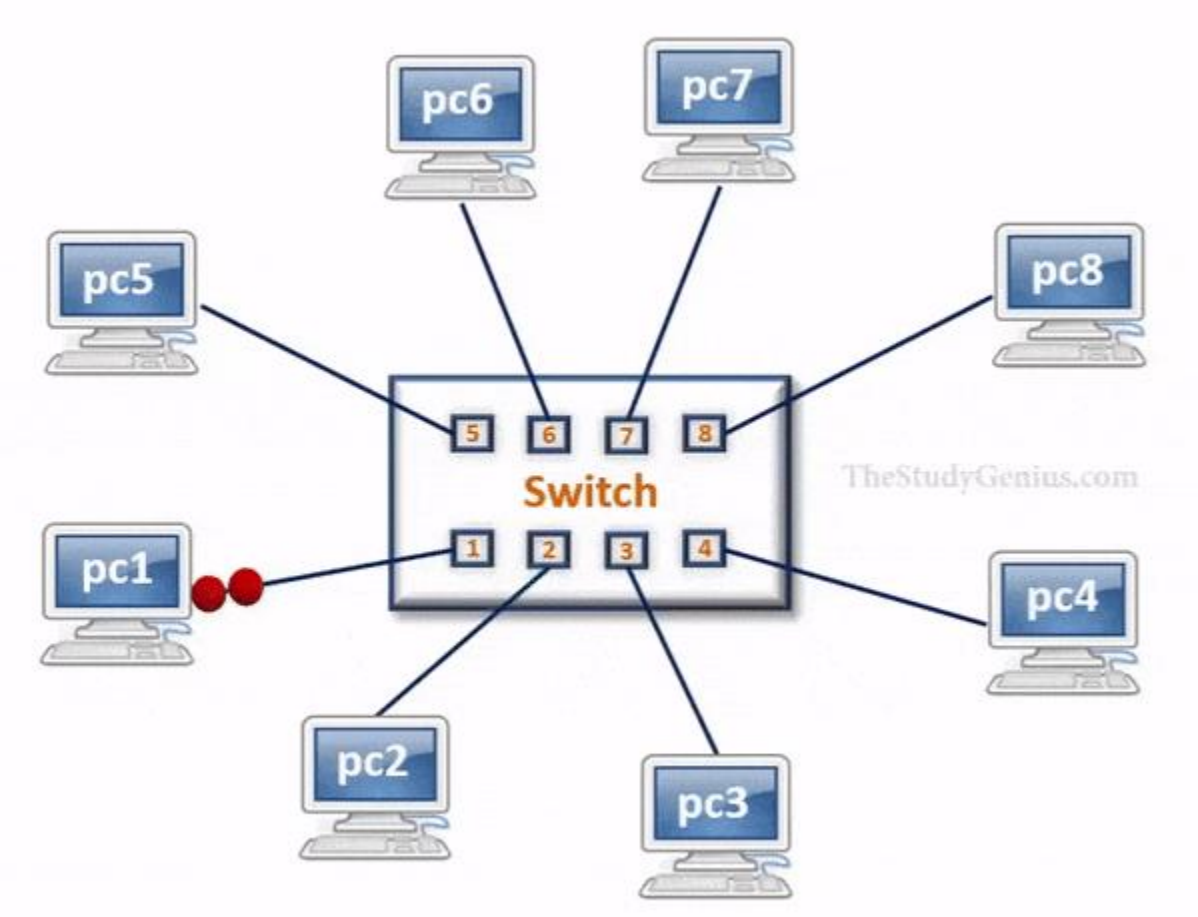
Assignment 1

❖ Switch

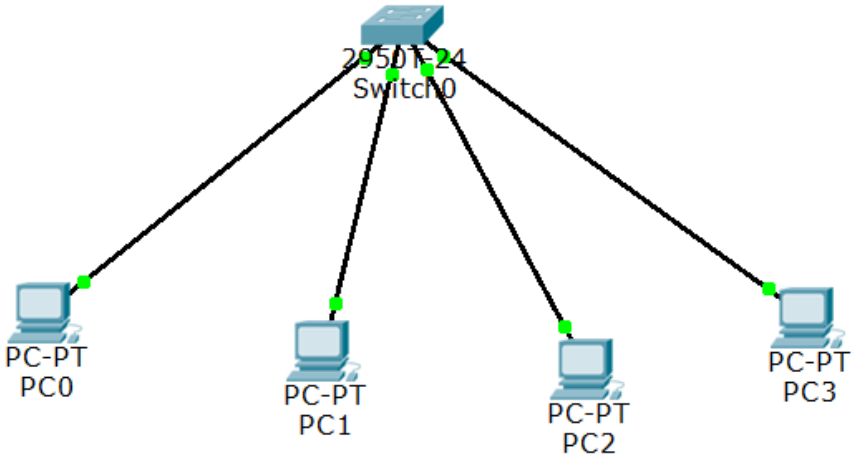
Theory:

A network switch connects devices in a network to each other, enabling them to talk by exchanging data packets. Switches can be hardware devices that manage physical networks or software-based virtual devices.

A network switch operates on the data-link layer, or Layer 2, of the Open Systems Interconnection (OSI) model. In a local area network (LAN) using Ethernet, a network switch determines where to send each incoming message frame by looking at the media access control (MAC) address. Switches maintain tables that match each MAC address to the port receiving the MAC address.

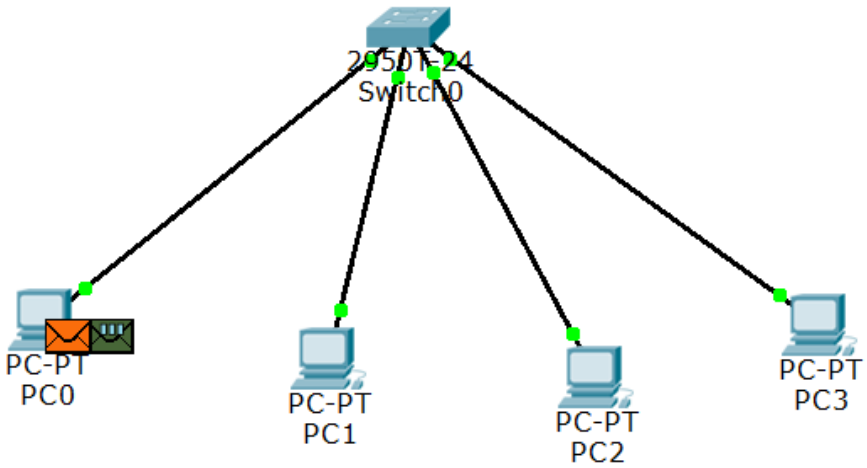


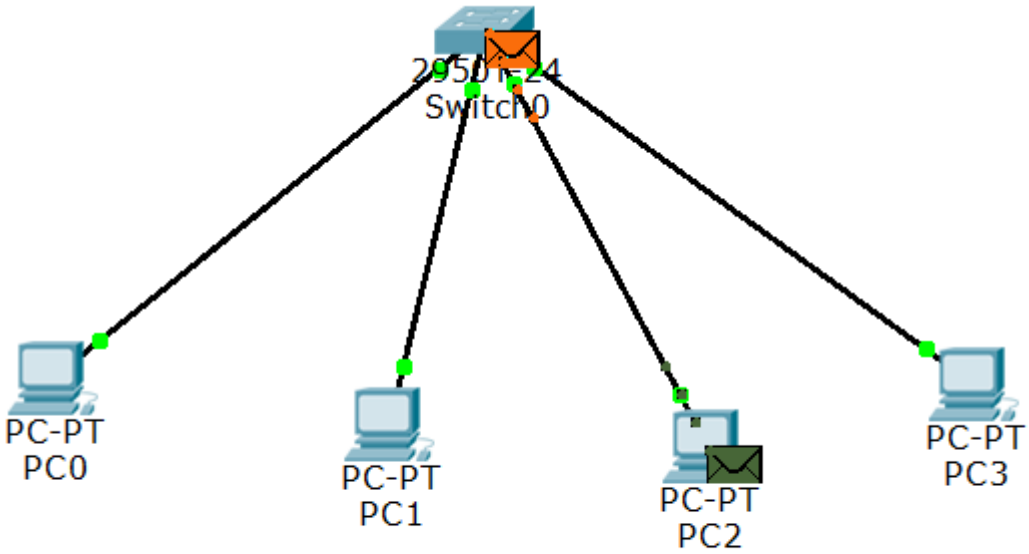
Implementation:

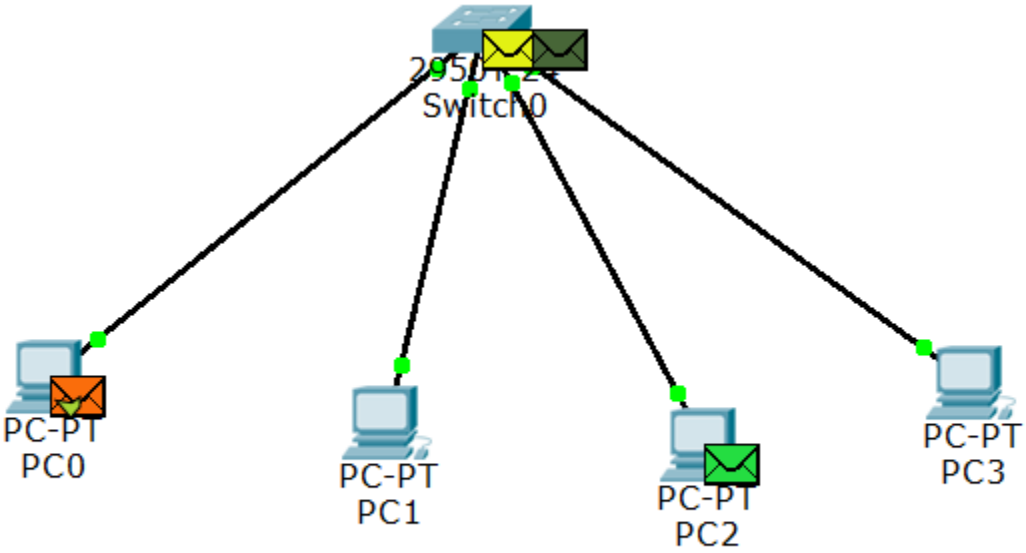


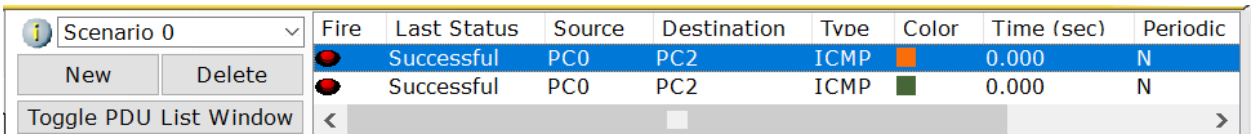
Event List | Simulation

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Period
	In Progress	PC0	PC2	ICMP		0.000	N
	In Progress	PC0	PC2	ICMP		0.000	N




2950T-24
Switch0
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3


Switch0
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3


Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time (sec)
Periodic
Successful
PC0
PC2
ICMP
0.000
N
Successful
PC0
PC2
ICMP
0.000
N

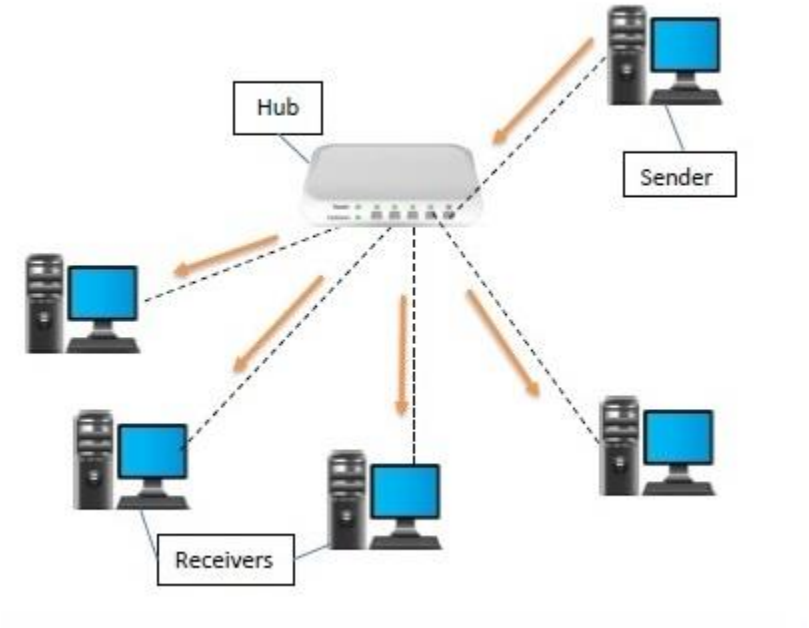
❖ Hub

Theory:

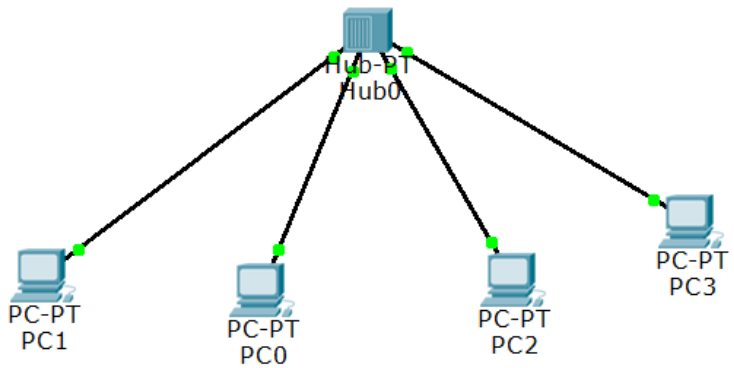
A hub is a physical layer networking device which is used to connect multiple devices in a network. They are generally used to connect computers in a LAN.

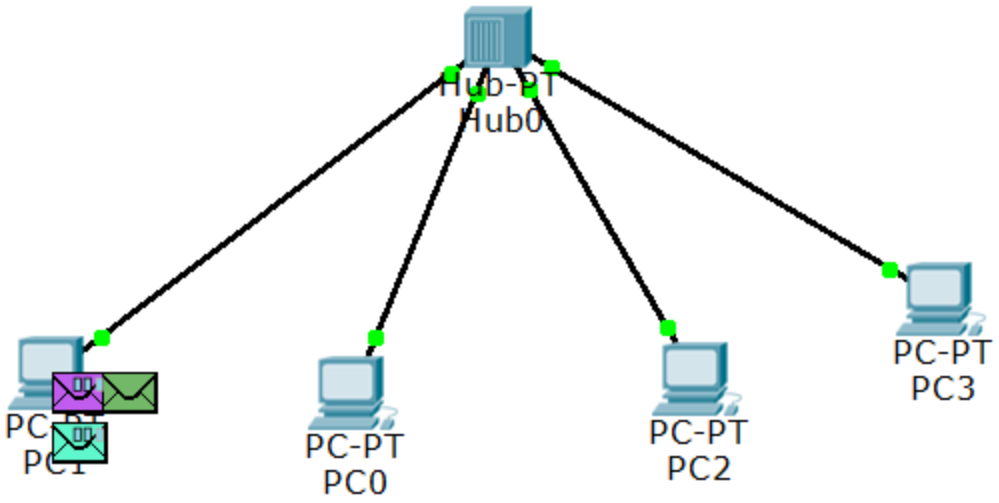
A hub has many ports in it. A computer which intends to be connected to the network is plugged in to one of these ports. When a data frame arrives at a port, it is broadcast to every other port, without considering whether it is destined for a particular destination or not.

A network hub is a node that broadcasts data to every computer or Ethernet-based device connected to it. A hub is less sophisticated than a switch, the latter of which can isolate data transmissions to specific devices. Network hubs are best suited for small, simple local area network (LAN) environments.

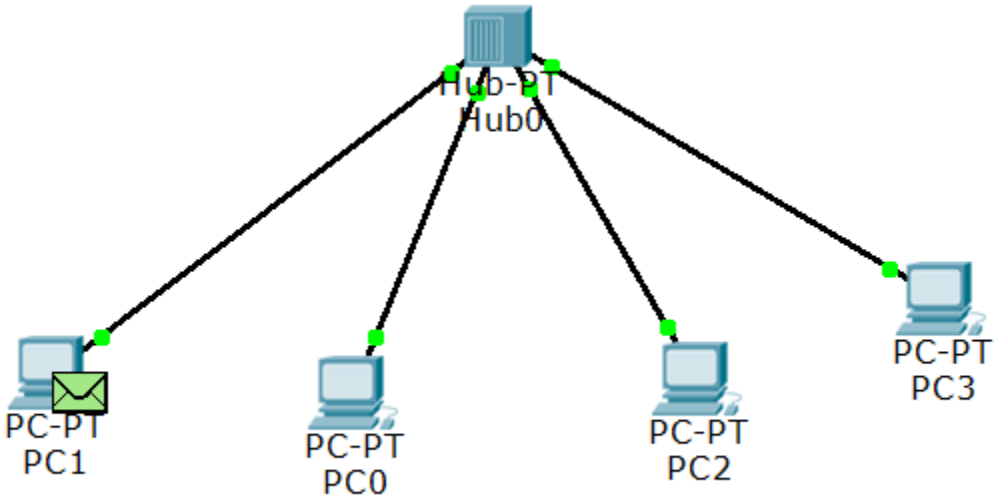


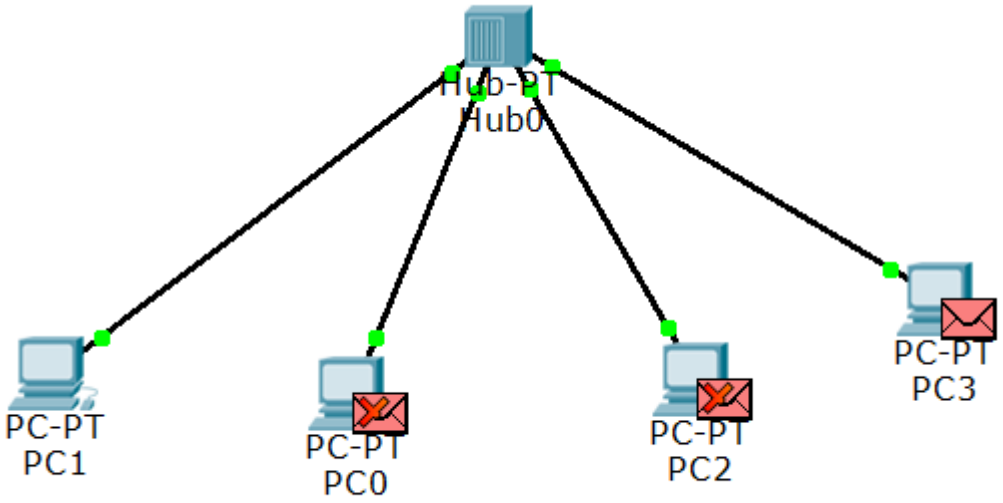
Implementation:

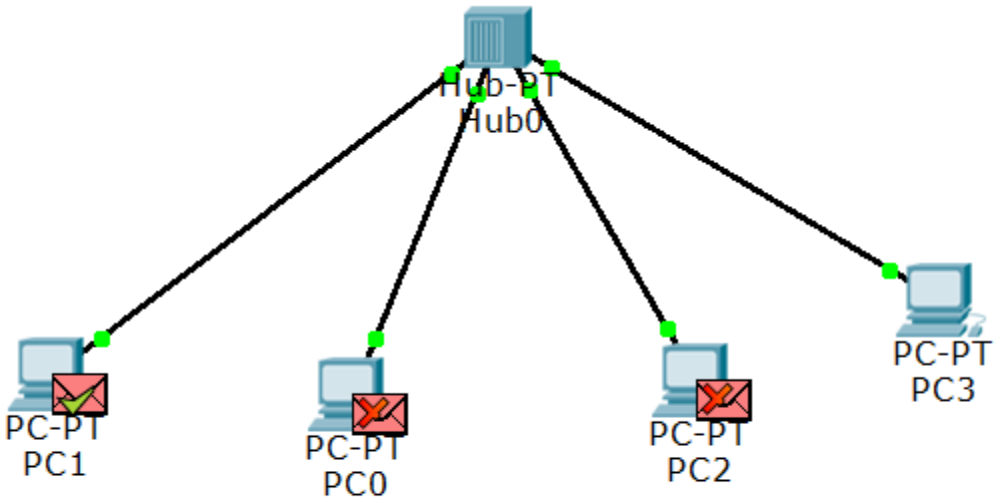




Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic
	In Progress	PC1	PC2	ICMP		0.000	N
	In Progress	PC1	PC3	ICMP		0.000	N







Event List | Simulation

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Period
	Failed	PC1	PC3	ICMP		0.000	N
	Successful	PC1	PC3	ICMP		290.580	N

Switch VS. Hub

- While a network switch is a Layer 2 device on the OSI model, a hub is a Layer 1 physical device.
- A hub is relatively simple compared to a network switch because, unlike a switch, it doesn't keep track of the addresses of the computers it transfers traffic to.
- The goal of a hub is to connect all the nodes in a network, whereas an Ethernet switch connects all the network devices together and transfers data packets between those devices.
- Because a hub can't manage data going in and out of it as a network switch can, there are a lot of communication collisions.
- Switches prevent collisions by buffering Ethernet frames, but hubs cannot prevent collisions as the devices are connected on a single transmission stream.