

WOSP-C '15: Workshop on Challenges in Performance Methods for Software Development

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ABSTRACT

The first ACM Workshop on Challenges in Performance Methods for Software Development is held in Austin, Texas, on Jan. 31 2015, and is co-located with the 2015 ACM/SPEC International Conference on Performance Engineering (ICPE). Its purpose is to open up new avenues of research on methods for software developers to address performance problems. The software world is changing, and there are new challenges. As its name implies, the workshop includes the description of problems as well as solutions. The acronym WOSP-C also recalls the original discussion-heavy format of WOSP, the ACM International Workshop on Software and Performance, which has been a co-organizer of ICPE since 2010.

Categories and Subject Descriptors

D.2 Software Engineering

General Terms

Software performance, Performance engineering.

Keywords

Software Performance Engineering.

1. CHALLENGES

The workshop papers and discussions will explore the new challenges to product performance that have arisen due to changes in software and in the development process, such as:

- faster development means less time for performance-related planning and analysis,
- the need for scalability and adaptability increases the pressure while introducing new sources of delay,
- model-driven engineering, component engineering and software development tools offer opportunities but their exploitation requires effort and carries risks,

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ICPE'15, Jan 31 – Feb 4, 2015, Austin, Texas, USA.

ACM 978-1-4503-3248-4/15/01.

<http://dx.doi.org/10.1145/2668930.2688201>.

- use of third-party services and components reduces the developer's control over the end-to-end performance
- mobile applications require fast response in a difficult environment

These software-related challenges have led to important performance failures, such as the roll-out of the healthcare.gov web site in the US. It is probably fair to say that

(1) performance is a major problem in system development today,

(2) no one is satisfied with the methods available to address it,

(3) there is no agreement on how to improve the situation.

This workshop is intended to describe the challenges and to explore ways in which software performance engineering methods can be developed to provide solutions.

New challenges imply new opportunities for progress, and there are new tools that we may be able to incorporate (for example, methods for big-data analysis). So suggestions for new lines of attack are as important for the workshop, as the characterization of the challenges.

2. SOFTWARE PERFORMANCE ENGINEERING METHODS

Three books that provide the background on methods for dealing with performance of software are those of Smith and Williams [1] (including making performance models from UML design models), Cortellessa et al [2] (using various kinds of models to analyze performance) and Bondi [3] (a book on useful processes, not model-based, and going beyond software).

Software performance engineering methods as understood for this workshop seek to structure and unify the understanding of performance effects and their causes, and to support extrapolation of existing knowledge to provide predictions of performance for new developments and configurations of a system. This generally requires some kind of model.

All kinds of models may be considered, ranging from regression models of data, through mathematical and simulation models of flows, contention, executions and timing in the system, to dynamic control models and semantic models of data gathered from execution. To be effective the models must relate seamlessly to existing or future system execution data. While purely data-driven performance tuning is not our main concern in this workshop, closely allied concerns such as measurement and monitoring methods are important.

3. DISCUSSION TOPICS

Roughly half of the workshop will be devoted to sessions for focused discussion. The issues for discussion will arise out of the paper presentations, and out of the concerns of those present.

Some topics which are expected to be prominent are:

- **DevOps and Software Performance Engineering (SPE):** is this a new opportunity? DevOps [4] integrates quality assurance (which includes performance concerns) with development and operations. QA usually means just testing: can SPE provide greater insights?
- **Model-driven SPE: is it a success?** Since the first WOSP there has been substantial research on SPE based on software models (e.g. UML models) (e.g. [5], [6], [7]). Is it ready for widespread use?
- **Clouds, scale, complexity and unpredictability:** large systems, rapid evolution, unpredictable workloads, complexity introduced by the combination of components that are not engineered to work together, make analysis unwieldy. New solutions may include big-data methods for analysis. A survey of current ideas is given in [8].
- **Adaptive systems: how can SPE contribute?** Model-based adaptation has the potential to be faster and to provide better and cheaper performance. A survey is given in [9].

The papers in this proceedings address these and other issues, and other topics of discussion will undoubtedly arise.

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