

RED HAT  
**SUMMIT**

BOSTON, MA  
JUNE 23-26, 2015

# OpenShift 3 and The Next Generation of PaaS

Ashesh Badani, Matt Hicks, Clayton Coleman, Joe Fernandes

June 24, 2015

# OpenShift Innovation at Red Hat Summit

## Wednesday

10:40 AM - 11:40 AM  
Room: 208

OpenShift in production: Customer Panel



Innovation in the large enterprise: Using Openstack, OpenShift, and automation to empower teams



A successful path to PaaS at University of Technology, Sydney



SecurePaaS with OpenShift on Red Hat JBoss Middleware



FICO Analytic Cloud: How we transitioned to SaaS from a legacy IBM/VMware application



3:40 PM - 4:40 PM  
Room: 304

4:50 PM - 5:50 PM  
Room: 309

1:20 PM - 2:20 PM  
Room: 206

2:30 PM - 3:30 PM  
Room: 309

4:50 PM - 5:50 PM  
Room: 306

9:45 AM - 10:45 AM  
Room: 313

## Thursday

Amadeus uses next-generation containerized application platform with OpenShift



Migrating legacy datacenter virtual environments to a Red Hat open source cloud platform



Building OpenShift and OpenStack platforms with Red Hat



## Friday

Cisco delivers a highly available platform using OpenShift Enterprise by Red Hat



# Software Disrupts Business



Retail



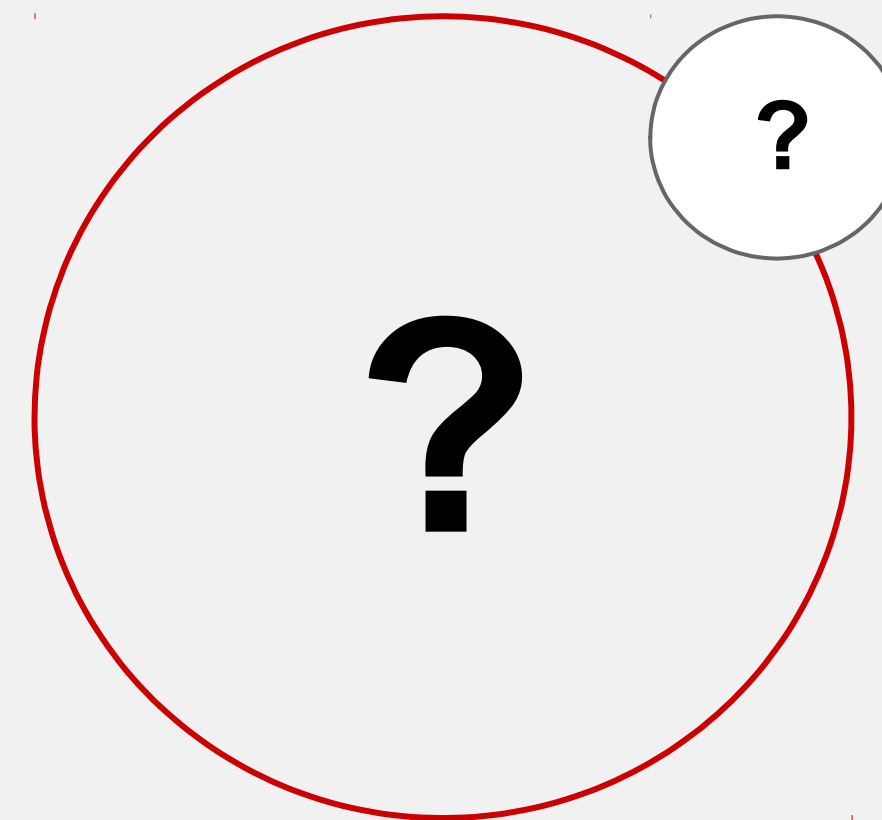
Finance



Media



Transportation



# Impact of Technology

US CEOs want innovation as much as new markets and customers from future alliances



PWC - 2015 US CEO Survey  
<http://www.pwc.com/us/en/ceo-survey/index.html>

36%

of US CEOs say they entered or considered entering a different industry at some point over the past three years

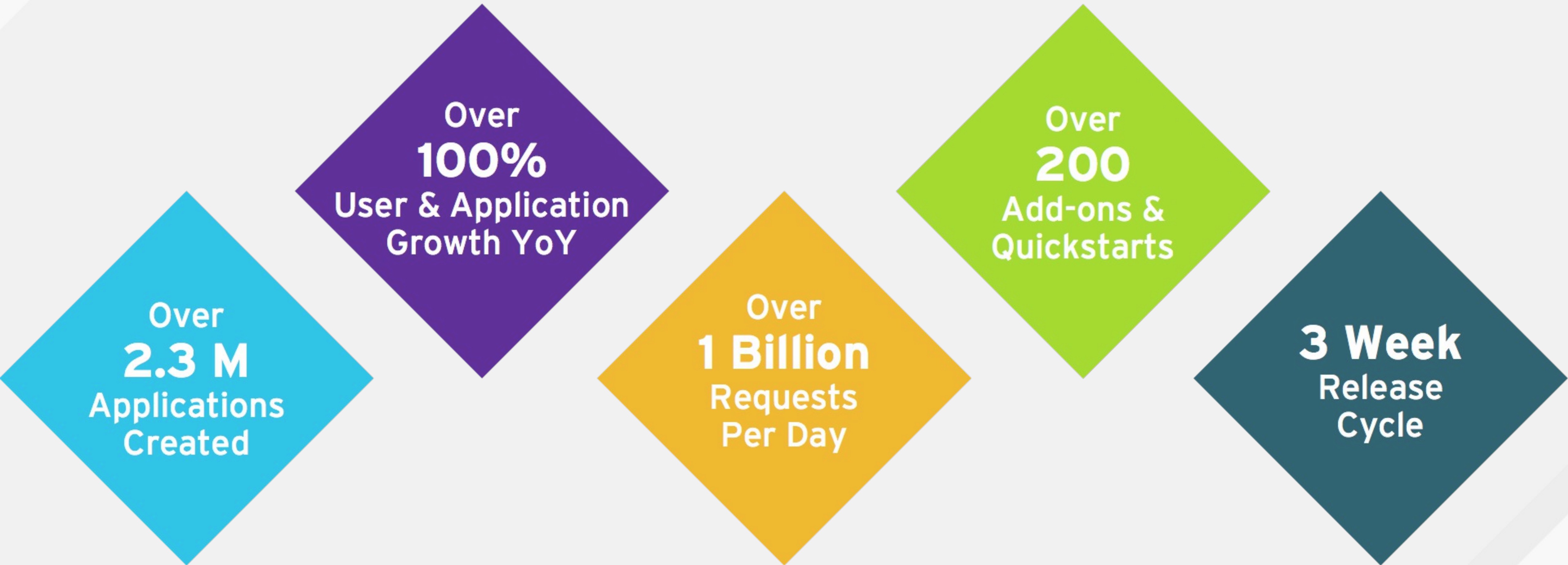
Half

Half of US CEOs believe a significant competitor is emerging or could emerge from technology sector versus 32% of CEOs globally.

Think it's likely competitors will compete in industries other than their own over the next three years

61%

# OpenShift Online



# OpenShift Enterprise



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

Read more at: [openshift.com/customers](https://openshift.com/customers)

# OpenShift 3: Roundtable Discussion

# OpenShift 3



**DEVOPS TOOLS & USER EXPERIENCE**

**LANGUAGE RUNTIMES, MIDDLEWARE,  
DATABASES AND OTHER SERVICES**

**CONTAINER ORCHESTRATION & MANAGEMENT**

**CONTAINER API**

**CONTAINER HOST**

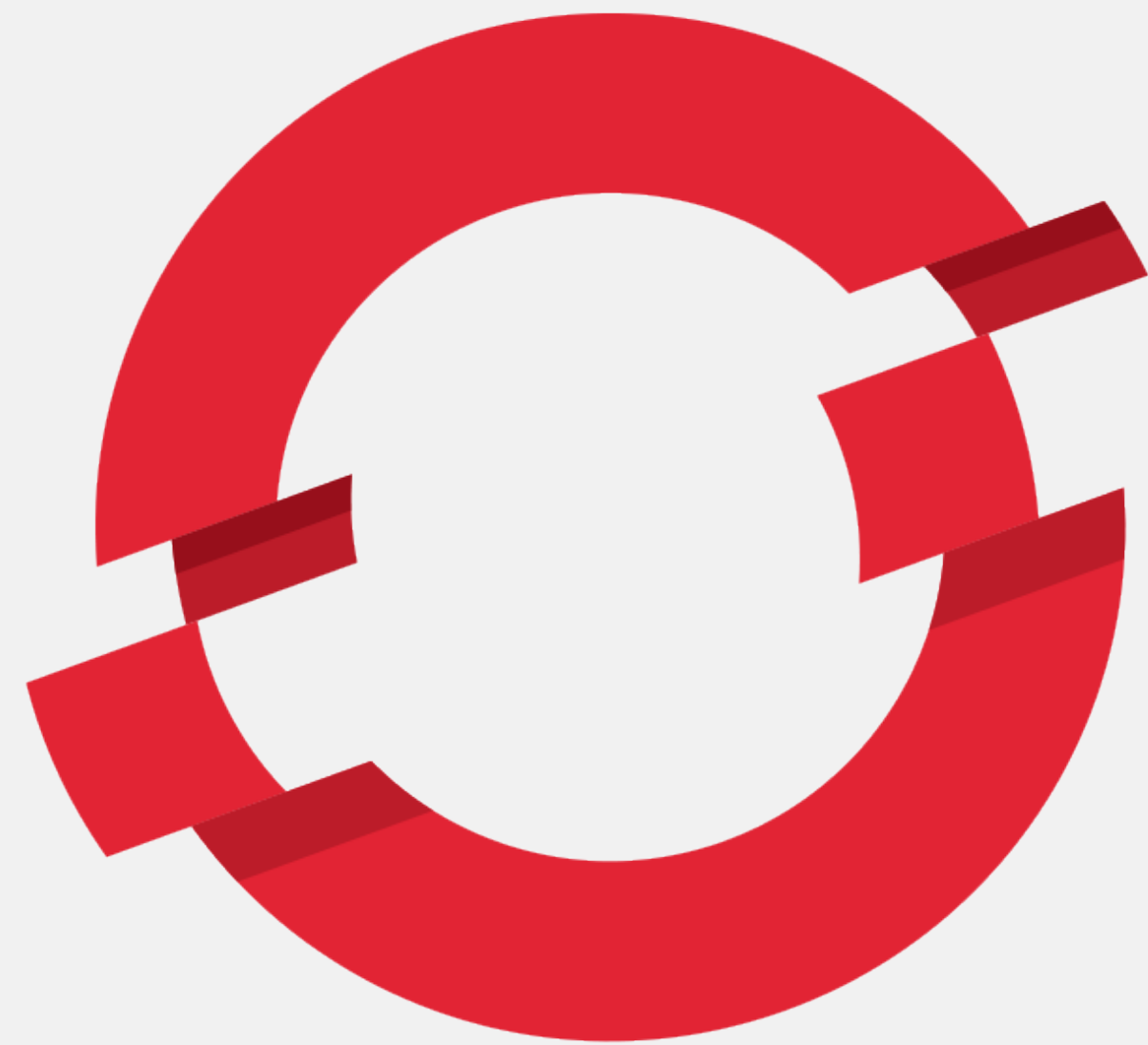
- Standard containers API
- Web-scale container orchestration & management
- Container-optimized OS
- Largest selection of supported application runtimes & services
- Robust tools and UX for Development & Operations
- Industry standard, web scale distributed application platform

# Community Powered Innovation



# Why Docker?

# OpenShift Has Always Been Built Around Containers



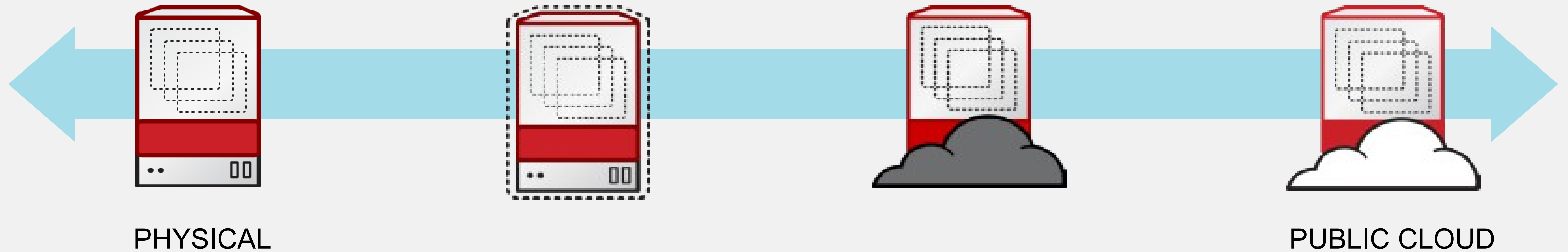
**OPENSHIFT**<sup>®</sup>  
by Red Hat<sup>®</sup>

## Why?

- Deploy applications faster
  - Enables a better developer experience
- Lower infrastructure costs
  - Greater application density per VM, less machines we have to pay for
- Increase operational efficiency
  - Fewer machines to secure & manage (provision, patch/update, monitor, etc.)

# Docker + Red Hat Enable Hybrid Cloud Portability


Application portability



# Docker Brings Huge Community Ecosystem

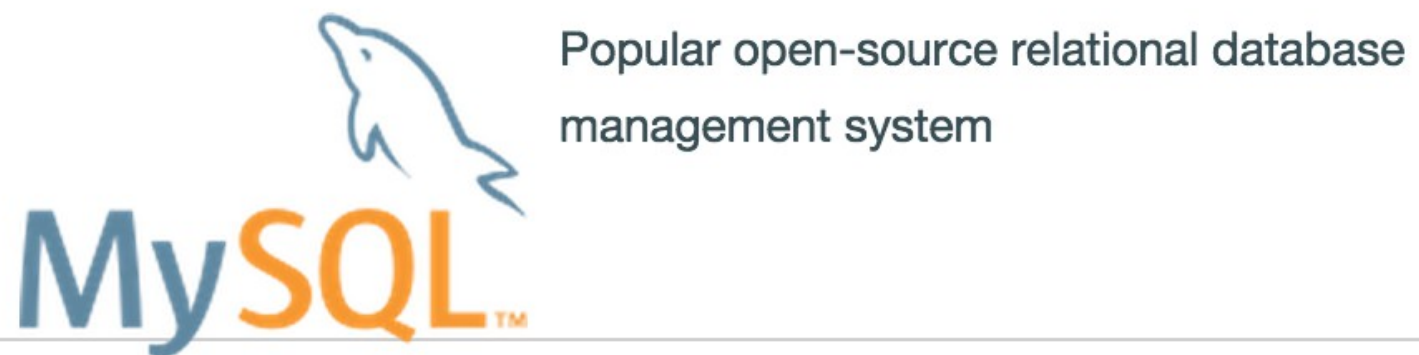
## Official Repositories



**ubuntu**  The Official Ubuntu base image



WordPress is a free and open source blogging tool and a content management system



Popular open-source relational database management system



Document-oriented NoSQL database



Official CentOS base image



High performance reverse proxy server



Relational database management system

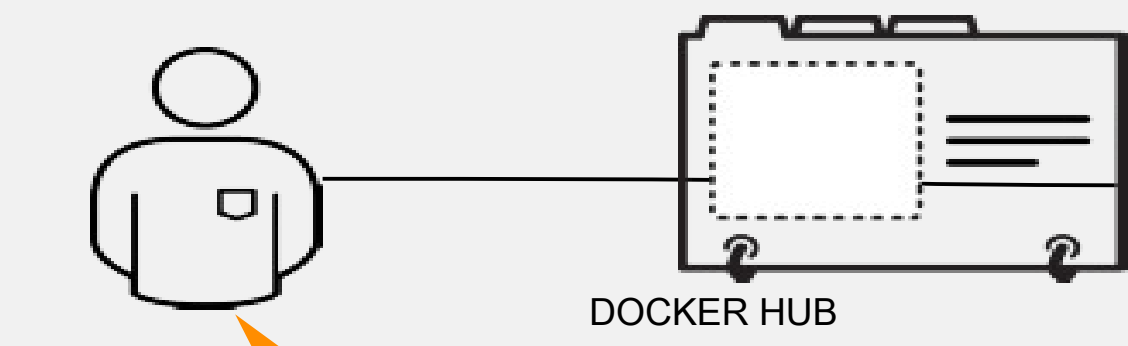


Node.js is a platform for scalable server-side and networking applications

## Top Contributors

## Popular Repositories

# How Do You Ensure Content Is Trusted?



docker search mongodb

- Who built this image?
- What's its purpose? Was it created to support a demo?
- Is it safe to consume?
- Who maintains it?

A screenshot of the Docker Hub website showing search results for 'mongodb'. The search bar contains 'mongodb' and a yellow warning triangle icon is overlaid on the search bar. The results list several repositories:

Repository	Age	Stars	Downloads
tutum/mongodb	18 days ago	23	17154
cpuguy83/mongodb	5 days ago	2	16882
tianon/mongodb-mms	2 days ago	0	131
mminke/mongodb	2 months ago	1	29
waitingkuo/mongodb	a year ago	4	1290

# Simplifying Container Adoption

RED HAT CONNECT  
for technology  
partners



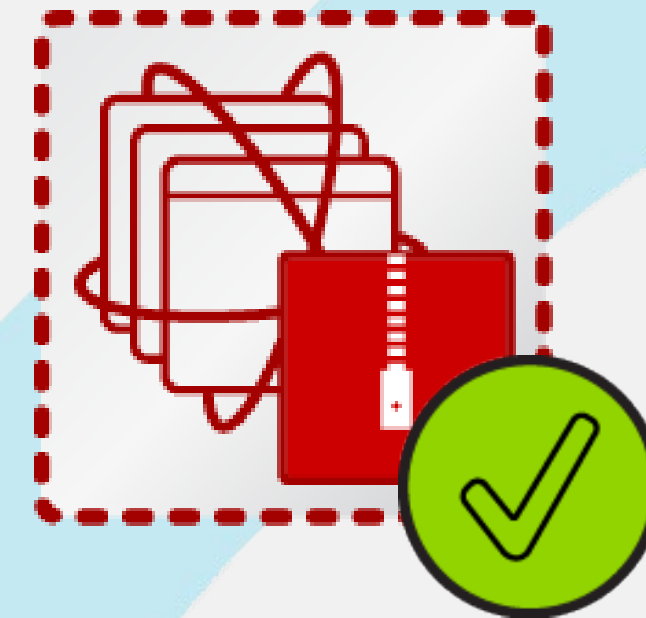
LEARN

RED HAT CONTAINER  
DEVELOPMENT  
KIT (CDK)



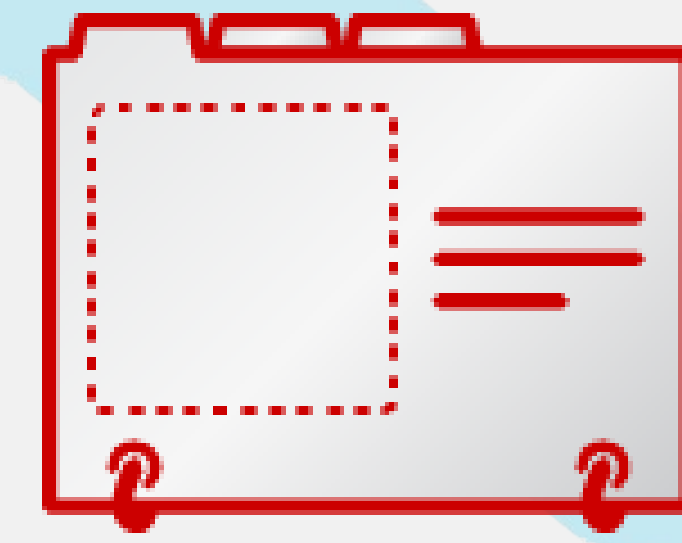
BUILD

RED HAT  
CONTAINER  
CERTIFICATION



CERTIFY

RED HAT  
CONTAINER  
REGISTRY



DISTRIBUTE

# Driving Container Standards

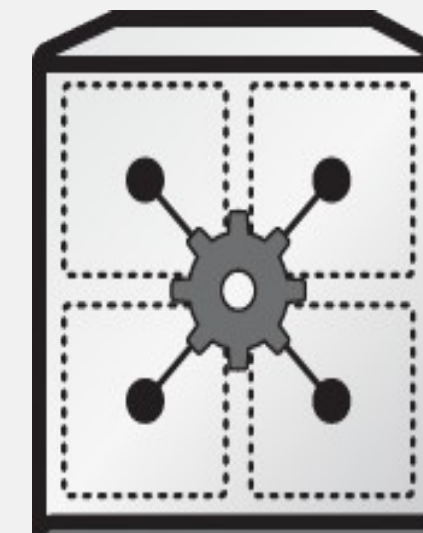
Red Hat works with the open source community to drive standards for containerization.



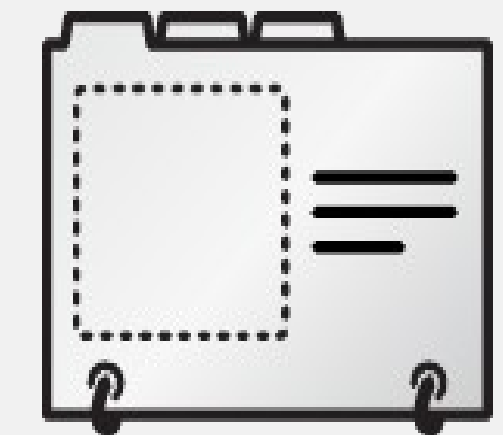
ISOLATION WITH  
LINUX CONTAINERS



CONTAINER FORMAT  
WITH DOCKER



ORCHESTRATION WITH  
KUBERNETES



CONTAINER DISCOVERY  
VIA REGISTRY

# Demo 1

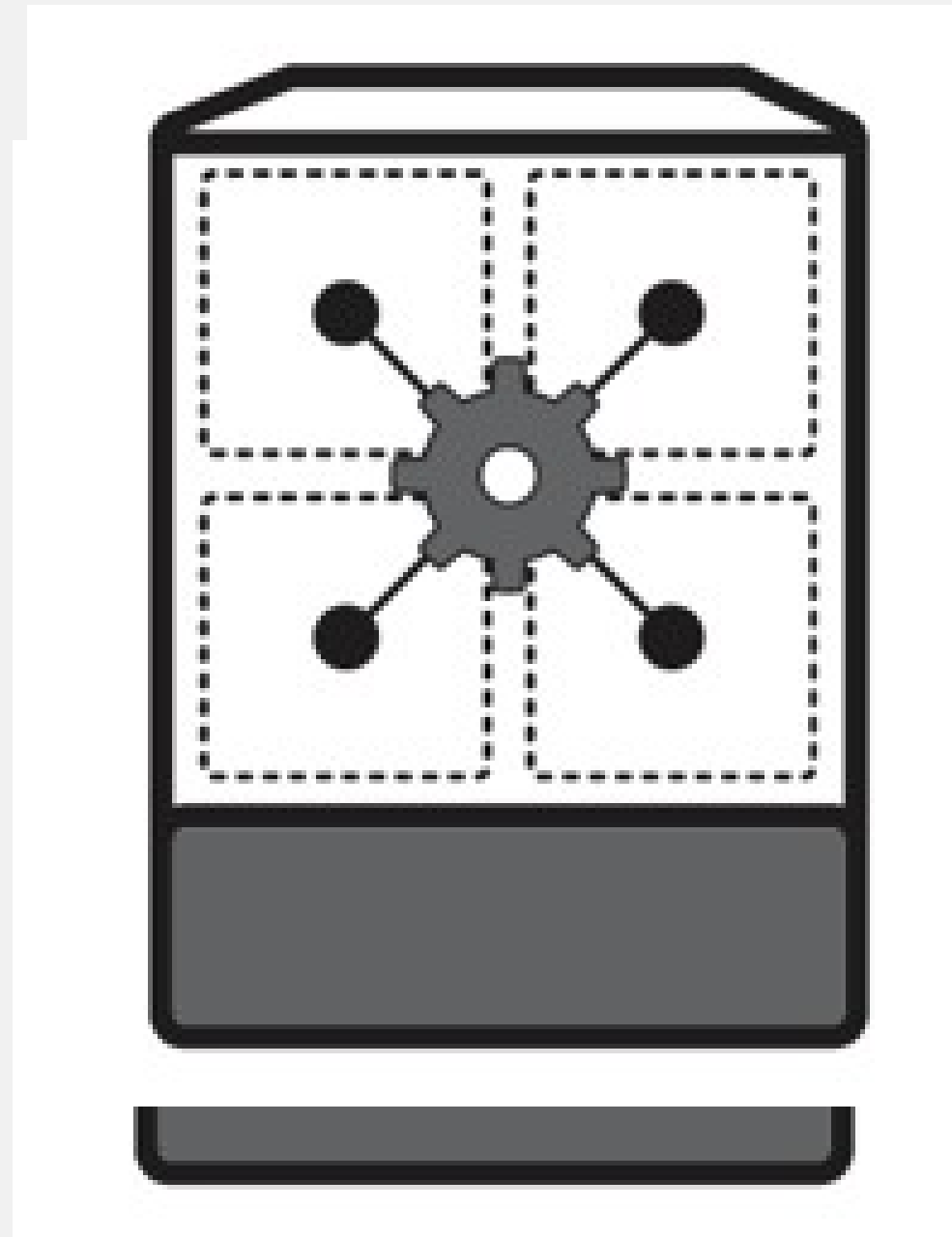
# Why Kubernetes?

# Need To Manage Lots Of Containers



**“I've got a single container working, but it looks like I'm going to need more. A LOT MORE!”**

# Container Orchestration and Management

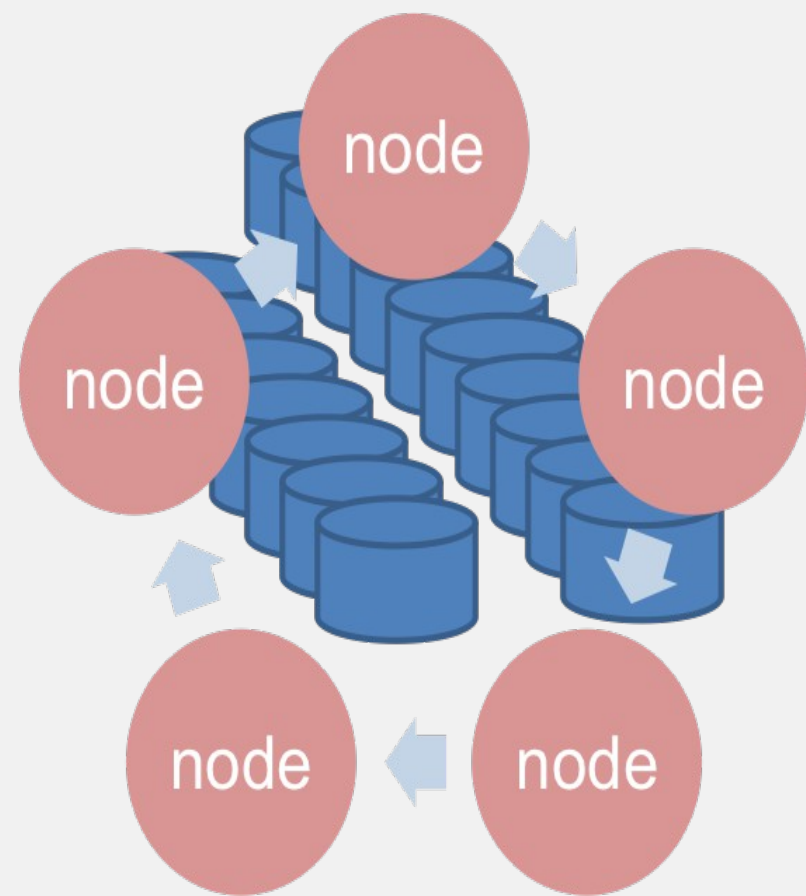


- Orchestration of application services that span multiple containers
- Scheduling and placement of containers across multiple hosts
- Management of container health to detect and automatically restart containers on failure

# Container Networking & Storage for Stateful Services

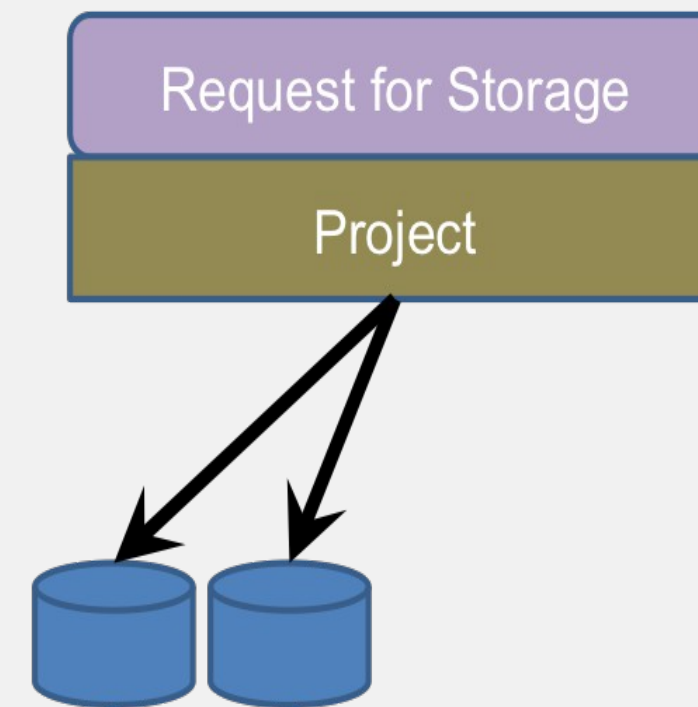
## Define Storage Volumes

- NFS supported & iSCSI, Gluster, Ceph, others coming soon



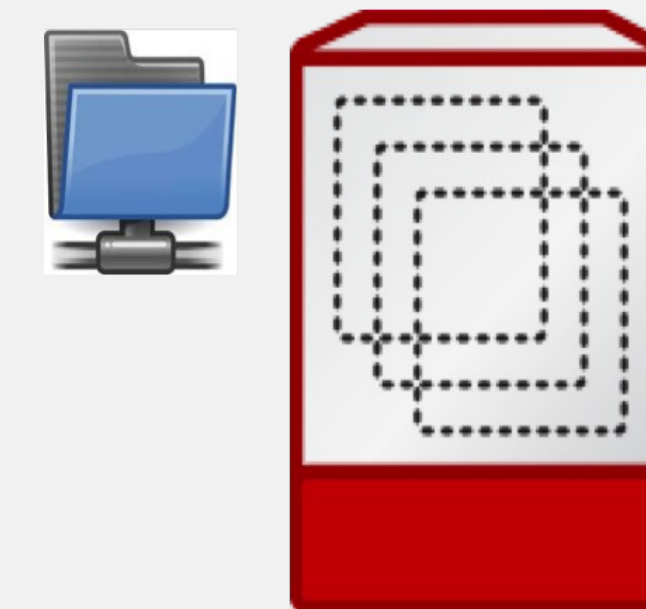
## Manage Volume Claims

- Enabled for user projects / namespaces in OpenShift

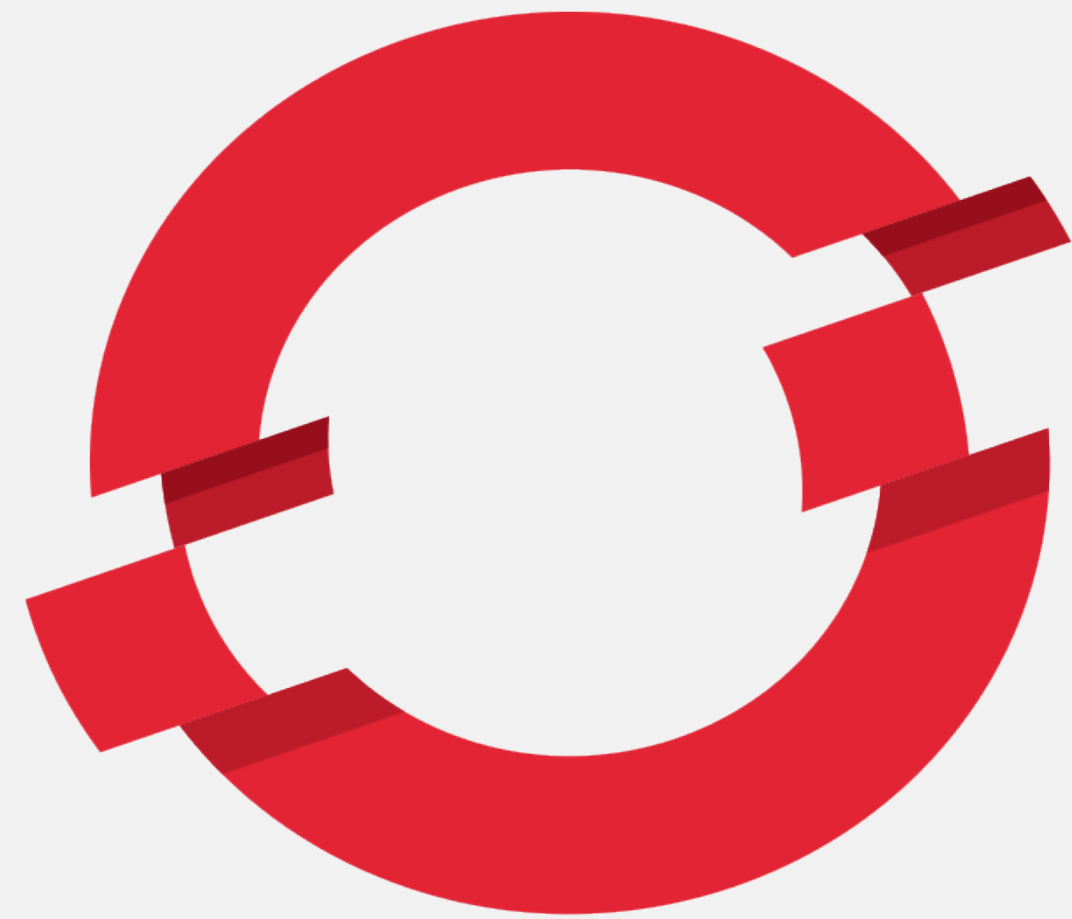


## Map Volumes to Pods

- Using Kubernetes storage volume mounts for pods



# Driving and Adopting Best of Breed Solutions



**OPENSIFT**<sup>®</sup>  
by Red Hat<sup>®</sup>

Google Cloud Platform Container Engine X Search this site

Why Google Products Solutions Launcher Pricing Customers Documentation Support Partners

## Container Engine **Alpha**

Run Docker containers on Google Cloud Platform, powered by Kubernetes. Google Container containers, based on declared needs, on a managed cluster of virtual machines.

[Start your free trial](#)

“Everything at Google, from Search to Gmail, is packaged and run in a Linux container.”<sup>1</sup>

- Eric Brewer, VP of Infrastructure, Google



**kubernetes**  
by Google™

<sup>1</sup> Source: <http://googlecloudplatform.blogspot.com/2014/06/an-update-on-container-support-on-google-cloud-platform.html>

# Demo 2

# Why OpenShift?

# Enabling Development and Operations

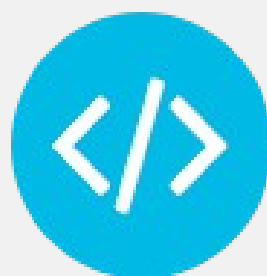
Self-Service



Standards Based



Multi-Language



Web Scale



Automation



Open Source



Collaboration



Enterprise Grade



# OPENS SHIFT<sup>®</sup>

by Red Hat<sup>®</sup>

# Self-Service for Developers

The screenshot displays the OpenShift Origin web console interface. At the top, the header shows 'OPENSIFT ORIGIN' and 'Documentation test'. Below the header, there are navigation options for 'Projects' (set to 'sample') and 'Filter by labels' (with a 'Label key' input and 'Add' button). A 'Create...' button is visible in the top right.

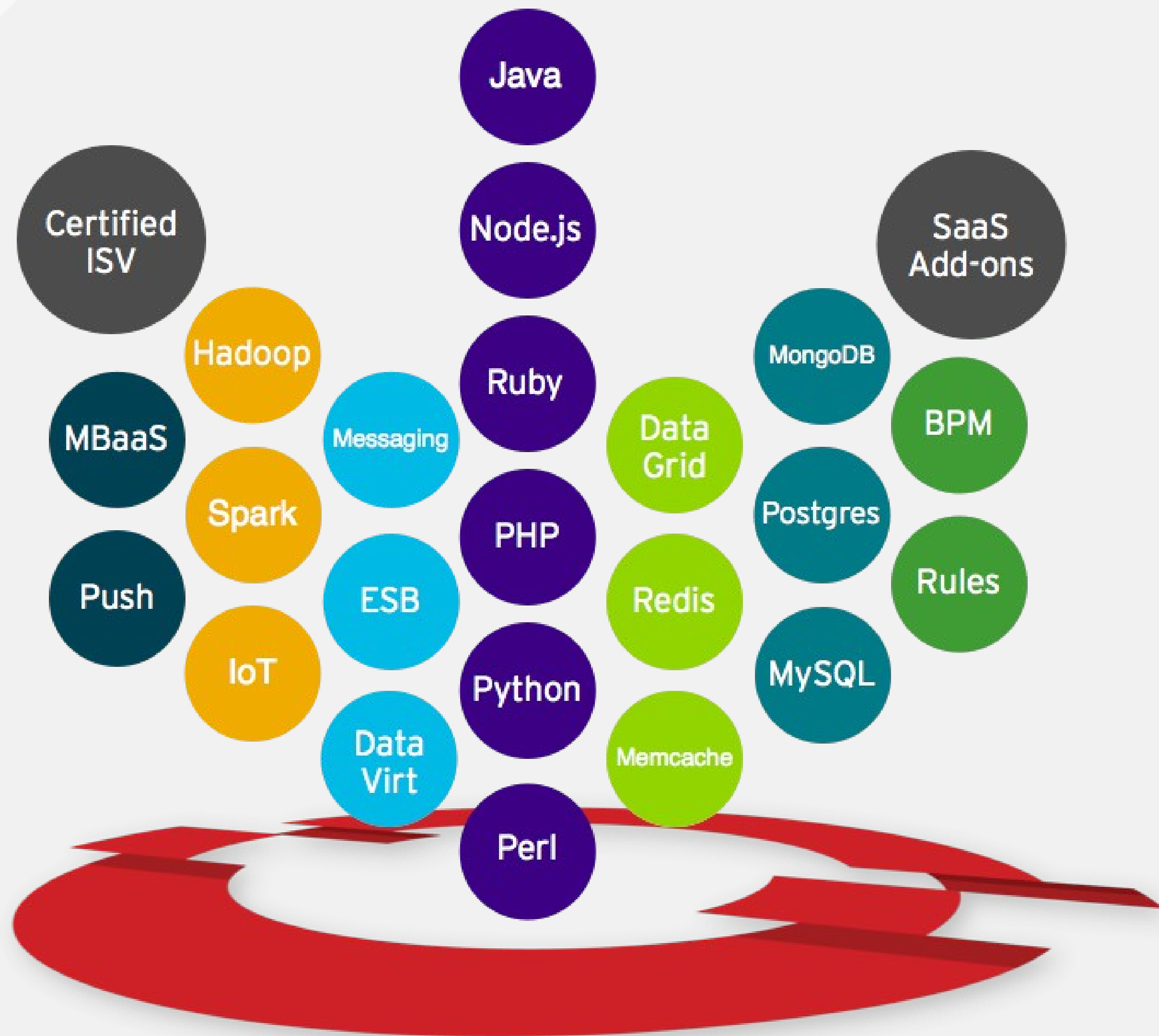
The main content area is divided into three sections:

- Overview:** Shows 'Project sample'.
- Browse:** Displays a list of services and deployments. The 'database' service is highlighted, showing it is routing traffic on 172.30.110.5 - port 5434 -> 3306 (TCP). Below it, the 'database, #1' deployment is shown as 'created an hour ago, triggered by a config change'. The pod template for 'ruby-helloworld-database' is visible, including the image 'openshift/mysql-55-centos7:latest' and port '3306 (TCP)'. A single pod is shown as 'Running' with IP 172.17.0.25.
- Settings:** Displays the 'frontend, #3' deployment, 'created 4 minutes ago, triggered by a new image for origin-ruby-sample:latest'. The pod template for 'ruby-helloworld' is shown, including the image 'sample/origin-ruby-sample (origin-rub)', build 'ruby-sample-build (ruby-sample-build-2-1432919588)', source 'Git', and port '8080 (TCP)'. Two pods are shown as 'Running' with IPs 172.17.0.46 and 172.17.0.47.

The right-hand sidebar provides details for the selected 'database' service:

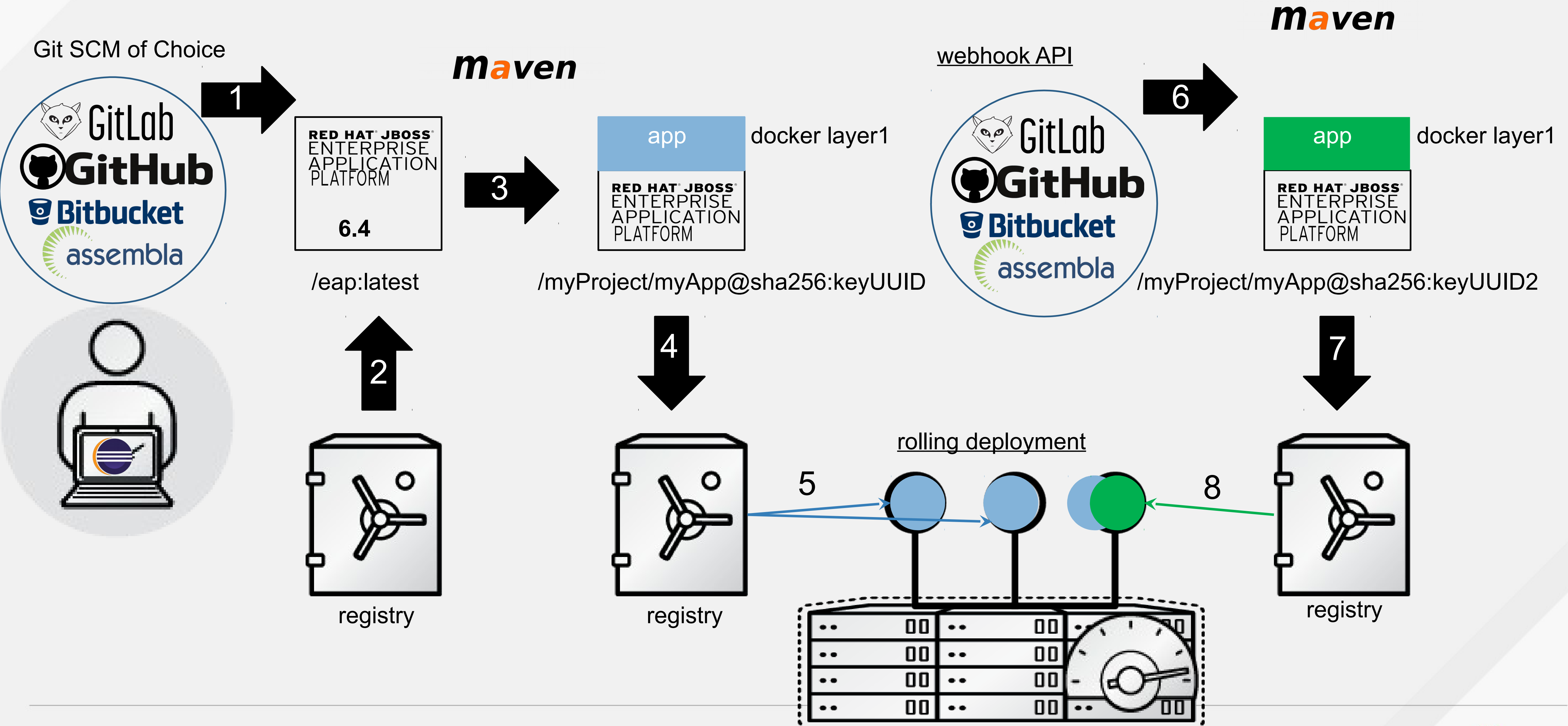
- ReplicationController:** Name: database-1, Namespace: sample, Created: May 29, 2015 11:57:55 AM, Replicas: 1.
- Selector:** deployment: database-1, deploymentconfig: database, name: database.
- Pod Template:** Restart policy: Always, DNS policy: ClusterFirst.
- Containers:** Name: ruby-helloworld-database, Image: openshift/mysql-55-centos7:latest, Ports: 3306/TCP, Env vars: MYSQL\_DATABASE=root, MYSQL\_PASSWORD=mJpCfdse, MYSQL\_USER=userJ05.
- Volumes:** none.
- Labels:** template: application-template-stibuild.
- Annotations:**

# OpenShift Application Services

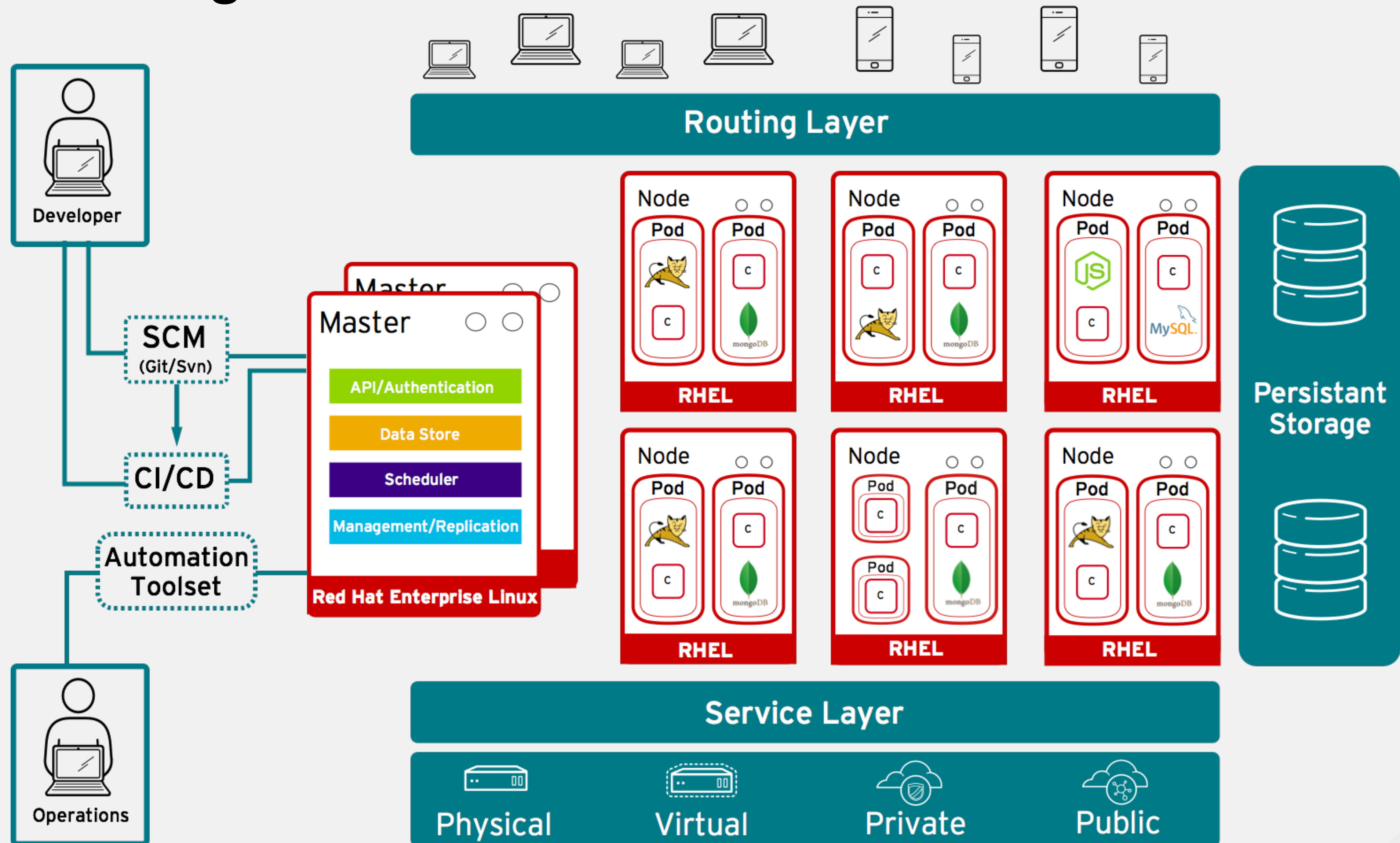


- From Red Hat
- From ISV Partners
- From the Community

# Build & Deployment Automation: Source-to-Image



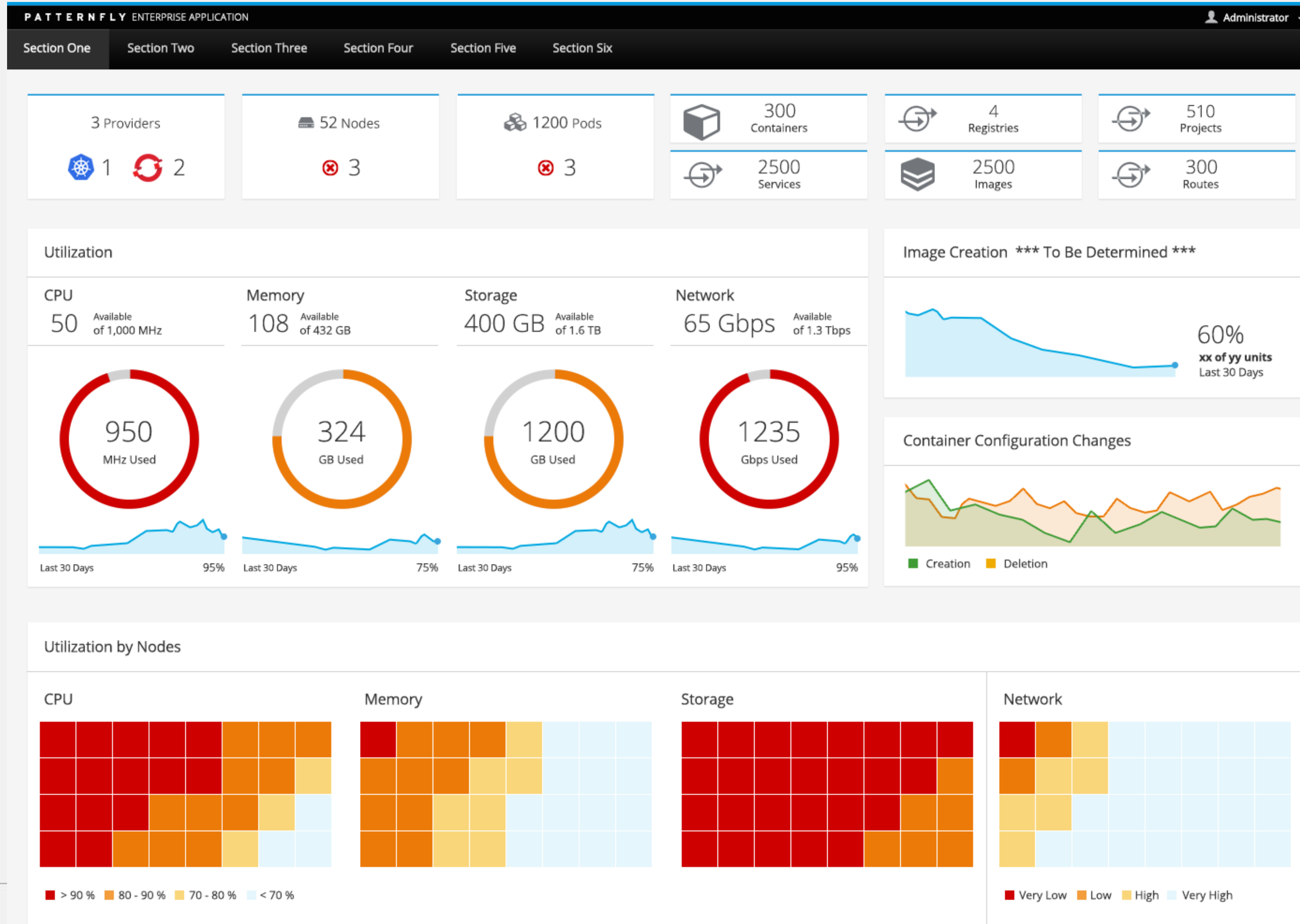
# Complete Integrated Solution



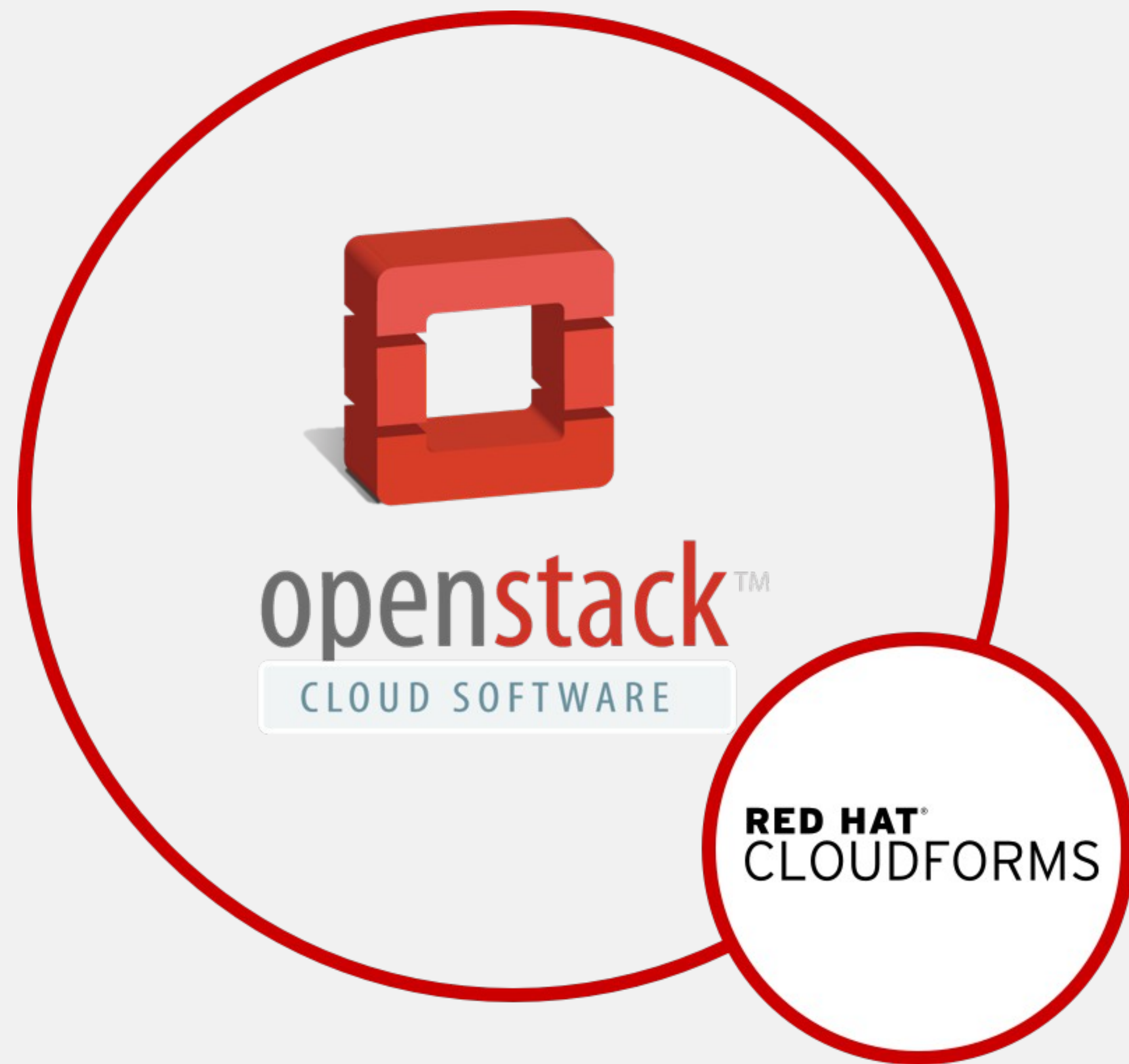
# Demo 3

# What's Next?

# Administration & Container Management with CloudForms



# Expanded OpenStack Integration



- Automating deployment of OpenShift clusters, add & remove Kubernetes Nodes
- Networking provider integration with Neutron
- Storage integration with OpenStack Cinder (Block) and Manila (File)
- Manage OpenStack and OpenShift with CloudForms

# Additional JBoss Middleware Services



## Application Container Services

- JBoss Enterprise Application Platform
- JBoss Web Server / Tomcat
- JBoss Developer Studio



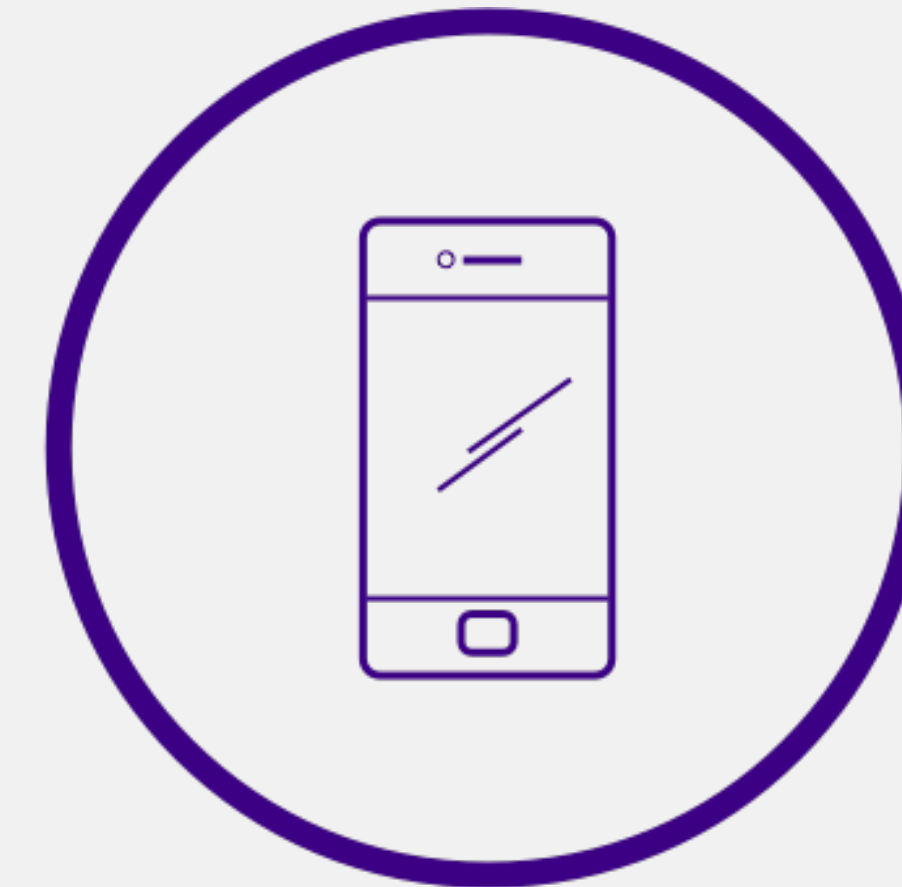
## Integration Services

- Fuse \*
- A-MQ
- Data Virtualization \*



## Business Process Services

- Business Process Management \*
- Business Rules Management System \*

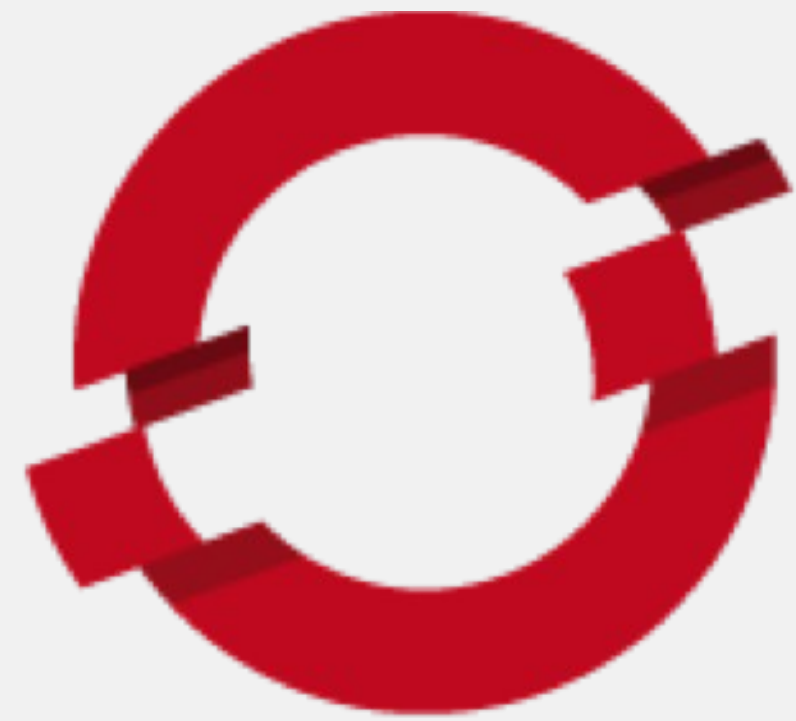


## Mobile Services

- Red Hat Mobile / FeedHenry \*

\* = Coming Soon

# OpenShift Online & OpenShift Dedicated



**OPENSHIFT**  
**ONLINE**  
by Red Hat\*



**OPENSHIFT**  
**DEDICATED**  
by Red Hat\*

- OpenShift 3 Public Cloud services managed by Red Hat
- OpenShift Dedicated - dedicated clusters (Nodes & Masters) for each customer
  - Deploy and run your applications on your own dedicated infrastructure
  - Integrate with on-premise services
  - Available now in Tech Preview
- OpenShift Online will also be migrating to v3 (1HCY2016)

# OpenShift Enterprise 3.x Enhancements



- Metric-driven autoscaling
- External service bridge/registry
- Pod/container idling
- SCL 2 image runtime version updates
- Enhanced GIT/SCM & CI integration
- User interface enhancements
- Logging & metrics analysis / ELK
- Additional storage plugins
- Networking enhancements

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