

Linux Assignment

Assignment No:02

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1)Introduction

If you have a network that ranges from 192.168.1.0 to 192.168.1.255 explain why individual divices in the network can only be assigned IP addresses in the range of 192.168.1.1 to 192.168.1.254(write down the answers in your written report)

Ans:

If I have a network that ranges from 192.168.1.0 to 192.168.1.255, then we can say that:

1)The network identifier would be 192.168.1.0

An address like 192.168.0.0 becomes unusable for any other purpose after it's established as a network number. If an administrator assigns 192.168.0.0 to any device on the network as a static IP address, the network stops functioning until that device is taken offline. As a network number, this address is used in routing tables and by routers to share network information with each other.

2)The broadcast address would be 192.168.1.255

A broadcast is a multipoint connection in a computer network. A data packet is transmitted from one point to all users of a messaging network in this way. This occurs with the use of the broadcast address.

So, valid ip addresses would be 192.168.1.1 to 192.168.1.254.

2)Find IP & MAC

Find out about network and hardware information for the computer you are currently using. (write down the IP & MAC address of your computer in your written report)

My IP address is 192.168.0.102 MAC address is 70-60-55-08-0C-05

```
piya@piya-VirtualBox: ~
piya@piya-VirtualBox:~$ ip -c address
        <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defau
   qlen 1000
     link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
                      1/8 scope host lo
        valid_lft forever preferred_lft forever
t6 ::1/128 scope host
valid_lft forever preferred_lft forever
valid_lft forever preferred_lft forever
)s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP g
2: enp0s3:
roup default qlen 1000
                               :29:d4:bb brd ff:ff:ff:ff:ff
     link/ether
        et 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3 valid_lft 86178sec preferred_lft 86178sec
                    .15/24 brd 10.0.2.255
         t6 fe80::82ee:ba8c:3085:6617/64 scope link noprefixroute valid_lft forever preferred_lft forever
        -system: <BROADCAST, MULTICAST> mtu 1500 qdisc noop state
                                                                                         group defau
   qlen 1000
     link/ether 1a:50:be:71:c3:71 brd ff:ff:ff:ff:ff
         <BROADCAST,MULTICAST> mtu 1500 qdisc noop state
                                                                              group default qlen
     link/ether ee:6f:66:47:46:49 brd ff:ff:ff:ff:ff
```

3)Routing Table basics

Now enter the command:"&netstat -r"to print your computers routing table.Explain(very briefly)the different columns:Destination,Gateway,Genmask,Flags,MSS,Window,irtt and Iface(write the ans in your written report in table form)

Ans:



- **Destination**: The destination network or destination host.
- Gateway: The gateway address or '*' if none set.
- **Genmask**: The netmask for the destination net; 255.255.255.55 for a host destination and 0.0.0.0 for the default route.
- Flags: The U output in this columns means that the route is up. The G output indicates that
 specified gateway should be used for this route. D stands for dynamically installed, M stands for
 modified, and R means reinstated.
- MSS: Default maximum segment size for TCP connections over
- Window: Default window size for TCP connections over this route.
- **irtt**: Initial RTT (Round Trip Time). The kernel uses this to guess about the best TCP protocol parameters without waiting on (possibly slow) answers.
- Iface: Interface to which packets for this route will be sent.

4) Virtual Interfaces

Linux offers the possibility to set up interfaces according to your networking needs. For instance, if needed, you can configure an interface for multiple IP addresses by creating new virtual interfaces with another IP address

a)Create a new virtual interface with following IP addresses,192.168.2.32 and netmask 255.255.255.0 then check to see if the interface was created successfully?(save a printscreen of your interface table to display in your written report document)

b)Now,you need to set up a route for this Interface so that your computer can see it.Otherwise, everyone else on the network will be able to reach the new interface except you. Issue the needed command, then issue the "\$netstat -r" command and check if the route to your added interface is visible (save a print screen of your routing table to display in your written report document together with the command(s) you used to set up the interface)

c)Next remove the route for this interface(write down the command(s)in your written report)

d)Then remove the interface completely(write down the command(s)in your written report)

Ans:

a)Creating virtual interface:

sudo ip addr add 192.168.2.32/24 brd + dev enp0s3 label enp0s3:pin

```
iya@piya-VirtualBox:~$ ip -c a
   .: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defau
 lt 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: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP g
roup default qlen 1000
              link/ether 08:00:27:29:d4:bb
inet 10.0.2.15/24 brd 10.0.2
                        nk/ether 08:00:27:29:d4:bb brd ff:ff:ff:ff:ff
et 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
valid_lft 84003sec preferred_lft 84003sec
                      et6 fe80::82ee:ba8c:3085:6617/64 scope link noprefixroute valid_lft forever preferred_lft forever
               inet6 f
 3: ovs-system: <BROADCAST, MULTICAST> mtu 1500 qdisc noop state DOWN group defau
lt qlen 1000
             link/ether
                                                     1e:f1:a3:e6:e0:1f brd ff:ff:ff:ff:ff
          s1: <BROADCAST, MULTICAST> mtu 1500 qdisc noop state DOWN group default qlen
1000
              link/ether ee:6f:66:47:46:49 brd ff:ff:ff:ff:ff
@piya-VirtualBox:~$ sudo ip addr add 192.168.2.32/24 brd + dev enp0s3 label
  enp0s3:pin
   iya@piya-VirtualBox:~$ ifconfig
piya@piya-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fe80::82ee:ba8c:3085:6617 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:29:d4:bb txqueuelen 1000 (Ethernet)
    RX packets 77770 bytes 81827915 (81.8 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 22485 bytes 1533452 (1.5 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
enp0s3:pin: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 192.168.2.32 netmask 255.255.255.0 broadcast 192.168.2.255
ether 08:00:27:29:d4:bb txqueuelen 1000 (Ethernet)
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65
inet 127.0.0.1 netmask 255.0.0.0
                                                                                                                           mtu 65536
                             inet6 ::1 prefixlen 128 scopeid 0x10<host>
                            loop txqueuelen 1000 (Local Loopback)
RX packets 926 bytes 58314 (58.3 KB)
                            RX packets 926 bytes 58314 (58.3 KB)

RX errors 0 dropped 0 overruns 0 frame 0

TX packets 926 bytes 58314 (58.3 KB)

TX errors 0 dropped 0 overruns 0 carrier 0 colliging at the colliging of the colliging at the collision at th
```

b)Inserting Interface in the routing table:

sudo route add default gw 192.168.2.32

```
VirtualBox:~$ netstat -r
Kernel IP routing table
                  Gateway
Destination
                                    Genmask
                                                      Flags
                                                              MSS Window
                                                                            irtt Iface
                 _gateway
0.0.0.0
default
                                    0.0.0.0
                                                     UG
                                                                 0 0
                                                                               0
                                                                                 enp0s3
10.0.2.0
link-local
                                    255.255.255.0
                                                      u
                                                                 0 0
                                                                               0 enp0s3
                 0.0.0.0
                                    255.255.0.0
                                                      U
                                                                 0 0
                                                                                 enp0s3
                                                                               0
192.168.2.0
                 0.0.0.0
                                    255.255.255.0
                                                                 0 0
                                                                               0 enp0s3
                                                     U
oiya@piya-VirtualBox:~$ sudo route add default gw 192.168.2.32
  ya@piya-VirtualBox:~$ netstat -r
Kernel IP routing table
Destination Gateway
                                    Genmask
                                                      Flags
                                                              MSS Window
                                                                            irtt Iface
default
                 192.168.2.32
                                   0.0.0.0
                                                      UG
                                                                0 0
                                                                               0 enp0s3
default
                 10.0.2.2
                                   0.0.0.0
                                                                 0 0
                                                                               0
                                                     UG
                                                                                 enp0s3
10.0.2.0
link-local
                 0.0.0.0
                                   255.255.255.0
                                                                 0 0
                                                                               0 enp0s3
                                                     U
                 0.0.0.0
                                   255.255.0.0
                                                     U
                                                                 0 0
                                                                               0
                                                                                 enp0s3
192.168.2.0
                                   255, 255, 255, 0
                                                                 0 0
                 0.0.0.0
                                                     U
                                                                               0 enp0s3
  ya@piya-VirtualBox:~$ netstat -rn
Kernel IP routing table
                 Gateway
Destination
                                                      Flags
                                                              MSS Window irtt Iface
                                   Genmask
                  192.168.2.32
                                                     UG
0.0.0.0
                                   0.0.0.0
                                                                 0 0
                                                                               0 enp0s3
                                   0.0.0.0
255.255.255.0
0.0.0.0
                  10.0.2.2
                                                     UG
                                                                 0 0
                                                                               0
                                                                                 enp0s3
10.0.2.0
169.254.0.0
                 0.0.0.0
                                                     U
                                                                 0 0
                                                                               0 enp0s3
                 0.0.0.0
                                    255.255.0.0
                                                     U
                                                                 0 0
                                                                               0
                                                                                 enp0s3
192.168.2.0
                  0.0.0.0
                                    255.255.255.0
                                                                 0 0
                                                                               0 enp0s3
```

C)Deleting Interface from routing table:

Sudo route delete default gw 192.168.2.32

```
oiya@piya-VirtualBox:~$ sudo route delete default gw 192.168.2.32
oiya@piya-VirtualBox:~$ netstat -rn
Kernel IP routing table
Destination
                 Gateway
                                    Genmask
                                                      Flags
                                                               MSS Window irtt Iface
0.0.0.0
                 10.0.2.2
                                    0.0.0.0
                                                      UG
                                                                 0 0
                                                                                0
                                                                                  enp0s3
10.0.2.0
                 0.0.0.0
                                    255.255.255.0
                                                                                0 enp0s3
                                                      U
169.254.0.0
                 0.0.0.0
                                    255.255.0.0
                                                                  0 0
                                                                                  enp0s3
                                    255.255.255.0
192.168.2.0
                 0.0.0.0
                                                                                  enp0s3
iya@piya-VirtualBox:~$
```

d)Deleting virtual Interface:

sudo ip addr delete 192.168.2.32/24 dev enp0s3:pin

```
plya@plya-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.15 netmask 255.255.0 broadcast 10.0.2.255
    inet6 fe80::82ee:ba8c:3085:6617 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:29:d4:bb txqueuelen 1000 (Ethernet)
    RX packets 249011 bytes 237002323 (237.0 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 92299 bytes 5730314 (5.7 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s3:pin: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.2.32 netmask 255.255.255.0 broadcast 192.168.2.255
    ether 08:00:27:29:d4:bb txqueuelen 1000 (Ethernet)

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<hook
    loop txqueuelen 1000 (Local Loopback)
    RX packets 2493 bytes 189329 (189.3 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 2493 bytes 189329 (189.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
plya@plya-VirtualBox:~$ sudo ip addr delete 192.168.2.32/24 dev enp0s3:pin plya@plya-VirtualBox:~$ ifconfig enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500 inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255 inet6 fe80::82ee:ba8c:3085:6617 prefixlen 64 scopeid 0x20ether 08:00:27:29:d4:bb txqueuelen 1000 (Ethernet) RX packets 249011 bytes 237002323 (237.0 MB) RX errors 0 dropped 0 overruns 0 frame 0 TX packets 92337 bytes 5732664 (5.7 MB) TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536 inet 127.0.0.1 netmask 255.0.0.0 inet6 ::1 prefixlen 128 scopeid 0x10<hoot>host>loop txqueuelen 1000 (Local Loopback) RX packets 2559 bytes 194165 (194.1 KB) RX errors 0 dropped 0 overruns 0 frame 0 TX packets 2559 bytes 194165 (194.1 KB) TX errors 0 dropped 0 overruns 0 carrier 0 colli
```