Continuous Integration in the Cloud for Everyone

Bachelor Project Proposal, WS 2015/2016 – SS 2016
Software Architecture Group, Prof. Dr. Robert Hirschfeld

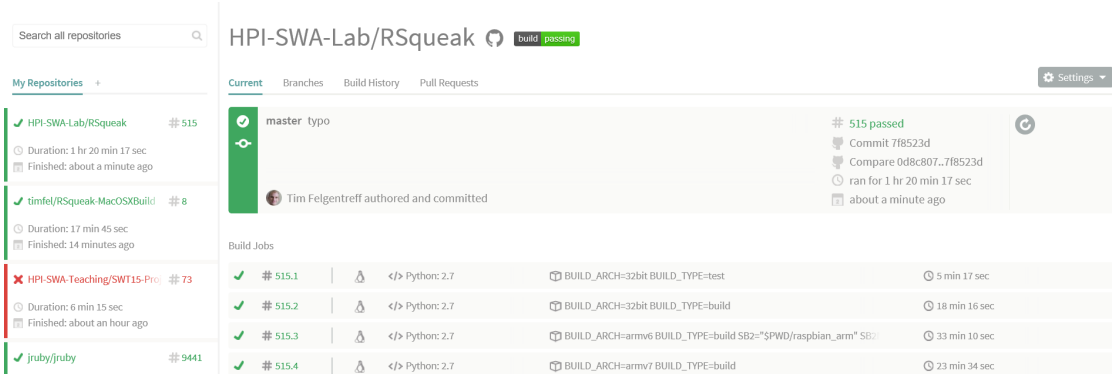
Travis CI

Travis CI (travis-ci.com) is a cloud-based continuous integration (CI) environment that provides CI as a service to open-source projects in many different languages. Using Travis CI for open-source projects in supported languages from Github just means flicking a switch and adding a single file to the project directory.

On each commit to the Github repository, the project's tests run on Travis CI. To that end Travis launches a prepared test container with language specific tools already installed. Ideally, the tests finish within seconds so that developers can have quick feedback if something goes wrong.

Working on Travis with non-standard Systems and Languages

However, using Travis CI with unsupported languages and systems has multiple problems. When no prepared containers for a particular language and system are available, the CI script must fall back to a generic container and download dependencies manually. If these dependencies require root access, they cannot use lightweight containers, but must fall back to fully virtualized machines (VMs). Both the installation of the dependencies and the slowdown through full virtualization often lead to the setup taking much longer than the actual test runs, increasing feedback loops.



The Travis CI interface

The goal of this project is to investigate the requirements of various non-standard projects and languages, including Squeak/Smalltalk, Lively Kernel, and RPython, and find ways to improve their use, setup, and performance with Travis CI. This will potentially involve the creation of tools for these systems to better integrate with Travis, which should help developers review test results and interact with Travis. To facilitate the latter, the implementation of new APIs for Travis CI may be required. Additionally, tools to aid developers in wrapping dependencies in a format that makes it easy and fast to install them on the Travis virtual machines should be constructed.

Implementation

The participants should be comfortable using a variety of languages and Github. The project will involve using Squeak/Smalltalk, the Lively Kernel, and the RPython toolchain as non-standard projects for which Travis CI is currently not optimized. It will also require learning about and extending the Travis infrastructure and their various services that are implemented in Ruby.

Organization

A group of about six to eight (6-8) students may participate in the project. Organization and tasks will be determined by the project participants. The project will be carried out at the Hasso Plattner Institute in Potsdam. Project participants are expected to communicate with our partner via Github issues, email, chat, or voice on a regular basis. All communication will be conducted in English. In WS 2015/2016, participants will work on exploring how Travis CI can be used with non-standard projects. Main steps in design and implementation of a solution are to be executed in SS 2016. Expected results include a working software accompanied by appropriate documentation.

Partner & Contact

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