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HTC Service Environment: A large-scale HTC Problem Solving Environment using Distributed and Heterogeneous Infrastructures

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Overview

We present a HTC Problem solving environment for efficient large-scale distributed computing on heterogeneous infrastructures. It protects users from the complexity of using different computing resources and minimizes the execution time of a sequence of jobs by using the resources more efficiently. We will demonstrate the architecture of the system and how it works with simple examples.

Impact

The HTC Service Environment focuses on how to effectively handle a large amount of jobs. Since it provides a simple and uniform web service interface to users, any GUI clients can simply access to the environment and run their jobs. It greatly improves users convenience. In addition, it is possible to submit jobs to on-demand resources like Clouds using Ganga. The HTC Service Environment helps users to execute their jobs on distribute and heterogeneous resources more easily and faster and to improve research productivity.

Description of the work

The main contributions of HTC Service Environment are as follows. First, it minimizes the execution time of a sequence of user jobs by using the resources more efficiently. It uses user-level job scheduling with dynamic algorithm that automatically selects more responsive and effective resources, based on the actual resource statistics from agents. Second, it protects users from 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 provides a simple and uniform interface to different distributed computing systems via Ganga, which is a tool for computational-task management and easy access to Grid resources. Ganga hides the complexity of using different resources from users.

Conclusions

We introduced a large-scale HTC Problem Solving Environment using Distributed and Heterogeneous Infrastructures. We expect that the HTC Service Environment will make it possible to effectively use many distributed and different resources and reduce the time of research process by reducing the user workload to handle a large amount of jobs and also improve research productivity.

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