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Master Thesis

Auto-Scaling of Cloud Applications

2015-05-13

Context

For service provider it is of utmost importance, to be able to provide one's service at a specific service level, meaning that it needs to fulfill the customer's needs, e.g. regarding response time. This means that scaling the provided application at the right time is crucial for its success. For this purpose several auto-scaling algorithms exist reaching from simple threshold mechanisms offered by the cloud providers to complex solutions requiring deep information about the application.

This thesis takes place in the context of the Cloudiator toolset. The Cloudiator (<https://github.com/cloudiator>) toolset developed by the Institute of Information Resource Management is a management framework for infrastructure as a service clouds. It aims at automating the resource selection and management in cloud computing. In this thesis, the toolset should be enhanced with application profiling capabilities.

Scope of the Thesis

In this work, you should investigate different approaches to enhance our Cloudiator platform with such an auto-scaling capability.

For this purpose you shall research the current state of the art regarding auto-scaling algorithms. Based on this work, you shall select three auto-scaling algorithms each taking a different approach regarding their autonomic mechanism, e.g.:

- action-based: simple threshold ruleset
- utility-based: each state is represented by a numeric utility value, allowing the system to calculate the optimal transition.
- goal-based: states of the system are split in desired / undesirable

As a next step, you shall develop an evaluation strategy, taking into consideration the performance of the algorithms and their applicability for the Cloudiator toolset. Using this evaluation strategy, you shall select the best-fitting algorithm for the Cloudiator toolset.

As a bonus, you provide an implementation of the selected algorithm within the Cloudiator toolset.

Requirements and Comments

If this thesis achieves good progress and outcome, its results are to be integrated in the Cloudiator toolchain which is released under an OpenSource license (APL 2.0 <http://www.apache.org/licenses/LICENSE-2.0.html>). For that reason, we appreciate if you are ready to OpenSource your results.

If you are interested in this or similar theses, please contact Daniel Baur either by mail or directly in his office.

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**Faculty of Engineering and
Computer Science**

Institute of Information
Resource Management

Die Uni-Farben im Überblick

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