

Abstract

For Master's Certification on the topic:
"Ontology-based Grid portals for knowledge"
by Vadim Khondar

The Relevance

With the increasing amount of information available, tools that enhance the efficiency of information analysis become especially important. For the effective implementation of these tools, it is necessary that the information and processes were handled semantically, that is, had a related machine-processable description of its meaning. The task of Grid technologies is to make it possible to process large volumes of data. Consequently, the ways of combining these two technologies - Semantic Web and Grid - are very interesting. One of the points of their intersection is the resource access portal. Therefore, the problem of defining the ways to use semantic technologies to enhance portal functionality is relevant.

Development of Semantic Grid Portal is an integral part of the State program "Establishment of a national Grid-infrastructure for science and education".

The Purpose

The purpose of this thesis is to identify parts of the existing infrastructure that can be improved by means of semantic technologies, analyze the necessary tools required for the development of semantically-enriched Web applications, explore possible problems in this process and define requirements to the portal content.

Problems Solved

For achievement of the purpose in work following tasks have been solved:

- research of basic features of semantic technologies;
- the analysis of achievements in a direction of integration of semantic web and Grid;

- formation of recommendations concerning structure and functions of a semantic Grid-portal;
- development and research of a semantic Web application.

Results Achieved

Having solved the problems put in work, the author defends:

- set of recommendations concerning development of a semantic portal;
- choice of means for implementation of semantic system for aggregation of the resource information in Grid.

Scientific novelty

The scientific novelty of this thesis lies in systematization of data on ways of the use of semantic technologies and the process of development of semantic applications. Existing researches have focused on individual aspects of the work and the application of semantics, which complicates the perception of the whole picture of its purpose and essence. This thesis gives versatile representation of the main points of semantic technologies.

According to the results of the research, presentation was made at the conference "System analysis and Information Technology 2010" on "Ontology Development Tools". The article titled "Semantic Technologies in Grid" was prepared for the digest "Systems Analysis and Cybernetics" (in print).

The practical value

By the results of analysis the semantic system of Grid-resource information aggregation has been offered and implemented.

Findings

The work presents the review of existing achievements in sphere of application of semantic technologies in Grid and gives analyse of semantic metadata instruments.

- 1) the basic requirements to functionality of a semantic portal of knowledge are defined;
- 2) recommendations concerning process of development of semantic Web applications are developed;
- 3) the short description of the developed implementation of a semantic Grid-resource information system is given.

Thesis on 127 pages, includes 33 illustrations and 1 table. Bibliography consists 39 different sources.

Keywords: SEMANTIC GRID, SEMANTICS, PORTAL, PORTLET, METADATA, ONTOLOGY, WEB SERVICE, AGENT, RESOURCE, SEMANTIC SEARCH, SEMANTIC TECHNOLOGIES.