

# Programming the **GL.iNet Mini Router** for 44Net VPN use



This document covers the following devices

[GL.iNet Mini Wireless Router GL-MT300N V2 “Mango”](#)

[GL.iNet Mini Smart Router GL-AR300M “Shadow”](#) and variants

[GL.iNet Beryl AX \(GL-MT3000\)](#) and variants

[GL.iNet Puli 4G LTE IOT Gateway/Router](#) and variants

[GL.iNet Brume 2 travel router](#)

**Mark Phillips, NI2O 20220406 V1.9**  
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### Version control

Author	Notes	Date
Mark Phillips, NI2O	Initial Creation	04/06/2022
Mark Phillips, NI2O	Updated to newer models	05/19/2024
Mark Phillips, NI2O	Changed test PING IP address	07/22/2024
Mark Phillips, NI2O	Added more supported models	01/11/2025

# 1 Assumptions

The device is not configured and is in a factory default state.

# 2 Power up and connect the Mini Router

Connect the Mini Router to a stable USB power supply. The power supply must be capable of delivering at least 2 amps. Failure to deliver proper power will result in random reboots and dropped data packets. Follow the device user guide for more details.

Connect the WAN port to your local network. Connect a regular CAT5/CAT5E/CAT6 cable between the LAN port of the Mini Router and any LAN port of your Internet router. A cable was supplied with your Mini Router.

# 3 Log in to the Mini Router

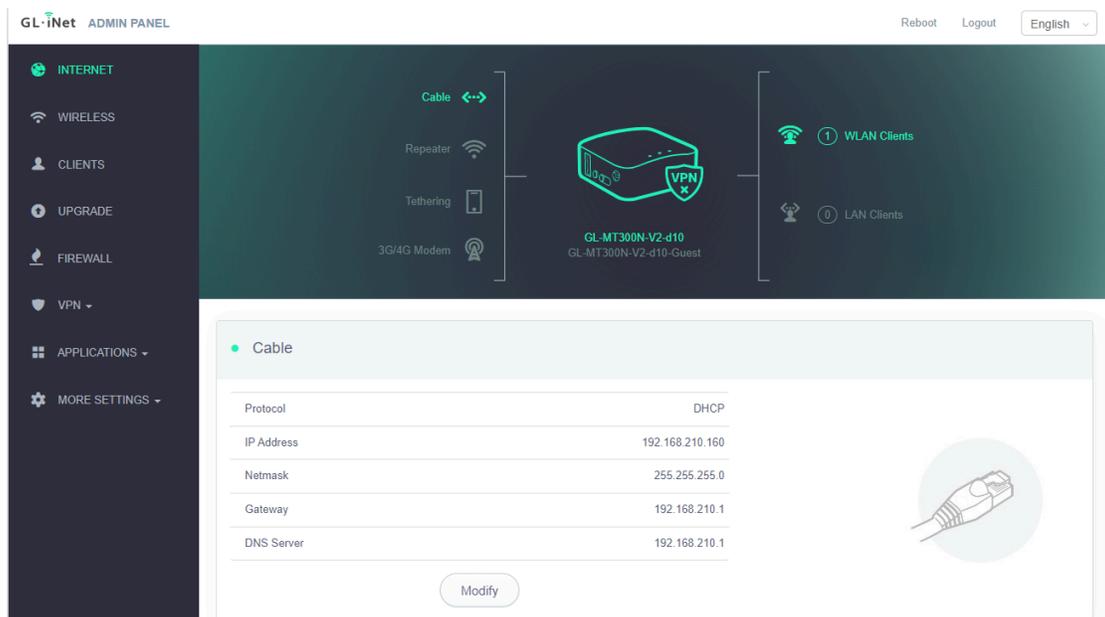
Log into the Mini Router by pointing your browser to <http://192.168.8.1>

# 4 Create a new password

This will become the permanent password required to access the web gui interface of the Mini Router

# 5 Confirm “WAN” connection

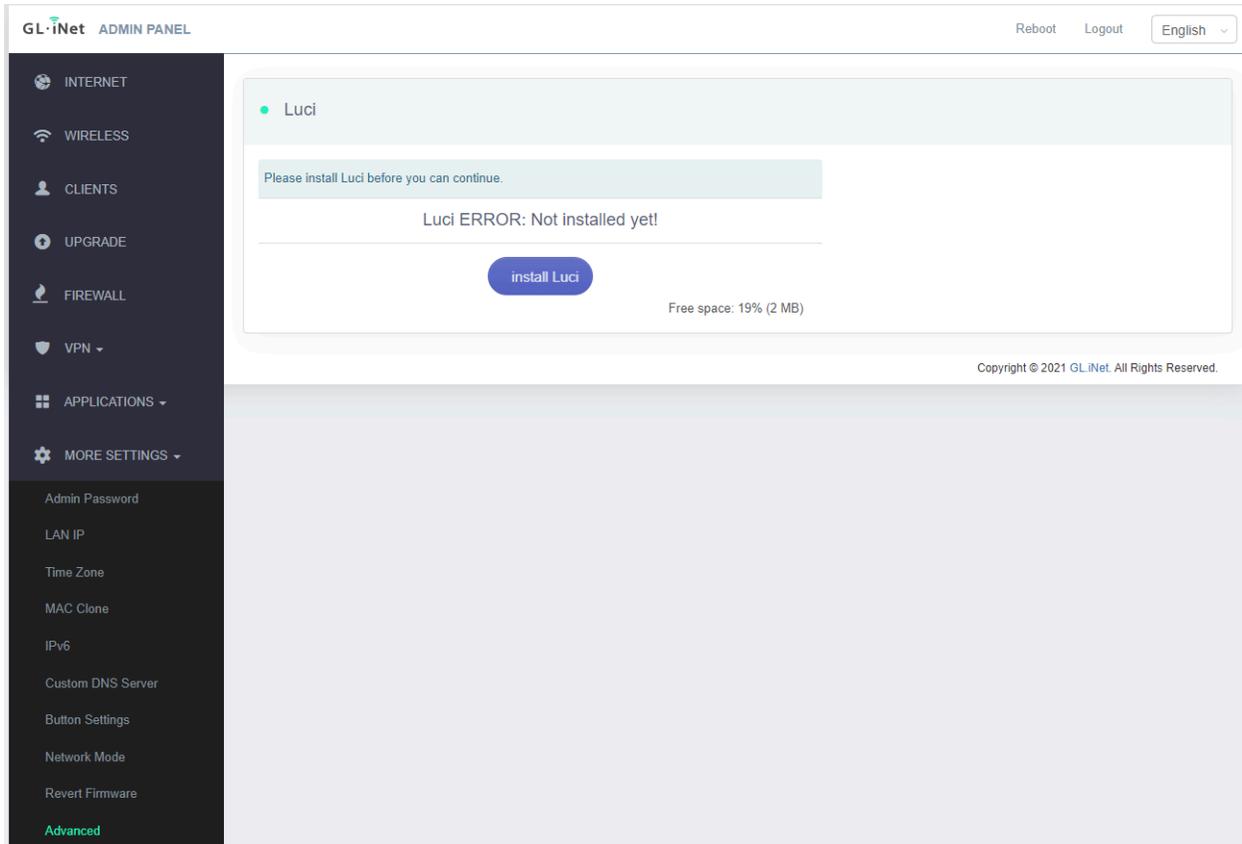
Confirm WAN port is connected by clicking the INTERNET button on the left menu



Make sure that the Mini Router has obtained an IP address from the network it is connected to. A static IP address can be installed by clicking the Modify button and populating the relevant fields accordingly (not covered in this document).

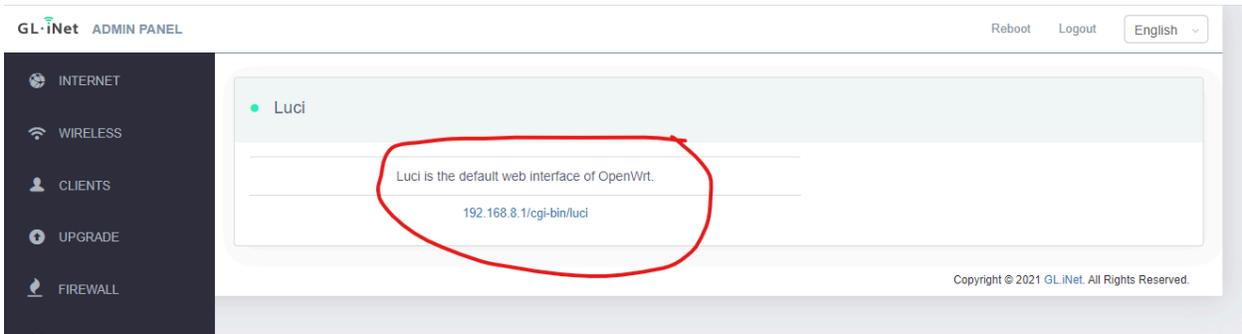
## 6 Install the Luci advanced config GUI

On the left menu click on MORE SETTINGS > Advanced



Click on the blue “install Luci” button.

When the install is complete the button will be replaced by a link. Click the link



Log in using the new password you created above.

## 7 Configure 44net IP settings

From the top black menu select Network > Interfaces

GL-MT300N-V2 Status System Network Logout REFRESHING

Interfaces Global network options

### Interfaces

<b>LAN</b> br-lan	Protocol: Static address Uptime: 0h 26m 43s MAC: 94:83:C4:17:0D:11 RX: 263.03 KB (1408 Pkts.) TX: 3.03 MB (1307 Pkts.) IPv4: 192.168.8.1/24 IPv6: undefined/0	Restart Stop Edit Delete
<b>WAN</b> eth0.2	Protocol: DHCP client Uptime: 0h 26m 41s MAC: 94:83:C4:17:0D:10 RX: 1.67 MB (3585 Pkts.) TX: 142.94 KB (1487 Pkts.) IPv4: 192.168.210.160/24	Restart Stop Edit Delete
<b>WAN6</b> eth0.2	Protocol: DHCPv6 client MAC: 94:83:C4:17:0D:10 RX: 1.67 MB (3585 Pkts.) TX: 142.94 KB (1487 Pkts.)	Restart Stop Edit Delete
<b>GUEST</b> br-guest	Protocol: Static address RX: 0 B (0 Pkts.) TX: 0 B (0 Pkts.) Error: Network device is not present	Restart Stop Edit Delete

Add new interface...

Save & Apply Save Reset

Select the top blue Edit button to edit the LAN information.

Change the IP address settings to those you were given for 44net by your local sysop then click save. Note that there is no field to enter the netmask information. You will therefore have to enter the IP address in proper CIDR notation e.g 44.1.2.3/28. If you are in any doubt please consult your allocation notice from your local sysop as in the below example.

*44net IP subnet details for NI2O .....*

*IP range 44.56.66.0/28*

*Netmask 255.255.255.240*

*Gateway 44.56.66.1*

*Broadcast 44.56.66.15*

*Usable IP's 13 (not including the gateway)*

**Interfaces » LAN**

General Settings | Advanced Settings | Physical Settings | Firewall Settings | DHCP Server

Status  Device: br-lan  
 Uptime: 0h 5m 1s  
 MAC: 94:83:C4:17:0D:11  
 RX: 422.96 KB (2148 Pkts.)  
 TX: 3.24 MB (1351 Pkts.)  
 IPv4: 192.168.8.1/24  
 IPv6: undefined/0

Protocol: Static address

Bring up on boot:

IPv4 address: 44.56.66.1/28

IPv4 gateway: 192.168.201.1 (wan)

IPv4 broadcast: 44.56.66.15

Use custom DNS servers:

IPv6 assignment length: 60  
Assign a part of given length of every public IPv6-prefix to this interface

IPv6 assignment hint: 0  
Assign prefix parts using this hexadecimal subprefix ID for this interface.

IPv6 suffix: ::1  
Optional. Allowed values: 'eui64', 'random', fixed value like '::1' or '::1:2'. When IPv6 prefix (like 'a:b:c:d::') is received from a delegating server, use the suffix (like '::1') to form the IPv6 address ('a:b:c:d::1') for the interface.

Dismiss Save

This next part must be completed within 90 seconds. Please read and re-read these steps before continuing. If you fail to re-connect to the Mini Router power cycle it and start from the beginning.

Press the “Save & Apply” button

Unplug the network cable from your computer

Count to 15

Plug the cable back in again

Open another tab in your browser and type in the ip address of the router you set above

With luck you should be presented with the router's login prompt again. Hit the reload button until you get the prompt.

Log in to the router using the password you set earlier

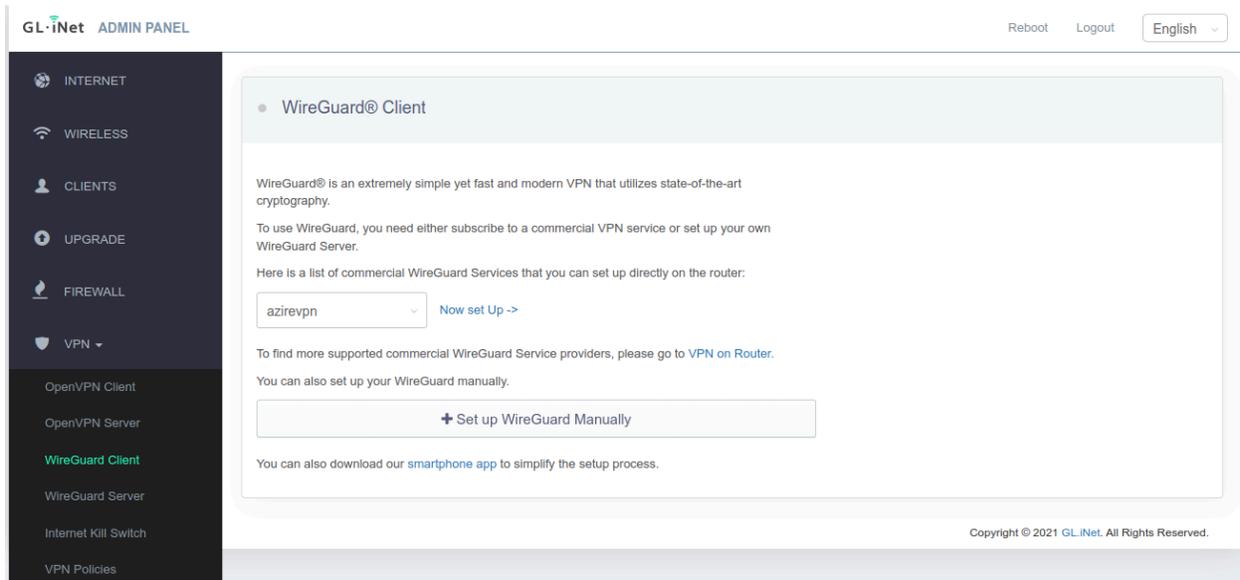
When successfully logged in, close the previous browser page.

## 8 VPN configuration

Close the browser page that is pointing to the “Advanced” settings and open a new page pointing to the Mini Router’s new IP address.

From the left menu, select VPN > WireGuard Client

Select “Set up WireGuard Manually” from the right hand side



The screenshot shows the GL.iNet Admin Panel interface. On the left is a dark sidebar menu with options: INTERNET, WIRELESS, CLIENTS, UPGRADE, FIREWALL, VPN (expanded), OpenVPN Client, OpenVPN Server, WireGuard Client (highlighted in green), WireGuard Server, Internet Kill Switch, and VPN Policies. The main content area is titled "WireGuard® Client" and contains the following text: "WireGuard® is an extremely simple yet fast and modern VPN that utilizes state-of-the-art cryptography. To use WireGuard, you need either subscribe to a commercial VPN service or set up your own WireGuard Server. Here is a list of commercial WireGuard Services that you can set up directly on the router:" followed by a dropdown menu showing "azirevpn" and a "Now set Up ->" link. Below this is a link to "VPN on Router" and a button labeled "+ Set up WireGuard Manually". At the bottom, it says "You can also download our smartphone app to simplify the setup process." The footer of the page reads "Copyright © 2021 GL.iNet. All Rights Reserved." In the top right corner of the admin panel, there are links for "Reboot", "Logout", and a language selector set to "English".

Select the configuration tab and paste the VPN config file you were given by your local sysop into the box as below (note, for security reasons the config in the example will not work). Click Next

### Add a New WireGuard® Client

Providers Configuration Manual Input

```
# Generated by WireguardConfig.com
[Interface]
Address = 44.56.0.254/26
ListenPort = 51844
PrivateKey = oDYIFu9Nqs1XfuQZ+MEQ58bt9q4iWfCnVBklogWKPUQ=

[Peer]
PublicKey = nW9HaYfZeM5opuqiBdPM9CkW0Eo42+CKH6SxWvKmlWWM=
PresharedKey = IO7CEGTKtPdW+/q7cx0tz2kl3d55oxU3uRQwh6EnnTE=
AllowedIPs = 44.0.0.0/9, 44.128.0.0/10
Endpoint = hamgatepa.ampr.org:51844
```

Cancel Next

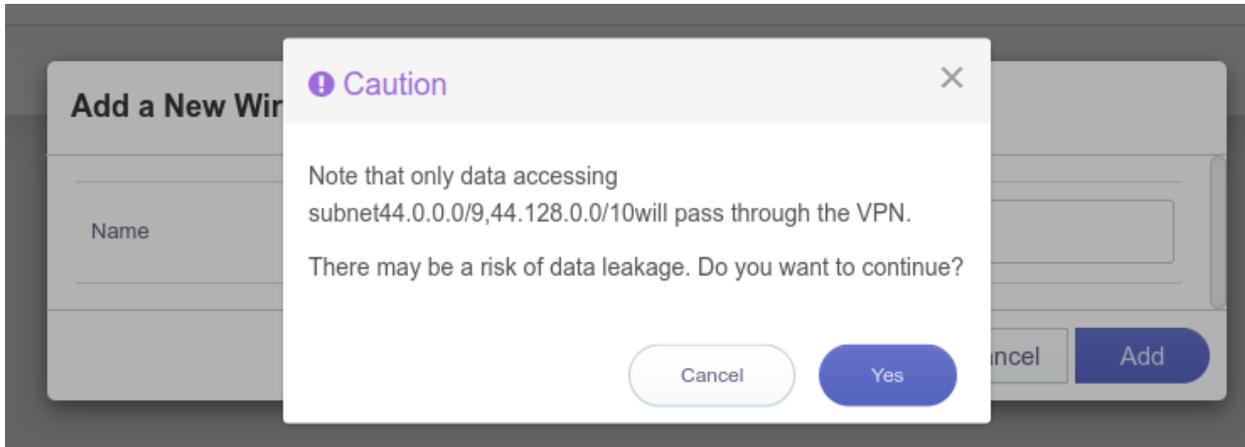
Give the new configuration a name and then click Add

### Add a New WireGuard® Client

Name

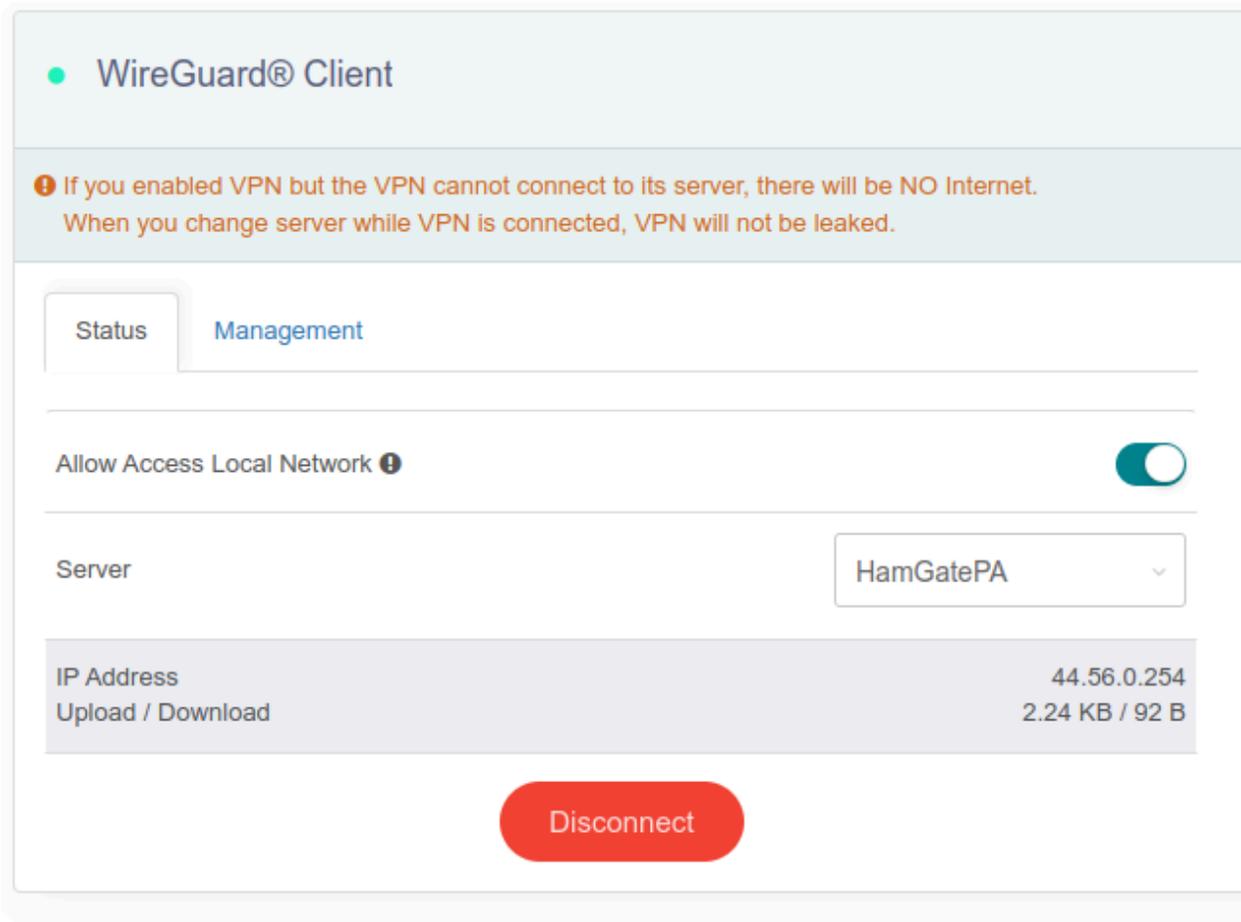
Cancel Add

You will get a warning that only the 44 network will be accessible through this connection. Click Yes. We are NOT your Internet provider. Only access to the 44net ham radio network is provided via this link.



At this point we need to make a decision. The point of having your own IP subnet is to allow the outside world to connect to your devices. If you want this to happen click the slider labeled “Allow Access Local Network”.

To turn the VPN on click the connect button. Within a few seconds you should see an IP address (not the same one you configured earlier) and some upload/download data. If the VPN fails to establish a connection an error will appear.



## 9 Correct DHCP settings

Your Mini Router needs to know the correct range of IP addresses to hand out to requesting devices on its LAN interface.

Your local sysop should have told you what usable addresses are available in your subnet. A discussion of subnets and how to establish usable addresses is beyond the scope of this document.

From the left menu click More Settings > LAN IP and then populate the fields on the right accordingly. You may also issue a particular IP address to a specific device by populating the device MAC address details in the table at the bottom of the page. This is required in some cases where services are made available to the outside world (such as a chat server) to avoid the IP address of the device changing after the DHCP timer has expired.

The screenshot shows the GL.iNet Admin Panel interface. The left sidebar contains a menu with options: INTERNET, WIRELESS, CLIENTS, UPGRADE, FIREWALL, VPN, APPLICATIONS, MORE SETTINGS, Admin Password, LAN IP (highlighted), Time Zone, MAC Clone, IPv6, Custom DNS Server, Button Settings, Network Mode, Revert Firmware, and Advanced. The main content area is titled 'LAN IP' and 'Guest IP'. The 'LAN IP' section includes a note: 'GL routers use 192.168.8.1 as the default LAN IP address. This is the address you would enter into your browser's address bar to access the router admin page. You can manually setup one within these three ranges: 192.168.x.x, 172.x(16-31).x.x or 10.x.x.x. Note: The starting IP address and ending IP address must be in the range of 2-254, and the ending address should be greater than starting address.' Below this, there are input fields for 'LAN IP' (44.56.66.1/28), 'Start IP Address' (44.56.66. 100), and 'End IP Address' (44.56.66. 249). The 'Static IP Address Binding' section includes a note: 'Usually your computer's IP address is dynamically assigned by the router. If you want your computer to have a static IP address, you can manually add your computer's MAC address and the static IP address you want to use. Mind the configured client has to reconnect the router to come into effect.' Below this is a table with columns 'MAC', 'IP', and 'Action'. The 'MAC' column has a dropdown menu, the 'IP' column has an input field, and the 'Action' column has an 'Add' button. The footer of the page reads 'Copyright © 2021 GL.iNet. All Rights Reserved.'

At this point any device connected to the Mini Router's LAN interface will be issued an IP address according to the subnet issued to you by your local sysop. If you connect more devices that you have IP addresses the later devices will fail to collect an address. If you need more addresses please make your case to your local sysop for a larger subnet.

## 10 Connection test

To test connectivity from your devices, issue a PING to 44.1.1.17 (portal.ampr.org). If this is successful, also do a traceroute or MTR to the same address. Your traceroute should reveal at least one other 44net device that your route passes along before arriving at the destination IP address. If you see only public (non 44.x.x.x) addresses in the path then you are NOT connected to the VPN.

```
root@AMPRVPN:~# traceroute 44.1.1.17
traceroute to 44.1.1.17 (44.1.1.17), 30 hops max, 60 byte packets
 1 vpnhost.hamgatepa.ampr.org (44.56.0.192) 13.186 ms 13.131 ms 13.119 ms
 2 * * *
 3 169.228.34.82 (169.228.34.82) 80.406 ms 80.788 ms 81.213 ms
 4 nodem-core-6807-vlan2995-gw.ucsd.edu (132.239.255.49) 80.292 ms 80.287 ms
 5 mx0-vlan2761-gw.ucsd.edu (132.239.254.162) 88.606 ms 80.236 ms 80.226 ms
Etc ....
```

## 11 Overcoming Masquerade/NAT

By default your Mini Router will masquerade or “NAT” all outgoing VPN traffic to present the inclusion that the traffic originates from the Mini Router itself. This is a common firewall practice that protects devices behind the firewall from incoming attacks. If however you require incoming access to your other machines served by the Mini Router you will need to disable this NAT feature.

Navigate your browser to the Advanced setting page of the Mini Router. Then from the top black menu select Network > Firewall.

## Firewall - Zone Settings

The firewall creates zones over your network interfaces to control network traffic flow.

### General Settings

Enable SYN-flood protection

Drop invalid packets

Input

Output

Forward

### Routing/NAT Offloading

Experimental feature. Not fully compatible with QoS/SQM.

Software flow offloading

Software based offloading for routing/NAT

### Zones

Zone ⇒ Forwardings	Input	Output	Forward	Masquerading	
lan ⇒ wan wireguard	accept	accept	accept	<input type="checkbox"/>	≡ Edit Delete
wan ⇒ REJECT	drop	accept	reject	<input checked="" type="checkbox"/>	≡ Edit Delete
guestzone ⇒ wan wireguard	reject	accept	reject	<input type="checkbox"/>	≡ Edit Delete
wireguard ⇒ wan lan guestzone	accept	accept	drop	<input checked="" type="checkbox"/>	≡ Edit Delete

Change the settings for the Wireguard zone to accept Forwarding and uncheck the Masquerade setting. Finally, select “Save & Apply”.

## 12 Force a reboot

Force the Mini Router to reboot by selecting the “Reboot” button at the top right of the screen. This will check that your router retains the configuration we have just created.

## 13 Configure WiFi and other router services

Your Mini Router has WiFi abilities as well as File Sharing and a few other things. These are optional steps and not covered in this document.