Tutorial

Migrating Software Testing to the Cloud

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TUTORIAL ABSTRACT

Regression testing is often performed as part of the software maintenance process. The amount of tests cases for a large-scale system can range from several hundred to many thousands, requiring significant computing resources and lengthy execution times, often precluding their use in an interactive setting. Traditional approaches to reduce the execution time for regression testing typically focus on excluding selected tests from the suite that need to be run after a change is made to the system.

Cloud computing offers an alternate solution to this problem: the use of virtualized hardware, effectively unlimited storage, and software services that can aid in reducing the execution time of large test suites in a cost-effective manner. However, migrating software testing to the cloud is not without cost, nor is it necessarily the best solution to all testing problems. The new area of software testing in the cloud (STITC) lies at the intersection of these key areas: software testing, cloud computing, and system migration.

This tutorial presents the SMART-T decision framework for migrating software testing to the cloud. The framework is based on the "SOA Migration, Adoption, and Reuse Technique" (SMART) from Carnegie Mellon University's Software Engineering Institute, which has been successfully used to migrate legacy components to a service-oriented environment. SMART-T helps organizations identify their current testing process, describe the requirements of the target cloud computing environment for performing software testing, and through a gap analysis of these two states map out the issues, effort, and potential benefits of migrating their software testing to the cloud. Several case studies are used to illustrate the use of the SMART-T framework in real-world settings.

Keywords-software testing, cloud computing, system migration

TUTORIAL PRESENTERS

Scott Tilley is Professor & Director of Software Engineering in the Department of Computer Sciences at the Florida Institute of Technology, a Professor of Management Information Systems in the College of Business, and an Associate Member of the Harris Institute for Assured Information. He is a Visiting Scientist at Carnegie Mellon University's Software Engineering Institute. He is Chair of the Steering Committee for the IEEE Web Systems Evolution (WSE) series of events, a member of the Steering Committee for the IEEE International Conference on Software Maintenance (ICSM), and the Immediate Past Chair of ACM SIGDOC. He was General Chair for ICSM 2008 in Beijing.

Tauhida Parveen is a PhD candidate in the Department of Computer Sciences at the Florida Institute of Technology. Her dissertation is on software testing in the cloud. She received her MSE degree in 2005 in the area of anti-reverse engineering techniques for digital rights management. Her research interests include software testing, cloud computing, service-oriented architecture (SOA), and legacy system migration.

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