University of Antwerp
Faculty of Applied Engineering

Sten Hulsbergen - 20242689

Session 8

1.

Configuring a `nat-network.xml` and defining a new network `nat-network` by using `sudo virsh net-define nat-network.xml`. Starting and autostart uses `sudo virsh net-start nat-network` and `sudo virsh net-autostart nat-network`.

To be able to to go and download files into `/var/lib/libvirt/images` it is necessary to be superuser. After downloading, installing and configuring the VM, there was a mistake with it's IP-address, which got fixed by changing it from `192.168.200.1` to `192.168.200.2`.

2.

Log in to `root` and run `apt-get install sudo` to be able to use the sudo-command, after that add the *dhcpserver* to *sudoers-group* with `adduser dhcpserver sudo`.

Use `sudo virsh detach-interface dhcp network 52:54:00:ff:d4:5a` to detach `nat-network` from the VM.

Configuring a `internal-network.xml` and defining a new network `internal-network` by using `sudo virsh net-define internal-network.xml`. Starting and autostart uses `sudo virsh net-start internal-network` and `sudo virsh net-autostart internal-network`.

Use `sudo virsh attach-interface --type network --source internal-network --model virtio dhcp --persistent` to attach `internal-network` to the VM.

Make a backup of the current kea-dhcp4 config with `cp /etc/kea/kea-dhcp4.conf /etc/kea/kea-dhcp4.conf.bak` and change the configuration to what is necessary.

3.

After everything is setup and loaded, the interfaces look like the following:

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    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 noprefixroute
       valid_lft forever preferred_lft forever
6: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 52:54:00:9a:27:06 brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.1/24 brd 192.168.1.255 scope global enp1s0
       valid_lft forever preferred_lft forever
    inet6 fe80::5054:ff:fe9a:2706/64 scope link
       valid_lft forever preferred_lft forever
```

4.

After configuring two more VM's, client1 and client2, and connecting them to `internal-network` will do nothing at first.

Use `sudo virsh attach-interface --type network --source internal-network --model virtio client(1/2) --persistent` to attach `internal-network` to the VM.

According to the exercise client1 will get a dynamic IP-address of `192.168.1.10-100` and client2 a static IP-address `192.168.1.111` which is outside the configured range.

Client1

Editing `/etc/network/interfaces` to the following will assign a dynamic IP.

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

source /etc/network/interfaces.d/*

# The loopback network interface
auto lo
iface lo inet loopback

allow-hotplug enp1s0
iface enp1s0 inet dhcp
```

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    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 noprefixroute
       valid_lft forever preferred_lft forever
5: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 52:54:00:ba:58:ff brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.11/24 brd 192.168.1.255 scope global dynamic enp1s0
       valid_lft 599sec preferred_lft 599sec
    inet6 fe80::5054:ff:feba:58ff/64 scope link
       valid_lft forever preferred_lft forever
```

Client2

Editing `/etc/network/interfaces` to the following will assign a static IP.

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

source /etc/network/interfaces.d/*

# The loopback network interface
auto lo
iface lo inet loopback

allow-hotplug enp1s0
iface enp1s0 inet static
address 192.168.1.111/24
gateway 192.168.1.254
# dns-* options are implemented by the resolvconf package, if installed
dns-nameservers 192.168.1.2
dns-search labnet.local
```

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    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 noprefixroute
       valid_lft forever preferred_lft forever
4: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 52:54:00:35:df:8c brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.111/24 brd 192.168.1.255 scope global enp1s0
       valid_lft forever preferred_lft forever
    inet6 fe80::5054:ff:fe35:df8c/64 scope link
       valid_lft forever preferred_lft forever
```

Logs

Systemctl shows the current logs of the DHCP-server service and it is clear to see an IP has been automatically allocated.

```
, cid=[no info], tid=0xbd49b31a: lease 192.168.1.11 will be advertised
cid=[no info], tid=0xbd49b31a: lease 192.168.1.11 has been allocated for 600
```

Journalctl shows all the past logs of the DHCP-server and the same logs appear in it.

```
, cid=[ff:00:ba:58:ff:00:01:00:01:2e:d1:33:5a:52:54:00:ba:58:ff], tid=0x34c0333
], cid=[no info], tid=0xbd49b31a: lease 192.168.1.11 will be advertised
, cid=[no info], tid=0xbd49b31a: lease 192.168.1.11 has been allocated for 600
```

Leases

The `kea-leases4.csv` shows all the leases and it is clear to see `192.168.1.11` has been leased to `52:54:00:BA:58:FF`.

```
address,hwaddr,client_id,valid_lifetime,expire,subnet_id,fqdn_fwd,fqdn_rev,hostname,state,user_context
192.168.1.11,52:54:00:ba:58:ff,ff:00:ba:58:ff:00:01:00:01:2e:d1:33:5a:52:54:00:ba:58:ff,600,1732148003,1,0,0,client1,0,
192.168.1.11,52:54:00:ba:58:ff,ff:00:ba:58:ff:00:01:00:01:2e:d1:33:5a:52:54:00:ba:58:ff,600,1732148241,1,0,0,client1,0,
192.168.1.11,52:54:00:ba:58:ff,,600,1732148317,1,0,0,client1,0,
192.168.1.11,52:54:00:ba:58:ff,ff:00:ba:58:ff:00:01:00:01:2e:d1:33:5a:52:54:00:ba:58:ff,600,1732148478,1,0,0,client1,0,
192.168.1.11,52:54:00:ba:58:ff,,600,1732148608,1,0,0,client1,0,
```

Renew DHCP

After using `dhclient -r` and `dhclient` on client1, nothing changes, the IP was already dynamic and stayed `192.168.1.11`.

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    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 noprefixroute
       valid_lft forever preferred_lft forever
5: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 52:54:00:ba:58:ff brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.11/24 brd 192.168.1.255 scope global dynamic enp1s0
       valid_lft 599sec preferred_lft 599sec
    inet6 fe80::5054:ff:feba:58ff/64 scope link
       valid_lft forever preferred_lft forever
```

After using `dhclient -r` and `dhclient` on client2 however, did remove the static allocation and changed it to dynamic allocation, the IP-address went from `192.168.1.111` to `192.168.1.10` because of the DHCP-server.

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    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 noprefixroute
       valid_lft forever preferred_lft forever
4: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 52:54:00:35:df:8c brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.10/24 brd 192.168.1.255 scope global dynamic enp1s0
       valid_lft 597sec preferred_lft 597sec
    inet6 fe80::5054:ff:fe35:df8c/64 scope link
       valid_lft forever preferred_lft forever
```