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CLASS: BCSE-III

GROUP: A1

ASSIGNMENT NUMBER: 6

PROBLEM STATEMENT: Use Cisco Packet Tracer Software to do the given experiments.

DEADLINE: 2nd November, 2021

DATE OF SUBMISSION: 24th November, 2021

OVERVIEW:

Cisco Packet Tracer is a cross-platform visual simulation tool designed by Cisco Systems that allows users to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated command line interface.

SYSTEM DETAILS:

OS: 64-bit Windows 10

Cisco Packet Tracer 8.0.1 (64 bit)

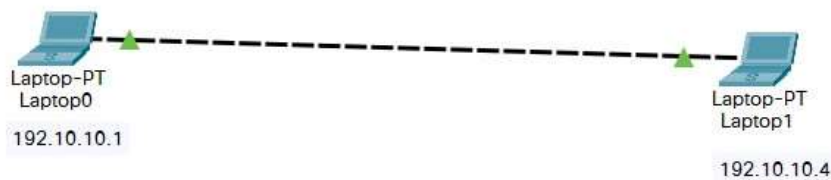
QUESTIONS

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

Two laptops Laptop0 and Laptop1 are connected with a cross-over cable. IPv4 addresses are assigned as follows:

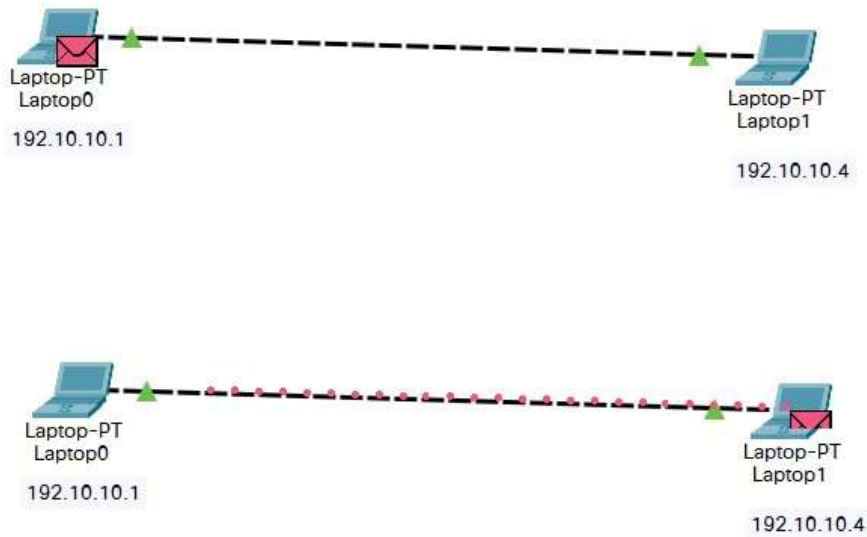
Laptop0: 192.10.10.1

Laptop1: 192.10.10.4



The connection is shown above.

The next screenshots are taken at different times when the laptops were sending pings at regular intervals (3 seconds).



The following screenshot shows the simulation panel capturing up to 12 seconds.

Simulation Panel

Event List

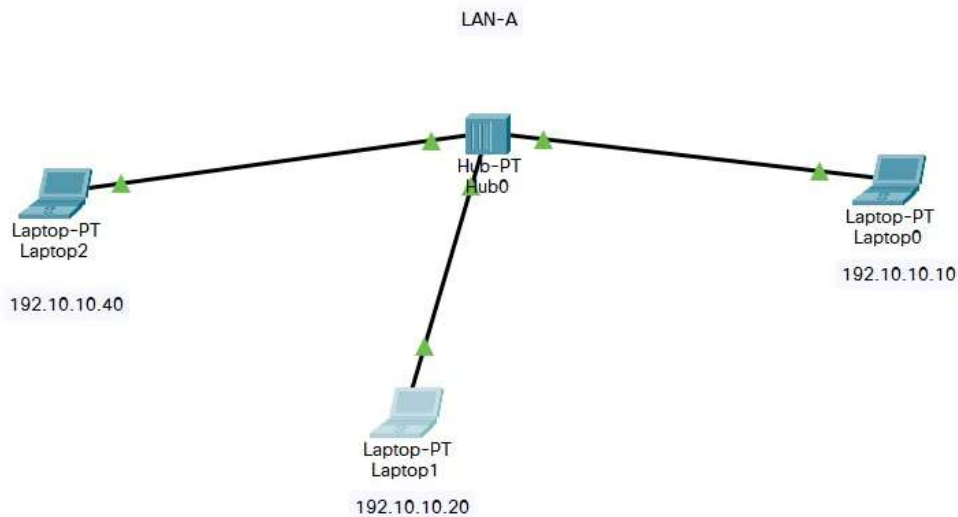
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	Laptop0	ICMP
	0.001	Laptop0	Laptop1	ICMP
	0.002	Laptop1	Laptop0	ICMP
	3.000	--	Laptop0	ICMP
	3.001	Laptop0	Laptop1	ICMP
	3.002	Laptop1	Laptop0	ICMP
	6.000	--	Laptop0	ICMP
	6.001	Laptop0	Laptop1	ICMP
	6.002	Laptop1	Laptop0	ICMP
	9.000	--	Laptop0	ICMP
	9.001	Laptop0	Laptop1	ICMP
	9.002	Laptop1	Laptop0	ICMP
Visible	12.000	--	Laptop0	ICMP

Reset Simulation
☒ Constant Delay
Captured to: 12.000 s

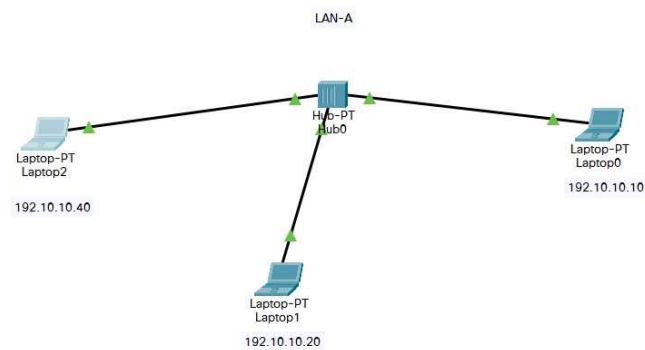
Play Controls

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

Three laptops are connected with the hub to form a Local Area Network, LAN-A. The three hosts have been assigned IPv4 addresses 192.10.10.10, 192.10.10.20 and 192.10.10.40.



Laptop2 pings Laptop0



```
Packet Tracer PC Command Line 1.0
C:\>ping 192.10.10.10

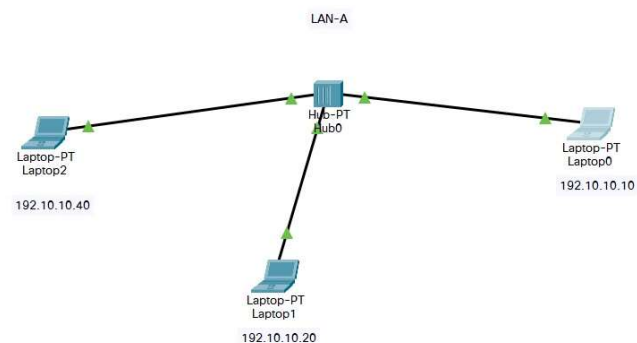
Pinging 192.10.10.10 with 32 bytes of data:

Reply from 192.10.10.10: bytes=32 time<1ms TTL=128
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Laptop0 pings Laptop1



```
Packet Tracer PC Command Line 1.0
C:\>ping 192.10.10.20

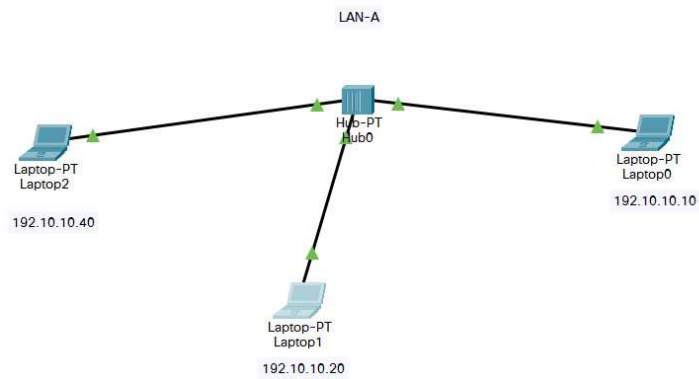
Pinging 192.10.10.20 with 32 bytes of data:

Reply from 192.10.10.20: bytes=32 time<1ms TTL=128
Reply from 192.10.10.20: bytes=32 time<1ms TTL=128
Reply from 192.10.10.20: bytes=32 time<1ms TTL=128
Reply from 192.10.10.20: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

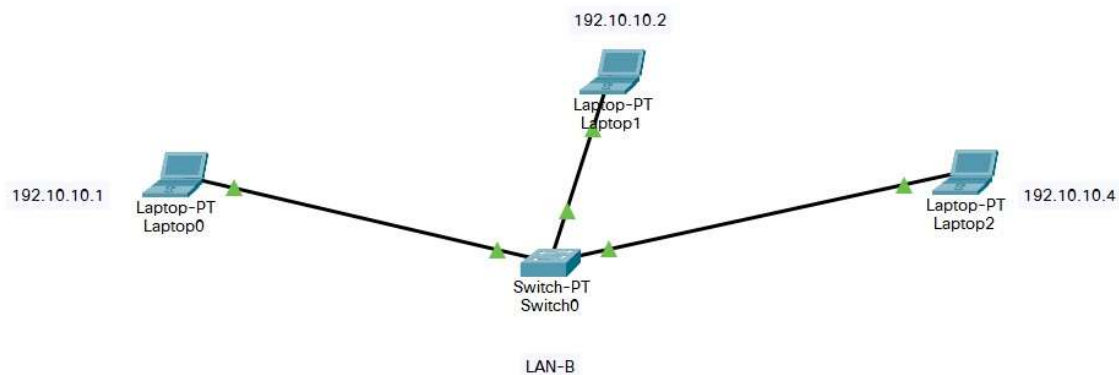
Laptop1 pings Laptop2



```
Laptop1
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.10.10.40
Pinging 192.10.10.40 with 32 bytes of data:
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128
Reply from 192.10.10.40: bytes=32 time=7ms TTL=128
Ping statistics for 192.10.10.40:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 7ms, Average = 1ms
C:\>
```

3. 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.

Three hosts, Laptop0, Laptop1 and Laptop2 are connected using a switch to form a LAN, LAN-B.



BEFORE PINGING:

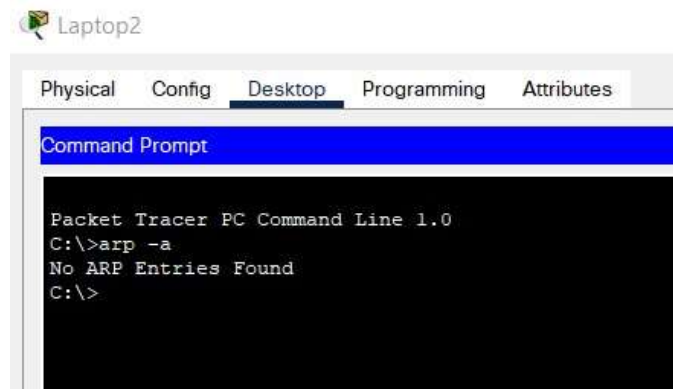
Contents of ARP Table of Laptop0

```
Laptop0
Physical Config Desktop Programming
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>arp
Packet Tracer PC ARP
Display ARP entries: arp -a
Clear ARP table: arp -d
C:\>arp -a
No ARP Entries Found
C:\>
```

Contents of ARP Table of Laptop1

```
Laptop1
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>arp -a
No ARP Entries Found
C:\>
```

Contents of ARP Table of Laptop2



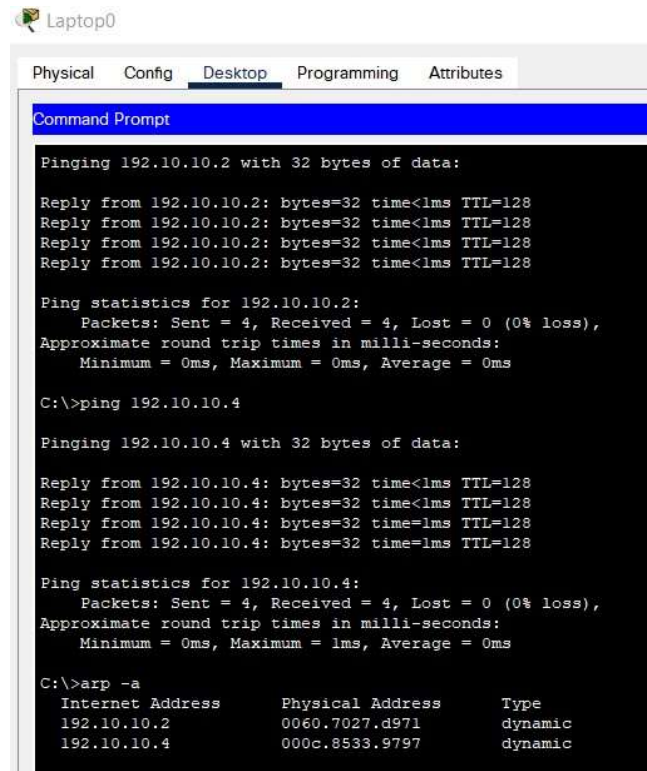
Contents of the MAC forwarding table of the switch

```
%SYS-5-CONFIG_I: Configured from console by console

Switch#show mac-address-table
      Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
Switch#
```

AFTER PINGING EACH PAIR OF NODES:

Contents of ARP Table of Laptop0

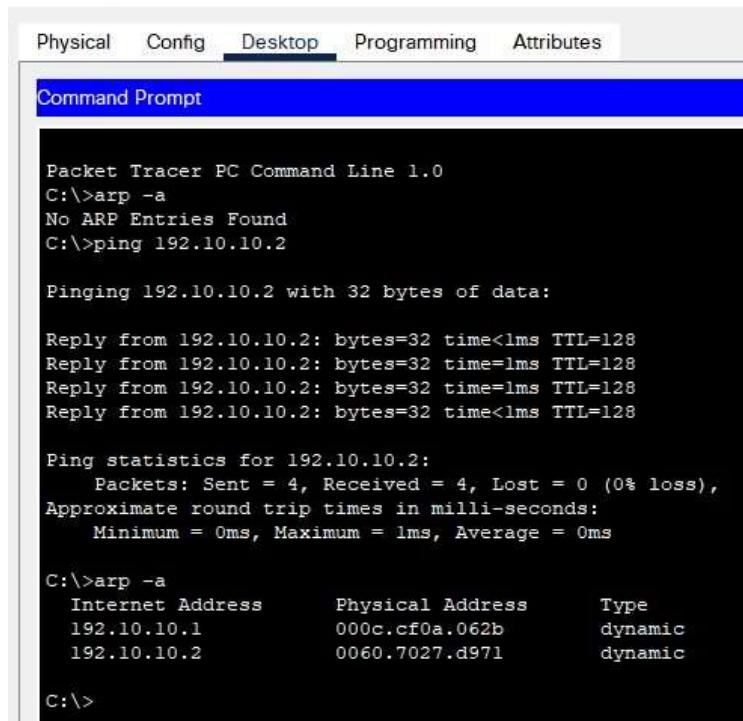


Contents of ARP Table of Laptop1

```
C:\>arp -a
Internet Address      Physical Address      Type
192.10.10.1           000c.cf0a.062b        dynamic
192.10.10.4           000c.8533.9797        dynamic
```

Contents of ARP Table of Laptop2

 Laptop2



The screenshot shows the Desktop tab of a Packet Tracer laptop named Laptop2. A Command Prompt window is open, displaying the following text:

```
Packet Tracer PC Command Line 1.0
C:\>arp -a
No ARP Entries Found
C:\>ping 192.10.10.2

Pinging 192.10.10.2 with 32 bytes of data:

Reply from 192.10.10.2: bytes=32 time<1ms TTL=128
Reply from 192.10.10.2: bytes=32 time=1ms TTL=128
Reply from 192.10.10.2: bytes=32 time=1ms TTL=128
Reply from 192.10.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

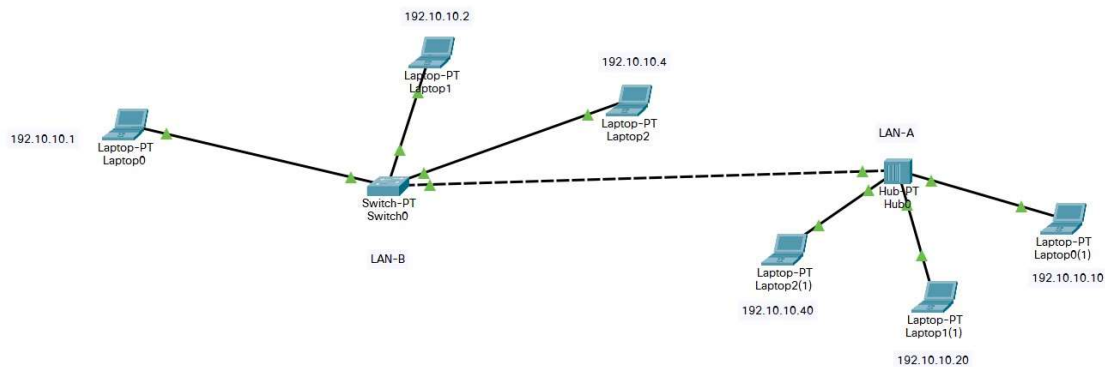
C:\>arp -a
Internet Address      Physical Address      Type
192.10.10.1           000c.cf0a.062b        dynamic
192.10.10.2           0060.7027.d971        dynamic
C:\>
```

Contents of the MAC forwarding table of the switch

```
Switch#show mac-address-table
Mac Address Table
-----
Vlan    Mac Address          Type    Ports
----    -
1       000c.8533.9797       DYNAMIC Fa2/1
1       000c.cf0a.062b       DYNAMIC Fa0/1
1       0060.7027.d971       DYNAMIC Fa1/1
Switch#
```

4. 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.

LAN-A and LAN-B are connected using a cross-over cable between their hub and switch respectively.



After each pair of hosts of LAN-A and LAN-B are pinged,

ARP Table of Laptop0 in LAN-A (192.10.10.1)

Laptop0

Physical Config Desktop Programming Attributes

Command Prompt

```

Reply from 192.10.10.10: bytes=32 time<1ms TTL=128
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.10.10.40

Pinging 192.10.10.40 with 32 bytes of data:

Reply from 192.10.10.40: bytes=32 time<1ms TTL=128
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.40:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>arp -a
Internet Address      Physical Address      Type
192.10.10.2           0030.a33c.d287       dynamic
192.10.10.4           00e0.8f01.c8e7       dynamic
192.10.10.10          000b.be4c.9102       dynamic
192.10.10.20          0007.ecba.e97b       dynamic
192.10.10.40          00e0.f964.64d3       dynamic
  
```


ARP Table of Laptop1 in LAN-A (192.10.10.2)

Laptop1

Physical Config Desktop Programming Attributes

Command Prompt

```
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.10.10.40

Pinging 192.10.10.40 with 32 bytes of data:

Reply from 192.10.10.40: bytes=32 time<1ms TTL=128
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.40:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>arp -a
```

Internet Address	Physical Address	Type
192.10.10.1	0060.7007.8885	dynamic
192.10.10.4	00e0.8f01.c8e7	dynamic
192.10.10.10	000b.be4c.9102	dynamic
192.10.10.20	0007.ecba.e97b	dynamic
192.10.10.40	00e0.f964.64d3	dynamic

ARP Table of Laptop2 in LAN-A (192.10.10.4)

Laptop2

Physical Config Desktop Programming Attributes

Command Prompt

```
Reply from 192.10.10.20: bytes=32 time<1ms TTL=128
Reply from 192.10.10.20: bytes=32 time<1ms TTL=128
Reply from 192.10.10.20: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.10.10.40

Pinging 192.10.10.40 with 32 bytes of data:

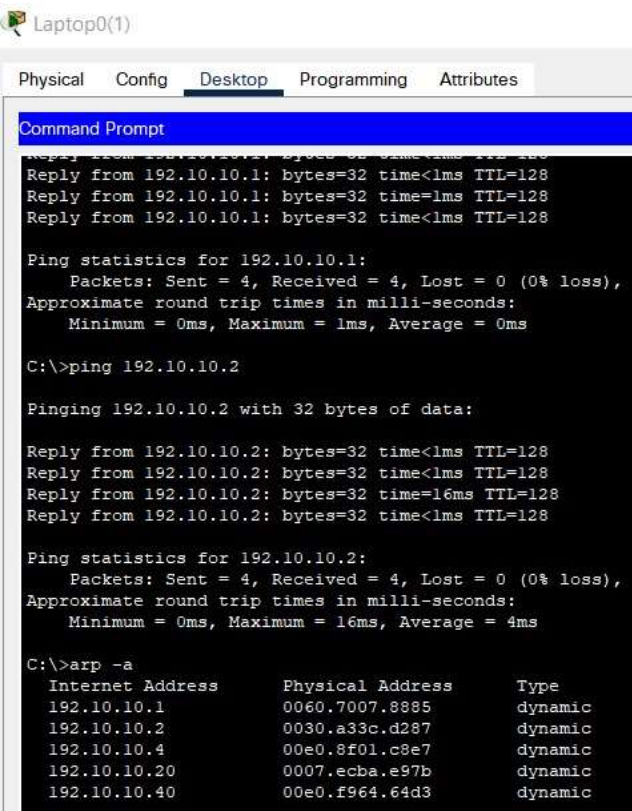
Reply from 192.10.10.40: bytes=32 time=3ms TTL=128
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128
Reply from 192.10.10.40: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.40:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 3ms, Average = 0ms

C:\>arp -a
```

Internet Address	Physical Address	Type
192.10.10.1	0060.7007.8885	dynamic
192.10.10.2	0030.a33c.d287	dynamic
192.10.10.10	000b.be4c.9102	dynamic
192.10.10.20	0007.ecba.e97b	dynamic
192.10.10.40	00e0.f964.64d3	dynamic

ARP Table of Laptop0 in LAN-B (192.10.10.10)



The screenshot shows a Windows Command Prompt window titled "Laptop0(1)". The window has tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes", with "Desktop" selected. The Command Prompt displays the following output:

```
Reply from 192.10.10.1: bytes=32 time<1ms TTL=128
Reply from 192.10.10.1: bytes=32 time<1ms TTL=128
Reply from 192.10.10.1: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.10.10.2

Pinging 192.10.10.2 with 32 bytes of data:

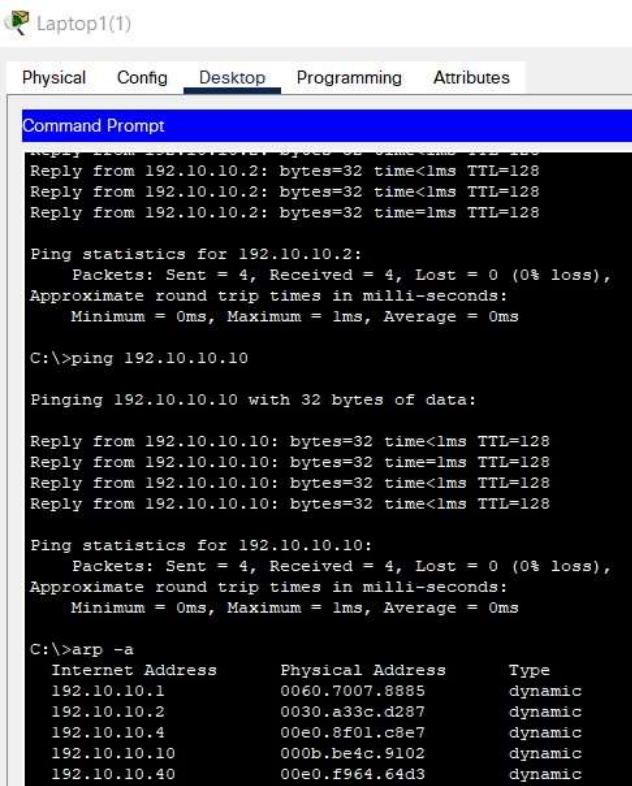
Reply from 192.10.10.2: bytes=32 time<1ms TTL=128
Reply from 192.10.10.2: bytes=32 time<1ms TTL=128
Reply from 192.10.10.2: bytes=32 time=16ms TTL=128
Reply from 192.10.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 16ms, Average = 4ms

C:\>arp -a

Internet Address      Physical Address      Type
192.10.10.1           0060.7007.8885       dynamic
192.10.10.2           0030.a33c.d287       dynamic
192.10.10.4           00e0.8f01.c8e7       dynamic
192.10.10.20          0007.ecba.e97b       dynamic
192.10.10.40          00e0.f964.64d3       dynamic
```

ARP Table of Laptop1 in LAN-B (192.10.10.20)



The screenshot shows a Windows Command Prompt window titled "Laptop1(1)". The window has tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes", with "Desktop" selected. The Command Prompt displays the following output:

```
Reply from 192.10.10.2: bytes=32 time<1ms TTL=128
Reply from 192.10.10.2: bytes=32 time<1ms TTL=128
Reply from 192.10.10.2: bytes=32 time=1ms TTL=128

Ping statistics for 192.10.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.10.10.10

Pinging 192.10.10.10 with 32 bytes of data:

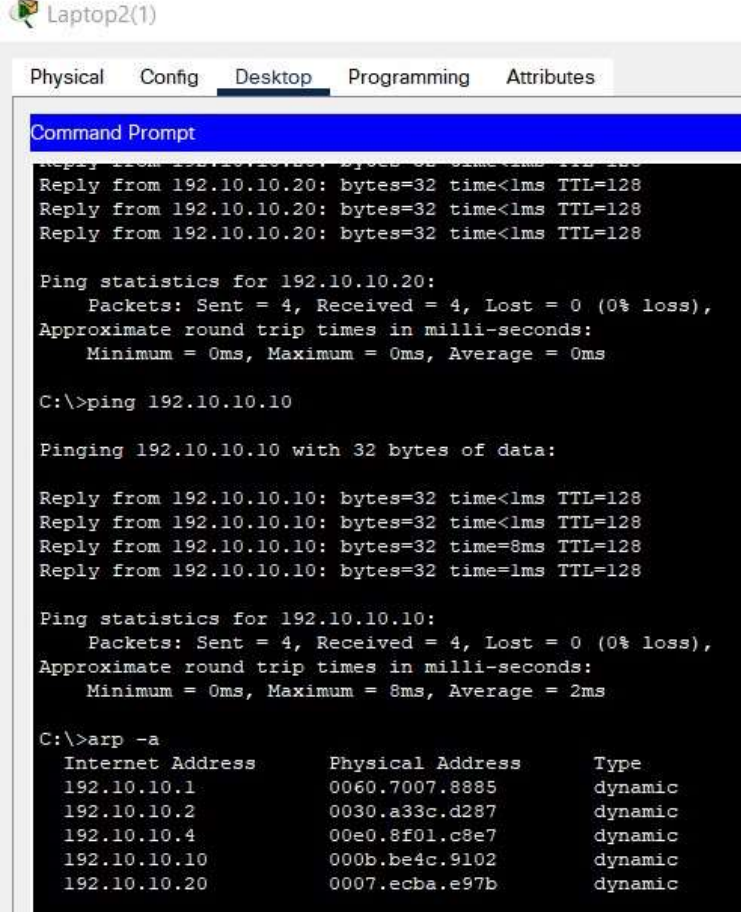
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128
Reply from 192.10.10.10: bytes=32 time=1ms TTL=128
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.10:
    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
192.10.10.1           0060.7007.8885       dynamic
192.10.10.2           0030.a33c.d287       dynamic
192.10.10.4           00e0.8f01.c8e7       dynamic
192.10.10.10          000b.be4c.9102       dynamic
192.10.10.40          00e0.f964.64d3       dynamic
```

ARP Table of Laptop2 in LAN-B (192.10.10.40)



The screenshot shows a Windows Command Prompt window titled "Laptop2(1)". The window has tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes", with "Desktop" currently selected. The command prompt displays the following text:

```
Command Prompt

Reply from 192.10.10.20: bytes=32 time<1ms TTL=128
Reply from 192.10.10.20: bytes=32 time<1ms TTL=128
Reply from 192.10.10.20: bytes=32 time<1ms TTL=128

Ping statistics for 192.10.10.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.10.10.10

Pinging 192.10.10.10 with 32 bytes of data:

Reply from 192.10.10.10: bytes=32 time<1ms TTL=128
Reply from 192.10.10.10: bytes=32 time<1ms TTL=128
Reply from 192.10.10.10: bytes=32 time=8ms TTL=128
Reply from 192.10.10.10: bytes=32 time=1ms TTL=128

Ping statistics for 192.10.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms

C:\>arp -a

Internet Address      Physical Address      Type
192.10.10.1           0060.7007.8885       dynamic
192.10.10.2           0030.a33c.d287       dynamic
192.10.10.4           00e0.8f01.c8e7       dynamic
192.10.10.10          000b.be4c.9102       dynamic
192.10.10.20          0007.ecba.e97b       dynamic
```

MAC Forwarding Table of the switch (switch0)

```
Switch#show mac-address-table
      Mac Address Table
-----
Vlan    Mac Address      Type        Ports
----    -
1       0007.ecba.e97b   DYNAMIC     Fa3/1
1       000b.be4c.9102   DYNAMIC     Fa3/1
1       0030.a33c.d287   DYNAMIC     Fa1/1
1       0060.7007.8885   DYNAMIC     Fa0/1
1       00e0.8f01.c8e7   DYNAMIC     Fa2/1
1       00e0.f964.64d3   DYNAMIC     Fa3/1
Switch#
```

The hub is connected to port Fa3/1 using cross-over cable. The hosts Laptop0, Laptop1 and Laptop2 in LAN-A are connected to the switch at ports Fa0/1, Fa1/1 and Fa2/1 respectively.

5. 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.

LAN named JU-Main is created with three hosts, PC0, PC1 and PC2 connected using PC-LAB1-Switch (Cisco 2950T-24). The switch is connected to a router, Router0 (Cisco 2911 --- Cisco 1818 is not available in current version of Packet Tracer). IP Addresses are assigned as follows:

PC0: 192.168.148.1 PC1: 192.168.148.2 PC2: 192.168.148.3

Router0 Interface connected to JU-Main: 192.168.148.4

The default gateway for each host is configured as 192.168.148.4.

LAN named JU-SL is created with three hosts, PC3, PC4 and PC5 connected using PC-LAB2-Switch (Cisco 2950T-24). The switch is connected to a router, Router1 (Cisco 2911 --- Cisco 1818 is not available in current version of Packet Tracer). IP Addresses are assigned as follows:

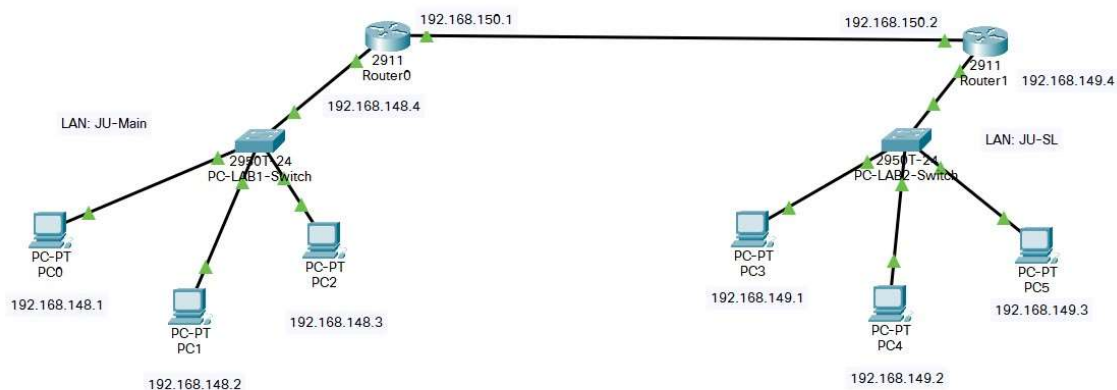
PC3: 192.168.149.1 PC4: 192.168.149.2 PC5: 192.168.149.3

Router1 Interface connected to JU-SL: 192.168.149.4

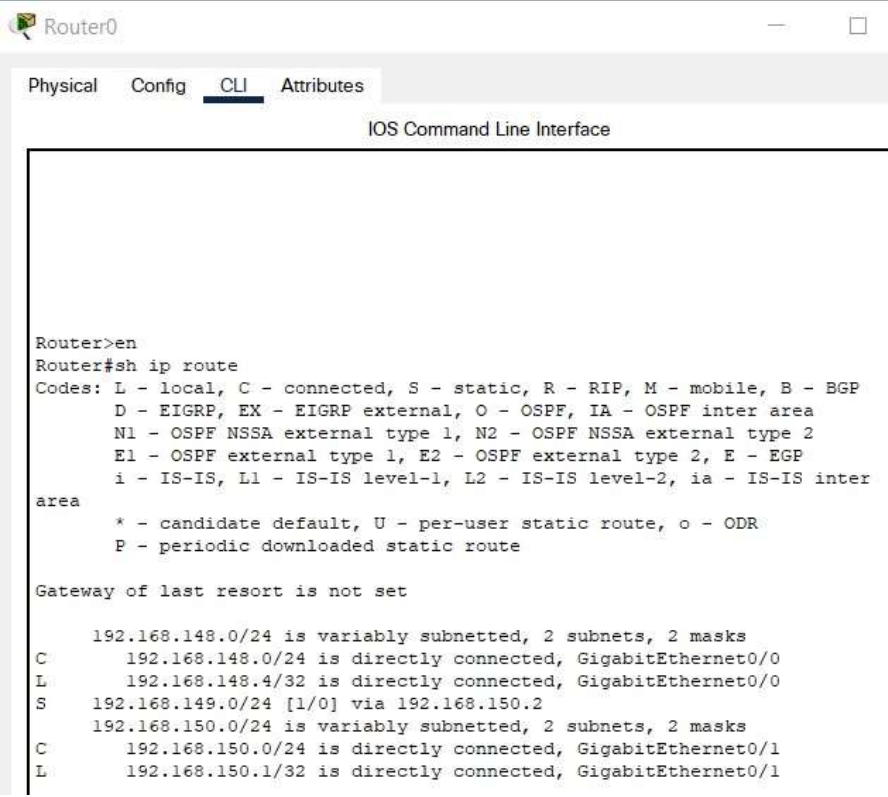
The default gateway for each host is configured as 192.168.149.4.

WAN Interface of Router0 is assigned IP Address 192.168.150.1 while WAN Interface of Router1 is assigned IP Address 192.168.150.2.

Static Route is added in both routers to route packets between JU-Main and JU-SL.



Router0 IP Route



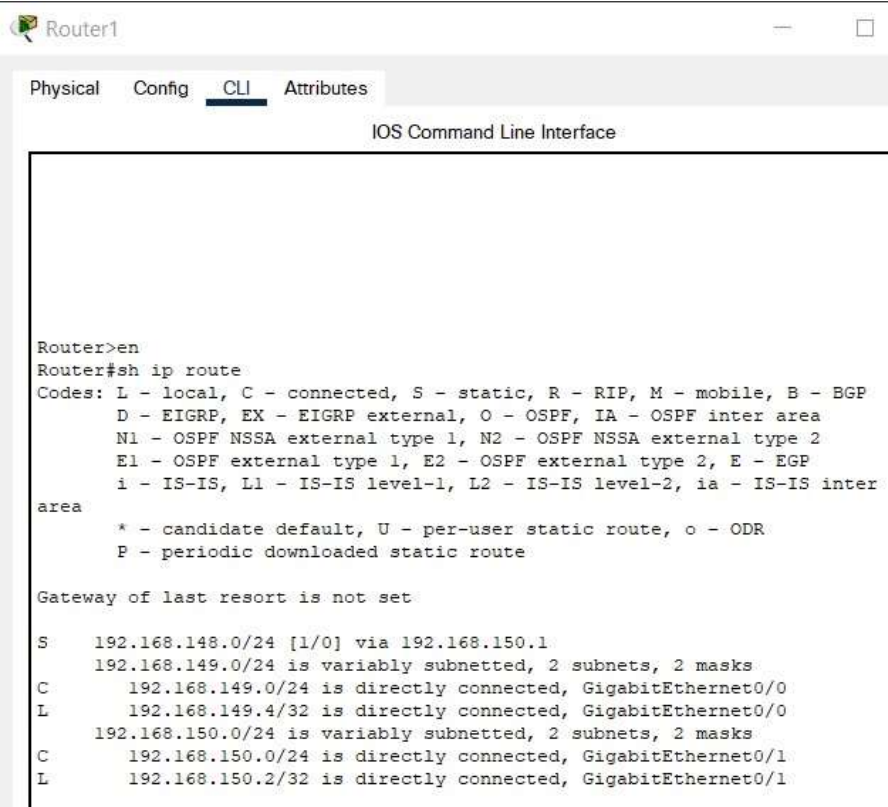
```
Router0
Physical Config CLI Attributes
IOS Command Line Interface

Router>en
Router#sh ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
        area
        * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route

Gateway of last resort is not set

    192.168.148.0/24 is variably subnetted, 2 subnets, 2 masks
    C       192.168.148.0/24 is directly connected, GigabitEthernet0/0
    L       192.168.148.4/32 is directly connected, GigabitEthernet0/0
    S       192.168.149.0/24 [1/0] via 192.168.150.2
    192.168.150.0/24 is variably subnetted, 2 subnets, 2 masks
    C       192.168.150.0/24 is directly connected, GigabitEthernet0/1
    L       192.168.150.1/32 is directly connected, GigabitEthernet0/1
```

Router1 IP Route



```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

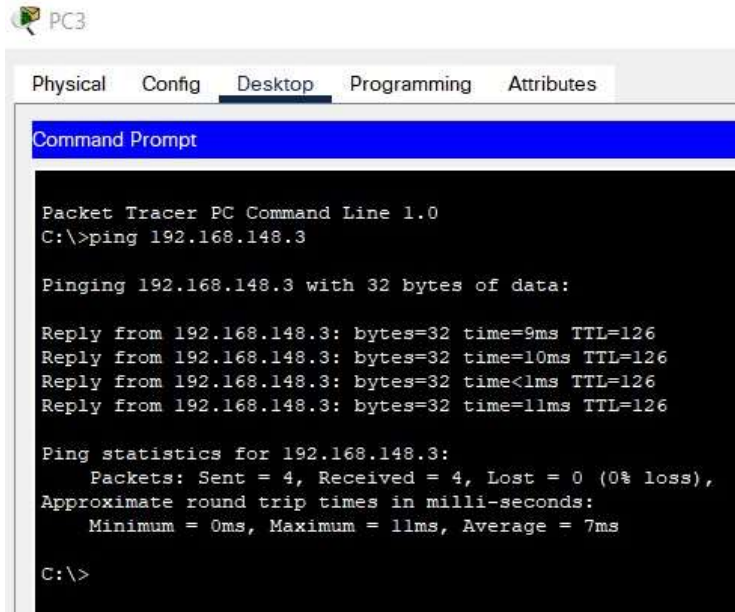
Router>en
Router#sh ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
        area
        * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route

Gateway of last resort is not set

    S       192.168.148.0/24 [1/0] via 192.168.150.1
    192.168.149.0/24 is variably subnetted, 2 subnets, 2 masks
    C       192.168.149.0/24 is directly connected, GigabitEthernet0/0
    L       192.168.149.4/32 is directly connected, GigabitEthernet0/0
    192.168.150.0/24 is variably subnetted, 2 subnets, 2 masks
    C       192.168.150.0/24 is directly connected, GigabitEthernet0/1
    L       192.168.150.2/32 is directly connected, GigabitEthernet0/1
```

To check whether packets can be successfully routed between the LANs,

1. Ping PC2 (JU-Main) from PC3 (JU-SL)



The screenshot shows the Packet Tracer PC Command Line interface for PC3. The 'Desktop' tab is selected. The command prompt displays the results of a ping command to 192.168.148.3. The output shows four successful replies with varying times and a 0% loss rate.

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.148.3

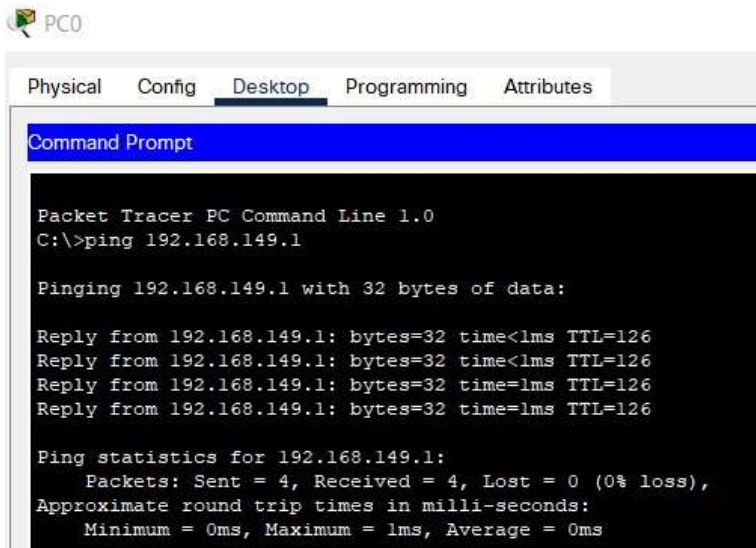
Pinging 192.168.148.3 with 32 bytes of data:

Reply from 192.168.148.3: bytes=32 time=9ms TTL=126
Reply from 192.168.148.3: bytes=32 time=10ms TTL=126
Reply from 192.168.148.3: bytes=32 time<1ms TTL=126
Reply from 192.168.148.3: bytes=32 time=11ms TTL=126

Ping statistics for 192.168.148.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 7ms

C:\>
```

2. Ping PC3 (JU-SL) from PC0 (JU-Main)



The screenshot shows the Packet Tracer PC Command Line interface for PC0. The 'Desktop' tab is selected. The command prompt displays the results of a ping command to 192.168.149.1. The output shows four successful replies with a time of less than 1ms and a 0% loss rate.

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.149.1

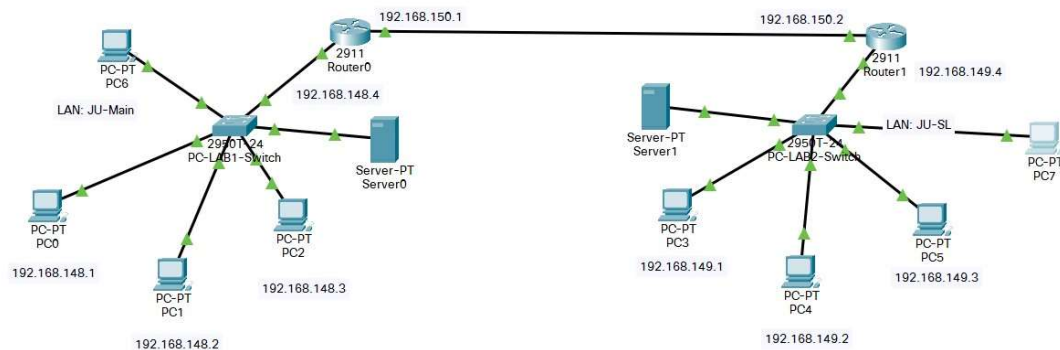
Pinging 192.168.149.1 with 32 bytes of data:

Reply from 192.168.149.1: bytes=32 time<1ms TTL=126
Reply from 192.168.149.1: bytes=32 time<1ms TTL=126
Reply from 192.168.149.1: bytes=32 time=1ms TTL=126
Reply from 192.168.149.1: bytes=32 time=1ms TTL=126

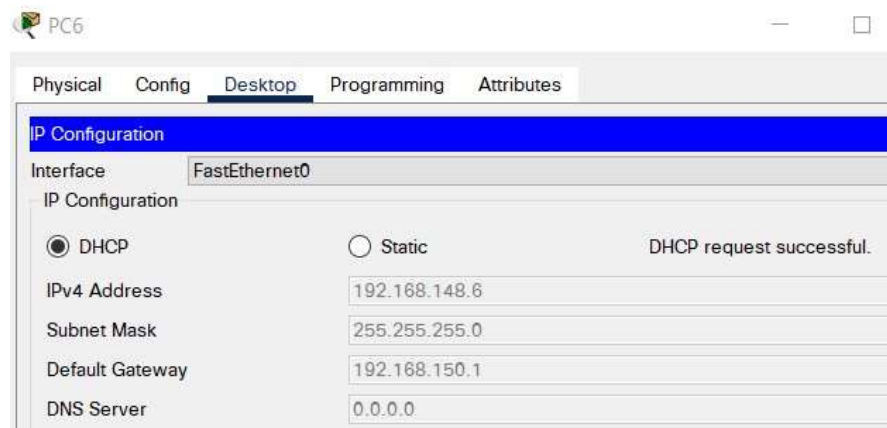
Ping statistics for 192.168.149.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

6. 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.

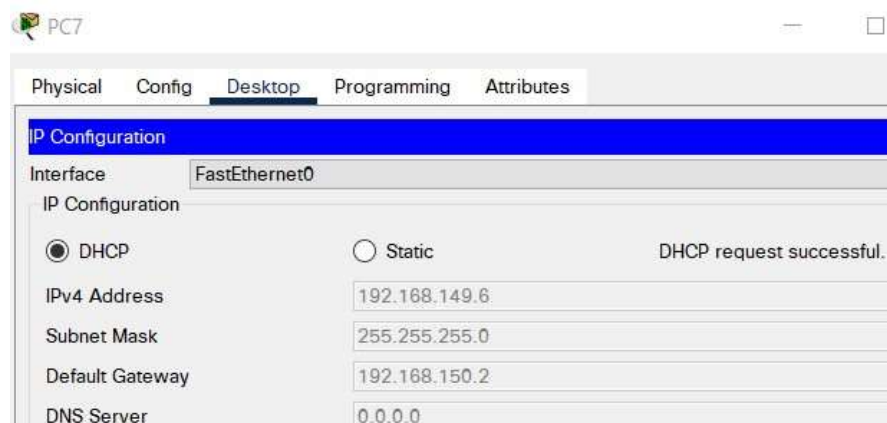
Server0 and Server1 are added to the LANs, JU-Main and JU-SL, respectively and configured as DHCP servers. A new host is added to each LAN so that we can check whether IP addresses are properly assigned to them by the DHCP server.



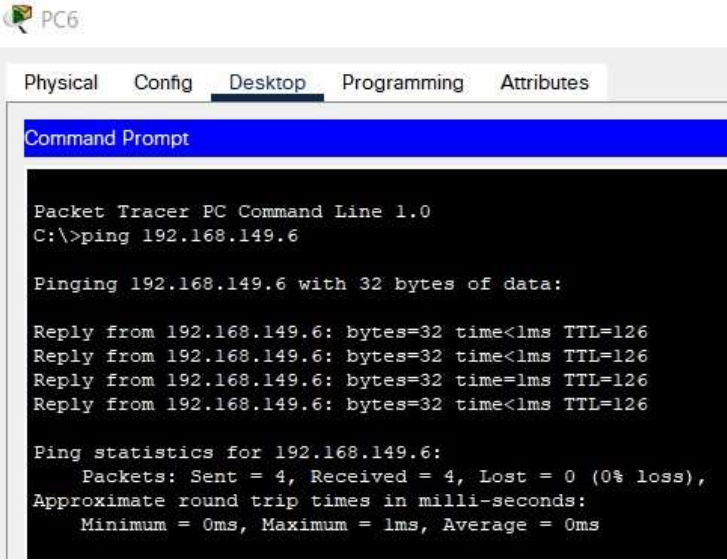
A new PC (PC6) is added to JU-Main and assigned IP Address 192.168.148.6 by the server.



A new PC (PC7) is added to JU-SL and assigned IP Address 192.168.149.6 by the server.



To check the connectivity, we ping PC7 from PC6.



The screenshot shows the Packet Tracer interface for PC6. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The command prompt shows the execution of a ping command to the IP address 192.168.149.6. The output indicates that all four packets were successfully received with 0% loss, and the round trip times are all 0ms.

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.149.6

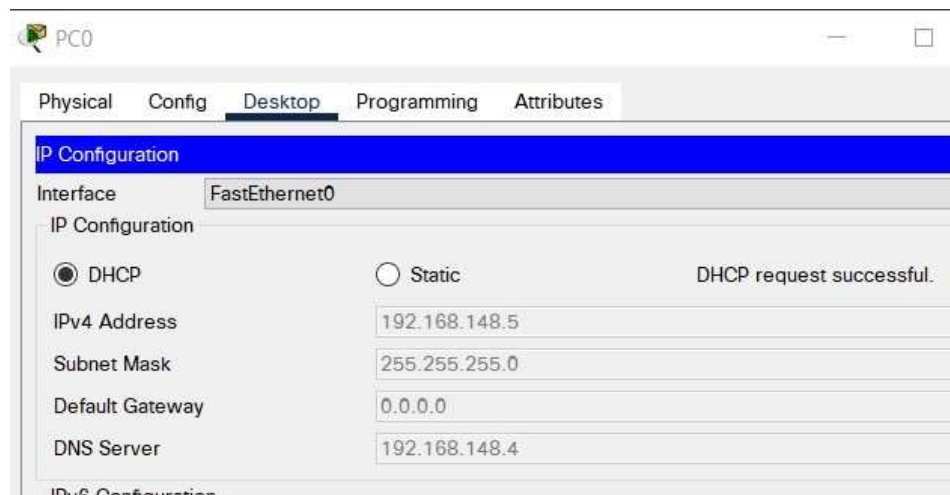
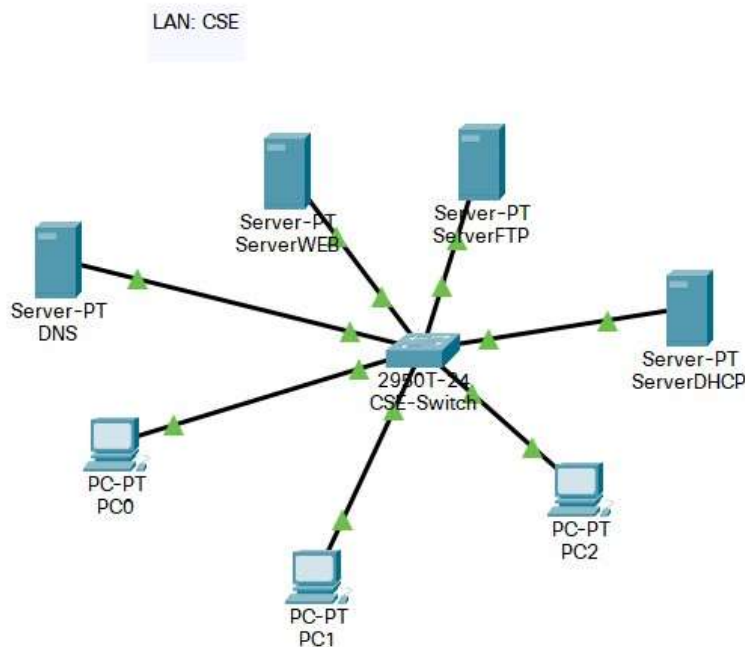
Pinging 192.168.149.6 with 32 bytes of data:

Reply from 192.168.149.6: bytes=32 time<1ms TTL=126
Reply from 192.168.149.6: bytes=32 time<1ms TTL=126
Reply from 192.168.149.6: bytes=32 time=1ms TTL=126
Reply from 192.168.149.6: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.149.6:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

7. 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.

Three hosts PC0, PC1 and PC2 are connected using Cisco 2950 switch, CSE-Switch. ServerDHCP is the local DHCP Server and is assigned IP Address 192.168.148.1. ServerWEB is the web server (192.168.148.2) and ServerFTP is the FTP Server (192.168.148.3). DNS is the local DNS Server added (192.168.148.4). The hosts dynamically get their IP Addresses from ServerDHCP and are configured to use DNS (192.168.148.4) for name resolution.



PC1

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static DHCP request successful.

IPv4 Address 192.168.148.6

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 192.168.148.4

PC2

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static DHCP request successful.

IPv4 Address 192.168.148.7

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 192.168.148.4

The local DNS server is used for name resolution.

Records in the local DNS Server:

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name Type A Record ▾

Address

Add Save Remove

No.	Name	Type	Detail
0	cse.myuniv.edu	A Record	192.168.148.4
1	dhcp.in	A Record	192.168.148.1
2	ftp.in	A Record	192.168.148.3
3	web.in	A Record	192.168.148.2

For checking the working of the name resolution, a host (PC0) uses the web browser to go to the image page for each server by using the name of the server.





COMMENTS

This assignment was very interesting and it helped me to easily explore how data traverses through a network. Designing and building networks of various sizes was a good way to practice the topics we learnt about in our theory class and simulate the real-world networks and how they are connected to each other. I also learnt how to work with the Cisco Packet Tracer tool and the experience was highly rewarding.