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Standardisation Strategies of the European Middleware Initiative

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Description of the Work

This paper will provide an overview of the standard adoptions and strategies carried out by the EMI project. One of the goals of EMI is to describe each service with the OGF GLUE2 standard in order to achieve a common EMI information ecosystem. Another key standard is the OGF Usage Record Format (UR) that is a normative schema for tracking resource usage. Since it essentially stands for computational resource usage information, EMI works not only on its evolution, but also on its extension towards storage resource tracking. In terms of security, the Security Assertion Markup Language (SAML) from OASIS is very well known in the industry, but also recently more and more in the scientific domain and thus relevant for EMI. Also many EMI products adopt this promising security standard thus paving the way of being used by new user communities interested in modern security setups. The eXtensible Access Control Markup Language (XACML) is the counterpart to SAML providing a very strong language for the definition of security policies used during authorization decisions. XACML is developed by OASIS and is also relevant to EMI especially in defining common attribute-based authorization policies across the different Grid middleware systems in EMI. Other important open standards is the Job Submission and Description Language (JSDL) and the closely related OGF OGSA-Basic Execution Service (BES) specification that makes use of JSDL in order to submit jobs to computational resources. Initial OGSA-BES/JSDL adoptions have been used in production setups leading to several additional requirements in terms of functionality. Therefore, EMI worked on an EMI execution services specification with numerous improvements in order to contribute to an improved version of this standard for production DCIs. Other standard adoptions include adoptions of OGF Storage Resource Manager (SRM) as well as WebDAV.

Conclusions

We can conclude from the findings of the EMI standards adoptions that it provides many benefits to the community in various areas of interest reaching from end-user satisfaction to technology effectiveness. But we can also conclude that the creation of specifications and adoption of open standard with subsequent deployments takes quite some time. One of the detailed conclusions we present in this paper is therefore that the standardization beyond project lifetimes within communities need to follow a greater framework or reference model. Like ISO/OSI and TCP/IP, we argue in this contribution, that the case can be made to adopt a reference model with many relevant standards that already exist and that needs to be tuned in order to get more efficient with some applications. In this sense, EMI contributes enormously to one greater reference model that governs a reference architecture based around open standards. This enables a separation between architecture and its implementation.

Impact

In the context of EMI, a common open standard is any standard developed by a standardization development organisation (SDO) following an open process and being commonly relevant to the e-Science community. They are normatively defined and publicly available. In principle, EMI works with standards that are normatively defined in specifications while some of them are still considered as so-called emerging open standards when these are not implemented by many technology providers yet. One important SDO relevant in the context of EMI is most notably the OGF with standards like GLUE2, SRM, GridFTP, WS-DAI, ByteIO, PGI/OGSA-BES/JSDL, UR, and others. EMI adoptions thus cover a broad range of OGF standards and thus EMI can be considered as one of the major adopter of OGF standards in various technical areas. Apart from OGF, EMI also adopts various standards from the Organization for the Advancement of Structured Information Standards (OASIS) such as SAML, XACML, and WS-Trust. This offers the potential to have interoperable technologies with mainstream Web-driven solutions in Business and e-Government deployments since OASIS is mostly steered by them. Finally, standards from the Internet Engineering Task Force (IETF) are adopted such as X.509-based Public Key Infrastructure (PKI). All in all, the EMI project has quite some impact in terms of standard adoptions and their practical use in world-wide distributed systems through their deployments in EGI, PRACE, and other DCIs. The broad standard adoption enables trust in technologies by end-users since standard-based solutions prevent vendor-locks. They also enable end-users with the possibility to choose the technology they want or require as long as it is compliant to open standard interfaces and schemas.

URL

http://www.eu-emi.eu/standardization

Overview (For the conference guide)

For several years there have been many issues surrounding the integration of Open Grid Services Architecture (OGSA) concepts in Distributed Computing Infrastructures (DCIs) and standardisation of Grid services within Grid middleware systems provided by EMI. OGSA represents a rather massive architecture in the context of distributed systems based on the concept of a plethora of Grid services that cover functionality of many technical areas. The issues can be partly explained by the fact that working interactions among numerous Grid services as envisaged by OGSA are non-trivial when we consider their implementations based on Web services message exchanges. In contrast, the standardization strategy of EMI follows a more lightweight and practical approach. This paper will contrast OGSA versus standards adopted by EMI following an approach that is based on the success of TCP/IP in contrast to ISO/OSI.

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