



VISHWAKARMA
UNIVERSITY
Maximising Human Potential

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Year	Third Year
Division	A
Subject	Computer Network Laboratory (BTECCE21506)
Assignment No	2

Assignment Number - 02

Title : Study of Linux and Windows Network commands

Problem Statement Studying Linux and Windows network commands. [ping, pathping, ipconfig/ ifconfig, arp, netstat, nbtstat, nslookup, route, traceroute/tracert, nmap, etc]

Try to execute following commands on linux terminal or Windows command prompt.

- ipconfig / ifconfig

```
(samarth@kali)-[~]
$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.64.2 netmask 255.255.255.0 broadcast 192.168.64.255
    inet6 fd29:12c9:aea6:e9b1:409e:e5ff:fe0b:4ad0 prefixlen 64 scopeid
0x0<global>
    inet6 fd29:12c9:aea6:e9b1:9293:db24:213d:184a prefixlen 64 scopeid
0x0<global>
    inet6 fe80::409e:e5ff:fe0b:4ad0 prefixlen 64 scopeid 0x20<link>
    ether 42:9e:e5:0b:4a:d0 txqueuelen 1000 (Ethernet)
    RX packets 7 bytes 1096 (1.0 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 31 bytes 4940 (4.8 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

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 (Local Loopback)
    RX packets 8 bytes 480 (480.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 8 bytes 480 (480.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

○ ping

```
samarth@kali: ~  
File Actions Edit View Help  
  
(samarth@kali)-[~]  
$ ping 192.168.64.2  
PING 192.168.64.2 (192.168.64.2) 56(84) bytes of data.  
64 bytes from 192.168.64.2: icmp_seq=1 ttl=64 time=0.050 ms  
64 bytes from 192.168.64.2: icmp_seq=2 ttl=64 time=0.112 ms  
64 bytes from 192.168.64.2: icmp_seq=3 ttl=64 time=0.116 ms  
64 bytes from 192.168.64.2: icmp_seq=4 ttl=64 time=0.123 ms  
64 bytes from 192.168.64.2: icmp_seq=5 ttl=64 time=0.112 ms  
64 bytes from 192.168.64.2: icmp_seq=6 ttl=64 time=0.108 ms  
64 bytes from 192.168.64.2: icmp_seq=7 ttl=64 time=0.148 ms  
64 bytes from 192.168.64.2: icmp_seq=8 ttl=64 time=0.094 ms  
64 bytes from 192.168.64.2: icmp_seq=9 ttl=64 time=0.106 ms  
64 bytes from 192.168.64.2: icmp_seq=10 ttl=64 time=0.048 ms  
64 bytes from 192.168.64.2: icmp_seq=11 ttl=64 time=0.095 ms  
64 bytes from 192.168.64.2: icmp_seq=12 ttl=64 time=0.079 ms  
64 bytes from 192.168.64.2: icmp_seq=13 ttl=64 time=0.111 ms  
64 bytes from 192.168.64.2: icmp_seq=14 ttl=64 time=0.099 ms  
64 bytes from 192.168.64.2: icmp_seq=15 ttl=64 time=0.051 ms  
64 bytes from 192.168.64.2: icmp_seq=16 ttl=64 time=0.093 ms  
64 bytes from 192.168.64.2: icmp_seq=17 ttl=64 time=0.110 ms  
64 bytes from 192.168.64.2: icmp_seq=18 ttl=64 time=0.106 ms  
  
64 bytes from 192.168.64.2: icmp_seq=19 ttl=64 time=0.102 ms  
64 bytes from 192.168.64.2: icmp_seq=20 ttl=64 time=0.127 ms  
64 bytes from 192.168.64.2: icmp_seq=21 ttl=64 time=0.117 ms  
64 bytes from 192.168.64.2: icmp_seq=22 ttl=64 time=0.099 ms  
64 bytes from 192.168.64.2: icmp_seq=23 ttl=64 time=0.104 ms  
64 bytes from 192.168.64.2: icmp_seq=24 ttl=64 time=0.074 ms  
64 bytes from 192.168.64.2: icmp_seq=25 ttl=64 time=0.039 ms  
64 bytes from 192.168.64.2: icmp_seq=26 ttl=64 time=0.061 ms  
64 bytes from 192.168.64.2: icmp_seq=27 ttl=64 time=0.095 ms  
64 bytes from 192.168.64.2: icmp_seq=28 ttl=64 time=0.092 ms  
64 bytes from 192.168.64.2: icmp_seq=29 ttl=64 time=0.108 ms  
64 bytes from 192.168.64.2: icmp_seq=30 ttl=64 time=0.072 ms  
64 bytes from 192.168.64.2: icmp_seq=31 ttl=64 time=0.101 ms  
64 bytes from 192.168.64.2: icmp_seq=32 ttl=64 time=0.098 ms  
64 bytes from 192.168.64.2: icmp_seq=33 ttl=64 time=0.104 ms  
64 bytes from 192.168.64.2: icmp_seq=34 ttl=64 time=0.081 ms  
64 bytes from 192.168.64.2: icmp_seq=35 ttl=64 time=0.054 ms  
64 bytes from 192.168.64.2: icmp_seq=36 ttl=64 time=0.115 ms  
64 bytes from 192.168.64.2: icmp_seq=37 ttl=64 time=0.112 ms
```

- Tracert/Traceroute/Tracepath

```
samarth@kali: ~  
File Actions Edit View Help  
(samarth@kali)-[~]  
$ traceroute 192.168.64.2  
traceroute to 192.168.64.2 (192.168.64.2), 30 hops max, 60 byte packets  
1 192.168.64.2 (192.168.64.2) 0.271 ms 0.228 ms 0.215 ms  
(samarth@kali)-[~]  
$
```

- NSlookup

```
(samarth@kali)-[~]  
$ nslookup 192.168.64.2  
** server can't find 2.64.168.192.in-addr.arpa: NXDOMAIN  
(samarth@kali)-[~]  
$
```

- Netstat

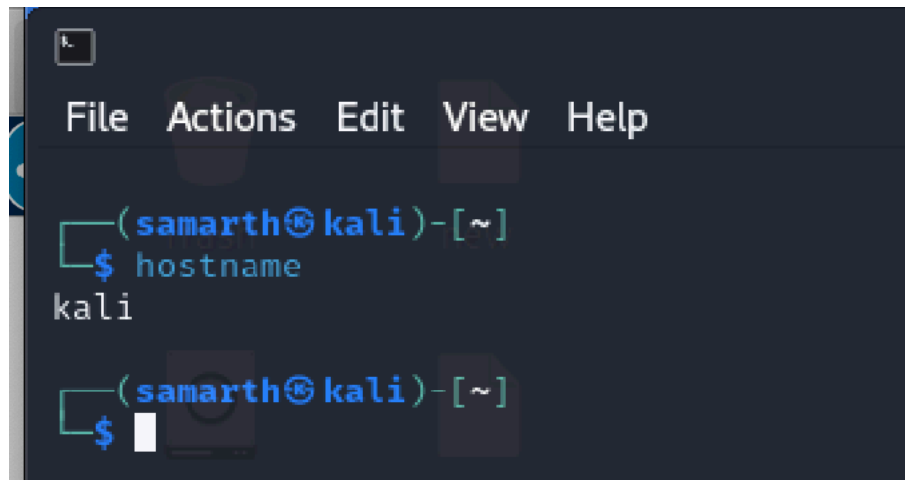
```

samarth@kali: ~
File Actions Edit View Help

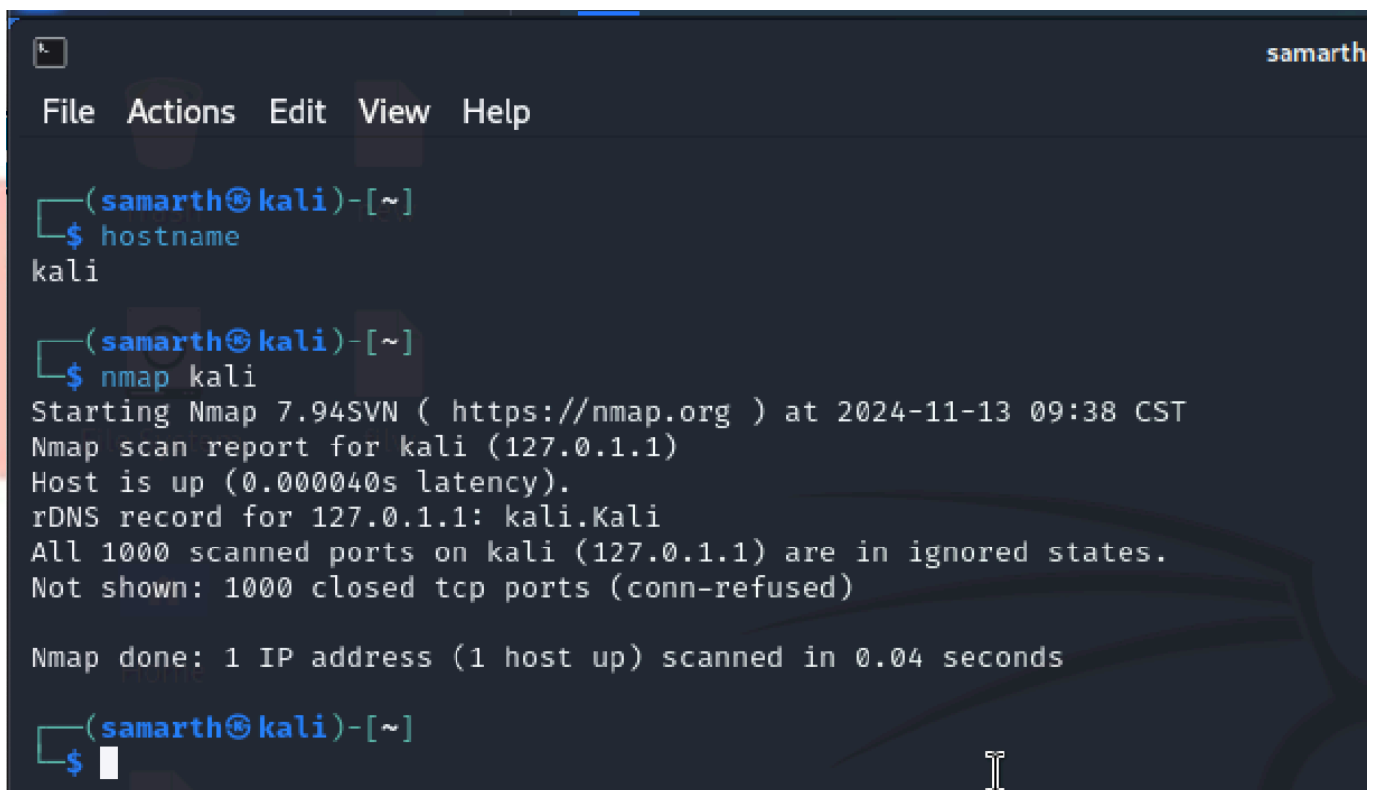
(samarth@kali)-[~]
$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 192.168.64.2:bootpc    192.168.64.1:bootps    ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags   Type       State         I-Node  Path
unix  3      [ ]  STREAM    CONNECTED    8843
unix  3      [ ]  STREAM    CONNECTED    7151    /run/dbus/system_bus_socket
unix  3      [ ]  STREAM    CONNECTED    7845
unix  2      [ ]  DGRAM     CONNECTED    9488
unix  3      [ ]  STREAM    CONNECTED    10511   @/tmp/.X11-unix/X0
unix  3      [ ]  STREAM    CONNECTED    8005
unix  3      [ ]  DGRAM     CONNECTED    2815
unix  3      [ ]  STREAM    CONNECTED    10561
unix  3      [ ]  STREAM    CONNECTED    10246   /run/user/1000/pipewire-0
unix  3      [ ]  STREAM    CONNECTED    991     /run/systemd/journal/stdout
unix  3      [ ]  STREAM    CONNECTED    6028    /run/systemd/journal/stdout
unix  3      [ ]  STREAM    CONNECTED    8748    @/tmp/.X11-unix/X0
unix  3      [ ]  STREAM    CONNECTED    10577
unix  2      [ ]  DGRAM     CONNECTED    483
unix  3      [ ]  STREAM    CONNECTED    9814    /run/user/1000/bus
unix  3      [ ]  STREAM    CONNECTED    8626
unix  3      [ ]  STREAM    CONNECTED    9219    @/tmp/.X11-unix/X0
unix  3      [ ]  STREAM    CONNECTED    8752    @/tmp/.X11-unix/X0
unix  3      [ ]  STREAM    CONNECTED    8844
unix  3      [ ]  STREAM    CONNECTED    2852
unix  3      [ ]  STREAM    CONNECTED    8644
unix  3      [ ]  STREAM    CONNECTED    2957
unix  3      [ ]  STREAM    CONNECTED    8900    /run/user/1000/bus
unix  3      [ ]  STREAM    CONNECTED    7995
unix  3      [ ]  STREAM    CONNECTED    7152    /run/dbus/system_bus_socket
unix  3      [ ]  STREAM    CONNECTED    8858
unix  3      [ ]  STREAM    CONNECTED    8608
unix  3      [ ]  STREAM    CONNECTED    6889    /run/dbus/system_bus_socket
unix  3      [ ]  STREAM    CONNECTED    7482
unix  3      [ ]  STREAM    CONNECTED    8093
unix  3      [ ]  STREAM    CONNECTED    8762    @/tmp/.X11-unix/X0
unix  3      [ ]  STREAM    CONNECTED    10609
unix  3      [ ]  DGRAM     CONNECTED    769
unix  3      [ ]  STREAM    CONNECTED    8839
unix  3      [ ]  STREAM    CONNECTED    8243    /run/systemd/journal/stdout

```

- Hostname

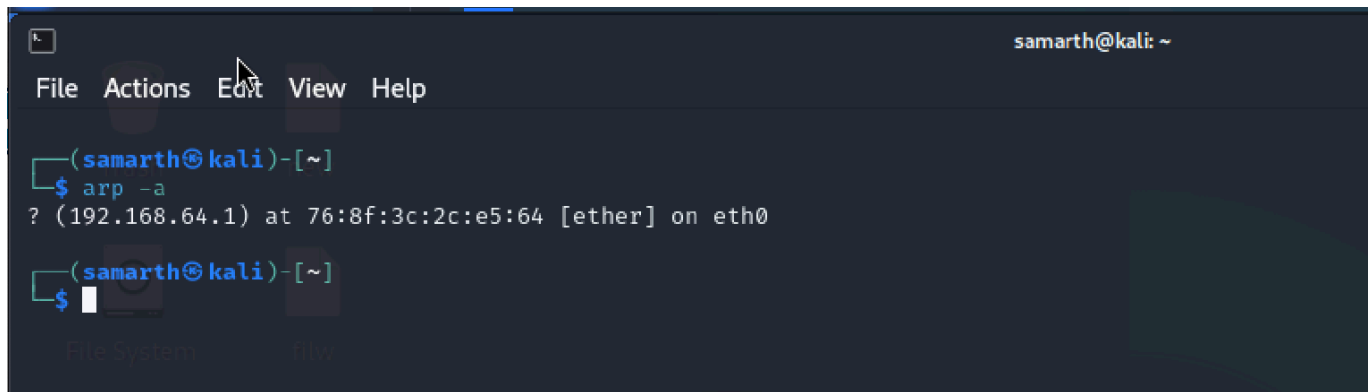


```
(samarth@kali)-[~]  
$ hostname  
kali  
  
(samarth@kali)-[~]  
$
```

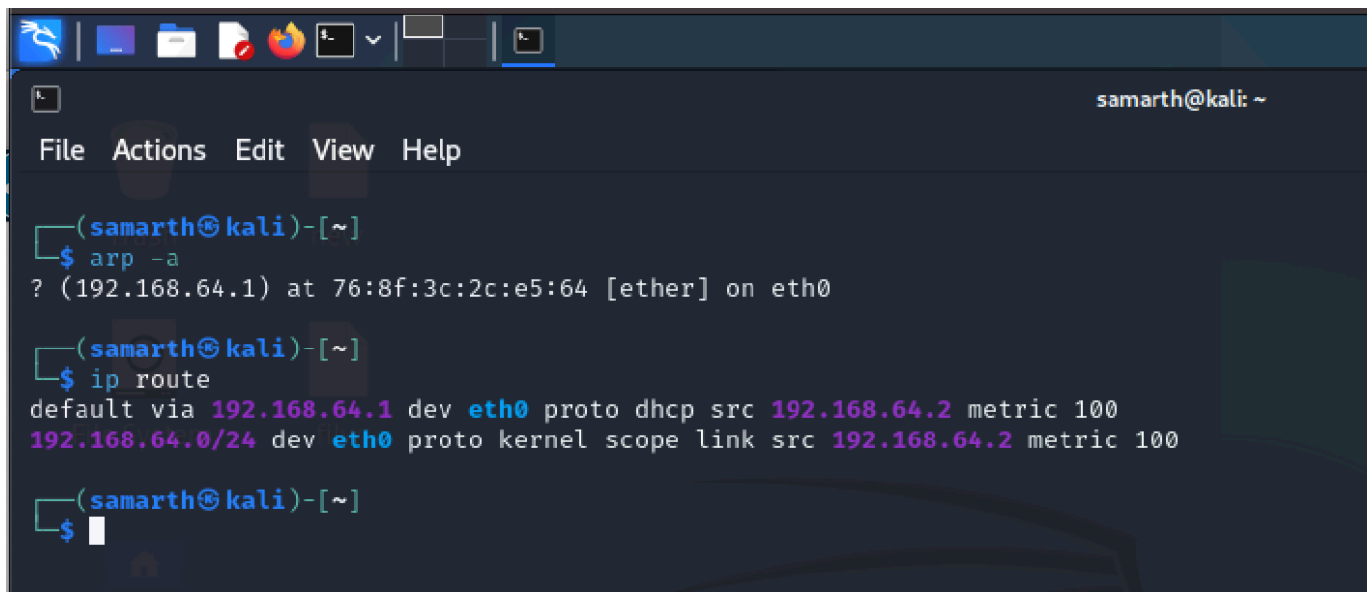


```
(samarth@kali)-[~]  
$ hostname  
kali  
  
(samarth@kali)-[~]  
$ nmap kali  
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-11-13 09:38 CST  
Nmap scan report for kali (127.0.1.1)  
Host is up (0.000040s latency).  
rDNS record for 127.0.1.1: kali.Kali  
All 1000 scanned ports on kali (127.0.1.1) are in ignored states.  
Not shown: 1000 closed tcp ports (conn-refused)  
  
Nmap done: 1 IP address (1 host up) scanned in 0.04 seconds  
  
(samarth@kali)-[~]  
$
```

- **Arp Route**



```
samarth@kali: ~  
File Actions Edit View Help  
(samarth@kali)-[~]  
$ arp -a  
? (192.168.64.1) at 76:8f:3c:2c:e5:64 [ether] on eth0  
(samarth@kali)-[~]  
$
```



```
samarth@kali: ~  
File Actions Edit View Help  
(samarth@kali)-[~]  
$ arp -a  
? (192.168.64.1) at 76:8f:3c:2c:e5:64 [ether] on eth0  
(samarth@kali)-[~]  
$ ip route  
default via 192.168.64.1 dev eth0 proto dhcp src 192.168.64.2 metric 100  
192.168.64.0/24 dev eth0 proto kernel scope link src 192.168.64.2 metric 100  
(samarth@kali)-[~]  
$
```

○ Whois

```
samarth@kali: ~  
File Actions Edit View Help  
No whois server is known for this kind of object.  
  
(samarth@kali)~  
$ whois 192.168.64.2  
  
#  
# ARIN WHOIS data and services are subject to the Terms of Use  
# available at: https://www.arin.net/resources/registry/whois/tou/  
#  
# If you see inaccuracies in the results, please report at  
# https://www.arin.net/resources/registry/whois/inaccuracy\_reporting/  
#  
# Copyright 1997-2024, American Registry for Internet Numbers, Ltd.  
#  
  
NetRange: 192.168.0.0 - 192.168.255.255  
CIDR: 192.168.0.0/16  
NetName: PRIVATE-ADDRESS-CBLK-RFC1918-IANA-RESERVED  
NetHandle: NET-192-168-0-1  
Parent: NET192 (NET-192-0-0-0)  
NetType: IANA Special Use  
OriginAS:  
Organization: Internet Assigned Numbers Authority (IANA)  
RegDate: 1994-03-15  
Updated: 2024-05-24  
Comment: These addresses are in use by many millions of independently operated networks, which might be as small as a single computer connected to a home gateway, and are automatically configured in hundreds of millions of devices. They are only intended for use within a private context and traffic that needs to cross the Internet will need to use a different, unique address.  
Comment: These addresses can be used by anyone without any need to coordinate with IANA or an Internet registry. The traffic from these addresses does not come from ICANN or IANA. We are not the source of activity you may see on logs or in e-mail records. Please refer to http://www.iana.org/abuse/answers  
Comment: These addresses were assigned by the IETF, the organization that develops Internet protocols, in the Best Current Practice document, RFC 1918 which can be found at:  
Comment: http://datatracker.ietf.org/doc/rfc1918  
Ref: https://rdap.arin.net/registry/ip/192.168.0.0  
  
OrgName: Internet Assigned Numbers Authority  
OrgId: IANA
```

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Theory :

1. Ipconfig – try to run with ipconfig-all



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Administrator: Command Prompt

```
C:\Windows\system32>ipconfig -all
```

Windows IP Configuration

```
Host Name . . . . . : DESKTOP-1LDG0NC
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
```

Wireless LAN adapter Local Area Connection* 1:

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . : 70-1C-E7-25-C7-F5
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
```

Ethernet adapter SST:

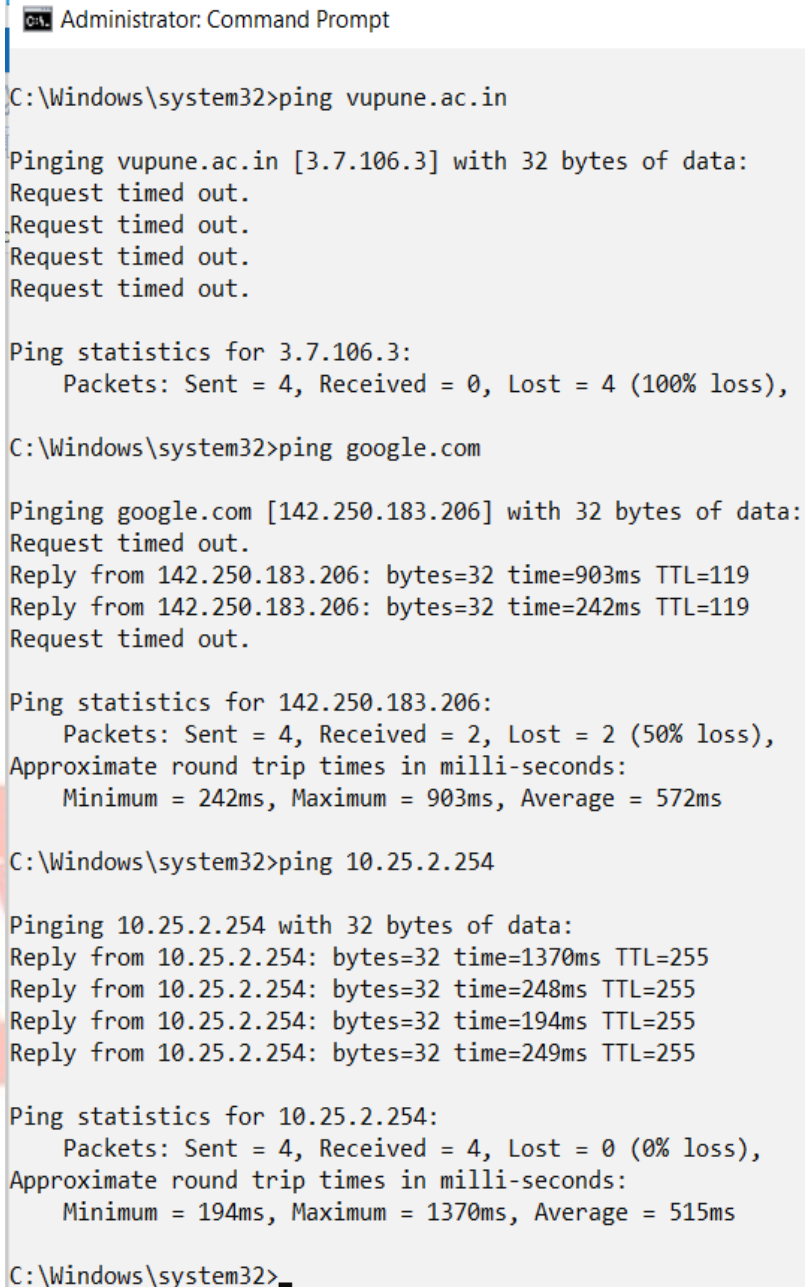
```
Connection-specific DNS Suffix . :
Description . . . . . : Realtek PCIe FE Family Controller
Physical Address. . . . . : 64-00-6A-FE-30-FA
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::5f77:6dd8:e8ae:1999%7(Preferred)
IPv4 Address. . . . . : 10.25.16.238(Preferred)
Subnet Mask . . . . . : 255.255.224.0
Default Gateway . . . . . : 10.25.2.254
DHCPv6 IAID . . . . . : 90439786
DHCPv6 Client DUID. . . . . : 00-01-00-01-29-8E-6B-37-64-00-6A-FE-30-FA
DNS Servers . . . . . : 8.8.8.8
NetBIOS over Tcpip. . . . . : Enabled
```

Wireless LAN adapter Wi-Fi:

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) Dual Band Wireless-AC 3165
Physical Address. . . . . : 70-1C-E7-25-C7-F4
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
```

```
C:\Windows\system32>
```

2. Ping



```
C:\Windows\system32>ping vupune.ac.in

Pinging vupune.ac.in [3.7.106.3] with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 3.7.106.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Windows\system32>ping google.com

Pinging google.com [142.250.183.206] with 32 bytes of data:
Request timed out.
Reply from 142.250.183.206: bytes=32 time=903ms TTL=119
Reply from 142.250.183.206: bytes=32 time=242ms TTL=119
Request timed out.

Ping statistics for 142.250.183.206:
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
Approximate round trip times in milli-seconds:
    Minimum = 242ms, Maximum = 903ms, Average = 572ms

C:\Windows\system32>ping 10.25.2.254

Pinging 10.25.2.254 with 32 bytes of data:
Reply from 10.25.2.254: bytes=32 time=1370ms TTL=255
Reply from 10.25.2.254: bytes=32 time=248ms TTL=255
Reply from 10.25.2.254: bytes=32 time=194ms TTL=255
Reply from 10.25.2.254: bytes=32 time=249ms TTL=255

Ping statistics for 10.25.2.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 194ms, Maximum = 1370ms, Average = 515ms

C:\Windows\system32>
```

3. Tracert /tracert

```
Administrator: Command Prompt
C:\Windows\system32>tracert 10.25.2.254

Tracing route to 10.25.2.254 over a maximum of 30 hops

  1  1663 ms    *      1526 ms  10.25.2.254

Trace complete.

C:\Windows\system32>tracert google.com

Tracing route to google.com [142.250.183.206]
over a maximum of 30 hops:

  1   14 ms    10 ms    25 ms  10.25.2.254
  2  249 ms   330 ms   294 ms  pnq-static-17.164.97.103-gazonindia.com [103.97.164.17]
  3    *        *        *      Request timed out.
  4   62 ms   159 ms   123 ms  72.14.196.76
  5   41 ms    27 ms    18 ms  142.251.76.27
  6  212 ms    *        20 ms  142.251.64.11
  7    *        *      332 ms  bom07s33-in-f14.1e100.net [142.250.183.206]

Trace complete.

C:\Windows\system32>
```

4. Hostname

```
Administrator: Command Prompt

C:\Windows\system32>hostname
DESKTOP-1LDG0NC

C:\Windows\system32>
```

5. Nslookup

```
Administrator: Command Prompt

C:\Windows\system32>hostname
DESKTOP-1LDG0NC

C:\Windows\system32>nslookup
Default Server:  dns.google
Address:  8.8.8.8

> ^Z

C:\Windows\system32>nslookup google.com
Server:  dns.google
Address:  8.8.8.8

Non-authoritative answer:
Name:    google.com
Addresses:  2404:6800:4009:826::200e
           142.250.183.206

C:\Windows\system32>nslookup vupune.ac.in
DNS request timed out.
        timeout was 2 seconds.
Server:  UnKnown
Address:  8.8.8.8

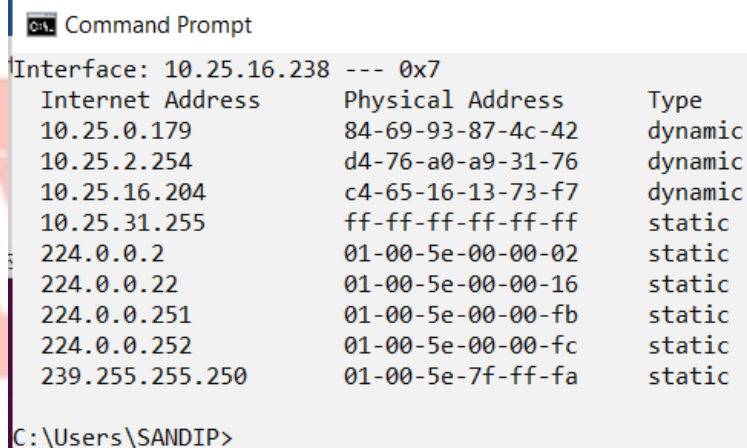
Non-authoritative answer:
Name:    vupune.ac.in
Address:  3.7.106.3

C:\Windows\system32>nslookup 142.250.183.206
DNS request timed out.
        timeout was 2 seconds.
Server:  UnKnown
Address:  8.8.8.8

Name:    bom07s33-in-f14.1e100.net
Address:  142.250.183.206

C:\Windows\system32>
```

6. Arp



```
Command Prompt
Interface: 10.25.16.238 --- 0x7
Internet Address      Physical Address      Type
10.25.0.179           84-69-93-87-4c-42     dynamic
10.25.2.254           d4-76-a0-a9-31-76     dynamic
10.25.16.204          c4-65-16-13-73-f7     dynamic
10.25.31.255          ff-ff-ff-ff-ff-ff     static
224.0.0.2             01-00-5e-00-00-02     static
224.0.0.22           01-00-5e-00-00-16     static
224.0.0.251          01-00-5e-00-00-fb     static
224.0.0.252          01-00-5e-00-00-fc     static
239.255.255.250       01-00-5e-7f-ff-fa     static

C:\Users\SANDIP>
```

Conclusion : <<Write Conclusion in your own words. Write about what you learn from assignment>>