



Bikash_Sah_002010501018_Computer Networks Lab Report_6

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Class: BCSE-3

Group: A1

Assignment Number: 6

Submission Date: 21 November, 2022

Deadline: 21st October, 2022

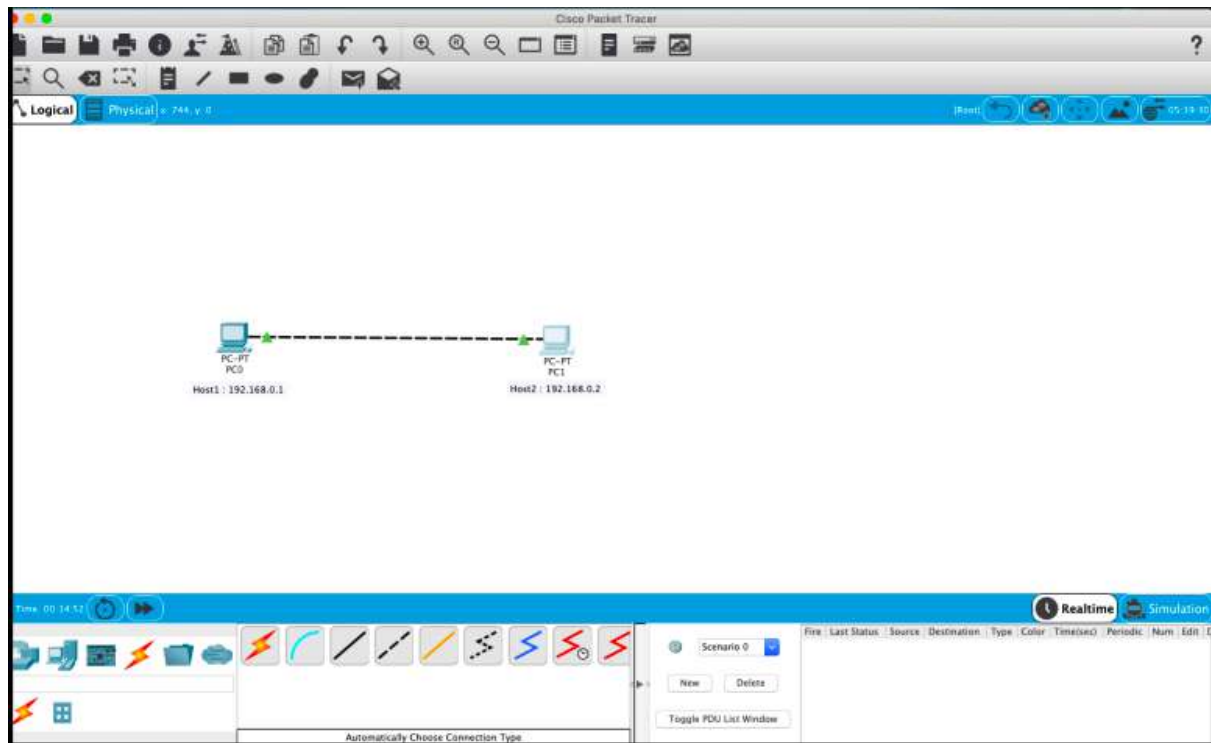
Problem Statement:

**Assignment 6: Use Cisco Packet Tracer software to do the following experiments.
Submission due: 17th -21st October 2022**

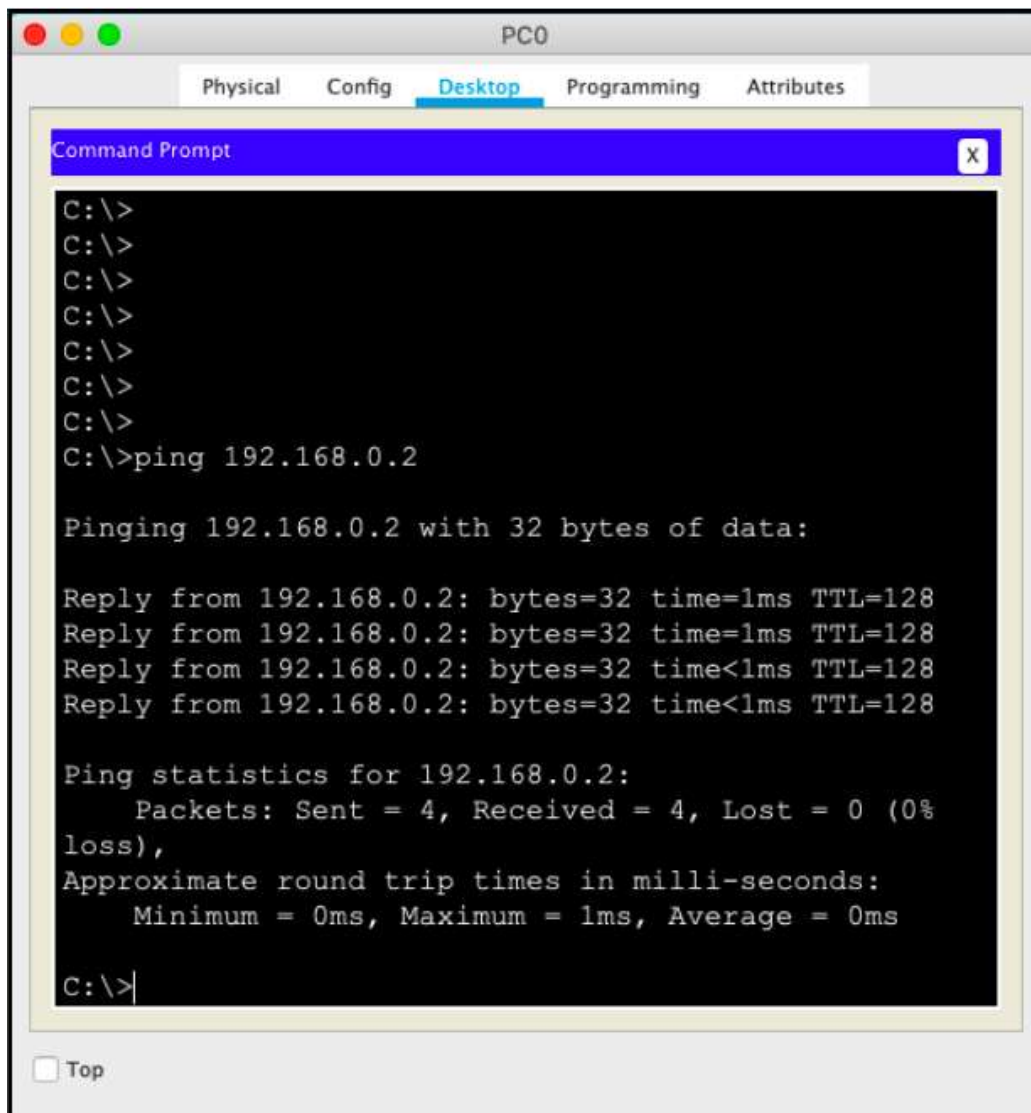
1. Connect two hosts back-to-back with a cross over cable. Assign IP addresses, and see whether they are able to ping each other.
2. Create a LAN (named LAN-A) with 3 hosts using a hub. Ping each pair of nodes.
3. Create a LAN (named LAN-B) with 3 hosts using a switch. Record contents of the ARP Table 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.
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.
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.
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.
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.

Q1

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 hosts connected over a cross-over cable.



The screenshot shows a window titled "PC0" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the following text:

```
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>ping 192.168.0.2

Pinging 192.168.0.2 with 32 bytes of data:

Reply from 192.168.0.2: bytes=32 time=1ms TTL=128
Reply from 192.168.0.2: bytes=32 time=1ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0%
loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

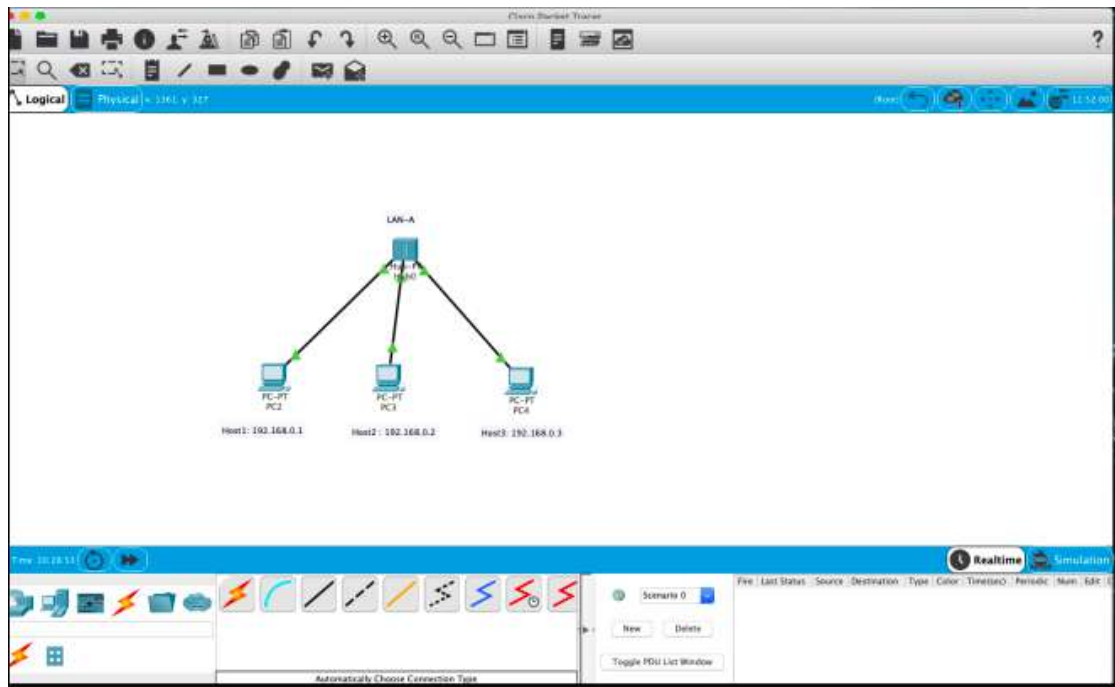
C:\>
```

At the bottom left of the Command Prompt window, there is a checkbox labeled "Top" which is currently unchecked.

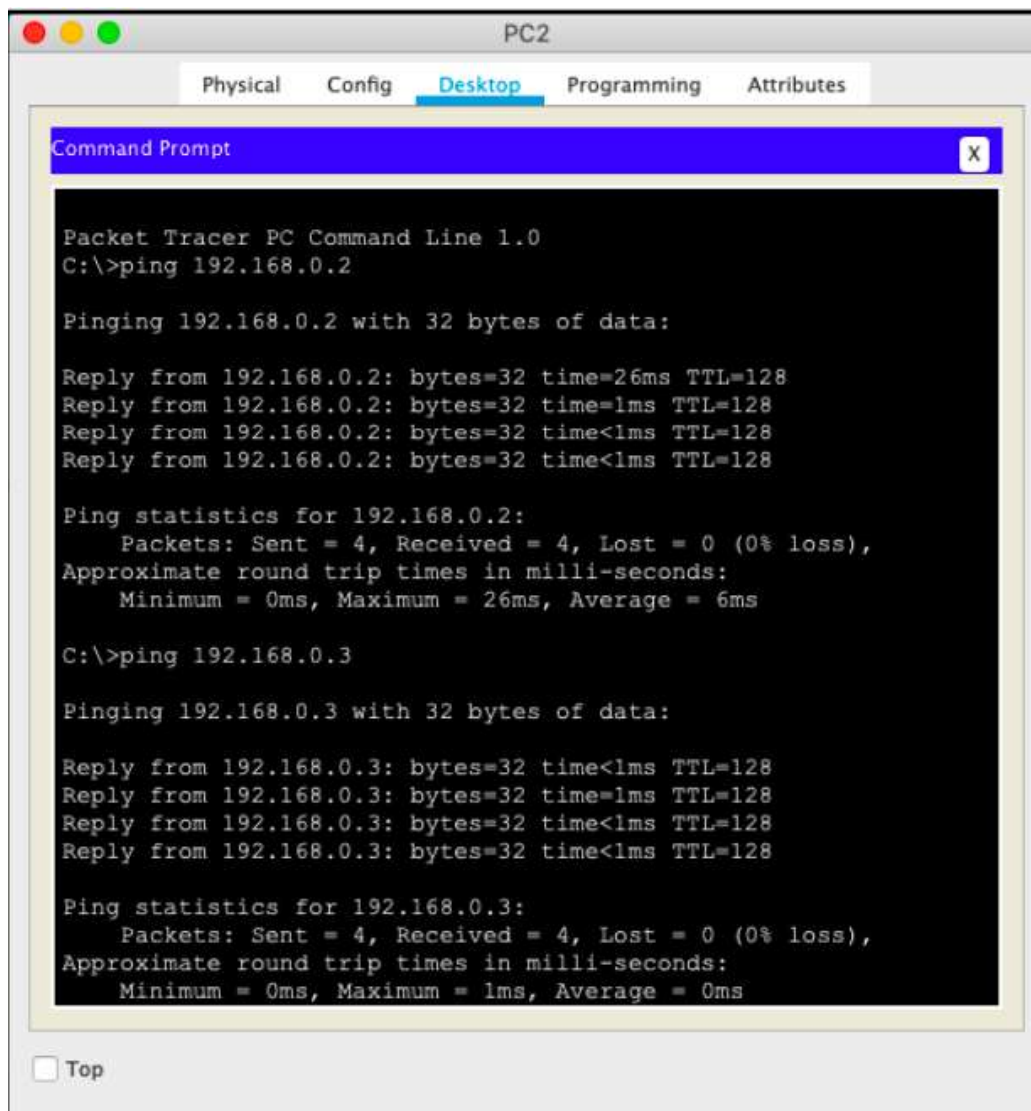
Host 1 with IP: 192.168.0.1 pinging Host 2 with IP : 192.168.0.2.

Q2

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



3 hosts connected using a hub creating a LAN.



Host 1 pinging Host 2 and Host 3.

The image shows a screenshot of a PC3 Desktop window. The window has a title bar with three colored buttons (red, yellow, green) and the text 'PC3'. Below the title bar are five tabs: 'Physical', 'Config', 'Desktop' (which is selected and highlighted in blue), 'Programming', and 'Attributes'. The main content area of the 'Desktop' tab contains a 'Command Prompt' window. The Command Prompt has a blue title bar with the text 'Command Prompt' and a close button 'X'. The background of the Command Prompt is black, and the text is white. The text in the Command Prompt is as follows:

```
C:\>ping 192.168.0.1

Pinging 192.168.0.1 with 32 bytes of data:

Reply from 192.168.0.1: bytes=32 time=1ms TTL=128
Reply from 192.168.0.1: bytes=32 time=1ms TTL=128
Reply from 192.168.0.1: bytes=32 time<1ms TTL=128
Reply from 192.168.0.1: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.0.3

Pinging 192.168.0.3 with 32 bytes of data:

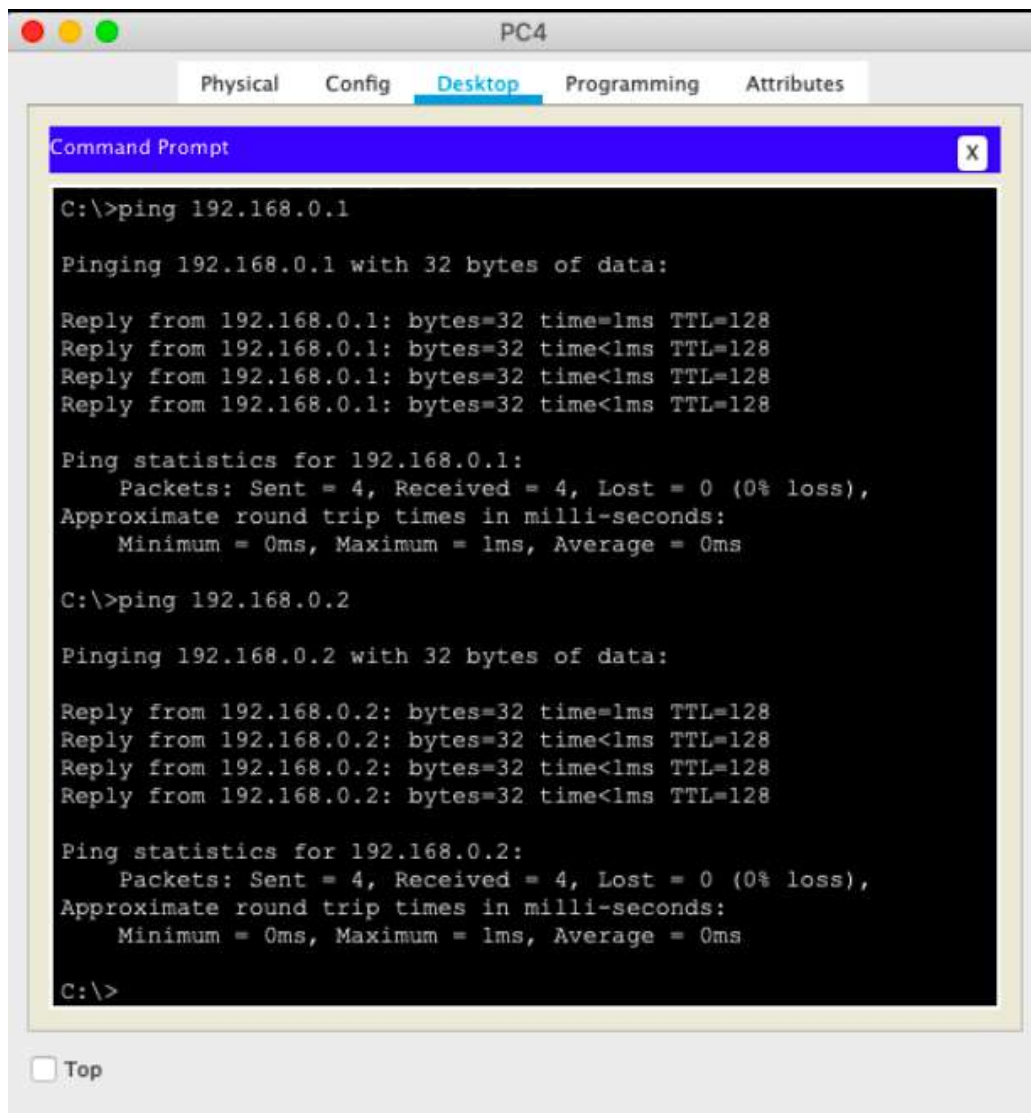
Reply from 192.168.0.3: bytes=32 time<1ms TTL=128
Reply from 192.168.0.3: bytes=32 time<1ms TTL=128
Reply from 192.168.0.3: bytes=32 time<1ms TTL=128
Reply from 192.168.0.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

At the bottom left of the Command Prompt window, there is a checkbox labeled 'Top'.

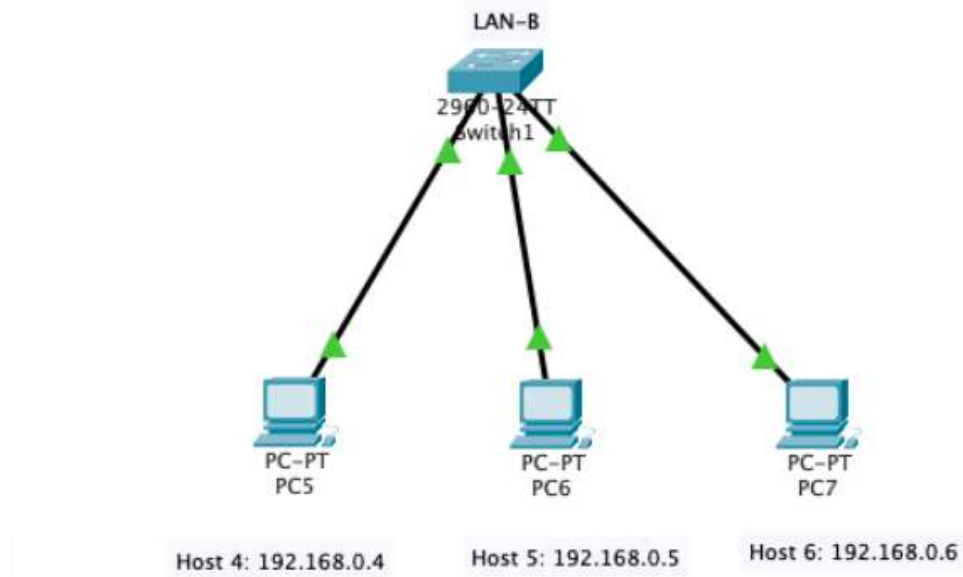
Host 2 pinging Host 1 and Host 3.



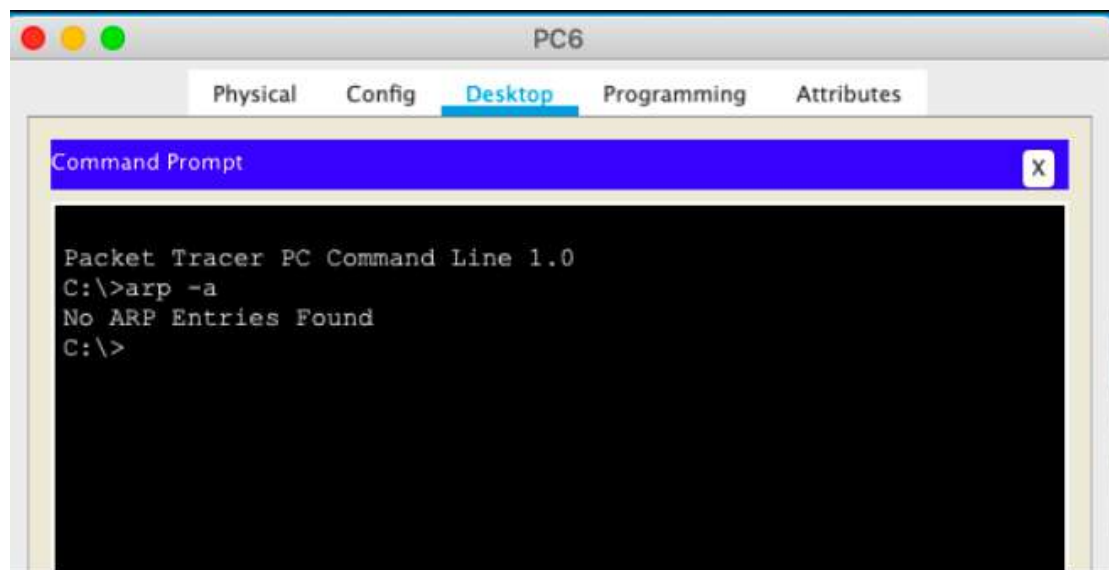
Host3 pinging Host 1 and Host 2.

Q3

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.



LAN-B created by connecting 3 hosts over a switch.



No ARP Table found in END Hosts

```
Switch>
Switch>
Switch>show ma
Switch>show mac-add
Switch>show mac-address-table
      Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
Switch>
```

Command+F6 to exit CLI focus

Copy Paste

No Mac Address Table found in switch

```
Packet Tracer PC Command Line 1.0
C:\>arp -a
No ARP Entries Found
C:\>ping 192.168.0.4

Pinging 192.168.0.4 with 32 bytes of data:

Reply from 192.168.0.4: bytes=32 time=1ms TTL=128
Reply from 192.168.0.4: bytes=32 time<1ms TTL=128
Reply from 192.168.0.4: bytes=32 time<1ms TTL=128
Reply from 192.168.0.4: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

Each pair of hosts pinged.

```
C:\>arp -a
Internet Address      Physical Address      Type
192.168.0.4           00e0.a369.0b71       dynamic
192.168.0.6           0090.0ce3.9ba2       dynamic

C:\>
```

```
C:\>arp -a
Internet Address      Physical Address      Type
192.168.0.5           00d0.ba01.e615        dynamic
192.168.0.6           0090.0ce3.9ba2        dynamic
```

ARP table of host 4 and 5

```
C:\>arp -a
Internet Address      Physical Address      Type
192.168.0.4           00e0.a369.0b71        dynamic
192.168.0.5           00d0.ba01.e615        dynamic
```

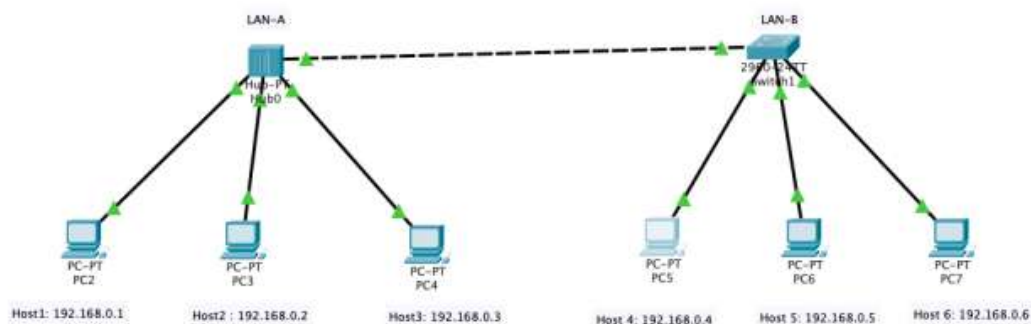
ARP table of host 6.

```
Switch#show mac address-table
Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
1       0090.0ce3.9ba2    DYNAMIC Fa0/3
1       00d0.ba01.e615    DYNAMIC Fa0/2
1       00e0.a369.0b71    DYNAMIC Fa0/1
Switch#
```

Mac Address Table of Switch after respective pings.

Q4

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 connected

```
C:\>arp -a
Internet Address      Physical Address      Type
192.168.0.1           0060.3ee7.a69c        dynamic
192.168.0.2           0004.9a6d.cbb4        dynamic
192.168.0.3           0006.2a05.0945        dynamic
192.168.0.5           00d0.ba01.e615        dynamic
192.168.0.6           0090.0ce3.9ba2        dynamic
```

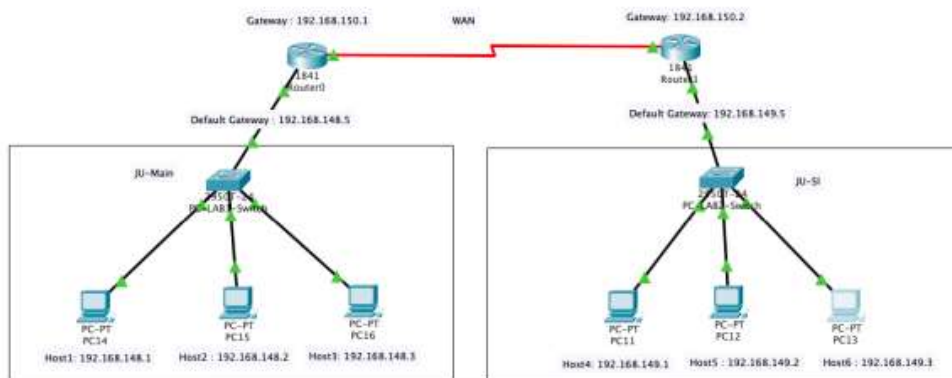
New formed ARP Table of the hosts showing addresses of Hosts 1,2 ,3 connected by the Hub.

```
Switch#
Switch#show mac address-table
      Mac Address Table
-----
Vlan    Mac Address      Type        Ports
----    -
1       0004.9a6d.cbb4    DYNAMIC     Fa0/4
1       0006.2a05.0945    DYNAMIC     Fa0/4
1       0060.3ee7.a69c    DYNAMIC     Fa0/4
1       0090.0ce3.9ba2    DYNAMIC     Fa0/3
1       00e0.a369.0b71    DYNAMIC     Fa0/1
Switch#
```

New mac-addresses shown in mac-address table, as Host 1 is pinged to Host 4, 5 and 6 connecting ethernet 4 of hub to switch. As new pings are made the mac address table is overwritten in switch.

Q5

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.



Two Local Area networks consisting of 3 hosts in ranges 192.168.148.0/24 and 192.168.149.0/24 connected by two switches respectively - connected over routers over a WAN with IP ranging from 192.168.150.0/24.

```

PC13
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix.:
    Link-local IPv6 Address.....: FE80::2D0:D3FF:FE24:7BE2
    IPv6 Address.....: ::
    IPv4 Address.....: 192.168.149.3
    Subnet Mask.....: 255.255.0.0
    Default Gateway.....: ::
                                192.168.149.5

Bluetooth Connection:

    Connection-specific DNS Suffix.:
    Link-local IPv6 Address.....: ::
    IPv6 Address.....: ::
    IPv4 Address.....: 0.0.0.0
    Subnet Mask.....: 0.0.0.0
    Default Gateway.....: ::
                                0.0.0.0

C:\>ping 192.168.148.3

Pinging 192.168.148.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.148.3: bytes=32 time=9ms TTL=126
Reply from 192.168.148.3: bytes=32 time=1ms TTL=126
Reply from 192.168.148.3: bytes=32 time=39ms TTL=126

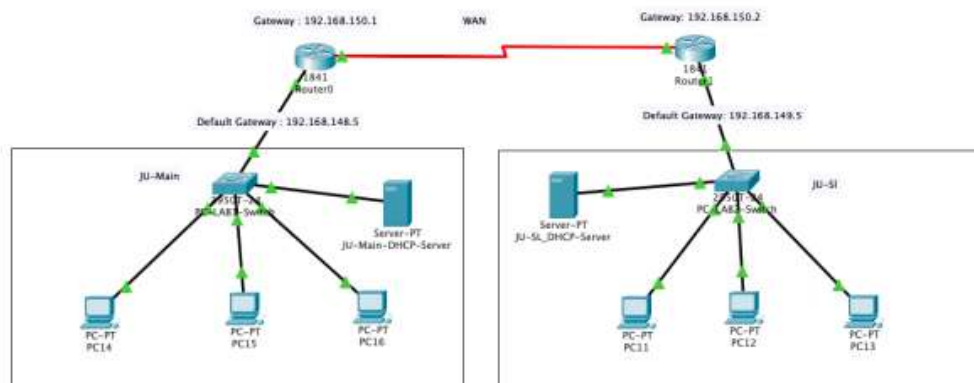
Ping statistics for 192.168.148.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 39ms, Average = 16ms

C:\>
  
```

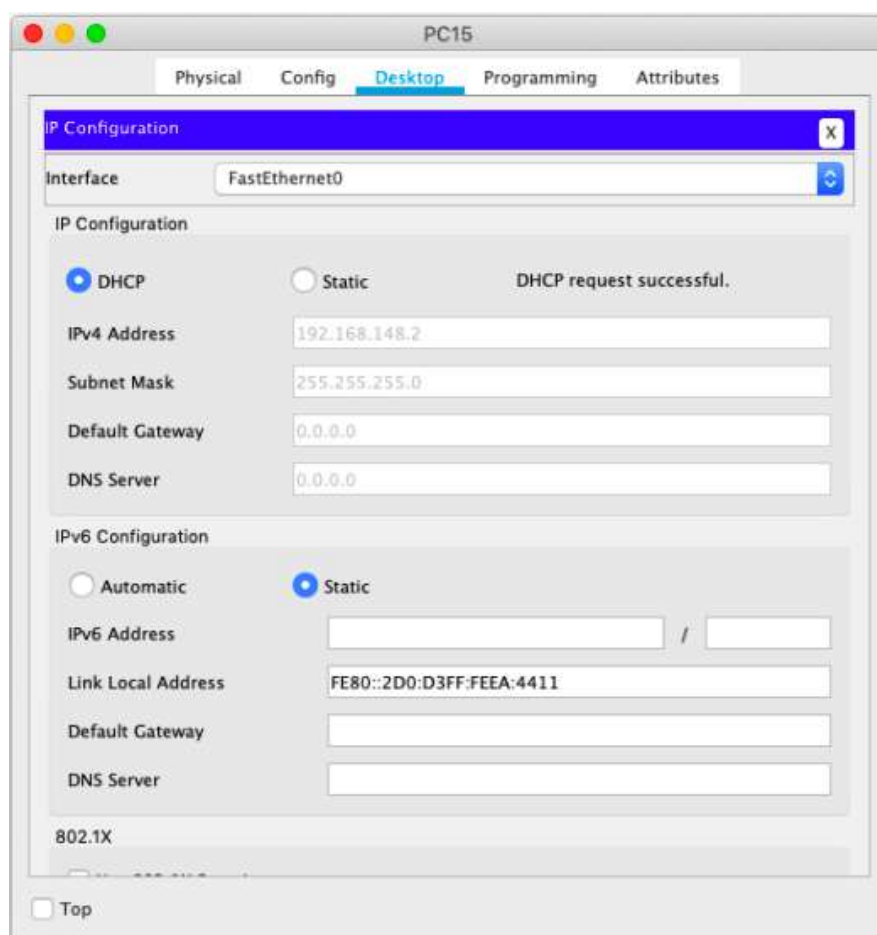
A host in JU-SL 192.168.149.3 pinging another host successfully in JU-MAIN with IP 192.168.148.3

Q6

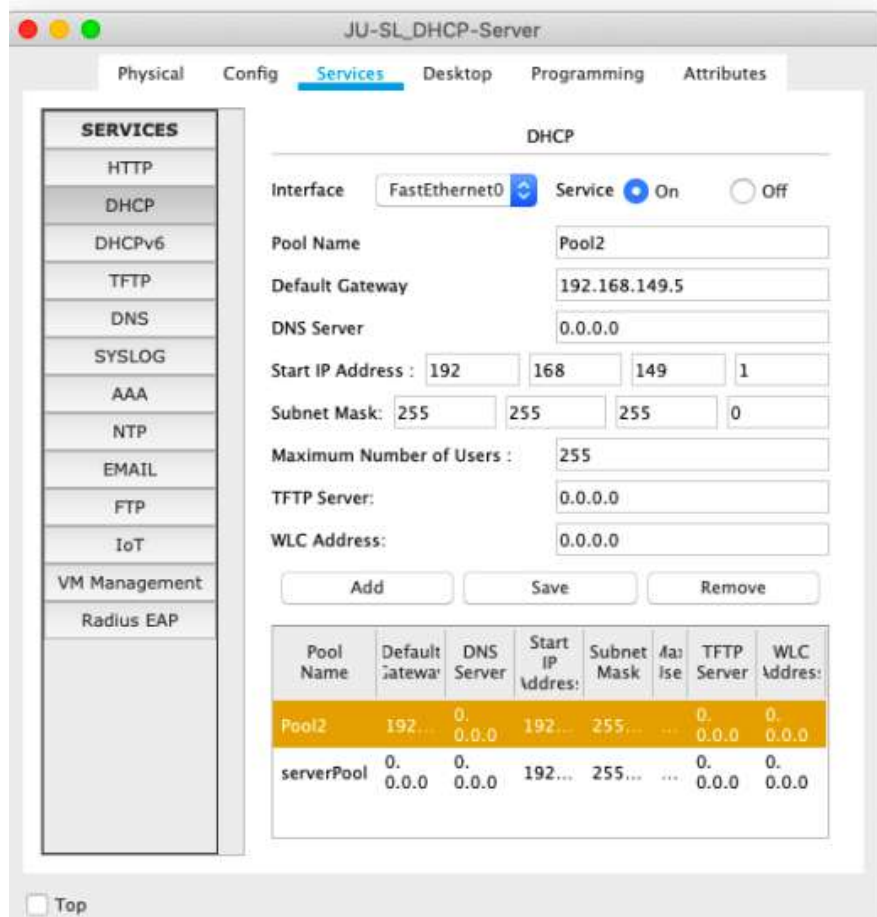
6. Add servers to the individual LANs (in problem 5) and configure them as a DHCP server. Configure the hosts in the individual LAN to obtain IP addresses and address of the default gateway via this DHCP server.



DHCP servers are added as an extension to network in 5, the host's IP configuration are modified to accommodate the dynamic change in IP.



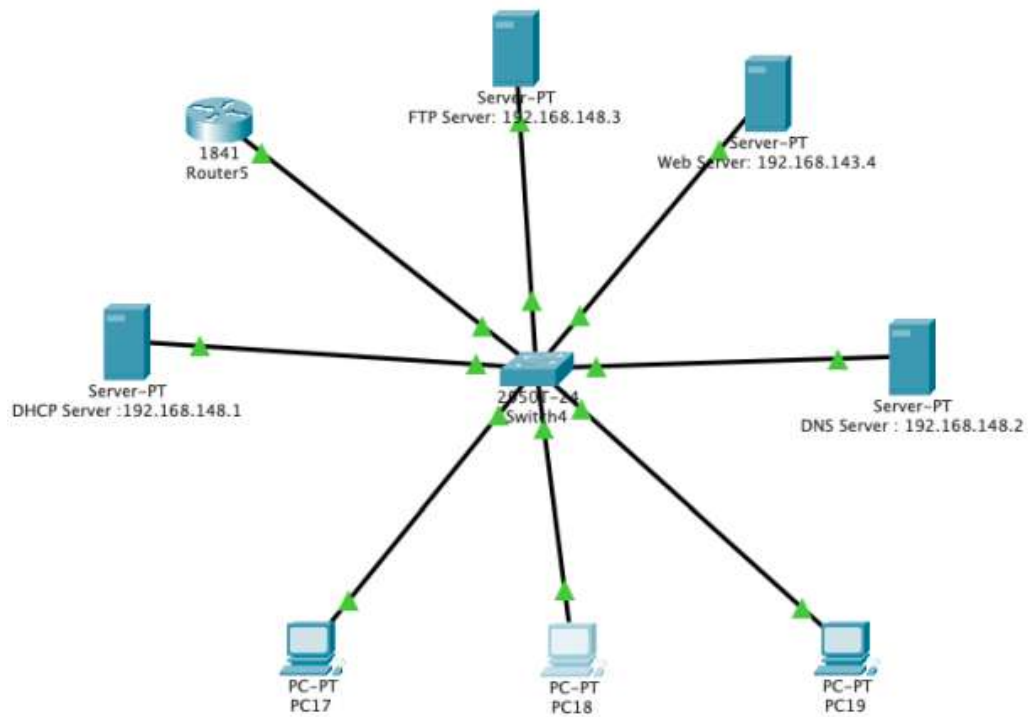
An example of host IP configuration in JU-Main getting its IP address dynamically as a result of DHCP.



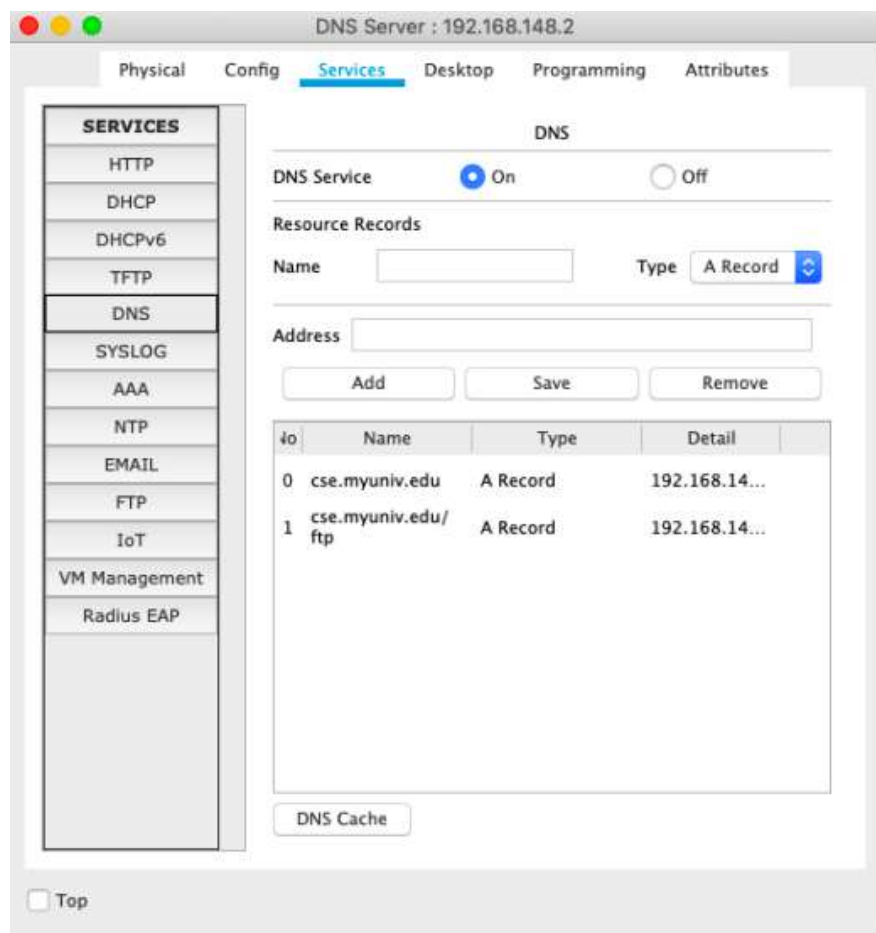
An example DHCP configuration in JUSL network.

Q7

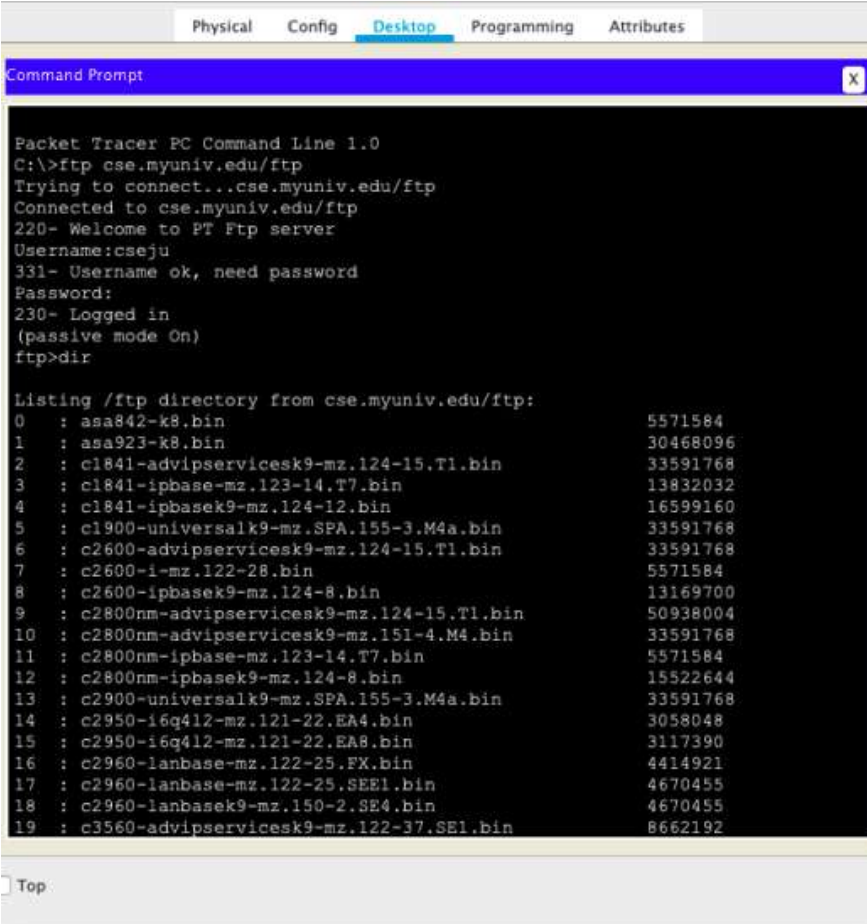
7. Create a LAN (CSE) with three hosts connected via a layer-2 switch (Cisco 2950 switch CSE-Switch). Also add a web server and a ftp server to this LAN. The hosts dynamically get their IP addresses from a local DHCP server. Servers are assigned fixed IP addresses. Configure the individual hosts to use 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.



LAN(CSE) created with a switch connecting three switches and a FTP server and a Web server.



Shows the DNS records in the DNS server

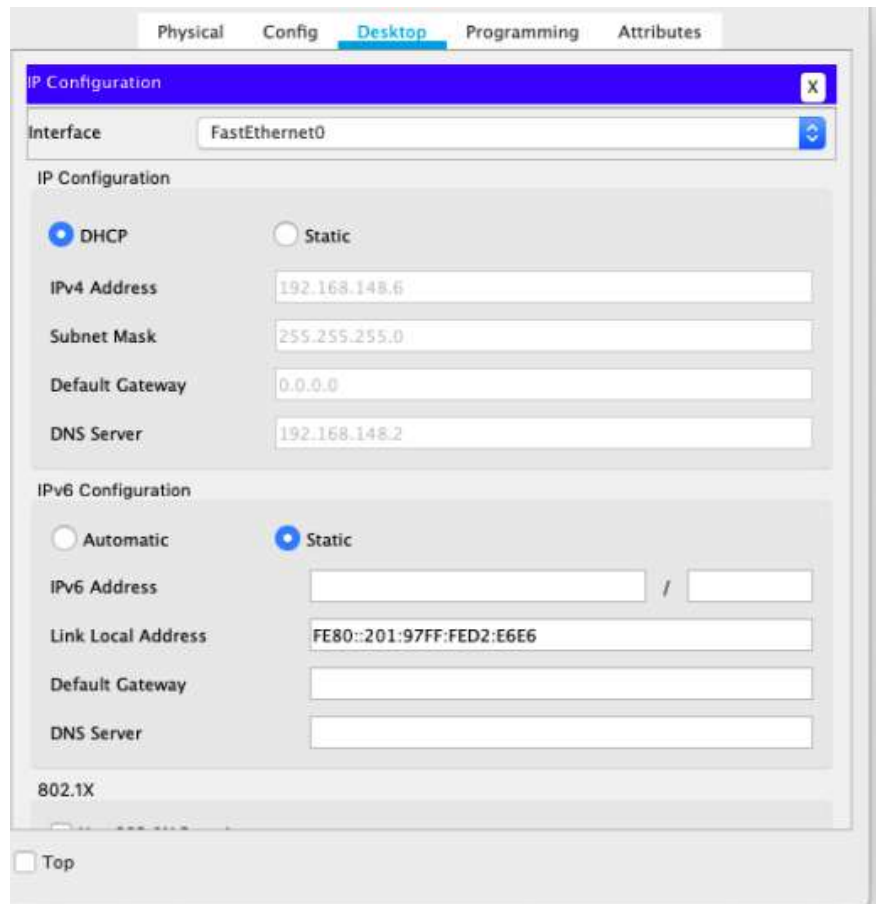


The screenshot shows a Packet Tracer PC Command Line window with tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, displaying a Command Prompt window. The Command Prompt shows the execution of an FTP command to connect to cse.myuniv.edu/ftp. The connection is successful, and the user 'cseju' is logged in. The user then enters the 'dir' command to list the contents of the directory. The output shows a list of files and their sizes.

```
Packet Tracer PC Command Line 1.0
C:\>ftp cse.myuniv.edu/ftp
Trying to connect...cse.myuniv.edu/ftp
Connected to cse.myuniv.edu/ftp
220- Welcome to PT Ftp server
Username:cseju
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>dir

Listing /ftp directory from cse.myuniv.edu/ftp:
0   : asa842-k8.bin                    5571584
1   : asa923-k8.bin                    30468096
2   : c1841-advipservicesk9-mz.124-15.T1.bin 33591768
3   : c1841-ipbase-mz.123-14.T7.bin    13832032
4   : c1841-ipbasek9-mz.124-12.bin     16599160
5   : c1900-universalk9-mz.SPA.155-3.M4a.bin 33591768
6   : c2600-advipservicesk9-mz.124-15.T1.bin 33591768
7   : c2600-i-mz.122-28.bin            5571584
8   : c2600-ipbasek9-mz.124-8.bin      13169700
9   : c2800nm-advipservicesk9-mz.124-15.T1.bin 50938004
10  : c2800nm-advipservicesk9-mz.151-4.M4.bin 33591768
11  : c2800nm-ipbase-mz.123-14.T7.bin   5571584
12  : c2800nm-ipbasek9-mz.124-8.bin     15522644
13  : c2900-universalk9-mz.SPA.155-3.M4a.bin 33591768
14  : c2950-i6q412-mz.121-22.EA4.bin   3058048
15  : c2950-i6q412-mz.121-22.EA8.bin   3117390
16  : c2960-lanbase-mz.122-25.FX.bin    4414921
17  : c2960-lanbase-mz.122-25.SE1.bin   4670455
18  : c2960-lanbasek9-mz.150-2.SE4.bin  4670455
19  : c3560-advipservicesk9-mz.122-37.SE1.bin 8662192
```

Shows the working of a successfully FTP login and working in one of the hosts in the network.



Shows the Dynamically configured IP of one of the hosts through DHCP.
