The OpenStack Cloud Computing Framework and Ecosystem

Thomas Michael Bohnert,

Andy Edmonds, Christof Marti,

#ICCLab / ZHAW

www.cloudcomp.ch

TechTalk 2012

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Disruption with Huge Potential

Merrill Lynch

- **$160 billion addressable market opportunity** for Cloud computing
- Cloud offers still in a lower maturity phase
- fast forming business

Forrester

- bandwidth for Amazon's EC2 and S3 in Q4 of 2007 exceeded the entire global Amazon.com web properties combined during their busiest time of the year.

IDC

- spending on cloud computing will grow almost threefold within the next five years,
- reaching **$42 billion by 2012** and accounting for 9% of revenues
- Cloud services are entering a period of widespread adoption
- Much cheaper way for businesses to acquire and use IT, which is of advantage in an economic downturn

Looming ever larger

Worldwide software-as-a-service revenue*, $bn

- Content, communications and collaborations
- Enterprise-resource planning
- Supply-chain management
- Customer-relationship management
- Office suites and digital-content creation
- Others

Compound annual growth rate, 2006-2011, %

FORECAST

29.1	
95.7	
25.9	
9.0	
15.9	
20.0	

2005 06 07† 08 09 10 11
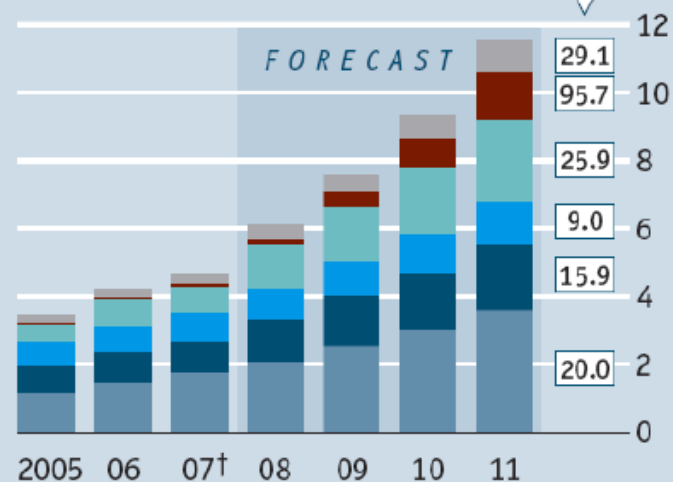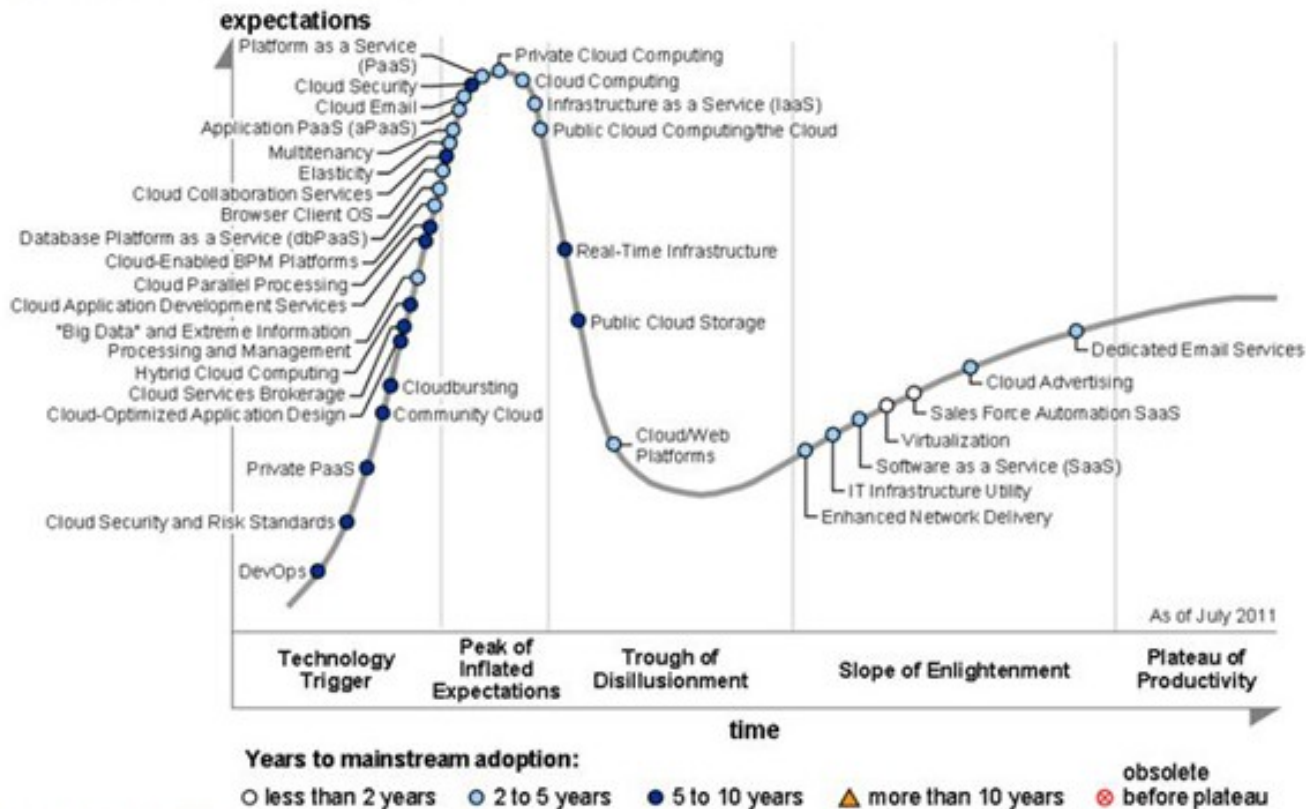
*Within the enterprise application markets †Estimate

Source: Gartner

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A Reality

Figure 1. Hype Cycle for Cloud Computing, 2011

Software as a Service

Platform as a Service

Infrastructure as a Service

Commercial Eco-System

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Swiss Perspective

CloudSigma

TECHTOUR 25 SELECTED COMPANIES

CloudSigma ist ein innovativer Anbieter auf dem Gebiet Infrastructure-as-a-Service (IaaS) mit Sitz in Zürich in der Schweiz. CloudSigma wurde gegründet, um die wachsende Nachfrage nach einem reinem IaaS, der seinen Nutzern beim Einsatz ihrer EDV-Ressourcen kaum oder keine Einschränkungen auferlegt, zu befriedigen.

CloudSigma reagiert dabei auf die aktuellen Marktangebote, die Nutzern zur Migration ihrer aktuellen Server-Konfigurationen in die Cloud zahlreiche komplizierte Schritte abverlangen. Weiterhin beschränken viele andere IaaS-Angebote die Auswahl der nutzbaren Betriebssysteme, die Größe der verfügbaren Server und mehr; Server verschwinden mit dem Anhalten, Datenspeicher sind nicht persistent usw. Das CloudSigma-Produkt wurde entwickelt, um genau diese Probleme anzugehen.

swisscom

Stable capacity

Scheduled increase in capacity

Scheduled increase in capacity
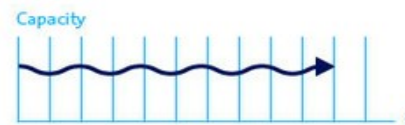
IBM

OOO Ringier **Google** Apps

Jüngst hatte Samuel Hügli, CFO und Leiter Corporate Center von Ringier, in der "Computerworld" die Gelegenheit, sich in einem Interview ausführlich über den Wechsel hin zu Google Apps und die daraus erwachsenen rechtlichen Herausforderungen zu äussern. Sein bestechendes Fazit zur Datensicherheit in Googles Cloud: "Durch einen hausinternen Setup des IT-Systems könnten wir nie diese Ausfallsicherheit erreichen. Unmöglich!"

hp

Many more: www.cloud-finder.ch

Periodic Bursting
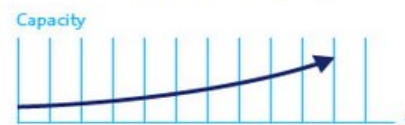
Predictable Bursting

On and Off - Inactive period

2010, HP to open Cloud Service Center in the Greater Zurich Area
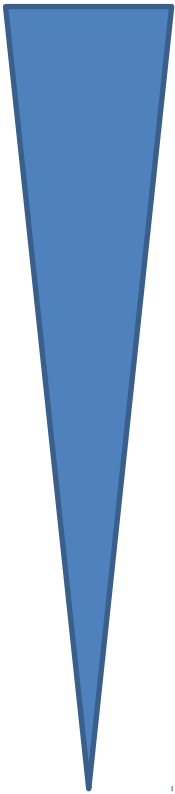
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Options

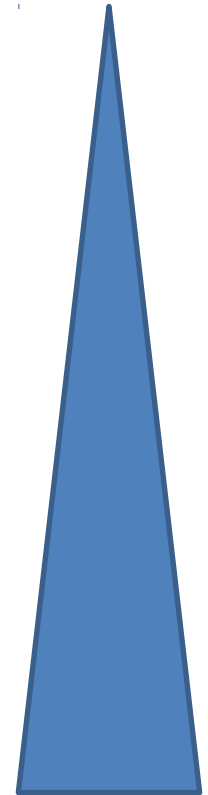www.cloudcomp.ch

Challenges

Diversity

Software as a Service

Platform as a Service

Infrastructure
as a Service
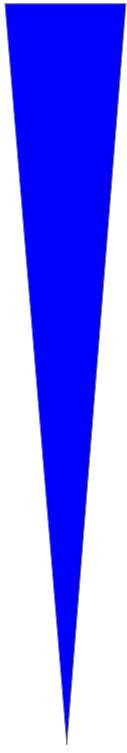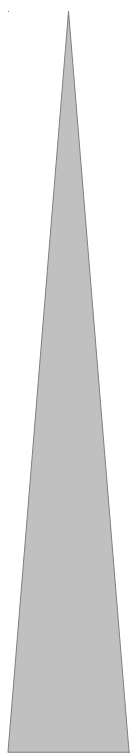
Availability

Considerations

Ease of Use, Reliance

Software as a Service — User

Platform as a Service — Developer

Infrastructure as a Service — IT Department

Tech Skill, Control

Threats

Lock-in

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Alternatives

Open Source
&
Open Standards

Cloud Computing Enablement

Open Source

- Xen, Xen Cloud Platform (XCP)

- KVM – Kernel-based Virtualization

- VirtualBox - Oracle supported Virtualization Solutions

- OpenVZ - Container-based, Similar to Solaris Containers or BSD Zones

- LXC – User-space chroot'ed installs

Open Source Software-as-a-Service

Very fuzzy …

Is Hotmail a Cloud Service? → Cloud Washing!

OSS Platform-as-a-Service

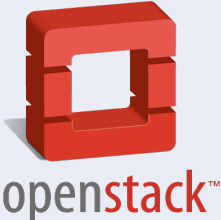|	Genesis	Sponsors	Supported Plattforms
CLOUD FOUNDRY™	2011	VMware	Java/Spring, Node.js, Grails, Ruby/Rails, Ruby/Sinatra, *)
OPENSHIFT	2011	RedHat	JavaEE6/JBoss, Ruby, PHP, Python, Perl, Node.js
WSO2 Stratos	2010	WSO2	JavaEE6, JBoss
SmartOS	2011	Joyent	Node.js

*) some derived products (AppFog, Stackato,…) also support PHP, Perl, Python, Erlang, Scala, Clojure, .Net

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OSS Infrastructure-as-a-Service

	Genesis	License	Supported Hypervisors
EUCALYPTUS	2006	GPL	Xen, KVM, VMware*
cloudstack open source cloud computing	2008	Apache 2 (since 2012)	Xen, KVM, VMware, OracleVM
OpenNebula	2008	Apache 2	Xen, KVM, VMware
openstack	2010	Apache 2	Xen, KVM, VMware, VirtualBox, Hyper-V, qcow2

*) not in OpenSource Version

Genesis of OpenStack

2005   2010

March	May	June	July

Rackspace Cloud developed

Rackspace Decides to Open Source Cloud Software

NASA Open Sources Nebula Platform

OpenStack formed b/w Rackspace and NASA

Inaugural Design Summit in Austin

2011

July	October	November	February

OpenStack launches with 25+ partners

First 'Austin' code release with 35+ partners

First public Design Summit in San Antonio

Second 'Bexar' code release planned
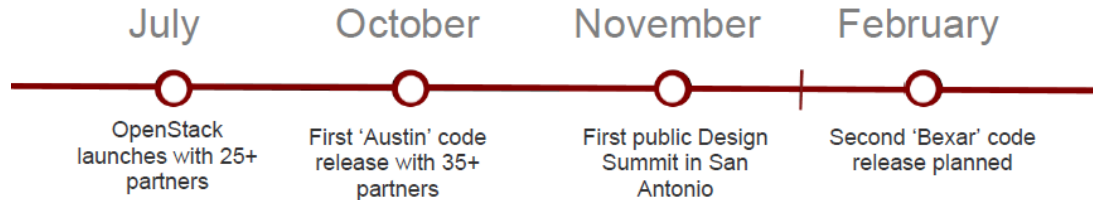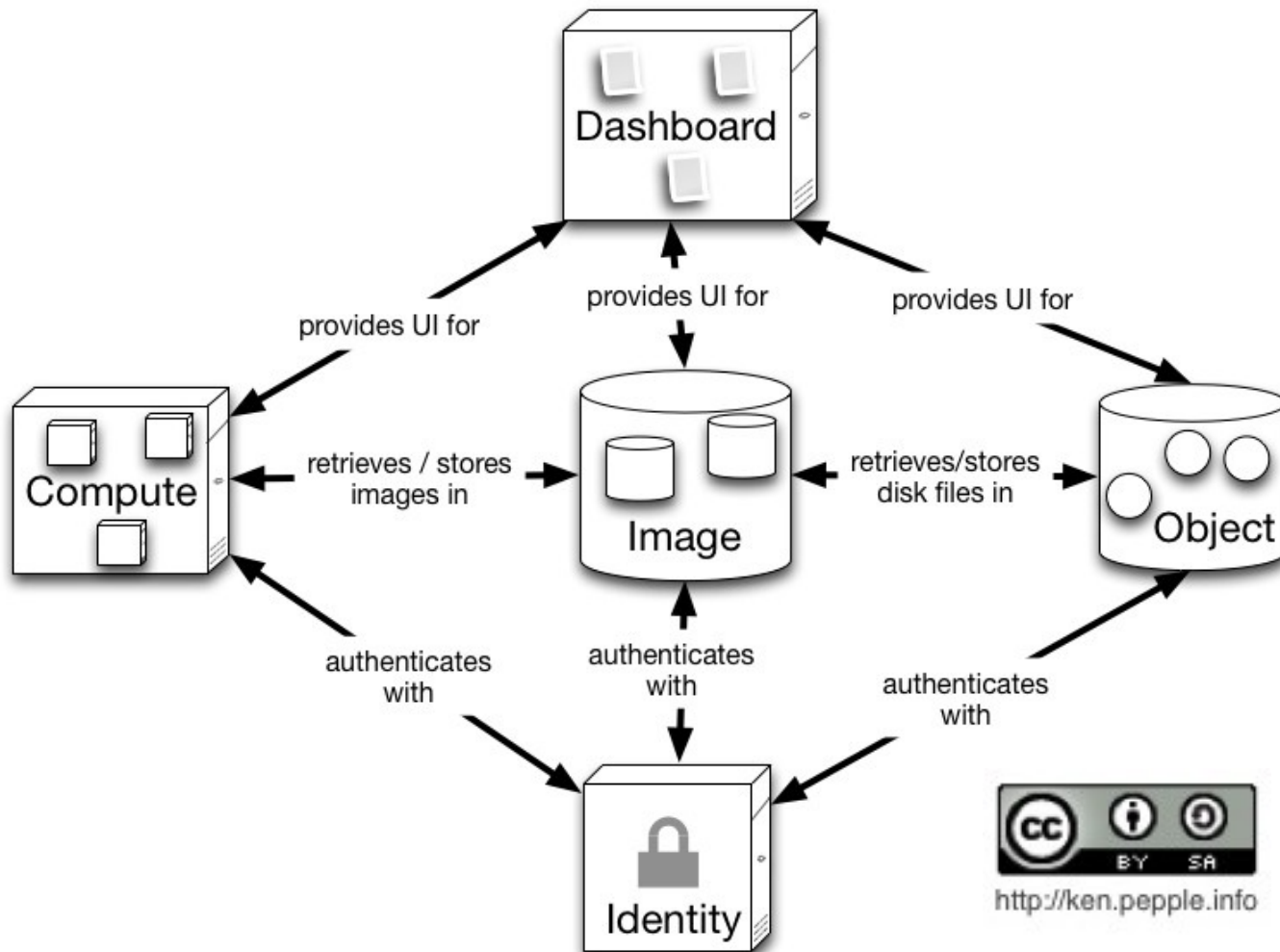
openstack™

Oct, 2012:
OpenStack 2012.2 (Folsom)
Delivers Pluggable Cloud Operating System to Power Global Clouds with Powerful Networking, Compute, and Storage Capabilities
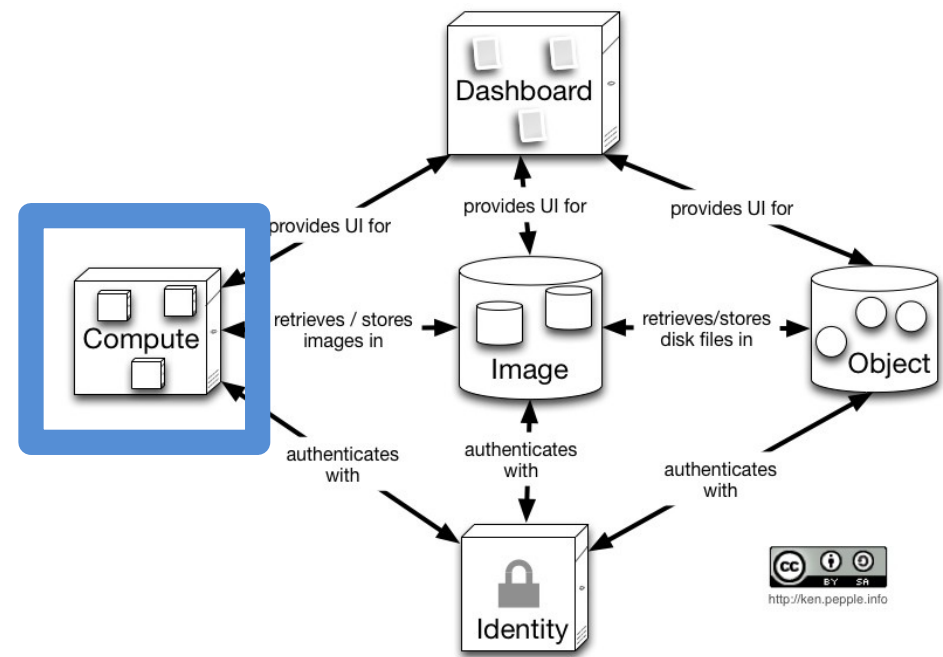
OpenStack Architecture

Everything has an API
Message based
Discrete Pluggable Components

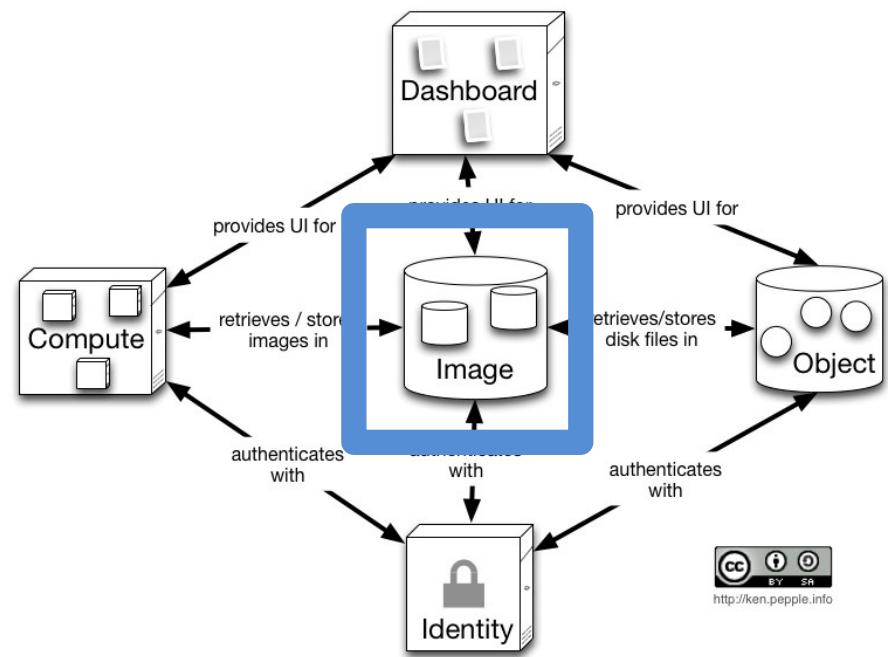www.cloudcomp.ch

Key Component: Compute

- **Nova:** Provides virtual servers on demand
  - KVM, Xen, VMware, HyperV, VirtualBox, LXC
- Looks after scheduling, networking & Block Storage
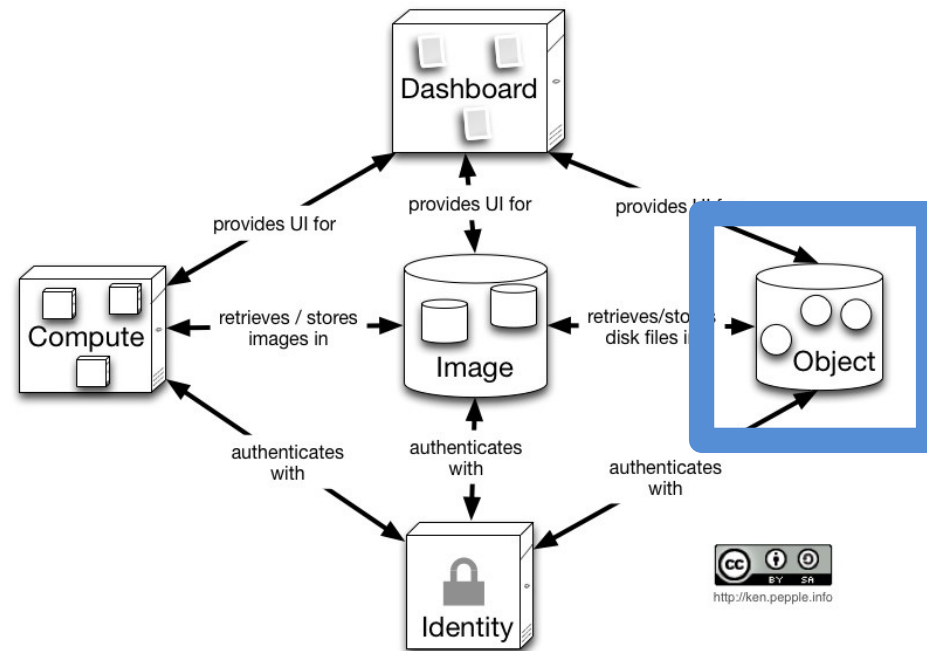 -

Key Component: Image

- **Glance:** Virtual Machine Image Registration and Storage
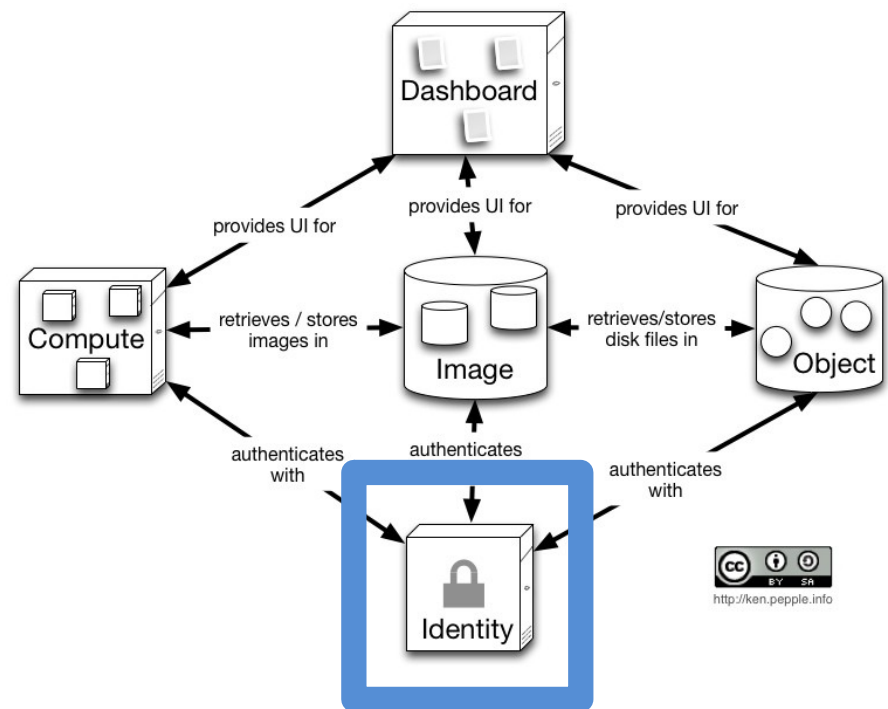
  – Storage via pluggable backends

Key Component: Object Storage

- **Swift:** Store & Retrieve data

- Data (*objects*) are stored in buckets (*containers*)

- Eventually consistent design
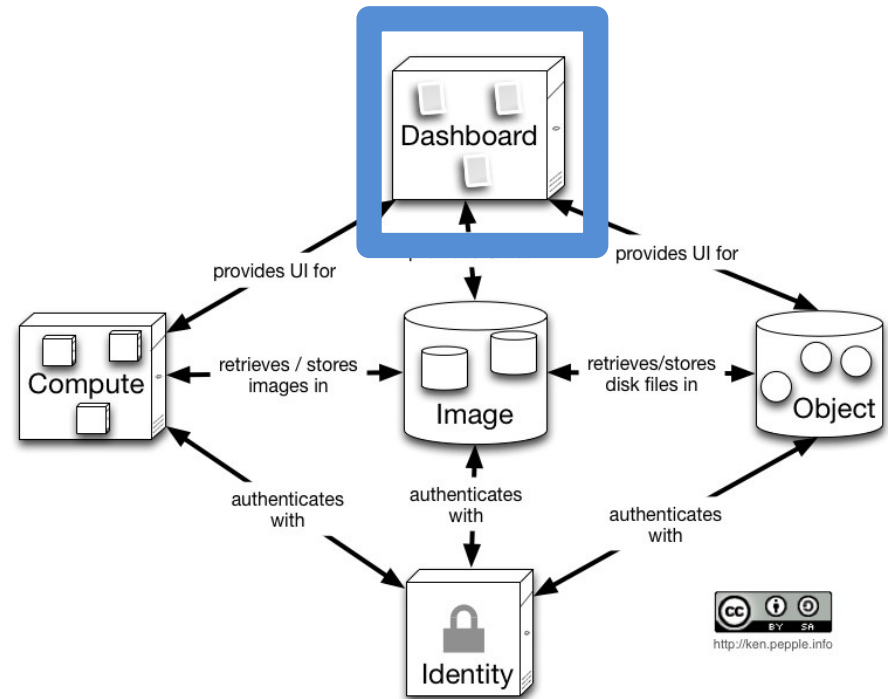
Key Component: Identity

- **Keystone:** authentication and authorization

  – all the OpenStack services.

- Service type catalog of services.

- Pluggable front and back ends
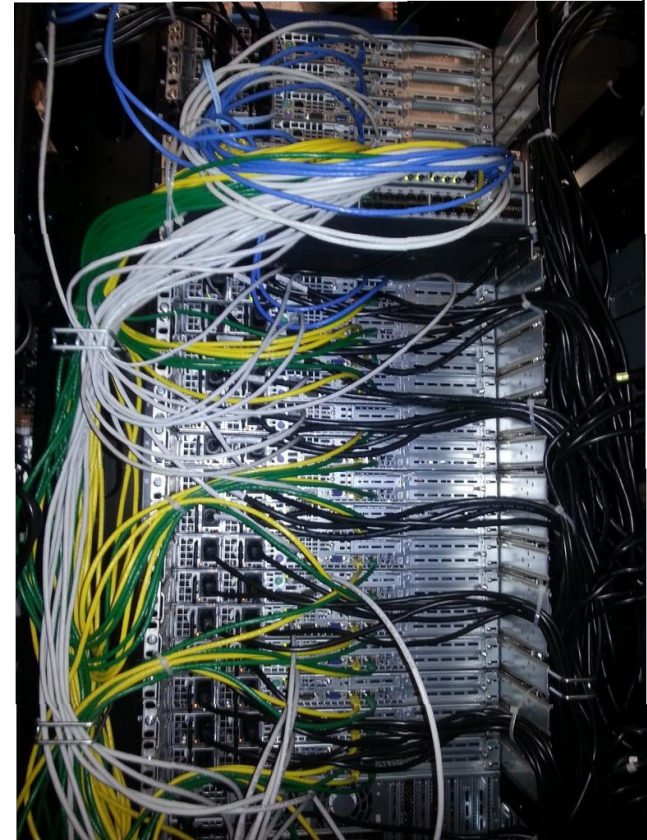
Key Component: Dashboard

- **Horizon:** A modular web-based user interface for all the OpenStack services

- Core functionality
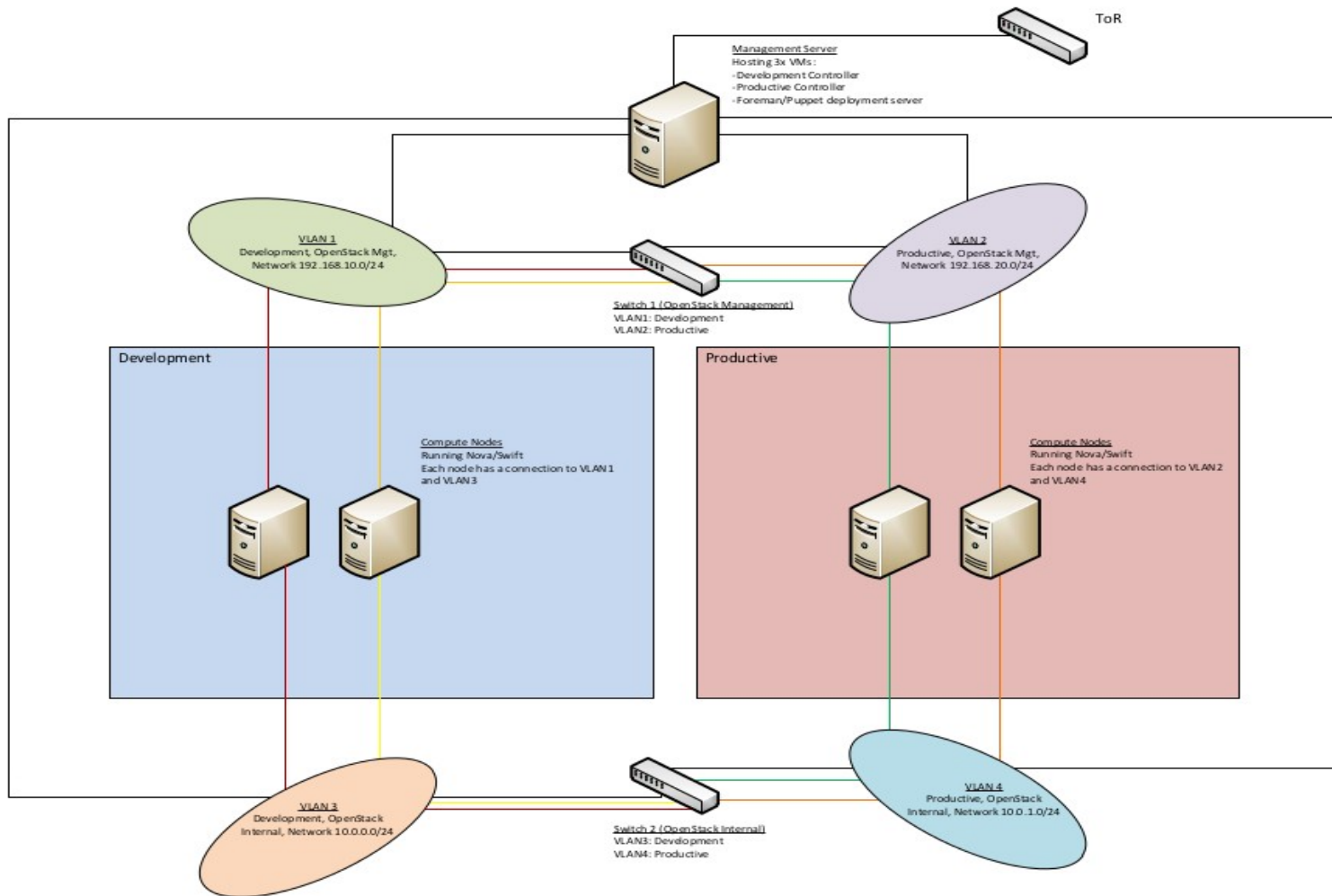 - Other via cmd. line

Usable … Useful … Used!

The ICCLab is equipped with COTS

- computing units, 8×2.4 Ghz Cores, 64GB RAM and 4×1TB local storage per unit.

- 12TB NFS or iSCSI Storage
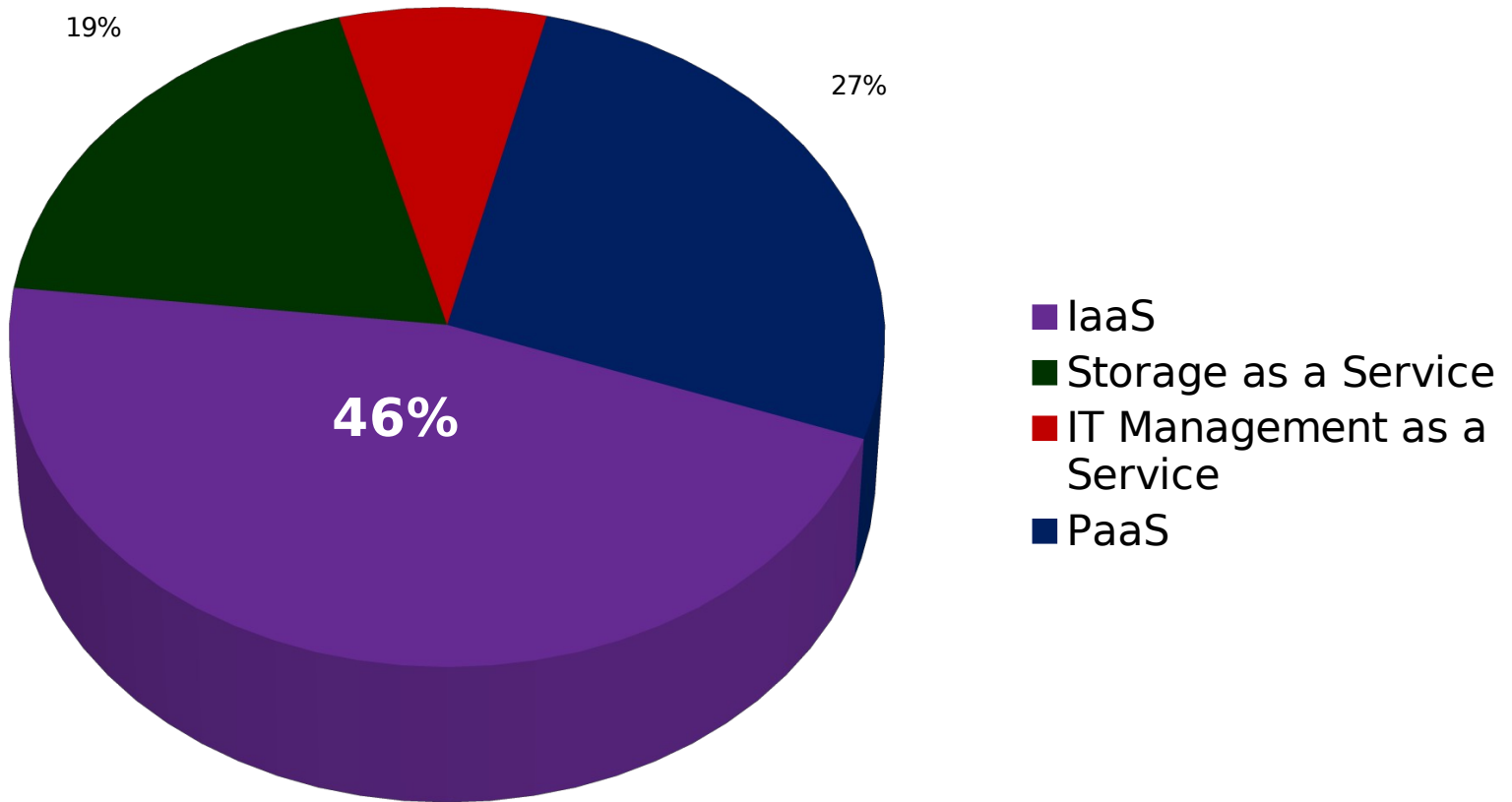
- 10Gbit Ethernet (data) 1Gbit (ctrl)

openstack™

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Usable ... Useful ... Used!

ICCLab – Development / Productive Environment

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Usable ... Useful ... Used!!

Commercially relevant?

19%

27%

46%

- IaaS
- Storage as a Service
- IT Management as a Service
- PaaS

Estimated 2012 Cloud Revenue Breakdown by Subsector – Total $4.3bn (220+ vendors)

Source: Cloud Adoption in the Enterprise: From the Playground to Production
William Fellows, VP Research, 451 Research

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How can **YOU** take part?

Swiss OpenStack User Group!

Meeting on 15th of Nov

@openstackch

http://linkd.in/os-ugch

Join in!

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