

EXPERIMENT 2

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AIM

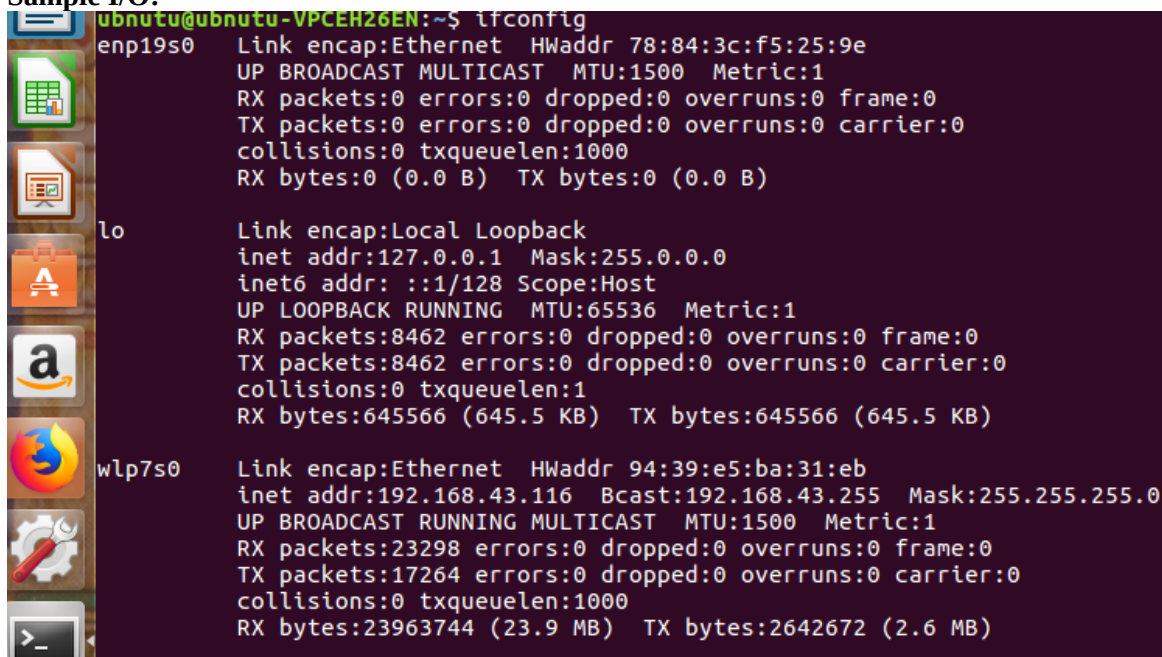
Set up the complete network interface by configuring services such as gateway, DNS, IP tables etc. using ifconfig

NETWORK CONFIGURATION & IFCONFIG:

Command 1 :

Purpose:View All Network Setting

Sample I/O:



```
ubnutu@ubnutu-VPCEH26EN:~$ ifconfig
enp19s0  Link encap:Ethernet  HWaddr 78:84:3c:f5:25:9e
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

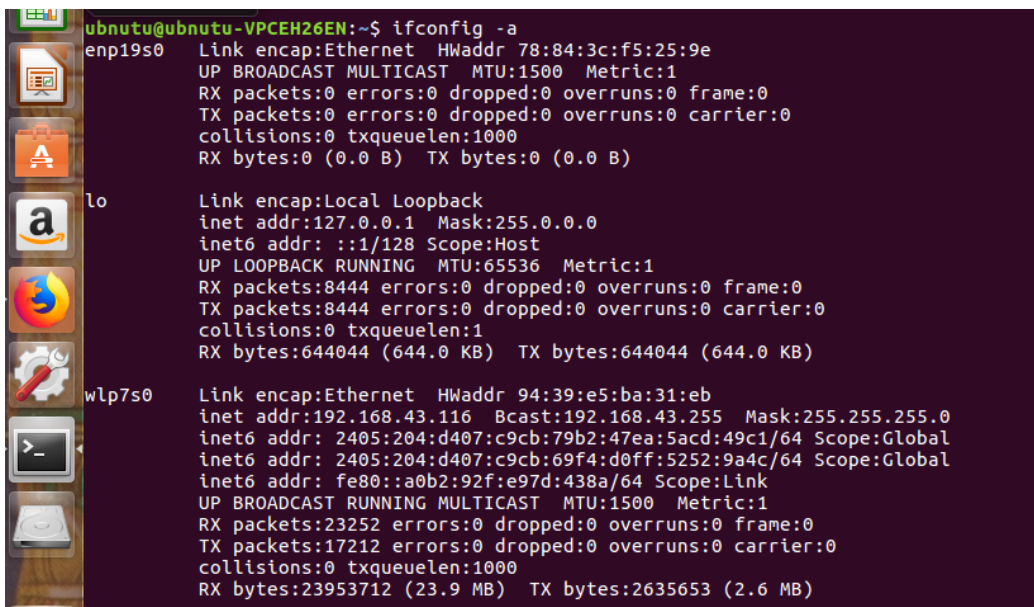
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:8462 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8462 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:645566 (645.5 KB)  TX bytes:645566 (645.5 KB)

wlp7s0    Link encap:Ethernet  HWaddr 94:39:e5:ba:31:eb
          inet addr:192.168.43.116  Bcast:192.168.43.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:23298 errors:0 dropped:0 overruns:0 frame:0
          TX packets:17264 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:23963744 (23.9 MB)  TX bytes:2642672 (2.6 MB)
```

Command 2 :

Purpose:Display Information of All Network Interfaces

Sample I/O:



```
ubnutu@ubnutu-VPCEH26EN:~$ ifconfig -a
enp19s0  Link encap:Ethernet  HWaddr 78:84:3c:f5:25:9e
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

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:8444 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8444 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:644044 (644.0 KB)  TX bytes:644044 (644.0 KB)

wlp7s0    Link encap:Ethernet  HWaddr 94:39:e5:ba:31:eb
          inet addr:192.168.43.116  Bcast:192.168.43.255  Mask:255.255.255.0
          inet6 addr: 2405:204:d407:c9cb:79b2:47ea:5acd:49c1/64 Scope:Global
          inet6 addr: 2405:204:d407:c9cb:69f4:d0ff:5252:9a4c/64 Scope:Global
          inet6 addr: fe80::a0b2:92f:e97d:438a/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:23252 errors:0 dropped:0 overruns:0 frame:0
          TX packets:17212 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:23953712 (23.9 MB)  TX bytes:2635653 (2.6 MB)
```

Command 3 :

Purpose:View Network Settings of Specific Interface

Sample I/O:

```
ubnutu@ubnutu-VPCEH26EN:~$ ifconfig wlp7s0
wlp7s0    Link encap:Ethernet  HWaddr 94:39:e5:ba:31:eb
          inet addr:192.168.43.116  Bcast:192.168.43.255  Mask:255.255.255.0
          inet6 addr: 2405:204:d407:c9cb:79b2:47ea:5acd:49c1/64  Scope:Global
          inet6 addr: 2405:204:d407:c9cb:69f4:d0ff:5252:9a4c/64  Scope:Global
          inet6 addr: fe80::a0b2:92f:e97d:438a/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:23271 errors:0 dropped:0 overruns:0 frame:0
          TX packets:17235 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:23955448 (23.9 MB)  TX bytes:2638296 (2.6 MB)
```

Command 4 :

Purpose:How to Enable an Network Interface

Sample I/O:

```
ubnutu@ubnutu-VPCEH26EN:~$ sudo ifconfig wlp7s0 up
ubnutu@ubnutu-VPCEH26EN:~$ ifconfig
enp19s0    Link encap:Ethernet  HWaddr 78:84:3c:f5:25:9e
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

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:8462 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8462 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:645566 (645.5 KB)  TX bytes:645566 (645.5 KB)

wlp7s0     Link encap:Ethernet  HWaddr 94:39:e5:ba:31:eb
          inet addr:192.168.43.116  Bcast:192.168.43.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:23298 errors:0 dropped:0 overruns:0 frame:0
          TX packets:17264 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:23963744 (23.9 MB)  TX bytes:2642672 (2.6 MB)
```

Command 5 :

Purpose:How to Disable an Network Interface

Sample I/O:

```
ubnutu@ubnutu-VPCEH26EN:~$ sudo ifconfig wlp7s0 down
ubnutu@ubnutu-VPCEH26EN:~$ ifconfig
enp19s0    Link encap:Ethernet  HWaddr 78:84:3c:f5:25:9e
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

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:8462 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8462 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:645566 (645.5 KB)  TX bytes:645566 (645.5 KB)
```

Command 6 :

Purpose:How to Assign a IP, Netmask and Broadcast to Network Interface

Sample I/O:

```
ubnutu@ubnutu-VPCEH26EN:~$ sudo ifconfig wlp7s0 192.168.99.6 netmask 255.255.255.255 broadcast 172.16.25.79
ubnutu@ubnutu-VPCEH26EN:~$ ifconfig
enp19s0    Link encap:Ethernet  HWaddr 78:84:3c:f5:25:9e
            UP BROADCAST MULTICAST  MTU:1500  Metric:1
            RX packets:0 errors:0 dropped:0 overruns:0 frame:0
            TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

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:13970 errors:0 dropped:0 overruns:0 frame:0
            TX packets:13970 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1
            RX bytes:1109977 (1.1 MB)  TX bytes:1109977 (1.1 MB)

wlp7s0     Link encap:Ethernet  HWaddr 94:39:e5:ba:31:eb
            inet addr:192.168.99.6  Bcast:172.16.25.79  Mask:255.255.255.255
            inet6 addr: 2405:204:d407:c9cb:69f4:d0ff:5252:9a4c/64 Scope:Global
            inet6 addr: 2405:204:d407:c9cb:549d:6210:7281:9309/64 Scope:Global
            inet6 addr: fe80::a0b2:92f:e97d:438a/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST  MTU:1280  Metric:1
            RX packets:44105 errors:0 dropped:0 overruns:0 frame:0
            TX packets:37868 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:35933228 (35.9 MB)  TX bytes:6068718 (6.0 MB)
```

Command 7 :

Purpose:How to Add New Alias to Network Interface

Sample I/O:

```
ubnutu@ubnutu-VPCEH26EN:~$ sudo ifconfig wlp7s0:0 172.16.25.100
ubnutu@ubnutu-VPCEH26EN:~$ ifconfig
enp19s0    Link encap:Ethernet  HWaddr 78:84:3c:f5:25:9e
            UP BROADCAST MULTICAST  MTU:1500  Metric:1
            RX packets:0 errors:0 dropped:0 overruns:0 frame:0
            TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

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:10361 errors:0 dropped:0 overruns:0 frame:0
            TX packets:10361 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1
            RX bytes:801195 (801.1 KB)  TX bytes:801195 (801.1 KB)

wlp7s0     Link encap:Ethernet  HWaddr 94:39:e5:ba:31:eb
            inet addr:192.168.99.6  Bcast:172.16.25.79  Mask:255.255.255.255
            UP BROADCAST RUNNING MULTICAST  MTU:900  Metric:1
            RX packets:26278 errors:0 dropped:0 overruns:0 frame:0
            TX packets:20585 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:25589179 (25.5 MB)  TX bytes:3175027 (3.1 MB)

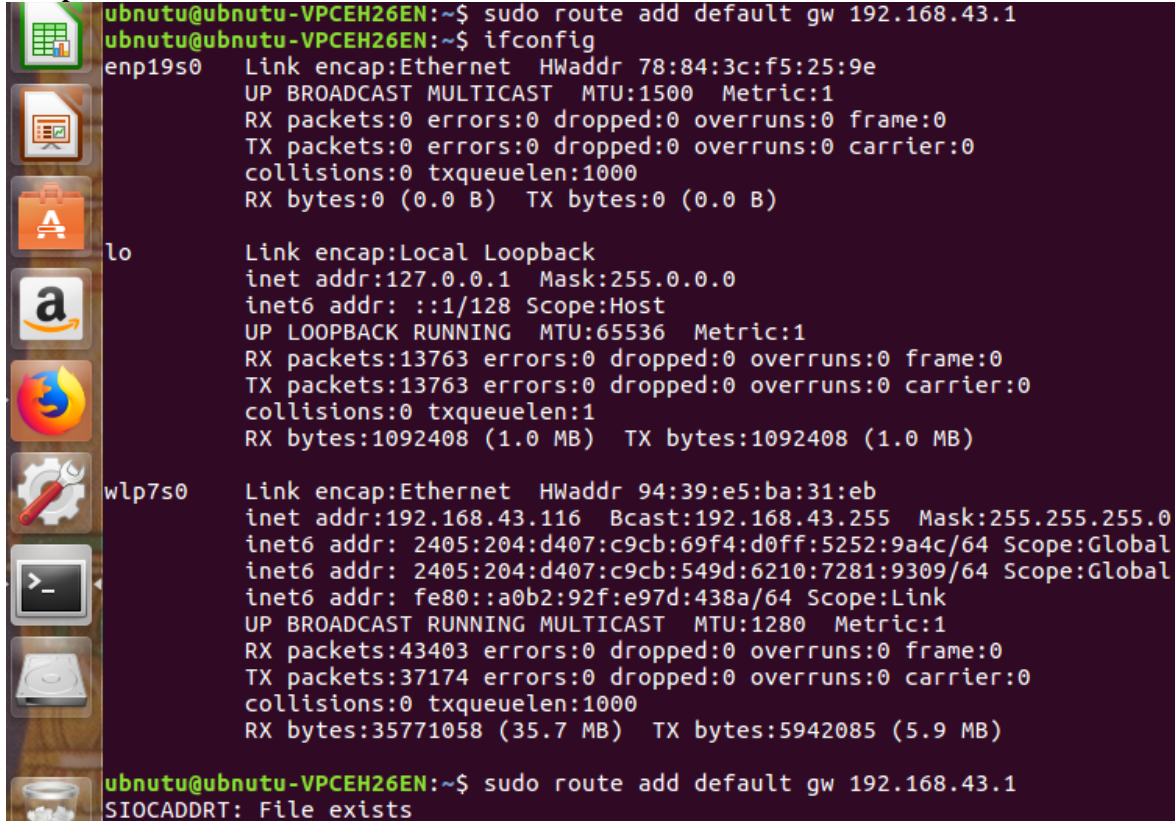
wlp7s0:0   Link encap:Ethernet  HWaddr 94:39:e5:ba:31:eb
            inet addr:172.16.25.100  Bcast:172.16.255.255  Mask:255.255.0.0
            UP BROADCAST RUNNING MULTICAST  MTU:900  Metric:1
```

GATEWAY CONFIGURATION :

Command 8 :

Purpose: To setup and show gateway configuration

Sample I/O:

A terminal window with a dark purple background and a vertical sidebar of application icons on the left. The terminal shows the execution of several commands to configure the network gateway. The first command sets the default gateway to 192.168.43.1. The second command shows the configuration of the 'enp19s0' interface, which is an Ethernet card with a MAC address of 78:84:3c:f5:25:9e and an MTU of 1500. The third command shows the configuration of the 'lo' loopback interface with IP 127.0.0.1 and MTU 65536. The fourth command shows the configuration of the 'wlp7s0' wireless interface with IP 192.168.43.116 and MTU 1280. The final command attempts to set the default gateway again, but it fails with the message 'SIOCADDRT: File exists'.

```
ubnutu@ubnutu-VPCEH26EN:~$ sudo route add default gw 192.168.43.1
ubnutu@ubnutu-VPCEH26EN:~$ ifconfig
enp19s0    Link encap:Ethernet  HWaddr 78:84:3c:f5:25:9e
           UP BROADCAST MULTICAST  MTU:1500  Metric:1
           RX packets:0 errors:0 dropped:0 overruns:0 frame:0
           TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
           collisions:0 txqueuelen:1000
           RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

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:13763 errors:0 dropped:0 overruns:0 frame:0
           TX packets:13763 errors:0 dropped:0 overruns:0 carrier:0
           collisions:0 txqueuelen:1
           RX bytes:1092408 (1.0 MB)  TX bytes:1092408 (1.0 MB)

wlp7s0     Link encap:Ethernet  HWaddr 94:39:e5:ba:31:eb
           inet addr:192.168.43.116  Bcast:192.168.43.255  Mask:255.255.255.0
           inet6 addr: 2405:204:d407:c9cb:69f4:d0ff:5252:9a4c/64  Scope:Global
           inet6 addr: 2405:204:d407:c9cb:549d:6210:7281:9309/64  Scope:Global
           inet6 addr: fe80::a0b2:92f:e97d:438a/64  Scope:Link
           UP BROADCAST RUNNING MULTICAST  MTU:1280  Metric:1
           RX packets:43403 errors:0 dropped:0 overruns:0 frame:0
           TX packets:37174 errors:0 dropped:0 overruns:0 carrier:0
           collisions:0 txqueuelen:1000
           RX bytes:35771058 (35.7 MB)  TX bytes:5942085 (5.9 MB)

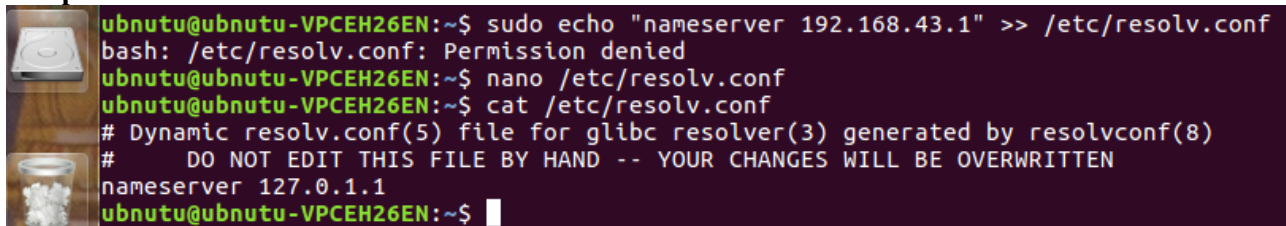
ubnutu@ubnutu-VPCEH26EN:~$ sudo route add default gw 192.168.43.1
SIOCADDRT: File exists
```

DNS CONFIGURATION :

Command 9 :

Purpose: To configure DNS

Sample I/O:

A terminal window with a dark purple background and a vertical sidebar of application icons on the left. The terminal shows the execution of commands to configure DNS. The first command attempts to echo the nameserver address to the resolv.conf file but is denied permission. The second command opens the file in nano. The third command shows the contents of the file, which includes a dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8). The final command shows the nameserver address 127.0.1.1.

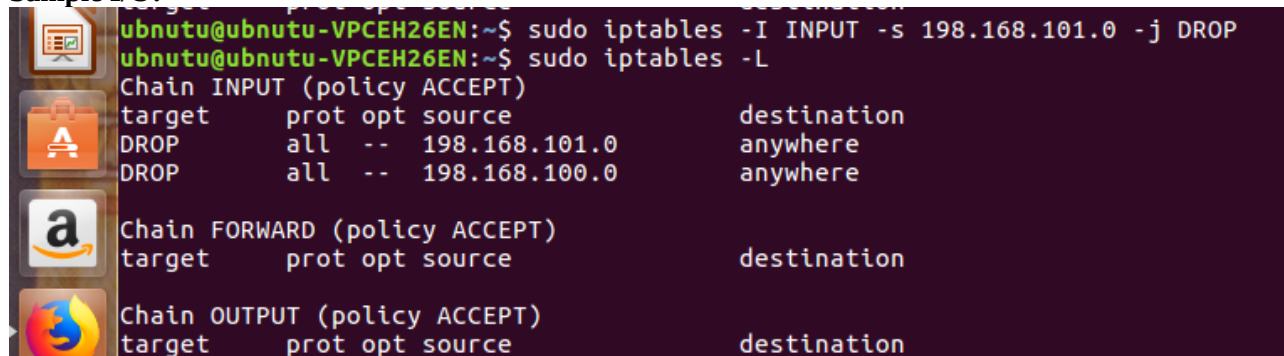
```
ubnutu@ubnutu-VPCEH26EN:~$ sudo echo "nameserver 192.168.43.1" >> /etc/resolv.conf
bash: /etc/resolv.conf: Permission denied
ubnutu@ubnutu-VPCEH26EN:~$ nano /etc/resolv.conf
ubnutu@ubnutu-VPCEH26EN:~$ cat /etc/resolv.conf
# Dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8)
#     DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN
nameserver 127.0.1.1
ubnutu@ubnutu-VPCEH26EN:~$
```


IP TABLES :

Command 10 :

Purpose: To create & show iptables

Sample I/O:



```
ubnutu@ubnutu-VPCEH26EN:~$ sudo iptables -I INPUT -s 198.168.101.0 -j DROP
ubnutu@ubnutu-VPCEH26EN:~$ sudo iptables -L
Chain INPUT (policy ACCEPT)
target     prot opt source                destination
DROP       all  --  198.168.101.0          anywhere
DROP       all  --  198.168.100.0          anywhere

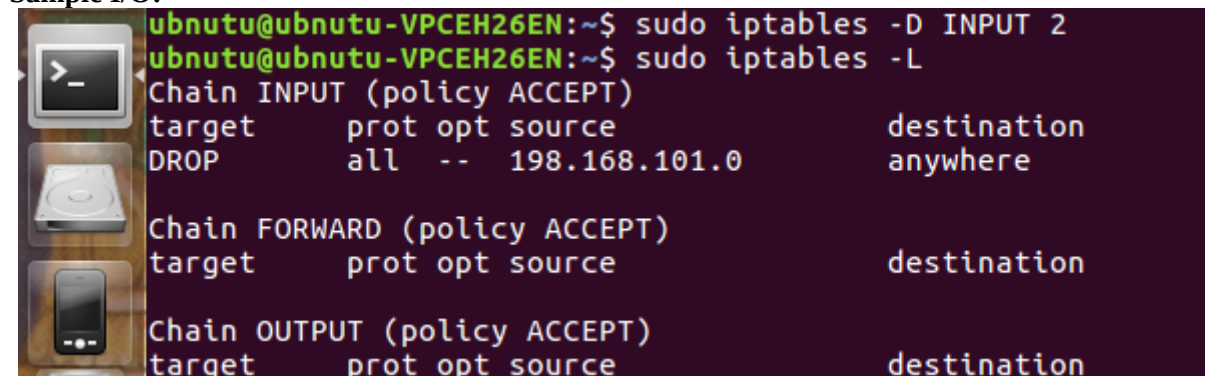
Chain FORWARD (policy ACCEPT)
target     prot opt source                destination

Chain OUTPUT (policy ACCEPT)
target     prot opt source                destination
```

Command 11 :

Purpose: To delete & show iptables

Sample I/O:



```
ubnutu@ubnutu-VPCEH26EN:~$ sudo iptables -D INPUT 2
ubnutu@ubnutu-VPCEH26EN:~$ sudo iptables -L
Chain INPUT (policy ACCEPT)
target     prot opt source                destination
DROP       all  --  198.168.101.0          anywhere

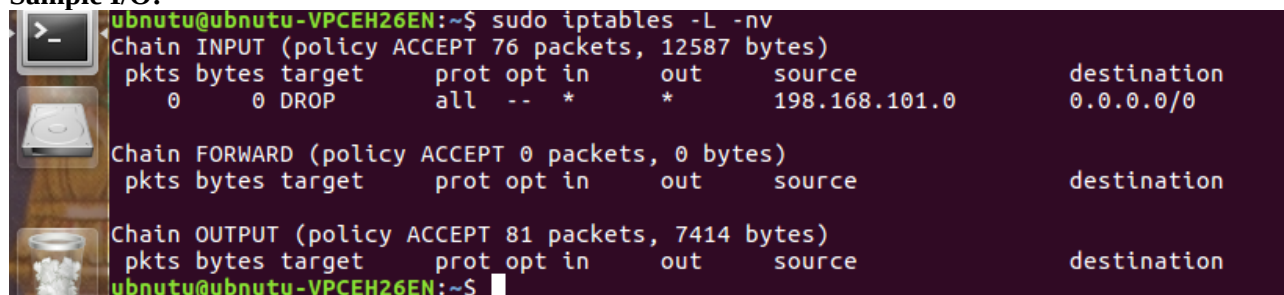
Chain FORWARD (policy ACCEPT)
target     prot opt source                destination

Chain OUTPUT (policy ACCEPT)
target     prot opt source                destination
```

Command 12 :

Purpose: To list iptable

Sample I/O:



```
ubnutu@ubnutu-VPCEH26EN:~$ sudo iptables -L -nv
Chain INPUT (policy ACCEPT 76 packets, 12587 bytes)
 pkts bytes target     prot opt in     out     source    destination
    0    0 DROP      all  --  *      *      198.168.101.0  0.0.0.0/0

Chain FORWARD (policy ACCEPT 0 packets, 0 bytes)
 pkts bytes target     prot opt in     out     source    destination

Chain OUTPUT (policy ACCEPT 81 packets, 7414 bytes)
 pkts bytes target     prot opt in     out     source    destination
ubnutu@ubnutu-VPCEH26EN:~$
```

Conclusion :

Setting up the complete network interface by configuring services such as gateway, DNS, IP tables etc. using ifconfig is done and results obtained using Ubuntu 16.04.