XenSummit Asia

November 2-3, 2011
Seoul, Korea

OpenStack

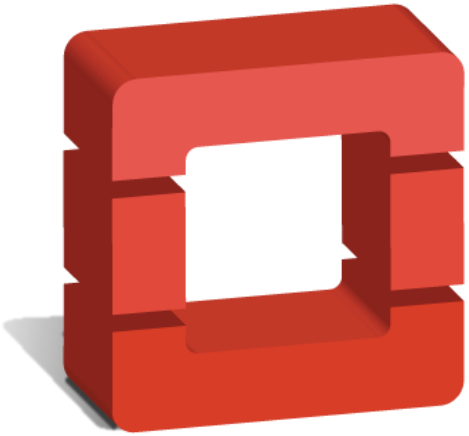
Open Community & Open Cloud

Sponsored by:

SAMSUNG & KOREA UNIVERSITY LIBERTAS JUSTITIA VERITAS & kt

& github SOCIAL CODING

Let's get started



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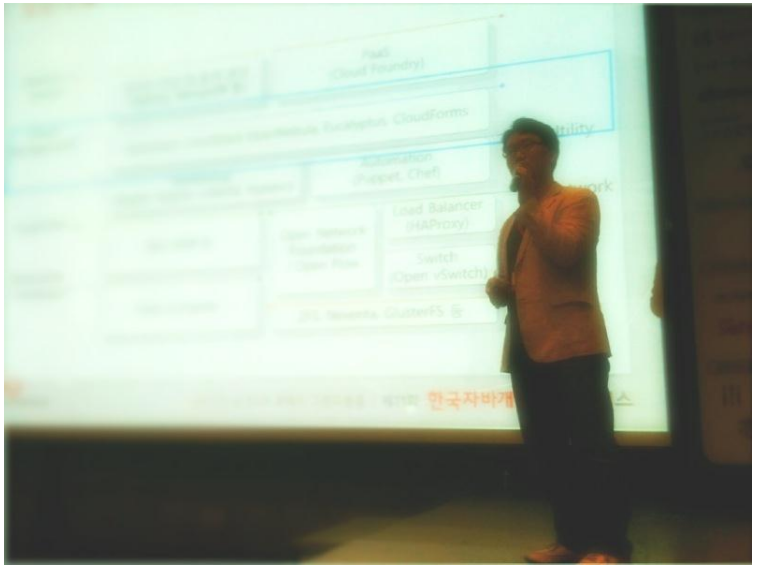
CLOUD SOFTWARE



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What is OpenStack?

OpenStack is a community of open source developers, participating organizations and users who are building and running *the* open source cloud operating system.

Another definition ...

"**OpenStack** is a Cloud Operating System, that takes resources such as compute, storage, network, virtualization technologies and controls those resources at a data center level"

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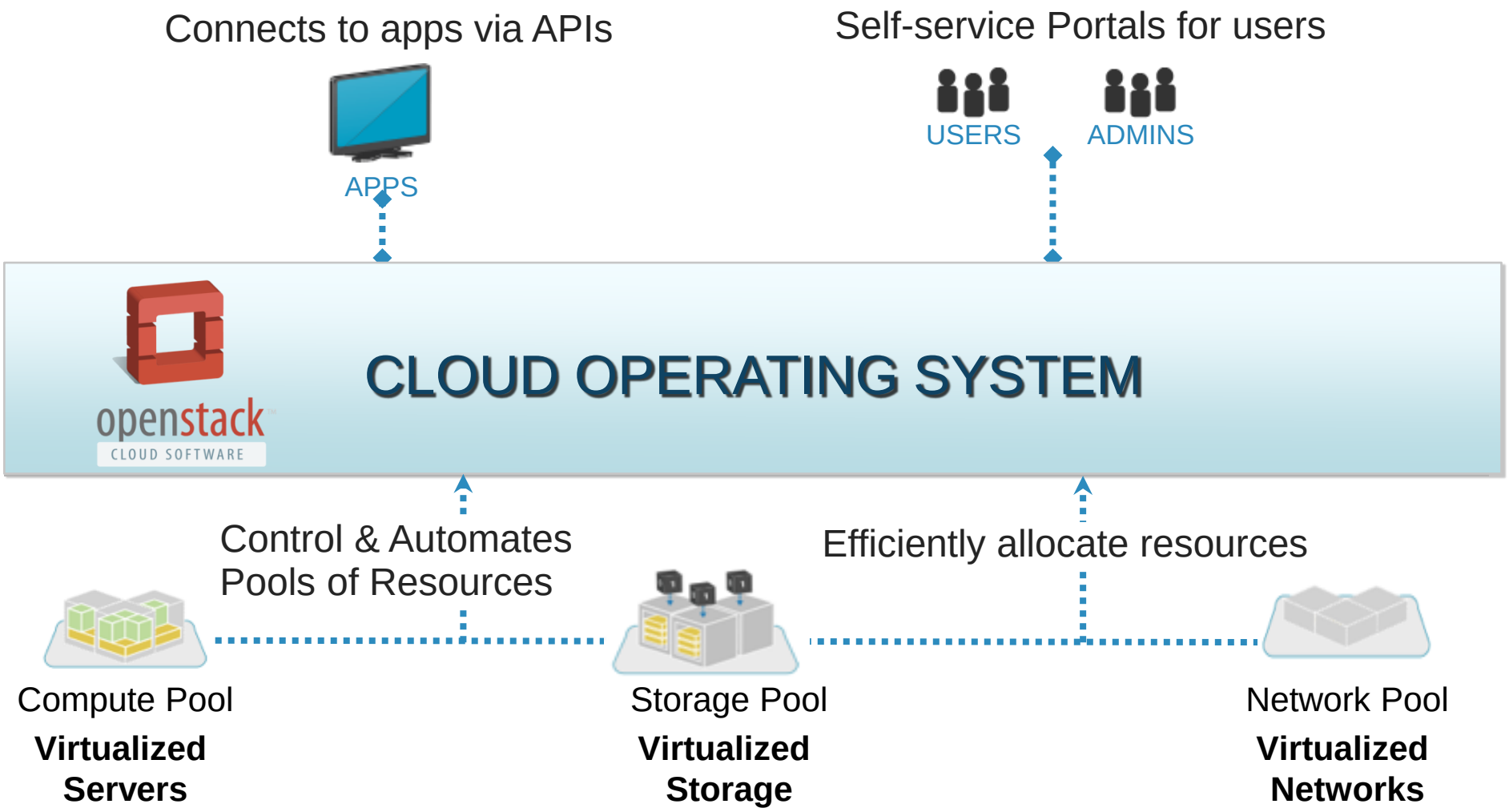
OpenStack, A Kernel of the Cloud OS



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Open Source

Apache 2.0 license, NO ‘enterprise’ version

Open Design

Open Design Summit

Open Development

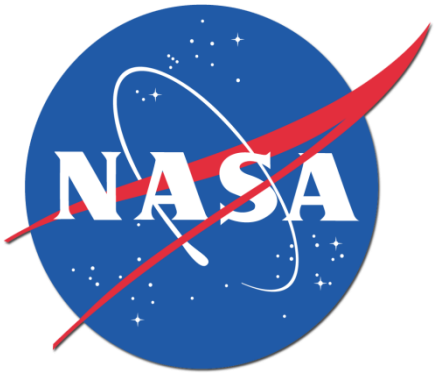
Anyone can involve development process

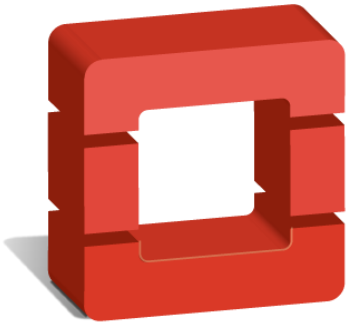
Open development management via Launchpad & Github

Open Community

OpenStack Foundation in 2012

In the beginning…





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History

To my boss,
Yes, I am from University of Texas at Austin. I love city of Austin.
When I said openstack is **important** to you in 2010,
I was just exiting to see a word “Austin”. I did not understand “openstack”.

June 2010: OpenStack Formed
July 2010: First design summit in **Austin** (35 partners)
October 2010: First release, "**Austin**"
November 2010: First Public Design Summit (San Antonio)
February 2011: "Bexar" released
April 2011: "Cactus" released
April 2011: Design Summit (Santa Clara)
October 2011: "Diablo" released
November 2011: Design Summit (Boston)
April 2012: "Essex" release planned

Now...

openstack
mercado Libre.com
midokura
SONY
COMPUTER ENTERTAINMENT
nebula
piston
kt
EnterpriseDB
The Enterprise PostgreSQL Company
CANONICAL
Microsoft
rackspace HOSTING
CITRIX
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cloudscaling
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CISCO
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GIGASPACES
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extreme networks
cloud.com
ENSTRATUS
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engine
Grid Dynamics
Scaling Mission-Critical Systems
peer1 hosting
Limelight NETWORKS
AUTONOMIC RESOURCES
FATHOMDB
nicira
Cirrascale
rPath
AMD
CLOUDSWITCH
sonian
MORPH
INTALIO
zuora
SPICEWORKS
XenSummitAsia

133 Companies

1644 People

Systems Management

Hardware

Service Providers

Government

Financial

E-commerce

>50 M
Venture Capital

Openstack only exists on the news article?

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mercado Libre.com

e-commerce / 8th Largest in the World
6000 VMs in Production

SONY COMPUTER ENTERTAINMENT ®

Sony Entertainment America
OpenStack Private Cloud

SAMSUNG

OpenStack-based Cloud Service
Currently, Private Beta

hp

at&t

Private Cloud based on OpenStack

Fidelity INVESTMENTS

Public Cloud Service based
on OpenStack

INTERNAP®
The intelligent way through the Internet

kt

Running Commercial Service
based on OpenStack Swift

Public Cloud Service based
on OpenStack

x.commerce

NASA

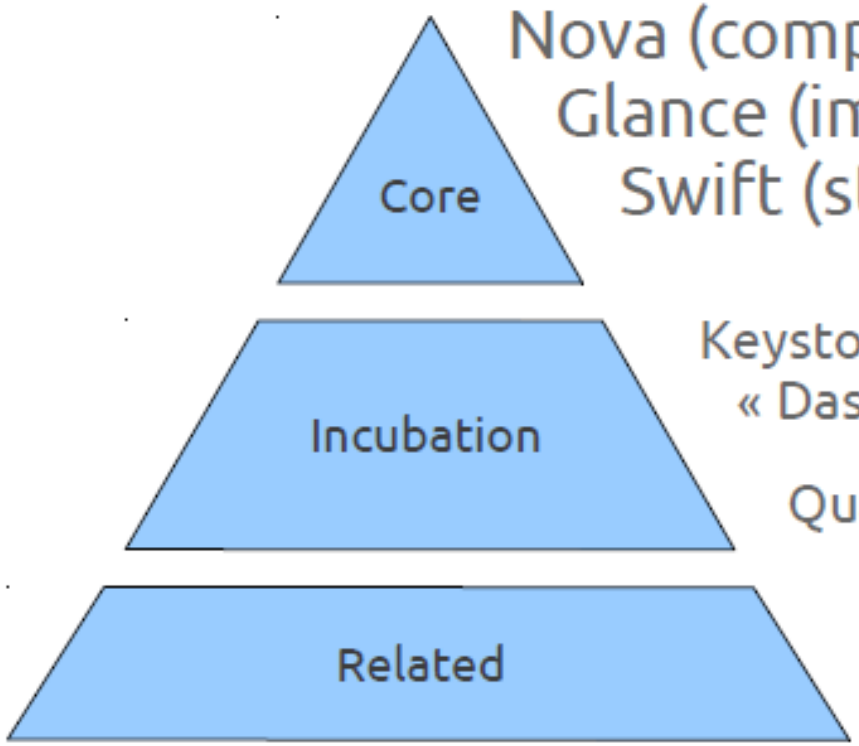
rackspace® HOSTING

ISI Information Sciences Institute

WIKIMEDIA FOUNDATION

Who are developing it?

OpenStack Projects



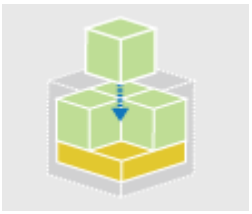
Nova (compute)
Glance (image service)
Swift (storage)

Keystone (common authentication)
« Dashboard » (web UI)

Quantum (virtual network service)

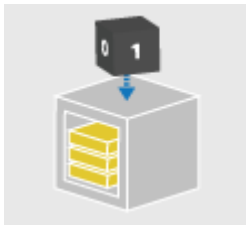
More… (database, queue, …)

Core Projects



✓**Compute (code-named “Nova”)**

-open source software and standards for large-scale deployments of automatically provisioned virtual compute instances.



✓**Object Storage (code-named “Swift”)**

-open source software and standards for large-scale, redundant storage of static objects

✓**Image Service (code-named “Glance”)**

-provides discovery, registration, and delivery services for virtual disk images.

OpenStack Incubated Projects

✓**OpenStack Identity (code-named Keystone)**

-The OpenStack Identity Service provides unified authentication across all OpenStack projects and integrates with existing authentication systems

✓**OpenStack Dashboard**

-Dashboard enables administrators and users to access and provision cloud-based resources through a self-service portal.

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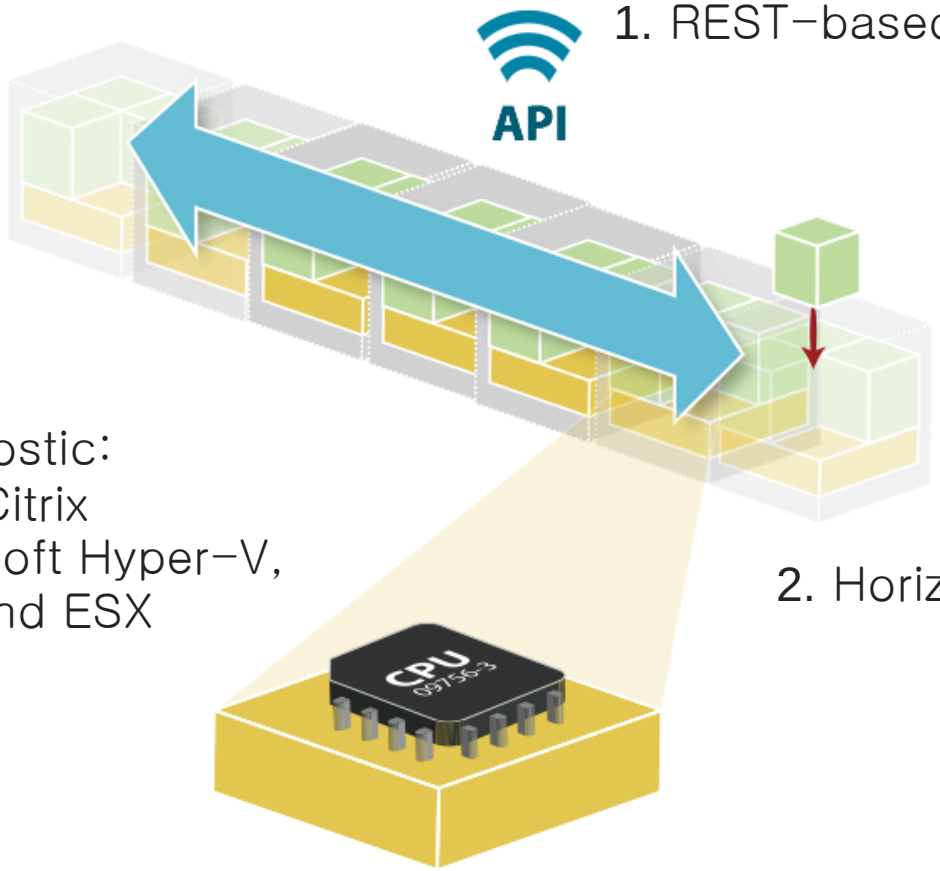
Nova (OpenStack Compute)



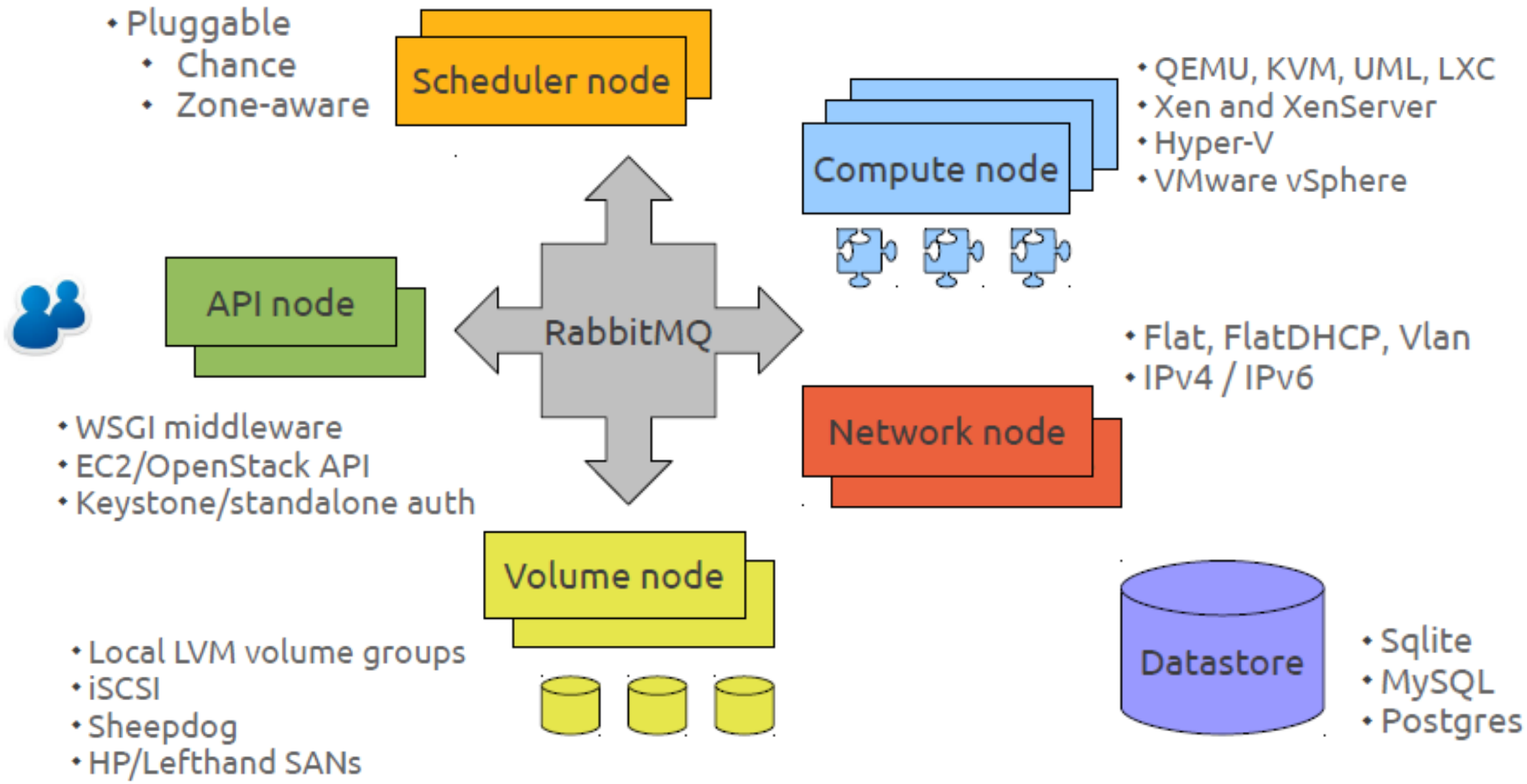
1. REST-based API

2. Horizontally and massively scalable

3. Hardware agnostic: supports a variety of standard hardware

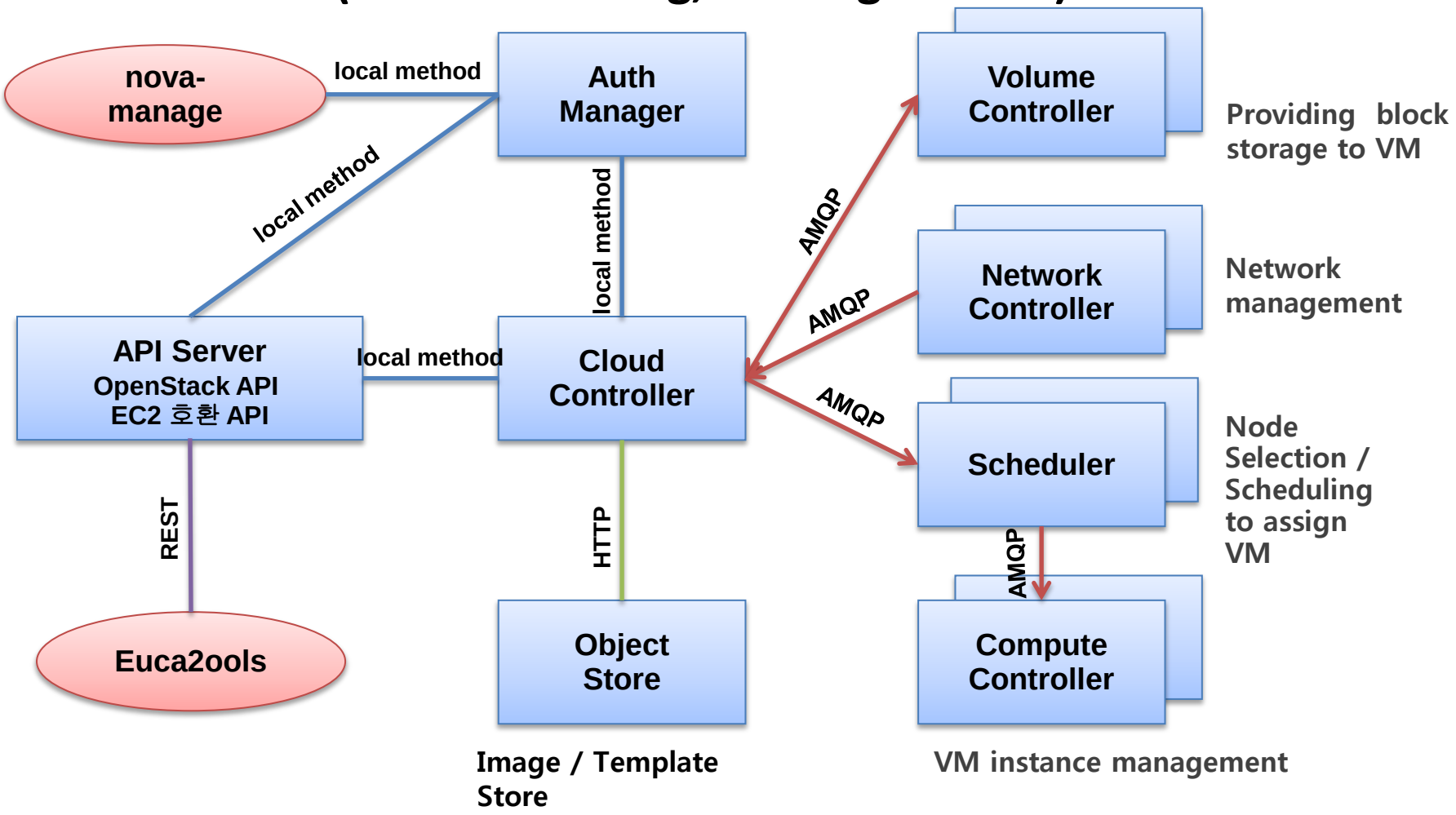
4. Hypervisor agnostic: support for Xen ,Citrix XenServer, Microsoft Hyper-V, KVM, UML, LXC and ESX

Nova Components



Nova Structure

(Shared-Nothing, Message-based)



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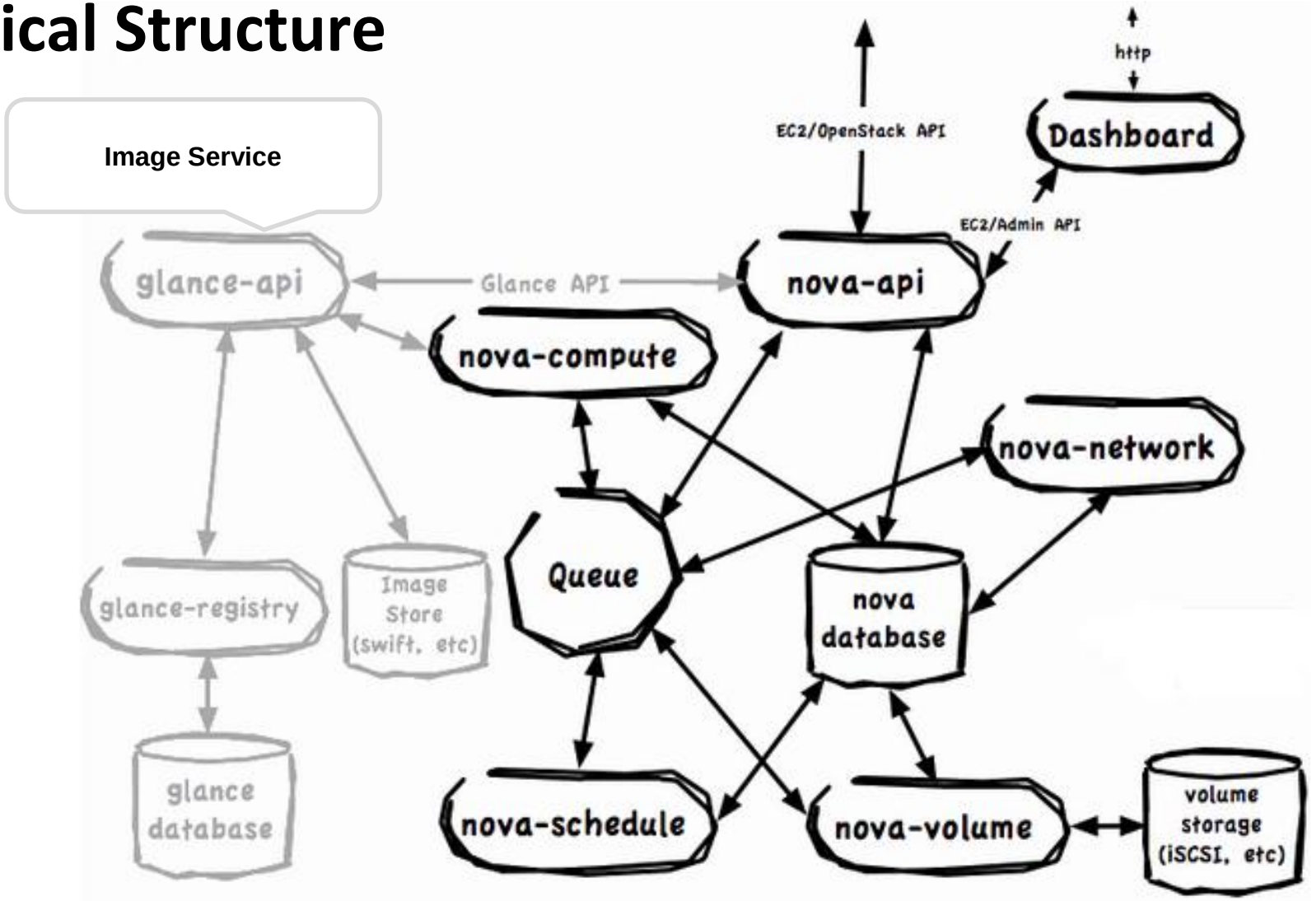
Logical Structure



http://ken.pepple.info

Feature	Benefit
Manage Local Area Networks (LAN) - Flat, Flat DHCP, VLAN DHCP, IPv6	Programmatically allocate IPs and VLANs VLANs Flexible networking models to suit needs of each application and/or user group
API with rate limiting and authentication	Designed for automation and security
Distributed and asynchronous architecture	Massively scalable and highly available system
Live VM management (Instance) Run, reboot, suspend, resize, terminate instances	Increase productivity with lifecycle management
Create and manage Instance Types (Flavors) Define sizes of VMs for CPU, RAM & Disk	Build a menu of options for users to select from Flavors make it easy to size VMs for workloads
iSCSI storage volume management Create, delete, attach and transfer volumes	Enables data to be managed separate from VMs for fault-tolerance and added flexibility
Live migration of instances	Minimize downtime with planned maintenance
Floating IP addresses	Keep IPs & DNS correct when managing VMs
Security Groups	Flexibility to assign and control access to VM instances by creating separation between resource pools
Role Based Access Control (RBAC)	Ensure security by user, role and project

Example Architecture (Flat, Flat DHCP)

Internet

LB

nova-api

nova-api

nova network

nova scheduler

nova volume

nova Object store

AMQP (Rabbitmq)

nova-compute

VM

VM

WEB UI SERVER (User Portal)

Center Controller

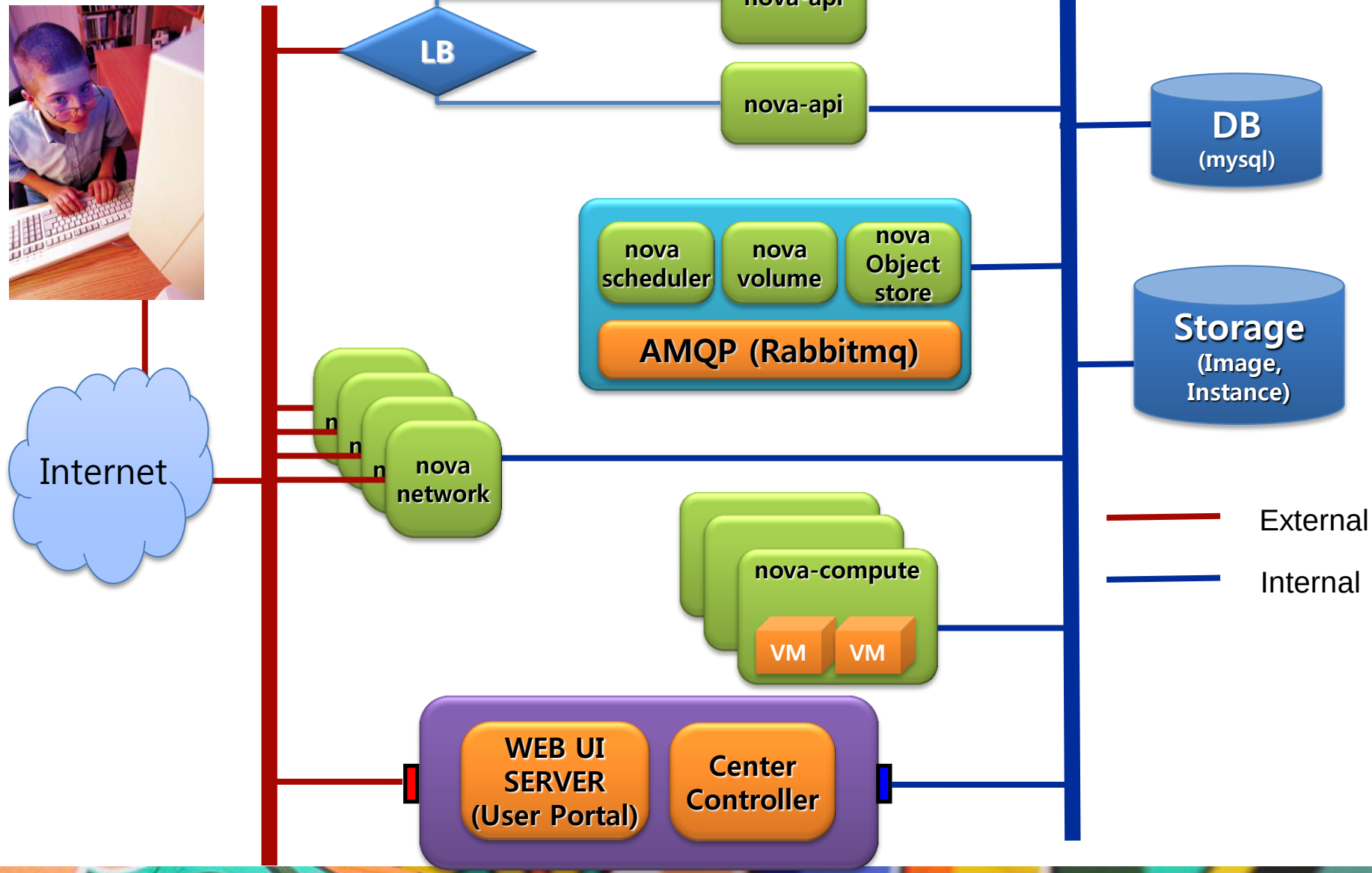
DB (mysql)

Storage (Image, Instance)

External

Internal

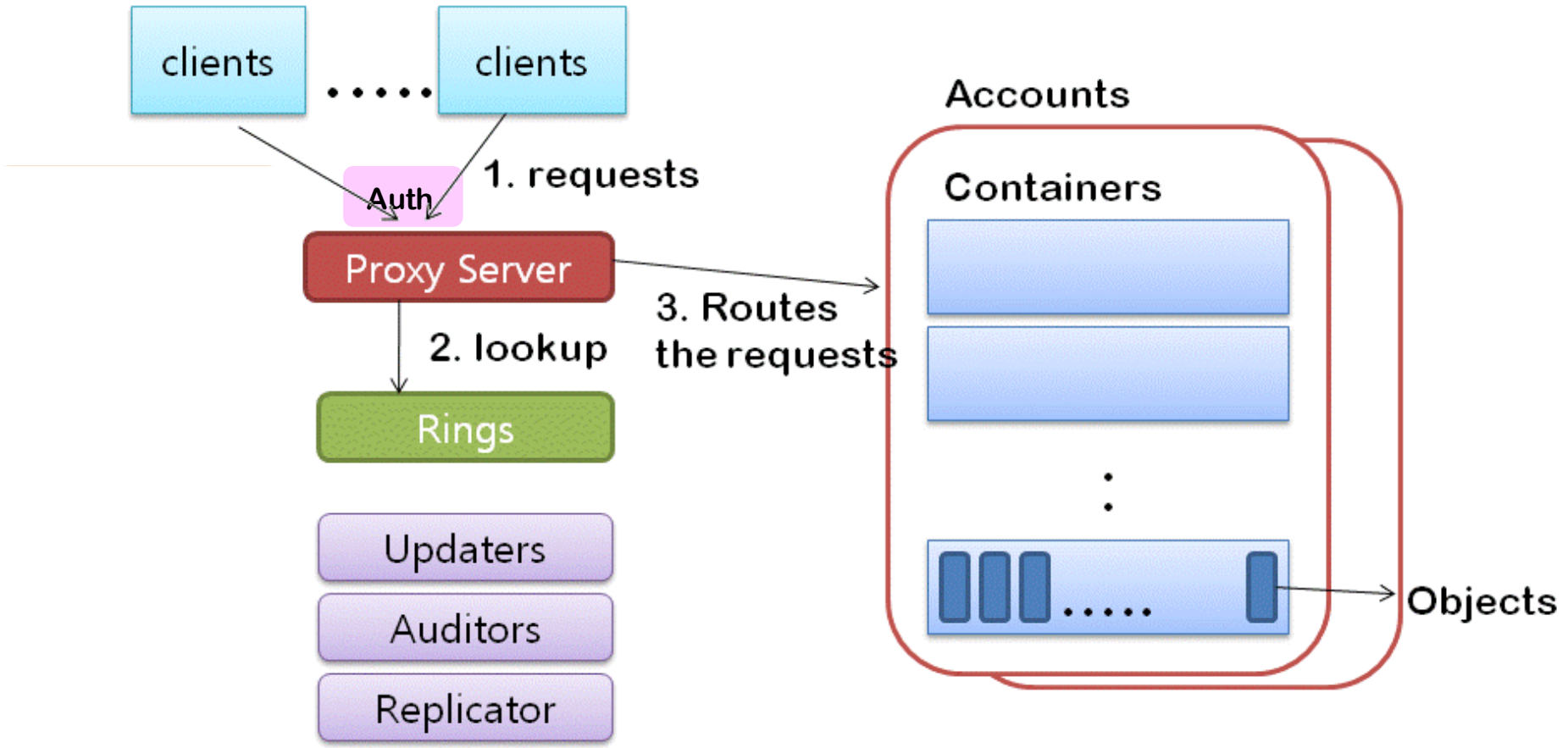
Example Architecture (vlan)



Swift (OpenStack Object Storage)

- Object Storage
- Simple storage service (GET, PUT, DELETE, COPY)
- Highly available, distributed, eventually consistent object/blob store
- RESTful interface
- No object size limit
- 3+ replication factor in separate “zones”
- Scales horizontally, No central index.
- Stable and deployed in production

Swift main components



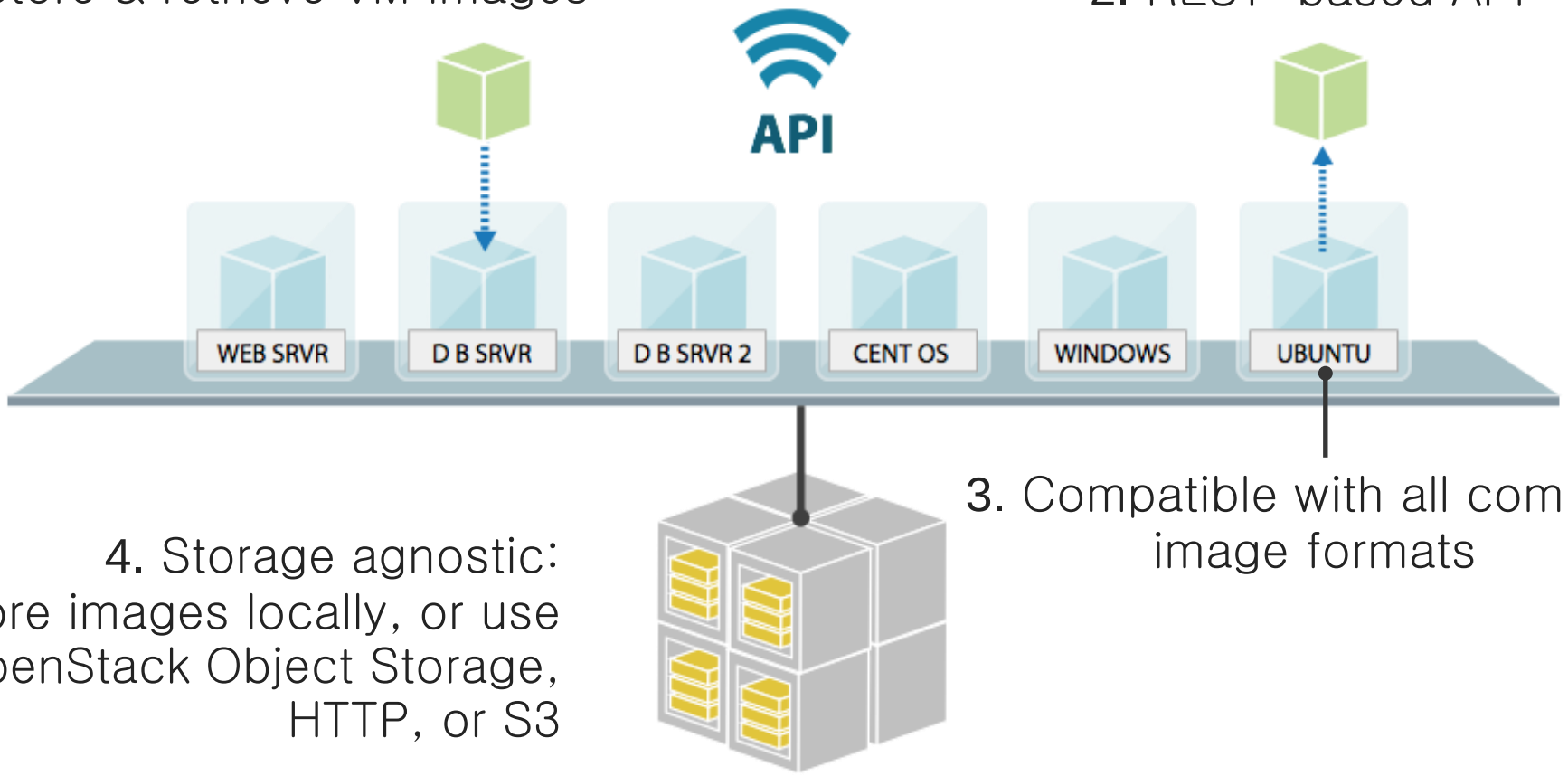
Glance (OpenStack Image Service)

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

Glance Structure

1. Store & retrieve VM images

2. REST-based API

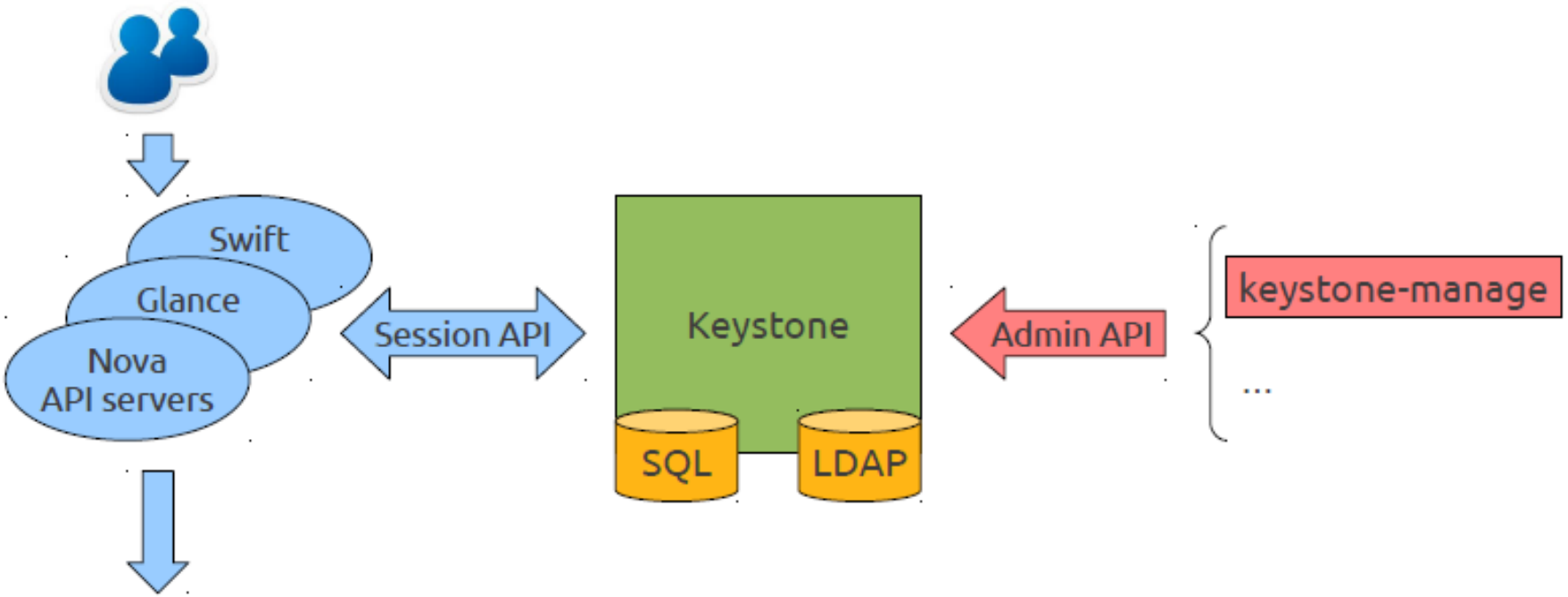


3. Compatible with all common image formats

4. Storage agnostic: Store images locally, or use OpenStack Object Storage, HTTP, or S3

Keystone (OpenStack Identity)

- Unified tenants / accounts for all services



Dashboard (OpenStack Web UI)

- Reference UI implementation
- Django module to build web UIs

Quantum (OpenStack Network-aaS)

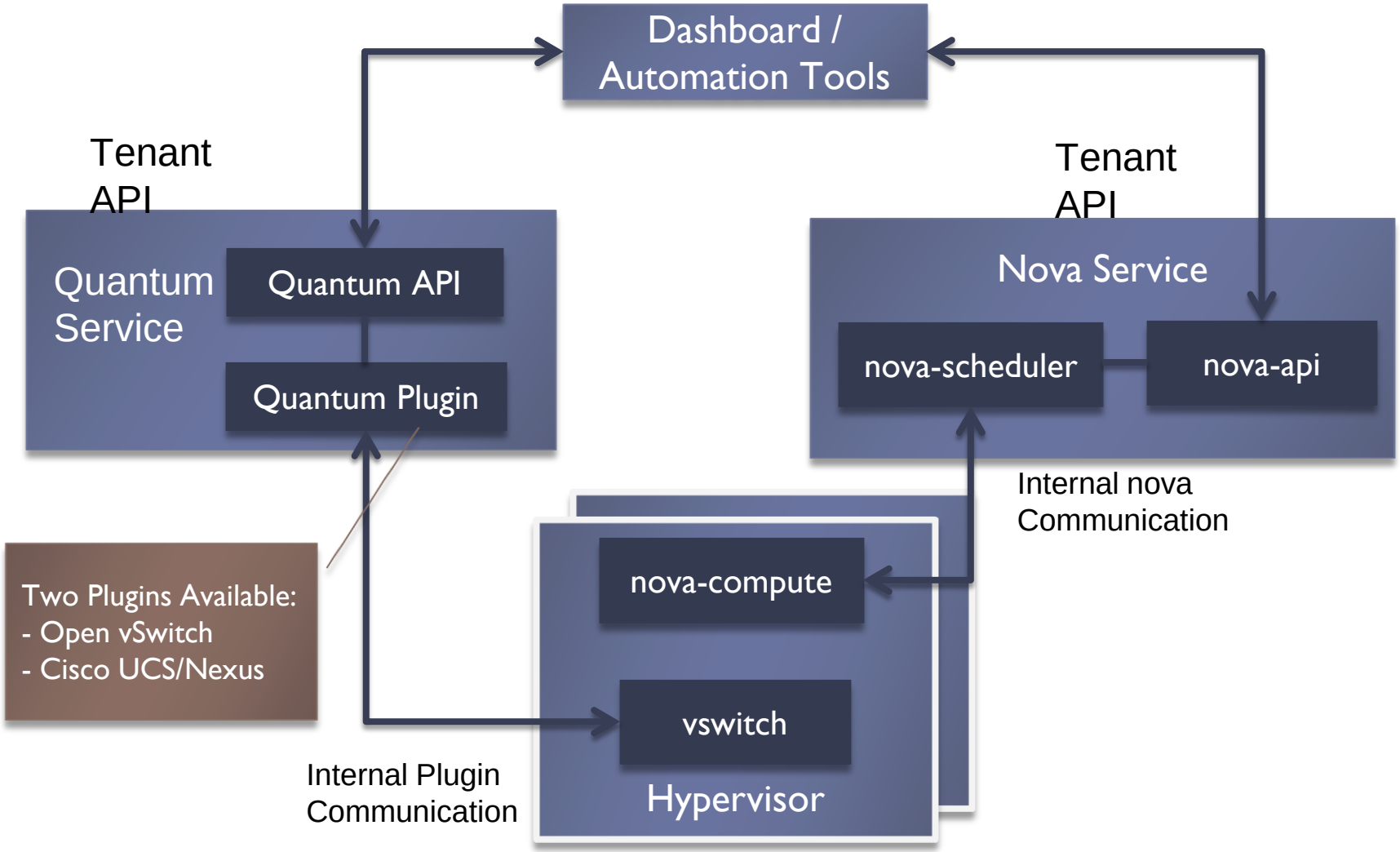
Nova : virtual server

Quantum : virtual network

Both:

- Expose a logical API for automated provisioning by cloud tenants.
- Manage physical devices in the data center to implement the logical model.
- Provide a "plugin" architecture to leverage support using different back-end technologies.

Example Architecture



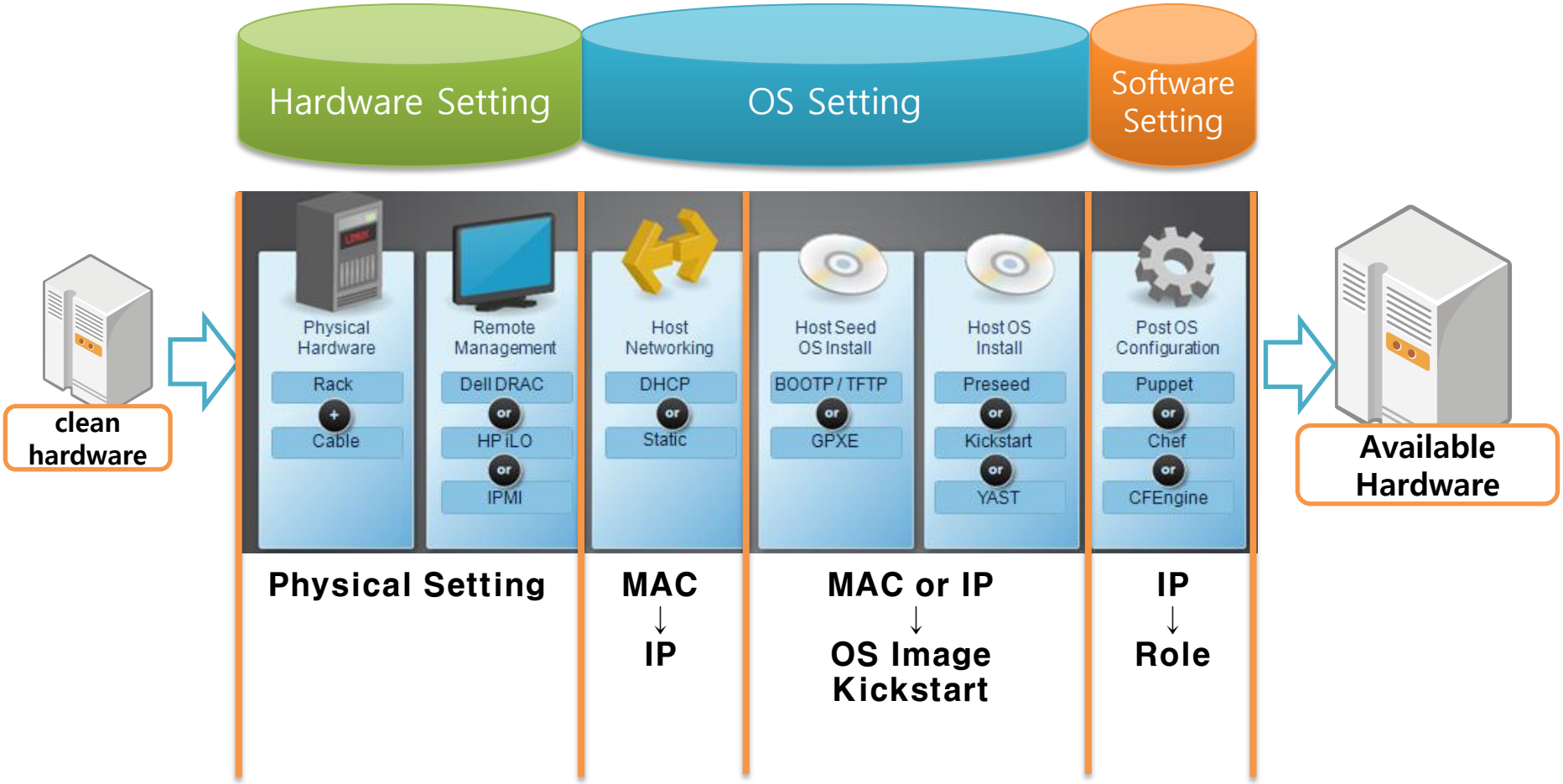
Want to deploy “large” scale cloud?

Manually?

Really?

You need better way to deploy.

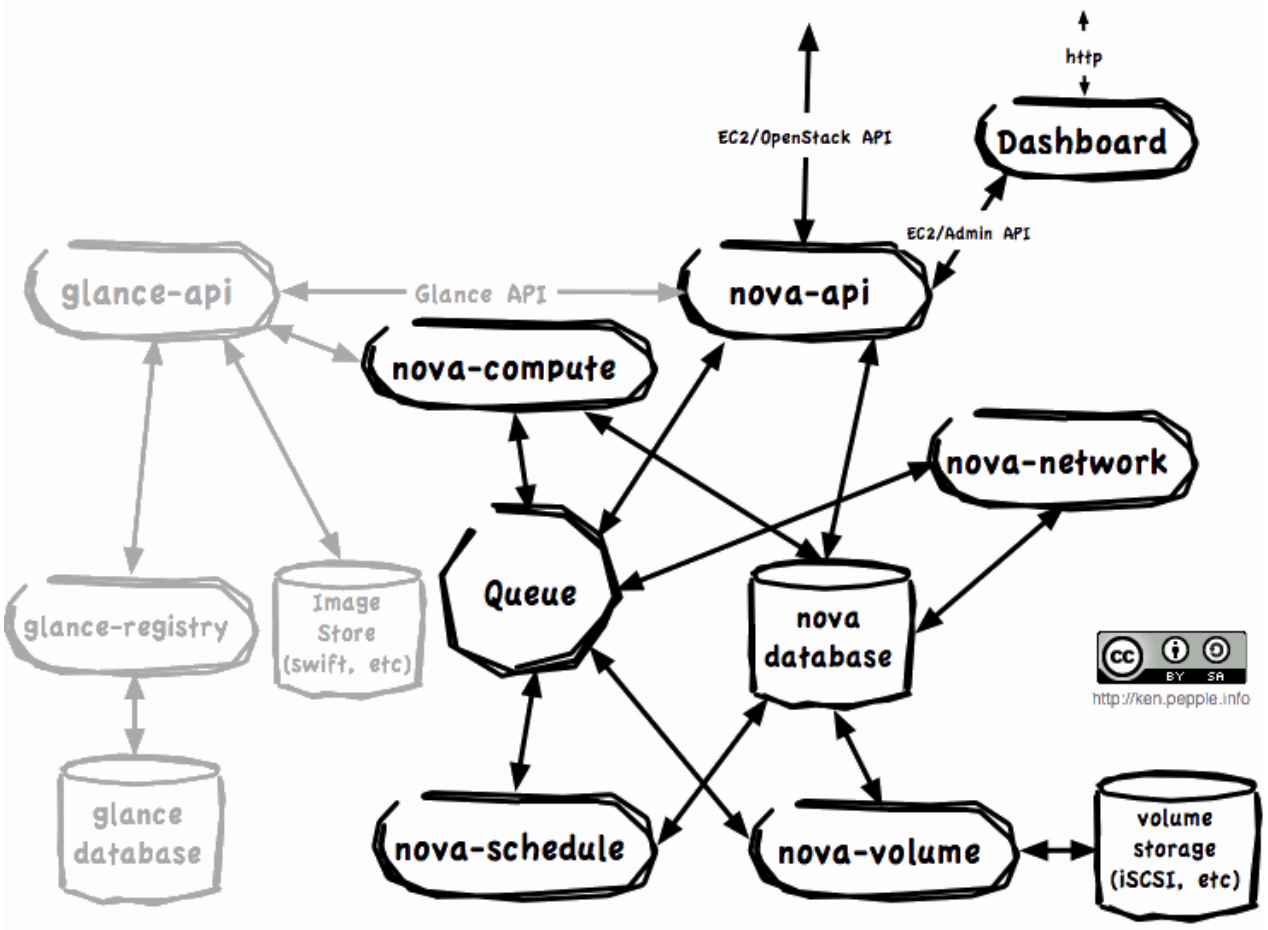
Bare Metal Provisioning



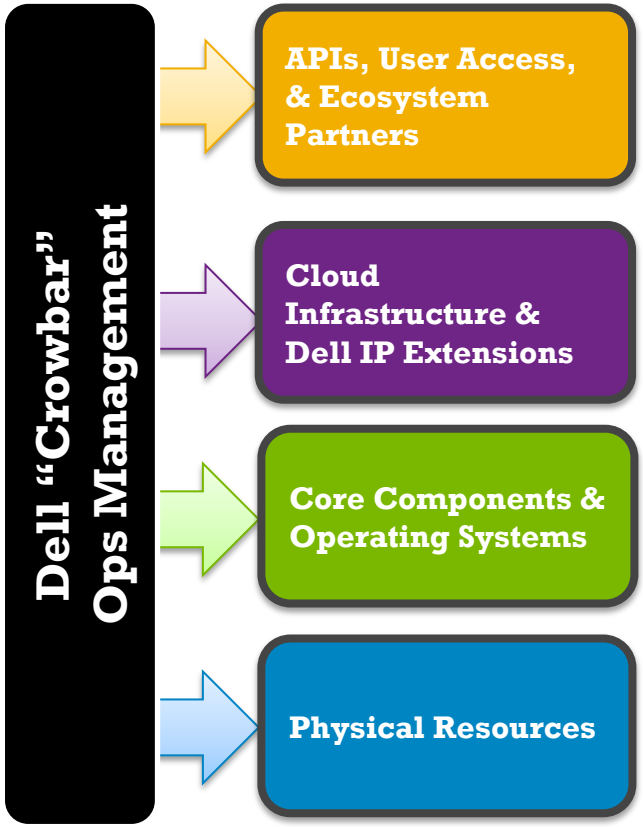
Crowbar

(https://github.com/dellcloudedge/crowbar)

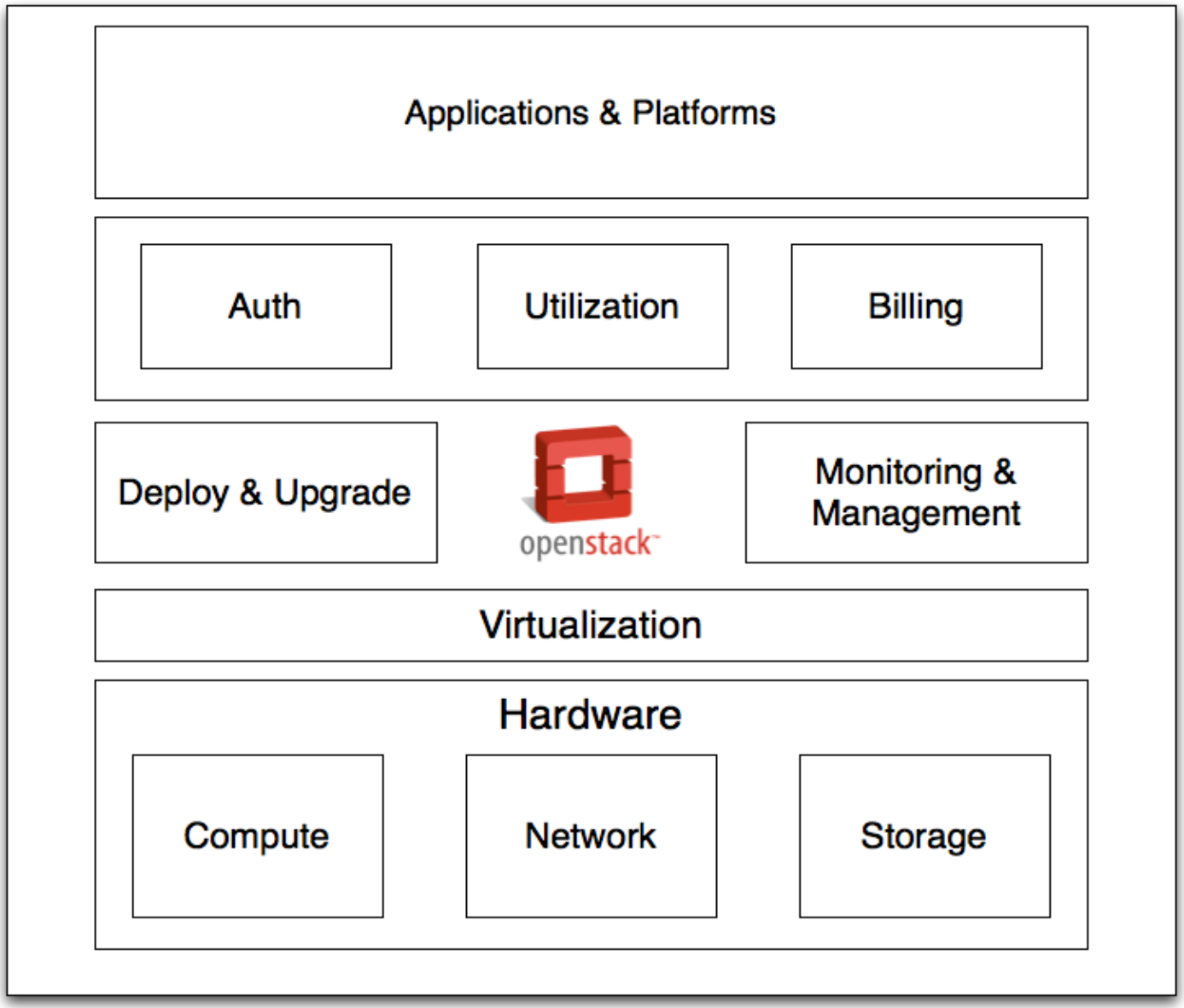
Crowbar has scripts that install the components of OpenStack in a proven pattern that can be customized after the fact.



Crowbar Stage of Deployment



* Includes all the components required to implement an *entire* cloud infrastructure including ecosystems partners
* Pluggable components deploy cloud infrastructure.
* Allow for addition of Dell IP and expansion by the community services and customers
* Can integrate with Dell existing products
* Delivers basic data center services and required cloud infrastructure.
* Provision bare-metal servers from box to cloud WITHOUT user intervention (other than racking/cabling and some minimal configuration questions) **NOT EXCLUSIVE TO DELL HARDWARE**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Auth
Utilization
Billing
Deploy & Upgrade
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Monitoring & Management
Virtualization
Hardware
Compute
Network
Storage

Global Community

General Information: http://openstack.org

Developers & Testers

http://launchpad.net/openstack

http://wiki.openstack.org

Writers: http://wiki.openstack.org/Documentation

Blog: http://openstack.org/blog

Twitter: http://twitter.com/openstack

Jobs: http://openstack.org/jobs

OpenStack Community in Korea

- http://www.openstack.or.kr
- http://wiki.openstack.or.kr
- http://www.facebook.com/groups/openstack.kr/

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Thank you.

감사합니다

谢谢

ありがとうございます

and.. Question?