

## Task 2

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

VM1 - Настройки

Сеть

Адаптер 1   Адаптер 2   Адаптер 3   Адаптер 4

☒ Включить сетевой адаптер

Тип подключения: Внутренняя сеть

Имя: intnet

Дополнительно

VM1 - Настройки

Сеть

Адаптер 1   Адаптер 2   Адаптер 3   Адаптер 4

☒ Включить сетевой адаптер

Тип подключения: NAT

Имя:

Дополнительно

VM2 - Настройки

Сеть

Адаптер 1   Адаптер 2   Адаптер 3   Адаптер 4

☒ Включить сетевой адаптер

Тип подключения: Внутренняя сеть

Имя: intnet

Дополнительно

VM3 - Настройки

Сеть

Адаптер 1   Адаптер 2   Адаптер 3   Адаптер 4

☒ Включить сетевой адаптер

Тип подключения: Внутренняя сеть

Имя: intnet

Дополнительно

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

```
GNU nano 2.2.6      File: /etc/dnsmasq.conf      Modified

# and this sets the source (ie local) address used to talk to
# 10.1.2.3 to 192.168.1.1 port 55 (there must be a interface with that
# IP on the machine, obviously).
# server=10.1.2.3@192.168.1.1#55

# If you want dnsmasq to change uid and gid to something other
# than the default, edit the following lines.
#user=
#group=

# If you want dnsmasq to listen for DHCP and DNS requests only on
# specified interfaces (and the loopback) give the name of the
# interface (eg eth0) here.
# Repeat the line for more than one interface.
interface=eth1
```

GNU nano 2.2.6 File: /etc/dnsmasq.conf

```
# 3) Provides the domain part for "expand-hosts"
#domain=thekelleys.org.uk

# Set a different domain for a particular subnet
#domain=wireless.thekelleys.org.uk,192.168.2.0/24

# Same idea, but range rather than subnet
#domain=reserved.thekelleys.org.uk,192.68.3.100,192.168.3.200

# Uncomment this to enable the integrated DHCP server, you need
# to supply the range of addresses available for lease and optionally
# a lease time. If you have more than one network, you will need to
# repeat this for each network on which you want to supply DHCP
# service.
dhcp-range=10.10.10.10,10.10.10.20,12h
```

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
```

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,
```

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

```
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
#address 10.10.10.2
#netmask 255.255.255.0
#broadcast 10.10.10.255
#gateway 10.10.10.1
```

```
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
```

### 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).

Already done at point 2

```
student@CsnKhai:~$ sudo iptables -S
[sudo] password for student:
-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
student@CsnKhai:~$
```

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

```
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: 42187
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

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

;; ANSWER SECTION:
g.co.                 237     IN      A      142.251.39.78

;; Query time: 13 msec
;; SERVER: 10.10.10.1#53(10.10.10.1)
;; WHEN: Sat Nov 20 22:10:52 UTC 2021
;; MSG SIZE  rcvd: 38
```

```
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: 26974
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

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

;; ANSWER SECTION:
g.co.                 300     IN      A      142.251.39.78

;; Query time: 243 msec
;; SERVER: 10.10.10.1#53(10.10.10.1)
;; WHEN: Sat Nov 20 22:09:22 UTC 2021
;; MSG SIZE  rcvd: 49
```

```
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: 47236
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

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

;; ANSWER SECTION:
g.co.                 211     IN      A      142.251.39.78

;; Query time: 15 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Sat Nov 20 22:10:51 UTC 2021
;; MSG SIZE  rcvd: 38
```