

Localized job scheduling system using cooperative and system-centric scheduling policy for market-oriented grids

Abstract:

In grid scheduling systems, a major challenge is to manage the consumers' job based on their Quality of Service (QoS) and provider nodes' satisfaction. Most of the capable job scheduling policies operate on the basis of meta-scheduling systems that may result in a complex management with overcrowding probability in market-oriented grids. Therefore, the need for an efficient job scheduling algorithm based on the local scheduling policy is vital to reduce overcrowding in the meta-scheduling system. This paper presents an efficient scheduling approach concerning the localization of job scheduling policy. This approach adapts appropriate computing nodes to jobs by taking their throughput into account and QoS requirements. The job management policy of the proposed scheduling approach focuses specially on increasing the job submission rate using accurate estimation procedure and completing the submitted jobs within defined deadline. Experiments were designed to study the performance of the proposed job scheduling approach. We compared the performance of the proposed approach with other popular algorithms and policies based on general and standard metrics. Results show an increase in the performance and user satisfaction criteria. Additionally, the overdue time for jobs which is a main concern in market-oriented grid computing systems was significantly improved.