

SlipStream™: a Framework using Cloud Computing to Automate Full-scale System Tests and In-Cloud Deployment

The ultimate goals of any software-testing regime are to make the software more robust and reliable, thereby reducing development and support costs and increasing customer satisfaction. Recent trends to use unit testing and other techniques, such as continuous integration, in the software build process help reach those goals. However with the move towards systems of interacting services, full-scale system tests are critical, yet are rarely done as systematically or completely as unit tests because of the large manual effort required to deploy a full-scale system and run the tests.

A couple technical advances have made automation of full-scale system tests possible. First, the advent of commercial cloud computing services, such as Amazon Web Services (AWS), provides a convenient, dynamic backend infrastructure avoiding the need to interact directly with system administrators for machine deployment. Second, working prototypes from the ETICS project have shown the feasibility and benefit of capturing deployment and test information in order to automatically deploy services in grid environments and execute system tests.

SixSq is developing SlipStream™ a framework for the automatic deployment and testing of n-tier and distributed software systems. The framework makes extensive use of cloud computing technologies, and more specifically AWS, to provide dynamic near-production environments for realistic tests of distributed systems. Using the dynamic pool of resources that clouds provide allows the automatic, low-cost deployment of test configurations. This means software projects don't have to procure, deploy and maintain their own test infrastructure, but can use a pay-as-you-go cloud model instead. Software-as-a-Service (SaaS) in this context means that users have a fully available test infrastructure from day one, without upfront investments required.

While the benefit of having the ability to assert, in a continuous integration fashion, the releasability of one's software into production is significant, in-cloud deployment of n-tier architecture systems also brings its challenges. From dynamic ip address allocation to parametric deployment topologies, in-cloud deployment can have a significant and positive impact on the way software systems are deployed, not only for system testing but also for production.

We presented on this topic at the Google Test Automation Conference (GTAC) 2008 in Seattle in October. While our GTAC presentation was focused on background work and lessons learned from prior projects, such as ETICS and EGEE, in this presentation we present our experience from the SlipStream™ alpha testing phase. This presentation will also include a range of use-cases and issues in deployment and test of services using clouds such as AWS, as well as future directions.