A Simplified Access to Grid Resources by Virtual Research Communities

In the current scientific activities Science Gateways are playing important roles and their relevance will further increase with the development of more efficient network technologies and bigger Grid infrastructures. Through the highly collaborative environment of a Science Gateway, users spread around the world and belonging to different organisations can easily cooperate to reach common goals and exploit all the resources they need to accomplish their work. A Science Gateway is defined as “a framework of tools that allows scientists to run applications with little concern for where the computation actually takes place. This is similar to cloud computing in which applications run as Web services on remote resources in a manner that is not visible to the end user. However, a science gateway is usually more than a collection of applications. Gateways often let users store, manage, catalogue, and share large data collections or rapidly evolving novel applications they cannot find anywhere else. Training and education are also a significant part of some Science Gateways”. A major task of a Science Gateway is the mapping of each user to the available services, denying the use of not authorised resources. This mapping complies with the role of users inside the Virtual Research Community. Users operating in a Science Gateway usually belong to different organisations having their own security policies and these have to be maintained by the Virtual Research Community. As a result, the security chain inside the Science Gateway has to hide the security mechanisms of the technologies underneath and to allow each institution to keep the control of their users. In this paper we present a new Science Gateway, built in the context of the EU DECIDE project, which has the goal of designing, implementing, and validating a Science Gateway for the computer-aided extraction of diagnostic markers from medical images for the early diagnosis of Alzheimer Disease and Schizophrenia. The DECIDE portal merges three levels of security mechanisms to allow users access Grid resources based on the credentials provided by their institutions. The idea is to combine Shibboleth2 System identities with X.509 “robot” certificates. The former enable the federation of organisations having different authentication policies while the latter allow access to Grid resources by individuals not owning any personal certificate. The combination is done through the use of a LDAP back-end that implements a mechanism to map authorised users on Grid resources. The approach done inside DECIDE is very general and provides users, belonging to Virtual Research Communities, with a single sign-on mechanism on Science Gateways built on top of computing and storage resources owned by different organisations. The implementation of the DECIDE Science Gateway has been done using Liferay as portal framework taking advantage of its capability to smoothly integrate additional security mechanisms and a whole set of web 2.0 tools and services.

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