Birla Institute of Technology & Science, Pilani
Work-Integrated Learning Programmes Division
First Semester 2020-2021
Advanced Computer Networks (CS ZG525)
Assignment

Due Date: 20-11-2020 [5:00 PM]
Date of Posting: 08-11-2020 [7:00 PM] **Max. Marks: 15**

Instructions:
Take this assignment as learning opportunity and attempt with full integrity.

Deliverables:

1. **The script file named as question1.tcl [it includes procedure to generate congestion.xg and the script for drop packet count]**
2. **XGraph for congestion-window-size vs. time of TCP Reno and TCP Cubic (you have to upload one graph file for each TCP variant out of multiple simulation time intervals runs performed.)**
3. **observation.txt file**

Create a zip file of all deliverables, i.e., question1.tcl, congestionReno.xg, congestionCubic.xg, and observation.txt to upload on TAXILA.

Problem Statement:

Write a TCL script (file name: **question1.tcl**) to simulate the network topology shown in Fig.1 in ns-2 simulator. All links are duplex with 2ms delay and DropTail queue. The bandwidth of individual links is mentioned in Fig.1. Use the Session routing policy for all the nodes. Create the UDP and TCP flows with required parameters as per the information mentioned in the Fig.1. Use different colors to designate the three different traffic flows for animation. Enable Nam and trace in the script. Run the simulation with different time intervals to observe the behavior of TCP Reno and TCP Cubic variants.

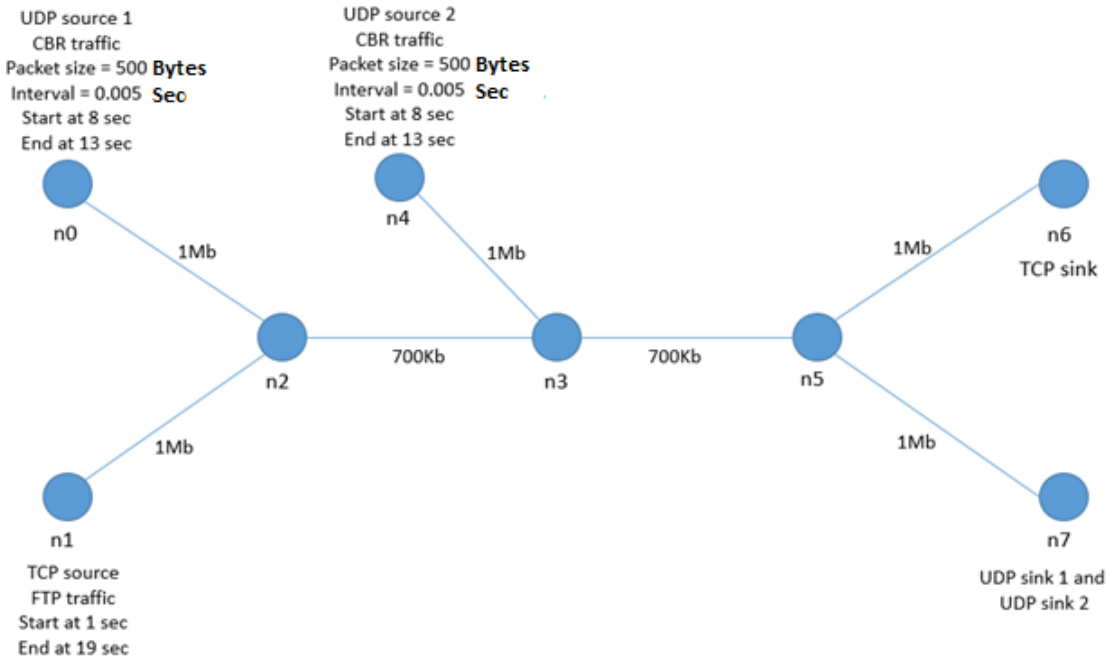

Fig.1

For the TCP flow between nodes n1 and n6:

a) Write a procedure in the **question1.tcl** named as **plotWindow** to generate a graph (**congestion.xg**) using Xgraph utility to plot the TCP congestion window size with-respect-to time for TCP Reno and TCP cubic variants. Plot the size of congestion window at every 0.1 second interval of time.

b) Write a script/commands to obtain dropped packets count for the TCP flow. Add this script/commands at the end of the **question1.tcl** file and comment it.

c) Write your observation/analysis based on packet dropped count and congestion window plots for TCP Reno and TCP Cubic variants.

Marking Scheme:

a) tcl script for topology simulation [6M]
b) xgraph plotting [3M]
c) Packet drop counting script [4M]
d) Observations [2M]
