COMP3533
IPSec Tunnelling

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1 Network Configuration

IPSec tunneling allows a user to connect to a specified endpoint over the Internet. This guide provides instructions on how to setup an IPSec tunnel to your home network; however, due to the variety of commercially available networking hardware and configurations, it is assumed that your network is configured with a local router connecting to a root access point (usually provided by your ISP - a gateway or modem) which connects your home network further to the Internet.

Please note the following:

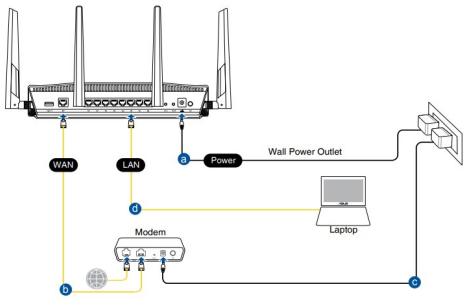
Permission to make these changes is required; you may need to contact your network administrator for support.

The screenshots included in this guide were captured in Asus router environment, a Telus gateway and an Android smartphone. Menu settings and locations may vary between hardware. Please consult your user manual(s) for additional information and support.

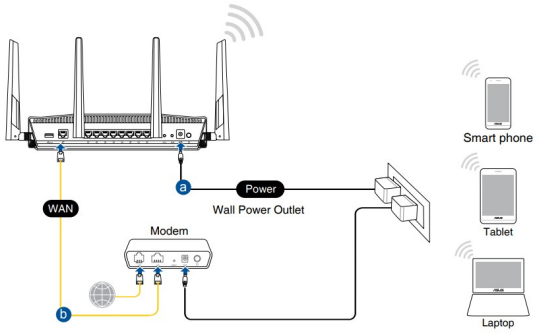
As with other open source documentation, no guarantees are provided - please be aware of how the changes in this guide may affect your Internet experience.

1.6.1 Wired connection

NOTE: You can use either a straight-through cable or a crossover cable for wired connection.



1.6.2 Wireless connection



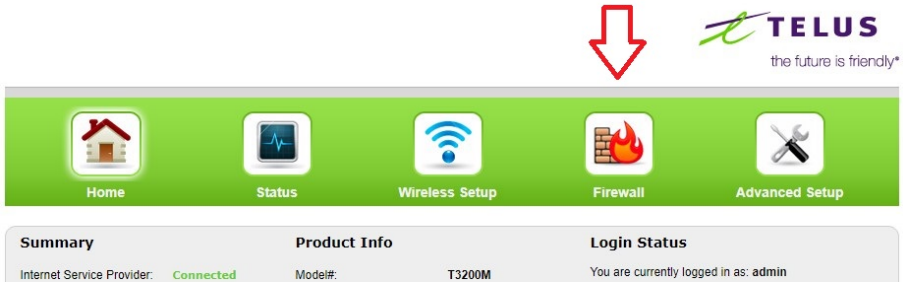
Images from ASUSTek Computer Inc. RT-AX88U User Manual

2 Port Forwarding

An IPSec tunnel endpoint is a VPN server located on your router that listens for incoming connection requests to create the tunnel and direct traffic through it. In order to have the endpoint receive client requests, the incoming connection must be port-forwarded from the outward facing root access point, your network's external IP address, to the local router. For IPSec tunnelling, ports 500 and 4500 need to be forwarded. Other types of tunneling use different ports, such as port 1194 for OpenVPN tunneling.

1. Log into your local router and make note of your WAN IP Address, your local router's IP address as assigned by your root access point.

2. Log into your root access point. On the bottom left portion of the Telus page is your **Modem IP address**. Take note of this address; it is your public IP address issued by your ISP. Please note, this value may change and the steps outlined in this guide may need to be updated. If you are a Telus customer, click on "Firewall" at the top menu.



3. Along the left navigation menu, select "Port Forwarding," and select the following details:

   (a) **Select LAN Device:** Use the pull down menu to select your router using the WAN IP address found in Step 1.

   (b) **LAN IP Address:** This should auto populate from the menu selection above, else manually input your WAN IP address into this field.

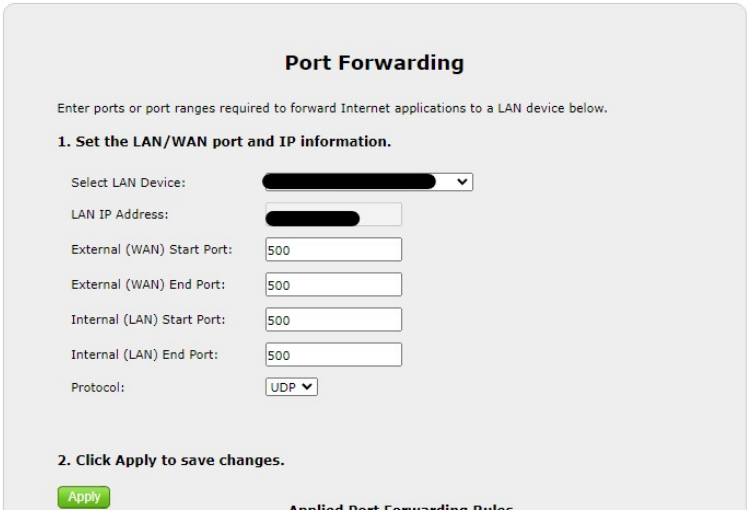
   (c) **External (WAN) Start Port:** 500

(d) **External (WAN) End Port:** 500

(e) **Internal (LAN) Start Port:** 500

(f) **Internal (LAN) Start Port:** 500

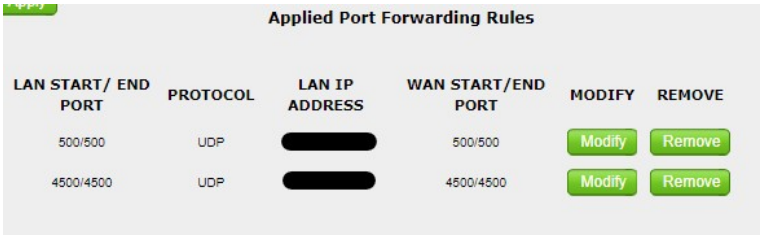
(g) **Protocol:** Use the pull down to select "UDP".



4. Apply settings. A success message should appear and redirect you back to the same page with a blank form.

5. Repeat step 3, this time using port 4500. A similar success message should be displayed.

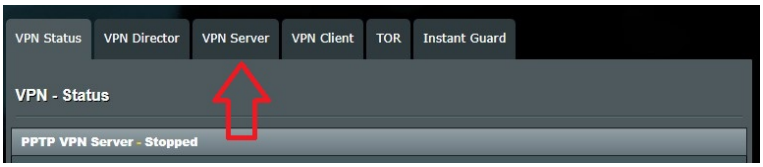
   At the bottom section of the "Port Forwarding" page of the Telus access point, similar details should be shown outlining the two ports being forwarded. Feel free to log out of the access point, no additional changes are necessary here.



3 Router Setup

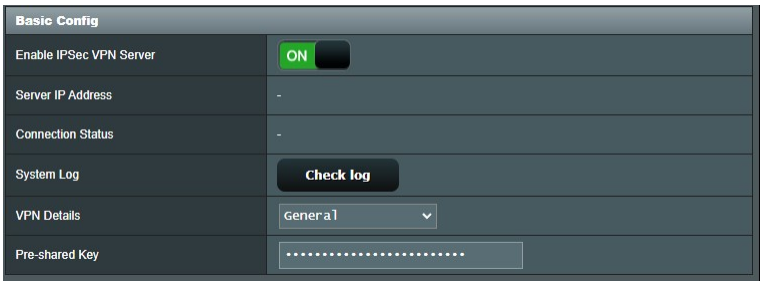
1. Back on your local router's GUI, navigate to the "VPN" settings page under "Advanced Settings" using the side navigation pane.

2. Select the "VPN Server" tab.

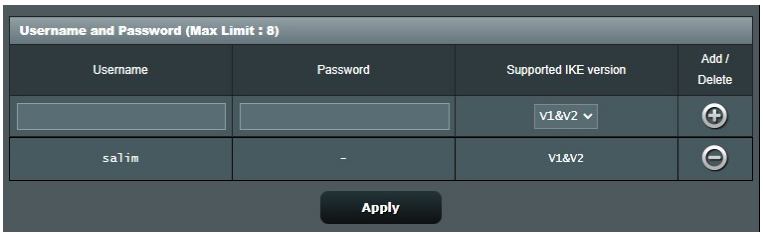


3. From the three IP tunnelling options at the top of this page, select "IPSec VPN" and enable the server. After creating the IPSec tunnel server, the note demarked by the red rectangle provides the **VPN connection type** for your device OS.

4. Create a **Pre-shared Key**. All devices connecting to the IPSec tunnel will require this key.



5. Create a **username** and **password** for each user to access the tunnel. When done, click "Apply," and ensure the server is on. Once the settings have taken effect, your IPSec VPN server is listening for incoming connections.



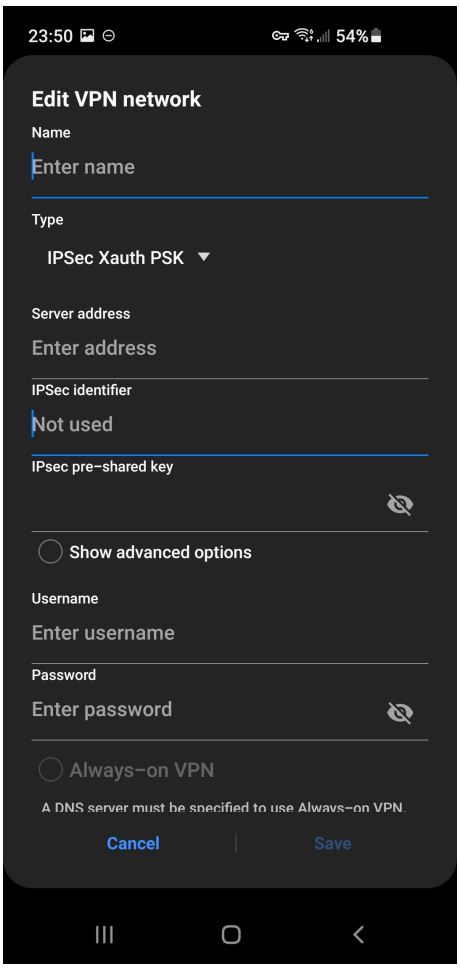
4 Connecting to your IPSec Tunnel

1. Access your network settings menu.

   For Android devices:
   From the main settings page → Connections → More Connection Settings → VPN.
   Using the hamburger menu at the top right, select **Add VPN profile.**

   For iOS devices:
   Settings → General → VPN → **Add VPN Configuration.**

2. Enter a name for your VPN tunnel. For **type**, select the value noted in the red rectangle from step 3 of the Router Setup section above; for Android "IPSec/Xauth PSK," or "Cisco IPSec" for iOS or MacOS devices, then input the following details:



(a) **Server address:** The **Modem IP Address** noted in step 2 of the Port Forwarding section of this guide.

(b) **Secret (iOS) / IPSec Pre-Shared Key:** The **pre-shared key** established in step 4 of the Router Setup section.

(c) **Account (iOS) / Username:** The **username** established in step 5 of the Router Setup section.

(d) **Password:** The **password** establised in step 5 of the Router Setup section.

3. Click "Save." Setup is now complete. Connect to your IPSec tunnel and enjoy the benefits of connecting to the Internet from behind your network configuration while away from home.

5 References

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