CS 356- Computer Network Lab

Lab Assignment 8

Q1: Simple Two-Node TCP Bulk Data Transfer Simulation

- **Topology Setup:**
    - Create a two-node network connected by a point-to-point link.
    - Configure the link with a defined bandwidth (e.g., 5Mbps) and delay (e.g., 2ms).
    - Assign appropriate IP addresses to both nodes.
- **TCP Application Configuration:**
    - On Node0 (the sender), install a TCP BulkSendApplication that continuously transmits data until a set limit is reached or the simulation time expires.
    - On Node1 (the receiver), set up a PacketSink application configured to accept TCP traffic.
    - Configure parameters such as the maximum segment size (MSS) if desired.
- **Simulation and Analysis:**
    - Run the simulation for a fixed duration (e.g., 10 seconds) and enable pcap tracing to capture packets.
    - Use FlowMonitor or similar NS3 analysis tools to extract the following performance metrics: TCP throughput and packet retransmissions.

Q2: Basic CSMA LAN Simulation

1. **Setup:**
    - Create a Local Area Network (LAN) using the CSMA protocol by setting up a network of 4 nodes.

- Configure the CSMA channel with a basic data rate (e.g., 100Mbps) and a fixed delay.

- Assign IP addresses to all nodes in the network.

2. **Application Deployment:**

    - Install a UDP Echo Server on one of the nodes and a UDP Echo Client on another node within the LAN.

3. **Experimentation and Analysis:**

    - Enable pcap tracing to capture the traffic on the LAN.

    - Run the simulation and document the packet flow.

    - Modify one CSMA channel parameter: the delay and analyze how the change affects the communication performance specifically in terms of communication delay and throughput.

    - Explain your observations and conclusions.