

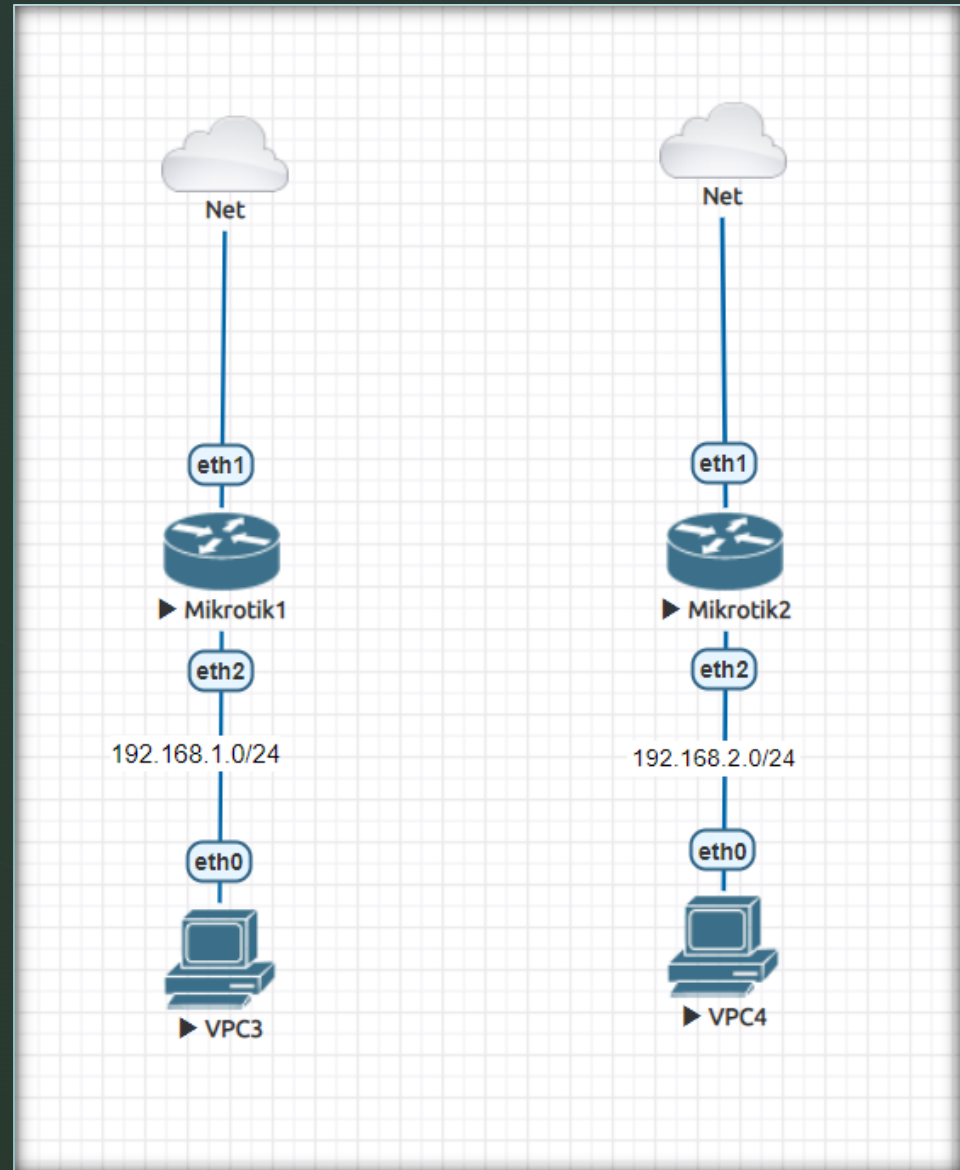


Laboratoare Retelistica

Protocolul Wireguard

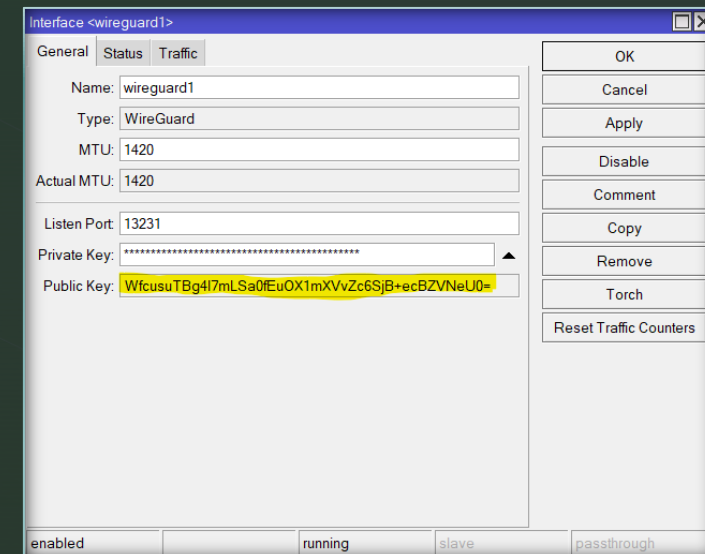
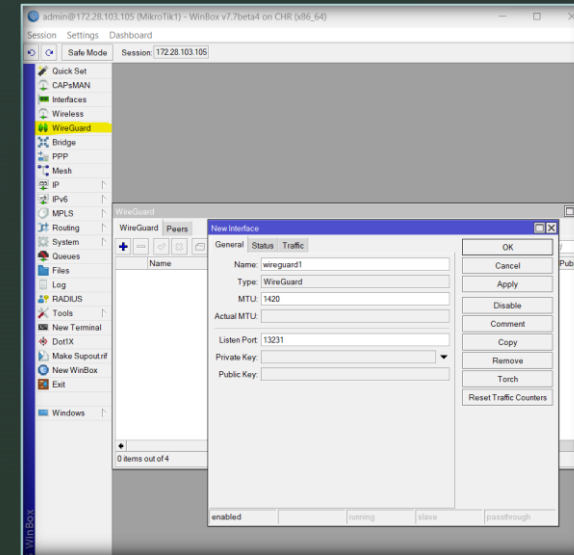
Topologie

- Avem topologia alaturata cu doua site-uri remote in care vom implementa un VPN Wireguard de tip site-to-site si folosind sistemul de operare de pe calculator vom face implementarea peer-to-site.
- Fiecare retea interna (192.168.1.0/24 si 192.168.2.0/24) are access la internet.



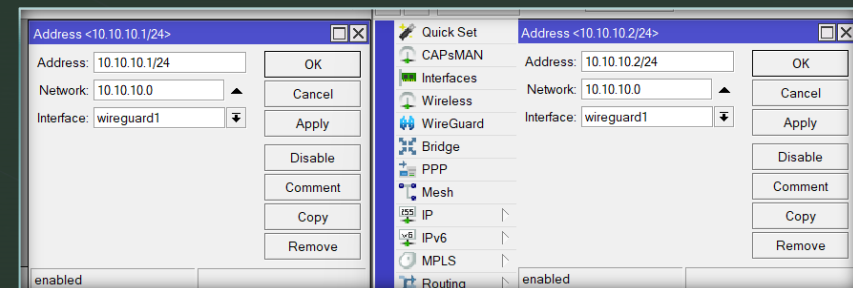
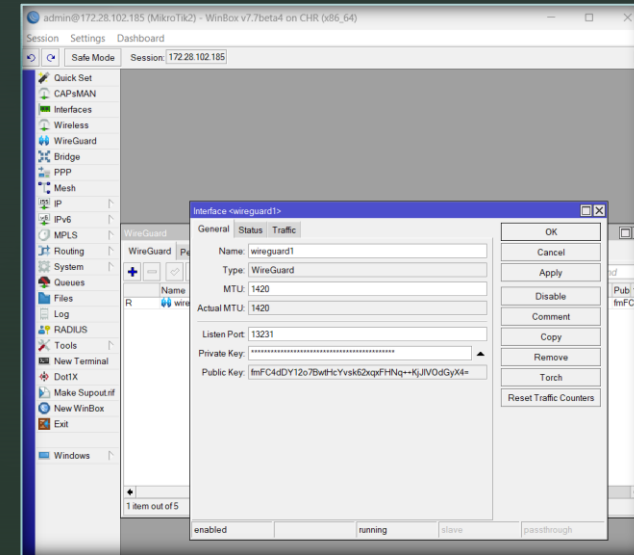
Configurare VPN pe MikroTik1

- Pentru a configura un server de Wireguard VPN intram in meniu si adaugam un nou server.
- Dupa ce salvam interfata putem vedea cheile generate si cheia publica o vom folosi pentru conexiunea la celalat router.



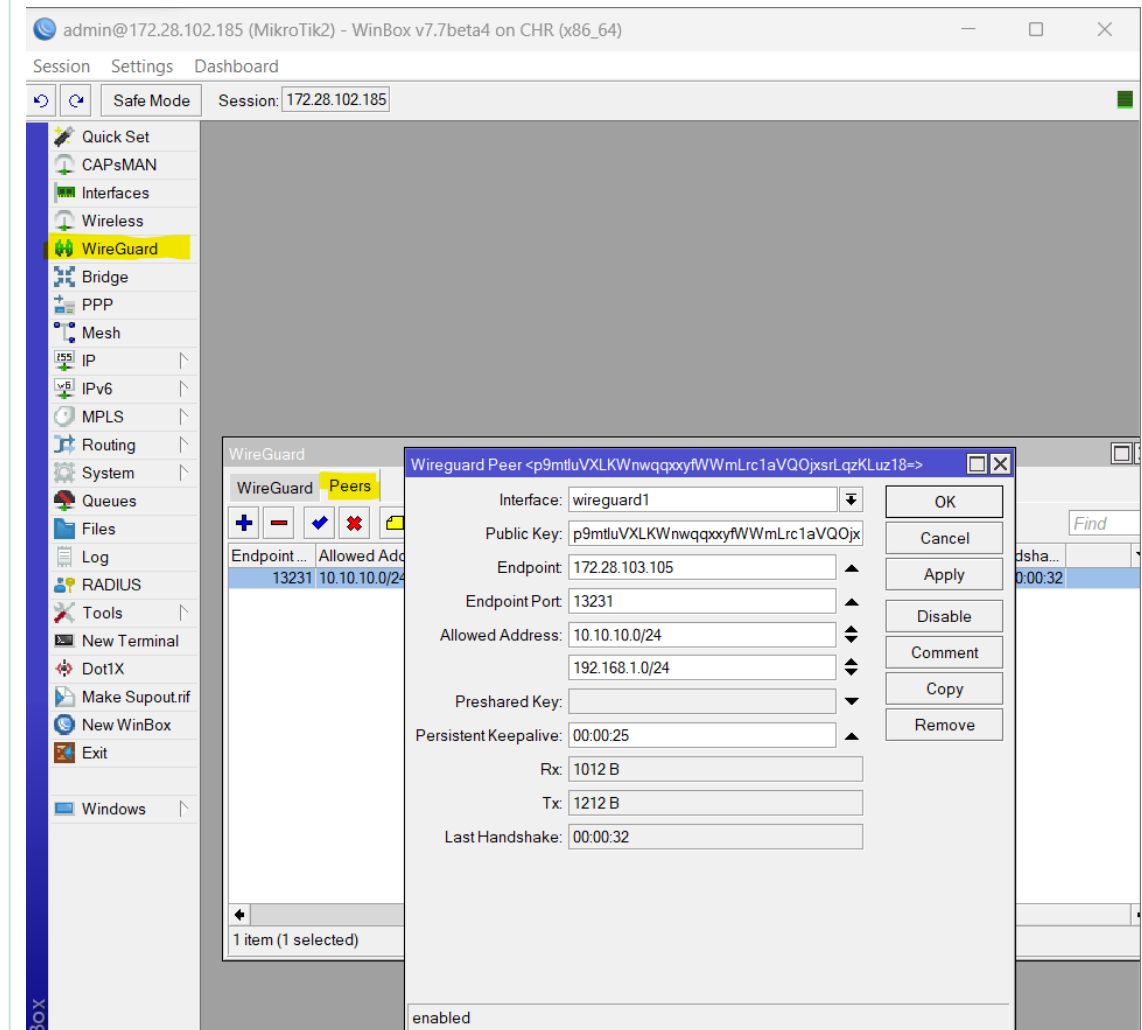
Configurare VPN pe MikroTik2

- Repetam procedura pe al doilea router.
- Si le asignam interfetelor nou create un ip in aceeași rețea (in cazul nostru 10.10.10.1 și respective 10.10.10.2).



Configurare conexiune intre cele doua.

- Incepem pe MikroTik1 si facem o conexiune client accesand Wireguard->Peers.
- Aici avem nevoie de cheia publica a routerului MikroTik2.
- La Endpoint trecem adresa publica a routerului MikroTik2.
- La Allowed Address trecem la ce retele vrem sa permitem accesul prin vpn in zona remote.
- In cazul nostru vom avea 10.10.10.0/24 si 192.168.2.0/24.
- Si trebuie sa setam un Persistent Keepalive de cca 10-20 secunde.
- Repetam procedura si pe MikroTik2.



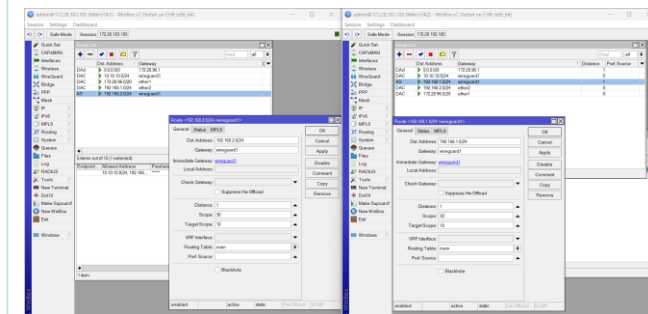
Configurare conexiune intre cele doua.

- Dupa ce vedem ca exista un handshake.
- Trebuie sa facem rurile intre cele doua.



The screenshot shows the 'WireGuard Peers' window. A single peer is listed with the following details:

Endpoint	Allowed Address	Preshared Key	Persist...	Rx	Tx	Last Handshake
13231	10.10.10.0/24, 192.168...	*****	00:00:25	1200 B	1520 B	00:01:11



Verificare conexiune.

- De pe cele doua calulatoare incercam un ping si traceroute.

```
VPC3

VPCS> ping 192.168.2.254

34 bytes from 192.168.2.254 icmp_seq=1 ttl=62 time=3.623 ms
^C
VPCS> trace 192.168.2.254
Trace to 192.168.2.254, 8 hops max, press Ctrl+C to stop
 1  192.168.1.1    0.724 ms  0.448 ms  0.385 ms
 2  10.10.10.2    1.563 ms  0.920 ms  1.119 ms
 3  *192.168.2.254  1.928 ms (ICMP type:3, code:3, Destination port unreachable)
^C
VPCS> show

NAME      IP/MASK      GATEWAY      GATEWAY
VPCS1    192.168.1.253/24  192.168.1.1  fe80::250:79ff:fe66:6803/64

VPCS>
```

```
VPC4

VPCS> show

NAME      IP/MASK      GATEWAY      GATEWAY
VPCS1    192.168.2.254/24  192.168.2.1  fe80::250:79ff:fe66:6804/64

VPCS> ping 192.168.1.254

192.168.1.254 icmp_seq=1 timeout
^C
VPCS> ping 192.168.1.253

34 bytes from 192.168.1.253 icmp_seq=1 ttl=62 time=2.862 ms
^C
VPCS> trace 192.168.1.253
Trace to 192.168.1.253, 8 hops max, press Ctrl+C to stop
 1  192.168.2.1    0.522 ms  0.466 ms  0.322 ms
 2  10.10.10.1    1.477 ms  0.934 ms  1.085 ms
 3  *192.168.1.253  5.915 ms (ICMP type:3, code:3, Destination port unreachable)
^C
VPCS>
```

Conexiune peer to site

- Pentru acest scenario folosim routerul Mikrotik1.
- Facem o noua interfata wireguard si asignam un port diferit.
- Pe calculatorul nostru instalam wireguard.
- Dupa care adaugam un tunel gol.

The screenshot displays the Mikrotik WinBox interface for configuring a WireGuard tunnel. The 'General' tab is active, showing the following fields:

- Name: wireguard2
- Type: WireGuard
- MTU: 1420
- Actual MTU: 1420
- Listen Port: 13232 (highlighted in yellow)
- Private Key: [Redacted]
- Public Key: AnjFAuQ+Kra3pc/nZUGMhMgK13vRoQihdpjZmu0qFVQ=

On the right side, there are buttons for OK, Cancel, Apply, Disable, Comment, Copy, Remove, Torch, and Reset Traffic Counters.

Below the configuration fields, there are tabs for 'enabled', 'running', 'slave', and 'passthrough'. The 'enabled' tab is selected, showing a list of interfaces: TO_INFRASTRUCTURE (selected) and wireguard.

The 'Interface: TO_INFRASTRUCTURE' section shows:

- Status: Inactive
- Public key: dIQ5n7D6ZQ/GPwtCtU+3IOBAzyQDI5s4jGLrMRjtBo=
- Addresses: 10.11.0.2/24
- DNS servers: 10.255.255.2
- An 'Activate' button is present.

The 'Peer' section shows:

- Public key: jJx8P3WEPWxD0Fzf8HpeU6Ng6syEaNfEMZsiU58DVmw=
- Allowed IPs: 10.10.10.0/24, 10.11.0.0/24, 10.255.255.0/30, 10.10.11.1/24
- Endpoint: 172.28.105.129:13231

At the bottom, there are buttons for 'Add Tunnel', 'Import tunnel(s) from file...' (with a keyboard shortcut Ctrl+O), and 'Add empty tunnel...' (with a keyboard shortcut Ctrl+N). An 'Edit' button is also visible in the bottom right corner.

Conexiune peer to site

- Vom avea ca default setate cheile publice si private.
- In interface vom asina adresa interfetei de wireguard:

Address = 10.10.11.2/24

- Iar in zona de peer vom seta certificatul public al interfetei de wg mikrotik, lista de retele la care permitem conexiunea si adresa si portul astfel:

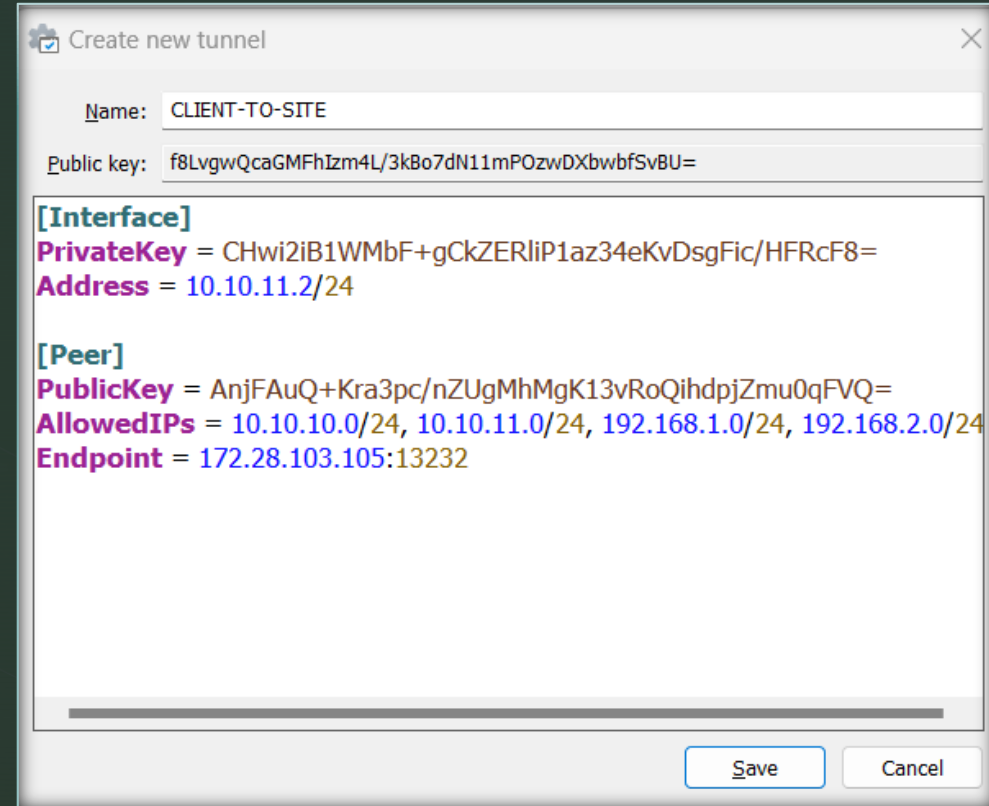
[Peer]

PublicKey =

AnjFAuQ+Kra3pc/nZUgMhMgK13vRoQihdpjZmu0qFVQ=

AllowedIPs = 10.10.10.0/24, 10.10.11.0/24,
192.168.1.0/24, 192.168.2.0/24

Endpoint = 172.28.103.105:13232



Create new tunnel

Name: CLIENT-TO-SITE

Public key: f8LvgwQcaGMFhIzm4L/3kBo7dN11mPOzwDXbwbfSvBU=

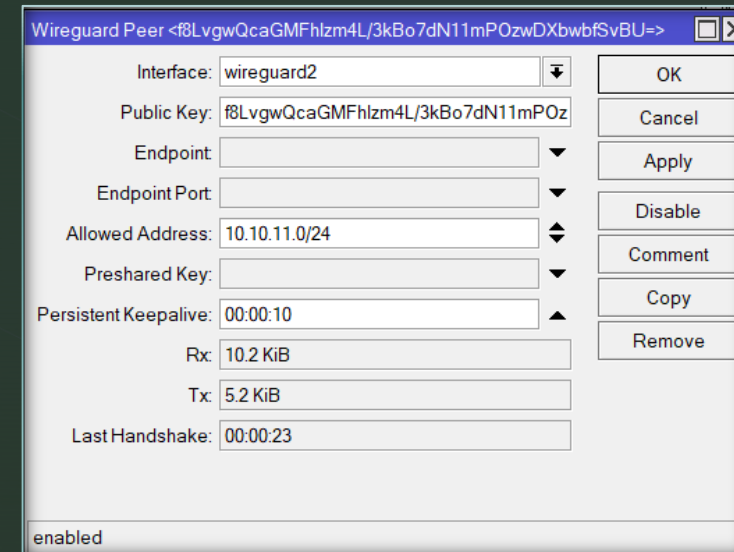
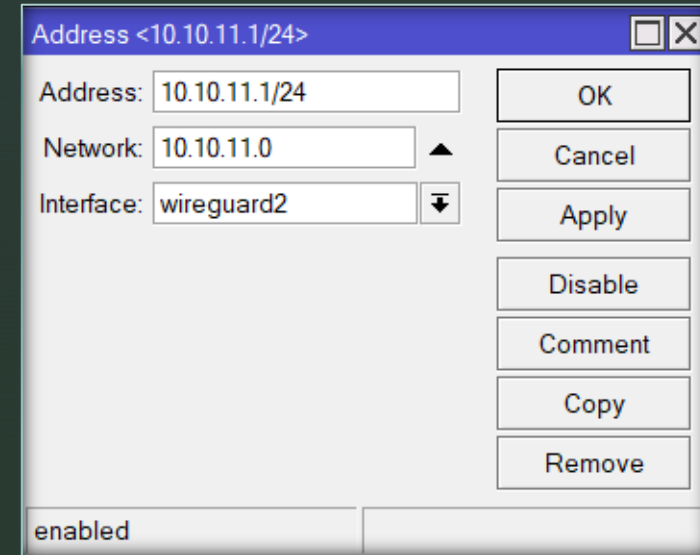
[Interface]
PrivateKey = CHwi2iB1WMbF+gCkZERliP1az34eKvDsgFic/HFRcF8=
Address = 10.10.11.2/24

[Peer]
PublicKey = AnjFAuQ+Kra3pc/nZUgMhMgK13vRoQihdpjZmu0qFVQ=
AllowedIPs = 10.10.10.0/24, 10.10.11.0/24, 192.168.1.0/24, 192.168.2.0/24
Endpoint = 172.28.103.105:13232

Save Cancel

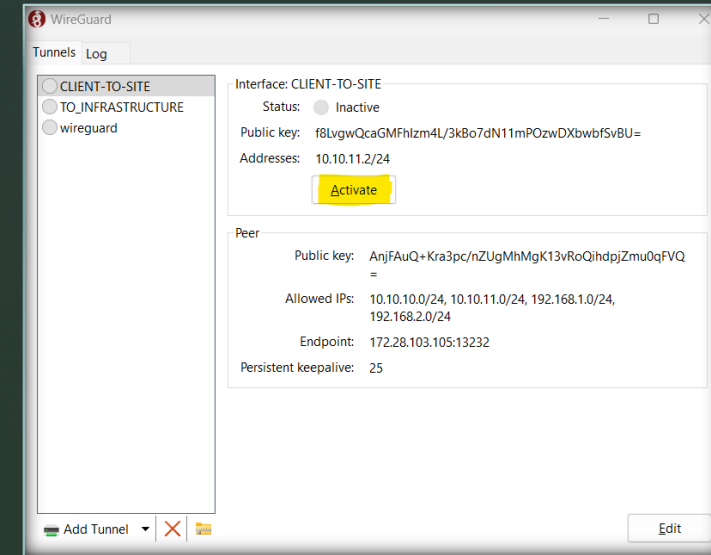
Conexiune peer to site

- Pe MikroTik1 setam adresa ip interfetei wireguard2 (10.10.11.1/24) .
- Dupa care facem un peer nou.
- Il asignam interfata wireguard2
- Punem cheia publica a clientului nostrum.
- La Allowed address trecem clasa asignata interfetei 2 si setam un persisten keepalive.



Testare

- Activam interfata pe client si verificam daca exista flux de date atat pe RX cat si pe TX.
- Dupa care putem face cateva teste de ping si traceroute.



```
Command Prompt
C:\Users\patri>ping 192.168.1.253

Pinging 192.168.1.253 with 32 bytes of data:
Reply from 192.168.1.253: bytes=32 time=3ms TTL=63
Reply from 192.168.1.253: bytes=32 time=1ms TTL=63

Ping statistics for 192.168.1.253:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 3ms, Average = 2ms
```