# Snakes on a cloud

A presentation of
the OpenStack project

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# Cloud ?

# Buzzword

# End-user services

Software as a Service (SaaS)






# End-user services

Online storage / streaming




# Backend services

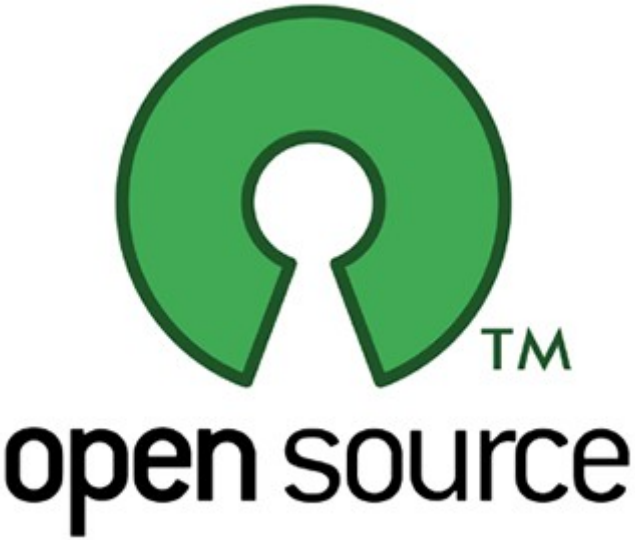
Raw compute / storage resources (IaaS)


# Backend services

Deployment platforms (PaaS)







TM
open source

# Open source cloud



# OpenStack project genesis


- Cloud servers
- Cloud files
- Open source

# OpenStack project genesis


- NovaCC
- Open source

# OpenStack project genesis


- ~~Cloud servers~~
- Cloud files
- Open source


- NovaCC
- Open source


- Nova (compute)
- Swift (storage)

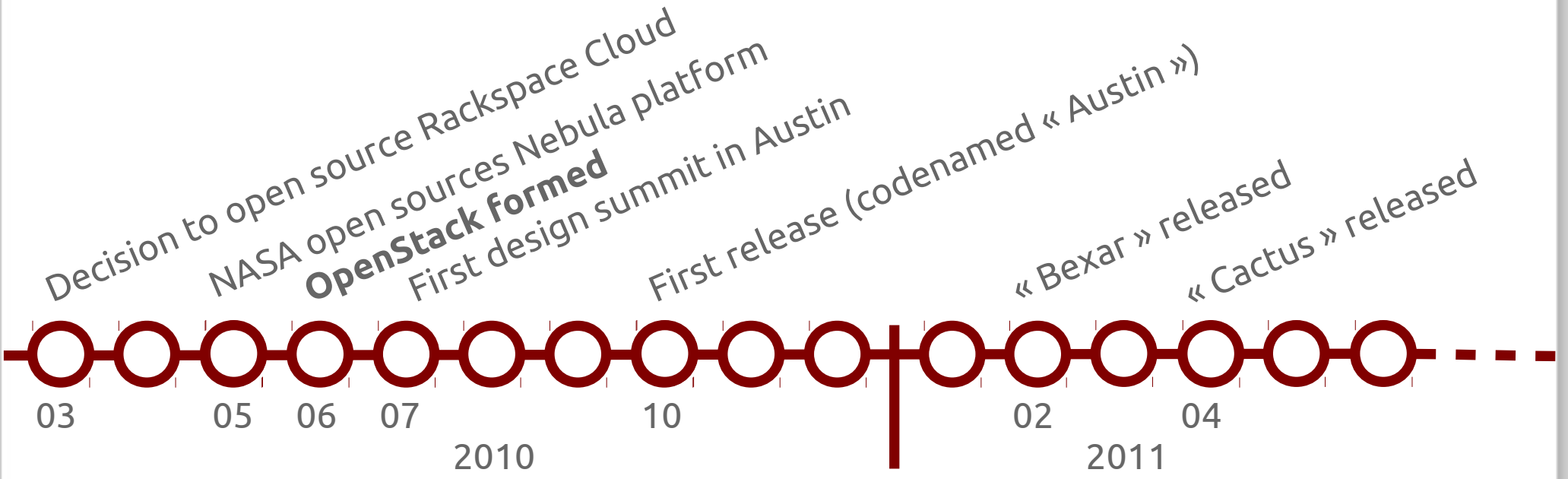
# Mission statement

"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.**"

# Open

- Open source
- Open design
- Open development
- Open community

# A young project



# 100 developers















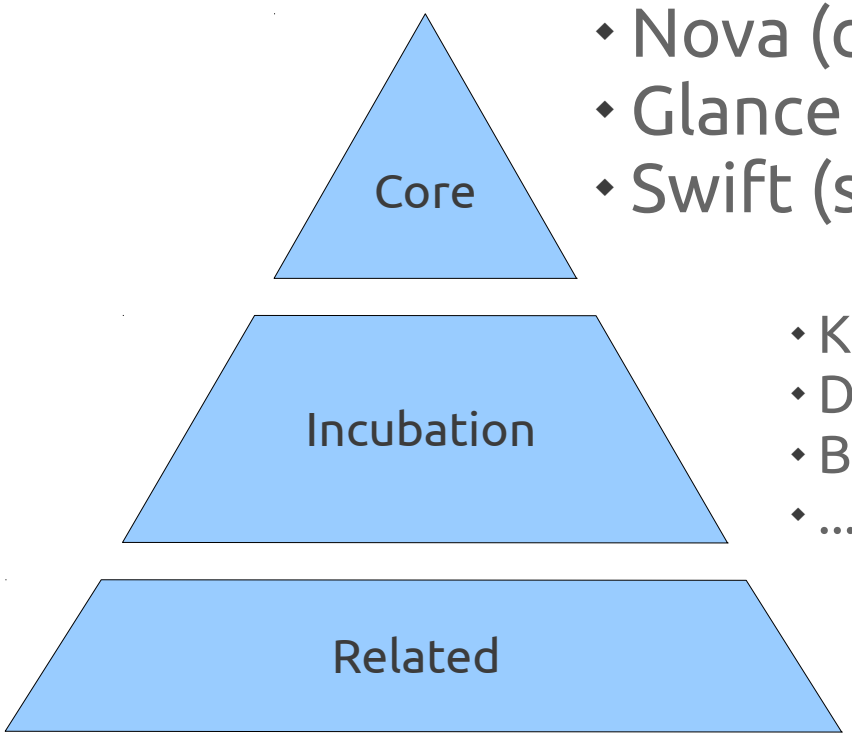




# Design and coding standards

- Scalability and elasticity
- Asynchronous
- Horizontally scalable
- Share-nothing (or sharding)
- Distribute everything
- Accept eventual consistency
- Test everything
- Enforce PEP-8

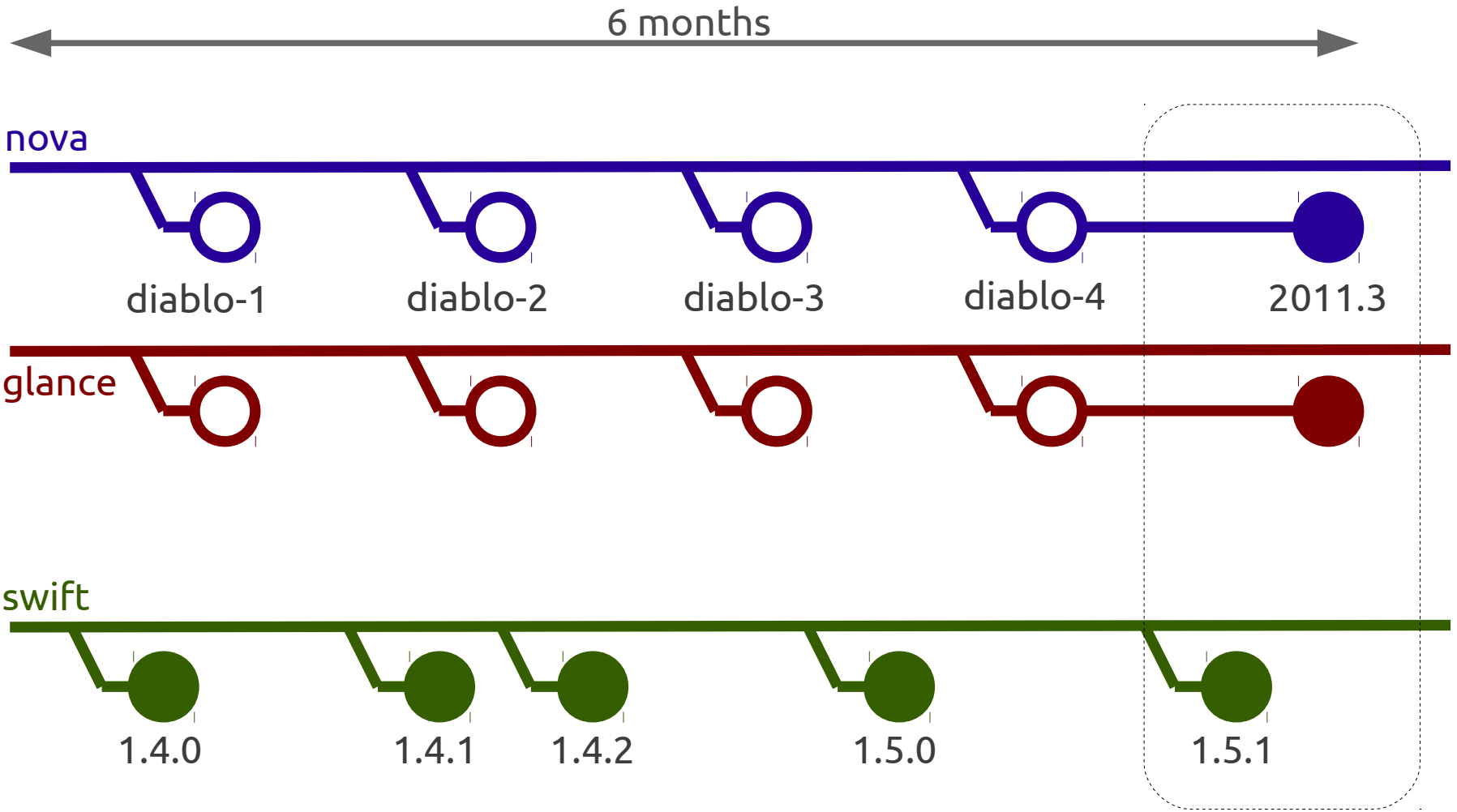
# OpenStack projects




- Nova (compute)
- Glance (image service)
- Swift (storage)

- Keystone (common authentication)
- Dashboard (django-based web UI)
- Burrow (queue service)
- ...

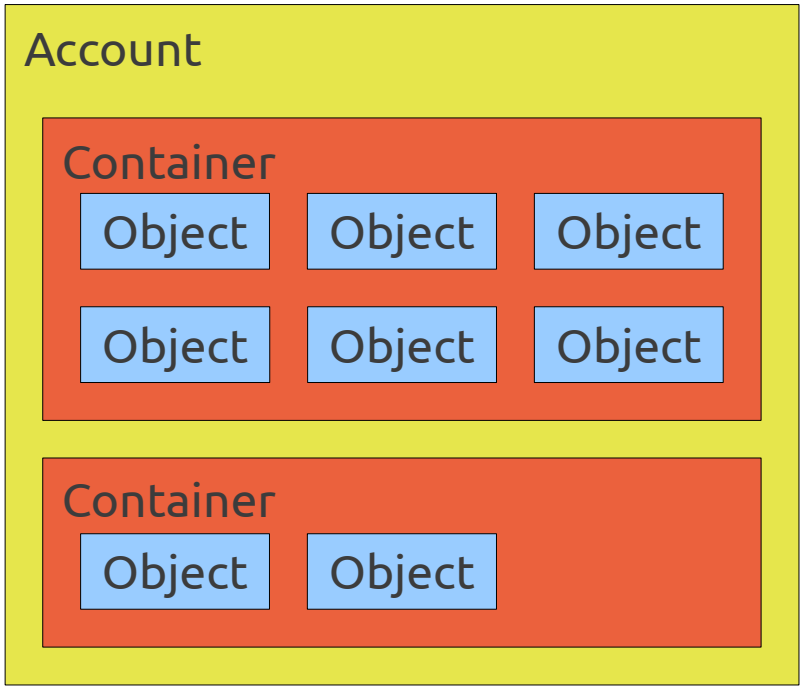
# Release cycle

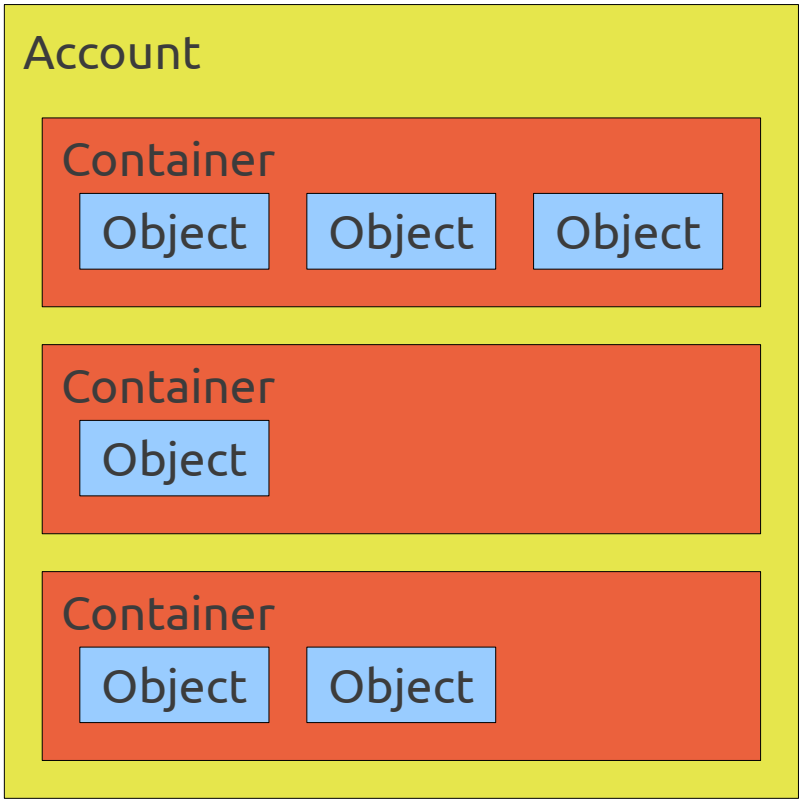


# Swift (Cloud Storage)

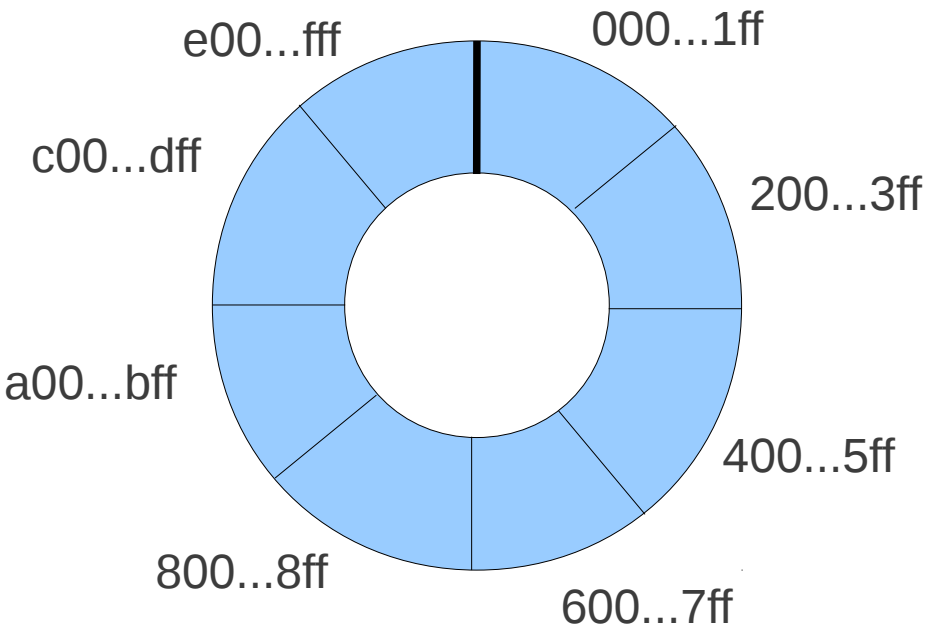
- Object storage
- RESTful interface
- No object size limit
- Stable and deployed in production
- Scales **massively**

# Objects, containers, accounts



# Rings

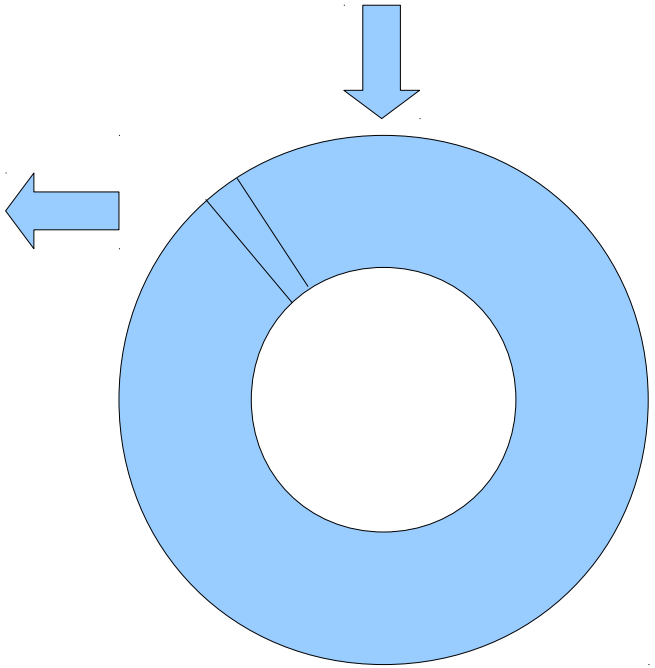


# The objects ring

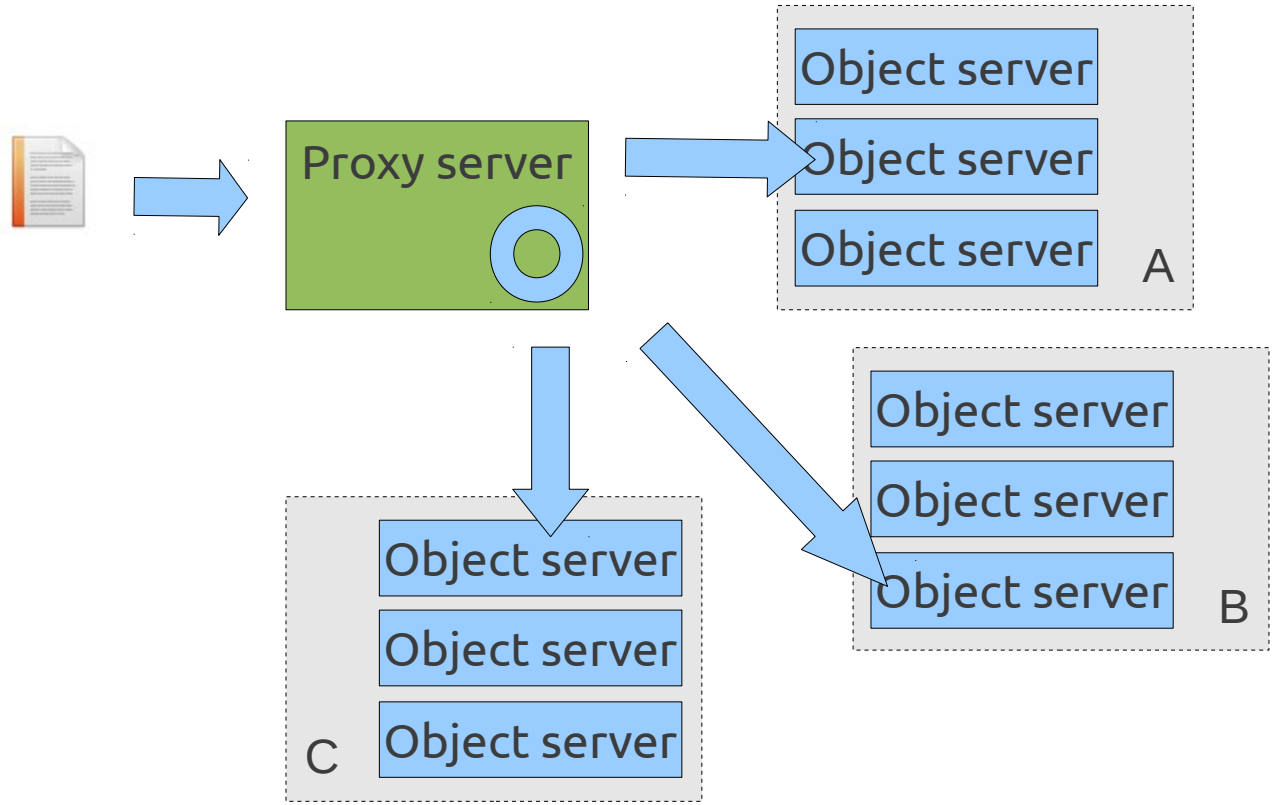
PUT /<api version>/<account>/<container>/<object>

ecb25d1facd7c6760f7663e394dbeddb

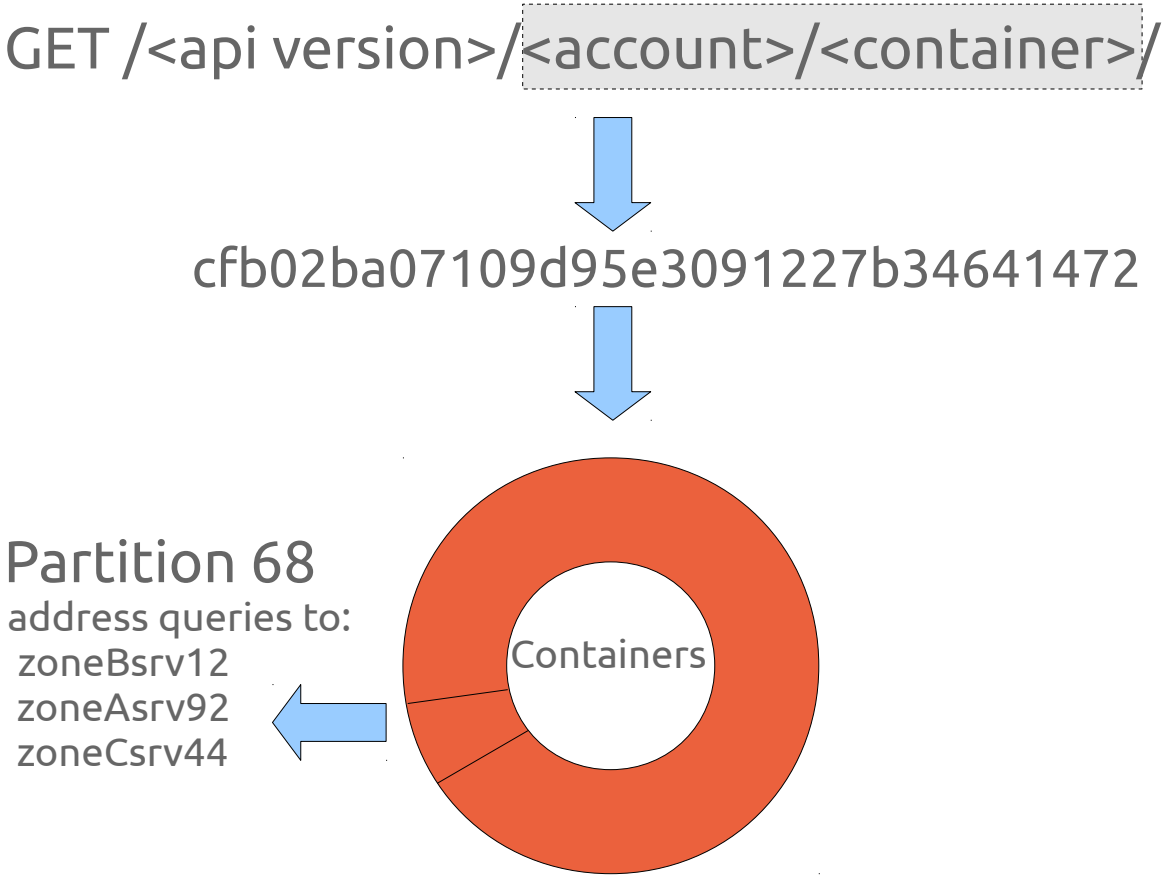
Partition 482
located on:
zoneAsrv73
zoneCsrv35
zoneBsrv98



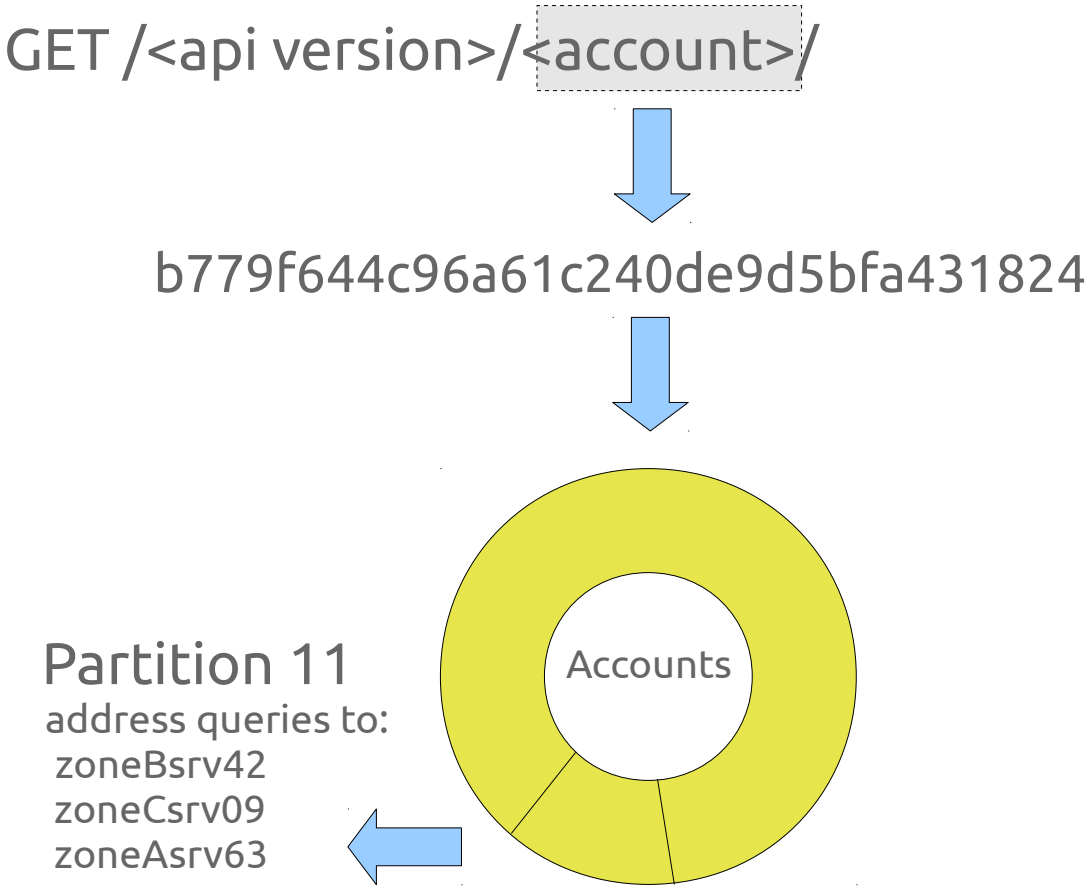
# Swift request



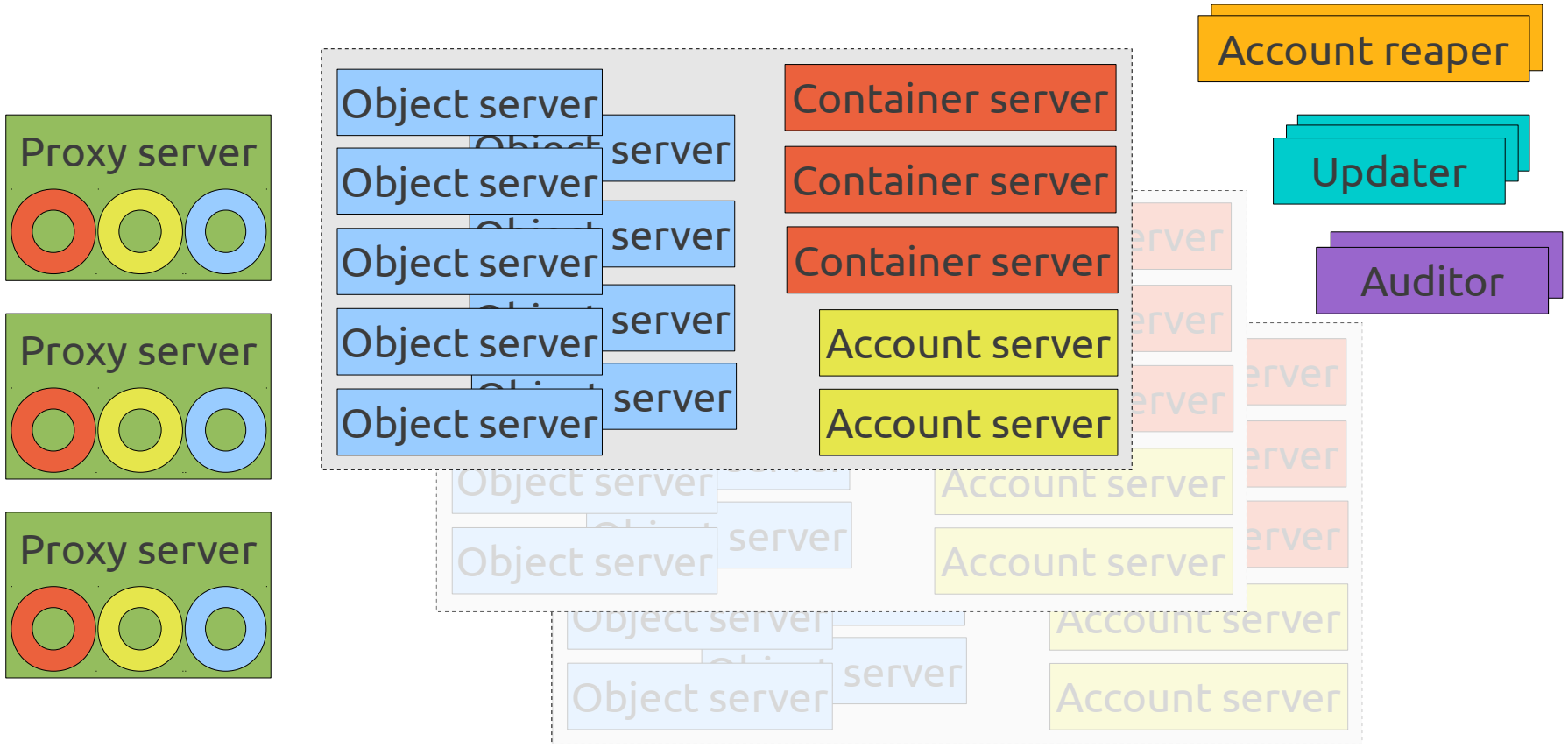
# Listing objects in a container



# Listing containers in an account



# Swift components

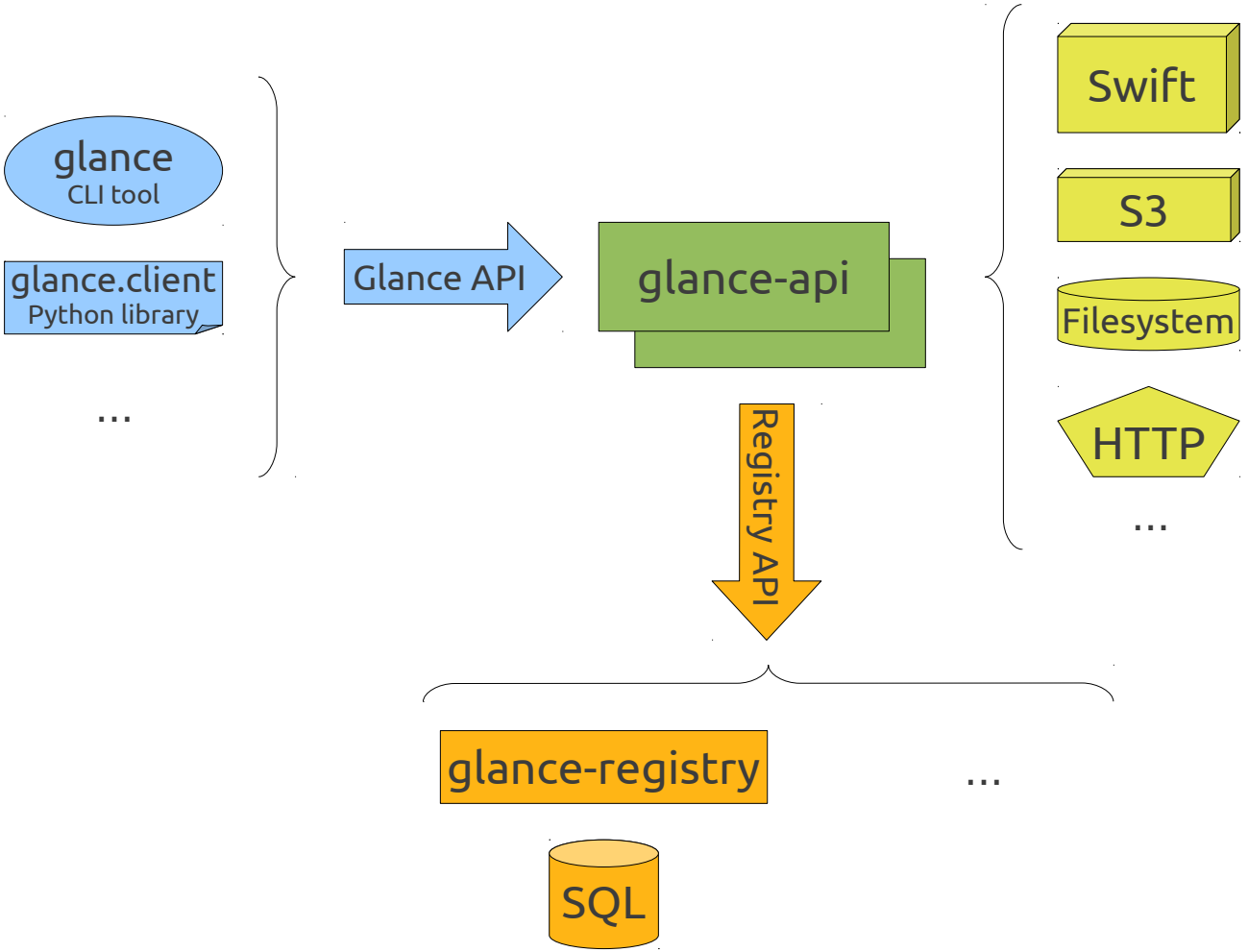



- Horizontal scaling
- Commodity hardware (no RAID)

# Glance (Image service)

- Disk images and associated metadata
- Discover, register and retrieve
- Multiple disk formats :
  raw, VHD, vmdk, vdi, ISO, qcow2, aki, ari, ami
- Multiple container formats :
  ovf, bare, aki, ari, ami

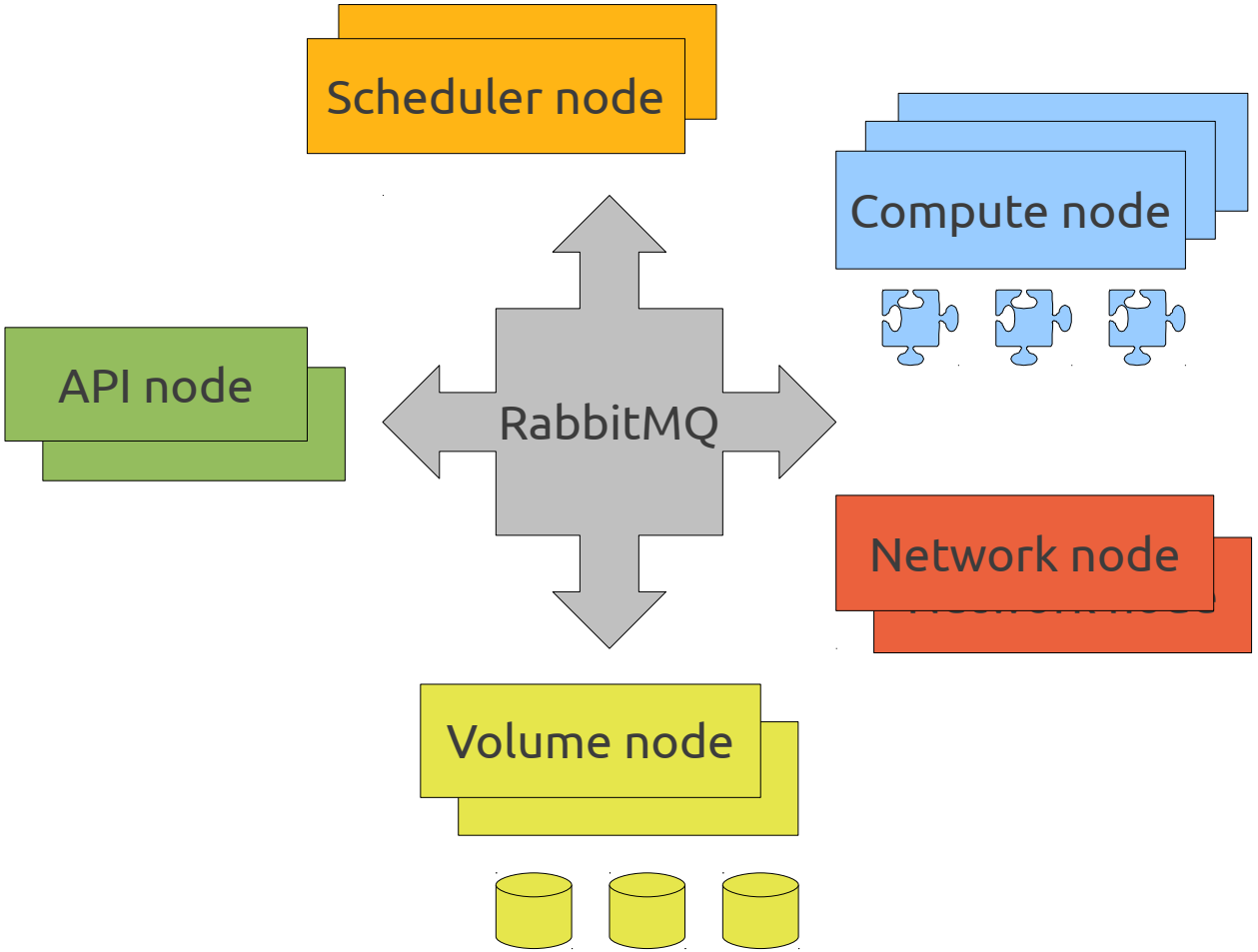
# Glance architecture



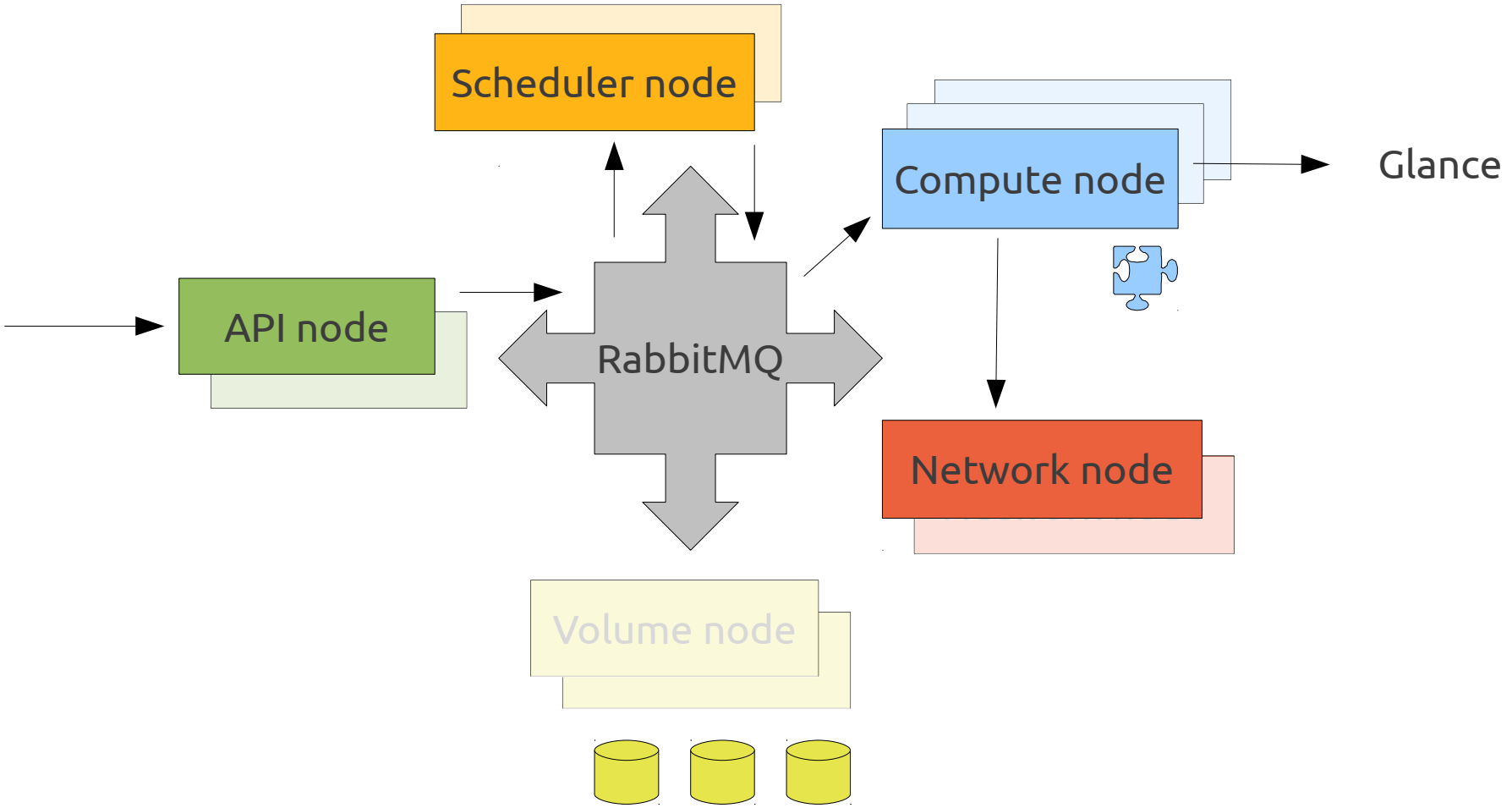
# Nova (Cloud Compute)

- « VMs one API call away »
- Highly-modular framework
- Under heavy development
- Used in production in NASA Nebula cloud

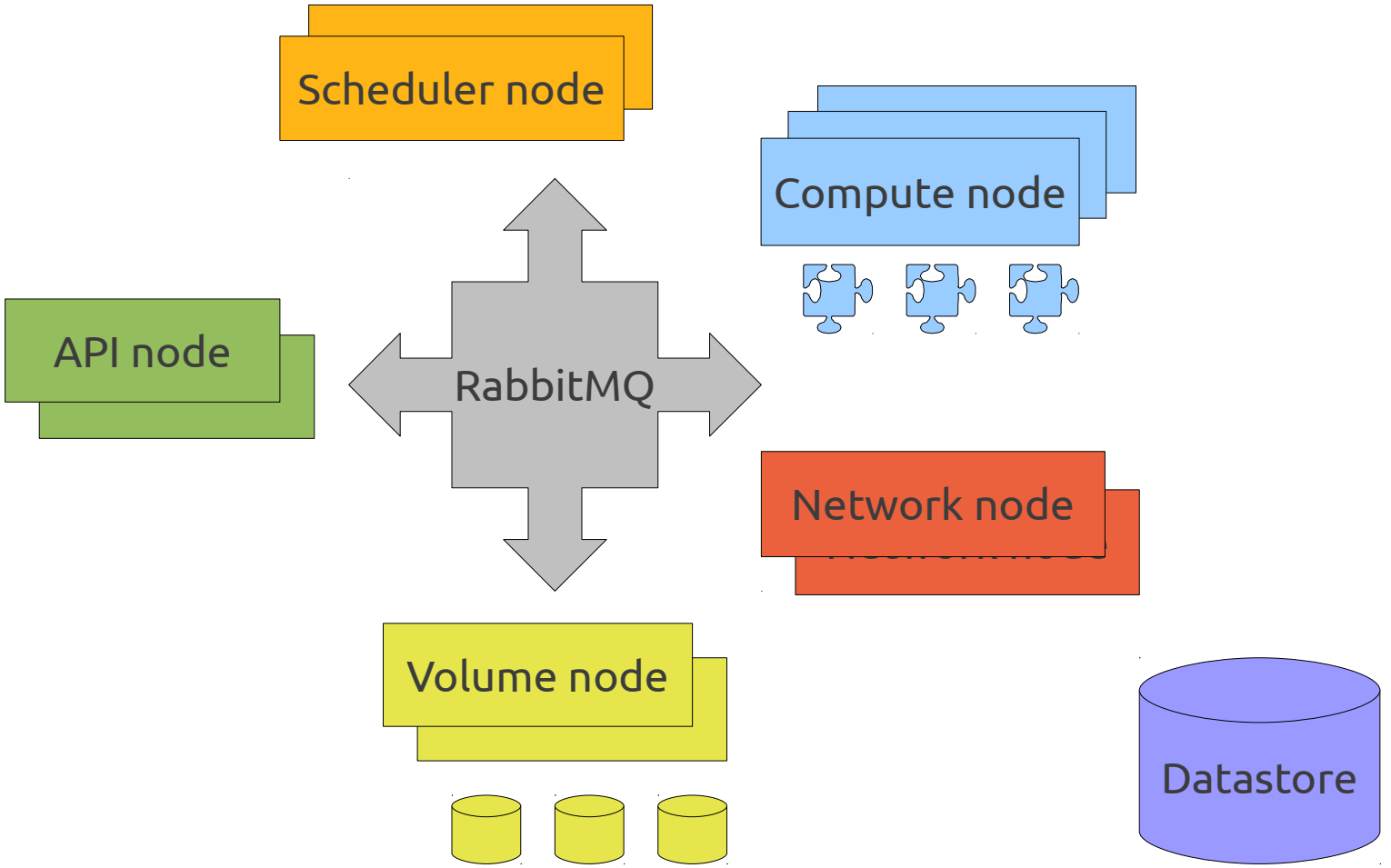
# Nova components



# Creating a new server



# Share nothing ? Not yet



# Nova modularity

API node

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

Network node

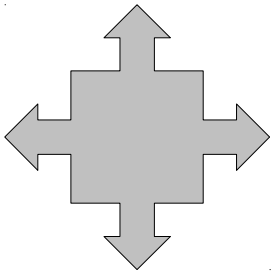
- Flat, FlatDHCP, Vlan
- IPv4 / IPv6

Scheduler node

- Pluggable
  - Chance
  - Zone-aware

Compute node

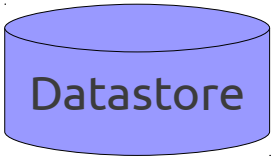
- QEMU, KVM, UML, LXC
- Xen and XenServer
- Hyper-V
- VMware vSphere



- AMQP

Volume node

- Local LVM volume groups
- iSCSI
- Sheepdog
- HP/Lefthand SANs




- Sqlite
- MySQL
- Postgres

# Coming up in Diablo...

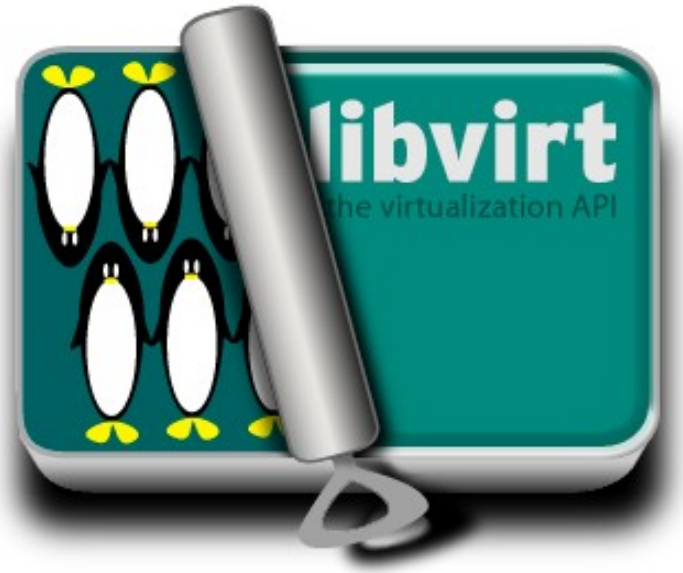
- Separate block storage service (LunR)
- Separate network services :
  Quantum (network API for cloud compute)
  Melange (network resources registry)
  Donabe (complex network containers)
- Use common authentication (Keystone)

# Coming up in Diablo...

- Snapshot, clone and boot from volumes
- Distributed scheduling
- OpenStack API 1.1
- Configuration drive


python
TM

# What we are using



# What we are using

Eventlet

Paste.deploy

*webob*

routes

http://www.flickr.com/photos/urtica/2354829631/

# What we are using


Carrot / AMQPlib

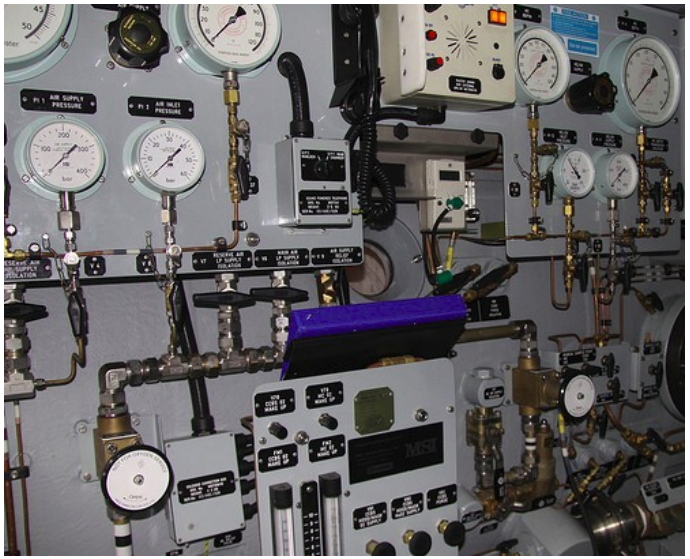
(Kombu ?)

SQLAlchemy

& sqlalchemy-migrate

http://www.flickr.com/photos/sapphir3blu3/3235526282/

# What we are using



boto

M2Crypto

*gflags*

http://www.flickr.com/photos/cgt/4592048715/

# Come and join the fun

http://launchpad.net/openstack
http://wiki.openstack.org
http://planet.openstack.org

## IRC (Freenode)

#openstack
#openstack-dev

## Mailing-list

https://launchpad.net/~openstack

# Questions ?

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