Batch: Btech SY IT- A **Experiment Number: 1**

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Aim of the Experiment: Study of various networking commands

Program/ Steps:

1. **Run all the commands mentioned in the theory and put the output in the results section. Executed in CMD**
   ↪ ping: used to test connectivity between two hosts. It sends ICMP echo request messages to the destination. The destination host replies with ICMP reply messages.
   ↪ ipconfig: This command displays all current TCP/IP network configuration values and refreshes Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) settings.
   ↪ tracert: This command is used to diagnose path-related problems.
   ↪ arp: The ARP protocol broadcasts a given IP address over a local network. The corresponding host responds to the broadcast with its MAC address.
   ↪ netstat: This command displays active connections, ports on which the computer is listening, Ethernet statistics, the IP routing table, and IP statistics.

2. **Identify 2 new networking commands, run these commands in CMD, and paste the output in the results section.**
   ↪ nslookup: It's a tool that helps you find out information about domain names or IP addresses by querying DNS servers, like looking up the address of a website.
   ↪ netsh: This is a command-line tool in Windows that lets you manage various network settings and configurations, such as IP addresses, routing, and firewall rules, all through text commands.

Output/Result:

ping

Administrator: Command Prompt

```
Microsoft Windows [Version 10.0.19045.4291]
(c) Microsoft Corporation. All rights reserved.

C:\Users\SVVAdmin>ping google.com

Pinging google.com [172.217.166.46] with 32 bytes of data:
Reply from 172.217.166.46: bytes=32 time=9ms TTL=58
Reply from 172.217.166.46: bytes=32 time=12ms TTL=58
Reply from 172.217.166.46: bytes=32 time=7ms TTL=58
Reply from 172.217.166.46: bytes=32 time=2ms TTL=58

Ping statistics for 172.217.166.46:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 12ms, Average = 7ms
```

ipconfig

Administrator: Command Prompt

```
C:\Users\SVVAdmin>ipconfig /all

Windows IP Configuration

   Host Name . . . . . . . . . . . . : 16DITB212-12
   Primary Dns Suffix  . . . . . . . :
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Realtek PCIe GbE Family Controller
   Physical Address. . . . . . . . . : D8-CB-8A-8D-18-39
   DHCP Enabled. . . . . . . . . . . : No
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::d214:552f:5fd6:6aaa%7(Preferred)
   IPv4 Address. . . . . . . . . . . : 172.17.16.172(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.254.0
   Default Gateway . . . . . . . . . : 172.17.17.254
   DHCPv6 IAID . . . . . . . . . . . : 114871178
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-2B-03-C1-49-D8-CB-8A-8D-18-39
   DNS Servers . . . . . . . . . . . : 172.31.0.25
                                       172.31.0.26
   NetBIOS over Tcpip. . . . . . . . : Enabled
```

tracert

Administrator: Command Prompt

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

Tracing route to www.google.co.in [142.250.183.35]
over a maximum of 30 hops:

  1     1 ms     1 ms     1 ms  172.17.17.254
  2     1 ms     1 ms     1 ms  172.17.52.240
  3    <1 ms    <1 ms    <1 ms  172.30.250.250
  4    11 ms    10 ms     4 ms  14.142.143.97.static-mumbai.vsnl.net.in [14.142.143.97]
  5     2 ms     2 ms     2 ms  115.113.165.98.static-mumbai.vsnl.net.in [115.113.165.98]
  6     3 ms     3 ms     4 ms  216.239.57.17
  7     2 ms     2 ms     2 ms  142.250.239.171
  8     9 ms     4 ms     2 ms  bom12s11-in-f3.1e100.net [142.250.183.35]

Trace complete.
```

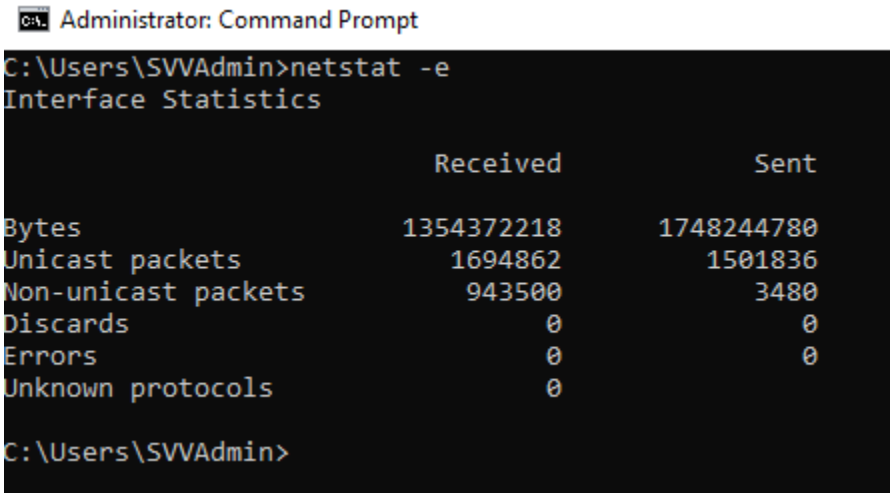
arp

Administrator: Command Prompt

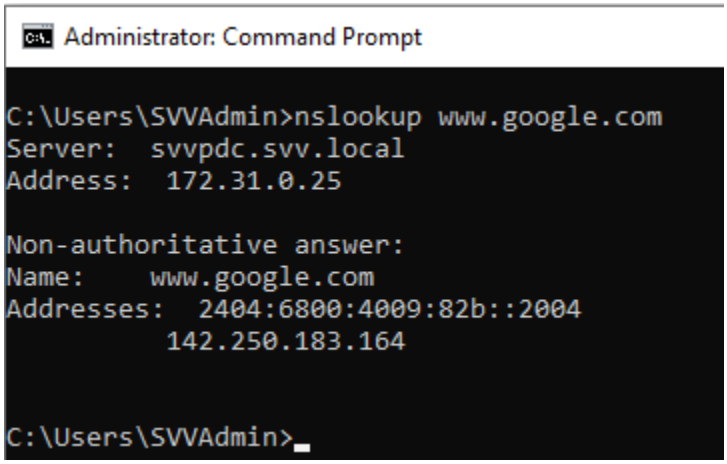
```
C:\Users\SVVAdmin>arp -a

Interface: 172.17.16.172 --- 0x7
  Internet Address      Physical Address      Type
  172.17.16.5           d8-cb-8a-0c-87-f2     dynamic
  172.17.16.7           d8-cb-8a-0c-89-0b     dynamic
  172.17.16.13          d8-cb-8a-8d-14-de     dynamic
  172.17.16.14          d8-cb-8a-0c-88-11     dynamic
  172.17.16.15          d8-cb-8a-8d-10-d0     dynamic
  172.17.16.17          d8-cb-8a-0c-84-bc     dynamic
  172.17.16.83          00-68-eb-b8-97-b1     dynamic
  172.17.16.84          00-68-eb-b8-a1-c6     dynamic
  172.17.16.122         3c-52-82-69-76-79     dynamic
  172.17.16.129         3c-52-82-6d-28-04     dynamic
  172.17.16.133         3c-52-82-70-5e-1e     dynamic
  172.17.16.136         3c-52-82-70-5e-20     dynamic
  172.17.16.161         d8-cb-8a-8d-16-3f     dynamic
  172.17.16.164         d8-cb-8a-8d-20-54     dynamic
  172.17.16.168         64-4e-d7-6d-69-ce     dynamic
  172.17.16.170         d8-cb-8a-8d-14-ba     dynamic
  172.17.17.69          6c-0b-84-04-ad-b3     dynamic
  172.17.17.103         a4-1f-72-5b-3c-68     dynamic
  172.17.17.104         a4-1f-72-5e-56-49     dynamic
  172.17.17.132         3c-52-82-67-e5-84     dynamic
  172.17.17.173         a0-8c-fd-e6-b1-3b     dynamic
  172.17.17.254         b0-aa-77-66-d1-41     dynamic
  172.17.17.255         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
```

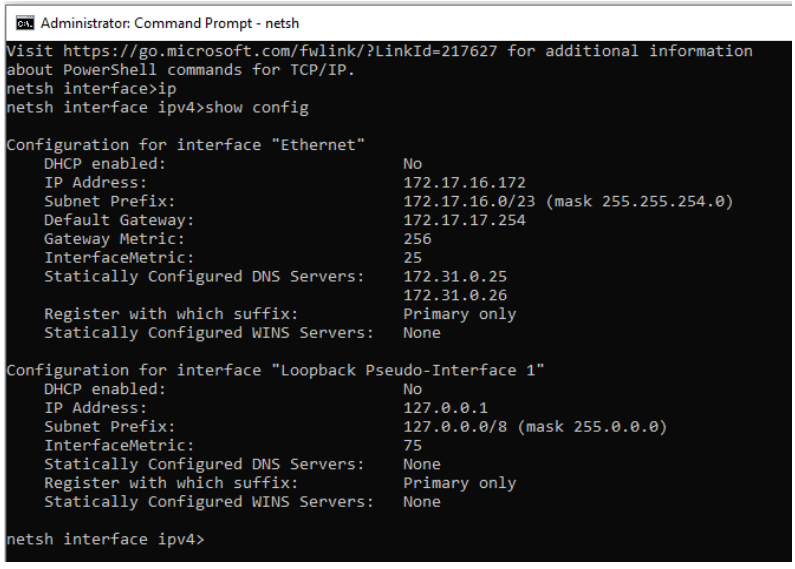
netstat



nslookup



netsh



Post Lab Question-Answers:

Questions

1. ICMP is used in _____
   a) Ping
   b) Traceroute
   c) Ifconfig
   d) Both Ping & Traceroute
   Answer:
   ↪ d) Both Ping & Traceroute

2. _____ command is used to manipulate TCP/IP routing table.
   a) route
   b) Ipconfig
   c) Ifconfig
   d) Traceroute
   Answer:
   ↪ a) route

3. Select the false statement from the following.
   a) Nslookup is used to query a DNS server for DNS data
   b) Ping is used to check connectivity
   c) Pathping combines the functionality of ping with that of route
   d) Ifconfig can configure TCP/IP network interface parameters
   Answer:
   ↪ d) Ifconfig can configure TCP/IP network interface parameters

Outcomes:

CO1: Understand the data communication systems, network topologies and network devices

Conclusion (based on the Results and outcomes achieved):

All commands run successfully. Enhanced understanding of network configurations, address resolutions, and DNS queries, crucial for effective network administration and troubleshooting.

References:

- Behrouz A Forouzan, Data Communication and Networking, Tata Mc Graw hill, India, 4th Edition
- A. S. Tanenbaum, ”Computer Networks”, 4th edition, Prentice Hall