

# Performance Engineering in Industry: Current Practices and Adoption Challenges

Ahmed E. Hassan  
Dept. of Electrical and Computer Engineering  
University of Victoria  
Victoria, Canada  
ahmed@ece.uvic.ca

Parminder Flora  
Performance Engineering  
Research In Motion (RIM)  
Waterloo, Canada  
pflora@rim.com

## ABSTRACT

This panel session discusses performance engineering practices in industry. Presentations in the session will explore the use of lightweight techniques and approaches in order to permit the cost effective and rapid adoption of performance modeling research by large industrial software systems.

## Categories and Subject Descriptors

D.2.9 [Software Engineering]: Management—*Software quality assurance (SQA)*; D.2.8 [Software Engineering]: Metrics—*performance measures*

## General Terms

Performance, Economics, Reliability

## 1. INTRODUCTION

Capacity planning activities are rapidly becoming an integral part of any large deployment of mission critical software system in enterprises worldwide. Unfortunately, developers of large software systems are not able to address customer's concerns about the performance characteristics of their products and the deployment requirements of these products. Current techniques and practices adopted in industry are barely adequate, instead they are ad-hoc and costly. Customers are given little help and support in conducting their capacity planning and performance analysis.

A slew of notations and approaches have been proposed in the past to capture performance requirements and to model them. Several software engineering specification languages have been extended and created in order to model performance. Use Case Maps (UCM) are used to express scenarios and can be annotated with performance attributes. Moreover, UML specifications can be annotated via the UML Profile for Schedulability, Performance and Time (SPT) in order to capture performance requirements. These specifications, annotated with performance attributes, are used to generate performance models that could be solved and analyzed.

## 2. RESEARCH ADOPTION IN PRACTICE

Performance modeling requires a good understanding of the software system. For example, to model a mail server

software system one must have a good knowledge of the different steps involved in processing email and the interaction between the different features offered by the software system. However, previous research in software maintenance and evolution has demonstrated that the documentation associated with software systems (such as architecture documents or UML diagrams) rarely exist and if they exist they are rarely updated. Current performance analysis techniques propose extending UML specification diagrams with performance attributes. The lack of documentation prevents the adoption of many research innovation for performance modeling and capacity planning practices.

In short, adopting performance modeling in practice is a costly and timely choice due to the absence of specification, missing system knowledge and limited access to performance experts. Many software development companies are neither willing nor able to conduct detailed performance modeling; instead these companies adopt simple ad-hoc processes like whitepapers or in many instances companies do not bother to perform any performance or capacity analysis. Customers, whose dependence on such software systems is increasing rapidly, are then shocked by the performance degradation of their deployed software systems and its inability to scale.

## 3. GOALS AND EXPECTED RESULTS

The main goal of this panel is to promote a *lively discussion* between performance engineering practitioners and researchers. We are interested in discussing proposals for lightweight agile techniques to reduce the cost of performance modeling in industry and to increase the adoption of state of the art research in industry. In particular, we hope to discuss:

1. Current state of performance modeling and capacity planning in industry.
2. Lightweight techniques to document performance requirements.
3. Guidelines for practitioners for cost effective and fast adoption of state of the art performance modeling approaches.
4. Proposal of techniques and approaches for performance modeling in the absence of up-to-date system knowledge.

The session will help explore possible avenues for future research avenues and collaboration between participants.