Task.Networking.2

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

```
🟏 VM1 [Запущено] - Oracle VM VirtualBox
                                                Довідка
        Машина
                 Перегляд
                            Введення
                                      Пристрої
student@CsnKhai:~$ ifconfig
         Link encap:Ethernet HWaddr 08:00:27:ed:14:1d
eth0
          inet addr:10.0.2.15 Bcast:10.0.2.255 Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:feed:141d/64 Scope:Link
         UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
         RX packets:68 errors:0 dropped:0 overruns:0 frame:0
         TX packets:78 errors:0 dropped:0 overruns:0 carrier:0
         collisions:0 txqueuelen:1000
         RX bytes:7456 (7.4 KB) TX bytes:7296 (7.2 KB)
eth1
         Link encap:Ethernet HWaddr 08:00:27:6d:16:d3
          inet addr:10.10.10.1 Bcast:10.10.10.255 Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:fe6d:16d3/64 Scope:Link
         UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
         RX packets:0 errors:0 dropped:0 overruns:0 frame:0
         TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
         collisions:0 txqueuelen:1000
         RX bytes:0 (0.0 B) TX bytes:648 (648.0 B)
```

🏏 VM2 [Запущено] - Oracle VM VirtualBox

🏏 VM3 [Запущено] - Oracle VM VirtualBox

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

DNSMASQ:

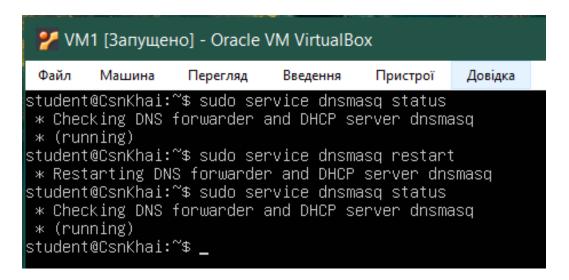
```
🟏 VM1 [Запущено] - Oracle VM VirtualBox
 Файл
        Машина
                  Перегляд
                             Введення
                                       Пристрої
                                                  Довідка
student@CsnKhai:~$ sudo apt install dnsmasq
[sudo] password for student:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libpvm3 libreadline-dev libreadline6-dev libtinfo-dev pvm
Use 'apt–get autoremove' to remove them.
The following extra packages will be installed:
 dnsmasq-base libmn10 libnetfilter-conntrack3
The following NEW packages will be installed:
 dnsmasq dnsmasq-base libmn10 libnetfilter-conntrack3
O upgraded, 4 newly installed, O to remove and 187 not upgraded.
Need to get 325 kB of archives.
After this operation, 970 kB of additional disk space will be u<u>s</u>ed.
Do you want to continue? [Y/n] ^[s
```

/etc/dnsmasq.conf:

```
# Repeat the line for more than one interface.
interface=eth1
# Or you can specify which interface not to

# service.
dhcp-range=10.10.10.10.10.10.10.20,12h
```

Restarting service:



Modifying /etc/network/interfaces on VM2 and VM3:

```
# 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

# The primary network interface auto eth0 iface eth0 inet dhcp address 10.10.10.2 netmask 255.255.255.0 broadcast 10.10.10.255 gateway 10.10.10.1
```

Checking result after interfaces restart:

```
student@CsnKhai:~$ sudo ifdown eth0
Internet Systems Consortium DHCP Client 4.2.4
Copyright 2004–2012 Internet Systems Consortium.
All rights reserved.
For info, please visit https://www.isc.org/software/dhcp/
Listening on LPF/eth0/08:00:27:ed:14:1d
Sending on LPF/eth0/08:00:27:ed:14:1d
Sending on Socket/fallback
DHCPRELEASE on eth0 to 192.168.0.1 port 67 (xid=0x28a9456f)
student@CsnKhai:~$ sudo ifup eth0
Internet Systems Consortium DHCP Client 4.2.4
Copyright 2004–2012 Internet Systems Consortium.
All rights reserved.
For info, please visit https://www.isc.org/software/dhcp/
Listening on LPF/ethO/O8:OO:27:ed:14:1d
Sending on LPF/eth0/08:00:27:ed:14:1d
Sending on
            Socket/fallback
DHCPDISCOVER on eth0 to 255.255.255.255 port 67 interval 3 (xid=0x6677415b)
DHCPREQUEST of 10.10.10.20 on eth0 to 255.255.255 port 67 (xid=0x5b417766)
DHCPOFFER of 10.10.10.20 from 10.10.10.1
DHCPACK of 10.10.10.20 from 10.10.10.1
bound to 10.10.10.20 -- renewal in 17707 seconds.
student@CsnKhai:~$ _
```

```
🟏 VM2 [Запущено] - Oracle VM VirtualBox
 Файл
       Машина
                 Перегляд
                            Введення
                                      Пристрої
                                                 Довідка
student@CsnKhai:~$ ifconfig
         Link encap:Ethernet HWaddr 08:00:27:ed:14:1d
          inet addr:10.10.10.20 Bcast:10.10.10.255 Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:feed:141d/64 Scope:Link
         UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
         RX packets:31 errors:0 dropped:0 overruns:0 frame:0
         TX packets:46 errors:0 dropped:0 overruns:0 carrier:0
         collisions:0 txqueuelen:1000
         RX bytes:3219 (3.2 KB) TX bytes:4598 (4.5 KB)
```

```
🟏 VM3 [Запущено] - Oracle VM VirtualBox
 Файл
        Машина
                 Перегляд
                            Введення
                                      Пристрої
                                                 Довідка
student@CsnKhai:~$ ifconfig
         Link encap:Ethernet HWaddr 08:00:27:7d:a6:07
         inet addr:10.10.10.17 Bcast:10.10.10.255 Mask:255.255.255.0
         inet6 addr: fe80::a00:27ff:fe7d:a607/64 Scope:Link
         UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
         RX packets:41 errors:0 dropped:0 overruns:0 frame:0
         TX packets:56 errors:0 dropped:0 overruns:0 carrier:0
         collisions:0 txqueuelen:1000
         RX bytes:4467 (4.4 KB) TX bytes:5452 (5.4 KB)
```

Now let's configure ISC-DHSPSERVER:

```
VM1 [Запущено] - Oracle VM VirtualBox
 Файл
        Машина
                  Перегляд
                            Введення
                                       Пристрої
                                                 Довідка
student@CsnKhai:~$ sudo apt install isc–dhcp–server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
 libpvm3 libreadline-dev libreadline6-dev libtinfo-dev pvm
Jse 'apt–get autoremove' to remove them.
The following extra packages will be installed:
 isc-dhcp-client isc-dhcp-common
Suggested packages:
 avahi-autoipd isc-dhcp-server-ldap
The following NEW packages will be installed:
 isc-dhcp-server
The following packages will be upgraded:
 isc-dhcp-client isc-dhcp-common
2 upgraded, 1 newly installed, O to remove and 185 not upgraded.
Need to get 2,066 kB of archives.
After this operation, 2,282 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Configuring /etc/dhcp/dhcpd.conf:

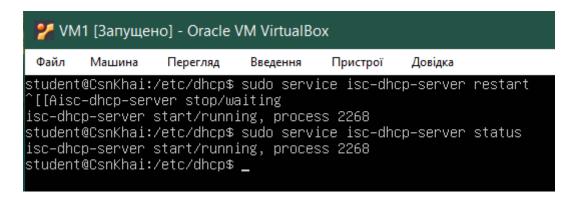
```
# DHCP server to understand the network topology.

subnet 10.10.10.0 netmask 255.255.255.0 {
    range 10.10.10.35 10.10.10.45;
    option routers 10.10.10.1;
}
```

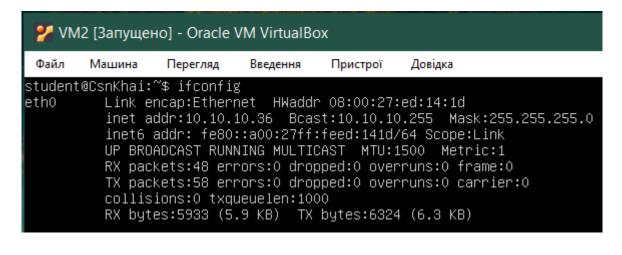
And interface in /etc/default/isc-dhcp-server:

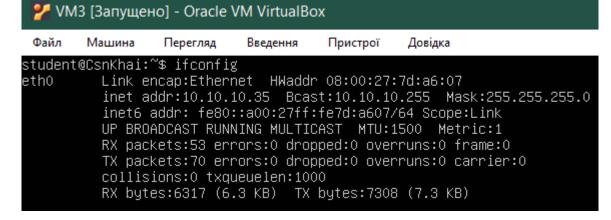
```
# On what interfaces should the DHCP server (dhcpd) serve DHCP requests?
# Separate multiple interfaces with spaces, e.g. "ethO eth1".
INTERFACES="eth1"
```

Restarting service:

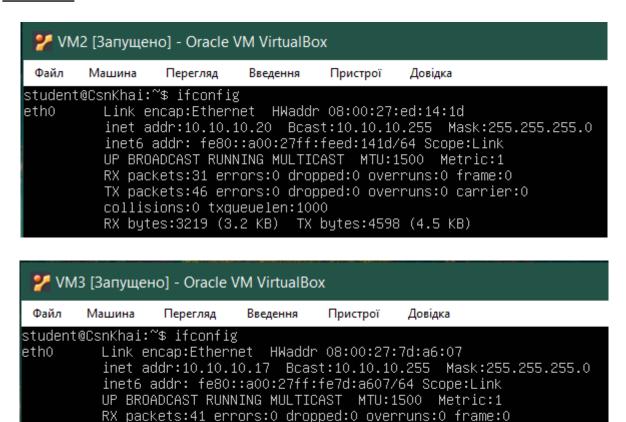


Checking VM2 and VM3 for obtaining ip:





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



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

TX packets:56 errors:0 dropped:0 overruns:0 carrier:0

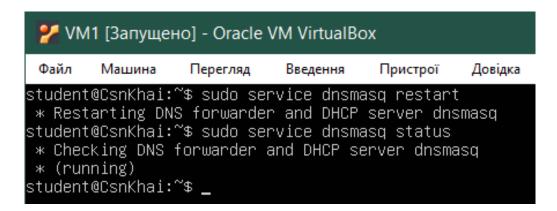
RX bytes:4467 (4.4 KB) TX bytes:5452 (5.4 KB)

collisions:O txqueuelen:1000

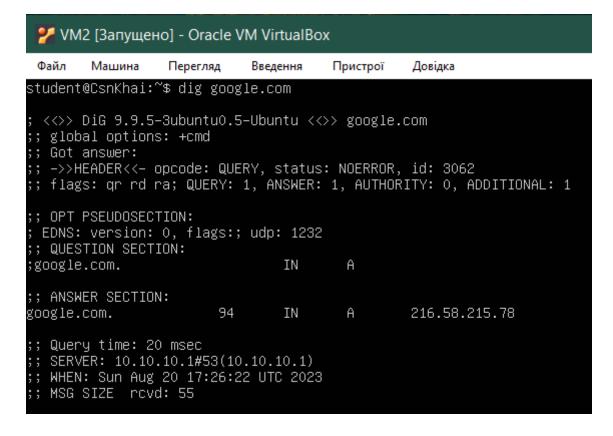
/etc/dhcp/dhclient.conf:

```
#supersede domain-name "fugue.com home.vix.com";
prepend domain-name-servers 127.0.0.1;
```

Restarting:



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



VM3 [Запущено] - Oracle VM VirtualBox Перегляд Файл Машина Введення Пристрої Довідка student@CsnKhai:~\$ nslookup dou.ua Server: 10.10.10.1 Address: 10.10.10.1#53 Non–authoritative answer: Name: dou.ua Address: 104.22.52.237 Name: dou.ua Address: 104.22.53.237 Name: dou.ua Address: 172.67.21.118