Universität Zürich
Institut für Informatik

Binzmühlestr. 14
CH-8050 Zürich
Schweiz
Tel. +41 044 635 43 33
Fax +41 044 635 68 09
boehlen@ifi.uzh.ch
www.ifi.uzh.ch/dbtg

Prof. Dr. Michael Böhlen
Database Technology

BSc thesis

Luis Schüller

Zürich, 8. November 2011

Enabling protocol comparisons of single- and multi-version scheduling protocols within the Oshiya demo application

In the proposed project, an existing demo application for the *Oshiya* scheduling model shall be extended in a way that the demo application

1. is able to cope with multi-version scheduling protocols such as SI and DSSI and

2. allows for protocol comparisons (e.g., single- vs. multi-version scheduling protocols).

It shall be designed and implemented in a way that it emphasize the characteristics and advantages of Oshiya. This task includes requirements analysis, conceptual design, implementation and testing.

Background:

Modern systems have to schedule huge amounts of concurrent client requests efficiently while guaranteeing that the produced schedules fulfill certain correctness criteria and/or service-level agreements. The state of the art is to develop schedulers imperatively for a given application, which yields very complex scheduler implementations and inflexibility to adapt to changing scheduling requirements.

In Oshiya, the scheduling state is stored in *scheduling relations*. A protocol is formalized as a set of constraints called *protocol specification*. A *protocol specification* is implemented by three *scheduling queries*. And request scheduling is performed by repeatedly executing the *scheduling queries* over the *scheduling relations*.

Tasks:

- Literature research on declarative scheduling [1, 2, 3]
- Based on the existing basic version of the demo application, requirements analysis and conceptual design (towards high modularity) shall be done for support for multi-version scheduling protocols and protocol comparisons.
- Implementation and testing of the new features
- Writing a bachelor thesis presenting and analyzing your results
- Presentation of results (15 minutes)

Requirements:

- Experience in programming Java (incl. thread programming), Java Swing
- Knowledge in concurrency control, transaction processing

Aim:

- A running Oshiya demo application allowing users to specify single- and multi-version scheduling protocols and providing functionality to compare two scheduling protocols visually.

Conditions:

- A project meeting will take place periodically (typically every two weeks). At least 24 hours prior to a project meeting a report has to be sent to the supervisor including (a) the progress since the last meeting, (b) planned next steps, (c) problems to discuss and (d) ideas to solve those problems.

Literatur

[1] Christian Tilgner and Boris Glavic and Michael H. Böhlen and Carl-Christian Kanne. Declarative Serializable Snapshot Isolation. In *ADBIS*, pages 170–184, September 2011.

[2] Christian Tilgner and Boris Glavic and Michael H. Böhlen and Carl-Christian Kanne. Smile: Enabling Easy and Fast Development of Domain-Specific Scheduling Protocols. In *BNCOD*, pages 128–131, 2011.

[3] C. Tilgner. Declarative Scheduling in Highly Scalable Systems. In *Proceedings of the 2010 EDBT/ICDT Workshops*, EDBT '10, pages 41:1–41:6, 2010.

Task assignment and Supervisor: Christian Tilgner

Starting date: 02.01.2012   Ending date: 02.07.2012

Department of Informatics, University of Zurich

Prof. Dr. Michael Böhlen