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Abstract

SWf (Scientific Workflows) are vastly used in scientific domains and typically include non-preemptive and preemptive tasks. Cloud computing facilitates an appropriate ways to access cloud resources as a “pay-as-you-go" model and several resources such as, reserved, on-demand and spot instances are offered by the cloud service providers. The spot instance renting price is less as compared to on-demand instances. But, failures happen due to difference in the instance bid price. Henceforth, it is a challenge to schedule the preemptive and non-preemptive tasks of SWf onto appropriate spot and on-demand spot instances. Therefore, in this paper a SWf scheduling problem using both spot and on-demand instances are considered and the main objective is to reduce the total execution cost under deadline constraints. An efficient rule-based scheduling algorithms are proposed to schedule non-preemptive and preemptive tasks of SWf. The algorithm considers three different rules such as, maximum number of successors, minimum processing time, and minimum slack time to schedule SWf efficiently. Experimental results demonstrate the effectiveness of the proposed rule-based task sequence initialization and virtual machine selection algorithms for different SWf

sizes.

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Index Terms

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Keywords

Cloud Computing, Scientific Workflows, Scheduling, Preemptive, Non-Preemptive, On-demand, Spot, Virtual Machine