

OpenWRT NetBird

version 23

Latest version:

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

This is a W.I.P., comments are welcome.

Introduction

NetBird is a modern, fully open-source Zero Trust VPN that provides a simple and secure way to connect users, devices, and services. It is built on WireGuard®, offering fast, encrypted peer-to-peer networking without the complexity of traditional VPN setups.

Unlike some alternatives, NetBird is fully open source and allows the entire control plane to be self-hosted. This can give full control over your networking infrastructure and data, and avoids dependency.

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 also as a remote VPN.

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 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](#) (also layer 2), [Cloudflare](#), [Tailscale](#) or [ngrok](#) and there are more.

I favor NetBird because it is fully open source and has some [advantages](#) over Tailscale, but it still is a commercial third party however a free tier is available which is sufficient for small to medium sized networks with up to 5 users (admins) and 100 peers (routers, VPS, client PC, phone, etc.).

Big advantage of NetBird is that it is fully open source and you can self host the control plane (Dashboard) in which case you are your own third party, self hosting the control plane is outside the scope of this paper.

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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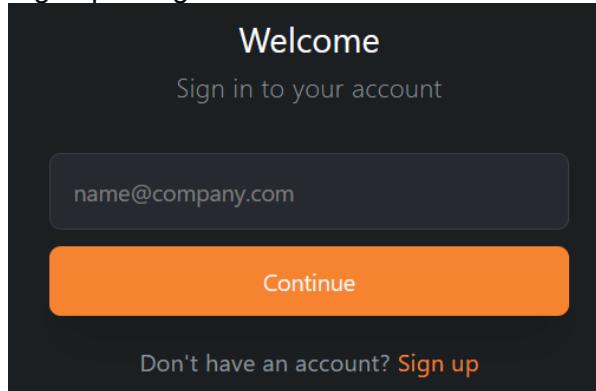
Make a free account on NetBird

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

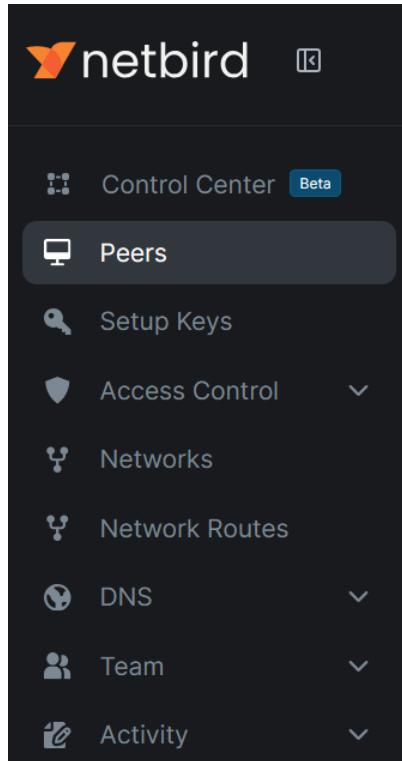
Click:

Get started - free

Sign up or login:



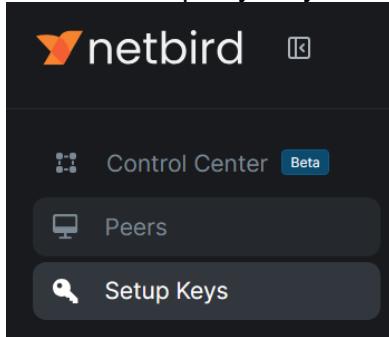
Now you are connected to your NetBird Dashboard the central administration (<https://app.netbird.io>):



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 screenshot shows the 'Create New Setup Key' configuration page. It includes fields for Name (set to 'OpeWRT 7800-2'), Make this key reusable (switched on), Usage limit (Unlimited Peer(s)), Expires in (Unlimited Day(s)), Ephemeral Peers (switched off), Allow Extra DNS Labels (switched on), and Auto-assigned groups (Routing Peers). At the bottom are 'Learn more about Setup Keys' and 'Create Setup Key' buttons.

Create New Setup Key
Use this key to register new machines in your network

Name
Set an easily identifiable name for your key
OpeWRT 7800-2

Make this key reusable
Use this type to enroll multiple peers

Usage limit
For example, set to 30 if you want to enroll 30 peers
Unlimited Peer(s)

Expires in
Days until the key expires.
Leave empty for no expiration.
Unlimited Day(s)

Ephemeral Peers
Peers that are offline for over 10 minutes will be removed automatically

Allow Extra DNS Labels
Enable multiple subdomain labels when enrolling peers (e.g., host.dev.example.com).

Auto-assigned groups
These groups will be automatically assigned to peers enrolled with this key
Routing Peers

Learn more about [Setup Keys](#) [Cancel](#) [+ Create Setup Key](#)

Copy and store the setup key

Install NetBird on OpenWRT router

NetBird is a rather large package around 12 MB written in Go so make sure your storage is sufficient, if you install it as a package it will take up double this storage, if your storage is not sufficient then make a new build using e.g. the [firmware selector](#) and *customize installed packages* adding *netbird*.

If you already have a running build then a very hand tool to make a list for the firmware selector is [owut](#) ([owut list](#)).

You can even use it for upgrading and adding a package like netbird ([owut upgrade --add netbird](#)).

Installing package

opkg (24.10):

opkg update

opkg install netbird

apk (25.12 and higher):

apk update

apk add netbird

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 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.

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!

Setup on Router with SSO login

After installing NetBird check that the OpenWRT service is running with service `netbird status`, if this is the case you can Run UP command to log in with SSO (interactive login): `netbird up`

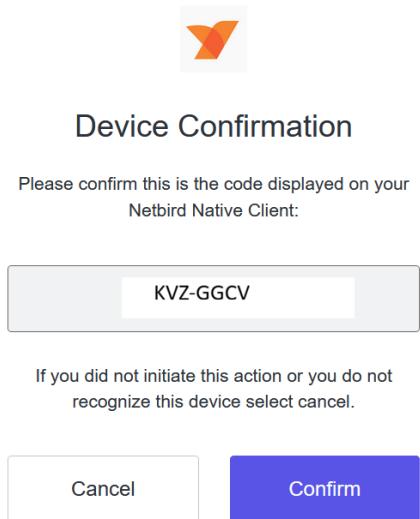
You will see the following text on the console:

Please do the SSO login in your browser.

If your browser didn't open automatically, use this URL to log in:

https://login.netbird.io/activate?user_code=ZKZX-AACCV

On your PC where you have opened the NetBird dashboard use your browser to login with the link (`user_code`) from the routers console and you should see:



Confirm the device and go to your NetBird Dashboard where you should see the new Peer been added

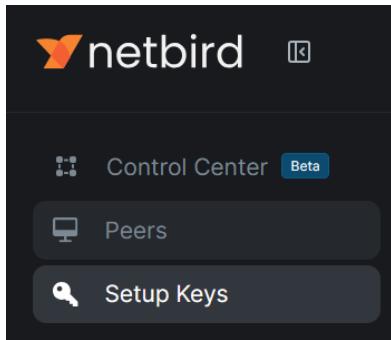
If this is successful proceed to [Post installation](#), [Network setup](#) and [Firewall setup](#)

|

If this does **not** work go to the next section, [Setup on router with key](#) and manually make a peer key on the Dashboard and use that peer key to setup NetBird.

Setup on router with manual made key

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*.

Create New Setup Key
Use this key to register new machines in your network

Name
Set an easily identifiable name for your key

Make this key reusable
Use this type to enroll multiple peers

Usage limit
For example, set to 30 if you want to enroll 30 peers Peer(s)

Expires in
Days until the key expires. Day(s)
Leave empty for no expiration.

Ephemeral Peers
Peers that are offline for over 10 minutes will be removed automatically

Allow Extra DNS Labels
Enable multiple subdomain labels when enrolling peers (e.g., host.dev.example.com).

Auto-assigned groups
These groups will be automatically assigned to peers enrolled with this key

Learn more about [Setup Keys](#)

Copy and store the setup key

Head back to the console of the router and execute:

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', 'All Groups', and a refresh button. Below is a table with columns: NAME, ADDRESS, GROUPS, LAST SEEN, and VERSION. One peer is listed: R7800-2 (IP 100.1.1.100), connected to r7800-2.netbird.cloud, in the Routing Peers group, last seen just now, and running version 0.50.2 (OpenWrt 24.10-snapshot).

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

Post installation

Open the Peer in the Dashboard by clicking on it in and change the settings.

You might want to disable Session Expiration and Enable SSH Access:

The screenshot shows the configuration page for a peer. It includes sections for 'Session Expiration' (disabled), 'Require login after disconnect' (disabled), and 'SSH Access' (enabled). Each section has a description and a toggle switch.

Setting	Status
Session Expiration	Disabled
Require login after disconnect	Disabled
SSH Access	Enabled

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**

```
/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, if you are going to use a VPN and traffic from the exit node should go via this VPN then also add the VPN interface!
- 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 a 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 checked="" type="checkbox"/> Enable network address and port translation IPv4 (NAT4 or NAF) typically enabled on the wan zone.
MSS clamping	<input checked="" 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 to other zones. *Source zones* match forwarded traffic from other zones targeted at netbird. The forwarding rule is unidirectional, e.g. a forward permission to forward from wan to lan as well.

Allow forward to *destination zones*:

 lan:   wg_stos_6: (empty)  ovpn_client tun1: (empty)  wg_mullv_se:  wg_proton_nl: (empty)  mullvad_ro: (empty)  wan wan:   wan6: 

Allow forward from *source zones*:

 lan:   wg_stos_6: (empty)

/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, `service netbird status` will show if the service is running. 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 (2001:1400:800:1000::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 an orange 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 'Peers' list. It displays 2 peers. The peer 'DL-WRX36' is listed with its status as 'Online'. To the right of the peer entry, there is a 'Connect' dropdown menu and an 'SSH' button. A red arrow points to the 'SSH' button.

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

The screenshot shows the NetBird SSH connection dialog for peer 'DL-WRX36'. It includes fields for 'Username & Port' (username: root, port: 44338) and a 'Connect' button. A red arrow points to the '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:

Policy Posture Checks Name & Description

Protocol

Allow only specified network protocols. To change traffic direction and ports, select **TCP** or **UDP** protocol.

Source Destination

Ports

Allow network traffic and access only to specified ports. Select ports or port ranges between 1 and 65535.

Enable Policy

Use this switch to enable or disable the policy.

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

Username & Port

The username and port you will use to connect to the remote host.

	root	@[REDACTED] 152.5
	22	

Username & Port

The username and port you will use to connect to the remote host.

	root	@[REDACTED]
	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
Add a private IPv4 address range

192.168.9.0/24

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

DL-WRX36

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 (On)

Masquerade (On)

Metric: 9999

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 correct 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>

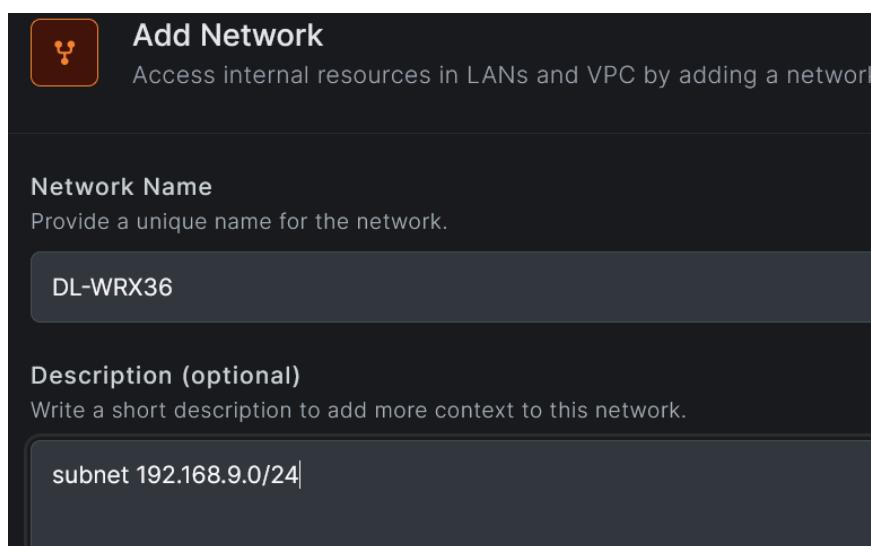
As I have just a few routers and a VPS to connect I use 'Network Routes' which is simpler then using Networks.

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:



Add Network

Access internal resources in LANs and VPC by adding a network

Network Name
Provide a unique name for the network.
DL-WRX36

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

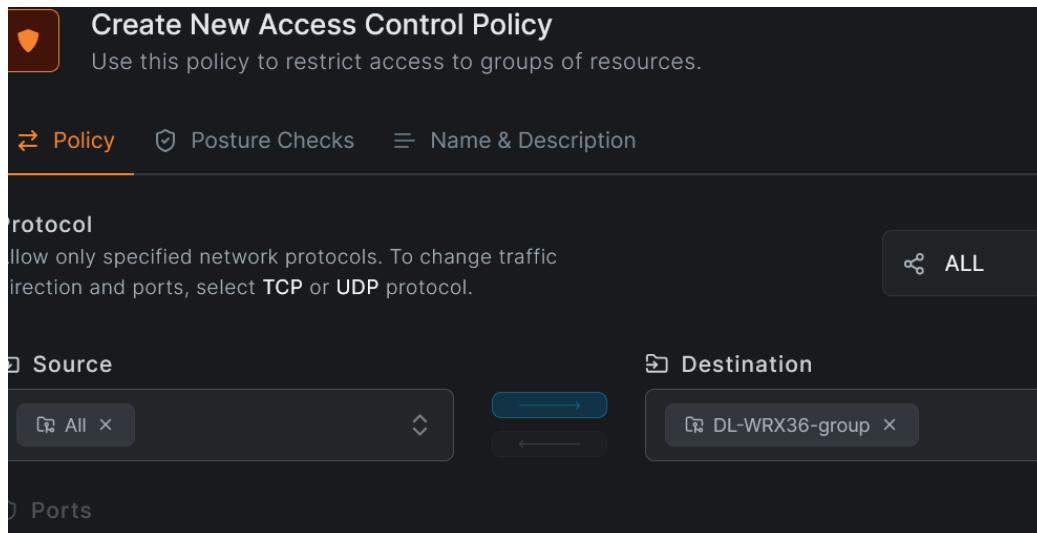
Proceed with making an Access Policy.

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

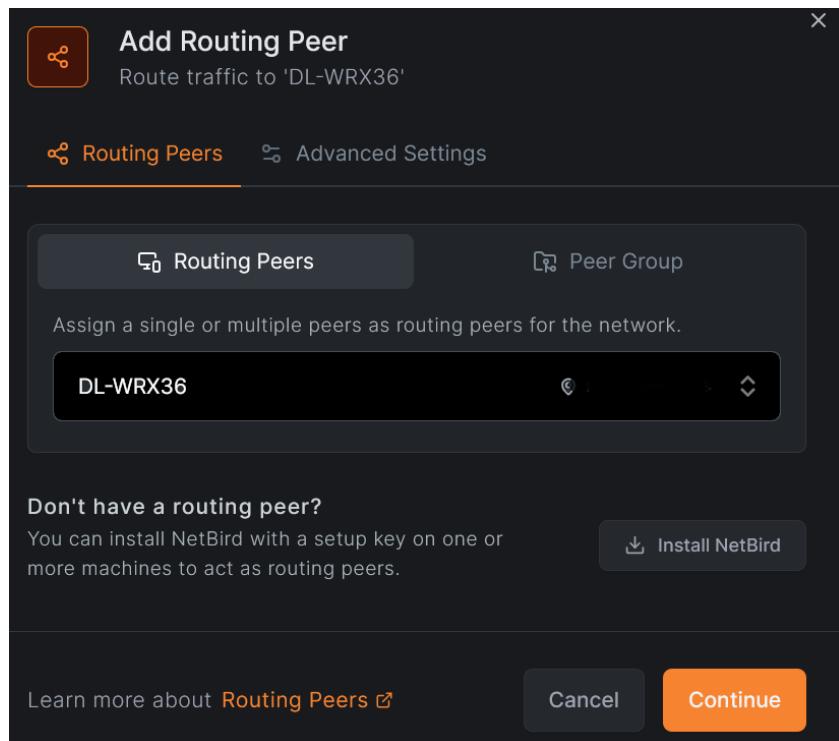
As Source I use 'All' as everything in my network can have access but you can restrict it to your liking.

Note:

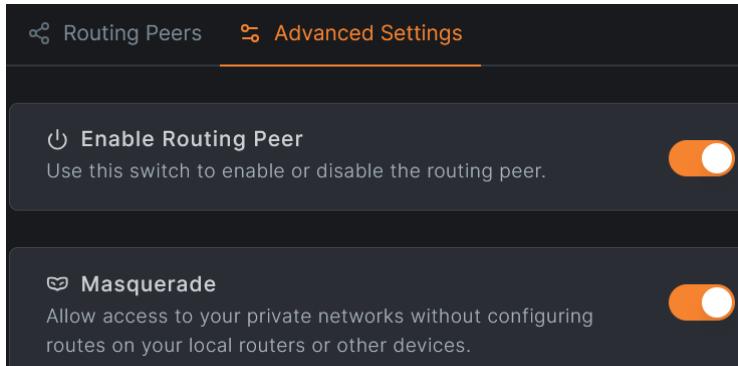
For every resource you have to make an Access Policy as the Destination Group you added is not automatically added to the 'All' group



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 'Groups' section of the Access Control interface. A group named 'DL-WRX36-group' is selected. The interface displays various statistics: 1 User, 1 Policy, 1 Resource, 1 Network Route, and 1 Nameserver. Below these are search and filter options. A message states: 'This group has no assigned peers. Install NetBird and assign existing peers to this group see them listed here.' At the bottom are buttons for 'Install NetBird' and '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>

<https://forum.openwrt.org/t/using-netbird-with-dnsmasq/218358/3?u=egc>

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, an 'Enabled' filter (set to 'All'), and a '10 rows per page' dropdown. A table lists one entry: 'DNS0.EU' with 'DNS0.EU DNS Servers' underneath. To the right of the entry is an orange toggle switch which is turned on, and a blue button labeled 'ALL'.

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 has '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 large central box contains the text 'Disable DNS management for these groups' with the sub-instruction: 'Peers in these groups will require manual domain name resolution.' At the bottom of this box is a button labeled 'All' with a delete icon.

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 the 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 interface. In the top section, a peer named 'DL-WRX36' is selected. The left panel displays basic peer information:

NetBird IP Address	100.10.10.10
Public IP Address	2001:1000:100:100::10
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 panel contains configuration options:

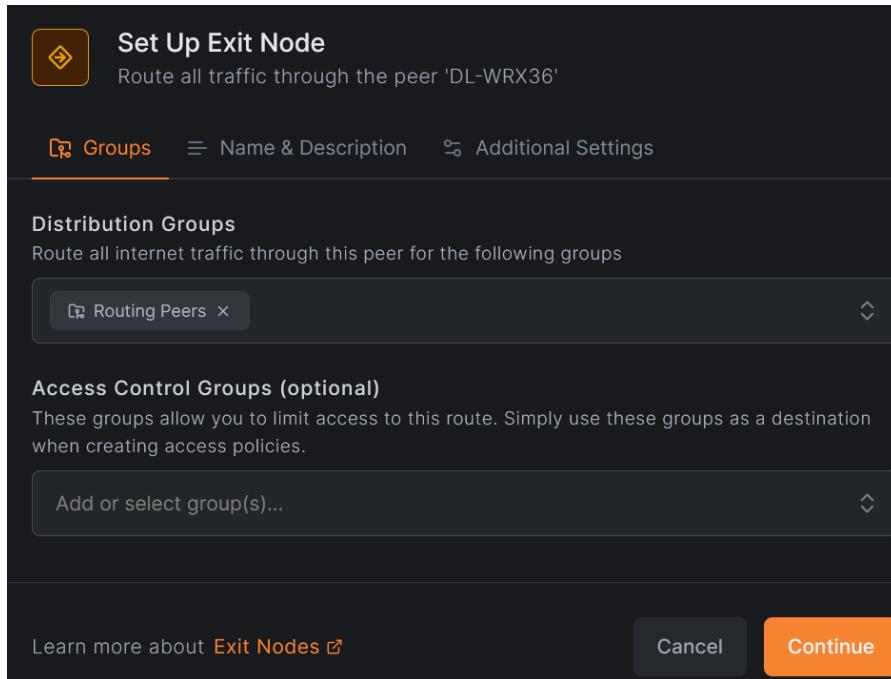
- Session Expiration:** A toggle switch is off.
- SSH Access:** A toggle switch is on.
- Remote Access:** A section with a link to 'SSH'.
- Assigned Groups:** A dropdown menu showing 'All' and 'Routing Peers' (selected).

At the bottom, there are links for 'Network Routes', 'Accessible Peers', and 'Traffic Events'. The 'Network Routes' section shows a single entry:

NAME	NETWORK	DISTRIBUTION GROUPS	ACTIVE	Actions
DL-WRX36	192.168.9.0/24	Routing Peers	On	Delete

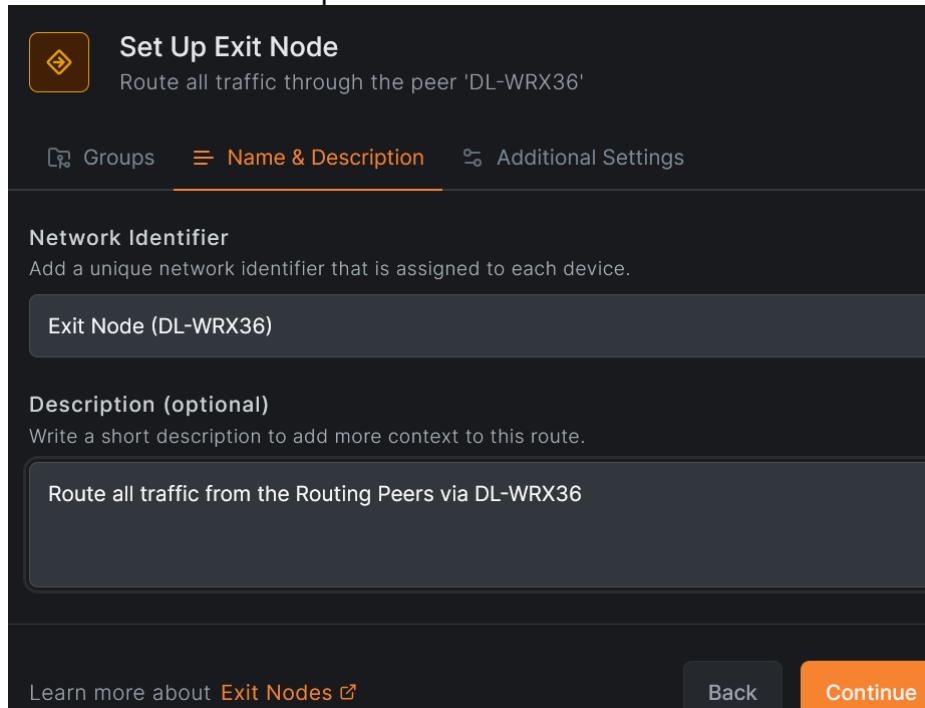
Buttons for 'Set Up Exit Node' and 'Add Route' are also visible.

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



Continue

Fill in names and Description:



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
```

Now all traffic from the R7800-2 (and all its LAN clients are routed) via NetBird interface, which is actually your WireGuard interface and `wg show` will show you how the routing is taking place via the exit node

Support

For support and questions see the NetBird support thread:

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

Known Problems

SSH-Access from Dashboard

Enabling [Lazy Connections](#) might stop SSH access from the Dashboard (Settings > Clients):

<https://netbird.io/knowledge-hub/lazy-connections>

<https://forum.openwrt.org/t/netbird-support-discussion-thread/237831/44?u=egc>

Policy Based Routing (PBR) together with NetBird

Policy based routing can be used to route traffic via different routes according to source and/or destination. It can be useful if you have set your peer (router) to use an exit node which means all traffic is routed via the specified exit node and you want to route some traffic via the WAN instead of the exit node.

You can setup this up [manually](#) but it is often easier to install the [PBR app](#).

To work together with the PBR app, add to the PBR config (**version 1.2.X** and higher):

`/etc/config/pbr:`

`option uplink_ip_rules_priority '99'`

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).

For checking rules and routes see [Check and Troubleshoot](#) section.

If everything runs you should see something like this:

```
root@R7800-2:~# ip rule show
0:      from all lookup local
97:     from all sport 52199 lookup pbr_wan
97:     from all lookup main suppress_prefixlength 1
98:     from all fwmark 0x20000/0xffff0000 lookup pbr_netbird1
99:     from all fwmark 0x10000/0xffff0000 lookup pbr_wan
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
```

Note the still existing NetBird rules and the PBR rules **before** the Netbird rules, so these take precedence.

Netbird starts rather late so you might need to restart PBR (`service pbr restart`) after setting up or after a reboot

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>

Configuration

See: <https://docs.netbird.io/get-started/cli>

Flags are for using on the command line e.g. **netbird up --flag** if these are also config items then it will be stored in the config in /root/.config/netbird/default.json so there is no need to add the flag again.

Most flags can also be set as Environment variable with syntax NB_FLAG and using underscores instead of hyphens e.g.: `export NB_FLAG=1` or set in the environment in the init script: `procd_append_param env NB_DISABLE_SSH_CONFIG="1"`

Disable SSH Authorization per user

flag (command line): --disable-ssh-auth
env param: NB_DISABLE_SSH_AUTH=1
config: "DisableSSHAUTH": true,

Enable SSH root user

flag: --enable-ssh-root
env param: NB_ENABLE_SSH_ROOT
config: EnableSSHRoot": true,

Disable Netbird DNS, this disables the writing to resolv.conf

config: "DisableDNS": true,

Disable SSH integration with OpenSSH, this disables the writing of /etc/ssh/sshd_config.d/99-netbird.conf:

flag: - --disable-ssh-config
env param: NB_DISABLE_SSH_CONFIG=1
config: "DisableSSHConfig": true

Addendum 1

```
/root/.config/netbird/default.json:
{
    "PrivateKey": "kDJR2ykm0=",
    "PreSharedKey": "",
    "ManagementURL": {
        "Scheme": "https",
        "Opaque": "",
        "User": null,
        "Host": "api.netbird.io:443",
        "Path": "",
        "RawPath": "",
        "OmitHost": false,
        "ForceQuery": false,
        "RawQuery": "",
        "Fragment": "",
        "RawFragment": ""
    },
    "AdminURL": {
        "Scheme": "https",
        "Opaque": "",
        "User": null,
        "Host": "app.netbird.io:443",
        "Path": "",
        "RawPath": "",
        "OmitHost": false,
        "ForceQuery": false,
        "RawQuery": "",
        "Fragment": "",
        "RawFragment": ""
    },
    "WgIface": "wt0",
    "WgPort": 51820,
    "NetworkMonitor": null,
    "IFaceBlackList": [
        "wt0",
        "wt",
        "utun",
        "tun0",
        "zt",
        "ZeroTier",
        "wg",
        "ts",
        "Tailscale",
        "tailscale",
        "docker",
        "veth",
        "br-",
        "lo"
    ],
    "DisableIPv6Discovery": false,
    "RosenpassEnabled": false,
    "RosenpassPermissive": false,
    "ServerSSHAllowed": true,
    "EnableSSHRoot": true,
    "EnableSSHSFTP": null,
    "EnableSSHLocalPortForwarding": null,
    "EnableSSHRemotePortForwarding": null,
```

```
"DisableSSHAuth": true,  
"SSHJWTCacheTTL": null,  
"DisableClientRoutes": false,  
"DisableServerRoutes": false,  
"DisableDNS": true,  
"DisableFirewall": false,  
"BlockLANAccess": false,  
"BlockInbound": false,  
"DisableNotifications": true,  
"DNSLabels": null,  
"SSHKey": "-----BEGIN PRIVATE KEY-----\nMC4CA\n-----END PRIVATE KEY-----\n",  
"NATExternalIPs": null,  
"CustomDNSAddress": "",  
"DisableAutoConnect": false,  
"DNSRouteInterval": 60000000000,  
"ClientCertPath": "",  
"ClientCertKeyPath": "",  
"LazyConnectionEnabled": false,  
"MTU": 1280  
}
```


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