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Enhancing Grid Infrastructures with Virtualization and Cloud Technologies

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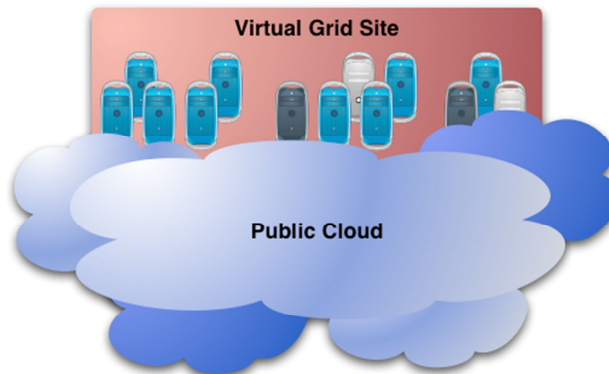
- **Vision:** Grid and cloud embody complementary computing models that will coexist and cooperate in existing and future e-infrastructures
- **Aim:** Incorporate cloud/virtualization innovation into existing Grid infrastructures to:
 - Simplify and optimize the use and operation of existing distributed computing infrastructures (e.g. EGEE/EGI) and,
 - Provide a more flexible, dynamic computing environment for scientists.
- **Work Plan:**
 - Explore the integration of cloud technologies and services, especially virtualization, into existing Grid Infrastructures in three scenarios
 - Integrate and maintain a software distribution to bring together cloud and grid technologies
- **Evolutionary Step:**
 - Complement existing middleware services, being fully transparent to upper layers in the infrastructure
 - Existing Grid middleware would continue to provide the glue to federate the distributed resources and the services for high-level job and data management

The StratusLab initiative was started in November 2008 to explore the integration of cloud technologies and services, especially virtualization, into existing Grid Infrastructures. Grid and cloud embody complementary computing models that will coexist and cooperate in existing and future e-infrastructures. While grid is about federation of resources and fostering collaboration, cloud is about flexibility, customization and on-demand provisioning of virtualized resources. We envision that **cloud computing will help both to overcome many of the barriers to grid adoption and to enhance the management, functionality, suitability, energy efficiency and utilization of production grid infrastructures.**



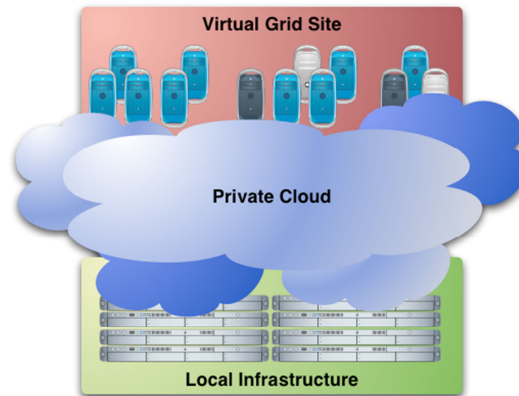
Enhancing Grid Infrastructures with Virtualization and Cloud Technologies

- **Aim:** Deploy an entire EGEE grid site within the Amazon cloud to determine if there are any technical or procedural barriers to using public cloud resources as part of the EGEE infrastructure.
- **Benefits:** Evaluate the performance, stability and functionality of cloud providers



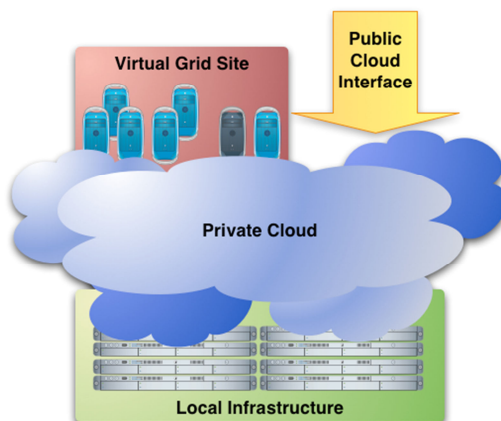
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- **Aim:** Transform the grid site into a private cloud to deploy a virtualized EGEE site
- **Benefits:** Flexibility of site resources, elasticity of grid service with dynamic provisioning of worker nodes to address the demands of different user communities, flexible load balancing and energy efficiency, elastic sites resources able to expand using remote cloud providers, enhanced failover and redundancy solutions...



Enhancing Grid Infrastructures with Virtualization and Cloud Technologies

- **Aim:** Enhance existing computing infrastructures with “IaaS” cloud-like delivery paradigms. The new interfaces would complement existing grid services, providing a new way to access to the same underlying grid site infrastructure without replacing the grid functionality.
- **Benefits:** Address the emerging IaaS cloud-like usage patterns from several user communities



StratusLab Toolkit for Cloud Computing

- The **toolkit will consist of:**
 - Cutting-edge open source software from third-party communities and research projects (RESERVOIR...)
 - New innovative service and cloud management technologies
 - Required additions in order to turn the software elements into an industry grade distribution to support production quality and operational systems
- StratusLab will **integrate, distribute and maintain** the open-source cloud distribution
- StratusLab will also provide scientists with pre-defined bioinformatics **virtual appliances** to run on their private cloud or on the public one
- Its quality will be demonstrated with the **operation of production level grid sites**
- The new enterprise-grade toolkit will also meet requirements from **non-grid industrial applications**

Enhancing Grid Infrastructures with Virtualization and Cloud Technologies

Help to Involve Industry in Grid Infrastructures

- Many industries are adopting the infrastructure cloud computing model, accessing on demand to remote cloud providers to deploy their service workloads
- **StratusLab will allow grid sites to provide infrastructure cloud services**, so offering resources not only for the scientific community but also for the industry

Enterprise-grade Open-source Toolkit for Cloud Computing

- Many industries are transforming their datacenters into private cloud infrastructures, enabling flexible and agile management of local infrastructure
- **StratusLab will enable any company to build its own public, private and hybrid cloud**

Visit us in Booth 22



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