



EXPERIMENT 2

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SEMESTER : 5

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SUBJECT: COMPUTER NETWORKS

SUBJECT CODE: 22CHS-312

1. Aim:

Study of basic network command and Network configuration commands.

2. Objective

- Configuring the Router commands
- General Commands to configure network
- Privileged Mode commands of a router
- Router Processes & Statistics
- IP Commands
- Other IP Commands e.g. show ip route etc.

3. Requirements:

Command Prompt or Packet Tracer.

4. Procedure:

- **Open Command Prompt:** Type `cmd` in the search bar and hit Enter.
- **View Network Configuration:** Enter `ipconfig` to 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 /displaydns` to see DNS records.



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- **Release and Renew IP Address:** Execute `ipconfig /release` followed by `ipconfig /renew`.
- **View Active Connections:** Enter `netstat` to see current network connections.
- **View ARP Table:** Use `arp -a` to show IP-to-MAC address mappings.
- **View Routing Table:** Type `route PRINT` to see local routes.
- **Configure Network with Netsh:** Use `netsh` for advanced network configuration.

4. Output:

```
C:\Users>ping www.google.com

Pinging www.google.com [216.58.213.100] with 32 bytes of data:
Reply from 216.58.213.100: bytes=32 time=23ms TTL=55
Reply from 216.58.213.100: bytes=32 time=23ms TTL=55
Reply from 216.58.213.100: bytes=32 time=24ms TTL=55
Reply from 216.58.213.100: bytes=32 time=23ms TTL=55

Ping statistics for 216.58.213.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 23ms, Maximum = 24ms, Average = 23ms

C:\Users>
```

Ipconfig cmd

Windows IP Configuration

```
Host Name . . . . . : DESKTOP-AN70H0S
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : hsd1.pa.comcast.net
```

Ethernet adapter Ethernet:

```
Connection-specific DNS Suffix . : hsd1.pa.comcast.net
Description . . . . . : Intel(R) Ethernet Controller (3) I225-V
Physical Address. . . . . : 3C-7C-3F-51-A4-06
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
IPv6 Address. . . . . : 2601:541:900:470::bb3a(Preferred)
Lease Obtained. . . . . : Thursday, September 7, 2023 20:21:37
Lease Expires . . . . . : Monday, September 11, 2023 00:46:52
IPv6 Address. . . . . : 2601:541:900:470:f93:51d7:73db:c3c9(Pref
erred)
```



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```
PS C:\Users\Equinox> ipconfig /flushdns

Windows IP Configuration

Successfully flushed the DNS Resolver Cache.
PS C:\Users\Equinox>
```

```
C:\Windows\System32>tracert www.geeksforgeeks.org

Tracing route to a1991.dscr.akamai.net [139.5.243.58]
over a maximum of 30 hops:

  1      2 ms      1 ms      1 ms    192.168.1.1
  2      3 ms      3 ms      6 ms    205.254.162.9
  3      4 ms      4 ms      3 ms    205.254.162.1
  4      *        29 ms     5 ms    205.254.162.38
  5      *        *         *       Request timed out.
  6      6 ms      4 ms      5 ms    139.5.243.58

Trace complete.
```

```
C:\Windows\system32>arp -a

Interface: 192.168.43.160 --- 0x15
Internet Address      Physical Address      Type
192.168.43.1          70-b7-aa-90-a3-07     dynamic
192.168.43.255        ff-ff-ff-ff-ff-ff     static
224.0.0.22            01-00-5e-00-00-16     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
```

```
C:\WINDOWS\system32>netstat -b

Active Connections

Proto Local Address           Foreign Address         State
TCP   192.168.1.6:8447        52.230.3.194:https      ESTABLISHED
WpnService
[svchost.exe]
TCP   192.168.1.6:8669        66.110.49.51:https      ESTABLISHED
[avp.exe]
TCP   192.168.1.6:9761        66.110.49.36:https      TIME_WAIT
TCP   192.168.1.6:9764        52.114.76.37:https      TIME_WAIT
```



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```
PS C:\Users\Equinox> nslookup howtogeek.com
Server:  cdns01.comcast.net
Address:  2001:558:feed::1

Non-authoritative answer:
Name:     howtogeek.com
Address:  3.222.102.97
```

```
C:\Users\Anmol>nslookup
Default Server:  local.airtelfiber.com
Address:  192.168.1.1

> www.google.com
Server:  local.airtelfiber.com
Address:  192.168.1.1

Non-authoritative answer:
Name:     www.google.com
Addresses: 2404:6800:4007:806::2004
          142.250.193.196

> www.amazon.com
Server:  local.airtelfiber.com
Address:  192.168.1.1

Non-authoritative answer:
Name:     e15316.a.akamaiedge.net
Address:  23.33.245.99
Aliases:  www.amazon.com
          tp.47cf2c8c9-frontier.amazon.com
          www.amazon.com.edgekey.net
```

```
IPv4 Route Table
=====
Active Routes:
Network Destination    Netmask          Gateway          Interface        Metric
0.0.0.0                0.0.0.0          192.168.1.1      192.168.1.3      40
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
192.168.1.0             255.255.255.0    On-link          192.168.1.3      296
192.168.1.3            255.255.255.255  On-link          192.168.1.3      296
192.168.1.255          255.255.255.255  On-link          192.168.1.3      296
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          192.168.1.3      296
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          192.168.1.3      296
=====
Persistent Routes:
None

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination Gateway
9 296 ::/0 fe80::1
1 331 ::1/128 On-link
9 296 fe80::/64 On-link
9 296 fe80::71d0:b52a:6e74:ca3a/128 On-link
1 331 ff00::/8 On-link
9 296 ff00::/8 On-link
=====
Persistent Routes:
None
```

```
C:\Users\Anmol>pathping www.facebook.com

Tracing route to star-mini.c10r.facebook.com [157.240.239.35]
over a maximum of 30 hops:
  0  LAPTOP-SGQGR4SB [192.168.1.3]
  1  local.airtelfiber.com [192.168.1.1]
  2  abts-mh-dynamic-001.33.169.122.airtelbroadband.in [122.169.33.1]
  3  nsg-corporate-41.78.186.122.airtel.in [122.186.78.41]
  4  116.119.55.33
  5  ae20.pr04.dell1.tfbnw.net [157.240.70.154]
  6  po104.psw04.dell1.tfbnw.net [157.240.50.231]
```

```
C:\Users\Anmol>systeminfo

Host Name:                LAPTOP-SGQGR4SB
OS Name:                  Microsoft Windows 11 Home Single Language
OS Version:               10.0.22000 N/A Build 22000
OS Manufacturer:         Microsoft Corporation
OS Configuration:        Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:         Anmol
Registered Organization:   N/A
Product ID:                00327-35857-50601-AAOEM
Original Install Date:     28-10-2021, 19:58:37
System Boot Time:          03-01-2022, 20:43:29
System Manufacturer:       LENOVO
System Model:              81NE
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 142 Stepping 12 GenuineIntel ~1600 Mhz
BIOS Version:              LENOVO APCN39WW, 23-06-2021
Windows Directory:         C:\WINDOWS
System Directory:          C:\WINDOWS\system32
Boot Device:               \Device\HarddiskVolume3
System Locale:              en-us;English (United States)
```

4. Learning Outcome:

- Learned viewing and managing network settings
- Analyze and optimize router performance using commands to manage processes and resources.
- To identify and fix network issues using commands