

The OMII Software - Flexible for being a Grid and a Cloud

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1. Introduction

Cloud Computing aims to provide scalable and inexpensive on-demand computing infrastructures with good quality of service (QoS) levels. More specifically, this involves a set of network-enabled services that can be accessed in a simple and pervasive way [1]. Currently Amazon EC2/S3, Windows Azure, Google Docs and Google Apps are leading commercial service providers. Open source cloud projects such as Nimbus, Eucalyptus, CloudSim and Aneka are offering incentives for pioneering cloud projects. There are attempts for re-prototyping Grid software as bespoke Cloud software, which include Globus and Nimbus. There is a particular project, OMII-UK software, which is started as a Grid but also in the process to be part of, or fulfil capabilities as a Cloud. To achieve this, we propose an OMII-UK Cloud Framework 1.0 to describe how OMII platform can be used as a Grid and a Cloud, particularly targeting for Platform as a Service (Paas) and Software as a Service (SaaS).

2. OMII-UK software as a Grid

A catalogue of OMII-UK [2] Grid and e-Science applications and projects have been developed and maintained since 2004. These applications include job submission, registry, database engines, workflow, accounting, security and several more [3]. OMII-UK software are in collaboration with the UK National Grid Service (NGS), which is an active academic e-Science/Grid Community based in the UK. OMII-UK software include GridSAM (job submission), Grimoires (registry), OGSADAI (database engine), Portlet Access Grid (PAG) and RAVE (visualisation server). Their partner projects, OMII-Europe, have demonstrated interoperability between OMII-UK, Globus and EGEE software stack. With all these regards, OMII-UK software is a Grid Infrastructure provider.

3. The OMII-UK software is working towards a Cloud

We propose an OMII-UK Cloud Framework 1.0 to describe how OMII-UK software components fit as a Cloud Infrastructure and fulfill characteristics for the Cloud:

(1) Pay as you Go: OMII-UK's accounting system allows payment of the service based on actual usage.

(2) Elastic: Both GridSAM and Grimoires can submit jobs and registry services, and are able to scale up and down depending on users' needs.

(3) Multi-Tenancy: OMII-UK's Taverna, BPEL, OGSADAI, Workflow Monitor and Diaser allow sharing underlying resources as opposed to building independent systems for all customers. These include workflow, database engines, monitoring and storage services.

(4) Virtualization: OMII-UK's software can be packaged as virtual images to allow plug-and-play and easy portability for virtual infrastructure and environments.

4. The OMII-UK Cloud Framework 1.0

The OMII-UK Cloud Framework 1.0 is based on Service Level Agreement (SLA), Service Oriented Architecture (SOA), as well as up-to-date reviews from integrations, interoperability, security and accessibility. It adopts the mainstream for Cloud service model: Infrastructure as a Service (IaaS), Platform as a Service (Paas) and Software as a Service (SaaS). The OMII-UK Cloud Framework is a proof of concepts and a test-bed for Infrastructure as a Service (selected core components), Platform as a Service (Taverna, OGSADAI, GridSAM) and Software as Service (MyExperiment).

5. Conclusion and Further Work

We have tested that OMII-UK software can work with Private Cloud Infrastructure, and other open source and proprietary cloud platforms such as VMware Server and VMware VSphere. We plan to further work on all software components jointly with SOA and SLA to deliver a more robust architecture and improve on OMII-UK Cloud Framework for IaaS, PaaS and SaaS.

6. References

[1] L Wang, M Kunze et al, "Cloud Computing: a Perspective Study", Grid Computing Environments (GCE) 08 Workshop, December 2008.

[2] OMII-UK website <http://www.omii.ac.uk>

[3] V. Chang (2007) The OMII Software – Demonstrations and Comparisons between two different deployments for Client-Server Distributed Systems. Technical Report, University of Southampton.