ZyWALL 1050

Internet Security Appliance

Support Notes

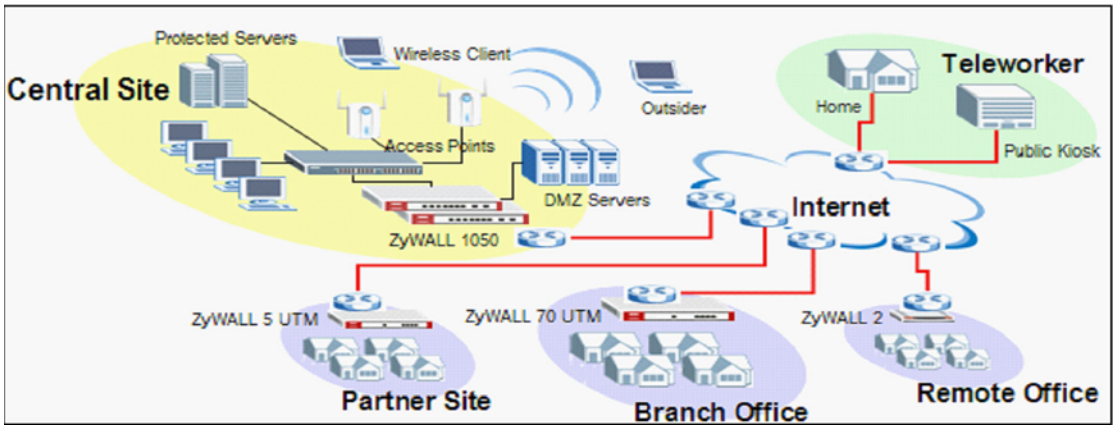
Version 1.00

June. 2006

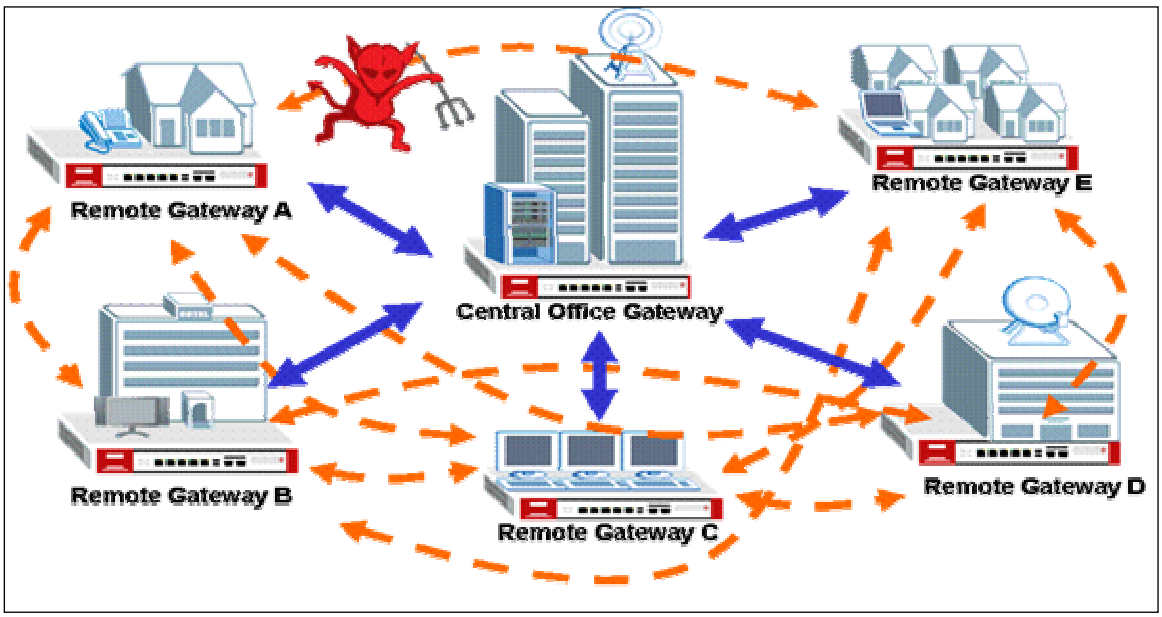
INDEX

1. VPN concentrator

VPN (Virtual Private Network) allows you to establish a virtual direct connection to remote locations or for telecommuters to access the internal network in the office. VPN is a replacement for the traditional site-to-site lease lines like T1 or ISDN. Through the VPN applications, it reduces setup cost, works for various types of Internet connection devices (ISDN modem, ADSL modem and FTTX…) and are easy to troubleshoot.

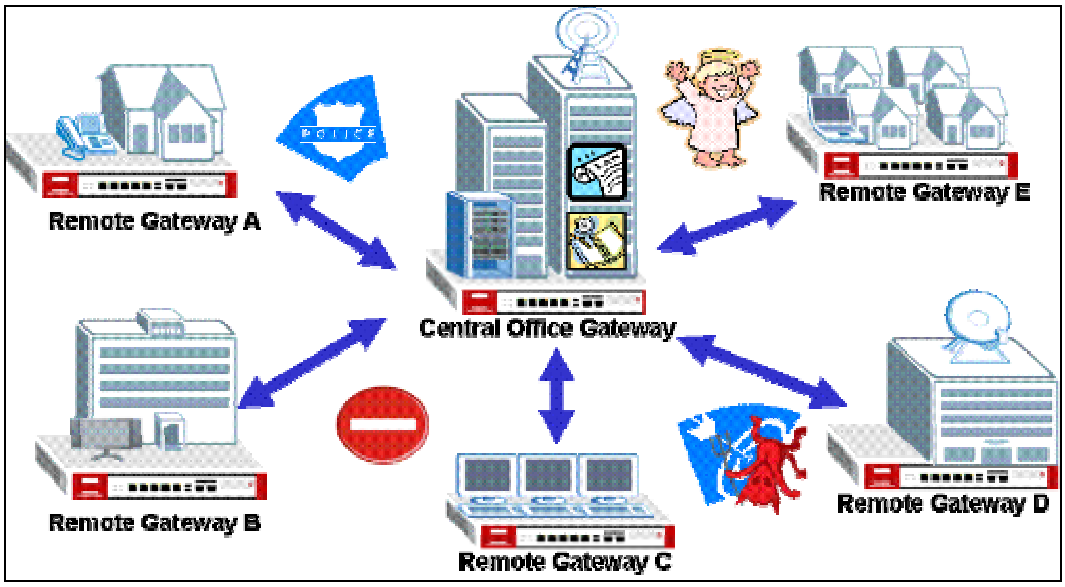


VPN gives you flexible site-to-site connection flexibility, however, with multiple VPN connections between sites, it can become more difficult to maintain. Traditionally, an administrator has to configure many site-to-site VPN connections to allow a truly global VPN network.



Now, VPN connection management is made easy with the VPN concentrator. The VPN concentrator routes VPN traffics across multiple remote sites without complex settings, thus reducing configuration overhead and the possibility of improper configuration. The VPN concentrator is also a centralize management tool for administrators because all traffic sent between remote sites had to go through the central office first and administrators can set up different access control rules based on the source address, remote address, user and schedule to enhance VPN security. To help reduce network intrusion attacks, administrators can configure the built-in IDP engine to inspect VPN traffic. For easy troubleshooting and monitoring, the VPN concentrator logs and stores system information and network status for easy troubleshooting and further analysis.

The VPN concentrator enhances the VPN routing ability and helps network administrators in setting up a global VPN network with less effort but stronger security and management ability.

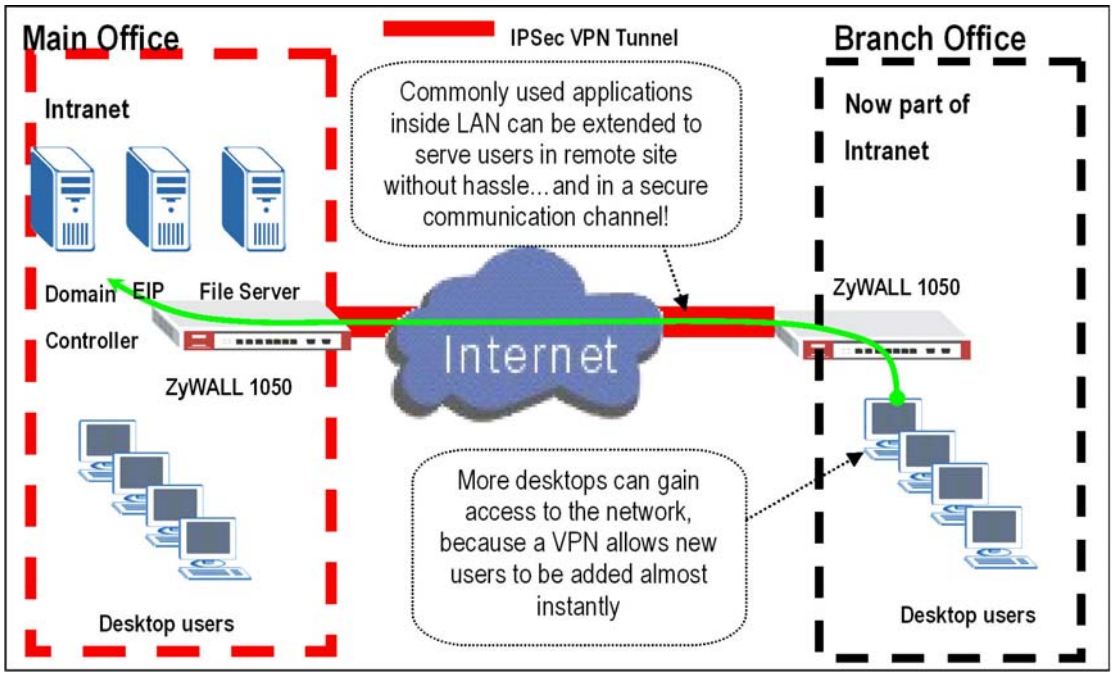


For SMB customer, ZyXEL provide total VPN solution from personal client to 500+ people firewall and all of them have the VPN connection ability.

- The benefit from deployment of ZyXEL VPN solutions
  - Security and Reliability
  - Improved communications
  - Increased flexibility
  - Lower cost

1.1 Extended Intranets

The ZyXEL VPN solutions primarily can be used to extend the intranet and deliver increased connectivity between operation sites. The branch office subnet will consider a part of main office internet thus user behind branch office also can use the internal network resource as in main office. User will have LAN-like user experience across the internet through the VPN connection. Use of a VPN for smaller branch offices, franchise sites, and remote workers provides nearly the same level of connectivity and reliability as a private network. The remote connection cost also can decrease by leveraging the Internet connections to replace expensive leased lines.

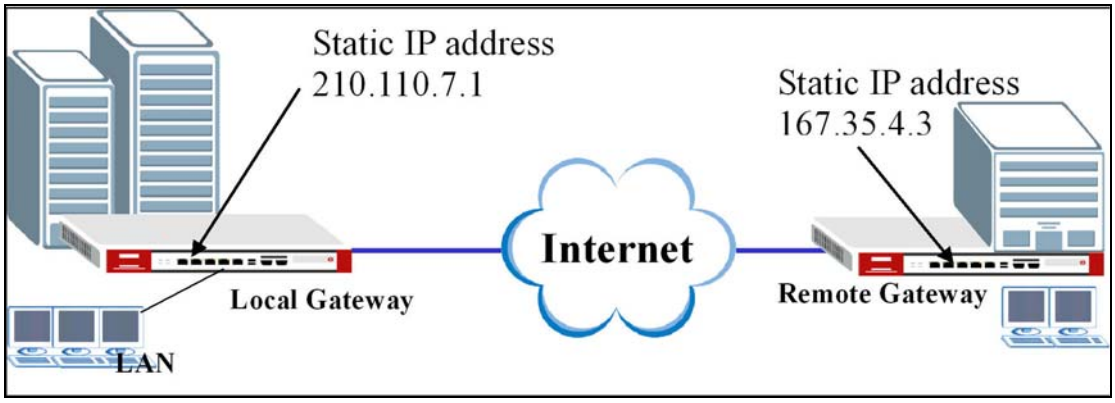


1.1.1 Site to Site VPN solutions:

Site to Site VPN is the basic VPN solution between local and remote gateway. We used this type of VPN connection to extend and join both site's local network as an internet over internet. There are two kinds of connection interface such as static IP, and Dynamic DNS.

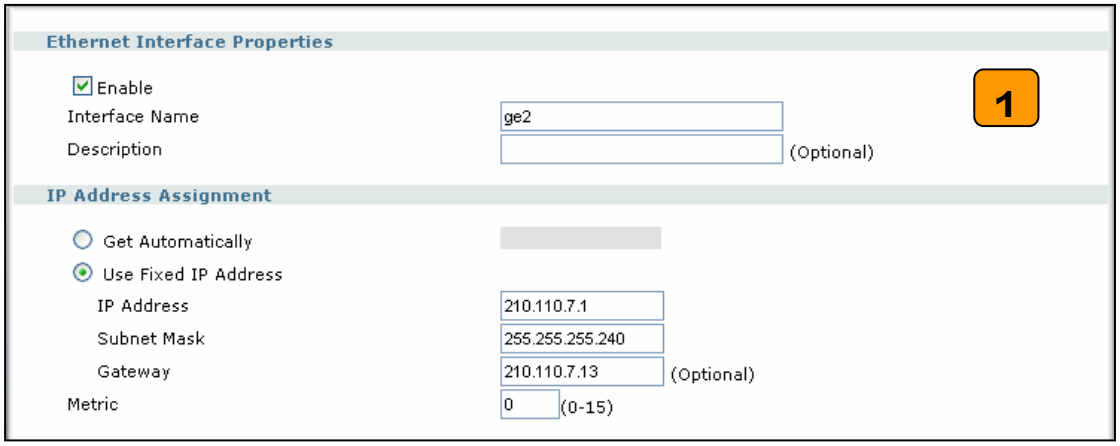
Configure ZyWALL1050 with Static IP address:

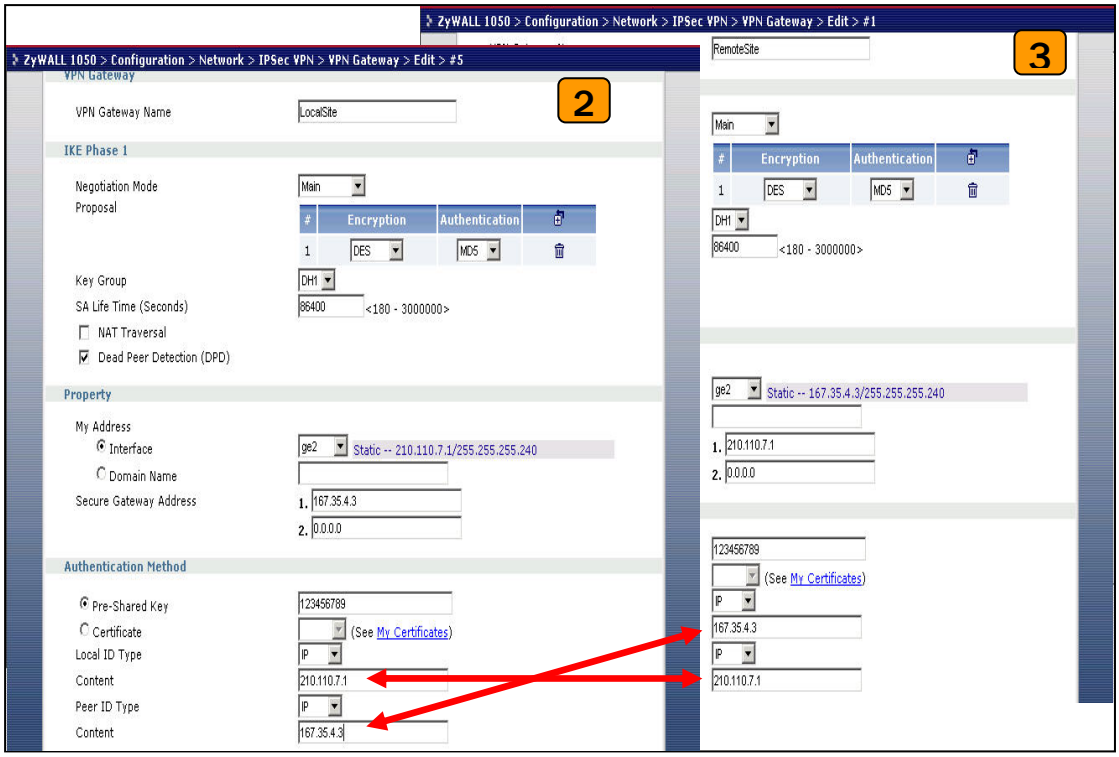
ZyWALL1050 uses the static IP address for VPN connection. The topology is as following figure.



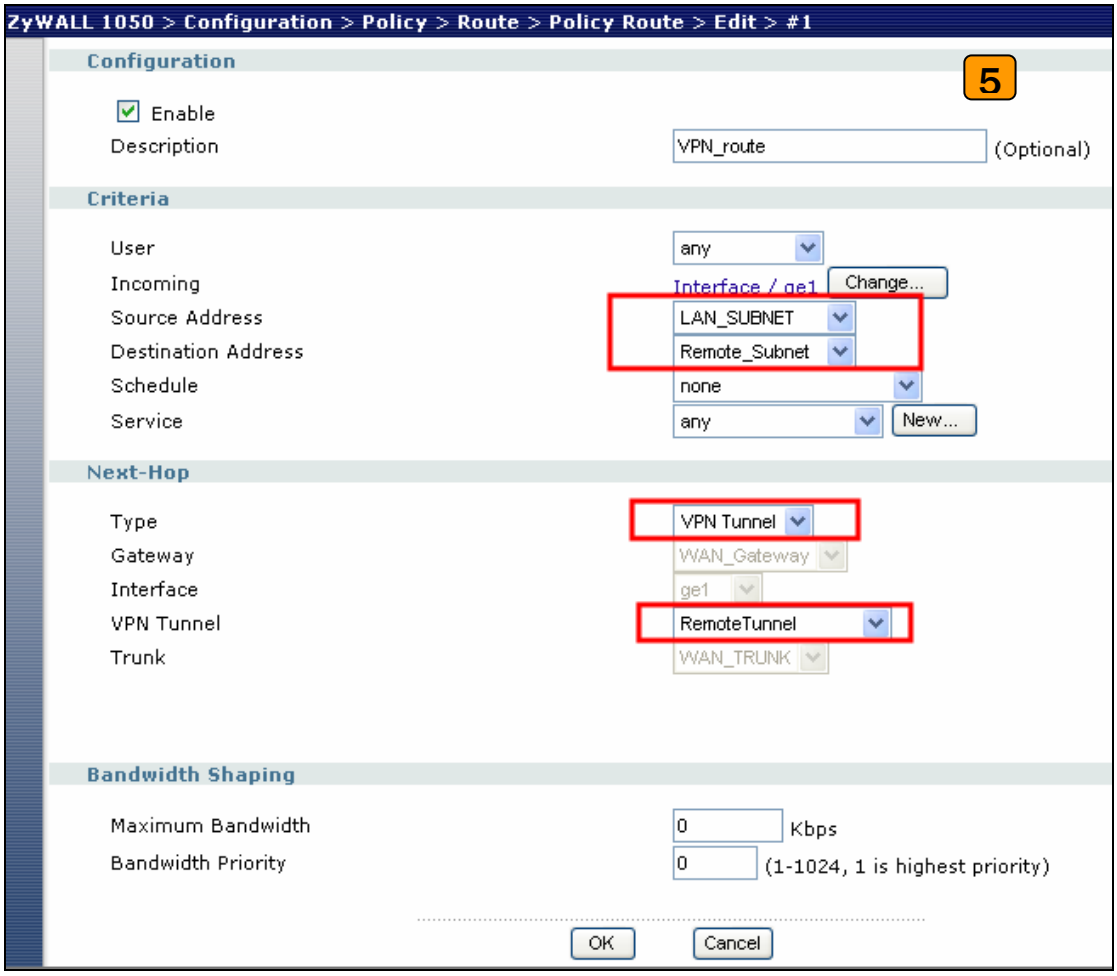
User need to configure the static IP address and then apply to VPN Gateway configuration page. The configuration steps as follow;

1) Login ZyWALL1050 GUI and setup the ge2 interface for internet connection and manually assign a static IP. The configuration path is at ZyWALL 1050 menu **Configuration** > **Network** > **Interface** > **Edit** > **ge2**
2) Switch to **Configuration** > **Network** > **IPSec VPN** > **VPN Gateway**, and select interface ge2 as **My Address** and then set remote gateway IP 167.35.4.3 in **Security Gateway Address** field. The **Local ID Type** and content are IP and 210.110.7.1, **Peer ID Type** and content are IP and 167.35.4.3.
3) Repeat the step1 & 2 to configure Remote ZyWALL1050. The **Local ID Type** & content and **Peer ID Type** & content are reverse to Local ZyWALL1050.





4) User can refer to the user guide to complete the rest settings for VPN tunnel.
5) The ZyWALL1050 VPN is the route-based VPN, this means the VPN tunnel can be an interface to route the VPN traffic. Thus, we need to configure a policy route for VPN traffic from local subnet to remote subnet after configured the VPN gateway and connection (phase1 and phase2). The purpose for this policy route is to tell the ZyWALL1050 send the traffic to VPN tunnel when traffic from local subnet and destination is remote subnet. Switch to ZyWALL 1050 > Configuration > Policy > Route > Policy Route and add a new policy route, the source and destination address are the local and remote subnet and the **Next-Hop** type is VPN tunnel and then choose the corresponding VPN connection rule from VPN tunnel drop down menu. After all, the VPN tunnel and routing had built up and user can start to test in field.



The CLI command for application:

Local Gateway:

```
[0] isakmp policy rename RemoteSite LocalSite
[1] isakmp policy LocalSite
[2] mode main
[3] transform-set des-md5
[4] lifetime 86400
[5] no natt
[6] dpd
[7] local-ip interface ge2
[8] peer-ip 167.35.4.3 0.0.0.0
[9] authentication pre-share
[10] keystring 123456789
[11] local-id type ip 210.110.7.1
[12] peer-id type ip 167.35.4.3
[13] peer-id type ip 167.35.4.3
[14] xauth type server default deactivate
[15] group1
[16] exit
```

Remote Gateway:

```
[0] isakmp policy RemoteSite
[1] mode main
[2] transform-set des-md5
[3] lifetime 86400
[4] no natt
[5] dpd
[6] local-ip interface ge2
[7] peer-ip 210.110.7.1 0.0.0.0
[8] authentication pre-share
[9] keystring 123456789
[10] local-id type ip 167.35.4.3
[11] peer-id type ip 210.110.7.1
[12] peer-id type ip 210.110.7.1
[13] xauth type server default deactivate
[14] group1
[15] exit
```

Policy Route for VPN traffic:

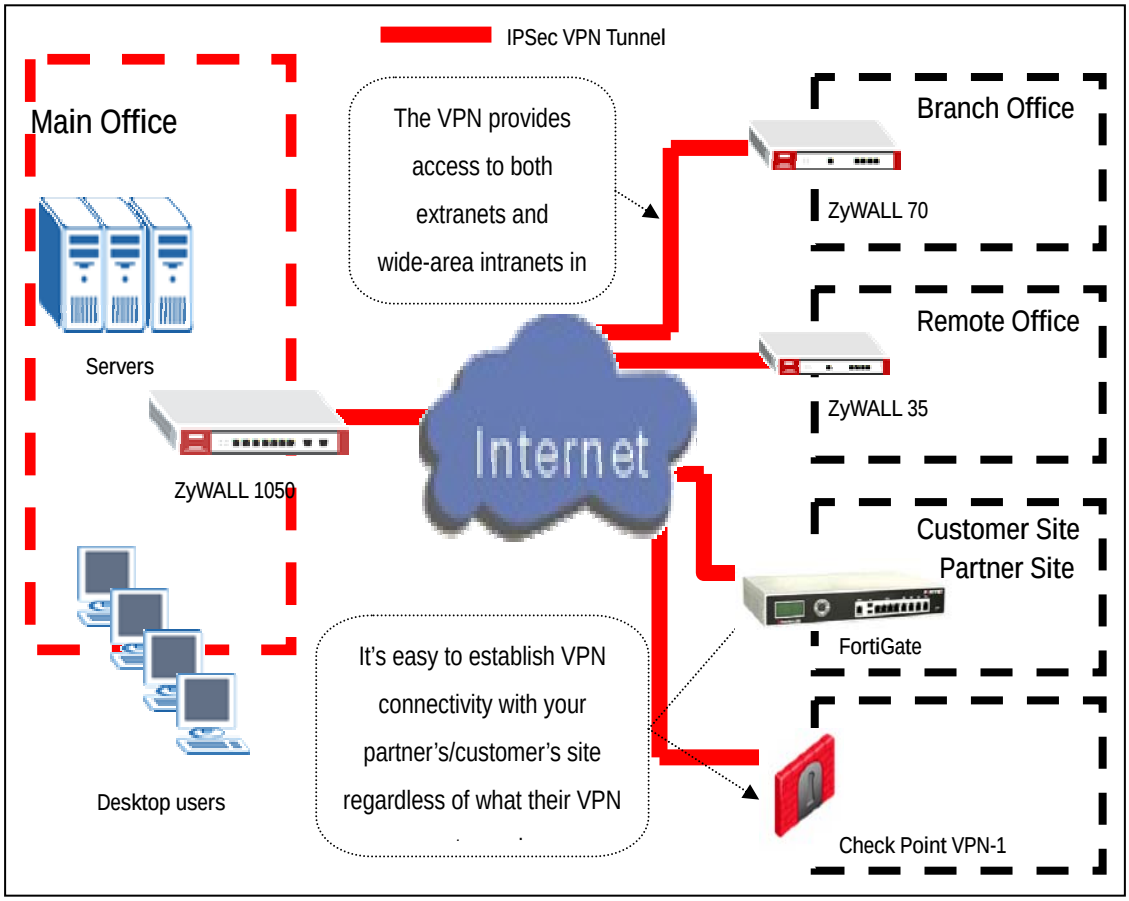
```
[0] policy 1
[1] no deactivate
[2] no description
[3] no user
[4] interface ge1
[5] source LAN_SUBNET
[6] destination Remote_Subnet
[7] no schedule
[8] service any
[9] no snat
[10] next-hop tunnel RemoteTunnel
[11] no bandwidth
[12] exit
```

Tips for application:

1. Make sure the **presharekey** is the same in local and remote gateway.
2. Make sure the **IKE & IPSec proposal** is the same in local and remote gateway.
3. Select the correct **interface** for VPN connection.
4. The **Local** and **Peer** ID type and content must opposite not in the same content.
5. Make sure the **VPN policy route** had been setup in ZyWALL1050.

1.2 Deployment of Extranet

The VPN provides the access to extranets which can provide the security path over internet to improve the client service, vendor support and company communications. The different and flexible business models have been development base on the global VPN extranet architecture. For example, customers can order equipment over the VPN and Suppliers also can check the orders electronically. The other general application is the employees across different branches can collaborate on project documents and share the different site's internal resource to complete the project.

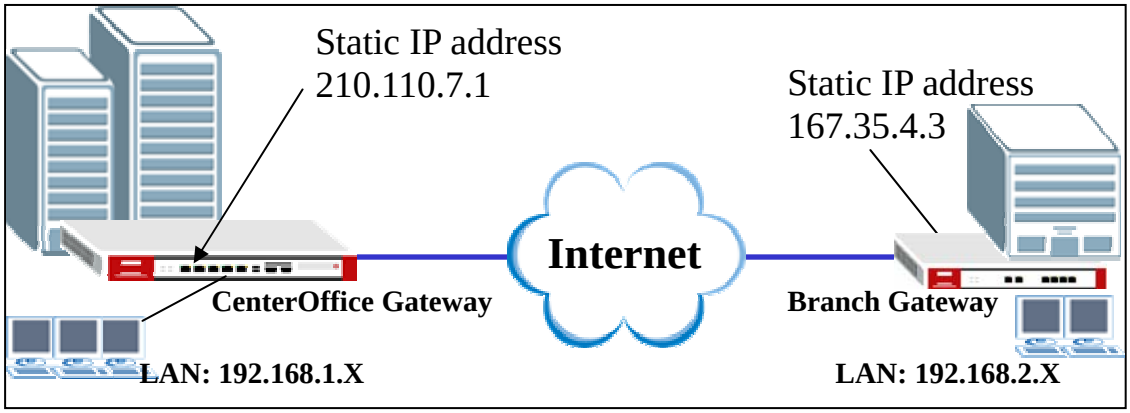


The ZyWALL 1050 can be placed as a VPN gateway in the central site. It can communicate with other ZyXEL's VPN-capable products as well as VPN products from other major vendors in the network device industry, e.g. Cisco PIX/IOS VPN products,

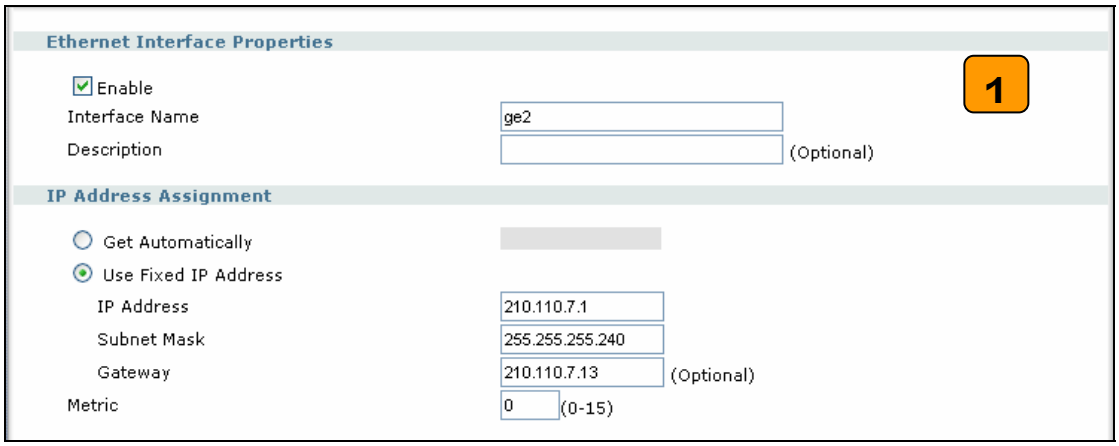
Check Point VPN Pro, Juniper NetScreen series and more…

1.2.1 Site to site VPN solutions (ZyWALL1050 to ZyWALL70)

The exciting ZyWALL35 or 70 users can replace their central office gateway to ZyWALL1050 and move the ZyWALL35 or 70 to remote office. The ZyWALL1050 can provide higher VPN throughput and deal with multiple VPN tunnels at the same time. We used ZyWALL70 as an example to show how to build tunnel between ZyWALL5/35/70 and ZyWALL1050.



1) Login ZyWALL1050 GUI and setup the ge2 interface for internet connection and manually assign a static IP. The configuration path is ZyWALL 1050 > Configuration > Network > Interface > Edit > ge2

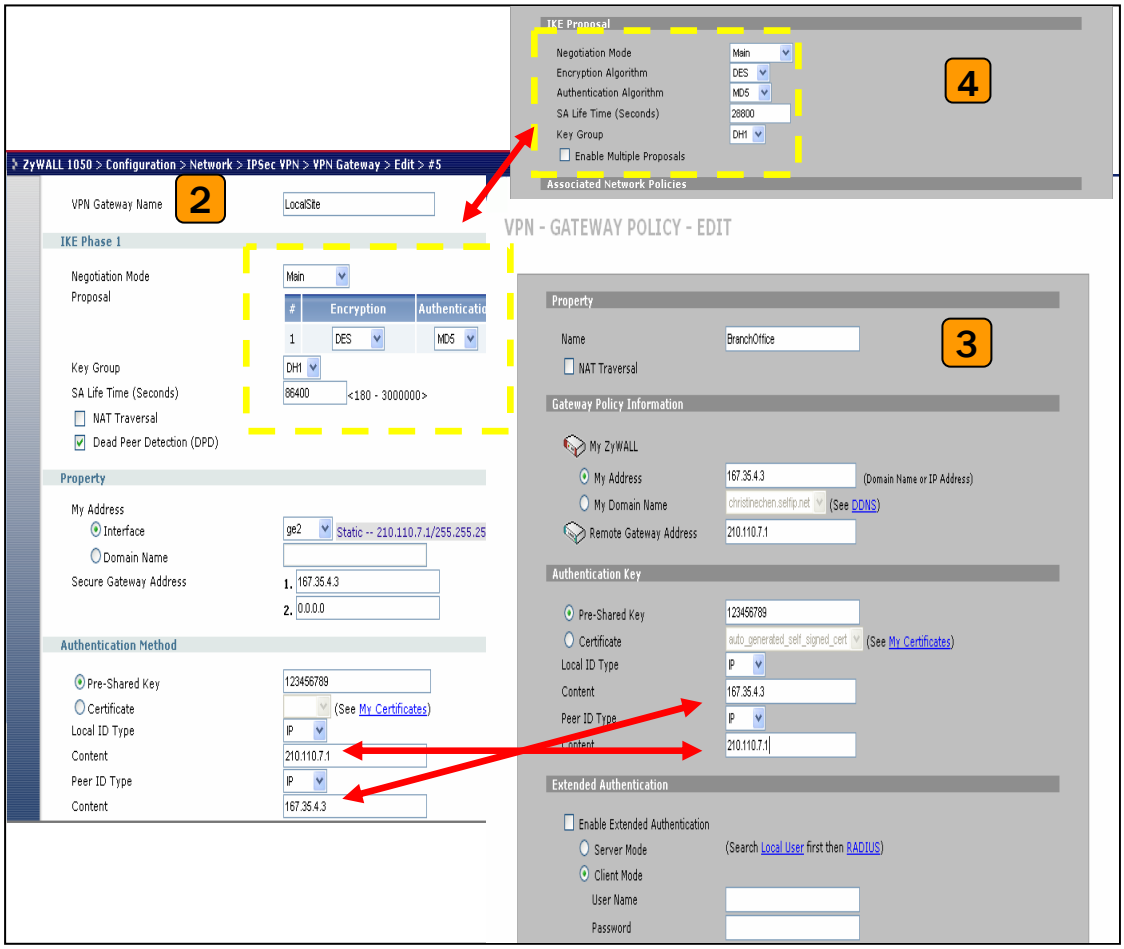


2) Switch to **Configuration** > **Network** > **IPSec VPN** > **VPN Gateway,** select interface ge2 as **My Address** and then set remote gateway IP 167.35.4.3 in **Security Gateway Address** field. The **Local ID Type** and content are IP and 210.110.7.1, **Peer ID Type**

and content are IP and 167.35.4.3.

3) Login to ZyWALL70 and go to **Security** > **VPN** > **Gateway Policy,** add a new gateway policy to connect with central office ZyWALL1050. The **My Address** and **Remote Gateway Address** are ZyWALL70 and ZyWALL1050 WAN IP address. The **Pre-Shared Key** configured in both sides must exactly the same. The **Local ID Type** & content and **Peer ID Type** & content are reverse to Local ZyWALL1050.

4) The **IKE Proposal** is very important setting when configuring the VPN tunnel. The proposal includes Negotiation Mode, Encryption and Authentication Algorithm and…. Please make sure the IKE proposal parameters must the same in both sides.

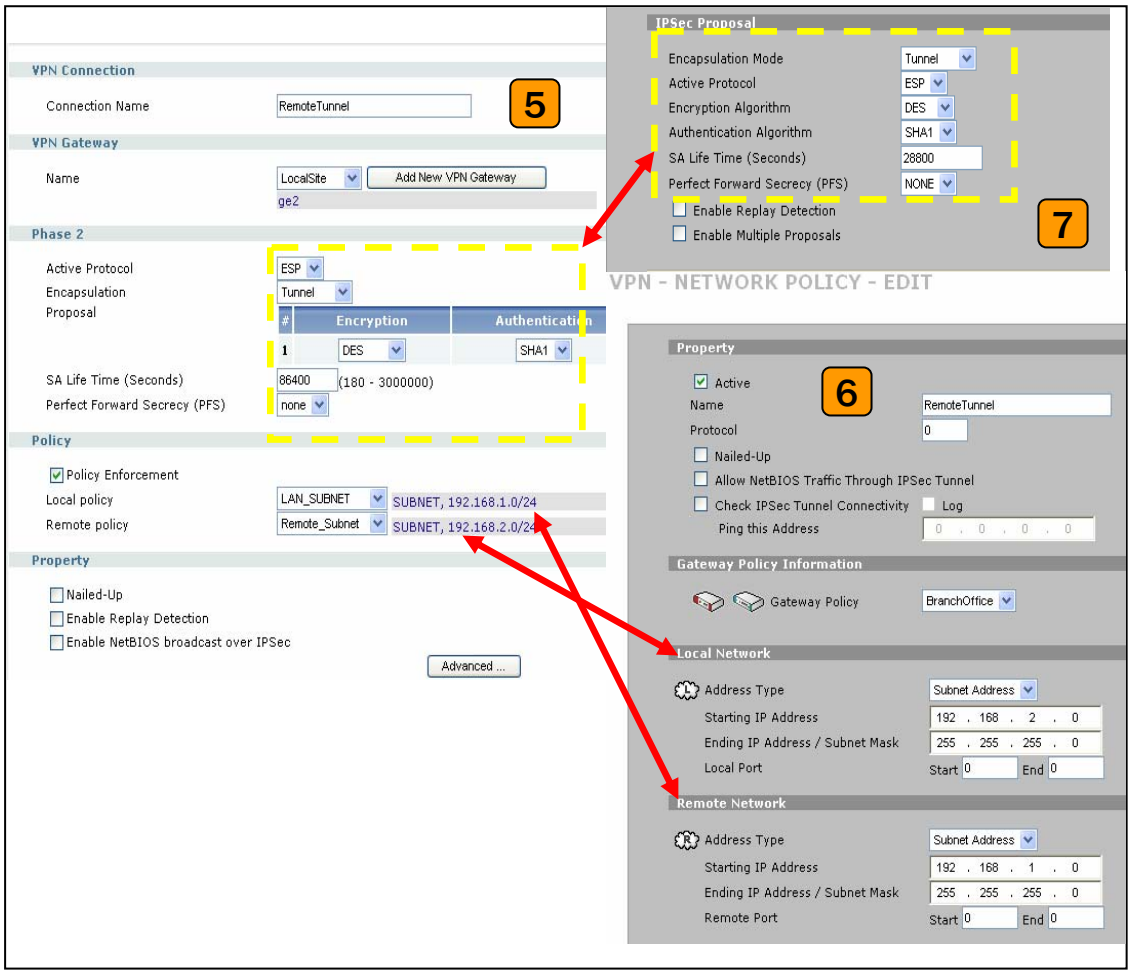


5) Switch to **Configuration** > **Network** > **IPSec VPN** > **VPN Connection,** add a new **VPN connection** (IPSec phase2). Please setup the Phase2 proposal and local and remote policies in turn. The phase2 proposal chosen must the same as remote site ZyWALL70.

6) In ZyWALL70, VPN is the rule based VPN; this means the traffic going to tunnel or not

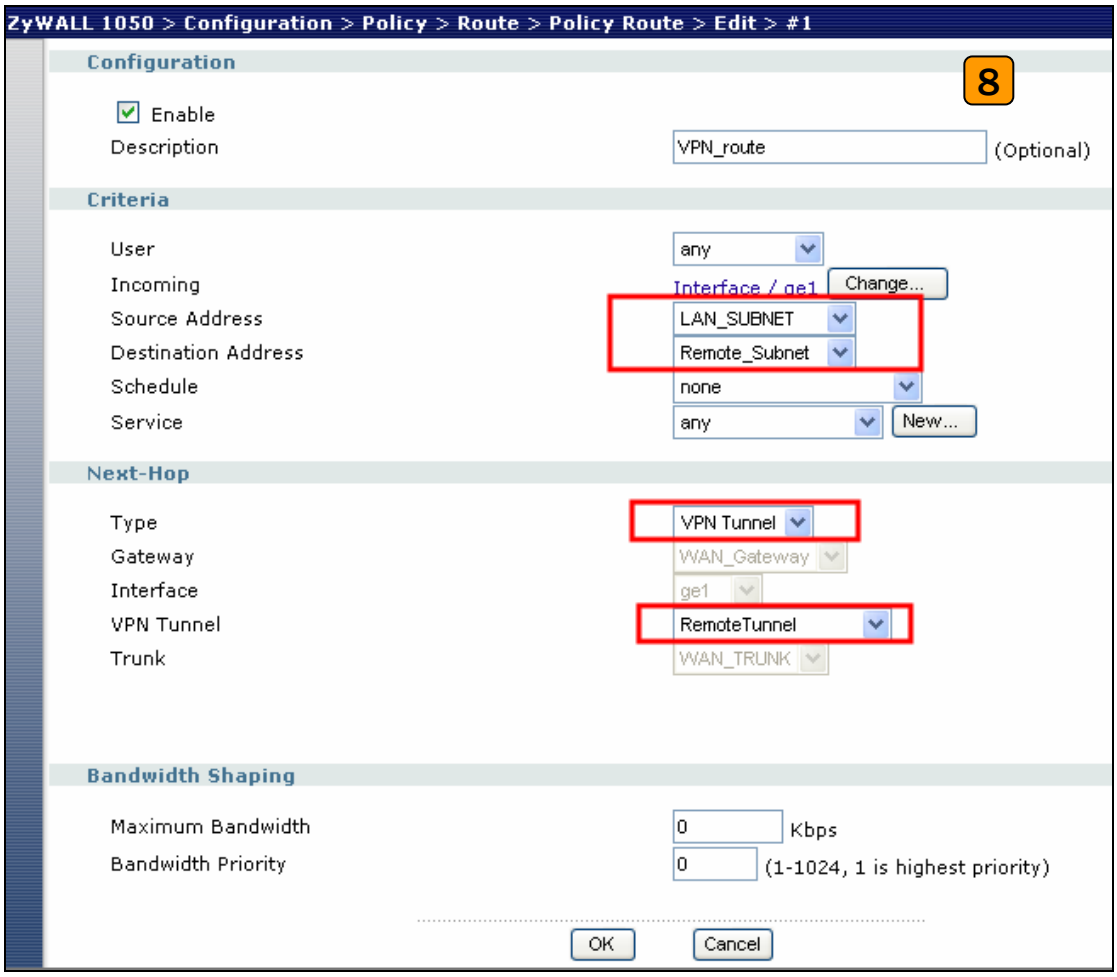
will depends on the local and remote policies. In this example, ZyWALL70 **local and remote policies** are 192.168.2.0 and 192.168.1.0 and the traffic from 192.168.2.X subnet to 192.168.1.X subnet will go through the VPN tunnel to the remote site as predefined. The ZyWALL1050 local and remote policies must reverse to the ZyWALL70's setting, otherwise the tunnel will fail to buildup.

7) Please confirm the **IPSec proposal** in both sites is the same and the configuration is done in both sites.



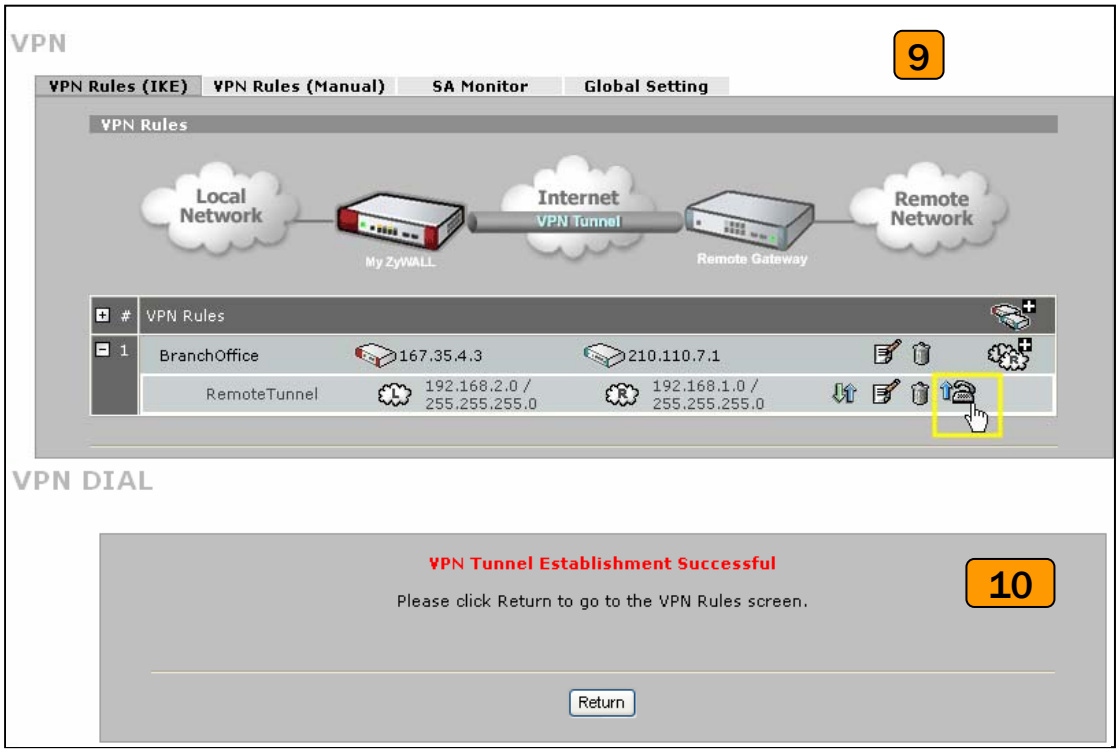
8) The ZyWALL1050 VPN is the route-based VPN, this means the VPN tunnel can be an interface to route the VPN traffic. Thus, we need to configure a policy route for VPN traffic from local subnet to remote subnet after configured the VPN gateway and connection (phase1 and phase2). The purpose for this policy route is to tell the ZyWALL1050 send the traffic to VPN tunnel when traffic from local subnet and destination is remote subnet. Switch to **Configuration** > **Policy** > **Route** > **Policy Route** and add a new policy route, the source and destination address are the local and remote subnet and the **Next-Hop** type is VPN tunnel and then choose the corresponding

VPN connection rule from VPN tunnel drop down menu. After all, the VPN tunnel and routing had built up and user can start to test in field.



9) After configured both sides VPN setting, we can click the Dial up VPN tunnel icon to test the VPN connectivity.

10) The tunnel had been successful dialed up message.



The CLI command for application:

ZyWALL1050 VPN Gateway:

```
[0] isakmp policy LocalSite
[1] mode main
[2] transform-set des-md5
[3] lifetime 86400
[4] no natt
[5] dpd
[6] local-ip interface ge2
[7] peer-ip 167.35.4.3 0.0.0.0
[8] authentication pre-share
[9] keystring 123456789
[10] local-id type ip 210.110.7.1
[11] peer-id type ip 167.35.4.3
[12] peer-id type ip 167.35.4.3
[13] xauth type server default deactivate
[14] group1
[15] exit
```

ZyWALL1050 VPN Connection:

```
[0] crypto map RemoteTunnel
[1] ipsec-isakmp LocalSite
[2] encapsulation tunnel
[3] transform-set esp-des-sha
[4] set security-association lifetime seconds 86400
```

```
[5] set pfs none
[6] policy-enforcement
[7] local-policy LAN_SUBNET
[8] remote-policy Remote_Subnet
[9] no nail-up
[10] no replay-detection
[11] no netbios-broadcast
[12] no out-snat activate
[13] no in-snat activate
[14] no in-dnat activate
[15] exit
```

Policy Route for VPN traffic:

```
[0] policy 1
[1] no deactivate
[2] no description
[3] no user
[4] interface ge1
[5] source LAN_SUBNET
[6] destination Remote_Subnet
[7] no schedule
[8] service any
[9] no snat
[10] next-hop tunnel RemoteTunnel
[11] no bandwidth
[12] exit
```

Tips for application:

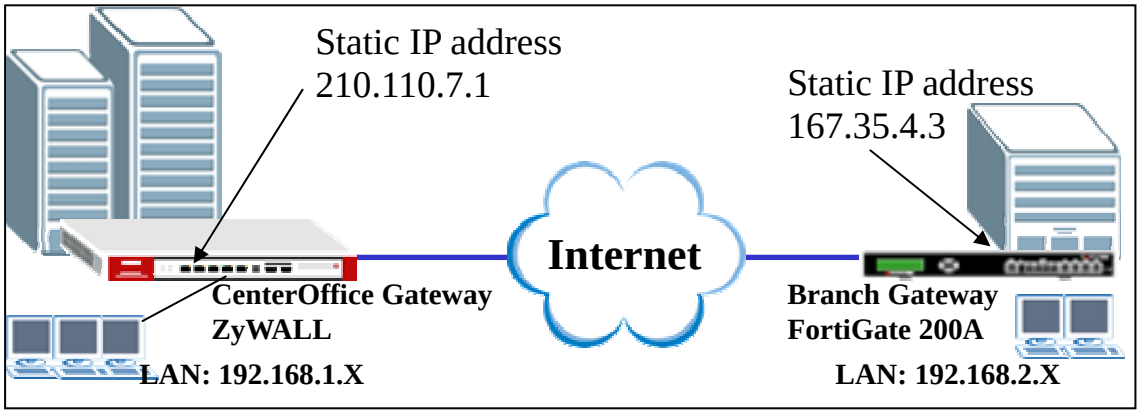
1. Make sure the **presharekey** is the same in local and remote gateway.
2. Make sure the **IKE & IPSec proposal** is the same in local and remote gateway.
3. Select the correct **interface** for VPN connection.
4. The **Local** and **Peer** ID type and content must opposite not in the same content.
5. Make sure the **VPN policy route** had been setup in ZyWALL1050.

1.2.2 Interoperability – VPN with other vendors

1.2.2.1 ZyWALL with FortiGate VPN Tunneling

This page guides how to setup a VPN connection between the ZyWALL 1050 and FortiGate 200A.

As the figure shown below, the tunnel between Central and Remote offices ensures the packet flows between them are secure. Because the packets go through the IPSec tunnel are encrypted. To setup this VPN tunnel, the required settings for ZyWALL and FortiGate are explained in the following sections.

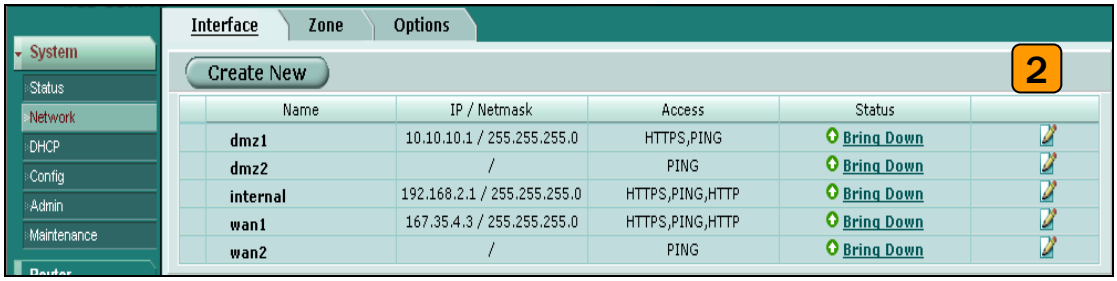


The central office gateway ZyWALL1050's interface and VPN setting retain the same setting as pervious example; if you are first jumping this section please refer to page8 ZyWALL1050 to ZYWALL70 VPN tunnel setting:

I made a list to briefly show the VPN phase1 and phase2 configuration parameter as below.

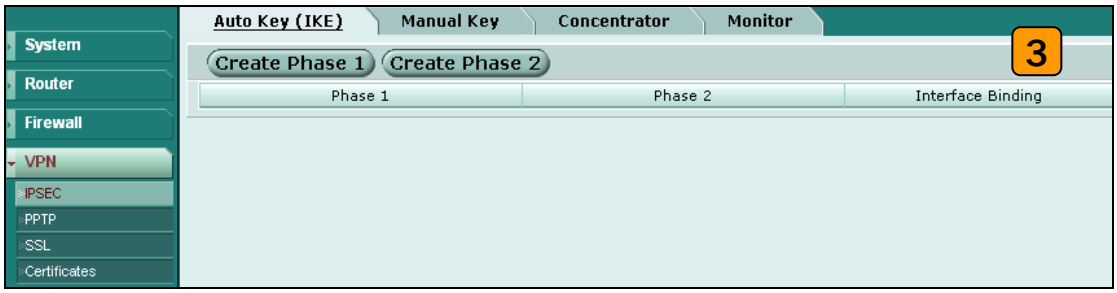
ZyWALL	FortiGate
WAN: 210.110.7.1 LAN: 192.168.1.0/24	WAN: 167.35.4.3 LAN: 192.168.2.0/24
Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1	Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1
Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None	Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None

1) Please configure the ZyWALL1050 ‘s VPN gateway and VPN connection as the list and please remember to configure the policy route for VPN traffic routing. User can refer to pervious scenario or user guide to setup the ZyWALL1050 VPN setting.
2) Login to FortiGate GUI and switch to System > Network > Interface and setup the wan1 interface as 167.35.4.3 and internal interface as 192.168.2.1/255.255.255.0.

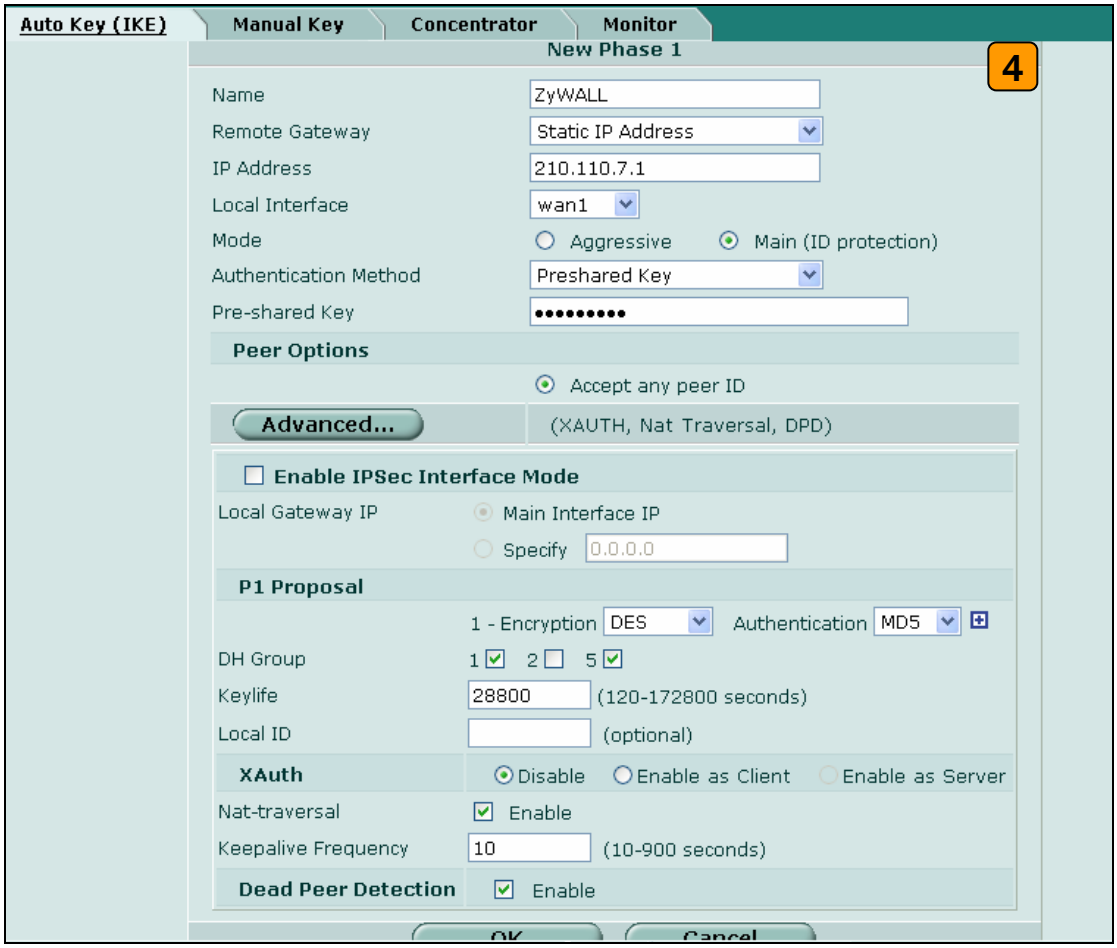


Note: About the detail interface settings, please refer to FortiGate user guide to get the detail info.

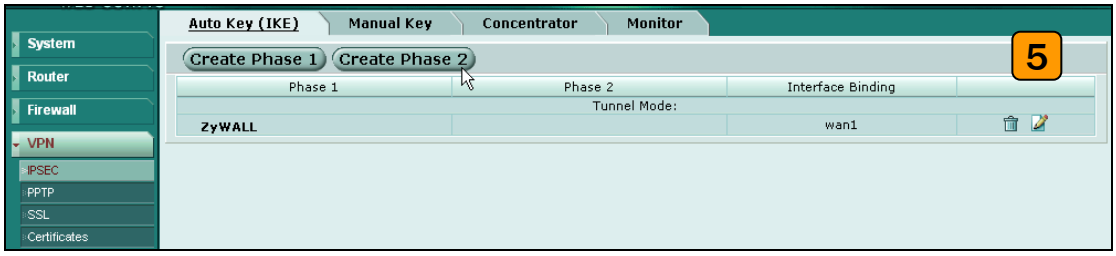
3) Switch to System > VPN > IPSEC and select the **Auto Key**(IKE) tab and click the **Create Phase 1** button, this will open a new page for VPN phase1 setup.



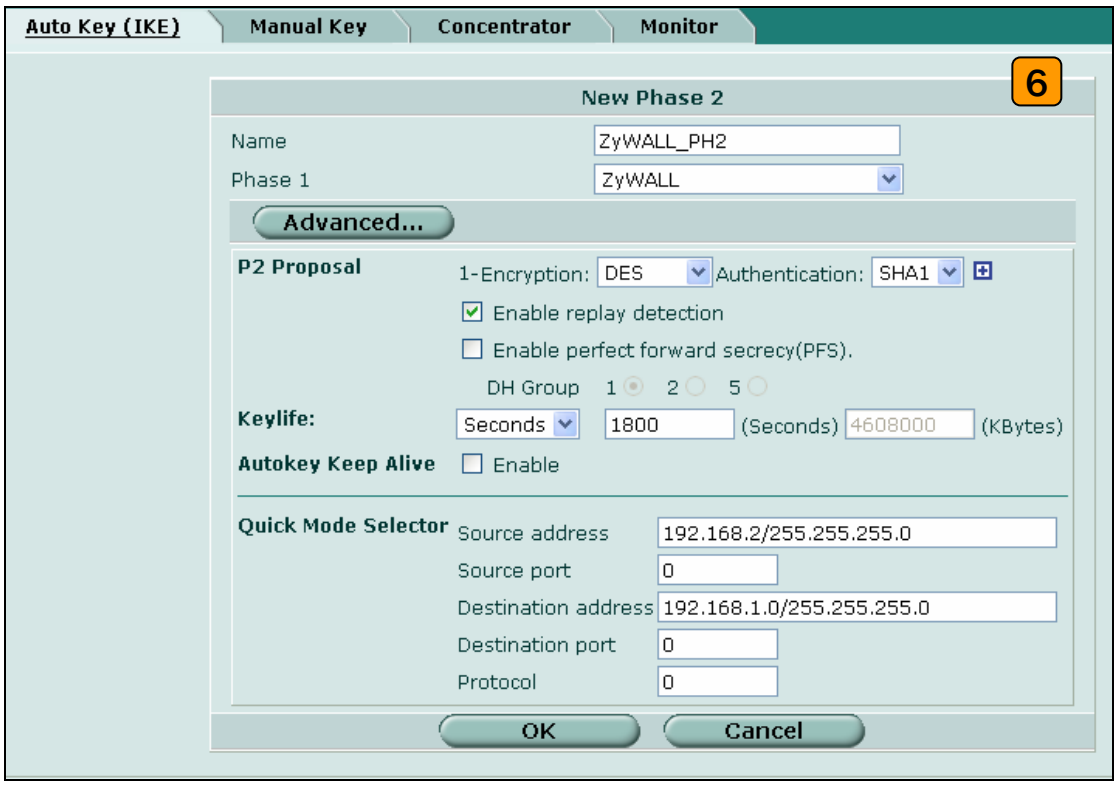
4) Fill-in the VPN phase1 setting according to the table listed. We don’t have to setup the ID type and content because FortiGate accept any peer ID. Make sure the pre-share key and proposal is the same as the ZyWALL1050.



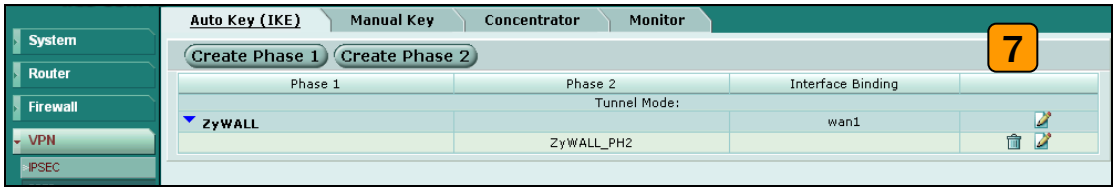
5) Back to the VPN configuration page again and click **Create Phase 2** button to add a new Phase2 policy.



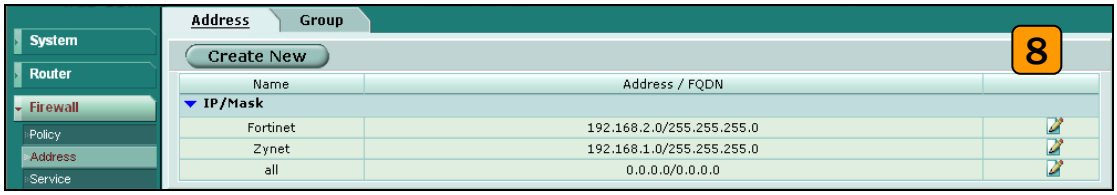
6) Select the "ZyWALL"(configured in step 4) policy from Phase 1 drop down menu and click the **Advanced…** button to edit the phase 2 proposal and source and destination address. Please make sure the phase 2 proposal is the same as ZyWALL1050 phase 2.



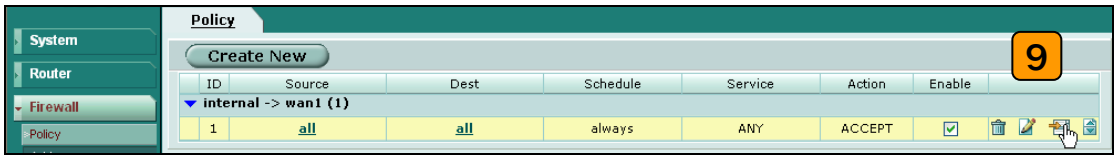
7) We finished the VPN tunnel configuration and the VPN IPSec page will show the VPN phase 1 and phase 2 rules under Auto Key (IKE) tab.



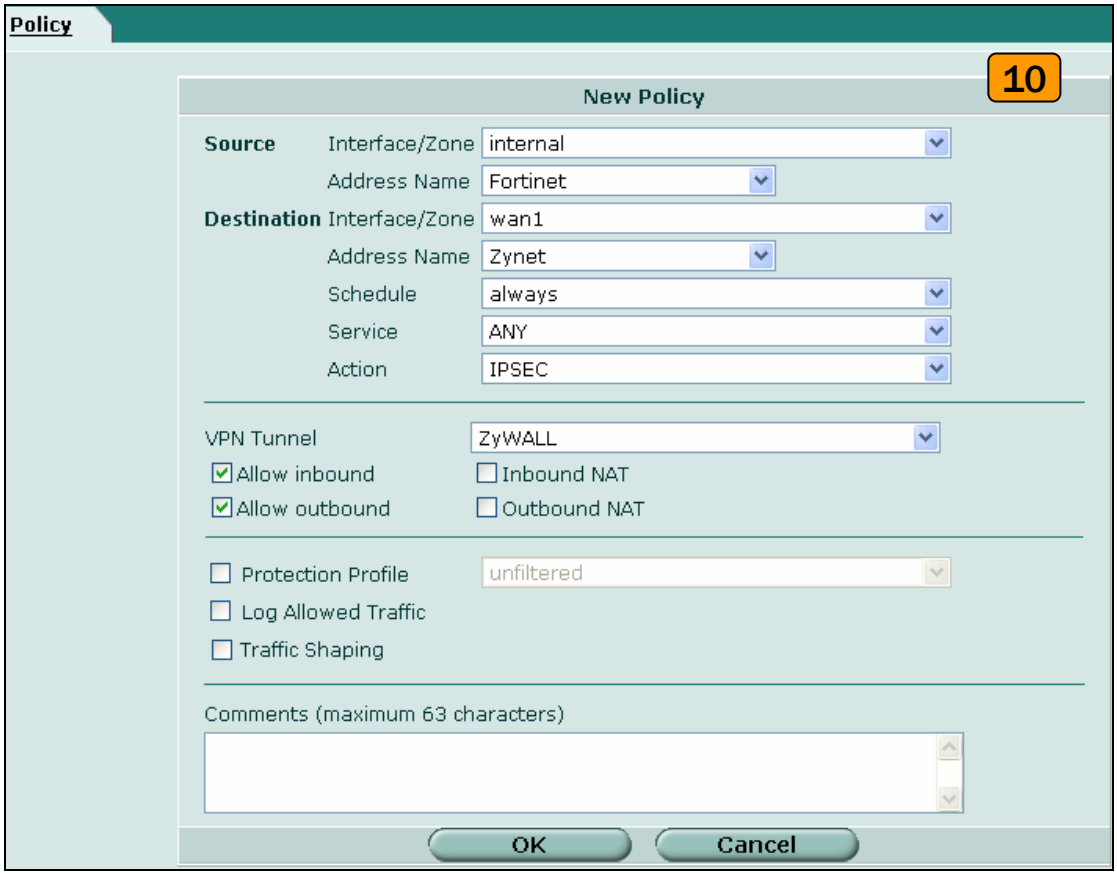
8) We need to setup the firewall rule for IPSec VPN traffic transmitting from ZyWALL to FortiGate and from FortiGate to ZyWALL. Switch to Firewall > VPN >Address menu and add two new address objects which stand for ZyWALL LAN subnet and FortiGate LAN subnet. Using "**Creat New**" button to creat new address object.



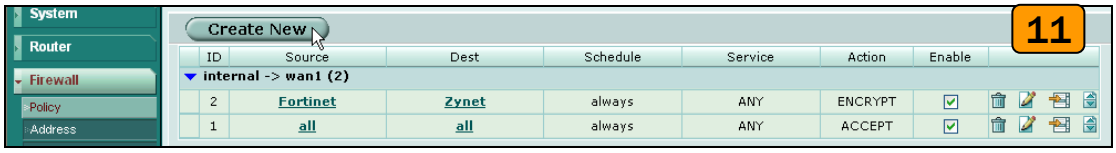
9) Switch to Firewall > Policy and click "Insert Policy Before" icon to add new policy for VPN traffic from FortiGate to ZyWALL.



10) We setup the FortiGate to ZyWALL policy in the new page. The source interface is **internal** and Address name is Fortinet (192.168.2.0/255.255.255.0 address object); the destination interface is **wan1** and Address name is Zynet (192.168.1.0/255.255.255.0 address object). Schedule and service type are always and ANY to ensure all kind of traffic can pass through VPN tunnel at any time. There are three kinds of Action available for user to configure, because the traffic sends from internal to wan and will be encrypted by IPSec VPN tunnel thus we select "IPSEC" as action and chose allow inbound and outbound traffic in ZyWALL tunnel.

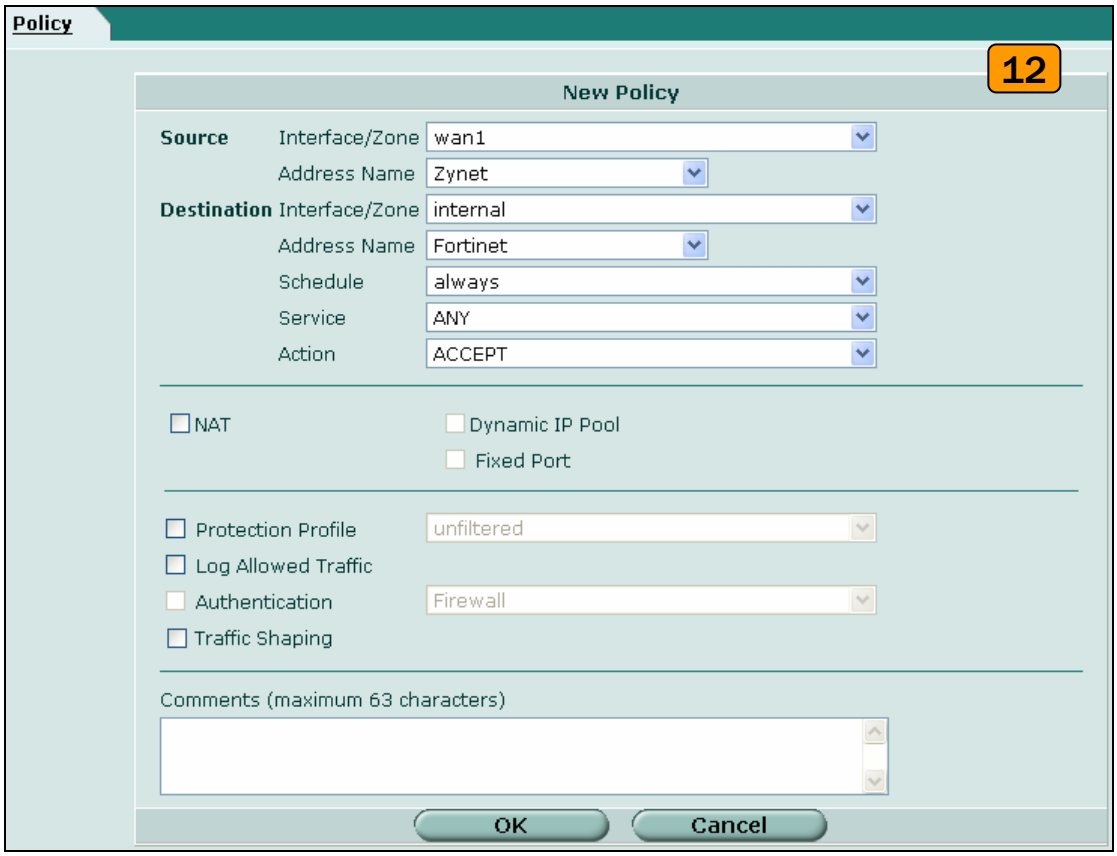


11) Switch to Firewall > Policy and click "Create New" button to add new policy for VPN traffic from ZyWALL to FortiGate.

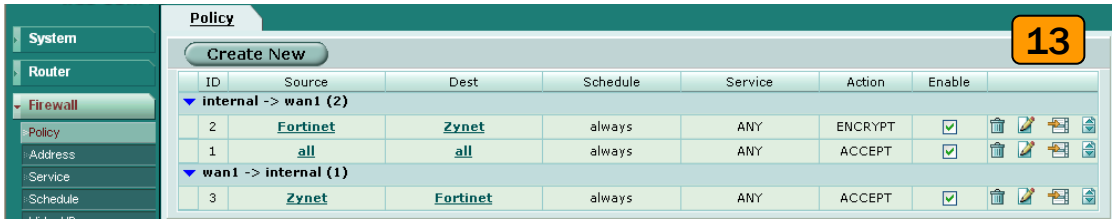


12) We setup the ZyWALL to FortiGate policy in the new page. The source interface is **wan1** and Address name is Zynet (192.168.1.0/255.255.255.0 address object); the destination interface is **internal** and Address name is Fortinet (192.168.2.0/255.255.255.0 address object). Schedule and service type are always and ANY to ensure all kind of traffic can pass through VPN tunnel at any time. We only

select “ACCEPT” as action this time because the traffic send from wan to internal must be decrypted first then can be transmitted. Don’t select the IPSec as the **Action** in this VPN traffic flow direction.



13) The overall firewall policy shows in follow figure and the VPN tunnel between ZyWALL and FortiGate had been successfully setup.



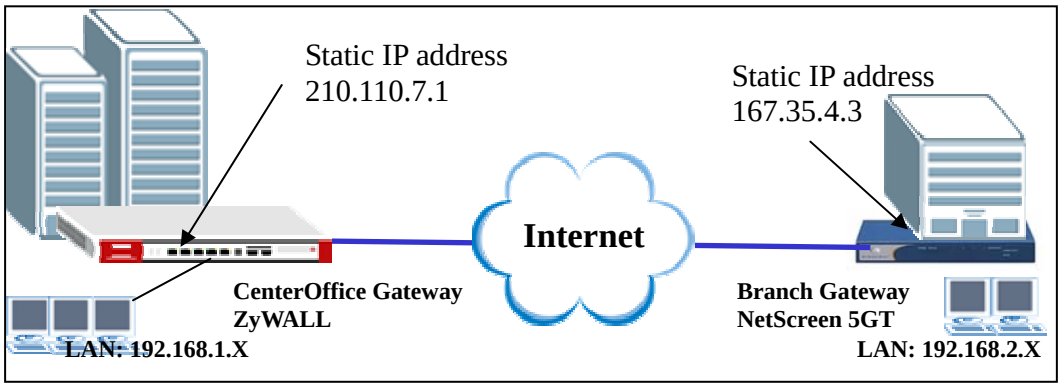
Tips for application:

1. Make sure the **Pre-Shared Key** is the same in local and remote gateway.
2. Make sure both **IKE** and **IPSec proposal** are the same in local and remote gateway.
3. Make sure the **VPN policy route** had been setup in ZyWALL1050.
4. Make sure the **Firewall rule** had been setup in FortiGate.

1.2.2.2 ZyWALL with NetScreen VPN Tunneling

This page guides how to setup a VPN connection between the ZyWALL 1050 and NetScreen 5GT.

As the figure shown below, the tunnel between Central and Remote offices ensures the packet flows between them are secure. Because the packets go through the IPSec tunnel are encrypted. To setup this VPN tunnel, the required settings for ZyWALL and NetScreen are explained in the following sections.

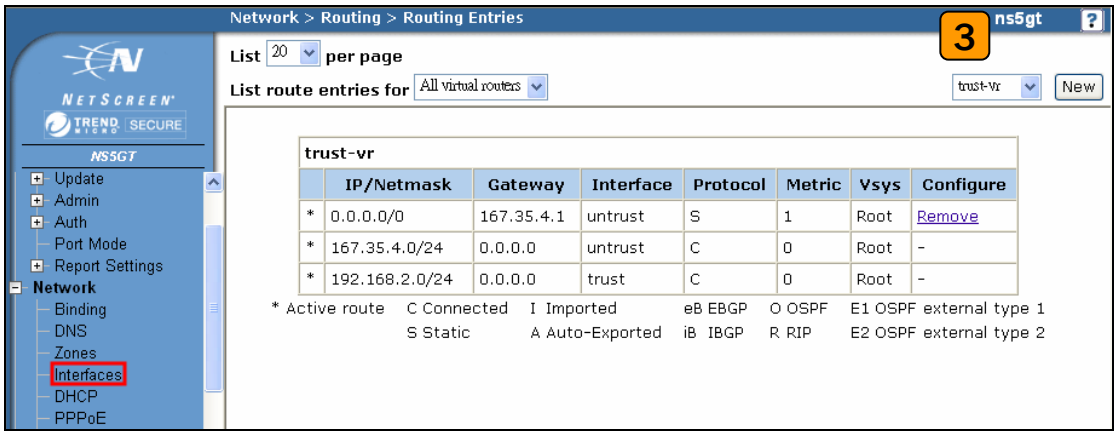


The central office gateway ZyWALL1050's interface and VPN setting retain the same setting as pervious example; if you are first jumping this section please refer to page8 ZyWALL1050 to ZYWALL70 VPN tunnel setting:
I made a list to briefly show the VPN phase1 and phase2 configuration parameter as below.

ZyWALL	NetScreen
WAN: 210.110.7.1 LAN: 192.168.1.0/24	WAN: 167.35.4.3 LAN: 192.168.2.0/24
Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1	Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1

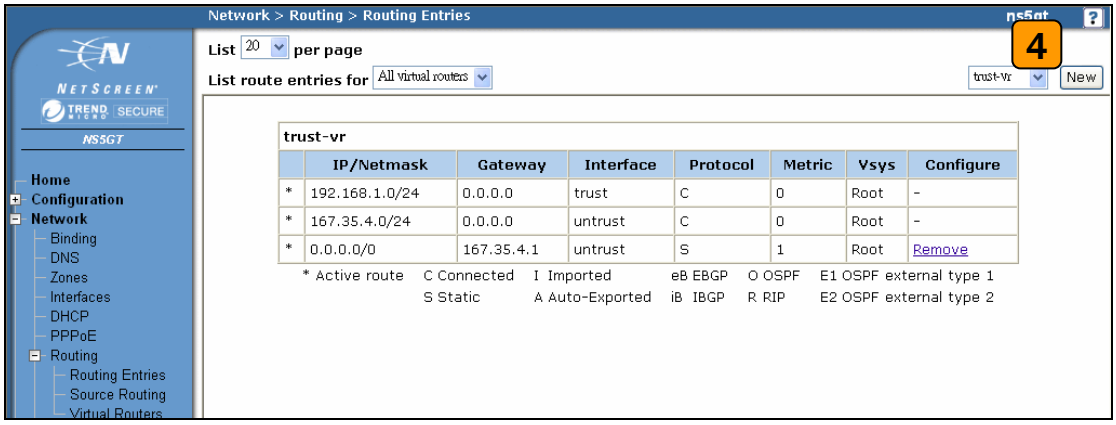
Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None	Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None

1) Please configure the ZyWALL1050 ‘s VPN gateway and VPN connection as the list and please remember to configure the policy route for VPN traffic routing. User can refer to pervious scenario or user guide to setup the ZyWALL1050 VPN setting.
2) Using a web browser, login NetScreen by giving the LAN IP address of NetScreen in URL field. The default username and password is netscreen/netscreen.
3) Switch to menu **Network** > **Inetrfaces** and configure the WAN/LAN IP address to WAN: 167.35.4.3 LAN: 192.168.2.0/24. The **trust interface** is stand for **LAN**, the **untrust interface** is stand for **WAN.**

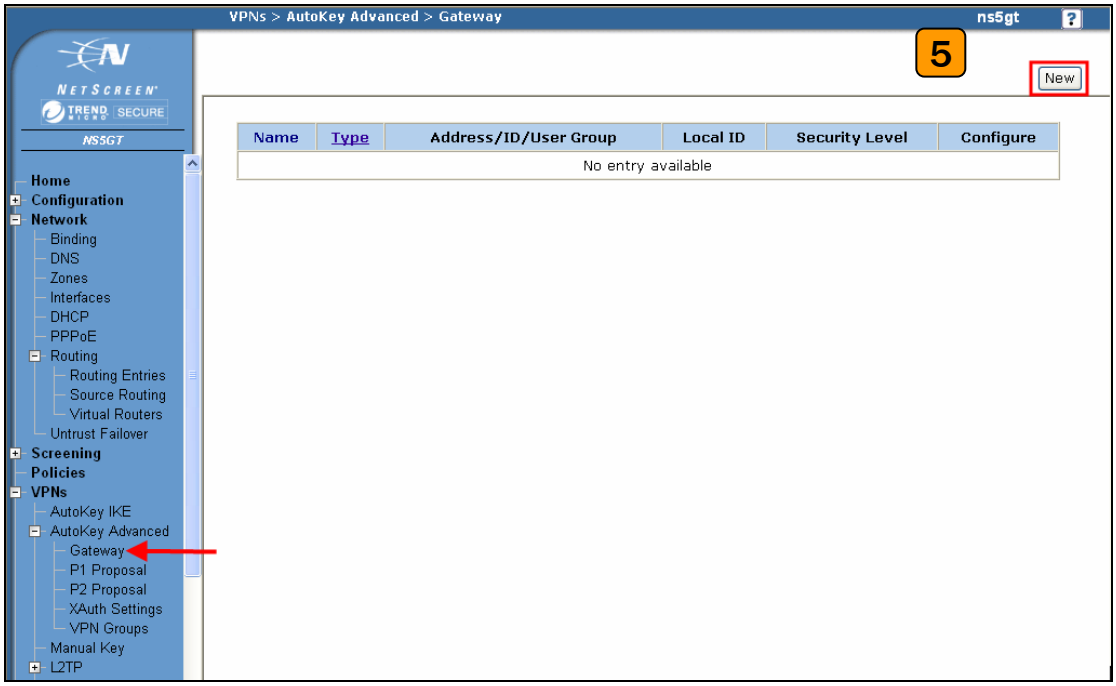


Note: About the detail interface settings, please refer to NetScreen user guide to get the detail info.

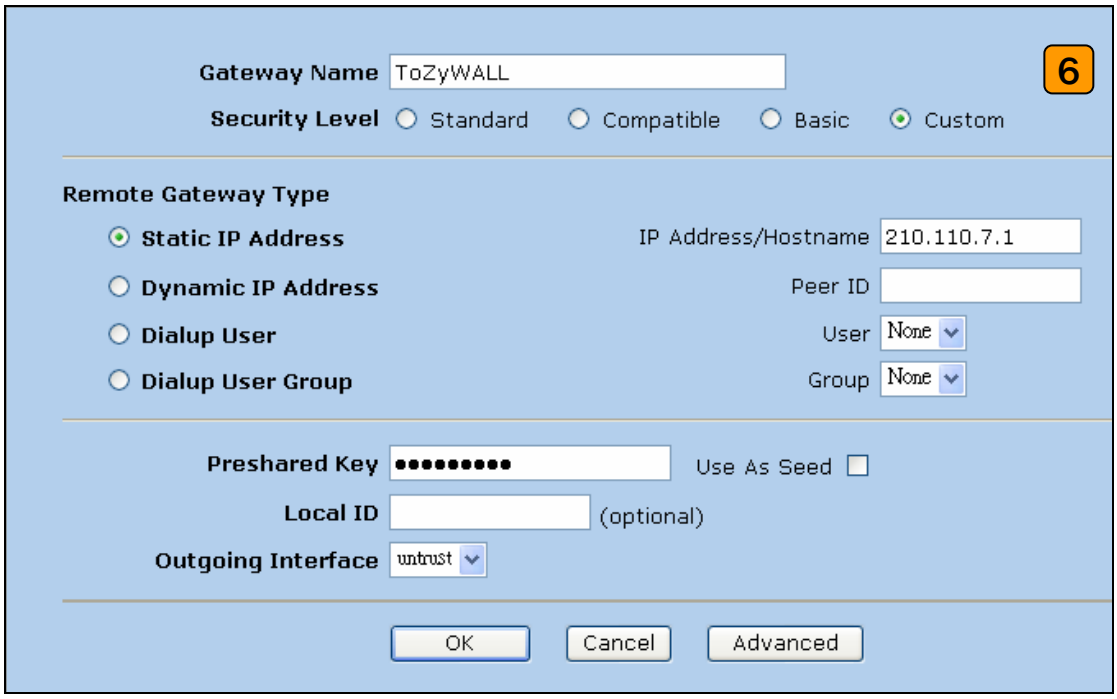
4) NetScreen won’t setup a route for the traffic to the external network; we have to manually add a route for it. After setup a static IP address for untrust interface, please switch to Network -> Routing -> Routing Entries to edit a default Gateway IP address. In this example, my Gateway IP address is 167.35.4.1.



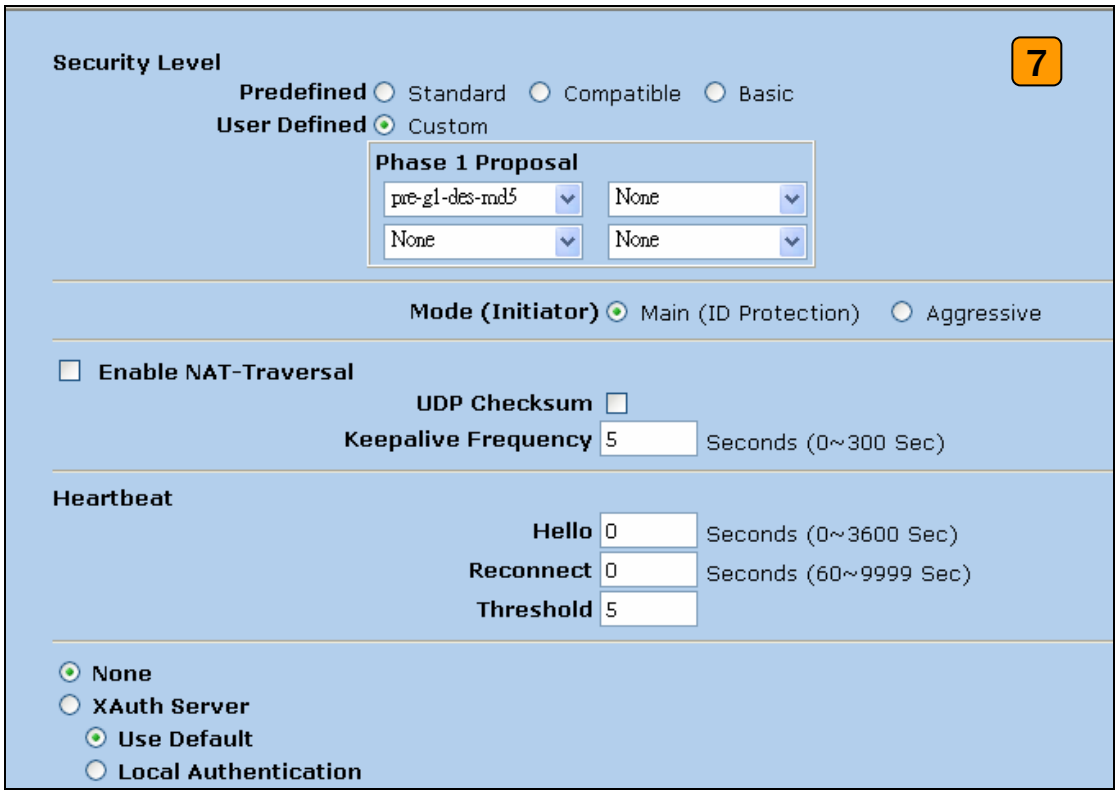
5) To edit the IPSec rule, the sequence is building the gateway policy first and then edit the IKE policy. Please switch to **VPNs** > **AutoKey Advanced** > **Gateway**, and then press **New** button.



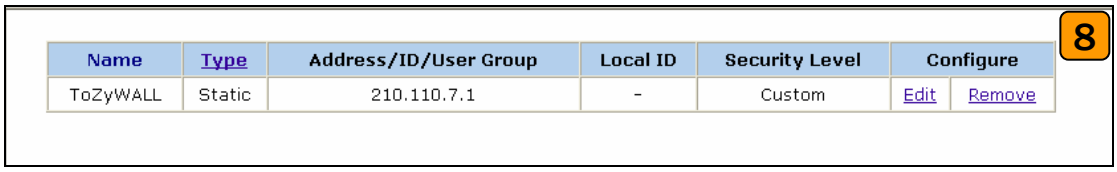
6) Give a name for the policy, for example "**ToZyWALL**". **Remote Gateway IP Addr** is the **ZyWALL's WAN IP address.** In this example, select **Static IP Address** option and set **210.110.7.1** on the text box. Enter the key string **123456789** on **Preshared Key** text box, and then press **Advanced** button to edit the advanced settings.



7) On Security Level settings, we can set up phase 1 proposal. In this example, select User Defined, and choose pre-g1-des-md5 rule. The pre-g1-des-md5 means `Pre-Share Key`, `group1`, **DES** for **Encryption Algorithm** and **MD5** for **Authentication Algorithm**. Select Main (ID Protection) option for Mode (Initiator). Then, press Return button, and press OK button on next page to save your settings.

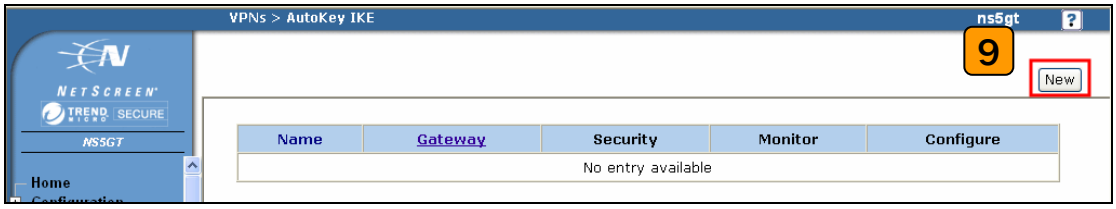


8) We can see an IKE rule on the page after the pervious settings.

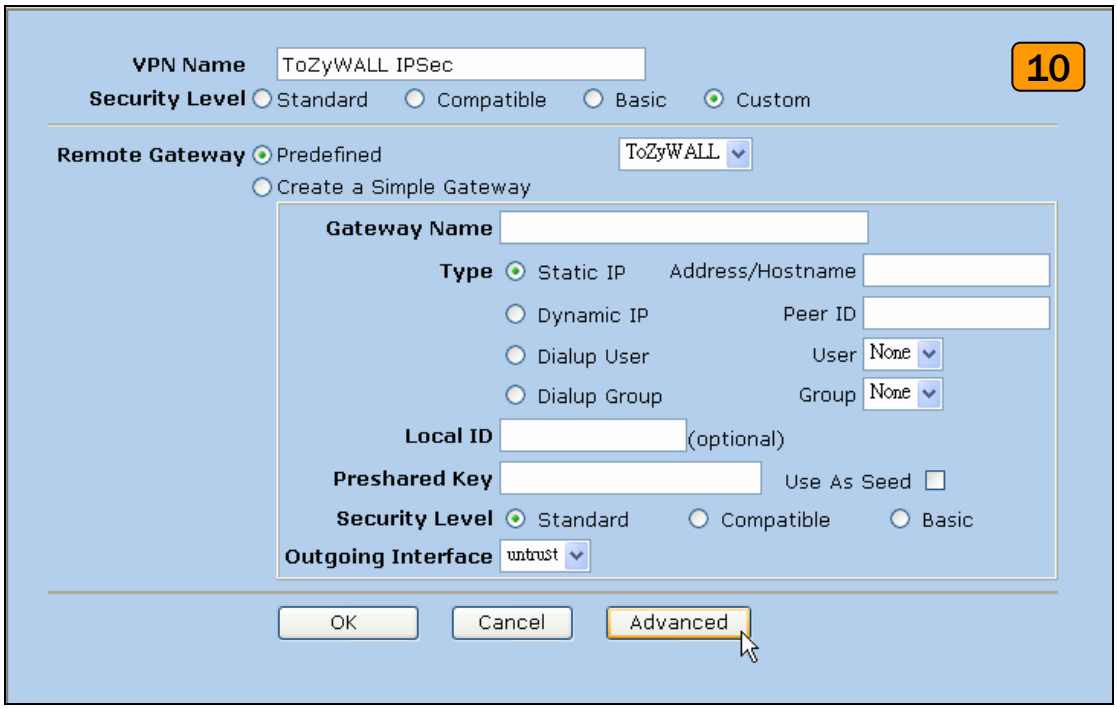


Name	Type	Address/ID/User Group	Local ID	Security Level	Configure	
ToZyWALL	Static	210.110.7.1	-	Custom	Edit	Remove

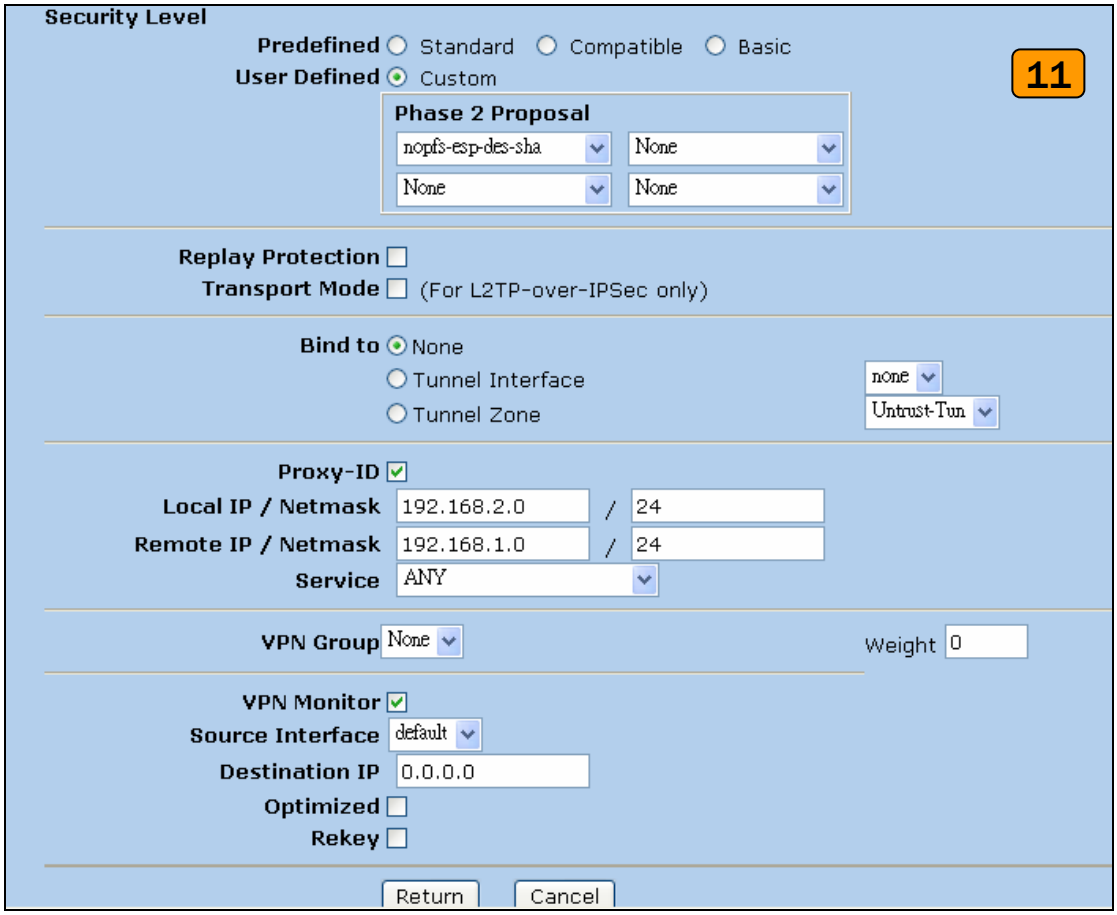
9) To edit the IPSec rule, switch to **VPNs** > **AutoKey IKE**, and then press **New** button to edit your IPSec rules.



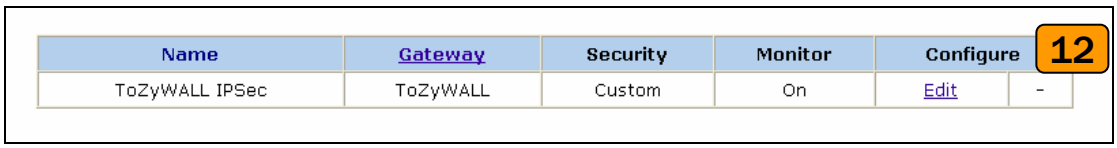
10) Give a name for the VPN, for example "**ToZyWALL IPSec**". On Remote Gateway, choose Predefined option and select ToZyWALL rule. Then, press **Advanced** button to edit the advanced settings.



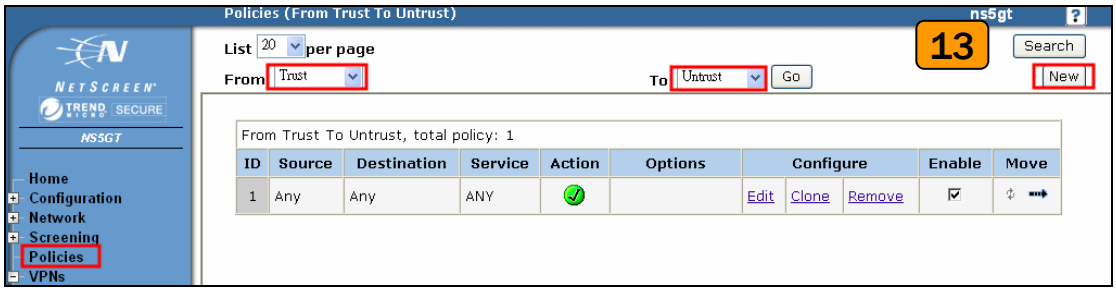
11) On **Security Level** settings, choose **User Defined** option, and choose **nopfs-esp-des-sha** rule on **Phase 2 Proposal**. The **nopfs-esp-des-sha** means no PFS, **ESP Protocol, Encryption Algorithm** to **DES** and **Authentication Algorithm** to **SHA1**. Check the **VPN Monitor** check box, thus you can monitor your VPN tunnels. Then, press Return button, and press OK button on next page to save the settings.



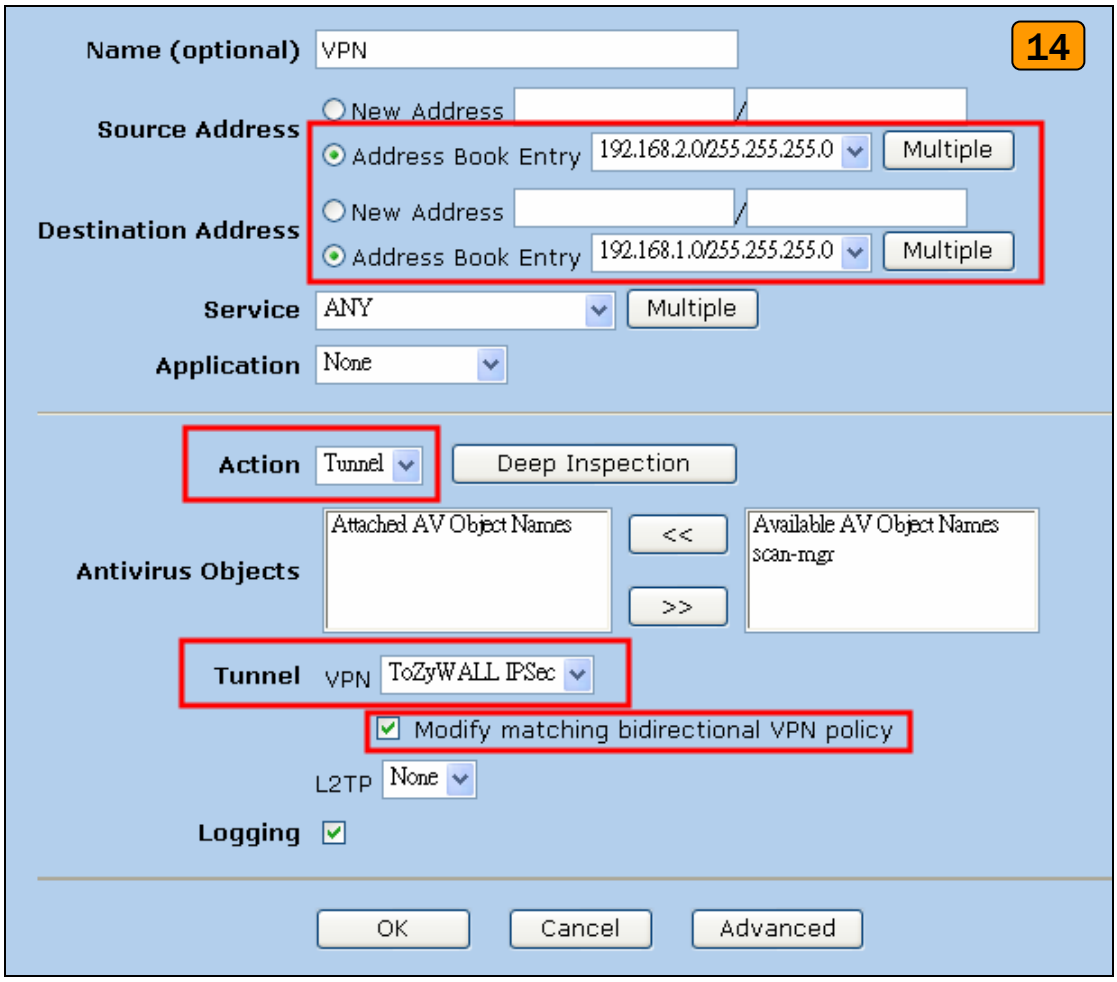
12) After the settings, the VPN IKE page will show an IPSec rule on the page.



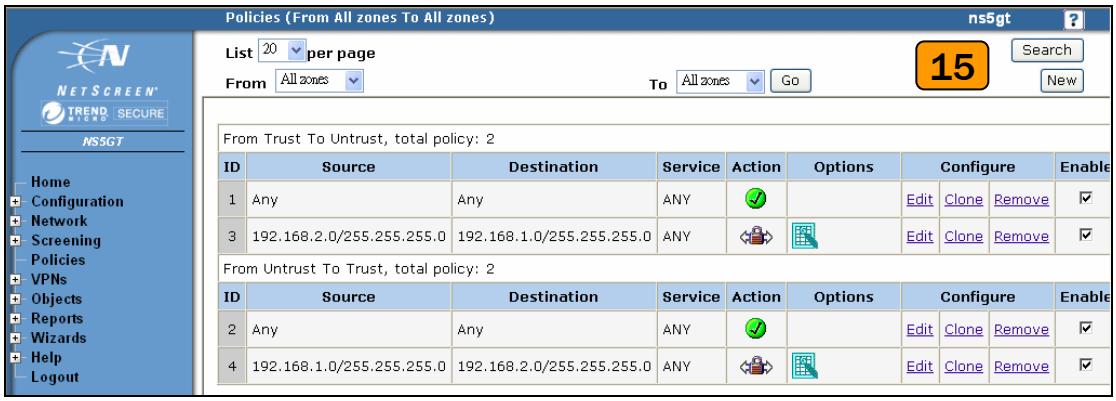
13) Switch to **Policies** to set up policy rules for VPN traffic. To choose **From** to **Trust**, and **To** to **Untrust** (it means from LAN to WAN), and then press **New** button to edit the policy rules.



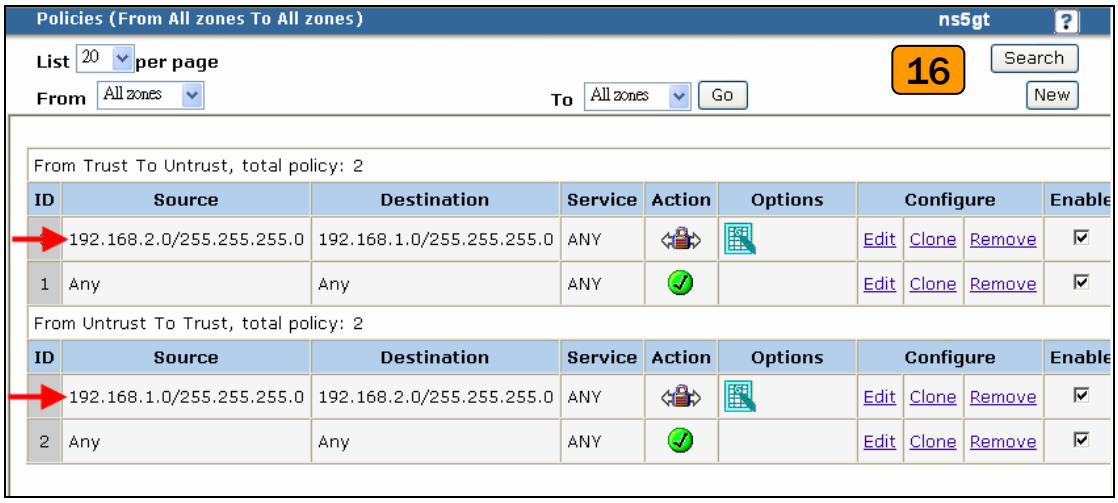
14) Give a name for this policy, for example "**VPN**". On **Source Address**, you should set up Local LAN IP addresses. In this example, select **New Address** option, and type **192.168.2.0 / 255.255.255.0** on the text box. On **Destination Address**, you should set up remote IP addresses. In this example, select **New Address** option, and type **192.168.1.0 / 255.255.255.0** on the text box. Select **Action** to **Tunnel**, and select **ToZyWALLIPSec**VPN rule. Check **Modify matching bidirectional VPN policy** check box, it means that you can create/modify the VPN policy for the opposite direction. Then, press **OK** button to save your settings.



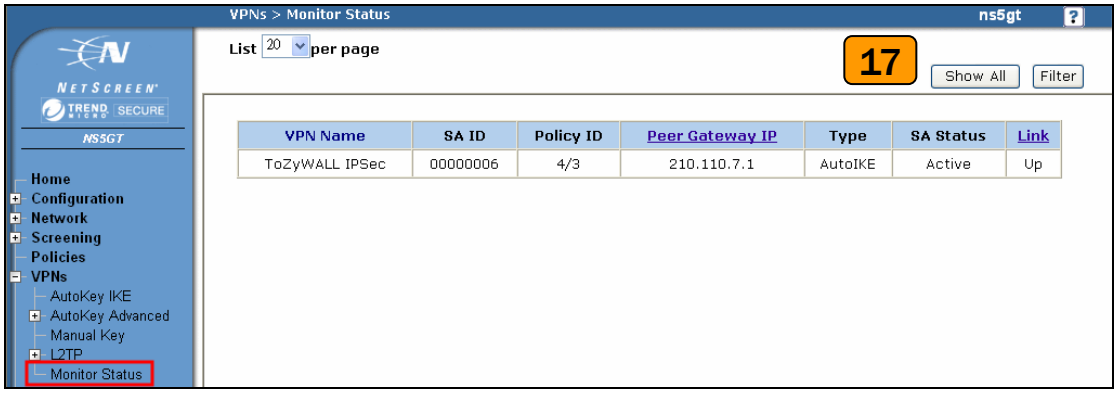
15) After the settings, the new policy rules will display in the **Policies** page.



16) Move the add policy rules to top, thus the VPN policies will be checked first.



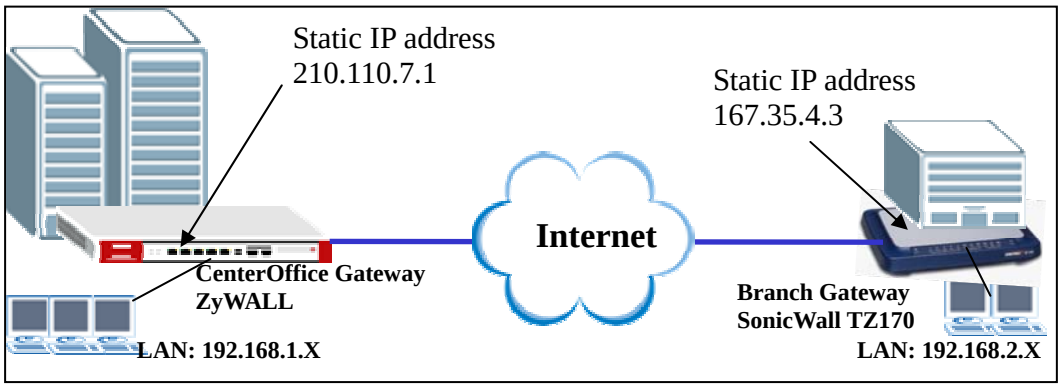
17) Ping the remote host and switch to VPNs > Monitor Status to check the VPN link status; if the **Link** status is Up means the VPN tunnel between ZyWALL and NetScreen had been successfully built-up.



1.2.2.3 ZyWALL with SonicWall VPN Tunneling

This page guides how to setup a VPN connection between the ZyWALL 1050 and SonicWall TZ170.

As the figure shown below, the tunnel between Central and Remote offices ensures the packet flows between them are secure. Because the packets go through the IPSec tunnel are encrypted. To setup this VPN tunnel, the required settings for ZyWALL and SonicWall are explained in the following sections.

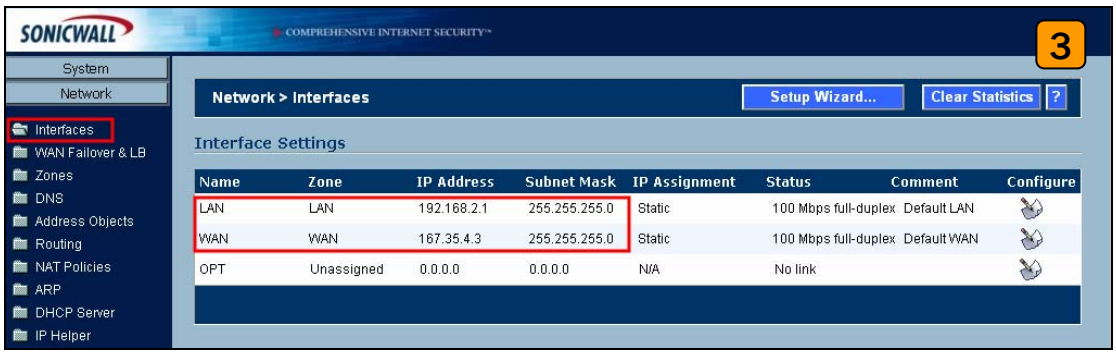


The central office gateway ZyWALL1050's interface and VPN setting retain the same setting as pervious example; if you are first jumping this section please refer to page8 ZyWALL1050 to ZYWALL70 VPN tunnel setting:
I made a list to briefly show the VPN phase1 and phase2 configuration parameter as below.

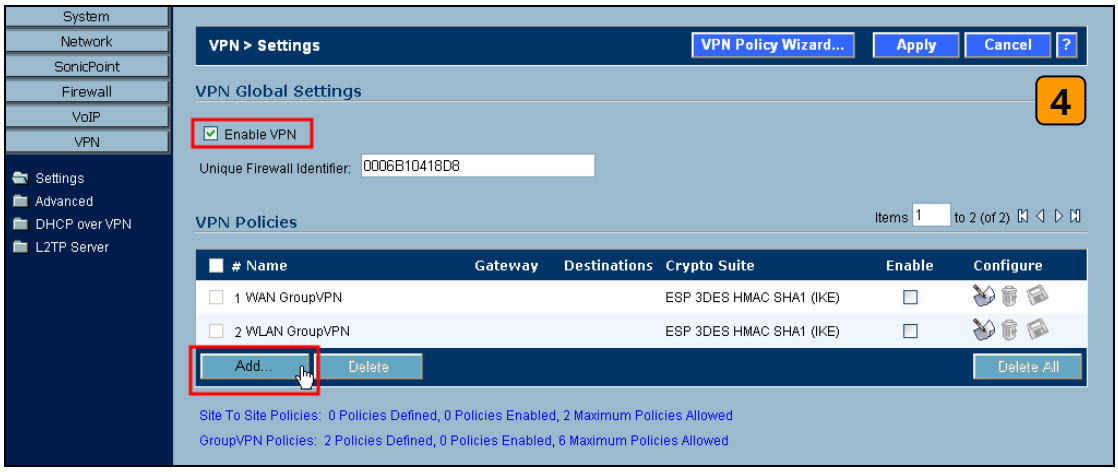
ZyWALL	SonicWall
WAN: 210.110.7.1 LAN: 192.168.1.0/24	WAN: 167.35.4.3 LAN: 192.168.2.0/24
Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1	Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1

Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None	Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None

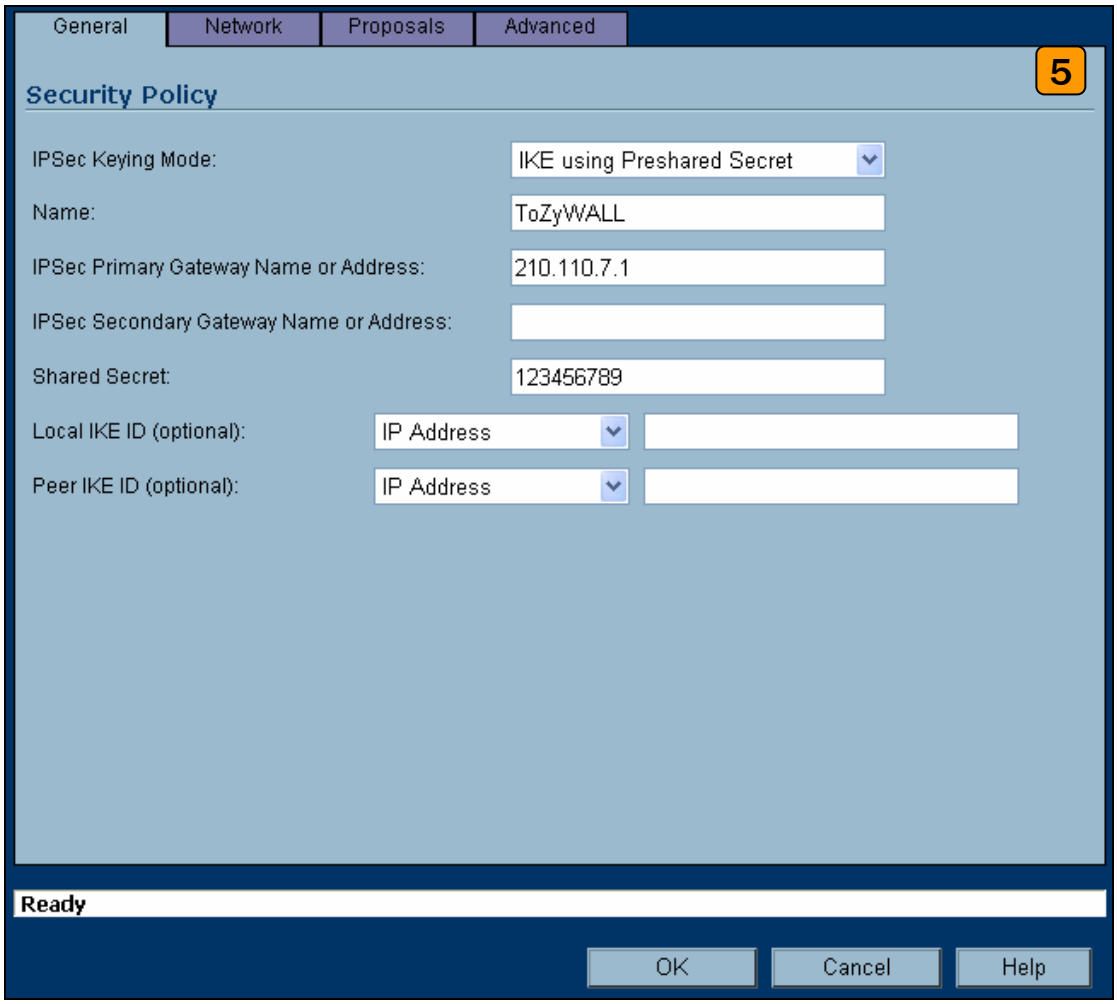
1) Please configure the ZyWALL1050 ‘s VPN gateway and VPN connection as the list and please remember to configure the policy route for VPN traffic routing. User can refer to pervious scenario or user guide to setup the ZyWALL1050 VPN setting.
2) Using a web browser, login SonicWall by giving the LAN IP address of SonicWall in URL field. The default username and password is admin/password.
3) Switch to menu **Network** > **Inetrfaces** and configure the WAN/LAN IP address to WAN: 167.35.4.3 LAN: 192.168.2.1/24.



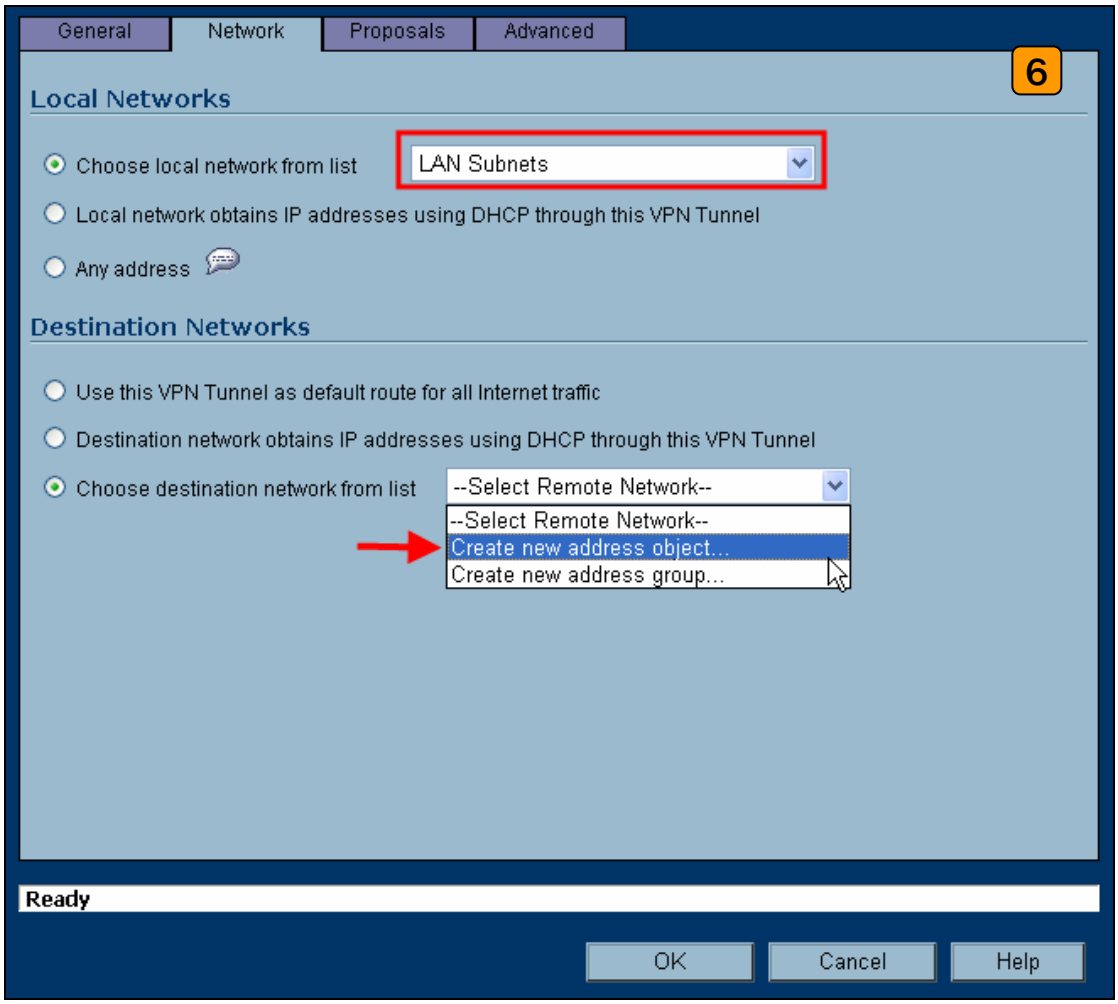
4) Switch to VPN > Settings, check **Enable VPN** check box, and then press **Add** button, it will bring up for VPN settings. (Note: The **VPN Policy Wizard** is an alternative way to set up VPN rules as well.)



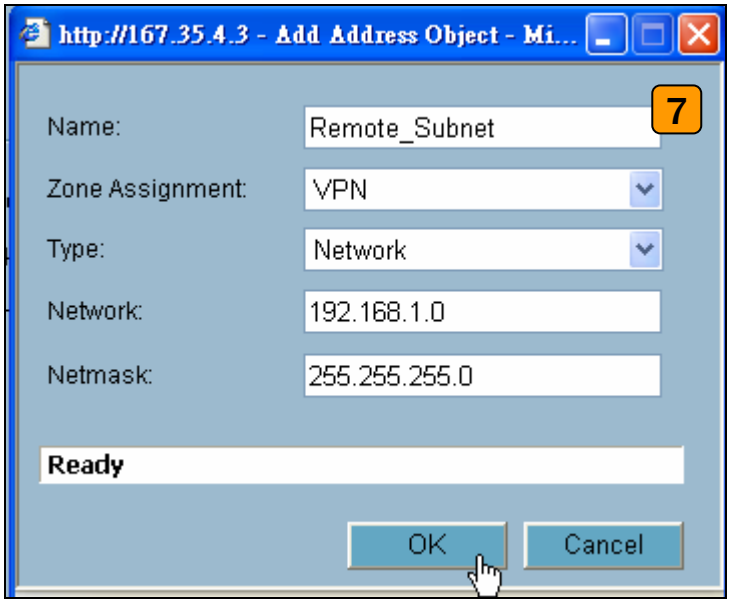
5) Click **General** tab, on Security Policy settings, give a name to this policy. In this example, type **ToZyWALL**. **IPSec Primary Gateway Name or Address** is the **ZyWALL's WAN IP Address** (remote gateway IP address). In this example, please type 210.110.7.1 on **IPSec Primary Gateway Name or Address** text box. Then, enter the key string **123456789** on **Shared Secret** text box.



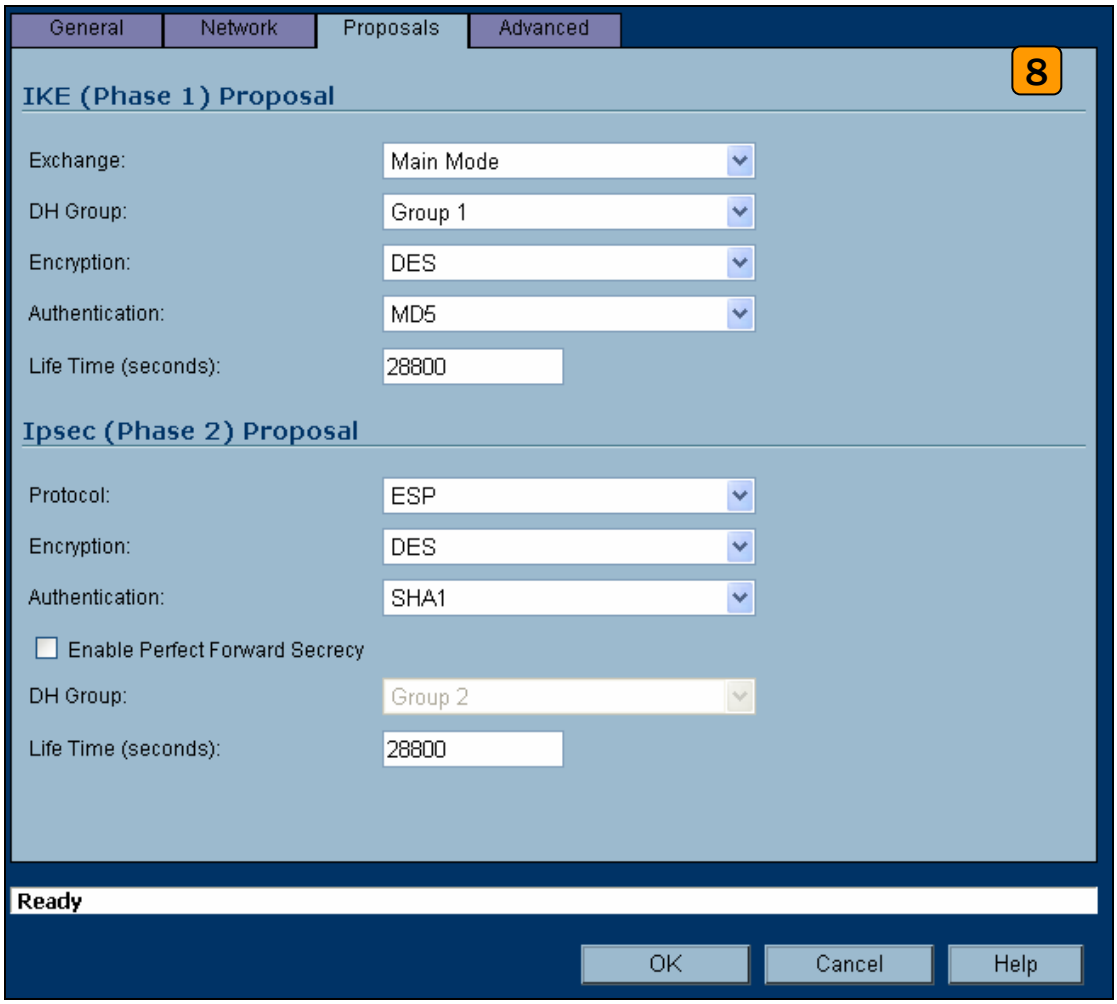
6) Switch to **Network** tab to configure the local and remote networks for VPN tunnel. We choose the predefined "LAN Subnets" object from the local network drop down list. There is no predefined address object for remote subnet, thus we have to create a new address object from remote network drop down list and the new address object window will popup.



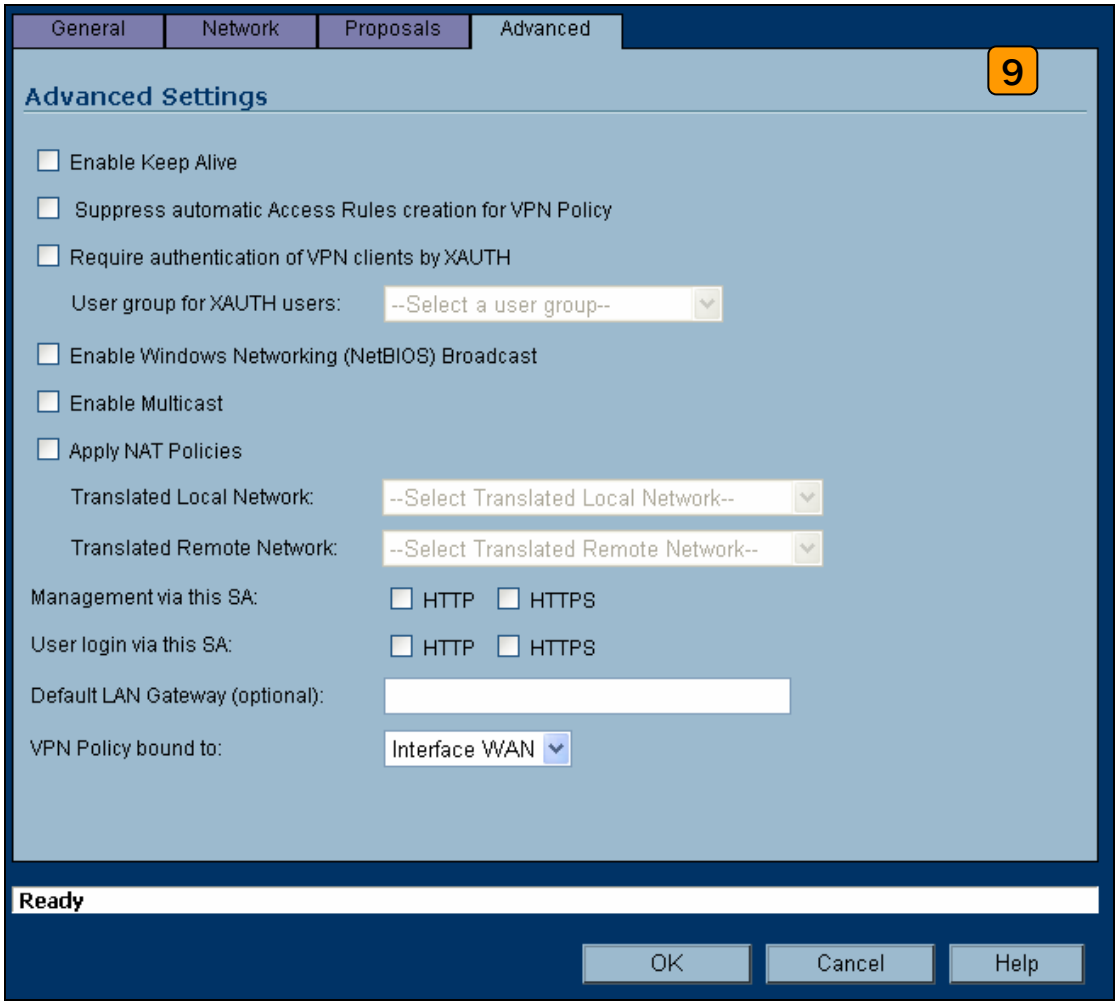
7) The name for this object can be “Remote_Subnet”; the **Network IP Address** and **Subnet Mask** are remote site LAN subnet. In this example, please type 192.168.1.0 on **Network** text box and then type 255.255.255.0 on **Subnet Mask** text box, and then press **OK** button. We can select the new address object “Remote_Subnet” from destination network drop down list after the address object successfully setup.



8) Switch to **Proposals** tab, on IKE (Phase1) proposal settings, select **Main mode**, **DH Group** to **Group1**, **Encryption** to **DES** and **Authentication** to **MD5**. On IPSec (Phase2) proposal settings, select **ESP Protocol**, **Encryption** to **DES** and **Authentication** to **SHA1**. Then, press **OK** button on this page.

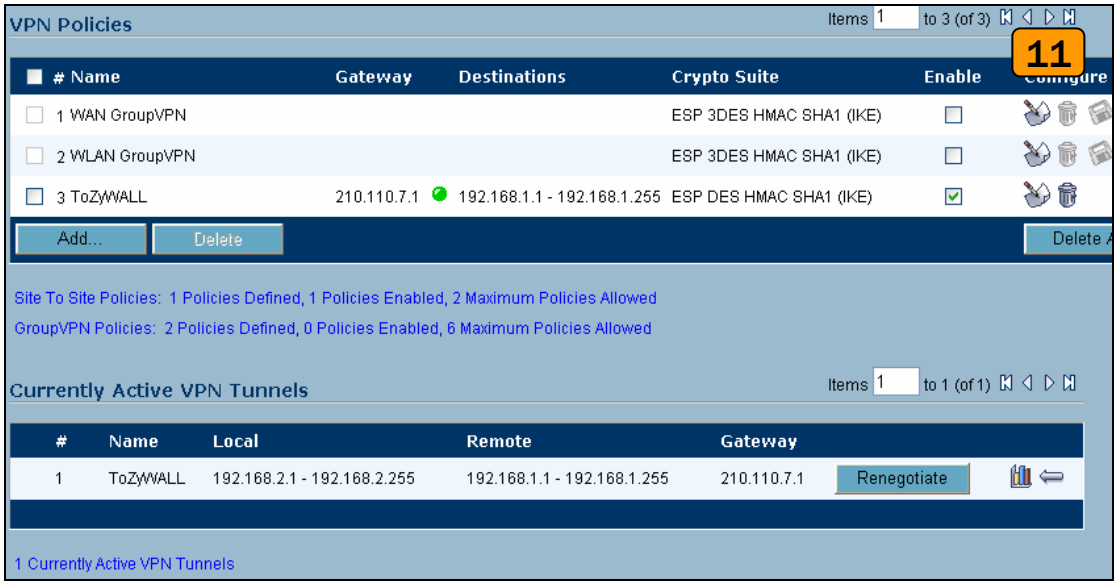


9) Switch to **Advanced** tab, on VPN policy bound to setting, select **Interface WAN.** Then, press **OK** button on this page.



10) The VPN status page will show a new VPN rule and please make sure the rule had been enabled.

11) Ping the remote host to dial up the tunnel. We can check the connected VPN status in the VPN status page. The VPN tunnel should be appeared in the **Currently Active VPN Tunnels** page and it indicated the tunnel had been successfully built-up.



1.3 Replacing Costly RAS Dial-in

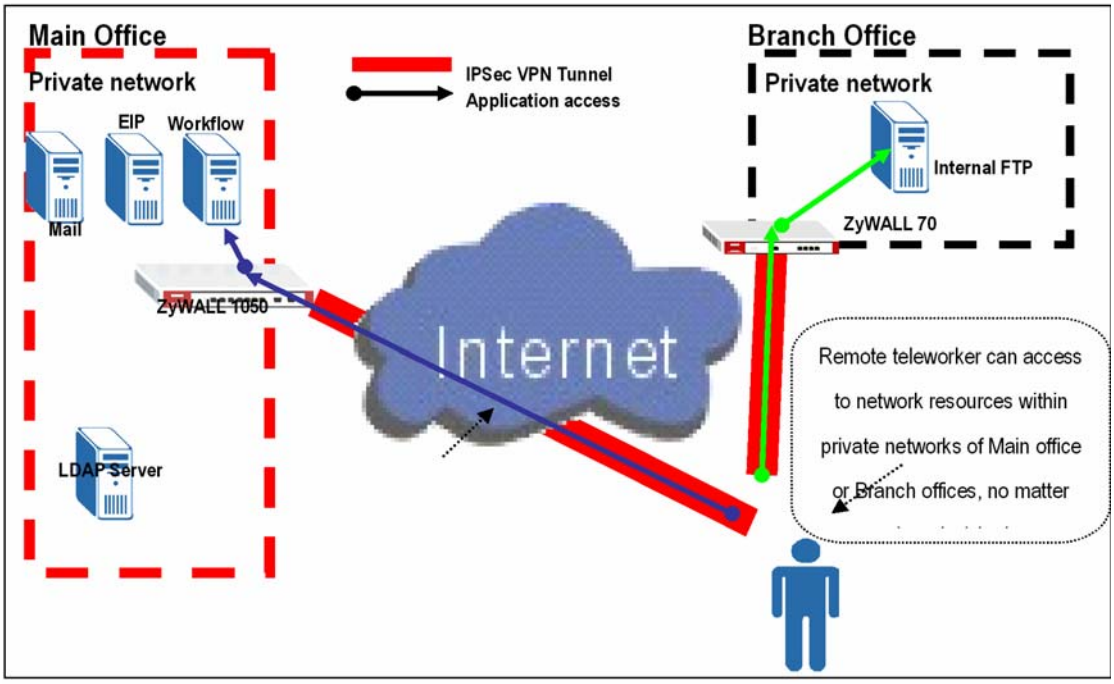
Remote Access VPN provides a cost-effective alternative to standard dial-in remote access to a company network. Users can connect to the network via the Internet, eliminating expensive long-distance or toll-free dial-in costs.

The most often applications scenario will like; an employee on the road, aka teleworker, can gain full network access simply by tapping into an Internet connection and this connection also provide the confidentiality during data transmitting between remote and host (Data transferring in VPN tunnel with encryption).

The other genius solution like “Mobile office” enabler: teleworker or home & SOHO employee can work at airport, cyber café, hot spots, hotel or home. The office building scope can be eliminated and the one global office can fully utilize the global resource.

1.3.1 Remote Access VPN

In this scenario, we assume the ZyWALL1050 admin configure VPN setting to allow teleworkers access internal network resource through remote access VPN. Since we don’t know which IP address will be at the remote teleworker’s PC/notebook, so we will use 0.0.0.0 which represents “any IPs” for ZyWALL1050’s remote gateway setting. On the other hands, the teleworkers use ZyWALL VPN client on his notebook to establish IPSec VPN with main office.



So we are going to complete following tasks.

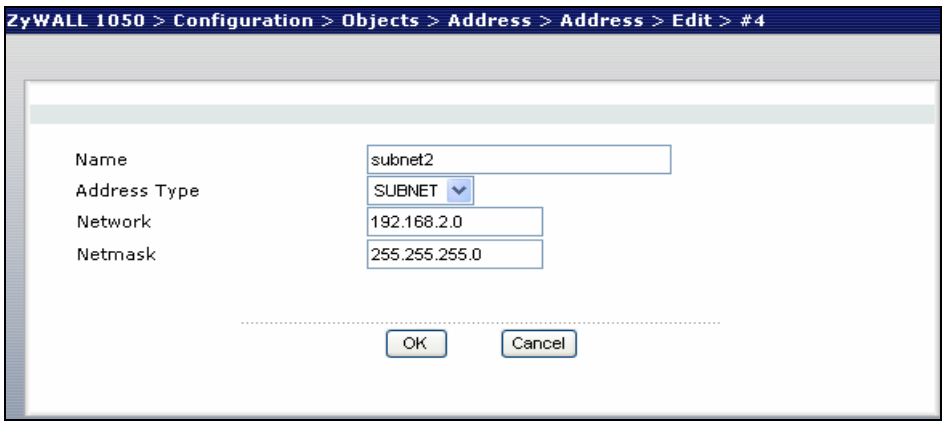
- Create object 'address' for local and remote network on ZyWALL1050
- Configure a VPN gateway and the VPN connection setting on ZyWALL1050
- Configure the corresponding VPN setting in ZyWALL VPN client

ZyWALL 1050	ZyWALL VPN Client
My address: **ge2(10.59.1.45)** Secure gateway address: **0.0.0.0** Local: **192.168.2.0/24** Remote: **0.0.0.0/24**	My address: **Any** Secure gateway address: **10.59.1.45** Local: **Any** Remote: **192.168.2.0/24**
Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1	Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1

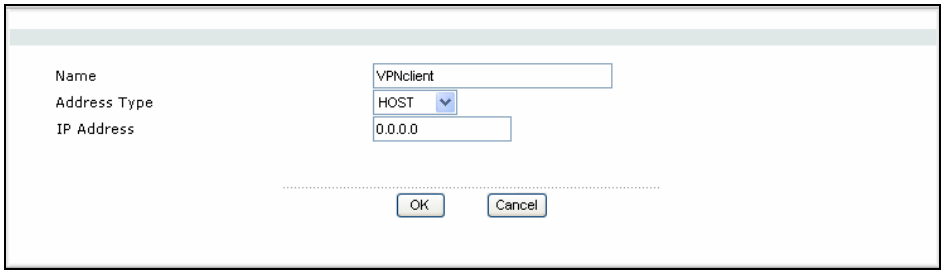
Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None	Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None

See configuration step by step as following.

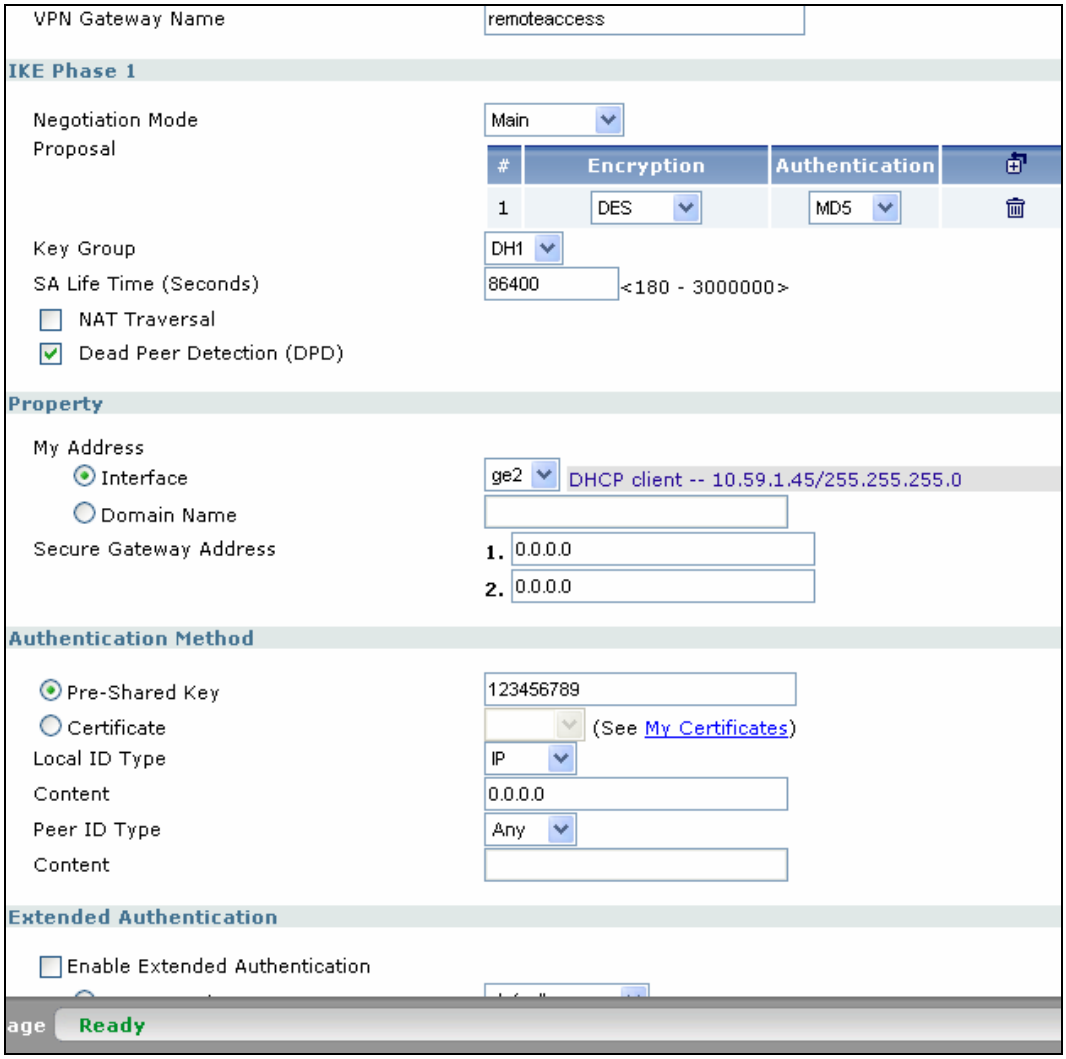
1) Login ZyWALL 1050 GUI and go to **Configuration** > **Objects** > **Address** to create address object (local subnet) for remote access.



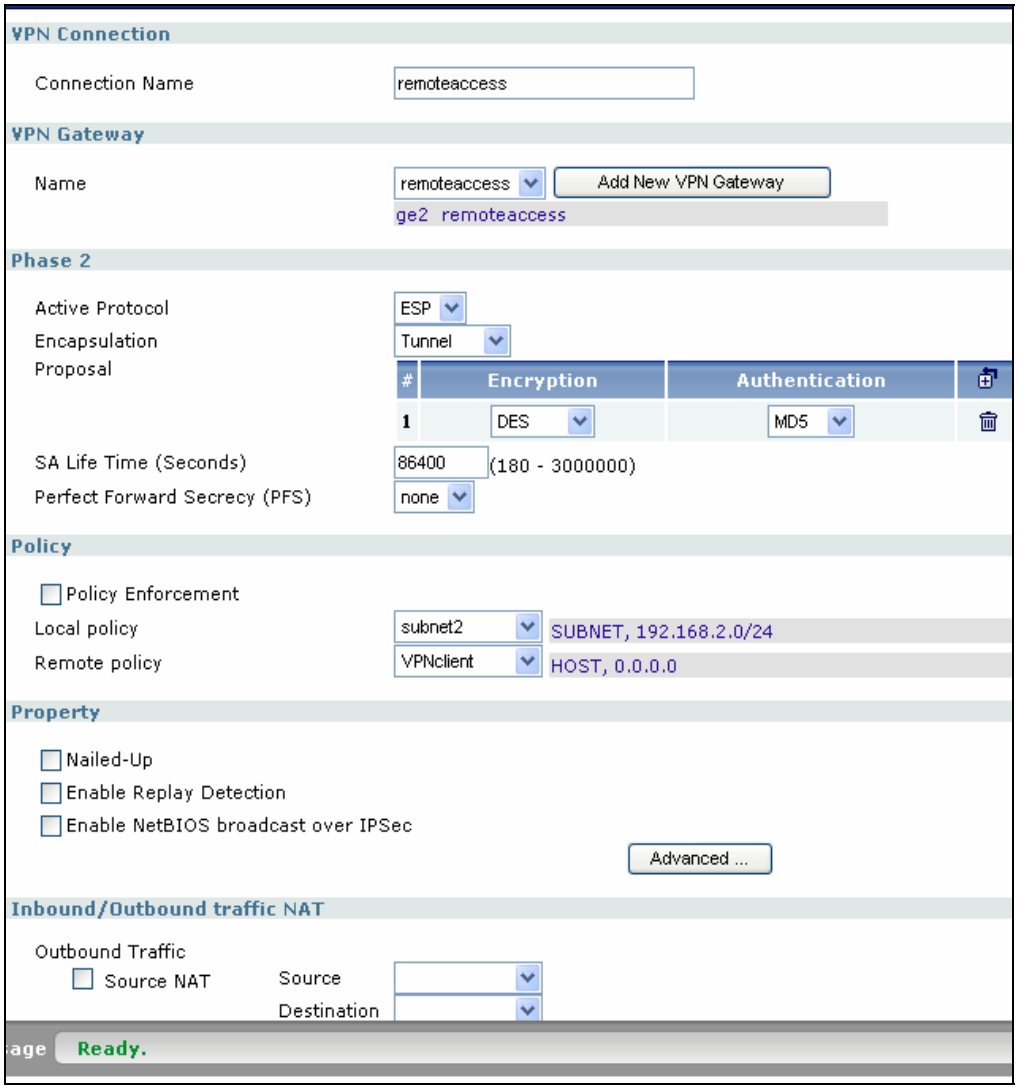
2) Create another address object for remote host. The **IP Address** of the host should be **0.0.0.0**, which means remote use dial in dynamically.



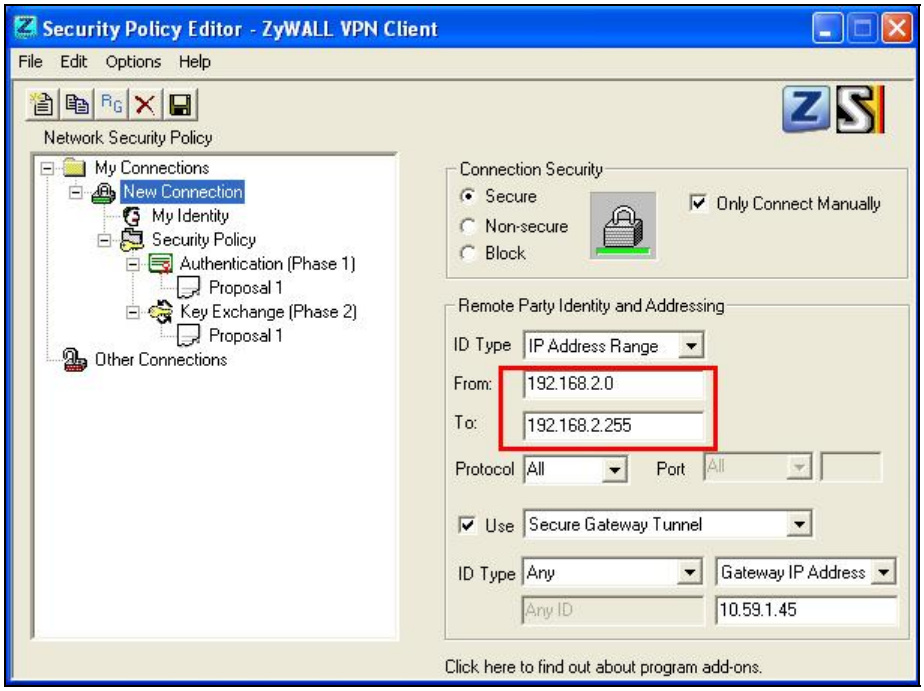
3) Go to **Configuration** > **Network** > **IPSec VPN** > **VPN Gateway** to create gateway for remote VPN client. Because this kind of VPN is initialed from remote user, the **Secure Gateway** should be put as dynamic one which is 0.0.0.0. Also VPN peers should keep consistence with each other for other parameter, such as Pre-Shared Key, ID Type, Encryption and Authentication proposal and so on.



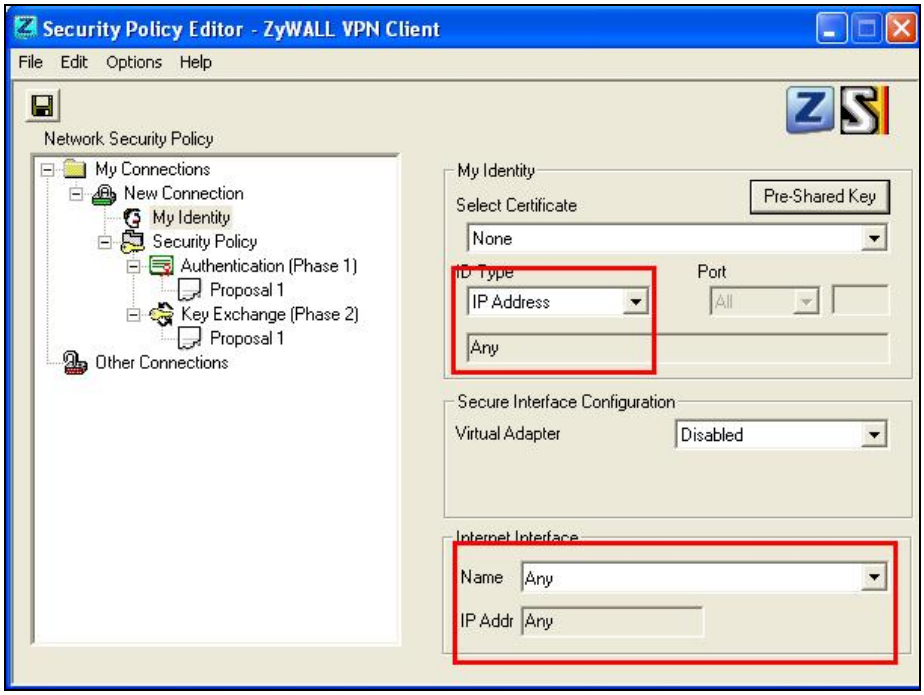
4) Go to **Configuration** > **Network** > **IPSec VPN** > **VPN Connection**, to create a VPN rule. Put **Policy** as those defined in step 1 and step2. Remote policy should be dynamic host address. We put **VPN Gateway** as dynamic which has been defined in step3.



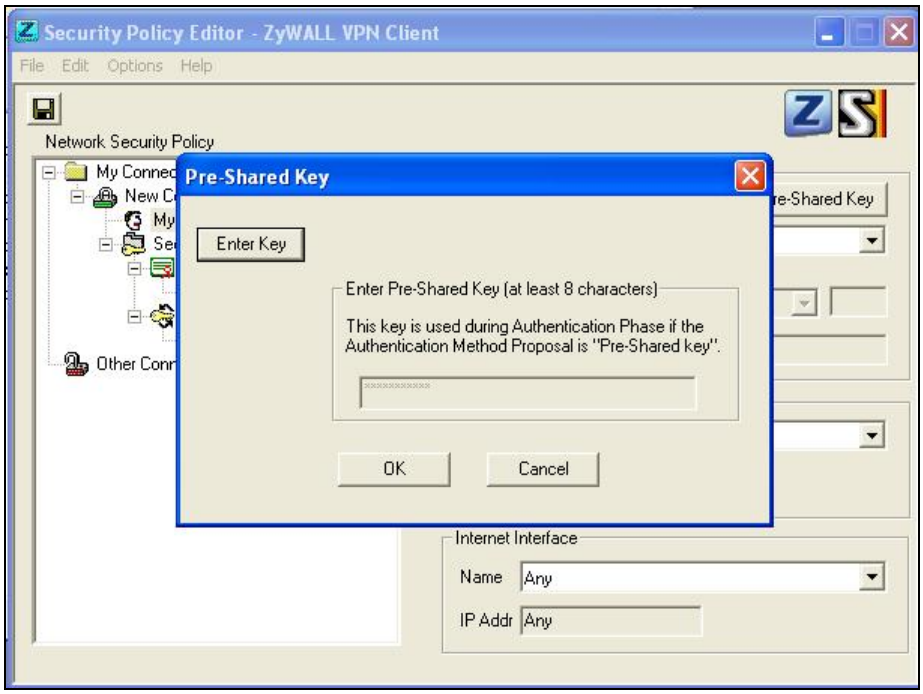
5) Go to remote host to configure ZyXEL VPN Client. We create a **Net Connection** and fill in remote access subnet as 192.168.2.x.



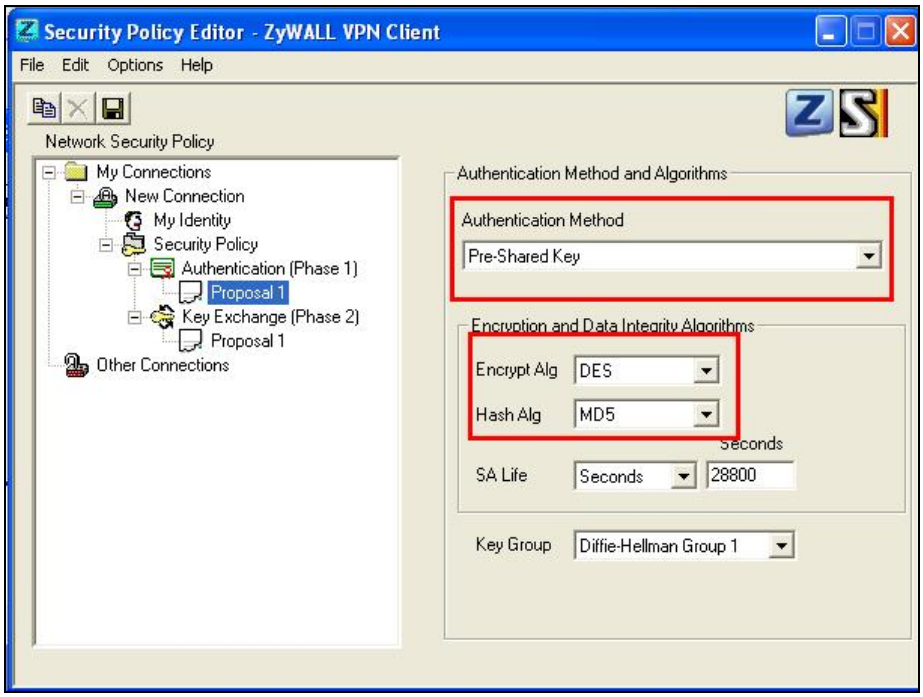
Under **My Identity** we select local **ID type** as Any.

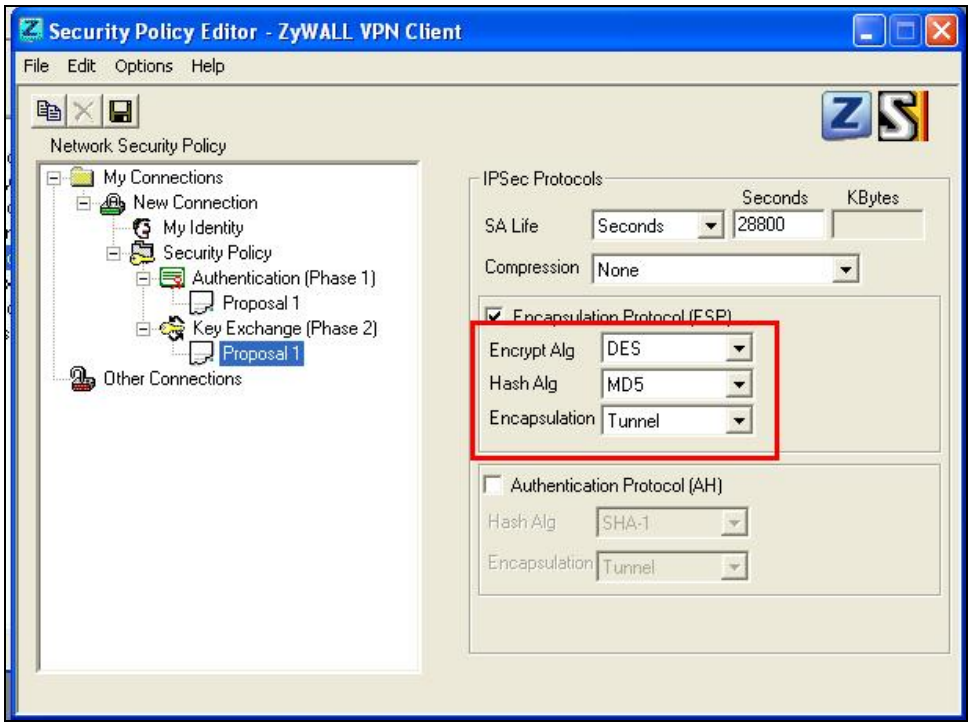


Also please do not forget to enter Pre-Shared Key by clicking **Pre-Shared Key** button.



The last step is to go to **Security Policy** to configure parameters for Phase1 and Phase 2. After saving the configuration, VPN connection should be initialed from this host site.





The CLI command for application:

Address Object for local subnet:

```
[0] address-object subnet2 192.168.2.0 255.255.255.0
```

Address Object for remote host:

```
[0] address-object VPNclient 0.0.0.0
```

Remote Gateway:

```
[0] isakmp policy remoteaccess
[1] mode main
[2] transform-set des-md5
[3] lifetime 86400
[4] no natt
[5] dpd
[6] local-ip interface ge2
[7] peer-ip 0.0.0.0 0.0.0.0
[8] authentication pre-share
[9] keystring 123456789
[10] local-id type ip 0.0.0.0
[11] peer-id type any
[12] xauth type server default deactivate
[13] group1
```

VPN Connection:

```
[0] crypto map remoteaccess
[1] ipsec-isakmp remoteaccess
[2] encapsulation tunnel
[3] transform-set esp-des-md5
[4] set security-association lifetime seconds 86400
[5] set pfs none
[6] no policy-enforcement
[7] local-policy subnet2
[8] remote-policy VPNclient
[9] no nail-up
[10] no replay-detection
[11] no netbios-broadcast
[12] no out-snat activate
[13] no in-snat activate
[14] no in-dnat activate
```

Tips for application:

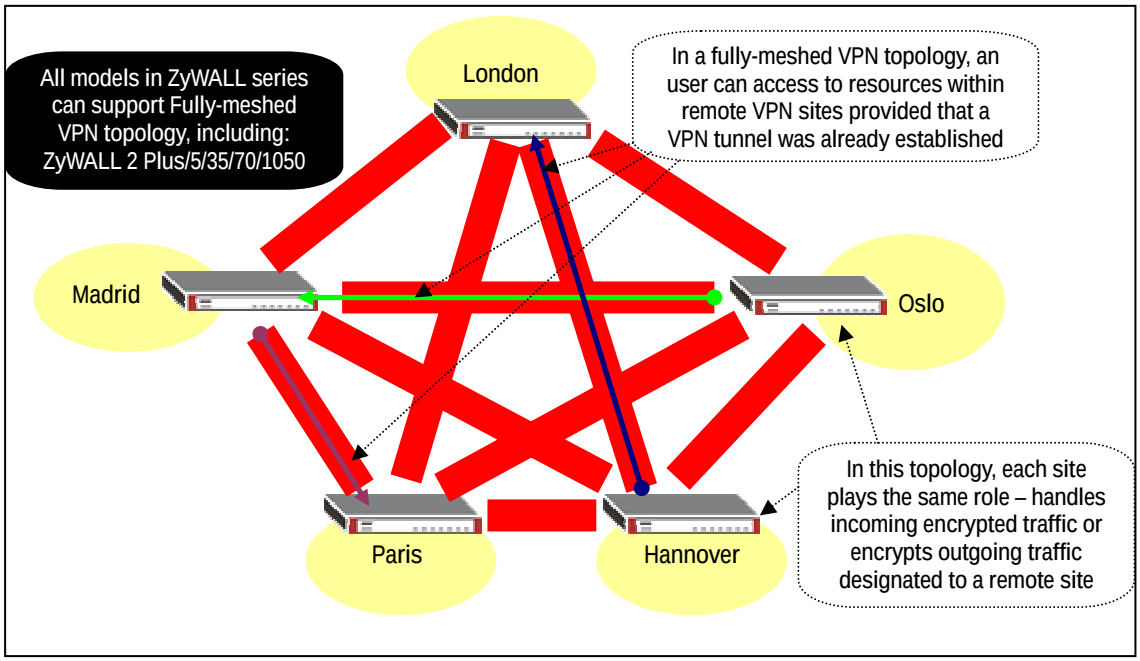
1. Make sure both **pre-shared key** settings are the same in local and remote gateway.
2. Make sure both **IKE proposal** settings are the same in local and remote gateway.
3. Select the correct **interface** for VPN connection.
4. The **Local** and **Peer ID type** and content must opposite not in the same content.
5. The **Local Policy** of ZyWALL 1050 should be ‘dynamic single host with the value 0.0.0.0. And VPN tunnel should be initialed from remote host site.

1.4 Large-scale VPN Deployment

With the business growing, network administrator will face the more and more complicated VPN topology and applications. ZyWALL 1050 supports various type of VPN topology which can meet the needs of organizations of any size.

ZyWALL1050 VPN Topology supported fully meshed topology that can be deployed when the total number of remote site is few. Star topology is recommended when the total number of remote site is huge and even more flexible design; Star and Mesh mixed topology (cascading topology) can be deployed while in a global distributed environment.

1.4.1 Fully Meshed Topology



1) In order to achieve the goal of all sites VPN connectivity; Each site must has directly connected VPN tunnels to all remote site in the fully meshed VPN topology. The network administrator has to pay huge establishment and maintenance effort with the new remote site joining. This VPN topology is suitable for few sites VPN deployment and the configuration need to well organization.
2) For example, to complete the above topology needs to repeat the same steps at least five times and totally need to establish 10 VPN tunnels. The tunnels list as follow:

Tunnel 1: London ←VPN →Madrid

Tunnel 2: London ←VPN →Paris

Tunnel 3: London ←VPN →Hannover

Tunnel 4: London ←VPN →Oslo

Tunnel 5: Madrid ←VPN → Paris

Tunnel 6: Madrid ←VPN → Hannover

Tunnel 7: Madrid ←VPN → Oslo

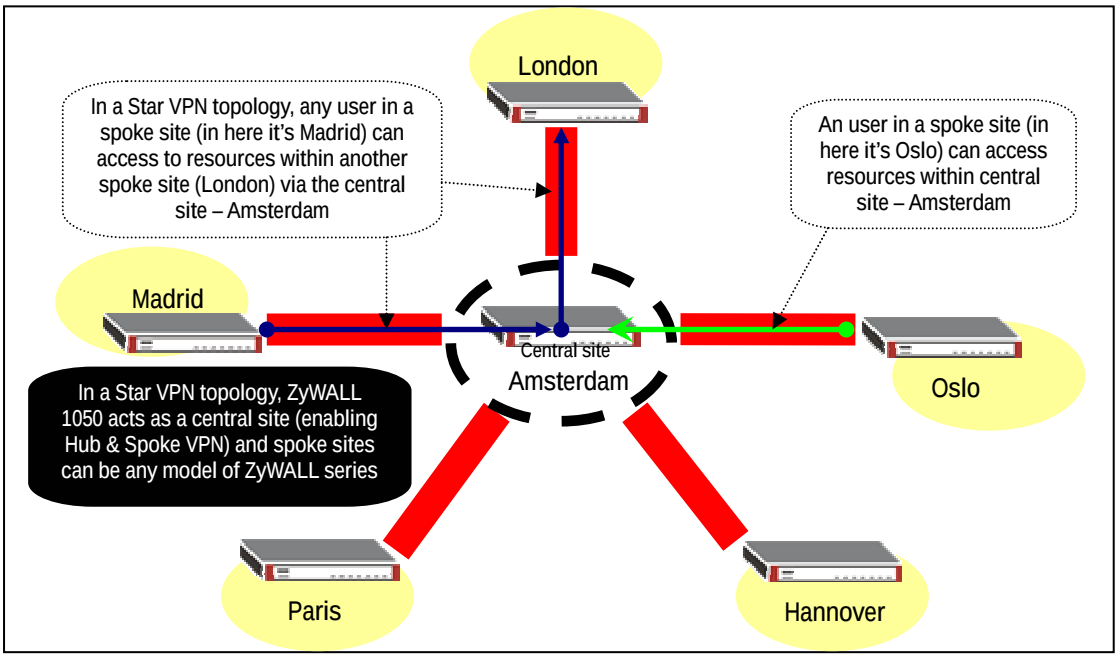
Tunnel 8: Paris ←VPN → Hannover

Tunnel 9: Paris ←VPN → Oslo

Tunnel 10: Hannover ←VPN → Oslo

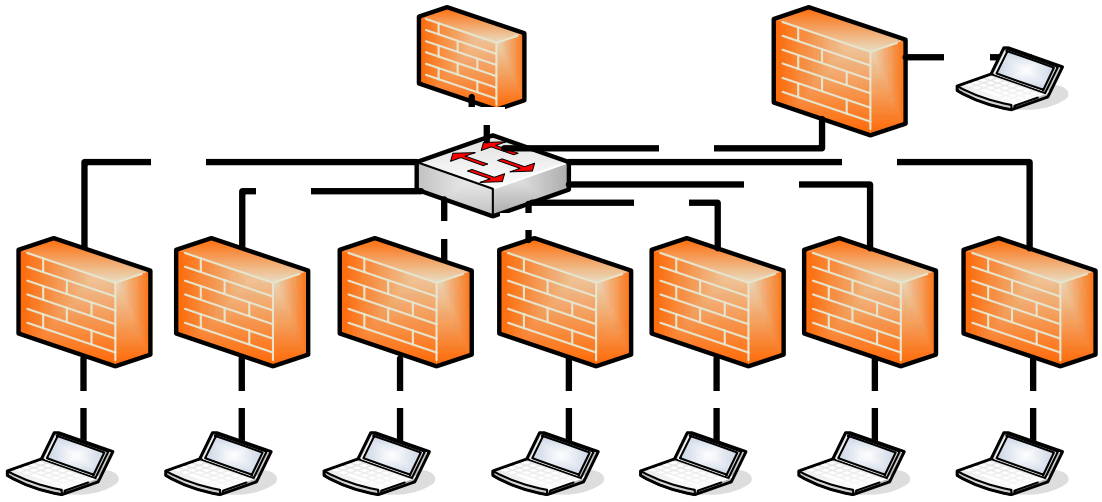
3) Please refer to the section ZyWALL1050 to ZyWALL1050 VPN tunnel configuration steps to build up the 10 tunnels in turn. We will introduce the configuration steps for VPN concentrator that will greatly help to reduce the total number of tunnel.

1.4.2 Star Topology



The ZyWALL1050 support Star topology via the VPN concentrator feature. The VPN concentrator can help to reduce the VPN tunnel numbers and centralized VPN tunnel management.

The topology used for our VPN concentrator guide.



This topology is designed to simulate a global VPN network deployment. The company has a global headquarter in Taiwan and other office around the world.
This company decided to build up a VPN concentrator let all office's internal network to share and connecting to each other based on a security link.
We will separate each group as a member of each office and build up the VPN tunnel with headquarter and then to route the VPN traffic across the HQ to destination office's internal network.

The VPN configuration parameter

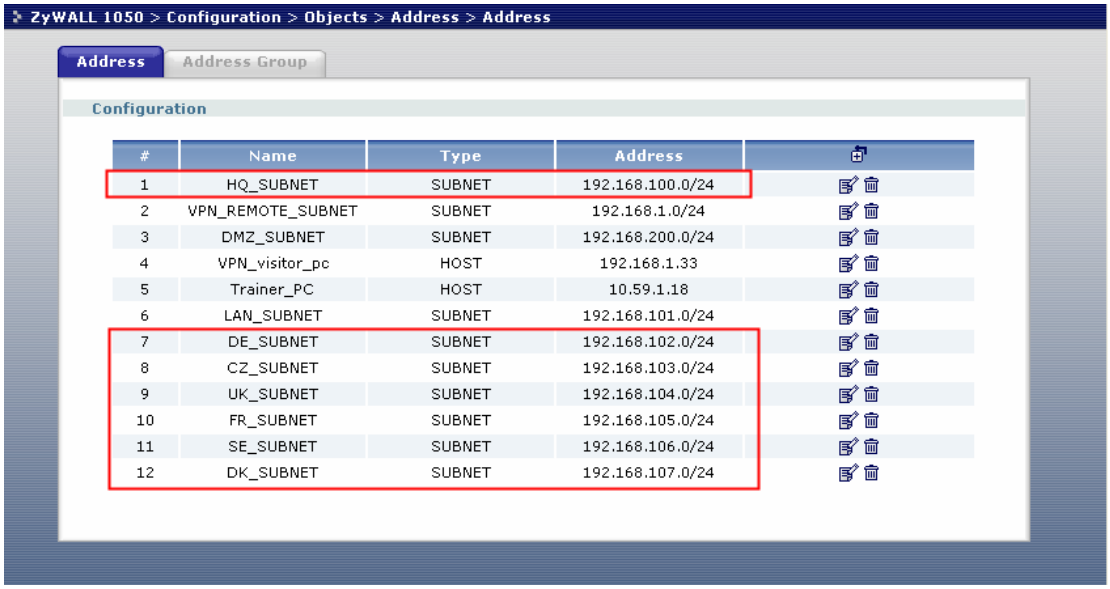
Remote Office	HQ
WAN: 10.59.1.11 ~ WAN: 10.59.1.17 LAN: 192.168.101.0/24 ~ LAN: 192.168.119.0/24	WAN: 10.59.1.10 LAN: 192.168.100.0/24

Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1	Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1
Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None	Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None

Setup VPN tunnel between each remote office to HQ

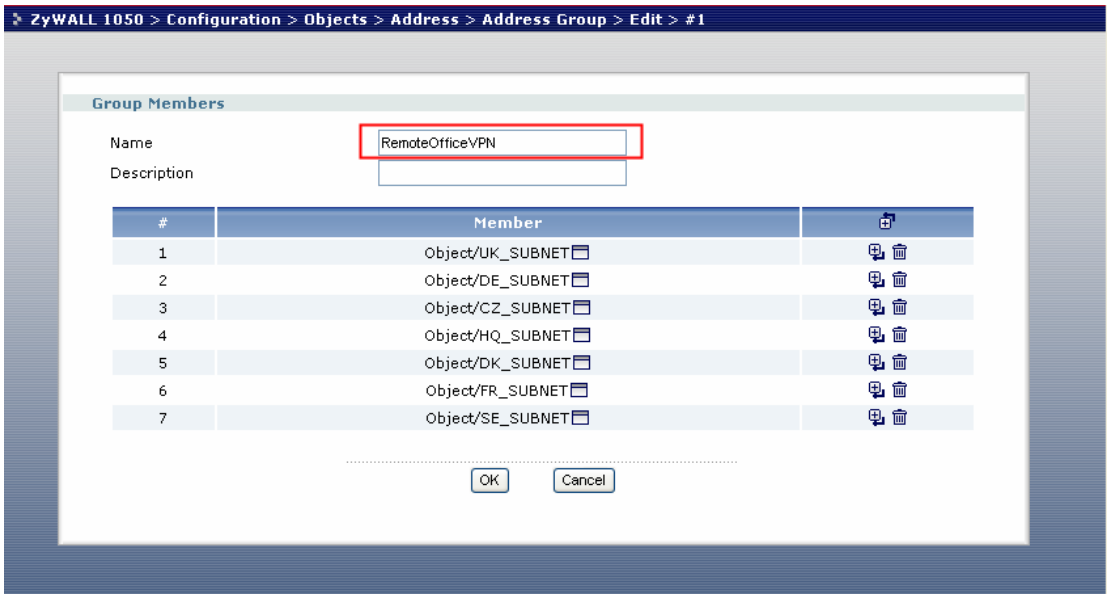
We used the Netherland site (NL) as an example to show how to setup tunnel between **NL** and **HQ.** I don't list the detail configuration steps in here, please refer the above VPN parameter table to setup the VPN gateway and connection.

Configure the **NL** site address object for each remote office subnet

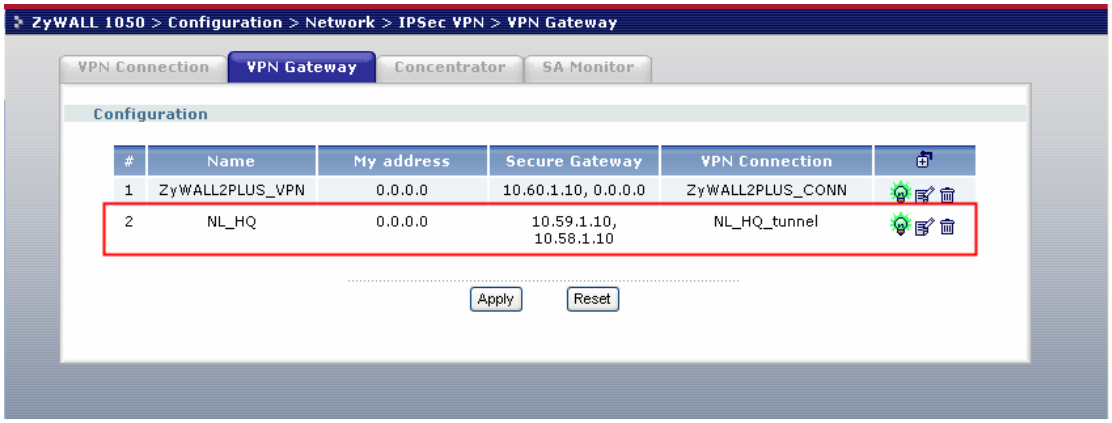


#	Name	Type	Address
1	HQ_SUBNET	SUBNET	192.168.100.0/24
2	VPN_REMOTE_SUBNET	SUBNET	192.168.1.0/24
3	DMZ_SUBNET	SUBNET	192.168.200.0/24
4	VPN_visitor_pc	HOST	192.168.1.33
5	Trainer_PC	HOST	10.59.1.18
6	LAN_SUBNET	SUBNET	192.168.101.0/24
7	DE_SUBNET	SUBNET	192.168.102.0/24
8	CZ_SUBNET	SUBNET	192.168.103.0/24
9	UK_SUBNET	SUBNET	192.168.104.0/24
10	FR_SUBNET	SUBNET	192.168.105.0/24
11	SE_SUBNET	SUBNET	192.168.106.0/24
12	DK_SUBNET	SUBNET	192.168.107.0/24

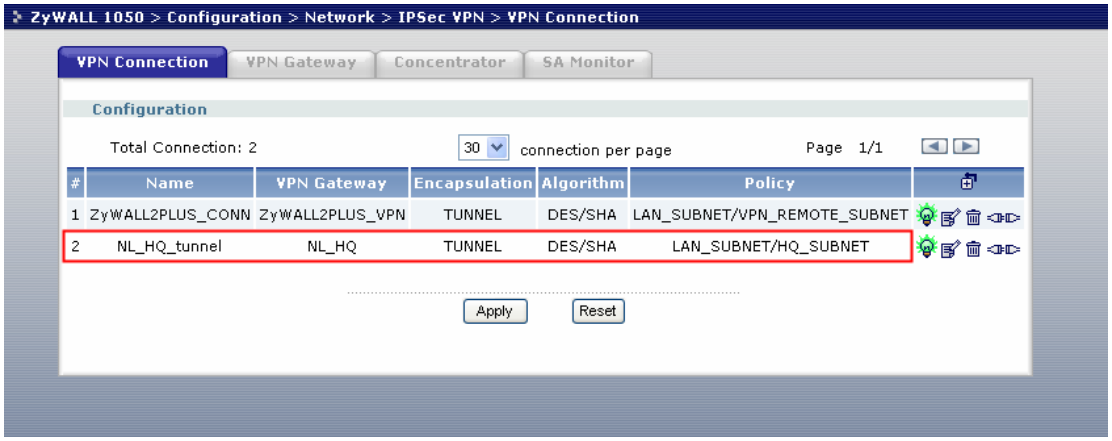
Setup **NL** site address group that includes all remote office subnets; the address object group is used for policy route destination criterion.



The screen shot below is the **NL** site VPN Gateway status page.

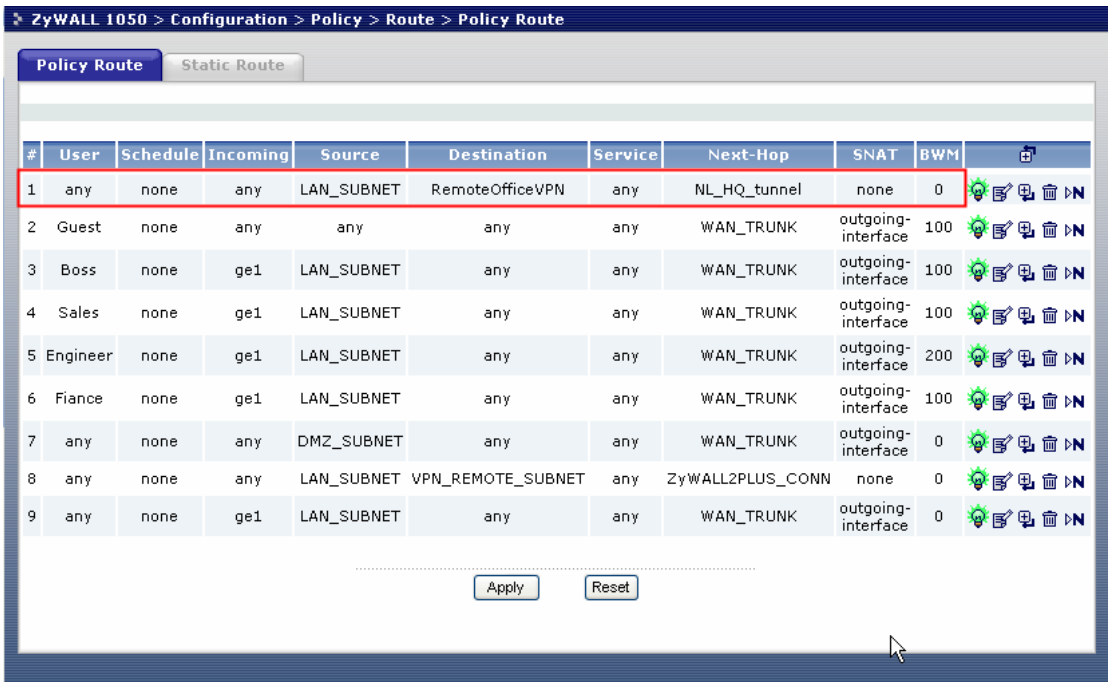


NL site VPN Connection status page



NL site policy route for VPN traffic, this policy route is used to indicate the ZyWALL1050

send the packet to VPN tunnel.



#	User	Schedule	Incoming	Source	Destination	Service	Next-Hop	SNAT	BWM
1	any	none	any	LAN_SUBNET	RemoteOfficeVPN	any	NL_HQ_tunnel	none	0
2	Guest	none	any	any	any	any	WAN_TRUNK	outgoing-interface	100
3	Boss	none	ge1	LAN_SUBNET	any	any	WAN_TRUNK	outgoing-interface	100
4	Sales	none	ge1	LAN_SUBNET	any	any	WAN_TRUNK	outgoing-interface	100
5	Engineer	none	ge1	LAN_SUBNET	any	any	WAN_TRUNK	outgoing-interface	200
6	Fiance	none	ge1	LAN_SUBNET	any	any	WAN_TRUNK	outgoing-interface	100
7	any	none	any	DMZ_SUBNET	any	any	WAN_TRUNK	outgoing-interface	0
8	any	none	any	LAN_SUBNET	VPN_REMOTE_SUBNET	any	ZyWALL2PLUS_CONN	none	0
9	any	none	ge1	LAN_SUBNET	any	any	WAN_TRUNK	outgoing-interface	0

HQ VPN concentrator configuration steps:

The next steps are introduced how to setup the VPN **concentrator** in HQ to route all remote site VPN traffic

The tunnel need to setup in HQ ZyWALL1050 is the amount of the remote sites.

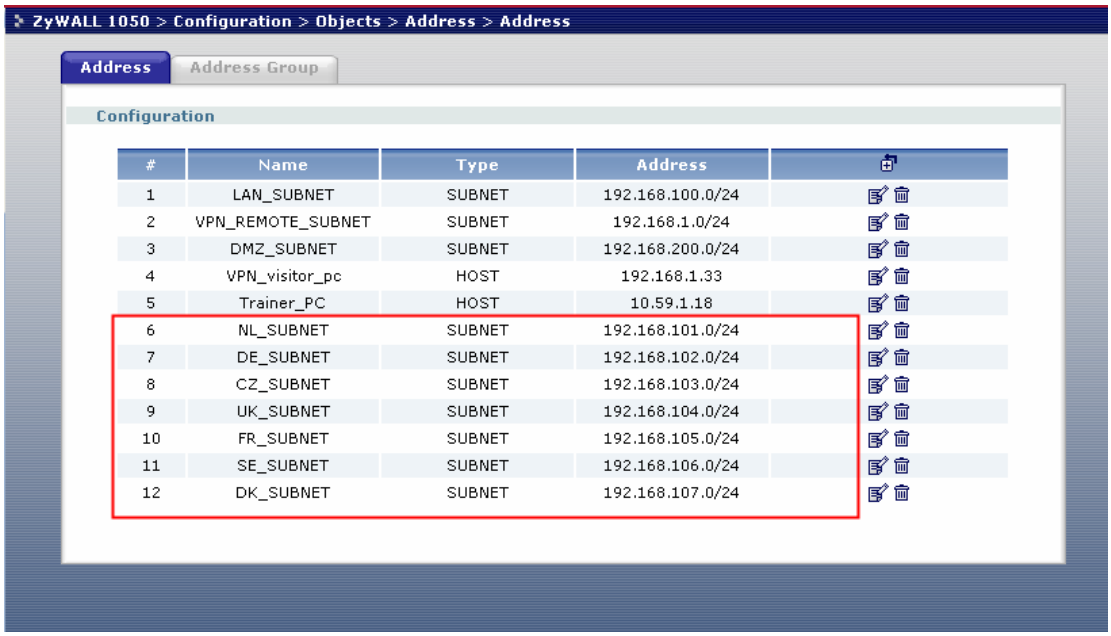
This means we need to configure 5 VPN tunnels from remote office to HQ if we want HQ to route 5 remote sites VPN traffic.

Please refer to below table for the HQ VPN tunnel setting

Remote Office	HQ
WAN: 10.59.1.11 ~ WAN: 10.59.1.17 LAN: 192.168.101.0/24 ~ LAN: 192.168.119.0/24	WAN: 10.59.1.10 LAN: 192.168.100.0/24
Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5	Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5

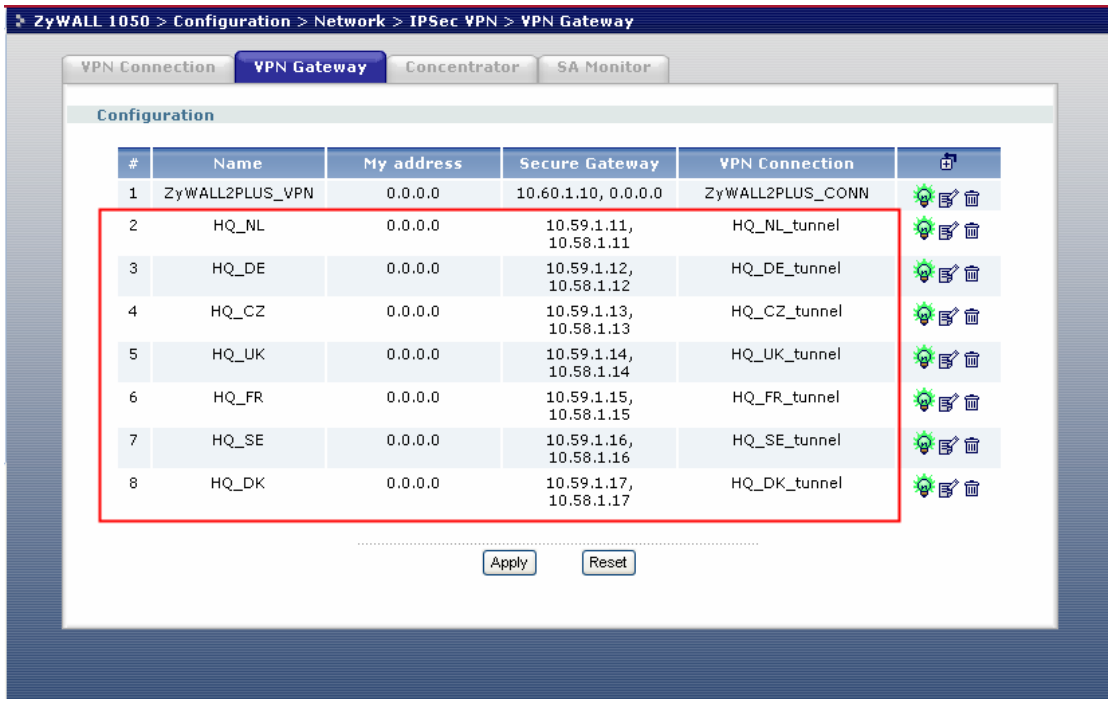
Key Group :DH1	Key Group :DH1
Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None	Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None

Setup the remote office subnets address objects for the further VPN setting.



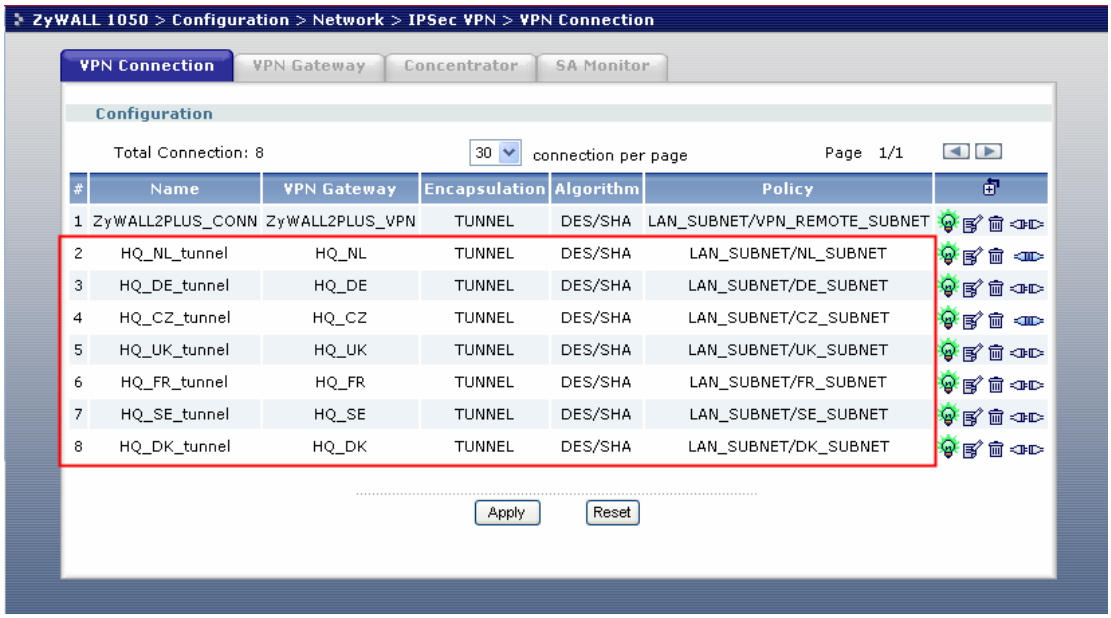
#	Name	Type	Address
1	LAN_SUBNET	SUBNET	192.168.100.0/24
2	VPN_REMOTE_SUBNET	SUBNET	192.168.1.0/24
3	DMZ_SUBNET	SUBNET	192.168.200.0/24
4	VPN_visitor_pc	HOST	192.168.1.33
5	Trainer_PC	HOST	10.59.1.18
6	NL_SUBNET	SUBNET	192.168.101.0/24
7	DE_SUBNET	SUBNET	192.168.102.0/24
8	CZ_SUBNET	SUBNET	192.168.103.0/24
9	UK_SUBNET	SUBNET	192.168.104.0/24
10	FR_SUBNET	SUBNET	192.168.105.0/24
11	SE_SUBNET	SUBNET	192.168.106.0/24
12	DK_SUBNET	SUBNET	192.168.107.0/24

Setup the HQ VPN Gateway for all remote sites



#	Name	My address	Secure Gateway	VPN Connection
1	ZyWALL2PLUS_VPN	0.0.0.0	10.60.1.10, 0.0.0.0	ZyWALL2PLUS_CONN
2	HQ_NL	0.0.0.0	10.59.1.11, 10.58.1.11	HQ_NL_tunnel
3	HQ_DE	0.0.0.0	10.59.1.12, 10.58.1.12	HQ_DE_tunnel
4	HQ_CZ	0.0.0.0	10.59.1.13, 10.58.1.13	HQ_CZ_tunnel
5	HQ_UK	0.0.0.0	10.59.1.14, 10.58.1.14	HQ_UK_tunnel
6	HQ_FR	0.0.0.0	10.59.1.15, 10.58.1.15	HQ_FR_tunnel
7	HQ_SE	0.0.0.0	10.59.1.16, 10.58.1.16	HQ_SE_tunnel
8	HQ_DK	0.0.0.0	10.59.1.17, 10.58.1.17	HQ_DK_tunnel

Setup the HQ VPN connection for all remote sites



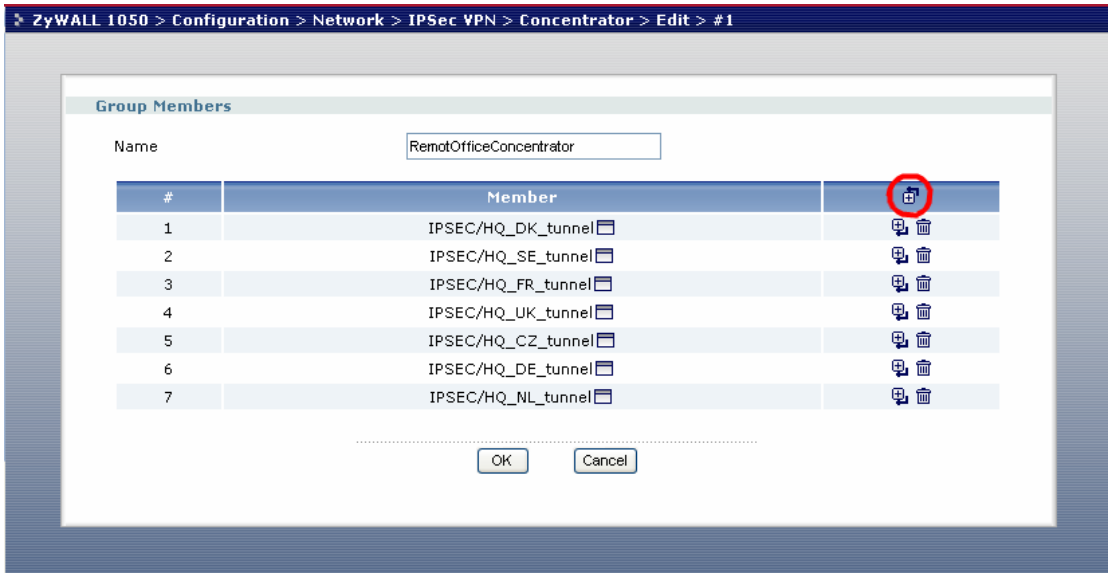
#	Name	VPN Gateway	Encapsulation	Algorithm	Policy
1	ZyWALL2PLUS_CONN	ZyWALL2PLUS_VPN	TUNNEL	DES/SHA	LAN_SUBNET/VPN_REMOTE_SUBNET
2	HQ_NL_tunnel	HQ_NL	TUNNEL	DES/SHA	LAN_SUBNET/NL_SUBNET
3	HQ_DE_tunnel	HQ_DE	TUNNEL	DES/SHA	LAN_SUBNET/DE_SUBNET
4	HQ_CZ_tunnel	HQ_CZ	TUNNEL	DES/SHA	LAN_SUBNET/CZ_SUBNET
5	HQ_UK_tunnel	HQ_UK	TUNNEL	DES/SHA	LAN_SUBNET/UK_SUBNET
6	HQ_FR_tunnel	HQ_FR	TUNNEL	DES/SHA	LAN_SUBNET/FR_SUBNET
7	HQ_SE_tunnel	HQ_SE	TUNNEL	DES/SHA	LAN_SUBNET/SE_SUBNET
8	HQ_DK_tunnel	HQ_DK	TUNNEL	DES/SHA	LAN_SUBNET/DK_SUBNET

The next step is the most important one. We need to build up a VPN concentrator to join all remote sites VPN traffic.

Switch to ZyWALL 1050 > Configuration > Network > IPSec VPN > Concentrator and then click the add icon to add a new concentrator.

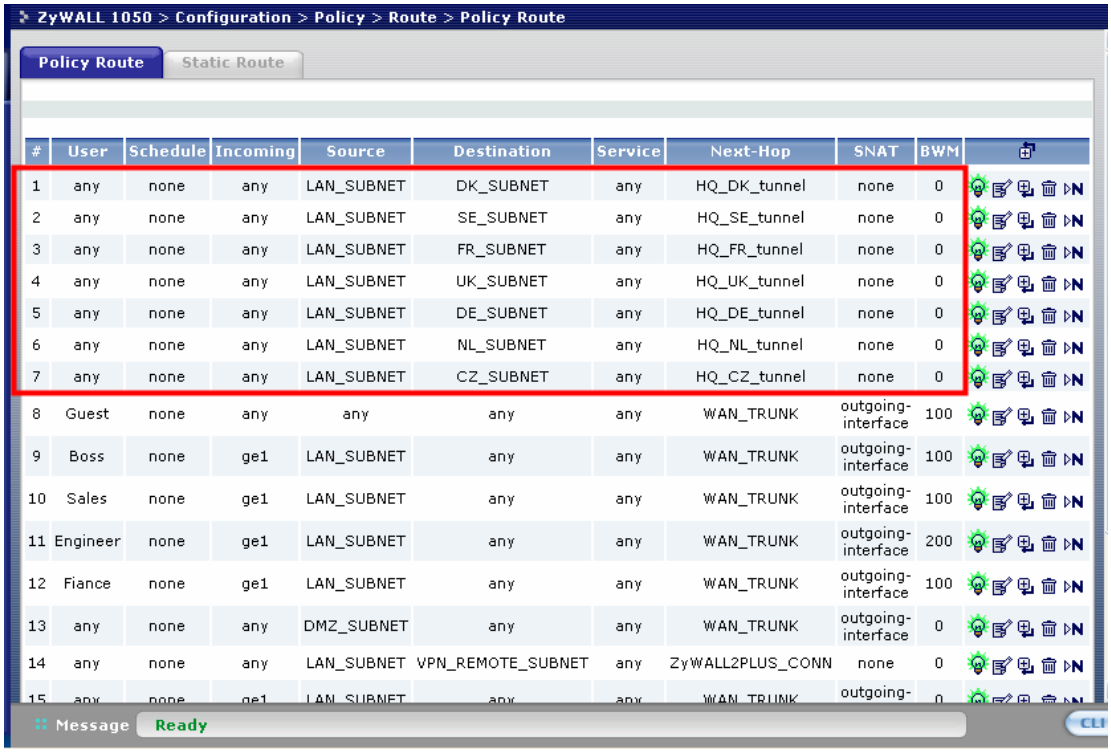
Under concentrator edit page click the add icon to add VPN connection to join this concentrator. The VPN traffic can be routed by HQ once the VPN connection had been

added to the concentrator. User doesn't need to add any policy route to the VPN tunnel when this tunnel already included in the concentrator.



Now, all the remote VPN tunnels had been linked to the HQ concentrator and remote site can reach other remote site via HQ after the VPN concentrator setup.

The VPN concentrator is design to route the remote site VPN traffic; user still need to setup the policy route for local subnet VPN traffic. For example, we only setup the VPN concentrator for HQ and remote site A & B then the A subnet can connect to B subnet but HQ subnet can't connect either A nor B subnet.
Thus, this depends on how customers want to deploy their Global VPN network.
We can add follow policy route to let HQ subnet also can connect with all concentrator's remote subnet.

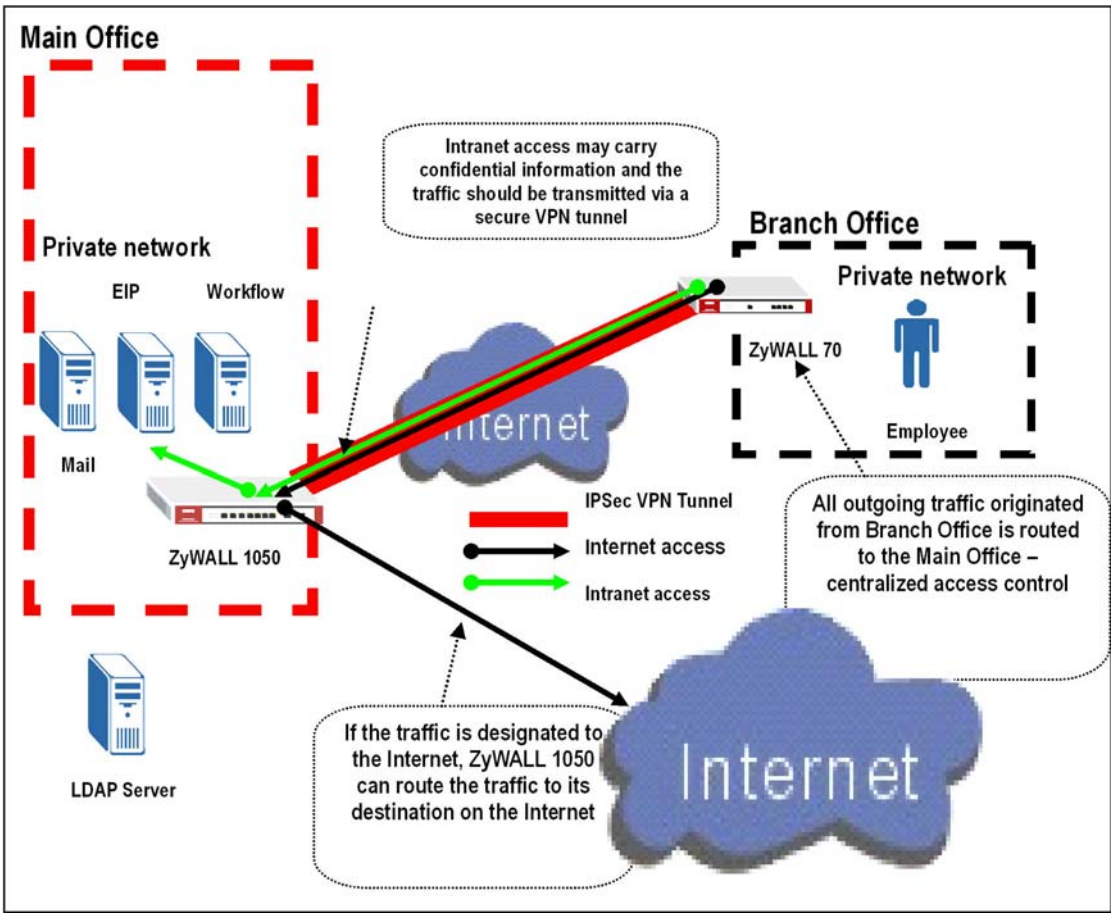


#	User	Schedule	Incoming	Source	Destination	Service	Next-Hop	SNAT	BWM
1	any	none	any	LAN_SUBNET	DK_SUBNET	any	HQ_DK_tunnel	none	0
2	any	none	any	LAN_SUBNET	SE_SUBNET	any	HQ_SE_tunnel	none	0
3	any	none	any	LAN_SUBNET	FR_SUBNET	any	HQ_FR_tunnel	none	0
4	any	none	any	LAN_SUBNET	UK_SUBNET	any	HQ_UK_tunnel	none	0
5	any	none	any	LAN_SUBNET	DE_SUBNET	any	HQ_DE_tunnel	none	0
6	any	none	any	LAN_SUBNET	NL_SUBNET	any	HQ_NL_tunnel	none	0
7	any	none	any	LAN_SUBNET	CZ_SUBNET	any	HQ_CZ_tunnel	none	0
8	Guest	none	any	any	any	any	WAN_TRUNK	outgoing-interface	100
9	Boss	none	ge1	LAN_SUBNET	any	any	WAN_TRUNK	outgoing-interface	100
10	Sales	none	ge1	LAN_SUBNET	any	any	WAN_TRUNK	outgoing-interface	100
11	Engineer	none	ge1	LAN_SUBNET	any	any	WAN_TRUNK	outgoing-interface	200
12	Fiance	none	ge1	LAN_SUBNET	any	any	WAN_TRUNK	outgoing-interface	100
13	any	none	any	DMZ_SUBNET	any	any	WAN_TRUNK	outgoing-interface	0
14	any	none	any	LAN_SUBNET	VPN_REMOTE_SUBNET	any	ZyWALL2PLUS_CONN	none	0
15	any	none	ge1	LAN_SUBNET	any	any	WAN_TRUNK	outgoing-	0

1.5 Internet Access via Central Gateway

1.5.1 VPN Tunnel to Central Side (ZyWALL 70 to ZyWALL 1050)

The scenario is to direct all outgoing traffic originated from branch office to main office so that network admin and control traffic or apply additional secure access control or inspection.



Main office – ZyWALL 1050	Branch office – ZyWALL 70
My Address: ge2, 10.59.1.55 Security Gateway Address: 10.59.1.69	My Address: 10.59.1.69 Security Gateway Address: 10.59.1.55

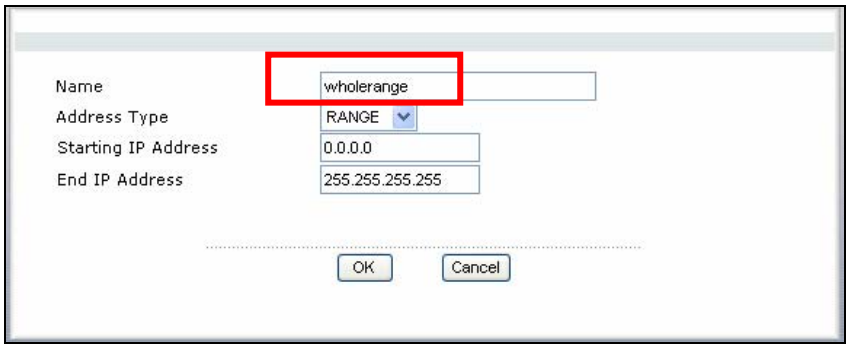
Local ID Type: IP, 1.1.1.1 Peer ID Type: IP, Any Local: Range, 0.0.0.0-255.255.255.255 Remote: Subnet, 192.168.1.0/24	Local ID Type: IP, 1.1.1.1 Peer ID Type: IP, 1.1.1.1 Local network: Subnet, 192.168.1.0/24 Remote network: Range, 0.0.0.0-255.255.255.255
Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1	Phase 1 Negotiation Mode : Main Pre-share key: 123456789 Encryption :DES Authentication :MD5 Key Group :DH1
Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None	Phase2 Encapsulation: Tunnel Active Protocol: ESP Encryption: DES Authentication: SHA1 Perfect Forward Secrecy (PFS): None

Thus, we are going to complete the tasks:

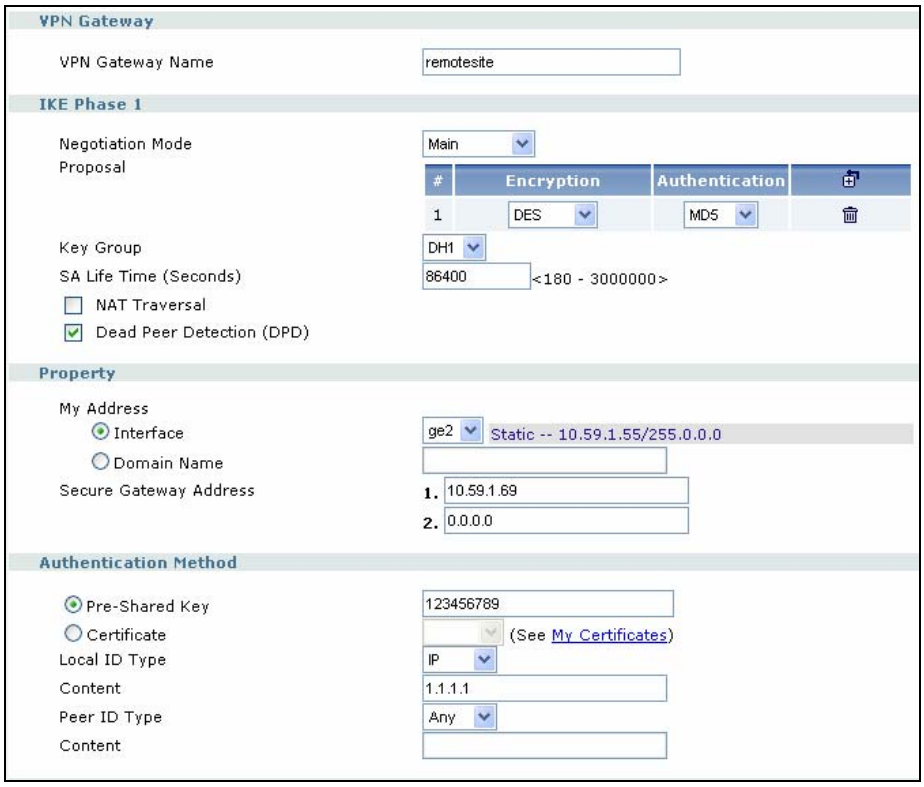
- Create object 'Address' for remote network ranging from 0.0.0.0 to 255.255.255.255 on ZyWALL1050
- Configure VPN gateway and connection setting on ZyWALL1050
- Configure the corresponding VPN setting on ZyWALL70

See the configuration step-by-step as following.

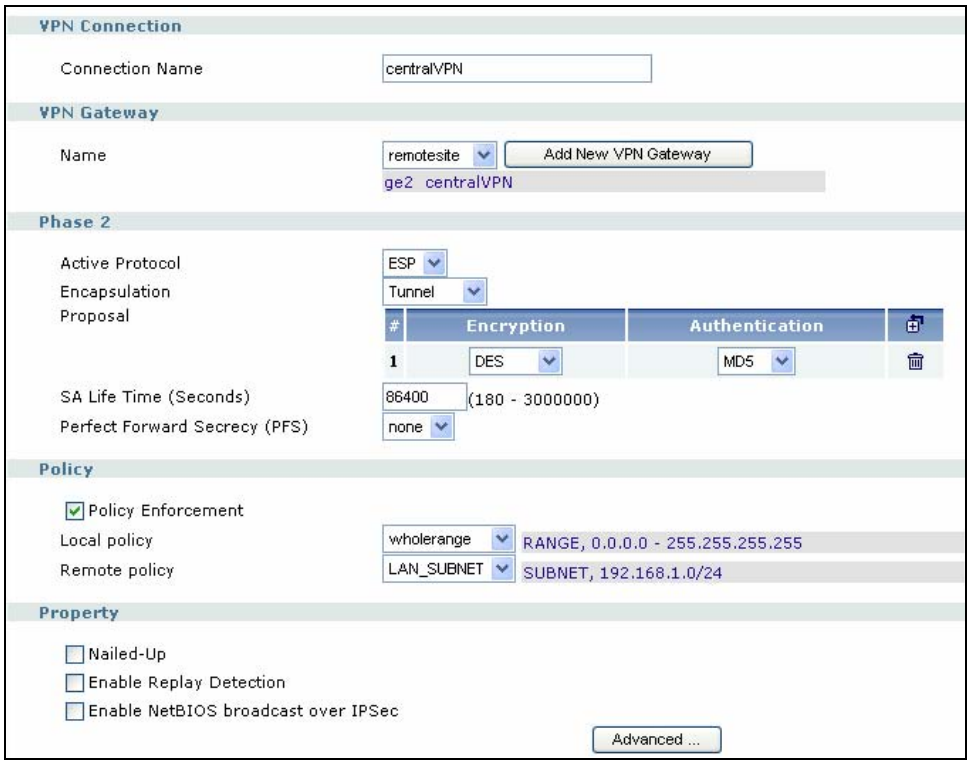
1) Login ZyWALL 1050 GUI and go to **Configuration** > **Object** >**Address** to create an address object for all incoming traffic.

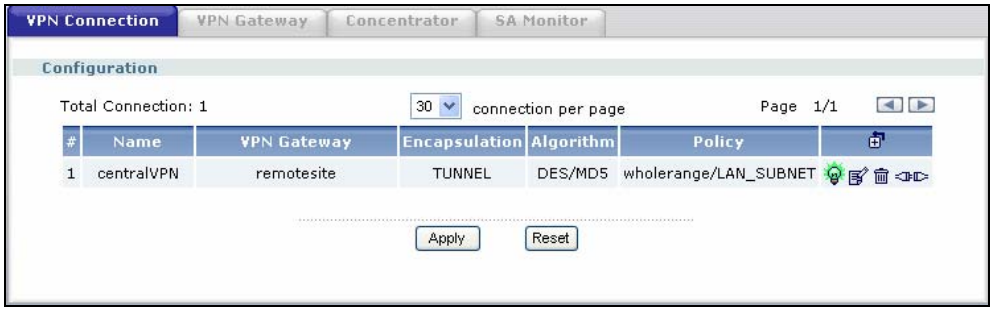


2) Switch to **Configuration** > **Network** > **IPSec VPN** > **VPN Connection** > **VPN Gateway** to set VPN Gateway. Here we select 'ge2' as **My Address**. We put 10.59.1.69 for **Security Gateway Address** and 123456789 for **Pre-Shared Key** .Also IP with value 1.1.1.1for **ID Type**. For other parameters, we remain them as default. There's no special settings for these parameters and the main concern is to let VPN peer match each other.



3) Go back to **Configuration** > **Network** > **IPSec VPN** >**VPN Connection** to set VPN Connection. Here we choose the gateway which has been configured in the step2 as VPN gateway. Because such VPN tunnel is used for central site, we should specify **Local policy** as a range of 0.0.0.0-255.255.255.255. This range has been predefined in step1. So here we just select it in the drop down list. Here we suppose peer subnet as 192.168.1.x and select the default address object 'LAN_SUBNET' to meet our requirement.





The CLI command for application:

Address Object:

```
[0] address-object wholerange 0.0.0.0-255.255.255.255
```

Remote Gateway:

```
[0] isakmp policy remotesite
[1] mode main
[2] transform-set des-md5
[3] lifetime 86400
[4] no natt
[5] dpd
[6] local-ip interface ge2
[7] peer-ip 10.59.1.69 0.0.0.0
[8] authentication pre-share
[9] keystring 123456789
[10] local-id type ip 1.1.1.1
[11] peer-id type any
```

```
[12] xauth type server default deactivate
[13] group1
```

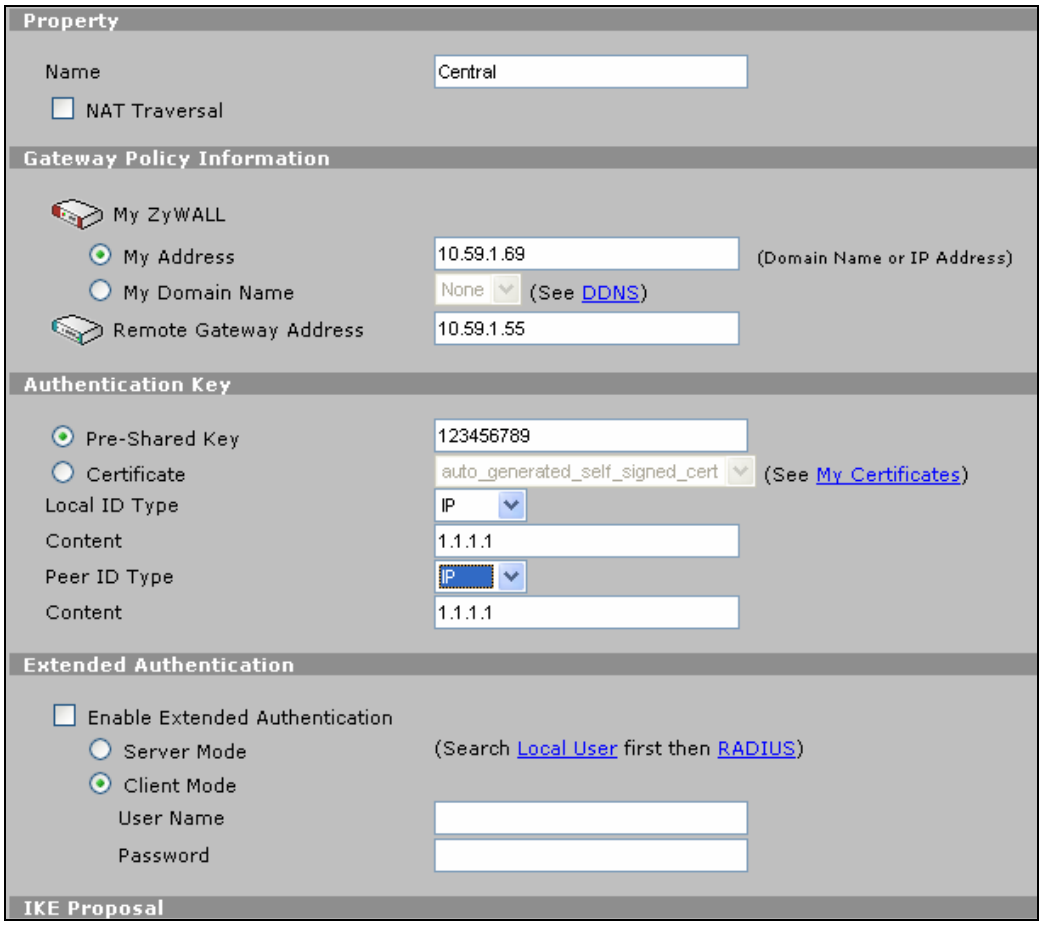
VPN Connection:

```
[0] crypto map centralVPN
[1] ipsec-isakmp remotesite
[2] encapsulation tunnel
[3] transform-set esp-des-md5
[4] set security-association lifetime seconds 86400
[5] set pfs none
[6] policy-enforcement
[7] local-policy wholerange
[8] remote-policy LAN_SUBNET
[9] no nail-up
[10] no replay-detection
[11] no netbios-broadcast
[12] no out-snat activate
[13] no in-snat activate
[14] no in-dnat activate
```

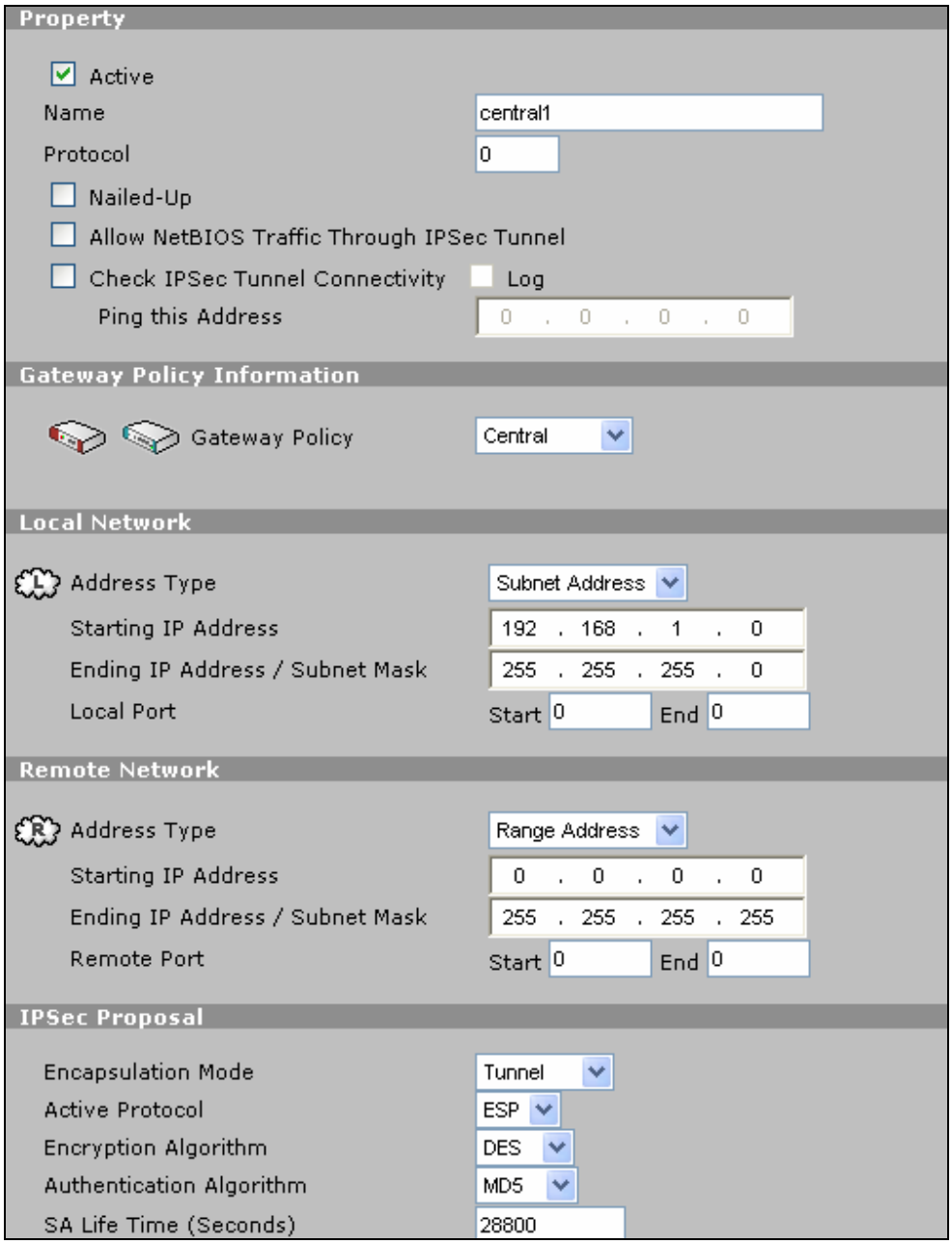
4) Go to GUI of ZyWALL 70 to configure VPN rule.

Go to **Security** >**VPN** to set IKE rules. We put 10.59.1.69 for **My Address** and 10.59.1.55 for **Remote Gateway** Address also 123456789 for **Pre-Shared Key.**

For other parameter we let them match those in the ZyWALL 1050.



Go to **Associated Network Policies** of this rule to configure IPSec rule. Please notice that Remote Network should be in 0.0.0.0-255.255.255.255 range.



Tips for application:

1. Make sure the **Pre-Shared Key** is the same in local and remote gateway.
2. Make sure the **IKE proposal** is the same in local and remote gateway.
3. Select the correct **Interface** for VPN connection on ZyWALL1050.
4. The **Local** and **Peer ID type** and content must opposite not in the same content.
5. The **Local Policy** of ZyWALL1050 should be the range of 0.0.0.0-255.255.255.255 then it can take the role as central center to control all the outgoing traffic from branch.

2. Security Policy Enforcement

What is a security policy?

Security policy, in the context of information security, defines an individual or an object's access privilege to information assets which is very important for company and it will impact company a lot if the security policy didn't be considered and deployed well. We could say that it is a mandatory process to protect information assets.

For example, ZyCompany doesn't want their guest or vendor to be able to access their internal network but allow them to access Internet in case they have to get some information outside like access their company's email. So ZyCompany defines a security policy--outsider could use 'guess/guess1234'to access Internet through wireless access, but it's forbidden for them to access company's Internal resource, like talk to LAN PC, access with DMZ servers, or access to branch office's data through VPN's environment.

What your business can be benefited from deployment of security policy?

Deploy security policy well could not only protect company information asset, but also increase overall productivity, mitigate the impact of malicious application or misuse, and compliant with regulatory.

2.1 Managing IM/P2P Application

2.1.1 Why bother to manage IM/P2P applications?

Because some virus/exploits which may cause security breaches are transmitted via IM/P2P applications, manage IM/P2P application well could mitigate security breaches. Besides, restricting access to IM/P2P applications can help employees focusing on his/her job to increase productivity and reduce misuse of network resources, e.g. bandwidth.

2.1.2 What does ZyWALL 1050 provide for managing IM/P2P applications?

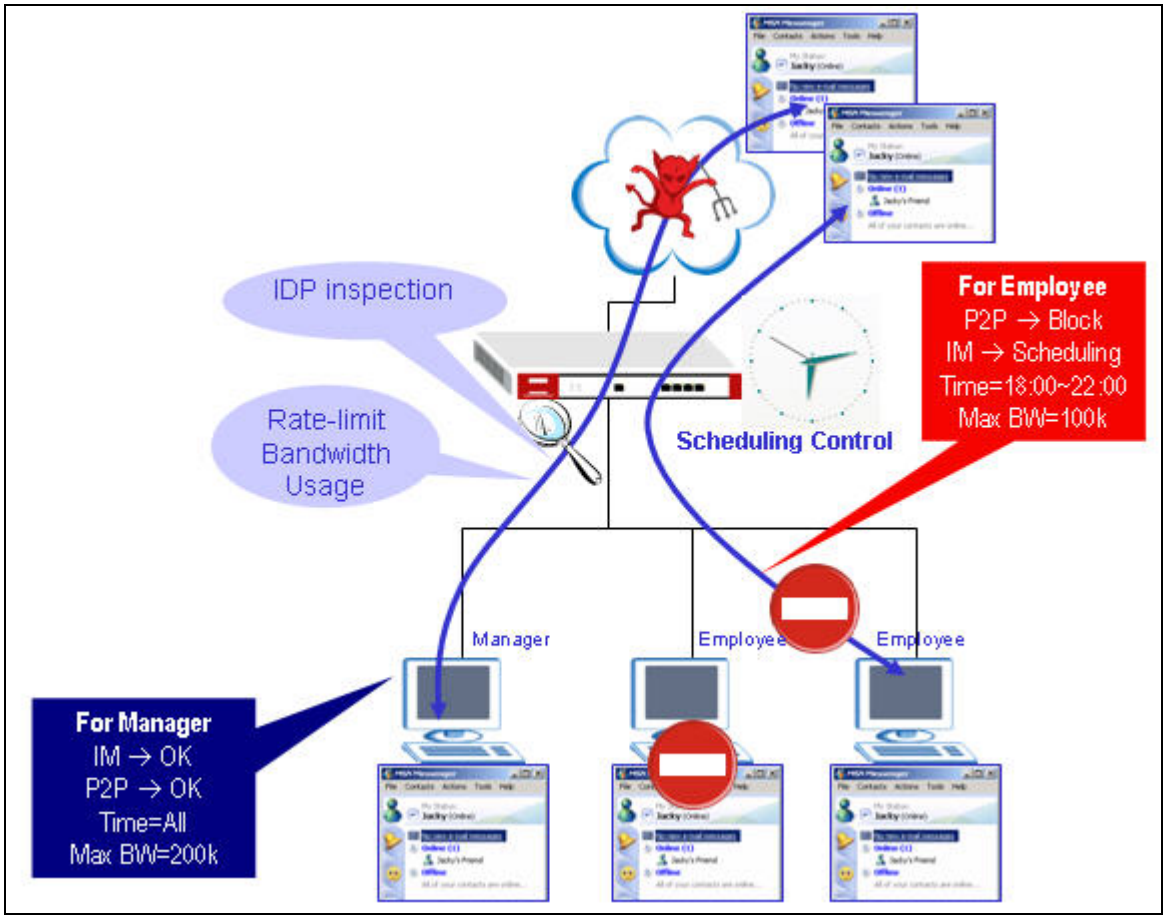
ZyWALL provides best solution to solve the rigidity of the “all-or-nothing” approach and can meet customer’s expectation.

1. Application patrol: it can “recognize” IM/P2P applications and IT administrators can leverage it to restrict access to IM/P2P applications

2. Access granularity: combined with access granularity, IT admin can enforce flexible policy against IM/P2P applications.

   ZyWALL1050’s access granularity for controlling hazardous IM/P2P applications:
   - By User/Group
   - By Time of access
   - By Bandwidth

2.1.3 Configuration Example



Here we show you an example. ZyCompany has rule to define some employees cannot use P2P/IM while some employees are not allowed to use P2P all the time but could use IM after work during 18:00 ~ 22:00 and the max bandwidth could be used is 100k. For managers, company's policy allows them to use IM and P2P applications all the time but max bandwidth for them is still controlled not over 200k. Besides, both traffic will be inspected by IDP and be monitored by bandwidth usage to prevent security threats from Internet through the applications.

We are going to complete following setting.

1. Create user/group object
2. Create schedule object
3. Configure layer 7 application control -- App Patrol
4. Configure Policy Route
5. Configure IDP

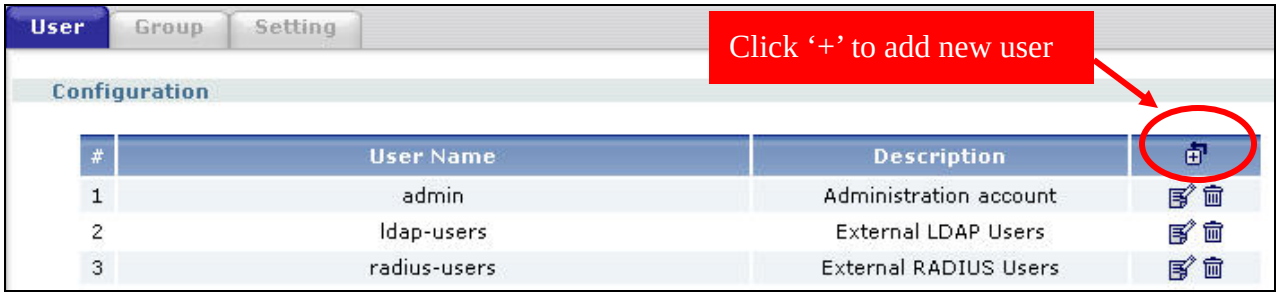
Let's see how to configure in ZW1050 step by step as following.

Step1. Create user/group object

1. We are going to create several users for different group.

user	group	P2P access	IM access	Time for access	Bandwidth
Victor	**Manager**	ok	ok	IM+P2P(all the time)	IM+P2P <=200k
Peter	**Engineer1**	X	X	N/A	N/A
John	**Engineer2**	X	ok	IM-(18:00 ~ 22:00)	IM <=100K

2. Go to menu **Configuration** >> **User/Group** >> **User tab**, add user 'Victor' as following figure.



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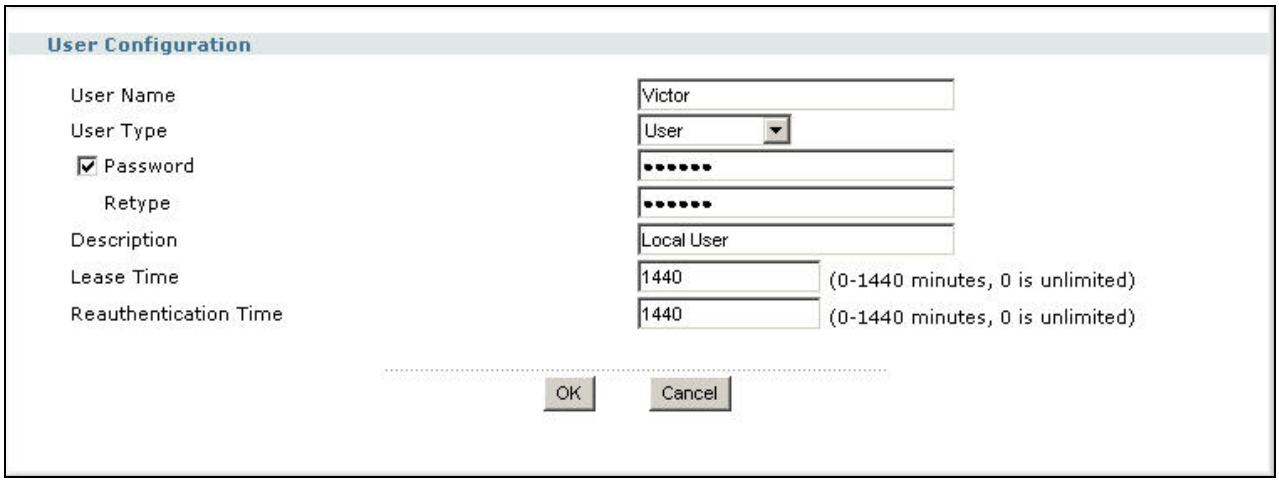
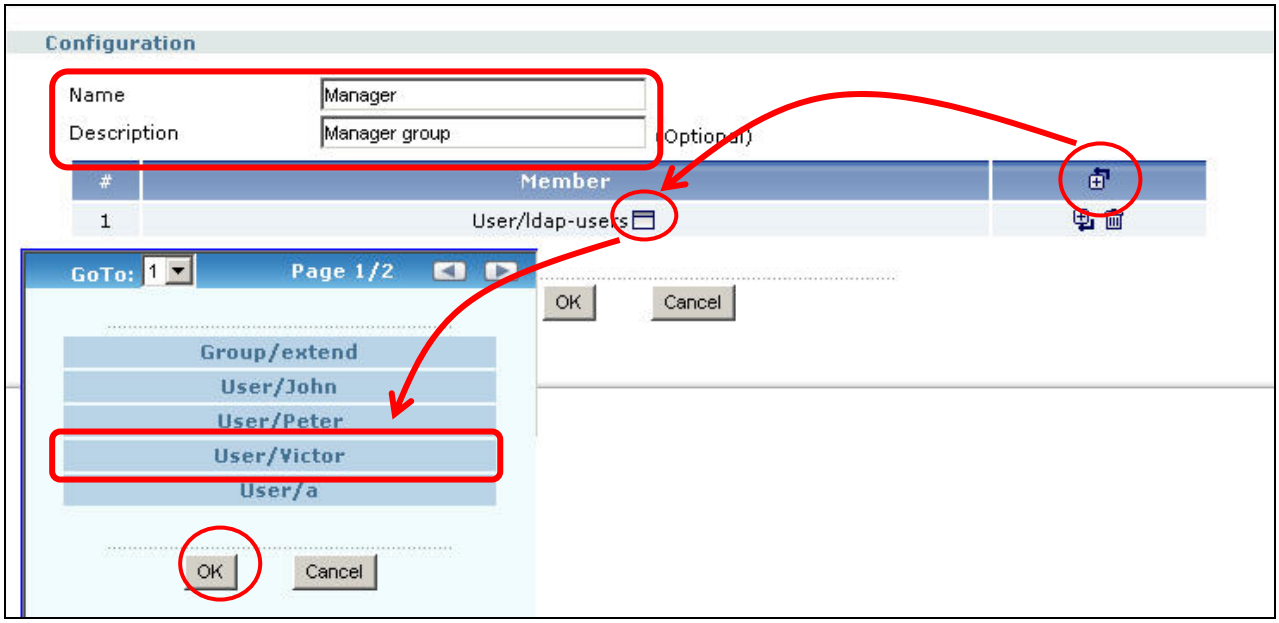


Corresponding CLI commends for your reference

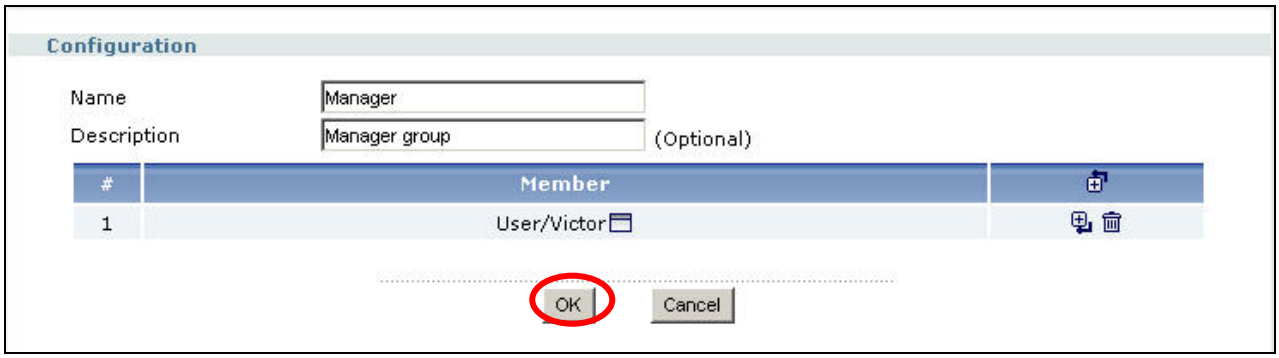
```
[0] username Victor password 1234 user-type user
[1] username Victor description Local User
[2] username Victor logon-lease-time 1440
[3] username Victor logon-re-auth-time 1440
```

3. Switch to Group tab, create group 'Manager' and add member 'Victor' to it as the

following figure.



4. Then press 'OK' button to complete the group creation.



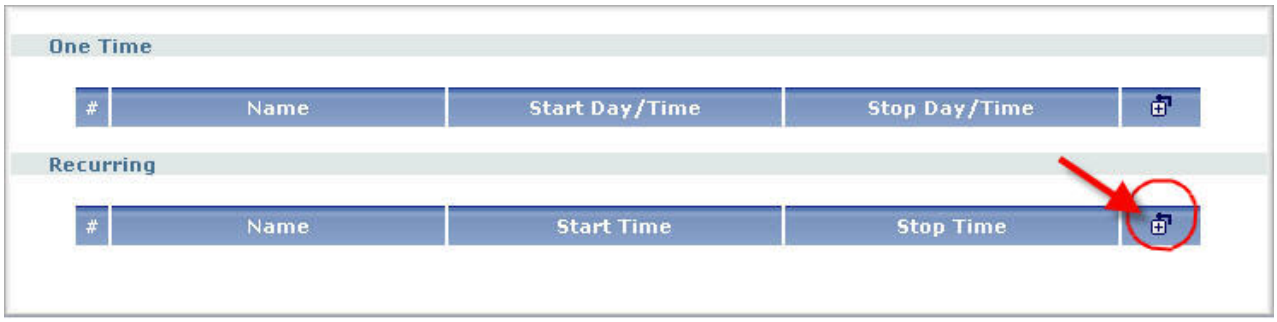
Corresponding CLI commends for your reference

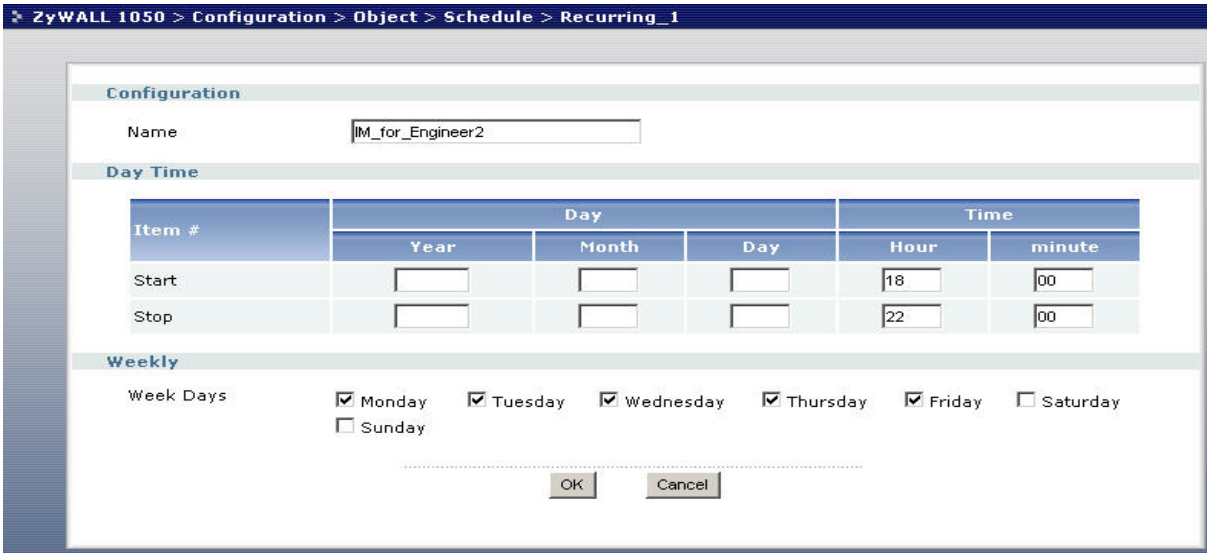
```
[0] groupname Manager
[1] description Manager group
[2] user Victor
[3] exit
```

5. Create two more group 'Engineer1' and Engineer2' to add 'Peter' and 'John' in through similar configuration.

Step2. Create schedule object

1. Go to menu **Object** >> **Schedule**, click the "+" from the Recurring schedule to create a new schedule as following figures.



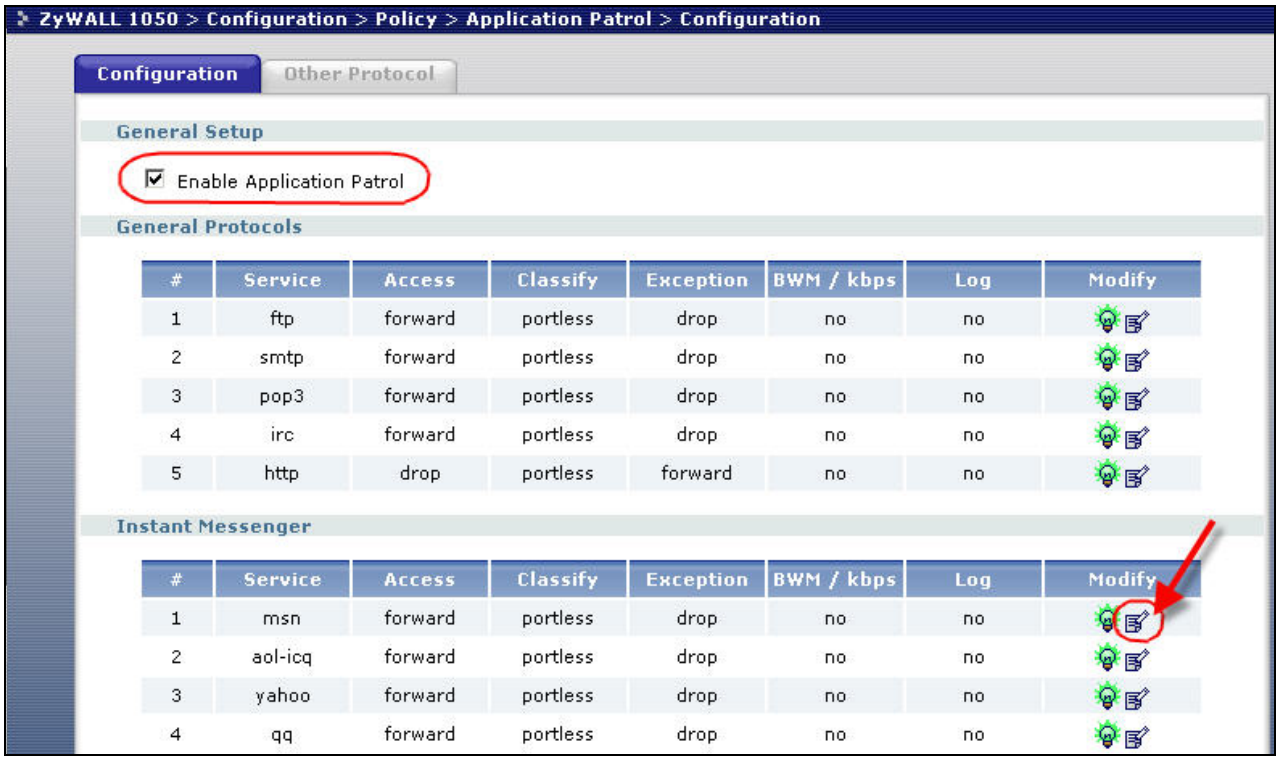


- Corresponding CLI commends for your reference

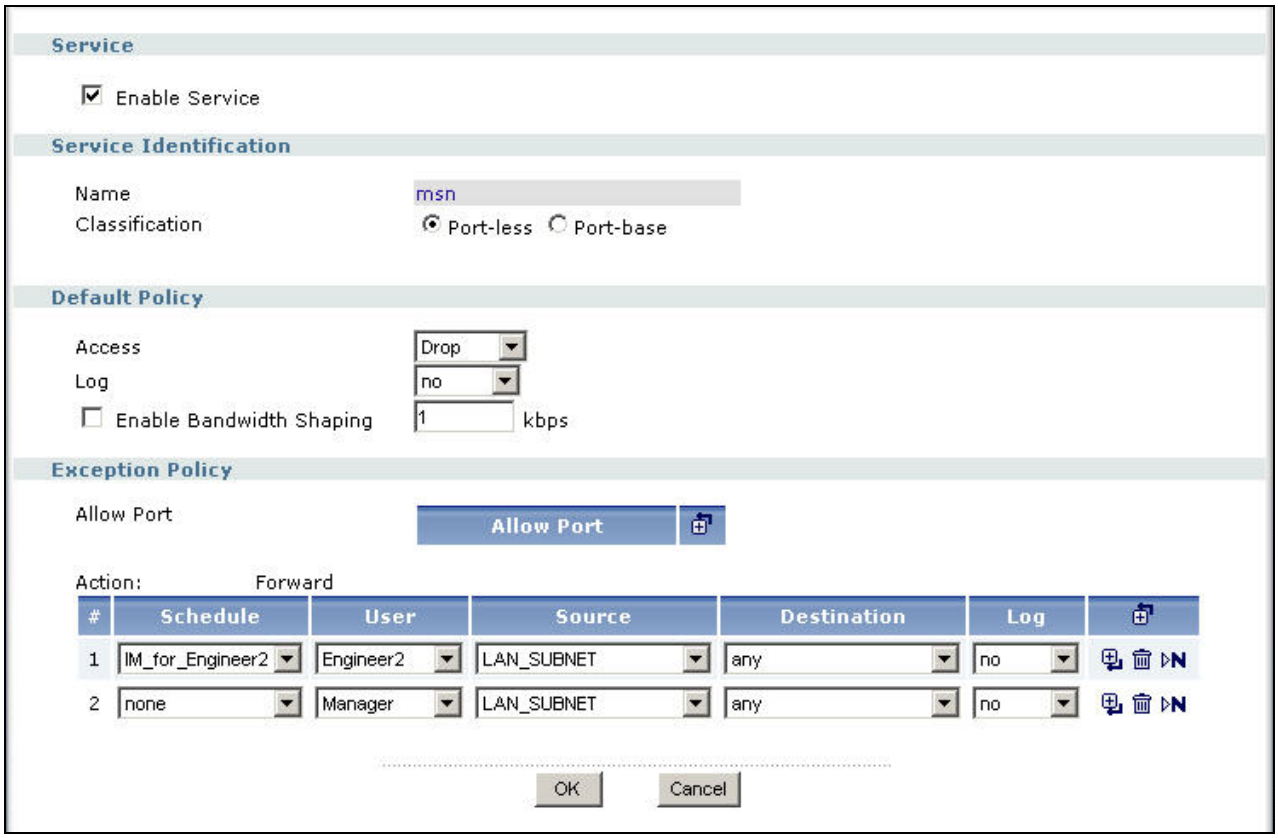
```
[0] schedule-object IM_for_Engineer2 18:00 22:00 mon tue wed thu
fri
```

Step3. Configuration in L7 application control -- App Patrol

1. Go to menu **Configuration** >> **Policy** >> **APP. Patrol**
2. Enable the application patrol.
3. Choose the application to define further setting. In Instant Messenger and Peer-to-Peer category, there are several applications allowed to be configured. We take 'MSN' for example. Click the modify icon to perform further configuration.



4. Enable the service
5. Choose the classification ‘Port-less’ to enable layer 7 packet inspection.
6. Choose access ‘Drop’, then the action in the exception policy will become ‘Forward’ automatically.
7. Click ‘+’ to add two exceptions rules for 2 groups, Engineer2 and Manager, as the figure shown below.



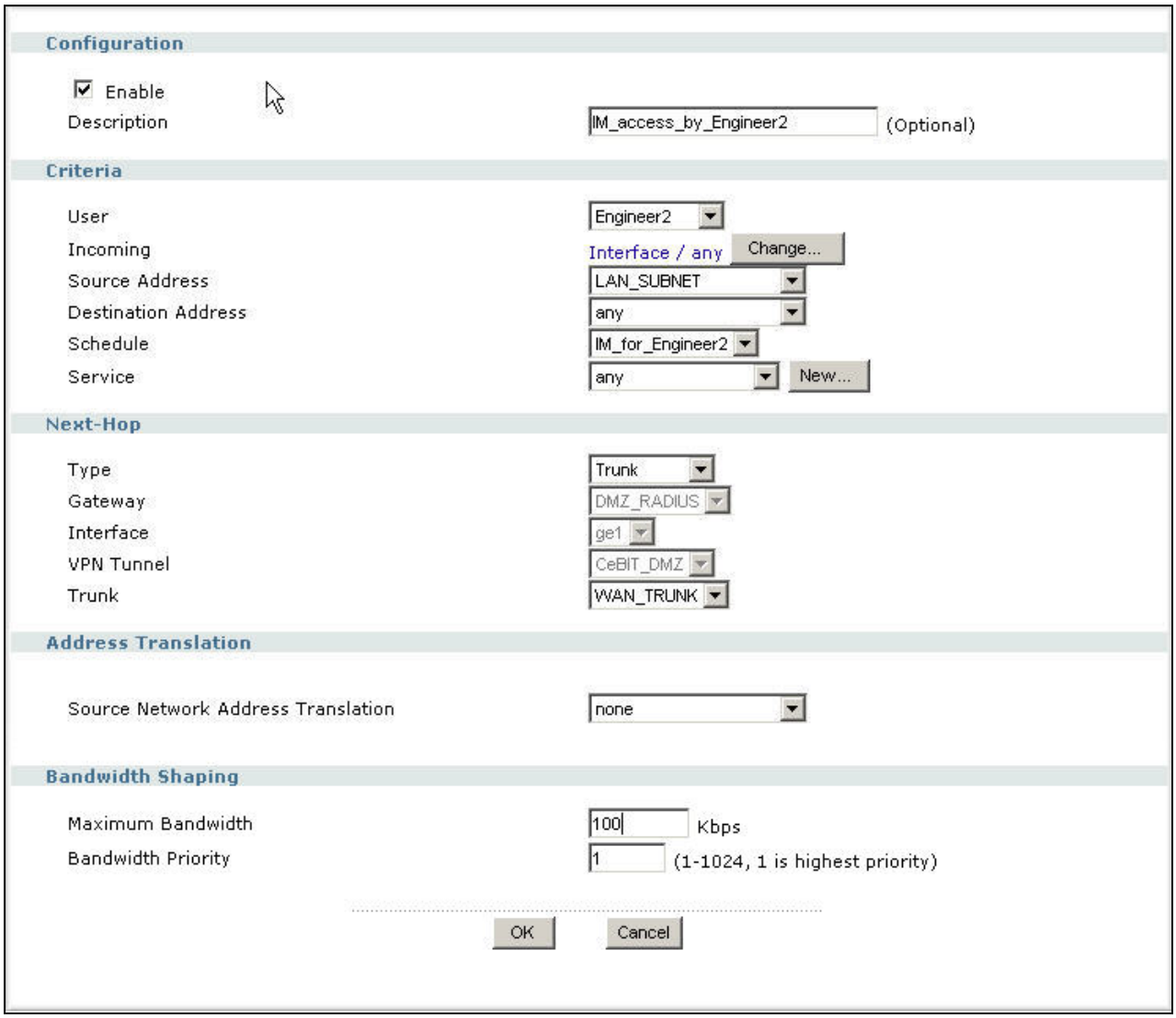
Corresponding CLI commends for your reference

```
[0] app msn drop exception forward
[1] no app msn log
[2] app msn activate
[3] app msn mode portless
[4] no app msn bwm
[5] app msn bandwidth 1
[6] app msn exception 1
[7] schedule IM_for_Engineer2
[8] user Engineer2
[9] source LAN_SUBNET
[10] no destination
[11] no log
[12] exit
[13] app msn exception 2
[14] no schedule
[15] user Manager
[16] source LAN_SUBNET
[17] no destination
[18] no log
[19] exit
```

Step4. Configuration in Policy Route

1. Got to menu **Configuration** >> **Policy** >> **Route**

2. Create a new policy route rule by clicking '+' icon. And fill out the setting as the figure shown below.
3. Note that:
   we choose user the group 'Engineer2'
   source from LAN subnet
   Schedule as what we just created named 'IM_for_Engineer2'
   From Next-Hop, choose 'Trunk' and choose 'WAN_Trunk' from Trunk field.
   Input the maximum bandwidth is 100Kbps.
4. Press **OK** button to complete the setting.



Corresponding CLI commends for your reference

```
[0] policy 1
[1] no deactivate
[2] description IM_access_by_Engineer2
[3] user Engineer2
[4] no interface
```

```
[5] no tunnel
[6] source LAN_SUBNET
[7] destination any
[8] schedule IM_for_Engineer2
[9] service any
[10] next-hop trunk WAN_TRUNK
[11] no snat
[12] bandwidth 100 priority 1
[13] exit
```

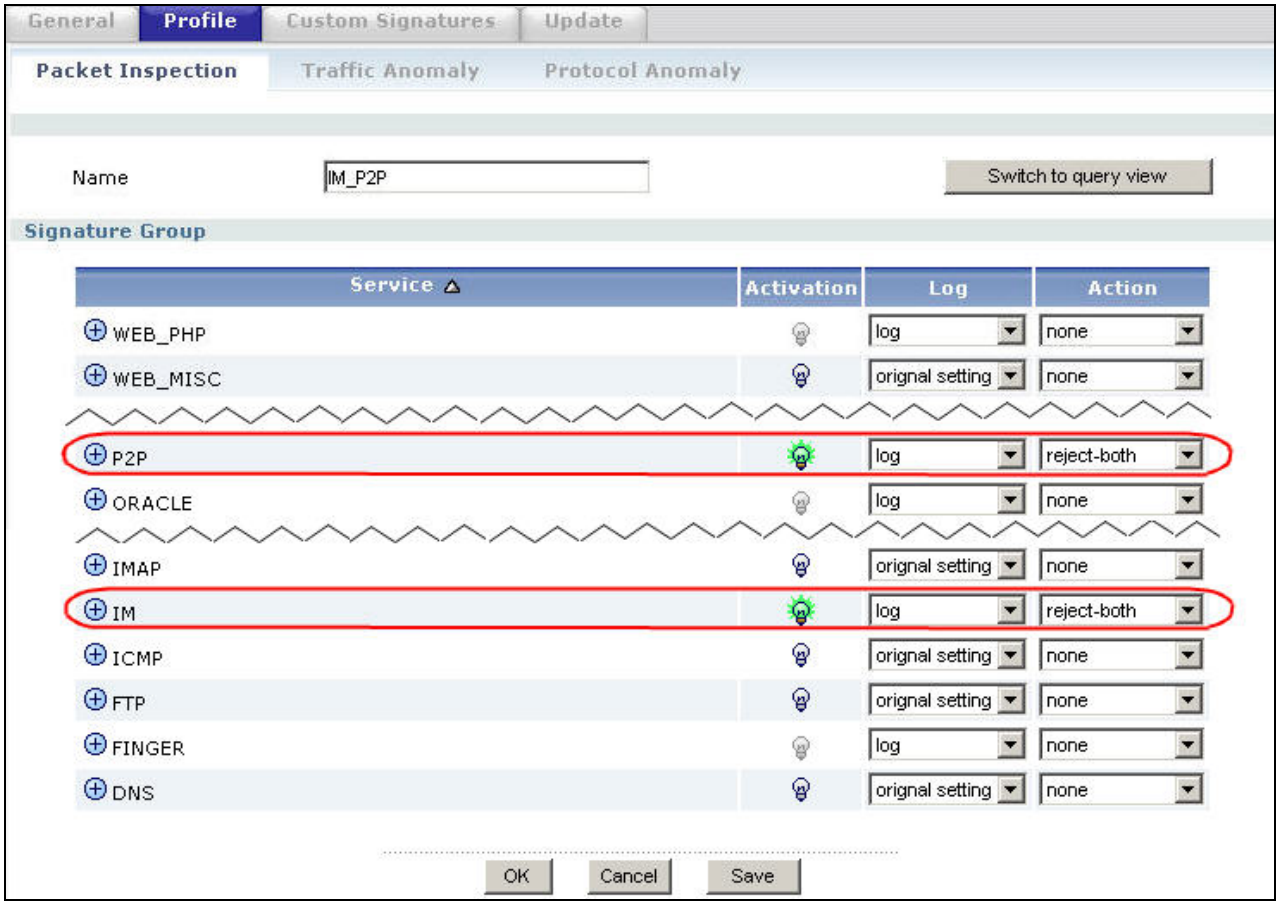
6. Then create another policy route rule for group 'Manager'. You will get the result as below after both rules are done.

Policy Route | Static Route

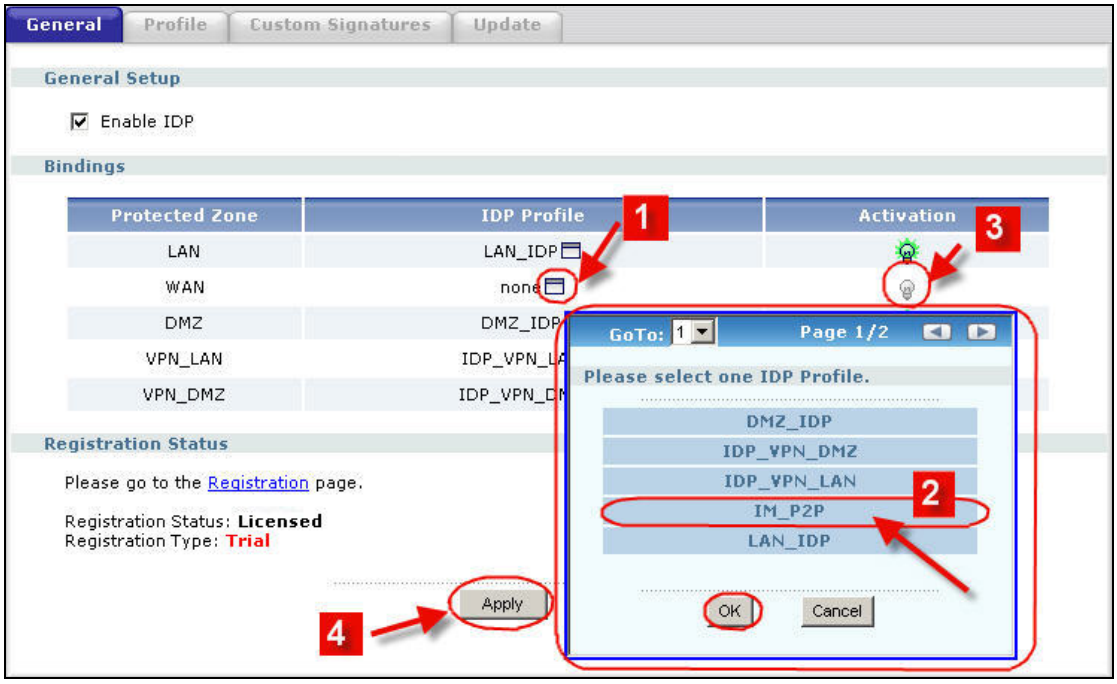
#	User	Schedule	Incoming	Source	Destination	Service	Next-Hop	SNAT	BWM	
1	Engineer2	IM_for_Engineer2	any	LAN_SUBNET	any	any	WAN_TRUNK	none	100	
2	Manager	none	any	LAN_SUBNET	any	any	WAN_TRUNK	none	200	

Step5. Configuration in IDP

1. First of all, make sure that you've registered and enable IDP function from menu Registration.
2. Then create an IDP profile by going to the menu **Policy** >> **IDP** >> **Profile tab** >> **Packet inspection tab**.
3. Name it as 'IM_P2P' and enable IM and P2P from application list.
4. Click **Ok** button then.



5. Back to **IDP** >> **General**, choose the IDP profile we just created for WAN zone as the figure below.
6. Enable it and click **Apply** button then.



2.2 Managing WLAN

2.2.1 Why the wireless networks need to be managed?

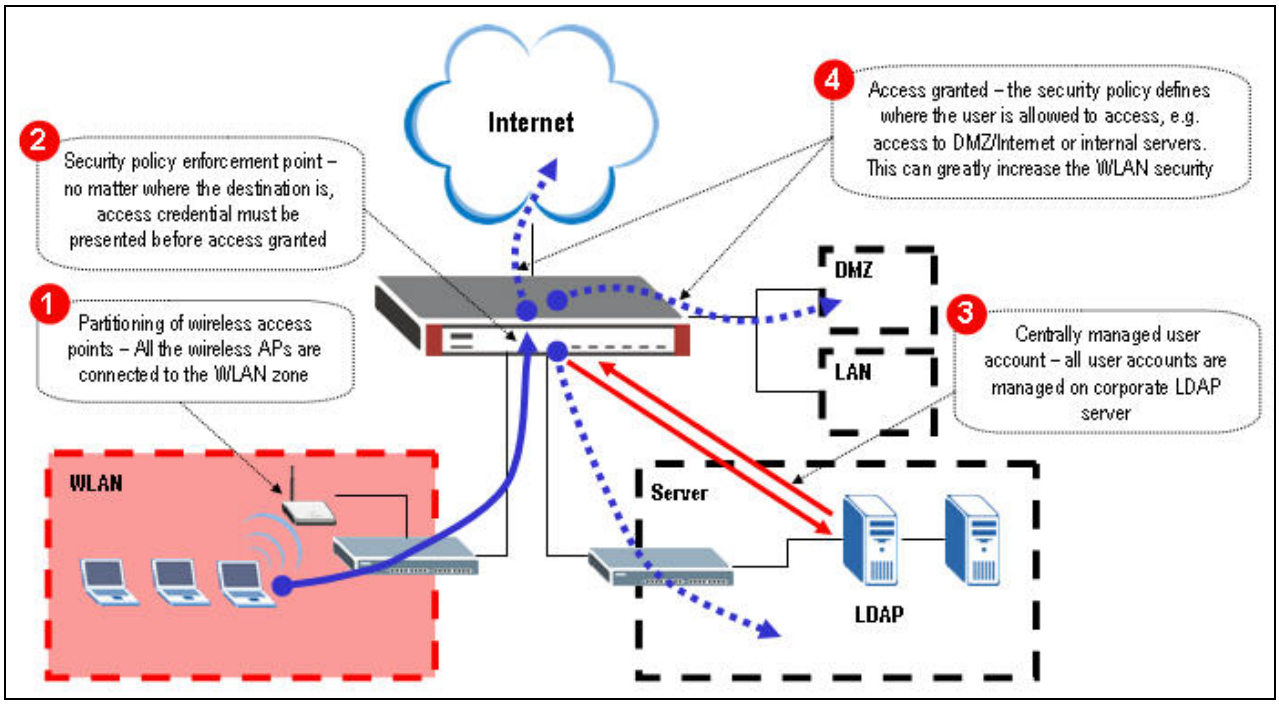
Wireless network reduce the cost of wired cabling and brings convenience to people to access anytime and anywhere like in the office or in a community. However, it might be harmful under certain condition:

1. People misuse – People who you don't know might probe your AP and break you're your network without your permission. We usually called it "Wardriving". When you are using wireless link to transfer confidential data, those important data might be eavesdropped by the temper guy.

2. People mis-configuration – In company, it's MIS's headache to control the "Rogue APs". Employees might connect an AP with non-security-mechanism or weak WEP/WAP passphrase to company's network without informing MIS people. It will create a security hole to allow outsides by pass the company's security checking and to access the company's confidential information or even use tools to damage the company's network service.

2.2.2 What can we do against wireless insecurity?

We recommend that Wireless AP must be isolated from your Intranet and a mechanism to centrally manage access privileges and access credentials regardless of wired or wireless clients.



So we are going to complete following setting.

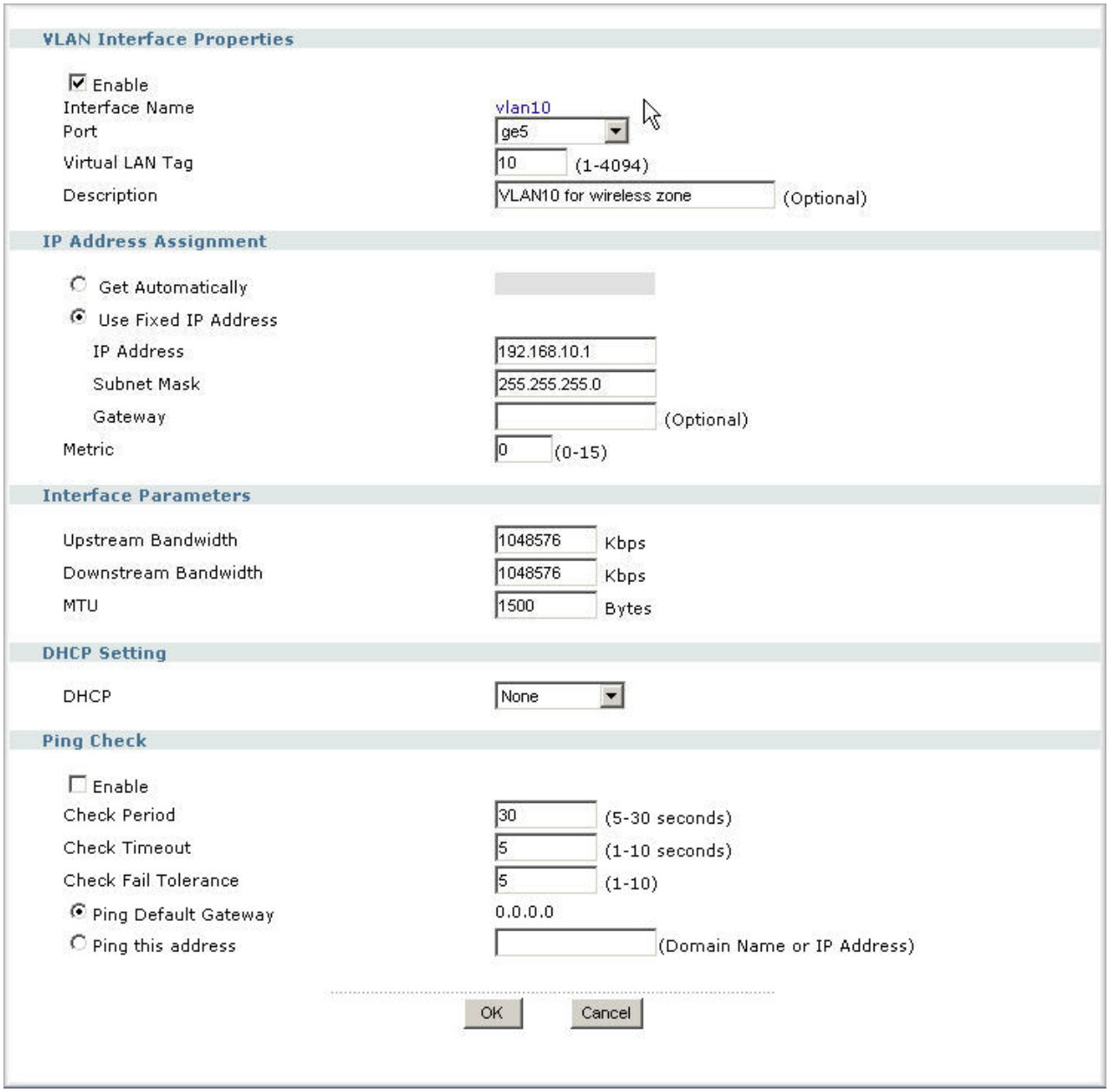
1. Create a VLAN interface dedicate for wireless access
2. Define WLAN zones
3. Enable Force Authentication Page Redirect
4. Configure LDAP server information.
5. Configure WWW Authentication Method
6. Define user/group to have different access granted

Step1. Create a VLAN interface dedicate for wireless access

In this example, all employees or visitors might access Internet through wireless network. For visitors, we want them limit their access to Internet only while employees can access all including LAN/DMZ zones. Through packet with VLAN tag added, it will be controlled by ZyWALL acting as a security guide to open which door(route) for packets according to LDAP server's authentication.

1. Go to menu **Network** >> **Interface** >> **VLAN**.
2. Create a VLAN interface binds with interface ge5 for wireless network. Here we define,
   Interface name is vlan10 (same as vlan tag id for not confusing)
   Physical port choose 'ge5' interface that we want to bind with
   Virtual VLAN Tag is 10
   Give it a clear description
   Use fixed IP address with 192.168.10.1/24

Leave other fields as default and press ‘ok’ button



Step2. Define WLAN zones

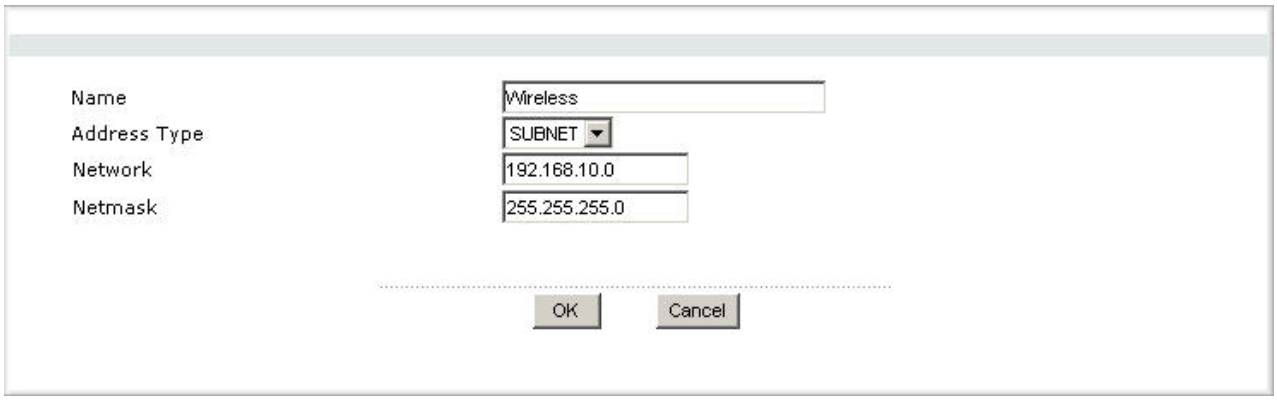
Go to menu **Network** >> **Zone**. Define a zone for wireless and it binds with interface “vlan10”.

Corresponding CLI commends for your reference

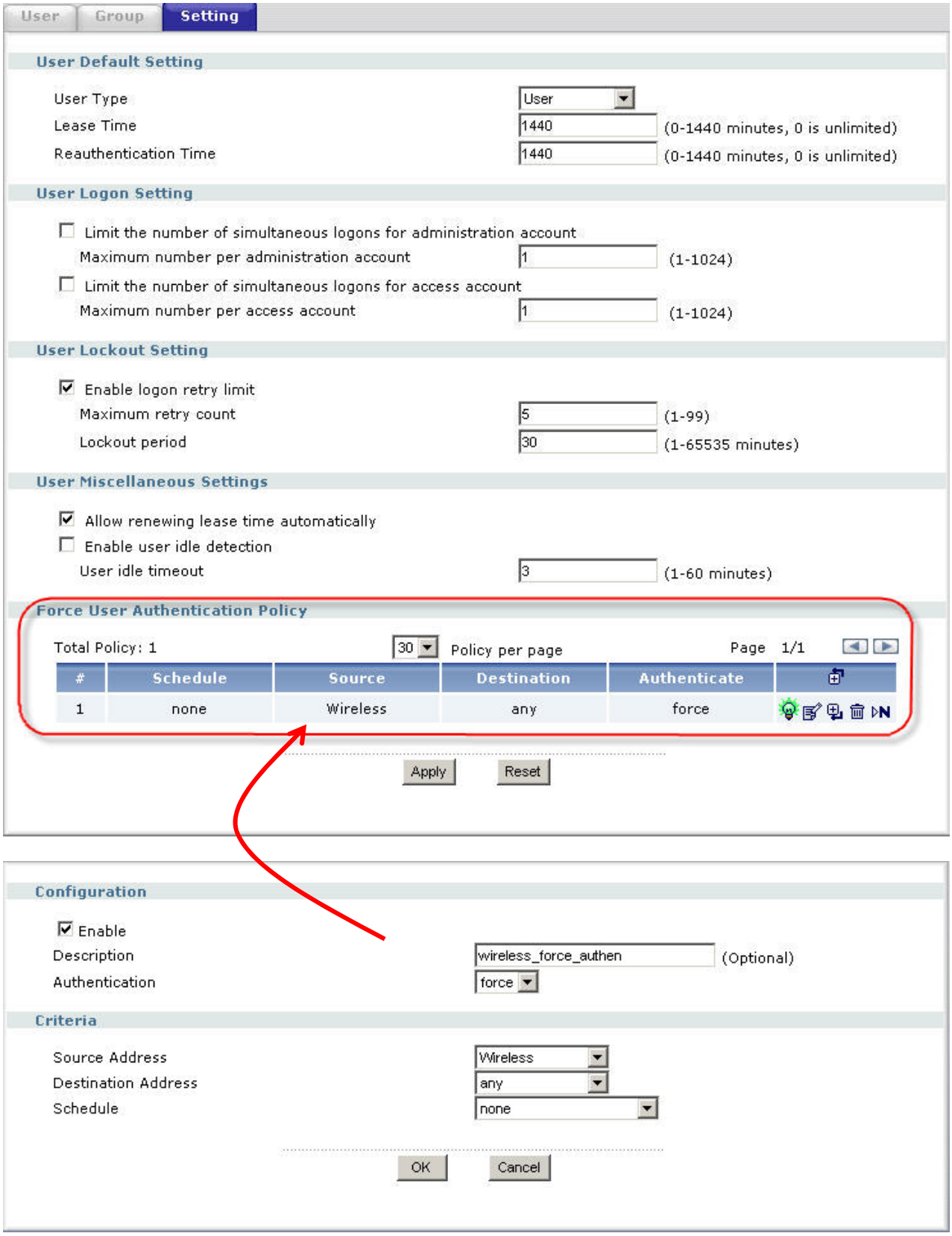
```
[0] zone Wireless_Zone
[1] no block
[2] interface vlan10
[3] exit
```

Step3. Enable Force Authentication Page Redirect

1. Go to menu **Object** >> **Address**, to create a subnet for wireless network. Name it 'Wireless' for further configuration use.

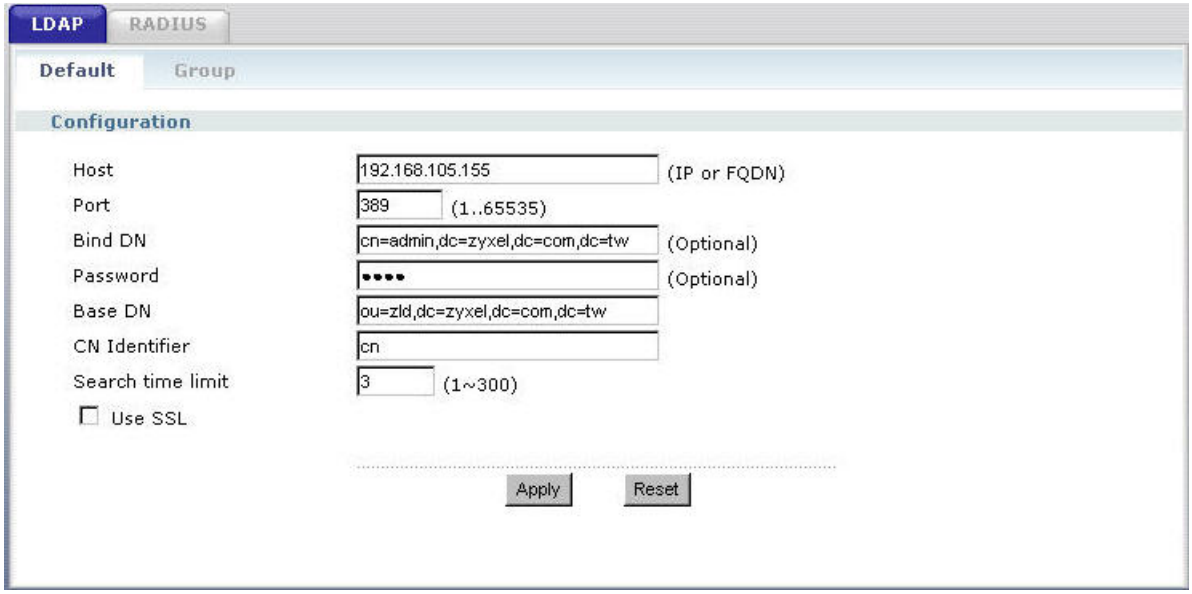


2. Go to menu **User/Group** >> **Setting** >> **Force User Authentication Policy**, click '+' to force all packets from wireless network will be redirected to the authentication page.



Step4. Configure LDAP server information.

1. Go to menu **Object** >> **AAA server** >> **LDAP tab** >> **Default**, configure the IP address, port and other necessary information. Click **Apply** button then.

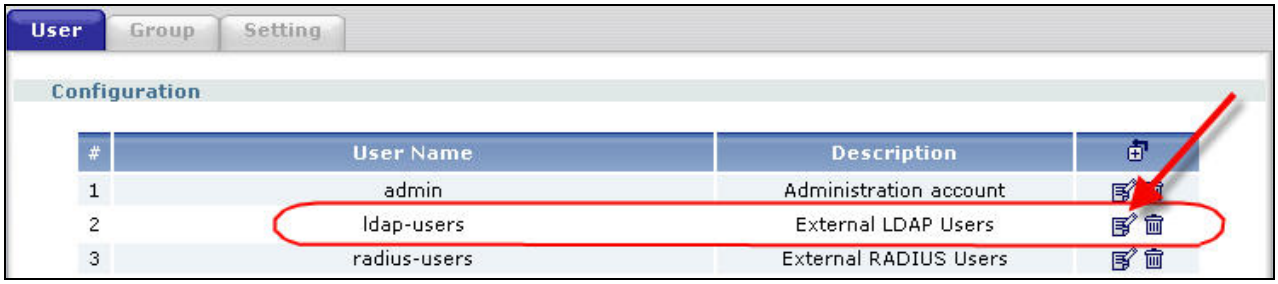


Note: Please consult your LDAP server admin to configure this part since LDAP has special setting than RADIUS server.

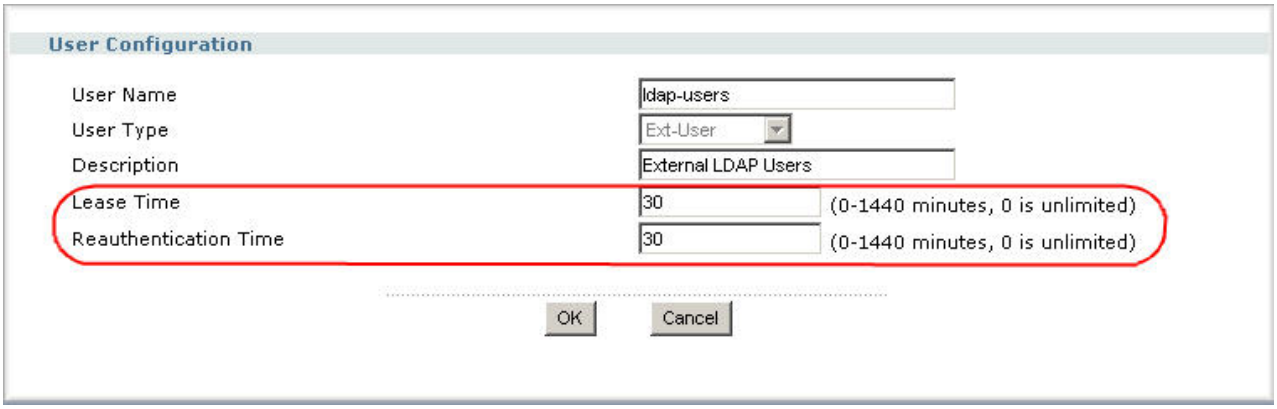
Corresponding CLI commends for your reference

```
[0] ldap-server host 192.168.105.155
[1] no ldap-server ssl
[2] ldap-server port 389
[3] ldap-server password 1234
[4] ldap-server basedn ou=ald,dc=zyxel,dc=com,dc=tw
[5] ldap-server binddn cn=admin,dc=zyxel,dc=com,dc=tw
[6] ldap-server search-time-limit 3
[7] ldap-server cn-identifier cn
```

2. Co-work with LDAP server admin to create user/groups with lease time / re-authentication time attributes configured.
3. Go to menu **User/Group** >> **User**, configure user “ldap-users” for “non-employees” by clicking the modify icon.

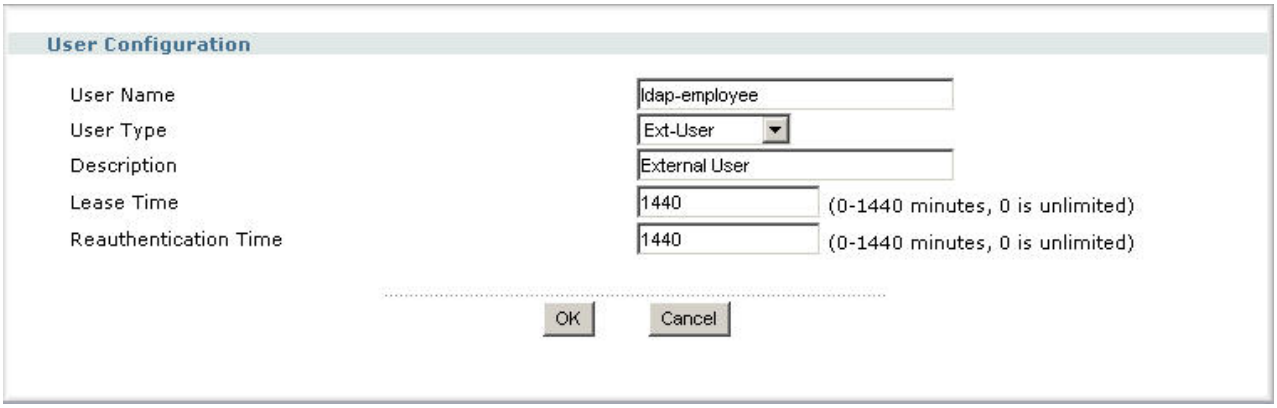


4. For security concern, those user's attributes which cannot be found in LDAP server will get shorter lease and re-authentication time. Here we use 30 minutes for example.



Corresponding CLI commends for your reference

```
[0] username ldap-users user-type ext-user
[1] username ldap-users description External LDAP Users
[2] username ldap-users logon-lease-time 30
[3] username ldap-users logon-re-auth-time 30
```

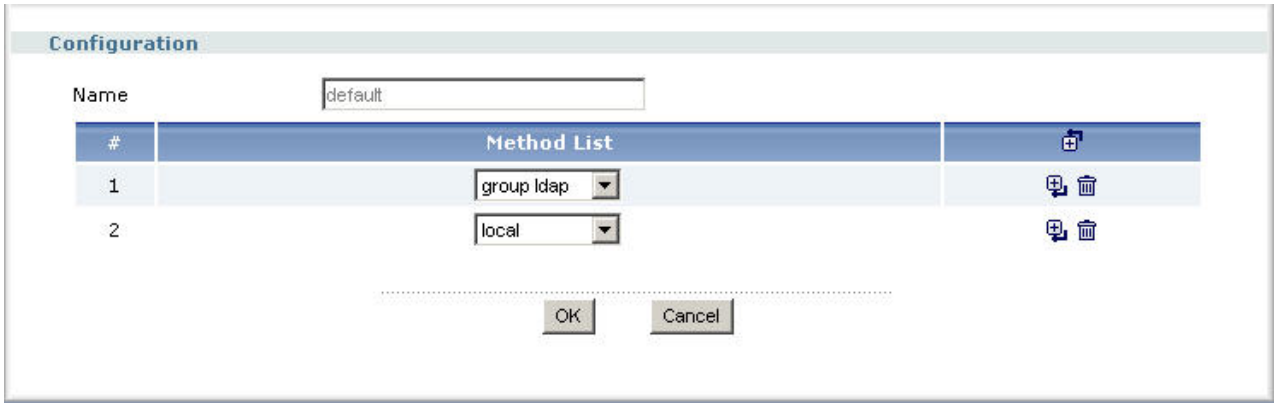


Corresponding CLI commends for your reference

```
[0] username ldap-employee user-type ext-user
[1] username ldap-employee description External User
[2] username ldap-employee logon-lease-time 1440
[3] username ldap-employee logon-re-auth-time 1440
```

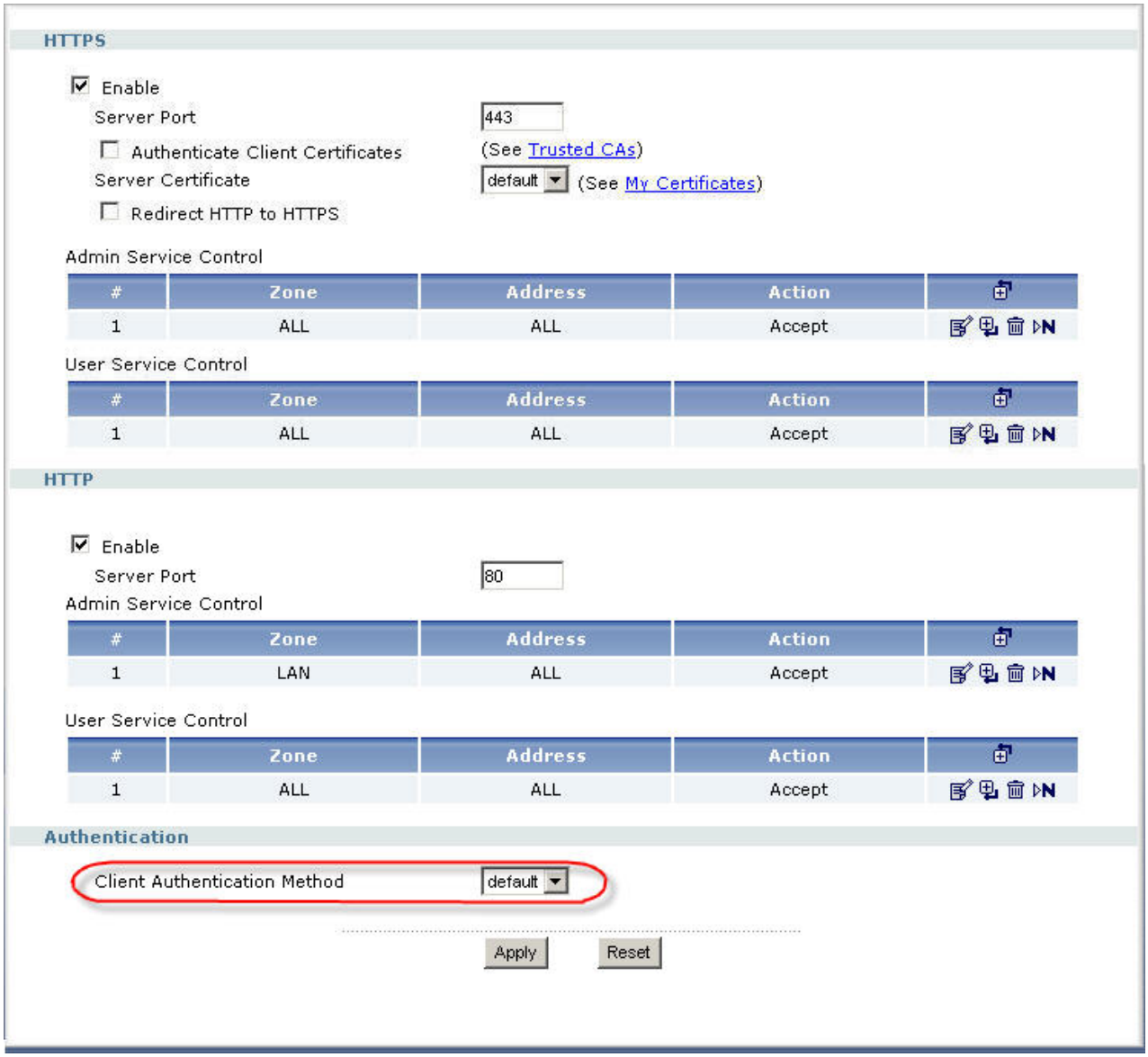
Step5. Configure WWW Authentication Method

1. Go to menu **Object** >> **AAA server**, modify the 'default' profile.
2. Configure the profile as following to be authenticated by LDAP server then local database in ZyWALL.



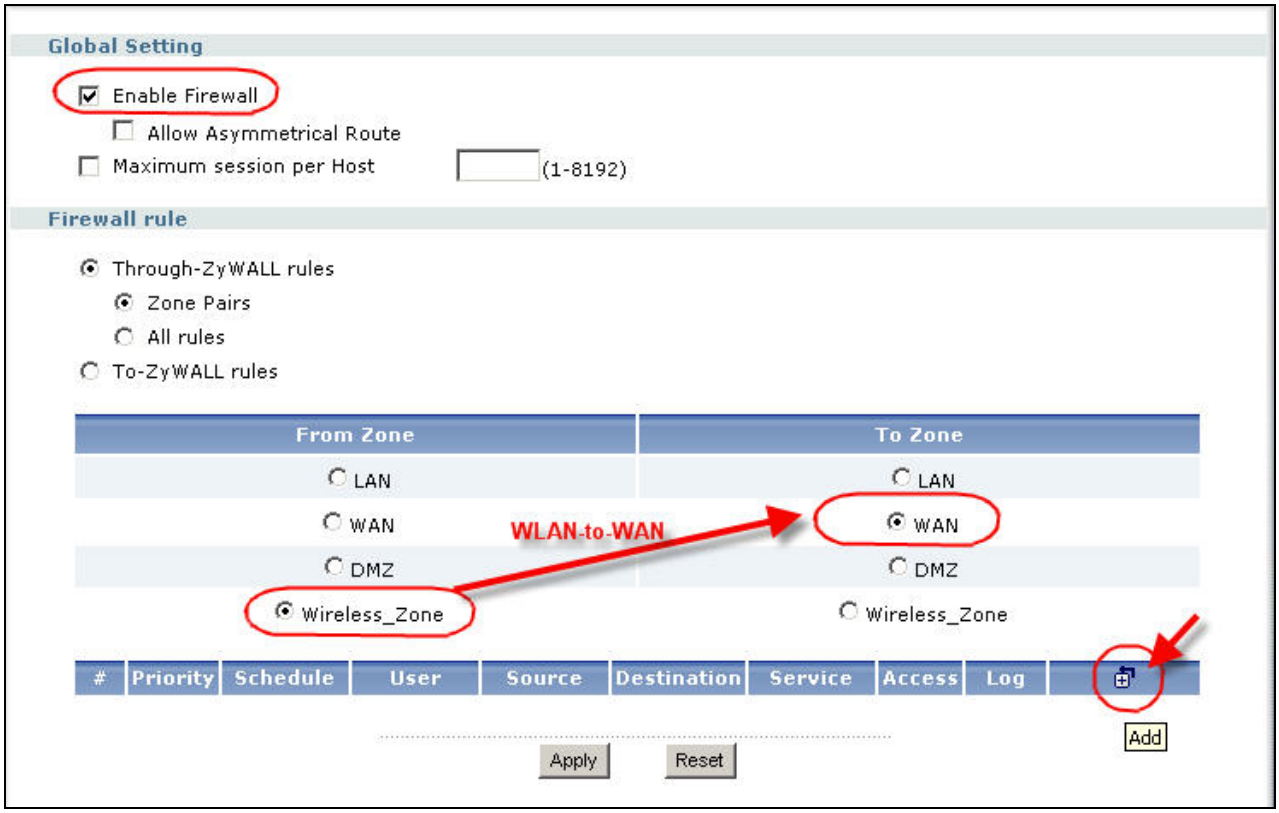
Note: The "group ldap" shown in the figure above will use the setting in **LDAP** >> **Default**, rather than **LDAP** >>**Group**.

3. Go to menu **System** >> **WWW**, make sure the authentication method is the profile we just modified. (That is, if I just create another profile which is not named as 'default', then here we have to choose it.)

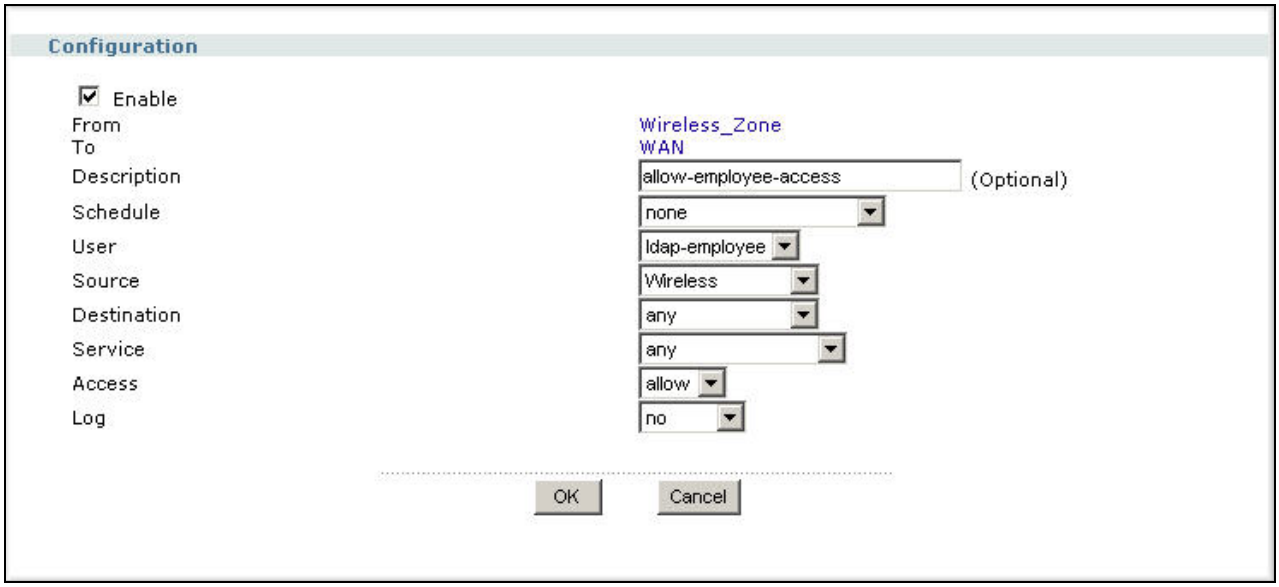


Step6. Define firewall ACL rule for different access granted

1. Go to menu **Network** >> **Firewall**
2. Enable firewall and choose from zone "Wireless_Zone" which we just created and to each zone. Here we configure to zone "WAN" first.
3. Click '+' to add rules.



4. Configure a rule to allow employee access from source “wireless network” to “any” in WAN.



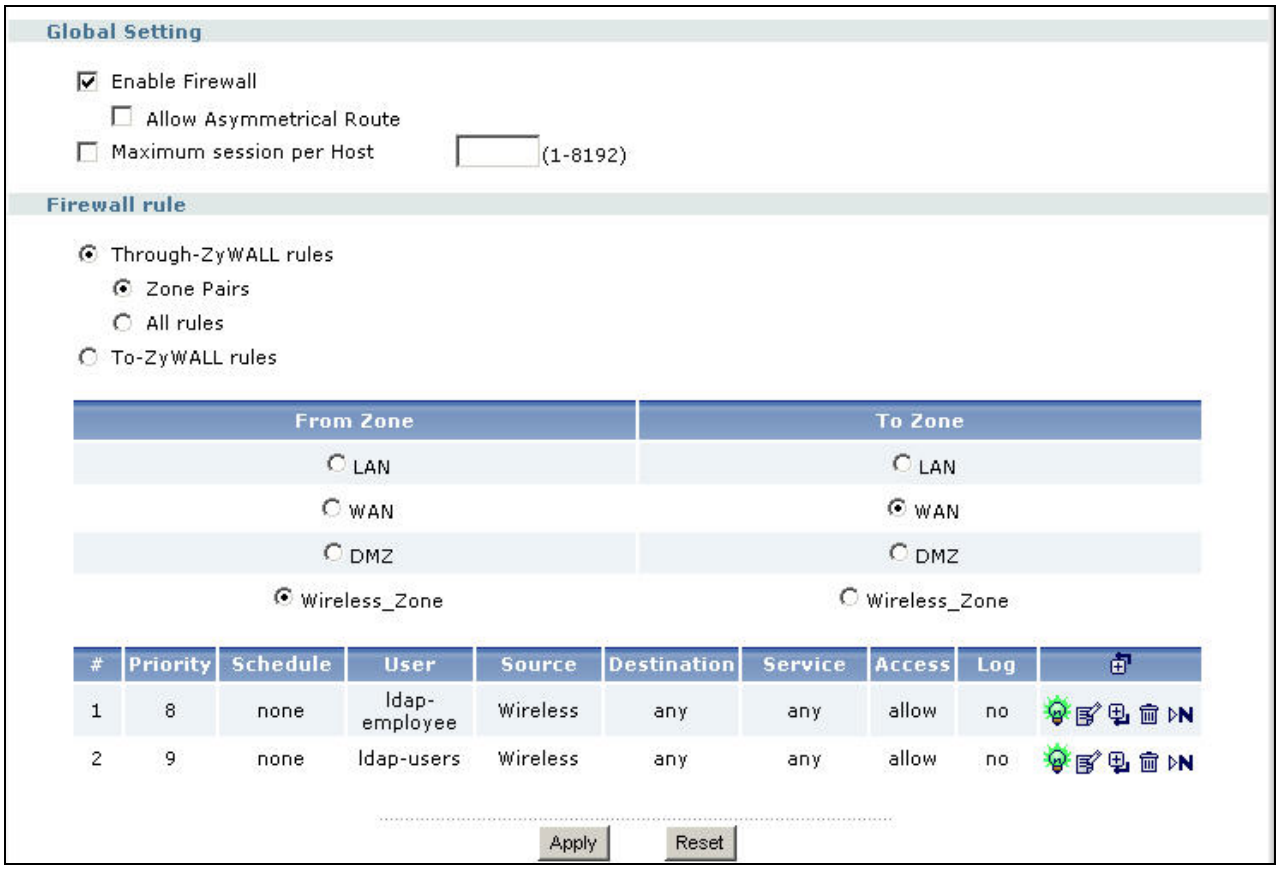
Corresponding CLI commends for your reference

```
[0] firewall 8
[1] no schedule
[2] user ldap-employee
[3] sourceip Wireless
[4] no destinationip
```

```
[5] no service
[6] action allow
[7] from Wireless_Zone
[8] to WAN
[9] no log
[10] activate
[11] description allow-employee-access
[12] exit
```

5. Configure another rule to allow non-employee access from source “wireless network” to “any” in WAN.

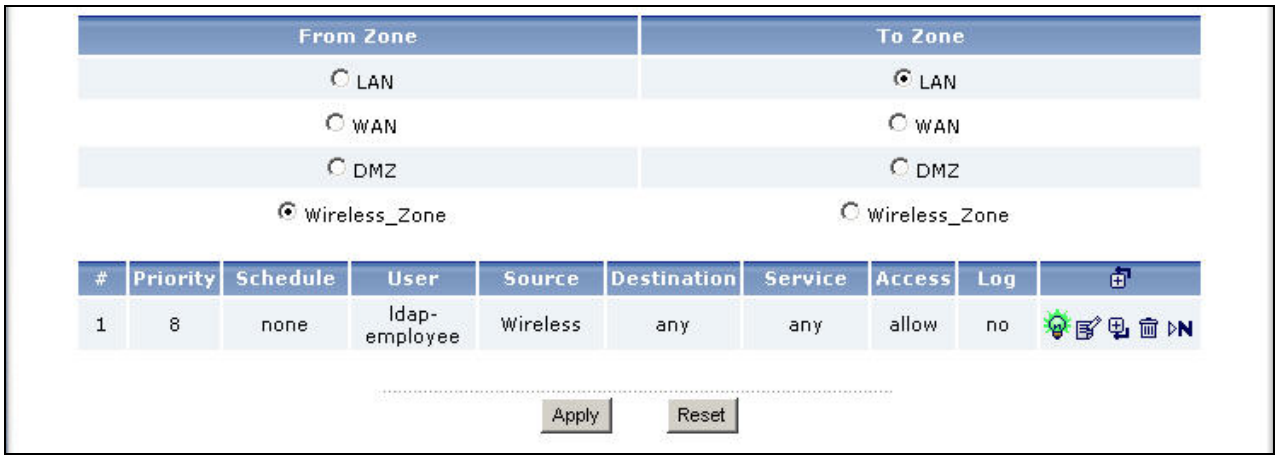
6. After setting, you will see the result as the figure below. Click Apply button.

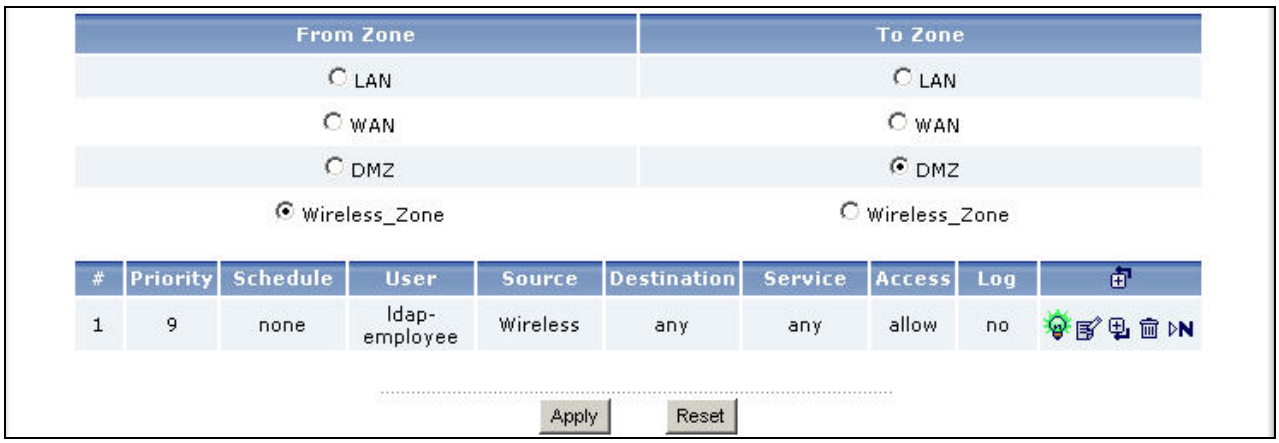


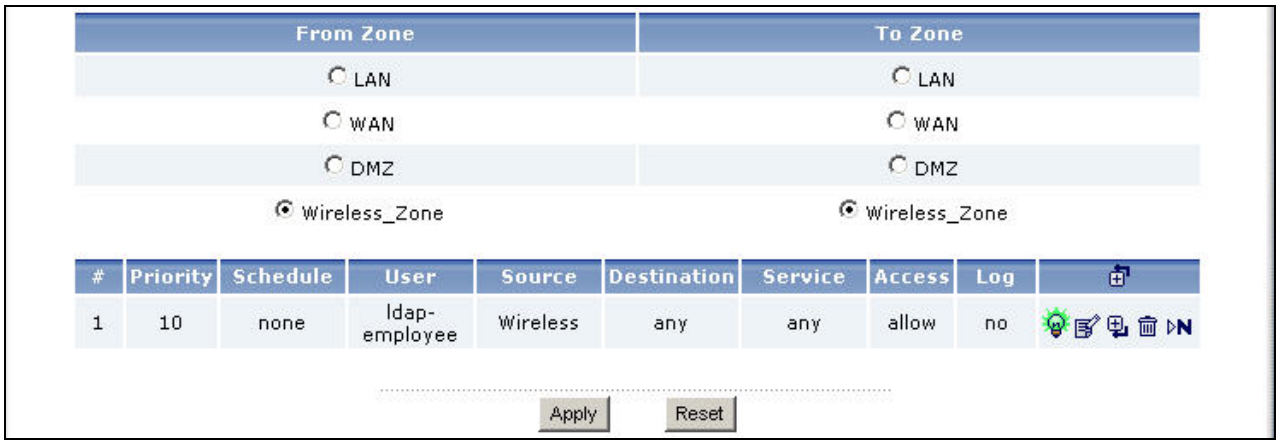
Corresponding CLI commends for your reference

```
[0] firewall activate
[1] no firewall asymmetrical-route activate
[2] firewall 8
[3] activate
[4] exit
[5] firewall 9
[6] activate
[7] exit
```

7. Continue to configure **WLAN-to-LAN**, **WLAN-to-DMZ**, **WLAN-to-WLAN**. Those are accessible for employees only. See following figures.







3. Seamless Incorporation

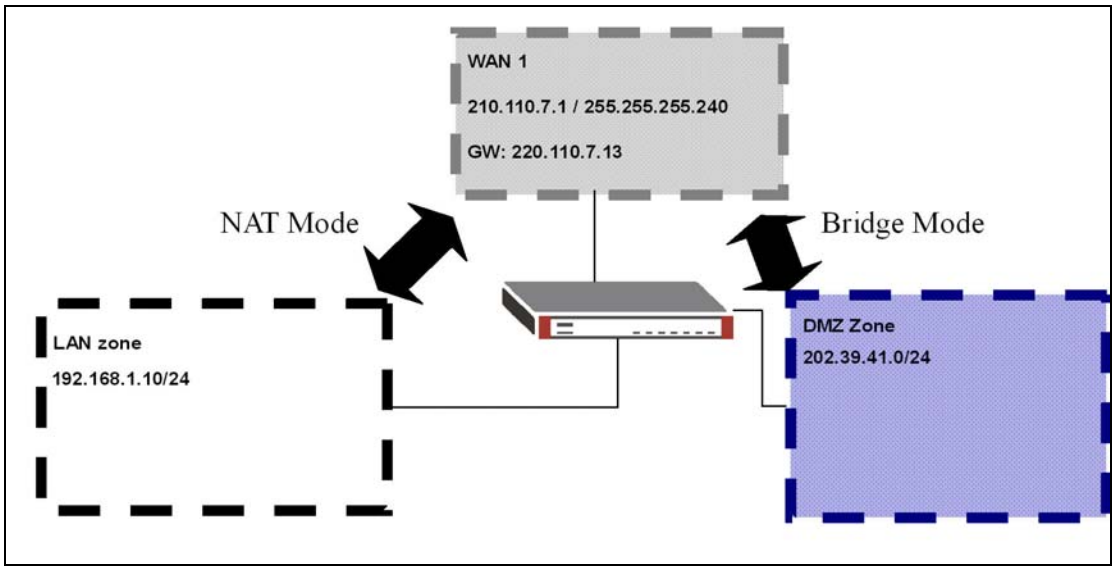
With robust networking functionalities in place, ZyWALL 1050 is easy to integrate into existing network infrastructure. You can easily implement the following applications. They are “Transparent firewall”, “Transparent IDP” and “Network Partitioning using VLAN”.

3.1 Transparent Firewall

With transparent firewall, you do not need to change the IP addressing scheme of your existing network topology. What you need to do is insert ZyWALL 1050 into your existing network environment. Bridge the ports you think that need to be included in this bridge interface. Apply the security policies that you want. And that will be it. Moreover, ZyWALL 1050 supports working as bridge mode and router mode on the same time; which means that they can co-exist.

3.1.1 Bridge mode & Router (NAT) mode co-exist

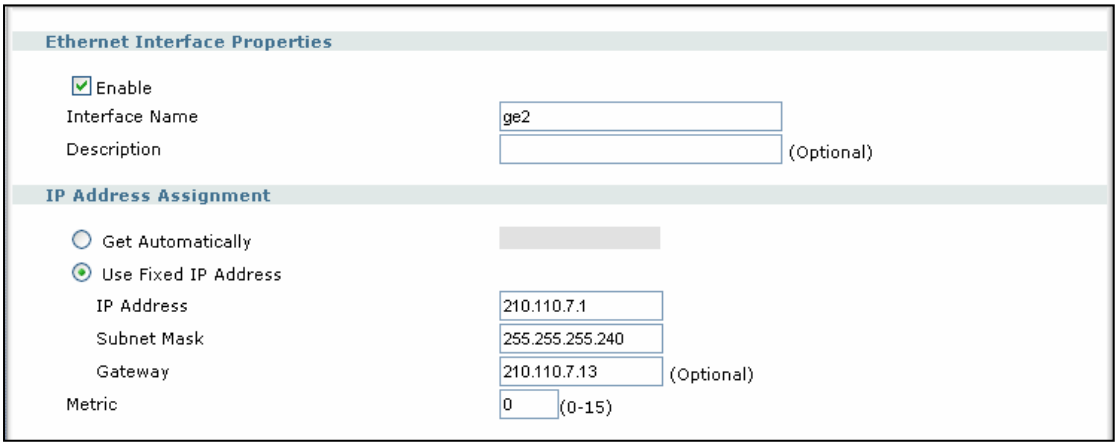
Here is an example:



DMZ and WAN zone can be bridged so that servers in the DMZ zone can keep using the same public IP address (as those in WAN zone) for effortless IP management. IP addressing in LAN zone is private IP segments. Thus, we need NAT, which is the router mode here. In our example, ge1 play the rule as LAN, ge2 and ge3 stands for WAN, ge4 and ge5 stands for DMZ.

To make this scenario works; the follow the configuration steps as below:

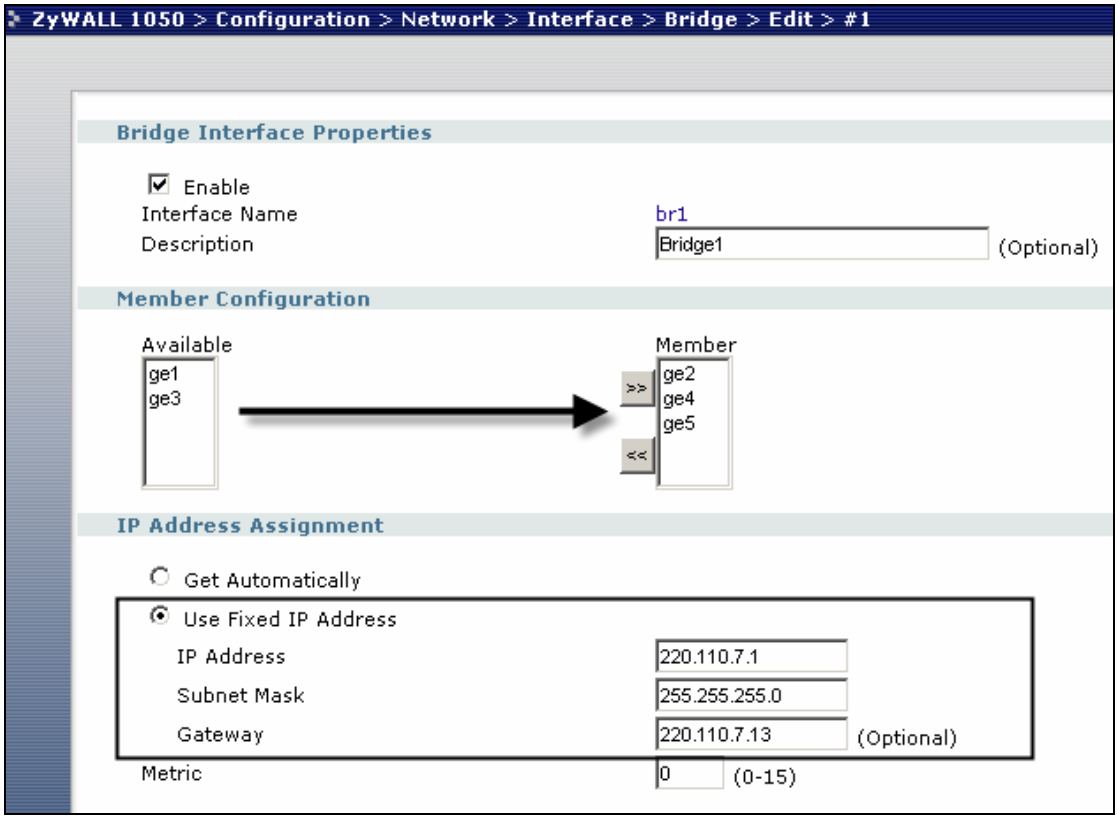
1) Login ZyWALL1050 GUI and setup the ge2 interface for internet connection and manually assign a static IP. The configuration path is ZyWALL 1050 > Configuration > Network > Interface > Edit > ge2



Please use this same method to assign IP for the LAN and DMZ interface.

2) Switch to **Configuration** > **Network** > **Interface** > **Bridge**, add a new Bridge Interface. First we enable this interface and give it a name, place the available ports into the member ports and make them become the member of this bridge interface. Moreover, don't forget to set the WAN IP information here since it is a "Bridge mode & Router (NAT) mode co-exist" example and the NAT mode will need it. Here the bridge mode looks most likely a routing bridge mode instead of the pure bridge mode. Thus, it needs an IP address. You may use the same IP address that it used in the WAN interface, however you will get a warning message like below.

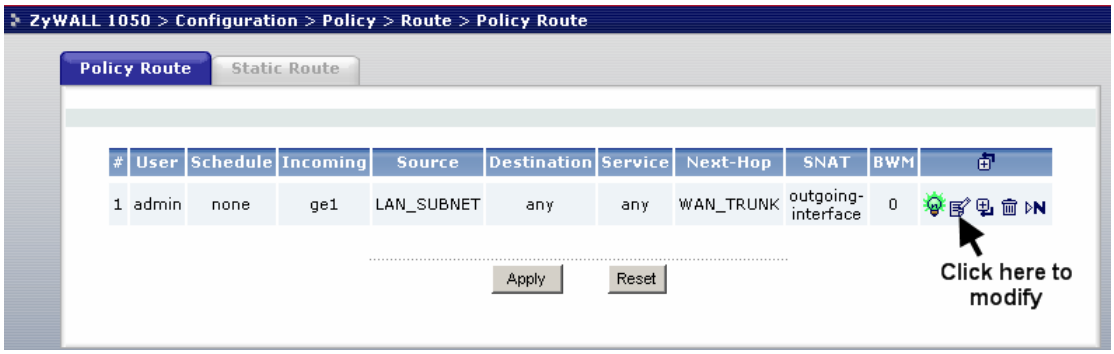
If you got more than one IP, you can pick the other one here.



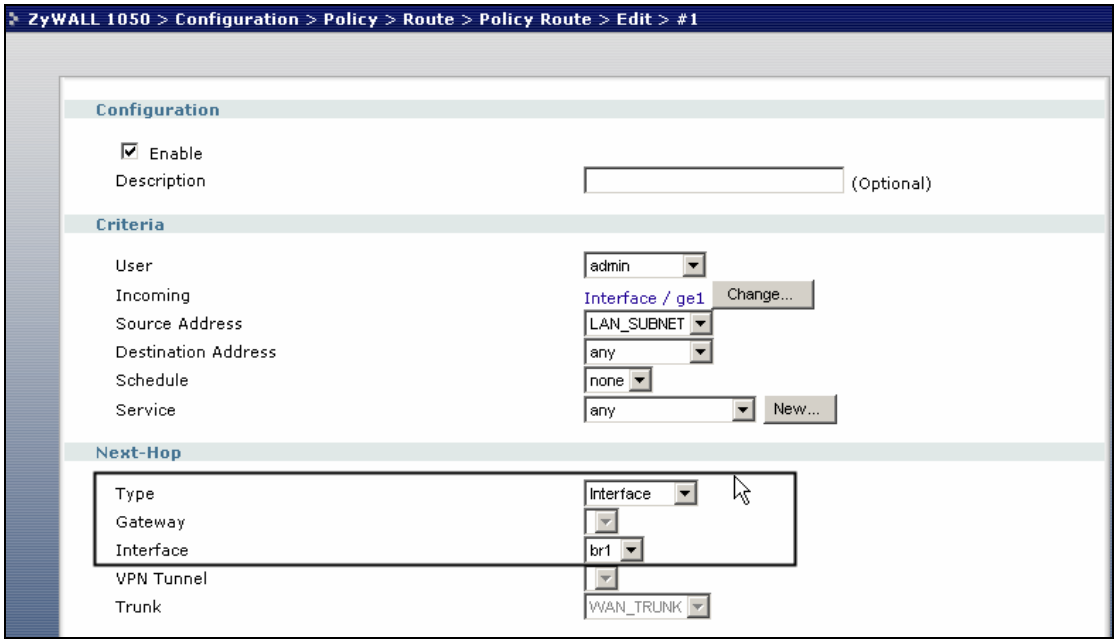
CLI to create this bridge interface:

```
[0] interface br1
[1] no join ge2
[2] no join ge4
[3] no join ge5
[4] join ge2
[5] join ge4
[6] join ge5
[7] ip address 220.110.7.1 255.255.255.0
[8] ip gateway 220.110.7.13 metric 0
[9] exit
```

3) Switch to **Configuration** > **Policy** > **Route** > **Policy Route**, to modify the default rule there. The default rule is for Router Mode (NAT Mode). Since we have two different modes co-existing here, we need to make some adjustments to this rule.



Here we need to modify the "Next-Hop" from "WAN_TRUNK" to "Interface" of the Bridge interface (br1) that we just created.



Then please click "OK" at the bottom to save the changes.

The CLI to create this rule:

```
[0] policy 1
[1] no deactivate
[2] no description
[3] user admin
[4] interface ge1
[5] source LAN_SUBNET
[6] destination any
[7] no schedule
[8] service any
[9] next-hop interface br1
[10] snat outgoing-interface
[11] no bandwidth
```

[12] exit

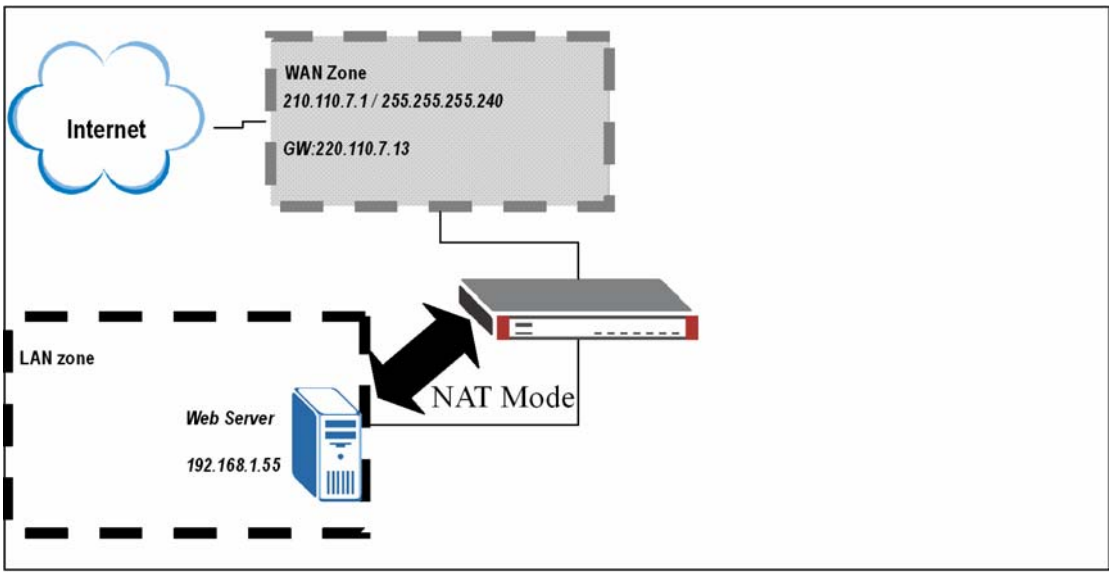
Tips for application:

Disable the Firewall to test the connectivity.

Each time you make a change, never forget to click the “apply” button

3.1.2 NAT & Virtual Server

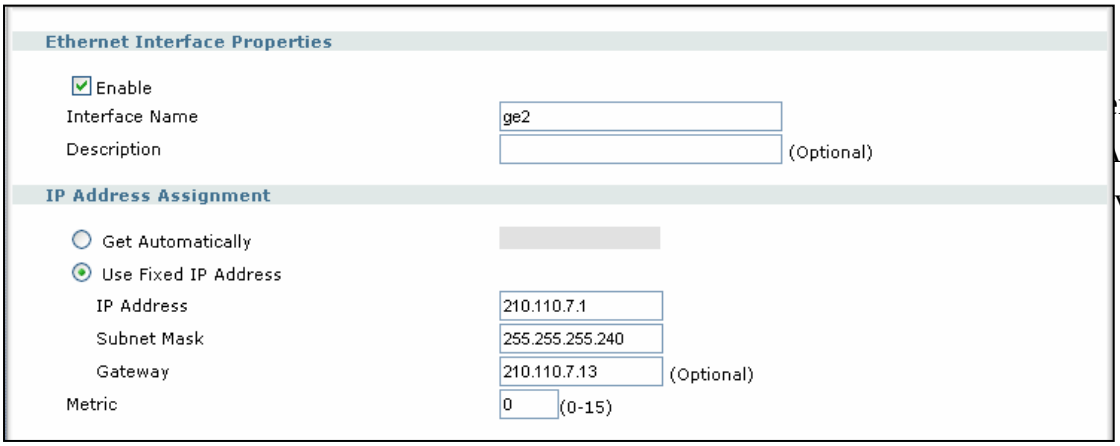
Here is an example:



There is a web server located in the DMZ zone. The virtual Server setting in ZyWALL1050 is required here for people outsider from WAN to access the Web pages locating on the Web Server in the DMZ zone.

To make this scenario works; the follow the configuration steps as below:

1) Login ZyWALL1050 GUI and setup the ge2 interface for internet connection and manually assign a static IP. Login ZyWALL 1050 GUI and go to **Configuration** > **Network** > **Interface** > **Edit** > **ge2**



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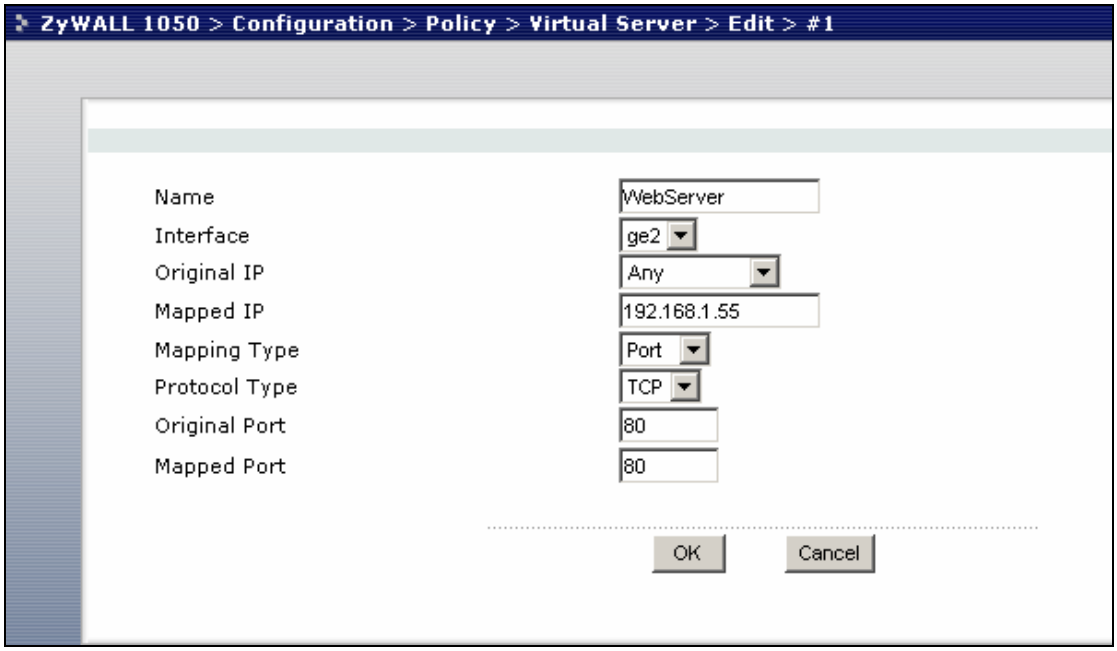
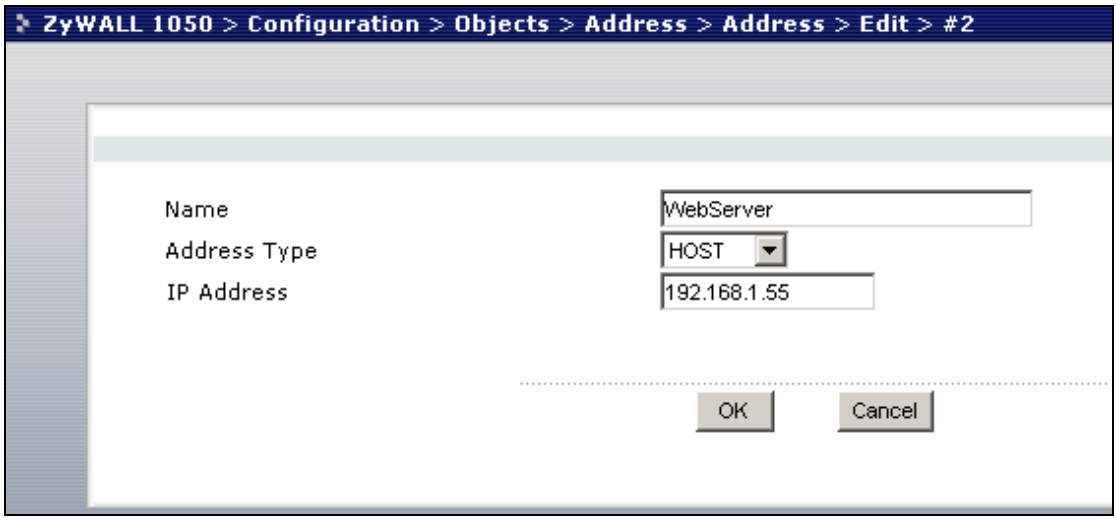


CLI to create a Virtual Server Mapping

```
[0] ip virtual-server WebServer interface ge2 original-ip any
map-to 192.168.1.55 map-type port protocol tcp original-port 80
mapped-port 80
```

3)Switch to **Configuration** > **Objects** > **Address**, and add a new address object for your Web server.

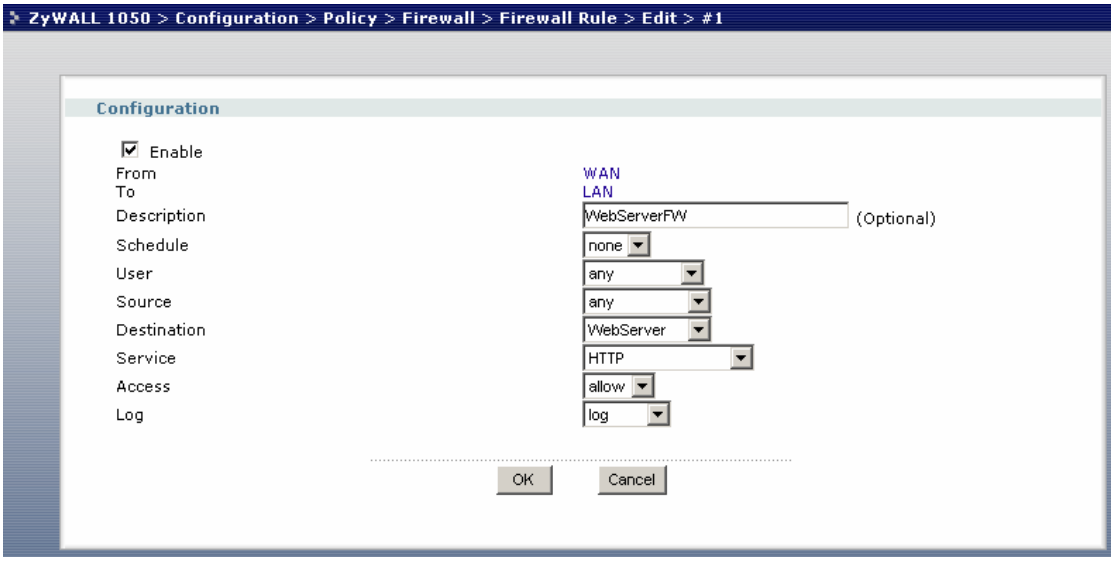


CLI to create an address object

```
[0] address-object WebServer 192.168.1.55
```

4)Switch to **Configuration** > **Policy** > **Firewall** > **Firewall Rule**, add a new firewall rule

for your virtual server. Since it is an web server, so we choose “HTTP” as the Service. And “Allow” for the access action.



CLI to create a firewall rule

```
[0] firewall 6
[1] no schedule
[2] no user
[3] no sourceip
[4] destinationip WebServer
[5] service HTTP
[6] action allow
[7] from WAN
[8] to LAN
[9] log
[10] activate
[11] description WebServerFW
[12] exit
```

Tips for application:

Do not forget to place your rule before the default “Deny all” Rule in the **WAN-to-LAN** direction.