DEPARTMENT OF INFORMATION TECHNOLOGY

COMPUTER NETWORKING LAB

LAB 5: 13/12/2022

Objective

To understand the configuration of and working of hub and switch in packet tracer

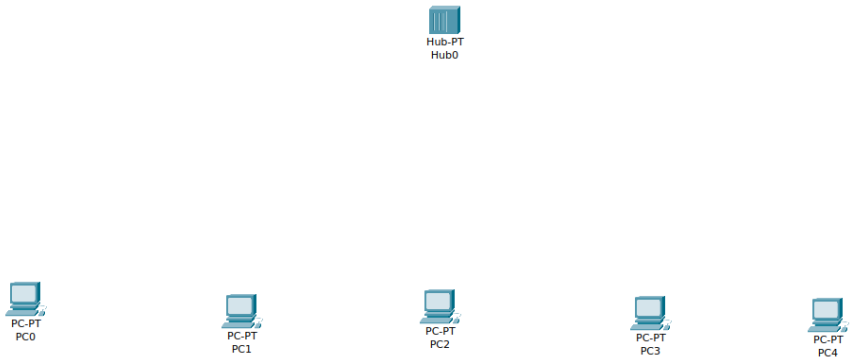
CCN LAB: Hub and Switch

1. Steps to design a simple network using hub

Select Cisco packet tracer simulator

Step 1: select the hub icon and drag to the panel

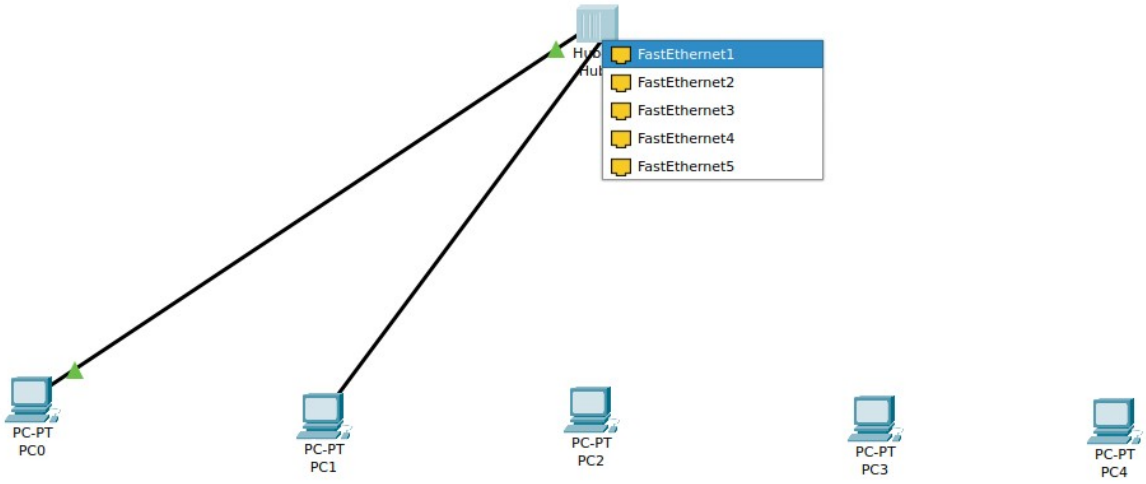
Step 2: Similarly select the end devices and arrange in the panel by dragging



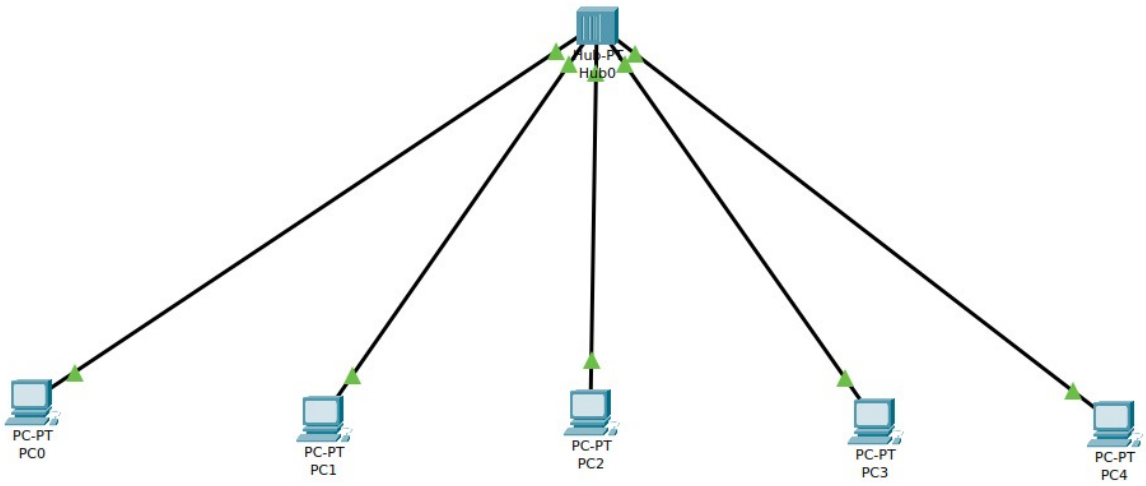
Step 3: Now select the copper straight wire (3rd one in the list)

Step 4: Now connect the end device and hub using wire for that select FastEthernet0 at end device side

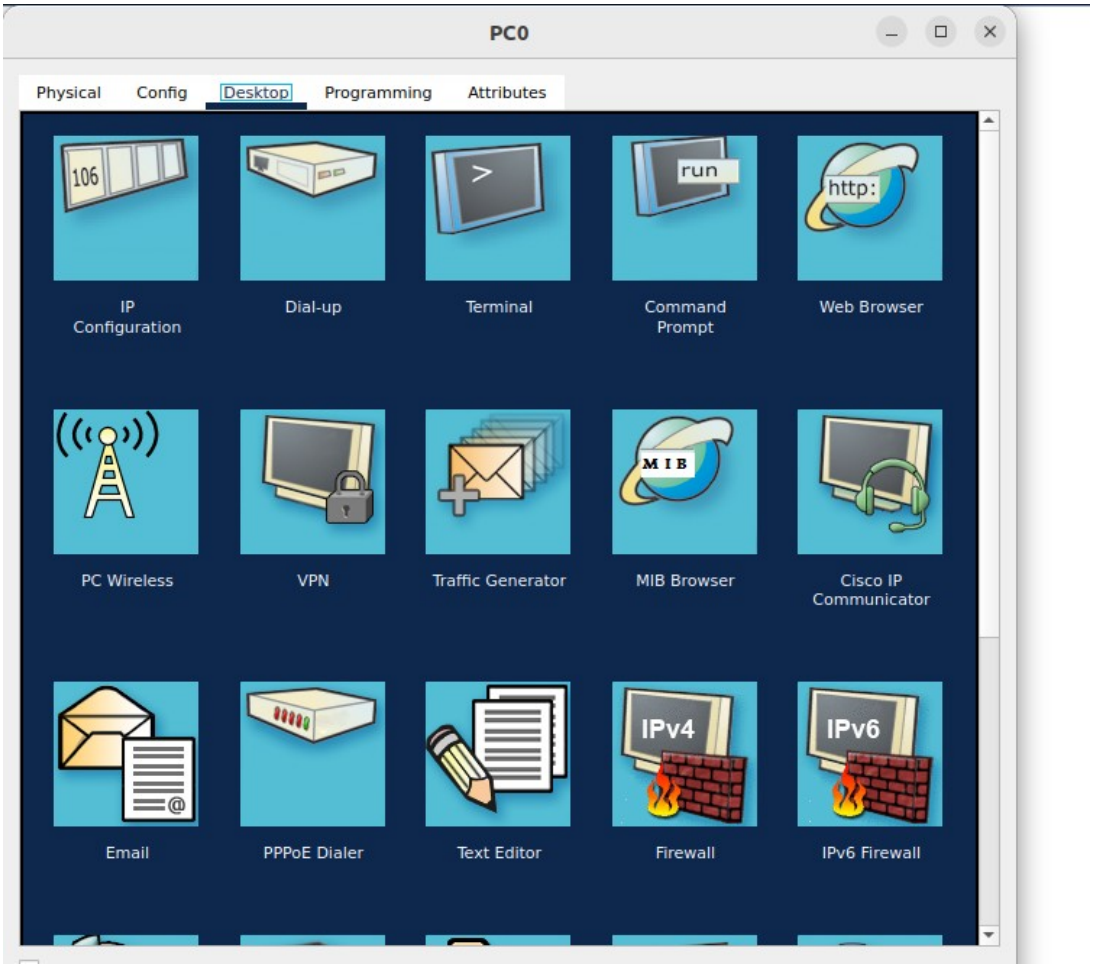
Step5: Select FastEthernet port at hub side also



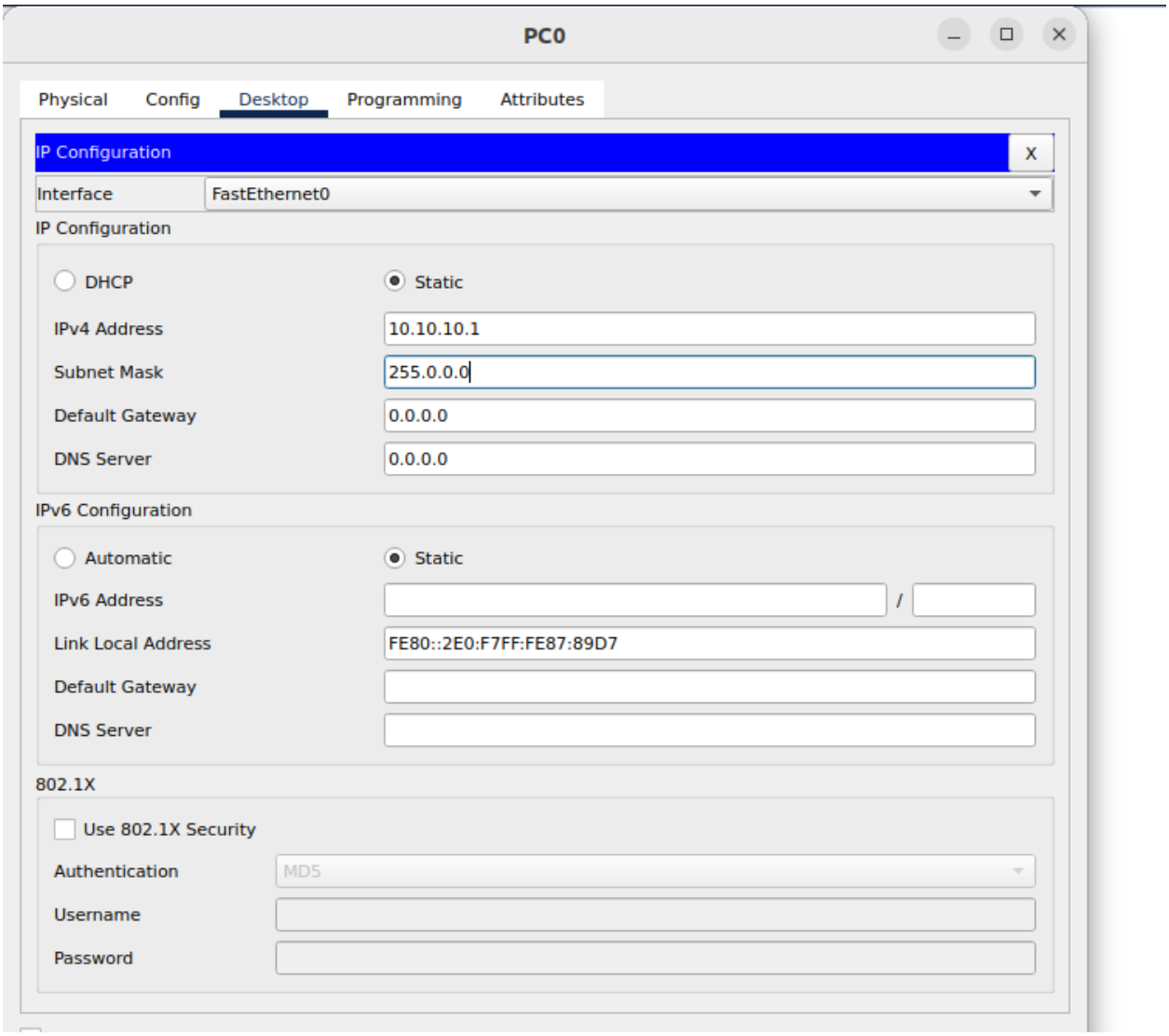
Step 6: Network topology created



Step 7: Right click on end device and select desktop option. Click on IP Configuration.

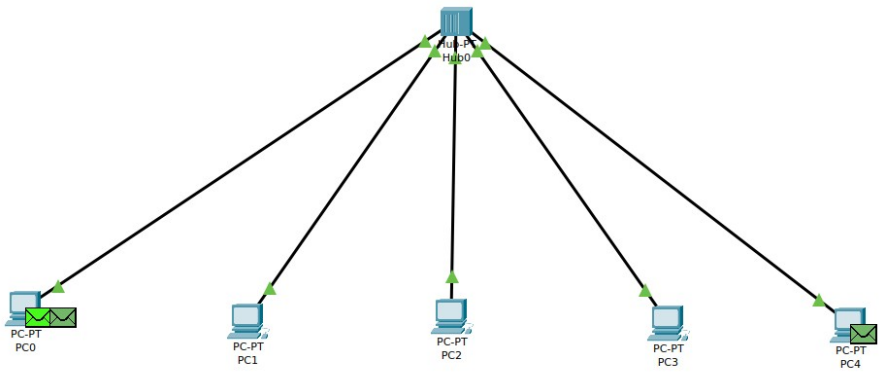


Step 8 : Configure the end device statically

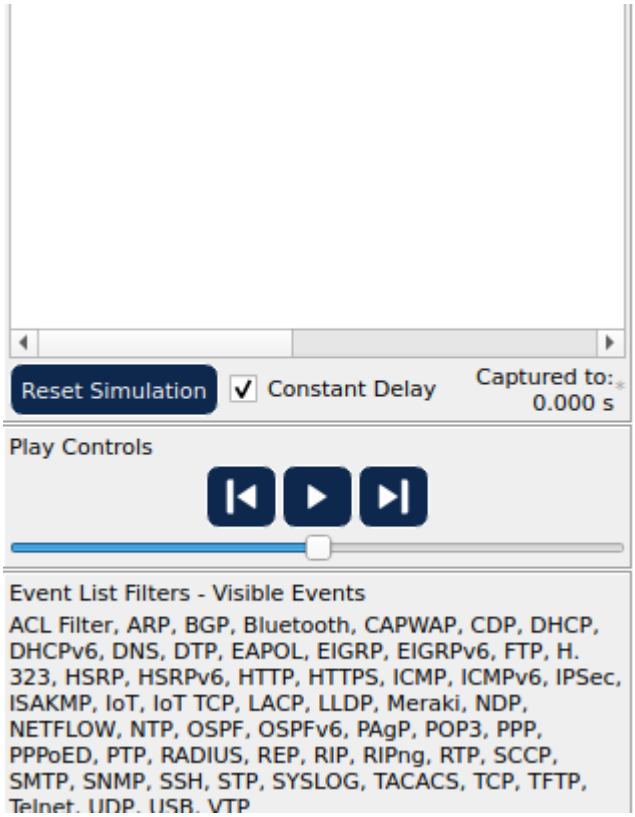


Step 9: Now add simple PDU

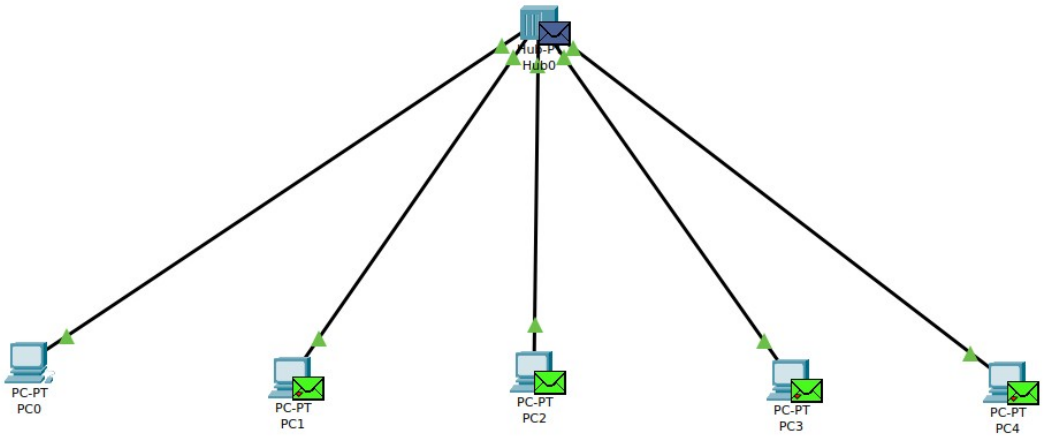
Step 10: Now select one end device source and any another one as destination



Step 11: Change to real time mode to simulation mode and click run

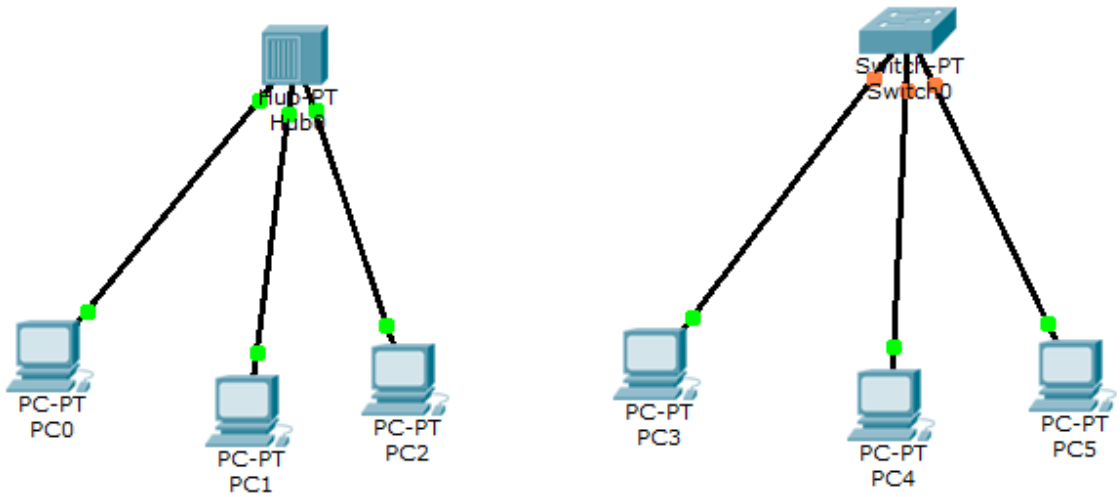


Step 12: Hub will broadcast that packet



Exercise

1. Construct a 3 or more node topology, by connecting a hub and switch as shown in the figure.



Consider IP address for each system as follows.

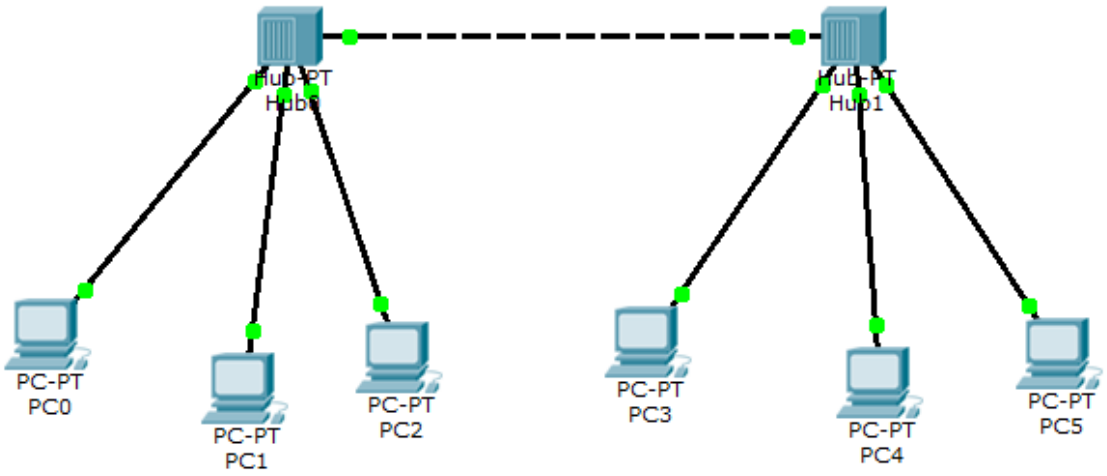
Node ID	IP address
PC0	192.168.2.2
PC1	192.168.2.3
PC2	192.168.2.4
PC3	192.168.2.5
PC4	192.168.2.6
PC5	192.168.2.7

Write a note on ICMP and ARP packet.

Perform following experiments and observe, what type of packets get transferred? Whether packets are unicasted or broadcasted?

- Set ICMP packet transfer/Ping between PC0 and PC2 and record the result.
- Set ICMP packet transfer /Ping between PC3 and PC5 and record the results.
  What is the difference between hub and switch?

2. Consider following topology of a network with 6 nodes and 2 hubs.

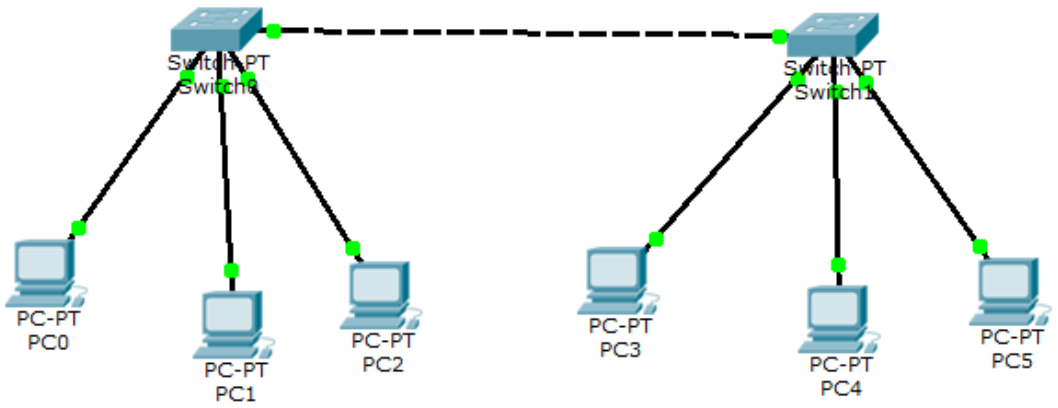


Consider the IP addresses same as (1). Perform following simulation and note down the results.

- ICMP packet transfer from PC0 to PC2. Note down, what type of packets is transferred? Broadcast or unicast? Whether packet gets transferred to hub1? Whether the packet is transferred to PC3, PC4 and PC5?

- Set new scenario, with ICMP packet transfer between PC0 to PC4. Note down, what type of packets is transferred? Broadcast or unicast? Whether packet gets transferred to hub1? Whether the packet is transferred to PC3, PC4 and PC5?
- Set new scenario, with ICMP packet transfer between PC0 to PC2 and PC3 to PC5 simultaneously. Note down, what type of packets is transferred? Broadcast or unicast? Whether packet gets transferred to hub1? Whether the packet is received by destination properly or not?
- Set new scenario, with ICMP packet transfer bewteen PC0 to PC4 and PC5 to PC2 simultaneously. Note down, what type of packets is transferred? Broadcast or unicast? Whether packet gets transferred to hub1? Whether the packet is transferred to PC3, PC4 and PC5? Whether packet is accepted by destination? Justify your answer?
- Now change the IP address of the PC3, PC4 and PC5 as 192.168.3.4, 192.168.3.5 and 192.168.3.6 and default gateway as 192.168.3.1. Set new scenario and set ICMP packet transfer between PC0 to PC4. Record your observation.

3. Consider following topology of a network with 6 nodes and 2 switches.



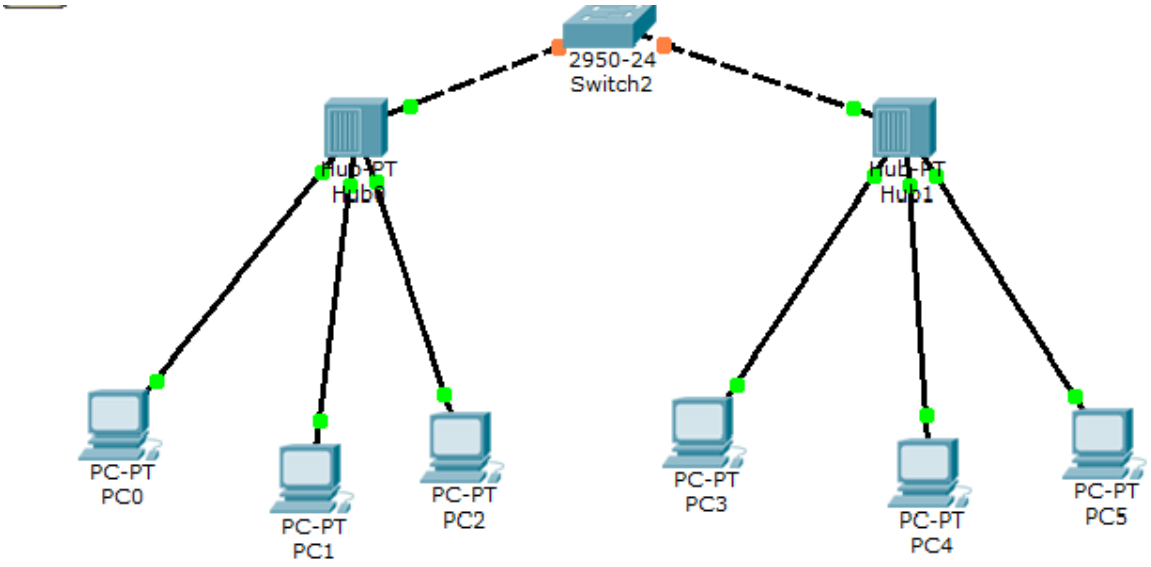
Consider the IP addresses same as (1). Perform following simulation and note down the results.

- ICMP packet transfer from PC0 to PC2. Note down, what type of packets is transferred? Broadcast or unicast? Whether packet gets transferred to switch1? Whether the packet is transferred to PC3, PC4 and PC5?
- Set new scenario, with ICMP packet transfer between PC0 to PC4. Note down, what type of packets is transferred? Broadcast or unicast? Whether packet gets transferred to switch1? Whether the packet is transferred to PC3, PC4 and PC5?
- Set new scenario, with ICMP packet transfer between PC0 to PC2 and PC3 to PC5 simultaneously. Note down, what type of packets is transferred? Broadcast

or unicast? Whether packet gets transferred to switch1? Whether the packet is received by destination properly or not?

- Set new scenario, with ICMP packet transfer between PC0 to PC4 and PC5 to PC2 simultaneously. Note down, what type of packets is transferred? Broadcast or unicast? Whether packet gets transferred other hub? Whether the packet is accepted by destination? Justify your answer?
- Now change the IP address of the PC3, PC4 and PC5 as 192.168.3.4, 192.168.3.5 and 192.168.3.6 and default gateway as 192.168.3.1. Set new scenario and set ICMP packet transfer between PC0 to PC4. Record your observation.

3. Consider following topology of a network with 6 nodes and 2 hubs and one switch.



Consider the IP addresses same as (1). Perform following simulation and note down the results.

- ICMP packet transfer from PC0 to PC2. Note down, what type of packets is transferred? Broadcast or unicast? Whether packet gets transferred to switch2? Whether the packet is transferred to PC3, PC4 and PC5?
- Set new scenario, with ICMP packet transfer between PC0 to PC4. Note down, what type of packets is transferred? Broadcast or unicast? Whether packet gets transferred to switch2? Whether the packet is transferred to PC3, PC4 and PC5?
- Set new scenario, with ICMP packet transfer between PC0 to PC2 and PC3 to PC5 simultaneously. Note down, what type of packets is transferred? Broadcast or unicast? Whether packet gets transferred to switch2? Whether the packet is received by destination properly or not?

- Set new scenario, with ICMP packet transfer between PC0 to PC4 and PC5 to PC2 simultaneously. Note down, what type of packets is transferred? Broadcast or unicast? Whether packet gets transferred other hub? Whether the packet is accepted by destination? Justify your answer?
- Now change the IP address of the PC3, PC4 and PC5 as 192.168.3.4, 192.168.3.5 and 192.168.3.6 and default gateway as 192.168.3.1. Set new scenario and set ICMP packet transfer between PC0 to PC4. Record your observation.

Write summary of working principle of hub and switch.
