Reusing Legacy Applications for Grid Computing *

Yu Huashan, Xu Zhuoqun, Ding Wenkui
School of Electronic Engineering and Computer Science, Peking University
Beijing, 100871, P.R. China
Email: yuhs@ailab.pku.edu.cn **Tel:** 010-62754248

ABSTRACT

In scientific computation domains, there are a large number of legacy applications that run on MPPs, clusters and workstations for daily work. One single application alone is generally restricted in computability and cannot meet the requirements of modern scientific problems. This paper presents a component model AOD for coordinating them to solve complex problems on the computational grid. Based on the software component technologies, legacy applications and their target platforms are encapsulated to be grid-programming components on the computational grid. Every grid-programming component provides a set of domain-termed operators that can be referred in grid applications to perform specific computation. A grid-programming component also encapsulates the domain-specific expertise for implementing its operators with the encapsulated resources. The AOD represents every grid application as an acyclic and directed graph that describes a workflow of references to operators provided by grid-programming components. These referred grid-programming components are invoked and coordinated by the AOD at runtime. We have developed a prototype of AOD, and an experimental result is presented to evaluate the implementation.

Keywords: Computational Grid, Software Component, Legacy application, Concurrency.

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