Experiment-2

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Subject Name: Computer Networks **Subject Code: 22CSH-312**

1. **Aim:** Study of basic network command and Network configuration commands.

2. **Requirements:** Command Prompt and Packet Tracer.

3. **Procedure:**

- **Open Command Prompt:** Type cmdin the search bar and hit Enter.
- **View Network Configuration:** Enter ipconfigto display IP, subnet mask, and gateway.
- **Test Network Connectivity:** Use ping [IP address]to check connections.
- **Trace Route to Host:** Type tracert [destination IP address to see packet paths
- **Display DNS Resolver Cache:** Run ipconfig /displaydnsto see DNS records.
- **Release and Renew IP Address:** Execute ipconfig /releasefollowed by ipconfig /renew.
- **View Active Connections:** Enter netstatto see current network connections
- **View ARP Table:** Use arp -ato show IP-to-MAC address mappings.
- **View Routing Table:** Type route PRINTto see local routes.
- **Configure Network with Netsh:** Use netshfor advanced network configuration.

4. **Commands:**

A. **Ping:** Ping(8) sends an ICMP ECHO_REQUEST packet to the specified host. If the host responds, youget an ICMP packet back.

```
C:\Users\sahar>ping 192.168.0.106

Pinging 192.168.0.106 with 32 bytes of data:
Reply from 192.168.0.106: bytes=32 time<1ms TTL=128
Reply from 192.168.0.106: bytes=32 time<1ms TTL=128
Reply from 192.168.0.106: bytes=32 time<1ms TTL=128
Reply from 192.168.0.106: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.106:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

B. **Ipconfig:** Displays all current TCP/IP network configuration values and refreshes Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) settings.

```
Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . : www.tendawifi.com
   Link-local IPv6 Address . . . . . : fe80::29bb:2fe6:747:30d0%2
   IPv4 Address. . . . . . . . . . . : 192.168.0.106
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.0.1
```

C. **Tracert:** Traces the route that data takes to reach a specific network host.

```
C:\Users\sahar>tracert 192.168.0.106

Tracing route to Saharsh.www.tendawifi.com [192.168.0.106]
over a maximum of 30 hops:

  1    <1 ms    <1 ms    <1 ms  Saharsh.www.tendawifi.com [192.168.0.106]

Trace complete.
```

D Arp: Displays and modifies the IP-to-Physical address translation tables

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

Interface: 192.168.0.106 --- 0x2
  Internet Address      Physical Address      Type
  192.168.0.1           04-95-e6-ab-b6-c0     dynamic
  192.168.0.104         06-5e-45-54-50-04     dynamic
  192.168.0.108         00-45-e2-a6-79-77     dynamic
  192.168.0.255         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
  239.255.102.18        01-00-5e-7f-66-12     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
  255.255.255.255       ff-ff-ff-ff-ff-ff     static
```

E. Nslookup: Queries the Domain Name System (DNS) to obtain domain name

```
C:\Users\sahar>nslookup google.com
Server:  UnKnown
Address:  192.168.0.1

Non-authoritative answer:
Name:    google.com
Addresses:  2404:6800:4002:817::200e
          142.250.195.14
```

F.**Netstat:** Displays network connections (both incoming and outgoing), routing tables,and a number of network interface statistics

```
Proto  Local Address          Foreign Address        State
TCP    127.0.0.1:49674        LAPTOP-B4K03U22:49675  ESTABLISHED
TCP    127.0.0.1:49675        LAPTOP-B4K03U22:49674  ESTABLISHED
TCP    127.0.0.1:49678        LAPTOP-B4K03U22:49679  ESTABLISHED
TCP    127.0.0.1:49679        LAPTOP-B4K03U22:49678  ESTABLISHED
TCP    192.168.0.108:49195    52.123.168.213:https   ESTABLISHED
TCP    192.168.0.108:49303    whatsapp-chatd-edge-shv-01-del1:5222  ESTABLISHED
TCP    192.168.0.108:49462    20.198.119.143:https   ESTABLISHED
TCP    192.168.0.108:49955    a23-57-74-16:https     CLOSE_WAIT
TCP    192.168.0.108:49956    52.97.168.210:https    ESTABLISHED
TCP    192.168.0.108:49960    13.107.246.254:https   CLOSE_WAIT
TCP    192.168.0.108:49962    152.199.43.62:https    CLOSE_WAIT
TCP    192.168.0.108:50244    24:https               TIME_WAIT
TCP    192.168.0.108:50245    24:https               TIME_WAIT
TCP    192.168.0.108:50246    13.89.179.14:https     TIME_WAIT
TCP    192.168.0.108:50248    52.168.117.170:https   ESTABLISHED
TCP    192.168.0.108:50250    52.109.124.29:https    TIME_WAIT
TCP    192.168.0.108:50251    52.109.124.29:https    TIME_WAIT
TCP    192.168.0.108:65138    sh-in-f188:5228        ESTABLISHED
TCP    192.168.0.108:65145    52.112.54.101:https    ESTABLISHED
TCP    192.168.0.108:65161    4.195.14.14:https      ESTABLISHED
TCP    192.168.0.108:65162    39:https               ESTABLISHED
TCP    192.168.0.108:65204    a104-73-165-79:https   CLOSE_WAIT
TCP    192.168.0.108:65205    relay-69b0a489:https   ESTABLISHED
TCP    192.168.0.108:65224    52.98.88.242:https     ESTABLISHED
TCP    192.168.0.108:65228    20.212.88.117:https    ESTABLISHED
TCP    192.168.0.108:65397    39:https               ESTABLISHED
TCP    192.168.0.108:65533    237:4070               ESTABLISHED
```

G. **Hostname:** Displays or sets the system's hostname

```
LAPTOP-B4K03U22
```

H.**Route:** Displays or modifies the routing table

```
C:\Users\sahar>route print
===========================================================================
Interface List
  7...f8 9e 94 d8 07 e4 ......Microsoft Wi-Fi Direct Virtual Adapter #3
  6...fa 9e 94 d8 07 e3 ......Microsoft Wi-Fi Direct Virtual Adapter #4
  2...f8 9e 94 d8 07 e3 ......Intel(R) Wireless-AC 9560
  1...........................Software Loopback Interface 1
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0    192.168.0.1    192.168.0.106     55
        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
      192.168.0.0    255.255.255.0         On-link     192.168.0.106    311
    192.168.0.106  255.255.255.255         On-link     192.168.0.106    311
    192.168.0.255  255.255.255.255         On-link     192.168.0.106    311
        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     192.168.0.106    311
  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     192.168.0.106    311
===========================================================================
Persistent Routes:
  None

IPv6 Route Table
===========================================================================
Active Routes:
 If Metric Network Destination      Gateway
  1    331 ::1/128                  On-link
  2    311 fe80::/64                On-link
  2    311 fe80::29bb:2fe6:747:30d0/128
                                    On-link
  1    331 ff00::/8                 On-link
  2    311 ff00::/8                 On-link
===========================================================================
Persistent Routes:
  None
```

I.**CURL:** CURL, which stands for client URL, is a command line tool that developers use to transfer data to and from a server

```
C:\Users\sahar>curl google.com
<HTML><HEAD><meta http-equiv="content-type" content="text/html;charset=utf-8">
<TITLE>301 Moved</TITLE></HEAD><BODY>
<H1>301 Moved</H1>
The document has moved
<A HREF="http://www.google.com/">here</A>.
</BODY></HTML>
```

5.Learning Outcome:

a. Learned viewing and managing network settings

b.Analyze and optimize router performance using commands to manage processes.

c.To identify and fix network issues using commands

d.Understand how devices communicate on a network