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DESRP: an efficient differential evolution algorithm for stochastic demand-oriented resource placement in heterogeneous clouds☆

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Abstract

Geographically dispersed online services receive user requests from all over the world, and the dramatic fluctuation in the user requests that arrive then introduce stochastic demands for various resources. Based on distributed cloud platforms, the application service provider must find the optimal resource placement for maximizing revenue under constraints. Nevertheless, simultaneously considering demand stochasticity and pricing heterogeneity significantly increases problem complexity. To address the problem, we propose an efficient differential evolution algorithm for stochastic demand-oriented resource placement (DESRP). Experiments using simulated and realistic data indicate that with less than triple the time cost, DESRP outperforms existing algorithms and can increase revenue by up to 27%.

Keywords: Resource placement, Stochastic demand, Heterogeneous clouds, Pricing function

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