2000 Paper 13 Question 1

Distributed Systems

In a distributed electronic conference application each participant has a replica of a shared whiteboard. Only one user at a time may write to the whiteboard, after which the user's update is propagated to all conference members. A dedicated process manages each whiteboard replica. Define and discuss a protocol that the replica managers could use to achieve this mutual exclusion. [10 marks]

A service database is replicated within a widely distributed system to achieve high availability and low access latency. Within a hierarchy of replicas a set of top-level primary servers maintain strong consistency of their replicas. Describe how this strong consistency could be achieved. [10 marks]