

Homework 3 Theory

1. Lamport's Algorithm can be modified by processing read requests differently. A write requests can still follow the same rules for accessing the critical section (it has the earliest timestamp in the queue and it has received an acknowledgement from every other process). However, a read must be earlier than all of the other write requests (and only write requests) in the queue and it must have received an acknowledgement from every other process. This way, writes never interfere with other writes or reads but reads are able to go as long as they are earlier than the other writes.
2.
 - a) A process with a timestamp t can enter the critical section if the number of timestamps that are earlier than t or the ones whose acknowledgements have not been received is less than k . This way, the process is able to enter the critical section and there can be up to k processes in CS at a time.
 - b) A process can enter the critical section if it receives $n - k$ "okay" replies from other processes. Keep the rest of the algorithm the same. This works because processes that are already in the critical section won't send an okay message and therefore there can only be k processes in the critical section at a time.