

StratusLab

Enhancing Grid Infrastructures with Virtualization and Cloud Technologies

Summary: StratusLab is aimed at service provisioning, networking and research of cloud and virtualization technologies to simplify and optimize the use and operation of existing distributed computing infrastructures like the European Grid Infrastructure (EGI). The project is developing the StratusLab Toolkit, an open source cloud distribution. It incorporates cloud and virtualization innovation into existing grid infrastructures by integrating cloud technologies and services within grid sites. Further, it enriches existing computing infrastructures with "Infrastructure as a Service" (IaaS) cloud-like delivery paradigms.

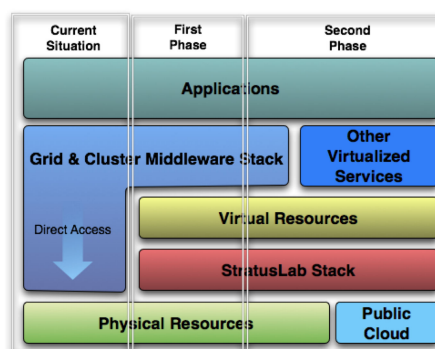
Objectives: StratusLab brings several benefits to the e-Infrastructure ecosystem, in terms of simplification, added flexibility, increased maintainability, quality, energy efficiency and resilience of the sites. The new StratusLab Toolkit cloud distribution complements existing grid middleware services: the aim is for the cloud layer to be fully transparent to layers above. Existing grid middleware continues to provide the glue to federate the distributed resources and the services for high-level job and data management. StratusLab will help to improve the usability of distributed computing infrastructures, to attract scientific user communities, to appeal equally to industrial users, to keep European research infrastructures at the technological forefront, and to strengthen the know-how in virtualization and cloud computing of European industry.

Action plan: StratusLab will integrate, distribute and maintain a sustainable open-source cloud distribution to bring cloud to existing and new grid sites. The StratusLab toolkit will be composed of existing cutting-edge open source software and the innovative service and cloud management technologies developed in the project. It will also include the required additions to turn the software elements into a production grade distribution to support production quality and operational systems, as will be demonstrated with the operation of production level grid sites in the project.

StratusLab is a two-phase project. In the **first phase**, the project will focus on **cloud computing for resource provisioning in grid sites**. This will entail development and integration of the initial StratusLab cloud platform, incorporating the components required for the virtualization of grid sites; and creation of virtual appliances for the scientific application domains in the project

In the **second phase** the emphasis will shift towards developing **new cloud-like delivery paradigms in grid sites**. This will build on the first phase, including new IaaS cloud interfaces and support for creation of new virtual appliances, which will be stored in a repository

Efforts to achieve both goals will start from the beginning of the project: the expectation is that the second goal will be achieved in the longer term.



Project acronym:
StratusLab

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Project type: CP-CSA

Start date: 01/06/2010

Duration: 24 months

Total budget:
3 137 221 €

Funding from the EC:
2 300 000 €

Total funded effort in person-month:
340

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Project participants:
CNRS FR
UCM ES
GRNET GR
SIXSQ CH
TID ES
TCD IE

Keywords:
Grid, Virtualization, Cloud,
Infrastructure as a Service

Collaboration with other EC funded projects:
EDGI
EGI-InSPIRE
EMI
GridTalk-II
IGE
RESERVOIR
SIENA
Venus-C

continues overleaf



Networking activities: The project's networking activities have been designed to foster collaboration over the complete spectrum of actors, from project participants, through our targeted user communities, to the ensemble of related European projects.

StratusLab will undertake extensive dissemination activities, targeting the user communities listed below, as well as the general public. Awareness of the project will be achieved through participation in relevant meetings, forums, workshops and conferences. StratusLab aims to publish in relevant journals and magazines. The project will also be active online through web presence. In-depth knowledge transfer will take place through demonstrations and training sessions.

Service activities: In order to certify the StratusLab toolkit, the project will deploy and maintain a small yet representative infrastructure. This 'pre-production' environment will provide the required platform for deploying incrementally the results of the cloud integration activity, but also provide a test-bed for joint research activities to deploy and test their research results.

The StratusLab infrastructure will also serve as an important platform for assessing the economical impact of cloud technologies in the provision of grid services both in terms of human resources (e.g. for administration and system maintenance) and environmental costs (power consumption, carbon footprint, etc.)

Joint Research activities: In StratusLab the research activity consists of very specific and focused actions to achieve the main goal of the project that is to integrate a toolkit for offering cloud and grid services. The research activity will be targeted to extend current grid site management functionality, providing or enhancing tools and components to define and dynamically support service elasticity and SLA-powered scalability, optimize site provisioning, placement heuristics, virtual images management and resource sharing capabilities.

User communities:

StratusLab benefits a wide variety of users: from scientists to system administrators.

Scientists	End-users that take advantage of existing machine images to run their scientific analyses.
Software Scientists and Engineers	Scientists and engineers that write and maintain core scientific community software and associated machine images.
Community Service Administrators	Scientists and engineers who are responsible for running community specific data management and analysis services.
System Administrators	Engineers or technicians who are responsible for running grid and non-grid services in a particular resource centre.
Hardware Technicians	Technicians who are responsible for maintaining the hardware and infrastructure at a resource centre.

International aspects: StratusLab brings together six partners from five European countries. The lead partner is the Centre National de la Recherche Scientifique (CNRS, France). The other partners are the Universidad Complutense de Madrid (UCM, Spain), the Greek Research And Technology Network S.A. (GRNET, Greece), SixSq Sàrl (Switzerland), Telefonica Investigacion y Desarrollo S.A. (TID, Spain), and Trinity College Dublin (TCD, Ireland).

The partners of the consortium are key players with recognized leadership, proven expertise, experience and skills in grid computing, cloud computing and virtualization. The aggregation of the individual consortium partners presents a balanced combination of academic, research and industrial institutes with complementary capabilities.