Testing Method of Mutual Exclusion

In our testing method, each process in the distributed system will write 2 timestamps into a verification file under the execution directory: one when the process gets into the critical section, and another when exiting the critical section. The timestamp consists of the Linux system’s hardware time in milliseconds along with the process number. After the execution of the mutual exclusion program, the testing program will parse the verification file and, by comparing the time of entry into the critical section of each process, and ensuring the entry of critical section of different process is larger than the pre-defined critical section execution time, find out whether a process has entered its critical section during another process’s critical section execution. In case of network delay and potential miniscule time difference across different machines, the program will allow a few milliseconds threshold to avoid over-sensitive error. If there are no entry timestamp of a process entering its critical section after another process’s entry timestamp, or the time record of entry timestamps is shorter than the pre-defined critical section execution time, then the distributed system algorithm passes the test of mutual exclusion.