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Master Thesis

Profiling of Cloud Applications

2015-05-13

Context

Cloud Computing is one of the major trends that currently exist in information technology. However due to the virtualization technology used for cloud computing, the environment is highly heterogeneous. This means, that i) a lot of different virtual machine configuration exist and b) the virtual offers may be backed with different physical hardware. To be able to select the correct computing offer / virtual server for one's application, the application's physical resource demands need to be know in advance.

This thesis takes place in the context of 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, existing approaches regarding application profiling should be reviewed and evaluated in respect to the demands in the area of cloud computing. Based on this research, an approach to profile running applications should be implemented, using the Cloudiator toolset.

For this purpose, the first step is to analyze the current state of the art of application profiling. This analysis should determine the different key indicators for resource consumption (e.g. CPU/Memory/Network/Disk) used for the later profiling task, and the approaches that can be used to measure these indicators on running applications in a virtual machine. Using the information, the running application should be categorized in respect to its resource consumption (e.g. CPU heavy). As a next step it needs to be investigated, how the current capabilities of Cloudiator (especially its monitoring infrastructure) can support such a task.

Finally, the selected approach should be implemented using the Cloudiator toolset. Missing capabilities for the purpose of this task should be integrated into the toolset. The result of the implementation should be evaluated in comparison to existing approaches, and further optimization approaches should be derived.

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.

mail: daniel.baur@uni-ulm.de
office: Uni West, 43.2.215

Faculty of Engineering and Computer Science

Institute of Information Resource Management

Die Uni-Farben im Überblick

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