



SmartLM

Grid-friendly Software Licensing for Location independent Application Execution

The currently existing licensing models for commercial applications are focusing on software used on compute resources within an administrative domain. Licenses are provided on the basis of named users, hostnames, or sometimes as a site license for the administrative domain of an organization. If we want to use this software in a distributed service oriented infrastructure, using resources that are spread across different administrative domains, that do not host the applications license server, we run into trouble. The licenses usually are bound to hardware within the domain of the user and do not allow access from outside thus enforcing local use of the protected applications only. Grid environments are usually spread across multiple organizations and their administrative domains, and virtualised infrastructures, like utility and cloud computing, hide the

underlying hardware and their performance indicators, e.g. CPU type and frequency, that are often used in license agreements. While current mechanisms limit the usage of licensed software in Grid environments and virtualized infrastructures, the increasing usage of these environments and infrastructures make it necessary to overcome these limitations.

Solution

SmartLM will provide a generic and flexible licensing virtualization technology based on standards for new service-oriented business models. The solution will implement software licenses as Grid services, providing platform-independent access just like other Grid resources and being accessible from resources outside organizational boundaries. Service Level Agreements based on evolving standards will govern licenses. Secure agreements will be used to transport licenses through the Grid and to make them available on the resource to which a user has been granted access for the execution of the application. The license agreement and conditions of use for an application will be reached through negotiation between service providers and service customers. SmartLM will integrate the generic licensing virtualization technology into the major Grid middleware solutions UNICORE and Globus.

New service-oriented business models for this approach will be identified and a number of widely-used license-protected commercial applications will be adapted to be executed under control of the new licensing mechanisms and will become part of a high quality show-case to convince more code-owners to adapt their applications.

Licenses as Grid Services

A promising approach to overcome the limitations of the current monolithic licensing models is to reformulate licenses as manageable Grid resources or even Grid services. This will allow managing and orchestrating licenses in a job or workflow together with other resources like compute nodes, data storage, and network Quality of Service (QoS). SmartLM will provide an orchestration service that is capable to co-allocate different resources and services to be used at the same time, e.g. reservation of compute nodes and the licenses for applications that will be executed in a workflow scheduled to these nodes.

Licenses managed as Agreements

In emerging Grids and virtualized infrastructures the conditions of resource usage reflect and extend the conventional Service Level Agreements (SLAs) which are made today between resource providers and resource consumers. These SLAs define for example the lifetime, resource usage, accounting and billing, but also the guarantee of QoS and penalties or compensations if guarantees are missed. In SmartLM the agreements between service provider and service consumer about using license protected software are expected to transport and propagate the appropriate licenses corresponding to the providers' and consumers' requirements. Encrypt-

ing and signing of the agreements will provide the necessary level of security and protection against fraud. All negotiations aiming to lead to a Service Level Agreement, i.e. an electronic contract, on terms of the usage of licensed software under the umbrella of the license contract framework. Agreement based license schema enable brokering of licenses, thus allowing to extend the current business models and to create new ones.

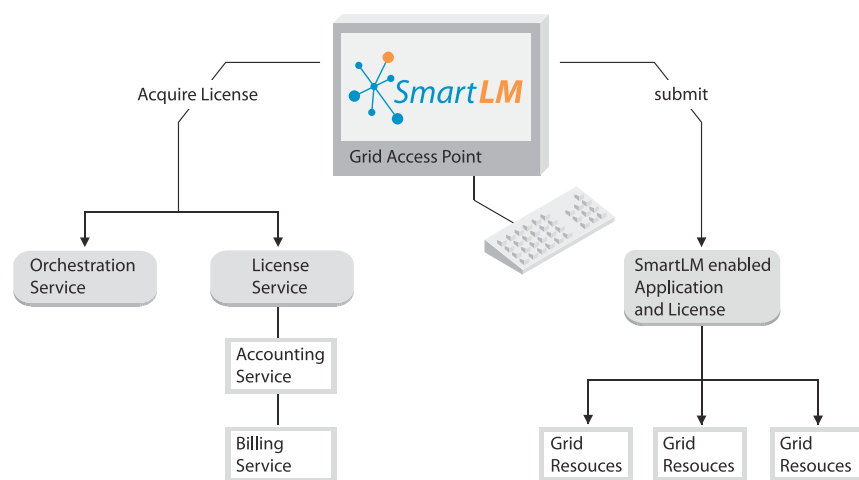
Dynamic Licenses

To support license agreements that change over time and for cases where negotiation between service provider (i.e. license provider) and service consumer is needed to settle an agreement, SmartLM will implement negotiation procedures. Making licenses flexible with respect to lifetime, agreed QoS, pricing, etc. allows for the re-negotiating of service consumption in case of unpredicted extension, reduction, or other changes of the requested and agreed service.

Project Facts

The SmartLM project is partly funded by the European Commission under contract number 216759. The project started in February 2008 and has a duration of 30 months. The project consortium, led by Atos Origin, is formed by Independent Software Vendor (ISV), Business Analyst, Application Service Provider (ASP), academic partners, and public centres: Atos Origin (Spain), Fraunhofer SCAI (Germany), FZ-Jülich (Germany), CINECA (Italy), The 451 Group (UK), INTES (Germany), ANSYS (Germany), LMS International (Belgium), T-Systems (Germany), CESSGA (Spain), and Gridcore Aktiebolag (Sweden).

The website of the project offers detailed information: <http://www.smartlm.eu/>



- Daniel Mallmann¹
- Wolfgang Ziegler²
- Josep Martrat³

¹ Forschungszentrum Jülich, Jülich Supercomputing Centre

² Fraunhofer Institut SCAI, Sankt Augustin

³ Atos Origin, Barcelona