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
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- 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.”
A young project

- Decision to open source Rackspace Cloud
- NASA open sources Nebula platform
- OpenStack formed
- First design summit in Austin
- First release (codenamed « Austin »)
- Design summit in San Antonio
- « Bexar » released

- March
- May
- June
- July
- Oct.
- Nov.
- February
Open source

- Apache license
- No « open core »
Open design

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

- DVCS using bzr
- 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>/

Partition 68
address queries to:
zoneBsrv12
zoneAsrv92
zoneCsrv44

GET /<api version>/<account>/

Partition 11
address queries to:
zoneBsrv42
zoneCsrv09
zoneAsrv63

Containers

Accounts
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

- Scheduler node
- Compute node
- Network node
- Volume node
- RabbitMQ
- API node (EC2, OpenStack)
Creating a new server

- Scheduler node
- API node (EC2, OpenStack)
- RabbitMQ
- Compute node
- Objectstore node (S3)
- Glance
- Network node
- Volume node

(EC2, OpenStack)
Share nothing? Not yet

- Scheduler node
- Compute node
- Network node
- Volume node
- Datastore
- RabbitMQ

- API node (EC2, OpenStack)
Nova modularity

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

Scheduler node
- Pluggable
- Chance
- Zone
- Carrot

Network node
- Flat, FlatDHCP, Vlan
- IPv6

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

Volume node
- Local LVM volume groups
- iSCSI
- Sheepdog

Datastore
- SQLAlchemy
- Sqlite, MySQL, Postgres
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

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