

**SCHOOL OF COMPUTING**

**GRAPHIC ERA HILL UNIVERSITY, BHIMTAL CAMPUS**

**2023-24**

A

Term-Work

On

**Computer Networks Laboratory (PMC-102)**

Submitted in partial fulfillment of the requirement for the I semester

**M.C.A**

By

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**…**

**Faculty-in-Charge**

**Dr. Bhupesh Rawat**



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**STUDENT’S DECLARATION**

I **Lalit Singh** hereby declare the work, which is being presented in the term-work, entitled “Computer Networks Laboratory ” in partial fulfillment of the requirement for the award of the degree **M.C.A** in the session **2023-2024**, is an authentic record of my own work carried out under the supervision of**Dr. Bhupesh Rawat.**

The matter embodied in this term-work has not been submitted by me for the award of any other degree.

Date: ………… (Full signature of student)



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**CERTIFICATE**

**The term-work entitled “Full stack lab” being submitted by Lalit Singh S/o Mr. Sher Singh, Enrollment no. PV-H2092027, roll no. 2351027 to Graphic Era Hill University Bhimtal Campus for the award of bonafide work carried out by him. He has worked under my guidance and supervision and fulfilled the requirement for the submission of report.**

**Dr. Bhupesh Rawat. Dr. Sandeep Budhani**

**Faculty-in-Charge (HOD)**

**PRACTICAL 1**

NAME -Lalit singh

COURSE -MCA 1st sem

ROLL NO -2351027

SUBJECT - Computer Networks Laboratory (PMC-102)

**OBJECTIVE:To apply basic networking tools and commands to troubleshoot network connectivity issues.**

**Theory: -**

1. **ipconfig (Internet Protocol configuration) is among the most common networking tools that allow you to query and show current TCP/IP (Transmission Control Protocol/Internet Protocol) network configuration. The command also includes options to perform different actions, such as refreshing Dynamic Host Configuration**

**Protocol (DHCP) and Domain Name System (DNS) settings.**

1. **Ping** is another essential networking tool because it allows you to send ICMP(Internet Control Message Protocol) echo request messages to test the IP connectivity with other devices, whether it is another computer in the network or internet service.
2. **tracert (Trace Route),** a diagnostic tool to determine the network path to a destination using a series of ICMP echo requests. However, unlike the ping command, each request includes a TTL (Time to Live) value that increases by one each time, allowing to display of a list of the route the requests have taken and their duration.
3. **netstat (Network Statistics)** tool displays statistics for all network connections. It allows you to understand open and connected ports to monitor and troubleshoot networking problems for Windows and apps.
4. **nslookup (Name Server Lookup)** tool can show valuable details to troubleshoot and resolve DNS-related issues. The tool includes an interactive and noninteractive modes. However, you will be using the non-interactive mode more often than not, which means you will type the full command to obtain the necessary information
5. **ARP:** Windows 10 maintains an arp (Address Resolution Protocol) table, which stores IP to Media Access Control (MAC) entries that the system has resolved. The arp tool lets you view the entire table, modify the entries, and use it to determine a remote computer's MAC address.
6. **Route:** The route tool displays the routing table that allows Windows 10 to understand the network and communicate with other devices and services. The tool also offers some options to modify and clear the table as needed.
7. **netsh (Network Shell)** is a legacy command-line tool that allows you to display and change virtually any network configuration. For instance, you can use the tool to view the current network configurations, manage wireless connections, reset the network stack to fix most common problems, enable or disable the firewall, and a lot more.

**PROCEDURE:**

1. **Steps for display network configuration**
2. Open Start.
3. Search for Command Prompt, right-click the top result, and select the Run as administrator option.
4. Type the following command to view a summary of the TCP/IP network
5. configuration and press Enter: **ipconfig.**
6. Type the following command to remove the current network configuration and press Enter: **ipconfig /release.**
7. Type the following command to reconfigure the network configuration and press Enter: **ipconfig /renew.**
8. Type the following command to clear the DNS system cache on the device and press Enter: **ipconfig /flushdns**
9. **Steps for Testing device connectivity**

1. Open Start.

2. Search for Command Prompt, right-click the top result, and select the Run as administrator option.

3. Type the following command to send ICMP echo requests to test connectivity and press Enter: **ping IP-OR-DOMAIN**

1. **Steps to trace the route to a destination with Command Prompt:**

1.Open Start.

2. Search for Command Prompt, right-click the top result, and select the Run as

administrator option.

3. Type the following command to understand the path taken to the destination and press Enter: **tracert IP-OR-DOMAIN**

1. **Steps to get started with nslookup :**

1. Open Start.

2. Search for Command Prompt, right-click the top result, and select the Run asadministrator option.

3. Type the following command to look up the local DNS name and address and press Enter: **nslookup**

4. Confirm the current DNS information.

5. Type the following command to exit the interactive mode and press Enter: **exit**

6. Type the following command to determine the name and address of a specific server and press Enter: **nslookup IP-ADDRESS**

7. Type the following command to determine the address of a specific server and press Enter: **nslookup DOMAIN-NAME**

1. **Steps to get started with netstat:**

1. Open Start.

2. Search for Command Prompt, right-click the top result, and select the Run as administrator option.

3. Type the following command to show all active TCP connections and

press Enter: **netstat**

4.Type the command to display active connections showing

numeric IP address and port number instead of trying to determine the names and press Enter: **netstat -n**

5.Type the following command to refresh the information at a specific

interval and press Enter: **netstat -n INTERVAL**

1. **Steps to get started with arp on Windows 10, use these steps:**

1. Open Start.

2. Search for Command Prompt, right-click the top result, and select the Run as administrator option.

3. Type the following command to view the current arp table cache on Windows 10 and press Enter: **arp -a**

4. Type the following command to determine the MAC address of a remote device and press Enter**: arp -a IP**

1. **Steps to view or flush the routing table available :**

1. Open Start.

2. Search for Command Prompt, right-click the top result, and select the Run as administrator option.

3. Type the following command to view the routing table known to Windows 10 and press Enter**: route print**

4. Confirm the routing table information.

5. Type the following command to clear the routing table and press Enter: **route -f**

1. **Steps to get started with the netsh command-line tool**

1. Open Start.

2. Search for Command Prompt, right-click the top result, and select the Run asadministrator option.

3. Type the following command to view a list of the available commands (contexts) and press Enter: **netsh /?**

4. Type the following command to view the list of available subcommands (subcontexts) for a specific option and press Enter: **netsh CONTEXT-COMMAND**

1. **Steps to Reset system network stack.**

1. Open Start.

2. Search for Command Prompt, right-click the top result, and select the Run as administrator option.

3. Type the following command to reset the winsock stack and press Enter: **netsh winsock reset**

4. Restart your computer

1. **Steps to Export network configuration**

1. Open Start.

2. Search for Command Prompt, right-click the top result, and select the Run as administrator option.

3. Type the following command to export the current configuration for all the network adapters and press Enter: **netsh -c interface dump>PATH\TO\EXPORTED.txt**

1. **Steps to Import network configuration.**

1. Open Start.

2. Search for Command Prompt, right-click the top result, and select the Run as administrator option.

3. Type the following command to import the network configuration and

press Enter: **netsh -c interface dump>PATH\TO\IMPORTED.txt**

1. **Steps to Enable and disable firewall**

1. Open Start.

2. Search for Command Prompt, right-click the top result, and select the Run as

administrator option.

3. Type the following command to enable the default firewall and press Enter: **netsh advfirewall set currentprofile state on OR netsh advfirewall set currentprofile state off**

**OUTPUT:**

1. **displaying network configuration**

C:\Users\lalit>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

Media State . . . . . . . . . . . : Media disconnected

Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection\* 1:

Media State . . . . . . . . . . . : Media disconnected

Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection\* 2:

Media State . . . . . . . . . . . : Media disconnected

Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . :

IPv6 Address. . . . . . . . . . . : 2409:4085:9c82:93ea:c718:e88c:db4e:bc4c

Temporary IPv6 Address. . . . . . : 2409:4085:9c82:93ea:d924:55a8:d4cb:74cb

Link-local IPv6 Address . . . . . : fe80::7c38:2cb:1c31:8e23%11

IPv4 Address. . . . . . . . . . . : 192.168.137.71

Subnet Mask . . . . . . . . . . . : 255.255.255.0

Default Gateway . . . . . . . . . : fe80::24ac:f2ff:fe68:15f9%11

192.168.137.252

Ethernet adapter Bluetooth Network Connection:

Media State . . . . . . . . . . . : Media disconnected

Connection-specific DNS Suffix . :

1. **Testing device connectivity**

