Task-5

a). Configure network devices, such as hubs and switches within a network topology using Packet Tracer software.

Step 1: Set Up the Workspace

1. **Open Packet Tracer**: Launch the software on your computer.
2. **Create a New Project**: Click on “File” and select “New.”

Step 2: Add Devices

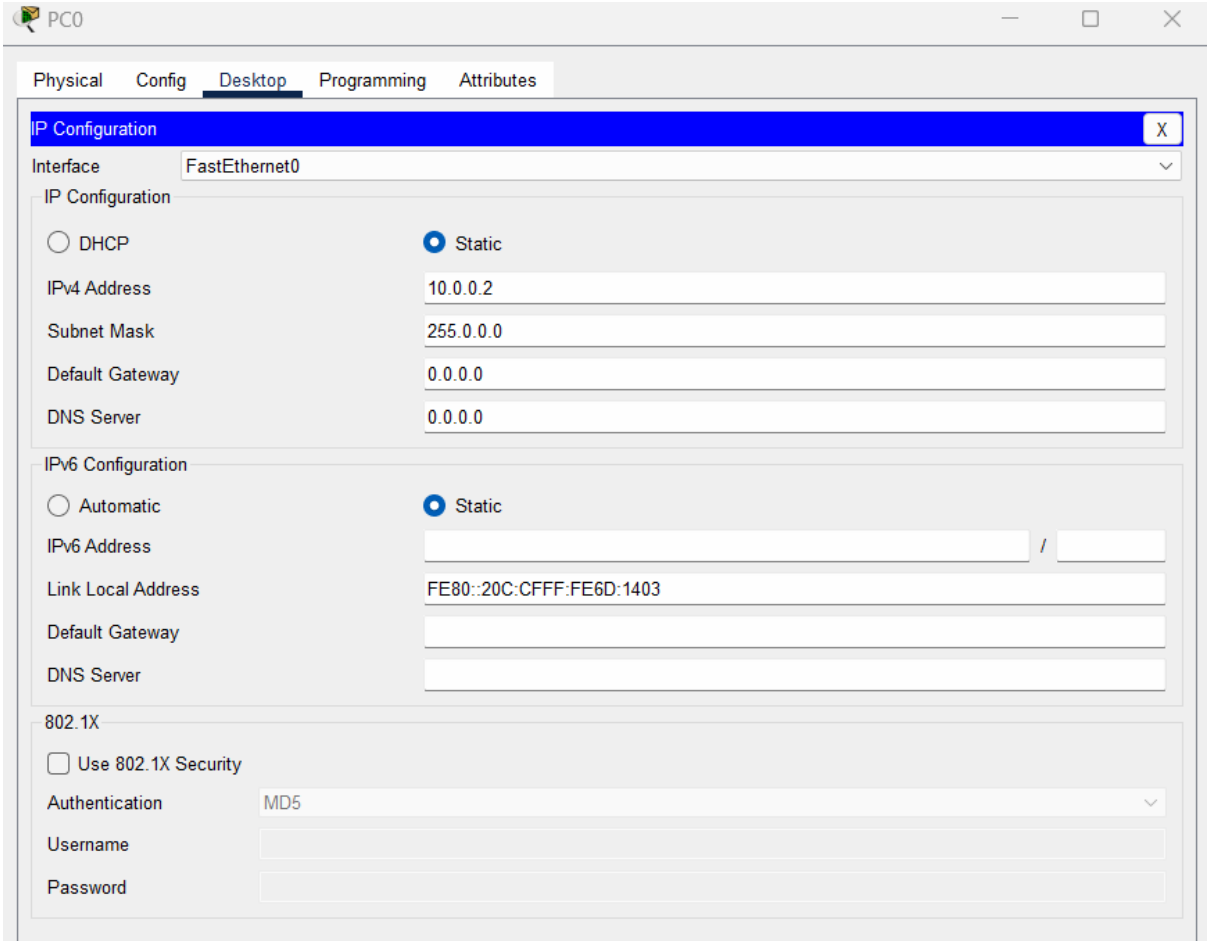
1. **Select Devices**: On the bottom left, find the device types.
    - **Hubs**: Navigate to the “Hubs” category and drag a **Hub-PT** onto the workspace.
    - **Switches**: Go to the “Switches” category and drag a **Switch-PT** onto the workspace.

Step 3: Connect Devices

2. **Select the Connection Tool**: Click on the "Connections" icon (the lightning bolt).
3. **Connect Devices**: Click on the first device (hub/switch) and then on the second device to create a link. Choose appropriate cables (usually copper straight-through and copper cross-over cables for connecting to switches).

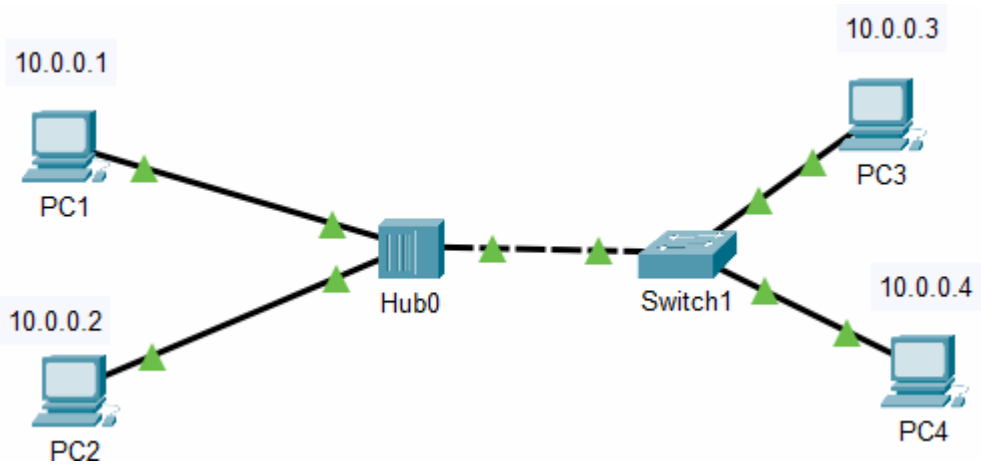
Step 4: Testing the Network

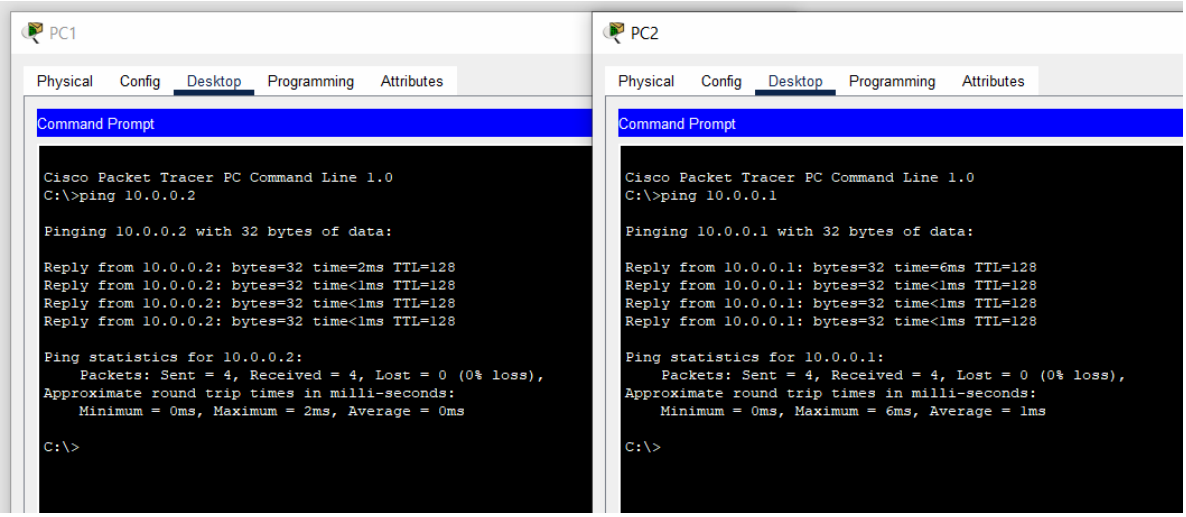
1. **Add End Devices**: Drag and drop PCs to the workspace and connect them to the switch/hub.
2. **Assign IP Addresses**:
    - Click on each PC, go to the "Desktop" tab, and select "IP Config."
    - Enter an IP address and subnet mask (e.g., 10.0.0.2) with a subnet mask of 255.255.255.0).
3. **Test Connectivity**:
    - Use the "Command Prompt" on PCs to ping each other (e.g., ping 10.0.0.3).



Step 7: Save Your Project

1. **Save**: Click on “File” and select “Save” to store your configuration.

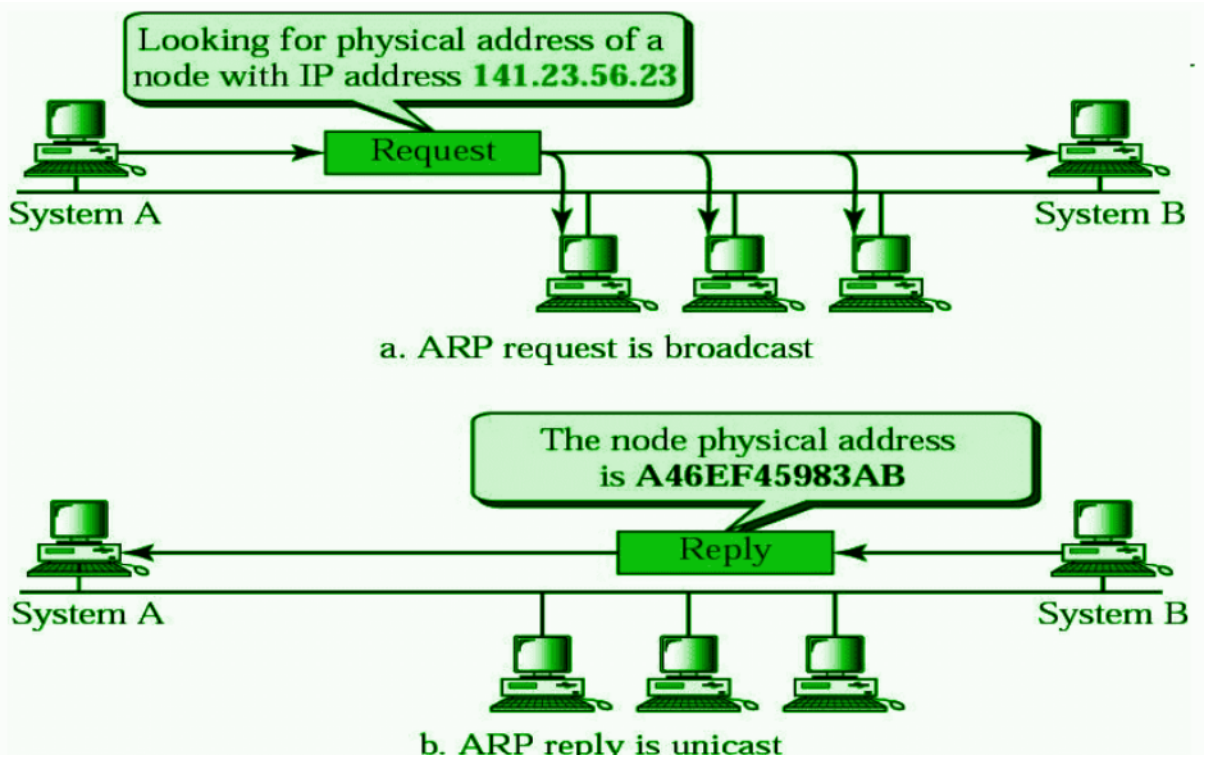



PC1
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.2
Pinging 10.0.0.2 with 32 bytes of data:
Reply from 10.0.0.2: bytes=32 time=2ms TTL=128
Reply from 10.0.0.2: bytes=32 time<1ms TTL=128
Reply from 10.0.0.2: bytes=32 time<1ms TTL=128
Reply from 10.0.0.2: bytes=32 time<1ms TTL=128
Ping statistics for 10.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 2ms, Average = 0ms
C:\>
PC2
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.1
Pinging 10.0.0.1 with 32 bytes of data:
Reply from 10.0.0.1: bytes=32 time=6ms TTL=128
Reply from 10.0.0.1: bytes=32 time<1ms TTL=128
Reply from 10.0.0.1: bytes=32 time<1ms TTL=128
Reply from 10.0.0.1: bytes=32 time<1ms TTL=128
Ping statistics for 10.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 6ms, Average = 1ms
C:\>

b).Construct a single LAN and understand the concepts and operation of ARP.

What is ARP?

- ARP is used to map IP addresses to MAC addresses in a local area network (LAN). When a device wants to communicate with another device in the same subnet, it must know the MAC address corresponding to the IP address it wants to reach.



Step 1: Create a Simple LAN in Packet Tracer

1. **Open Packet Tracer**: Launch the application.
2. **Add Devices**:
    - **Switch**: Drag a switch onto the workspace.
    - **PCs**: Drag two or more PCs onto the workspace.

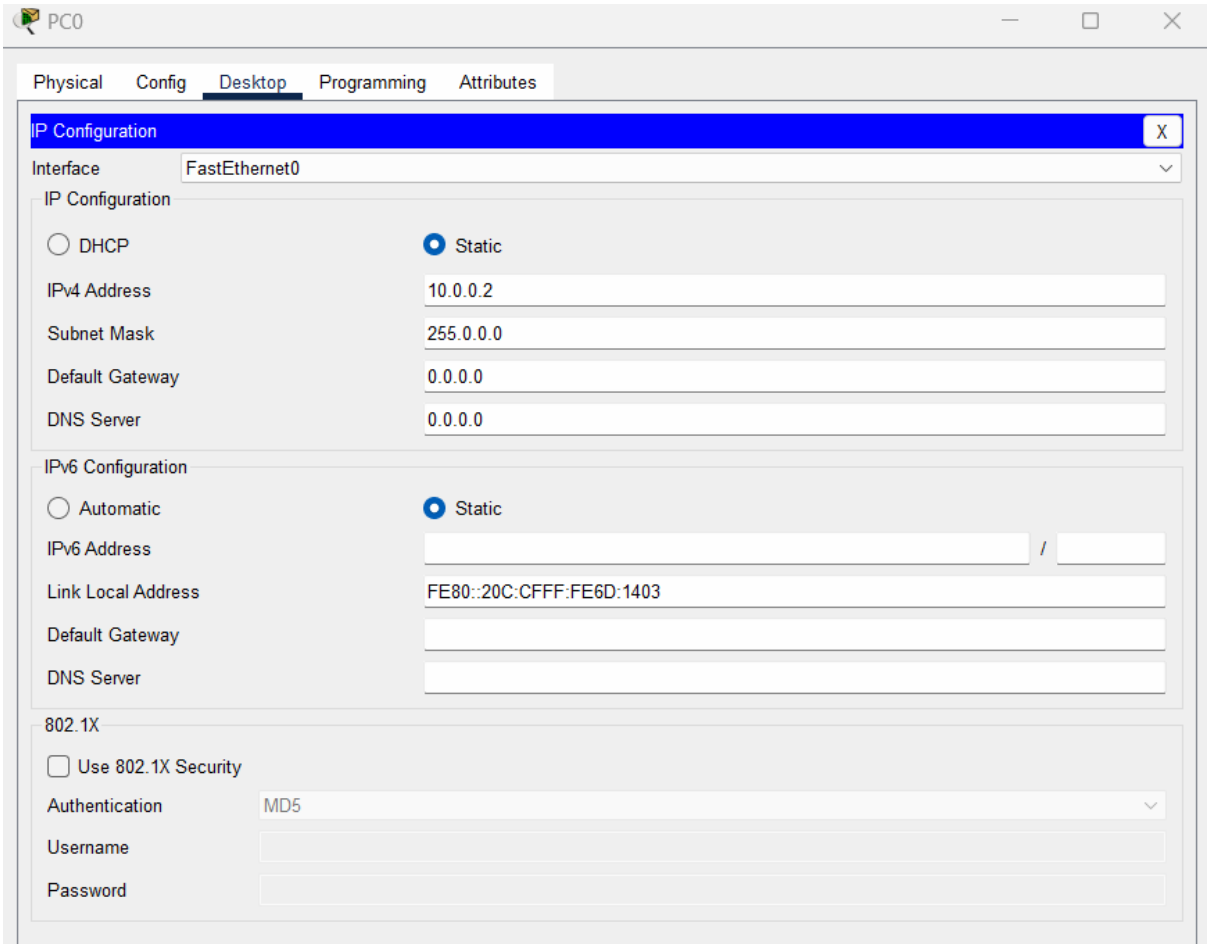
Step 2: Connect Devices

1. **Select the Connection Tool**: Click on the "Connections" icon (lightning bolt).
2. **Connect PCs to the Switch**: Use copper straight-through cables to connect each PC to the switch.

Step 3: Configure IP Addresses

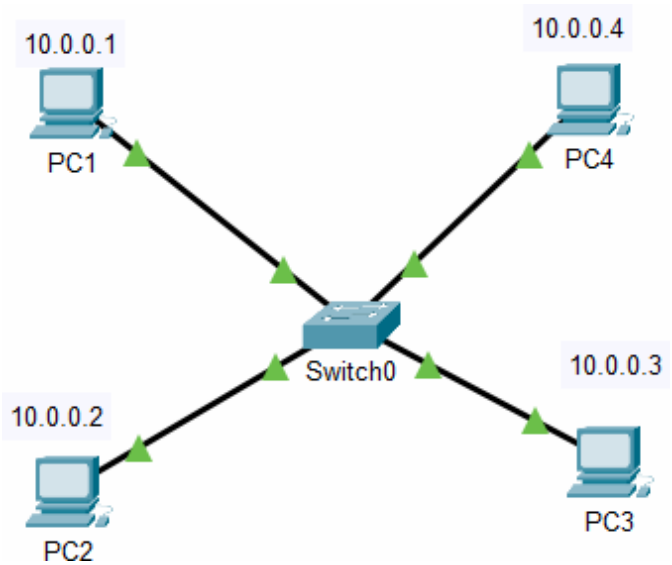
1. **Select Each PC**:
    - Click on the PC and go to the "Desktop" tab.
    - Open "IP Configuration".
    - Assign IP addresses and subnet masks:
        - **PC1**: IP Address: 10.0.0.1, Subnet Mask: 255.0.0.0

- **PC2**: IP Address: 10.0.0.2, Subnet Mask: 255.0.0.0
- (Continue for more PCs if desired, incrementing the last octet)

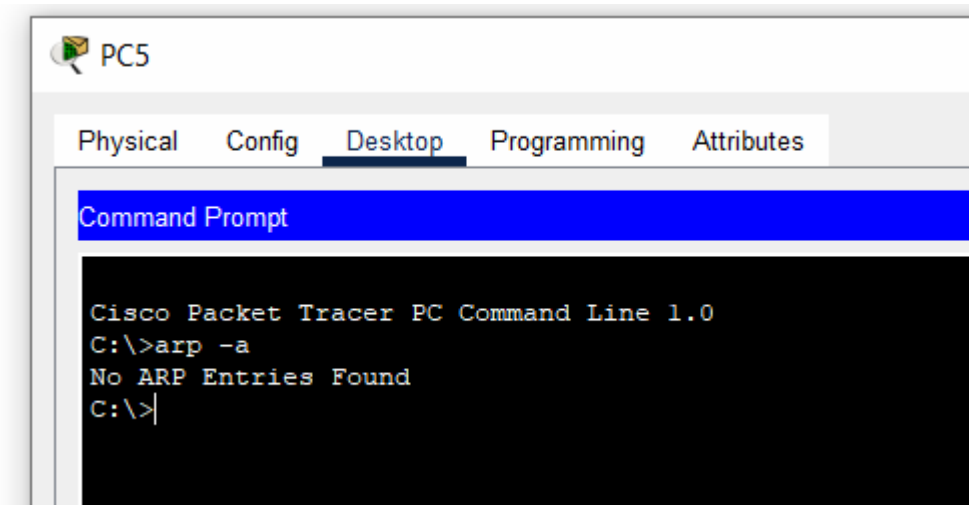


Step 4: Understand ARP

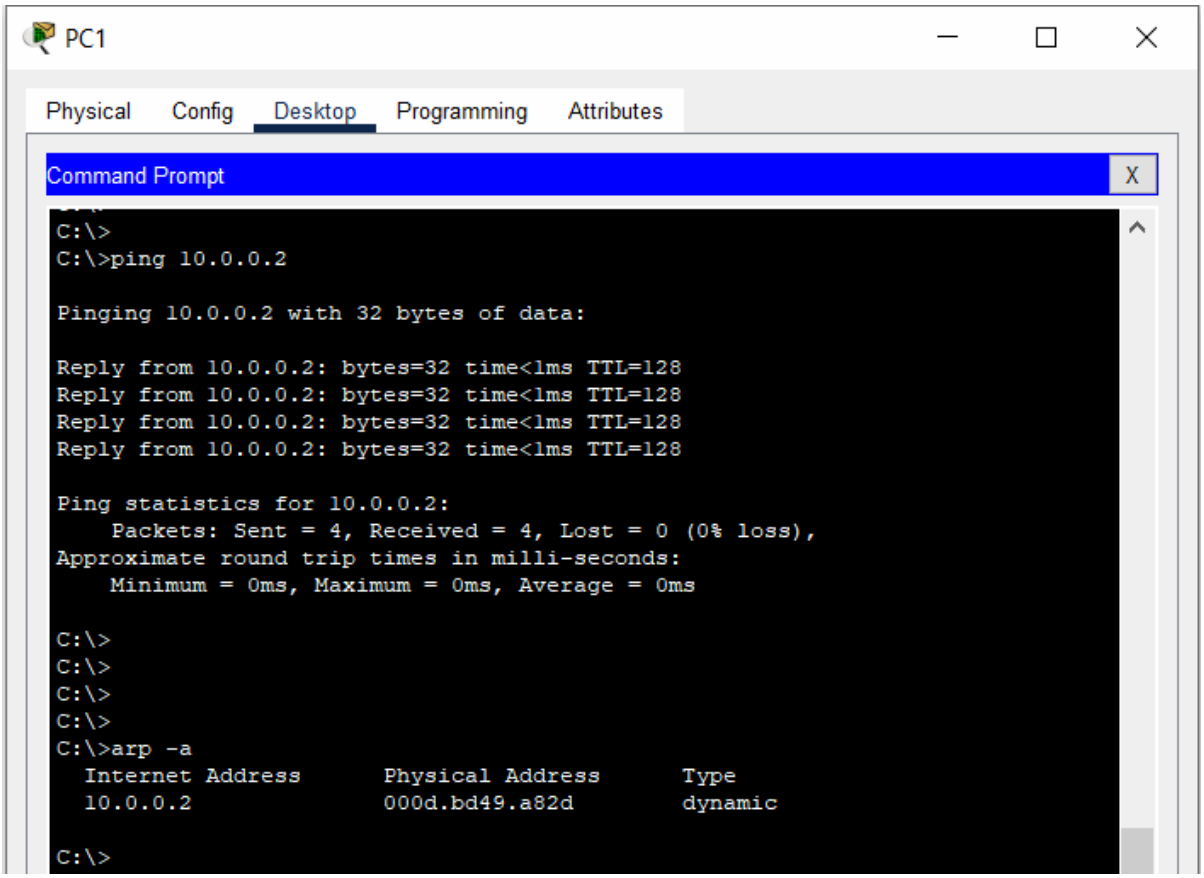
Below topology illustrates 4 PCs with IP address ranging from 10.0.0.1- 10.0.0.4



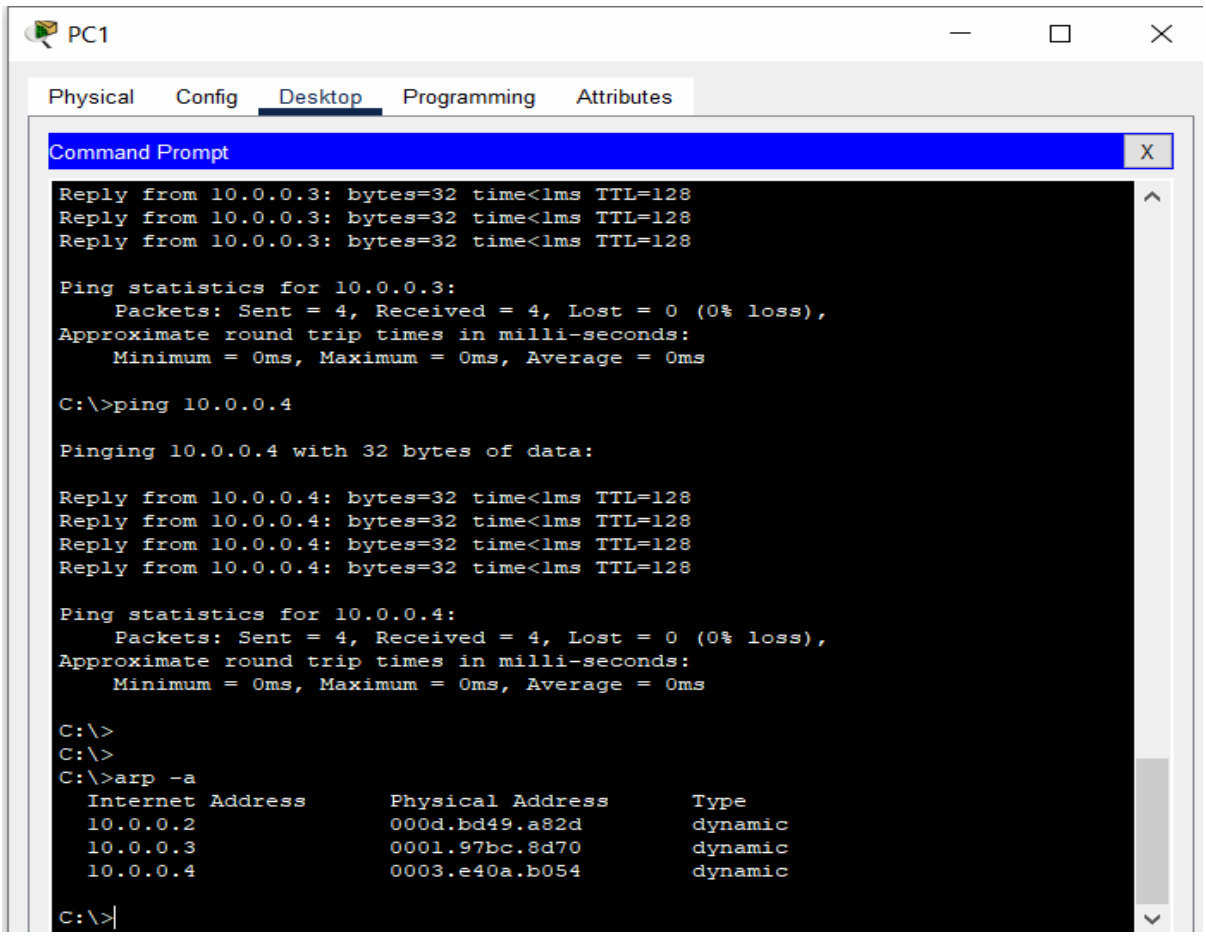
Initially if we look into ARP table of PC 1 there are no entries



Now ping to PC2 from PC1 as illustrated below. And check the arp rable.



Now from PC1 ping PC3 and PC4 and watch the arp tables



Now you can ping from other systems and see how the ARP tables are constructed.