Computer Communication and Networks Lab

Exp 1 & 2

Components in Computer Networking

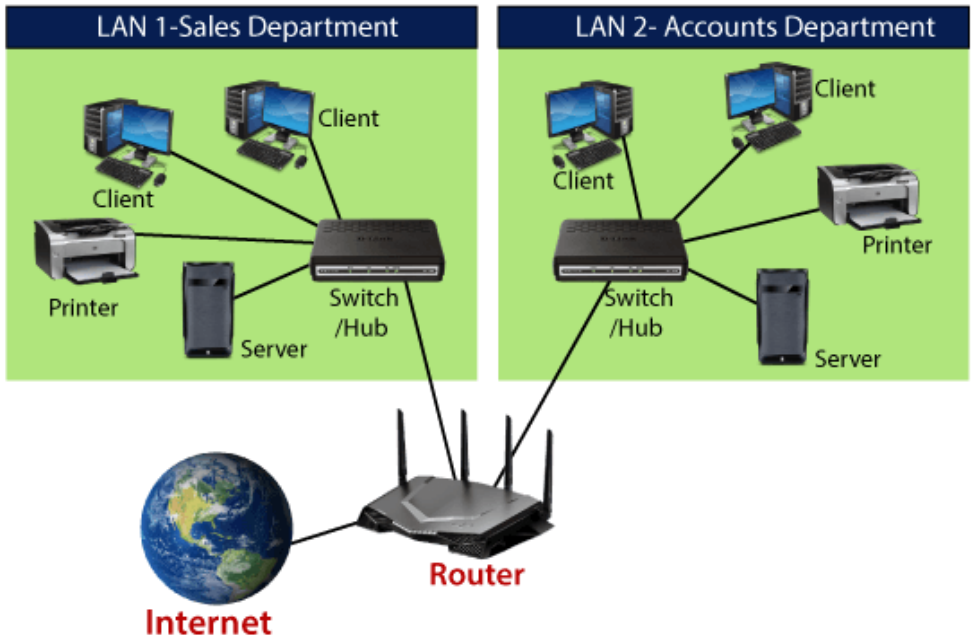
Hardware Components

- **Routers / Switches / Bridge / Repeater / Firewall / NIC Card**

Wires

Components :
Router

- Routers guide and direct network data
  - Packets that contain various kinds of data
  - Such as files, communications, and simple transmissions like web interactions.



TP-Link Archer C6 Gigabit MU-MIMO Wireless Router

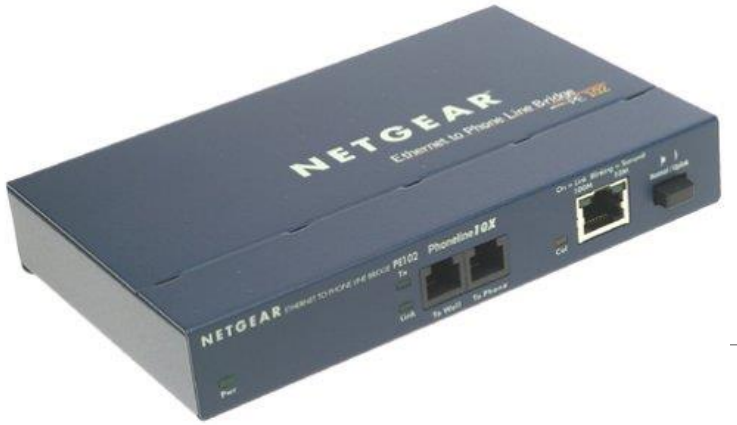
Components :
Switch

- Is networking hardware that connects devices on a computer network
- By using packet switching to receive and forward data to the destination device.
- Also called switching hub, bridging hub

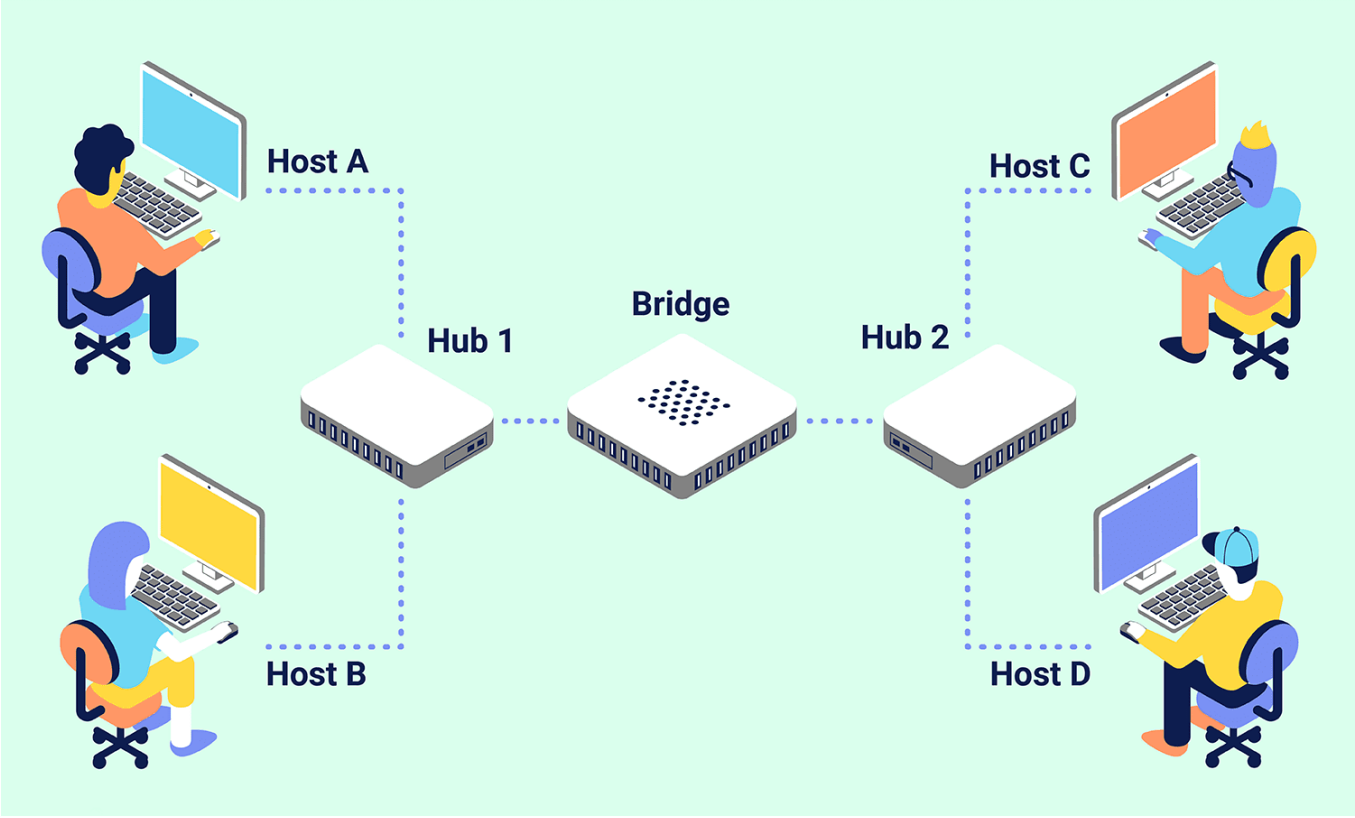
Avaya ERS 2550T-PWR, a 50-port Ethernet switch

TP-Link TL-SF1008D 8-Port
10/100Mbps Desktop Switch

Components :
Bridge



- A network bridge joins two separate computer networks.
- The network bridge enables communication between the two networks and provides a way for them to work as a single network.
- Bridges extend local area networks to cover a larger physical area than the LAN can reach.



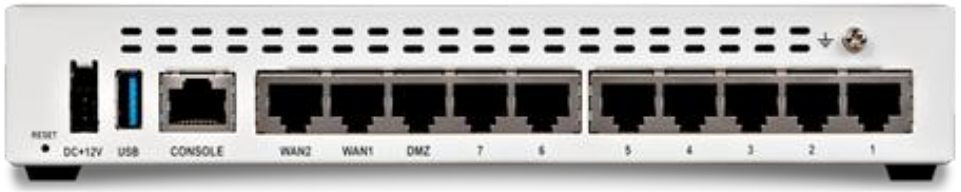
Components :
Repeater

- An electronic device that receives a signal and retransmits it at a higher level or higher power
- So that the signal can cover longer distances.

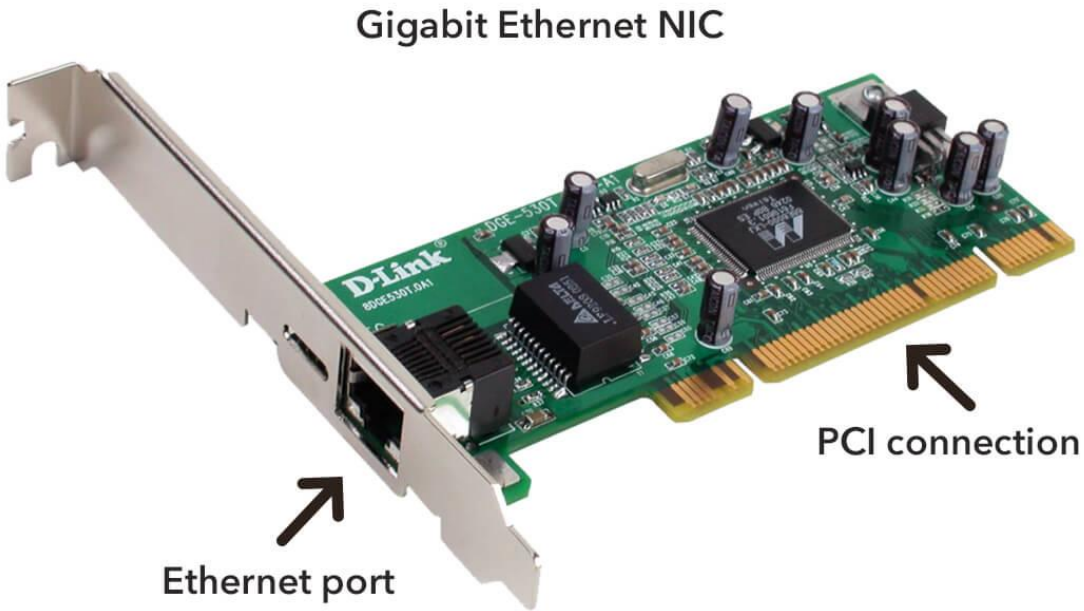
Components :
Firewall

- A Firewall is a network security device that monitors and filters incoming and outgoing network traffic based on an organization's previously established security policies.

- At its most basic, a firewall is essentially the barrier that is placed in between a private internal network and the public Internet.

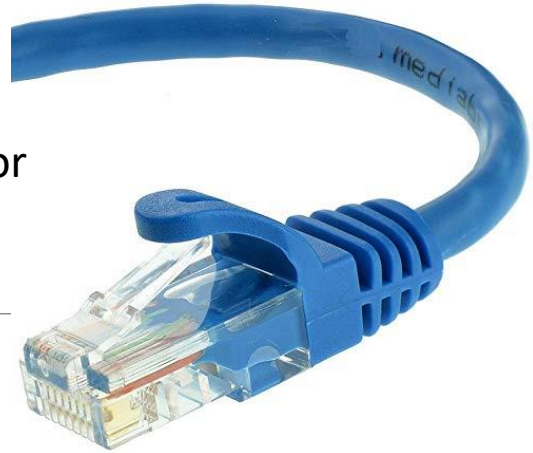


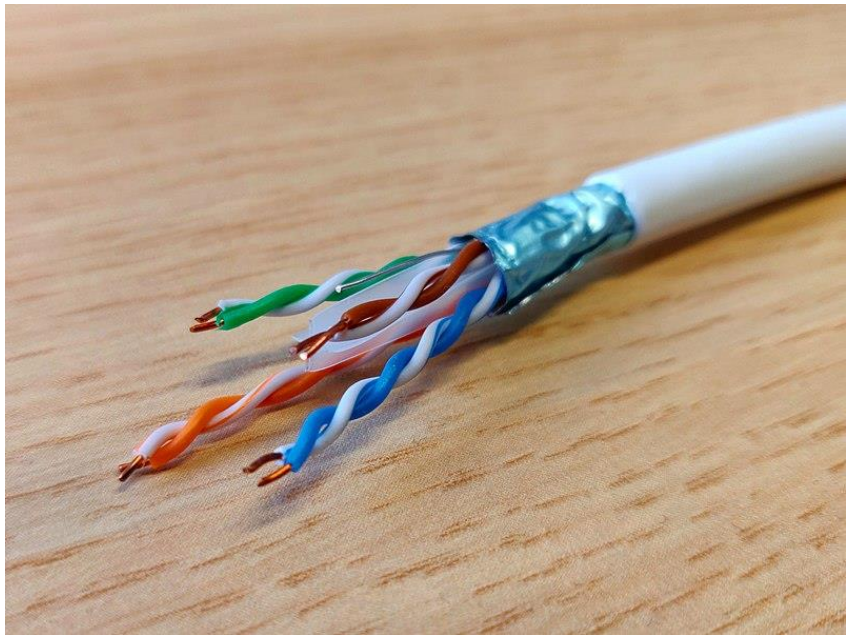
Components :
NIC Card



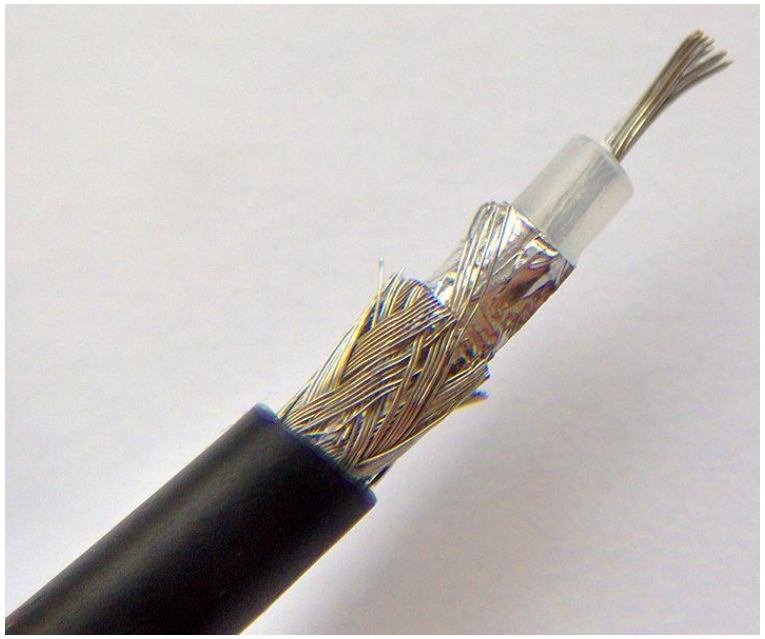
Wires

RJ45 Connector





Twisted Pair Cable
(Unshielded & Shielded)



Coaxial Cable

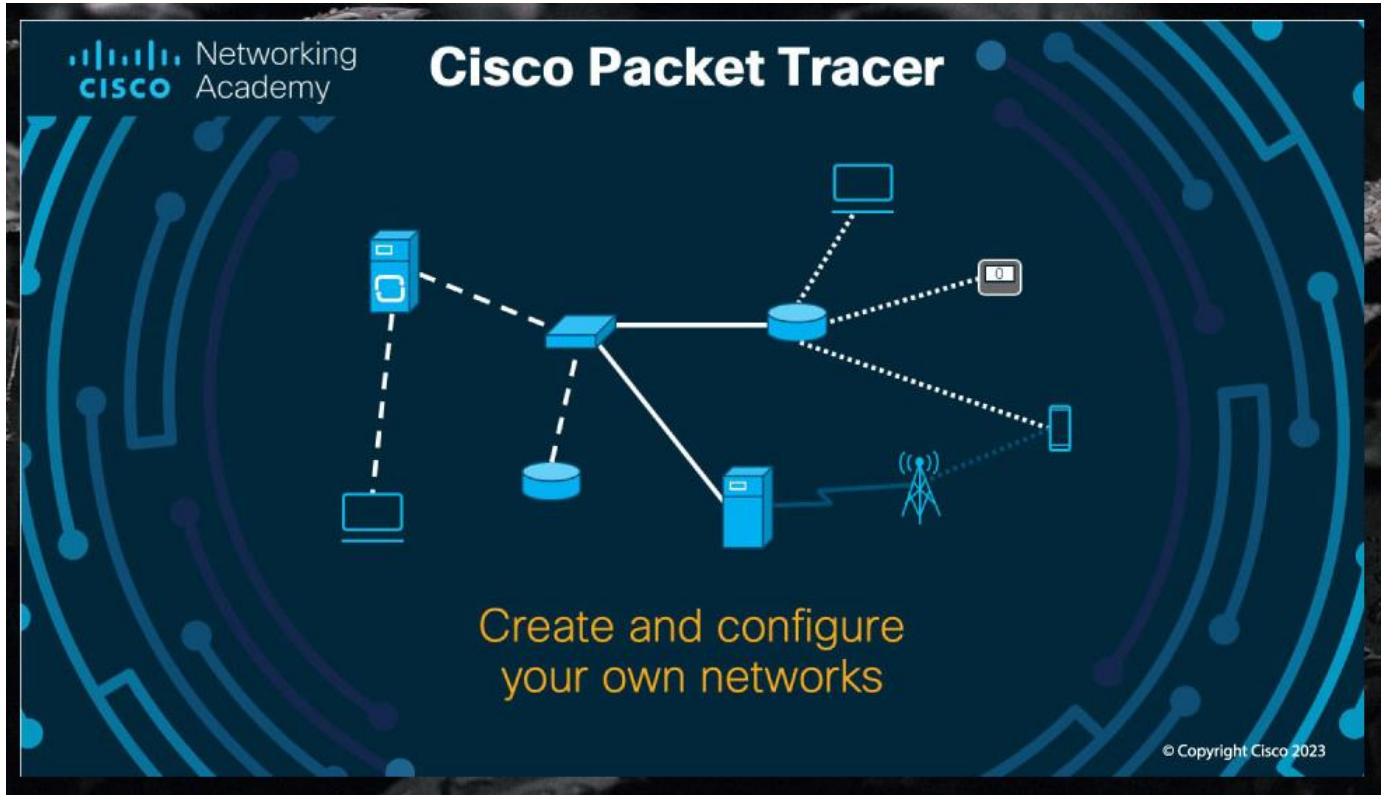
OFC

Cisco Packet Tracer

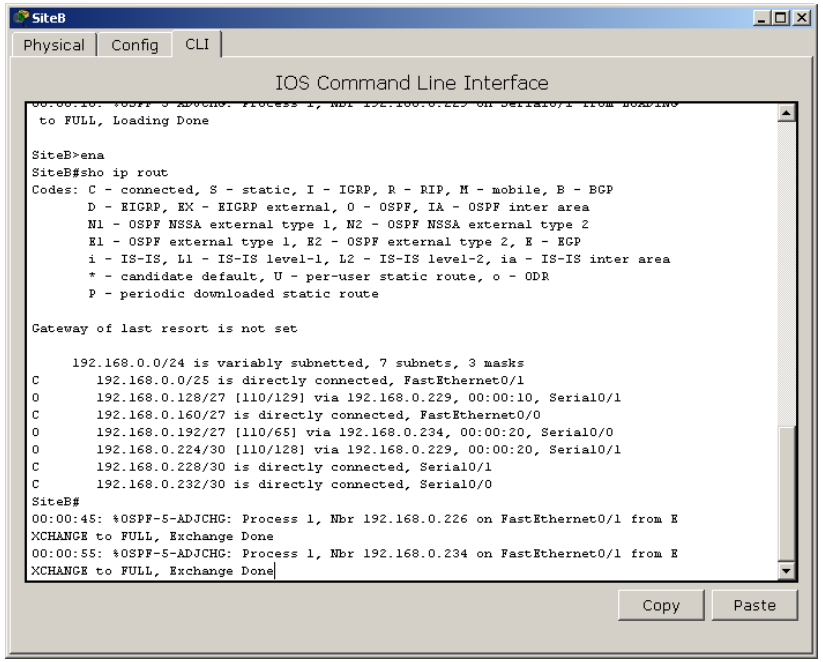
Cisco Packet Tracer

Packet Tracer is a **cross-platform visual simulation tool** designed by Cisco Systems that allows users **to create network topologies** and **imitate modern computer networks.**

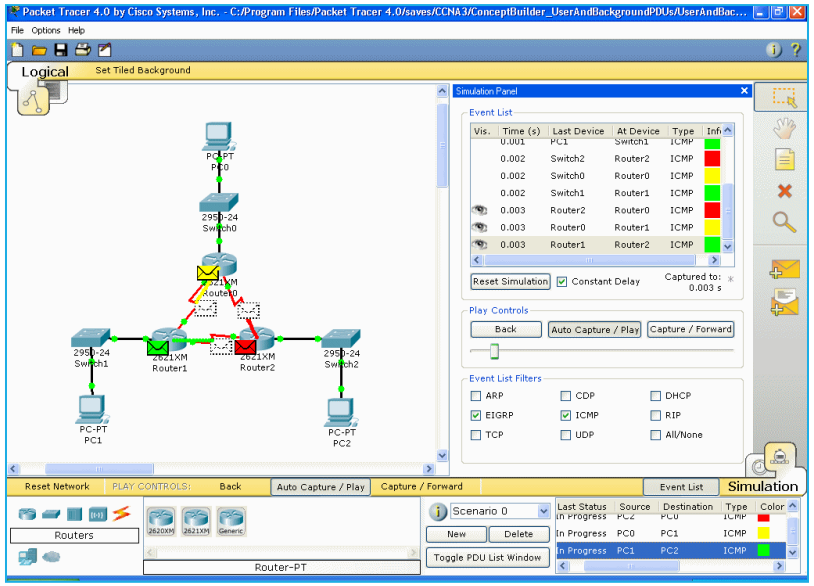
Packet Tracer makes use of a **drag and drop user interface**, allowing users to add and remove simulated network devices as they see fit.



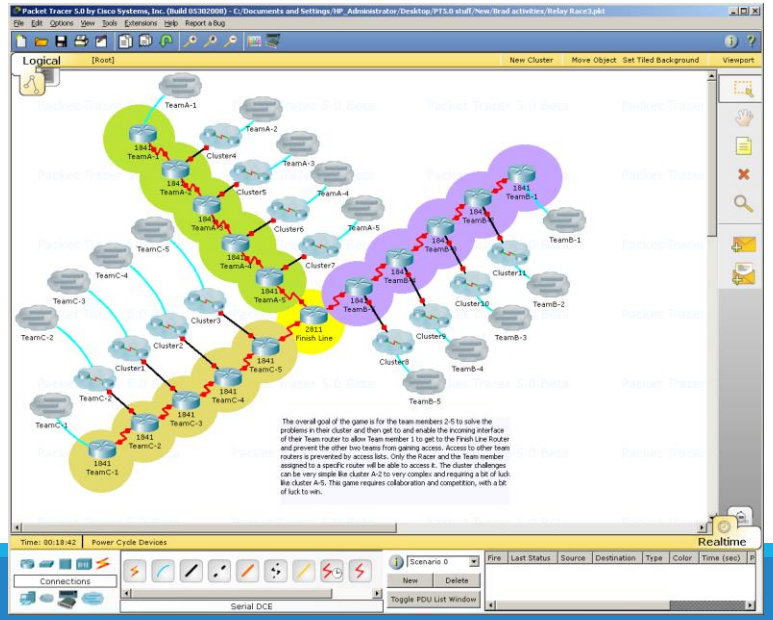
Simulation, Visualization, Collaboration



simulate IOS commands



visualize network traffic



collaborate on multiuser activities

Various Networking Specific Commands

- **ipconfig**
  - Displays all current TCP/IP network configuration
- **ping**
  - Syntax: ping [target address].
  - e.g. ping www.google.com
- **tracert**
  - Determines the path taken to a destination by sending Internet Control Message Protocol (ICMP) echo.
  - e.g. tracert www.google.com
- **netstat**
  - Displays active TCP connections, ports on which the computer is listening
- **nslookup**
  - Lets users enter a host name and find out the corresponding IP address or domain name system (DNS) record.

Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objectives:

1. Set-up a simple point-to-point network between two hosts.

2. Setup a local area network using star topology using a Data Link Layer Switch

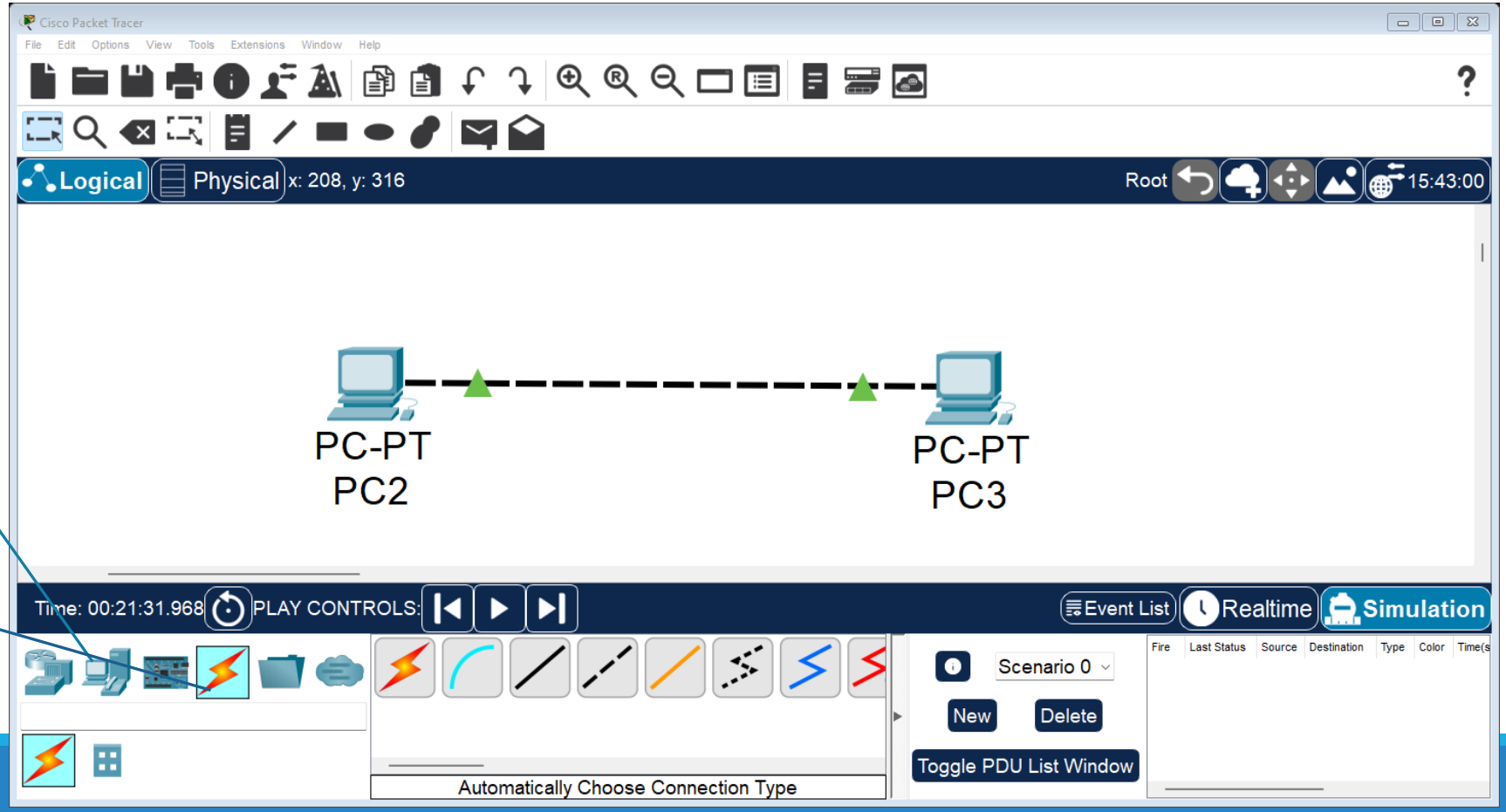
3. Setup a Server Client Topology

Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objective 1: Set-up a simple point-to-point network between two hosts.

Step 1 Choose the Hosts

Step 2 Choose the Connecting cable

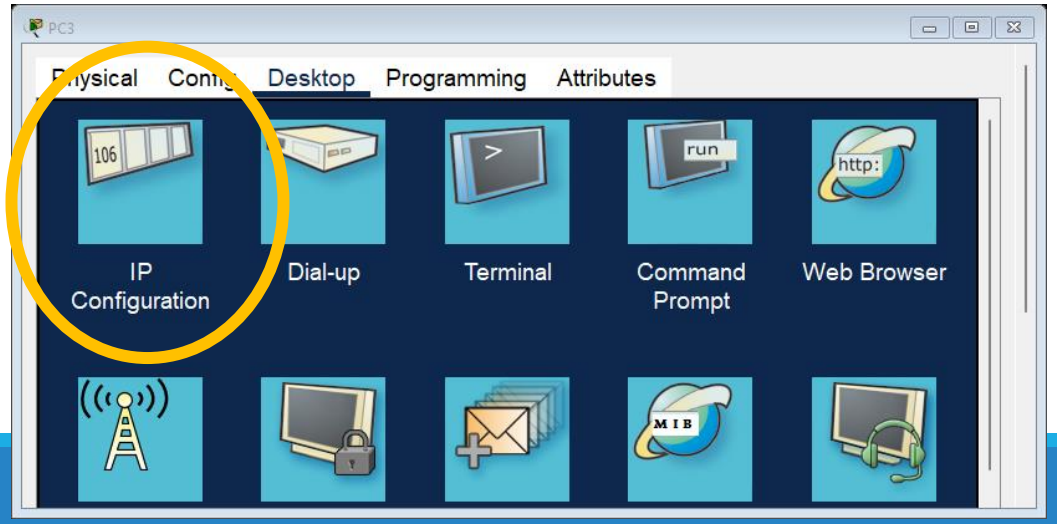


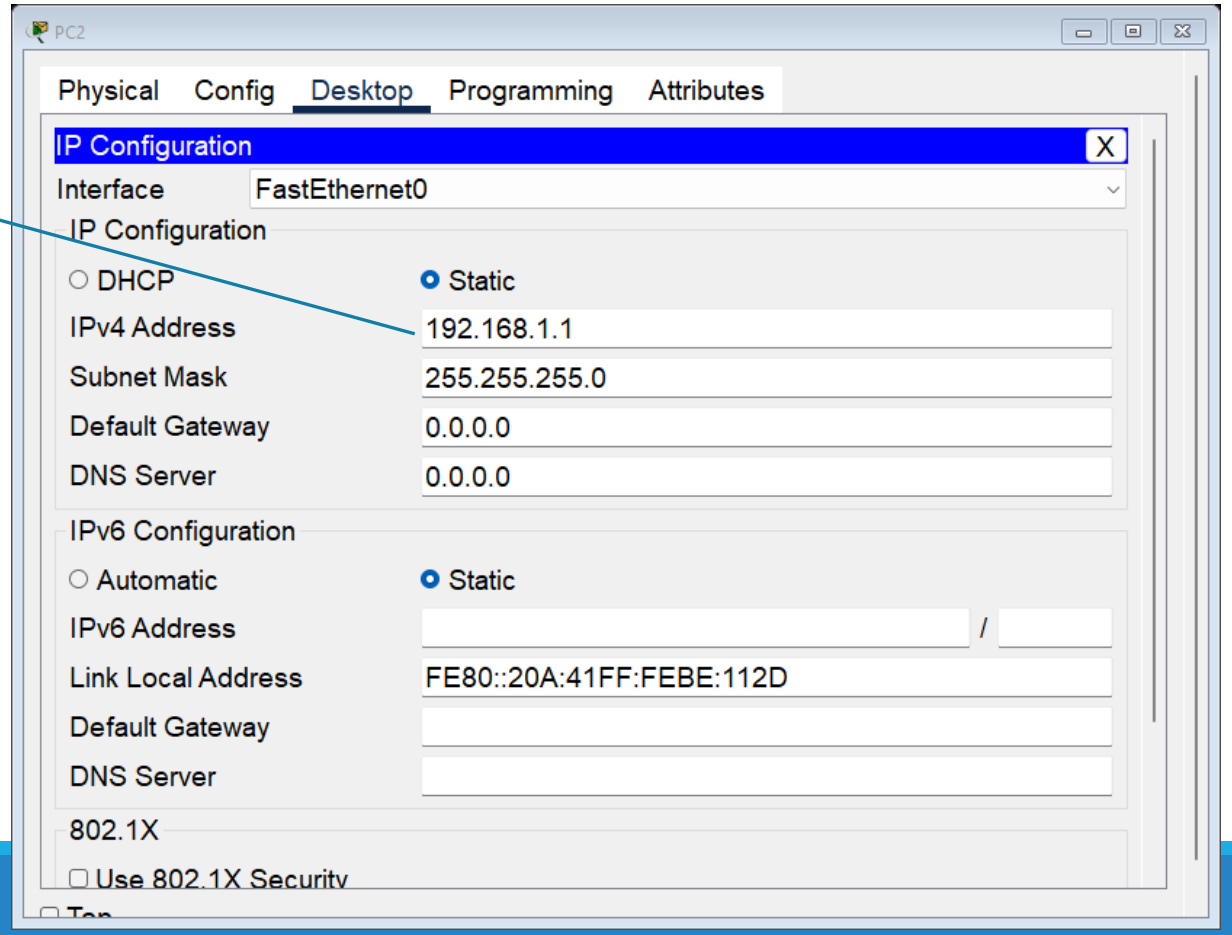
Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objective 1: Set-up a simple point-to-point network between two hosts.

Step 3 Configure the IP Address of each Host as:

Host 1 : 192.168.1.1
Host 2 : 192.168.1.2

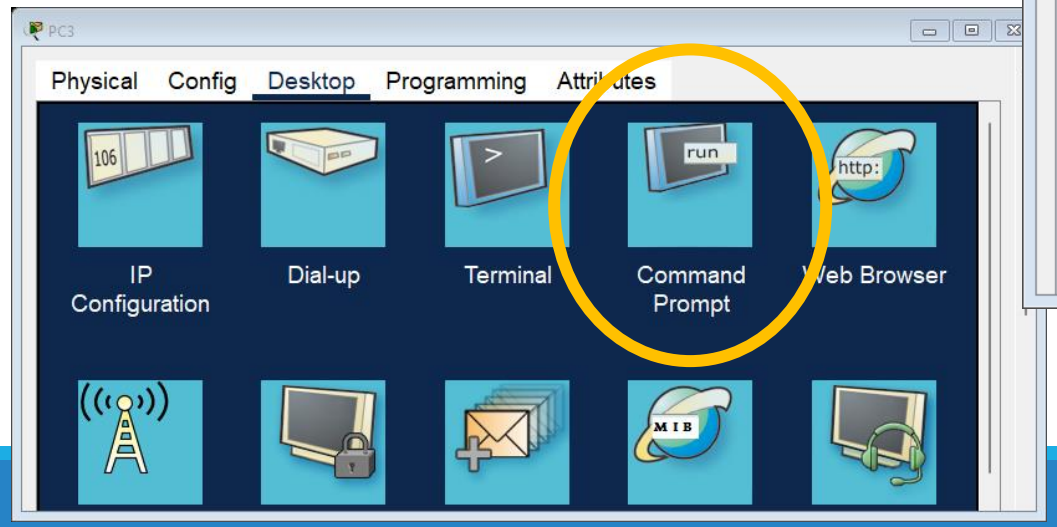


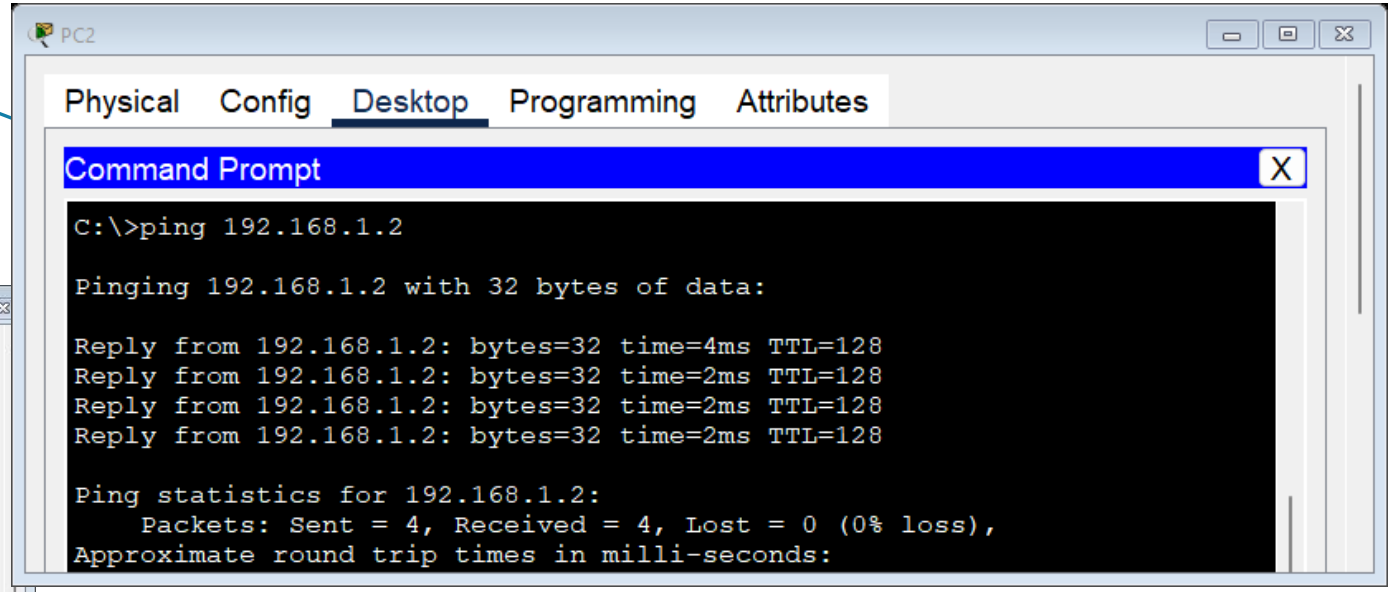


Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objective 1: Set-up a simple point-to-point network between two hosts.

Step 4 *use ping command to access the Host 2 from Host 1 to verify if they are connected.*
Host 1 : ping 192.168.1.2





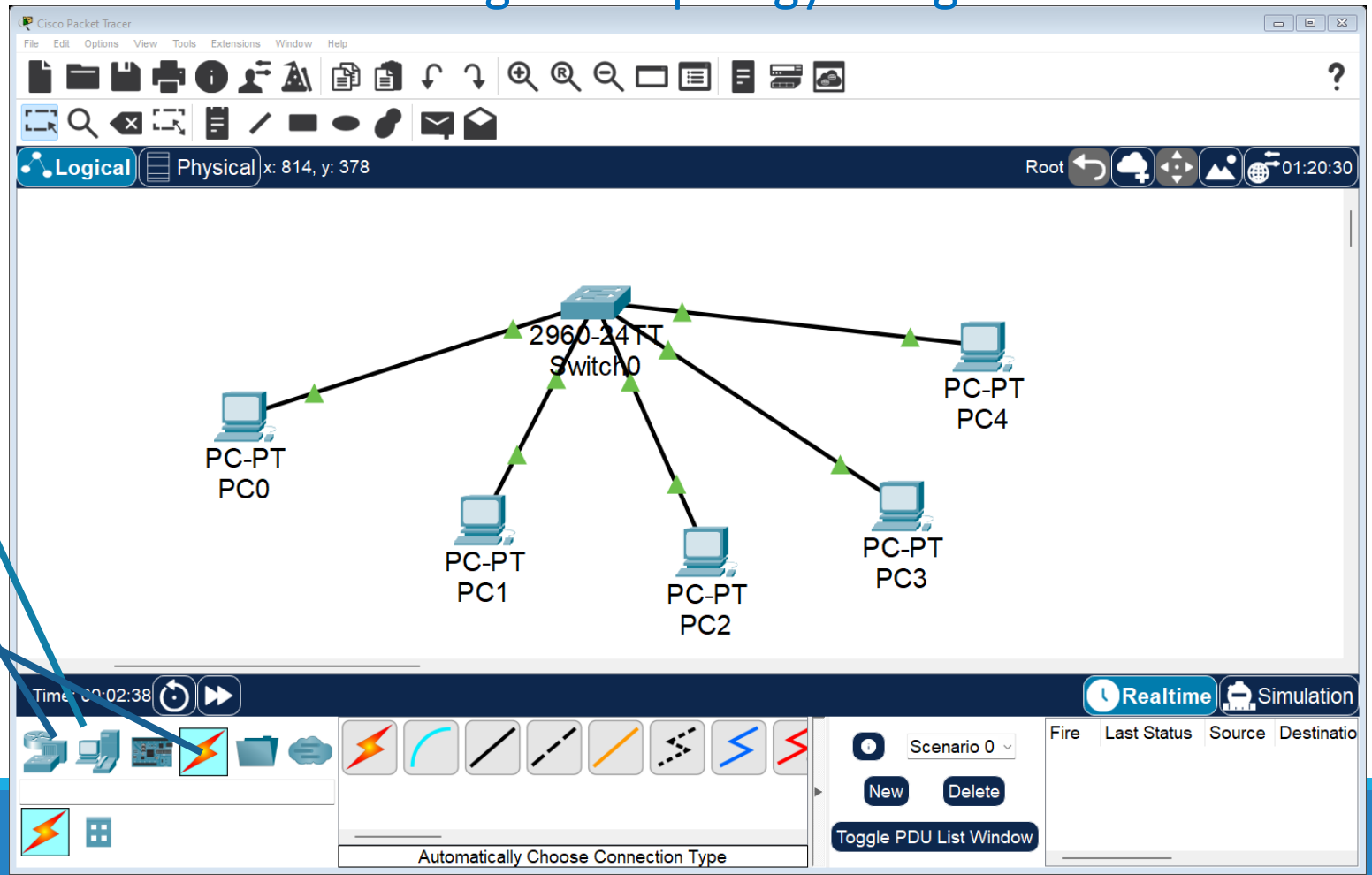
Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objective 2: Setup a local area network using star topology using a Data Link Layer Switch.

Step 1 Choose the Hosts

Step 2 Choose the Switch

Step 3 Choose the Connecting cable

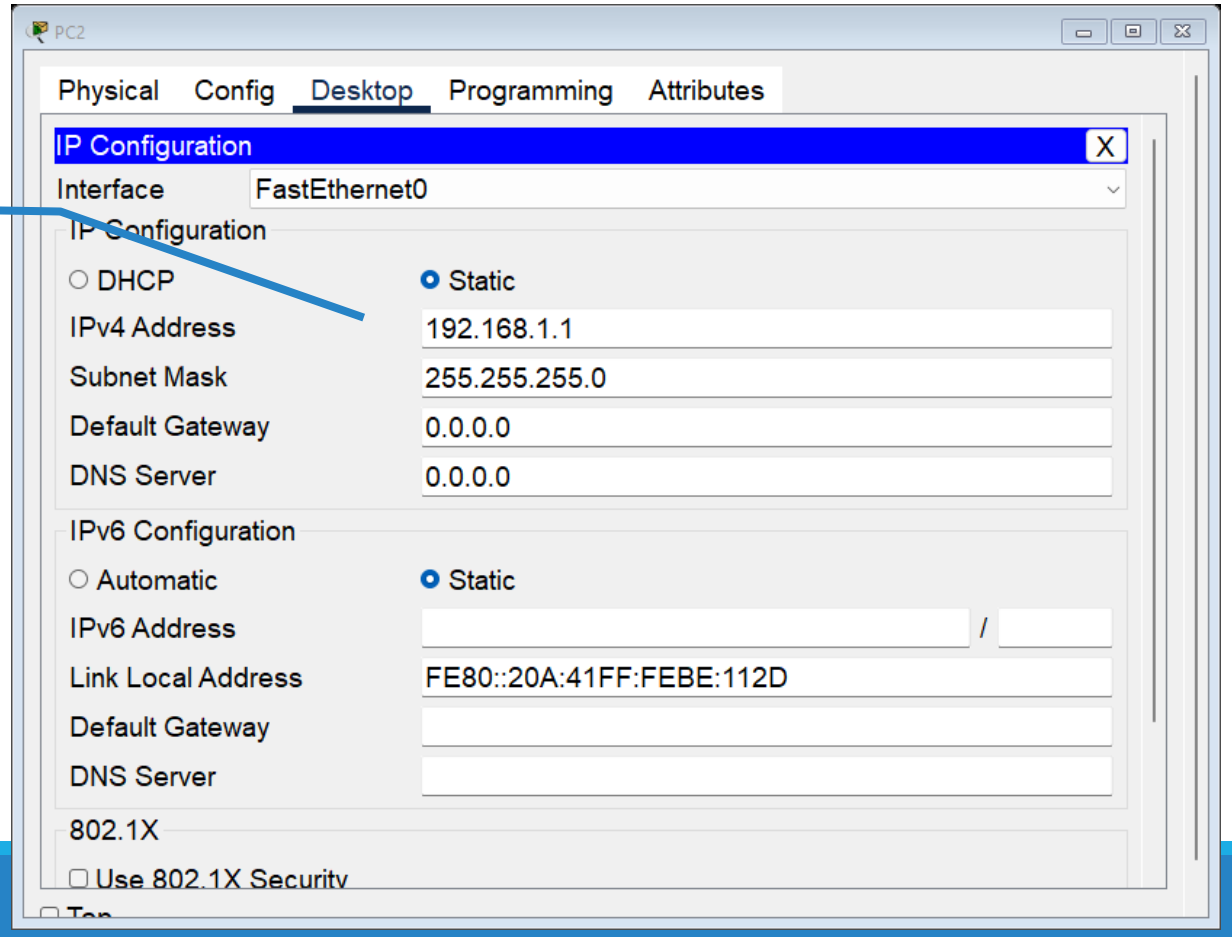


Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objective 2: Setup a local area network using star topology using a Data Link Layer Switch.

Step 3 Configure the IP Address of each Host as:

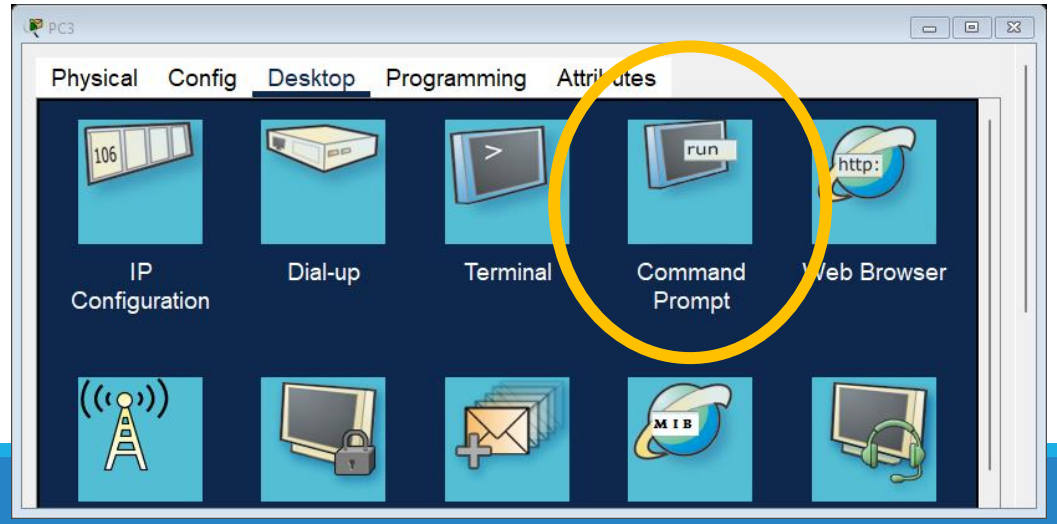
Host 1 : 192.168.1.1
Host 2 : 192.168.1.2
Host 3 : 192.168.1.3
Host 4 : 192.168.1.4
Host 5 : 192.168.1.5

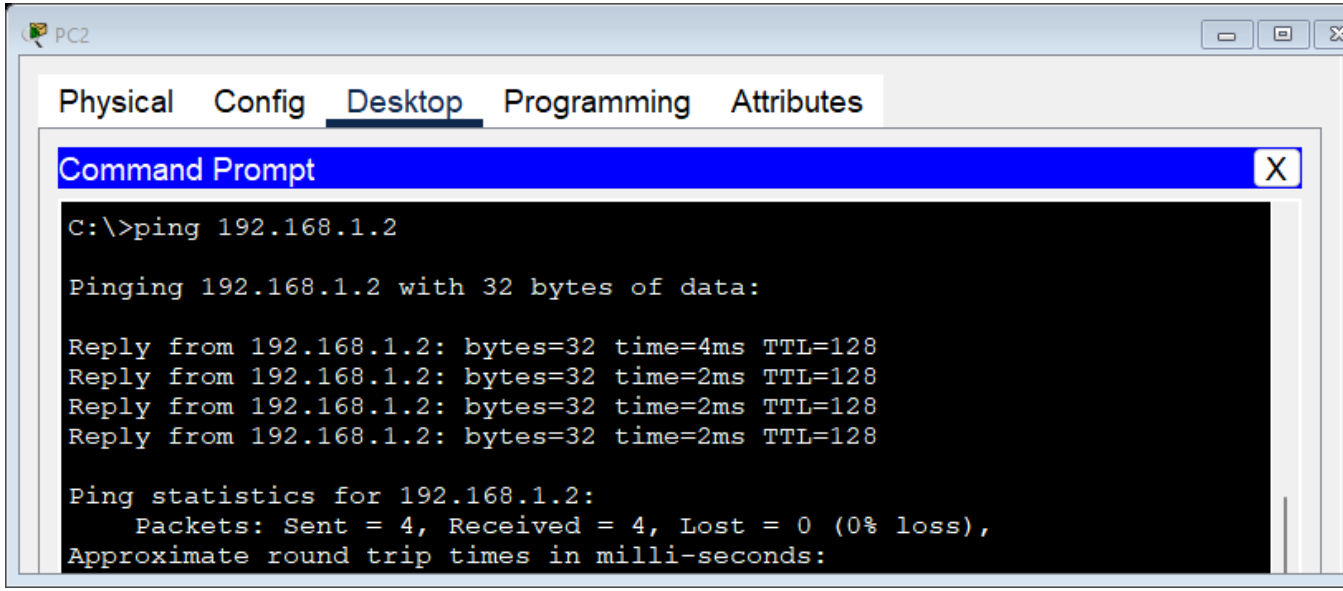


Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objective 2: Setup a local area network using star topology using a Data Link Layer Switch.

Step 4 *use ping command to access the Host 4 from Host 1 to verify if they are connected.*
Host 1 : ping 192.168.1.4





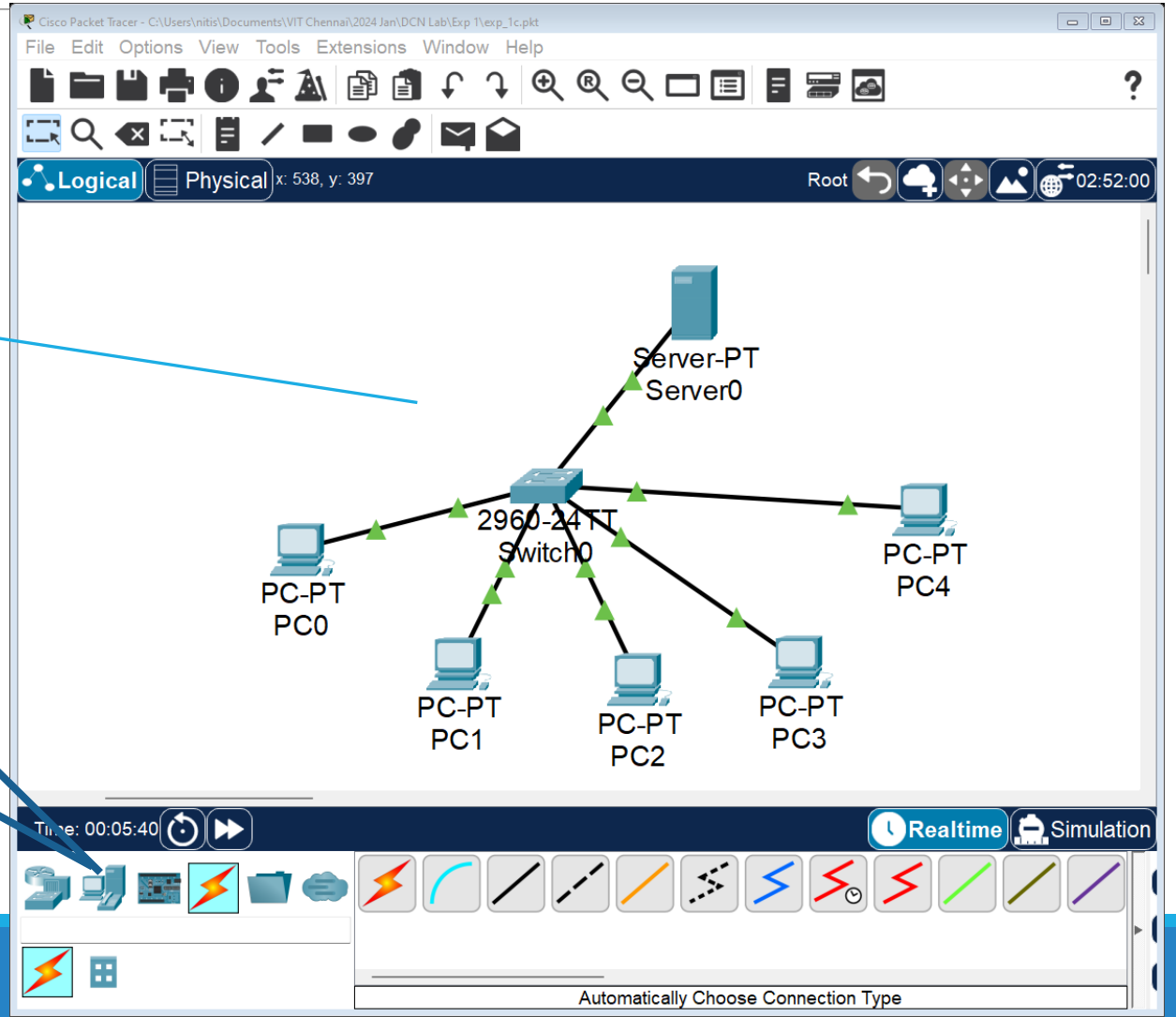
Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objective 3:
Setup a Server Client Topology

Setup the network as done in Objective 2

Step 1 Choose the Server

Step 2 Configure the Server



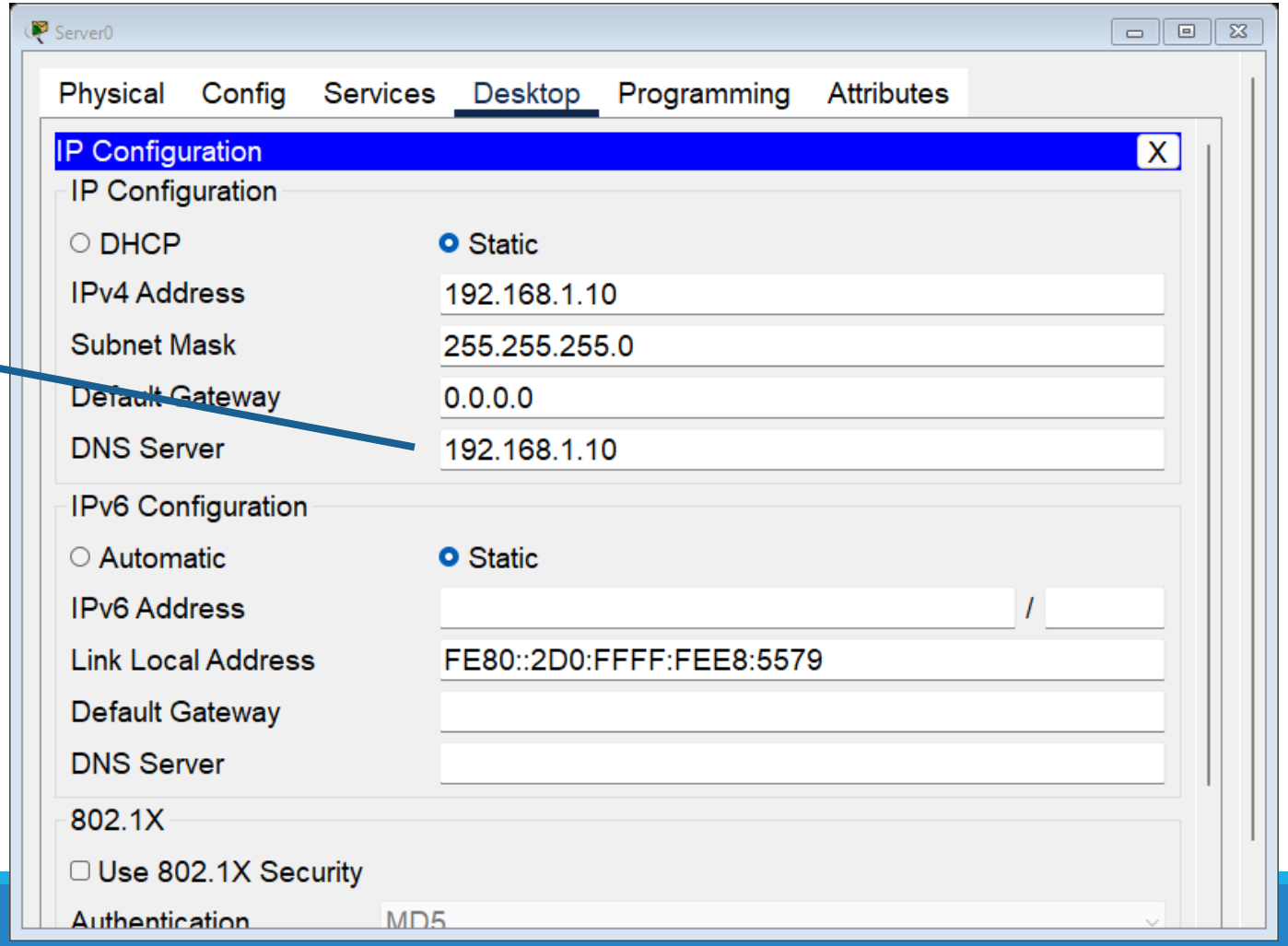
Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objective 3:

Setup a Server Client Topology

Step 3 Configure the Server

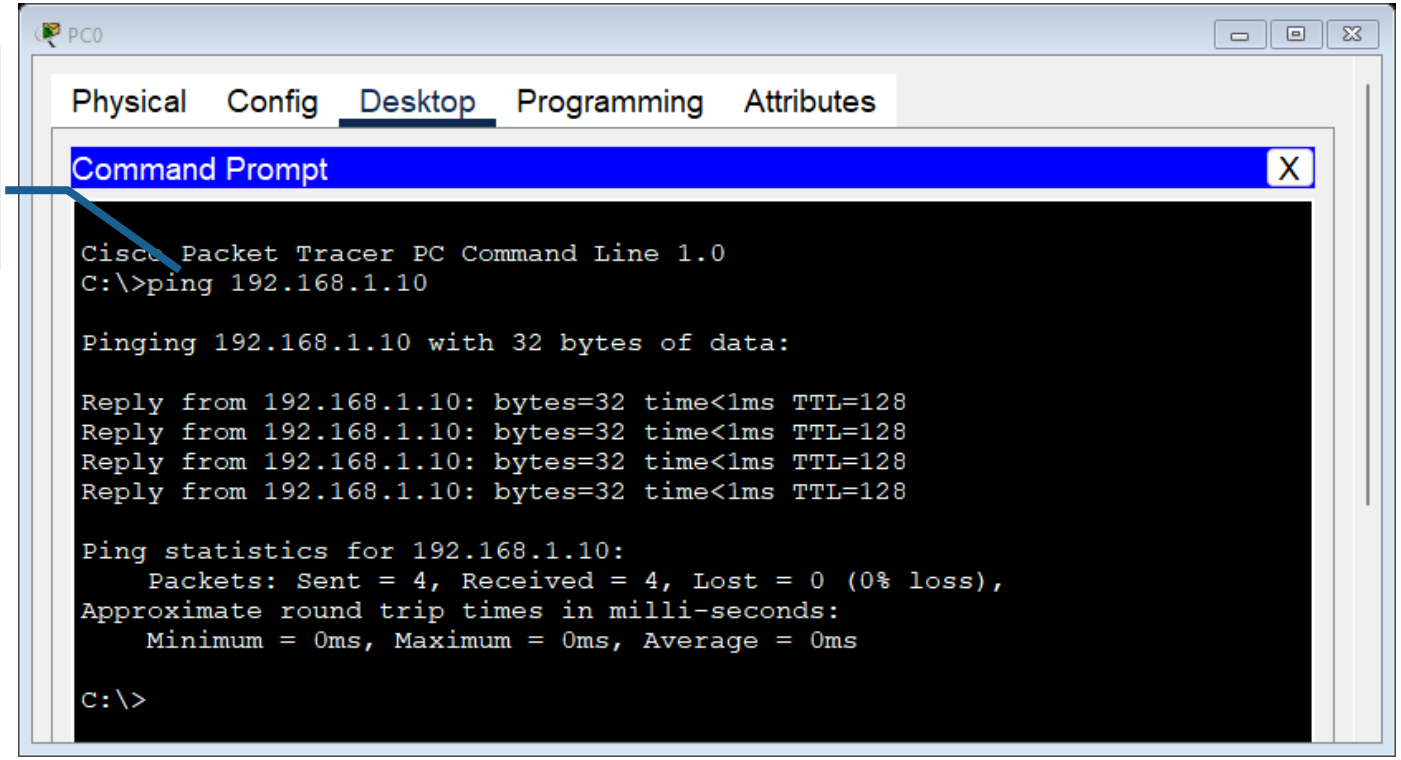
Give the same IP as the DNS Server IP



Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objective 3:
Setup a Server Client Topology

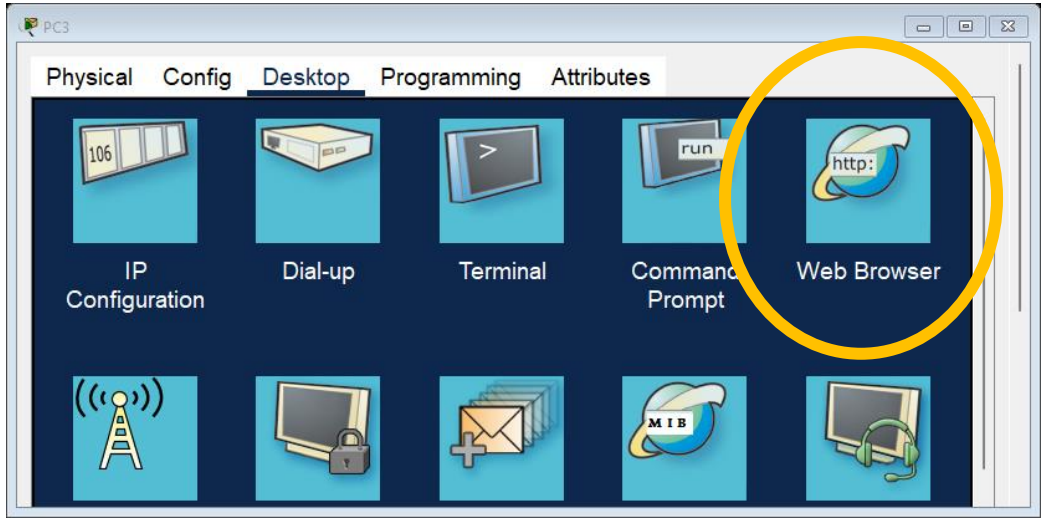
Step 4 Check for Connectivity from Hosts
Using the ping command from hosts
ping 192.168.1.10



Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objective 3:
Setup a Server Client Topology

Step 5 use the services of Server
from any host open the browser and enter the URL as
http://192.168.1.10/index.html



Expt. 1:
Client-Server Network Topology using Cisco Packet Tracer

Objective 3:

Setup a Server Client Topology

Step 5 use the services of Server
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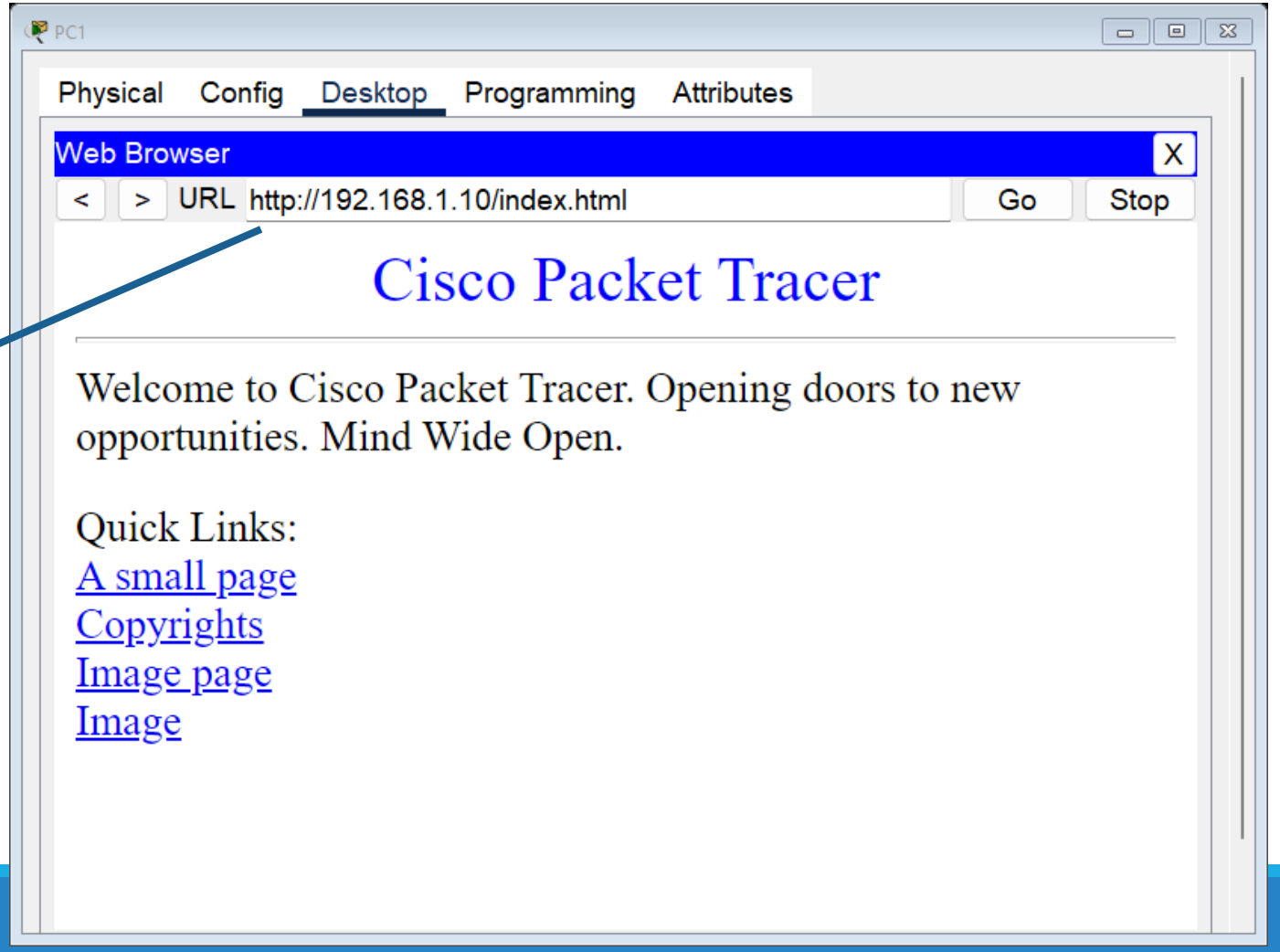


Expt. 2:
Set-up a Wide Area Network using a router in Cisco Packet Tracer

Objectives:

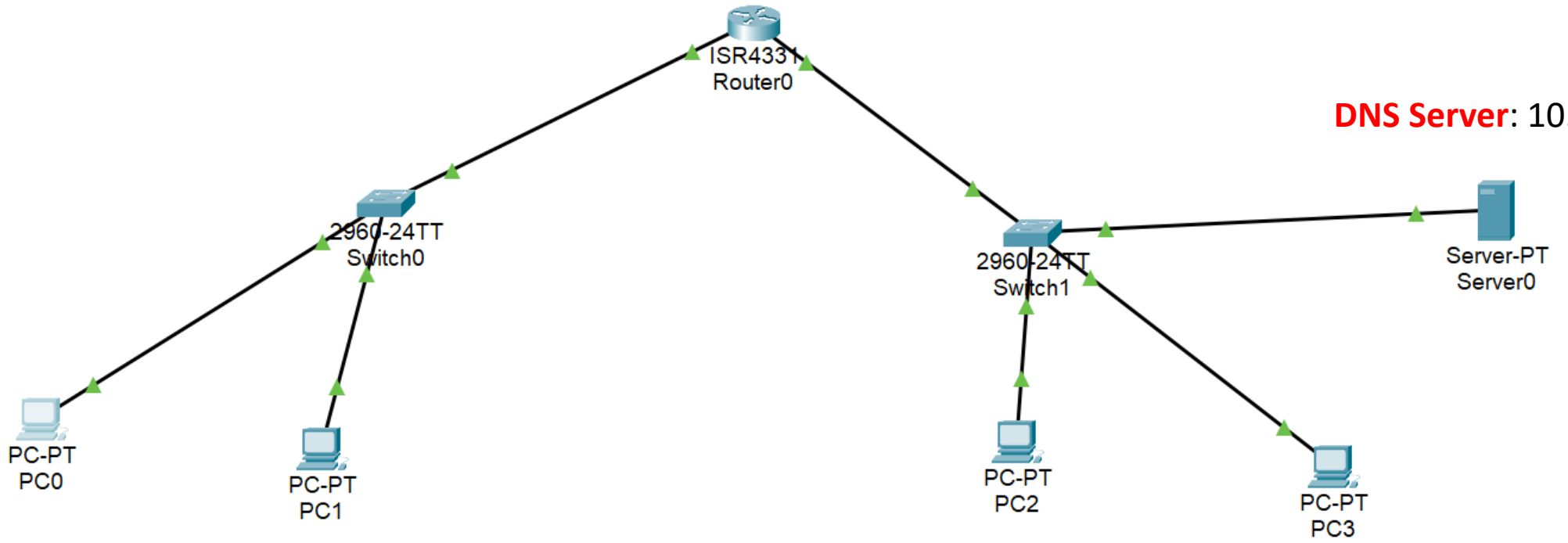
1. To set-up a physical network wide area network using a router

2. Configure a server on LAN-2

3. Try to access the server on LAN-1

Expt. 2:

Set-up a Wide Area Network using a router in Cisco Packet Tracer



DNS Server: 10.10.10.10

LAN 1 : 192.168.1.X

LAN 2 : 10.10.10.X

Expt. 2:
Set-up a Wide Area Network using a router in Cisco Packet Tracer

Step 1:

Select the following components:

a. End Devices > PC

b. Network Devices > Switches > Switch 2960

c. Network Devices > Routers > Router 2911

Step 2:

Form 2 LANs, and connect PCs to each via a 2960 switch via straight cables

a. Assign IP Addresses to LAN 1

i. Assign IP address ‘192.168.1.X’ to PCX

b. Assign IP Addresses to LAN 2

i. Assign IP address ‘10.10.10.Y’ to PCY

Expt. 2:
Set-up a Wide Area Network using a router in Cisco Packet Tracer

Step 3:

Connect the Switches to the Router 2911 via Gigabit interface

i. Connect Gig0/1 of SW 1 to Gig0/0 of Router

- Assign IP Addresses '192.168.1.X' to the Gig0/0 interface of the router 2911 and
- Check 'Port Status' to 'On'

ii. Connect Gig0/1 of SW 2 to Gig0/1 of Router

- Assign IP Addresses '10.10.10.Y' to the Gig0/1 interface of the router 2911 and
- Check 'Port Status' to 'On'

Expt. 2:

Set-up a Wide Area Network using a router in Cisco Packet Tracer

Step 4:

Assign Default Gateway Addresses:

i. GW Address ‘192.168.1.4’ to LAN 1

ii. GW Address ’10.10.10.4’ to LAN 2

Step 5:

Configure Server on LAN-2

Step 6:

i. ping LAN 2 from LAN 1 to check for connectivity

ii. Access DNS server on LAN 1