

Ex. NO. 1

Practical-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

172.16.7.2, 172.16.7.2 - 5a-1c-2f-b2-91 dynamic

224.0.0.2 ff-ff-ff-ff-ff-ff static

239.192.153.143 01-00-5e-40-72-3f static

2. hostname

O/P: K803-78

3. ipconfig /all

O/P windows IP config

Hostname: K803-78

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 IP Address: [0.0.0.0]

5. netstat - n

O/P : Interface list

11... 20 88 10 86 70 26

16... 41 82 a9 78 70 46

IPv4 Route table

Network Destination Netmask Gateway Interface Metric

0.0.0.0

0.0.0.0

172.16.72.1

172.16.72.291

6. nslookup 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 1803.78

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 1803-28

Reply from ::1 : time < 1ms

packets : sent = 4, received = 4, lost = 0

minimum = 0ms, Maximum = 0ms

9. route print

0/p Interface list

11... 20 88 10 86 7a db

10... 42 82 a9 79 70 46

PPV4 Route table

1) ip:

The ip command show address information, manipulate router plus display network various devices, interfaces and tunnels

a) ip address show

To show the IP address assigned to an interface on your server.

output:

```
20: <LOOPBACK,UP,LOWER_UP> mx a 65536 qdisc noqueue  
state UNKNOWN group default after 1000 link/loopback 00:00:00:00:  
00:00 brd 00:00:00:00:00:00  
inet 127.0.0.1/8 scope host to  
    ahid - lft forever preferred - lft forever
```

b) ip address add 192.168.1.25 my dev wlp280:

To assign an IP to an interface

c) ip address del 192.168.1.25/24 dev wlp280:

To delete an IP on an interface

d) ip link set wlp280 up:

After the status of the interface by bringing the interface wlp280 online

e) ip link set wlp280 down:

After the status of the interface by bringing the interface wlp280 offline.

f) ip link set wlp280 promisc on:

After the status of the interface by enabling promiscuous mode for wlp280

g) ip route add default via 192.168.1.254 dev wlp280:

Add a default route (for all address) via the local gateway 192.168.1.254 that can be reached on device wlp280

h) ip route add 192.168.1.0/24 via 192.168.1.254/

Add a route to 192.168.1.0/24 via the gateway at 192.168.1.254.

i) ip route add 192.168.1.0/24 dev wlp280:
Adds a route for 192.168.1.0/24 via that gateway at 192.168.1.254 that can be reached on device wlp280

j) ip route delete 192.168.1.0/24 via 192.168.1.254

Delete the route for 192.168.1.0/24 via the gateway at 192.168.1.254

k) ip route get 10.10.1.4:

Display the route taken for IP 10.10.1.4
output:

10.10.1.4 dev wlp280 192.168.1.254 uid 0 cache

2. if config:

This command was staple in many sysadmin's tool belt for configuring and troubleshooting networks.

output:

enp0s31f6: flags=4096<UP, BROADCAST, MULTICAST> mtu 1500

ether 30:00:10:00:78:64 txqueuelen 1000 ethernet

Rx packets 0 bytes (0.0 B)

Rx packets 0 dropped 0 overruns 0 frame 0

tx packets 0 bytes (0.0 B)

3. mtr:

Mat's traceroute is a program with a command-line interface that serves as network diagnostic & troubleshooting tool

a) mtr google.com

It shows the statistics including each hop (hostnames) with time and loss %.

output:

Host	Packets Loss %	Sent	Last	Avg	Ping Best	Worst	Stddev
1. IN 115.245.95.249	0.0 %	83	6.2	14.2	5.8	202	24
2. V8 72.14.217.252	0.0 %	84	8.4	82.0	5.5	2839	59.8

b) mtr -b google.com

show the numeric IP address and hostnames too.

output:

	Packets Loss %	Sent	Last	Avg	Ping Best	Worst	Stddev
172.16.12.122	0.0 %	302	3.8	12.3	2.6	812.2	50.1
172.16.12.122	0.0 %	321	6.5	15.5	5.9	368.8	25.3

4. tcpdump:

This command is designed for capturing and displaying packets

a) tcpdump -i wlp2s0

This command captures the traffic on wlp2s0

output:

dropped prior to tcpdump

tcpdump: verbose output suppressed, use -v[v]... for full protocol decode

listening on wlp2s0, link-type EN10MB (Ethernet), snapshot length 262144 bytes

23:15:48.819979 ARP, Request who has linux-ay-at3

* b) `tcpdump -i wlp2s0 -c 10 host 8.8.8.8`

To capture traffic to and coming from one specific host
output:

dropped privs to `tcpdump`

`tcpdump`: verbose output suppressed, use `-v[v]`... for full
protocol decode

listening on `wlp2s0`, link-type `EN10MB (Ethernet)`, snapshot
length 262144 bytes.

- 0 packets captured
- 0 packets received by filters
- 0 packets dropped by kernel

c) `tcpdump -i wlp2s0 net 10.0.0.0 mask 255.255.255.0`

To capture traffic to and from a specific network.
output:

dropped privs to `tcpdump`

`tcpdump`: verbose output suppressed, use `-v[v]`... for full
protocol decode

listening on `wlp2s0`, link-type `EN10MB (Ethernet)`

- 0 packets captured
- 0 packets received by filter.

d) `tcpdump -i wlp2s0 port 53`

To capture traffic to and from port numbers

output:

dropped privs to `tcpdump`

`tcpdump`: verbose output suppressed, use `-v[v]`... for full
protocol decode

- 0 packets captured
- 0 packets received by filter.

5. Ping:

It is used to troubleshoot connectivity, reachability and name resolution
ping google.com

output:

PING google.com (142.253.221.266) 56(34) bytes of data

From fedora (192.168.1.294) 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?

→ Ping

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

→ Trace route

3. which command displays the ip config of machine?

→ ifconfig

4. which command displays the TCP port status in your machine

→ netstat

5. write the modify ip configuration in linux machine?

→ use ip address add or ip route add

Result:

Hence the study of various Network and Linux commands are executed.

20/10/22

1. Unshielded Twisted Pair (UTP) Cable
2. Shielded Twisted Pair (STP) Cable
3. Coaxial Cable
4. Fibre Optic Cable

Cable type	Category	Maximum Data Transmission	Advantages / Disadvantages	Application / use
UTP	Category 3	10 Mbps	Advantages • Cheaper in cost • Easy to install as they have smaller overall diameter	10 Base-T Ethernet
UTP	Category 5	100 Mbps	Advantages • More prone to EMI • Electromagnetic interference and noise	Fast Ethernet Gigabit Ethernet
STP	Category 5e	10 Gbps	Advantages • Shielded • Faster than UTP • Less susceptible to noise and interference	Fast Ethernet Gigabit Ethernet
Coaxial	Category 1	10 Gbps	Advantages • Greater installation effort	