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Abstract

A formal framework for the analysis of execution traces collected from distributed systems at run-time is presented. We introduce the notions of event and message traces to capture the consistency of causal dependencies between the elements of a trace. We formulate an approach to property testing where a partially ordered execution trace is modeled by a collection of communicating automata. We prove that the model exactly characterizes the causality relation between the events/messages in the observed trace and discuss the implementation of this approach in SDL, where ObjectGEODE is used to verify properties using model-checking techniques. Finally, we illustrate the approach with industrial case studies.

Keywords : Distributed systems - System validation - Passive testing - Trace analysis - SDL - Monitoring