An Introduction To OpenStack

https://www.slideshare.net/HaimAteya/an-intrudction-to-openstack-2017

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Agenda

- Quick introduction to OpenStack project
- Explain the OpenStack architecture and how its built
- Get you familiar with the different terminology and concepts
- Get you familiar with OpenStack services (components)
- Go over installation methods and tools
- Review risks

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Definition of Cloud Computing

- **Cloud computing**, also known as 'on-demand computing', is a kind of Internet-based computing, where shared resources, data and information are provided to computers and other devices on-demand.

- It is a model for enabling **ubiquitous**, **on-demand access** to a **shared pool** of **configurable computing resources**

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10 Amendments Of The Cloud

- Massive scale
- Agility \ Elasticity
- Abstraction
- Automation
- Infinite capacity
- Converged API’s
- Quick provisioning of resources
- On demand service
- Metering (billing)
- Pay as you go

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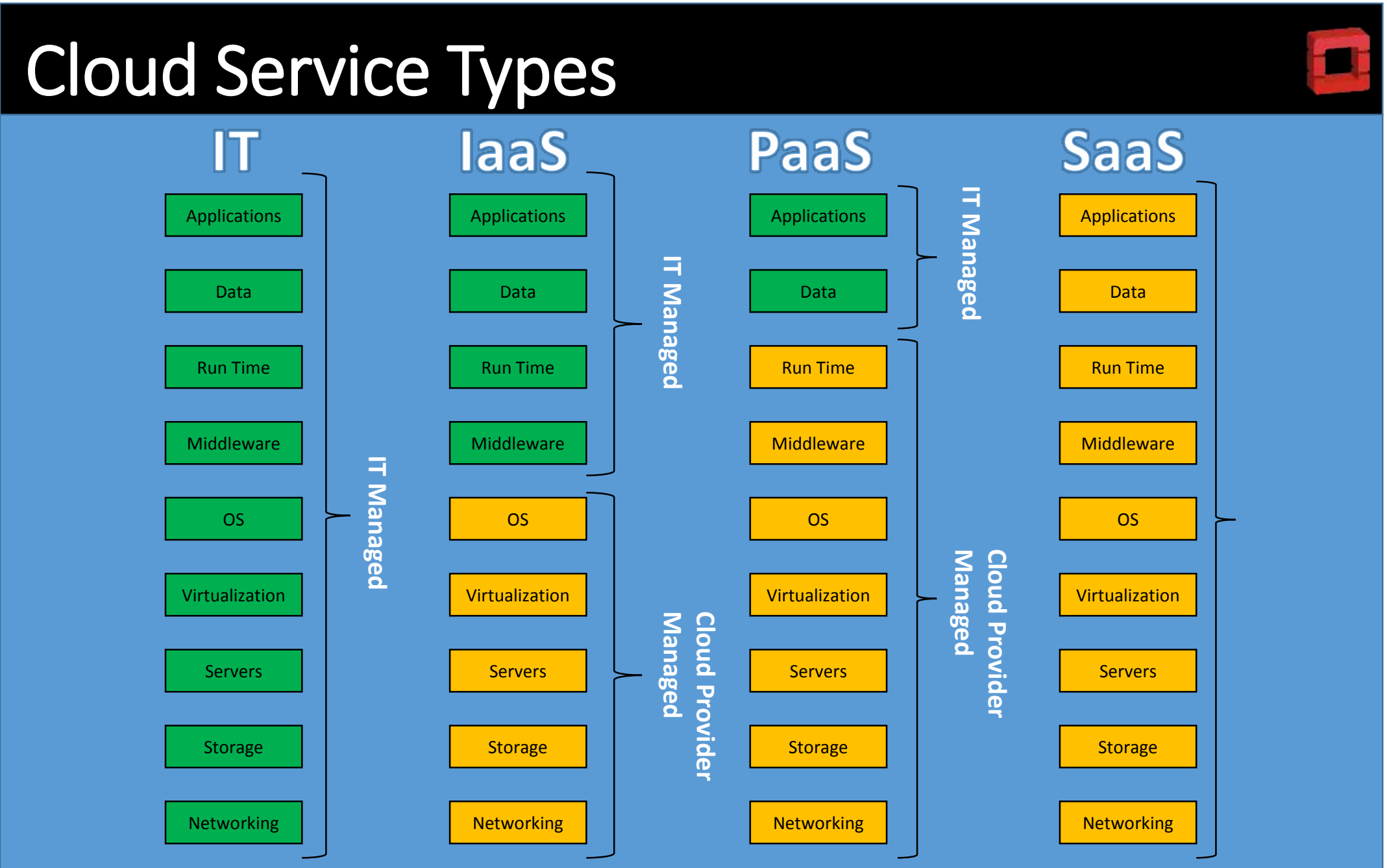
Cloud Service Types



What Is OpenStack ?

OpenStack is a cloud computing
project aimed at providing
an Infrastructure as a service (IaaS). ”

It’s Open Source!

Cloud Computing platform that will meet the needs of public and private clouds regardless of size, by being simple to implement and massively scalable.”

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What OpenStack Provides ?

- Virtual machines on demand
- Virtual networks management
- Storage for VMs and arbitrary files
- Multi-tenancy
- Metering
- Orchestration

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History

- Begun in 2010 as a joint project of Rackspace hosting and NASA to build Cloud based operating system
- Free and open source software platform under the apache license
- Actively driven by a strong open-source community with thousands of developers and more than 500 companies that actively contributing to the project: IBM, Red Hat, HP, Cisco, Intel, Google, Oracle, Dell, EMC, VMware.
- 15 releases to this point (Havana → Pike)

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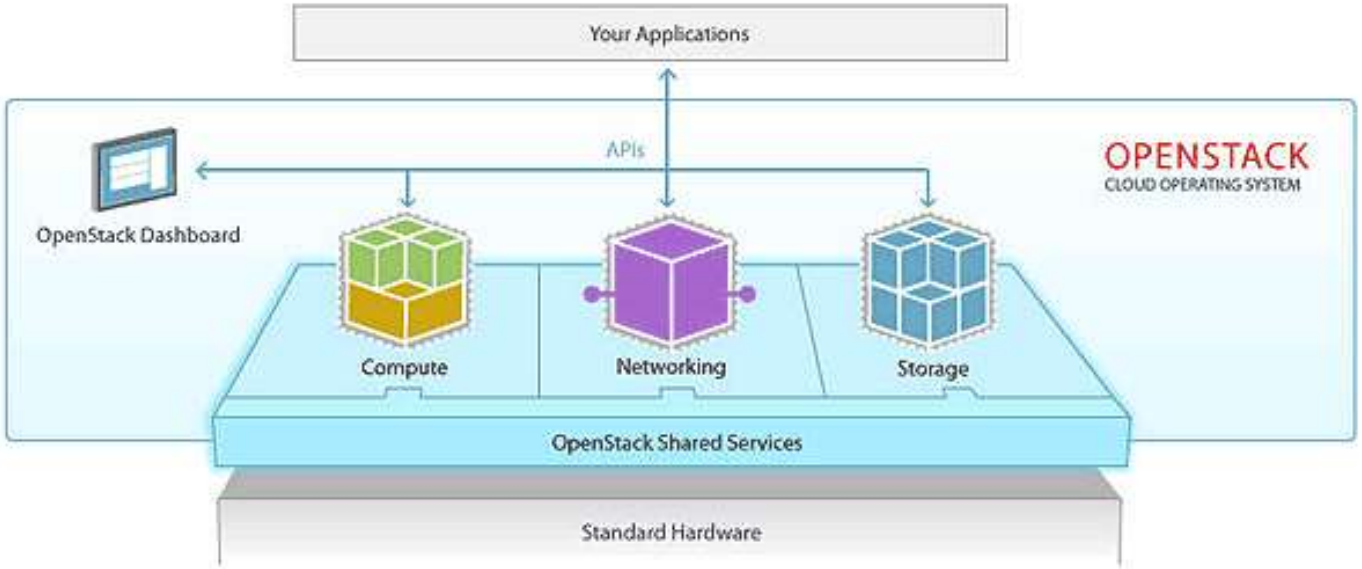
OpenStack In A Nutshell

Cloud **operating system** that controls **large pools of compute, storage, and networking resources** throughout a datacenter, all managed through a **dashboard** that gives administrators control while empowering their **users to provision resources through a web interface.**



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Cont.

- Controls large pools of storage, network and compute resources throughout a data-center.
- Believes in open source, open design, open development, all in an open community that encourages participation by anyone
- Consists of a series of interrelated projects delivering various components for a cloud infrastructure solution

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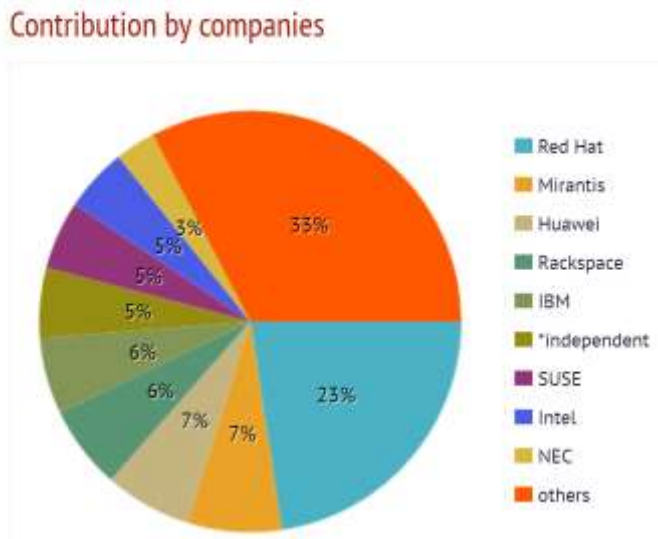
OpenStack Statistics (stackalytics.com)

- One of the fastest growing open-source communities in the world with more than 15,0000 contributors
  - Code submission
  - Code reviews
  - Testing
  - Documentation

#	Company	Reviews
1	Red Hat	24225
2	Mirantis	7748
3	Huawei	7118
4	Rackspace	6881
5	IBM	6253
	*independent	5781
6	SUSE	5650
7	Intel	5220
8	NEC	3336
9	Fujitsu	2547

#	Module	Reviews
1	nova	6739
2	project-config	4547
3	neutron	4085
4	cinder	3846
5	tripleo-heat-templates	2808
6	kolla-ansible	2788
7	ironic	2473
8	openstack-manuals	2281
9	tempest	2241
10	horizon	1761



STACKALYTICS

Code Contribution

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OpenStack Distributions



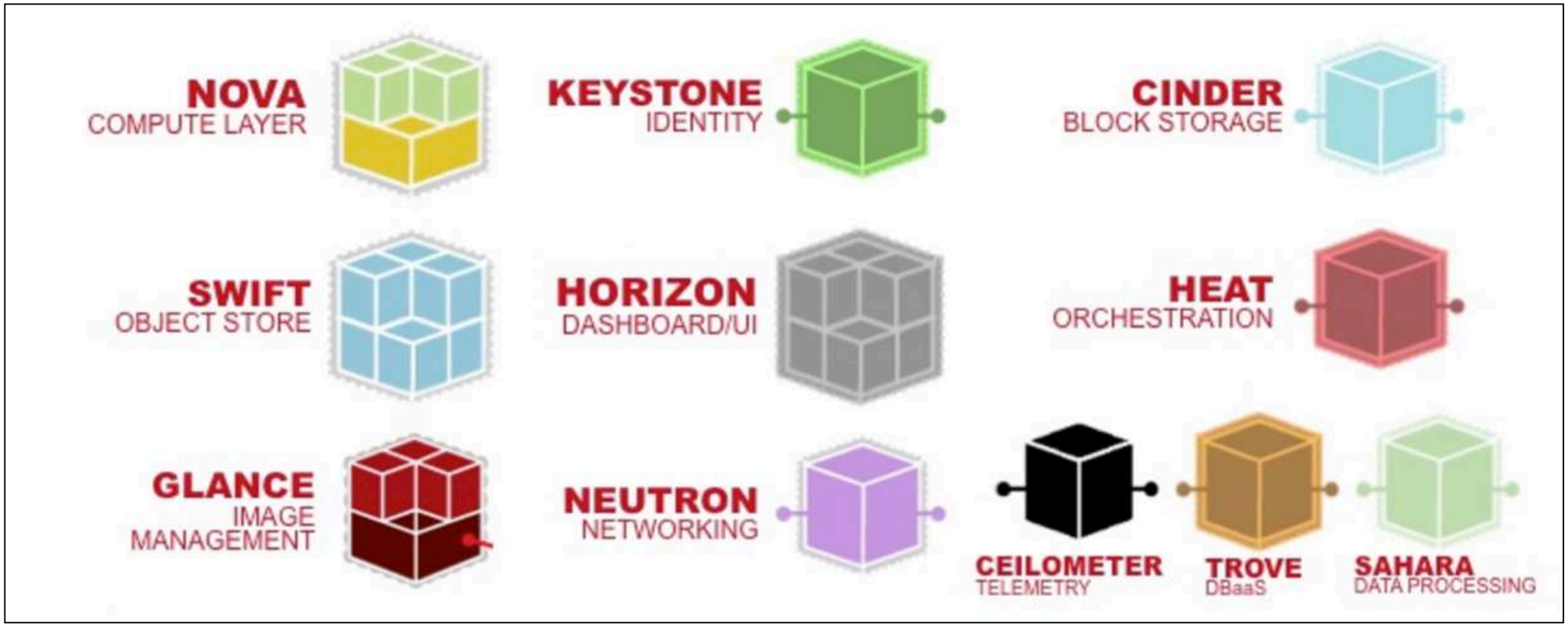









OpenStack Projects



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Introduction to OpenStack

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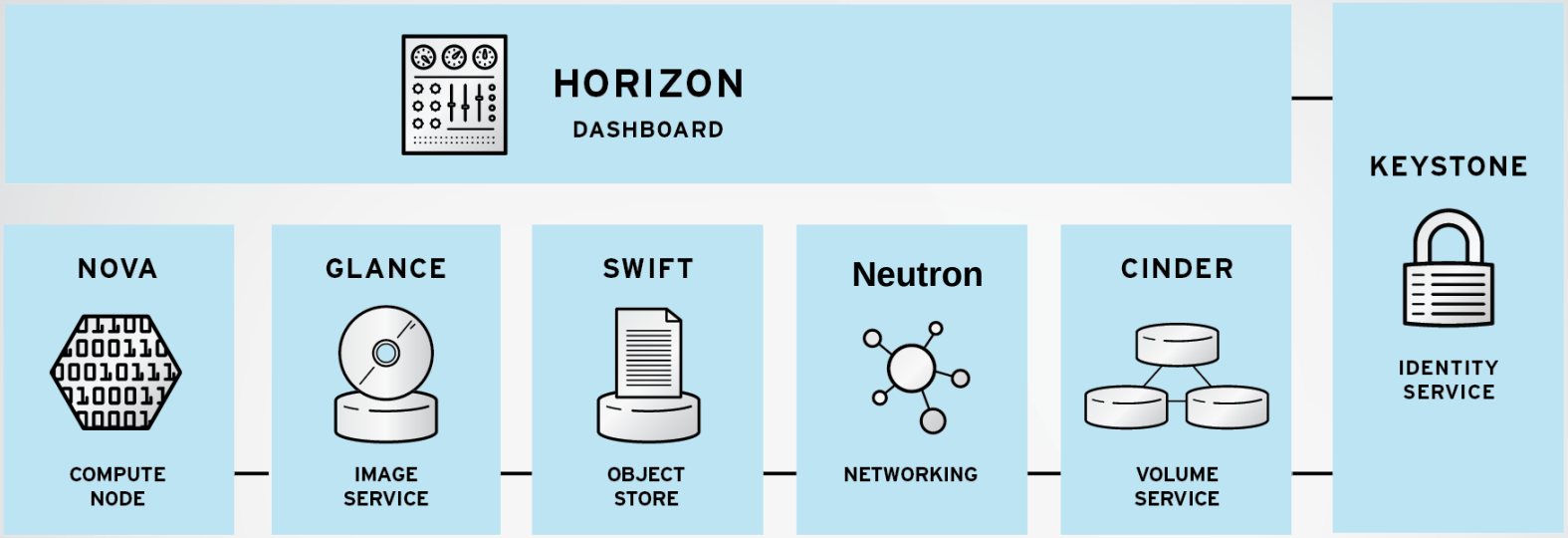
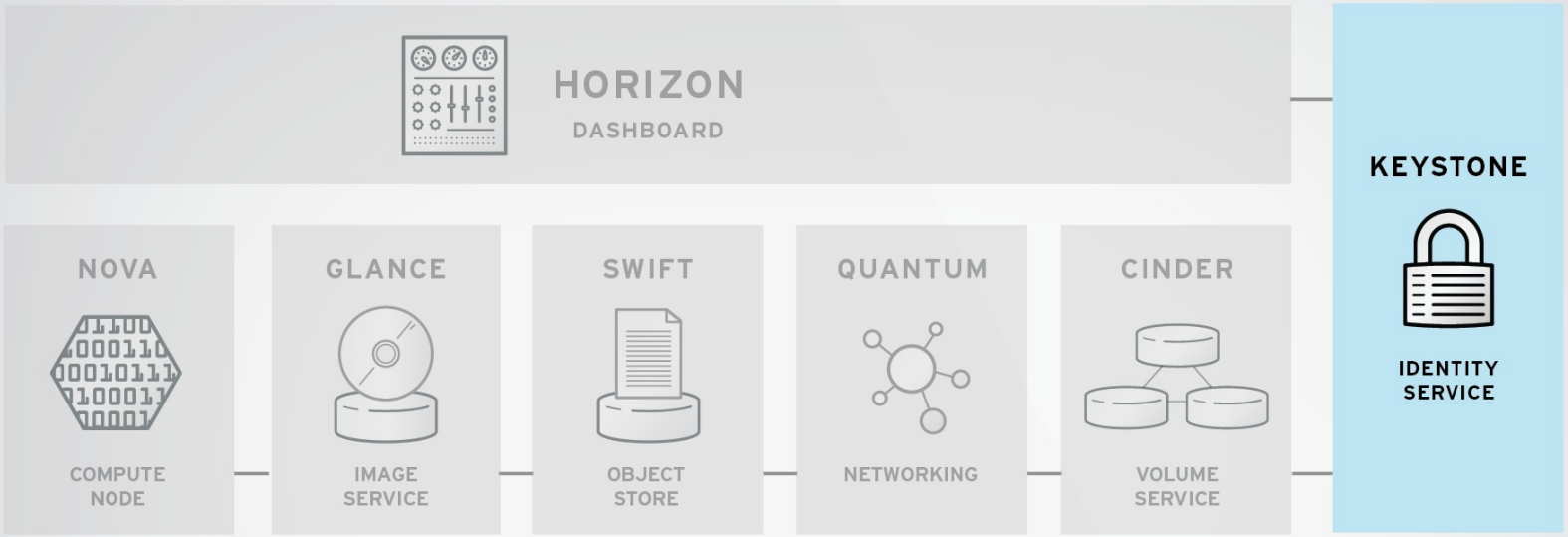
OpenStack Architecture

OPENSTACK ARCHITECTURE



- Modular architecture
- Designed to easily scale out
- Based on (growing) set of core services

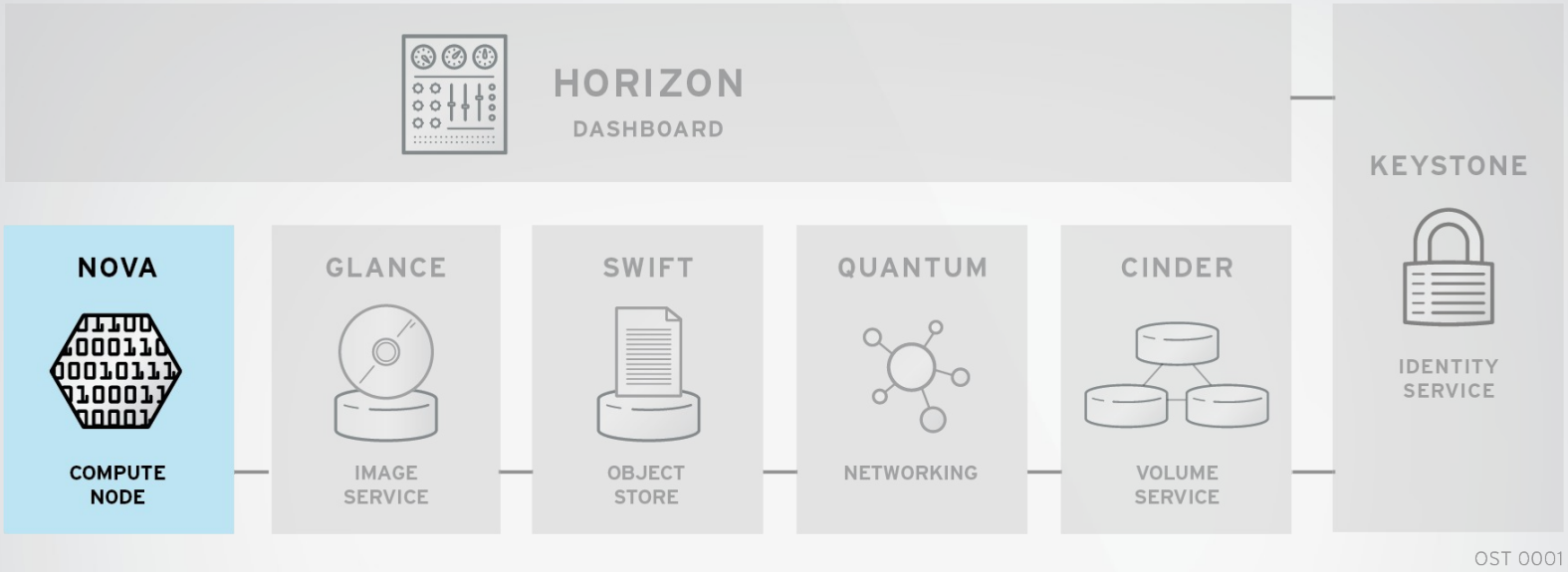
OPENSTACK ARCHITECTURE



Keystone

- Identity Service
- Common authorization framework
- Manages users, tenants and roles
- Pluggable backends (SQL, PAM, LDAP, IDM, etc)

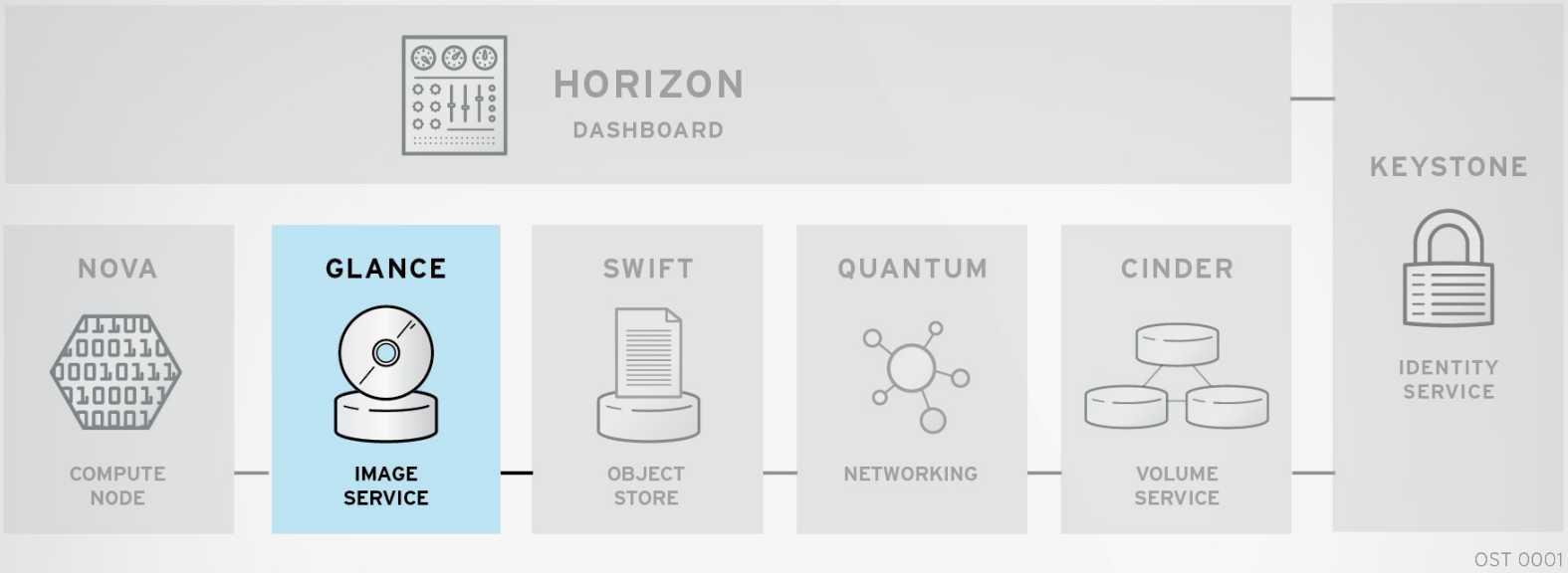
OPENSTACK ARCHITECTURE



NOVA

- Core compute service comprised of
  - Compute Nodes – hypervisors that run virtual machines
    - Supports multiple hypervisors KVM, Xen, LXC, Hyper-V and ESX
  - Distributed controllers that handle scheduling, API calls, etc
    - Native OpenStack API and Amazon EC2 compatible API

OPENSTACK ARCHITECTURE



Glance

- Image service
- Stores and retrieves disk images (virtual machine templates)
- Supports Raw, QCOW, VMDK, VHD, ISO, OVF & AMI/AKI
- Backend storage : Filesystem, Swift, Gluster, Amazon S3

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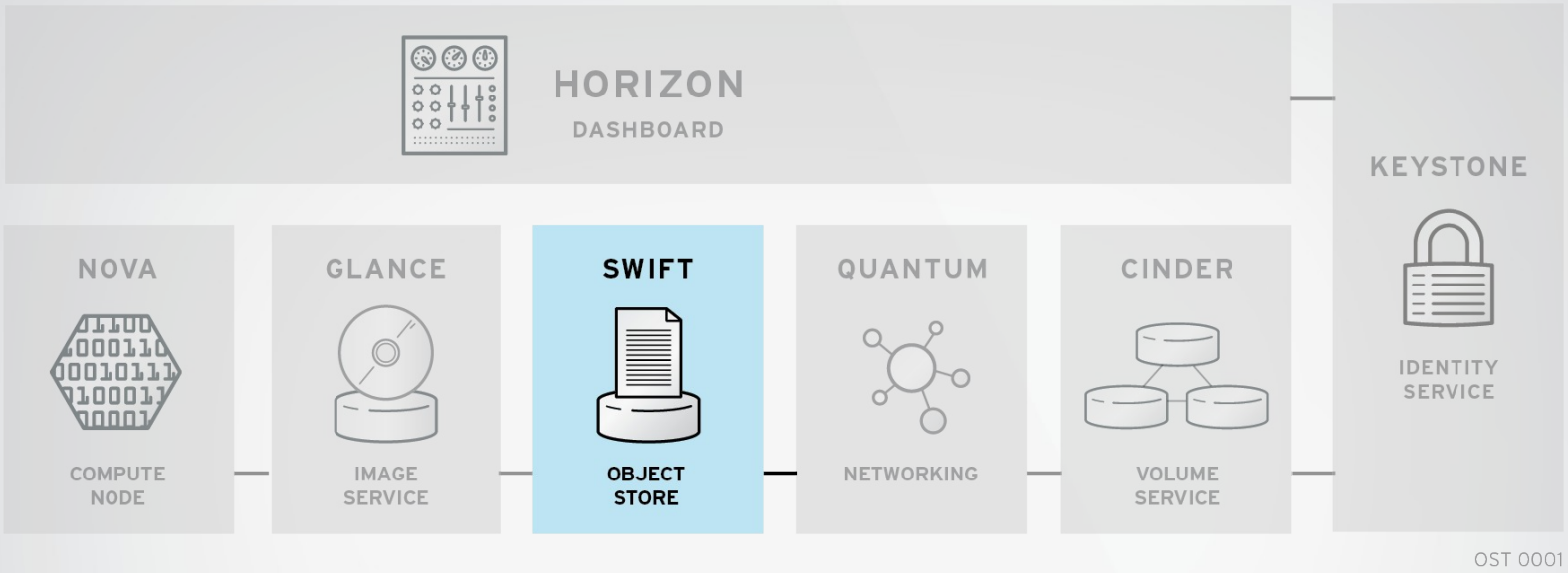

Swift

- Object Storage service
- Modeled after Amazon's S3 service
- Provides simple service for storing and retrieving arbitrary data
- Native API and S3 compatible API

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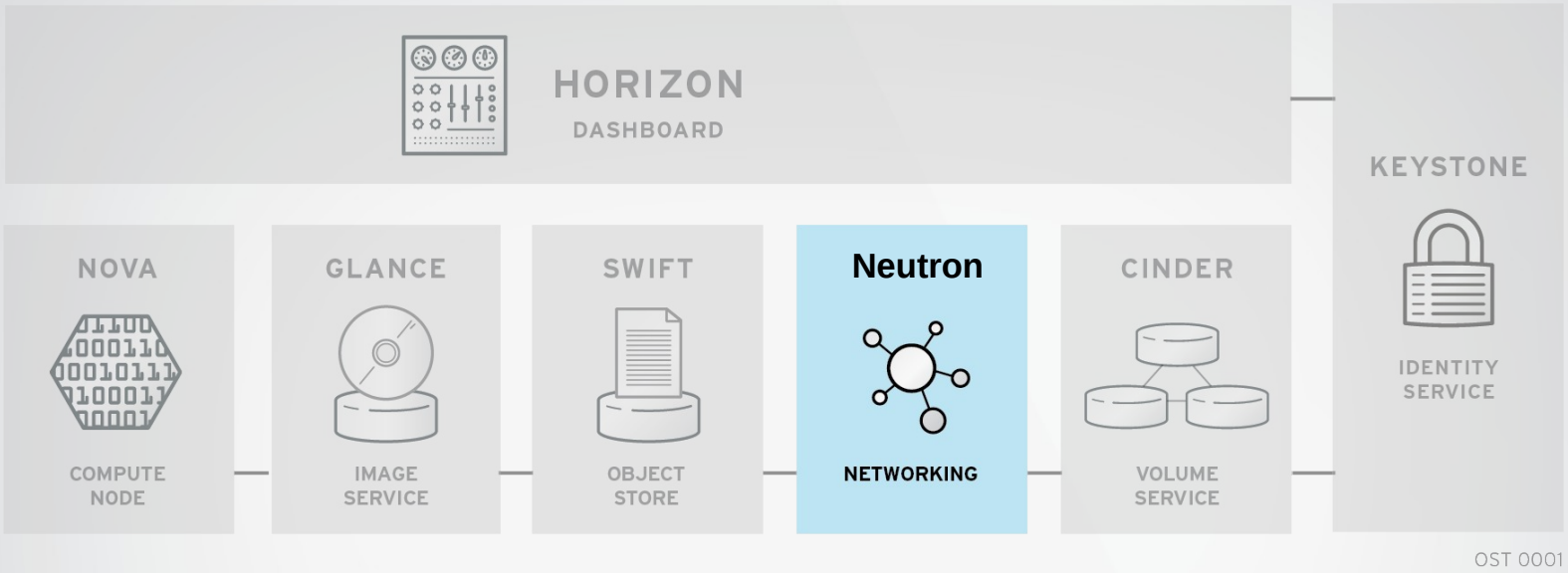

Neutron

- Network Service
- Provides framework for Software Defined Network (SDN)
- Plugin architecture
  - Allows integration of hardware and software based network solutions
    - Open vSwitch, Cicso UCS, Standard Linux Bridge, Nicira NVP

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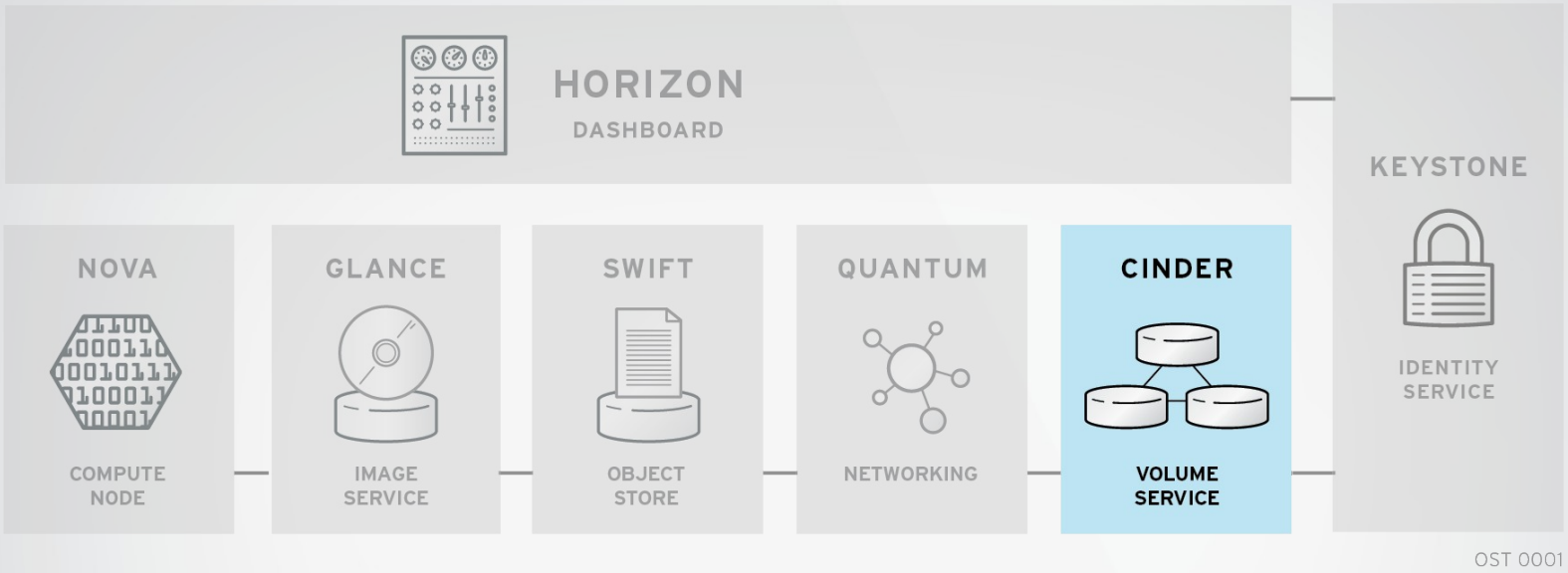
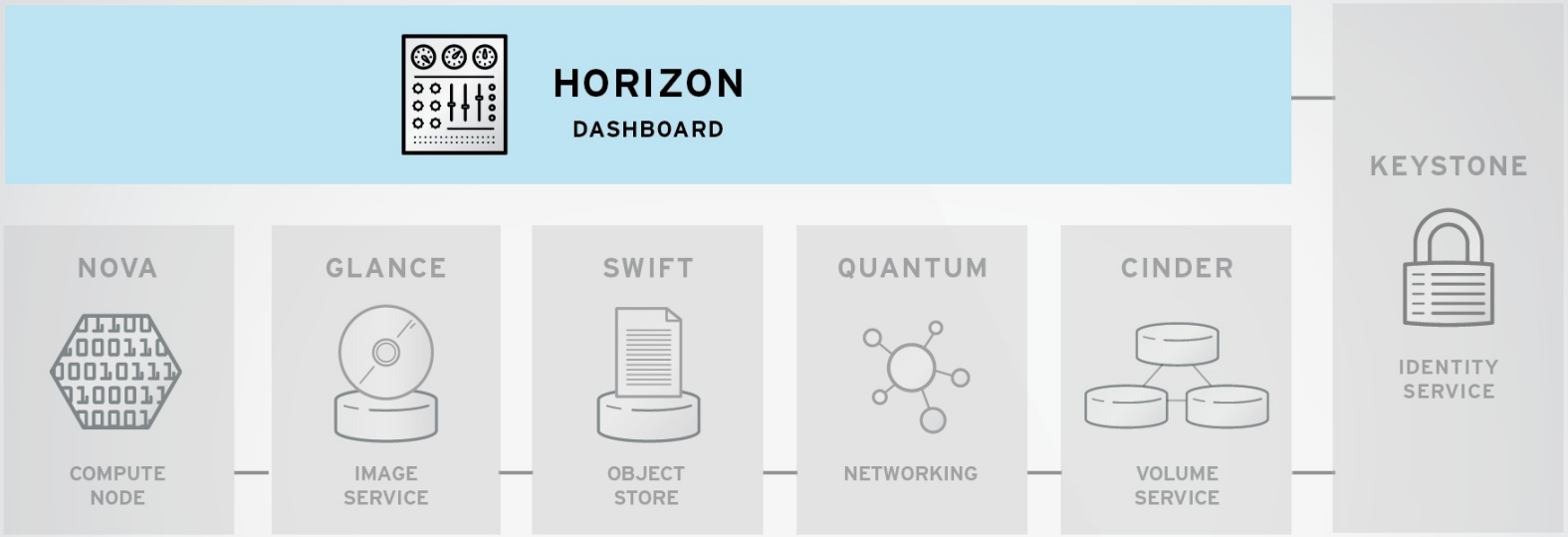


Cinder

- Block Storage (Volume) Service
- Provides block storage for virtual machines (persistent disks)
- Similar to Amazon EBS service
- Plugin architecture for vendor extensions

  eg. NetApp driver for Cinder

OPENSTACK ARCHITECTURE



Horizon

- Dashboard
- Provides simple self service UI for end-users
- Basic cloud administrator functions
  - Define users, tenants and quotas
  - No infrastructure management

Let's Follow a Request..