Installing and configuring DHCP

The Dynamic Host Configuration Protocol is a network management protocol used on UDP/IP networks whereby a DHCP server dynamically assigns an IP address and other network configuration parameters to each device on a network so they can communicate with other IP networks.

In lab 4, students are suppose to install and configure DHCP server in Centos and check it with using Fedora.

Step 1

Disable the DHCP settings in VMnet 2.

Step 2

Installing DHCP in Centos.

To install DHCP server on CentOS, enter the following command

```
$ yum install –y dhcp
```

```
================================================================================================================================================
Install  1 Package
Upgrade             ( 3 Dependent packages)

Total download size: 1.1 M
Downloading packages:
Delta RPMs disabled because /usr/bin/applydeltarpm not installed.
warning: /var/cache/yum/x86_64/7/base/packages/dhcp-libs-4.2.5-68.el7.centos.1.x86_64.rpm: Header V3 RSA/SHA256 Signature, key ID f4a80eb5: NOKEY  00:00:11 ETA
Public key for dhcp-libs-4.2.5-68.el7.centos.1.x86_64.rpm is not installed
(1/4): dhcp-libs-4.2.5-68.el7.centos.1.x86_64.rpm                                                        | 131 kB  00:00:02
(2/4): dhclient-4.2.5-68.el7.centos.1.x86_64.rpm                                                         | 284 kB  00:00:03
(3/4): dhcp-common-4.2.5-68.el7.centos.1.x86_64.rpm                                                      | 175 kB  00:00:04
(4/4): dhcp-4.2.5-68.el7.centos.1.x86_64.rpm                                                             | 513 kB  00:00:07
------------------------------------------------------------------------------------------------------------------------------------------------
Total                                                                                  153 kB/s | 1.1 MB  00:00:07
Retrieving key from file:///etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-7
Importing GPG key 0xF4A80EB5:
 Userid     : "CentOS-7 Key (CentOS 7 Official Signing Key) <security@centos.org>"
 Fingerprint: 6341 ab27 53d7 8a78 a7c2 7bb1 24c6 a8a7 f4a8 0eb5
 Package    : centos-release-7-1.1503.el7.centos.2.8.x86_64 (@anaconda)
 From       : /etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-7
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Updating   : 12:dhcp-libs-4.2.5-68.el7.centos.1.x86_64                                                  1/7
  Updating   : 12:dhcp-common-4.2.5-68.el7.centos.1.x86_64                                                2/7
  Installing : 12:dhcp-4.2.5-68.el7.centos.1.x86_64                                                       3/7
  Updating   : 12:dhclient-4.2.5-68.el7.centos.1.x86_64                                                   4/7
  Cleanup    : 12:dhclient-4.2.5-36.el7.centos.x86_64                                                     5/7
  Cleanup    : 12:dhcp-common-4.2.5-36.el7.centos.x86_64                                                  6/7
  Cleanup    : 12:dhcp-libs-4.2.5-36.el7.centos.x86_64                                                    7/7
  Verifying  : 12:dhcp-4.2.5-68.el7.centos.1.x86_64                                                       1/7
  Verifying  : 12:dhcp-common-4.2.5-68.el7.centos.1.x86_64                                                2/7
  Verifying  : 12:dhclient-4.2.5-68.el7.centos.1.x86_64                                                   3/7
  Verifying  : 12:dhcp-libs-4.2.5-68.el7.centos.1.x86_64                                                  4/7
  Verifying  : 12:dhcp-libs-4.2.5-36.el7.centos.x86_64                                                    5/7
  Verifying  : 12:dhclient-4.2.5-36.el7.centos.x86_64                                                     6/7
  Verifying  : 12:dhcp-common-4.2.5-36.el7.centos.x86_64                                                  7/7

Installed:
  dhcp.x86_64 12:4.2.5-68.el7.centos.1

Dependency Updated:
  dhclient.x86_64 12:4.2.5-68.el7.centos.1          dhcp-common.x86_64 12:4.2.5-68.el7.centos.1          dhcp-libs.x86_64 12:4.2.5-68.el7.centos.1

Complete!
[root@mlb-dc1-centos7 ~]#
```

Step 3

Configuring DHCP settings.

Now we need to mention the interface details, which is going to be the DHCP interface.

To do that, edit file /etc/sysconfig/dhcpd

vi /etc/sysconfig/dhcpd

Now assign the network interface

You can use the line DHCPDARGS to do that

DHCPDARGS=eth0

```
DHCPDARGS=eno33554984_
~
~
~
```

Save and close the file.

Copy the sample dhcp configuration file to /etc/dhcp/ directory

cp /usr/share/doc/dhcp-4.1.1/dhcpd.conf.sample /etc/dhcp/dhcpd.conf

```
root@mlb-dc1-centos7 ~]# cp /usr/share/doc/dhcp-4.2.5/dhcpd.conf.example /etc/dhcp/dhcpd.conf
p: overwrite '/etc/dhcp/dhcpd.conf'? yes
```

Now, edit dhcpd.conf file,

vi /etc/dhcp/dhcpd.conf

Make the changes as shown below.

Set the domain name and domain-name servers

And,

If this DHCP server is the official DHCP server for the local network, you should uncomment the following line:

[...] authoritative; [...]

```
# dhcpd.conf
#
# Sample configuration file for ISC dhcpd
#

# option definitions common to all supported networks...
option domain-name "dsnm.sub";
option domain-name-servers server.unixmen.local;

default-lease-time 600;
max-lease-time 7200;

# Use this to enble / disable dynamic dns updates globally.
#ddns-update-style none;

# If this DHCP server is the official DHCP server for the local
# network, the authoritative directive should be uncommented.
authoritative;

# Use this to send dhcp log messages to a different log file (you also
# have to hack syslog.conf to complete the redirection).
log-facility local7;

# No service will be given on this subnet, but declaring it helps the
# DHCP server to understand the network topology.

subnet 10.152.187.0 netmask 255.255.255.0 {
}

# This is a very basic subnet declaration.

subnet 10.254.239.0 netmask 255.255.255.224 {
  range 10.254.239.10 10.254.239.20;
  option routers rtr-239-0-1.example.org, rtr-239-0-2.example.org;
}

# This declaration allows BOOTP clients to get dynamic addresses,
# which we don't really recommend.
```

Define the sunbet, range of ip addresses, domain and domain name servers like below:

[...] # A slightly different configuration for an internal subnet.
subnet 10.0.1.0 netmask 255.255.255.0 {
range 10.0.1.20 10.0.1.30;
option domain-name-servers server.unixmen.local;
2 option domain-name "dsnm.sub";
option routers 10.0.1.1;
option broadcast-address 10.0.1.255;
default-lease-time 600;

```
        max-lease-time 7200;
        }
[...]
```

```
# A slightly different configuration for an internal subnet.
subnet 10.0.1.0 netmask 255.255.255.0 {
  range 10.0.1.20 10.0.1.30;
  option domain-name-servers server.unixmen.local;
  option domain-name "dsnm.sub";
  option routers 10.0.1.1;
  option broadcast-address 10.0.1.255;
  default-lease-time 600;
  max-lease-time 7200;
}
```

After making all the changes you want, save and close the file. Be mindful that if you have another unused entries on the dhcpd.conf file, comment them. Otherwise, you'll have issues while starting dhcpd service.

Now, start the dhcpd service and make it to start automatically on every reboot.

```
service dhcpd start
```

If you want to start up the DHCP server at logon to the server session use;

```
chkconfig dhcpd on
```

```
/etc/sysconfig/dhcpd" 20L, 913C written
root@mlb-dc1-centos7 ~]# service dhcpd start
edirecting to /bin/systemctl start  dhcpd.service
root@mlb-dc1-centos7 ~]# chkconfig dhcpd on
ote: Forwarding request to 'systemctl enable dhcpd.service'.
n -s '/usr/lib/systemd/system/dhcpd.service' '/etc/systemd/system/multi-user.target.wants/dhcp
root@mlb-dc1-centos7 ~]#
```

Step 4

Checking the status of DHCP server and client.

You can use the following command and check the DHCP server status.

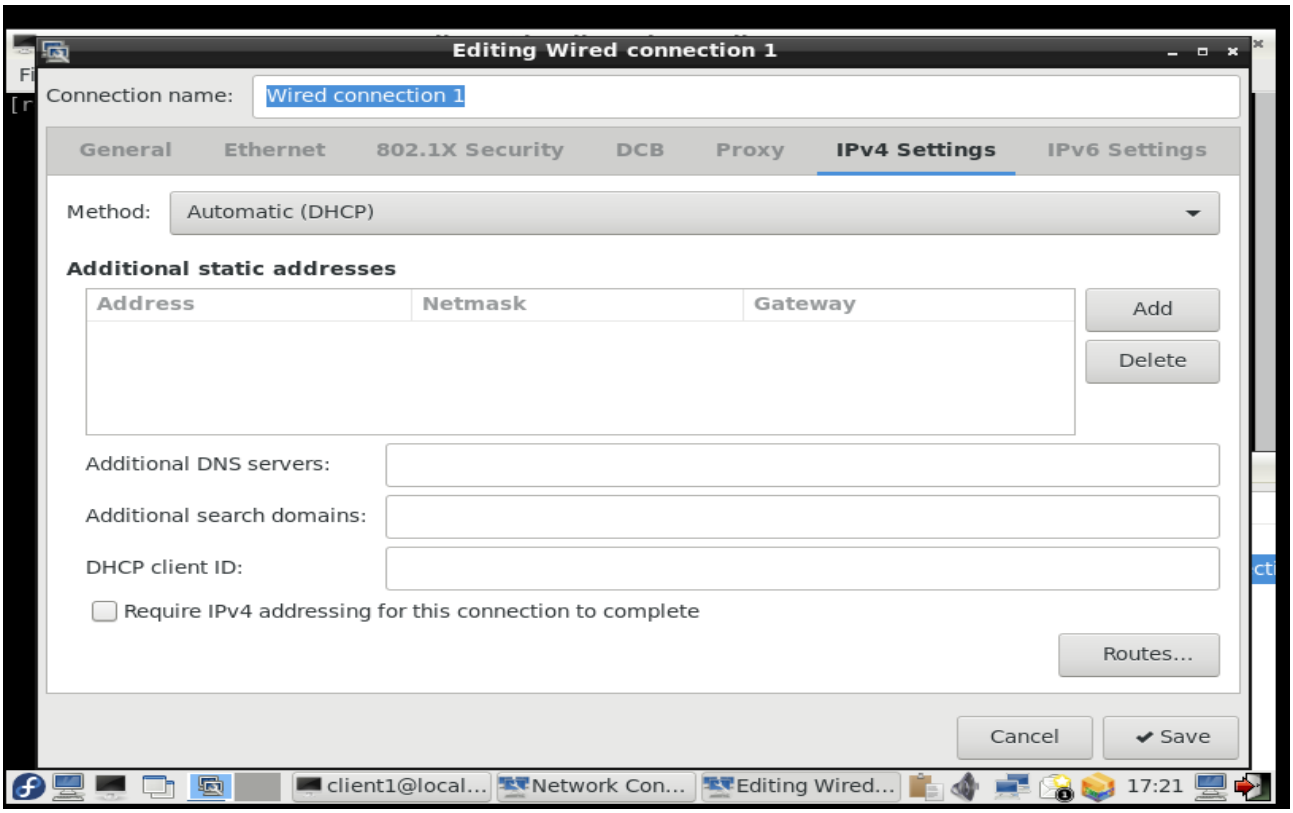
```
# Systemctl status dhcpd
```

DHCP must active and running now.

```
exiting.
[root@mlb-dc1-centos7 ~]# systemctl start dhcpd
[root@mlb-dc1-centos7 ~]# systemctl status dhcpd
dhcpd.service - DHCPv4 Server Daemon
   Loaded: loaded (/usr/lib/systemd/system/dhcpd.service; enabled)
   Active: active (running) since Tue 2019-02-26 12:02:16 EST; 16min ago
     Docs: man:dhcpd(8)
           man:dhcpd.conf(5)
 Main PID: 2858 (dhcpd)
   Status: "Dispatching packets..."
   CGroup: /system.slice/dhcpd.service
           └─2858 /usr/sbin/dhcpd -f -cf /etc/dhcp/dhcpd.conf -user dhcpd -group dhcpd --no-pid

Feb 26 12:00:20 mlb-dc1-centos7.dsnm.lk dhcpd[2858]: DHCPDISCOVER from 00:0c:29:bf:91:0e via eno33554984
Feb 26 12:00:20 mlb-dc1-centos7.dsnm.lk dhcpd[2858]: DHCPOFFER on 10.0.1.80 to 00:0c:29:bf:91:0e via eno33554984
Feb 26 12:00:20 mlb-dc1-centos7.dsnm.lk dhcpd[2858]: DHCPREQUEST for 10.0.1.5 (10.0.1.254) from 00:0c:29:bf:91:0e via eno33554984: unknown lease 10.0.1.5.
Feb 26 12:14:45 mlb-dc1-centos7.dsnm.lk dhcpd[2858]: DHCPREQUEST for 10.0.1.20 from 00:0c:29:bf:91:0e via eno33554984: unknown lease 10.0.1.20.
Feb 26 12:16:27 mlb-dc1-centos7.dsnm.lk dhcpd[2858]: DHCPREQUEST for 10.0.1.20 from 00:0c:29:bf:91:0e via eno33554984: unknown lease 10.0.1.20.
Feb 26 12:17:07 mlb-dc1-centos7.dsnm.lk dhcpd[2858]: DHCPREQUEST for 10.0.1.20 from 00:0c:29:bf:91:0e via eno33554984: unknown lease 10.0.1.20.
Feb 26 12:18:41 mlb-dc1-centos7.dsnm.lk dhcpd[2858]: DHCPREQUEST for 10.0.1.20 from 00:0c:29:bf:91:0e via eno33554984: unknown lease 10.0.1.20.
Feb 26 12:18:46 mlb-dc1-centos7.dsnm.lk dhcpd[2858]: DHCPREQUEST for 10.0.1.20 from 00:0c:29:bf:91:0e via eno33554984: unknown lease 10.0.1.20.
Feb 26 12:18:52 mlb-dc1-centos7.dsnm.lk dhcpd[2858]: DHCPDISCOVER from 00:0c:29:bf:91:0e via eno33554984
Feb 26 12:19:05 mlb-dc1-centos7.dsnm.lk systemd[1]: Started DHCPv4 Server Daemon.
[root@mlb-dc1-centos7 ~]# _
```

Now, go to the client's network configration settings and change the IP settings to Automatic (DHCP).



Now check the ip address of fedora and see if the DHCP server is working or not.

You can use the command

Ifconfig

Self-Study (included in report)

Changing IP Configurations in Linux

There are three methods that can be used to change IP configurations in a Linux System.

- GUI method.
- CLI method using network commands (eg:- nmcli/nmtui)
- Assigning a Temporary IP Address.

By editing network interface configurations file. GUI method is not going to be discussed in the lab and you can test it out by yourselves.

The 2nd method is discussed in the 1st Lab when the connection is established between the two systems CentOs 7 Server and the Fedora 28 Client. **Assigning a Temporary IP address** A temporary IP address can be assigned to an existing interface with an IP address using the **ifconfig** command.

1. Identify the interface you need to configure using the **ifconfig** command.

2. Assign the temporary IP;

ifconfig <interface name> up <IP Address> netmask <subnetmask>

3. A default gateway can be assigned by using the command;

route add default gw <Gateway IP>

This IP address will be removed if the existing interface is disabled and enabled again. (Will used the statically assigned one)

Editing Network Interface Configuration File

By changing the network interface configuration files, the IP address can be statically configured.

- /etc – Directory which contain Linux Configuration files
- Interface configurations files are in the */etc/sysconfig/network-scripts*
- Interface configuration files will start with the phrase "**ifcfg-**"
- Open up the relevant interface configuration file and edit the IP address related information according to the requirements.
- After editing the configuration file, save it and disconnect and connect the network device again using the **nmcli** command;

nmcli connection down <connection name>

nmcli connection up <connection name>