

Computer Networks

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Course Title : Computer Networks

Course code : BCSE308P

Slot : L45-46

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S.No	Experiment Name	Date	Page No.	Marks
1.	Basic Network Configuration Commands	10-01-2024		

Experiment No. 1

Experiment Name: Basic Network Configuration Commands

Date: 10-1-2024

Problem Statement

Execute the following network commands on a terminal (both UNIX and WINDOWS)

Aim

To execute the given list of network command prompts in both UNIX and WINDOWS operating systems.

Algorithm or Procedure

1. The command ipconfig in windows is used to display current TCP/IP network configurations and IPv4 and IPv6 addresses

Observation

Works in windows

Output

```
PS D:\OneDrive\BCSE308P-22BAI1471-LAB1> ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . : VITCHOSSRV
    Link-local IPv6 Address . . . . . : fe80::c713:6015:b812:7d3f%11
    IPv4 Address. . . . . : 172.20.32.158
    Subnet Mask . . . . . : 255.255.248.0
    Default Gateway . . . . . : 172.20.32.1
PS D:\OneDrive\BCSE308P-22BAI1471-LAB1> |
```

In Linux terminal ifconfig is used instead of ipconfig and the output is obtained.

Usage

ifconfig

Observation

Works in Linux terminal

Output

```
saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$ ifconfig /all
/all: error fetching interface information: Device not found
saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$ ifconfig -a
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
    inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
    inet6 fe80::9a85:a2c5:bff9:4b6c  prefixlen 64  scopeid 0x20<link>
    ether 08:00:27:08:32:dc  txqueuelen 1000  (Ethernet)
    RX packets 169937  bytes 244122098 (244.1 MB)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 45433  bytes 2776189 (2.7 MB)
    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 483  bytes 48230 (48.2 KB)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 483  bytes 48230 (48.2 KB)
    TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0
```

-
2. The command ipconfig /all will displays the full TCP/IP configuration for all adapters.In general this gives MAC address

Usage

ipconfig /all

Observation

works in windows

Output

```
Windows PowerShell
PS D:\OneDrive\BCSE308P-22BAI1471-LAB1> ipconfig /all

Windows IP Configuration

Host Name . . . . . : Saranya
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : VITCHOSSRV

Ethernet adapter Ethernet:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Realtek PCIe GbE Family Controller
Physical Address. . . . . : 58-11-22-80-9D-26
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 1:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . : B6-8C-9D-66-8C-29
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 2:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address. . . . . : B6-8C-9D-66-8C-39
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . : VITCHOSSRV
Description . . . . . : MediaTek Wi-Fi 6 MT7921 Wireless LAN Card
Physical Address. . . . . : B4-8C-9D-66-8C-39
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::c713:6015:b812:7d3f%11(Preferred)
IPv4 Address. . . . . : 172.20.32.158(Preferred)
Subnet Mask . . . . . : 255.255.248.0
Lease Obtained. . . . . : 10 January 2024 20:39:47
Lease Expires . . . . . : 11 January 2024 01:39:22
Default Gateway . . . . . : 172.20.32.1
```

In linux terminal it produces the same result

Usage

ifconfig

Output

```
saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fe80::9a85:a2c5:bff9:4b6c prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:08:32:dc txqueuelen 1000 (Ethernet)
    RX packets 261 bytes 302994 (302.9 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 224 bytes 20924 (20.9 KB)
    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 129 bytes 11157 (11.1 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 129 bytes 11157 (11.1 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$
```

3. The command hostname provides the configured name of the host

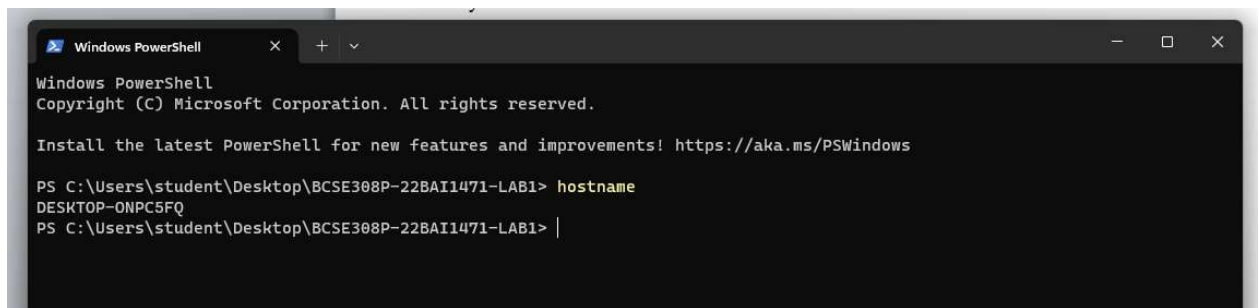
Usage

hostname

Observation

The command prompt worked in windows and produced output

Output



```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> hostname
DESKTOP-ONPC5FQ
PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> |
```

The command hostname can be used in Linux environment to get the similar output.

Usage

hostname

Observation

Gives hostname.

Output

```
saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$ hostname  
saranya-VirtualBox
```

4. The command arp provides with address resolution protocol

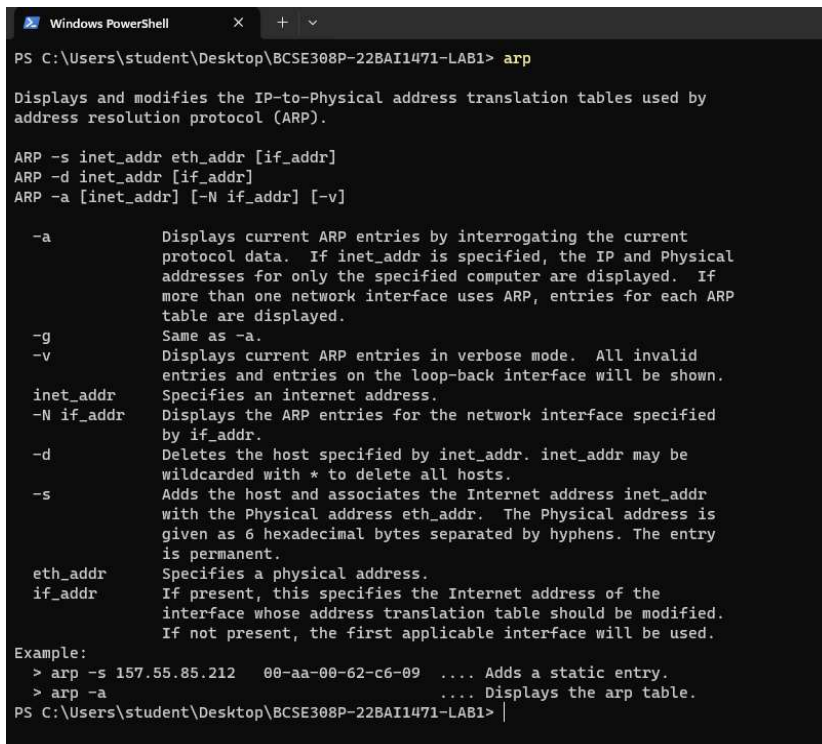
Usage

arp

Observation

The command prompt worked and produced the following output.

Output



```
Windows PowerShell
PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> arp

Displays and modifies the IP-to-Physical address translation tables used by
address resolution protocol (ARP).

ARP -s inet_addr eth_addr [if_addr]
ARP -d inet_addr [if_addr]
ARP -a [inet_addr] [-N if_addr] [-v]

-a          Displays current ARP entries by interrogating the current
             protocol data. If inet_addr is specified, the IP and Physical
             addresses for only the specified computer are displayed. If
             more than one network interface uses ARP, entries for each ARP
             table are displayed.

-g          Same as -a.

-v          Displays current ARP entries in verbose mode. All invalid
             entries and entries on the loop-back interface will be shown.

inet_addr  Specifies an internet address.

-N if_addr Displays the ARP entries for the network interface specified
             by if_addr.

-d          Deletes the host specified by inet_addr. inet_addr may be
             wildcarded with * to delete all hosts.

-s          Adds the host and associates the Internet address inet_addr
             with the Physical address eth_addr. The Physical address is
             given as 6 hexadecimal bytes separated by hyphens. The entry
             is permanent.

eth_addr   Specifies a physical address.

if_addr    If present, this specifies the Internet address of the
             interface whose address translation table should be modified.
             If not present, the first applicable interface will be used.

Example:
> arp -s 157.55.85.212 00-aa-00-62-c6-09 .... Adds a static entry.
> arp -a .... Displays the arp table.
PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> |
```

The command arp in Linux produces the similar output. It produces address,Flagmask and ether details of the current network being used.

Usage

arp

Observation

Works in Linux terminal

Output

```
saranya@saranya-VirtualBox: ~/Desktop/BCSE308P_22BAI1471$ arp
Address      Hwtype  Hwaddress  Flags Mask      Iface
_gateway     ether    52:54:00:12:35:02  C              enp0s3
```

5. The command arp -a provides the current ARP entries by negotiating the current protocol data

Usage

arp -a

Observation

The command prompt worked in windows and produced the following output.

Output


```
PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> arp -a
```

```
Interface: 172.16.15.77 --- 0x4
Internet Address      Physical Address      Type
172.16.15.2           04-d5-90-60-53-5f    dynamic
172.16.15.4           38-ca-84-46-1c-ea    dynamic
172.16.15.5           38-ca-84-46-1a-48    dynamic
172.16.15.7           38-ca-84-46-1e-1f    dynamic
172.16.15.8           38-ca-84-45-db-cf    dynamic
172.16.15.9           38-ca-84-46-1b-ca    dynamic
172.16.15.10          38-ca-84-46-1c-b8    dynamic
172.16.15.11          38-ca-84-46-1e-1b    dynamic
172.16.15.12          38-ca-84-46-1e-40    dynamic
172.16.15.13          38-ca-84-45-db-6a    dynamic
172.16.15.14          38-ca-84-46-1a-4d    dynamic
172.16.15.15          38-ca-84-46-1c-b2    dynamic
172.16.15.16          38-ca-84-46-1a-5c    dynamic
172.16.15.17          38-ca-84-46-1d-e8    dynamic
172.16.15.19          38-ca-84-46-1c-2c    dynamic
172.16.15.20          38-ca-84-46-1b-ac    dynamic
172.16.15.22          38-ca-84-46-1d-b7    dynamic
172.16.15.23          38-ca-84-46-1d-c2    dynamic
172.16.15.24          38-ca-84-46-1e-25    dynamic
172.16.15.25          38-ca-84-45-db-aa    dynamic
172.16.15.26          38-ca-84-45-db-e8    dynamic
172.16.15.27          38-ca-84-45-d6-ea    dynamic
172.16.15.28          38-ca-84-45-db-24    dynamic
172.16.15.29          38-ca-84-46-1d-f8    dynamic
172.16.15.30          38-ca-84-45-db-1b    dynamic
172.16.15.32          38-ca-84-46-1e-2b    dynamic
172.16.15.35          38-ca-84-46-1e-0c    dynamic
172.16.15.36          38-ca-84-46-1c-ef    dynamic
172.16.15.37          38-ca-84-45-db-2e    dynamic
172.16.15.38          38-ca-84-46-1e-09    dynamic
172.16.15.39          38-ca-84-46-1d-cd    dynamic
172.16.15.40          38-ca-84-46-19-3d    dynamic
172.16.15.42          38-ca-84-46-1a-51    dynamic
172.16.15.43          38-ca-84-46-1a-37    dynamic
172.16.15.45          38-ca-84-46-1e-27    dynamic
172.16.15.47          38-ca-84-45-dc-74    dynamic
172.16.15.48          38-ca-84-46-1c-18    dynamic
172.16.15.49          38-ca-84-46-1c-9f    dynamic
172.16.15.50          38-ca-84-46-1e-6c    dynamic
172.16.15.51          38-ca-84-45-dc-62    dynamic
172.16.15.52          38-ca-84-45-db-7d    dynamic
172.16.15.53          38-ca-84-46-1d-06    dynamic
172.16.15.54          38-ca-84-46-1d-c5    dynamic
172.16.15.55          38-ca-84-46-19-c5    dynamic
172.16.15.58          38-ca-84-46-1a-3e    dynamic
172.16.15.59          38-ca-84-46-1e-13    dynamic
172.16.15.60          38-ca-84-46-1e-19    dynamic
```

```
Windows PowerShell
172.16.15.49      38-ca-84-46-1c-9f      dynamic
172.16.15.50      38-ca-84-46-1e-6c      dynamic
172.16.15.51      38-ca-84-45-dc-62      dynamic
172.16.15.52      38-ca-84-45-db-7d      dynamic
172.16.15.53      38-ca-84-46-1d-06      dynamic
172.16.15.54      38-ca-84-46-1d-c5      dynamic
172.16.15.55      38-ca-84-46-19-c5      dynamic
172.16.15.58      38-ca-84-46-1a-3e      dynamic
172.16.15.59      38-ca-84-46-1e-13      dynamic
172.16.15.60      38-ca-84-46-1e-19      dynamic
172.16.15.61      38-ca-84-45-da-da      dynamic
172.16.15.62      38-ca-84-46-1d-a6      dynamic
172.16.15.63      38-ca-84-45-dc-66      dynamic
172.16.15.64      38-ca-84-45-db-99      dynamic
172.16.15.65      38-ca-84-46-1c-15      dynamic
172.16.15.66      38-ca-84-46-1a-0c      dynamic
172.16.15.67      38-ca-84-45-db-d8      dynamic
172.16.15.68      38-ca-84-45-db-fb      dynamic
172.16.15.69      38-ca-84-46-1a-14      dynamic
172.16.15.70      38-ca-84-45-dc-ae      dynamic
172.16.15.71      38-ca-84-46-1c-cb      dynamic
172.16.15.72      38-ca-84-46-1c-f7      dynamic
172.16.15.73      38-ca-84-46-1c-35      dynamic
172.16.15.74      38-ca-84-46-1d-01      dynamic
172.16.15.76      38-ca-84-45-db-a7      dynamic
172.16.15.81      38-ca-84-45-db-dc      dynamic
172.16.15.82      38-ca-84-46-1c-21      dynamic
172.16.15.255     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

Interface: 192.168.164.1 --- 0x5
Internet Address  Physical Address  Type
192.168.164.255   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

Interface: 192.168.209.1 --- 0xc
Internet Address  Physical Address  Type
192.168.209.254   00-50-56-ee-ef-89 dynamic
192.168.209.255   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
PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1>
```

arp -a: This command is used to display the ARP table for a particular IP address

Usage

arp -a

Output in Linux terminal

```
saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$ arp -a
_gateway (10.0.2.2) at 52:54:00:12:35:02 [ether] on enp0s3
```

6. The command `ping host-name` is the primary TCP/IP command used to troubleshoot connectivity, reachability, and name resolution. Its most basic use is to confirm network connectivity between two hosts.

Usage

`ping host-name`

Observation

The command worked in the windows. It sends four packets to the server we are trying to ping and in return we get 4 packets or responses from the server we are trying to contact with.

Output

```
PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> ping www.google.com

Pinging www.google.com [142.250.182.36] with 32 bytes of data:
Reply from 142.250.182.36: bytes=32 time=3ms TTL=119
Reply from 142.250.182.36: bytes=32 time=4ms TTL=119
Reply from 142.250.182.36: bytes=32 time=4ms TTL=119
Reply from 142.250.182.36: bytes=32 time=4ms TTL=119

Ping statistics for 142.250.182.36:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 4ms, Average = 3ms
PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> |
```

The command `ping host-name` works in the same way in the Linux terminal

Usage

`ping www.youtube.com`

Observation

Works in Linux Terminal

Output

```

saranya@saranya-VirtualBox: ~/Desktop/8C5E308F_228A11471$ ping www.youtube.com
PING youtube-ui.l.google.com (142.250.192.46) 56(84) bytes of data.
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=1 ttl=58 time=59.2 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=2 ttl=58 time=331 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=3 ttl=58 time=241 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=4 ttl=58 time=288 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=5 ttl=58 time=399 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=6 ttl=58 time=294 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=7 ttl=58 time=271 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=8 ttl=58 time=196 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=9 ttl=58 time=565 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=10 ttl=58 time=409 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=11 ttl=58 time=824 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=12 ttl=58 time=800 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=13 ttl=58 time=683 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=14 ttl=58 time=1276 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=15 ttl=58 time=984 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=16 ttl=58 time=622 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=18 ttl=58 time=53.1 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=19 ttl=58 time=106 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=20 ttl=58 time=66.4 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=21 ttl=58 time=55.9 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=22 ttl=58 time=49.2 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=23 ttl=58 time=26.6 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=24 ttl=58 time=82.2 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=25 ttl=58 time=152 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=26 ttl=58 time=75.0 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=27 ttl=58 time=109 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=28 ttl=58 time=102 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=29 ttl=58 time=46.1 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=30 ttl=58 time=107 ms

```

-
7. The command `ping -c 5 -q domain-name` is used to only get the summary about the network.

Usage

`ping -c 5 -q www.google.com`

Observation

This command is not worked in the windows producing the output administrative privileges are denied.

Output


```
PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> ping -c 5 -q www.google.com
Access denied. Option -c requires administrative privileges.
PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> |
```

The command `ping -c 5 -q domain-name` when used in Linux produces the output

Usage

`ping -c 5 -q www.google.com`

Output

```
saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$ ping -c 5 -q www.google.com
PING www.google.com (142.250.195.100) 56(84) bytes of data.

--- www.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4008ms
rtt min/avg/max/mdev = 6.361/37.617/124.433/43.808 ms
```

-
8. The command `tracert domain-name` The traceroute results display the path across the network (Internet) that data takes from your computer to a destination.

Usage

`tracert www.google.com`

Observation

This command worked on windows and produced output. Showed the number of intermediate routers the packet from our computer is hitting to the destination.

Output

```

PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> tracert www.google.com

Tracing route to www.google.com [142.250.182.36]
over a maximum of 30 hops:

  1     1 ms     1 ms     1 ms    172.16.15.2
  2     3 ms     2 ms     3 ms    122.184.65.193
  3     4 ms     *         *       116.119.68.247
  4     6 ms     6 ms     5 ms    142.250.169.206
  5     5 ms     3 ms     3 ms    142.251.71.187
  6     4 ms     3 ms     4 ms    142.251.55.237
  7     4 ms     3 ms     3 ms    maa05s19-in-f4.1e100.net [142.250.182.36]

Trace complete.
PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> |

```

The command `tracert -I www.google.com` is used to find route to given domain in Linux terminal

`tracert`: Initiates the `tracert` command.

`-I`: Specifies the use of ICMP Echo Request packets for the trace.

`google.com`: The destination host for which you want to trace the route.

Usage: `tracert -I www.google.com`

Output

```

saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$ traceroute -I google.com
traceroute to google.com (142.250.182.46), 30 hops max, 60 byte packets
send: No route to host

```

The `route -n` command in Linux is used to display the kernel routing table in a concise numeric format. Here's a breakdown of the command:

- `route`: The command itself for managing the IP routing table.
- `-n`: This option instructs `route` to display numeric IP addresses instead of attempting to resolve hostnames.

Output

```
saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$ route -n
Kernel IP routing table
Destination      Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0          10.0.2.2       0.0.0.0         UG    100    0      0 enp0s3
10.0.2.0         0.0.0.0        255.255.255.0   U    100    0      0 enp0s3
169.254.0.0      0.0.0.0        255.255.0.0     U    1000   0      0 enp0s3
```

9. The command nslookup finds IP address that corresponds to a host

Usage:

nslookup www.google.com

Observation:

The commands works in the windows and produce the following ouput.

Output:

```
PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> nslookup www.google.com
Server: UnKnown
Address: 172.16.1.11

Non-authoritative answer:
Name: www.google.com
Addresses: 2404:6800:4007:81a::2004
          142.250.182.36

PS C:\Users\student\Desktop\BCSE308P-22BAI1471-LAB1> |
```

The command nslookup finds IP address that corresponds to the host in the Linux terminal

Usage:

nslookup www.google.com

Output:

```
saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$ nslookup www.google.com
Server:      127.0.0.53
Address:     127.0.0.53#53

Non-authoritative answer:
Name:   www.google.com
Address: 172.217.31.196
Name:   www.google.com
Address: 2404:6800:4007:809::2004
```

10. The command netstat displays all the active network connections.

Usage:

netstat

Observation:

The command works in windows and produce the following output

```
PS D:\OneDrive\BCSE308P-22BAI1471-LAB1> netstat

Active Connections

Proto Local Address           Foreign Address         State
TCP   127.0.0.1:1042           Saranya:49718           ESTABLISHED
TCP   127.0.0.1:1042           Saranya:49733           ESTABLISHED
TCP   127.0.0.1:9012           Saranya:49721           ESTABLISHED
TCP   127.0.0.1:13030          Saranya:49670           ESTABLISHED
TCP   127.0.0.1:17532          Saranya:49723           ESTABLISHED
TCP   127.0.0.1:49670          Saranya:13030           ESTABLISHED
TCP   127.0.0.1:49671          Saranya:49672           ESTABLISHED
TCP   127.0.0.1:49672          Saranya:49671           ESTABLISHED
TCP   127.0.0.1:49673          Saranya:49674           ESTABLISHED
TCP   127.0.0.1:49674          Saranya:49673           ESTABLISHED
TCP   127.0.0.1:49718          Saranya:1042            ESTABLISHED
TCP   127.0.0.1:49721          Saranya:9012            ESTABLISHED
TCP   127.0.0.1:49723          Saranya:17532           ESTABLISHED
TCP   127.0.0.1:49730          Saranya:65001           ESTABLISHED
TCP   127.0.0.1:49733          Saranya:1042            ESTABLISHED
TCP   127.0.0.1:65001          Saranya:49730           ESTABLISHED
TCP   172.20.32.158:49410      20.198.119.84:https     ESTABLISHED
TCP   172.20.32.158:52249      20.198.119.84:https     ESTABLISHED
TCP   172.20.32.158:52273      20.187.186.89:https     ESTABLISHED
TCP   172.20.32.158:52575      a23-215-215-217:https   CLOSE_WAIT
```

Similarly it works in the linux terminal to display all the networks connected actively


```

saranya@saranya-VirtualBox:~/Desktop/8C5E308P_228AI1471$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 saranya-VirtualB:bootpc _gateway:bootps        ESTABLISHED

Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags               Type               State         I-Node   Path
unix   3      [ ]                  STREAM             CONNECTED      25514      /run/systemd/journal/stdout
unix   3      [ ]                  STREAM             CONNECTED      25491      /run/systemd/journal/stdout
unix   3      [ ]                  STREAM             CONNECTED      24338      /run/systemd/journal/stdout
unix   3      [ ]                  STREAM             CONNECTED      25770      @/home/saranya/.cache/ibus/dbus-Q9roIgfx
unix   3      [ ]                  STREAM             CONNECTED      25292      /run/systemd/journal/stdout
unix   3      [ ]                  STREAM             CONNECTED      25719      /run/user/1000/bus
unix   3      [ ]                  STREAM             CONNECTED      23535      /run/systemd/journal/stdout
unix   3      [ ]                  STREAM             CONNECTED      25226
unix   3      [ ]                  STREAM             CONNECTED      24193
unix   3      [ ]                  STREAM             CONNECTED      23468
unix   3      [ ]                  STREAM             CONNECTED      24075      /run/systemd/journal/stdout
unix   2      [ ]                  STREAM             CONNECTED      20676
unix   3      [ ]                  STREAM             CONNECTED      19570
unix   3      [ ]                  STREAM             CONNECTED      32194      /run/user/1000/bus
unix   3      [ ]                  STREAM             CONNECTED      25816      /run/user/1000/bus
unix   3      [ ]                  STREAM             CONNECTED      25186
unix   3      [ ]                  STREAM             CONNECTED      24498      /run/dbus/system_bus_socket
unix   3      [ ]                  DGRAM              CONNECTED      20844
unix   3      [ ]                  STREAM             CONNECTED      19452      /run/systemd/journal/stdout
unix   3      [ ]                  STREAM             CONNECTED      25536      /run/user/1000/bus
unix   3      [ ]                  STREAM             CONNECTED      24408      /run/systemd/journal/stdout
unix   3      [ ]                  STREAM             CONNECTED      25836      /run/user/1000/bus
unix   3      [ ]                  STREAM             CONNECTED      25800      /run/dbus/system_bus_socket
unix   3      [ ]                  STREAM             CONNECTED      25362
unix   3      [ ]                  STREAM             CONNECTED      24040
unix   3      [ ]                  STREAM             CONNECTED      23416
unix   3      [ ]                  STREAM             CONNECTED      26419
unix   3      [ ]                  STREAM             CONNECTED      25868
unix   3      [ ]                  STREAM             CONNECTED      19503
unix   3      [ ]                  STREAM             CONNECTED      19377
unix   3      [ ]                  STREAM             CONNECTED      23599
unix   3      [ ]                  STREAM             CONNECTED      33581      /run/user/1000/pulse/native
unix   3      [ ]                  STREAM             CONNECTED      25926      /run/user/1000/bus
unix   3      [ ]                  STREAM             CONNECTED      25481      /run/systemd/journal/stdout

```

11. The command host displays the details of the host of the working pc

Usage:

host

Observation: Worked in windows and displays the current output

Output

```

PS D:\OneDrive\BCSE308P-22BAI1471-LAB1> host

Name           : ConsoleHost
Version        : 5.1.22621.2506
InstanceId     : 4a7ba8f3-7a56-40e8-8ac5-9dab2b950088
UI             : System.Management.Automation.Internal.Host.InternalHostUserInterface
CurrentCulture : en-IN
CurrentUICulture : en-US
PrivateData    : Microsoft.PowerShell.ConsoleHost+ConsoleColorProxy
DebuggerEnabled : True
IsRunspacePushed : False
Runspace       : System.Management.Automation.Runspace.LocalRunspace

```

The command `host` in Linux terminal doesn't show the host details instead it displays various inputs that can be specified to obtain various results

Usage

`host`

Output

```

saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$ host
Usage: host [-aCdilrTvVw] [-c class] [-N ndots] [-t type] [-W time]
          [-R number] [-m flag] [-p port] hostname [server]
-a is equivalent to -v -t ANY
-A is like -a but omits RRSIG, NSEC, NSEC3
-c specifies query class for non-IN data
-C compares SOA records on authoritative nameservers
-d is equivalent to -v
-l lists all hosts in a domain, using AXFR
-m set memory debugging flag (trace|record|usage)
-N changes the number of dots allowed before root lookup is done
-p specifies the port on the server to query
-r disables recursive processing
-R specifies number of retries for UDP packets
-s a SERVFAIL response should stop query
-t specifies the query type
-T enables TCP/IP mode
-U enables UDP mode
-v enables verbose output
-V print version number and exit
-w specifies to wait forever for a reply
-W specifies how long to wait for a reply
-4 use IPv4 query transport only
-6 use IPv6 query transport only
saranya@saranya-VirtualBox:~/Desktop/BCSE308P_22BAI1471$

```