Paxos with multiple leaders

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Distributed computing is becoming evermore important as the e-* services become part of our everyday life. It is not an easy task to fulfil the demand for 7x24 availability. One possible way of creating reliable services is to use multiple servers with the same set of services. An issue here is that these servers should have the same knowledge so that they can work in a consistent manner. This problem is frequently solved with the help of different group communication services. These services can provide different levels of fault tolerant services from FIFO multicast to virtual synchrony. One well known group communication service is the Paxos algorithm which is a 2000 year old algorithm first used by ancient Greeks as a parliamentary protocol. The traditional Paxos algorithm uses, among other abstractions, a single leader functionality to serialise parallel events which in turn provides a global ordering property for the system. However, this single dedicated point weakens the reliability of a distributed system. Here we will present several new solutions for distributed global ordering based on the Paxos algorithm and we will compare them on the basis of message complexity and the safety level provided.

Keywords: *distributed system, consistency, Paxos, group communication services*