CS 6378: Programming Project II

Instructor: Ravi Prakash

Assigned on: April 13, 2022
Due date: May 5, 2022

This is an individual project and you are required to demonstrate its operation to the instructor and/or the TA to get credit for the project.

In this project, you are required to implement functionality similar to Project II, with the same number of servers (3) and clients (5), with the following important differences:

1. Mutual exclusion algorithm is implemented among the clients. The clients, numbered C_0 through C_4, execute Maekawa's mutual exclusion algorithm among them (instead of the Ricart-Agrawala algorithm) to decide which client gets to enter the critical section to access a file.

2. Quorum size is equal to three.

3. Quorum of client C_i consists of the set $\{C_i,\ C_{(i+1)mod5},\ C_{(i+2)mod5}\}$.

4. Once a client enters the critical section, it communicates with the three servers and writes to all replicas of the corresponding file. Once all three replicas of the file have been updated, the client exits the critical section.

5. If any server is unwilling to perform the write, then the write should be aborted. Hint: Think two-phase commit protocol. You must be able to demonstrate this feature of your implementation.

6. Make sure to implement all messages for Maekawa's algorithm, including ENQUIRE, YIELD and FAILED.

Submission Information

The submission should be through eLearning in the form of an archive consisting of:

1. File(s) containing the source code. Your source code must have the following, otherwise you will lose points:

   (a) Proper comments indicating what is being done.
   (b) Error checking for all function and system calls.

2. The README file, which describes how to run your program.