

Abstract

Development and implementation of Grid infrastructures in case one of the pillars of modern science. Semantic Grid is a new evolutionary round of Grid technologies. Due to the deep semantics that all Grid entities are provided, it enables a larger infrastructure with deeper interaction between their components.

Semantic metadata is the key notion of Semantic Grid. Metadata gives deep meaning to all phenomena and processes in this infrastructure. This work is intended investigation of semantic metadata and data in Grid environment. Without a detailed understanding of the aspects of metadata use, creation, cooperation and modification we can't use them effectively, and thus can't build Semantic Grid.

Development and implementation of Semantic Grid is one of the parts of the state program "Creation of a national Grid-infrastructure for science and education".

The purpose of this work is to systematize and summarize approaches in dealing with semantic metadata research issues and "pitfalls" that may be encountered on the path of construction means and methods of metadata management in particular, and efficient development infrastructure of the Semantic Grid as a whole. It has been made a survey of existing implementations and architectures, to identify further development matters vector.

The objects of this study are the semantic metadata in a Grid environment: annotations, ontologies, semantic links and information and resources that they describe. The subject is a study of properties of metadata and ontologies, how they are implemented and used.

Scientific novelty of this work is in systematic and comprehensive consideration of semantic metadata in the Grid. Most studies on this issue are centered around certain aspects of the life cycle or the use of metadata, or focus on specific implementations and development in the specific areas. This work can serve as a starting point in the study of architecture and development of Semantic Grid in Ukraine.

According to this work a report was made at the "System Analysis and Information Technologies 2010" Conference on "Data and metadata in the Semantic Grid". The article "Organization of Metadata in Semantic Grid" was published in the "Cybernetics and Systems Analysis" journal (in print).

Keywords: Semantic Grid, metadata, ontology, semantics, data, information, knowledge, service, resource, workflow, semantic binding, service-oriented approach, agent.