



Diplomanden- und Doktorandenseminar
des Instituts für Informatik

Workflow Scheduling for the German D-Grid Using a Two-Tier Approach

Dipl.-Inf. Dietmar Sommerfeld, Rechenzentrum
der Max-Planck-Gesellschaft in Göttingen

In this talk we examine the adaptation of life science applications to Grid computing in the context of MediGRID which is part of the German D-Grid. We describe how an application is represented as a Petri net workflow comprising several tasks, which are automatically distributed to appropriate Grid resources by a workflow engine.

Afterwards we analyze the availability of resources in D-Grid and present three methods to estimate queue waiting times for the prevalent cluster resources. Additionally, we propose three selection algorithms to automatically select the best current estimation method. Our evaluation shows that prediction works very well and recognizes the peaks in waiting times that last up to hours.

For the mapping of workflow tasks to resources we propose and evaluate a two-tier approach that combines scheduling strategies for workflows and Grids and is suitable for production environments. The first tier uses a list scheduling heuristic to create a prioritized list of tasks. The second tier performs a just-in-time mapping of tasks to resources according to queue waiting times. The approach is integrated into the MediGRID workflow engine and assessed by measurements that demonstrate a significant acceleration in workflow processing compared to the existing strategies.

Dienstag, den 13.12.2011

13 Uhr s.t. in Raum 106, IfI, Julius-Albert-Straße 4