Batch: D-2 **Roll No.:** 16010122151

Experiment / assignment / tutorial No._3_____

Grade: AA / AB / BB / BC / CC / CD /DD

Signature of the Staff In-charge with date

Experiment No.:3

TITLE: Building and configuring simple topology using Network tool - CISCO PACKET TRACER.

AIM: To build and configure simple network topology using CISCO Packet Tracer.

Packet Tracer is a network simulation program that allows students to experiment with network behaviour and ask "what if" questions. Packet Tracer provides simulation, visualization, and authoring, assessment, and collaboration capabilities and facilitates the teaching and learning of complex technology concepts.

Expected Outcome of Experiment:

CO:

Books/ Journals/ Websites referred:

1. http://www.google.com
2. A. S. Tanenbaum, "Computer Networks", Pearson Education, Fourth Edition
3. B. A. Forouzan, "Data Communications and Networking", TMH, Fourth Edition
4. CISCO PACKET TRACER 8.0.1 and Higher version (free download)

Pre-Lab/ Prior Concepts: Simple Network flow

New Concepts to be learned: Purpose of this lab is to become familiar with building topologies in Packet Tracer.

Stepwise-Procedure:

Creating a simple LAN network using packet tracer:
Step 1: Select two PCs (PC0 and PC1) from the end devices and one fast ethernet switch (2950/24 ports)

Step 2: Connect PCs and switch via copper cable from the panel. Connection can be verified by appearance of all green dots on the links.

Step 3: For PCs to communicate click on PC0.

- Dialog box for PC0 appears
- Click on desktop applications by packet tracer.
- Go to IP configuration.
- Enter IP address to identify host i.e. PC0 (for example: 192.168.1.1)
- Subnet mask-by default already set one can change it as per his/her specification.

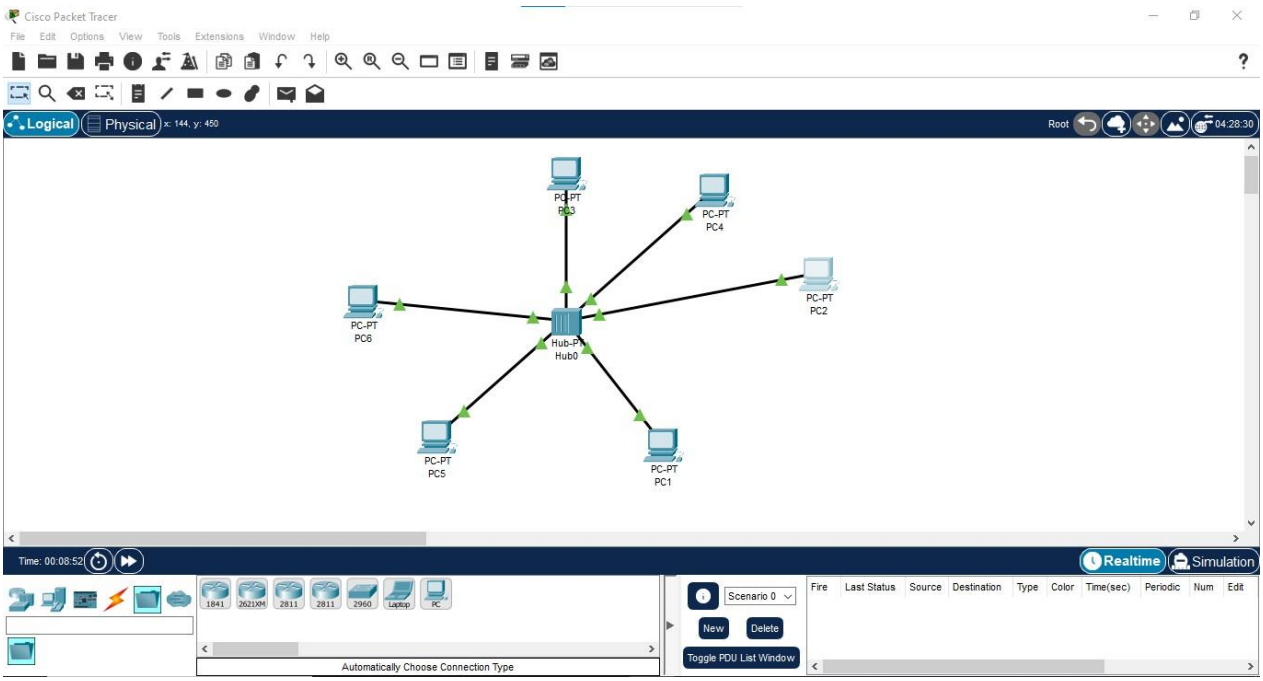
Step 4: Repeat step 3 for PC1

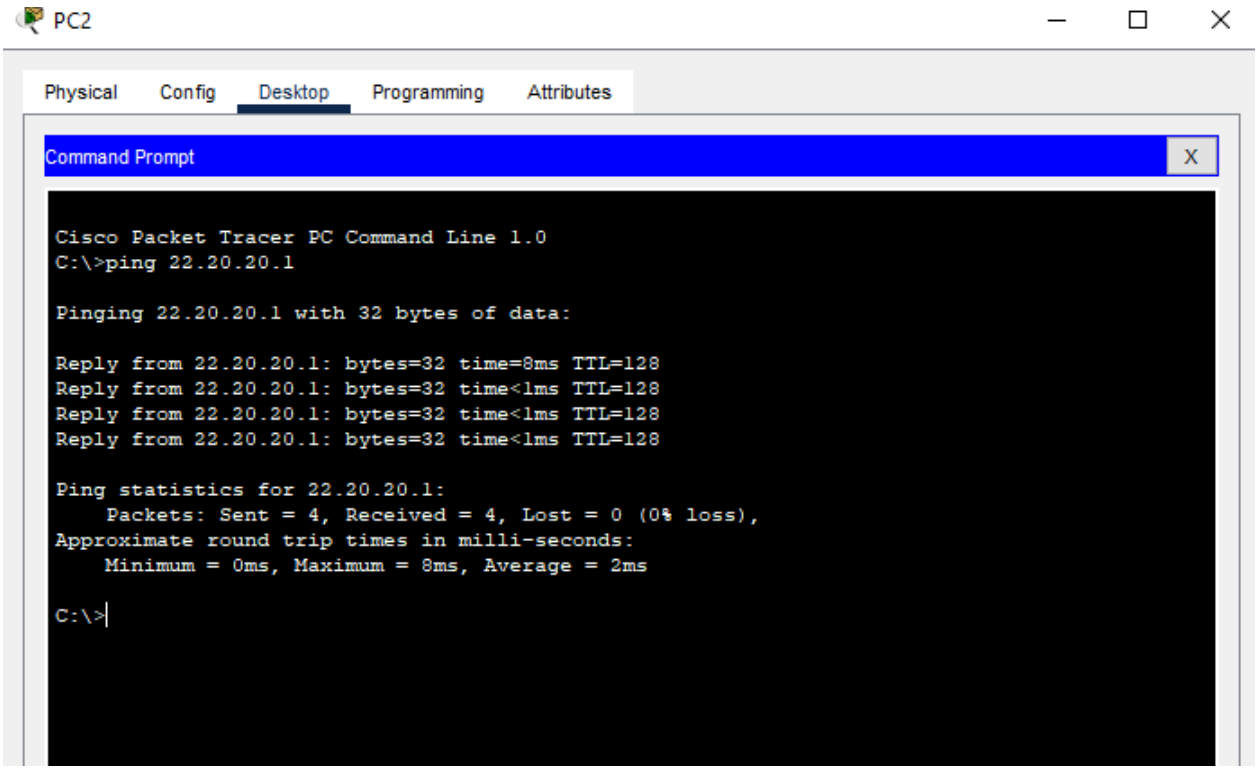
Step 5: Ping both the PCs and check their working status.

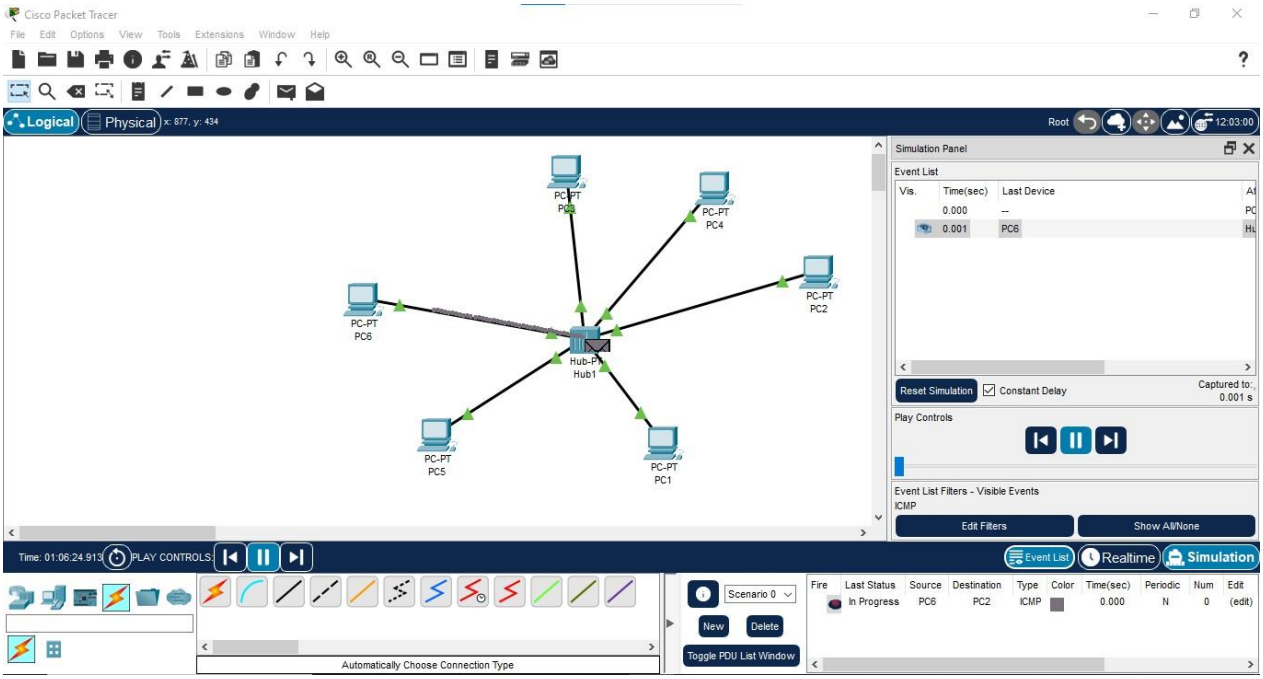
Step 6: Simple PDU (Protocol Data Unit) to simulate network traffic by sending ICMP PDU to assess the network traffic. View simulation in simulation mode

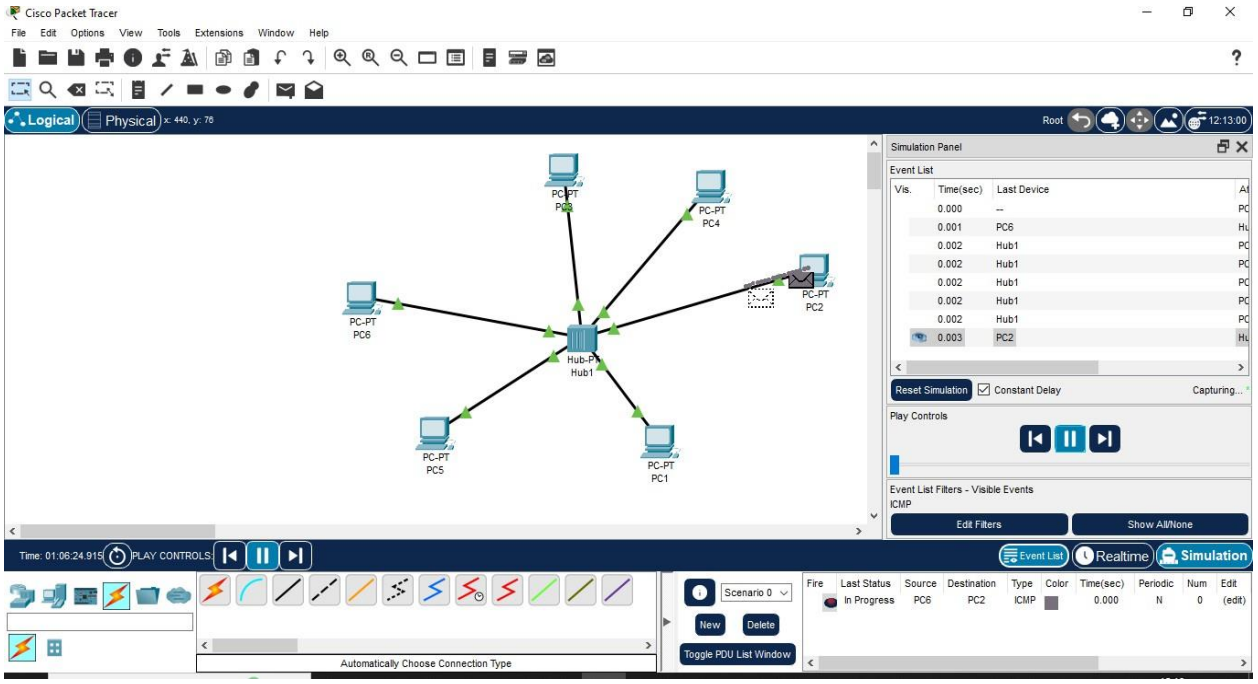
IMPLEMENTATION: (printout of simulation code)

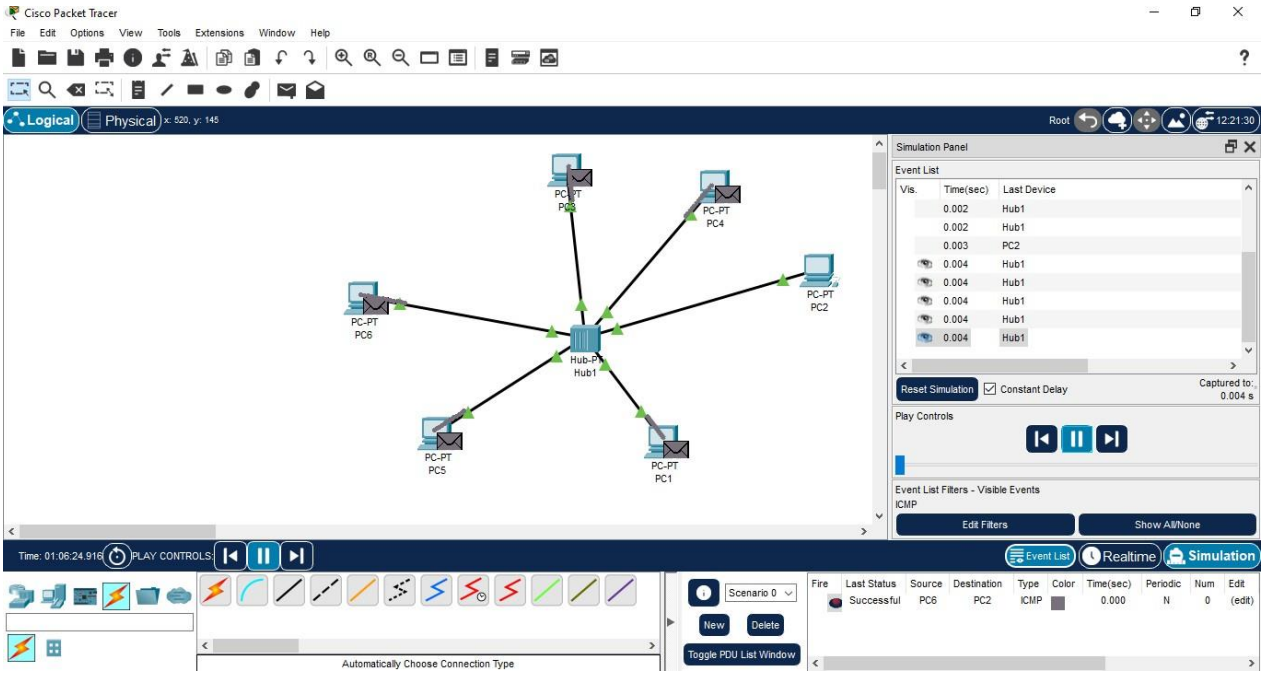
1. HUB

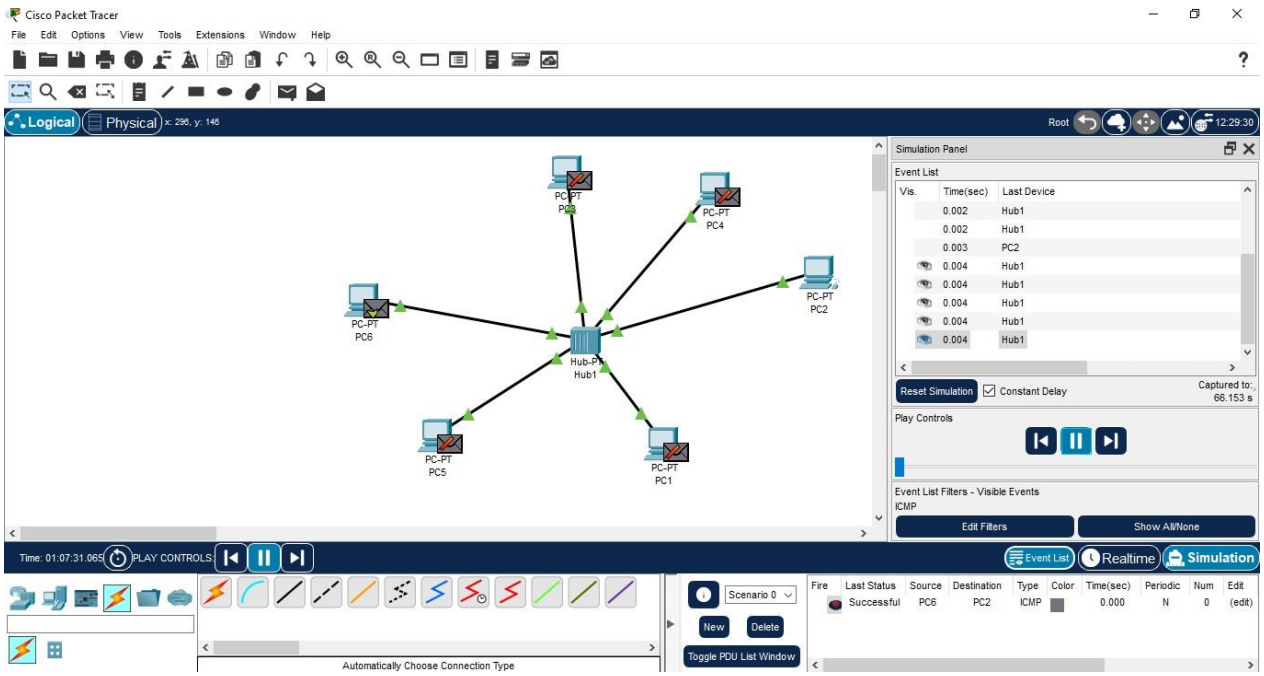

Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical
Physical
Root
PC-PT PC3
PC-PT PC4
PC-PT PC2
PC-PT PC6
Hub-PT Hub0
PC-PT PC5
PC-PT PC1
Time: 00:08:52
Realtime
Simulation
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit


PC2
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 22.20.20.1
Pinging 22.20.20.1 with 32 bytes of data:
Reply from 22.20.20.1: bytes=32 time=8ms TTL=128
Reply from 22.20.20.1: bytes=32 time<1ms TTL=128
Reply from 22.20.20.1: bytes=32 time<1ms TTL=128
Reply from 22.20.20.1: bytes=32 time<1ms TTL=128
Ping statistics for 22.20.20.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 8ms, Average = 2ms
C:\>

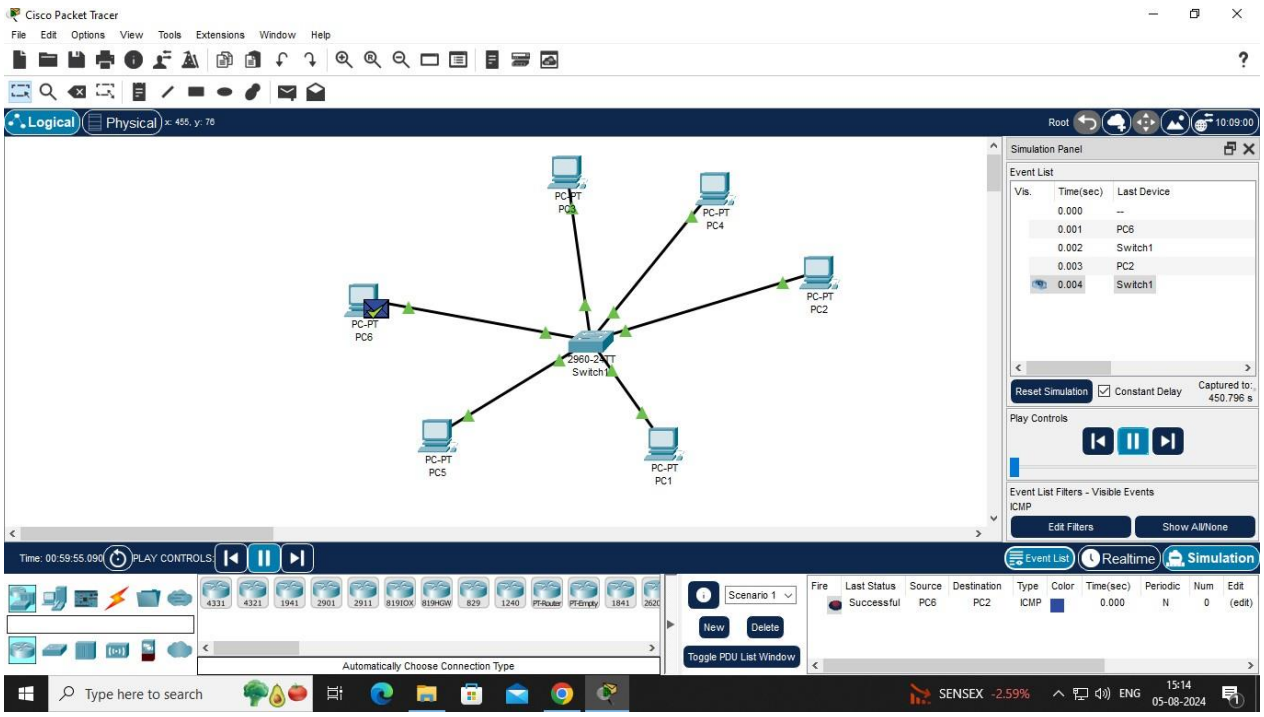

Cisco Packet Tracer
Logical
Physical
Simulation Panel
Event List
PC-PT PC3
PC-PT PC4
PC-PT PC2
PC-PT PC6
Hub-PT Hub1
PC-PT PC5
PC-PT PC1
Reset Simulation
Constant Delay
Play Controls
Edit Filters
Show All/None
Realtime
Simulation
Automatically Choose Connection Type


Cisco Packet Tracer
Logical
Physical
Simulation Panel
Event List
PC-PT PC3
PC-PT PC4
PC-PT PC2
PC-PT PC6
Hub-PT Hub1
PC-PT PC5
PC-PT PC1
Reset Simulation
Constant Delay
Play Controls
Edit Filters
Show All/None
Realtime
Simulation
Automatically Choose Connection Type

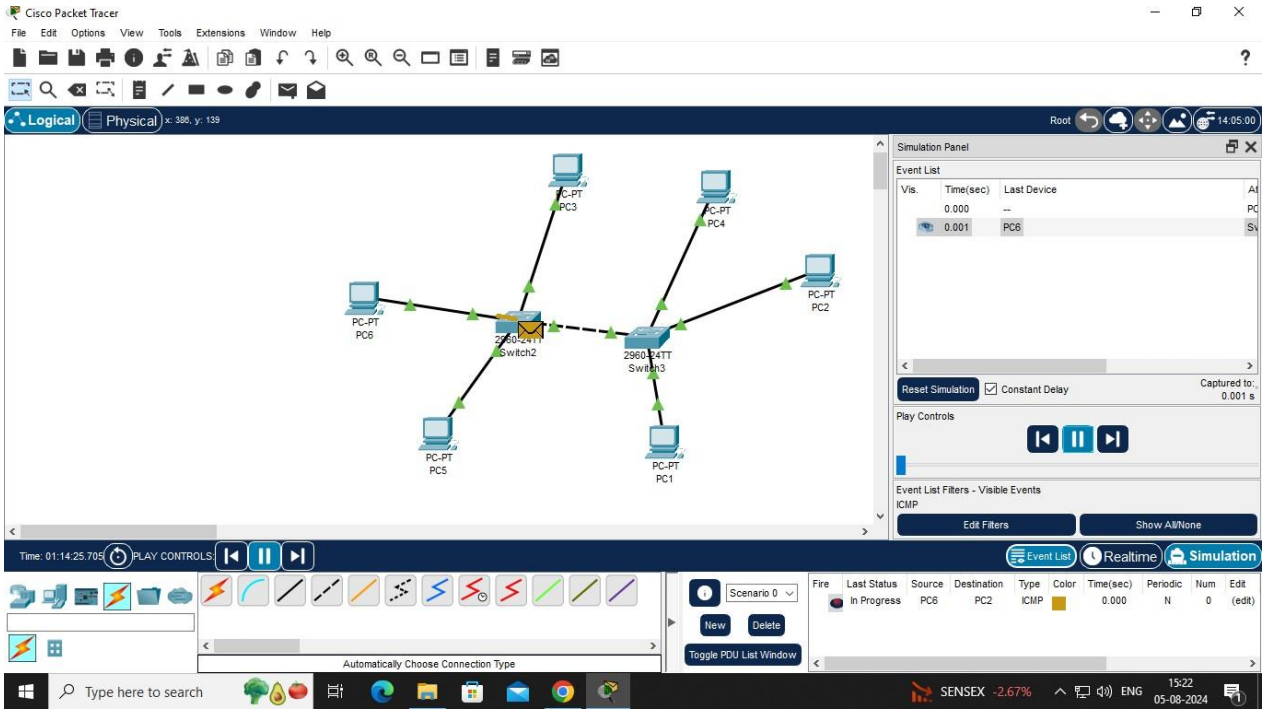

Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical Physical
Root
Simulation Panel
Event List
Vis. Time(sec) Last Device
0.002 Hub1
0.002 Hub1
0.003 PC2
0.004 Hub1
0.004 Hub1
0.004 Hub1
0.004 Hub1
0.004 Hub1
PC-PT PC3
PC-PT PC4
PC-PT PC2
PC-PT PC6
Hub-PT Hub1
PC-PT PC5
PC-PT PC1
Reset Simulation
Constant Delay
Captured to: 0.004 s
Play Controls
Event List Filters - Visible Events
ICMP
Edit Filters
Show All/None
Time: 01:06:24.916
PLAY CONTROLS:
Event List
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit
Successful PC6 PC2 ICMP 0.000 N 0 (edit)
Automatically Choose Connection Type


Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical Physical
Root
Simulation Panel
Event List
Vis. Time(sec) Last Device
0.002 Hub1
0.002 Hub1
0.003 PC2
0.004 Hub1
0.004 Hub1
0.004 Hub1
0.004 Hub1
0.004 Hub1
PC-PT PC3
PC-PT PC4
PC-PT PC2
PC-PT PC6
Hub-PT Hub1
PC-PT PC5
PC-PT PC1
Reset Simulation
Constant Delay
Captured to: 66.153 s
Play Controls
Event List Filters - Visible Events
ICMP
Edit Filters
Show All/None
Time: 01:07:31.065
PLAY CONTROLS:
Event List
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit
Successful PC6 PC2 ICMP 0.000 N 0 (edit)
Automatically Choose Connection Type

2. Single Switch

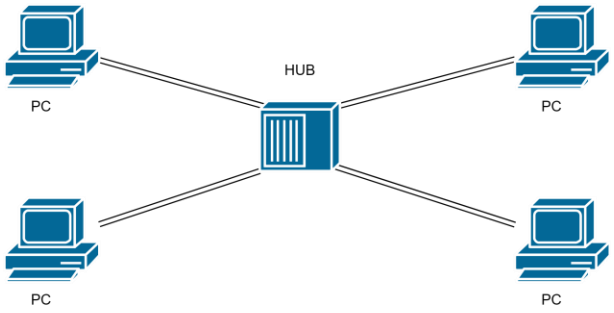


1. Double Switch :

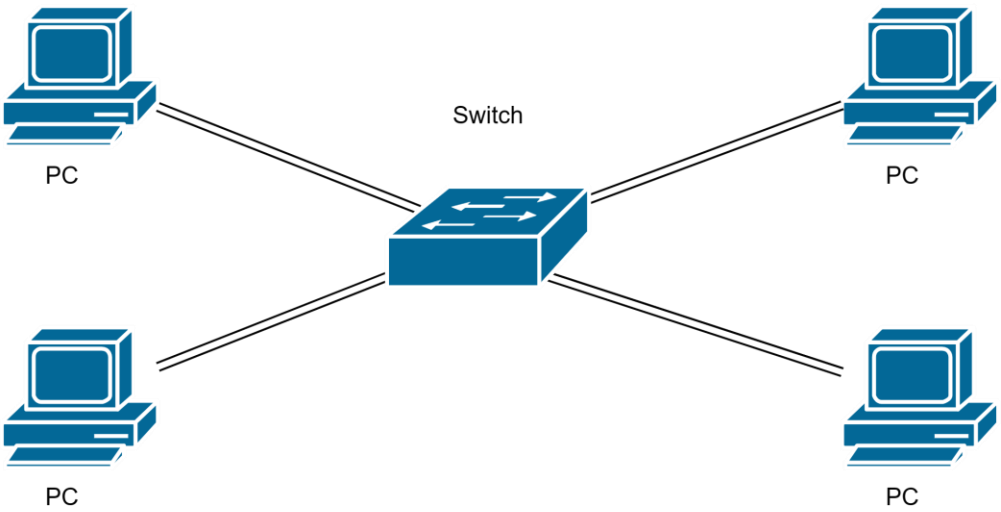

Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical
Physical
Root
Simulation Panel
Event List
Vis. Time(sec) Last Device
0.000 --
0.001 PC6
PC-PT PC3
PC-PT PC4
PC-PT PC2
PC-PT PC6
Switch2
Switch3
PC-PT PC5
PC-PT PC1
Reset Simulation
Constant Delay
Captured to: 0.001 s
Play Controls
Event List Filters - Visible Events
ICMP
Edit Filters
Show All/None
Time: 01:14:25.705
PLAY CONTROLS:
Event List
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit
In Progress PC6 PC2 ICMP 0.000 N 0 (edit)
Automatically Choose Connection Type
Type here to search
SENSEX -2.67%
ENG
15:22
05-08-2024

Network Topologies:

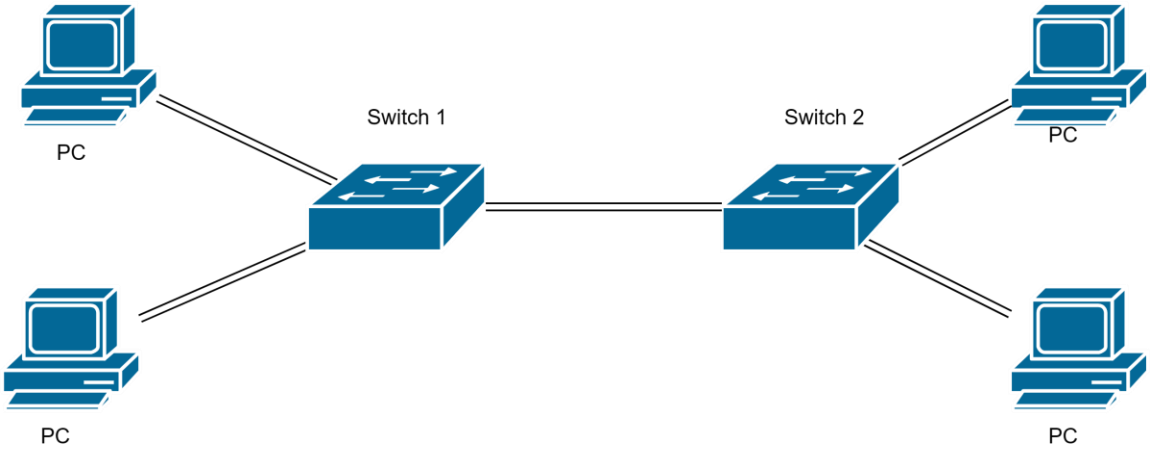
1. Topology with a HUB



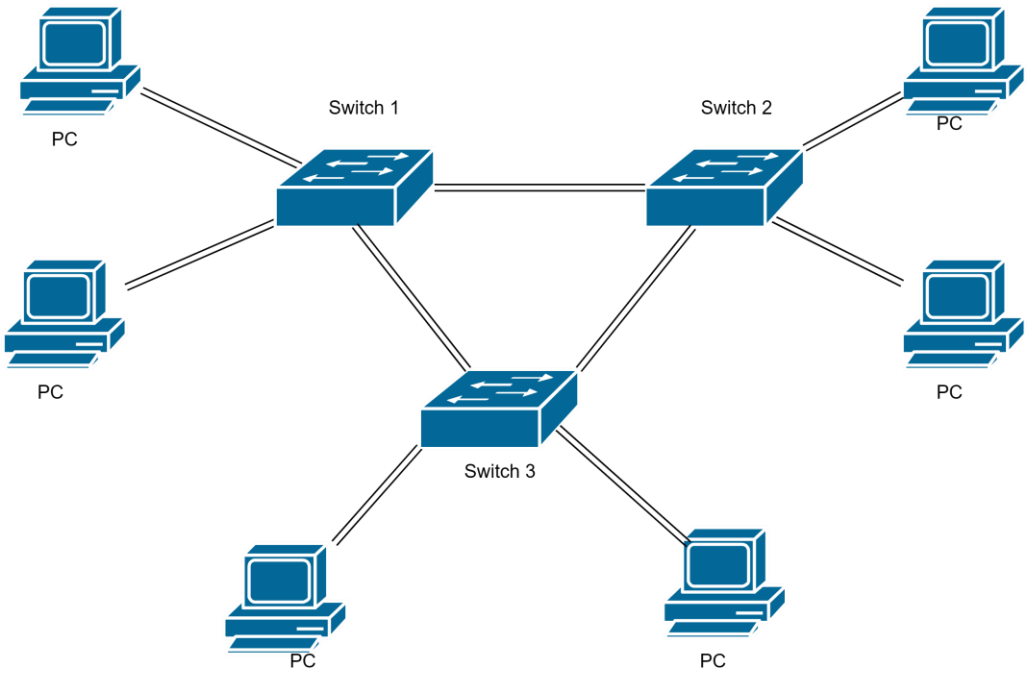
2. Topology with a Switch



3. Topology with two switches



5. Topology with 3 switches in a loop (Concept of STP)



CONCLUSION:

We learned that by using CISCO Packet Tracer, we can build and configure a simple network topology. This hands-on experience involved setting up basic network devices such as routers, switches, and end devices, and configuring them to enable communication across the network. Through this exercise, we gained practical knowledge of key networking concepts, including IP addressing, subnetting, and routing protocols. The simulation in CISCO Packet Tracer provided valuable insights into the design and configuration of networks, reinforcing theoretical concepts with practical application.

Post Lab Questions

1. **List features of CISCO packet tracer.**

A) CISCO Packet Tracer allows users to design, configure, and visualize network topologies with a wide range of simulated networking devices, including routers, switches, and end devices. It provides an interactive learning environment where users can practice and understand networking concepts without the need for physical hardware. The tool supports various networking protocols, such as routing and switching protocols, enabling users to simulate real-world scenarios effectively. Additionally, Packet Tracer includes IoT simulation features, allowing users to create and experiment with IoT networks, making it a versatile tool for both education and network design.

2. Explain difference between working of a Hub and a Switch in a given topology

The key differences between a hub and a switch in a network topology:

A) **Data Transmission:** A hub broadcasts data to all devices, leading to unnecessary traffic and potential collisions, while a switch sends data only to the intended recipient, reducing traffic and collisions.
B) **Performance:** Switches offer better performance by allowing multiple simultaneous data transmissions, whereas hubs can cause network congestion and slower performance.
C) **Security:** Switches enhance security by directing data only to the intended device, unlike hubs, which expose data to all connected devices.
D) **Collision Domain:** Hubs create a single collision domain for all devices, increasing the likelihood of collisions, while switches provide a separate collision domain for each device, reducing collisions and improving network efficiency.

Date: 05/08/2024 **Signature of faculty in-charge**