

NETWORKING & SYSTEM ADMINISTRATION LAB

Experiment No.: 26

Aim

Introduction to command line tools for networking
IPv4 networking, network commands: ping route
tracert, nslookup, ip.

Name: Shefany Shanavas

Roll No: 37

Batch: MCA-B

Date: 02-06-2022

Procedure

1. Ipconfig

"Ipconfig" often comes up as the most-used networking command on Windows. Not only is it useful for the information it provides, but you can combine it with a couple of switches to execute certain tasks.

```
Microsoft Windows [Version 10.0.19041.1]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Student>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::7d6a:3c61:569b:44f0%6
    IPv4 Address. . . . . : 192.168.6.37
    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::507c:61fe:cd4e:cded%15
    IPv4 Address. . . . . : 192.168.56.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :
```

2. Nslookup

"Nslookup" stands for Name Server Lookup. It packs a lot of power, but most users won't need that power. For regular folks like you and me, its main use is finding out the IP address behind a certain domain name.

```
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
```

3. Ping

"Ping" is one of the most basic yet useful network commands to utilize in the command prompt application. It tells you whether your computer can reach some destination IP address or domain name, and if it can, how long it takes data to travel there and back again.

```
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
```

4. Tracert

"Tracert" stands for Trace Route. And much like "ping," it sends out a data packet as a way to troubleshoot any network issues you might have, but it instead tracks the route of the packet as it hops from server to server.

```
-b 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   2 ms     9 ms     1 ms    172.24.9.34
  3   *        *        *      Request timed out.
  4   *        *        *      Request timed out.
  5  31 ms    17 ms    17 ms    72.14.218.250
  6  17 ms    18 ms    18 ms    216.239.43.133
  7  15 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.
```

5. Netstat

"Netstat" is a tool for network statistics, diagnostics, and analysis. It's powerful and complex but can be simple enough if you ignore the advanced aspects that you don't need to know about (assuming you aren't managing a massive business or campus network, for example).

The -f option clears the routing tables of all gateway entries. If you use the -f option in conjunction with one of the commands, the tables are cleared before you run the command.

By default, routes are not preserved when you restart the system. Use the -p option with the add command to make a route persistent. Use the -p option with the print command to view the list of registered persistent routes.

```
C:\Users\Student>netstat

Active Connections

Proto Local Address          Foreign Address         State
TCP   192.168.6.37:3907      20.198.162.76:https     ESTABLISHED
TCP   192.168.6.37:3950      144.2.14.25:https       CLOSE_WAIT
TCP   192.168.6.37:3951      117.18.237.29:http       CLOSE_WAIT
TCP   192.168.6.37:3957      49.44.50.18:https       CLOSE_WAIT
```

6. Route print

You can use the route command to view, add and delete routes on a Microsoft Windows NT server that runs Cisco ICM. You can use these options with the route command.

```
C:\Users\Student>route print
=====
Interface List
 6...1c 87 2c 71 89 31 .....Realtek PCIe GBE Family Controller
 15...0a 00 27 00 00 0f .....VirtualBox Host-Only Ethernet Adapter
 1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
0.0.0.0                    0.0.0.0          192.168.6.100    192.168.6.37     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          192.168.6.37     281
192.168.6.37               255.255.255.255  On-link          192.168.6.37     281
192.168.6.255              255.255.255.255  On-link          192.168.6.37     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          192.168.6.37     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          192.168.6.37     281
=====
Persistent Routes:
Network Address          Netmask  Gateway Address  Metric
0.0.0.0                  0.0.0.0   192.168.6.100    Default
=====

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
1    331 ::1/128                      On-link
15   281 fe80::/64                      On-link
6    281 fe80::/64                      On-link
15   281 fe80::507c:61fe:cd4e:cded/128
                                      On-link
6    281 fe80::7d6a:3c61:569b:44f0/128
```