

COMPUTER COMMUNICATION **NETWORKS**

LAB EXPERIMENT 8

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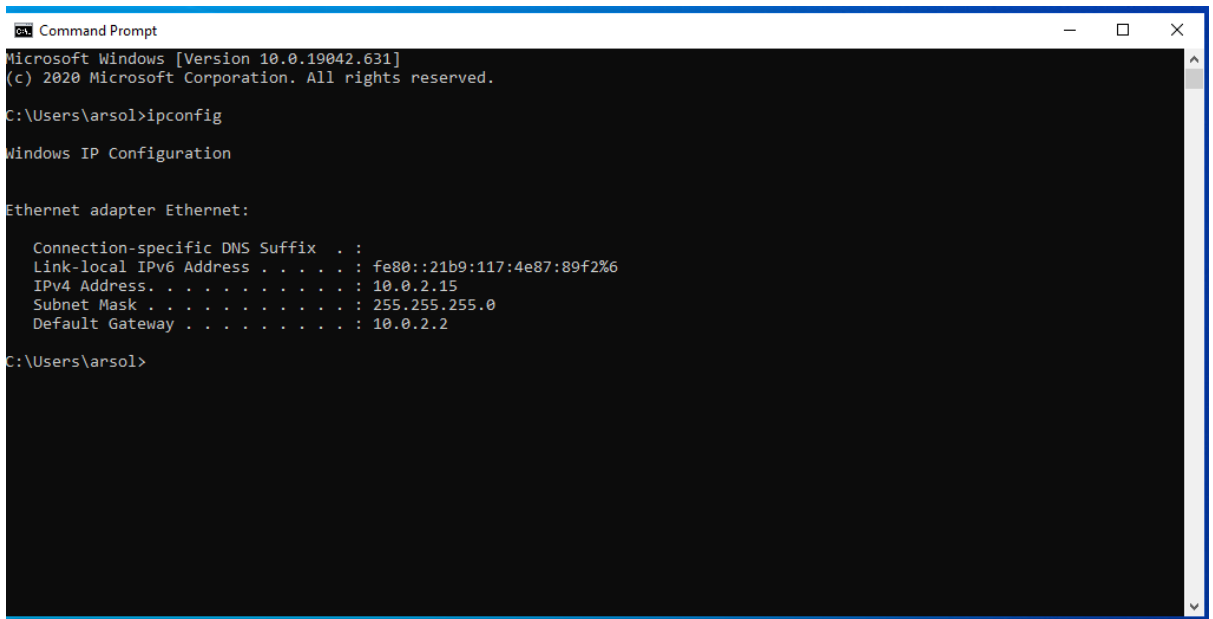
DIVISION: G2; EA 3

Aim: To list out all the possible commands used for troubleshooting and implement in your command prompt.

Theory: You can run common network troubleshooting commands such as arp, ping, ping6, traceroute, traceroute6, NSlookup, and AvgRTTs from the admin console. You can use these connectivity tools to see the network path from the system to a specified server. If a client can ping or traceroute to the access system, and the access system can ping the target server, any remote users should be able to access the server through the access system. The operating system consists of various built-in, command-line networking utilities that are used for network troubleshooting. We will see various networking commands which are most essentials for every network administrator.

Outputs and Explanation:

1. IP Config: The command IP config will display basic details about the device's IP address configuration. Just type IP config in the Windows prompt and the IP, subnet mask and default gateway that the current device will be presented. If you have to see full information, then type on command prompt config-all and then you will see full information. There are also choices to assist you in resolving DNS and DHCP issues.

A screenshot of a Windows Command Prompt window. The title bar reads 'Command Prompt'. The window content shows the following text:

```
Microsoft Windows [Version 10.0.19042.631]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\arsol>ipconfig

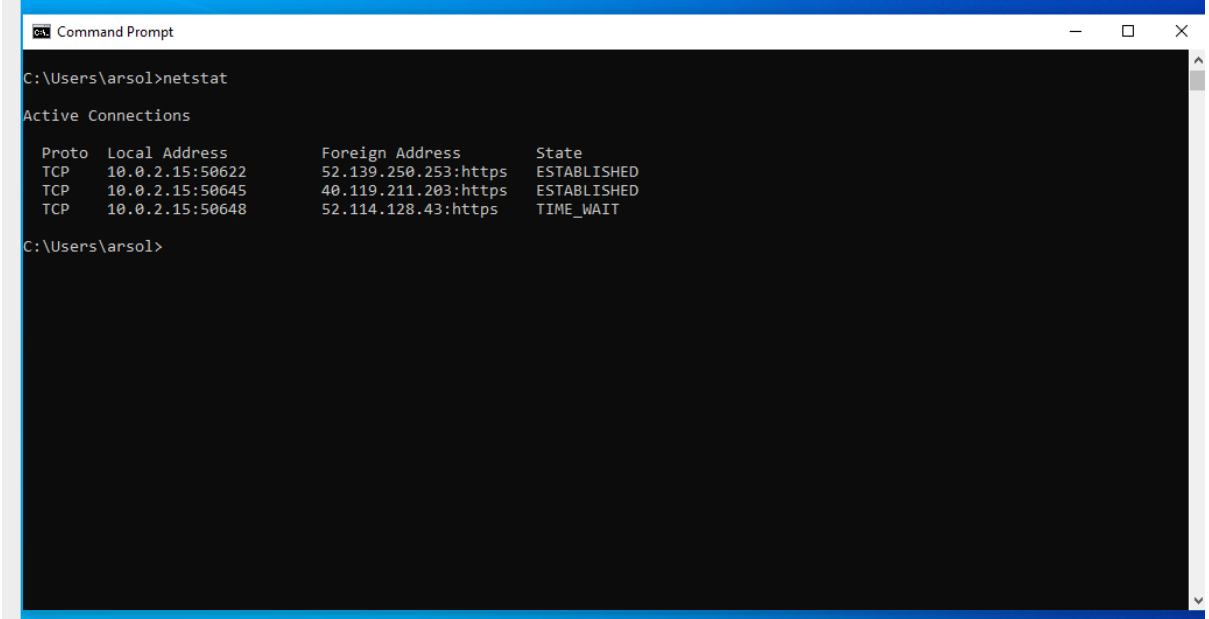
Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::21b9:117:4e87:89f2%6
    IPv4 Address. . . . . : 10.0.2.15
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.0.2.2

C:\Users\arsol>
```

2. Netstat: It is a Common TCP – IP networking command-line method present in most Windows, Linux, UNIX, and other operating systems. The netstat provides the statistics and information in the use of the current TCP-IP Connection network about the protocol.



```
C:\Users\arsol>netstat

Active Connections

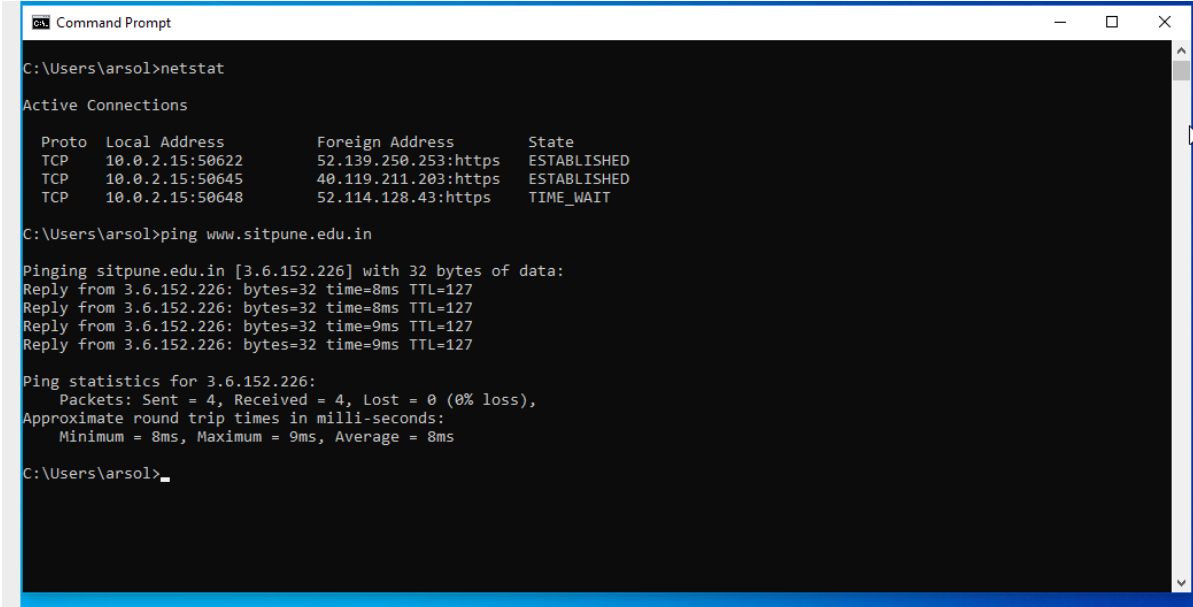
Proto Local Address           Foreign Address         State
TCP   10.0.2.15:50622         52.139.250.253:https    ESTABLISHED
TCP   10.0.2.15:50645         40.119.211.203:https    ESTABLISHED
TCP   10.0.2.15:50648         52.114.128.43:https     TIME_WAIT

C:\Users\arsol>
```

The screenshot shows a Windows Command Prompt window with the title bar "Command Prompt". The user has entered the command `netstat` at the prompt `C:\Users\arsol>`. The output displays active network connections in a table format. The table has four columns: "Proto", "Local Address", "Foreign Address", and "State". There are three rows of data showing established and time-wait connections to various external IP addresses on port 443 (https).

Proto	Local Address	Foreign Address	State
TCP	10.0.2.15:50622	52.139.250.253:https	ESTABLISHED
TCP	10.0.2.15:50645	40.119.211.203:https	ESTABLISHED
TCP	10.0.2.15:50648	52.114.128.43:https	TIME_WAIT

3. Ping: Ping is used to testing a network host capacity to interact with another host. Just enter the command Ping, followed by the target host's name or IP address. The ping utilities seem to be the most common network tool.



```
C:\Users\arsol>netstat

Active Connections

Proto Local Address           Foreign Address         State
TCP   10.0.2.15:50622         52.139.250.253:https    ESTABLISHED
TCP   10.0.2.15:50645         40.119.211.203:https    ESTABLISHED
TCP   10.0.2.15:50648         52.114.128.43:https     TIME_WAIT

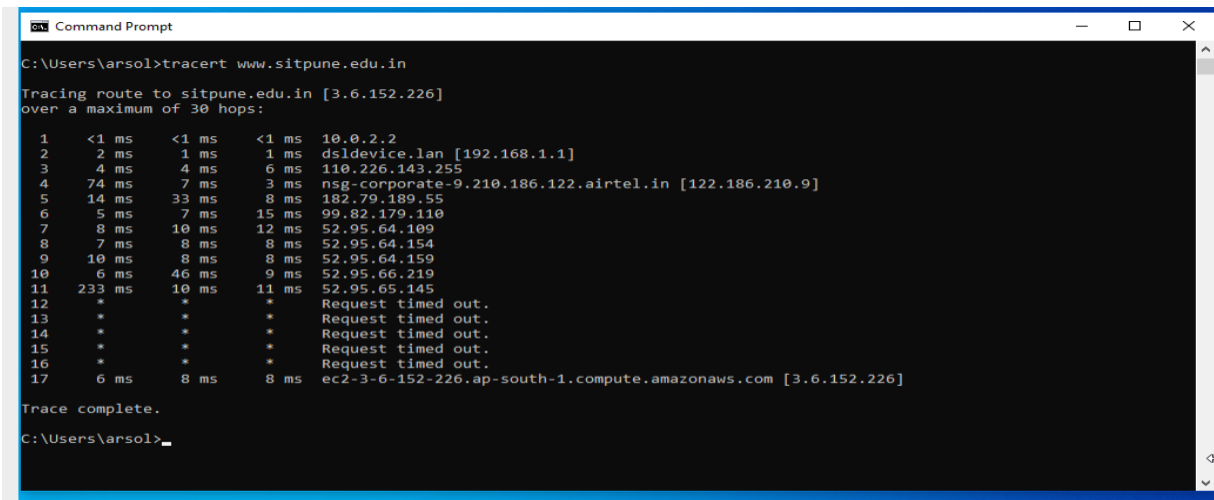
C:\Users\arsol>ping www.sitpune.edu.in

Pinging sitpune.edu.in [3.6.152.226] with 32 bytes of data:
Reply from 3.6.152.226: bytes=32 time=8ms TTL=127
Reply from 3.6.152.226: bytes=32 time=8ms TTL=127
Reply from 3.6.152.226: bytes=32 time=9ms TTL=127
Reply from 3.6.152.226: bytes=32 time=9ms TTL=127

Ping statistics for 3.6.152.226:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 8ms, Maximum = 9ms, Average = 8ms

C:\Users\arsol>_
```

4. Tracert: The tracert command is a Command Prompt command which is used to get the network packet being sent and received and the number of hops required for that packet to reach to target. This command can also be referred to as a traceroute. It provides several details about the path that a packet takes from the source to the specified destination.



```
C:\Users\arsol>tracert www.sitpune.edu.in

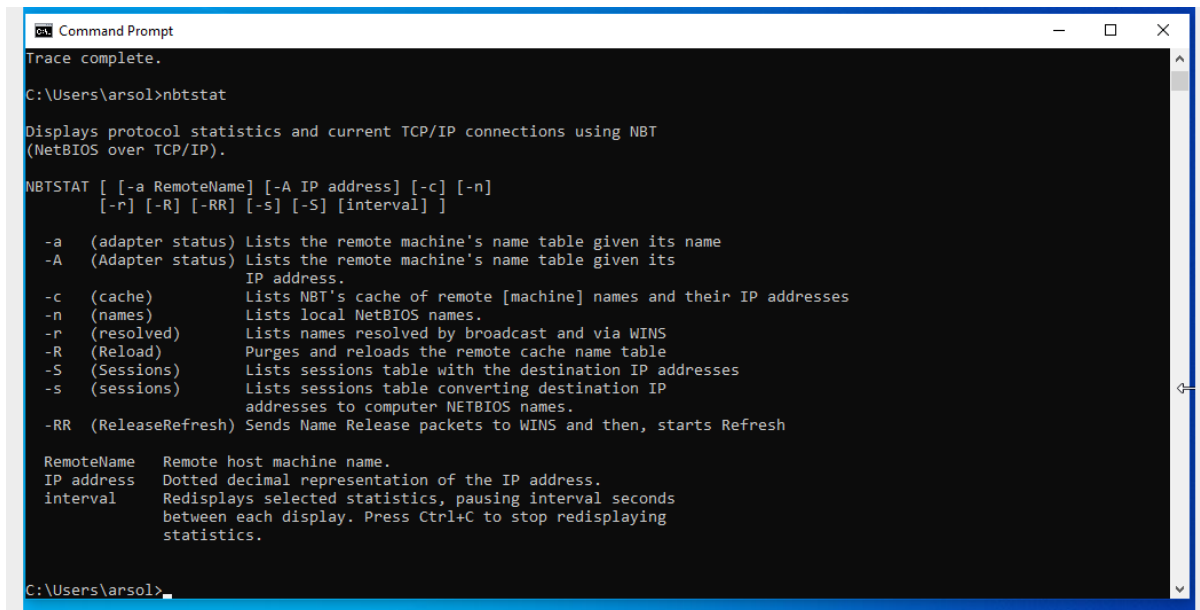
Tracing route to sitpune.edu.in [3.6.152.226]
over a maximum of 30 hops:

  0  <1 ms    <1 ms    <1 ms    10.0.2.2
  1  2 ms     1 ms     1 ms     dsldevice.lan [192.168.1.1]
  2  4 ms     4 ms     6 ms     110.226.143.255
  3  74 ms    7 ms     3 ms     nsg-corporate-9-210.186.122.airtel.in [122.186.210.9]
  4  14 ms    33 ms    8 ms     182.79.189.55
  5  5 ms     7 ms     15 ms    99.82.179.110
  6  8 ms     10 ms    12 ms    52.95.64.109
  7  7 ms     8 ms     8 ms     52.95.64.154
  8  10 ms    8 ms     8 ms     52.95.64.159
  9  6 ms     46 ms    9 ms     52.95.66.219
 10  233 ms   10 ms    11 ms    52.95.65.145
 11  *        *        *        Request timed out.
 12  *        *        *        Request timed out.
 13  *        *        *        Request timed out.
 14  *        *        *        Request timed out.
 15  *        *        *        Request timed out.
 16  *        *        *        Request timed out.
 17  6 ms     8 ms     8 ms     ec2-3-6-152-226.ap-south-1.compute.amazonaws.com [3.6.152.226]

Trace complete.

C:\Users\arsol>_
```

5. NBTSTAT: Displays NetBIOS over TCP/IP (NetBT) protocol statistics, NetBIOS name tables for both the local computer and remote computers, and the NetBIOS name cache. This command also allows a refresh of the NetBIOS name cache and the names registered with Windows Internet Name Service (WINS). Used without parameters, this command displays Help information.



```
Trace complete.

C:\Users\arsol>nbtstat

Displays protocol statistics and current TCP/IP connections using NBT
(NetBIOS over TCP/IP).

NBTSTAT [ [-a RemoteName] [-A IP address] [-c] [-n]
          [-r] [-R] [-RR] [-s] [-S] [interval] ]

-a (adapter status) Lists the remote machine's name table given its name
-A (Adapter status) Lists the remote machine's name table given its
                      IP address.
-c (cache)           Lists NBT's cache of remote [machine] names and their IP addresses
-n (names)           Lists local NetBIOS names.
-r (resolved)        Lists names resolved by broadcast and via WINS
-R (Reload)          Purges and reloads the remote cache name table
-S (Sessions)        Lists sessions table with the destination IP addresses
-s (sessions)        Lists sessions table converting destination IP
                      addresses to computer NETBIOS names.
-RR (ReleaseRefresh) Sends Name Release packets to WINS and then, starts Refresh

RemoteName  Remote host machine name.
IP address  Dotted decimal representation of the IP address.
interval    Redisplays selected statistics, pausing interval seconds
             between each display. Press Ctrl+C to stop redisplaying
             statistics.

C:\Users\arsol>
```

Conclusion: From this experiment we have studied about the importance and different troubleshooting commands using the command prompt.