Bikash_Sah_002010501018_Computer Networks Lab Report_6

Name: Bikash Sah

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.
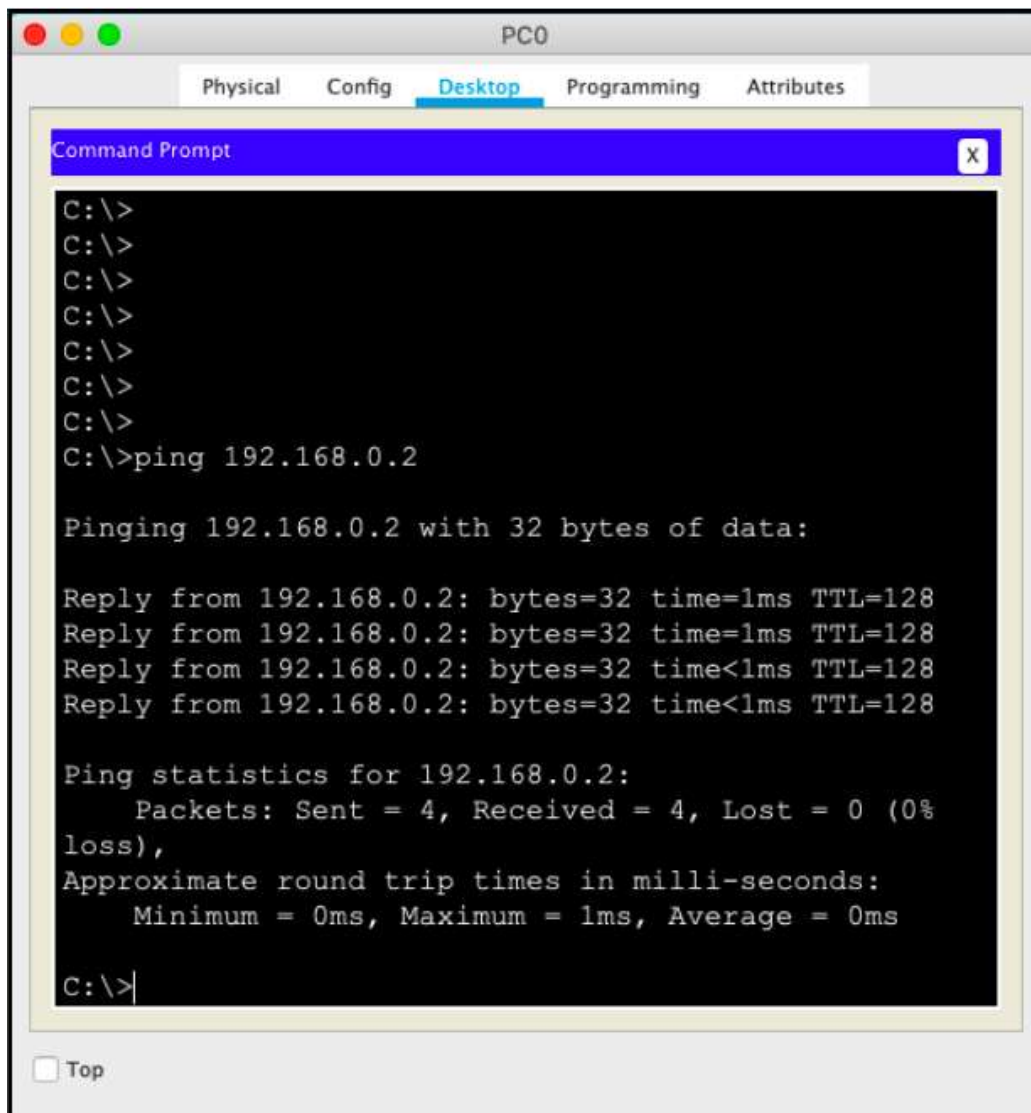Submission due: 17th -21st October 2022

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.
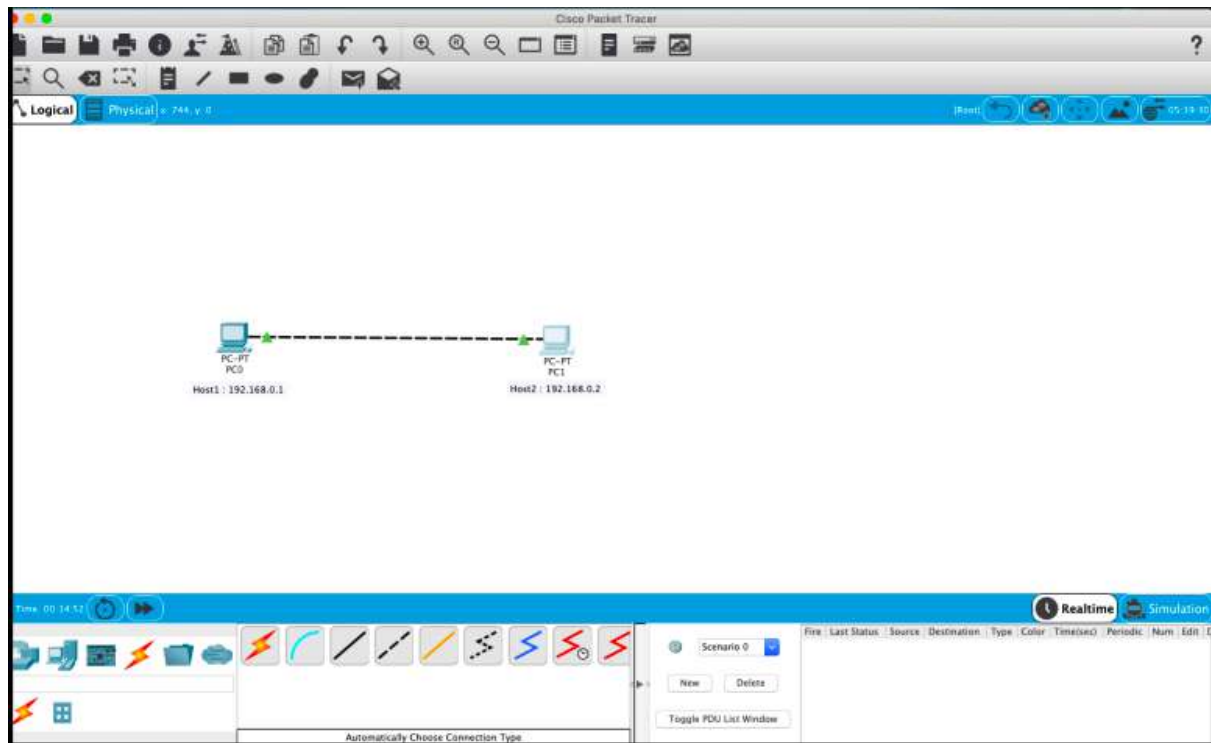
Two hosts connected over a cross-over cable.

```
PC0
    Physical    Config    Desktop    Programming    Attributes

Command Prompt                                              X

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:\>

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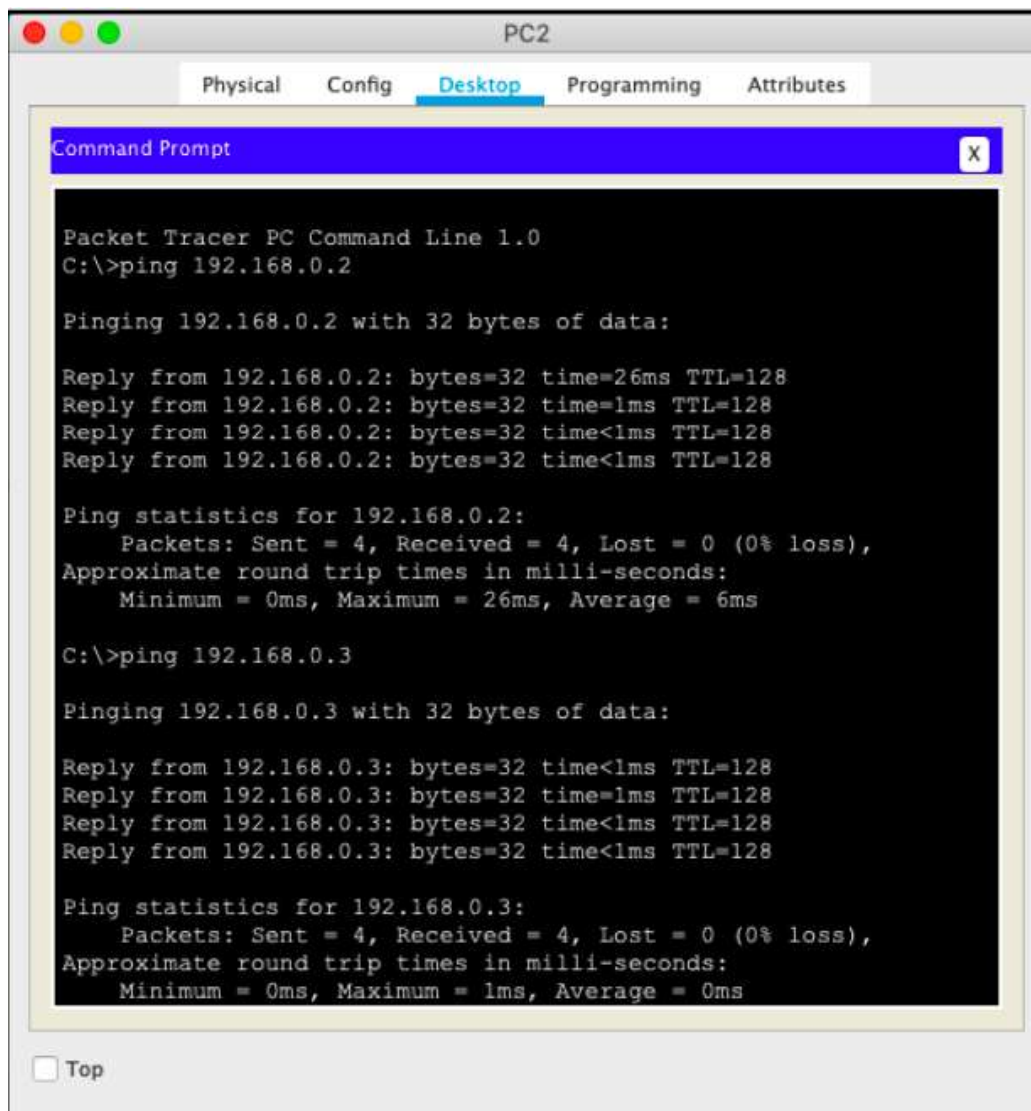
Host 1 with IP: 192.168.0.1 pinging Host 2 with IP : 192.168.0.2.

Q2

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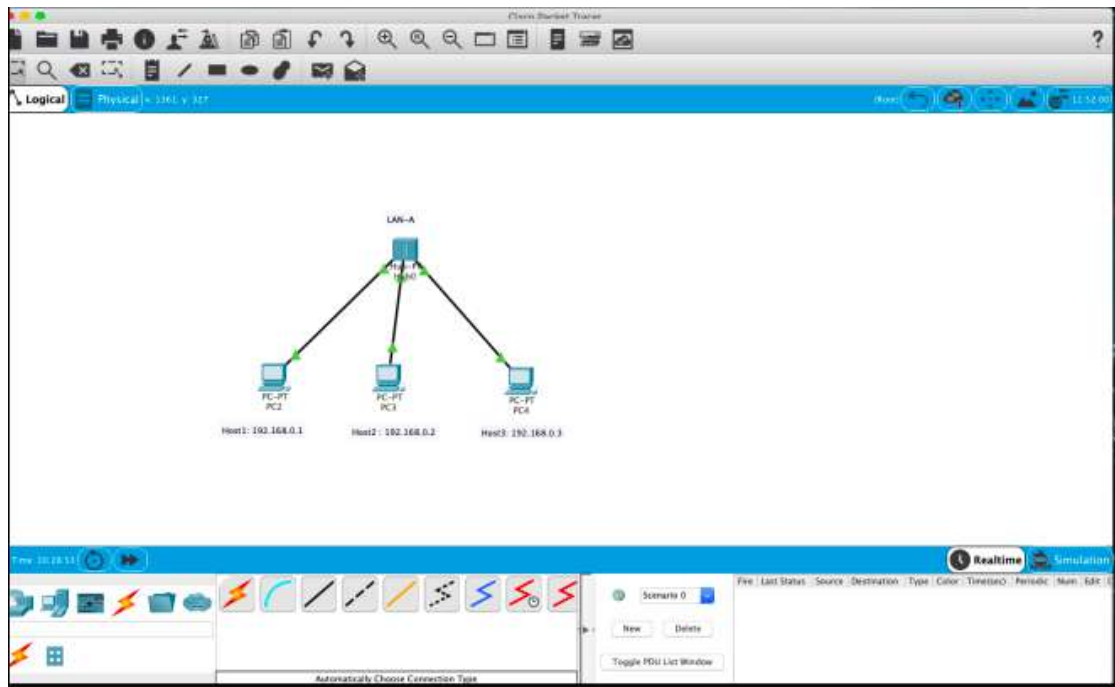
3 hosts connected using a hub creating a LAN.

Host 1 pinging Host 2 and Host 3.

Host 2 pinging Host 1 and Host 3.
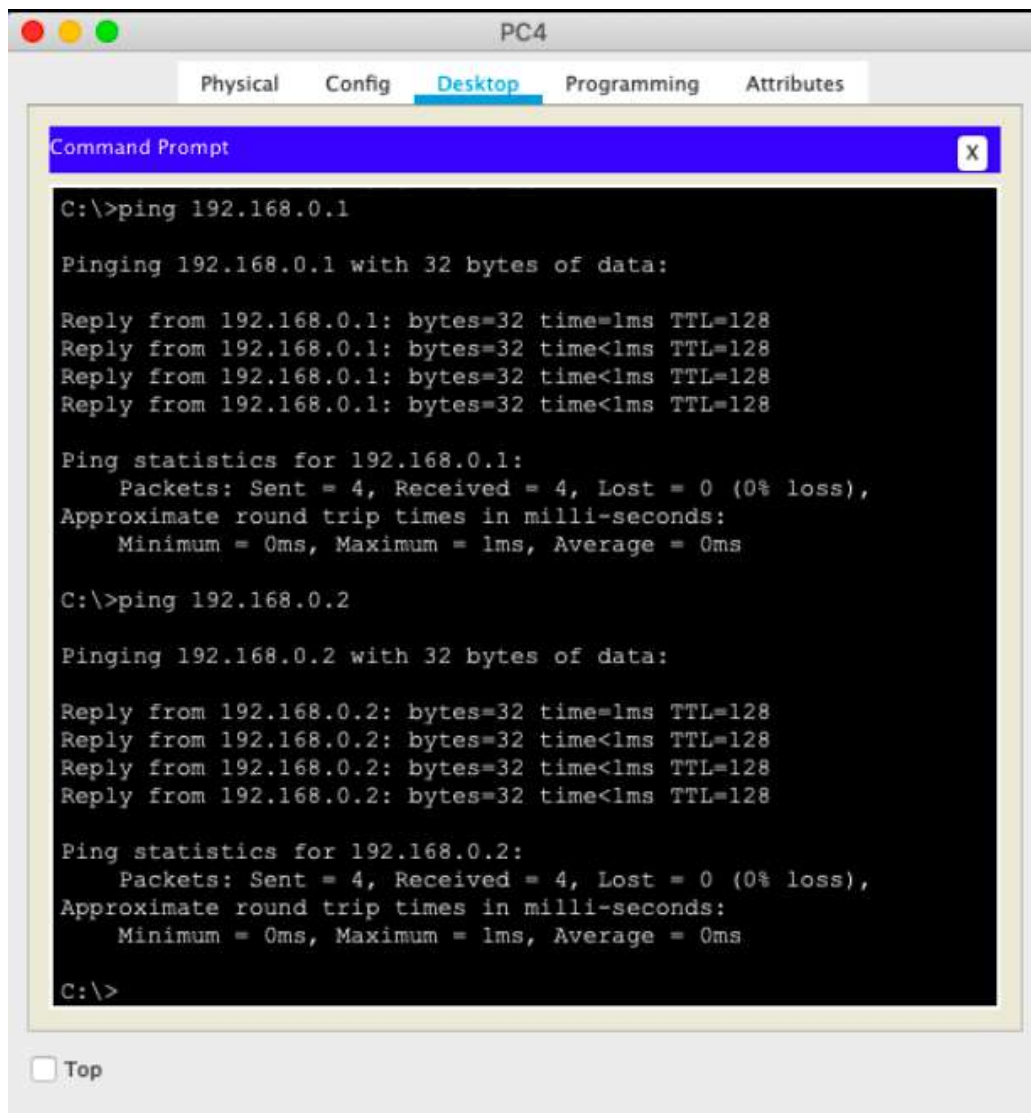
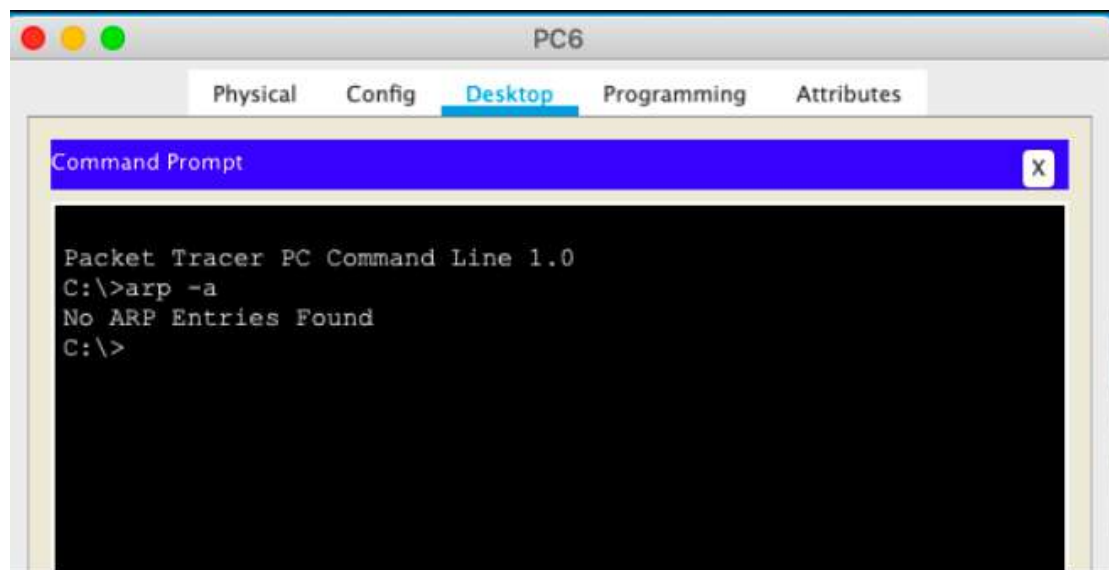Host3 pinging Host 1 and Host 2.

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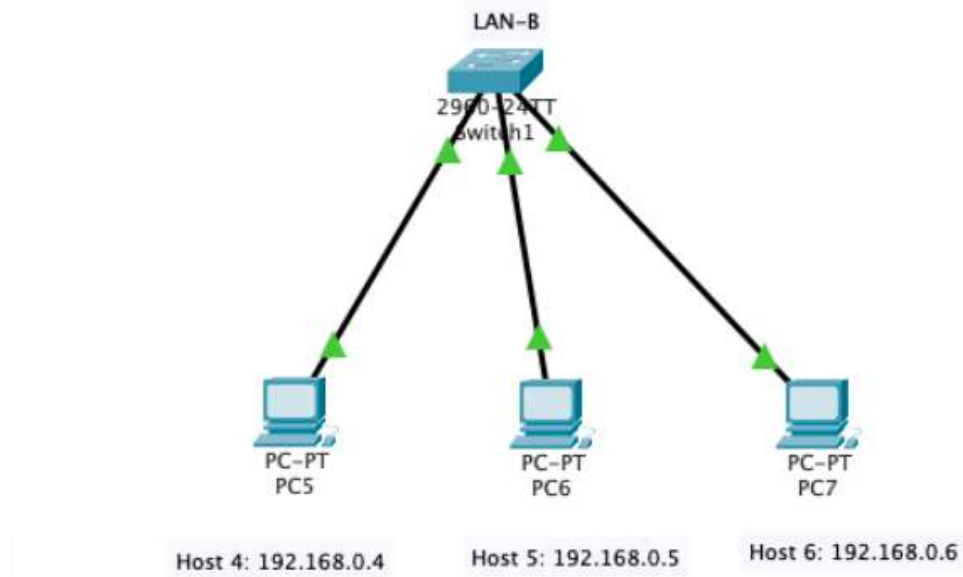
LAN-B created by connecting 3 hosts over a switch.

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

C:\>
```

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

C:\>
```
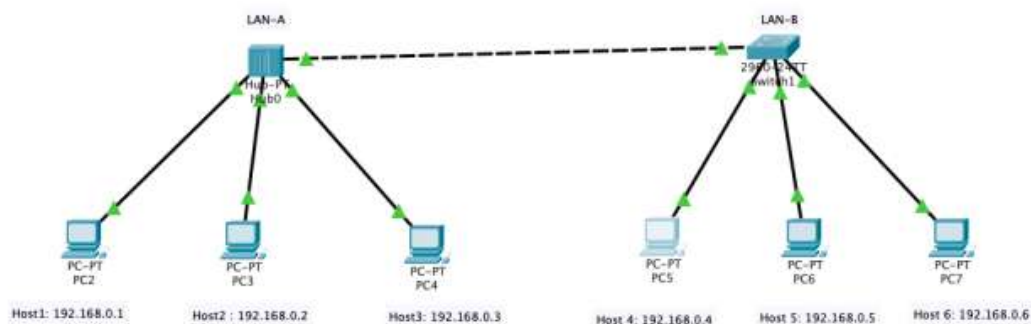
ARP table of host 6.

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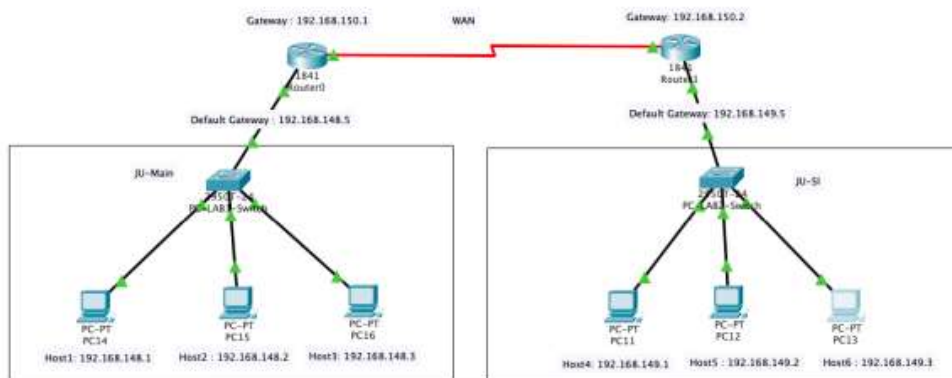
New formed ARP Table of the hosts showing addresses of Hosts 1,2 ,3 connected by the Hub.

```
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.

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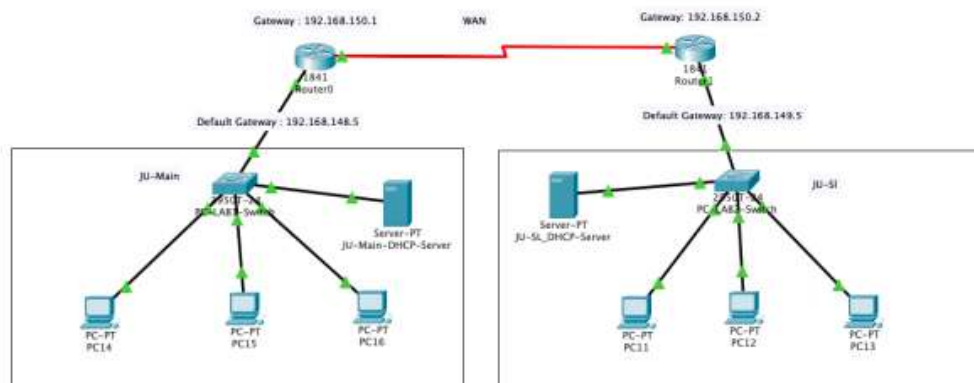
DHCP servers are added as an extension to network in 5, the host's IP configuration are modified to accommodate the dynamic change in IP.
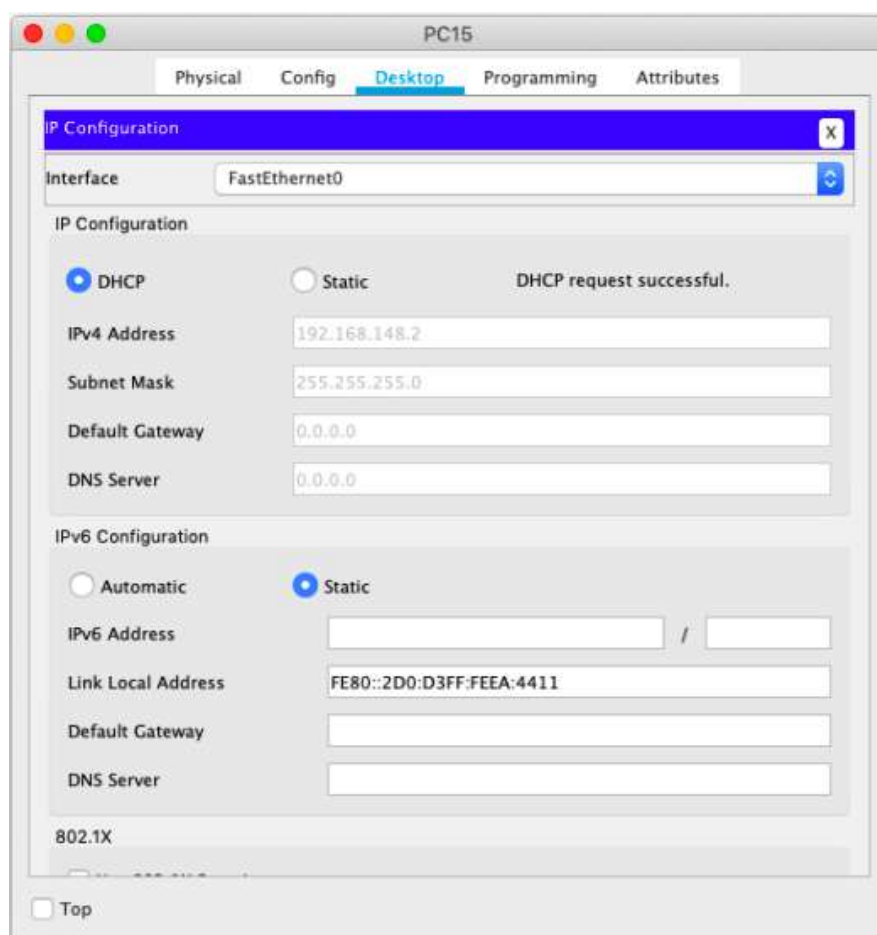

An example of host IP configuration in JU-Main getting its IP address dynamically as a result of DHCP.
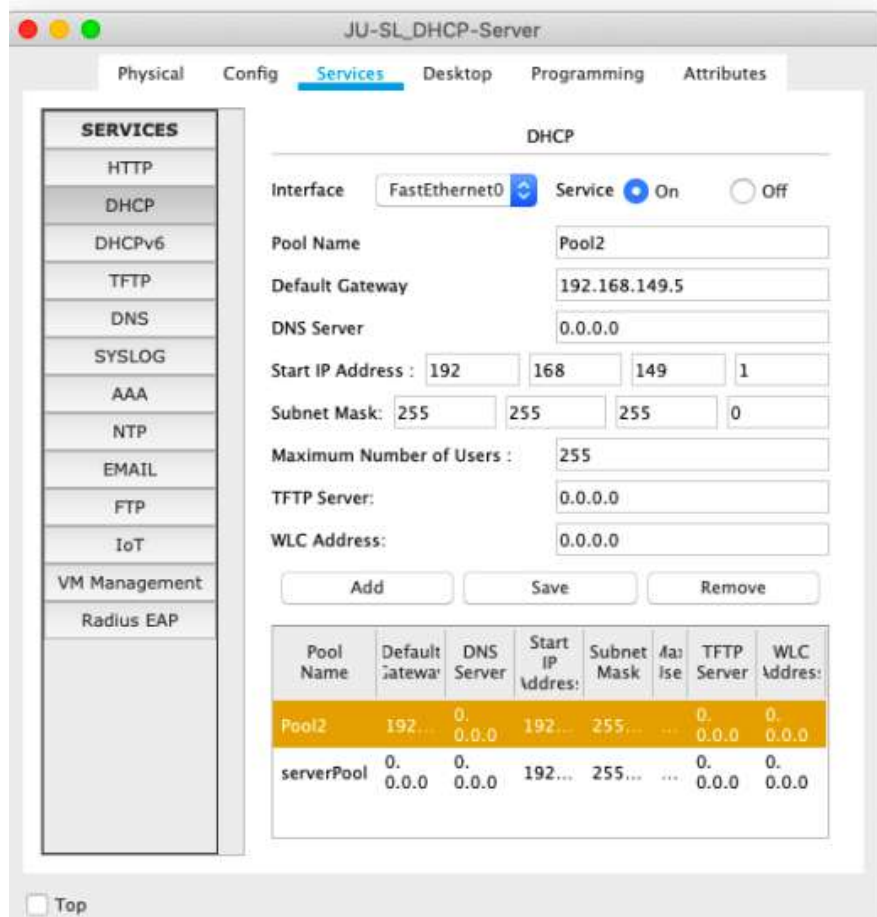
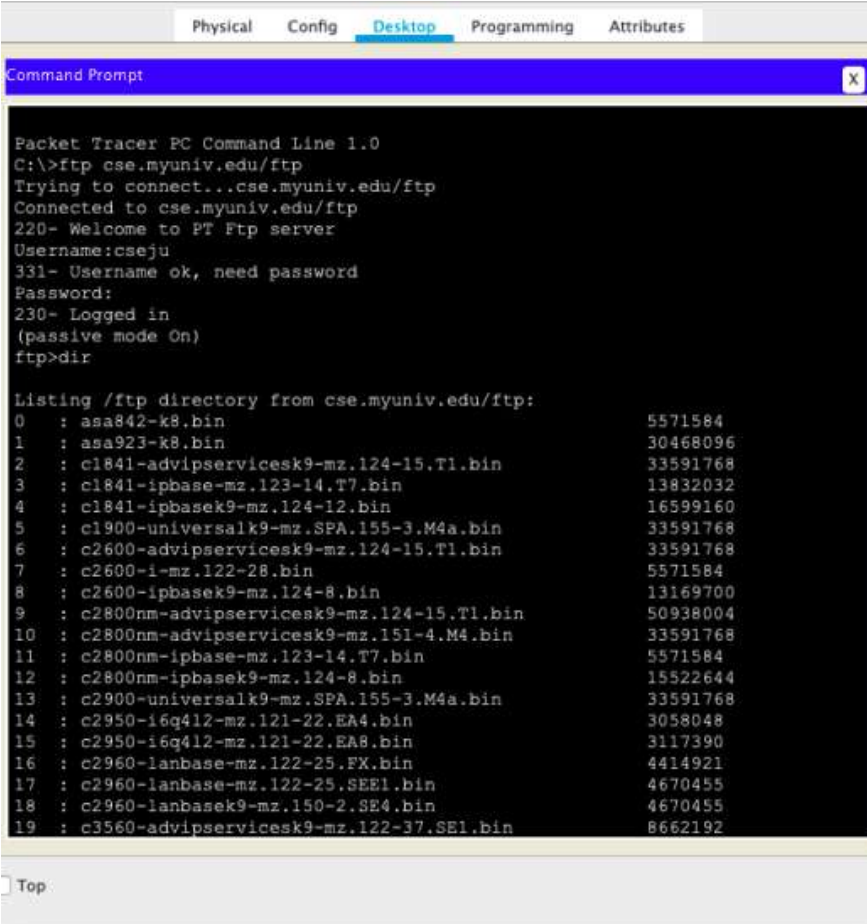An example DHCP configuration in JUSL network.

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.
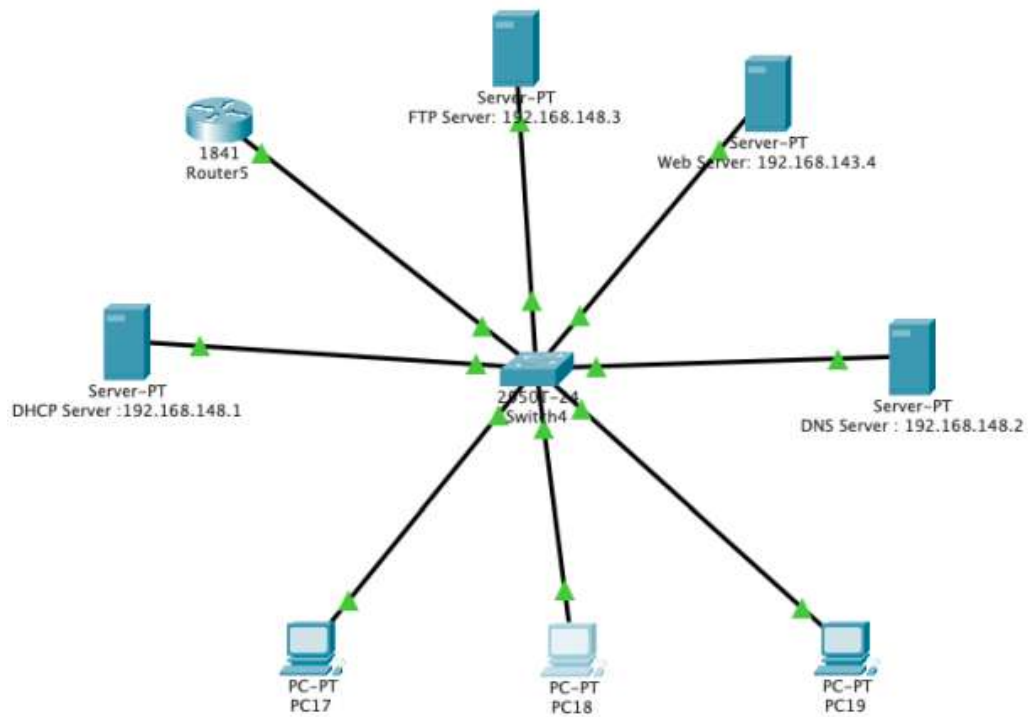
LAN(CSE) created with a switch connecting three switches and a FTP server and a Web server.
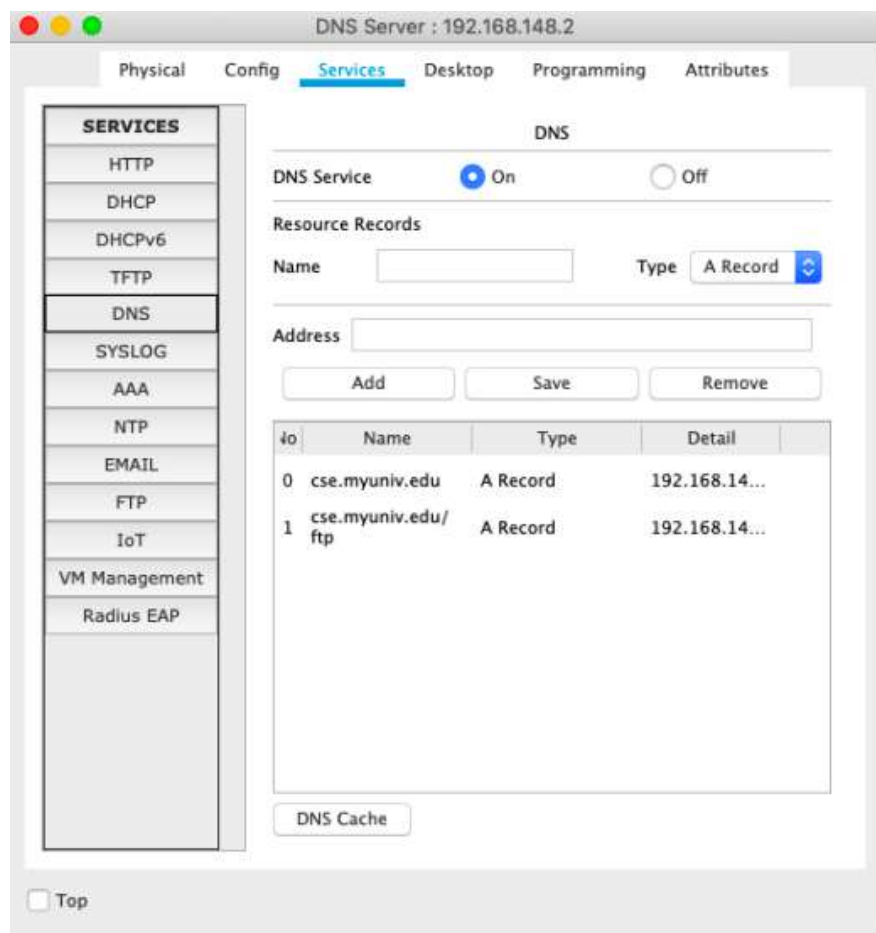
Shows the DNS records in the DNS server


```
                    Physical    Config    Desktop    Programming    Attributes

Command Prompt                                                              [X]

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.SEE1.bin                 4670455
18   : c2960-lanbasek9-mz.150-2.SE4.bin                 4670455
19   : c3560-advipservicesk9-mz.122-37.SE1.bin          8662192

□ Top
```

Shows the working of a successfully FTP login and working in one of the hosts in the network.
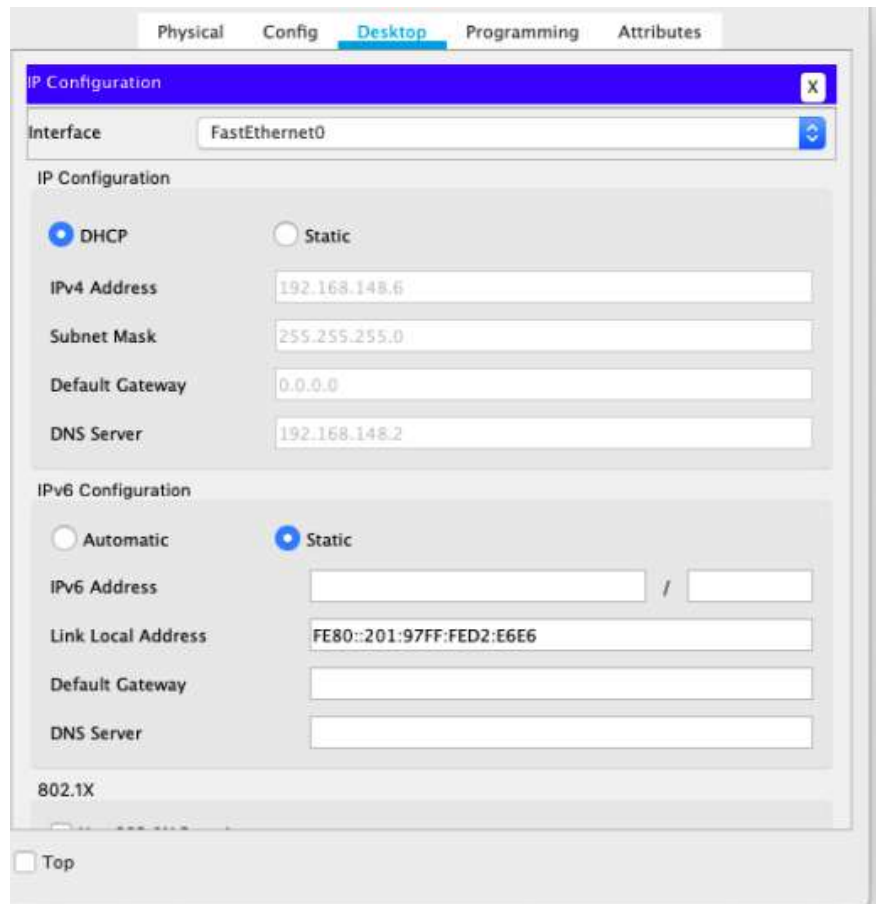
Shows the Dynamically configured IP of one of the hosts through DHCP.