Date

Assignment - IV

Problem Statement :- Install & configure DHCP server & while a program to install the software on remote machine

Theory :-

- DHCP stands for Dynamic Host Configuration Protocol. It is used on Internet protocol Network for dynamically distributing n/w config parameters such as IP address.
- It can be any server (window or linux) that is used to distribute IP addresses automatically.
- The most common settings provided by a DHCP server to DHCP client include :
  - IP address & network
  - IP address of default gateway to use.
  - IP address of DNS servers to use.
- A DHCP server can also supply configuration properties such as
  - Host name
  - Domain name
  - Time server
  - Print Server

Advantages :-

- It has become easier to integrate new computers into network.
- No need to check for IP address
- Conflicts of IP address allocation are also reduced.

- A DHCP server can provide configuration settings using following methods.

i) MAC address (Manual allocation)
- This method entails using DHCP to identify the unique h/w address of each network & then continually supplying a constant configuration each time the DHCP client makes a request to server with need device.

ii) Address Pool (Dynamic allocation)
- In this method the DHCP servers will assign an IP address from a pool of addresses for a lease, that is configured to server as until client informs server that it doesn't need address anymore.

iii) Automatic allocation :-
- Using this method, DHCP automatically assigns an IP addresses permanently to a device, selecting it from a pool of available addresses.
- Usually a DHCP server can assign a temporary address to a client but can allow an infinite lease time.
- Ubuntu is shipped with both server & client
- The server is 'dhcpd' & client is 'dhcpclient'

- Install DHCP server on Ubuntu.

To install enter full command
sudo apt-get install isc-dhcp-server.

Configuration :-

- First assign on what interfaces should the DHCP server (dhcpd) server DHCP request.
- In case you have only 1 interface, so assign that
- To do that, edit file/etc/default/isc-dhcp-server
  /sudo vi /etc/default/isc-dhcp-server.

Assign the n/w interface.

/ Interfaces = "enp0s3"

- save & close the file.

Now edit dhcpd.conf file.

/sudo vi/etc/dehcp/dhcpd.conf

- set domain name & domain servers (or comment it)

option domain_name = " "

option domain-name-servers server ,

If this DHCP server is the official DHCP server for local n/w, you should uncomment the following line

/ authoritative.

- Define the subnet, range of IP addresses, domain & domain name servers.

```
/subnet 10.0.2.0 netmask 255.255.255.0{
range 10.0.2.10 10.0.2.20
# option domain-name-servers ...
# option domain-name "internal.example.org";
option routers 10.0.2.255
option broadcast address 10.0.2.255
default-lease-time 600;
max-lease-time 7200; }
```

- If you want to assign a fixed IP address to your client, you should enter its MAC id & then IP address

```
host ubuntu-client {
hardware-ethernet 00:22:64:48:e9,3a;
fixed address 10.0.2.15; }
```

- After making all changes you want, save & close the file comment all the unnecessary things, to avoid further issues while starting dhcp service.

* Configure DHCP Clients :-

Go to client configuration network settings & change the IP settings to automatic (DHCP) Restart the network or reboot the client system to get IP address automatically from DHCP server.

Run : sudo ifconfig

- Now you can see that the IP address assigned is among the range mentioned at the server side

Conclusion :

In this assignment, we learn t how to install DHCP server & its configuration.

Code

dhcp_server.py

```
import os
#Install DHCP Package
os.system("yum install dhcp")
#Change Subnet mask ip address to 192.168.5.0
os.system("gedit /etc/dhcp/dhcpd.conf")
#Starting DHCP Service
os.system("systemctl start dhcpd.service")
os.system("systemctl enable dhcpd.service")
os.system("systemctl status dhcpd.service")
```

dhcp_client.py

```
import os
#Install DHCP Package
os.system("dhclient -r")
os.system("dhclient -r -v")
os.system("dhclient -v")
```

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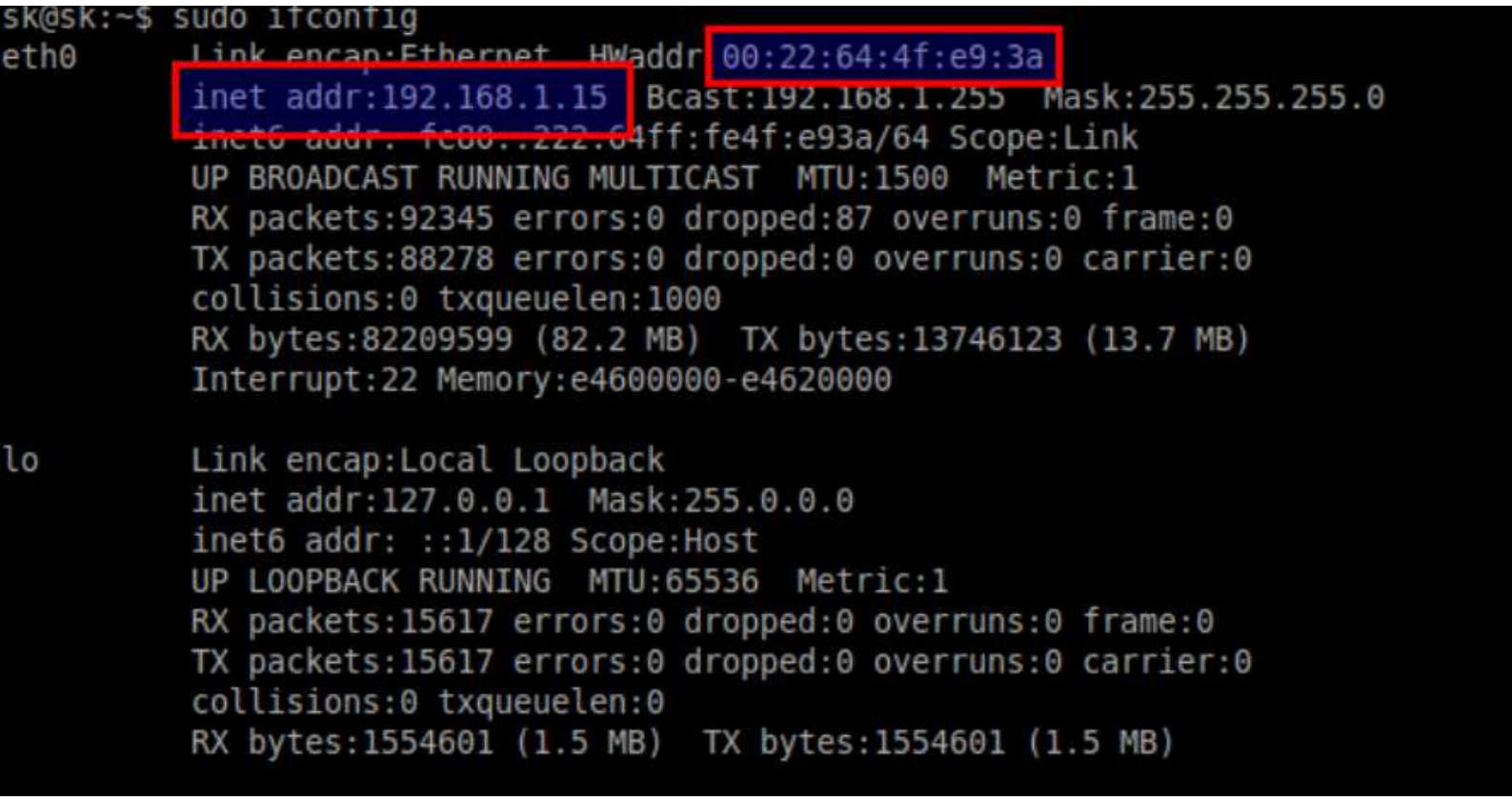
sk@sk:~$ sudo ifconfig
eth0 Link encap:Ethernet HWaddr 00:22:64:4f:e9:3a
inet addr:192.168.1.15 Bcast:192.168.1.255 Mask:255.255.255.0
inet6 addr: fe80::222:64ff:fe4f:e93a/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:92345 errors:0 dropped:87 overruns:0 frame:0
TX packets:88278 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:82209599 (82.2 MB) TX bytes:13746123 (13.7 MB)
Interrupt:22 Memory:e4600000-e4620000
lo Link encap:Local Loopback
inet addr:127.0.0.1 Mask:255.0.0.0
inet6 addr: ::1/128 Scope:Host
UP LOOPBACK RUNNING MTU:65536 Metric:1
RX packets:15617 errors:0 dropped:0 overruns:0 frame:0
TX packets:15617 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:1554601 (1.5 MB) TX bytes:1554601 (1.5 MB)