EGEE09 Conference
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OpenNebula/RESERVOIR Open-source Toolkit to Build Private, Hybrid and Public Clouds

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Objectives

First Scenario: Extended Cloud

- Very brief overview of Cloud deployments: The *Public*, the *Private* … and the *Hybrid*
- Learn how to use OpenNebula/RESERVOIR to build them

Cloud Computing in a Nutshell

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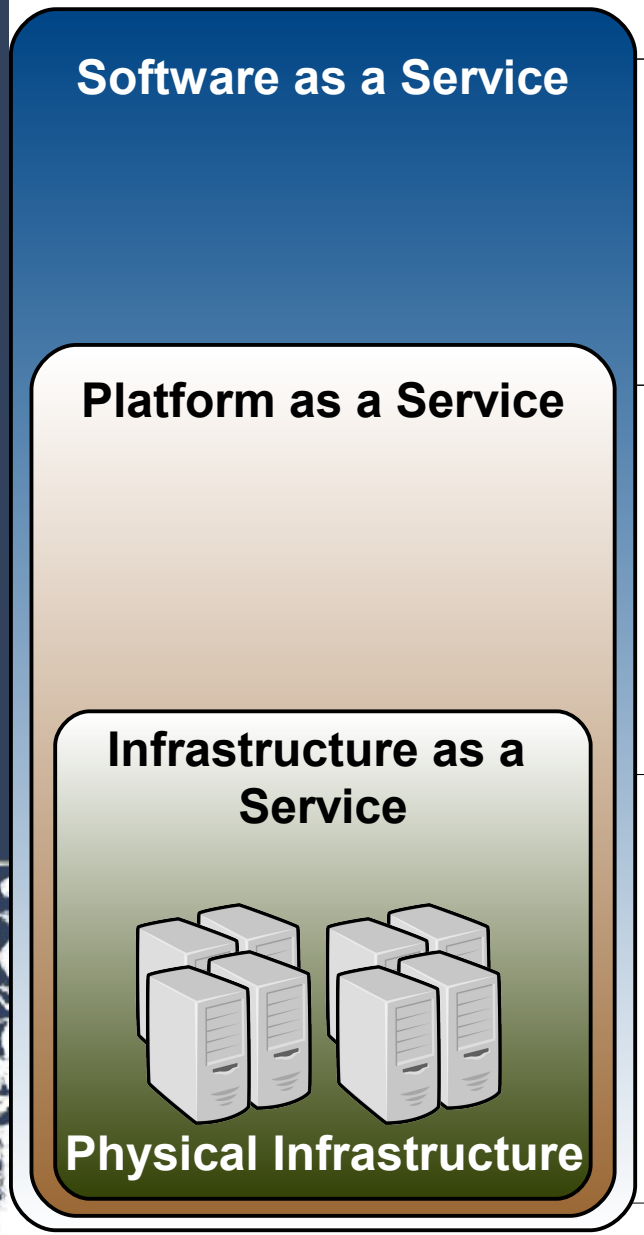

What	Who
On-demand access to any application	**End-user** (does not care about hw or sw) skype facebook
Platform for building and delivering web applications	**Developer** (no managing of the underlying hw & swlayers) Windows Azure force.com platform as a service
Delivery of a *raw* computer infrastructure	**System Administrator** (complete management of the computer infrastructure) GOGRID flexiscale amazon web services

The Public IaaS Cloud

- **Simple Web Interface**
- **Raw *Infrastructure* Resources**
  - Total control of the resources
  - Capacity leased in the form of Vms
  - Complete Service-HW decoupling
- **Pay-as-you-go (On-demand access)**
  - A single user can not get all the resources
  - Multi-tenancy
- **Elastic & *"infinite"* Capacity**

The Public IaaS Cloud

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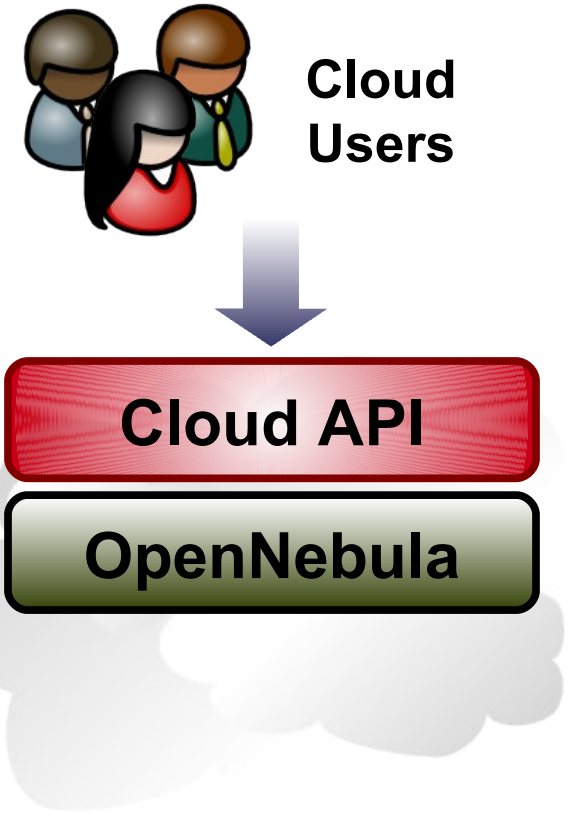

Total control of the infrastructure

- Software Stack
- Type & Number of components
- Infrastructure Elasticity

Feature	Function
Cloud Interfaces for Users	• Implementation of a subset of the EC2 Query API and OGF - OCCI
Flexibility	• The Cloud Service allows the implementation of new Cloud interfaces

The Private IaaS Cloud

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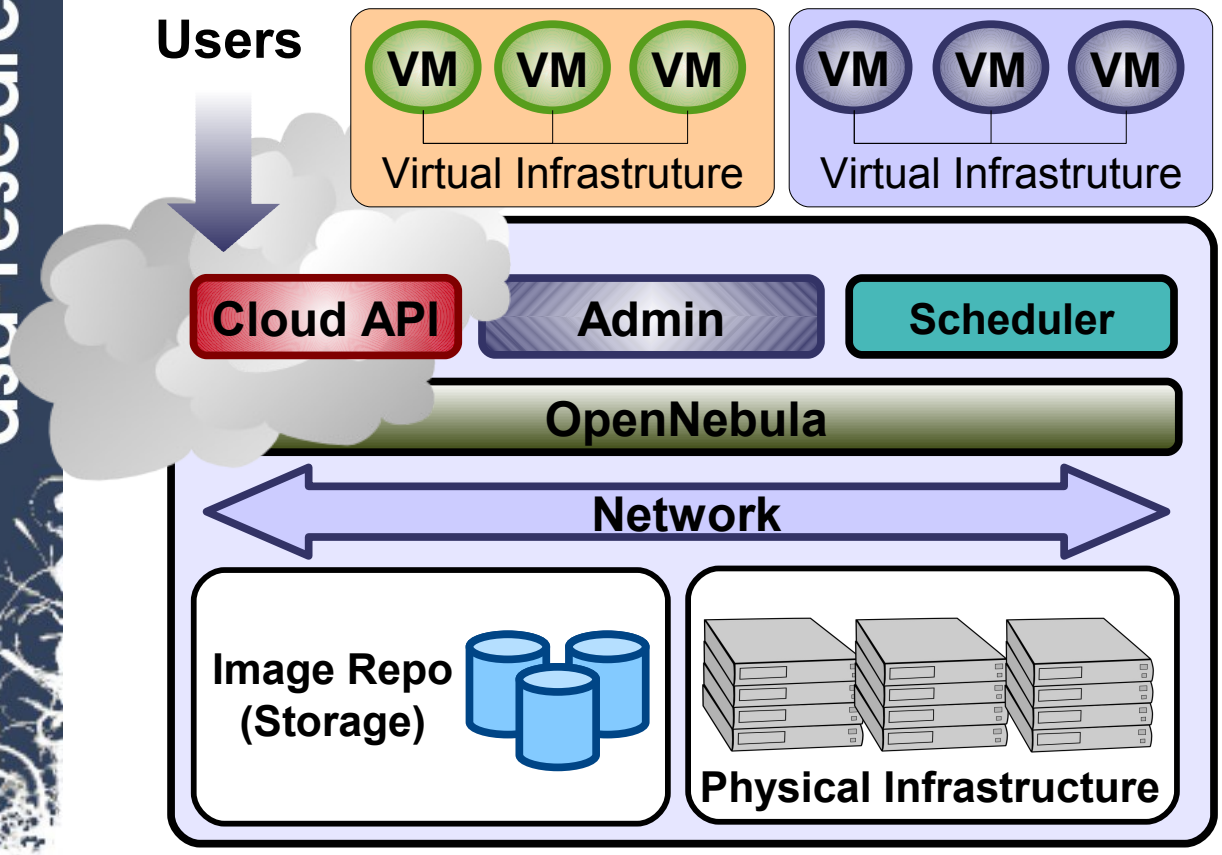
A "*Public Cloud behind the firewall*"

- Security
- Flexible management (consolidation, adaptation, provisioning...)



The headaches...

- Orchestrate:
  - Virtualization
  - Networking
  - Storage
- Admin Interfaces
- VM placement

The Private IaaS Cloud

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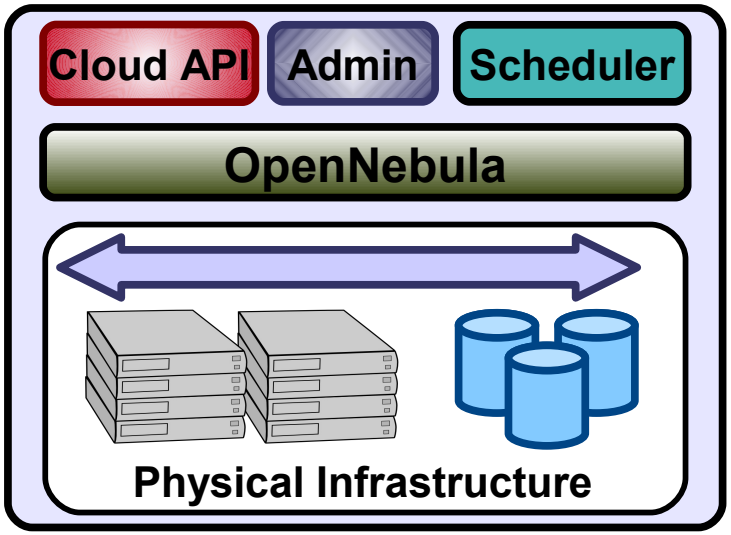

- Open and extensible architecture
- Minium installation requirements
- Distributed with Ubuntu (Jaunty 9.04)
- Open Source – Apache 2

Feature	Function
Internal Interface	• Unix-like CLI for fully management of VM life-cycle and physical boxes • XML-RPC API and libvirt virtualization API
Scheduler	• Requirement/rank matchmaker allowing the definition of workload and resource-aware allocation policies • Support for advance reservation of capacity through Haizea
Virtualization Management	• Xen, KVM, and VMware
Image Management	• General mechanisms to transfer and clone VM images
Network Management	• Definition of isolated virtual networks to interconnect VMs
Service Management and Contextualization	• Support for multi-tier services consisting of groups of inter-connected VMs, and their auto-configuration at boot time

The Hybrid IaaS Cloud

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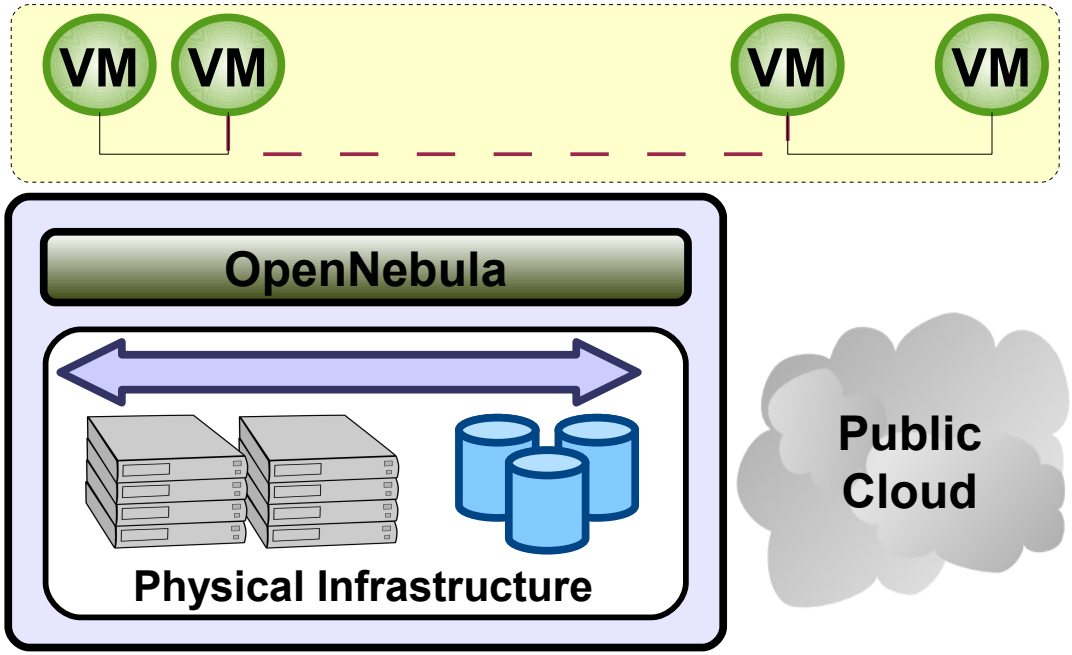
- Supplement the capacity of the local infrastructure
- Transparent access to the resulting hybrid cloud



Feature	Function
Cloud Plugins	• Amazon EC2 and ElasticHosts connectors
Federation	• Support for simultaneous access to several remote clouds
Flexibility	• Modular approach to develop new connectors

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