

2008 Paper 12 Question 4

Distributed Systems

- (a) It is proposed that persistent, strongly consistent data replicas should be maintained by a widely distributed, open, unstructured process group.
- (i) Discuss the potential advantages of replication, bearing in mind that strong consistency is required. [2 marks]
 - (ii) Describe algorithms for maintaining strong consistency while retaining at least some of the advantages of replication. Show how your algorithms are robust with respect to concurrency and failure. [8 marks]
- (b) A distributed conference application provides a shared whiteboard. Each member of the conference has a replica of the whiteboard that is managed by a member of a closed process group. Discuss one approach by which the processes can achieve mutually exclusive access to the whiteboard, prior to propagation of the update to the whole group. [8 marks]
- (c) Contrast the styles of replica management required for (a) and (b) above. [2 marks]