Experiment No. 2

Aim: To perform basic networking commands in windows command prompt and understand their functions.

Apparatus (software): Command prompt (for windows).

Details of Networking Commands:

1. hostname

- It will provide the name of your computer. The first part of the result is the name of a computer and the second part is the name of the domain.

2. ping

- Ping is used to testing a network host capacity to interact with another host.
- This is performed by using the Internet Control Message Protocol, which allows the echo packet to be sent to the destination host and a listening mechanism.
- If the destination host reply to the requesting host, that means the host is reachable.
- This utility usually gives a basic image of where there may be a specific networking issue.
- There are various options a user can use with the Ping command.

Options	Description
target	This is the destination IP address or a hostname user want to ping.
-a	This option resolves the hostname of an IP address target.
-t	This ping command option will ping the target until you stop it by pressing Ctrl-C.
-n count	This option is used to set the number of ICMP Echo Requests to send, from 1 to 4294967295. If -n is not specified, the ping command will return 4 by default.
-l size	This option is used to set the size, in bytes, of the echo-request packet from 32 to 65,527. If the -l option is not specified, the ping command will send a 32-byte echo request.
-s count	This option is used to report the time in the Internet Timestamp format that each echo request is received and an echo reply is sent. The maximum count value is 4, i.e. only the first four hops can be time stamped.
-r count	This command uses the ping command option to specify the number of hops between the source computer and the target computer. The maximum count value is 9; the Tracert command can also be used if the user wants to view all the hops between two devices.
-i TTL	This ping command option sets the Time to Live (TTL) value; the maximum value is 255.
-f	Use this ping command option to prevent ICMP Echo Requests from being fragmented by routers between the source and the target. The -f

	option is often used to troubleshoot Path Maximum Transmission Unit (PMTU) issues.
-w timeout	A timeout value must be specified while executing this ping command. It adjusts the amount of time in milliseconds. If the -w option is not specified, then the default timeout value of 4000 is set, which is 4 seconds.
-p	To ping a Hyper-V Network Virtualization provider address.
-S srcaddr	This option is used to specify the source address.

3. ipconfig

- The command IP config will display basic details about the device's IP address configuration.
- The output is the IP address, subnet mask and default gateway that the current device will be presented.
- If you have to see full information, then type on command prompt "ipconfig -all" or "ipconfig /all" and then you will see full information.
- There are also choices to assist you in resolving DNS and DHCP issues.

4. netstat

- The netstat provides the statistics and information in the use of the current TCP-IP Connection network about the protocol.
- There are various options a user can use with the Netstat command.

Options	Description
-a	This will display all connection and ports
-b	Shows the executable involved in each connection or hearing port
-e	This protocol will combine with the -sand display the ethernet statistics
-n	This will display the address and the port number in the form of numerical
-o	It will display the ID of each connection for the ownership process.
-r	It will display the routing table
-v	When used in combination with -b, the link or hearing port sequence for every executable is shown.

5. tracert

- The trace route (tracert) command is a Command Prompt command which is used to get the network packet being sent and received and the number of hops required for that packet to reach to target.

6. nslookup

- The nslookup, which stands for name server lookup command, is a network utility command used to obtain information about internet servers.

- It provides name server information for the DNS (Domain Name System), i.e. the default DNS server's name and IP Address.

7. route

- In IP networks, routing tables are used to direct packets from one subnet to another.
- The Route command provides the device's routing tables. To get this result, just type route print.
- The Route command returns the routing table, and the user can make changes by Commands such as Route Add, Route Delete, and Route Change, which allows modifying the routing table as a requirement.

8. arp

- ARP stands for Address Resolution Protocol. Although network communications can readily be thought of as an IP address, the packet delivery depends ultimately on the media access control (MAC). This is where the protocol for address resolution comes into effect.
- You can add the remote host IP address, which is an arp -a command, in case you have issues to communicate with a given host.
- The ARP command provides information like Address, Flags, Mask, IFace, Hardware Type, Hardware Address, etc.

Procedure:

1. Open command prompt in windows.
2. Type following commands one by one and study the output/results. Upload the screenshots of the results in Google Classroom.
    i. hostname
    ii. ping 192.168.10.1
    iii. ping 192.168.0.1
    iv. ping www.google.in
    v. ping www.google.in -t
    vi. ping www.google.in -n 6
    vii. ping www.google.in -r 8
    viii. ping www.google.in -l 100
    ix. ipconfig
    x. ipconfig -all
    xi. netstat -r
    xii. tracert 192.168.10.1
    xiii. tracert 192.168.0.1
    xiv. tracert www.google.in
    xv. nslookup www.google.in
    xvi. route print
    xvii. arp -a

Conclusion:

Q. What is the role of networking commands?

Ans.- Networking commands are used at the command prompt to get network information like the IP address of the system, MAC address, network route traversed by a packet, and the IP address of the server in which a website or URL is hosted. They can be used to configure, monitor and troubleshoot the network.