REG NO	:	19BCS0012
NAME	:	NITHISH G
COURSE CODE	:	CSC3002
COURSE	:	COMPUTER NETWORKS
DATE	:	25.03.2021
SLOT	:	L37+L38

1. What is spanning Tree Protocol? Implement spanning Tree protocol(STP) in Packet tracer Spanning Tree protocol using switches
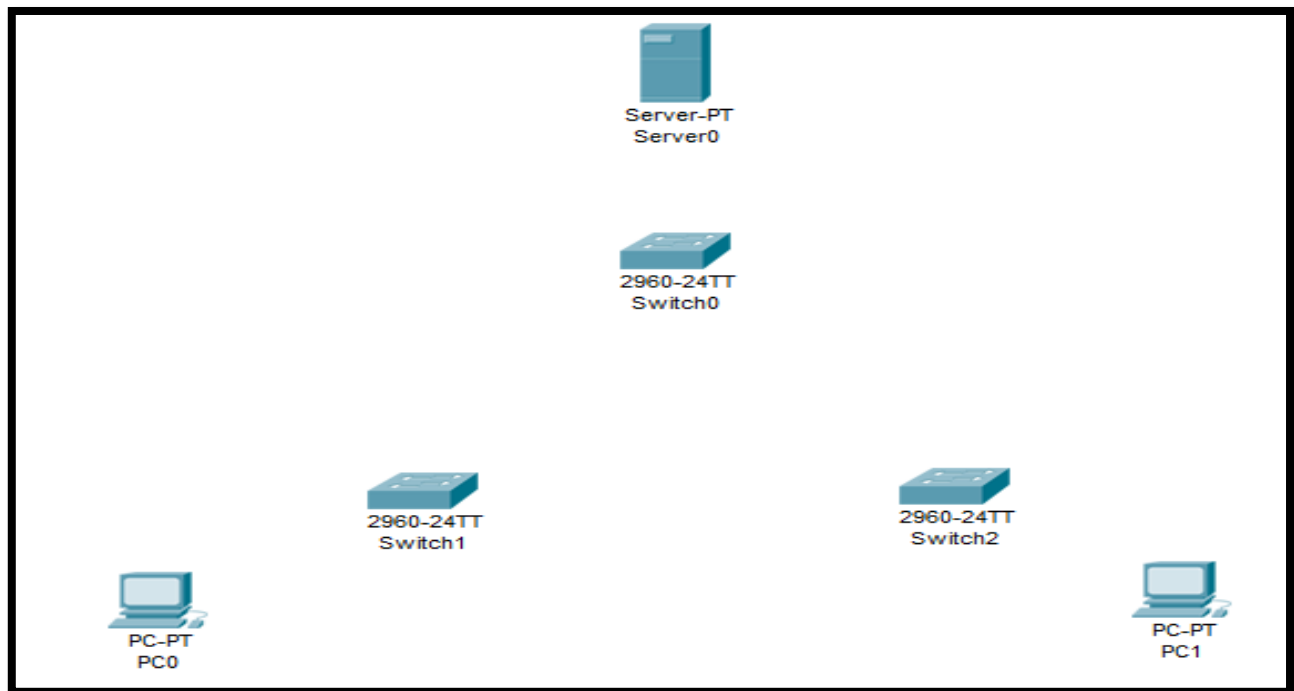
Spanning Tree Protocol

➢ Spanning tree protocol (STP) is a <u>Layer 2</u> network protocol used to prevent looping within a <u>network topology</u>. STP was created to avoid the problems that arise when computers compete for the ability to use the shared telecommunications path on a local area network (<u>LAN</u>).

➢ STP prevents the condition known as bridge <u>looping</u>. To reduce the likelihood of looping, a LAN can be divided into two or more *network segments* with a device called a bridge connecting any two segments.

➢ Each message (called a <u>frame</u>) goes through the bridge before being sent to the intended destination. The bridge determines whether the message is for a destination within the same segment as the sender's or for the other segment, and forwards accordingly.
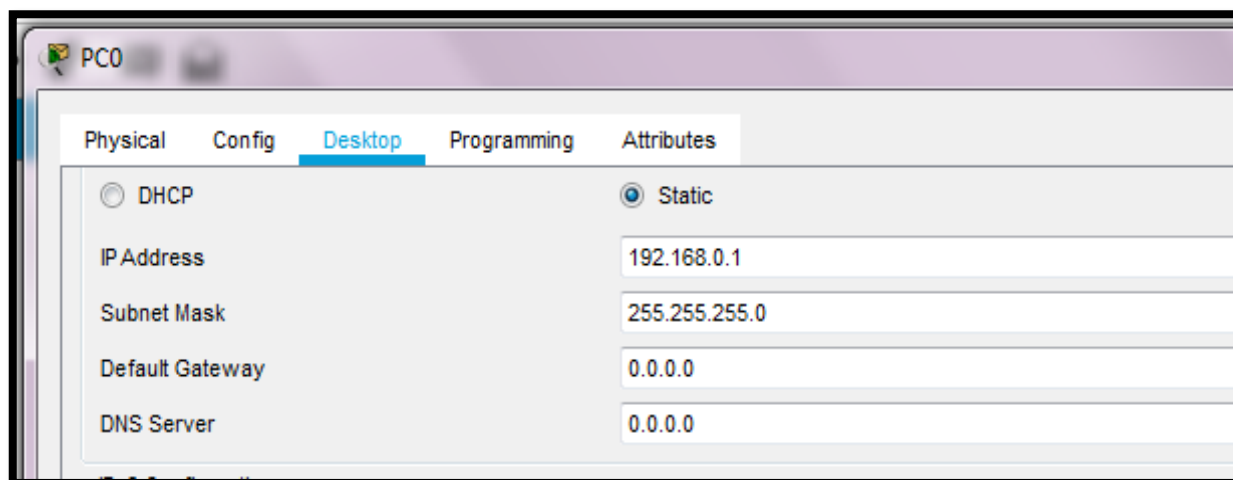
➢ A bridge looks at the destination address and, based on its understanding of the two segments (which computers are on which segments), forwards it on the right path (which means to the correct outgoing <u>port</u>).

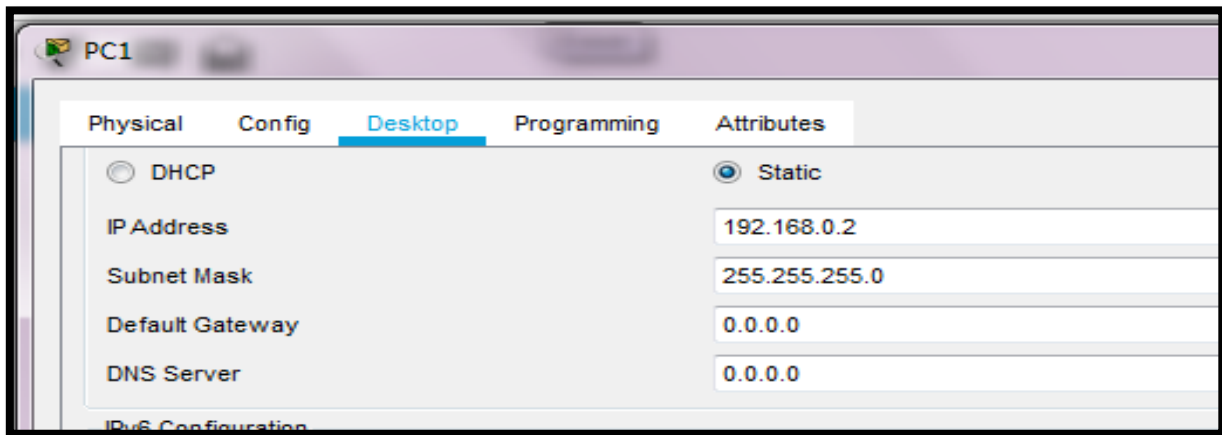# <u>Implement spanning Tree protocol (STP) in Packet tracer Spanning Tree protocol using switches</u>

Step 1 : Place Two PC's and Three Switch's and a server on the workspace on packer tracer
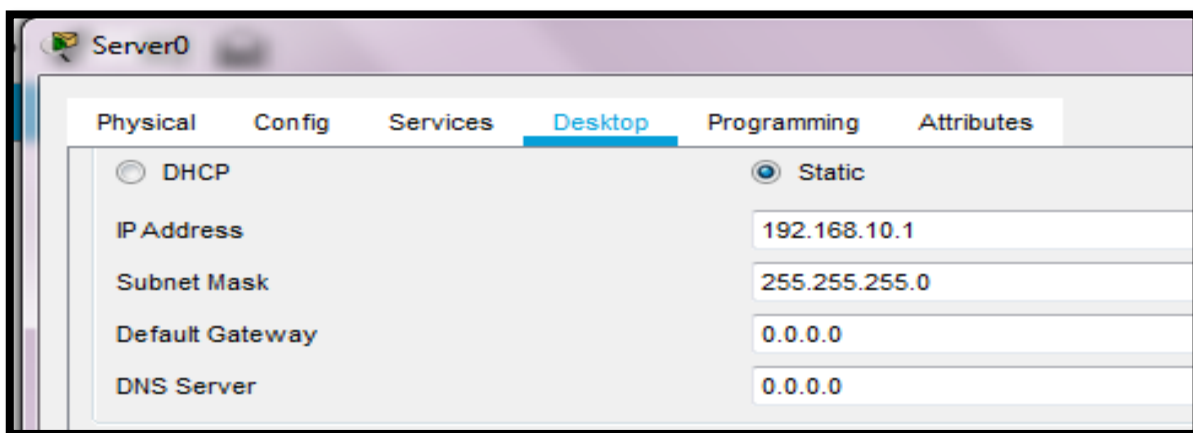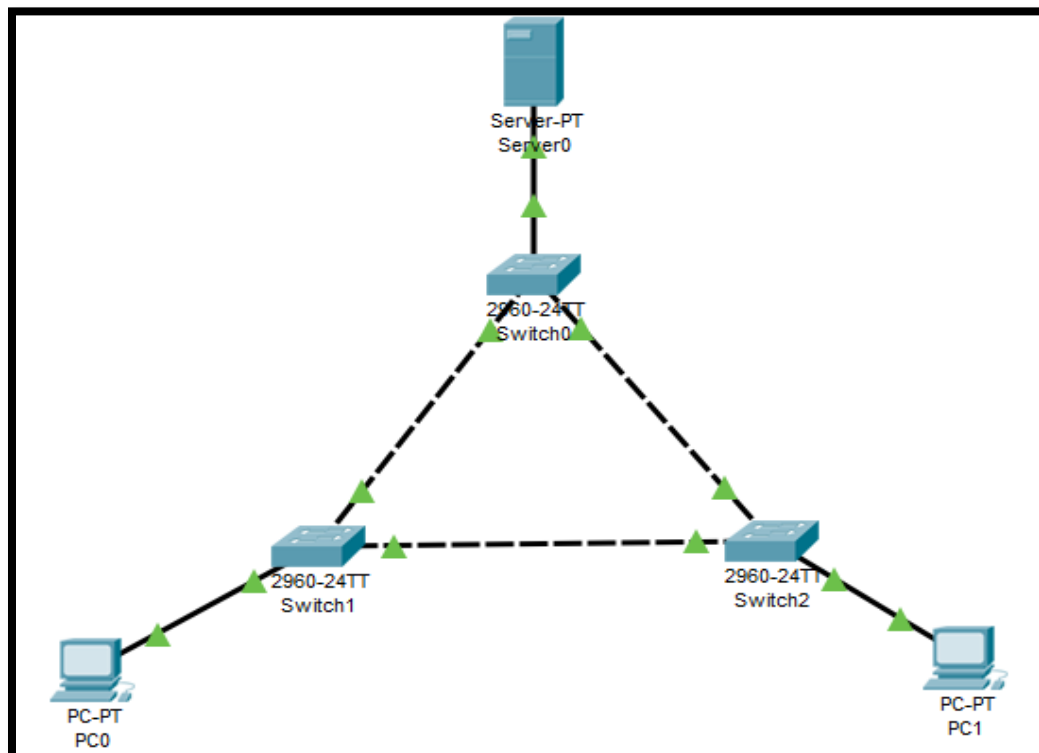

PC0:

PC1:

PC1

Physical	Config	Desktop	Programming	Attributes

○ DHCP   ◉ Static

IP Address   192.168.0.2

Subnet Mask   255.255.255.0

Default Gateway   0.0.0.0

DNS Server   0.0.0.0

IPv6 Configuration

Server 0:

Server0

Physical	Config	Services	Desktop	Programming	Attributes

○ DHCP   ◉ Static

IP Address   192.168.10.1

Subnet Mask   255.255.255.0

Default Gateway   0.0.0.0

DNS Server   0.0.0.0

Establish the connection between them

If we send it without following the spanning tree protocol the message can't send properly
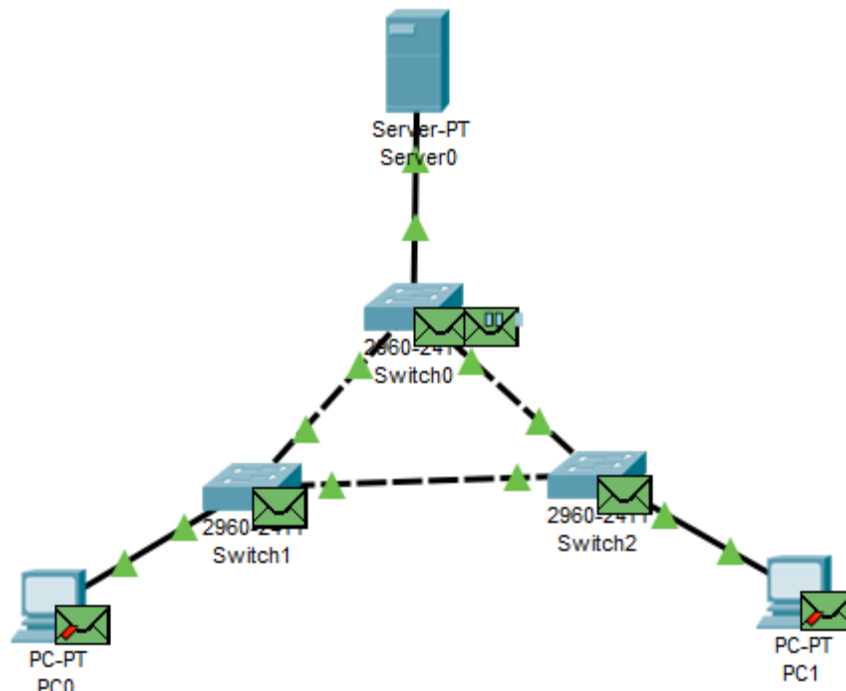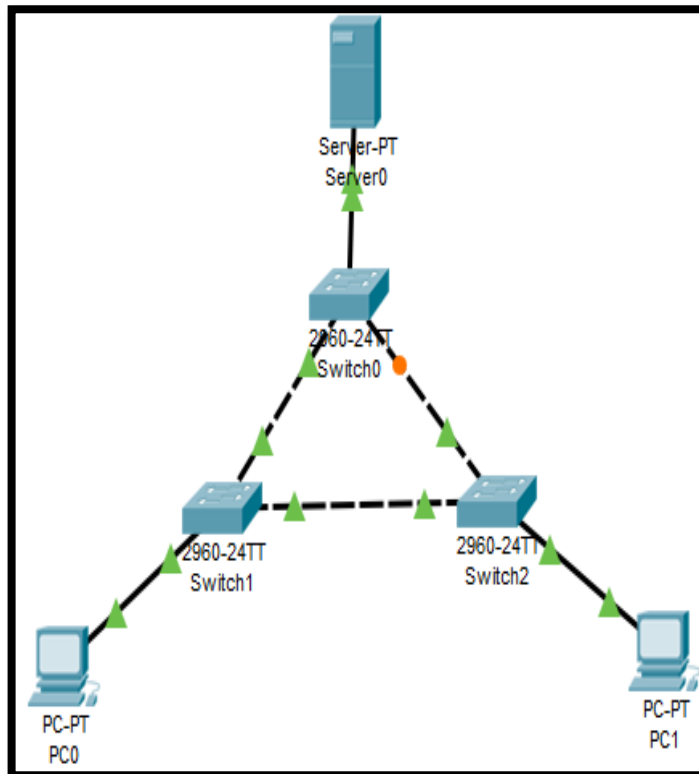
PC0 TO PC1

1.
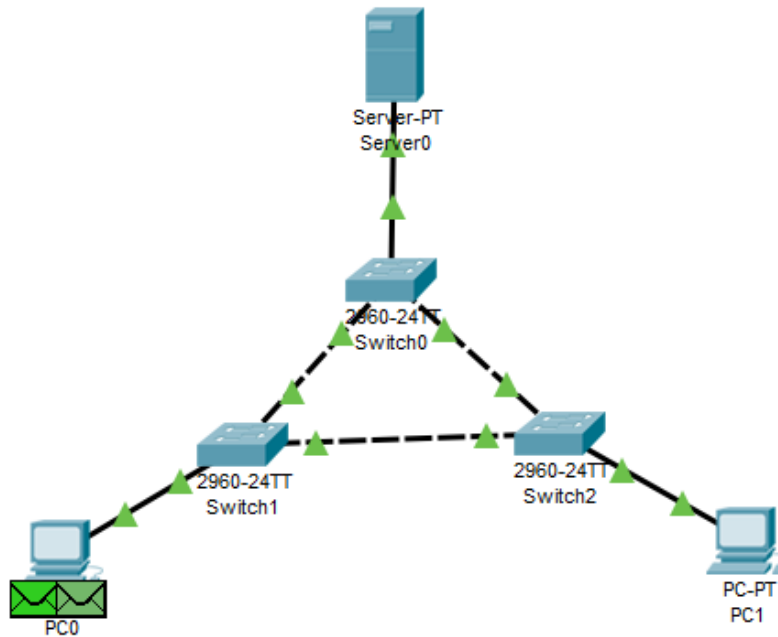
The message can't reach its correct destination because it fails to follow the spanning tree protocol
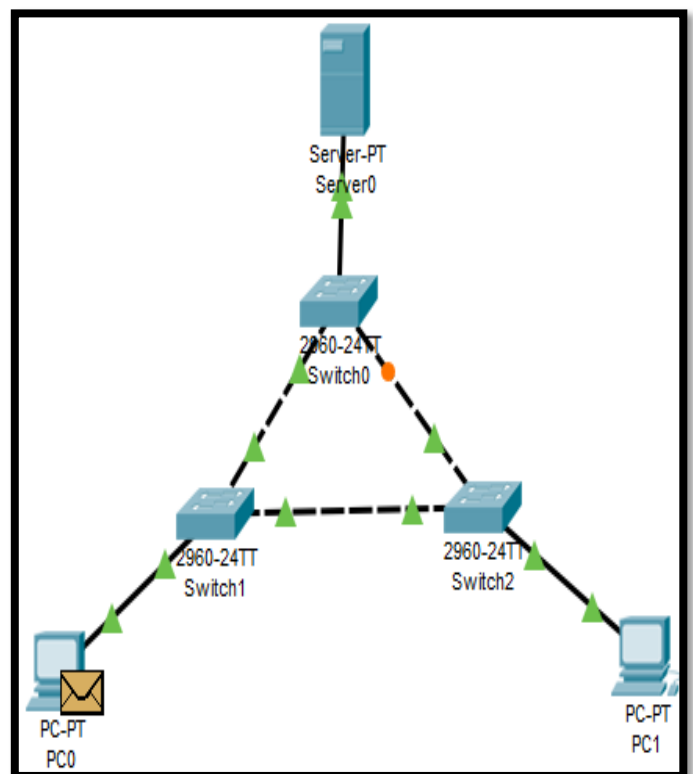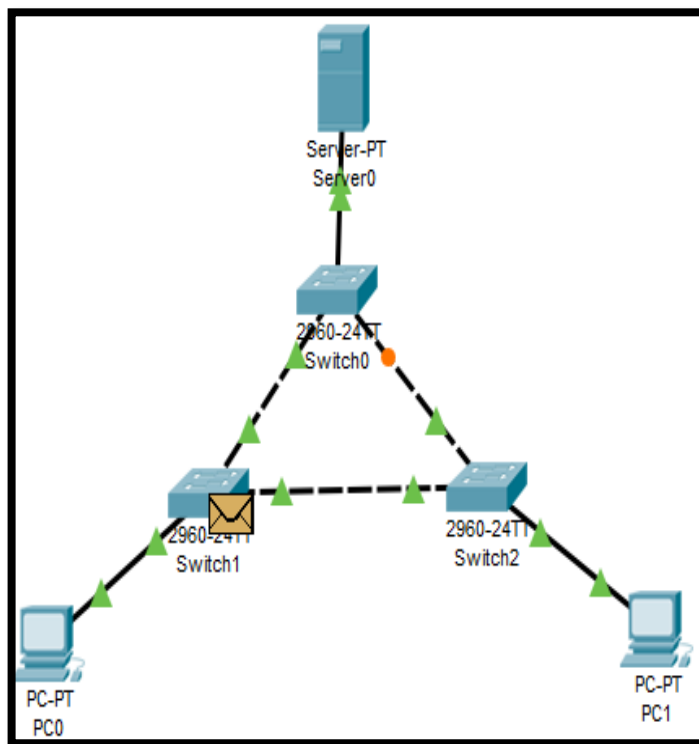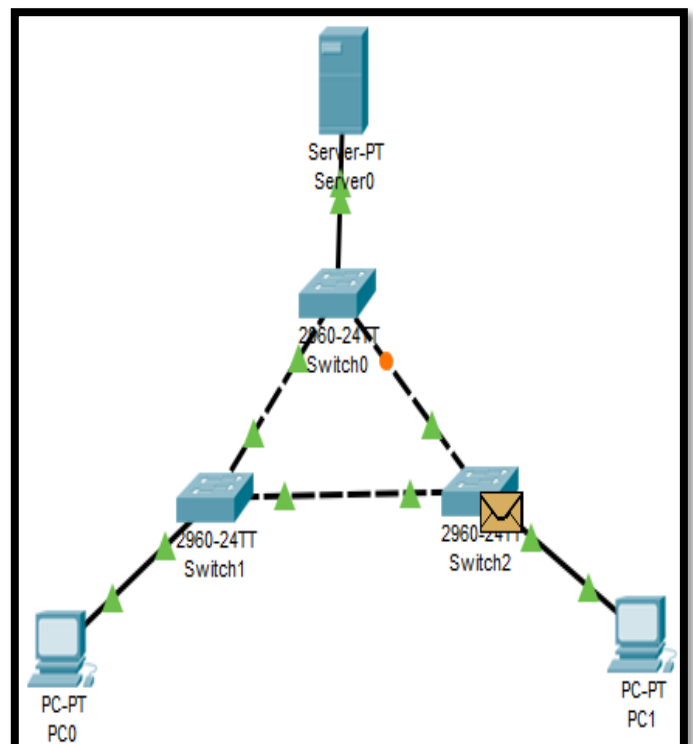
2.

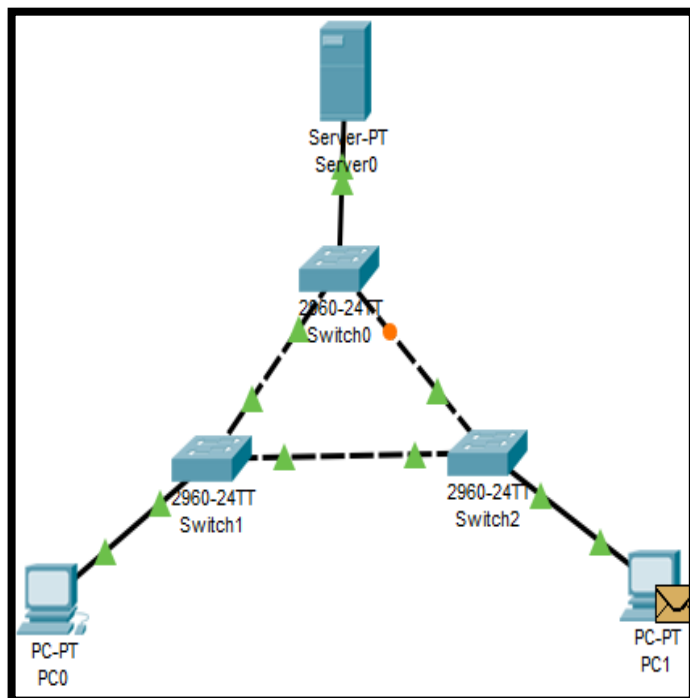# Using the spanning tree protocol

1.

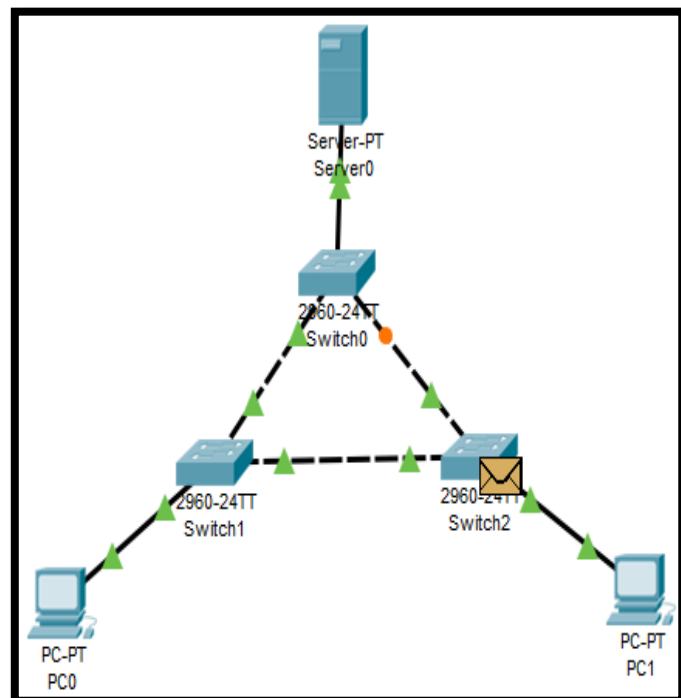

2.

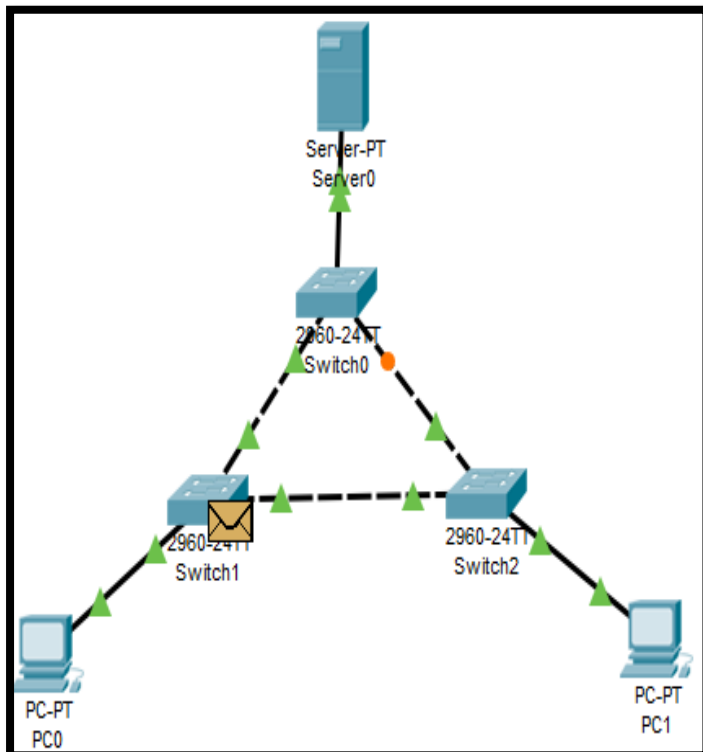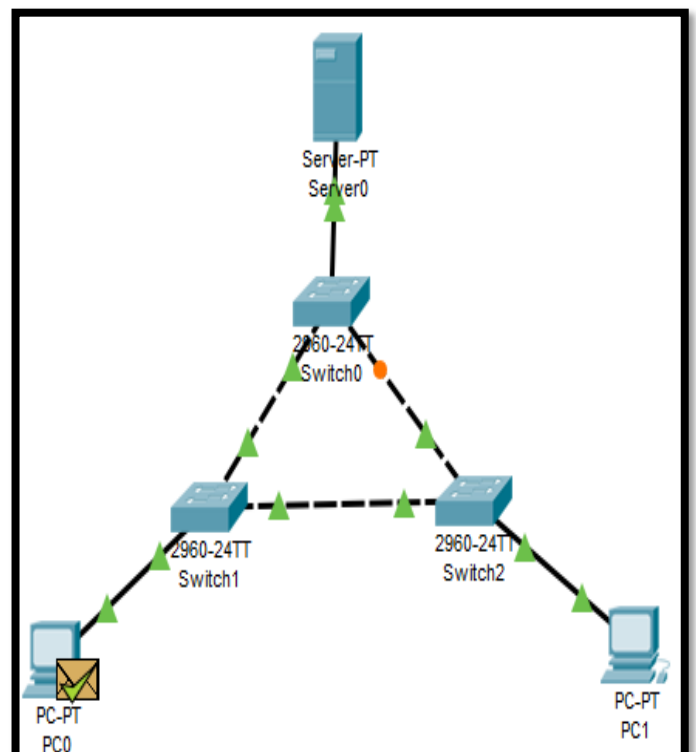**3.**

4.

5.

6.

7.

8.

<u>**Because of Spanning tree Protocol the it avoided the long way transmission by checking the some of the condition which is given bellow**</u>

Rules of Operation(STP)

This section lists rules for how STP works. When the switches first come up, they start the root switch selection process. Each switch transmits a BPDU to the directly connected switch on a per-VLAN basis.

As the BPDU goes out through the network, each switch compares the BPDU that the switch sends to the BPDU that the switch receives from the neighbors. The switches then agree on which switch is the root switch. The switch with the lowest bridge ID in the network wins this election process.

Note: Remember that one root switch is identified per-VLAN. After the root switch identification, the switches adhere to these rules:

- **STP Rule 1**—All ports of the root switch must be in forwarding mode.
  Note: In some corner cases, which involve self-looped ports, there is an exception to this rule. Next, each switch determines the best path to get to the root. The switches determine this path by a comparison of the information in all the BPDUs that the switches receive on all ports. The switch uses the port with the least amount of information in the BPDU in order to get to the root switch; the port with the least amount of information in the BPDU is the root port. After a switch determines the root port, the switch proceeds to rule 2.

- **STP Rule 2**—The root port must be set to forwarding mode.
  In addition, the switches on each LAN segment communicate with each other to determine which switch is best to use in order to move data from that segment to the root bridge. This switch is called the designated switch.

- **STP Rule 3**—In a single LAN segment, the port of the designated switch that connects to that LAN segment must be placed in forwarding mode.

- **STP Rule 4**—All the other ports in all the switches (VLAN-specific) must be placed in blocking mode. The rule only applies to ports that connect to other bridges or switches. STP does not affect ports that connect to workstations or PCs. These ports remain forwarded.
  Note: The addition or removal of VLANs when STP runs in per-VLAN spanning tree (PVST / PVST+) mode triggers spanning tree recalculation for that VLAN instance and the traffic is disrupted only for that VLAN. The other VLAN parts of a trunk link can forward traffic normally. The addition or removal of VLANs for a Multiple Spanning Tree (MST) instance that exists triggers spanning tree recalculation for that instance and traffic is disrupted for all the VLAN parts of that MST instance.

2. Constructing the network topology of having two different LAN and connecting them using the bridge and sending the message from one PC in a LAN to other PC which is present on Other LAN.
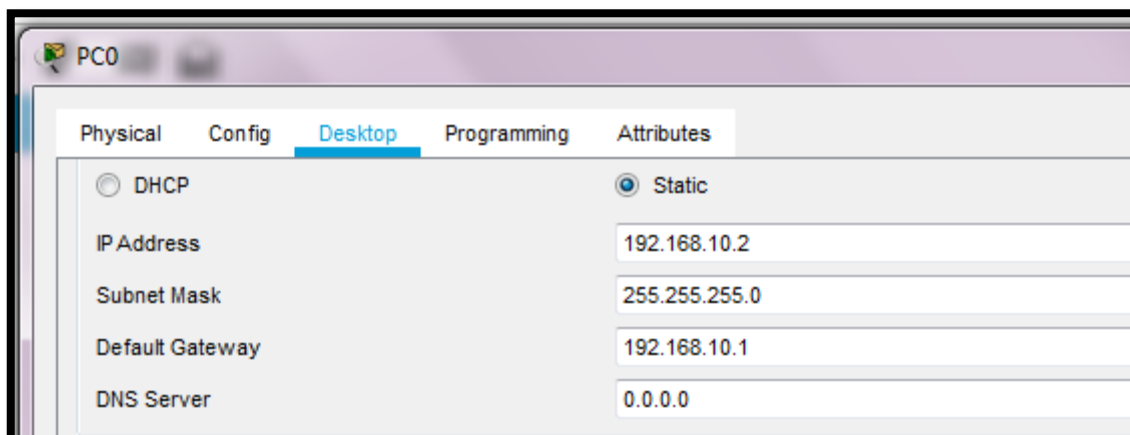
Step 1:

Placing the components like PC's, Switch, Bridge on the workspace on Cisco packet tracer and establishing the connection by using the appropriate connections show bellow.
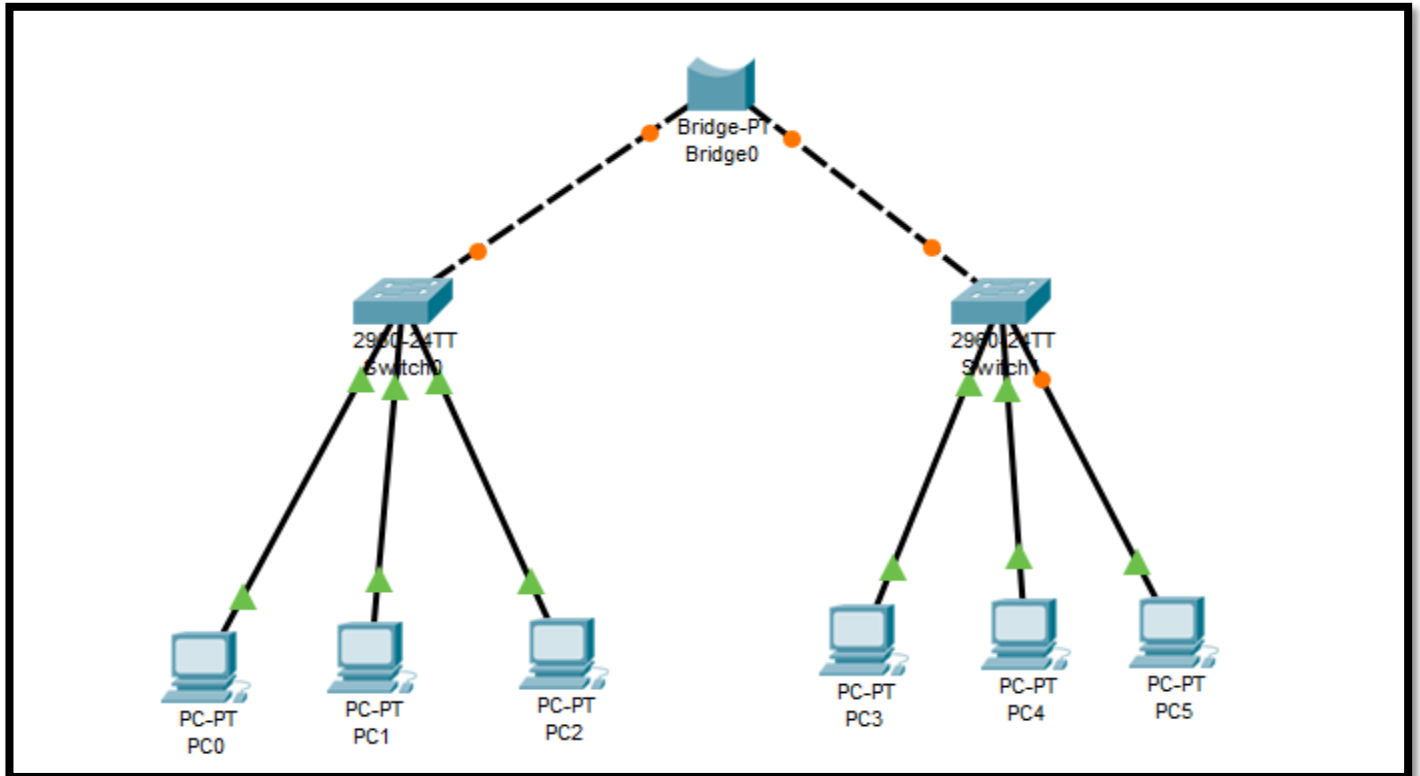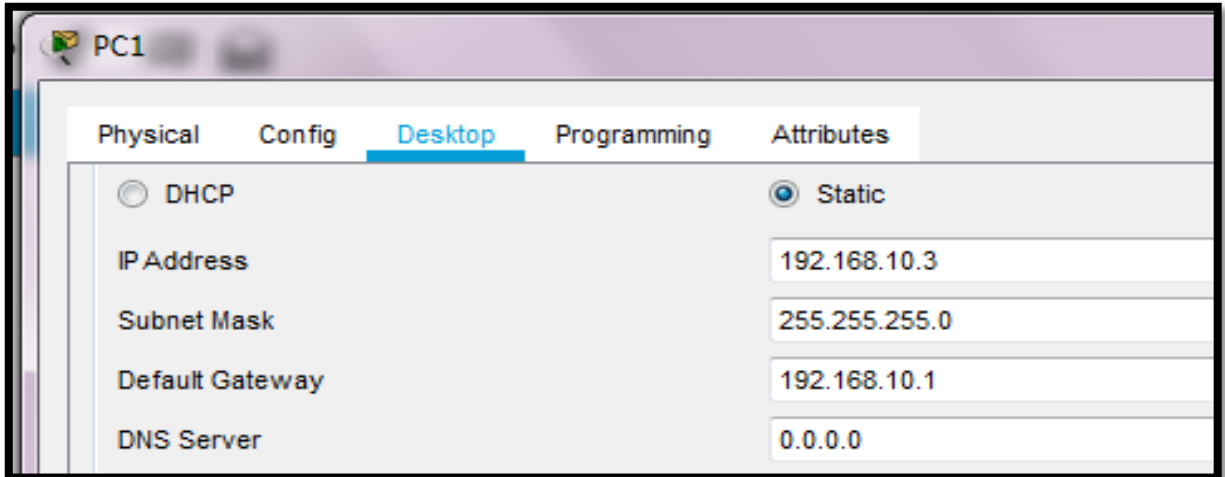

Step 2 configuring the Pc's IP address

PC0

PC1

Physical	Config	Desktop	Programming	Attributes

○ DHCP   ◉ Static

IP Address	192.168.10.3
Subnet Mask	255.255.255.0
Default Gateway	192.168.10.1
DNS Server	0.0.0.0
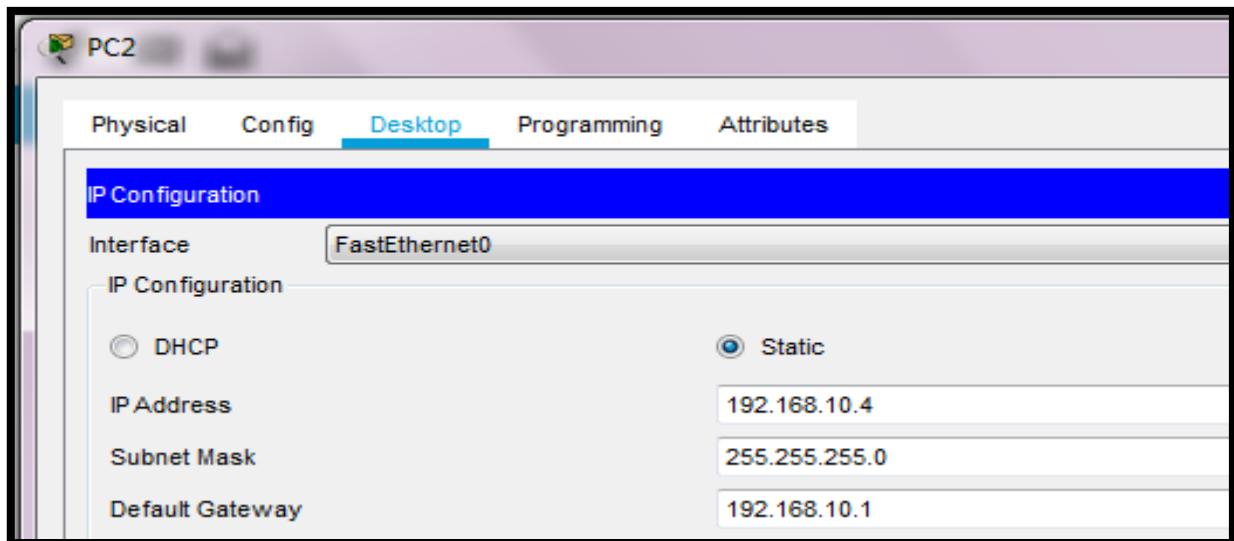
PC2

Physical	Config	Desktop	Programming	Attributes

IP Configuration

Interface	FastEthernet0

IP Configuration

○ DHCP   ◉ Static
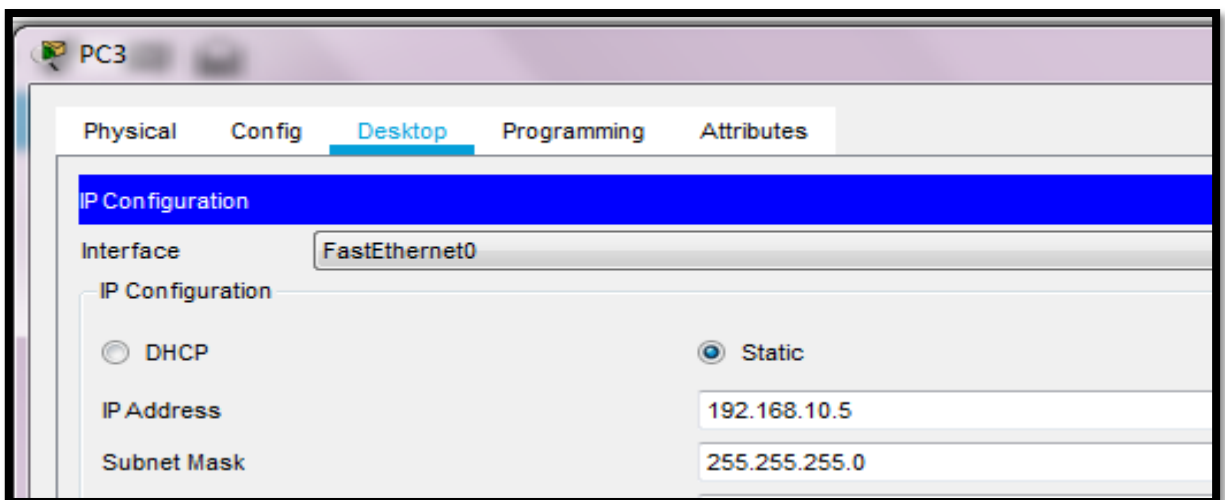
IP Address	192.168.10.4
Subnet Mask	255.255.255.0
Default Gateway	192.168.10.1

PC3

Physical	Config	Desktop	Programming	Attributes

IP Configuration

Interface	FastEthernet0

IP Configuration

○ DHCP   ◉ Static

IP Address	192.168.10.5
Subnet Mask	255.255.255.0

PC4

PC4

Physical | Config | Desktop | Programming | Attributes

IP Configuration

Interface: FastEthernet0

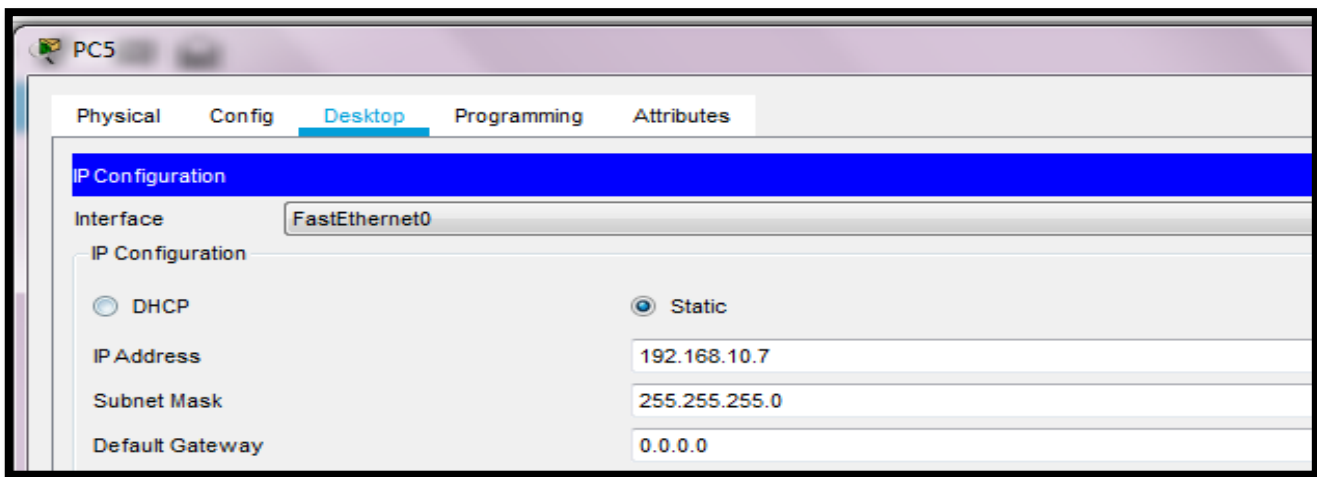IP Configuration

○ DHCP   ● Static

IP Address: 192.168.10.6

Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0

PC5

PC5

Physical | Config | Desktop | Programming | Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

○ DHCP   ● Static

IP Address: 192.168.10.7

Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0
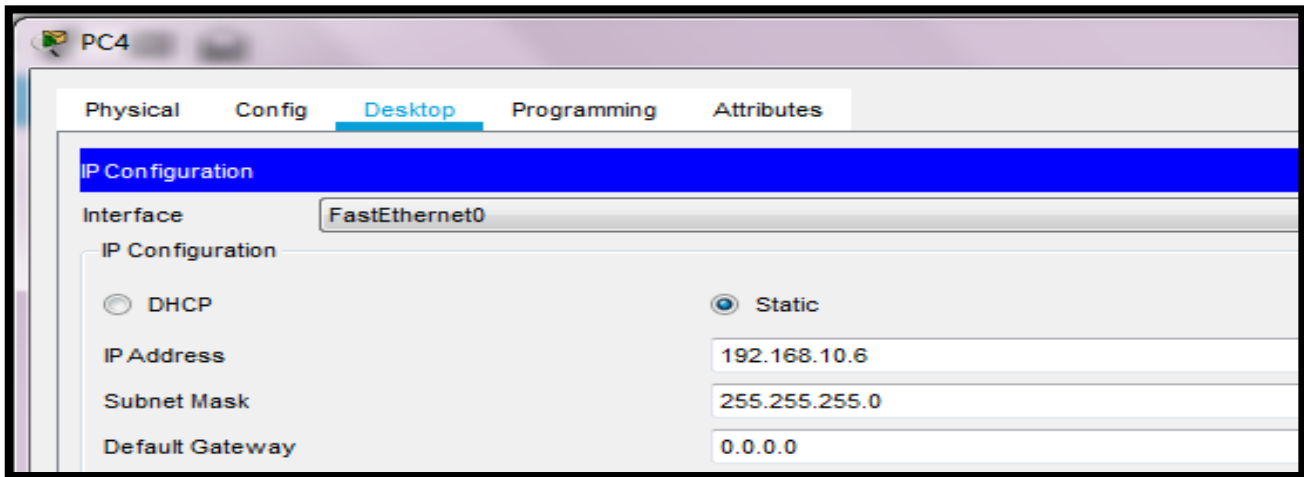
Sending the simple PDU PC1 TO PC4

1.
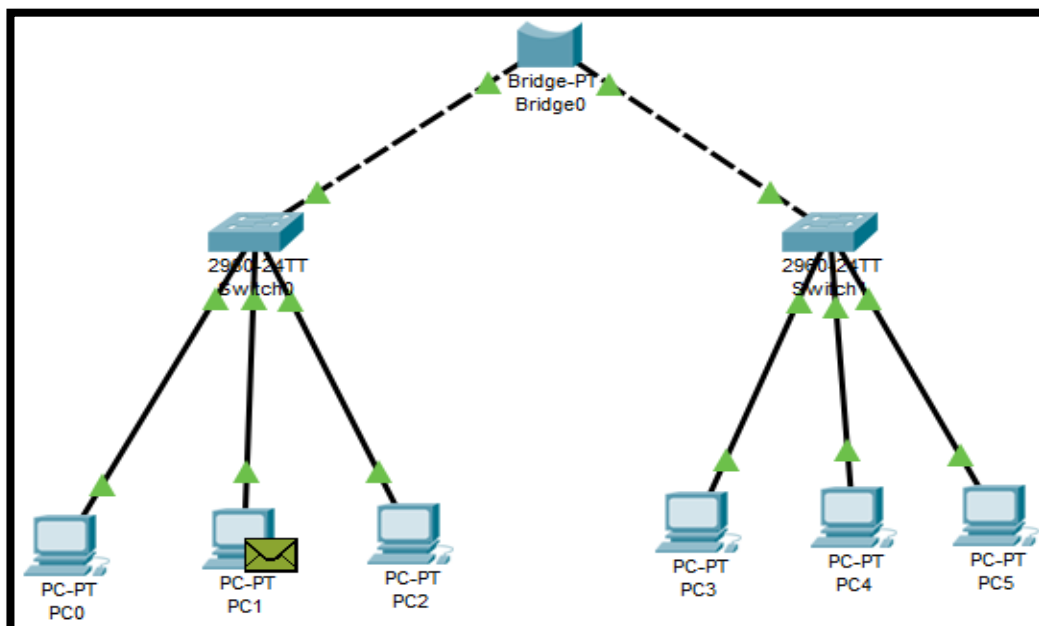
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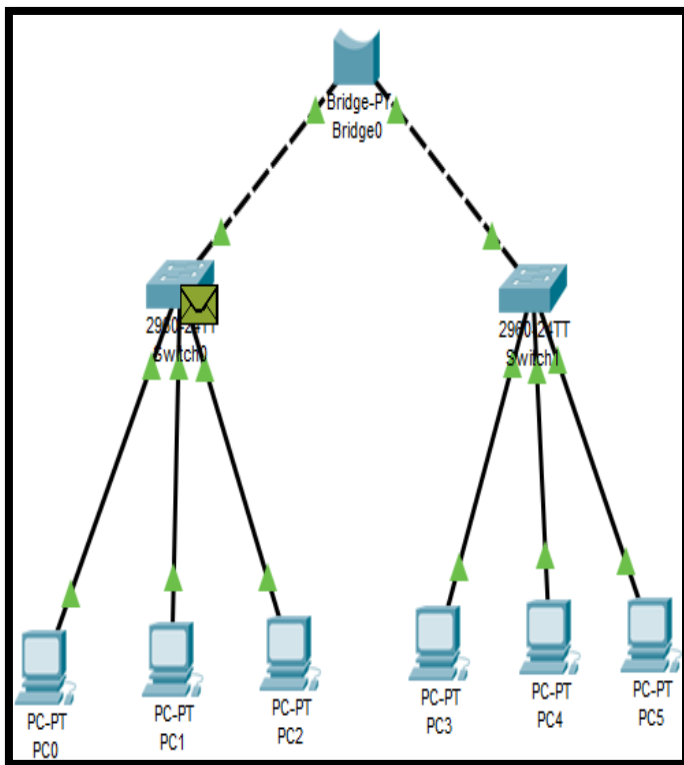
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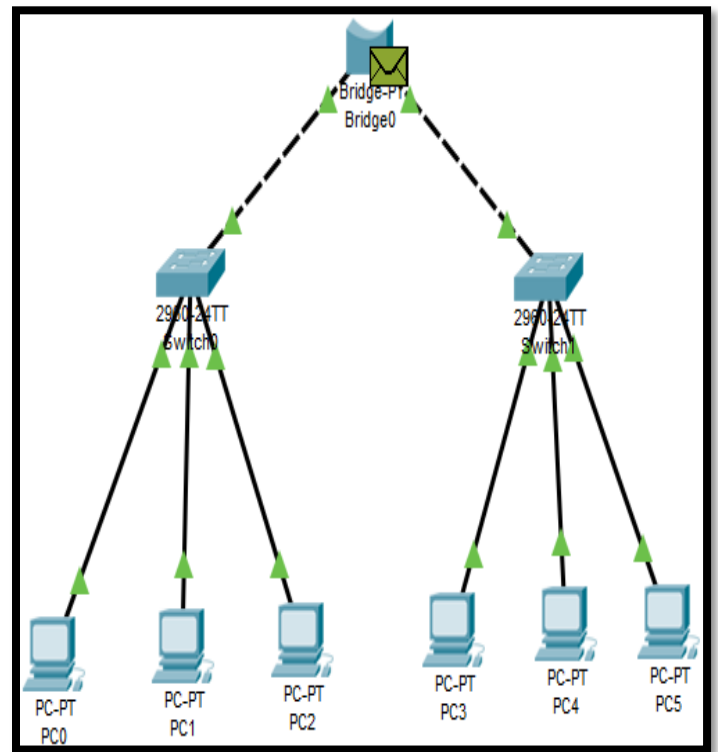
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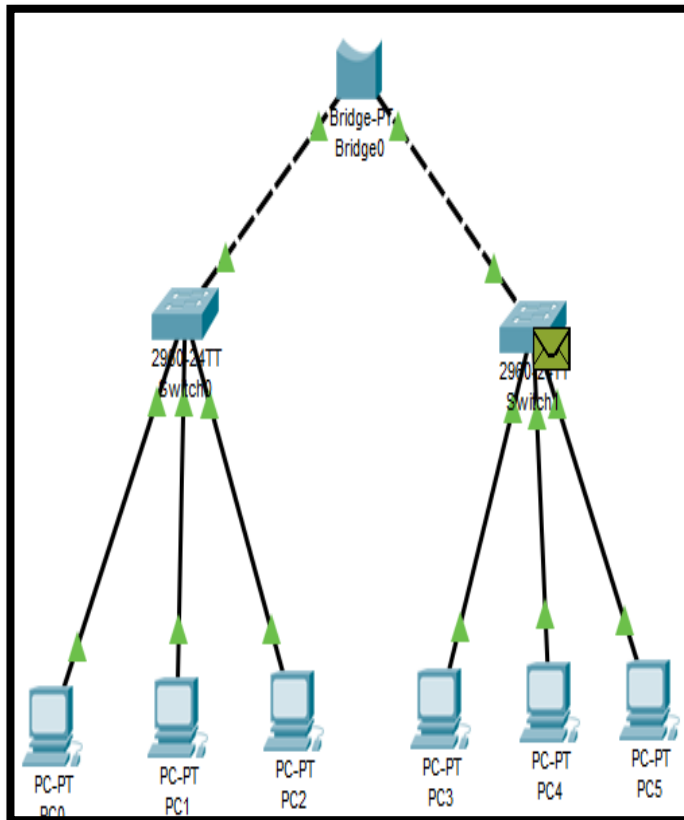
5.
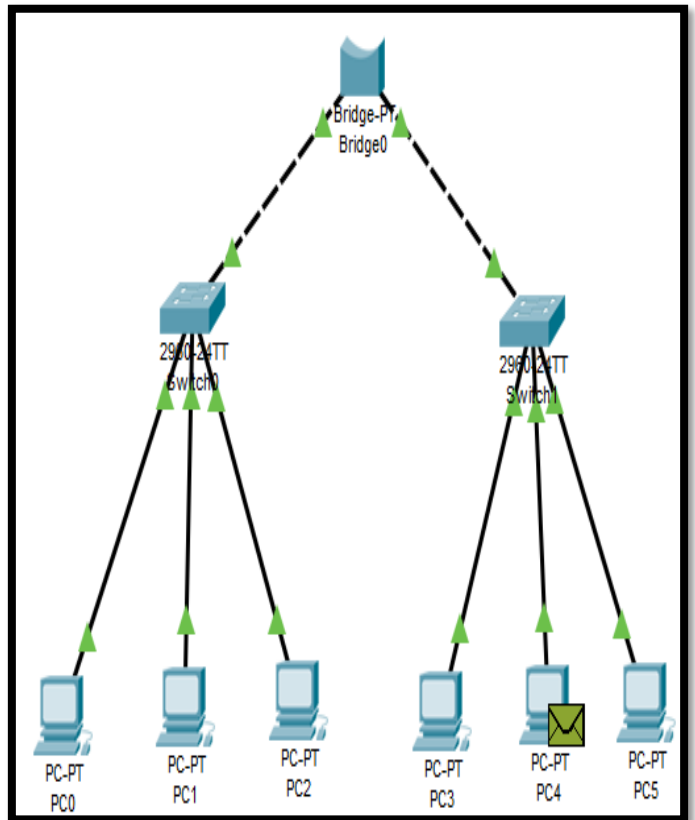
6.
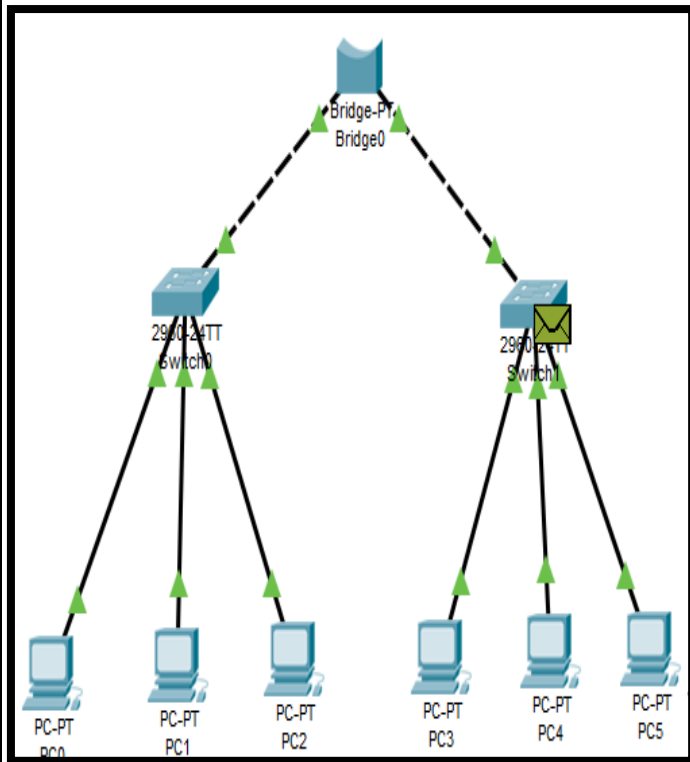
7.

8.

9.

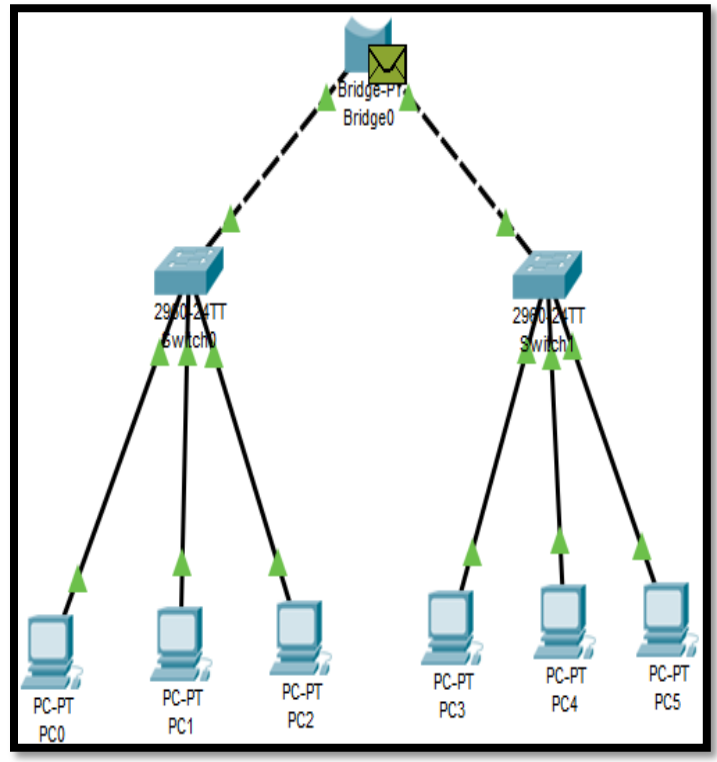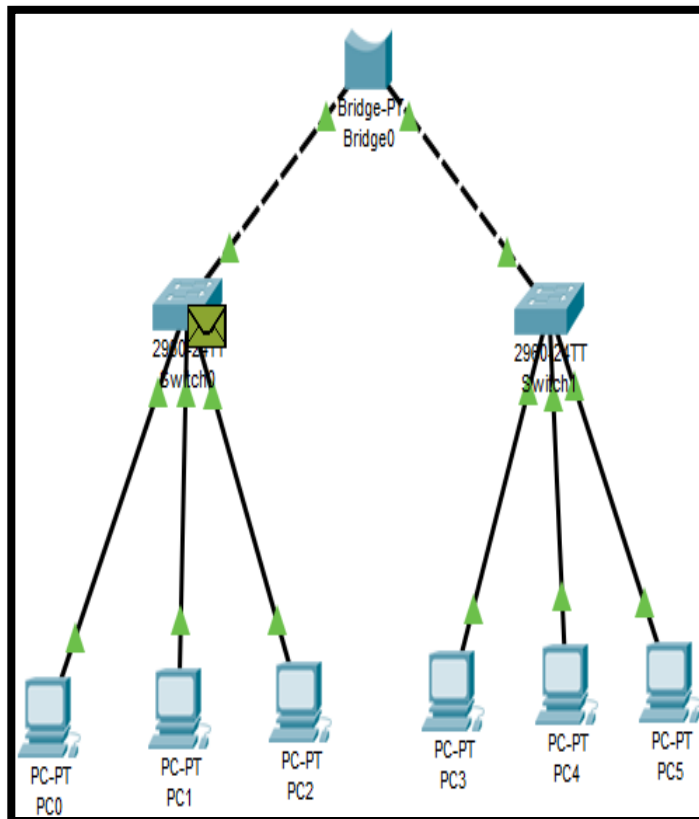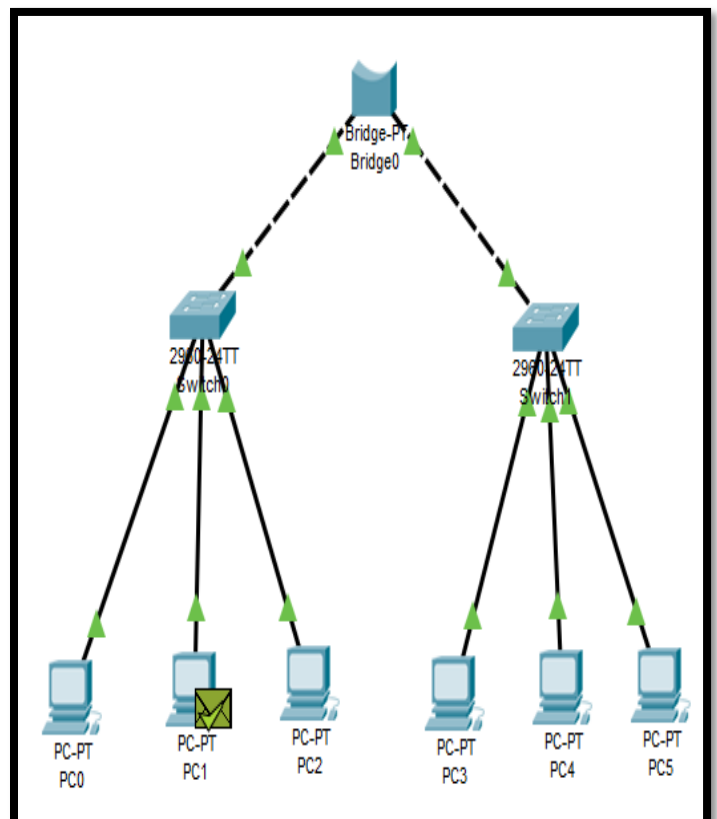<u>**Simple PDU transmitted successfully by using Bridge from source to Destination.**</u>

<u>**Thank you!**</u>