

EXPT NO : 2

REPORT

DATE :21/02/2019

AIM : To set up the complete network interface by configuring services such as gateway , DNS , IPtables etc. using ifconfig

1. Ifconfig : to configure,assign,add,delete,control and query network interface in Unix/Linux machine.

```
File Edit View Search Terminal Help
root@localhost:/home/haseena# ifconfig
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1 (Local Loopback)
    RX packets 656 bytes 53496 (52.2 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 656 bytes 53496 (52.2 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlp2s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether 86:69:10:d0:75:0b txqueuelen 1000 (Ethernet)
    RX packets 50897 bytes 32637377 (31.1 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 40483 bytes 9449117 (9.0 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@localhost:/home/haseena# |
```

2. **ifconfig -a** : view details of all interface including the disabled ones

```
File Edit View Search Terminal Help
root@localhost:/home/haseena# ifconfig -a
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1 (Local Loopback)
    RX packets 656 bytes 53496 (52.2 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 656 bytes 53496 (52.2 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlp2s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether 86:69:10:d0:75:0b txqueuelen 1000 (Ethernet)
    RX packets 50897 bytes 32637377 (31.1 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 40483 bytes 9449117 (9.0 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@localhost:/home/haseena# |
```

3. **ifconfig <interface>** : view the details of the specified interface

```
File Edit View Search Terminal Help
root@localhost:/home/haseena# ifconfig wlp2s0
wlp2s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    inet 192.168.1.2 netmask 255.255.255.0 broadcast 192.168.1.255
    ether d2:bf:d3:b0:cb:e4 txqueuelen 1000 (Ethernet)
    RX packets 50897 bytes 32637377 (31.1 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 40483 bytes 9449117 (9.0 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@localhost:/home/haseena# ifconfig wlp2s0 mtu 1450
root@localhost:/home/haseena# ifconfig wlp2s0
wlp2s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1450
    inet 192.168.1.2 netmask 255.255.255.0 broadcast 192.168.1.255
    ether d2:bf:d3:b0:cb:e4 txqueuelen 1000 (Ethernet)
    RX packets 50897 bytes 32637377 (31.1 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 40483 bytes 9449117 (9.0 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@localhost:/home/haseena# |
```

4. **ifconfig <interface> up**: enable an interface

```
File Edit View Search Terminal Help
root@localhost:/home/haseena# ifconfig wlp2s0
wlp2s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
        ether 86:69:10:d0:75:0b txqueuelen 1000 (Ethernet)
        RX packets 50897 bytes 32637377 (31.1 MiB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 40483 bytes 9449117 (9.0 MiB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@localhost:/home/haseena#
root@localhost:/home/haseena# ifconfig wlp2s0 up
root@localhost:/home/haseena# |
```

5. **ifconfig <interface> down:** disable an interface

```
File Edit View Search Terminal Help
root@localhost:/home/haseena# ifconfig wlp2s0
wlp2s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
        ether 86:69:10:d0:75:0b txqueuelen 1000 (Ethernet)
        RX packets 50897 bytes 32637377 (31.1 MiB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 40483 bytes 9449117 (9.0 MiB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@localhost:/home/haseena# ifconfig wlp2s0 down
root@localhost:/home/haseena# |
```

6. **ifconfig <interface> <ip>:** assign ip address to interface
ifconfig <interface> netmask <>: change subnet mask of the interface
ifconfig <interface> broadcast <>: change broadcast address of interface

```
File Edit View Search Terminal Help
root@localhost:/home/haseena# ifconfig wlp2s0 192.168.1.1
root@localhost:/home/haseena# ifconfig wlp2s0 netmask 255.255.255.0
root@localhost:/home/haseena# ifconfig wlp2s0 broadcast 192.168.1.255
root@localhost:/home/haseena# ifconfig wlp2s0
wlp2s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    inet 192.168.1.1 netmask 255.255.255.0 broadcast 192.168.1.255
    ether 9a:8c:97:f6:25:10 txqueuelen 1000 (Ethernet)
    RX packets 50897 bytes 32637377 (31.1 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 40483 bytes 9449117 (9.0 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@localhost:/home/haseena# |
```

7. **ifconfig <interface> netmask <> broadcast <>**: assign ip-address, netmask and broadcast at the same time to the interface

```
File Edit View Search Terminal Help
root@localhost:/home/haseena# ifconfig wlp2s0 192.168.1.2 netmask 255.255.255.0 broadcast 192.168.1.255
root@localhost:/home/haseena# ifconfig wlp2s0
wlp2s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    inet 192.168.1.2 netmask 255.255.255.0 broadcast 192.168.1.255
    ether f2:fc:c5:ac:be:22 txqueuelen 1000 (Ethernet)
    RX packets 50897 bytes 32637377 (31.1 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 40483 bytes 9449117 (9.0 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@localhost:/home/haseena# |
```

8. **ifconfig <interface> mtu <>** : change mtu of the network interface


```
File Edit View Search Terminal Help
root@localhost:/home/haseena# ifconfig wlp2s0
wlp2s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    inet 192.168.1.2 netmask 255.255.255.0 broadcast 192.168.1.255
    ether d2:bf:d3:b0:cb:e4 txqueuelen 1000 (Ethernet)
    RX packets 50897 bytes 32637377 (31.1 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 40483 bytes 9449117 (9.0 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

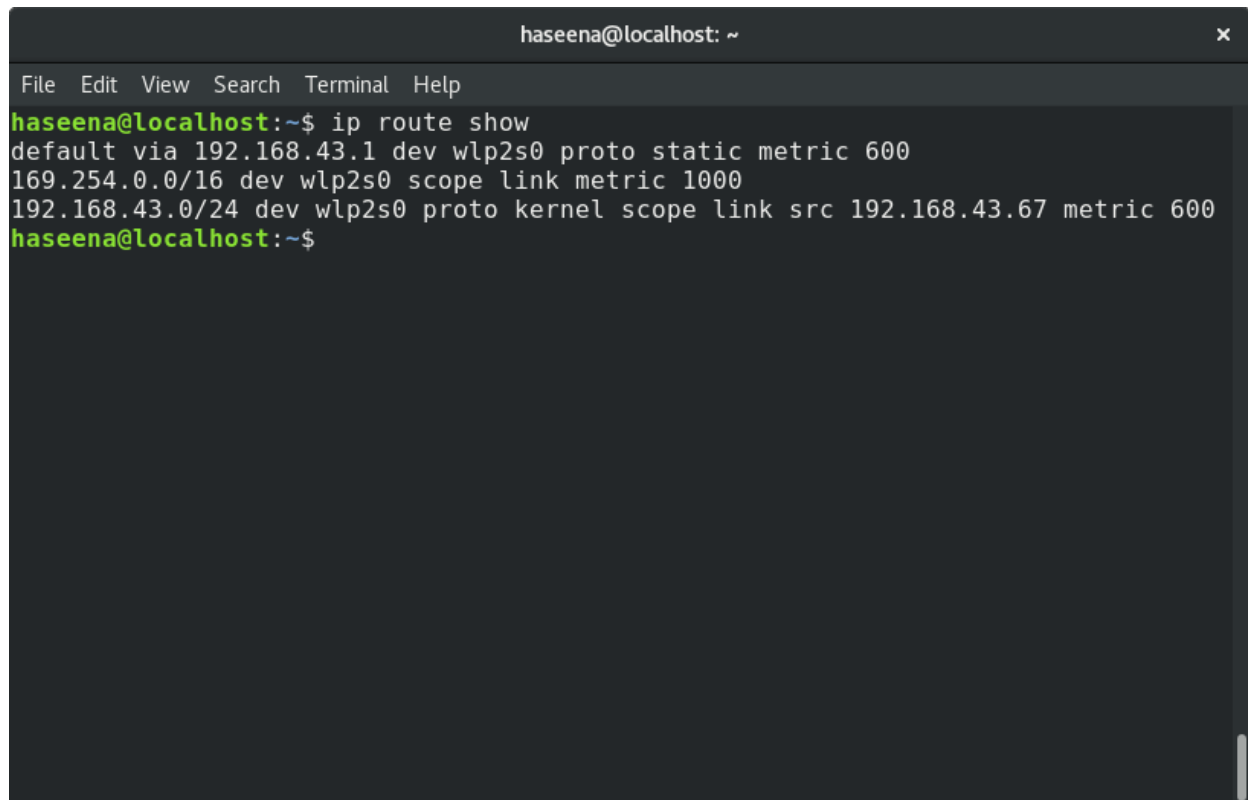
root@localhost:/home/haseena# ifconfig wlp2s0 mtu 1450
root@localhost:/home/haseena# ifconfig wlp2s0
wlp2s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1450
    inet 192.168.1.2 netmask 255.255.255.0 broadcast 192.168.1.255
    ether d2:bf:d3:b0:cb:e4 txqueuelen 1000 (Ethernet)
    RX packets 50897 bytes 32637377 (31.1 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 40483 bytes 9449117 (9.0 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@localhost:/home/haseena#
```

9. **ip addr show** :Look at protocol addresses or flush protocol addresses.

```
haseena@localhost: ~
File Edit View Search Terminal Help
haseena@localhost:~$
haseena@localhost:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1
    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: wlp2s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:21:6a:e7:97:f3 brd ff:ff:ff:ff:ff:ff
    inet 192.168.43.67/24 brd 192.168.43.255 scope global dynamic wlp2s0
        valid_lft 2606sec preferred_lft 2606sec
    inet6 fe80::e60f:9999:83df:5f25/64 scope link
        valid_lft forever preferred_lft forever
haseena@localhost:~$
```

10. ip route show: Manipulate route entries in the kernel routing tables keep information about paths to other networked nodes.

A terminal window titled 'haseena@localhost: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the command 'ip route show' and its output: 'default via 192.168.43.1 dev wlp2s0 proto static metric 600', '169.254.0.0/16 dev wlp2s0 scope link metric 1000', and '192.168.43.0/24 dev wlp2s0 proto kernel scope link src 192.168.43.67 metric 600'. The prompt 'haseena@localhost:~\$' is shown at the end.

```
haseena@localhost:~$ ip route show
default via 192.168.43.1 dev wlp2s0 proto static metric 600
169.254.0.0/16 dev wlp2s0 scope link metric 1000
192.168.43.0/24 dev wlp2s0 proto kernel scope link src 192.168.43.67 metric 600
haseena@localhost:~$
```

11. iptables -L -n -v :

```
haseena@localhost: ~
File Edit View Search Terminal Help
root@localhost:/home/haseena# iptables -L -n -v
Chain INPUT (policy ACCEPT 226 packets, 23174 bytes)
pkts bytes target      prot opt in      out     source      destination

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

Chain OUTPUT (policy ACCEPT 244 packets, 65486 bytes)
pkts bytes target      prot opt in      out     source      destination
root@localhost:/home/haseena#
```

12. iptables -N custom-filter :is used to make decisions about whether to let a packet continue to its intended destination or to deny its request

```
File Edit View Search Terminal Help
root@localhost:/home/haseena# iptables -N custom-filter
root@localhost:/home/haseena# iptables -L
Chain INPUT (policy ACCEPT)
target      prot opt source                destination

Chain FORWARD (policy ACCEPT)
target      prot opt source                destination

Chain OUTPUT (policy ACCEPT)
target      prot opt source                destination

Chain custom-filter (0 references)
target      prot opt source                destination
root@localhost:/home/haseena#
```

13. iptables -t nat -L -v -n :port forwarding is set up on the router and lets you send all traffic that comes into that interface on a given port to a specific address


```
haseena@localhost: ~
File Edit View Search Terminal Help
root@localhost:/home/haseena# iptables -t nat -L -v -n
Chain PREROUTING (policy ACCEPT 0 packets, 0 bytes)
pkts bytes target      prot opt in      out     source      destination

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

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

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

root@localhost:/home/haseena#
```

14. netstat -nr : displays network connections for the Transmission Control Protocol (both incoming and outgoing), routing tables, and a number of network interface (network interface controller or software-defined network interface) and network

```
File Edit View Search Terminal Help
root@localhost:/home/haseena# netstat -nr
Kernel IP routing table
Destination      Gateway          Genmask         Flags   MSS Window  irtt Iface
0.0.0.0          192.168.43.1    0.0.0.0         UG      0 0        0 wlp2s0
169.254.0.0      0.0.0.0         255.255.0.0     U       0 0        0 wlp2s0
192.168.43.0     0.0.0.0         255.255.255.0   U       0 0        0 wlp2s0
root@localhost:/home/haseena#
```

15. nmcli devices status : when we create a new connection or modify an existing one with nmcli or nmtui, the results are saved here as connection profiles.

```
haseena@localhost: ~  
File Edit View Search Terminal Help  
haseena@localhost:~$ nmcli device status  
DEVICE  TYPE      STATE      CONNECTION  
wlp2s0  wifi      connected  Lenovo C2  
lo      loopback  unmanaged  --  
haseena@localhost:~$
```

16. /etc/nsswitch.conf file : defines the order in which to contact different name services. This instructs your computer to look up hostnames and IP addresses first in the /etc/hosts file, and to contact the DNS server if a given host does not occur in the local hosts file.

```
File Edit View Search Terminal Help  
root@localhost:/home/haseena# grep hosts /etc/nsswitch.conf  
hosts:      files mdns4_minimal [NOTFOUND=return] dns myhostname  
root@localhost:/home/haseena# |
```

17. traceroute command: To check the route that packets follow to a network host

```
File Edit View Search Terminal Help
root@localhost:/home/haseena# /usr/sbin/traceroute www.eunet.be
traceroute to www.eunet.be (109.68.162.39), 30 hops max, 60 byte packets
 1 gateway (192.168.43.1)  1.962 ms  1.940 ms  2.075 ms
 2 * * *
 3 10.72.51.2 (10.72.51.2)  57.574 ms  57.965 ms  57.954 ms
 4 * * *
 5 * * *
 6 * * *
 7 * * *
 8 * * *
 9 * * *
10 103.198.140.174 (103.198.140.174)  89.488 ms  89.476 ms  88.627 ms
11 103.198.140.77 (103.198.140.77)  208.918 ms  103.198.140.75 (103.198.140.75)  213.332 ms  190.264 ms
12 * * *
13 xe-0-1-0.br10.zav.as39923.net (109.68.160.11)  198.525 ms ge-2-0-9.br10.zav.as39923.net (109.68.160.13)  197.143 ms xe-0-1-0.br10.zav.as39923.net (109.68.160.11)  190.898 ms
14 * po0.ar0.zav.as39923.net (109.68.160.15)  213.838 ms  208.875 ms
15 * * *
16 * * *
17 * * *
18 * * *
19 * * *
20 * * *
```

CONCLUSION

By setting up complete network interface using ifconfig and iptable commands, familiarised in configuring services such as gateway , DNS , IPtables etc. and controlling server traffic.**Ifconfig** stands for Interface Configuration .It is a utility for Linux machines which common linux users uses it to assign ip address and netmask to an interface or to disable or enable a given interface.

