Diploma/Master Thesis

Predicting Performance of Transactional Enterprise Applications

Motivation
Ensuring data consistency in transactional information systems affects the system’s performance and scalability to a great extent. This is particularly true when a locking-based mechanism (e.g., two-phase lock, 2PL) has been chosen to ensure consistency of concurrent transactions. While transactional behaviour is well-understood in the database community, it is not in the community of architecture-level performance prediction and is therefore often neglected in application performance models, or not reflected in a proper manner.

Goals
In this thesis, you create a performance model of an e-Commerce Application (e.g. TPC-W Benchmark) using the Palladio Approach for component-based software performance prediction. Since Palladio performance models represent software systems on an architectural level, you do not want to model every transaction-related detail of the TPC-W application, but rather you want to find an appropriate abstraction for transactional behaviour. For this, you design and perform experiments (measurements) targeted at identifying the most influential performance factors, which need to be captured by your performance model. Where the Palladio Approach turns out to be unpractical for your purposes, you might suggest necessary extensions.

This thesis is located in the intersection between the areas of software architectures, software performance engineering and database systems. If you have a strong background in one or more of these topics, and/or if you are highly motivated to gain knowledge in these areas, please don’t hesitate to let us know.

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