The Study of Real-Time Scheduling Using Multiple Schedulers in the Cloud Environments

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ABSTRACT

The emerging Cloud computing has become the de facto distributed computation. It only requires a portal that users can use services provided by distributed computing, and the portal needs to select the machine what provide services for user. The environment is dynamic in the sense that the arrivals of user requests are unpredictable and due to this versatility, traditional scheduling algorithms fail to match user requests to the most feasible processing elements because no prior knowledge about the requests is available until they arrive at the schedulers. The situation is getting worse particularly in a large scaled system, in which the single scheduler is often the bottleneck that the queue is congested with a large amount of user requests. One of the solutions to this problem is to use multiple schedulers. However, the scheduling complexity can rise dramatically since a scheduler must consult others and maintain a global state of all processing elements in order to generate a feasible plan. Sometimes the imposed costs of synchronizing the schedulers and processing elements can turn into the major cause of system degradation. In this research, we take the resource competition approach in which the schedulers compete for the resources without acknowledging other competitors and the processing elements accept only the first request arrives and reject the others. We conduct thorough simulations, and the results about scheduling complexity and processing elements' utility are positive.

Keywords : Cloud Computing、Resource Competition、Distributed Scheduling

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