

# OpenWRT Netbird

version 16

Latest version:

<https://raw.githubusercontent.com/egc112/OpenWRT-egc-add-on/main/notes/OpenWRT%20Netbird.pdf>

This is a WIP, I am working to make a real install guide, comments are welcome.

## Introduction

NetBird combines a WireGuard®-based overlay network with Zero Trust Network Access, providing a unified open source platform for reliable and secure connectivity

This sounds amazing and you can use it for remote access to your home network, to connect multiple routers and other clients (phone/PC/Mac etc.) and when setup as exit node as a remote VPN but you are using a commercial third party and although it is advertised as free and it is to some extent, they do have an incentive to pull you into a paid tier, besides they know your clients and routes but the traffic of course is still encrypted via the WireGuard encryption. But with Netbird you should be able to [self host your control plane](#) in which case none of the drawbacks should exist.

Usually you can do the same by setting up your own WireGuard server and clients.

[WireGuard Server Setup Guide](#)

[WireGuard Client Setup Guide](#)

But this only works if you have at least a public IP address on one side of the connection.

If you are behind CGNAT, so do not have a public IPv4 address and also do not have a public IPv6 address (check with: `ifstatus wan6`) or using IPv6 is not applicable then you have to involve a commercial third party as man-in-the-middle.

This can be a VPN provider which supports port forwarding (e.g. ProtonVPN), or you can rent a Virtual Private Server (I have an Oracle VPS which can be had for free, see at the bottom of this guide), or use things like [Netbird](#), [Zerotier](#), [Cloudflare](#), [Tailscale](#) or [ngrok](#) and there are more.

I favor Netbird because it is open source and has some [advantages](#) over Tailscale, but all things mentioned will get the job done, using Netbird is just my personal choice.

Start with viewing: <https://docs.netbird.io/how-to/getting-started>

All the docs can be found at: <https://docs.netbird.io/>

A [Netbird wiki](#) is in the works

A very useful OpenWRT thread for discussion and support: <https://forum.openwrt.org/t/netbird-support-discussion-thread/237831>

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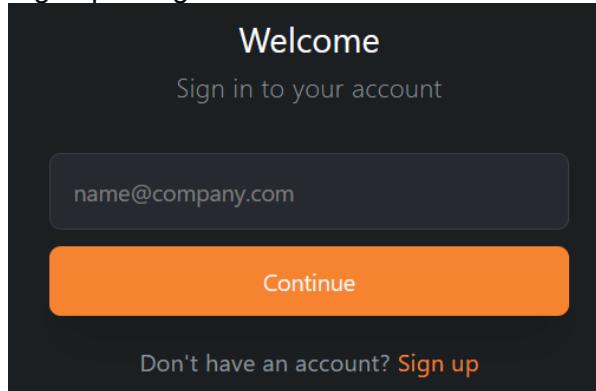
## Make a free account on Netbird

go to: <http://netbird.io>

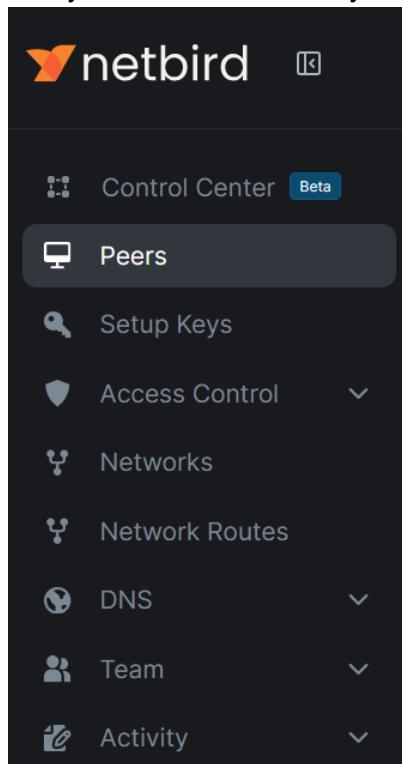
Click:

Get started - free

Sign up or login:



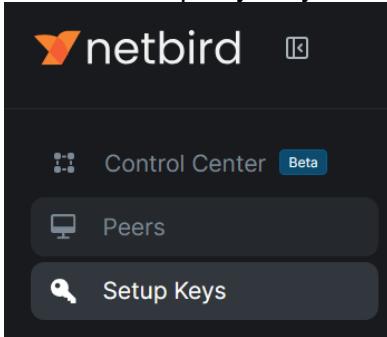
Now you are connected to your Netbird Dashboard the central administration (<https://app.netbird.io>):



### MFA (Multi Factor Authentication)

If you click on your Icon in the upper right hand corner > Profile Settings: you can enable Netbird MFA for added security.

Create a setup key for your OpenWRT router: **Netbird Dashboard > Setup Keys**:



Fill in the name of your router and change the other items, shown are my settings, when done Click **Create Setup Key**.

The form is titled "Create New Setup Key" and includes the following fields:

- Name:** Set an easily identifiable name for your key. Value: OpeWRT 7800-2
- Make this key reusable:** Use this type to enroll multiple peers. (Switch is on)
- Usage limit:** For example, set to 30 if you want to enroll 30 peers. Value: Unlimited Peer(s)
- Expires in:** Days until the key expires. Value: Unlimited Day(s)
- Ephemeral Peers:** Peers that are offline for over 10 minutes will be removed automatically. (Switch is off)
- Allow Extra DNS Labels:** Enable multiple subdomain labels when enrolling peers (e.g., host.dev.example.com). (Switch is on)
- Auto-assigned groups:** These groups will be automatically assigned to peers enrolled with this key. Value: Routing Peers

At the bottom are links to "Learn more about Setup Keys" and "Cancel", and a large orange button labeled "+ Create Setup Key".

**Copy and store the setup key**

## Install Netbird on OpenWRT router

For opkg:

*opkg update*

*opkg install netbird*

or for apk:

*apk update*

*apk add netbird*

Netbird is a rather large package around 12 MB written in Go so make sure your storage is sufficient

The Netbird executable is stored in */usr/bin/netbird*.

You can use **netbird help** to see the available commands e.g.:

*netbird up/down/status* etc.

Netbird is added as a service to OpenWRT which can be called from */etc/init.d/netbird*

See **service netbird help** for commands but the regular commands are available

Make the Netbird service start at boot up with **service netbird enable** but this should be done automatically.

Having the service start is imperative for the right config path as that is set in the service profile.

The config file (>0.55) is stored in */root/.config/netbird*, you might add this path to */etc/sysupgrade.conf*, so that it is included in the backup!

When installed you can setup with:

**netbird up --setup-key <key from previous step>**

After some time you will see:

root@R7800-2:~# netbird up --setup-key E20033F4-0XXXXXXXXXXXXXXX

**Connected**

root@R7800-2:~#

In your Dashboard you can now see the installed peer

The screenshot shows the 'Peers' section of the Netbird dashboard. At the top, there's a search bar and filters for 'All', 'Online', 'Offline', '10 rows per page', and 'All Groups'. Below this is a table with columns: NAME, ADDRESS, GROUPS, LAST SEEN, and VERSION. A single peer is listed: 'R7800-2' with IP 'r7800-2.netbird.cloud' and version '0.50.2'. The 'LAST SEEN' column shows 'just now' and the 'VERSION' column shows 'OpenWrt 24.10-snapshot'. There are buttons for 'Connect' and 'Routing Peers'.

with ifconfig or ip address show on the router, you should see the new interface (device) **wt0**

|

Check netbird status with: *netbird status* and *service netbird status* both should output: *running*.

If not reboot and check again

## Network setup

Create a new unmanaged interface via LuCI: **Network > Interfaces > Add new interface**

- Name: **netbird1**
- Protocol: **Unmanaged**
- Device: **wt0** #For compatibility e.g. with e.g. PBR always name your interface e.g. **wtx**

Interfaces » netbird1

General Settings Advanced Settings Firewall Settings DHCP Server

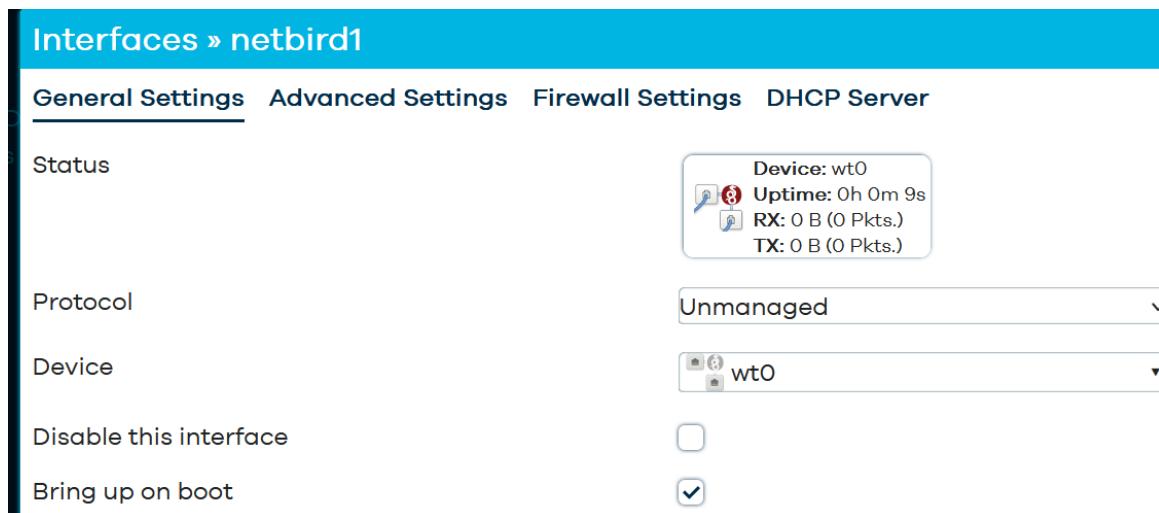
Status

Protocol: Unmanaged

Device: wt0

Disable this interface:

Bring up on boot:



/etc/config/network:

```
config interface 'netbird1'
    option proto 'none'
    option device 'wt0'
```

## Firewall setup

Create a new firewall zone via LuCI: **Network → Firewall → Zones → Add**

- Name: **netbird**
- Input: **ACCEPT** (default)
- Output: **ACCEPT** (default)
- Forward: **ACCEPT**
- Masquerading: **on** (might not be necessary)
- MSS Clamping: **on** (might not be necessary when using [0.59.12](#) )
- Covered networks: **netbird1**
- Allow forward to destination zones: Select your **LAN** (and/or other internal zones or **WAN** if you plan on using this device as an exit node), as this is an exit node **WAN** is selected
- Allow forward from source zones: Select your **LAN** (and/or other internal zones or leave it blank if you do not want to route LAN traffic to other netbird hosts)

Click **Save & Apply**

## Firewall - Zone Settings

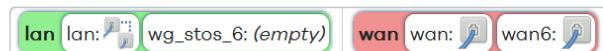
General Settings Advanced Settings Conntrack Settings

This section defines common properties of "netbird". The *input* and *output* options set the default policies for traffic entering and leaving the zone. The *forward* option describes the policy for forwarded traffic between different networks within the zone. *Covered networks* specifies which networks are covered by this zone.

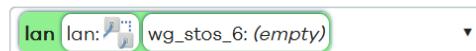
Name	netbird
Input	accept
Output	accept
Intra zone forward	accept
IPv4 Masquerading	<input type="checkbox"/> Enable network address and port translation IPv4 (NAT4) typically enabled on the <i>wan</i> zone.
MSS clamping	<input type="checkbox"/>
Covered networks	netbird1: 

The options below control the forwarding policies between this zone (netbird) and other zones. *Destination zones* cover forwarded traffic from this zone. *Source zones* match forwarded traffic from other zones **targeted at netbird**. The forwarding rule is **unidirectional**, e.g. a forward rule from wan to lan does not give permission to forward from wan to lan as well.

Allow forward to *destination zones*:



Allow forward from *source zones*:



```
/etc/config/firewall:  
config zone  
    option name 'netbird'  
    option input 'ACCEPT'  
    option output 'ACCEPT'  
    option forward 'ACCEPT'  
    option masq '1'  
    option mtu_fix '1'  
    list network 'netbird1'  
  
config forwarding  
    option src 'netbird'  
    option dest 'lan'  
  
config forwarding  
    option src 'lan'  
    option dest 'netbird'  
  
# As this is an exit node traffic from netbird to wan is allowed  
config forwarding  
    option src 'netbird'  
    option dest 'wan'
```

In the end **reboot** the router or do service network restart, service firewall restart and service netbird restart.

## Check and Troubleshoot

### Interface

```
ip address show wt0
```

```
31: wt0: <POINTOPOINT,NOARP,UP,LOWER_UP> mtu 1280 qdisc noqueue state UNKNOWN group default qlen 1000
    link/none
    inet 100.105.224.116/16 brd 100.105.255.255 scope global wt0
        valid_lft forever preferred_lft forever
```

### Routing

```
ip route
```

```
default via 192.168.0.1 dev wan proto static src 192.168.0.9
100.105.0.0/16 dev wt0 proto kernel scope link src 100.105.224.116
```

### Status

`netbird status --detail` to get a detailed status report which also will show if you have a fast P2P connection or a relayed connection.

### Info

`Service netbird info` to get the info from the OpenWRT ubus service e.g. the NB\_STATE\_DIR, use `service netbird help` for more commands

### WireGuard

`wg show` this shows the connections to peers and the Allowed IPs which should also show the subnet routes if you made any.

### Log

```
cat /var/log/netbird/client.log
```

You can increase the log level by starting netbird with `--log-level notice|debug`  
(see: <https://docs.netbird.io/get-started/cli> )

### OpenWRT Forum

<https://forum.openwrt.org/t/netbird-support-discussion-thread/237831/1>

### Online

See: <https://docs.netbird.io/help/troubleshooting-client>

## Allow SSH access from Dashboard

In the **Netbird Dashboard** open the peer and *Enable SSH Access*:

The screenshot shows the Netbird Dashboard interface for peer 'DL-WRX36'. On the left, there's a list of peer details: NetBird IP Address (100.105.224.116), Public IP Address (2001:1400:808:1000::C2), Domain Name (dl-wrx36.netbird.cloud), Hostname (DL-WRX36), Region (The Netherlands), and Operating System (OpenWrt snapshot). On the right, under 'Session Expiration', the toggle switch is off. Under 'SSH Access', the toggle switch is on, indicated by a green circle. Below that, there's a 'Remote Access' section with a 'SSH' button.

### On the router

Make sure SSH is allowed (<https://github.com/netbirdio/netbird/issues/2632>):

`netbird down`

`netbird up --allow-server-ssh`

On your Netbird dashboard you should now be able to SSH into your router:

Dashboard > Peers > Connect dropdown and click SSH:

The screenshot shows the Netbird Dashboard with the 'Peers' tab selected. It displays a list of 2 peers. The peer 'DL-WRX36' is highlighted with a green dot. To its right is a 'Connect' dropdown menu, and below it is a large red arrow pointing to a 'SSH' button.

Connect with the default port 44338 to the in netbird included SSH server:

The screenshot shows the SSH connection dialog for peer 'DL-WRX36'. It includes fields for 'Username & Port' (username 'root' and port '44338'), a 'Learn more about SSH' link, a 'Cancel' button, and a prominent orange 'Connect' button.

Changes Starting with version 0.60

<https://docs.netbird.io/manage/peers/ssh>

<https://forum.netbird.io/t/upcoming-breaking-change-to-netbird-ssh/292>

You need to start Netbird with:

`netbird up --allow-server-ssh --disable-ssh-auth --enable-ssh-root`

Furthermore you need to add an Access policy for port 22 and port 22022 (when using the Standard Dropbear SSH) in the Netbird Dashboard:

Access Control > Policies > Add Policy:

The screenshot shows the 'Add Policy' form. At the top, there are three tabs: 'Policy' (selected), 'Posture Checks', and 'Name & Description'. Below the tabs, the 'Protocol' section is set to TCP. The 'Source' and 'Destination' sections both have dropdown menus showing 'All'. Under 'Ports', two ports are selected: 22 and 22022. In the bottom right corner, the 'Enable Policy' switch is turned on.

Start the SSH with user root and port 22.

If you have dropbear running (which is the default in OpenWRT) instead of OpenSSH (sshd) then you need to use port 22022 and also make an Access Policy for port 22022

The screenshot shows the 'Username & Port' configuration. It displays a table with two rows. The first row has columns for 'User' (root) and 'Port' (22). The second row has columns for 'User' (root) and 'Port' (22022).

The screenshot shows the 'Username & Port' configuration. It displays a table with two rows. The first row has columns for 'User' (root) and 'Port' (22022).

## Create Routes

See: <https://docs.netbird.io/how-to/routing-traffic-to-private-networks>

Note for routing between your peers it is imperative that all involved subnets are unique!

My DL-WRX36 has subnet 192.168.9.0/24.

I will create a routing rule to create a route for this 192.168.9.0/24 subnet to my DL-WRX36 and push that route to all peers.

Those pushed routes are pushed to an alternate routing table on all peers, this table is usually called netbird.

Lets go:

Netbird Dashboard > Network Routes > Add Route

Add the network range to my DL-WRX36:

**Create New Route**  
Access LANs and VPC by adding a network route.

Route Groups Name & Description Additional Se

**Route Type**  
Select your route type to add either a network range or a list of domains.

Network Range  Domain

**Network Range**  
Add a private IPv4 address range

192.168.9.0/24

**Routing Peer** **Peer Group**  
Assign a single peer as a routing peer for the network route.

DL-WRX36  100.

Advertise this route to all my peers:

## Create New Route

Access LANs and VPC by adding a network route.

Route Groups **Name & Description** Additional Settings

### Distribution Groups

Advertise this route to peers that belong to the following groups

Routing Peers X

### Access Control Groups (optional)

These groups allow you to limit access to this route. Simply use these groups as a destination when creating access policies.

Add or select group(s)...

Learn more about [Network Routes](#)

Back Continue

Name and description:

## Create New Route

Access LANs and VPC by adding a network route.

Route Groups **Name & Description** Additional Settings

### Network Identifier

Add a unique network identifier that is assigned to each device.

DL-WRX36

### Description (optional)

Write a short description to add more context to this route.

Route to DL-WRX36 192.168.9.0/24 subnet

Additional settings:

Create New Route

Access LANs and VPC by adding a network route.

Route Groups Name & Description Additional Settings

Enable Route

Use this switch to enable or disable the route.

Masquerade

Allow access to your private networks without configuring routes on your local routers or other devices.

Metric

A lower metric indicates higher priority.

You might need to restart netbird on all peers

On my Oracle VPS I can now see the rules and the alternate routing table created by netbird:

```
ubuntu@vps-egc:~$ ip rule show
0: from all lookup local
105: from all lookup main suppress_prefixlength 0
110: not from all fwmark 0x1bd00 lookup netbird
32766: from all lookup main
32767: from all lookup default
ubuntu@vps-egc:~$
```

```
ubuntu@vps-egc:~$ ip route show table netbird
```

```
192.168.9.0/24 dev wt0
```

```
ubuntu@vps-egc:~$
```

wg show should also show the 192.168.9.0/24 added to the rcorrect peer:

```
ubuntu@vps-egc:~$ sudo wg show
peer: < peer key >
  endpoint: [XXXXX:fedf]:33423
  allowed ips: 100.211.224.116/32, 192.168.9.0/24
  latest handshake: 42 seconds ago
  transfer: 1.41 KiB received, 2.00 KiB sent
  persistent keepalive: every 25 seconds
```

```
peer: < peer key >
  endpoint: [XXXX:1000:bea5:11ff:fe3e]:51555
  allowed ips: 192.168.5.0/24, 100.211.152.75/32
  latest handshake: 1 minute, 39 seconds ago
  transfer: 156 B received, 392 B sent
  persistent keepalive: every 25 seconds
```

So from my oracle VPS there now is a route to my DL-WRX36 subnet

## Create Networks

See: <https://docs.netbird.io/how-to/networks>

As I have just a few routers and a VPS to connect I use 'Network Routes' which is simpler then using Networks.

Networks is new and has finer grained control but needs more work to setup and lacks support for exit nodes so that has still to be done with [Network Routes](#).

For OpenWRT the networks are often simple, so basically a Network has one routing peer which is the router or appliance in that network which holds the Netbird connection. This connects Netbird with the resources of the routing peer so basically the subnet or an IP address of a server which is running on this subnet. In this case I have my subnet as resource.

The access is controlled by Access Policies more on that later.

Start with creating a new Network e.g. the Network of my DL-WRX36 router which has subnet 192.168.9.0/24 and I want everyone to have access to this subnet:

The screenshot shows a dark-themed configuration interface for adding a new network. At the top, there is a header with a small icon and the text "Add Network". Below the header, a descriptive text reads: "Access internal resources in LANs and VPC by adding a network". The main form area contains two sections: "Network Name" and "Description (optional)". The "Network Name" section has a placeholder "Provide a unique name for the network." and a text input field containing "DL-WRX36". The "Description (optional)" section has a placeholder "Write a short description to add more context to this network." and a text input field containing "subnet 192.168.9.0/24".

Proceed with making a new Resource:

Fill in name and address, under Destination Groups (these are the Access Control List > Groups) make a new group which later will hold our routing peer (added later to this the Access Control Destination group). Just enter the text for the new group e.g. DL-WRX36-group

## Add Resource

Add new resource to "DL-WRX36"

**Name**  
Provide a name for your resource

**Description (optional)**  
Write a short description to add more context to this resource.

**Address**  
Enter a single IP address, CIDR block or domain name

**Destination Groups**  
Add this resource to groups and use them as destinations when creating policies  
  
   
 Add this group by pressing '**Enter**'

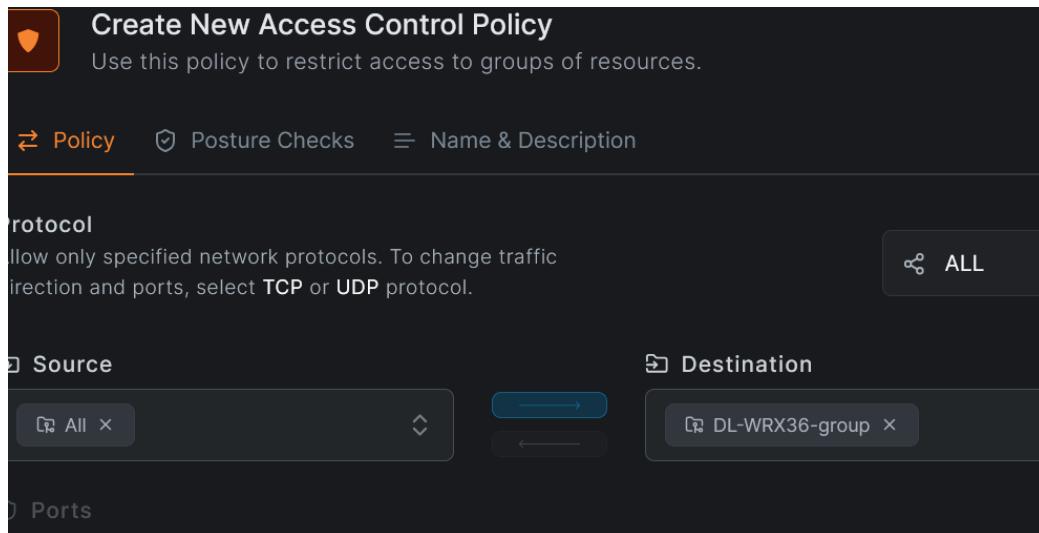
Proceed with making an Access Policy.

The destination is automatically your newly created Destination group (we will later add our peer to this Access group).

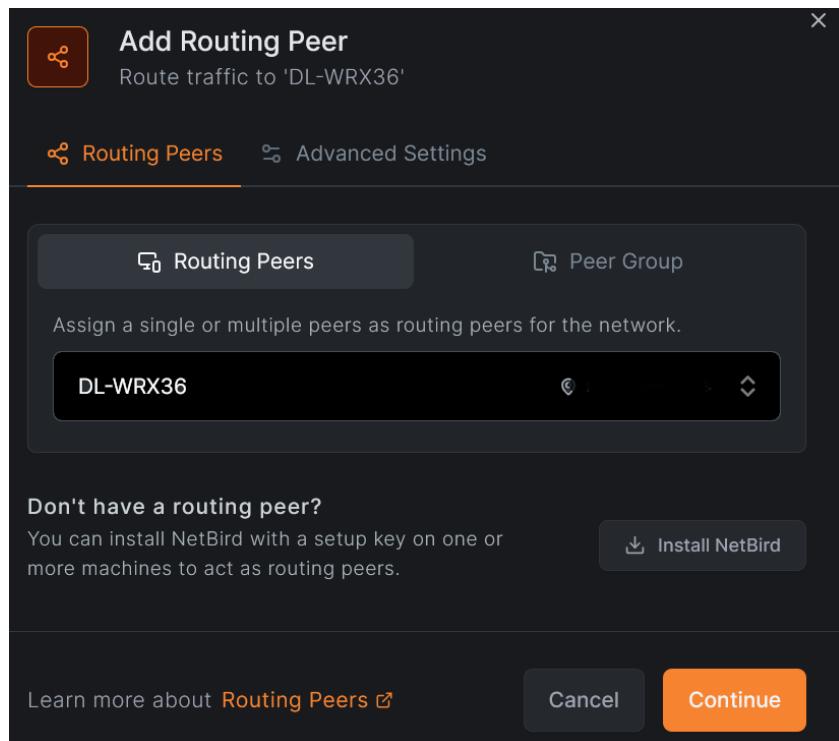
As Source I use 'All' as everything in my network can have access but you can restrict it to your liking.

Note:

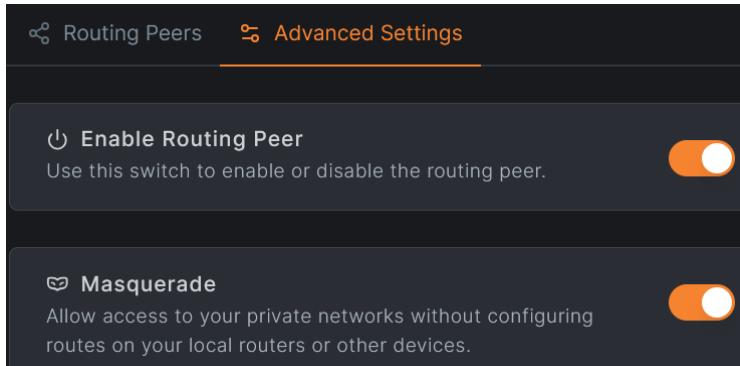
For every resource you have to make an Access Policy as the Destination Group you added is not automatically added to the 'All' group



Proceed with adding a Routing Peer which is of course my DL-WRX36 peer:



On Advanced settings enable Masquerading:



The last step is to add the DL-WRX36 peer to the Access Control Group DL-WRX36-group.

Goto Access Control > Groups and open the DL-WRX36 -group > Peers and assign you peer (the router or appliance Netbird runs on in that Network):

The screenshot shows the 'Control Center' interface with a sidebar on the left containing various navigation options like Peers, Setup Keys, Access Control, Policies, Groups, Posture Checks, Networks, Network Routes, DNS, Team, Users, and Service Users. The main area is titled 'DL-WRX36-group' and shows a summary: 1 User, 1 Policy, 1 Resource, 1 Network Route, 1 Nameserver, and 1 Setup Key. Below this is a search bar and filters for All, Online, Offline, and 10 rows per page. A message states 'This group has no assigned peers' and includes a link to 'Install NetBird' and a button to 'Assign Peers'.

What I found confusing is that when making a resource you have to add the destination group. The Destination group is an Access List group to control access and it is only possible to control access by group and not by individual peer so you have to make a new Access control group and add your peer later to that group.

## DNS settings

See: <https://docs.netbird.io/how-to/manage-dns-in-your-network>

Netbird by default runs its own DNS server on the peers, this is included in the Netbird executable and is used by default.

So make sure you set a Nameserver under DNS settings:

**Dashboard > DNS > Nameservers:**

The screenshot shows the 'Nameservers' section of the Netbird dashboard. On the left sidebar, 'Nameservers' is selected under the 'DNS' category. The main area has a heading 'Nameservers' with a sub-instruction 'Add nameservers for domain name resolution in your NetBird network.' Below this is a search bar and filters for 'Enabled', 'All', '10 rows per page', and a refresh icon. A table lists one entry: 'DNS0.EU' with 'DNS0.EU DNS Servers' in the details column, and an 'Enabled' toggle switch which is turned on. There is also a 'Match Domains' filter and a 'ALL' button.

I have chosen the DNS0.EU nameserver but you can choose others from a list or add your own.

If you do not want to use the Netbird DNS on your peers than you can disable it:

**Dashboard > DNS > DNS Settings:**

The screenshot shows the 'DNS Settings' section of the Netbird dashboard. The left sidebar shows 'DNS Settings' selected. The main area has a heading 'DNS Settings' with a sub-instruction 'Manage your account's DNS settings.' Below this is another sub-instruction 'Learn more about DNS in our documentation.' A section titled 'Disable DNS management for these groups' contains the text 'Peers in these groups will require manual domain name resolution' and a dropdown menu with the option 'All'.

In this example I have disabled it for all peers, so all peers are using their own DNS settings and servers.

If you have one central DNS server you can set the netbird name (e.g. mywrx36.netbird.cloud) of that server as Nameserver

## Create Exit node

An exit node is a peer which acts as a VPN server other designated peers route all their traffic via the exit node.

On the exit node it is important that the firewall allows forwarding from **netbird** to **wan**, see paragraph about [firewall](#).

Netbird documentation: <https://netbird.io/knowledge-hub/netbird-network-routes>, scroll down to he bottom.

Log in to the Netbird dashboard

**Peers** > Click on the peer you want to be the exit node > On the overview page scroll to the bottom and click **Setup Exit node**

The screenshot shows the Netbird Peer Overview page for the peer 'DL-WRX36'. The left sidebar lists basic peer information:

- NetBird IP Address: 100.0.0.1
- Public IP Address: 2001:0:0:0:0:0:0:1
- Domain Name: dl-wrx36.netbird.cloud
- Hostname: DL-WRX36
- Region: The Netherlands
- Operating System: OpenWrt snapshot
- Registered on: 8 October, 2025 at 6:53 PM (2 days ago)
- Last seen: just now
- Agent Version: 0.58.2

The right side of the page contains several configuration sections:

- Session Expiration:** A toggle switch is off.
- SSH Access:** A toggle switch is on.
- Remote Access:** A section with a 'SSH' button.
- Assigned Groups:** A dropdown menu shows 'All' and 'Routing Peers' (which is selected).

At the bottom of the page, there are three navigation links: 'Network Routes', 'Accessible Peers', and 'Traffic Events'. There are also two buttons: 'Set Up Exit Node' and 'Add Route'.

NAME	NETWORK	DISTRIBUTION GROUPS	ACTIVE	
DL-WRX36	192.168.9.0/24	Routing Peers	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>

Under **Groups** add the peers you want to use the exit node, I had created a group **Routing Peers** and I want all those peers to use this router as exit node

**Set Up Exit Node**  
Route all traffic through the peer 'DL-WRX36'

Groups    Name & Description    Additional Settings

**Distribution Groups**  
Route all internet traffic through this peer for the following groups

Routing Peers

**Access Control Groups (optional)**  
These groups allow you to limit access to this route. Simply use these groups as a destination when creating access policies.

Add or select group(s)...

Learn more about [Exit Nodes](#)

Cancel    Continue

## Continue

Fill in names and Description:

**Set Up Exit Node**  
Route all traffic through the peer 'DL-WRX36'

Groups    **Name & Description**    Additional Settings

**Network Identifier**  
Add a unique network identifier that is assigned to each device.

Exit Node (DL-WRX36)

**Description (optional)**  
Write a short description to add more context to this route.

Route all traffic from the Routing Peers via DL-WRX36

Learn more about [Exit Nodes](#)

Back    Continue

## Continue

Enable Route and Auto Apply Route

**Set Up Exit Node**  
Route all traffic through the peer 'DL-WRX36'

Groups Name & Description Additional Settings

**Enable Route**  
Use this switch to enable or disable the route.

**Auto Apply Route**  
Automatically apply this exit node to your distribution groups. This requires NetBird client v0.55.0 or higher.

**Metric**  
A lower metric indicates higher priority routes.

Learn more about [Exit Nodes](#) [Add Exit Node](#)

## Add Exit Node

My DL-WRX36 is running Snapshot with Netbird 0.58 (you can see it on the overview page if you click on the Peer) so all routes are applied automatically.

My DL-WRX36 now has set a route to its own subnet (which is 192.168.9.0/24), pushed to all the Routing peers en an Exit node which pushes a default route to all the routing peers.

Network Routes Accessible Peers Traffic Events

**2 Network Routes**

Access other networks without installing NetBird on every resource.

NAME	NETWORK	DISTRIBUTION GROUPS	ACTIVE
Exit Node (DL-WRX36)	Exit Node	Routing Peers	<input checked="" type="checkbox"/>
DL-WRX36	192.168.9.0/24	Routing Peers	<input checked="" type="checkbox"/>

You can check on one of the other routing peers e.g. my R7800-2 where you can see the pushed default route and the pushed route to reach the DL-WRX36:

```
root@R7800-2:~# ip route show table netbird
default dev wt0
192.168.9.0/24 dev wt0
root@R7800-2:~#
```

Now all traffic from the R7800-2 (and all its clients are routed) via Netbird, Netbird internally routes this traffic to the exit node.

## Support

For support and questions see the Netbird support thread:

<https://forum.openwrt.org/t/netbird-support-discussion-thread/237831/8>

## Using PBR together with Netbird

To work together with [PBR](#) add to the PBR config (**version 1.2.X** and higher), `/etc/config/pbr`:

or from command line:

```
uci set pbr.config.uplink_ip_rules_priority ="99"  
uci commit pbr  
service pbr restart
```

This will make sure the PBR ip rules will come before the netbird rules (>100).

## Install on Oracle VPS with Ubuntu (24.04)

```
sudo apt-get update  
sudo apt install ca-certificates curl gnupg -y  
curl -sSL https://pkgs.netbird.io/debian/public.key | sudo gpg --dearmor --output /usr/share/keyrings/netbird-archive-keyring.gpg  
echo 'deb [signed-by=/usr/share/keyrings/netbird-archive-keyring.gpg] https://pkgs.netbird.io/debian stable main' | sudo tee /etc/apt/sources.list.d/netbird.list
```

```
sudo apt-get update  
sudo apt-get install netbird  
# only for the GUI  
#sudo apt-get install netbird-ui
```

**netbird up –setup-key <setup-key made on dashboard> --allow-server-ssh**

Log on Ubuntu: `cat /var/log/netbird/client.log`

SSH access note that the user name is usually: `ubuntu`

For (SSH) Access add thes firewall rules

```
sudo iptables -I INPUT 3 -p udp --dport 3478 -j ACCEPT # NetBird TURN  
sudo iptables -I INPUT 4 -p tcp --dport 44338 -j ACCEPT # SSH service port from netbird  
  
sudo iptables -I INPUT 5 -p udp --dport 51820 -j ACCEPT # NetBird WireGuard  
#sudo iptables -t nat -I POSTROUTING -o wt0 -j MASQUERADE #To Masquerade traffic ?  
#sudo iptables -t nat -I POSTROUTING -o ens3 -j MASQUERADE #To Masquerade traffic ?
```

Make persistent:

`sudo netfilter-persistent save`

**vcn-XXX > Security > Default Security List for vcn-XXX > Security rules:**

<input type="checkbox"/>	No	0.0.0.0/0	UDP	All	3478
<input type="checkbox"/>	No	0.0.0.0/0	TCP	All	44338
<input type="checkbox"/>	No	0.0.0.0/0	UDP	All	51820

## Throughput improvements via transport layer offloading

Tuning two features may show improved throughput:

- rx-udp-gro-forwarding: Enables UDP Generic Receive Offload (GRO) forwarding, which aggregates incoming UDP packets to reduce CPU overhead on receive.
- rx-gro-list: If disabled (off), it prevents multiple flows from being aggregated simultaneously which simplifies flow handling and performance on some workloads.

From command line:

1. Install "ethtool":

```
apk update  
apk add ethtool
```

2. Apply the changes:

Substitute "wan" below for your WAN interface.</WRAP>

```
ethtool -K wan rx-gro-list off  
ethtool -K wan rx-udp-gro-forwarding on
```

3. Test the changes before and after before committing them permanently with something similar to the following commands.

You want to verify:

- Packet aggregation is working as measured by reduced packets/sec on the wire with GRO enabled (verify with tools like: ethtool -S <interface> | grep udp or netstat -su)
- CPU usage is reduced. Lower CPU usage on the receiver compared to same test with rx-udp-gro-forwarding turned off
- High throughput is achieved near line rate (e.g., 1 Gbps, 10Gbps, etc) without packetloss. You need iperf3 for proper measurement

## Setup Oracle free OpenVPN cloud server

<https://www.youtube.com/watch?v=E-CLtExRzX8>

<https://mateo.cogeanu.com/2020/wireguard-vpn-pihole-on-free-oracle-cloud/>

## References

Netbird support thread: <https://forum.openwrt.org/t/netbird-support-discussion-thread/237831/8>

Upgrade from 0.50 to 0.58: <https://github.com/netbirdio/netbird/issues/4322>

## Netbird Releases

<https://github.com/netbirdio/netbird/releases>