Getting started with OpenStack

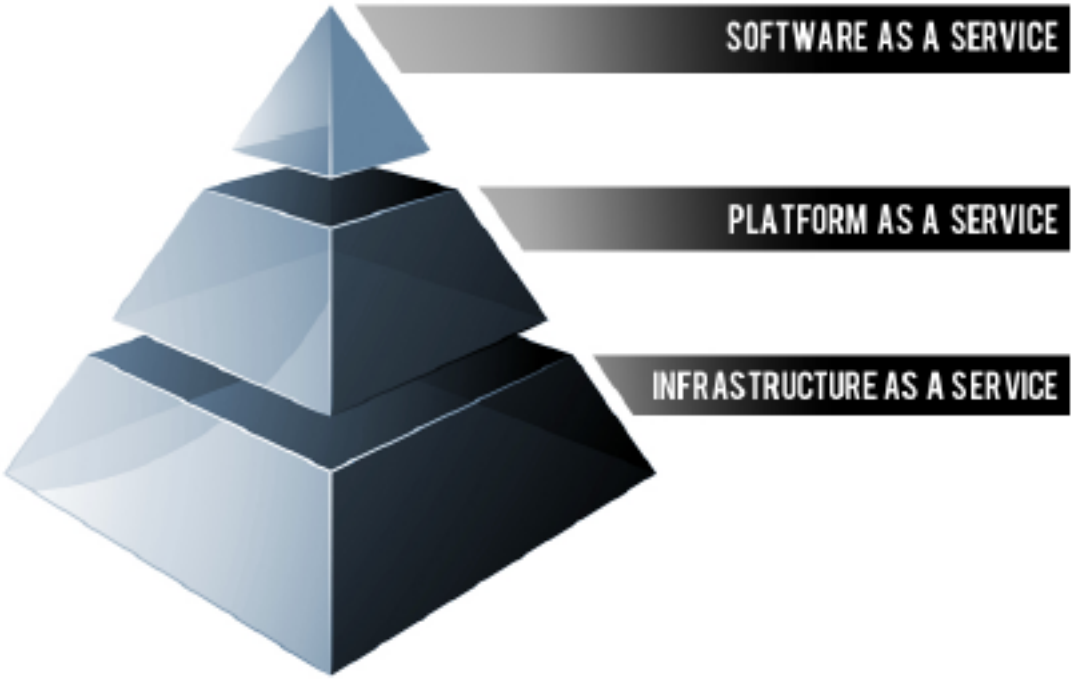
Rackspace

March 2013

Agenda

- What is OpenStack
- Projects under OpenStack
- OpenStack Architecture
- Technologies used
- How Community Works
- How to contribute
- Hands on lab

Cloud Service Model



Common Properties of Cloud

- Accessed over network
- Utility computing
- Programmable
- Elastic
- Access control model
- Multi-tenant (common)

Quiz - Is it Cloud?

- Netflix
- Youtube
- Blog site on Blogger
- Virtual server from Rackspace
- Physical server from Rackspace

What is OpenStack?

- Software for building public and private clouds
  - Open Source (Apache 2 License)
  - Open Design
  - Open Development
  - Open Community

OpenStack Integrated Projects

- OpenStack Identity (Keystone)
- OpenStack Compute (Nova)
- Openstack Image Service (Glance)
- OpenStack Object Storage (Swift)
- OpenStack Networking (Quantum)
- OpenStack Block Storage (Cinder)
- OpenStack Dashboard (Horizon)

OpenStack Incubated Projects

- Metering (Ceilometer)
- Orchestration(Heat)

OpenStack Ecosystem Projects

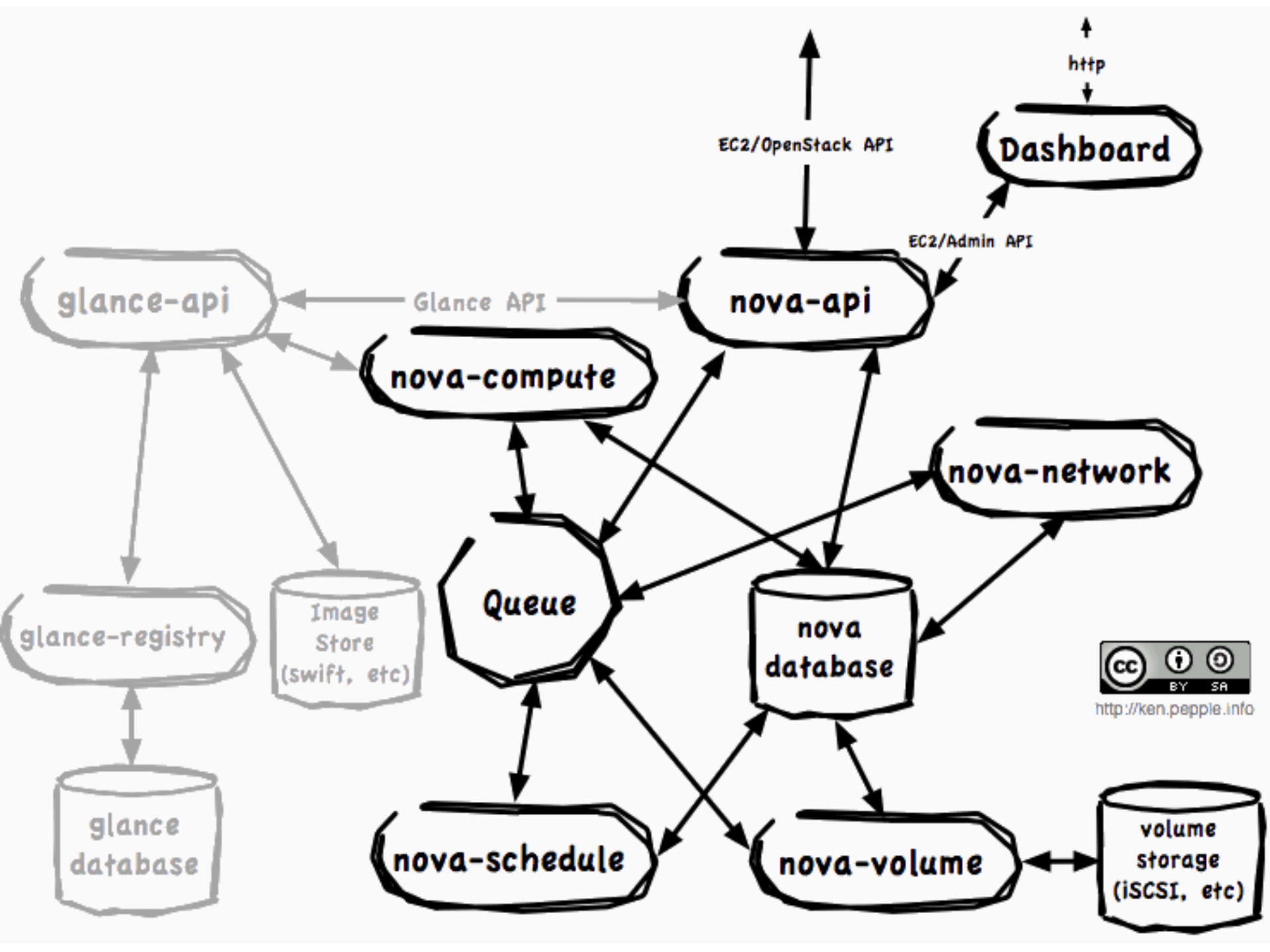
- Database as a Service (Reddwarf)
- Hadoop as a Service (Savanna)
- Messaging as a Service (Marconi)
- Logging as a Service (Meniscus)

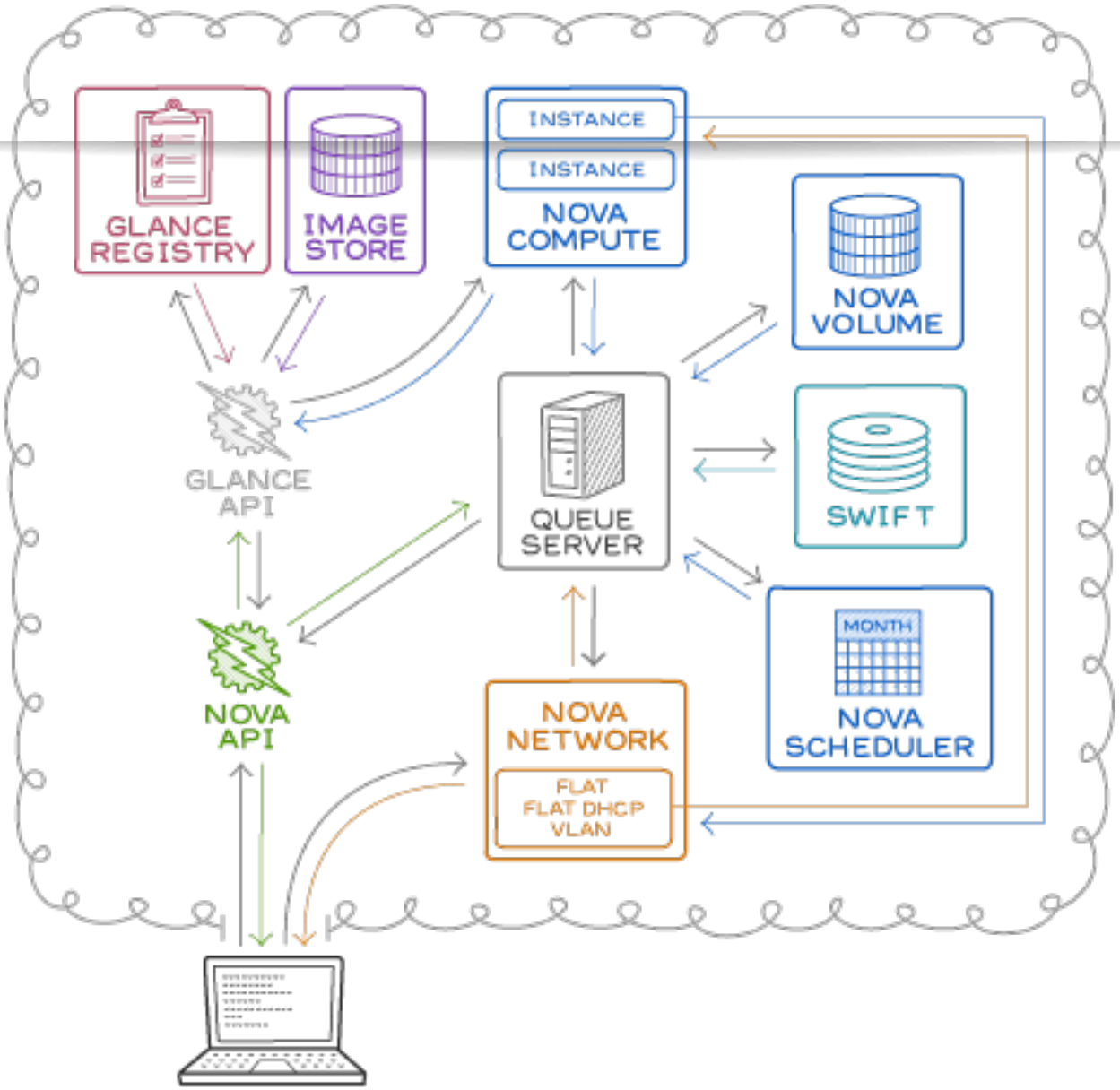
OpenStack Foundation

- Board of Directors (8+8+8)
- Technical Committee (8+5)
- User Committee
- Project Technical Lead
- Developer Summit
- Release Cycle

OpenStack Compute (Nova)

- Provision and manage a large number of virtual machines


http
Dashboard
EC2/OpenStack API
EC2/Admin API
glance-api
Glance API
nova-api
nova-compute
nova-network
Queue
nova database
glance-registry
Image Store (swift, etc)
glance database
nova-schedule
nova-volume
volume storage (iSCSI, etc)
http://ken.pepple.info


GLANCE REGISTRY
IMAGE STORE
INSTANCE
INSTANCE
NOVA COMPUTE
NOVA VOLUME
GLANCE API
QUEUE SERVER
SWIFT
NOVA API
MONTH
NOVA SCHEDULER
NOVA NETWORK
FLAT
FLAT DHCP
VLAN

Nova API

- ReSTful API web service that is used to interact with nova
- User and admin APIs
- Only way to interact with the cluster

Nova Database

- Stores the current state of all object in the compute cluster
- Pluggable via SqlAlchemy
- MySQL, PostgreSQL

Message Queue

- Way to communicate between services
- AMQP (Advanced Message Queue Protocol)
- RabbitMQ
- Asynchronous
- Call vs Cast

Nova Scheduler

- Determines which host the request should run on
  - Chance, picks a random host
  - Simple, picks the most free host
  - Filter (RAM, CPU, Availability Zone,)

Nova Compute

- Periodically updates the Nova database with its status and details
- Delegates calls to Hypervisor driver
- Some integration with Network and Volume.

Technologies Used

- Python
  - Paste
  - Eventlet
  - SQLAlchemy
- Messaging
  - RabbitMQ, Qpid, ZeroMQ
- Database
  - MySQL, PostgreSQL, SQLite

Technologies Used

- Virtualization
  - LXC
  - Qemu
  - KVM
  - Xen
  - Hyper-V
  - PowerVM
  - VMware ESX
- Baremetal Provisioning

Customize Nova

- Choose
  - Hypervisor
  - Database
  - Message Queue
  - Network Model
  - Scheduler
  - API Extensions
- Configuration
  - 500+ options

How to Contribute

- Website: http://www.openstack.org/
- Wiki: http://wiki.openstack.org/
- Blogs: http://planet.openstack.org/
- Docs: http://docs.openstack.org/
- Join the OpenStack team in Launchpad: https://launchpad.net/~nova
- Subscribe to the Mailing Lists: https://launchpad.net/~openstack

How to Contribute

- Join the Foundation
  - https://www.openstack.org/join/
  - http://www.openstack.org/community/members/
- Irc.free.node.net
  - #openstack
  - #openstack-dev
  - #openstack-meeting

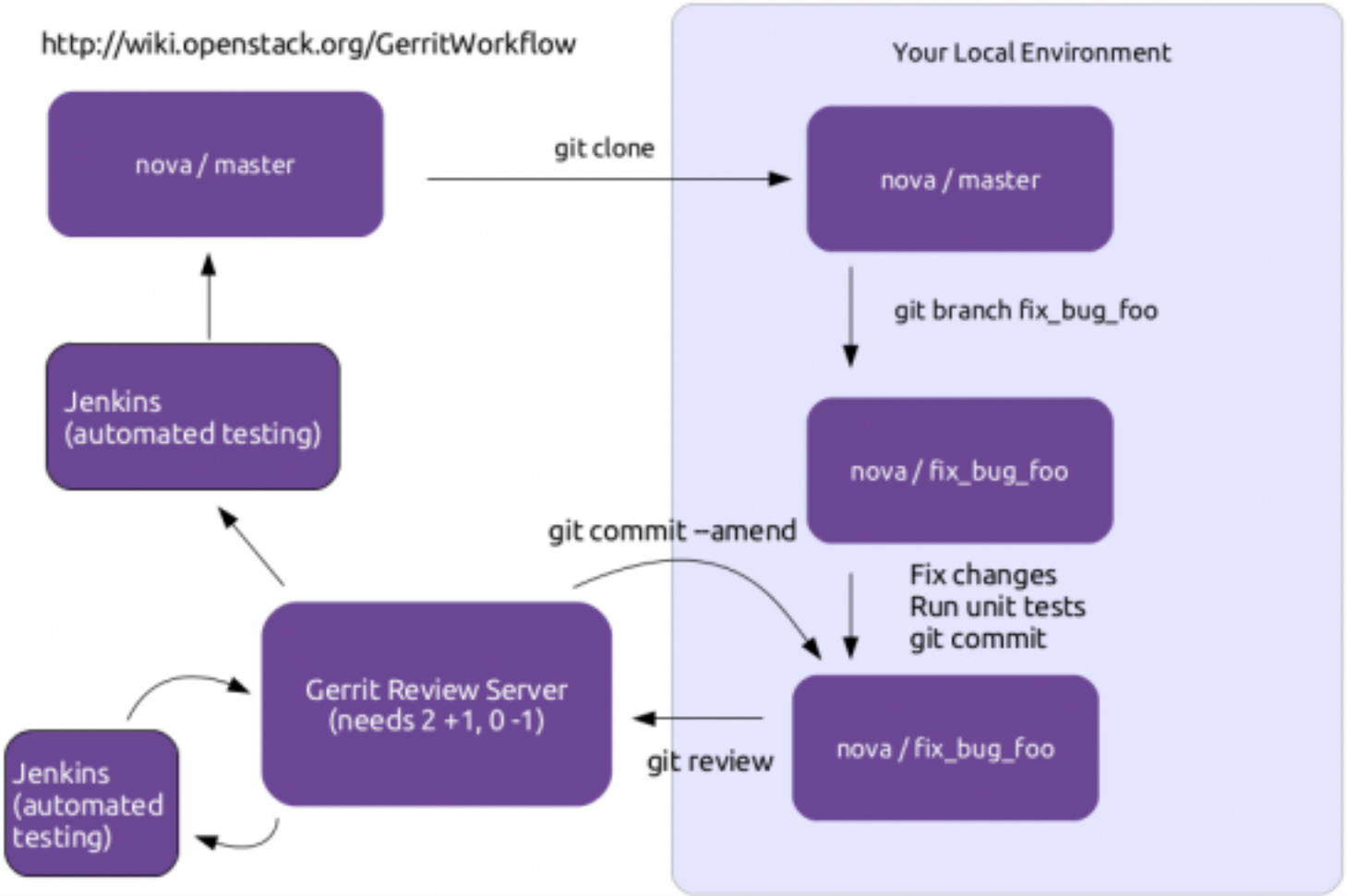
How to Contribute

- Gerrit Review
  - https://review.openstack.org/
- Jenkins
  - https://jenkins.openstack.org
- Code
  - https://github.com/openstack

How to Contribute

- Bugs
  - https://bugs.launchpad.net/nova
  - https://bugs.launchpad.net/nova/+bugs?field.tag=low-hanging-fruit
- Feature Development
  - https://blueprints.launchpad.net/nova

The path of code contributions



Coding Philosophy

- Pep8
- Pluggability
- Extensibility
- Asynchronous
- Scale
- Fail fast

Workshop

- https://github.com/sacharya/openstack-101