

OpenWRT Netbird

version 11

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, comment is 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.

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

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

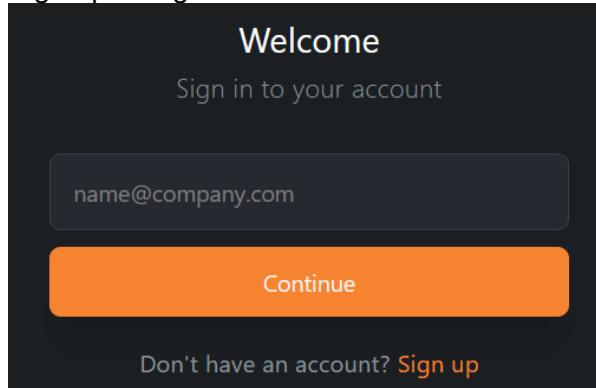
Very useful OpenWRT thread for discussion and support: <https://forum.openwrt.org/t/netbird-support-discussion-thread/237831>

Make a free account on Netbird

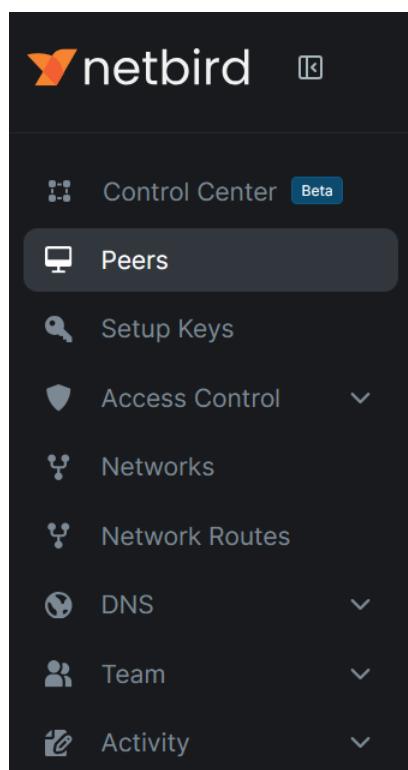
go to: <http://netbird.io>

Click: Get started - free

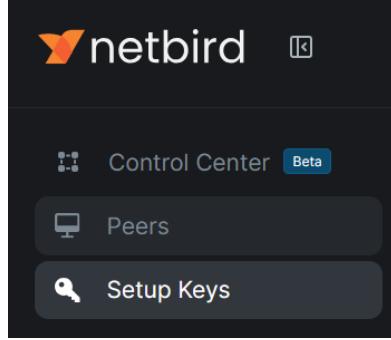
Sign up or login:



Now you are connected to your Netbird Dashboard the central administration:



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). Note: Leave empty for no expiration.
- 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 right are two buttons: "Cancel" and a large orange "Create Setup Key" button.

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 20 MB written in Go so make sure your storage is sufficient

The netbird executable is stored in `/usr/share/netbird`, or in later versions (>0.55) in `/usr/bin/netbird`.

The service is called from `/etc/init.d/netbird`

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:~#
```

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

`netbird up/down/status etc`

but using e.g.:

`service netbird status/stop/start etc.` will also work (for complete list: `service netbird`)

In your Dashboard you can now see the installed peer

The screenshot shows a table titled "Peers" with one row of data. The columns are labeled: NAME, ADDRESS, GROUPS, LAST SEEN, and VERSION. The data row is as follows:

NAME	ADDRESS	GROUPS	LAST SEEN	VERSION
R7800-2	r7800-2.netbird.cloud		just now	0.50.2

Below the table, 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`

If not reboot the router and check netbird status: `netbird status`

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

Device: wt0
Uptime: 0h 0m 9s
RX: 0 B (0 Pkts.)
TX: 0 B (0 Pkts.)

Protocol

Device

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: **off** (might be necessary under some circumstances)
- MSS Clamping: **on** (might not be necessary)
- 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 the networks that this zone applies to.

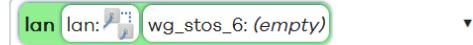
Name	netbird
Input	accept
Output	accept
Intra zone forward	accept
IPv4 Masquerading	<input type="checkbox"/> Enable network address and port translation IPv4 (NAT44). This is typically enabled on the <i>wan</i> zone.
MSS clamping	<input type="checkbox"/>
Covered networks	netbird1:  

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 with ifconfig (ip a) and ip route that the interface (wt0) and route are present:

```
root@DL-WRX36:~# 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
```

```
root@DL-WRX36:~# 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
```

Allow SSH access from Dashboard

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

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

DL-WRX36

NetBird IP Address: 100.105.224.116

Public IP Address: 2001:1003:8061:1000:8007:1000:1000:1000

Domain Name: dl-wrx36.netbird.cloud

Hostname: DL-WRX36

Region: The Netherlands, B

Operating System: OpenWrt snapshot

Session Expiration: Enable to require SSO login peers to re-authenticate when their session expires after a certain period of time. (Disabled)

SSH Access: Enable the SSH server on this peer to access the machine via an secure shell. (Enabled)

Remote Access: Connect directly to this peer via SSH or RDP. (Disabled)

Cancel Save Changes

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:

Peers

Setup Keys

Access Control

Networks

Network Routes

DNS

Team

Activity

Settings

2 Peers

A list of all machines and devices connected to your private network. Use this Learn more about [Peers](#) in our documentation.

Search by name, IP, owner or group... ⌘ K

All Online Offline

	NAME	ADDRESS
<input type="checkbox"/>	DL-WRX36	dl-wrx 100.105.224.116

Connect SSH

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

DL-WRX36

Connect to 100.105.224.116 via SSH

Username & Port

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

	root	@100.105.224.116
	44338	<input type="button"/>

Learn more about [SSH](#)

Cancel Connect

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:

The screenshot shows the 'Create New Route' interface. At the top, there's a header with a logo and the title 'Create New Route'. Below it, a sub-header says 'Access LANs and VPC by adding a network route.' There are four tabs at the top: 'Route' (selected), 'Groups', 'Name & Description', and 'Additional Settings'.

The 'Route Type' section asks to select a route type: 'Network Range' or 'Domain'. 'Network Range' is selected.

The 'Network Range' section contains a field for entering a private IPv4 address range, which is filled with '192.168.9.0/24'.

The 'Routing Peer' section contains a dropdown menu where 'DL-WRX36' is selected. Other options like 'Peer Group' and '100.' are also visible.

At the bottom right, there's a 'Save' button.

Advertise this route to all my peers:

The screenshot shows the 'Create New Route' interface. At the top, there's a header with a gear icon and the title 'Create New Route'. Below it, a sub-header says 'Access LANs and VPC by adding a network route.' There are four tabs at the top: 'Route' (disabled), 'Groups' (selected, indicated by an orange underline), 'Name & Description', and 'Additional Settings'.

The 'Groups' section is titled 'Distribution Groups' and asks to 'Advertise this route to peers that belong to the following groups'. It contains a dropdown menu with 'Routing Peers' and a close button 'X'.

The 'Access Control Groups (optional)' section allows limiting access to the route via groups. It has a dropdown menu with 'Add or select group(s)...' and a close button 'X'.

At the bottom, there are two buttons: 'Back' and 'Continue' (orange). A link 'Learn more about Network Routes' is also present.

Name and description:

The screenshot shows the 'Create New Route' interface with the 'Name & Description' tab selected (indicated by an orange underline).

The 'Network Identifier' section asks to add a unique identifier assigned to each device. It contains a dropdown menu with 'DL-WRX36' and a close button 'X'.

The 'Description (optional)' section asks to write a short description. It contains a text input field with the placeholder 'Route to DL-WRX36 192.168.9.0/24 subnet'.

At the bottom, there are two buttons: 'Back' and 'Continue' (orange).

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.

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:~\$

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>

Using Networks comes instead of creating routes. Although the routes will stay valid and available

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' and 'All'. A table lists one entry: 'DNS0.EU' with 'DNS0.EU DNS Servers' 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. On the left sidebar, 'DNS Settings' is 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 prominent warning message says: 'Disable DNS management for these groups' followed by 'Peers in these groups will require manual domain name resolution.' A button labeled 'All' is shown with a clear 'X' icon. There is also a small dropdown arrow icon.

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

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.

Login in 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 dashboard interface. On the left, the 'DL-WRX36' peer details are listed:

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

On the right, under 'Session Expiration', the toggle switch is off. Under 'SSH Access', the toggle switch is on. The 'Remote Access' section shows 'SSH' is selected. In the 'Assigned Groups' section, 'Routing Peers' is selected. At the bottom, there are buttons for 'Set Up Exit Node' (orange) and 'Add Route' (orange). The 'Network Routes' section shows one entry: DL-WRX36 with network 192.168.9.0/24, active, and a delete button.

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](#) i

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](#) i

Back Continue

Continue

Enable Route and Auto Apply Route

The screenshot shows the 'Set Up Exit Node' configuration page. At the top, there's a small orange icon with a diamond shape. Below it, the title 'Set Up Exit Node' and a subtitle 'Route all traffic through the peer 'DL-WRX36''. Underneath, there are three tabs: 'Groups' (disabled), 'Name & Description' (disabled), and 'Additional Settings' (selected). The 'Additional Settings' section contains two toggle switches: 'Enable Route' (disabled) and 'Auto Apply Route' (disabled). Below these is a 'Metric' field set to 9999. At the bottom, there are buttons for 'Learn more about Exit Nodes' and '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.

The screenshot shows the 'Network Routes' configuration page. At the top, there are three tabs: 'Network Routes' (selected), 'Accessible Peers', and 'Traffic Events'. Below, the title '2 Network Routes' and a note 'Access other networks without installing NetBird on every resource.' There are two rows of network route entries:

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>

Netbird log

Showing netbird log:

`cat /tmp/log/netbird/client.log`

Using PBR together with Netbird

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

`option uplink_ip_rules_priority '99'`

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 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

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>