

An Evolution-based Dynamic Scheduling Algorithm in Grid Computing Environment

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Abstract

Grid computing can integrate computational resources from different networks or regional areas into a high performance computational platform and be used to solve complex computing-intensive problems efficiently. Scheduling problem is an important issue in a grid computing environment, because of the heterogeneity of computing resources. This paper proposes an evolution-based dynamic scheduling algorithm (EDSA) for scheduling in grid computing environments. The proposed algorithm uses the genetic algorithm as search technique to find an efficient schedule in grid computing and adapts to variable numbers of computing nodes which has different computational capabilities. Furthermore, the hybrid crossover and incremental mutation operations within the algorithm can move the solution away from the local-optimal solution towards a near-optimal solution. And, a simulation with randomly generated task sets was performed to compare the performance with five other scheduling algorithms. The results show that the proposed EDSA outperformed all other schedulers across a range of scenarios.

Keyword : Genetic algorithm, grid computing, heterogeneous, scheduling algorithm.