



Grid Workflow Management

Fraunhofer Enterprise Grids
<http://www.epg.fraunhofer.de>

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Executing complex processes in heterogeneous distributed computing environments is a major goal in applying Information and Communication Technologies in industry and science. While several tools are established in the market for modelling pure business processes, until now only few products support process execution in Grid environments. They are applicable mostly to restricted categories of processes. Often they also require user knowledge about the underlying platforms and software components.

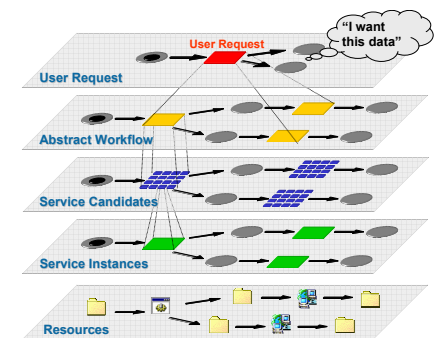
Managing complex, distributed processes

The Grid Workflow Management System developed by Fraunhofer FIRST enables automation and interactive monitoring of complex processes executed in Grid environments. A unique feature of the solution is the completely virtualized resource allocation based on abstract modelling of the process structure and the powerful resource description formalism. The user is able to invoke workflows without any knowledge of underlying hardware and software specifics, allowing her to concentrate on the real focus of her work.

Technology

The process modelling language of the *Grid Workflow Management System* is based on the sound theoretical foundation of Petri Nets, enabling formal analysis, verification and optimization of workflows. The *Grid Workflow Execution Service* (GWES) is the system's core component, controlling the execution of workflows and maintaining a persistent image of their state in a XML database. The GWES is implemented as a standard Web Service,

thus easing its integration into existing IT infrastructures and business processes. An intuitive user interface is available as a JSR168-conformant Java portlet which can be smoothly integrated into existing portal solutions (e.g., GridSphere). The Grid Workflow Management System is compatible to several Grid middleware stacks (such as Globus Toolkit, Condor, PBS, Web Services) and platforms (Windows, Linux, Unix).



Complete resource virtualization: suitable resources are allocated automatically

Application domains

The system is currently being used by a number of projects in various domains such as bioinformatics, traffic management, flood forecasting, environmental risk analysis, and in enterprise resource planning. The licensing allows free use for scientific or educational purposes.