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Modeling and Evaluation of Pre-Copy Live VM Migration Using Probabilistic Model Checking

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Abstract

The proliferation of cloud technologies hosting complex applications has taken availability, scalability and affordability of IT services to the next level. Live VM migration is one of the core tools that automates the process of workload transfer without interfering with the applications running in dynamic cloud environments. In this paper we propose and implement a probabilistic model checking framework to study live VM migration process. In particular, we modeled well-known precopy live migration approach and evaluated the influence of various system parameters on the performance of live migration. The proposed implementation can be used as a stepping stone for modeling more complex live migration scenarios, and it can be a very beneficial tool for cloud service providers in predetermining various critical performance parameters of their cloud data centers in relation to the optimized utilization of the valuable IT resources. © 2018 IEEE.

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