

## **A Study of Designing a Grid-Enabled Expert System Language**

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### Abstract

Because enriching grid applications is crucial to promote grid computing and grid economy, in this paper we focus on how to attract expert system programmers to run their applications on grid systems. CLIPS is a rule-based language designed to help construct expert systems more easily because it is not required to design an algorithm to solve any problem. Instead, it relies on the CLIPS inference engine to draw a conclusion from the known facts and rules. However, because of the language's characteristics, it is very time-consuming to execute a CLIPS application when compared with other algorithmic languages. To address the problem, we propose to execute a CLIPS-based expert system in parallel by emerging cluster and grid systems in this paper. To achieve the goal, CLIPS has to be extended with new syntax to be a parallel version. In addition, we propose to adopt the SPMD computational model for programming to maintain parallel CLIPS applications in an easier way. According to experimental results, it is appealing to run CLIPS-based expert systems in parallel on cluster and grid systems by adopting our approach because the performance improvements can be superlinear.

Key words: Grid computing; Parallel computing; Expert system;  
Programming language