

OpenStack

Towards a fully open cloud

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Cloud ?



Why we need open source IaaS

- ◆ A cloud building block
- ◆ Emergence of a standard
- ◆ Eliminate cloud vendor lock-in
- ◆ Enable federation of clouds

Eucalyptus

- The first attempt to open source IaaS
- Java implementation of EC2 / S3 APIs
- Scaling ?
- Openness & Business model ?
- Innovation ?



Project genesis



- ♦ Cloud servers
- ♦ Cloud files (Swift)
- ♦ Open source

Project genesis



- ◆ Nebula & Eucalyptus
- ◆ NovaCC
- ◆ Open source

Project genesis



- ~~Cloud servers~~
- ~~Cloud files (Swift)~~
- ~~Open source~~



- ~~Nebula & Eucalyptus~~
- ~~NovaCC~~
- ~~Open source~~



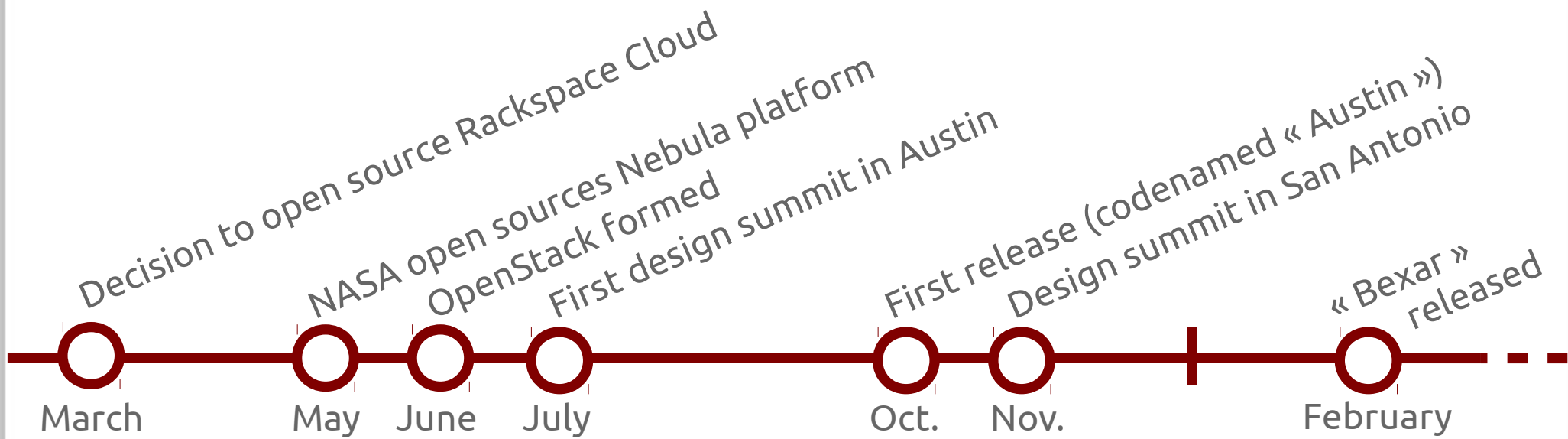
- Nova (compute)
- Swift (storage)

A decorative header consisting of a grid of small squares in shades of gray, arranged in a pattern that tapers towards the right side.

Mission statement

“To produce the **ubiquitous** open source cloud computing platform that will meet the needs of public and private cloud providers regardless of size, by being **simple to implement** and **massively scalable.**”

A young project





Open **source**

- ♦ Apache license
- ♦ No « open core »



Open design

- Open design summits every 6 months
- Everyone may submit blueprints



Open development

- DVCS using bazaar
- Uses Launchpad
- Everyone can propose branches
- Open code reviews



Open **community**

- Discussions happen on public channels
- Community-elected technical leads
- Community-elected seats on board



Swift (Cloud Storage)

- ◆ Object storage
- ◆ RESTful interface
- ◆ No object size limit
- ◆ Stable and deployed in production
- ◆ Scales **massively**

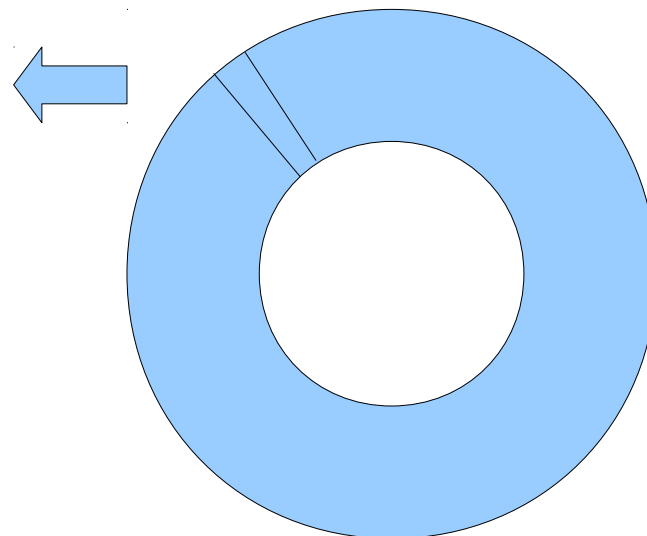
Swift rings

PUT /<api version>/<account>/<container>/<object>

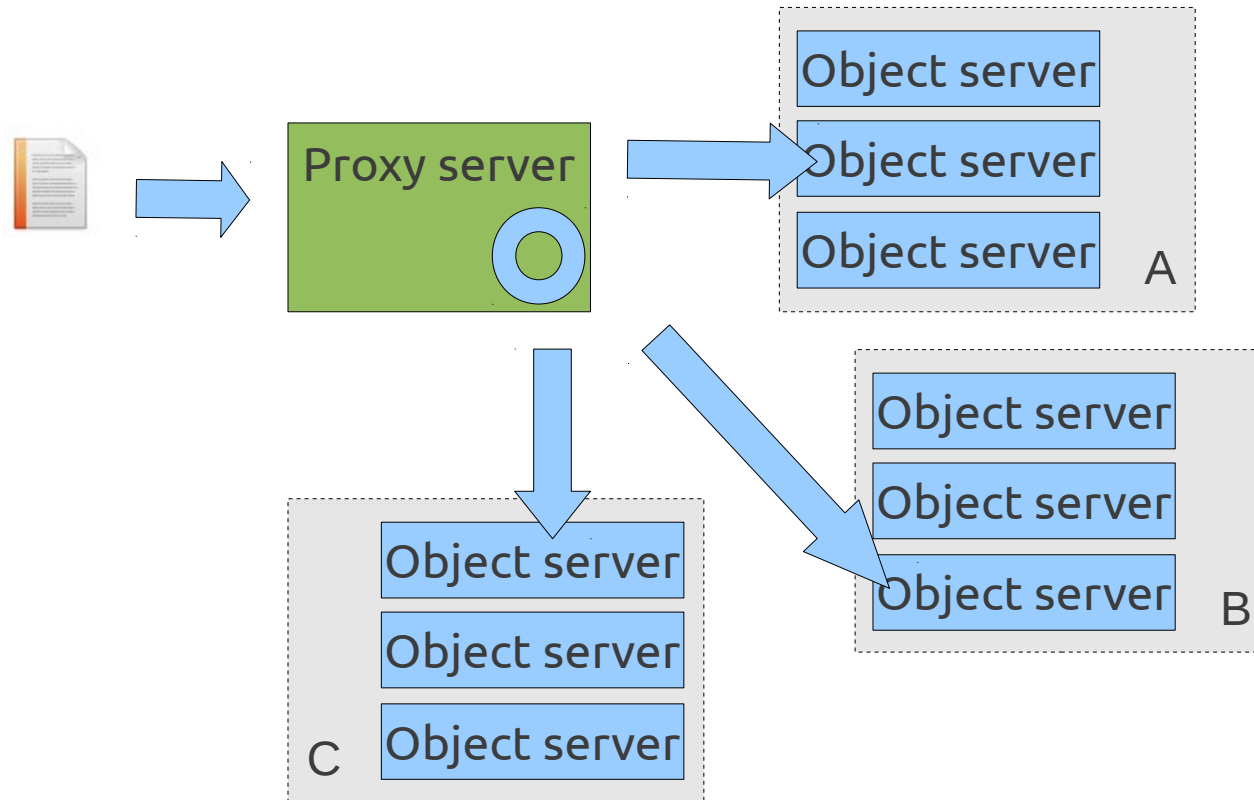
ecb25d1facd7c6760f7663e394dbeddb

Partition 482

located on:
zoneAsrv73
zoneCsrv35
zoneBsrv98

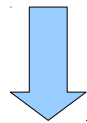


Swift request

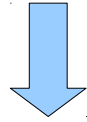


Object / container listing

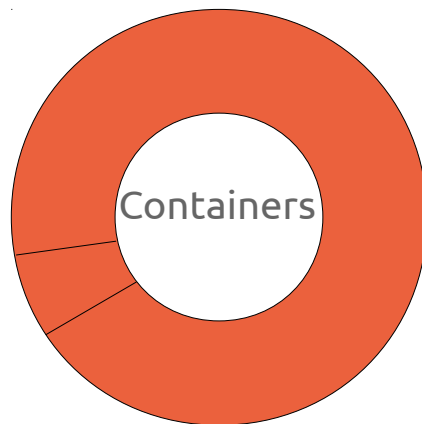
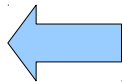
GET /<api version>/<account>/<container>/



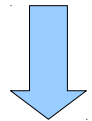
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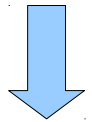
Partition 68
address queries to:
zoneBsrv12
zoneAsrv92
zoneCsrv44



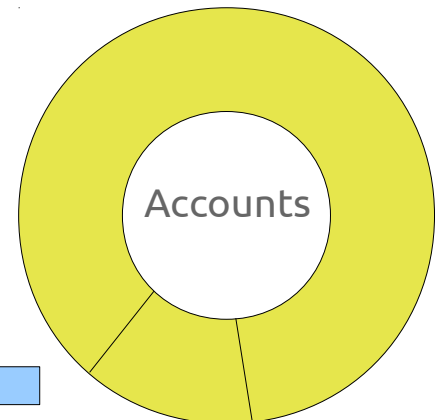
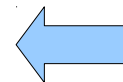
GET /<api version>/<account>/



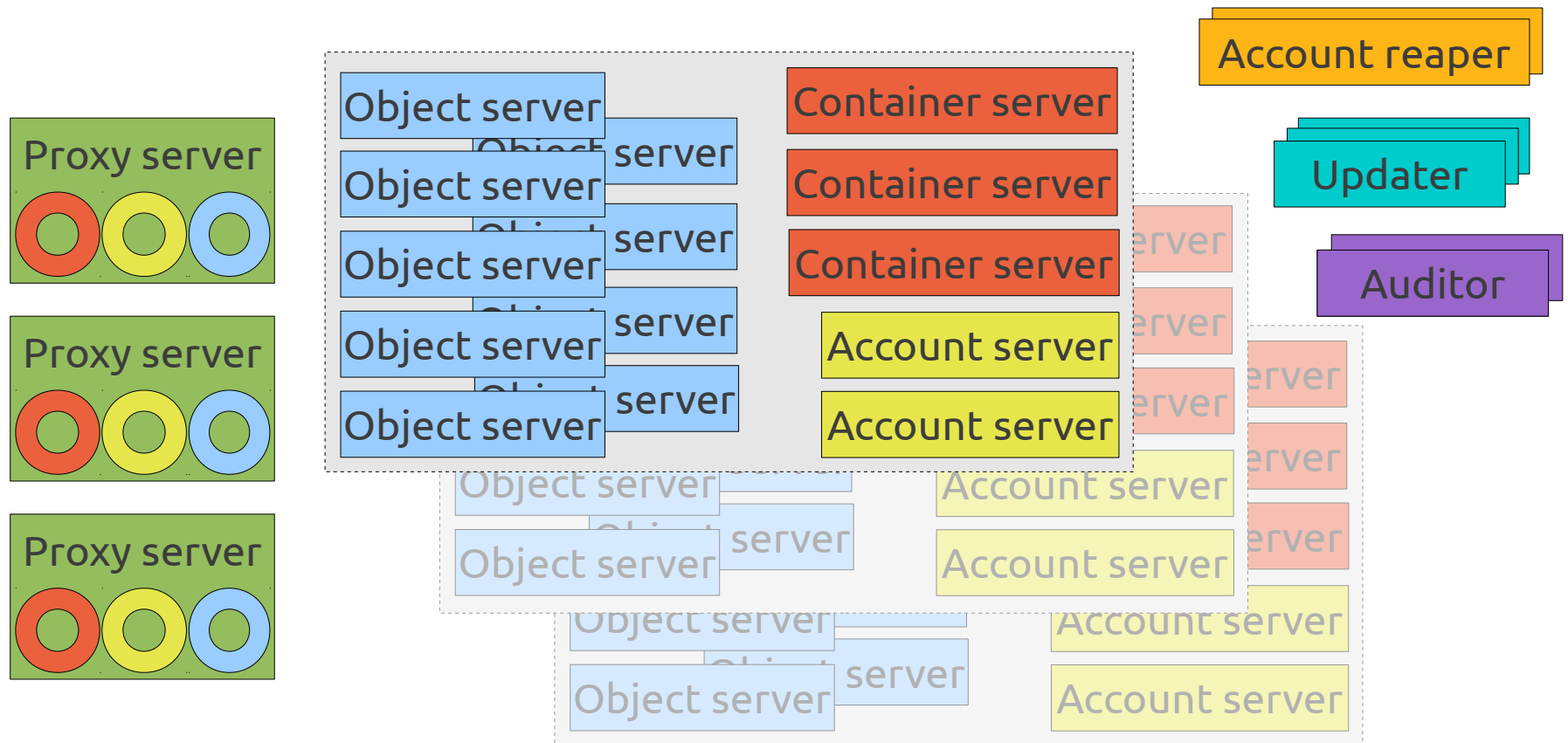
b779f644c96a61c240de9d5bfa431824



Partition 11
address queries to:
zoneBsrv42
zoneCsrv09
zoneAsrv63



Swift components



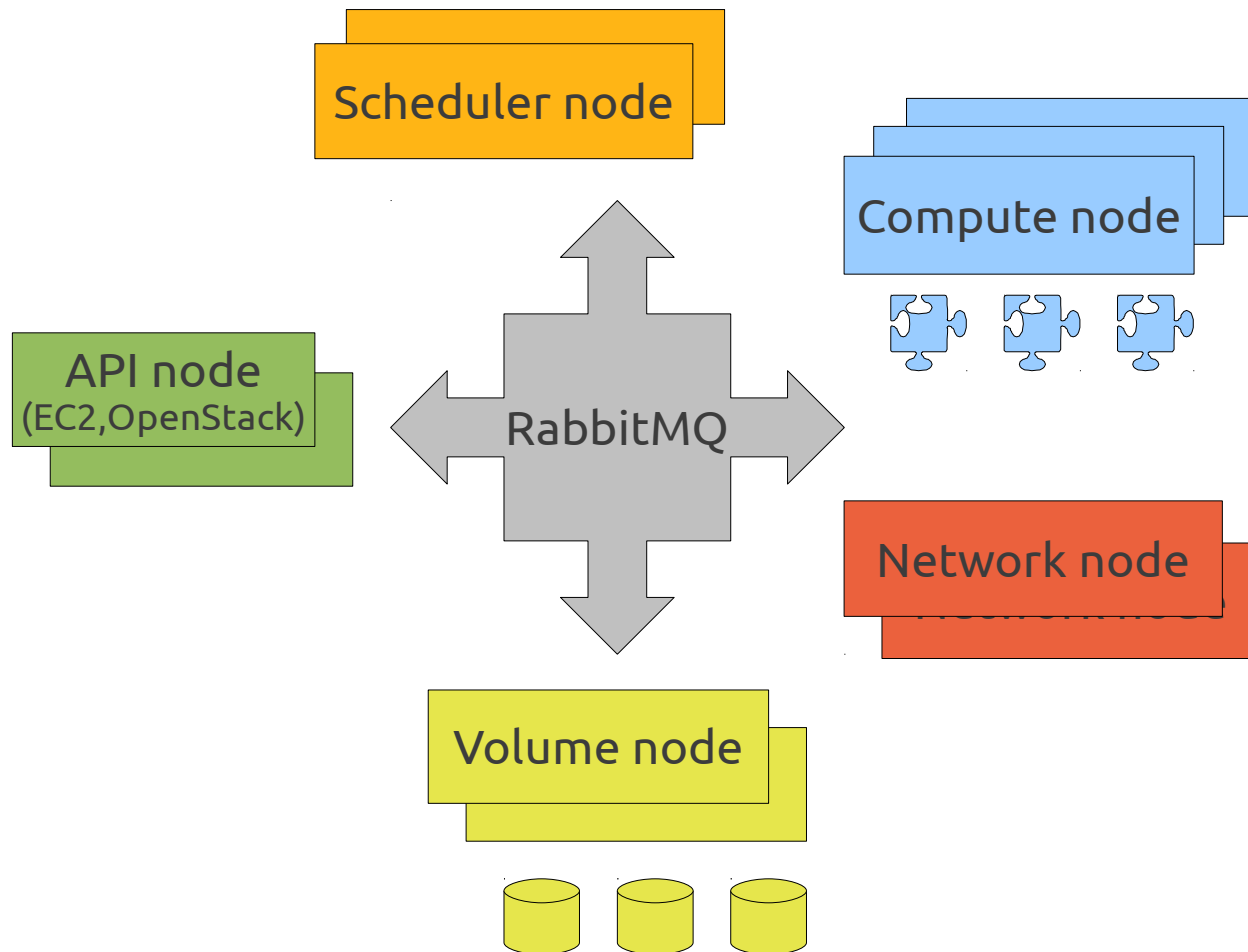
- Horizontal scaling
- Commodity hardware (no RAID)



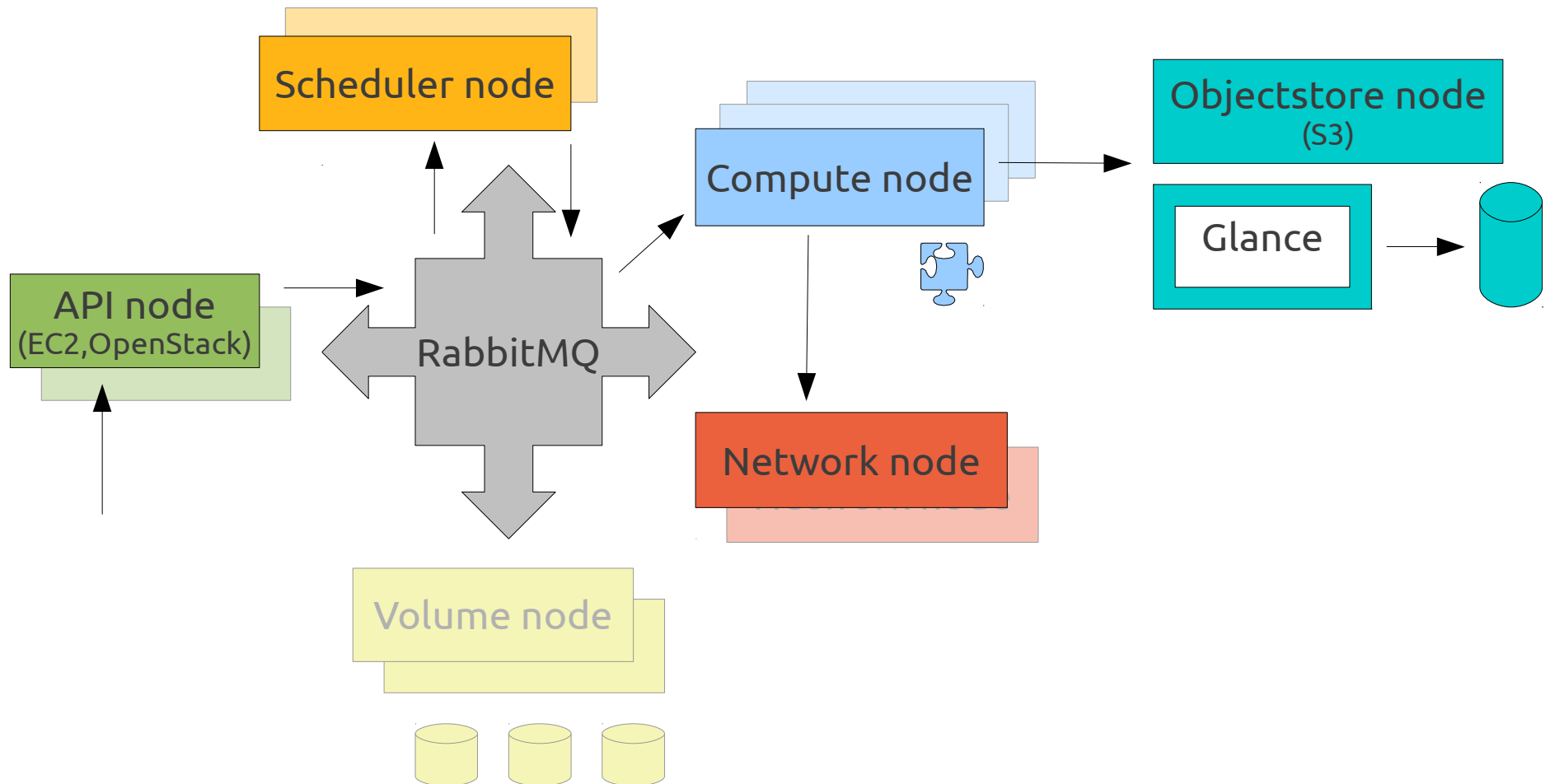
Nova (Cloud Compute)

- VMs one API call away
- EC2 API and OpenStack API
- Under heavy development
- Used in production in NASA Nebula cloud

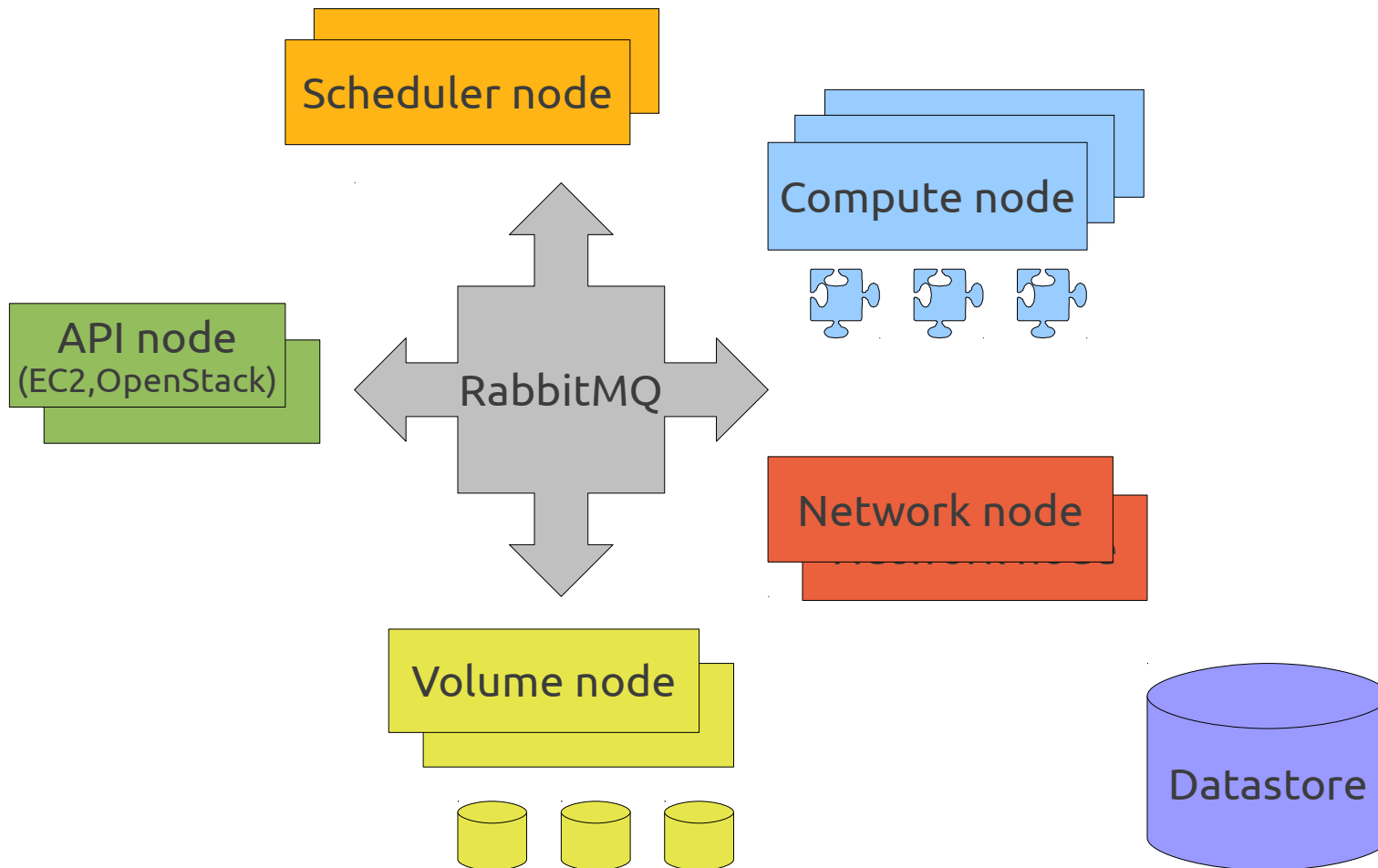
Nova components



Creating a new server



Share nothing ? Not yet



Nova modularity

API node

- WSGI / Paste
- EC2/OpenStack API
- DB/LDAP auth plugin

Network node

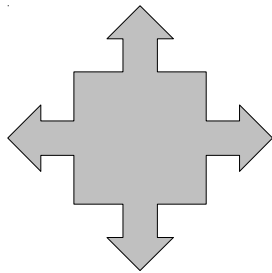
- Flat, FlatDHCP, Vlan
- IPv6

Scheduler node

- Pluggable
 - Chance
 - Zone

Compute node

- Libvirt (KVM, QEMU, UML)
- Xen
- Hyper-V



- Carrot

Datastore

- SQLAlchemy
- Sqlite, MySQL, Postgres

Volume node

- Local LVM volume groups
- iSCSI
- Sheepdog

How to test

- ◆ Ubuntu Server as reference platform
- ◆ PPAs for Lucid/Maverick/Natty
- ◆ 11.04 will be released with latest
- ◆ Supports all-in-one installs

```
# Example for Nova on Ubuntu 10.10
$ sudo apt-get install python-software-properties
$ sudo add-apt-repository ppa:nova-core/trunk
$ sudo apt-get update
$ sudo apt-get install rabbitmq-server
$ sudo apt-get install nova-api nova-objectstore nova-compute
nova-scheduler nova-network
```




Other OpenStack projects

Core projects

- Glance Image service

Incubating projects

- OpenStack dashboard
- Burrow queue service

Ecosystem projects

- Deployment tools
- Mobile phone clients

Coming up next



« Cactus » release, Apr 14

- Stabilization release
- Nova : OpenStack API 1.1, Live migration, LXC support
- Glance : new CLI tool, support for multiple image formats
- Swift : async backend requests, performance fixes

Conference & Design summit

- April 26-29, Santa Clara, California, USA

Come and join the fun

Web

<http://wiki.openstack.org>

<http://planet.openstack.org>

IRC

#openstack on Freenode

Mailing-list

<https://launchpad.net/~openstack>



Questions ?

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