Homework DevOps. Bobrov Dmytro.

Домашка по нетворкингу:
1. создать VM 1 на локальных ресурсах Debian OS
2. создать VM 2 на локальных ресурсах Ubuntu Os
3. создать VM 3 - EC2 линукс интанс on AWS.

сеть между VM 1 и VM 2 - хост онли нетворк. вторая сеть для VM 2 к хосту с гипервизором - NAT сеть.
настроить роутинг: VM 2 - дефаулт гейтвей для VM 1, для VM 2 - дефаулт роутер - хост с гипервизором.
настроить IPSEC VPN с VM 2 до VM3
продемонстировать трейс с VM 1 до google.com

добавить на VM 1-3 правила фаервола, которые запретят все, но позволят работать ссш и трейсроуту.

дополнительное задание: построить AWS site-2-site VPN (например по этому гайду https://aws.amazon.com/premiumsupport/knowledge-center/create-connection-vpc/
)
внимание - сайт2сайт стоит денег (немного - но это не бесплатный тир)

Create VM1 on Debian OS

```
dbobrov@debian:~$  lsb_release -a
No LSB modules are available.
Distributor ID: Debian
Description:    Debian GNU/Linux 10 (buster)
Release:        10
Codename:       buster
dbobrov@debian:~$
```

```
dbobrov@debian:~$ uname -a
Linux debian 4.19.0-9-amd64 #1 SMP Debian 4.19.118-2 (2020-04-29) x86_64 GNU/Linux
dbobrov@debian:~$
```

Setting up network on VM1

On VM1 (debian) we edit the file `/etc/network/interfaces` and add the lines to configure the static ip and the gateway network gateway 192.168.65.101 (the ip address of VM2 on the network is enp0s3)

```
allow-hotplug enp0s3
iface enp0s3 inet static
address 192.168.65.100
netmask 255.255.255.0
gateway 192.168.65.101
network 192.168.65.0
broadcast 192.168.65.255
```

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```
root@debian:/home/dbobrov# cat /etc/network/interfaces
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

source /etc/network/interfaces.d/*

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
# The host-only network
allow-hotplug enp0s3
iface enp0s3 inet static
address 192.168.65.100
netmask 255.255.255.0
#VM2 IP
gateway 192.168.65.101
network 192.168.65.0
broadcast 192.168.65.255
root@debian:/home/dbobrov#
```

```
dbobrov@debian:~$ ip r
default via 192.168.65.101 dev enp0s3 onlink
169.254.0.0/16 dev enp0s3 scope link metric 1000
192.168.65.0/24 dev enp0s3 proto kernel scope link src 192.168.65.100
dbobrov@debian:~$
```

Demonstrating command ping google.com on VM1

```
dbobrov@debian:~$ ping google.com
PING google.com (216.58.215.78) 56(84) bytes of data.
64 bytes from waw02s16-in-f14.1e100.net (216.58.215.78): icmp_seq=1 ttl=53 time=22.7 ms
64 bytes from waw02s16-in-f14.1e100.net (216.58.215.78): icmp_seq=2 ttl=53 time=21.10 ms
64 bytes from waw02s16-in-f14.1e100.net (216.58.215.78): icmp_seq=3 ttl=53 time=21.10 ms
64 bytes from waw02s16-in-f14.1e100.net (216.58.215.78): icmp_seq=4 ttl=53 time=22.0 ms
^C
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 6ms
rtt min/avg/max/mdev = 21.969/22.179/22.736/0.354 ms
dbobrov@debian:~$
```

Command traceroute didn't work, I didn't resolve this problem.

Create VM2 on Ubuntu OS

```
root@bobrov-ubuntu-server:~# lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 20.04 LTS
Release:        20.04
Codename:       focal
root@bobrov-ubuntu-server:~#
```

Setting up network on VM2

We create the `nano /etc/netplan/networks.yaml file` on VM2 (ubuntu) with the contents:

```
network:
 version: 2
 renderer: networkd
 ethernets:
  enp0s3:
   dhcp4: no
   addresses: [192.168.65.101/24]
   nameservers:
     addresses: [192.168.65.1, 8.8.8.8]
  enp0s8:
   dhcp4: no
   addresses: [10.0.2.100/24]
   gateway4: 10.0.2.1
   nameservers:
     addresses: [8.8.8.8]
```

This file allows us to set a static ip address for VM1 in the NAT network (`enp0s8`) and the Only-host network (`enp0s3`) after we execute the command to apply changes `netplan apply.`

For constant forwarding, open the file /`etc/sysctl.conf` and change (or uncomment) the lines in it:

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

Then run command

```
iptables -t nat -A POSTROUTING -o eth1 -j MASQUERADE
```

And save iptables changes

```
netfilter-persistent save
```

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```
root@bobrov-ubuntu-server:~# ip r
default via 10.0.2.1 dev enp0s8 proto static
10.0.2.0/24 dev enp0s8 proto kernel scope link src 10.0.2.100
192.168.65.0/24 dev enp0s3 proto kernel scope link src 192.168.65.101
root@bobrov-ubuntu-server:~#
```

```
root@bobrov-ubuntu-server:~# cat /etc/netplan/networks.yaml
# static ip for host-only interface

network:
 version: 2
 renderer: networkd
 ethernets:
  enp0s3:
   dhcp4: no
   addresses: [192.168.65.101/24]
   nameservers:
     addresses: [192.168.65.1, 8.8.8.8]
  enp0s8:
   dhcp4: no
   addresses: [10.0.2.100/24]
   gateway4: 10.0.2.1
   nameservers:
     addresses: [8.8.8.8]
root@bobrov-ubuntu-server:~#
```

Create and run VM3 on AWS.

```
root@bobrov-ubuntu-server:/home/bobrov/folderS# ssh -i 'Frankfurt-VM3-HW5.pem' ec2-user@35.157.105.22
8

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      ___|\___|___|

https://aws.amazon.com/amazon-linux-2/
```

I could not set up IPSEC, I ran into a problem that I don't have a public IP.