Task.Networking.1

Pashynskyi Maxim

1) **Create virtual machines connection according to figure 1:**

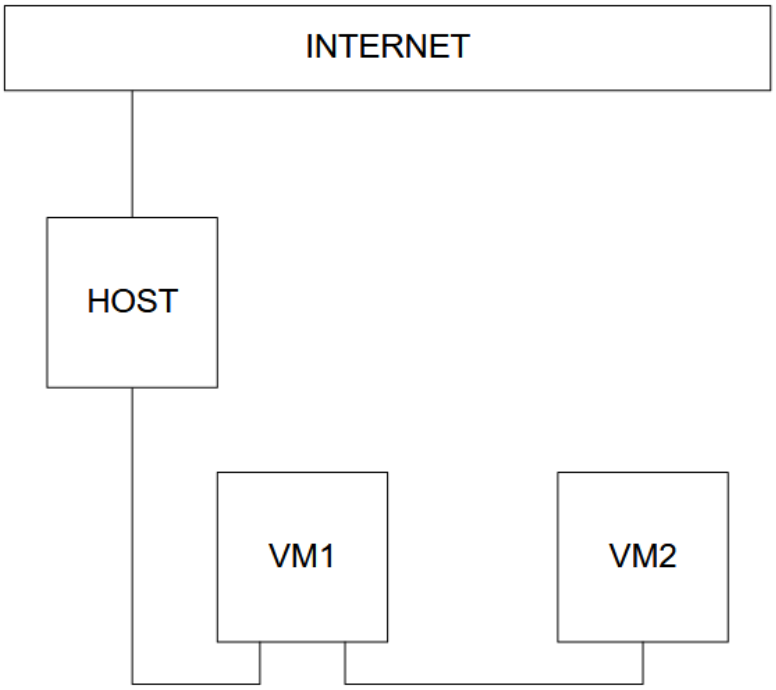
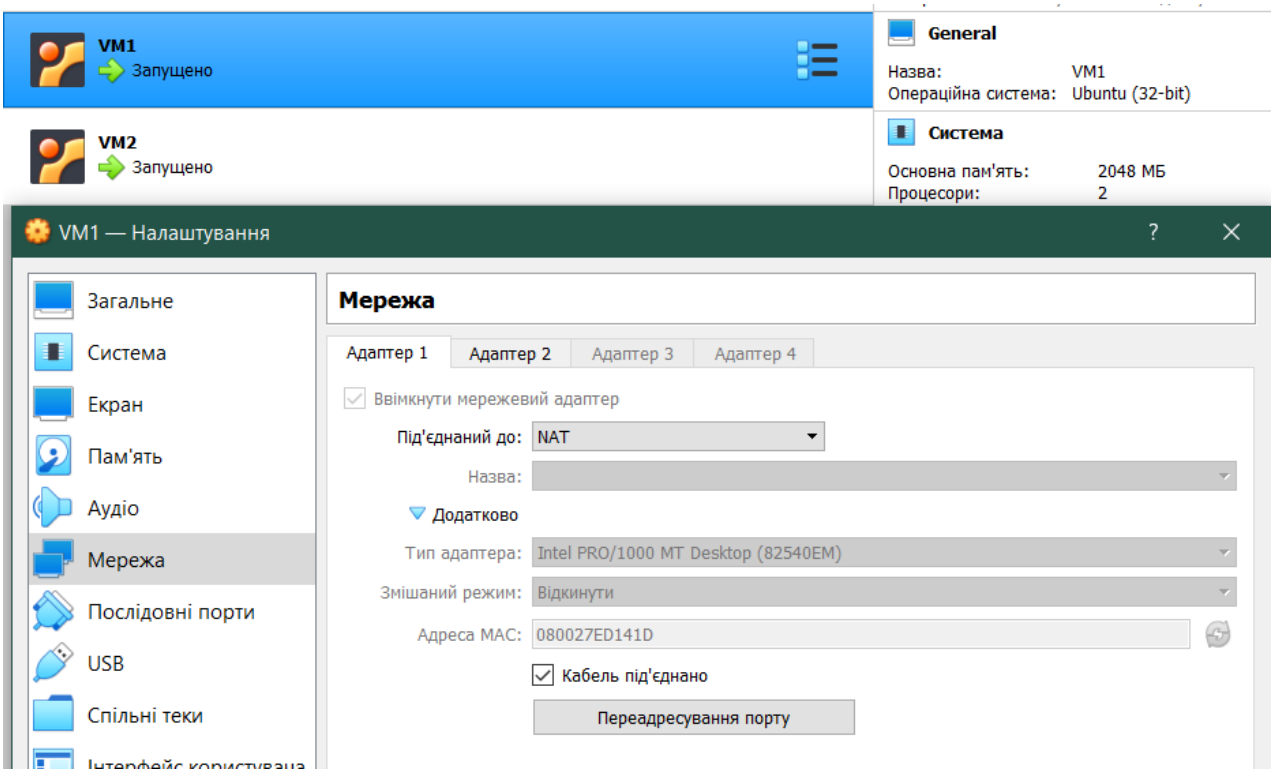
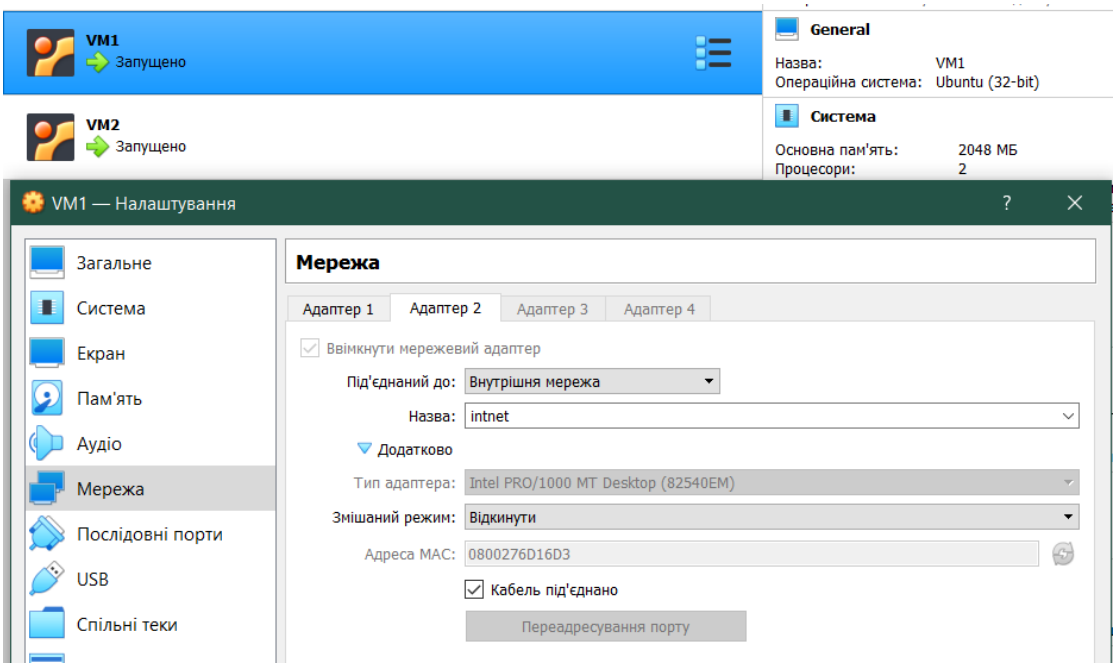


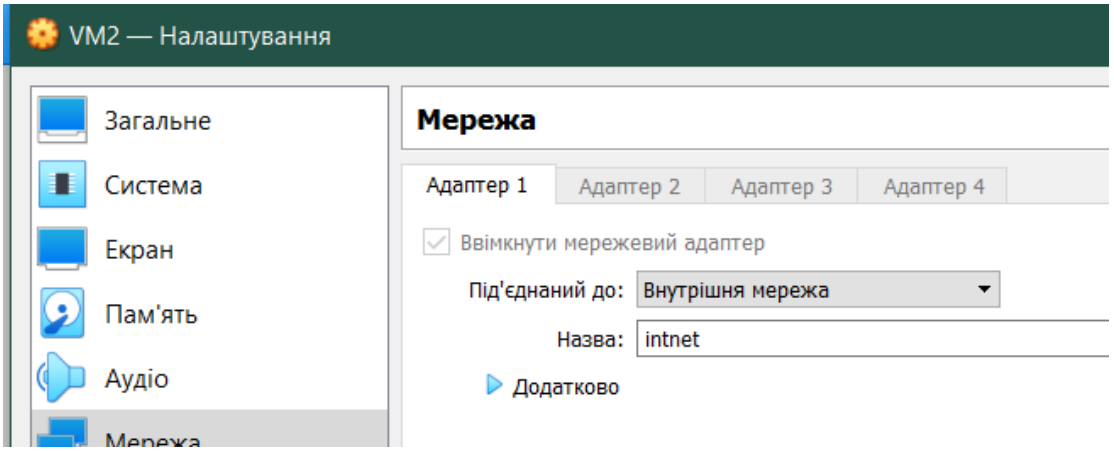
Figure 1 – VMs connection

Network interfaces on ***VM1***:



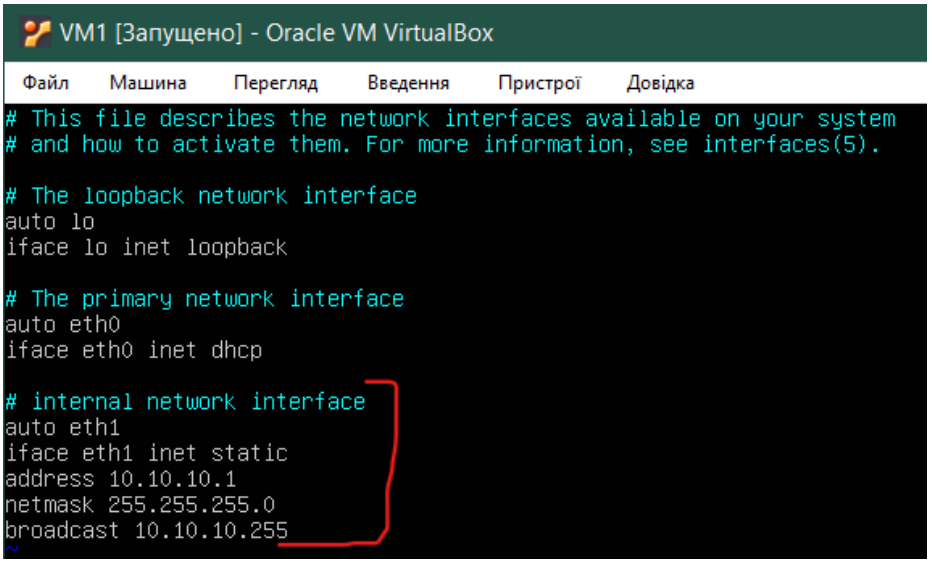


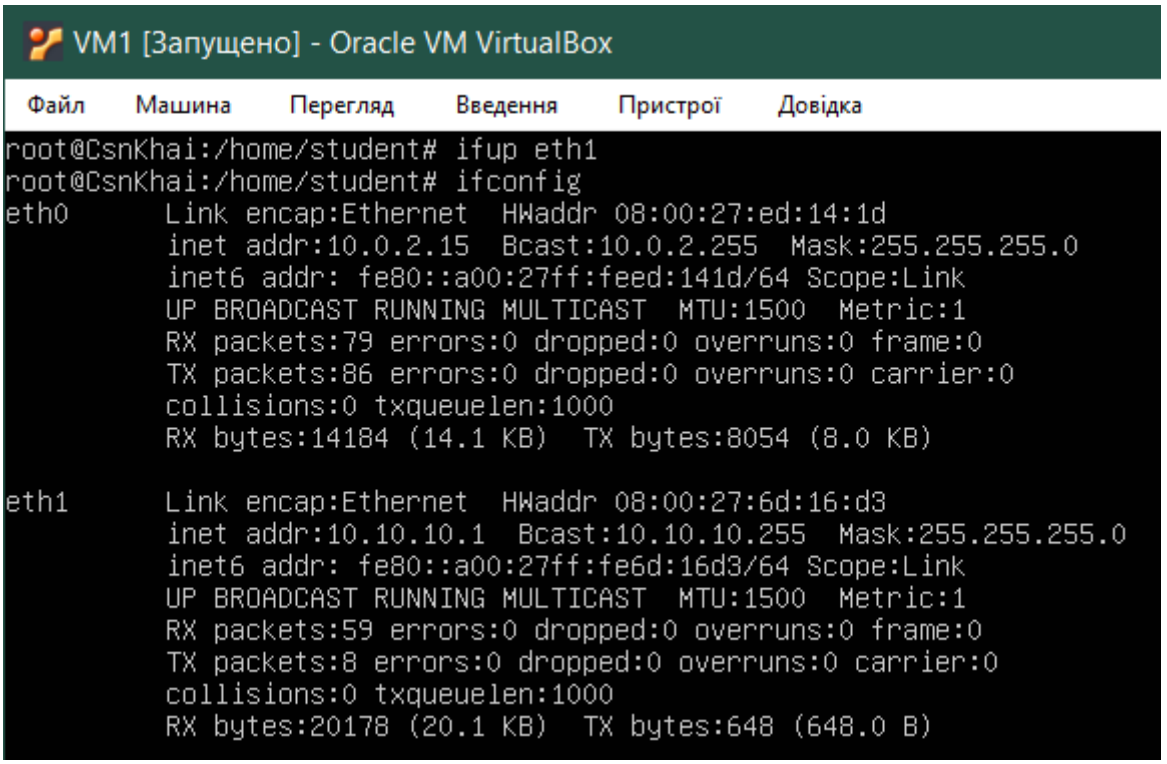
Network interface on ***VM2***:



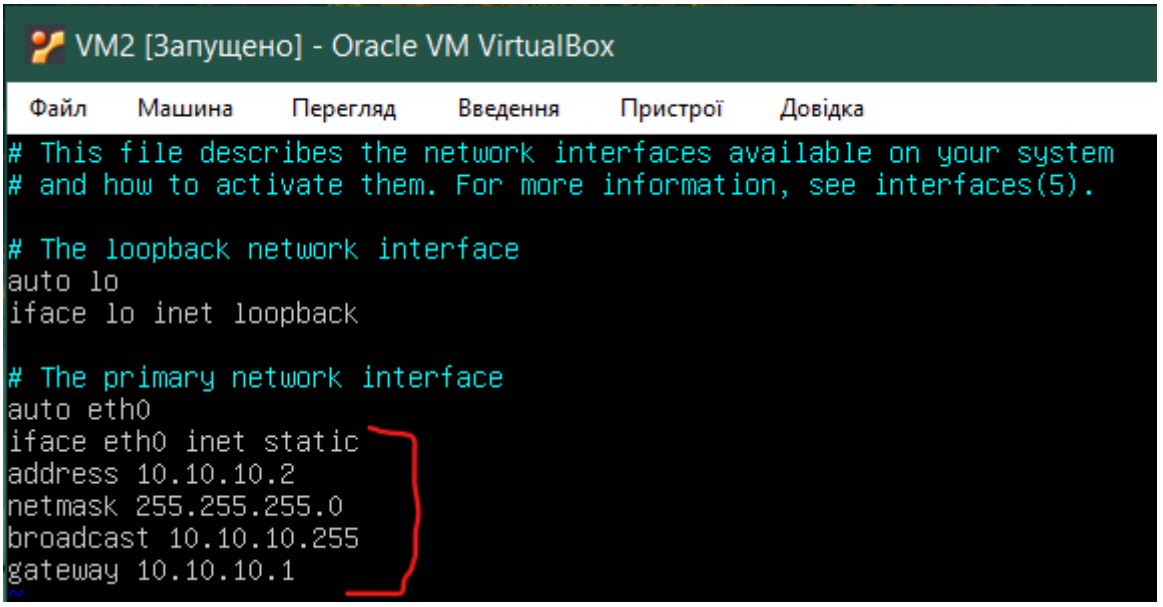
2) **<u>VM2 has one interface (internal), VM1 has 2 interfaces (NAT and internal). Configure all network interfaces in order to make VM2 have access to the Internet (iptables, forward, masquerade).</u>**

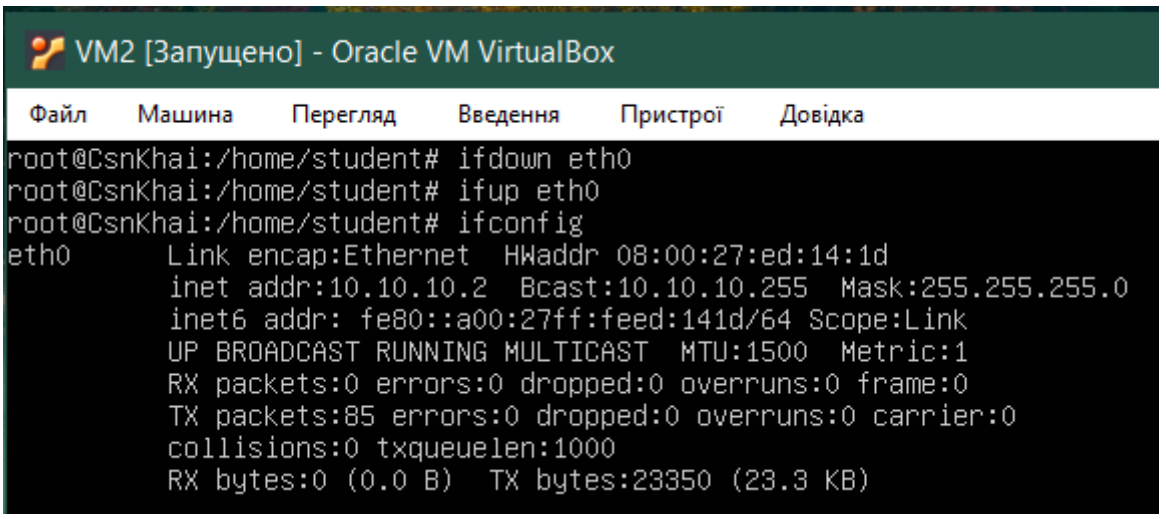
Accessing ***VM1*** to setup internal interface in ***/etc/network/interfaces***:





Accessing ***VM2*** to set static IP and VM1 as default gateway in ***/etc/network/interfaces***:

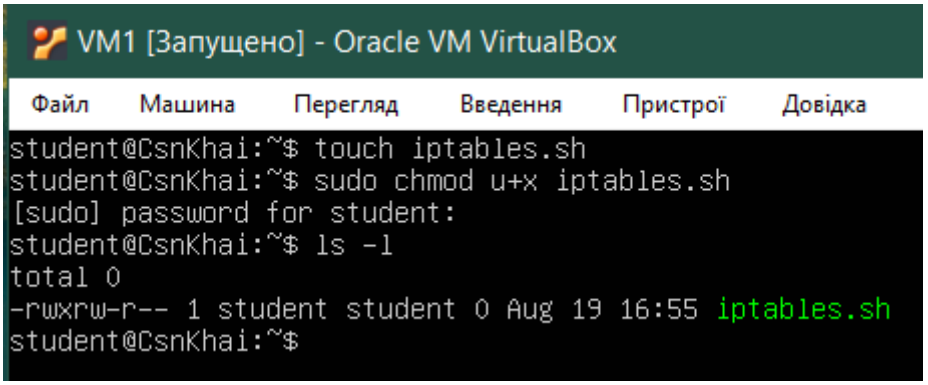


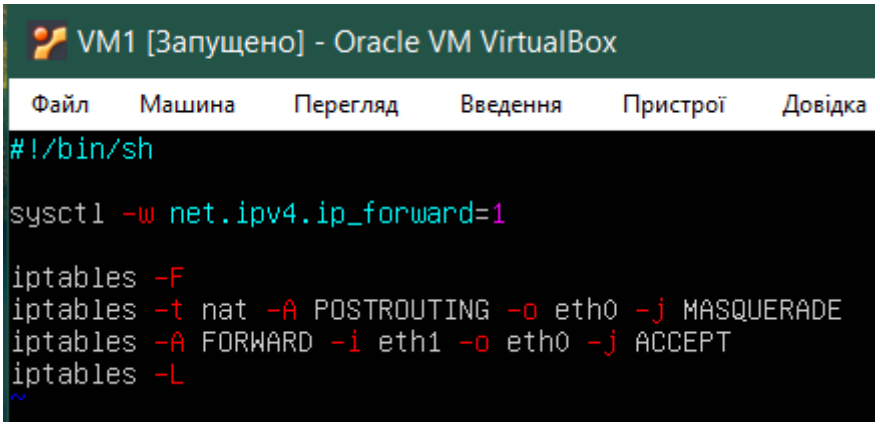


Uncommenting line in ***/etc/sysctl.conf*** on ***VM1***:

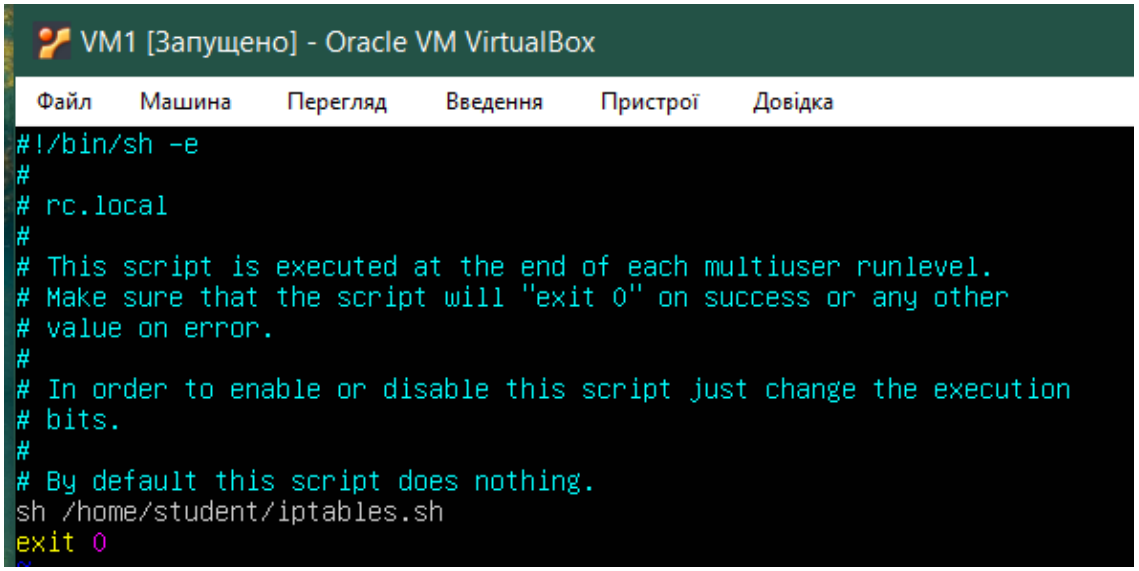
```
# Uncomment the next line to enable packet forwarding for IPv4
net.ipv4.ip_forward=1
```

Creating file named ***iptables.sh*** on ***VM1***, that will contain ***iptables*** instructions to execute on system startup (**to avoid losing result after reboot**):

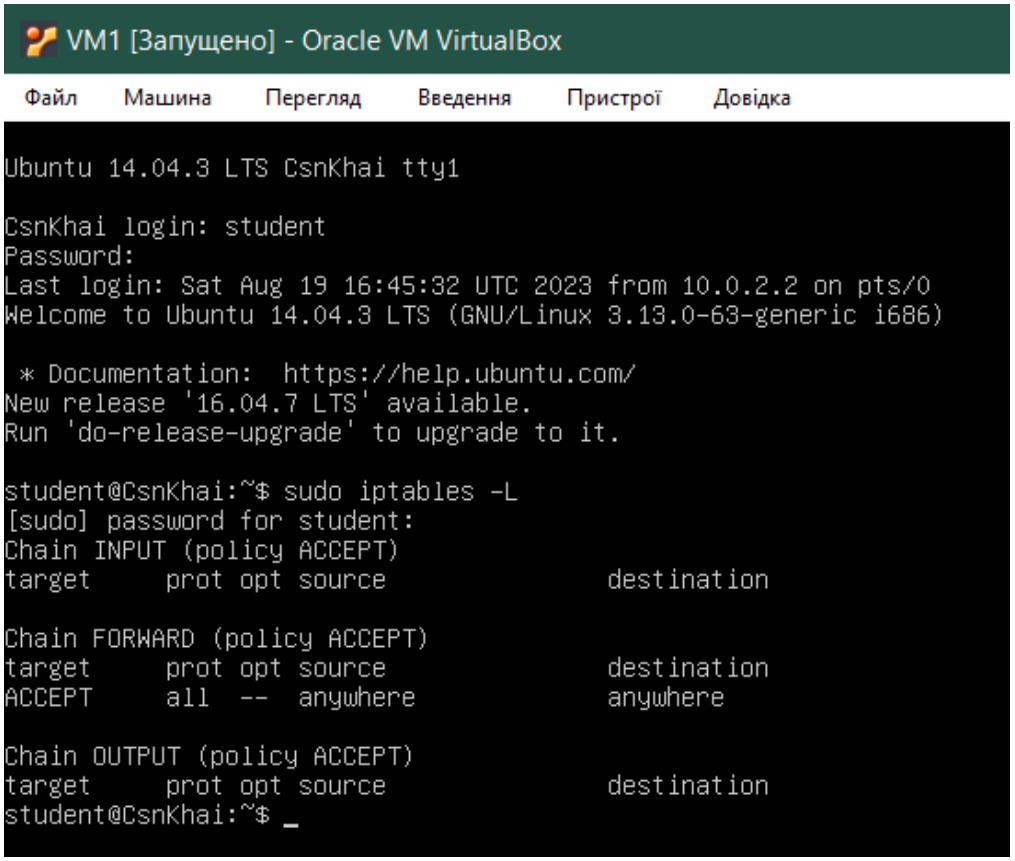




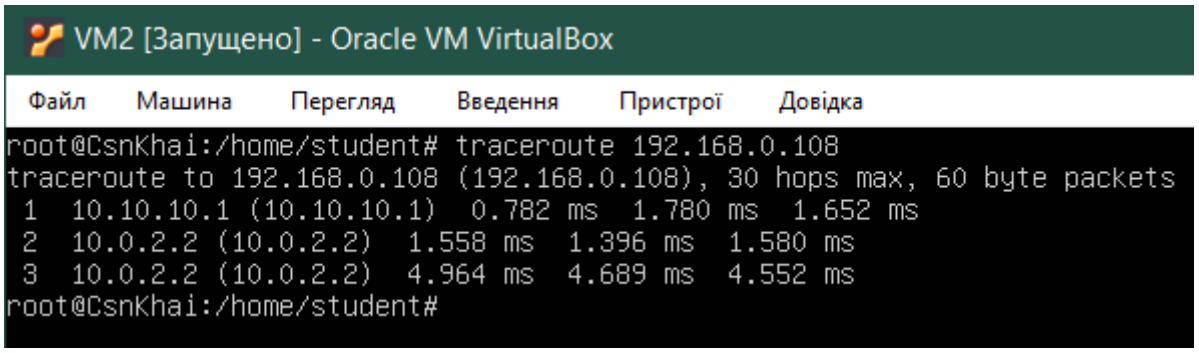
Adding ***iptables.sh*** execution line to ***/etc/rc.d/rc.local*** (this file executes on startup):



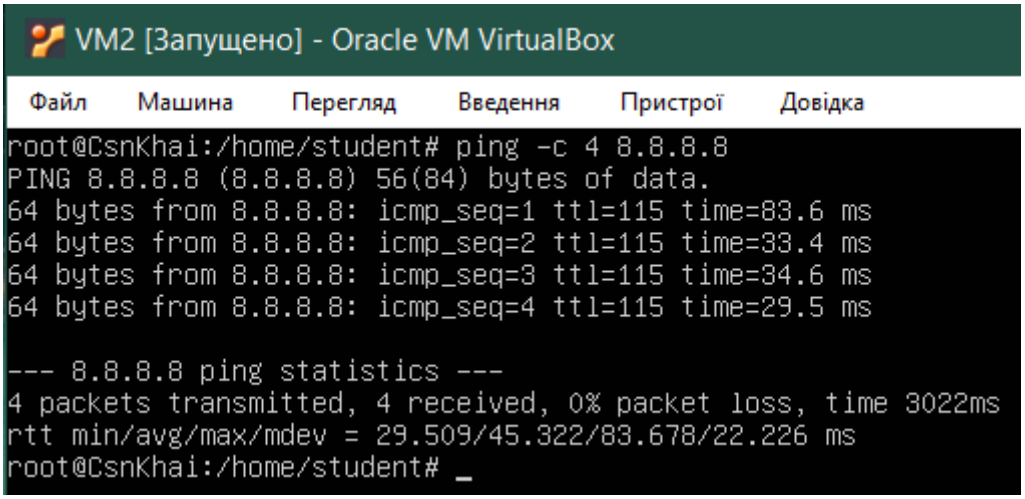
iptables rules automatically saved after system restart:



3) **Check the route from VM2 to Host.**



4) **Check the access to the Internet, (just ping, for example, 8.8.8.8).**



5) **Determine, which resource has an IP address 8.8.8.8.**

whois 8.8.8.8 command output:

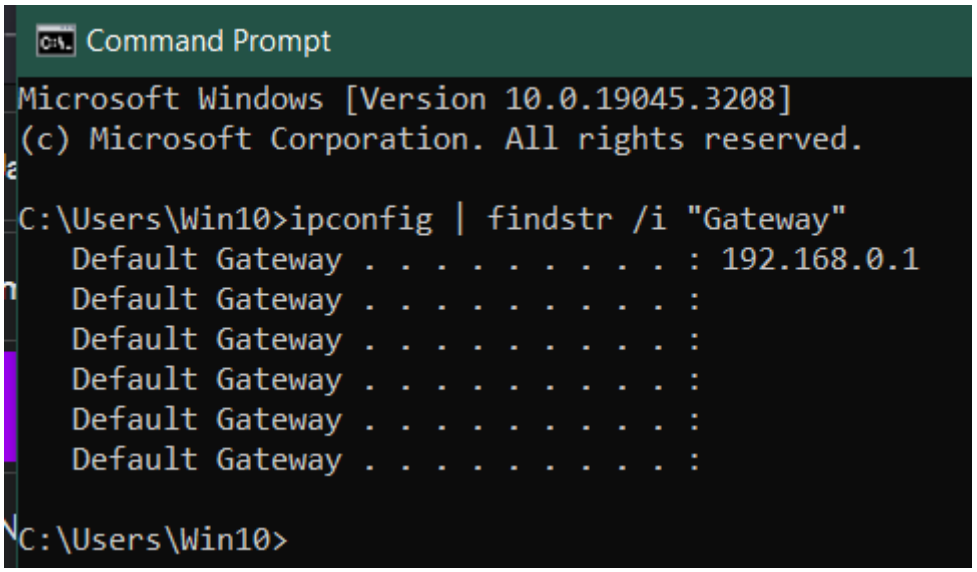
```
# start

NetRange:       8.8.8.0 - 8.8.8.255
CIDR:           8.8.8.0/24
NetName:        LVLT-GOGL-8-8-8
NetHandle:      NET-8-8-8-0-1
Parent:         LVLT-ORG-8-8 (NET-8-0-0-0-1)
NetType:        Reallocated
OriginAS:
Organization:   Google LLC (GOGL)
RegDate:        2014-03-14
Updated:        2014-03-14
Ref:            https://rdap.arin.net/registry/ip/8.8.8.0



OrgName:        Google LLC
OrgId:          GOGL
Address:        1600 Amphitheatre Parkway
City:           Mountain View
StateProv:      CA
PostalCode:     94043
Country:        US
RegDate:        2000-03-30
Updated:        2019-10-31
Comment:        Please note that the recommended way to file abuse complaints are located in the following links.
Comment:
Comment:        To report abuse and illegal activity: https://www.google.com/contact/
Comment:
Comment:        For legal requests: http://support.google.com/legal
Comment:
Comment:        Regards,
Comment:        The Google Team
Ref:            https://rdap.arin.net/registry/entity/GOGL
```

6) **Determine, which IP address belongs to resource epam.com.**

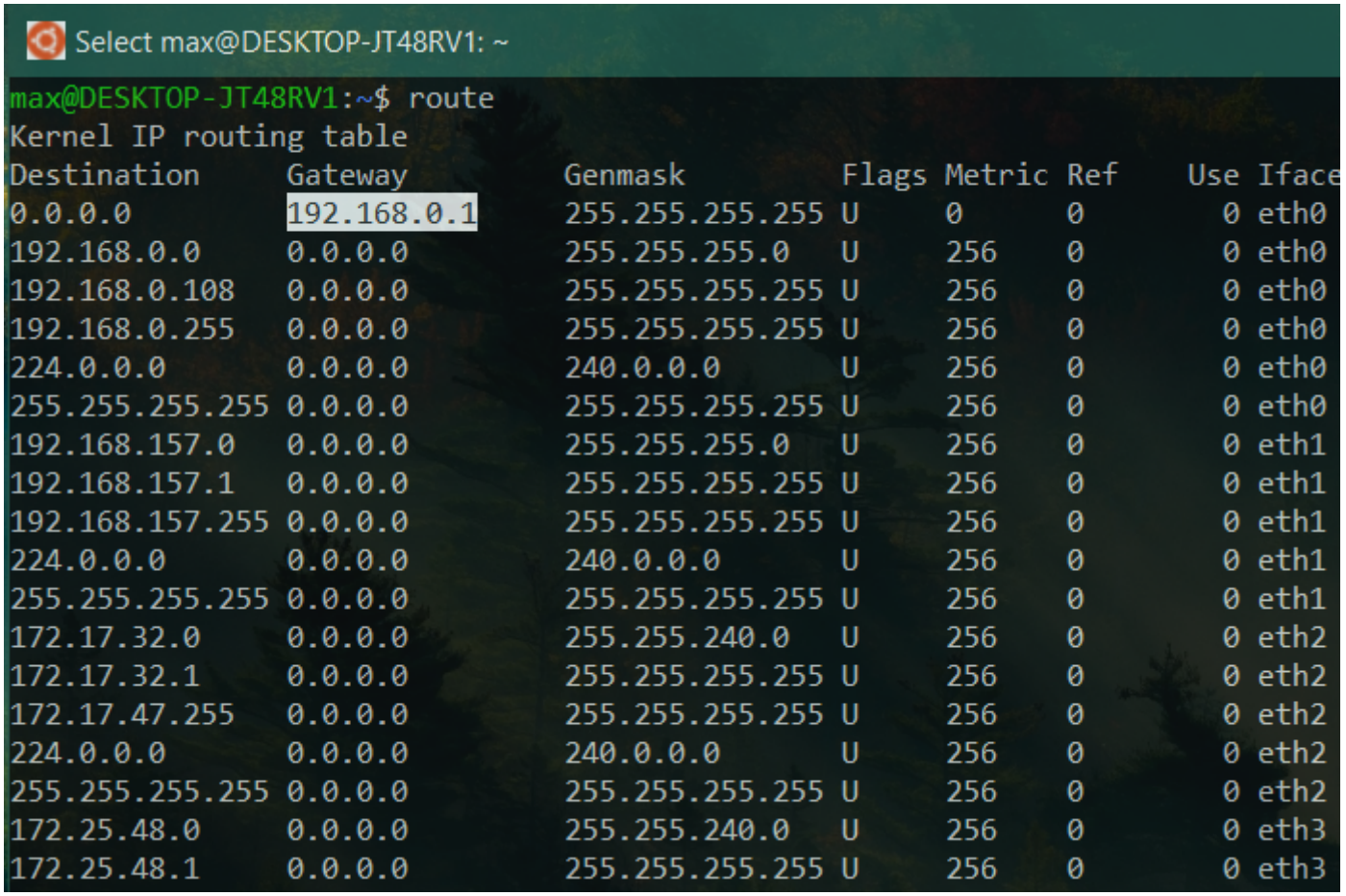
```
student@CsnKhai:~$ dig epam.com

; <<>> DiG 9.9.5-3ubuntu0.5-Ubuntu <<>> epam.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 4552
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
;; QUESTION SECTION:
;epam.com.                      IN      A

;; ANSWER SECTION:
epam.com.               2989    IN      A       3.214.134.159

;; Query time: 21 msec
;; SERVER: 192.168.0.1#53(192.168.0.1)
;; WHEN: Sat Aug 19 18:07:43 UTC 2023
;; MSG SIZE  rcvd: 53
```

7) **Determine the default gateway for your HOST and display routing table.**

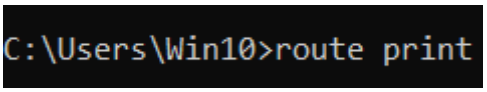
Default gateway of my ***Windows HOST*** from ***CMD***:



Using ***WSL***:



Displaying ***routing table*** with ***CMD***:



```
IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0      192.168.0.1    192.168.0.108     35
        127.0.0.0        255.0.0.0         On-link         127.0.0.1    331
        127.0.0.1  255.255.255.255         On-link         127.0.0.1    331
  127.255.255.255  255.255.255.255         On-link         127.0.0.1    331
      172.17.32.0    255.255.240.0         On-link       172.17.32.1   5256
      172.17.32.1  255.255.255.255         On-link       172.17.32.1   5256
    172.17.47.255  255.255.255.255         On-link       172.17.32.1   5256
      172.25.48.0    255.255.240.0         On-link       172.25.48.1   5256
      172.25.48.1  255.255.255.255         On-link       172.25.48.1   5256
    172.25.63.255  255.255.255.255         On-link       172.25.48.1   5256
      172.26.80.0    255.255.240.0         On-link       172.26.80.1   5256
      172.26.80.1  255.255.255.255         On-link       172.26.80.1   5256
    172.26.95.255  255.255.255.255         On-link       172.26.80.1   5256
      172.31.16.0    255.255.240.0         On-link       172.31.16.1   5256
      172.31.16.1  255.255.255.255         On-link       172.31.16.1   5256
    172.31.31.255  255.255.255.255         On-link       172.31.16.1   5256
      192.168.0.0    255.255.255.0         On-link     192.168.0.108    291
    192.168.0.108  255.255.255.255         On-link     192.168.0.108    291
    192.168.0.255  255.255.255.255         On-link     192.168.0.108    291
    192.168.157.0    255.255.255.0         On-link     192.168.157.1    291
    192.168.157.1  255.255.255.255         On-link     192.168.157.1    291
  192.168.157.255  255.255.255.255         On-link     192.168.157.1    291
        224.0.0.0        240.0.0.0         On-link         127.0.0.1    331
        224.0.0.0        240.0.0.0         On-link     192.168.0.108    291
        224.0.0.0        240.0.0.0         On-link       172.17.32.1   5256
        224.0.0.0        240.0.0.0         On-link       172.25.48.1   5256
        224.0.0.0        240.0.0.0         On-link       172.26.80.1   5256
        224.0.0.0        240.0.0.0         On-link     192.168.157.1    291
        224.0.0.0        240.0.0.0         On-link       172.31.16.1   5256
  255.255.255.255  255.255.255.255         On-link         127.0.0.1    331
  255.255.255.255  255.255.255.255         On-link     192.168.0.108    291
  255.255.255.255  255.255.255.255         On-link       172.17.32.1   5256
  255.255.255.255  255.255.255.255         On-link       172.25.48.1   5256
  255.255.255.255  255.255.255.255         On-link       172.26.80.1   5256
  255.255.255.255  255.255.255.255         On-link     192.168.157.1    291
  255.255.255.255  255.255.255.255         On-link       172.31.16.1   5256
```

8) Trace the route to google.com.

```
C:\Users\Win10>tracert google.com

Tracing route to google.com [142.250.203.206]
over a maximum of 30 hops:

  1    <1 ms    <1 ms    <1 ms  192.168.0.1
  2     5 ms     5 ms     5 ms  77.88.248.147.p2p.datagroup.ua [77.88.248.147]
  3     5 ms     5 ms     5 ms  77.88.248.146.p2p.datagroup.ua [77.88.248.146]
  4    13 ms    13 ms    13 ms  et-4-3-0.2.at.mx10.iev1.core.as3326.net [88.81.245.160]
  5    13 ms    13 ms    13 ms  192.178.68.164
  6    14 ms    14 ms    14 ms  142.250.238.57
  7    13 ms    13 ms    16 ms  108.170.248.138
  8    28 ms    27 ms    26 ms  142.251.242.35
  9    27 ms    27 ms    27 ms  142.250.46.55
 10    28 ms    28 ms    28 ms  108.170.250.209
 11    26 ms    26 ms    26 ms  209.85.252.109
 12    27 ms    27 ms    27 ms  waw02s22-in-f14.1e100.net [142.250.203.206]

Trace complete.
```