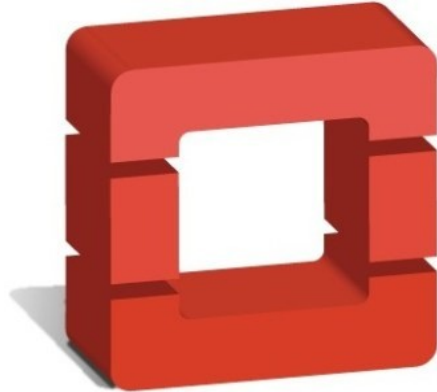


Como gerenciar uma nuvem pública ou privada utilizando o Openstack



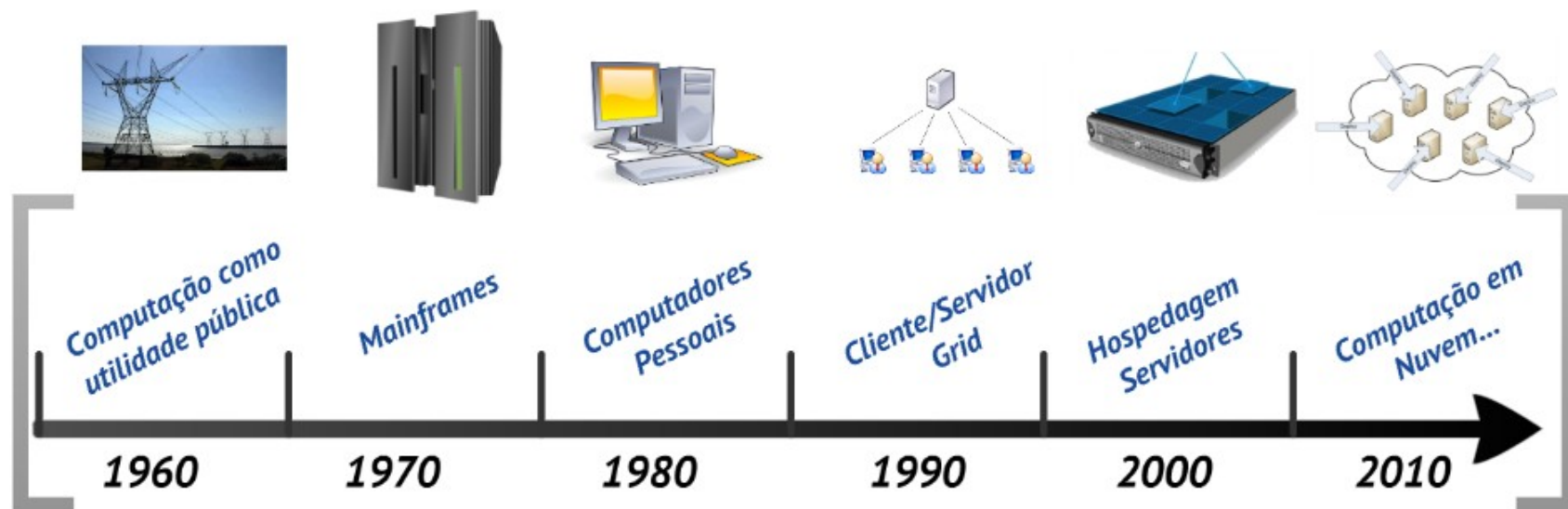
openstack™
CLOUD SOFTWARE

Marcelo Dieder – marcelodieder@gmail.com
GTER 35 – Foz do Iguaçu

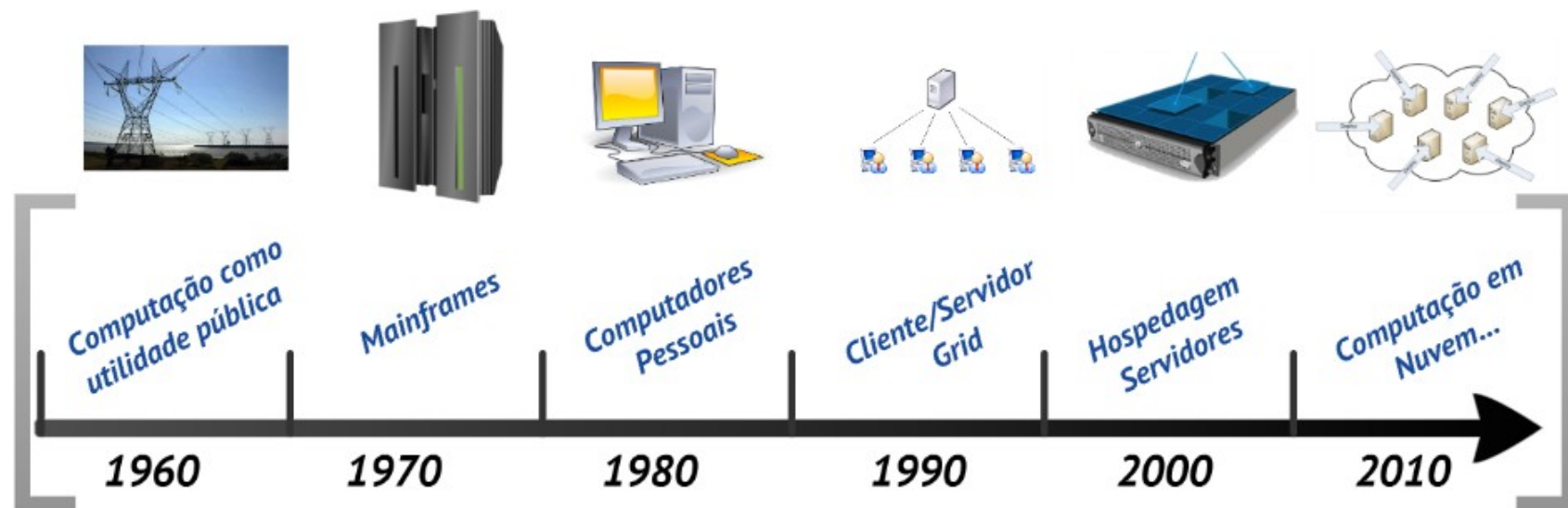
Agenda

- Contextualização do tema
- Soluções IaaS
- Referência: Amazon AWS
- Breve Histórico: Openstack
- Componentes Openstack
- Dúvidas

Linha do tempo da Computação



Linha do tempo da Computação



E depois?

Problema

Precisamos de demanda **instantânea** em ambientes **heterogêneos**. Temos diferentes **soluções** de virtualização, armazenamento e infraestrutura de rede. Como **gerenciar** o ciclo de vida destas instâncias em um ambiente tão **complexo**?

Conceitos de utilização da Nuvem

- Pool de Recursos
- Serviços sob demanda
- Elasticidade
- Acesso amplo
- Contabilização

Soluções de Nuvem IaaS



EUCALYPTUS

OpenNebula.org

cloudstack

Caminho do Openstack

Interesse com o passar do tempo ?

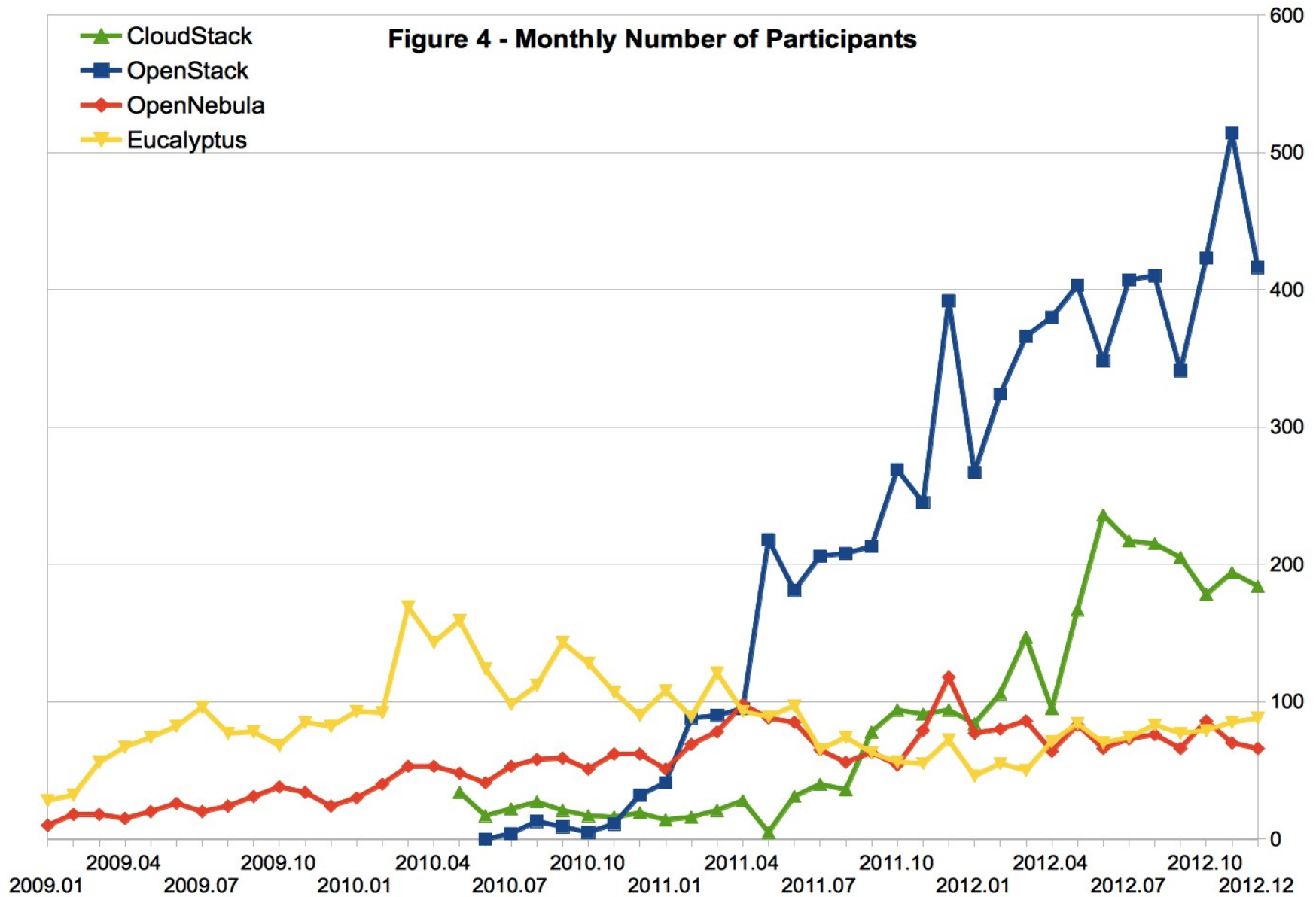
O número 100 representa o interesse máximo das pesquisas

Títulos das notícias Previsão ?



Fonte: Google Trends

Comparativo de participações



Fonte: <http://www.qyjohn.net/?p=2733>

Amazon – Padrão de Indústria



Amazon EC2 - Elastic Compute Cloud

Amazon EBS - Elastic Block Store

Amazon S3 - Simple Storage Service

Openstack – Cloud Operation System

- Criação de nuvem pública / privada
- Fundação Openstack
- + **9128** membros individuais
- + **850** organizações
- + **87** países
- Início desenvolvimento em 2010
- Idealizado pela NASA (EUA) e Rackspace
- Release atual: **Grizzly**
- Linguagem: **python**
- <http://www.openstack.org>



Openstack – Organizações



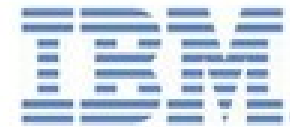
AT&T



Canonical



HP



IBM



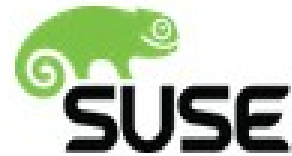
Nebula



Rackspace



Red Hat, Inc.



SUSE

Openstack – Organizações



CCAT



Cisco



Cloudscaling



Dell



DreamHost



eNovance



Ericsson



Intel



Juniper Networks



Mirantis



Morphlabs



NEC



NetApp



Piston Cloud



VMware



Yahoo!

Openstack – Organizações



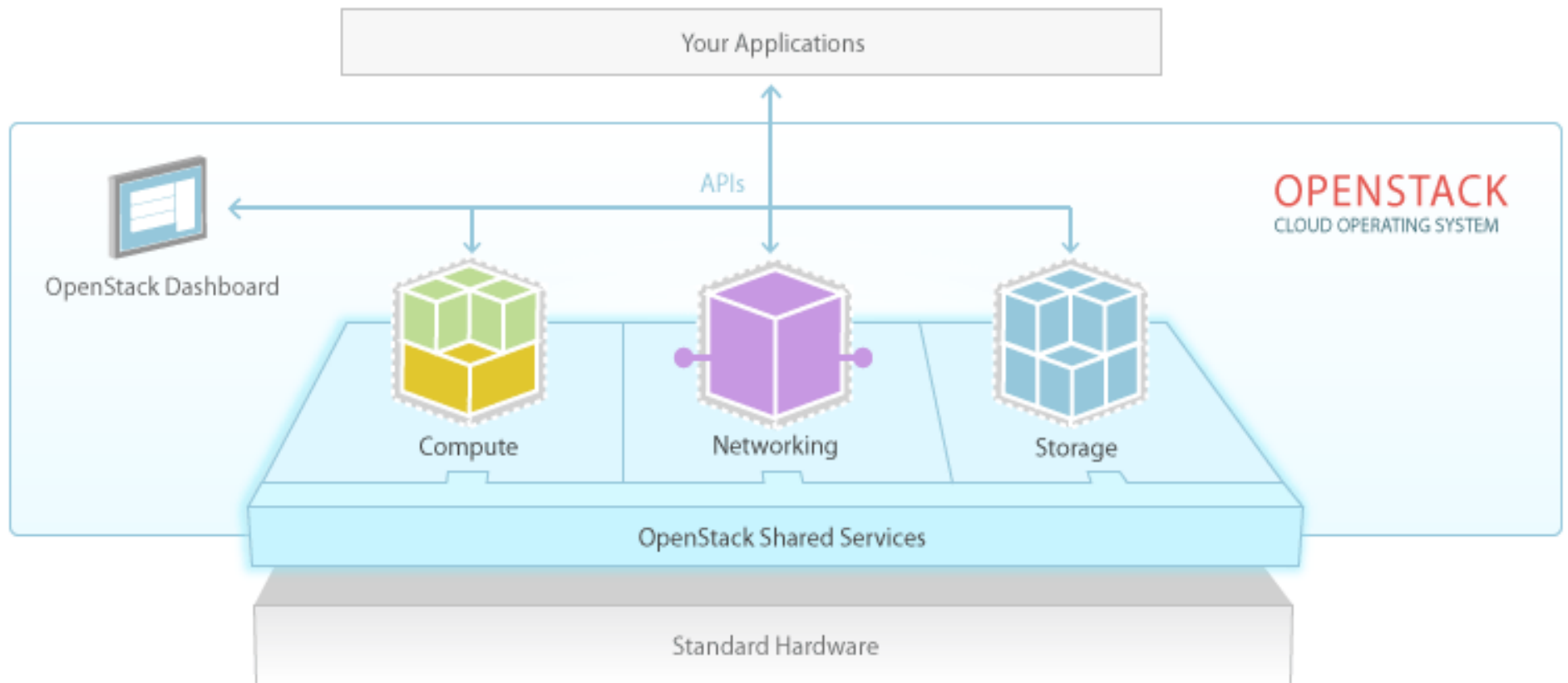
Openstack – Releases

Series	Status	Releases	Date
Havana	Under development	Due	Oct 17, 2013
Grizzly	Current stable release, security-supported	2013.1	Apr 4, 2013
Folsom	Community-supported, security-supported	2012.2	Sep 27, 2012
		2012.2.1	Nov 29, 2012
		2012.2.2	Dec 13, 2012
		2012.2.3	Jan 31, 2013
		2012.2.4	Apr 11, 2013
Essex	Community-supported	2012.1	Apr 5, 2012
		2012.1.1	Jun 22, 2012
		2012.1.2	Aug 10, 2012
		2012.1.3	Oct 12, 2012
Diablo	Community-supported	2011.3	Sep 22, 2011
		2011.3.1	Jan 19, 2012
Cactus	Deprecated	2011.2	Apr 15, 2011
Bexar	Deprecated	2011.1	Feb 3, 2011
Austin	Deprecated	2010.1	Oct 21, 2010

Openstack – Participação Mundial



Openstack – Visão Global



Fonte: openstack.org

Openstack – Hypervisors

Openstack não é um
novo hypervisor!

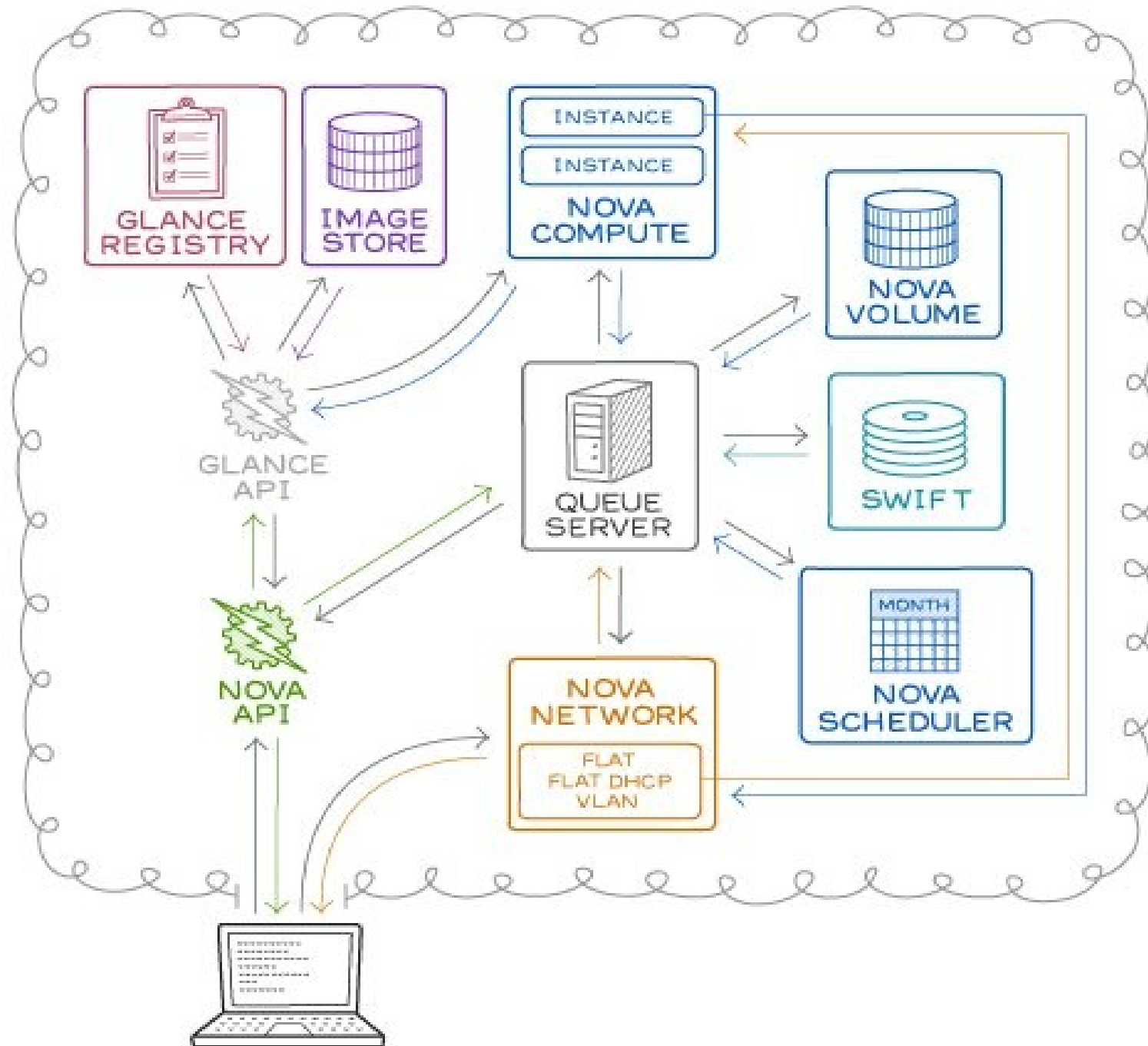
Openstack – Hypervisors

Feature	XenServer/XCP	KVM ↗	QEMU ↗	LXC ↗	ESXi/VC ↗	Hyper-V	Baremetal	PowerVM
Launch	✓	✓	✓	✓	✓	✓	✓	✓
Reboot	✓	✓	✓	✓	✓	✓	✓	✓
Terminate	✓	✓	✓	✓	✓	✓	✓	✓
Resize	✓	✓	✓			✓		✓
Rescue	✓	✓	✓		✓			X
Pause	✓	✓	✓		X	✓		X
Un-pause	✓	✓	✓		X	✓		X
Suspend	✓	✓	✓		✓	✓		X
Resume	✓	✓	✓		✓	✓		X
Inject Networking	✓*(1)(2)	✓*(1)	✓*(1)		✓*	✓	✓	X
Inject File	✓	✓*	✓*			X*(6)	✓	X
Serial Console	X*(4)	✓	✓	X	✓	X	✓*	X
VNC Console	✓*(5)	✓*	✓*		✓			X
Attach Volume	✓	✓	✓	X	✓	✓		X
Detach Volume	✓	✓	✓	X	✓	✓		X
Live Migration	✓	✓	✓		✓	✓		X
Snapshot	✓	✓	✓		✓	✓		✓
iSCSI	✓	✓	✓		✓	✓		
Set Admin Pass	✓	X	X		X	X*(6)		X
Get Guest Info	✓	✓	✓		✓	✓		✓
Get Host Info	✓	✓	✓		✓	✓		✓
Glance Integration	✓	✓	✓		✓	✓	✓	✓

Openstack – Componentes

- OpenStack Compute (code-name **Nova**) - Austin release
 - Gerenciamento de instâncias virtuais;
- OpenStack Object Storage (code-name **Swift**) - Austin release
 - Armazenamento de objetos em um ambiente distribuído;
- OpenStack Image Service (code-name **Glance**) - Bexar release
 - Controle de imagens de S.O.;
- OpenStack Identity (code-name **Keystone**) - Essex release
 - Controle de autenticação e autorização entre ações;
- OpenStack Dashboard (code-name **Horizon**) - Essex release
 - Gerenciamento web
- OpenStack Networking (code-name **Quantum**) - Folsom release
 - Gerenciamento de rede
- OpenStack Block Storage (code-name **Cinder**) - Folsom release
 - Gerência para armazenamento de blocos (sistema de arquivos).

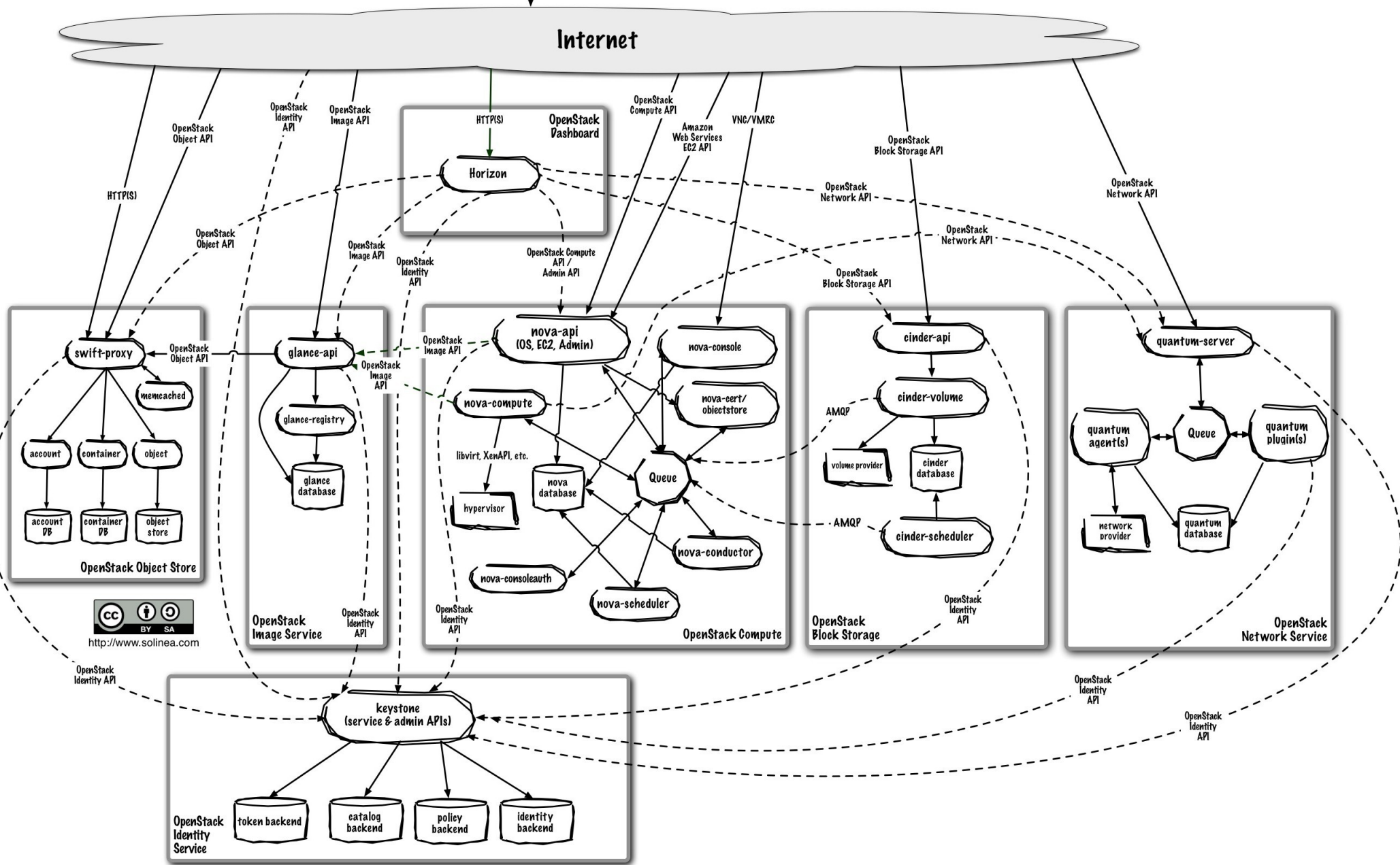
Openstack – Ambiente



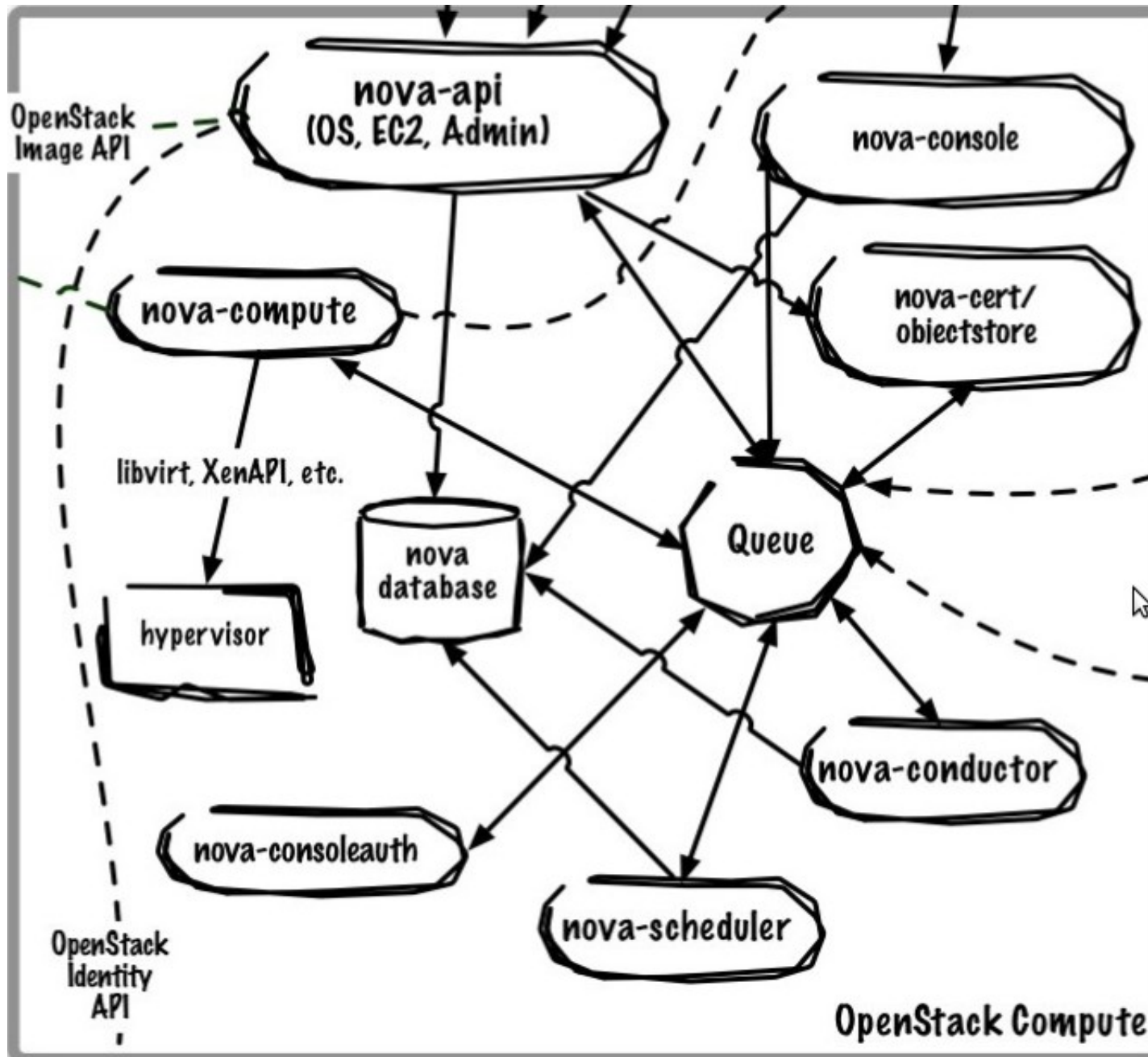
Openstack – Arquitetura Lógica



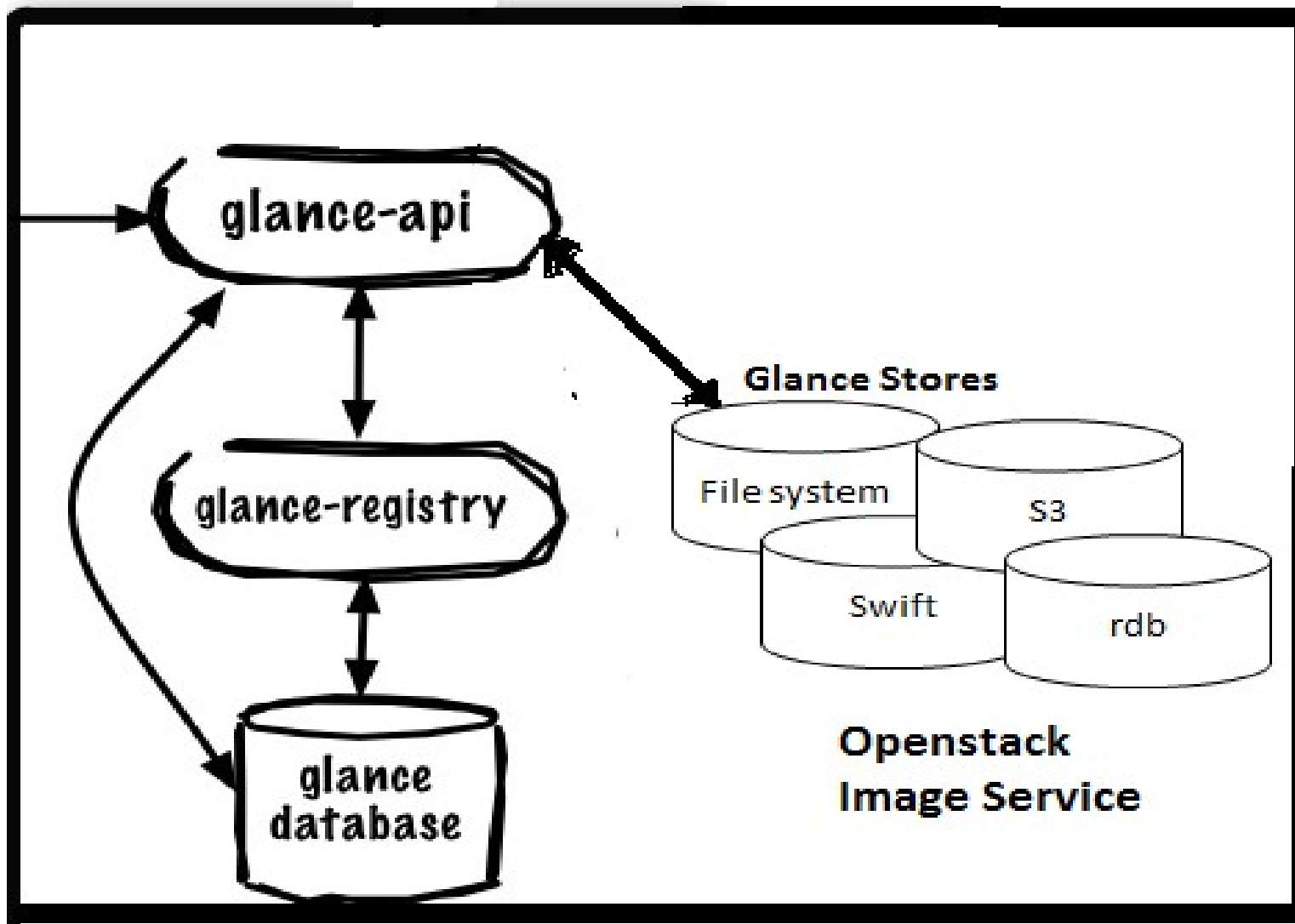
- OpenStack Command Line Tools (nova-client, swift-client, etc.)
- Cloud Management Tools (Rightscale, Enstratus, etc.)
- GUI tools (Cyberduck, iPhone client, etc.)



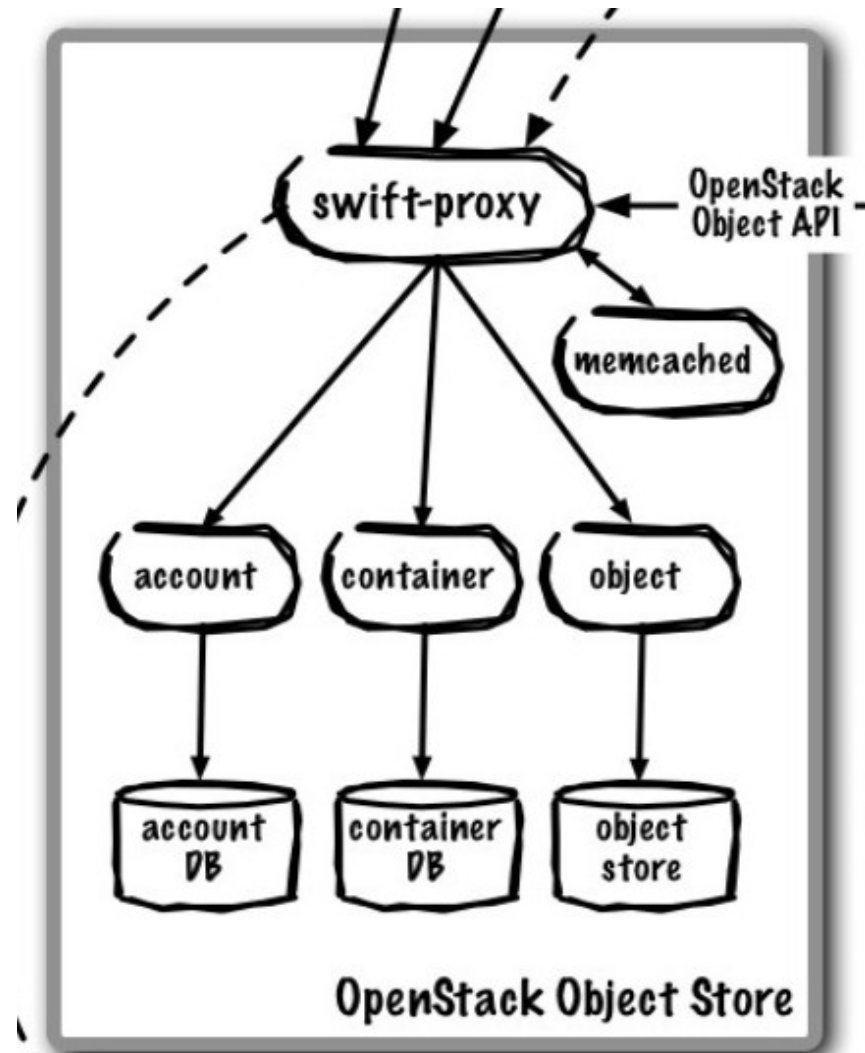
Openstack – Compute (gerência virtualizadores)



Openstack – Glance (gerência de imagens)

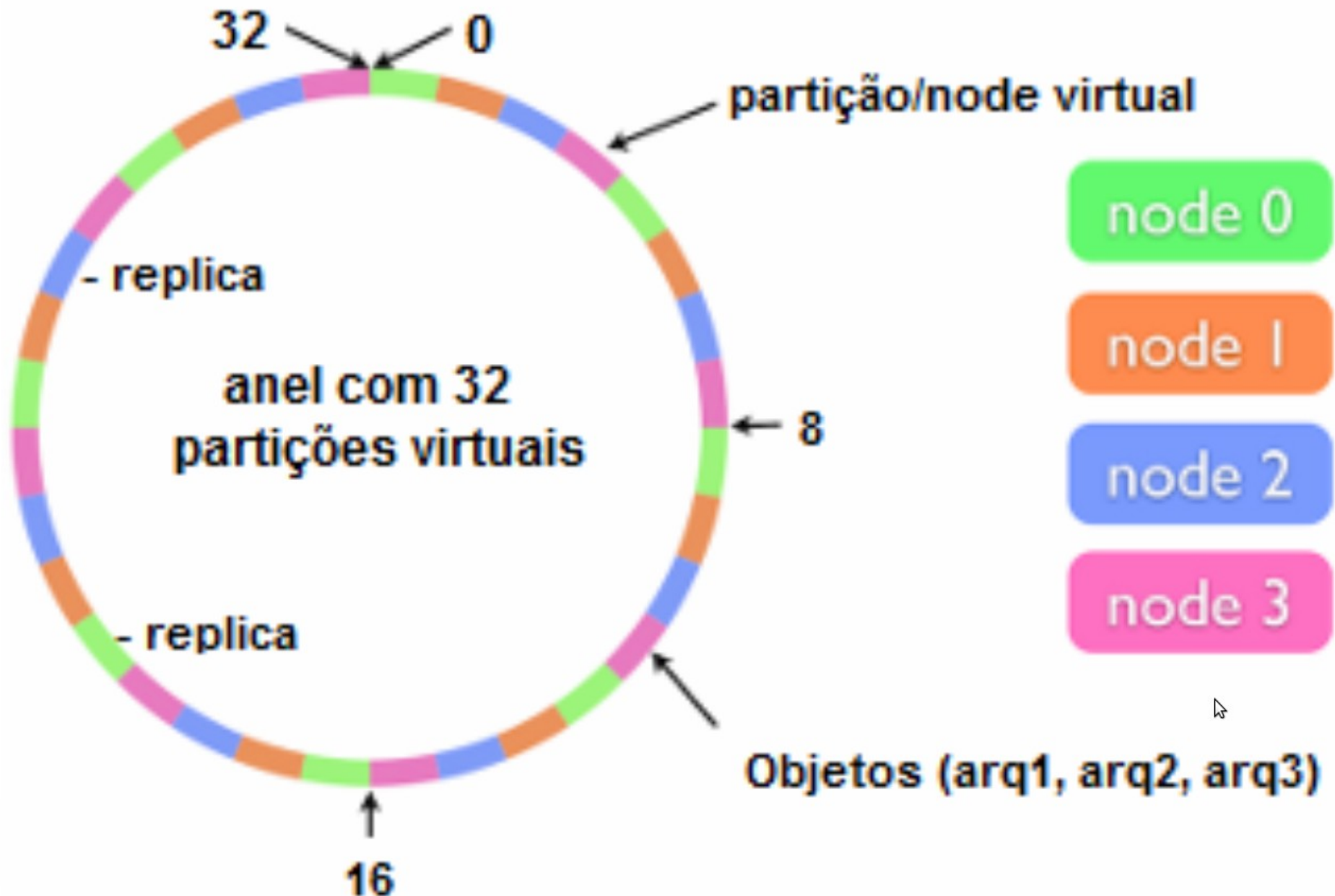


Openstack – Swift (Object Store)

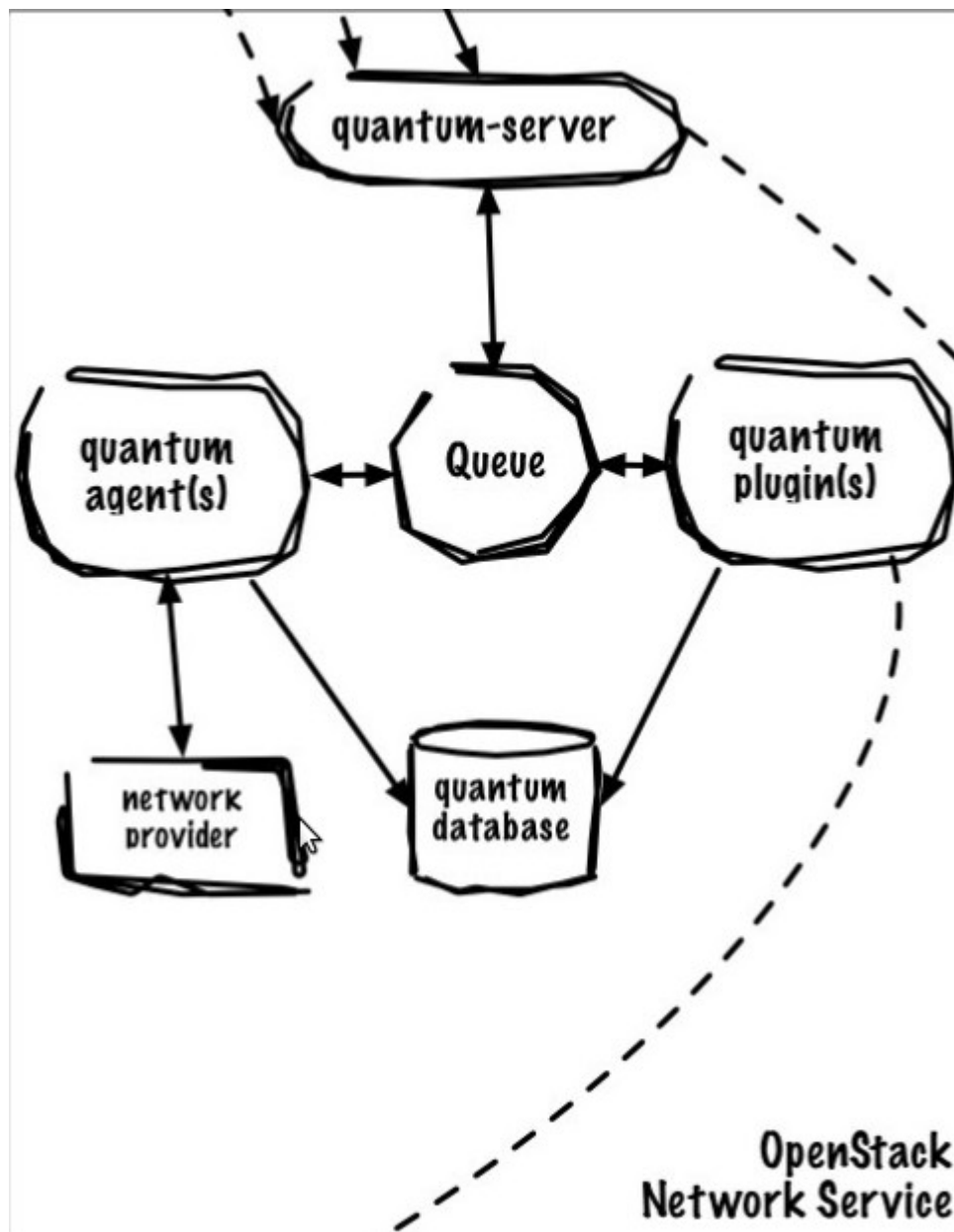


<http://www.solinea.com>

Openstack – Swift (anel)



Openstack – Quantum (Gerência Networking)

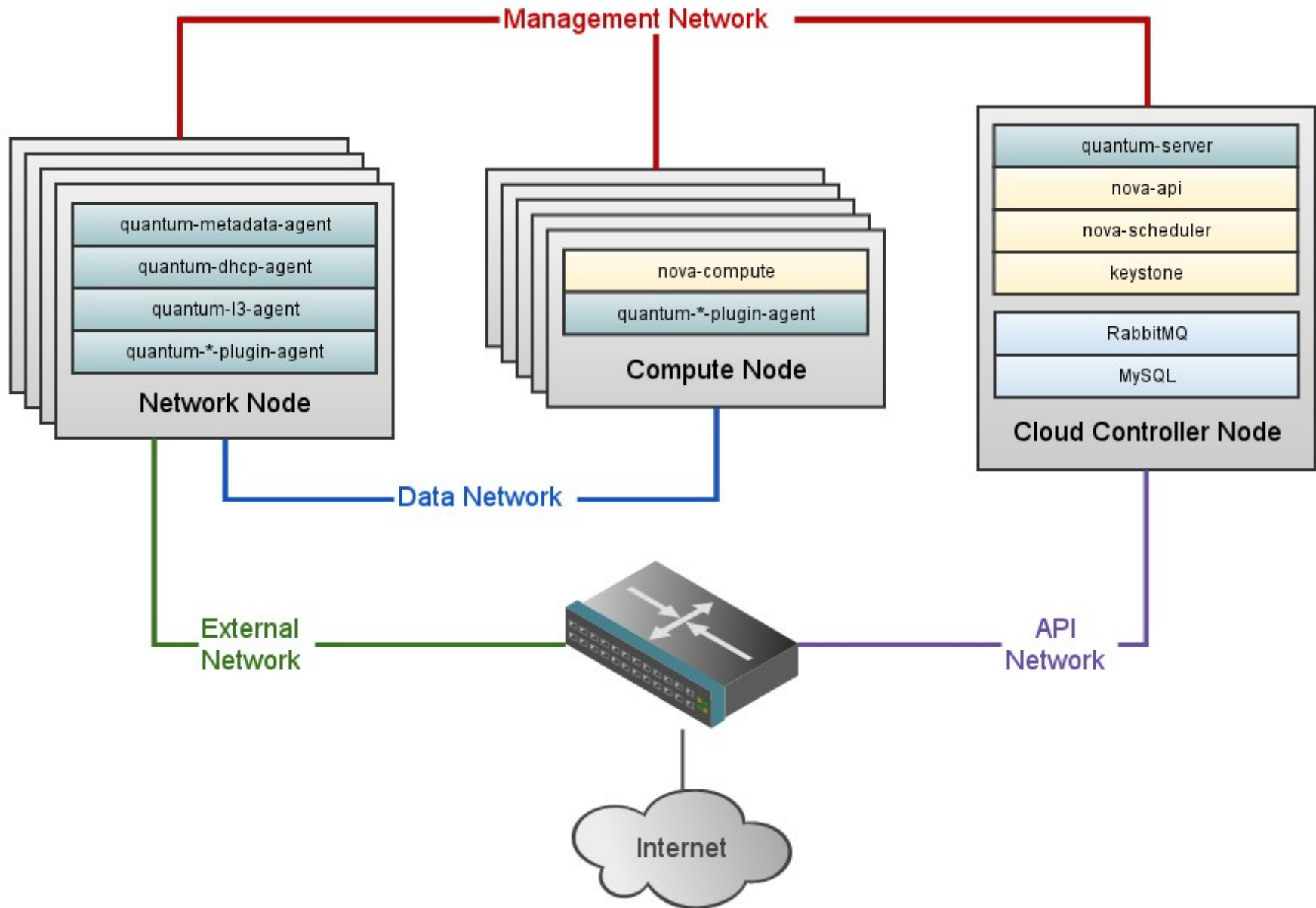


Openstack – Quantum (Gerência Networking)

Objetivos

- Forçene gerenciamento de rede
- Networking as a service
- Gerenciamento
 - L2/L3
 - Openflow
 - DHCP
 - Vlan
 - QoS
 - LB-aaS, VPN-aaS, firewall-aaS, IDS-aaS, data-center-interconnect-aaS.

Openstack – Quantum (Gerência Networking)



Openstack – Comandos / APIs

- Podem ser executados via comando
- Rest APIs
- Eucatoools (euca2ools)

Ex. Enviar uma imagem

```
# glance image-create --is-public true --disk-format qcow2  
--container-format bare --name "Cirros 0.3.1" < cirros-0.3.1-  
x86_64-disk.img
```

```
root@cloud01:~# glance image-list  
+-----+-----+-----+-----+  
| ID | Name | Disk Format | Container |  
Format | Size | Status | |  
+-----+-----+-----+-----+  
| df998a99-1c90-40c3-b744-86c9538172c4 | Cirros 0.3.1 | qcow2 | bare |  
| 13147648 | active | | |  
+-----+-----+-----+-----+
```

Openstack – APIs

Ex. Criar um rede para associar com as instâncias

```
# quantum net-create public --router:external=True
# quantum subnet-create --ip_version 4 --gateway
192.168.57.1 public 192.168.57.0/24 --allocation-pool
start=192.168.57.200,end=192.168.57.250 --disable-dhcp
--name public-subnet
# quantum router-gateway-set demo-router public
```

```
root@cloud01:~# quantum subnet-list
```

id	name	cidr	allocation_pools
6cf585a9-66e4-43dd-94eb-e0b9f3c42a07	demo-net-subnet	10.5.5.0/24	{"start": "10.5.5.2", "end": "10.5.5.254"}
6fe329f1-cf65-49e2-a7b3-3503118e78c8	public-subnet	192.168.57.0/24	{"start": "192.168.57.200", "end": "192.168.57.250"}

Openstack – APIs

Ex. Criar uma nova instância

```
# ssh-keygen -f ~/.ssh/id_rsa -t rsa -N "  
# nova keypair-add --pub_key ~/.ssh/id_rsa.pub default_key  
# nova secgroup-add-rule default tcp 22 22 0.0.0.0/24  
# nova boot --flavor 1 --image df998a99-1c90-40c3-b744-  
86c9538172c4 --key-name default_key teste3
```

```
root@cloud01:~# nova list
```

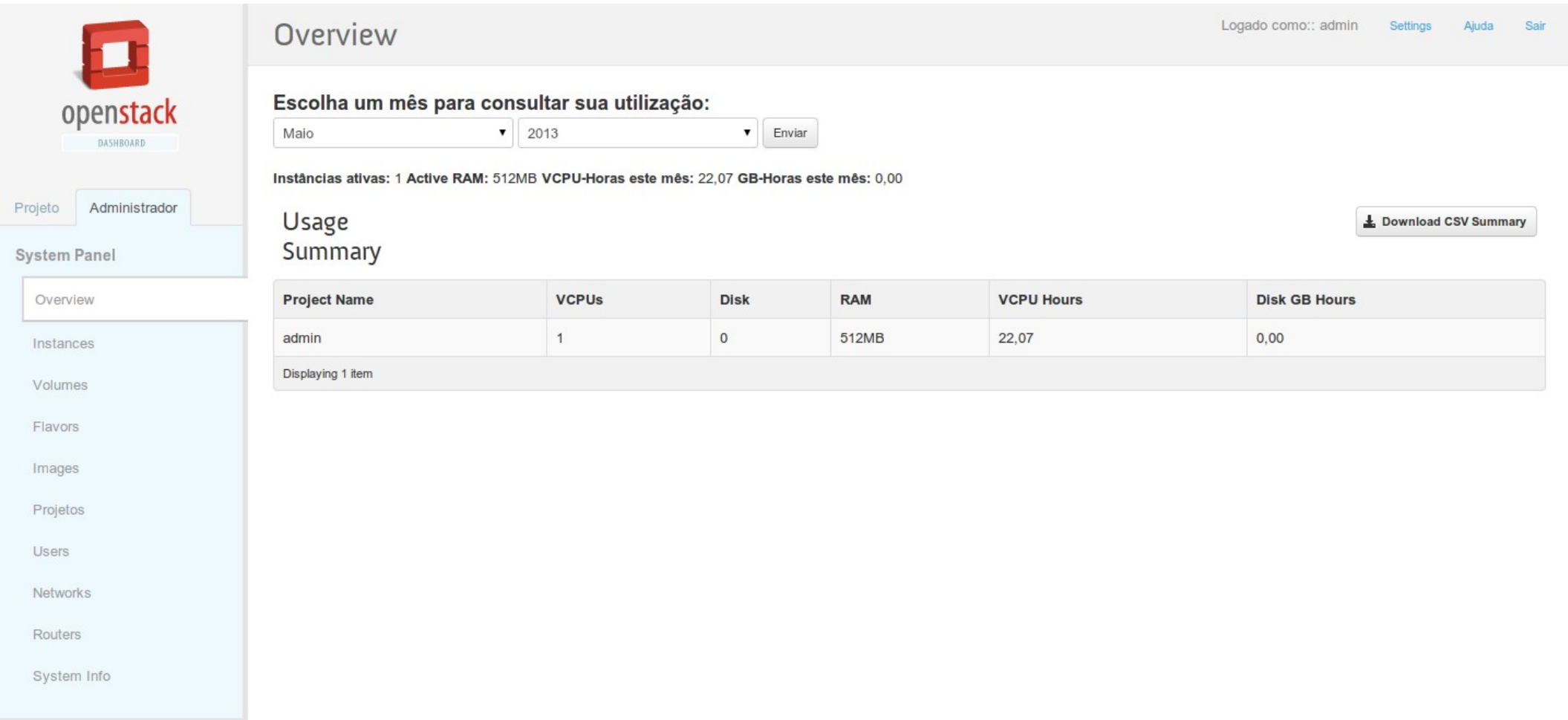
ID	Name	Status	Networks
b22f95c8-6d7c-4d9c-a17b-8204b9be6312	teste2	ERROR	
e19d6da0-453f-4b01-9311-4e02bd2be5f7	teste3	ACTIVE	public=192.168.57.201
cab344bf-1043-4e08-889b-cadbb471e5a4	teste_cirros	ERROR	

Openstack – APIs

Ex. Buscar Objeto Swift via REST

```
# curl -X GET -H "X-Auth-Token: fc81aaa6-98a1-9ab0-94ba-  
aba9a89aa9ae"  
https://storage.swiftdrive.com/v1/CF_xer7_343/dogs/JingleRocky.jpg >  
JingleRocky.jpg
```

Openstack – Horizon (Dashboard)



The screenshot shows the OpenStack Horizon dashboard. On the left is a navigation sidebar with the OpenStack logo and a 'DASHBOARD' button. Below it are tabs for 'Projeto' and 'Administrador', and a 'System Panel' menu with options: Overview, Instances, Volumes, Flavors, Images, Projetos, Users, Networks, Routers, and System Info. The main content area is titled 'Overview' and shows the user is logged in as 'admin'. It includes a filter for usage by month and year (May 2013) and a summary of active instances: 1 Active RAM: 512MB VCPU-Horas este mês: 22,07 GB-Horas este mês: 0,00. A 'Usage Summary' table is displayed with columns for Project Name, VCPUs, Disk, RAM, VCPU Hours, and Disk GB Hours. A 'Download CSV Summary' button is also present.

Logado como:: admin [Settings](#) [Ajuda](#) [Sair](#)

Overview

Escolha um mês para consultar sua utilização:

Maio 2013 Enviar


Instâncias ativas: 1 Active RAM: 512MB VCPU-Horas este mês: 22,07 GB-Horas este mês: 0,00

Usage Summary [Download CSV Summary](#)

Project Name	VCPUs	Disk	RAM	VCPU Hours	Disk GB Hours
admin	1	0	512MB	22,07	0,00

Displaying 1 item

Openstack – Horizon (Dashboard)



openstack
DASHBOARD

Projeto **Administrador**

System Panel

- Overview
- Instances**
- Volumes
- Flavors
- Images
- Projetos
- Users
- Networks
- Routers
- System Info

All Instances

Logado como: admin [Settings](#) [Ajuda](#) [Sair](#)


Instances

 Terminate Instances

<input type="checkbox"/>	Projeto	Host	Name	IP Address	Size	Status	Task	Power State	Ações
<input type="checkbox"/>	admin	c01	teste3	192.168.57.201	m1.tiny 512MB RAM 1 VCPU 0 Disk	Active	None	Running	Edit Instance More ▾
<input type="checkbox"/>	admin	-	teste2		m1.tiny 512MB RAM 1 VCPU 0 Disk	Error	None	No State	Edit Instance More ▾
<input type="checkbox"/>	admin	-	teste_cirros		m1.tiny 512MB RAM 1 VCPU 0 Disk	Error	None	No State	Edit Instance More ▾

Displaying 3 items

Openstack – Horizon (Dashboard)



openstack
DASHBOARD

Projeto Administrador

PROJETO ATUAL
admin

Manage Compute

- Overview
- Instances
- Volumes
- Images & Snapshots
- Access & Security

Manage Network

- Networks
- Routers
- Network Topology

Network Topology

Logado como: admin [Settings](#) [Ajuda](#) [Sair](#)

[Launch Instance](#) [Create Network](#) [Create Router](#)



Openstack – Release Havana

DevOps Installer

- Chef
- Crowbar (chef)
- Puppet
- Juju

Soluções Na Caixa

- Nebula
- StackOps
- Piston
- Fuel Mirantis

Openstack – Release Havana

Novos projetos – Outubro 2013

- Heat – Informações gerais da nuvem (ubiquidade)
- Ceilometer – Medindo a utilização de recursos

Openstack – Ferramentas / Soluções

DevOps Installer

- Chef
- Crowbar (chef)
- Puppet
- Juju

Soluções Na Caixa

- Nebula
- StackOps
- Piston

Alta Disponibilidade Openstack

- Pacemaker

Openstack – Requisitos

- Qual o tipo **ambiente**?
- **Desenvolvimento** ou **Produção**?
- Qual **hypervisor** será utilizado?
- Infraestrutura **disponível**?

Dúvidas?

Obrigado!

Marcelo Dieder

marcelodieder@gmail.com

Grupo Openstack-br:

<http://www.brasilopenstack.com.br>

<http://groups.google.com/group/openstack-br>