Experiment 1.2

Student Name: Ravi Shankar Singh **UID: 21BCS11619**
Branch: CSE **Section/Group: 808/B**
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Subject Name: Computer Networks **Subject Code: 21CSH-256**

Aim:- Study the basic network command and Network configuration commands like ping, variations of ipconfig, tracert, nslookup, netstat, arp, rarp, hostname, pathping etc.

Software Requirement :- Command Prompt (CMD)

Hardware Requirements:- PC/laptop with active Internet connection

Task to be done:

Go to command prompt and type the following commands:

1. Ping
2. Ipconfig
3. Tracert
4. Nslookup
5. Netstat
6. Arp
7. Hostname
8. Pathping

Commands-

1. Ping Command:

- The ping command is the primary TCP / IP command used to troubleshoot connectivity, reachability, and name resolution between two hosts.
- This command is used to test both the computer name and the IP address of the computer.
- This command takes as input the IP address or the URL and sends a data packet to the specified address with the message “PING” and get a response from the server/host this time is recorded which is called latency.

Output-

```
C:\Users\rs962>ping www.google.com

Pinging www.google.com [142.250.194.100] with 32 bytes of data:
Reply from 142.250.194.100: bytes=32 time=55ms TTL=115
Reply from 142.250.194.100: bytes=32 time=15ms TTL=115
Reply from 142.250.194.100: bytes=32 time=15ms TTL=115
Reply from 142.250.194.100: bytes=32 time=15ms TTL=115

Ping statistics for 142.250.194.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 15ms, Maximum = 55ms, Average = 25ms
```

2. **Ipconfig Command-**

IPCONFIG stands for **Internet Protocol Configuration**. This is a command-line application which displays all the current TCP/IP (Transmission Control Protocol/Internet Protocol) network configuration, refreshes the DHCP (Dynamic Host Configuration Protocol) and DNS (Domain Name Server). It also displays IP address, subnet mask, and default gateway for all adapters.

Output-

```
C:\Users\rs962>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet:

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

Wireless LAN adapter Local Area Connection* 3:

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

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::4842:8c75:4e6b:fcdd%11
   IPv4 Address. . . . . . . . . . . : 192.168.1.4
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.1.1
```

3. Tracert Command:

The Traceroute command (tracert) is a utility designed for displaying the time it takes for a packet of information to travel between a local computer and a destination IP address or domain.

Output-

```
C:\Users\rs962>tracert www.flipkart.com

Tracing route to flipkart.com [103.243.32.90]
over a maximum of 30 hops:

  1  1091 ms     8 ms     3 ms  gpon.net [192.168.1.1]
  2     2 ms     2 ms     2 ms  100.77.128.1
  3    15 ms     4 ms     4 ms  172.18.13.29 [172.18.13.29]
  4     5 ms     5 ms     4 ms  192.168.231.101 [192.168.231.101]
  5     5 ms     *        5 ms  192.168.234.21 [192.168.234.21]
  6     6 ms     5 ms     5 ms  192.168.200.28 [192.168.200.28]
  7     6 ms     5 ms     5 ms  121.23.41.103.netplus.co.in [103.41.23.121]
  8    29 ms     7 ms     6 ms  aes-static-125.34.144.59.airtel.in [59.144.34.125]
  9     5 ms     5 ms     5 ms  aes-static-125.34.144.59.airtel.in [59.144.34.125]
 10     *        *        *     Request timed out.
 11    50 ms    49 ms    49 ms  121.240.1.201
 12    53 ms    51 ms    51 ms  115.110.250.202.static-ahmedabad.tcl.net.in [115.110.250.202]
 13     *        *        *     Request timed out.
 14     *        *        *     Request timed out.
 15     *        *        *     Request timed out.
 16     *        *        *     Request timed out.
 17    49 ms    50 ms    50 ms  103.243.32.90

Trace complete.
```

4. Nslookup Command:

- Nslookup command stands for “Name Server Lookup”. It is a useful command for getting information from the DNS Server.
- It is a network administration tool for querying the Domain Name System (DNS) to obtain domain name or IP address mapping or any other specific DNS record.
- It is also used to troubleshoot DNS-related problems.

Output-

```
C:\Users\rs962>nslookup flipkart.com
Server:   gpon.net
Address:   192.168.1.1

Non-authoritative answer:
Name:     flipkart.com
Address:   163.53.76.86
```

5. Netstat Command:

- Netstat command stands for Network Statistics. It is a networking tool used for troubleshooting and configuration.
- Also used as a monitoring tool for connections over the network.
- This command displays various network related information such as network connections, routing tables, interface statistics, masquerade connections, multicast memberships etc.

Output:

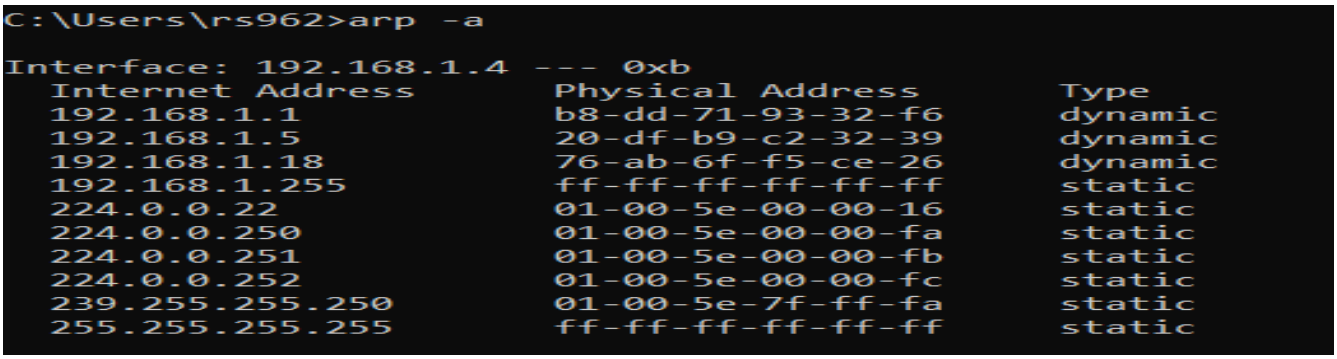
```
C:\Users\rs962>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:55739        Ravvviii:65001         ESTABLISHED
  TCP    127.0.0.1:65001        Ravvviii:55739         ESTABLISHED
  TCP    192.168.1.4:49525      20.198.119.84:https    ESTABLISHED
  TCP    192.168.1.4:58885      13.107.5.88:https      ESTABLISHED
  TCP    192.168.1.4:59046      13.107.6.163:https     ESTABLISHED
  TCP    192.168.1.4:59204      52.98.123.226:https    ESTABLISHED
  TCP    192.168.1.4:59528      server-18-164-217-50:https   CLOSE_WAIT
  TCP    192.168.1.4:60418      server-18-164-217-111:https  CLOSE_WAIT
  TCP    192.168.1.4:60661      ec2-13-127-107-25:https   ESTABLISHED
  TCP    192.168.1.4:60664      ec2-13-127-107-25:https   ESTABLISHED
  TCP    192.168.1.4:61071      192:8009               ESTABLISHED
  TCP    192.168.1.4:61072      ec2-18-207-28-55:https   ESTABLISHED
  TCP    192.168.1.4:61078      ec2-54-152-163-54:https   ESTABLISHED
  TCP    192.168.1.4:61093      199.232.254.137:https  ESTABLISHED
  TCP    192.168.1.4:61100      a23-63-109-9:https     CLOSE_WAIT
  TCP    192.168.1.4:61101      a23-63-109-9:https     CLOSE_WAIT
  TCP    192.168.1.4:61102      a23-63-109-9:https     CLOSE_WAIT
  TCP    192.168.1.4:61103      a23-63-109-9:https     CLOSE_WAIT
  TCP    192.168.1.4:61104      a23-63-109-9:https     CLOSE_WAIT
  TCP    192.168.1.4:61105      a23-63-109-9:https     CLOSE_WAIT
  TCP    192.168.1.4:61107      ec2-35-162-35-191:https   CLOSE_WAIT
  TCP    192.168.1.4:61109      ec2-13-251-160-226:https   ESTABLISHED
  TCP    192.168.1.4:61110      13.89.178.27:https     TIME_WAIT
  TCP    192.168.1.4:61111      ec2-54-69-249-49:https   TIME_WAIT
  TCP    192.168.1.4:61112      ec2-54-225-178-127:https   ESTABLISHED
```

6. Arp Command:

- ARP Command stands for Address Resolution Protocol is a TCP/IP utility and Microsoft Windows command for viewing and modifying the local Address Resolution Protocol (ARP) cache, which contains recently resolved MAC addresses of Internet Protocol (IP) hosts on the network.

- **ARP command** manipulates the System's ARP cache. It also allows a complete dump of the ARP cache. ARP stands for Address Resolution Protocol. The primary function of this protocol is to resolve the IP address of a system to its mac address, and hence it works between level 2(Data link layer) and level 3(Network layer). **Command:** arp -a

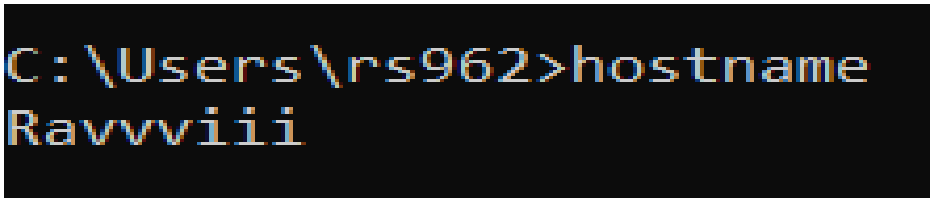
Output:



7. Hostname Command:

hostname command in Linux is used to obtain the DNS(Domain Name System) name and set the system's hostname or NIS(Network Information System) domain name. A hostname is a name which is given to a computer and it attached to the network. Its main purpose is to uniquely identify over a network.

Output:



8. Pathping Command:

- The PathPing command is a command-line network utility supplied in Windows 2000 and beyond that combines the functionality of ping with that of tracert. It is used to locate spots that have network latency and network loss.

Output:

```
C:\Users\rs962>pathping

Usage: pathping [-g host-list] [-h maximum_hops] [-i address] [-n]
                [-p period] [-q num_queries] [-w timeout]
                [-4] [-6] target_name

Options:
    -g host-list     Loose source route along host-list.
    -h maximum_hops  Maximum number of hops to search for target.
    -i address       Use the specified source address.
    -n               Do not resolve addresses to hostnames.
    -p period        Wait period milliseconds between pings.
    -q num_queries   Number of queries per hop.
    -w timeout       Wait timeout milliseconds for each reply.
    -4               Force using IPv4.
    -6               Force using IPv6.
```

RESULT: Troubleshooting of networks and devices