

CSE 303L: Data Communication and Computer Networks

Lab01



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Submitted by: **Mohsin Sajjad**

Registration No: **22pwsce2149**

Class Section: **A**

“On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work.”

A handwritten signature in black ink that reads "Mohsin Sajjad".

Student Signature: _____

Submitted to:

Dr. Yasir Saleem Afridi

Month Day, Year (26 02, 2025)

Department of Computer Systems Engineering
University of Engineering and Technology, Peshawar

Lab 01

PC Network TCP/IP Configuration

OBJECTIVES OF THE LAB

Following topics will be covered in this lab

1. Gather information including connection, host name, Layer 2 MAC address and Layer 3 TCP/IP network address information.
2. Compare network information to other PCs on the network.
3. Identify tool used for discovering a computer's network configuration.

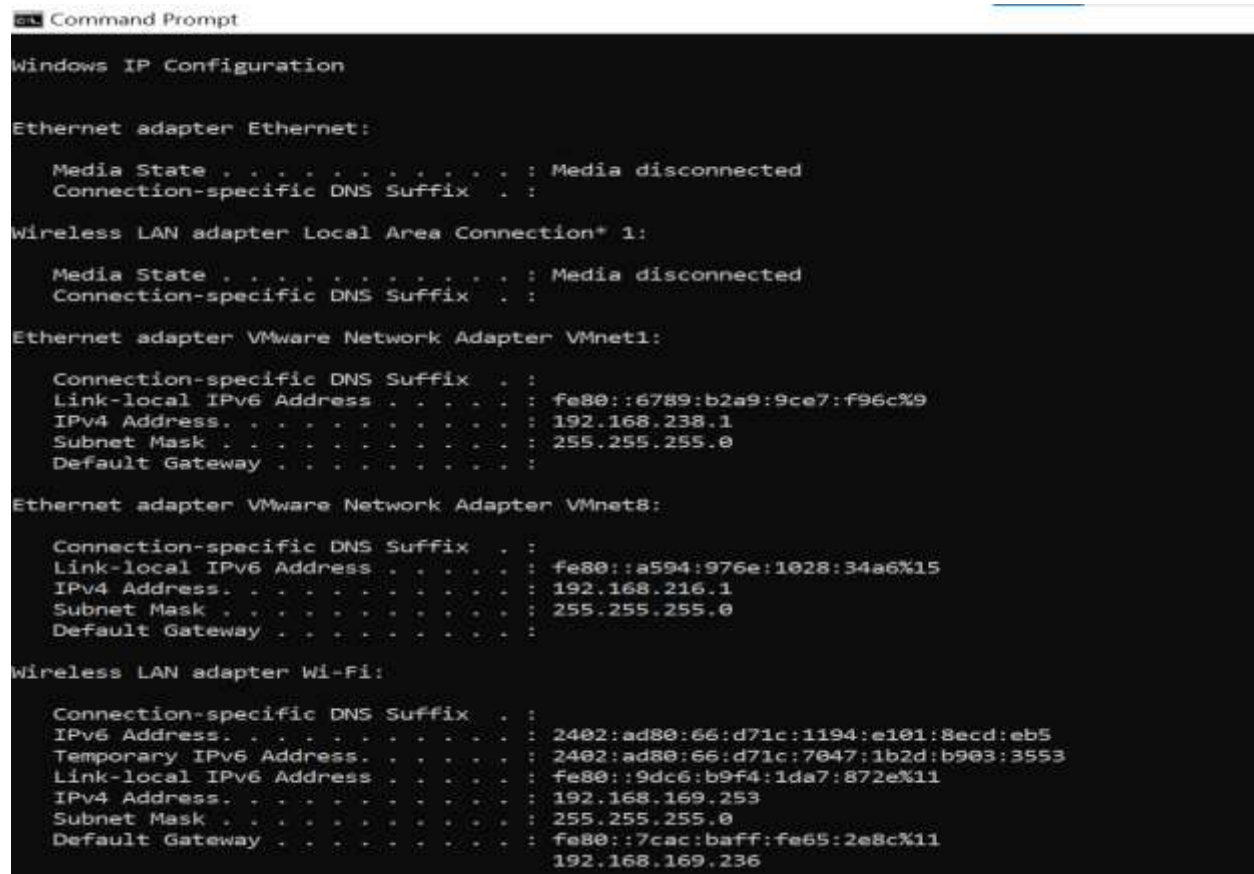
Step 1

Establish and verify connectivity to the Internet. This ensures the computer has an IP address.

Step 2

Use the Start menu to open the Command Prompt, an MS-DOS-like window. Press Start >

The following figure shows the Command screen. Type ipconfig and press the Enter key. The spelling of ipconfig is critical while case is not. It is short for IP Configuration.



```
Command Prompt
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  . :

Ethernet adapter VMware Network Adapter VMnet1:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::6789:b2a9:9ce7:f96c%9
    IPv4 Address. . . . . : 192.168.238.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :

Ethernet adapter VMware Network Adapter VMnet8:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::a594:976e:1028:34a6%15
    IPv4 Address. . . . . : 192.168.216.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    IPv6 Address. . . . . : 2402:ad80:66:d71c:1194:e101:8ecd:eb5
    Temporary IPv6 Address. . . . . : 2402:ad80:66:d71c:7047:1b2d:b903:3553
    Link-local IPv6 Address . . . . . : fe80::9dc6:b9f4:1da7:872e%11
    IPv4 Address. . . . . : 192.168.169.253
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::7cac:baff:fe65:2e8c%11
                                192.168.169.236
```

Step 3

Record the following TCP/IP information for at least three computers.

	Computer 1	Computer 2 (Neighbor 1)	Computer 3 (Neighbor 1)
IP Address	192.168.239.153	192.168.243.149	192.168.160.40
Subnet Mask	255.255.255.0	255.255.255.0	255.255.255.0
Default Gateway	192.168.239.1	192.160.243.1	192.168.160.1
DNS Address	192.168.239.121	192.168.239.121	192.168.239.121
DHCP Address	192.168.100.121	192.168.100.153	192.168.100.153

Step 4

Compare the TCP/IP configuration of this computer to others on the LAN

If this computer is on a LAN, compare the information of several machines.

Are there any similarities?

Ans: Yes, the machines will have similar IP addresses, subnet masks, and default gateways as they are part of the same Local Area Network (LAN).

What is similar about the IP addresses?

Ans: They all start with **192.168.1**. This indicates they are all within the same private network range, specifically the 192.168.1.0/24 subnet.

What is similar about the default gateways?

Ans: The default gateway is usually the same for all devices on a LAN because it's the IP address of the router or network device that connects the local network to external networks

The IP addresses should share the same network portion. All machines in the LAN should share the same default gateway.

Record a couple of the IP Addresses:

Step 5

Check additional TCP/IP configuration information

To see detailed information, type `ipconfig /all` and press Enter. The figure shows the detailed IP configuration screen.

Command Prompt

```
C:\Users\T470s>ipconfig /all
```

Windows IP Configuration

```
Host Name . . . . . : DESKTOP-F1QMP69
Primary Dns Suffix . . . . . :
Node Type . . . . . : Mixed
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
```

Ethernet adapter Ethernet:

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) Ethernet Connection I219-LM
Physical Address. . . . . : 8C-16-45-E2-71-14
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
```

Wireless LAN adapter Local Area Connection* 1:

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . : 20-16-B9-76-0B-8E
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
```

Wireless LAN adapter Local Area Connection* 10:

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address. . . . . : 22-16-B9-76-0B-8D
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
```

Command Prompt

```

Connection-specific DNS Suffix . : 
Description . . . . . : VMware Virtual Ethernet Adapter for VMnet1
Physical Address. . . . . : 00-50-56-C0-00-01
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::6789:b2a9:9ce7:f96c%9(Preferred)
IPv4 Address. . . . . : 192.168.238.1(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Wednesday, 26 February 2025 1:39:54 am
Lease Expires . . . . . : Wednesday, 26 February 2025 2:39:54 am
Default Gateway . . . . . : 
DHCP Server . . . . . : 192.168.238.254
DHCPv6 IAID . . . . . : 973099094
DHCPv6 Client DUID. . . . . : 00-01-00-01-2D-B6-17-6E-8C-16-45-E2-71-14
DNS Servers . . . . . : fec0:0:0:ffff::1%1
                       : fec0:0:0:ffff::2%1
                       : fec0:0:0:ffff::3%1

NetBIOS over Tcpip. . . . . : Enabled

```

Ethernet adapter VMware Network Adapter VMnet8:

```

Connection-specific DNS Suffix . : 
Description . . . . . : VMware Virtual Ethernet Adapter for VMnet8
Physical Address. . . . . : 00-50-56-C0-00-08
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::a594:976e:1028:34a6%15(Preferred)
IPv4 Address. . . . . : 192.168.216.1(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Wednesday, 26 February 2025 1:39:55 am
Lease Expires . . . . . : Wednesday, 26 February 2025 2:39:55 am
Default Gateway . . . . . : 
DHCP Server . . . . . : 192.168.216.254
DHCPv6 IAID . . . . . : 1006653526
DHCPv6 Client DUID. . . . . : 00-01-00-01-2D-B6-17-6E-8C-16-45-E2-71-14
DNS Servers . . . . . : fec0:0:0:ffff::1%1
                       : fec0:0:0:ffff::2%1
                       : fec0:0:0:ffff::3%1

Primary WINS Server . . . . . : 192.168.216.2
NetBIOS over Tcpip. . . . . : Enabled

```

```

Command Prompt
Connection-specific DNS Suffix . : 
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . : B4-B6-76-2A-67-29
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 2:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . : 
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address. . . . . : B6-B6-76-2A-67-2B
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . : 
Description . . . . . : Intel(R) Centrino(R) Advanced-N 6235
Physical Address. . . . . : B4-B6-76-2A-67-28
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::ba19:38c0:a6cd:b0f6%10(Preferred)
IPv4 Address. . . . . : 192.168.239.153(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Tuesday, February 25, 2025 10:29:55 PM
Lease Expires . . . . . : Tuesday, February 25, 2025 11:51:18 PM
Default Gateway . . . . . : 192.168.239.121
DHCP Server . . . . . : 192.168.239.121
DHCPv6 IAID . . . . . : 95729278
DHCPv6 Client DUID. . . . . : 80-01-00-01-2E-22-3D-EA-F0-1F-AF-13-94-10
DNS Servers . . . . . : 192.168.239.121
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\haris>

```

Notice the Physical Address (MAC) and the NIC model (Description).

Ans: Physical address (MAC): 8C-16-45-E2-71-14,

NIC model: Intel(R) Ethernet Connection I219-LM

Write down the IP addresses of any servers listed:

Ans: IPv4 Address: 192.168.238.1(Preferred)

Write down the computer Host Name:

Ans: Host name: DESKTOP-F1QMP69

Write down the Host Names of a couple other computers:

Ans:

Computer 1: DESKTOP-T3I4Q71

Computer 2: DESKTOP-K3R4TSE

Do all of the servers and workstations share the same network portion of the IP address as the student workstation?

Ans: Yes, they likely share the same network portion (192.168.1).

It would not be unusual for some or all of the servers and workstations to be in another network.

It means that the computer default gateway is going to forward requests to the other network.

Step 6

Close the screen when finished examining network settings.

Repeat the previous steps as necessary. Make sure that it is possible to return to and interpret this

screen.

Based on observations, what can be deduced about the following results taken from three computers connected to one switch?

Computer 1

IP Address: 192.168.5.13

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.12.1

Computer 2

IP Address: 192.168.5.5

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.12.1

Computer 3

IP Address: 192.168.11.97

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.12.1

Should they be able to talk to each other?

Ans: Computer 1 and computer 2 are on the same network but computer three is on different network, so direct communication is not possible without a router.

Are they all on the same network? Why or why not?

Ans: No. They are not on the same network because their IP addresses have different network portions (192.168.5.x and 192.168.11.x)