A Simplified Particle Swarm Optimization for Job Scheduling in Cloud Computing

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Authors:

Ibrahim Attiya, Xiaotong Zhang

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Abstract

Recent advances in various areas such as networking, information and communication technologies have greatly boosted the potential capabilities of cloud computing and made it become more prevalent in recent years. Cloud computing is a promising computing paradigm that facilitates the delivery of IT infrastructure, platforms, and applications of any kind to consumers as services over the internet. Although cloud computing systems nowadays provide better ways to accomplish the job requests in terms of responsiveness and scalability under various workloads, scheduling of jobs or tasks in cloud environment is still NP-complete and complex in nature due to the dynamicity of resources and on-demand user application requirements. In this paper, a simplified version of particle swarm optimization (PSO) algorithm is proposed to solve the job scheduling problem in cloud computing environment. To evaluate the performance of the proposed approach, this study compares the proposed PSO strategy with genetic algorithm (GA), by having both of them implemented on CloudSim toolkit. The results obtained demonstrate that the presented PSO algorithm can significantly reduce the makespan of job scheduling problem compared with the other metaheuristic algorithm.
evaluated in this paper.

References


Index Terms
Computer Science       Distributed Systems
Keywords

Cloud computing, job scheduling, makespan, particle swarm optimization, resource allocation.