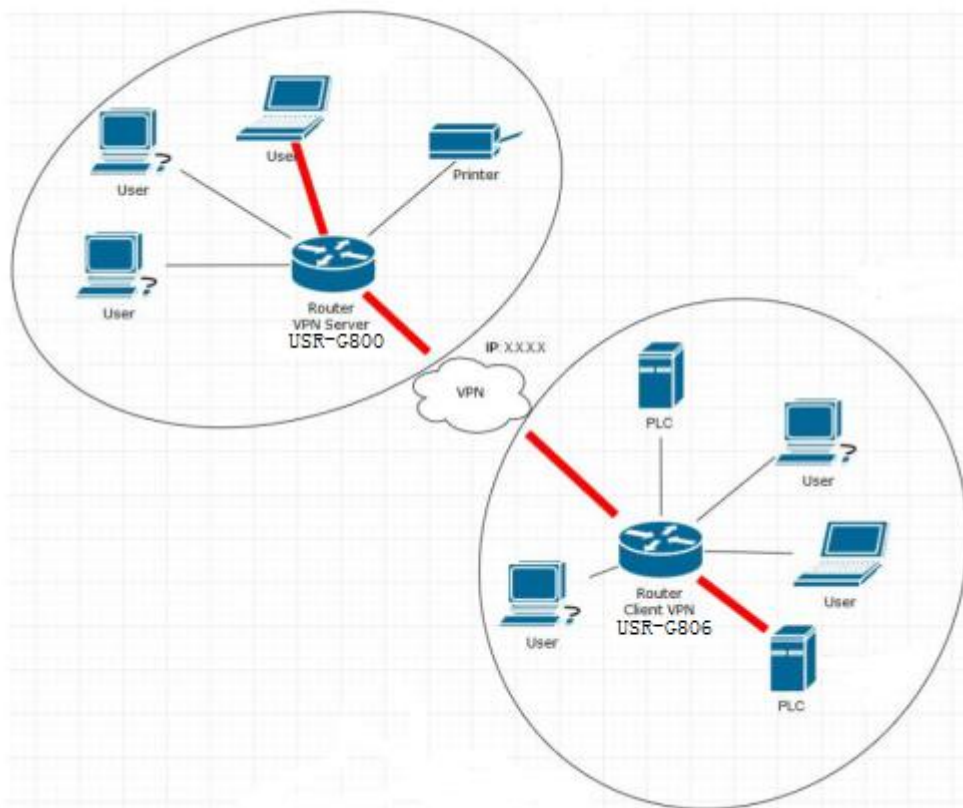


G800(VPN Server)+G806(VPN Client) realize VPN networking

File Version: V1.0.0



Overview

This manual is to introduce the method to establish VPN tunnel between USR-G800(VPN Server) and USR-G806(VPN Client).

Note: After configuring G806 and G800, user needs to restart modules. And user can connect G800 VPN server interface(Only G806 one VPN Client connection, so only ppp0 in test) after configuring and restarting G806 and G800.

1.Configure USR-G800

1.1.Enter G800 Web Server

Connect PC to G800 LAN interface or WLAN interface and configure PC into DHCP mode as follow:

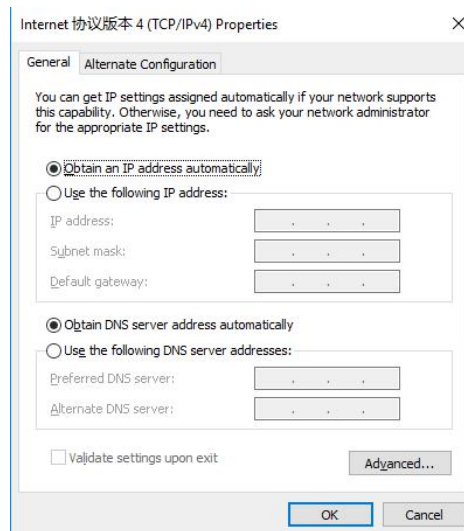


Figure 1 Configure PC to DHCP mode

Then enter G800 Web Server by entering G800 LAN interface IP address (Default is 192.168.1.1) and login with username and password(Default both are root). User can switch between English/Chinese from top right corner.

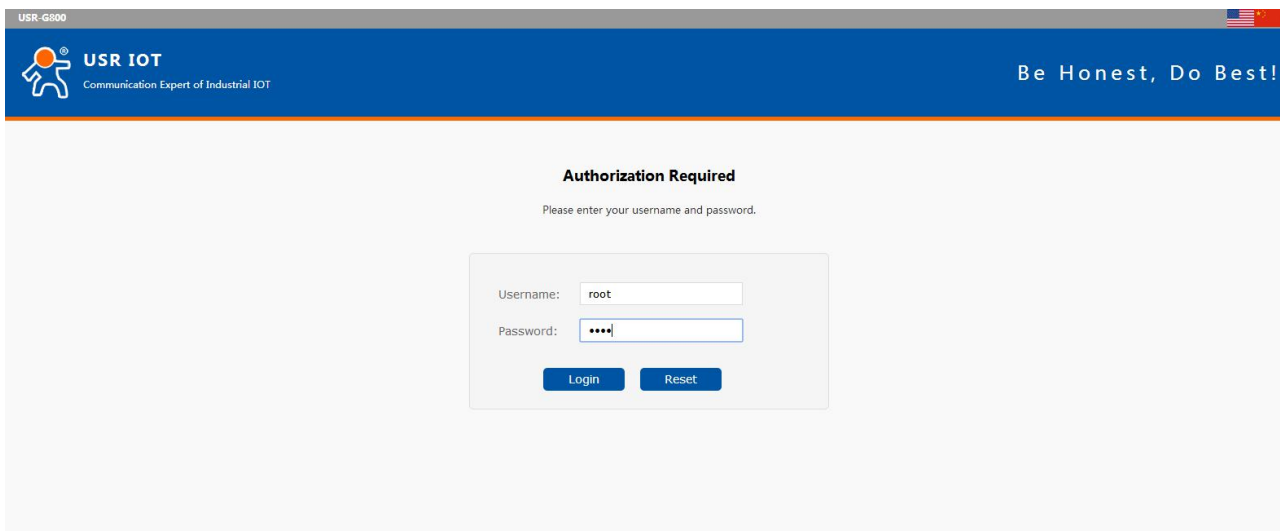


Figure 2 Enter G800 Web Server

1.2.Upgrade firmware

User also needs to upgrade G800 firmware to **USR-G800-V1.0.15-vpnserver-1801221557.bin** which supports VPN Server function.

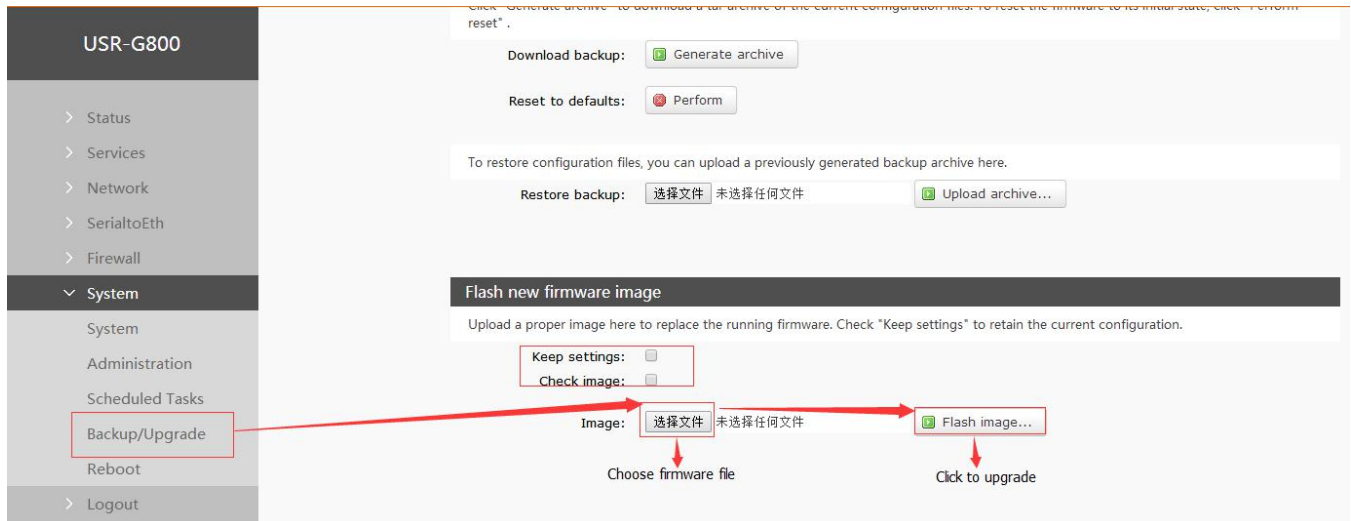


Figure 3 Upgrade firmware

Note: User can't choose 'Check image' if user upgrades G800 from higher firmware to lower firmware.

The whole firmware upgrading process will last 30s~50s and user must keep powering the module and connecting to module during upgrading process. User needs to enter Web Serve again after upgrading successfully(Over 50s).

1.3.Enable VPN Server and configure parameters

Firstly, user should enable VPN Server and configure general parameters by Web Server as follow:

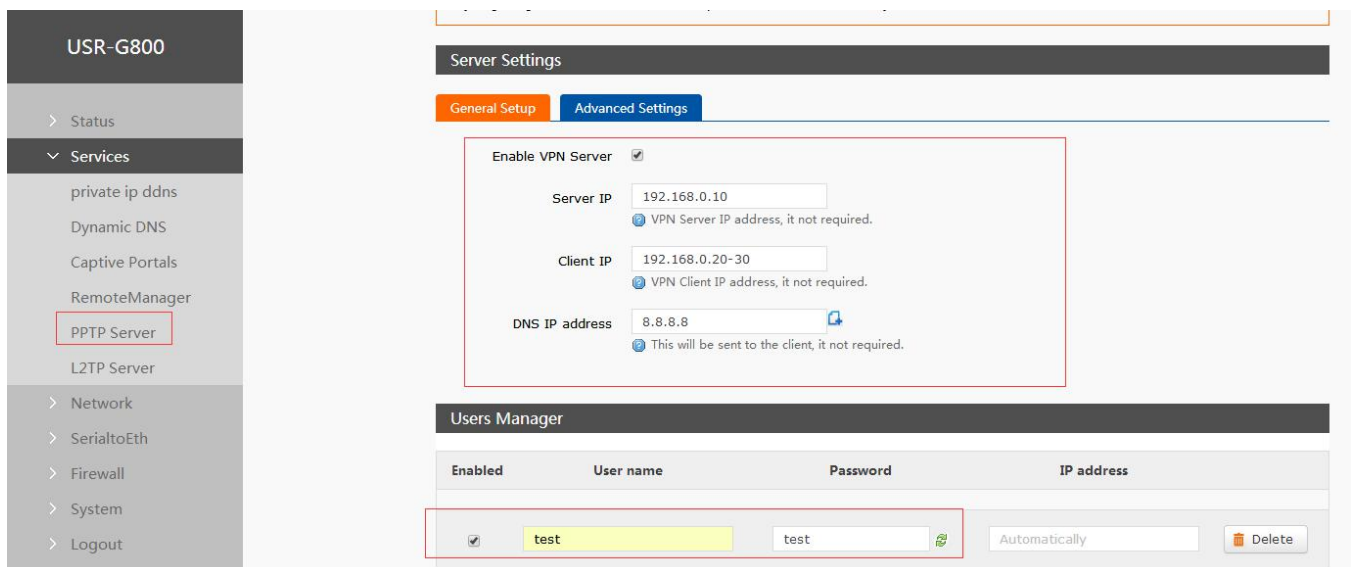
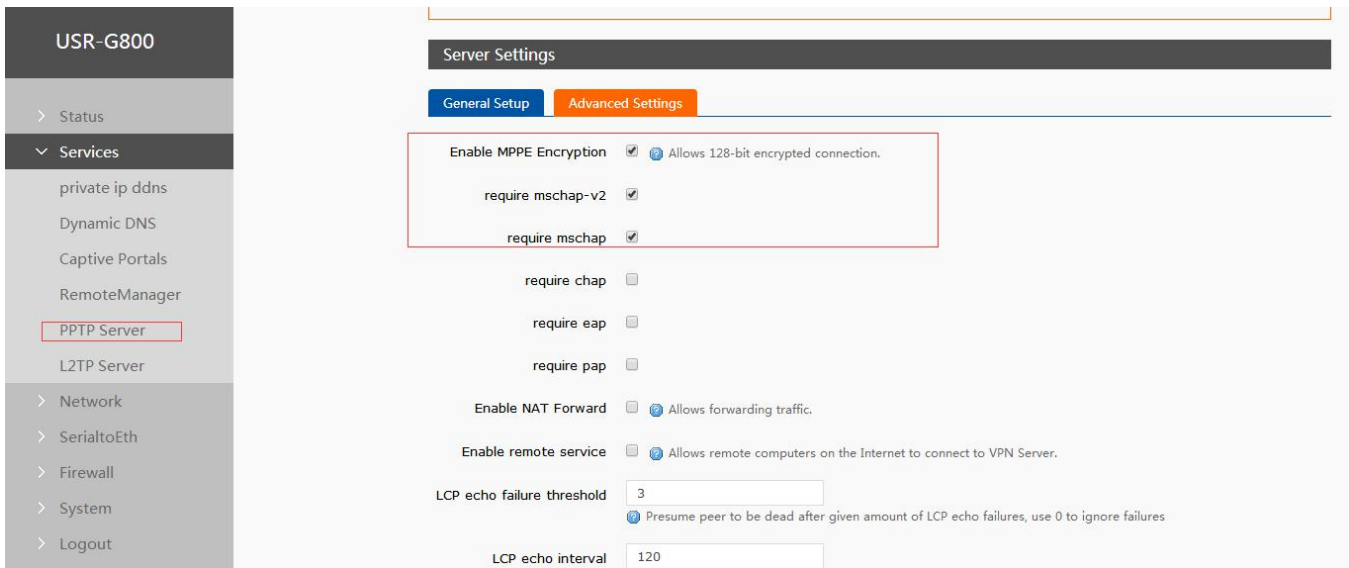


Figure 4 VPN Server general parameters

After clicking 'Save & Apply' on bottom of web page, user also needs to configure VPN Server advanced parameters as follow:



The screenshot shows the 'Advanced Settings' tab for the VPN Server. A red box highlights the following options:

- Enable MPPE Encryption Allows 128-bit encrypted connection.
- require mschap-v2
- require mschap

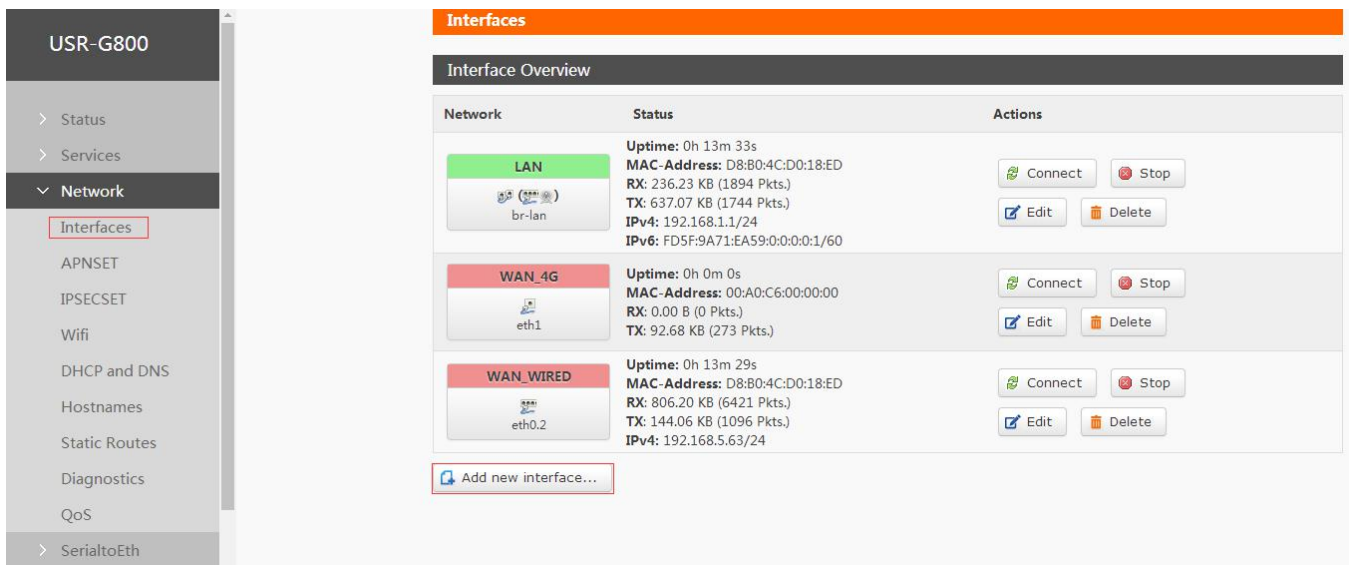
Other visible settings include:

- require chap
- require eap
- require pap
- Enable NAT Forward Allows forwarding traffic.
- Enable remote service Allows remote computers on the Internet to connect to VPN Server.
- LCP echo failure threshold: Presume peer to be dead after given amount of LCP echo failures, use 0 to ignore failures
- LCP echo interval:

Figure 5 VPN Server advanced parameters

1.4.Add VPN Server interface

User can add VPN Server interface as follow:



The screenshot shows the 'Interfaces' page with an 'Interface Overview' table:

Network	Status	Actions
LAN br-lan	Uptime: 0h 13m 33s MAC-Address: D8:B0:4C:D0:18:ED RX: 236.23 KB (1894 Pkts.) TX: 637.07 KB (1744 Pkts.) IPv4: 192.168.1.1/24 IPv6: FD5F:9A71:EA59:0:0:0:1/60	Connect Stop Edit Delete
WAN_4G eth1	Uptime: 0h 0m 0s MAC-Address: 00:A0:C6:00:00:00 RX: 0.00 B (0 Pkts.) TX: 92.68 KB (273 Pkts.)	Connect Stop Edit Delete
WAN_WIRED eth0.2	Uptime: 0h 13m 29s MAC-Address: D8:B0:4C:D0:18:ED RX: 806.20 KB (6421 Pkts.) TX: 144.06 KB (1096 Pkts.) IPv4: 192.168.5.63/24	Connect Stop Edit Delete

At the bottom, there is a button labeled 'Add new interface...'.

Figure 6 Add new interface

Then configure VPN interface as follow:

- Name of the new interface: User can configure the 'Name of the new interface' according to own wants which must conform to rules.
- Protocol of the new interface: Choose 'Unmanaged'.
- Cover the following interface: When user adds new VPN Server interface and configures 'Custom Interface', user should add one new interface from ppp0 once there is new VPN Client connection.(In this manual, only one G806 connects to G800 as VPN Client, so configure 'Custom Interface' to 'ppp0'. If there are two VPN Client connections, G800 should have two new interface with "ppp0' and 'ppp1')

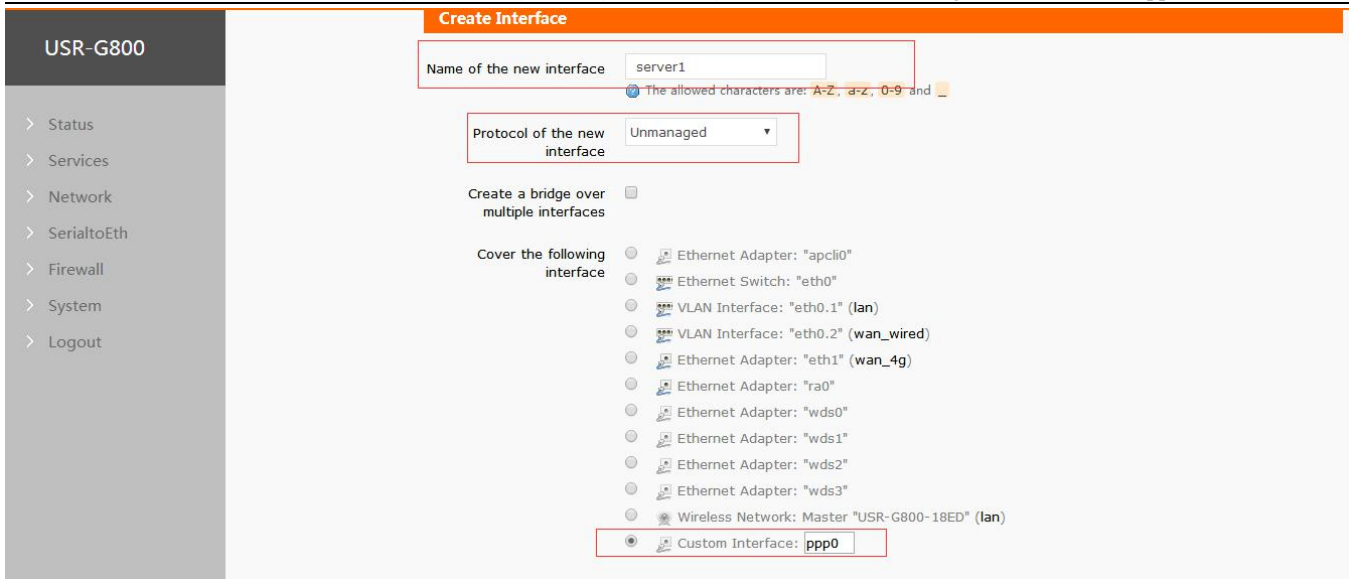


Figure 7 Configure VPN Server interface

After VPN Client connecting, the ppp0 interface will display as follow:

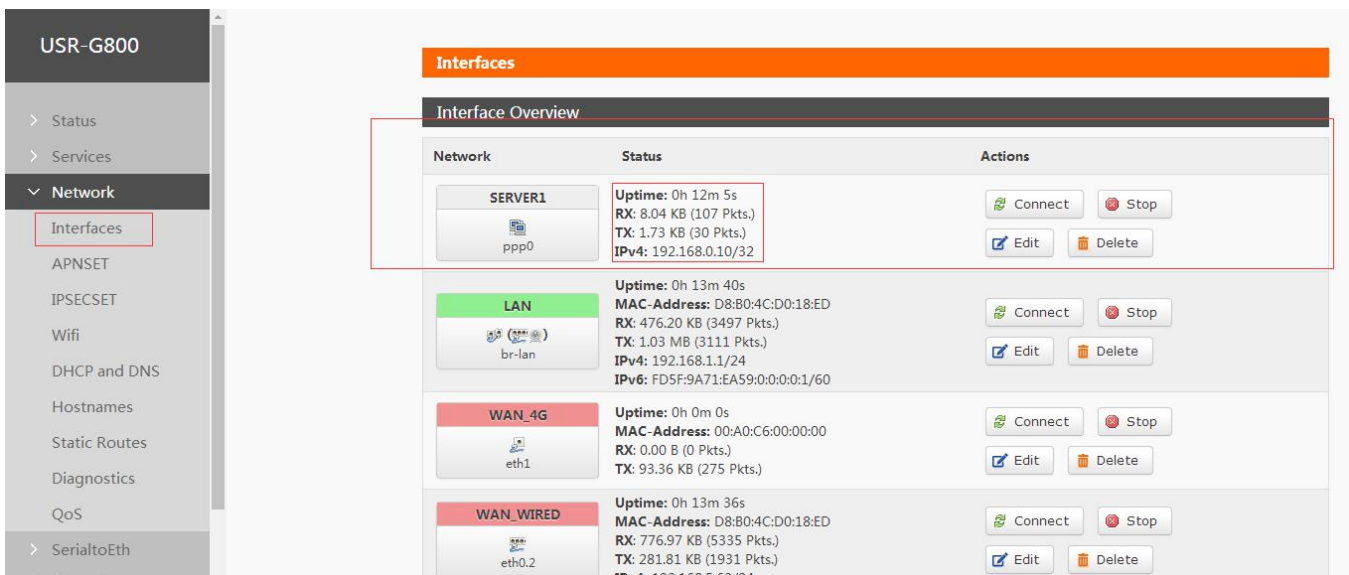


Figure 8 VPN Server interface

1.5. Configure Static Routes

To achieve communication between two router's device through VPN tunnel, user should configure 'Static Routes'.

Configure the Static routes as follows:

- Interface: Choose VPN interface.(server1 in this test)
- Target: 192.168.10.0. IP of VPN Client's(G806) device. G806's LAN IP is changed to 192.168.10.1 in next steps, so Target set to 192.168.10.0 can communicate to all device which connect to G806 LAN interface.
- IPv4-Netmask: 255.255.255.0.
- IPv4-Gateway: 192.168.0.10(VPN Server IP which same as G800 PPTP Server parameters)

Static IPv4 Routes

Interface	Target	IPv4-Netmask	IPv4-Gateway	Metric	MTU
server1	192.168.10.0	255.255.255.0	192.168.0.10	0	1500

Static IPv6 Routes

This section contains no values yet

Figure 9 Static Routes configuration

1.6.Configure Firewall

Forward accept

Zones

Zone => Forwardings	Input	Output	Forward	Masquerading	MSS clamping
lan: lan => wan	accept	accept	accept	<input type="checkbox"/>	<input type="checkbox"/>
wan: wan_wired => wan_4g => ACCEPT	accept	accept	accept	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 10 Configure Firewall

2.Configure USR-G806

2.1.Enter G806 Web Server

Connect PC to G806 LAN interface or WLAN interface and configure PC into DHCP mode as follow:

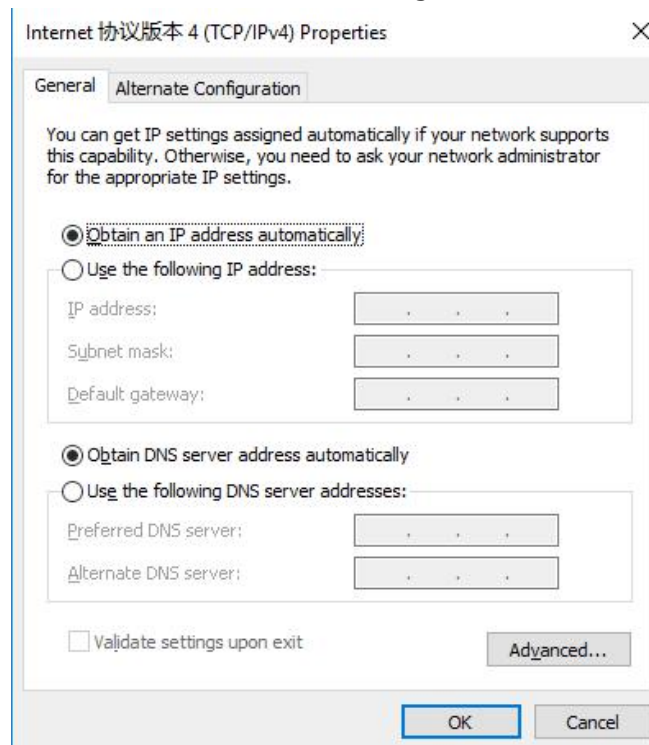


Figure 11 Configure PC to DHCP mode

Then enter G806 Web Server by entering G806 LAN interface IP address (Default is 192.168.1.1) and login with username and password(Default both are root). User can switch between English/Chinese from top right corner.

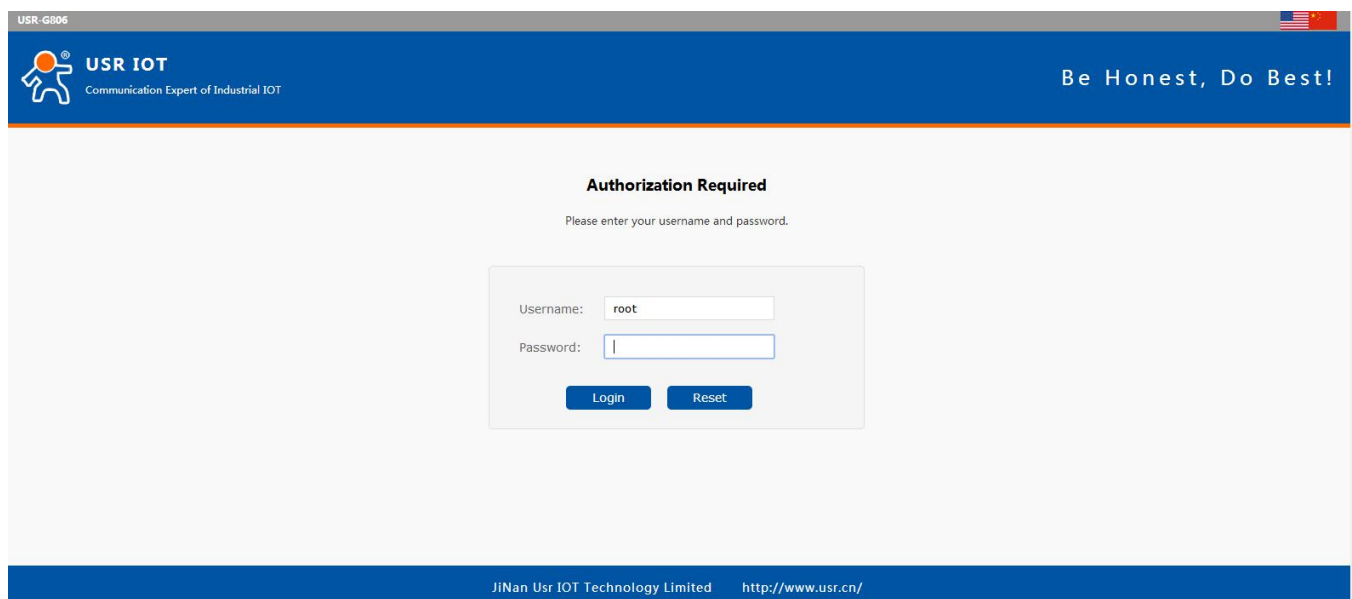
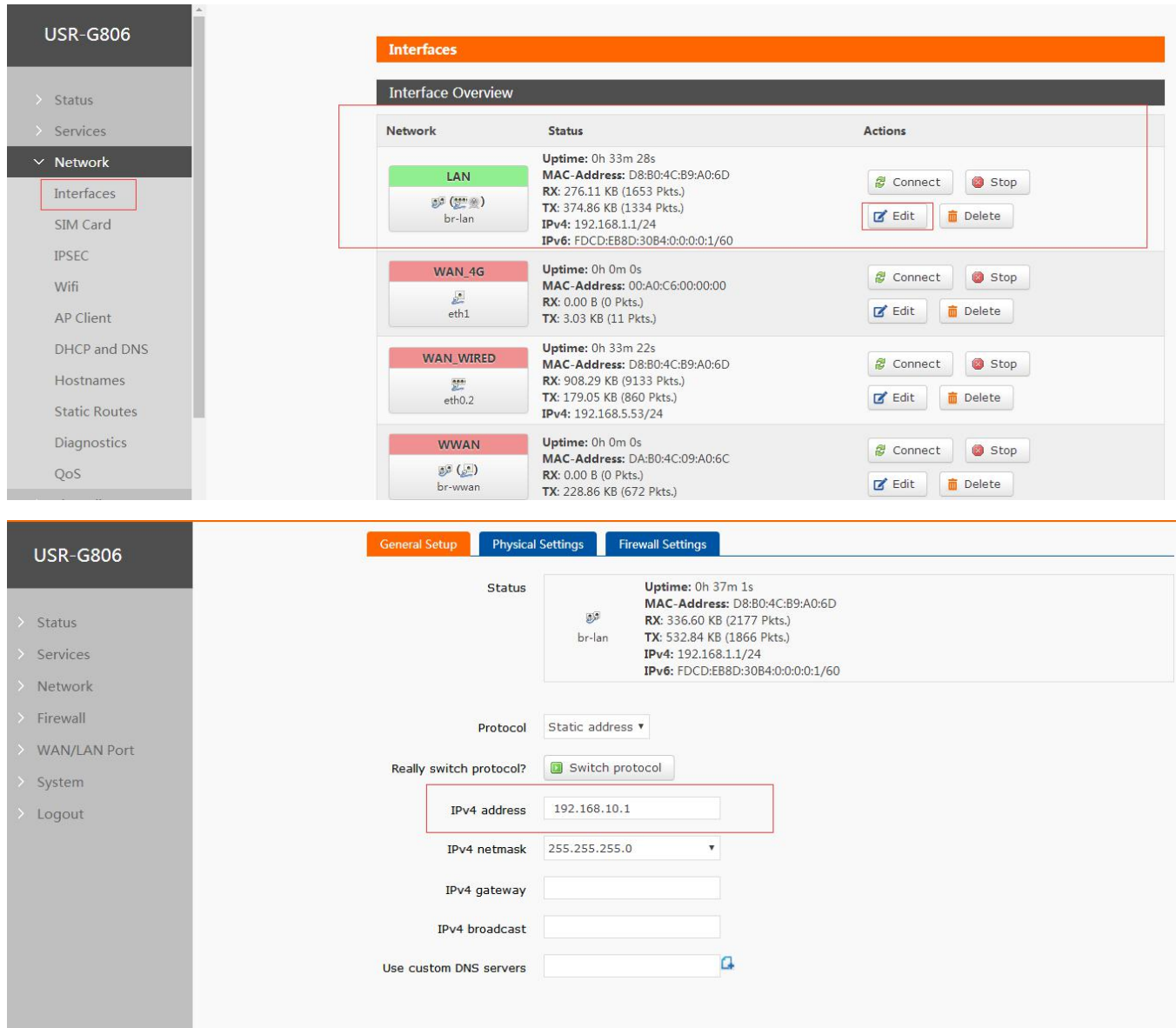


Figure 12 Enter G806 Web Server

2.2. Modify G806 LAN interface IP

After entering G806 Web Server, because G806's default LAN interface IP is same as G800's default LAN interface, we change G806's LAN interface IP address to 192.168.10.1 as follows:



The figure shows two screenshots from the USR-G806 web interface. The top screenshot displays the 'Interfaces' section, where the LAN interface (br-lan) is highlighted. The LAN interface details are as follows:

Network	Status	Actions
LAN br-lan	Uptime: 0h 33m 28s MAC-Address: D8:B0:4C:B9:A0:6D RX: 276.11 KB (1653 Pkts.) TX: 374.86 KB (1334 Pkts.) IPv4: 192.168.1.1/24 IPv6: FDCC:EB8D:30B4:0:0:0:1/60	Connect, Stop, Edit, Delete
WAN_4G eth1	Uptime: 0h 0m 0s MAC-Address: 00:A0:C6:00:00:00 RX: 0.00 B (0 Pkts.) TX: 3.03 KB (11 Pkts.)	Connect, Stop, Edit, Delete
WAN_WIRED eth0.2	Uptime: 0h 33m 22s MAC-Address: D8:B0:4C:B9:A0:6D RX: 908.29 KB (9133 Pkts.) TX: 179.05 KB (860 Pkts.) IPv4: 192.168.5.53/24	Connect, Stop, Edit, Delete
WWAN br-wwan	Uptime: 0h 0m 0s MAC-Address: DA:B0:4C:09:A0:6C RX: 0.00 B (0 Pkts.) TX: 228.86 KB (672 Pkts.)	Connect, Stop, Edit, Delete

The bottom screenshot shows the 'General Setup' page for the LAN interface. The 'IPv4 address' field is set to 192.168.10.1, which is highlighted with a red box. Other fields include IPv4 netmask (255.255.255.0), IPv4 gateway, IPv4 broadcast, and a checkbox for 'Use custom DNS servers'.

Figure 13 Modify G806 LAN interface IP

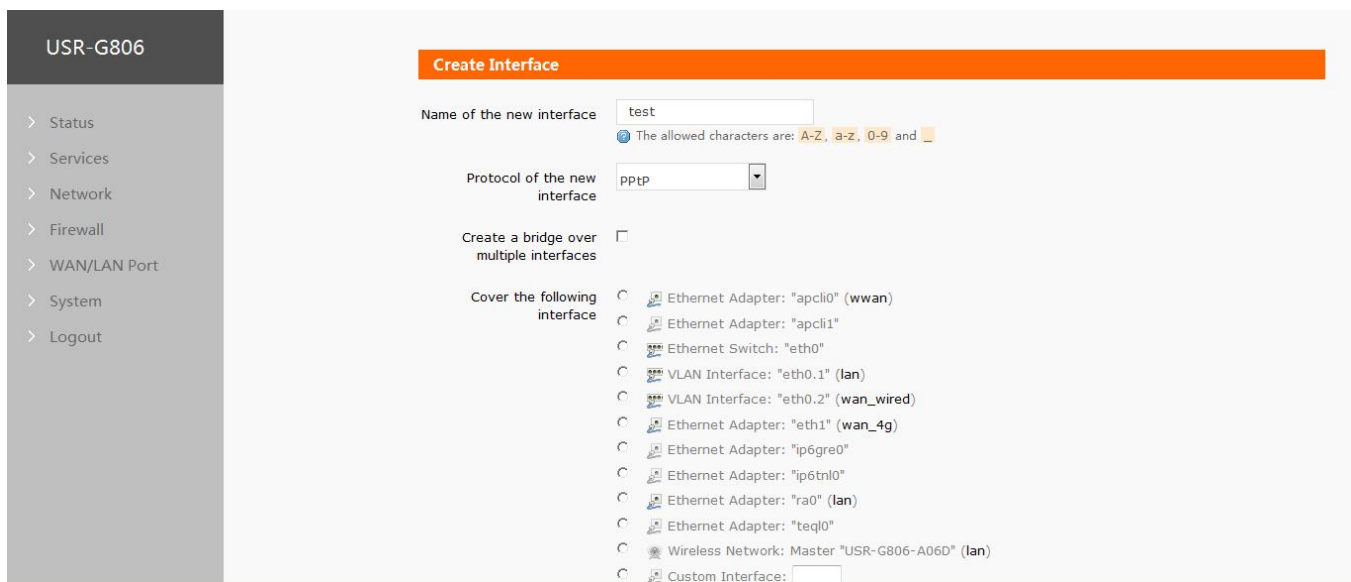
After modifying to 192.168.10.1, user should click 'Save&Apply' on bottom of web page to make settings take effect. And user also needs to enter Web Server by 192.168.10.1 again.

2.3. Add VPN Client interface

Firstly, add new interface with protocol PPTP as follows:



Network	Status	Actions
LAN br-lan	Uptime: 0h 4m 58s MAC-Address: D8:B0:4C:B9:A0:6D RX: 432.55 KB (4734 Pkts.) TX: 14.80 MB (11759 Pkts.) IPv4: 192.168.10.1/24 IPv6: FDCC:E88D:30B4:0:0:0:1/60	Connect Stop Edit Delete
WAN_4G eth1	Uptime: 0h 0m 0s MAC-Address: 00:A0:C6:00:00:00 RX: 0.00 B (0 Pkts.) TX: 6.80 KB (22 Pkts.)	Connect Stop Edit Delete
WAN_WIRED eth0.2	Uptime: 0h 42m 57s MAC-Address: D8:B0:4C:B9:A0:6D RX: 14.84 MB (22928 Pkts.) TX: 542.93 KB (4185 Pkts.) IPv4: 192.168.5.53/24	Connect Stop Edit Delete
WWAN br-wwan	Uptime: 0h 0m 0s MAC-Address: DA:B0:4C:09:A0:6C RX: 0.00 B (0 Pkts.) TX: 294.19 KB (863 Pkts.)	Connect Stop Edit Delete



Create Interface

Name of the new interface:

The allowed characters are: A-Z, a-z, 0-9 and

Protocol of the new interface:

Create a bridge over multiple interfaces:

Cover the following interface:

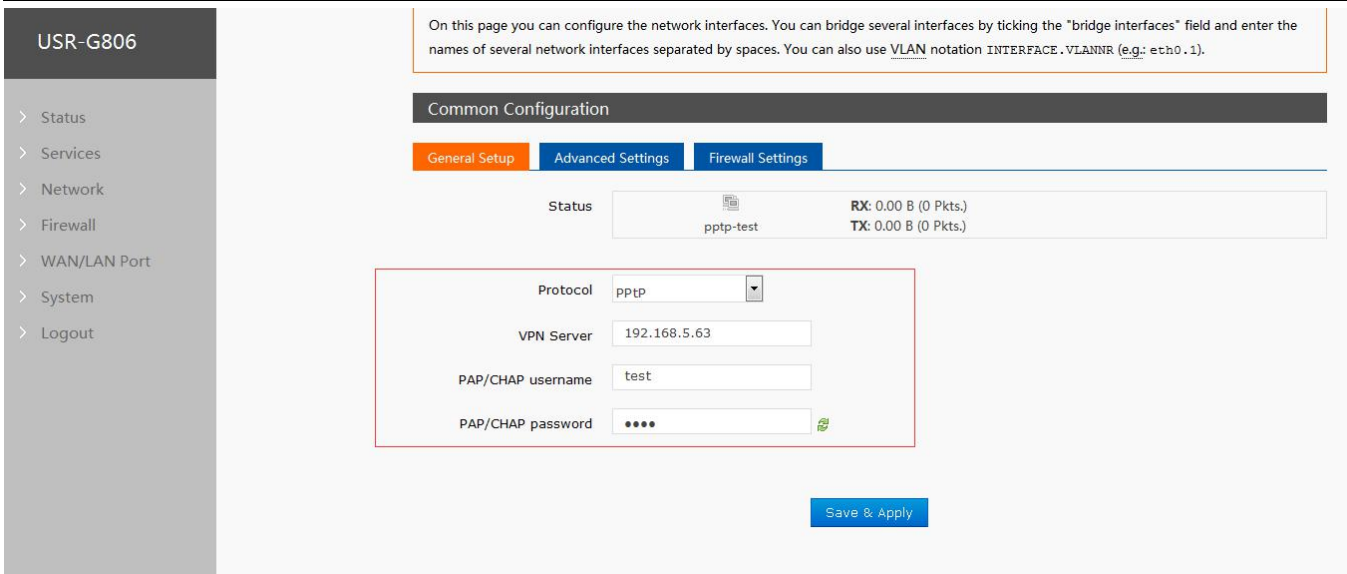
- Ethernet Adapter: "apcli0" (wwan)
- Ethernet Adapter: "apcli1"
- Ethernet Switch: "eth0"
- VLAN Interface: "eth0.1" (lan)
- VLAN Interface: "eth0.2" (wan_wired)
- Ethernet Adapter: "eth1" (wan_4g)
- Ethernet Adapter: "ip6gre0"
- Ethernet Adapter: "ip6tnl0"
- Ethernet Adapter: "ra0" (lan)
- Ethernet Adapter: "teql0"
- Wireless Network: Master "USR-G806-A06D" (lan)
- Custom Interface:

Figure 14 Add new VPN Client interface

After configuration, user should click 'Submit' on bottom of web page to continue configuring.

Then configure VPN Client interface as follows:

- VPN Server: 192.168.5.63 (We take LAN test as a example, so we write G800's WAN interface IP address from superior router here. In actual use, user should use public network IP address or domain name)
- PAP/CHAP username: test (Same as G800 VPN settings)
- PAP/CHAP password: test (Same as G800 VPN settings)



On this page you can configure the network interfaces. You can bridge several interfaces by ticking the "bridge interfaces" field and enter the names of several network interfaces separated by spaces. You can also use VLAN notation INTERFACE.VLANNR (e.g.: eth0.1).

Common Configuration

General Setup | **Advanced Settings** | Firewall Settings

Status: pptp-test RX: 0.00 B (0 Pkts.)
TX: 0.00 B (0 Pkts.)

Protocol: pptp

VPN Server: 192.168.5.63

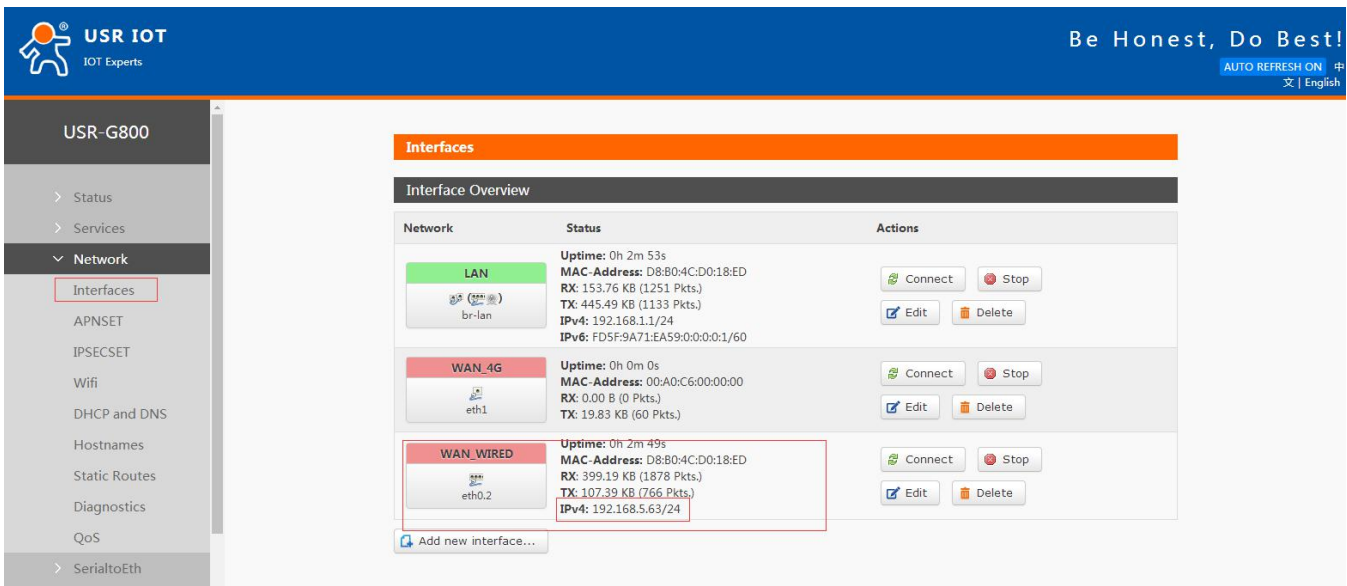
PAP/CHAP username: test

PAP/CHAP password: ****

Save & Apply

Figure 15 Configure VPN Client interface

User can know G800's WAN interface IP as follow(We connect G800 to superior router by wired WAN interface not insert SIM card to connect internet in the test):



Interfaces

Interface Overview

Network	Status	Actions
LAN br-lan	Uptime: 0h 2m 53s MAC-Address: D8:80:4C:D0:18:ED RX: 153.76 KB (1251 Pkts.) TX: 445.49 KB (1133 Pkts.) IPv4: 192.168.1.1/24 IPv6: FDF5F:9A71:EAS9:0:0:0:1/60	Connect Stop Edit Delete
WAN_4G eth1	Uptime: 0h 0m 0s MAC-Address: 00:A0:C6:00:00:00 RX: 0.00 B (0 Pkts.) TX: 19.83 KB (60 Pkts.)	Connect Stop Edit Delete
WAN_WIRED eth0.2	Uptime: 0h 2m 49s MAC-Address: D8:80:4C:D0:18:ED RX: 399.19 KB (1878 Pkts.) TX: 107.39 KB (766 Pkts.) IPv4: 192.168.5.63/24	Connect Stop Edit Delete

Add new interface...

Figure 16 G800 WAN interface IP

2.4. Configure Static Routes

To achieve communication between two router's device by VPN tunnel, user should configure 'Static Routes'.

Configure the Static routes as follows:

- Interface: Choose VPN interface.(test in this test)
- Target: 192.168.1.0. IP of VPN Server's(G800) device. G800's LAN IP is 192.168.1.1, so Target set to 192.168.1.0 can communicate to all device which connect to G800 LAN interface.
- IPv4-Netmask: 255.255.255.0.
- IPv4-Gateway: 192.168.0.20(VPN Client IP which same as G800 PPTP Server parameters)

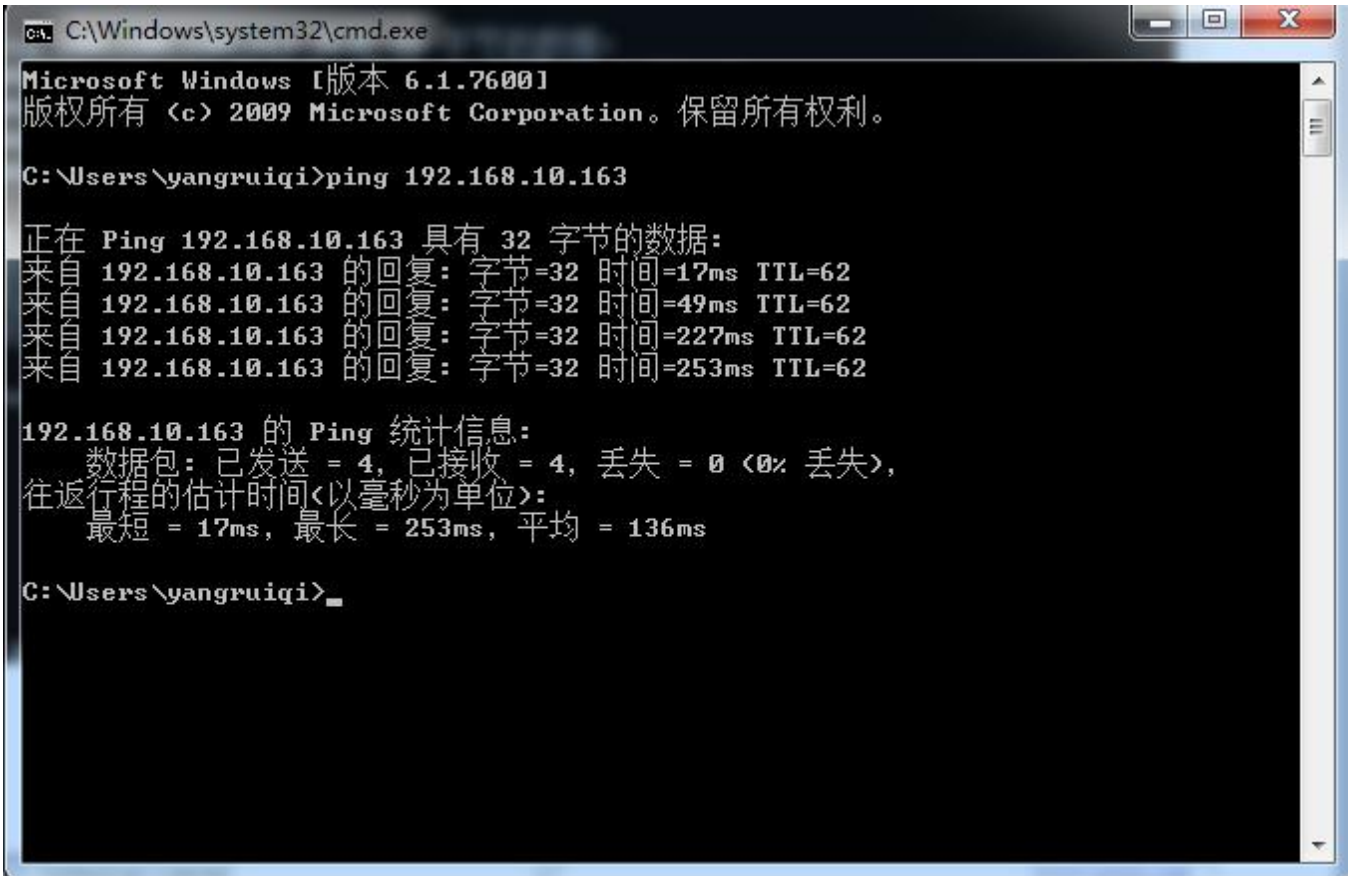
Figure 17 Configure Static Routes

2.5.Configure Firewall

Figure 18 Configure Firewall

3.Test

After above all configuration, user can connect G806 and G800 to a same superior router and ping successfully between G800's device and G806's device as follow:



```
C:\Windows\system32\cmd.exe
Microsoft Windows [版本 6.1.7600]
版权所有 (c) 2009 Microsoft Corporation。保留所有权利。

C:\Users\yangruiqi>ping 192.168.10.163

正在 Ping 192.168.10.163 具有 32 字节的数据:
来自 192.168.10.163 的回复: 字节=32 时间=17ms TTL=62
来自 192.168.10.163 的回复: 字节=32 时间=49ms TTL=62
来自 192.168.10.163 的回复: 字节=32 时间=227ms TTL=62
来自 192.168.10.163 的回复: 字节=32 时间=253ms TTL=62

192.168.10.163 的 Ping 统计信息:
    数据包: 已发送 = 4, 已接收 = 4, 丢失 = 0 (0% 丢失),
    往返行程的估计时间(以毫秒为单位):
        最短 = 17ms, 最长 = 253ms, 平均 = 136ms

C:\Users\yangruiqi>
```

Figure 19 Ping successfully

4.Contact Us

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Web: www.usriot.com

Support: h.usriot.com

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5.Disclaimer

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6.Update History

2018-02-09 V1.0.0 established.