Fa09 - CS 553 Distributed Systems - Project

In this project, you will test the performance of the Singhal-Kshemkalyani (SK) optimization of vector clocks.

- The star topology overlay captures client-server interaction, where the central node in the star is the server. Clients communicate only with the server. For the SK optimization, plot the percentage overhead of vector clocks as a function of n, where $n-1$ is the number of clients in the star configuration.

- Examine the savings of the SK optimizaiton under statistical behavior. Simulate the message passing among multiple sites, along the line of the study in:
  P. Chandra, P. Gambhire, A. D. Kshemkalyani, Performance of the Optimal Causal Multicast Algorithm: A Statistical Analysis, IEEE Transactions on Parallel and Distributed Systems, 15(1): 40-52, January 2004.
  as a guideline. You can perform the following experiments.

  1. Vary n, keeping MIMT, MTT and M/T fixed
  2. Vary MIMT, keeping n, MTT and M/T fixed
  3. Vary M/T, keeping n, MIMT and MTT fixed

  For each of the experiments, for the SK optimization, plot the percentage overhead of vector clocks. Analyze your results in each experiment. Why do you observe what you observe?