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Operating a public cloud with StratusLab

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Description of the Work

The StratusLab project began in June 2010 with the aim of producing a fully open source Infrastructure-as-a-Service (IaaS) cloud, to allow various services, including grid services, to run on a cloud infrastructure. The first release of the StratusLab distribution was in October 2010, and Version 1.0 was released in July 2011. Recent releases have added new features such as integration of OpenNebula 3, persistent disk storage, improved monitoring and enhanced image lifecycle management through the Marketplace.

StratusLab has worked with EGI to ensure that the distribution has evolved in a way consistent with the policies of the EGI Federated Cloud Task Force.

Since November 2010 StratusLab has run a public cloud infrastructure, as well as a Grid site deployed on a cloud since early 2011. The project has a wealth of experience in cloud provision for e-Science and on deploying grid sites across such infrastructures.

Cloud technologies offer great potential for e-Science infrastructures and can significantly alter the way grid services are currently deployed and operated. By exploiting the inherent capabilities of IaaS clouds for on-demand provision of elastic computing services, grid resource providers can optimize utilization of physical computing resources.

The StratusLab Cloud distribution, with available virtual images, allow for accelerated instantiation of both cloud and grid sites, making it easier to try out new features or validate middleware updates. Virtual machine images for a range of user communities allow sites to support new users with the minimum investment of time and resources.

A major driver behind integrating cloud services with e-Science infrastructures is thus the expected reduction in operating costs. StratusLab has conducted a cost analysis to validate this assumption, the results of which are presented. Issues related to provision of cloud infrastructures for e-Science are also discussed.

Conclusions

StratusLab will provide an update on operational issues in deploying clouds for e-Science, along with an analysis of the impact on cost of virtualisation.

Impact

Cloud and virtualisation technologies, with the ability to rapidly instantiate machines and optimize usage of physical resources, hold the promise of optimization of reducing both maintenance requirements and operating costs for e-Science infrastructures. The application of cloud and virtual technologies to grid computing is expected to reduce total cost of ownership of these infrastructures, as well as giving end users additional capabilities such as increasing user or VO control of the compute environment without adversely impacting

the security of the sites. This presentation looks at some of the issues involved in using cloud and virtualisation for e-Science infrastructures and examines the claims above based on the experiences of the StratusLab project in running a public cloud infrastructure and a grid site deployed on a cloud.

URL

<http://www.stratuslab.eu/>

Overview (For the conference guide)

The StratusLab project provides an open-source cloud distribution that allows data centers to expose computing resources as an “Infrastructure as a Service” (IaaS) type cloud. Administrators can run services over the cloud to improve availability, scalability, and maintainability. The StratusLab project also maintains a reference cloud infrastructure, used by several scientific user communities, and a complete Grid site hosted on the cloud.

This presentation describes deployment and operational issues related to provision of Clouds for e-Science, based on the experiences of the StratusLab project. This will include issues with cloud provision within educational and research institutes, as well as with deploying Grid services on the cloud. In particular the session will include a discussion on the impact of virtualisation on operating costs for e-Science and Grid infrastructures, informed by an analysis of the cost of running the StratusLab reference infrastructure and Grid site.

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