



Open Source Cloud Technology for Enterprise Computing

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ECC Conference
Marist College, June 14-16 2015



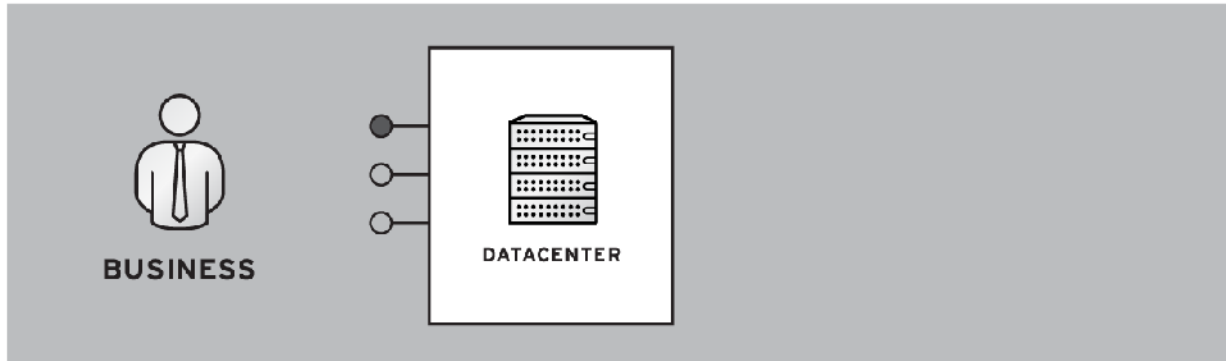


Open Hybrid Cloud



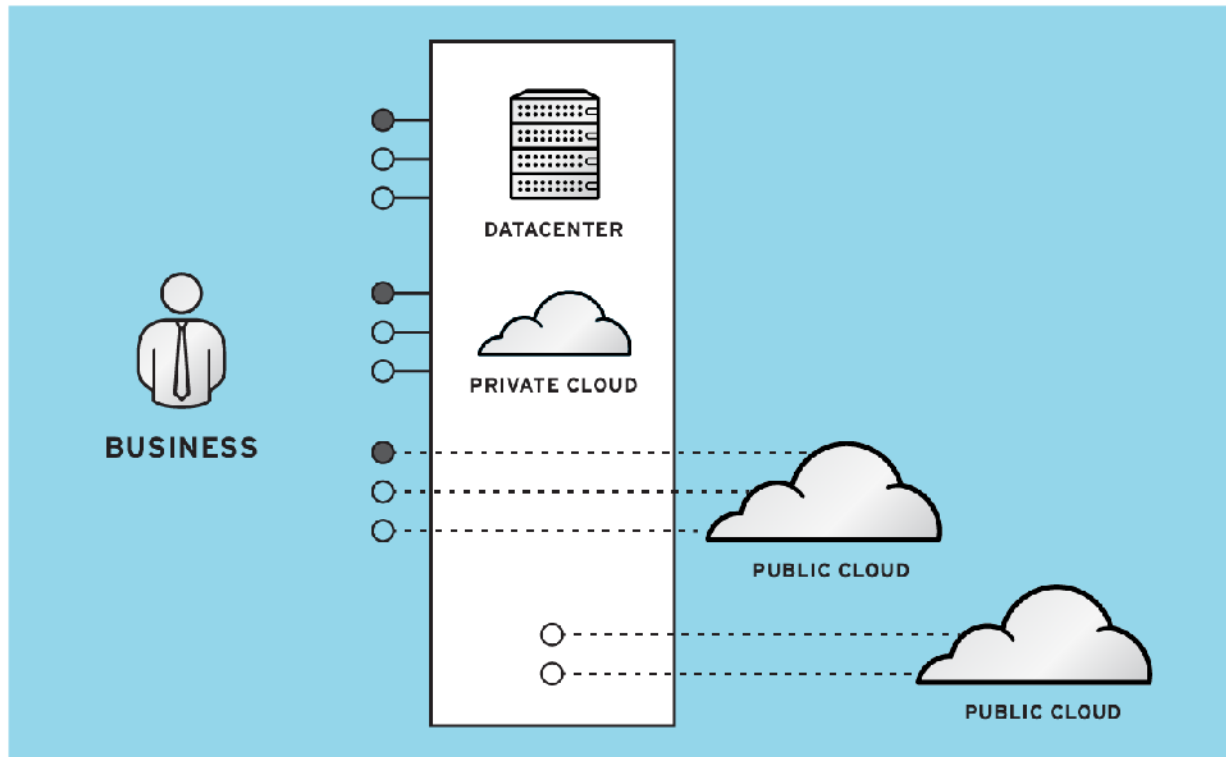
THE ROLE OF IT IS CHANGING

From service provider to strategic partner



TRADITIONAL IT

- IT providing services on traditional infrastructure



HYBRID IT

IT is:

- providing services on traditional infrastructure
- providing services on private cloud
- brokering services from public clouds
- consuming services from public clouds



FIRST CLOUDS BUILT ON RED HAT

TOP PUBLIC CLOUDS

- 80% Apps running on Linux
- Open source
- On demand “unlimited scalability”
- Multi-tenancy
- High density computing



TOP PUBLIC CLOUDS
RELY ON RED HAT





OPEN CLOUD CHARACTERISTICS

- OPEN SOURCE** →
 - YOU CHOOSE YOUR ECONOMICS, NOT YOUR VENDOR
 - AVOID LOCK-IN

- VIABLE INDEPENDENT COMMUNITY** →
 - NOT CONTROLLED OR LIMITED BY ONE VENDOR

- OPEN STANDARDS** →
 - OPEN STANDARDS AT EVERY LEVEL OF THE STACK
 - ACCESS TO GREATER INNOVATION

- FREEDOM TO USE IP** →
 - ABLE TO BE DEPLOYED WITHOUT PATENT RESTRICTIONS

- CHOICE OF INFRASTRUCTURE** →
 - DEPLOY TO ANY INFRASTRUCTURE YOU CHOOSE
 - ONE THAT'S RIGHT FOR YOU, NOT YOUR VENDOR

- OPEN APIs** →
 - EXTENSIBLE APIs FOR OPEN INTEROPERABILITY

- PORTABILITY** →
 - APPLICATION PORTABILITY ACROSS PRIVATE AND PUBLIC CLOUDS

GET STARTED WITH PRIVATE CLOUD TODAY

PLATFORM-AS-A-SERVICE



AGILE



FRAMEWORK AND
LANGUAGE CHOICE



DEVELOPER
PRODUCTIVITY

OpenShift Enterprise by Red Hat

CLOUD MANAGEMENT



SELF-SERVICE



ORCHESTRATION



INTEROPERABILITY

Red Hat CloudForms

INFRASTRUCTURE-AS-A-SERVICE



MASSIVE
SCALABILITY



ON DEMAND



INCREASED
EFFICIENCY

Red Hat OpenStack

VIRTUALIZATION



SECURE



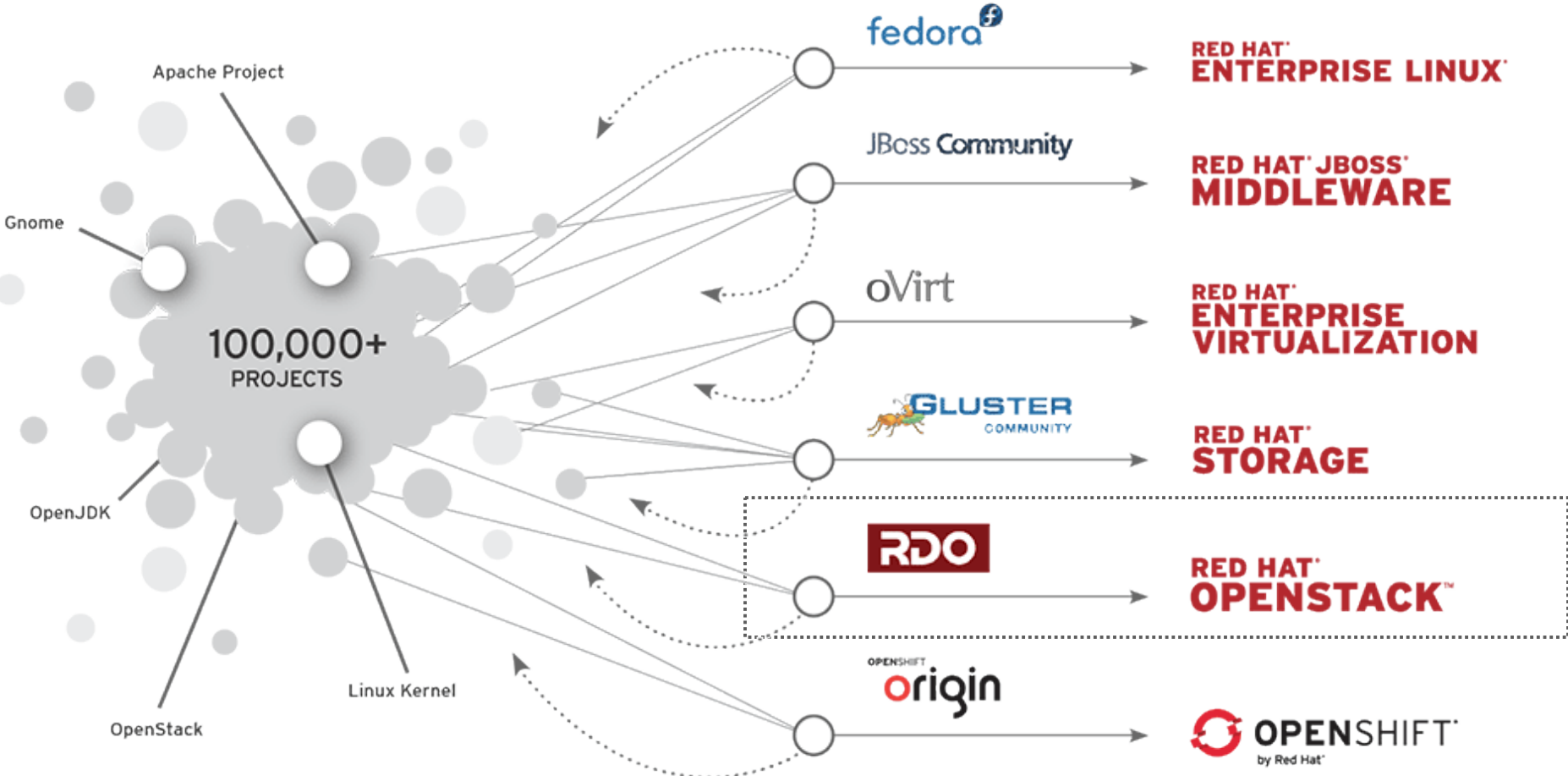
COST
EFFECTIVE

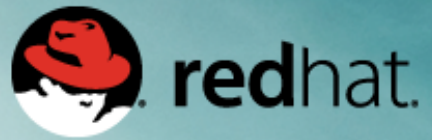


HIGH
PERFORMANCE

Red Hat Enterprise Virtualization

RED HAT LEADS THROUGH OPEN INNOVATION





OpenStack



WHAT IS OPENSTACK?

- An open source virtualization platform to deliver public and private IaaS clouds
- Building blocks for creating public / private clouds
- Massive scale
- Horizontally scalable services
- Illusion of infinite resources
- Rapid provisioning / tear down of resources
- Modular services with well defined APIs
- Being led by the same folks doing the actual coding
- Rapid development, evolution, innovation



TRADITIONAL VIRTUALIZATION VS CLOUD



TRADITIONAL VIRTUALIZATION VS CLOUD

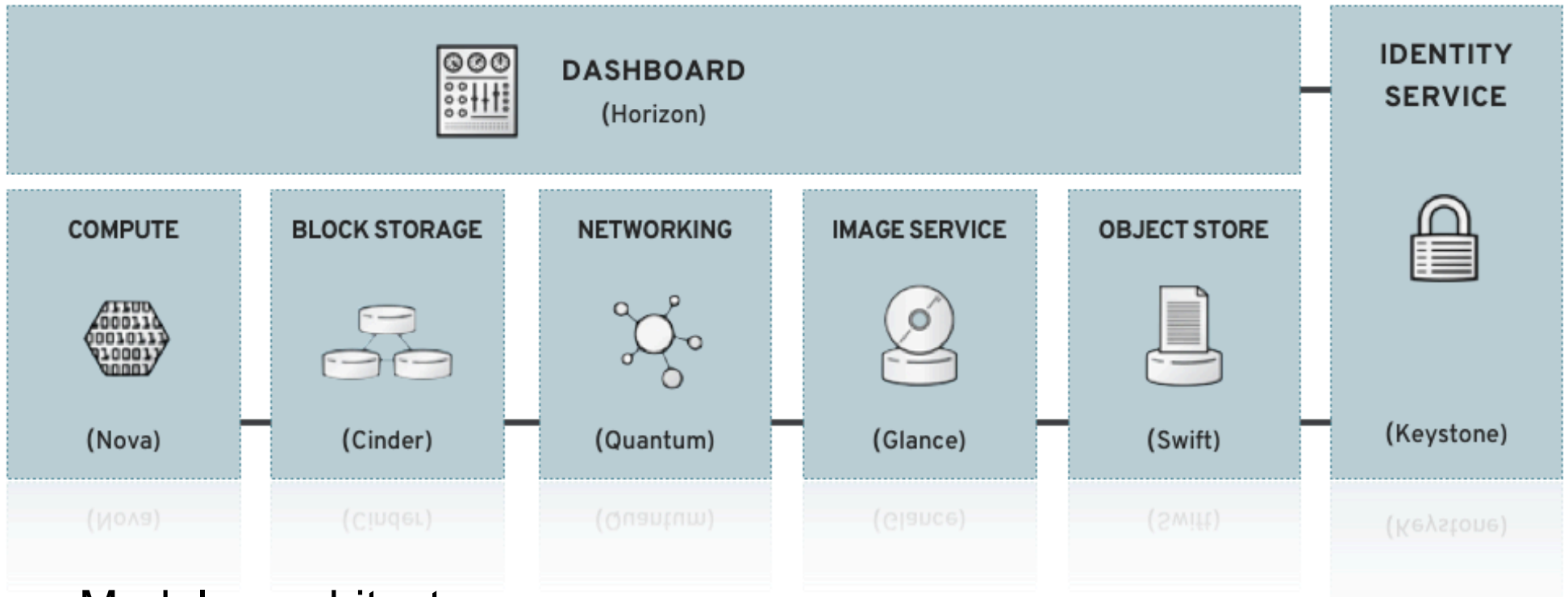


<http://www.wallsonline.net/cats-animals-grass-kittens/>

<http://www.earthtimes.org/climate/no-hiding-cattle-methane-culprits/401/>



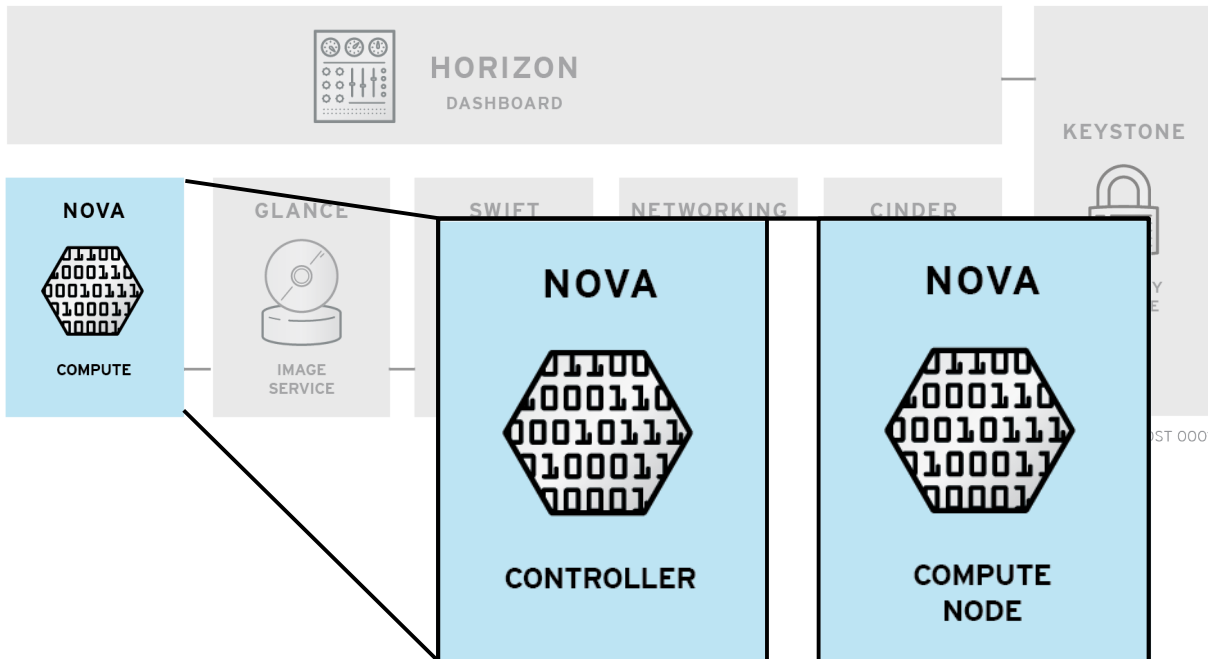
OPENSTACK ARCHITECTURE



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

OPENSTACK CORE PROJECTS

COMPUTE (NOVA)

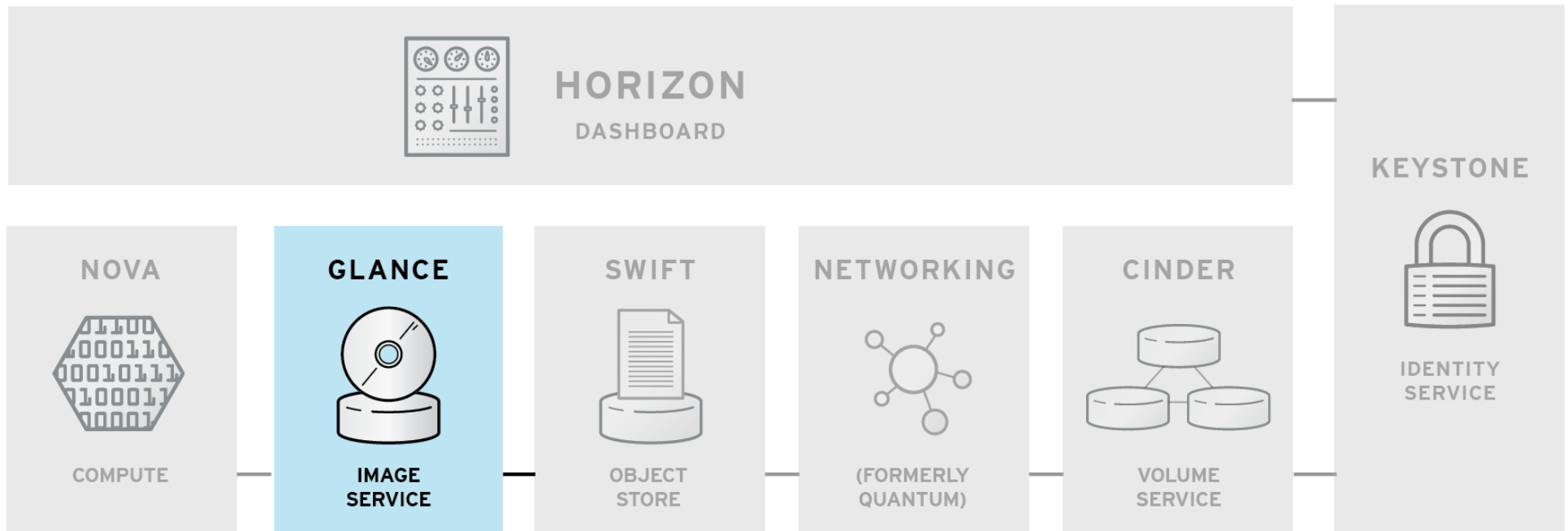


– Core compute service comprised of:

- Compute Nodes – hypervisors that run virtual machines
- Supports multiple hypervisors: **KVM** (Xen, LXC, Hyper-V, ESX)
- Distributed controllers that handle scheduling, API calls, etc
- Native OpenStack API and Amazon EC2 compatible API

OPENSTACK CORE PROJECTS

IMAGE SERVICE (GLANCE)



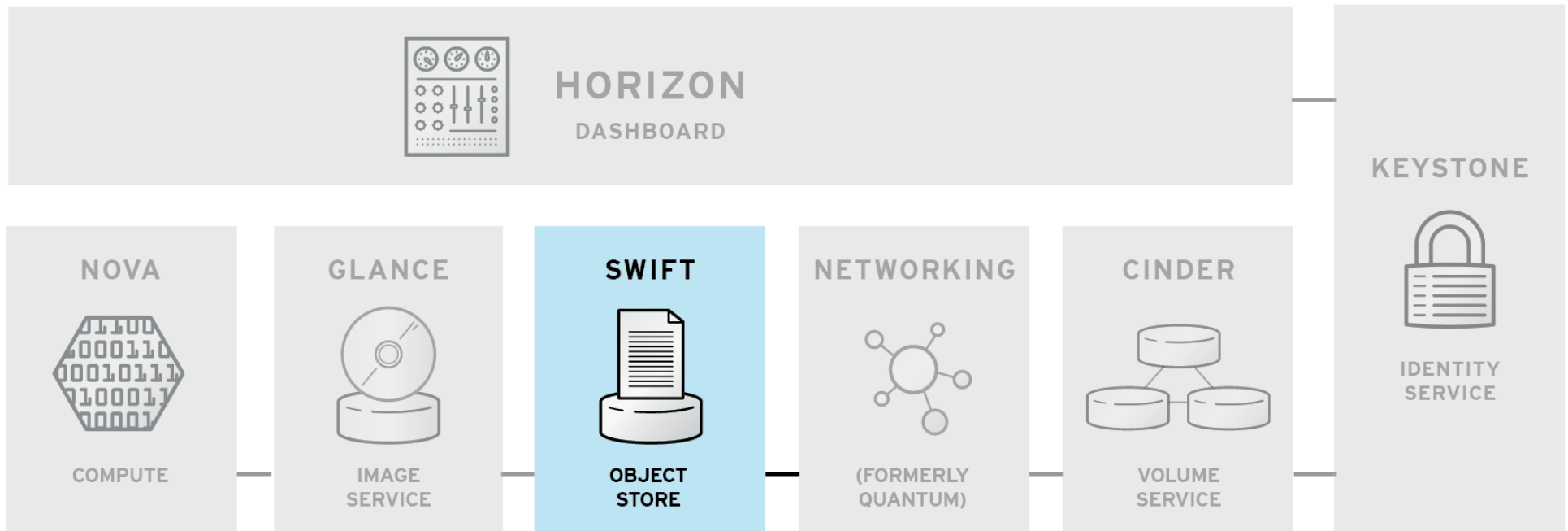
OST 0001

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



OPENSTACK CORE PROJECTS

OBJECT STORAGE (SWIFT)



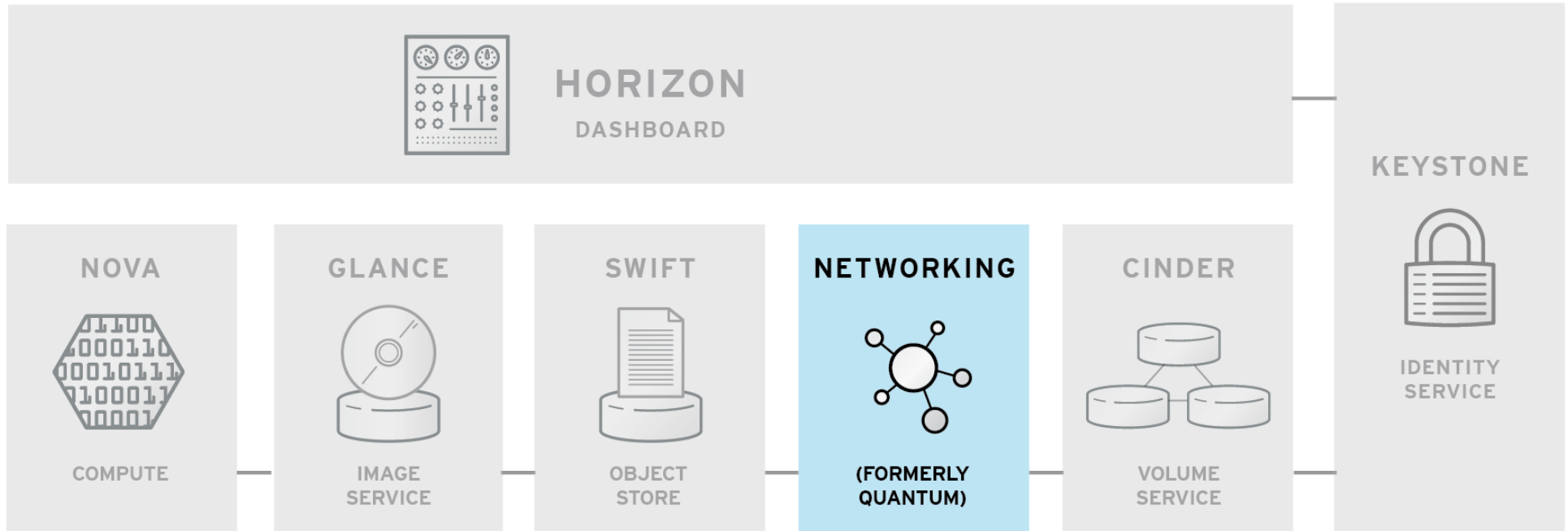
OST 0001

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



OPENSTACK CORE PROJECTS

NETWORKING (NEUTRON / FORMERLY QUANTUM)



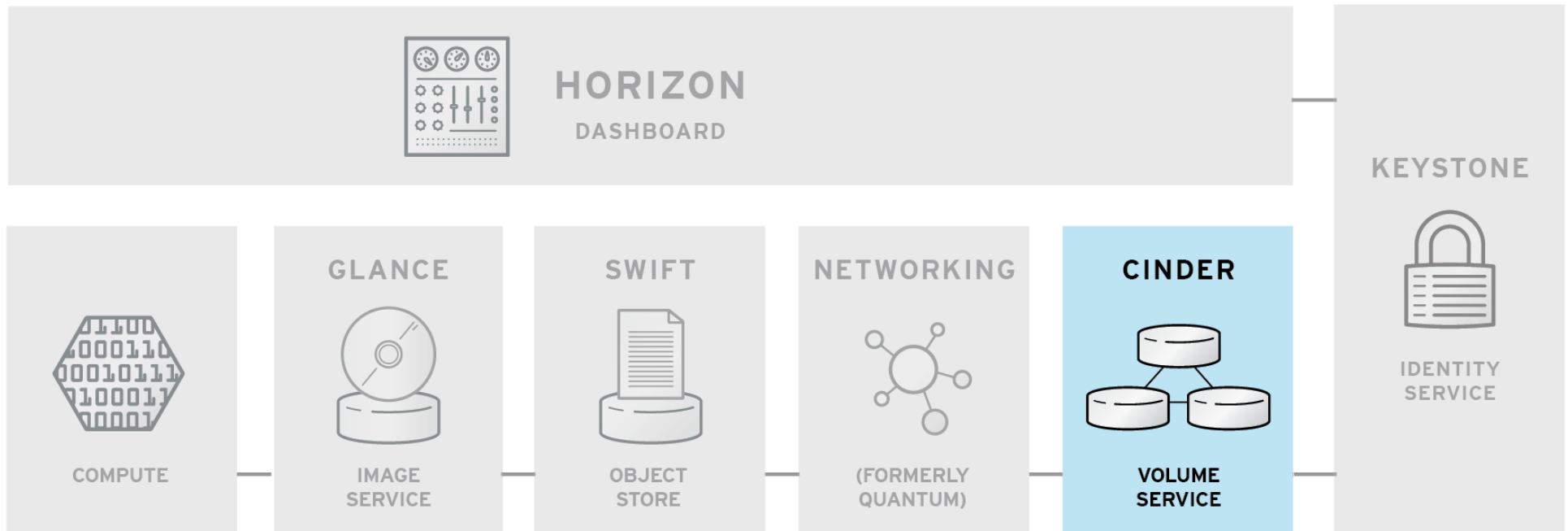
OST 0001

- Network Service
- Provides framework for Software Defined Network (SDN)
- Plugin architecture
 - Allows integration of hardware and software based network solutions



OPENSTACK CORE PROJECTS

BLOCK STORAGE (CINDER)



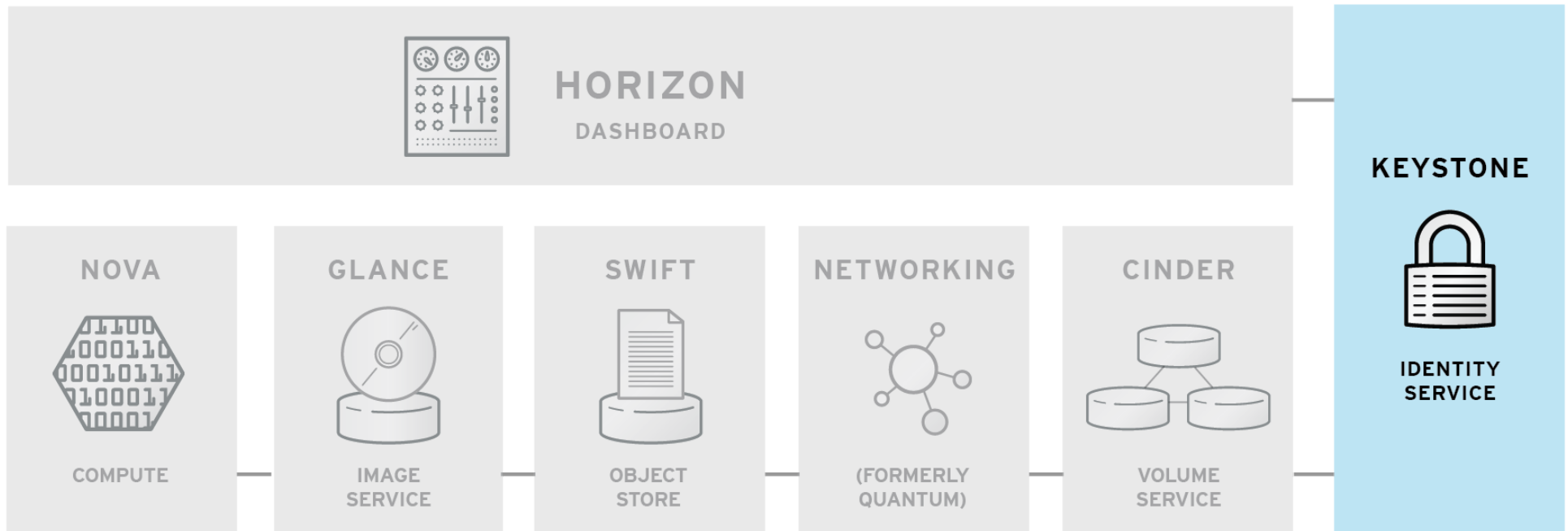
OST 0001

- 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 CORE PROJECTS

IDENTITY (KEYSTONE)



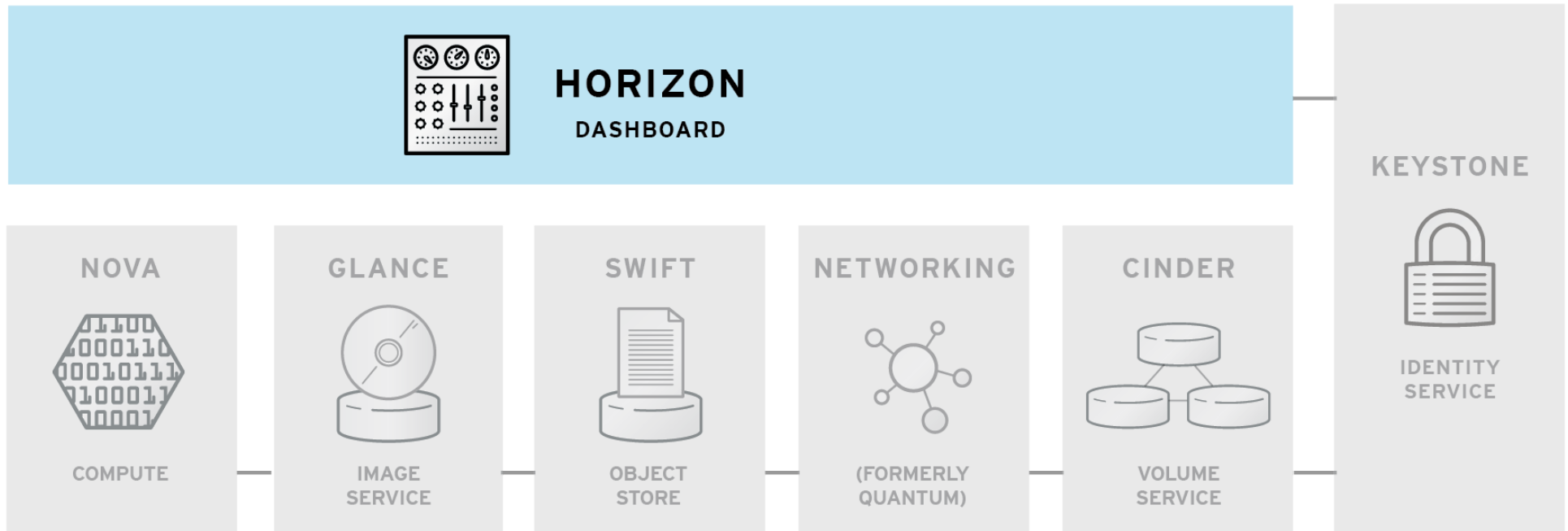
OST 0001

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



OPENSTACK CORE PROJECTS

DASHBOARD (HORIZON)



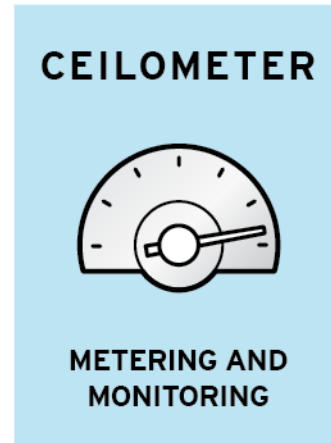
OST 0001

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



OPENSTACK INCUBATING PROJECTS

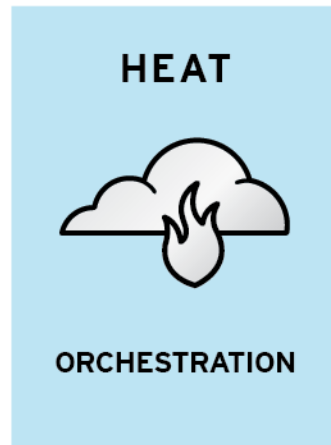
METERING (CEILOMETER)



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

OPENSTACK INCUBATING PROJECTS

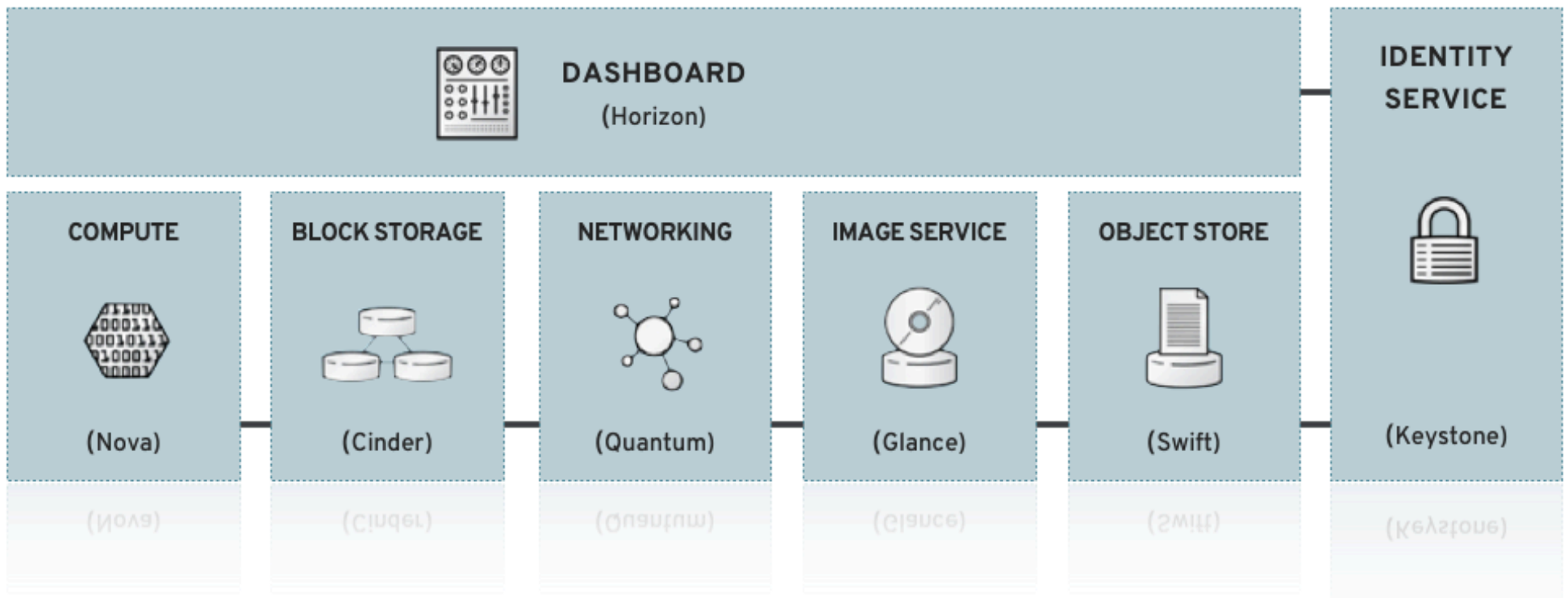
ORCHESTRATION (HEAT)



OpenStack Orchestration (HEAT)

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

OPENSTACK DEMO





OpenShift



Software Disrupts Business



Retail



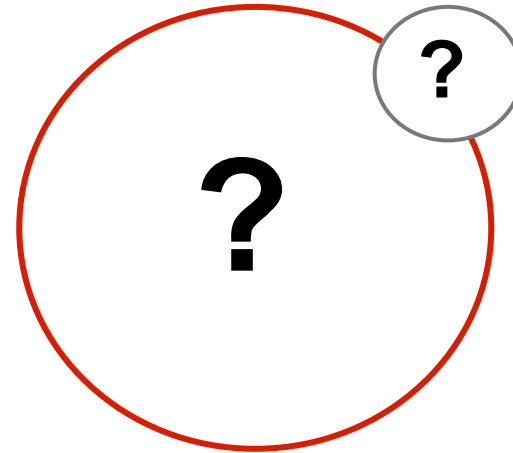
Finance



Media



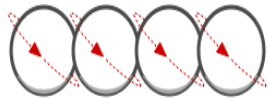
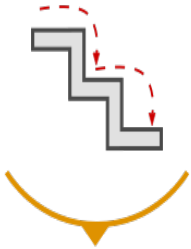
Transportation



IT Must Evolve to Stay Ahead of Demands

Development Process

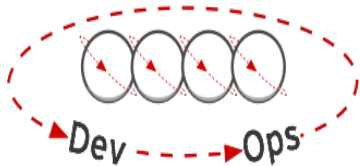
Waterfall



Agile

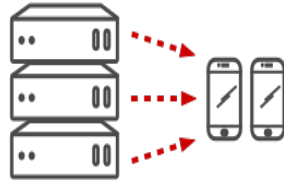
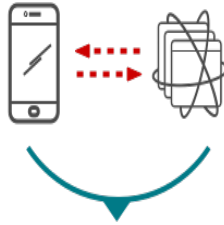


DevOps



Application Architecture

Monolithic



N-Tier



Microservices



Deployment & Packaging

Physical Servers



Virtual Servers

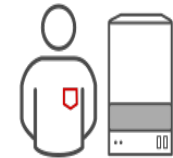
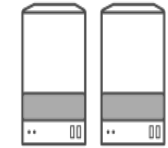


Containers



Application Infrastructure

Datacenter

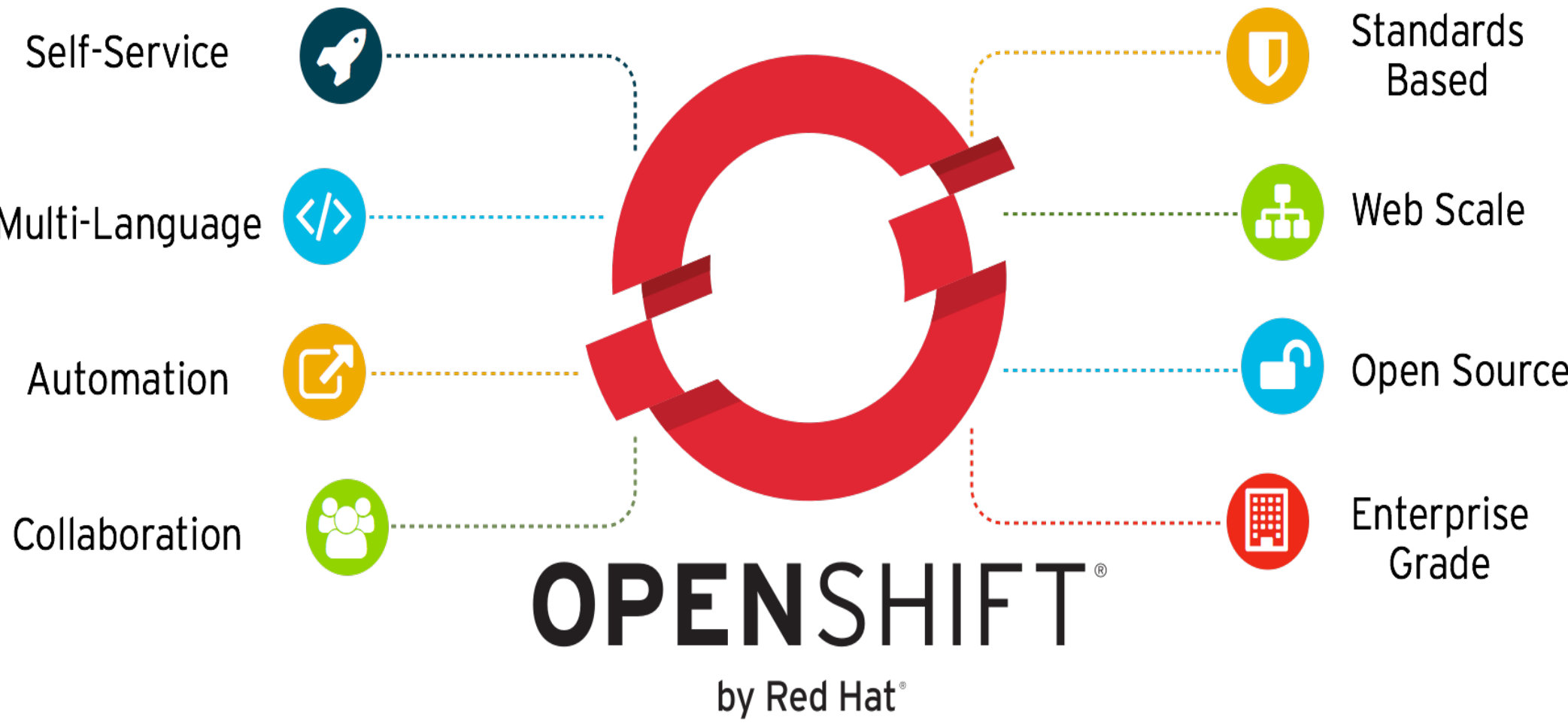


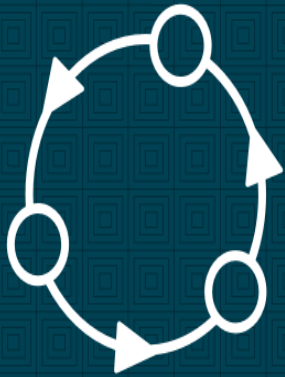
Hosted



Cloud







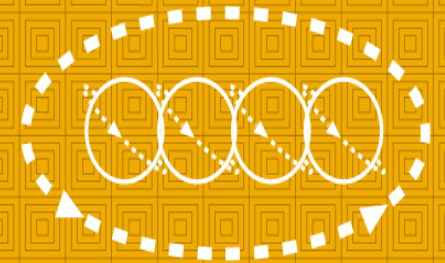
**Expedite
Innovation To Market**



**Accelerate
Application Development**

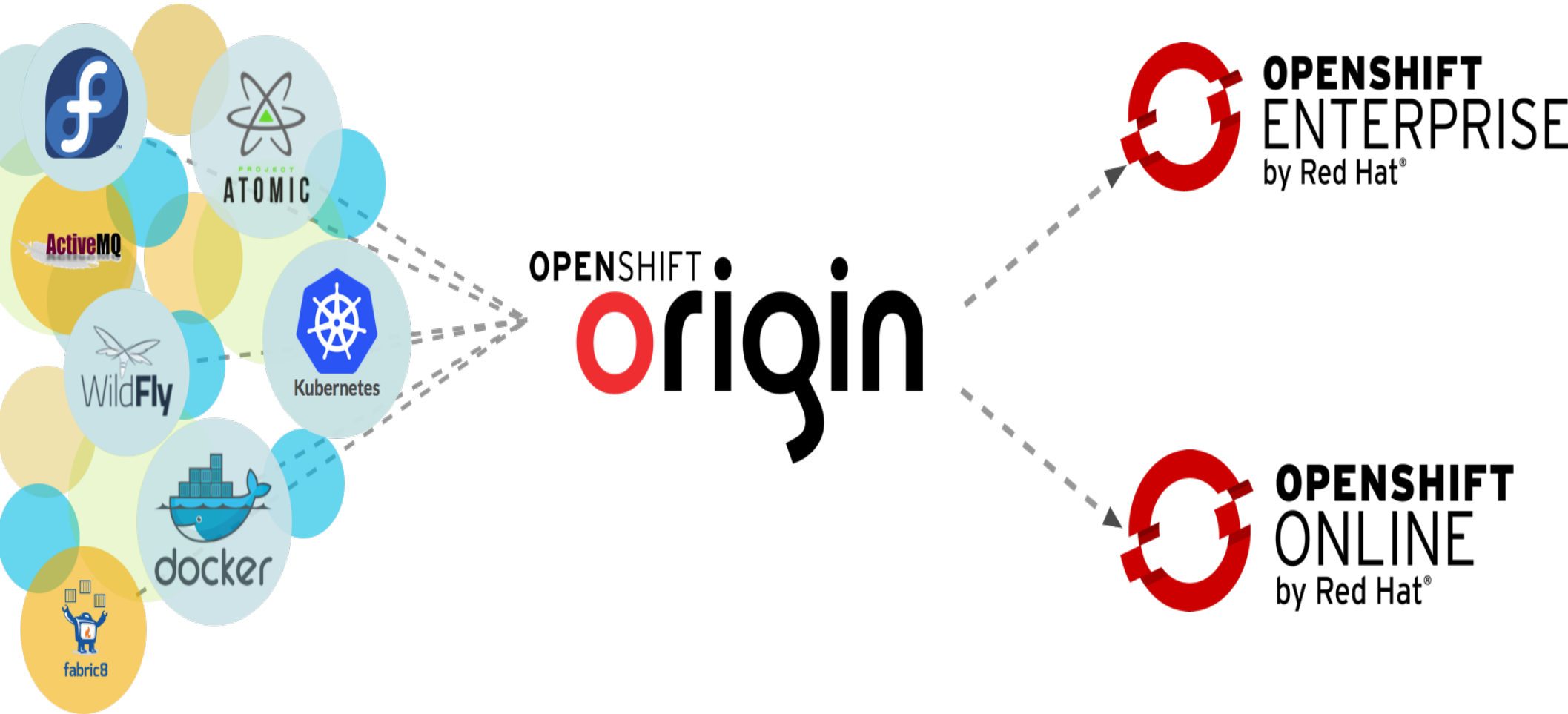


**Increase
Operational Efficiency**



**Enable
DevOps**

Community Powered Innovation



OpenShift Online

Over
2.3 M
Applications
Created

Over
100%
User & Application
Growth YoY

Over
1 Billion
Requests
Per Day

Over
200
Add-ons &
Quickstarts

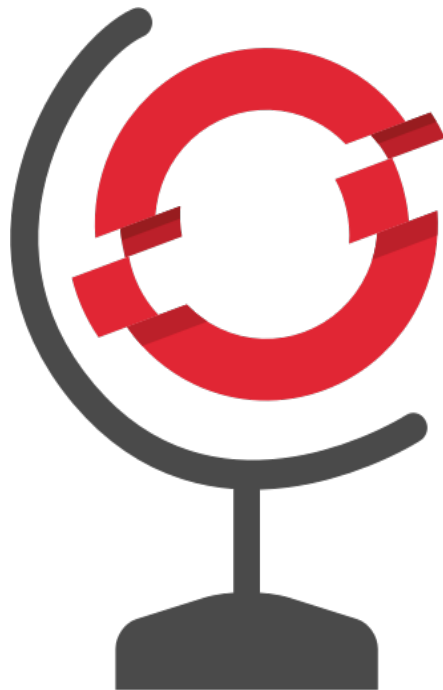
3 Week
Release
Cycle

OpenShift Enterprise

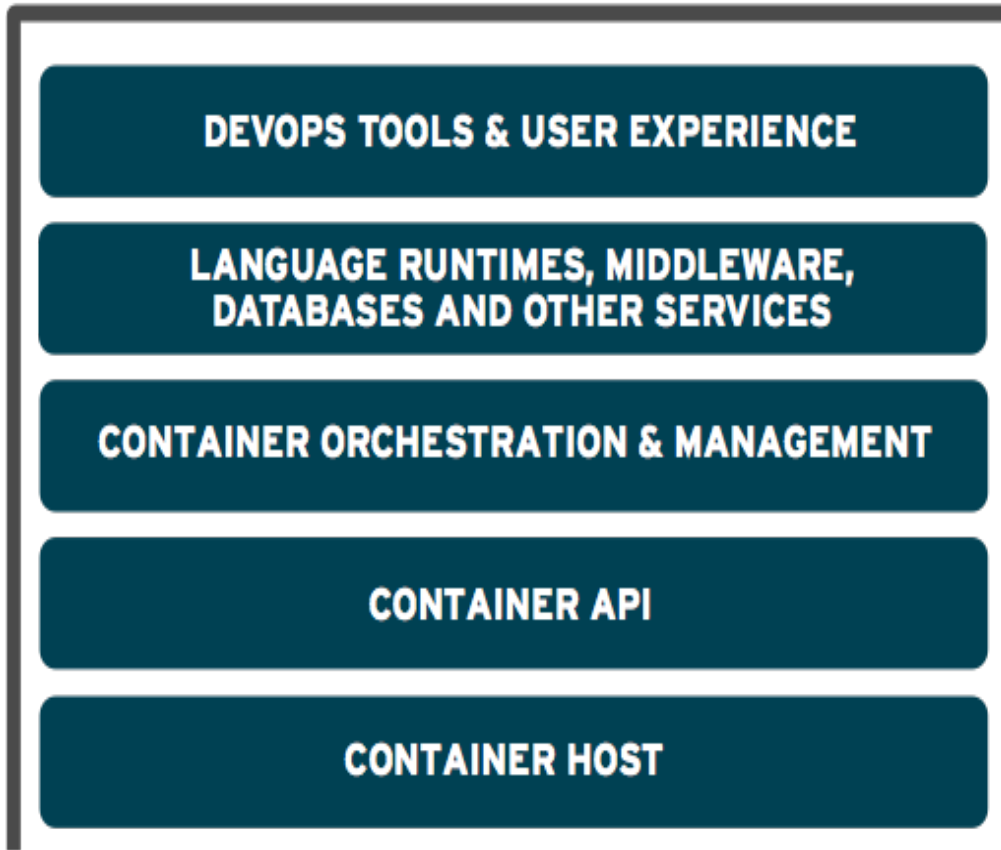


THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

Read more at: openshift.com/customers



OpenShift Architecture

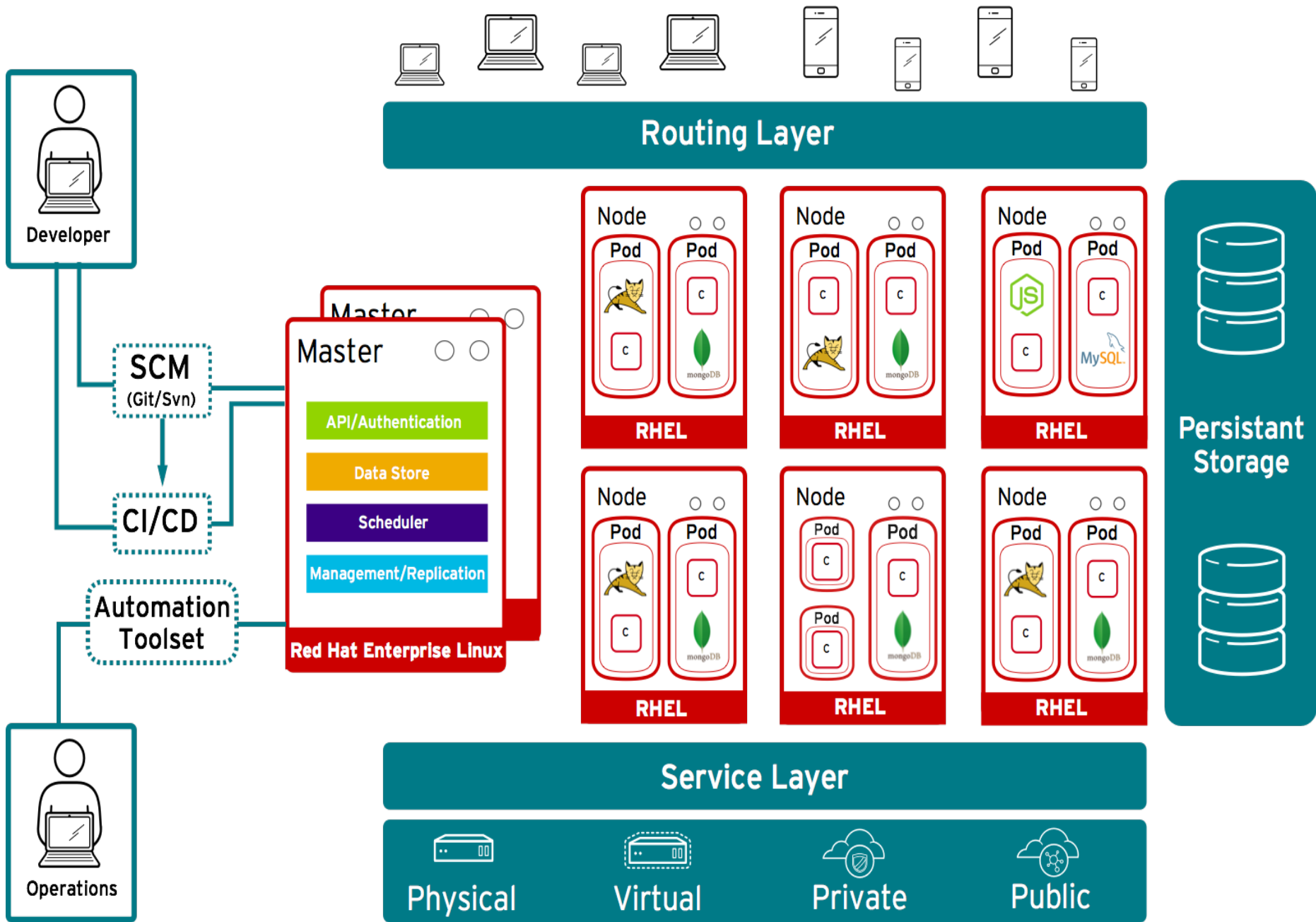


- Standard containers API
- Web-scale container orchestration & management
- Container-optimized OS
- Largest selection of supported application runtimes & services
- Robust tools and UX for Development & Operations
- Industry standard, web scale distributed application platform

OpenShift Application Services

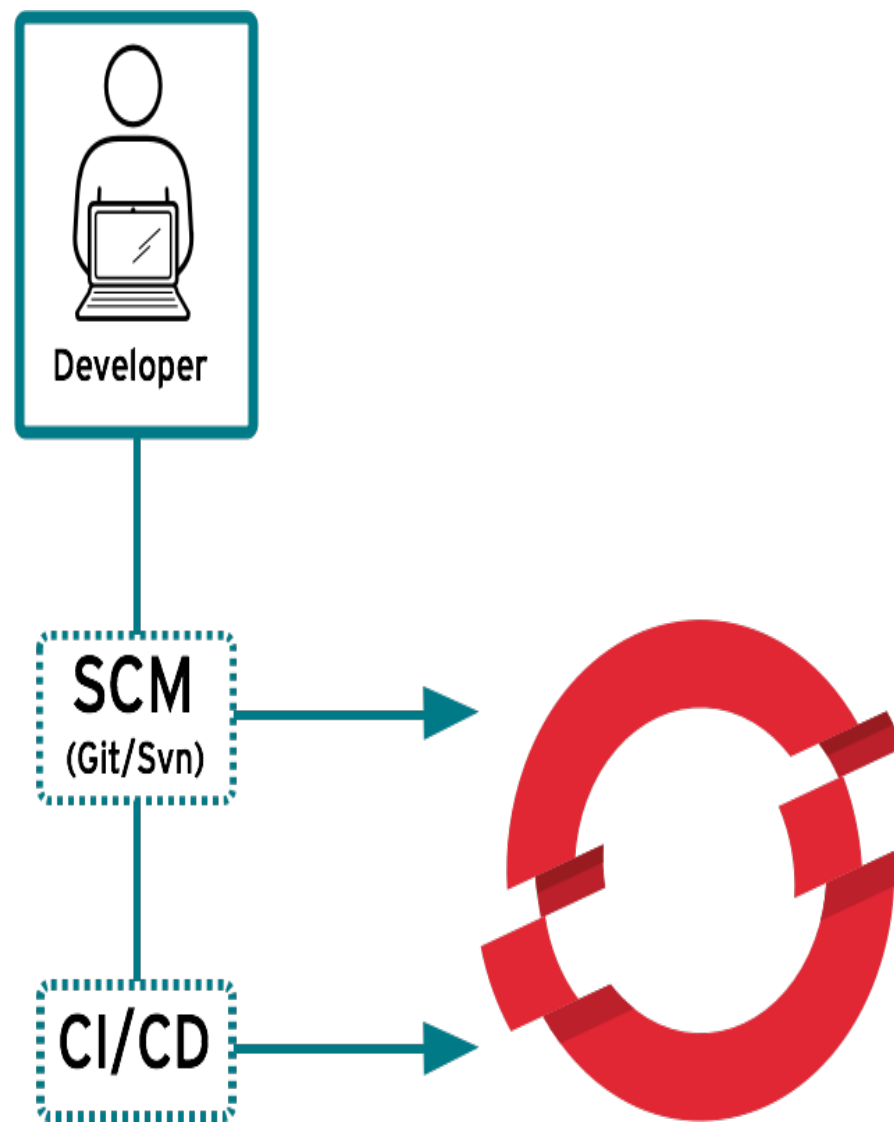


- From Red Hat
- From ISV Partners
- From the Community

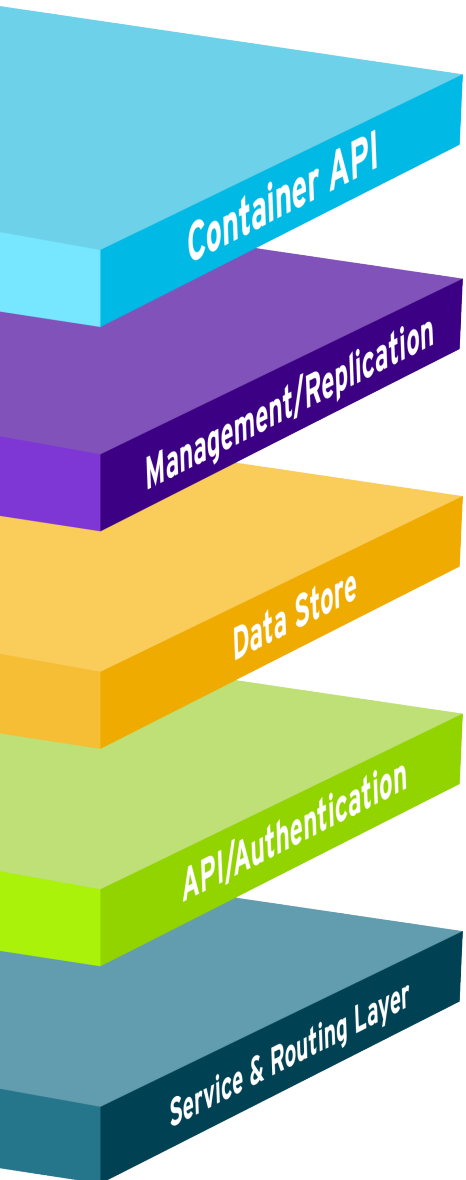


Benefits for Developers

- Access a broad selection of application components
- Deploy application environments on-demand
- Leverage your choice of interface & integrate with existing tools
- Automate application deployments, builds and source-to-image
- Enable collaboration across users, teams & projects



Benefits for IT Operations



- Deploy a secure, enterprise-grade container-based application platform
- Enable application developers while improving operational efficiency & infrastructure utilization
- Utilize advanced scheduling and automated placement with regions and zones for HA
- Leverage powerful declarative management for application services
- Manage user & team access and integrate with enterprise authentication systems

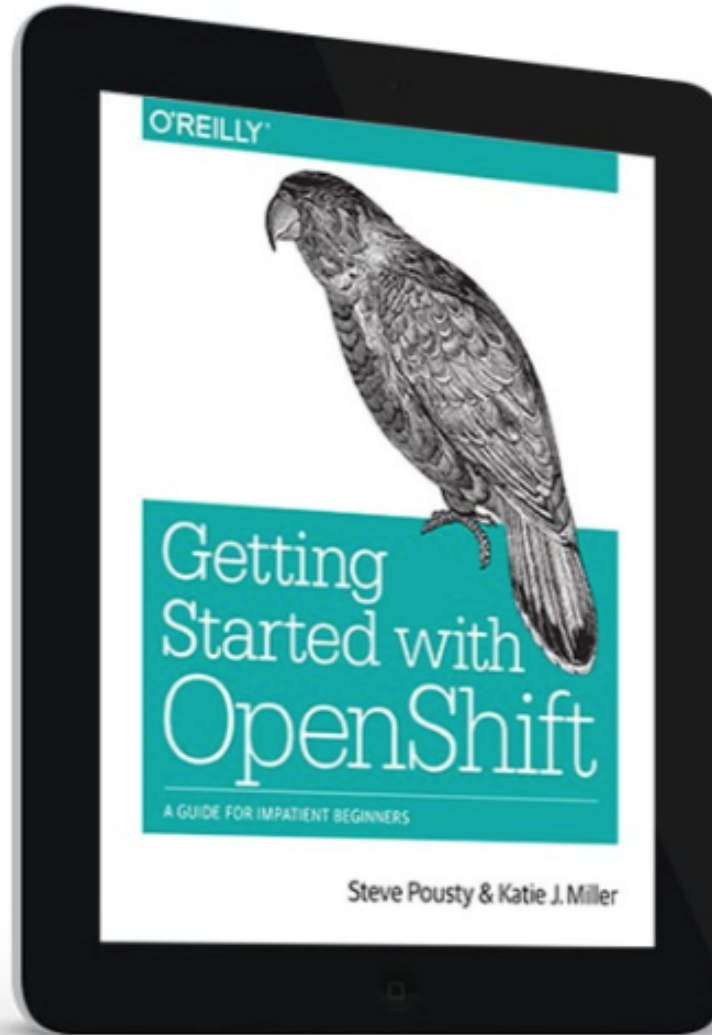
OpenShift Commons



An interactive community for all OpenShift PaaS Users, Customers, Contributors, Partners, Service Providers and Developers to share ideas, code, best practices, and experiences.

More at
<http://commons.openshift.org/>

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OpenShift Demo



<https://www.openshift.com/>

Open Source Cloud Technology: Bringing It All Together

