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Ex.no.1

Aim : Study various Network commands used in Linux and windows.

## Basic Networking Commands

### windows:

1. arp-a

O/P : Interface : 172.16.75.78 ..... 0x5

| | | |
|---|---|---|
| 172.16.72.1 | 7c-5a-1c-cf-be-41 | dynamic |
| 244.0.0.2 | ff-ff-ff-ff-ff-ff | static |
| 239.192.152.143 | 01-00-5e-40-98-8f | static |

2. hostname

O/P : KS03-78

3. ipconfig /all

O/P Windows IP config

Host name : KS03-78

Node type : hybrid

Ethernet adapter

Media state : disconnected

Description : Intel (R) connection

4. nbtstat -a

O/P local area connection * 11 :

Node IP Address : [0.0.0.0]

No names in cache

Ethernet

Node IpAddress : [0.0.0.0]

5) netstat - r

o/p : Interface list

11 ... 20 88 10 86 70 2b

16 ... Al 82 a9 78 70 4b

TPV4 Route table

| Network Destination | Netmask | Gateway | Interface | Metric |
|---|---|---|---|---|
| 0.0.0.0 | 0.0.0.0 | 172.16.72.1 | 172.16.78 | 291 |

6) ns lookup www.google.com

o/p Server : unknown,

Address: 172.16.72.1

Name : www.google.com

7) pathping www.google.com

o/p : Tracing Route

0 ks03-78

1 172.16.72.1

| Hop | RTT | lost/sent = PCT | Address |
|---|---|---|---|
| 1 | 20ms | 0/100 = 0% | 172.16.72.1 |

8) ping localhost

o/p pinging ks03-78

Reply from : : 1 : time < 1ms

pockets : sent = 4 . received = 4 , lost = 0

Minimum = 0ms , Maximum = 0ms

9) route print

o/p Interface list

11 ... 20 88 10 81 7a db

16 ... 4e 82 a9 78 70 4b

IPV4 Route table

| Destination | Netmask | Gateway | Interface | Metric |
|---|---|---|---|---|
| 127.0.0.0 | 255.0.0.0 | on-link | 127.0.0.1 | 331 |

# Linux commands

1) ip : Setting up new systems and assigning IP's to trouble shooting existing systems

ip <OPTIONS> <OBJECT> <COMMANDS>

a) ip address show

o/p

1. lo : <LOOPBACK, UP, LOWER_UP>
2. enps3lf6 : <NO-CARRIER, BROADCAST, MULTICAST, UP>
3. wlp2s0 : <BROADCAST, MULTICAST, UP, LOWER_UP>

b) Add an IP address.

ip address add 192.168.1.254/24 dev enps3146.

RTNETLINK answers : File exists.

c) To delete an IP

ip address del 192.168.1.254/24 dev enps3lf6.

d) Alter the status of the interface [online]

ip link set enps3lf6 up

e) Alter the status of the interface [offline]

ip line set enps3lf6 ~~promise on~~ down.

f) Alter the status by enabling promiscuous mode.

ip link set enps3lf6 promise on.

g) Add a default route

ip route add default via 192.168.1.25 & dev enps3lf6

h) ~~After~~ Add a route via gateway.

ip route add 192.168.1.0124 via 192.168.1.254

i) Add a route that can be reached on device

ip route add 192.168.1.0124 dev enps3lf6.

j) Delete the route

ip route delete 192.168.1.0124 via 192.168.1.254

k) Display the route

ip route get 10.10.1.4

2) ifconfig : It is a staple in many sys admin's tool belt for configuring and troubleshooting networks.

output :

```
enps31f6: flag = 4099 <UP, BROADCAST, MULTCAST> mtu 1500
ether 20:88.10.86.8d:d4 txqueuelen 1000 (Ethernet)
RX packets 0 byts 0 (0.0B)
RX errors 0 dropped 0 overrun 0 frame 0
TX packets 0 bytes 0 (0.0.B)
lo : flags = 73 < UP, LOOPBACK, RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet :: 1 prefexlen 128 scopeil 0x10 < host>
wlp2s0 : flag = 4163 < UP, BROADCAST, RUNNING,
                        MULTICAST > mtu 1500.
```

3) mtr : (Matt's traceout) is a program with a command-line interface that selves as a network diagnostic and troubleshooting tool.

syntax : mtr <options> hostname / IP

a) The basic mtr command shows you the statistics, including each hop (hostnames) with time and loss %. :

mtr google.com

o/p My traceout [v0.95]

fedora (172.16.75.86) → google.com (142.251.221.206)

2025-07-14 09:04:22 +0530

keys : Help Display mode Restart statistics orders & fields.

| Host | packets | | | pings | | |
|---|---|---|---|---|---|---|
| | Loss % | Snt | last | Avg | Best | Wrst |
| 1. - gateway | 0.0% | 219 | 2.2 | 5.6 | 1.8 | 82.5 |
| 2. 142.250.171 | 0.0% | 261 | 7.2 | 12.0 | 4.6 | 253.2 |
| 3. 142.251.227 | 17.0% | 261 | 175.5 | 185.6 | 154.9 | 344.2 |

(b) Show numeric IP addresses

mtr -g google.com

c) Show the numeric IP addresses and hostnames too:

mtr -b google.com.

d) Set the number of pings.

mtr -c 10 : google.com.

4) tcpdump : It is designed for capturing and displaying packets.

For install : dnf install -y tcpdump

a) tcpdump -i enps31f6

This command captures the traffic on enps31f6.

o/p : dropped privs to tcpdump
tcpdump : verbose output suppressed, use -v[v] for full protocol decode.

b) tcpdump -i enps31f6 -c 10 host 8.8.8.8 :

To capture traffic to and coming from one specific host.

o/p : dropped privs to tcpdump.
tcpdump : verbose output suppressed, use -v[v]... for full protocol decode.
snapshot length 262244 bytes.
0 packets captured.

o packets received by filter.
o packets dropped by kernel.

c) tcpdump i enp53if6 net 10.1.0.0 mask 255.255.255.0
To capture traffic to and from a specific network.

O/P: dropped privs to tcpdump.
tcpdump: verbose output supressed, use -v [v]... for full protocol decode.
listening on enp53if6, link-type EN10MB (Ethernet)
o packets captured
o packets received by filter.

d) tcpdump -i enp53if6 port 53:
To capture traffic to and from port numbers.

O/P: dropped privis to tcpdump.
tcpdump: verbose output suppressed, use -v [v]... for full protocol decode.
o packets captured
o packets received by filter.

5) Ping: It is used to troubleshoot connectivity, reachability and name resolution.
ping google.com:

O/P: PING google.com (142.253.221.288) 56 (34) bytes of data
From fedora (192.168.8.294) icmp_seq = 1
Destination Host unreachable.
From fedora (192.168.1.294) icmp_seq = 2
Destination.
Host unreachable.

## Student Observation

1) which command is used to find the reachability of a host machine from your device ?

Ans ping <hostname or IP>
ping google.com

2) which command will give the details of hops taken by packet to reach its destination ?

mtr <hostname>
mtr google.come

3) which command displays the ip configuration of your machine

on linux : ip address show
on windows : ip config / all

4) which command displays the TCP port status?

netstat
netstat -r

5) write the command to modify the IP configuration in a linux machine ?

Ans to add : ip address add 192.168.1.254/24 dev enpos31f6

to del : ip address del 192.168.254/24 dev enpos31f6.

Result : Various network commands used in linux and windows has been executed successfully.

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