

**EXP NO:1A**  
**DATE:24.7.24**

**NAME:M.KALAIYARASI**  
**ROLLNO:231901503**

## **BASIC NETWORKING COMMANDS IN WINDOWS OPERATING SYSTEM**

**Aim:**

To study the basic commands operating system in window operating system.

### **1. IPCONFIG**

The IPConfig network command provides a comprehensive view of information regarding the IP address configuration of the device we are currently working on.

The IPConfig command also provides us with some variation in the primary command that targets specific system settings or data, which are:

- IPConfig/all - Provides primary output with additional information about network adapters.
- IPConfig/renew - Used to renew the system's IP address.
- IPConfig/release - Removes the system's current IP address.

**SYNTAX- ipconfig EXAMPLE**

**: ipconfig OUTPUT:**

```
Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix  . : 
IPv6 Address. . . . . : 2401:4900:627c:2a61:9862:5395:90c1:5276
Temporary IPv6 Address. . . . . : 2401:4900:627c:2a61:fc13:88d:9b99:9c25
Link-local IPv6 Address . . . . . : fe80::f8bb:f0d2:58f7:6e8c%6
IPv4 Address. . . . . : 192.168.92.14
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : fe80::8e0:3bff:febf:798d%6
                          192.168.92.49
```

### **2. NSLOOKUP**

The NSLOOKUP command is used to troubleshoot network connectivity issues in the system. Using the nslookup command, we can access the information related to our system's DNS server, i.e., domain name and IP address.

**Syntax- nslookup**

OUTPUT:

Example : nslookup [www.google.com](http://www.google.com)

```
C:\Users\Windows>nslookup www.google.com
Server: UnKnown
Address: 192.168.92.49

Non-authoritative answer:
Name: www.google.com
Addresses: 2404:6800:4007:82b::2004
          142.250.193.100
```

### 3. HOSTNAME

The HOSTNAME command displays the hostname of the system. The hostname command is much easier to use than going into the system settings to search for it.

SYNTAX- hostname EXAMPLE :

hostname OUTPUT:

```
C:\Users\Windows>hostname
DESKTOP-B1SLH79
```

### 4. PING

The Ping command is one of the most widely used commands in the prompt tool, as it allows the user to check the connectivity of our system to another host.

This command sends four experimental packets to the destination host to check whether it receives them successfully, if so, then, we can communicate with the destination host. But in case the packets have not been received, that means, no communication can be established with the destination host.

OUTPUT:

SYNTAX- ping [www.destination\\_host\\_name.com](http://www.destination_host_name.com)

EXAMPLE : ping [www.facebook.com](http://www.facebook.com)

```
C:\Users\Windows>ping www.facebook.com

Pinging star-mini.c10r.facebook.com [2a03:2880:f184:186:face:b00c:0:25de] with 32 bytes of data:
Reply from 2a03:2880:f184:186:face:b00c:0:25de: time=23ms
Reply from 2a03:2880:f184:186:face:b00c:0:25de: time=54ms
Reply from 2a03:2880:f184:186:face:b00c:0:25de: time=47ms
Reply from 2a03:2880:f184:186:face:b00c:0:25de: time=37ms

Ping statistics for 2a03:2880:f184:186:face:b00c:0:25de:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 23ms, Maximum = 54ms, Average = 40ms
```

## 5. TRACERT

The TRACERT command is used to trace the route during the transmission of the data packet over to the destination host and also provides us with the “hop” count during transmission. Using the number of hops and the hop IP address, we can troubleshoot network issues and identify the point of the problem during the transmission of the data packet.

SYNTAX- tracert IP-address OR tracert [www.destination\\_host\\_name.com](http://www.destination_host_name.com)

EXAMPLE : tracert [www.facebook.com](http://www.facebook.com)

OUTPUT:

```
C:\Users\Windows>tracert www.facebook.com

Tracing route to star-mini.c10r.facebook.com [2a03:2880:f184:186:face:b00c:0:25de]
over a maximum of 30 hops:
  0  6 ms   4 ms   3 ms  2401:4900:627c:2a61::4c
  1  *      *      *      Request timed out.
  2  43 ms  25 ms  33 ms  2401:4900:c4:46bb::1
  3  62 ms  46 ms  41 ms  2401:4900:0:6f8::6
  4  *      59 ms  34 ms  2401:4900:0:6f8::1
  5  *      *      *      Request timed out.
  6  27 ms  31 ms  20 ms  2404:a800:3a00:1::4c5
  7  56 ms  25 ms  26 ms  2404:a800::92
  8  36 ms  24 ms  32 ms  ae5.pr01.tir1.tfbnw.net [2620:0:1cff:dead:beef::952]
  9  38 ms  20 ms  22 ms  po101.asw02.tir3.tfbnw.net [2620:0:1cff:dead:beef::3ca]
 10  59 ms  24 ms  24 ms  po238.psw03.tir3.tfbnw.net [2620:0:1cff:dead:beef::886f]
 11  22 ms  28 ms  31 ms  po3.msw1ad.02.tir3.tfbnw.net [2a03:2880:f09d:ffff::6f]
 12  75 ms  30 ms  25 ms  edge-star-mini6-shv-02-tir3.facebook.com [2a03:2880:f184:186:face:b00c:0:25de]
 13

Trace complete.
```

OUTPUT:

## 6. NETSTAT

The Netstat command as the name suggests displays an overview of all the network connections in the device. The table shows detail about the connection protocol, address, and the current state of the network.

SYNTAX- netstat EXAMPLE

: netstat

```
C:\Users\Windows>netstat
Active Connections

Proto Local Address           Foreign Address         State
TCP   127.0.0.1:49990          DESKTOP-B1SLH79:49991  ESTABLISHED
TCP   127.0.0.1:49991          DESKTOP-B1SLH79:49990  ESTABLISHED
TCP   192.168.92.14:60089      20.212.88.117:https     ESTABLISHED
TCP   192.168.92.14:60145      4.193.45.35:https       ESTABLISHED
TCP   192.168.92.14:60149      13.83.65.43:https       ESTABLISHED
TCP   192.168.92.14:60158      13.83.65.43:https       ESTABLISHED
TCP   192.168.92.14:60165      20.249.168.26:https     ESTABLISHED
TCP   192.168.92.14:60212      relay-058f44e1:https    ESTABLISHED
TCP   192.168.92.14:60377      52.96.190.162:https     ESTABLISHED
TCP   [2401:4900:627c:2a61:fc13:88d:9b99:9c25]:60189 [2603:1063:15::10]:https ESTABLISHED
TCP   [2401:4900:627c:2a61:fc13:88d:9b99:9c25]:60316 [2603:1040:a06:6::]:https ESTABLISHED
TCP   [2401:4900:627c:2a61:fc13:88d:9b99:9c25]:60365 g2600-140f-2400-0000-0000-0000-173b-af33:https CLOSE_WAIT
TCP   [2401:4900:627c:2a61:fc13:88d:9b99:9c25]:60366 g2600-140f-2400-0000-0000-0000-173b-af33:https CLOSE_WAIT
TCP   [2401:4900:627c:2a61:fc13:88d:9b99:9c25]:60369 [2603:1046:c06:803::2]:https ESTABLISHED
TCP   [2401:4900:627c:2a61:fc13:88d:9b99:9c25]:60370 g2600-140f-2400-0000-0000-0000-173b-af33:https CLOSE_WAIT
TCP   [fe80::fe7e:8045:d871:a810%41]:1521 DESKTOP-B1SLH79:54128 ESTABLISHED
TCP   [fe80::fe7e:8045:d871:a810%41]:54128 DESKTOP-B1SLH79:1521 ESTABLISHED
```

## 7. ARP(Address Resolution Protocol)

The ARP command is used to access the mapping structure of IP addresses to the MAC address. This provides us with a better understanding of the transmission of packets in the network channel.

SYNTAX- arp

EXAMPLE : arp -a

OUTPUT:

## OUTPUT:

```
C:\Users\Windows>arp -a
```

```
Interface: 192.168.92.14 --- 0x6
```

Internet Address	Physical Address	Type
192.168.92.49	0a-e0-3b-bf-79-8d	dynamic
192.168.92.255	ff-ff-ff-ff-ff-ff	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
255.255.255.255	ff-ff-ff-ff-ff-ff	static

```
Interface: 192.168.56.1 --- 0x29
```

Internet Address	Physical Address	Type
192.168.56.255	ff-ff-ff-ff-ff-ff	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

## 8. SYSTEMINFO

Using the SYSTEMINFO command, we can access the system's hardware and software details, such as processor data, booting data, Windows version, etc.

SYNTAX– systeminfo

EXAMPLE : systeminfo OUTPUT:

C:\Users\Windows>systeminfo

Host Name: DESKTOP-B1SLH79  
OS Name: Microsoft Windows 10 Pro  
OS Version: 10.0.19045 N/A Build 19045  
OS Manufacturer: Microsoft Corporation  
OS Configuration: Standalone Workstation  
OS Build Type: Multiprocessor Free  
Registered Owner: Windows  
Registered Organization:  
Product ID: 00330-52334-95812-AAOEM  
Original Install Date: 27-05-2024, 01:04:28  
System Boot Time: 18-07-2024, 20:39:06  
System Manufacturer: Dell Inc.  
System Model: Latitude 7480  
System Type: x64-based PC  
Processor(s): 1 Processor(s) Installed.  
[01]: Intel64 Family 6 Model 78 Stepping 3 GenuineIntel ~2607 Mhz  
BIOS Version: Dell Inc. 1.36.0, 29-01-2024  
Windows Directory: C:\WINDOWS  
System Directory: C:\WINDOWS\system32  
Boot Device: \Device\HarddiskVolume1  
System Locale: en-us;English (United States)  
Input Locale: 00004009  
Time Zone: (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi  
Total Physical Memory: 8,073 MB  
Available Physical Memory: 3,074 MB  
Virtual Memory: Max Size: 15,694 MB  
Virtual Memory: Available: 8,540 MB  
Virtual Memory: In Use: 7,154 MB  
Page File Location(s): C:\pagefile.sys  
Domain: WORKGROUP  
Logon Server: \\DESKTOP-B1SLH79  
Hotfix(s): 7 Hotfix(s) Installed.  
[01]: KB5037587  
[02]: KB5037592  
[03]: KB5011048  
[04]: KB5015684  
[05]: KB5039211  
[06]: KB5037240  
[07]: KB5037995  
Network Card(s): 4 NIC(s) Installed.  
[01]: Intel(R) Ethernet Connection (4) I219-LM  
Connection Name: Ethernet  
Status: Media disconnected  
[02]: Intel(R) Dual Band Wireless-AC 8265  
Connection Name: Wi-Fi  
DHCP Enabled: Yes  
DHCP Server: 192.168.92.49  
IP address(es)  
[01]: 192.168.92.14  
[02]: fe80::f8bb:f0d2:58f7:6e8c  
[03]: 2401:4900:627c:2a61:fc13:88d:9b99:9c25  
[04]: 2401:4900:627c:2a61:9862:5395:90c1:5276  
[03]: Bluetooth Device (Personal Area Network)  
Connection Name: Bluetooth Network Connection  
Status: Media disconnected  
[04]: VirtualBox Host-Only Ethernet Adapter  
Connection Name: Ethernet 2  
DHCP Enabled: No  
IP address(es)  
[01]: 192.168.56.1  
[02]: fe80::fe7e:8045:d871:a810  
Hyper-V Requirements: VM Monitor Mode Extensions: Yes  
Virtualization Enabled In Firmware: Yes  
Second Level Address Translation: Yes  
Data Execution Prevention Available: Yes

## 9. ROUTE

Provides the data of routing data packets in the system over the communication channel.

SYNTAX – route print EXAMPLE

: route print

OUTPUT:



```
C:\Users\Windows>route print
```

```
=====
```

```
Interface List
```

```
16...8c 04 ba 33 04 12 .....Intel(R) Ethernet Connection (4) I219-LM
41...0a 00 27 00 00 29 .....VirtualBox Host-Only Ethernet Adapter
15...dc 71 96 ea 88 ba .....Microsoft Wi-Fi Direct Virtual Adapter
17...de 71 96 ea 88 b9 .....Microsoft Wi-Fi Direct Virtual Adapter #2
6...dc 71 96 ea 88 b9 .....Intel(R) Dual Band Wireless-AC 8265
5...dc 71 96 ea 88 bd .....Bluetooth Device (Personal Area Network)
1.....Software Loopback Interface 1
```

```
=====
```

```
IPv4 Route Table
```

```
=====
```

```
Active Routes:
```

Network	Destination	Netmask	Gateway	Interface	Metric
	0.0.0.0	0.0.0.0	192.168.92.49	192.168.92.14	50
	127.0.0.0	255.0.0.0	On-link	127.0.0.1	331
	127.0.0.1	255.255.255.255	On-link	127.0.0.1	331
127.255.255.255	255.255.255.255		On-link	127.0.0.1	331
192.168.56.0	255.255.255.0		On-link	192.168.56.1	330
192.168.56.1	255.255.255.255		On-link	192.168.56.1	330
192.168.56.255	255.255.255.255		On-link	192.168.56.1	330
192.168.92.0	255.255.255.0		On-link	192.168.92.14	306
192.168.92.14	255.255.255.255		On-link	192.168.92.14	306
192.168.92.255	255.255.255.255		On-link	192.168.92.14	306
224.0.0.0	240.0.0.0		On-link	127.0.0.1	331
224.0.0.0	240.0.0.0		On-link	192.168.92.14	306
224.0.0.0	240.0.0.0		On-link	192.168.56.1	330
255.255.255.255	255.255.255.255		On-link	127.0.0.1	331
255.255.255.255	255.255.255.255		On-link	192.168.92.14	306
255.255.255.255	255.255.255.255		On-link	192.168.56.1	330

```
=====
```

```
Persistent Routes:
```

Network Address	Netmask	Gateway Address	Metric
-----------------	---------	-----------------	--------

```
=====
```

```
Persistent Routes:
```

Network Address	Netmask	Gateway Address	Metric
0.0.0.0	0.0.0.0	172.16.18.1	Default

```
=====
```

```
IPv6 Route Table
```

```
=====
```

```
Active Routes:
```

If	Metric	Network	Destination	Gateway
6	66	:::0		fe80::8e0:3bff:febf:798d
1	331	:::1/128		On-link
6	66	2401:4900:627c:2a61::/64		On-link
6	306	2401:4900:627c:2a61:9862:5395:90c1:5276/128		On-link
6	306	2401:4900:627c:2a61:fc13:88d:9b99:9c25/128		On-link
6	306	fe80::/64		On-link
41	281	fe80::/64		On-link
6	306	fe80::f8bb:f0d2:58f7:6e8c/128		On-link
41	281	fe80::fe7e:8045:d871:a810/128		On-link
1	331	ff00::/8		On-link
6	306	ff00::/8		On-link
41	281	ff00::/8		On-link

```
=====
```

```
Persistent Routes:
```

```
None
```

## **RESULT**

Hence, the study of basic networking commands in window operating system is studied.