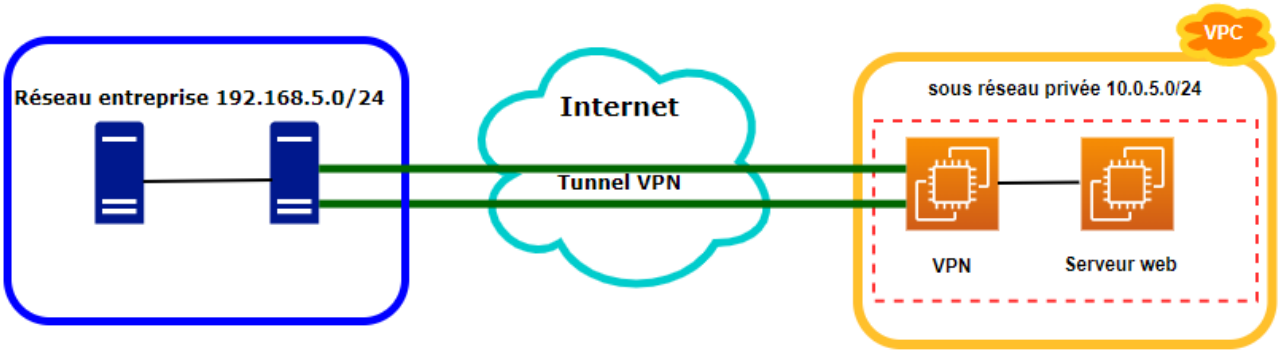
Configuration VPN Site-to-Site entre le réseau on Premise et le VPC

I-\ Schéma réseau de l'architecture du projet

Openvpn a été utilisé pour configurer la communication à travers un tunnel VPN entre le réseau de l'entreprise et le sous-réseau privé sur la zone de disponibilité C du VPC



II-\ Le réseau on Premise :

1-\ Le serveur openVPNClient:

a-\ Configuration du réseau

nano /etc/network/interface

```
#interface pour le reseau prive
auto ens33
iface ens33 inet static
  address 192.168.5.2
  netmask 255.255.255.0
# interface pour sortir a internet
auto ens38
iface ens38 inet static
  address 192.168.1.51
  netmask 255.255.255.0
  gateway 192.168.1.1
```

Activer le routage et le rendre permanant:

```
nano /etc/sysctl.conf
```

Eliminer # dans cette ligne :

```
net.ipv4.ip_forward=1
```

Restarter le service :

```
sudo systemctl restart procps
```

Activer le nat entre les cartes (eth0 ==> carte externe)

```
iptables -A POSTROUTING -t nat -o ens38 -j MASQUERADE
```

Installer iptables-persistent pour rendre les changements d'iptables persistants

```
apt-get install iptables-persistent
```

Sauvegarder de façon permanentes les regles

```
iptables-save > /etc/iptables/rules.v4
```

b-\ Installation de openvpn :

```
apt-get update
apt-get install wget
apt-get install gnupg
```

Then import the public GPG key that is used to sign the packages:

```
wget -O - https://swupdate.openvpn.net/repos/repo-public.gpg|apt-key add -
```

Next you need to create a sources.list fragment (as root) so that apt can find the new OpenVPN packages. One way to do it is this:

```
echo "deb http://build.openvpn.net/debian/openvpn/release/2.5 buster main" > /etc/apt/sources.list.d/openvpn-aptrepo.list
```

Installing OpenVPN

On Debian/Ubuntu use

```
apt-get update && apt-get install openvpn
```

creation d’un fichier de configuration dans le repertoire /etc/openvpn/client

```
nano openvpn-client.ovpn
```

```
client
dev tun
proto udp
remote 13.36.150.214 1194
resolv-retry infinite
nobind
persist-key
persist-tun
remote-cert-tls server
cipher AES-256-GCM
auth SHA256
key-direction 1
```

```
verb 3
; If Linux client do NOT use systemd-resolved
script-security 2
up /etc/openvpn/update-resolv-conf
down /etc/openvpn/update-resolv-conf
<ca>
-----BEGIN CERTIFICATE-----
**********************************
-----END CERTIFICATE-----
</ca>
<cert>
-----BEGIN CERTIFICATE-----
**********************************
-----END CERTIFICATE-----
</cert>
<key>
-----BEGIN PRIVATE KEY-----
**********************************
-----END PRIVATE KEY-----
</key>
<tls-crypt>
-----BEGIN OpenVPN Static key V1-----
*************************************
-----END OpenVPN Static key V1-----
</tls-crypt>
```

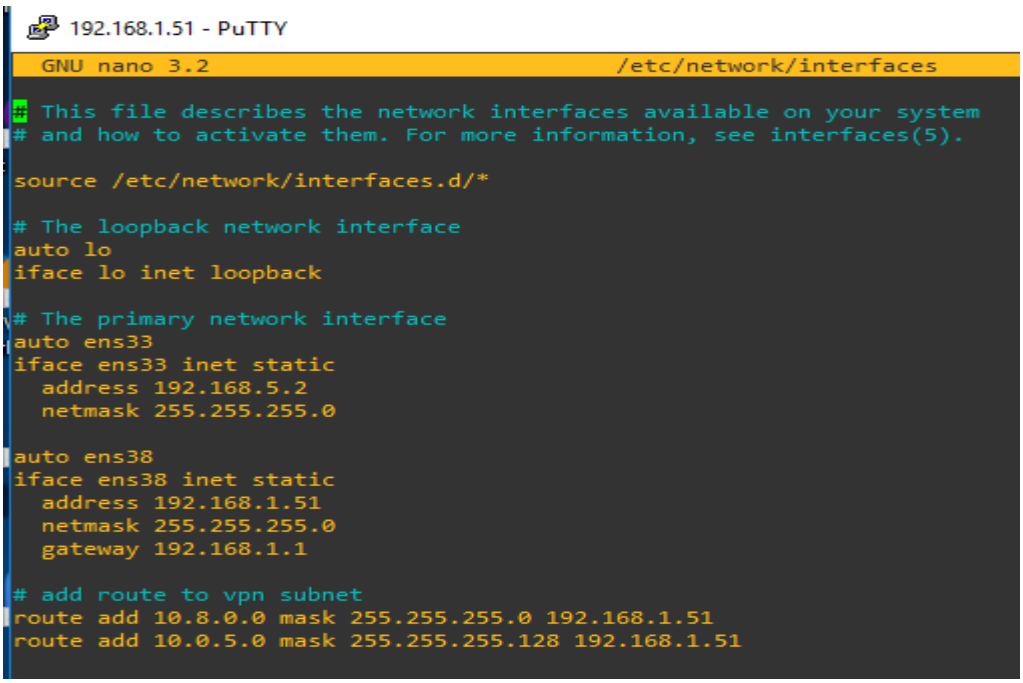
c-\ ajouter une route statique

nano /etc/network/interfaces

```
# add route to vpn subnet

route add 10.8.0.0 mask 255.255.255.0 192.168.1.51

route add 10.0.5.0 mask 255.255.255.128 192.168.1.51
```



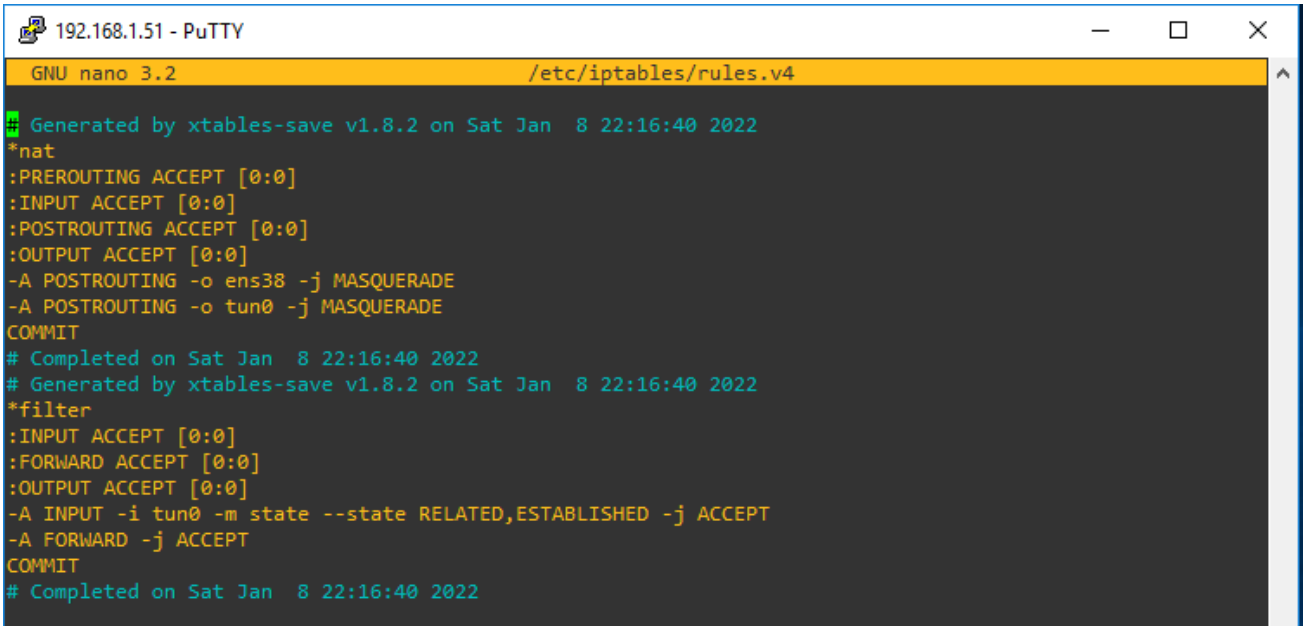
d-\ ajouter des règles dans iptable

Pour diriger les flux vers le tunnel , ajouter les 3 règles suivantes :

```
iptables -t nat -A POSTROUTING -o tun0 -j MASQUERADE
iptables -A INPUT -i tun0 -m state --state RELATED,ESTABLISHED -j ACCEPT
iptables -A FORWARD -j ACCEPT
```

Enregistrer ces règles :

```
iptables-save > /etc/iptables/rules.v4
```



2-\ serveur de fichier

a-\ configuration du réseau

```
# The primary network interface
auto ens33
iface ens33 inet static
  address 192.168.5.3
  netmask 255.255.255.0
  gateway 192.168.5.2
```

III-\ Le réseau VPC :

1-\ L'installation et la configuration du serveur openvpnserver :

a-\ Installation :

Update Ubuntu repositories

```
sudo apt update
```

Check OpenVPN candidate

```
apt policy openvpn
```

We would need to run commands as a root, let's temporary use sudo -s

```
sudo -s
```

Then import the public GPG key that is used to sign the packages:

```
wget -O - https://swupdate.openvpn.net/repos/repo-public.gpg|apt-key add
-
```

Add OpenVPN repo

```
echo "deb http://build.openvpn.net/debian/openvpn/stable focal main" >
/etc/apt/sources.list.d/openvpn-aptrepo.list
```

Update repositories again with the new openvpn source list

```
apt update
```

Exit root

```
exit
```

Check version of candidate again

```
apt policy openvpn
```

Install the latest one

```
sudo apt install openvpn=2.5.3-focal0
```

<u>Install easy-rsa on Ubuntu 20.04:</u>

Check the candidate verion

```
apt policy easy-rsa
```

Download easy-esa tarball

```
wget https://github.com/OpenVPN/easy-
rsa/releases/download/v3.0.8/EasyRSA-3.0.8.tgz
```

Untar it

```
tar -zxf EasyRSA-3.0.8.tgz
```

Clean UP

```
ls
rm EasyRSA-3.0.8.tgz
```

Move easy-rsa to OpenVPN

```
sudo mv EasyRSA-3.0.8/ /etc/openvpn/easy-rsa
```

(Optionally) create soft link

```
sudo ln -s /etc/openvpn/easy-rsa/easyrsa /usr/local/bin/
```

Change directory to home and test cli

```
easyrsa –version
```

<u>Creating PKI for OpenVPN with easy-rsa:</u>

Change directory to openvpn

```
cd /etc/openvpn/easy-rsa
```

Initialize a PKI CA

```
easyrsa init-pki
```

List directories

```
ls
ls pki
```

Create vars file

```
vim vars
```

Create CA (security or convenience)

```
easyrsa build-ca nopass
```

List files

```
ls pki
ls pki/private
```

<u>Generate Certificate for OpenVPN Server:</u>

Generate signing request

```
easyrsa gen-req openvpn-server nopass
```

Sign cert

easyrsa sign-req server openvpn-server

Configure OpenVPN Cryptographic Material

Generate the tls-crypt pre-shared key

```
openvpn --genkey secret ta.key
cat ta.key
```

Configure OpenVPN server

Enable IP forwarding

```
sudo vim /etc/sysctl.conf
```

Read the file and load the new values for the current session

```
sudo sysctl -p
```

Configure IP Tables

```
sudo iptables -t nat -S
```

Find out network public network interface

```
ip route list default
```

Configure nat routing

```
sudo iptables \
  -t nat -I POSTROUTING -s 10.8.0.0/24 -o eth0 -j MASQUERADE
```

Save iptables

```
sudo apt-get install iptables-persistent
```

Create config file, leave routes out for now

```
sudo vim /etc/openvpn/server/server.conf
```

Check if you have nobody user

```
cat /etc/passwd | grep nobody
```

Check if you have nogroup

```
cat /etc/group | grep nogroup
```

Start OpenVPN

```
sudo systemctl start openvpn-server@server
```

Check status OpenVPN

```
sudo systemctl status openvpn-server@server
```

Enable openvpn-server

```
sudo systemctl enable openvpn-server@server
```

Check logs

```
journalctl \
  --no-pager --full -u openvpn-server@server -f
```

b-\ Configuration du serveur openvpnserver:

le contenue de fichier server.conf est le suivant :

```
# Port for OpenVPN
port 1194
# Protocol
proto udp
# It will create a routed IP tunnel
dev tun
#Location of the Certificate Authority
ca /etc/openvpn/easy-rsa/pki/ca.crt
# Location of the OpenVPN Certificate
cert /etc/openvpn/easy-rsa/pki/issued/openvpn-server.crt
# Location of the OpenVPN private key
key /etc/openvpn/easy-rsa/pki/private/openvpn-server.key
# Disable Diffie Hellman since we are using elliptic curves
dh none
# Location of the ta secret that's used as an additional HMAC signature
#to all SSL/TLS handshake packets for integrity verification.
tls-crypt /etc/openvpn/easy-rsa/ta.key 0
# Cipher to use
cipher AES-256-GCM
# Auth used to authenticate received packets
auth SHA256
# Configure server mode and supply a VPN subnet for OpenVPN to draw
client addresses from
```

```
server 10.8.0.0 255.255.255.0

# Location to save records of client <-> virtual IP addresses

ifconfig-pool-persist /var/log/openvpn/ipp.txt

# ping-like messages to be sent back and forth to check the stattus

keepalive 10 120

# Used reduce the OpenVPN daemons privileges after initialization

user nobody

group nogroup

# Persist certain options that may no longer be available

#ngrade

persist-key

persist-tun

# Show current connections

status /var/log/openvpn/openvpn-status.log

# Log verbosity

verb 3

# Notify the client when the server restarts so it can automatically
reconnect

explicit-exit-notify 1

# Network topology

topology subnet

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# Network topology

topology subnet

# Push route from AWS, 10.0.5.0/25 pub

push "route 10.0.5.0 255.255.255.128"

# Push route from AWS, 10.0.5.128/25 priv

push "route 10.0.5.128 255.255.255.128"

# Push AWS name server since we want to use private hosted zones

push "dhcp-option DNS 10.0.0.2"
```
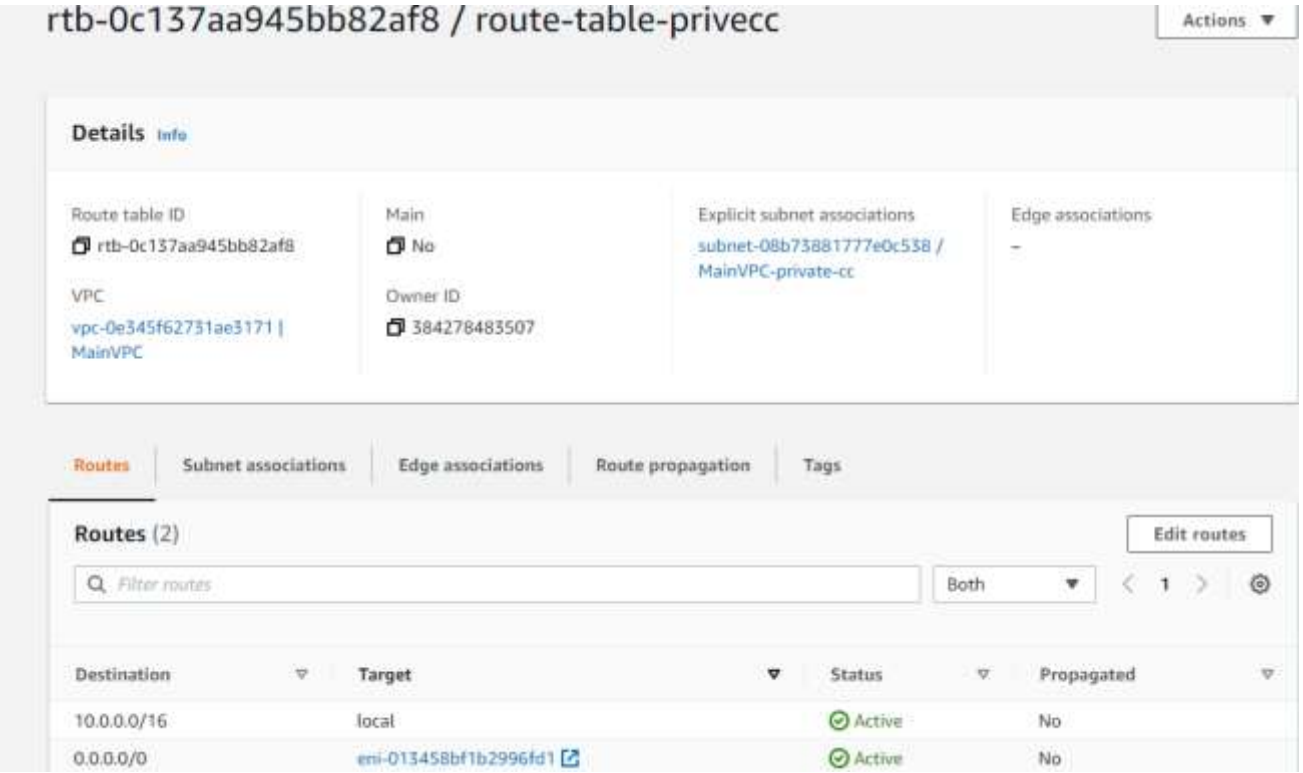
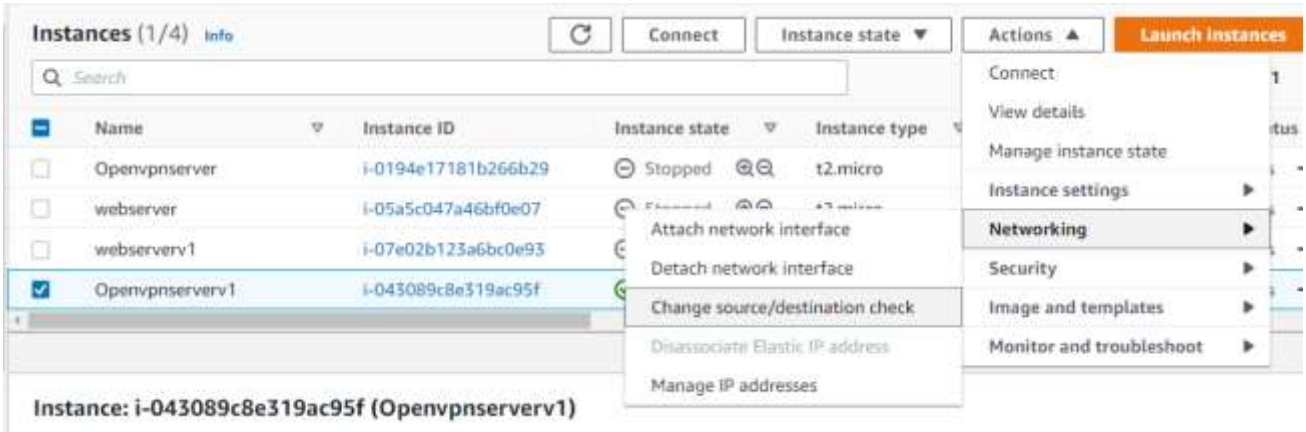
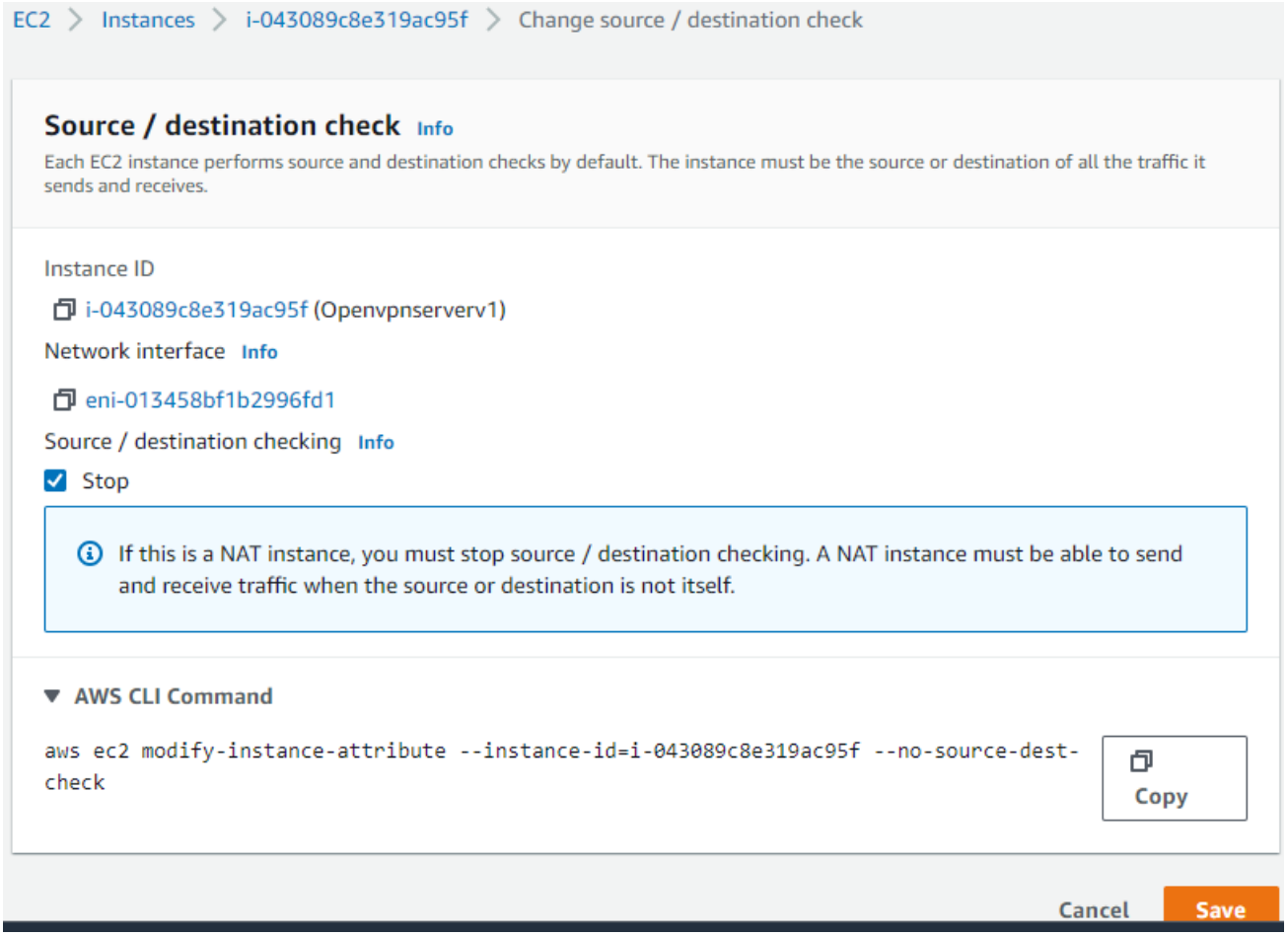

c-\ Configuration des routes sur aws



Rendre le serveur openvpn joue le rôle de natgatway



Cliquer sur stop



webography

https://community.openvpn.net/openvpn/wiki/OpenvpnSoftwareRepos?_ga=2.75016273.276901016.1641476933-1742649908.1639558820&__cf_chl_jschl_tk__=VHoUYcp8dNpauEQt3vH7vrIu23NaYkKqTCpTT8VEGmo-1641546537-0-gaNycGzNCL0#DebianUbuntu:UsingOpenVPNaptrepositories

https://unix.stackexchange.com/questions/283801/iptables-forward-traffic-to-vpn-tunnel-if-open

https://www.youtube.com/watch?v=yaXiAqH-4LE&t=1501s

https://github.com/antonputra/tutorials/tree/main/lessons/084