Abstract

Desktop grids are usually equipped with hundreds or thousands of desktops which use the idle cycles of desktop PCs of small enterprises and institutions. From conventional multi-site cluster grids, desktop grids vary markedly in terms of their dynamic nature. In terms of their dynamic nature such grids vary markedly from conventional grids. This causes the need of new scheduling algorithms, tailor-made for such systems. Such desktop grids become worthwhile research issue since the nature of these grids attract highly parallel algorithms, designing efficient scheduling algorithms of parallel jobs on desktop grids. A SLA based adaptive scheduling framework (ASF) for desktop grids has been presented in this paper, where based on a resource selection algorithm after SLA verification that set by the users' tasks are assigned to different available grid resources. Based on a given set of parameter and previous execution log in an adaptive (flexible) manner the resource selection algorithm, which works in an online mode, selects resources. Whether the user submitted jobs can be executed within the deadline and other constraints specified in the SLA or not the execution log decides. Choosing the most relevant computational parameter depending upon the tasks that are assigned to grid resources is also decided by it during task execution. Later, if performance of
any task degrades during the task execution, then adaptive algorithm assists the scheduling policy to adapt the system to achieve the high throughput by re-scheduling to either the server node or to the best available local node at present. Unpredictable execution conditions commonly encountered on desktop grids which can violate the SLA constraints set by the user can also be handled by this method. In this paper, for setting up desktop grid test bed GridGain 2.0 has been used and the performance of the aforesaid SLA based adaptive scheduling framework has been presented.

References


Index Terms
Computer Science
Parallel Computing

Keywords
Adaptive execution desktop grid GridGain rescheduling performance tuning service level agreement