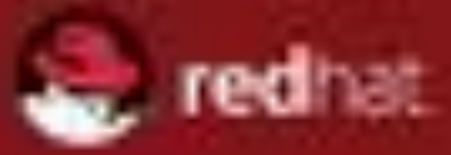
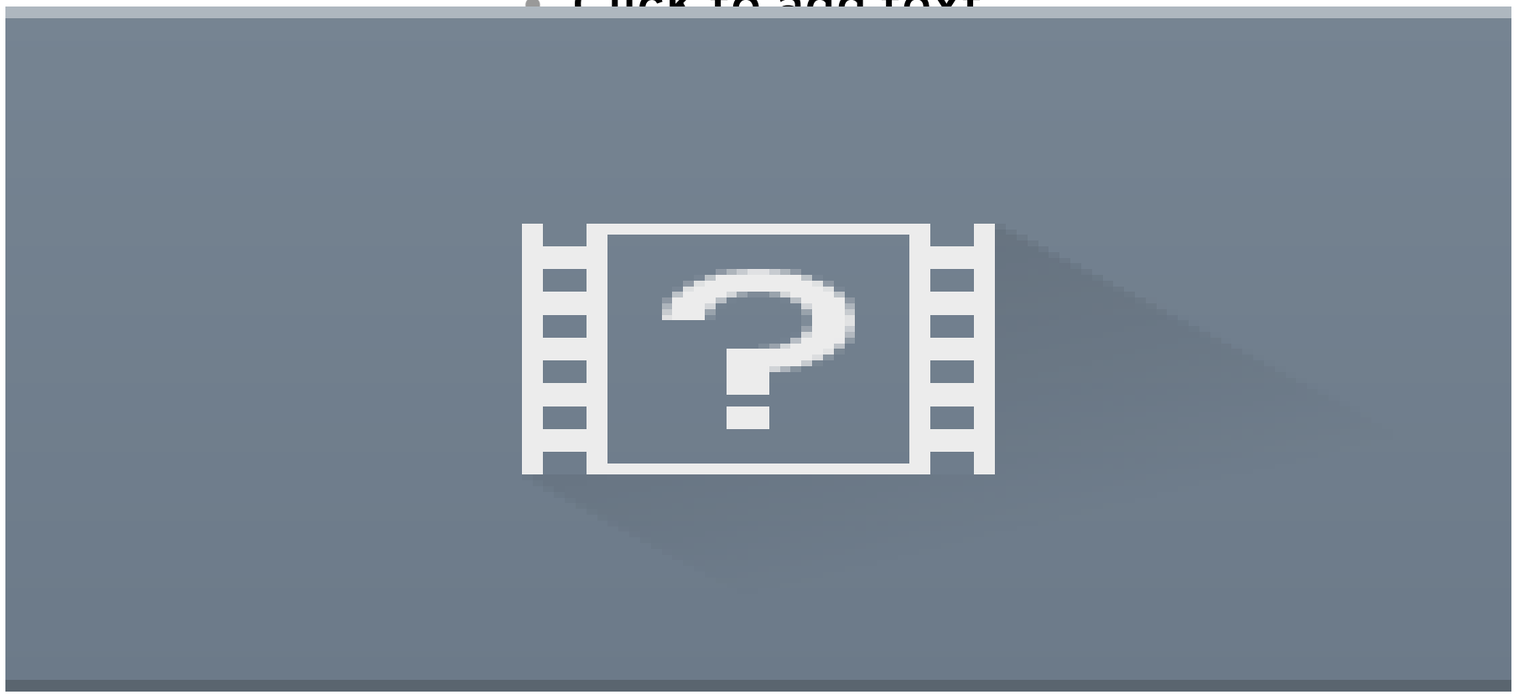


MANAGING THE CLOUD
OpenStack, CloudForms, Public Cloud

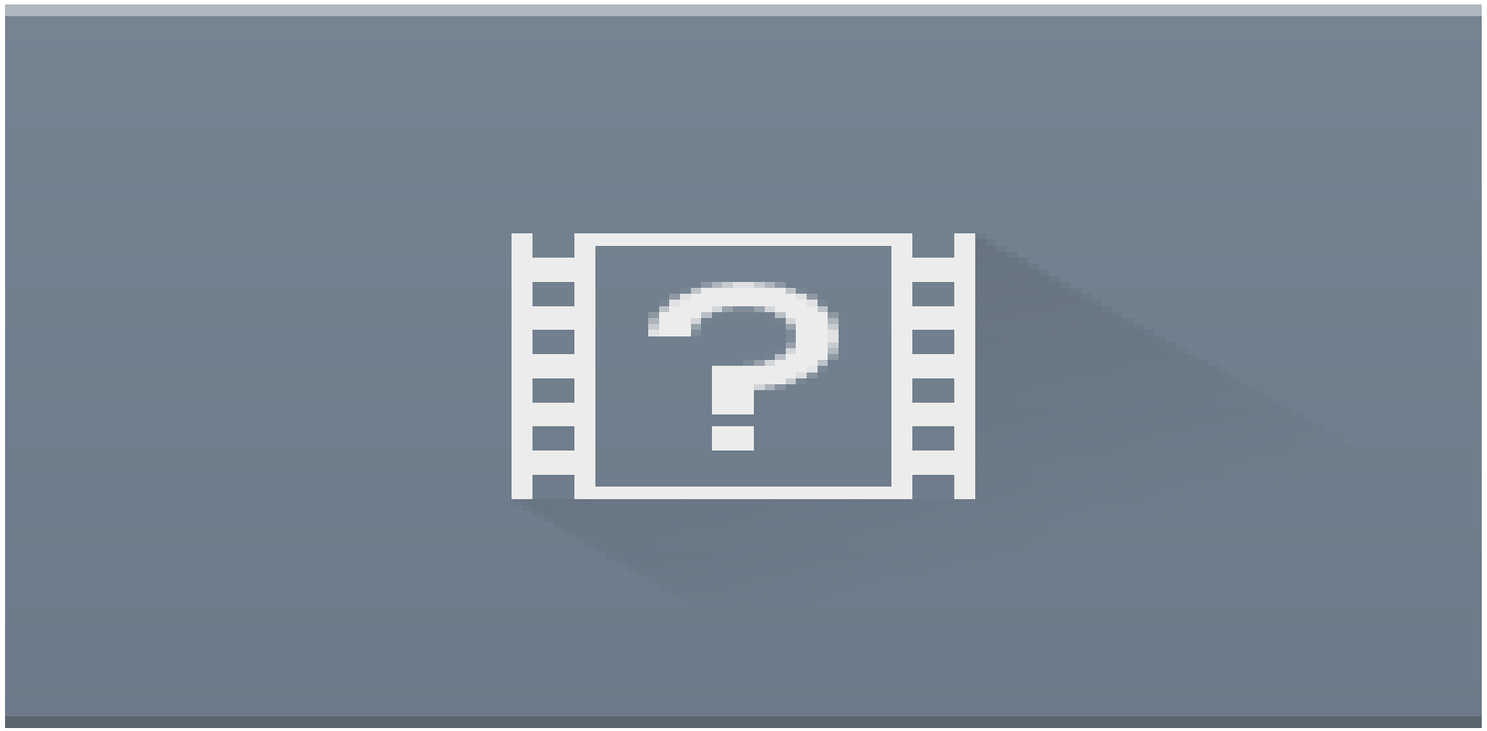
Karl Stevens
Senior Solution Architect – Red Hat

TECHNOLOGY LANDSCAPE

- Click to add text



TECHNOLOGY LANDSCAPE



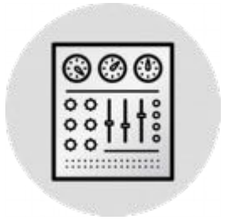
TECHNOLOGY LANDSCAPE

You need a continuous competitive advantage

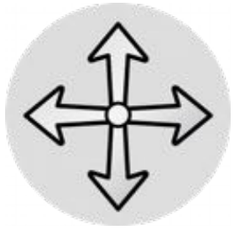
You are a software company

Your competition is everywhere

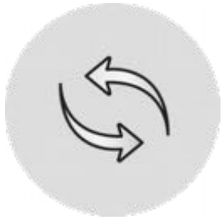
BUSINESSES MUST EVOLVE



Streamlined and automated



Elastic and scalable



Agile and responsive

Utility-like

Velocity at Amazon AWS

amazon web services

10,000	11.6	.001%
max deployment per hour	mean time between deployments (seconds)	deployments causing an outage

Source: 2014 State of DevOps Report, Puppet Labs, IT Revolution Press, ThoughtWorks

BARRIERS TO EVOLUTION..?

Existing infrastructure is not designed to cope with the demand

- Data is too large
  - We're producing vast amounts of unstructured data
  - Scaling UP no longer works. Scaling OUT is a necessity

- Too many service requests
  - More client devices coming online – Laptops, tablets, phones, watches, etc...
  - BYOD generation is here

- Applications and infrastructure were not designed for this level of demand
  - Traditional capabilities are being exhausted

RED HAT SOLUTIONS: CLOUDFORMS; OPENSTACK

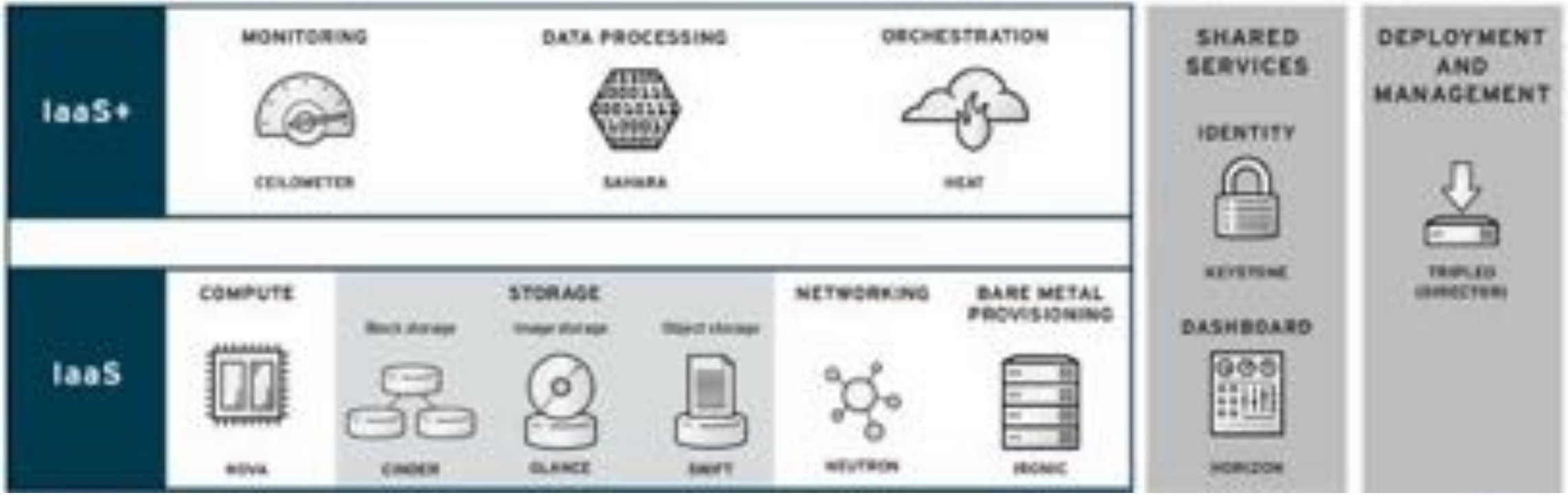
WHAT IS OPENSTACK?

openstack™

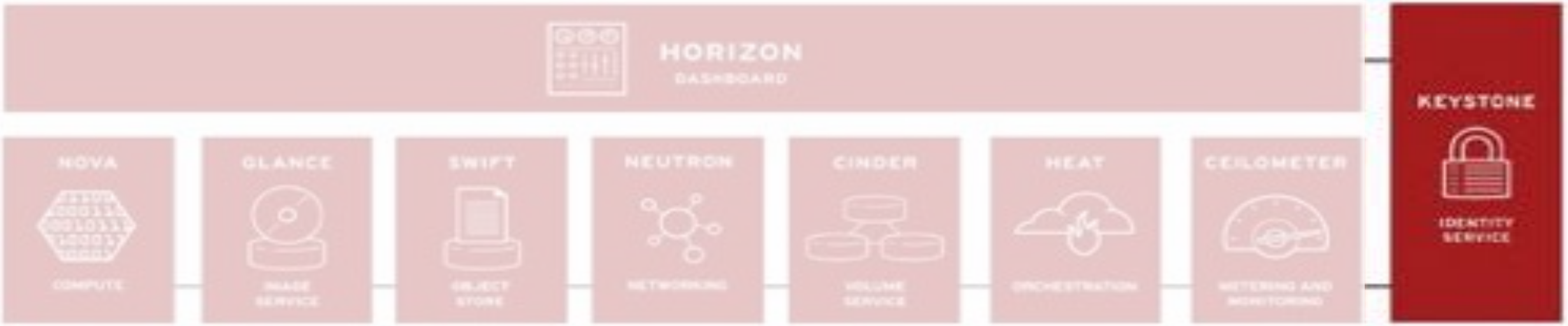
CLOUD SOFTWARE

CLOUD INFRASTRUCTURE FOR CLOUD WORKLOADS

- Modular architecture
- Designed to easily scale out
- Based on (continuously growing) set of core services
- ***Brings public cloud-like capabilities into your datacentre***
- Provides massive on-demand (scale-out) capacity
- Removes vendor lock-in

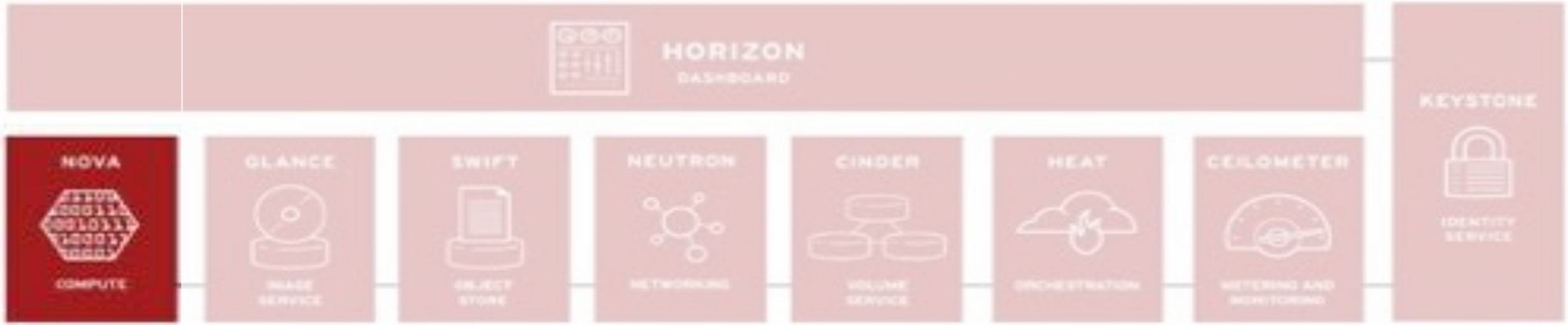


OPENSTACK IDENTITY SERVICE (KEYSTONE)



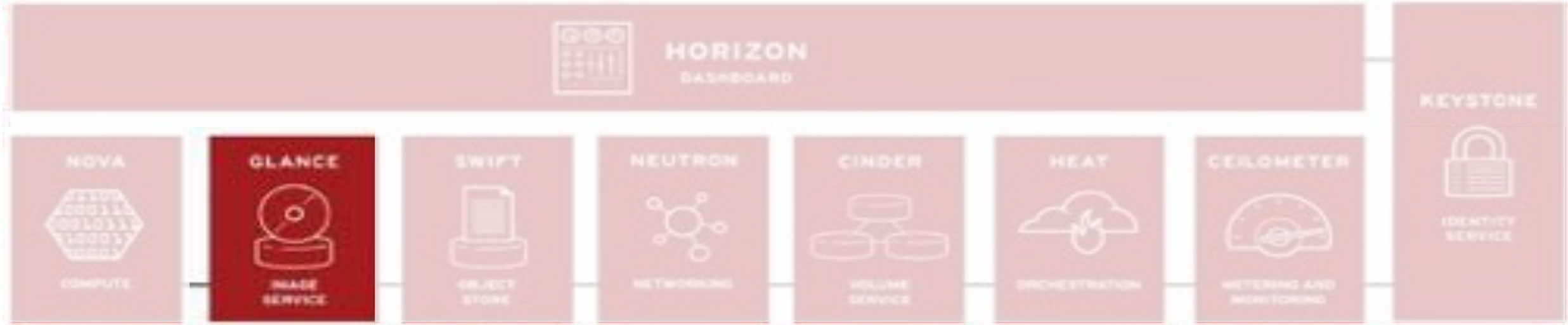
- Keystone provides a common authentication and authorization store for OpenStack
- Responsible for users, their roles, and to which project(s) they belong to
- Provides a catalog of all other OpenStack services API endpoints
- All OpenStack services typically rely on Keystone to verify a user's request

OPENSTACK COMPUTE (NOVA)



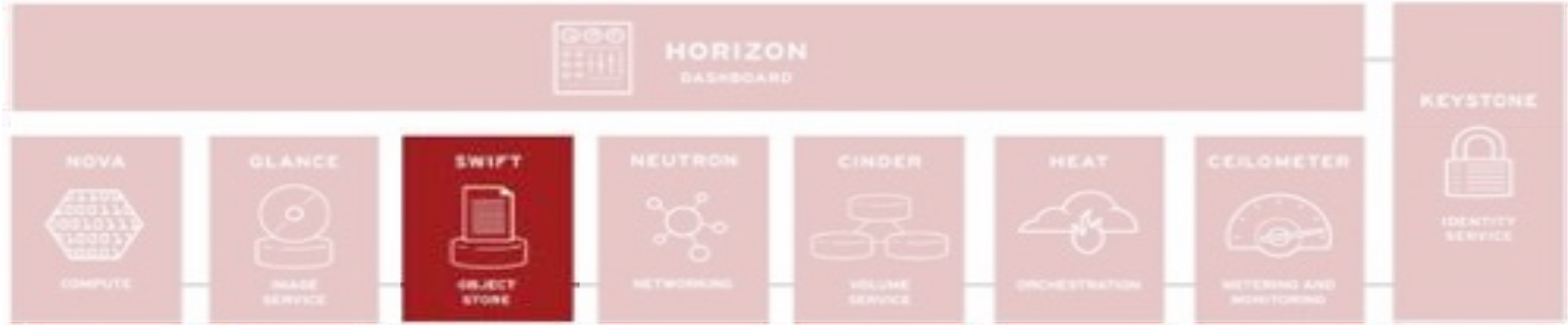
- Nova is responsible of running instances within OpenStack
- Manages multiple different hypervisor types via drivers, e.g:
    - Red Hat Enterprise Linux (+KVM)
    - VMware vSphere

OpenStack Image Service (Glance)



- Glance provides a mechanism for the storage and retrieval of disk images/templates
- Supports a wide variety of image formats, including qcow2, vmdk, ami, and ovf
- Many different back end storage options for images, including Swift…

OPENSTACK OBJECT STORE (SWIFT)



- Swift provides a mechanism for storing and retrieving arbitrary unstructured data
- Provides an object based interface via a RESTful/HTTP-based API
- Highly fault-tolerant with replication, self-healing, and load-balancing
- Designed to be implemented using commodity compute and storage

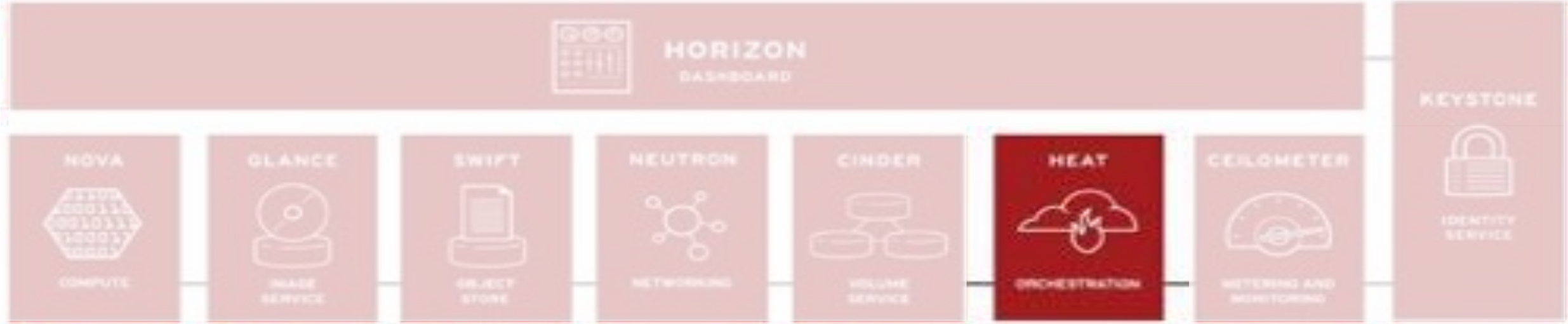
OPENSTACK NETWORKING (NEUTRON)

- Neutron is responsible for providing networking to running instances within OpenStack
- Provides an API for defning, confguring, and using networks
- Relies on a plugin architecture for implementation of networks, examples include:
  - Open vSwitch (default in Red Hat's distribution)
  - Cisco, PLUMgrid, Juniper, Arista, Mellanox, Brocade, etc.

OPENSTACK VOLUME SERVICE (CINDER)

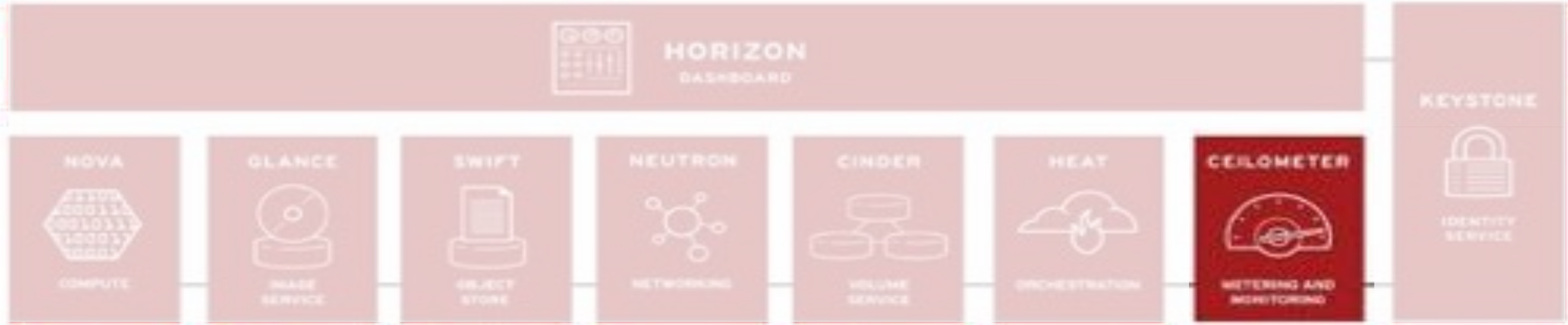
- Cinder provides block storage to instances running within OpenStack
- Used for providing persistent and/or additional storage
- Relies on a plugin/driver architecture for implementation, examples include Red Hat Ceph Storage, EMC, Netapp, IBM XIV, HP Leftland, 3PAR, etc.

OPENSTACK ORCHESTRATION (HEAT)



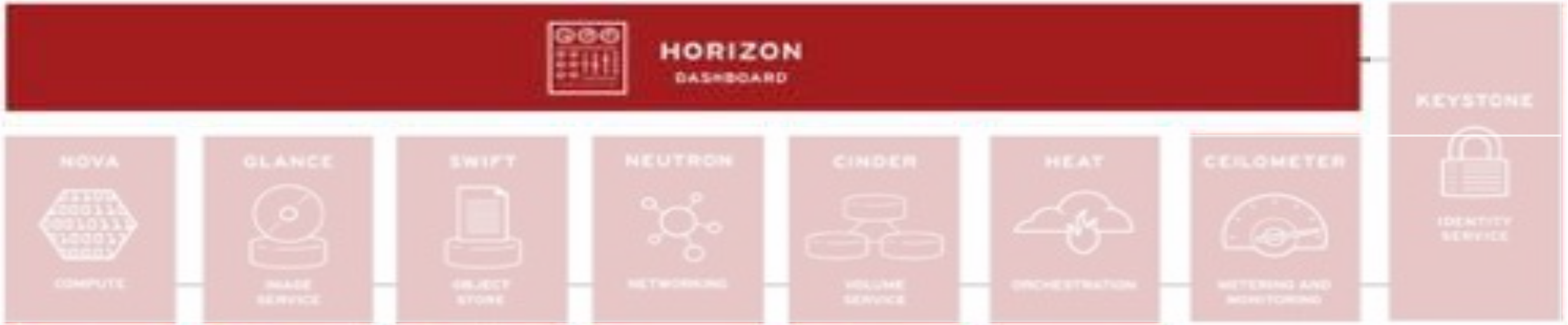
- Heat facilitates the creation of ‘application stacks’ made from multiple resources
- Stacks are imported as a descriptive template language
- Heat manages the automated orchestration of resources and their dependencies
- Allows for dynamic scaling of applications based on confgurable metrics

OPENSTACK TELEMETRY (CEILOMETER)



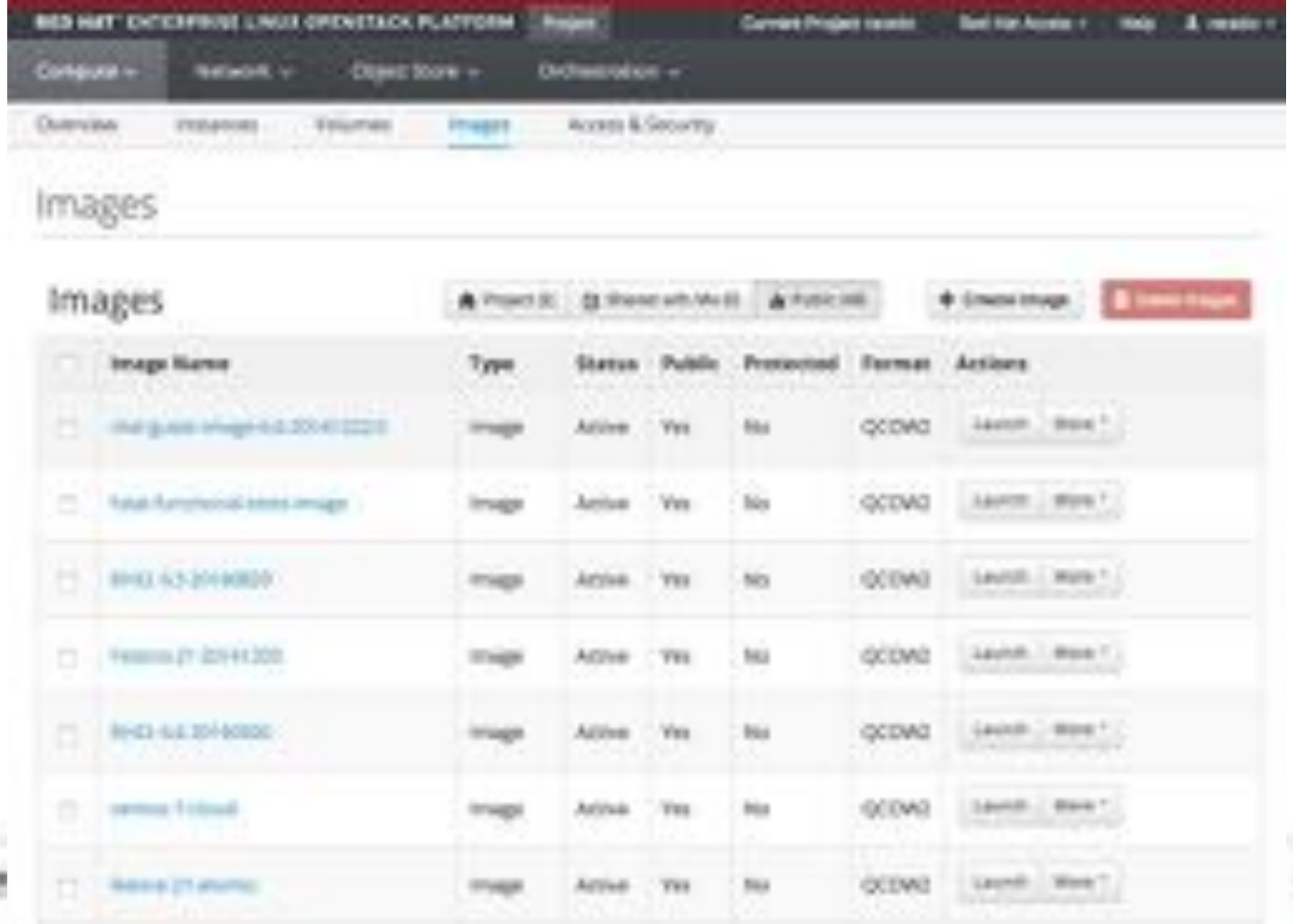
- Ceilometer is a central collection of metering and monitoring data
- Primarily used for chargeback of resource usage, but could be used for other purposes as well (autoscaling, monitoring)
- Ceilometer consumes data from the other components - e.g. via agents
- Architecture is completely extensible - meter what you want to - expose via API

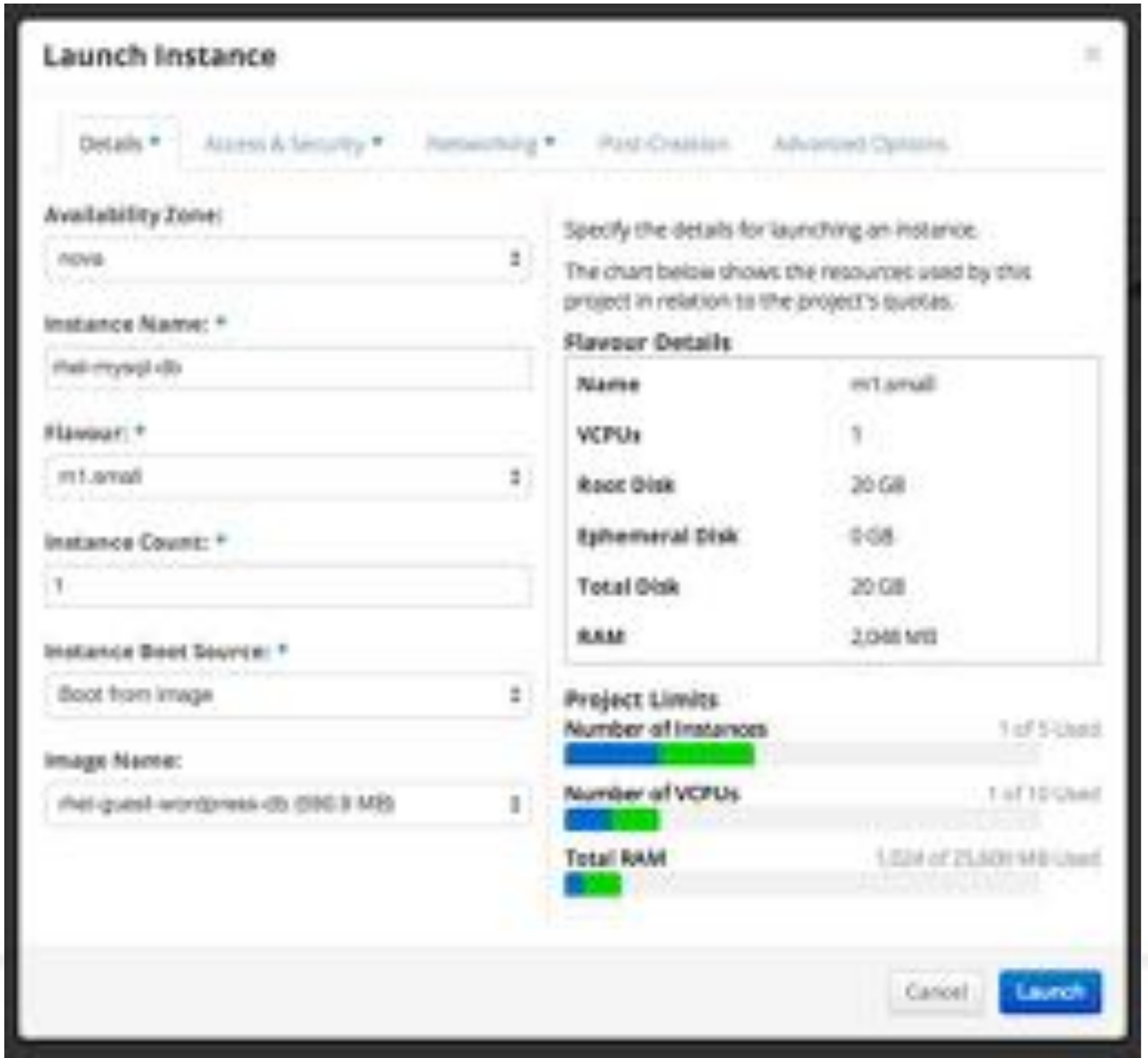
OPENSTACK DASHBOARD (HORIZON)

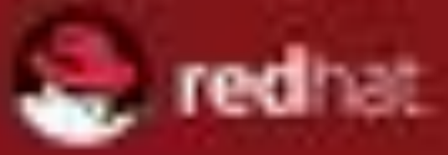


- Horizon is OpenStack's web-based self-service portal
- Sits on-top of all of the other OpenStack components via API interaction
- Provides a (growing) subset of underlying functionality
- Examples include: instance creation, network confguration, block storage attachment, users administration, etc.


Compute
Network
Object Store
Orchestration
Overview
Instances
Volumes
Images
Access & Security
Overview
Limit Summary
Instances
Used 4 of 10
VCPUs
Used 4 of 20
RAM
Used 4.0GB of 50.0GB
Floating IPs
Used 1 of 50
Security Groups
Used 1 of 10
Volumes
Used 2 of 10
Volume Storage
Used 3.0GB of 1000.0GB

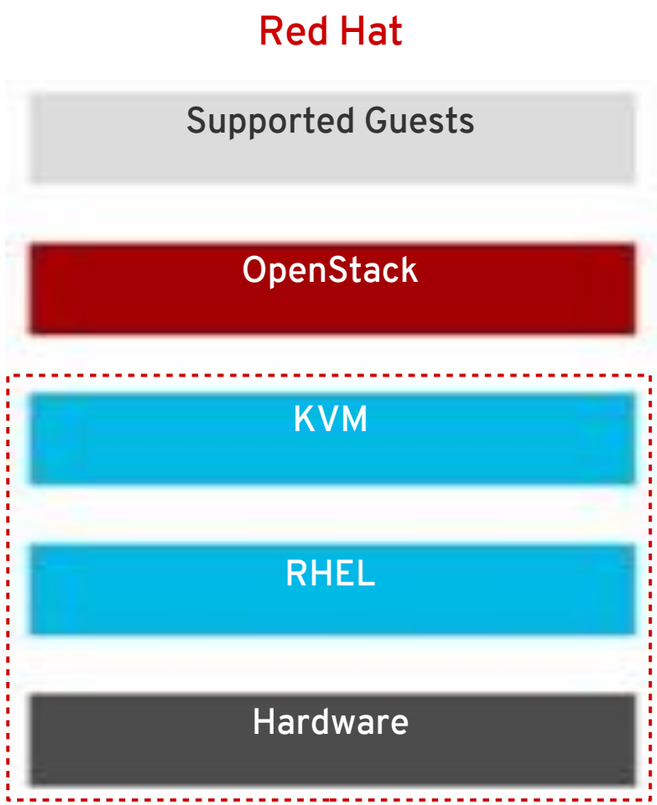

Images
Images
Image Name
Type
Status
Public
Protected
Format
Actions


Launch Instance
Details *
Access & Security *
Networking *
Post-Creation
Advanced Options
Availability Zone:
nova
Instance Name: *
rhel-mysql-db
Flavour: *
m1.small
Instance Count: *
1
Instance Boot Source: *
Boot from image
Image Name:
rhel-guest-wordpress-db (990.9 MB)
Specify the details for launching an instance.
The chart below shows the resources used by this project in relation to the project's quotas.
Flavour Details
Name
m1.small
VCPUs
1
Root Disk
20 GB
Ephemeral Disk
0 GB
Total Disk
20 GB
RAM
2,048 MB
Project Limits
Number of Instances
1 of 5 Used
Number of VCPUs
1 of 10 Used
Total RAM
1,024 of 25,600 MB Used
Cancel
Launch



WHY REDHAT?

THE IMPORTANCE OF INTEGRATION WITH LINUX



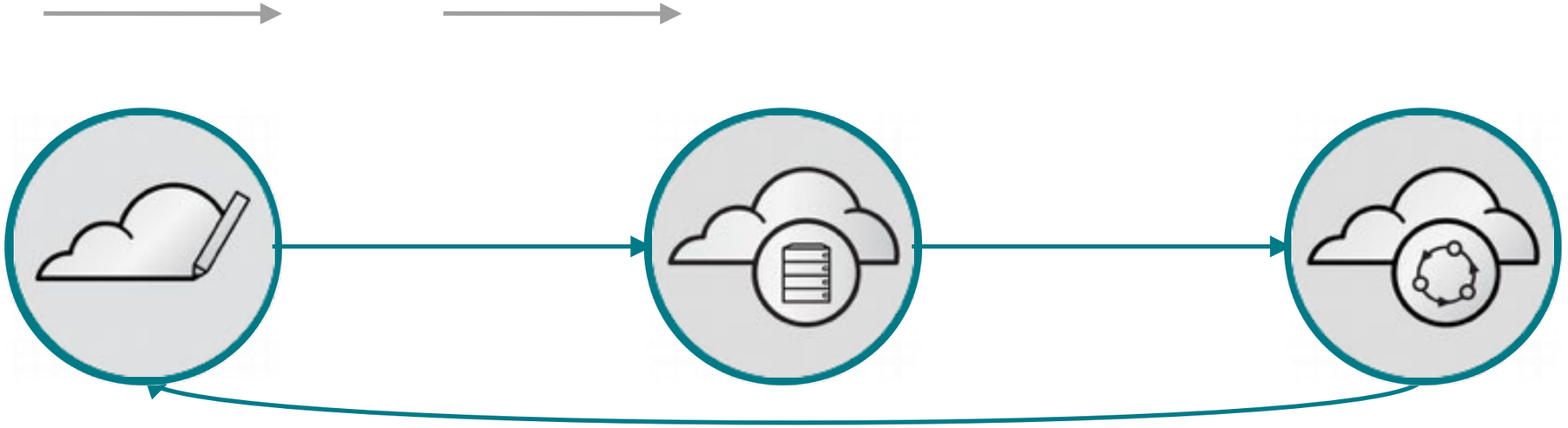
A typical OpenStack cloud is made up of at least 10 core services + plugins to interact with 3rd party systems

- These services run on top of a Linux distribution with a complex set of user space integration dependencies
- OpenStack cannot be productized as a stand alone layer
- A supported, stable platform requires integration and testing of each of the components

"If your Windows virtual machine hosted by a KVM hypervisor running on an IBM blade, connecting to an EMC storage array through an Emulex HBA has issues with storage corruption, who do you call?"

RED HAT OPENSTACK PLATFORM DIRECTOR

OpenStack Orchestration



PLANNING

Network topology
Service parameters
Resource capacity

DEPLOYMENT

Deployment orchestration
Service configuration
Sanity checks

OPERATIONS

Updates and upgrades
Scaling up and down
Change management

LARGEST CERTIFIED PARTNER ECOSYSTEM

- Over 400+ members since launch in April 2013
- Over 900 certified solutions in partner Marketplace
- Over 4,000 RHEL certified compute servers

OEMs, IHVs, ISVs

Channel Partners

System Integrators

Cloud Service Providers

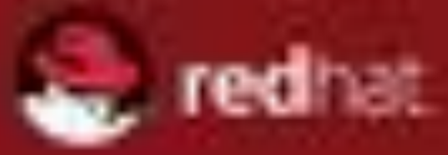
Managed Service Providers

RED HAT CLOUD SERVICES

- **Training**
  - Red Hat OpenStack Administration I (CL110)
  - Red Hat OpenStack Administration II (CL210)
  - Red Hat OpenStack Administration III (CL310)

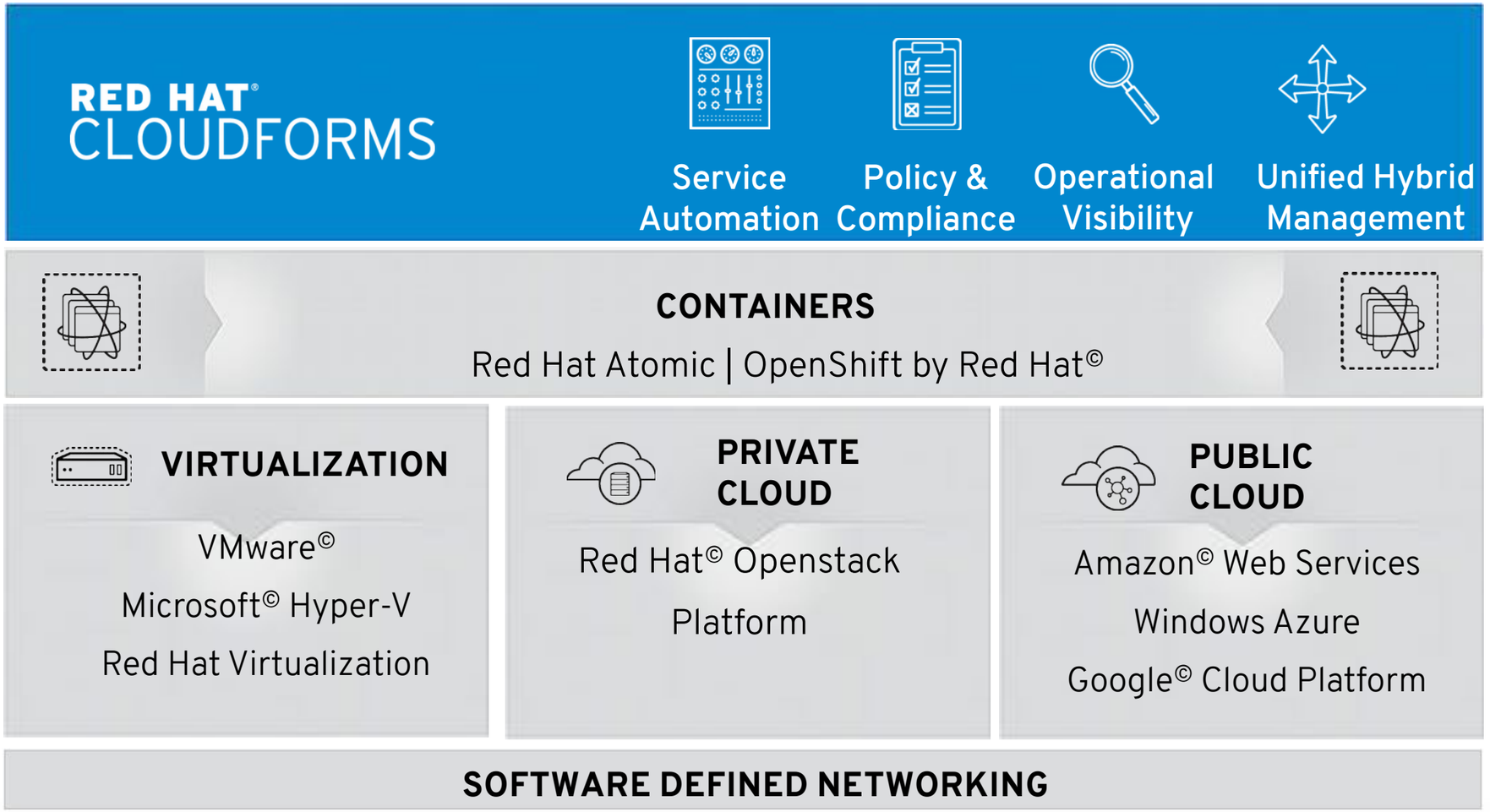
- **Certification**
  - Red Hat Certified System Administrator (RHCSA) in Red Hat OpenStack
  - Red Hat Certified Engineer (RHCE) in Red Hat OpenStack

- **Consulting**
  - Red Hat Consulting: Cloud Migration
  - Red Hat Consulting: Optimize IT with Open Management for Virtualization



CLOUDFORMS
(Enterprise Cloud Management)

AN EVOLUTIONARY PATH TO HYBRID CLOUD



CLOUDFORMS FEATURES

AGENTLESS, VIRTUAL APPLIANCE

NON-INVASIVE, EASY MAINTENANCE

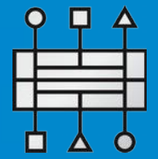
WEB-BASED, SELF-SERVICE, ADMIN AND OPERATIONS

ACCESS FROM ANY BROWSER

MULTI-TENANT AND MULTI-LOCATION

SECURELY SHARE INFRASTRUCTURE

PLUGABLE API FRAMEWORK

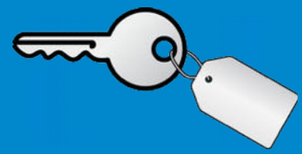


EASY TO INTEGRATE AND EXTENSIBLE TO OTHER PLATFORMS

HORIZONTALLY SCALABLE, LOAD-BALANCED

HIGHLY SCALABLE, HIGHLY AVAILABLE WITH FAILOVER AND FALLBACK

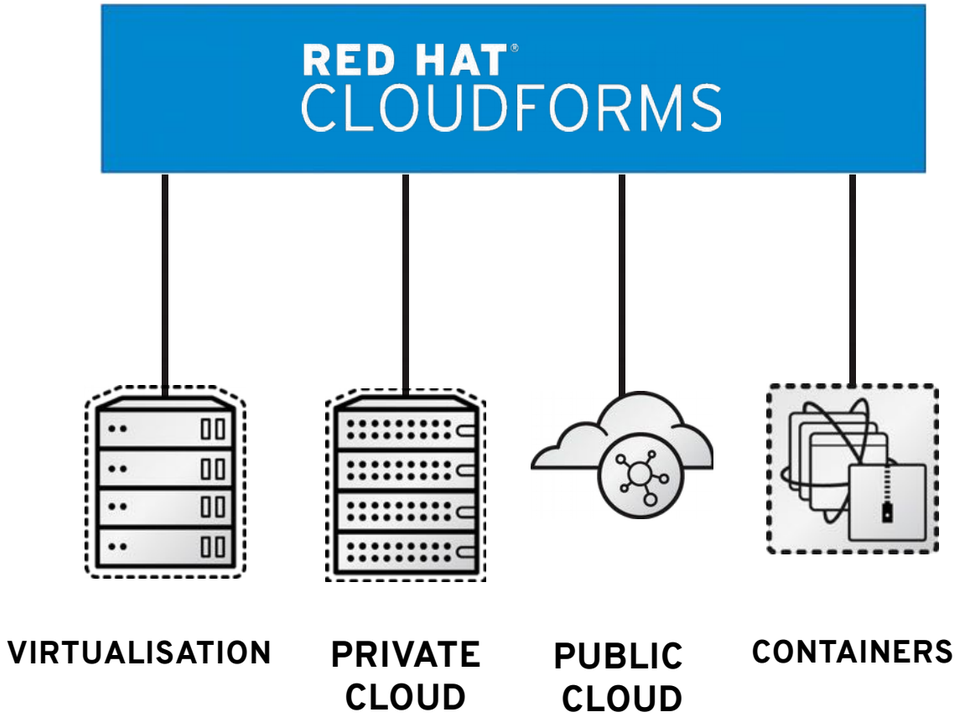
ROLE-BASED ACCESS CONTROL AND ENTITY TAGGING



SEGMENT USER ACCESS - DRIVE COMPLIANCE, CONTROL & REPORTING

UNIFIED HYBRID MANAGEMENT WITH CLOUDFORMS

- One management system
- Consistent automation and Policy
- Agentless management



VIRTUALIZATION MANAGEMENT

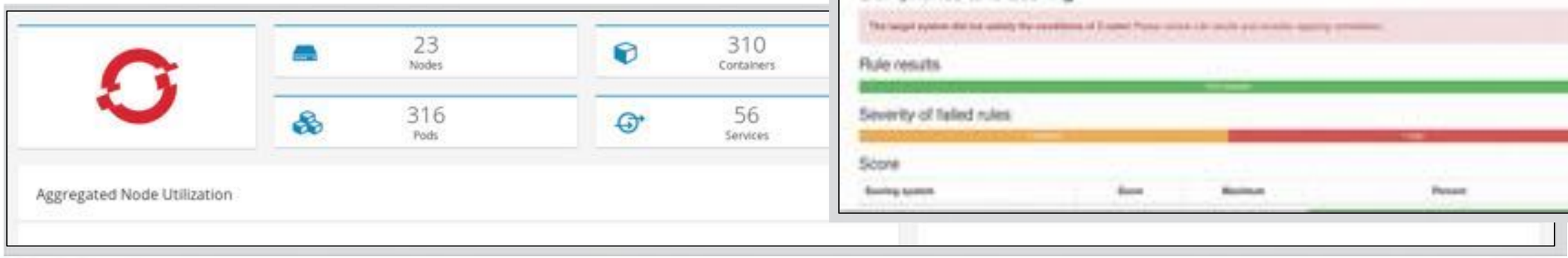
- Provision VMs
- View VM genealogy and history
- Track VM drift
- Manage VM lifecycle

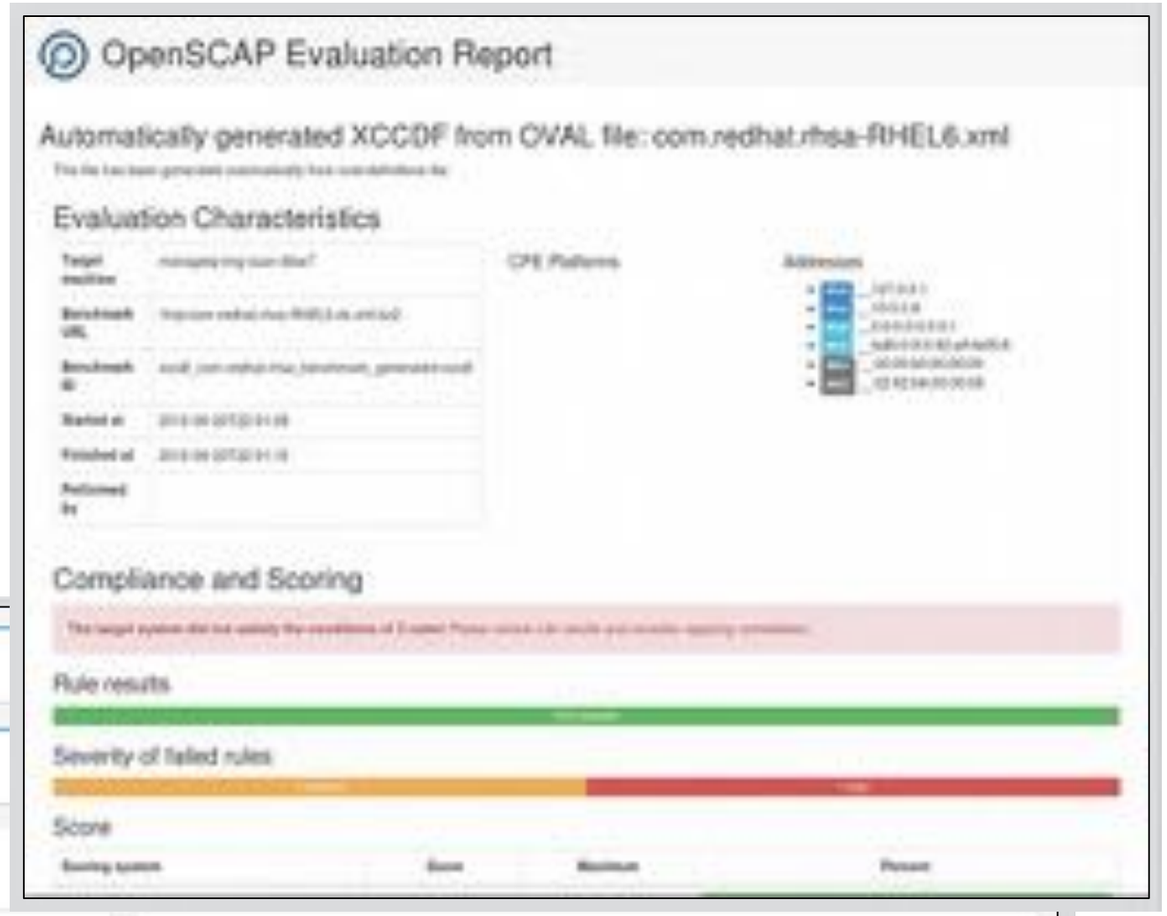
CLOUD MANAGEMENT

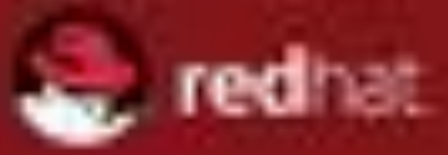
- View & manage full inventory
- Provision instances, storage and networking.
- Monitor and respond to events.

CONTAINER MANAGEMENT

- View relationships in one place
- Apply automation and enforce policies
- Scan containers for vulnerabilities

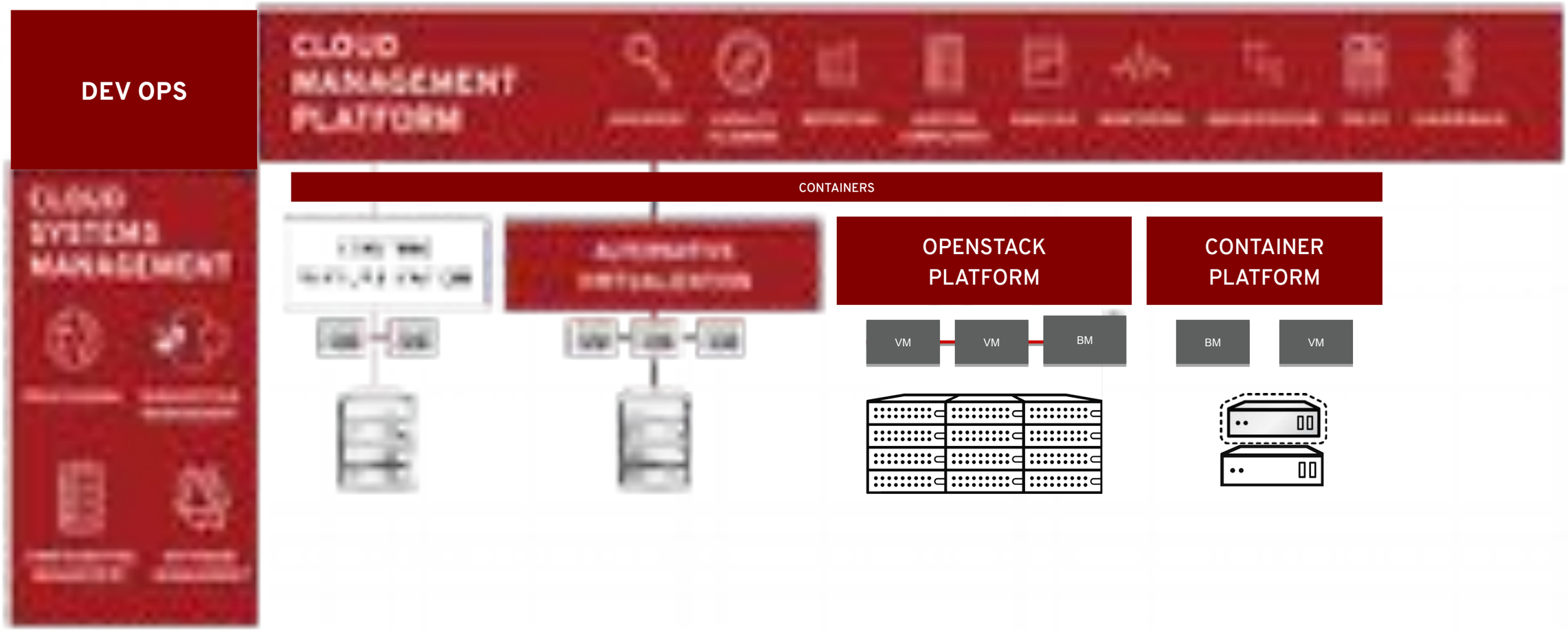




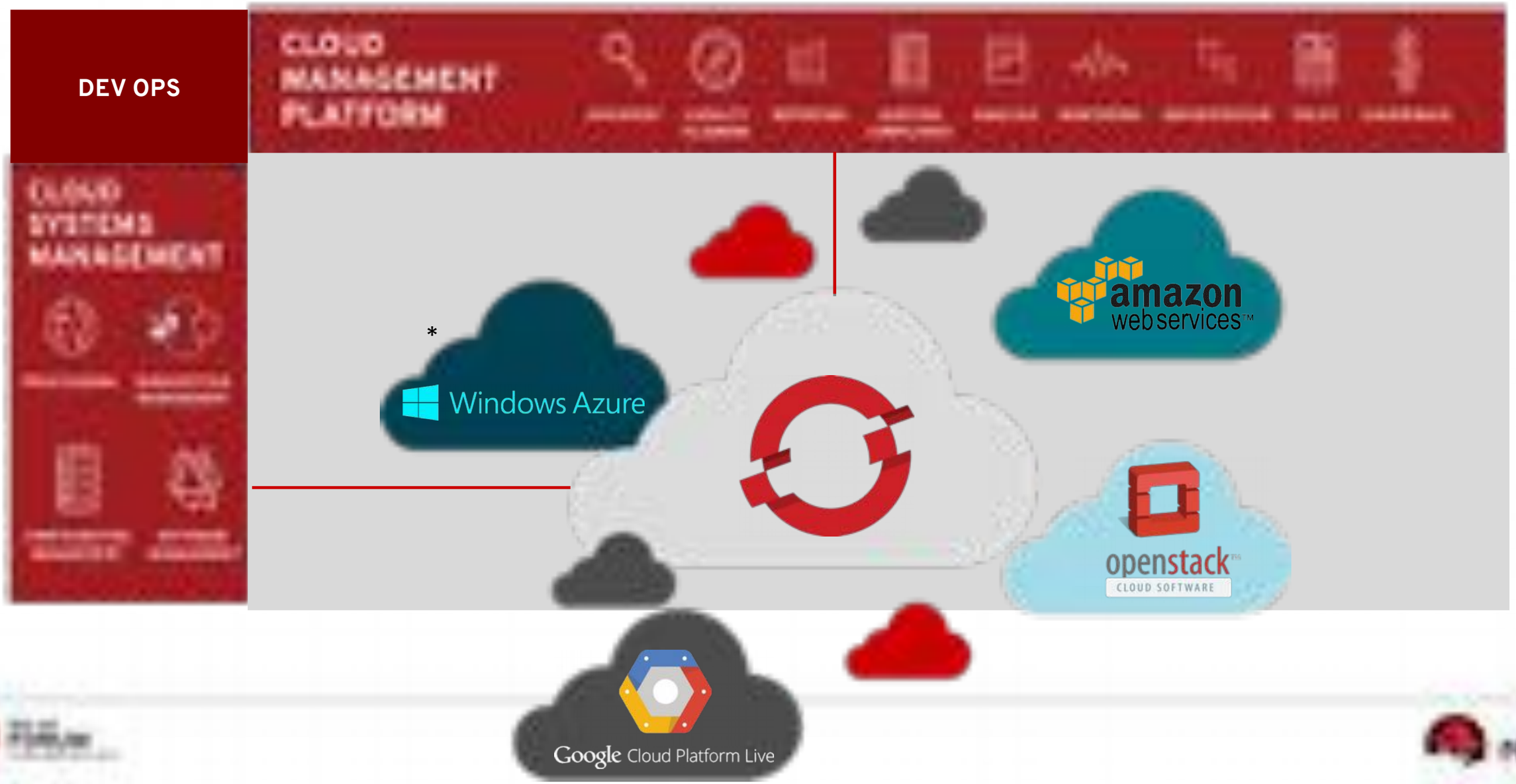


PUBLIC CLOUD

PUBLIC CLOUD



PUBLIC CLOUD



MANY RED HAT CERTIFIED CLOUDS WITH CLOUD ACCESS

Google Cloud Platform

Source: https://access.redhat.com/ecosystem/search/#/category/Cloud%20Provider

MONTHLY TECHTALK SERIES

October 26th	An introduction to 3Scale and API Management.
November 23rd	EAP 7 and A-MQ 7. JEE and core
December 13th	RHEL, RHEV, Atomic and OpenStack.
January 25th	Software Defined Storage, Gluster, Ceph.
February 22nd	Hybrid Cloud Architectures and Cloudforms

All @ Red Hat Monument Office – Morning and Evening sessions

redhat.