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Task scheduling of cloud computing using integrated particle swarm algorithm and ant colony algorithm Xuan Chen¹ · Dan Long² Received: 29 September 2017 / Revised: 25 November 2017 / Accepted: 3 December 2017 © Springer Science+Business Media, LLC, part of Springer Nature 2017

1 Introduction

Abstract The optimization of task scheduling in cloud computing is built with the purpose of improving its working efficiency. Aiming at resolving the deficiencies during the method deployment, supporting algorithms are therefore introduced. This paper proposes a particle swarm optimization algorithm with the combination of based on ant colony optimization, which proposes the parameter determination into particle swarm algorithm. The integrated algorithm is capable of keeping particles in the fitness level at a certain concentration and guarantee the diversity of population. Further, the global best solution with high accurate converge can be exactly gained with the adjustment of learning factor. After the implementation of proposed method in task scheduling, the scheme for optimizing task scheduling shows better working performance in fitness, cost as well as running period, which presents a more reliable and efficient idea of optimal task scheduling. **Keywords** Cloud computing · Particle swarm algorithm · Ant colony optimization · Task scheduling

1 Introduction Cloud computing have been studied for several years already since Ramnath Chellappa's work [1] and developed in several different fields by a number of researchers in the past decade [2]. Cloud computing in commercial use must balance Xuan Chen 734140999@qq.com ¹ Zhejiang Industry Polytechnic College, Shaoxing 312006, China ² Zhejiang University, Hangzhou 310007, China and requirements of fast response, cost controlling and algorithm reliability [3]. The trend towards highly-integrated cloud computing system is gradually being implemented to back up or replace the traditional data analysis strategies [4,5]. Thus, the task scheduling step is deemed best able to meet the efficiency and stability demands. Nowadays, the promises of cloud computing have led to the development of task scheduling scheme, with the employment of intelligent algorithm as well as statistical experience [6]. The architecture of task scheduling is sufficiently robust to huge number of tasks so as to ensure the computing