OpenStack in Action!

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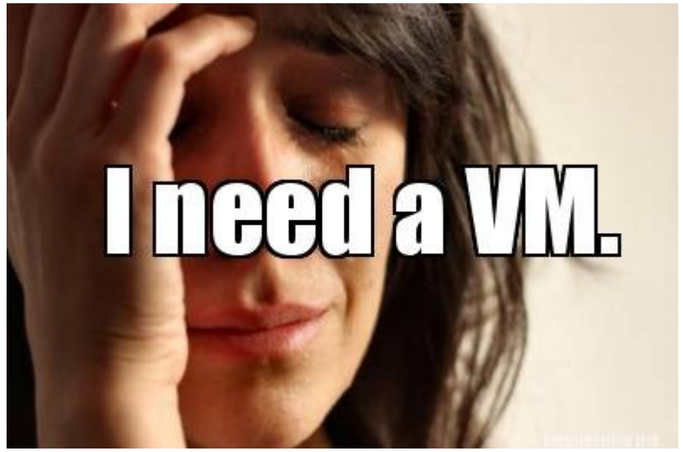
Who am I?

- Emilien Macchi
- French citizen residing in Montreal
- Software Engineer at eNovance (by Red Hat)
- Active contributor involved in OpenStack since 2011
- Specialized in Automation & Product development
- Passionated by traveling, running and learning new things


Your Data-center is changing.

Back in old-days

- Plan the project
- Estimate resources we need
- Submit a ticket
- Wait
- Wait a bit more...
- Get what you need (sometimes)



Change the model

- Still users/devs
- Ticket System to API's
- Server/Network/Storage admins to Cloud admins that feed resource pools
- Agile, scalable, automated, predictable

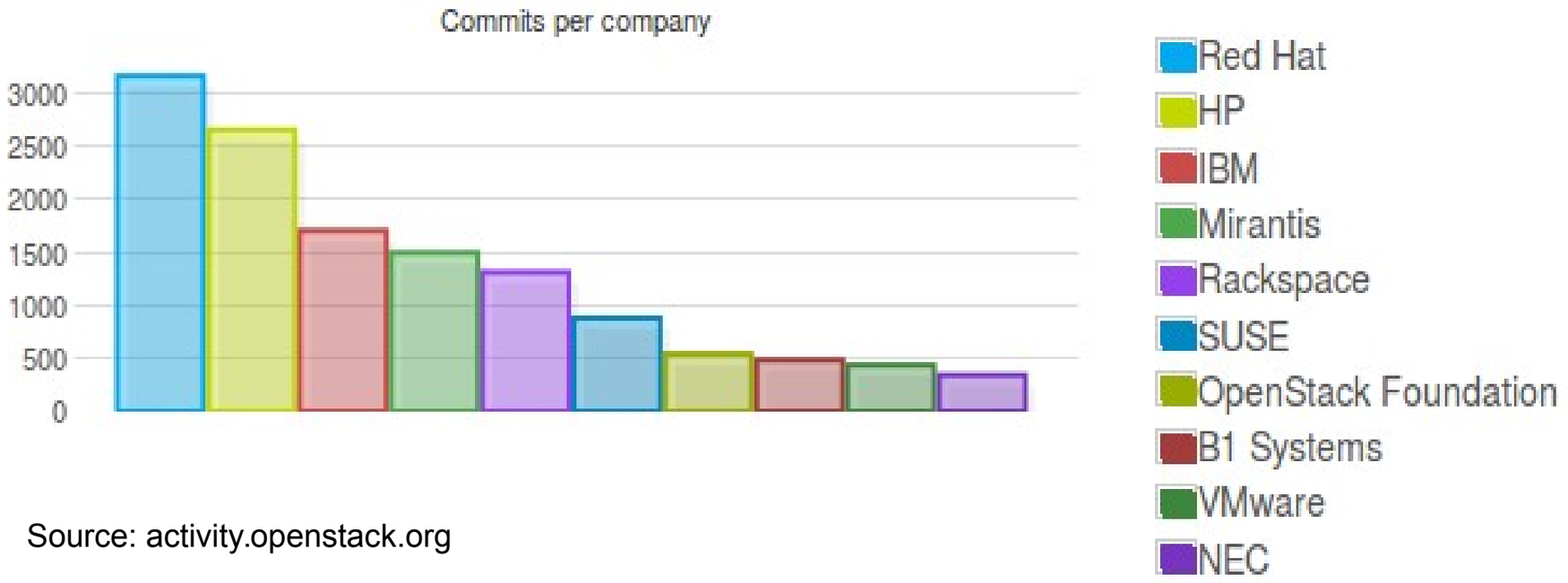
OpenStack

What is OpenStack?

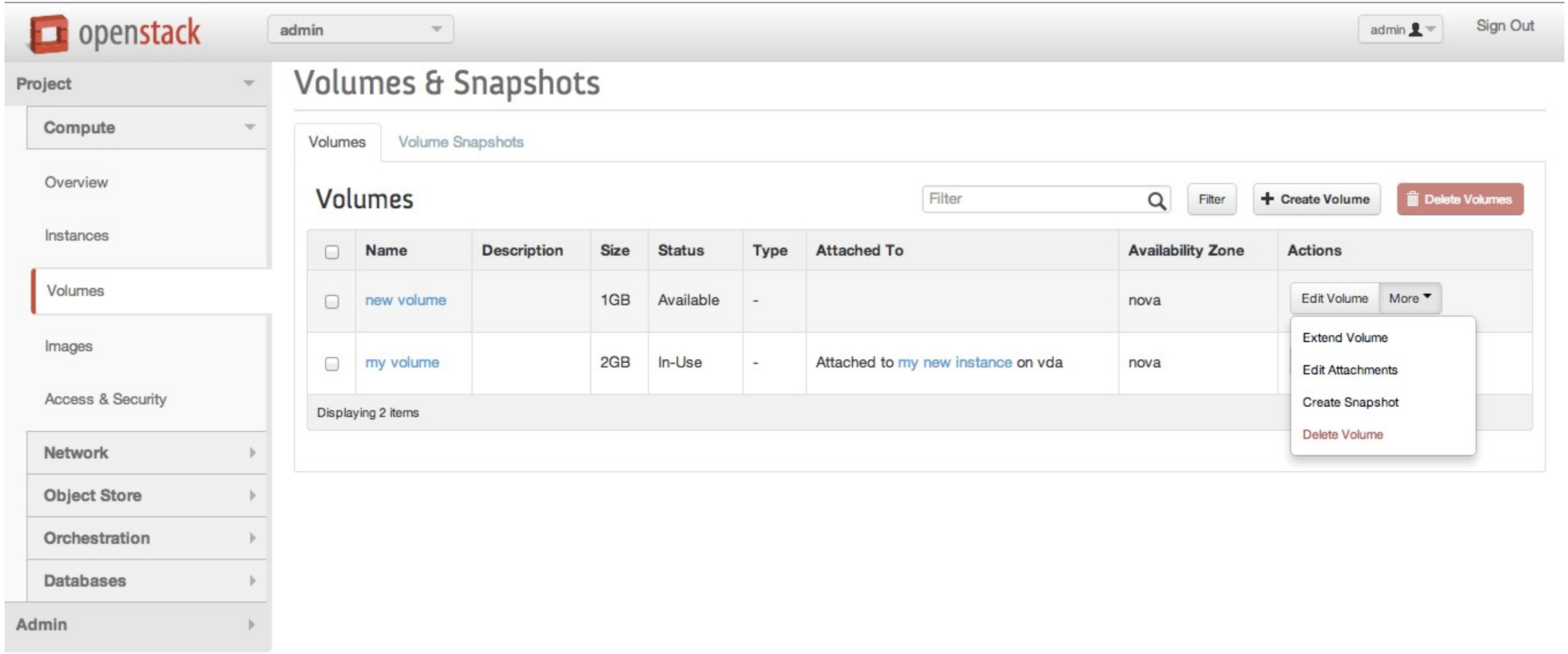
- Open-Source IaaS Cloud Software
- Launched by NASA and Rackspace in 2010
- Massively scalable
- Managed by the OpenStack Foundation
- Fast grow and large adoption
- Release every 6 months
- 10 releases (current stable is Juno)
- Upgrades supported

Who is doing OpenStack?

- 130 organizations
- 1,420 devs
- 18,704 commits



Source: activity.openstack.org

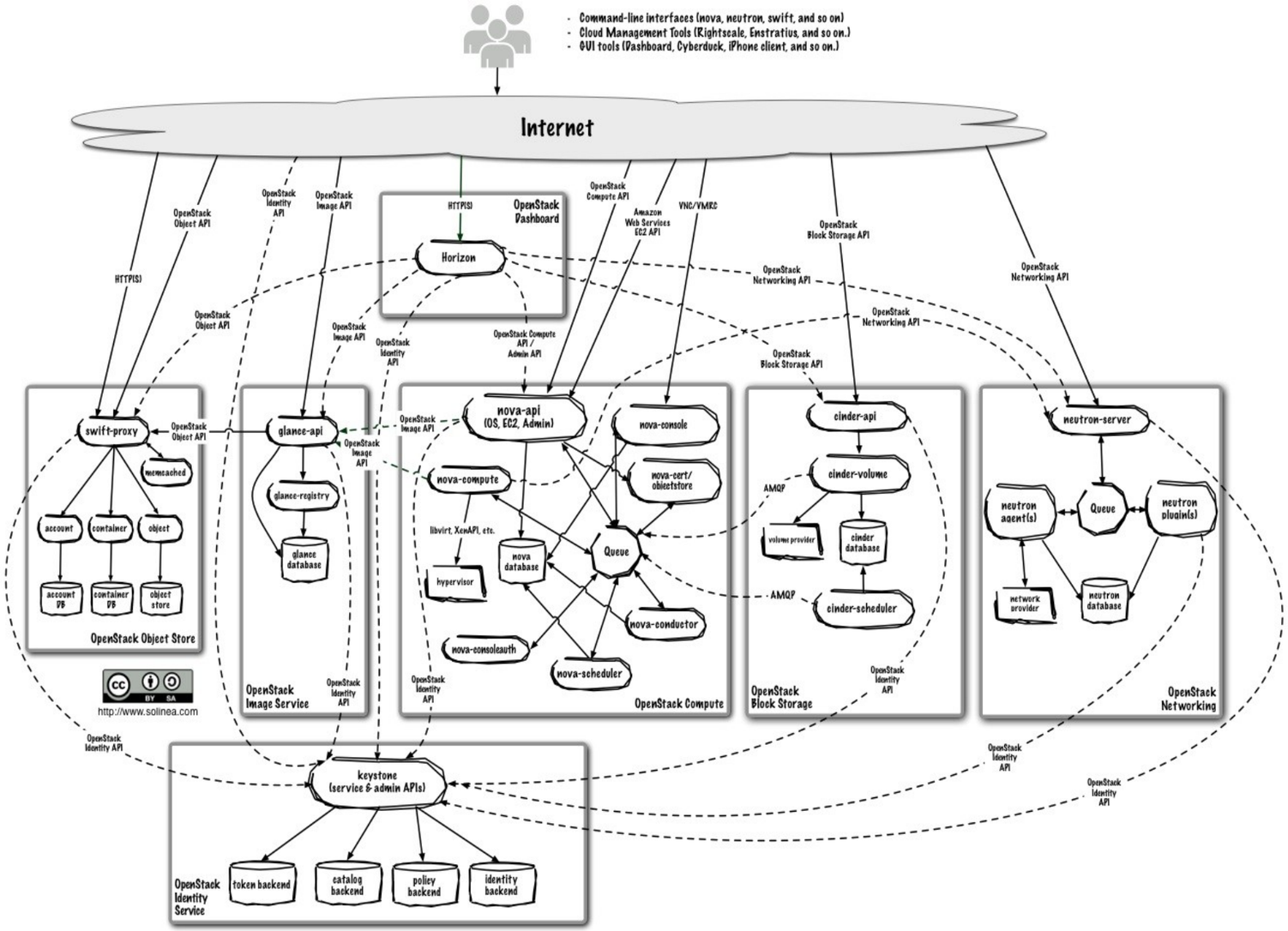


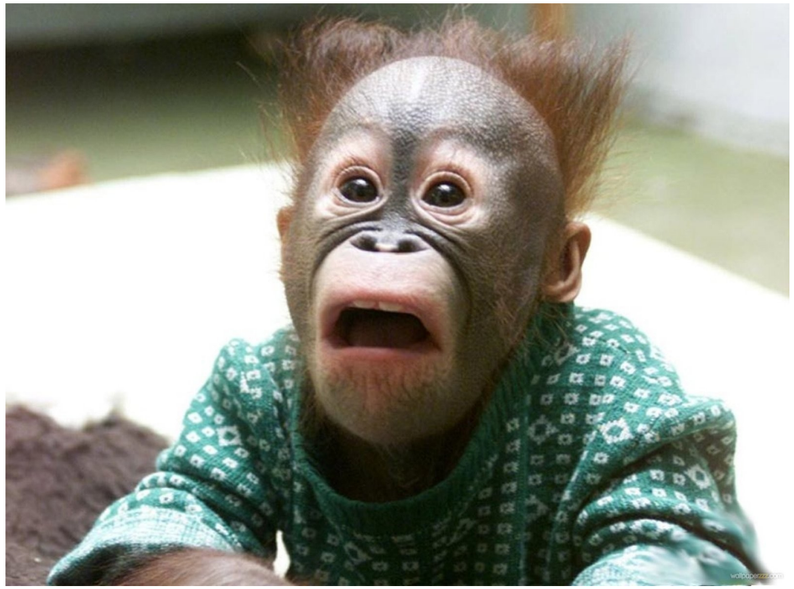
OpenStack Dashboard

Use-cases

- SaaS and Web vendors
  - Delivering a SaaS (ERP) application with Swift
- Service Providers
  - Provides SIP-based call control for voice and video
- Enterprise Private Cloud & IT Operations
  - Private Cloud for HPC Cancer Research
- Infrastructure technology suppliers
  - Provide Storage driver for Cinder

How does it work?

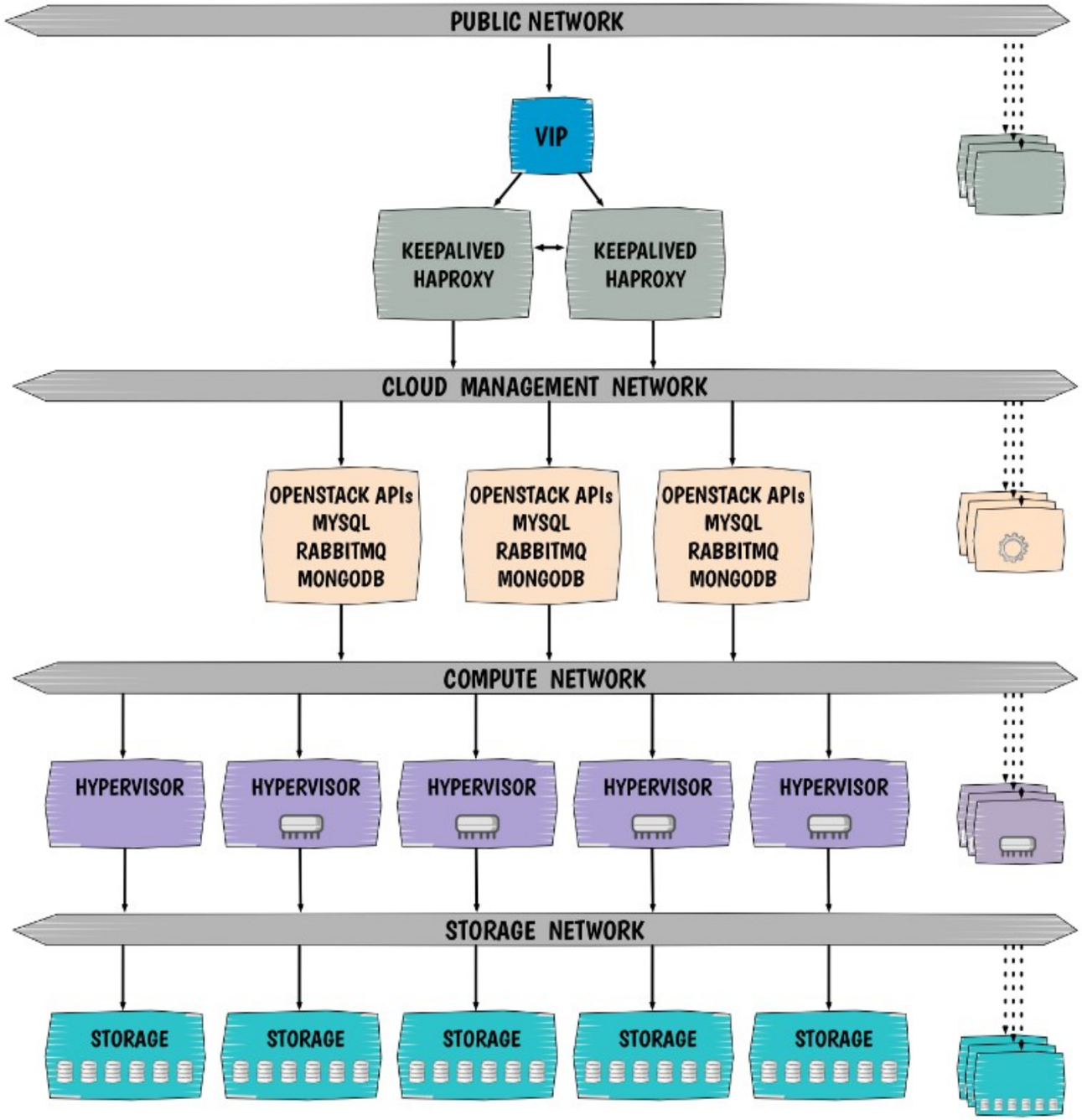




You may want a product.

What you need

- Reference Architecture
- Supportability
- Stability & Code maturity
- Lifecycle
- Certified Hardware
- Certified Operating System
- Storage, Network, Virtualization, Ecosystem, Security



- Scalable
- Highly available
- Flexible
- Secure

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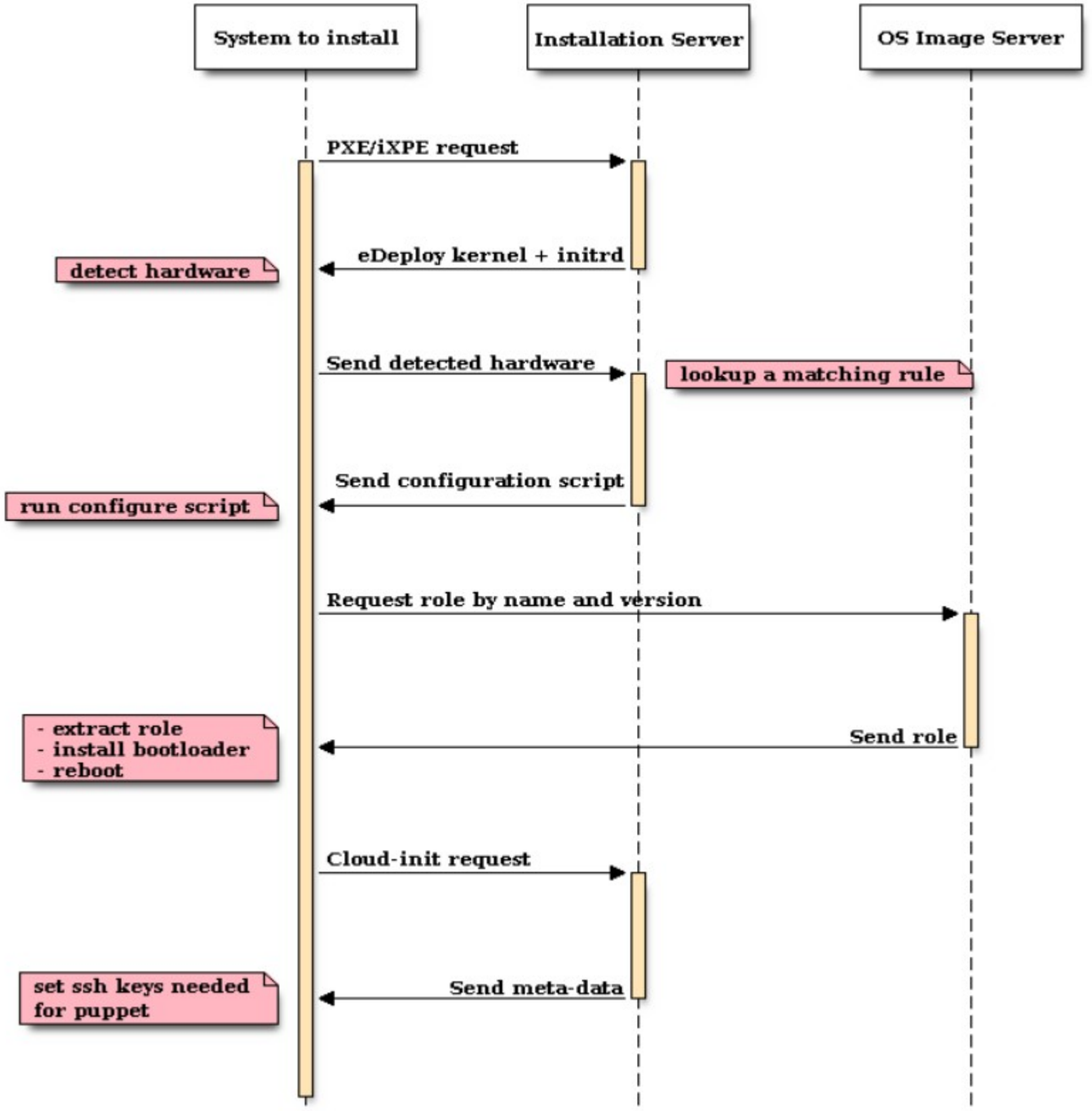
Scalable bare-metal deployment

- Image-based deployment
- Build images in advance
  - Automated with Jenkins
  - Once built and archived => reproducible at wish
- Philosophy:
  - Reusable images for all customers, so no specific to configuration
  - Configuration will be done by an config management system like Puppet

OpenStack Images

- Install Server
  - Puppet master
  - Bare-metal provisionning server
  - Upgrade server
  - CI server
- OpenStack Full
  - All OpenStack & Ceph services with none activated
  - Puppet client



eDeploy

- Bare-metal provisioner
- Based on standard protocols
  (PXE / iPXE, HTTP and rsync)
- Automatic Hardware matching
- No auto-install description: powerful configuration by Python scripts to do only the hardware config.

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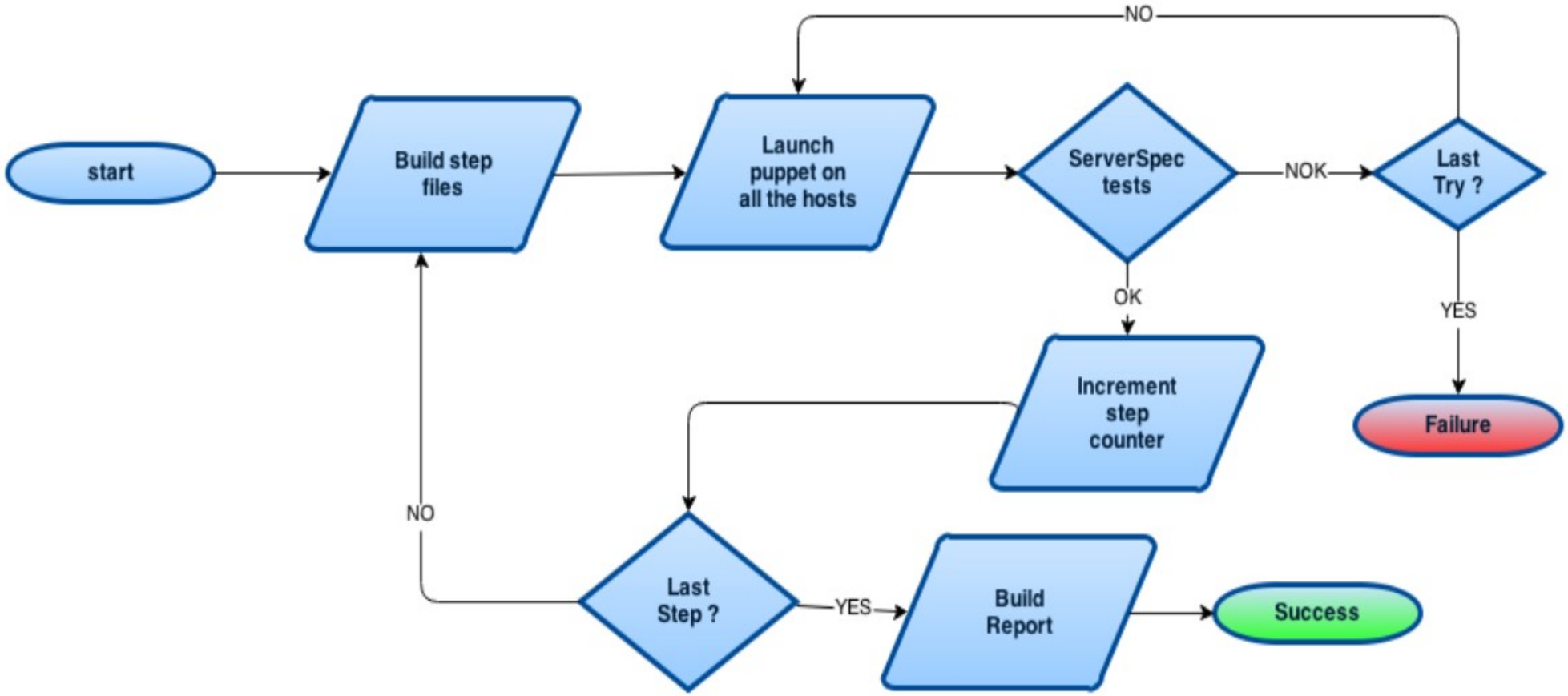
Hardware Validator: AHC

- Automatic Health Check
- Check that hardware is ready to receive OpenStack
- Validate machine components individually
- Validate the set of machines
- Detect black sheeps
- Integrated in eDeploy

Step-by-step deployment

- Based on 100% upstream Puppet modules (~50)
- OpenStack services configuration for HA architectures
- Flexible to many use cases and customer specifics settings
- Evolve with deployments
- Fully unit tested
- Deployment as a 5 steps scenario where each step:
  - Is composed of Puppet classes managed by Hiera
  - Is validated by integration tests (serverspec)
  - Can be debugged easily (TDD style)

Step-by-step workflow



Sanity

- Validate an OpenStack deployment
- Based on Tempest to validate API / CLI (1600 tests)
- Javelin to test resource surviving after an upgrade
- Smoke scripts to create resources within a scenario

Deployment by Jenkins Jobs

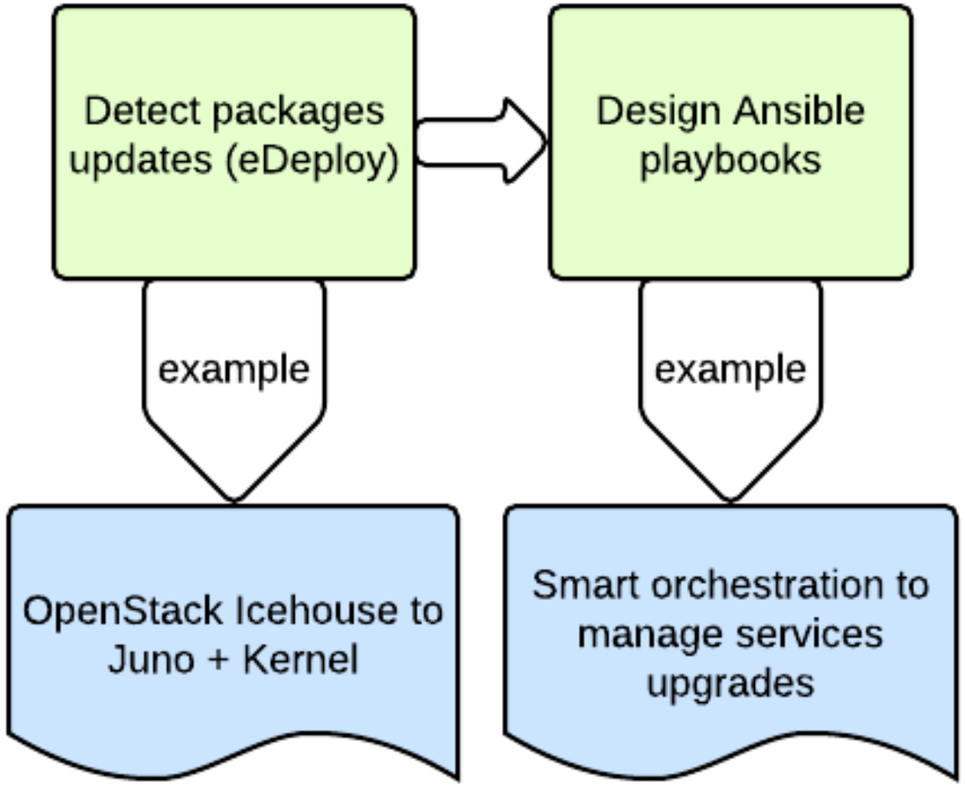
5 jobs:

- AHC: hardware validation
- eDeploy: bootstrap / hardware management
- Puppet: configuration
- Sanity: validation
- Upgrade: upgrade the platform to the last release

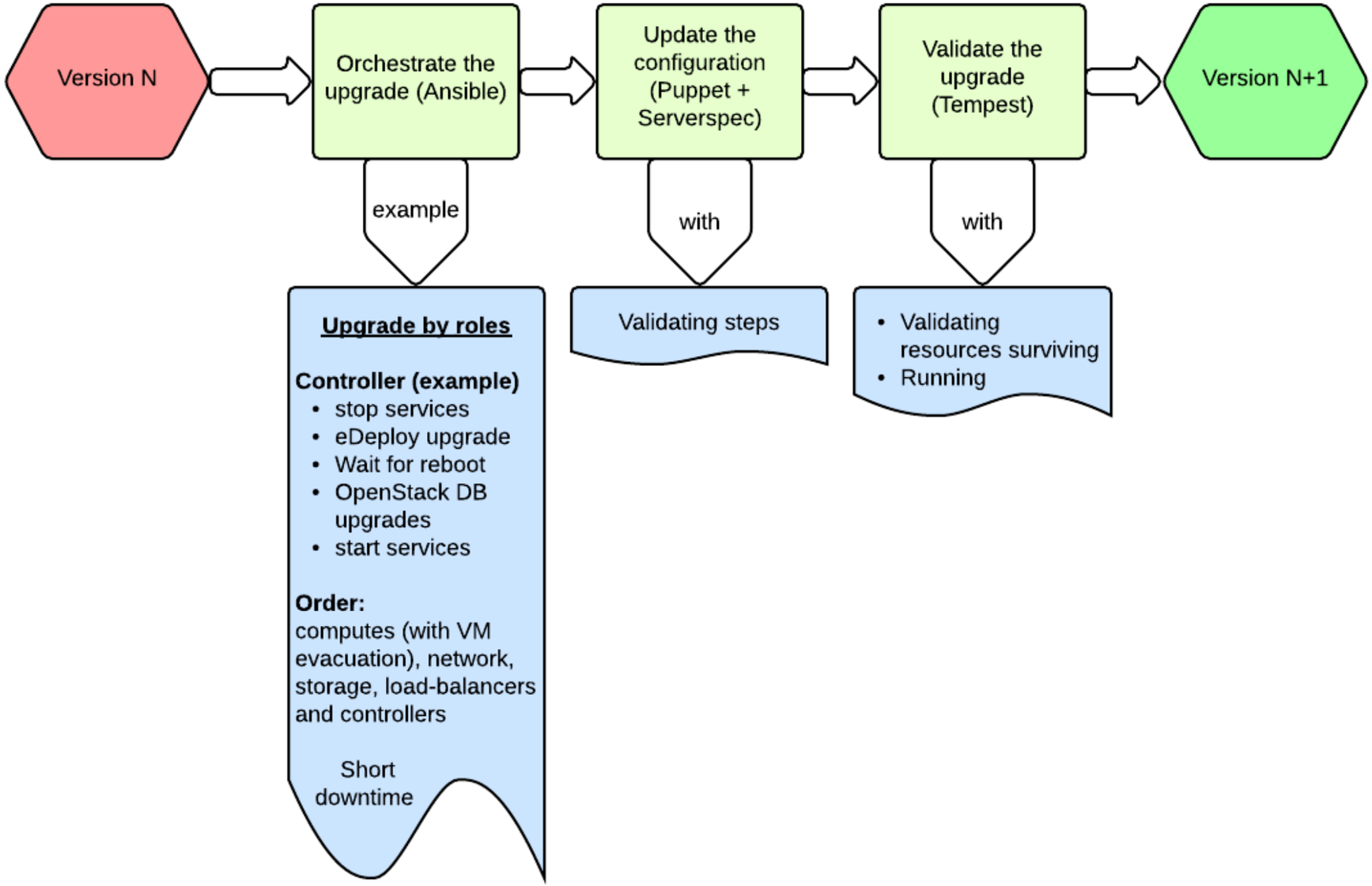
Upgrade process

- eDeploy image-base:
  - Predictible and reproducible
  - Faster than package upgrades (rsync vs packaging)
- Orchestrated by Ansible playbook
- Configuration updated by Puppet
- Validated by Tempest (javelin + functional tests)
- Works only from n to n+1 (n to n+2 not possible)

Upgrade preparation



Upgrade execution




EVERYTHING IS OPEN-SOURCE.

Do it yourself

- OpenStack core projects from upstream
- OpenStack Puppet modules from Stackforge & Puppetlabs
- eDeploy & configuration tools on Github / eNovance
  - https://github.com/enovance/edeploy
  - https://github.com/enovance/edeploy-roles
  - https://github.com/enovance/config-tools
  - https://github.com/stackforge/puppet-openstack-cloud/
  - https://github.com/enovance/openstack-yaml-infra
  - http://spinalstack.enovance.com

THANK YOU

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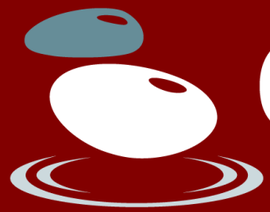

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