

# Mikrotik

- [VPN](#)
  - [Mullvad VPN - Wireguard](#)
  - [Wireguard Site to Site](#)
- [Configuration Examples](#)
  - [Aruba ADP DHCP Configuration](#)

VPN

# Mullvad VPN - Wireguard

First, we need to add a Wireguard interface in the Mikrotik router to auto-generate a key pair. We will copy the private key and import it into the Mullvad device configuration page. Mullvad will use the imported private key to generate a public key. Mullvad will use this public key to encrypt data packets back to the Mikrotik firewall.

```
## interface/wireguard/add name=Mullvad
```

```
## interface/wireguard/print  
Flags: X - disabled; R - running  
0 R name="Mullvad" mtu=1420 listen-port=26477 private-  
key="qG7LMj39vPGUAX+FtFBZu5DVJH2q3nH6CSDa4ociPGM="  
public-key="Fea2vkj2H2Tk0apEn7t2ivXx7ssTs+w23zkm3mOp+xo="
```

Once you have the private key from the Wireguard interface you'll need to login into Mullvad and browse to "My account" and then click on "Manage devices and ports". It should take you to a page that looks like the one shown below.

# Manage devices and ports

## My devices (3/5)

To make it easier to manage devices, we are adding names to identify them. This feature has been added to the [2022.2-beta1 desktop app](#) and will be gradually added to other platforms.

*You can still view the corresponding WireGuard keys under the device name.*

### Stunning Coral

WireGuard key `im5NSh3eq41gw3rHu+eBRad7KK3eKbEvyhAm5d5Ixm8=`

Created 2022-06-06 

### Spicy Toucan

WireGuard key `nbI8RGEvfnz2b11r+Ikn2v5xxJTNLujWwNOF2tQFbxg=`

Created 2022-06-06 

### Sensible Mole

WireGuard key `Y7OgUquWcjXYK5DW8Rvqcg1VgbGE+TZ8KTApsGaRGyU=`

Created 2022-06-06 

You can create a device automatically [using our app](#) (recommended) or by generating a [WireGuard configuration file](#).

## Port forwarding

Port forwarding makes it possible for remote computers to access a specific computer or service within a private local area network (LAN).

Next, you'll want to click on the "WireGuard configuration file" link. Your web page should look similar to the page below.

## 1. Choose your platform

Windows macOS **Linux** iOS

Android/Chrome OS

## 2. Generate a WireGuard key

Generate key No key generated

[Manage keys ^](#)

### Manage WireGuard keys

Use	Public key	Created	Revoke
×	im5NSh3eq4lgw3rHu+eBRad7KK3eKbEvyhAm5d5Ixm8=	2022-06-06	×
×	nbI8RGEvfz2b11r+IkN2v5xxJTNLujWwNOF2tQFbxg=	2022-06-06	×
×	Y7OgUquWcjXYK5DW8Rvgcg1VgbGE+TZ8KTApSgaRGyU=	2022-06-06	×

qG7LMj39vPGUAX+FtFBZu5DVJH2q3nH6CSDa4ociPGM= Import key

Next, you'll take the private key you saved from your Mikrotik configuration and import it. Once your private key is imported it should look similar to the image below. You can see that Mullvad created the public key from the private key.

## 1. Choose your platform

Windows macOS **Linux** iOS

Android/Chrome OS

## 2. Generate a WireGuard key

Generate key Fea2vkJ2H2Tk0apEn7t2ivXx7ssTs+w23zkm3mOp+xo= ✓

[Manage keys ^](#)

### Manage WireGuard keys

Use	Public key	Created	Revoke
<input type="checkbox"/>	im5NSh3eq41gw3rHu+eBRad7KK3eKbEvyhAm5d5Ixm8=	2022-06-06	<input type="checkbox"/>
<input type="checkbox"/>	nbI8RGEVfnz2b11r+Ikn2v5xxJTNLuJwWNOF2tQFbxg=	2022-06-06	<input type="checkbox"/>
<input type="checkbox"/>	Y7OgUquWcjXYK5DW8Rvgcg1VgbGE+Tz8KTApSgaRGyU=	2022-06-06	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Fea2vkJ2H2Tk0apEn7t2ivXx7ssTs+w23zkm3mOp+xo=	2022-06-06	<input type="checkbox"/>

Enter private key

The next step is to scroll down and pick a server and other options you may be interested in. Once you picked your options you'll click "Download file" to retrieve the configuration needed to finish the peer configuration in the firewall.

We never get access to your private key, only the public key is sent to us. The private key is stored locally in your browser so that you can create multiple files from the same key and as soon as you leave this page, it is deleted.

### 3. Select one or multiple exit locations

🇺🇸 USA 📍 Chicago, IL ☰ us4-wireguard

[Advanced settings](#) ▾

### 4. Configure Content Blocking

Select the type of content to block

Select All None

Ads  Trackers  Malware  Adult content  Gambling

### 5. Generate and download configuration

📄 Download file 📄 Generate QR code

Once the configuration is downloaded, open it in a text editor to retrieve the rest of parameters to finish the Wireguard peer configuration. Below is an example of a configuration file.

```
“ [Interface]
  PrivateKey = qG7LMj39vPGUAX+FtFBZu5DVJH2q3nH6CSDa4ociPGM=
  Address = 10.67.171.164/32,fc00:bbbb:bbbb:bb01::4:aba3/128
  DNS = 10.64.0.1

[Peer]
  PublicKey = MRZsEblqO4wlq0WPnZgp5X9ex4Z2FHm9bljO/a/Mznk=
  AllowedIPs = 0.0.0.0/0,::0/0
  Endpoint = 68.235.43.82:51820
```

You'll need the Address, PublicKey, AllowedIPs and Endpoint information for the configuration below.

```
interface/wireguard/peers/add interface=Mullvad endpoint-  
address=68.235.43.82 endpoint-port=51820 allowed-address=0.0.0.0/0 public-  
key="MRZsEblqO4wlq0WPnZgp5X9ex4Z2FHm9bljO/a/Mznk="
```

```
“ ip/address/add interface=Mullvad address=10.67.171.164/32
```

The commands below are used to setup a routing table, NAT and a address list to assign specific IPs to be routing out of the firewall using the Mullvad VPN.

```
“ routing/table/add name=Mullvad fib
```

```
“ ip/route/add dst-address=0.0.0.0/0 gateway=Mullvad routing-table=Mullvad
```

The command below will allow you to specify which IPs you want to route out the Mullvad VPN.

```
“ ip/firewall/address-list/add list=Mullvad-VPN address=172.16.5.20
```

```
“ ip/firewall/mangle/add action=mark-routing chain=prerouting new-routing-  
mark=Mullvad passthrough=yes src-address-list=Mullvad-VPN
```

```
“ ip/firewall/nat/add action=masquerade chain=srcnat src-address-list=Mullvad-  
VPN
```

# Wireguard Site to Site

The configuration below is an example of how I setup a site to site VPN using wireguard. I also included configuration on how to setup GRE and EoIP interfaces on top of the wireguard tunnel.

If you add a wireguard interface and don't specify the private key a new private key and corresponding public key will be automatically generated for you. The public key is always used for remote peers to be able to encrypt data sent back to the interface. You'll see this in the example below. In this example I am using a 10.255.129.128/30 for my point-to-point network.

## Site 1 configuration (Server)

Add the interface and choose a custom port if you're already using the default. The default MTU is 1420 but since I'll be stacking GRE on top I needed to make a little room for the GRE header.

```
## interface/wireguard/add name=wg-IP32 listen-port=13232 mtu=1404
```

Next, I print out the interface to record the public key that I'll use in the peer configuration for site 2 (Client) configuration.

```
## interface/wireguard/print
1 R ;; Casselton to Fargo
   name="wg-IP32" mtu=1404 listen-port=13232 private-
   key="<super_secret>" public-
   key="vc1sgmjS8k9t5UMZ+i+gDE9xjPZKCix/K9ksFCdASU4="
```

I have already created the interface for Site 2 (Client) ahead of time and copied the public key to put in the peer on Site 1 (Server) side configuration.

```
## interface/wireguard/peer/add allowed-address=10.255.129.128/30
   interface=wg-IP32 persistent-keepalive=25s public-
   key="chEwjsJhIXviZvzP98qvnqI9u/dtGWzjcGWT8ValKy8="
```

Now we need to add an IP to the wireguard interface.

```
ip/address/add address=10.255.129.129/30 interface=wg-IP32
```

Since I'll be stacking services on top of wireguard I need a firewall rule to allow the IPs in the point-to-point network. Make sure you put this rule in the correct place in your firewall policy. You'll also need to create a firewall policy to let clients connect to your server side wireguard tunnel.

```
ip/firewall/filter/add action=accept chain=input dst-address=10.255.129.0/24  
src-address=10.255.129.0/24
```

```
ip/firewall/filter/add action=accept chain=input connection-state=new dst-  
address=96.3.215.245 dst-port=13232 in-interface=WAN1 protocol=udp
```

The next command will create a GRE interface and stack it on top of our wireguard tunnel and assign an IP to it. The GRE interface provides a good layer 3 overlay to route and pass traffic.

```
interface/gre/add local-address=10.255.129.129 name=IPSec-GRE32 remote-  
address=10.255.129.130
```

```
ip/address/add address=10.255.128.129/30 interface=IPSec-GRE32
```

The last configuration for Site 1 (Server) side is a layer 2 EoIP interface to pass VLANs from site to site.

```
interface/eoip/add local-address=10.255.129.129 name=Designlogic-Casselton-  
EoIP remote-address=10.255.129.130 tunnel-id=32
```

## Site 2 configuration (Client)

Add the interface and choose a custom port if you're already using the default. The default MTU is 1420 but since I'll be stacking GRE on top I needed to make a little room for the GRE header.

```
interface/wireguard/add name=wg-IP32 listen-port=13232 mtu=1404
```

Next, I print out the interface to record the public key that I'll use in the peer configuration for site 1 (Server) configuration.

```
interface/wireguard/print
Flags: X - disabled; R - running
 1 R name="wg-IP32" mtu=1404 listen-port=13232 private-
key="<super_secret>" public-
key="chEwjsJhIXviZvzP98qvnqI9u/dtGWzjcGWT8ValKy8="
```

I have already create the interface for Site 1 (Server) ahead of time and copied the public key to put in the peer on Site 2 (Client) side configuration.

```
interface/wireguard/peers/add allowed-address=10.255.129.128/30 endpoint-
address=96.3.215.245 endpoint-port=13232 interface=wg-IP32 persistent-
keepalive=25s public-
key="vc1sgmjS8k9t5UMZ+i+gDE9xjPZKCix/K9ksFCdASU4="
```

Now we need to add an IP to the wireguard interface.

```
add address=10.255.129.130/30 interface=wg-IP32
```

Since I'll be stacking services on top of wireguard I need a firewall rule to allow the IPs in the point-to-point network. Make sure you put this rule in the correct place in your firewall policy.

```
ip/firewall/filter/add action=accept chain=input dst-address=10.255.129.0/24
src-address=10.255.129.0/24
```

The next command will create a GRE interface and stack it on top of our wireguard tunnel and assign an IP to it. The GRE interface provides a good layer 3 overlay to route and pass traffic.

```
interface/gre/add local-address=10.255.129.130 name=IPSec-GRE32 remote-
address=10.255.129.129

ip/address/add address=10.255.128.130/30 interface=IPSec-GRE32
```

The last configuration for Site 2 (Client) side is a layer 2 EoIP interface to pass VLANs from site to site.

```
interface/eoip/add local-address=10.255.129.130 name=Designlogic-Casselton-  
EoIP remote-address=10.255.129.129 tunnel-id=32
```

# Configuration Examples

# Aruba ADP DHCP Configuration

## Configure Mikrotik DHCP Server for Aruba Mobility ADP

```
"/ip dhcp-server option
add code=43 name=ArubaAP-43 value=""10.128.140.10""
add code=60 name=ArubaAP-60 value=""ArubaAP""
```