ZYXEL

www.zyxel.com

SBG Series

SBG 5500-A/SBG5500-B

Small Business Gateway

Firmware 100AAZT0b2s1
Edition 1, 6/2017

Handbook

Default Login Details	
LAN Port IP Address	https://192.168.1.1
User Name	admin
Password	1234

Table of Content

How to Setup SBG Series connect with Android Mobile via L2TP tunnel

This is an example of using the L2TP VPN and VPN client software included in Android mobile phone operating systems. When the VPN tunnel is configured, users can securely access the network and allow traffic from L2TP clients to go to the Internet from an Android mobile phone.

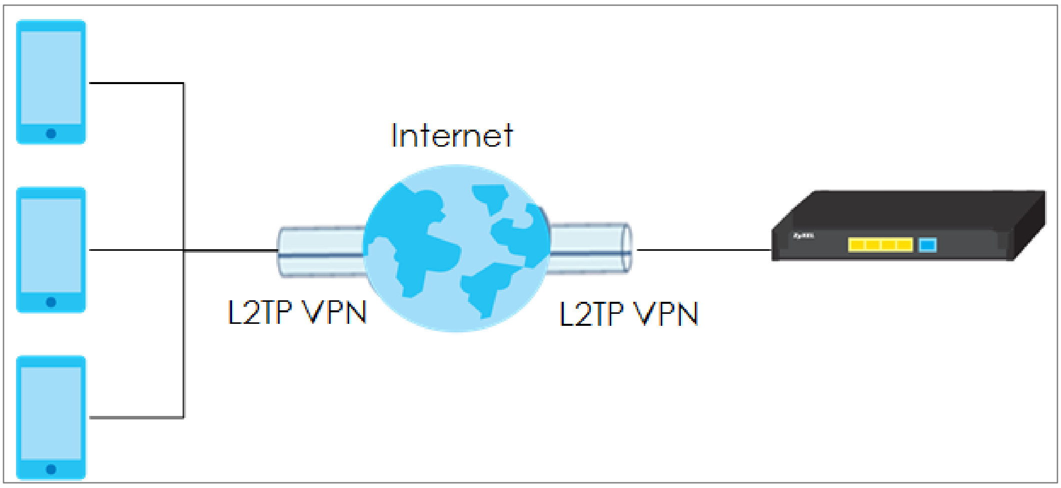
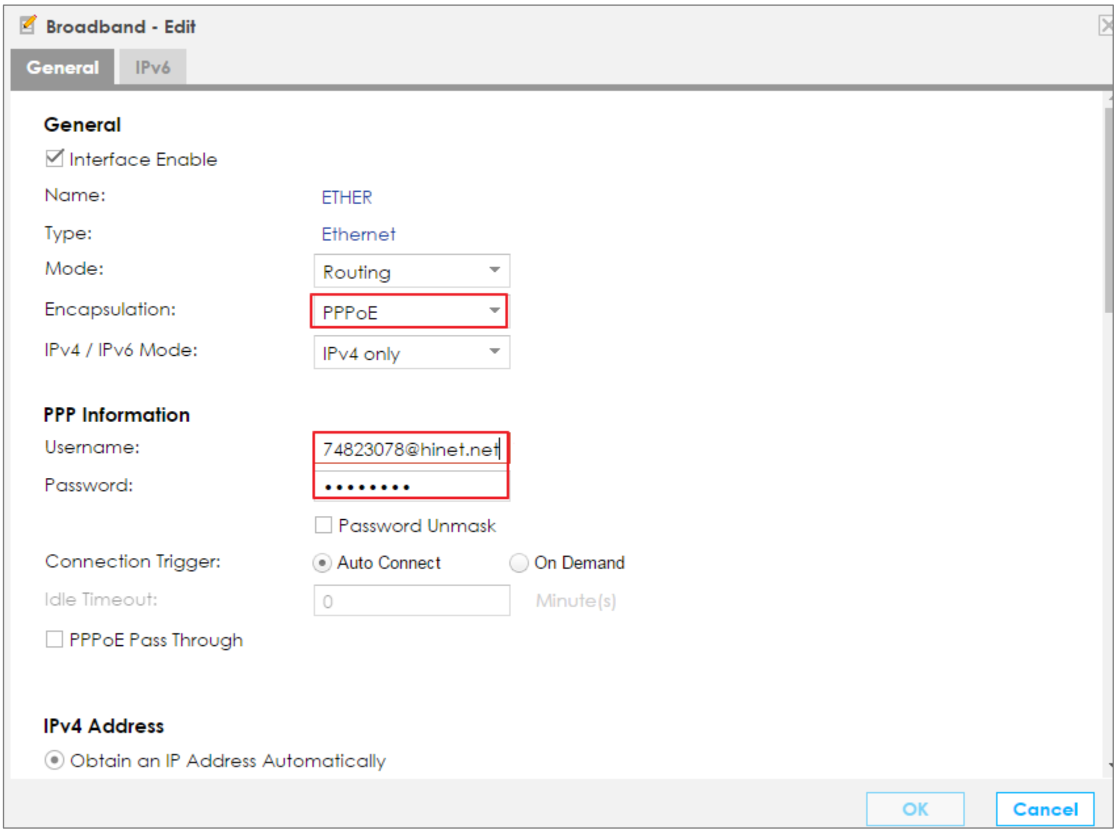


Figure SBG Series connect with Mobile through L2TP VPN Tunnel

Note:
All network IP addresses and subnet masks are used as examples in this article. Please replace them with your actual network IP addresses and subnet masks.

Set Up the PPPoE Connection On SBG Series

Go to **Configuration> Wan/Internet> Broadband> ETHER> Edit**, change the **Encapsulation** from default IPoE to PPPoE and fill the username/password on **PPP information.**



Broadband - Edit

General | IPv6

General

☑ Interface Enable

Name:	ETHER
Type:	Ethernet
Mode:	Routing
Encapsulation:	PPPoE
IPv4 / IPv6 Mode:	IPv4 only

PPP Information

Username:	74823078@hinet.net
Password:	••••••••

□ Password Unmask

Connection Trigger: ● Auto Connect ○ On Demand

Idle Timeout: 0 Minute(s)

□ PPPoE Pass Through

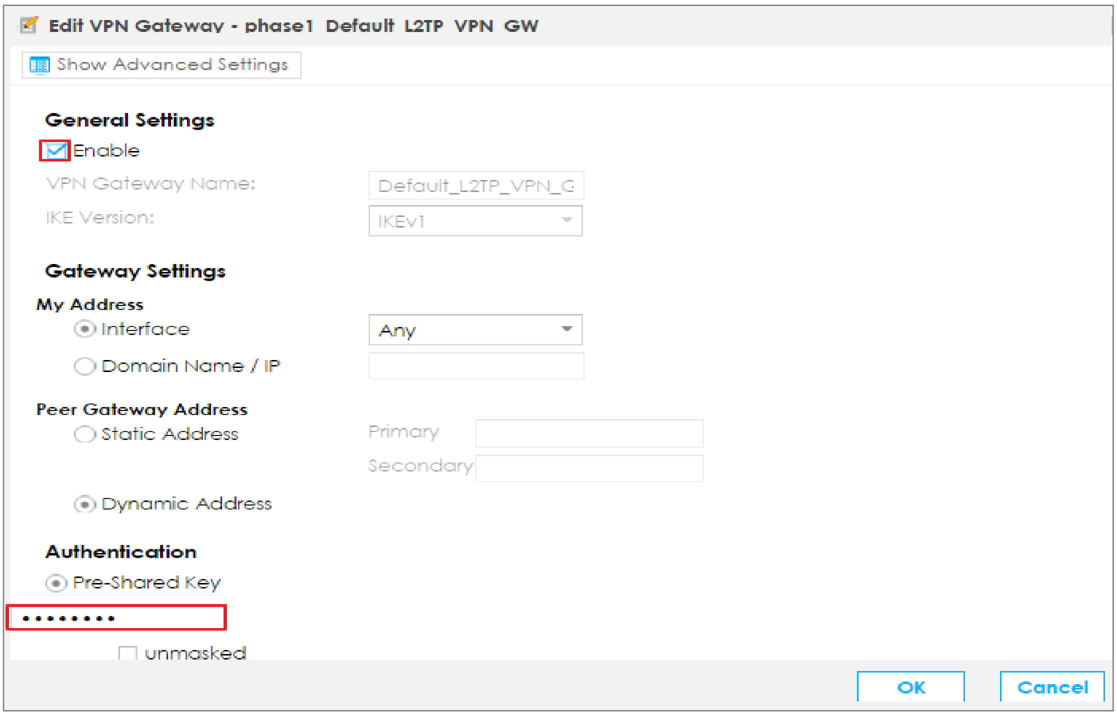
IPv4 Address

● Obtain an IP Address Automatically

Set Up the L2TP VPN Tunnel on SBG Series

Go to **Configuration> VPN> IPsec VPN > Default_L2TP_VPN_GW and Default_L2TP_VPN_Connection > Edit,** enable both of rule and fill the pre-share key on Default_L2TP_VPN_GW.

Figure Configuration> VPN> IPsec VPN > Default_L2TP_VPN_GW



Edit VPN Gateway - phase1 Default L2TP VPN GW

Show Advanced Settings

General Settings

☑ Enable

VPN Gateway Name: Default_L2TP_VPN_G

IKE Version: IKEv1

Gateway Settings

My Address

● Interface Any

○ Domain Name / IP

Peer Gateway Address

○ Static Address Primary

Secondary

● Dynamic Address

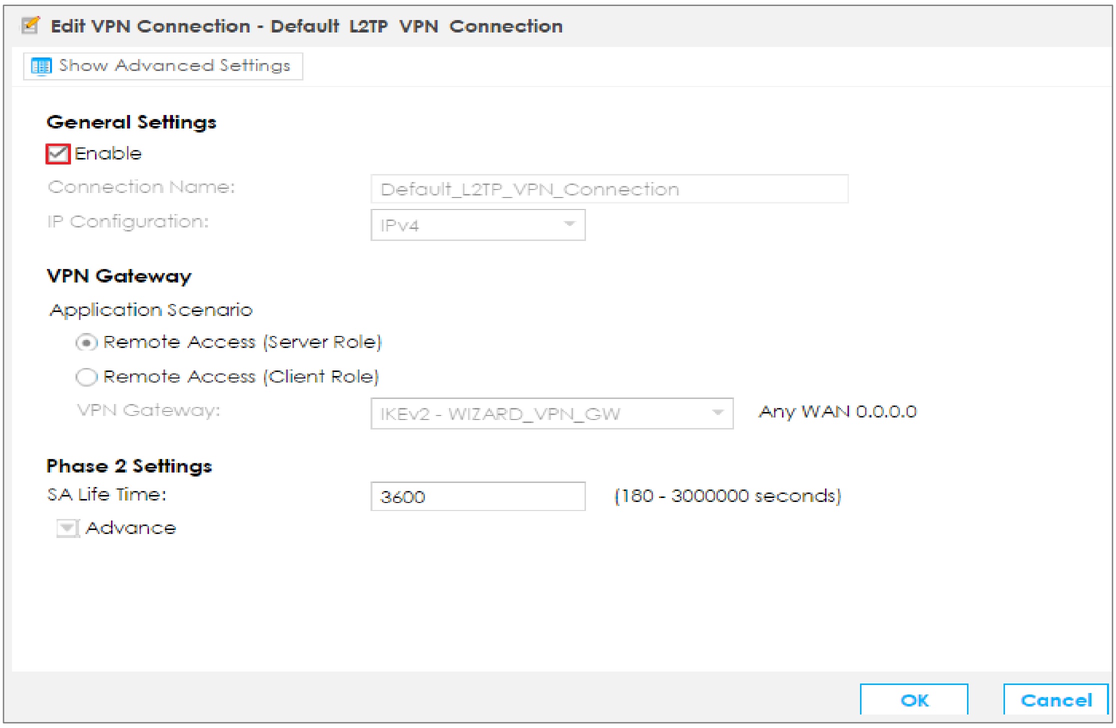
Authentication

● Pre-Shared Key

••••••••

□ unmasked

Figure Configuration> VPN> IPsec VPN > Default_L2TP_VPN_Connection



Edit VPN Connection - Default L2TP VPN Connection

Show Advanced Settings

General Settings

☑ Enable

Connection Name: Default_L2TP_VPN_Connection

IP Configuration: IPv4

VPN Gateway

Application Scenario

● Remote Access (Server Role)

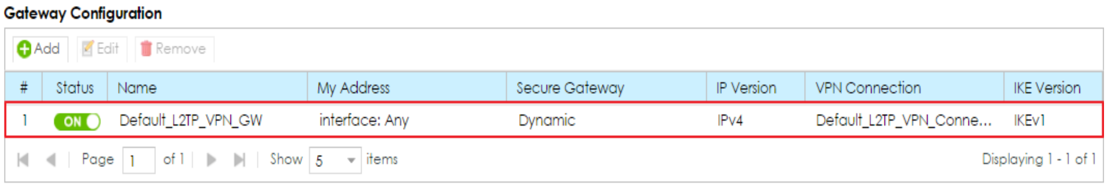
○ Remote Access (Client Role)

VPN Gateway: IKEv2 - WIZARD_VPN_GW Any WAN 0.0.0.0

Phase 2 Settings

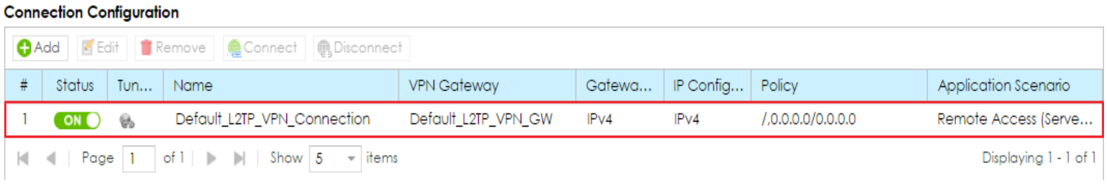
SA Life Time: 3600 (180 - 3000000 seconds)

Advance



Gateway Configuration

#	Status	Name	My Address	Secure Gateway	IP Version	VPN Connection	IKE Version
1	ON	Default_L2TP_VPN_GW	interface: Any	Dynamic	IPv4	Default_L2TP_VPN_Conne...	IKEv1



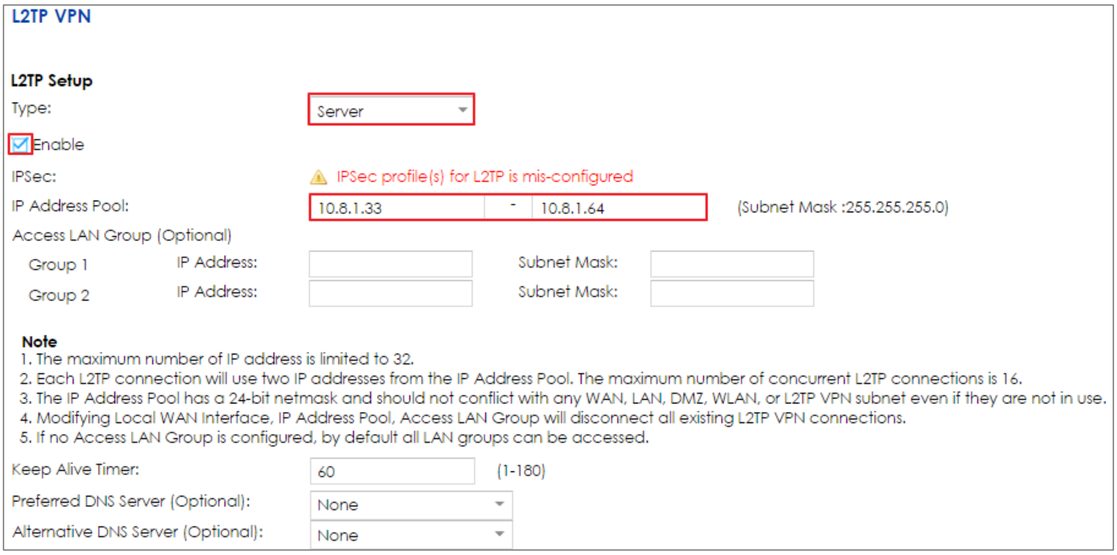
Connection Configuration

#	Status	Tun...	Name	VPN Gateway	Gatewa...	IP Config...	Policy	Application Scenario
1	ON		Default_L2TP_VPN_Connection	Default_L2TP_VPN_GW	IPv4	IPv4	/,0.0.0.0/0.0.0.0	Remote Access (Serve...

Move to **L2TP VPN, Enable** this feature, and select **Server** type.

Fill the IP Address which will be assigned to l2tp client on **IP Address Pool**.

Figure Configuration> VPN> L2TP VPN



L2TP VPN

L2TP Setup

Type: Server

☑ Enable

IPSec: ⚠ IPSec profile(s) for L2TP is mis-configured

IP Address Pool: 10.8.1.33 - 10.8.1.64 (Subnet Mask :255.255.255.0)

Access LAN Group (Optional)

Group 1 IP Address: Subnet Mask:

Group 2 IP Address: Subnet Mask:

Note
1. The maximum number of IP address is limited to 32.
2. Each L2TP connection will use two IP addresses from the IP Address Pool. The maximum number of concurrent L2TP connections is 16.
3. The IP Address Pool has a 24-bit netmask and should not conflict with any WAN, LAN, DMZ, WLAN, or L2TP VPN subnet even if they are not in use.
4. Modifying Local WAN Interface, IP Address Pool, Access LAN Group will disconnect all existing L2TP VPN connections.
5. If no Access LAN Group is configured, by default all LAN groups can be accessed.

Keep Alive Timer: 60 (1-180)

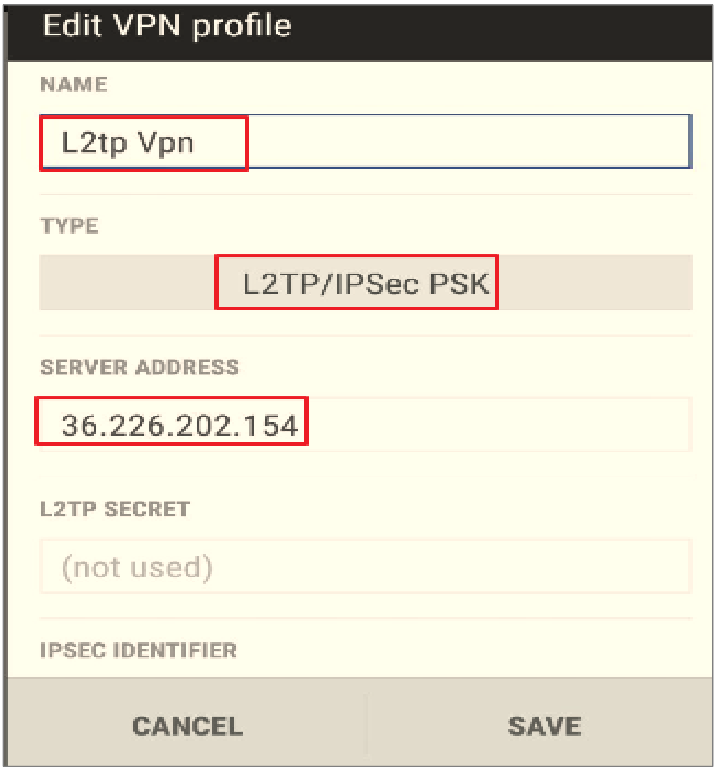
Preferred DNS Server (Optional): None

Alternative DNS Server (Optional): None

Configure the L2TP VPN Tunnel on Android Mobile (Version 5.0.2)

Go to **Setting> Wireless & Networks > VPN> Add VPN Profile,** and fill the name of profile.

Select L2TP/IPSec PSK on Type field, enter Server address and pre-shared key.



Edit VPN profile

NAME

L2tp Vpn

TYPE

L2TP/IPSec PSK

SERVER ADDRESS

36.226.202.154

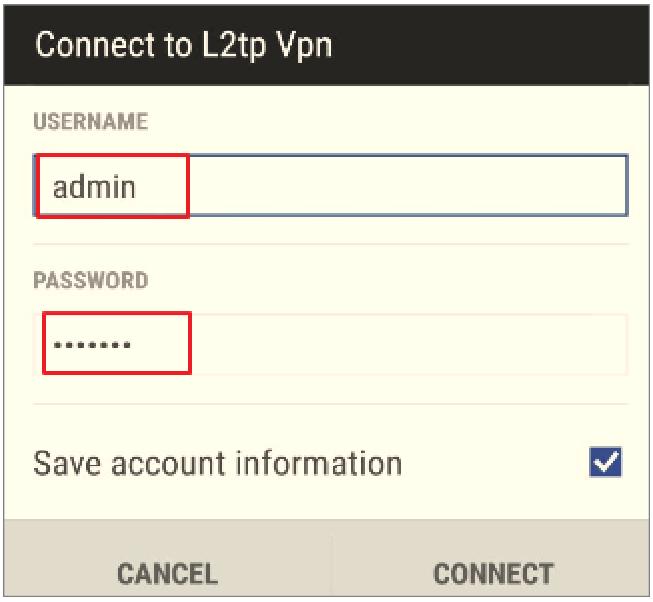
L2TP SECRET

(not used)

IPSEC IDENTIFIER

Test the L2TP over IPSec VPN Tunnel

Type the username and password, and press CONNECT



Connect to L2tp Vpn

USERNAME

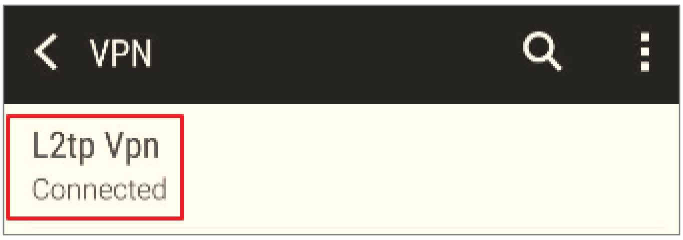
admin

PASSWORD

•••••••

Save account information ☑

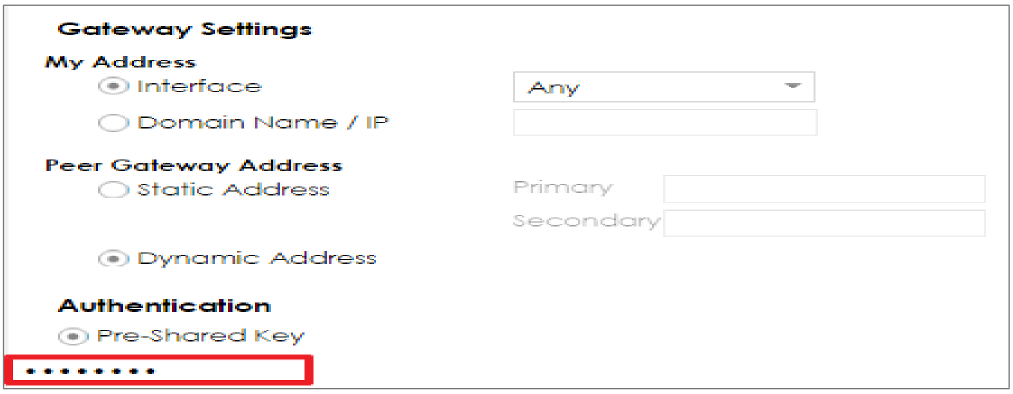
The L2TP VPN session connected



L2tp Vpn
Connected

What Could Go Wrong?

Make sure your Pre-shared key on SBG and on Mobile are the same



Gateway Settings

My Address

● Interface Any

○ Domain Name / IP

Peer Gateway Address

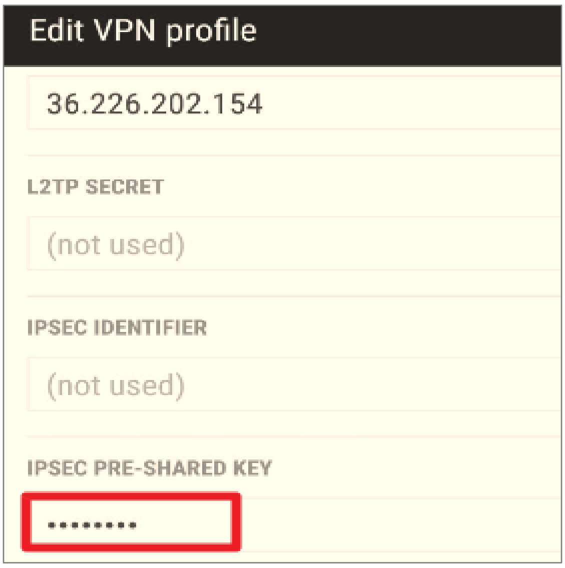
○ Static Address Primary
Secondary

● Dynamic Address

Authentication

● Pre-Shared Key

•••••••••



Edit VPN profile

36.226.202.154

L2TP SECRET

(not used)

IPSEC IDENTIFIER

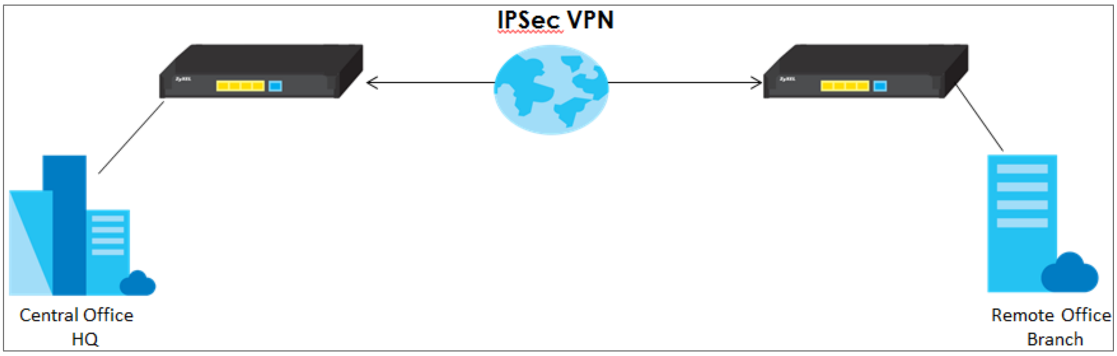
(not used)

IPSEC PRE-SHARED KEY

•••••••••

How to configure site to site VPN

The multinational corporations have many sites at each country, so if they want to communicate from HQ to branch under security, the client to Site VPN is the option they needed.



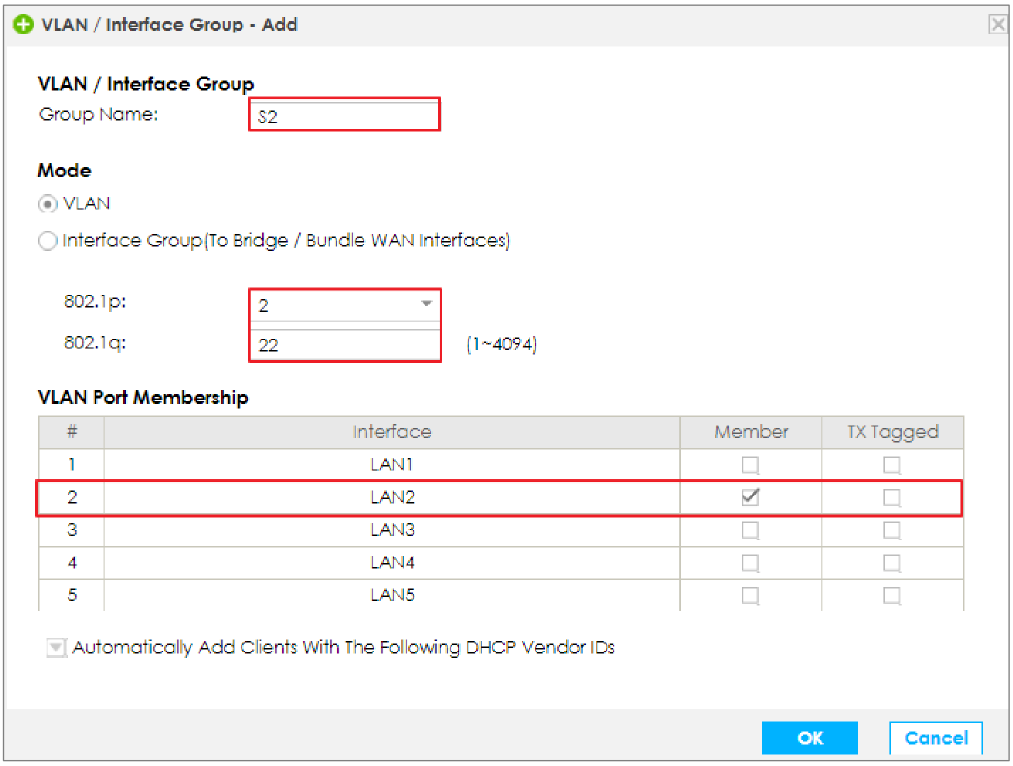
Note:

All network IP addresses and subnet masks are used as examples in this article. Please replace them with your actual network IP addresses and subnet masks. This example was tested using SBG5500.

This scenario uses two units of SBG5500 to create an IPSec VPN connection.
Moreover, both USGs get their public IPs via PPPoE .
HQ WAN IP: 61.231.53.228, LAN IP: 192.168.2.1
Branch WAN IP: 36.226.203.74 LAN IP: 192.168.3.1

Configuration the Lan IP on HQ Site

Go to **Configuration > Lan/ Home network > Vlan/ Interface Group > Add**
Create the Lan Subnet: 192.168.2.X/24, first go to vlan to separate the Lan2, and then change the subnet to 192.168.2.X/24



VLAN / Interface Group
Group Name: S2

Mode
● VLAN
○ Interface Group(To Bridge / Bundle WAN Interfaces)

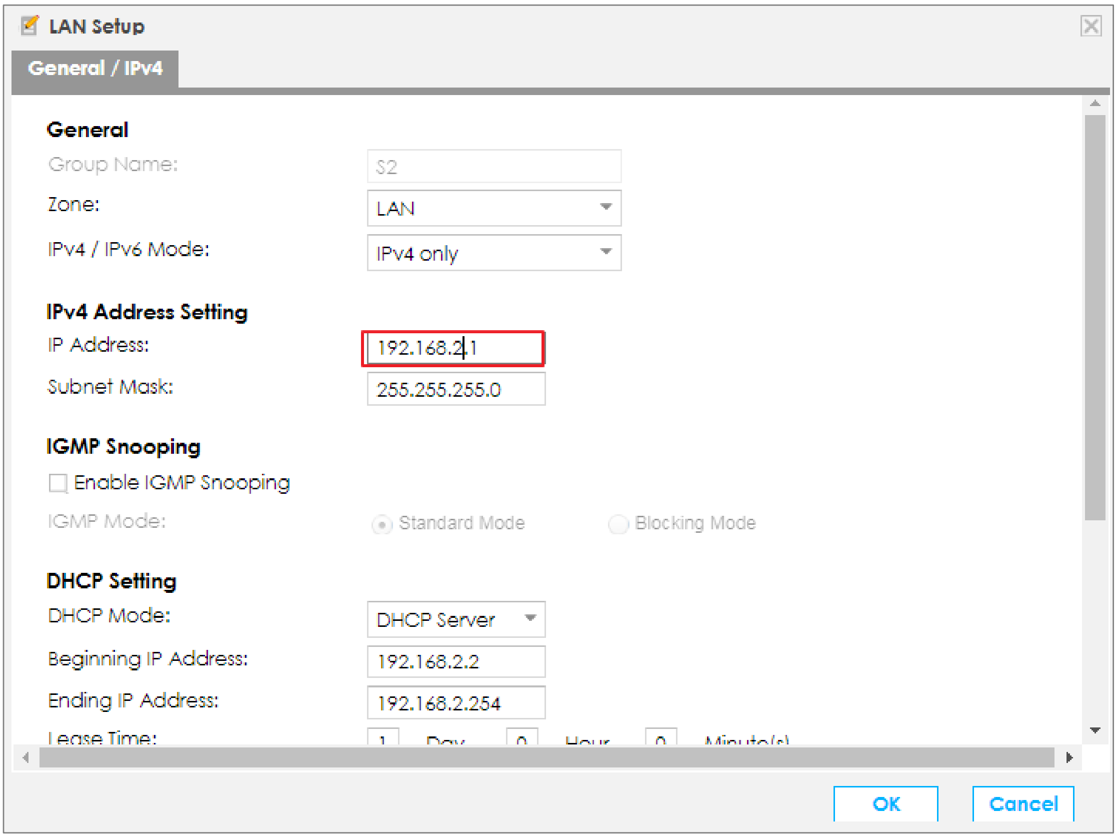
802.1p: 2
802.1q: 22 (1~4094)

VLAN Port Membership

#	Interface	Member	TX Tagged
1	LAN1	□	□
2	LAN2	☑	□
3	LAN3	□	□
4	LAN4	□	□
5	LAN5	□	□

□ Automatically Add Clients With The Following DHCP Vendor IDs

Go to **Configuration > Lan Setup >Edit**



LAN Setup

General / IPv4

General

Group Name: S2

Zone: LAN

IPv4 / IPv6 Mode: IPv4 only

IPv4 Address Setting

IP Address: 192.168.2.1

Subnet Mask: 255.255.255.0

IGMP Snooping

□ Enable IGMP Snooping

IGMP Mode: ● Standard Mode ○ Blocking Mode

DHCP Setting

DHCP Mode: DHCP Server

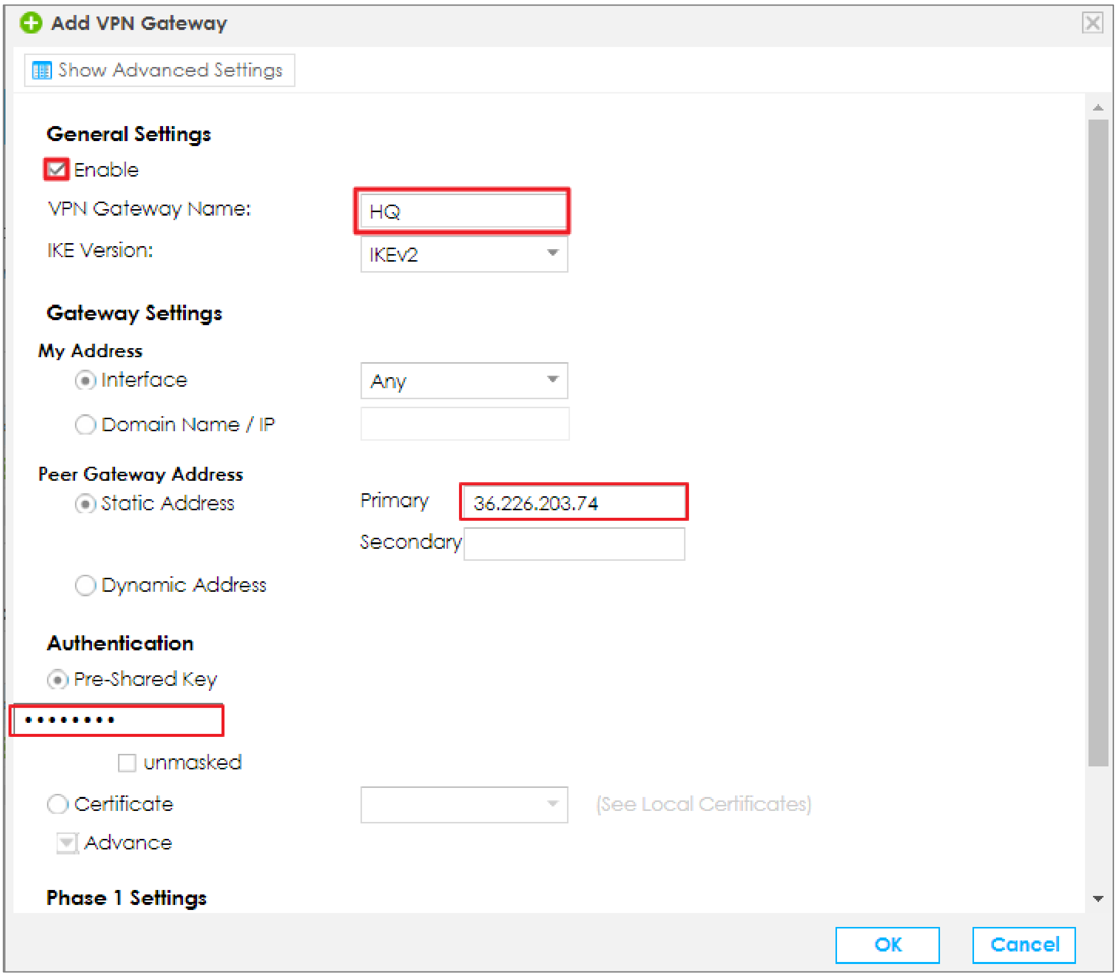
Beginning IP Address: 192.168.2.2

Ending IP Address: 192.168.2.254

Lease Time: 1 Day 0 Hour 0 Minute(s)

Setup the VPN configuration on HQ Site

Go to **Configuration > VPN > IPSec VPN > Add** the profile on **Gateway configuration** and **Connection configuration**
For the VPN gateway, please enter the VPN gateway name, select the Interface (for public IP), enter the peer's domain in the Primary field, and enter the Pre-Shared Key.



Add VPN Gateway

Show Advanced Settings

General Settings

☑ Enable

VPN Gateway Name: HQ

IKE Version: IKEv2

Gateway Settings

My Address

● Interface: Any

○ Domain Name / IP

Peer Gateway Address

● Static Address: Primary 36.226.203.74

Secondary

○ Dynamic Address

Authentication

● Pre-Shared Key: ••••••••

□ unmasked

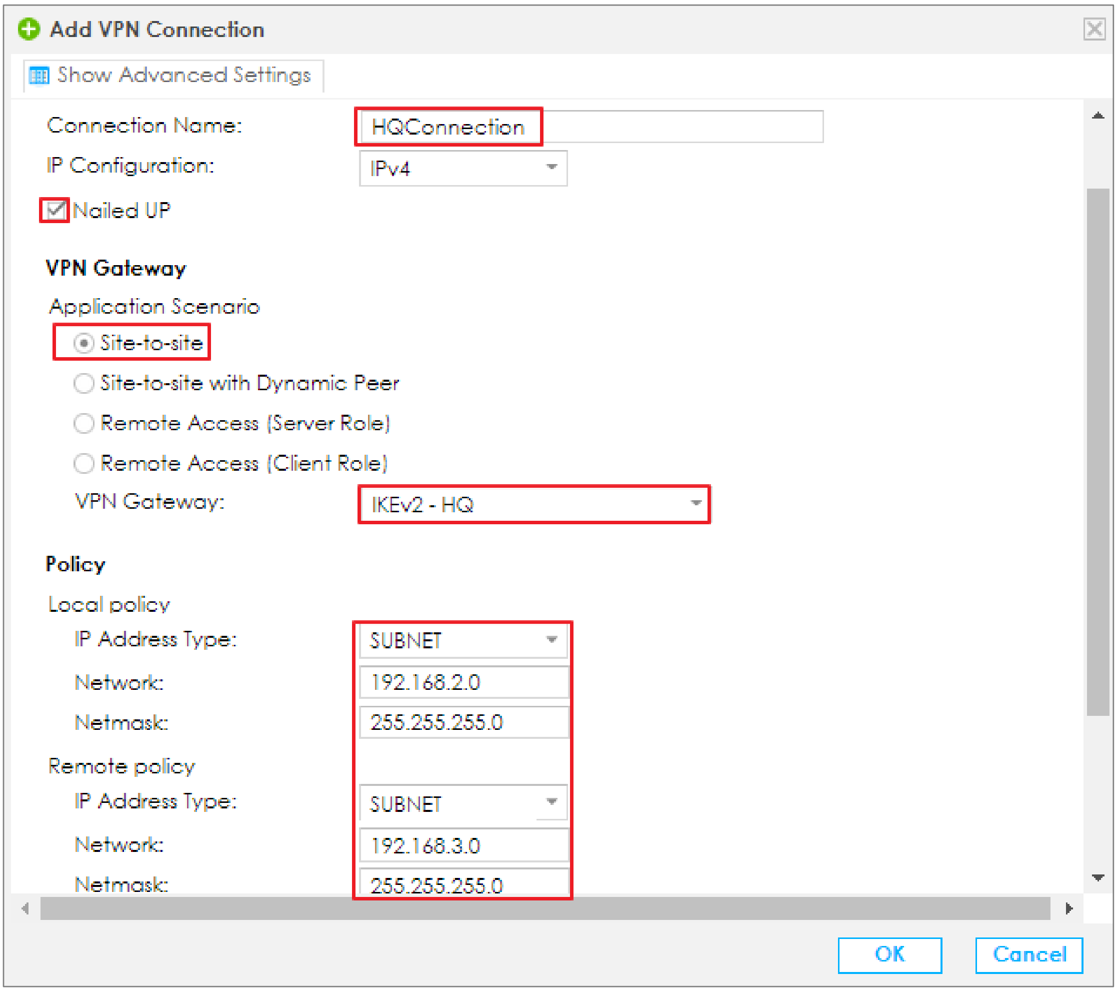
○ Certificate (See Local Certificates)

□ Advance

Phase 1 Settings

For the VPN connection (Phase 2):

1. Enter the **Connection Name**, select **Site-to-site** as the **Application Scenario**, and select the name of the phase 1 profile (**Branch**) in the **VPN Gateway** field.
2. For **Local policy**, choose the subnet that your PC is connected to.



Add VPN Connection

Show Advanced Settings

Connection Name: HQConnection

IP Configuration: IPv4

☑ Nailed UP

VPN Gateway

Application Scenario

● Site-to-site

○ Site-to-site with Dynamic Peer

○ Remote Access (Server Role)

○ Remote Access (Client Role)

VPN Gateway: IKEv2 - HQ

Policy

Local policy

IP Address Type: SUBNET

Network: 192.168.2.0

Netmask: 255.255.255.0

Remote policy

IP Address Type: SUBNET

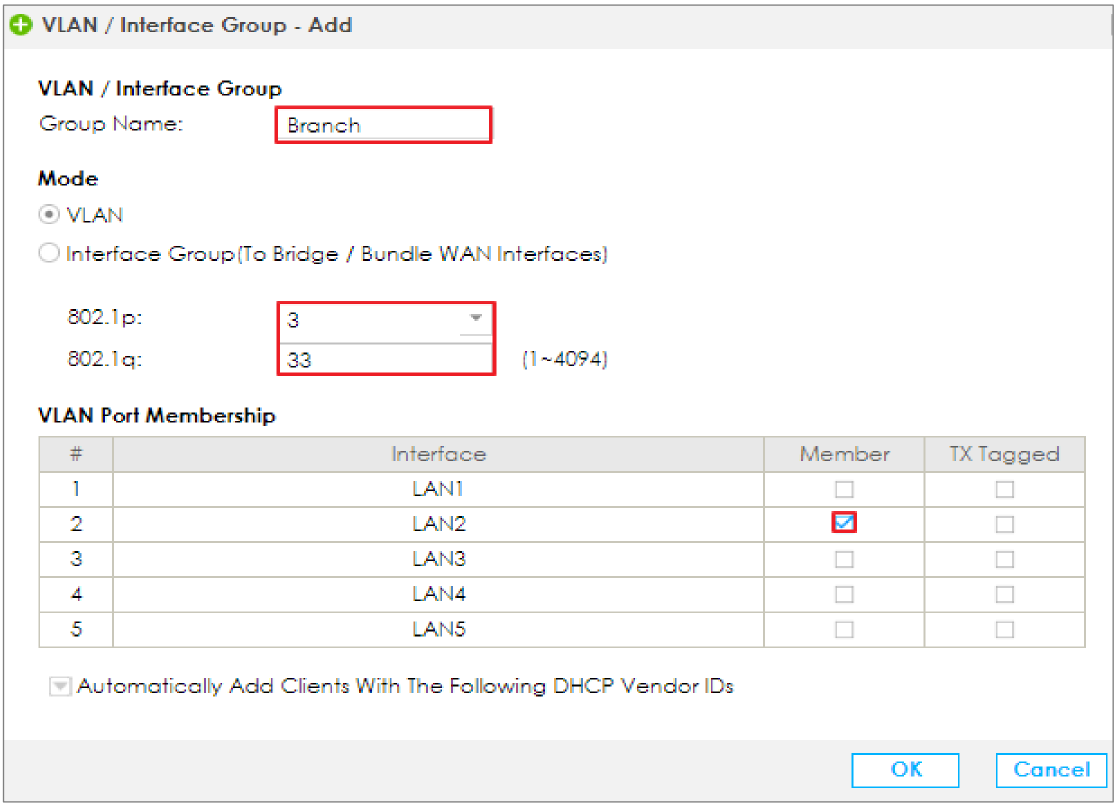
Network: 192.168.3.0

Netmask: 255.255.255.0

Configuration the Lan IP on Branch Site

Go to **Configuration > Lan/ Home network > Vlan/ Interface Group > Add**

Create the Lan Subnet: 192.168.3.X/24, first go to vlan to separate the Lan2, and then change the subnet to 192.168.3.X/24



VLAN / Interface Group

Group Name: Branch

Mode

● VLAN

○ Interface Group(To Bridge / Bundle WAN Interfaces)

802.1p: 3

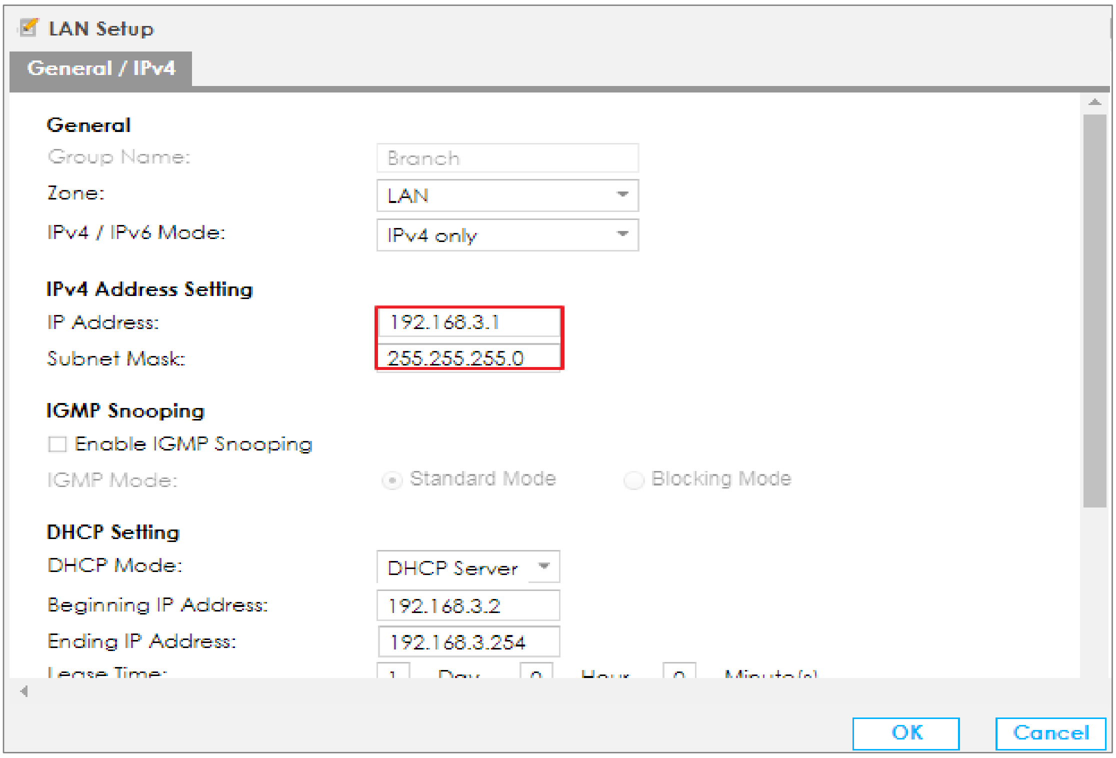
802.1q: 33 (1~4094)

VLAN Port Membership

#	Interface	Member	TX Tagged
1	LAN1	□	□
2	LAN2	☑	□
3	LAN3	□	□
4	LAN4	□	□
5	LAN5	□	□

Automatically Add Clients With The Following DHCP Vendor IDs

Go to **Configuration > Lan Setup >Edit**



General

Group Name: Branch

Zone: LAN

IPv4 / IPv6 Mode: IPv4 only

IPv4 Address Setting

IP Address: 192.168.3.1

Subnet Mask: 255.255.255.0

IGMP Snooping

□ Enable IGMP Snooping

IGMP Mode: ● Standard Mode ○ Blocking Mode

DHCP Setting

DHCP Mode: DHCP Server

Beginning IP Address: 192.168.3.2

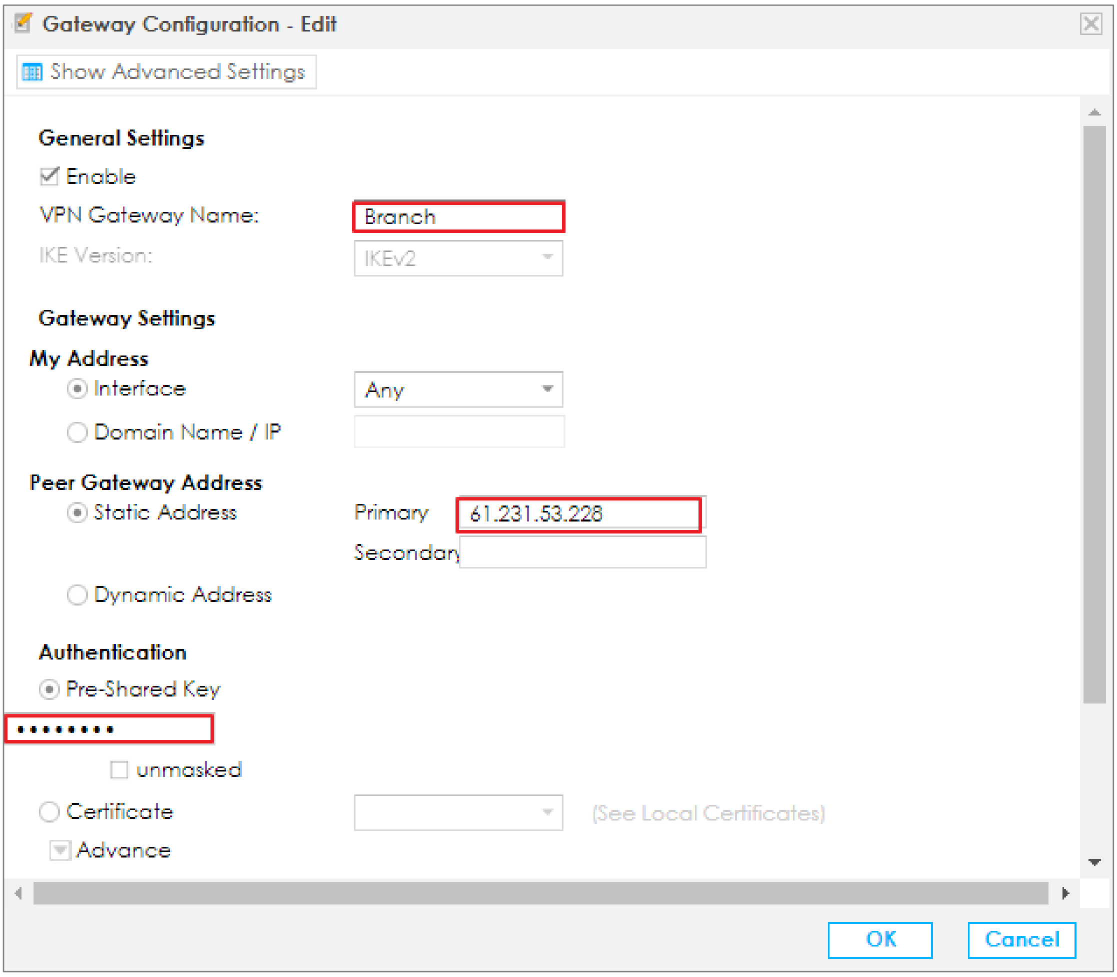
Ending IP Address: 192.168.3.254

Lease Time: 1 Day 0 Hour 0 Minute(s)

Setup the VPN configuration on Branch Site

Go to **Configuration > VPN > IPSec VPN > Add** the profile on **Gateway configuration** and **Connection configuration**

For the VPN gateway, please enter the VPN gateway name, select the Interface (for public IP), enter the peer's domain in the Primary field, and enter the Pre-Shared Key.



Gateway Configuration - Edit

Show Advanced Settings

General Settings

☑ Enable

VPN Gateway Name: Branch

IKE Version: IKEv2

Gateway Settings

My Address

● Interface: Any

○ Domain Name / IP

Peer Gateway Address

● Static Address — Primary: 61.231.53.228 — Secondary:

○ Dynamic Address

Authentication

● Pre-Shared Key: ••••••••

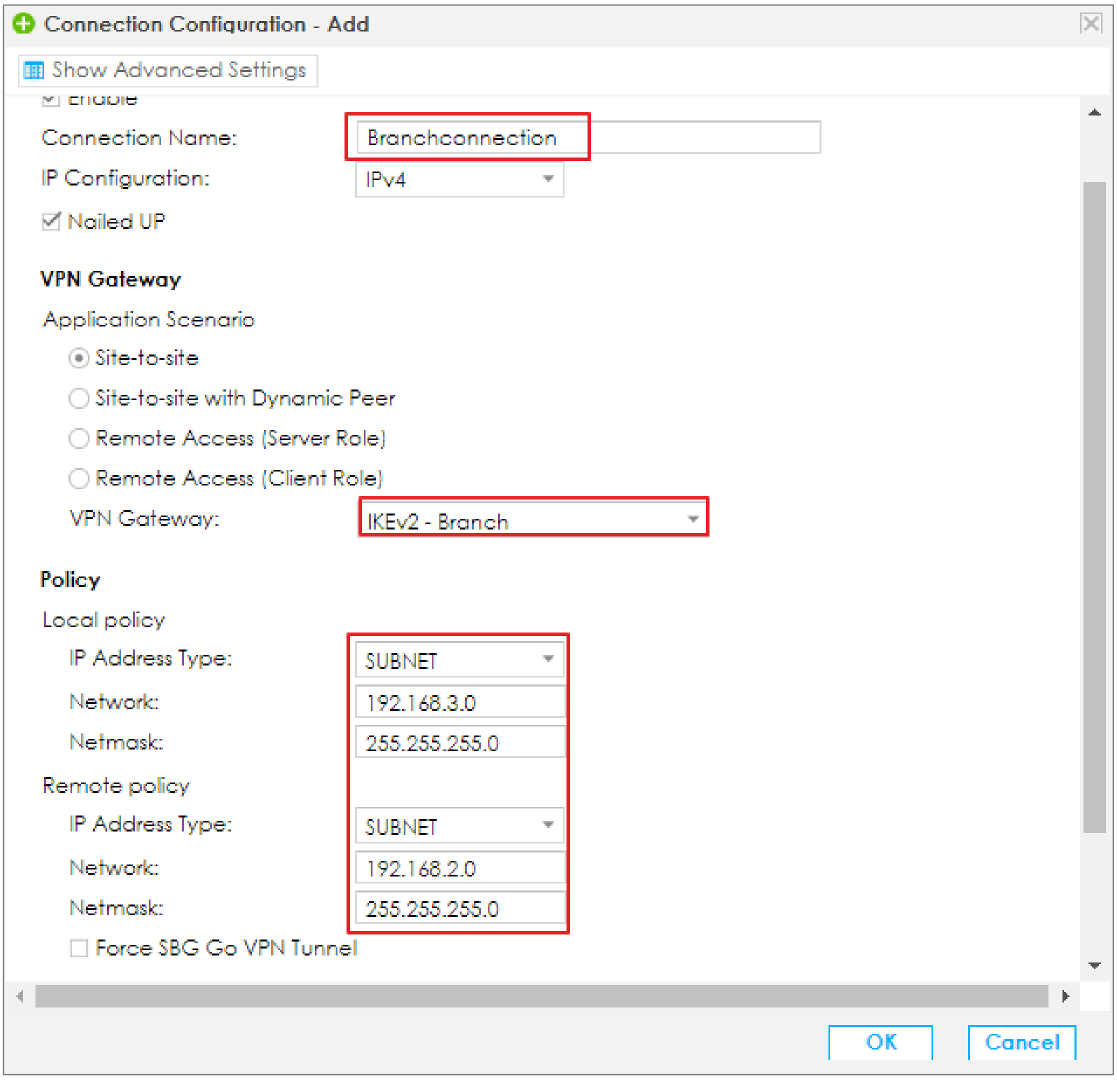
□ unmasked

○ Certificate (See Local Certificates)

Advance

For the VPN connection (Phase 2):

3. Enter the **Connection Name**, select **Site-to-site** as the **Application Scenario**, and select the name of the phase 1 profile (**Branch**) in the **VPN Gateway** field.
4. For **Local policy**, choose the subnet that your PC is connected to.



Connection Configuration - Add

Show Advanced Settings

☑ Enable

Connection Name: Branchconnection

IP Configuration: IPv4

☑ Nailed UP

VPN Gateway

Application Scenario

● Site-to-site

○ Site-to-site with Dynamic Peer

○ Remote Access (Server Role)

○ Remote Access (Client Role)

VPN Gateway: IKEv2 - Branch

Policy

Local policy

IP Address Type: SUBNET

Network: 192.168.3.0

Netmask: 255.255.255.0

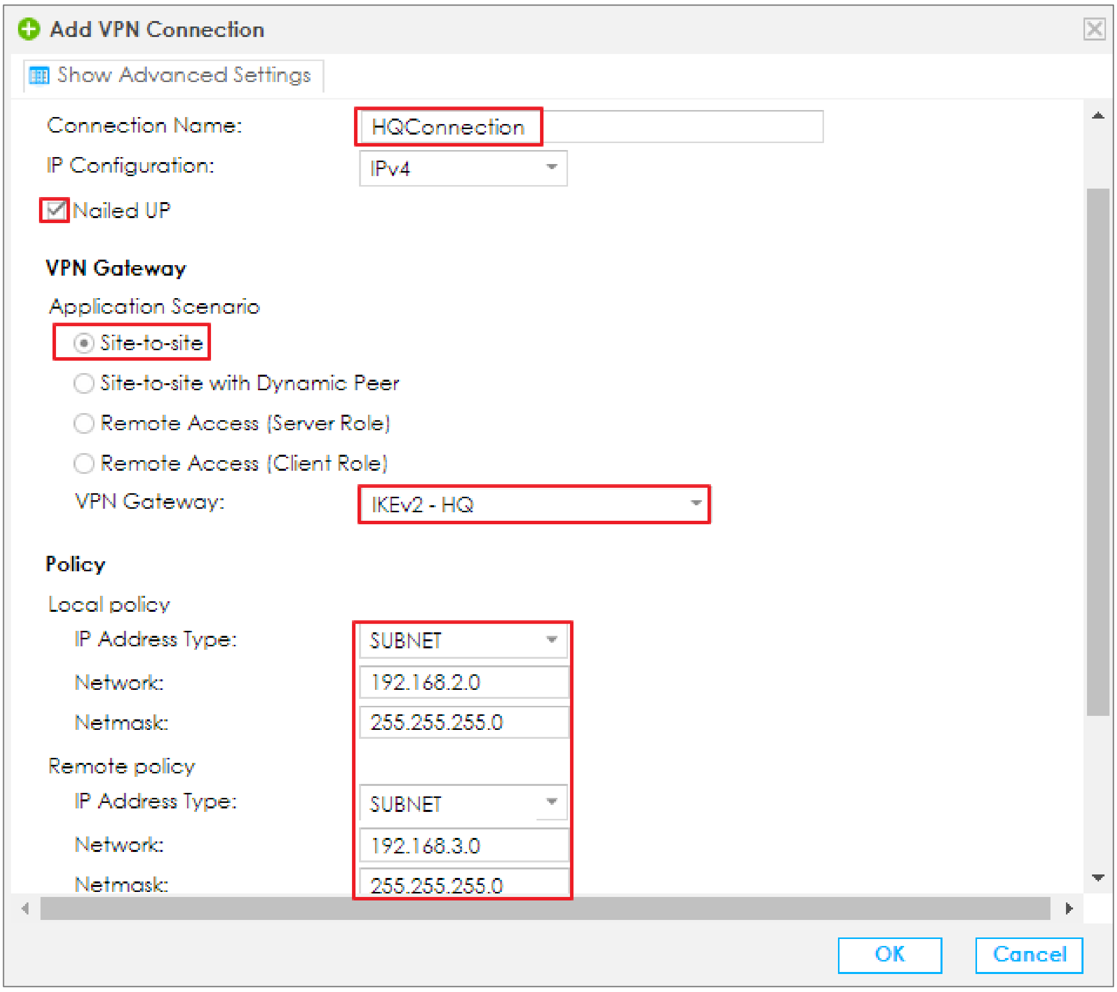
Remote policy

IP Address Type: SUBNET

Network: 192.168.2.0

Netmask: 255.255.255.0

□ Force SBG Go VPN Tunnel



Connection Name: HQConnection

IP Configuration: IPv4

☑ Nailed UP

VPN Gateway

Application Scenario

- ● Site-to-site
- ○ Site-to-site with Dynamic Peer
- ○ Remote Access (Server Role)
- ○ Remote Access (Client Role)

VPN Gateway: IKEv2 - HQ

Policy

Local policy

IP Address Type: SUBNET

Network: 192.168.2.0

Netmask: 255.255.255.0

Remote policy

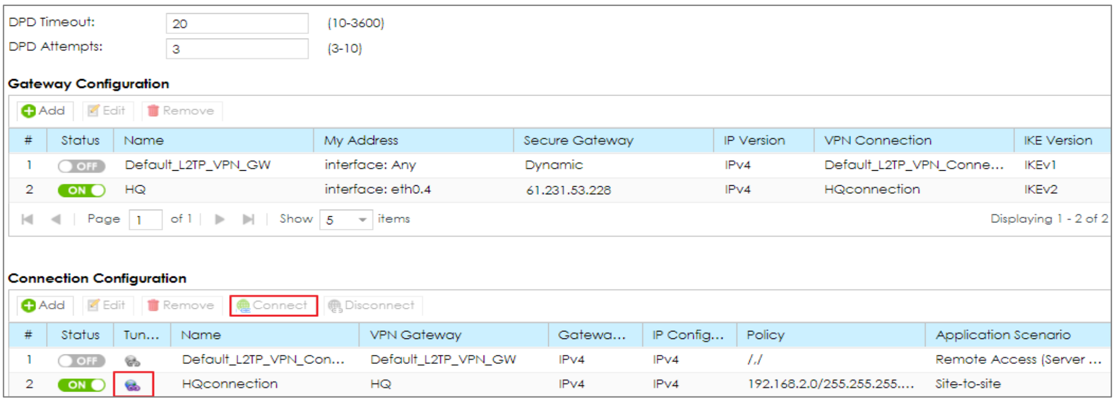
IP Address Type: SUBNET

Network: 192.168.3.0

Netmask: 255.255.255.0

Test IPSec VPN on SBG Series

Press the connect button, and the Icon will change from Gray to light



DPD Timeout: 20 (10-3600)

DPD Attempts: 3 (3-10)

Gateway Configuration

#	Status	Name	My Address	Secure Gateway	IP Version	VPN Connection	IKE Version
1	OFF	Default_L2TP_VPN_GW	interface: Any	Dynamic	IPv4	Default_L2TP_VPN_Conne...	IKEv1
2	ON	HQ	interface: eth0.4	61.231.53.228	IPv4	HQconnection	IKEv2

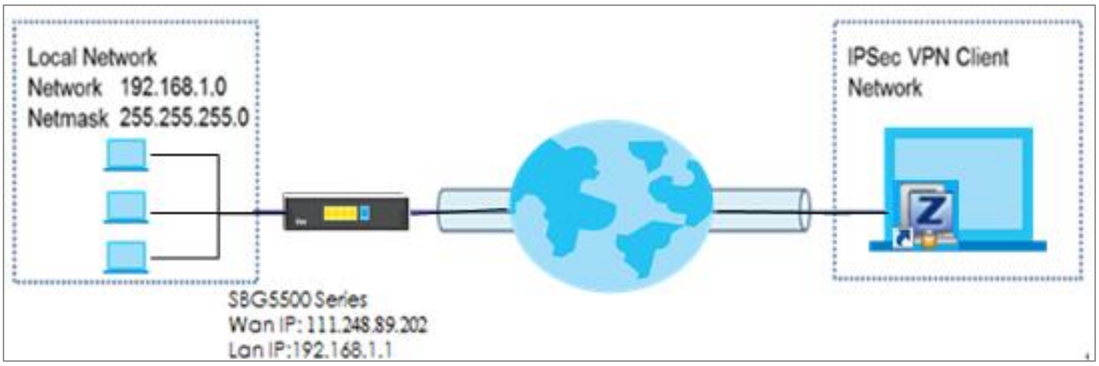
Displaying 1 - 2 of 2

Connection Configuration

#	Status	Tun...	Name	VPN Gateway	Gatewa...	IP Config...	Policy	Application Scenario
1	OFF		Default_L2TP_VPN_Con...	Default_L2TP_VPN_GW	IPv4	IPv4	/./	Remote Access (Server ...
2	ON		HQconnection	HQ	IPv4	IPv4	192.168.2.0/255.255.255....	Site-to-site

How to configure VPN with PC -Server Role

This scenario shows how to use the VPN Setup to create a site-to-site VPN between a SBG 5500 Series and a ZyWALL IPSec VPN Client. The example instructs how to configure the VPN tunnel between each site. When the VPN tunnel is configured, each site can be accessed securely.

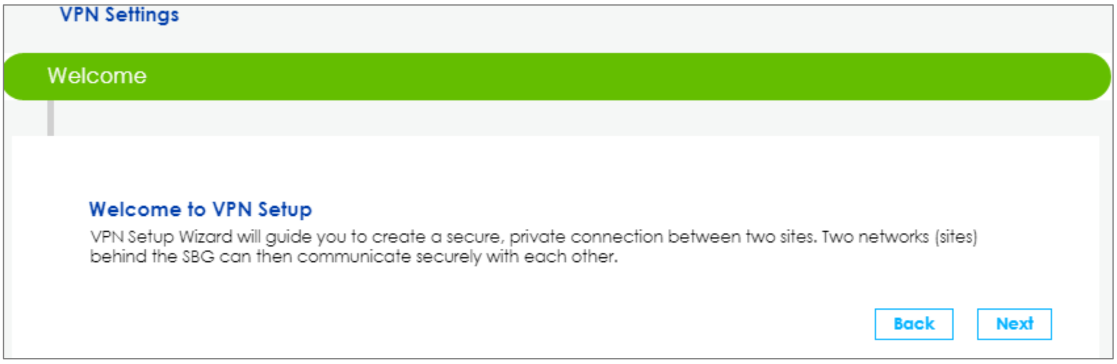


Note:
All network IP addresses and subnet masks are used as examples in this article. Please replace them with your actual network IP addresses and subnet masks.

Set Up the IPSec VPN Tunnel on the SBG 5500 Series

In the SBG 5500 Series, go to **Wizard > Welcome to VPN Setup**, use the **VPN Settings for Configuration Provisioning** wizard to create a VPN rule that can be used with the ZyWALL IPSec VPN Client. Click **Next**.

Figure Wizard > Welcome to VPN Setup



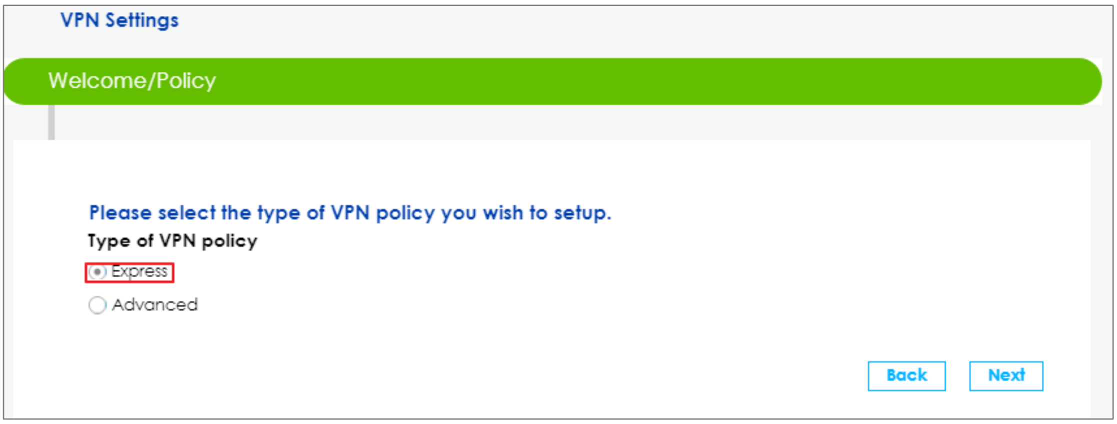
Welcome to VPN Setup

VPN Setup Wizard will guide you to create a secure, private connection between two sites. Two networks (sites) behind the SBG can then communicate securely with each other.

Choose **Express** to create a VPN rule with the default phase 1 and phase 2 settings and use a pre-shared key to be the authentication method.

Click **Next**.

Figure Wizard > Welcome to VPN Setup



Please select the type of VPN policy you wish to setup.

Type of VPN policy

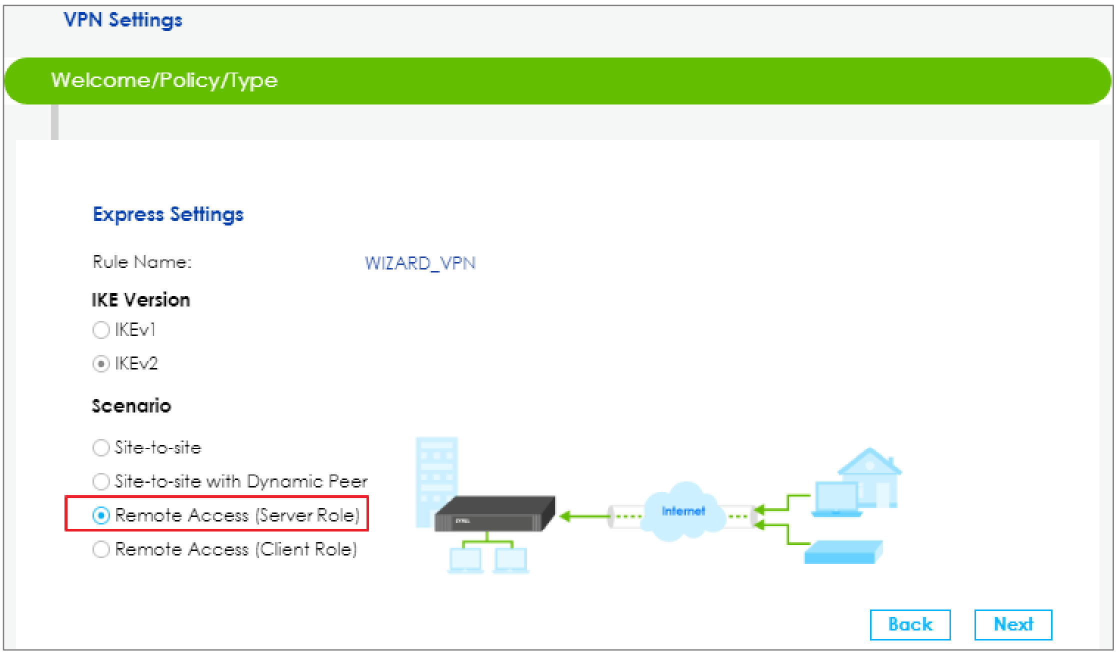
● Express

○ Advanced

Select the What Scenario which will be deployed. (Remote Access, Server Role), and

press **Next.**

Figure Wizard > Welcome to VPN Setup



VPN Settings

Welcome/Policy/Type

Express Settings

Rule Name: WIZARD_VPN

IKE Version

○ IKEv1

● IKEv2

Scenario

○ Site-to-site

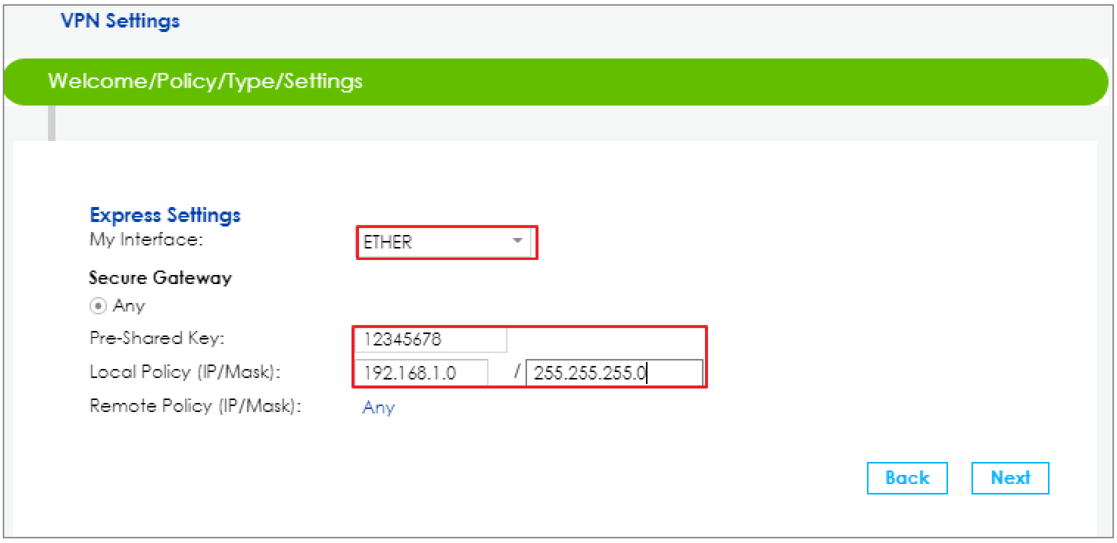
○ Site-to-site with Dynamic Peer

● Remote Access (Server Role)

○ Remote Access (Client Role)

Choose the **ETHER** for My Interface and fill pre-Shared Key and local IP Address.

Figure Wizard > Welcome to VPN Setup



VPN Settings

Welcome/Policy/Type/Settings

Express Settings

My Interface: ETHER

Secure Gateway

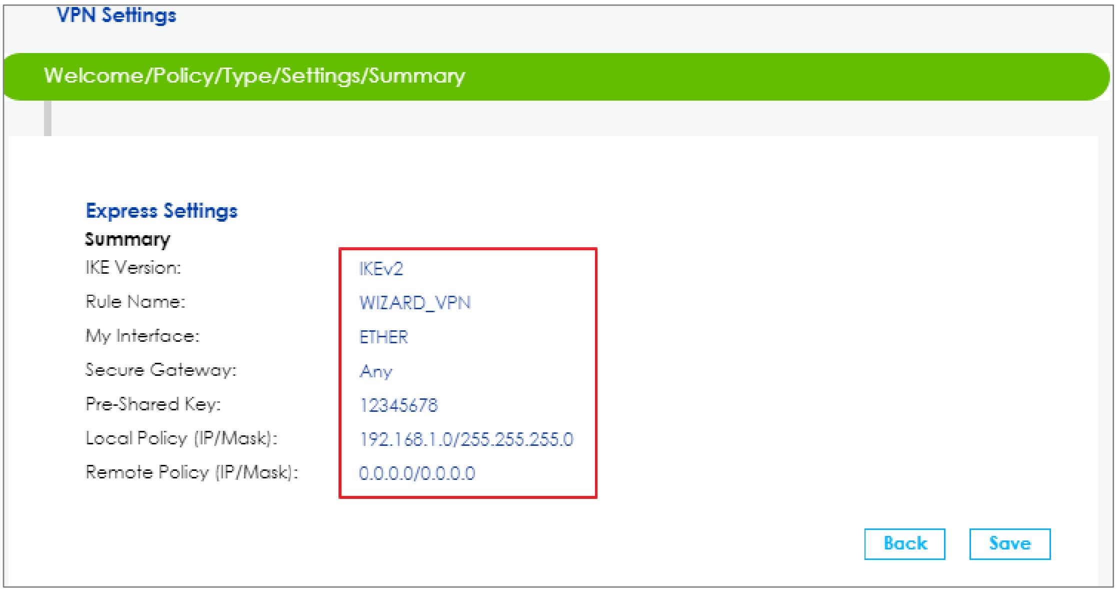
● Any

Pre-Shared Key: 12345678

Local Policy (IP/Mask): 192.168.1.0 / 255.255.255.0

Remote Policy (IP/Mask): Any

The configured result will be displayed. Press **Save**



VPN Settings

Welcome/Policy/Type/Settings/Summary

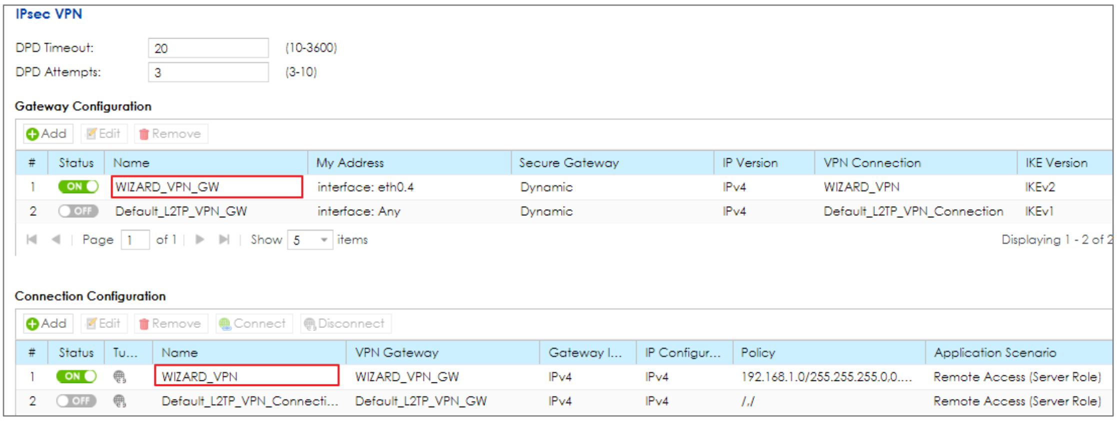
Express Settings

Summary

IKE Version:	IKEv2
Rule Name:	WIZARD_VPN
My Interface:	ETHER
Secure Gateway:	Any
Pre-Shared Key:	12345678
Local Policy (IP/Mask):	192.168.1.0/255.255.255.0
Remote Policy (IP/Mask):	0.0.0.0/0.0.0.0

And then Go to **Configuration > VPN > IPsec VPN**, the Server role already created on VPN.

Figure Configuration > VPN > IPsec VPN



IPsec VPN

DPD Timeout: 20 (10-3600)

DPD Attempts: 3 (3-10)

Gateway Configuration

#	Status	Name	My Address	Secure Gateway	IP Version	VPN Connection	IKE Version
1	ON	WIZARD_VPN_GW	interface: eth0.4	Dynamic	IPv4	WIZARD_VPN	IKEv2
2	OFF	Default_L2TP_VPN_GW	interface: Any	Dynamic	IPv4	Default_L2TP_VPN_Connection	IKEv1

Page 1 of 1 | Show 5 items Displaying 1 - 2 of 2

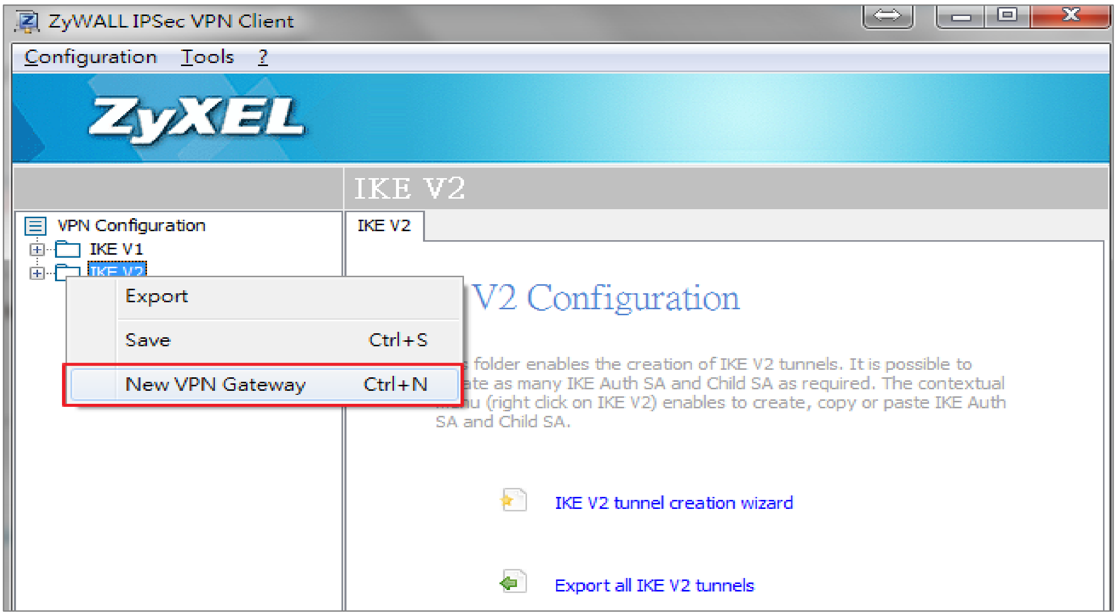
Connection Configuration

#	Status	Tu...	Name	VPN Gateway	Gateway I...	IP Configur...	Policy	Application Scenario
1	ON		WIZARD_VPN	WIZARD_VPN_GW	IPv4	IPv4	192.168.1.0/255.255.255.0,0....	Remote Access (Server Role)
2	OFF		Default_L2TP_VPN_Connecti...	Default_L2TP_VPN_GW	IPv4	IPv4	/,/	Remote Access (Server Role)

Setup the Zywall Ipsec VPN client

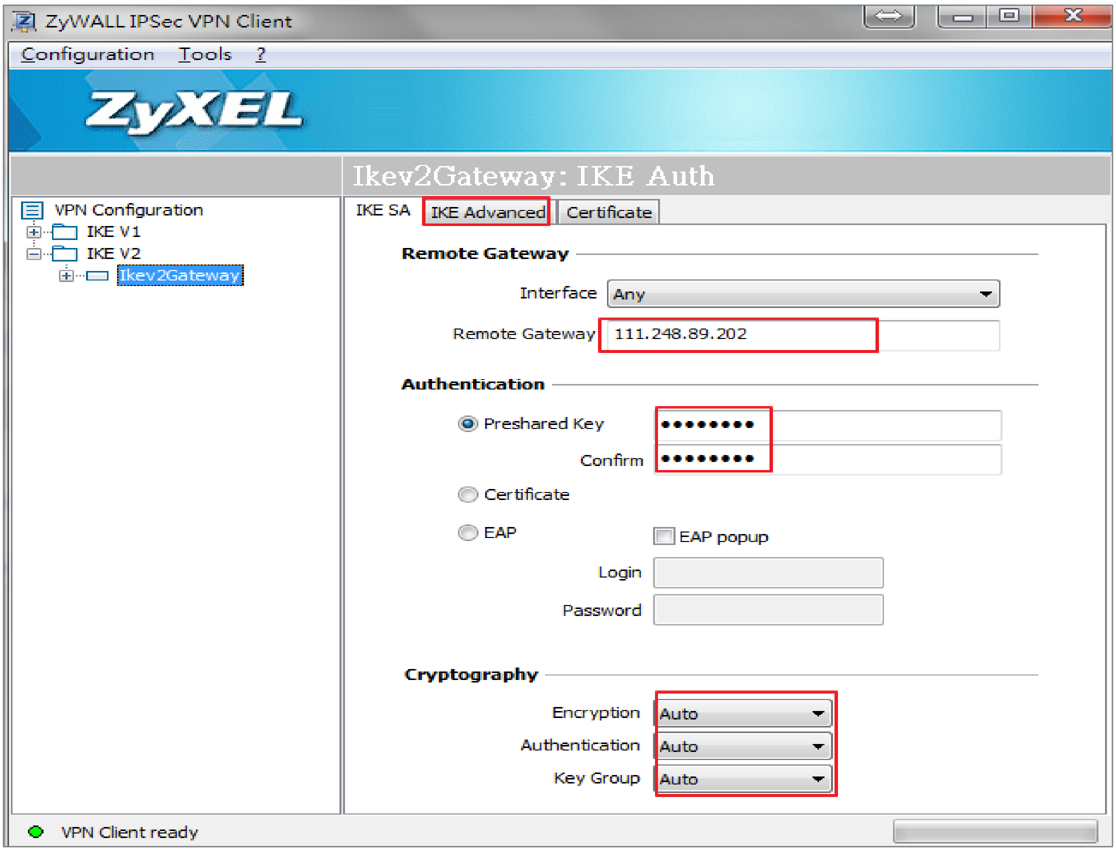
Since the IKE Version 2 is using, so the **New VPN Gateway** need to be added on IKEV2 on IPSec VPN Client.

Figure IPSec VPN Client



folder enables the creation of IKE V2 tunnels. It is possible to ...ate as many IKE Auth SA and Child SA as required. The contextual ...u (right click on IKE V2) enables to create, copy or paste IKE Auth SA and Child SA.

Fill **Remote Gateway** IP address and pre-shared key, and then move to **IKE Advance**



Remote Gateway

Interface: Any

Remote Gateway: 111.248.89.202

Authentication

● Preshared Key: ••••••••

Confirm: ••••••••

○ Certificate

○ EAP □ EAP popup

Login

Password

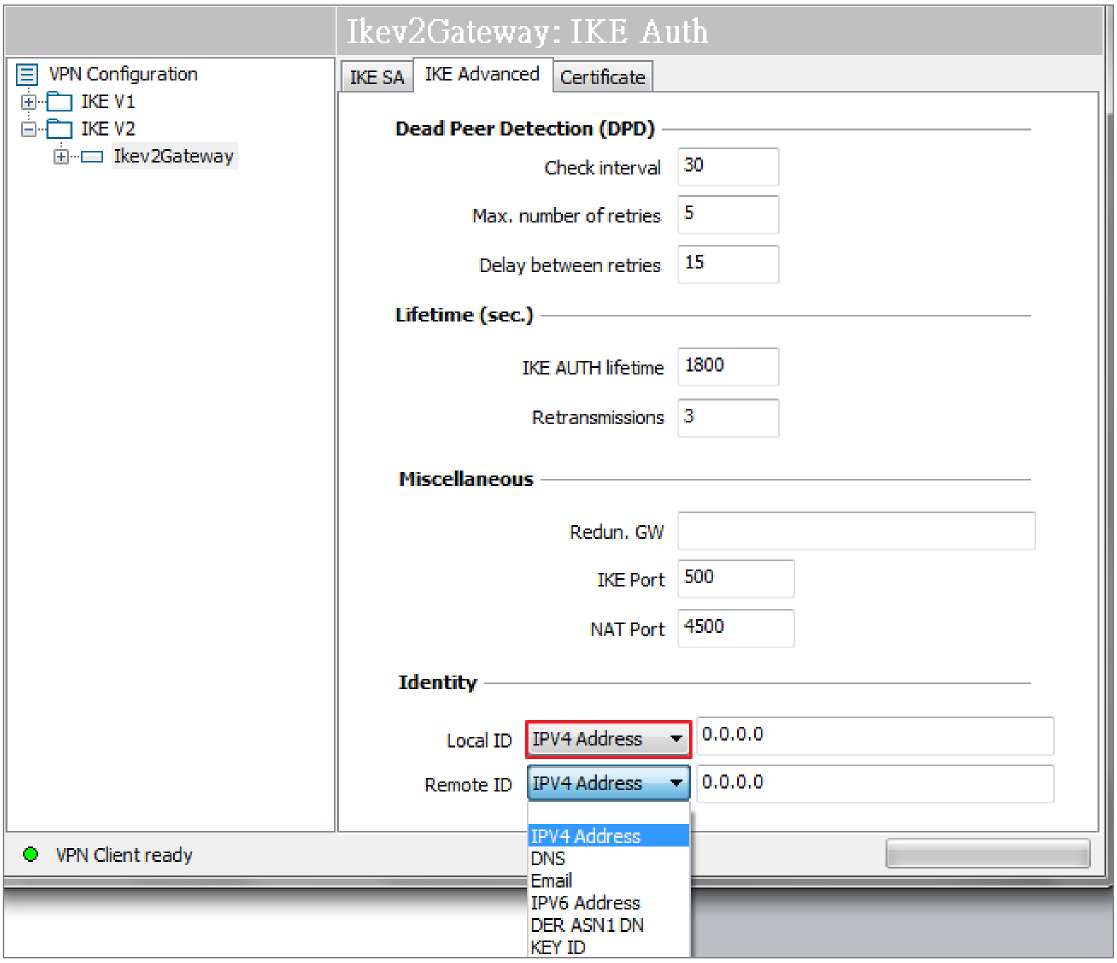
Cryptography

Encryption: Auto

Authentication: Auto

Key Group: Auto

On the IKE Advance page, Select **IPV4 Address** and fill **0.0.0.0** on **local and Remote ID.**



Ikev2Gateway: IKE Auth

Dead Peer Detection (DPD)

Check interval: 30
Max. number of retries: 5
Delay between retries: 15

Lifetime (sec.)

IKE AUTH lifetime: 1800
Retransmissions: 3

Miscellaneous

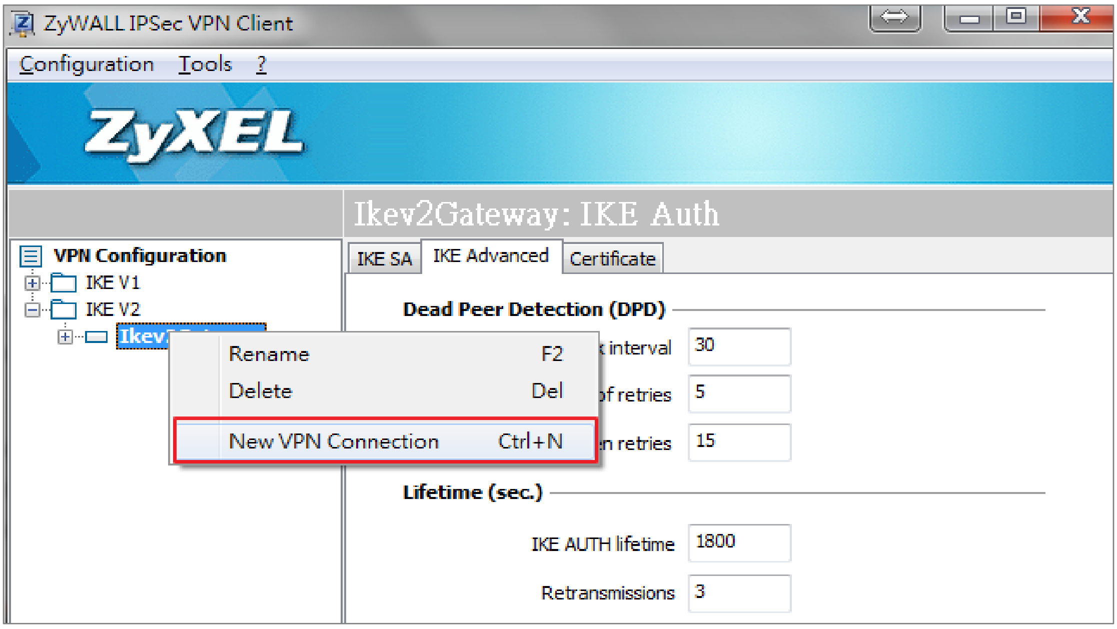
Redun. GW:
IKE Port: 500
NAT Port: 4500

Identity

Local ID: IPV4 Address 0.0.0.0
Remote ID: IPV4 Address 0.0.0.0

VPN Client ready

After that, Create the New VPN Connection



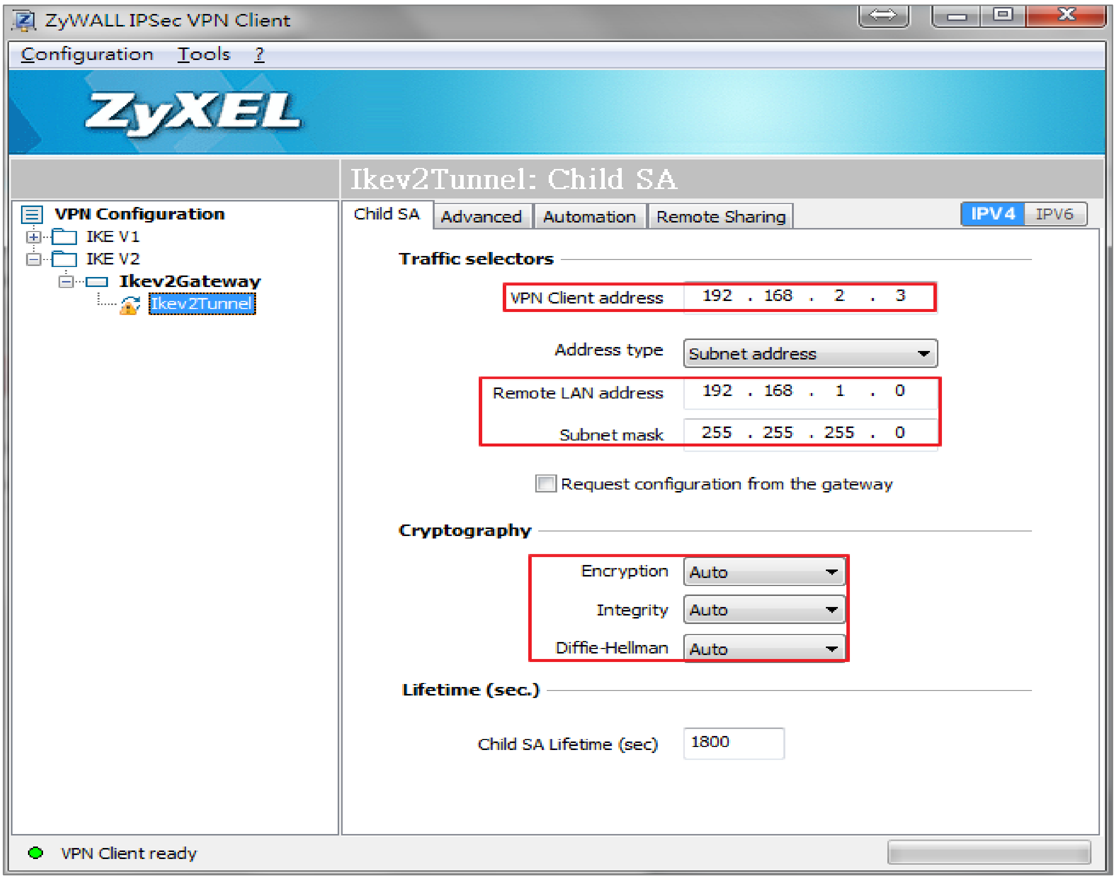
Dead Peer Detection (DPD)

...interval	30
...of retries	5
...n retries	15

Lifetime (sec.)

IKE AUTH lifetime	1800
Retransmissions	3

On the IKev2 Tunnel, please fill **VPN Client address** and **Remote Lan address**



Traffic selectors

VPN Client address	192 . 168 . 2 . 3
Address type	Subnet address
Remote LAN address	192 . 168 . 1 . 0
Subnet mask	255 . 255 . 255 . 0

□ Request configuration from the gateway

Cryptography

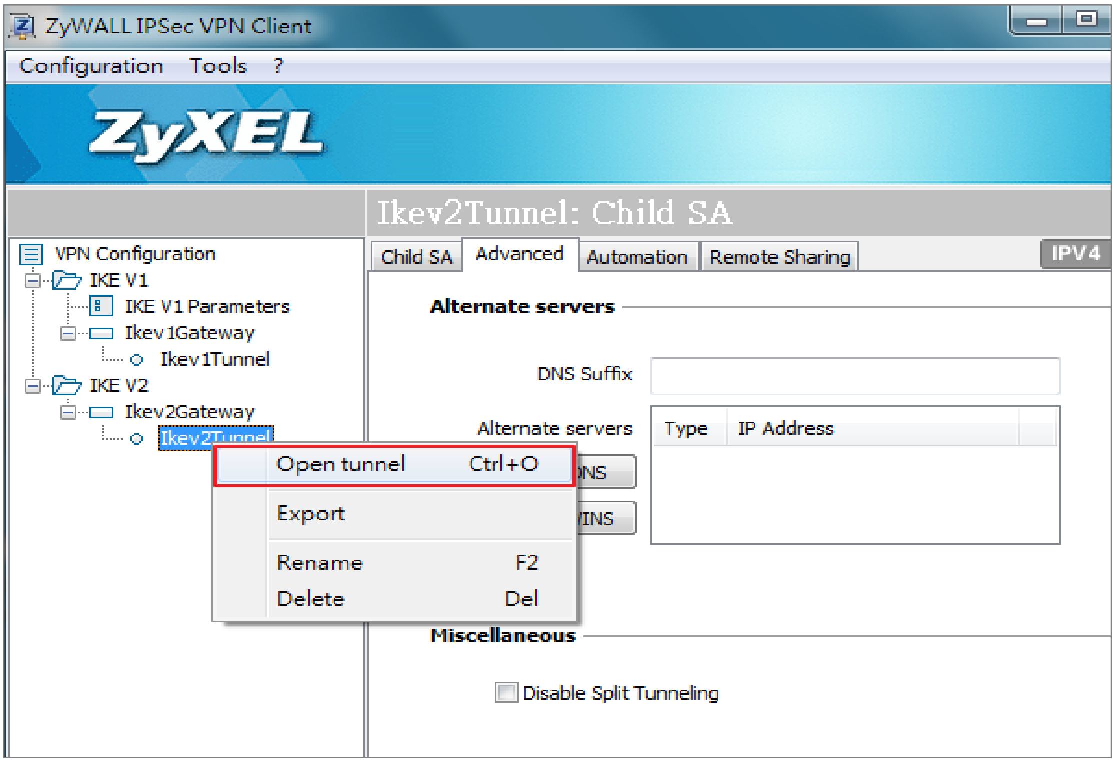
Encryption	Auto
Integrity	Auto
Diffie-Hellman	Auto

Lifetime (sec.)

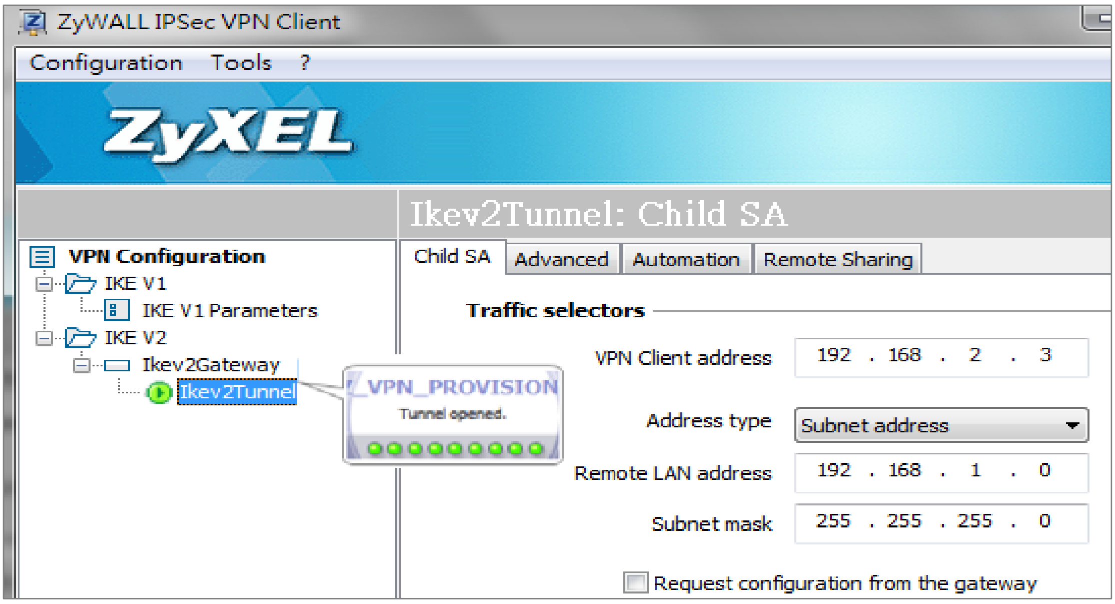
Child SA Lifetime (sec)	1800

Test SBG 5500 Series as Server Role

Click Open Tunnel



The Tunnel established



Traffic selectors

VPN Client address: 192 . 168 . 2 . 3

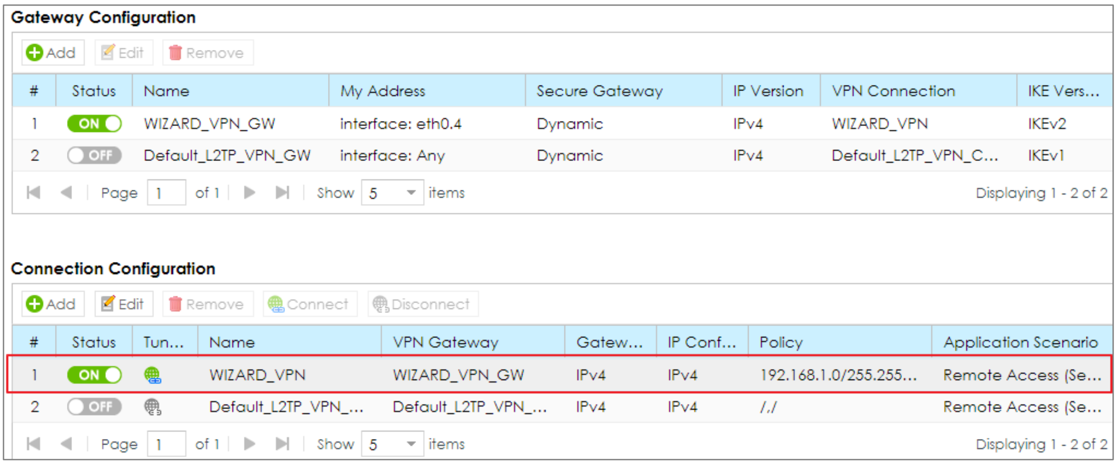
Address type: Subnet address

Remote LAN address: 192 . 168 . 1 . 0

Subnet mask: 255 . 255 . 255 . 0

□ Request configuration from the gateway

The result display on VPN on SBG 5500 Series



Gateway Configuration

#	Status	Name	My Address	Secure Gateway	IP Version	VPN Connection	IKE Vers...
1	ON	WIZARD_VPN_GW	interface: eth0.4	Dynamic	IPv4	WIZARD_VPN	IKEv2
2	OFF	Default_L2TP_VPN_GW	interface: Any	Dynamic	IPv4	Default_L2TP_VPN_C...	IKEv1

Page 1 of 1 | Show 5 items | Displaying 1 - 2 of 2

Connection Configuration

#	Status	Tun...	Name	VPN Gateway	Gatew...	IP Conf...	Policy	Application Scenario
1	ON		WIZARD_VPN	WIZARD_VPN_GW	IPv4	IPv4	192.168.1.0/255.255...	Remote Access (Se...
2	OFF		Default_L2TP_VPN_...	Default_L2TP_VPN_...	IPv4	IPv4	/./	Remote Access (Se...

Page 1 of 1 | Show 5 items | Displaying 1 - 2 of 2

How to setup scheduled rule via firewall on SBG

This example will illustrate the SBG Series User Access Control allows IT manager arrange Internet access schedule to limit specific or all LAN PC Internet access time.

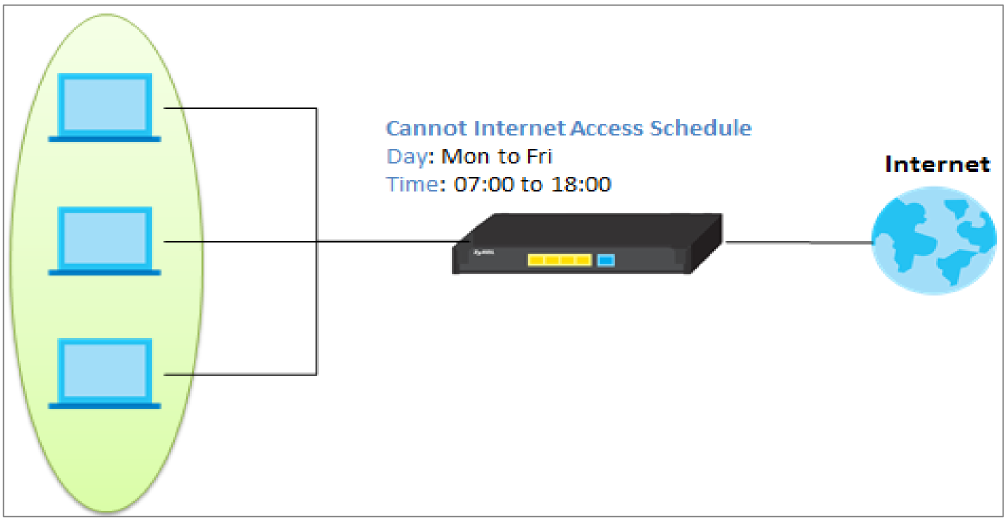


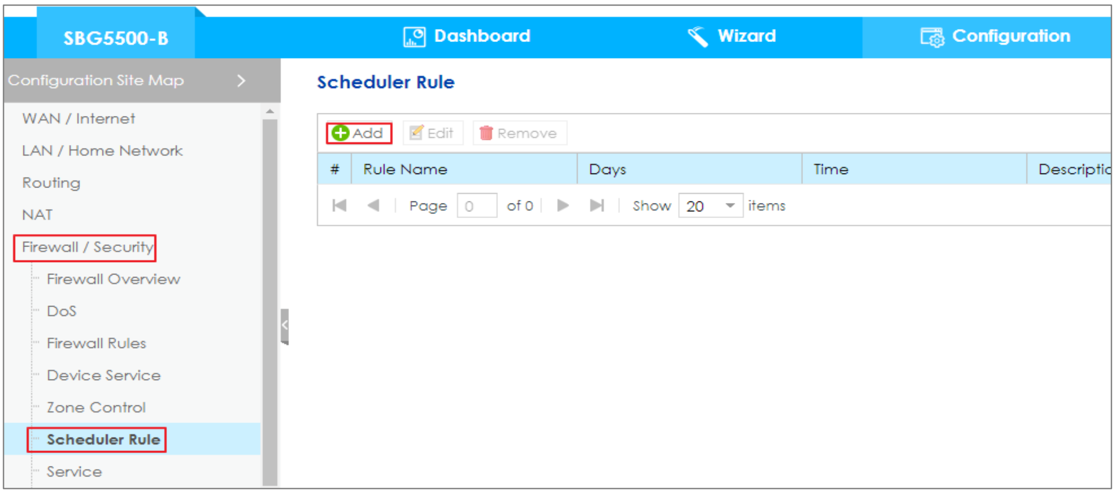
Figure User Access Control

Note:
The rules of internet access schedule related with device need to be double checked by IT Manager.

Setup the schedule rule on the SBG Series

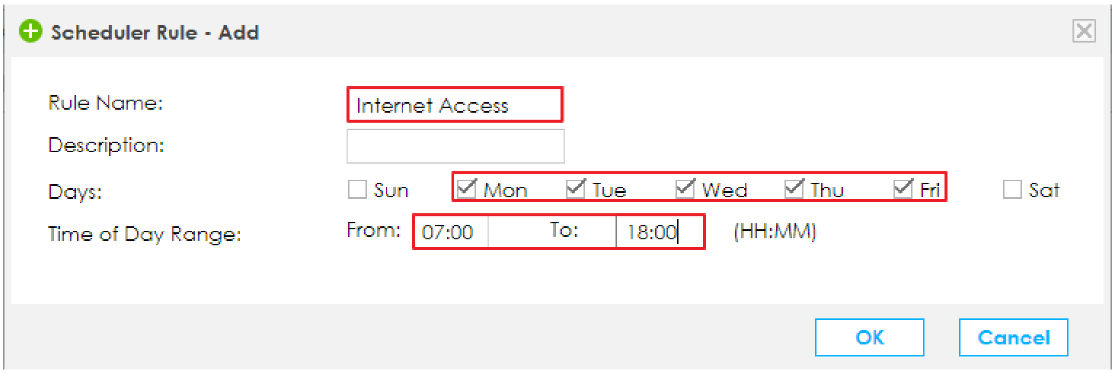
Go to **Firewall/Security** > **Scheduler Rule** > **Add**
Fill the name of the schedule rule and tick **Mon to Fri** on the Days field.
On the Time of Day Range, enter **7:00 to 18:00**. Press **OK**.

Figure Schedule Rule



#	Rule Name	Days	Time	Descriptic

Figure Schedule Rule



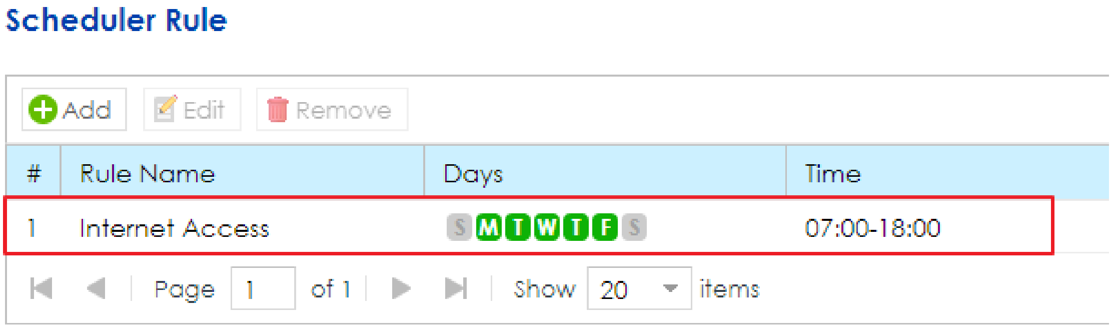
Scheduler Rule - Add

Rule Name: Internet Access

Description:

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

Time of Day Range: From: 07:00 To: 18:00 (HH:MM)



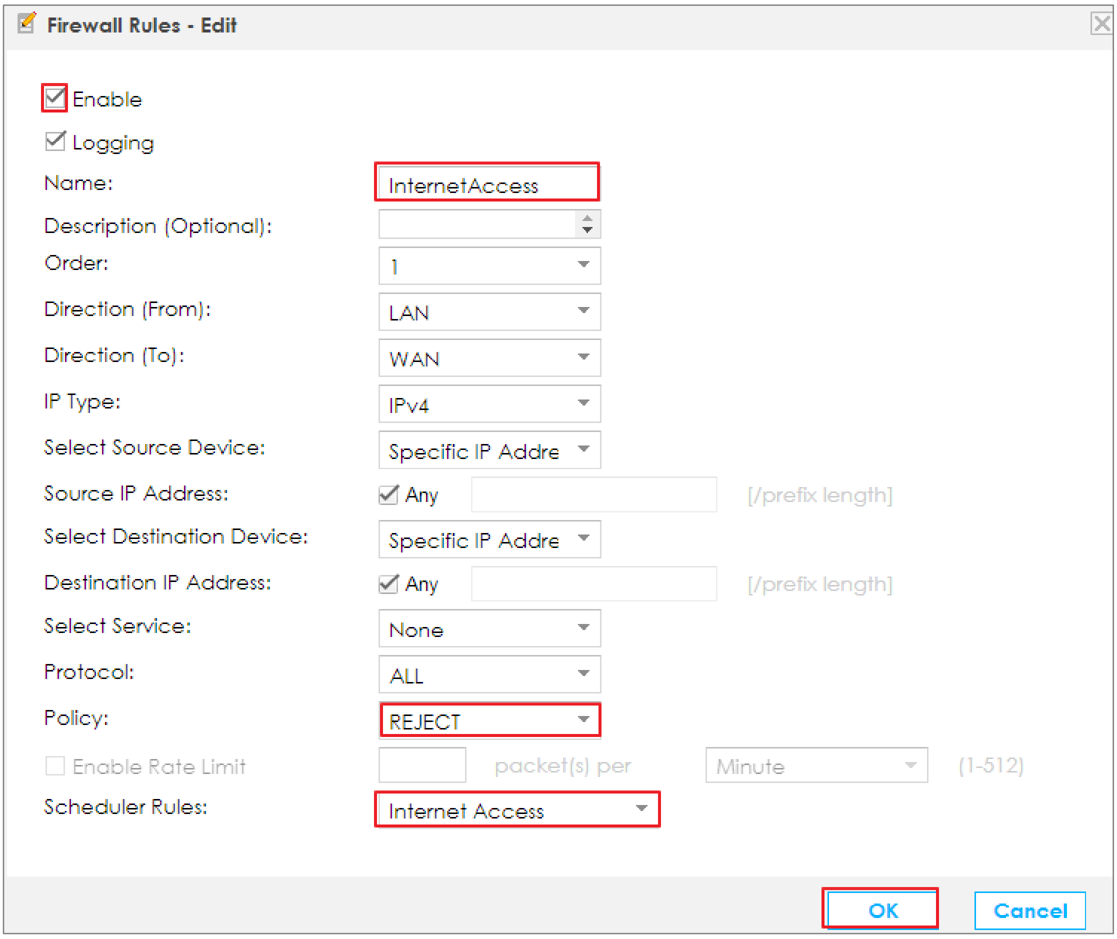
Scheduler Rule

#	Rule Name	Days	Time
1	Internet Access	S M T W T F S	07:00-18:00

Move to **Firewall/Security >Firewall Rules > Add**, Create the Firewall Rule which related with Schedule rule.

Tick **Enable**, fill the name of rule, and tick **Any** to limit all device in the schedule. Choose **REJECT** as your policy. Select **Internet Access** which created on schedule rule.

Figure Firewall/Security >Firewall Rules > Add



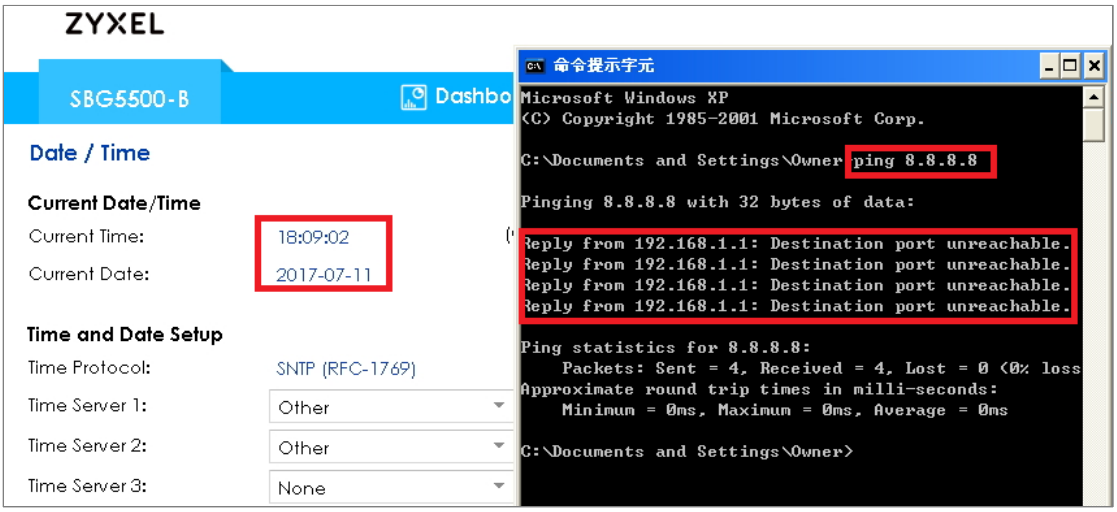
Firewall Rules - Edit

☑ Enable

☑ Logging

Name:	InternetAccess
Description (Optional):	
Order:	1
Direction (From):	LAN
Direction (To):	WAN
IP Type:	IPv4
Select Source Device:	Specific IP Addre
Source IP Address:	☑ Any [/prefix length]
Select Destination Device:	Specific IP Addre
Destination IP Address:	☑ Any [/prefix length]
Select Service:	None
Protocol:	ALL
Policy:	REJECT
□ Enable Rate Limit	packet(s) per Minute (1-512)
Scheduler Rules:	Internet Access

Test scheduled rule via firewall on SBG Series



Date / Time

Current Date/Time

Current Time: 18:09:02

Current Date: 2017-07-11

Time and Date Setup

Time Protocol: SNTP (RFC-1769)

Time Server 1: Other

Time Server 2: Other

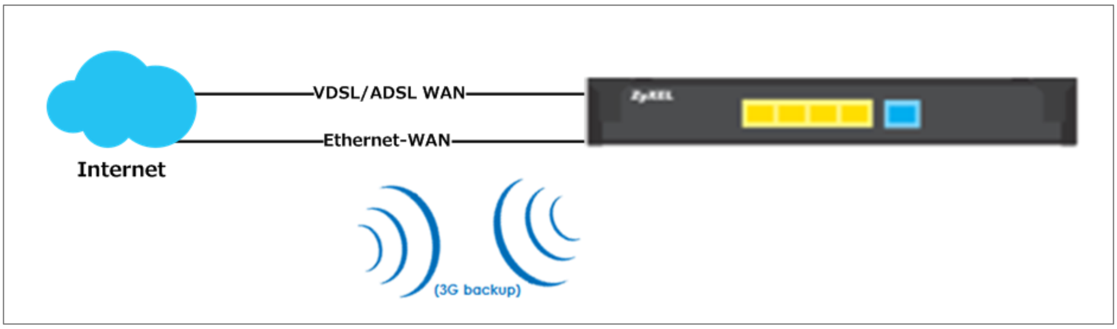
Time Server 3: None

```
Microsoft Windows XP
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Owner>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:

Reply from 192.168.1.1: Destination port unreachable.
Reply from 192.168.1.1: Destination port unreachable.
Reply from 192.168.1.1: Destination port unreachable.
Reply from 192.168.1.1: Destination port unreachable.

Ping statistics for 8.8.8.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Owner>
```

How to configure Multi-WAN

This example shows how to use the Multi-WAN, There are VDSL, Ethernet, 3G connections. The bandwidth for the VDSL :100M, Ethernet:20M. The ratio should be 5:1 on VDSL and Ethernet. The 3G connection is WAN backup, since most 3G connection charge the user more cost.

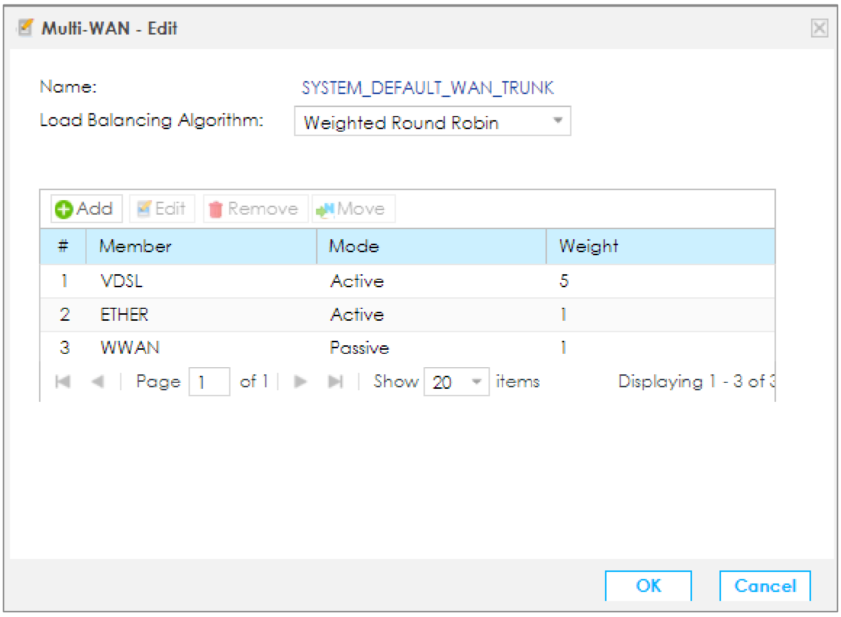
Figure Multi-WAN



Set Up the Multi-WAN on the SBG.

Sign into the SBG. Go to Configuration > WAN / Internet > Multi-WAN

Click Configuration > WAN / Internet > Multi-WAN > Edit open the follow screen.



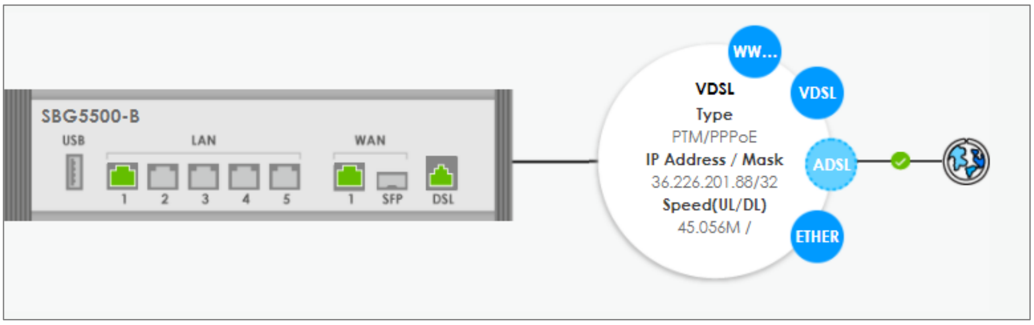
Name:	SYSTEM_DEFAULT_WAN_TRUNK
Load Balancing Algorithm:	Weighted Round Robin

#	Member	Mode	Weight
1	VDSL	Active	5
2	ETHER	Active	1
3	WWAN	Passive	1

Check the Multi-WAN status

VDSL WAN connection

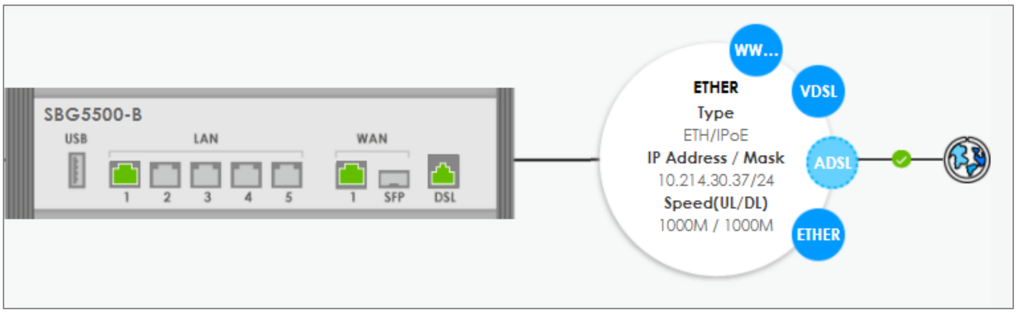
Click Dashboard open the follow screen.



VDSL
Type
PTM/PPPoE
IP Address / Mask
36.226.201.88/32
Speed(UL/DL)
45.056M /

Ethernet WAN connection

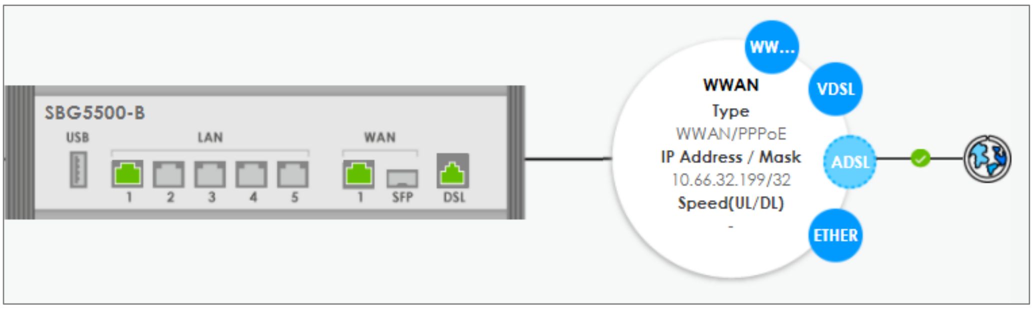
Click Dashboard open the follow screen.



ETHER
Type
ETH/IPoE
IP Address / Mask
10.214.30.37/24
Speed(UL/DL)
1000M / 1000M

WWAN 3G connection

Click Dashboard open the follow screen.

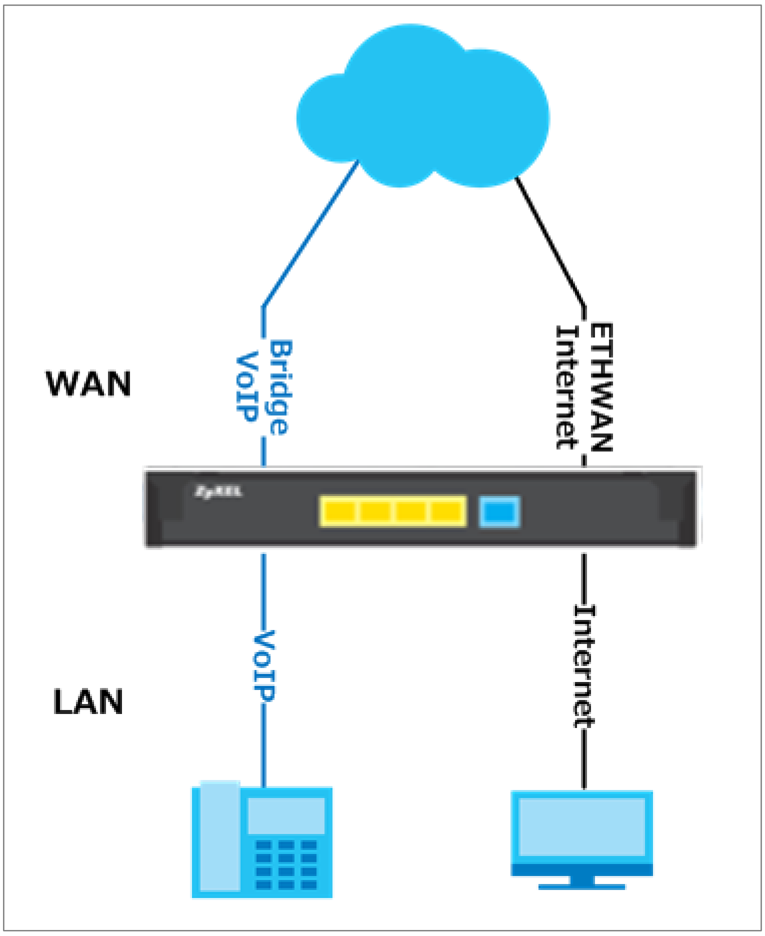


WWAN
Type
WWAN/PPPoE
IP Address / Mask
10.66.32.199/32
Speed(UL/DL)
-

How to Configure Interface Group Bridge / Bundle WAN Interface

This example shows how to use the Interface Group. There are Internet and VoIP, connections. The Interface Group VoIP should be bridge to WAN interface VoIP. When the Interface Group is configured, Internet and VoIP traffic can be isolated and VoIP can be use L2 traffic to the WAN interface

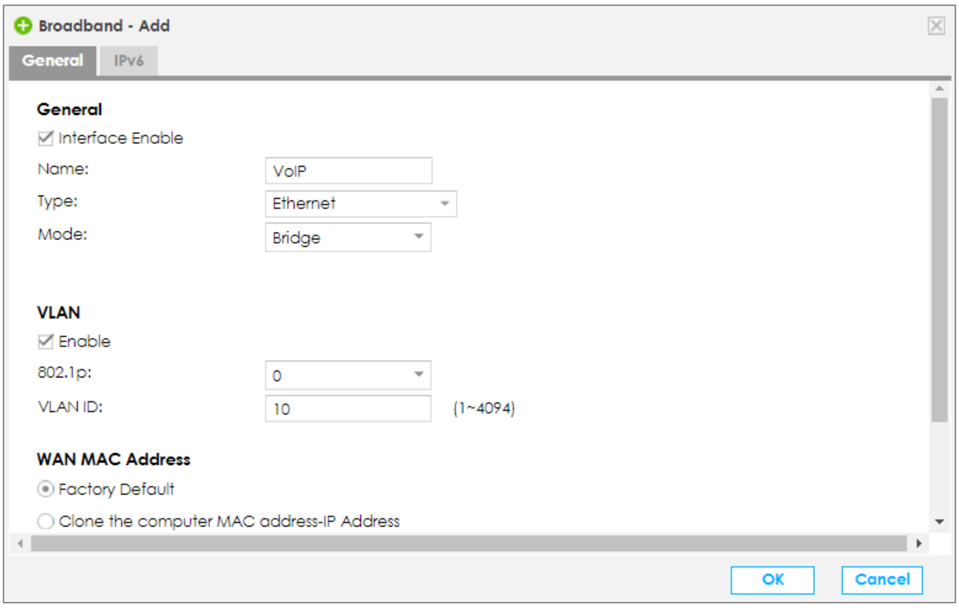
Figure Interface Group Bridge / Bundle WAN Interface



Set Up the Interface Group Bridge / Bundle WAN Interface Group on the SBG.

Sign into the SBG. Go to LAN / Home Network > VLAN / Interface Group

Click Configuration > WAN / Internet > Broadband > Add to open the follow screen.



Broadband - Add

General | IPv6

General

☑ Interface Enable

Name:	VoIP
Type:	Ethernet
Mode:	Bridge

VLAN

☑ Enable

802.1p:	0
VLAN ID:	10 (1~4094)

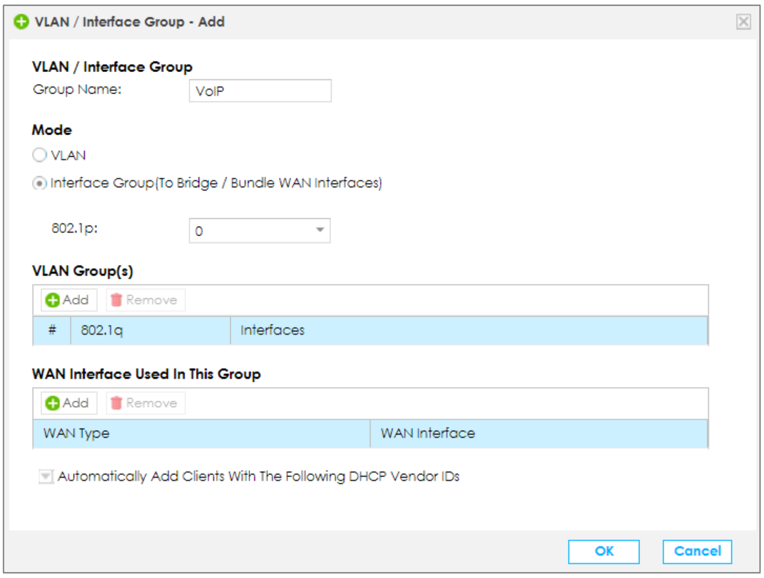
WAN MAC Address

● Factory Default

○ Clone the computer MAC address-IP Address

OK Cancel

Click Configuration > LAN / Home Network > VLAN / Interface Group > Add to open the follow screen.



VLAN / Interface Group - Add

VLAN / Interface Group

Group Name: VoIP

Mode

○ VLAN

● Interface Group(To Bridge / Bundle WAN Interfaces)

802.1p: 0

VLAN Group(s)

Add Remove

#	802.1q	Interfaces

WAN Interface Used In This Group

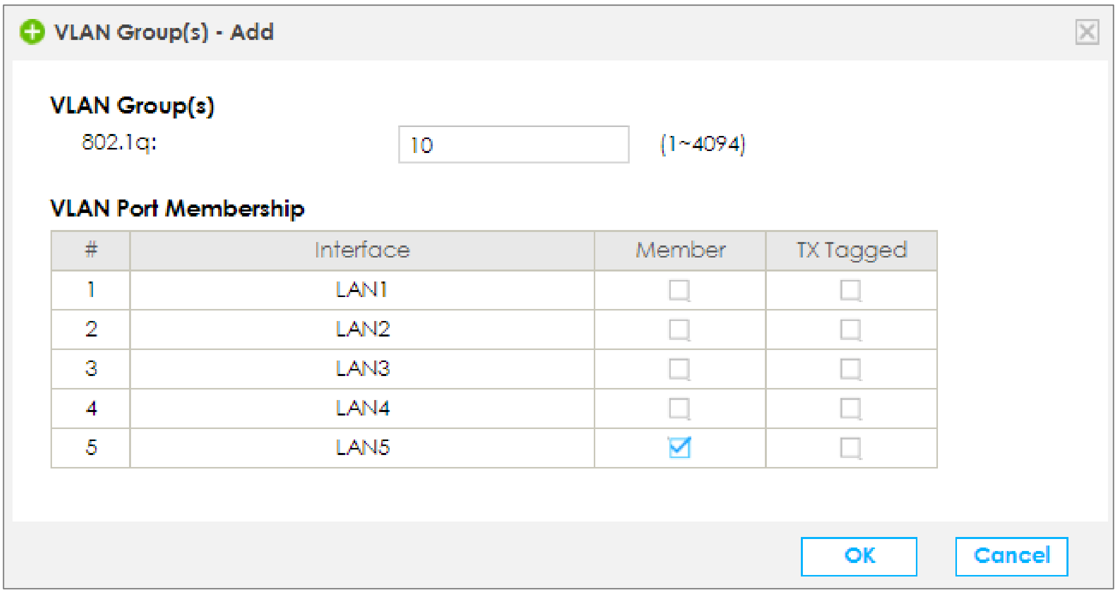
Add Remove

WAN Type	WAN Interface

☐ Automatically Add Clients With The Following DHCP Vendor IDs

OK Cancel

Click **Configuration > LAN / Home Network > VLAN / Interface Group > Add > VLAN Group(s) Add** to open the follow screen.



VLAN Group(s) - Add

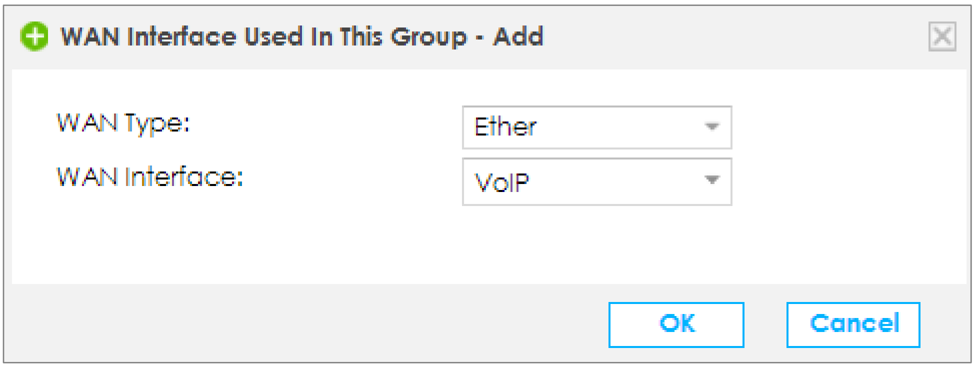
VLAN Group(s)

802.1q: 10 (1~4094)

VLAN Port Membership

#	Interface	Member	TX Tagged
1	LAN1	□	□
2	LAN2	□	□
3	LAN3	□	□
4	LAN4	□	□
5	LAN5	☑	□

Click **Configuration > LAN / Home Network > VLAN / Interface Group > Add > WAN Interface Used In This Group Add** to open the follow screen.

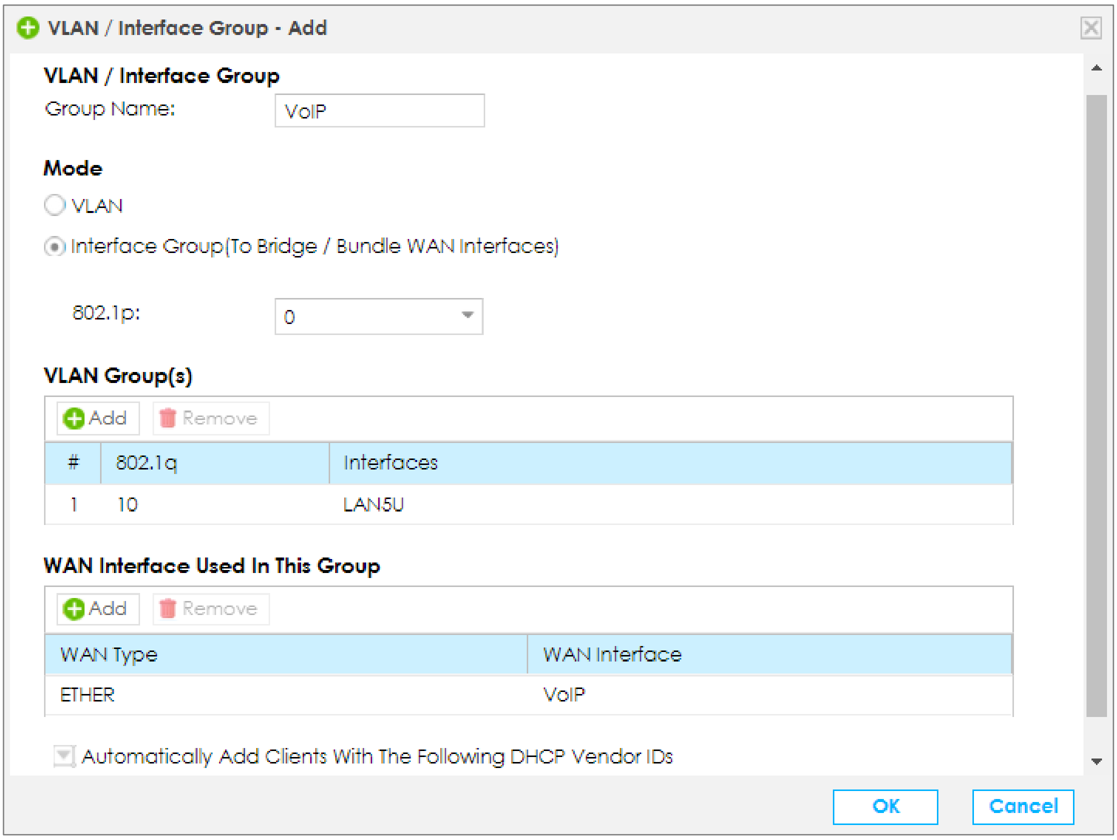


WAN Interface Used In This Group - Add

WAN Type: Ether

WAN Interface: VoIP

Click Configuration > LAN / Home Network > VLAN / Interface Group > Add to open the follow screen.



VLAN / Interface Group - Add

VLAN / Interface Group

Group Name: VoIP

Mode

○ VLAN

● Interface Group(To Bridge / Bundle WAN Interfaces)

802.1p: 0

VLAN Group(s)

#	802.1q	Interfaces
1	10	LAN5U

WAN Interface Used In This Group

WAN Type	WAN Interface
ETHER	VoIP

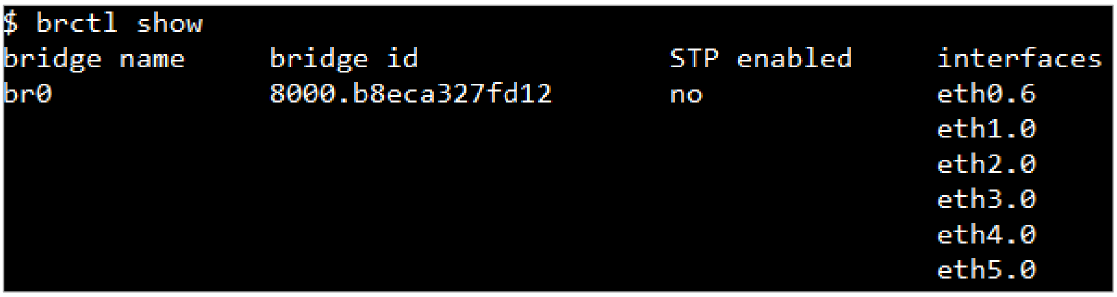
□ Automatically Add Clients With The Following DHCP Vendor IDs

Check the Interface Group Bridge WAN Interface

Using Telnet/ssh/console cable sign into the SBG

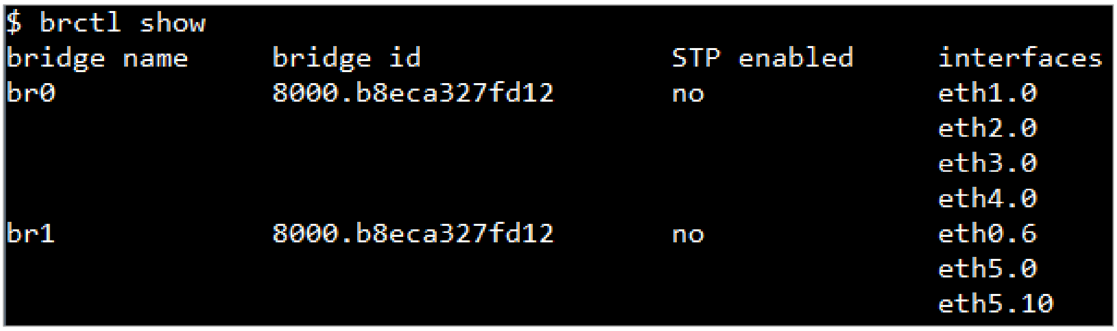
Type 'brctl show' check bridge status.

Before Interface Group Bridge WAN Interface



```
$ brctl show
bridge name     bridge id               STP enabled     interfaces
br0             8000.b8eca327fd12       no              eth0.6
                                                        eth1.0
                                                        eth2.0
                                                        eth3.0
                                                        eth4.0
                                                        eth5.0
```

After Interface Group Bridge WAN Interface

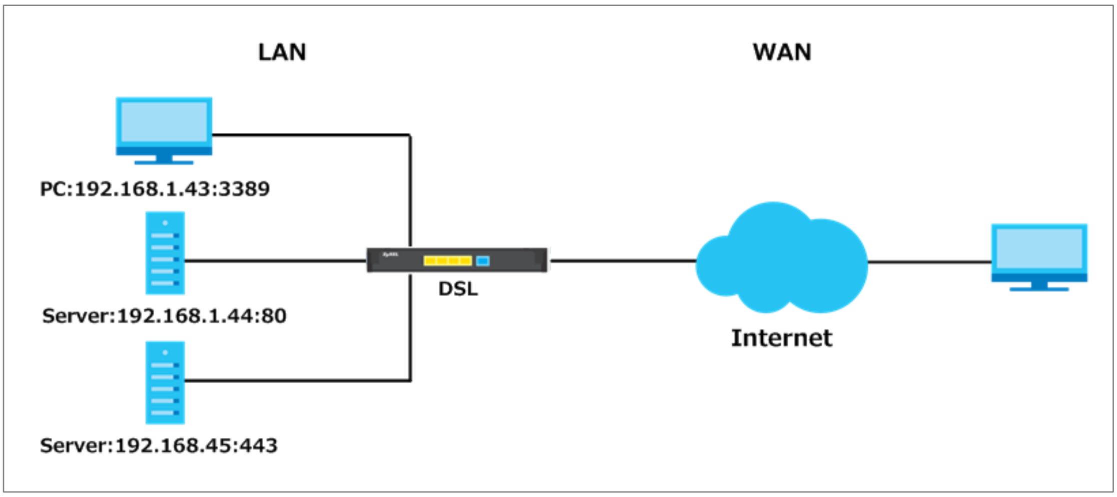


```
$ brctl show
bridge name     bridge id               STP enabled     interfaces
br0             8000.b8eca327fd12       no              eth1.0
                                                        eth2.0
                                                        eth3.0
                                                        eth4.0
br1             8000.b8eca327fd12       no              eth0.6
                                                        eth5.0
                                                        eth5.10
```

How to Configure NAT Port Forwarding

This example shows how to use the Port Forwarding to access local server. The example instructs how to configure the Port Forwarding. When the Port Forwarding is configured, each server can be accessed from Internet.

Figure Multiple Servers Behind NAT Example



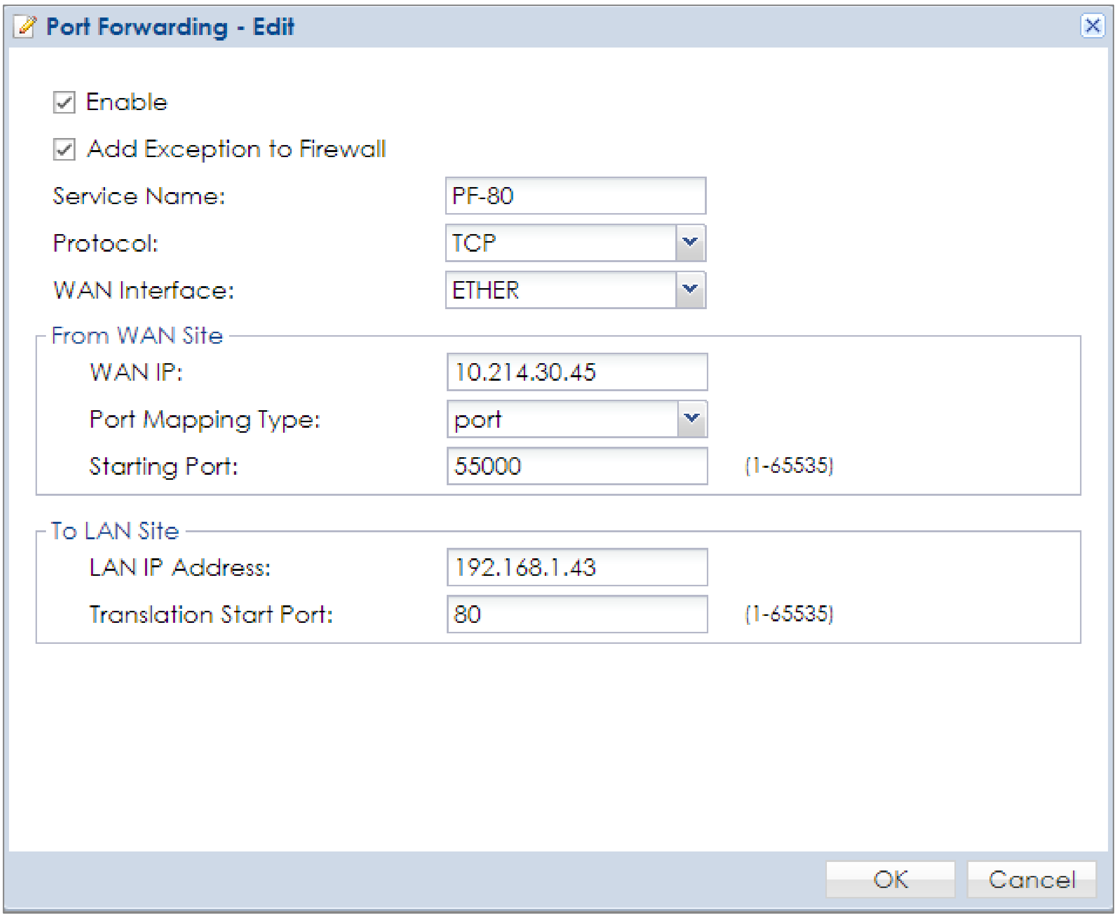
Note:

1. The TCP port is reserved for TR069 connection request port.

Set Up the Port Forwarding on the SBG.

Sign into the SBG. Go to NAT > Port Forwarding

Click Configuration > NAT > Port Forwarding > Add to open the follow screen.



☑ Enable

☑ Add Exception to Firewall

Service Name:	PF-80	
Protocol:	TCP	
WAN Interface:	ETHER	

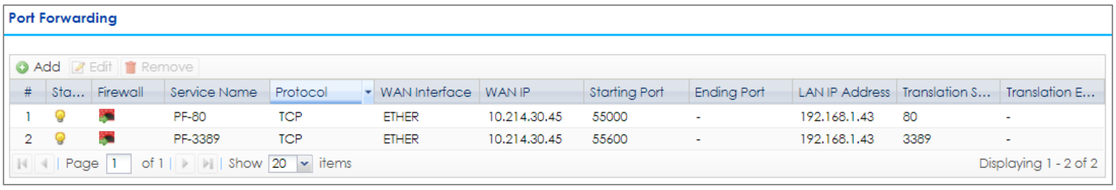
From WAN Site

WAN IP:	10.214.30.45	
Port Mapping Type:	port	
Starting Port:	55000	(1-65535)

To LAN Site

LAN IP Address:	192.168.1.43	
Translation Start Port:	80	(1-65535)

Click Configuration > NAT > Port Forwarding open the follow screen.

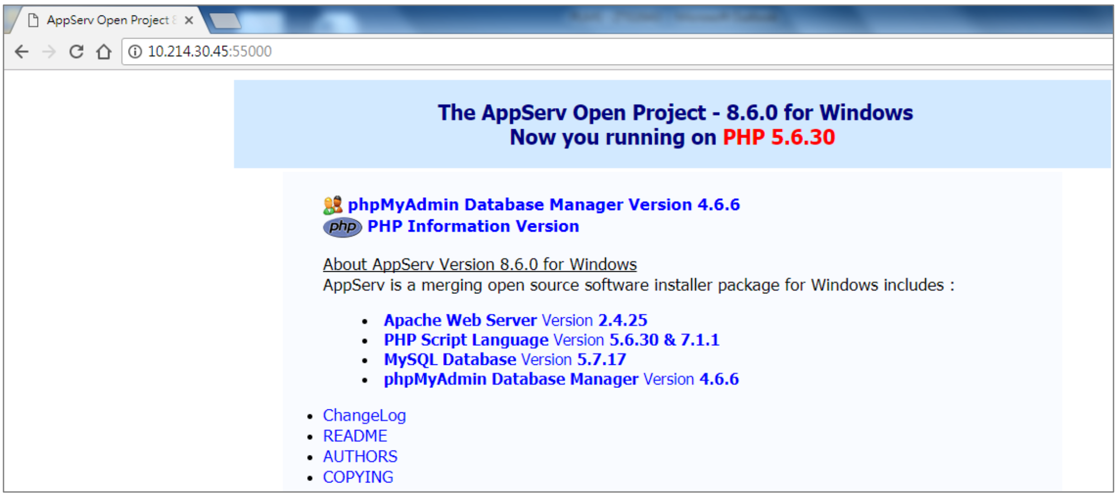


#	Sta...	Firewall	Service Name	Protocol	WAN Interface	WAN IP	Starting Port	Ending Port	LAN IP Address	Translation S...	Translation E...
1	●	●	PF-80	TCP	ETHER	10.214.30.45	55000	-	192.168.1.43	80	-
2	●	●	PF-3389	TCP	ETHER	10.214.30.45	55600	-	192.168.1.43	3389	-

Page 1 of 1 | Show 20 items   Displaying 1 - 2 of 2

Test the Port Forwarding

Connect to http://10.214.30.45:55000 will access Server B 192.168.1.43:80



AppServ Open Project

10.214.30.45:55000

The AppServ Open Project - 8.6.0 for Windows
Now you running on PHP 5.6.30

phpMyAdmin Database Manager Version 4.6.6
PHP Information Version

About AppServ Version 8.6.0 for Windows
AppServ is a merging open source software installer package for Windows includes :

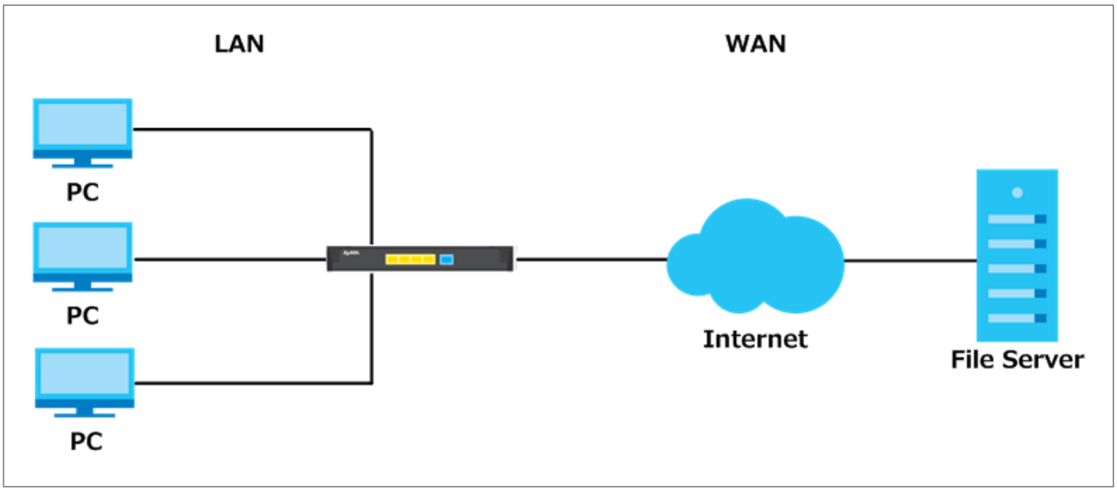
- **Apache Web Server** Version **2.4.25**
- **PHP Script Language** Version **5.6.30 & 7.1.1**
- **MySQL Database** Version **5.7.17**
- **phpMyAdmin Database Manager** Version **4.6.6**

- ChangeLog
- README
- AUTHORS
- COPYING

How to Configure NAT Port Triggering

This example shows how to create a Port Triggering on the SBG. The example instructs how to configure the Port Triggering. When Port Triggering is opened, File Server will forward to the open port. .

Trigger Port Forwarding Process: Example



Note:

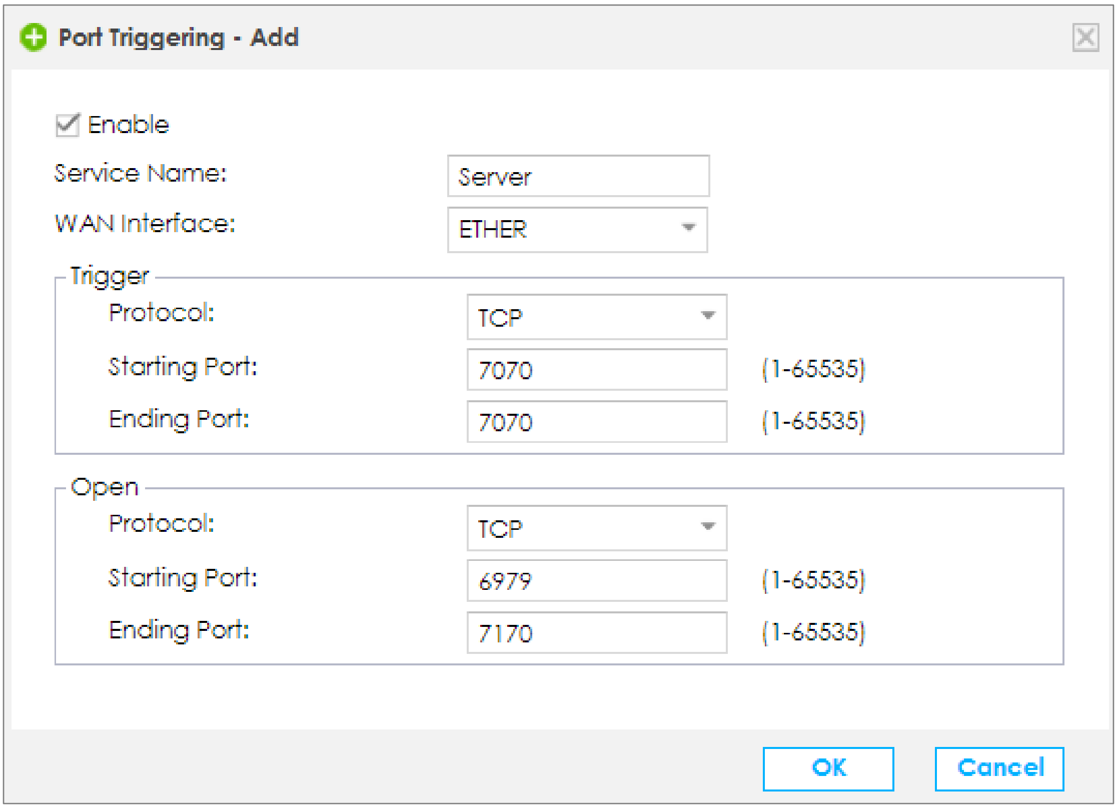
1. Only one PC can connect to the File Server until the connection is closed or time out.
2. The times out in three minutes with UDP or two hours with TCP/IP.

Set Up the Port Triggering on the SBG

In the SBG, go to NAT > Port Triggering.

.

Click Configuration > NAT > Port Triggering > Add to open the follow screen.



Port Triggering - Add

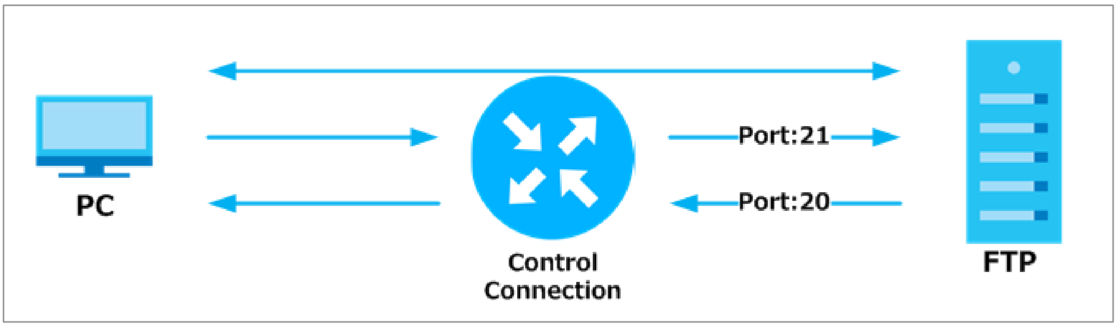
☑ Enable

Service Name:	Server	
WAN Interface:	ETHER	
Trigger		
Protocol:	TCP	
Starting Port:	7070	(1-65535)
Ending Port:	7070	(1-65535)
Open		
Protocol:	TCP	
Starting Port:	6979	(1-65535)
Ending Port:	7170	(1-65535)

How to Enable NAT ALG

This example shows how to create NAT ALG on the SBG. The example instructs how to configure the NAT ALG. When the NAT ALG is configured, will solve major problem for peer-to-peer communication in NAT

Figure FTP ALG



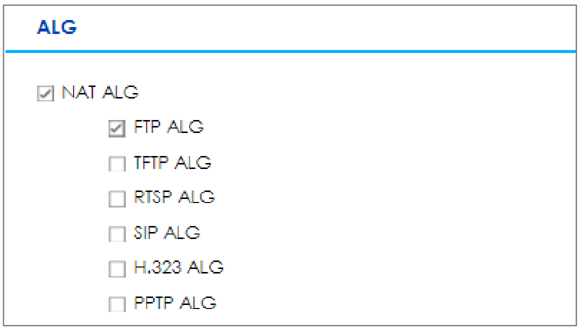
Note:

1. Mack sure ALG works correctly with port-forwarding and address mapping rules.

Enable the ALG on the SBG

1. In the SBG, go to NAT > ALG.

.Click Configuration > NAT > ALG open the follow screen.



ALG

☑ NAT ALG

☑ FTP ALG

□ TFTP ALG

□ RTSP ALG

□ SIP ALG

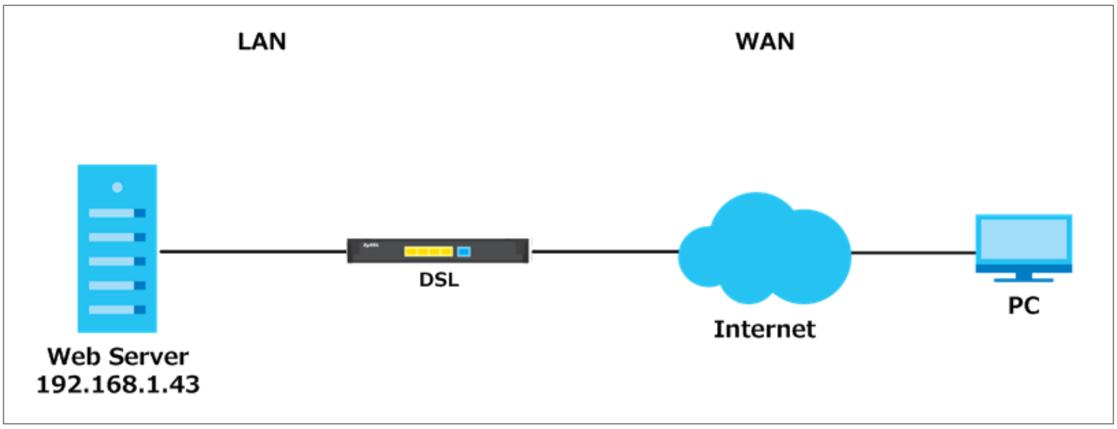
□ H.323 ALG

□ PPTP ALG

How to Configure NAT Default Server

This example shows how to create Default Server on the SBG. The example instructs how to configure the Default Server. When the Default Server is configured, each Internet PC can be accessed Web Server.

Figure Default Server



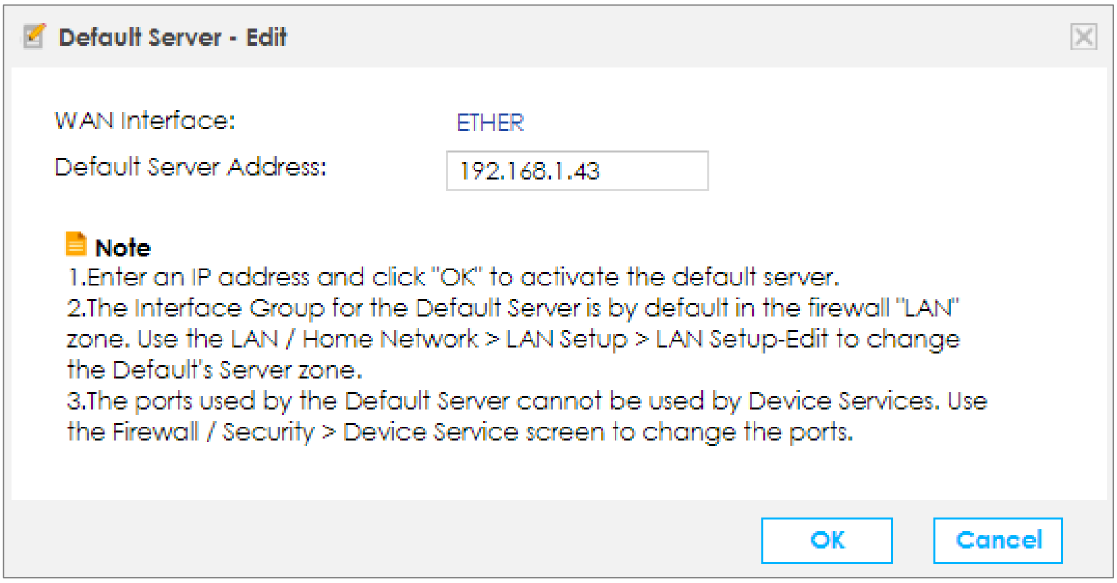
Note:

1. Enter IP address and click "OK" to activate the default server.
2. The Interface Group for the default server is by default on firewall "LAN" zone. Use LAN to configure it to other zone, if desired.
3. Some default ports of services are already used by device service. If you need the same ports for the default server, please change the ports used by device service from Firewall / Security > Device Service.

Set Up the Default Server on the SBG

1. In the SBG, go to NAT > Default Server.

Click Configuration > NAT > Default Server > Add to open the follow screen.



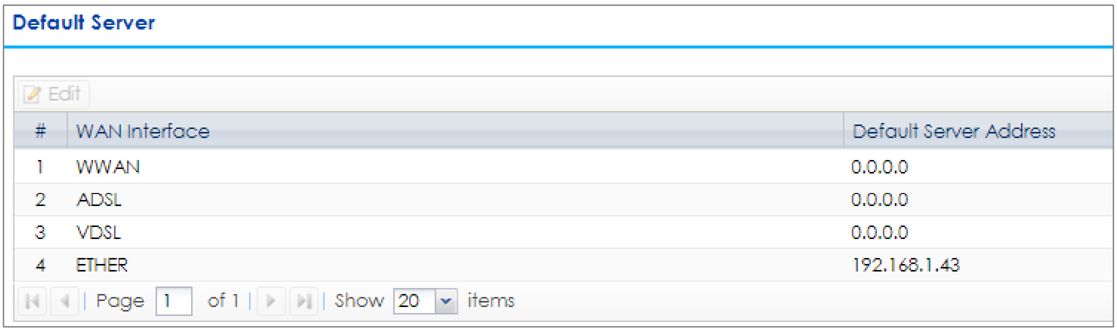
Default Server - Edit

WAN Interface: ETHER

Default Server Address: 192.168.1.43

Note
1.Enter an IP address and click "OK" to activate the default server.
2.The Interface Group for the Default Server is by default in the firewall "LAN" zone. Use the LAN / Home Network > LAN Setup > LAN Setup-Edit to change the Default's Server zone.
3.The ports used by the Default Server cannot be used by Device Services. Use the Firewall / Security > Device Service screen to change the ports.

Click Configuration > NAT > Default Server open the follow screen.



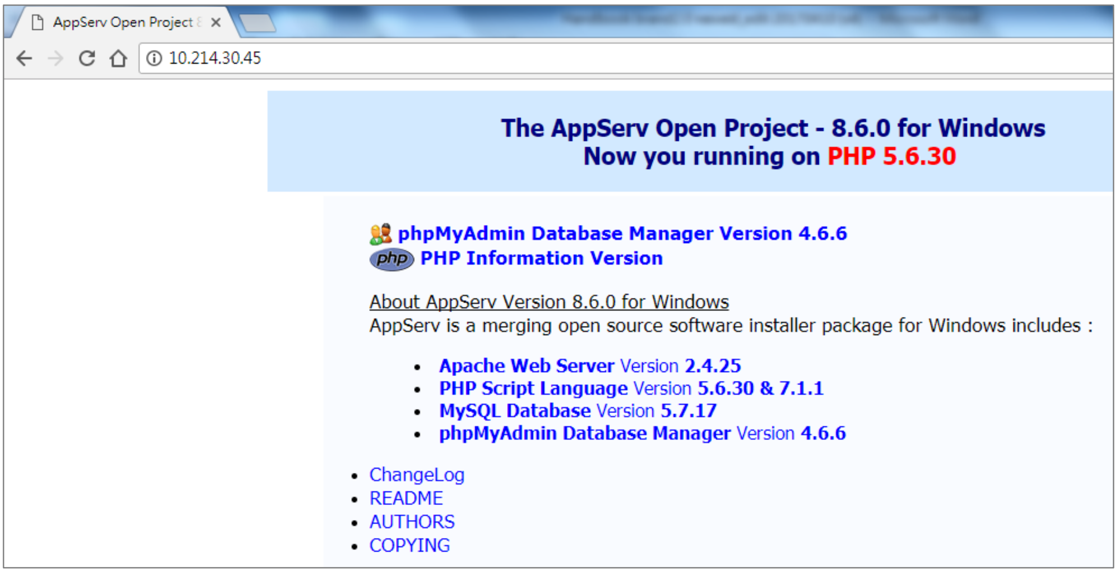
Default Server

Edit

#	WAN Interface	Default Server Address
1	WWAN	0.0.0.0
2	ADSL	0.0.0.0
3	VDSL	0.0.0.0
4	ETHER	192.168.1.43

Test the Default Server

Connect to http://10.214.30.45 will access Server B 192.168.1.43



The AppServ Open Project - 8.6.0 for Windows
Now you running on PHP 5.6.30

phpMyAdmin Database Manager Version 4.6.6
PHP Information Version

About AppServ Version 8.6.0 for Windows
AppServ is a merging open source software installer package for Windows includes :

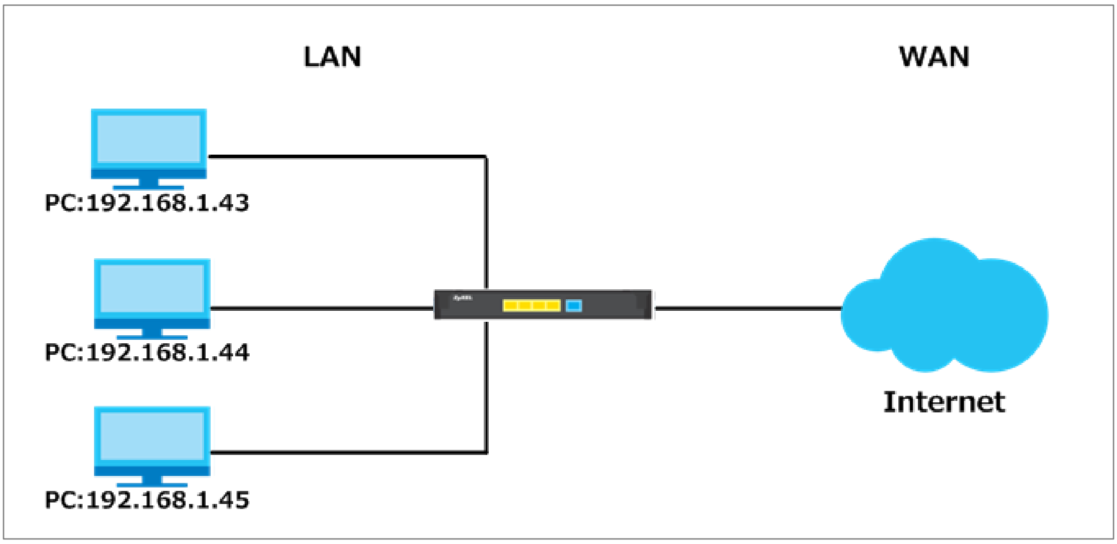
- Apache Web Server Version 2.4.25
- PHP Script Language Version 5.6.30 & 7.1.1
- MySQL Database Version 5.7.17
- phpMyAdmin Database Manager Version 4.6.6

- ChangeLog
- README
- AUTHORS
- COPYING

How to Configure NAT Address Mapping

This example shows how to create NAT Address Mapping. You want to LAN users browser Internet, but you don't have enough Public. So we can use Address Mapping to translate Private IP to Public IP. When the Address Mapping is configured, each user can be browser Internet.

Figure NAT Address Mapping



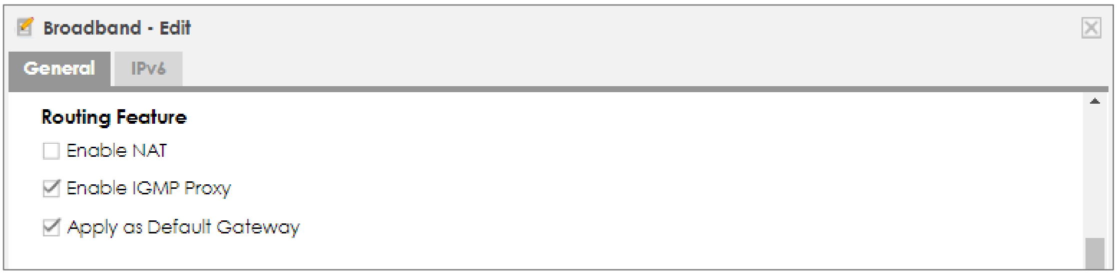
Note:

1. Address mapping rule sets do not have priority above each other, and might not give the desired result if the IP ranges overlap.

Set Up the SBG Address Mapping (One-to-One)

In the SBG, go to WAN / Internet > Broadband.

Click Configuration > WAN / Internet > Broadband > Choice ETHER > Edit to open the follow screen.



Broadband - Edit

Routing Feature

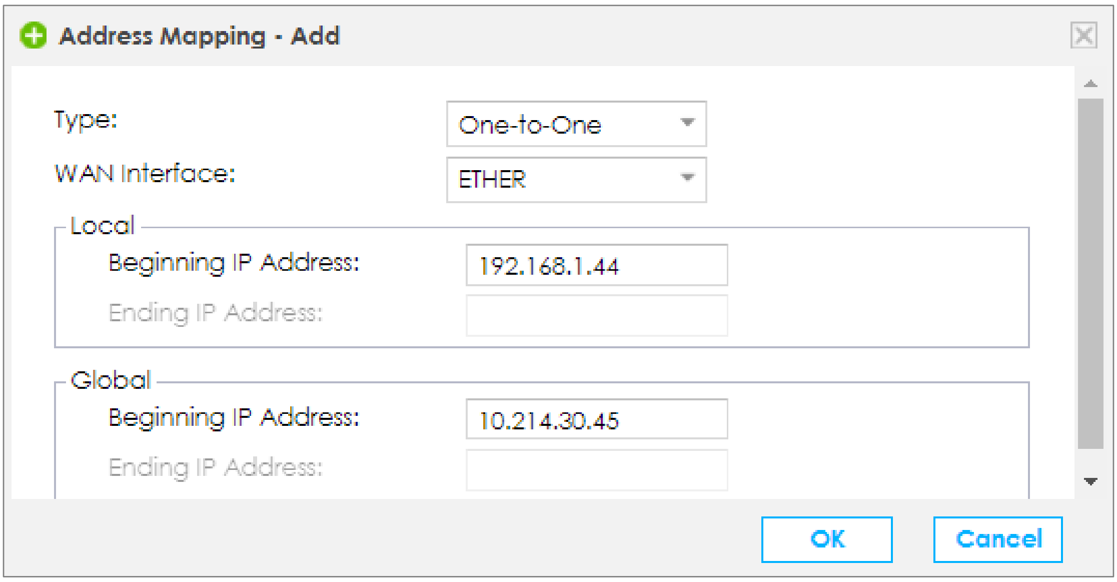
□ Enable NAT

☑ Enable IGMP Proxy

☑ Apply as Default Gateway

2. In the SBG, go to NAT > Address Mapping.

Click Configuration > NAT > Address Mapping > Add to open the follow screen.



Address Mapping - Add

Type: One-to-One

WAN Interface: ETHER

Local

Beginning IP Address: 192.168.1.44

Ending IP Address:

Global

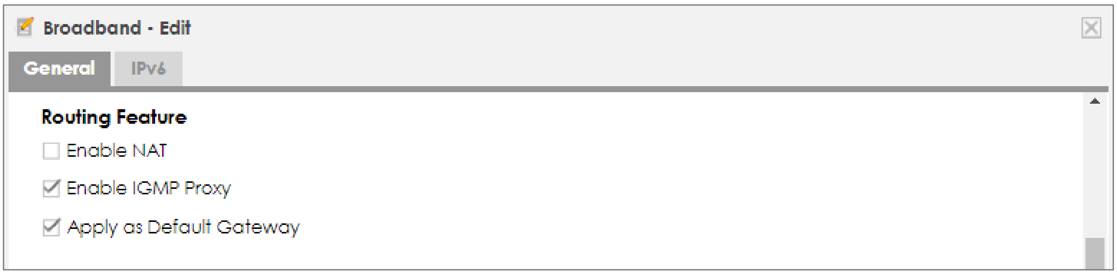
Beginning IP Address: 10.214.30.45

Ending IP Address:

Set Up the SBG Address Mapping (Many-to-Many)

In the SBG, go to WAN / Internet > Broadband.

Click Configuration > WAN / Internet > Broadband > Choice ETHER > Edit to open the follow screen.



Broadband - Edit

Routing Feature

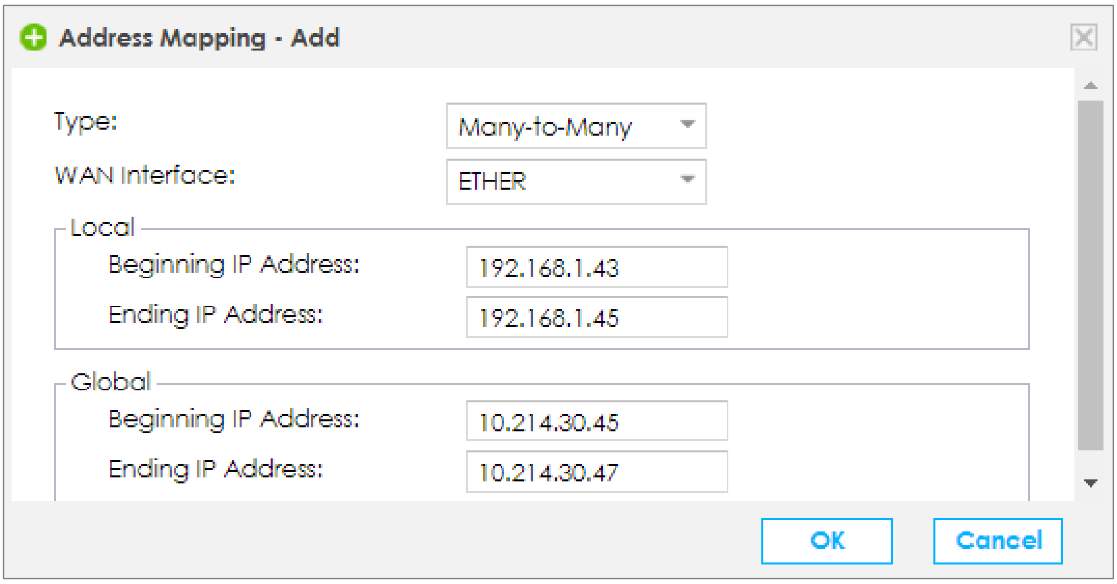
□ Enable NAT

☑ Enable IGMP Proxy

☑ Apply as Default Gateway

3. In the SBG, go to NAT > Address Mapping.

Click Configuration > NAT > Address Mapping > Add to open the follow screen.



Address Mapping - Add

Type: Many-to-Many

WAN Interface: ETHER

Local

Beginning IP Address: 192.168.1.43

Ending IP Address: 192.168.1.45

Global

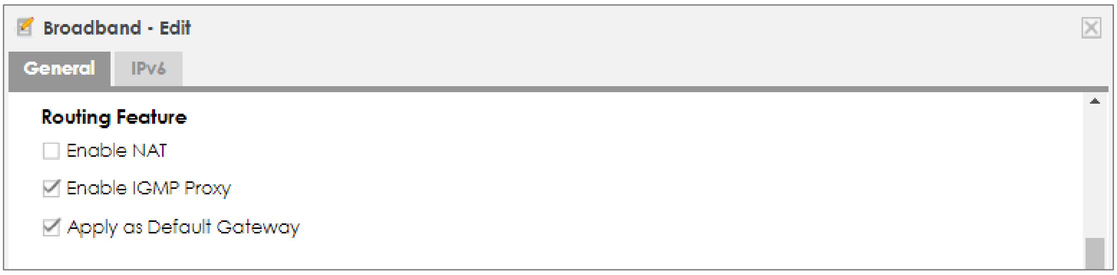
Beginning IP Address: 10.214.30.45

Ending IP Address: 10.214.30.47

Set Up the SBG Address Mapping (Many-to-one)

In the SBG, go to WAN / Internet > Broadband.

Click Configuration > WAN / Internet > Broadband > Choice ETHER > Edit to open the follow screen.



Broadband - Edit

Routing Feature

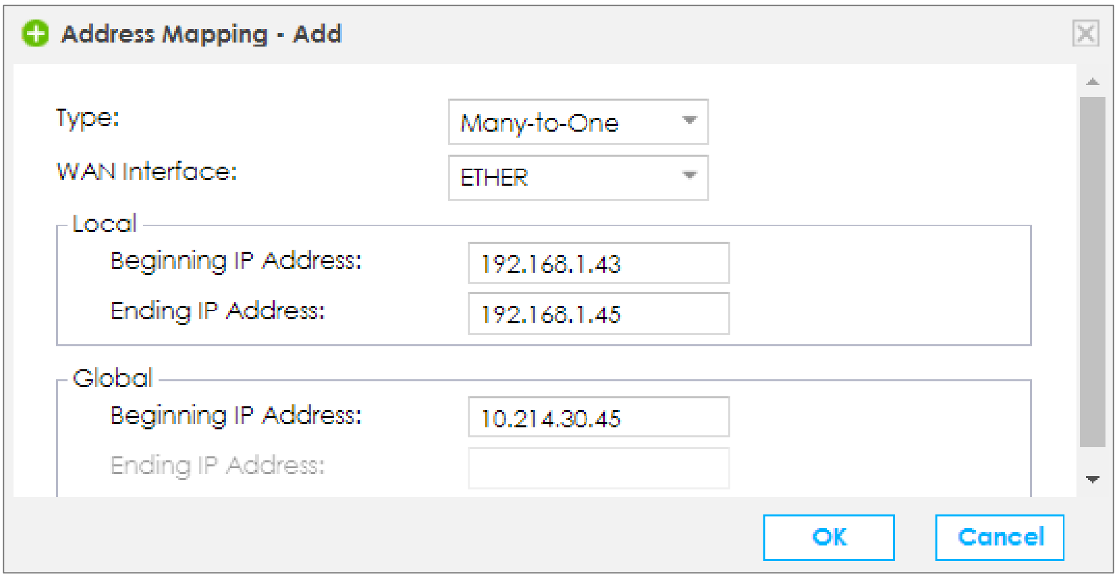
□ Enable NAT

☑ Enable IGMP Proxy

☑ Apply as Default Gateway

4. In the SBG, go to NAT > Address Mapping.

Click Configuration > NAT > Address Mapping > Add to open the follow screen.



Address Mapping - Add

Type:	Many-to-One
WAN Interface:	ETHER

Local

Beginning IP Address:	192.168.1.43
Ending IP Address:	192.168.1.45

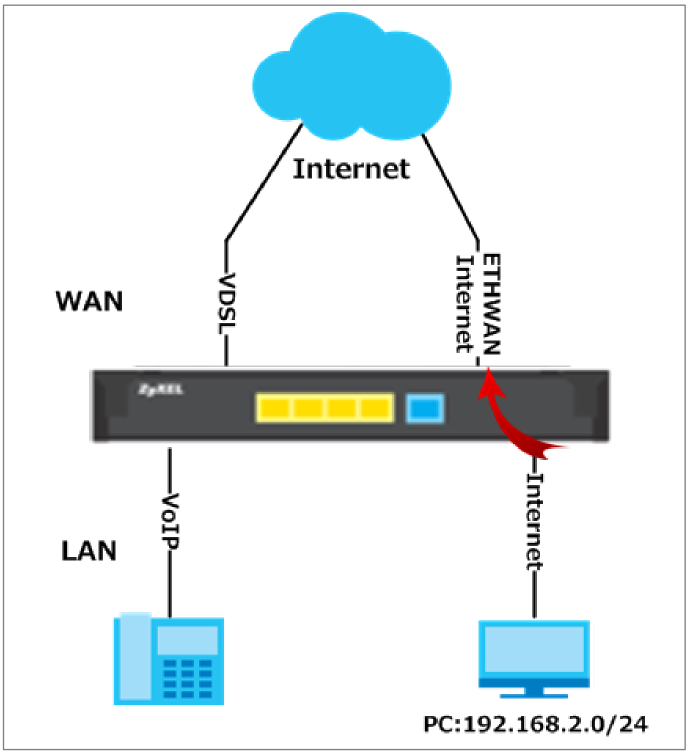
Global

Beginning IP Address:	10.214.30.45
Ending IP Address:	

How to setup policy route to force SBG clients following rules

This example shows how to create Policy Route. You want to LAN users bower Internet use different interface; however you won't to use static route. Therefore we can use Policy Route to reach this purpose. When the Policy Route is configured, each LAN user can be used different interface go to Internet..

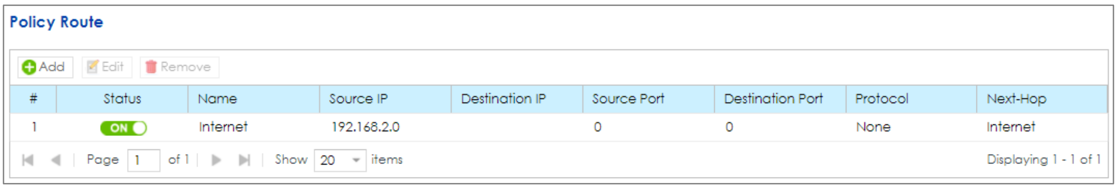
Figure NAT Address Mapping



Set Up the policy route to force SBG clients following rules

In the SBG, go to WAN / Internet > Broadband.

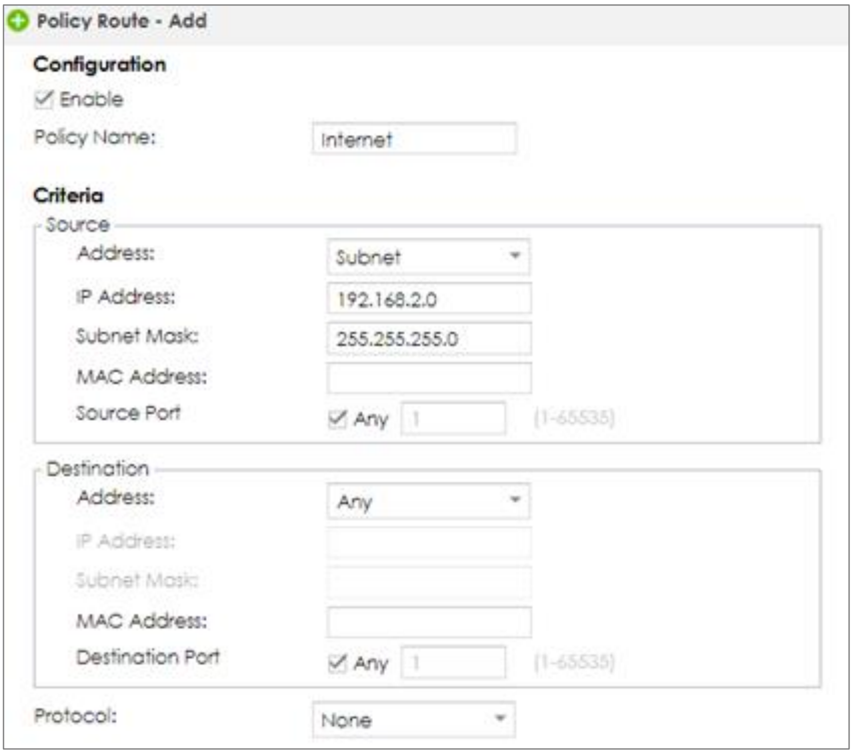
Click Configuration > Routing > Policy Route to open the follow screen.



Policy Route

#	Status	Name	Source IP	Destination IP	Source Port	Destination Port	Protocol	Next-Hop
1	ON	Internet	192.168.2.0		0	0	None	Internet

Click Configuration > Routing > Policy Route > Add to open the follow screen.



Policy Route - Add

Configuration

☑ Enable

Policy Name: Internet

Criteria

Source

Address: Subnet

IP Address: 192.168.2.0

Subnet Mask: 255.255.255.0

MAC Address:

Source Port ☑ Any 1 (1-65535)

Destination

Address: Any

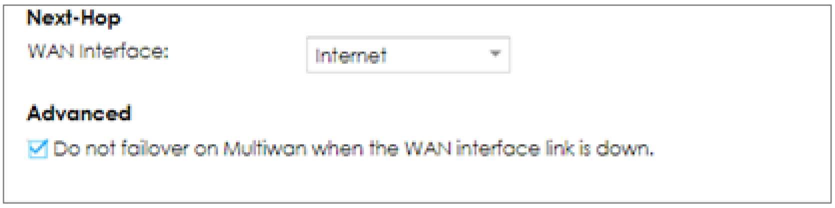
IP Address:

Subnet Mask:

MAC Address:

Destination Port ☑ Any 1 (1-65535)

Protocol: None



Next-Hop

WAN Interface: Internet

Advanced

☑ Do not failover on Multiwan when the WAN interface link is down.