Indian Institute of Technology Roorkee

Department of Computer Science and Engineering

CSN-361: Computer Networks Laboratory (Autumn 2019-2020)

Lab Assignment-4 (L4) **Date: August 22, 2019** **Duration: 2 Weeks**

General Instructions:

1. Every Lab Assignment will be performed by the students individually**.** No group formation is required and the evaluations will be done every week for the students individually**.**
2. Use of Linux OS is mandatory for this Lab to complete all the Lab Assignments**.**

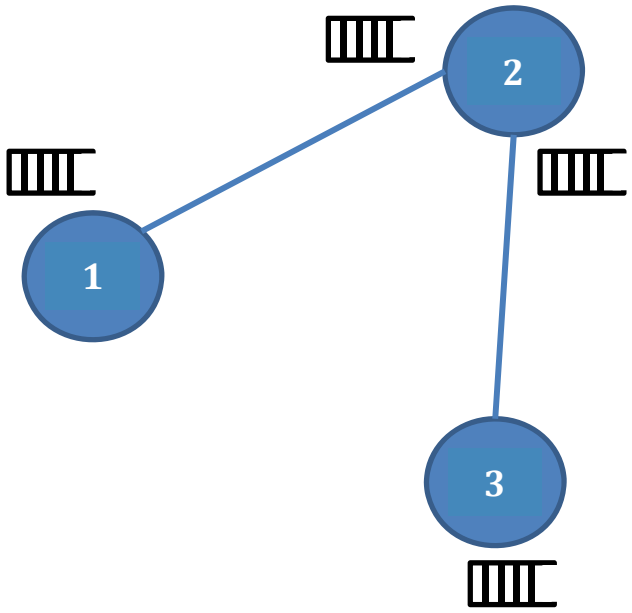
Submission and Evaluation Instructions:

1. **Submit your** zipped folder (**<filename>.zip** or **<filename>.tar.gz**) through your account in Moodle through the submission link for this Lab Assignment in Moodle course site: https://moodle.iitr.ac.in/course/view.php?id=47
2. **Hard deadline for Final submission in Moodle: September 5, 2019 (9:00 am Indian Time).** For any submission after Final Deadline, 20% marks will be deducted (irrespective of it is delayed by a few seconds or a few days). The key to success is starting early. You can always take a break, if you finish early.
3. The submitted zipped folder (**<filename>.zip** or **<filename>.tar.gz**) must contain the following:
   (a) The source code files in a folder.
   (b) A report file (**<filename>.DOC** or **<filename>.PDF**) should contain the details like:
      i. Title page with details of the student
      ii. Problem statements
      iii. Algorithms and data structures used in the implementation
      iv. Snapshots of running the codes for each of the problems
4. The submission by each student will be checked with others' submission to identify any copy case (using such detection software). If we detect that the code submitted by a student is a copy (partially or fully) of other's code, then the total marks obtained by one student will be divided by the total number of students sharing the same code.

Instructions for L4:

1. Objective of this Lab Assignment L4 is to make the students familiar with the hardware and software aspects of computer networking and extracting information related to computer networking using TCL programs.
2. The student will have to demonstrate and explain the coding done for this Lab Assignment L4 in the next laboratory class to be held on **September 5, 2019** for evaluation**.**

Problem Statement 1: Write a Network Simulator (NS2) code to simulate a three node network with duplex links among them as shown in figure. Show the topology using NAM. Study the variation in number of packets dropped with the variation of the queue size in the nodes and with the variation of the bandwidth of the links.



Problem Statement 2: Write a Network Simulator (NS2) code to simulate the transmission of ping messages over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion. Study the variation in number of packets dropped with the variation of the queue size in the nodes and with the variation of the bandwidth of the links.

Nodes are connected as follows:
0-2, 1-2, 2-3, 3-4 and 3-5

Packet transmissions:
0-4 and 5-1