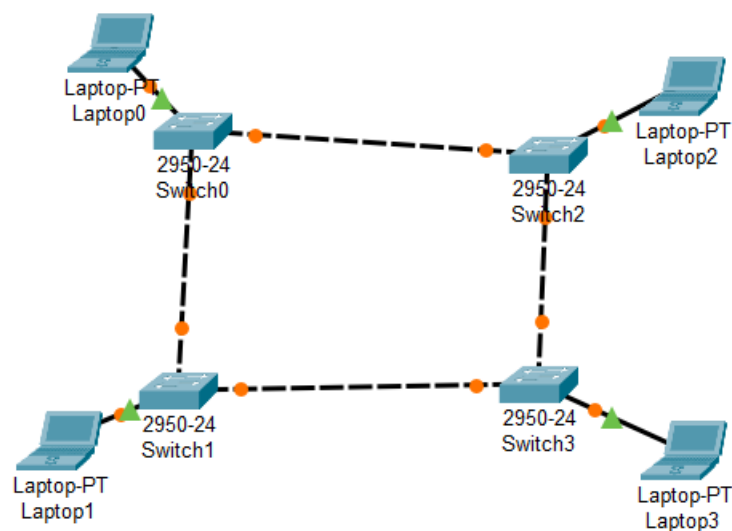


# Creation Of Various Topologies Using Cisco Packet Simulator

## Ring Topology

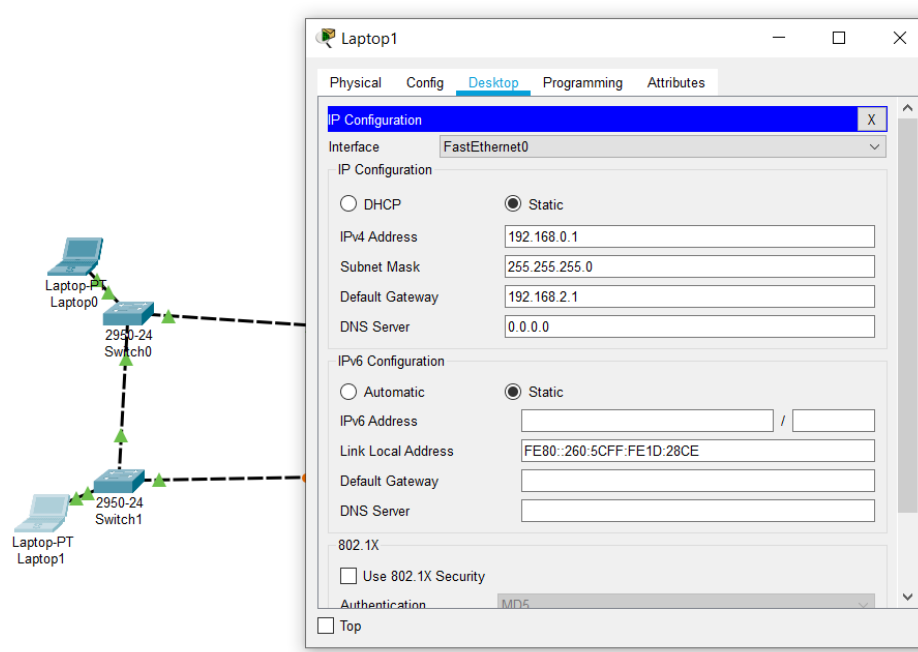
- A **ring network** is a **network topology** in which each node connects to exactly two other nodes, forming a single continuous pathway for signals through each node - a **ring**.
- Data travels from node to node, with each node along the way handling every packet.
- It forms a ring as each computer is connected to another computer, with the last one connected to the first.
- Exactly two neighbours for each device.



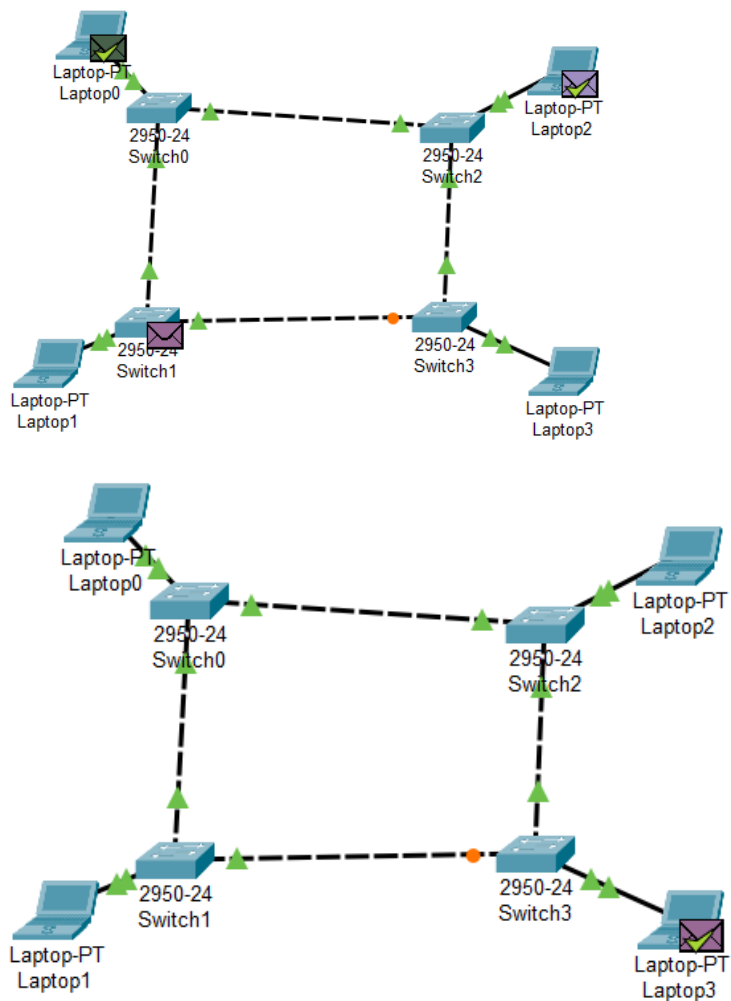
### 1. Choosing Laptop as Host



## 2. Adding Hosts to the Network



## 3. Upon Successful Delivery of Messages



## Advantages of Ring topology

- Better performance than bus topology
- Easy to implement
- Fairly easy configuration
- Reasonably cheap institution cost

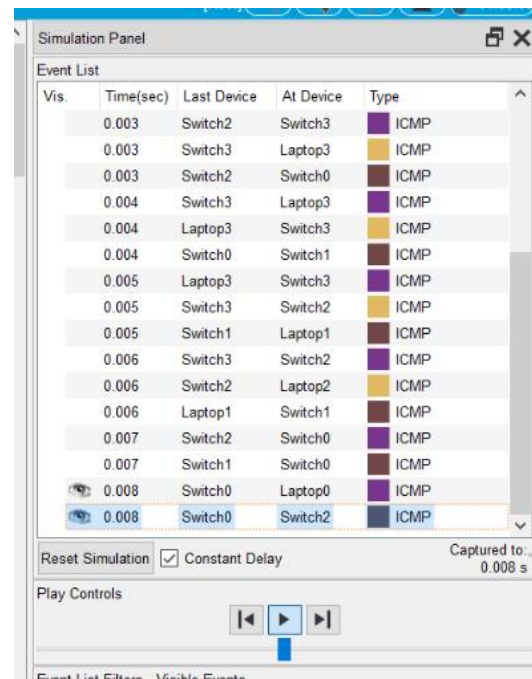
### 4. Routing Table

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Laptop0	Laptop2	ICMP		0.000	N	0	(edit)	(delete)
	Successful	Laptop2	Laptop3	ICMP		0.000	N	1	(edit)	(delete)
	Successful	Laptop3	Laptop1	ICMP		0.000	N	2	(edit)	(delete)

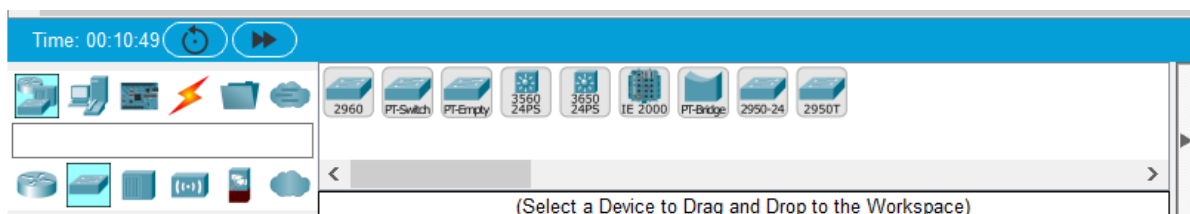
### 5. Simulation Panel

## Ring topology Losses

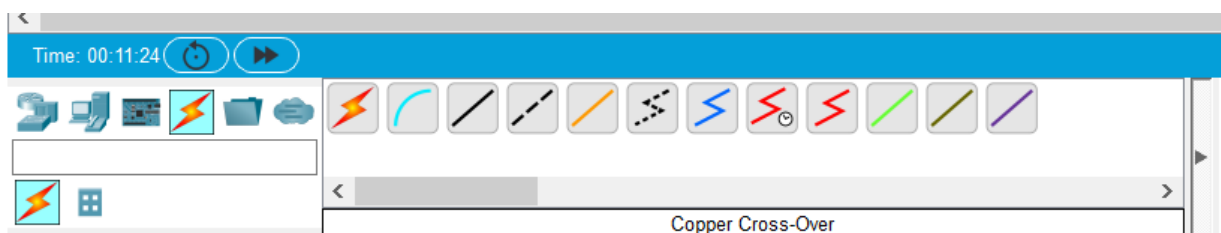
- Communication performance in this topology is assessed by the number or number of dots or nodes
- Pretty complicated Troubleshooting
- If one of the connections is disconnected then the other connection will also disconnect
- Data collisions often occur



### 6. Adding Switches

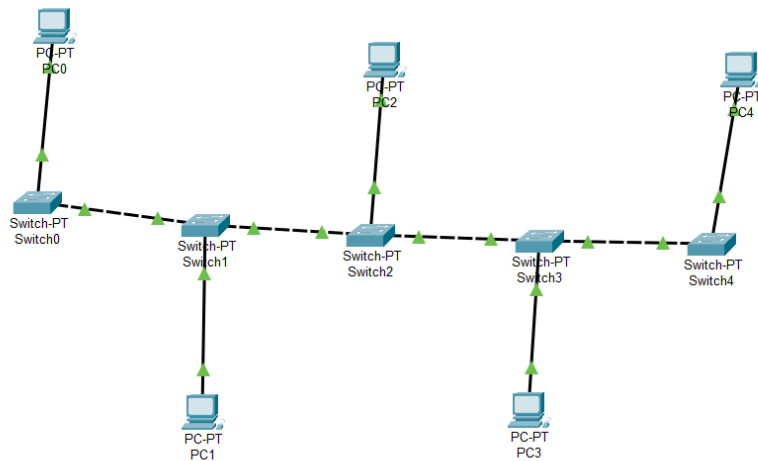


### 7. Choosing the required wire



## Bus Topology

- A **bus topology** is a **topology** for a Local Area **Network** (LAN) in which all the nodes are connected to a single cable.
- The cable to which the nodes connect is called a "backbone". If the backbone is broken, the entire segment fails.



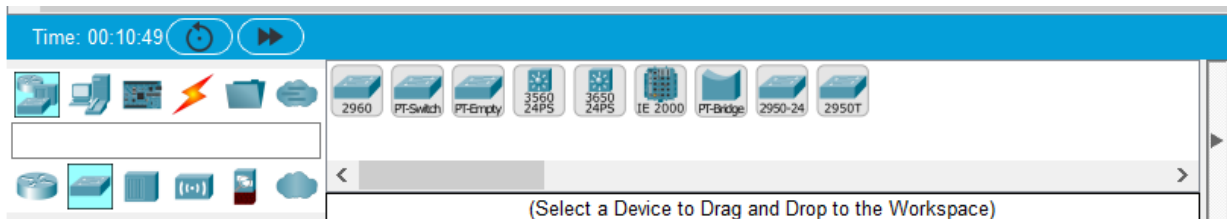
### 1. Adding hosts to the network

The screenshot shows a network configuration window for PC0. The window has tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, showing the IP Configuration section. The interface selected is FastEthernet0. The IP Configuration section has two sub-sections: IP Configuration and IPv6 Configuration. In the IP Configuration section, the DHCP radio button is unselected, and the Static radio button is selected. The fields for IP Address, Subnet Mask, Default Gateway, and DNS Server are filled with the values 192.168.1.1, 255.255.255.0, 192.168.2.1, and 0.0.0.0 respectively. In the IPv6 Configuration section, the Automatic radio button is unselected, and the Static radio button is selected. The fields for IPv6 Address, Link Local Address, Default Gateway, and DNS Server are empty. The 802.1X section is also visible, with the Use 802.1X Security checkbox unselected and the Authentication dropdown set to MD5. The Top checkbox is also unselected. In the background, a partial view of the bus topology diagram is visible, showing PC0 connected to Switch0, which is connected to Switch1, which is connected to Switch2.

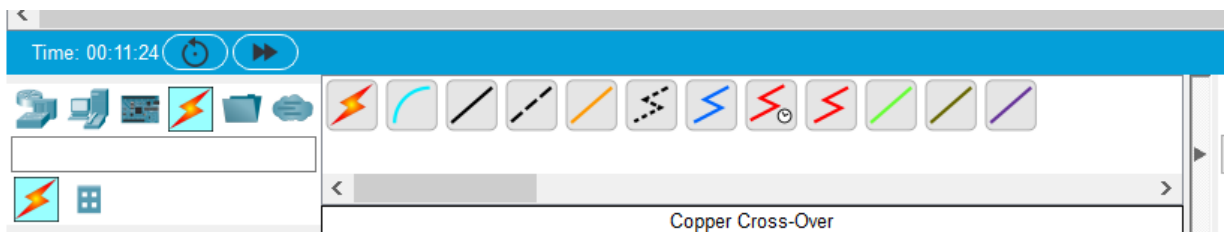
## 2. Adding PC as hosts



## 3. Choosing the switch



## 4. Using the required wires



## 5. Routing table

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC1	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC2	PC3	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC4	PC3	ICMP		0.000	N	2	(edit)	(delete)

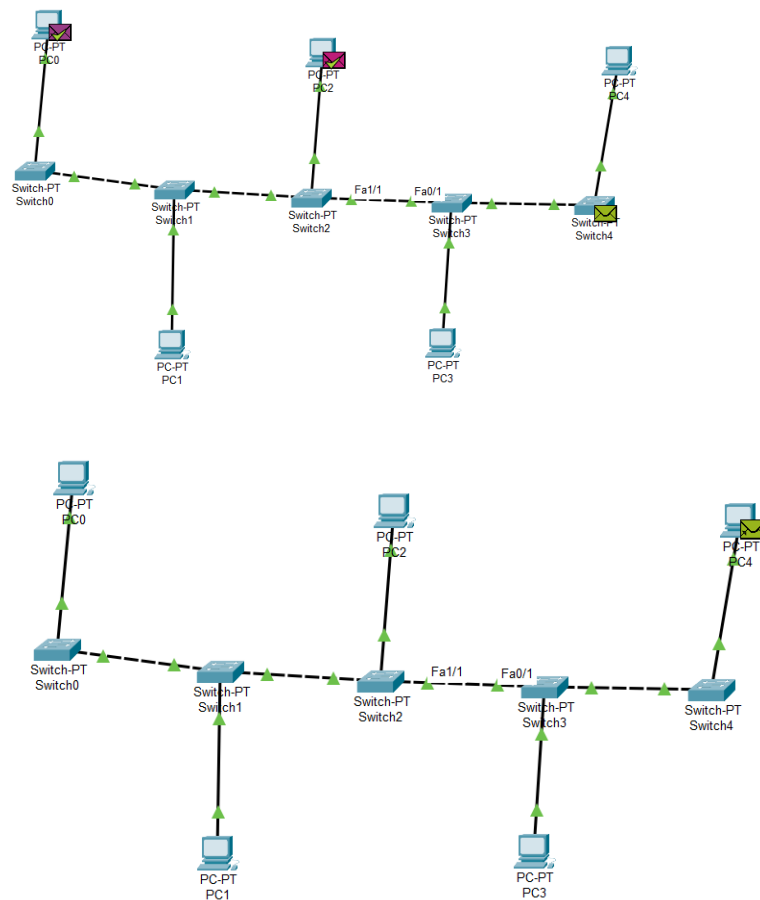
## Advantages of Bus topology

- The use is quite easy and efficient
- The addition of new client/workstation can be easily
- Using only a few cables
- Cheap cost
- Simple

## Disadvantages of Bus topology

- If one of the cables is disconnected or problematic, it may interfere with another client/workstation computer
- The process of sending and receiving less efficient data, usually there are frequent collision or collision data
- Very old and hard to develop topology

## 6. Upon Successful receipt of messages



## 7. Simulation Panel

Simulation Panel

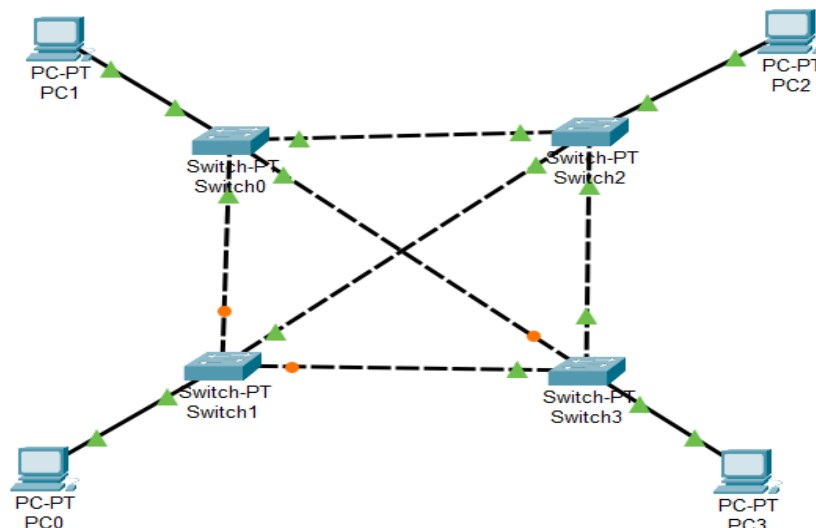
Vis.	Time(sec)	Last Device	At Device	Type
	0.001	PC4	Switch4	ICMP
	0.002	Switch0	Switch1	ICMP
	0.002	Switch2	Switch3	ICMP
	0.002	Switch4	Switch3	ICMP
	0.003	Switch1	PC1	ICMP
	0.003	Switch3	PC3	ICMP
	0.003	--	Switch3	ICMP
	0.004	Switch3	PC3	ICMP
	0.004	PC1	Switch1	ICMP
	0.004	PC3	Switch3	ICMP
	0.005	PC3	Switch3	ICMP
	0.005	Switch1	Switch0	ICMP
	0.005	Switch3	Switch2	ICMP
	0.006	Switch3	Switch4	ICMP
	0.006	Switch0	PC0	ICMP
	0.006	Switch2	PC2	ICMP

Reset Simulation ☒ Constant Delay Captured to: 0.006 s

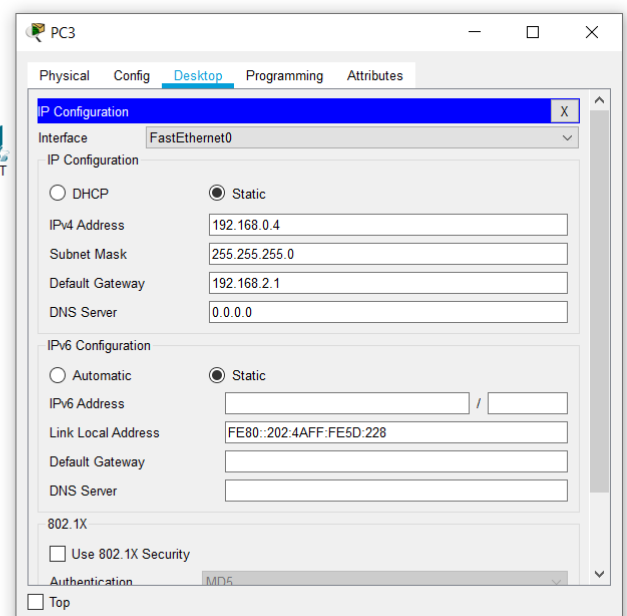
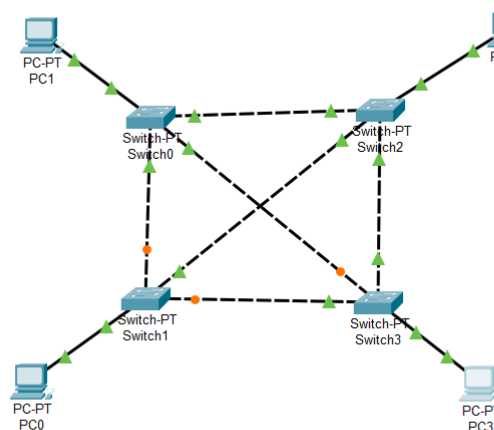
Play Controls

## Mesh Topology

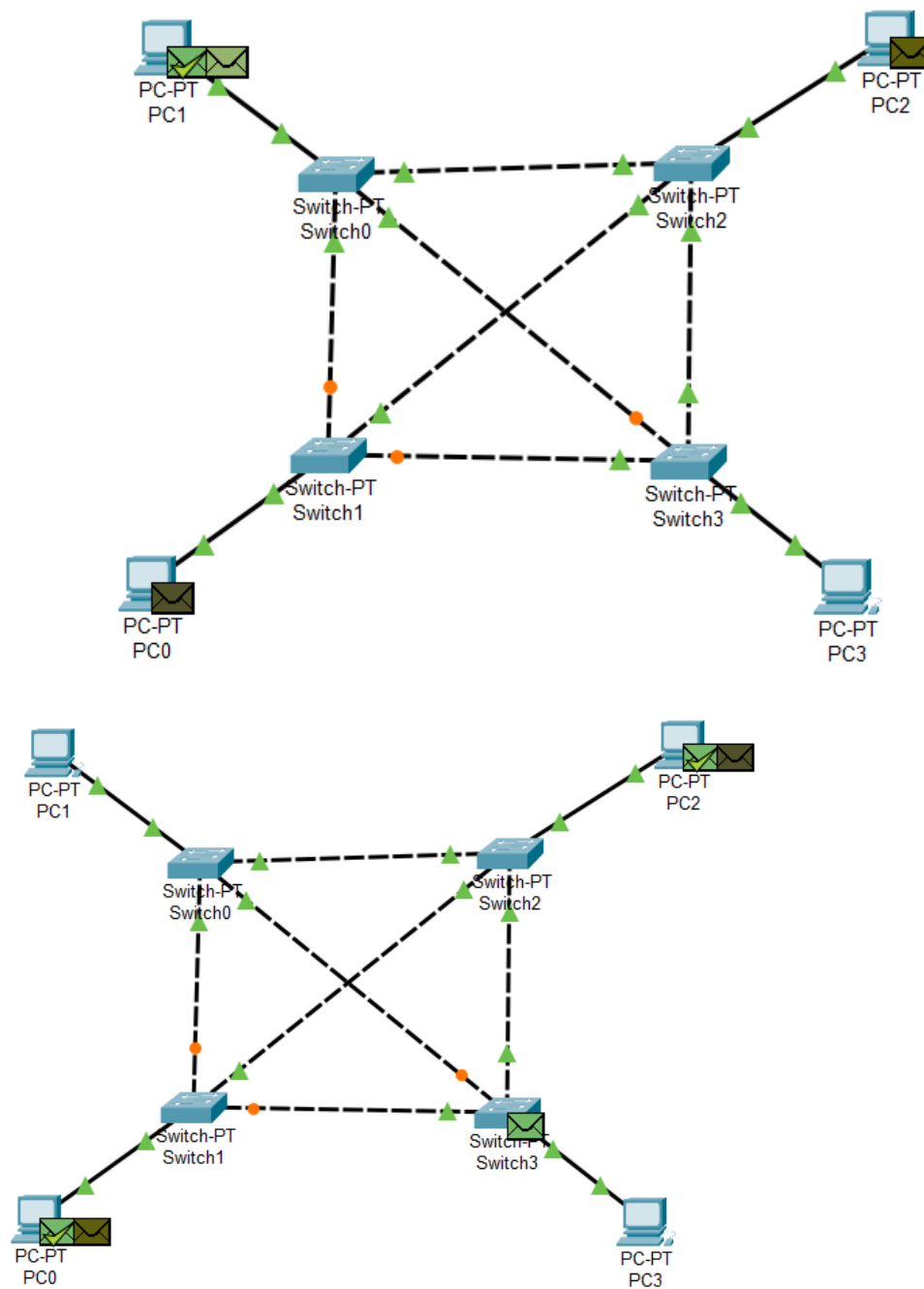
- A mesh topology is a network setup where each computer and network device are interconnected with one another.
- This topology setup allows for most transmissions to be distributed even if one of the connections goes down.
- It is a topology commonly used for wireless networks.



### 1. Adding hosts to the network



## 2. Successful receipt of messages



## 3. Routing table

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC2	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC1	PC3	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC2	PC0	ICMP		0.000	N	2	(edit)	(delete)



#### 4. Simulation Panel

Vis	Time(sec)	Last Device	At Device	Type
	0.000	--	PC2	ICMP
	0.001	PC0	Switch1	ICMP
	0.001	PC1	Switch0	ICMP
	0.001	PC2	Switch2	ICMP
	0.002	Switch1	Switch2	ICMP
	0.002	Switch0	Switch2	ICMP
	0.002	Switch2	Switch1	ICMP
	0.003	Switch2	PC2	ICMP
	0.003	Switch2	Switch3	ICMP
	0.003	Switch1	PC0	ICMP
	0.004	PC2	Switch2	ICMP
	0.004	Switch3	PC3	ICMP
	0.004	PC0	Switch1	ICMP
👁	0.005	Switch2	Switch1	ICMP
👁	0.005	PC3	Switch3	ICMP
👁	0.005	Switch1	Switch2	ICMP

Reset Simulation ☒ Constant Delay Capturing...  
Play Controls: [Previous] [Play] [Next]

#### Advantages Of Mesh Topology:

Each connection can carry its own data load

It is robust

A fault is diagnosed easily

Provides security and privacy

#### Disadvantages Of Mesh Topology:

Installation and configuration are difficult if the connectivity gets more

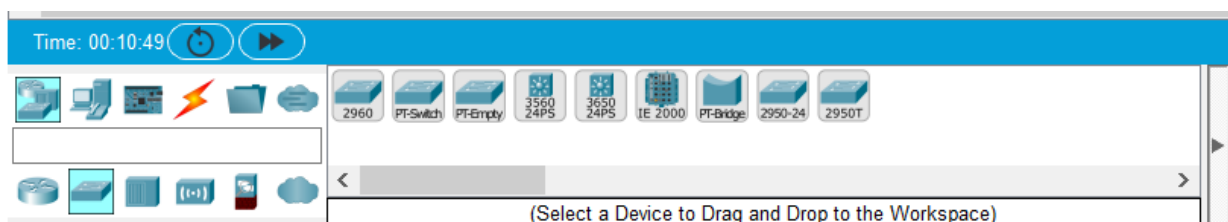
Cabling cost is more and the most in case of a fully connected mesh topology

Bulk wiring is required

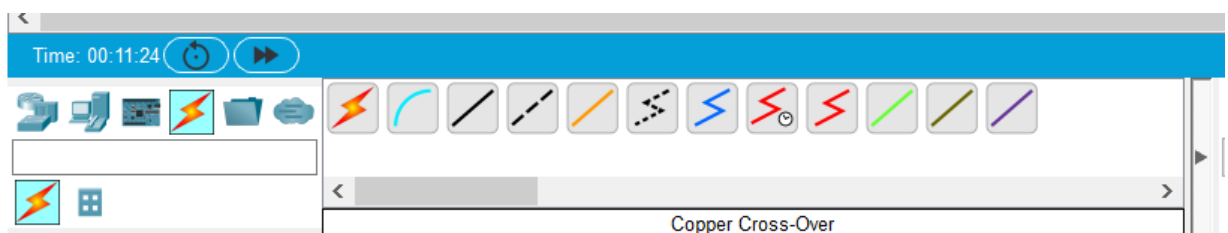
#### 5. Adding PC as hosts



#### 6. Selecting the required Switch



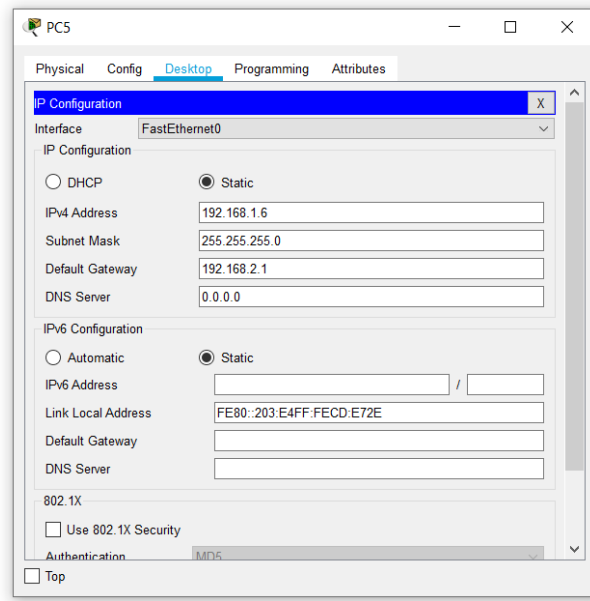
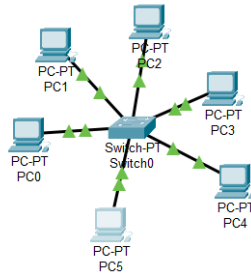
#### 7. Selecting the required wires



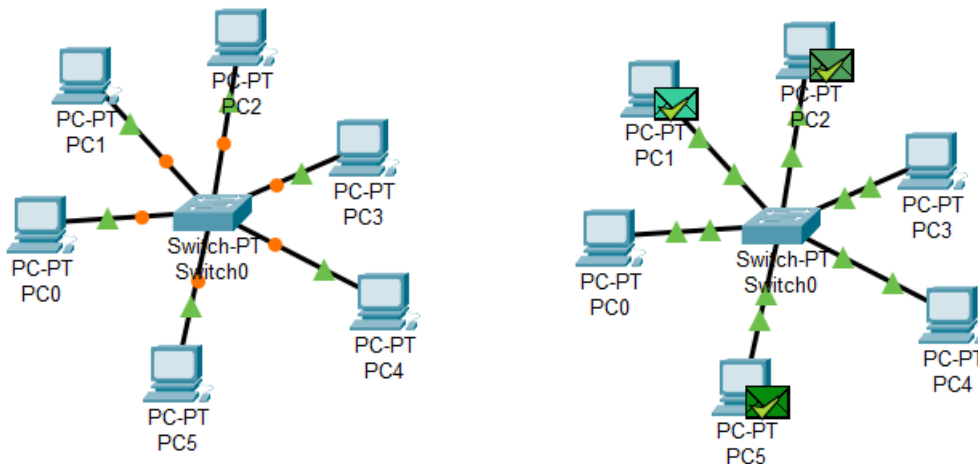
## STAR TOPOLOGY

- A **star topology** is a **topology** for a Local Area **Network** (LAN) in which all nodes are individually connected to a central connection point, like a hub or a switch.
- A **star** takes more cable than e.g. a bus, but the benefit is that if a cable fails, only one node will be brought down.

### 1. Adding hosts to the network



### 2. Upon successful receipt of messages



### 3. Simulation Panel

[Root] 01:11:30

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.004	PC4	Switch0	ARP
	0.004	PC1	Switch0	ARP
	0.004	Switch0	PC1	ARP
	0.004	--	PC1	ICMP
	0.005	Switch0	PC2	ARP
	0.005	Switch0	PC5	ARP
	0.005	--	PC2	ICMP
	0.005	PC1	Switch0	ICMP
	0.005	--	PC5	ICMP
	0.006	PC2	Switch0	ICMP
	0.006	PC5	Switch0	ICMP
	0.006	Switch0	PC3	ICMP
	0.007	Switch0	PC4	ICMP
	0.007	Switch0	PC1	ICMP
	0.007	PC3	Switch0	ICMP
	0.008	PC4	Switch0	ICMP

Reset Simulation ☒ Constant Delay Captured to: 2.956 s

Play Controls

## Advantages of Star Topology

Easy to install and wire. No disruptions to the network when connecting or removing devices. Easy to detect faults and to remove parts.

## Disadvantages of Star Topology

Requires more cable length than a linear bus topology. If the connecting network device (network switch) fails, nodes attached are disabled and cannot participate in computer network communication. More expensive than linear bus topology because of the cost of the connecting devices.

### 4. Routing Table

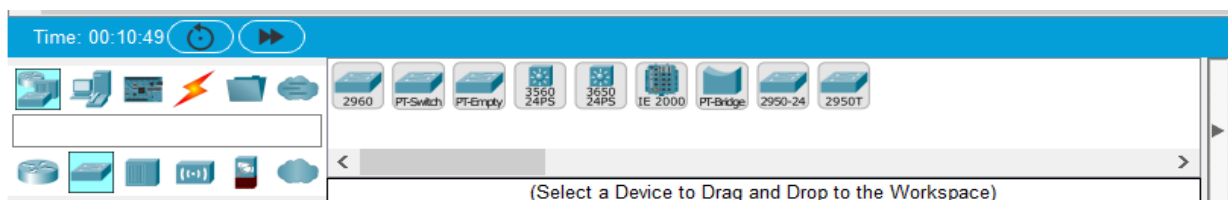
Event List Realtime Simulation

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC1	PC3	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC2	PC4	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC5	PC1	ICMP		0.000	N	2	(edit)	(delete)

### 5. Adding PC as host



### 6. Choosing the required switch



### 7. Choosing the required wire

