Computer Networks Lab Task-1

(Dr Anil Kumar, Dept of CSE)

Lab Task will be evaluated i.e marks will be assigned to each of these tasks. These marks are considered in Students Grade Evaluation as Part of Lab Component.

Deadline : CSE: Aug 26th during your lab session

Before coming to lab, students should complete their lab task
During Lab Session, Faculty will check programs and outputs. (Late Submission lead to penalty)

Students should not share their code with other students. If anybody copy code their programs will not be evaluated and they will not given any marks for that lab task. Students can refer Google for their doubts but should not copy codes.

IMPORTANT: During evaluation faculty or TA will ask students to change the code or explain the code. Based on students performance marks or grade will be assigned.

Evaluation Criteria:

Q1 will be evaluated for 25 Marks
Q2 will be evaluated for 25 Marks

In evaluation faculty checks following aspects:

1. **Usage of proper function names and variable names and, indentation**
2. **Expected correct outputs for given inputs**
3. **Error Handling**
4. **You will be asked to change code on the spot or explain logic or part of the code**

Question-1:

Write a NS-3 program to

Create the following topology:

USE Point to Point links n1--n2--n-3
|
n4

Configure n1-n2 Data Rate as 100Mbps
Configure n2-n4 Data Rate as 1Gbps
Configure n2-n3 Data Rate as 50Mbps
Configure delay 10ms for all links

Install UDP echo server1 on n3
Install UDP echo client1 on n1 (Packet Size: 1024 Bytes, Packet Interval 0.01, Max Packets 200000)

Install UDP echo server2 on n4
Install UDP echo client2 on n3 (Packet Size: 1024 Bytes, Packet Interval 0.01, Max Packets 200000)
Echo client1 should communicate with Echo Server 1
Echo client2 should communicate with Echo Server 2

Note: All clients should start at 1st sec.
Finally evaluate your network performance and at the end of the simulation print average throughput, delay, jitter and packet lost ratio for all traffic flows. Note down key observations from the simulation runs.

Question-2:

Write a NS-3 program to

Create the following topology:

USE CSMA protocol and create a LAN with 50 Nodes (Linear topology n1 n2 … n50)

Configure Data Rate as 1Gbps
Configure delay 100ms

Install a UDP echo server on Node 50 (Print its IP address and MAC address while simulation is running)

On first 10 Nodes install UDP echo clients (Packet Size: 1024 Bytes, Packet Interval 0.01, Max Packets 100000)

Install a TCP server (use PacketSinkHelper) on Node 1 (Print its IP address and MAC address while simulation is running)
On last 10 Nodes (41 to 50) install TCP clients (use BulkSendHelper).

Finally evaluate your network performance and at the end of the simulation print average throughput, delay, jitter and packet lost ratio for all traffic flows. Note down key observations from the simulation runs.

Note: All clients should start at 1st sec.

Refer below link for TCP server and client installation help
https://www.nsnam.org/doxygen/tcp-bulk-send_8cc_source.html