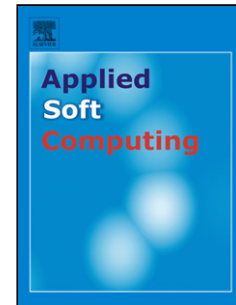


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On Scheduling Transactions in a Grid Processing System considering load through Ant Colony Optimization

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Abstract

Load balanced transaction scheduling problem is an important issue in distributed computing environments including grid system. This problem is known to be NP-hard and can be solved by using heuristic as well as any meta-heuristic method. We ponder over the problem of the load balanced transaction scheduling in a grid processing system by using an Ant Colony Optimization for load balancing. The problem that we consider is to achieve good execution characteristics for a given set of transactions that has to be completed within their given deadline. We propose a transaction processing algorithm based on Ant Colony Optimization (ACO) for load balanced transaction scheduling. We modify two meta-heuristic along with ACO and three heuristic scheduling algorithms for the purpose of comparison with our proposed algorithm. The results of the comparison show that the proposed algorithm provides better results for the load balanced transaction scheduling in the grid processing system.

Keywords: Grid Processing System; Load Balanced Transaction Scheduling; Ant Colony Optimization.

1. Introduction

A lot of work has been done on scheduling tasks of processes/jobs with load balancing and without load balancing in different distributed computing environments including grid system. Transactions have peculiar nature regarding their computation operation and their completion on various nodes of a grid processing system, and hence scheduling of transactions of a grid processing system deserves special attention. Load-balanced transaction scheduling problem is the problem which consists in determining the node for the transaction execution by optimizing the load [1].

We define grid transaction as a group of operations executed to perform some specific functions by accessing and updating a database [2]. It consists of various service calls executed by different peers of the grid [3]. It refers to a reliable and coherent process unit which interacts with one or more systems, independently of the other. It is one of

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