Enhancing QoS Workflows Performance by Using Elastic Advance Co-Reservations*

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Abstract

Many researches showed the ability of advance reservation to improve the predictability of the system; that allows it to deliver the applications required time constrains. Applications with many tasks require the system to ensure a number of reservations on many different distributed resources, which usually carried out through multi-level negotiation adding by that additional overhead on the application total response time. The extra overhead depends on many parameters including system workload and contention. Workflows add more complexity due to their tasks' dependencies; thus, any rejection of or delay for a task reservation would increase application complete time.

This paper suggests the use of elastic advanced reservation plans that depend on time gaps presented in the sub-optimal schedules, in order to improve the reservation acceptance rate. It presents an elastic co-reservation agent which provides the needed reservations using First Fit allocation strategy.

The results show the ability of the proposed agent to *always* improve the acceptance rate with an average of (22.25%). The more important came out result is the agent ability to increase the reservation acceptance rate with the increasing of system competence, reaching (48.4%) for simultaneous 90 users at the system.

Keywords: Utility Computing, Workflows, Scheduling, Co-Allocation, Advance reservation, Elastic reservation.

* For the paper in Arabic see pages (411-424).

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