

Network Assignment 6

Name: - Santanu Mandal

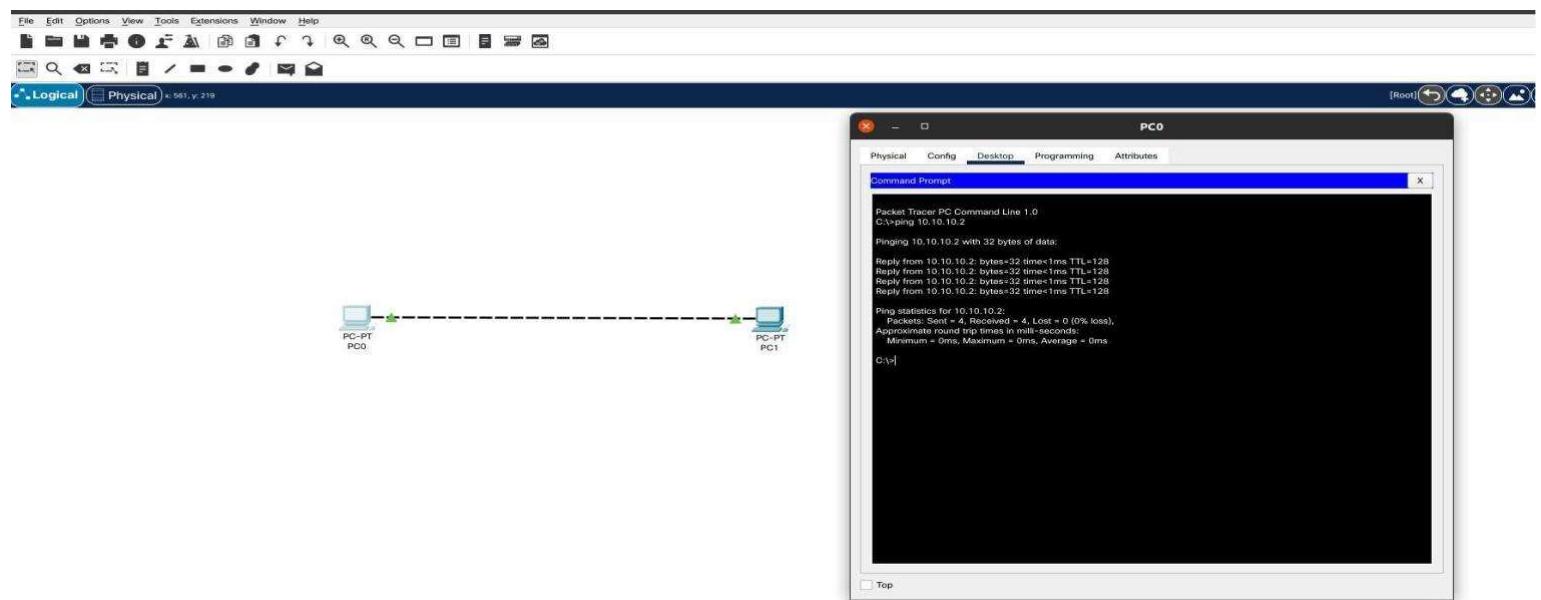
Roll: - 002010501102

Overview:

This entire assignment has been done using the CISCO Packet tracer tool.

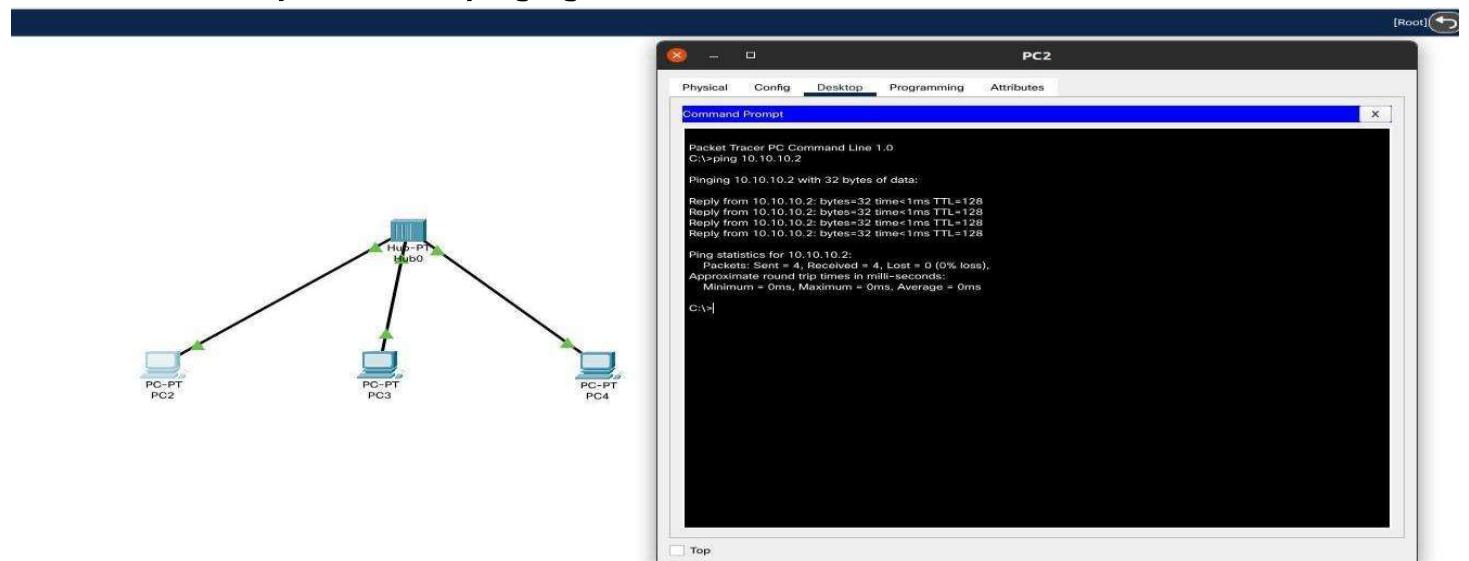
System: Linux (Ubuntu 22.04), hp, (i3 5 th gen octa core processor)

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

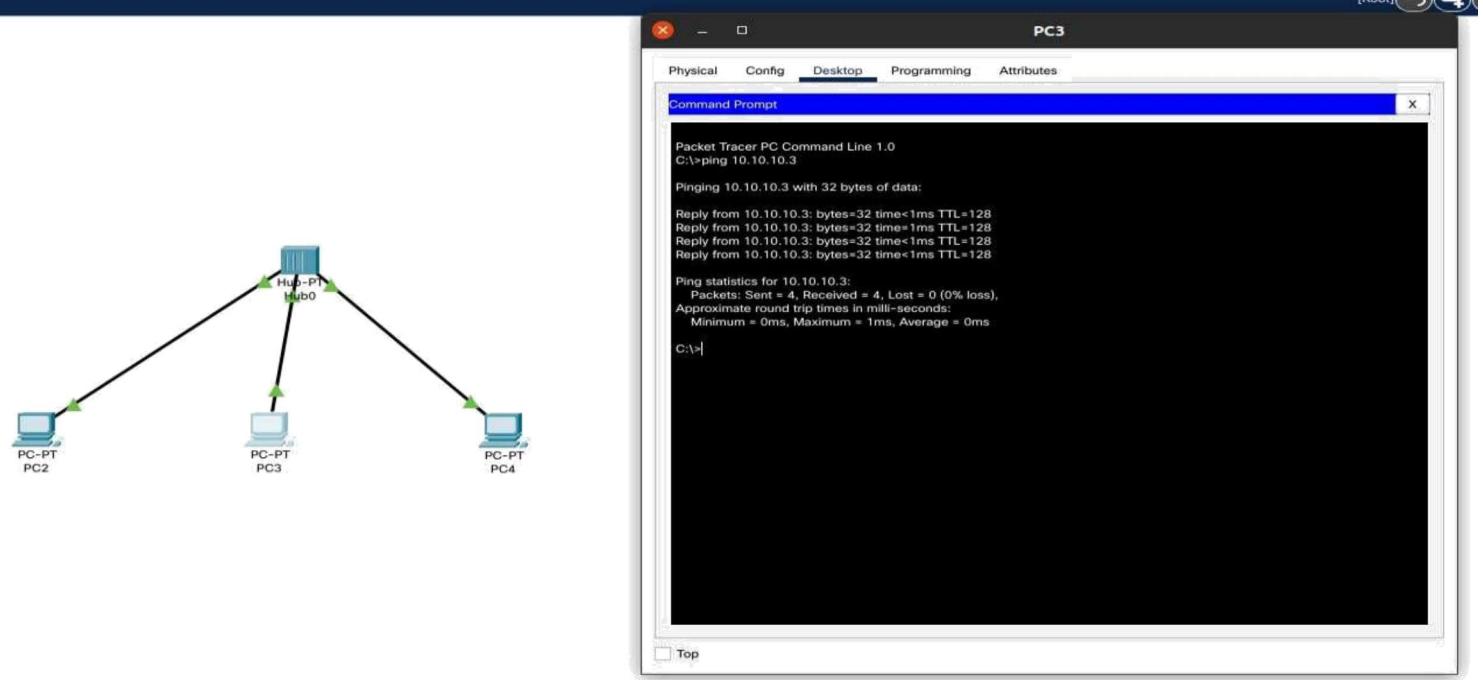


1. Create a LAN (named LAN-A) with 3 hosts using a hub. Ping each pair of

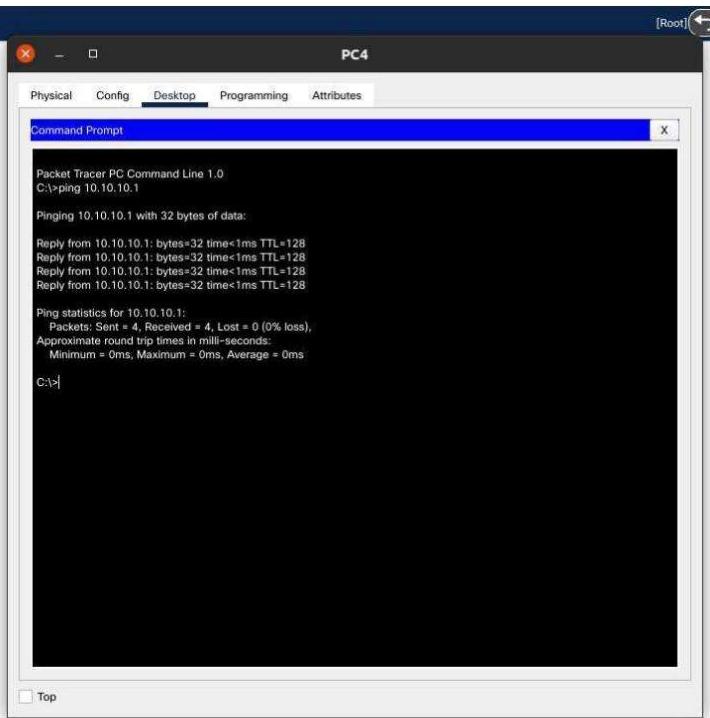
nodes. host with ip 10.10.10.1 pinging to 10.10.10.2



host with ip 10.10.10.2 pinging to 10.10.10.3



host with ip 10.10.10.3 pinging to 10.10.10.1



2. 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.

Initial contents of the MAC Address table for the switch

switch2

Physical Config CLI Attributes

IOS Command Line Interface

```
* 1 26 WS-C2960-24TT-L 15.0(2)SE4 C2960-LANBASEK9-M
Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M), Version 15.0(2)SE4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2013 by Cisco Systems, Inc.
Compiled Wed Jun 26 02:49 by mnguyen

Press RETURN to get started!

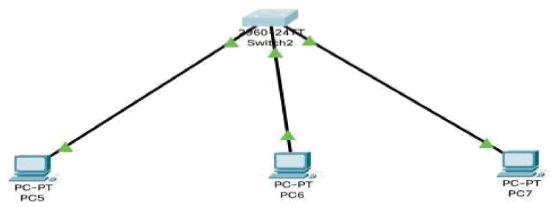
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINKPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINKPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINKPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

Switch>EN
Switch#show mac-address-table
Mac Address Table

Vlan Mac Address Type Ports
-----
```

Ctrl+F6 to exit CLI focus

Copy Paste Top



ARP Record of host 1 before sending

PCS

Physical Config Desktop Programming Attributes

Command Prompt

```
C:\>ping 20.20.20.2
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 20.20.20.2
Pinging 20.20.20.2 with 32 bytes of data:
Reply from 20.20.20.2: bytes=32 time<1ms TTL=128

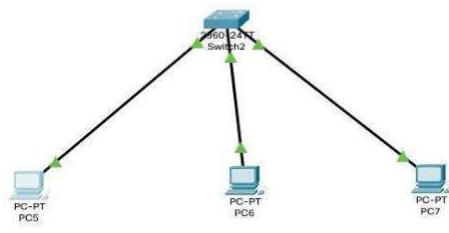
Ping statistics for 20.20.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>arp -a
No ARP Entries Found
C:\>ping 20.20.20.2
Pinging 20.20.20.2 with 32 bytes of data:
Reply from 20.20.20.2: bytes=32 time<1ms TTL=128

Ping statistics for 20.20.20.2:
    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
20.20.20.2          0006.2ac3.ca43  dynamic
C:\>
```

Top



ARP Record of host 1 after pinging host 2

PCS

Physical Config Desktop Programming Attributes

Command Prompt

```
C:\>ping 20.20.20.2
Packet Tracer PC Command Line 1.0
C:\>ping 20.20.20.2
Pinging 20.20.20.2 with 32 bytes of data:
Reply from 20.20.20.2: bytes=32 time<1ms TTL=128

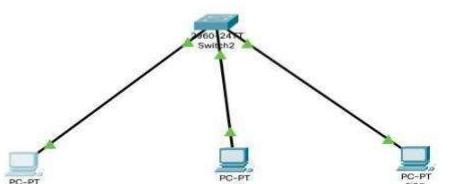
Ping statistics for 20.20.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 20.20.20.2
Pinging 20.20.20.2 with 32 bytes of data:
Reply from 20.20.20.2: bytes=32 time<1ms TTL=128

Ping statistics for 20.20.20.2:
    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
No ARP Entries Found
C:\>
```

Top



MAC Address Table of the switch after a ping operation from host1 -> host2

```

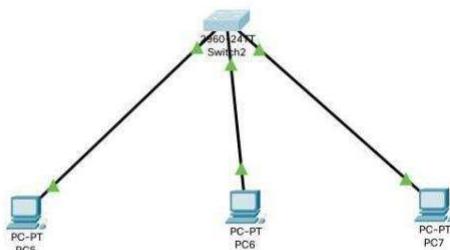
Switch2
Physical Config CLI Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINK-5-CHANGED: Line protocol on Interface FastEthernet0/3, changed state to up

Switch#sh mac-address-table
Mac Address Table

Vlan Mac Address Type Ports
---- -----
Switch#show arp-table
A
% Invalid input detected at "A" marker.
Switch#show arp
Switch#sh mac-address-table
Mac Address Table

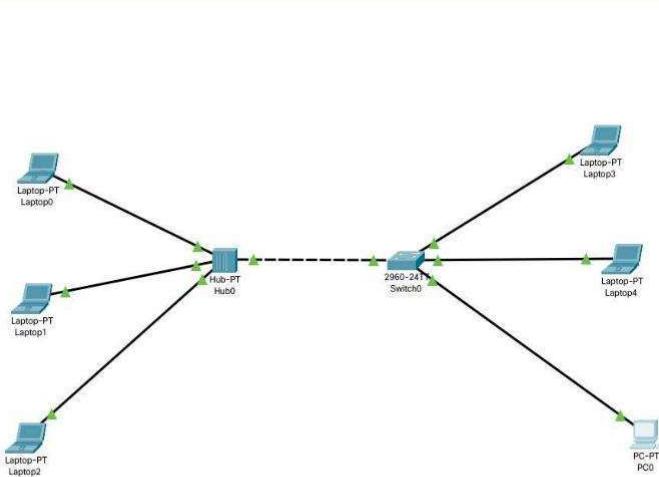
Vlan Mac Address Type Ports
---- -----
1 0006.2ac3.ca43 DYNAMIC Fa0/2
1 00d0.d39c.781d DYNAMIC Fa0/1
Switch#f
Ctrl+F6 to exit CLI focus
Copy Paste
Top

```



3. Connect LAN-A and LAN-B by connecting the hub and switch using a crossoverable. 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.

ARP Table after connecting LAN A and LAN B



```

Laptop0
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\ping 10.10.10.4
Pinging 10.10.10.4 with 32 bytes of data:
Reply from 10.10.10.4: bytes=32 time=1ms TTL=128

Ping statistics for 10.10.10.4:
    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
10.10.10.4 0090.0c43.25b8 dynamic
C:\|

```

Laptop0

Physical Config Desktop Programming Attributes

Command Prompt

```
Packet Tracer PC Command Line 1.0.
C:>ping 10.10.10.4

Pinging 10.10.10.4 with 32 bytes of data:

Reply from 10.10.10.4: bytes=32 time=1ms TTL=128
Reply from 10.10.10.4: bytes=32 time<1ms TTL=128
Reply from 10.10.10.4: bytes=32 time=1ms TTL=128
Reply from 10.10.10.4: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.10.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Switch0

Physical Config CLI Attributes

IOS Command Line Interface

```
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on interface FastEthernet0/7, changed state to up
%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 FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on interface FastEthernet0/3, changed state to up

Switch>EN
Switch#show mac-table-address
^
% Invalid input detected at '^' marker.

Switch#show mac-address-table
Mac Address Table
-----
Vlan Mac Address Type Ports
-----
1 0001.422a.2973 DYNAMIC Fa0/3
1 0030.a3d2.b6c7 DYNAMIC Fa0/7
1 0090.0c43.25b8 DYNAMIC Fa0/1
Switch#
```

Ctrl+F6 to exit CLI focus Copy Paste

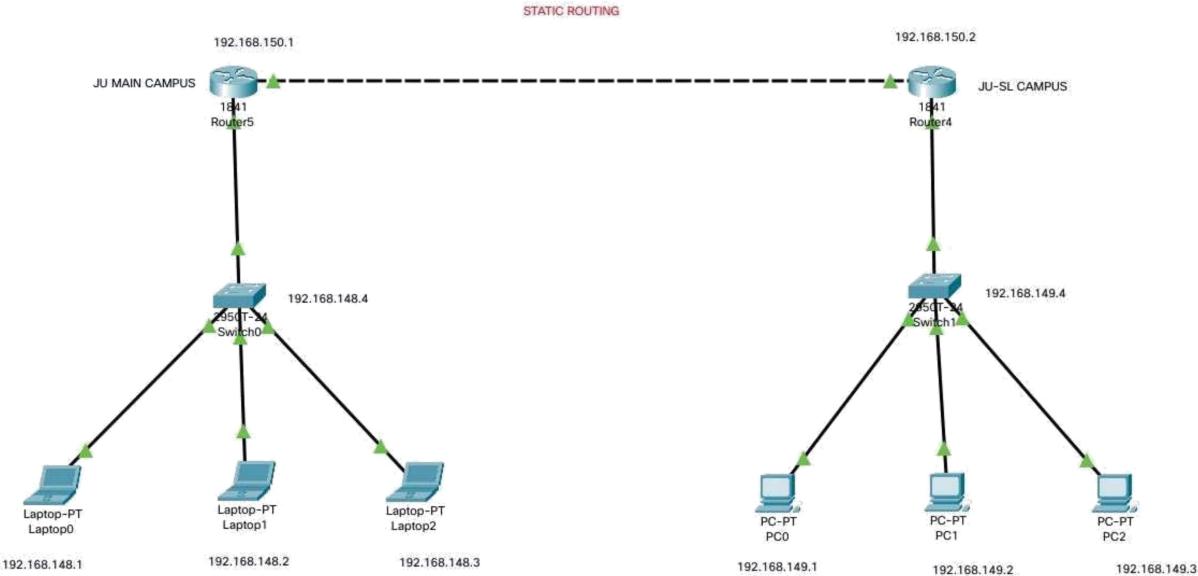
Top

MAC Forwarding Table of the switch in LAN B

4. 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 the default gateway of each host 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 the default gateway of each host 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.

Network Layout



Pinging a host (192.168.149.2, JU-SL Campus) from a host (192.168.148.2, JU-MAIN Campus) using static routing.

```
Packet Tracer PC Command Line 1.0
C:>ping 192.168.149.2

Pinging 192.168.149.2 with 32 bytes of data:

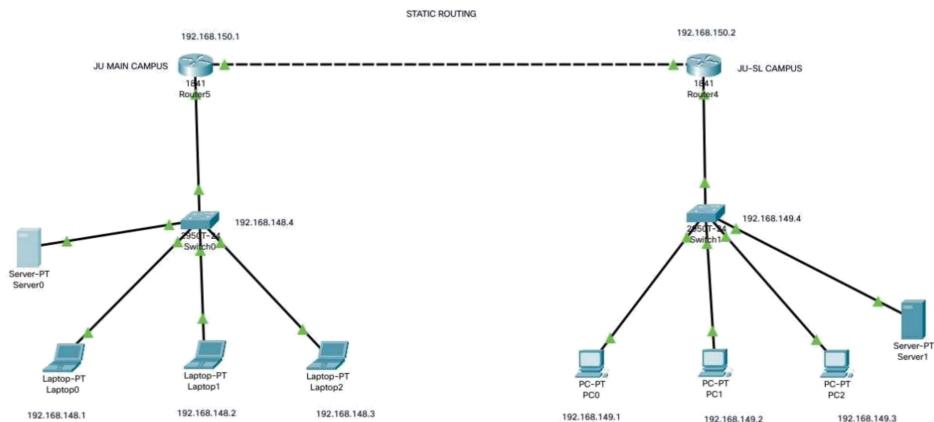
Request timed out.
Reply from 192.168.149.2: bytes=32 time<1ms TTL=126
Reply from 192.168.149.2: bytes=32 time=1ms TTL=126
Reply from 192.168.149.2: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.149.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:>
```

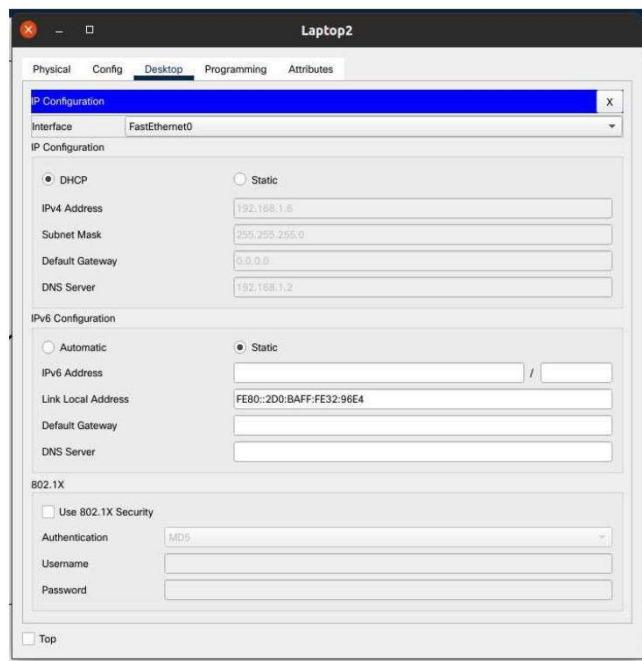
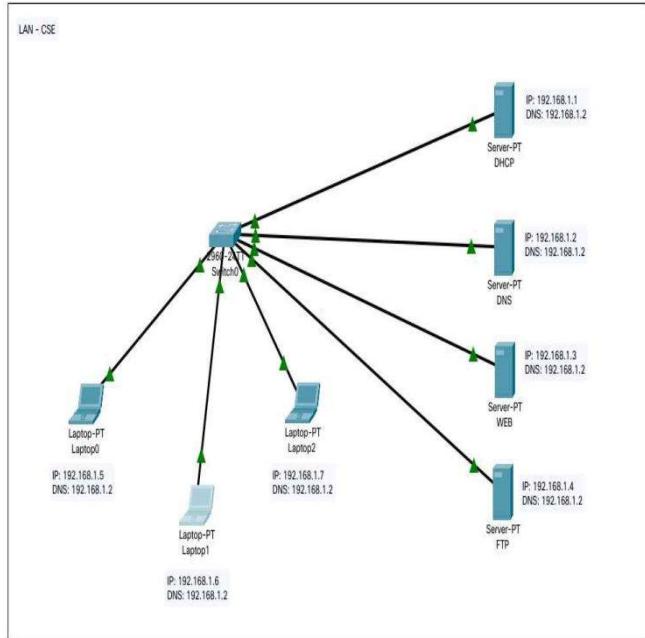
5. Add servers to the individual LANs (in problem 5) and configure them as a DHCPserver.

Configure the hosts in the individual LAN to obtain IP addresses and address of the default gateway via this DHCP ser



6. 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.

Network Layout



IP Configuration of a Laptop

Comments:

The CISCO packet tracer is actually a pretty useful tool in simulating the Network Layout. It can help to plan the architecture, simulate events and then deploy it in real life so that we can be aware about the performance of the network in production. Further it helps experience a practical knowledge of how elements of an entire work are when deployed in an integrated fashion. Hoping to get more of such assignments to that learning becomes fun and not stressful.

