Experiment 5

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Subject Name: Computer Networks **Subject Code:** 22CSH-312

1. **Aim**: Implement data link layer protocols such as CSMA/CD.

2. **Objectives:**
   The objective here is to implement and understand the functioning of data link layers protocols namely Carrier Sense multiple access / collision detection. How they manage traffic and collisions are simulated. Also to observe how CSMA/CD ensures efficient communication on a shared medium.

3. **Apparatus used:** Cisco Packet tracer

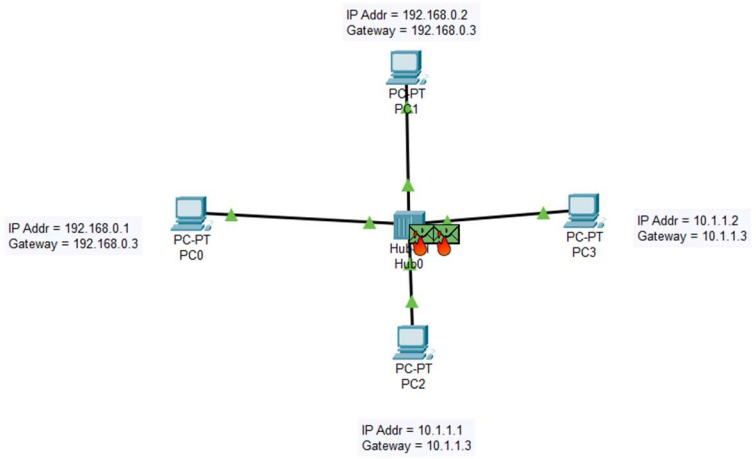
4. **Theory:**

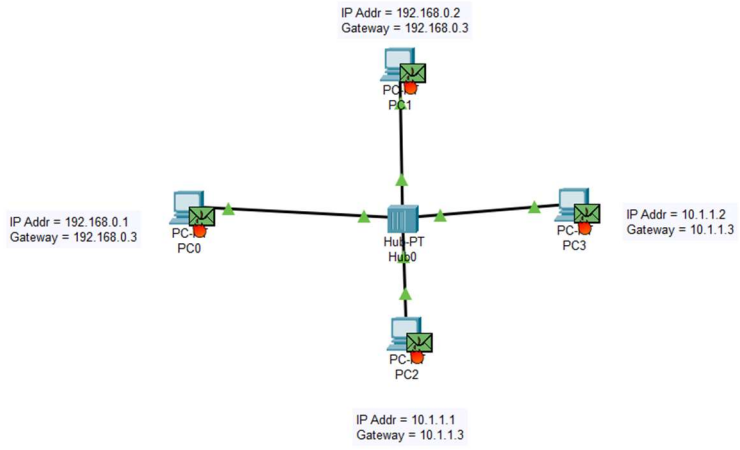
Key	CSMA/CA	CSMA/CD
Effectiveness	CSMA/CA is effective before a collision.	CSMA/CD is effective after a collision.
Network Type	CSMA/CA is generally used in wireless networks.	CSMA/CD is generally used in wired networks.
Recovery Time	CSMA/CA minimizes the risk of collision.	CSMA/CD reduces the recovery time.
Conflict Management	CSMA/CA initially transmits the intent to send the data. Once an acknowledgment is received, the sender sends the data.	CSMA/CD resends the data frame in case a conflict occurs during transmission.
IEEE Standards	CSMA/CA is part of the IEEE 802.11 standard.	CSMA/CD is part of the IEEE 802.3 standard.
Efficiency	CSMA/CA is similar in efficiency as CSMA.	CSMA/CD is more efficient than CSMA.

5. **Implementation:**
   1. Launch cisco packet tracer on your system.
   2. Add an connect 4 PCs to create two separate systems connected via hub.
   3. Configure IP Addresses of the PCs.
   4. Assign packets across network to simulate collision condition.

5. Switch to simulation mode and observe how data frames are transmitted through the hub.

6. Output:





7. Learning Outcome:

- Understood how CSMA/ CD manages network traffic and handles collisions.
- Learn to configure network devices and assign static ip addresses.
- Simulating packets to confirm the connection is established or not.
- Observe behaviour of data transmission through a hub and its impact on network performance.
- Analyze the difference between collision management.