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**Optimizing Autonomic Resources for the Management of Large Service-Based Business Processes**

**Abstract**

Cloud Computing, as a distributed computing paradigm, consists of the provisioning of infrastructure, platform, and software resources as services. This paradigm is being increasingly used for the deployment and execution of service-based business processes. To efficiently manage them according to the autonomic computing paradigm, service-based business processes can be associated with autonomic managers that monitor these processes, analyze monitoring data, plan configuration actions, and execute these actions on these processes. Although, during these last years, autonomic management of cloud services has received increasing attention, the optimization of autonomic managers to be assigned to cloud services remains not well explored. In fact, almost all the existing solutions on autonomic computing have been interested in modeling and implementing autonomic mechanisms without making any effort to optimize the number of used autonomic managers. Moreover, when it comes to large service-based business processes, optimization of management resources becomes a critical issue. To overcome this issue, we present in this paper a novel approach to determine how many autonomic managers to use for the management of large service-based business processes in order to minimize their cost while avoiding management bottlenecks. Experiments conducted on three different types of datasets highlight the effectiveness of our approach.