



ZyWALL USG Series

Unified Security Gateway

Version 3.30
Edition 2, 9/2013

User's Guide

Default Login Details

LAN IP Address	http://192.168.1.1
User Name	admin
Password	1234

IMPORTANT!

READ CAREFULLY BEFORE USE.

KEEP THIS GUIDE FOR FUTURE REFERENCE.

Screenshots and graphics in this book may differ slightly from your product due to differences in your product firmware or your computer operating system. Every effort has been made to ensure that the information in this manual is accurate.

Related Documentation

- Quick Start Guide

The Quick Start Guide shows how to connect the ZyWALL and access the Web Configurator wizards. (See the wizard real time help for information on configuring each screen.) It also contains a connection diagram and package contents list.

- CLI Reference Guide

The CLI Reference Guide explains how to use the Command-Line Interface (CLI) to configure the ZyWALL.

Note: It is recommended you use the Web Configurator to configure the ZyWALL.

- Web Configurator Online Help

Click the help icon in any screen for help in configuring that screen and supplementary information.

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Introduction

1.1 Overview

This guide covers the ZyWALL USG series and refers to all models as “ZyWALL”. Features and interface names vary by model. Key feature differences between ZyWALL models are as follows. Other features are common to all models although features may vary slightly by model. See the specific product’s datasheet for detailed specifications.

Table 1 Model-Specific Features

FEATURE	ZYWALL USG
Application Patrol	50, 100, 100-PLUS, 200, 300, 1000, 2000
Anti-Virus	50, 100, 100-PLUS, 200, 300, 1000, 2000
Intrusion, Protection and Detection	50, 100, 100-PLUS, 200, 300, 1000, 2000
Two Ethernet WAN Ports	50, 100, 100-PLUS
Two Plus Ethernet WAN Ports	200, 300, 1000, 2000
WiFi (embedded or optional card)	20W, 300, 100, 200
Dual Personality Interfaces (1000Base-T/mini-GBIC combo ports)	2000
Dual Internal Buses for Gigabit Interfaces	2000
Rack-mounting	50, 100, 100-PLUS, 200, 300, 1000, 2000
Wall-mounting	20, 20W
Dual Power Modules	2000
Security Extender Module Slot	2000
Hard Disk Slot ^A	2000
Device High Availability	100, 200, 300, 1000, 2000
Auxiliary Port	100, 200, 300, 1000, 2000

A. Reserved for future use.

1.1.1 Key Applications

Here are some ZyWALL application scenarios. The following chapters have configuration tutorials.

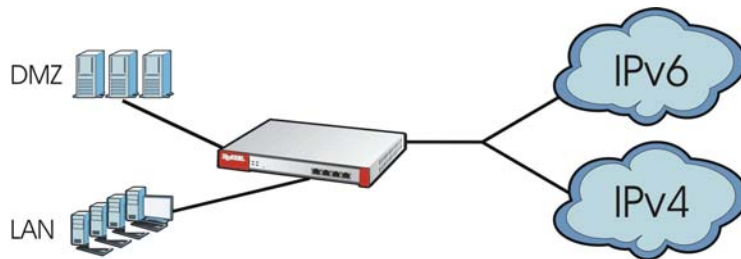
Security Router

Security features include a stateful inspection firewall, intrusion, detection & prevention, anomaly detection & prevention, content filtering, anti-virus, and anti-spam.

Figure 1 Applications: Security Router

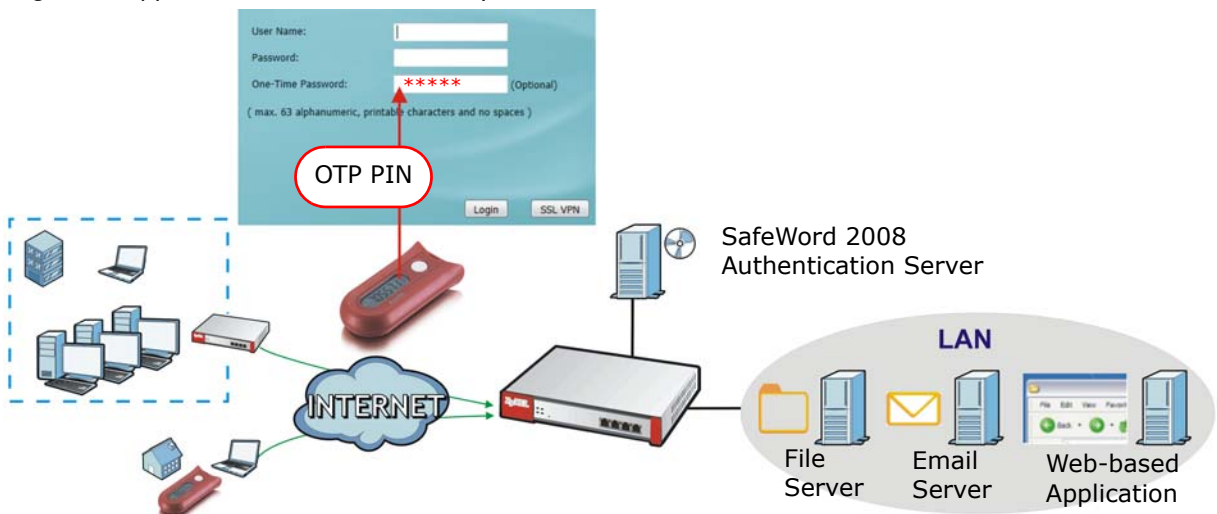
IPv6 Routing

The ZyWALL supports IPv6 Ethernet, PPP, VLAN, and bridge routing. You may also create IPv6 policy routes and IPv6 objects. The ZyWALL can also route IPv6 packets through IPv4 networks using different tunneling methods.

Figure 2 Applications: IPv6 Routing

VPN Connectivity

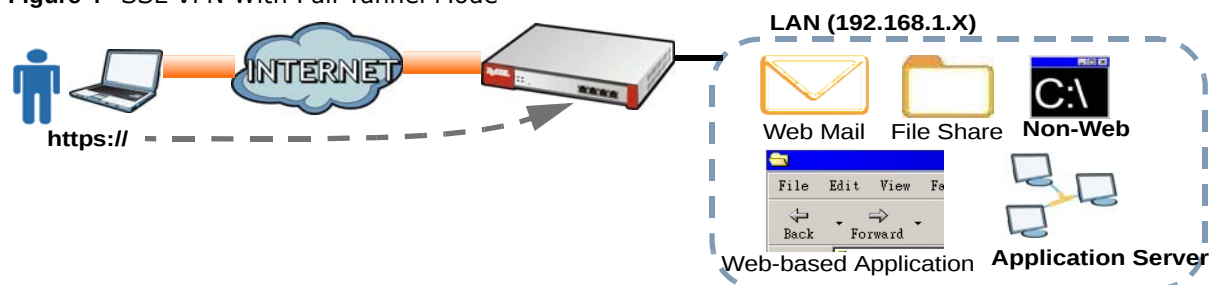
Set up VPN tunnels with other companies, branch offices, telecommuters, and business travelers to provide secure access to your network. You can also purchase the ZyWALL OTPv2 One-Time Password System for strong two-factor authentication for Web Configurator, Web access, SSL VPN, and ZyXEL IPSec VPN client user logins.

Figure 3 Applications: VPN Connectivity

SSL VPN Network Access

SSL VPN lets remote users use their web browsers for a very easy-to-use VPN solution. A user just browses to the ZyWALL's web address and enters his user name and password to securely connect to the ZyWALL's network. Here full tunnel mode creates a virtual connection for a remote user and gives him a private IP address in the same subnet as the local network so he can access network resources in the same way as if he were part of the internal network.

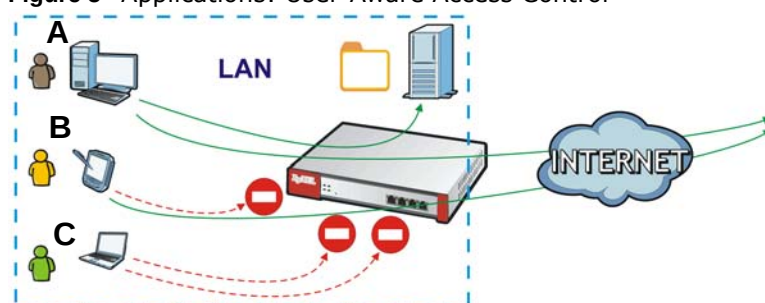
Figure 4 SSL VPN With Full Tunnel Mode



User-Aware Access Control

Set up security policies to restrict access to sensitive information and shared resources based on the user who is trying to access it. In the following figure user **A** can access both the Internet and an internal file server. User **B** has a lower level of access and can only access the Internet. User **C** is not even logged in and cannot access either.

Figure 5 Applications: User-Aware Access Control



Load Balancing

Set up multiple connections to the Internet on the same port, or different ports, including cellular interfaces. In either case, you can balance the traffic loads between them.

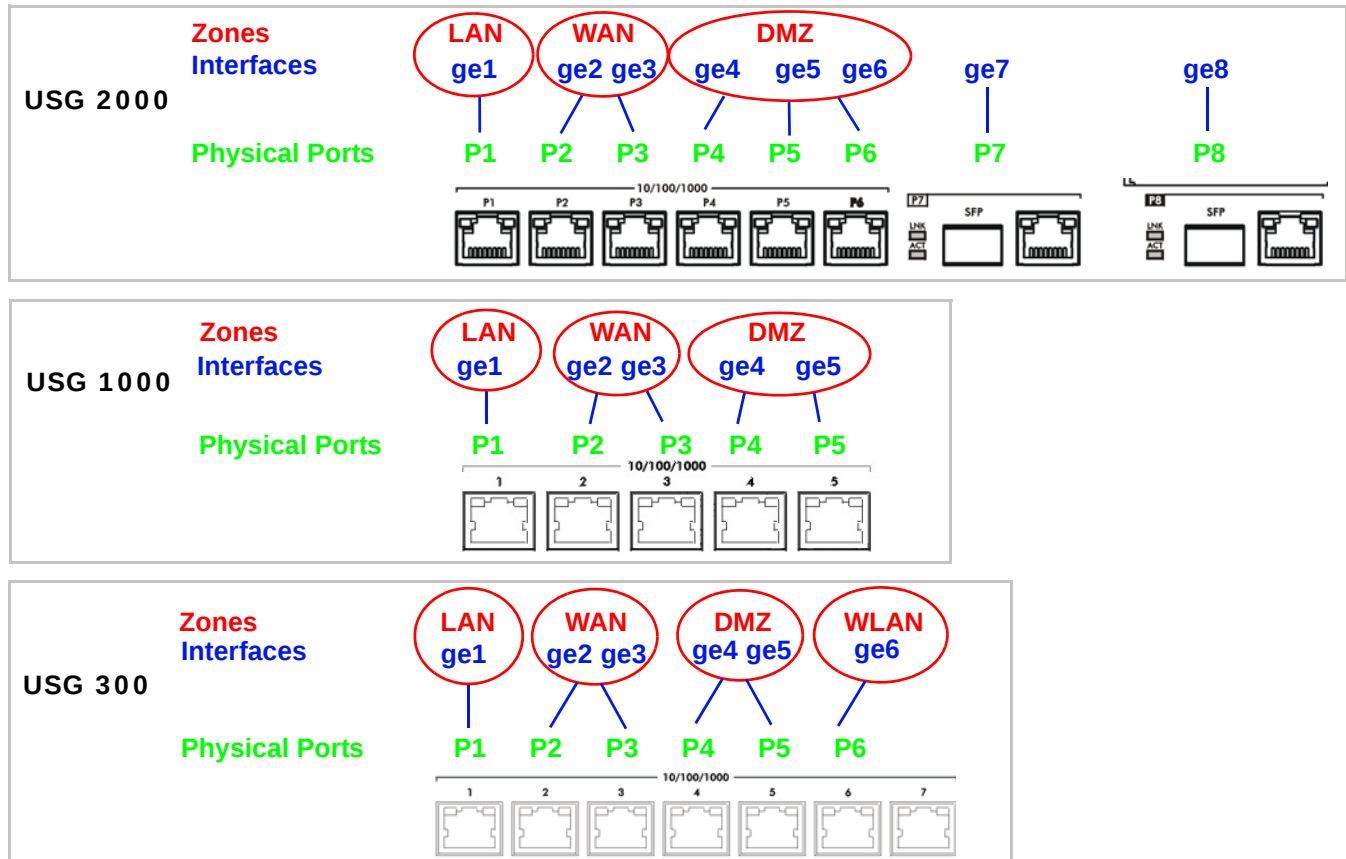
Figure 6 Applications: Multiple WAN Interfaces



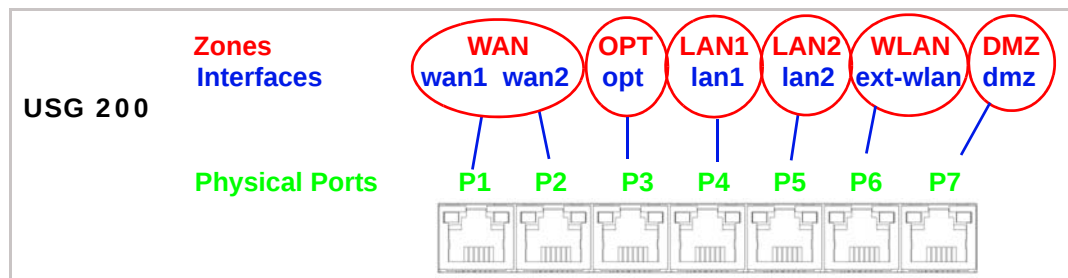
1.2 Default Zones, Interfaces, and Ports

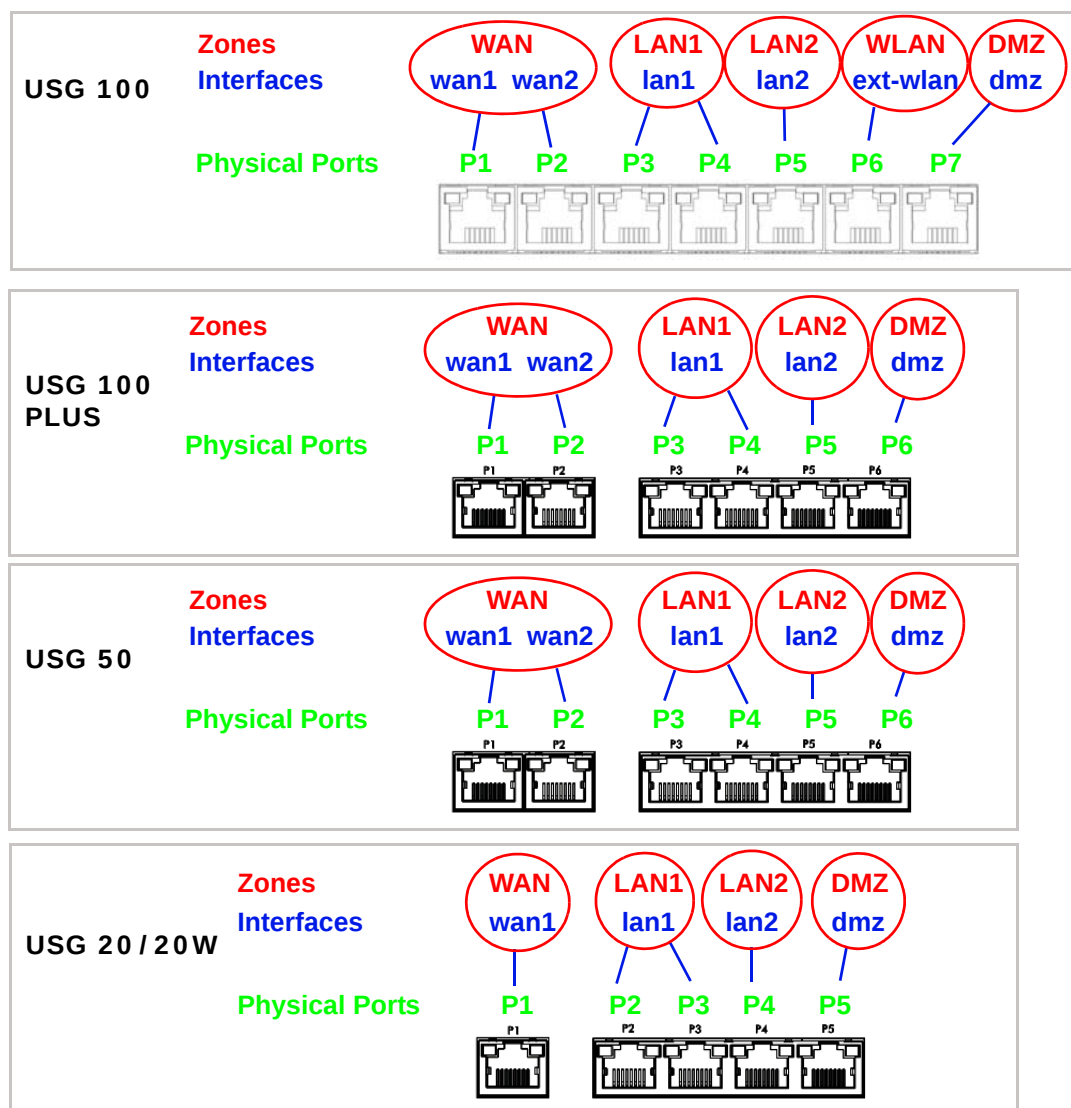
The default configurations for zones, interfaces, and ports are as follows. References to interfaces may be generic rather than the specific name used in your model. For example, this guide may use “the WAN interface” rather than “ge2” or “ge3”.

Figure 7 Zones, Interfaces, and Physical Ethernet Ports



Configure the ZyWALL USG 200's OPT (optional) Gigabit Ethernet port as a third WAN port, an additional LAN1, WLAN, or DMZ port or a separate network.





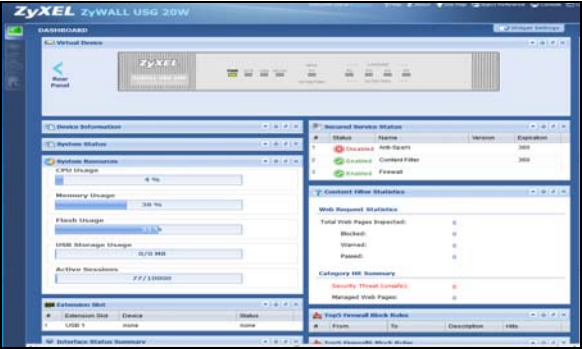
1.3 Management Overview

You can manage the ZyWALL in the following ways.

Web Configurator

The Web Configurator allows easy ZyWALL setup and management using an Internet browser. This User's Guide provides information about the Web Configurator.

Figure 8 Managing the ZyWALL: Web Configurator



Command-Line Interface (CLI)

The CLI allows you to use text-based commands to configure the ZyWALL. Access it using remote management (for example, SSH or Telnet) or via the physical or Web Configurator console port. See the Command Reference Guide for CLI details. The default settings for the console port are:

Table 2 Console Port Default Settings

SETTING	VALUE
Speed	115200 bps
Data Bits	8
Parity	None
Stop Bit	1
Flow Control	Off

Vantage CNM

The browser-based Vantage CNM (Centralized Network Management) global management tool lets administrators to manage multiple devices. Use the **System > Vantage CNM** screen to allow your ZyWALL to be managed by the Vantage CNM server. See the Vantage CNM User's Guide for details.

1.4 Web Configurator

In order to use the Web Configurator, you must:

- Use one of the following web browser versions or later: Internet Explorer 7, Firefox 3.5, Chrome 9.0, Opera 10.0, Safari 4.0
- Allow pop-up windows (blocked by default in Windows XP Service Pack 2)
- Enable JavaScripts, Java permissions, and cookies

The recommended screen resolution is 1024 x 768 pixels.

1.4.1 Web Configurator Access

- 1 Make sure your ZyWALL hardware is properly connected. See the Quick Start Guide.

- In your browser go to <http://192.168.1.1>. By default, the ZyWALL automatically routes this request to its HTTPS server, and it is recommended to keep this setting. The **Login** screen appears.

User Name:

Password:

One-Time Password: (Optional)

(max. 63 alphanumeric, printable characters and no spaces)

- Type the user name (default: "admin") and password (default: "1234").
If you have a OTP (One-Time Password) token generate a number and enter it in the **One-Time Password** field. The number is only good for one login. You must use the token to generate a new number the next time you log in.
- Click **Login**. If you logged in using the default user name and password, the **Update Admin Info** screen appears. Otherwise, the dashboard appears.
- The **Network Risk Warning** screen displays any unregistered or disabled security services. Select how often to display the screen and click **OK**.

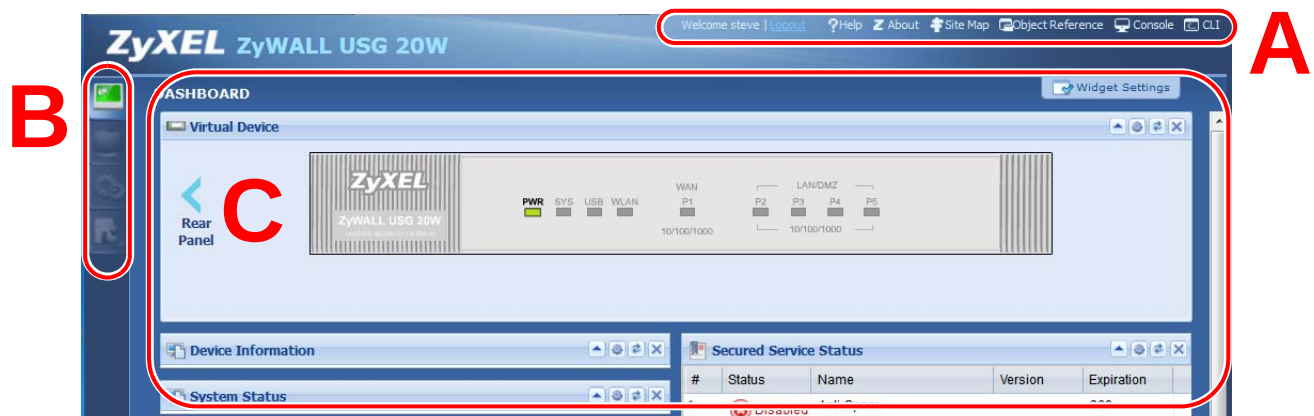
Network Risk Warning

Your network has potential security risk due to following malware protection features disabled or unlicensed. To provide continuous security protection of your network, please activate license and features listed below.

Service	Status
Anti-Spam	Disabled
Content Filter	Disabled

Please remind me:

- Follow the directions in the **Update Admin Info** screen. If you change the default password, the **Login** screen appears after you click **Apply**. If you click **Ignore**, the **Installation Setup Wizard** opens if the ZyWALL is using its default configuration; otherwise the dashboard appears.



1.4.2 Web Configurator Screens Overview

The Web Configurator screen is divided into these parts (as illustrated on [page 11](#)):

- **A** - title bar
- **B** - navigation panel
- **C** - main window

Title Bar

Figure 9 Title Bar



The title bar icons in the upper right corner provide the following functions.

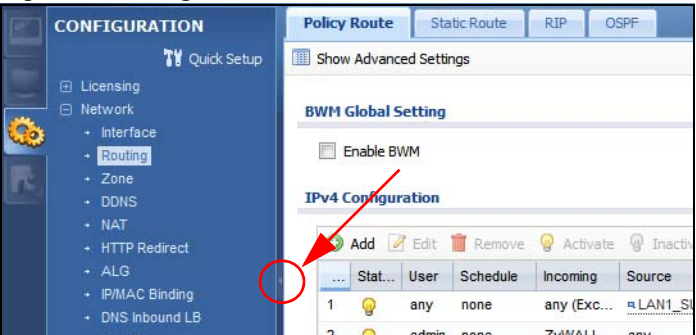
Table 3 Title Bar: Web Configurator Icons

LABEL	DESCRIPTION
Logout	Click this to log out of the Web Configurator.
Help	Click this to open the help page for the current screen.
About	Click this to display basic information about the ZyWALL.
Site Map	Click this to see an overview of links to the Web Configurator screens.
Object Reference	Click this to check which configuration items reference an object.
Console	Click this to open a Java-based console window from which you can run command line interface (CLI) commands. You will be prompted to enter your user name and password. See the Command Reference Guide for information about the commands.
CLI	Click this to open a popup window that displays the CLI commands sent by the Web Configurator to the ZyWALL.

1.4.3 Navigation Panel

Use the navigation panel menu items to open status and configuration screens. Click the arrow in the middle of the right edge of the navigation panel to hide the panel or drag to resize it. The following sections introduce the ZyWALL’s navigation panel menus and their screens.

Figure 10 Navigation Panel



Dashboard

The dashboard displays general device information, system status, system resource usage, licensed service status, and interface status in widgets that you can re-arrange to suit your needs. See the Web Help for details on the dashboard.

Monitor Menu

The monitor menu screens display status and statistics information.

Table 4 Monitor Menu Screens Summary

FOLDER OR LINK	TAB	FUNCTION
System Status		
Port Statistics		Displays packet statistics for each physical port.
Interface Status		Displays general interface information and packet statistics.
Traffic Statistics		Collect and display traffic statistics.
Session Monitor		Displays the status of all current sessions.
DDNS Status		Displays the status of the ZyWALL's DDNS domain names.
IP/MAC Binding		Lists the devices that have received an IP address from ZyWALL interfaces using IP/MAC binding.
Login Users		Lists the users currently logged into the ZyWALL.
WLAN Status		Displays the connection status of the ZyWALL's wireless clients.
Cellular Status		Displays details about the ZyWALL's 3G connection status.
USB Storage		Displays details about USB device connected to the ZyWALL.
AppPatrol Statistics		Displays bandwidth and protocol statistics.
VPN Monitor		
IPSec		Displays and manages the active IPSec SAs.
SSL		Lists users currently logged into the VPN SSL client portal. You can also log out individual users and delete related session information.
L2TP over IPSec		Displays details about current L2TP sessions.
Anti-X Statistics		
Anti-Virus		Collect and display statistics on the viruses that the ZyWALL has detected.
IDP		Collect and display statistics on the intrusions that the ZyWALL has detected.
Content Filter	Report	Collect and display content filter statistics
	Cache	Manage the ZyWALL's URL cache.
Anti-Spam	Report	Collect and display spam statistics.
	Status	Displays how many mail sessions the ZyWALL is currently checking and DNSBL (Domain Name Service-based spam Black List) statistics.
Log		Lists log entries.

Configuration Menu

Use the configuration menu screens to configure the ZyWALL's features.

Table 5 Configuration Menu Screens Summary

FOLDER OR LINK	TAB	FUNCTION
Quick Setup		Quickly configure WAN interfaces or VPN connections.
Licensing		
Registration	Registration	Register the device and activate trial services.
	Service	View the licensed service status and upgrade licensed services.
Signature Update	Anti-Virus	Update anti-virus signatures immediately or by a schedule.
	IDP/AppPatrol	Update IDP signatures immediately or by a schedule.
	System Protect	View system-protect signatures status.
Network		
Interface	Port Grouping	Configure physical port groups.
	Port Role	Use this screen to set the ZyWALL's flexible ports as LAN1, WLAN, or DMZ.
	Ethernet	Manage Ethernet interfaces and virtual Ethernet interfaces.
	PPP	Create and manage PPPoE and PPTP interfaces.
	Cellular	Configure a cellular Internet connection for an installed 3G card.
	Tunnel	Configure tunneling between IPv4 and IPv6 networks.
	WLAN	Configure settings for an installed wireless LAN card.
	VLAN	Create and manage VLAN interfaces and virtual VLAN interfaces.
	Bridge	Create and manage bridges and virtual bridge interfaces.
	Auxiliary	Manage the AUX port.
	Trunk	Create and manage trunks (groups of interfaces) for load balancing and link High Availability (HA).
Routing	Policy Route	Create and manage routing policies.
	Static Route	Create and manage IP static routing information.
	RIP	Configure device-level RIP settings.
	OSPF	Configure device-level OSPF settings, including areas and virtual links.
Zone		Configure zones used to define various policies.
DDNS	Profile	Define and manage the ZyWALL's DDNS domain names.
NAT		Set up and manage port forwarding rules.
HTTP Redirect		Set up and manage HTTP redirection rules.
ALG		Configure SIP, H.323, and FTP pass-through settings.
IP/MAC Binding	Summary	Configure IP to MAC address bindings for devices connected to each supported interface.
	Exempt List	Configure ranges of IP addresses to which the ZyWALL does not apply IP/MAC binding.
DNS Inbound LB	DNS Load Balancing	Configure DNS Load Balancing.
Auth. Policy		Define rules to force user authentication.
Firewall	Firewall	Create and manage level-3 traffic rules.
	Session Limit	Limit the number of concurrent client NAT/firewall sessions.

Table 5 Configuration Menu Screens Summary (continued)

FOLDER OR LINK	TAB	FUNCTION
VPN		
IPSec VPN	VPN Connection	Configure IPSec tunnels.
	VPN Gateway	Configure IKE tunnels.
	Concentrator	Combine IPSec VPN connections into a single secure network
	Configuration Provisioning	Set who can retrieve VPN rule settings from the ZyWALL using the ZyWALL IPSec VPN Client.
SSL VPN	Access Privilege	Configure SSL VPN access rights for users and groups.
	Global Setting	Configure the ZyWALL's SSL VPN settings that apply to all connections.
L2TP VPN	L2TP VPN	Configure L2TP over IPSec tunnels.
AppPatrol	General	Enable or disable traffic management by application and see registration and signature information.
	Query	Manage traffic management by application.
	Other	Manage other kinds of traffic.
BWM	BWM	Enable and configure bandwidth management rules.
Anti-X		
Anti-Virus	General	Turn anti-virus on or off, set up anti-virus policies and check the anti-virus engine type and the anti-virus license and signature status.
	Black/White List	Set up anti-virus black (blocked) and white (allowed) lists of virus file patterns.
	Signature	Search for signatures by signature name or attributes and configure how the ZyWALL uses them.
IDP	General	Display and manage IDP bindings.
	Profile	Create and manage IDP profiles.
	Custom Signatures	Create, import, or export custom signatures.
ADP	General	Display and manage ADP bindings.
	Profile	Create and manage ADP profiles.
Content Filter	General	Create and manage content filter policies.
	Filter Profile	Create and manage the detailed filtering rules for content filtering policies.
	Trusted Web Sites	Create a list of allowed web sites that bypass content filtering policies.
	Forbidden Web Sites	Create a list of web sites to block regardless of content filtering policies.
Anti-Spam	General	Turn anti-spam on or off and manage anti-spam policies.
	Mail Scan	Configure e-mail scanning details.
	Black/White List	Set up a black list to identify spam and a white list to identify legitimate e-mail.
	DNSBL	Have the ZyWALL check e-mail against DNS Black Lists.

Table 5 Configuration Menu Screens Summary (continued)

FOLDER OR LINK	TAB	FUNCTION
Device HA	General	Configure device HA global settings, and see the status of each interface monitored by device HA.
	Active-Passive Mode	Configure active-passive mode device HA.
	Legacy Mode	Configure legacy mode device HA for use with ZyWALLs that already have device HA setup using a firmware version earlier than 2.10.
Object		
User/Group	User	Create and manage users.
	Group	Create and manage groups of users.
	Setting	Manage default settings for all users, general settings for user sessions, and rules to force user authentication.
Address	Address	Create and manage host, range, and network (subnet) addresses.
	Address Group	Create and manage groups of addresses.
Service	Service	Create and manage TCP and UDP services.
	Service Group	Create and manage groups of services.
Schedule	Schedule	Create one-time and recurring schedules.
AAA Server	Active Directory	Configure the Active Directory settings.
	LDAP	Configure the LDAP settings.
	RADIUS	Configure the RADIUS settings.
Auth. Method	Authentication Method	Create and manage ways of authenticating users.
Certificate	My Certificates	Create and manage the ZyWALL's certificates.
	Trusted Certificates	Import and manage certificates from trusted sources.
ISP Account	ISP Account	Create and manage ISP account information for PPPoE/PPTP interfaces.
SSL Application		Create SSL web application objects.
Endpoint Security		Create Endpoint Security (EPS) objects.
DHCPv6	Request	Configure IPv6 DHCP request type and interface information.
	Lease	Configure IPv6 DHCP lease type and interface information.
System		
Host Name		Configure the system and domain name for the ZyWALL.
USB Storage	Settings	Configure the settings for the connected USB devices.
Date/Time		Configure the current date, time, and time zone in the ZyWALL.
Console Speed		Set the console speed.
DNS		Configure the DNS server and address records for the ZyWALL.
WWW	Service Control	Configure HTTP, HTTPS, and general authentication.
	Login Page	Configure how the login and access user screens look.
SSH		Configure SSH server and SSH service settings.
TELNET		Configure telnet server settings for the ZyWALL.
FTP		Configure FTP server settings.
SNMP		Configure SNMP communities and services.

Table 5 Configuration Menu Screens Summary (continued)

FOLDER OR LINK	TAB	FUNCTION
Dial-in Mgmt.		Configure settings for an out of band management connection through a modem connected to the AUX port.
Vantage CNM		Configure and allow your ZyWALL to be managed by the Vantage CNM server.
Language		Select the Web Configurator language.
IPv6		Enable IPv6 globally on the ZyWALL here.
Log & Report		
Email Daily Report		Configure where and how to send daily reports and what reports to send.
Log Setting		Configure the system log, e-mail logs, and remote syslog servers.

Maintenance Menu

Use the maintenance menu screens to manage configuration and firmware files, run diagnostics, and reboot or shut down the ZyWALL.

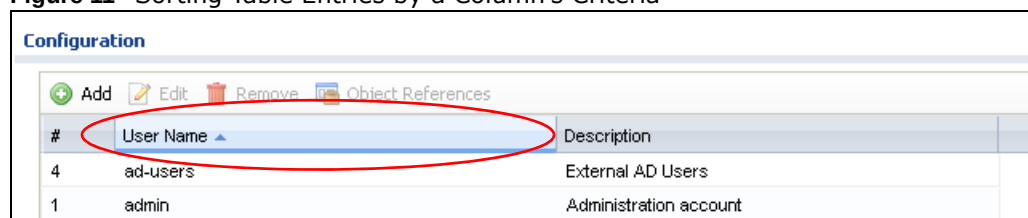
Table 6 Maintenance Menu Screens Summary

FOLDER OR LINK	TAB	FUNCTION
File Manager	Configuration File	Manage and upload configuration files for the ZyWALL.
	Firmware Package	View the current firmware version and to upload firmware.
	Shell Script	Manage and run shell script files for the ZyWALL.
Diagnostics	Diagnostic	Collect diagnostic information.
	Packet Capture	Capture packets for analysis.
	System Log	Connect a USB device to the ZyWALL and archive the ZyWALL system logs to it here.
Packet Flow Explore	Routing Status	Check how the ZyWALL determines where to route a packet.
	SNAT Status	View a clear picture on how the ZyWALL converts a packet's source IP address and check the related settings.
Reboot		Restart the ZyWALL.
Shutdown		Turn off the ZyWALL.

1.4.4 Tables and Lists

Web Configurator tables and lists are flexible with several options for how to display their entries.

Click a column heading to sort the table's entries according to that column's criteria.

Figure 11 Sorting Table Entries by a Column's Criteria


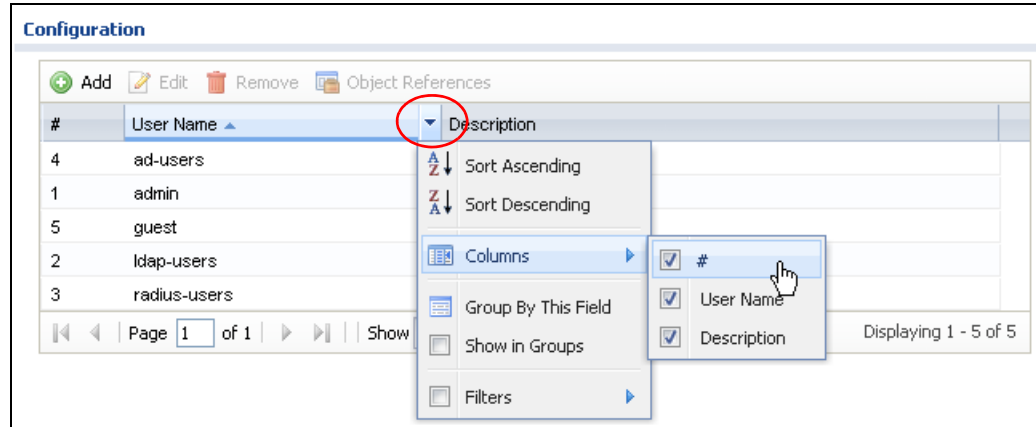
The screenshot shows the 'Configuration' page with a table of users. The table has two columns: '# User Name' and 'Description'. The 'User Name' column header is highlighted with a red oval. Below the header, there are two rows of data: '4 ad-users' with description 'External AD Users' and '1 admin' with description 'Administration account'.

#	User Name	Description
4	ad-users	External AD Users
1	admin	Administration account

Click the down arrow next to a column heading for more options about how to display the entries. The options available vary depending on the type of fields in the column. Here are some examples of what you can do:

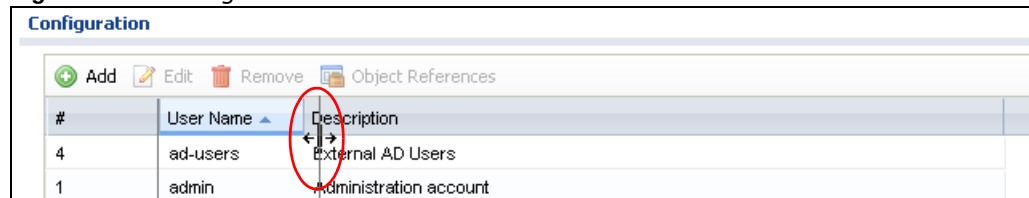
- Sort in ascending or descending (reverse) alphabetical order
- Select which columns to display
- Group entries by field
- Show entries in groups
- Filter by mathematical operators (<, >, or =) or searching for text

Figure 12 Common Table Column Options



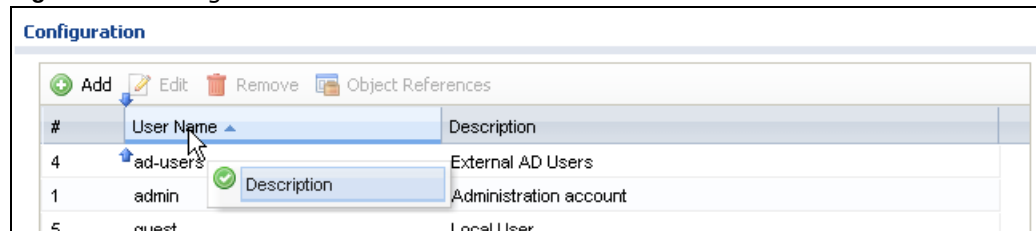
Select a column heading cell's right border and drag to re-size the column.

Figure 13 Resizing a Table Column

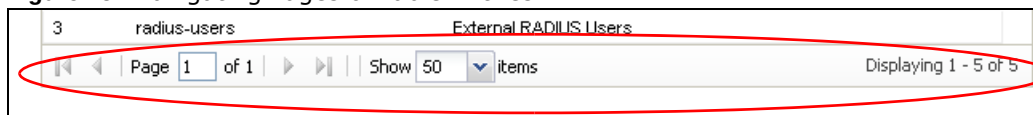


Select a column heading and drag and drop it to change the column order. A green check mark displays next to the column's title when you drag the column to a valid new location.

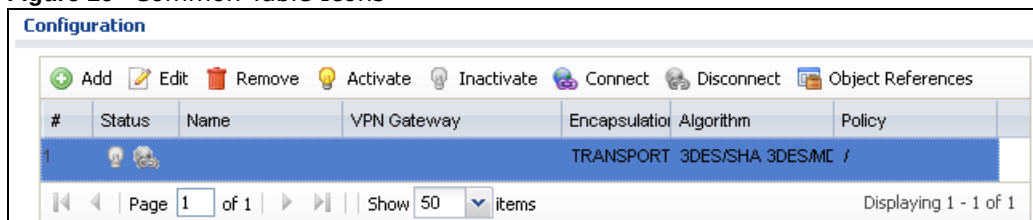
Figure 14 Moving Columns



Use the icons and fields at the bottom of the table to navigate to different pages of entries and control how many entries display at a time.

Figure 15 Navigating Pages of Table Entries

The tables have icons for working with table entries. You can often use the [Shift] or [Ctrl] key to select multiple entries to remove, activate, or deactivate.

Figure 16 Common Table Icons

Here are descriptions for the most common table icons.

Table 7 Common Table Icons

LABEL	DESCRIPTION
Add	Click this to create a new entry. For features where the entry's position in the numbered list is important (features where the ZyWALL applies the table's entries in order like the firewall for example), you can select an entry and click Add to create a new entry after the selected entry.
Edit	Double-click an entry or select it and click Edit to open a screen where you can modify the entry's settings. In some tables you can just click a table entry and edit it directly in the table. For those types of tables small red triangles display for table entries with changes that you have not yet applied.
Remove	To remove an entry, select it and click Remove . The ZyWALL confirms you want to remove it before doing so.
Activate	To turn on an entry, select it and click Activate .
Inactivate	To turn off an entry, select it and click Inactivate .
Connect	To connect an entry, select it and click Connect .
Disconnect	To disconnect an entry, select it and click Disconnect .
Object References	Select an entry and click Object References to check which settings use the entry.
Move	To change an entry's position in a numbered list, select it and click Move to display a field to type a number for where you want to put that entry and press [ENTER] to move the entry to the number that you typed. For example, if you type 6, the entry you are moving becomes number 6 and the previous entry 6 (if there is one) gets pushed up (or down) one.

Working with Lists

When a list of available entries displays next to a list of selected entries, you can often just double-click an entry to move it from one list to the other. In some lists you can also use the [Shift] or [Ctrl] key to select multiple entries, and then use the arrow button to move them to the other list.

Figure 17 Working with Lists

1.5 Stopping the ZyWALL

Always use **Maintenance > Shutdown > Shutdown** or the `shutdown` command before you turn off the ZyWALL or remove the power. Not doing so can cause the firmware to become corrupt.

1.6 Rack-mounting

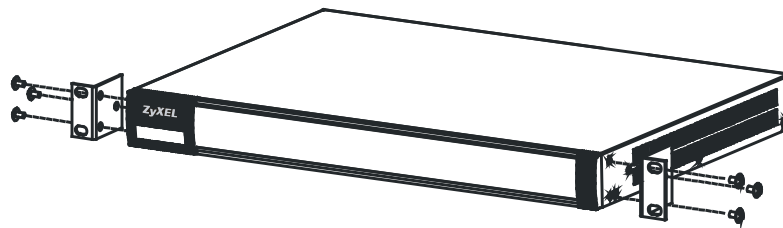
See [Table 1 on page 5](#) for the ZyWALL USG models that can be rack mounted. Use the following steps to mount the ZyWALL on an EIA standard size, 19-inch rack or in a wiring closet with other equipment using a rack-mounting kit. Make sure the rack will safely support the combined weight of all the equipment it contains and that the position of the ZyWALL does not make the rack unstable or top-heavy. Take all necessary precautions to anchor the rack securely before installing the unit.

Note: Leave 10 cm of clearance at the sides and 20 cm in the rear.

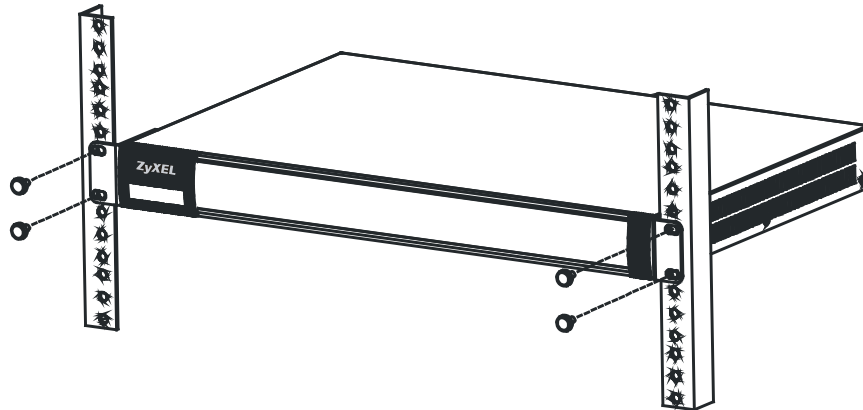
Use a #2 Phillips screwdriver to install the screws.

Note: Failure to use the proper screws may damage the unit.

- 1 Align one bracket with the holes on one side of the ZyWALL and secure it with the included bracket screws (smaller than the rack-mounting screws).
- 2 Attach the other bracket in a similar fashion.



- 3 After attaching both mounting brackets, position the ZyWALL in the rack and up the bracket holes with the rack holes. Secure the ZyWALL to the rack with the rack-mounting screws.



1.7 Wall-mounting

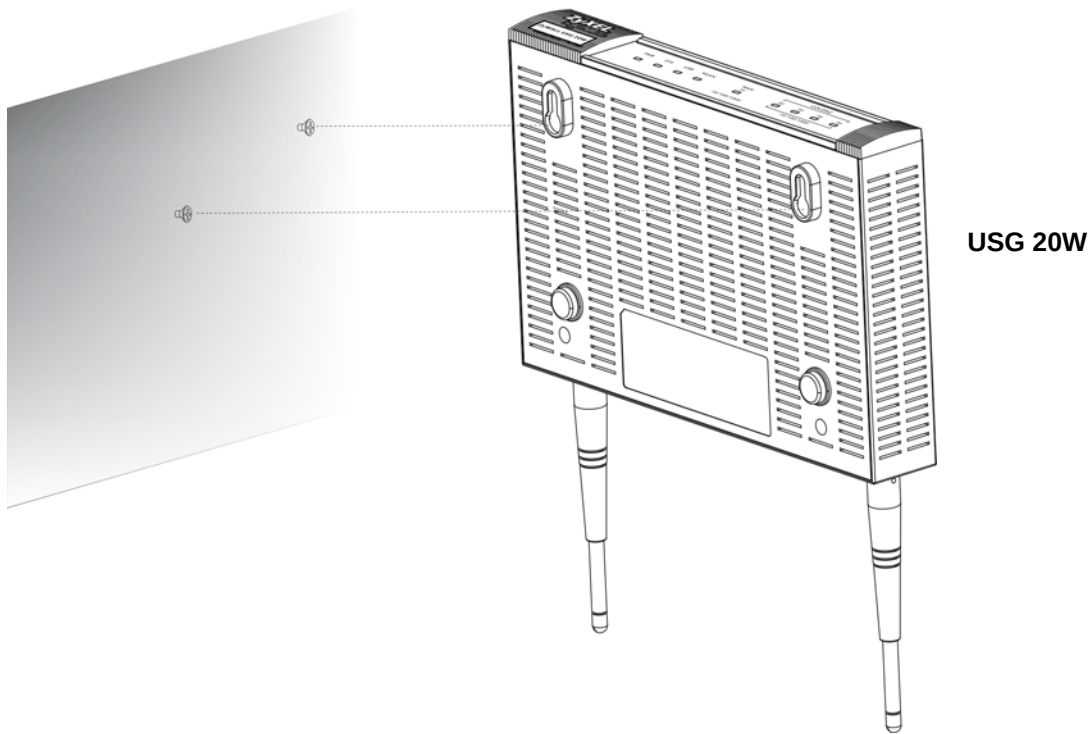
See [Table 1 on page 5](#) for the ZyWALL USG models that can be wall-mounted. Do the following to attach your ZyWALL to a wall.

- 1 Screw two screws with 6 mm ~ 8 mm (0.24" ~ 0.31") wide heads into the wall 150 mm apart (see the figure in step 2). Do not screw the screws all the way in to the wall; leave a small gap between the head of the screw and the wall.

The gap must be big enough for the screw heads to slide into the screw slots and the connection cables to run down the back of the ZyWALL.

Note: Make sure the screws are securely fixed to the wall and strong enough to hold the weight of the ZyWALL with the connection cables.

- 2 Use the holes on the bottom of the ZyWALL to hang the ZyWALL on the screws.

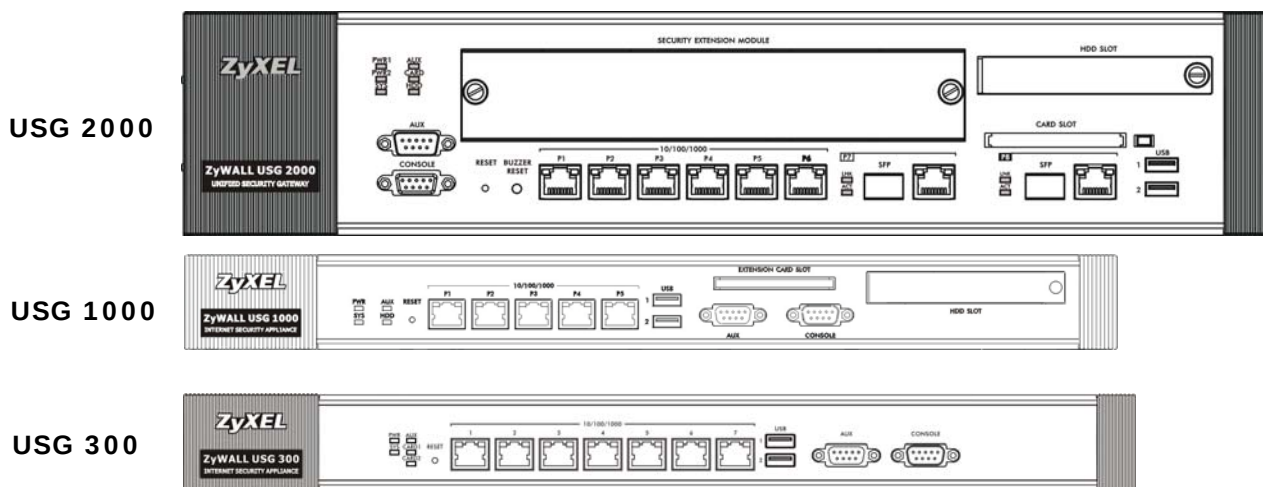


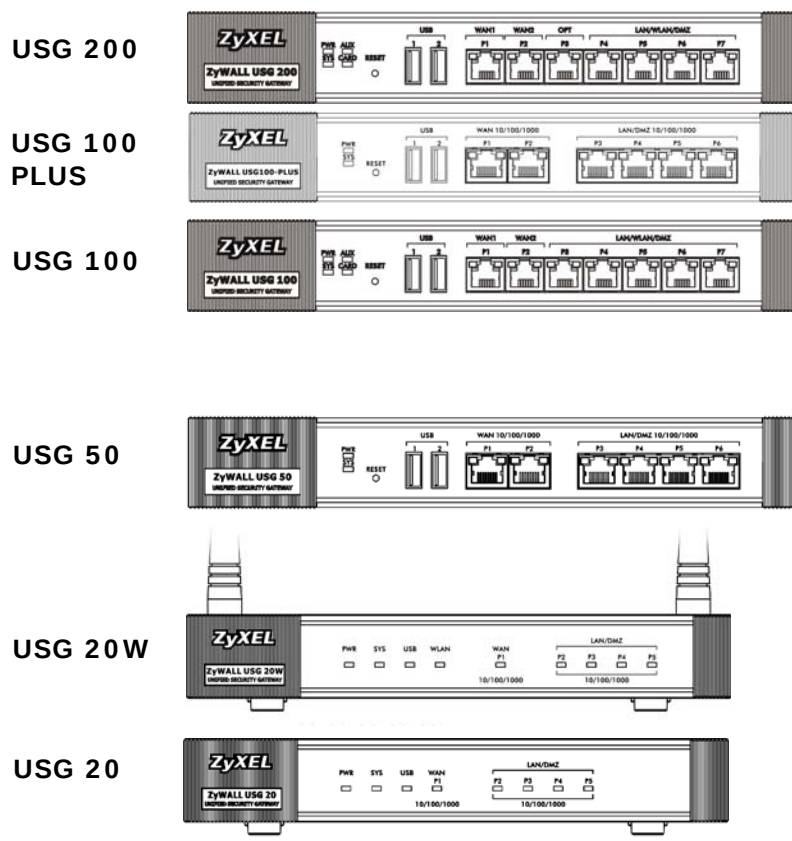
Wall-mount the ZyWALL horizontally. The ZyWALL's side panels with ventilation slots should not be facing up or down as this position is less safe.

1.8 Front Panel

This section introduces the ZyWALL's front panel.

Figure 18 ZyWALL Front Panel





1.8.1 Dual Personality Interfaces

A dual personality interface is a 1000Base-T/mini-GBIC combo port. For each interface you can connect either to the 1000Base-T port or the mini-GBIC port. The mini-GBIC port has priority over the 1000Base-T port so the 1000Base-T port is disabled if both are connected at the same time.

1000Base-T Ports

The 1000Base-T auto-negotiating, auto-crossover Ethernet ports support 100/1000 Mbps Gigabit Ethernet so the speed can be 100 Mbps or 1000 Mbps. The duplex mode is full at 1000 Mbps and half or full at 100 Mbps. An auto-negotiating port can detect and adjust to the optimum Ethernet speed (100/1000 Mbps) and duplex mode (full duplex or half duplex) of the connected device. An auto-crossover (auto-MDI/MDI-X) port automatically works with a straight-through or crossover Ethernet cable. The factory default negotiation settings for the Ethernet ports on the ZyWALL are speed: auto, duplex: auto, and flow control: on (you cannot configure the flow control setting, but the ZyWALL can negotiate with the peer and turn it off if needed)

Mini-GBIC Slots

These are slots for Small Form-Factor Pluggable (SFP) transceivers (not included). A transceiver is a single unit that houses a transmitter and a receiver. Use a transceiver to connect a fiber-optic cable to the ZyWALL. Use transceivers that comply with the Small Form-Factor Pluggable (SFP) Transceiver MultiSource Agreement (MSA). See the SFF committee's INF-8074i specification Rev

1.0 for details. You can change transceivers while the ZyWALL is operating. You can use different transceivers to connect to devices with different types of fiber-optic connectors.

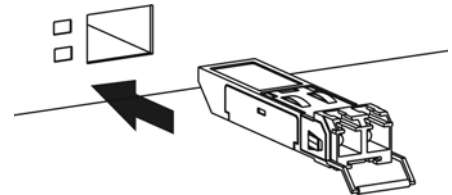
- Type: SFP connection interface
- Connection speed: 1 Gigabit per second (Gbps)

To avoid possible eye injury, do not look into an operating fiber-optic module's connectors or fiber-optic cable.

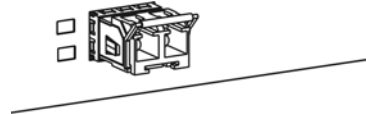
Transceiver and Fiber-optic Cable Installation

Use the following steps to install a mini GBIC transceiver (SFP module).

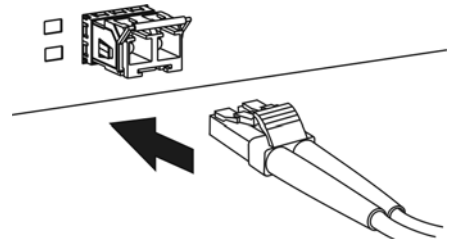
- 1 Insert the transceiver into the slot with the exposed section of PCB board facing down.



- 2 Press the transceiver firmly until it clicks into place.



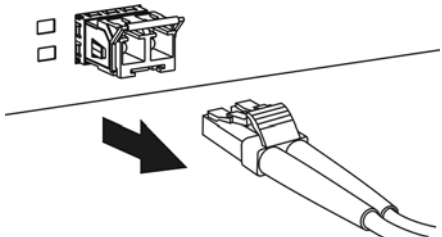
- 3 Push the end of the fiber-optic cable firmly into the transceiver until it locks into place. When the other end of the fiber-optic cable is connected, check the LEDs to verify the link status.



Fiber-optic Cable and Transceiver Removal

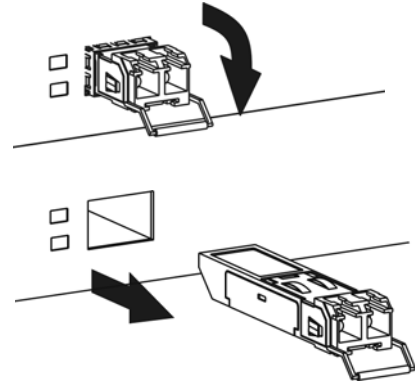
Use the following steps to remove a mini GBIC transceiver (SFP module).

- 1 Press down on the top of the fiber-optic cable where it connects to the transceiver to release it. Then pull the fiber-optic cable out.



- 2 Open the transceiver's latch (latch styles vary).

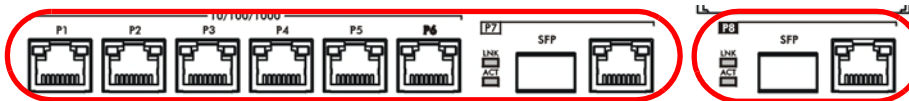
- 3 Pull the transceiver out of the slot.



1.8.2 Maximizing Throughput

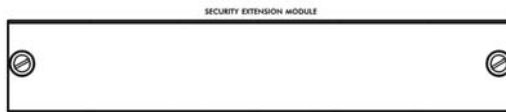
A ZyWALL USG with dual internal buses (see [Table 1 on page 5](#)) for Gigabit interfaces has one internal bus for ports **P1-P7** and another for port **P8**. To maximize the ZyWALL's throughput, use **P8** for your connection with the most traffic.

Figure 19 Gigabit Interfaces and Internal Buses



Some ZyWALLs (see [Table 1 on page 5](#)) let you add an optional Security Extension Module (SEM) to enhance the VPN or VPN and Unified Threat Management (UTM) capabilities.

Figure 20 Security Extension Module



- The VPN module (SEM-VPN) increases the maximum VPN throughput from 100 Mbps to 500 Mbps, the maximum number of IPSec VPN tunnels from 1,000 to 2,000 and the maximum number of SSL VPN users from 250 (with a license) to 750 (with a license).
- The SEM-DUAL module provides the VPN performance enhancements and increases the maximum anti-virus and IDP traffic throughput from 100 Mbps to 400 Mbps.

1.8.3 Front Panel LEDs

The following tables describe the LEDs.

Table 8 ZyWALL USG 20 ~ USG 1000 Front Panel LEDs

LED	COLOR	STATUS	DESCRIPTION
PWR		Off	The ZyWALL is turned off.
	Green	On	The ZyWALL is turned on.
	Red	On	There is a hardware component failure. Shut down the device, wait for a few minutes and then restart the device (see Section 1.5 on page 20). If the LED turns red again, then please contact your vendor.

Table 8 ZyWALL USG 20 ~ USG 1000 Front Panel LEDs (continued)

LED	COLOR	STATUS	DESCRIPTION
SYS	Green	Off	The ZyWALL is not ready or has failed.
		On	The ZyWALL is ready and running.
		Blinking	The ZyWALL is booting.
	Red	On	The ZyWALL had an error or has failed.
AUX	Green	Off	The AUX port is not connected.
		Flashing	The AUX port is sending or receiving packets.
		On	The AUX port is connected.
1, 2 ...	Green	Off	There is no traffic on this port.
		Blinking	The ZyWALL is sending or receiving packets on this port.
	Orange	Off	There is no connection on this port.
		On	This port has a successful link.
USB	Green	Off	No device is connected to the ZyWALL's USB port or the connected device is not supported by the ZyWALL.
		On	A 3G USB card or USB storage device is connected to the USB port.
	Orange	On	Connected to a 3G network through the connected 3G USB card.
WLAN	Green	Off	The wireless function is disabled on the ZyWALL.
		On	The wireless function is enabled on the ZyWALL.
P1~P5	Green	Off	There is no traffic on this port.
		Blinking	The ZyWALL is sending or receiving packets on this port.
	Orange	Off	There is no connection on this port.
		On	This port has a successful link.
Card1,2	Green	Off	There is no card in the slot.
		On	There is a card in the slot.
		Flashing	The card in the slot is sending or receiving traffic.

Table 9 ZyWALL USG 2000 Front Panel LEDs

LED	COLOR	STATUS	DESCRIPTION
PWR1, PWR2		Off	Both power modules are turned off, not receiving power, or not functioning.
	Green	On	The power module is operating.
	Red	On	The power module has malfunctioned. Turn the power module off, wait a few minutes, and turn the power module back on (see Section 1.5 on page 20). If the LED shines red again, then please contact your vendor.
SYS		Off	The ZyWALL is turned off.
	Green	On	The ZyWALL is ready and operating normally.
		Flashing	The ZyWALL is self-testing.
	Red	On	The ZyWALL is malfunctioning.
AUX		Off	The AUX port is not connected.
	Orange	On	The AUX port has a dial-in management connection.
		Flashing	The AUX port is sending or receiving packets for the dial-in management connection.
	Green	On	The AUX port has a dial backup connection.
		Flashing	The AUX port is sending or receiving packets for the dial backup connection.

Table 9 ZyWALL USG 2000 Front Panel LEDs (continued)

LED	COLOR	STATUS	DESCRIPTION
CARD	Green	Off	Reserved for future use. There is no card in the CARD SLOT .
		On	There is a card in the CARD SLOT .
HDD			This LED is reserved for future use.
P1~P8	Green	Off	There is no traffic on this port.
		Flashing	The ZyWALL is sending or receiving packets on this port.
	Orange	Off	There is no connection on this port.
		On	This port has a successful link.
LNK	Orange	Off	The Ethernet link is down.
		On	The Ethernet link is up.
ACT	Green	Off	The system is not transmitting/receiving Ethernet traffic.
		Blinking	The system is transmitting/receiving Ethernet traffic.

How to Set Up Your Network

Here are examples of using the Web Configurator to set up your network in the ZyWALL.

Note: The tutorials featured here require a basic understanding of connecting to and using the Web Configurator, see [Section 1.4 on page 10](#) for details. For field descriptions of individual screens, see the Web Configurator Online Help.

- [Wizard Overview on page 29](#)
- [How to Configure Interfaces, Port Roles, and Zones on page 29](#)
- [How to Configure a Cellular Interface on page 32](#)
- [How to Set Up a Wireless LAN on page 34](#)
- [How to Configure Ethernet, PPP, VLAN, Bridge and Policy Routing on page 37](#)
- [How to Set Up IPv6 Interfaces For Pure IPv6 Routing on page 38](#)
- [How to Set Up an IPv6 6to4 Tunnel on page 44](#)
- [How to Set Up an IPv6-in-IPv4 Tunnel on page 48](#)

2.1 Wizard Overview

Use the wizards to quickly configure Internet connection and VPN settings as well as activate subscription services.

WIZARD	DESCRIPTION
Installation Setup Wizard	Use this wizard the first time log into the Web Configurator to configure WAN connections and register your ZyWALL.
Quick Setup	You can find the following wizards in the CONFIGURATION navigation panel.
WAN Interface	Use these wizard screens to quickly configure a WAN interface's encapsulation and IP address settings.
VPN Setup	Use these wizard screens to quickly configure an IPSec VPN or IPSec VPN configuration provisioning.

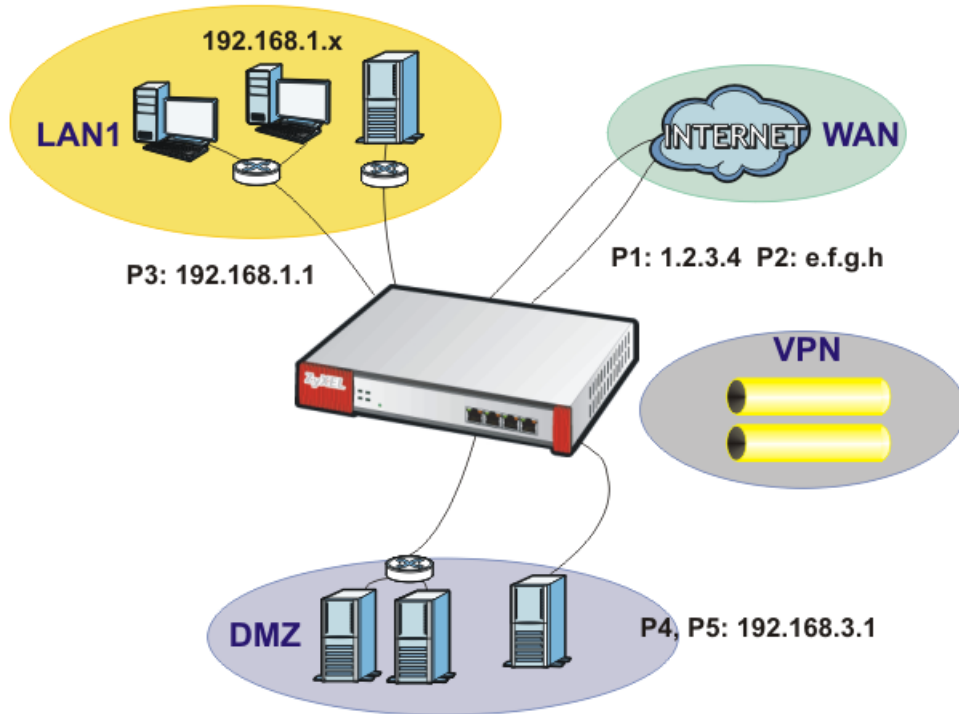
After you complete a wizard, you can go to the **CONFIGURATION** screens to configure advanced settings.

2.2 How to Configure Interfaces, Port Roles, and Zones

This tutorial shows how to configure Ethernet interfaces, port roles, and zones for the following example configuration.

- The **wan1** interface uses a static IP address of 1.2.3.4.
- Add **P5** (lan2) to the DMZ interface (Note: In USG 20/20W, use **P4** (lan2) instead of **P5** in this example). The DMZ interface is used for a protected local network. It uses IP address 192.168.3.1 and serves as a DHCP server by default.
- You want to be able to apply specific security settings for the VPN tunnel created by the **Quick Setup - VPN Setup** wizard (named **WIZ_VPN**). So you create a new zone and add **WIZ_VPN** to it.

Figure 21 Ethernet Interface, Port Roles, and Zone Configuration Example



2.2.1 Configure a WAN Ethernet Interface

You need to assign the ZyWALL's **wan1** interface a static IP address of 1.2.3.4.

Click **Configuration > Network > Interface > Ethernet** and double-click the **wan1** interface's entry in the **Configuration** section. Select **Use Fixed IP Address** and configure the IP address, subnet mask, and default gateway settings and click **OK**.

Edit Ethernet

IPv4 View Show Advanced Settings Create new Object

Description: (Optional)

IP Address Assignment

☐ Get Automatically

☒ Use Fixed IP Address

IP Address: 1.2.3.4

Subnet Mask: 255.255.255.0

Gateway: 1.2.3.254 (Optional)

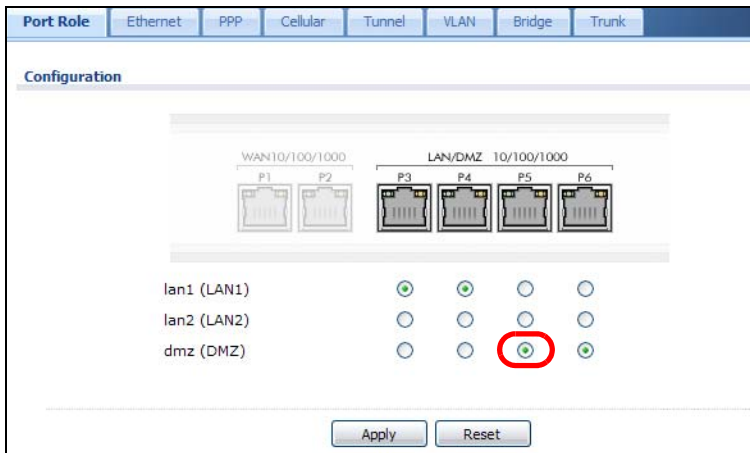
Metric: 0 (0-15)

Interface Parameters

2.2.2 Configure Port Roles

Here is how to take the **P5** port from the lan2 interface and add it to the dmz interface.

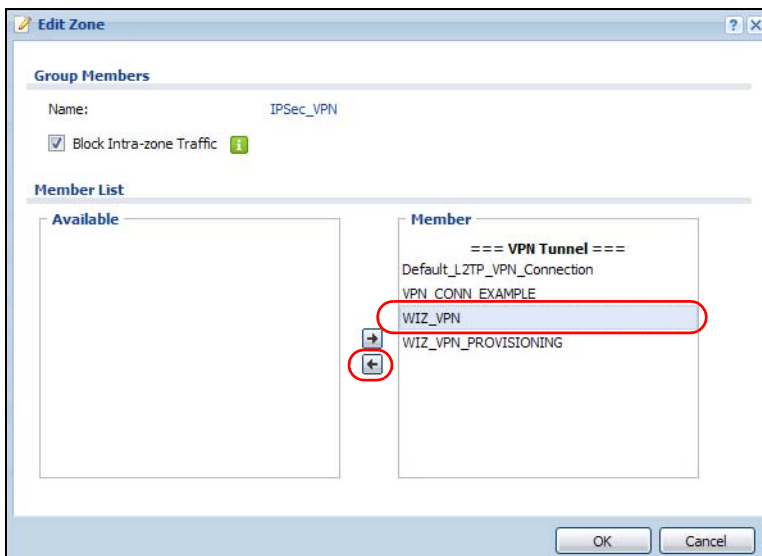
- 1 Click **Configuration > Network > Interface > Port Role**.
- 2 Under **P5** select the **dmz (DMZ)** radio button and click **Apply**.



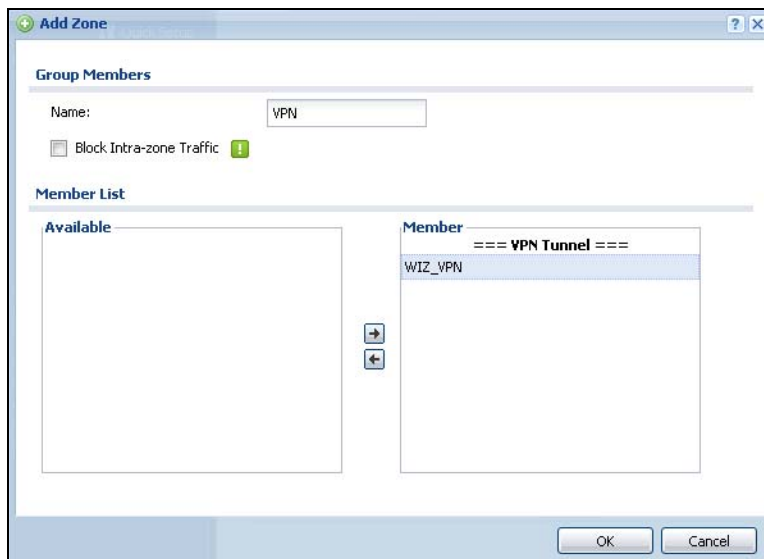
2.2.3 Configure Zones

In this example you have created a **WIZ_VPN** tunnel through the **Quick Setup - VPN Setup** wizard. By default, it is assigned to the **IPSec_VPN** zone. Do the following to move **WIZ_VPN** from the **IPSec_VPN** zone to a new zone.

- 1 Click **Configuration > Network > Zone** and then double-click the **IPSec_VPN** entry.
- 2 Select **WIZ_VPN** and remove it from the **Member** box and click **OK**.



- 3 Back to the **Configuration > Network > Zone** screen and click **Add in the User Configuration section**.
- 4 Enter **VPN** as the new zone's name. Select **WIZ_VPN** and move it to the **Member** box and click **OK**.

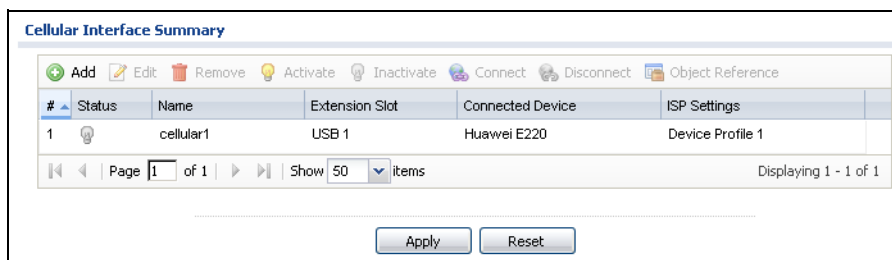


Then you can configure firewall rules to apply specific security settings to this **VPN** zone.

2.3 How to Configure a Cellular Interface

Use 3G cards for cellular WAN (Internet) connections. See www.zyxel.com for a supported 3G card. In this example you connect the 3G USB card before you configure the cellular interfaces but is also possible to reverse the sequence.

- 1 Make sure the 3G device's SIM card is installed.
- 2 Connect the 3G device to one of the ZyWALL's USB ports.
- 3 Click **Configuration > Network > Interface > Cellular**. Select the 3G device's entry and click **Edit**.



- 4 Enable the interface and add it to a zone. It is highly recommended that you set the **Zone** to **WAN** to apply your WAN zone security settings to this 3G connection. Leaving **Zone** set to **none** has the ZyWALL not apply any security settings to the 3G connection. Enter the **PIN Code** provided by the cellular 3G service provider (0000 in this example).

Edit Cellular configuration

Hide Advanced Settings

General Settings

☒ Enable Interface

Interface Properties

Interface Name: cellular1

Zone: WAN

Extension Slot: USB 1

Connected Device: Huawei E220

Description: (Optional)

Connectivity

☒ Nailed-Up

Idle timeout: 0 seconds

ISP Settings

Profile Selection: ☒ Device ☐ Custom

Profile 1

APN: n/a

Dial String: n/a

SIM Card Setting

PIN Code: ****

Retype to Confirm: ****

OK Cancel

Note: The **Network Selection** is set to **auto** by default. This means that the 3G USB modem may connect to another 3G network when your service provider is not in range or when necessary. Select **Home** to have the 3G device connect only to your home network or local service provider. This prevents you from being charged using the rate of a different ISP.

- Go to the **Dashboard**. The **Interface Status Summary** section should contain a "cellular" entry. When its connection status is **Connected** you can use the 3G connection to access the Internet.

#	Name	Status	Zone	IP Address	Action
1	wan1	Down	WAN	0.0.0.0	n/a
2	wan1_pp	Disconnected	WAN		
3	wan2	Down	WAN	0.0.0.0	Renew
4	lan1	Down	LAN1	192.168.1.1	n/a
5	lan2	100M/Full	LAN2	192.168.2.1	n/a
6	dmz	Down	DMZ	192.168.3.1	n/a
7	cellular1	Connected	n/a		

Page 1 of 1 | Show 50 items | Displaying 1 - 7 of 7

- The ZyWALL automatically adds the cellular interface to the system default WAN trunk. If the ZyWALL is using a user-configured trunk as its default trunk and you want this cellular interface to be part of it, use the **Trunk** screens to add it.

This way the ZyWALL can automatically balance the traffic load amongst the available WAN connections to enhance overall network throughput. Plus, if a WAN connection goes down, the ZyWALL still sends traffic through the remaining WAN connections. For a simple test, disconnect all of the ZyWALL's wired WAN connections. If you can still access the Internet, your cellular interface is properly configured and your cellular device is working.

2.4 How to Set Up a Wireless LAN

This tutorial applies only to models that include wireless LAN.

You can configure different interfaces to use on the wireless LAN card. This lets you have different wireless LAN networks using different SSIDs. You can configure the WLAN interfaces before or after you install the wireless LAN card. This example shows how to create a WLAN interface that uses WPA or WPA2 security and the ZyWALL's local user database for authentication.

2.4.1 Set Up User Accounts

Besides WPA-PSK, the ZyWALL also supports TTLS using PAP so you can use the ZyWALL's local user database with WPA or WPA2 instead of needing an external RADIUS server. For each WLAN user, set up a user account containing the user name and password the WLAN user needs to enter to connect to the wireless LAN.

- 1 Click **Configuration > Object > User/Group > User** and the **Add** icon.
- 2 Set the **User Name** to **wlan_user**. Enter (and re-enter) the user's password. Click **OK**.

The screenshot shows a window titled "Edit User wlan-user". Inside, there's a "User Configuration" section with the following fields:

- User Name: wlan_user
- User Type: user (dropdown menu)
- Password: masked with dots
- Retype: masked with dots
- Description: Local User
- Authentication Timeout Settings:
 - ☒ Use Default Settings
 - ☐ Use Manual Settings
- Lease Time: 1440 minutes
- Reauthentication Time: 1440 minutes

At the bottom right are "OK" and "Cancel" buttons.

- 3 Use the **Add** icon in the **Configuration > Object > User/Group > User** screen to set up the remaining user accounts in similar fashion.

2.4.2 Create the WLAN Interface

- 1 Click **Configuration > Network > Interface > WLAN > Add** to open the **WLAN Add** screen.

2 Edit this screen as follows.

A (internal) name for the WLAN interface displays. You can modify it if you want to.

The ZyWALL's security settings are configured by zones. Select to which security zone you want the WLAN interface to belong (the WLAN zone in this example). This determines which security settings the ZyWALL applies to the WLAN interface.

Configure the **SSID** (ZYXEL_WPA in this example).

If all of your wireless clients support WPA2, select **WPA2-Enterprise** as the **Security Type**, otherwise select **WPA / WPA-2-Enterprise**. Set the **Authentication Type** to **Auth Method**. The ZyWALL can use its default authentication method (the local user database) and its default certificate to authenticate the users.

Configure the interface's IP address and set it to **DHCP Server**. Click **OK**.

Add WLAN

Show Advanced Settings

General Settings

☒ Enable Interface

Interface Name: wlan-1-2

Description: (Optional)

Zone: Please select one ...

Virtual Access Point Settings

SSID: ZYXEL_WPA

☐ Hide SSID Broadcast

☐ Block Intra BSS Traffic

Maximum Associations: 255

WLAN Security Settings

Security Type: WPA2-Enterprise

Authentication Type: Auth Method

Authentication Method: default

TLS Certificate: default

IP Address Assignment

IP Address: 10.1.1.1

Subnet Mask: 255.255.0.0

Interface Parameters

Egress Bandwidth: 1048576 Kbps

DHCP Setting

DHCP: DHCP Server

IP Pool Start Address (Optional):

First DNS Server (Optional): Custom Defined

Pool Size: 1

Apply Reset OK Cancel

3 Turn on the wireless LAN and click **Apply**.

Port Role Ethernet PPP Cellular **WLAN** VLAN Bridge Auxiliary Trunk

General MAC Filter

Show Advanced Settings

WLAN Device Settings

Extension Slot: slot1 ZyXEL G-1705

☒ Enable WLAN Device

802.11 Band: b+g

Channel: 6

Interface Summary

Add Edit Remove Activate Inactivate Object Reference

#	Status	Name	SSID	IP Address	Mask	Security
1	Light Bulb	wlan-1-1	ZyXEL01	10.59.1.1	255.255.255.0	none
2	Light Bulb	wlan-1-2	ZYXEL_WF	10.1.1.1	255.255.0.0	wpa2-aes-eap

Page 1 of 1 Show 50 items Displaying 1 - 2 of 2

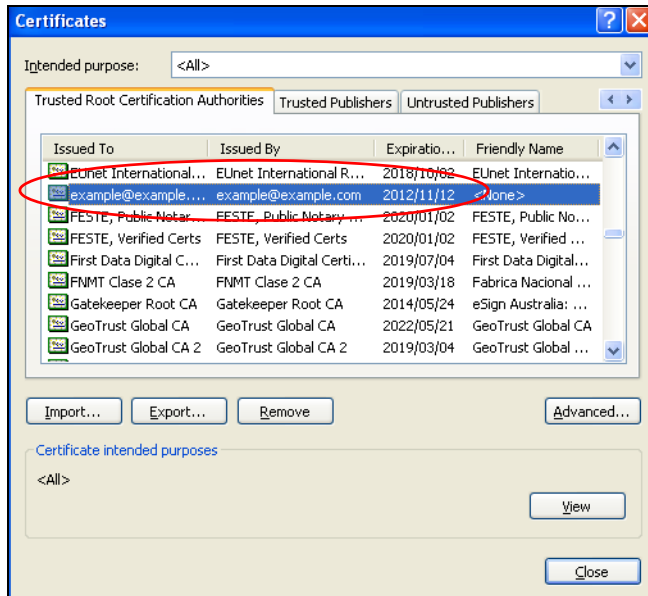
Apply Reset

- 4 Configure your wireless clients to connect to the wireless network.

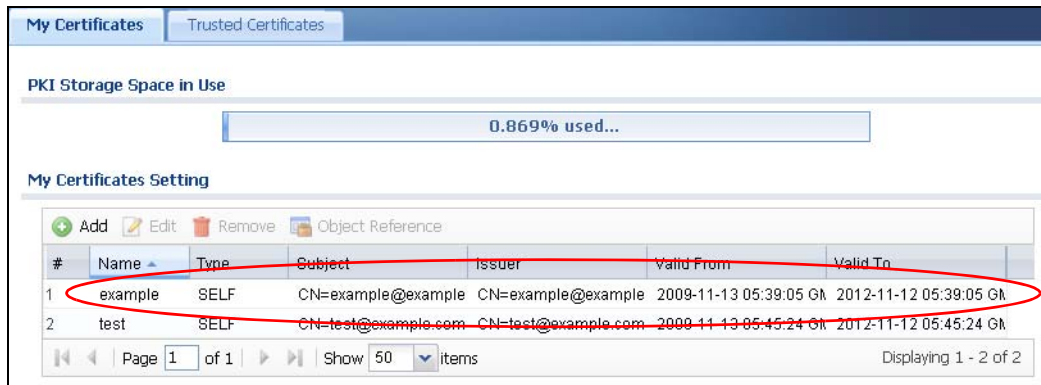
2.4.2.1 Wireless Clients Import the ZyWALL's Certificate

You must import the ZyWALL's certificate into the wireless clients if they are to validate the ZyWALL's certificate. Use the **Configuration > Object > Certificate > Edit** screen to export the certificate the ZyWALL is using for the WLAN interface. Then do the following to import the certificate into each wireless client computer.

- 1 In Internet Explorer, click **Tools > Internet Options > Content** and click the **Certificates** button.
- 2 Click **Import**.
- 3 Use the wizard screens to import the certificate. You may need to change the **Files of Type** setting to **All Files** in order to see the certificate file.
- 4 When you get to the **Certificate Store** screen, select the option to automatically select the certificate store based on the type of certificate.
- 5 If you get a security warning screen, click **Yes** to proceed.
- 6 The **Internet Explorer Certificates** screen remains open after the import is done. You can see the newly imported certificate listed in the **Trusted Root Certification Authorities** tab. The values in the **Issued To** and **Issued By** fields should match those in the ZyWALL's **My Certificates** screen's **Subject** and **Issuer** fields (respectively).



The **My Certificates** screen indicates what type of information is being displayed, such as Common Name (CN), Organizational Unit (OU), Organization (O) and Country (C).



Repeat the steps to import the certificate into each wireless client computer that is to validate the ZyWALL's certificate when using the WLAN interface.

2.4.2.2 Wireless Clients Use the WLAN Interface

Wireless clients enter their username and password when they connect to the wireless network.

2.5 How to Configure Ethernet, PPP, VLAN, Bridge and Policy Routing

The following table describes when to configure the Ethernet, PPP, VLAN, Bridge screens under **Configuration > Network > Interface** and the **Configuration > Network > Routing > Policy Routing** screen.

Table 10 Ethernet, PPP, VLAN, Bridge and Policy Routing Screen Relationships

SCREEN	DESCRIPTION
Ethernet	Configure this if any interface on the ZyWALL is connecting to an Ethernet network. Ethernet interfaces are the foundation for defining other interfaces and network policies.
PPP	Configure this if you need your service provider to provide an IP address through PPPoE or PPTP in order to access the Internet or another network.
VLAN	Configure this if you want to divide your physical networks into multiple VLANs, or your service provider or an aggregated network needs the ZyWALL to recognize the VLAN tags in the packets flowing through the ZyWALL.
Bridge	Configure this if you want the ZyWALL to combine two or multiple network segments into one single network. Although the ZyWALL is "transparent" in this mode, you can still apply security checking on packets flowing through the ZyWALL.
Policy Routing	Configure this if you want to override the ZyWALL's default routing behavior in order to send packets through the appropriate interface or VPN tunnel.

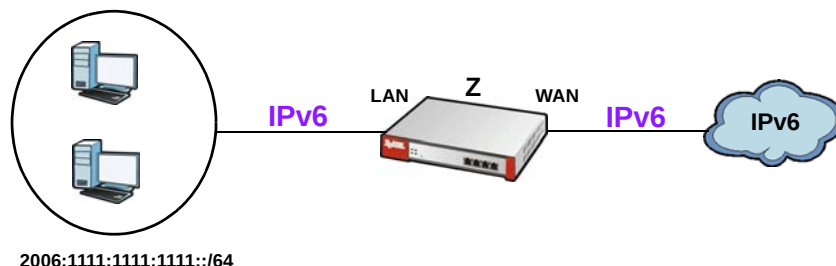
Since firmware version 3.00, the ZyWALL supports IPv6 configuration in these **Ethernet**, **PPP**, **VLAN**, **Bridge** and **Policy Route** screens under **Configuration > Network > Interface** and **Configuration > Network > Routing**. Basically, these are the same as the ones for IPv4 networks except the following differences:

- You have to enable IPv6 globally in the **CONFIGURATION > System > IPv6** screen to make the IPv6 settings work.
- An **Enable IPv6** setting - Select this in the screens listed above to enable the ZyWALL to be able to send and receive IPv6 packets through the interface. Otherwise, the ZyWALL discards IPv6 packets flowing through the interface.
- **IPv6 Address Assignment** - This section allows you to enable auto-configuration and configure prefix delegation.
- **DHCPv6 Setting** - This section allows you to configure the DHCPv6 role and the corresponding settings for the interface.

2.6 How to Set Up IPv6 Interfaces For Pure IPv6 Routing

This example shows how to configure your ZyWALL Z's WAN and LAN interfaces which connects two IPv6 networks. ZyWALL Z periodically advertises a network prefix of 2006:1111:1111:1111::/64 to the LAN through router advertisements.

Note: Instead of using router advertisement, you can use DHCPv6 to pass the network settings to the computers on the LAN.

Figure 22 Pure IPv6 Network Example

2.6.1 Setting Up the WAN IPv6 Interface

- 1 In the **CONFIGURATION > Network > Interface > Ethernet** screen's **IPv6 Configuration** section, double-click the **wan1**.
- 2 The **Edit Ethernet** screen appears. Select **Enable Interface** and **Enable IPv6**. Select **Enable Auto-Configuration**. Click **OK**.

Note: Your ISP or uplink router should enable router advertisement.

Edit Ethernet

IPv6 View Show Advanced Settings Create new Object

General Settings

☒ Enable Interface

General IPv6 Setting

☒ Enable IPv6

Interface Properties

Interface Type: external

Interface Name: wan1

Port: P1

Zone: WAN

MAC Address: 00:00:AA:79:73:79

Description: (Optional)

IPv6 Address Assignment

☒ Enable Auto-configuration

Link-Local Address: n/a

IPv6 Address/Prefix Length: (Optional)

2.6.2 Setting Up the LAN Interface

- 1 In the **CONFIGURATION > Network > Interface > Ethernet** screen, double-click the **lan1** in the **IPv6 Configuration** section.
- 2 The **Edit Ethernet** screen appears. Select **Enable Interface** and **Enable IPv6**. Select **Enable Router Advertisement** and click **Add** and configure a network prefix for the LAN1 (2006:1111:1111:1111::/64 in this example). Click **OK**.

Edit Ethernet

IPv6 View Show Advanced Settings Create new Object

General Settings

☒ Enable Interface

General IPv6 Setting

☒ Enable IPv6

Interface Properties

Interface Type: Internal

Interface Name: lan1

Port: P3, P4

Zone: LAN1

MAC Address: 00:00:AA:79:73:75

Description: (Optional)

IPv6 Address Assignment

☐ Enable Auto-configuration

Link-Local Address: n/a

IPv6 Address/Prefix Length: (Optional)

DHCPv6 Setting

DHCPv6: N/A

IPv6 Router Advertisement Setting

☒ Enable Router Advertisement

Router Preference: Medium

Advertised Prefix Table

#	IPv6 Address/Prefix Length
1	2006:1111:1111:1111::/64

Page 1 of 1 Show 50 items No data to display

You have completed the settings on the ZyWALL. But if you want to request a network address prefix from your ISP for your computers on the LAN, you can configure prefix delegation (see [Section 2.6.3 on page 40](#)).

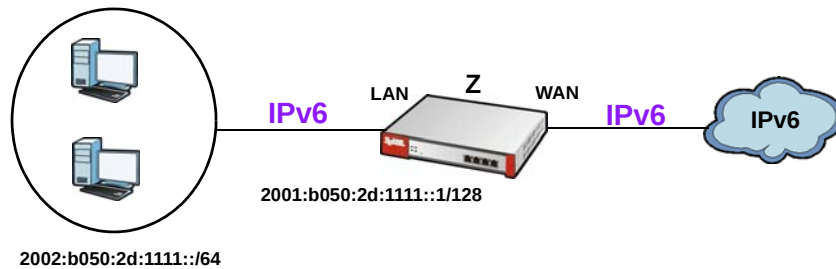
2.6.3 Prefix Delegation and Router Advertisement Settings

This example shows how to configure prefix delegation on the ZyWALL's WAN and router advertisement on the LAN.

2.6.3.1 Apply a Network Prefix From Your ISP

First of all, you have to apply a network prefix from your ISP or the uplink router's administrator. The WAN port's DUID is required when you apply the prefix. You can check the DUID information in the **WAN IPv6 Interface Edit** screen.

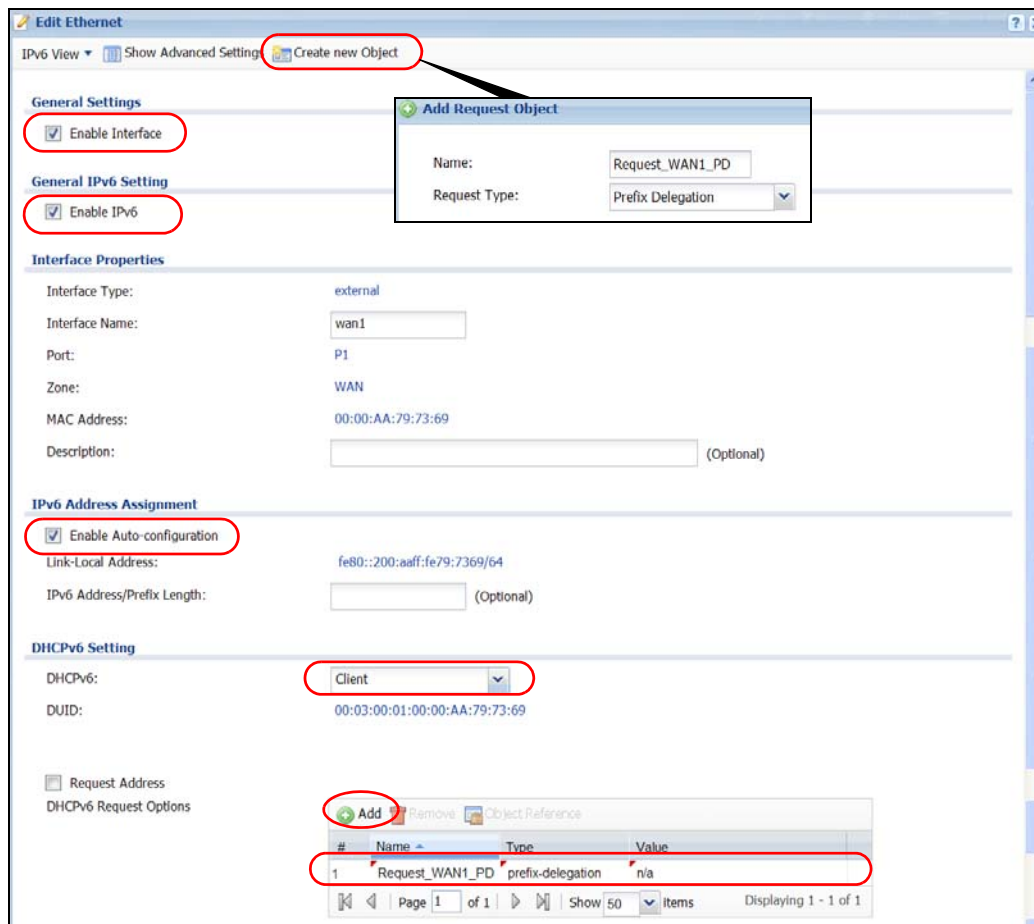
This example assumes that you were given a network prefix of 2001:b050:2d::/48 and you decide to divide it and give 2001:b050:2d:1111::/64 to the LAN network. LAN1's IP address is 2001:b050:2d:1111::1/128.

Figure 23 Pure IPv6 Network Example Using Prefix Delegation

2.6.3.2 Setting Up the WAN IPv6 Interface

- 1 In the **Configuration > Network > Interface > Ethernet** screen's **IPv6 Configuration** section, double-click the **wan1**.
- 2 The **Edit Ethernet** screen appears. Select **Enable Interface** and **Enable IPv6**.
Click **Create new Object** to add a **DHCPv6 Request** object with the **Prefix Delegation** type.
Select **Enable Auto-Configuration**.
Select **Client** in the **DHCPv6** field. (WAN1's DUID appears.)
Click **Add** in the **DHCPv6 Request Options** table and select the DHCPv6 request object you just created. You cannot see the prefix your ISP gave you in the **Value** field until you click **OK** and then come back to this screen again. It is 2001:b050:2d::/48 in this example.

Note: Your ISP or a DHCPv6 server in the same network as the WAN should assign an IPv6 IP address for the WAN interface.



2.6.3.3 Setting Up the LAN Interface

- 1 In the **Configuration > Network > Interface > Ethernet** screen, double-click the **lan1** in the **IPv6 Configuration** section.
- 2 The **Edit Ethernet** screen appears. Click **Show Advanced Settings** to display more settings on this screen.

Select **Enable Interface** and **Enable IPv6**.

In the **Address from DHCPv6 Prefix Delegation** table, click **Add** and select the DHCPv6 request object from the drop-down list, type `::1111:0:0:0:1/128` in the **Suffix Address** field. (The combined address `2001:b050:2d:1111::1/128` will display as LAN1's IPv6 address after you click **OK** and come back to this screen again).

Note: You can configure the IPv6 Address/Prefix Length field instead if the delegated prefix is never changed.

Select **Enable Router Advertisement**.

In the **Advertised Prefix from DHCPv6 Prefix Delegation** table, click **Add** and select the DHCPv6 request object from the drop-down list, type `::1111/64` in the **Suffix Address** field. (The combined prefix `2001:b050:2d:1111::/64` will display for the LAN1's network prefix after you click **OK** and come back to this screen again).

Edit Ethernet

IPv6 View ▾ Hide Advanced Settings Create new Object

General Settings

☒ Enable Interface

General IPv6 Setting

☒ Enable IPv6

Interface Properties

Interface Type: internal

Interface Name: lan1

Port: P3, P4

Zone: LAN1

MAC Address: 00:00:AA:79:73:75

Description: (Optional)

IPv6 Address Assignment

☐ Enable Stateless Address Auto-configuration (SLAAC)

Link-Local Address: n/a

IPv6 Address/Prefix Length: (Optional)

Gateway: (Optional)

Metric: (0-15)

Address from DHCPv6 Prefix Delegation

#	Delegated Prefix	Suffix Address	Address
1	Request_WAN1_PD	::1111:0:0:1/128	n/a

Page 1 of 1 Show 50 ns No data to display

DHCPv6 Setting

DHCPv6: N/A

IPv6 Router Advertisement Setting

☒ Enable Router Advertisement

☐ Advertised Hosts Get Network Configuration From DHCPv6

☐ Advertised Hosts Get Other Configuration From DHCPv6

Router Preference: Medium

MTU: 1480 (1280-1500, 0 is disabled)

Hop Limit: 64 (0-255, 0 is disabled)

Advertised Prefix Table

#	Delegated Prefix	Suffix Address	Address
1	Request_WAN1_PD	::1111/64	n/a

Page 1 of 1 Show 50 ns No data to display

Advertised Prefix from DHCPv6 Prefix Delegation

#	Delegated Prefix	Suffix Address	Address
1	Request_WAN1_PD	::1111/64	n/a

Page 1 of 1 Show 50 ns No data to display

2.6.4 Test

- 1 Connect a computer to the ZyWALL's LAN1.

- 2 Enable IPv6 support on your computer.

In Windows XP, you need to use the `IPv6 install` command in a Command Prompt.

In Windows 7, IPv6 is supported by default. You can enable IPv6 in the **Control Panel > Network and Sharing Center > Local Area Connection** screen.

- 3 Your computer should get an IPv6 IP address (starting with 2001:b050:2d:1111: for this example) from the ZyWALL.
- 4 Open a web browser and type `http://www.kame.net`. If your IPv6 settings are correct, you can see a dancing turtle in the website.

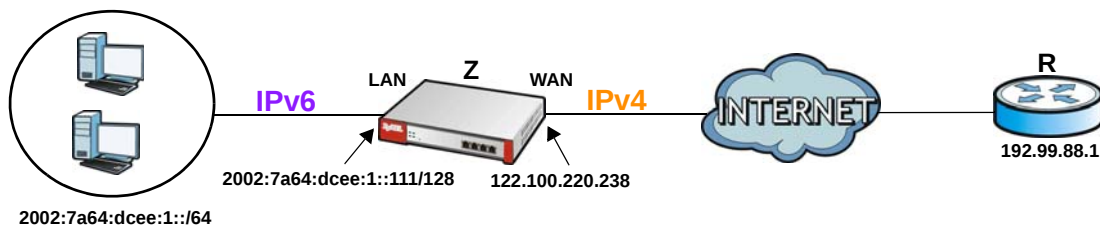
2.6.5 What Can Go Wrong?

- 1 If you forgot to enable **Auto-Configuration** on the WAN1 IPv6 interface, you will not have any default route to forward the LAN's IPv6 packets.
- 2 To use prefix delegation, you must set the WAN interface to a DHCPv6 client, enable router advertisements on the LAN interface as well as configure the **Advertised Prefix from DHCPv6 Prefix Delegation** table.
- 3 If the **Value** field in the WAN1's **DHCPv6 Request Options** table displays **n/a**, contact your ISP for further support.
- 4 In Windows, some IPv6 related tunnels may be enabled by default such as Teredo and 6to4 tunnels. It may cause your computer to handle IPv6 packets in an unexpected way. It is recommended to disable those tunnels on your computer.

2.7 How to Set Up an IPv6 6to4 Tunnel

This example shows how to use the interface configuration screens to create the following 6to4 tunnel.

Figure 24 6to4 Tunnel Example



In this example, the ZyWALL (Z) acts as a 6to4 router which connects the IPv4 Internet (through WAN1 with an IP address of 122.100.220.238) and an IPv6 intranet network. In the 6to4 tunnel application, you must configure the LAN1 with an IP address starting with 2002:7a64:dcee::/48 if you decide to use the WAN1 IP address to forward 6to4 packets to the IPv4 network. The second and third sets of 16-bit IP address from the left must be converted from 122.100.220.238. It becomes 7a64:dcee in hexadecimal. You are free to use the fourth set of 16-bit IP address from the left in order to allocate different network addresses (prefixes) to IPv6 interfaces. In this example,

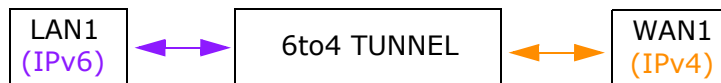
the LAN1 network address is assigned to use 2002:7a64:dcee:1::/64 and the LAN1 IP address is set to 2002:7a64:dcee:1::111/128.

A relay router **R** (192.99.88.1) is used in this example in order to forward 6to4 packets to any unknown IPv6 addresses.

2.7.1 Configuration Concept

After the 6to4 tunnel settings are complete, IPv4 and IPv6 packets transmitted between WAN1 and LAN1 will be handled by the ZyWALL through the following flow.

Figure 25 6to4 Tunnel Configuration Concept



2.7.2 Setting Up the LAN IPv6 Interface

- 1 In the **CONFIGURATION > Network > Interface > Ethernet** screen's **IPv6 Configuration** section, double-click the **lan1**.
- 2 The **Edit Ethernet** screen appears. Select **Enable Interface** and **Enable IPv6**.
Type **2002:7a64:dcee:1::111 / 128** in the **IPv6 Address / Prefix Length** field for the LAN1's IP address.
Enable **Router Advertisement**. Then click **Add** in the **Advertised Prefix Table** to add **2002:7a64:dcee:1:: / 64**. The LAN1 hosts will get the network prefix through the router advertisement messages sent by the LAN1 IPv6 interface periodically. Click **OK**.

General Settings

☒ Enable Interface

General IPv6 Setting

☒ Enable IPv6

Interface Properties

Interface Type: internal

Interface Name: lan1

Port: P2, P3

Zone: LAN1

MAC Address: 00:00:AA:79:73:6A

Description: (Optional)

IPv6 Address Assignment

☐ Enable Stateless Address Auto-configuration (SLAAC)

Link-Local Address: fe80::200:aaff:fe79:736a/64

IPv6 Address/Prefix Length: 2002:7a64:dcee:1::111 (Optional)

DHCPv6 Setting

DHCPv6: N/A

IPv6 Router Advertisement Setting

☒ Enable Router Advertisement

Router Preference: Medium

Advertised Prefix Table

[Add](#) [Edit](#) [Remove](#)

#	IPv6 Address/Prefix Length
1	2002:7a64:dcee:1::/64

Page 1 of 1 | Show 50 items | Displaying 1 - 1 of 1

2.7.3 Setting Up the 6to4 Tunnel

1 Click **Add** in the **CONFIGURATION > Network > Interface > Tunnel** screen.

2 The **Add Tunnel** screen appears. Select **Enable**.

Enter **tunnel0** as the **Interface Name** and select **6to4** as the **Tunnel Mode**.

In the **6to4 Tunnel Parameter** section, this example just simply uses the default **6to4 Prefix**, 2002::/16. Enter your relay router's IP address (192.88.99.1 in this example).

Select **wan1** as the gateway. Click **OK**.

Add Tunnel

Show Advanced Settings

General Settings

☒ Enable

Interface Properties

Interface Name: tunnel0

Zone: TUNNEL

Tunnel Mode: 6to4

IPv6 Address Assignment

IPv6 Address/Prefix Length: (Optional)

Metric: 0 (0-15)

6to4 Tunnel Parameter

6to4 Prefix: 2002::/16

Relay Router: 192.88.99.1 (Optional)

NOTE: traffic destined to the non-6to4 prefix domain tunnels to the relay router

Gateway Settings

My Address

☒ Interface wan1 DHCP client -- 122.100.220.238/255.255.255.0

☐ IP Address 0.0.0.0

Remote Gateway Address: Automatic

2.7.4 Testing the 6to4 Tunnel

- 1 Connect a computer to the ZyWALL's LAN1.
- 2 Enable IPv6 support on your computer.
In Windows XP, you need to use the `IPv6 install` command in a Command Prompt.
In Windows 7, IPv6 is supported by default. You can enable IPv6 in the **Control Panel > Network and Sharing Center > Local Area Connection** screen.
- 3 You should get an IPv6 IP address starting with 2002:7a64:dcee:1:.
- 4 Type `ping -6 ipv6.google.com` in a Command Prompt to test. You should get a response.

2.7.5 What Can Go Wrong?

- 1 Do not enable Auto-Configuration for the LAN1 IPv6 interface. Enabling it will cause two default routes, however, the ZyWALL only needs a default route generated by your relay router setting.
In 6to4, the ZyWALL doesn't need a policy route to determine where to forward a 6to4 packet (starting with 2002 in the IPv6 IP address). The next gateway information of where to forward a 6to4 packet can be retrieved from the packet's destination IP address. The ZyWALL only forwards a 6to4 packet to the relay router using the default route if the packet's destination is not an IP address starting with 2002.

- 2 You don't need to activate the WAN1 IPv6 interface but make sure you enable the WAN1 IPv4 interface. In 6to4, the ZyWALL uses the WAN1 IPv4 interface to forward your 6to4 packets over the IPv4 network.

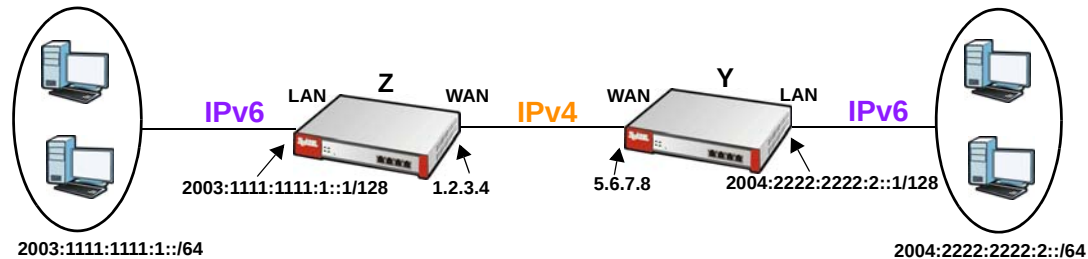
Note: For 6to4, you do not need to enable IPv6 in the wan1 since the IPv6 packets will be redirected into the 6to4 tunnel.

- 3 In Windows, some IPv6 related tunnels may be enabled by default such as Teredo and 6to4 tunnels. It may cause your computer to handle IPv6 packets in an unexpected way. It is recommended to disable those tunnels on your computer.

2.8 How to Set Up an IPv6-in-IPv4 Tunnel

This example shows how to use the interface and policy route configuration screens to create an IPv6-in-IPv4 tunnel.

Figure 26 IPv6-in-IPv4 Tunnel Example



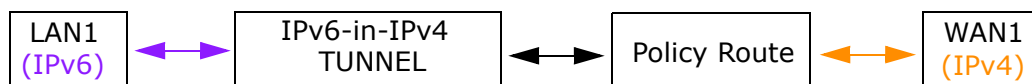
In this example, the ZyWALLs (Z and Y) act as IPv6-in-IPv4 routers which connect the IPv4 Internet and an individual IPv6 network. This configuration example only shows the settings on ZyWALL Z. You can use similar settings to configure ZyWALL Y.

Note: In the IPv6-in-IPv4 tunnel application, you must configure the peer gateway's WAN IPv4 address as the remote gateway IP.

2.8.1 Configuration Concept

After the IPv6-in-IPv4 tunnel settings are complete, IPv4 and IPv6 packets transmitted between WAN1 and LAN1 will be handled by the ZyWALL through the following flow.

Figure 27 IPv6-in-IPv4 Tunnel Configuration Concept



2.8.2 Setting Up the IPv6-in-IPv4 Tunnel

- 1 Click **Add** in the **CONFIGURATION > Network > Interface > Tunnel** screen.

- 2 The **Edit Tunnel** screen appears. Select **Enable**.
Enter **tunnel0** as the **Interface Name** and select **IPv6-in-IPv4** as the **Tunnel Mode**.
Select **wan1** in the **Interface** field in the **Gateway Settings** section.
Enter **5.6.7.8** as the remote gateway's IP address. Click **OK**.

Edit Tunnel

Show Advanced Settings

General Settings

☒ Enable

Interface Properties

Interface Name: tunnel0

Zone: TUNNEL

Tunnel Mode: IPv6-in-IPv4

IPv6 Address Assignment

IPv6 Address/Prefix Length: (Optional)

Metric: 0 (0-15)

Gateway Settings

My Address

☒ Interface wan1 DHCP client -- 10.1.8.54/255.255.0

☐ IP Address 0.0.0.0

Remote Gateway Address: 5.6.7.8

2.8.3 Setting Up the LAN IPv6 Interface

- 1 Select lan1 in the **IPv6 Configuration** section in the **CONFIGURATION > Network > Interface > Ethernet** screen and click **Edit**.
- 2 The **Edit Ethernet** screen appears. Select **Enable Interface** and **Enable IPv6**.
Type **2003:1111:1111:1::1 / 128** in the **IPv6 Address/Prefix Length** field for the LAN1's IP address.
Enable **Router Advertisement**. Then click **Add** in the **Advertised Prefix Table** to add **2003:1111:1111:1:: / 64**. The LAN1 hosts will get the network prefix through router advertisements sent by the LAN1 IPv6 interface periodically. Click **OK**.

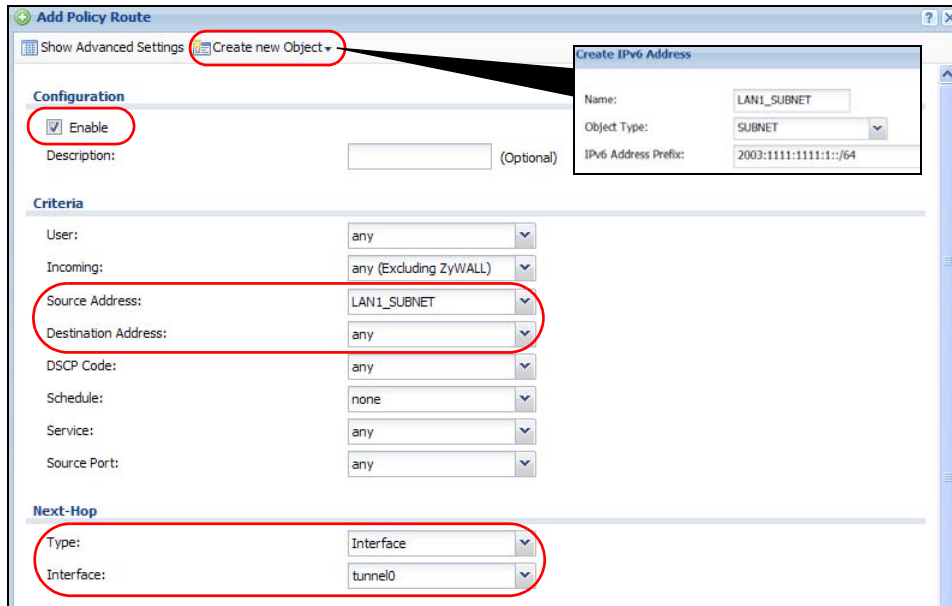
The screenshot shows the 'Edit Ethernet' configuration window with the following sections and settings:

- General Settings:** ☒ Enable Interface
- General IPv6 Setting:** ☒ Enable IPv6
- Interface Properties:**
 - Interface Type: internal
 - Interface Name: lan1
 - Port: P2, P3
 - Zone: LAN1
 - MAC Address: 00:00:AA:79:73:6A
 - Description: (Optional)
- IPv6 Address Assignment:**
 - ☐ Enable Stateless Address Auto-configuration (SLAAC)
 - Link-Local Address: fe80::200:aaff:fe79:736a/64
 - IPv6 Address/Prefix Length: 2003:1111:1111:1::1/1 (Optional)
- DHCPv6 Setting:**
 - DHCPv6: N/A
- IPv6 Router Advertisement Setting:**
 - ☒ Enable Router Advertisement
 - Router Preference: Medium
 - Advertised Prefix Table:

#	IPv6 Address/Prefix Length
1	2003:1111:1111:1::/64

2.8.4 Setting Up the Policy Route

- 1 Go to the **CONFIGURATION > Network > Routing** screen and click **Add** in the **IPv6 Configuration** table.
- 2 The **Add Policy Route** screen appears. Click **Create New Object** to create an IPv6 address object with the address prefix of **2003:1111:1111:1::/64**.
 Select **Enable**.
 Select the address object you just created in the **Source Address** field.
 Select **any** in the **Destination Address** field.
 Select **Interface** as the next-hop type and then **tunnel0** as the interface. Click **OK**.



2.8.5 Testing the IPv6-in-IPv4 Tunnel

- 1 Connect a computer to the ZyWALL's LAN1.
- 2 Enable IPv6 support on you computer.
In Windows XP, you need to use the `IPv6 install` command in a Command Prompt.
In Windows 7, IPv6 is supported by default. You can enable IPv6 in the **Control Panel > Network and Sharing Center > Local Area Connection** screen.
- 3 You should get an IPv6 IP address starting with 2003:1111:1111:1000:.
- 4 Use the `ping -6 [IPv6 IP address]` command in a Command Prompt to test whether you can ping a computer behind ZyWALL Y. You should get a response.

2.8.6 What Can Go Wrong?

- 1 You don't need to activate the WAN1 IPv6 interface but make sure you enable the WAN1 IPv4 interface. In IPv6-in-IPv4, the ZyWALL uses the WAN1 IPv4 interface to forward your 6to4 packets to the IPv4 network.
- 2 In Windows, some IPv6 related tunnels may be enabled by default such as Teredo and 6to4 tunnels. It may cause your computer to handle IPv6 packets in an unexpected way. It is recommended to disable those tunnels on your computer.

Protecting Your Network

These sections cover configuring the ZyWALL to protect your network.

- [Firewall on page 53](#)
- [User-aware Access Control on page 54](#)
- [Endpoint Security \(EPS\) on page 55](#)
- [Device and Service Registration on page 55](#)
- [Anti-Virus Policy Configuration on page 56](#)
- [IDP Profile Configuration on page 58](#)
- [ADP Profile Configuration on page 59](#)
- [Content Filter Profile Configuration on page 61](#)
- [Viewing Content Filter Reports on page 63](#)
- [Anti-Spam Policy Configuration on page 66](#)

3.1 Firewall

The firewall controls the travel of traffic between or within zones for services using static port numbers. Use application patrol to control services using flexible/dynamic port numbers (see [Section 5.8 on page 120](#) for an example). The firewall can also control traffic for NAT (DNAT) and policy routes (SNAT). Firewall rules can use schedule, user, user groups, address, address group, service, and service group objects. To-ZyWALL firewall rules control access to the ZyWALL itself including management access. By default the firewall allows various types of management from the LAN, HTTPS from the WAN and no management from the DMZ. The firewall also limits the number of user sessions.

This example shows the ZyWALL's default firewall behavior for WAN to LAN traffic and how stateful inspection works. A LAN user can initiate a Telnet session from within the LAN zone and the firewall allows the response. However, the firewall blocks Telnet traffic initiated from the WAN zone and destined for the LAN zone. The firewall allows VPN traffic between any of the networks.

Figure 28 Default Firewall Action



3.1.1 What Can Go Wrong

- The ZyWALL checks the firewall rules in order and applies the first firewall rule the traffic matches. If traffic is unexpectedly blocked or allowed, make sure the firewall rule you want to apply to the traffic comes before any other rules that the traffic would also match.
- Even if you have configured the firewall to allow access for a management service such as HTTP, you must also enable the service in the service control rules.
- The ZyWALL is not applying your firewall rules for certain interfaces. The ZyWALL only apply's a zone's rules to the interfaces that belong to the zone. Make sure you assign the interfaces to the appropriate zones. When you create an interface, there is no security applied on it until you assign it to a zone.

3.2 User-aware Access Control

You can configure many policies and security settings for specific users or groups of users. Users can be authenticated locally by the ZyWALL or by an external (AD, RADIUS, or LDAP) authentication server. Here is how to have the ZyWALL use a RADIUS server to authenticate users before giving them access.

- 1 Set up user accounts in the RADIUS server.
- 2 Set up user accounts and groups on the ZyWALL (**Configuration > Object > User/Group**).
- 3 Configure an object for the RADIUS server. Click **Configuration > Object > AAA Server > RADIUS** and double-click the **radius** entry.
- 4 Then, set up the authentication method, Click **Configuration > Object > Auth. Method**. Double-click the **default** entry. Click the **Add** icon.
- 5 Configure the ZyWALL's security settings. The ZyWALL can use the authentication method in authenticating wireless clients, HTTP and HTTPS clients, IPSec gateways (extended authentication), L2TP VPN, and authentication policy.

3.2.1 What Can Go Wrong

- The ZyWALL always authenticates the default **admin** account locally, regardless of the authentication method setting. You cannot have the RADIUS server authenticate the ZyWALL's default admin account.
- The authentication attempt will always fail if the ZyWALL tries to use the local database to authenticate an **ext-user**. An external server such as AD, LDAP or RADIUS must authenticate the ext-user accounts.
- Attempts to add the admin users to a user group with access users will fail. You cannot put access users and admin users in the same user group.
- Attempts to add the default admin account to a user group will fail. You cannot put the default **admin** account into any user group.

3.3 Endpoint Security (EPS)

Use endpoint security objects with authentication policies or SSL VPN to make sure users' computers meet specific security requirements before they are allowed to access the network.

- 1 Configure endpoint security objects (**Configuration > Object > Endpoint Security > Add**).
- 2 Configure an authentication policy to use the endpoint security objects (**Configuration > Auth. Policy > Add**).

3.3.1 What Can Go Wrong

- Endpoint security checking fails if user computers do not have Sun's Java (Java Runtime Environment or 'JRE') installed and enabled with a minimum version of 1.4.
- When authentication or SSL VPN policies use multiple endpoint security objects the ZyWALL checks users' computers against the endpoint security objects in order. This may take awhile if many objects need to be checked. Place the endpoint security objects that most user logins should match higher in the list.

3.4 Device and Service Registration

This tutorial shows you how to create a myZyXEL.com account and register the ZyWALL. You can then activate your service subscription.

- 1 You can directly create a myZyXEL.com account and register the ZyWALL on the **Registration** screen. Click **Configuration > Licensing > Registration** to open the following screen. Select **new myZyXEL.com account**. Fill in the fields marked in red in this screen. Click **Apply** to create your account and register the device.

- 2 Click the **Service** tab. To activate or extend a standard service subscription enter your iCard's license key in the **License Key** field. The license key can be found on the reverse side of the iCard.

Registration **Service**

License Status

#	Service	Status	Registration Type	Expiration Date	Count
1	Anti-Virus Signature Service	Not Licensed			N/A
2	IDP/AppPatrol Signature Service	Not Licensed			N/A
3	Anti-Spam Service	Not Licensed			N/A
4	Commtouch Content Filter Service	Not Licensed			N/A
5	BlueCoat Content Filter Service	Not Licensed			N/A
6	SSL VPN Service	Not Licensed			2

Page 1 of 1 | Show 50 items | Displaying 1 - 6 of 6

License Activation

License Key:

ZyXEL

Service License Key

This key allows you to activate/update ZyXEL ZyWALL security services.

E-ICARD 2 YR KASPERSKY AV ZYWALL USG 50

S-KAV002-XXXXXXXXXXXXXXX

How to activate/update your services:

- Log into the ZyXEL device web configurator.
- Click **Registration** and then the **Service** tab.
- Enter the key exactly as shown on the reverse side of this ICARD in the **License Key** field then click the **Update** button.

ICARD SECURITY

Part Number: 10-100-214018
EAN Code: 4 718937 518712
Serial Number: 000010000000

ICARD SECURITY

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3.5 Anti-Virus Policy Configuration

This tutorial shows you how to configure an Anti-Virus policy.

Note: You need to first activate your Anti-Virus service license or trial. See [Device and Service Registration on page 55](#).

- 1 Click **Configuration > Anti-X > Anti-Virus** to display the Anti-Virus **General** screen. In the **Policies** section click **Add** to display the **Add Rule** screen. Select **Enable**. In the **Direction** section, you can select the **From** and **To** zones for traffic to scan for viruses. You can also select traffic types to scan for viruses under **Protocols to Scan**. Click **OK**.

- The policy configured in the previous step will display in the **Policies** section. Select **Enable Anti-Virus and Anti-Spyware** and click **Apply**.

St...	Pr...	From	To	Protocol
1	WAN	LAN1	HTTP FTP SMTP POP3 IMAP4	

3.5.1 What Can Go Wrong

- The ZyWALL does not scan the following file/traffic types:
 - Simultaneous downloads of a file using multiple connections. For example, when you use FlashGet to download sections of a file simultaneously.
 - Encrypted traffic. This could be password-protected files or VPN traffic where the ZyWALL is not the endpoint (pass-through VPN traffic).
 - Traffic through custom (non-standard) ports. The only exception is FTP traffic. The ZyWALL scans whatever port number is specified for FTP in the ALG screen.
 - ZIP file(s) within a ZIP file.

3.6 IDP Profile Configuration

IDP (Intrusion, Detection and Prevention) detects malicious or suspicious packets and protects against network-based intrusions.

Note: You need to first activate your IDP service license or trial. See [Device and Service Registration on page 55](#).

You may want to create a new profile if not all signatures in a base profile are applicable to your network. In this case you should disable non-applicable signatures so as to improve ZyWALL IDP processing efficiency.

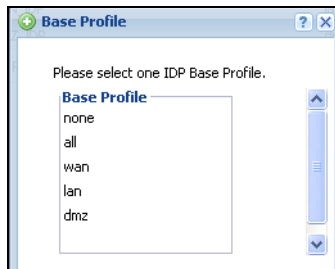
You may also find that certain signatures are triggering too many false positives or false negatives. A false positive is when valid traffic is flagged as an attack. A false negative is when invalid traffic is wrongly allowed to pass through the ZyWALL. As each network is different, false positives and false negatives are common on initial IDP deployment.

You could create a new 'monitor profile' that creates logs but all actions are disabled. Observe the logs over time and try to eliminate the causes of the false alarms. When you're satisfied that they have been reduced to an acceptable level, you could then create an 'inline profile' whereby you configure appropriate actions to be taken when a packet matches a signature.

3.6.1 Procedure To Create a New Profile

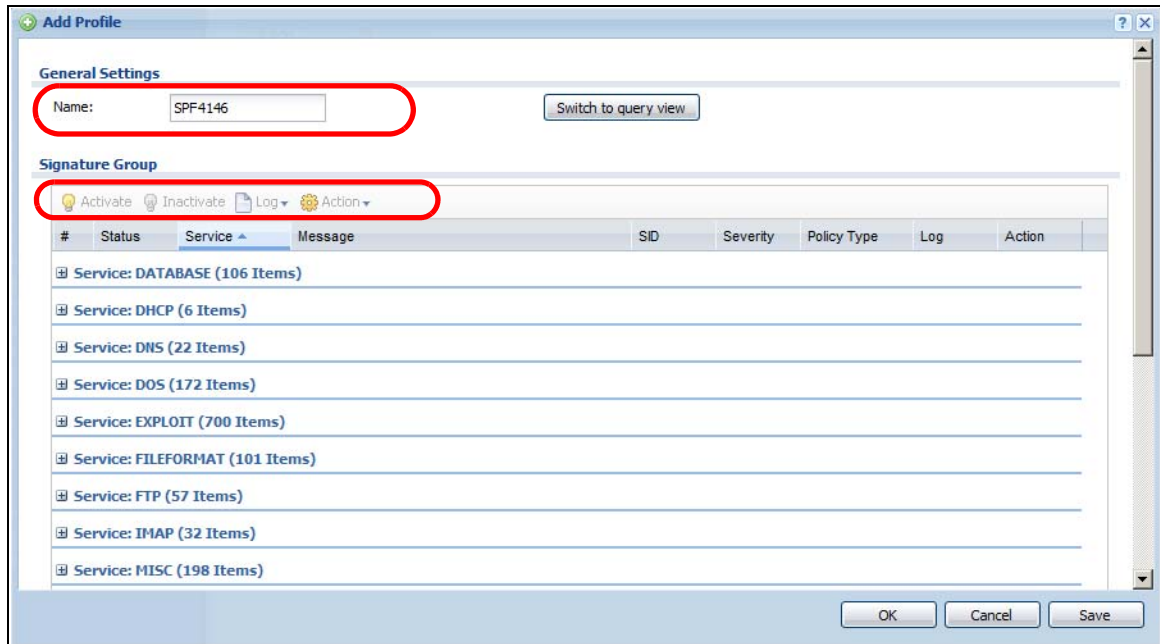
To create a new profile:

- 1 Click **Configuration > Anti-X > IDP > Profile** and in the **Profile Management** section of this screen, click the **Add** icon. A pop-up screen will appear allowing you to choose a base profile. Select a base profile to go to the profile details screen.



Note: If Internet Explorer opens a warning screen about a script making Internet Explorer run slowly and the computer maybe becoming unresponsive, just click **No** to continue.

- 2 Type a new profile **Name**. Enable or disable individual signatures by selecting a row and clicking **Activate** or **Inactivate**. Click **OK**.



- 3 Edit the default log options and actions.

3.7 ADP Profile Configuration

ADP (Anomaly Detection and Prevention) protects against anomalies based on violations of protocol standards (RFCs – Requests for Comments) and abnormal traffic flows such as port scans.

You may want to create a new profile if not all traffic or protocol rules in a base profile are applicable to your network. In this case you should disable non-applicable rules so as to improve ZyWALL ADP processing efficiency.

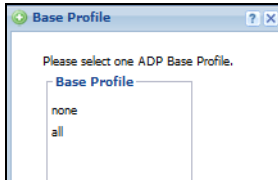
You may also find that certain rules are triggering too many false positives or false negatives. A false positive is when valid traffic is flagged as an attack. A false negative is when invalid traffic is wrongly allowed to pass through the ZyWALL. As each network is different, false positives and false negatives are common on initial ADP deployment.

You could create a new 'monitor profile' that creates logs but all actions are disabled. Observe the logs over time and try to eliminate the causes of the false alarms. When you're satisfied that they have been reduced to an acceptable level, you could then create an 'inline profile' whereby you configure appropriate actions to be taken when a packet matches a detection.

3.7.1 Procedure To Create a New ADP Profile

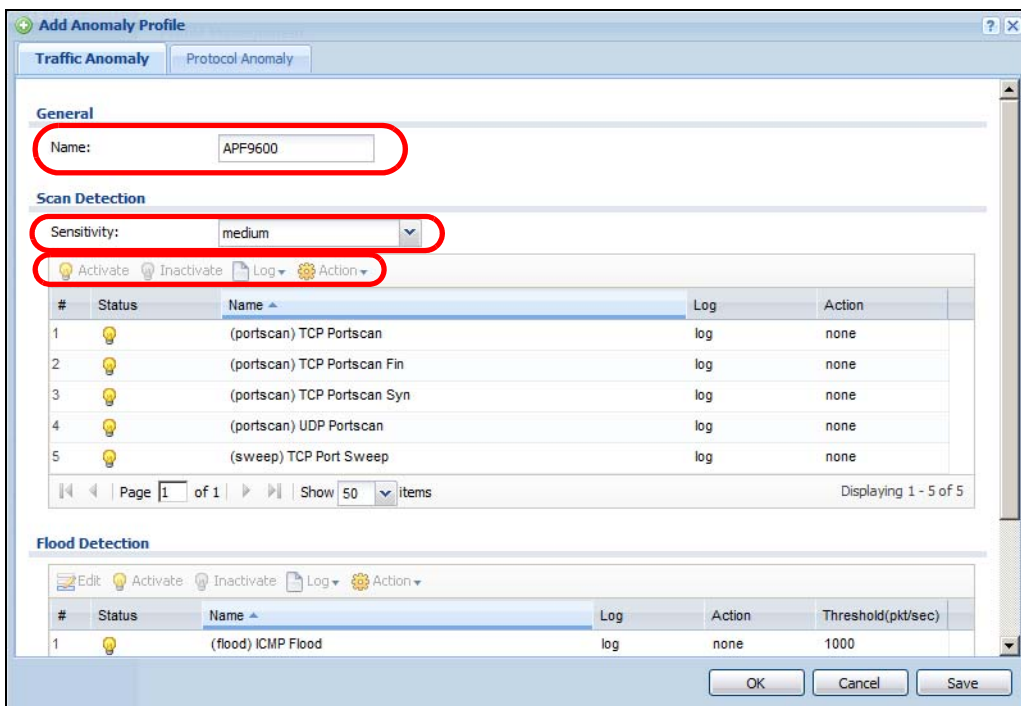
To create a new profile:

- 1 Click **Configuration > Anti-X > ADP > Profile** and in the **Profile Management** section of this screen, click the **Add** icon. A pop-up screen will appear allowing you to choose a base profile. Select a base profile to go to the profile details screen.

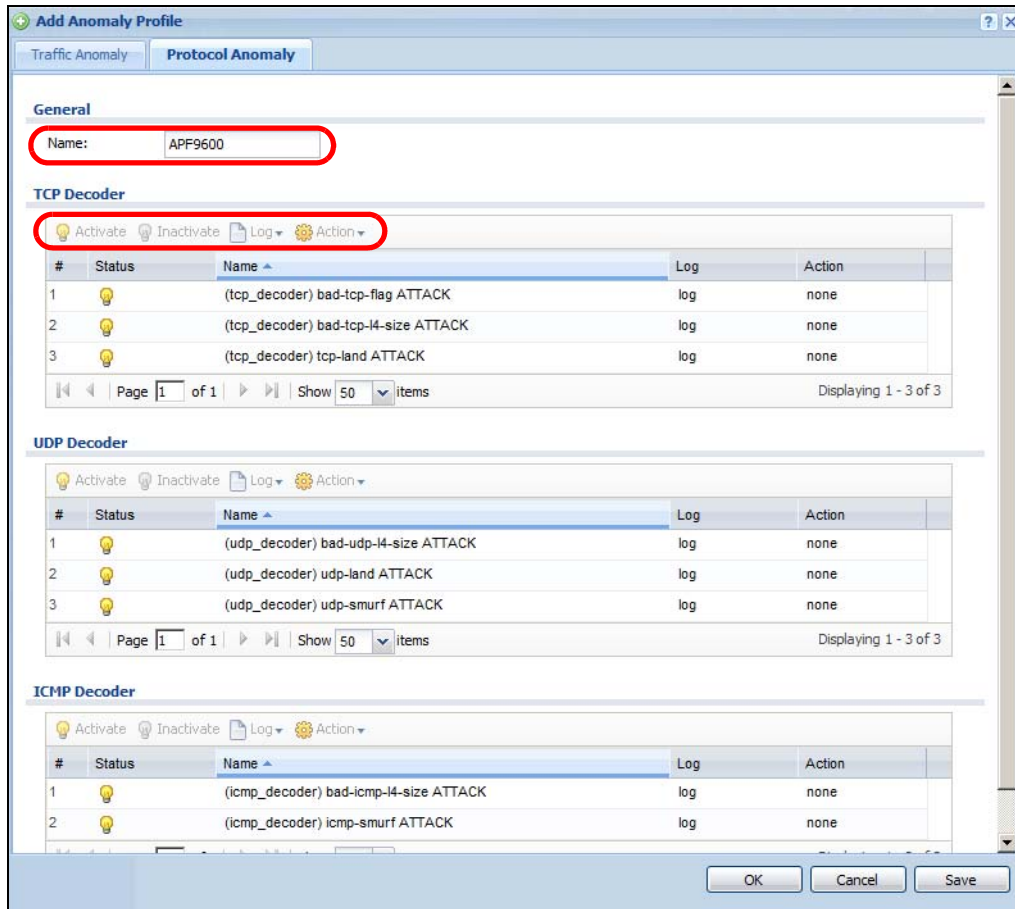


Note: If Internet Explorer opens a warning screen about a script making Internet Explorer run slowly and the computer maybe becoming unresponsive, just click **No** to continue.

- 2 The **Traffic Anomaly** screen will display. Type a new profile **Name**. Enable or disable individual scan or flood types by selecting a row and clicking **Activate** or **Inactivate**. Selecting different levels in the **Sensitivity** drop-down menu adjusts levels for scan thresholds and sample times. Edit the default log options and actions by selecting a row and making a selection in the **Log** or **Action** drop-down menus. Click **OK**.



- 3 Click the **Protocol Anomaly** tab. Type a new profile **Name**. Enable or disable individual rules by selecting a row and clicking **Activate** or **Inactivate**. Edit the default log options and actions by selecting a row and making a selection in the **Log** or **Action** drop-down menus. Click **OK**.



3.8 Content Filter Profile Configuration

Content filter allows you to control access to specific web sites or filter web content by checking against an external database. This tutorial shows you how to configure a Content Filter profile.

Note: You need to first activate your Content Filter service license or trial to use Commtouch or BlueCoat content filtering service. See [Device and Service Registration on page 55](#).

- 1 You will first configure a content filter profile. Click **Configuration > Anti-X > Content Filter > Filter Profile > Add** to open the following screen. Enter a profile **Name** and select **Enable Content Filter Category Service** and select desired actions for the different web page categories. Then select the categories to include in the profile or select **Select All Categories**. Click **Apply**.

General Settings

License Status: Licensed

License Type: Trial

Name: BlueCoat

☒ Enable Content Filter Category Service

Action for Unsafe Web Pages: Warn Log

Action for Managed Web Pages: Block Log

Action for Unrated Web Pages: Warn Log

Action When Category Server Is Unavailable: Warn Log

Select Categories

☒ Select All Categories ☐ Clear All Categories

- Click the **General** tab and in the **Policies** section click **Add**. In the **Add Policy** screen that appears, select the **Filter Profile** you created in the previous step. Click **OK**.

Add Policy

Create new Object

☒ Enable Policy

Schedule: none

Address: any

Filter Profile: BlueCoat

User/Group: any

OK Cancel

- In the **General** screen, the configured policy will appear in the **Policies** section. Select **Enable Content Filter** and select **BlueCoat**. Then select **Enable Content Filter Report Service** to collect content filtering statistics for reports. Click **Apply**.

General Filter Profile Trusted Web Sites Forbidden Web Sites

General Settings

☒ Enable Content Filter

☐ Commtouch

☒ BlueCoat

☒ Enable Content Filter Report Service

Content Filter Category Service Timeout: 10 (1~60 Seconds)

Content Filter Port

Policies

☐ Block web access when no policy is applied

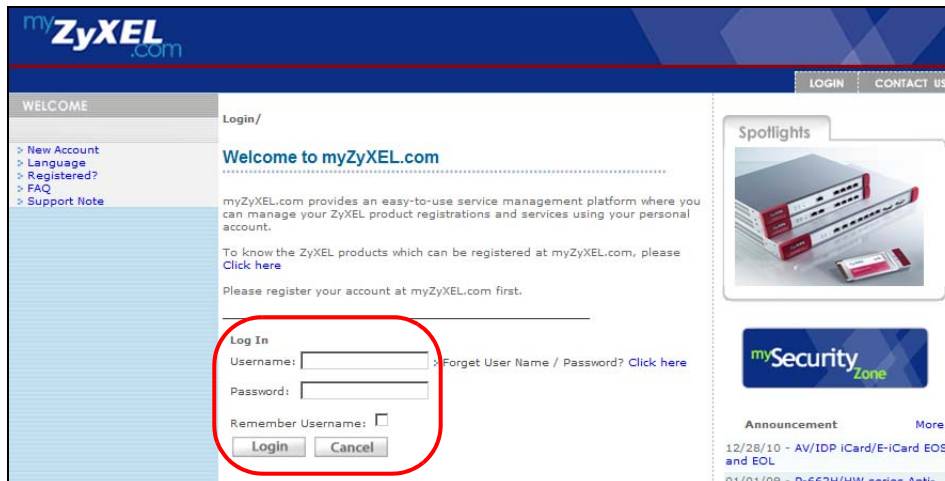
#	Status	Address	Schedule	User	Filter Profile
1	Lightbulb icon	any	none	any	BlueCoat

Page 1 of 1 Show 50 items Displaying 1 - 1 of 1

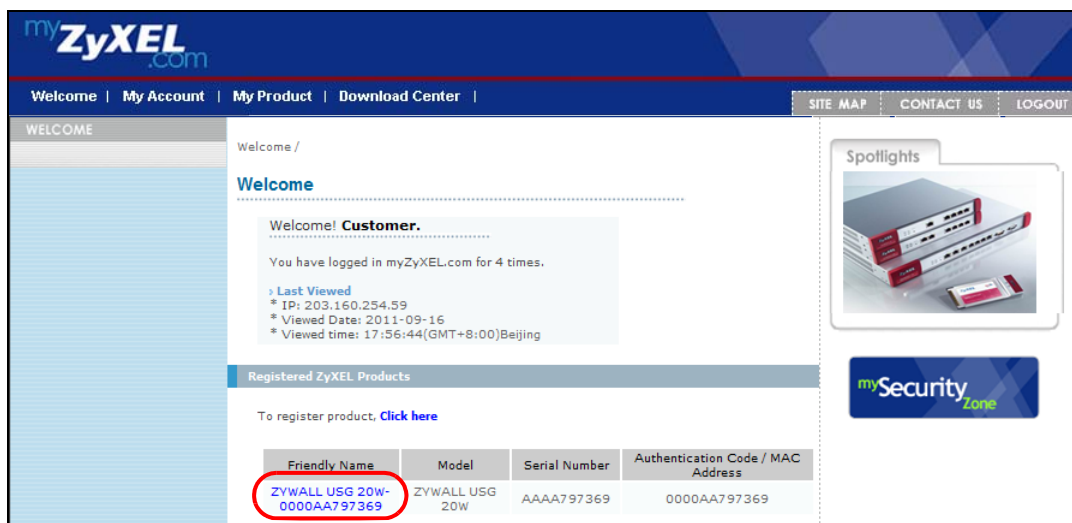
3.9 Viewing Content Filter Reports

Content filtering reports are generated statistics and charts of access attempts to web sites belonging to the categories you selected in your device content filter screen. You need to register your iCard before you can view content filtering reports. Alternatively, you can also view content filtering reports during the free trial (up to 30 days).

- 1 Go to <http://www.myZyXEL.com>. Fill in your myZyXEL.com account information and click **Login**.



- 2 A welcome screen displays. Click your ZyWALL's model name and/or MAC address under **Registered ZyXEL Products** (the ZyWALL 20W is shown as an example here). You can change the descriptive name for your ZyWALL using the **Rename** button in the **Service Management** screen.



- 3 In the **Service Management** screen click **Content Filter (BlueCoat)** or **Content Filter (CommTouch)** in the **Service Name** column to open the content filter reports screens.

My Products / Service Activation

Service Management

Product Information

ZYWALL USG 20W-0000AA797369

Serial Number:AAAA797369

Products:ZYWALL USG 20W

Authentication Code / MAC Address:0000AA797369

Activation Key:N/A

Edit Reseller Information

Reseller Business Name:

Reseller Email:

Reseller Phone Number:

VAT Number:

Manage Product

Manage this product's registration by clicking on the appropriate buttons below

> ZYWALL USG 20W-0000AA797369

Rename

Transfer

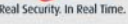
Available Service List

To enable your service(s), please click "Activate" shown below to enter your license key(s).

	Service Name	Service Activation	Service Type	Status	Expiration Date	Remark
1	Content Filter(BlueCoat):Applied	Upgrade	Trial	Installed	2011-09-30 extends to 2012-09-30	-
2	Content Filter(CommTouch)	Upgrade	Trial	Installed	2011-09-30 extends to 2012-09-30	-

- 4 In the **Web Filter Home** screen, click **CommTouch Report** or **BlueCoat Report**.





Powered By



Technical Support



Web Filter Home

Welcome

You're protected by Web Filtering. Web Filtering provides you the ability to control what web sites can be accessed on your home or business PC. Web Filter allows you to modify blocked categories and view reports of Internet activity.

REPORTS:

Track Internet activity by viewing user reports, including site violations.

Click links bellow to enter Commtouch / BlueCoat report:

 [Commtouch Report](#)

 [BlueCoat Report](#)

- 5** Select items under **Global Reports** to view the corresponding reports.

[Technical Support](#)

**Commtouch Reports**

[Report Home](#) | [Global Reports](#)



Report Home

Report Navigation

Global reports provide You with an overview of all your Internet use.

Global Reports

- [Allowed/Blocked](#)
- [Categories](#)
- [URLs](#)

- 6 Select a time period in the **Date Range** field, either **Allowed** or **Blocked** in the **Action Taken** field and a category (or enter the user name if you want to view single user reports) and click **Run Report**. The screens vary according to the report type you selected in the **Report Home** screen.

- 7 A chart and/or list of requested web site categories display in the lower half of the screen.



- 8 You can click a category in the **Categories** report or click **URLs** in the **Report Home** screen to see the URLs that were requested.



3.10 Anti-Spam Policy Configuration

This tutorial shows you how to configure an Anti-Spam policy with Mail Scan functions and DNS Black List (DNSBL).

Note: You need to first activate your Anti-Spam service license or trial to use the Mail Scan functions (Sender Reputation, Mail Content Analysis and Virus Outbreak Detection). See [Device and Service Registration on page 55](#).

- 1 To use the Mail Scan functions (Sender Reputation, Mail Content Analysis and Virus Outbreak Detection) you need to enable them in the **Mail Scan** screen. Click **Configuration > Anti-X > Anti-Spam > Mail Scan** to open this screen. Enable the desired Mail Scan functions. Click **Apply**.

The screenshot shows the 'Mail Scan' configuration screen. The 'Mail Scan' tab is active. The 'Sender Reputation' section has 'Enable Sender Reputation Checking (SMTP only)' checked. The 'Mail Content Analysis' section has 'Enable Mail Content Analysis' checked. The 'Virus Outbreak Detection' section has 'Enable Virus Outbreak Detection' checked. Each checked checkbox is circled in red.

- 2 To configure DNS Black List (DNSBL), click the **DNSBL** tab. Select **Enable DNS Black List (DNSBL) Checking**. In the **DNSBL Domain** section click **Add**. Enter the **DNSBL Domain** for a DNSBL service. In this example, **zen.spamhaus.org** is used. Click **Apply**.

The screenshot shows the 'DNSBL' configuration screen. The 'DNSBL' tab is active. Under 'General Settings', 'Enable DNS Black List (DNSBL) Checking' is checked. Under 'Query Timeout Settings', 'SMTP' and 'POP3' are set to 'forward with tag'. Under 'DNSBL Domain List', the 'Add' button is circled in red, and 'zen.spamhaus.org' is entered in the 'DNSBL Domain' field.

- 3 Click the **General** tab. In the **Policy Summary** section, click **Add** to display the **Add rule** screen. Select from the list of available **Scan Options** and click **OK** to return to the **General** screen.

- 4 In the **General** screen, the policy configured in the previous step will display in the **Policy Summary** section. Select **Enable Anti-Spam** and click **Apply**.

St...	Pri...	From	To	Protocol	Scan Options
1		any	any	smtp, pop3	WL, BL, IP Reputation, Mail Content, Virus Outbre...

Page 1 of 1 | Show 50 items | Displaying 1 - 1 of 1

Create Secure Connections Across the Internet

These sections cover using VPN to create secure connections across the Internet.

- [IPSec VPN on page 69](#)
- [VPN Concentrator Example on page 71](#)
- [Hub-and-spoke IPSec VPN Without VPN Concentrator on page 73](#)
- [ZyWALL IPSec VPN Client Configuration Provisioning on page 75](#)
- [SSL VPN on page 77](#)
- [L2TP VPN with Android, iOS, and Windows on page 79](#)
- [One-Time Password Version 2 \(OTPV2\) on page 92](#)

4.1 IPSec VPN

Besides using the VPN quick setup wizard to configure settings for an IPSec VPN tunnel, you can use the **Configuration > VPN > IPSec VPN** screens to configure and activate or deactivate VPN gateway and IPSec VPN connection policies. You can also connect or disconnect IPSec VPN connections.

- Use the **VPN Gateway** screens to manage the ZyWALL's VPN gateways. A VPN gateway specifies the IPSec routers at either end of a VPN tunnel and the IKE SA settings (phase 1 settings). You can also activate or deactivate each VPN gateway.
- Use the **VPN Connection** screens to specify which IPSec VPN gateway an IPSec VPN connection policy uses, which devices behind the IPSec routers can use the VPN tunnel, and the IPSec SA settings (phase 2 settings). You can also activate or deactivate and connect or disconnect each VPN connection (each IPSec SA).

4.1.1 Test the VPN Connection

After you configure the VPN gateway and VPN connection settings, set up the VPN settings on the peer IPSec router and try to establish the VPN tunnel. To trigger the VPN, either try to connect to a device on the peer IPSec router's LAN or click **Configuration > VPN > IPSec VPN > VPN Connection** and use the VPN connection screen's **Connect** icon.

4.1.2 Configure Security Policies for the VPN Tunnel

You configure security policies based on zones. The new VPN connection was assigned to the IPSec_VPN zone. By default, there are no security restrictions on the IPSec_VPN zone, so, next, you should set up security policies that apply to the IPSec_VPN zone.

4.1.3 What Can Go Wrong

If the IPSec tunnel does not build properly, the problem is likely a configuration error at one of the IPSec routers. Log into both IPSec routers and check the settings in each field methodically and slowly. Make sure both the ZyWALL and remote IPSec router have the same security settings for the VPN tunnel. It may help to display the settings for both routers side-by-side.

Here are some general suggestions.

- The system log can often help to identify a configuration problem.
- If you enable NAT traversal, the remote IPSec device must also have NAT traversal enabled.
- Both routers must use the same authentication method to establish the IKE SA.
- Both routers must use the same negotiation mode, encryption algorithm, authentication algorithm, and DH key group.
- When using manual keys, both routers must use the same encryption key and authentication key.
- When using pre-shared keys, both routers must use the same pre-shared key.
- The ZyWALL's local and peer ID type and content must match the remote IPSec router's peer and local ID type and content, respectively.
- Both routers must use the same active protocol, encapsulation, and SPI.
- If the sites are/were previously connected using a leased line or ISDN router, physically disconnect these devices from the network before testing your new VPN connection. The old route may have been learnt by RIP and would take priority over the new VPN connection.
- To test whether or not a tunnel is working, ping from a computer at one site to a computer at the other.
Before doing so, ensure that both computers have Internet access (via the IPSec routers).
- It is also helpful to have a way to look at the packets that are being sent and received by the ZyWALL and remote IPSec router (for example, by using a packet analyzer such as Wireshark).

Check the configuration for the following ZyWALL features.

- Make sure the To-ZyWALL firewall rules allow IPSec VPN traffic to the ZyWALL. IKE uses UDP port 500, AH uses IP protocol 51, and ESP uses IP protocol 50.
- The ZyWALL supports UDP port 500 and UDP port 4500 for NAT traversal. If you enable this, make sure the To-ZyWALL firewall rules allow UDP port 4500 too.
- Make sure regular firewall rules allow traffic between the VPN tunnel and the rest of the network. Regular firewall rules check packets the ZyWALL sends before the ZyWALL encrypts them and check packets the ZyWALL receives after the ZyWALL decrypts them. This depends on the zone to which you assign the VPN tunnel and the zone from which and to which traffic may be routed.
- If you set up a VPN tunnel across the Internet, make sure your ISP supports AH or ESP (whichever you are using).
- If you have the ZyWALL and remote IPSec router use certificates to authenticate each other, You must set up the certificates for the ZyWALL and remote IPSec router first and make sure they trust each other's certificates. If the ZyWALL's certificate is self-signed, import it into the remote IPsec router. If it is signed by a CA, make sure the remote IPsec router trusts that CA. The ZyWALL uses one of its **Trusted Certificates** to authenticate the remote IPSec router's certificate. The trusted certificate can be the remote IPSec router's self-signed certificate or that of a trusted CA that signed the remote IPSec router's certificate.
- Multiple SAs connecting through a secure gateway must have the same negotiation mode.

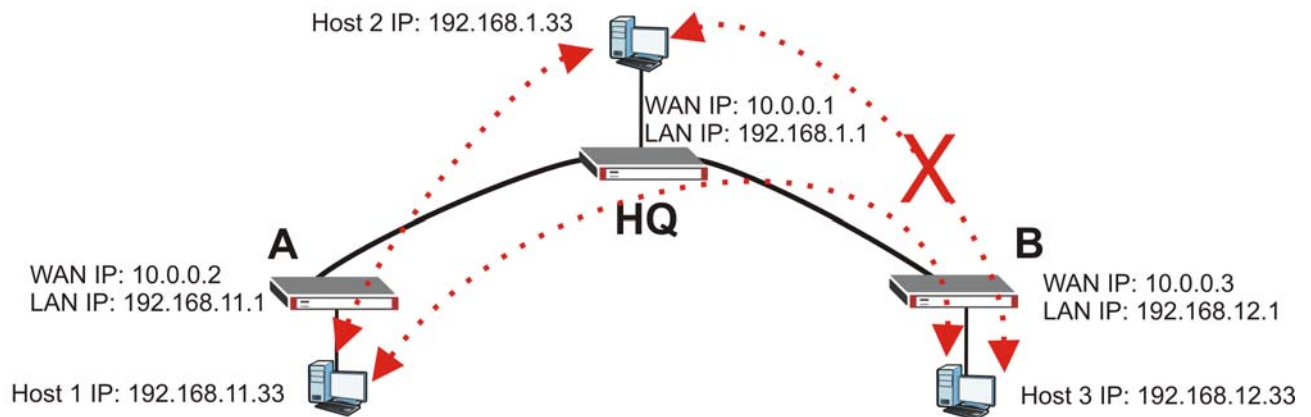
If you have the **Configuration > VPN > IPsec VPN > VPN Connection** screen's **Use Policy Route to control dynamic IPsec rules option** enabled and the VPN connection is up but VPN traffic cannot be transmitted through the VPN tunnel, check the routing policies to see if they are sending traffic elsewhere instead of through the VPN tunnels.

4.2 VPN Concentrator Example

A VPN concentrator uses hub-and-spoke VPN topology to combine multiple IPsec VPN connections into one secure network. The hub routes VPN traffic between the spoke routers and itself. This reduces the number of VPN connections to set up and maintain. Here a VPN concentrator connects ZLD-based ZyWALLs at headquarters (HQ) and branch offices A and B in one secure network.

- Branch A's ZyWALL uses one VPN rule to access both the headquarters (HQ) network and branch B's network.
- Branch B's ZyWALL uses one VPN rule to access branch A's network only. Branch B is not permitted to access the headquarters network.

Figure 29 IPsec VPN Concentrator Example



This IPsec VPN concentrator example uses the following settings.

Branch Office A

VPN Gateway (VPN Tunnel 1):

- My Address: 10.0.0.2
- Peer Gateway Address: 10.0.0.1

VPN Connection (VPN Tunnel 1):

- Local Policy: 192.168.11.0/255.255.255.0
- Remote Policy: 192.168.1.0/255.255.255.0
- Disable Policy Enforcement

Policy Route

- Source: 192.168.11.0

- Destination: 192.168.12.0
- Next Hop: VPN Tunnel 1

Headquarters

VPN Gateway (VPN Tunnel 1):

- My Address: 10.0.0.1
- Peer Gateway Address: 10.0.0.2

VPN Connection (VPN Tunnel 1):

- Local Policy: 192.168.1.0/255.255.255.0
- Remote Policy: 192.168.11.0/255.255.255.0
- Disable Policy Enforcement

VPN Gateway (VPN Tunnel 2):

- My Address: 10.0.0.1
- Peer Gateway Address: 10.0.0.3

VPN Connection (VPN Tunnel 2):

- Local Policy: 192.168.1.0/255.255.255.0
- Remote Policy: 192.168.12.0/255.255.255.0
- Disable Policy Enforcement

Concentrator

- Add VPN tunnel 1 and VPN tunnel 2 to an IPSec VPN concentrator.

Firewall

- Block traffic from VPN tunnel 2 from accessing the LAN.

Branch Office B

VPN Gateway (VPN Tunnel 2):

- My Address: 10.0.0.3
- Peer Gateway Address: 10.0.0.1

VPN Connection (VPN Tunnel 2):

- Local Policy: 192.168.12.0/255.255.255.0
- Remote Policy: 192.168.1.0/255.255.255.0
- Disable Policy Enforcement

Policy Route

- Source: 192.168.12.0

- Destination: 192.168.11.0
- Next Hop: VPN Tunnel 2

4.2.1 What Can Go Wrong

Consider the following when using the VPN concentrator.

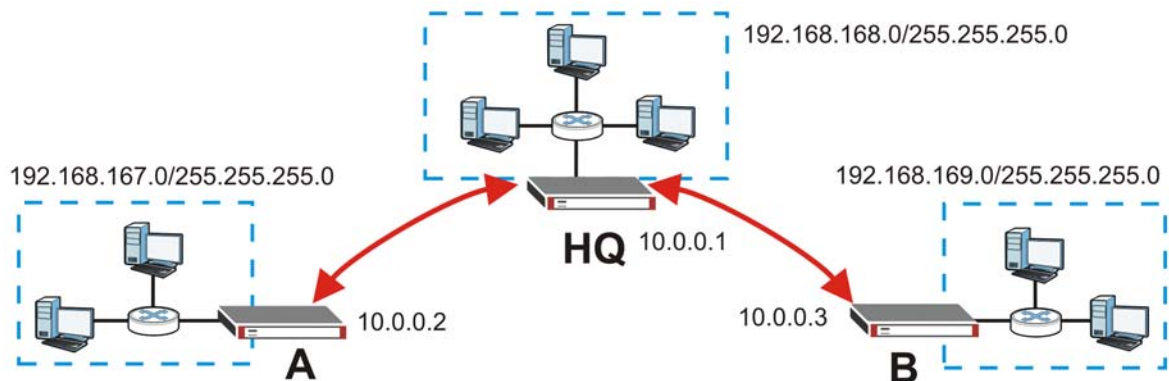
- The local IP addresses configured in the VPN rules should not overlap.
- The concentrator must have at least one separate VPN rule for each spoke. In the local policy, specify the IP addresses of the networks with which the spoke is to be able to have a VPN tunnel. This may require you to use more than one VPN rule for each spoke.
- To have all Internet access from the spoke routers go through the VPN tunnel, set the VPN rules in the spoke routers to use 0.0.0.0 (any) as the remote IP address.
- Your firewall rules can still block VPN packets.
- If on a USG ZyWALL or ZyWALL 1050 the concentrator's VPN tunnels are members of a single zone, make sure it is not set to block intra-zone traffic.

4.3 Hub-and-spoke IPSec VPN Without VPN Concentrator

Here is an example of a hub-and-spoke VPN that does not use the ZyWALL's VPN concentrator feature. Here branch office A has a ZyNOS-based ZyWALL and headquarters (HQ) and branch office B have ZLD-based ZyWALLs.

- Branch A's ZyWALL uses one VPN rule to access both the headquarters (HQ) network and branch B's network.
- Branch B's ZyWALL uses one VPN rule to access both the headquarters and branch A's networks.

Figure 30 Hub-and-spoke VPN Example



This hub-and-spoke VPN example uses the following settings.

Branch Office A (ZyNOS-based ZyWALL):

Gateway Policy (Phase 1):

- My Address: 10.0.0.2
- Primary Remote Gateway: 10.0.0.1

Network Policy (Phase 2): Local Network: 192.168.167.0/255.255.255.0; Remote Network: 192.168.168.0~192.168.169.255

Headquarters (ZLD-based ZyWALL):

VPN Gateway (VPN Tunnel 1):

- My Address: 10.0.0.1
- Peer Gateway Address: 10.0.0.2

VPN Connection (VPN Tunnel 1):

- Local Policy: 192.168.168.0~192.168.169.255
- Remote Policy: 192.168.167.0/255.255.255.0
- Disable Policy Enforcement

VPN Gateway (VPN Tunnel 2):

- My Address: 10.0.0.1
- Peer Gateway Address: 10.0.0.3

VPN Connection (VPN Tunnel 2):

- Local Policy: 192.168.167.0~192.168.168.255
- Remote Policy: 192.168.169.0/255.255.255.0
- Disable Policy Enforcement

Branch Office B (ZLD-based ZyWALL):

VPN Gateway:

- My Address: 10.0.0.3
- Peer Gateway Address: 10.0.0.1

VPN Connection:

- Local Policy: 192.168.169.0/255.255.255.0
- Remote Policy: 192.168.167.0~192.168.168.255
- Disable Policy Enforcement

4.3.1 What Can Go Wrong

Consider the following when implementing a hub-and-spoke VPN.

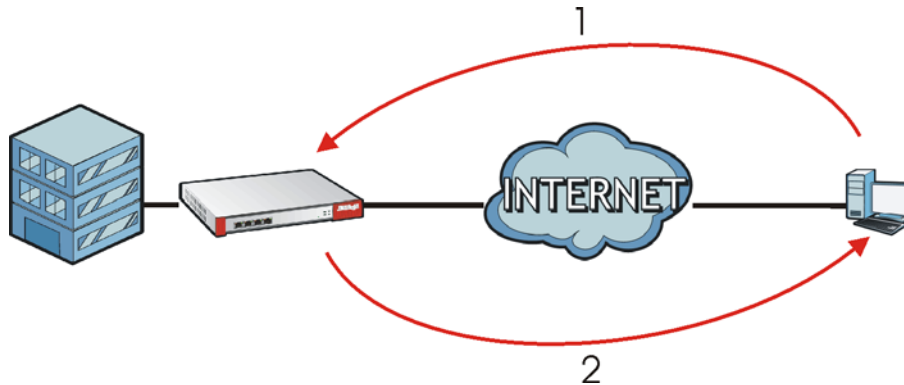
- This example uses a wide range for the ZyNOS-based ZyWALL's remote network, to use a narrower range, see [Section 4.3 on page 73](#) for an example of configuring a VPN concentrator.
- The local IP addresses configured in the VPN rules should not overlap.
- The hub router must have at least one separate VPN rule for each spoke. In the local policy, specify the IP addresses of the hub-and-spoke networks with which the spoke is to be able to have a VPN tunnel. This may require you to use more than one VPN rule.

- To have all Internet access from the spoke routers to go through the VPN tunnel, set the VPN rules in the spoke routers to use 0.0.0.0 (any) as the remote IP address.
- Your firewall rules can still block VPN packets.
- If the ZLD-based ZyWALLs' VPN tunnels are members of a single zone, make sure it is not set to block intra-zone traffic.
- The ZyNOS based ZyWALLs don't have user-configured policy routes so the only way to get traffic destined for another spoke router to go through the ZyNOS ZyWALL's VPN tunnel is to make the remote policy cover both tunnels.
- Since the ZLD-based ZyWALLs automatically handle the routing for VPN tunnels, if a ZLD-based ZyWALL ZyWALL is a hub router and the local policy covers both tunnels, the automatic routing takes care of it without needing a VPN concentrator.
- If a ZyNOS-based ZyWALL's remote network setting overlaps with its local network settings, set `ipsec swSkipOverlapIp` to on to send traffic destined to A's local network to A's local network instead of through the VPN tunnel.

4.4 ZyWALL IPsec VPN Client Configuration Provisioning

VPN configuration provisioning gives ZyWALL IPsec VPN Client users VPN rule settings automatically.

Figure 31 IPsec VPN Configuration Provisioning Process

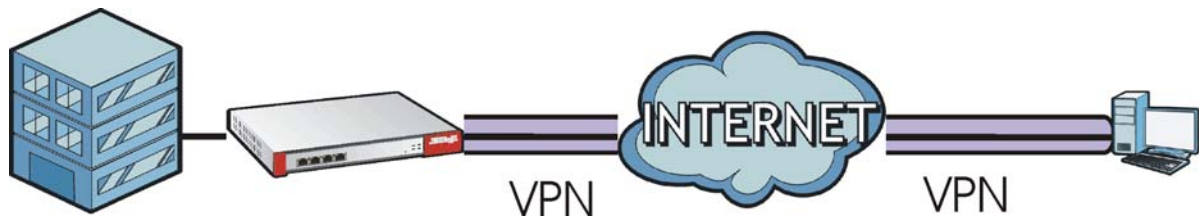


- 1 User Charlotte with the ZyWALL IPsec VPN Client sends her user name and password to the ZyWALL.
- 2 The ZyWALL sends the settings for the matching VPN rule.

4.4.1 Overview of What to Do

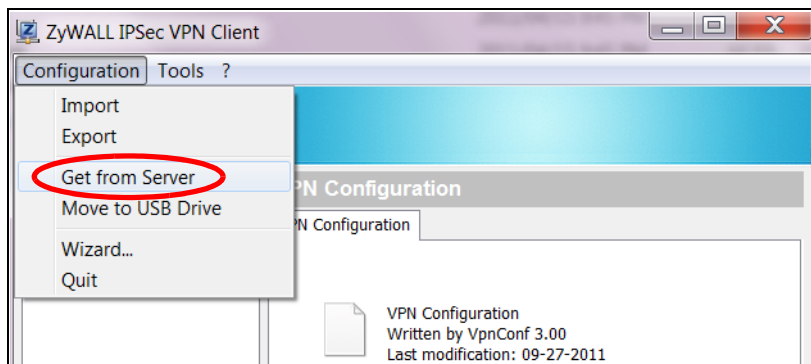
- 1 Create a VPN rule on the ZyWALL using the VPN Configuration Provisioning wizard.
- 2 Configure a username and password for the rule on the ZyWALL.
- 3 On a computer, use the ZyWALL IPsec VPN Client to get the VPN rule configuration.

Now user Charlotte can access the network behind the ZyWALL through the VPN tunnel.

Figure 32 ZyWALL IPSec VPN Client with VPN Tunnel Connected

4.4.2 Configuration Steps

- 1 In the ZyWALL **Quick Setup** wizard, use the **VPN Settings for Configuration Provisioning** wizard to create a VPN rule that can be used with the ZyWALL IPSec VPN Client.
- 2 Click **Configuration > Object > User/Group** and create a user account for the ZyWALL IPSec VPN Client user.
- 3 Then, enable **Configuration Provisioning** in **Configuration > VPN > IPSec VPN > Configuration Provisioning** and configure it to allow the newly created user to retrieve this rule's settings using the ZyWALL IPSec VPN Client.
- 4 On the ZyWALL IPSec VPN Client, select **Configuration > Get From Server**.



- 5 Enter the WAN IP address or URL for the ZyWALL. If you changed the default HTTPS port on the ZyWALL, then enter the new one here. Enter the user name (**Login**) and password exactly as configured on the ZyWALL or external authentication server. Click **Next**.

- 6 Click **OK**. The rule settings are now imported from the ZyWALL into the ZyWALL IPsec VPN Client.

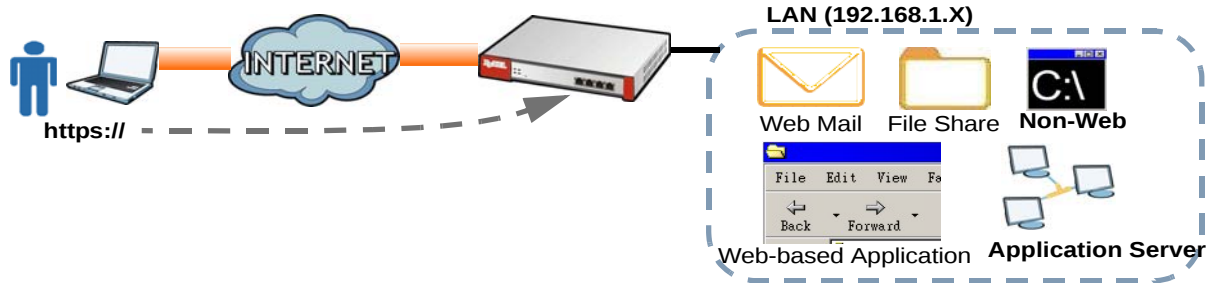
4.4.3 What Can Go Wrong

- VPN rule settings violate the the ZyWALL IPsec VPN Client restrictions:
Check that the rule does not contain **AH** active protocol, **NULL** encryption, **SHA512** authentication, or a subnet/range remote policy.
The ZyWALL IPsec VPN Client can also indicate rule violations. Check its warning screen.
Although the rule settings may be valid, whether the tunnel actually works depends on the network environment. For example, a remote policy IP address for a server may be valid, but the server may be down or have an actual different IP address.
- There is a login problem:
Reenter the user name (**Login**) and password in the ZyWALL IPsec VPN Client exactly as configured on the ZyWALL or the external authentication server.
Check that the client authentication method selected on the ZyWALL is where the user name and password are configured . For example, if the user name and password are configured on the ZyWALL, then the configured authentication method should be **Local**.
- There's a network connectivity problem between the ZyWALL and the ZyWALL IPsec VPN Client:
Check that the correct ZyWALL IP address and HTTPS port (if the default port was changed) was entered.
Ping the ZyWALL from the computer on which the ZyWALL IPsec VPN Client is installed.
If there is no reply, check that the computer has Internet access.
If the computer has Internet access, contact the ZyWALL administrator.
- The entry is not activated:
Make sure that both **Enable Configuration Provisioning** in **Configuration > VPN > IPsec VPN > Configuration Provisioning** is selected and that the entry has a yellow **Status** icon.

4.5 SSL VPN

SSL VPN uses remote users' web browsers to provide the easiest-to-use of the ZyWALL's VPN solutions. A user just types the ZyWALL's web address and enters his user name and password to securely access the ZyWALL's network. Here a user uses his browser to securely connect to network resources in the same way as if he were part of the internal network.

Figure 33 SSL VPN



- Click **Configuration > Object > SSL Application** and configure an SSL application object to specify the type of application and the address of the local computer, server, or web site SSL users are to be able to access.
- Click **Configuration > VPN > SSL VPN > Access Privilege** to configure SSL access policies.
- Use the **Configuration > VPN > SSL VPN > Global Setting** screen to set the IP address of the ZyWALL (or a gateway device) on your network for full tunnel mode access, enter access messages or upload a custom logo to be displayed on the remote user screen.

Remote users can access resources on the local network using one of the following methods:

- Using a supported web browser
Once you have successfully logged in through the ZyWALL, you can access intranet sites, web-based applications, or web-based e-mails using one of the supported web browsers.
- Using the ZyWALL SecuExtender client
Once you have successfully logged into the ZyWALL, if the SSL VPN access policy has network extension enabled the ZyWALL automatically loads the ZyWALL SecuExtender client program to your computer. With the ZyWALL SecuExtender, you can access network resources, remote desktops and manage files as if you were on the local network.

4.5.1 What Can Go Wrong

- If you uploaded a logo to show in the SSL VPN user screens but it does not display properly, check that the logo graphic is in GIF, JPG, or PNG format. The graphic should use a resolution of 103 x 29 pixels to avoid distortion when displayed. The ZyWALL automatically resizes a graphic of a different resolution to 103 x 29 pixels. The file size must be 100 kilobytes or less. Transparent background is recommended.
- If users can log into the SSL VPN but cannot see some of the resource links check the SSL application object's configuration.
- If the user account is not included in an SSL VPN access policy, the ZyWALL redirects the user to the user aware screen.
- Operating system and browser requirements for the remote user's computer:
 - Windows 7 (32 or 64-bit), Vista (32 or 64-bit), 2003 (32-bit), XP (32-bit), or 2000 (32-bit)
 - Internet Explorer 7 and above or Firefox 1.5 and above
 - Using RDP requires Internet Explorer
 - Sun's Runtime Environment (JRE) version 1.6 or later installed and enabled.
- Changing the HTTP/HTTPS configuration disconnects SSL VPN network extension sessions. Users need to re-connect if this happens.

4.6 L2TP VPN with Android, iOS, and Windows

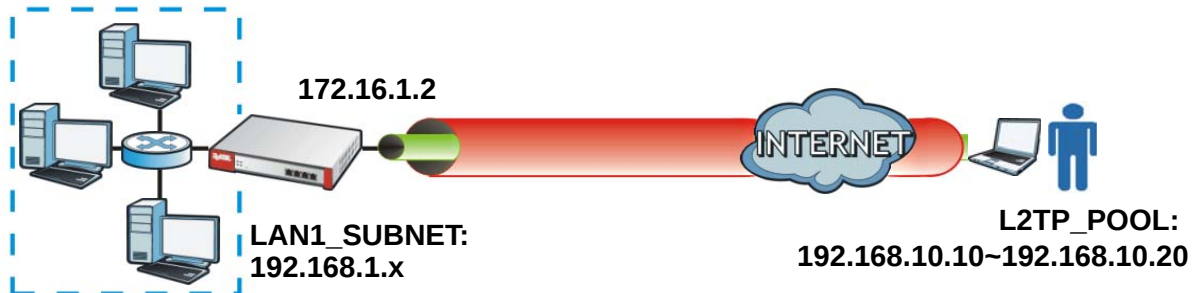
L2TP VPN uses the L2TP and IPsec client software included in remote users' Android, iOS, or Windows operating systems for secure connections to the network behind the ZyWALL.

- 1 L2TP VPN uses one of the ZyWALL's IPsec VPN connections. Edit **Default_L2TP_VPN_GW** as follows:
 - Set **My Address** to the WAN interface domain name or IP address you want to use.
 - Replace the default **Pre-Shared Key**.
- 2 Create a host-type address object containing the **My Address** IP address configured in the **Default_L2TP_VPN_GW** and set the **Default_L2TP_VPN_Connection's Local Policy** to use it.
- 3 In **Configuration > VPN > L2TP VPN** enable the connection and set the VPN connection L2TP VPN uses, the L2TP client IP address pool, the authentication method, and the allowed users.
- 4 Configure a policy route to let remote users access resources on the network behind the ZyWALL.
 - Set the policy route's **Source Address** to the address object that you want to allow the remote users to access (**LAN1_SUBNET** in the following example).
 - Set the **Destination Address** to the IP address pool that the ZyWALL assigns to the remote users (**L2TP_POOL** in the following example).
 - Set the next hop to be the VPN tunnel you are using for L2TP.

4.6.1 L2TP VPN Example

Here a sales representative uses a laptop to securely connect to the ZyWALL's network.

Figure 34 L2TP VPN Example



- The ZyWALL has a WAN interface with a static IP address of 172.16.1.2.
- The remote user has a dynamic public IP address and connects through the Internet.
- You configure an IP address pool object named **L2TP_POOL** to assign the remote users IP addresses from 192.168.10.10 to 192.168.10.20 for use in the L2TP VPN tunnel.
- The VPN rule allows the remote user to access the **LAN1_SUBNET** (the 192.168.1.x subnet).

Do the following to configure the L2TP VPN example:

- 1 Click **Configuration > VPN > IPSec VPN > VPN Gateway** and double-click the **Default_L2TP_VPN_GW** entry.

Select **Enable**.

Set **My Address**. This example uses a WAN interface with static IP address 172.16.1.2.

Set **Authentication** to **Pre-Shared Key** and configure a password. This example uses **top-secret**. Click **OK**.

- 2 Click the **VPN Connection** tab and double-click the **Default_L2TP_VPN_Connection** entry.

Click **Create New Object > Address** and create a host type address object that contains the **My Address** IP address you configured in the **Default_L2TP_VPN_GW**. The address object in this example uses the WAN interface's IP address (172.16.1.2) and is named **L2TP_IFACE**.

Select **Enable**, set **Application Scenario** to **Remote Acces** and **Local Policy** to **L2TP_IFACE**, and click **OK**.

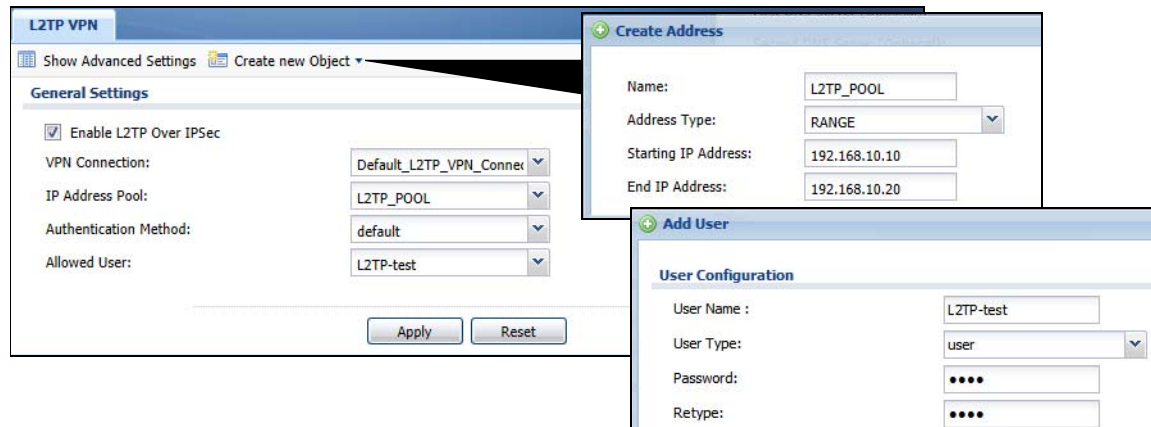
- Click **Configuration > VPN > L2TP VPN** and then **Create New Object > Address** to create an IP address pool for the L2TP VPN clients. This example uses **L2TP_POOL** with a range of 192.168.10.10 to 192.168.10.20. Click **Create New Object > User / Group** to create a user object for the users allowed to use the tunnel. This example uses a user object named **L2TP-test**.

Enable the connection.

Set **VPN Connection** to **Default_L2TP_VPN_Connection**.

Set **IP Address Pool** to **L2TP_POOL**.

Select the authentication method (default in this example), and select the users that can use the tunnel (**L2TP-test** in this example).



4.6.2 Configuring Policy Routing

You must also configure a policy route to let remote users access resources on the network behind the ZyWALL.

- Set the policy route's **Source Address** to the address object that you want to allow the remote users to access (**LAN_1SUBNET** in this example).
- Set the **Destination Address** to the IP address pool that the ZyWALL assigns to the remote users (**L2TP_POOL** in this example).
- Set the next hop to be the VPN tunnel that you are using for L2TP VPN.

Add Policy Route

Show Advanced Settings Create new Object

Configuration

☒ Enable

Description: L2TP_VPN (Optional)

Criteria

User: any

Incoming: any (Excluding ZyWALL)

Source Address: LAN1_SUBNET

Destination Address: L2TP_POOL

DSCP Code: any

Schedule: none

Service: any

Next-Hop

Type: VPN Tunnel

VPN Tunnel: Default_L2TP_VPN_Conne

To manage the ZyWALL through the L2TP VPN tunnel, create a routing policy that sends the ZyWALL's return traffic back through the L2TP VPN tunnel.

- Set **Incoming** to **ZyWALL**.
- Set **Destination Address** to the L2TP address pool.
- Set the next hop to be the VPN tunnel that you are using for L2TP.

Add Policy Route

Show Advanced Settings Create new Object

Configuration

☒ Enable

Description: Remote Management (Optional)

Criteria

User: admin

Incoming: ZyWALL

Source Address: any

Destination Address: L2TP_POOL

DSCP Code: any

Schedule: none

Service: any

Next-Hop

Type: VPN Tunnel

VPN Tunnel: Default_L2TP_VPN_Conne

If some of the traffic from the L2TP clients needs to go to the Internet, create a policy route to send traffic from the L2TP tunnels out through a WAN trunk.

- Set **Incoming** to **Tunnel** and select your L2TP VPN connection.
- Set the **Source Address** to the L2TP address pool.

- Set the **Next-Hop Type** to **Trunk** and select the appropriate WAN trunk.

Edit Policy Route

Show Advanced Settings Create new Object

Configuration

☒ Enable

Description: L2TP VPN to Internet (Optional)

Criteria

User: L2TP-test

Incoming: Tunnel

Please select one member: Default_L2TP_VPN_Connei

Source Address: L2TP_POOL

Destination Address: any

DSCP Code: any

Schedule: none

Service: any

Next-Hop

Type: Trunk

Trunk: SYSTEM_DEFAULT_WAN_1

4.6.3 Configuring L2TP VPN in Android

To configure L2TP VPN in an Android device, go to **Menu > Settings > Wireless & networks > VPN settings > Add VPN > Add L2TP/IPSec PSK VPN** and configure as follows. The example settings here go along with the L2TP VPN configuration example in [Section 4.6.1 on page 79](#).

- **VPN name** is for the user to identify the VPN configuration.
- **Set VPN server** is the ZyWALL's WAN IP address.
- **Set IPSec pre-shared key** is the pre-shared key of the IPSec VPN gateway the ZyWALL uses for L2TP VPN over IPSec (top-secret in this example).
- **Enable L2TP secret** turn this off.
- **DNS search domain** leave this on.
- When dialing the L2TP VPN, the user will have to enter his account and password.

4.6.4 Configuring L2TP VPN in iOS

To configure L2TP VPN in an iOS device, go to **Settings > VPN > Add VPN Configuration > L2TP** and configure as follows. The example settings here go along with the L2TP VPN configuration example in [Section 4.6.1 on page 79](#).

- **Description** is for the user to identify the VPN configuration.
- **Server** is the ZyWALL's WAN IP address.
- **Account** is the user's account for using the L2TP VPN (L2TP-test in this example).
- **RSA SecurID** leave this off.
- **Password** is the password for the user's account.

- **Secret** is the pre-shared key of the IPSec VPN gateway the ZyWALL uses for L2TP VPN over IPSec (top-secret in this example).
- **Send All Traffic** leave this on.
- **Proxy** leave this off.

4.6.5 Configuring L2TP VPN in Windows

The following sections cover how to configure L2TP in remote user computers using Windows 7, Vista, or XP. The example settings here go along with the L2TP VPN configuration example in [Section 4.6.1 on page 79](#).

4.6.5.1 Configuring L2TP in Windows 7 or Windows Vista

Do the following to establish an L2TP VPN connection.

Create a Connection Object

- 1 Open the **Network and Sharing Center** screen.
Windows 7: click **Start > Control Panel > View network status and tasks > Set up a new connection or network**.
Windows Vista: click **Start > Network > Network and Sharing Center > Set up a connection or network**).
- 2 Select **Connect to a workplace** and click **Next**.
- 3 Select **Use my Internet connection (VPN)**.
- 4 For the **Internet address** enter the **My Address** domain name or WAN IP address of the VPN gateway the ZyWALL is using for L2TP VPN (172.16.1.2 in this example).
4a For the **Destination name**, specify a name to identify this VPN (L2TP to ZyWALL for example).
4b Select **Don't connect now, just set it up so I can connect later** and click **Next**.

The screenshot shows the 'Type the Internet address to connect to' window in the Windows Network Setup Wizard. It contains the following elements:

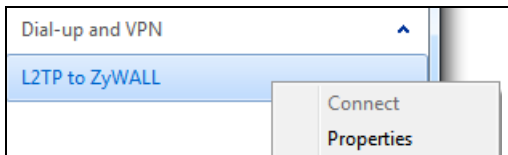
- Title: Type the Internet address to connect to
- Text: Your network administrator can give you this address.
- Internet address: 172.16.1.2
- Destination name: L2TP to ZyWALL
- Use a smart card: ☐
- Allow other people to use this connection: ☐ (with a subtext: This option allows anyone with access to this computer to use this connection.)
- Don't connect now, just set it up so I can connect later: ☒
- Buttons: Next, Cancel

- 5 Enter your ZyWALL user name and password and click **Create**.

- Click **Close**.

Configure the Connection Object

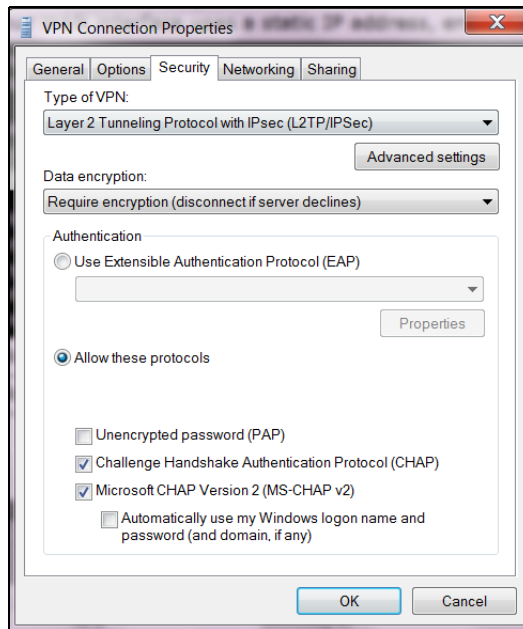
- In the **Network and Sharing Center** screen, click **Connect to a network**. Right-click the L2TP VPN connection and select **Properties**.



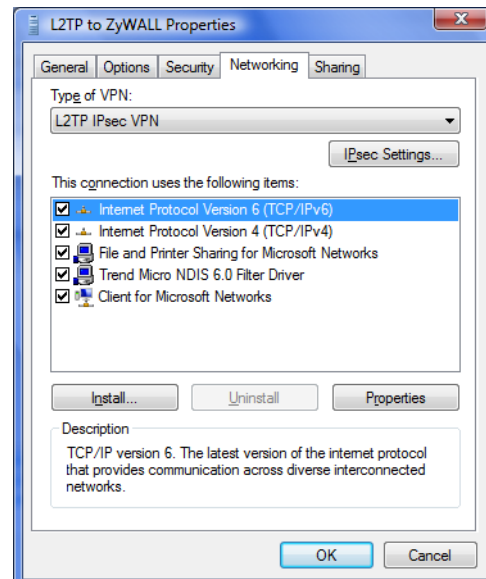
- In Windows 7, click **Security** and set the **Type of VPN** to **Layer 2 Tunneling Protocol with IPsec (L2TP/IPSec)**. Then click **Advanced settings**.

In Windows Vista, click **Networking**. Set the **Type of VPN** to **L2TP IPsec VPN** and click **IPsec Settings**.

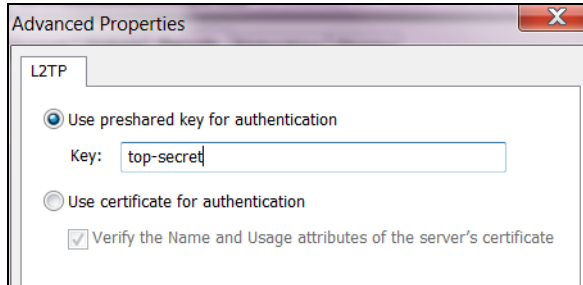
Windows 7



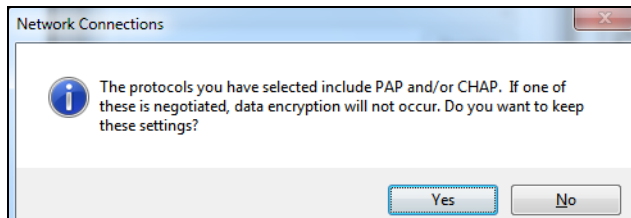
Windows Vista



- Select **Use preshared key for authentication** and enter the pre-shared key of the VPN gateway entry the ZyWALL is using for L2TP VPN (top-secret in this example). Click **OK** to save your changes and close the **Advanced Properties** screen. Then click **OK** again to close the **Properties** window.



- 4 If a warning screen about data encryption not occurring if PAP or CHAP is negotiated, click **Yes**. When you use L2TP VPN to connect to the ZyWALL, the ZyWALL establishes an encrypted IPSec VPN tunnel first and then builds an L2TP tunnel inside it. The L2TP tunnel itself does not need encryption since it is inside the encrypted IPSec VPN tunnel.

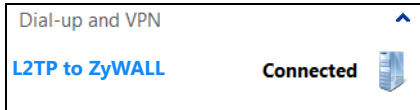


Connect Using L2TP VPN

- 1 In the **Network and Sharing Center** screen, click **Connect to a network**, select the L2TP VPN connection and click **Connect** to display a login screen. Enter the user name and password of your ZyWALL user account and click **Connect**.



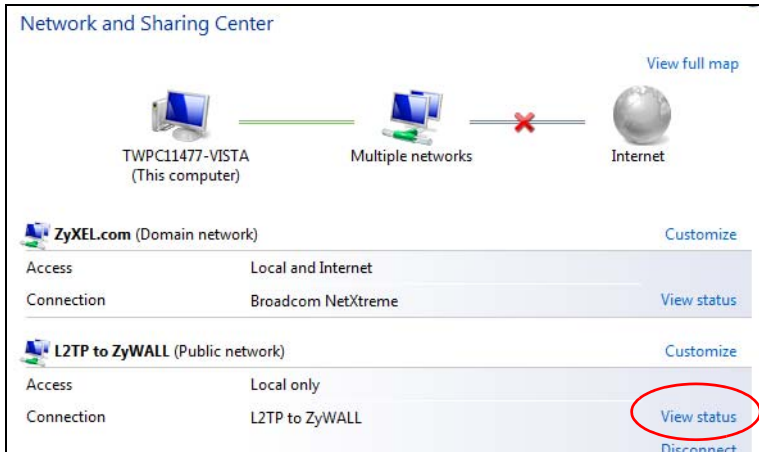
- 2 A window appears while the user name and password are verified. The **Connect to a network** screen shows **Connected** after the L2TP over IPSec VPN tunnel is built.



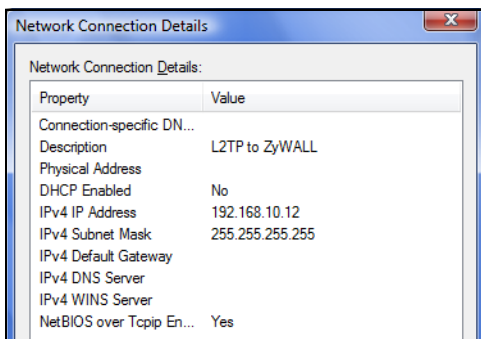
- After the connection is up a connection icon displays in your system tray. Click it and then the L2TP connection to open a status screen.



- Click the L2TP connection's **View status** link to open a status screen.



- Click **Details** to see the address that you received is from the L2TP range you specified on the ZyWALL (192.168.10.10-192.168.10.20 in the example).



- Access a server or other network resource behind the ZyWALL to make sure your access works.

4.6.5.2 Configuring L2TP in Windows XP

In Windows XP, first issue the following command from the Windows command prompt (including the quotes) to make sure the computer is running the Microsoft IPsec service.

```
net start "ipsec services".
```

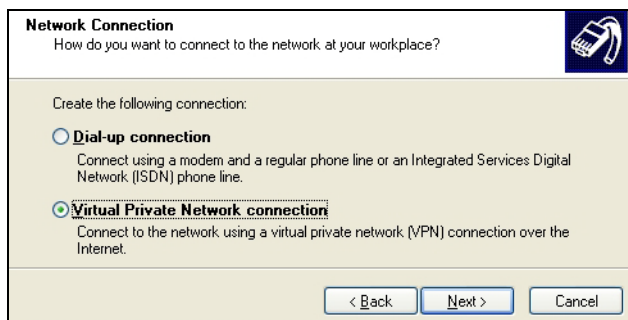
Then do the following to establish an L2TP VPN connection.

- Click **Start > Control Panel > Network Connections > New Connection Wizard**.

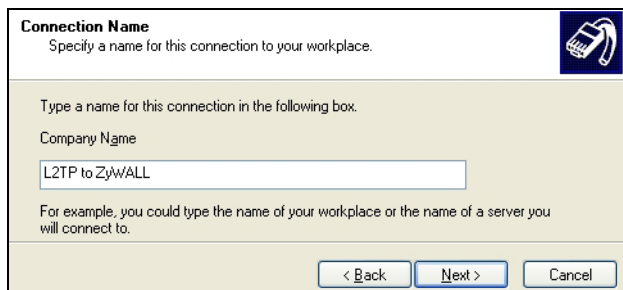
- 2 Click **Next** in the **Welcome** screen.
- 3 Select **Connect to the network at my workplace** and click **Next**.



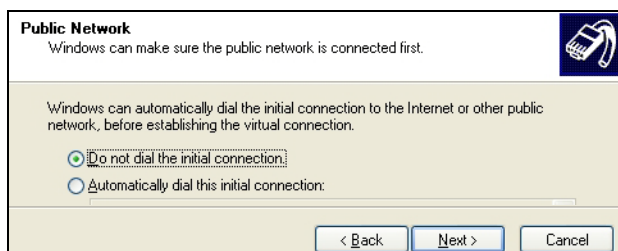
- 4 Select **Virtual Private Network connection** and click **Next**.



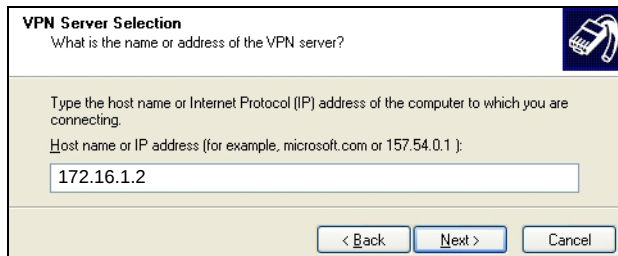
- 5 Type **L2TP to ZyWALL** as the **Company Name**.



- 6 Select **Do not dial the initial connection** and click **Next**.



- 7 Enter the domain name or WAN IP address configured as the **My Address** in the VPN gateway configuration that the ZyWALL is using for L2TP VPN (172.16.1.2 in this example).



VPN Server Selection
What is the name or address of the VPN server?

Type the host name or Internet Protocol (IP) address of the computer to which you are connecting.
Host name or IP address (for example, microsoft.com or 157.54.0.1):

172.16.1.2

< Back Next > Cancel

- 8 Click **Finish**.
- 9 The **Connect L2TP to ZyWALL** screen appears. Click **Properties > Security**.



Connect L2TP to ZyWALL

User name:

Password:

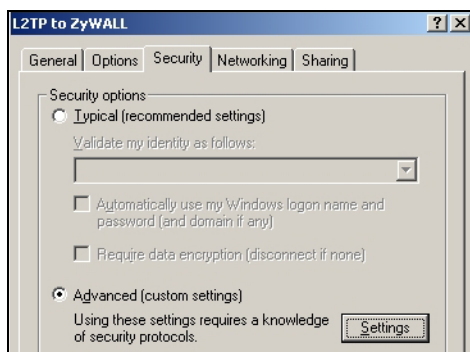
☐ Save this user name and password for the following users:

☒ Me only

☐ Anyone who uses this computer

Connect Cancel Properties Help

- 10 Click **Security**, select **Advanced (custom settings)** and click **Settings**.



L2TP to ZyWALL

General Options Security Networking Sharing

Security options

☒ Typical (recommended settings)

Validate my identity as follows:

☐ Automatically use my Windows logon name and password (and domain if any)

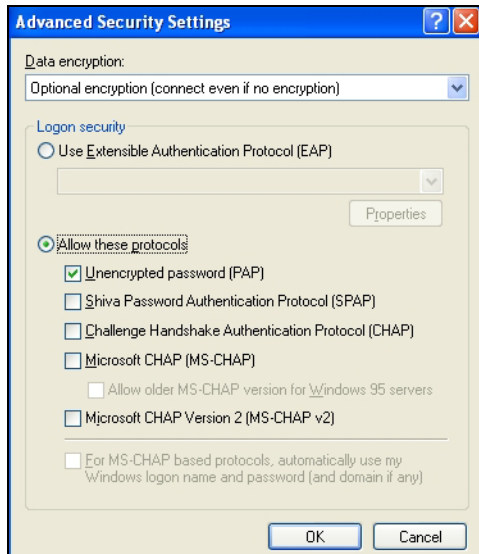
☐ Require data encryption (disconnect if none)

☒ Advanced (custom settings)

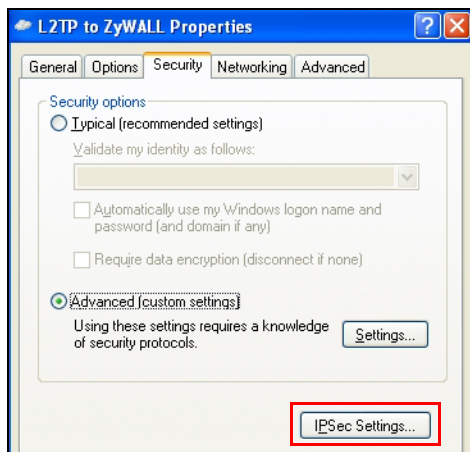
Using these settings requires a knowledge of security protocols.

Settings

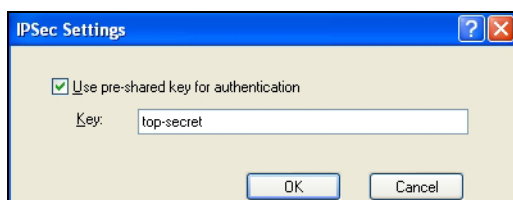
- 11 Select **Optional encryption (connect even if no encryption)** and the **Allow these protocols** radio button. Select **Unencrypted password (PAP)** and clear all of the other check boxes. Click **OK**.



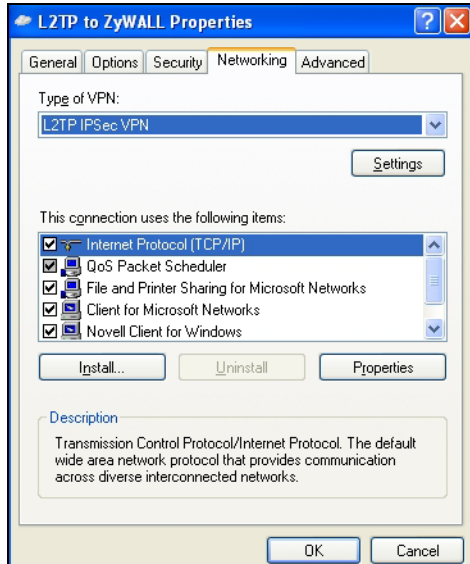
12 Click **IPSec Settings**.



13 Select the **Use pre-shared key for authentication** check box and enter the pre-shared key used in the VPN gateway configuration that the ZyWALL is using for L2TP VPN. Click **OK**.



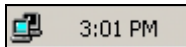
14 Click **Networking**. Select **L2TP IPSec VPN** as the **Type of VPN**. Click **OK**.



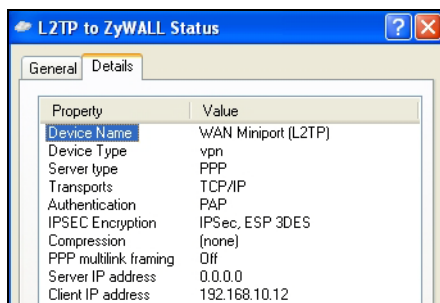
- 15 Enter the user name and password of your ZyWALL account. Click **Connect**.



- 16 A window appears while the user name and password are verified.
- 17 A ZyWALL-L2TP icon displays in your system tray. Double-click it to open a status screen.



- 18 Click **Details** to see the address that you received from the L2TP range you specified on the ZyWALL (192.168.10.10-192.168.10.20).



- 19 Access a server or other network resource behind the ZyWALL to make sure your access works.

4.6.6 What Can Go Wrong

The IPSec VPN connection must:

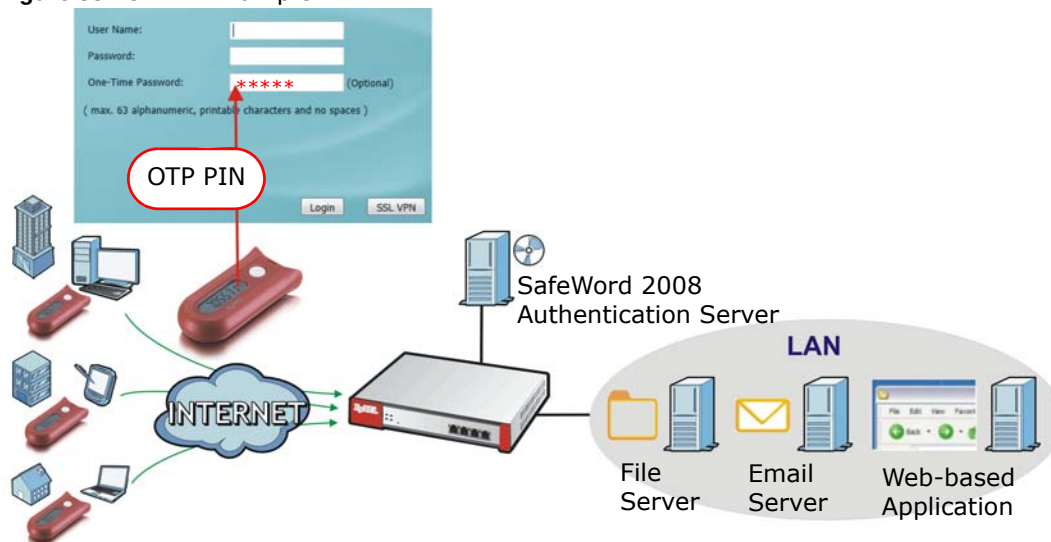
- Be enabled
- Use transport mode
- Not be a manual key VPN connection
- Use **Pre-Shared Key** authentication
- Use a VPN gateway with the **Secure Gateway** set to **0.0.0.0** if you need to allow L2TP VPN clients to connect from more than one IP address.

Disconnect any existing L2TP VPN sessions before modifying L2TP VPN settings. The remote users must make any needed matching configuration changes and re-establish the sessions using the new settings.

4.7 One-Time Password Version 2 (OTPV2)

Two-factor authentication requires a user to provide two kinds of identification. Purchase the ZyWALL OTPv2 One-Time Password System for strong two-factor authentication for Web Configurator, Web access, SSL VPN, and ZyXEL IPSec VPN client user logins. For each login a user must use his ZyWALL OTPv2 token to generate a new OTP password and use it along with his normal account user name and password (the second kind of identification). An attacker cannot re-use an OTP password that was already used for login because it is no longer valid. The system contains SafeWord 2008 authentication server software, hardware OTPv2 tokens, and software OTPv2 tokens for Windows computers and Android and iOS mobile devices.

Figure 35 OTPv2 Example



Here is an overview of how to use OTP. See the ZyWALL OTPv2 support note for details.

- 1 Install the SafeWord 2008 authentication server software on a computer.
- 2 Create user accounts on the ZyWALL and in the SafeWord 2008 authentication server.
- 3 Import each ZyWALL OTPv2 token's database file (located on the included CD) into the server.
- 4 Assign users to ZyWALL OTPv2 tokens on the server.
- 5 Configure the SafeWord 2008 authentication server as a RADIUS server in the ZyWALL's **Configuration > Object > AAA Server** screens.
- 6 Configure the appropriate authentication method object to use the SafeWord 2008 authentication server RADIUS server object.
- 7 Configure Auth. Policy and VPN to use the authentication method object.
- 8 Give the ZyWALL OTPv2 tokens to the assigned users.
- 9 A user presses his ZyWALL OTPv2 token's button to generate a password to enter in the **Login** screens' **One-Time Password** field.

4.7.1 What Can Go Wrong

- Users cannot log in if they try to re-use a password that they have already used to log in. Users must generate a new password for each login.
- Authentication fails if the SafeWord 2008 authentication server goes down, loses its network connection, or is too busy. Users can try again a little later.

Managing Traffic

These sections cover controlling the traffic going through the ZyWALL.

- [How to Configure Bandwidth Management on page 95](#)
- [How to Configure a Trunk for WAN Load Balancing](#)
- [How to Use Multiple Static Public WAN IP Addresses for LAN-to-WAN Traffic on page 104](#)
- [How to Use Device HA to Backup Your ZyWALL on page 105](#)
- [How to Configure DNS Inbound Load Balancing on page 110](#)
- [How to Allow Public Access to a Web Server on page 112](#)
- [How to Manage Voice Traffic on page 114](#)
- [How to Limit Web Surfing and MSN to Specific People on page 120](#)

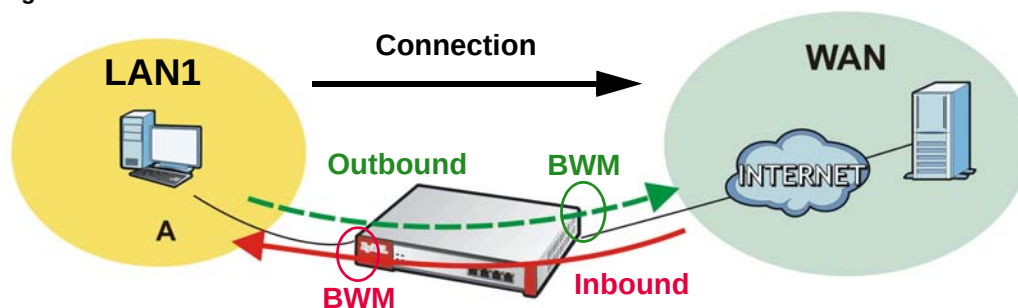
5.1 How to Configure Bandwidth Management

Bandwidth management is very useful when applications are competing for limited bandwidth.

Connection and Packet Directions

Bandwidth management looks at the connection's direction from the interface it was initiated on to the interface it goes out. The connection initiator sends outbound traffic and receives inbound traffic. The ZyWALL controls each flow's bandwidth as it goes out through an interface or VPN tunnel. For example, a LAN1 to WAN connection is initiated from LAN1 and goes to the WAN.

Figure 36 LAN1 to WAN Connection and Packet Directions



- Outbound traffic goes from a LAN1 device to the WAN. The ZyWALL applies bandwidth management before sending the packets out a WAN interface.
- Inbound traffic comes back from the WAN to the LAN1 device. The ZyWALL applies bandwidth management before sending the traffic out a LAN1 interface.

You can set outbound and inbound guaranteed and maximum bandwidths for an application.

5.1.1 Bandwidth Allocation Example

Say a 10-person office has WAN1 connected to a 50 Mbps downstream and 5 Mbps upstream VDSL line and you want to allocate bandwidth for the following:

- SIP: Up to 10 simultaneous 100 Kbps calls guaranteed
- Video conferencing: Up to 10 simultaneous 128 Kbps Skype video calls guaranteed
- Video streaming: up to 10 simultaneous 256 Kbps sessions
- HTTP: Internet access including downloading files for 10 users
- SMTP: 10 users sending email
- POP3: 10 users receiving email
- FTP: 10 users uploading and downloading files

Here is an example of allocating the any to WAN connection's inbound and outbound packet flows. Enable Maximize Bandwidth Usage (Max B.U.) on a packet flow to set no limit on it and let it use any available bandwidth on the out-going interface.

Table 11 50 Mbps / 5 Mbps Connection Any to WAN Bandwidth Allocation Example

PRIORITY AND APPLICATION		GUARANTEED K / MAXIMUM K OR MAX B.U.	
		INBOUND	OUTBOUND
1	SIP	1000/2000	1000/2000
2	Video conferencing	1280/3840	1280/3840
3	Video streaming	2560/3584	*
4	HTTP	10240/46080	*
4	SMTP	*	2048/Max B.U.
4	POP3	10240/Max B.U.	*
5	FTP	10240/46080	792/3072
Total guaranteed bandwidth:		35560 Kbps	5120 Kbps

* This application does not usually generate enough traffic in this direction to require management.

5.1.2 Setting the Interface's Bandwidth

Use the **Configuration > Interface** screens to set the WAN1 interface's upstream (egress) bandwidth to be equal to (or slightly less than) what the connected device can support. This example uses 5120 Kbps.

5.1.3 SIP Bandwidth Management

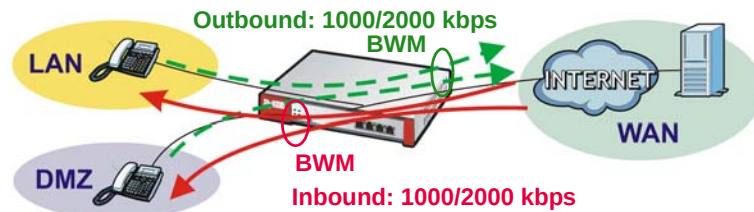
The most effective way to ensure the quality of SIP calls is to go to the **Configuration > BWM** screen and enable BWM and select **Enable Highest Bandwidth Priority for SIP Traffic**. See the following section if you prefer to configure specific bandwidth management rules for SIP instead.

5.1.4 SIP Any-to-WAN and WAN-to-Any Bandwidth Management Example

- Manage SIP traffic going to WAN1 from users on the LAN or DMZ.

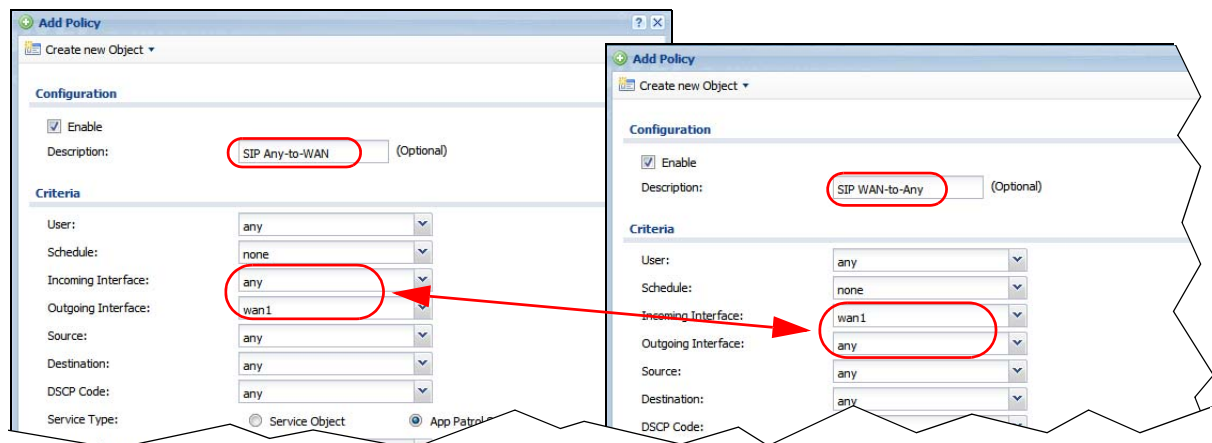
- Inbound and outbound traffic are both guaranteed 1000 kbps and limited to 2000 kbps.

Figure 37 SIP Any-to-WAN Guaranteed / Maximum Bandwidths Example



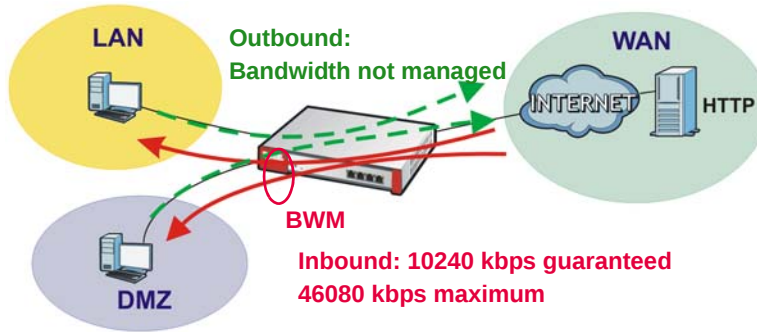
- 1 In the **Configuration > BWM** screen, click **Add**.
- 2 In the **Add Policy** screen, select **Enable** and type **SIP Any-to-WAN** as the policy's name. Leave the incoming interface to **any** and select **wan1** as the outgoing interface. Select **App Patrol Service** and **sip** as the service type. Set the inbound and outbound guaranteed bandwidth to **1000** (kbps) and maximum bandwidth to **2000** kbps and priority **1**. Click **OK**.

Note: Use **App Patrol Service** for the services classified by the ZyWALL's IDP packet inspection signatures. Use **Service Object** for pre-defined services.
- 3 Repeat the steps above to create another policy named **SIP WAN-to-Any** for calls coming in from the SIP server on the WAN. It is the same as the **SIP Any-to-WAN** policy, but with the directions reversed (WAN-to-Any instead of Any-to-WAN).



5.1.5 HTTP Any-to-WAN Bandwidth Management Example

- Set inbound guaranteed and maximum rates as the local users on the LAN and DMZ will probably download more than they upload to the Internet.
- Set fourth highest priority (4) for the HTTP traffic in both directions.

Figure 38 HTTP Any-to-WAN Bandwidth Management Example

- 1 In the **Configuration > BWM** screen, click **Add**.
- 2 In the **Add Policy** screen, select **Enable** and type **HTTP Any-to-WAN** as the policy's name. Leave the incoming interface to **any** and select **wan1** as the outgoing interface. Select **App Patrol Service** and **http** as the service type. Set the guaranteed inbound bandwidth to **10240** (kbps) and set priority **4**. Set the maximum to **46080** (kbps). Set the outbound priority to **4**. Click **OK**.

Add Policy

Create new Object ▾

Configuration

☒ Enable

Description: HTTP Any-to-WAN (Optional)

Criteria

User: any

Schedule: none

Incoming Interface: any

Outgoing Interface: wan1

Source: any

Destination: any

DSCP Code: any

Service Type: ☐ Service Object ☒ App Patrol Service

App Patrol Service: http

DSCP Marking

DSCP Marking

Inbound Marking: preserve

Outbound Marking: preserve

Bandwidth Shaping

Guaranteed Bandwidth

Inbound: 10240 kbps (0 : disabled) Priority: 4

☐ Maximize Bandwidth Usage Maximum: 46080 kbps

Outbound: 0 kbps (0 : disabled) Priority: 4

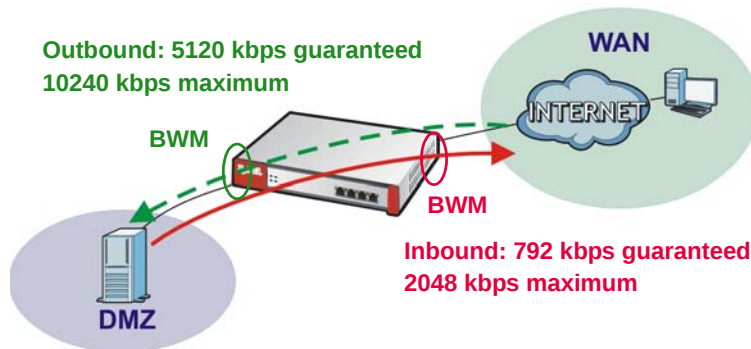
☐ Maximize Bandwidth Usage Maximum: 0 kbps

5.1.6 FTP WAN-to-DMZ Bandwidth Management Example

Suppose the office has an FTP server on the DMZ. Here is how to limit WAN1 to DMZ FTP traffic so it does not interfere with SIP and HTTP traffic.

- Allow remote users only 2048 kbps inbound for downloading from the DMZ FTP server but up to 10240 kbps outbound for uploading to the DMZ FTP server.
- Set the fifth highest priority (5) for the FTP traffic.

Figure 39 FTP WAN-to-DMZ Bandwidth Management Example



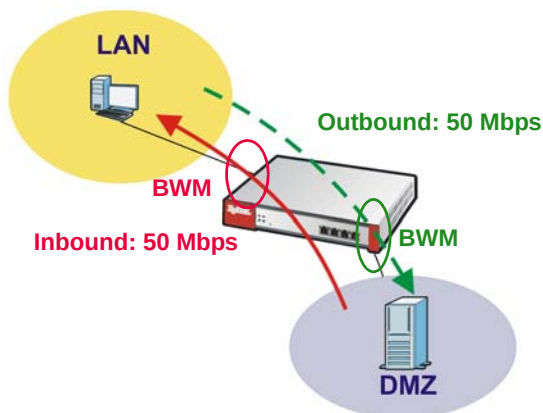
- 1 In the **Configuration > BWM** screen, click **Add**.
- 2 In the **Add Policy** screen, select **Enable** and type **FTP WAN-to-DMZ** as the policy's name. Select **wan1** as the incoming interface and **dmz** as the outgoing interface. Select **App Patrol Service** and **ftp** as the service type. Set inbound guaranteed bandwidth to **792 kbps**, priority **5**, and maximum **2048 kbps**. Set outbound guaranteed bandwidth to **5120 kbps**, priority **5**, and maximum **10240 kbps**. Click **OK**.

5.1.7 FTP LAN-to-DMZ Bandwidth Management Example

FTP traffic from the LAN1 to the DMZ can use more bandwidth since the interfaces support up to 1 Gbps connections, but give it lower priority and limit it to avoid interference with other traffic.

- Limit both outbound and inbound traffic to 50 Mbps.
- Set fifth highest priority (5) for the FTP traffic.

Figure 40 FTP LAN-to-DMZ Bandwidth Management Example



- 1 In the **Configuration > BWM** screen, click **Add**.
- 2 In the **Add Policy** screen, select **Enable** and type **FTP LAN-to-DMZ** as the policy's name. Select **lan1** as the incoming interface and **dmz** as the outgoing interface. Select **App Patrol Service** and **ftp** as the service type. Type **10240** (kbps) with priority **5** for both the inbound and outbound guaranteed bandwidth. Do not select the **Maximize Bandwidth Usage**. Set the maximum to **51200** (kbps). Click **OK**.

Finally, in the **BWM** screen, select **Enable BWM**. Click **Apply**.

Status	Priority	Description	User	Schedule	Incoming L.	Outgoing L.	Source	Destina...	DSC...	Service	BWM In/PrO...	DSCP M...
1	1	FTP LAN-to-DMZ	any	none	lan1	dmz	any	any	any	App:ftp	10240/5/102...	preserv...
2	2	FTP WAN-to-DMZ	any	none	wan1	dmz	any	any	any	App:ftp	792/5/5120/5	preserv...
3	3	HTTP Any-to-WAN	any	none	any	wan1	any	any	any	App:h...	10240/4/no/4	preserv...
4	4	SIP Any-to-WAN	any	none	any	wan1	any	any	any	App:sip	1000/1/1000/1	preserv...
5	5	SIP WAN-to-Any	any	none	wan1	any	any	any	any	App:sip	1000/1/1000/1	preserv...
6	6	FTP LAN-to-DMZ	any	none	lan1	dmz	any	any	any	Obj:any	10000/5/100...	preserv...
default			any	none	any	any	any	any	any	Obj:any	no/7/no/7	preserv...

5.1.8 What Can Go Wrong?

- The “outbound” in the guaranteed bandwidth settings apply to traffic going from the connection initiator to the outgoing interface. The “inbound” refers to the reverse direction.
- Make sure you have registered the IDP/App.Patrol service on the ZyWALL to use **App Patrol Service** as the service type in the bandwidth management rules. The application patrol service uses the ZyWALL’s IDP packet inspection signatures to classify services.

5.2 How to Configure a Trunk for WAN Load Balancing

These examples show how to configure a trunk for two WAN connections to the Internet. The available bandwidth for the connections is 1 Mbps (**wan1**) and 512 Kbps (**wan2 or cellular1**) respectively. As these connections have different bandwidth, use the **Weighted Round Robin** algorithm to send traffic to wan1 and wan2 (or cellular1) in a 2:1 ratio.

Figure 41 Trunk Example For Dual WANs

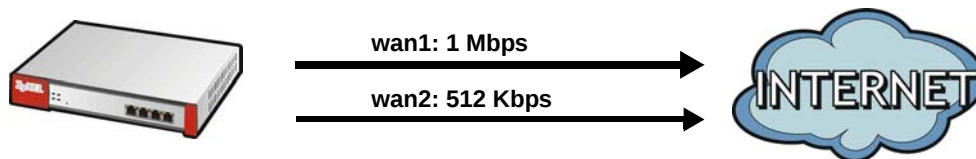
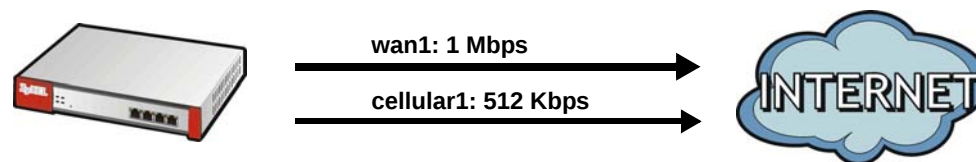


Figure 42 Trunk Example For WAN and 3G Interface



You do not have to change many of the ZyWALL’s settings from the defaults to set up this trunk. You only have to set up the outgoing bandwidth on each of the WAN interfaces and configure the WAN_TRUNK trunk’s load balancing settings.

5.2.1 Set Up Available Bandwidth on Ethernet Interfaces

Here is how to set a limit on how much traffic the ZyWALL tries to send out through each WAN interface.

- 1 Click **Configuration > Network > Interface > Ethernet** and double-click the **wan1** entry. Enter the available bandwidth (1000 kbps) in the **Egress Bandwidth** field. Click **OK**.

Edit Ethernet

IPv4 View Show Advanced Settings Create new Object

General Settings

☒ Enable Interface

Interface Properties

Interface Type: external

Interface Name: wan1

Port: P1

Zone: WAN

MAC Address: 00:00:AA:79:73:79

Description: (Optional)

IP Address Assignment

☐ Get Automatically

☒ Use Fixed IP Address

IP Address: 1.2.3.4

Subnet Mask: 255.255.255.0

Gateway: 1.2.3.254 (Optional)

Metric: 0 (0-15)

Interface Parameters

Egress Bandwidth: 1000 Kbps

Connectivity Check

☐ Enable Connectivity Check

OK Cancel

- 2 Repeat the process to set the egress bandwidth for **wan2** to 512 Kbps.
- 3 For 3G interface settings, go to **Configuration > Network > Interface > Cellular**. Double-click the **cellular1** entry and set the egress bandwidth for **cellular1** to 512 Kbps.

5.2.2 Configure the WAN Trunk

- 1 Click **Configuration > Network > Interface > Trunk**. Click the **Add** icon.
- 2 Name the trunk and set the **Load Balancing Algorithm** field to **Weighted Round Robin**.
Add **wan1** and enter 2 in the **Weight** column.
Add **wan2 (or cellular1)** and enter 1 in the **Weight** column.
Click **OK**.

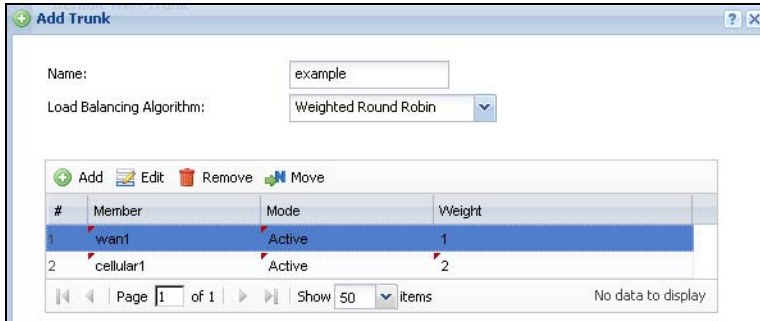
Add Trunk

Name: example

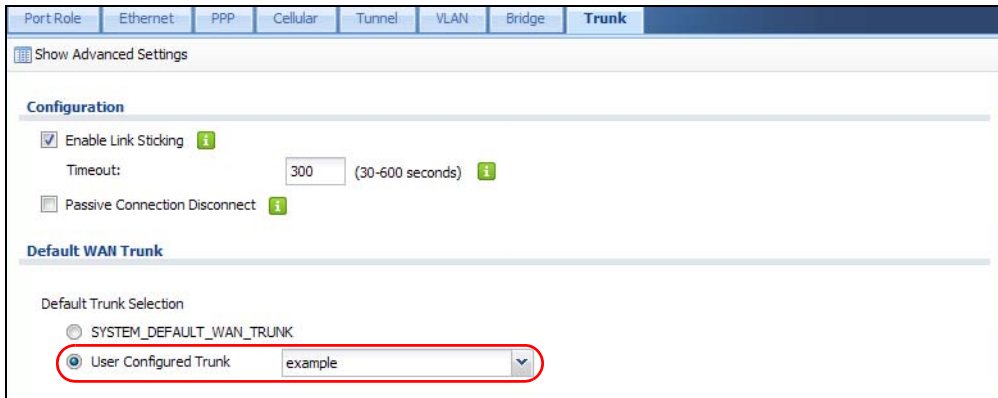
Load Balancing Algorithm: Weighted Round Robin

#	Member	Mode	Weight
1	wan1	Active	2
2	wan2	Active	1

Page 1 of 1 Show 50 items No data to display



- 3 Select the trunk as the default trunk and click **Apply**.

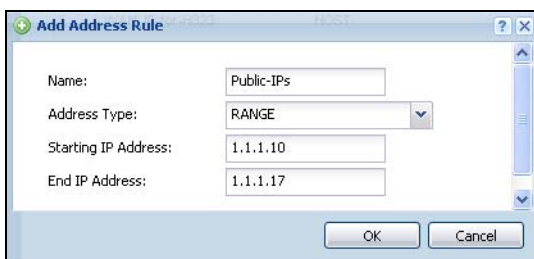


5.3 How to Use Multiple Static Public WAN IP Addresses for LAN-to-WAN Traffic

If your ISP gave you a range of static public IP addresses, this example shows how to configure a policy route to have the ZyWALL use them for traffic it sends out from the LAN.

5.3.1 Create the Public IP Address Range Object

Click **Configuration > Object > Address > Add** (in **IPv4 Address Configuration**) to create the address object that represents the range of static public IP addresses. In this example you name it **Public-IPs** and it goes from 1.1.1.10 to 1.1.1.17.



5.3.2 Configure the Policy Route

Now you need to configure a policy route that has the ZyWALL use the range of public IP addresses as the source address for WAN to LAN traffic.

Click **Configuration > Network > Routing > Policy Route > Add** (in IPv4 Configuration).

It is recommended to add a description. This example uses **LAN-to-WAN-Range**.

Specifying a **Source Address** is also recommended. This example uses **LAN1_SUBNET**.

Set the **Source Network Address Translation** to **Public-IPs** and click **OK**.

Add Policy Route

Show Advanced Settings Create new Object

Configuration

☒ Enable

Description: LAN-to-WAN-Range (Optional)

Criteria

User: any

Incoming: any (Excluding ZyWALL)

Source Address: LAN1_SUBNET

Destination Address: any

DSCP Code: any

Schedule: none

Service: any

Next-Hop

Type: Auto

DSCP Marking

DSCP Marking: preserve

Address Translation

Source Network Address Translation: Public-IPs

OK Cancel

5.4 How to Use Device HA to Backup Your ZyWALL

Use device high availability (HA) to set up an additional ZyWALL as a backup gateway to ensure the default gateway is always available for the network.

Active-Passive Mode and Legacy Mode

Active-passive mode has a backup ZyWALL take over if the master ZyWALL fails and is recommended for general device failover deployments. Use legacy mode if you need a more complex relationship between the master and backup ZyWALLs, such as having both ZyWALLs active or using different ZyWALLs as the master for individual interfaces. The ZyWALLs must all use the same device HA mode (either active-passive or legacy).

Management Access IP Addresses

For each interface you can configure an IP address in the same subnet as the interface IP address to use to manage the ZyWALL whether it is the master or the backup.

Synchronization

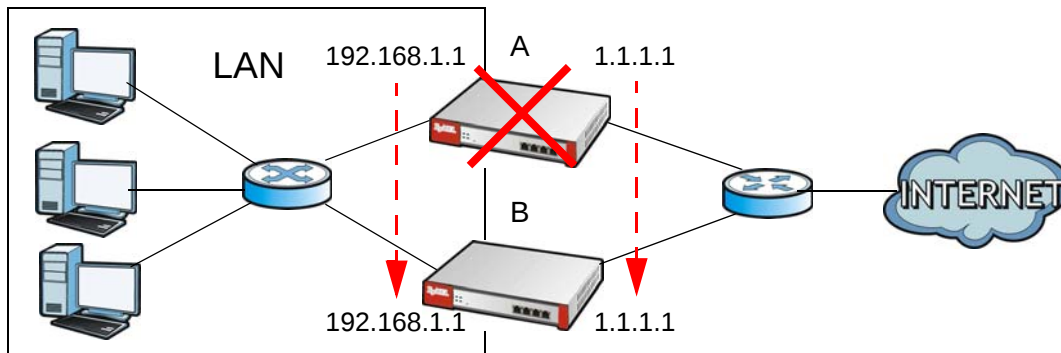
Synchronize ZyWALLs of the same model and firmware version to copy the master ZyWALL's configuration, signatures (anti-virus, IDP/application patrol, and system protect), and certificates to the backup ZyWALL so you do not need to do it manually.

5.4.1 Active-Passive Mode Device HA Example

Here active-passive mode device HA has backup ZyWALL **B** automatically takes over all of master ZyWALL **A**'s functions if **A** fails or loses its LAN or WAN connection.

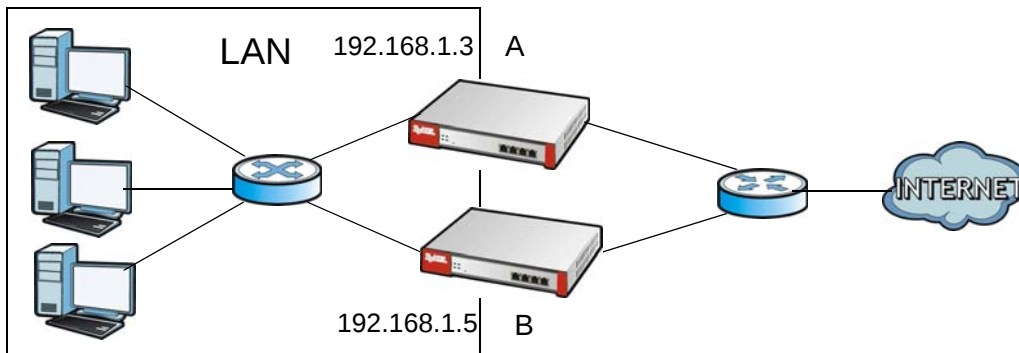
An Ethernet switch connects both ZyWALLs' LAN interfaces to the LAN. Whichever ZyWALL is functioning as the master uses the default gateway IP address of the LAN computers (192.168.1.1) for its LAN interface and the static public IP address (1.1.1.1) for its WAN interface. If ZyWALL **A** recovers (has both its LAN and WAN interfaces connected), it resumes its role as the master and takes over all of its functions again.

Figure 43 Device HA: Master Fails and Backup Takes Over



Each ZyWALL's LAN interface also has a separate management IP address that stays the same whether the ZyWALL functions as the master or a backup. ZyWALL **A**'s management IP address is 192.168.1.3 and ZyWALL **B**'s is 192.168.1.5.

Figure 44 Device HA: Management IP Addresses

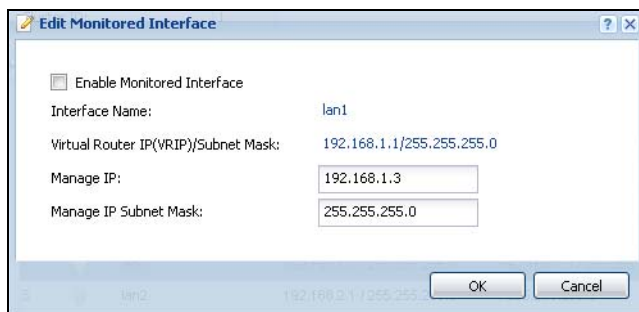


5.4.2 Before You Start

ZyWALL **A** should already be configured. You will use device HA to copy ZyWALL **A**'s settings to **B** later (in [Section 5.4.4 on page 108](#)). To avoid an IP address conflict, do not connect ZyWALL **B** to the LAN subnet until after you configure its device HA settings and the instructions tell you to deploy it (in [Section 5.4.5 on page 110](#)).

5.4.3 Configure Device HA on the Master ZyWALL

- 1 Log into ZyWALL **A** (the master) and click **Configuration > Device HA > Active-Passive Mode**. Double-click the LAN interface's entry.
- 2 Configure 192.168.1.3 as the **Manage IP** and 255.255.255.0 as the **Manage IP Subnet Mask**. Click **OK**.



- 3 Set the **Device Role** to **Master**. This example focuses on the connection from the LAN to the Internet through the WAN interface, so select the LAN and WAN interfaces and click **Activate**. Enter a **Synchronization Password** ("mySyncPassword" in this example). Retype the password and click **Apply**.

General Active-Passive Mode Legacy Mode

Show Advanced Settings

General Settings

Device Role: ☒ Master ☐ Backup

Cluster Settings

Cluster ID: 1

Monitored Interface Summary

#	Status	Interface	Virtual Router IP/Netmask	Management IP/Netmask	Link Status
1		wan1	1.2.3.4 / 255.255.0.0	/ 255.255.0.0	Down
2		wan2	/	/	Up
3		opt	192.168.4.1 / 255.255.255.0	/ 255.255.255.0	Down
4		lan1	192.168.1.1 / 255.255.255.0	192.168.1.3 / 255.255.255.0	Down
5		lan2	192.168.2.1 / 255.255.255.0	/ 255.255.255.0	Down
6		ext-wlan	10.59.0.1 / 255.255.255.0	/ 255.255.255.0	Down
7		dmz	192.168.3.1 / 255.255.255.0	/ 255.255.255.0	Down

Page 1 of 1 Show 50 items Displaying 1 - 7 of 7

Synchronization

Server Address: 1.2.3.4, 172.16.1.34, 192.168.4.1, 192.168.1.1, 192.168.2.1, 10.59.0.1, 192.1

Server Port: 21 (Configure)

Password:

Note: Backup device's configuration can synchronize with master device's.

Apply Reset

- Click the **General** tab, enable device HA, and click **Apply**.

General Active-Passive Mode Legacy Mode

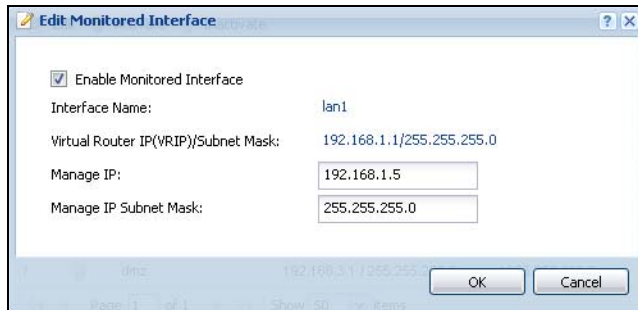
General Settings

☒ Enable Device HA

Device HA Mode: Active-Passive Mode (Switch to Legacy Mode page)

5.4.4 Configure the Backup ZyWALL

- Connect a computer to ZyWALL B's LAN interface and log into its Web Configurator. Connect ZyWALL B to the Internet and subscribe it to the same subscription services (like content filtering and anti-virus) to which ZyWALL A is subscribed. See the **Registration** screens for more on the subscription services.
- In ZyWALL B click **Configuration > Device HA > Active-Passive Mode** and the LAN interface **Edit** icon.
- Configure 192.168.1.5 as the **Manage IP** and 255.255.255.0 as the **Subnet Mask**. Click **OK**.



Edit Monitored Interface

☒ Enable Monitored Interface

Interface Name: lan1

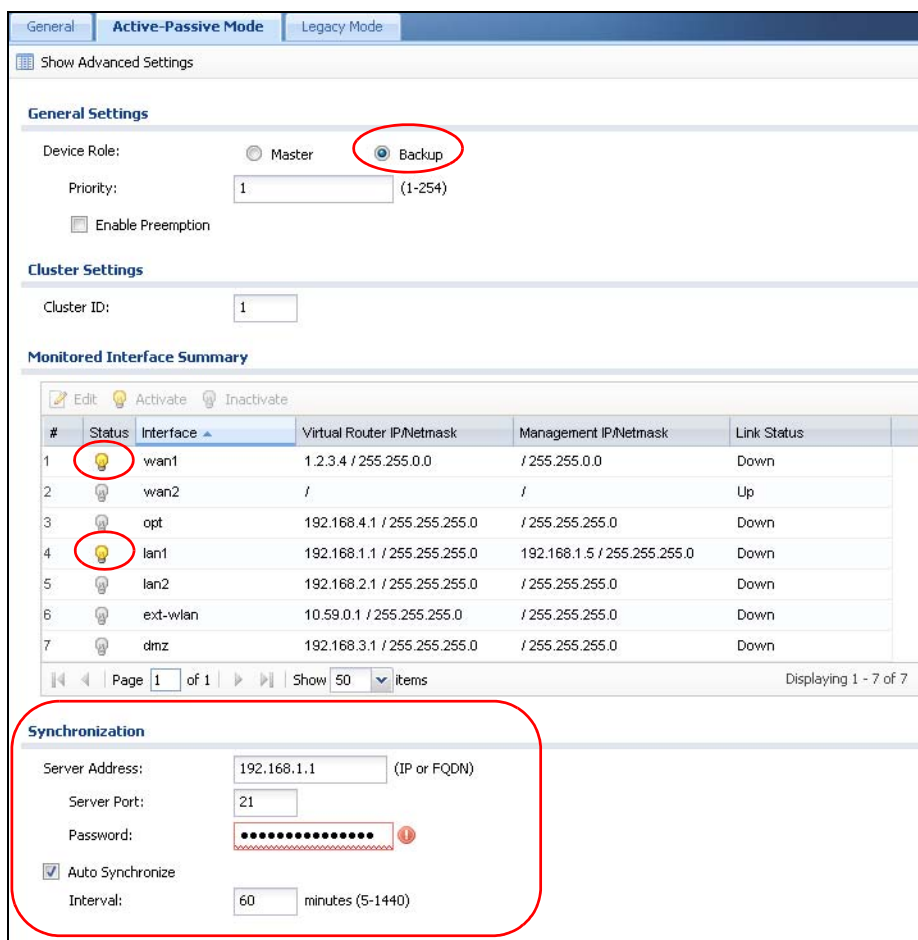
Virtual Router IP(VRIP)/Subnet Mask: 192.168.1.1/255.255.255.0

Manage IP: 192.168.1.5

Manage IP Subnet Mask: 255.255.255.0

OK Cancel

- 4 Set the **Device Role** to **Backup**. Activate monitoring for the LAN and WAN interfaces. Set the **Synchronization Server Address** to 192.168.1.1, the **Port** to 21, and the **Password** to "mySyncPassword". Retype the password, select **Auto Synchronize**, and set the **Interval** to 60. Click **Apply**.



General **Active-Passive Mode** Legacy Mode

Show Advanced Settings

General Settings

Device Role: ☐ Master ☒ Backup

Priority: 1 (1-254)

☐ Enable Preemption

Cluster Settings

Cluster ID: 1

Monitored Interface Summary

#	Status	Interface	Virtual Router IP/Netmask	Management IP/Netmask	Link Status
1		wan1	1.2.3.4 / 255.255.0.0	/ 255.255.0.0	Down
2		wan2	/	/	Up
3		opt	192.168.4.1 / 255.255.255.0	/ 255.255.255.0	Down
4		lan1	192.168.1.1 / 255.255.255.0	192.168.1.5 / 255.255.255.0	Down
5		lan2	192.168.2.1 / 255.255.255.0	/ 255.255.255.0	Down
6		ext-wlan	10.59.0.1 / 255.255.255.0	/ 255.255.255.0	Down
7		dmz	192.168.3.1 / 255.255.255.0	/ 255.255.255.0	Down

Page 1 of 1 Show 50 items Displaying 1 - 7 of 7

Synchronization

Server Address: 192.168.1.1 (IP or FQDN)

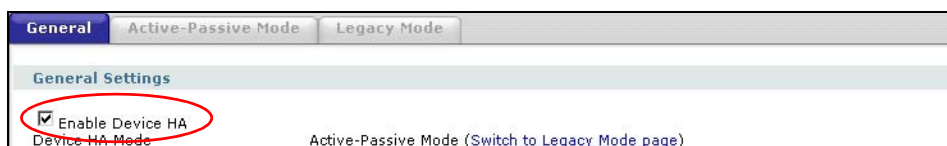
Server Port: 21

Password:

☒ Auto Synchronize

Interval: 60 minutes (5-1440)

- 5 In the **General** tab enable device HA and click **Apply**.



General Active-Passive Mode Legacy Mode

General Settings

☒ Enable Device HA

Device HA Mode Active-Passive Mode ([Switch to Legacy Mode page](#))

5.4.5 Deploy the Backup ZyWALL

Connect ZyWALL **B**'s LAN interface to the LAN network. Connect ZyWALL **B**'s WAN interface to the same router that ZyWALL **A**'s WAN interface uses for Internet access. ZyWALL **B** copies **A**'s configuration (and re-synchronizes with **A** every hour). If ZyWALL **A** fails or loses its LAN or WAN connection, ZyWALL **B** functions as the master.

5.4.6 Check Your Device HA Setup

- 1 To make sure ZyWALL **B** copied ZyWALL **A**'s settings, you can log into ZyWALL **B**'s management IP address (192.168.1.5) and check the configuration. You can use the **Maintenance > File Manager > Configuration File** screen to save copies of the ZyWALLs' configuration files that you can compare.
- 2 To test your device HA configuration, disconnect ZyWALL **A**'s LAN or WAN interface. Computers on LAN should still be able to access the Internet. If they cannot, check your connections and device HA configuration.

Congratulations! Now that you have configured device HA for LAN, you can use the same process for any of the ZyWALL's other local networks. For example, enable device HA monitoring on the DMZ interfaces and use an Ethernet switch to connect both ZyWALLs' DMZ interfaces to your publicly available servers.

5.5 How to Configure DNS Inbound Load Balancing

This example shows you how to configure the ZyWALL to respond to DNS query messages with the least loaded interface's IP address. The DNS query senders will then transmit packets to that interface instead of an interface that has a heavy load.

This example assumes that your company's domain name is www.example.com. You want your ZyWALL's WAN1 (202.1.2.3) and WAN2 (202.5.6.7) to use DNS inbound load balancing to balance traffic loading coming from the Internet.

- 1 In the **CONFIGURATION > Network > Inbound LB** screen, select **Enable DNS Load Balancing**. Click **Apply**.



- Click **Add** in the **Configuration** table. The following screen appears.

Select **Enable**, enter ***.example.com** as the **Query Domain Name**.

Enter **300** in the **Time to Live** field to have DNS query senders keep the resolved DNS entries on their computers for 5 minutes.

Select **any** in the **IP Address** field and **WAN** in the **Zone** field to apply this rule for all DNS query messages the WAN zone receives.

Select **Least Load - Total** as the load balancing algorithm.

Click **Add** to add WAN1 and WAN2 as the member interfaces. Click **OK**.

Add DNS Load Balancing

Create new Object ▾

General Settings

☒ Enable

DNS Setting

Query Domain Name: *.example.com

Time to Live: 300 (0-2147483647 seconds, 0 is unchanged)

Query From Setting

IP Address: any

Zone: WAN

Load Balancing Member

Load Balancing Algorithm: Least Load - Total

Failover IP Address: 0.0.0.0 (Optional)

Add **Edit** **Remove**

#	IP Address	Monitor Interface
1	202.1.2.3	wan1
2	202.5.6.7	wan2

Page 1 of 1 Show 50 items

Load Balancing Member

Member: 1

Monitor Interface: wan1

IP Address

☒ Same as Monitor Interface 202.1.2.3

☐ Custom 0.0.0.0

Load Balancing Member

Member: 2

Monitor Interface: wan2

IP Address

☒ Same as Monitor Interface 202.5.6.7

☐ Custom 0.0.0.0

OK Cancel

Continue to go to the **Configuration > Firewall** and **Configuration > Network > NAT** screens to configure the corresponding firewall rules and NAT virtual server for the inbound service access.

5.5.1 What Can Go Wrong?

- Using a greater TTL value makes DNS inbound load balancing become ineffective, although it can reduce the ZyWALL's loading as the DNS request senders does not need to send new queries to the ZyWALL that often.
- If you choose **Custom** in the **Load Balancing Member** screen and enter another IP address for a member interface, make sure the entered IP address is configured in the corresponding firewall and NAT virtual server rules.

5.6 How to Allow Public Access to a Web Server

This is an example of making an HTTP (web) server in the DMZ zone accessible from the Internet (the WAN zone). In this example you have public IP address 1.1.1.1 that you will use on the WAN interface and map to the HTTP server's private IP address of 192.168.3.7.

Figure 45 Public Server Example Network Topology



5.6.1 Configure NAT

Create a NAT rule to send HTTP traffic coming to WAN IP address 1.1.1.1 to the HTTP server's private IP address of 192.168.3.7.

- 1 Click **Configuration > Network > NAT > Add > Create New Object > Address** and create an IPv4 host address object named **DMZ_HTTP** for the HTTP server's private IP address of 192.168.3.7. Repeat to create a host address object named **Public_HTTP_Server_IP** for the public WAN IP address 1.1.1.1.

- 2 Configure the NAT rule.

For the **Incoming Interface** select the WAN interface.

Set the **Original IP** to the **Public_HTTP_Server_IP** object and the **Mapped IP** to the **DMZ_HTTP** object.

HTTP traffic and the HTTP server in this example both use TCP port 80. So you set the **Port Mapping Type** to **Port**, the **Protocol Type** to **TCP**, and the original and mapped ports to 80.

Keep **Enable NAT Loopback** selected to allow users connected to other interfaces to access the HTTP server.

Add NAT

Create new Object

General Settings

☒ Enable Rule

Rule Name: DMZ_HTTP

Port Mapping Type

Classification: ☒ Virtual Server ☐ 1:1 NAT ☐ Many 1:1 NAT

Mapping Rule

Incoming Interface: wan1

Original IP: Public_HTTP_Server_IP

Mapped IP: DMZ_HTTP

Port Mapping Type: Port

Protocol Type: TCP

Original Port: 80

Mapped Port: 80

Related Settings

☒ Enable NAT Loopback

Configure [Firewall](#)

OK Cancel

Add Address Rule

Name: DMZ_HTTP

Address Type: HOST

IP Address: 192.168.3.7

Add Address Rule

Name: Public_HTTP_Server_IP

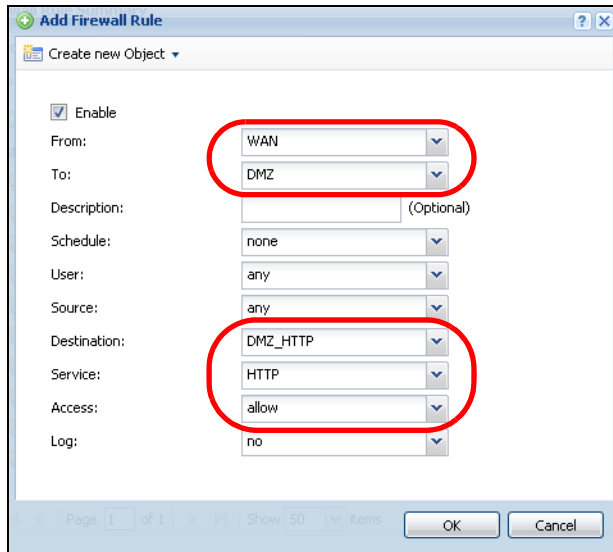
Address Type: HOST

IP Address: 1.1.1.1

5.6.2 Set Up a Firewall Rule

Create a firewall rule to allow the public to send HTTP traffic to IP address 1.1.1.1 in order to access the HTTP server. If a domain name is registered for IP address 1.1.1.1, users can just go to the domain name to access the web server.

Click **Configuration > Firewall > Add**. Set the **From** field as **WAN** and the **To** field as **DMZ**. Set the **Destination** to the HTTP server's DMZ IP address object (**DMZ_HTTP**). **DMZ_HTTP** is the destination because the ZyWALL applies NAT to traffic before applying the firewall rule. Set the **Access** field to **allow** and the **Service** to **HTTP**, and click **OK**.



5.6.3 What Can Go Wrong

- The ZyWALL checks the firewall rules in order and applies the first firewall rule the traffic matches. If traffic matches a rule that comes earlier in the list, it may be unexpectedly blocked.
- The ZyWALL does not apply the firewall rule. The ZyWALL only apply's a zone's rules to the interfaces that belong to the zone. Make sure the WAN interface is assigned to WAN zone.

5.7 How to Manage Voice Traffic

Here are examples of allowing H.323 and SIP traffic through the ZyWALL.

5.7.1 How to Allow Incoming H.323 Peer-to-peer Calls

Suppose you have a H.323 device on the LAN for VoIP calls and you want it to be able to receive peer-to-peer calls from the WAN. Here is an example of how to configure NAT and the firewall to have the ZyWALL forward H.323 traffic destined for WAN IP address 10.0.0.8 to a H.323 device located on the LAN and using IP address 192.168.1.56.

Figure 46 WAN to LAN H.323 Peer-to-peer Calls Example



5.7.1.1 Turn On the ALG

Click **Configuration > Network > ALG**. Select **Enable H.323 ALG** and **Enable H.323 transformations** and click **Apply**.

Figure 47 Configuration > Network > ALG

ALG

SIP Settings

☐ Enable SIP ALG

☒ Enable SIP Transformations

☒ Enable Configure SIP Inactivity Timeout

SIP Media Inactivity Timeout : 120 (seconds)

SIP Signaling Inactivity Timeout : 1800 (seconds)

SIP Signaling Port :

#	Port
1	5060

H.323 Settings

☒ Enable H.323 ALG

☒ Enable H.323 Transformations

H.323 Signaling Port : 1720 (1025-65535)

Additional H.323 Signaling Port for Transformations : 1720 (1025-65535) (Optional)

5.7.1.2 Set Up a NAT Policy For H.323

In this example, you need a NAT policy to forward H.323 (TCP port 1720) traffic received on the ZyWALL's 10.0.0.8 WAN IP address to LAN IP address 192.168.1.56.

- 1 Click **Configuration > Network > NAT > Add > Create New Object > Address** and create an IPv4 host address object for the public WAN IP address (called WAN_IP-for-H323 here). Repeat to create an address object for the H.323 device's private LAN IP address (called LAN_H323 here).

Configure a name for the rule (WAN-LAN_H323 here).

You want the LAN H.323 device to receive peer-to-peer calls from the WAN and also be able to initiate calls to the WAN so you set the **Classification** to **NAT 1:1**.

Set the **Incoming Interface** to the WAN interface.

Set the **Original IP** to the WAN address object (**WAN_IP-for-H323**).

Set the **Mapped IP** to the H.323 device's LAN IP address object (**LAN_H323**).

Set the **Port Mapping Type** to **Port**, the **Protocol Type** to **TCP** and the original and mapped ports to 1720.

Click **OK**.

Add NAT

Create new Object

General Settings

☒ Enable Rule

Rule Name: WAN-LAN_H323

Port Mapping Type

Classification: ☐ Virtual Server ☒ 1:1 NAT ☐ Many 1:1 NAT

Mapping Rule

Incoming Interface: wan1

Original IP: WAN_IP-for-H323

Mapped IP: LAN_H323

Port Mapping Type: Port

Protocol Type: TCP

Original Port: 1720

Mapped Port: 1720

Related Settings

☒ Enable NAT Loopback

Configure [Firewall](#)

OK Cancel

Create Address

Name: WAN_IP-for-H323

Address Type: HOST

IP Address: 10.0.0.8

Add Address Rule

Name: LAN_H323

Address Type: HOST

IP Address: 192.168.1.56

5.7.1.3 Set Up a Firewall Rule For H.323

Configure a firewall rule to allow H.323 (TCP port 1720) traffic received on the WAN_IP-for-H323 IP address to go to LAN IP address 192.168.1.56.

- 1 Click **Configuration > Firewall > Add**.

In the **From** field select WAN.

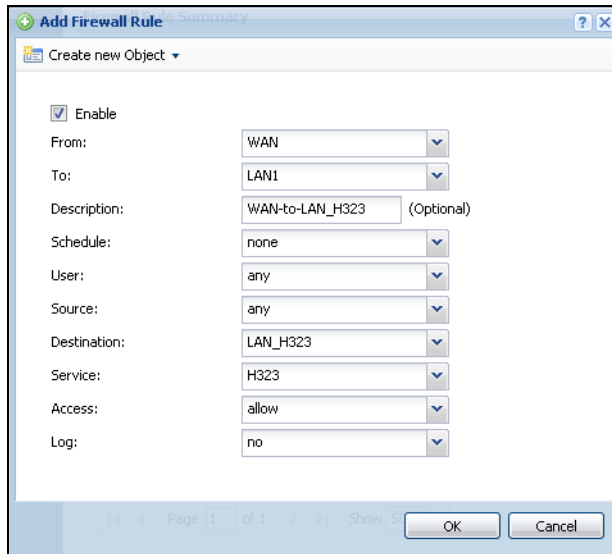
In the **To** field select LAN1.

Configure a name for the rule (WAN-to-LAN_H323 here).

Set the **Destination** to the H.323 device's LAN1 IP address object (**LAN_H323**). **LAN_H323** is the destination because the ZyWALL applies NAT to traffic before applying the firewall rule.

Set the **Service** to **H.323**.

Click **OK**.



5.7.2 How to Use an IPPBX on the DMZ

This is an example of making an IPPBX x6004 using SIP in the DMZ zone accessible from the Internet (the WAN zone). In this example you have public IP address 1.1.1.2 that you will use on the WAN interface and map to the IPPBX's private IP address of 192.168.3.9. The local SIP clients are on the LAN.

Figure 48 IPPBX Example Network Topology



5.7.2.1 Turn On the ALG

Click **Configuration > Network > ALG**. Select **Enable SIP ALG** and **Enable SIP Transformations** and click **Apply**.

Figure 49 Configuration > Network > ALG



5.7.2.2 Set Up a NAT Policy for the IPPBX

Click **Configuration > Network > NAT > Add > Create New Object > Address** and create an IPv4 host address object for the IPPBX's private DMZ IP address of 192.168.3.9. Repeat to create a host address object named IPPBX-Public for the public WAN IP address 1.1.1.2.

- Configure a name for the rule (WAN-DMZ_IPPBX here).
- You want the IPPBX to receive calls from the WAN and also be able to send calls to the WAN so you set the **Classification** to **NAT 1:1**.
- Set the **Incoming Interface** to use the WAN interface.
- Set the **Original IP** to the WAN address object (**IPPBX-Public**). If a domain name is registered for IP address 1.1.1.2, users can use it to connect to for making SIP calls.
- Set the **Mapped IP** to the IPPBX's DMZ IP address object (**IPPBX-DMZ**).
- Set the **Port Mapping Type** to **Port**, the **Protocol Type** to **UDP** and the original and mapped ports to 5060.
- Keep **Enable NAT Loopback** selected to allow the LAN users to use the IPPBX.
- Click **OK**.

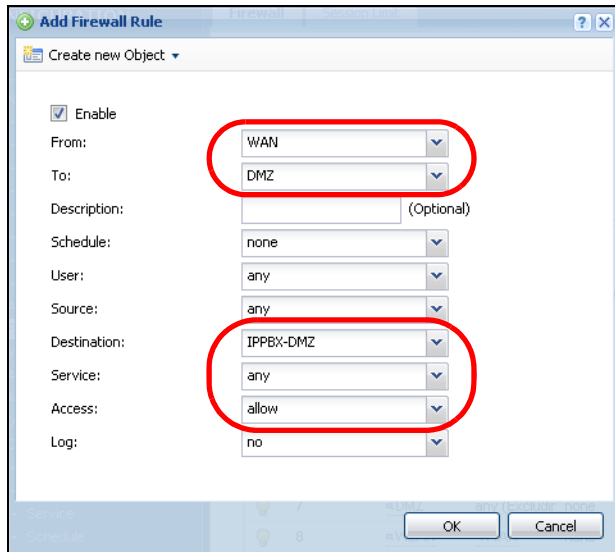
Figure 50 Configuration > Network > NAT > Add

The screenshot displays the 'Add NAT' configuration window. The 'General Settings' section has 'Enable Rule' checked and 'Rule Name' set to 'WAN-DMZ_IPPBX'. The 'Port Mapping Type' section shows 'Classification' set to '1:1 NAT'. The 'Mapping Rule' section has 'Incoming Interface' set to 'wan1', 'Original IP' set to 'IPPBX-Public', 'Mapped IP' set to 'IPPBX-DMZ', 'Port Mapping Type' set to 'Port', 'Protocol Type' set to 'UDP', and both 'Original Port' and 'Mapped Port' set to '5060'. The 'Related Settings' section has 'Enable NAT Loopback' checked. Two 'Add Address Rule' pop-up windows are overlaid: one for 'IPPBX-DMZ' with IP address '192.168.3.9' and another for 'IPPBX-Public' with IP address '1.1.1.2'. Both address rules are configured as 'HOST' type.

5.7.2.3 Set Up a WAN to DMZ Firewall Rule for SIP

The firewall blocks traffic from the WAN zone to the DMZ zone by default so you need to create a firewall rule to allow the public to send SIP traffic to the IPPBX. If a domain name is registered for IP address 1.1.1.2, users can use it to connect to for making SIP calls.

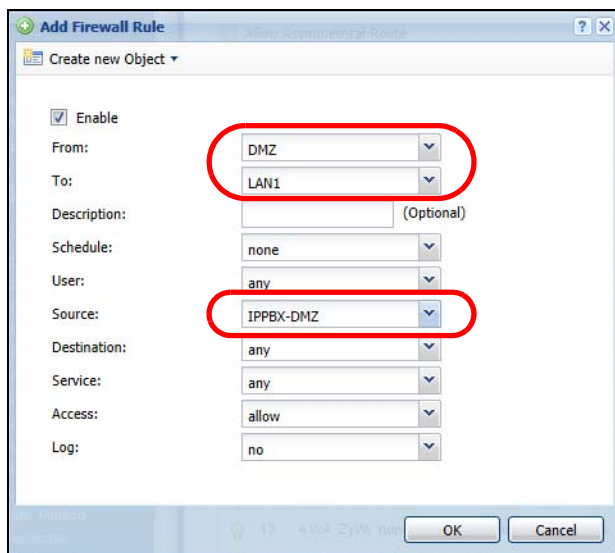
Click **Configuration > Firewall > Add**. Set the **From** field as **WAN** and the **To** field as **DMZ**. Set the **Destination** to the IPPBX's DMZ IP address object (**DMZ_SIP**). **IPPBX_DMZ** is the destination because the ZyWALL applies NAT to traffic before applying the firewall rule. Set the **Access** field to **allow** and click **OK**.



5.7.2.4 Set Up a DMZ to LAN Firewall Rule for SIP

The firewall blocks traffic from the DMZ zone to the LAN1 zone by default so you need to create a firewall rule to allow the IPPBX to send SIP traffic to the SIP clients on the LAN.

- 1 Click **Configuration > Firewall > Add**. Set the **From** field as **DMZ** and the **To** field as **LAN1**. Set the **Destination** to the IPPBX's DMZ IP address object (**DMZ_SIP**). Set the **Source** to **IPPBX_DMZ**. Leave the **Access** field to **allow** and click **OK**.



5.7.3 What Can Go Wrong

- The ZyWALL checks the firewall rules in order and applies the first firewall rule the traffic matches. If traffic matches a rule that comes earlier in the list, it may be unexpectedly blocked.
- The ZyWALL does not apply the firewall rule. The ZyWALL only apply's a zone's rules to the interfaces that belong to the zone. Make sure the WAN interface is assigned to WAN zone.

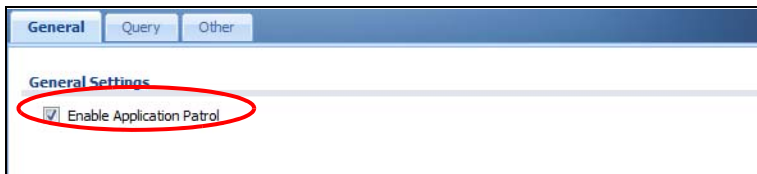
5.8 How to Limit Web Surfing and MSN to Specific People

The following is an example of using application patrol (AppPatrol) to enforce web surfing and MSN policies for the sales department of a company.

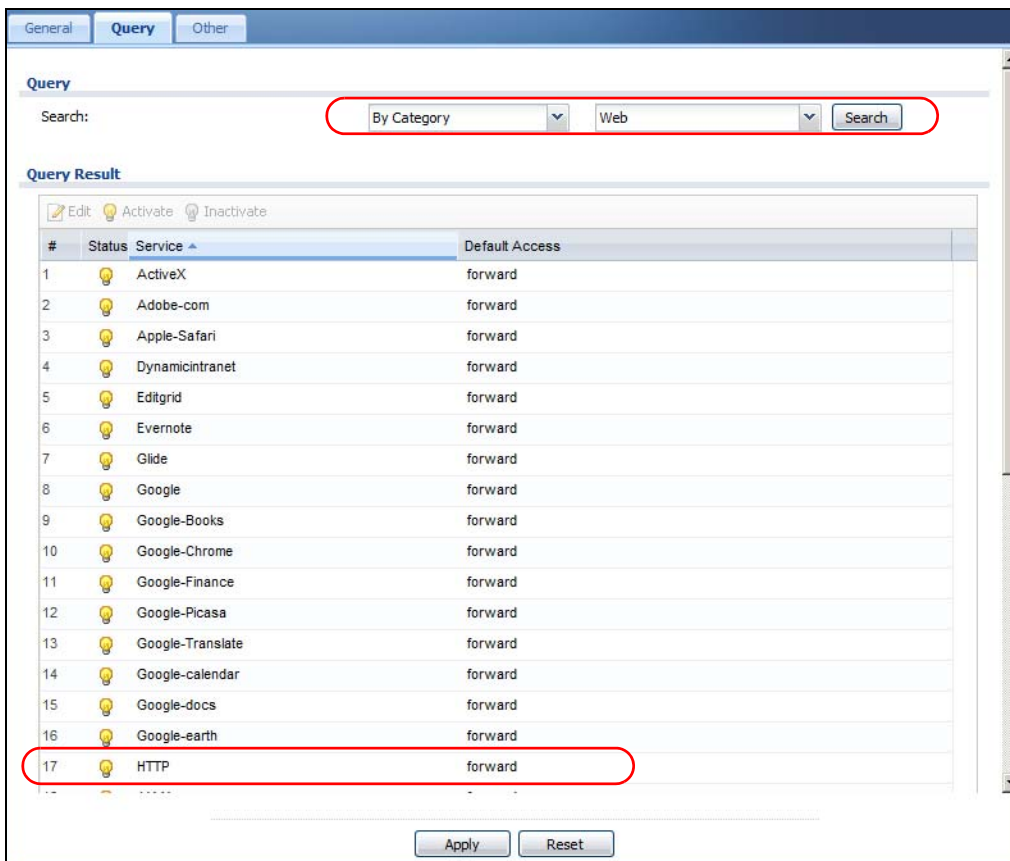
5.8.1 Set Up Web Surfing Policies

Before you configure any policies, you must have already subscribed for the application patrol service. You can subscribe using the **Configuration > Licensing > Registration** screens or using one of the wizards.

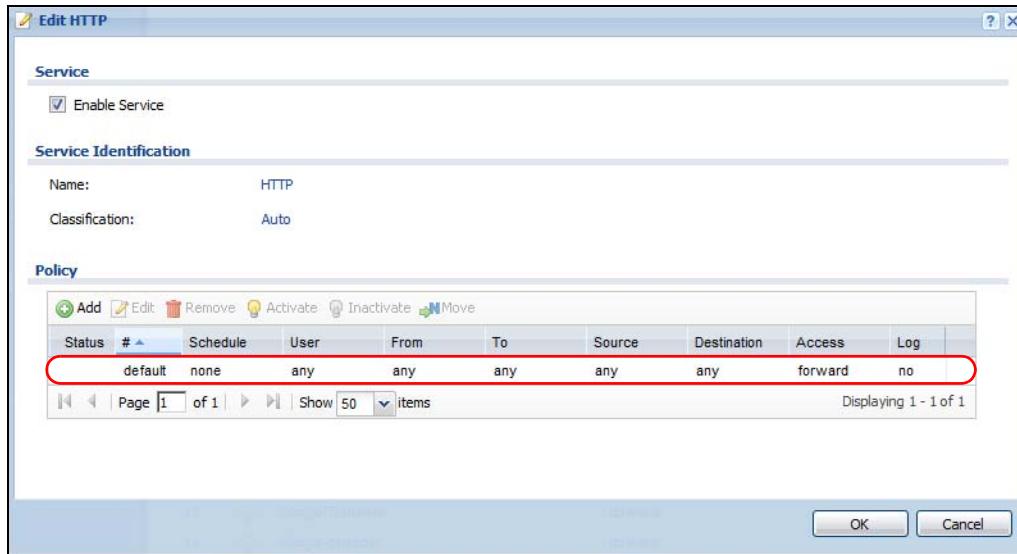
- 1 Click **Configuration > AppPatrol**. If application patrol is not enabled, enable it, and click **Apply**.



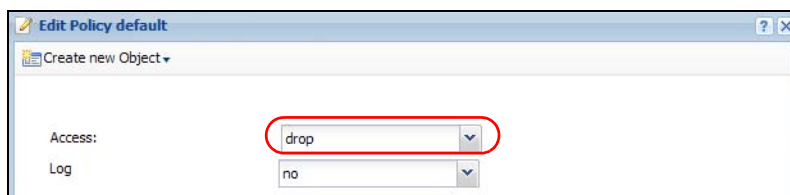
- 2 Click **Configuration > AppPatrol > Query**. In the first drop down menu select **By Category** and in the second drop down menu select **Web**, then click **Search**. Double-click the **http** entry to edit it.



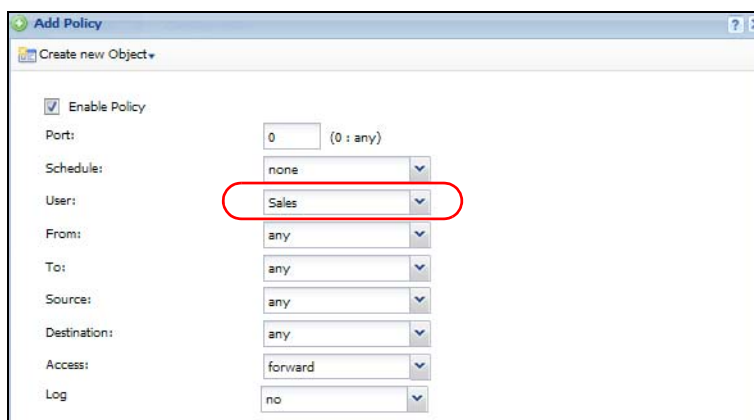
- 3 Double-click the **Default** policy.



- 4 Change the access to **Drop** because you do not want anyone except authorized user groups to browse the web. Click **OK**.



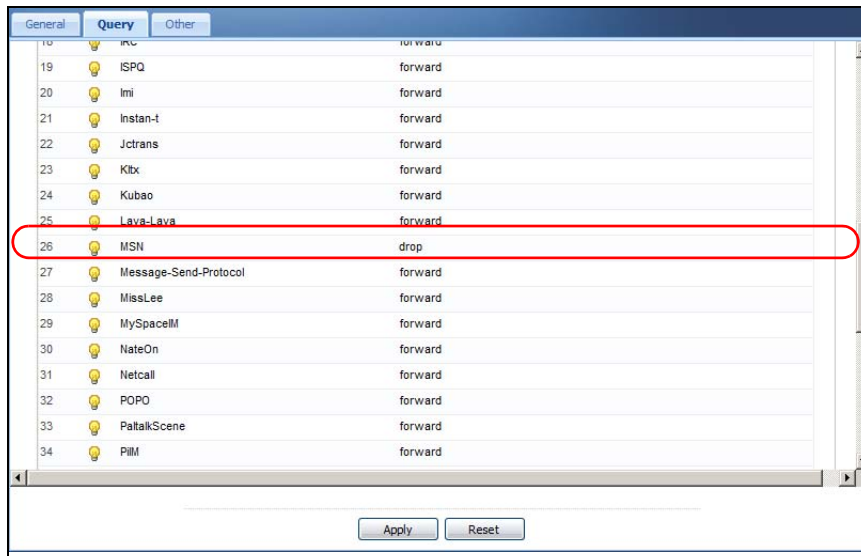
- 5 Click the **Add** icon in the policy list. In the new policy, select **Sales** as the user group allowed to browse the web. (The user group should be set in the **Configuration > Object > User/Group > Group > Add** screen.) Click **OK**.



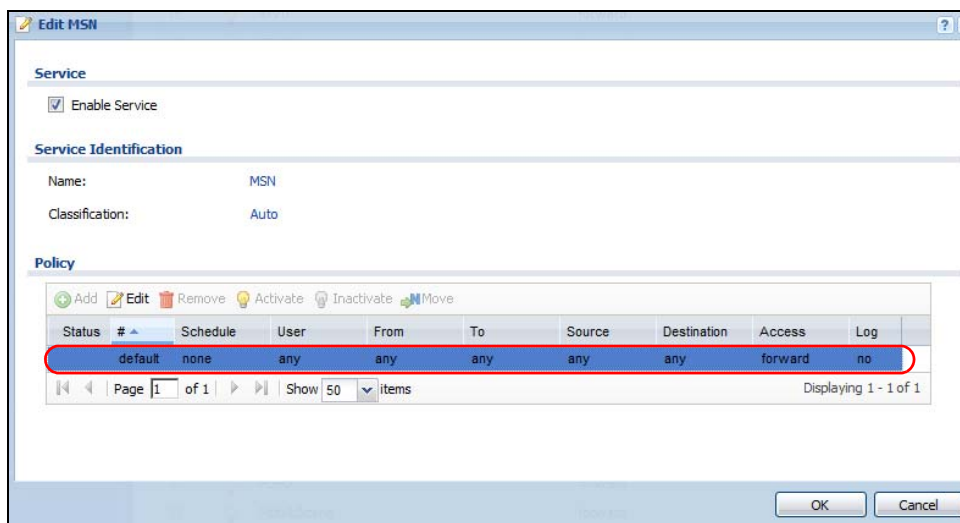
5.8.2 Set Up MSN Policies

In this part of the tutorial, you can set up a recurring schedule and apply it to the MSN application patrol rule so that only the sales department is allowed to use MSN during work hours on weekdays.

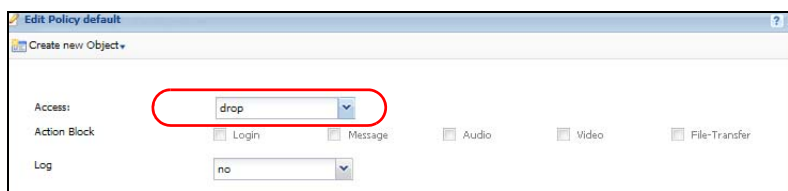
- 1 Click **Configuration > AppPatrol > Query**, and in the second dropdown menu, select **Instant Messenger**, and click **Search**. Then, double-click the **msn** entry to edit it.



- 2 Double-click the **Default** policy.



- 3 Change the access to **Drop** because you do not want anyone except the authorized user group (sales) to use MSN. Click **OK**.



- 4 Now you will need to set up a recurring schedule object first. Click **Configuration > Object > Schedule**. Click the **Add** icon for recurring schedules.
- 5 Give the schedule a descriptive name such as **WorkHours**. Set up the days (Monday through Friday) and the times (08:00 - 17:30) when the sales group is allowed to use MSN. Click **OK**.

Add Schedule Recurring Rule

Configuration

Name:

Day Time

Start Time:

Stop Time:

Weekly

Week Days: ☒ Monday ☒ Tuesday ☒ Wednesday ☒ Thursday ☒ Friday ☐ Saturday ☐ Sunday

- 6 Click **Configuration > AppPatrol > Query**, and in the second dropdown menu, select **Instant Messenger**, and click **Search**. Then, double-click the **msn** entry to edit it.

Protocol	Action
IRC	forward
ISPQ	forward
Imi	forward
Instant	forward
Jctrans	forward
Kltx	forward
Kubao	forward
Leve-Love	forward
MSN	drop
Message-Send-Protocol	forward
MissLee	forward
MySpaceIM	forward
NateOn	forward
Netcall	forward
POPO	forward
PaltalkScene	forward
PIM	forward

Buttons:

- 7 Click the **Add** icon in the policy list. In the new policy, select **WorkHours** as the schedule and **Sales** as the user group that is allowed to use MSN at the appointed schedule. Then select **forward** in the **Access** field. Click **OK** to finish the setup.

Edit Policy 1

Create new Object ▾

☒ Enable Policy

Port: 0 (0 : any)

Schedule: WorkHours ▾

User: Sales ▾

From: any ▾

To: any ▾

Source: any ▾

Destination: any ▾

Access: forward ▾

Action Block: ☐ Login ☐ Message ☐ Audio ☐ Video ☐ File-Transfer

Log: no ▾

OK Cancel

Now only the sales group may use MSN during work hours on week days.

5.8.3 What Can Go Wrong

If you have not already subscribed for the application patrol service, you will not be able to configure any policies. You can do so by using the **Configuration > Licensing > Registration** screens or using one of the wizards.

Maintenance

These sections cover managing and maintaining the ZyWALL.

- [How to Allow Management Service from WAN on page 125](#)
- [How to Use a RADIUS Server to Authenticate User Accounts based on Groups on page 128](#)
- [How to Use SSH for Secure Telnet Access on page 129](#)
- [How to Manage ZyWALL Configuration Files on page 130](#)
- [How to Manage ZyWALL Firmware on page 131](#)
- [How to Download and Upload a Shell Script on page 132](#)
- [How to Change a Power Module on page 133](#)
- [How to Save System Logs to a USB Storage Device on page 135](#)
- [How to Get the ZyWALL's Diagnostic File on page 138](#)
- [How to Capture Packets on the ZyWALL on page 139](#)
- [How to Use Packet Flow Explore for Troubleshooting on page 143](#)

6.1 How to Allow Management Service from WAN

There are several ways that remote users can manage the ZyWALL: through WWW, SSH, Telnet, FTP, and SNMP. HTTPS and SSH access are more secure than others. To allow the ZyWALL to be accessed from a remote user using one of these services, make sure you do not have a service control rule or to-ZyWALL firewall rule to block this traffic.

To allow a remote management service, you must ensure the following:

- The service is enabled in its corresponding system screen (for example, you make sure the HTTPs service in the **Configuration > System > WWW** screen is enabled for it to work).
- The allowed IP address (address object) in the **Service Control** table should match the client IP address.
- The IP address (address object) in the **Service Control** table is in the allowed zone and the action is set to **accept**.
- The to-ZyWALL firewall rules allow this traffic.

The following example is used to check that administrators and users are allowed to access the ZyWALL from the WAN using HTTPs.

6.1.1 Check Service Control

- 1 Click **Configuration > System > WWW**.

- 2 Check the **Admin Service Control** and **User Service Control** sections:
 - **accept** under **Action** means that the user is to access the ZyWALL from the specified computers.
 - **ALL** under **Zone** means that all ZyWALL zones are allowed to use this service.
 - **ALL** under **Address** means that all computers are allowed to communicate with the ZyWALL using this service.

Service Control Login Page

HTTPS

☒ Enable

Server Port:

☐ Authenticate Client Certificates (See [Trusted CAs](#))

Server Certificate:

☒ Redirect HTTP to HTTPS

Admin Service Control

#	Zone	Address	Action
-	ALL	ALL	accept

Page 1 of 1 | Show 50 items | Displaying 1 - 1 of 1

User Service Control

#	Zone	Address	Action
-	ALL	ALL	accept

Page 1 of 1 | Show 50 items | Displaying 1 - 1 of 1

- 3 If you want to create a different service control rule for HTTPs service, click the **Add** icon to do so. Refer to **How to Configure Service Control** in the **Tutorials** chapter for details.

6.1.2 Check Firewall Settings

- 1 Click **Configuration > Firewall**.
- 2 If the **WAN to ZyWALL** firewall rule denies access, double-click it to edit it.
 Mouse over the **Service** field and if **HTTPS** is not in the **Default_Allow_WAN_To_ZyWALL** service group list go to the **Object > Service > Service Group** screen to edit it.

Firewall Session Limit

General Settings

☒ Enable Firewall

IPv4 Rule Summary

☐ Allow Asymmetrical Route

From Zone: any To Zone: any Refresh

Status	Priority	From	To	Schedule	User	IPv4 Source	IPv4 Destination	Service	Access	Log
1	1	WAN	DMZ	none	any	any	IPBXX-DMZ	any	allow	no
2	2	WAN	LAN1	none	any	any	LAN_H323	H323	allow	no
3	3	WAN	DMZ	none	any	any	DMZ_HTTP	HTTP	allow	no
4	4	LAN1	any (Excluding...	none	any	any	any	any	allow	no
5	5	LAN2	any (Excluding...	none	any	any	any	any	allow	no
6	6	DMZ	WAN	none	any	any	any	any	allow	no
7	7	IPSec_VPN	any (Excluding...	none	any	any	any	any	allow	no
8	8	SSL_VPN	any (Excluding...	none	any	any	any	any	allow	no
9	9	TUNNEL	any (Excluding...	none	any	any	any	any	allow	no
10	10	LAN1	ZyWALL	none	any	any	any	any	allow	no
11	11	LAN2	ZyWALL	none	any	any	any	any	allow	no
12	12	DMZ	ZyWALL	none	any	any	any	Default_Allo...	allow	no
13	13	WAN	ZyWALL	none	any	any	any	Default_Allo...	allow	no
14	14	IPSec_VPN	ZyWALL	none	any	any	any	any	allow	no
15	15	SSL_VPN	ZyWALL	none	any	any	any	any	allow	no
16	16	TUNNEL	ZyWALL	none	any	any	any	any	allow	no
Default		any	any	none	any	any	any	any	allow	no

Page 1 of 1 Show 50 items

IPv6 Rule Summary

Default_Allow_WAN_To_ZyWALL

Description: System Default Allow From WAN To ZyWALL

Members: AH, ESP, HTTPS, IKE, NATT, GRE

In the **Edit Firewall Rule** screen, you can also configure a schedule object, address object, or apply it to certain a user/user group. Refer to **24.1.4 Firewall Rule Configuration Example** for details on firewall configuration.

Edit Firewall Rule 13

Create new Object

☒ Enable

From: WAN

To: ZyWALL

Description: (Optional)

Schedule: none

User: any

Source: any

Destination: any

Service: Default_Allow_WAN_To_ZyWALL

Access: allow

Log: no

OK Cancel

6.2 How to Use a RADIUS Server to Authenticate User Accounts based on Groups

The previous example showed how to have a RADIUS server authenticate individual user accounts. If the RADIUS server has different user groups distinguished by the value of a specific attribute, you can make a couple of slight changes in the configuration to have the RADIUS server authenticate groups of user accounts defined in the RADIUS server.

- 1 Click **Configuration > Object > AAA Server > RADIUS**. Double-click the **radius** entry. Besides configuring the RADIUS server's address, authentication port, and key; set the **Group Membership Attribute** field to the attribute that the ZyWALL is to check to determine to which group a user belongs. This example uses **Class**. This attribute's value is called a group identifier; it determines to which group a user belongs. In this example the values are Finance, Engineer, Sales, and Boss.

Edit RADIUS

General Settings

Name: radius

Description: (Optional)

Server Settings

Server Address: 192.168.1.200 (IP or FQDN)

Authentication Port: 1812 (1-65535)

Backup Server Address: (IP or FQDN) (Optional)

Backup Authentication Port: (1-65535) (Optional)

Timeout: 5 (1-300 seconds)

☐ case-sensitive

Server Authentication

Key:

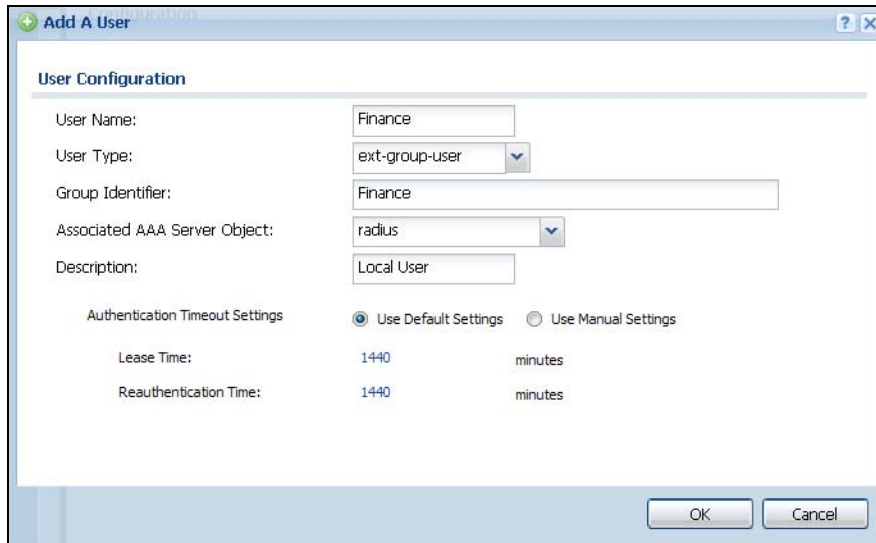
User Login Settings

Group Membership Attribute: Class(25) 25

OK Cancel

- 2 Now you add ext-group-user user objects to identify groups based on the group identifier values. Set up one user account for each group of user accounts in the RADIUS server. Click **Configuration > Object > User/Group > User**. Click the **Add** icon.

Enter a user name and set the **User Type** to **ext-group-user**. In the **Group Identifier** field, enter Finance and set the **Associated AAA Server Object** to **radius**.



- 3 Repeat the steps above if you need to add other user groups.

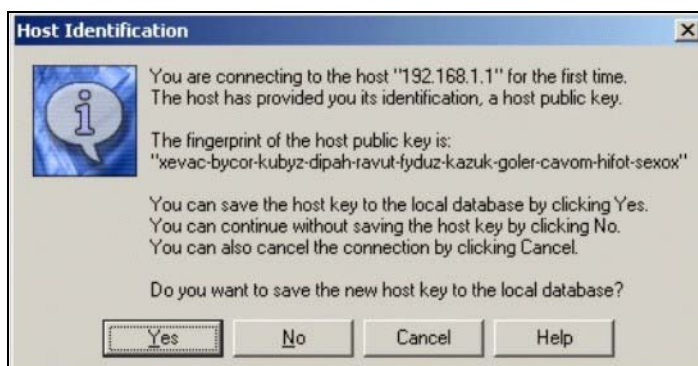
6.3 How to Use SSH for Secure Telnet Access

This section shows two examples using a command interface and a graphical interface SSH client program to remotely access the ZyWALL. The configuration and connection steps are similar for most SSH client programs. Refer to your SSH client program user's guide.

6.3.1 Example 1: Microsoft Windows

This section describes how to access the ZyWALL using the Secure Shell Client program.

- 1 Launch the SSH client and specify the connection information (IP address, port number) for the ZyWALL.
- 2 Configure the SSH client to accept connection using SSH version 1.
- 3 A window displays prompting you to store the host key in you computer. Click **Yes** to continue.



Enter the password to log in to the ZyWALL. The CLI screen displays next.

6.3.2 Example 2: Linux

This section describes how to access the ZyWALL using the OpenSSH client program that comes with most Linux distributions.

- 1 Test whether the SSH service is available on the ZyWALL.

Enter `telnet 192.168.1.1 22` at a terminal prompt and press [ENTER]. The computer attempts to connect to port 22 on the ZyWALL (using the default IP address of 192.168.1.1).

A message displays indicating the SSH protocol version supported by the ZyWALL.

```
$ telnet 192.168.1.1 22
Trying 192.168.1.1...
Connected to 192.168.1.1.
Escape character is '^]'.
SSH-1.5-1.0.0
```

- 2 Enter `ssh -1 192.168.1.1`. This command forces your computer to connect to the ZyWALL using SSH version 1. If this is the first time you are connecting to the ZyWALL using SSH, a message displays prompting you to save the host information of the ZyWALL. Type `yes` and press [ENTER]. Then enter the password to log in to the ZyWALL.

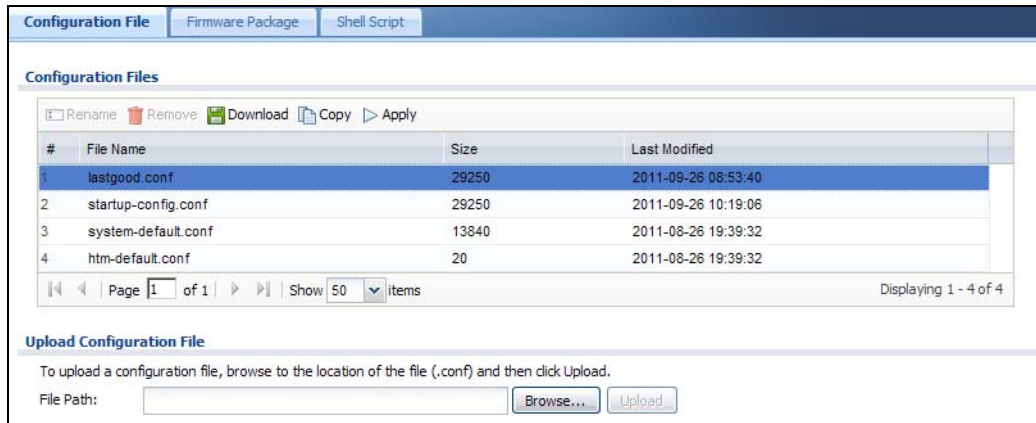
```
$ ssh -1 192.168.1.1
The authenticity of host '192.168.1.1 (192.168.1.1)' can't be established.
RSA1 key fingerprint is 21:6c:07:25:7e:f4:75:80:ec:af:bd:d4:3d:80:53:d1.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.1.1' (RSA1) to the list of known hosts.
Administrator@192.168.1.1's password:
```

- 3 The CLI screen displays next.

6.4 How to Manage ZyWALL Configuration Files

Configuration files define the ZyWALL's settings. You can use the **Configuration File** screen to backup configuration files from the ZyWALL to your computer and restore them from your computer to the ZyWALL.

To backup your configuration files, click **Maintenance > File Manager > Configuration File**. Select the configuration file that you want save to your computer and click **Download**. If you want to upload a configuration file, select the *.conf file from its path and click **Upload**. After the upload is successful, you can find the *.conf file in the configuration file list. Click **Apply** to run the selected configuration file.



The default configuration files are:

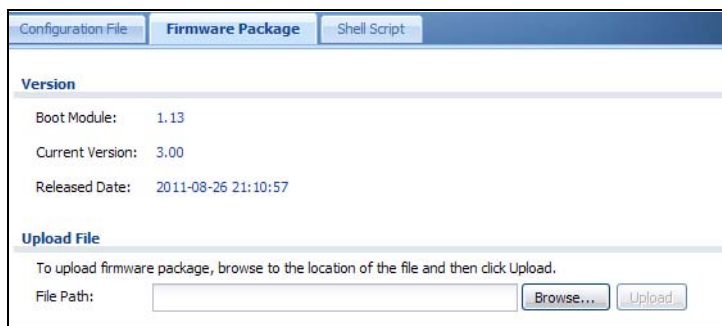
- **system-default.conf:** This file contains all of the ZyWALL settings. If you apply this file, the ZyWALL's default IP address and password will be restored.
- **startup-config.conf:** This is the configuration file that the ZyWALL is currently using. All the changes you have saved/applied in the Web Configurator or in CLI commands (when you use the write command) are applied to this file.
- **lastgood.conf:** This is the most recently used (valid) configuration file that was saved when the device last restarted. If you upload and apply a configuration file with an error, you can apply lastgood.conf to return to a valid configuration.

6.4.1 What Can Go Wrong

- You cannot upload **system-default.conf** or **lastgood.conf**.
- During boot up, the ZyWALL first applies **start-up.conf**. If the application is successful, it will be copied into **lastgood.conf**. If the application fails, the ZyWALL will try to apply **lastgood.conf**.
- If **lastgood.conf** fails to apply, the ZyWALL will restore by using the **system-default.conf** file so that the device can boot up normally.

6.5 How to Manage ZyWALL Firmware

Click **Maintenance > File Manager > Firmware Package**. Use this screen to check current firmware version and upload firmware to the ZyWALL.

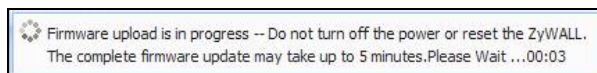


You can find and download the latest firmware package for the ZyWALL at www.zyxel.com in a *.zip file. After you unzip the file, you will find several files contained in the package. The file that you should use for firmware upload is a *.bin file, for example "300BDS0C0.bin". In the firmware naming rule, 300 is the major firmware version; BDS0 is the USG model (for example, BDS is USG50 and BDQ is USG20) and its patch version; and C0 is the release firmware version. Other files such as *.nor, *.db, and *.ri files cannot be uploaded by the Web Configurator and could cause damage to the ZyWALL if used improperly. Refer to the release note (available in the firmware package) for the purpose of these files.

After you upload the *.bin file, the ZyWALL automatically restarts causing a temporary network disconnect. In some operating systems, you may see the following icon on your desktop.



A message will show the progress of the upload, which usually takes five minutes or more. Do not turn off or reset the ZyWALL during upload.



The ZyWALL will automatically reboot after the upload is complete and you will be automatically be redirected to the login screen. Go to the **Dashboard** screen to check if your firmware version is the latest.

6.5.1 What Can Go Wrong

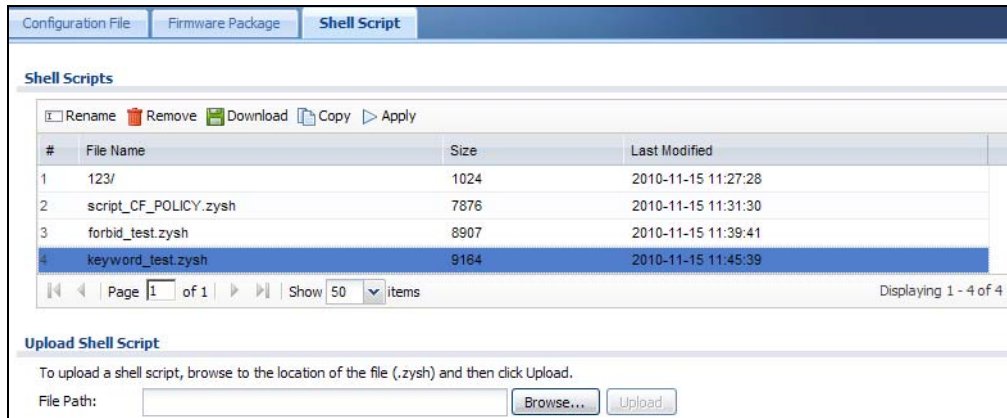
- If you see an error message during firmware upload, check if you have uploaded the correct file.
- A firmware file should have a .bin extension.
- Do not upload other file types which might cause damage to the ZyWALL.

6.6 How to Download and Upload a Shell Script

A shell script is a list of commands that the ZyWALL runs in sequence. You can edit shell scripts in a text editor and upload them to the ZyWALL. Shell scripts use a .zysh extension.

To backup your shell script, click **Maintenance > File Manager > Configuration File**. Select the shell script that you want save to your computer and click **Download**. If you want to upload a shell script, select the *.zysh file from its path and click **Upload**. After the upload is successful, you can find the *.zysh file in the shell script list. Click **Apply** to run the selected shell script.

When you run a shell script, the ZyWALL only applies the commands that it contains. Other settings do not change.



6.6.1 What Can Go Wrong

When you run a shell script, the ZyWALL processes the file line-by-line. The ZyWALL checks the first line and applies the line if no errors are detected. Then it continues with the next line. If the ZyWALL finds an error, it stops applying the shell script.

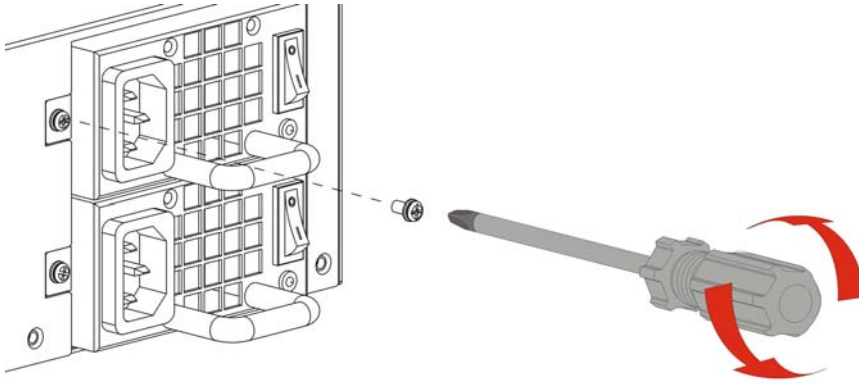
If you want the ZyWALL to ignore any errors in the shell script and applies all of the valid commands, include `setenv stop-on-error off` in the shell script. The shell script will keep running regardless of error. You can still find the logs for shell script errors.

6.7 How to Change a Power Module

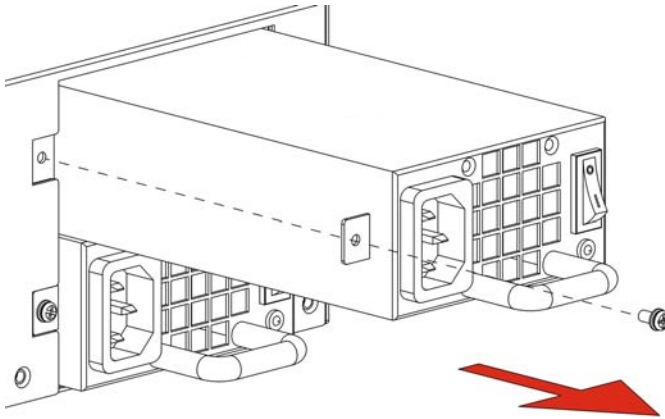
This tutorial applies only to USG 2000.

The ZyWALL has two power modules. It can continue operating on a single power module if one fails. The power modules are near the top of the front panel of the main chassis. Obtain ZyWALL power modules from your local vendor. Use the following procedure to change a power module.

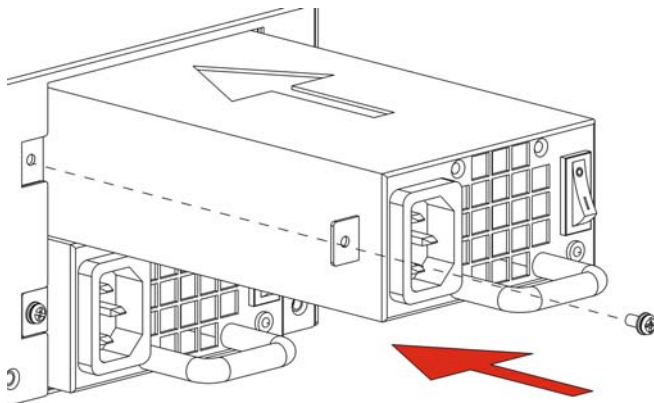
- 1 Make sure that the power module you want to disconnect has the power switch in the off position. You only need to turn off the power module that has failed. The ZyWALL can continue operating on power from the other power module.
- 2 Disconnect the power cord from the power outlet.
- 3 Disconnect the power cord from the ZyWALL's power module.
- 4 Use a Phillips screwdriver to remove the power module's retaining screw.



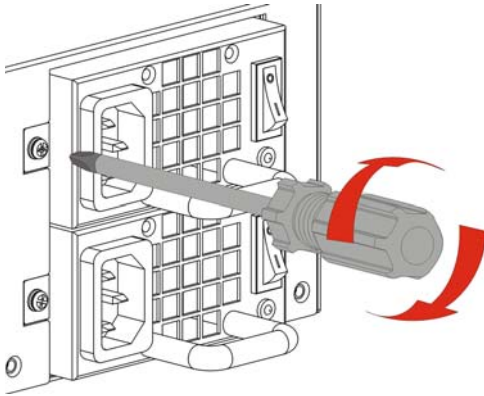
- 5 Use the handle to slide out the power module and remove it.



- 6 Install the new ZyWALL power module.



- 7 Tighten the power module's retaining screw.



- 8 Connect the power cord to the new ZyWALL power module.
- 9 Reconnect the power cord to the power outlet.
- 10 Push the ZyWALL power module switch to the on position.

6.8 How to Save System Logs to a USB Storage Device

The ZyWALL uses the memory space to store system logs. Once the memory is full, the ZyWALL has new logs override old logs. If your ZyWALL's memory is full or the size of the system logs you want to save may exceed the remaining space, you can use a USB storage device. This tutorial shows you how to save the ZyWALL's system logs to a USB storage device directly connected to the ZyWALL.

Note: You can check the remaining memory space in the **Dashboard** screen.

Note: System logs saved on the ZyWALL cannot be transferred to a USB device directly connected to the ZyWALL. The ZyWALL saves new system logs to the connected USB storage after you complete the settings shown here.

- 1 Insert a USB storage device to any USB port on your ZyWALL. In the **Monitor > System Status > USB Storage** screen, you can see the USB device's information.

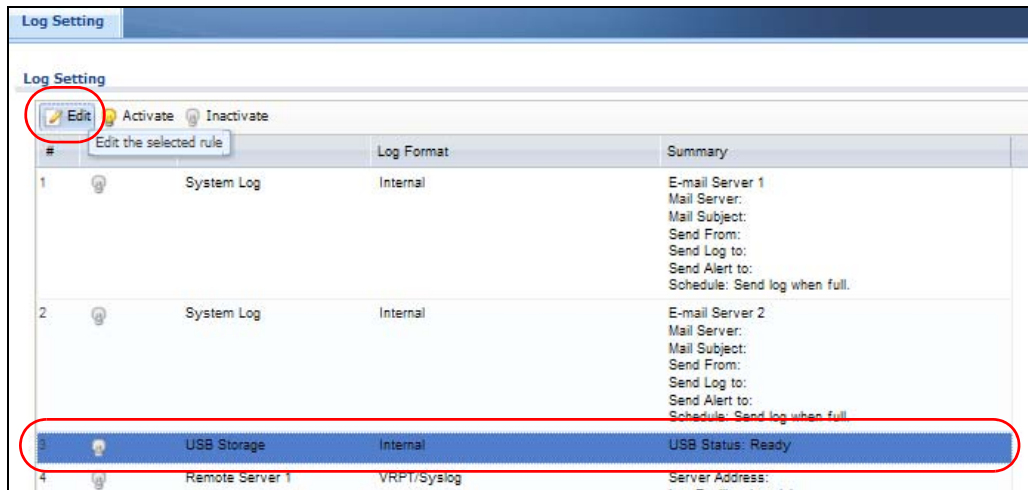
Note: Make sure the USB device's file system is supported by the ZyWALL. (It should not display "Unknown".)

Storage Information	
Information	
Device description:	Kingston DataTraveler
Usage:	5.5GB / 7.6GB (72.8 %)
Filesystem:	FAT32
Speed:	USB 2.0 480Mbps
Status:	Ready
Detail:	Deactivated

- Go to **Configuration > System > USB Storage**, select **Activate USB storage service** and click **Apply** to allow the ZyWALL to save diagnostic data to the connected USB device.

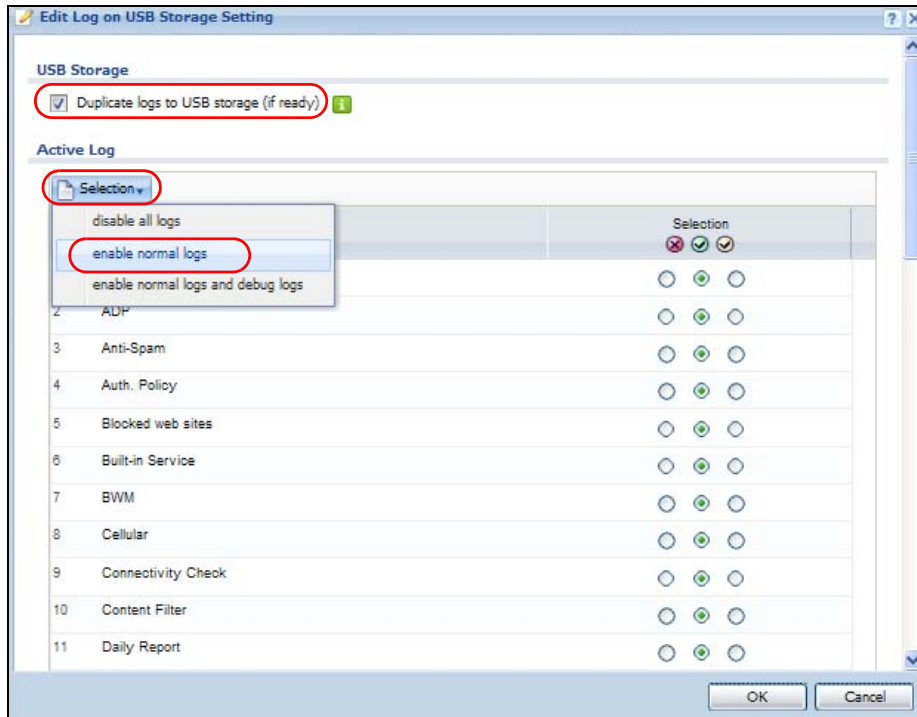


- Go to **Configuration > Log & Report > Log Setting**, select the **USB Storage** entry and click **Edit**.

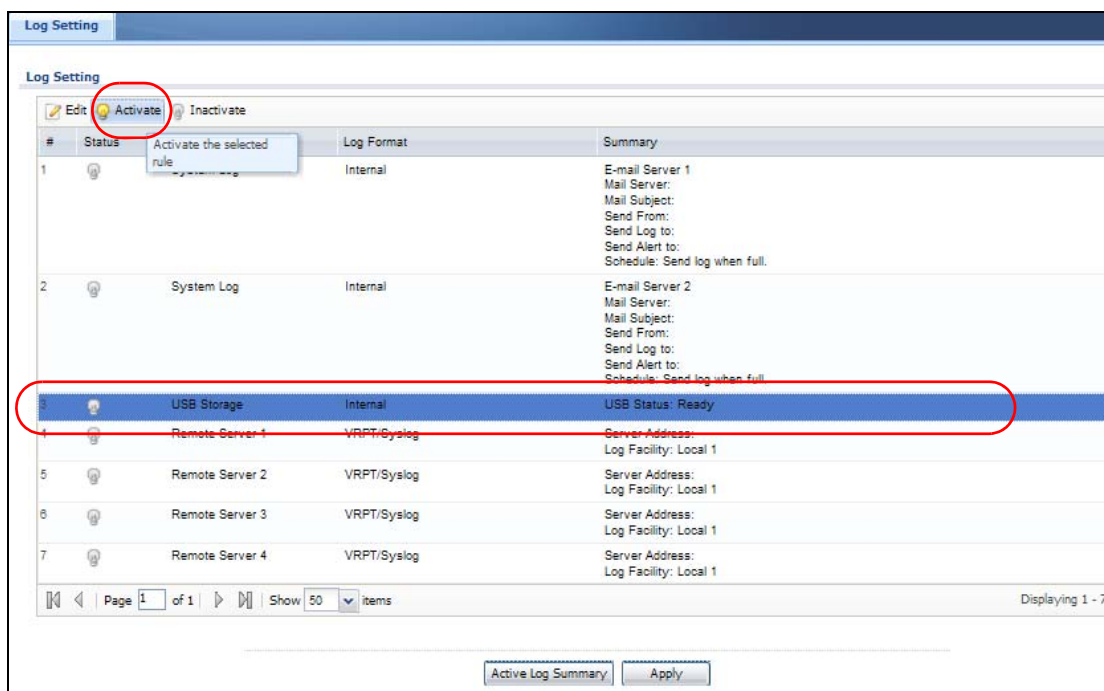


- In the **Edit Log on USB Storage Setting** screen, select **Duplicate logs to USB storage**.

Select the green check marks to log regular information and alerts from the corresponding categories. You can also simply click **Selection** and then **enable normal logs** to select the green check marks for all categories as shown in this example. Click **OK**.



- 5 In the **Configuration > Log & Report > Log Setting** screen, select the **USB Storage** entry again and click **Activate**. Click **Apply** to have the ZyWALL start recording system logs to the USB device.



- 6 In the **Maintenance > Diagnostics > System Log** screen, you can see a new log file which is recording the system logs. You can select it and click **Download** if you want to save it to your computer.

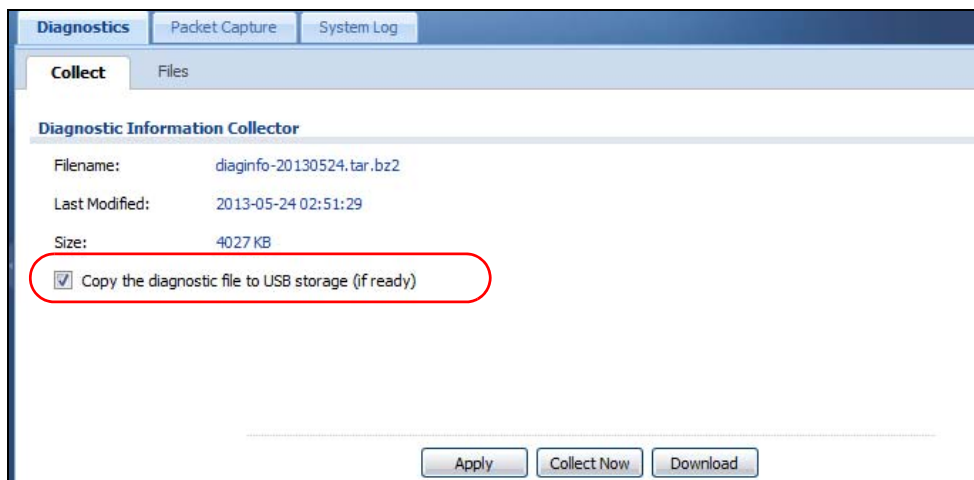
6.8.1 What Can Go Wrong?

- Before you physically remove a connected USB device, go to **Monitor > System Status > USB Storage** and click **Remove Now**.
- If you want to use the USB device and you have not physically remove it, click **Use It** in the same screen to mount the device.

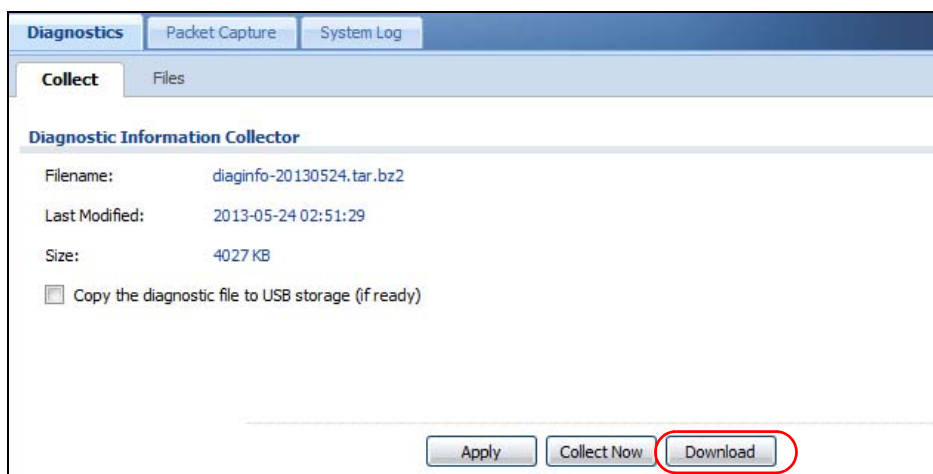
6.9 How to Get the ZyWALL's Diagnostic File

This example shows you how to generate a file containing the ZyWALL's configuration and diagnostic information if you need to provide it to customer support for troubleshooting.

- 1 Go to the **Maintenance > Diagnostics > Collect** screen, click **Collect Now**.



- 2 After the process is done, the file information displays on the screen. Click **Download** to save the file to your computer.



The ZyWALL uses the flash space to store diagnostic files. Once the flash is full, the ZyWALL stops generating the file. If your ZyWALL's flash is almost full, you can use a USB storage device.

Note: You can check the remaining flash space in the **Dashboard** or **Maintenance > Diagnostics > Packet Capture** screen.

To save diagnostic files to a USB storage device, do the following before you collect a diagnostic file:

- 1 Insert the USB storage device to any USB port on your ZyWALL. In the **Monitor > System Status > USB Storage** screen, make sure the USB device's file system doesn't display "unknown".
- 2 Go to **Configuration > System > USB Storage**, select **Activate USB storage service** and click **Apply**.
- 3 In the **Maintenance > Diagnostics > Collect** screen, select **Copy the diagnostic file to USB storage**. Click **Apply**.

The screenshot shows the 'Diagnostics' tab with sub-tabs for 'Packet Capture', 'Core Dump', and 'System Log'. The 'Collect' sub-tab is active, showing a 'Diagnostic Information Collector' section. It includes fields for 'Filename', 'Last Modified', and 'Size', all set to 'none'. A checkbox labeled 'Copy the diagnostic file to USB storage (if ready)' is checked and circled in red. At the bottom, there are three buttons: 'Apply', 'Collect Now', and 'Download'.

6.10 How to Capture Packets on the ZyWALL

This example traces the IPv4 packets (you can also capture IPv6 packets) sent from or to a specific IP address (172.16.1.33) through the ZyWALL's LAN1 and WAN1. You have to evaluate when the best timing is to capture packets for troubleshooting and do it at the right time.

- 1 Go to **Maintenance > Diagnostics > Packet Capture > Capture**, select **wan1** and **lan1** and move them to the **Capture Interfaces** box.

Select **IPv4** in the **IP Version** field.

Select **User Defined** and enter **172.16.1.33** in the **Host IP** field.

Select **Save data to onboard storage only** (if the displayed available size is enough). Click **Capture**.

The screenshot shows the 'Packet Capture' configuration page. It includes tabs for 'Diagnostics', 'Packet Capture', and 'System Log'. The 'Packet Capture' tab is active, showing sub-tabs for 'Capture' and 'Files'. The 'Capture' sub-tab is selected, displaying the following configuration options:

- Interfaces:**
 - Available Interfaces:** wan1, wan2, lan1, lan2, dmz
 - Capture Interfaces:** (Empty)
- Filter:**
 - IP Version: any
 - Protocol Type: any
 - Host IP: any
 - Host Port: 0 (0: any)
- Misc setting:**
 - ☐ Continuously capture and overwrite old ones
 - ☒ Save data to onboard storage only (available: 55 MB)
 - ☐ Save data to USB storage (service deactivated)
 - Captured Packet Files: 10 MB
 - Split threshold: 2 MB
 - Duration: 0 (0: unlimited)
 - File Suffix: -packet-capture
 - Number Of Bytes To Capture (Per Packet): 1500 Bytes

At the bottom of the page are three buttons: 'Capture', 'Stop', and 'Reset'.

- 2 Click the **Stop** button to end the packet-capture session when you think you have captured enough packets. How long it may take depends on the packet type and network behavior that you want to capture.
- 3 Click the **Files** tab, you can see two files (CAP and TXT) generated for each interface. Select a file and click **Download**.

The TXT files display the packet statistics, such as packets captured according to your filters, packets received in total, and packets dropped.

The CAP files display each captured packet's details. You will need a packet analyzer tool to view them (see [Section 6.10.1 on page 142](#) for an example).

Diagnostics Packet Capture System Log			
Capture Files			
Captured Packet Files			
Remove Download			
#	File Name	Size	Modify
1	lan2--packet-capture.00000.cap	45322	2011-03-17 09:12:01
2	lan2--packet-capture.txt	80	2011-03-17 09:12:01
Page 1 of 1 Show 50 items Displaying 1 - 2 of 2			
Captured Packet Files in USB storage			
Remove Download			
#	File Name	Size	Modify
Page 1 of 1 Show 50 items No data to display			

The ZyWALL uses the flash space to store packet capture files. Once the flash is full, the ZyWALL stops generating the file or has new captured packets override old packets depending on your setting. If your ZyWALL's flash is full or the size of the packet capture files you want to capture may exceed the remaining space, you can use a USB storage device.

Note: You can check the remaining flash space in the **Dashboard** or **Maintenance > Diagnostics > Packet Capture** screen.

To save packet capture files to a connected USB storage device, do the following:

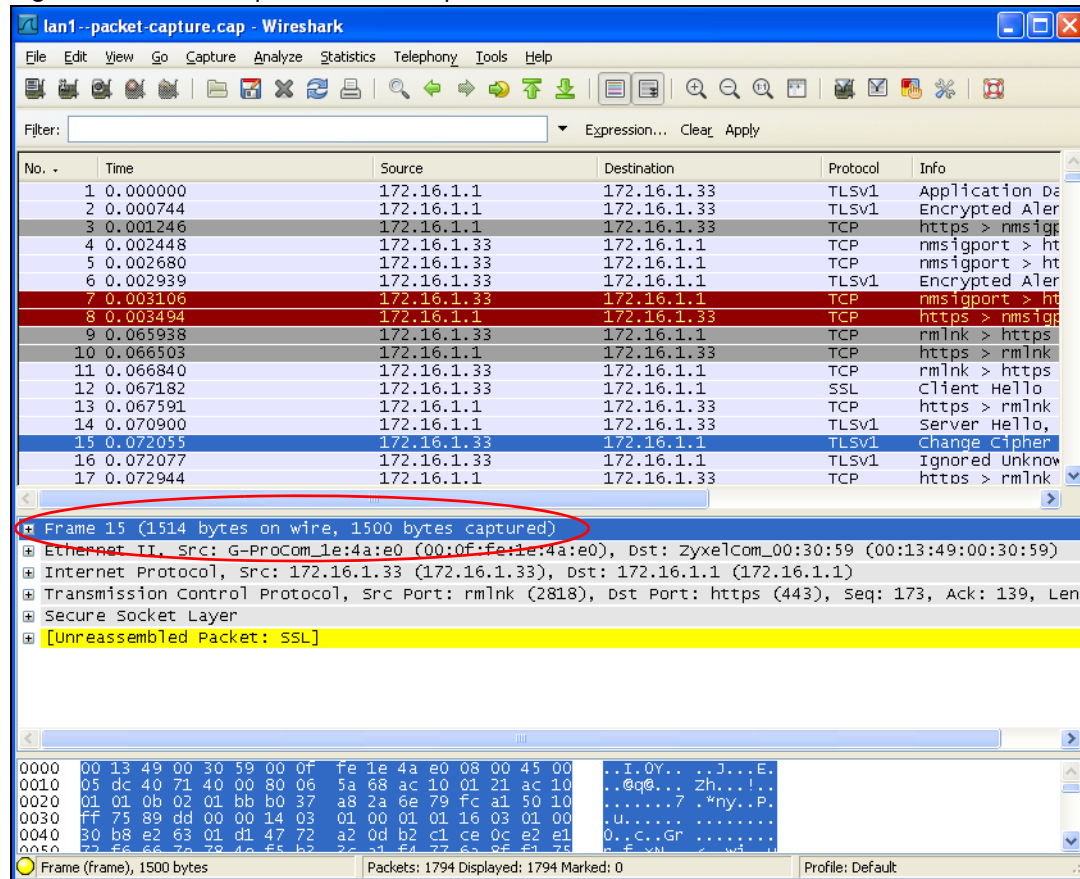
- 1 Insert a USB storage device to any USB port on your ZyWALL. In the **Monitor > System Status > USB Storage** screen, make sure the USB device's file system doesn't display "Unknown".
- 2 Go to **Configuration > System > USB Storage**, select **Activate USB storage service** and click **Apply**.
- 3 In the **Maintenance > Diagnostics > Packet Capture > Collect** screen, select **Save data to USB storage**.

The screenshot shows the ZyWALL Packet Capture configuration page. The 'Packet Capture' tab is selected. The 'Capture' sub-tab is active. Under 'Interfaces', the 'Available Interfaces' list contains 'wan2', 'lan2', and 'dmz'. The 'Capture Interfaces' list contains 'wan1' and 'lan1', with 'lan1' selected. The 'Filter' section has dropdowns for 'IP Version' (any), 'Protocol Type' (any), and 'Host IP' (any), and a text field for 'Host Port' (0). The 'Misc setting' section has three radio buttons: 'Continuously capture and overwrite old ones' (unchecked), 'Save data to onboard storage only (available: 54 MB)' (unchecked), and 'Save data to USB storage (available: 1129 MB)' (checked, circled in red). Below these are fields for 'Captured Packet Files' (10 MB), 'Split threshold' (2 MB), 'Duration' (0, unlimited), 'File Suffix' (-packet-capture), and 'Number Of Bytes To Capture (Per Packet)' (1500 Bytes). At the bottom are 'Capture', 'Stop', and 'Reset' buttons.

6.10.1 Example of Viewing a Packet Capture (CAP) File

Here is an example of a packet capture file viewed in the Wireshark packet analyzer. Notice that the size of frame 15 on the wire is 1514 bytes while the captured size is only 1500 bytes. The ZyWALL truncated the frame because the capture screen's **Number Of Bytes To Capture (Per Packet)** field was set to 1500 bytes.

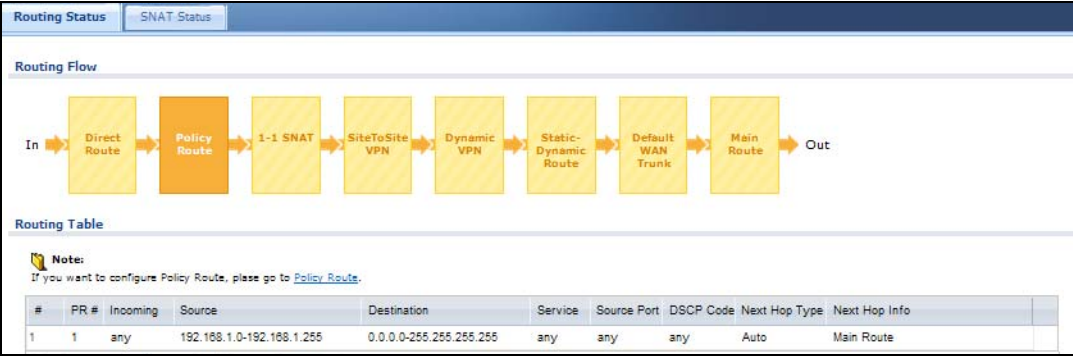
Figure 51 Packet Capture File Example



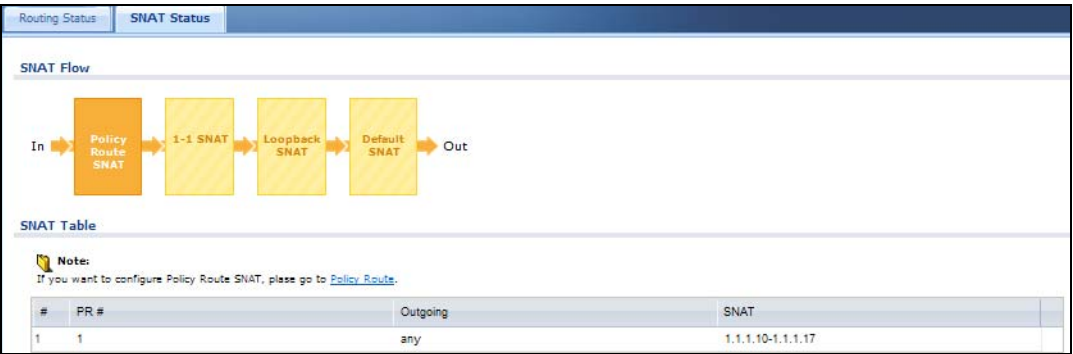
6.11 How to Use Packet Flow Explore for Troubleshooting

Use the packet flow explore function to help resolve routing or NAT problems. For example: an interface suddenly goes down, you configure a policy route but packets do not go through the configured interface or go through another route.

The **Maintenance > Packet Flow Explore > Routing Status** screen displays the ZyWALL's current routing flow. Click a function box to get the corresponding active routes. The ZyWALL routes packets in the order of the flow as shown from left to right. Once a packet matches the criteria of a route, the ZyWALL routes the packet and does not perform any further routing checking.



The **Maintenance > Packet Flow Explore > SNAT Status** screen displays the ZyWALL's current source NAT (SNAT) flow. Click a function box to see the corresponding active SNAT rules. The ZyWALL checks if a packet matches an SNAT rule's criteria by following the order of the flow as shown from left to right. Once a packet matches the criteria of an SNAT rule, the ZyWALL takes the corresponding action on the packet and does not perform any further SNAT flow checking.



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Certifications (Class B for ZyWALL USG 20, 20W, 50, 100, 100-PLUS, and 200)

Federal Communications Commission (FCC) Interference Statement

The device complies with Part 15 of FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operations.

This device has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device 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. However, there is no guarantee that interference will not occur in a particular installation.

If this device does cause harmful interference to radio/television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- 1 Reorient or relocate the receiving antenna.
- 2 Increase the separation between the equipment and the receiver.
- 3 Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- 4 Consult the dealer or an experienced radio/TV technician for help.



FCC Radiation Exposure Statement

- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- IEEE 802.11n (20MHz) operation of this product in the U.S.A. is firmware-limited to channels 1 through 11. IEEE 802.11n (40MHz) operation of this product in the U.S.A. is firmware-limited to channels 3 through 9.
- To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.
- For product available in the USA market, only channel 1~11 can be operated. Selection of other channels is not possible.

注意！

依據 低功率電波輻射性電機管理辦法

第十二條 經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用
者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現
有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。
前項合法通信，指依電信規定作業之無線電信。低功率射頻電機須忍
受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

本機限在不干擾合法電臺與不受被干擾保障條件下於室內使用。
減少電磁波影響，請妥適使用。

Notices

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Certifications (Class A for ZyWALL USG 300, 1000, and 2000)

Federal Communications Commission (FCC) Interference Statement

This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operations.

FCC Warning

This device has been tested and found to comply with the limits for a Class A digital switch, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE Mark 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.

Taiwanese BSMI (Bureau of Standards, Metrology and Inspection) A Warning:

警告使用者

這是甲類的資訊產品，在居住的環境使用時，

可能造成射頻干擾，在這種情況下，

使用者會被要求採取某些適當的對策。

Notices

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CLASS 1 LASER PRODUCT

APPAREIL À LASER DE CLASS 1

PRODUCT COMPLIES WITH 21 CFR 1040.10 AND 1040.11.

PRODUIT CONFORME SELON 21 CFR 1040.10 ET 1040.11.

Viewing Certifications

- 1 Go to <http://www.zyxel.com>.
- 2 Select your product on the ZyXEL home page to go to that product's page.
- 3 Select the certification you wish to view from this page.

ZyXEL Limited Warranty

ZyXEL warrants to the original end user (purchaser) that this product is free from any defects in material or workmanship for a specific period (the Warranty Period) from the date of purchase. The Warranty Period varies by region. Check with your vendor and/or the authorized ZyXEL local distributor for details about the Warranty Period of this product. During the warranty period, and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, ZyXEL will, at its discretion, repair or replace the defective products or components without charge for either parts or labor, and to whatever extent it shall deem necessary to restore the product or components to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal or higher value, and will be solely at the discretion of ZyXEL. This warranty shall not apply if the product has been modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions.

Note

Repair or replacement, as provided under this warranty, is the exclusive remedy of the purchaser. This warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular use or purpose. ZyXEL shall in no event be held liable for indirect or consequential damages of any kind to the purchaser.

To obtain the services of this warranty, contact your vendor. You may also refer to the warranty policy for the region in which you bought the device at http://www.zyxel.com/web/support_warranty_info.php.

Registration

Register your product online to receive e-mail notices of firmware upgrades and information at www.zyxel.com for global products, or at www.us.zyxel.com for North American products.

Open Source Licenses

This product contains in part some free software distributed under GPL license terms and/or GPL like licenses. Open source licenses are provided with the firmware package. You can download the latest firmware at www.zyxel.com. To obtain the source code covered under those Licenses, please contact support@zyxel.com.tw to get it.

Regulatory Information

European Union

The following information applies if you use the product within the European Union.

Declaration of Conformity with Regard to EU Directive 1999/5/EC (R&TTE Directive)

Compliance Information for 2.4GHz and 5GHz Wireless Products Relevant to the EU and Other Countries Following the EU Directive 1999/5/EC (R&TTE Directive)

[Czech]	ZyXEL tímto prohlašuje, že tento zařízení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/EC.
[Danish]	Undertegnede ZyXEL erklærer herved, at følgende udstyr overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
[German]	Hiermit erkläre ZyXEL, dass sich das Gerät Ausstattung in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EU befindet.
[Estonian]	Käesolevaga kinnitab ZyXEL seadme seadme vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, ZyXEL declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
[Spanish]	Por medio de la presente ZyXEL declara que el equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
[Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ ΖΥΧΕΛ ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
[French]	Par la présente ZyXEL déclare que l'appareil équipements est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/EC.
[Italian]	Con la presente ZyXEL dichiara che questo attrezzatura è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
[Latvian]	Ar šo ZyXEL deklarē, ka iekārtas atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
[Lithuanian]	Šiuo ZyXEL deklaruoją, kad šis įranga atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
[Dutch]	Hierbij verklaart ZyXEL dat het toestel uitrusting in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EC.
[Maltese]	Hawnhekk, ZyXEL, jiddikjara li dan taghmir jikkonforma mal-htigijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
[Hungarian]	Alulírott, ZyXEL nyilatkozom, hogy a berendezés megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EK irányelv egyéb előírásainak.
[Polish]	Niniejszym ZyXEL oświadcza, że sprzęt jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
[Portuguese]	ZyXEL declara que este equipamento está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/EC.
[Slovenian]	ZyXEL izjavlja, da je ta oprema v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/EC.
[Slovak]	ZyXEL týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/EC.
[Finnish]	ZyXEL vakuuttaa täten että laitteet tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
[Swedish]	Härmed intygar ZyXEL att denna utrustning står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EC.
[Bulgarian]	С настоящото ZyXEL декларира, че това оборудване е в съответствие със съществените изисквания и другите приложими разпоредбите на Директива 1999/5/EC.
[Icelandic]	Hér með lýsir, ZyXEL því yfir að þessi búnaður er í samræmi við grunnkröfur og önnur viðeigandi ákvæði tilskipunar 1999/5/EC.
[Norwegian]	Erklærer herved ZyXEL at dette utstyret er i samsvar med de grunnleggende kravene og andre relevante bestemmelser i direktiv 1999/5/EF.
[Romanian]	Prin prezenta, ZyXEL declară că acest echipament este în conformitate cu cerințele esențiale și alte prevederi relevante ale Directivei 1999/5/EC.



National Restrictions

This product may be used in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

Ce produit peut être utilisé dans tous les pays de l'UE (et dans tous les pays ayant transposés la directive 1999/5/CE) sans aucune limitation, excepté pour les pays mentionnés ci-dessous:

Questo prodotto è utilizzabile in tutte i paesi EU (ed in tutti gli altri paesi che seguono le direttive EU 1999/5/EC) senza nessuna limitazione, eccetto per i paesi menzionati di seguito:

Das Produkt kann in allen EU Staaten ohne Einschränkungen eingesetzt werden (sowie in anderen Staaten die der EU Direktive 1995/5/CE folgen) mit Ausnahme der folgenden aufgeführten Staaten:

In the majority of the EU and other European countries, the 2, 4- and 5-GHz bands have been made available for the use of wireless local area networks (LANs). Later in this document you will find an overview of countries in which additional restrictions or requirements or both are applicable.

The requirements for any country may evolve. ZyXEL recommends that you check with the local authorities for the latest status of their national regulations for both the 2,4- and 5-GHz wireless LANs.

The following countries have restrictions and/or requirements in addition to those given in the table labeled "Overview of Regulatory Requirements for Wireless LANs":

Overview of Regulatory Requirements for Wireless LANs			
Frequency Band (MHz)	Max Power Level (EIRP) ¹ (mW)	Indoor ONLY	Indoor and Outdoor
2400-2483.5	100		V
5150-5350	200	V	
5470-5725	1000		V

Belgium

The Belgian Institute for Postal Services and Telecommunications (BIPT) must be notified of any outdoor wireless link having a range exceeding 300 meters. Please check <http://www.bipt.be> for more details.

Draadloze verbindingen voor buitengebruik en met een reikwijdte van meer dan 300 meter dienen aangemeld te worden bij het Belgisch Instituut voor postdiensten en telecommunicatie (BIPT). Zie <http://www.bipt.be> voor meer gegevens.

Les liaisons sans fil pour une utilisation en extérieur d'une distance supérieure à 300 mètres doivent être notifiées à l'Institut Belge des services Postaux et des Télécommunications (IBPT). Visitez <http://www.ibpt.be> pour de plus amples détails.

Denmark

In Denmark, the band 5150 - 5350 MHz is also allowed for outdoor usage.

I Danmark må frekvensbåndet 5150 - 5350 også anvendes udendørs.

Italy

This product meets the National Radio Interface and the requirements specified in the National Frequency Allocation Table for Italy. Unless this wireless LAN product is operating within the boundaries of the owner's property, its use requires a "general authorization." Please check <http://www.sviluppoeconomico.gov.it/> for more details.

Questo prodotto è conforme alla specifiche di Interfaccia Radio Nazionali e rispetta il Piano Nazionale di ripartizione delle frequenze in Italia. Se non viene installato all'interno del proprio fondo, l'utilizzo di prodotti Wireless LAN richiede una "Autorizzazione Generale". Consultare <http://www.sviluppoeconomico.gov.it/> per maggiori dettagli.

Latvia

The outdoor usage of the 2.4 GHz band requires an authorization from the Electronic Communications Office. Please check <http://www.esd.lv> for more details.

2.4 GHz frekvenču joslas izmantošanai ārpus telpām nepieciešama atļauja no Elektronisko sakaru direkcijas. Vairāk informācijas: <http://www.esd.lv>.

Notes:

1. Although Norway, Switzerland and Liechtenstein are not EU member states, the EU Directive 1999/5/EC has also been implemented in those countries.
2. The regulatory limits for maximum output power are specified in EIRP. The EIRP level (in dBm) of a device can be calculated by adding the gain of the antenna used (specified in dBi) to the output power available at the connector (specified in dBm).

Safety Warnings

- Do NOT use this product near water, for example, in a wet basement or near a swimming pool.
- Do NOT expose your device to dampness, dust or corrosive liquids.
- Do NOT store things on the device.
- Do NOT install, use, or service this device during a thunderstorm. There is a remote risk of electric shock from lightning.
- Connect ONLY suitable accessories to the device.
- Do NOT open the device or unit. Opening or removing covers can expose you to dangerous high voltage points or other risks. ONLY qualified service personnel should service or disassemble this device. Please contact your vendor for further information.
- Make sure to connect the cables to the correct ports.
- Place connecting cables carefully so that no one will step on them or stumble over them.
- Always disconnect all cables from this device before servicing or disassembling.
- Use ONLY an appropriate power adaptor or cord for your device. Connect it to the right supply voltage (for example, 110V AC in North America or 230V AC in Europe).
- Do NOT remove the plug and connect it to a power outlet by itself; always attach the plug to the power adaptor first before connecting it to a power outlet.
- Do NOT allow anything to rest on the power adaptor or cord and do NOT place the product where anyone can walk on the power adaptor or cord.
- Do NOT use the device if the power adaptor or cord is damaged as it might cause electrocution.
- If the power adaptor or cord is damaged, remove it from the device and the power source.
- Do NOT attempt to repair the power adaptor or cord. Contact your local vendor to order a new one.
- Do not use the device outside, and make sure all the connections are indoors. There is a remote risk of electric shock from lightning.
- CAUTION: RISK OF EXPLOSION IF BATTERY (on the motherboard) IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS. Dispose them at the applicable collection point for the recycling of electrical and electronic equipment. For detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the store where you purchased the product.
- Do NOT obstruct the device ventilation slots, as insufficient airflow may harm your device.

- ZyWALL USG 20W: Antenna Warning! This device meets ETSI and FCC certification requirements when using the included antenna(s). Only use the included antenna(s).
- ZyWALL USG 20, 20W: If you wall mount your device, make sure that no electrical lines, gas or water pipes will be damaged.

Your product is marked with this symbol, which is known as the WEEE mark. WEEE stands for Waste Electronics and Electrical Equipment. It means that used electrical and electronic products should not be mixed with general waste. Used electrical and electronic equipment should be treated separately.



ROHS

ENGLISH	DEUTSCH	ESPAÑOL	FRANÇAIS
Green Product Declaration RoHS Directive 2011/65/EU  WEEE Directive 2002/96/EC (WEEE: Waste Electrical and Electronic Equipment) 2003/108/EC; 2008/34/EC  Declaration Signature: Name/Title: Raymond Huang / Quality & Customer Service Division / Assistant VP. Date (yyyy/mm/dd): 2013/02/01	Grünes Produkt Erklärung RoHS Richtlinie 2011/65/EU  ElektroG Richtlinie 2002/96/EG (ElektroG: Über Elektro- und Elektronik-Altgeräte) 2003/108/EG; 2008/34/EG  Unterschrift des Erklärenden: Name/Title: Raymond Huang / Quality & Customer Service Division / Assistant VP. Date (yyyy/mm/dd): 2013/02/01	Declaración de Producto Ecológico Directiva RoHS 2011/65/UE  Directiva RAEE 2002/96/CE (RAEE: Residuos de Aparatos Eléctricos y Electrónicos) 2003/108/CE; 2008/34/CE  Firma de declaración: Nombre/Título: Raymond Huang / Quality & Customer Service Division / Assistant VP. Fecha (aaaa/mm/dd): 2013/02/01	Déclaration de Produit Vert Directive RoHS 2011/65/UE  Directive DEEE 2002/96/CE (DEEE: déchets d'équipements électriques et électroniques) 2003/108/CE; 2008/34/CE  Signature de la déclaration: Nom/Titre: Raymond Huang / Quality & Customer Service Division / Assistant VP. Date (aaaa/mm/jj): 2013/02/01
ITALIANO	NEDERLANDS	SVENSKA	
Prodotto dichiarazione di verde Direttiva RoHS 2011/65/UE  Direttiva RAEE 2002/96/CE (RAEE: Rifiuti di Apparecchiature Elettriche ed Elettroniche) 2003/108/CE; 2008/34/CE  Firma dichiarazione: Nome/titolo: Raymond Huang / Quality & Customer Service Division / Assistant VP. Data (aaaa/mm/gg): 2013/02/01	Productmilieuverklaring RoHS Richtlijn 2011/65/EU  AEEA-Richtlijn 2002/96/EG (AEEA: Afgedankte Elektrische en Elektronische apparatuur) 2003/108/EG; 2008/34/EG  Verklaringshandtekening: Naam/titel: Raymond Huang / Quality & Customer Service Division / Assistant VP. Datum (jjjj/mm/dd): 2013/02/01	Miljödeklaration RoHS Direktiv 2011/65/EU  WEEE Direktiv 2002/96/EG (WEEE: om avfall som utgörs av eller innehåller elektriska eller elektroniska produkter) 2003/108/EG; 2008/34/EG  Deklaration undertecknad av: Namn/Titel: Raymond Huang / Quality & Customer Service Division / Assistant VP. Datum (åååå/mm/dd): 2013/02/01	

