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HTCaaS(HTC as a Service): A Large-scale HTC Problem Solving Environment Using Distributed and Heterogeneous Infrastructures

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Content :

With the growing availability of computing resources such as grids, supercomputer and clouds, it becomes possible to solve complex HTC problems by utilizing as many computing resources as possible. However, it is still difficult for normal researchers without much knowledge of computer to learn and utilize a variety of computing resources. Also, it is challenging to effectively use and manage all available resources that are usually under control by resource providers. We present a HTC Problem Solving Environment for efficient large-scale distributed computing on heterogeneous infrastructures. First, by providing a simple and uniform WS-Interface, it protects users from the complexity of using heterogeneous computing resources. Second, it hides the instability of underlying resources by providing fully automatic job submission and failure management. It reduces the user work overhead for handling a large amount of jobs. Finally, it minimizes the total execution time of a sequence of user jobs by effectively using resources. It uses user-level job scheduling with a dynamic workload balancing algorithm that automatically selects more responsive and effective resources, based on the actual resource statistics from agents. We demonstrate the architecture of the system and how it works with simple examples.

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