

A PSO-Based Task Scheduling Improved by Load-Balancing Technique for Cloud Computing Environment

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ABSTRACT

Cloud computing has attracted many researchers and users over the last few years due to the considerable advantages that cloud services provide for their consumers regarding cost and efficiency. Task scheduling in cloud environment is responsible for assigning tasks to virtual machines in a way to consider user requirements in the one hand and to increase resource utilization in the other hand. It is generally a NP-hard problem. In this paper we present a static task scheduling method based on Particle Swarm Optimization algorithm. We have improved our method to increase the resource utilization and performance, reduce make span time and keep the whole system balanced. The proposed method also considers performance of the base PSO method using a load balancing technique to produce better initial population. We have compared our method to Round Robin task scheduling, base PSO task scheduling and a load balancing technique. The simulation results show that our method outperforms all of the mentioned algorithms. It improves resources utilization by 22% and reduces the make span duration by 33% comparing to the base PSO algorithm.

Keywords: Cloud Computing, Scheduling, Particle Swarm Optimization, Load Balancing, Resource Utilization.