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Grid-Friendly License Management

License Management Solution Developed in the BEinGRID Project

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In the scope of the BEinGRID project a complete License Management Architecture (LM-Architecture) is developed which provides a grid-friendly License Management based on the de-facto industry standard FlexNet of Acresso. The architecture enables codes of Independent Software Vendors (ISV) that base their License Management on FlexNet to run in grid environments.

The architecture consists of the following components:

- LM-Job Submission and Description,
- LM-Authorization,
- LM-Proxy,
- LM-Monitor, and
- LM-Accounting.

The solution is generic and independent of any grid middleware. An out-of-band negotiation with the resource provider is not required. Additionally, a cost-unit based accounting and the possibility to check validity of license accounts at job submission time is provided by the LM-Architecture. None of these features exist so far.

The huge majority of HPC - and therefore potentially grid-relevant - applications currently used in industry are FlexNet based commercial ISV codes. The architecture allows any proprietary LM client-server based ISV software (e.g. FlexNet) to be used in grid environments.

LM-Authorization provides generic, middleware independent, secure and scalable ways to access external networks which is achieved by a PIN/TAN based runtime authorization. Due to the proprietary encrypted communication between client and license server, this authorization is performed on a very low level (SOCKS). The LM-Architecture therefore immediately can be used in a variety of other scenarios, e.g. accessing a remote database at job runtime.

Usage Scenario

A usage scenario is as follows: Organization BSYS owns a certain number of licenses for an ISV code. The organization runs a corresponding FlexNet License Server and wants to use these licenses for calculations at the resources of a grid provider. Since BSYS uses the ISV Code for a large number of projects, BSYS requires the cost-unit accounting context within which the calculations are performed. The resource provider might not be known at job submission time. In order to perform the calculation with the ISV Code, organization BSYS now would have to open its firewall and allow any potential remote grid site to access its license server. The LM-Architecture resolves this problem by authorizing access to the license server at BSYS via a PIN/TAN mechanism. The FlexNet license server here is encapsulated as a WEB/SOCKS Service which is able to handle authorization, monitoring, but also cost-unit based accounting.

Benefits

The key functionality of the LM Architecture is the secure and authorized access to a local or remote License Server, the encapsulation of FlexNet as a SOCKS/Web Service,

the scalability of the license service, the accounting of the usage of licenses within a specific accounting context, the possibility to reject invalid requests at job submission time (e.g. not enough funding for given cost-unit) and the monitoring of available licenses. Most importantly – except for the details of job submission – the functionality is generic. The LM architecture not only supports FlexNet but rather any client-server based License Management.