České vysoké učení technické v Praze

Fakulta elektrotechnická
Katedra počítačů, Karlovo náměstí 13, 121 35 Praha

The opponent review of diploma thesis, for:

Roman Smetana

Next generation of Second-Screen, Realtime application MyICPC

Roman's work focuses on providing a "second screen" experience for participants in an ICPC event through a web interface optimized for mobile devices. This enables the audience to view event details from their perspective instead of the traditional, one-size-fits-all view. For example, the participants might want to look at a view of the event schedule based on the current time and their particular interests. During the actual contest, this will allow participants to follow their own teams and/or region. Generalized scoreboards and live coverage cannot provide the individualized focus. This personalized experience provides for better engagement as well as encourages participants to engage globally through social media.

Previous versions of MyICPC has experienced some problems with generalized applicability, robustness and scalability. This work attempts to address these issues in several ways. First, careful evaluation and selection is made for architecture and technology that will not interfere with scaling techniques, as well as foster easy development and maintenance. Second, this new version of MyICPC replaces the master-slave implementation, which removes both the bottleneck and vulnerability of a master system. Third, the new system modified the data store connection approach to reduce the transaction time, allowing connections to be released much sooner and thereby removing the connection bottleneck. Fourth, system modularity is introduced, which allows components to be selectively replicated for scaling. For example, to handle the demand the schedule module may only require one copy while the scoreboard module may need to be replicated many times due to high demand. Finally, previous versions of MyICPC limited applicability to a single contest while the new version enables support of an entire hierarchy of contests.

Testing of MyICPC for correctness and scalability is particularly important given its global visibility. During development, MyICPC was made available to regional contest. This enabled testing in production, which is critical. In addition, the system includes unit testing for component verification. Since scale was a problem in previous versions of MyICPC, this work focuses on load testing to determine scalability with respect to computation and memory for both single and cluster server configurations. Unfortunately, there's no UI testing for this project.

Strengths: MyICPC is a critical system for providing a second screen experience for ICPC events. This new version of MyICPC addresses fundamental problems with previous versions such as lack of scalability and robustness. This work demonstrates that this system can work effectively both through production testing at regionals and simulated load testing.

Weaknesses: While this project does provide basic unit testing for classes and data source as well as load testing, it does not provide any system UI testing, which creates uncertainty in UI maintenance and development. While the thesis provides details on extension features, self-contained developer documentation for this version of MyICPC is missing.

Questions:
1. In Section 3.3, you describe the technologies you used. Where is the evaluation of competing technologies? Why were these selected instead of others?
2. By rejecting the Open Session in View pattern, do you end up loading extraneous data in the service layer? Does it make development more difficult to require developers to write custom, complete queries? If so, how much? Does it make maintenance more difficult since the queries must be kept in sync with the data model? Are there deploy-time hints if there's a disconnect between queries and data model?
3. Explain and clarify how was the feed processing tested

I recommend a grade of A (Excellent) for this thesis.

Michael J. Donahoo, Ph.D.
Opponent
Professor of Computer Science
Baylor University

In Waco, Texas, US 26. 1. 2016