

Constructing a Fuzzy Logic-Based High Performance Computing Environment: A case study of an IC Design House

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Abstract

Because of the advances in IC manufacturing, designing IC has become more complicated. Processing extensive data has become very costly in terms of time needed. In order to shorten the developing time and thus promote the competitive advantage of an enterprise, the help of Electronic Design Automation (EDA) is necessary. Using EDA used to require a very complicated workflow. A computing host had to be selected using either a random or a sequential approach, then a license had to be requested from the License Server. For the users, this workflow was too time-consuming. There was further a strong probability that an incorrect computing host would be chosen. In order to solve the above problems, a Sun Grid Engine based Resource Broker Framework (SGRBF) is proposed. When jobs were submitted, the Load Sensor Module in the Resource Broker would automatically manage and request the license which was needed by the application. When the request was accepted, the Job Scheduling Module would dynamically determine the load status of the computing hosts and select the fittest one to execute the job. Because of this integrated and convenient framework, all the complicated and time-consuming job assigning processes could be avoided and the executing of jobs could be improved. In order to prove the performance of this framework, practical experiments were done. Based on the experimental results, this Resource Broker Framework (SGRBF) could utilize both software and hardware resources more efficiently and thus perform better.

Keyword : IC Design, EDA tool, Heterogeneous, Fuzzy Logic, Resource Broker Framework.