



# **IT3010**

## **Network Design & Management**

### **3<sup>rd</sup> Year, 2<sup>nd</sup> Semester**

## **Lab 2**

## **Practical 2**

**Y3.S2.WE.IT.02.02**

Submitted to

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Bachelor of Science Special Honors Degree in Information Technology

2/27/2024

## **Declaration**

I certify that this report does not incorporate without acknowledgement, any material previously submitted for a degree or diploma in any university, and to the best of my knowledge and belief it does not contain any material previously published or written by another person, except where due reference is made in text.

Registration Number: IT21271700

Name: Gunawardane K.C.

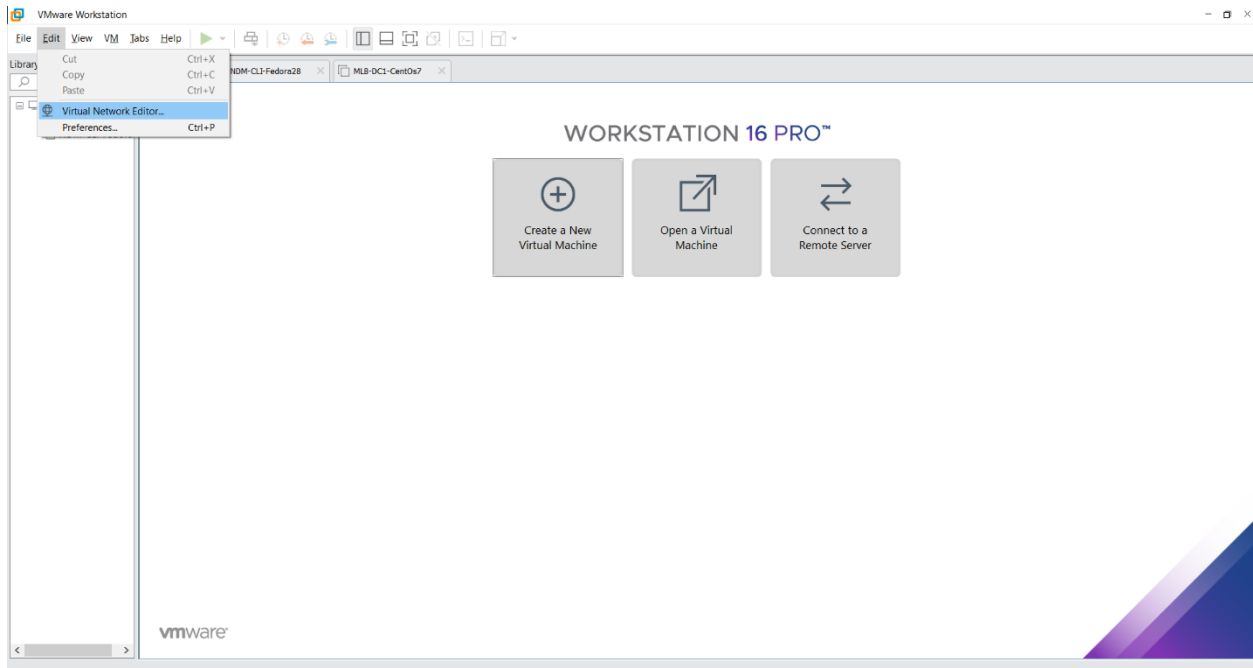
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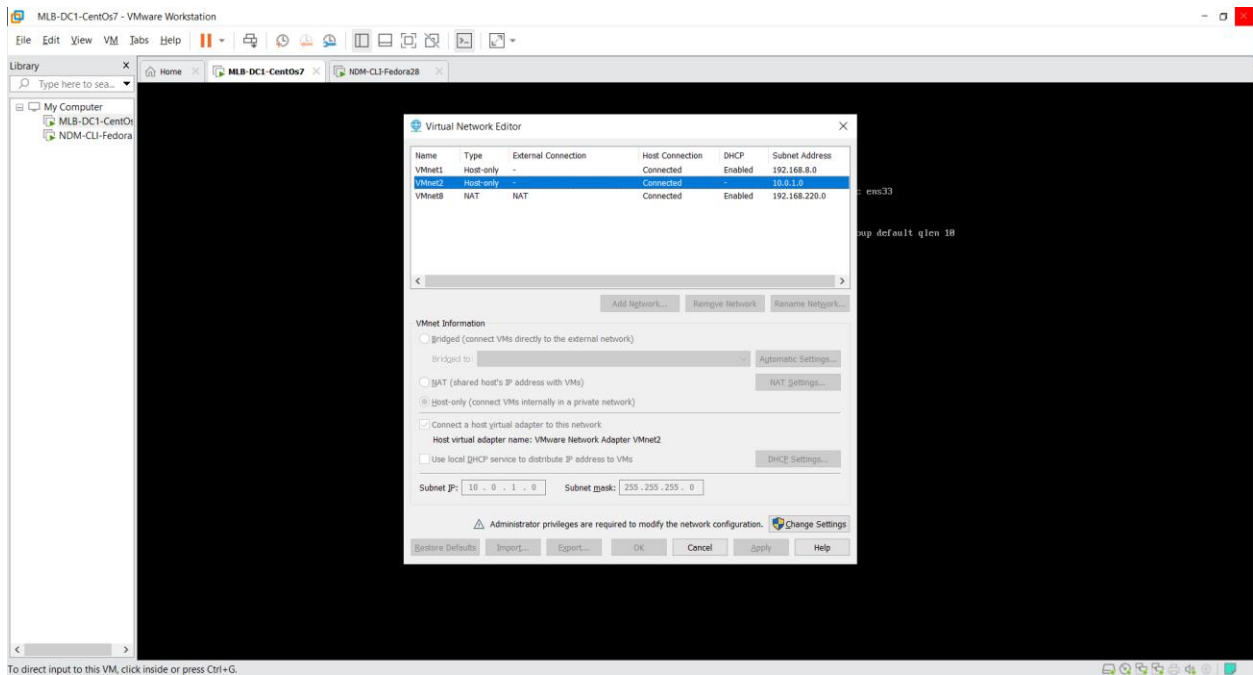
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## 01. Installing and configuring DHCP.



**Figure 1.0 go to virtual network editor**

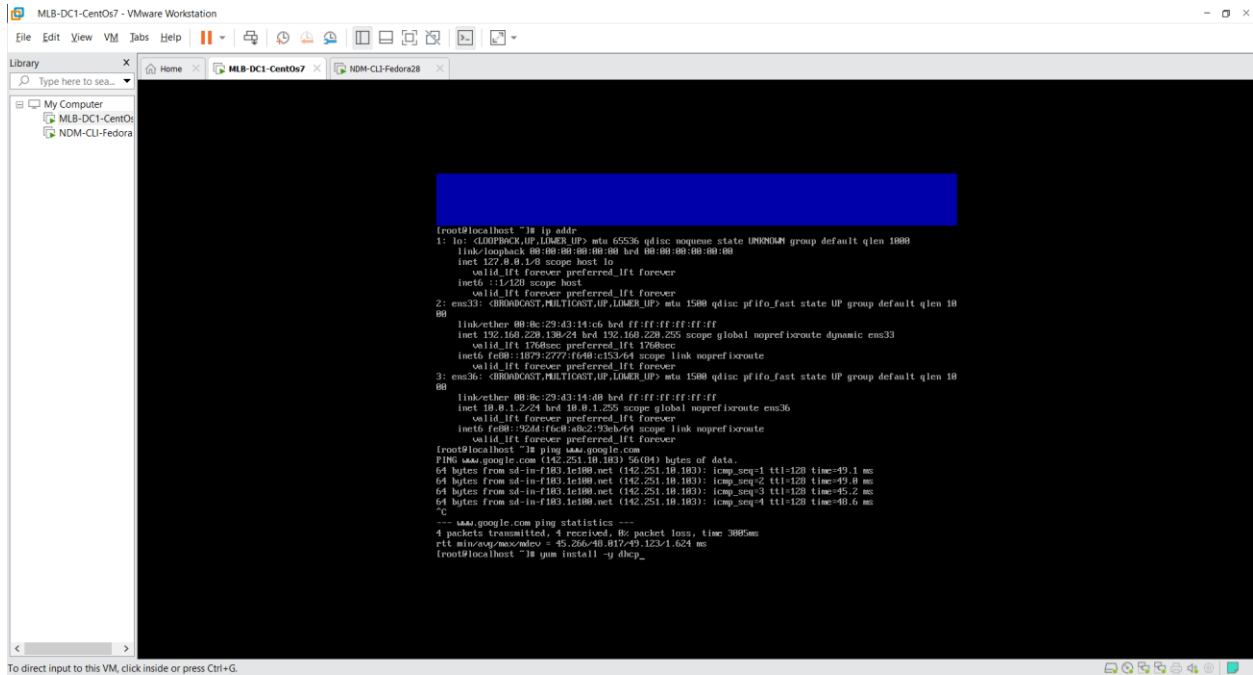
Click on edit tab and go to virtual network editor.



**Figure 1.1 Disable DHCP service**

Disable DHCP service.

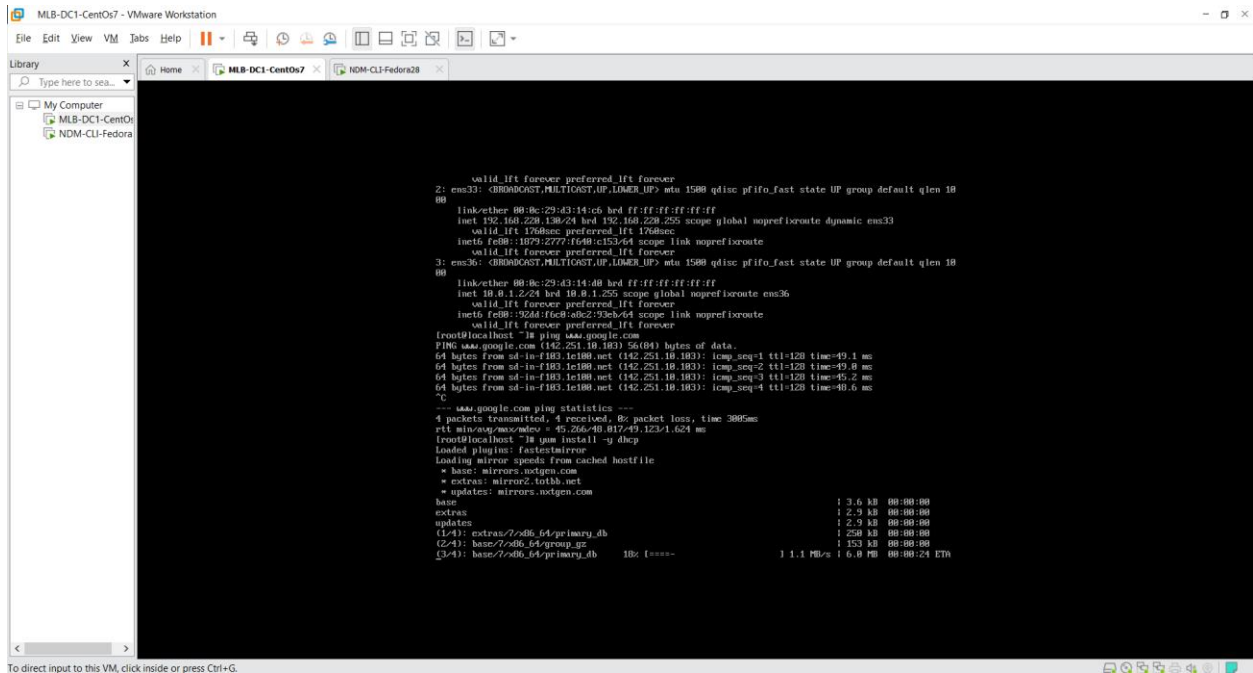
## 01.01.Installing DHCP for the server



```
root@localhost ~# ip addr
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
        valid_lft forever preferred_lft forever
2: em33: <BRIDGECAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 10
    link/ether 00:0c:29:a3:14:c6 brd ff:ff:ff:ff:ff:ff
    inet 192.168.220.130/24 brd 192.168.220.255 scope global nopreforoute dynamic em33
        valid_lft 1768sec preferred_lft 1768sec
    inet6 fe80::1079:2777:f640:c153:64 scope link nopreforoute
        valid_lft forever preferred_lft forever
3: em36: <BRIDGECAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 10
    link/ether 00:0c:29:a3:14:c6 brd ff:ff:ff:ff:ff:ff
    inet 10.0.1.2/24 brd 10.0.1.255 scope global nopreforoute em36
        valid_lft forever preferred_lft forever
    inet6 fe80::924a:f6c8:a0c2:53b7:64 scope link nopreforoute
        valid_lft forever preferred_lft forever
root@localhost ~# ping www.google.com
PING www.google.com (142.251.10.103) 56(04) bytes of data:
64 bytes from sd-in-f103.1e100.net (142.251.10.103): icmp_seq=1 ttl=120 time=49.1 ms
64 bytes from sd-in-f103.1e100.net (142.251.10.103): icmp_seq=2 ttl=120 time=49.0 ms
64 bytes from sd-in-f103.1e100.net (142.251.10.103): icmp_seq=3 ttl=120 time=45.2 ms
64 bytes from sd-in-f103.1e100.net (142.251.10.103): icmp_seq=4 ttl=120 time=40.6 ms
^C
--- www.google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 45.266/48.817/49.123/1.624 ms
root@localhost ~# yum install -y dhcp_
```

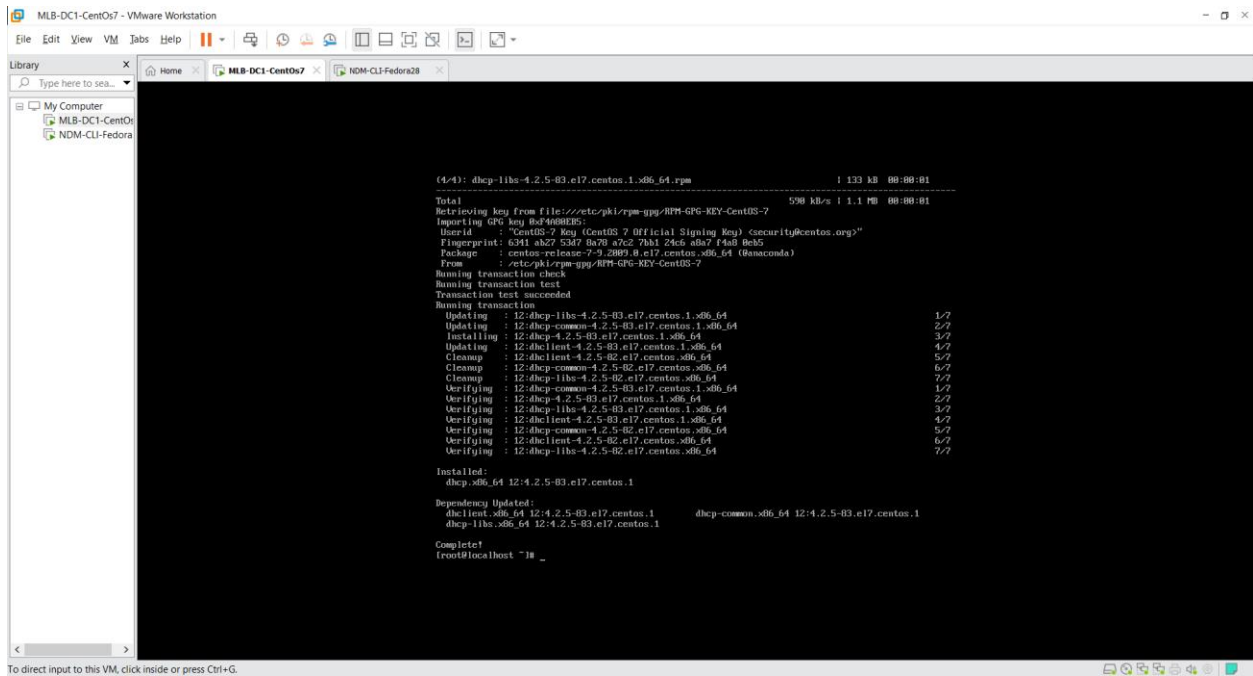
Figure 1.1.0 command “yum install –y dhcp”

Run the command “yum install –y dhcp” to install the DHCP in server.



```
valid_lft forever preferred_lft forever
2: em33: <BRIDGECAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 10
    link/ether 00:0c:29:a3:14:c6 brd ff:ff:ff:ff:ff:ff
    inet 192.168.220.130/24 brd 192.168.220.255 scope global nopreforoute dynamic em33
        valid_lft 1768sec preferred_lft 1768sec
    inet6 fe80::1079:2777:f640:c153:64 scope link nopreforoute
        valid_lft forever preferred_lft forever
3: em36: <BRIDGECAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 10
    link/ether 00:0c:29:a3:14:c6 brd ff:ff:ff:ff:ff:ff
    inet 10.0.1.2/24 brd 10.0.1.255 scope global nopreforoute em36
        valid_lft forever preferred_lft forever
    inet6 fe80::924a:f6c8:a0c2:53b7:64 scope link nopreforoute
        valid_lft forever preferred_lft forever
root@localhost ~# ping www.google.com
PING www.google.com (142.251.10.103) 56(04) bytes of data:
64 bytes from sd-in-f103.1e100.net (142.251.10.103): icmp_seq=1 ttl=120 time=49.1 ms
64 bytes from sd-in-f103.1e100.net (142.251.10.103): icmp_seq=2 ttl=120 time=49.0 ms
64 bytes from sd-in-f103.1e100.net (142.251.10.103): icmp_seq=3 ttl=120 time=45.2 ms
64 bytes from sd-in-f103.1e100.net (142.251.10.103): icmp_seq=4 ttl=120 time=40.6 ms
^C
--- www.google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 45.266/48.817/49.123/1.624 ms
root@localhost ~# yum install -y dhcp
Loading mirror speeds from cached hostfile
* base: mirrors.netgen.com
* extras: mirror2.tuhh.net
* updates: mirrors.netgen.com
base                               1.3 kB |00:00:00
extras                             1.2 kB |00:00:00
updates                           1.2 kB |00:00:00
(1-4): extras/7/x86_64/primary.db 1.2 kB |00:00:00
(2-4): base/7/x86_64/group.gp    1.1 kB |00:00:00
(3-4): base/7/x86_64/primary.db 10B |00:00:00
1.1 MB/s | 6.0 MB |00:00:24 ETA
```

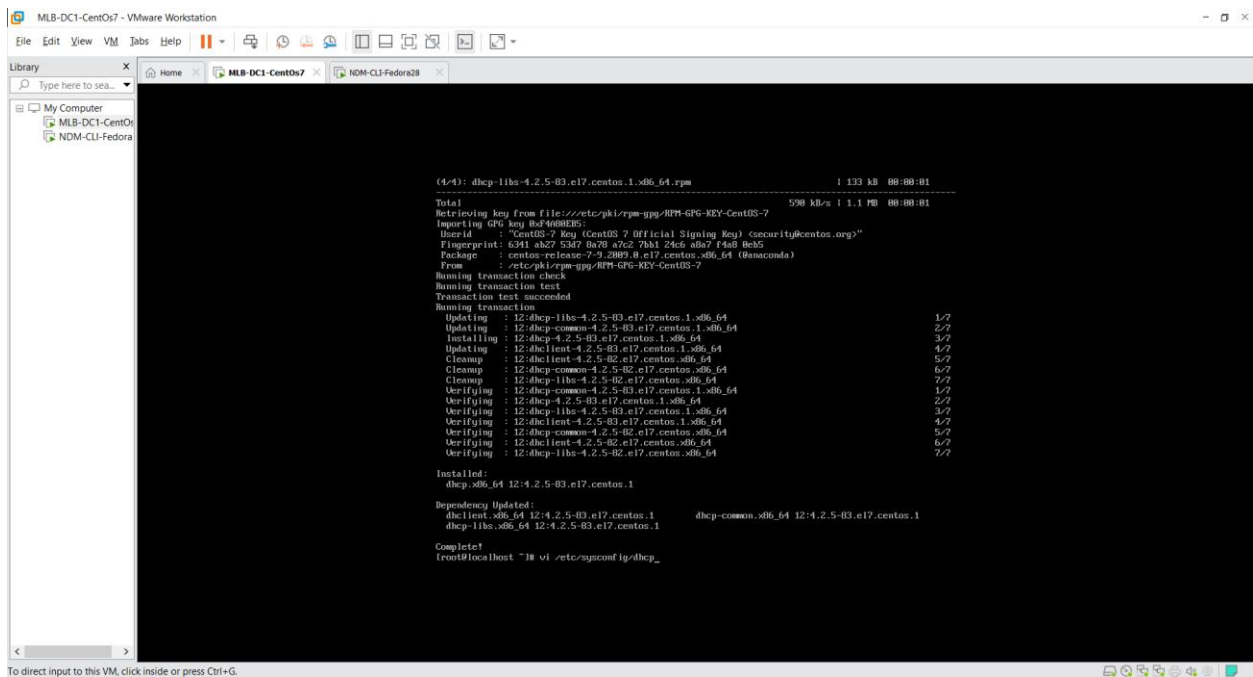
Figure 1.1.1 installing DHCP



**Figure 1.1.2 DHCP installation complete**

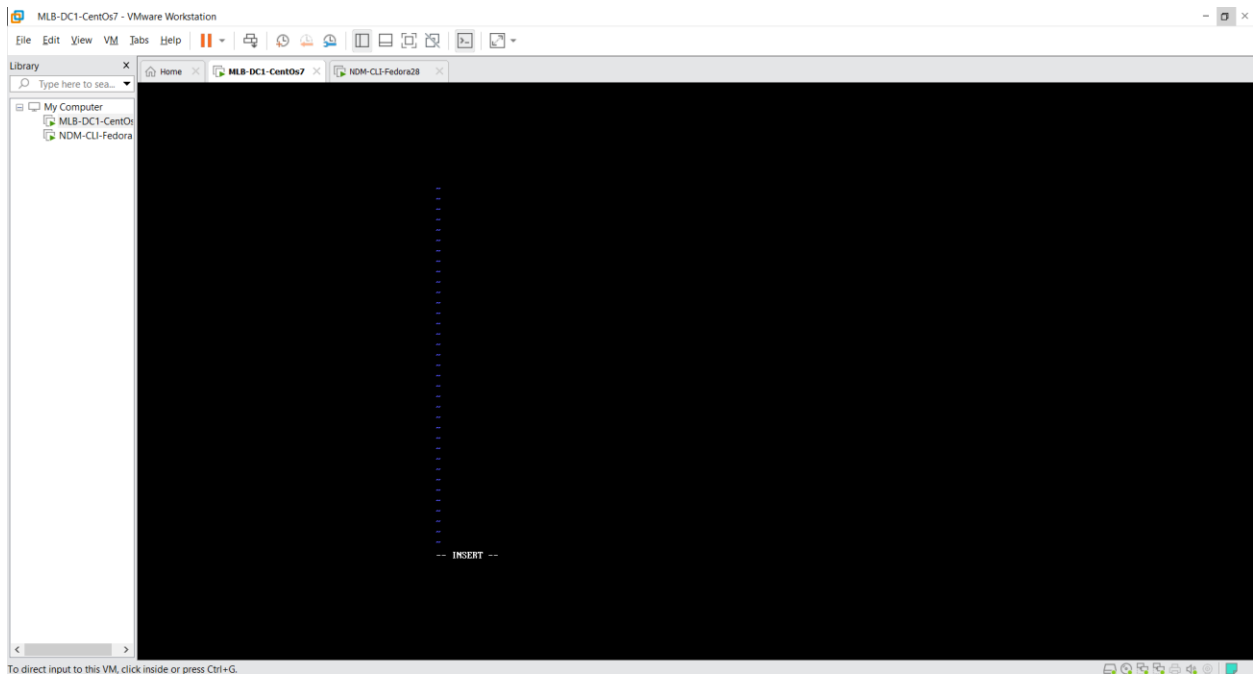
DHCP will install and complete the process.

## 01.02. Configuring the DHCP



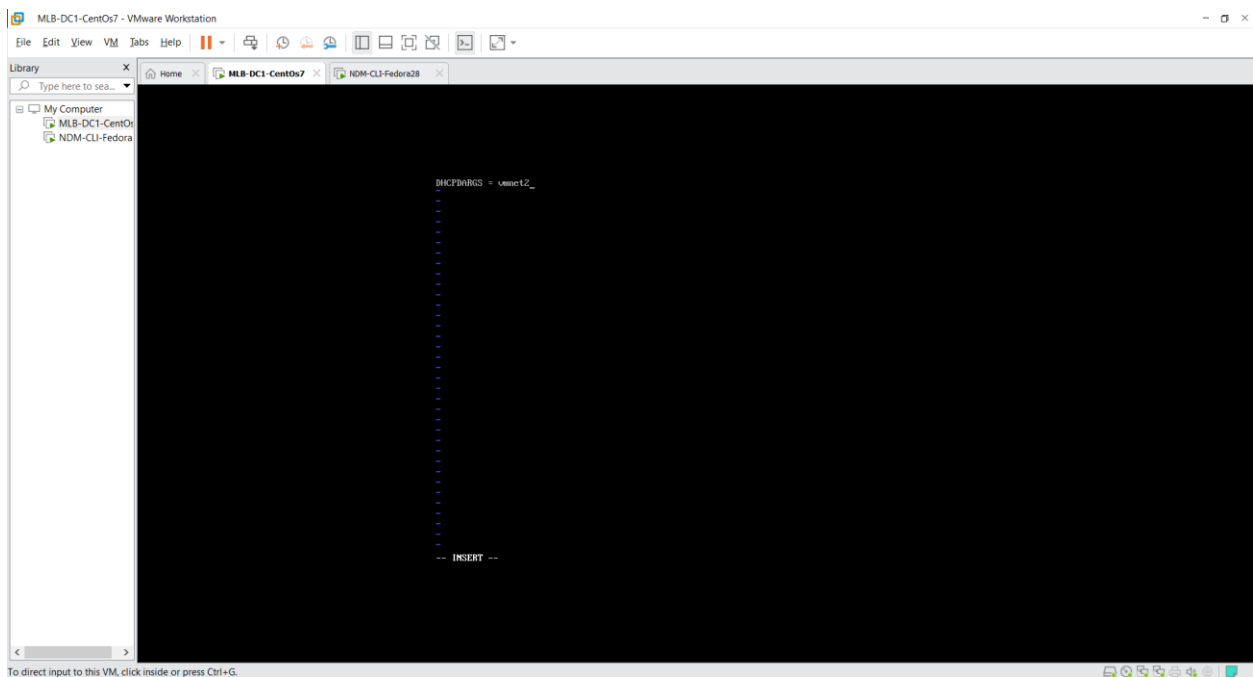
**Figure 1.2.1 command “vi /etc/sysconfig/dhcpd”**

Run the command “vi /etc/sysconfig/dhcpd” to mention the interface details.



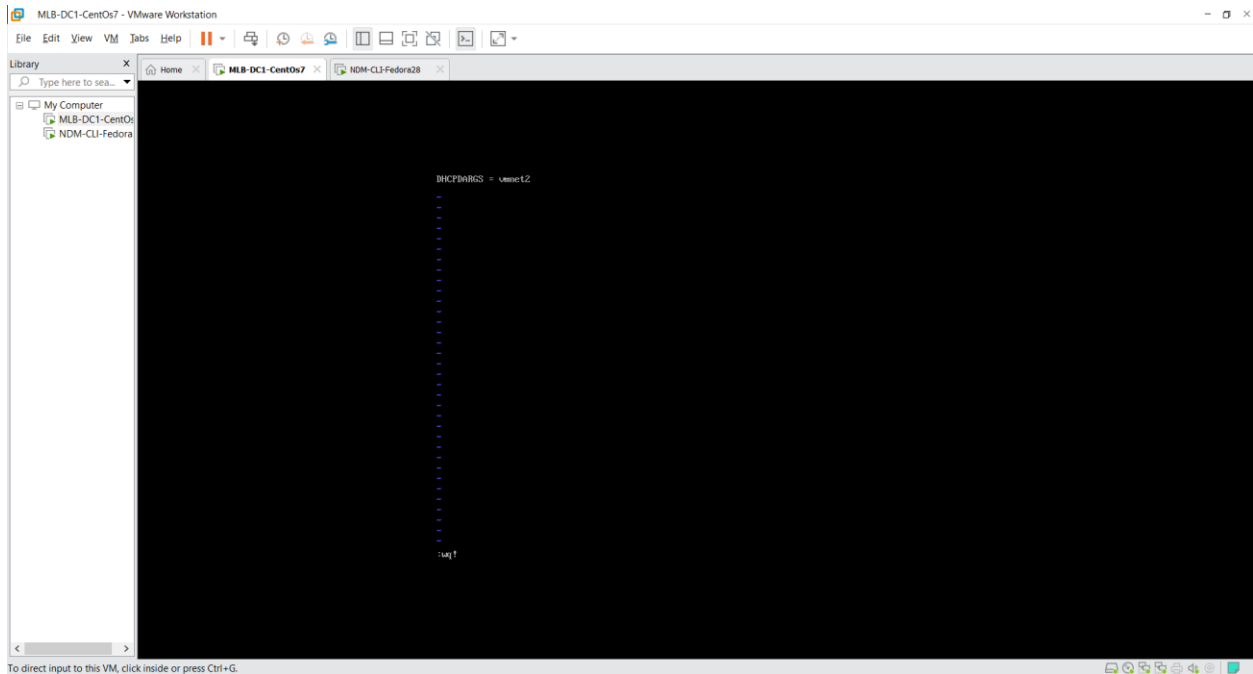
**Figure 1.2.2 insert data to the file**

Press the button “i” to move the cursor and insert data.



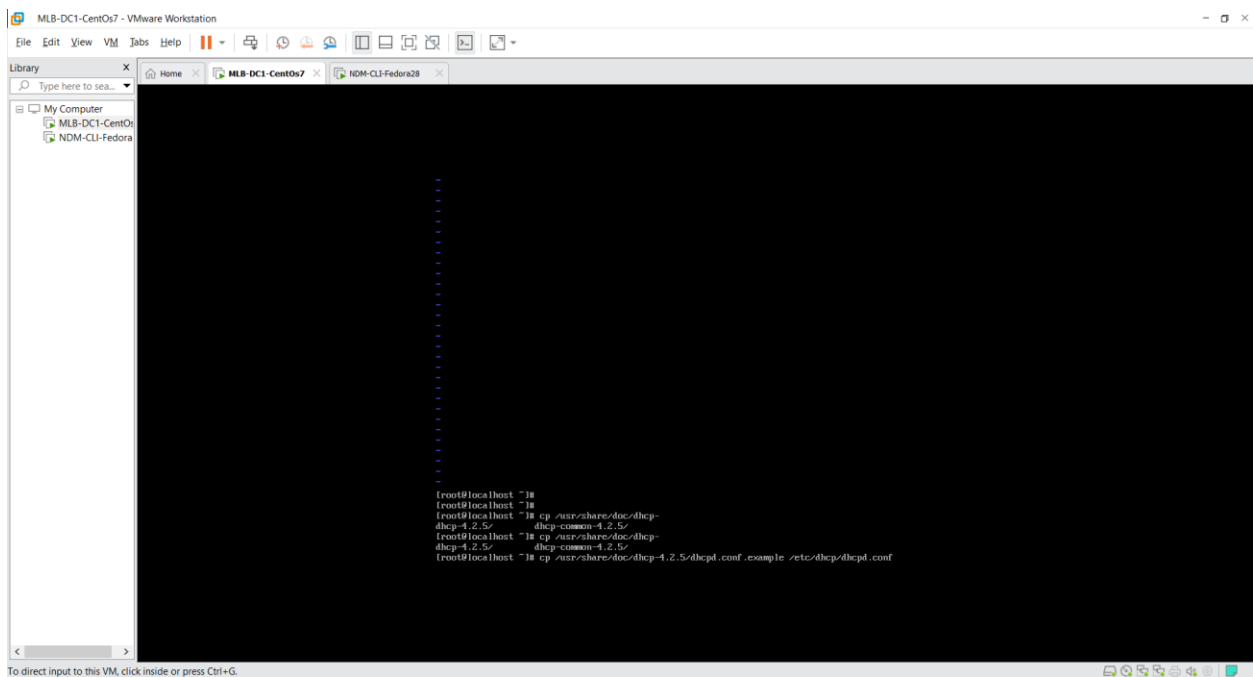
**Figure 1.2.3 command “DHCPDARGS = vmnet2”**

Run the command “DHCPDARGS = vmnet2” to assign the network interface.



**Figure 1.2.4** save and close the file

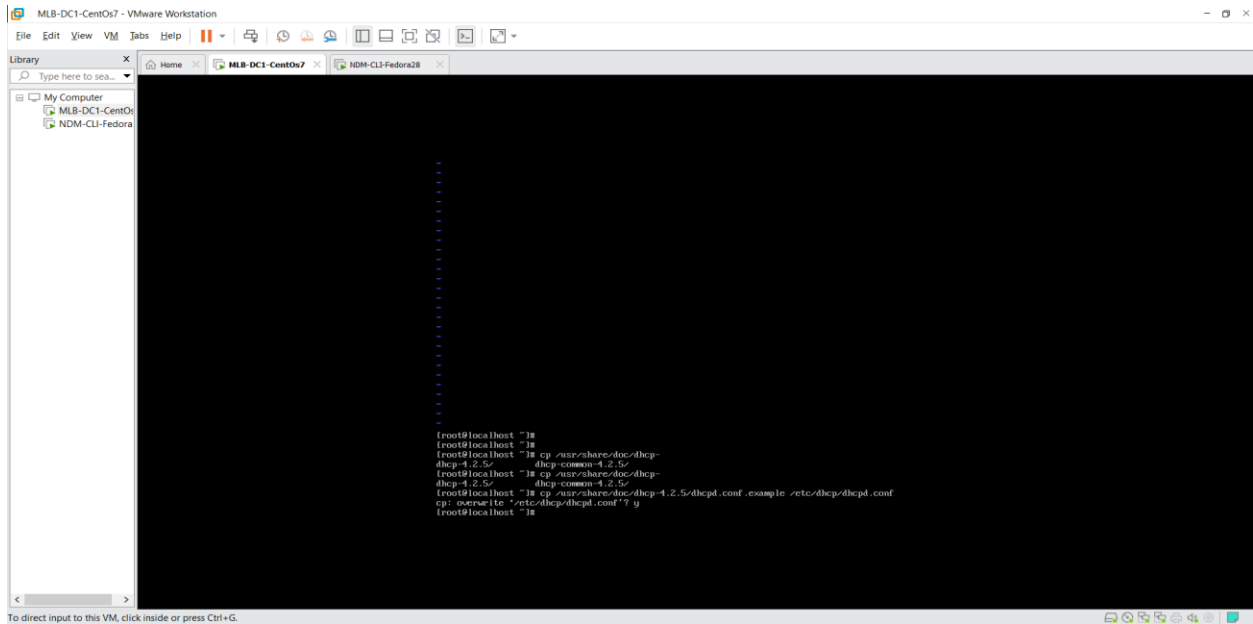
Press esc button and run the command “wq!” to save and close the file.



**Figure 1.2.5** command “cp /usr/share/doc/dhcp-4.2.5/dhcpd.conf.example /etc/dhcp/dhcpd.conf”

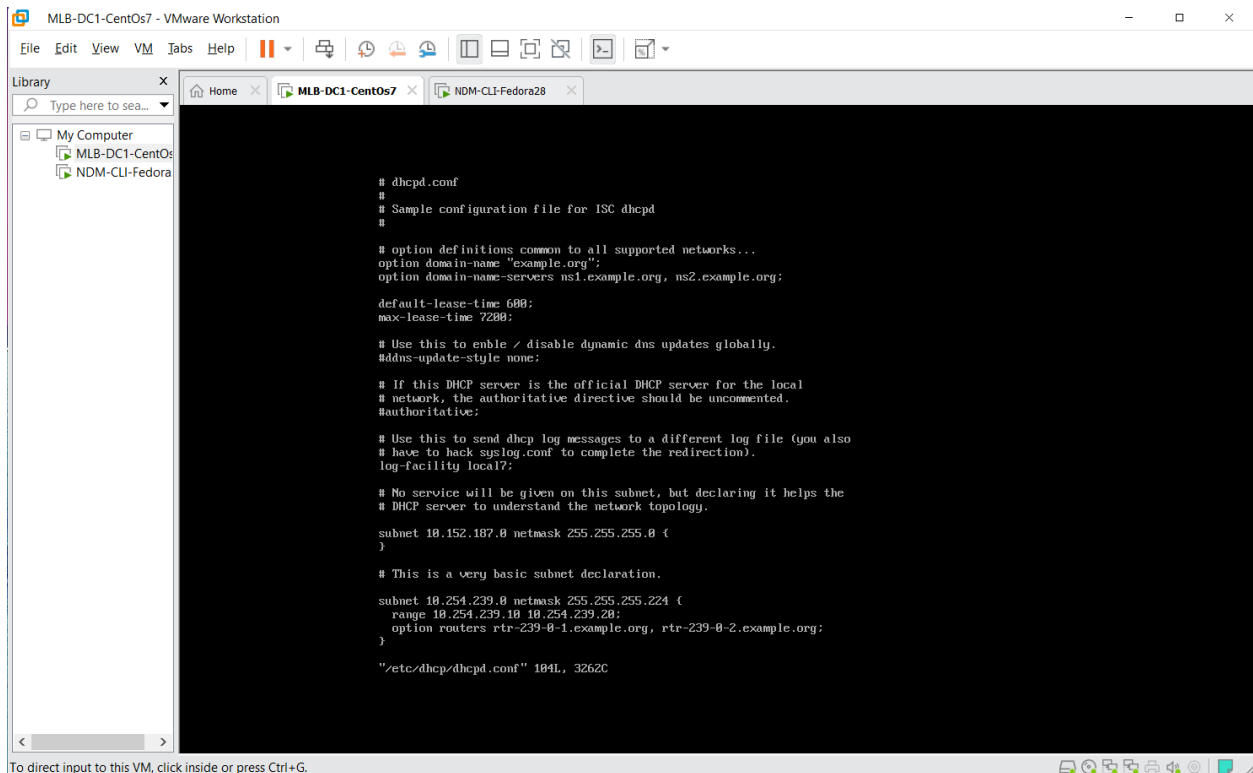
Run the command “cp /usr/share/doc/dhcp-4.2.5/dhcpd.conf.example /etc/dhcp/dhcpd.conf” to copy the sample dhcp configuration file.





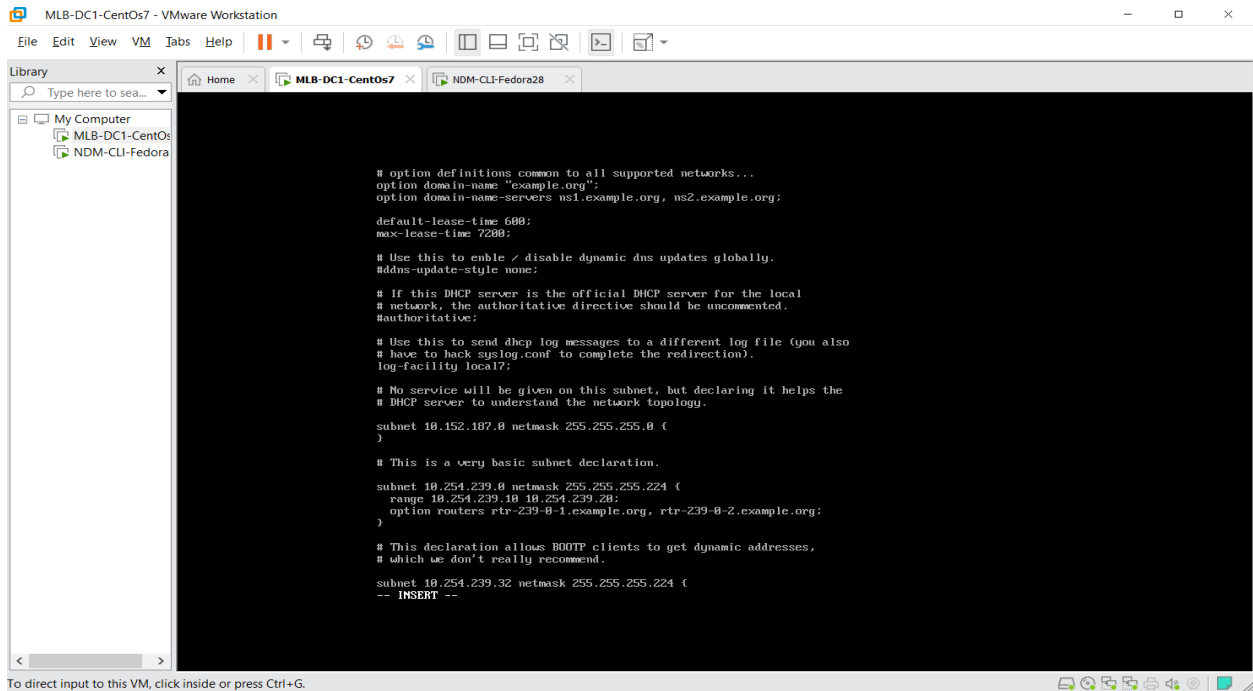
**Figure 1.2.6** overwrite the file directory

Press y to overwrite the file at the directory.



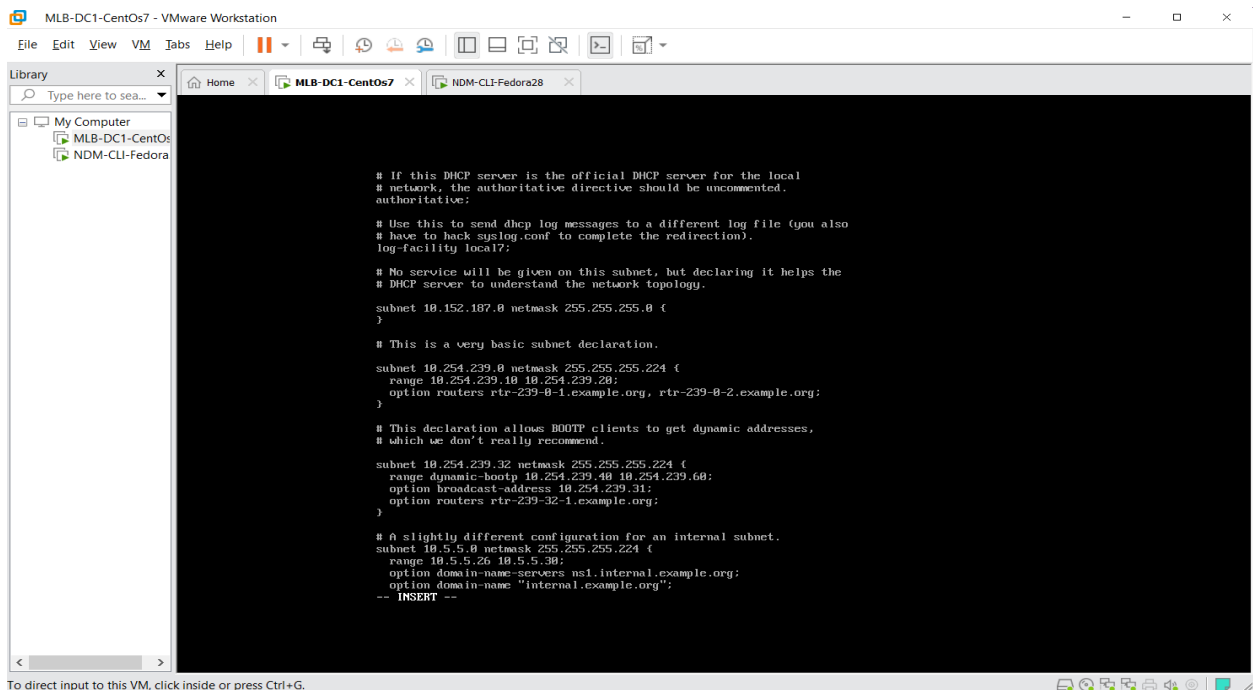
**Figure 1.2.7** command “vi /etc/dhcp/dhcpd.conf”

Run the command “vi /etc/dhcp/dhcpd.conf” to edit the file.



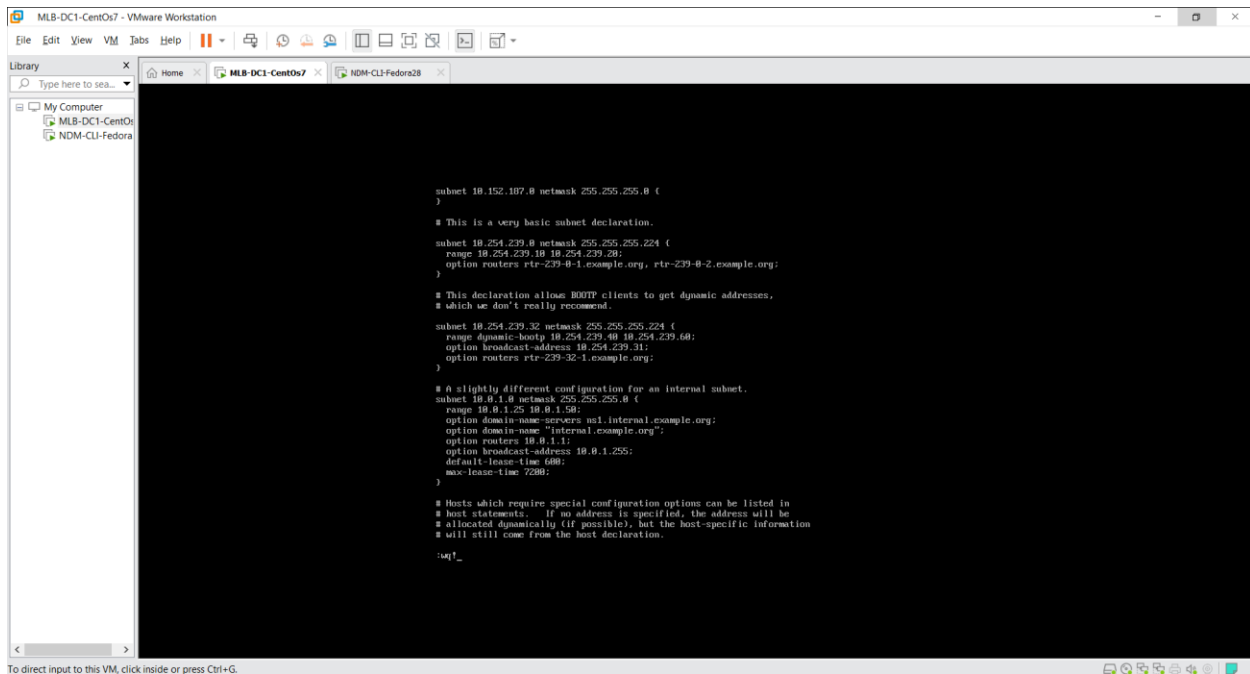
**Figure 1.2.8** edit the file

Press button “i” to move the cursor and edit the file.



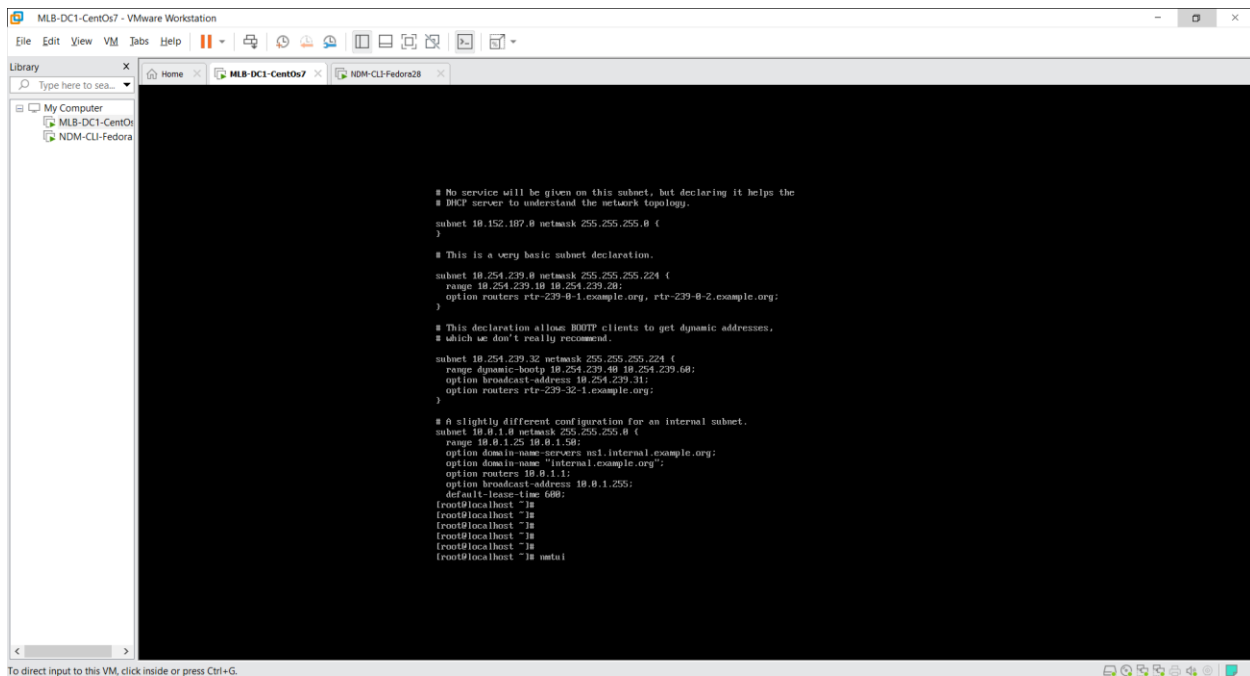
**Figure 1.2.9** uncomment the authoritative

Remove the symbol “#” before the authoritative word to uncomment the authoritative. It makes the DHCP server as the official DHCP server for the local network.



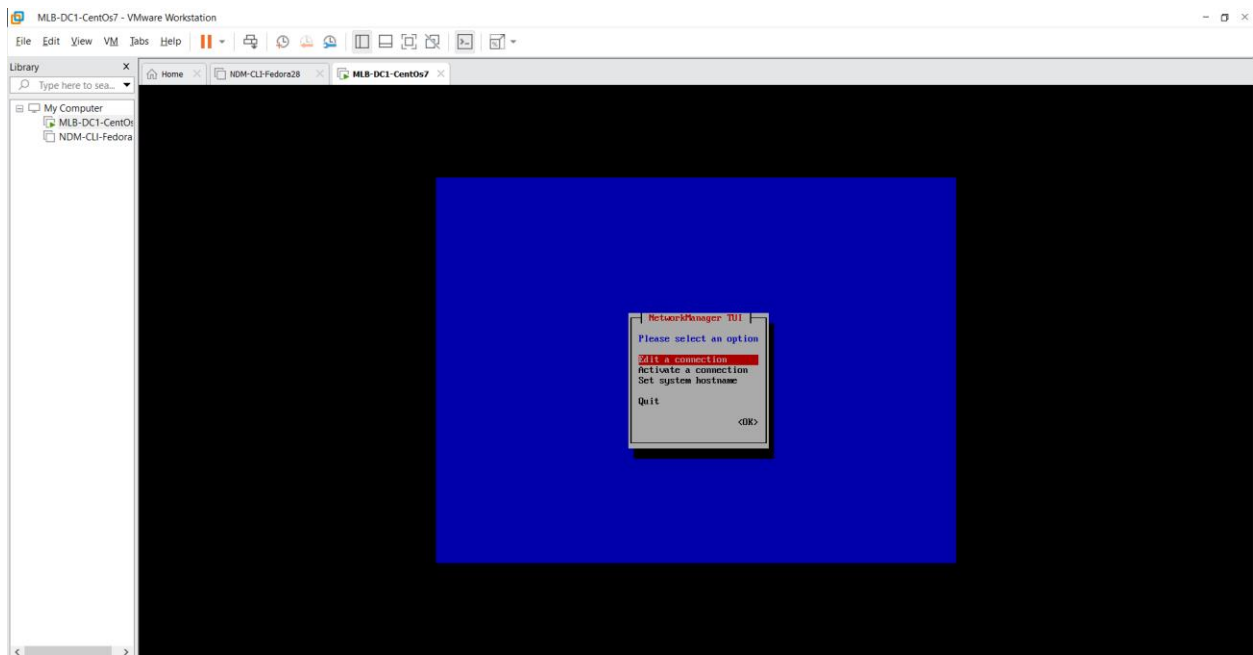
**Figure 1.2.10** change the network details

Change subnet as 10.0.1.0 , netmask as 255.255.255.0 , range as 10.0.1.25 10.0.1.50 , option routers as 10.0.1.1 and option broadcast-address as 10.0.1.255 to define the subnet, range of IP addresses , option routers and broadcast-address.



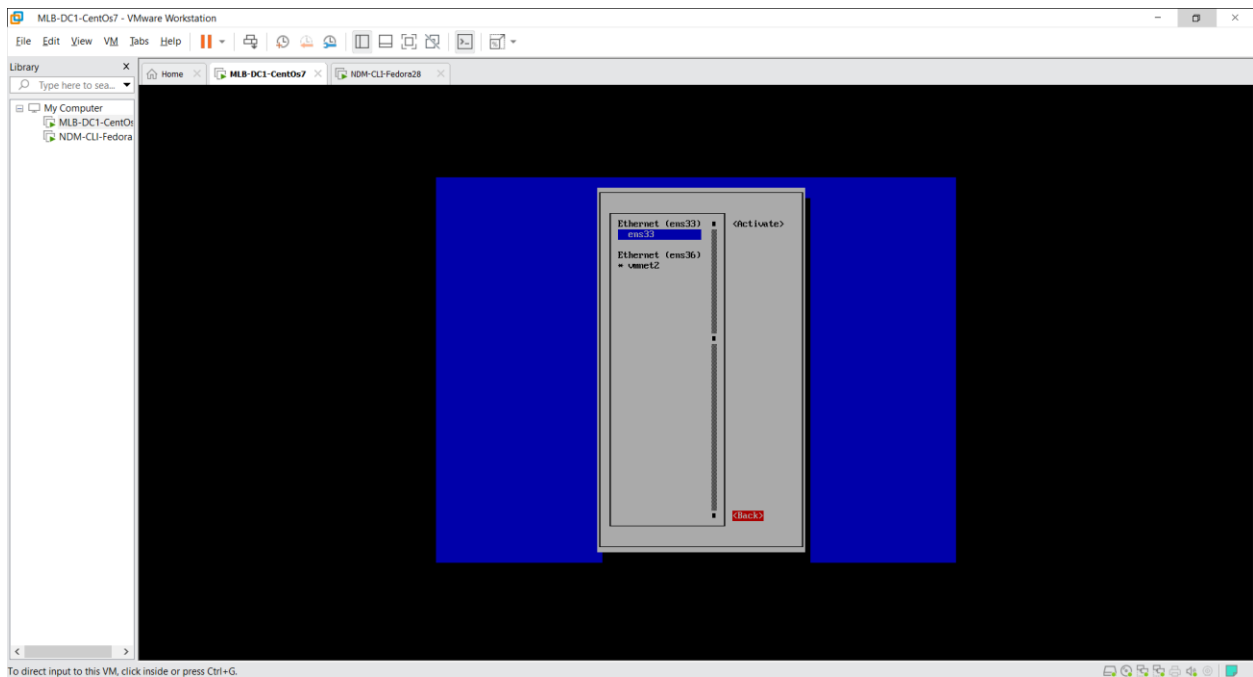
**Figure 1.2.11** go to NetworkManager TUI

Run the command “nmtui” to go to NetworkManager TUI.



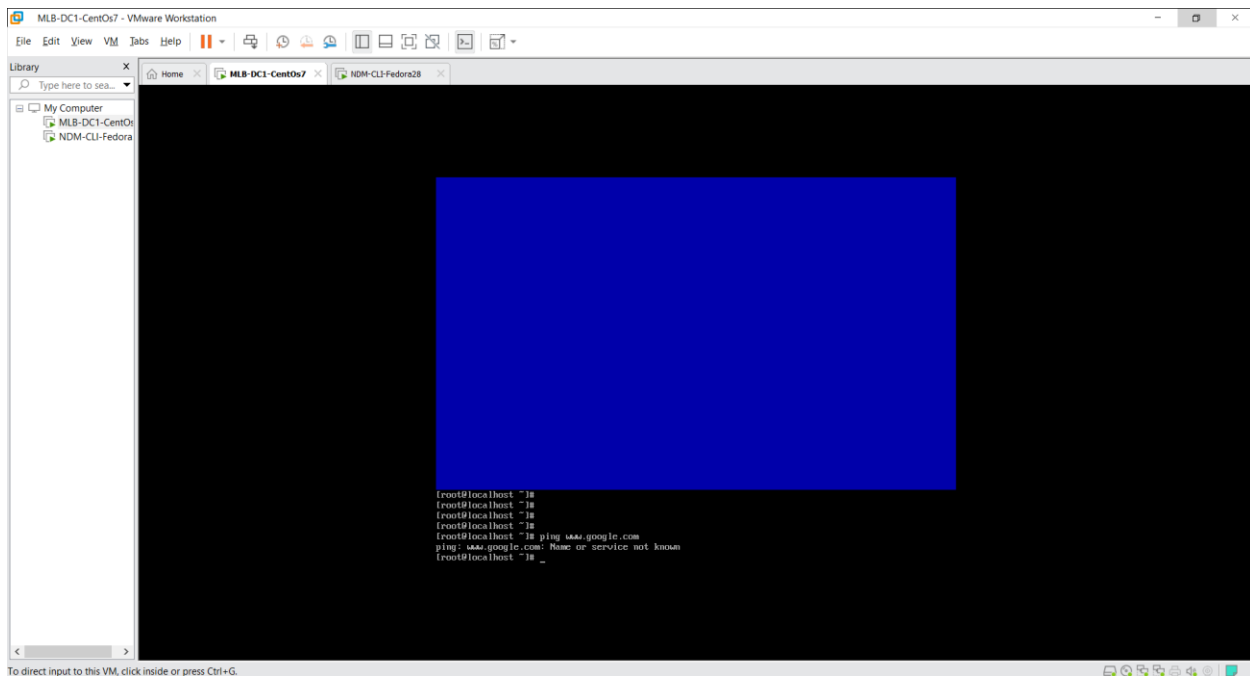
**Figure 1.2.12 activate a connection**

Go to activate a connection.



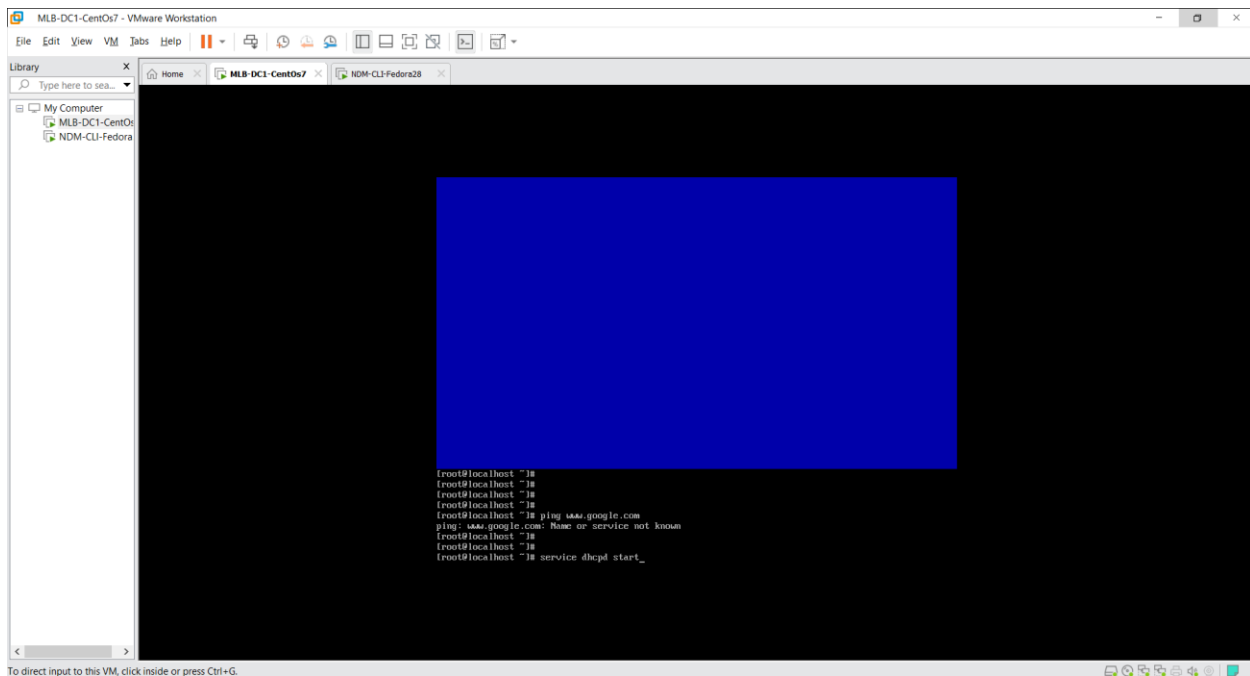
**Figure 1.2.13 Deactivate the ens33 network**

Deactivate the ens33 network to ensure that the internet connection has disabled.



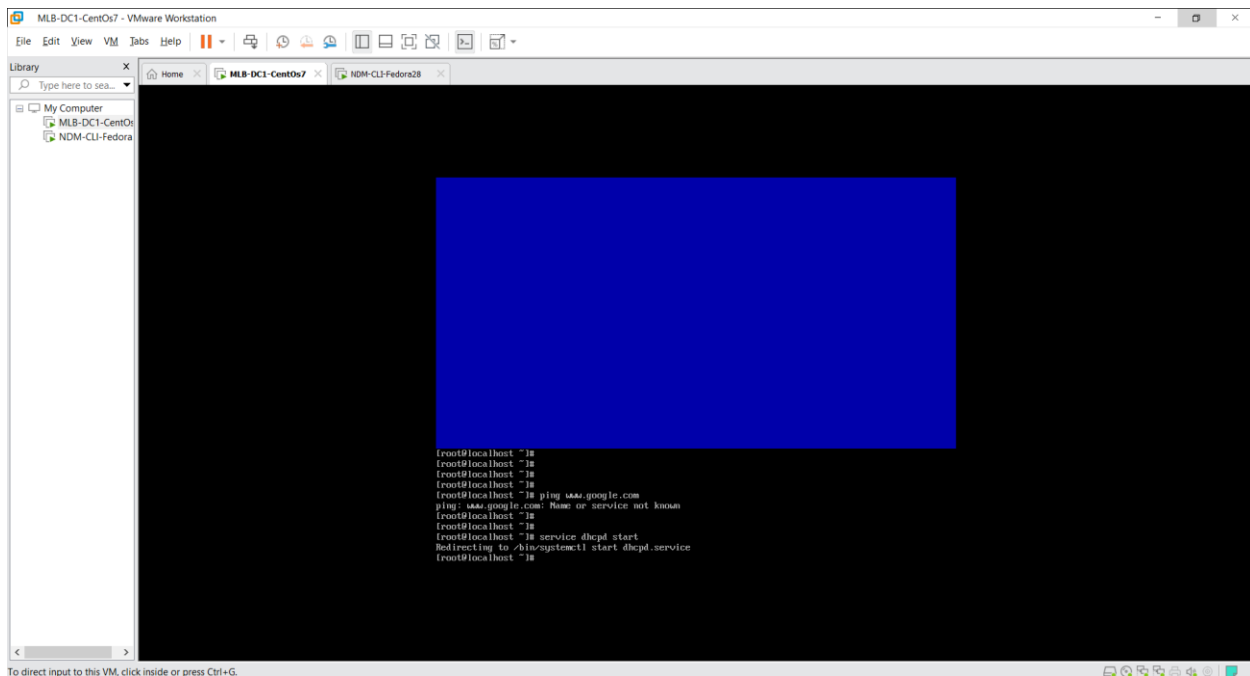
**Figure 1.2.14** clarify the network

Run the command “ping [www.google.com](http://www.google.com)” to clarify that there is any network connection.

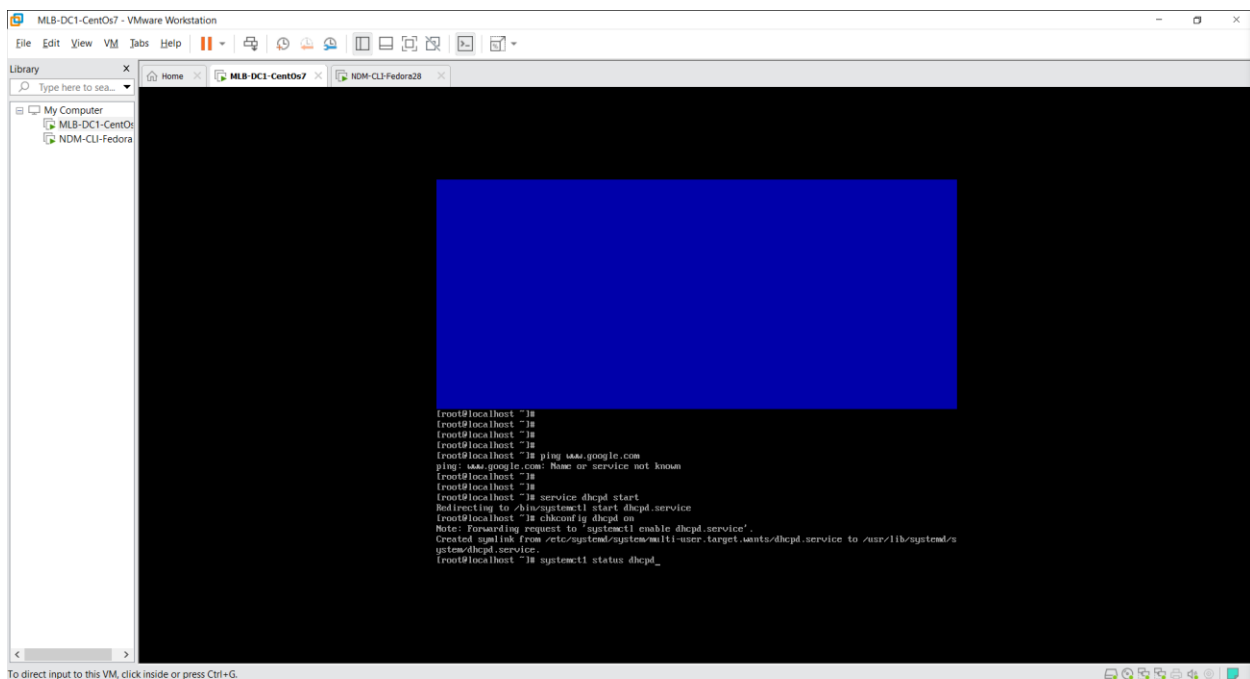


**Figure 1.2.15** command “service dhcpd start”

Run the command “service dhcpd start” to start the dhcpd service and make it to start automatically on every reboot.

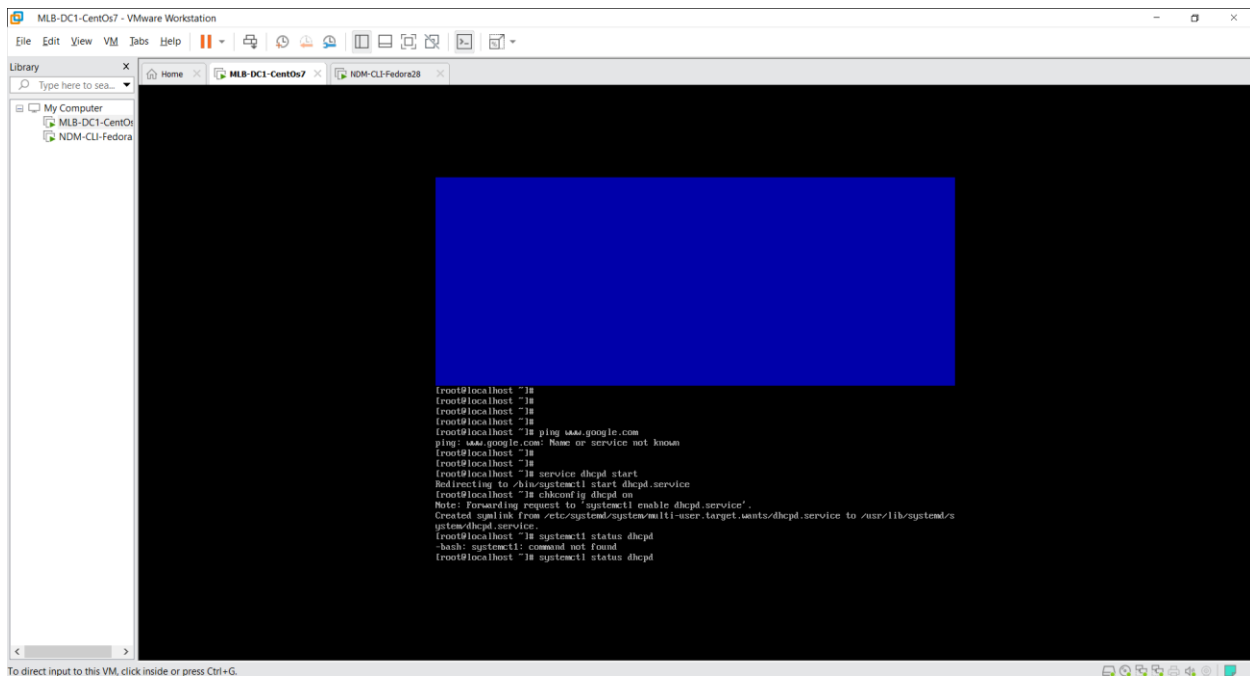


**Figure 1.2.16** command “service dhcpd start”(2)



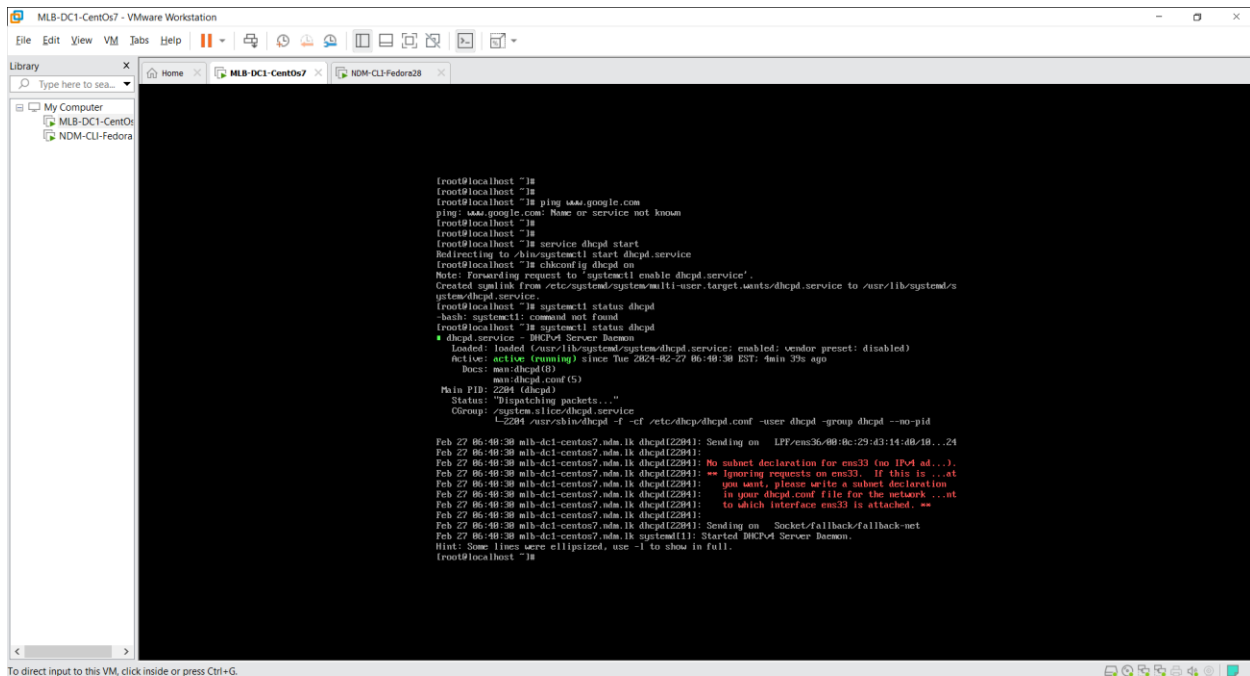
**Figure 1.2.17** command “chkconfig dhcpd on”

Run the command “chkconfig dhcpd on” to o start up the DHCP server at login to the server session use.

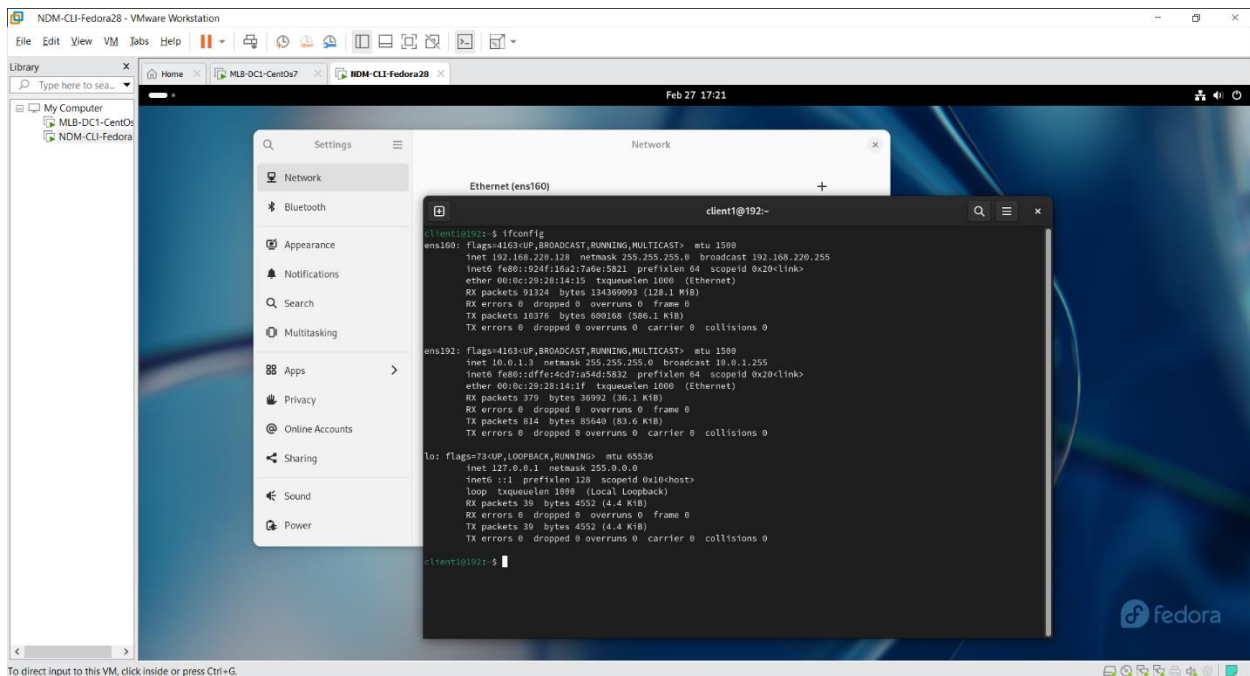


**Figure 1.2.18 command “Systemctl status dhcpd”**

Run the command “Systemctl status dhcpd” to check the DHCP server status.

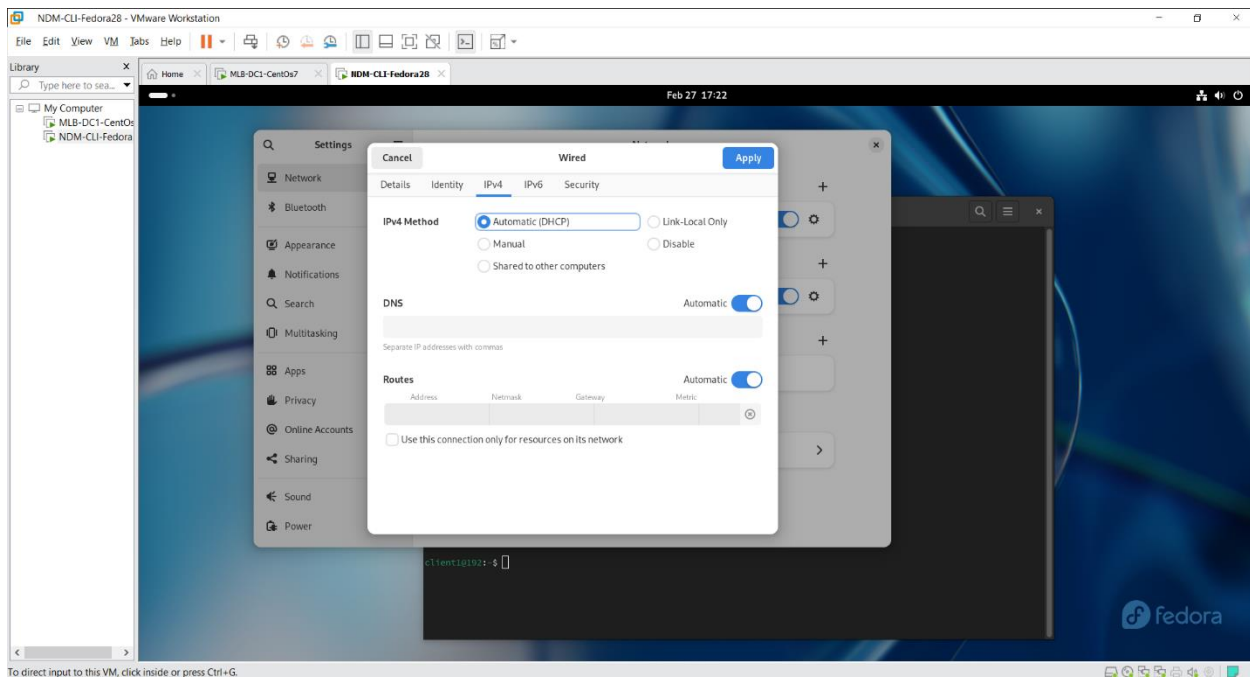


**Figure 1.2.19 DHCP server status**



**Figure 1.2.20** to check the connected networks on client

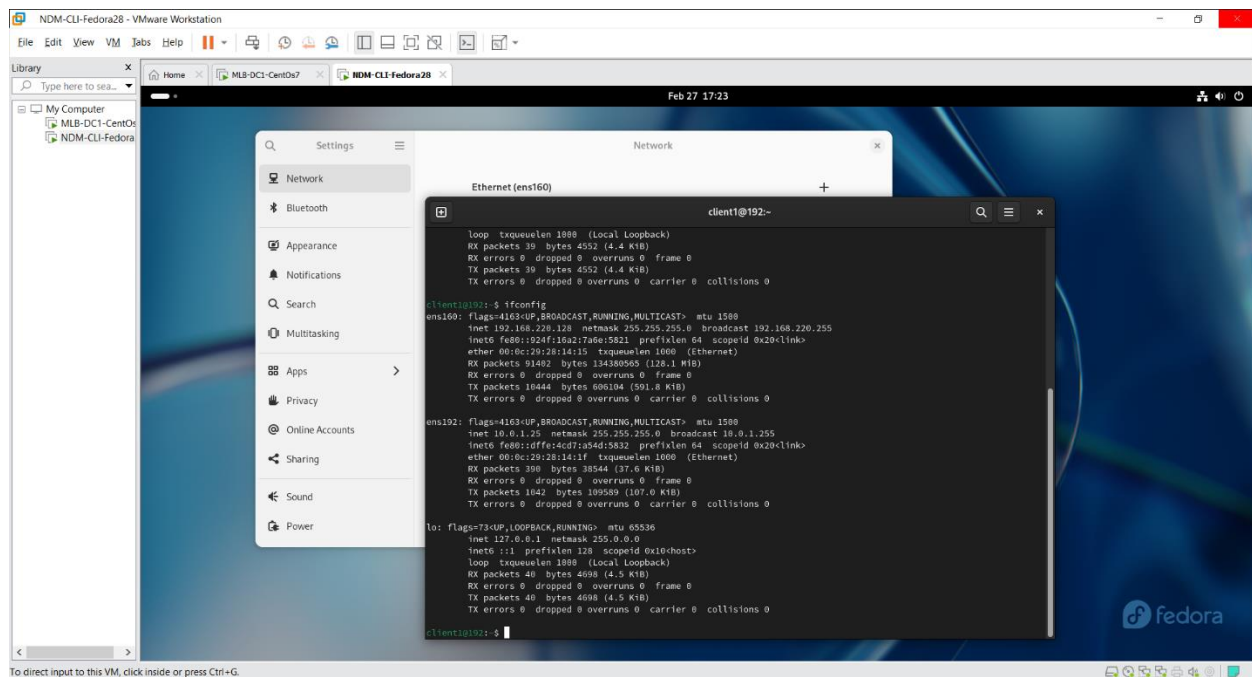
Go to terminal in the client OS and run the command “ifconfig” to check the connected networks. Ens192 network shows the IP as 10.0.1.3.



**Figure 1.2.21** connect the network via DHCP on client

Go to network setting and set the ens192 network IPv4 method as Automatic(DHCP) to connect the network via DHCP.





**Figure 1.2.22** clarify the network

Re-run the command “ifconfig” to clarify the network ens192 has connected via DHCP. The network IP of the ens192 network shows as 10.0.1.25 (First IP address of the given IP range of the DHCP)