Motivation

Germany’s national Grid Initiative provides its users a variety of computing and storage resources for use in e-science. Today, the usage of D-Grid’s resources is still realized as a best-effort and first-come first-served approach. Existing resources can be used as they are, and if they are available. To organize users’ jobs, traditional batch systems are used. Resource availability or special resource configuration can neither be requested nor scheduled in advance. Users do not have any guarantees for resource usage or quality of service. To address these issues, the SLA4D-Grid project designed and realized a Service Level Agreement management layer for the German Grid infrastructure.

Challenges & Highlights

Diverse Requirements of different users and communities had to be realized within one comprehensive solution to build a valuable SLA implementation. To achieve this, the SLA4D-Grid project closely worked together with user communities to create a generic but customizable D-Grid SLA. Additionally, specific SLAs were realized for project partners’ use cases.

The SLA layer has been implemented as a value-added service, so that it does not interfere with the hitherto use of the D-Grid infrastructure. It has been integrated with all valuable services of the current D-Grid infrastructure; such as the resource management, the monitoring infrastructure D-Mon, and the authentication of users and resources. L3S managed the integration of the SLA layer into the D-Grid core service infrastructure. Thereby the on-going movement from the D-Grid to EGIs NGI-DE posed different challenges. The final integration level has been chosen to get the most benefit for its use within D-Grid on the one hand, but also to be independently operable in other contexts on the other hand. By this, the SLA layer can also be integrated with other Grid infrastructures and can be used beyond the operation time of D-Grid.

The final implementation of the SLA layer has been implemented within the third project year. It includes services to register SLA templates, to negotiate SLA offers, as well as compute resource reservation for the Globus Toolkit 4 and the UNICORE 6 middleware. Also included are the generic D-Grid SLA and the specific SLA for a geo-spatial data scenario. In addition, a web-based live demonstration of a geo-spatial data application using the prior prototype of the SLA layer has been published to prove its functionality.

The implementation of the SLA layer is based on web-service standards of the Open Grid Forum. SLA4D-Grid participated in the extension of standards within the GRAAP working group of the Open Grid Forum.

Potential applications & future issues

The Service Level Agreement management layer has to be integrated in the German Grid infrastructure for future use. The SLA layer may be tailored for the use in other Grid or Cloud infrastructures in possible follow-up projects.

Logo:

Service Level Agreements (SLAs) are widely used within business today. SLAs are negotiated agreements between two contracting parties; the customer and the corresponding service provider. They range from informal agreements to legally binding contracts defining guarantees and penalties. To provide e-business foundations for resource usage within the German Grid Initiative, the SLA4D-Grid project designed and realized a Service Level Agreements management implementation. SLAs shall be the base for establishing a sustainable, economical and widely accepted Grid infrastructure.

Project duration:
01.06.2009 - 31.05.2012

Bibsonomy show project publications:
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Members:
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Project manager:
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Project research areas:
E-Science
Distributed Services

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Status of the Project: