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StratusLab: Use cases, features and sustainability

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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, which uses virtualization technologies for the provision of computing resources. At the heart of the StratusLab cloud distribution lies the popular OpenNebula (<http://www.opennebula.org>) cloud management toolkit which has been extended with additional capabilities, either developed within the project or integrated from the ecosystem of existing add-ons. The first release of the StratusLab distribution was made in October 2010, and Version 1.0 was released in July 2011. Recent incremental releases have added new features such as integration of OpenNebula 3, persistent disk storage, improved monitoring and enhanced image lifecycle management through the Marketplace.

A number of use cases have been identified to guide the development of the StratusLab software. A primary use case relates to integration with and support for Grid services, which has been demonstrated through operation of a production EGI site on StratusLab.

Members of the bioinformatics community have adopted StratusLab to host biological databases and common tools on cloud storage and virtual machines. The next step is to offer cloud-hosted web services with integrated Shibboleth access.

One of our commercial partners has developed a use case for an auction website based on a common three-tier web application architecture. This makes use of Claudia service deployment and automatic scaling based on metrics.

A spacecraft ground control system provides a further significant use case. This complex system of operational software is orchestrated by SlipStream and deployed on a StratusLab cloud.

Conclusions

The features available in StratusLab make it a compelling cloud distribution particularly for those areas that have requirements in common with the identified use cases.

StratusLab is re-evaluating its software, service and other assets to put into action suitable plans for sustaining some or all of these, through re-use in commercial and academic settings.

Impact

The StratusLab Marketplace allows user communities to create, search for and share customised digitally-signed virtual machine images. The Marketplace can also meet the requirements of the EGI "Security Policy for the Endorsement and Operation of Virtual Machine Images", via the secure digital signing of virtual machine metadata, and the project has produced several Grid virtual images which are preinstalled with basic grid middleware components.

In addition, authentication via Grid credentials is supported.

Persistent Storage provides on-site management of persistent storage areas (a la Amazon Elastic Block Store) allowing users to create disks of a given size, to launch a machine with the disks attached, and to persist the disks after their use, so that the disks are available for use by another machine instance.

OpenNebula 3 integration brings access to many new features including fine-grained ACLs and group management, improved network virtualization.

URL

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

Overview (For the conference guide)

Cloud computing has emerged in the recent years as the new paradigm for the provision of on-demand distributed computing resources. The StratusLab project develops and provides an open-source cloud distribution that allows data centers to expose their computing resources as an “Infrastructure as a Service” (IaaS) type cloud. Administrators can run their services over the cloud to improve availability, scalability, and maintainability.

StratusLab supports a number of Grid-specific features, and aims to integrate easily into traditional grid sites and the existing EGI ecosystem. We present a number of existing use cases, and the current status of the StratusLab distribution. New and enhanced features of the StratusLab cloud distribution such as persistent storage and the Marketplace will be introduced. We conclude with a discussion of plans to ensure future evolution and sustainability of the StratusLab software.

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