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

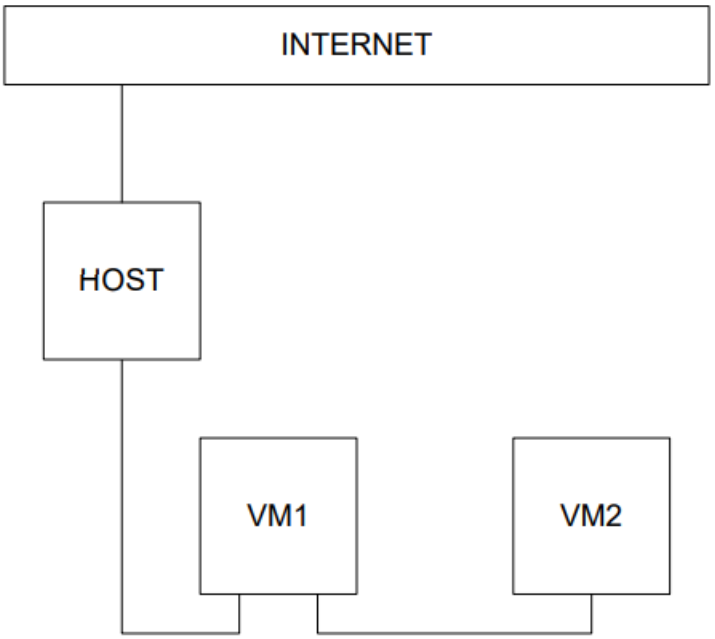
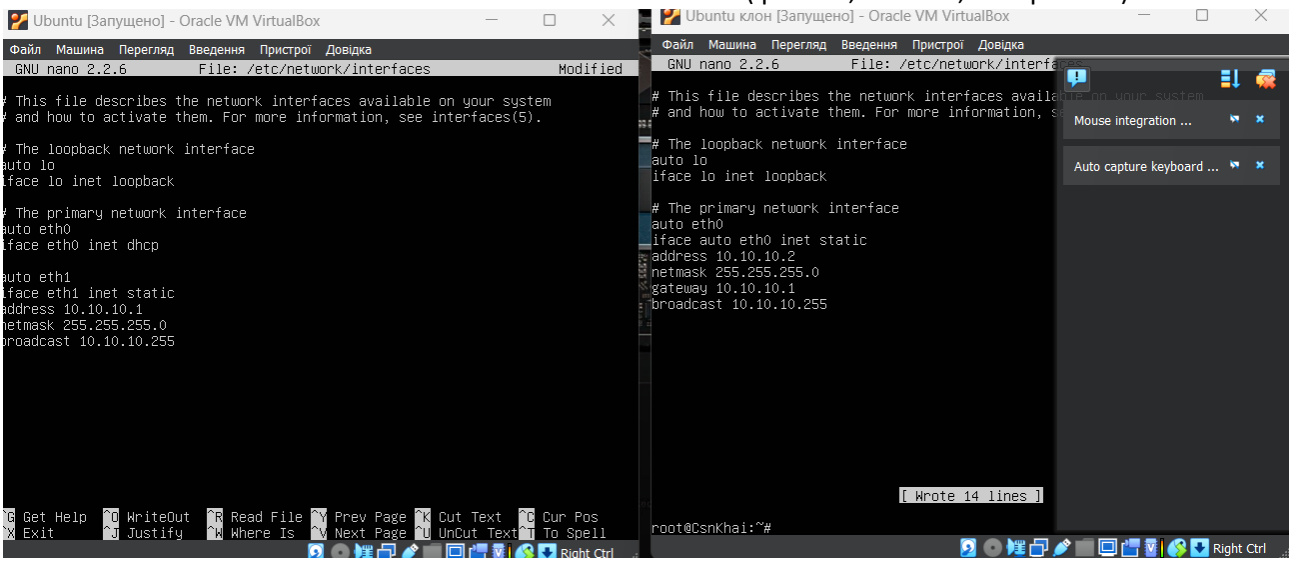
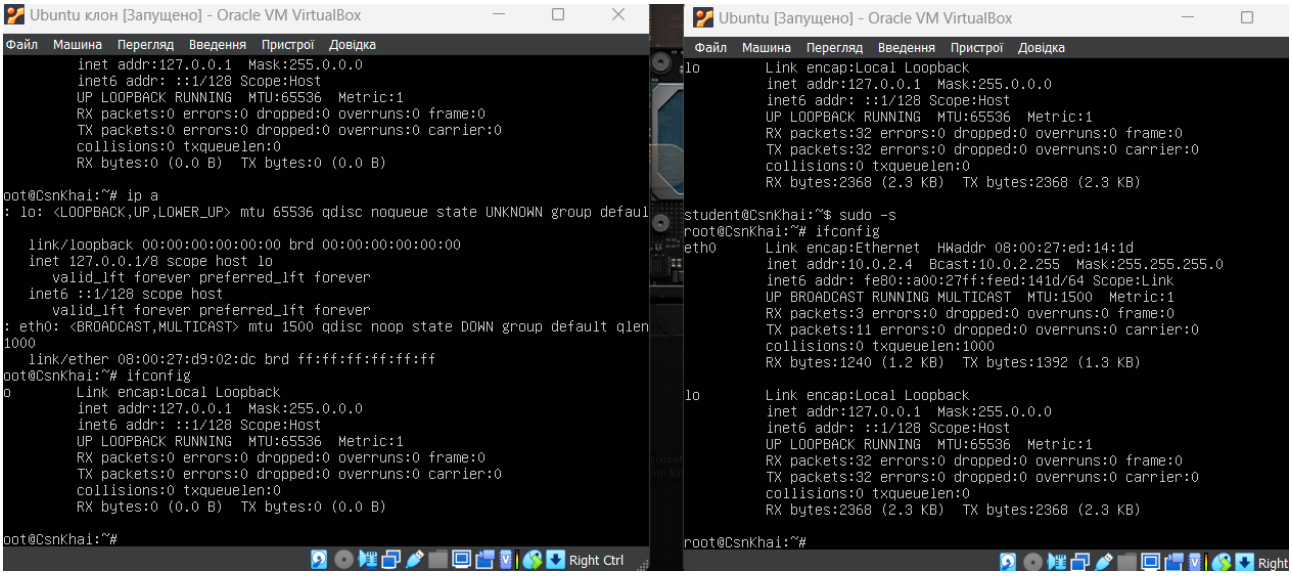


Figure 1 – VMs connection

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).





Uncomment the line in /etc/sysctl.conf

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

 Note: This may impact IPv6 TCP sessions too
net.ipv4.tcp_syncookies=1

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

Configure iptables

```
root@CsnKhai:~# iptables -S
-P INPUT ACCEPT
-P FORWARD ACCEPT
-P OUTPUT ACCEPT
-A FORWARD -i eth1 -o eth0 -m state --state RELATED,ESTABLISHED -j ACCEPT
-A FORWARD -i eth1 -o eth0 -j ACCEPT
root@CsnKhai:~#
```

3. Check the route from VM2 to Host.

```
root@CsnKhai:~# route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         10.0.2.1        0.0.0.0         UG    0      0        0 eth0
10.0.2.0        *               255.255.255.0   U     0      0        0 eth0
root@CsnKhai:~#
```

Right Ctrl

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

```
root@CsnKhai:~# ping -c 7 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=114 time=101 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=114 time=22.7 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=114 time=22.3 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=114 time=24.7 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=114 time=22.4 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=114 time=22.2 ms
64 bytes from 8.8.8.8: icmp_seq=7 ttl=114 time=24.5 ms

--- 8.8.8.8 ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6009ms
rtt min/avg/max/mdev = 22.290/34.329/101.204/27.318 ms
root@CsnKhai:~# _
```

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

```
root@CsnKhai:~# dig -x 8.8.8.8

; <<>> DiG 9.9.5-3ubuntu0.5-Ubuntu <<>> -x 8.8.8.8
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 35419
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
;; QUESTION SECTION:
;8.8.8.8.in-addr.arpa.          IN      PTR

;; ANSWER SECTION:
8.8.8.8.in-addr.arpa.   73683   IN      PTR     dns.google.

;; Query time: 19 msec
;; SERVER: 192.168.1.1#53(192.168.1.1)
;; WHEN: Mon Aug 21 10:26:59 UTC 2023
;; MSG SIZE  rcvd: 73

root@CsnKhai:~#
```

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

```
root@CsnKhai:~# dig epam.com

; <<>> DiG 9.9.5-3ubuntu0.5-Ubuntu <<>> epam.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 36201
;; 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.               905     IN      A       3.214.134.159

;; Query time: 16 msec
;; SERVER: 192.168.1.1#53(192.168.1.1)
;; WHEN: Mon Aug 21 10:27:41 UTC 2023
;; MSG SIZE  rcvd: 53

root@CsnKhai:~#
```

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

```
root@CsnKhai:~# ip route
default via 10.0.2.1 dev eth0
10.0.2.0/24 dev eth0  proto kernel  scope link  src 10.0.2.4
root@CsnKhai:~#
```

8. Trace the route to google.com.

```
root@CsnKhai:~# traceroute google.com
traceroute to google.com (142.250.203.206), 30 hops max, 60 byte packets
 1  10.0.2.2 (10.0.2.2)  0.475 ms  0.414 ms  0.398 ms^[S
```