

High Performance Cloud Computing Day

BiG Grid - SARA

Amsterdam, The Netherlands, October 4th, 2011

HPC Cloud Computing with OpenNebula

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OpenNebula.org

Acknowledgments

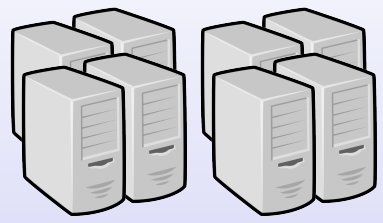


The research leading to these results has received funding from the *Ministerio de Ciencia e Innovación* of Spain through research grant TIN2009-07146.

HPC Cloud Computing with OpenNebula

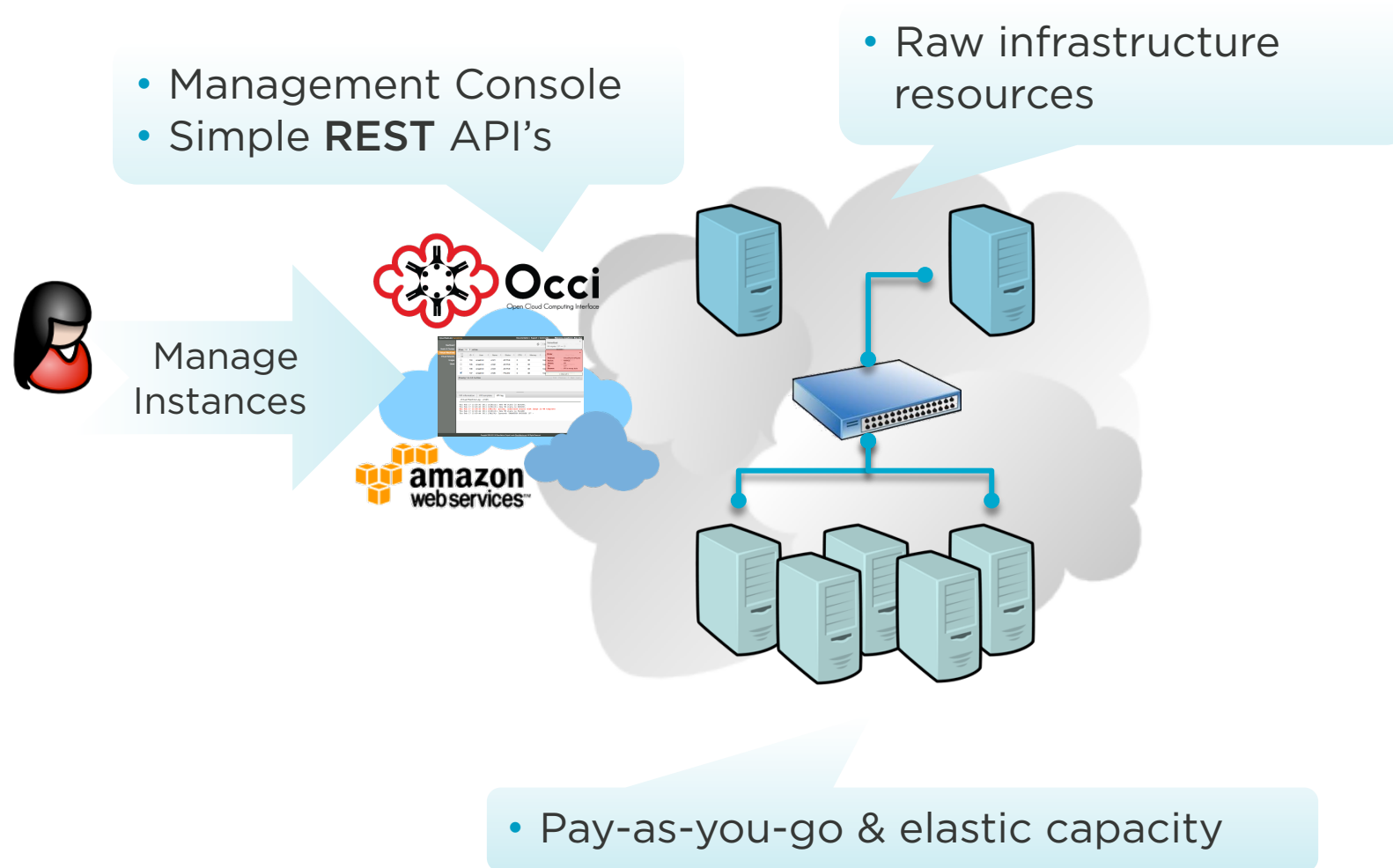
- What is Cloud Computing?
- What is OpenNebula?
- HPC and Science Cloud Computing
- HPC Cloud Computing at SARA and BiG Grid

Types of Cloud Services for Provision of IT Capabilities as a Service

	What	Who
Software as a Service	On-demand access to any application	End-user (does not care about hw or sw)   
Platform as a Service	Platform for building and delivering web applications	Developer (no managing of the underlying hw & sw layers)  
Infrastructure as a Service  Physical Infrastructure	Raw computer infrastructure	System Administrator (complete management of the computer infrastructure)    

What is Cloud Computing?

Provision of Virtualized Resources as a Service



What is OpenNebula?

OpenNebula.org

IaaS Cloud Computing Tool for Managing a Data Center's Virtual Infrastructure

Adaptable

- Customizable and Extensible

Proven

- Many Massive Scale Production Deployments

Powerful and Innovative

- Advanced Enterprise-class Functionality

No Lock-in

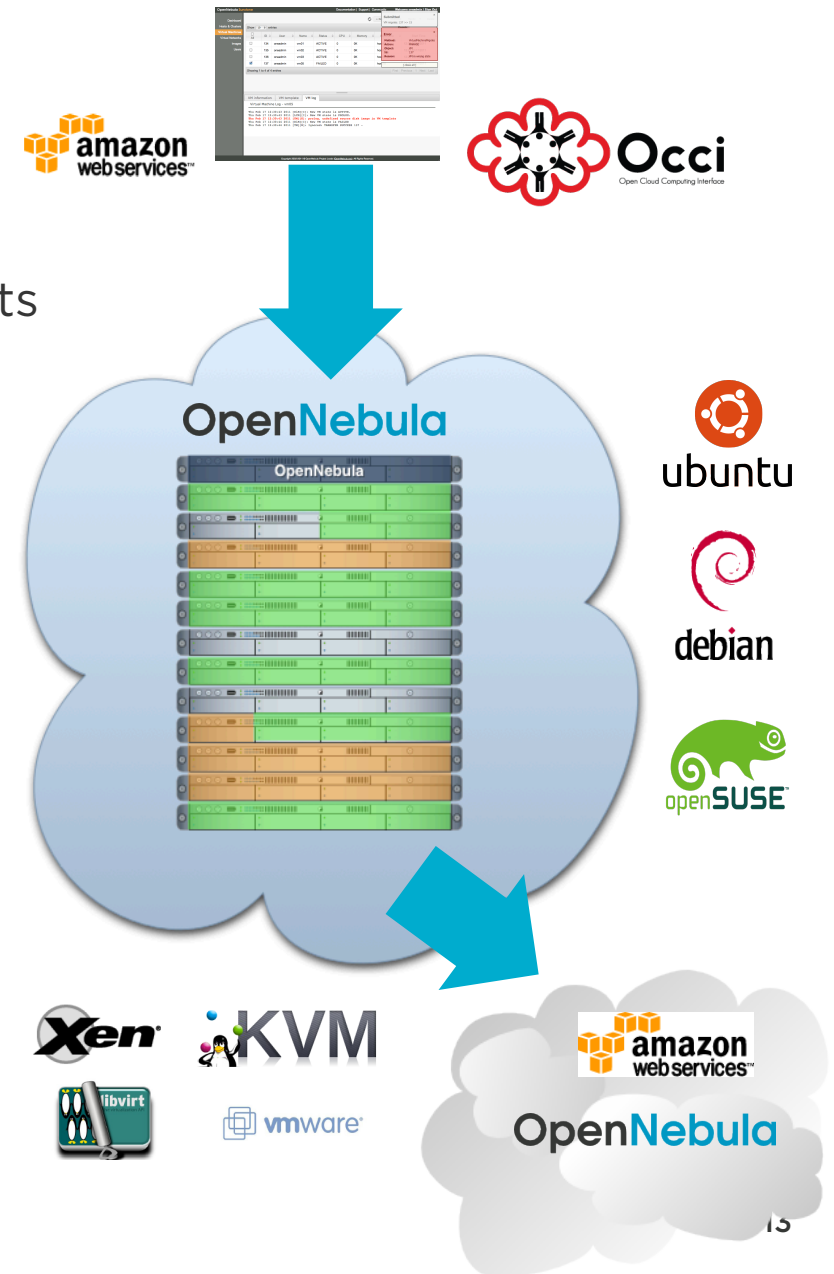
- Platform Independent and Interoperable

Interoperable

- Popular cloud APIs and standard based

Openness

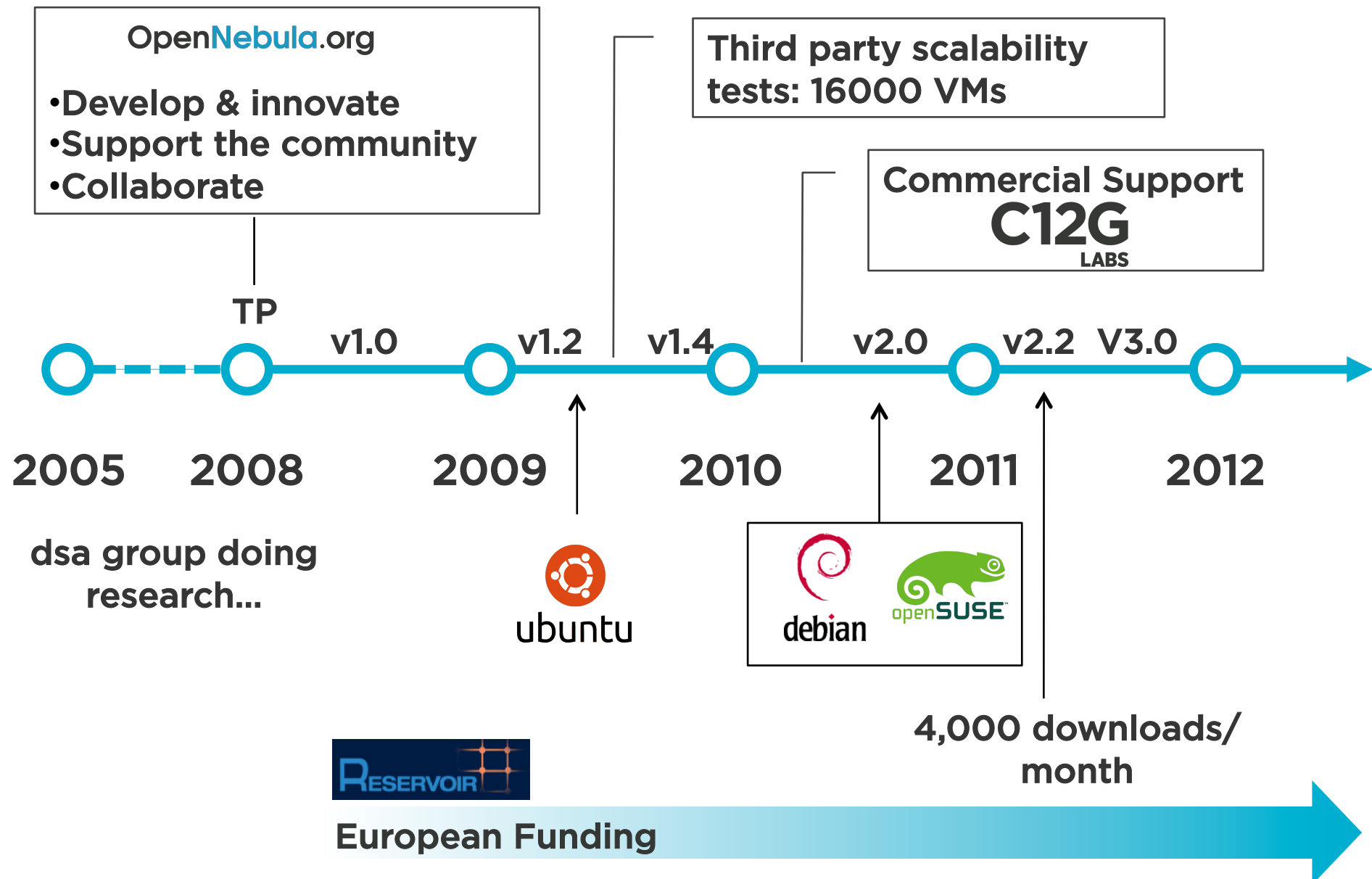
- Fully open-source
- Apache license



What is OpenNebula?

OpenNebula.org

Building the Industry Standard Open Source Cloud Computing Tool



Organizations Building Clouds and Innovative Projects

Organizations Building Clouds for Development, Testing and Production



Projects Building an Open Cloud Ecosystem Around OpenNebula



Different Models of Deployment

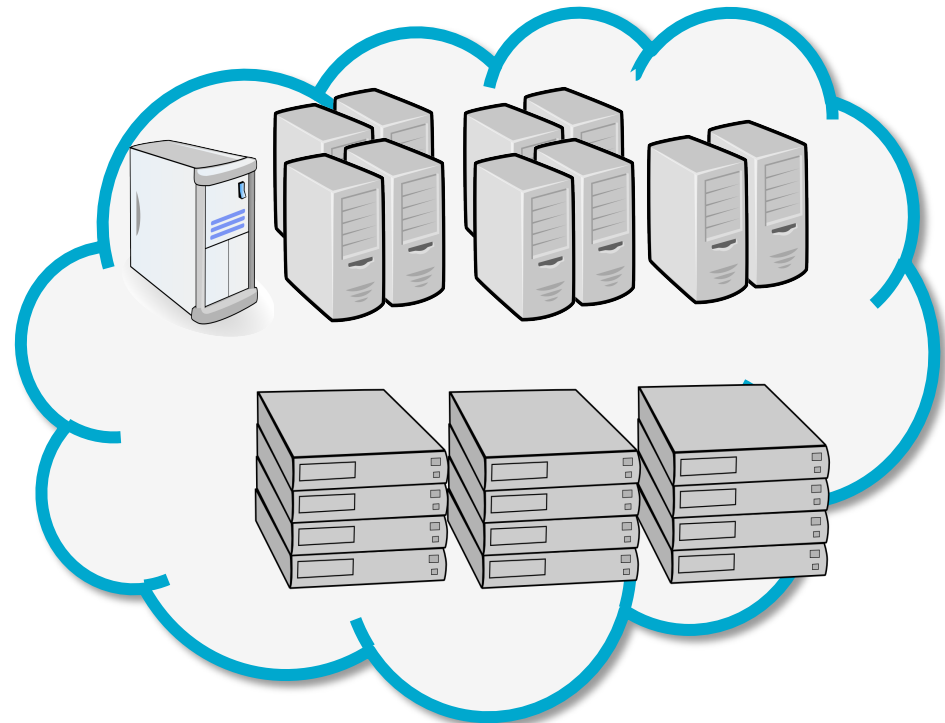
Model	Definition	Cloud Cases
Private	Infrastructure is owned by a single organization and made available only to the organization	• Optimize and simplify internal operation • SaaS/PaaS support • IT consolidation within large organizations (Government Clouds, University Clouds...)
Public	Infrastructure is owned by a single organization and made available to other organizations over the Internet	• Commercial cloud providers, mostly hosting providers to offer low cost solutions with limited control/configuration and security/reliability good enough • Science public clouds to enable scientific and educational projects or to experiment with cloud computing
Virtual Private	Infrastructure is owned by a single organization and made available to other organization over a dedicated private network	• Telecom cloud providers to offer premium solutions with additional control/configuration and security/reliability

HPC and Science Cloud Computing

One of Our Main User Communities

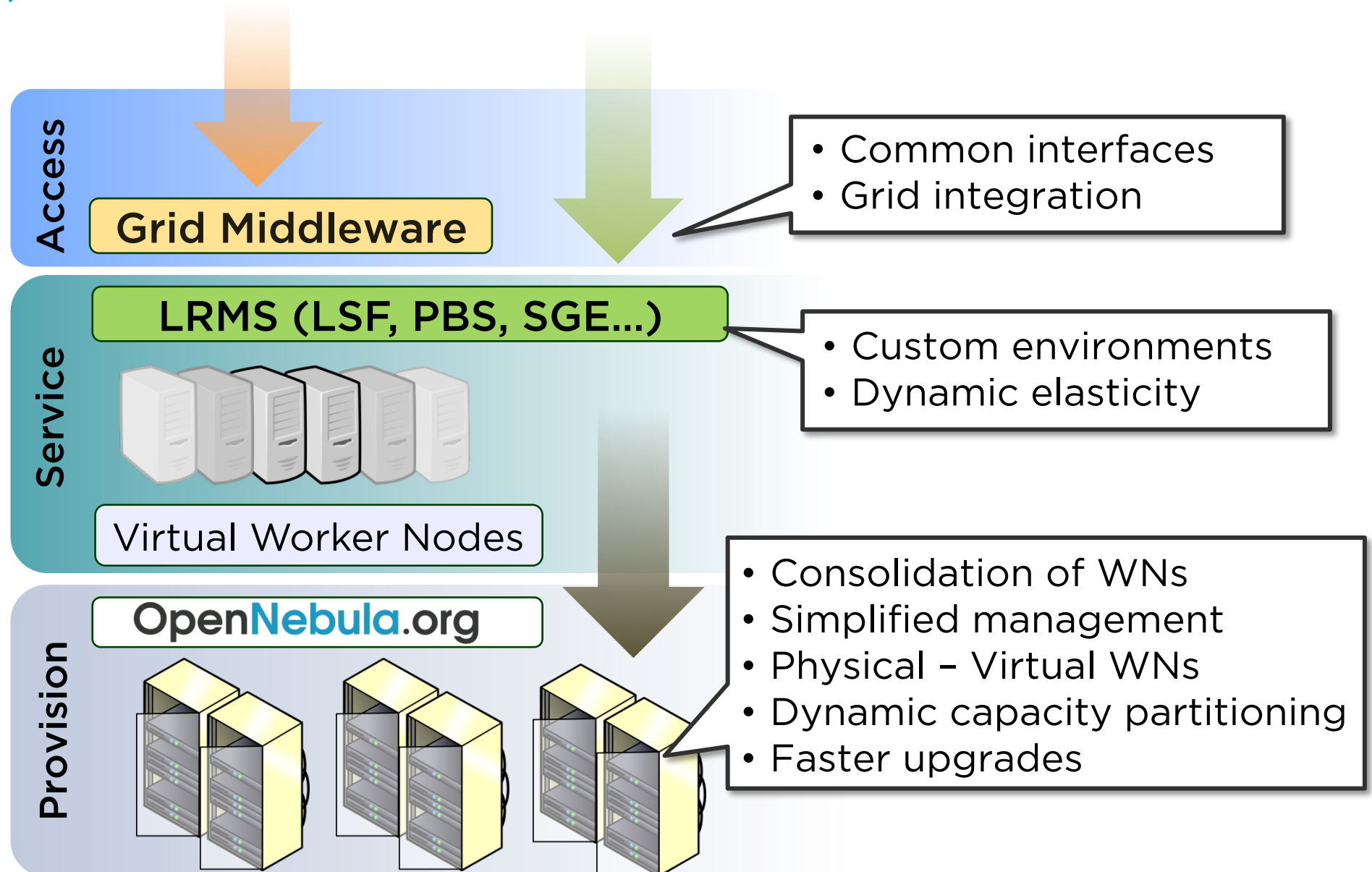
Deployment Scenarios

- **Private clouds as infrastructure tool** for hosting virtualized computing environments (job managers or pre-defined scientific platforms)
- **Public clouds as provisioning tool** for providing users with “HPC cluster as a service” resource provisioning using cloud interfaces



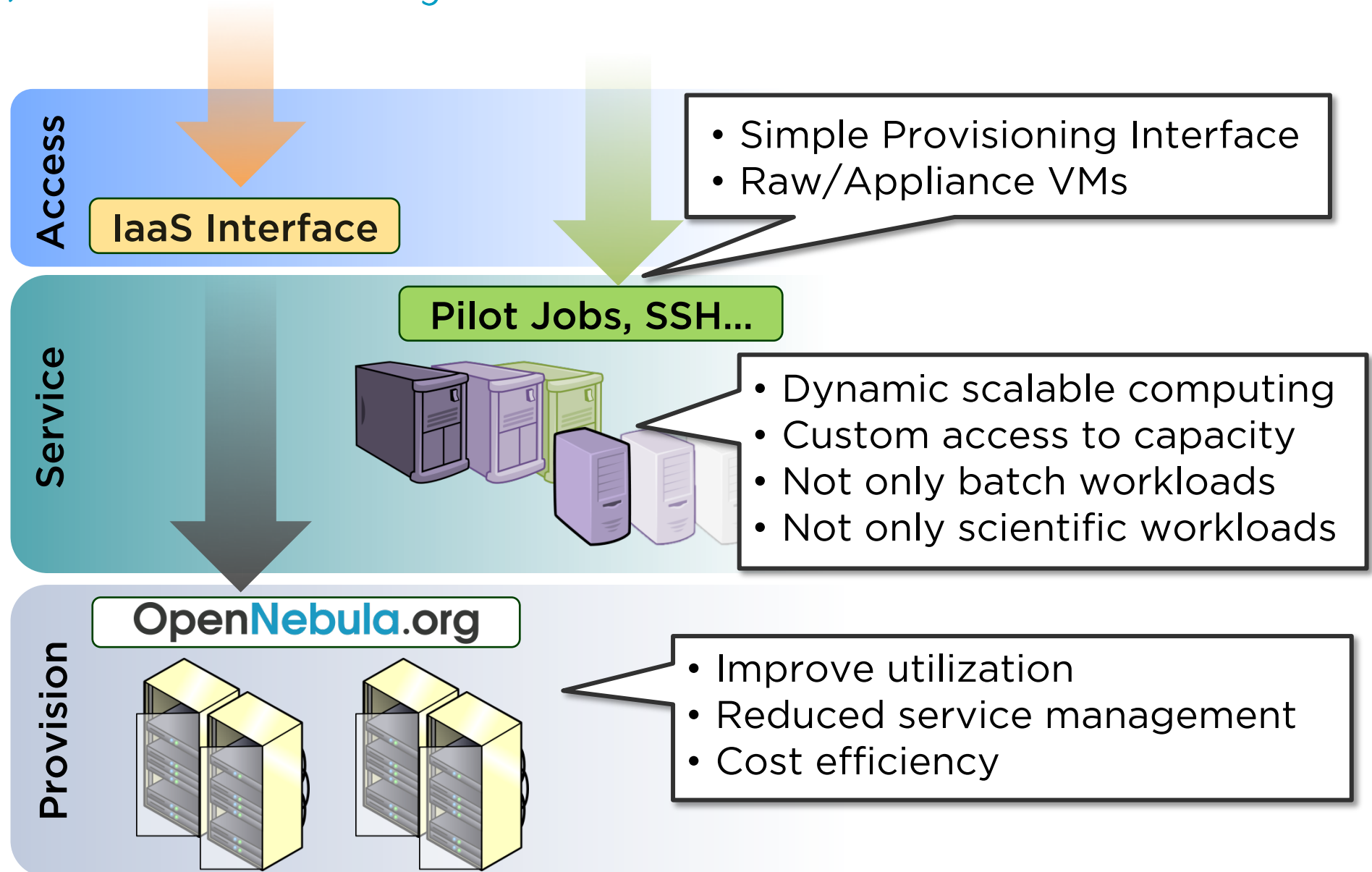
HPC and Science Cloud Computing

OpenNebula as an Infrastructure Tool



HPC and Science Cloud Computing

OpenNebula as an Provisioning Tool

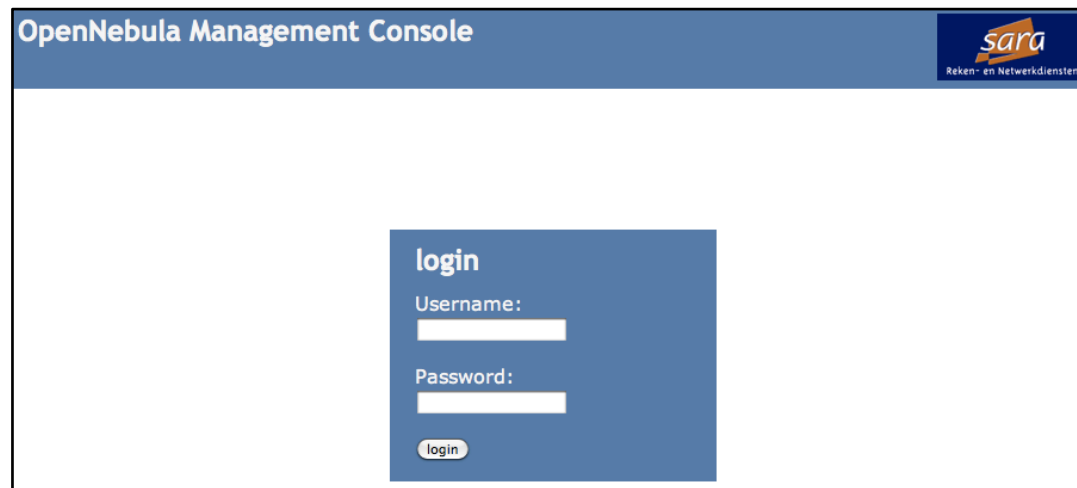


HPC Cloud Computing at SARA and BiG Grid

BiG Grid and SARA as Leaders in HPC Cloud Computing Services

Pioneers in Design and Deployment of HPC Clouds

- OpenNebula is only one of the components
- Deployment and integration are very complex tasks
- There is a lot of complexity behind this portal to make your life easier

The image shows a screenshot of the OpenNebula Management Console. At the top, there is a blue header bar with the text "OpenNebula Management Console" on the left and the "sara" logo with the text "Reken- en Netwerkdiensten" on the right. The main content area is white and contains a blue login box in the center. The login box has the word "login" at the top, followed by "Username:" and a text input field, then "Password:" and another text input field, and finally a "login" button at the bottom.

A Mutually Beneficial Collaboration

- Early adopters of the software contributed to beta testing of the code
- Authors of the well-known OpenNebula Management Console

Questions?

We Will Be Happy to Answer Any Question



CloudPlan.org



@imllorente



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