1.07.24

# Basic Windows and Linux network commands.

1. arp -a :-
   Displays all IP devices along with their MAC addresses

2. hostname :-
   Displays hostname of PC.

3. ipconfig / ifconfig :-
   Displays all network devices alongwith IPs

4. netStat :-
   Used to modify / manage IP devices

5. nbtstat :-
   Displays net bios.

6. Ping :-
   Pings server for packets (Packet internet Groper)

7. Pathping :-
   25 hops test

8. Route :-
   Manipulate routing

9. nslookup :-
   domain lookup.

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## Experiment :- (1)

Basic Windows network commands

**ATM :- Study of various Network commands in Linux/Windows**

1. arp -a

o/p

Interface: 172.16.75.19 --- 0x13

| Internet address | Physical address | Type |
|---|---|---|
| 172.16.72.1 | 1c-5a-1c-cf-be-41 | dynamic |
| 172.16.72.133 | 4c-ae-a3-65-91-f3 | dynamic |
| 172.16.72.195 | 4c-ae-a3-64-fc-50 | dynamic |
| 224.0.0.2 | 01-00-5e-00-00-02 | static |
| 224.0.0.22 | 01-00-5e-00-00-16 | Static |
| 224.0.0.113 | 01-00-5e-00-00-71 | Static |
| 224.0.0.251 | 01-00-5e-00-00-fb | Static |
| 224.0.0.252 | 01-00-5e-00-00-fc | static |
| 224.0.1.187 | 01-00-5e-00-01-bb | Static |
| 224.2.2.2 | 01-00-5e-02-02-02 | static |
| 224.8.8.8 | 01-00-5e-08-08-08 | Static |
| 239.0.0.8 | 01-00-5e-00-00-08 | static |
| 239.192.152.143 | 01-00-5e-40-98-8f | Static |
| 239.255.102.18 | 01-00-5e-7f-66-12 | Static |
| 239.255.255.250 | 01-00-5e-7f-ff-fa | Static |
| 239.255.255.251 | 01-00-5e-7f-ff-fb | Static |

2. hostname

o/p DESKTOP-C01BH7OP

3. ipconfig

o/p Windows IP configuration

Ethernet adapter Ethernet 3:

Media State . . . . . : Media disconnected

Connection-specific DNS Suffix:

Wireless LAN adapter Wi-Fi 3:

Connection-specific DNS suffix:

Link-Local IPv6 Address . . . : fe80::4cac::623a:81e8:166

IPv4 Address . . . . . : 172.16.75.19

Subnet Mask . . . . . : 255.255.248.0

Default Gateway . . . . . : 172.16.72.1

4. netstat

| Proto | Local Address | Foriegn Address | State |
|---|---|---|---|
| TCP | 127.0.0.1:49682 | DESKTOP-C01BH70D:49683 | ESTABLISHED |
| TCP | 127.0.0.1:49683 | DESKTOP-C01BH70D:49682 | ESTABLISHED |
| TCP | 127.0.01:49684 | DESKTOP-C01BH70D:49685 | ESTABLISHED |
| TCP | 127.0.0.1:49685 | DESKTOP-C01BH70D:49684 | ESTABLISHED |
| TCP | 127.0.0.1:49690 | DESKTOP-C01BH70D:496890 | ESTABLISHED |

nbtstat -n

NetBIOS Local name Table

| Name | Type | Status |
|---|---|---|
| DESKTOP-C01BH70 <20> | UNIQUE | Registered |
| DESKTOP-C01BH70<00> | UNIQUE | Registered |
| WORKGROUP <00> | UNIQUE | Registered |

Local Area Connection* 13:
Node IpAddress: [0.0.0.0] Scope Id: []

No names in cache

6. Ping

o/p ping Google.com

pinging google.com [172.217.163.206] with 32 bytes of data:
Reply from 172.217.163.206: bytes=32 time=56ms TTL=120

Ping statistics for 172.217.163.206:
Packets: Sent = 4, Recieved = 1, Lost = 0 (0% Loss),
Approximate round trip times in milli-seconds:
Minimum = 8ms, Maximum = 56ms, Average = 25ms

7. Pathping google.com

o/p Tracing route to google.com [172.216.163.206]
over a maximum of 30 hops:
0 DESKTOP-C[illegible]170 [172.16.75.19]
1 172.16.72.1
2 static-41.229.249.49-tatlidc.co.in [49.249.229.41]
3 142.250.171.162
4 142.251.277.215
5 209.85.248.211
6 maa05s06-in-f14.1e100.net [172.217

Computing statistis for 150 seconds...

| HOP | RTT | Lost/Sent = Pct |
|---|---|---|
| 0 | | |
| 1 | 15ms | 0/ 100 = 0% |
| 2 | 18ms | 0/ 100 = 0% |
| 3 | 13ms | 0/ 100 = 0% |
| 4 | 11ms | 0/ 100 = 0% |
| 5 | 13ms | 0/ 100 = 0% |
| 6 | 22ms | 0/ 100 = 0% |

8. nslookup

o/p Name: www.google.com
Address: 142.250.76.164

9. route

o/p Interface list

5...50 eb f6 9b 27 b8 ..... Intel(R)
1..... Software Loopback Interface 1
7..... d4.6.a.ba 82 69 1d. Microsoft Wifi
IPv6
Active Routes:
Network address Netmask Gateway Active Interface metric

0.0.0.0 0.00.0 199.98.126.2 199.98.126.16 1

127.0.0.0 255.6.6.0 127.0.0.1 127.0.0.1 1

244.0.00 224.0.0.0 199.98.126.26 199.98.126.6

## Some Important Linux networking commands

1. ip

ip address shows-

o/p

1: lo: <LOOPBACK, UP, LOWER_UP> mtu 65536
qdisc noqueue State UNKNOWN
group default qlen 1000
link/loopback 00:00:00:00:00:00 brd
00:00:00:00

2. ifconfig

o/p enp250: flags=4163<UP, BROADCAST RUNNING MULTICAST>
mtu 1500
inet 172.16.8.103 netmask 255.255.252.0
broadcast 172.16.11.255
inet6 fe80::6743:e5fc:1b86:5e9 prefixlen 64
ether 50:9a:4c:34:d3:eee txqueuelen 1000
RX packets 415262 bytes 217680607
RX errors 0 dropped 43 overruns 0 frame
TX Packets 110220 bytes 15640689
TX errors 0 dropped 0 overruns 0 carrier

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 1000
RX packets 0 bytes (0.0B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 0 bytes 0 (0.0B)
TX errors 0 dropped 0 overruns 0 carrier 0

wlp3s0: flags = 4099<UP, BROADCAST, MULTICAST> mtu 1500
ether 0e:37:8c:2d:65:89 txqueuelen 1000 (Ethernet)
Rx Packets 0 bytes 0
Rx errors 0 dropped 0 overruns 0 frame 0
TX Packets 0 bytes 0
Tx errors 0 dropped 0 overruns 0 frame 0

3. mtr (Matt's trace route)

o/p Host
1. 172.16.8.1
2. static-41.229.249.49-tataidc.co.in
3. 142.250.171.162
4. 142.251.227.215
5. 142.250.228.81
6. maa05s12-in-f14.1e100.net

4. tcpdump

o/p 1. enp2s0 [Up, Running]
2. any (Pseudo-device that captures Interfaces) [Up, Runnin
3. lo [Up, Running, Loopback]
4. wlp3s0 [Up]
5. bluetooth0 (bluetooth adapter 0)

VERIFICATION

6. IP address show enp2s0

o/p enp2s0: <BROADCAST, MULTICAST, LOWERUP> mtu 1500
qdisc fq_codel state UP group default 1000
inet 172.16.8.103/22 brd 172.16.11.255 scope global
valid_lft forever preffered lft forever
inet6 fe80: e7483: e5f0: 11b8b.

7. ip route show defaut

o/p defautt via 172.16.8.1 dev enp2s0 proto static me
172.16.8.0/22 dev enp2s0 proto kernel scope link
src 172.16.8.103 metric 100

8. cat /etc/resolv.conf

o/p # Genirated by NetworkManager
nameServer 172.16.8.1

9. Ping Google.com

o/p PING Google.com (142.250.67.46) 56 (84) bytes of d
64 bytes from maa05s1e-in-f14.1e100.net (142.250.67.1
icmp_seq=1 ttl=120 time=2.31ms

STUDENT OBSERVATION:-

1. Ping command is used to check
2. The mtr commdnd and route command
3. ipconfig / ifconfig
4. ~~TEP~~ arp -a
5. nmcli modify "name" ipv4.method manual
ipv4.address <---->

6. bluetooth monitor (Blue tooth Linux monitor)
7. nflog ( Linux netfilter Log (NFLOG) interface)
8. nfque (Linux netfilter que (NFQUEUE) interface)
9. usbmon1 (usb bus number 1)
10. usbmon2 (usb bus number 2)

## Configuring a network connection using nmcli

1. nmcli connection show

o/p

| NAME | UUID | TYPE | DEVICE |
|---|---|---|---|
| New 802-3-ethernet connection | f8ac81f-cf23-4aa5-81ac-3100162225e0 | 802-3-ethernet | enp2s0 |

2. nmcli connection modify "New 802-3-ethernet connection" connection.ID "Wi"

nmcli connection show

o/p

| NAME | UUID | TYPE | DEVICE |
|---|---|---|---|
| Wi | f8ac812f-cf23-4aa5-81ae-3100162223e0 | 802-3-ethernet | enp2s0 |

3. nmcli connection modify "Wi" ipv4.method auto
4. nmcli connection modify "Wi" ipv6.method auto
5. nmcli connection up Internal-LAN

RESULT:-
Thus the basic networking commands on Windows & Linux are studied

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