

# Computer Networks Lab Report- Assignment 6

## TITLE:

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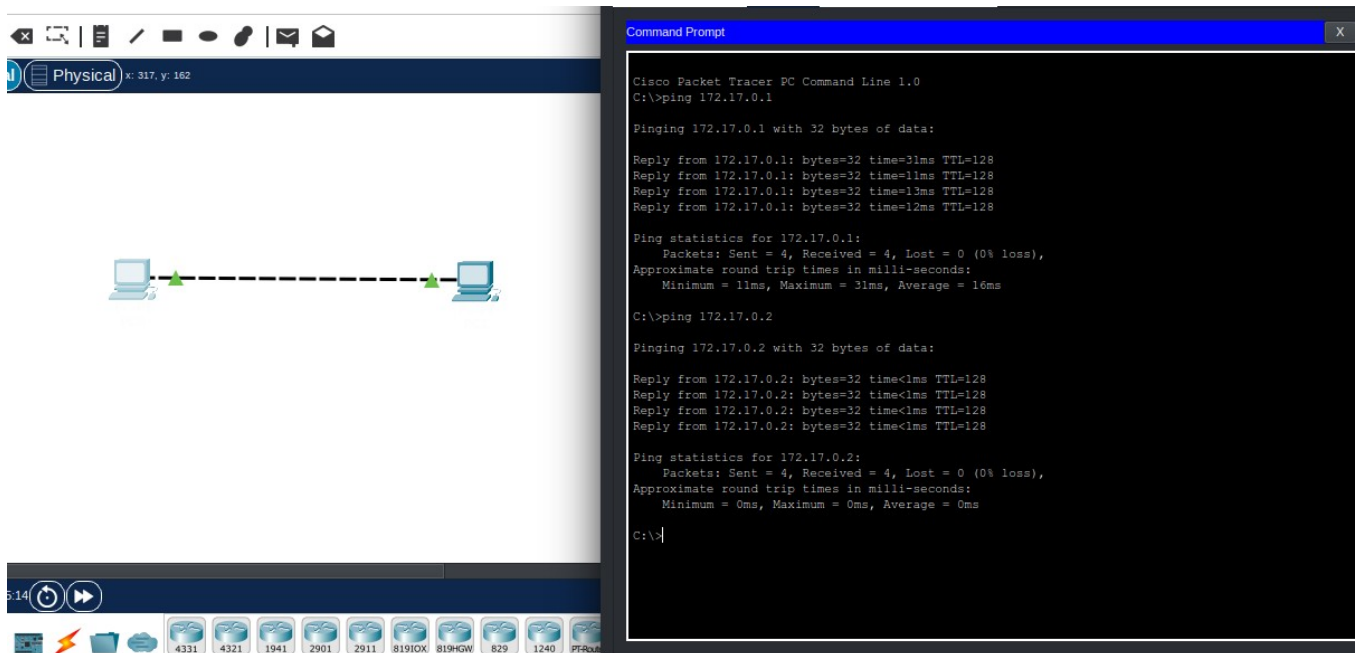
**Class:** BCSE 3 rd Year

**Group:** A3

**Submission Date:** 21/10/2022

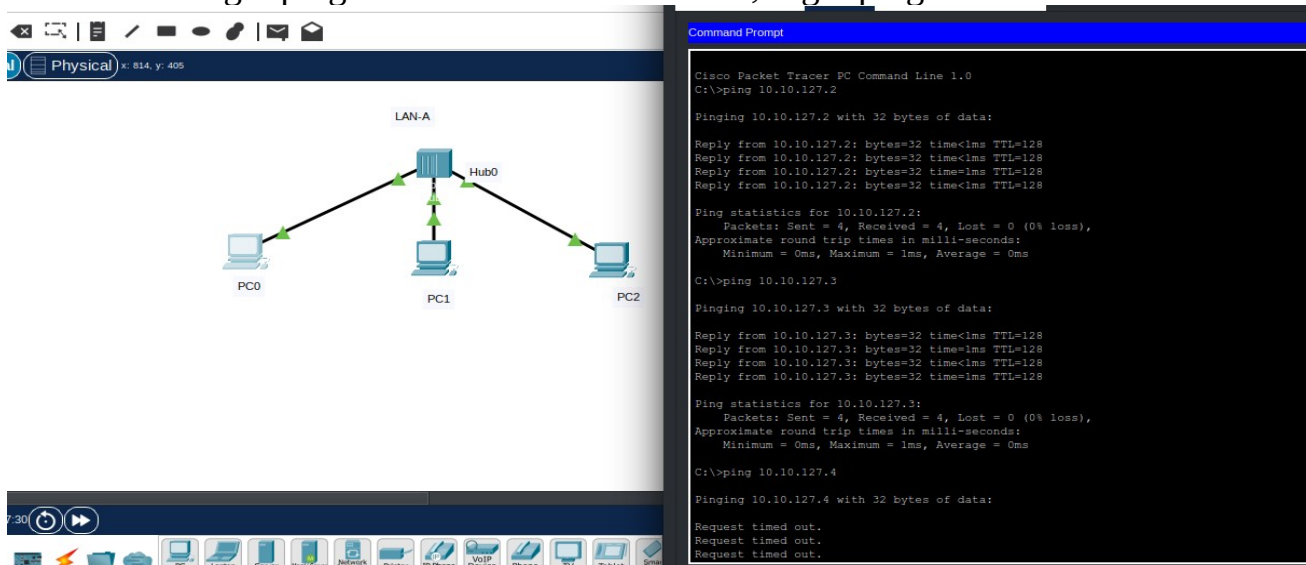
Q1) Connect two hosts back-to-back with a cross over cable. Assign IP addresses, and see whether they are able to ping each other.

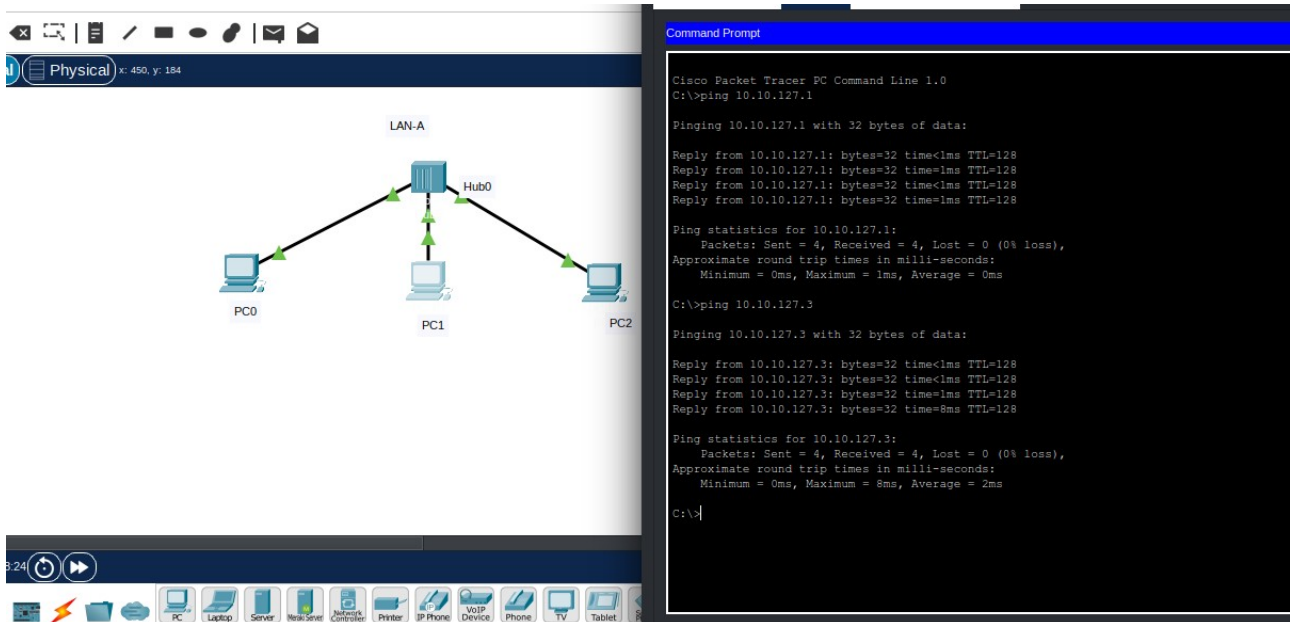
## RESULTS:



Q2) Create a LAN (named LAN-A) with 3 hosts using a hub. Ping each pair of nodes.

RESULTS: Fig1: ping from PC0 to PC1 and PC2, Fig2: ping from PC1 to PC2





The screenshot shows a Cisco Packet Tracer workspace with a topology labeled LAN-A. A central Hub0 is connected to three PCs: PC0, PC1, and PC2. The Command Prompt window on the right shows the following output:

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.10.127.1

Pinging 10.10.127.1 with 32 bytes of data:

Reply from 10.10.127.1: bytes=32 time<1ms TTL=128
Reply from 10.10.127.1: bytes=32 time<1ms TTL=128
Reply from 10.10.127.1: bytes=32 time<1ms TTL=128
Reply from 10.10.127.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.127.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.10.127.3

Pinging 10.10.127.3 with 32 bytes of data:

Reply from 10.10.127.3: bytes=32 time<1ms TTL=128
Reply from 10.10.127.3: bytes=32 time<1ms TTL=128
Reply from 10.10.127.3: bytes=32 time<1ms TTL=128
Reply from 10.10.127.3: bytes=32 time=8ms TTL=128

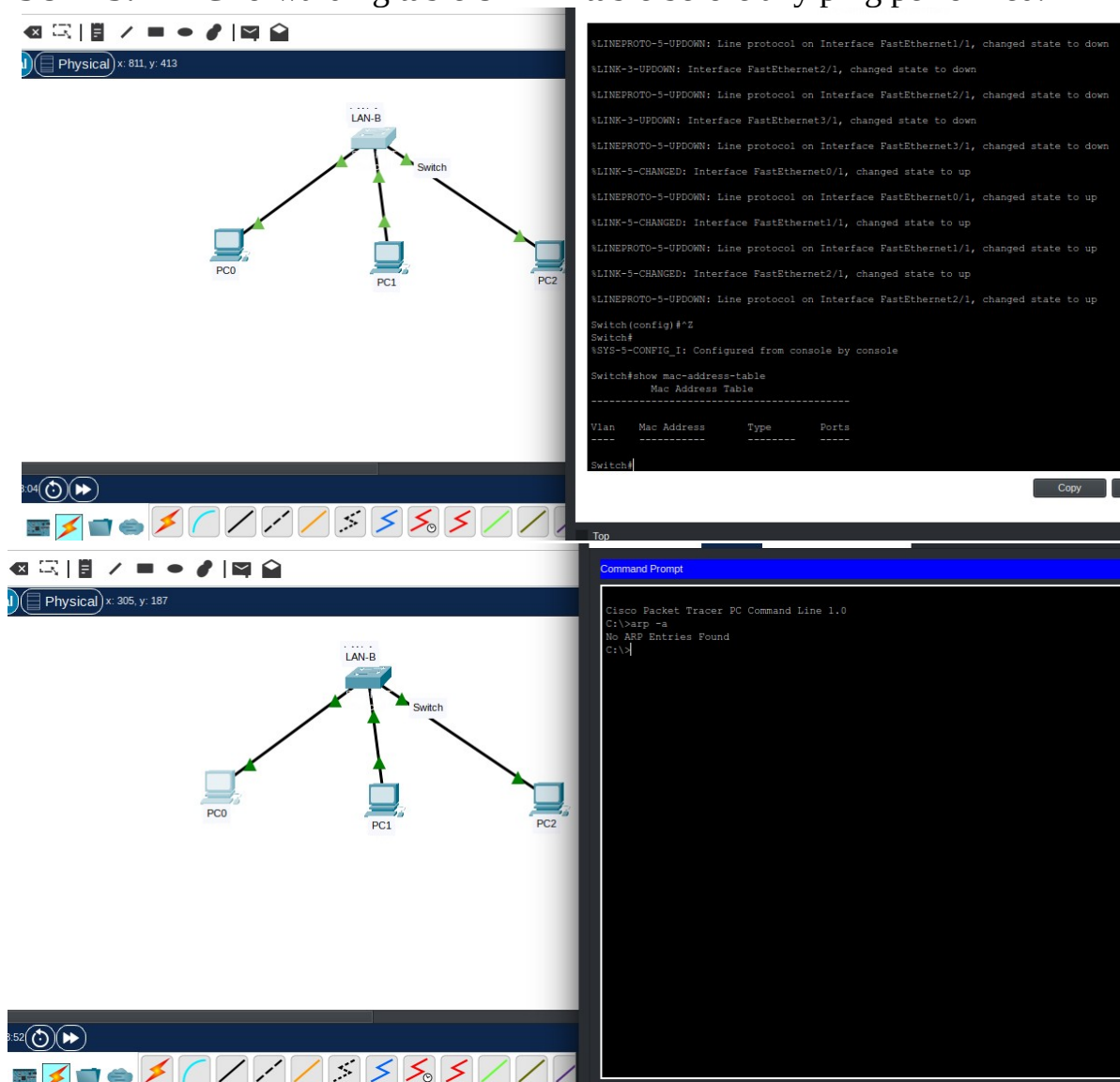
Ping statistics for 10.10.127.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms

C:\>

```

Q3) Create a LAN (named LAN-B) with 3 hosts using a switch. Record contents of the ARP Table of end hosts and the MAC Forwarding Table of the switch. Ping each pair of nodes. Now record the contents of the ARP Table of end hosts and the MAC Forwarding Table of the switch again.

**RESULTS:** MAC forwarding table & ARP table before any ping performed.



The screenshot shows a Cisco Packet Tracer workspace with a topology labeled LAN-B. A central Switch is connected to three PCs: PC0, PC1, and PC2. The Command Prompt window on the right shows the following output:

```

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/1, changed state to down
%LINK-3-UPDOWN: Interface FastEthernet2/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet2/1, changed state to down
%LINK-3-UPDOWN: Interface FastEthernet3/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/1, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet1/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet2/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet2/1, changed state to up

Switch(config)#?
Switch#
Switch#show mac-address-table
Mac Address Table
-----
Vlan    Mac Address      Type      Ports
---
Switch#

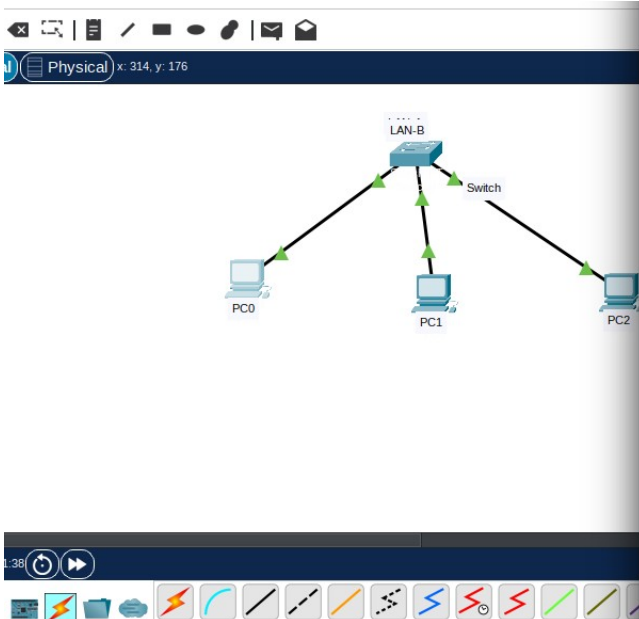
```

The Command Prompt window on the right shows the following output:

```

Cisco Packet Tracer PC Command Line 1.0
C:\>arp -a
No ARP Entries Found
C:\>

```



```

Cisco Packet Tracer PC Command Line 1.0
C:\>arp -a
No ARP Entries Found
C:\>ping 172.17.0.2

Pinging 172.17.0.2 with 32 bytes of data:

Reply from 172.17.0.2: bytes=32 time<1ms TTL=128
Reply from 172.17.0.2: bytes=32 time<1ms TTL=128
Reply from 172.17.0.2: bytes=32 time<1ms TTL=128
Reply from 172.17.0.2: bytes=32 time<1ms TTL=128

Ping statistics for 172.17.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 172.17.0.3

Pinging 172.17.0.3 with 32 bytes of data:

Reply from 172.17.0.3: bytes=32 time<1ms TTL=128
Reply from 172.17.0.3: bytes=32 time<1ms TTL=128
Reply from 172.17.0.3: bytes=32 time<1ms TTL=128
Reply from 172.17.0.3: bytes=32 time<1ms TTL=128

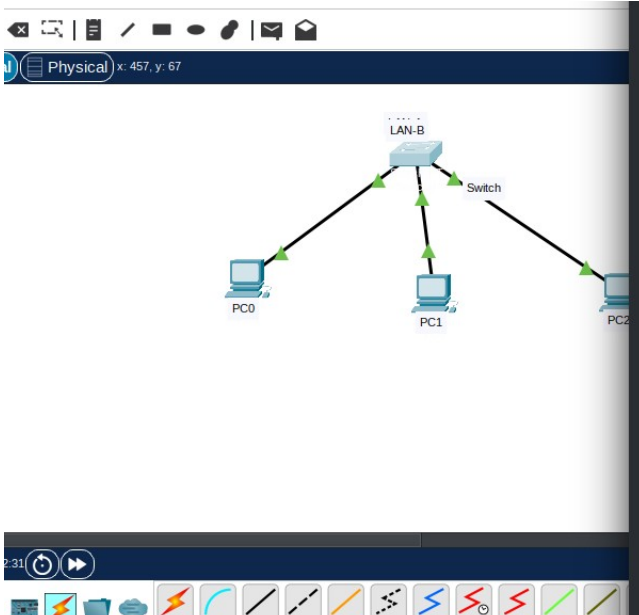
Ping statistics for 172.17.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>arp -a

Internet Address      Physical Address      Type
-----
172.17.0.2            0090.0c98.2633       dynamic
172.17.0.3            0001.646b.3e45       dynamic
C:\>

```

### ARP table after ping



```

\LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
\LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
\LINK-5-CHANGED: Interface FastEthernet1/1, changed state to up
\LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/1, changed state to up
\LINK-5-CHANGED: Interface FastEthernet2/1, changed state to up
\LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet2/1, changed state to up

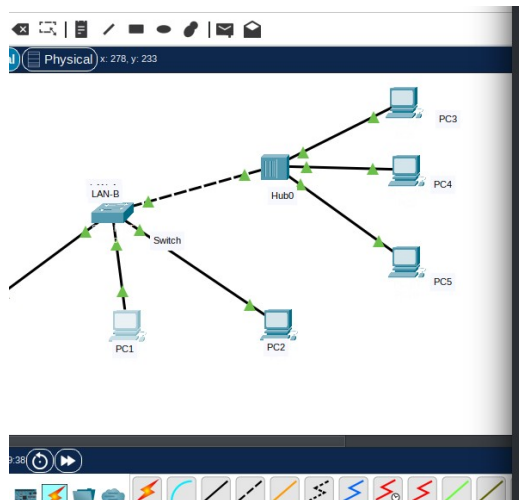
Switch(config)#^Z
Switch#
Switch#show mac-address-table
Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----
Switch#show mac-address-table
Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----
1       0001.646b.3e45   DYNAMIC Fa2/1
1       0090.0c98.2633   DYNAMIC Fa1/1
1       00d0.5832.595a   DYNAMIC Fa0/1
Switch#

```

### MAC forwarding table after ping

Q4) Connect LAN-A and LAN-B by connecting the hub and switch using a cross-over cable. Ping between each pair of hosts of LAN-A and LAN-B. Now record the contents of the ARP Table of end hosts and the MAC Forwarding Table of the switch again.

RESULTS:



```

Cisco Packet Tracer PC Command Line 1.0
C:\>arp -a

Internet Address      Physical Address      Type
-----
172.17.0.1            00d0.5832.595a       dynamic

C:\>ping 172.17.0.6

Pinging 172.17.0.6 with 32 bytes of data:

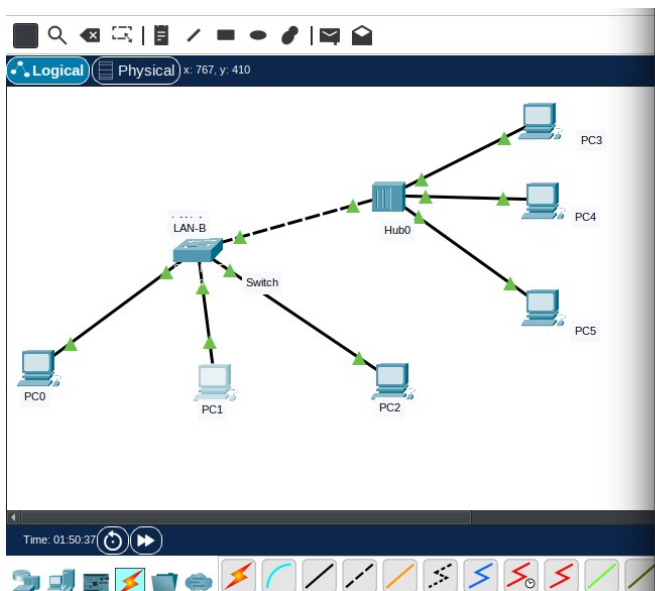
Reply from 172.17.0.6: bytes=32 time<1ms TTL=128
Reply from 172.17.0.6: bytes=32 time<1ms TTL=128
Reply from 172.17.0.6: bytes=32 time<1ms TTL=128
Reply from 172.17.0.6: bytes=32 time<1ms TTL=128

Ping statistics for 172.17.0.6:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>arp -a

Internet Address      Physical Address      Type
-----
172.17.0.1            00d0.5832.595a       dynamic
172.17.0.6            00e0.8180.754b       dynamic
C:\>

```



```
Switch>show mac-address-table
Mac Address Table
-----
Vlan    Mac Address      Type      Ports
-----
1       0001.6305.2046   DYNAMIC   Fa3/1
1       0001.6461.8216   DYNAMIC   Fa3/1
1       00e0.8f80.754b   DYNAMIC   Fa3/1
Switch>show mac-address-table
Mac Address Table
-----
Vlan    Mac Address      Type      Ports
-----
1       0001.6305.2046   DYNAMIC   Fa3/1
1       0001.6461.8216   DYNAMIC   Fa3/1
1       0090.0c98.2633   DYNAMIC   Fa1/1
1       00d0.5832.595a   DYNAMIC   Fa0/1
1       00e0.8f80.754b   DYNAMIC   Fa3/1
Switch>
```

MAC forwarding table after performing ping across LAN-A and LAN-B

Q5) Create a LAN (named JU-Main) with three hosts connected via a layer-2 switch (Cisco 2950 switch PC-LAB1-Switch). Connect the switch to a router (Cisco 1818). Assign IP addresses to all the hosts and the router interface connected to this LAN from network 192.168.148.0/24. Configure default gateway of each hosts as the IP address of the interface of the router which is connected to the LAN. Create another LAN (named JU-SL) with three hosts connected via a layer-2 switch (Cisco 2950 switch PC-LAB2-Switch). Connect this switch to another router (Cisco 1818). Assign IP addresses to all the hosts and the router interface connected to this LAN from network 192.168.149.0/24. Configure default gateway of each hosts as the IP address of the interface of the router which is connected to the LAN. Connect the two routers through appropriate WAN interfaces. Assign IP addresses to the WAN interfaces from network 192.168.150.0/24. Add static route in both of the routers to route packets between two LANs.

## RESULTS:

```
CLI
Press RETURN to get started!

Router>conf t
^
% Invalid input detected at '^' marker.

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int
% Incomplete command.
Router(config)#int Fa0/0
Router(config-if)#ip address 192.168.149.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#int Fa0/1
Router(config-if)#ip address 192.168.150.2 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

Router(config-if)#exit
Router(config)#ip route 192.168.149.0 255.255.255.0 192.168.150.1
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
```

```
CLI
Press RETURN to get started!

Router>en
Router#conf t
Translating "conf t"...domain server (255.255.255.255)
Unknown command or computer name, or unable to find computer address

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int Fa0/1
Router(config-if)#ip address 192.168.148.1 255.255.255.0
Router(config-if)#no shutdown

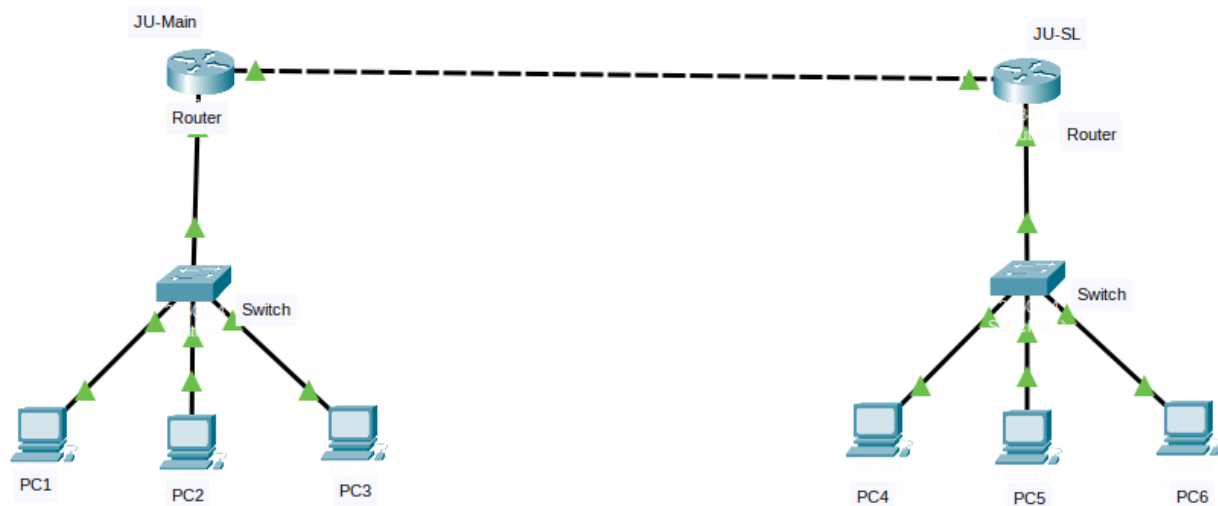
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router(config-if)#exit
Router(config)#int Fa0/0
Router(config-if)#ip address 192.168.150.1 255.255.255.254
bad mask /31 for address 192.168.150.1
Router(config-if)#ip address 192.168.150.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#ip route 192.168.148.0 255.255.255.0 192.168.150.2
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
```

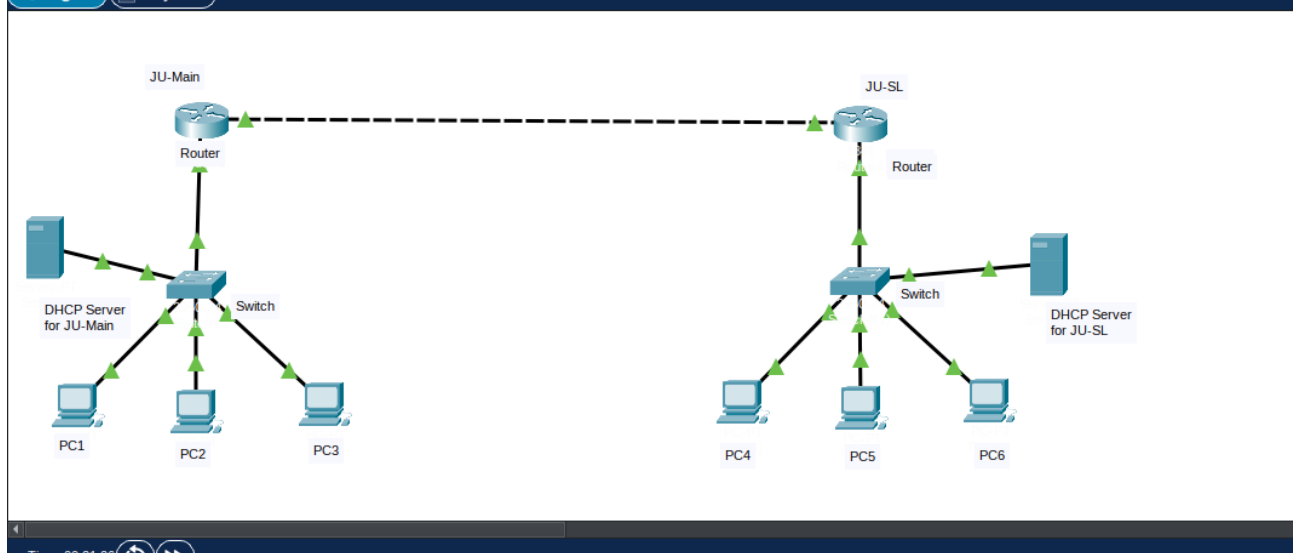
Configuration of the routers to route between 192.168.149.0/24, 192.168.148.0/24 and 192.168.150.0/24 and assigning the subnet masks.



Structure of the Network

Q6) Add servers to the individual LANs (in problem 5) and configure them as a DHCP server. Configure the hosts in the individual LAN to obtain IP addresses and address of the default gateway via this DHCP server.

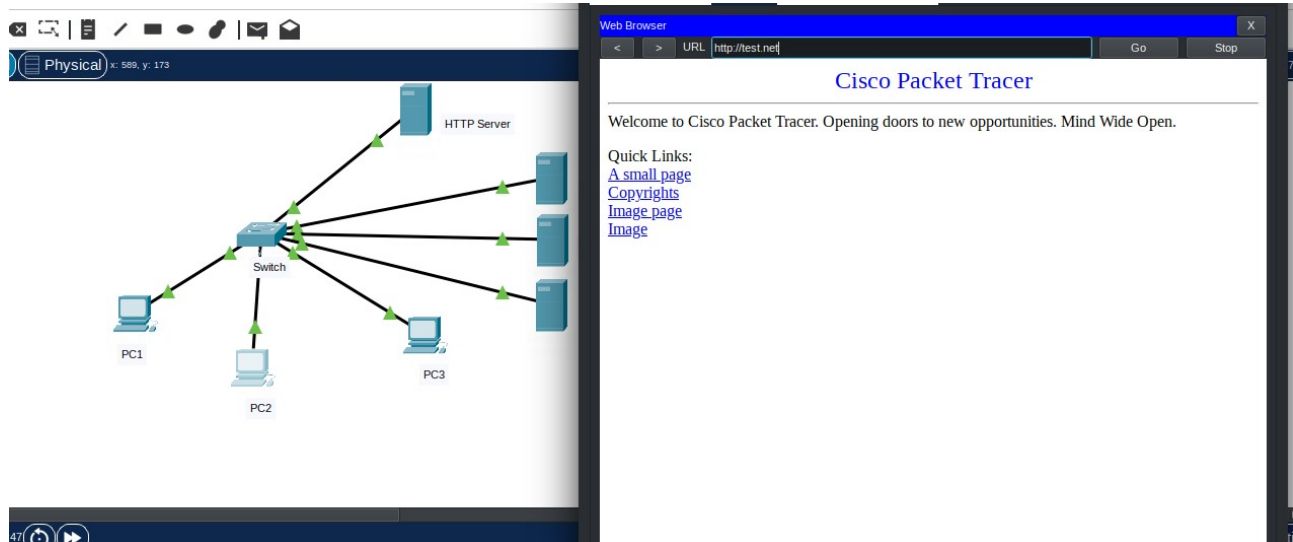
## RESULTS:



Q7) Create a LAN (CSE) with three hosts connected via a layer-2 switch (Cisco 2950 switch CSE-Switch). Also add a web server and a ftp server to this LAN. The hosts dynamically get their IP addresses from a local DHCP server. Servers are assigned fixed IP addresses. Configure the individual hosts to use the local DNS server for name resolution. Add a Domain Name Server (DNS) to this LAN. Create appropriate records in the DNS server for the individual servers in the LAN. The domain name of the LAN is cse.myuniv.edu. Configure the individual hosts to use the local DNS server for name resolution.



## RESULTS:



The bottom left shows the DNS configuration window in Cisco Packet Tracer. The "DNS Service" is set to "On". The "Resource Records" table is as follows:

No.	Name	Type	Detail
0	cse.myuniv.edu	A Record	192.168.1.2
1	dhcp.page	A Record	192.168.1.1
2	dns.page	A Record	192.168.1.2
3	ftp.page	A Record	192.168.1.4
4	web.page	A Record	192.168.1.3

The bottom right shows the "Laptop2" configuration window. The "IP Configuration" tab is selected. The "Interface" is "FastEthernet0". The "IP Configuration" section has "DHCP" selected. The "IPv4 Address" is "192.168.1.6", "Subnet Mask" is "255.255.255.0", "Default Gateway" is "0.0.0.0", and "DNS Server" is "192.168.1.2". The "IPv6 Configuration" section has "Static" selected. The "IPv6 Address" is empty, "Link Local Address" is "FE80::2D0:BAFF:FE32:96E4", and "Default Gateway" is empty.

DNS entries

IPs Assigned by DHCP server

The bottom screenshot shows the "Laptop1" configuration window. The "Web Browser" tab is selected. The "URL" is `http://web.page`. The browser displays the Cisco Packet Tracer logo and the text "Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open." Below this, it says "Hey! You're viewing the WEB server" in large, bold letters.