#### Practical 1:-

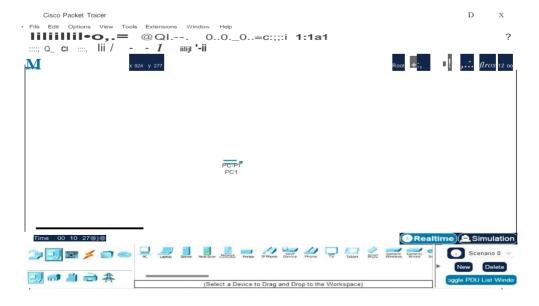
To Study basic network command and Network configuration commands.

#### Steps:

1. Open Cisco Packet Tracer.



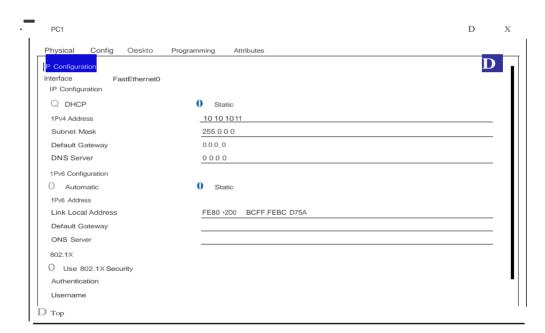
- 2. At the bottom left, go to the End Devices category.
  - Drag and drop PC to the workspace.



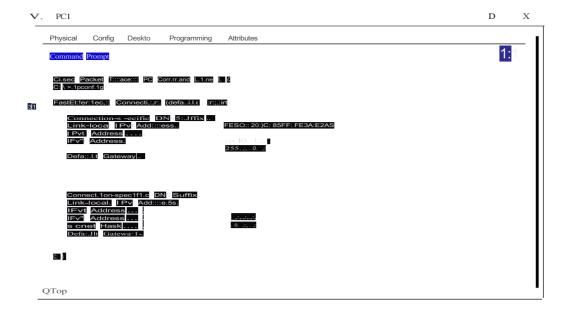
- 3. Assign Ip address to PC:-
  - Right Click on PC > Go to desktop > Choose IP configuration



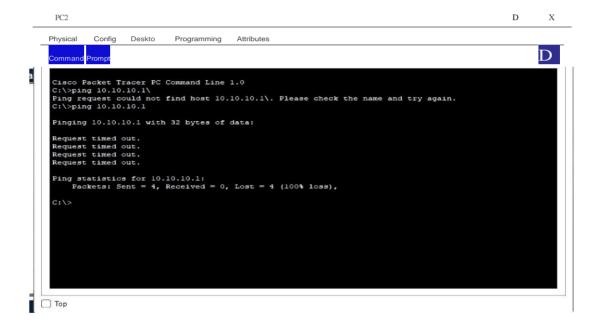
Assign PC ip address - 10.10.10.1



- 4. On PC0 Go to Desktop > Command Prompt:
  - Type: ipconfig 10.10.10.1 Check successfully assigned ip address.



Type: ping 192.168.1.2 Check reply

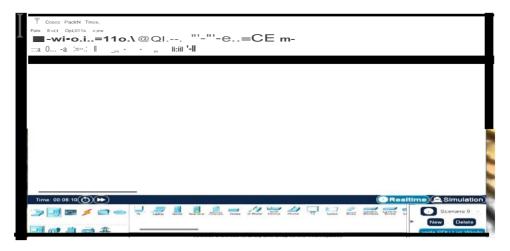


## Practical 2:-

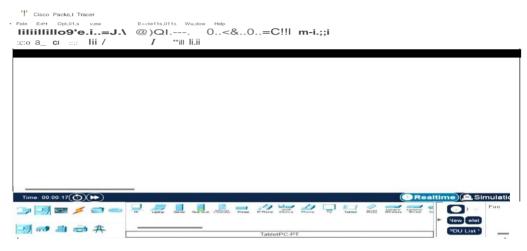
To study and perform PC to PC communication.

## Steps:

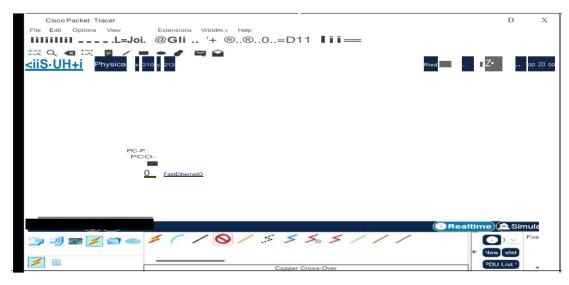
1. Open Cisco Packet Tracer.



- 2. At the bottom left, go to the End Devices category.
  - Drag and drop 2 PCs to the workspace.



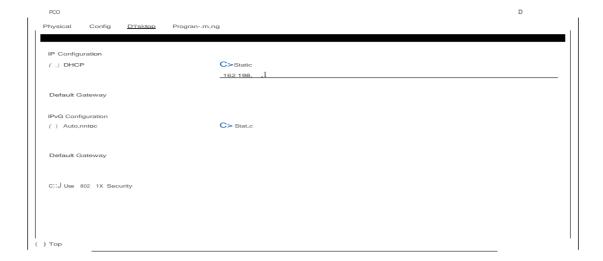
- 3. Go to the Connections category (lightning bolt icon).
  - Select "Copper Cross-Over Cable".
  - Click PC0 FastEthernet0, then PCl FastEthernet0.



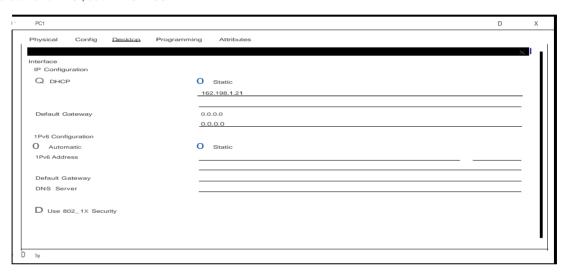
4. Click on PC0 Go to Desktop > IP Configuration:

• IP Address: 162.198.1.1

• Subnet Mask: 255.255.255.0

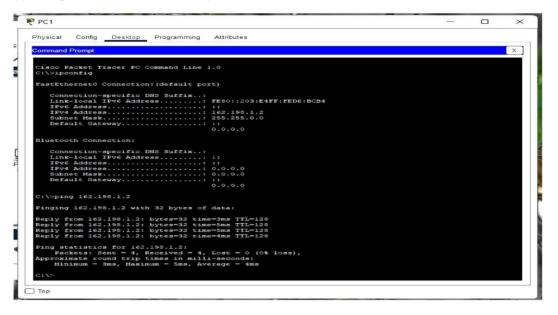


5. Do the same for PCI, set IP: 162.198.1.2



- 6. On PC0 Go to Desktop > Command Prompt:
  - Type: ping 192.168.1.2 Check reply.

- 7. On PC0Goto Desktop> Command Prompt:
  - Type: ping 192.168.1.2 Check reply.

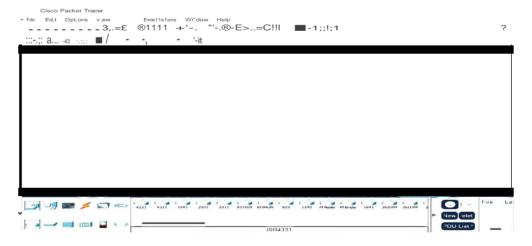


#### Practical 3:-

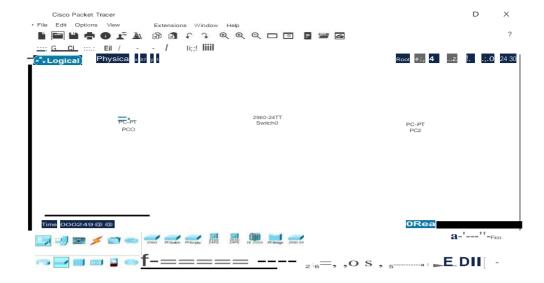
• To create Star topology using Switch.

# Steps:

- 1. Add Devices:
  - Go to End Devices (bottom-left panel) drag 3 PCs into the workspace.

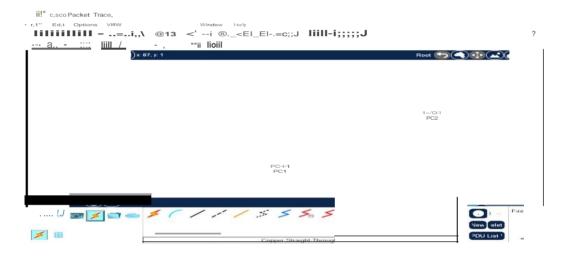


• Go to Network Devices > Switches drag a Switch (2960) into the center of the workspace.



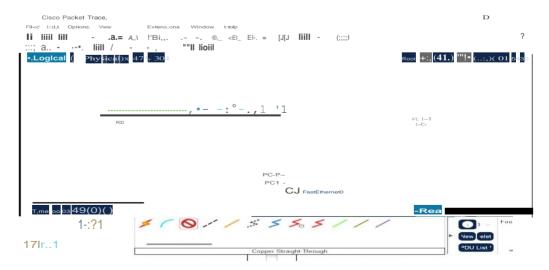
#### 2. Connect Devices:

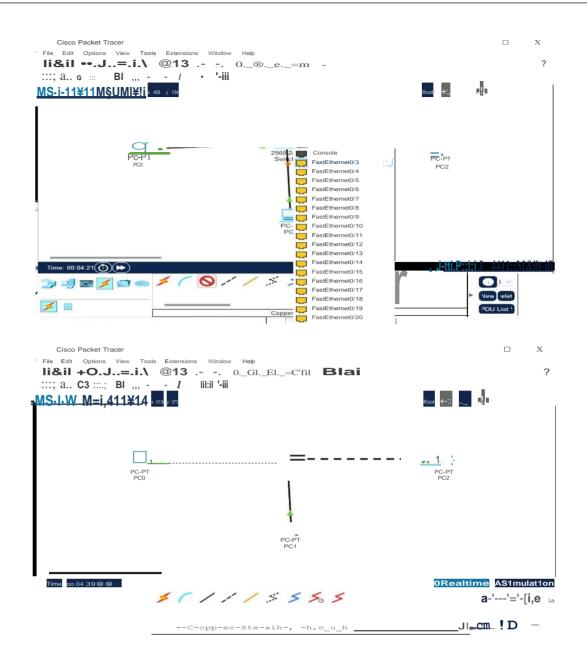
Go to Connections (Lightning Icon), Select Copper Straight-Through Cable (first solid line).



· Connect each PC to the Switch:

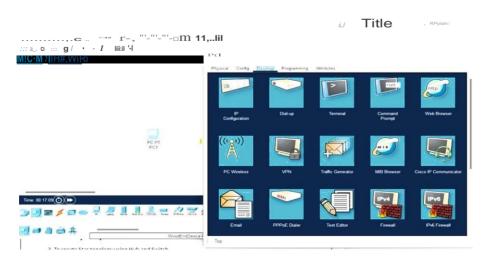
PC0 Switch (FastEthernet0/1), PCI Switch (FastEthernet0/2) , PC2 Switch (FastEthernet0/3)





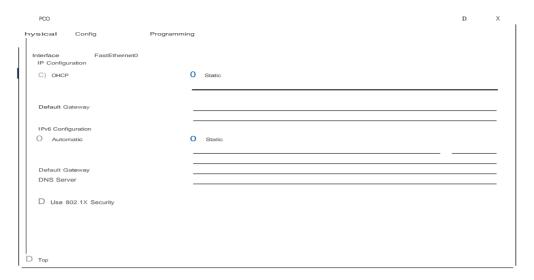
## 3. Configure IP Addresses:

• Click on each PC Desktop> IP Configuration.



• Assign IPs as follows:

PC0: 192.168.1.1 PCI: 192.168.1.2 PC2: 192.168.1.3 , Subnet Mask: 255.255.255.0 for all .



#### Same as for PCI and PC2:



# 4. Test Connectivity:

• On PC0 Desktop> Command Prompt

• Type: ping 192.168.1.2 Check reply

• Type: ping 192.168.1.3

```
Χ
                                                                                                                                                                                                 D
vi <u>PCO</u>
        Physical
                          Config Deskto Programming Attributes
                                                                                                                                                                                                                          1
           Cisco Packet Tracer PC Command Line 1.0 C:\>ipconfig
           FastEthernet0 Connection: (default port)
                tEtherneto contection DNS Suffix.:

Connection-specific DNS Suffix.:
Link-local IPv6 Address....: FE80::201:42FF:FEE9:5918

IPv6 Address....: : 198.162.1.1

IPv4 Address....: 255.255.255.0

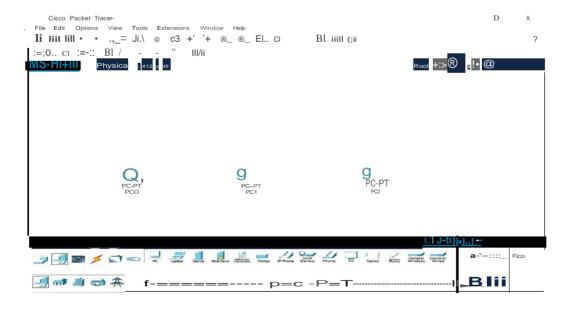
Default Gateway...: :

0.0.0.0
                Connection-specific DNS Suffix::
Link-local IPv6 Address::
IPv6 Address::
IPv4 Address::
Subnet Mask::
Default Gateway::
           C:\>ping 198.162.1.2
           Pinging 198.162.1.2 with 32 bytes of data:
                  g statistics for 198.162.1.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
coximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
7
           C:\>ping 198.162.1.3
           Pinging 198.162.1.3 with 32 bytes of data:
          Reply from 198.162.1.3: bytes=32 time<1ms TTL=128 Reply from 198.162.1.3: bytes=32 time<1ms TTL=128
```

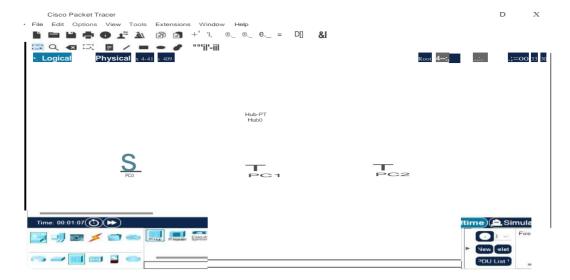
# 2. To create Star topology using Hub:

## Step:

- 1. Add Devices
  - In End Devices, Drag 3 more PCs.

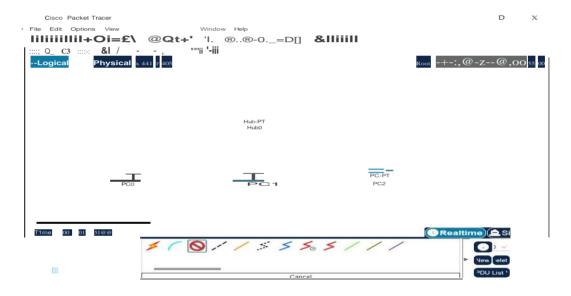


• InNetwork Devices> Hubs, drag 1 Hub (PT-HUB).

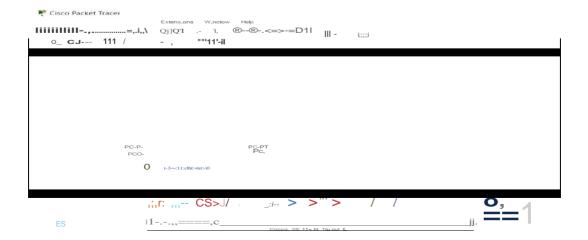


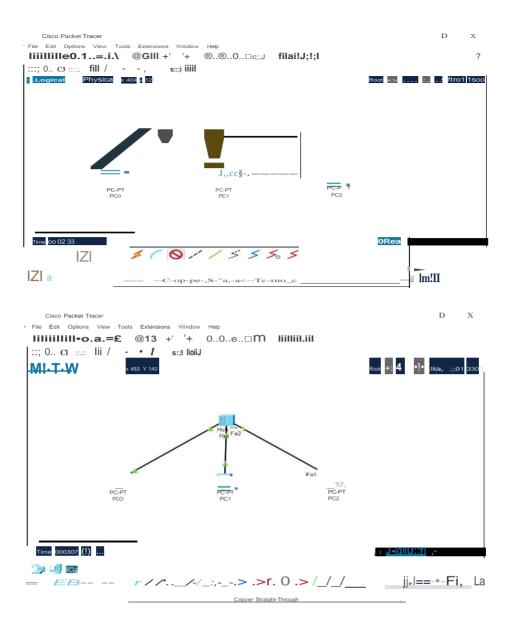
#### 2. Connect Devices

• Use Copper Straight-Through Cable.



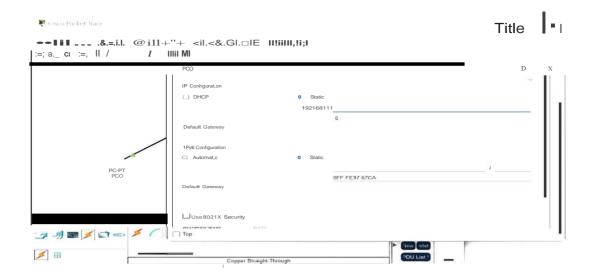
- Connect:
  - 1. PCO Hub (Port 0)
  - 2. PCI Hub (Port 1)
  - 3. PC2 Hub (Port 2)



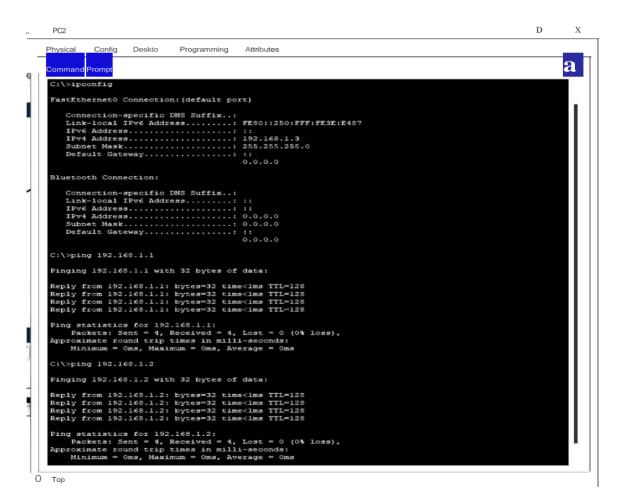


#### 3. Configure IP Addresses

- Click each PC IP Configuration:
  - 1. PCO: 192.168.1.4
  - 2. PCI: 192.168.1.5
  - 3. PC2: 192.168.1.6
  - 4. Subnet Mask: 255.255.255.0



- 4. Test Connectivity
- On PC2 ping 192.168.1.1, ping 192.168.1.2



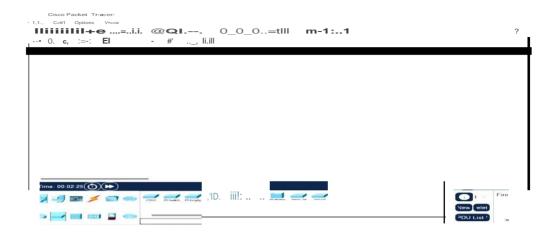
#### Practical 4:-

To create Bus topologies.

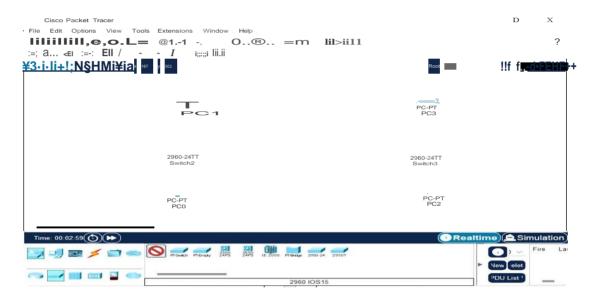
Steps:

Add Devices

• In End Devices, Drag 4 more PCs.

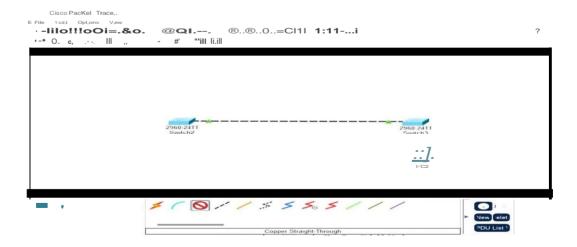


• Go to Network Devices> Switches drag a Switch (2960) into the center of the workspace.

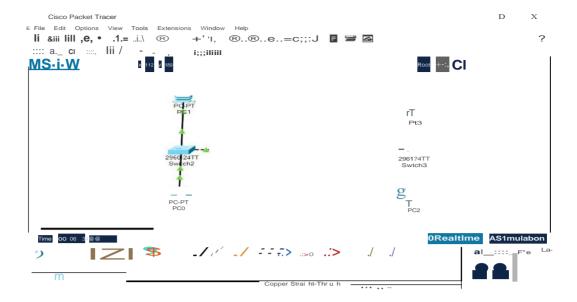


#### 2. Connect Devices:

Go to Connections (Lightning Icon), "Copper Cross-Over Cable" for Connecting Switches.



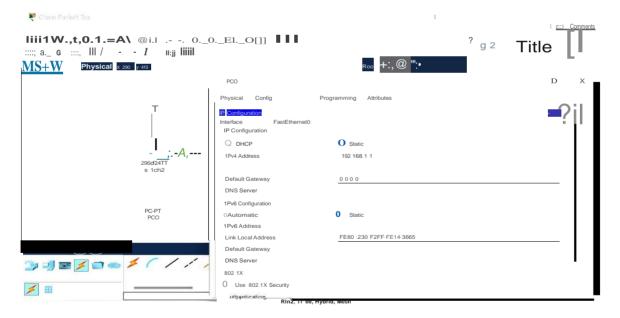
 Go to Connections (Lightning Icon), Select Copper Straight-Through Cable (first solid line) and Connect all PCs to switch.



#### 3. Configure IP Addresses

PC0: 192.168.1.4PCI: 192.168.1.5PC2: 192.168.1.6

• Subnet Mask: 255.255.255.0



## 4. Test Connectivity

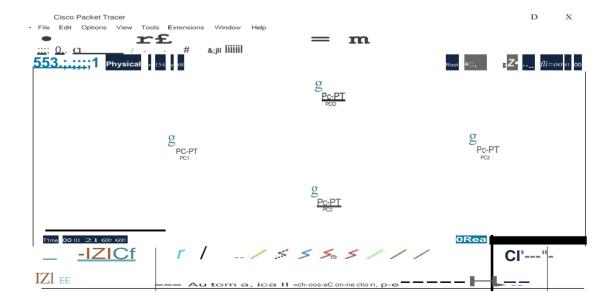
• On PC4 ping 192.168.1.1, ping 192.168.1.2, ping 192.168.1.3

```
PC3
                                                                                                                                                                                                                 D
                                                                                                                                                                                                                                   \mathbf{X}
   Physical
                       Config Deskto
                                                                 Programming
                                                                                                Attributes
   Command Prompt
     C:\>ping 192.168.1.1
     Pinging 192.168.1.1 with 32 bytes of data:
     Reply from 192.168.1.1: bytes=32 time<1ms TTL=128
Reply from 192.168.1.1: bytes=32 time<1ms TTL=128
Reply from 192.168.1.1: bytes=32 time<1ms TTL=128
Reply from 192.168.1.1: bytes=32 time=4ms TTL=128
     Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 1ms
     C:\>ping 192.168.1.2
     Pinging 192.168.1.2 with 32 bytes of data:
     Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
    Ping statistics for 192.168.1.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
     C:\>ping 192.168.1.3
     Pinging 192.168.1.3 with 32 bytes of data:
    Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time=5ms TTL=128
    Ping statistics for 192.168.1.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 5ms, Average = 1ms
D Тор
```

# Ring Topology:-

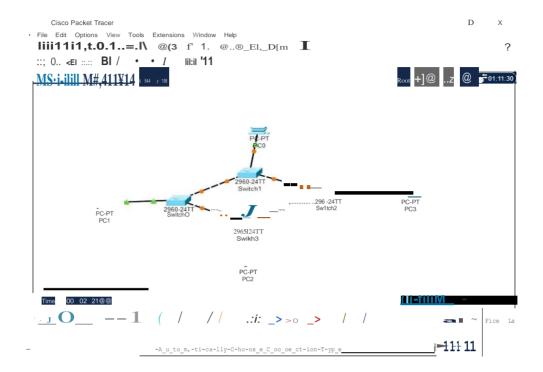
# Steps:

1. Add 4 PCs: PCO, PCI, PC2, PC3 (End Devices section)



#### 2. Connections:

- Use Select Copper Straight-Through Cable (first solid line) and Connect all PCs to switch.
  - o Connect all PCs to Switch and Switch to a close loop.



#### 3. Assign IPs:

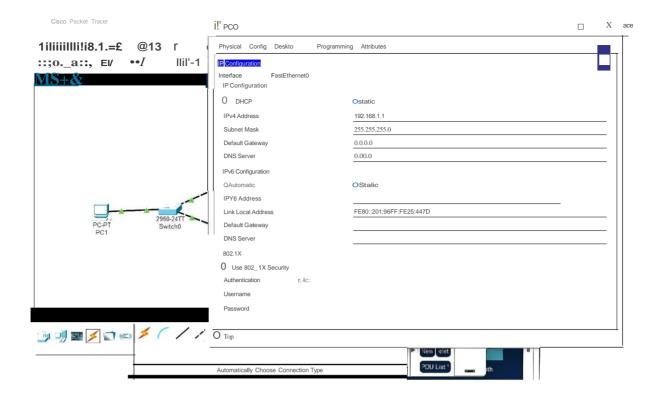
o PCO: 192.168.1.1

o PCI: 192.168.1.2

o PC2: 192.168.1.3

o PC3: 192.168.1.4

o Subnet Mask: 255.255.255.0 for all.



# 4. Test: Ping between PCs.

```
|i!:' PC1
                                                                                                                                                                                                                                                   Χ
                               Config
                                                Deskto
                                                                    Programming Attributes
                                                                                                                                                                                                                                              a
                                        Tracer PC Command Line 1.0
             FastEthernet0 Connection: (default port)
=
                   Connection-specific DNS Suffix.:
Link-local IPv6 Address....: FE80::260:5CFF:FE70:9CBA
IPv6 Address...::
IPv4 Address...:: 192.168.1.2
Subnet Mask...:: 255.255.255.0
a
                   Default Gateway....:::
             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 192.168.1.1
            Pinging 192.168.1.1 with 32 bytes of data:
             Reply from 192.168.1.1: bytes=32 time<lms TTL=128
             Ping statistics for 192.168.1.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = Oms, Maximum = Oms, Average = Oms
             C:\>ping 192.168.1.3
             Pinging 192.168.1.3 with 32 bytes of data:
             Reply from 192.168.1.3: bytes=32 time<lms TTL=128
             Ping statistics for 192.168.1.3:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

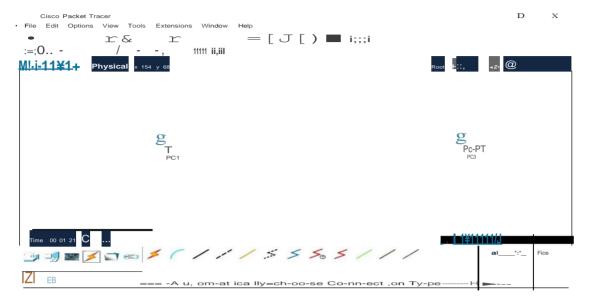
Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

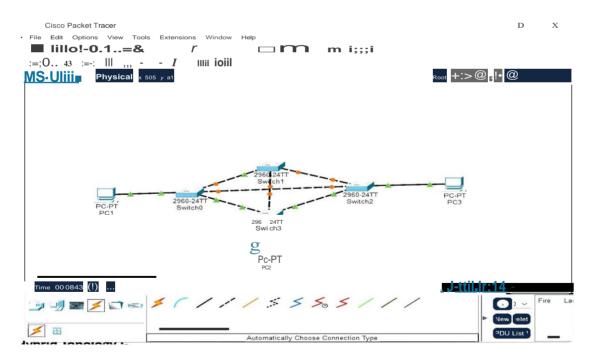
# Mesh Topology :-

#### Steps:

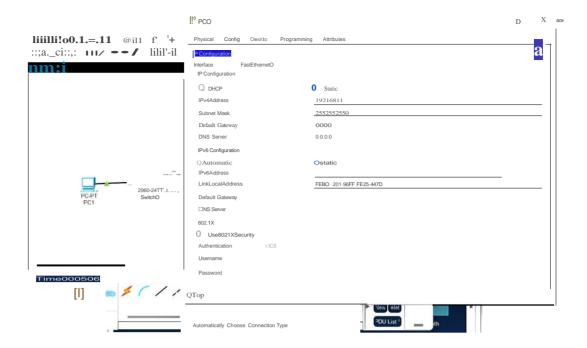
- 1. Add 4 PCs: PCO, PCI, PC2, PC3.
- 2. Arrange in a square or diamond shape.



- 3. Connections:
  - Use Select Copper Straight-Through Cable (first solid line) and Connect all PCs to switch.
    - o Connect all PCs to Switch and Switch to Switch a close loop.



- 4. Assign IPs:
  - o PCO: 192.168.2.1
  - o PCI: 192.168.2.2
  - o PC2: 192.168.2.3
  - o PC3: 192.168.2.4



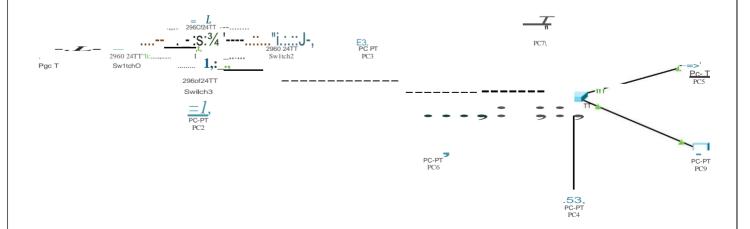
5. Test: Ping all PCs to each other.

{Same as we do for Ring topology)

# **Hybrid Topology**:-

Steps:

- 1. Add a Switch and 5 PCs: PCO, PCl, PC2, PC3, PC4.
- 2. Star Part:
  - o Connect PC4,PC5, PC6,PC7, PCS to Switch using Straight-Through Cables.
- 3. Ring Part:
  - o Connect PCO, PC1, PC2 and PC3



4. Assign IPs and Do ping Test:-

```
PC9
                                                                                                                                                                                                                             D
                                                                                                                                                                                                                                              Χ
   Physical Config Oeskto
                                                             Programming
                                                                                           Attributes
   Command Prompt
    C:\>ipconfig
     FastEthernet0 Connection: (default port)
          Connection-specific DNS Suffix.:
Link-local IPv6 Address...: FE80::290:2BFF:FE4E:67E2
IPv6 Address...: 192.168.1.9
Subnet Mask...: 255.255.255.0
Default Gateway...: 100.0.0
     Bluetooth Connection:
           Connection-specific DNS Suffix.:
Link-local IPvé Address. ::
IPv6 Address ::
IPv4 Address : 0.0.0.0
Subnet Mask : 0.0.0.0
Default Gateway ::
Default Gateway ::

    C:\>ping 192.168.1.1
    Pinging 192.168.1.1 with 32 bytes of data:
    Reply from 192.168.1.1: bytes=32 time<lms TTL=128 Reply from 192.168.1.1: bytes=32 time<lms TTL=128 Reply from 192.168.1.1: bytes=32 time<lms TTL=128 Reply from 192.168.1.1: bytes=32 time<lms TTL=128
    Ping statistics for 192.168.1.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 0ms, Average = 0ms
      C:\>ping 192.168.1.5
    Pinging 192.168.1.5 with 32 bytes of data:
    Reply from 192.168.1.5: bytes=32 time<lms TTL=128 Reply from 192.168.1.5: bytes=32 time<lms TTL=128 Reply from 192.168.1.5: bytes=32 time<lms TTL=128 Reply from 192.168.1.5: bytes=32 time<lms TTL=128
    Fing statistics for 192.168.1.5:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

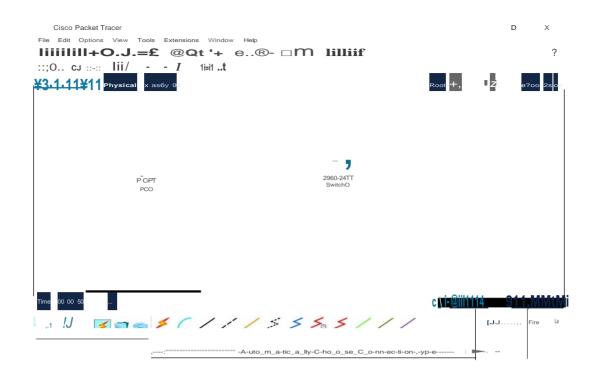
Minimum = 0ms, Maximum = 0ms, Average = 0ms
D тор
```

#### Practical 5:-

Perform an initial Switch configuration.

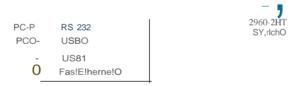
#### Steps:

- 1. Add Devices
  - Drag 1 Switch and 1 PC into the workspace.



#### 2. Connect Devices

- Use Console Cable:
  - o Connect PC RS-232 (Serial Port).



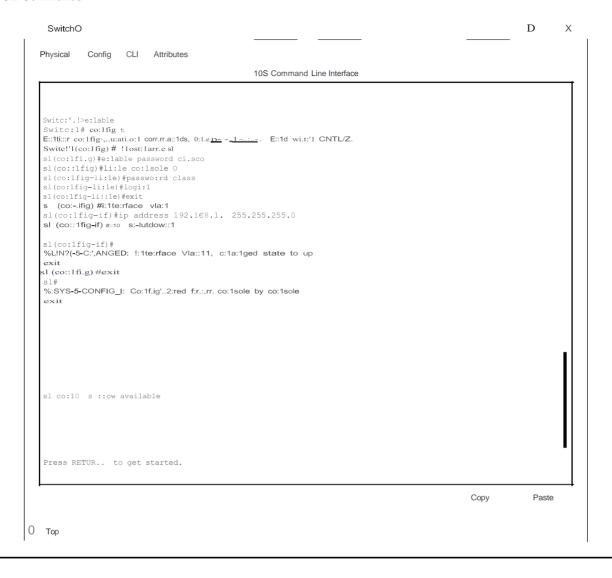
o Connect Switch Console port.



## 3. Open Terminal

• Click on PC Desktop tab Terminal Press OK.

#### 4. Enter CLI Commands

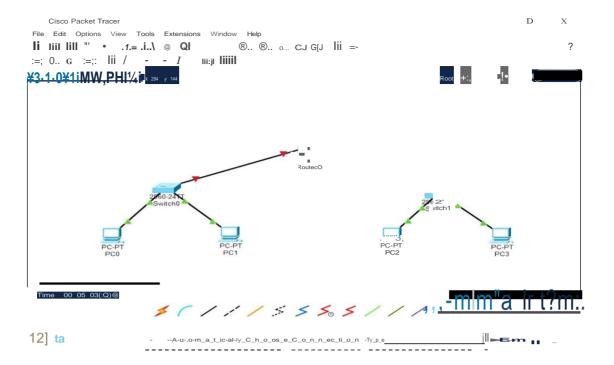


## Practical 6:-

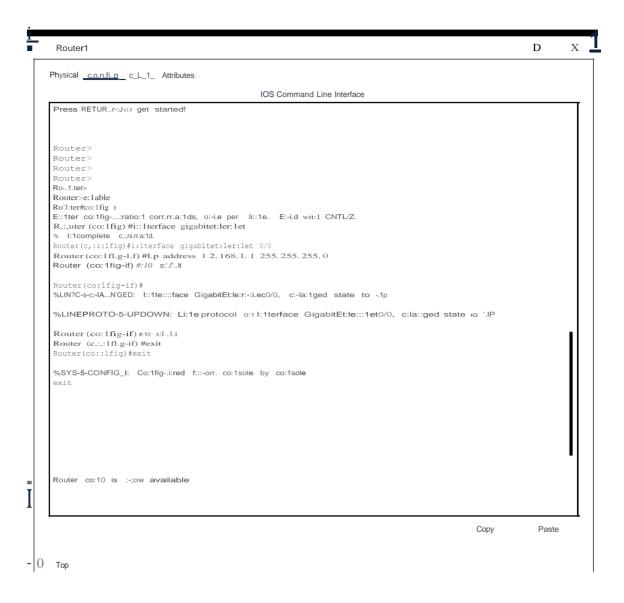
Perform an initial Router configuration.

#### Steps:

- Add Devices
  - Drag Router (e.g., 1941)
  - · Drag 4 PCs and switches (for CLI access)
  - · Drag 2 switches.
- · Connect Switches to Router and PCs to Swtches using Straight Copper through cable.



- Access CLI
  - Click PC Desktop > Terminal OK.
- · Configure Basic Settings

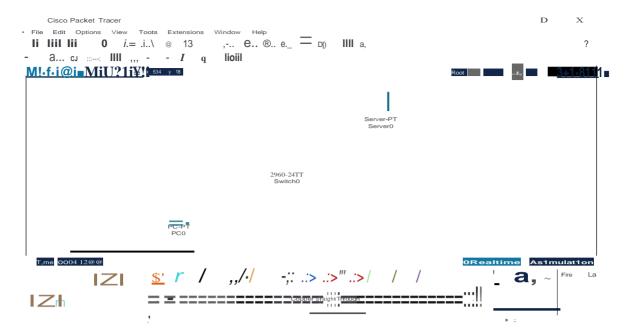


## Practical 7:-

To implement Client Server Network.

# Steps:

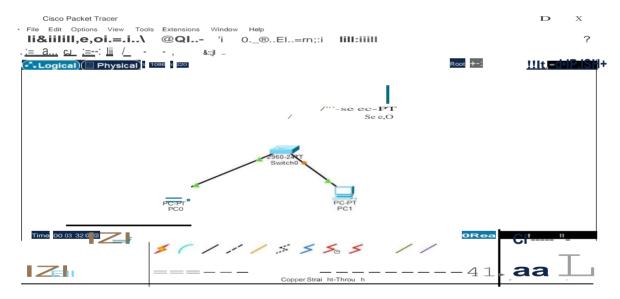
- · Step 1: Add Devices
  - SwitchO
  - · PCO, PC1
  - ServerO



· Step 2: Connect Devices

Use Copper Straight-Through Cable:

- PC0 Switch
- · PCI Switch
- Server0 Switch



· Step 3: Assign IPs

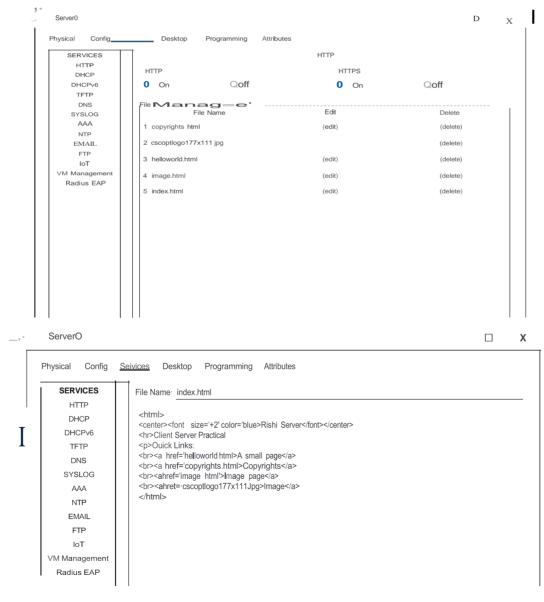
Click each device Desktop IP Configuration:

- PC0: 192.168.1.1 and Default gateway IP of server
- PCI: 192.168.1.2 and Default gateway IP of server
- Subnet Mask: 255.255.255.0
- Server0: 10.10.10.1 255.0.0.0



#### • Step 4: Configure Server

• Click Server0 Desktop Set service (HTTP, FTP, DHCP) ON as needed.



Step 5: Test

- Server Web Browser type http://10.10.10.1
- Ping Server from PCs.

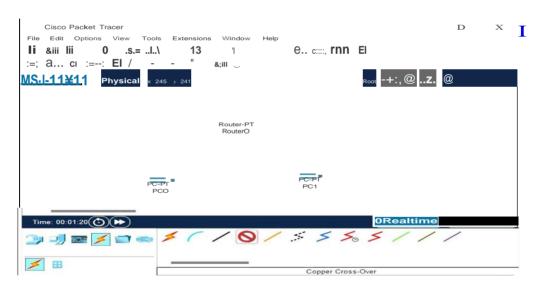


#### Practical 8:-

To implement connection between devices using router.

#### Steps:

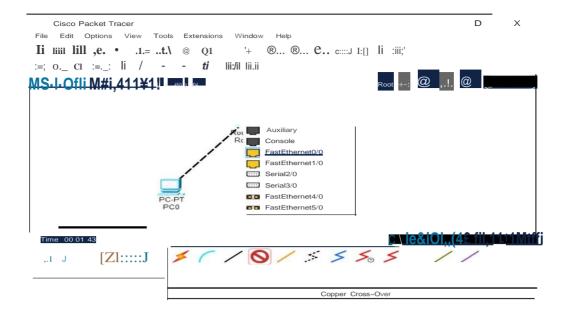
- · Step 1: Add Devices
  - Router0
  - PC0
  - PCI

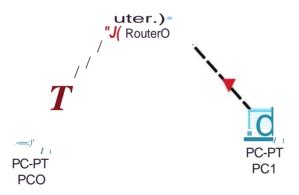


• Step 2: Connect Devices

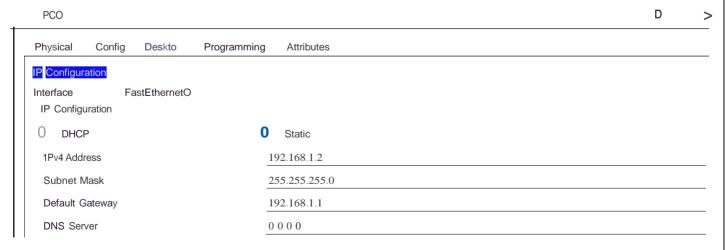
**Use Copper Cross-Over Cable:** 

- PC0 Router (Gig0/0)
- PCI Router (Gig0/1)

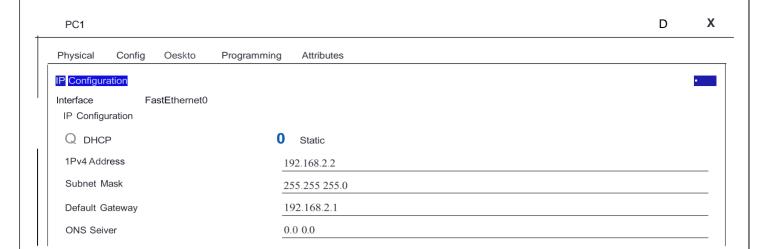




- Step 3: Assign IPs to PCs
  - PCO: 192.168.1.2, Gateway: 192.168.1.1

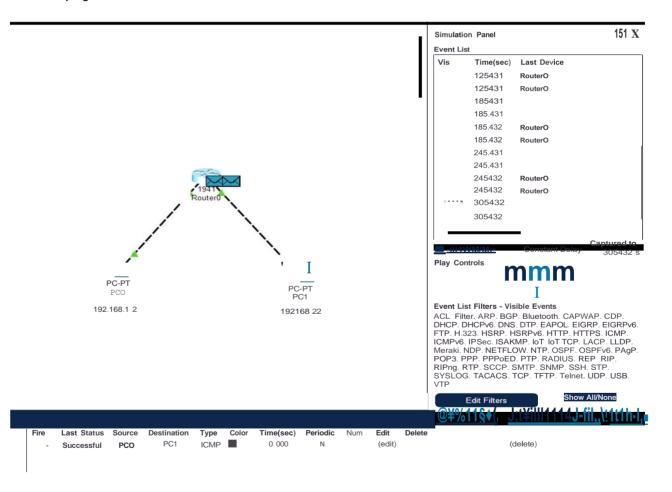


· PCl: 192.168.2.2, Gateway: 192.168.2.1



### Step 5: Test

- PCO ping 192.168.2.2
- PCl ping 192.168.1.2



+ Cables Reminder:		
Connection	Cable Type	
PC Switch	Copper Straight-Through	
PC Router	Copper Cross-Over	
PC PC (direct)	Copper Cross-Over	
Router Switch	Copper Straight-Through	