Network Lab Report

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JU-BCSE - III

Assignment 6:
Use Cisco Packet Tracer software to do the following experiments.

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.

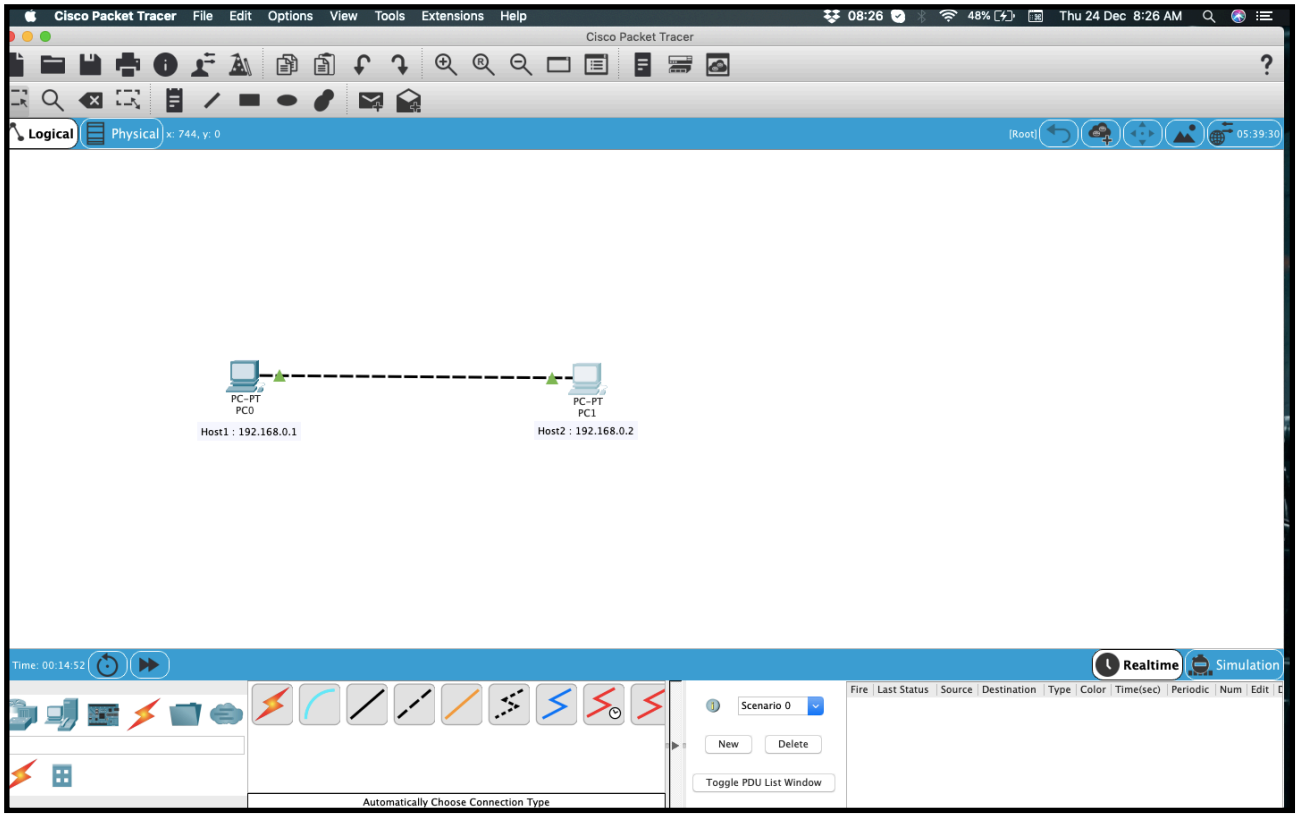

fig 1a : Two hosts connected over a cross-over cable.

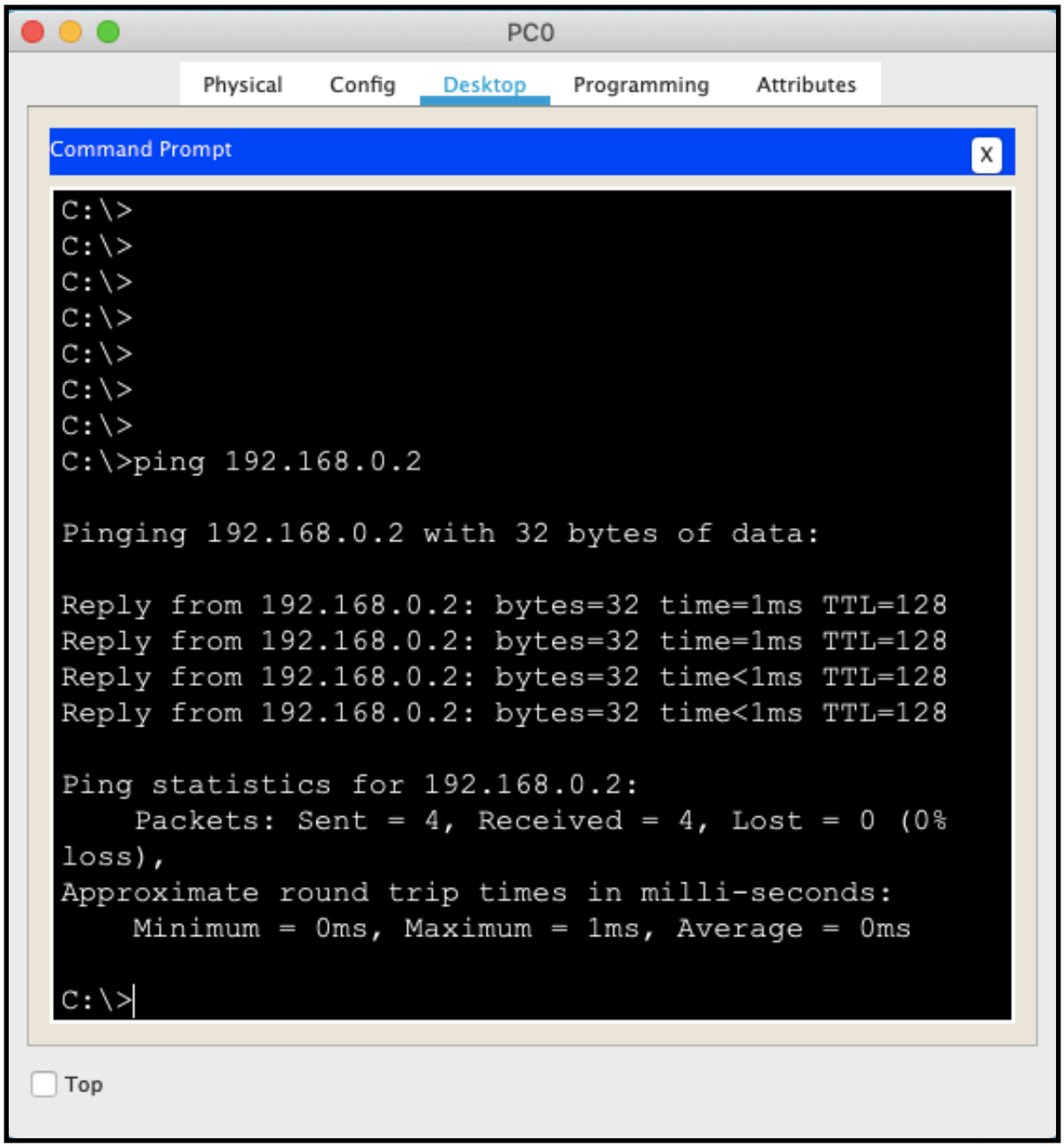

Fig 1b Host 1 with IP: 192.168.0.1 pinging Host 2 with IP : 192.168.0.2.

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

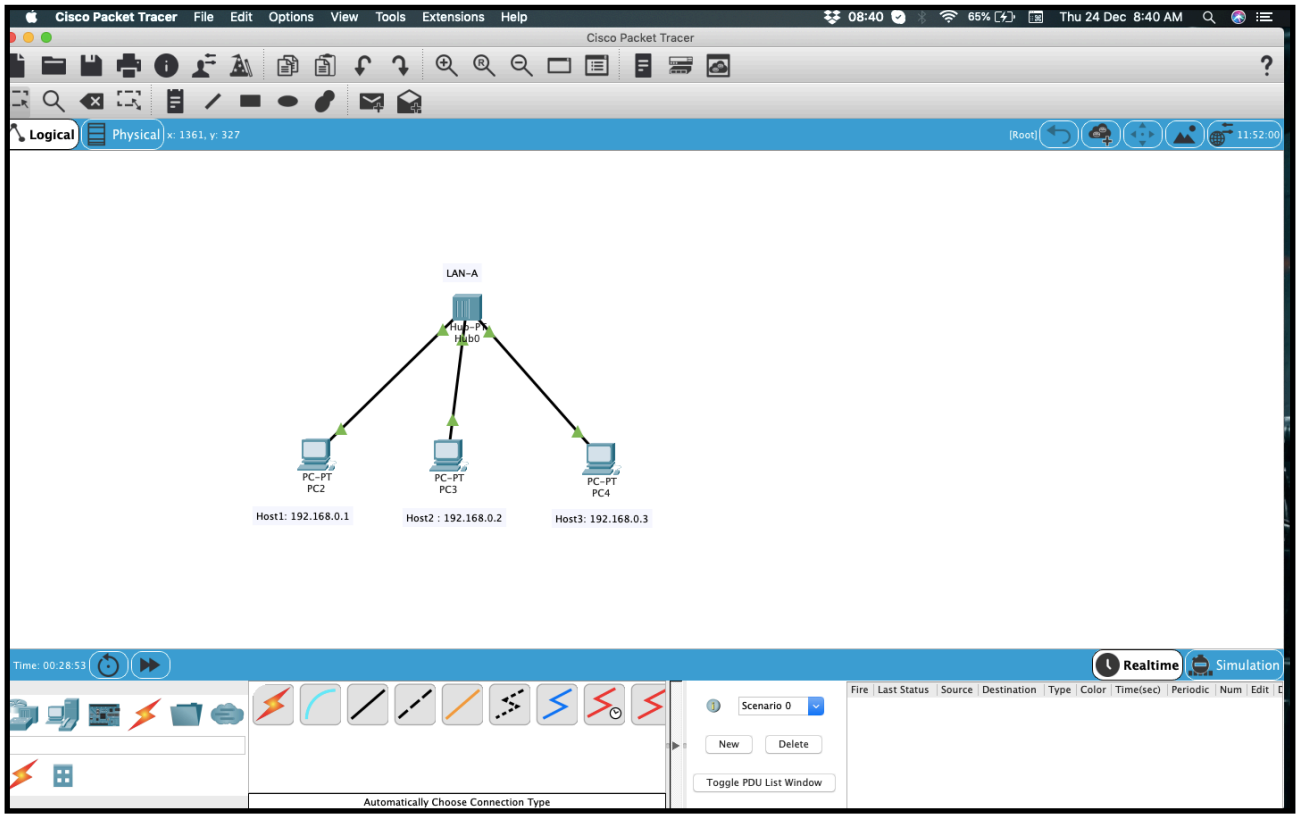

fig 2a : 3 hosts connected using a hub creating a LAN.

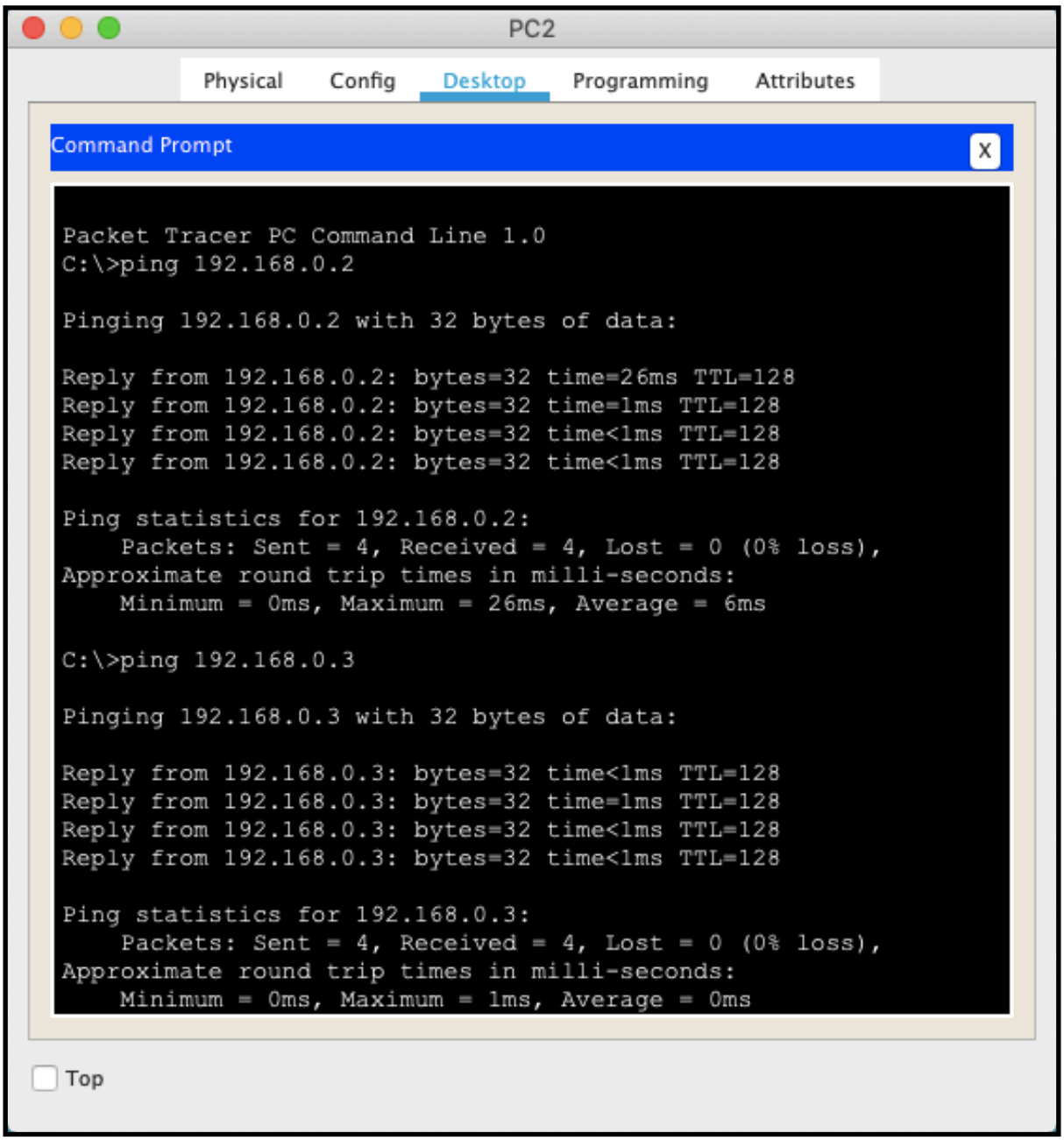

fig: 2b: Host 1 pinging Host 2 and Host 3.

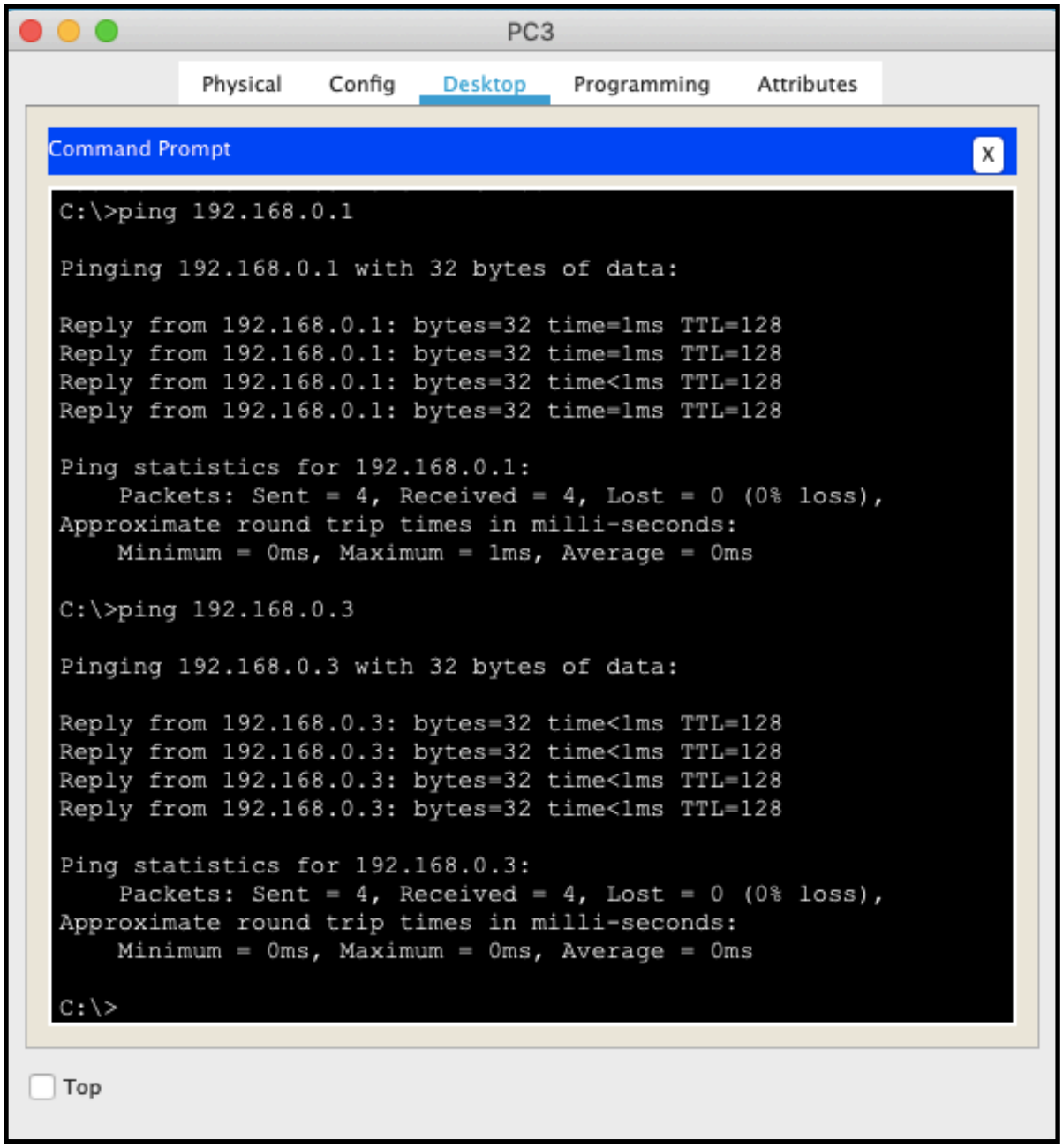

fig 2b : Host 2 pinging Host 1 and Host 3.

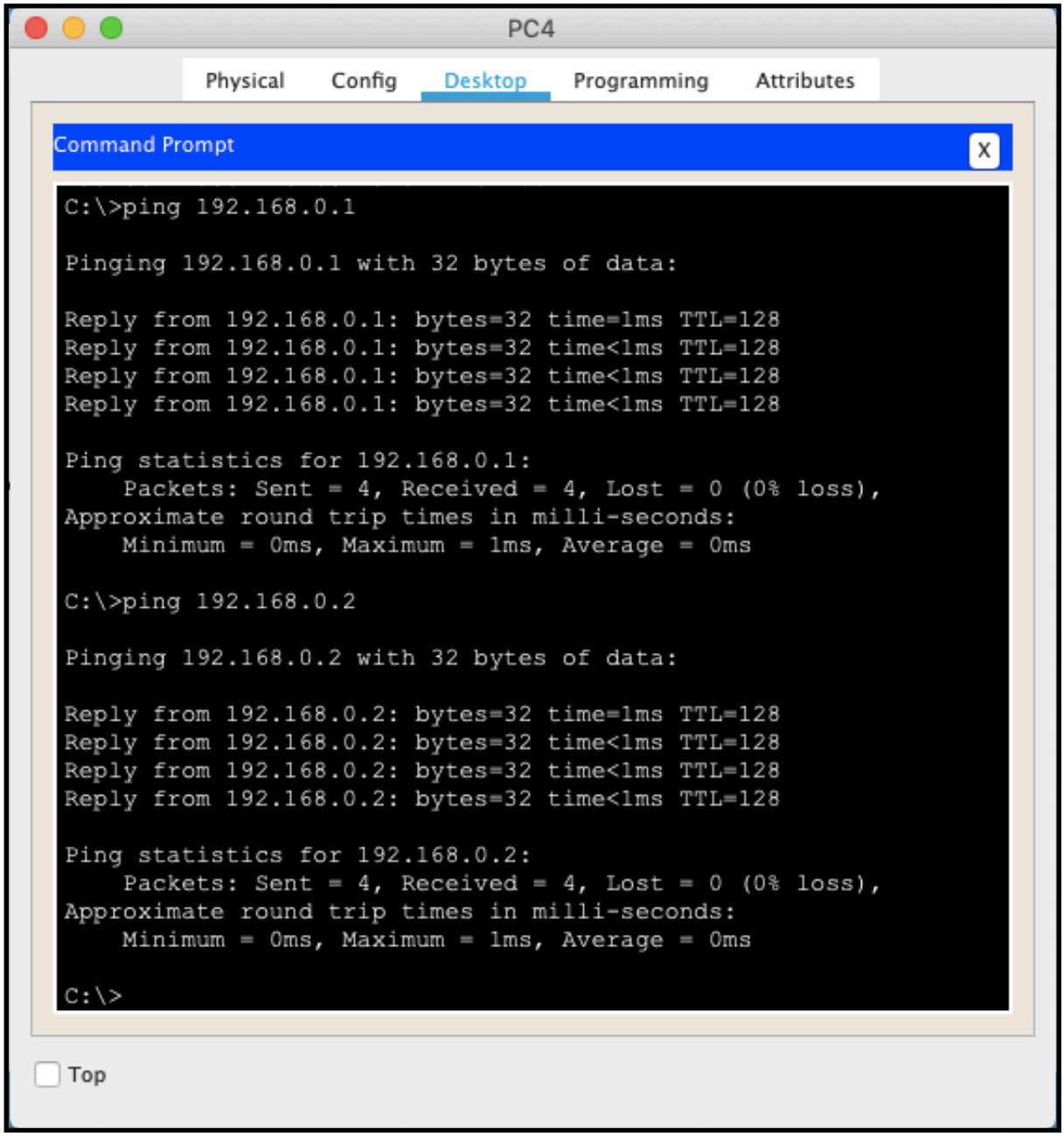

fig 2c : Host3 pinging Host 1 and Host 2.

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.

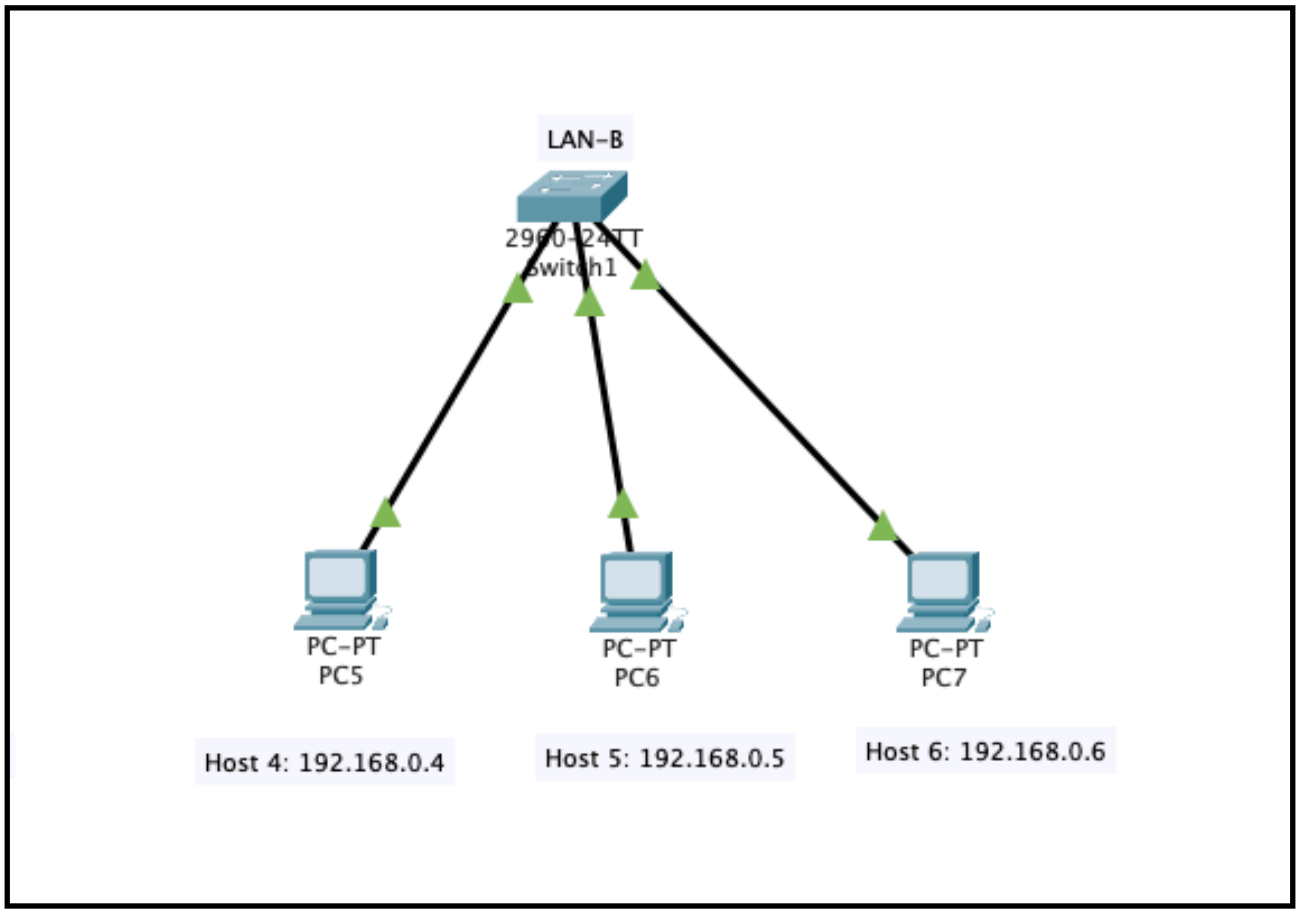

Fig 3a. LAN-B created by connecting 3 hosts over a switch.

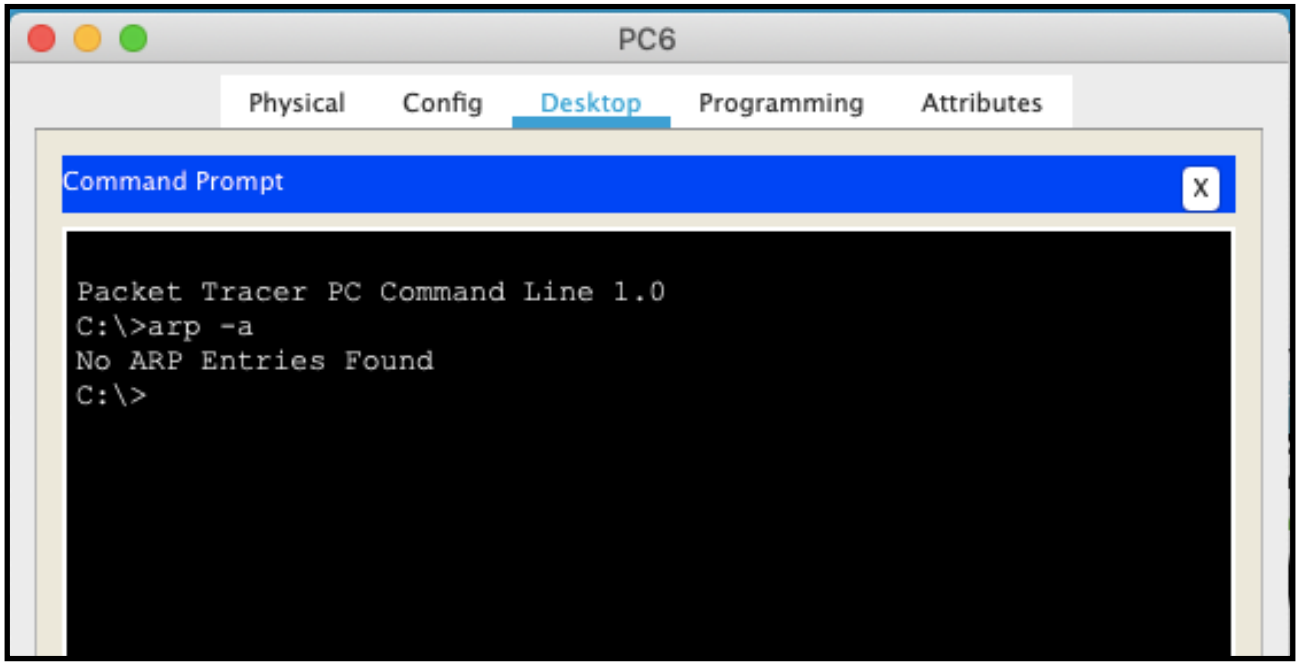

Fig 3b. No ARP Table found in END Hosts

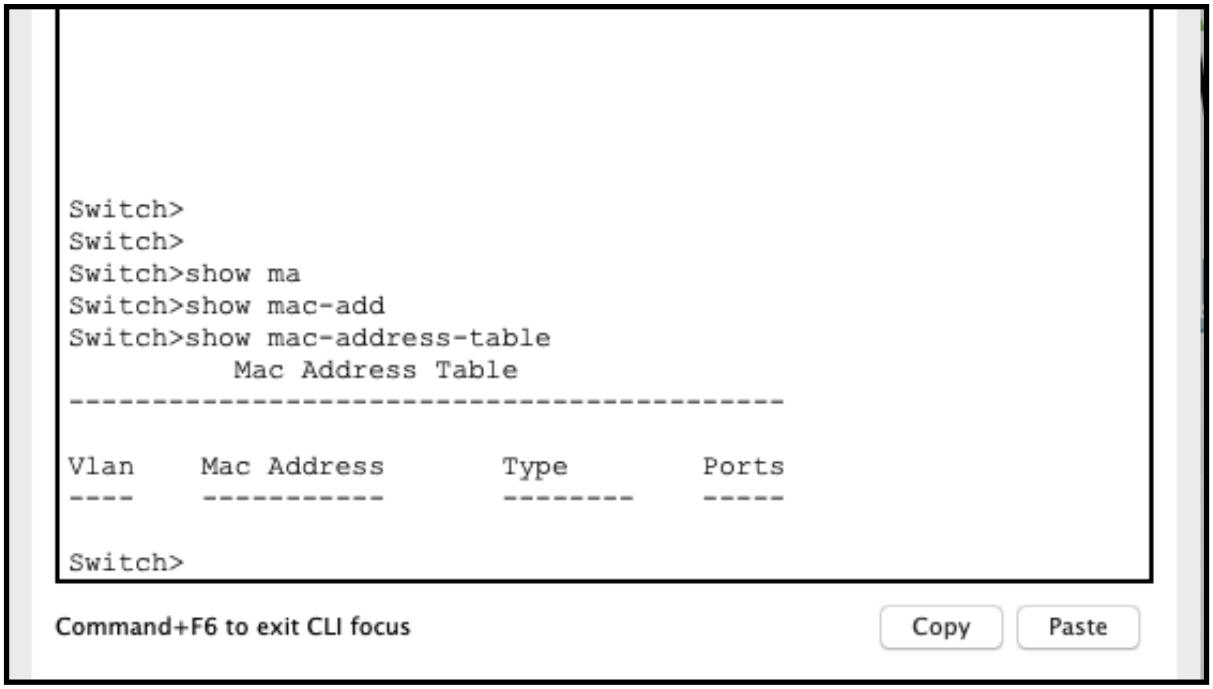

Fig 3c: No Mac Address Table found in switch

```
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:\>
```

Fig 3d. 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:\>
```

Fig 3e. 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:\>
```

Fig 3f. 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#
```

Fig 3g. Mac Address Table of Switch after respective pings.

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.

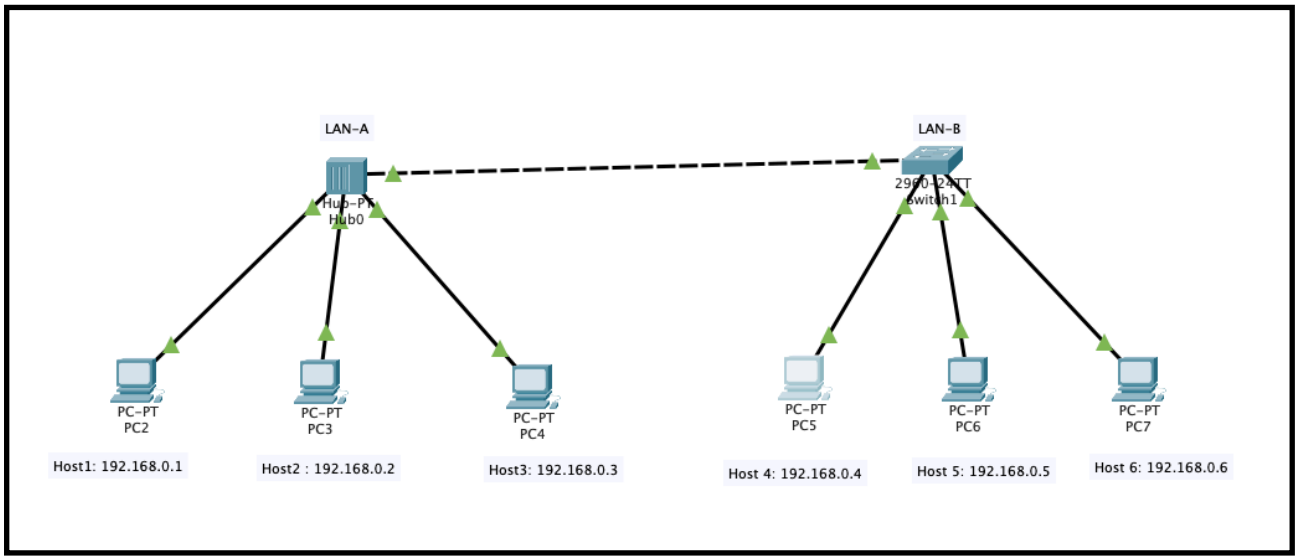

Fig 4a. LAN-A and LAN-B connected .

```
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

C:\>
```

Fig 4b. 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#
```

Fig 4c. 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.

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.

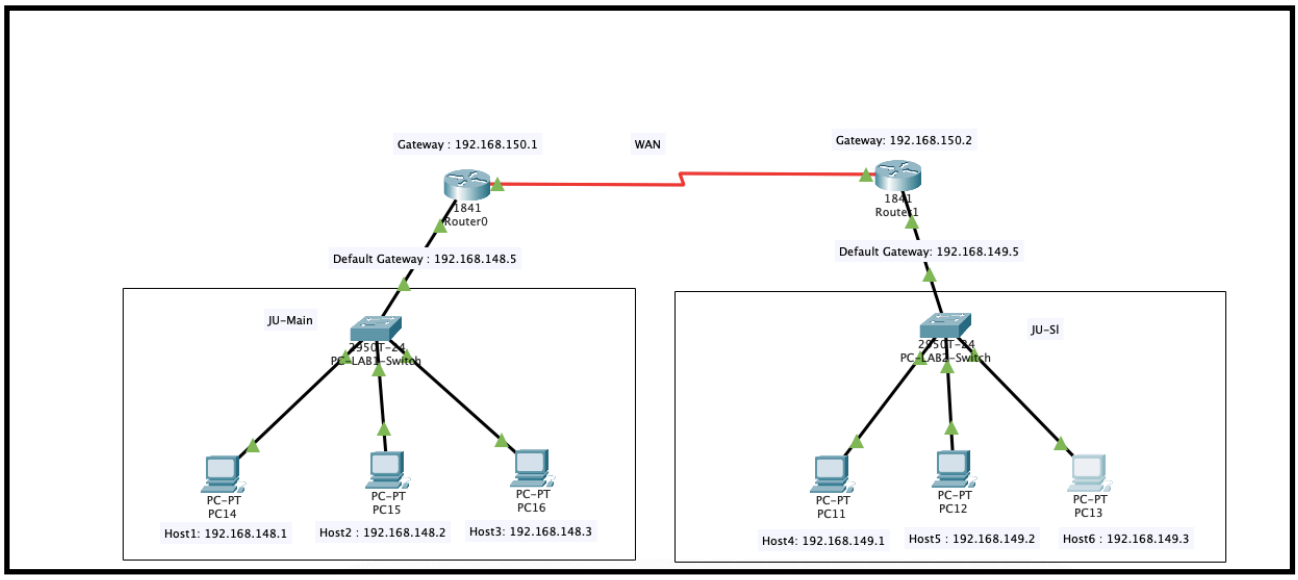

Fig 5a. Two Local Area networks consisting of 3 hosts in ranges 192.168.148.0/24 and 192.168.149.0/24 connected by two switches respectively - connected over routers over a WAN with IP ranging from 192.168.150.0/24.

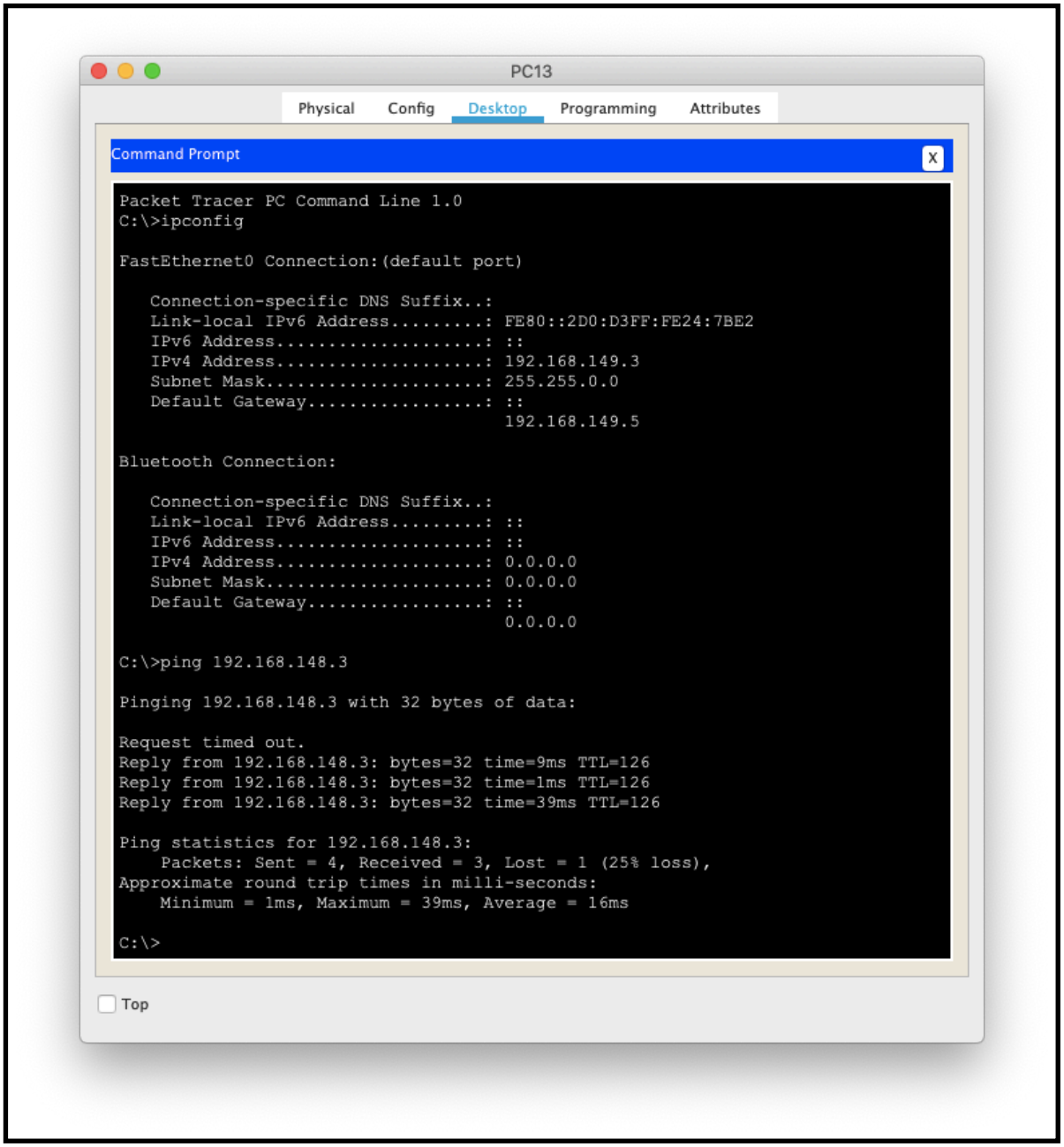

Fig 5b. A host in JU-SL 192.168.149.3 pinging another host successfully in JU-MAIN with IP 192.168.148.3

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.

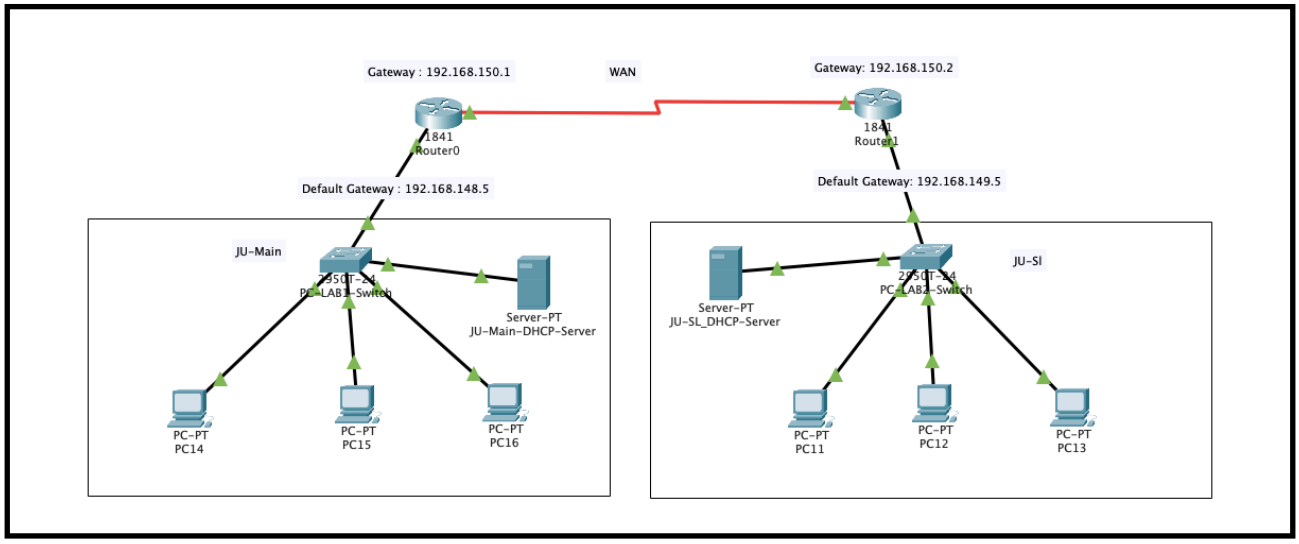

Fig 6a. DHCP servers are added as an extension to network in 5, the host's IP configuration are modified to accommodate the dynamic change in IP.

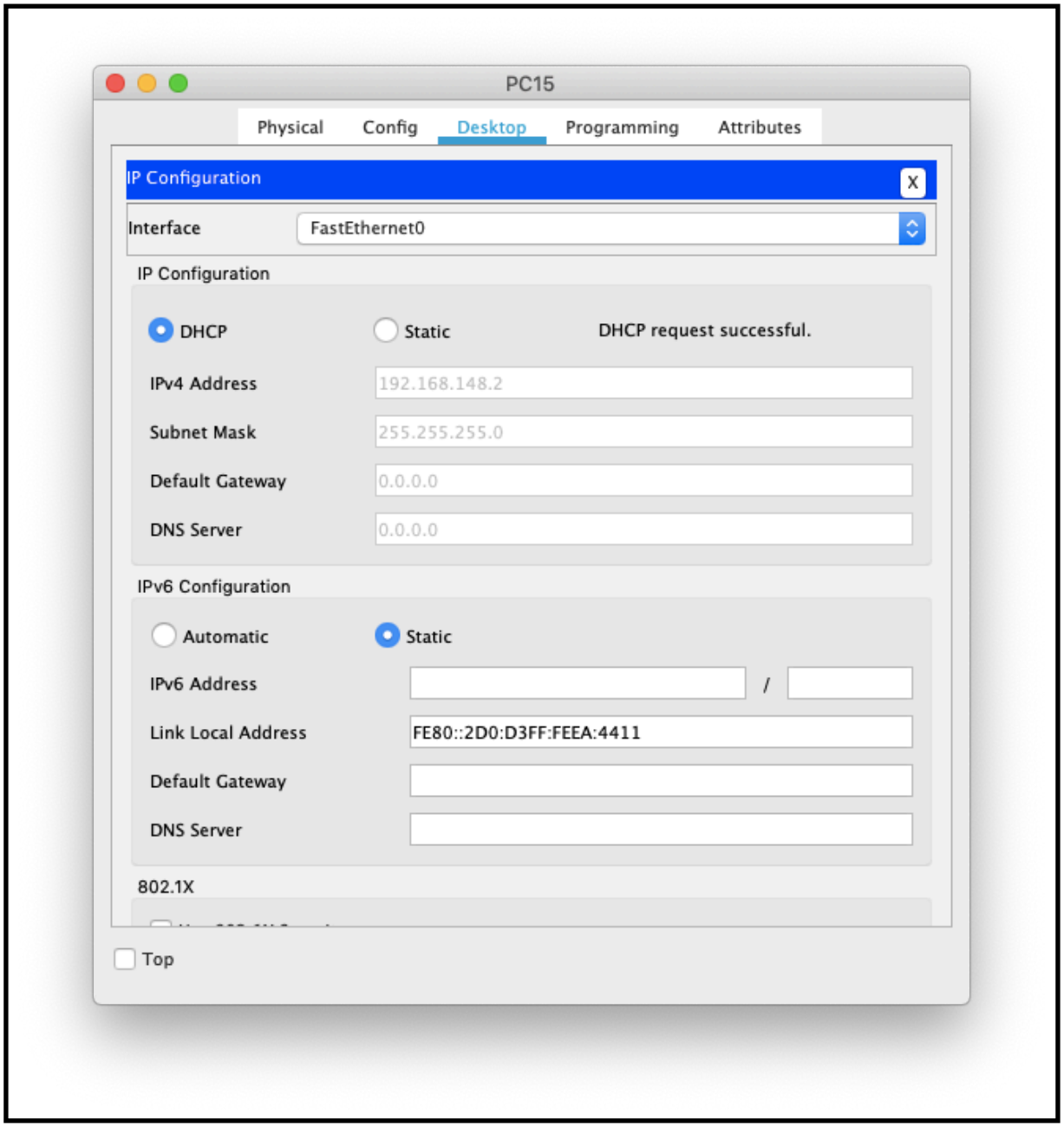

Fig 6b. An example of host IP configuration in JU-Main getting its IP address dynamically as a result of DHCP.

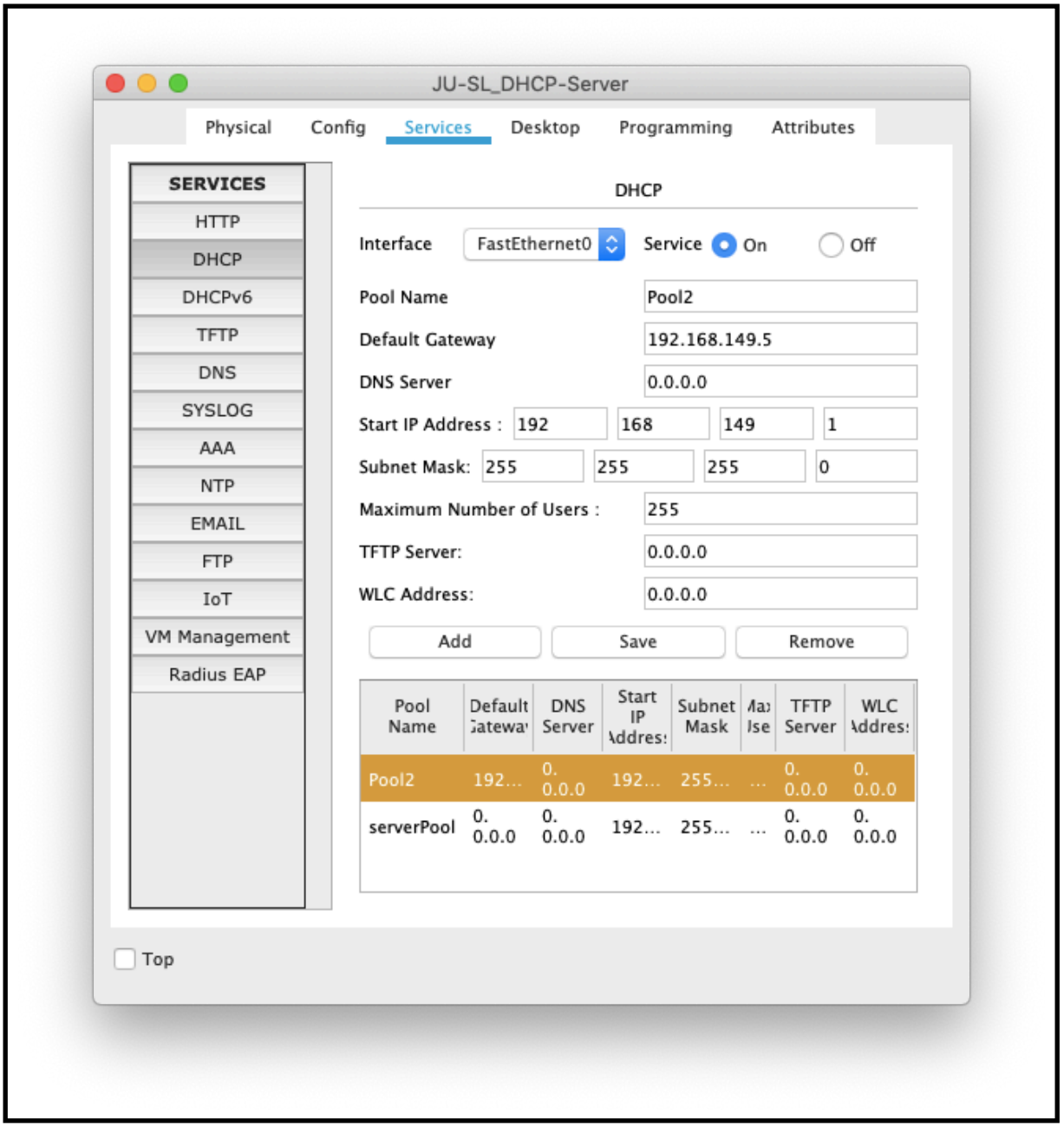

Fig 6c. An example DHCP configuration in JUSL network.

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.

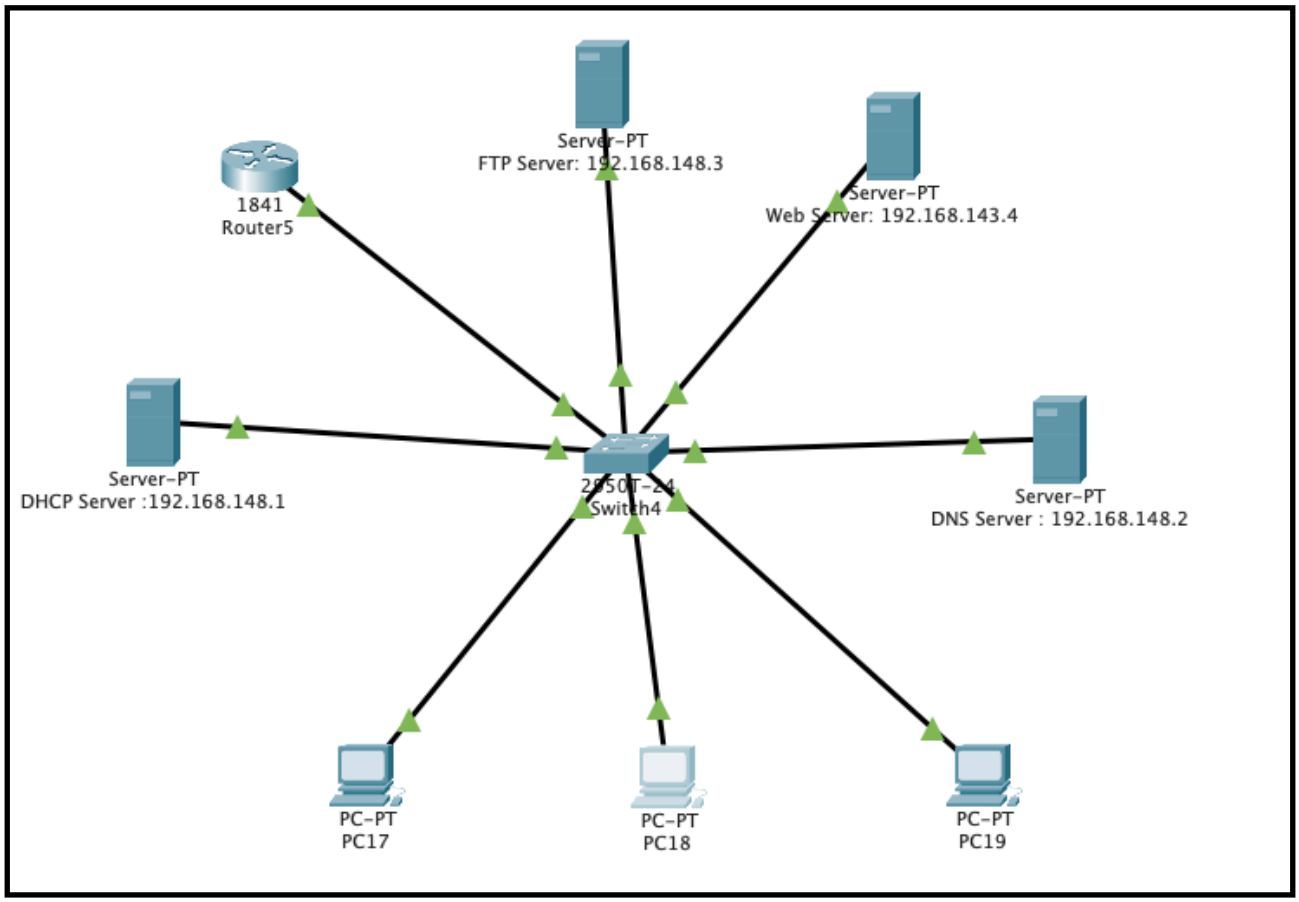

Fig 7a. LAN(CSE) created with a switch connecting three switches and a FTP server and a Web server.

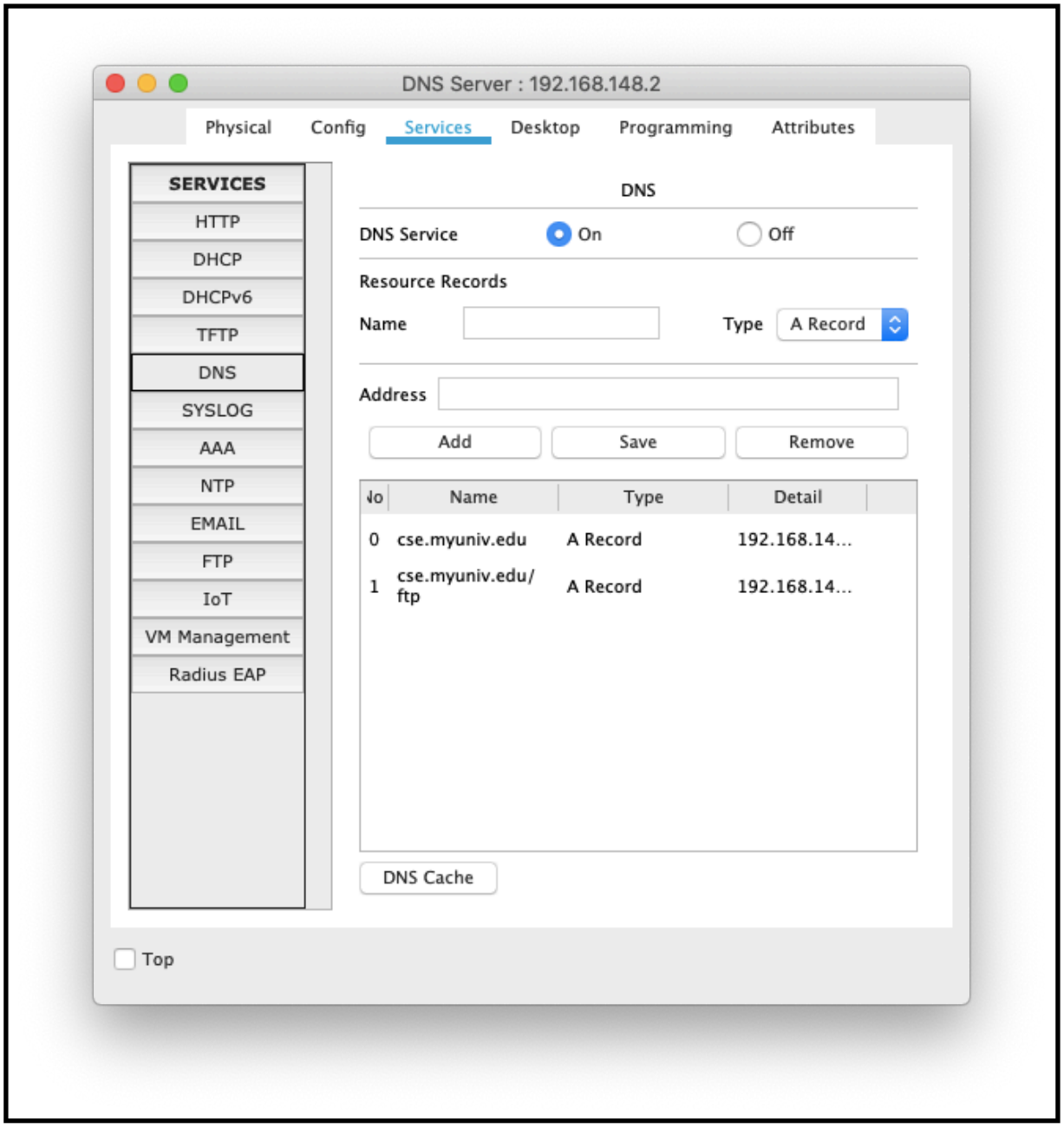

Fig 7b. Shows the DNS records in the DNS server.

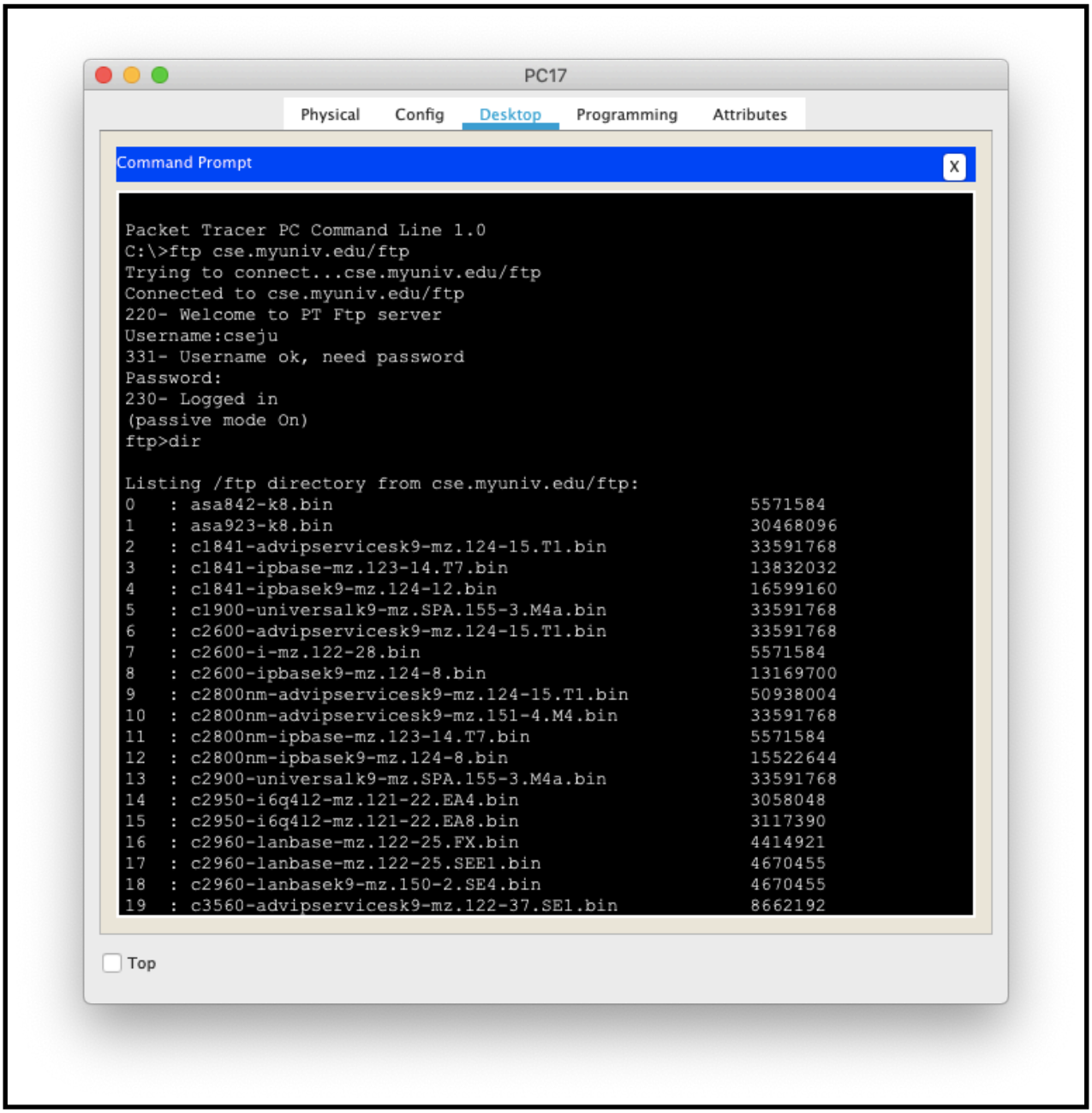

Fig 7c. Shows the working of a successfully FTP login and working in one of the hosts in the network.

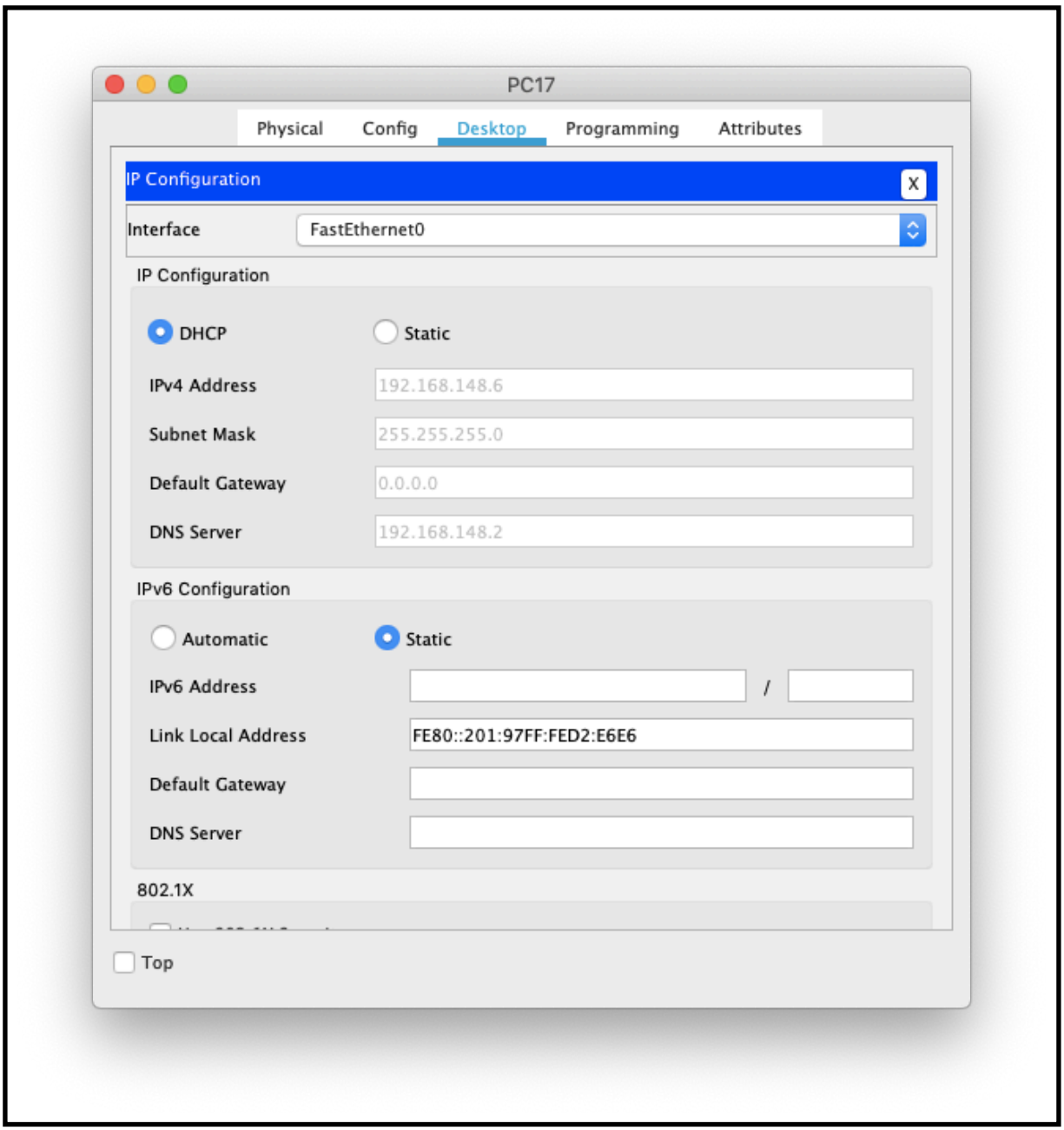

Fig 7d. Shows the Dynamically configured IP of one of the hosts through DHCP.