

# 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 V1.7**

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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

GL.iNet ADMIN PANEL Reboot Logout English

**INTERNET**

WIRELESS

CLIENTS

UPGRADE

FIREWALL

VPN

APPLICATIONS

MORE SETTINGS

Cable ↔

Repeater

Tethering

3G/4G Modem

**GL-MT300N-V2-d10**  
GL-MT300N-V2-d10-Guest

VPN


1 WLAN Clients

0 LAN Clients

**Cable**

Protocol	DHCP
IP Address	192.168.210.160
Netmask	255.255.255.0
Gateway	192.168.210.1
DNS Server	192.168.210.1

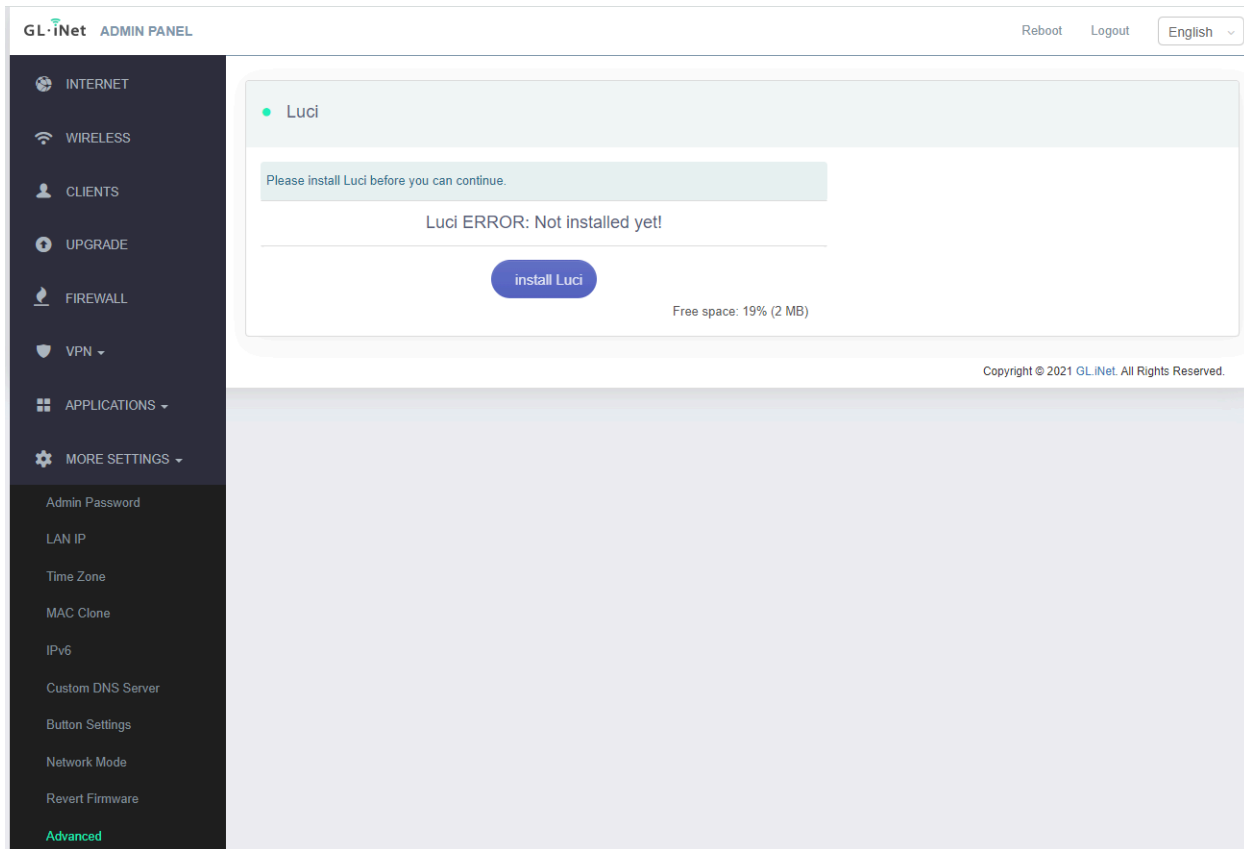
Modify



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).

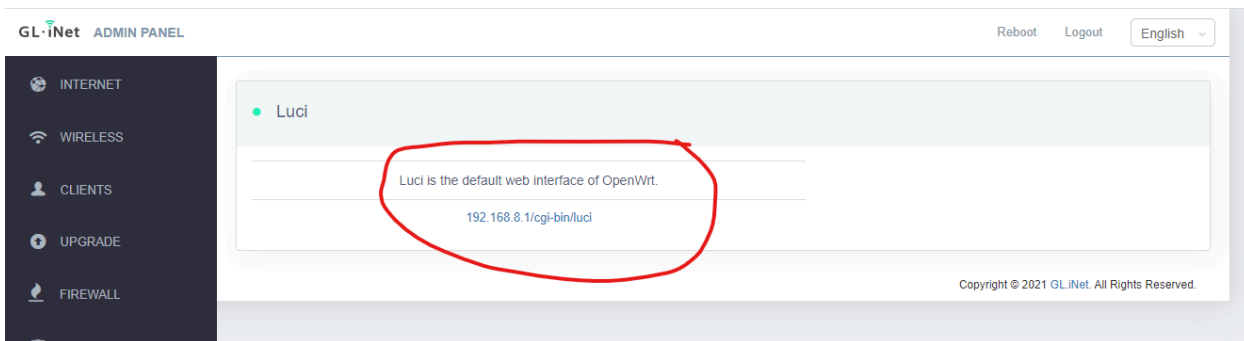
## 6 Install the Luci advanced config GUI

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.

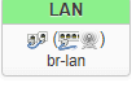


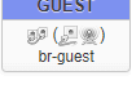
## 7 Configure 44net IP settings

From the top black menu select Network > Interfaces

Interfaces

Global network options

## Interfaces

 <p>LAN br-lan</p>	<p>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</p>	<p>Restart Stop Edit Delete</p>
 <p>WAN eth0.2</p>	<p>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</p>	<p>Restart Stop Edit Delete</p>
 <p>WAN6 eth0.2</p>	<p>Protocol: DHCPv6 client MAC: 94:83:C4:17:0D:10 RX: 1.67 MB (3585 Pkts.) TX: 142.94 KB (1487 Pkts.)</p>	<p>Restart Stop Edit Delete</p>
 <p>GUEST br-guest</p>	<p>Protocol: Static address RX: 0 B (0 Pkts.) TX: 0 B (0 Pkts.) Error: Network device is not present</p>	<p>Restart Stop Edit Delete</p>

[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  +

IPv4 gateway

IPv4 broadcast

Use custom DNS servers  +

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

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

IPv6 suffix   
 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.

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

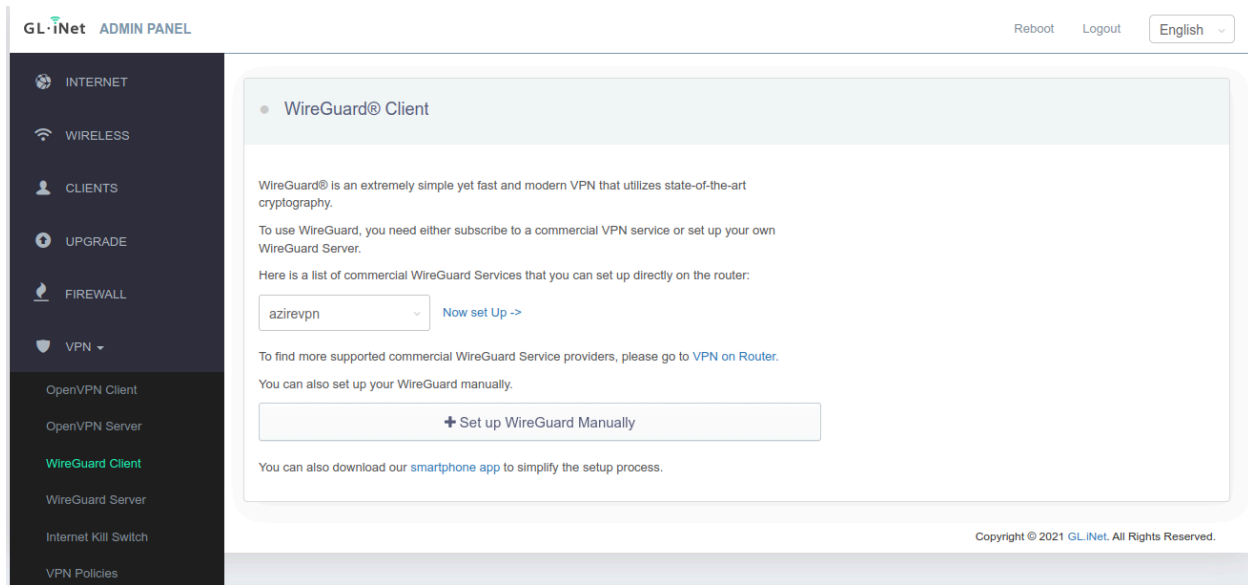
When successfully logged in, close the previous browser page.

## 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. The top navigation bar includes "GL.iNet ADMIN PANEL", "Reboot", "Logout", and a language dropdown set to "English". The left sidebar menu is expanded to the "VPN" section, with "WireGuard Client" highlighted in green. 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:
  - A dropdown menu shows "azirevpn" with a "Now set Up ->" link next to it.
- To find more supported commercial WireGuard Service providers, please go to [VPN on Router](#).
- You can also set up your WireGuard manually.
- A large button labeled "+ Set up WireGuard Manually" is prominently displayed.
- You can also download our [smartphone app](#) to simplify the setup process.

At the bottom right of the page, there is a copyright notice: "Copyright © 2021 GL.iNet. All Rights Reserved."

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

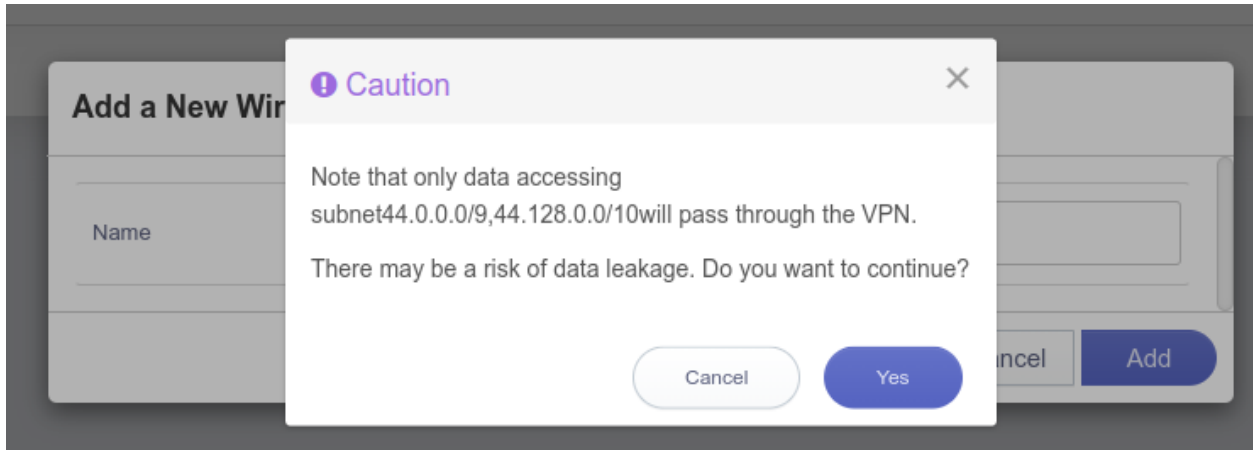
Give the new configuration a name and then click Add

### Add a New WireGuard® Client

Name

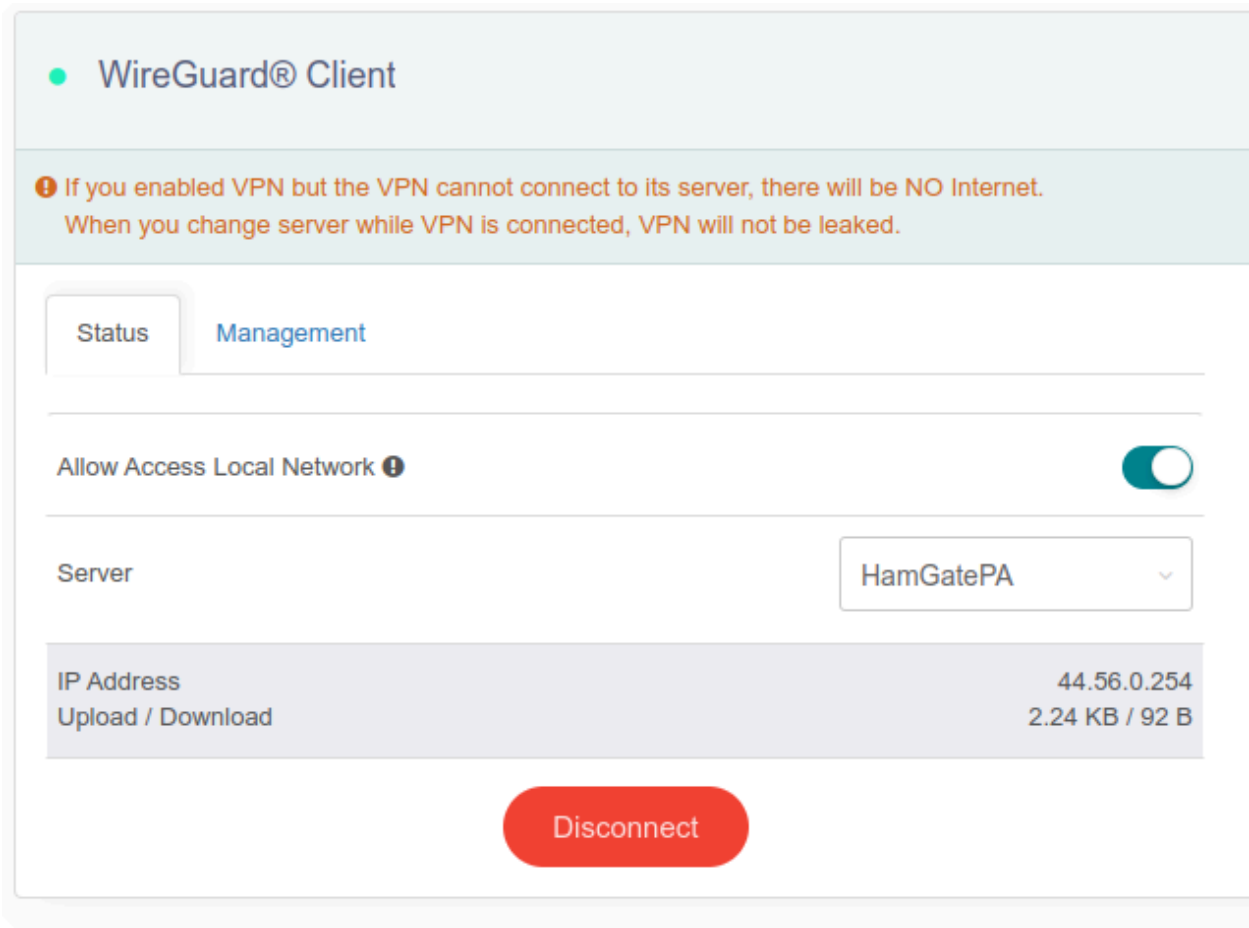
Cancel Add

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 navigation 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 text box with the value '44.56.66.1/28', a 'Start IP Address' field with '44.56.66.100', and an 'End IP Address' field with '44.56.66.249'. Below this is the 'Static IP Address Binding' section, which includes a text box explaining that usually a computer's IP address is dynamically assigned, and a table for binding MAC addresses to static IP addresses. The table has columns for MAC, IP, and Action, with an 'Add' button in the Action column.

MAC	IP	Action
<input type="text"/>	<input type="text"/>	<input type="button" value="Add"/>

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	<input type="text" value="accept"/>	<input type="text" value="accept"/>	<input type="text" value="accept"/>	<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Delete"/>
wan ⇒ REJECT	<input type="text" value="drop"/>	<input type="text" value="accept"/>	<input type="text" value="reject"/>	<input checked="" type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Delete"/>
guestzone ⇒ wan wireguard	<input type="text" value="reject"/>	<input type="text" value="accept"/>	<input type="text" value="reject"/>	<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Delete"/>
wireguard ⇒ wan lan guestzone	<input type="text" value="accept"/>	<input type="text" value="accept"/>	<input type="text" value="drop"/>	<input checked="" type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Delete"/>

Powered by LuCI openwrt-19.07 branch (git-21.189.23240-7b931da) / OpenWrt 19.07.8 r11364-ef56c85848

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.