CS/CE 6378: Advanced Operating Systems
Section 001
Practice Programming Assignment

Instructor: Neeraj Mittal

Assigned on: Tuesday, August 20, 2024

This programming project is primarily meant as an exercise for those students who do not have much background in socket and/or thread programming. You are *not* required to submit this project for grading.

Since the project involves socket programming, you can *only use machines dcXX.utdallas.edu, where XX* $\in$ {*01, 02, .., 45*}*, for running the program.*

1 Project Description

You are required to implement a distributed system consisting of eight nodes numbered from 0 to 7.

1. There are reliable socket connections, implemented using either TCP or SCTP, between every pair of nodes, and all messages are exchanged over these connections. All connections are established in the beginning and stay intact until the program ends.

2. Each node randomly waits for a period of time that is uniformly distributed in the range [2,16] time units. It then selects an integer at random from the range [0,1000] and broadcasts the integer to all other nodes in the system.

3. Once a node has sent fifty messages to each node and has received fifty messages from each node, it sends a *finish signal* to node zero.

4. Once node zero has received *finish signal* from all the nodes, it brings the distributed system to a halt by sending a *terminate signal* to every node.

2 Data Collection

For each node, report the sum total of all the integers it has received from each node. Note that every node will report seven integers, one for each node in the system excluding itself. For example, node 0 will report the total of the integers it has received from node 1 and so on.