



D-GRDL

Describing and Locating Resources in IT Environments

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

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For the execution of complex processes in heterogeneous distributed computing environments, locating resources is an essential topic. It is the basis of IT support for virtualized execution of complex processes in industry and science.

Locating Suitable IT Resources for Executing Complex Processes

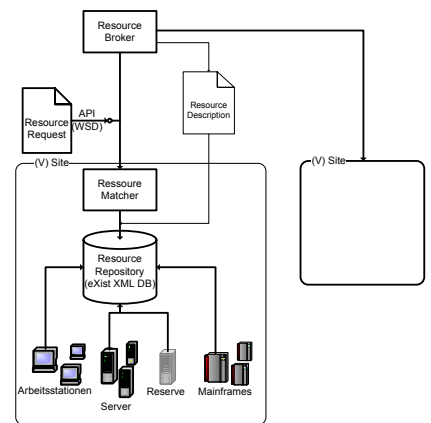
In order to describe and locate resources in IT environments, Fraunhofer FIRST developed the universal *D-Grid Resource Definition Language* (D-GRDL). With its help, users can define resource properties, classify resources and relate them to each other. Using this language, it is possible to rapidly find suitable resources (e.g. hard- and software) for executing single process steps. For this purpose, the description language D-GRDL also features a suitable request and a corresponding response language.

Further software tools for generating descriptions, for integrity checks and for the evaluation of requests support the formation and use of comprehensive unified resource repositories, which due to the D-GRDL's flexibility are able to comply with, e.g., the popular *GLUE Schema*, too.

Technology

The description, request and answer languages are specified forms of the Extended Markup Language (XML), thus the syntax being fixed by XML schemas and the semantics being specified in a formal-logical way. Users can create and edit resource descriptions in the D-GRDL language via a web portal implemented by Fraunhofer IAO. The resource descriptions are persistently stored in an XML database.

A *resource checker* is provided to validate the integrity of existing or newly-created descriptions. Inconsistencies found during validation will be shown for correction. A *resource matcher* translates resource requests into semantically equivalent XQuery XML database queries, which upon execution directly yield descriptions of matching resources. By exploiting the raw performance of the highly optimized XML database system, this is a very efficient approach.



Locating suitable resources in distributed IT environments using D-GRDL descriptions

Application Domains

The D-GRDL and especially the *resource matcher* are successfully being used in projects of diverse industries, e.g., in medical image processing together with the *Grid Workflow Execution Service* (GWES) developed by Fraunhofer FIRST.

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