How to Configure PnPVPN

Hillstone Networks Inc.

Submitter	Auditor		Version	Date
Name	Name		V1	2018/x/xY

Content

1. Preface

This setting guide is for PnP IPSec vpn, for further support please contact TAC

The workflow for PnPVPN is as follows:

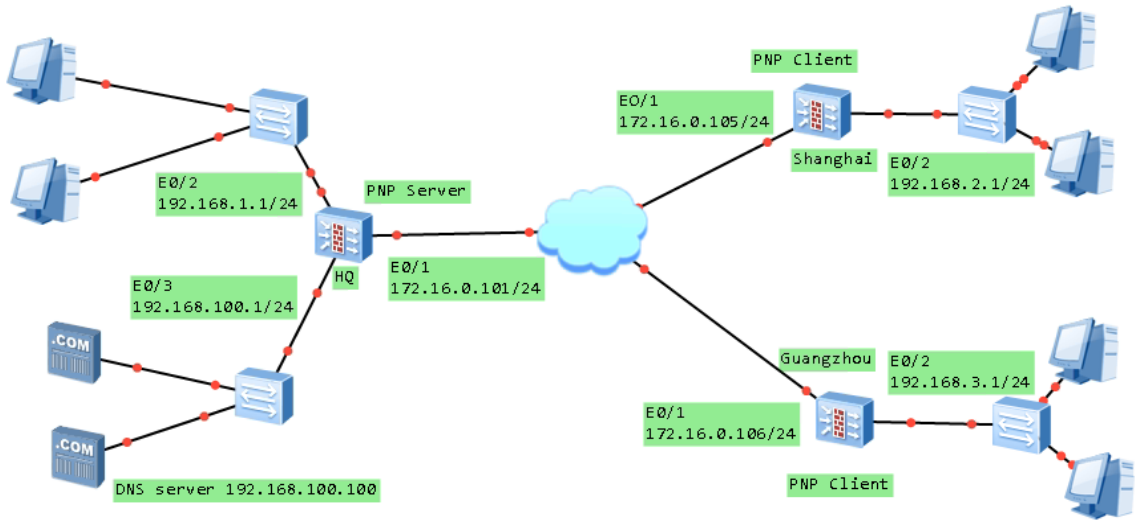
1. The client initiates a connection request and sends its own ID and password to the server.

2. The server validates the ID and password when it receives the client request. If the client passes the authentication, the server issues configuration information including DHCP address pool, DHCP mask, DHCP gateway, WINS, DNS and tunnel routes, etc. to the client.

3. The client distributes the received information to corresponding functional modules.

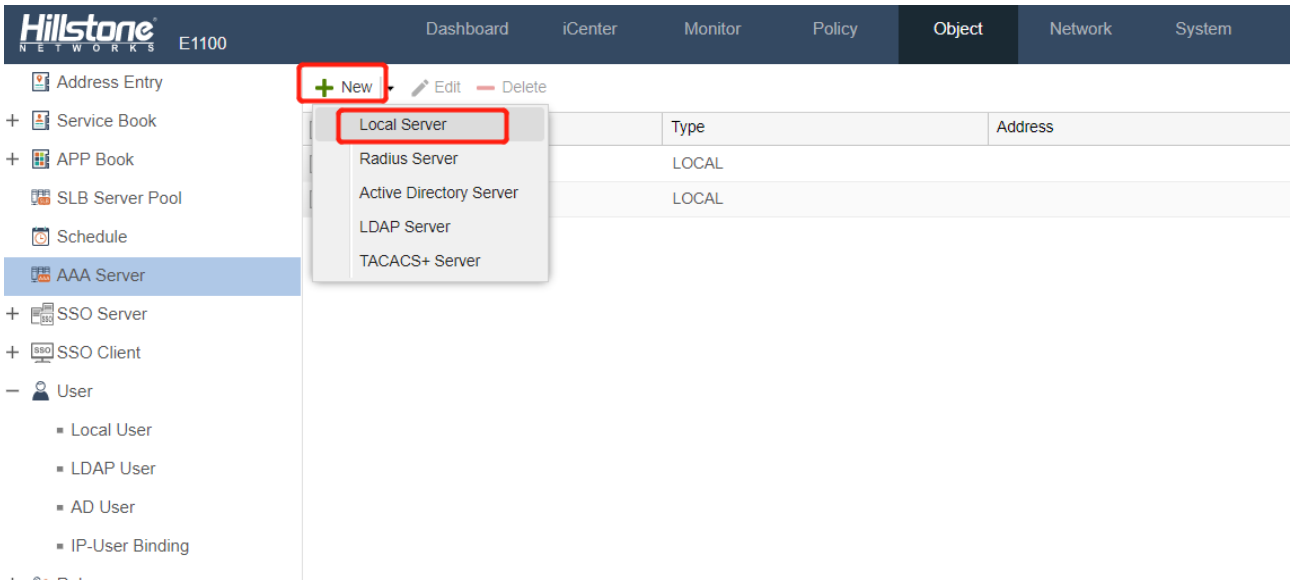
4. The client PC automatically gains an IP address, IP mask, gateway address and other network parameters and connects itself to the VPN.

2. Topology

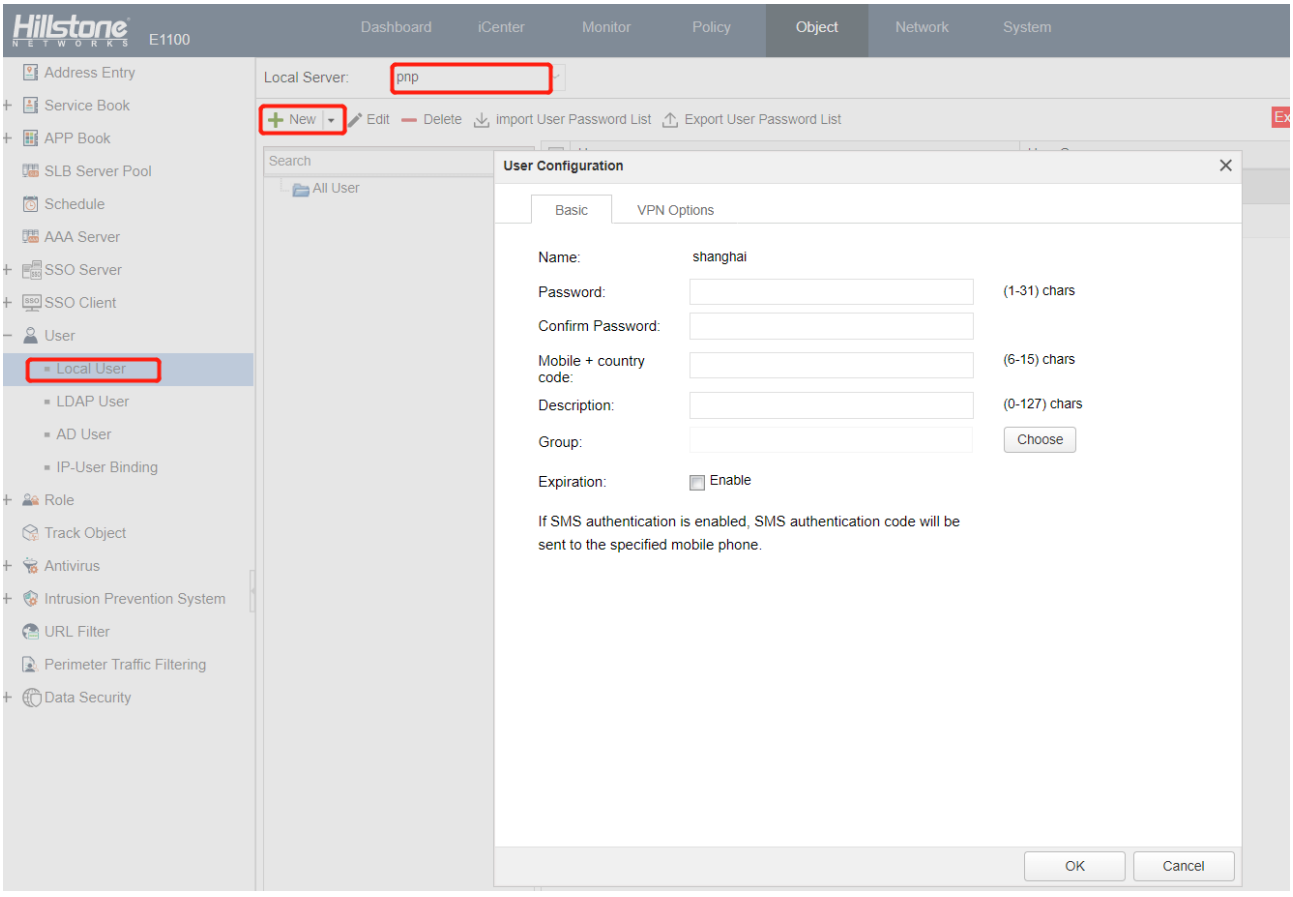


3. Step by Step

Configure AAA server and user, choose Local Server

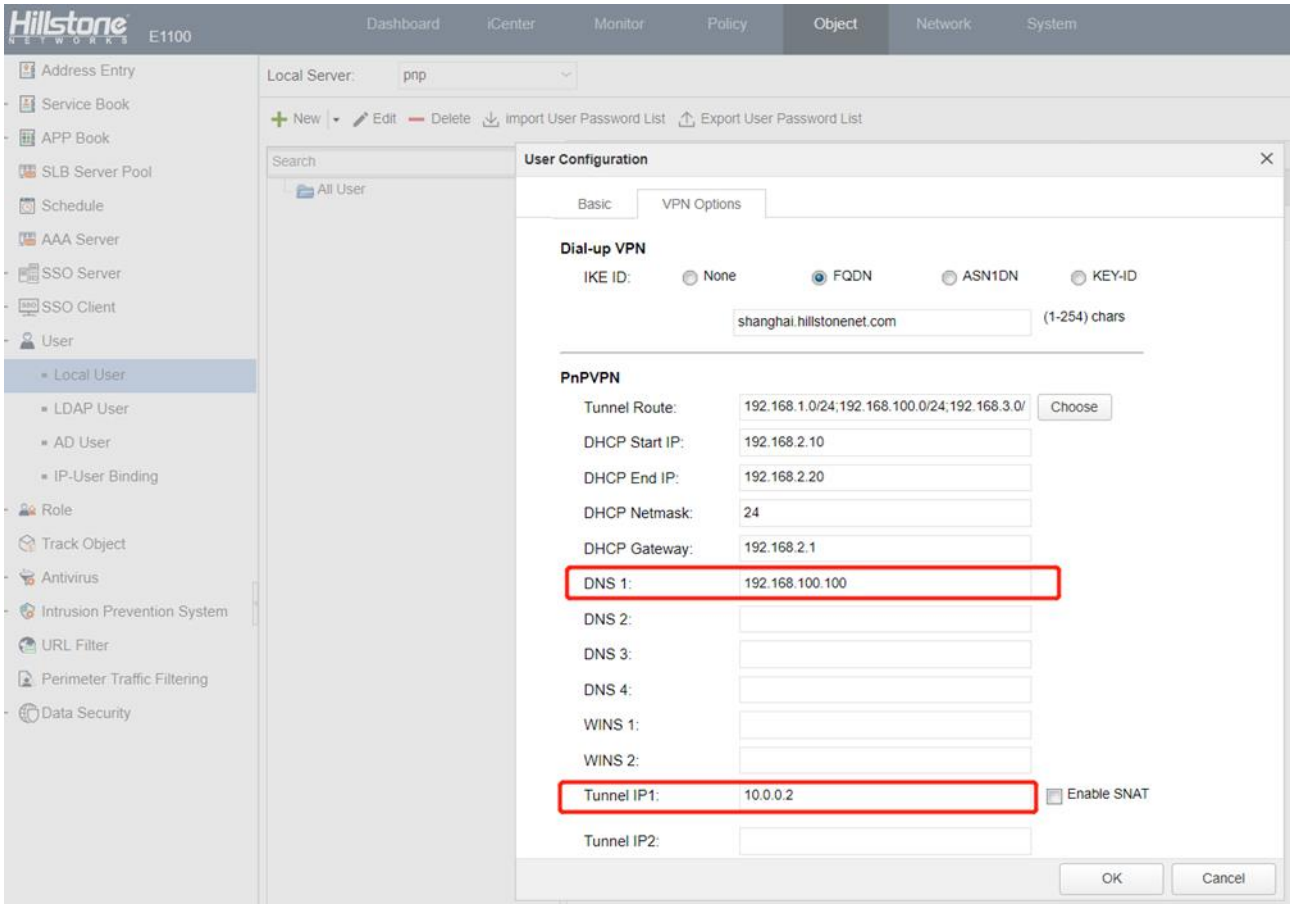


Add user in the AAA server you have created



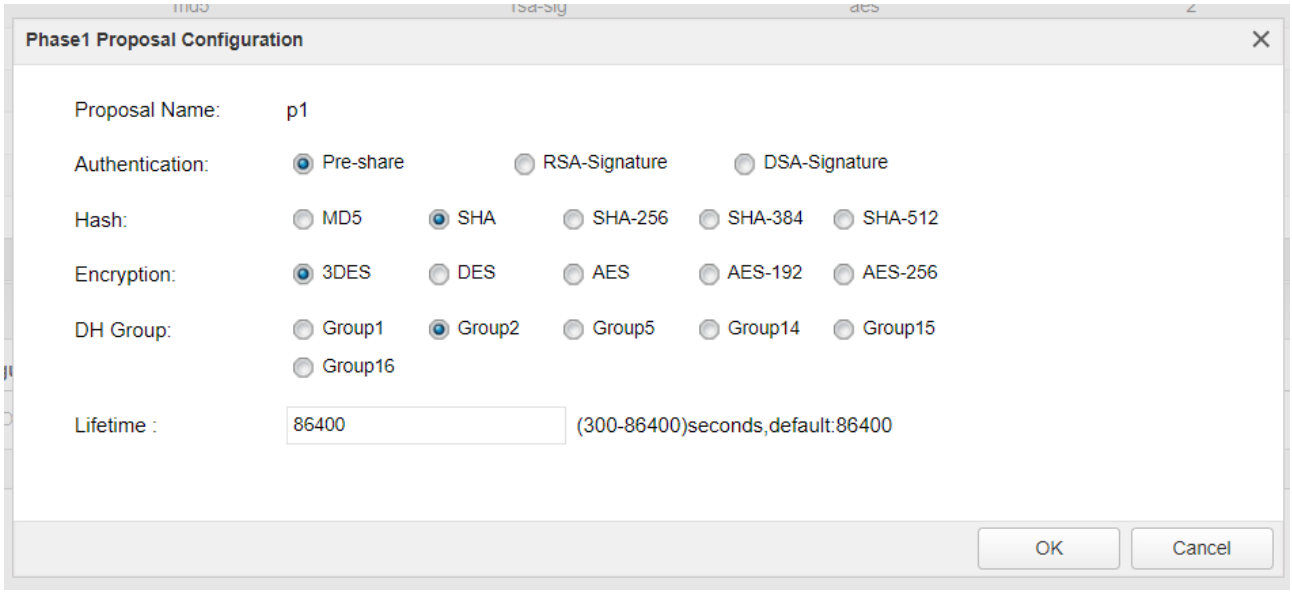
Configure user's network

Caution：If there is an internal DNS server in server side which would be used by client side, you need to configure Tunnel IP for this user, because PnPVPN enabled DNS proxy on the VPN incoming interface, client firewall works as a DNS proxy for client PC or client server, if there is no Tunnel IP configured, the DNS proxy would fail

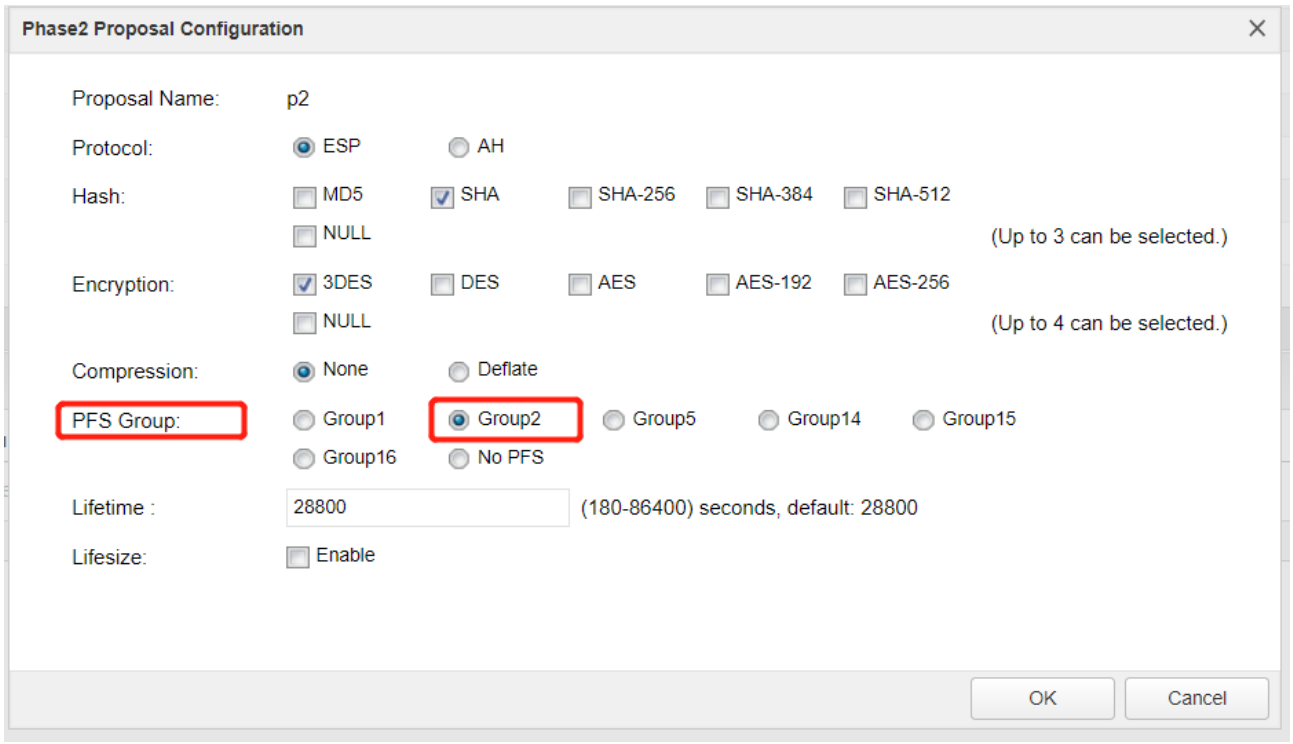


Configure IKE VPN

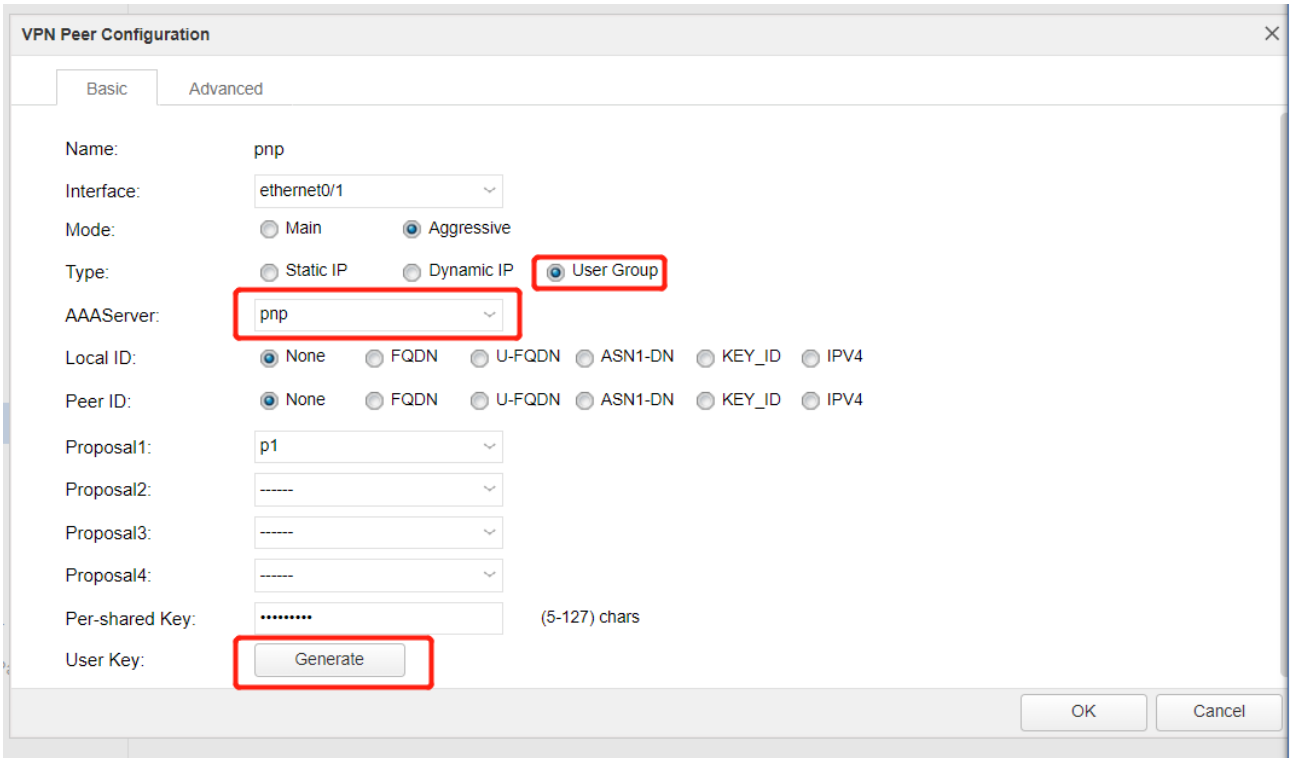
Start with p1 proposal，here we use default setting

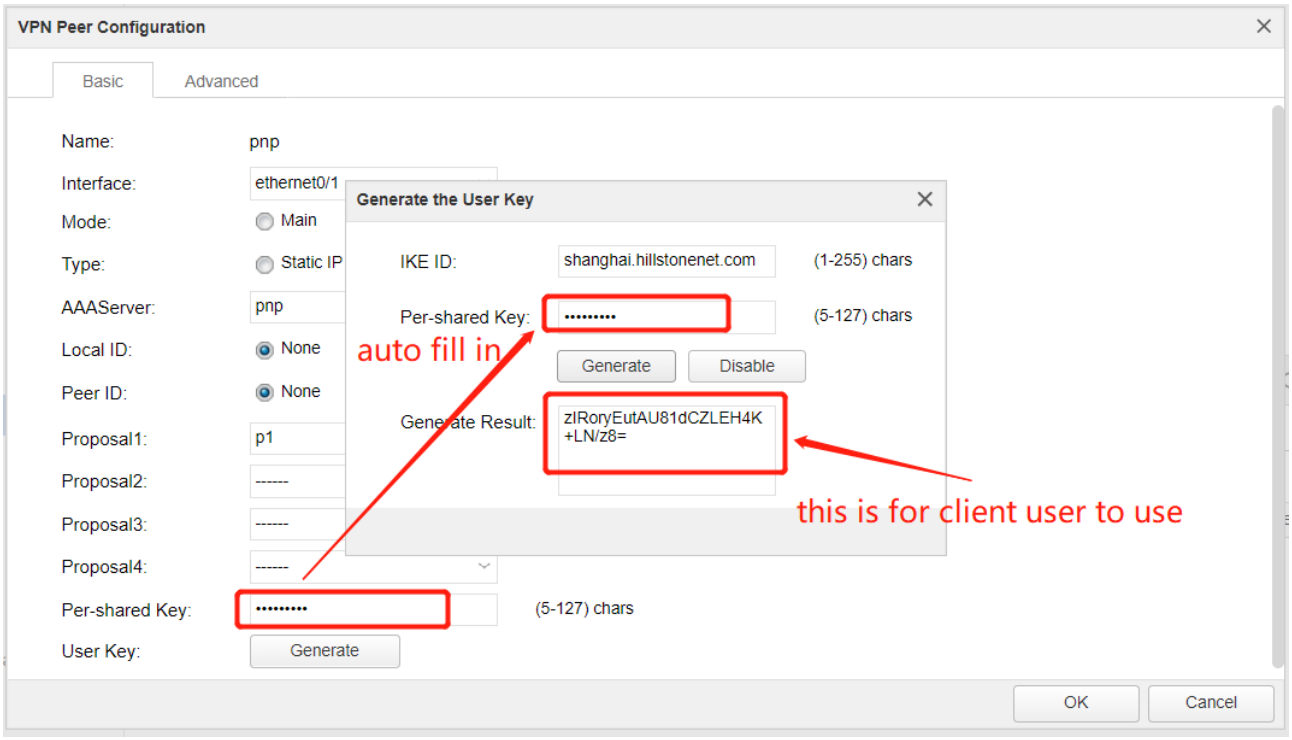


Then comes p2 proposal, pay attention here that PFS Group should choose Group2

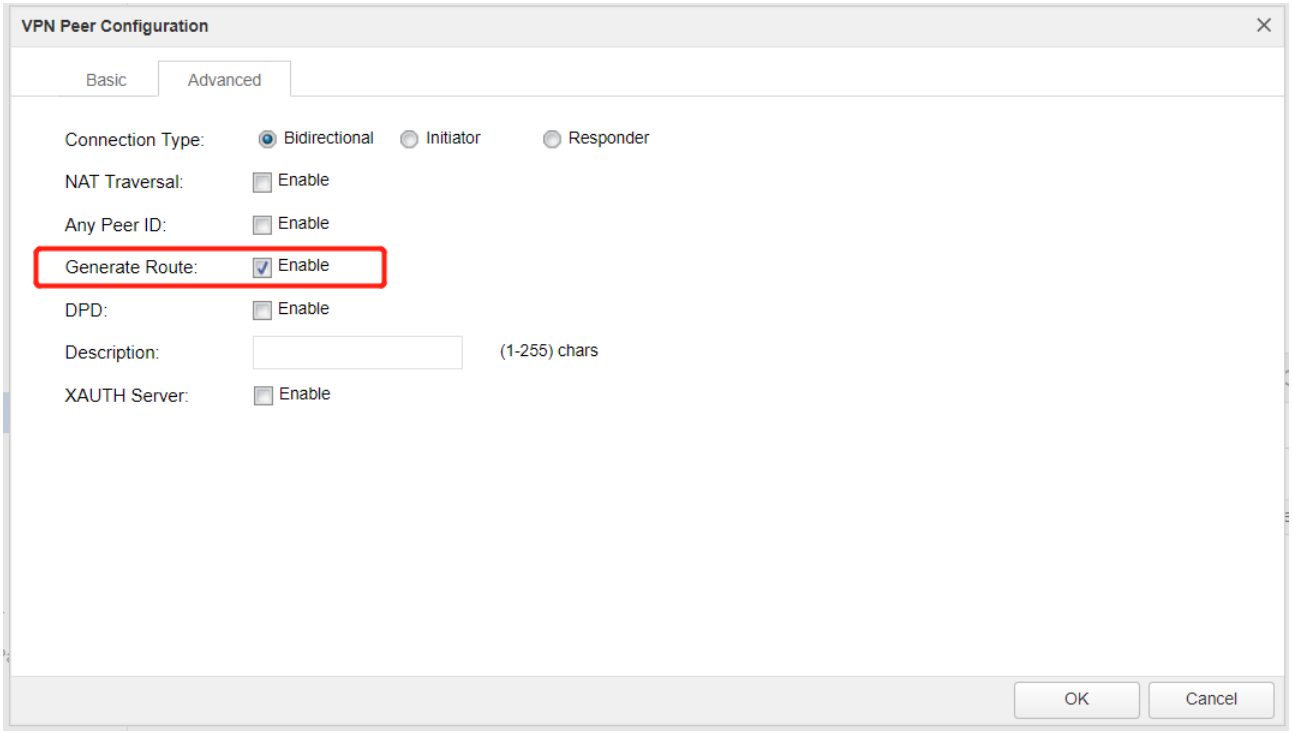


Now configure VPN peer, it is a little different from site-to-site IPSec, after fill in the parameter, click Generate button to generate PnP client user password

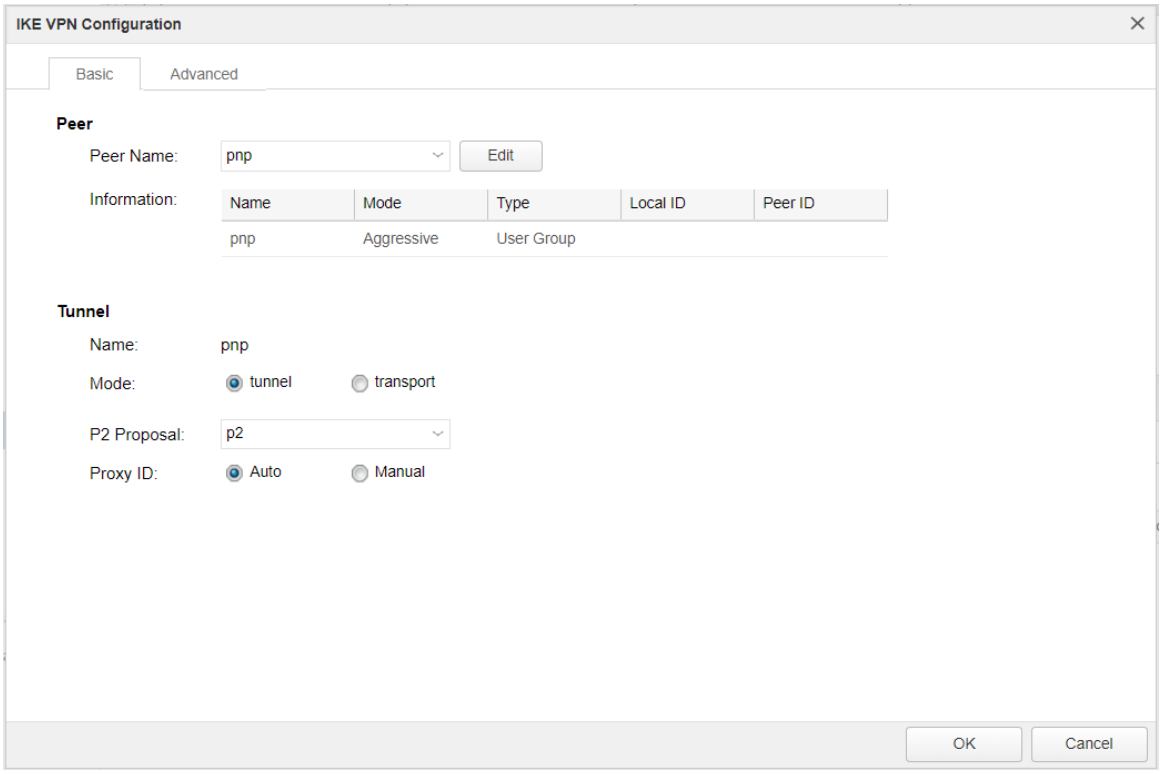




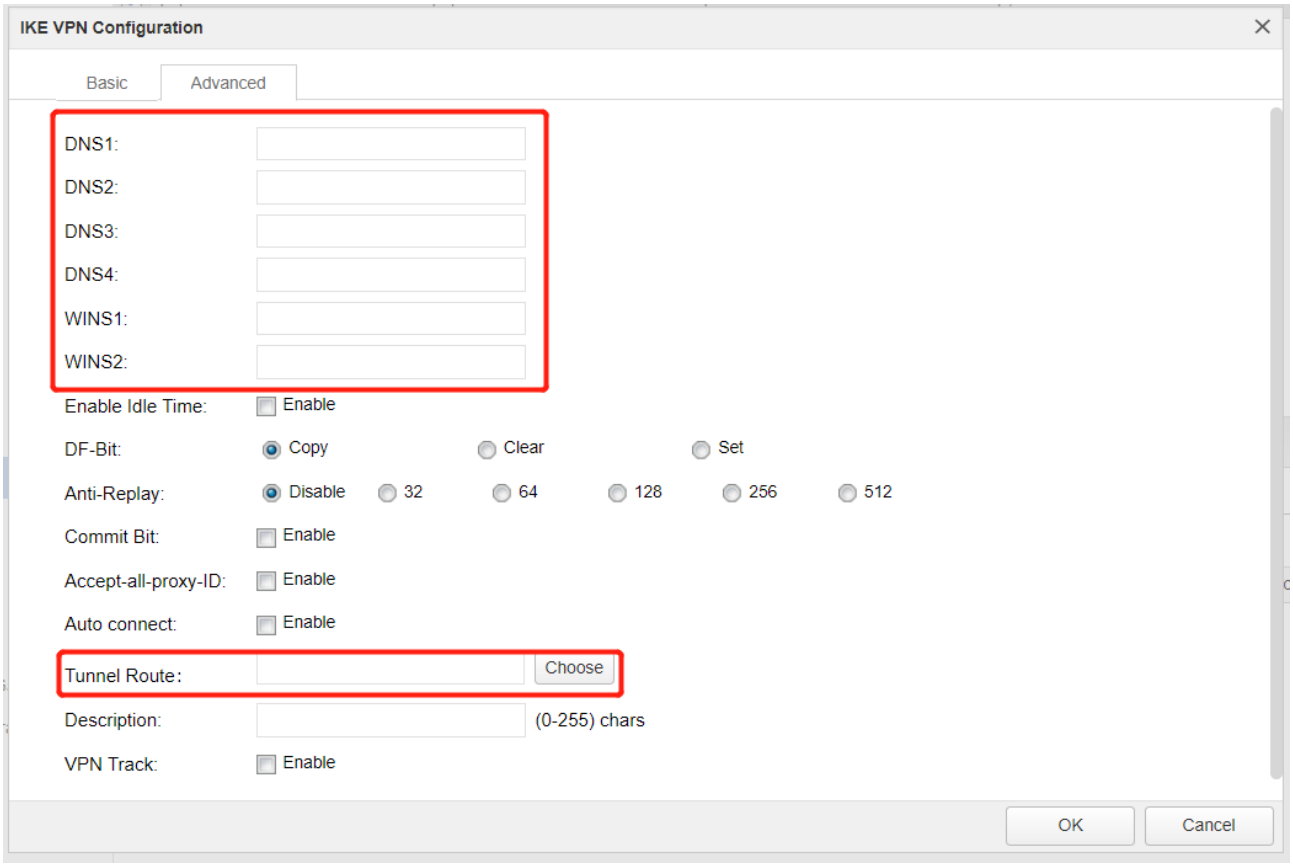
Then go to advanced page of VPN peer, choose Generate Route option to generate route towards client subnet automatically

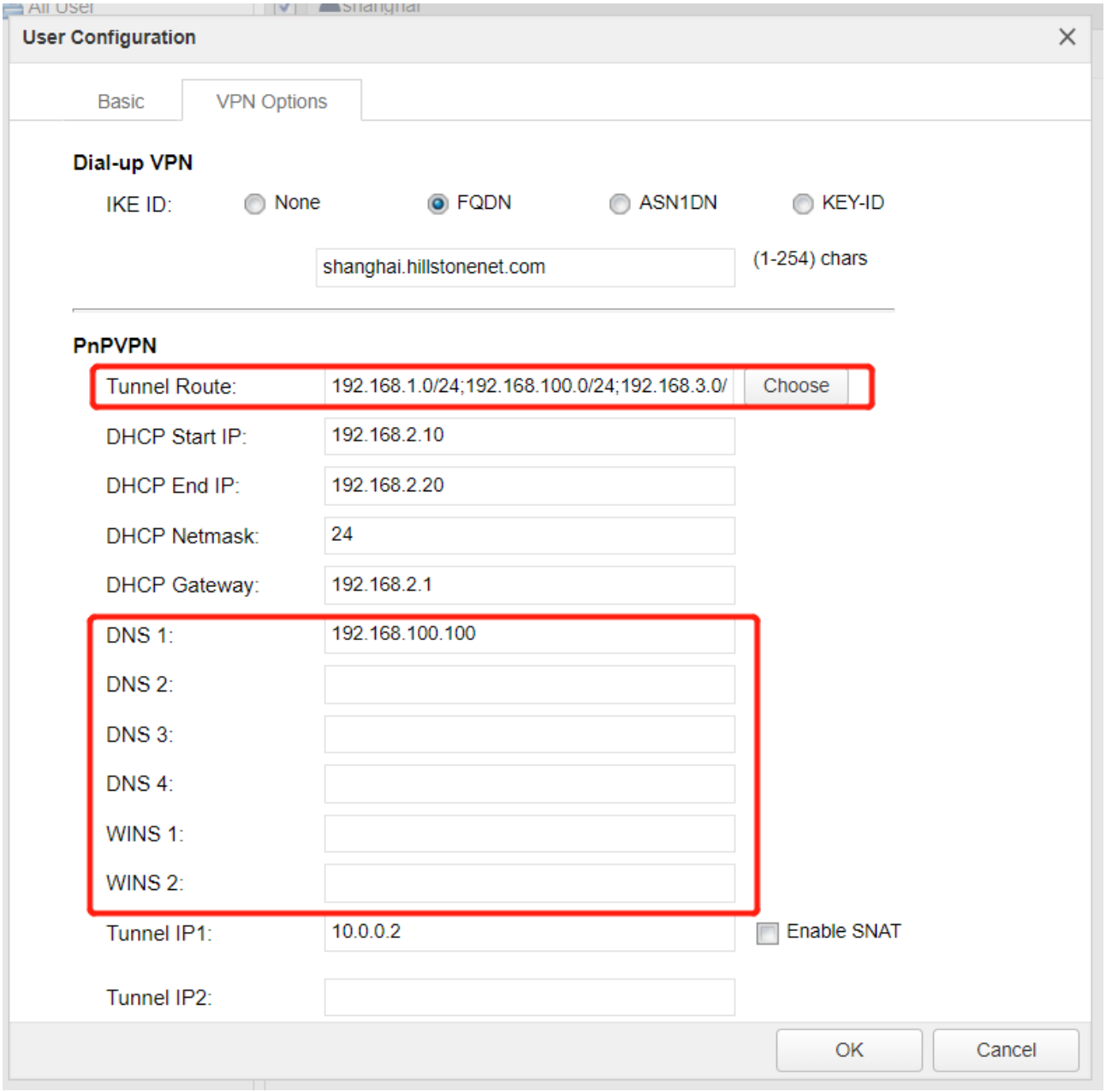


Configure IKE VPN options

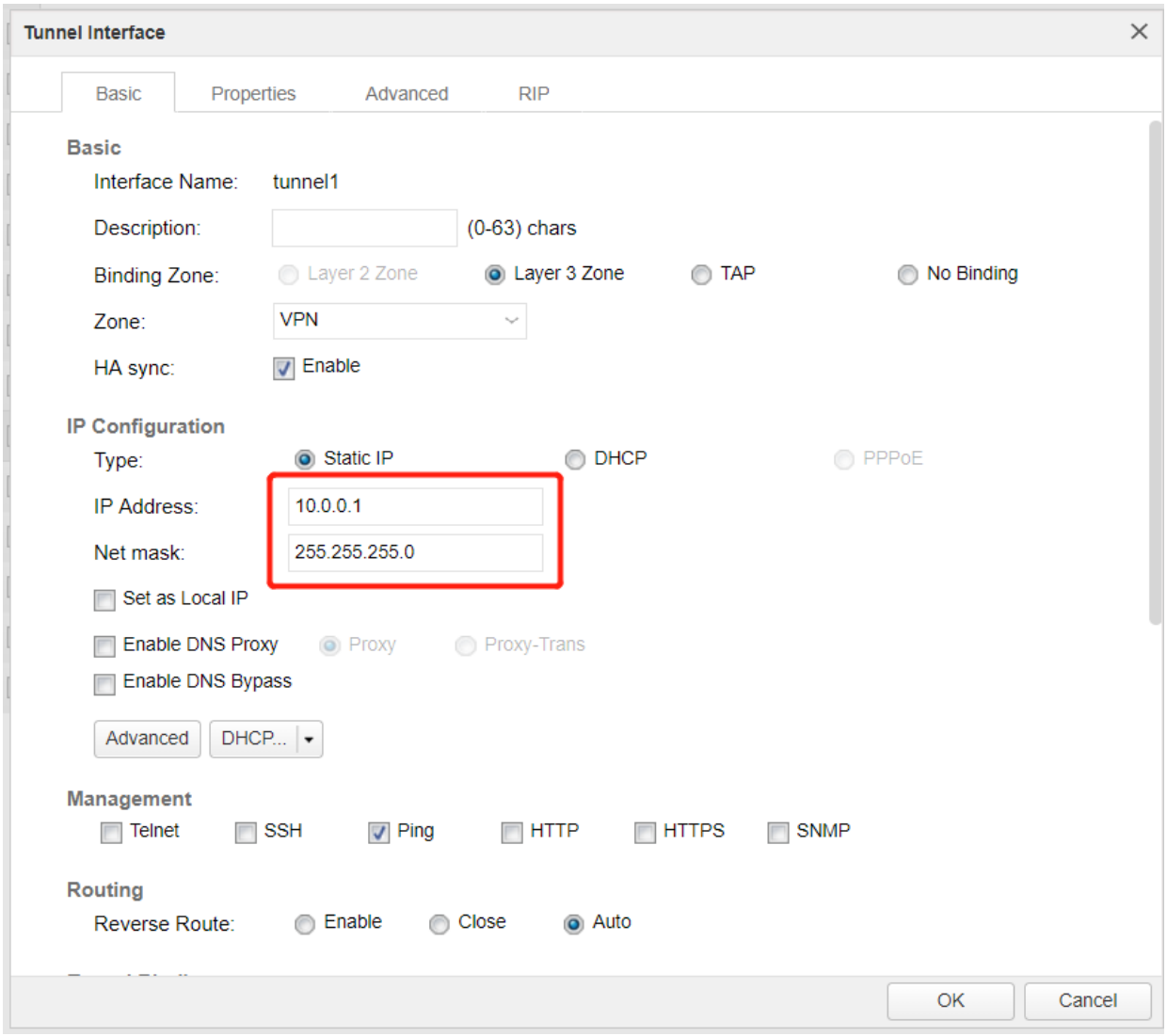


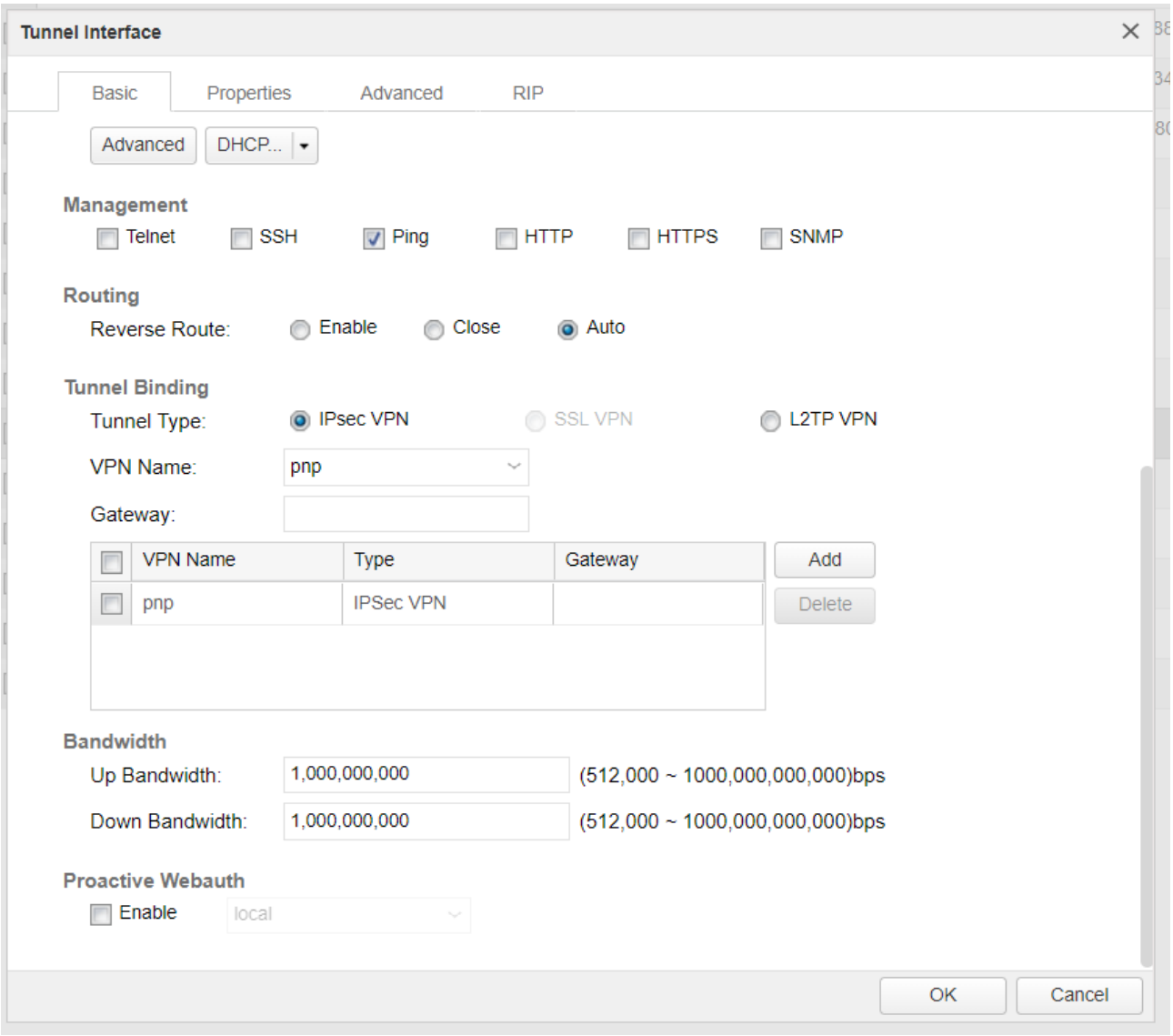
On the advanced option page, here are some parameters overlapped with user configuration page, they are designed for distributing uniform parameter to save troubles, when there is a conflict between the two settings, configuration in the user configuration mode has higher priority over settings in the IKE tunnel configuration mode





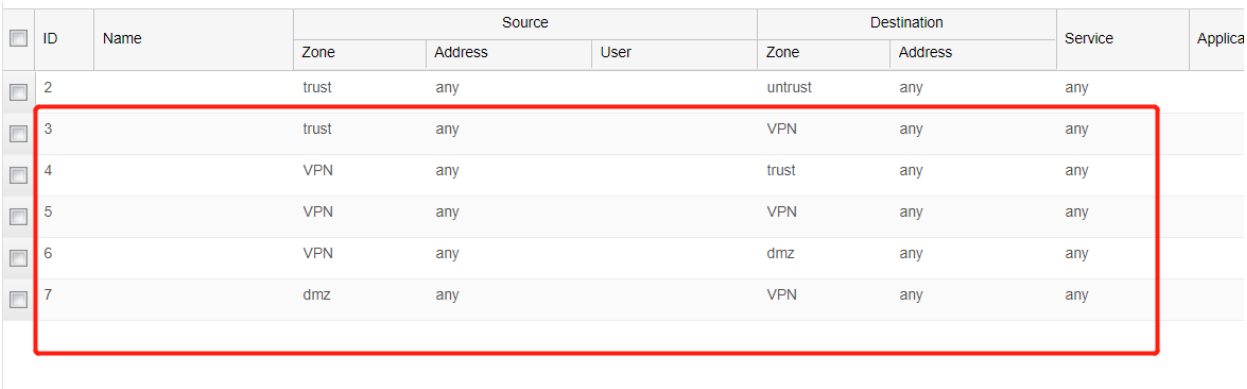
Configure tunnel interface, of course ip address is needed if there configured Tunnel IP for client user


Tunnel Interface
Basic
Properties
Advanced
RIP
Basic
Interface Name: tunnel1
Description: (0-63) chars
Binding Zone: Layer 2 Zone Layer 3 Zone TAP No Binding
Zone: VPN
HA sync: Enable
IP Configuration
Type: Static IP DHCP PPPoE
IP Address: 10.0.0.1
Net mask: 255.255.255.0
Set as Local IP
Enable DNS Proxy Proxy Proxy-Trans
Enable DNS Bypass
Advanced DHCP...
Management
Telnet SSH Ping HTTP HTTPS SNMP
Routing
Reverse Route: Enable Close Auto
OK
Cancel



Since we have choose Generate Route option in VPN peer setting, here we don't bother to add routes manually, or we need to add it manually

Then comes to the policy making, make sure PnP client devices could access what they need to access through the tunnel



	ID	Name	Source			Destination		Service	Applica
			Zone	Address	User	Zone	Address		
	2		trust	any		untrust	any	any	
	3		trust	any		VPN	any	any	
	4		VPN	any		trust	any	any	
	5		VPN	any		VPN	any	any	
	6		VPN	any		dmz	any	any	
	7		dmz	any		VPN	any	any	

The configure on server side is done here

Now go to the client site to set up the PnP VPN

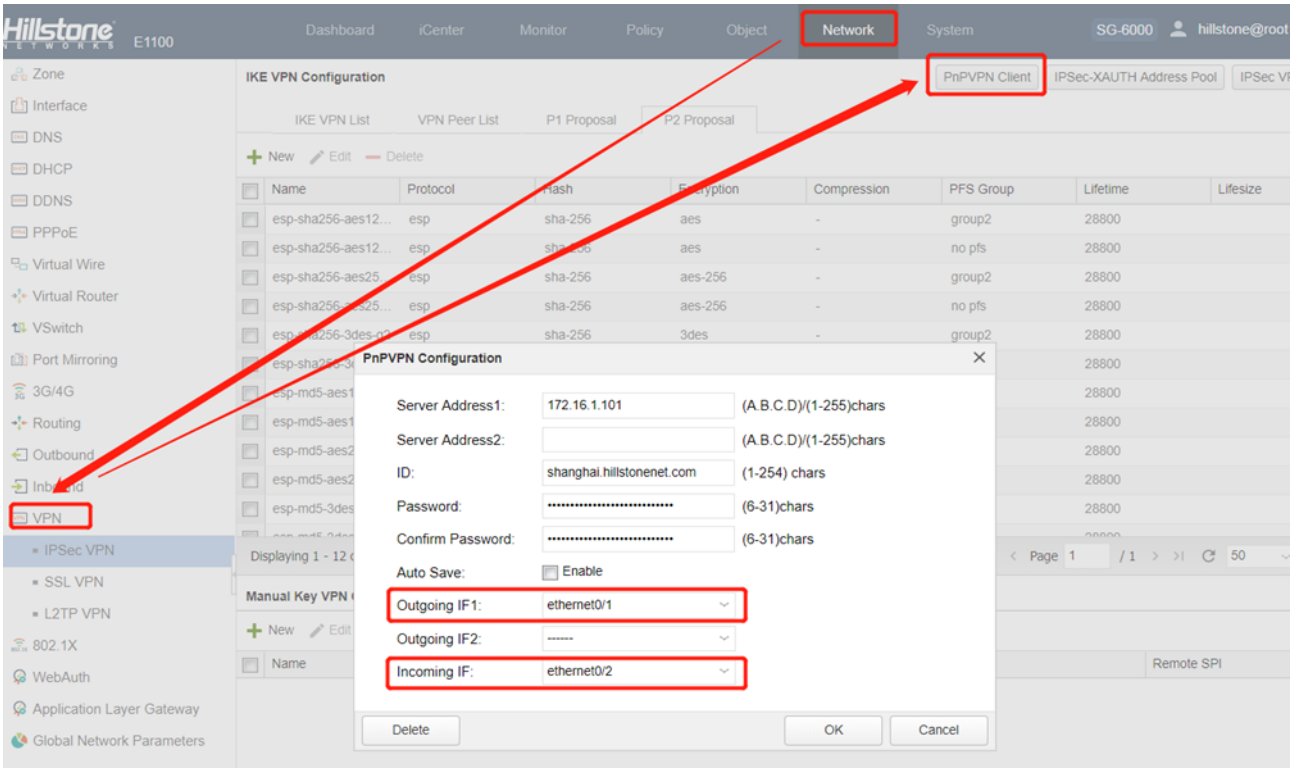
Server address is the PnP egress interface ip on server's side

ID is the fqdn string in user configuration

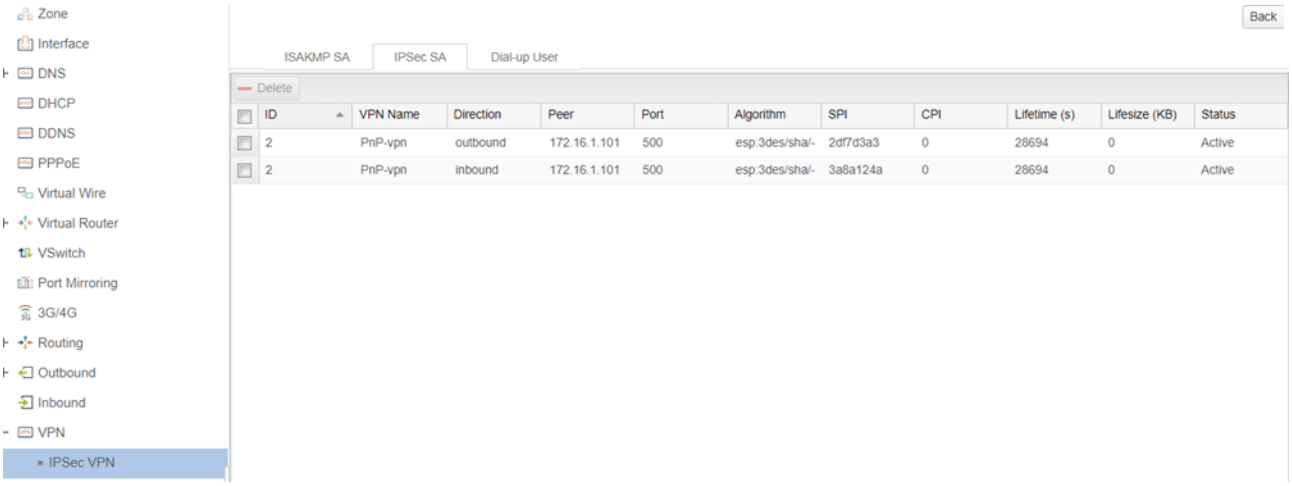
Password is generated in VPN peer page

Outgoing IF is the interface connecting to the Internet on client firewall

Incoming IF is the interface connecting internal PC or Server on client firewall



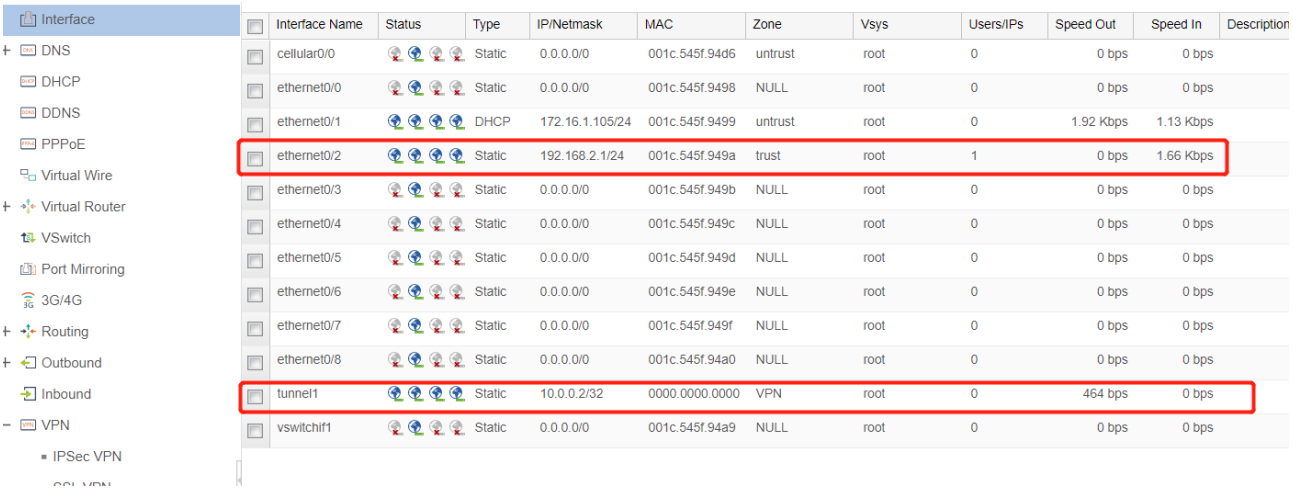
After clicking OK, we can see that the PnP vpn is established

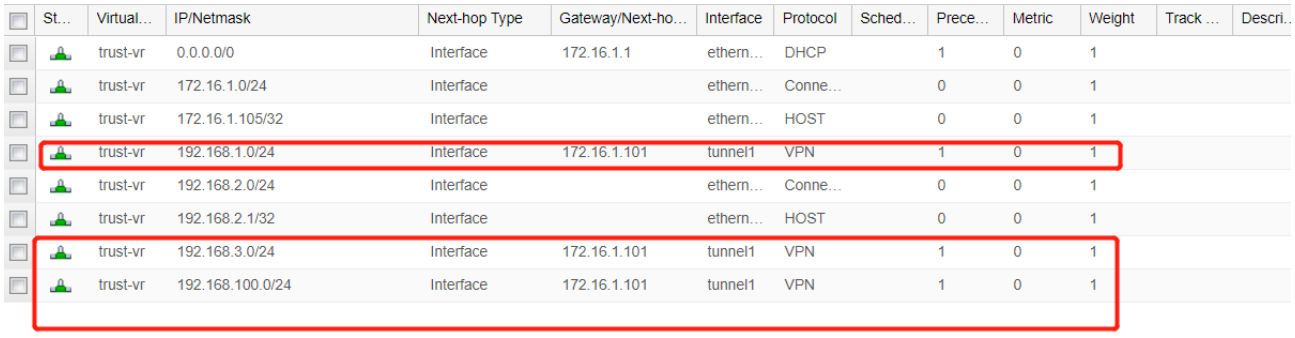


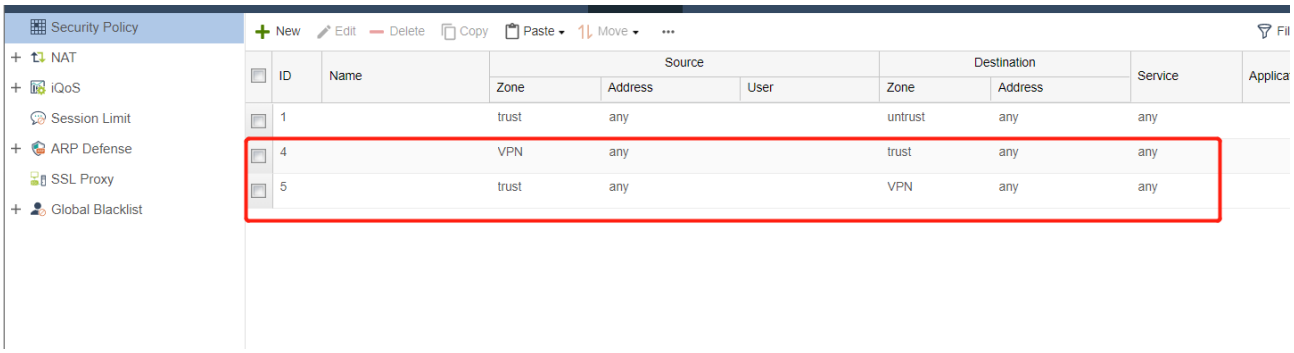
Route is genetated on server side

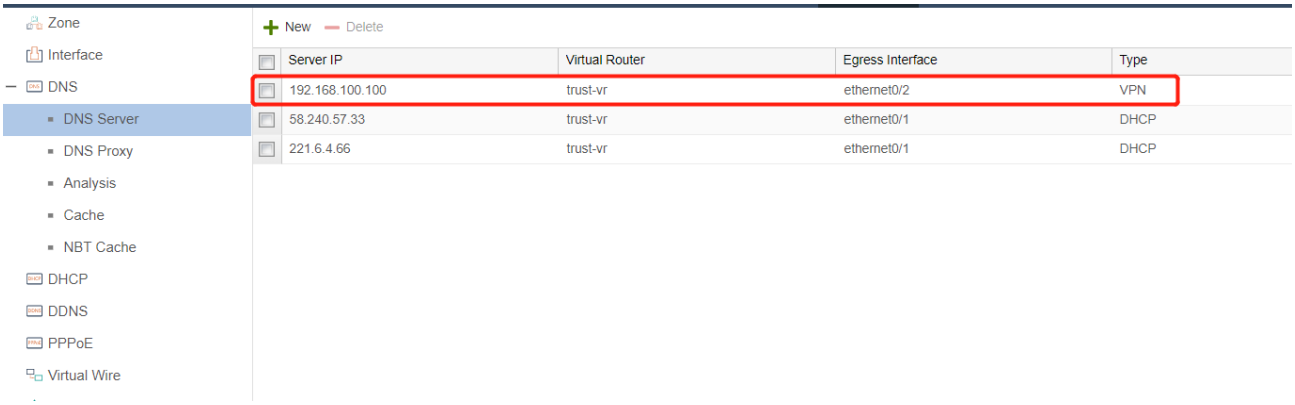
St...	Virtual R...	IP/Netmask	Next-hop ...	Gateway/...	Interface	Protocol	Schedule	Precede...	Metric	Weight	Track Sta...
	trust-vr	0.0.0.0/0	Interface	172.16.1.1	ethernet0/1	DHCP		1	0	1	
	trust-vr	10.0.0.0/24	Interface		tunnel1	Connected		0	0	1	
	trust-vr	10.0.0.1/32	Interface		tunnel1	HOST		0	0	1	
	trust-vr	10.0.0.2/32	Interface	10.0.0.2	tunnel1	VPN		1	0	1	
	trust-vr	172.16.1.0/24	Interface		ethernet0/1	Connected		0	0	1	
	trust-vr	172.16.1.101/32	Interface		ethernet0/1	HOST		0	0	1	
	trust-vr	192.168.1.0/24	Interface		ethernet0/2	Connected		0	0	1	
	trust-vr	192.168.1.1/32	Interface		ethernet0/2	HOST		0	0	1	
	trust-vr	192.168.2.0/24	Interface	10.0.0.2	tunnel1	VPN		1	0	1	
	trust-vr	192.168.100.0/24	Interface		ethernet0/3	Connected		0	0	1	
	trust-vr	192.168.100.1/32	Interface		ethernet0/3	HOST		0	0	1	

Incoming interface on client side has acquired relevant configuration, tunnel interface has been created accordingly, and also route, policy, DNS server


Interface
DNS
DHCP
DDNS
PPPoE
Virtual Wire
Virtual Router
VSwitch
Port Mirroring
3G/4G
Routing
Outbound
Inbound
VPN
IPSec VPN
Interface Name | Status | Type | IP/Netmask | MAC | Zone | Vsys | Users/IPs | Speed Out | Speed In | Description
cellular0/0 | Static | 0.0.0.0/0 | 001c.545f.94d6 | untrust | root | 0 | 0 bps | 0 bps
ethernet0/0 | Static | 0.0.0.0/0 | 001c.545f.9498 | NULL | root | 0 | 0 bps | 0 bps
ethernet0/1 | DHCP | 172.16.1.105/24 | 001c.545f.9499 | untrust | root | 0 | 1.92 Kbps | 1.13 Kbps
ethernet0/2 | Static | 192.168.2.1/24 | 001c.545f.949a | trust | root | 1 | 0 bps | 1.66 Kbps
ethernet0/3 | Static | 0.0.0.0/0 | 001c.545f.949b | NULL | root | 0 | 0 bps | 0 bps
ethernet0/4 | Static | 0.0.0.0/0 | 001c.545f.949c | NULL | root | 0 | 0 bps | 0 bps
ethernet0/5 | Static | 0.0.0.0/0 | 001c.545f.949d | NULL | root | 0 | 0 bps | 0 bps
ethernet0/6 | Static | 0.0.0.0/0 | 001c.545f.949e | NULL | root | 0 | 0 bps | 0 bps
ethernet0/7 | Static | 0.0.0.0/0 | 001c.545f.949f | NULL | root | 0 | 0 bps | 0 bps
ethernet0/8 | Static | 0.0.0.0/0 | 001c.545f.94a0 | NULL | root | 0 | 0 bps | 0 bps
tunnel1 | Static | 10.0.0.2/32 | 0000.0000.0000 | VPN | root | 0 | 464 bps | 0 bps
vswitchif1 | Static | 0.0.0.0/0 | 001c.545f.94a9 | NULL | root | 0 | 0 bps | 0 bps


St... | Virtual... | IP/Netmask | Next-hop Type | Gateway/Next-ho... | Interface | Protocol | Sched... | Prece... | Metric | Weight | Track ... | Descri...
trust-vr | 0.0.0.0/0 | Interface | 172.16.1.1 | ethern... | DHCP | 1 | 0 | 1
trust-vr | 172.16.1.0/24 | Interface | ethern... | Conne... | 0 | 0 | 1
trust-vr | 172.16.1.105/32 | Interface | ethern... | HOST | 0 | 0 | 1
trust-vr | 192.168.1.0/24 | Interface | 172.16.1.101 | tunnel1 | VPN | 1 | 0 | 1
trust-vr | 192.168.2.0/24 | Interface | ethern... | Conne... | 0 | 0 | 1
trust-vr | 192.168.2.1/32 | Interface | ethern... | HOST | 0 | 0 | 1
trust-vr | 192.168.3.0/24 | Interface | 172.16.1.101 | tunnel1 | VPN | 1 | 0 | 1
trust-vr | 192.168.100.0/24 | Interface | 172.16.1.101 | tunnel1 | VPN | 1 | 0 | 1


Security Policy
NAT
iQoS
Session Limit
ARP Defense
SSL Proxy
Global Blacklist
New
Edit
Delete
Copy
Paste
Move
ID | Name | Source | Destination | Service
Zone | Address | User | Zone | Address
1 | trust | any | untrust | any | any
4 | VPN | any | trust | any | any
5 | trust | any | VPN | any | any


Zone
Interface
DNS
DNS Server
DNS Proxy
Analysis
Cache
NBT Cache
DHCP
DDNS
PPPoE
Virtual Wire
New
Delete
Server IP | Virtual Router | Egress Interface | Type
192.168.100.100 | trust-vr | ethernet0/2 | VPN
58.240.57.33 | trust-vr | ethernet0/1 | DHCP
221.6.4.66 | trust-vr | ethernet0/1 | DHCP

4. Troubleshooting

We can debug the whole process of vpn negotiation and parameter distribution via enable debug vpn ike basic/packet, here I cited the part of parameter distributing on server side, we can easily see the way how it works here

2019-06-09 03:41:46, DEBUG@VPN: IPC start (SA_BIND_INT)
2019-06-09 03:41:46, DEBUG@VPN: Sa index: 7
2019-06-09 03:41:46, DEBUG@VPN: SA 7 tunnel interface(48) is binded,nh_addr:ac10
0165
2019-06-09 03:41:46, DEBUG@VPN: dns notify: ifid:33, vrid:1, dns1:00000000, doma
inname:(null), action:0
2019-06-09 03:41:46, DEBUG@VPN: dns notify: ifid:33, vrid:1, dns1:c0a86464, doma
inname:(null), action:1
2019-06-09 03:41:46, DEBUG@VPN: pnpvpn gen config
2019-06-09 03:41:46, DEBUG@VPN: Generate conf:
interface ethernet0/2
no dns-proxy
no dhcp-server enable
no ip address
exit
no dhcp-server pool pnpauto
dhcp-server pool pnpauto
address 192.168.2.10 192.168.2.20
gateway 192.168.2.1
netmask 255.255.255.0
exit
ip dns-proxy domain any name-server use-system
interface ethernet0/2
ip address 192.168.2.1 255.255.255.0
dhcp-server enable pool pnpauto
dns-proxy
exit
interface tunnel1
no ip address
no ip address unnumber
ip address 10.0.0.2/32
exit