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Abstract

An approach to optimize the deployment of microservices-based applications using containers in multi-cloud architectures is presented. The optimization objectives are three: cloud service cost, network latency among microservices, and time to start a new microservice when a provider becomes unavailable. The decision variables are: the scale level of the microservices; their allocation in the virtual machines; the provider and virtual machine type selection; and the number of virtual machines. The experiments compare the optimization results between a Greedy First-Fit and a Non-dominated Sorting Genetic Algorithm II (NSGA-II). NSGA-II with a two-point crossover operator and three mutation operators obtained an overall improvement of 300% in regard to the greedy algorithm.

Keywords

Microservices Cloud computing Container orchestration Genetic algorithm
Multi-objective optimization

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Notes

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