TASK 1

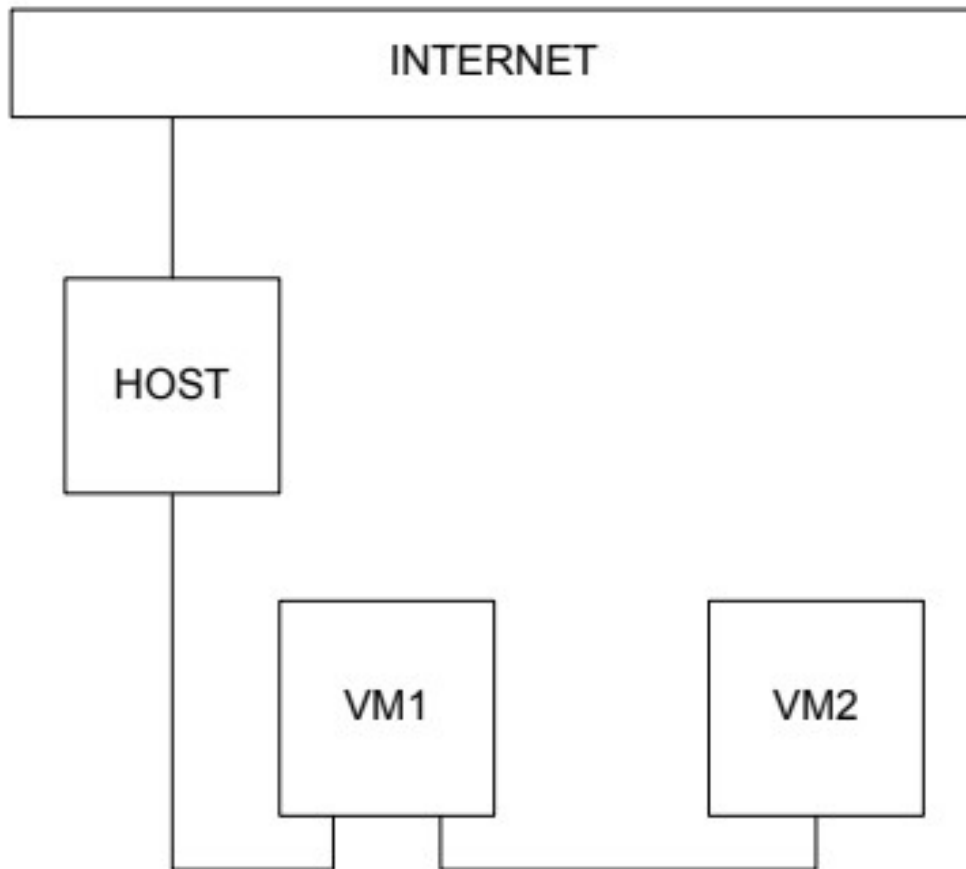**1. Create virtual machines connection according to figure:**

2. VM2 has one interface (internal), VM1 has 2 interfaces (NAT and internal). Configure all network
interfaces in order to make VM2 has an access to the Internet (iptables, forward, masquerade).

VM1:

```
  GNU nano 2.2.6          File: /etc/network/interfaces

# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

# The loopback network interface
auto lo
iface lo inet loopback

# NAT
auto eth0
iface eth0 inet dhcp

# internal
auto eth1
iface eth1 inet static
#network 10.10.10.1
address 10.10.10.1
netmask 255.255.255.0
broadcast 10.10.10.255
```

```
  GNU nano 2.2.6              File: /etc/sysctl.conf

#
# Uncomment the next two lines to enable Spoof protection (reverse-path filter)
# Turn on Source Address Verification in all interfaces to
# prevent some spoofing attacks
#net.ipv4.conf.default.rp_filter=1
#net.ipv4.conf.all.rp_filter=1

# Uncomment the next line to enable TCP/IP SYN cookies
# See http://lwn.net/Articles/277146/
# Note: This may impact IPv6 TCP sessions too
#net.ipv4.tcp_syncookies=1

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

VM2:

```
  GNU nano 2.2.6           File: /etc/network/interfaces

# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

# The loopback network interface
auto lo
iface lo inet loopback


# internal
auto eth0
iface eth0 inet static
address 10.10.10.2
netmask 255.255.255.0
broadcast 10.10.10.255
gateway 10.10.10.1
```

3. Check the route from VM2 to Host.

```
student@CsnKhai:~$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         10.0.2.2        0.0.0.0         UG    0      0        0 eth0
10.0.2.0        *               255.255.255.0   U     0      0        0 eth0
10.10.10.0      *               255.255.255.0   U     0      0        0 eth1
student@CsnKhai:~$
```

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

```
student@CsnKhai:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=61 time=74.0 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=61 time=161 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=61 time=60.9 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=61 time=121 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=61 time=57.5 ms
^C
--- 8.8.8.8 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4003ms
rtt min/avg/max/mdev = 57.581/95.164/161.642/40.381 ms
student@CsnKhai:~$
```

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

$ whois 8.8.8.8

```
Ref:            https://rdap.arin.net/registry/entity/GOGL


OrgAbuseHandle: ABUSE5250-ARIN
OrgAbuseName:   Abuse
OrgAbusePhone:  +1-650-253-0000
OrgAbuseEmail:  network-abuse@google.com
OrgAbuseRef:    https://rdap.arin.net/registry/entity/ABUSE5250-ARIN

OrgTechHandle: ZG39-ARIN
OrgTechName:   Google LLC
OrgTechPhone:  +1-650-253-0000
OrgTechEmail:  arin-contact@google.com
OrgTechRef:    https://rdap.arin.net/registry/entity/ZG39-ARIN

# end



#
# ARIN WHOIS data and services are subject to the Terms of Use
# available at: https://www.arin.net/resources/registry/whois/tou/
#
# If you see inaccuracies in the results, please report at
# https://www.arin.net/resources/registry/whois/inaccuracy_reporting/
#
# Copyright 1997-2021, American Registry for Internet Numbers, Ltd.
#

student@CsnKhai:~$
```

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

```
student@CsnKhai:~$ traceroute epam.com
traceroute to epam.com (3.214.134.159), 30 hops max, 60 byte packets
 1  10.0.2.2 (10.0.2.2)  0.412 ms  0.350 ms  0.329 ms
 2  192.168.172.216 (192.168.172.216)  3.340 ms  3.724 ms  5.868 ms
```

```
(a-ic333121-ash-b2.ip.twelve99-cust.net (213.240.00.33)   170.030 ms vadata-ic333
120-ash-b2.ip.twelve99-cust.net (62.115.11.249)  178.864 ms
16  * * *
17  * * *
18  * 52.93.28.80 (52.93.28.80)  310.778 ms 52.93.28.82 (52.93.28.82)  297.882 m
s
19  * * *
20  * * *
21  * * *
22  * * *
23  * * *
24  * * *
25  * * *
26  * * *
27  * * *
28  * * *
29  * * *
30  * * *
student@CsnKhai:~$
```

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

```
student@CsnKhai:~$ netstat -r
Kernel IP routing table
Destination     Gateway         Genmask         Flags   MSS Window  irtt Iface
default         10.10.10.1      0.0.0.0         UG        0 0          0 eth0
10.10.10.0      *               255.255.255.0   U         0 0          0 eth0
student@CsnKhai:~$
```

8. Trace the route to google.com.

```
student@CsnKhai:~$ traceroute google.com
traceroute to google.com (142.250.180.238), 30 hops max, 60 byte packets
 1  10.0.2.2 (10.0.2.2)  0.283 ms  0.231 ms  0.212 ms
 2  192.168.172.216 (192.168.172.216)  2.951 ms  3.714 ms  3.518 ms
 3  * * *
 4  88-214-103-129.vf-ua.net (88.214.103.129)  53.302 ms  65.698 ms  65.594 ms
 5  88-214-102-230.vf-ua.net (88.214.102.230)  65.208 ms  65.076 ms  64.987 ms
 6  * * *
 7  209.85.168.35 (209.85.168.35)  62.610 ms  56.603 ms  58.299 ms
 8  209.85.168.34 (209.85.168.34)  62.326 ms  43.524 ms  58.733 ms
 9  * * *
10  108.170.248.129 (108.170.248.129)  64.772 ms 209.85.253.120 (209.85.253.120)
  58.424 ms 209.85.255.40 (209.85.255.40)  58.693 ms
11  108.170.248.139 (108.170.248.139)  57.322 ms  53.222 ms 108.170.248.155 (108
.170.248.155)  61.229 ms
12  142.251.67.218 (142.251.67.218)  67.387 ms 108.170.227.210 (108.170.227.210)
  61.750 ms  61.527 ms
13  74.125.242.225 (74.125.242.225)  68.404 ms 142.251.77.181 (142.251.77.181)
67.769 ms 74.125.242.225 (74.125.242.225)  68.366 ms
14  142.251.65.217 (142.251.65.217)  72.033 ms  60.251 ms  60.230 ms
15  bud02s34-in-f14.1e100.net (142.250.180.238)  70.076 ms 142.251.65.217 (142.2
51.65.217)  62.798 ms bud02s34-in-f14.1e100.net (142.250.180.238)  62.986 ms
student@CsnKhai:~$
```