Managing and Providing Software Licenses for Grids and Clouds

The Problem
- IT Infrastructure paradigms have been changing over the last years to support more flexibility and reduce costs at the same time.
  - Grid computing aims at providing infrastructure for sharing or pooling resources including HPC resources for increased demand of computational simulations.
  - Clouds focus on resource provisioning, e.g. for peak demand or when customer owned infrastructure is overloaded or its use is not appropriate for any reason.
- However, extending a company’s business or a research institution’s information processing beyond the borders of the respective administrative domain raises a number of issues, one of them being the use of license-protected software.
- Software protection and licensing are important topics for both the independent software vendors and software users.
- In Grid and Cloud environments, the use of license-protected applications is almost impossible and becomes a challenging task for two major reasons:
  - there are – with a few exceptions for the Amazon EC2 environment that have been introduced recently – no business models of the independent software vendors for Grids or Clouds and
  - there is no licensing technology suitable for Grid and Cloud environments.
- The 451 group concluded in a survey on licensing issues in Grids that current software licensing practices are limiting the acceleration of Grid adoption already in 2005.
- Just recently the 451 group published a survey on Cloud adoption where software license technology was ranked on the second place of limiting factors for Cloud adoption.

The Solution
The European project SmartLM explored and implemented new mechanisms for managing and using software licenses in a more fair and flexible way. SmartLM licenses may be used seamlessly in local cluster environments, as well as in local or remote Grid and Cloud environments.

Goals achieved
- New framework for software licenses
- SmartLM Policy Decision Point for evaluating the license token to be linked into the ISV application
- License usage terms embedded in mobile tokens for off-site and off-line authorisation
- New ISV License Models for »mobile« licenses
- Additional features like accounting & billing
- Sophisticated mechanisms to secure the token

The Product
- Based on the prototype developed in SmartLM a product is under development: elasticLM
- The basic version of elasticLM is now available for early adopters and for evaluation.

Main Innovations of elasticLM
- elasticLM Licenses are mobile objects that may move as applications move to different execution environments. Use of protected applications is granted through Service Level Agreements resulting from negotiation of license terms prior to application execution.
- Using elasticLM allows advance reservation of licenses. Thus, licenses are available when needed but not blocked when the application is waiting for execution.
- All authorization for the use of a license is done locally at the home organisation of a user, taking into account policies of the ISV, site-specific policies defined locally or user-specific attributes as e.g. retrieved from a Virtual Organisation.
- Signed and encrypted terms of a license are scheduled to the (remote) execution environment.
- Integration of an Accounting and Billing System allows price determination and budget control when the license is requested.

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