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Class/Section	S23 Slot-1
Ex.No:	7a
Name of the Experiment	Spanning Tree Protocol Configuration

Objective(s):

To design and implement spanning tree configuration using packet tracer

Introduction:

In a typical network topology, we have redundant connections between switches. Redundant connections play a very crucial role as it eliminates the single point of failure in the network. However, redundant connections create loop in the network. And to prevent those loops in networks the Spanning Tree Protocol chooses the best link while blocking the redundant links.

Root Bridge is the most important switch in a Spanning Tree Network. And all the other switches choose the best way to reach a Root Bridge and block the redundant links. Therefore, it is very important to choose the best switch in the network as a Root Bridge.

Root is selected on the basis of a Bridge ID. So, whichever switch will have the lowest Bridge ID, that very switch will be selected as a Root Bridge. Basically, Bridge ID is made up of a priority number and the MAC Address. And by default, all switches have the same priority number – 32768 to be precise – so the Spanning Tree relies on a MAC address for the selection of Root Bridge. But the problem is that by default any switch which has the lowest Bridge ID can be automatically selected as a Root Bridge. And if that switch is slow then it will slow down the entire network because its network traffic will pass through that switch. Hence, it is very important that every Spanning Tree Network has the best Switch as a root.

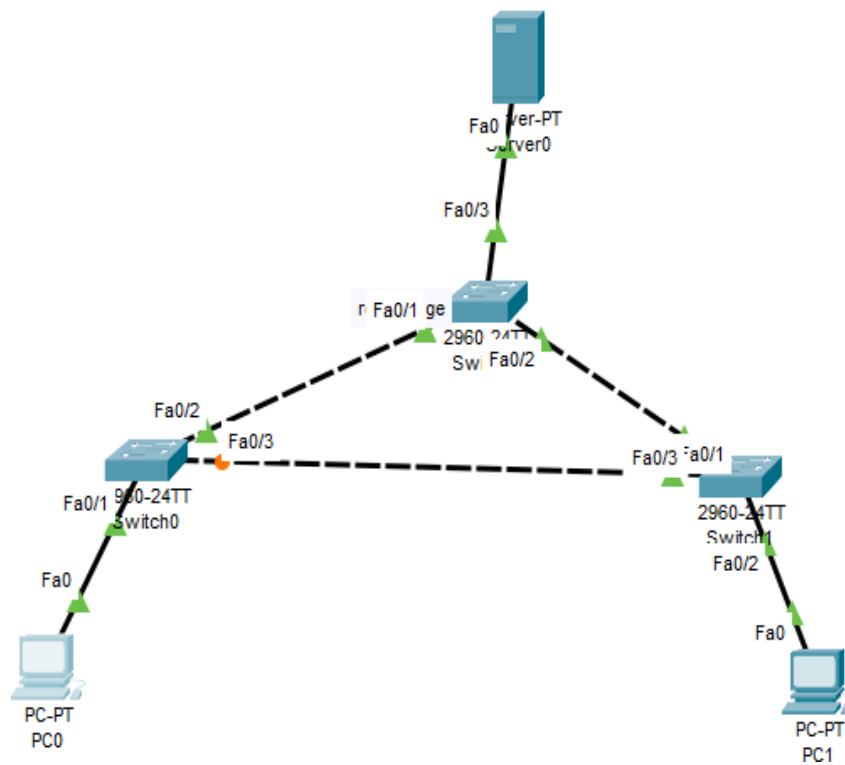
By default, the Spanning Tree is enabled on the switches so if we create a redundant connection on switches then the Spanning Tree Protocol will automatically come into action to prevent a loop in the network. Therefore, for maximum optimization it is very important to select the right switch as a Root Bridge.

We cannot however, change the MAC address of a switch so we will have to change the priority number of switches to influence the selection of a Root Bridge.

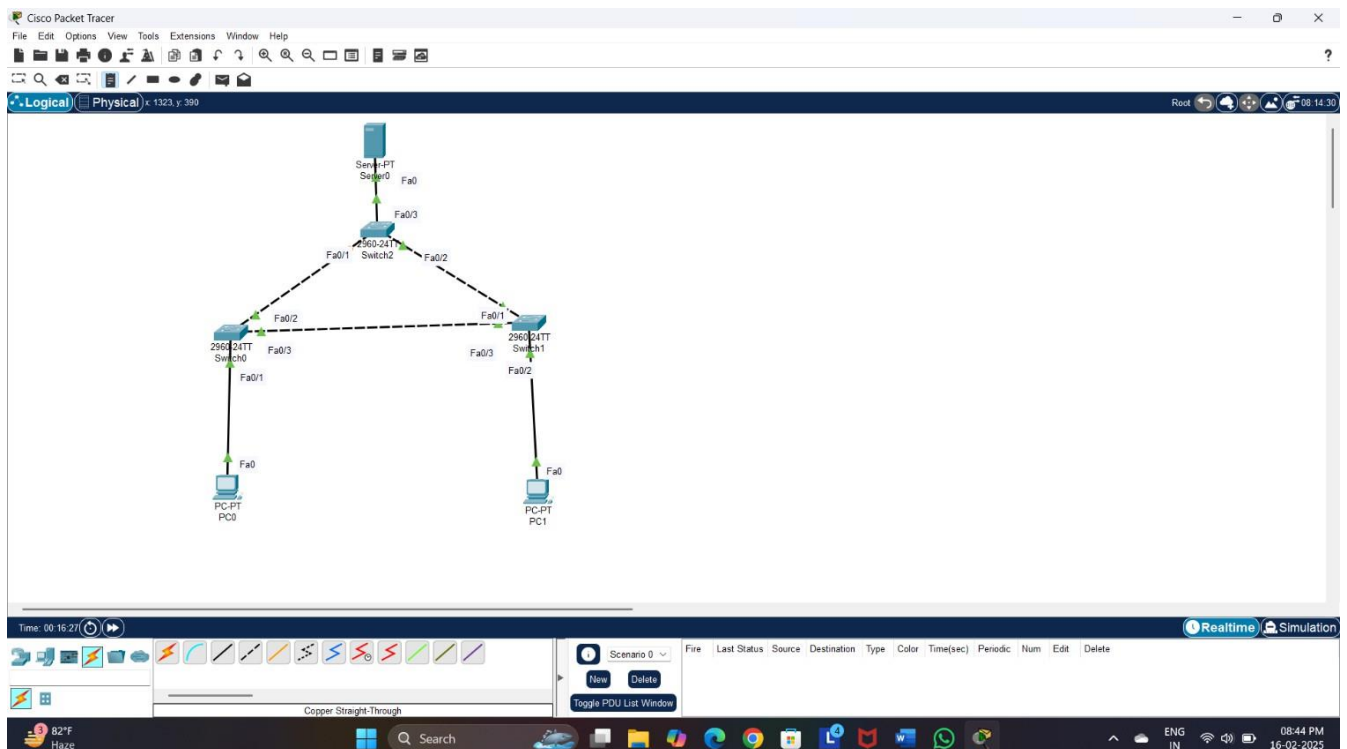
In this lab, we will try changing the priority of a switch to be able to select the switch of our choice as a Root Bridge. Root Bridge is selected as per the VLAN number so we have to mention that for which VLAN, the switch is a root. We will also enable a newer version of the Spanning Tree which is a Rapid Spanning Tree.

1. Device Requirements:

- 1.Pc
- 2.Switch
- 3.Connection wire
- 4.Server

2. Network Diagram for your experiment (draw the diagram either hand drawing/ms paint or any other drawing tools)

3. Network Diagram (Packet tracer diagram before configuration):



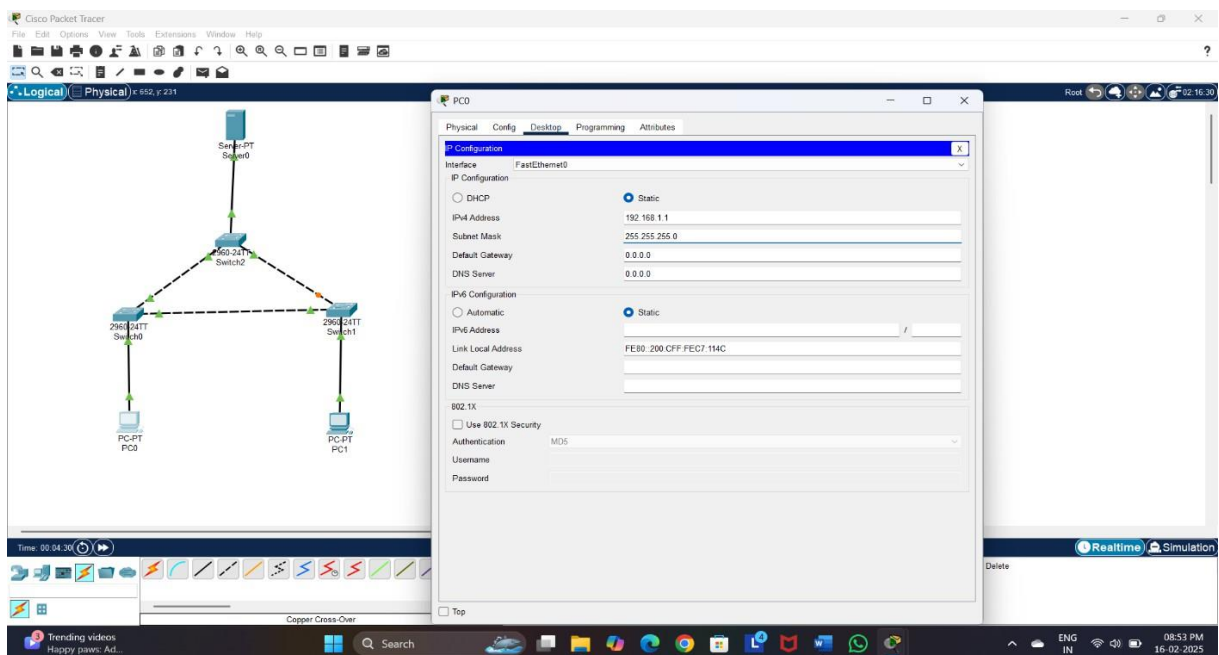
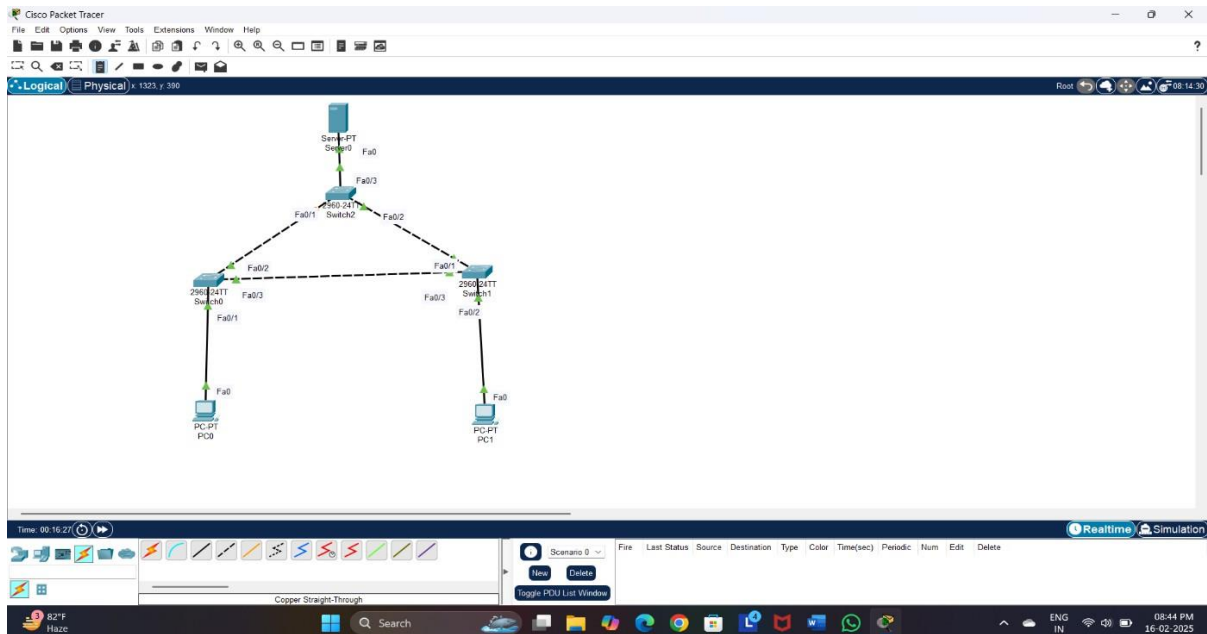
4. Configuration details:

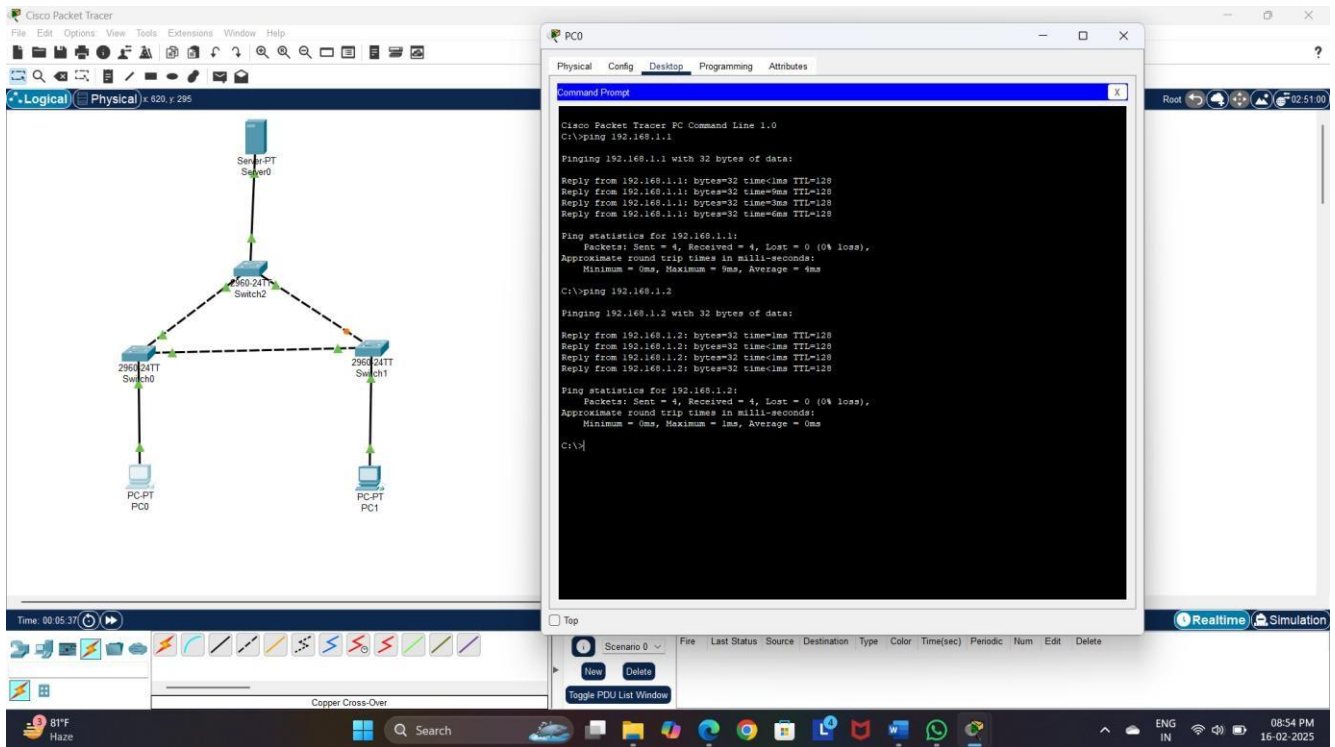
Device Name	Interface Name	IP Address	Subnet mask
PC1	Fa0/1	192.168.1.1	255.0.0.0
PC2	Fa0/2	192.168.1.2	255.0.0.0
PC3	Fa0/3	192.168.1.3	255.0.0.0
PC4	Fa0/4	192.168.1.4	255.0.0.0
PC5	Fa0/5	192.168.1.5	255.0.0.0

5. Describe step by step configuration steps properly (you may copy the commands used in the configuration tab and paste it.)

1. Create VLANs
2. Configure interfaces
3. Configure trunking

6. Output Diagram (Minimum 3 screenshot):





Google Drive link of the packet tracer file (give view permission):

Link: https://drive.google.com/file/d/1LfOMJeP2-BEf2X0ru_NPiT6v_0xagmUx/view?usp=drive_link

CONCLUSION:

Configuring Spanning Tree Protocol (STP) in Cisco Packet Tracer helps prevent network loops and ensures redundancy by designating a root bridge and blocking redundant paths. This setup enhances network stability and performance by dynamically managing port roles and paths.

Rubrics for Experiment Assessment:

Rubrics	Good	Normal	Poor	Marks
Creation of Topology (4)	Created the topology, Identify the proper devices and making the connections (4)	Created the topology, Identify the proper devices, making the connections But missing some features (3)	Created wrong topology, Failed to Identify the proper devices and making connections (1)	
Verify the connectivity (4)	Verified the connectivity in all the levels (4)	Verified the connectivity at some levels (only some nodes) (2)	Verified the connectivity is not done. (1)	
Timely Completion (2)	Completed the lab before the allotted time (2)	Completed the lab after the deadline (1)	Did not submitted before grading (0)	
Total				