FI-Ops

Easing your operations

Components that you need

It is just an introduction to OpenStack and ITBox

Alessandro M. Martellone

alessandro.martellone@create-net.org

10 years 2003-2013 CREATE-NET

Goals

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- What is OpenStack?
- Where did it come from?
- Who is using it?
- How can I use it?

In a nutshell

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- It is an open source software for building private and public cloud environments.
- It is composed by several modules.
- Independent and driven by community

Where did it come from?

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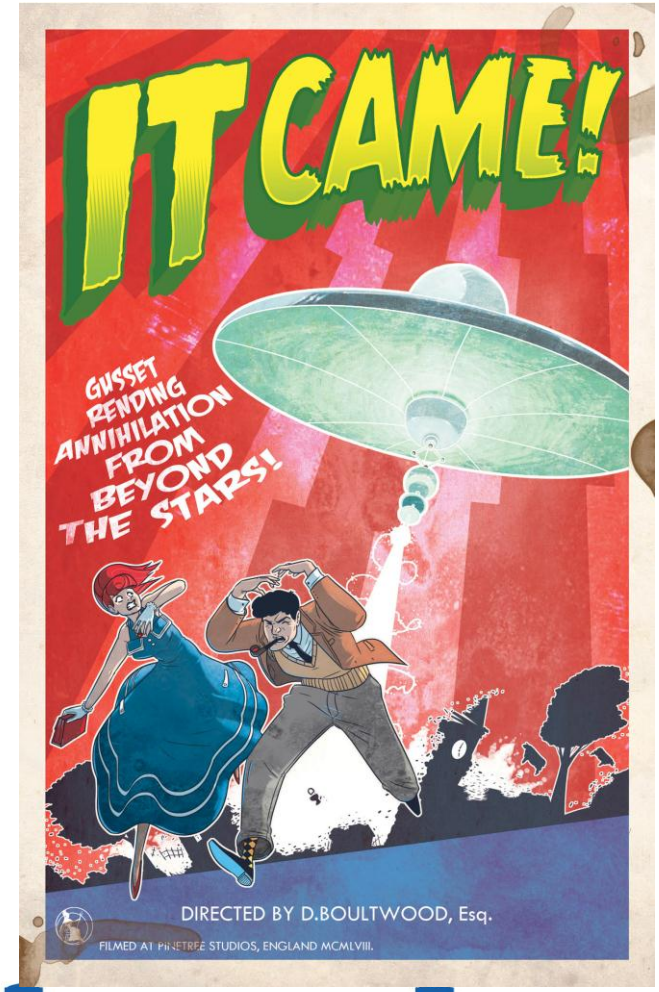
- From the space?



…almost!

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- OpenStack began in 2010 as a joint project of Rackspace and NASA.
- NASA started Nebula project in 2008.

Companies involved in the project

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AT&T

Canonical

HP

IBM

Nebula

Rackspace

Red Hat, Inc.

SUSE

CCAT

Cisco

Cloudscaling

Dell

DreamHost

eNovance

Ericsson

Intel

Juniper Networks

Mirantis

Morphlabs

NEC

NetApp

Piston Cloud

VMware

Yahoo!

Google trends

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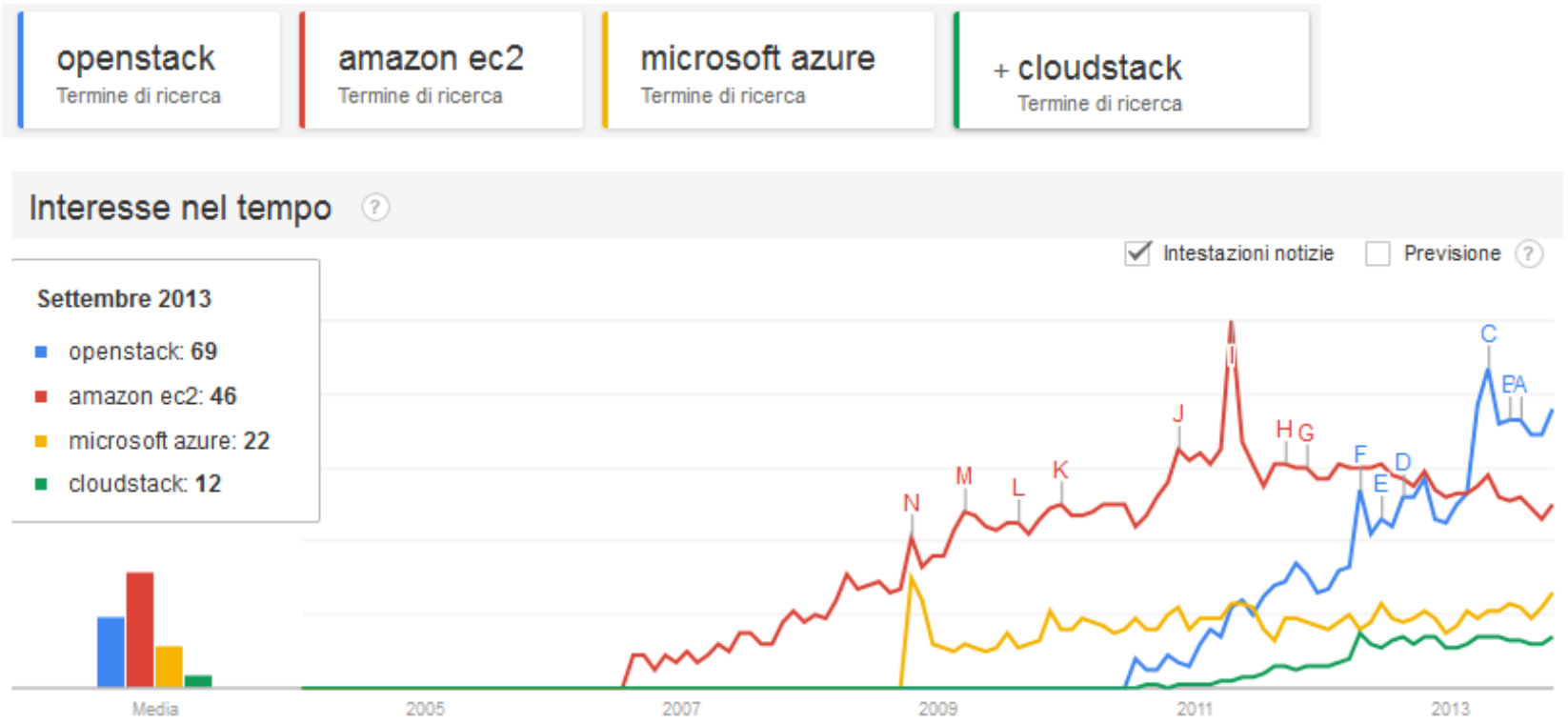

The numbers on the graph reflect how many searches have been done for a particular term, relative to the total number of searches done on Google over time. They don't represent absolute search volume numbers, because the data is normalized and presented on a scale from 0-100. Each point on the graph is divided by the highest point, or 100. When we don't have enough data, 0 is shown.

OpenStack architecture

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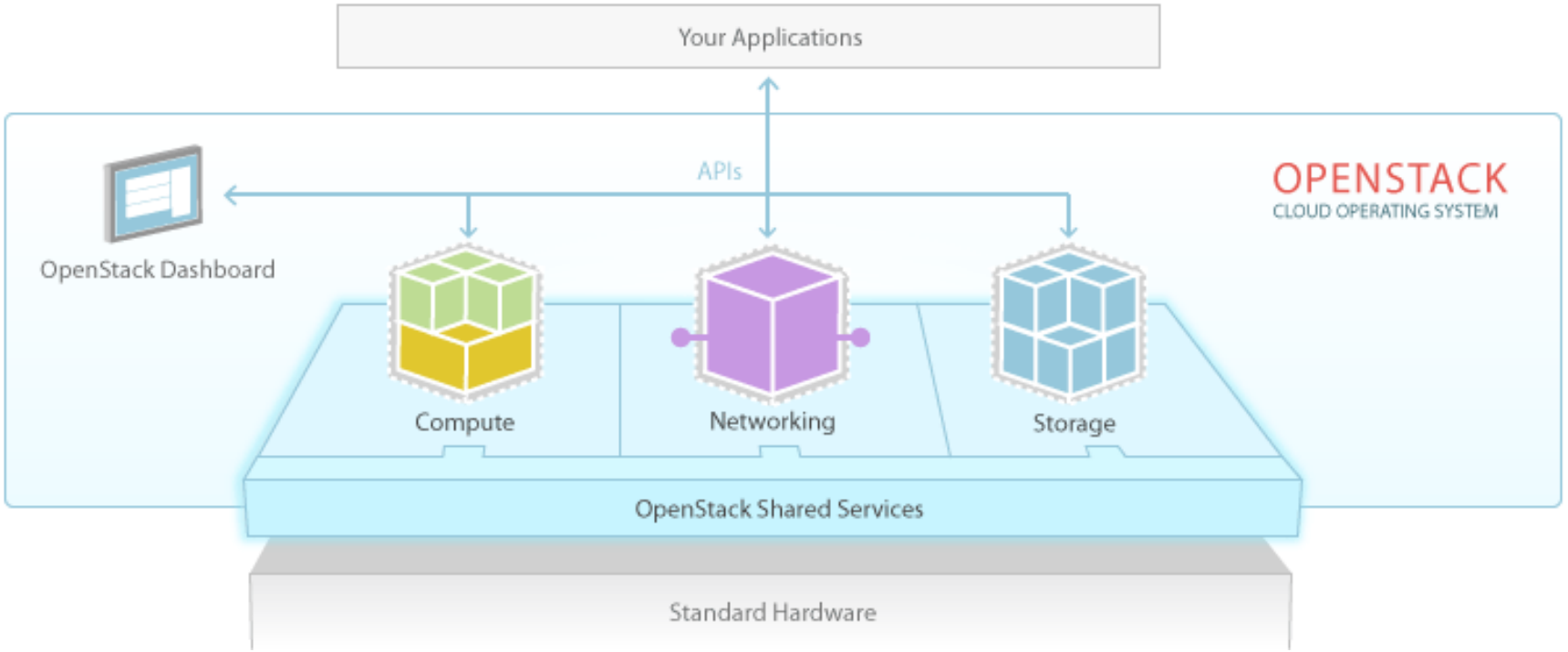
- Distributed, modular and scalable.



A cloud…many services, many projects

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- Computing – NOVA
- Networking – NEUTRON/QUANTUM
- File storage – SWIFT
- Identity – KEYSTONE
- Block storage – CINDER
- OS Images - GLANCE

OpenStack architecture

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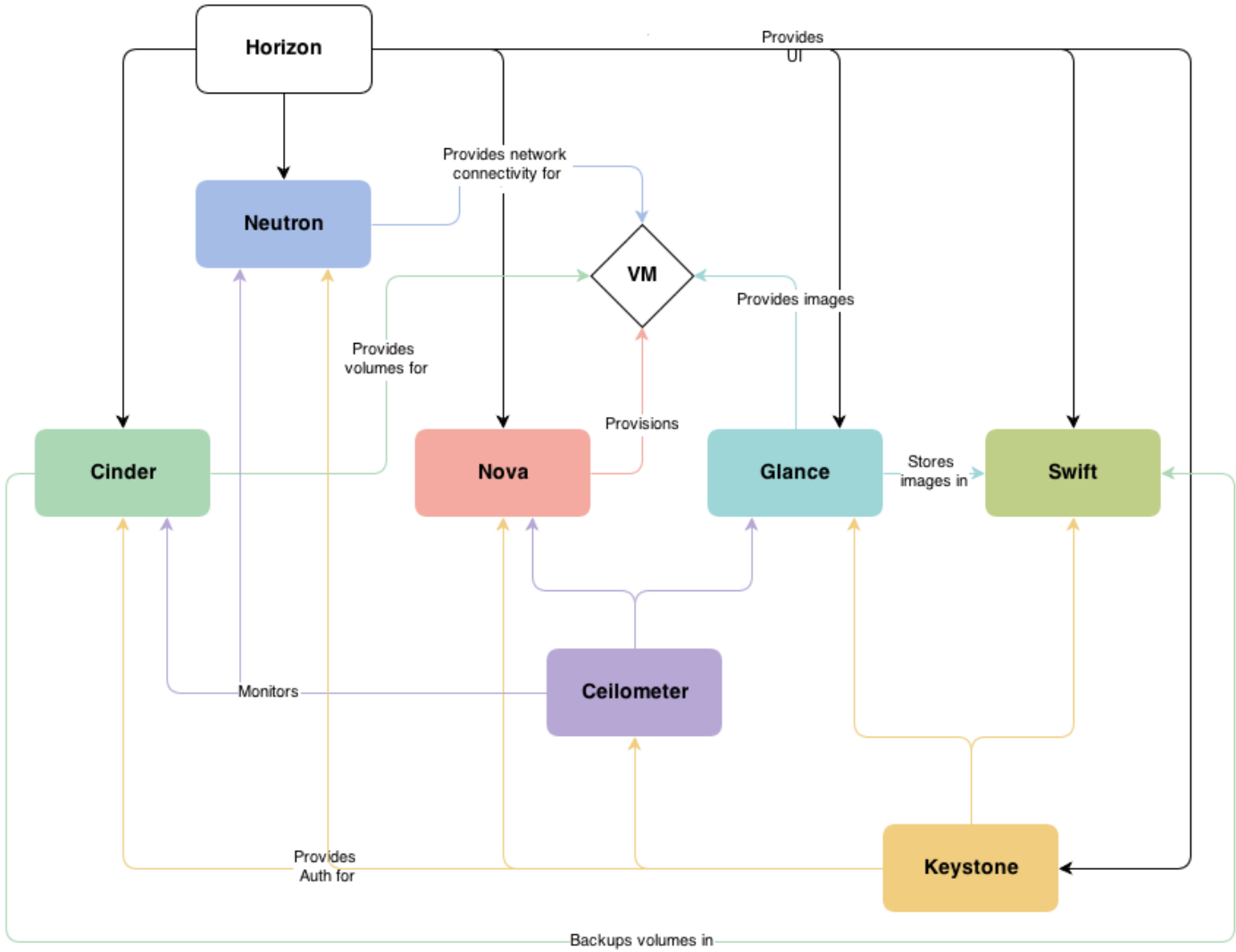

OpenStack architecture

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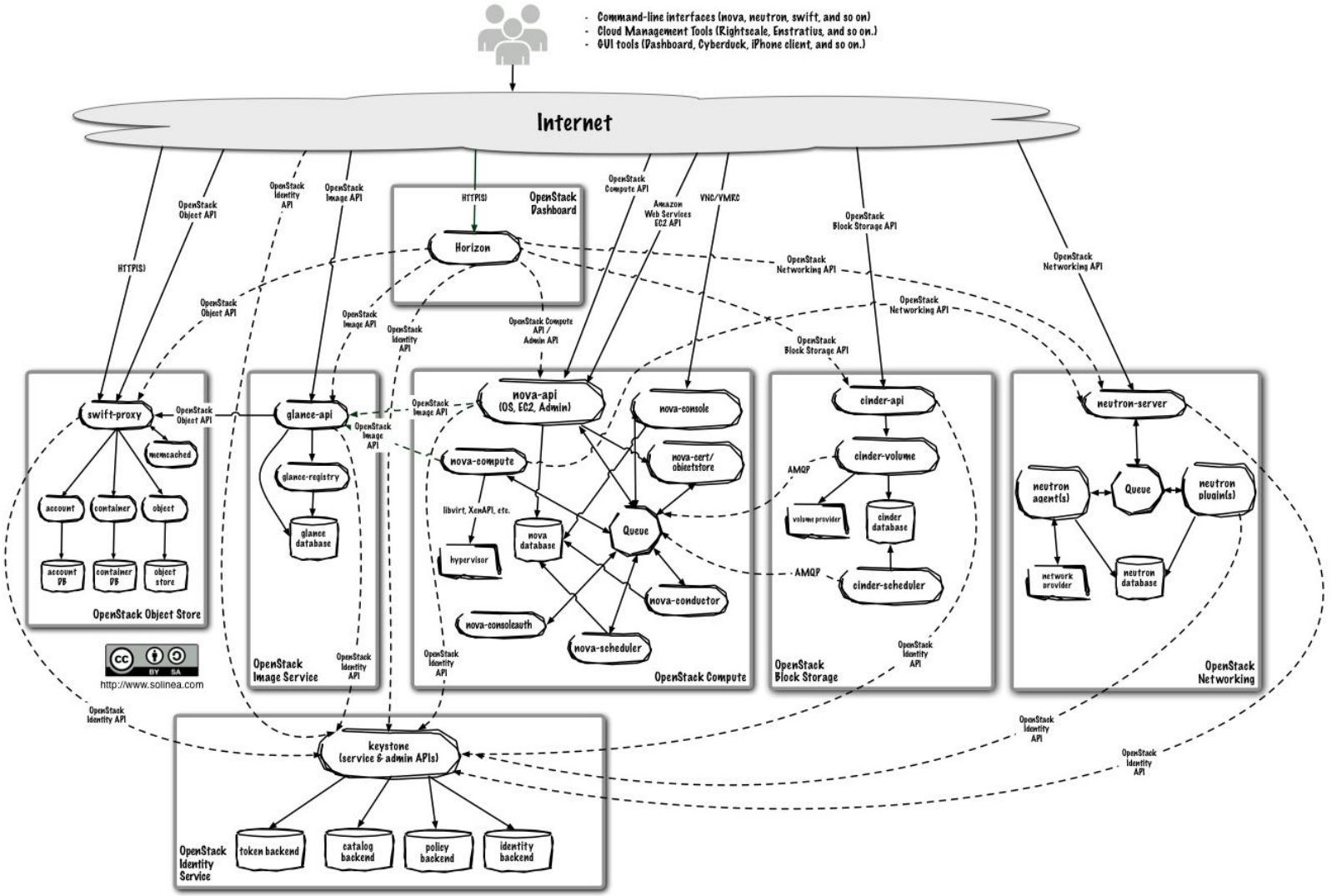

Deployment models and node roles

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Deployment models and node roles

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- Before you install any hardware or software, you must know what you're trying to achieve.
  - Team: hardware capabilities
  - Goals: which services I would offer to users?
  - Strategy: a multi-node deployment or a High-Availability deployment?

A multi-node deployment

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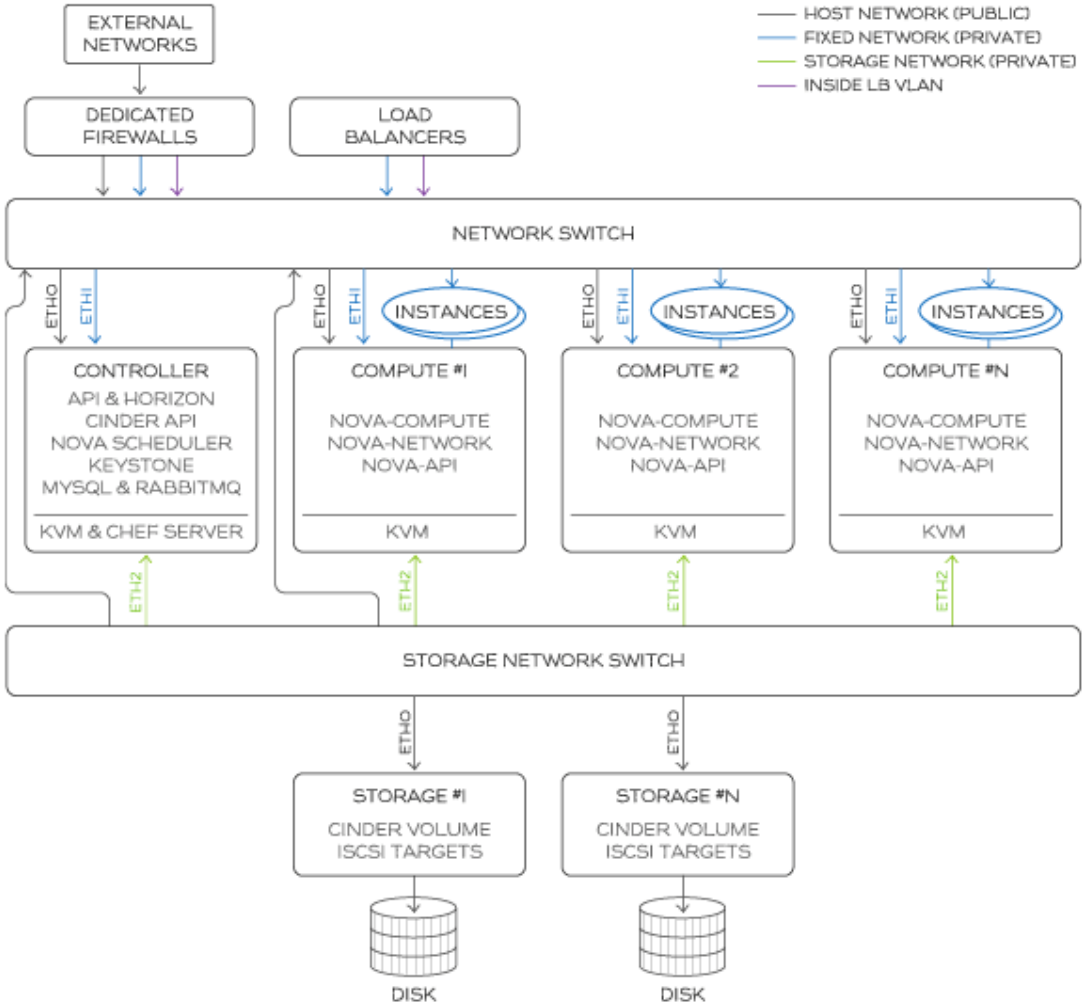

A High-Availability deployment

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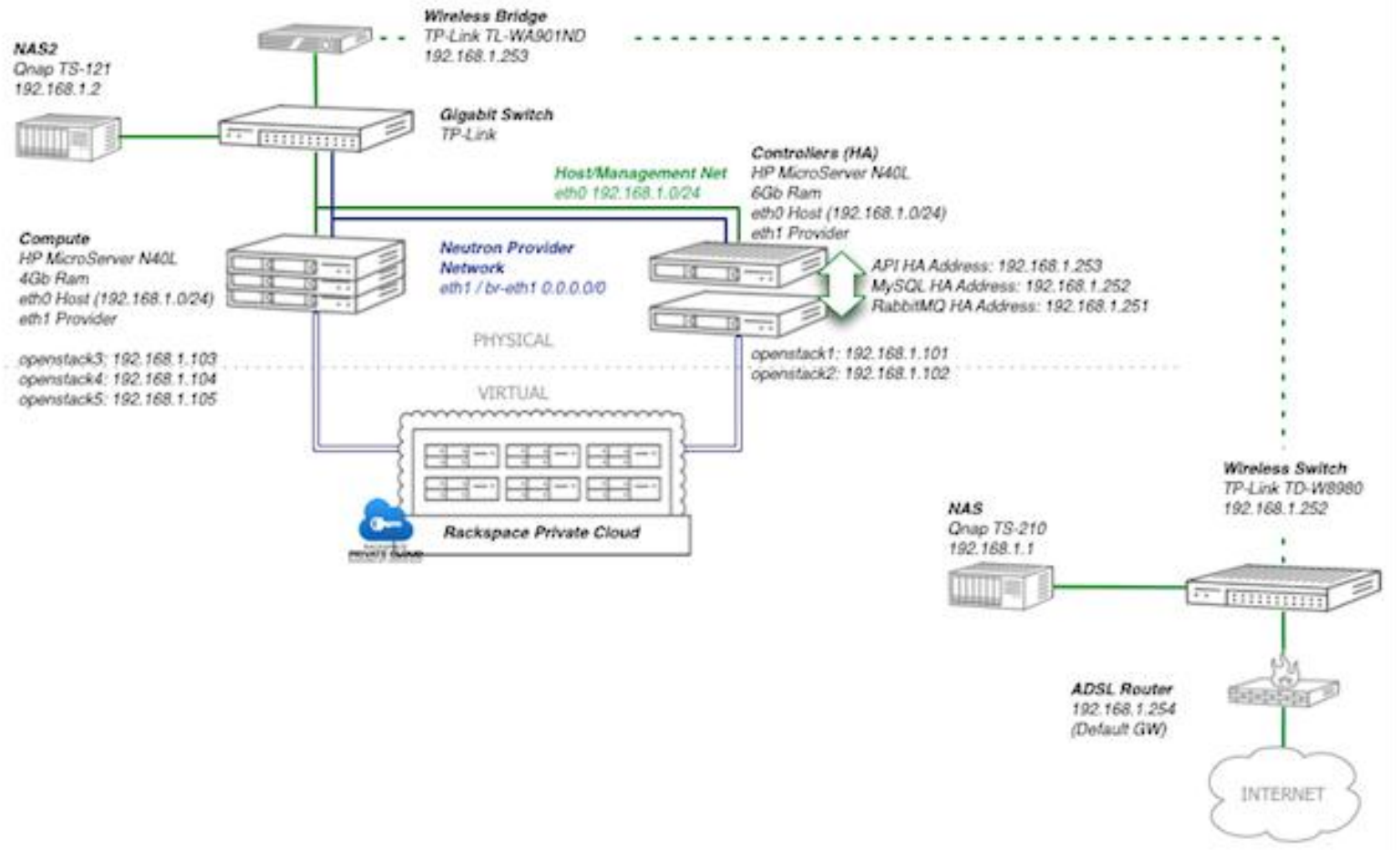

- High Availability systems seek to minimize two things:
- **System downtime** — occurs when a *user-facing* service is unavailable beyond a specified maximum amount of time, and
- **Data loss** — accidental deletion or destruction of data.

HA: some details

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- Elimination of single points of failure (SPOFs).
- Redundancy of network components (switches and routers)
- Automatic service migration
- Facility services such as power, air conditioning, and fire protection

HA: some details

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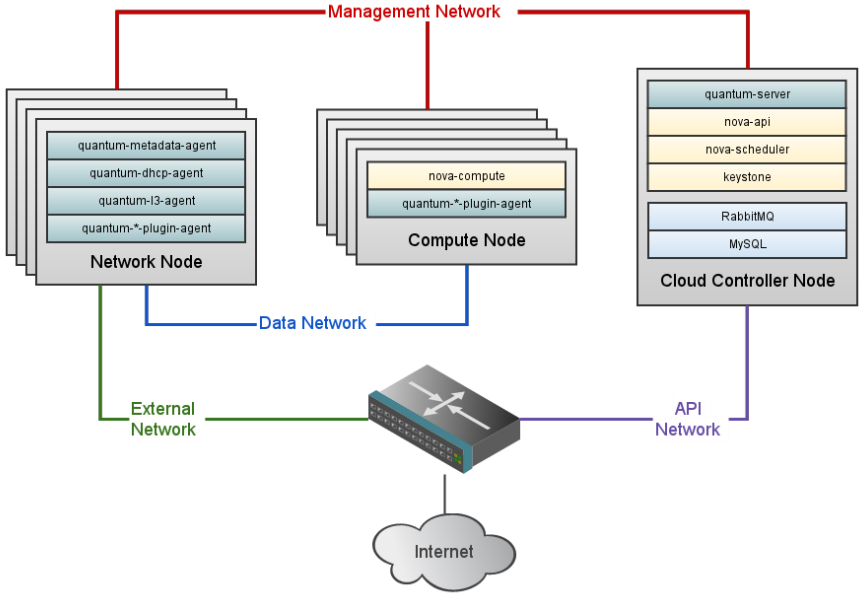
- A stateless service is one that provides a response after your request
  - nova-api, nova-conductor, glance-api, keystone-api, neutron-api and nova-scheduler
- A stateful service is one where subsequent requests to the service depend on the results of the first request.
  - They are more difficult to manage
  - Making stateful services highly available can depend on whether you choose an active/passive or active/active configuration.

- **Active/Passive**
  - In an active/passive configuration, systems are set up to bring additional resources online to replace those that have failed.
  - A typical active/passive installation maintains a replacement resource that can be brought online when required. A separate application (such as Pacemaker or Corosync) monitors these services,
  - E.g. Quantum

- **Active/Active**
  - In an active/active configuration, systems also use a backup but will manage both the main and redundant systems concurrently.
- Database
  - Mysql with Galera
- HAProxy
  - is a very fast and reliable solution offering high availability, load balancing, and proxying for TCP and HTTP-based applications.

Basic networking



- **Management network**: Used for internal communication between nodes.
- **Data network**: Used for VM data communication.
- **External network**: Used to provide Internet access to VMs.
- **API network**: Exposes all OpenStack APIs, including the Quantum API, to tenants. The IP addresses on this network should be reachable by anyone on the Internet.

Fuel: live demo

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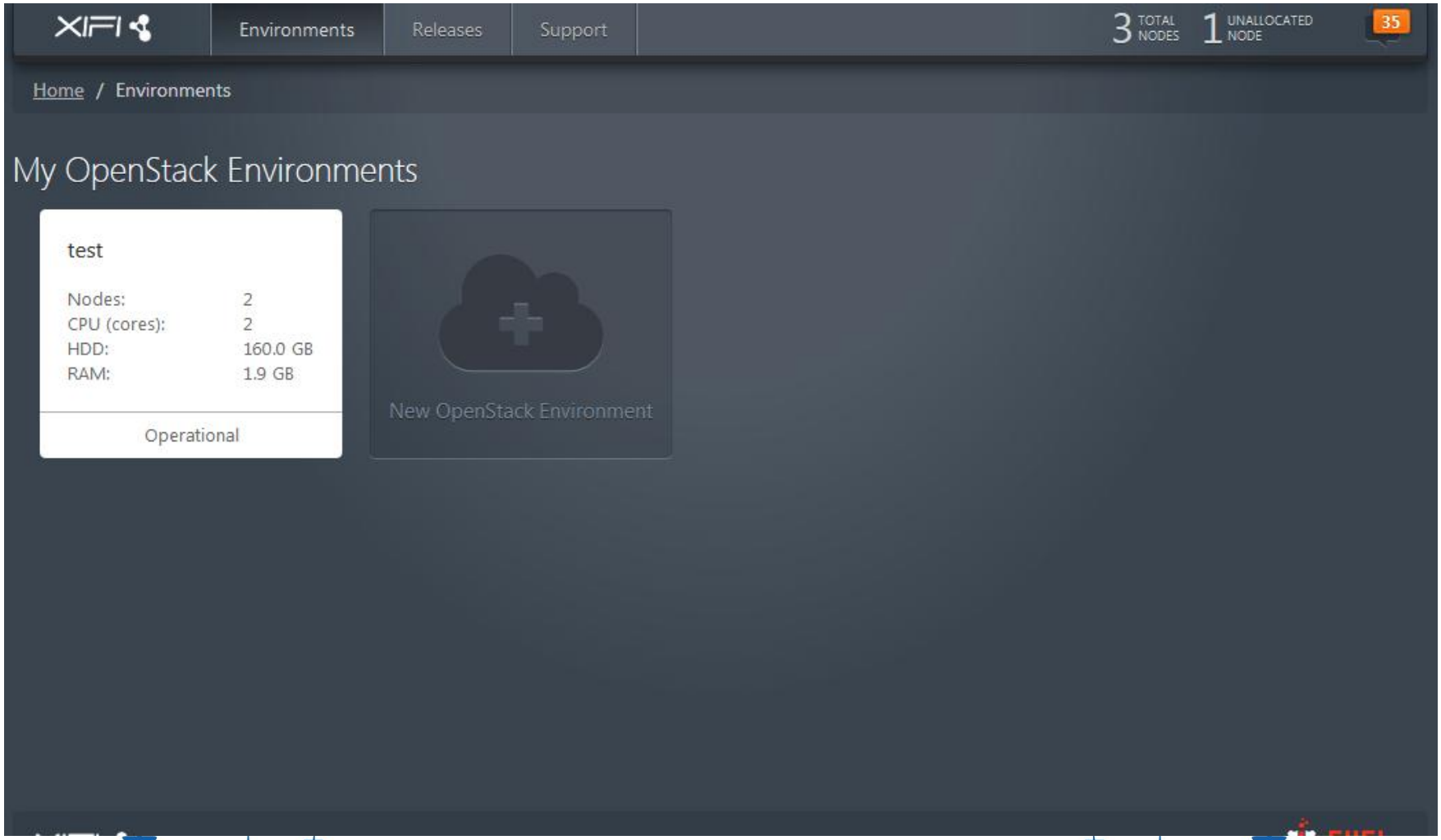

Thank you for your attention!

Find us at www.fi-xifi.eu

Author:

alessandro.martellone@create-net.org

Create-Net : http://www.create-net.org/

Acknowledgments:

The research conducted by XIFI receives funding from the European Commission FP7 under grant agreement N° : 604590. The European Commission has no responsibility for the content of this presentation.