

# NETWORK SECURITY AND CRYPTOGRAPHY

## LAB FILE

### LAB 2

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B TECH CSE 6B

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1. 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\jjj>ping www.google.co.in

Pinging www.google.co.in [2404:6800:4009:81a::2003] with 32 bytes of data:
Reply from 2404:6800:4009:81a::2003: time=80ms
Reply from 2404:6800:4009:81a::2003: time=78ms
Reply from 2404:6800:4009:81a::2003: time=81ms
Reply from 2404:6800:4009:81a::2003: time=48ms

Ping statistics for 2404:6800:4009:81a::2003:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 48ms, Maximum = 81ms, Average = 71ms

C:\Users\jjj>ping www.google.co.in -n 6

Pinging www.google.co.in [2404:6800:4009:81a::2003] with 32 bytes of data:
Reply from 2404:6800:4009:81a::2003: time=52ms
Reply from 2404:6800:4009:81a::2003: time=105ms
Reply from 2404:6800:4009:81a::2003: time=81ms
Reply from 2404:6800:4009:81a::2003: time=76ms
Reply from 2404:6800:4009:81a::2003: time=99ms
Reply from 2404:6800:4009:81a::2003: time=94ms

Ping statistics for 2404:6800:4009:81a::2003:
    Packets: Sent = 6, Received = 6, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 52ms, Maximum = 105ms, Average = 84ms
```

2. TRACERT stands for Trace Route. 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.

```
C:\Users\jjj>tracert www.google.co.in

Tracing route to www.google.co.in [2404:6800:4009:81a::2003]
over a maximum of 30 hops:

  0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16
  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
  1  5 ms  3 ms  4 ms  2401:400d:8000:0000:0000:0000:0000:0000
  2  42 ms  32 ms  36 ms  2401:400d:8000:0000:0000:0000:0000:0000
  3  *  *  *  Request timed out.
  4  66 ms  47 ms  25 ms  2401:400d:8000:0000:0000:0000:0000:0000
  5  92 ms  23 ms  25 ms  2401:400d:8000:0000:0000:0000:0000:0000
  6  120 ms  101 ms  24 ms  2404:a000:0000:0000:0000:0000:0000:0000
  7  57 ms  39 ms  33 ms  2001:400d:8000:0000:0000:0000:0000:0000
  8  48 ms  *  *  2404:6800:4009:81a::2003
  9  98 ms  30 ms  34 ms  2001:400d:8000:0000:0000:0000:0000:0000
 10  51 ms  39 ms  32 ms  2001:400d:8000:0000:0000:0000:0000:0000
 11  49 ms  57 ms  52 ms  2001:400d:8000:0000:0000:0000:0000:0000
 12  112 ms  77 ms  46 ms  2001:400d:8000:0000:0000:0000:0000:0000
 13  113 ms  62 ms  79 ms  2001:400d:8000:0000:0000:0000:0000:0000
 14  65 ms  53 ms  47 ms  2001:400d:8000:0000:0000:0000:0000:0000
 15  61 ms  67 ms  100 ms  2001:400d:8000:0000:0000:0000:0000:0000
 16  43 ms  49 ms  45 ms  bom12s01

0031

Trace complete.
```

3. PATHPING is similar to tracert except more informative, which means it takes a lot longer to execute. After sending out packets from you to a given destination, it analyzes the route taken and computes packet loss on a per-hop basis.

```
C:\Users\jjj>pathping www.google.co.in

Tracing route to www.google.co.in [2404:6800:4002:810::2003]
over a maximum of 30 hops:
  0  Anmol [2401:4900:415e:166a:126:acb4:a9ce:51d8]
  1  2401:4900:415e:166a::ba
  2  2401:4900:415e:166a:0:17:fbf1:bf40
  3  * * *
Computing statistics for 50 seconds...
Hop  RTT      Source to Here   This Node/Link   Address
  0                               Lost/Sent = Pct  Lost/Sent = Pct  Anmol [2401:49
4:a9ce:51d8]
  1    7ms      0/ 100 = 0%      0/ 100 = 0%      2401:4900:415e
  2    ---     100/ 100 =100%   0/ 100 = 0%      2401:4900:415e

Trace complete.
```

4. 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.

```
C:\Users\jjj>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Ethernet adapter Local Area Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wireless Network Connection:

    Connection-specific DNS Suffix  . :
    IPv6 Address. . . . . : 2401:4900:415e:166a:2058:ca2b:d701:a651
    Temporary IPv6 Address. . . . . : 2401:4900:415e:166a:126:acb4:a9ce:51d8
    Link-local IPv6 Address . . . . . : fe80::2058:ca2b:d701:a651%12
    IPv4 Address. . . . . : 192.168.43.202
```

5. GETMAC Every device that's compliant with IEEE 802 standards has a unique MAC address (Media Access Control). The manufacturer assigns MAC addresses and stores them in the device's hardware.

```
C:\Users\Joel>getmac
```

Physical Address	Transport Name
00-FF-CB-10-15-73	Media disconnected
28-F0-76-10-E8-E2	Media disconnected
38-C9-86-21-D0-4D	\Device\Tcpip_{FCEE928D-4AE1-4204-8F5F-4C64CD07A080}

6. NSLOOKUP stands for Name Server Lookup. Its main use is finding out the IP address behind a certain domain name.

```
C:\Users\jjj>nslookup www.google.co.in
Server: Unknown
Address: 192.168.43.84

Non-authoritative answer:
Name: www.google.co.in
Addresses: 2404:6800:4009:81a::2003
216.58.196.99
```

7. NETSTAT is a tool for network statistics, diagnostics, and analysis.

```
C:\Users\jjj>netstat
```

Active Connections

Proto	Local Address	Foreign Address	State
TCP	192.168.43.202:49318	199.232.21.2:https	ESTABLISHED
TCP	192.168.43.202:49324	104.18.3.159:https	TIME_WAIT
TCP	192.168.43.202:49405	199.232.22.49:https	ESTABLISHED
TCP	192.168.43.202:49411	ip-185-184-8-30:https	ESTABLISHED
TCP	192.168.43.202:49421	46:https	ESTABLISHED
TCP	192.168.43.202:49422	46:https	TIME_WAIT
TCP	192.168.43.202:49425	a23-1-12-26:https	ESTABLISHED
TCP	192.168.43.202:49432	a23-1-12-26:https	ESTABLISHED
TCP	192.168.43.202:49433	ec2-52-220-138-206:https	ESTABLISHED
TCP	192.168.43.202:49434	ec2-52-74-162-2:https	CLOSE_WAIT