

Optimization of Complex Elastic Processes

Reference:

P. Hoenisch, D. Schuller, S. Schulte, C. Hochreiner, and S. Dustdar, "Optimization of Complex Elastic Processes (accepted for publication)," in IEEE Transactions on Services Computing, vol. NN, no. NN, pp. NN-NN, 2015.

Abstract:

Business Process Management is a matter of great importance in different industries and application areas. In many cases, it involves the execution of resource-intensive tasks in terms of computing power such as CPU and RAM. Due to the emergence of Cloud computing, theoretically unlimited resources can be used for the enactment of business processes. These Cloud resources render several challenges for Business Process Management Systems to ensure a predefined Quality of Service level during Cloud-based process enactment. Therefore, new solutions for process scheduling and resource allocation are required to tackle these challenges.

Within this paper, we present a novel approach to schedule business processes and optimize the used Cloud-based computational resources in a cost-efficient way, thus realizing so-called elastic processes. For that, we specify the Service Instance Placement Problem, i.e., an optimization model which defines the setting of how service instances are scheduled among resources. Through extensive evaluations we show the benefits of our contributions and compare the novel approach against a baseline which follows an ad hoc approach.