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**Abstract**

Development of distributed systems is complicated by the absence of reliable global timing, concurrency, and nondeterminism. To deal with these obstacles log files are produced by an instrumented system facilitating analysis, testing, and debugging. This paper presents a formal framework for the analysis of distributed system logs based on event trace concept. A partially ordered trace of events executed by a distributed system is modeled by a collection of communicating automata. We present an implementation of the analysis approach in SDL based on ObjectGEODE. A formalization of a property of an event trace, being a replica of another trace, is discussed.