

# Router Set-Up

*Before you disconnect any existing ISP gear, please read this initial section carefully, as there is information we need from the existing deployment.*

There are two forms of DSL login, the most common is PPPoE and Windstream exclusively uses this for DSL. TDS uses two different approaches, one supports PPPoE and the other uses DHCP.

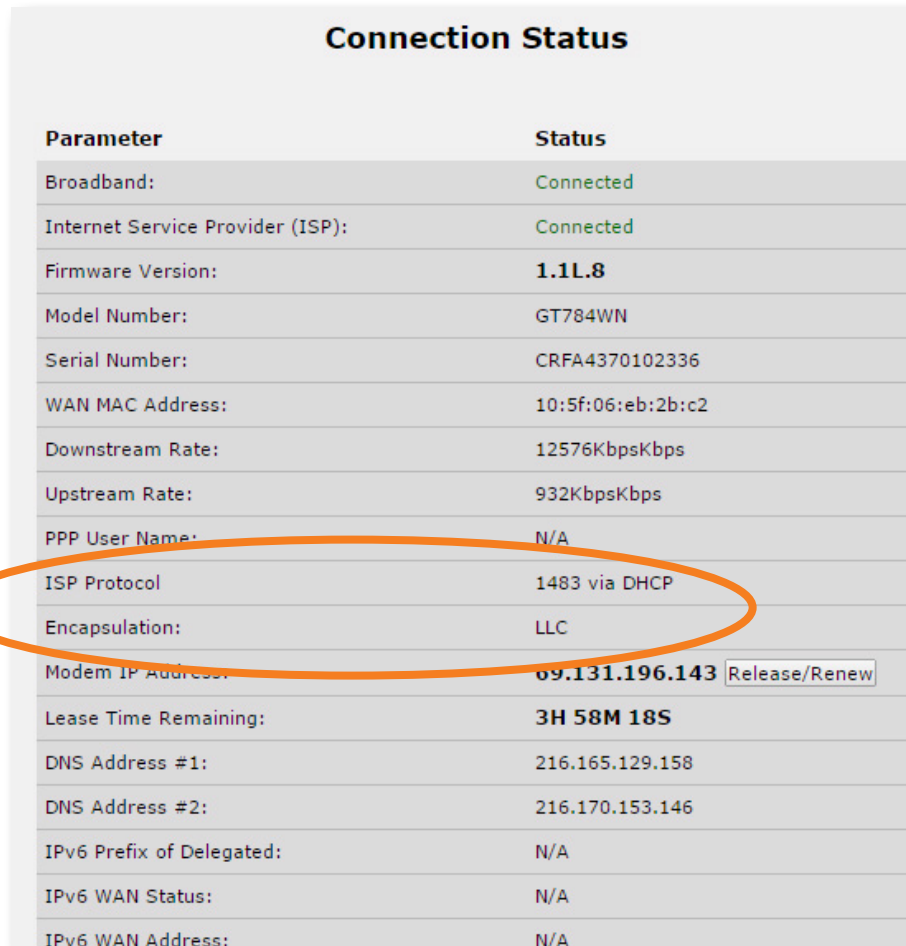
All the PPPoE cases require that you know your ISP-provided credentials.

Windstream, this is your user@windstream.net and an ISP-provided PPPoE password

TDS, this your current user@tds.net email address and current email password.

For TDS users, here's how you determine if you are on a DHCP link.

- Log into your current TDS router by going to 192.168.0.1 with a browser
- Click on Connection status and you will get a display that look like this:



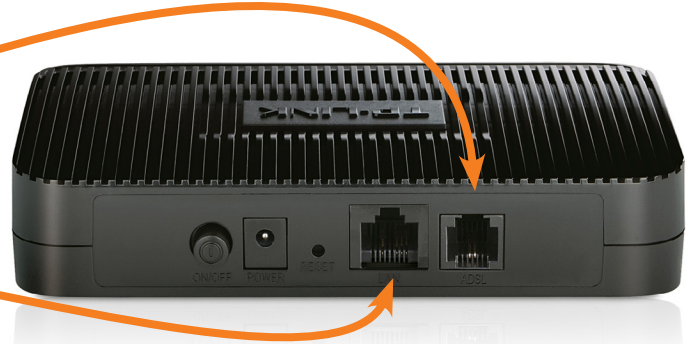
Parameter	Status
Broadband:	Connected
Internet Service Provider (ISP):	Connected
Firmware Version:	<b>1.1L.8</b>
Model Number:	GT784WN
Serial Number:	CRFA4370102336
WAN MAC Address:	10:5f:06:eb:2b:c2
Downstream Rate:	12576KbpsKbps
Upstream Rate:	932KbpsKbps
PPP User Name:	N/A
ISP Protocol	1483 via DHCP
Encapsulation:	LLC
Modem IP Address:	<b>09.131.196.143</b> <input type="button" value="Release/Renew"/>
Lease Time Remaining:	<b>3H 58M 18S</b>
DNS Address #1:	216.165.129.158
DNS Address #2:	216.170.153.146
IPv6 Prefix of Delegated:	N/A
IPv6 WAN Status:	N/A
IPv6 WAN Address:	N/A

- If the ISP Protocol says "1483 via DHCP", then you must use DHCP as the connection style in steps 20 & 21.

Before we start, please execute a speed test on the old gear so we have a good record of the 'before' state. Instructions for this start on step 33 on page 13.

We assume you are replacing existing ISP-supplied equipment, so we start with removing that first.

1. Power off your existing ISP router / modem
2. Make note of which wires go to which ports on your old gear. Taking several pictures can help make this easy
3. Unbox the TP-Link modem (the small box)
4. Plug your DSL phone-line cable into the RJ-11 port (the smaller of the two) on the modem.
5. Plug the supplied Ethernet cable into the RJ-45 port of the modem
6. Plug in the power supply to the modem, and plug supply into AC power



Back of new TP-Link Modem

7. Unbox the TP-Link router
8. Plug the Ethernet cable from step 5 from the modem into the blue 'WAN' port of the router
9. Plug in any LAN Ethernet cables that might have been connected to the prior router into the LAN (Yellow) ports of the TP-Link router.
10. Plug in the power supply to the router and plug supply into AC power
11. Push in the power button on the modem
12. Push in the power button on the router



Back of new TP-Link Router

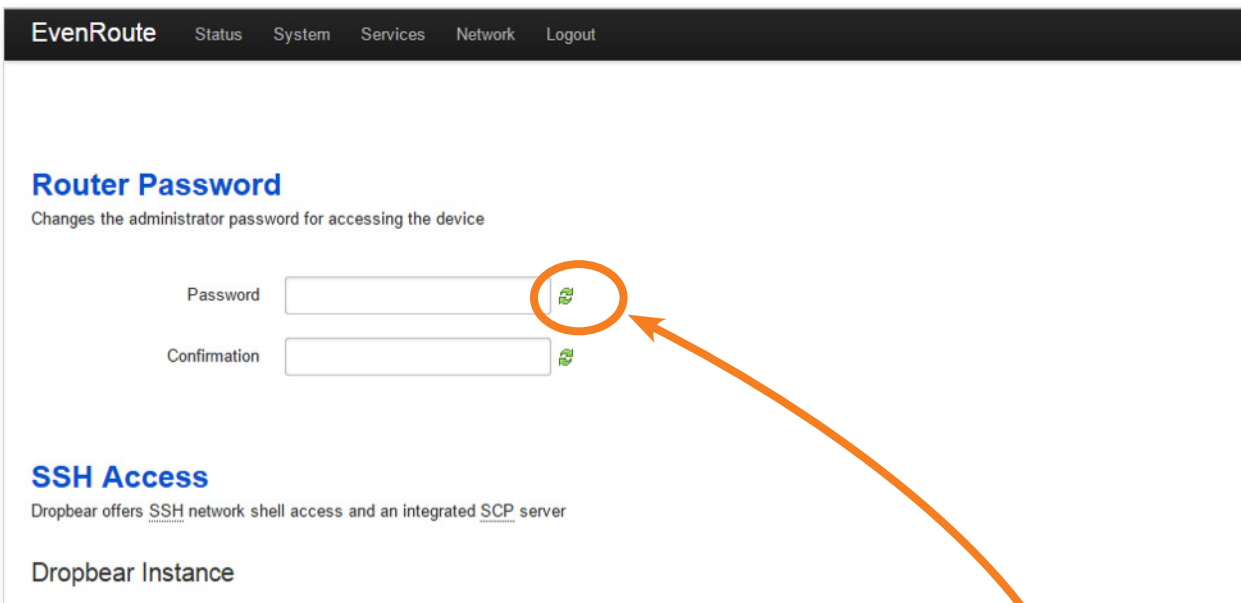
13. Connect a laptop via Ethernet cable to one of the LAN ports

**Alternate via WiFi:**

- Connect to the 'evenroute' access point
- WPA2 Security key is 'FastRouter' (note: the caps are important)

14. Launch a Browser window and in the URL bar type **192.168.0.1**

15. You will see a prompt for user id and password. Enter "**root**" as user id and "**FastRouter**" for the password.



16. Once logged in, please change your password by selecting System → Administration

- Enter a password and please make note of it, you will need to enter it to access the configuration in the future
- Click the 'Save and Apply' button at the bottom of the screen

*Tip: click the little green arrows to view your password*

17. Go to Network → Interfaces to set your ISP information for PPPoE

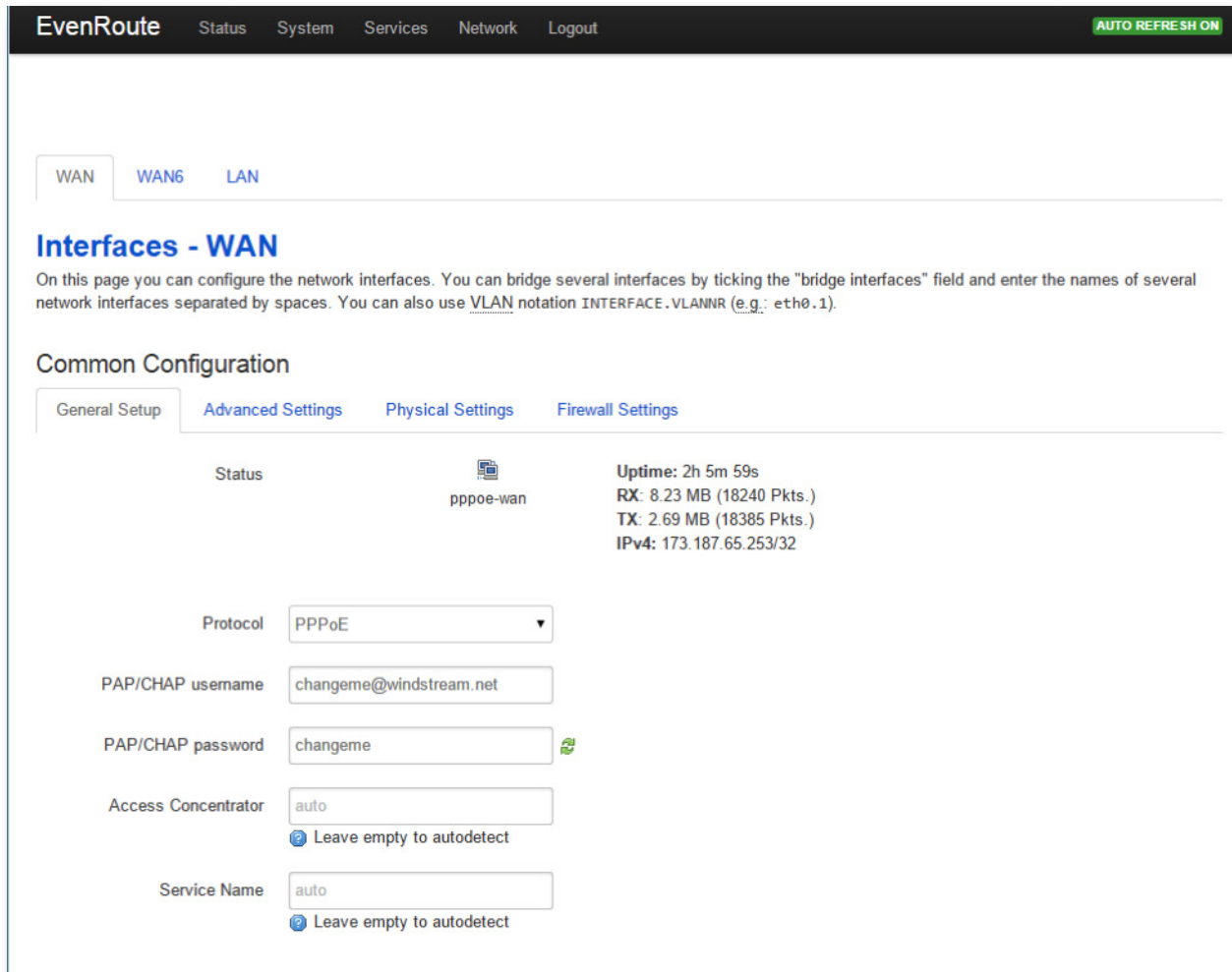
18. Click the Edit button on the WAN interface

The screenshot shows the Mikrotik WinBox 'Interfaces' page. At the top, there are tabs for 'WAN', 'WAN6', 'MODEM', and 'LAN'. Below the tabs is the 'Interfaces' title and 'Interface Overview' subtitle. The main content is a table with columns for 'Network', 'Status', and 'Actions'. The 'WAN' interface is highlighted in red, and its 'Edit' button is circled in orange. An orange arrow points from the text '18. Click the Edit button on the WAN interface' to this button.

Network	Status	Actions
<b>LAN</b> br-lan	<b>Uptime:</b> 0h 0m 55s <b>MAC-Address:</b> 30:B5:C2:31:33:FE <b>RX:</b> 133.28 KB (1093 Pkts.) <b>TX:</b> 314.82 KB (746 Pkts.) <b>IPv4:</b> 192.168.0.1/24 <b>IPv6:</b> FDD0:32DE:8595:0:0:0:0:1/60	Connect Stop Edit Delete
<b>MODEM</b> eth0.2	<b>Uptime:</b> 0h 0m 55s <b>MAC-Address:</b> 30:B5:C2:31:33:FE <b>RX:</b> 0.00 B (0 Pkts.) <b>TX:</b> 2.52 KB (57 Pkts.) <b>IPv4:</b> 192.168.1.2/24	Connect Stop Edit Delete
<b>WAN</b> pppoe-wan	<b>RX:</b> 0.00 B (0 Pkts.) <b>TX:</b> 0.00 B (0 Pkts.)	Connect Stop Edit Delete
<b>WAN6</b> @wan	<b>MAC-Address:</b> 00:00:00:00:00:00 <b>RX:</b> 0.00 B (0 Pkts.) <b>TX:</b> 0.00 B (0 Pkts.)	Connect Stop Edit Delete

If you use PPPoE then follow steps 19 to 21, else skip to page 6:

19. In the 'PAP/Chap username' field, enter the user ID your ISP gave you
20. In the PAP/Chap password' field, enter the password your ISP gave you
21. Click the "Save and Apply" button



Continue with step 22 on page 9.

If you are a TDS user with DHCP, follow steps A to F:

A. Since we need to use DHCP, we must change the 'Protocol' drop-down to DHCP.

B. Click 'Save & Apply' button

This is what it looks like once you are done:

The screenshot shows the Mikrotik WinBox configuration page for network interfaces. The title is "Interfaces - WinBox". Below the title, there is a description: "On this page you can configure network interfaces separated by...". A dark overlay menu is visible, listing options: "Mount Points", "LED Configuration", "Backup / Flash Firmware", and "Reboot".

The main configuration area is titled "Common Configuration" and has four tabs: "General Setup", "Advanced Settings", "Physical Settings", and "Firewall Settings". The "General Setup" tab is active.

Under "General Setup", the "Status" section shows the interface "eth0.2" with a status icon. To the right, the following information is displayed:

- Uptime: 0h 3m 25s
- MAC-Address: 14:CC:20:B5:44:2B
- RX: 4.30 MB (5123 Pkts.)
- TX: 845.07 KB (8064 Pkts.)
- IPv4: 192.168.1.2/24, 69.131.196.143/21

The "Protocol" section has a dropdown menu set to "DHCP client". Below it, the "Hostname to send when requesting DHCP" field contains the text "EvenRoute".

C. Click on Advanced Settings, and it should look like this:

## Interfaces - WAN

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

### Common Configuration

[General Setup](#) **Advanced Settings** [Physical Settings](#) [Firewall Settings](#)

Bring up on boot

Use builtin IPv6-management

Use broadcast flag  [?](#) Required for certain ISPs, e.g. Charter with DOCSIS 3

Use default gateway  [?](#) If unchecked, no default route is configured

Use DNS servers advertised by peer  [?](#) If unchecked, the advertised DNS server addresses are ignored

Use gateway metric

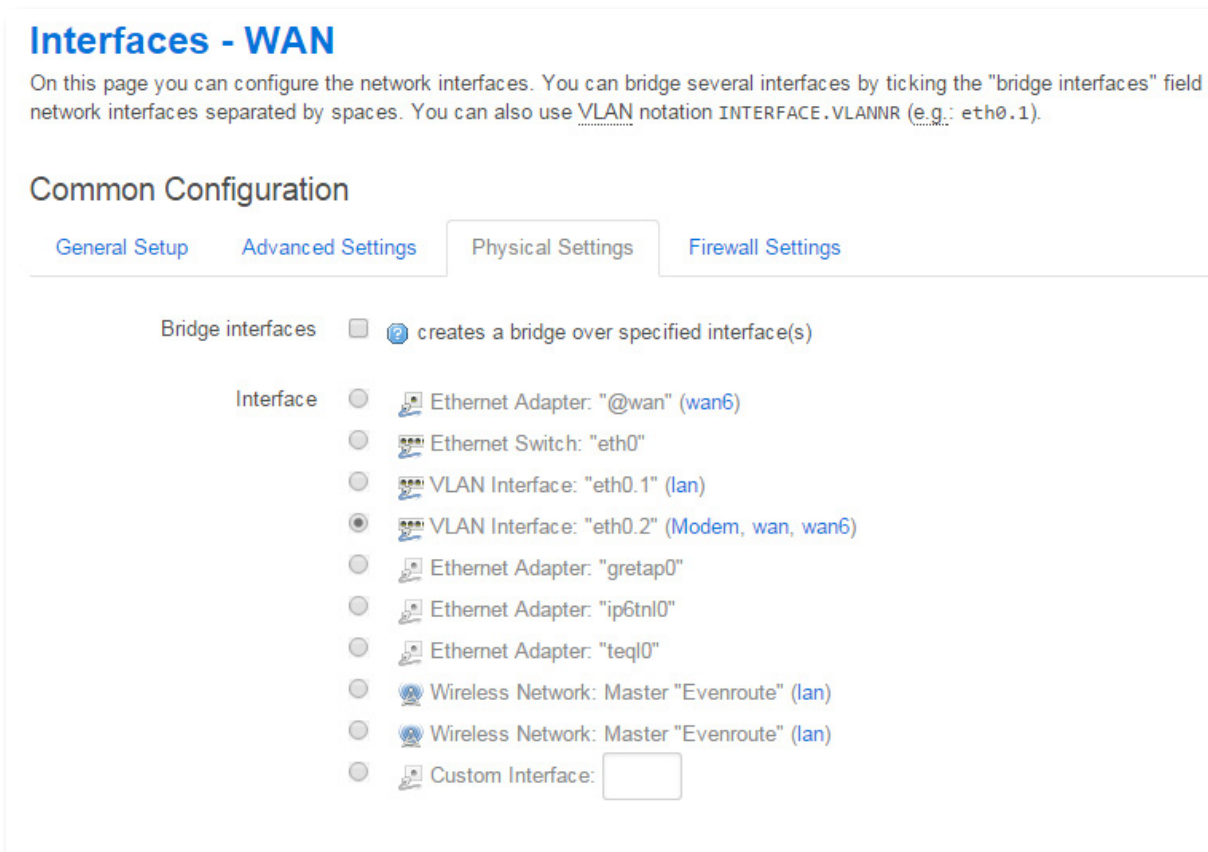
Client ID to send when requesting DHCP

Vendor Class to send when requesting DHCP

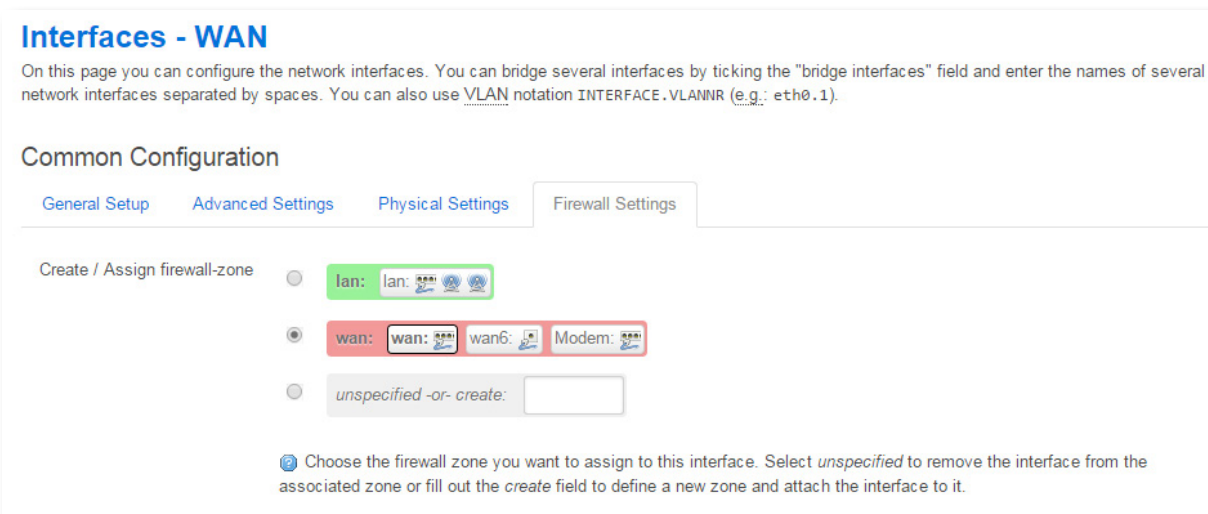
Override MAC address

Override MTU

D. Click on Physical settings and ensure that the eth0.2 interface is chosen, it should look like this:



E. Click on the Firewall setting to make sure the Wan zone is assigned to this, it should look like this:



F. Click 'Save & Done'

Continue with step 22 on next page.



22. Now go to Network → SQM / QOS to set your upload and download speeds. This is critical to get right, so don't skip this step

- For 12Mbps service, start with a value of 10200
- For 6Mbps DSL service, start with a value of 5200
- For 3Mbps service, start with a value of 2600
- Leave the upload speed at 650 for now

23. IF you are a TDS DHCP user, you will need to select the correct interface, please pick eth0.2 from the drop down, **only if you are TDS DHCP**. All Windstream is PPPoE and some TDS accounts as well.

24. Click the 'Save & Apply' button, wait 30 seconds for it to apply

The screenshot shows the 'Smart Queue Management' configuration page in the EvenRoute interface. The page has a dark header with the 'EvenRoute' logo and navigation links for 'Status', 'System', 'Services', 'Network', and 'Logout'. Below the header, the main content area is titled 'Smart Queue Management' and includes a descriptive paragraph: 'With SQM you can enable traffic shaping, better mixing (Fair Queuing), active queue length management (AQM) and prioritisation on one network interface.' Underneath, there is a 'Queues' section with a 'Delete' button. The configuration is organized into three tabs: 'Basic Settings' (selected), 'Queue Discipline', and 'Link Layer Adaptation'. In the 'Basic Settings' tab, there is an 'Enable' checkbox which is checked. Below this, there is a dropdown menu for 'Interface name' set to 'pppoe-wan'. There are two input fields: 'Download speed (kbit/s) (ingress):' with the value '10200' and 'Upload speed (kbit/s) (egress):' with the value '650'. At the bottom left of the configuration area is an 'Add' button with a plus icon. At the bottom right are three buttons: 'Save & Apply', 'Save', and 'Reset'.

## Note:

If you have many WiFi connected devices like WiFi printers or set top boxes that are hard to reconfigure, you can save yourself a lot of time by making the WiFi settings on this new router mimic the ones from your old router. Just enter your existing SSID into the ESSID field shown in the screen shot for step 28. The capitalization matters, so copy it exactly the same.

The in step 29, also use the existing WiFi security key from your current router. This way, all the devices will automatically join to this new touter. If they don't, it's because there was a typo in either the SSID or the security key, so come back and re-enter them correctly.

The SSID and key phrase are typically printed on the side or bottom of the Routers the ISPs provide.

25. Now, let's change the default WiFi security key, the default is 'FastRouter', and we recommend you change it to something you select

26. Go to Network → WiFi

27. Click on the 'Edit' button for Radio0 to get to the details of this WiFi interface

The screenshot shows the EvenRoute web interface. At the top, there is a navigation bar with 'EvenRoute' and links for 'Status', 'System', 'Services', 'Network', and 'Logout'. An 'AUTO REFRESH ON' button is in the top right. Below the navigation bar, there are two radio entries: 'radio0: Master "Evenroute"' and 'radio1: Master "Evenroute"'. The main section is titled 'Wireless Overview'. It contains two radio configuration cards. The first card is for 'Generic MAC80211 802.11bgn (radio0)'. It shows 'Channel: 11 (2.462 GHz) | Bitrate: ? Mbit/s'. Below this, it displays 'SSID: Evenroute | Mode: Master' and '0% BSSID: 14:CC:20:B5:45:16 | Encryption: WPA2 PSK (CCMP)'. To the right of this card are three buttons: 'Scan', 'Add', and 'Edit'. The 'Edit' button is circled in orange, and an orange arrow points from the text above to it. The second card is for 'Atheros AR9580 802.11an (radio1)'. It shows 'Channel: 36 (5.180 GHz) | Bitrate: ? Mbit/s'. Below this, it displays 'SSID: Evenroute | Mode: Master' and '0% BSSID: 14:CC:20:B5:45:17 | Encryption: WPA2 PSK (CCMP)'. To the right of this card are three buttons: 'Scan', 'Add', and 'Remove'.

28. Click on the 'Wireless Security' link to go to the setting for the security key

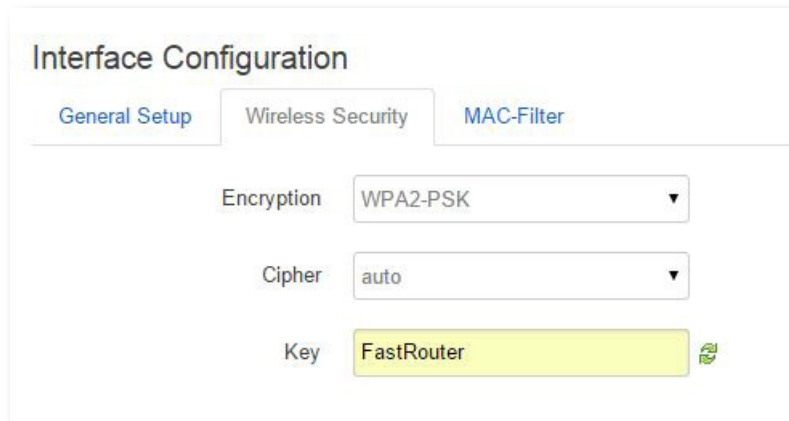
The screenshot displays the configuration page for a wireless network named "Evenroute" (wlan0). The interface is divided into several sections:

- Header:** EvenRoute | Status | System | Services | Network | Logout
- Radio Information:** radio0: Master "Evenroute" | radio1: Master "Evenroute"
- Section Header:** Wireless Network: Master "Evenroute" (wlan0)
- Description:** The *Device Configuration* section covers physical settings of the radio hardware such as channel, transmit power and defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or op... Configuration.
- Device Configuration:**
  - General Setup | **Advanced Settings**
  - Status: Mode: Master | SSID: Evenroute | 0% | BSSID: 14:CC:20:35:45:16 | Encryption: WPA2 PSK (CCMP) | Channel: 11 (2.412 GHz) | Tx-Power: 18 dBm | Signal: 0 dBm | Noise: -95 dBm | Bitrate: 0.0 Mb/s | Country: US
  - Wireless network is enabled:
  - Channel: 11 (2.462 GHz)
  - Transmit Power: 18 dBm (63 mW) | dBm
- Interface Configuration:**
  - General Setup | **Wireless Security** | MAC-Filter
  - ESSID: Evenroute
  - Mode: Access Point
  - Network:  lan: [Icons]

An orange arrow originates from the "Wireless Security" link in the "Interface Configuration" section and points to the "Wireless Security" link in the "Advanced Settings" section.

29. In the 'key' field, type a key phrase you'd like to use (remember people will be typing this in on mobiles and such)

30. Click 'Save and Apply'



Interface Configuration

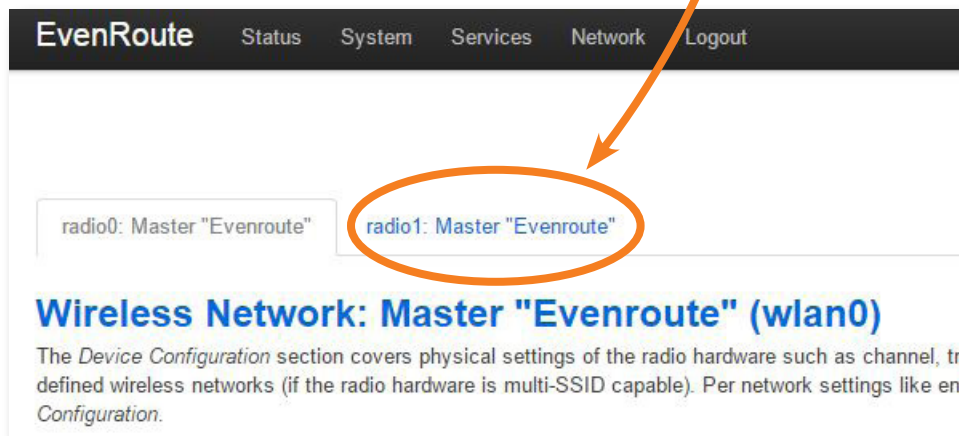
General Setup | **Wireless Security** | MAC-Filter

Encryption: WPA2-PSK

Cipher: auto

Key: FastRouter

31. Click on the 'Radio1 Master 'evenroute' to switch to configuring that interface



EvenRoute | Status | System | Services | Network | Logout

radio0: Master "Evenroute" | **radio1: Master "Evenroute"**

### Wireless Network: Master "Evenroute" (wlan0)

The *Device Configuration* section covers physical settings of the radio hardware such as channel, transmit power, and antenna. The *Network Configuration* section covers logical settings of the wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption, authentication, and security are covered in the *Wireless Security* section.

32. Repeat steps 28 through 30 for radio1 (use the same key phrase)

33. OK, we are done with configuration! Time to test and see how we are doing

34. Open a new window (or tab) in your browser and go to <http://www.dslreports.com/speedtest>

Tests done:  
562,539

Start the test by selecting your connection type:

Fiber Cable **DSL** Satellite WISP More..

Test History

35. Click the green 'DSL' button to start the test

36. Once the test completes, click the pulsing green 'Results + Share' button

**BROADBAND**  
DSLReports.com

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## Speed Test

Test your download, upload and latency from a [mobile phone](#) up to optical fiber, and everything between. For gigabit+ testing [please review this page](#). We don't use insecure or annoying browser plugins, relying on pure HTML5.

This test requires your browser's full attention for accurate results. Run the test when your network is quiet, and don't switch to other applications or change browser tabs during the test. A few Windows [security and privacy](#) software packages can block the test or slow the browser.

Tests done: 562,539

[Test Again](#) [Results + Share](#)

Setup ping  
GA, USA: 16ms  
NC, USA: 23ms  
NY, USA: 33ms

Bufferbloat (ms)  
+0ms

8.46 megabit/s 8 ☁

545.8 kilobit/s 2 ☁

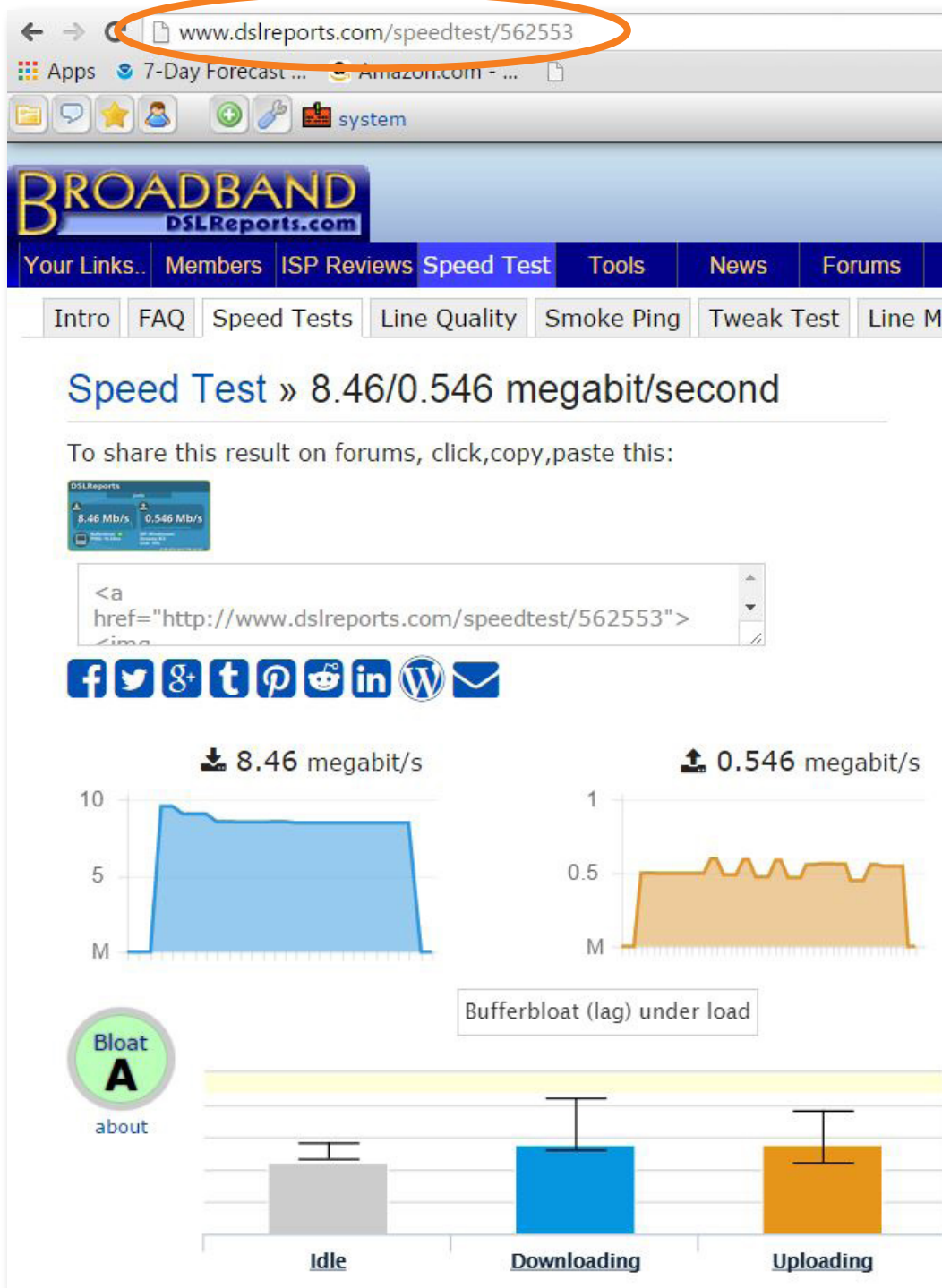
VA, USA ON, Canada QC, Canada  
TX, USA NEAR CA, USA  
SEA, USA CO, USA  
NY, USA GA, USA  
NC, USA IA, USA  
MI, USA LA, USA IL, USA

FAR

10 5 M 1 0.5 M

The screenshot displays the DSLReports.com speed test results. At the top, there's a navigation menu with 'Speed Test' highlighted. Below the navigation, the 'Speed Test' title is followed by a brief description and instructions. The main results area shows 'Tests done: 562,539' and two buttons: 'Test Again' and 'Results + Share'. On the left, there are three colored boxes: a green one for ping times (GA: 16ms, NC: 23ms, NY: 33ms) and bufferbloat (+0ms); a blue one for download speed (8.46 megabit/s); and an orange one for upload speed (545.8 kilobit/s). On the right, there are two charts: a radar chart showing latency to various locations (VA, TX, SEA, NY, NC, MI, LA, IL, GA, IA, CO, CA) and a line graph showing download and upload rates over time. The radar chart has a green area labeled 'FAR' in the center. The line graph shows a blue line for download and an orange line for upload, both peaking during the test.

- 37. Note your score, ideally you got an 'A' rating for bloat. If you go anything less, we will need to fine-tune the DSL rate set in step 22
- 38. Copy paste the URL of this result and send to jf@jonathanfoulkes.com



- 39. We are done configuring and testing!
- 40. For hardwired devices that might be connected (tower PC, AV gear, etc.) please reboot them.
- 41. WiFi connected devices can now connect to the 'evenroute' access point and will need to enter the security key you typed in at step 29 of these instructions (default is 'FastRouter')