Diploma/Master Thesis

Provisioning of Pattern-based Cloud Development Environments

Beginning: WS 2012 or earlier
(Thesis may be written in English or German)

Background

One of the advantages introduced by cloud computing is the homogenization of runtime environments, one of the major cost driver in IT management [1]. Rather than maintaining a multitude of version of hardware and middleware, common infrastructure and platform offerings are provided according to the corresponding service model, Infrastructure as a Service or Platform as a Service. These offerings can further be provisioned and decommissioned on-demand using self-service interfaces and APIs. Clouds, thus, hold the opportunity to provision development environments for custom applications in an automated fashion. Best practices for such applications have been captured in human-readable documents, so-called patterns [2] that can be implemented for different cloud providers. The implementation and deployment of such patterns, however, still involves many manual tasks, since the homogenization of the cloud runtime environment has not yet been extended to reoccurring implementations of cloud patterns. Providing patterns not only as human-readable documents but with customizable reference implementations could significantly speed-up the pattern-based development of cloud applications. The provisioning of pattern implementation templates could be automated using the functionality provided by clouds.

Tasks

The main objective of this thesis is to define a method to create customizable reference implementations for cloud computing patterns available at http://www.cloudcomputingpatterns.org. This objective includes the following tasks:

- Development of some reference implementations for cloud computing patterns for different providers (Amazon AWS, VMware, Windows Azure).
- Identification of customization points in such reference implementations.
- Integration of reference implementations into IT systems management tools, such as Chef (http://www.opscode.com/chef/), Puppet (http://puppetlabs.com/) or eCloudManager (http://www.fluidops.com/ecloudmanager/) to automate their provisioning.

Requirements

We assume a basic understanding of pattern-based approaches to document knowledge in computer science. Existing knowledge in the above mentioned development tools would be beneficial.

Literature


Contact

Dipl.-Inf. Christoph Fehling
+49 711 685-88486
christoph.fehling@iaas.uni-stuttgart.de

Supervisor

Prof. Dr. Frank Leymann