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Theory and methodology

### Markov and Markov reward model transient analysis: An overview of numerical approaches

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#### Abstract

The advent of fault-tolerant, distributed systems has led to increased interest in analytic techniques for the prediction of reliability, availability, and combined performance and reliability measures. Markov and Markov reward models are common tools for fault-tolerant system reliability prediction. In this paper, we first derive instantaneous and cumulative measures of Markov and Markov reward model behavior. We then compare the complexity of several competing algorithms for the computation of these measures. Better approaches for Markov model solution should lead to more effective techniques for fault-tolerant system modeling.



## Keywords

Markov chains; Markov reward models; transient analysis; performability models; sensitivity analysis; performance modeling; reliability modeling

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