

Computer Networks Lab Assignment 1

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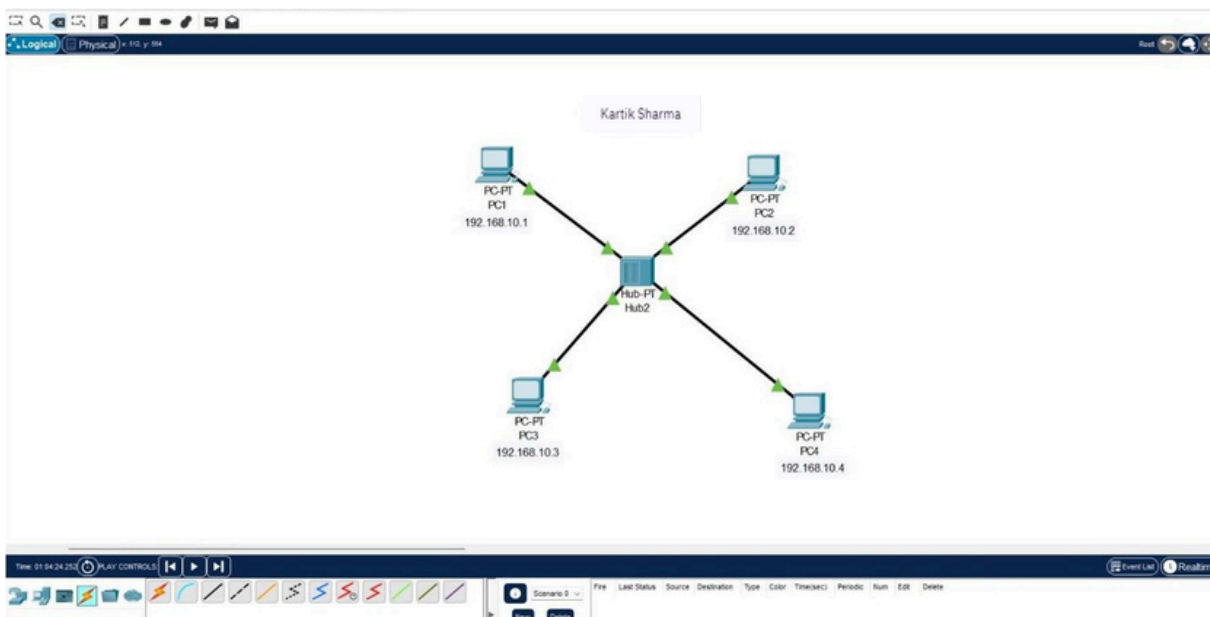
AIM: To create a network in CISCO PACKET TRACKER to study the working of a HUB and a SWITCH

THEORY: Hubs are simple devices with an input Ethernet port that connects to a router and multiple output ports for devices to connect to. When it receives data, it transmits it to all connected devices, leaving the intended device to recognize the data. A network switch is a hardware connection device that is smarter than a hub. Once a switch knows the routes and ports, it reads data packet headers to determine which device it is supposed to transmit information to via its unique MAC address.

NETWORK DESIGN:

DEVICES USED: Hub, PCs, Switch, Copper Straight-through cable, Copper crossover cable

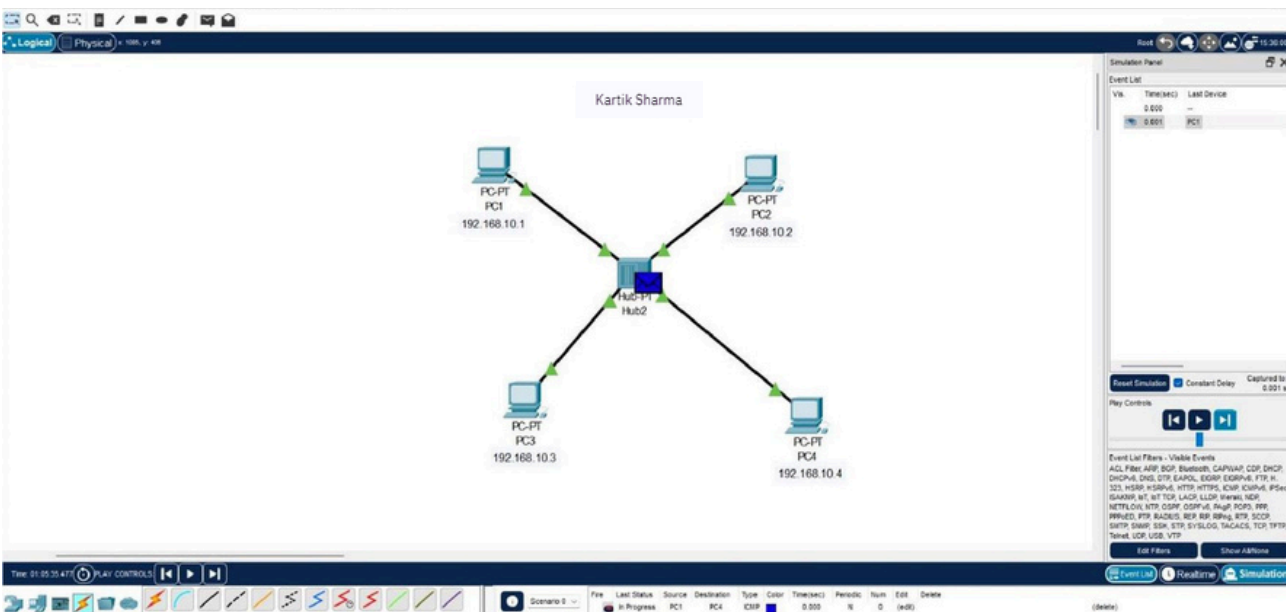
HUBS IN NETWORK:

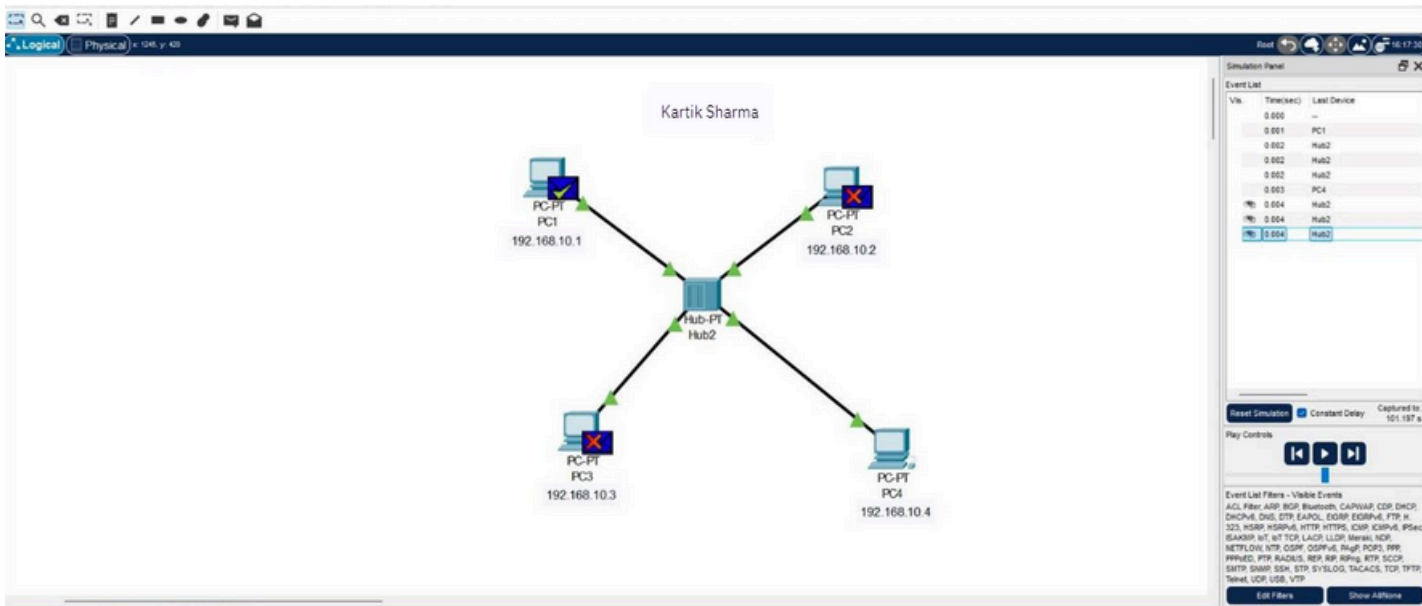


SETTINGS:

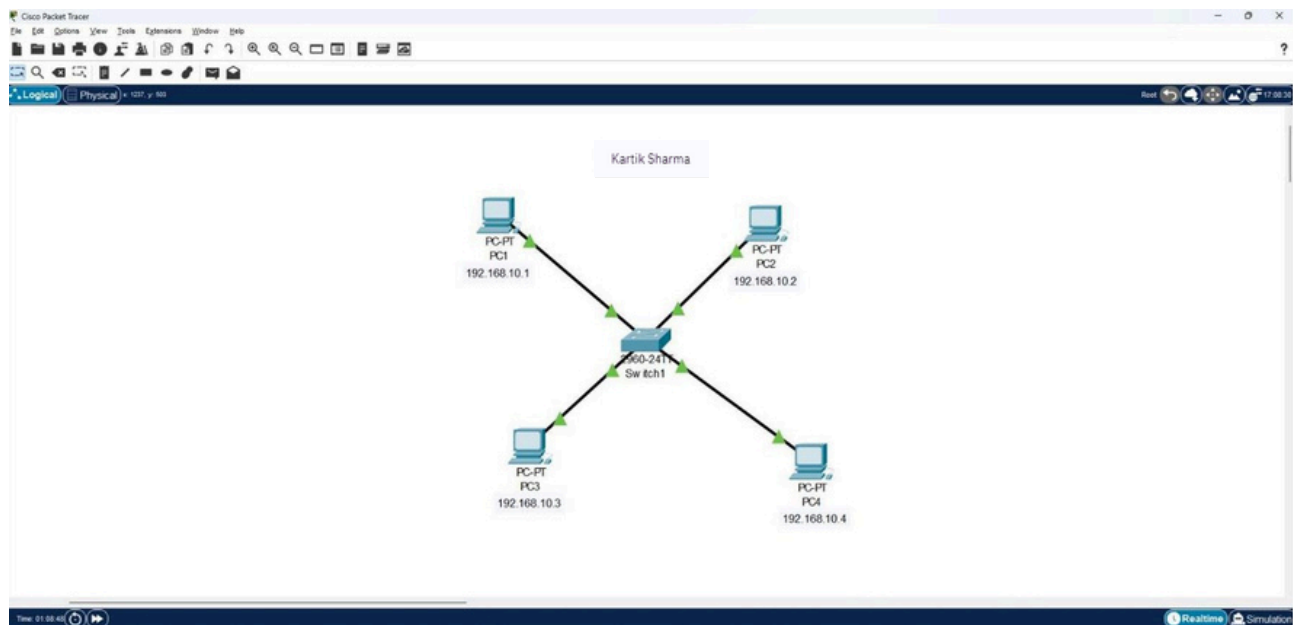
DEVICE NAME	IP ADDRESS	SUBNET MASK
PC1	192.168.10.1	255.255.255.0
PC2	192.168.10.2	255.255.255.0
PC3	192.168.10.3	255.255.255.0
PC4	192.168.10.4	255.255.255.0

```
C: \>ping 192.168.10.1
```

[illegible]



SWITCHES IN NETWORK:



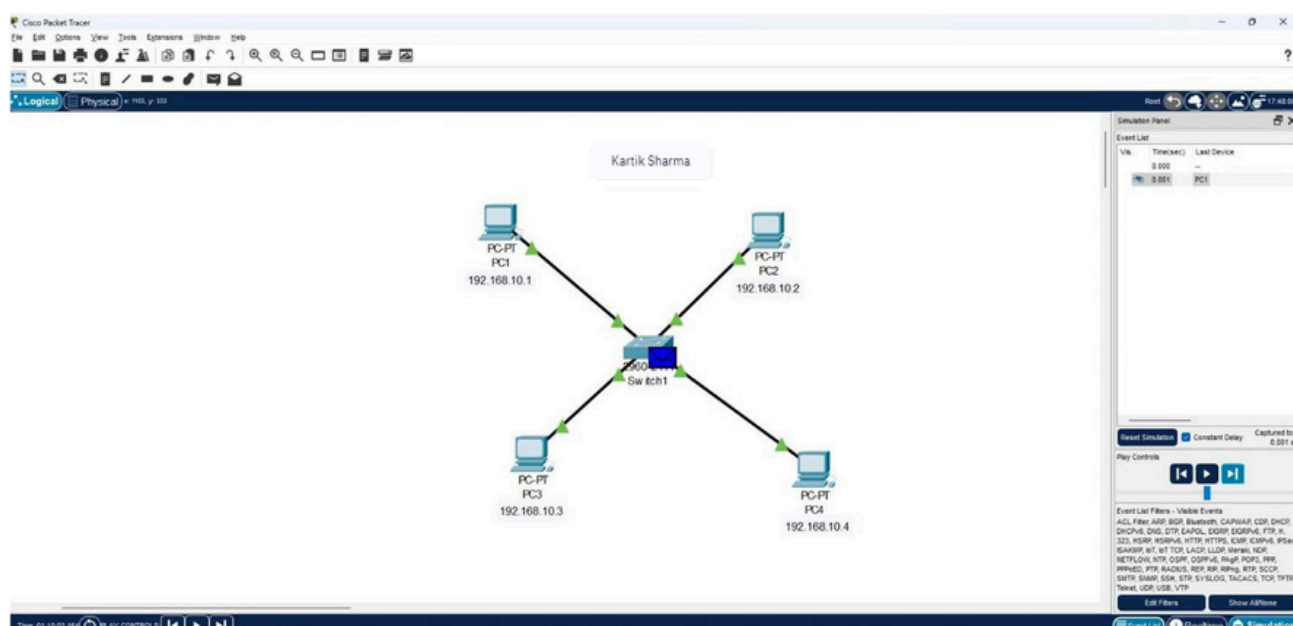
SETTINGS:

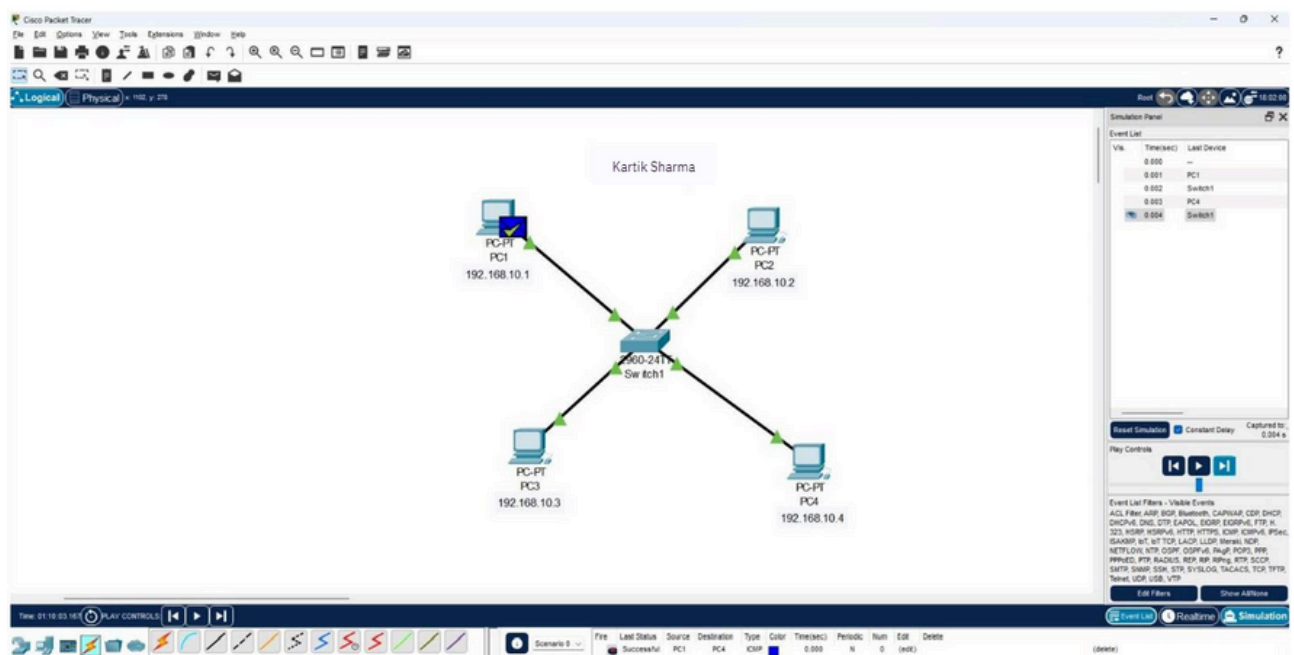
DEVICE NAME	IP ADDRESS	SUBNET MASK
PC1	192.168.10.1	255.255.255.0
PC2	192.168.10.2	255.255.255.0
PC3	192.168.10.3	255.255.255.0
PC4	192.168.10.4	255.255.255.0

Connectivity is checked by using the PING command.

```
C:\>ping 192.168.10.1
```

SIMULATION: A document is initiated by PC1 addressed to PC4. This document is sent to the switch which in turn transmits this data to PC4 in the network. PC4 accepts the document and sends an acknowledgement to the switch addressed to PC1 which again transmits it PC1 in the network. PC1 accepts this acknowledgement.





COMPARISON BETWEEN HUB AND SWITCH:

Switch	Hub
Switches function on layer 2 of the OSI framework.	Hubs function on layer 1 of the OSI framework.
Switches record MAC addresses in a table to learn which devices to transmit information to.	Hubs are less intelligent devices and always send all information to all connected devices
Switches can operate at full duplex or half duplex, using all available bandwidth, creating faster and more efficient networks.	Hubs operate at half duplex, making them slower and forcing devices to share bandwidth equally.
Switches send information using data packets.	Hubs send information using bits.

HUBS AND SWITCHES TOGETHER IN A NETWORK:

