Computer Networks Lab Manual

IV Semester BCA-NEP

1. Execute the following commands:

a) Ipconfig

Steps:

Click on Start->cmd-> Right click -> Run as administrator

Type ipconfig

```
Wireless LAN adapter Wireless Network Connection:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::20c7:e2da:e2b:d638%11
   IPv4 Address. . . . . . . . . . . : 192.168.0.188
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.0.1
```

Computer Address is IPv4 address [4 Bytes- 32 bits].

Router Address is Default Gateway address. [First Router on the path to the destination]

Ipconfig/all→ Gives the MAC or Physical Address [6 Bytes – 48 bits]

```
Wireless LAN adapter Wireless Network Connection:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Atheros AR5B125 Wireless Network Adapter
   Physical Address. . . . . . . . . : 74-E5-43-03-3F-38
```

b) Nslookup

```
C:\Windows\system32>nslookup
Default Server:  UnKnown
Address:  192.168.0.1

> www.claretcollege.edu.in
Server:  UnKnown
Address:  192.168.0.1

Non-authoritative answer:
Name:    claretcollege.edu.in
Address:  148.66.136.215
Aliases:  www.claretcollege.edu.in
```

nslookup is a network administration command-line tool for querying the Domain Name System to obtain the mapping between domain name and IP address

Press Ctrl + C to come out of nslookup. [Use **cls** to clear screen]

c) Ping

```
C:\Windows\system32>ping 148.66.136.215

Pinging 148.66.136.215 with 32 bytes of data:
Reply from 148.66.136.215: bytes=32 time=70ms TTL=47
Reply from 148.66.136.215: bytes=32 time=41ms TTL=47
Reply from 148.66.136.215: bytes=32 time=40ms TTL=47
Reply from 148.66.136.215: bytes=32 time=41ms TTL=47

Ping statistics for 148.66.136.215:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 40ms, Maximum = 70ms, Average = 48ms
```

A ping (**Packet Internet or Inter-Network Groper**) is a basic Internet program that allows a user to test and verify if a particular destination IP address exists and can accept requests in computer network administration

d) Traceroute (tracert)

```
C:\Windows\system32>nslookup
Default Server:  UnKnown
Address:  192.168.0.1

> www.claretcollege.edu.in
Server:  UnKnown
Address:  192.168.0.1

Non-authoritative answer:
Name:    claretcollege.edu.in
Address:  148.66.136.215
Aliases:  www.claretcollege.edu.in

>
C:\Windows\system32>tracert 148.66.136.215

Tracing route to 148.66.136.215 over a maximum of 30 hops

  1     2 ms     2 ms     2 ms  192.168.0.1
  2     *        *        *     Request timed out.
  3    65 ms     *        *     49.205.72.47.actcorp.in [49.205.72.47]
  4     3 ms     3 ms     3 ms  121.242.109.241.static-bangalore.vsnl.net.in [12
1.242.109.241]
```

In computing, traceroute and tracert are computer network diagnostic commands for displaying possible routes and measuring transit delays of packets across an Internet Protocol network.

e) Arp

ARP is used for mapping **IP network address** to the **hardware MAC address** of a device

Static arp entries are address resolutions that are manually added to the cache table for a device and are retained in the cache on a permanent basis.

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

Interface: 192.168.0.188 --- 0xb
  Internet Address      Physical Address      Type
  192.168.0.1           3c-84-6a-c5-6b-9e     dynamic
  192.168.0.255         ff-ff-ff-ff-ff-ff     static
  224.0.0.2             01-00-5e-00-00-02     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     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
```

Arp –d is used to delete the entries from the cache table.

```
C:\Windows\system32>arp -d 224.0.0.2

C:\Windows\system32>arp -a

Interface: 192.168.0.188 --- 0xb
  Internet Address      Physical Address      Type
  192.168.0.1           3c-84-6a-c5-6b-9e     dynamic
  192.168.0.255         ff-ff-ff-ff-ff-ff     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     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
```

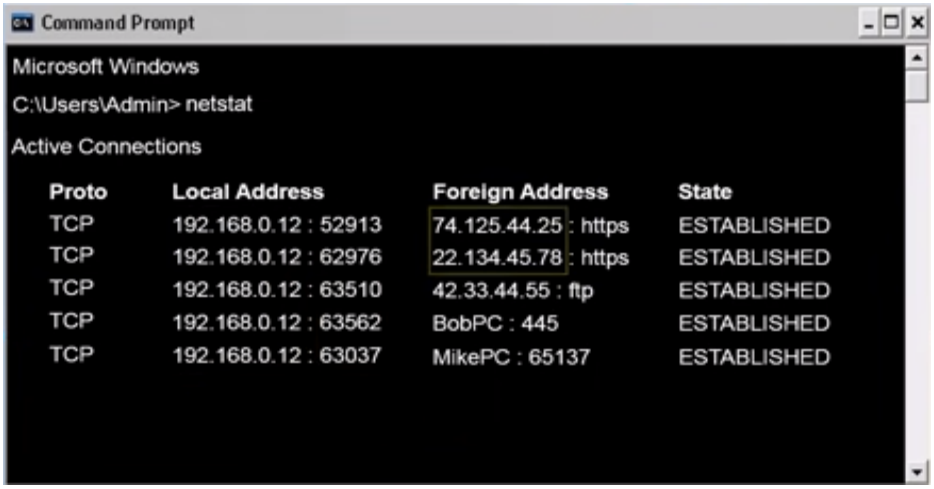
f) Hostname

The /usr/bin/hostname command displays the name of the current host system. Only users with root user authority can set the host name.

```
C:\Windows\system32>hostname
Renita-PC
```

g) Netstat (Network Statistics)

The netstat command displays the contents of various network-related data structures for active connections. This netstat function shows the state of all configured interfaces. This function of the netstat command clears all the statistic counters for the **netstat -i** command to zero.




```
C:\Windows\system32>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:49169        Renita-PC:49170        ESTABLISHED
  TCP    127.0.0.1:49170        Renita-PC:49169        ESTABLISHED
  TCP    127.0.0.1:49171        Renita-PC:49172        ESTABLISHED
  TCP    127.0.0.1:49172        Renita-PC:49171        ESTABLISHED
  TCP    192.168.0.188:49157    nos-fe-prod-003:http   ESTABLISHED
  TCP    192.168.0.188:49161    fra02-012:http         ESTABLISHED
  TCP    192.168.0.188:49178    202:http               CLOSE_WAIT
  TCP    192.168.0.188:49314    sf-in-f188:5228        ESTABLISHED
  TCP    192.168.0.188:50287    232:https              ESTABLISHED
  TCP    192.168.0.188:50303    202:http               TIME_WAIT
  TCP    192.168.0.188:50304    filerep-replica-prod-001:http  FIN_WAIT_1
  TCP    [fe80::20c7:e2da:e2b:d638%11]:1521  Renita-PC:49173        ESTABLISHED
  TCP    [fe80::20c7:e2da:e2b:d638%11]:49173  Renita-PC:1521        ESTABLISHED
```

h) Netdiag

The Netdiag command-line diagnostic tool helps to isolate networking and connectivity problems by performing a series of tests to determine the state of your network client.

i) Pathping

This command sends multiple echo Request messages to each router between a source and destination, over a period, and then computes results based on the packets returned from each router.

```
C:\Windows\system32>pathping www.google.com

Tracing route to www.google.com [172.217.163.164]
over a maximum of 30 hops:
  0  Renita-PC [192.168.0.188]
  1  192.168.0.1
  2     *        *        *
Computing statistics for 25 seconds...
            Source to Here   This Node/Link
Hop  RTT    Lost/Sent = Pct  Lost/Sent = Pct  Address
  0                                           Renita-PC [192.168.0.188]
                                    0/ 100 =  0%   |
  1    2ms     0/ 100 =  0%     0/ 100 =  0%  192.168.0.1

Trace complete.
```