Installing and configuring DHCP Server
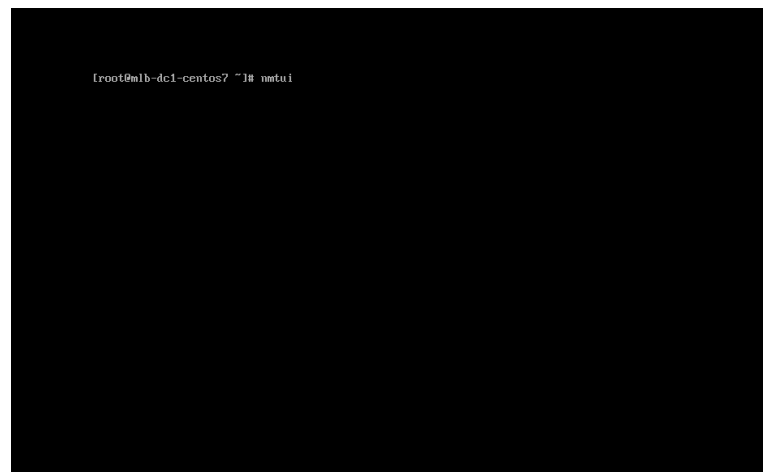
Computer Systems and Network Engineering
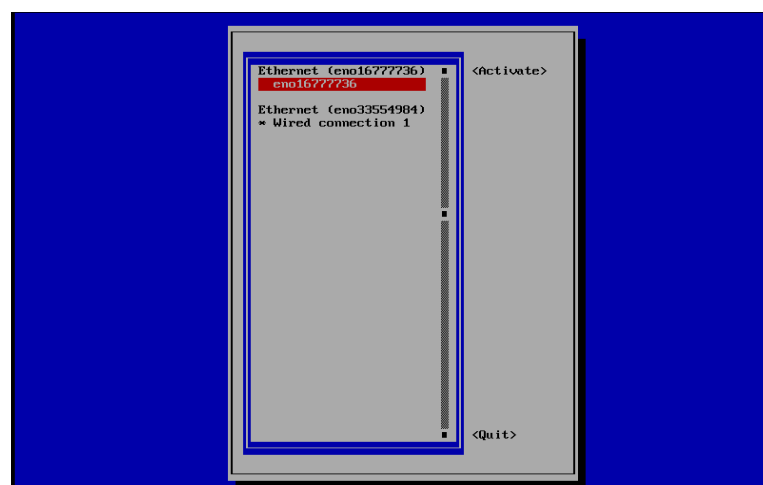**Lab Sheet 03**
SLIIT

Author: KH Chamod Gayashan

First you need to make sure NAT interface turn on and VmNet2 Interface is disable.

Step 01

Access Network Manager TUI (**nmtui**)

Activate wired Connection (NAT)

Author: KH Chamod Gayashan

Step 02

Installing DHCP in Centos.
To install DHCP server on CentOS, enter the following command.

$ yum install –y dhcp **(if you use -y command cent OS wait for our confirmation)**

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

Author: KH Chamod Gayashan

Step 03

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 /ec/sysconfig/dhcpd

```
[root@mlb-dc1-centos7 ~]# vi /etc/sysconfig/dhcpd_
```

Press I go to insert mode in vi editor.

```
# WARNING: This file is NOT used anymore.

# If you are here to restrict what interfaces should dhcpd listen on,
# be aware that dhcpd listens *only* on interfaces for which it finds subnet
# declaration in dhcpd.conf. It means that explicitly enumerating interfaces
# also on command line should not be required in most cases.

# If you still insist on adding some command line options,
# copy dhcpd.service from /lib/systemd/system to /etc/systemd/system and modify
# it there.
# https://fedoraproject.org/wiki/Systemd#How_do_I_customize_a_unit_file.2F_add_a_custom_unit_file.3F

# example:
# $ cp /usr/lib/systemd/system/dhcpd.service /etc/systemd/system/
# $ vi /etc/systemd/system/dhcpd.service
# $ ExecStart=/usr/sbin/dhcpd -f -cf /etc/dhcp/dhcpd.conf -user dhcpd -group dhcpd --no-pid <your_in
terface_name(s)>
# $ systemctl --system daemon-reload
# $ systemctl restart dhcpd.service
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
-- INSERT --
```

Author: KH Chamod Gayashan

Now assign the network interface
You can use the line DHCPDARGS (your VmNet2 name) to do that.

DHCPDARGS=eno16777736

And press esc and type: wq! (write and quit)

```
# WARNING: This file is NOT used anymore.

# If you are here to restrict what interfaces should dhcpd listen on,
# be aware that dhcpd listens *only* on interfaces for which it finds subnet
# declaration in dhcpd.conf. It means that explicitly enumerating interfaces
# also on command line should not be required in most cases.

# If you still insist on adding some command line options,
# copy dhcpd.service from /lib/systemd/system to /etc/systemd/system and modify
# it there.
# https://fedoraproject.org/wiki/Systemd#How_do_I_customize_a_unit_file.2F_add_a_custom_unit_file.3F

# example:
# $ cp /usr/lib/systemd/system/dhcpd.service /etc/systemd/system/
# $ vi /etc/systemd/system/dhcpd.service
# $ ExecStart=/usr/sbin/dhcpd -f -cf /etc/dhcp/dhcpd.conf -user dhcpd -group dhcpd --no-pid <your_in
terface_name(s)>
# $ systemctl --system daemon-reload
# $ systemctl restart dhcpd.service

DHCPDARGS=eno16777736
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
:wq_
```

Save and close the file.

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

Hint : if you typing path press tab key to each word begin (first or second letter) when you typing correctly OS is auto complete your word if you are wrong and you can hear beep sound.

1   2   3

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

Author: KH Chamod Gayashan

```
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
```

1. CP = Copy command
2. /usr/share/doc/dhcp-4.1.1/dhcpd.conf.sample = Copy file source
3. /etc/dhcp/dhcpd.conf = Copy file Destination (and rename dhcpd.conf)

```
[root@mlb-dc1-centos7 ~]# cp /usr/share/doc/dhcp-4.2.5/dhcpd
dhcpd6.conf.example  dhcpd.conf.example
[root@mlb-dc1-centos7 ~]# cp /usr/share/doc/dhcp-4.2.5/dhcpd.conf.example /etc/dhcp/dhcpd.conf
cp: overwrite '/etc/dhcp/dhcpd.conf'? y
[root@mlb-dc1-centos7 ~]#
```

Now, edit dhcpd.conf file,

vi /etc/dhcp/dhcpd.conf

```
[root@mlb-dc1-centos7 ~]# vi /etc/dhcp/dhcpd.conf _
```

Now, edit dhcps.config file,

Author: KH Chamod Gayashan

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.
```
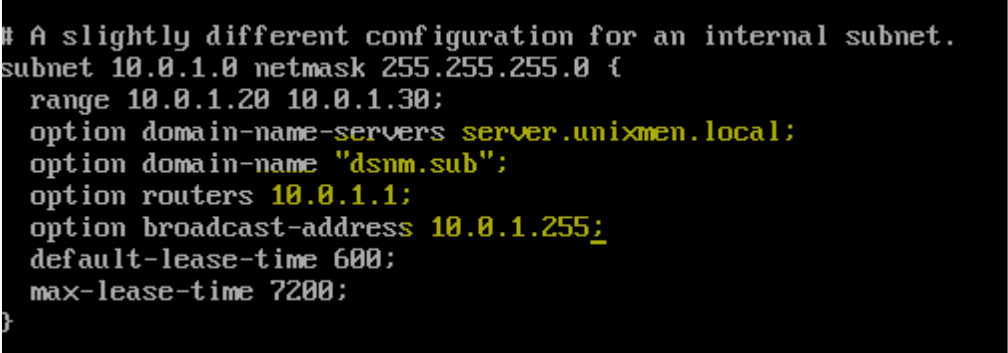
Define the subnet, range of ip addresses, domain and domain name servers like below:

Author: KH Chamod Gayashan

[...] # 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 entry 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.

If you get this error

job for dhcpd.service failed because the control process exited error code . see "systemctl status dhcpd service" and journalctl -xe for details.

you need set manual ipv4 configuration in Vmnet2 interface using **nmtui command** in Network Manager TUI and enter to access **Edit connection** window.

Author: KH Chamod Gayashan

```
[root@mlb-dc1-centos7 ~]# nmtui
```

Later set IPV4 Configuration is Manual and enter ok for save changes.


```
┤ Edit Connection ├

        Profile name eno16777736_____
              Device eno16777736 (00:0C:29:89:8E:5A)_____

    = ETHERNET                                              <Show>

    ■ IPv4 CONFIGURATION <Manual>                           <Hide>
            Addresses 10.0.1.2/24_____ <Remove>
                      <Add...>
              Gateway 10.0.1.1_____
          DNS servers <Add...>
        Search domains <Add...>

              Routing (No custom routes) <Edit...>
    [ ] Never use this network for default route

    [ ] Require IPv4 addressing for this connection


    = IPv6 CONFIGURATION <Automatic>                        <Show>

    [ ] Automatically connect
    [X] Available to all users

                                              <Cancel> <OK>
```

Author: KH Chamod Gayashan

Later you need to activate VmNet2 Interface and disable NAT.

Author: KH Chamod Gayashan
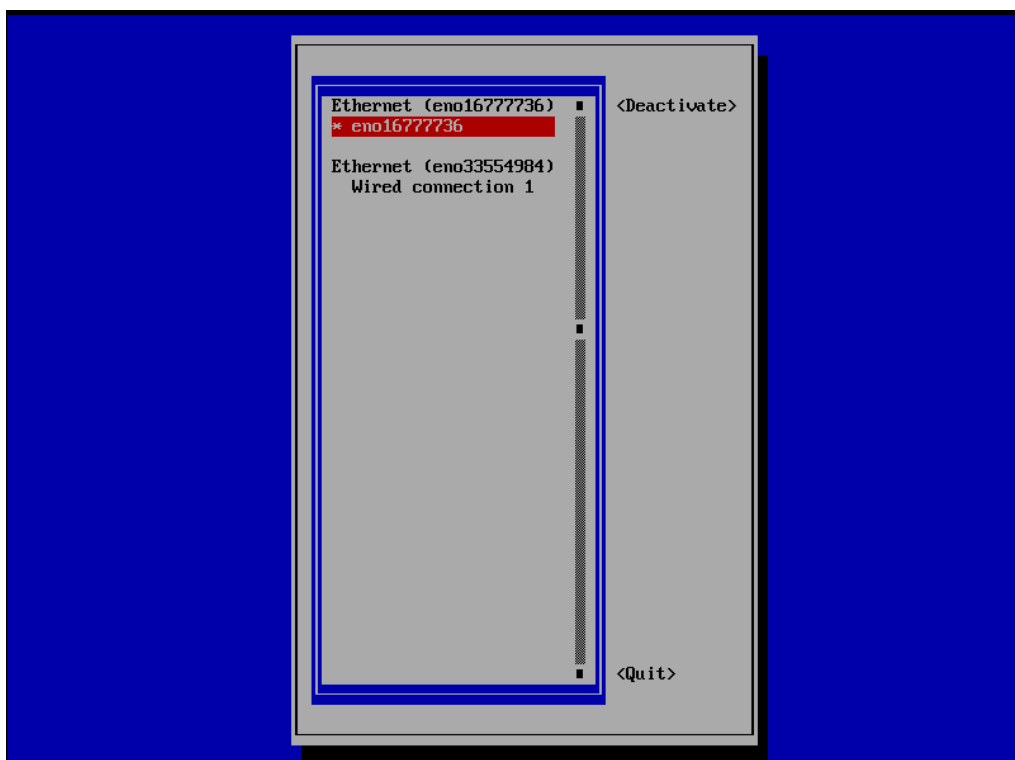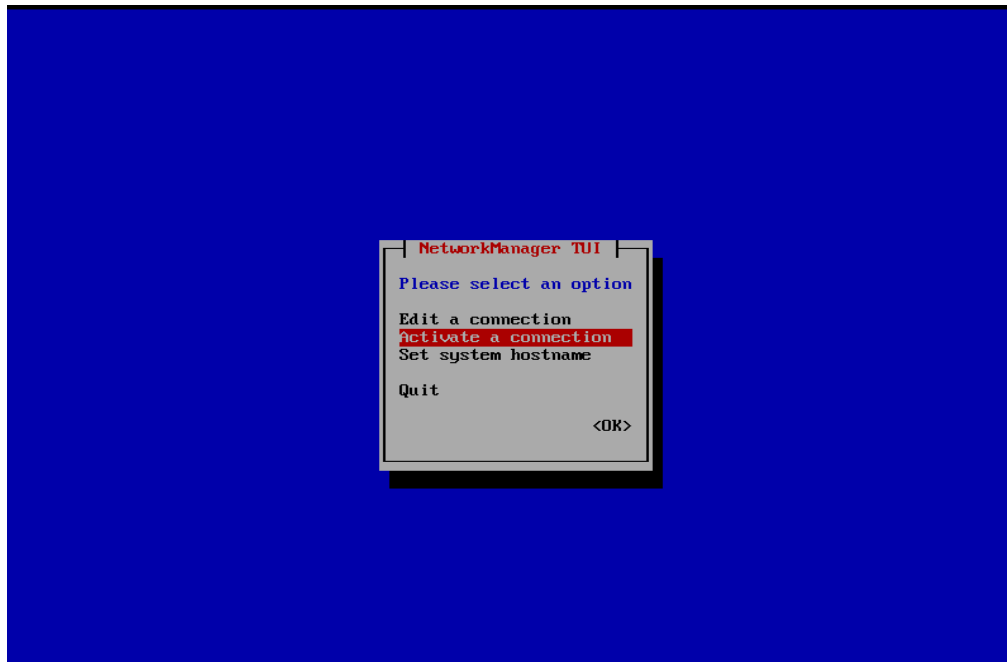
Now, start the dhcpd service and make it to start automatically on every reboot.

systemctl start dhcpd

```
[root@mlb-dc1-centos7 ~]# systemctl start dhcpd
```

```
[root@mlb-dc1-centos7 ~]# systemctl status dhcpd
```

Author: KH Chamod Gayashan

Check Status of DHCP Server

systemctl status dhcpd


```
[root@mlb-dc1-centos7 ~]# systemctl status dhcpd
■ dhcpd.service - DHCPv4 Server Daemon
   Loaded: loaded (/usr/lib/systemd/system/dhcpd.service; disabled; vendor preset: disabled)
   Active: active (running) since Thu 2021-03-18 03:04:56 EDT; 2min 21s ago
     Docs: man:dhcpd(8)
           man:dhcpd.conf(5)
 Main PID: 3107 (dhcpd)
   Status: "Dispatching packets..."
   CGroup: /system.slice/dhcpd.service
           └─3107 /usr/sbin/dhcpd -f -cf /etc/dhcp/dhcpd.conf -user dhcpd -group dhcpd --no-pid

Mar 18 03:04:56 mlb-dc1-centos7.lk dhcpd[3107]: No subnet declaration for eno33554984 (no IPv4...s).
Mar 18 03:04:56 mlb-dc1-centos7.lk dhcpd[3107]: ** Ignoring requests on eno33554984.  If this ...hat
Mar 18 03:04:56 mlb-dc1-centos7.lk dhcpd[3107]:    you want, please write a subnet declaration
Mar 18 03:04:56 mlb-dc1-centos7.lk dhcpd[3107]:    in your dhcpd.conf file for the network segment
Mar 18 03:04:56 mlb-dc1-centos7.lk dhcpd[3107]:    to which interface eno33554984 is attached. **
Mar 18 03:04:56 mlb-dc1-centos7.lk dhcpd[3107]:
Mar 18 03:04:56 mlb-dc1-centos7.lk dhcpd[3107]: Listening on LPF/eno16777736/00:0c:29:89:8e:5a.../24
Mar 18 03:04:56 mlb-dc1-centos7.lk dhcpd[3107]: Sending on   LPF/eno16777736/00:0c:29:89:8e:5a.../24
Mar 18 03:04:56 mlb-dc1-centos7.lk dhcpd[3107]: Sending on   Socket/fallback/fallback-net
Mar 18 03:04:56 mlb-dc1-centos7.lk systemd[1]: Started DHCPv4 Server Daemon.
Hint: Some lines were ellipsized, use -l to show in full.
[root@mlb-dc1-centos7 ~]# _
```

Now, go to the client's network configuration settings and change the IP settings to Automatic (DHCP).
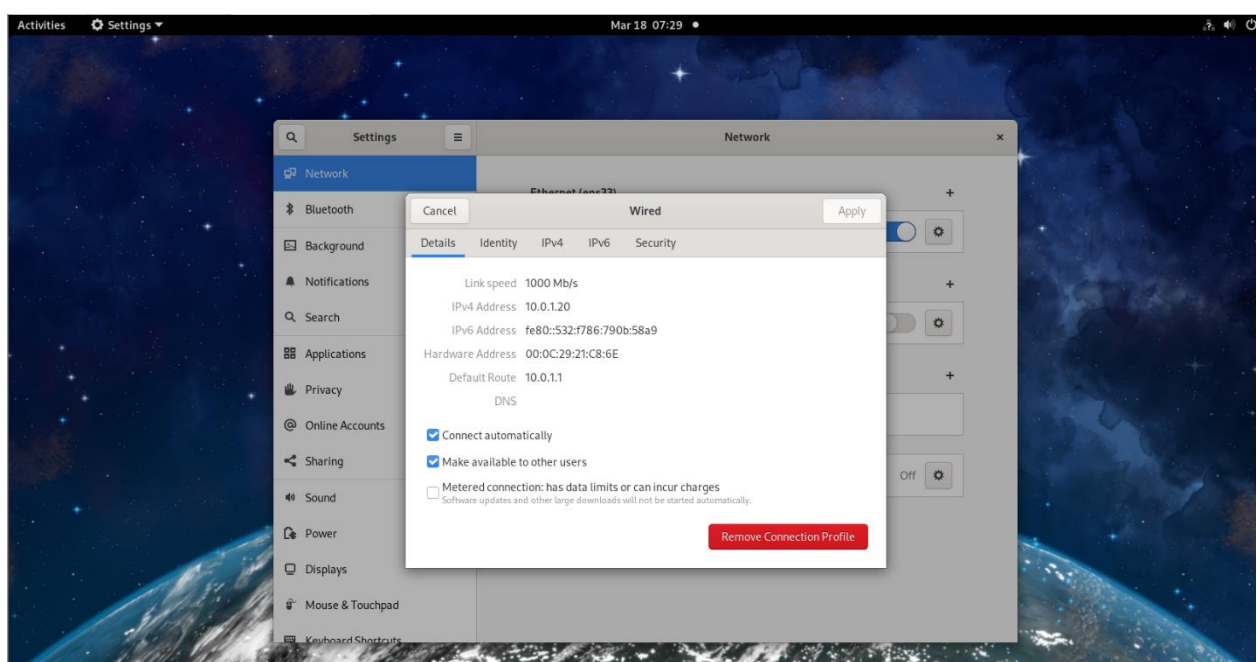
Now check the IP address of fedora and see if the DHCP server is working or not.
You can use the **Ifconfig** command.

Author: KH Chamod Gayashan

END.