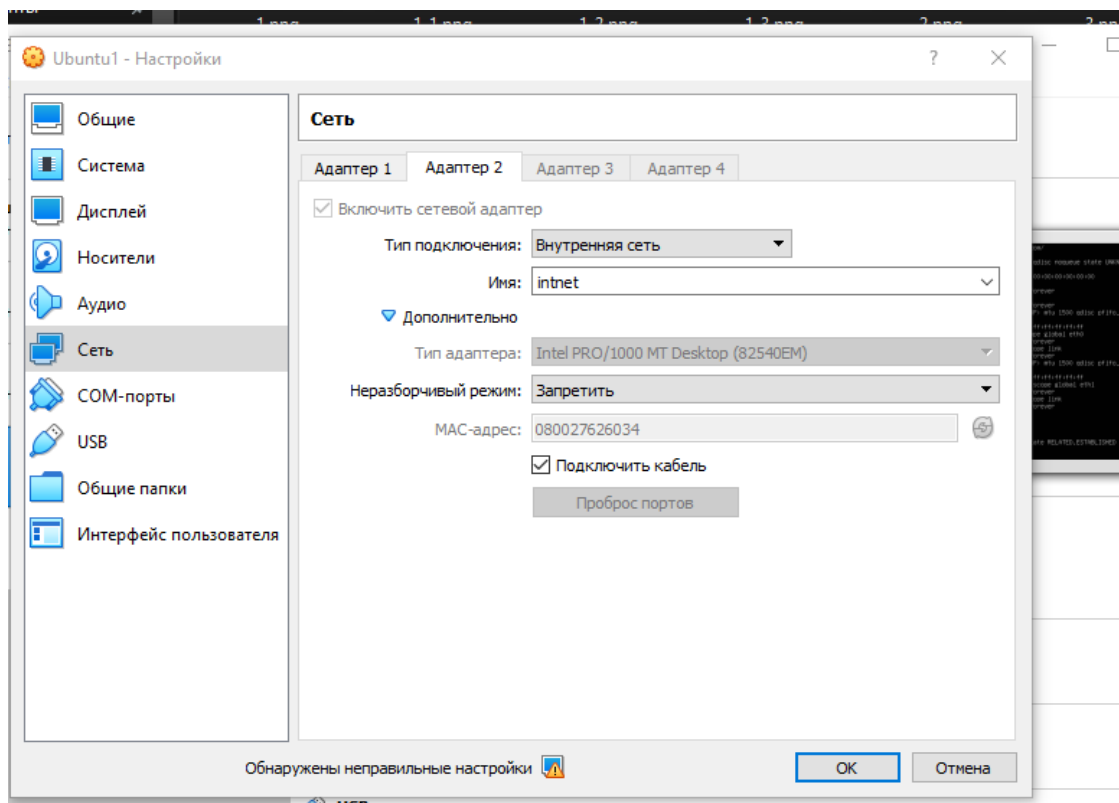
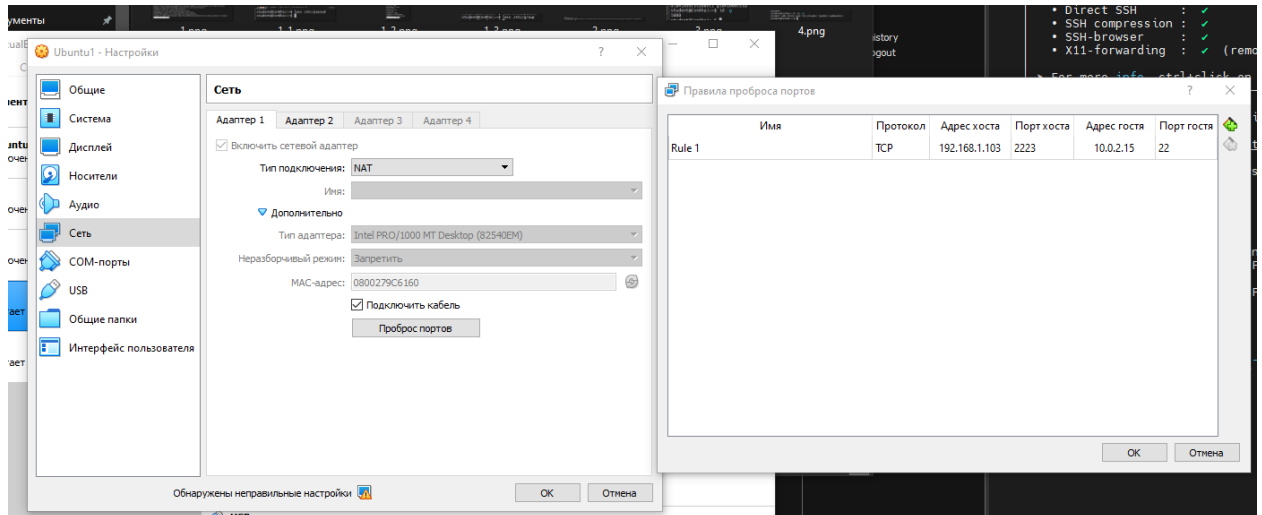
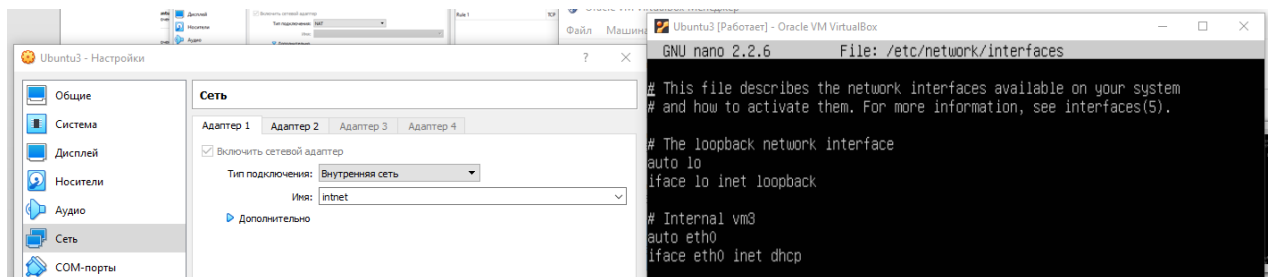
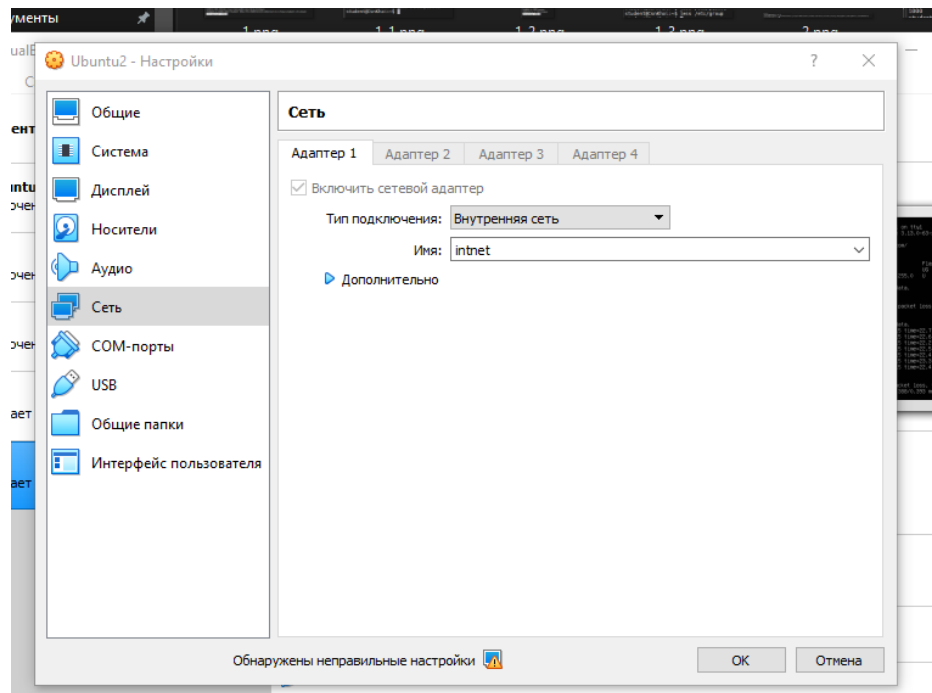


Task №2

1. Use already created internal-network for three VMs (VM1-VM3). VM1 has NAT and internal, VM2, VM3 – internal only interfaces.





2. Install and configure DHCP server on VM1. (3 ways: using VBoxManage, DNSMASQ and ISC-DHSPSERVER). You should use at least 2 of them.

```

interface
student@CsnKhai:~$ sudo cat /etc/dnsmasq.conf | grep interface
# 10.1.2.3 to 192.168.1.1 port 55 (there must be a interface with that
# specified interfaces (and the loopback) give the name of the
# interface (eg eth0) here.
# Repeat the line for more than one interface.
interface=eth1
# Or you can specify which interface _not_ to listen on
#except-interface=
# If you want dnsmasq to provide only DNS service on an interface,
#no-dhcp-interface=
# even when it is listening on only some interfaces. It then discards
# working even when interfaces come and go and change address. If you
# want dnsmasq to really bind only the interfaces it is listening on,
#bind-interfaces
# that these two Ethernet interfaces will never be in use at the same
student@CsnKhai:~$

```

```
#log-dhcp
student@CsnKhai:~$ sudo cat /etc/dnsmasq.conf | grep dhcp-range
dhcp-range=10.10.10.10,10.10.10.20,12h
#dhcp-range=192.168.0.50,192.168.0.150,255.255.255.0,12h
#dhcp-range=set:red,192.168.0.50,192.168.0.150
#dhcp-range=tag:green,192.168.0.50,192.168.0.150,12h
# dhcp-host declarations will be ignored unless there is a dhcp-range
#dhcp-range=192.168.0.0,static
#dhcp-range=1234::2, 1234::500, 64, 12h
#dhcp-range=1234::, ra-only
#dhcp-range=1234::, ra-names
#dhcp-range=1234::, ra-only, 48h
#dhcp-range=1234::2, 1234::500, slaac
#dhcp-range=1234::, ra-stateless
#dhcp-range=1234::, ra-stateless, ra-names
# (see dhcp-range for the declaration of the "red" network)
student@CsnKhai:~$
```

Ubuntu1 [Работаer] - Oracle VM VirtualBox

GNU nano 2.2.6

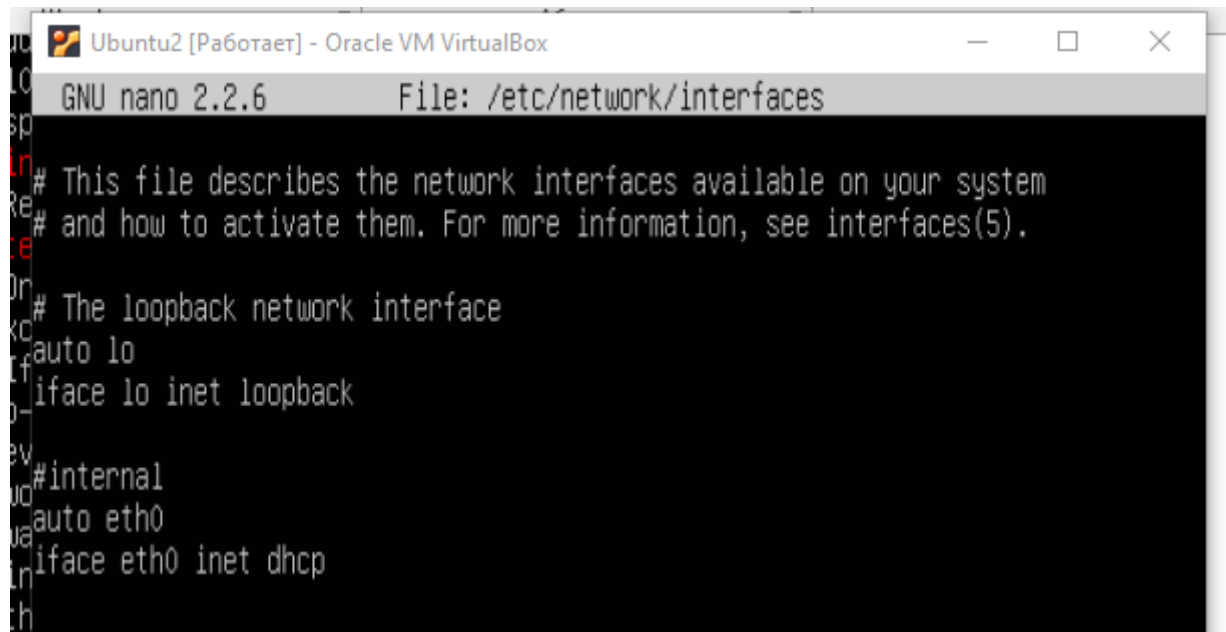
File: /etc/dhcp/dhclient.conf

Modified

```
# Configuration file for /sbin/dhclient, which is included in Debian's
#   dhcp3-client package.
#
# This is a sample configuration file for dhclient. See dhclient.conf's
#   man page for more information about the syntax of this file
#   and a more comprehensive list of the parameters understood by
#   dhclient.
#
# Normally, if the DHCP server provides reasonable information and does
#   not leave anything out (like the domain name, for example), then
#   few changes must be made to this file, if any.
#
option rfc3442-classless-static-routes code 121 = array of unsigned integer 8;

#send host-name "andare.fugue.com";
send host-name = gethostname();
#send dhcp-client-identifier 1:0:a0:24:ab:fb:9c;
#send dhcp-lease-time 3600;
#supersede domain-name "fugue.com home.vix.com";
prepend domain-name-servers 127.0.0.1;
request subnet-mask, broadcast-address, time-offset, routers,
       domain-name, domain-name-servers, domain-search, host-name,
       dhcp6.name-servers, dhcp6.domain-search,
       netbios-name-servers, netbios-scope, interface-mtu,
```

3. Check VM2 and VM3 for obtaining network addresses from DHCP server.

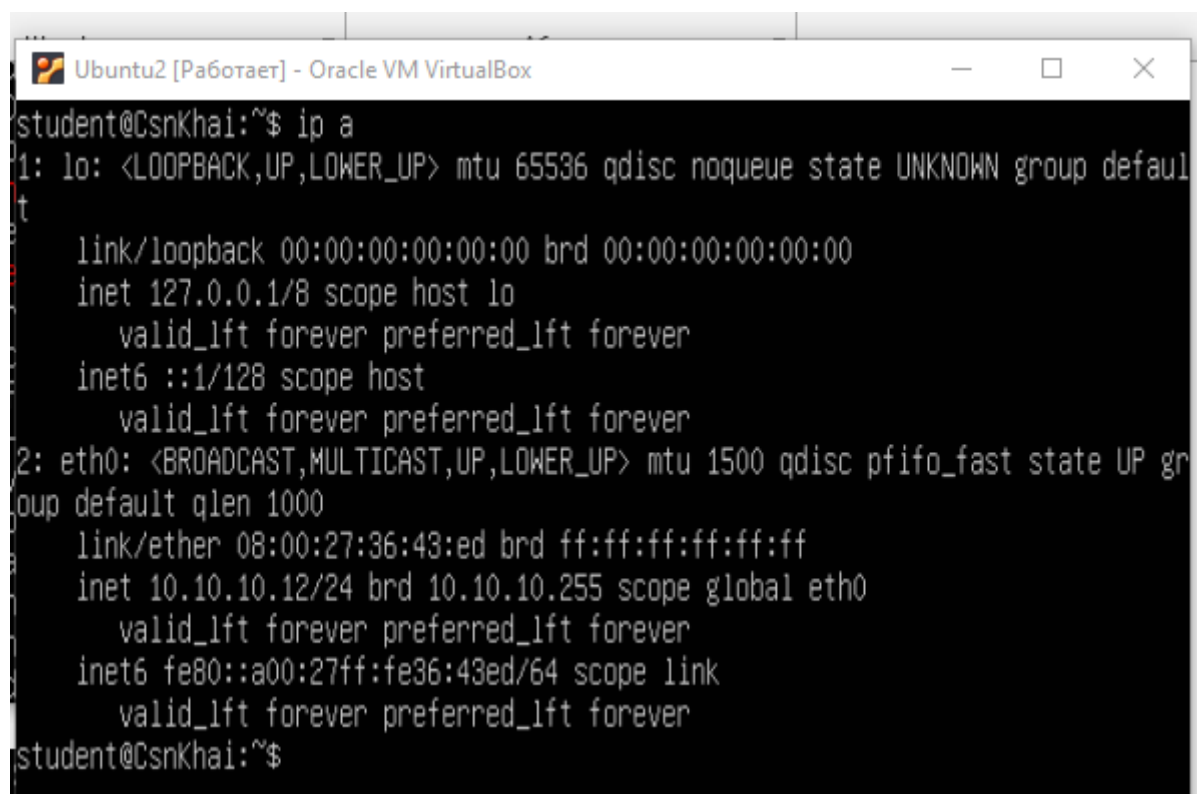


```
Ubuntu2 [Работает] - Oracle VM VirtualBox
GNU nano 2.2.6      File: /etc/network/interfaces

# 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 dhcp
```



```
Ubuntu2 [Работает] - Oracle VM VirtualBox
student@CsnKhai:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 08:00:27:36:43:ed brd ff:ff:ff:ff:ff:ff
    inet 10.10.10.12/24 brd 10.10.10.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:fe36:43ed/64 scope link
        valid_lft forever preferred_lft forever
student@CsnKhai:~$
```

```
Ubuntu3 [Работаer] - Oracle VM VirtualBox
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 vm3
auto eth0
iface eth0 inet dhcp
```

```
Ubuntu3 [Работаer] - Oracle VM VirtualBox
student@CsnKhai:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 08:00:27:e4:82:49 brd ff:ff:ff:ff:ff:ff
    inet 10.10.10.11/24 brd 10.10.10.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:fee4:8249/64 scope link
        valid_lft forever preferred_lft forever
student@CsnKhai:~$ _
```

4. Using existed network for three VMs (from p.1) install and configure DNS server on VM1. (You can use DNSMASQ, BIND9 or something else).

```
Ubuntu1 [Работает] - Oracle VM VirtualBox
GNU nano 2.2.6      File: /etc/resolv.conf

# Dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8)
#     DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN
nameserver 127.0.0.1
```

```
Ubuntu1 [Работает] - Oracle VM VirtualBox
GNU nano 2.2.6      File: /etc/dhcp/dhclient.conf

# Configuration file for /sbin/dhclient, which is included in Debian's
#     dhcp3-client package.
#
# This is a sample configuration file for dhclient. See dhclient.conf's
#     man page for more information about the syntax of this file
#     and a more comprehensive list of the parameters understood by
#     dhclient.
#
# Normally, if the DHCP server provides reasonable information and does
#     not leave anything out (like the domain name, for example), then
#     few changes must be made to this file, if any.
#

option rfc3442-classless-static-routes code 121 = array of unsigned integer 8;

#send host-name "andare.fugue.com";
send host-name = gethostname();
#send dhcp-client-identifier 1:0:a0:24:ab:fb:9c;
#send dhcp-lease-time 3600;
#supersede domain-name "fugue.com home.vix.com";
prepend domain-name-servers 127.0.0.1;
request subnet-mask, broadcast-address, time-offset, routers,
       domain-name, domain-name-servers, domain-search, host-name,
       dhcp6.name-servers, dhcp6.domain-search,
       netbios-name-servers, netbios-scope, interface-mtu,
[ Read 56 lines ]
```

5. Check VM2 and VM3 for gaining access to DNS server (naming services).

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

;<> DiG 9.9.5-3ubuntu0.5-Ubuntu <> google.com
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 55272
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;google.com.                IN      A

;; ANSWER SECTION:
google.com.                191     IN      A      142.250.180.238

;; Query time: 2 msec
;; SERVER: 10.10.10.1#53(10.10.10.1)
;; WHEN: Mon Dec 27 11:56:02 UTC 2021
;; MSG SIZE rcvd: 44

student@CsnKhai:~$ _

Ubuntu 14.04.3 LTS CsnKhai tty1
CsnKhai login: student
Password:
Last login: Mon Dec 27 12:46:35 UTC 2021 on tty1
Welcome to Ubuntu 14.04.3 LTS (GNU/Linux 3.13.0-63-generic i686)

* Documentation:  https://help.ubuntu.com/
student@CsnKhai:~$ dig google.com

;<> DiG 9.9.5-3ubuntu0.5-Ubuntu <> google.com
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 45719
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags: 0; udp: 4096
;; QUESTION SECTION:
;google.com.                IN      A

;; ANSWER SECTION:
google.com.                204     IN      A      142.250.180.238

;; Query time: 9 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Mon Dec 27 12:56:24 UTC 2021
;; MSG SIZE rcvd: 55

student@CsnKhai:~$
```

```
student@CsnKhai:~$ dig g.co

;<> DiG 9.9.5-3ubuntu0.5-Ubuntu <> g.co
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 45516
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;g.co.                      IN      A

;; ANSWER SECTION:
g.co.                      231     IN      A      142.250.180.238

;; Query time: 3 msec
;; SERVER: 10.10.10.1#53(10.10.10.1)
;; WHEN: Mon Dec 27 11:57:20 UTC 2021
;; MSG SIZE rcvd: 38

student@CsnKhai:~$ _

student@CsnKhai:~$ dig g.co

;<> DiG 9.9.5-3ubuntu0.5-Ubuntu <> g.co
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 49411
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

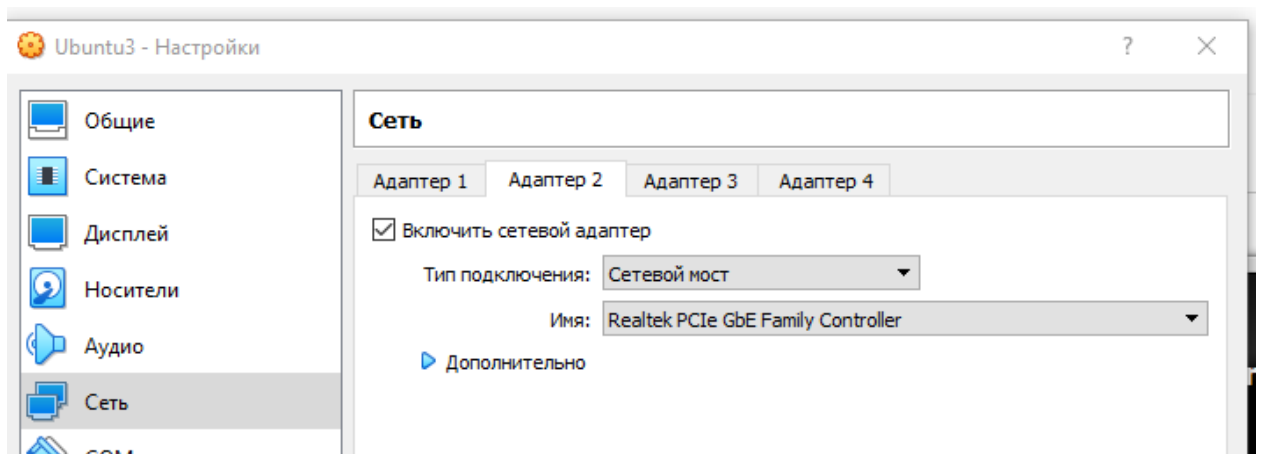
;; QUESTION SECTION:
;g.co.                      IN      A

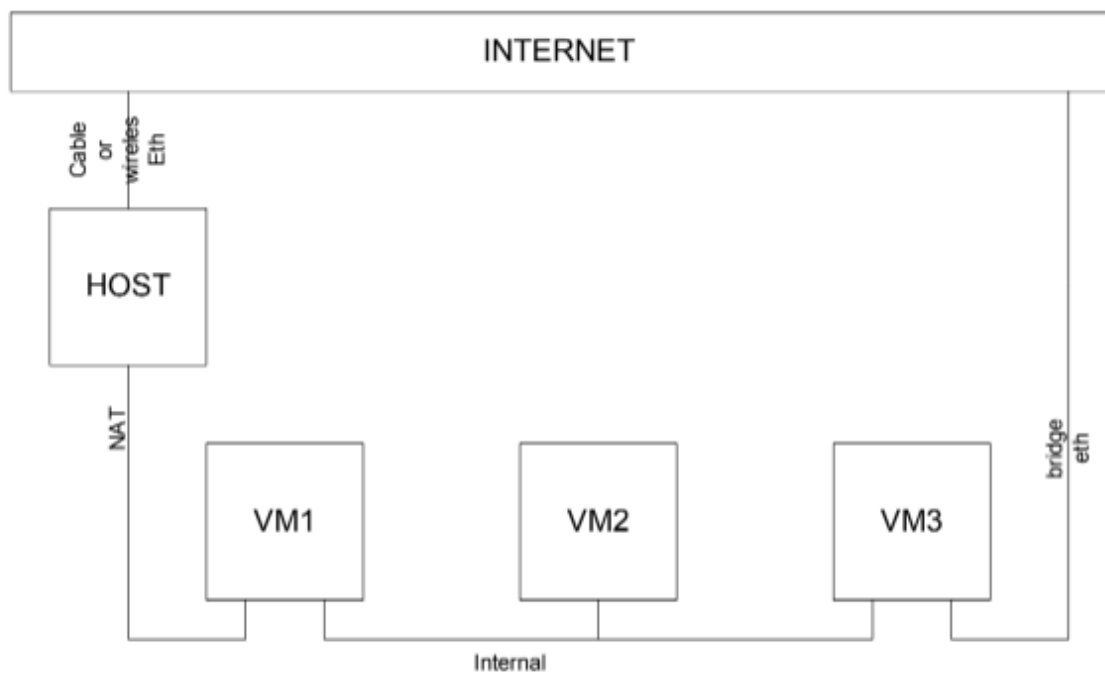
;; ANSWER SECTION:
g.co.                      226     IN      A      142.250.180.238

;; Query time: 0 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Mon Dec 27 12:58:00 UTC 2021
;; MSG SIZE rcvd: 38

student@CsnKhai:~$ _
```

6. ***Using the scheme which follows, configure dynamic routing using OSPF protocol.





7. Check results.

```
Ubuntu3 [Работаer] - Oracle VM VirtualBox
student@CsnKhai:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 08:00:27:e4:82:49 brd ff:ff:ff:ff:ff:ff
    inet 10.10.10.11/24 brd 10.10.10.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:fee4:8249/64 scope link
        valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default qlen 1000
    link/ether 08:00:27:bd:ea:40 brd ff:ff:ff:ff:ff:ff
student@CsnKhai:~$ _
```