuration summary page as shown in Figure 6.1.

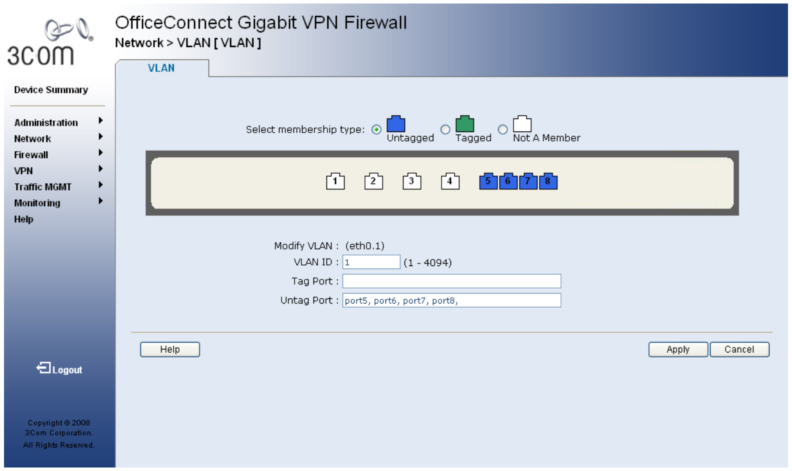


VLAN list

ame	VLAN ID	Untag Port	Tag Port	
N1/LAN	1	5,		✎
N2/LAN	2	6,		✎
N3/LAN	3	7,		✎
N4/LAN	4	8,		✎
N5/DMZ1	5	3,		✎
VLAN6/DMZ2	6	4,		✎
VLAN7/WAN1	7	1,		✎
VLAN8/WAN2	8	2,		✎

Figure 6.1 VLAN Configuration Summary Page

6. Click on the Pan icon of the desired VLAN to enter the VLAN Configuration page.



Select membership type: ● Untagged ○ Tagged ○ Not A Member

Modify VLAN : (eth0.1)

VLAN ID : 1 (1 - 4094)

Tag Port :

Untag Port : port5, port6, port7, port8,

Figure 6.2 VLAN Configuration Page

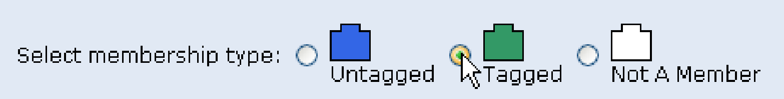
7. Enter a valid ID into the specified VLAN ID field.

8. Move the mouse cursor to the desired VLAN membership type icon and click on the icon to select the membership type.

🟦 Untagged VLAN

🟩 Tagged VLAN

□ Not A Member



Select membership type: ○ Untagged ● Tagged ○ Not A Member

Figure 6.3 Select a VLAN Membership Type

9. Move the mouse cursor to the desired port icon and click on the RJ45 icon to apply the membership type to the selected port. Please see Figure 6.4.

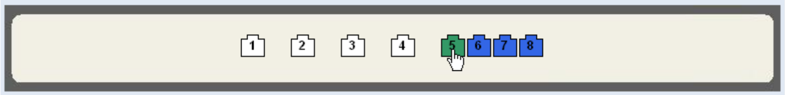


Figure 6.4 VLAN Membership assignment

10. Click. Apply to save the LAN IP address.

7 Configuring Spanning Tree Settings

7.1 Spanning Tree Overview

This section contains information for configuring STP. The Spanning Tree Protocol (STP) provides tree topography for any arrangement of bridges. STP also provides a single path between end stations on a network, eliminating loops.

Loops occur when alternate routes exist between hosts. Loops in an extended network can cause bridges to forward traffic indefinitely, resulting in increased traffic and reducing network efficiency.

While Classic STP prevents Layer 2 forwarding loops in a general network topology, convergence can take between 30-60 seconds. Rapid Spanning Tree Protocol (RSTP) detects and uses network topologies that allow a faster STP convergence without creating forwarding loops.

The device supports the following STP versions:

- Classic STP — Provide a single path between end stations, avoiding and eliminating loops.
- Rapid STP — Detect and use network topologies that provide faster convergence of the spanning tree, without creating forwarding loops. While Classic STP prevents Layer 2 forwarding loops in a general network topology, convergence can take between 30-60 seconds. Rapid Spanning Tree Protocol (RSTP) detects and uses network topologies that allow a faster STP convergence without creating forwarding loops.

7.2 Spanning Tree Configuration Parameters

Table 7.1 describes the configuration parameters available for VLAN configuration.

Table 7.1 Spanning Tree Configuration Parameters

Setting	Description
System Priority	Specifies the bridge priority value. When switches or bridges are running STP, each is assigned a priority. After exchanging BPDUs, the device with the lowest priority value be comes the Root Bridge. The field range is 0-61440. The default value is 32768. The port priority value is provided in increments of 4096.
Hello Time	Specifies the device Hello Time. The Hello Time indicates the amount of time in seconds a Root Bridge waits between configuration messages. The default is 2 seconds.
Max Age	Specifies the device Maximum Age Time. The Maximum Age Time is the amount of time in seconds a bridge waits before sending configuration messages. The default Maximum Age Time is 20 seconds.
Forward Delay	Specifies the device Forward Delay Time. The Forward Delay Time is the amount of time in seconds a bridge remains in a listening and learning state before forwarding packets. The default is 15 seconds.

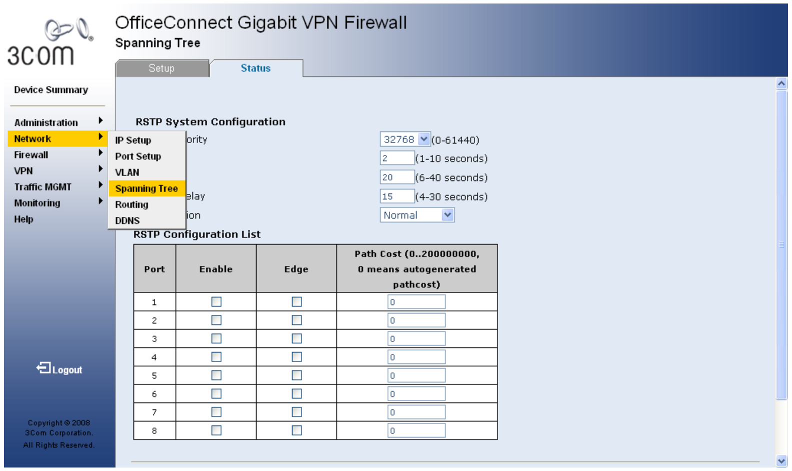
Force Version	Specifies the STP version to run on the device. The possible values are: **Normal** – RTSP mode only **Compatible** – STP compatible mode
Per-port settings	
Enable	Indicates that STP or RSTP is enabled on the port.
Edge	Indicates if Edge Port is enabled on the port. If Edge Port is enabled for a port, the Port State is automatically placed in the Forwarding state when the port link is up. Edge Port optimizes the STP protocol convergence. STP convergence takes 30 seconds and is not dependent on the number of switches in the network. However, an edge port that receives a BPDU immediately loses edge port status and becomes a normal spanning tree port.
Path Cost	Indicates the port contribution to the root path cost. The path cost is adjusted to a higher or lower value, and is used to forward traffic when a path is re-routed.

7.3 Configuring the Spanning Tree settings

Follow these steps to change the Spanning Tree settings.

1. Log into Configuration Manager as administrator, and then click the Network menu.

When the submenus of Network menu displays, clicks on Spanning Tree submenu to display the Spanning Tree Configuration page as shown in Figure 7.1.



RSTP System Configuration

ority 32768 (0-61440)

2 (1-10 seconds)

20 (6-40 seconds)

elay 15 (4-30 seconds)

ion Normal

RSTP Configuration List

Port	Enable	Edge	Path Cost (0..200000000, 0 means autogenerated pathcost)
1	□	□	0
2	□	□	0
3	□	□	0
4	□	□	0
5	□	□	0
6	□	□	0
7	□	□	0
8	□	□	0

Figure 7.1 Spanning Tree Configuration Page

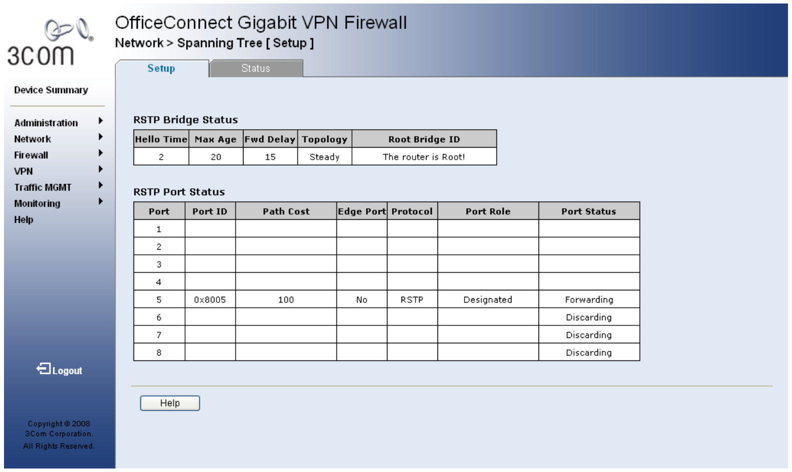
2. Enter the bridge priority value into the System Priority field. Please see Table 7.1 for more detail description.
3. Enter the Hello Time value in the specified field. The Hello Time indicates the amount of time in seconds a Root Bridge waits between configuration messages.
4. Enter the Max Age Time value in the specified field. Please note that the default value is 20 seconds.
5. Enter the Forward Delay Time value in the specified field. Please note that the default value if 15 seconds.
6. Select an appropriate STP version from the Force Version drop-down list.
7. Go to the RSTP Configuration List. Click on the Enable button to enable the Spanning Tree function on the specified port. If this port is also an edge port, click on the Edge button.

8. Enter the path code in the space provided to indicate the port contribute to the root path cost.

9. Click. Apply to save the LAN IP address.

7.4 Viewing the Spanning Tree Status

To display the port status of Spanning Tree, log into Configuration Manager as administrator, click on the Network menu and Spanning Tree submenu, and then click on the Status tab button (See Figure 7.2 RSTP/STP Status Page).



RSTP Bridge Status

Hello Time	Max Age	Fwd Delay	Topology	Root Bridge ID
2	20	15	Steady	The router is Root!

RSTP Port Status

Port	Port ID	Path Cost	Edge Port	Protocol	Port Role	Port Status
1						
2						
3						
4						
5	0x8005	100	No	RSTP	Designated	Forwarding
6						Discarding
7						Discarding
8						Discarding

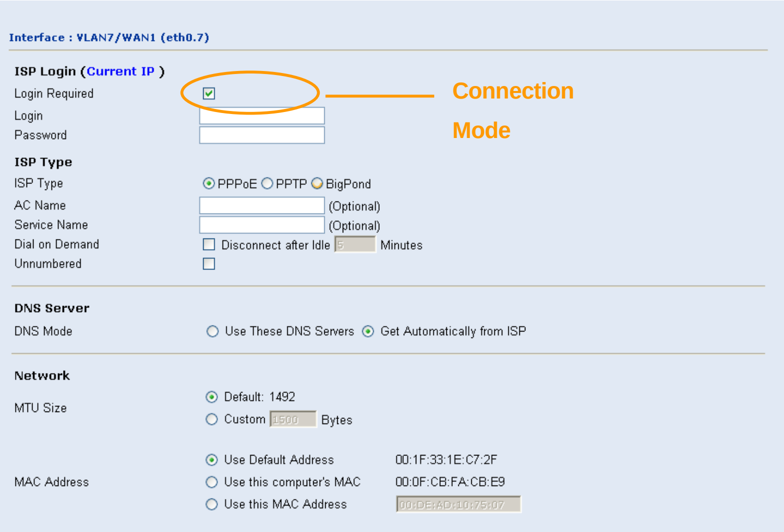
Figure 7.2 RSTP/STP Status Page

8 Configuring WAN Settings

This chapter describes how to configure WAN settings for the WAN interface on the OfficeConnect Gigabit VPN Firewall that communicates with your ISP. You'll learn to configure IP address, DHCP and DNS server for your WAN in this chapter.

8.1 WAN Connection Mode

Three modes of WAN connection are supported by the OfficeConnect Gigabit VPN Firewall – PPPoE, PPTP, Telstra BigPond, dynamic IP and static IP. If your WAN connection requires a login, please make the "Login Required" checkbox checked as shown in Figure 8.1.



Interface : VLAN7/WAN1 (eth0.7)

ISP Login (Current IP)

Login Required ☑
Login
Password

ISP Type

ISP Type ● PPPoE ○ PPTP ○ BigPond
AC Name (Optional)
Service Name (Optional)
Dial on Demand □ Disconnect after Idle 5 Minutes
Unnumbered □

DNS Server

DNS Mode ○ Use These DNS Servers ● Get Automatically from ISP

Network

MTU Size ● Default: 1492
○ Custom 1500 Bytes

MAC Address ● Use Default Address 00:1F:33:1E:C7:2F
○ Use this computer's MAC 00:0F:CB:FA:CB:E9
○ Use this MAC Address 00:DE:AD:10:75:07

Figure 8.1 WAN Connection Type Configuration

8.2 PPPoE

8.2.1 WAN PPPoE Configuration Parameters

Table 8.1 describes the configuration parameters available for PPPoE connection mode.

Table 8.1 WAN PPPoE Configuration Parameters

Setting	Description
User Name and Password	Enter the username and password you use to log into your ISP. (Note: this is different from the information you used to log into Configuration Manager.)
AC Name (Optional)	If your ISP requires PPPoE AC Name, please enter the valid AC name into this field. Leave this field blank if it is not necessary.
Service Name	If your ISP requires Service Name, please enter the valid Service name into this field. Leave this field blank if it is not necessary.

Setting	Description
Dial On Demand	Enter the inactivity timeout period at which you want to disconnect the Internet connection when there is no traffic. The minimum value of inactivity timeout is 30 seconds. RIP and SNTP services may interfere with this function if there are activities from these two services. Make sure that the update interval setting of the system date and time (in the System Management / Date/Time Setup configuration page – see 17.5 Setup Date and Time for details) is greater than the inactivity timeout value.
Unnumbered	If your ISP assigned a block of IP addresses, you would select "Enable" radio button to give your PPPoE interface an IP address from the same range assigned to your LAN. Otherwise, select "Disable".

8.2.2 Configuring PPPoE for WAN

Follow the instructions below to configure PPPoE settings:

1. Please make the "Login Required" checkbox checked as shown in Figure 8.1
2. If you are connecting to the Internet using PPPoE, you probably only have to enter User Name and Password in the PPPoE Configuration page as shown in Figure 8.1 unless you want to use your preferred DNS servers.
3. (Optional) Enter AC name in the space provided if required by your ISP. Otherwise, please leave this field blank.
4. (Optional) Enter Service name in the space provided if required by your ISP. Otherwise, please leave this field blank.
5. (Optional) If you like to use DNS setting provided by your ISP, please select "Get Automatically from ISP" radio button. Otherwise, select "Use These DNS Servers" radio button and enter IP addresses for the primary and secondary DNS servers.
6. Choose a connection option and enter appropriate setting if desired. The default setting is "Disable".
7. Click Apply to save the PPPoE settings when you are done with the configuration. You'll see a summary of the WAN configuration at the bottom half of the configuration page. Note that if the default gateway address is not shown immediately, click on the WAN menu to open the WAN configuration page again.

8.3 PPTP

8.3.1 WAN PPTP Configuration Parameters

Table 8.2 WAN PPTP Configuration Parameters

Setting	Description
User Name and Password	Enter the username and password you use to log into your ISP. (Note: this is different from the information you used to log into Configuration Manager.)
Service Name	If your ISP requires Service Name, please enter the valid Service name into this field. Leave this field blank if it is not necessary.
PPTP Server IP Address	IP Address of the PPTP server.
Interface IP Address	IP Address assigned by your ISP to make the connection with the PPTP server.

8.3.2 Configuring PPTP for WAN

Follow the instructions below to configure PPPoE settings:

1. Please make the "Login Required" checkbox checked as shown in Figure 8.1.
2. If you are connecting to the Internet using PPTP, you have to enter User Name and Password in the specified fields.
3. Enter a valid PPTP IP address in the PPTP Server IP Address field.
4. If the IP address of WAN interface is automatically assigned by your ISP, select "DHCP" radio button in the Connection Mode field. Otherwise, select "Static IP Address" button and enter valid IP address, Subnet mask and Gateway IP address in the specified fields.
5. (Optional) If you like to use DNS setting provided by your ISP, please select "Get Automatically from ISP" radio button. Otherwise, select "Use These DNS Servers" radio button and enter IP addresses for the primary and secondary DNS servers.
6. Click Apply to save the PPTP settings when you are done with the configuration. You'll see a summary of the WAN configuration at the bottom half of the configuration page. Note that if the default gateway address is not shown immediately, click on the WAN menu to open the WAN configuration page again.

8.4 Dynamic IP

8.4.1 WAN Dynamic IP Configuration Parameters

Table 8.3 describes the configuration parameters available for dynamic IP connection mode.

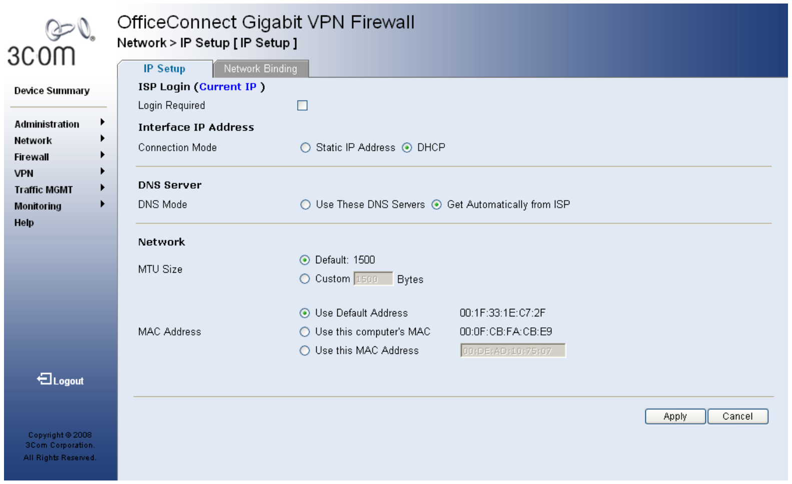
Table 8.3 WAN Dynamic IP Configuration Parameters

Field	Description
Primary/ Secondary DNS	IP address of the primary and/or secondary DNS are optional as DHCP client will automatically obtain the DNS IP addresses configured at your ISP. However, if there are other DNS servers you would rather use, enter the IP addresses in the spaces provided.
MAC Cloning	The default is to use the MAC address of the WAN interface. However, if you had registered a MAC address previously with your ISP, you may need to enter that MAC address here.

8.4.2 Configuring Dynamic IP for WAN

Follow the instructions below to configure dynamic IP settings:

1. Please make the "Login Required" checkbox unchecked as shown in Figure 8.1.
2. (Optional) If you want to manually enter the DNS servers, please click "Use These DNS Servers" radio button and enter the IP addresses for the primary and secondary DNS servers if you want to use your preferred DNS servers; otherwise, skip this step.
3. If you had previously registered a specific MAC address with your ISP for Internet access, click "Use this MAC Addresse" radio button and enter the registered MAC address here and make sure you check the MAC cloning check box.
4. Click Apply to save the Dynamic IP settings when you are done with the configuration. You'll see a summary of the WAN configuration at the bottom half of the configuration page. Note that if the default gateway address is not shown immediately, click on the WAN menu to open the WAN configuration page again.



OfficeConnect Gigabit VPN Firewall

Network > IP Setup [IP Setup]

ISP Login (Current IP)

Login Required □

Interface IP Address

Connection Mode ○ Static IP Address ● DHCP

DNS Server

DNS Mode ○ Use These DNS Servers ● Get Automatically from ISP

Network

MTU Size ● Default: 1500 ○ Custom 1500 Bytes

MAC Address ● Use Default Address 00:1F:33:1E:C7:2F ○ Use this computer's MAC 00:0F:CB:FA:CB:E9 ○ Use this MAC Address 00:DE:AD:10:75:07

Figure 8.2 WAN Dynamic IP (DHCP client) Configuration Page

8.5 Static IP

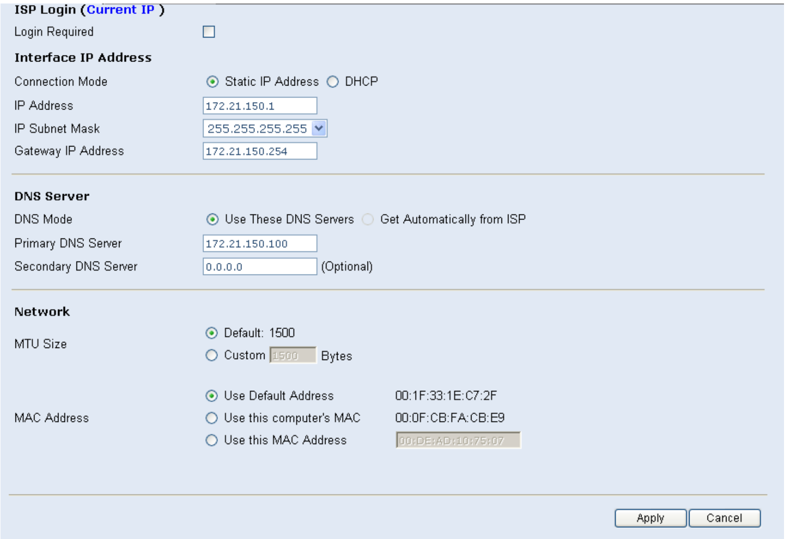
8.5.1 WAN Static IP Configuration Parameters

Table 8.4 describes the configuration parameters available for static IP connection mode.

Table 8.4 WAN Static IP Configuration Parameters

Setting	Description
IP Address	WAN IP address provided by your ISP.
IP Subnet Mask	WAN subnet mask provided by your ISP. Typically, it is set as 255.255.255.0.
Gateway IP Address	Gateway IP address provided by your ISP. It must be in the same subnet as the WAN on the OfficeConnect Gigabit VPN Firewall.
Primary/ Secondary DNS	You must at least enter the IP address of the primary DNS server. Secondary DNS is optional

8.5.2 Configuring Static IP for WAN



ISP Login (Current IP)

Login Required □

Interface IP Address

Connection Mode ● Static IP Address ○ DHCP

IP Address 172.21.150.1

IP Subnet Mask 255.255.255.255

Gateway IP Address 172.21.150.254

DNS Server

DNS Mode ● Use These DNS Servers ○ Get Automatically from ISP

Primary DNS Server 172.21.150.100

Secondary DNS Server 0.0.0.0 (Optional)

Network

MTU Size ● Default: 1500 ○ Custom 1500 Bytes

MAC Address ● Use Default Address 00:1F:33:1E:C7:2F ○ Use this computer's MAC 00:0F:CB:FA:CB:E9 ○ Use this MAC Address 00:DE:AD:10:75:07

Figure 8.3 WAN Static IP Configuration Page

Follow the instructions below to configure static IP settings:

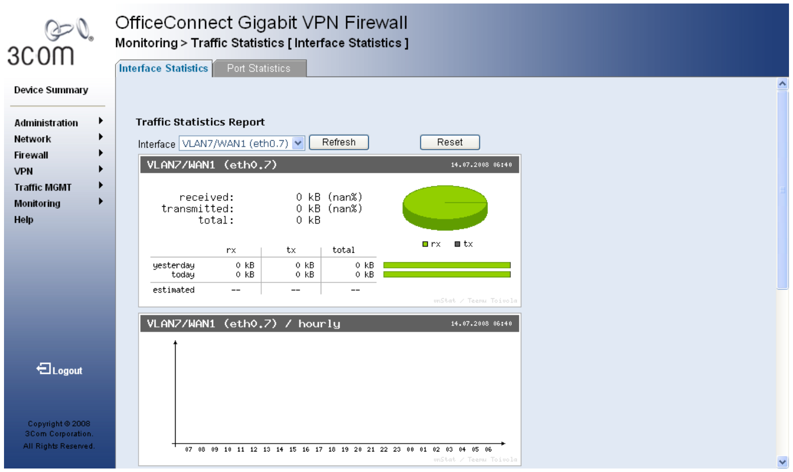
1. Select Static from the Connection Mode drop-down list as shown in Figure 8.3.

2. Enter WAN IP address in the IP Address field. This information should be provided by your ISP.
3. Enter Subnet Mask for the WAN. This information should be provided by your ISP. Typically, it is 255.255.255.0.
4. Enter gateway address provided by your ISP in the space provided.
5. Enter the IP address of the primary DNS server. This information should be provided by your ISP. Secondary DNS server is optional.
6. Click Apply to save the static IP settings when you are done with the configuration. You'll see a summary of the WAN configuration at the bottom half of the configuration page.

8.6 Viewing WAN Statistics

You can view statistics of your WAN traffic. You will not typically need to view this data, but you may find it helpful when working with your ISP to diagnose network and Internet data transmission problems.

To view WAN IP statistics, click Status on the menu. Figure 8.4 shows the WAN Statistics page:



OfficeConnect Gigabit VPN Firewall

Monitoring > Traffic Statistics [Interface Statistics]

Traffic Statistics Report

Interface VLAN7/WAN1 (eth0.7)

VLAN7/WAN1 (eth0.7) 14.07.2008 06:40

```
     received:        0 kB (nan%)
  transmitted:        0 kB (nan%)
        total:        0 kB
```

	rx	tx	total
yesterday	0 kB	0 kB	0 kB
today	0 kB	0 kB	0 kB
estimated	--	--	--

VLAN7/WAN1 (eth0.7) / hourly 14.07.2008 06:40

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Figure 8.4 WAN Statistics Page

9 Configuring Routes

You can use Configuration Manager to define specific routes for your Internet and network data communication. This chapter describes basic routing concepts and provides instructions for creating routes.

Note that most users do not need to define routes.

9.1 Overview of IP Routes

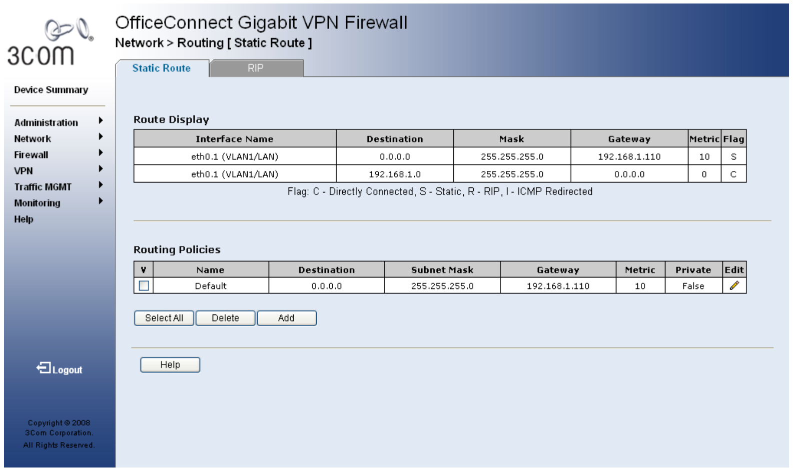
The essential challenge of a router is: when it receives data intended for a particular destination, which next device should it send that data to? When you define IP routes, you provide the rules that the OfficeConnect Gigabit VPN Firewall uses to make these decisions.

9.1.1 Do I need to define IP routes?

Most users do not need to define IP routes. On a typical small home or office LAN, the existing routes that set up the default gateways for your LAN computers and for the OfficeConnect Gigabit VPN Firewall provide the most appropriate path for all your Internet traffic.

- On your LAN computers, a default gateway directs all Internet traffic to the LAN port on the OfficeConnect Gigabit VPN Firewall. Your LAN computers know their default gateway either because you assigned it to them when you modified their TCP/IP properties, or because you configured them to receive the information dynamically from a server whenever they access the Internet. (Each of these processes is described in the Quick Start Guide instructions, Part 2.)
- On the OfficeConnect Gigabit VPN Firewall itself, a default gateway is defined to direct all outbound Internet traffic to a router at your ISP. This default gateway is assigned automatically by your ISP whenever the device negotiates an Internet connection. (The process for adding a default route is described in section 9.3.2 Adding Static Routes.)

You may need to define routes if your home setup includes two or more networks or subnets, if you connect to two or more ISP services, or if you connect to a remote corporate LAN.



Route Display

Interface Name	Destination	Mask	Gateway	Metric	Flag
eth0.1 (VLAN1/LAN)	0.0.0.0	255.255.255.0	192.168.1.110	10	S
eth0.1 (VLAN1/LAN)	192.168.1.0	255.255.255.0	0.0.0.0	0	C

Flag: C - Directly Connected, S - Static, R - RIP, I - ICMP Redirected

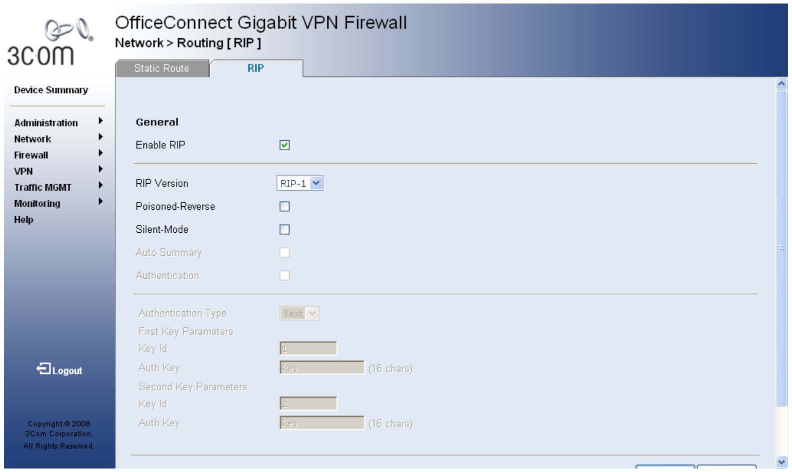
Routing Policies

V	Name	Destination	Subnet Mask	Gateway	Metric	Private	Edit
□	Default	0.0.0.0	255.255.255.0	192.168.1.110	10	False	✎

Figure 9.1 Routing Configuration Page

9.2 Dynamic Routing using RIP (Routing Information Protocol)

RIP enables routing information exchange between routers; thus, routes are updated automatically without human intervention. It is recommended that you enable RIP in the System Services Configuration Page as shown in Figure 9.2.


3com
OfficeConnect Gigabit VPN Firewall
Network > Routing [RIP]
Static Route
RIP
Device Summary
Administration
Network
Firewall
VPN
Traffic MGMT
Monitoring
Help
Logout
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General

Enable RIP ☑

RIP Version RIP-1

Poisoned-Reverse ☐

Silent-Mode ☐

Auto-Summary ☐

Authentication ☐

Authentication Type Text

First Key Parameters

Key Id 1

Auth Key key (16 chars)

Second Key Parameters

Key Id 2

Auth Key key (16 chars)

Figure 9.2 RIP Configuration Page

9.2.1 Enabling/Disabling RIP

Follow these instructions to enable or disable RIP:

1. Click Network Routing submenu and click “RIP” tab, click the “Yes” or “No” radio button in “Enable RIP” field depending on whether you want to enable or disable RIP.
2. Select RIPv1 or RIPv2 from the “RIP Version” drop-down list.
3. If automatic route summarization is required, click “Auto-Summary” option box.
4. If authentication for RIPv2 is required, select “Yes” button in the Authentication field and enter “First Key Parameters” and “Second Key Parameters” in the specified fields.
5. Click Apply to enable or disable RIP.

9.3 Static Routing

9.3.1 Static Route Configuration Parameters

The following table defines the available configuration parameters for static routing configuration.

Table 9.1 Static Route Configuration Parameters

Field	Description
Route Name	Specifies route name for a specific static route entry.
Destination Address	Specifies the IP address of the destination computer or an entire destination network. It can also be specified as all zeros to indicate that this route should be used for all destinations for which no other route is defined (this is the route that creates the default gateway). Note that destination IP must be a network ID. The default route uses a destination IP of 0.0.0.0. Refer to Appendix 18 for an explanation of network ID.
Subnet Mask	Indicates which parts of the destination address refer to the network and which parts refer to a computer on the network. Refer to Appendix 18, for an explanation of network masks. The default route uses a netmask of 0.0.0.0.
Private	Select Private if this static route entry will not be advertised in RIP.
Interface	Specifies the interface which is the physical network interface through which route is accessible.

Field	Description
Gateway IP Address	Gateway IP address

9.3.2 Adding Static Routes

Follow these instructions to add a static route to the routing table.

1. Click Network ☐ Routing submenu to enter the Static Routes Configuration page.
2. Click Add button to enter Add Static Route page.
3. Enter a route name for this static route in the Route Name field.
4. If you want to advertise this static route in RIP, please do not check "Private" button.
5. Enter the Destination Address, Subnet Mask and Gateway IP Address to the specified field.
6. Select a interface from the Interface drop-down list.
7. Click Apply to add a new route.

9.3.3 Deleting Static Routes

Follow these instructions to delete a static route from the routing table.

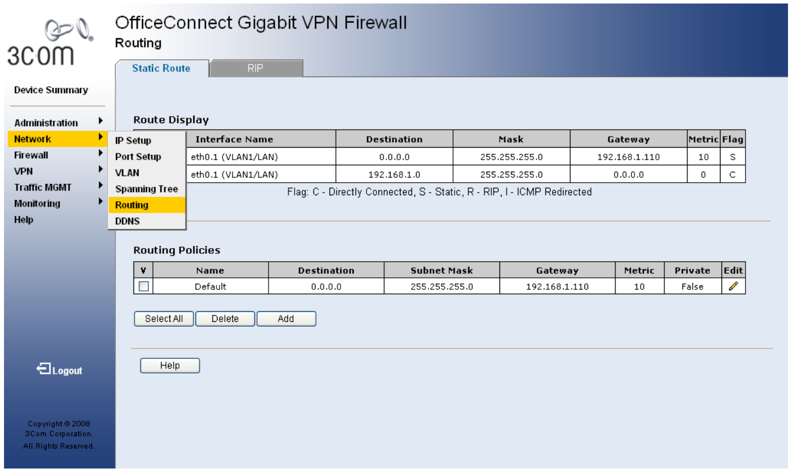
1. Click Network ☐ Routing submenu to enter the Static Routes Configuration page
2. Click on the check box in front of the rule to be selected.
3. Click Delete to delete the selected route entries.

WARNING

> *Do not remove the route for default gateway unless you know what you are doing. Removing the default route will render the Internet unreachable.*

9.3.4 Viewing the Static Routing Table

All IP-enabled computers and routers maintain a table of IP addresses that are commonly accessed by their users. For each of these *destination IP addresses*, the table lists the IP address of the first hop the data should take. This table is known as the device's *routing table*.



OfficeConnect Gigabit VPN Firewall

Routing

Route Display

Interface Name	Destination	Mask	Gateway	Metric	Flag
eth0.1 (VLAN1/LAN)	0.0.0.0	255.255.255.0	192.168.1.110	10	S
eth0.1 (VLAN1/LAN)	192.168.1.0	255.255.255.0	0.0.0.0	0	C

Flag: C - Directly Connected, S - Static, R - RIP, I - ICMP Redirected

Routing Policies

V	Name	Destination	Subnet Mask	Gateway	Metric	Private	Edit
☐	Default	0.0.0.0	255.255.255.0	192.168.1.110	10	False	✎

Figure 9.3 Viewing Routing Table

10 Configuring DDNS

Dynamic DNS is a service that allows computers to use the same domain name, even when the IP address changes from time to time (during reboot or when the ISP's DHCP server resets IP leases). OfficeConnect Gigabit VPN Firewall connects to a Dynamic DNS service whenever the WAN IP address changes. It supports setting up the web services such as Web server, FTP server using a domain name instead of the IP address. Dynamic DNS supports the DDNS clients with the following features:

- Update DNS records (addition) when an external interface comes up

Any interface status change to an external interface sends a DDNS update to the DDNS service provider.

Dynamic DNS Client

DDNS client uses the mechanism provided by the popular DDNS service providers for updating the DNS records dynamically. In this case, the service provider updates DNS records in the DNS. OfficeConnect Gigabit VPN Firewall uses HTTP to trigger this update.

The OfficeConnect Gigabit VPN Firewall supports HTTP DDNS update with the following service providers:

- DynDNS.org
- TZO.com
- Oray.net
- DtDNS.com
- 3322.org

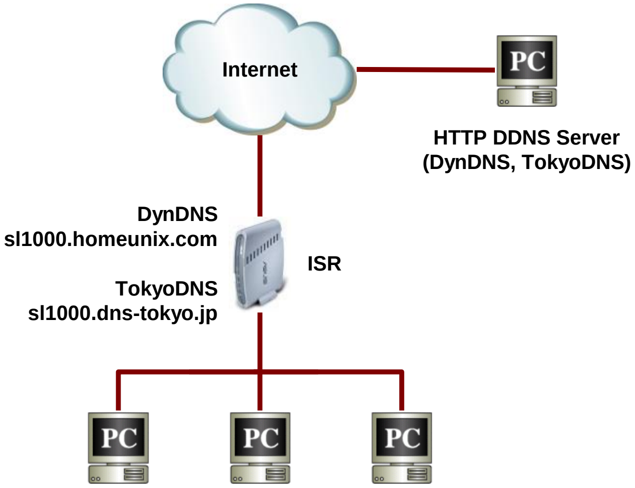


Figure 10.1 Network Diagram for HTTP DDNS

Whenever IP address of the configured DDNS interface changes, DDNS update is sent to the specified DDNS service provider. OfficeConnect Gigabit VPN Firewall should be configured with the DDNS username and password that are obtained from the DDNS service provider.

10.1 DDNS Configuration Parameters

Table 10.1 describes the configuration parameters available for DDNS service.

Table 10.1 DDNS Configuration Parameters

Field	Description

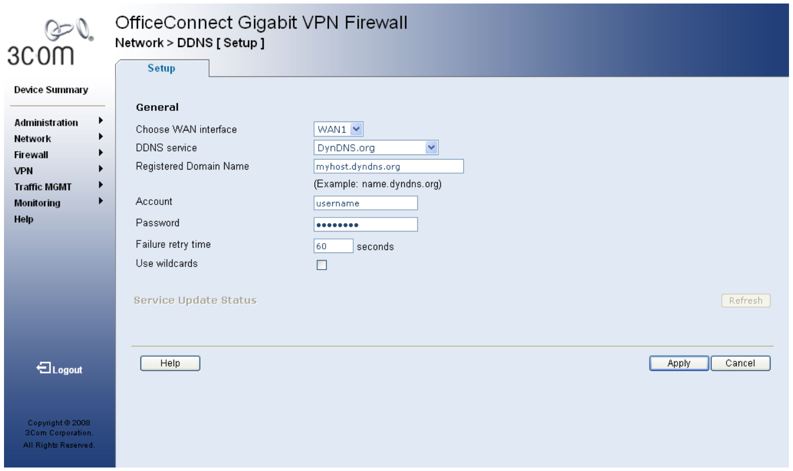
Field	Description
Choose WAN Interface	Specifies an interface to be used for the DDNS update.
Select DDNS Service	
DynDNS	Please visit http://www.dyndns.org for more details.
TZO.com	Please visit http://www.tzo.com for more details.
Oray.net	Please visit http://www.oray.cn for more details.
DtDNS.com	Please visit http://www.dtdns.com for more details.
3322.org	Please visit http://www.3322.com for more details
Registered Domain Name	Enter the registered domain name in the specified field
Account	Enter the username provided by your DDNS service provider in the specified field.
Password	Enter the password provided by your DDNS service provider in the specified field.

10.2 Access DDNS Configuration Page

Log into Configuration Manager as admin, and then click the **DDNS** menu. The DDNS Configuration page displays, as shown in Figure 10.2.

Note that when you open the DDNS Configuration page, a list of existing DDNS configuration is displayed at the bottom half of the configuration page such as those shown in Figure 10.2.

10.3 Configuring HTTP DDNS Client



OfficeConnect Gigabit VPN Firewall

Network > DDNS [Setup]

General

Choose WAN interface: WAN1

DDNS service: DynDNS.org

Registered Domain Name: myhost.dyndns.org
(Example: name.dyndns.org)

Account: username

Password: ••••••••

Failure retry time: 60 seconds

Use wildcards: □

Service Update Status

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Figure 10.2 HTTP DDNS Configuration Page

Follow these instructions to configure the HTTP DDNS:

1. First, you should have already registered a domain name to the DDNS service provider. If you have not done so, please visit www.dyndns.org or www.tzo.com for more details.
2. Click Network ➔ DDNS submenu to open the DDNS configuration page.
3. Select a DDNS service provider from radio buttons.
4. Enter the registered domain name, username and password in the specified fields.
5. Open the DDNS Configuration page (see section 10.2)
6. Click on Add button to send a DNS update request to your DDNS service provider. Note that DNS update request will also be sent to your DDNS Service provider automatically whenever the WAN port status is changed.

11 Configuring Firewall/NAT Settings

The OfficeConnect Gigabit VPN Firewall provides built-in firewall/NAT functions, enabling you to protect the system against denial of service (DoS) attacks and other types of malicious accesses to your LAN while providing Internet access sharing at the same time. You can also specify how to monitor attempted attacks, and who should be automatically notified.

This chapter describes how to create/modify/delete ACL (Access Control List) rules to control the data passing through your network. You will use firewall configuration pages to:

- Create, modify, delete and view inbound/outbound ACL rules.
- Create, modify and delete pre-defined services, IP pools, NAT pools, application filters and Schedules to be used in inbound/outbound ACL configurations.
- View firewall statistics.

Note: *When you define an ACL rule, you instruct the OfficeConnect Gigabit VPN Firewall to examine each data packet it receives to determine whether it meets criteria set forth in the rule. The criteria can include the network or internet protocol it is carrying, the direction in which it is traveling (for example, from the LAN to the Internet or vice versa), the IP address of the sending computer, the destination IP address, and other characteristics of the packet data.*

If the packet matches the criteria established in a rule, the packet can either be accepted (forwarded towards its destination), or denied (discarded), depending on the action specified in the rule.

11.1 Firewall Overview

11.1.1 Stateful Packet Inspection

The stateful packet inspection engine in the OfficeConnect Gigabit VPN Firewall maintains a state table that is used to keep track of connection states of all the packets passing through the firewall. The firewall will open a “hole” to allow the packet to pass through if the state of the packet that belongs to an already established connection matches the state maintained by the stateful packet inspection engine. Otherwise, the packet will be dropped. This “hole” will be closed when the connection session terminates. No configuration is required for stateful packet inspection and please note that the firewall service is enabled by default.

11.1.2 DoS (Denial of Service) Protection

Both DoS protection and stateful packet inspection provide first line of defense for your network. No configuration is required for both protections on your network as long as firewall is enabled for the OfficeConnect Gigabit VPN Firewall. By default, the firewall is enabled at the factory.

11.1.3 Firewall and Access Control List (ACL)

11.1.3.1 Priority Order of ACL Rule

All ACL rules have a rule ID assigned – the smaller the rule ID, the higher the priority. Firewall monitors the traffic by extracting header information from the packet and then either drops or forwards the packet by looking for a match in the ACL rule table based on the header information. Note that the ACL rule checking starts from the rule with the smallest rule ID until a match is found or all the ACL rules are examined. If no match is found, the packet is dropped; otherwise, the packet is either dropped or forwarded based on the action defined in the matched ACL rule.

11.1.3.2 Tracking Connection State

The stateful inspection engine in the firewall keeps track of the state, or progress, of a network connection. By storing information about each connection in a state table, OfficeConnect Gigabit VPN Firewall is able to quickly determine if a packet passing through the firewall belongs to an already established connection. If it does, it is passed through the firewall without going through ACL rule evaluation.

For example, an ACL rule allows outbound ICMP packet from 192.168.1.1 to 192.168.2.1. When 192.168.1.1 sends an ICMP echo request (i.e. a ping packet) to 192.168.2.1, 192.168.2.1 will send an ICMP echo reply to 192.168.1.1. In the OfficeConnect Gigabit VPN Firewall, you don't need to create another inbound ACL rule because stateful packet inspection engine will remember the connection state and allows the ICMP echo reply to pass through the firewall

11.1.4 Default ACL Rules

The OfficeConnect Gigabit VPN Firewall supports three types of default access rules:

- Inbound Access Rules: for controlling incoming access to computers on your LAN.
- Outbound Access Rules: for controlling outbound access to external networks for hosts on your LAN.
- Self Access Rules: for controlling access to the OfficeConnect Gigabit VPN Firewall itself.

Default Inbound Access Rules

No default inbound access rule is configured. That is, all traffic from external hosts to the internal hosts is denied.

Default Outbound Access Rules

The default outbound access rule allows all the traffic originated from your LAN to be forwarded to the external network using NAT.

11.2 NAT Overview

Network Address Translation allows use of a single device, such as the OfficeConnect Gigabit VPN Firewall, to act as an agent between the Internet (public network) and a local (private) network. This means that a NAT IP address can represent an entire group of computers to any entity outside a network. Network Address Translation (NAT) is a mechanism for conserving registered IP addresses in large networks and simplifying IP addressing management tasks. Because of the translation of IP addresses, NAT also conceals true network address from privy eyes and provide a certain degree security to the local network.

The NAT modes supported are static NAT, dynamic NAT, NAPT, reverse static NAT and reverse NAPT.

11.2.1 Static (or One-to-One) NAT

Static NAT maps an internal host address to a globally valid Internet address (one-to-one). The IP address in each packet is directly translated with a globally valid IP contained in the mapping. Figure 11.1 illustrates the IP address mapping relationship between the three private IP addresses and the three globally valid IP addresses. Note that this mapping is static, i.e. the mapping will not change over time until this mapping is manually changed by the administrator. This means that a host will always use the same global valid IP address for all its outgoing traffic.

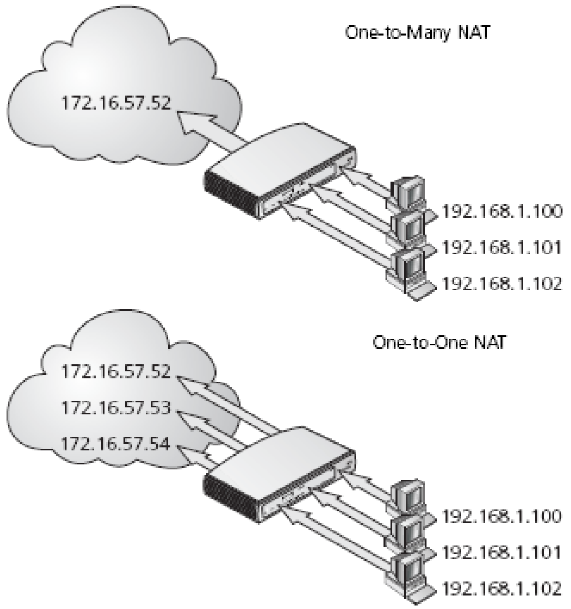


Figure 11.1 One-to-One NAT and One-to-Many NAT

11.2.2 NAPT (or One-to-Many NAT)

Also called IP Masquerading, this feature maps many internal hosts to one globally valid Internet address. The mapping contains a pool of network ports to be used for translation. Every packet is translated with the globally valid Internet address and the port number is translated with an un-used port from the pool of network ports. Figure 11.1 shows that all the hosts on the local network gain access to the Internet by mapping to only one globally valid IP address and different port numbers from a free pool of network ports.

11.2.3 Reverse Static NAT

Reverse static NAT maps a globally valid IP address to an internal host address for the inbound traffic. All packets coming to that globally valid IP address are relayed to the internal address. This is useful when hosting services in an internal machine.

11.2.4 Virtual Server (or Reverse NAPT)

Reverse NAPT is also called inbound mapping, port mapping, or virtual server. Any packet coming to the OfficeConnect Gigabit VPN Firewall can be relayed to the internal host based on the protocol, port number and/or IP address specified in the ACL rule. This is useful when multiple services are hosted on different internal machines. This means that the inbound traffic of these four services will be directed to respective host hosting these services.

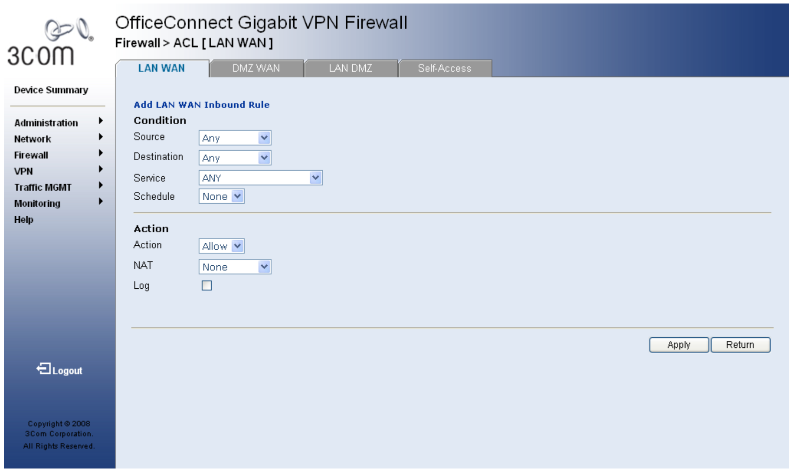
11.3 Configuring Inbound ACL Rules

By creating ACL rules in Inbound ACL configuration page as shown in Figure 11.2, you can control (allow or deny) incoming access to computers on your LAN.

Options in this configuration page allow you to:

- Add a rule, and set parameters for it
- Modify an existing rule
- Delete an existing rule
- View configured ACL rules

Comment [Julian1]: Put a rever static nat diagram here.



Add LAN WAN Inbound Rule

Condition

Source: Any

Destination: Any

Service: ANY

Schedule: None

Action

Action: Allow

NAT: None

Log: □

Figure 11.2. Inbound ACL Configuration Page

11.3.1 Inbound ACL Rule Configuration Parameters

Table 11.1 describes the configuration parameters available for firewall inbound ACL rule.

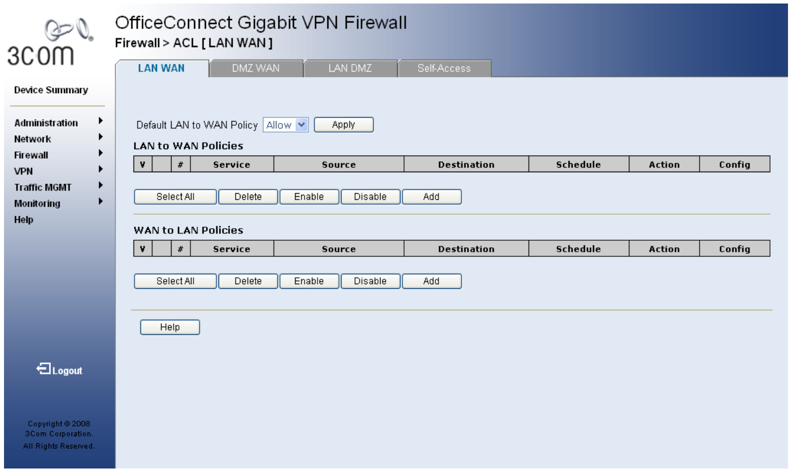
Table 11.1. Inbound ACL Rule Configuration Parameters

Field	**Description**
Source This option allows you to set the **source network** to which this rule should apply. Use the drop-down list to select one of the following options:	
Any	This option allows you to apply this rule to all the computers in the source network, such as those on the Internet.
IP Address	This option allows you to specify an IP address on which this rule will be applied.
IP Address	Specify the appropriate network address
Subnet	This option allows you to include all the computers that are connected in an IP subnet. When this option is selected, the following fields become available for entry:
Address	Enter the appropriate IP address.
Mask	Enter the corresponding subnet mask.
Range	This option allows you to include a range of IP addresses for applying this rule. The following fields become available for entry when this option is selected:
Begin	Enter the starting IP address of the range
End	Enter the ending IP address of the range
Destination This option allows you to set the **destination network** to which this rule should apply. Use the drop-down list to select one of the following options:	
Any	This option allows you to apply this rule to all the computers in the local network.
IP Address, Subnet and Range	Select any of these options and enter details as described in the **Source** section above.
Interface	This option allows you to set the destination address IP address of selected interface.

Field	Description
Service	
This option allows you to select any of the pre-configured services (selectable from the drop-down list) instead of the destination port. The following are examples of services: AH, AH and ESP, AIM, AOL, AUTH, BIT-TORRENT, CIFS, DHCP, DNS, EMULE, ESP, FINGER, FTP, GRE, HTTP, HTTPS, HTTP PROXY, ICMP, IGMP, IMAP4, IMAPS, IP Phone, IRC, ISAKMP, KERBEROS, L2TP, LDAP, MSN Messenger, NETHOOD, NetMeeting (Setup), NetMeeting (T.120), NNTP, NTP, PING, POP3, PPTP, QQ, QUAKE, RDP, RealAudio, SIP, SKYPE, SMTP, SNMP, SNMP TRAP, SOCKS, SSH, TCP, TELENET, TFTP, UDP, Yahoo Messenger, 3Com NBX Telephony **Note:** service is a combination of protocol and port number. They appear here after you add them in the "Firewall Service" configuration page.	
Schedule	
Select a pre-configured schedule during which the rule is active. Select "None" to make the rule active at all times.	
Action	
Allow	Select Allow from the drop-down list to configure rule as an allow rule. This rule when bound to the firewall will allow matching packets to pass.
Deny	Select Deny from the drop-down list to configure rule as an deny rule. This rule when bound to the firewall will allow matching packets to drop.
NAT	
None	Select this option if you don't intend to use NAT in this inbound ACL rule.
IP Address	Select this option to specify the IP address of the computer (usually a server in your LAN) that you want the incoming traffic to be directed. Note this option is called reverse NAPT or virtual server.
Port Number	Select "Assign" to manually specify a destination port number. Select "Auto" to specify a destination port number automatically.
Log	
This option allows you to enable or disable logging for this ACL rule.	

11.3.2 Access Inbound ACL Rule Configuration Page

To log into Configuration Manager as admin, click the Firewall menu, and then click the ACL submenu. The ACL Rule List Table displays as shown in Figure 11.3.



Default LAN to WAN Policy: Allow

LAN to WAN Policies

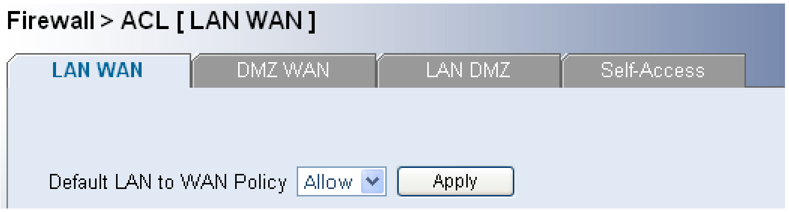
V	#	Service	Source	Destination	Schedule	Action	Config

WAN to LAN Policies

V	#	Service	Source	Destination	Schedule	Action	Config

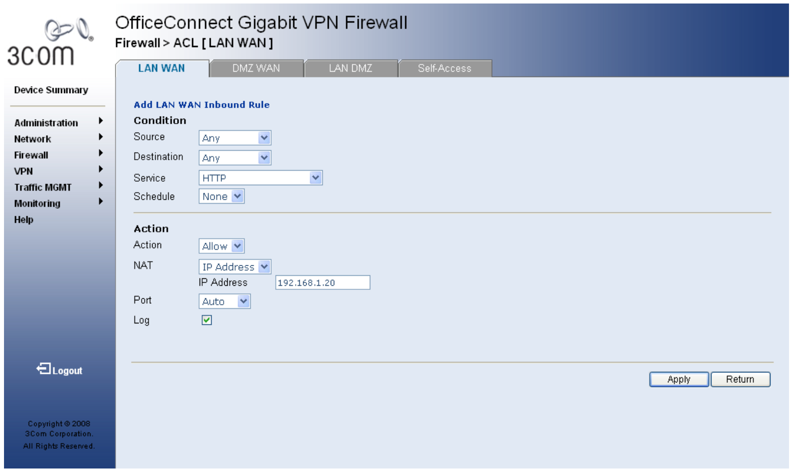
Figure 11.3 ACL Rule List Table

You can configure ACL rules for LAN/WAN, DMZ/WAN DMZ/LAN and Self-Access traffic by clicking tab button on the top of the ACL Rule List Table (See Figure 11.4).



Default LAN to WAN Policy: Allow

Figure 11.4 Tab Buttons for Different Traffic Types



Add LAN WAN Inbound Rule

Condition

Source: Any
Destination: Any
Service: HTTP
Schedule: None

Action

Action: Allow
NAT: IP Address
IP Address: 192.168.1.20
Port: Auto
Log: ☑

Figure 11.5. Inbound ACL Configuration Example

11.3.3 Add Inbound ACL Rules

To add an inbound ACL rule, follow the instructions below:

1. Click Add button in the inbound access control list table to add a new inbound ACL rule.
2. Make changes to any or all of the following fields: source/destination IP, Service and Schedule. Please see Table 11.1 for explanation of these fields.
3. Set desired action (Allow or Deny) from the "**Action**" drop-down list.
4. If you want to use NAT in this rule, select "IP Address" and specify IP address for the reverse NAPT (See 11.2.4 for detailed explanation).
5. If you want to manually assign the port number, select "Assign" from the drop-down list and specify port number in the "Port" field. Otherwise, select "Auto" to assign the destination port automatically.
6. Click on the Apply button to create the new ACL rule. The new ACL rule will then be displayed in the inbound access control list table at the bottom half of the ACL Configuration page.

7. Figure 11.5. Inbound ACL Configuration Example illustrates how to create a rule to allow inbound HTTP (i.e. web server) service. This rule allows inbound HTTP traffic to be directed to the host w/ IP address 192.168.1.28.

11.3.4 Modify Inbound ACL Rules

To modify an inbound ACL rule, follow the instructions below:

1. Open the Outbound ACL Rule Configuration Page (see section *11.3.2 Access Inbound ACL Rule Configuration Page*).
2. Click on the ✎ icon of the rule to be modified in the inbound ACL list table.
3. Make desired changes to any or all of the following fields: action, source/destination IP, Service, Schedule, Action, NAT and Log. Please see Table 11.1 for explanation of these fields.
4. Click on the Apply button to modify this ACL rule. The new settings for this ACL rule will then be displayed in the inbound access control list table at the bottom half of the Inbound ACL Configuration page.

11.3.5 Delete Inbound ACL Rules

To delete an inbound ACL rule, click on the check box in front of the rule to be deleted and follow the instructions below to delete selected inbound ACL rules.

1. Open the Inbound ACL Rule Configuration Page (see section *11.3.2 Access Inbound ACL Rule Configuration Page*).
2. Click on the check box in front of the rule to be selected.
3. Click on the Delete button to delete the selected inbound ACL rules. Note that the ACL rule deleted will be removed from the ACL rule table located at the bottom half of the same configuration page.

11.3.6 Display Inbound ACL Rules

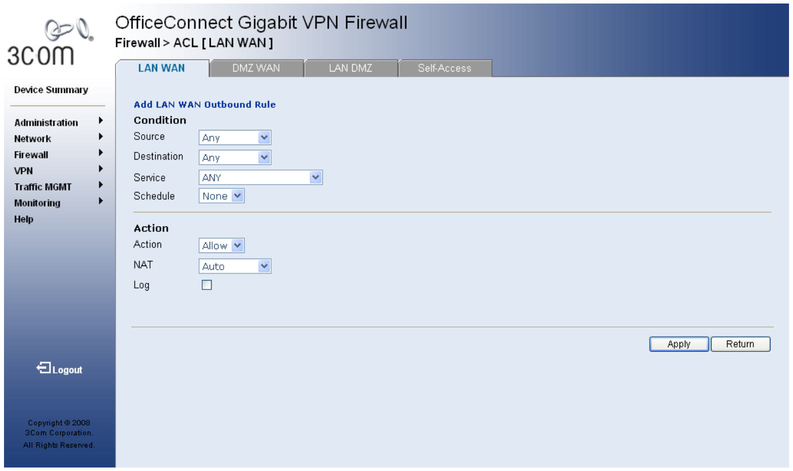
To see existing inbound ACL rules, just open the Inbound ACL Rule Configuration page as described in section *11.3.2 Access Inbound ACL Rule Configuration Page*.

11.4 Configuring Outbound ACL Rules

By creating ACL rules in outbound ACL configuration page as shown in Figure 11.6, you can control (allow or deny) Internet or external network access for computers on your LAN.

Options in this configuration page allow you to:

- Add a rule, and set parameters for it
- Modify an existing rule
- Delete an existing rule
- View configured ACL rules



OfficeConnect Gigabit VPN Firewall

Firewall > ACL [LAN WAN]

Add LAN WAN Outbound Rule

Condition

Source: Any

Destination: Any

Service: ANY

Schedule: None

Action

Action: Allow

NAT: Auto

Log: □

Figure 11.6. Outbound ACL Configuration Page

11.4.1 Outbound ACL Rule Configuration Parameters

Table 11.2 describes the configuration parameters available for firewall outbound ACL rule.

Table 11.2. Outbound ACL Rule Configuration Parameters

Field	Description
Source This option allows you to set the **source network** to which this rule should apply. Use the drop-down list to select one of the following options:	
Any	This option allows you to apply this rule to all the computers in the source network, such as those on the Internet.
IP Address	This option allows you to specify an IP address on which this rule will be applied.
IP Address	Specify the appropriate network address
Subnet	This option allows you to include all the computers that are connected in an IP subnet. When this option is selected, the following fields become available for entry:
Address	Enter the appropriate IP address.
Mask	Enter the corresponding subnet mask.
Range	This option allows you to include a range of IP addresses for applying this rule. The following fields become available for entry when this option is selected:
Begin	Enter the starting IP address of the range
End	Enter the ending IP address of the range
Destination This option allows you to set the **destination network** to which this rule should apply. Use the drop-down list to select one of the following options:	
Any	This option allows you to apply this rule to all the computers in the local network.
IP Address, Subnet and Range	Select any of these options and enter details as described in the **Source** section above.
Service This option allows you to select any of the pre-configured services (selectable from the drop-down list) instead of the destination port. The following are examples of services: AH, AH and ESP, AIM, AOL, AUTH, BIT-TORRENT, CIFS, DHCP, DNS, EMULE, ESP, FINGER, FTP, GRE, HTTP, HTTPS, HTTP PROXY, ICMP, IGMP, IMAP4, IMAPS, IP Phone, IRC, ISAKMP, KERBEROS, L2TP, LDAP, MSN Messenger, NETHOOD, NetMeeting (Setup), NetMeeting (T.120), NNTP, NTP, PING, POP3, PPTP, QQ, QUAKE, RDP, RealAudio, SIP, SKYPE, SMTP, SNMP, SNMP TRAP, SOCKS, SSH, TCP, TELENET, TFTP, UDP, Yahoo Messenger, 3Com NBX Telephony **Note:** service is a combination of protocol and port number. They appear here after you add them in the "Firewall Service" configuration page.	
Schedule Select a pre-configured schedule during which the rule is active. Select "None" to make the rule active at all times.	
Action	
Allow	Select Allow from the drop-down list to configure rule as an allow rule. This rule when bound to the firewall will allow matching packets to pass.

Field	Description
Deny	Select Deny from the drop-down list to configure rule as an deny rule. This rule when bound to the firewall will allow matching packets to drop.
NAT	
None	Select this option if you don't intend to use NAT in this outbound ACL rule.
IP Address	Select this option if you want to change the source IP address of the outbound traffic to the specified IP address.
Auto	Select "Auto" if you want to assign the IP address automatically.
Log This option allows you to enable or disable logging for this ACL rule.	

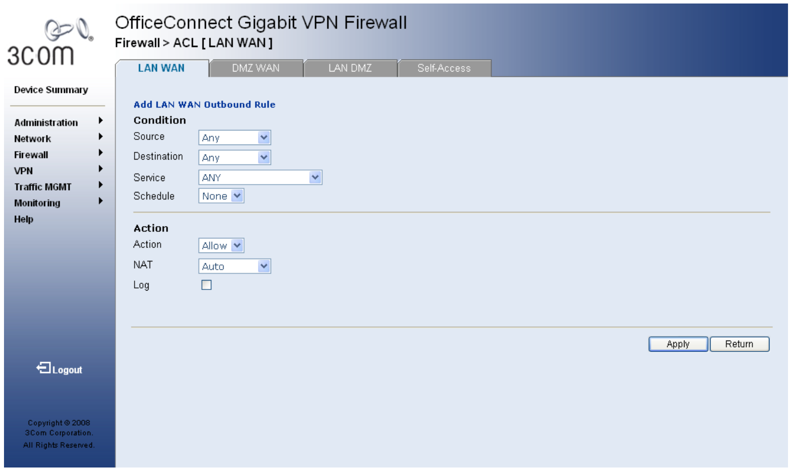
11.4.2 Access Outbound ACL Rule Configuration Page

Log into Configuration Manager as admin, click the **Firewall** menu, and then click the **Outbound ACL** submenu. The Firewall Outbound ACL Configuration page displays, as shown in Figure 11.6.

Note that when you open the Outbound ACL Configuration page, a list of existing ACL rules is also displayed at the bottom half of the configuration page such as those shown in Figure 11.6.

1. Click Add button in the outbound access control list table to add a new inbound ACL rule.
2. Make changes to any or all of the following fields: source/destination IP, Service and Schedule. Please see Table 11.1 for explanation of these fields.
3. Set desired action (Allow or Deny) from the "**Action**" drop-down list.
4. If you want to use NAT in this rule, select "IP Address" and specify IP address for the NAT (See 11.2.4 for detailed explanation).
5. Click on the Apply button to create the new ACL rule. The new ACL rule will then be displayed in the outbound access control list table at the top half of the ACL Configuration page.

Figure 11.7 illustrates how to create a rule to allow outbound HTTP (i.e. web server) access.



OfficeConnect Gigabit VPN Firewall

Firewall > ACL [LAN WAN]

Add LAN WAN Outbound Rule

Condition

Source: Any

Destination: Any

Service: ANY

Schedule: None

Action

Action: Allow

NAT: Auto

Log: □

Figure 11.7 Outbound ACL Configuration Example

11.4.3 Modify Outbound ACL Rules

To modify an outbound ACL rule, follow the instructions below:

1. Open the Outbound ACL Rule Configuration Page (see section 11.4.2).
2. Click on the ✎ icon of the rule to be modified in the inbound ACL list table.

3. Make desired changes to any or all of the following fields: action, source/destination IP, Service, Schedule, Action, NAT and Log. Please see Table 11.1 for explanation of these fields.
4. Click on the Apply button to modify this ACL rule. The new settings for this ACL rule will then be displayed in the inbound access control list table at the bottom half of the Outbound ACL Configuration page.

11.4.4 Delete Outbound ACL Rules

To delete an outbound ACL rule, click on the check box in front of the rule to be deleted and follow the instructions below to delete selected outbound ACL rules.

1. Open the Inbound ACL Rule Configuration Page (see section *11.3.2 Access Inbound ACL Rule Configuration Page*).
2. Click on the check box in front of the rule to be selected.
3. Click on the Delete button to delete the selected inbound ACL rules. Note that the ACL rule deleted will be removed from the ACL rule table located at the bottom half of the same configuration page.

11.4.5 Display Outbound ACL Rules

To see existing outbound ACL rules, just open the outbound ACL Rule Configuration page as described in section *11.3.2 Access Inbound ACL Rule Configuration Page*.

11.5 Configuring Content Filter

Keyword based Content (Uniform Resource Locator, e.g. www.yahoo.com) filtering allows you to define one or more keywords that should not appear in URL's. Any URL containing one or more of these keywords will be blocked. This is a policy independent feature i.e. it cannot be associated to ACL rules. This feature can be independently enabled/disabled, but works only if firewall is enabled.

11.5.1 Content Filter Configuration Parameters

Table 11.3 describes the configuration parameters available for a Content filter rule.

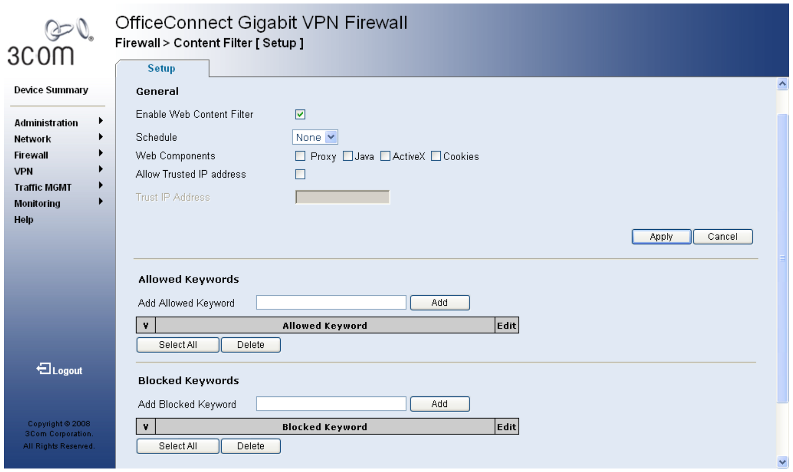
Table 11.3. Content Filter Configuration Parameters

Field	**Description**
Enable Web Content Filter	Click on "Yes" or "No" radio button to enable or disable Content filtering.
Schedule	Select a pre-configured schedule during which the rule is active. Select "None" to make the rule active at all times.
Web Components Blocking	You can block the following Web component types: Proxy, Java, ActiveX and Cookies. Even sites on the Trusted list will be subject to Web Components blocking when the blocking of a particular Web Component is enabled.
Trust IP	Enter IP address in the Trust IP field.
Blocked Keywords	Define a keyword that should not appear in the URL.

11.5.2 Access Content Filter Configuration Page

Log into Configuration Manager as admin, click the **Firewall** menu, and then click the **Content Filter** submenu. The Firewall Content filter Configuration page displays, as shown in Figure 11.8.

Note that when you open the Content filter Configuration page, a list of existing Content filter rules is also displayed at the bottom half of the configuration page such as those shown in Figure 11.8.



General

Enable Web Content Filter ☑

Schedule None

Web Components □ Proxy □ Java □ ActiveX □ Cookies

Allow Trusted IP address □

Trust IP Address

Allowed Keywords

Add Allowed Keyword

V	Allowed Keyword	Edit

Blocked Keywords

Add Blocked Keyword

V	Blocked Keyword	Edit

Figure 11.8. Content Filter Configuration Page

11.5.3 Add an Content Filter Rule

To add a Content Filter, follow the instructions below:

1. Open the Content Filter Configuration page (see section 11.5.2 Access Content Filter Configuration Page).
2. Click the check boxes of any Web Components you wish to block.
3. If you wish to configure the Trust IP, click the "Allow Trusted IP To Visit Blocked Sites" and enter IP address in the IP Address filed.
4. Click on the Apply button to save your changes.
5. Enter a keyword to the Keyword field.
6. Click on the Add button to create the Content Filter rule. The new rule will then be displayed in the Content filter Configuration Summary table.

11.5.4 Modify an Content Filter Rule

To modify a Content Filter rule, you must first delete the existing Content filter rule (see Section 11.5.5) and then add a new one (see Section 11.5.3 Add an Content Filter Rule).

11.5.5 Delete an Content Filter Rule

To delete a Content Filter rule, just click on the 🗑 in front of the rule to be deleted or follow the instructions below:

1. Open the URL Configuration page (see section 11.5.2 Access Content Filter Configuration Page).
2. Click on the check box in front of rule to be deleted.
3. Click on the Delete button to delete selected rules.

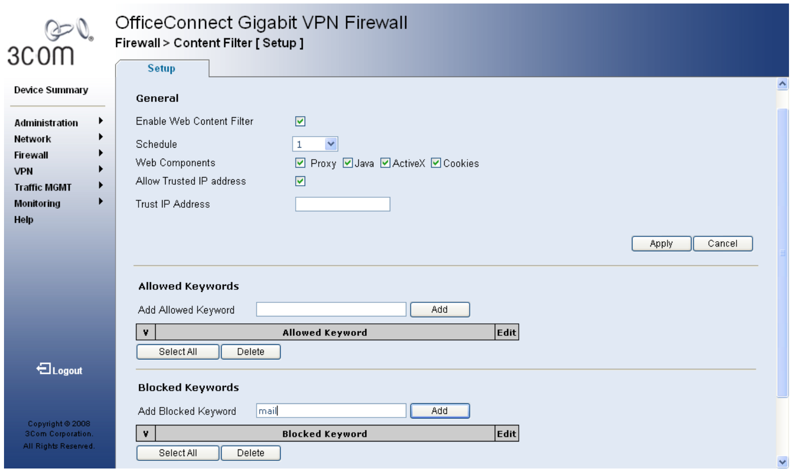
11.5.6 View Configured Content Filter Rules

To see existing Content filter rules, just open the Content Filter Configuration page as described in section 11.5.2 Access Content Filter Configuration Page.

11.5.7 Content Filter Rule Example

Figure 11.9 shows a Content filter rule example. It demonstrates

- How to add the keyword "mail". Any URL containing this keyword will be blocked.
- How to configure the Web Components.



OfficeConnect Gigabit VPN Firewall
Firewall > Content Filter [Setup]

General

Enable Web Content Filter ☑
Schedule 1
Web Components ☑ Proxy ☑ Java ☑ ActiveX ☑ Cookies
Allow Trusted IP address ☑
Trust IP Address

Allowed Keywords

Add Allowed Keyword

∨	Allowed Keyword	Edit

Blocked Keywords

Add Blocked Keyword mail

∨	Blocked Keyword	Edit

Figure 11.9. Content filter Rule Example

11.6 Configuring Advanced Firewall Features

This option sequence brings up the screen with the following sub-options for setting advanced firewall features:

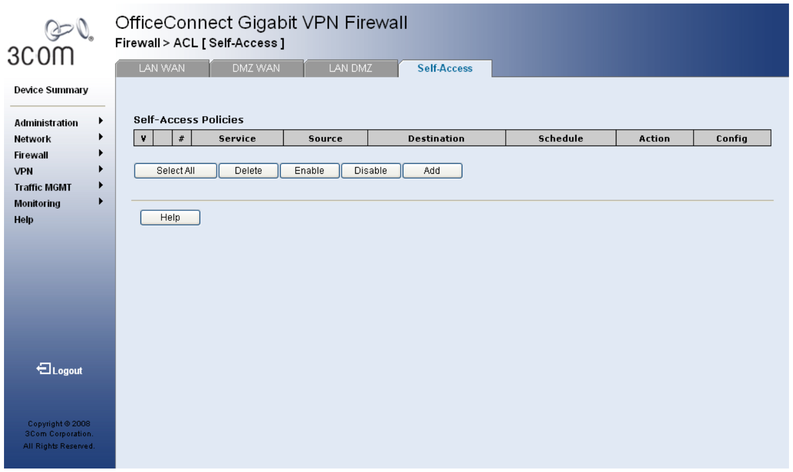
- Self Access – This option allows you to configure rules for controlling packets targeting the OfficeConnect Gigabit VPN Firewall itself.
- Services – Use this option to configure services (applications using specified port numbers). Each service record contains the name of service record, the IP protocol value and its corresponding port number.
- DoS – Use this option to configure DoS – Denial of Service – parameters. This option lists the default set of DoS attacks against which the OfficeConnect Gigabit VPN Firewall provides protection.

The following sections describe usage of these options

11.6.1 Configuring Self Access Rules

Self Access rules control access to the OfficeConnect Gigabit VPN Firewall itself. You may use Self Access Rule Configuration page, as illustrated in Figure 11.10, to:

- Add a Self Access rule, and set basic parameters for it
- Modify an existing Self Access rule
- Delete an existing Self Access rule
- View existing Self Access rules



OfficeConnect Gigabit VPN Firewall
Firewall > ACL [Self-Access]

Self-Access Policies

∨	#	Service	Source	Destination	Schedule	Action	Config

Figure 11.10. Self Access Rule Table Page

11.6.1.1 Self Access Configuration Parameters

Table 11.4 describes the configuration parameters available in the Self Access configuration page.

Table 11.4. Self Access Configuration Parameters

Field	Description

Field	Description
Source This option allows you to set the **source network** to which this rule should apply. Use the drop-down list to select one of the following options:	
Any	This option allows you to apply this rule to all the computers in the source network, such as those on the Internet.
IP Address	This option allows you to specify an IP address on which this rule will be applied.
IP Address	Specify the appropriate network address
Subnet	This option allows you to include all the computers that are connected in an IP subnet. When this option is selected, the following fields become available for entry:
Address	Enter the appropriate IP address.
Mask	Enter the corresponding subnet mask.
Range	This option allows you to include a range of IP addresses for applying this rule. The following fields become available for entry when this option is selected:
Begin	Enter the starting IP address of the range
End	Enter the ending IP address of the range

Field	Description
Destination This option allows you to set the **destination network** to which this rule should apply. Use the drop-down list to select one of the following options:	
Any	This option allows you to apply this rule to all the computers in the local network.
IP Address, Subnet and Range	Select any of these options and enter details as described in the **Source** section above.
Service This option allows you to select any of the pre-configured services (selectable from the drop-down list) instead of the destination port. The following are examples of services: AH, AH and ESP, AIM, AOL, AUTH, BIT-TORRENT, CIFS, DHCP, DNS, EMULE, ESP, FINGER, FTP, GRE, HTTP, HTTPS, HTTP PROXY, ICMP, IGMP, IMAP4, IMAPS, IP Phone, IRC, ISAKMP, KERBEROS, L2TP, LDAP, MSN Messenger, NETHOOD, NetMeeting (Setup), NetMeeting (T.120), NNTP, NTP, PING, POP3, PPTP, QQ, QUAKE, RDP, RealAudio, SIP, SKYPE, SMTP, SNMP, SNMP TRAP, SOCKS, SSH, TCP, TELENET, TFTP, UDP, Yahoo Messenger, 3Com NBX Telephony **Note:** service is a combination of protocol and port number. They appear here after you add them in the "Firewall Service" configuration page.	
Schedule Select a pre-configured schedule during which the rule is active. Select "None" to make the rule active at all times.	

Field	Description
Action	
Allow	Select Allow from the drop-down list to configure rule as an allow rule. This rule when bound to the firewall will allow matching packets to pass.
Deny	Select Deny from the drop-down list to configure rule as an deny rule. This rule when bound to the firewall will allow matching packets to drop.
Log This option allows you to enable or disable logging for this ACL rule.	

11.6.1.2 Access Self Access Rule Table

Log into Configuration Manager as admin, click the **Firewall** menu, click the **ACL** submenu and then click the **Self Access** tab button on top of the Self Access rule table. The Self Access Rule Table displays, as shown in Figure 11.10.

11.6.1.3 Add a Self Access Rule

To add a Self Access rule, follow the instructions below:

1. Open the Self Access Rule Table (see section 11.6.1.2 Access Self Access Rule).
2. Click on the Add button to display the Self Access Rule Configuration page.
3. Make desired changes to any or all of the following fields: Source, Destination, Service, Schedule and Action. (See Table 11.4. Self Access Configuration Parameters for more detailed explanation.)
4. Click on the Apply button to create the new Self Access rule. The new rule will then be displayed in the Self Access Rule table.

Example

Figure 11.10 displays the screen with entries to:

- Add a new Self Access rule to:
  - Allow TCP port 80 traffic (i.e. HTTP traffic) from the LAN and deny the HTTP traffic from the WAN port (i.e. from the external network) to the OfficeConnect Gigabit VPN Firewall.

11.6.1.4 Modify a Self Access Rule

To modify a Self Access rule, follow the instructions below:

1. Open the Self Access Rule Table (see section 11.6.1.2 Access Self Access Rule).
2. Click on the ✎ icon of the Self Access rule to be modified in the Self Access rule table.
3. Make desired changes to any or all of the following fields: Source, Destination, Service, Schedule and Action. (See Table 11.4. Self Access Configuration Parameters for more detailed explanation.)
4. Click on the Apply button to save the changes.

11.6.1.5 Delete a Self Access Rule

To delete a Self Access rule, follow the instruction below:

1. Open the Self Access Rule Table (see section 11.6.1.2 Access Self Access Rule).
2. Click on the check box in front of rule to be deleted.
3. Click on the Delete button to delete selected rules.

11.6.1.6 View Configured Self Access Rules

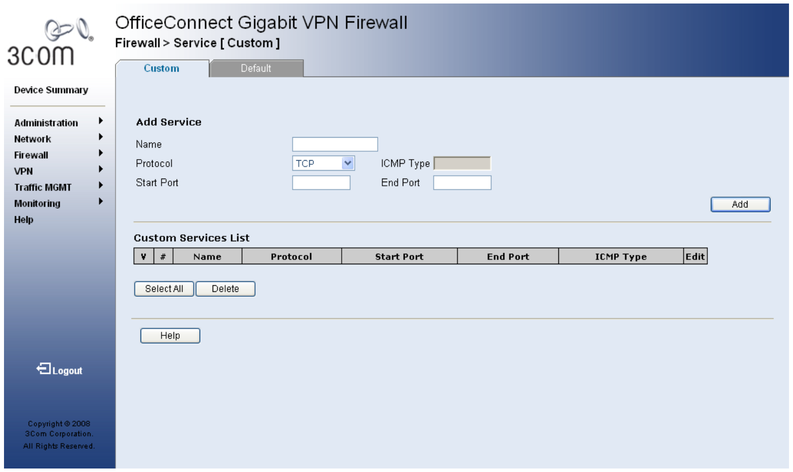
To see existing Self Access Rules, just open the Self Access Rule Table page as described in section 11.6.1.2 Access Self Access Rule .

11.6.2 Configuring Service List

Services are a combination of Protocol and Port number. It is used in inbound and outbound ACL rule configuration. You may use Service Configuration Page to:

- Add a service, and set parameters for it
- Modify an existing service
- Delete an existing service
- View configured services

Figure 11.11 shows the Firewall Service List Configuration page. The configured services are listed at the bottom half of the same page.



OfficeConnect Gigabit VPN Firewall

Firewall > Service [Custom]

Add Service

Name

Protocol TCP

ICMP Type

Start Port

End Port

Custom Services List

V	#	Name	Protocol	Start Port	End Port	ICMP Type	Edit

Figure 11.11. Service List Configuration Page

11.6.2.1 Service List Configuration Parameters

Table 11.5 describes the available configuration parameters for firewall service list.

Table 11.5. Service List configuration parameters

Field	Description
Name	Enter the name of the Service to be added. Note that only alphanumeric characters are allowed in a name.
Protocol	Enter the type of protocol the service uses.
Start Port	Enter the start port number that is set for this service.
Finish Port	Enter the finish port number that is set for this service.
ICMP Type	If the transport layer protocol is ICMP, enter the ICMP Type in this field.

11.6.2.2 Access Service List Configuration Page

Log into Configuration Manager as admin, click the **Firewall** menu and then click **Service** submenu. The Service List Configuration page displays, as shown in Figure 11.11.

Note that when you open the Service List Configuration page, a list of existing configured services is also displayed at the bottom half of the configuration page such as those shown in Figure 11.11.

11.6.2.3 Add a Service

To add a service, follow the instructions below:

1. Open the Service List Configuration Page (see section 11.6.2.2 Access Service List Configuration Page).
2. Enter a desired name, preferably a meaningful name that signifies the nature of the service, in the "**Name**" field. Note that only alphanumeric characters are allowed in a name.

3. Make changes to any or all of the following fields: public port and protocol. Please see Table 11.5 for explanation of these fields.

4. Click on the Add button to create the new service. The new service will then be displayed in the service list table at the bottom half of the Service Configuration page.

11.6.2.4 Modify a Service

To modify a service, follow the instructions below:

1. Open the Service List Configuration Page (see section 11.6.2.2 Access Service List Configuration Page).

2. Select the service from the service drop-down list or click on the ✏ icon of the service to be modified in the service list table.

3. Make desired changes to any or all of the following fields: name, public port and protocol. Please see Table 11.5 for explanation of these fields.

4. Click on the Apply button to modify this service. The new settings for this service will then be displayed in the service list table at the bottom half of the Service Configuration page.

11.6.2.5 Delete a Service

To delete a service, follow the instructions below:

1. Open the Service List Configuration Page (see section 11.6.2.2 Access Service List Configuration Page).

2. Click on the check box in front of rule to be deleted.

3. Click on the Delete button to delete selected rules.

11.6.2.6 View Configured Services

To see a list of existing services, follow the instructions below:

1. Open the Service List Configuration Page (see section 11.6.2.2 Access Service List Configuration Page).

2. The service list table located at the bottom half of the Service Configuration page shows all the configured services.

11.6.3 Configuring DoS Settings

The OfficeConnect Gigabit VPN Firewall has an Attack Defense Engine that protects internal networks from Denial of Service (DoS) attacks such as SYN flooding, IP smurfing, LAND, Ping of Death and all re-assembly attacks. It can drop ICMP redirects and IP loose/strict source routing packets. For example, a security device with the OfficeConnect Gigabit VPN Firewall provides protection from "WinNuke", a widely used program to remotely crash unprotected Windows systems in the Internet. The OfficeConnect Gigabit VPN Firewall also provides protection from a variety of common Internet attacks such as IP Spoofing, Ping of Death, Land Attack, Reassembly and SYN flooding. For a complete list of DoS protection provided by the OfficeConnect Gigabit VPN Firewall, please see Table 2.3.

11.6.3.1 DoS Protection Configuration Parameters

Table 11.6 describes the configuration parameters available for DoS Protection.

Table 11.6. DoS Protection Configuration Parameters

Field	**Description**
TCP/UDP Flooding	Check or un-check this option to enable or disable protection against SYN Flood attacks. This attack involves sending connection requests to a server, but never fully completing the connections. This will cause some computers to get into a "stuck state" where they cannot accept connections from legitimate users. ("SYN" is short for "SYNchronize"; this is the first step in opening an Internet connection). You can select this box if you wish to protect the network from TCP SYN flooding. By default, SYN Flood protection is enabled.
Winnuke	Check or un-check this option to enable or disable protection against Winnuke attacks. Some older versions of the Microsoft

Field	Description
	Windows OS are vulnerable to this attack. If the computers in the LAN are not updated with recent versions/patches, you are advised to enable this protection by checking this check box.
TCP/UDP/ICMP Port Scan	Check or un-check this option to enable or disable protection against such attacks. 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 etwork location anonymous.
IP Spoofing	Check or un-check this option to enable or disable protection against such attacks. IP spoofing is one of the most common forms of on-line camouflage. In IP spoofing, an attacker gains unauthorized access to a computer or a network by making it appear that a malicious message has come from a trusted machine by "spoofing" the IP address of that machine.
Ping of Death	Check or un-check this option to enable or disable protection against such attacks. A ping of death is a type of attack on a computer that involves sending a malformed or otherwise malicious ping to a computer. A ping is normally 64 bytes in size (or 84 bytes when IP header is considered); many computer systems cannot handle a ping larger than the maximum IP packet size, which is 65,535 bytes. Sending a ping of this size can crash the target computer.
LAND Attack	Check or un-check this option to enable or disable protection against such attacks. A LAND attack is a DoS (Denial of Service) attack that consists of sending a special poison spoofed packet to a computer, causing it to lock up.
Echo Chargen	
TearDrop	Check or un-check this option to enable or disable protection against such attacks. A Teardrop attack involves sending mangled IP fragments with overlapping, over-sized, payloads to the target machine. A bug in the TCP/IP fragmentation re-assembly code of various operating systems caused the fragments to be improperly handled, crashing them as a result of this.[4] Windows 3.1x, Windows 95 and Windows NT operating systems, as well as versions of Linux prior to versions 2.0.32 and 2.1.63 are vulnerable to this attack.
TCP XMAS/NULL/SYNFIN Scan	Check or un-check this option to enable or disable protection against such attacks. During a normal TCP connection, the source initiates the connection by sending a SYN packet to a port on the destination system. If a service is listening on that port, the service responds with a SYN/ACK packet. The client

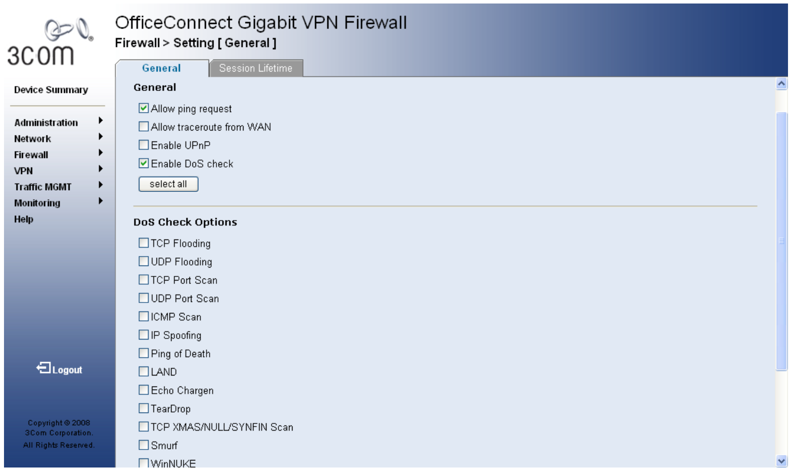
Field	Description
	initiating the connection then responds with an ACK packet, and the connection is established. If the destination host is not waiting for a connection on the specified port, it responds with an RST packet. Most system logs do not log completed connections until the final ACK packet is received from the source. Sending other types of packets that do not follow this sequence can elicit useful responses from the target host, without causing a connection to be logged. This is known as a TCP half scan, or a stealth scan, because it does not generate a log entry on the scanned host.
Smurf Attack	Check or un-check this option to enable or disable protection against such attacks. The Smurf attack is a way of generating a lot of computer network traffic to a victim host. That is, it is a type of denial-of-service attack. Specifically, it floods a target system via spoofed broadcast ping messages.

11.6.3.2 Access DoS Configuration Page

Log into Configuration Manager as admin, click the **Firewall** menu and then click the **Setting** submenu. The DoS Configuration page displays, as shown in Figure 11.12.

11.6.3.3 Configuring DoS Settings

By default, most DoS protection against all supported attack types are disabled. Figure 11.12 shows the default configuration for DoS settings. You may check or uncheck the "Enable DoS Check" to enable/disable the DoS check function. You may check or un-check individual type of attack defense to disable or enable protection against that specific type of attack.



OfficeConnect Gigabit VPN Firewall

Firewall > Setting [General]

General

☑ Allow ping request
☐ Allow traceroute from WAN
☐ Enable UPnP
☑ Enable DoS check

DoS Check Options

☐ TCP Flooding
☐ UDP Flooding
☐ TCP Port Scan
☐ UDP Port Scan
☐ ICMP Scan
☐ IP Spoofing
☐ Ping of Death
☐ LAND
☐ Echo Chargen
☐ TearDrop
☐ TCP XMAS/NULL/SYNFIN Scan
☐ Smurf
☐ WinNUKE

Figure 11.12. DoS Configuration Page

11.6.4 Configuring Schedule

With this option you can configure access Schedule records for eventual association with ACL rules. ACL rules associated with a Schedule record will be active only during the scheduled period. If the ACL rule denies HTTP access during 10:00hrs to 18:00hrs, then before 10:00hrs and after 18:00hrs the HTTP traffic will be permitted to pass through. One Schedule record can contain up to three time periods. For example:

Office hours on weekdays (Mon-Fri) can have the following periods:

- Pre-lunch period between 9:00 and 13:00 Hrs
- Post-lunch period between 14:00 and 18:30 Hrs

Office hours on weekends (Saturday-Sunday) can have the following periods:

- 9:00 to 12:00 Hrs

Such varying time periods can be configured into a single Schedule record. Access rules can be activated based on these time periods.

11.6.4.1 Schedule Configuration Parameters

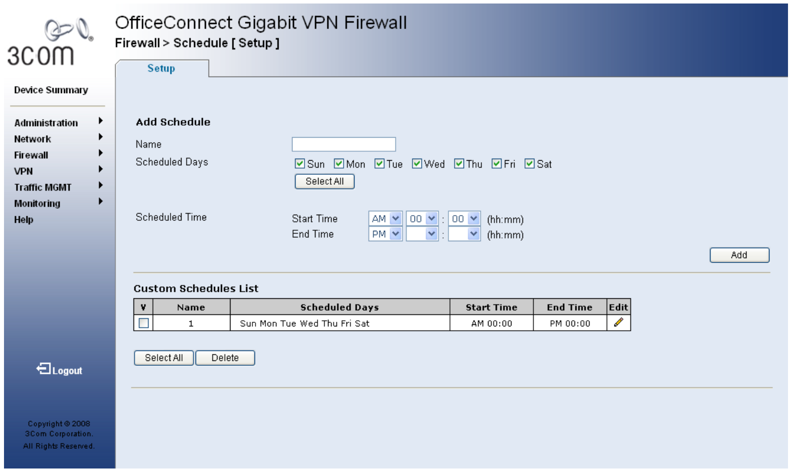
Table 11.7 describes the configuration parameters available for a Schedule.

Table 11.7. Schedule Configuration Parameters

Field	Description
Active on days	Check the radio button "All Days" or "Specific Days". If you select "Specific Days", check the radio button for each day you want to schedule to be in effect.
Days of Week	Set the days for the schedule.
Active on time of days	Check the radio button "All Day" or "Specific Times". If you select "Specific Times", enter Start Time and End Time in the specified fields.

11.6.4.2 Access Schedule Configuration Page

Log into Configuration Manager as admin, click the **Firewall** menu and then click the **Schedule** submenu. The Schedule Configuration page displays, as shown in Figure 11.13.



OfficeConnect Gigabit VPN Firewall

Firewall > Schedule [Setup]

Setup

Add Schedule

Name

Scheduled Days ☑ Sun ☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri ☑ Sat

Select All

Scheduled Time

Start Time AM : 00 : 00 (hh:mm)

End Time PM : : (hh:mm)

Add

Custom Schedules List

∨	Name	Scheduled Days	Start Time	End Time	Edit
□	1	Sun Mon Tue Wed Thu Fri Sat	AM 00:00	PM 00:00	✎

Select All Delete

Figure 11.13. Schedule Configuration Page

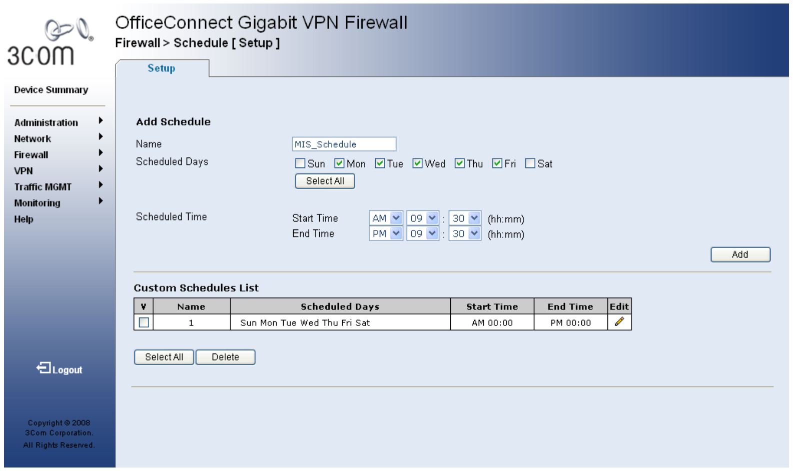
11.6.4.3 Add a Schedule

To configure schedules, follow the instructions below:

1. Open the Schedule Configuration page (see section 11.6.4.2 Access Schedule Configuration Page).
2. Select **Schedule1** tab button from the top of the Schedule Configuration page.
3. Check the radio button for All Days or Specific Days. If you chose Specific Days, check the radio button for each day you want the schedule to be in effect.
4. Check the radio button to schedule the time of day: All Day, or Specific Times. If you chose Specific Times, enter the Start Time and End Time fields (Hour, Minute, AM/PM), which will limit access during certain times for the selected days.
5. Click on the Apply button to create the new schedule.
6. Repeat these steps to configure **Schedule2** and **Schedule3**.

11.6.4.4 Schedule Example

1. Create a Schedule – see Figure 11.14.



Add Schedule

Name: MIS_Schedule

Scheduled Days: □ Sun ☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri □ Sat

Scheduled Time

Start Time: AM 09 : 30 (hh:mm)

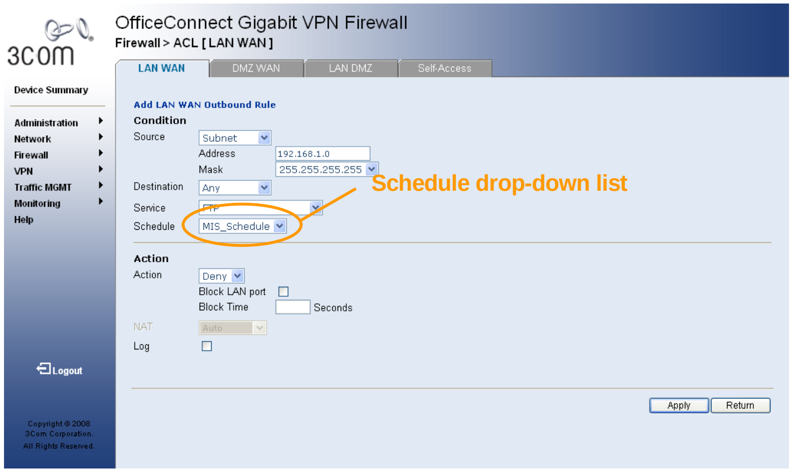
End Time: PM 09 : 30 (hh:mm)

Custom Schedules List

V	Name	Scheduled Days	Start Time	End Time	Edit
□	1	Sun Mon Tue Wed Thu Fri Sat	AM 00:00	PM 00:00	✎

Figure 11.14. Schedule Example – Create a Schedule

2. Associate the Schedule to an outbound ACL rule by selecting an existing Schedule from the Schedule drop-down list. Figure 11.15 shows that MISgroup1 is denied FTP access during office hours.



Add LAN WAN Outbound Rule

Condition

Source: Subnet

Address: 192.168.1.0

Mask: 255.255.255.255

Destination: Any

Service: FTP

Schedule: MIS_Schedule

Action

Action: Deny

Block LAN port □

Block Time Seconds

NAT: Auto

Log □

Figure 11.15. Schedule Example – Deny FTP Access for MISgroup1 During OfficeHours

11.6.5 Configuring IP/MAC Binding

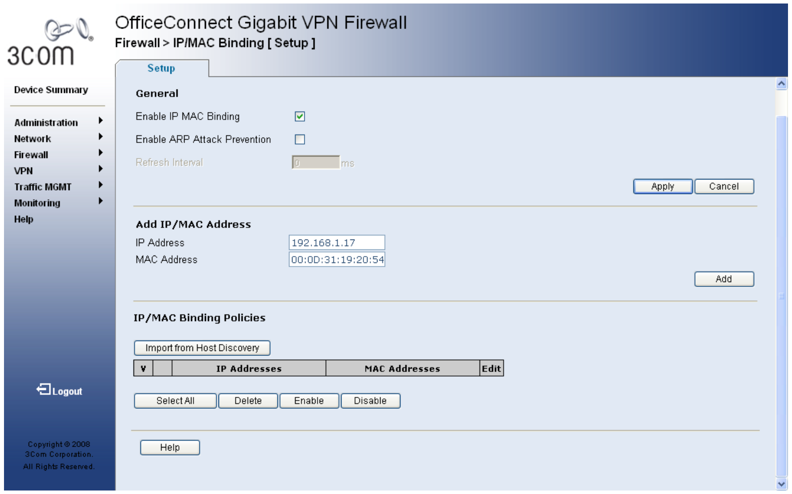
This feaure allows the system administrator to binding an IP address with a specific MAC address to prevent LAN computers being affected by the ARP spoofing attack.

Please refer the following sections to configuring the IP/MAC binding rules.

11.6.5.1 Adding an IP/MAC binding rule

To adding an IP/MAC binding for the firewall, follow these steps:

1. Click on **Firewall > IP/MAC Binding** to enter the IP/MAC Binding configuration page. See Figure 11.16 IP/MAC Binding Configuration Page.


3com
OfficeConnect Gigabit VPN Firewall
Firewall > IP/MAC Binding [Setup]
Setup
Device Summary
Administration
Network
Firewall
VPN
Traffic MGMT
Monitoring
Help
Logout
Copyright © 2008 3Com Corporation. All Rights Reserved.
Apply
Cancel
Add
Import from Host Discovery
Select All
Delete
Enable
Disable
Help

General

Enable IP MAC Binding ☑

Enable ARP Attack Prevention □

Refresh Interval 0 ms

Add IP/MAC Address

IP Address 192.168.1.17

MAC Address 00:0D:31:19:20:54

IP/MAC Binding Policies

V		IP Addresses	MAC Addresses	Edit

Figure 11.16 IP/MAC Binding Configuration Page

2. Enter an IP address and MAC address on "Add IP/MAC Address" section.

3. Click on the Add button to save the change. The new entry will be displayed in the IP/MAC Policy Table at the bottom half of the IP/MAC Binding configuration page.

4. Please note that instead of manually create IP/MAC binding rule, you can optionaly create multiple IP/MAC binding rule at the same time by using the **Import from Host Discovery** feature.

11.6.5.2 Editing an IP/MAC binding rule

To editing an existing IP/MAC binding rule for the firewall, follow these steps:

1. Click on **Firewall > IP/MAC Binding** to enter the IP/MAC Binding configuration page.

2. Click on ✎ icon of the rule to be modified in the IP/MAC Binding Policies table.

3. Make desired changes to any or all of the following fields: IP Address, MAC Address.

4. Click on the Apply button to save the changes.

11.6.5.3 Removing an existing IP/MAC binding rule

To removing an existing IP/MAC binding rule for the firewall, follow these steps:

1. Click on **Firewall > IP/MAC Binding** to enter the IP/MAC Binding configuration page.

2. Click on the check box in front of the rule to be deleted.

3. Click on the Delete button to remove the selected rules.

11.6.6 Configuring Port-Triggering

Port triggering feature can automate port forward incoming port traffic to initiator when initiator which behind NAT router connects to a predetermined outgoing port of remote host. It is useful if no application layer gateway support for the special application which requires remote host make another connection back to initiator.

11.6.6.1 Configuration parameters for the Port-Triggering feature

The configuration parameters for the Port-Triggering feature are shown as below:

Table 11.8 Port-Triggering Configuration Parameters

Field	Description
Name	Specify a name for this rule.
Service User	Select Any will allow this service to be used by any computers in your LAN network. Otherwise, select Single Address and enter the IP address of one computer to restrict the service to a particular computer.

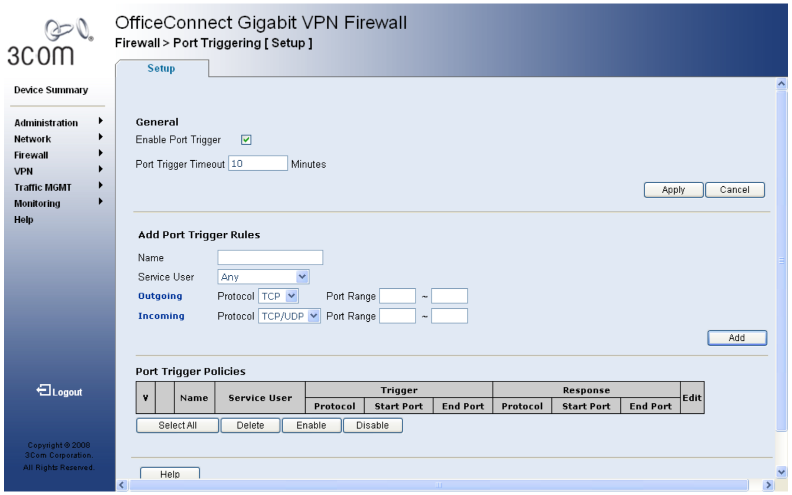
Field	Description
Outgoing Protocol	Select the protocol type from the drop-down list. The available options are TCP and UDP
Outgoing Port Range	The port range this application uses when it sends outbound packets. The outgoing port numbers act as the trigger. When the router detects the outgoing packets with these port numbers, it will allow the corresponding inbound packets with the incoming port numbers specified in the Incoming Port Range field to pass through the router.
Incoming Protocol	The protocol that the corresponding inbound packet used. The available options are TCP and UDP
Incoming Port Range	The port range that the corresponding inbound packet used.

Please refer to the following sections to configuring the Port-Triggering rule for the OfficeConnect Gigabit VPN Firewall.

11.6.6.2 Adding an Port-Triggering Rule

Follow these steps to setup a Port-Triggering Rule:

1. Click on **Firewall > Port Triggering** menu to enter the Port Triggering configuration page. See Figure 11.17 Port-Triggering Configuration Page.
2. Make changes to any or all of the following fields: Service Name, Service User, Outgoing/Incoming Protocol and Outgoing/Incoming Port Rang. Please see Table 11.8 for detail explanation of these fields.
3. Click on the Add button to save the change. The new entry will then be displayed in the Port-Triggering Policy List Table at the buttom half of the Port-Triggering Configuration Page.



Enable Port Trigger ☑

Port Trigger Timeout 10 Minutes

Name

Service User Any

Outgoing Protocol TCP Port Range ~

Incoming Protocol TCP/UDP Port Range ~

V		Name	Service User	Trigger			Response			Edit
				Protocol	Start Port	End Port	Protocol	Start Port	End Port	

Figure 11.17 Port-Triggering Configuration Page

11.6.6.3 Editing an Port-Triggering Rule

Follow these steps to modify an existing Port-Triggering Rule:

1. Click on **Firewall > Port Triggering** menu to enter the Port Triggering configuration page.
2. Click on ✎ icon of the rule to be modified in the Port-Triggering Policy list table.
3. Make changes to any or all of the following fields: Service Name, Service User, Outgoing/Incoming Protocol and Outgoing/Incoming Port Rang. Please see Table 11.8 for detail explanation of these fields.
4. Click on the Apply button to save the changes.

11.6.6.4 Removing Port-Triggering Rules

To removing an existing Port-Triggering rule for the firewall, follow these steps:

1. Click on **Firewall > Port Triggering** menu to enter the Port Triggering configuration page.
2. Click on the check box in front of the rule to be deleted.
3. Click on the Delete button to remove the selected rules.

11.6.7 Configuring P2P Service Prevention

P2P file sharing applications such as Kazaa, eDonkey, Bit-Torrent and others have grown increasingly popular on the Internet. However, the P2P applications can also exhaust bandwidth and seriously degrade network performance. For this reason, it is necessary to introduce the P2P Service Prevention mechanism to prevent P2P applications from burdening your network bandwidth.

The configuration parameters for the P2P Service Prevention are shown as Table 11.9.

Table 11.9 P2P Service Prevention Configuration Parameters

Field	**Description**
Enable P2P Prevention	To enable P2P Service Prevention, tick the check box.
Name	Specify a name of the service to be created.
Protocol	Select an appropriate protocol from the drop-down list.
Start Port	The start TCP or UDP port range.
End Port	The end TCP or UDP port range.

To configure the P2P Service Prevention, please refer to the following sections.

11.6.7.1 Adding a P2P Service Prevention Rule

Follow these steps to add a new P2P Service Prevention Rule:

1. Click on **Firewall > P2P Prevention** menu to enter the P2P Service Prevention configuration page.
2. Prior to configuring the P2P Service Prevention rule, please tick the Enable P2P Prevention chick box.
3. Make changes to any or all of the following fields: Name, Protocol, Start Port, End Port. Please see Table 11.9 for detail explanation of these fields.
4. Click on the Add button to save the change. The new entry will then be displayed in the P2P Service Prevention Rule Table at the buttom half of the Configuration Page.

11.6.7.2 Editing a P2P Service Prevention Rule

Follow these steps to edit an existing P2P Service Prevention Rule.

1. Click on **Firewall > P2P Prevention** menu to enter the P2P Prevention configuration page.
2. Click on ✎ icon of the rule to be modified in the P2P Prevention Policy list table.
3. Make changes to any or all of the following fields: Name, Protocol, Start Port, End Port. Please see Table 11.9 for detail explanation of these fields.
4. Click on the Apply button to save the changes.

11.6.7.3 Removing a P2P Service Prevention Rule

⚠ **WARNING**

It is impossible to remove the default rules listed in theP2P Service Prevention Rule Table!

To removing an existing rule for the firewall, follow these steps:

1. Click on **Firewall > P2P Prevention** to enter the P2P Prevention configuration page.

2. Click on the check box in front of the rule to be deleted.
3. Click on the Delete button to remove the selected rules.

11.6.8 Configuring Session Limit

Session Limit is used to limit the number of firewall sessions (i.e., TCP/UDP connections or ICMP Request/Response) that each user can create and occupy, therefore preventing malicious users from hogging the system and network resources. Besides, also could against some viruses which attempt to generate large sessions.

The following table shows the configuration parameters of Session Limit.

Table 11.10 Session Limit Configuration Parameters

Field	Description
Disable	Tick this check box if you want to disable the Session Limit function.
Single IP cannot exceed X Sessions	Specified a number of session that a network host can create.
When single IP exceed X Sessions	Specified a number of session that a network host can create. Once a network host creates more sessions than the limit, the user is blocked to create more sessions for the next defined minutes if selecting "**block this IP to add new session for X minutes**". Or, all of the traffic created from the user is discarded for the specified minutes if selecting "**block this IP's all connection for X minutes**".

Follow these steps to configure the Session Limit function:

1. Click on **Firewall > Session Limit** menu to enter the Session Limit configuration page.
2. Leave the Disable checkbox unchecked if you want to enable the Session Limit feature; otherwise, tick the Disable checkbox.
3. Make changes to any or all of the following fields: **Single IP cannot exceed X Sessions** and **When single IP exceed X Sessions**. Please see Table 11.10 for detail explanation of these fields.

12 Configuring Quality of Service

12.1 Overview

Quality of Service (QoS) is the ability to provide different priority to different applications, users, or data flows, or to guarantee a certain level of performance to a data flow. For instance, a required bit rate, delay, jitter, packet dropping probability and/or bit error rate may be guaranteed. Quality of Service (QoS) guarantees are important if the network capacity is insufficient, especially for real-time streaming multimedia applications such as voice over IP, online games and IP-TV.

You may follow these steps to configure the QoS on the OfficeConnect Gigabit VPN Firewall:

Step 1: Define the maximum bandwidth of WAN interface.

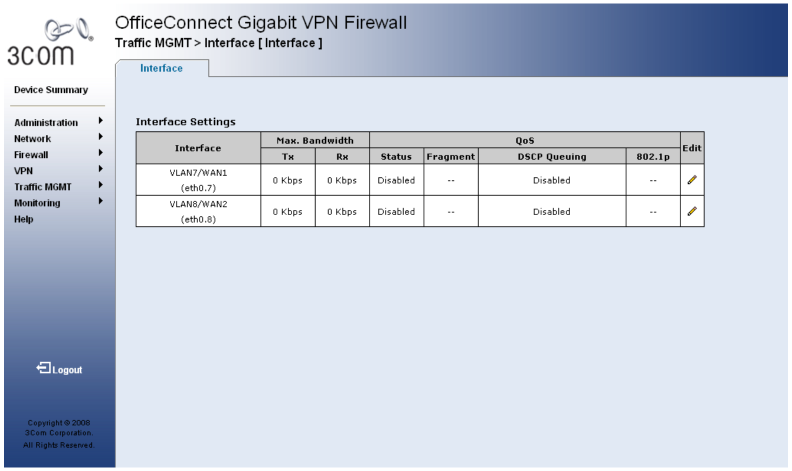
Step 2: Create a QoS Class Object

Step 3: Create a QoS Policy and apply the policy to a specific interface

12.2 Define the Maximum Bandwidth

To define the maximum bandwidth of WAN interface, follow these steps:

1. Click "Traffic MGMG" menu in the main menu and then click "Interface" sub-menu. The existing settings are summarized in the Interface Settings table. See Figure 12.1.
2. Click on the ✎ icon to edit the selected interface.
3. Enter Max. TX to limit the gateway's bandwidth transmission rate. The purpose is to limit the bandwidth of the WAN device to that of the weakest outbound link, for instance, the DSL speed provided by the ISP. This forces OffceConnect Gigabit VPN Firewall to be the network bottleneck, where sophisticated QoS prioritization can be performed. If the device's bandwidth is not limited correctly, the bottleneck will be in an unknown router or modem on the network path, rendering QoS useless.
4. In the same manner, enter Max. RX to limit the gateway's bandwidth reception rate to that of the DSL modem.



OfficeConnect Gigabit VPN Firewall

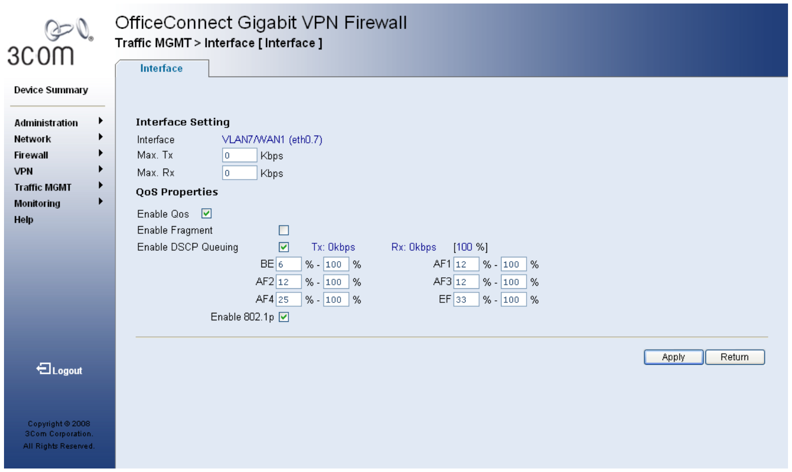
Traffic MGMT > Interface [Interface]

Interface Settings

Interface	Max. Bandwidth		QoS				Edit
	Tx	Rx	Status	Fragment	DSCP Queuing	802.1p	
VLAN7/WAN1 (eth0.7)	0 Kbps	0 Kbps	Disabled	--	Disabled	--	✎
VLAN8/WAN2 (eth0.8)	0 Kbps	0 Kbps	Disabled	--	Disabled	--	✎

Figure 12.1 Interface Settings List Table

5. Make the "Enable QoS" check box checked if you want to associate QoS policy to the selected WAN interface.
6. Make the "Enable DSCP Queuing" check box checked if you want to create queues for the DiffServ QoS.
7. Make the "802.1p" check box checked if you want to allow 802.1p to DSCP mapping.
8. Click on the Apply button to save the settings.



Traffic MGMT > Interface [Interface]

Interface Setting

Interface VLAN7/WAN1 (eth0.7)

Max. Tx 0 Kbps

Max. Rx 0 Kbps

QoS Properties

Enable Qos ☑

Enable Fragment □

Enable DSCP Queuing ☑ Tx: 0kbps Rx: 0kbps [100 %]

BE 6 % - 100 % AF1 12 % - 100 %

AF2 12 % - 100 % AF3 12 % - 100 %

AF4 25 % - 100 % EF 33 % - 100 %

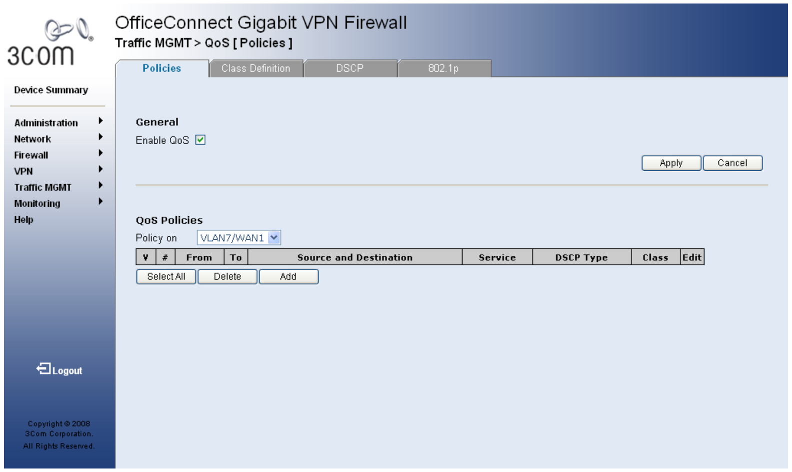
Enable 802.1p ☑

Figure 12.2 Maximum Interface Bandwidth Configuration Page

12.3 Defining the QoS Class Object

To define the QoS class object, follow these steps:

1. Click "Traffic MGMP" menu and then click "QoS" sub-menu to enter to QoS configuration page. See Figure 12.3.



Traffic MGMT > QoS [Policies]

General

Enable QoS ☑

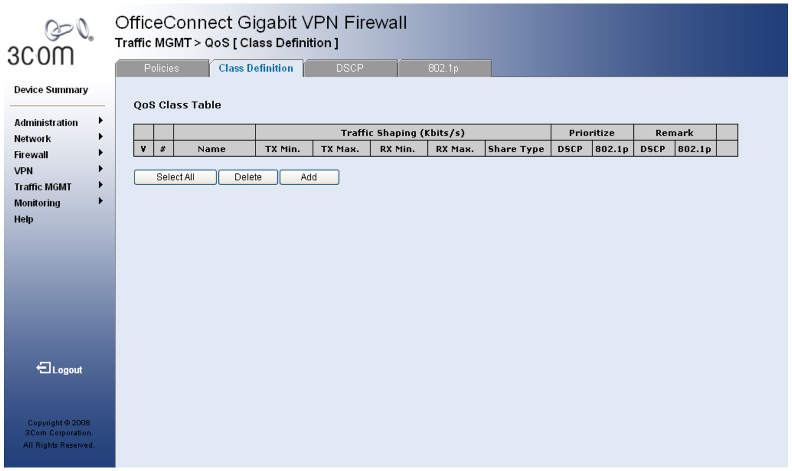
QoS Policies

Policy on VLAN7/WAN1

V	#	From	To	Source and Destination	Service	DSCP Type	Class	Edit

Figure 12.3 QoS Configuration Page

2. Click "Class Definition" tag on the top of the QoS configuration page to enter the Class Definition page. See .



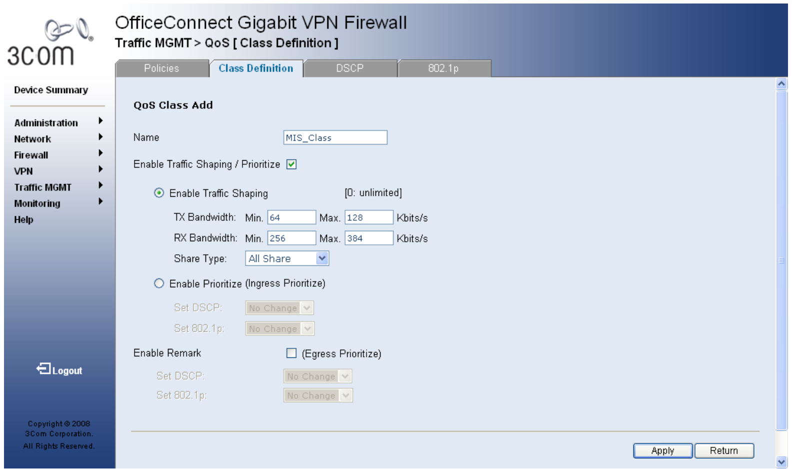
Traffic MGMT > QoS [Class Definition]

QoS Class Table

			Traffic Shaping (Kbits/s)					Prioritize		Remark		
V	#	Name	TX Min.	TX Max.	RX Min.	RX Max.	Share Type	DSCP	802.1p	DSCP	802.1p	

Figure 12.4 QoS Class Definition Page

3. Click Add button to create a new QoS Class Object. See



3com
OfficeConnect Gigabit VPN Firewall
Traffic MGMT > QoS [Class Definition]
Policies
Class Definition
DSCP
802.1p
Device Summary
Administration
Network
Firewall
VPN
Traffic MGMT
Monitoring
Help
Logout
Copyright © 2008 3Com Corporation. All Rights Reserved.
Apply
Return

QoS Class Add

Name: MIS_Class

Enable Traffic Shaping / Prioritize ☑

● Enable Traffic Shaping [0: unlimited]

TX Bandwidth: Min. 64 Max. 128 Kbits/s

RX Bandwidth: Min. 256 Max. 384 Kbits/s

Share Type: All Share

○ Enable Prioritize (Ingress Prioritize)

Set DSCP: No Change

Set 802.1p: No Change

Enable Remark □ (Egress Prioritize)

Set DSCP: No Change

Set 802.1p: No Change

Figure 12.5 Add a new QoS Class Object

4. Enter a name to the new QoS Class Object.
5. If you want to enable traffic shaping and prioritization, make "Enable Traffic Shapping / Prioritize" check box checked.
6. Click on "Enable Traffic Shaping" radio button in case you want to configure a QoS policy with traffic shaping mechanism. And then provide minimum/maximum bandwidth for the outgoing (TX) direction and incoming (RX) direction.
7. Click on "Enable Prioritize" radio button in case you want to configure a QoS policy with traffic prioritize mechanism. After that, user can select DiffServ Code Point (DSCP) or 802.1p tag for the ingress packet.
8. To configure traffic prioritization for the egress packet, make the "Enable Remark" check box checked and then select DiffServ Code Point and 802.1p tag.
9. Click on the Apply button to save the settings.

12.4 Traffic Classification

OfficeConnect Gigabit VPN Firewall allows you to define QoS policy to classify the traffic based on the following parameters:

- Source / destination IP address
- Source / destination port
- Protocol
- DiffServ Code Point (DSCP)

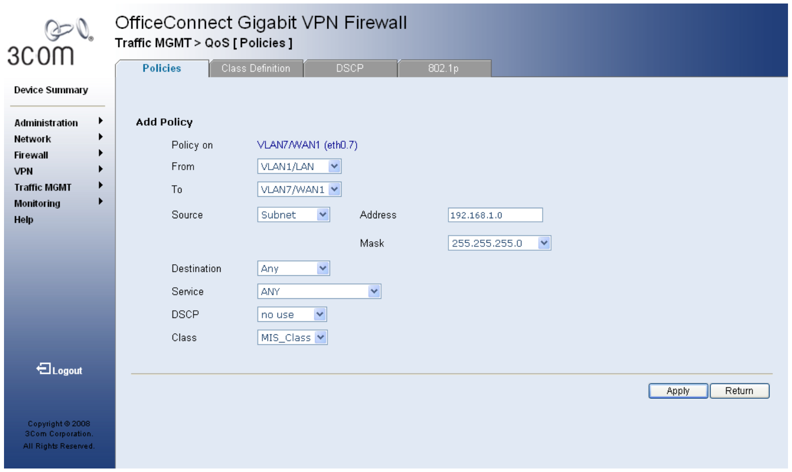
OfficeConnect Gigabit VPN Firewall supports two priority marking methods for packet prioritization:

- DSCP
- 802.1p Priority

The matching of packets by rules is connection-based, known as Stateful Packet Inspection (SPI), using the same connection-tracking mechanism used by OfficeConnect Gigabit VPN Firewall. Once a packet matches a rule, all subsequence packets with the same attributes receive the same QoS parameters, both inbound and outbound.

To configure the QoS policy, follow these steps:

1. Click "Traffic MGMT" from the main menu and then click "QoS" sub-menu to enter the QoS Configuration page.
2. Select an appropriate interface from "Policy on" drop-down list.
3. Click Add button to enter the QoS Policy Configuration page. See Figure 12.6.



Add Policy

Policy on VLAN7/WAN1 (eth0.7)
From VLAN1/LAN
To VLAN7/WAN1
Source Subnet Address 192.168.1.0
Mask 255.255.255.0
Destination Any
Service ANY
DSCP no use
Class MIS_Class

Figure 12.6 QoS Policy Configuration Page

4. Select the originated network interface from the "From" drop-down list.
5. Select the destination network interface from the "To" drop-down list.
6. To configure the source address, select the address type from the drop down list and then fill appropriate value to the Address and Mask fields.
7. To configure the destination address, select the address type from the drop down list and then fill appropriate value to the Address and Mask fields.
8. Select "Service" from the drop down list.
9. Select "DSCP" from the drop down list.
10. Select Class Object from the drop down list.
11. Click on the Apply button to save the settings.

13 Configuring WAN Load-Balancing & Failover

13.1 Introduction

WAN Load-Balancing and Failover allows user to select one of the WAN interfaces as a backup WAN port. If the primary WAN port is down or unavailable, all outbound traffic can be switched to the selected backup WAN port. Moreover, OfficeConnect Gigabit VPN Firewall also allows user to configure WAN Load-Balancing to dividing outbound traffic flows between the two WAN ports so that user can be able to fully utilize the available bandwidth.

13.2 Configuring WAN Failover

The configuration parameters for the WAN Failover are shown in the following table.

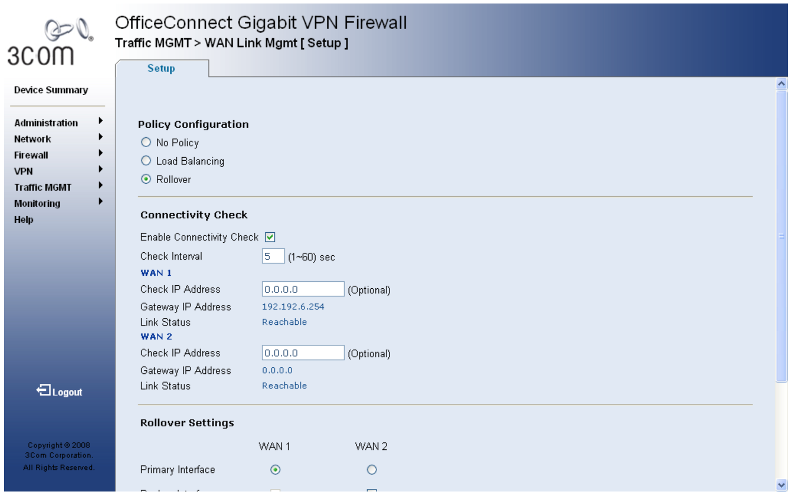
Table 13.1 WAN Failover Configuration Parameters

Field	Description
Connectivity Check	This option is available under both “Load balancing” and “Rollover” mode and mandatory for “Rollover”. Connectivity check is used to monitor the link status for the WAN ports by sending PING request packets periodically to the configured IP address.
Enable Connectivity Check	To enable the connectivity check, please tick this check box.
Check Interval	The interval that the router sends PING request packets at. The allowable value is 1 to 60 seconds.
Check IP Address	Enter the IP address of the specific network device that the traffic will pass through. This field is optional. Normally, you don't need to provide any IP address here, unless you know the traffic must pass a specific network device. If this field is absent, the route will send PING request to gateway IP address to monitor the link status.
Gateway IP Address	The gateway IP address. Please note that this field is read-only.
Link Status	Display the current WAN link status.
Rollover Settings	A rollover process means a change to default gateway. Only one WAN link is active at a time when in the rollover mode. When the primary WAN has lost physical connection, the configurable backup WAN links must be able to take over. Besides, anytime when a used WAN lost its connection, the rollover process will chose a link that has been up for the longest time to take over the lost WAN link. This operation is transparent to all hosts on the LAN side although the users may experience slight service interruption. During the rollover process, all services must be re-negotiated. This includes Dynamic DNS, and any VPN tunnels/policies.

Field	Description
Primary Interface	Click on the desired radio button to select the Primary Interface.
Backup Interface	Tick the check box to enable the Backup Interface. Please note that the Primary Link
Deferred Time	When the primary WAN has returned its service, the rollover from the backup WAN links back to primary WAN will take place based on the configurable rollover deferred time.

Follow these steps to configuring the WAN Failover:

1. Click on **Traffic MGMT > WAN Link Mgmt** to enter the WAN Link Configuration page. See Figure 13.1 WAN Link Mgmt Configuration Page.



OfficeConnect Gigabit VPN Firewall

Traffic MGMT > WAN Link Mgmt [Setup]

Policy Configuration

○ No Policy
○ Load Balancing
● Rollover

Connectivity Check

Enable Connectivity Check ☑
Check Interval 5 (1~60) sec

WAN 1
Check IP Address 0.0.0.0 (Optional)
Gateway IP Address 192.192.6.254
Link Status Reachable

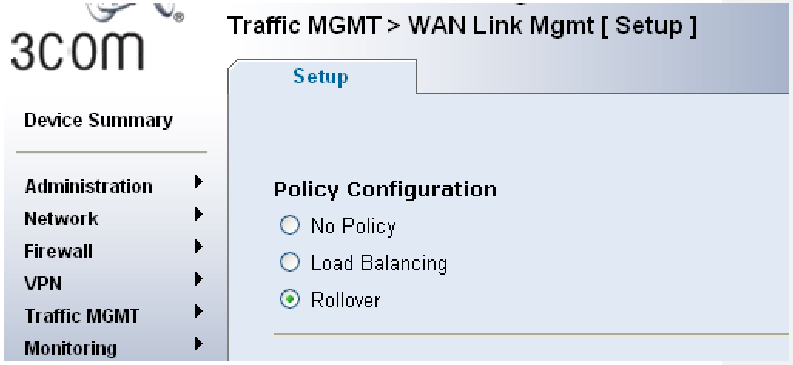
WAN 2
Check IP Address 0.0.0.0 (Optional)
Gateway IP Address 0.0.0.0
Link Status Reachable

Rollover Settings

	WAN 1	WAN 2
Primary Interface	●	○

Figure 13.1 WAN Link Mgmt Configuration Page

2. In the **Policy Configuration** field, click on Rollover radio button to enable the WAN Failover. See

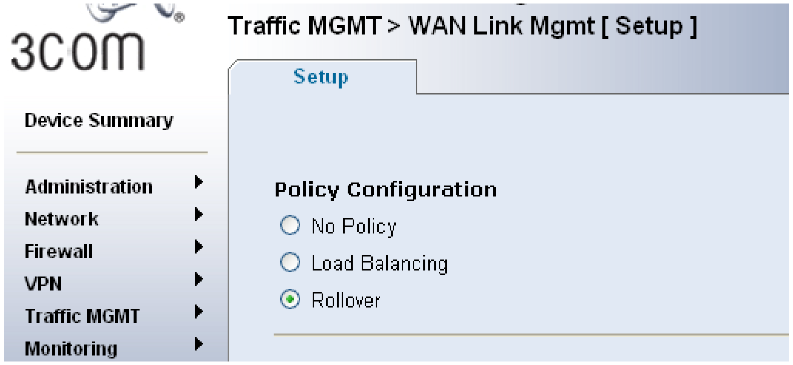


Traffic MGMT > WAN Link Mgmt [Setup]

Policy Configuration

○ No Policy
○ Load Balancing
● Rollover

Figure 13.2.



Traffic MGMT > WAN Link Mgmt [Setup]

Policy Configuration

○ No Policy
○ Load Balancing
● Rollover

Figure 13.2 Enable the WAN Failover

3. Enter a number between 1 and 60, in the **Check Interval** field. The default value is 5 seconds.
4. Enter the IP address of the target device into the **Check IP Address** field.
5. Select an interface from the **Primary Interface**. The selected interface will be the Primary Interface.

6. If you want to assign another WAN port as a backup interface, please tick on the checkbox in the **Backup Interfaces** field.
7. Enter a number between 1 and 86400, in the **Deferred Time** field. Please note that the default value is 600 seconds.
8. Click on the Apply button to save the settings.

13.3 Configuring WAN Load-Balancing

The configuration parameters for the WAN Load-Balancing are shown in the following table.

Field	**Description**
Connectivity Check	This option is available under both "Load balancing" and "Rollover" mode and mandatory for "Rollover". Connectivity check is used to monitor the link status for the WAN ports by sending PING request packets periodically to the configured IP address.
Enable Connectivity Check	To enable the connectivity check, please tick this check box.
Check Interval	The interval that the router sends PING request packets at. The allowable value is 1 to 60 seconds.
Check IP Address	Enter the IP address of the specific network device that the traffic will pass through. This field is optional. Normally, you don't need to provide any IP address here, unless you know the traffic must pass a specific network device. If this field is absent, the route will send PING request to gateway IP address to monitor the link status.
Gateway IP Address	The gateway IP address. Please note that this field is read-only.
Link Status	Display the current WAN link status.
Load Balancing Settings	When the WAN Load Balancing is selected. The OfficeConnect Gigabit VPN Firewall can distribute outgoing traffic across all active WAN interfaces on a per-connection basis.
Algorithm	Select one of the following algorithms from the drop-down list: (a) **Weighted Round Robin**: This algorithm assigns network session capacity to each WAN link in different portions, called weight, and handles network traffic in order without priority. (b) **Least Traffic First**: By the implication of its name, the algorithm chooses the dispatched WAN link according to the most bandwidth remains.
Bandwidth Allocation (in Ratio)	You can configure this algorithm to obtain the weight factors from normalizing the configured WAN TX bandwidths (tick the box "Calculate from [Tx Max.]") or just set these values manually.

Follow these steps to configure the WAN Load-Balancing:

1. Click on **Traffic MGMT > WAN Link Mgmt** to enter the WAN Link Configuration page. See Figure 13.1 WAN Link Mgmt Configuration Page.

2. Click on the **Load Balancing** radio button in the **Policy Configuration** field to enable the WAN load balancing mode.
3. If you want to enable the Connectivity Check, please tick the Enable Connectivity Check checkbox and then fill in all necessary fields.
4. Select an appropriate load balancing algorithm from the **Algorithm** drop-down list.
5. **[Weighted Round Robin Only]** Tick the "Calculate from [Tx Max.]" checkbox to allow the system to automatically calculate the weight based on the configured maximum transmits bandwidth of the WAN interface.
6. **[Weighted Round Robin Only]** If you want to manually assign the weight, please specify a number into WAN1 and WAN2 fields. For example: If you assign 10 to WAN1 field and 100 to WAN2 field, it means the first 10 sessions will go through WAN1 interface and the subsequent 100 sessions will go through WAN2 interface.
7. Click on the Apply button to save the settings.

14 Configuring IPSec VPN

OfficeConnect Gigabit VPN Firewall provides secure, encrypted communication to business partners and remote offices at a fraction of the cost of dedicated leased lines. Using the OfficeConnect Gigabit VPN Firewall Configuration Manager, you can quickly create a VPN policy to a remote site. Whenever data is intended for the remote site, the OfficeConnect Gigabit VPN Firewall automatically encrypts the data and sends it over the Internet to the remote site, where it is decrypted and forwarded to the intended destination.

The chapter contains instructions for configuring VPN connections using automatic keying and manual keys.

14.1 VPN Tunnel Configuration Parameters

Table 14.1 describes all the VPN tunnel configuration parameters available for various VPN configurations.

Table 14.1. VPN Tunnel Configuration Parameter

Options	Description
General Settings	
Policy Name	Enter a unique name, preferably a meaningful name that signifies the tunnel connection. Note that only alphanumeric characters are allowed in this field.
Policy Type	Select "Auto" for automatic keying such as IKEv1 or IKEv2. Otherwise, select "Manual" for manual keying.
IPSec Mode	Select "Tunnel" mode if you want to create a site-to-site VPN tunnel. If you want to use L2TP over IPSec, a Transport mode setting is required.
L2TP	This option allows you to setup IPSec policy for L2TP/IPSec.
Local Gateway	This option allows you to terminate the IPSec VPN tunnel on a specific interface.
Local Site This option allows you to set the **local secure network** to which this rule should apply. This option allows you to apply this rule inclusively on all computers in the internal network. Use the "**Type**" drop-down list to select one of the following:	
Any	Select this option to accept connection request from any computer.
Subnet	This option allows you to include all the computers that are connected in an IP subnet. The following fields become available when this option is selected:
IP Address	Specify the appropriate network address.
Subnet Mask	Enter the subnet mask.
Remote Site This option allows you to set the **remote (destination) secure network** to which this rule should apply. This option allows you to apply this rule inclusively on all computers in the external network. Use the "**Type**" drop-down list to select one of the following:	
Any	Select this option to accept connection request from

Options	Description
	any computer.
Subnet	This option allows you to include all the computers that are connected in an IP subnet. The following fields become available when this option is selected:
IP Address	Specify the appropriate network address.
Subnet Mask	Enter the subnet mask.
Remote Gateway You have a choice of entering either the IP address for the remote secure gateway.	
IP Address	Select this option to specify an IP address for the remote secure gateway.
IKE Identity Use the following options to configure identities for IKE protocol.	
Local ID Type	This option allows you to configure local identity type.
IP Address	Set the IKE local identity type to be the IPv4 address.
FQDN/user_FQDN	Set the IKE local identity type to be the Fully Qualified Domain Name (FQDN). Enter the identity string in the **Identifier** field. For examples: vpn1.3com.com
Any	Set the IKE local identity type to be Any.
Remote ID Type	This option allows you to configure local identity type.
IP Address	Set the IKE local identity type to be the IPv4 address.
FQDN/user_FQDN	Set the IKE local identity type to be the Fully Qualified Domain Name (FQDN). Enter the identity string in the **Identifier** field. For examples: vpn1.3com.com. For examples: vpn1.3com.com
Any	Set the IKE local identity type to be Any.
IKE Proposal Settings (only available for Auto Keying) Note that all options for the IKE proposal settings are available only when pre-shared key is selected.	
IKE Version	IKEv1 and IKEv2 are supported. Make sure the proper version of IKE protocol is selected.
Exchange Mode	Main mode and aggressive mode are supported. Click the proper radio button for the desired Exchange mode.
NAT Traversal	Check this option to enable the NAT Traversal support.
Pre-shared Key	Enter the shared secret (this should match the secret key at the other end).
IKE Encryption	Select the IKE encryption from the drop-down list. The following encryption algorithms are supported. DES 3DES AES-128 AES-192 AES-256
IKE	Select the IKE authentication from the drop-down list.

Comment [Julian3]: Need to kn
the meaning of Any.

Comment [Julian2]: Need to kn
the meaning of Any.

Options	Description
Authentication	The following encryption algorithms are supported. MD-5 SHA-1
SA-Lifetime	Enter the IKE security association life time in seconds.
DH	Select a proper Diffie-Hellman key exchange algorithm from the drop-down list. Currently, the following algorithms are supported: DH Group 1 DH Group 2 DH Group 5
IPSec Proposal Settings	
IPSec Encryption	Select the IPSec encryption from the drop-down list. The following encryption algorithms are supported. DES 3DES AES-128 AES-192 AES-256
IPSec Authentication	Select the IKE authentication from the drop-down list. The following encryption algorithms are supported. MD-5 SHA-1
PFS	PFS stands for perfect forward secrecy.You may choose to use the same keys (generated when the IKE tunnel is created) for all re-negotiations or you can choose to generate new keys for every re-negotiation. Select “None” to use the same keys for all the re-negotiations. Select a specific DH (Diffie-Hellman) group to generate new keys for every re-negotiation. The supported DH groups are DH-1, DH-2 and DH-5. The greater the group number, the more secure the connection is. However, the greater the group number, the more time it takes to negotiate a tunnel.
Life Times	Enter the life time of IPSec security association in seconds, minutes, hours or days and kilo bytes. Default value is 3600 seconds.
Manual Key Specific Options	
Encryption Key	Enter the encryption key. To enter the encryption key in hex, start with 0x.
Authentication Key	Enter the authentication. To enter the authentication key in hex, start with 0x.
SPI-Incoming	Enter the inbound security parameter index.
SPI-Outgoing	Enter the outbound security parameter index.

14.2 Establish VPN Connection Using Automatic Keying

This section describes the steps to establish the VPN tunnel using the Configuration Manager. Internet Key Exchange (IKE) is the automatic keying protocol used to exchange the key that is used to encrypt/authenticate the data packets according to the user-configured rule. The parameters that should be configured are:

- the network addresses of internal and remote networks.
- the remote gateway address and the local gateway address.
- pre-shared secret for remote gateway authentication.
- appropriate priority for the connection.

This option sequence brings up the screen as illustrated in Figure 4.2. Fields and buttons represent the basic VPN parameters. Use them to configure basic Access Rule that will be used to establish a tunnel from local secure group to remote secure group with basic parameters.

Options in this screen allow you to:

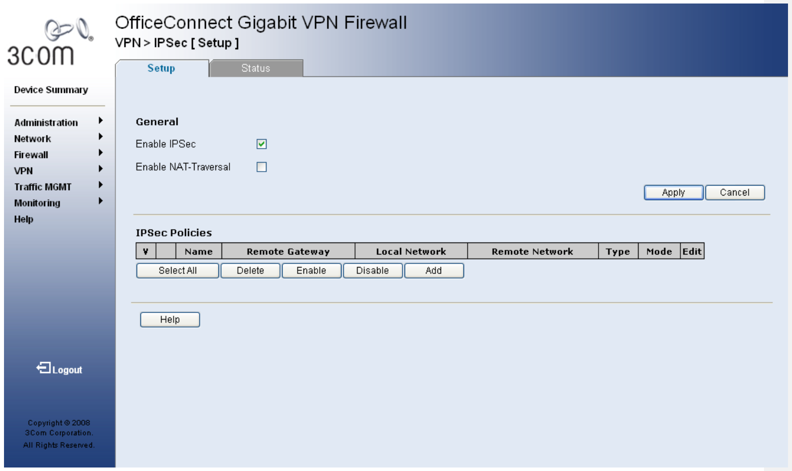
- Add a VPN policy, and set basic parameters for it
- Modify a VPN policy
- Delete an existing VPN policy

14.2.1 Add a Rule for VPN Connection Using Pre-shared Key

VPN Tunnel Configuration Page, as illustrated in the Figure 14.2, is used to configure a rule for VPN connection using pre-shared key

To add a rule for a VPN connection, follow the instructions below:

1. Log into Configuration Manager as admin, click the **VPN** menu, and then click the **IPSec** submenu. The VPN policy list table displays, as shown in Figure 14.1. IPSec VPN Policy List Table.
2. Prior to adding a VPN policy, make sure that the VPN service is enabled in VPN policy list table.
3. Click on the Add button to enter the VPN Tunnel Configuration Page as illustrated in Figure 14.2.
4. Enter a desired name, preferably a meaningful name that signifies the nature of the VPN connection, in the "**Name**" field. Note that only alphanumeric characters are allowed in a name.
5. Click on "**Enable**" or "**Disable**" radio button to enable or disable this rule.



General

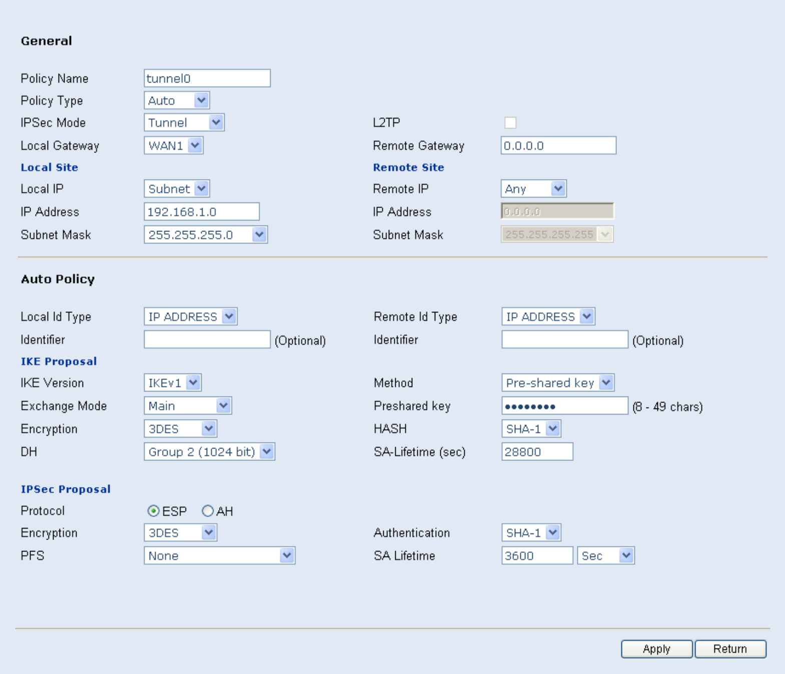
Enable IPSec ☑

Enable NAT-Traversal ☐

IPSec Policies

∨		Name	Remote Gateway	Local Network	Remote Network	Type	Mode	Edit

Figure 14.1. IPSec VPN Policy List Table



General

Policy Name	tunnel0		
Policy Type	Auto		
IPSec Mode	Tunnel	L2TP	□
Local Gateway	WAN1	Remote Gateway	0.0.0.0
Local Site		**Remote Site**	
Local IP	Subnet	Remote IP	Any
IP Address	192.168.1.0	IP Address	0.0.0.0
Subnet Mask	255.255.255.0	Subnet Mask	255.255.255.255

Auto Policy

Local Id Type	IP ADDRESS	Remote Id Type	IP ADDRESS
Identifier	(Optional)	Identifier	(Optional)
IKE Proposal			
IKE Version	IKEv1	Method	Pre-shared key
Exchange Mode	Main	Preshared key	•••••••• (8 - 49 chars)
Encryption	3DES	HASH	SHA-1
DH	Group 2 (1024 bit)	SA-Lifetime (sec)	28800
IPSec Proposal			
Protocol	● ESP ○ AH		
Encryption	3DES	Authentication	SHA-1
PFS	None	SA Lifetime	3600 Sec

Figure 14.2. VPN Tunnel Configuration Page – Pre-shared Key Mode

5. Make changes to any or all of the following fields: local/remote secure group, remote gateway, key management type (select **Preshared Key**), pre-shared key for IKE, encryption/authentication algorithm for IKE, lifetime for IKE, encryption/authentication algorithm for IPSec, operation mode for IPSec, PFS group for IPSec and lifetime for IPSec. Please see Table 14.1 for explanation of these fields.
6. Click on the Apply button to create the new VPN rule. The new VPN rule will then be displayed in the VPN policy list table.

14.2.2 Modify VPN Rules

To modify a VPN rule, follow the instructions below:

1. Log into Configuration Manager as admin, click the **VPN** menu, and then click the **IPSec** submenu.
2. Prior to modifying a VPN rule, make sure that the VPN service is enabled in System Service Configuration page.
3. Click on the ✎ icon of the rule to be modified in the VPN policy rule table.
4. Make changes to any or all of the following fields: local/remote secure group, remote gateway, key management type (select **Preshared Key**), pre-shared key for IKE, encryption/authentication algorithm for IKE, lifetime for IKE, encryption/authentication algorithm for IPSec, operation mode for IPSec, PFS group for IPSec and lifetime for IPSec. Please see Table 14.1 for explanation of these fields.
5. Click on the Apply button to modify this VPN rule. The new settings for this VPN rule will then be displayed in the VPN policy list table.

14.2.3 Delete VPN Rules

To delete an VPN policies, follow the instructions below:

1. Log into Configuration Manager as admin, click the **VPN** menu, and then click the **IPSec** submenu.
2. Click on the check box in front of rule to be deleted.
3. Click on the Delete button to delete selected rules.

14.2.4 Display VPN Rules

To see existing VPN rules, follow the instructions below:

1. Log into Configuration Manager as admin, click the **VPN** menu, and then click the **IPSec** submenu.
2. All the configured VPN policies are displayed in the VPN policy list table.

14.3 Establish VPN Connection Using Manual Keys

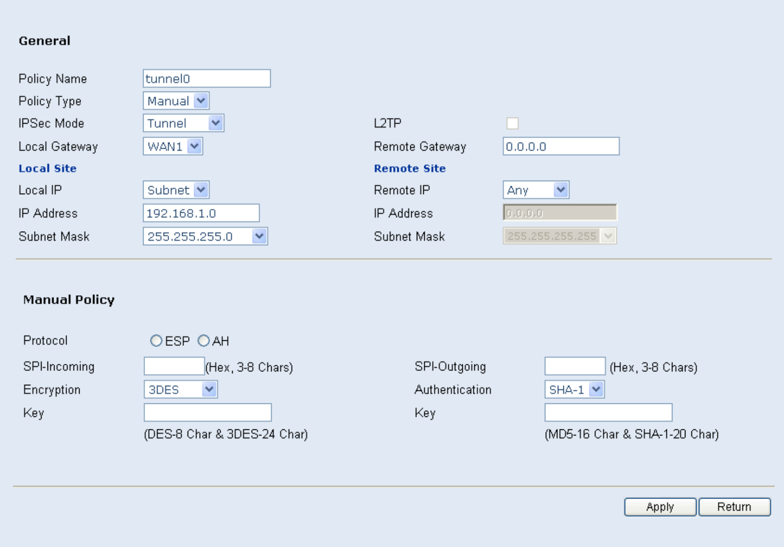
This section describes the steps to establish the VPN tunnel-using manual keying. Manual keying is a method to achieve security when ease of configuration and maintenance is more important or automatic keying is not feasible due to interoperability issues between IKE implementations on the gateways. However, this is a weak security option as all packets use the same keys unless you – as the network administrator, use different key for authentication.

14.3.1 Add a Rule for VPN Connection Using Manual Key

VPN Tunnel Configuration Page, as illustrated in the Figure 14.3, is used to configure a rule for VPN connection using manual key.

To add a rule for a VPN connection, follow the instructions below:

1. Log into Configuration Manager as admin, click the **VPN** menu, and then click the **IPSec** submenu. The VPN policy list table displays as shown in Figure 14.1.



General

Policy Name	tunnel0		
Policy Type	Manual		
IPSec Mode	Tunnel	L2TP	□
Local Gateway	WAN1	Remote Gateway	0.0.0.0
Local Site		**Remote Site**	
Local IP	Subnet	Remote IP	Any
IP Address	192.168.1.0	IP Address	0.0.0.0
Subnet Mask	255.255.255.0	Subnet Mask	255.255.255.255

Manual Policy

Protocol	○ ESP ○ AH		
SPI-Incoming	(Hex, 3-8 Chars)	SPI-Outgoing	(Hex, 3-8 Chars)
Encryption	3DES	Authentication	SHA-1
Key	(DES-8 Char & 3DES-24 Char)	Key	(MD5-16 Char & SHA-1-20 Char)

Figure 14.3. VPN Tunnel Configuration Page – Manual Key Mode

2. Make sure that the VPN service is enabled in VPN policy list table.

3. Click on the Add button to enter the VPN Tunnel Configuration Page as illustrated in Figure 14.2.
4. Enter a desired name, preferably a meaningful name that signifies the nature of the VPN connection, in the "**Name**" field. Note that only alphanumeric characters are allowed in a name.
5. Select the "Manual" from the Policy Type drop-down list. Option fields for manual keying displays as shown in Figure 14.3.
6. Make changes to any or all of the following fields: local/remote secure group, remote gateway, key management type (select **Manual Key**), SPI-Incoming, SPI-Outgoing, Encryption Key, Authentication Key and lifetime for IPSec. Please see Table 14.1 for explanation of these fields.
7. Click on the Apply button to create the new VPN rule. The new VPN rule will then be displayed in the VPN policy rule list table.

14.3.2 Modify VPN Rules

To modify a VPN rule, follow the instructions below:

1. Log into Configuration Manager as admin, click the **VPN** menu, and then click the **IPSec** submenu.
2. Prior to modifying a VPN rule, make sure that the VPN service is enabled in System Service Configuration page.
3. Click on the ✎ icon of the rule to be modified in the VPN policy rule table.
4. Make changes to any or all of the following fields: local/remote secure group, remote gateway, key management type (select **Manual Key**), SPI-Incoming, SPI-Outgoing, Encryption Key, Authentication Key and lifetime for IPSec. Please see Table 14.1 for explanation of these fields.
5. Click on the Apply button to modify this VPN rule. The new settings for this VPN rule will then be displayed in the VPN policy list table.

14.3.3 Delete VPN Rules

To delete an VPN policies, follow the instructions below:

1. Log into Configuration Manager as admin, click the **VPN** menu, and then click the **IPSec** submenu.
2. Click on the check box in front of rule to be deleted.
3. Click on the Delete button to delete selected rules.

14.3.4 Display VPN Rules

To see existing VPN rules, follow the instructions below:

1. Log into Configuration Manager as admin, click the **VPN** menu, and then click the **IPSec** submenu.
2. All the configured VPN policies are displayed in the VPN policy list table.

14.4 VPN Connection Examples

Gateways with integrated VPN and Firewall are useful in scenarios where:

- The traffic between branch offices is protected by VPN and
- Traffic destined for public Internet goes through Firewall/NAT.

To avoid NAT/IPSec interoperability issues, outgoing traffic is first processed by Firewall/NAT and then by IPSec. Hence, you must ensure that appropriate Firewall rules are configured to let the VPN traffic goes through. This section describes these scenarios and presents step-by-step instructions for configuring these scenarios.

14.4.1 Intranet Scenario – firewall + VPN and no NAT for VPN traffic

This is a common scenario where traffic to the public Internet goes through the Firewall/NAT only and traffic between private networks is allowed without NAT before IPSec processing. The same authority administers the networks that are protected by VPN to avoid any possible address clash. Configure each of the OfficeConnect Gigabit VPN Firewall for the Intranet scenario using the following steps:

- Configure VPN connection rules.
- Configure Firewall access rules to allow inbound and outbound VPN traffic.
- Configure a Firewall self rule to allow IKE packets into the OfficeConnect Gigabit VPN Firewall.

14.4.1.1 Configure Rules on OfficeConnect Gigabit VPN Firewall 1 (ISR1)

This section describes the steps to establish the VPN/Firewall for the Internet scenario. Figure 14.4 depicts the typical Intranet connections. Note that ADSL or cable modem is not required if the two networks are connected via Ethernet connections.The setting of each configuration step is illustrated in a figure. For instructions on configuration of each step, please refer to the corresponding section for details.

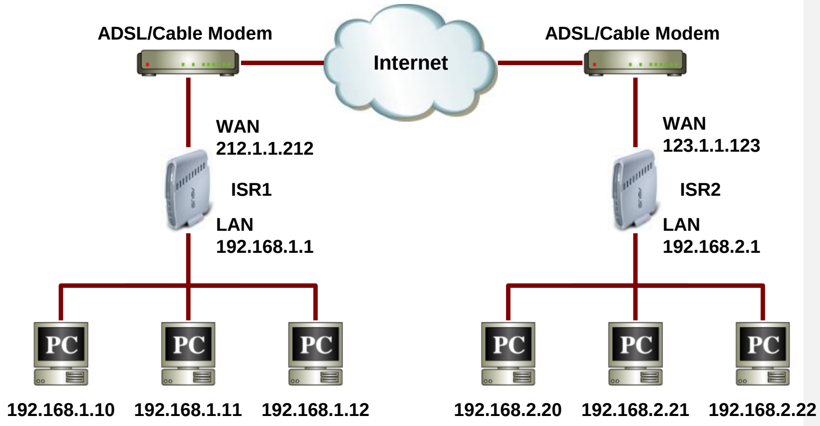
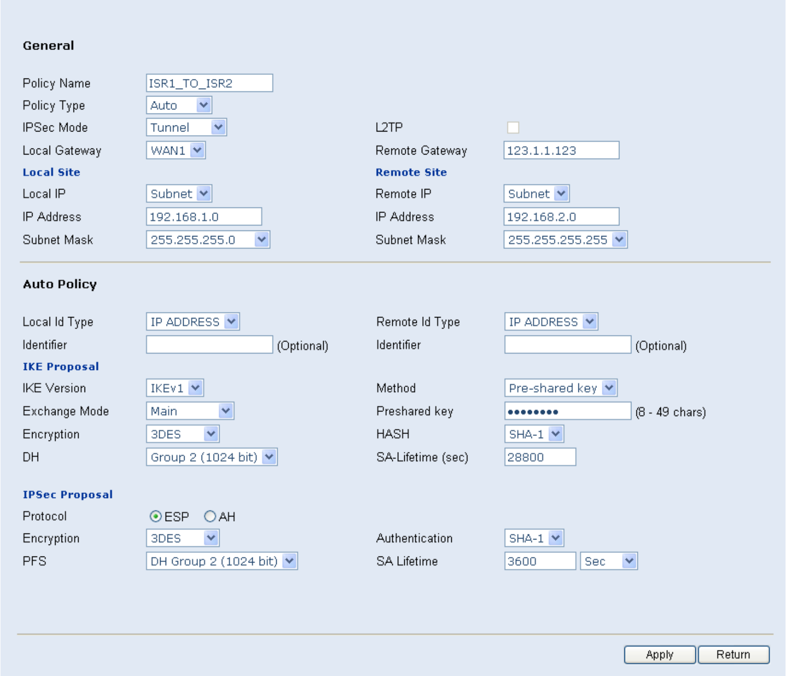


Figure 14.4. Typical Intranet Network Diagram



General

Policy Name	ISR1_TO_ISR2		
Policy Type	Auto		
IPSec Mode	Tunnel	L2TP	□
Local Gateway	WAN1	Remote Gateway	123.1.1.123
Local Site		**Remote Site**	
Local IP	Subnet	Remote IP	Subnet
IP Address	192.168.1.0	IP Address	192.168.2.0
Subnet Mask	255.255.255.0	Subnet Mask	255.255.255.255

Auto Policy

Local Id Type	IP ADDRESS	Remote Id Type	IP ADDRESS
Identifier	(Optional)	Identifier	(Optional)
IKE Proposal			
IKE Version	IKEv1	Method	Pre-shared key
Exchange Mode	Main	Preshared key	•••••••• (8 - 49 chars)
Encryption	3DES	HASH	SHA-1
DH	Group 2 (1024 bit)	SA-Lifetime (sec)	28800
IPSec Proposal			
Protocol	● ESP ○ AH		
Encryption	3DES	Authentication	SHA-1
PFS	DH Group 2 (1024 bit)	SA Lifetime	3600 Sec

Figure 14.5. Intranet VPN Policy Configuration on ISR1

Step 1: Configure VPN connection rules

Refer to the section 14.2 Establish VPN Connection Using Automatic Keying to configure VPN policies on ISR1 using automatic keying.

Step 2: Configure Firewall rules

1. Configure outbound Firewall rule to allow packets from 192.168.1.0/255.255.255.0 to 192.168.2.0/255.255.255.0 without any NAT
2. Configure inbound Firewall rule to allow packets from 192.168.2.0/255.255.255.0 to 192.168.1.0/255.255.255.0 without any NAT.

Table 14.2 and Table 14.3 provide the parameters to be configured for the outbound and inbound Firewall rule fields. For a general description on configuring any inbound/outbound Firewall rule, please refer to sections 11.3 and 11.4.

Table 14.2. Outbound Un-translated Firewall Rule for VPN Packets on ISR1

Field		**Value**
Source IP	Type	Subnet
	Address	192.168.1.0
	Mask	255.255.255.0
Destination IP	Type	Subnet
	Address	192.168.2.0
	Mask	255.255.255.0
NAT		None
Action		Allow

Note: *The outbound Un-translated Firewall rule has to be added the existing rule ID 1001.*

Table 14.3. Inbound Un-translated Firewall Rule for VPN Packets on ISR1

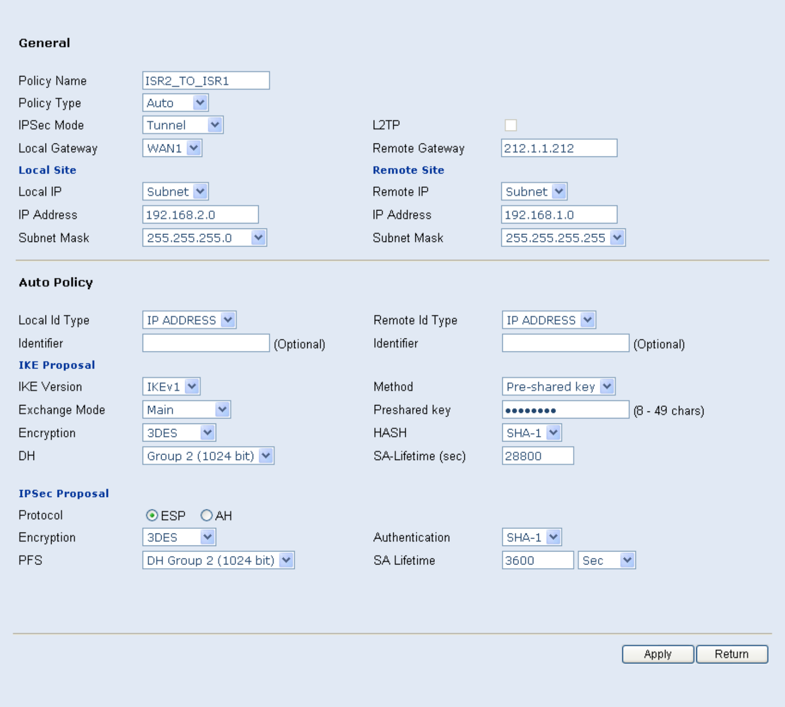
Field		**Value**
Source IP	Type	Subnet
	Address	192.168.2.0
	Mask	255.255.255.0

Field		**Value**
Destination IP	Type	Subnet
	Address	192.168.1.0
	Mask	255.255.255.0
NAT		None
Action		Allow

14.4.1.2 Configure Rules on OfficeConnect Gigabit VPN Firewall 2 (ISR2)

Step 1: Configure VPN connection rules

Refer to the section 14.2 Establish VPN Connection Using Automatic Keying to configure VPN policies on ISR2 using automatic keying.



General

Policy Name: ISR2_TO_ISR1
Policy Type: Auto
IPSec Mode: Tunnel
L2TP: □
Local Gateway: WAN1
Remote Gateway: 212.1.1.212

Local Site

Local IP: Subnet
IP Address: 192.168.2.0
Subnet Mask: 255.255.255.0

Remote Site

Remote IP: Subnet
IP Address: 192.168.1.0
Subnet Mask: 255.255.255.255

Auto Policy

Local Id Type: IP ADDRESS
Identifier: (Optional)
Remote Id Type: IP ADDRESS
Identifier: (Optional)

IKE Proposal

IKE Version: IKEv1
Method: Pre-shared key
Exchange Mode: Main
Preshared key: •••••••• (8 - 49 chars)
Encryption: 3DES
HASH: SHA-1
DH: Group 2 (1024 bit)
SA-Lifetime (sec): 28800

IPSec Proposal

Protocol: ● ESP ○ AH
Encryption: 3DES
Authentication: SHA-1
PFS: DH Group 2 (1024 bit)
SA Lifetime: 3600 Sec

Figure 14.6. Intranet VPN Policy Configuration on ISR2

Step 2: Configure Firewall rules

1. Configure outbound Firewall rule to allow packets from 192.168.2.0/255.255.255.0 to 192.168.1.0/255.255.255.0 without any NAT.
2. Configure inbound Firewall rule to allow packets from 192.168.1.0/255.255.255.0 to 192.168.2.0/255.255.255.0 without any NAT.

Table 14.4 and Table 14.5 provide the parameters to be configured for the outbound and inbound Firewall rule fields. For a general description on configuring any inbound/outbound Firewall rule, please refer to sections 11.3 and 11.4.

Table 14.4. Outbound Un-translated Firewall Rule for VPN Packets on ISR1

Field		**Value**
Source IP	Type	Subnet
	Address	192.168.2.0
	Mask	255.255.255.0
Destination IP	Type	Subnet
	Address	192.168.1.0
	Mask	255.255.255.0
NAT		None
Action		Allow

Note: *The outbound Un-translated Firewall rule has to be added the existing rule ID 1001.*

Table 14.5. Inbound Un-translated Firewall Rule for VPN Packets on ISR1

Field		**Value**
Source IP	Type	Subnet
	Address	192.168.1.0
	Mask	255.255.255.0
Destination IP	Type	Subnet
	Address	192.168.2.0
	Mask	255.255.255.0
NAT		None
Action		Allow
VPN		Enable

14.4.1.3 Establish Tunnel and Verify

- Ping continuously from a host in the LAN behind ISR1 to a host in the LAN behind ISR2. The first few pings might fail. After a few seconds, the host in the LAN behind ISR1 should start getting ping response.

14.5 Managing VPN User Account

OfficeConnect Gigabit VPN Firewall provides a mechanism for user level authentication that gives user to access VPN tunnels and send data across the encrypted connection. You can configure the router to use the local user database to authenticate users and control their access to the network resource.

Follow these steps to add a new user to the local user database:

1. Click on **VPN > Users > Local User** to enter the Local User configuration page.

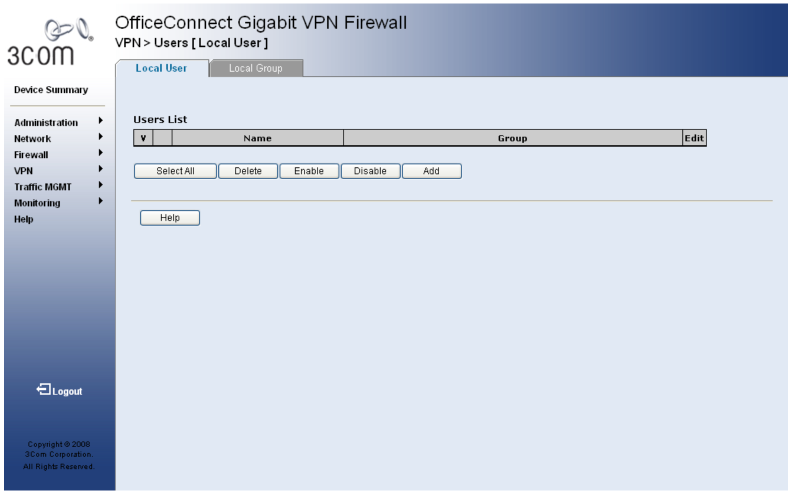


Figure 14.7 VPN User Account Configuration Page

2. Click on Add button to add a new user.

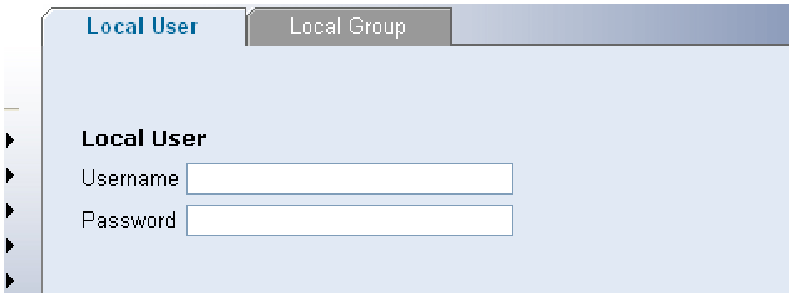
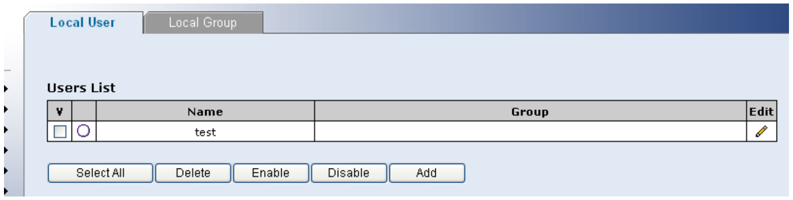


Figure 14.8 Configuring VPN User Account

3. Enter the username and password into the space provided.
4. Click on Apply button to save the change.

To edit an existing user, please follow these steps:

1. Click on the ✎ icon of the entry to be modified in the Users List table.



Users List

v		Name	Group	Edit
□	○	test		✎

Figure 14.9 Editing an existing VPN User

2. Enter the username and password into the space provided.
3. Click on Apply button to save the change.
4. To delete one or more user entries, please follow these steps:
5. Check the checkbox in front of the user entry to be selected.
6. Click on Delete button to remove selected entries.
7. To enable/disable one or more user entries, please follow these steps:
8. Check the checkbox in front of the user entry to be selected.
9. Click on Enable or Disable button to modify the selected entries.

Follow these steps to configure the Local Group:

1. Click on **VPN > Users > Local Group** to enter the Local Group configuration page.

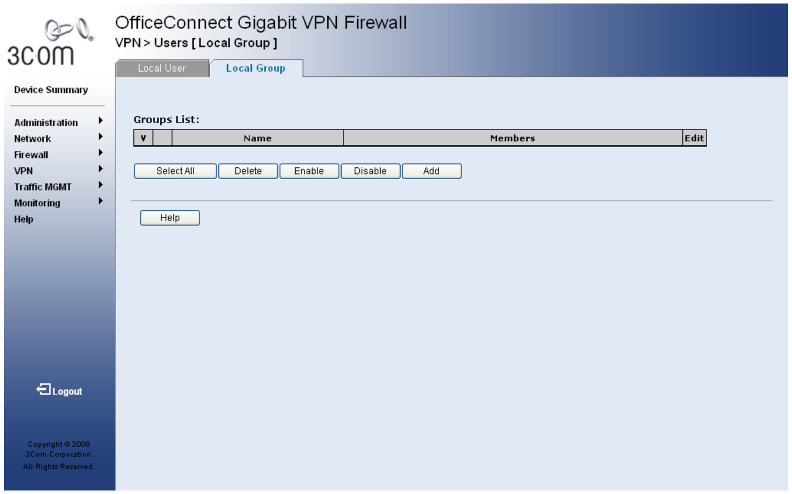


Figure 14.10 VPN User Group Configuration Page

2. Enter the group name into the space provided.
3. Move the cursor to the desired user in the left pane. Hold the CTRL key down to click on multiple users. Release the CTRL key and click on the Right Arrow button to add selected users into the right pane as group members.

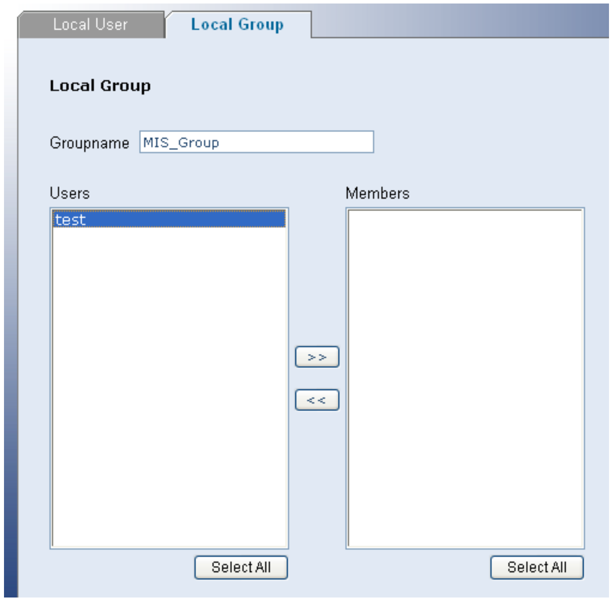

Groupname MIS_Group

Figure 14.11 Configuring a User Group

4. Click on Apply button to save the change.

15 Configuring L2TP Server

15.1 Introduction

The OfficeConnect Gigabit VPN Firewall can terminate L2TP-over-IPsec connections from incoming Microsoft Windows 2000 and Windows XP clients. You can use Layer 2 Tunneling Protocol (L2TP) to create VPN over public networks such as the Internet. L2TP provides interoperability between different VPN vendors that protocols such as PPTP and L2F do not, although L2TP combines the best of both protocols and is an extension of them. L2TP is supported on Microsoft Windows 2000 Operating System. L2TP supports several of the authentication options supported by PPP, including Password Authentication Protocol (PAP), Challenge Handshake Authentication Protocol (CHAP), and Microsoft Challenge Handshake Authentication Protocol (MS-CHAP). You can use L2TP to authenticate the endpoints of a VPN tunnel to provide additional security, and you can implement it with IPsec to provide a secure, encrypted VPN solution.

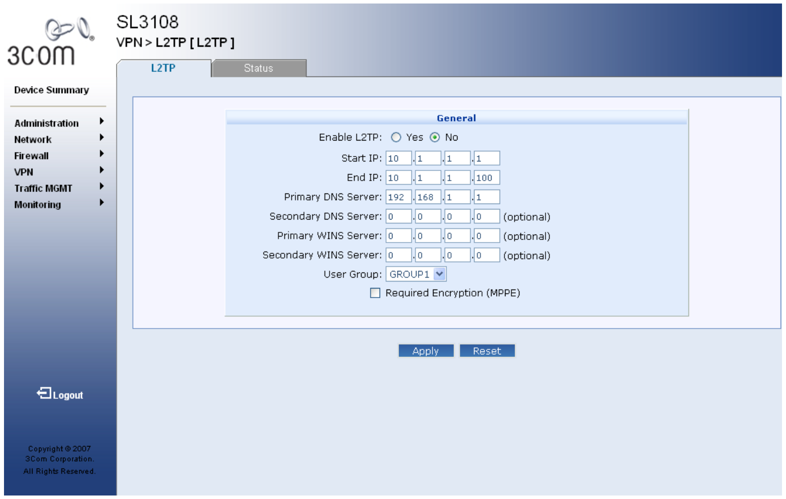
The chapter contains instructions for configuring L2TP server and also provides an example for configuring L2TP over IPSec.

15.2 L2TP Server Configuration Parameters

Table 14.1describes all the L2TP Server configuration parameters.

Table 15.1. L2TP Server Configuration Parameters

Options	Description
General Settings	
Enable L2TP	Click on **Yes** radio button if you want to enable the L2TP server.
Start IP	Enter the starting IP address of L2TP address pool in the specified field.
End IP	Enter the ending IP address of L2TP address poll in the specified field.
Primary DNS Server	Enter the first DNS server address in the specified field.
Secondary DNS Server	If you want to specify the secondary DNS address, enter the address in the specified field.
Primary WINS Server	Enter the first WINS server address in the specified field.
Secondary WINS Server	If you want to specify the secondary WINS server address, enter the address in the specified field.
User Group	Specifies a user group from the drop-down list. Make sure the user group has been configured properly.



Enable L2TP: ○ Yes ● No
Start IP: 10 . 1 . 1 . 1
End IP: 10 . 1 . 1 . 100
Primary DNS Server: 192 . 168 . 1 . 1
Secondary DNS Server: 0 . 0 . 0 . 0 (optional)
Primary WINS Server: 0 . 0 . 0 . 0 (optional)
Secondary WINS Server: 0 . 0 . 0 . 0 (optional)
User Group: GROUP1
□ Required Encryption (MPPE)

Figure 15.1. L2TP Server Configuration Page

15.3 Configuring L2TP Server

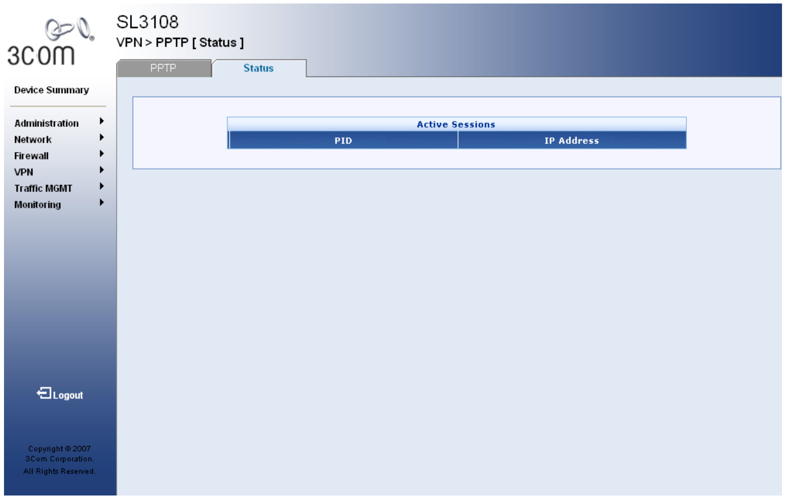
Log into Configuration Manager as admin, click the **VPN** menu and then click **L2TP** submenu. The L2TP Server Configuration page displays, as shown in Figure 15.1.

To configure the L2TP Server, follow below instructions:

1. To enable L2TP Server functionality on the OfficeConnect Gigabit VPN Firewall, select "Yes" in the Enable L2TP field.
2. Make changes to any or all of the following fields: Start IP, End IP, Primary DNS Server, Secondary DNS Server, Primary WINS Server, Secondary WINS Server and User Group for L2TP Server. Please see Table 15.1for explanation of these fields.
3. Click on the Apply button to modify L2TP Server settings.

15.4 Viewing Active L2TP Session

Log into Configuration Manager as admin, click the VPN menu, click L2TP submenu and then click the Status tab on the top of the configuration page, as shown in Figure 15.2.



Active Sessions	
PID	IP Address

Figure 15.2. Viewing Active L2TP Sessions

16 Configuring PPTP Server

16.1 Introduction

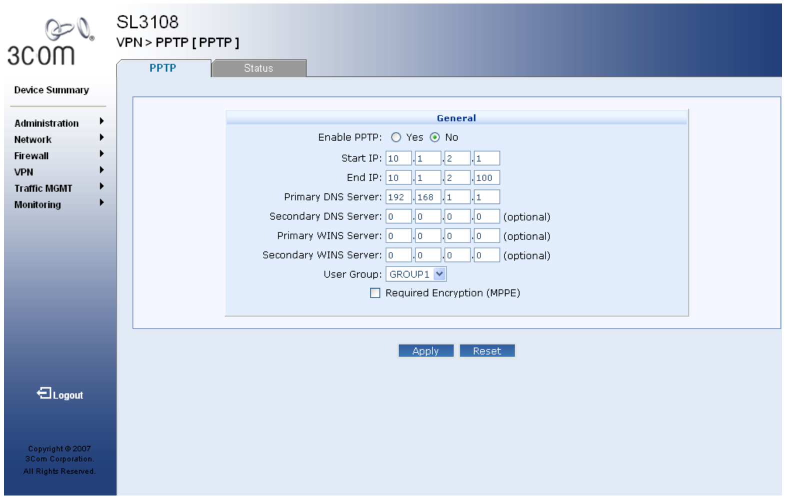
PPTP (Point-to-Point Tunnelling Protocol) is an encrypted VPN protocol like IPSec. It is not as secure as IPSec but is easy to administrate. PPTP does not support gateway to gateway connections and is only suitable for connecting remote users.

16.2 PPTP Server Configuration Parameters

Table 16.1 describes all the PPTP Server configuration parameters.

Table 16.1. PPTP Server Configuration Parameters

Options	Description
General Settings	
Enable PPTP	Click on **Yes** radio button if you want to enable the PPTP server.
Start IP	Enter the starting IP address of PPTP address pool in the specified field.
End IP	Enter the ending IP address of PPTP address poll in the specified field.
Primary DNS Server	Enter the first DNS server address in the specified field.
Secondary DNS Server	If you want to specify the secondary DNS address, enter the address in the specified field.
Primary WINS Server	Enter the first WINS server address in the specified field.
Secondary WINS Server	If you want to specify the secondary WINS server address, enter the address in the specified field.
User Group	Specifies a user group from the drop-down list. Make sure the user group has been configured properly.



General

Enable PPTP: ○ Yes ● No

Start IP: 10 .1 .2 .1

End IP: 10 .1 .2 .100

Primary DNS Server: 192 .168 .1 .1

Secondary DNS Server: 0 .0 .0 .0 (optional)

Primary WINS Server: 0 .0 .0 .0 (optional)

Secondary WINS Server: 0 .0 .0 .0 (optional)

User Group: GROUP1

□ Required Encryption (MPPE)

Figure 16.1. PPTP Server Configuration Page

16.3 Configuring PPTP Server

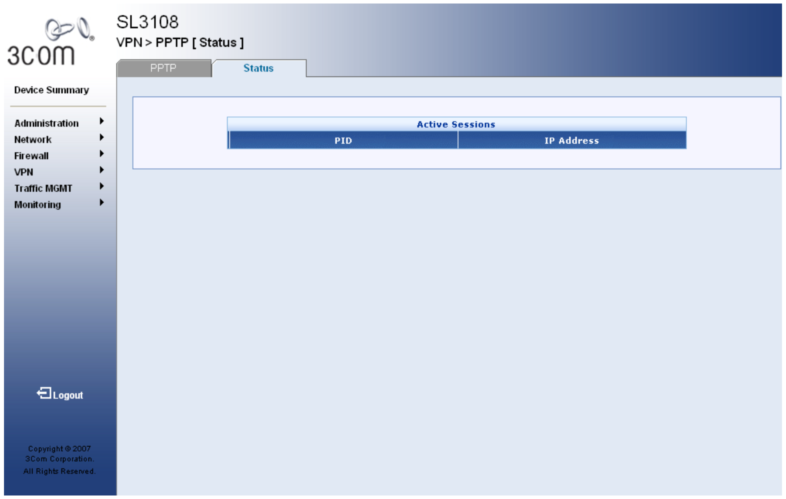
Log into Configuration Manager as admin, click the **VPN** menu and then click **PPTP** submenu. The PPTP Server Configuration page displays, as shown in Figure 16.1. PPTP Server Configuration Page.

To configure the PPTP Server, follow below instructions:

1. To enable PPTP Server functionality on the OfficeConnect Gigabit VPN Firewall, select “Yes” in the Enable PPTP field.
2. Make changes to any or all of the following fields: Start IP, End IP, Primary DNS Server, Secondary DNS Server, Primary WINS Server, Secondary WINS Server and User Group for PPTP Server. Please see Table 16.1 for explanation of these fields.
3. Click on the Apply button to modify PPTP Server settings.

16.4 Viewing Active PPTP Session

Log into Configuration Manager as admin, click the VPN menu, click PPTP submenu and then click the Status tab on the top of the configuration page, as shown in Figure 16.2.



Active Sessions

PID	IP Address

Figure 16.2. Viewing Active PPTP Sessions

17 System Management

This chapter describes the following administrative tasks that you can perform using Configuration Manager:

- Configure Port Mirroring
- Modify password
- Modify system Information
- Modify system date and time
- Reset, backup and restore system configuration
- Update firmware
- Logout of Configuration Manager

You can access these tasks from the System Management menu.

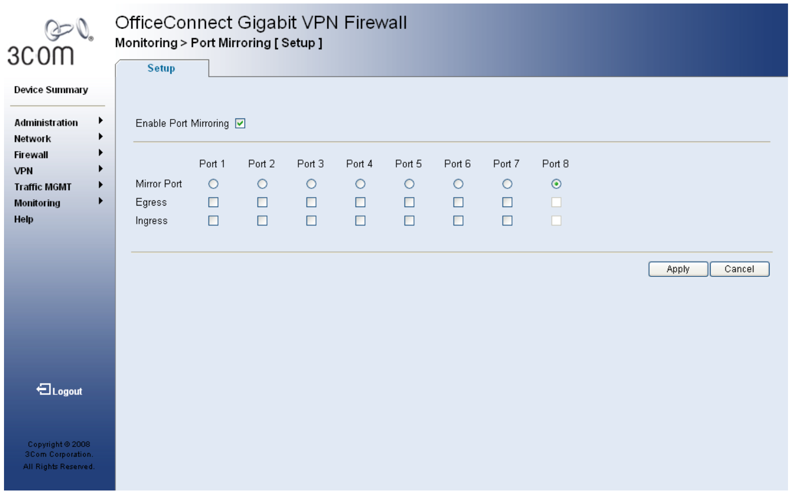
17.1 Configure Port Mirroring

Port mirroring monitors and mirrors network traffic by forwarding copies of incoming and outgoing packets from one port to a monitoring port. Port mirroring can be used as a diagnostic tool as well as a debugging feature. Port mirroring also enables switch performance monitoring.

Network administrators can configure port mirroring by selecting a specific port from which to copy all packets, and other ports to which the packets copied.

Follow these steps to configure the port mirroring feature:

1. Log into the configuration manager, click "Monitoring" menu and then click "Port Mirroring" submenu to enter the Port Mirroring Configuration Page. See Figure 17.1.



OfficeConnect Gigabit VPN Firewall

Monitoring > Port Mirroring [Setup]

Enable Port Mirroring ☑

	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Mirror Port	○	○	○	○	○	○	○	●
Egress	□	□	□	□	□	□	□	□
Ingress	□	□	□	□	□	□	□	□

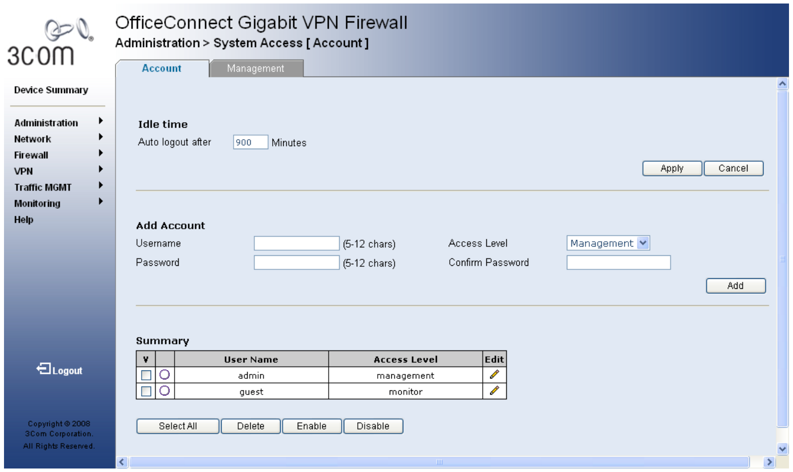
Figure 17.1 Port Mirroring Configuration Page

2. Make the "Enable Port Mirroring" checkbox checked.
3. Click on the Mirror Port radio button to select a desired port that is used to monitor packets to and from other ports.
4. Click on the ports that you want the packets sent out of the selected ports monitored. Any packet sent out of the selected port(s) will have a duplicate copy delivered to the mirror port.
5. Click on the ports that you want the packets coming into the selected ports monitored. Any packet sent to the selected port(s) will have a duplicate copy delivered to the mirror port.
6. Click on the Apply button to save the changes.

17.2 Change the Login Password

The first time you log into the Configuration Manager, you use the default username and password (*admin* and *password*). The system allows two types of users – administrator (username: admin) and guest (username: guest). Administrator has the privilege to modify the system settings while guest can only view the system settings. Passwords of both the admin and guest accounts can be changed by the administrator.

> **Note**
>
> *This username and password is only used for logging into the Configuration Manager; it is not the same as the login password you may use to connect to your ISP.*



OfficeConnect Gigabit VPN Firewall

Administration > System Access [Account]

Idle time

Auto logout after 900 Minutes

Add Account

Username (5-12 chars) Access Level Management

Password (5-12 chars) Confirm Password

Summary

V		User Name	Access Level	Edit
□	○	admin	management	✎
□	○	guest	monitor	✎

Figure 17.2. System Access Account Configuration Page

Table 17.1 describes all the System Access Account configuration parameters.

Table 17.1 System Access Account Configuration Parameters

Options	Description
Idle time	
Auto Logout After	You can specify and idle timeout threshold for the management session.
Add Account	
Username	Enter the username for the specific management account.
Password	Enter the password for the specific management account.
Confirm Password	Enter the password again to confirm the new password.
Access Level	Specifies the Access Level from the drop-down list. ● **Management**: If you need to assign a read/write privilege to a specific user, please select "Management" from the drop down list. ● **Monitor**: If you need to assign a read only privilege to a specific user, please select "Monitor" from the drop down list.

Follow these steps to add a management account:

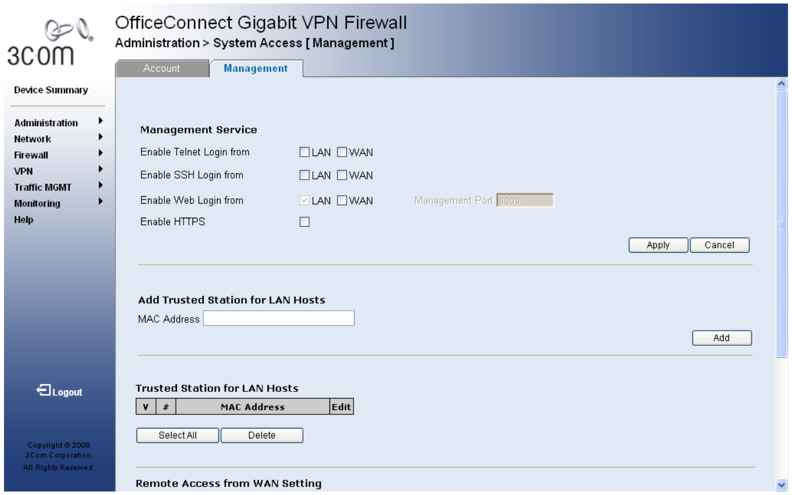
1. Log into the Configuration Manager as administrator, click on "Administrator" menu and then click on "System Access" submenu to enter the Management Account Configuration Page.
2. Enter the username into the Username field for the new management account.
3. Enter the password into the Password field for the new management account.
4. To confirm the new password, enter the new password into the Confirm Password field again.
5. Click on Apply button to save the new password.

17.3 Configuring the Management Interface

The management service enables system administrator to manage the OfficeConnect Gigabit VPN Firewall from various management interfaces such as Web (HTTP / HTTPS) or Command Line Interface (Telnet / SSH). The system administrator can create security polices to restrict access to the management interfaces from trusted computers or hosts. Any management access coming from outside trusted hosts is prohibited.

Follow these steps to setup the trusted station:

1. Click **Administration > System Access** menu and then click on **Management** tab to enter the Management Interface configuration page. See Figure 17.3.



OfficeConnect Gigabit VPN Firewall
Administration > System Access [Management]

Management Service

Enable Telnet Login from ☐ LAN ☐ WAN

Enable SSH Login from ☐ LAN ☐ WAN

Enable Web Login from ☑ LAN ☐ WAN Management Port 8000

Enable HTTPS ☐

Add Trusted Station for LAN Hosts

MAC Address

Trusted Station for LAN Hosts

V	#	MAC Address	Edit

Remote Access from WAN Setting

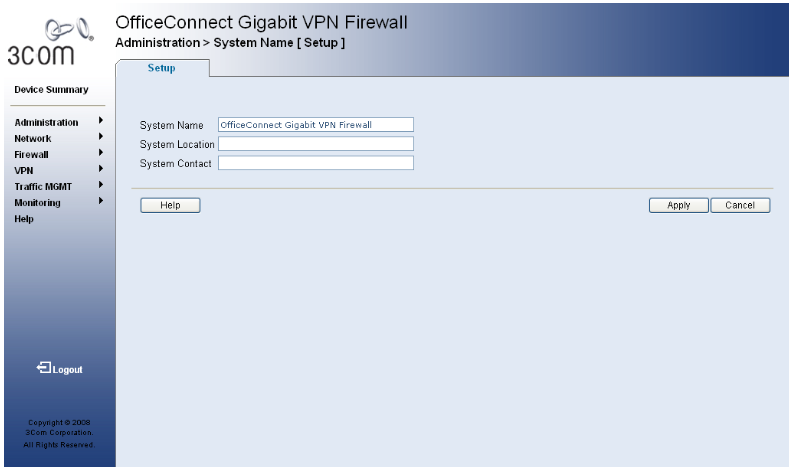
Figure 17.3 Management Interface Configuration Page

2. Enter the MAC address of the trusted host behind the LAN interface. Please note that the MAC address format is six colon-separated pairs of hexadecimal characters (0-9 and A-F), such as 00:0D:31:45:17:1B.
3. Click on Add button the save the change.
4. If you want to limit the WAN user to access the management interfaces, you can click on "IP address range" or "Only this IP address" to specify one or multiple WAN users to access the management interfaces.

17.4 Modify System Information

As illustrated in Figure 17.4, you can use System Information Setup page to enter system specific information such as system name (unique name for this device), system location (where this device is located), and contact person information for this device. Note that all fields allow only alphanumeric characters.

When you are done entering system specific information, click on Apply button to save the changes.



OfficeConnect Gigabit VPN Firewall
Administration > System Name [Setup]

System Name: OfficeConnect Gigabit VPN Firewall

System Location:

System Contact:

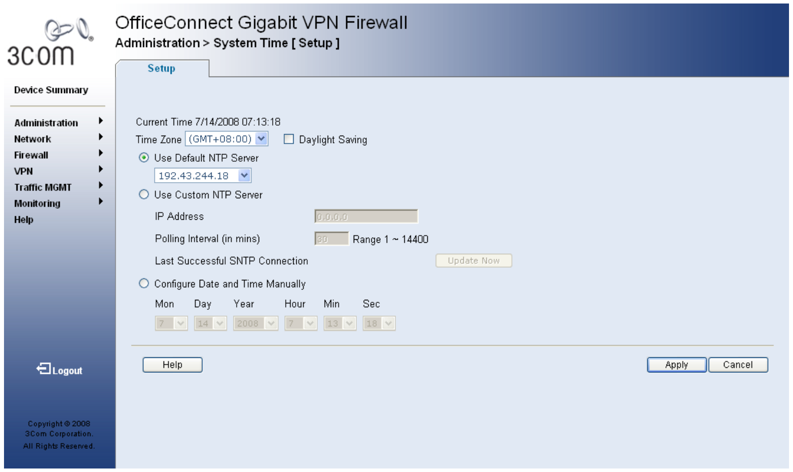
Figure 17.4. System Information Configuration Page

17.5 Setup Date and Time

The OfficeConnect Gigabit VPN Firewall keeps a record of the current date and time, which it uses to calculate and report various performance data.

Note

Changing the OfficeConnect Gigabit VPN Firewall date and time does not affect the date and time on your PCs.



OfficeConnect Gigabit VPN Firewall

Administration > System Time [Setup]

Current Time 7/14/2008 07:13:18

Time Zone (GMT+08:00) □ Daylight Saving

● Use Default NTP Server

192.43.244.18

○ Use Custom NTP Server

IP Address 0.0.0.0

Polling Interval (in mins) 30 Range 1 ~ 14400

Last Successful SNTP Connection

○ Configure Date and Time Manually

Mon	Day	Year	Hour	Min	Sec
7	14	2008	7	13	18

Figure 17.5. Date and Time Configuration Page

Although there is an internal real time clock in the OfficeConnect Gigabit VPN Firewall, you'll probably still need to configure the NTP service so that the date and time can be maintained by external network time server (NTP Server). The only fields configurable in this configuration page are the "**Time Zone**", IP address of time servers and the desired update interval. Select your time zone from the "Time Zone" drop-down list, change the IP address of the time servers and the update interval if desired and then click on Apply button to save the changes.

17.5.1 View the System Date and Time

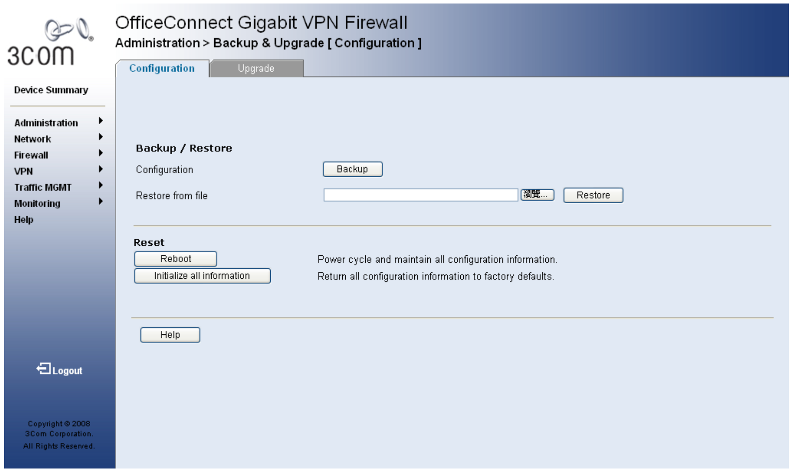
To view the updated system date and time, log into Configuration Manager as admin, click the **Administration** menu, and then click the **Date and Time Setup** submenu.

17.6 System Configuration Management

17.6.1 Reset System Configuration

At times, you may want to revert to factory default settings to eliminate problems resulted from incorrect system configuration. Follow the steps below to reset system configuration:

1. Log into Configuration Manager as admin and then click the **Administration** menu, click the **Backup/Restore/Upgrade** submenu. The configuration page displays, as shown in Figure 17.6.
2. Click on "Initialize all information" button to set the system configuration back to factory default. Note that the OfficeConnect Gigabit VPN Firewall will reboot to make the factory default configuration in effect.



Power cycle and maintain all configuration information.

Return all configuration information to factory defaults.

Figure 17.6. Default Setting Configuration Page

Sometimes, you may find that you have no way to access the OfficeConnect Gigabit VPN Firewall, e.g. you forget your password. The only way out in this scenario is to reset the system configuration to the factory default by following the procedures below using the reset switch:

1. Push and hold the reset button for at least 10 seconds. You will see the TEST LED flashing at 0.5 second interval.
2. Releases the reset button and the system configuration will be revert to the factory default once the system boot is complete.

17.6.2 Backup System Configuration

Follow the steps below to backup system configuration:

1. Log into Configuration Manager as admin and then click the **Administration** menu, click the **Backup/Restore/Upgrade** submenu. The configuration page displays, as shown in Figure 17.6.
2. Click on "Backup" button to backup the system configuration.

17.6.3 Restore System Configuration

Follow the steps below to backup system configuration:

1. Log into Configuration Manager as admin and then click the **Administration** menu, click the **Backup/Restore/Upgrade** submenu. The configuration page displays, as shown in Figure 17.6.
2. Enter the path and name of the system configuration file that you want to restore in the "Configuration File" text box. Alternatively, you may click on the Browse... button to search for the system configuration file on your hard drive. A window similar to the one shown in Figure 17.7 will pop up for you to select the configuration file to restore.

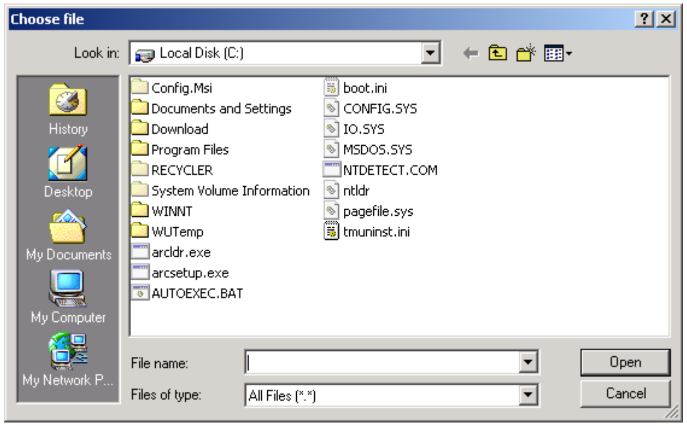


Figure 17.7. Windows File Browser

3. Click on "Restore" button to restore the system configuration. Note that the OfficeConnect Gigabit VPN Firewall will reboot to make the new system configuration in effect.

17.7 Upgrade Firmware

3Com may from time to time provide you with an update to the firmware running on the OfficeConnect Gigabit VPN Firewall. All system software is contained in a single file, called an *image*. Configuration Manager provides an easy way to upload the new firmware image. To upgrade the image, follow this procedure:

1. Log into Configuration Manager, click the **System Management** menu and then click the **Firmware Upgrade** submenu. The Firmware Upgrade page displays, as shown in Figure 17.8.

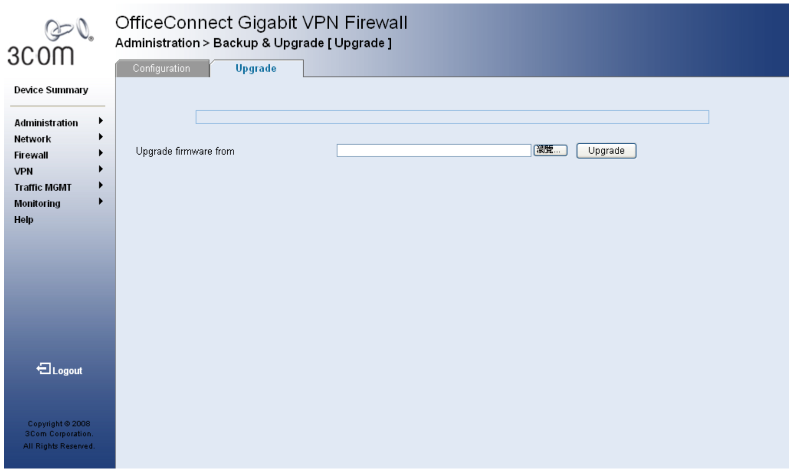

3com
OfficeConnect Gigabit VPN Firewall
Administration > Backup & Upgrade [Upgrade]
Configuration
Upgrade
Device Summary
Administration
Network
Firewall
VPN
Traffic MGMT
Monitoring
Help
Upgrade firmware from
Upgrade
Logout
Copyright © 2008 3Com Corporation. All Rights Reserved.

Figure 17.8. Firmware Upgrade Page

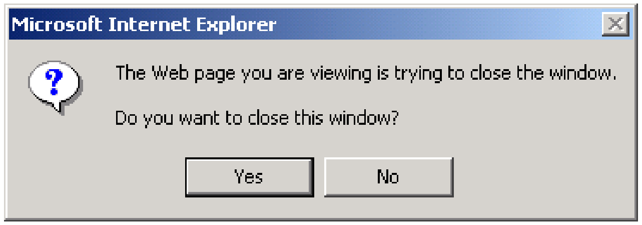
2. In the Firmware text box, enter the path and name of the firmware image file. Alternatively, you may click on Browse... button to search for it on your hard drive.
3. Click on "Upgrade" button to update the firmware. Note: it may take up to 5 minutes for the firmware upgrade. Note that after the transfer of firmware is completed, the OfficeConnect Gigabit VPN Firewall will reboot to make the new firmware in effect.

17.8 Reset the OfficeConnect Gigabit VPN Firewall

To reset the OfficeConnect Gigabit VPN Firewall, click on the Apply button in the Configuration Manager Reset page.

17.9 Logout Configuration Manager

To logout of Configuration Manager, click on the Logout button in the Configuration Manager Logout page. If you are using IE as your browser, a window similar to the one shown in Figure 17.9 will prompt for confirmation before closing your browser.



The Web page you are viewing is trying to close the window.

Do you want to close this window?

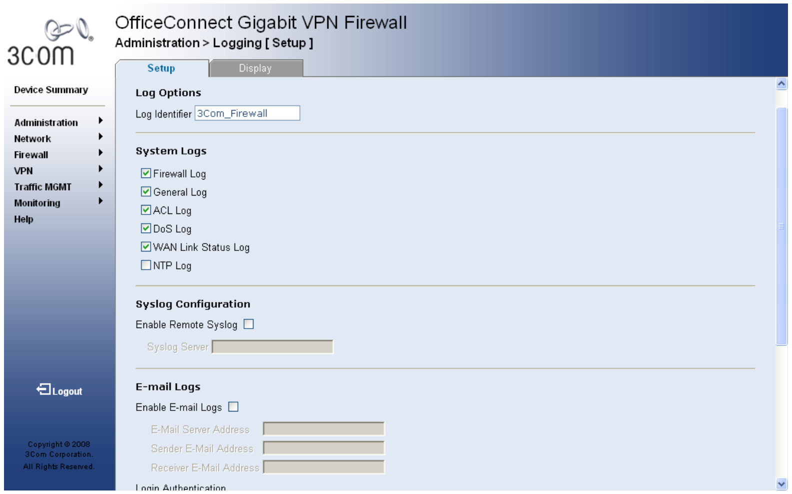
Figure 17.9. Confirmation for Closing Browser (IE)

17.10 Configuring Logging

The event logger in the OfficeConnect Gigabit VPN Firewall can be configured to log general or security related events to the local database, or deliver the generated event to the external SMTP or Syslog server.

To configure the Logging, please follow these steps:

1. Click on Administration > Logging menu to enter the Logging configuration page. See Figure 17.10.


3com
OfficeConnect Gigabit VPN Firewall
Administration > Logging [Setup]
Setup
Display
Device Summary
Administration
Network
Firewall
VPN
Traffic MGMT
Monitoring
Help
Logout
Copyright © 2008 3Com Corporation. All Rights Reserved.

Log Options

Log Identifier 3Com_Firewall

System Logs

☑ Firewall Log
☑ General Log
☑ ACL Log
☑ DoS Log
☑ WAN Link Status Log
□ NTP Log

Syslog Configuration

Enable Remote Syslog □

Syslog Server

E-mail Logs

Enable E-mail Logs □

E-Mail Server Address
Sender E-Mail Address
Receiver E-Mail Address

Login Authentication

Figure 17.10 Logging Configuration Page

2. Specify a log identifier in the space provided. The log identifier is a mandatory field used to identify the log messages. Please note that the log identifier string should not contain any special characters including space and the default value of Log Identifier is 3Com_Firewall.
3. In the System Logs field, please check the checkbox for the type of system events to be logged. The available options are shown below:
    - Firewall Log
    - General Log
    - ACL Log
    - DoS Log
    - WAN Link Status Log
    - NTP Log
4. In the Syslog Configuration field, please check the Enable Remote Syslog check box to enable the syslog function and then enter the IP address of the Syslog server
5. In the E-mail Configuration field, please check the Enable E-mail Logs checkbox to enable the E-mail Log function. Enter the IP address of the Email (SMTP) server into the E-Mail Server Address and Email address to the Sender and Receiver E-Mail Address fields. Here is an example of Email address:

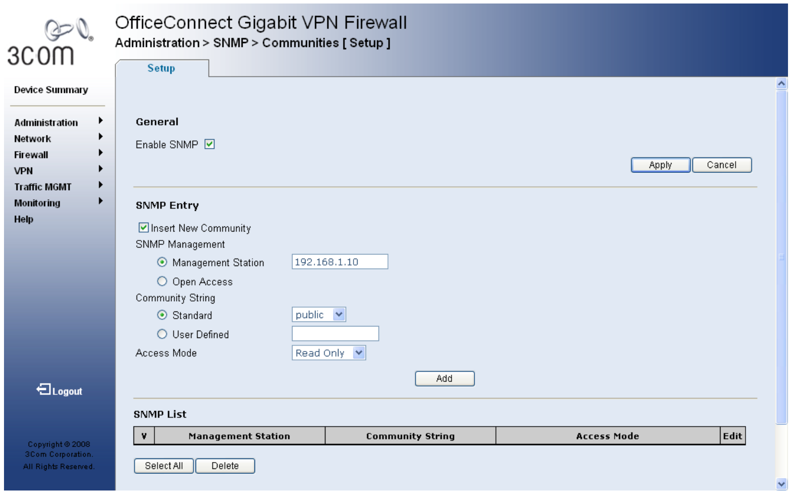
   user01@domain.com
6. If authentication is required, please select a corresponding authentication method – either Plain Text or CRAM-MD5 based on the information provided by your network administrator. And specify the username and password into the space provided. If the OfficeConnect Gigabit VPN Firewall needs to respond the IDENT protocol from the SMTP Server, check the “Respond to Identd from SMTP Server” checkbox.
7. Enter a Schedule for sending the logs. From the drop-down list, select: Never, Hourly, Daily, or Weekly. Then fill in the Day and Time fields that correspond to your selection.
8. Click the Apply button to save the changes.

17.11 Configuring SNMP

The SNMP agents maintain a list of variables, which are used to manage the device. The variables are defined in the Management Information Base (MIB). The SNMP agent defines the MIB specification format, as well as the format used to access the information over the network. Access rights to the SNMP agents are controlled by access strings.

Follow these steps to enable/disable the SNMP function or configure the SNMP communities:

1. Click **Administration > SNMP > Communities** to enter the SNMP Communities configuration page.



OfficeConnect Gigabit VPN Firewall

Administration > SNMP > Communities [Setup]

General

Enable SNMP ☑

SNMP Entry

☑ Insert New Community

SNMP Management

- ● Management Station: 192.168.1.10
- ○ Open Access

Community String

- ● Standard: public
- ○ User Defined:

Access Mode: Read Only

SNMP List

V	Management Station	Community String	Access Mode	Edit

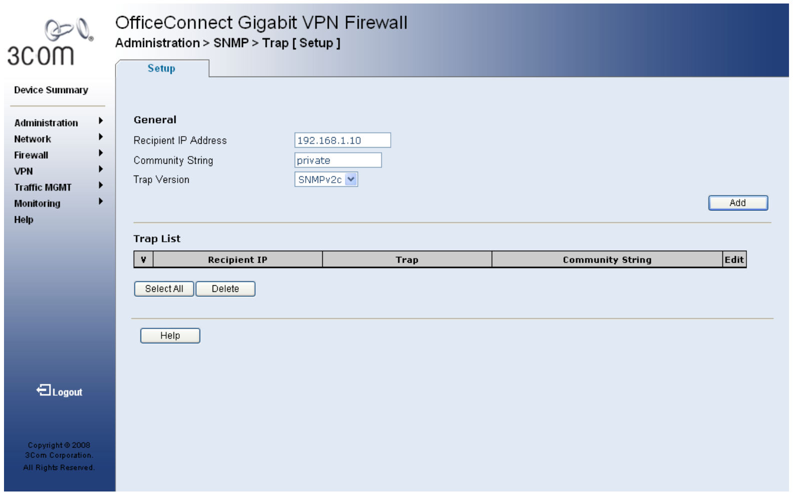
Figure 17.11 SNMP Community Configuration Page

2. To enable the SNMP feature, check the Enable SNMP checkbox and then click the Apply button to save the change.
3. Check the "Insert New Community" checkbox to add a new SNMP community. To edit an existing SNMP community, click on the ✎ icon of the entry to be modified in the SNMP List table.
4. To configure the SNMP management station, click on "Management Station" radio button and then enter the IP address of the permitted management station. Otherwise, click on "Open Access" to permit SNMP access to all management stations.
5. To configure the SNMP community, select one of the pre-defined communities from the Standard drop-down list. Or specify a user-defined community string into the User Defined field.
6. To define the access mode, select "Read Only" if you want to restrict the management access to read-only. Otherwise, select "Read Write" to permit full access to the specified SNMP community.
7. Click on the Add button to create the new community or clicks on the Apply button to save the changes.

The SNMP Traps Setup Page contains information for defining filters that determine whether traps are sent to specific users, and the trap type sent.

Follow these steps to configure the SNMP Trap settings:

1. Click Administration > SNMP > Trap to enter the SNMP Trap configuration page.



OfficeConnect Gigabit VPN Firewall

Administration > SNMP > Trap [Setup]

General

Recipient IP Address: 192.168.1.10

Community String: private

Trap Version: SNMPv2c

Trap List

V	Recipient IP	Trap	Community String	Edit

Figure 17.12 SNMP Trap Configuration Page

2. Enter an IP address into the Recipient IP Address field. The SNMP trap will be sent to the specified IP address.
3. To define the community string of the manager, please enter community string in the space provided.
4. Select an appropriate trap version from the Trap Version drop-down list.
5. Click on the Add button to create the new entry.
6. To edit the existing entry, click on the ✎ icon to enter the SNMP Trap configuration page. Make any changes you like and then click on the Apply button to save the changes.

18 ALG Configuration

Table 18.1 lists all the supported ALGs (Application Layer Gateway).

Table 18.1. Supported ALG

ALG/Application Name	Protocol and Port	Predefined Service Name	Tested Software Version
PCAnywhere	UDP/22	PC-ANYWHERE	pcAnywhere 9.0.0
RTSP-554	TCP/554	RTSP554	RealPlayer 8 Plus QuickTime Version 6
	UDP/53	DNS	
	TCP/80	HTTP	
RTSP-7070	TCP/7070	RTSP7070	RealPlayer 8 Plus
	UDP/53	DNS	QuickTime Version 6
	TCP/80	HTTP	
Net2Phone	UDP/6801	N2P	Net2Phone CommCenter Release 1.5.0
	TCP/80	HTTP	
	TCP/443	HTTPS	
	UDP/53	DNS	
CUSeeMe	TCP/7648	CUSEEME	CUSeeMe Version 5.0.0.043
	TCP/80	HTTP	
	UDP/53	DNS	
Netmeeting	TCP/1720	H323	
	UDP/53	DNS	
Netmeeting with ILS	TCP/1720	H323	Windows Netmeeting Version 3.01 Opengk Version
	TCP/389	ILS	
	UDP/53	DNS	
Netmeeting with GK	TCP/1720	H323	1.2.0
	UDP/1719	H323GK	
	UDP/53	DNS	
SIP	UDP/5060	SIP	SIP User Agent 2.0
Intel Video Phone	TCP/1720	H323	Intel Video Phone Version 5.0
	UDP/53	DNS	
FTP	TCP/21	FTP	WFTPD version 2.03 Redhat Linux 7.3
	UDP/53	DNS	
Security ALGs			
L2TP	UDP/1701	L2TP	Windows 2000 Server built-in
	UDP/53	DNS	
PPTP	TCP/1723	PPTP	Windows 2000 Server built-in
	UDP/53	DNS	
IPSec (Only Tunnel Mode with ESP)	UDP/500	IKE	Windows 2000 Server built-in
	ESP		
	UDP/53	DNS	
Chats			
AOL Chat	TCP/ 5190	AOL	AOL Instant Messenger Version 5.0.2938
	TCP/80	HTTP	
	UDP/53	DNS	
ICQ Chat NB: Application should be configured to use TCP/5191	TCP /5191	ICQ_2000	ICQ 2000b
	TCP/80	HTTP	
	UDP/53	DNS	
IRC	TCP/ 6667	IRC	MIRC v6.02
	TCP/80	HTTP	

ALG/Application Name	Protocol and Port	Predefined Service Name	Tested Software Version
	UDP/53	DNS	
MSIM	TCP/1863	MSN	MSN Messenger Service Version 3.6.0039
	TCP/80	HTTP	
	UDP/53	DNS	
Games			
Flight Simulator 2002 (Gaming Zone)	TCP/47624	MSG1	Flight Simulator 2002, Professional Edition
	TCP/28801	MSN-ZONE	
	TCP/443	HTTPS	
	TCP/80	HTTP	
	UDP/53	DNS	
Quake II (Gaming Zone)	UDP/ 27910	QUAKE	Quake II
	TCP/28801	MSN-ZONE	
	TCP/443	HTTPS	
	TCP/80	HTTP	
	UDP/53	DNS	
Age Of Empires (Gaming Zone)	TCP/47624	MSG1	Age of Empires, Gold Edition
	TCP/28801	MSN-ZONE	
	TCP/443	HTTPS	
	TCP/80	HTTP	
	UDP/53	DNS	
Diablo II (BATTLE-NET-TCP, BATTLE-NET-UDP)	TCP/4000	DIABLO-II	Diablo II
	TCP/ 6112	BATTLE-NET-TCP, BATTLE-NET-UDP	
	UDP/53	DNS	
	UDP/6112	Diablo II	

ALG/Application Name	Protocol and Port	Predefined Service Name	Tested Software Version
Other common Applications			
POP3	TCP/110	POP3	Outlook Express 5
	UDP/53	DNS	
IMAP	TCP/143	IMAP4	Outlook Express 5
	UDP/53	DNS	
SMTP	TCP/25	SMTP	Outlook Express 5
	UDP/53	DNS	
HTTPS / TLS / SSL	TCP/443	HTTPS	Internet Explorer 5
	TCP/80	HTTP	
	UDP/53	DNS	
LDAP	TCP/389	ILS	Openldap 2.0.25
	UDP/53	DNS	
NNTP	TCP/119	NNTP	Outlook Express 5
	UDP/53	DNS	
Finger	TCP/79	FINGER	Redhat Linux 7.3
	UDP/53	DNS	

19 IP Addresses, Network Masks, and Subnets

19.1 IP Addresses

Note

This section pertains only to IP addresses for IPv4 (version 4 of the Internet Protocol). IPv6 addresses are not covered.

This section assumes basic knowledge of binary numbers, bits, and bytes. For details on this subject, see Appendix 18.

IP addresses, the Internet's version of telephone numbers, are used to identify individual nodes (computers or devices) on the Internet. Every IP address contains four numbers, each from 0 to 255 and separated by dots (periods), e.g. 20.56.0.211. These numbers are called, from left to right, field1, field2, field3, and field4.

This style of writing IP addresses as decimal numbers separated by dots is called *dotted decimal notation*. The IP address 20.56.0.211 is read "twenty dot fifty-six dot zero dot two-eleven."

19.1.1 Structure of an IP address

IP addresses have a hierarchical design similar to that of telephone numbers. For example, a 7-digit telephone number starts with a 3-digit prefix that identifies a group of thousands of telephone lines, and ends with four digits that identify one specific line in that group.

Similarly, IP addresses contain two kinds of information.

- *Network ID*

  Identifies a particular network within the Internet or Intranet

- *Host ID*

  Identifies a particular computer or device on the network

The first part of every IP address contains the network ID, and the rest of the address contains the host ID. The length of the network ID depends on the network's *class* (see following section). Table 19.1 shows the structure of an IP address.

Table 19.1. IP Address structure

	Field1	**Field2**	**Field3**	**Field4**
Class A	Network ID	Host ID		
Class B	Network ID		Host ID	
Class C	Network ID			Host ID

Here are some examples of valid IP addresses:

Class A: 10.30.6.125 (network = 10, host = 30.6.125)
Class B: 129.88.16.49 (network = 129.88, host = 16.49)
Class C: 192.60.201.11 (network = 192.60.201, host = 11)

19.2 Network classes

The three commonly used network classes are A, B, and C. (There is also a class D but it has a special use beyond the scope of this discussion.) These classes have different uses and characteristics.

Class A networks are the Internet's largest networks, each with room for over 16 million hosts. Up to 126 of these huge networks can exist, for a total of over 2 billion hosts. Because of their huge size, these networks are used for WANs and by organizations at the infrastructure level of the Internet, such as your ISP.

Class B networks are smaller but still quite large, each able to hold over 65,000 hosts. There can be up to 16,384 class B networks in existence. A class B network might be appropriate for a large organization such as a business or government agency.

Class C networks are the smallest, only able to hold 254 hosts at most, but the total possible number of class C networks exceeds 2 million (2,097,152 to be exact). LANs connected to the Internet are usually class C networks.

Some important notes regarding IP addresses:

- The class can be determined easily from field1:

field1 = 1-126:	Class A
field1 = 128-191:	Class B
field1 = 192-223:	Class C

  (field1 values not shown are reserved for special uses)

- A host ID can have any value except all fields set to 0 or all fields set to 255, as those values are reserved for special uses.

19.3 Subnet masks

Definition

mask

A mask *looks like a regular IP address, but contains a pattern of bits that tells what parts of an IP address are the network ID and what parts are the host ID: bits set to 1 mean "this bit is part of the network ID" and bits set to 0 mean "this bit is part of the host ID."*

Subnet masks are used to define *subnets* (what you get after dividing a network into smaller pieces). A subnet's network ID is created by "borrowing" one or more bits from the host ID portion of the address. The subnet mask identifies these host ID bits.

For example, consider a class C network 192.168.1. To split this into two subnets, you would use the subnet mask:

255.255.255.128

It's easier to see what's happening if we write this in binary:

11111111. 11111111. 11111111.10000000

As with any class C address, all of the bits in field1 through field 3 are part of the network ID, but note how the mask specifies that the first bit in field 4 is also included. Since this extra bit has only two values (0 and 1), this means there are two subnets. Each subnet uses the remaining 7 bits in field4 for its host IDs, which range from 0 to 127 (instead of the usual 0 to 255 for a class C address).

Similarly, to split a class C network into four subnets, the mask is:

255.255.255.192 or 11111111. 11111111. 11111111.11000000

The two extra bits in field4 can have four values (00, 01, 10, 11), so there are four subnets. Each subnet uses the remaining six bits in field4 for its host IDs, ranging from 0 to 63.

Note

Sometimes a subnet mask does not specify any additional network ID bits, and thus no subnets. Such a mask is called a default subnet mask. *These masks are:*

Class A:	*255.0.0.0*
Class B:	*255.255.0.0*
Class C:	*255.255.255.0*

These are called default *because they are used when a network is* *initially configured, at which time it has no subnets.*

20 Troubleshooting

This appendix suggests solutions for problems you may encounter in installing or using the OfficeConnect Gigabit VPN Firewall, and provides instructions for using several IP utilities to diagnose problems.

Contact Customer Support if these suggestions do not resolve the problem.

Problem	Troubleshooting Suggestion
LEDs	
Power LED does not illuminate after product is turned on.	Verify that you are using the power adapter provided with the device and that it is securely connected to the OfficeConnect Gigabit VPN Firewall and a wall socket/power strip.
LINK WAN LED does not illuminate after Ethernet cable is attached.	Verify that an Ethernet cable like the one provided is securely connected to the Ethernet port of your ADSL or cable modem and the WAN port of the OfficeConnect Gigabit VPN Firewall. Make sure that your ADSL or cable modem is powered on. Wait 30 seconds to allow the OfficeConnect Gigabit VPN Firewall to negotiate a connection with your broadband modem.
LINK LAN LED does not illuminate after Ethernet cable is attached.	Verify that the Ethernet cable is securely connected to your LAN hub or PC and to the OfficeConnect Gigabit VPN Firewall. Make sure the PC and/or hub is turned on. Verify that your cable is sufficient for your network requirements. A 100 Mbit/sec network (100BaseTx) should use cables labeled Cat 5. 10Mbit/sec cables may tolerate lower quality cables.
Internet Access	
PC cannot access Internet	Use the ping utility, discussed in the following section, to check whether your PC can communicate with the OfficeConnect Gigabit VPN Firewall's LAN IP address (by default 192.168.1.1). If it cannot, check the Ethernet cabling. If you statically assigned a private IP address to the computer, (not a registered public address), verify the following: • Check that the gateway IP address on the computer is your public IP address (see the Quick Start Guide chapter, Part 2 for instructions on viewing the IP information.) If it is not, correct the address or configure the PC to receive IP information automatically. • Verify with your ISP that the DNS server specified for the PC is valid. Correct the address or configure the PC to receive this information automatically. • Verify that a Network Address Translation rule has been defined on the OfficeConnect Gigabit VPN Firewall to translate the private address to your public IP address. The assigned IP address must be within the range specified in the NAT rules. Or,

Problem	Troubleshooting Suggestion
	configure the PC to accept an address assigned by another device (see section 3.3 "Part 3 — Configuring Your Computers"). The default configuration includes a NAT rule for all dynamically assigned addresses within a predefined pool
PCs cannot display web pages on the Internet.	Verify that the DNS server specified on the PCs is correct for your ISP, as discussed in the item above. You can use the ping utility, discussed in the following section, to test connectivity with your ISP's DNS server.
Configuration Manager Program	
You forgot/lost your Configuration Manager user ID or password.	If you have not changed the password from the default, try using "admin" as both the user ID and password. Otherwise, you can reset the device to the default configuration by following the instructions provided in section 17.6.1 "Reset System Configuration". **WARNING:** Resetting the device removes any custom settings and returns all settings to their default values.

Problem	Troubleshooting Suggestion
Cannot access the Configuration Manager program from your browser.	Use the ping utility, discussed in the following section, to check whether your PC can communicate with the OfficeConnect Gigabit VPN Firewall's LAN IP address (by default 192.168.1.1). If it cannot, check the Ethernet cabling. Verify that you are using Internet Explorer v5.5, Netscape 7.0.2 or later. Support for Javascript® must be enabled in your browser. Support for Java® may also be required. Verify that the PC's IP address is defined as being on the same subnet as the IP address assigned to the LAN port on the OfficeConnect Gigabit VPN Firewall.
Changes to Configuration *Manager are not being retained.*	Be sure to click on Apply button to save any changes.

20.1 Diagnosing Problem using IP Utilities

20.1.1 ping

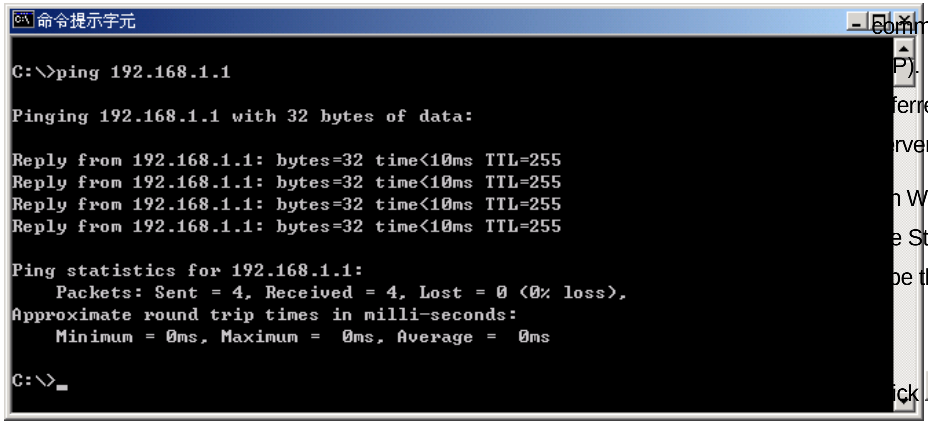
Ping is a command you can use to check whether your PC can recognize other computers on your network and the Internet. A ping command sends a message to the computer you specify. If the computer receives the message, it sends messages in reply. To use it, you must know the IP address of the computer with which you are trying to communicate.

On Windows-based computers, you can execute a ping command from the Start menu. Click the Start button, and then click Run. In the Open text box, type a statement such as the following:

ping 192.168.1.1

Click OK. You can substitute any private IP address on your LAN or a public IP address for an Internet site, if known.

If the target computer receives the message, a Command Prompt window displays like that shown in Figure 20.1.



```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<10ms TTL=255
Reply from 192.168.1.1: bytes=32 time<10ms TTL=255
Reply from 192.168.1.1: bytes=32 time<10ms TTL=255
Reply from 192.168.1.1: bytes=32 time<10ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum =  0ms, Average =  0ms

C:\>_
```

Figure 20.1. Using the ping Utility

If the target computer cannot be located, you will receive the message "Request timed out."

Using the ping command, you can test whether the path to the OfficeConnect Gigabit VPN Firewall is working (using the preconfigured default LAN IP address 192.168.1.1) or another address you assigned.

You can also test whether access to the Internet is working by typing an external address, such as that for www.yahoo.com (216.115.108.243). If you do not know the IP address of a particular Internet location, you can use the nslookup command, as explained in the following section.

From most other IP-enabled operating systems, you can execute the same command at a command prompt or through a system administration utility.

20.1.2 nslookup

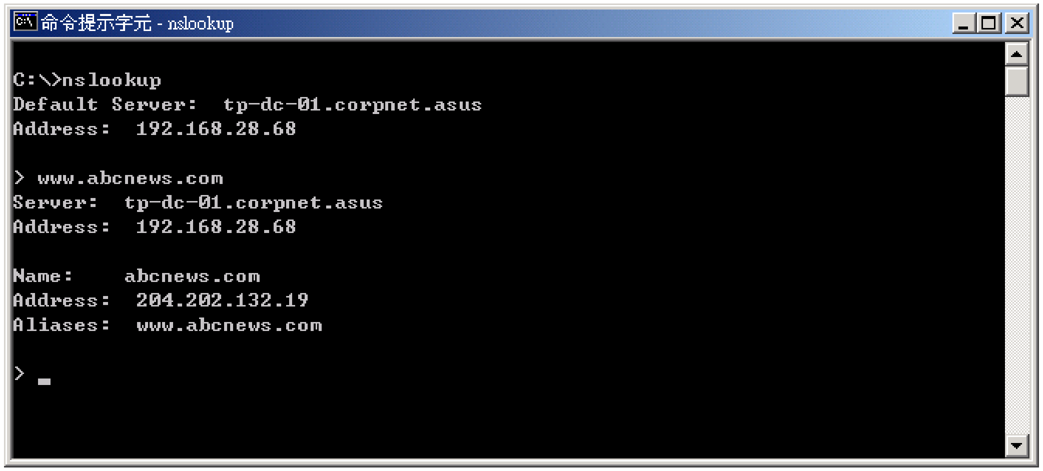
You can use the nslookup command to determine the IP address associated with an Internet site name. You specify the common name, and the nslookup command looks up the name on your DNS server (usually located with your P). If that name is not an entry in your ISP's DNS table, the request is then ferred to another higher-level server, and so on, until the entry is found. The rver then returns the associated IP address.

n Windows-based computers, you can execute the nslookup command from e Start menu. Click the Start button, and then click Run. In the Open text box, pe the following:

nslookup

ick OK. A Command Prompt window displays with a bracket prompt (>). At the prompt, type the name of the Internet address you are interested in, such as www.absnews.com.

The window will display the associate IP address, if known, as shown in Figure 20.2.



```
C:\>nslookup
Default Server:  tp-dc-01.corpnet.asus
Address:  192.168.28.68

> www.abcnews.com
Server:  tp-dc-01.corpnet.asus
Address:  192.168.28.68

Name:    abcnews.com
Address:  204.202.132.19
Aliases:  www.abcnews.com

> _
```

Figure 20.2. Using the nslookup Utility

There may be several addresses associated with an Internet name. This is common for web sites that receive heavy traffic; they use multiple, redundant servers to carry the same information.

To exit from the nslookup utility, type **exit** and press **<Enter>** at the command prompt.

21 SAFETY INFORMATION

Important Safety Information

***WARNING**: Warnings contain directions that you must follow for your personal safety. Follow all directions carefully.*
You must read the following safety information carefully before you install or remove the unit:

***WARNING**: Exceptional care must be taken during installation and removal of the unit.*

***WARNING**: Only stack the Firewall with other OfficeConnect units.*

***WARNING**: To ensure compliance with international safety standards, only use the power adapter that is supplied with the unit.*

***WARNING**: The socket outlet must be near to the unit and easily accessible. You can only remove power from the unit by disconnecting the power cord from the outlet.*

***WARNING**: This unit operates under SELV (Safety Extra Low Voltage) conditions according to IEC 60950. The conditions are only maintained if the equipment to which it is connected also operates under SELV conditions.*

***WARNING**: There are no user-replaceable fuses or user-serviceable parts inside the Firewall. If you have a physical problem with the unit that cannot be solved with problem solving actions in this guide, contact your supplier.*

***WARNING**: Disconnect the power adapter before moving the unit.*

***WARNING: RJ-45 ports.** These are shielded RJ-45 data sockets. They cannot be used as telephone sockets. Only connect RJ-45 data connectors to these sockets.*

Wichtige Sicherheitshinweise

***VORSICHT:** Warnhinweise enthalten Anweisungen, die Sie zu Ihrer eigenen Sicherheit befolgen müssen. Alle Anweisungen sind sorgfältig zu befolgen.*
Sie müssen die folgenden Sicherheitsinformationen sorgfältig durchlesen, bevor Sie das Geräts installieren oder ausbauen:

***VORSICHT:** Bei der Installation und beim Ausbau des Geräts ist mit höchster Vorsicht vorzugehen.*

***VORSICHT:** Stapeln Sie das Geräts nur mit anderen OfficeConnect Gerätes zusammen.*

***VORSICHT:** Aufgrund von internationalen Sicherheitsnormen darf das Gerät nur mit dem mitgelieferten Netzadapter verwendet werden.*

***VORSICHT:** Die Netzsteckdose muß in der Nähe des Geräts und leicht zugänglich sein. Die Stromversorgung des Geräts kann nur durch Herausziehen des Gerätenetzkabels aus der Netzsteckdose unterbrochen werden.*

***VORSICHT:** Der Betrieb dieses Geräts erfolgt unter den SELV-Bedingungen (Sicherheitskleinstspannung) gemäß IEC 60950. Diese Bedingungen sind nur gegeben, wenn auch die an das Gerät angeschlossenen Geräte unter SELV-Bedingungen betrieben werden.*

***VORSICHT:** Es sind keine von dem Benutzer zu ersetzende oder zu wartende Teile in dem Gerät vorhanden. Wenn Sie ein Problem mit dem Firewall haben, das nicht mittels der Fehleranalyse in dieser Anleitung behoben werden kann, setzen Sie sich mit Ihrem Lieferanten in Verbindung.*

***VORSICHT:** Vor dem Ausbau des Geräts das Netzadapterkabel herausziehen.*

***VORSICHT: RJ-45-Anschlüsse.** Dies sind abgeschirmte RJ-45-Datenbuchsen. Sie können nicht als Telefonanschlußbuchsen verwendet werden. An diesen Buchsen dürfen nur RJ-45-Datenstecker angeschlossen werden.*

Consignes importantes de sécurité

⚠ ***AVERTISSEMENT:*** *Les avertissements présentent des consignes que vous devez respecter pour garantir votre sécurité personnelle. Vous devez respecter attentivement toutes les consignes.*
Nous vous demandons de lire attentivement les consignes de sécurité ci-après avant d'installer ou de désinstaller l'appareil:

⚠ ***AVERTISSEMENT:*** *Faites très attention lors de l'installation et de la désinstallation de l'appareil.*

⚠ ***AVERTISSEMENT:*** *L'appareil ne doit être empilé qu'avec d'autres produits OfficeConnect.*

⚠ ***AVERTISSEMENT:*** *Pour garantir le respect des normes internationales de sécurité, utilisez uniquement l'adaptateur électrique remis avec cet appareil.*

⚠ ***AVERTISSEMENT:*** *La prise secteur doit se trouver à proximité de l'appareil et son accès doit être facile. Vous ne pouvez mettre l'appareil hors circuit qu'en débranchant son cordon électrique au niveau de la prise.*

⚠ ***AVERTISSEMENT:*** *L'appareil fonctionne à une tension de sécurité extrêmement basse, conformément à la norme CEI 60950. La conformité à cette norme n'est maintenue que si l'équipement auquel il est raccordé fonctionne également dans des conditions conformes à cette norme.*

⚠ ***AVERTISSEMENT:*** *Il n'y a pas d'élément remplaçable ou réparable par l'utilisateur à l'intérieur de l'appareil. Si vous rencontrez avec cet appareil un problème ne pouvant être résolu par les actions de résolution de problèmes présentés dans ce manuel, veuillez contacter votre fournisseur.*

⚠ ***AVERTISSEMENT:*** *Débranchez l'adaptateur électrique avant de désinstaller cet appareil.*

⚠ ***AVERTISSEMENT: Ports RJ-45.*** *Il s'agit de prises de données femelles blindées RJ-45. Vous ne pouvez pas les utiliser comme prise de téléphone. Branchez uniquement des connecteurs de données RJ-45 dans ces prises femelles.werden.*

22 OBTAINING SUPPORT FOR YOUR PRODUCT

3Com offers product registration, case management, and repair services through eSupport.3com.com. You must have a user name and password to access these services, which are described in this appendix.

Register Your Product to Gain Service Benefits

Warranty and other service benefits start from the date of purchase, so it is important to register your product quickly to ensure you get full use of the warranty and other service benefits available to you.

Warranty and other service benefits are enabled through product registration. Register your product at http://eSupport.3com.com/. 3Com eSupport services are based on accounts that you create or have authorization to access. First time users must apply for a user name and password that provides access to a number of eSupport features including Product Registration, Repair Services, and Service Request. If you have trouble registering your product, please contact 3Com Global Services for assistance.

Troubleshoot Online

You will find support tools posted on the 3Com Web site at
www.3Com.com
3Com Knowledgebase — Helps you to troubleshoot 3Com products. This query-based interactive tool is located at:
http://knowledgebase.3com.com
It contains thousands of technical solutions written by 3Com support engineers.

Purchase Extended Warranty and Professional Services

To enhance response times or extend warranty benefits, contact 3Com or your authorized 3Com reseller. Value-added services like 3Com Express SM and Guardian SM can include 24x7 telephone technical support, software upgrades, onsite assistance or advance hardware replacement. Experienced engineers are available to manage your installation with minimal disruption to your network. Expert assessment and implementation services are offered to fill resource gaps and ensure the success of your networking projects.

More information on 3Com maintenance and Professional Services is available at www.3com.com.

Contact your authorized 3Com reseller or 3Com for additional product and support information. See the table of access numbers later in this appendix.

Access Software Downloads

Software Updates are the bug fix/maintenance releases for the version of software initially purchased with the product. In order to access these Software Updates you must first register your product on the 3Com Web site at http://eSupport.3com.com/.

First time users will need to apply for a user name and password. A link to software downloads can be found at http://eSupport.3com.com/, or under the Product Support heading at http://www.3com.com/ Software Upgrades are the feature releases that follow the software version included with your original product. In order to access upgrades and related documentation you must first purchase a service contract from 3Com or your reseller.

Contact Us

3Com offers telephone, e-mail and internet access to technical support and repair services. To access these services for your region, use the appropriate telephone number, URL or e-mail address from the list below. You will find a current directory of support telephone numbers posted on the 3Com web site at

http://csoweb4.3com.com/contactus/

Telephone Technical Support and Repair

To obtain telephone support as part of your warranty and other service benefits, you must first register your product at

http://eSupport.3com.com/

When you contact 3Com for assistance, please have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision level
- Diagnostic error messages
- Details about recent configuration changes, if applicable

To send a product directly to 3Com for repair, you must first obtain a return authorization number (RMA). Products sent to 3Com, without authorization numbers clearly marked on the outside of the package, will be returned to the sender unopened, at the sender's expense. If your product is registered and under warranty, you can obtain an RMA number online at **http://eSupport.3com.com/**. First time users will need to apply for a user name and password.

Telephone numbers are correct at the time of publication. Find a current directory of support telephone numbers posted on the 3Com web site at http://csoweb4.3com.com/contactus/

Country	Telephone Number
Asia, Pacific Rim Telephone Technical Support and Repair	
Australia	1800 075 316
Hong Kong	2907 0456
India	000 800 440 1193
Indonesia	001 803 852 9825
Japan	03 3507 5984
Malaysia	1800 812 612
New Zealand	0800 450 454
Philippines	1800 144 10220 or 029003078
PR of China	800 810 0504
Singapore	800 448 1433
South. Korea	080 698 0880
Taiwan	00801 444 318
Thailand	001 800 441 2152

Pakistan Call the U.S. direct by dialing 00 800 01001, then

dialing 800 763 6780

Sri Lanka Call the U.S. direct by dialing 02 430 430, then

dialing 800 763 6780

Vietnam Call the U.S. direct by dialing 1 201 0288, then

dialing 800 763 6780

You can also obtain non-urgent support in this region at this email address **`apr_technical_support@3com.com`**

Or request a return material authorization number (RMA) by FAX using

this number: +61 2 9937 5048, or send an email at this email address: **`ap_rma_request@3com.com`**

Country	Telephone Number
Europe, Middle East, and Africa – Telephone Technical Support and Repair	
From anywhere in these regions not listed below, call: +44 1442 435529	
From the following countries, call the appropriate number:	
Austria	0800 297 468

Country	Telephone Number
Belgium	0800 71429
Denmark	800 17309
Finland	0800 113153
France	0800 917959
Germany	0800 182 1502
Hungary	06800 12813
Ireland	1 800 533 117
Israel	180 945 3794
Italy	0800 879489
Luxembourg	800 23625
Netherlands	0800 0227788
Norway	800 11376
Poland	00800 4411 357
Portugal	800 831416
Russia	88005558588
Saudi Arabia	800 8 445 312
South Africa	0800 995 014
Spain	900 938 919
Sweden	020 795 482
Switzerland	0800 553 072
U.A.E.	04-3908997
U.K.	0800 096 3266

Country	Telephone Number

You can also obtain support in this region using this URL:

`http://emea.3com.com/support/email.html`

You can also obtain non-urgent support in this region at these email addresses:

Technical support and general requests: `customer_support@3com.com`

Return material authorization number: `warranty_repair@3com.com`

Contact Requests: `emea_contact@3com.com`

Country	Telephone Number
Latin America – Telephone Technical Support and Repair	
Antigua	AT&T +800 988 2112
Antigua Barbuda	AT&T +800 988 2112
Argentina	AT&T +800 988 2112
Aruba	AT&T +800 988 2112
Bahamas	AT&T +800 988 2112
Barbados	AT&T +800 988 2112
Belize	AT&T +800 988 2112
Bermuda	AT&T +800 988 2112
Bolivia	AT&T +800 988 2112
Brasil	0800-133266 (0800-13-3COM)
Brasil Local	+5511 5643 2700
British Virgin Islands	AT&T +800 988 2112
Cayman Islands	AT&T +800 988 2112
Chile	AT&T +800 988 2112
Colombia	AT&T +800 988 2112
Colombia Local	+571 592 5000
Costa Rica	AT&T +800 988 2112
Curaço	AT&T +800 988 2112
Dominican Republic	AT&T +800 988 2112
El Salvador	AT&T +800 988 2112
Equator	AT&T +800 988 2112
French Guyana	AT&T +800 988 2112
Grenada	AT&T +800 988 2112
Guadalupe	AT&T +800 988 2112
Guatemala	AT&T +800 988 2112
Guyana	AT&T +800 988 2112
Haiti	AT&T +800 988 2112
Honduras	AT&T +800 988 2112
Jamaica	AT&T +800 988 2112
Mexico	1800 849 2273
Mexico Local	+52-55-52-01-0004
Monserrat	AT&T +800 988 2112

Country	Telephone Number
Nicaragua	AT&T +800 988 2112
Panama	AT&T +800 988 2112
Paraguay	AT&T +800 988 2112
Peru	AT&T +800 988 2112
Puerto Rico	AT&T +800 988 2112
Rest of Latin America	+1 508 323 6234
St. Kitts Nevis	AT&T +800 988 2112
St. Lucia	AT&T +800 988 2112
St. Vincent	AT&T +800 988 2112
Suriname	AT&T +800 988 2112
Trinidad and Tobago	AT&T +800 988 2112
Turks and Caicos	AT&T +800 988 2112
Uruguay – Montivideo	AT&T +800 988 2112
Venezuela	AT&T +800 988 2112
Virgin Islands	AT&T +800 988 2112

You can also obtain support in this region in the following ways:

Spanish speakers, enter the URL:

`http://lat.3com.com/lat/support/form.html`

Portuguese speakers, enter the URL:

`http://lat.3com.com/br/support/form.html`

English speakers in Latin America should send an e-mail to:

`lat_support_anc@3com.com`

Country	Telephone Number
US and Canada – Telephone Technical Support and Repair	
All locations:	
Network Jacks; Wired	1 847 262 0070
All other 3Com products	1 800 876 3226

Country	Telephone Number
Asia, Pacific Rim Telephone Technical Support and Repair	
Australia	1800 075 316
Hong Kong	2907 0456
India	000 800 440 1193
Indonesia	001 803 852 9825
Japan	03 3507 5984
Malaysia	1800 812 612
New Zealand	0800 450 454
Philippines	1800 144 10220 or

Country	Telephone Number
	029003078
PR of China	800 810 0504
Singapore	800 448 1433
South. Korea	080 698 0880
Taiwan	00801 444 318
Thailand	001 800 441 2152

Pakistan Call the U.S. direct by dialing 00 800 01001, then

dialing 800 763 6780

Sri Lanka Call the U.S. direct by dialing 02 430 430, then

dialing 800 763 6780

Vietnam Call the U.S. direct by dialing 1 201 0288, then

dialing 800 763 6780

You can also obtain non-urgent support in this region at this email address **apr_technical_support@3com.com**

Or request a return material authorization number (RMA) by FAX using

this number: +61 2 9937 5048, or send an email at this email address: **ap_rma_request@3com.com**

Country	Telephone Number
Europe, Middle East, and Africa – Telephone Technical Support and Repair	
From anywhere in these regions not listed below, call: +44 1442 435529	
From the following countries, call the appropriate number:	
Austria	0800 297 468
Belgium	0800 71429
Denmark	800 17309
Finland	0800 113153
France	0800 917959
Germany	0800 182 1502
Hungary	06800 12813
Ireland	1 800 533 117
Israel	180 945 3794
Italy	0800 879489
Luxembourg	800 23625
Netherlands	0800 0227788
Norway	800 11376
Poland	00800 4411 357
Portugal	800 831416
Russia	88005558588
Saudi Arabia	800 8 445 312

Country	Telephone Number
South Africa	0800 995 014
Spain	900 938 919
Sweden	020 795 482
Switzerland	0800 553 072
U.A.E.	04-3908997
U.K.	0800 096 3266

You can also obtain support in this region using this URL:

`http://emea.3com.com/support/email.html`

You can also obtain non-urgent support in this region at these email addresses:

Technical support and general requests: **`customer_support@3com.com`**

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Antigua Barbuda	AT&T +800 988 2112
Argentina	AT&T +800 988 2112
Aruba	AT&T +800 988 2112
Bahamas	AT&T +800 988 2112
Barbados	AT&T +800 988 2112
Belize	AT&T +800 988 2112
Bermuda	AT&T +800 988 2112
Bolivia	AT&T +800 988 2112
Brasil	0800-133266 (0800-13-3COM)
Brasil Local	+5511 5643 2700
British Virgin Islands	AT&T +800 988 2112
Cayman Islands	AT&T +800 988 2112
Chile	AT&T +800 988 2112
Colombia	AT&T +800 988 2112
Colombia Local	+571 592 5000
Costa Rica	AT&T +800 988 2112
Curaço	AT&T +800 988 2112
Dominican Republic	AT&T +800 988 2112
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Guadalupe	AT&T +800 988 2112
Guatemala	AT&T +800 988 2112
Guyana	AT&T +800 988 2112

Country	Telephone Number
Haiti	AT&T +800 988 2112
Honduras	AT&T +800 988 2112
Jamaica	AT&T +800 988 2112
Mexico	1800 849 2273
Mexico Local	+52-55-52-01-0004
Monserrat	AT&T +800 988 2112
Nicaragua	AT&T +800 988 2112
Panama	AT&T +800 988 2112
Paraguay	AT&T +800 988 2112
Peru	AT&T +800 988 2112
Puerto Rico	AT&T +800 988 2112
Rest of Latin America	+1 508 323 6234
St. Kitts Nevis	AT&T +800 988 2112
St. Lucia	AT&T +800 988 2112
St. Vincent	AT&T +800 988 2112
Suriname	AT&T +800 988 2112
Trinidad and Tobago	AT&T +800 988 2112
Turks and Caicos	AT&T +800 988 2112
Uruguay – Montivideo	AT&T +800 988 2112
Venezuela	AT&T +800 988 2112
Virgin Islands	AT&T +800 988 2112

You can also obtain support in this region in the following ways:

Country	Telephone Number

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`http://lat.3com.com/lat/support/form.html`

Portuguese speakers, enter the URL:

`http://lat.3com.com/br/support/form.html`

English speakers in Latin America should send an e-mail to:

`lat_support_anc@3com.com`

Country	Telephone Number
US and Canada – Telephone Technical Support and Repair	
All locations:	
Network Jacks; Wired	1 847 262 0070
All other 3Com products	1 800 876 3226

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GOVERNING LAW: This Agreement shall be governed by the laws of the State of California, U.S.A. excluding its conflicts of laws principles and excluding the United Nations Convention on Contracts for the International Sale of Goods.

SEVERABILITY: In the event any provision of this Agreement is found to be invalid, illegal or unenforceable, the validity, legality and enforceability of any of the remaining provisions shall not in any way be affected or impaired and a valid, legal and enforceable provision of similar intent and economic impact shall be substituted therefor.

ENTIRE AGREEMENT: This Agreement sets forth the entire understanding and agreement between you and 3Com and supersedes all prior agreements, whether written or oral, with respect to the Software and Documentation, and may be amended only in a writing signed by both parties.

Should you have any questions concerning this Agreement or if you desire to contact 3Com for any reason, please contact the 3Com subsidiary serving your country, or write:

3Com Corporation, 350 Campus Drive, Marlborough, MA USA 01752-3064

This product contains encryption and may require U.S. and/or local government authorisation prior to export or import to another country.

24 Regulatory Notices

24.1.1.1 FCC STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference to radio communications, in which case the user will be required to correct the interference at their own expense.

24.1.1.2 INFORMATION TO THE USER

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

How to Identify and Resolve Radio-TV Interference Problems

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

In order to meet FCC emissions limits, this equipment must be used only with cables which comply with IEEE 802.3.

24.1.1.3 ICES STATEMENT

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

24.1.1.4 CE STATEMENT (EUROPE)

3Com Europe Limited
Peoplebuilding 2,
Peoplebuilding Estate
Maylands Avenue
Hemel Hempstead,
Hertfordshire
HP2 4NW
United Kingdom

This product complies with the European Low Voltage Directive 73/23/EEC and EMC Directive 89/336/EEC as amended by European Directive 93/68/EEC.

Warning: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

A copy of the signed Declaration of Conformity can be downloaded from the Product Support web page for the OfficeConnect Gigabit VPN Firewall (3CREVF100-73) at http://www.3Com.com.

Also available at http://support.3com.com/doc/3CREVF100-73_EU_DOC.pdf

25 Glossary

10BASE-T A designation for the type of wiring used by Ethernet networks with a data rate of 10 Mbps. Also known as Category 3 (CAT 3) wiring. *See also data rate, Ethernet*.

100BASE-T A designation for the type of wiring used by Ethernet networks with a data rate of 100 Mbps. Also known as Category 5 (CAT 5) wiring. *See also data rate, Ethernet*.

ADSL Asymmetric Digital Subscriber Line
The most commonly deployed "flavor" of DSL for home users. The term asymmetrical refers to its unequal data rates for downloading and uploading (the download rate is higher than the upload rate). The asymmetrical rates benefit home users because they typically download much more data from the Internet than they upload.

authenticate To verify user's identity, such as by prompting for a password.

binary The "base two" system of numbers, that uses only two digits, 0 and 1, to represent all numbers. In binary, the number 1 is written as 1, 2 as 10, 3 as 11, 4 as 100, etc. Although expressed as decimal numbers for convenience, IP addresses in actual use are binary numbers; e.g., the IP address 209.191.4.240 is 11010001.10111111.00000100.11110000 in binary. *See also bit, IP address, network mask*.

bit Short for "binary digit," a bit is a number that can have two values, 0 or 1. *See also binary*.

bps bits per second

broadband A telecommunications technology that can send different types of data over the same medium. DSL is a broadband technology.

broadcast To send data to all computers on a network.

DHCP Dynamic Host Configuration Protocol
DHCP automates address assignment and management. When a computer connects to the LAN, DHCP assigns it an IP address from a shared pool of IP addresses; after a specified time limit, DHCP returns the address to the pool.

DHCP relay Dynamic Host Configuration Protocol relay
A DHCP relay is a computer that forwards DHCP data between computers that request IP addresses and the DHCP server that assigns the addresses. Each of the OfficeConnect Gigabit VPN Firewall's interfaces can be configured as a DHCP relay. *See DHCP*.

DHCP server Dynamic Host Configuration Protocol server
A DHCP server is a computer that is responsible for assigning IP addresses to the computers on a LAN. *See DHCP*.

DNS Domain Name System
The DNS maps domain names into IP addresses. DNS information is distributed hierarchically throughout the Internet among computers called DNS servers. When you start to access a web site, a DNS server looks up the

requested domain name to find its corresponding IP address. If the DNS server cannot find the IP address, it communicates with higher-level DNS servers to determine the IP address. *See also domain name.*

domain name A domain name is a user-friendly name used in place of its associated IP address. For example, www.3com.com is the domain name associated with IP address 192.136.34.41. Domain names must be unique; their assignment is controlled by the Internet Corporation for Assigned Names and Numbers (ICANN). Domain names are a key element of URLs, which identify a specific file at a web site, e.g., http://www.3com.com. *See also DNS.*

download To transfer data in the downstream direction, i.e., from the Internet to the user.

DSL Digital Subscriber Line
A technology that allows both digital data and analog voice signals to travel over existing copper telephone lines.

Ethernet The most commonly installed computer network technology, usually using twisted pair wiring. Ethernet data rates are 10 Mbps and 100 Mbps. *See also 10BASE-T, 100BASE-T, twisted pair*.

filtering To screen out selected types of data, based on filtering rules. Filtering can be applied in one direction (upstream or downstream), or in both directions.

filtering rule A rule that specifies what kinds of data the a routing device will accept and/or reject. Filtering rules are defined to operate on an interface (or multiple interfaces) and in a particular direction (upstream, downstream, or both).

firewall Any method of protecting a computer or LAN connected to the Internet from intrusion or attack from the outside. Some firewall protection can be provided by packet filtering and Network Address Translation services.

FTP File Transfer Protocol
A program used to transfer files between computers connected to the Internet. Common uses include uploading new or updated files to a web server, and downloading files from a web server.

hop When you send data through the Internet, it is sent first from your computer to a router, and then from one router to another until it finally reaches a router that is directly connected to the recipient. Each individual "leg" of the data's journey is called a hop.

hop count The number of hops that data has taken on its route to its destination. Alternatively, the maximum number of hops that a packet is allowed to take before being discarded (*see also TTL*).

host A device (usually a computer) connected to a network.

HTTP Hyper-Text Transfer Protocol
HTTP is the main protocol used to transfer data from web sites so that it can be displayed by web browsers. *See also web browser, web site*.

ICMP Internet Control Message Protocol
An Internet protocol used to report errors and other

network-related information. The ping command makes use of ICMP.

IGMP Internet Group Management Protocol
An Internet protocol that enables a computer to share information about its membership in multicast groups with adjacent routers. A multicast group of computers is one whose members have designated as interested in receiving specific content from the others. Multicasting to an IGMP group can be used to simultaneously update the address books of a group of mobile computer users or to send company newsletters to a distribution list.

Internet The global collection of interconnected networks used for both private and business communications.

intranet A private, company-internal network that looks like part of the Internet (users access information using web browsers), but is accessible only by employees.

IP *See TCP/IP*.

IP address Internet Protocol address
The address of a host (computer) on the Internet, consisting of four numbers, each from 0 to 255, separated by periods, e.g., 209.191.4.240. An IP address consists of a *network ID* that identifies the particular network the host belongs to, and a *host ID* uniquely identifying the host itself on that network. A network mask is used to define the network ID and the host ID. Because IP addresses are difficult to remember, they usually have an associated domain name that can be specified instead. *See also domain name, network mask*.

ISP Internet **S**ervice **P**rovider
A company that provides Internet access to its customers, usually for a fee.

LAN **L**ocal **A**rea **N**etwork
A network limited to a small geographic area, such as a home, office, or small building.

LED Light Emitting Diode
An electronic light-emitting device. The indicator lights on the front of the OfficeConnect Gigabit VPN Firewall are LEDs.

MAC address Media Access Control address
The permanent hardware address of a device, assigned by its manufacturer. MAC addresses are expressed as six pairs of characters.

mask *See network mask*.

Mbps Abbreviation for Megabits per second, or one million bits per second. Network data rates are often expressed in Mbps.

NAT Network Address Translation
A service performed by many routers that translates your network's publicly known IP address into a *private* IP address for each computer on your LAN. Only your router and your LAN know these addresses; the outside world sees only the public IP address when talking to a computer on your LAN.

NAT rule A defined method for translating between public and private IP addresses on your LAN.

network A group of computers that are connected together, allowing them to communicate with each other and share resources, such as software, files, etc. A network can be small, such as a *LAN*, or very large, such as the *Internet*.

network mask A network mask is a sequence of bits applied to an IP address to select the network ID while ignoring the host ID. Bits set to 1 mean "select this bit" while bits set to 0 mean "ignore this bit." For example, if the network mask 255.255.255.0 is applied to the IP address 100.10.50.1, the network ID is 100.10.50, and the host ID is 1. *See also binary, IP address, subnet, "IP Addresses Explained" section*.

NIC Network Interface Card
An adapter card that plugs into your computer and provides the physical interface to your network cabling, which for Ethernet NICs is typically an RJ-45 connector. *See Ethernet, RJ-45.*

packet Data transmitted on a network consists of units called packets. Each packet contains a payload (the data), plus overhead information such as where it came from (source address) and where it should go (destination address).

ping Packet Internet (or Inter-Network) Groper
A program used to verify whether the host associated with an IP address is online. It can also be used to reveal the IP address for a given domain name.

port A physical access point to a device such as a computer or router, through which data flows into and out of the device.

PPP Point-to-Point Protocol
A protocol for serial data transmission that is used to carry IP (and other protocol) data between your ISP and your computer. The WAN interface on the OfficeConnect Gigabit VPN Firewall uses two forms of PPP called PPPoA and PPPoE. *See also PPPoA, PPPoE*.

PPPoE Point-to-Point Protocol over Ethernet
One of the two types of PPP interfaces you can define for a Virtual Circuit (VC), the other type being PPPoA. You can define one or more PPPoE interfaces per VC.

protocol A set of rules governing the transmission of data. In order for a data transmission to work, both ends of the connection have to follow the rules of the protocol.

remote In a physically separate location. For example, an employee away on travel who logs in to the company's intranet is a remote user.

RIP Routing Information Protocol
The original TCP/IP routing protocol. There are two versions of RIP: version I and version II.

RJ-45 Registered Jack Standard-45
The 8-pin plug used in transmitting data over phone lines. Ethernet cabling usually uses this type of connector.

routing Forwarding data between your network and the Internet on the most efficient route, based on the data's destination

IP address and current network conditions. A device that performs routing is called a router.

rule *See filtering rule, NAT rule*.

SDNS Secondary Domain Name System (server)
A DNS server that can be used if the primary DSN server is not available. *See DNS*.

SNMP Simple Network Management Protocol
The TCP/IP protocol used for network management.

subnet A subnet is a portion of a network. The subnet is distinguished from the larger network by a *subnet mask* which selects some of the computers of the network and excludes all others. The subnet's computers remain physically connected to the rest of the parent network, but they are treated as though they were on a separate network. *See also network mask*.

subnet mask A mask that defines a subnet. *See also network mask*.

TCP *See TCP/IP*.

TCP/IP Transmission Control Protocol/Internet Protocol
The basic protocols used on the Internet. TCP is responsible for dividing data up into packets for delivery and reassembling them at the destination, while IP is responsible for delivering the packets from source to destination. When TCP and IP are bundled with higher-level applications such as HTTP, FTP, Telnet, etc., TCP/IP refers to this whole suite of protocols.

Telnet An interactive, character-based program used to access a remote computer. While HTTP (the web protocol) and FTP only allow you to download files from a remote computer, Telnet allows you to log into and use a computer from a remote location.

TFTP Trivial File Transfer Protocol
A protocol for file transfers, TFTP is easier to use than File Transfer Protocol (FTP) but not as capable or secure.

TTL Time To Live
A field in an IP packet that limits the life span of that packet. Originally meant as a time duration, the TTL is usually represented instead as a maximum hop count; each router that receives a packet decrements this field by one. When the TTL reaches zero, the packet is discarded.

twisted pair The ordinary copper telephone wiring long used by telephone companies. It contains one or more wire pairs twisted together to reduce inductance and noise. Each telephone line uses one pair. In homes, it is most often installed with two pairs. For Ethernet LANs, a higher grade called Category 3 (CAT 3) is used for 10BASE-T networks, and an even higher grade called Category 5 (CAT 5) is used for 100BASE-T networks. *See also 10BASE-T, 100BASE-T, Ethernet*.

upstream The direction of data transmission from the user to the Internet.

WAN Wide Area Network .

Any network spread over a large geographical area, such as a country or continent. With respect to the OfficeConnect Gigabit VPN Firewall, WAN refers to the Internet.

Web browser A software program that uses Hyper-Text Transfer Protocol (HTTP) to download information from (and upload to) web sites, and displays the information, which may consist of text, graphic images, audio, or video, to the user. Web browsers use Hyper-Text Transfer Protocol (HTTP). Popular web browsers include Netscape Navigator and Microsoft Internet Explorer. *See also HTTP, web site, WWW*.

Web page A web site file typically containing text, graphics and hyperlinks (cross-references) to the other pages on that web site, as well as to pages on other web sites. When a user accesses a web site, the first page that is displayed is called the *home page*. *See also hyperlink, web site*.

Web site A computer on the Internet that distributes information to (and gets information from) remote users through web browsers. A web site typically consists of web pages that contain text, graphics, and hyperlinks. *See also hyperlink, web page*.

WWW World Wide Web

Also called *(the) Web.* Collective term for all web sites anywhere in the world that can be accessed via the Internet

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