NETWORKING & SYSTEM ADMINISTRATION LAB

Name: VYSHNAVI BABU S

Roll No: 55

Batch: B

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Experiment No.: 28

Aim

Familiarization of basic network commands in windows

Procedure

1. ipconfig

This commands in windows allows you to see a summarized information of your network such as ip address, subnet mask , server address etc.

Syntax :- $ ipconfig

Output :-

```
C:\Users\Student>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet 4:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::142f:9783:684f:a27d%7
   IPv4 Address. . . . . . . . . . . : 192.168.6.46
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.6.100

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::60c6:9871:f4d0:b304%3
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Tunnel adapter Teredo Tunneling Pseudo-Interface:

   Connection-specific DNS Suffix  . :
   IPv6 Address. . . . . . . . . . . : 2001:0:2851:fcb0:d3:14b6:8a3e:b01e
   Link-local IPv6 Address . . . . . : fe80::d3:14b6:8a3e:b01e%12
   Default Gateway . . . . . . . . . : ::
```

2. ipconfig/all

To see the the network information in detail. It is an extension of ipconfig command

Syntax :- $ ipconfig/all

Output :-

```
C:\Users\Student>ipconfig/all

Windows IP Configuration

   Host Name . . . . . . . . . . . . : S46
   Primary Dns Suffix  . . . . . . . : mca.com
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No
   DNS Suffix Search List. . . . . . : mca.com

Ethernet adapter Ethernet 4:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Realtek PCIe GBE Family Controller #2
   Physical Address. . . . . . . . . : 78-24-AF-BA-C2-13
   DHCP Enabled. . . . . . . . . . . : No
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::142f:9783:684f:a27d%7(Preferred)
   IPv4 Address. . . . . . . . . . . : 192.168.6.46(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.6.100
   DHCPv6 IAID . . . . . . . . . . . : 410526895
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-22-BD-FA-08-F0-79-59-8F-00-CC
   DNS Servers . . . . . . . . . . . : 192.168.6.254
                                       8.8.8.8
   NetBIOS over Tcpip. . . . . . . . : Enabled

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : VirtualBox Host-Only Ethernet Adapter
   Physical Address. . . . . . . . . : 0A-00-27-00-00-03
   DHCP Enabled. . . . . . . . . . . : No
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::60c6:9871:f4d0:b304%3(Preferred)
   IPv4 Address. . . . . . . . . . . : 192.168.56.1(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :
   DHCPv6 IAID . . . . . . . . . . . : 470417447
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-22-BD-FA-08-F0-79-59-8F-00-CC
   DNS Servers . . . . . . . . . . . : fec0:0:0:ffff::1%1
                                       fec0:0:0:ffff::2%1
                                       fec0:0:0:ffff::3%1
```

```
   NetBIOS over Tcpip. . . . . . . . : Enabled

Tunnel adapter Teredo Tunneling Pseudo-Interface:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Microsoft Teredo Tunneling Adapter
   Physical Address. . . . . . . . . : 00-00-00-00-00-00-00-E0
   DHCP Enabled. . . . . . . . . . . : No
   Autoconfiguration Enabled . . . . : Yes
   IPv6 Address. . . . . . . . . . . : 2001:0:2851:fcb0:d3:14b6:8a3e:b01e(Preferred)
   Link-local IPv6 Address . . . . . : fe80::d3:14b6:8a3e:b01e%12(Preferred)
   Default Gateway . . . . . . . . . : ::
   DHCPv6 IAID . . . . . . . . . . . : 167772160
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-22-BD-FA-08-F0-79-59-8F-00-CC
   NetBIOS over Tcpip. . . . . . . . : Disabled
```

3. nslookup

To show the server to which the system is connected by default. If we want to find the ip address of a particular domain name, we can also use nslookup

Syntax :- $ nslookup

Output :-

```
C:\Users\Student>nslookup
Default Server:  UnKnown
Address:  192.168.6.254

> www.google.com
Server:  UnKnown
Address:  192.168.6.254

Non-authoritative answer:
Name:    www.google.com
Addresses:  2404:6800:4007:826::2004
          142.250.195.164

> www.amazon.com
Server:  UnKnown
Address:  192.168.6.254

Non-authoritative answer:
Name:    d3ag4hukkh62yn.cloudfront.net
Address:  52.84.12.185
Aliases:  www.amazon.com
          tp.47cf2c8c9-frontier.amazon.com
```

4. ping

The command used to check the availability of a host. The response shows the URL you are pinging, the ip address associated with the URL and the size of packets being sent on the first line . The next four lines shows the replies from each individual packets including the time(in milliseconds) for the response and the time to live(TLL) of the packet, that is the amount of time that must pass before the packet discarded.

Syntax :- $ ping <IP_address>

Output :-

```
C:\Users\Student>ping 192.168.6.254

Pinging 192.168.6.254 with 32 bytes of data:
Reply from 192.168.6.254: bytes=32 time<1ms TTL=128
Reply from 192.168.6.254: bytes=32 time<1ms TTL=128
Reply from 192.168.6.254: bytes=32 time<1ms TTL=128
Reply from 192.168.6.254: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.6.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Student>

C:\Users\Student>ping 2404:6800:4007:826::2004

Pinging 2404:6800:4007:826::2004 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 2404:6800:4007:826::2004:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\Student>ping 142.250.195.164

Pinging 142.250.195.164 with 32 bytes of data:
Reply from 142.250.195.164: bytes=32 time=20ms TTL=59
Reply from 142.250.195.164: bytes=32 time=20ms TTL=59
Reply from 142.250.195.164: bytes=32 time=20ms TTL=59
Reply from 142.250.195.164: bytes=32 time=20ms TTL=59

Ping statistics for 142.250.195.164:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 20ms, Maximum = 20ms, Average = 20ms
```

5. tracert

The command used to show the packets that are passed through the router to which our system is connected to.

Syntax :- $ tracert <ip_address_of_system>

Output :-

```
C:\Users\Student>tracert

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
    -d                 Do not resolve addresses to hostnames.
    -h maximum_hops    Maximum number of hops to search for target.
    -j host-list       Loose source route along host-list (IPv4-only).
    -w timeout         Wait timeout milliseconds for each reply.
    -R                 Trace round-trip path (IPv6-only).
    -S srcaddr         Source address to use (IPv6-only).
    -4                 Force using IPv4.
    -6                 Force using IPv6.

C:\Users\Student>tracert 142.250.195.164

Tracing route to maa03s41-in-f4.1e100.net [142.250.195.164]
over a maximum of 30 hops:

  1    <1 ms    <1 ms    <1 ms  192.168.6.100
  2     1 ms     1 ms     5 ms  172.24.9.34
  3     *        *        *     Request timed out.
  4     *        *        *     Request timed out.
  5    17 ms    17 ms    17 ms  72.14.218.250
  6    17 ms    19 ms    18 ms  216.239.43.133
  7    16 ms    15 ms    15 ms  142.251.55.91
  8    20 ms    20 ms    20 ms  maa03s41-in-f4.1e100.net [142.250.195.164]

Trace complete.
```

6. route print

The command used to display and updates network routing table

Syntax :- $ route print

Output :-

```
C:\Users\Student>route print
===========================================================================
Interface List
  7...78 24 af ba c2 13 ......Realtek PCIe GBE Family Controller #2
  3...0a 00 27 00 00 03 ......VirtualBox Host-Only Ethernet Adapter
  1...........................Software Loopback Interface 1
 12...00 00 00 00 00 00 00 e0 Microsoft Teredo Tunneling Adapter
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0    192.168.6.100     192.168.6.46    281
        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
      192.168.6.0    255.255.255.0         On-link      192.168.6.46    281
     192.168.6.46  255.255.255.255         On-link      192.168.6.46    281
    192.168.6.255  255.255.255.255         On-link      192.168.6.46    281
     192.168.56.0    255.255.255.0         On-link      192.168.56.1    281
     192.168.56.1  255.255.255.255         On-link      192.168.56.1    281
   192.168.56.255  255.255.255.255         On-link      192.168.56.1    281
        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      192.168.56.1    281
        224.0.0.0        240.0.0.0         On-link      192.168.6.46    281
  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      192.168.56.1    281
  255.255.255.255  255.255.255.255         On-link      192.168.6.46    281
===========================================================================
Persistent Routes:
  Network Address          Netmask  Gateway Address  Metric
          0.0.0.0          0.0.0.0    192.168.6.100  Default
          0.0.0.0          0.0.0.0    192.168.6.100  Default
===========================================================================
```

```
IPv6 Route Table
===========================================================================
Active Routes:
 If Metric Network Destination      Gateway
 12    331 ::/0                     On-link
  1    331 ::1/128                  On-link
 12    331 2001::/32                On-link
 12    331 2001:0:2851:fcb0:d3:14b6:8a3e:b01e/128
                                    On-link
  3    281 fe80::/64                On-link
  7    281 fe80::/64                On-link
 12    331 fe80::/64                On-link
 12    331 fe80::d3:14b6:8a3e:b01e/128
                                    On-link
  7    281 fe80::142f:9783:684f:a27d/128
                                    On-link
  3    281 fe80::60c6:9871:f4d0:b304/128
                                    On-link
  1    331 ff00::/8                 On-link
  3    281 ff00::/8                 On-link
  7    281 ff00::/8                 On-link
 12    331 ff00::/8                 On-link
===========================================================================
Persistent Routes:
  None
```

7. netstat

The network statistics or netstat command is a networking tool used for troubleshooting and configuration that can also serve a monitoring tool for the connections over the network. **Syntax :-** netstat

Output :-

```
C:\Users\Student>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    192.168.6.46:2754      20.198.162.76:https    ESTABLISHED
  TCP    192.168.6.46:2795      a104-104-60-83:https   CLOSE_WAIT
  TCP    192.168.6.46:2829      117.18.237.29:http     CLOSE_WAIT
  TCP    192.168.6.46:2941      maa03s37-in-f3:https   TIME_WAIT
  TCP    192.168.6.46:2942      maa05s20-in-f5:https   TIME_WAIT
  TCP    192.168.6.46:2943      maa05s15-in-f10:https  TIME_WAIT
  TCP    192.168.6.46:2944      maa03s47-in-f14:https  TIME_WAIT
  TCP    192.168.6.46:2945      maa03s34-in-f1:https   TIME_WAIT
  TCP    192.168.6.46:2946      maa03s45-in-f3:https   TIME_WAIT
  TCP    192.168.6.46:2947      maa03s43-in-f10:https  TIME_WAIT
  TCP    192.168.6.46:2948      maa03s38-in-f14:https  TIME_WAIT
  TCP    192.168.6.46:2949      maa05s22-in-f14:https  TIME_WAIT
  TCP    192.168.6.46:2950      maa03s47-in-f14:https  TIME_WAIT
  TCP    192.168.6.46:2951      maa03s34-in-f1:https   TIME_WAIT
  TCP    192.168.6.46:2952      maa03s47-in-f14:https  ESTABLISHED
  TCP    192.168.6.46:2953      maa03s34-in-f1:https   ESTABLISHED
  TCP    192.168.6.46:2954      maa05s24-in-f13:https  ESTABLISHED
  TCP    192.168.6.46:2955      123:http               ESTABLISHED
  TCP    192.168.6.46:2956      maa05s19-in-f14:https  ESTABLISHED
  TCP    192.168.6.46:2957      maa05s19-in-f14:https  ESTABLISHED
  TCP    192.168.6.46:2960      maa05s16-in-f10:https  ESTABLISHED
  TCP    192.168.6.46:2961      maa05s20-in-f5:https   ESTABLISHED
  TCP    192.168.6.46:2962      maa03s40-in-f11:https  ESTABLISHED
  TCP    192.168.6.46:2963      maa05s10-in-f10:https  ESTABLISHED
  TCP    192.168.6.46:2964      maa03s41-in-f4:https   ESTABLISHED
  TCP    192.168.6.46:2965      si-in-f188:5228        ESTABLISHED
  TCP    192.168.6.46:2966      maa03s37-in-f3:https   ESTABLISHED
  TCP    192.168.6.46:2967      sf-in-f139:https       ESTABLISHED
  TCP    192.168.6.46:2968      maa05s12-in-f10:https  ESTABLISHED
  TCP    192.168.6.46:2969      maa05s22-in-f14:https  ESTABLISHED
  TCP    192.168.6.46:2973      maa05s24-in-f3:https   ESTABLISHED
  TCP    192.168.6.46:2977      maa03s38-in-f14:https  ESTABLISHED
  TCP    192.168.6.46:2978      maa03s46-in-f10:https  ESTABLISHED
  TCP    192.168.6.46:2982      maa05s10-in-f3:https   ESTABLISHED
  TCP    192.168.6.46:2986      maa05s19-in-f14:https  ESTABLISHED
  TCP    192.168.6.46:2987      maa05s21-in-f14:https  ESTABLISHED
  TCP    192.168.6.46:2988      maa05s12-in-f14:https  ESTABLISHED
  TCP    192.168.6.46:2989      maa05s12-in-f14:https  ESTABLISHED
```