



Application Guide

Hongdian-L2TP Server-VPN



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Revision History

Updates between document versions are cumulative. Therefore, the latest document version contains all updates made to previous versions.

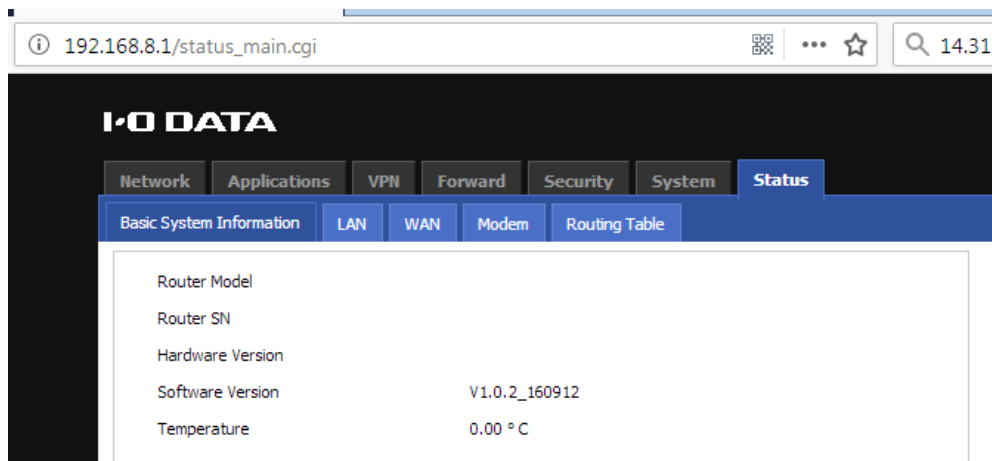
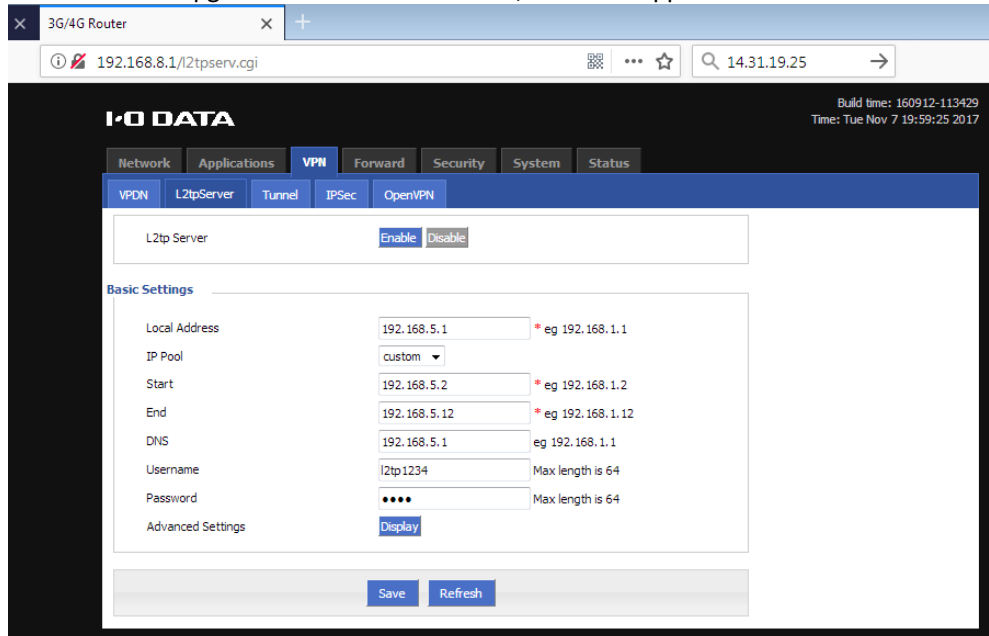
Doc Version	Product	Release Data	Details
V0.2	Hongdian Router	2017.12.06	Beta Version

1 Overview

Hongdian routers support L2TP VPN function. This document shows how to build up a L2TP VPN between H8951 and H8922S, wherein we take **H8922S** to be the **L2TP client**, and the **H8951** to be the **L2TP Server**. If you are using your own L2TP server instead of the H8951, the L2TP server configuration may be different with this document.

Tips:

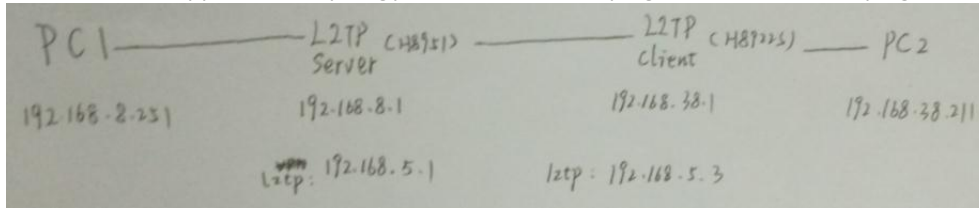
H8951 need to upgrade the custom firmware, which is support the L2TP Server function.



2 L2TP VPN and Routing

This section shows you the steps about build up the L2TP VPN connection and setup subnet routing.

Please see the application topology as below, we can ping PC2 from PC1 (or ping on the opposite).

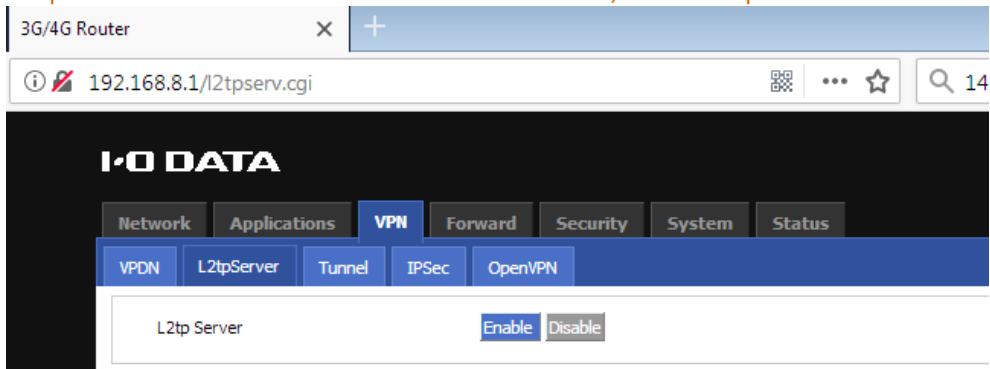


```

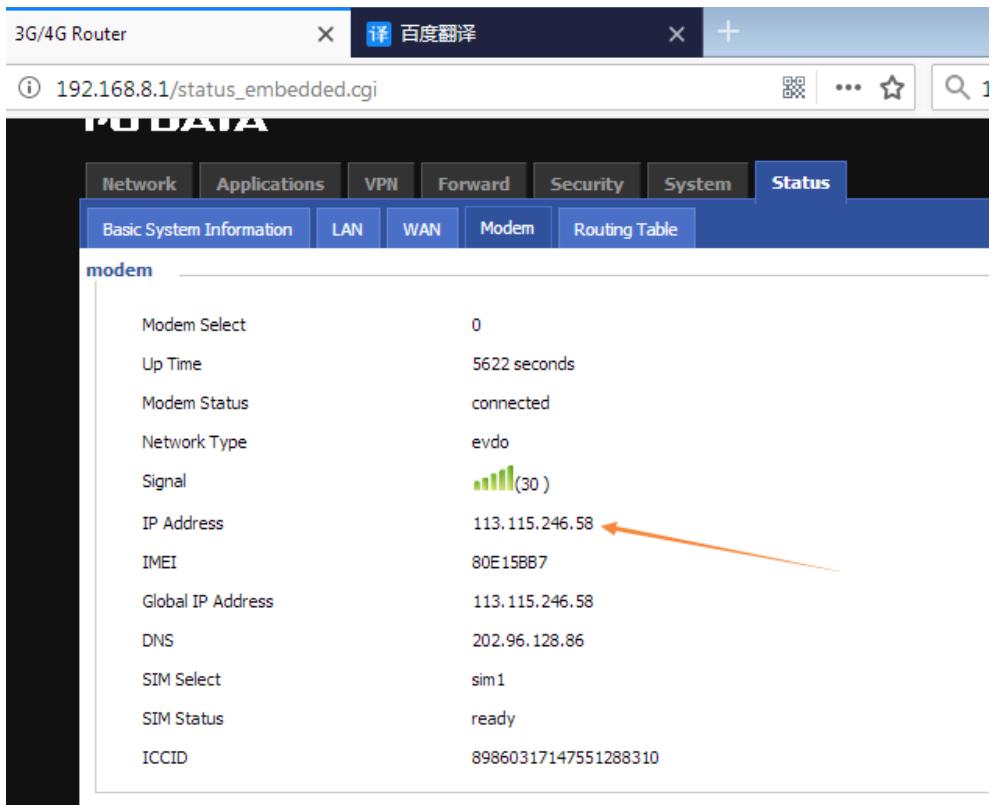
Pinging 192.168.38.211 from 192.168.8.251 with 32 bytes of data:
Reply from 192.168.38.211: bytes=32 time=167ms TTL=126
Reply from 192.168.38.211: bytes=32 time=156ms TTL=126
  
```

Notice: Your L2TP Server may not be the same as this document's case, so please prepare your L2TP Server by yourself.

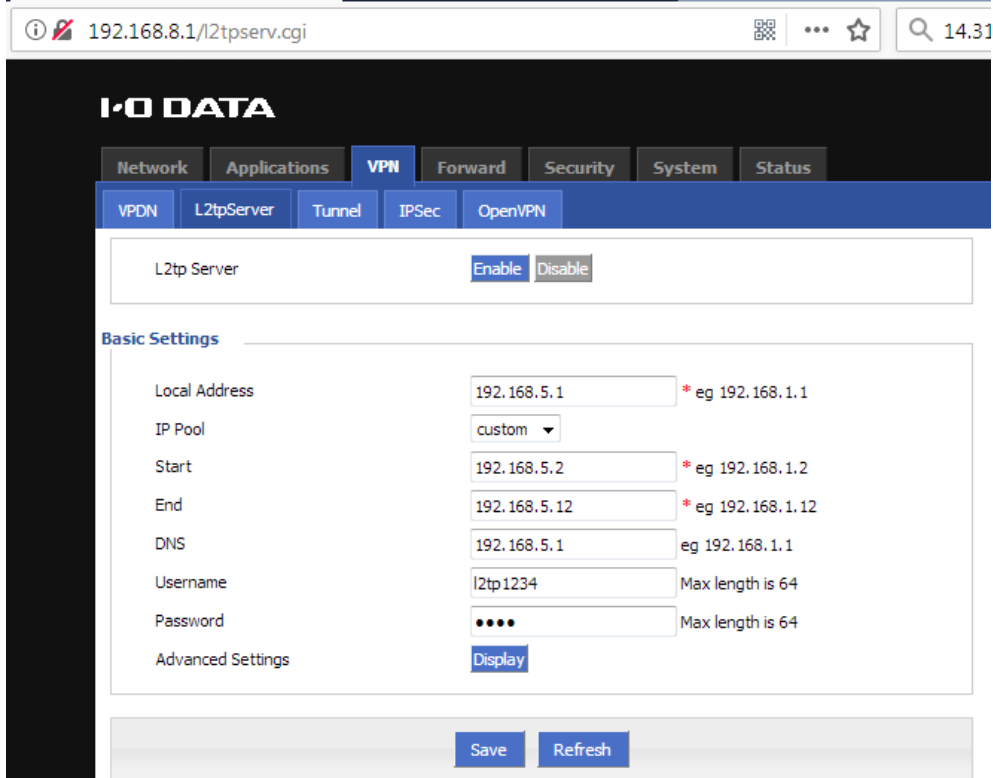
1. Open the L2TP Server function of the H8951 router, see the l2tp server shows.



2. Prepare a CT SIM card, which supports public IP in EVDO network, and prepare the MC2716 3G module. Install into the H8951.

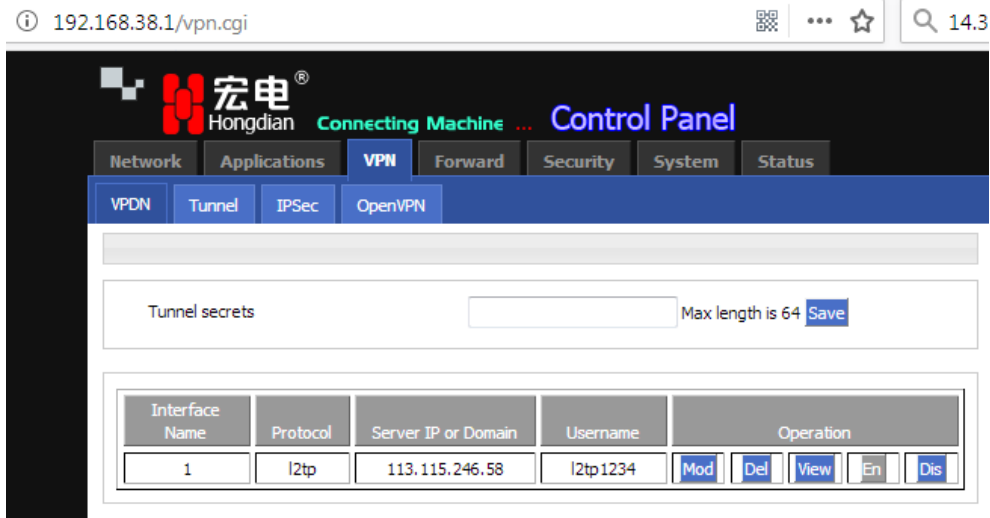


3. Input custom l2tp server settings

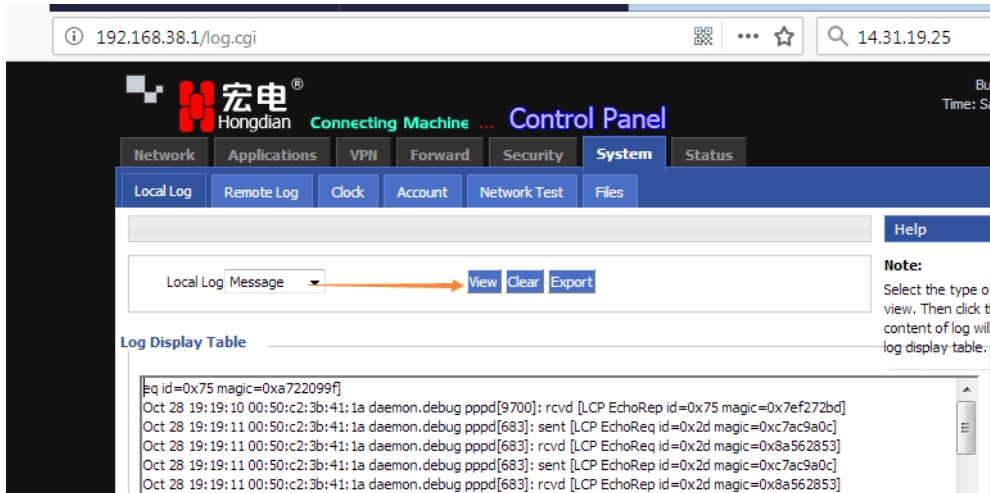


4. Power on H8922S, make sure it can access the Internet, you should insert the SIM card and etc. Enable l2tp

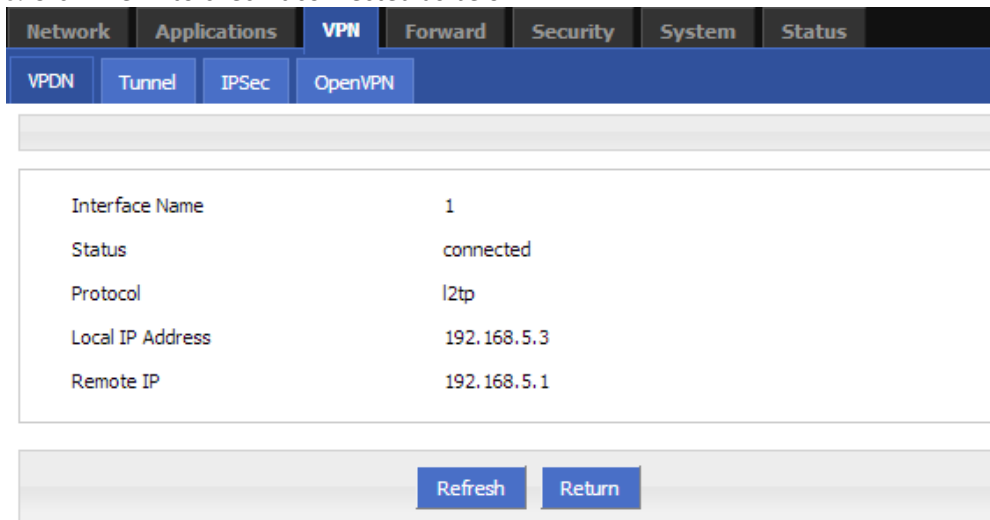
connection



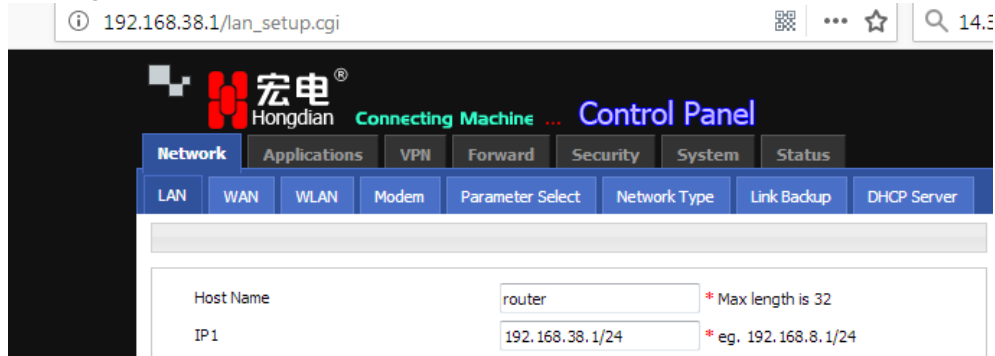
5. View the log check what happen in l2tp building 113.114.242.153



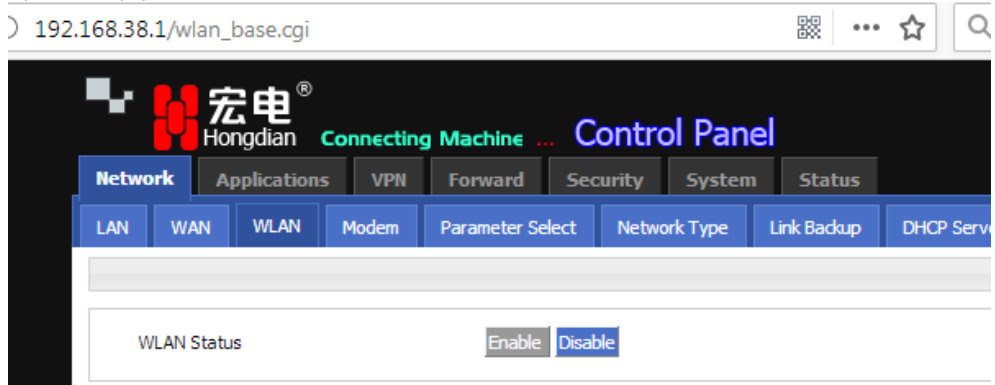
6. Click "view" to check it connected as below.



7. Change the H8922S default LAN IP:192.168.8.1 to other's, such as 192.168.38.1.



By the way, you can also use WIFI connect to H8922S and connect H8951 with PC's Ethernet



8. Check the ping from the l2tp server to client.

Server (VPN IP:192.168.5.1)

```
root@router:~# ping 192.168.5.3
PING 192.168.5.3 (192.168.5.3): 56 data bytes
64 bytes from 192.168.5.3: seq=0 ttl=64 time=161.051 ms
```

You can also login CLI of both two routers for more convenient in ping:

L2TP Server : telnet 192.168.8.1 23

L2TP Client : telnet 192.168.38.1 23

9. The routing's network shall be the subnet of the opposite end.

That is:

L2TP server: Routing network is the subnet of the l2tp client.

L2TP client: Routing network is the subnet of the l2tp server.

Server:

The screenshot shows the I-O DATA router configuration interface. The browser address bar displays `192.168.8.1/static_route.cgi`. The page title is "I-O DATA". The navigation menu includes "Network", "Applications", "VPN", "Forward", "Security", "System", and "Status". Under the "Forward" tab, there are sub-tabs for "NAT", "Routing", "RIP", "OSPF", and "QoS". The "Routing" sub-tab is active, showing a table of static routes:

Route Type	Network	Gateway	Priority	Operation
Route	0.0.0.0/0	modem		Delete
Route	192.168.38.0/24	l2tpserv0		Delete

Below the table are "Add" and "Refresh" buttons.

Client:

The screenshot shows the Hongdian router configuration interface. The browser address bar displays `192.168.38.1/static_route.cgi`. The page title is "宏电® Hongdian Connecting Machine ... Control Panel". The navigation menu includes "Network", "Applications", "VPN", "Forward", "Security", "System", and "Status". Under the "Forward" tab, there are sub-tabs for "NAT", "Routing", "RIP", "OSPF", and "QoS". The "Routing" sub-tab is active, showing a table of static routes:

Route Type	Network	Gateway	Priority	Operation
Static Route	0.0.0.0/0	modem		Delete
Static Route	192.168.8.0/24	vpdn1		Delete

Below the table are "Add" and "Refresh" buttons.

10. Compare both iptables:

Server:

192.168.8.1/route_table.cgi

I-O DATA

Network Applications VPN Forward Security System **Status**

Basic System Information LAN WAN Modem **Routing Table**

Route

Network	Subnet Mask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	0.0.0.0	modem	1
14.31.191.254	255.255.255.255	0.0.0.0	modem	0
192.168.5.3	255.255.255.255	0.0.0.0	l2tpserv1	0
192.168.8.0	255.255.255.0	0.0.0.0	br0	0
192.168.10.0	255.255.255.0	0.0.0.0	eth0	0
192.168.18.0	255.255.255.0	0.0.0.0	br0	0
192.168.38.0	255.255.255.0	0.0.0.0	l2tpserv1	0

Client:

192.168.38.1/route_table.cgi

宏电®
Hongdian Connecting Machine ... **Control Panel**

Network Applications VPN Forward Security System **Status**

Basic System Information LAN WAN WLAN Modem **Routing Table**

Static Route

Network	Subnet Mask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	0.0.0.0	modem	1
10.0.0.0	255.255.255.0	0.0.0.0	eth0	0
192.168.5.1	255.255.255.255	0.0.0.0	vpdn1	0
192.168.8.0	255.255.255.0	0.0.0.0	vpdn1	0
192.168.28.0	255.255.255.0	0.0.0.0	br0	0
192.168.38.0	255.255.255.0	0.0.0.0	br0	0

Policy Route

Network	Subnet Mask	Gateway	Interface	Priority
---------	-------------	---------	-----------	----------

Refresh

If you added routing rule fail, such as Server routing added fail, as below.

192.168.8.1/route_table.cgi 14.31

I-O DATA

Network Applications VPN Forward Security System **Status**

Basic System Information LAN WAN Modem **Routing Table**

Route

Network	Subnet Mask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	0.0.0.0	modem	1
14.31.191.254	255.255.255.255	0.0.0.0	modem	0
192.168.5.3	255.255.255.255	0.0.0.0	l2tpserv1	0
192.168.8.0	255.255.255.0	0.0.0.0	br0	0
192.168.10.0	255.255.255.0	0.0.0.0	eth0	0
192.168.18.0	255.255.255.0	0.0.0.0	br0	0

Policy Route

Network	Subnet Mask	Gateway	Interface	Priority

Refresh

So let us delete that routing rule of server, and add it again.

Network Applications VPN **Forward** Security System Status

NAT **Routing** RIP OSPF QoS

Route Type	Network	Gateway	Priority	Operation
Route	0.0.0.0/0	modem		Delete
Route	192.168.38.0/24	l2tpserv1		Delete

Add Refresh

Now it is added successful as below.

192.168.8.1/route_table.cgi

I-O DATA

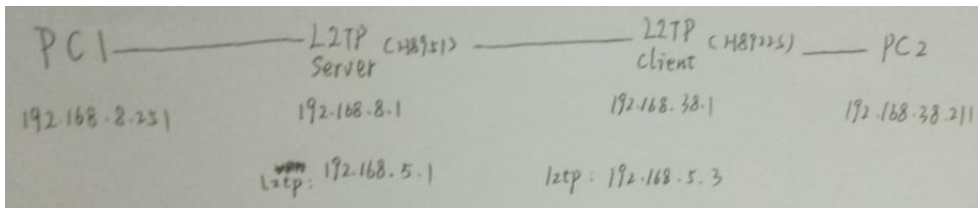
Network Applications VPN Forward Security System **Status**

Basic System Information LAN WAN Modem **Routing Table**

Route

Network	Subnet Mask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	0.0.0.0	modem	1
14.31.191.254	255.255.255.255	0.0.0.0	modem	0
192.168.5.3	255.255.255.255	0.0.0.0	l2tpserv1	0
192.168.8.0	255.255.255.0	0.0.0.0	br0	0
192.168.10.0	255.255.255.0	0.0.0.0	eth0	0
192.168.18.0	255.255.255.0	0.0.0.0	br0	0
192.168.38.0	255.255.255.0	0.0.0.0	l2tpserv1	0

11. Ping network



Server

```

root@router:~# ping 192.168.38.1
PING 192.168.38.1 (192.168.38.1): 56 data bytes
64 bytes from 192.168.38.1: seq=0 ttl=64 time=181.596 ms
64 bytes from 192.168.38.1: seq=1 ttl=64 time=190.889 ms
  
```

```

root@router:~# ping 192.168.38.211
PING 192.168.38.211 (192.168.38.211): 56 data bytes
64 bytes from 192.168.38.211: seq=0 ttl=127 time=208.516 ms
64 bytes from 192.168.38.211: seq=1 ttl=127 time=208.915 ms
  
```

```

root@router:~# ping 192.168.8.251
  
```

Client

```

root@router:~# ping 192.168.8.1
PING 192.168.8.1 (192.168.8.1): 56 data bytes
64 bytes from 192.168.8.1: seq=0 ttl=64 time=224.992 ms
  
```

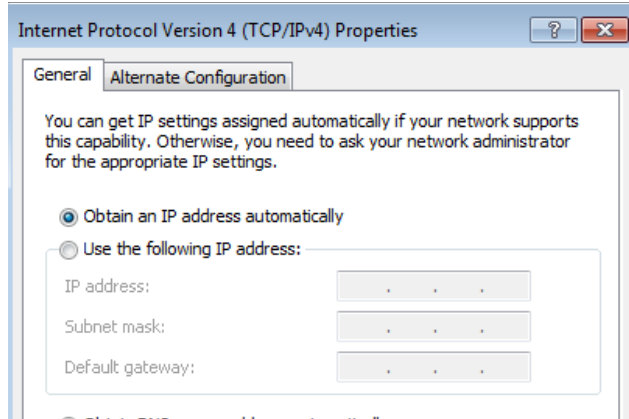
```

root@router:~# ping 192.168.8.251
PING 192.168.8.251 (192.168.8.251): 56 data bytes
64 bytes from 192.168.8.251: seq=0 ttl=127 time=210.067 ms
  
```

```
root@router:~# ping 192.168.38.211
```

Be careful:

Make sure the PC is configured the correct gateway, or it has enabled auto obtaining the IP from DHCP, as below.



PC1

```
C:\Users\Administrator>ping -S 192.168.8.251 192.168.38.211 -t
```

```
Pinging 192.168.38.211 from 192.168.8.251 with 32 bytes of data:
```

```
Reply from 192.168.38.211: bytes=32 time=167ms TTL=126
```

```
Reply from 192.168.38.211: bytes=32 time=156ms TTL=126
```

PC2

```
C:\Users\Administrator>ping -S 192.168.8.251 192.168.38.211 -t
```

```
Pinging 192.168.38.211 from 192.168.8.251 with 32 bytes of data:
```

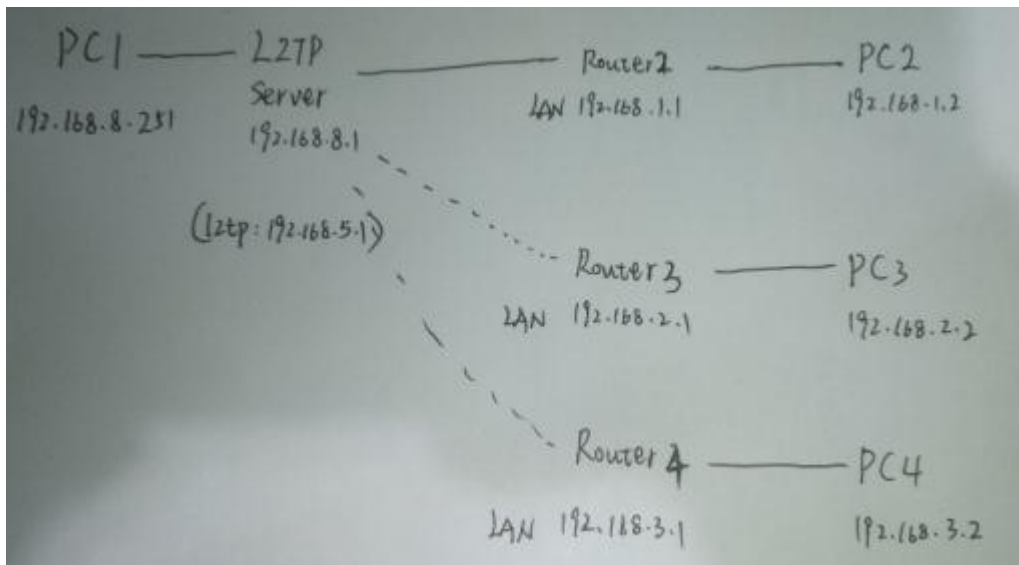
```
Reply from 192.168.38.211: bytes=32 time=167ms TTL=126
```

```
Reply from 192.168.38.211: bytes=32 time=156ms TTL=126
```

That is, PC1(192.168.8.251) and PC2(192.168.8.251) are connected.

3 L2TP VPN with multiple clients

If there are multiple clients in the VPN connection, as below:



Router2~4 are the VPN clients, and make sure their LAN IP are different, such as 192.168.1.1/24, 192.168.2.1/24 and 192.168.3.1/24.

Also the slave machine PC2~PC4 also need to be in the related subnet, such as 192.168.1.2, 192.168.2.2 and 192.168.3.2

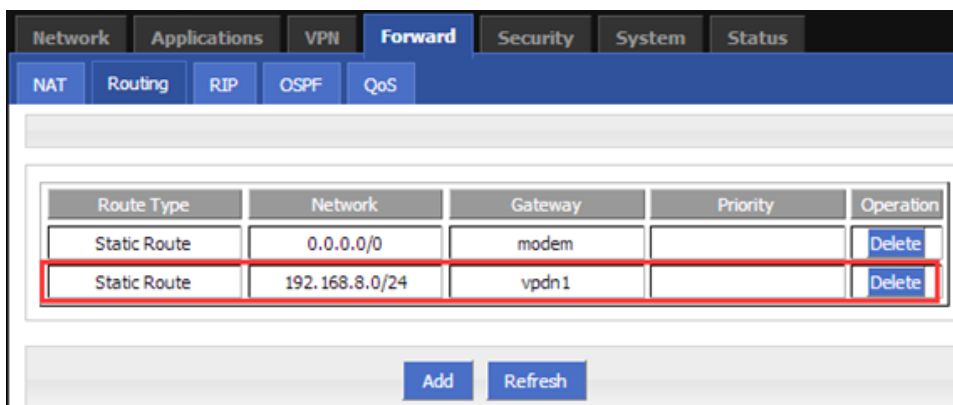
After building up the VPN, following are the two routing cases:

Routing case 1

If you want to access PC2~PC4 from the PC1 (that is PC1-PC2, PC1-PC3, PC1-PC4); You can add the routing as below:

After router2~router4 building up the VPN with the L2TP server, the client router(1~4) should add the routing rule:

```
network: 192.168.8.0/24 gateway: l2tp interface
```



And the L2TP server should add 3 routing rules:

```
network: 192.168.1.0/24 gateway: l2tp interface
network: 192.168.2.0/24 gateway: l2tp interface
```

```
network:192.168.3.0/24 gateway:l2tp interface
```

Routing case 2

If you want to access PC3~PC4 from the PC2(That is PC2-PC3, PC2-PC4); You can add the routing as below:
After router2~router4 building up the VPN with the L2TP server, the Router 3 and Router 4 should add the routing rule:

```
network:192.168.1.0/24 gateway:l2tp interface
```

And the Router 2 should add the routing rules:

```
network:192.168.2.0/24 gateway:l2tp interface
```

```
network:192.168.3.0/24 gateway:l2tp interface
```



Create smart things



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