



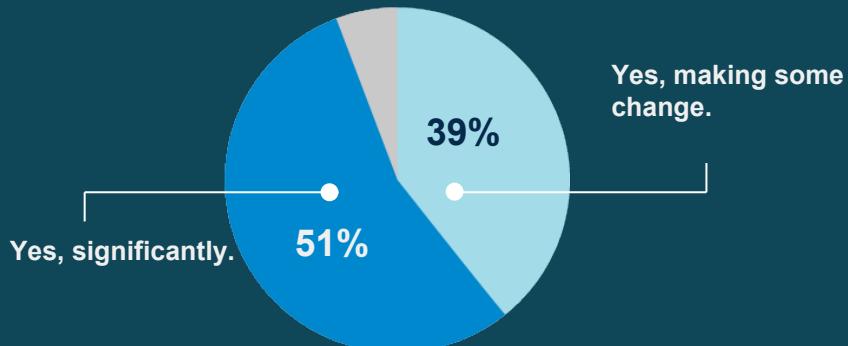
# Red Hat OpenShift

## Overview Deck

Satish Kale  
Principal Solution Architect  
January 2018



# 90% OF CEOS ARE CHANGING HOW THEY USE TECHNOLOGY



## A NEW COMPETITIVE ENVIRONMENT

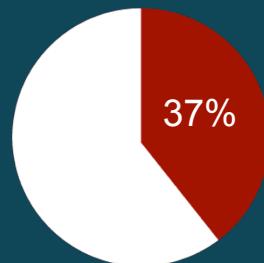


Feel they are expected to address wider stakeholder needs.



Technology is one of the top 3 influencers transforming stakeholder expectations for the business

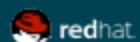
## EXPECTED DIGITAL BUSINESS REVENUE



CIOs expect digital revenue to grow from 16% to 37% in the next 5 years.

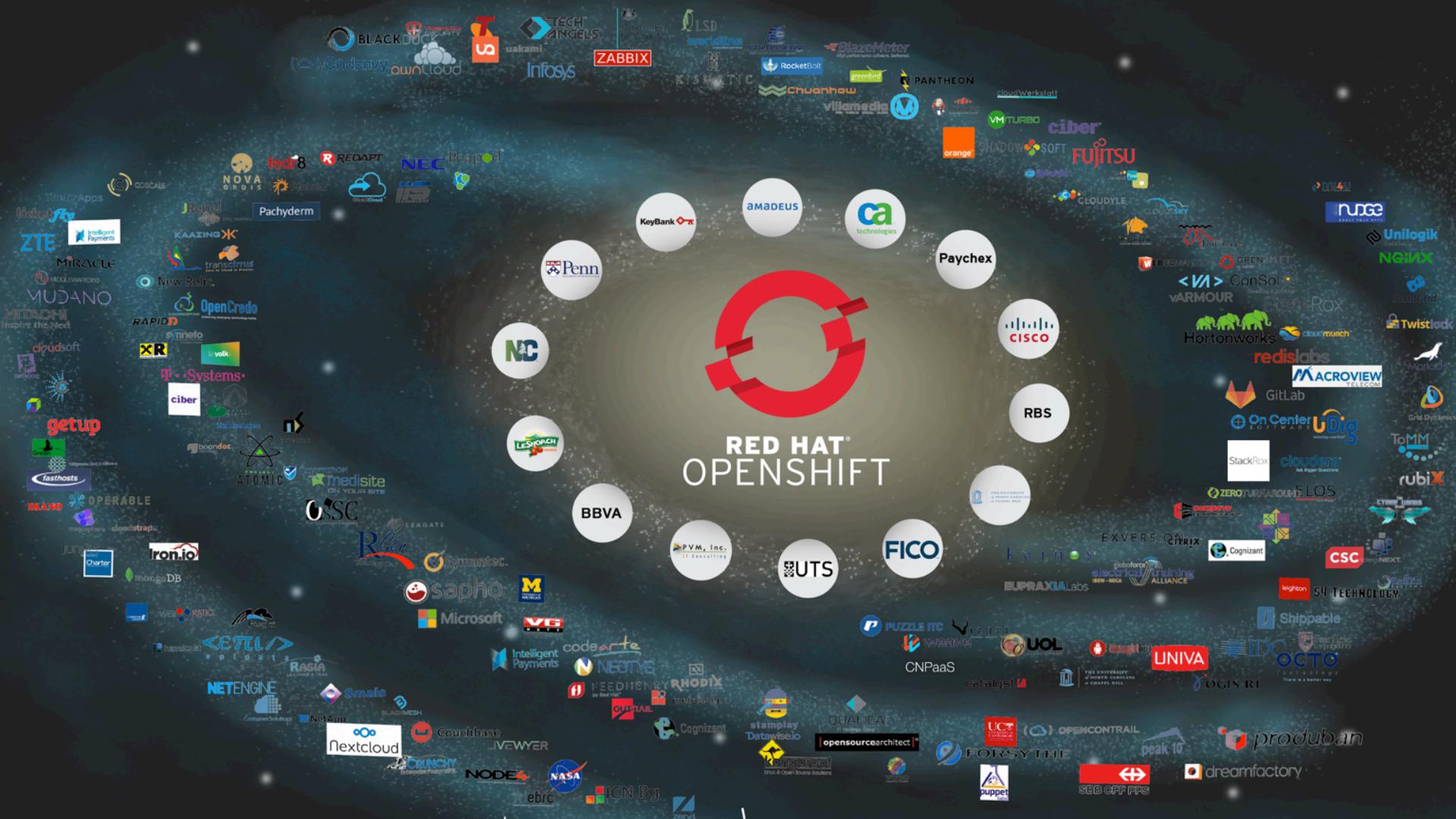
Source:

[Survey of 1,409 CEOs in 83 countries by PricewaterhouseCooper, 19th Annual Global CEO Survey, January 2016, http://www.pwc.com/gx/en/ceo/surveys/2016/global-ceo-survey-19th-annual-global-ceo-survey-january-2016.pdf](http://www.pwc.com/gx/en/ceo/surveys/2016/global-ceo-survey-19th-annual-global-ceo-survey-january-2016.pdf)





RED HAT®  
OPENSHIFT



# How do you enable Digital Transformation?

It requires an evolution in....



## Applications

New ways of developing,  
delivering, and  
integrating applications



## Infrastructure

Modernize existing and  
build new cloud-based  
infrastructure

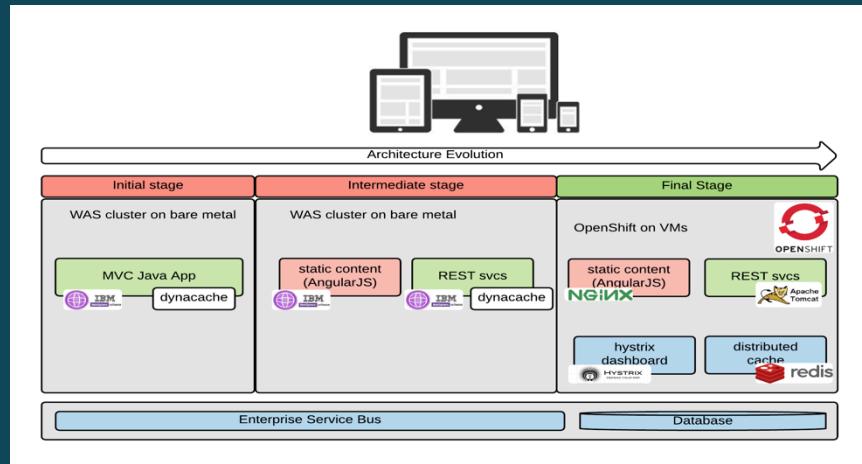


## Process

More agile process  
across both IT and  
the business

# Application Architecture

- Shift from monolithic applications to microservices
- Independently deployable and updatable, limited dependencies
- Optimized for agility & accelerated time to market



# Evolving Application Architecture at Volvo

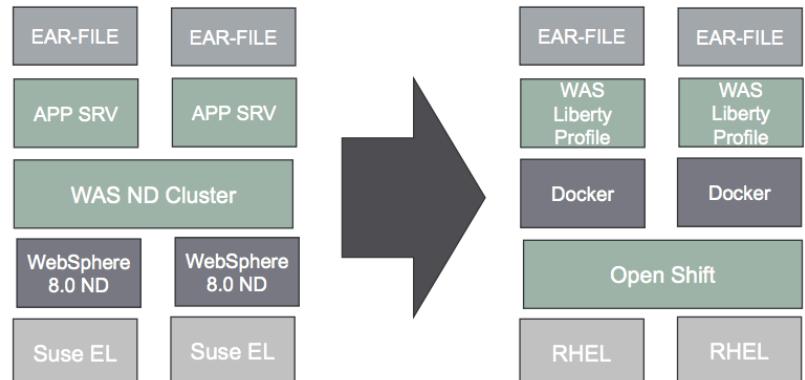
785 apps across 560 app servers

OpenShift provides build, distribution & runtime environment

Platform for DevOps and Microservices

Running OpenShift on Azure,  
automatically provisioned with  
Ansible

## OUR NEW ENVIRONMENT



The background image shows an aerial view of a large airport terminal and runway. Numerous aircraft are parked at gates or on the tarmac. The word "AMADEUS" is overlaid in large blue capital letters across the top left.

AMADEUS



Datacenter



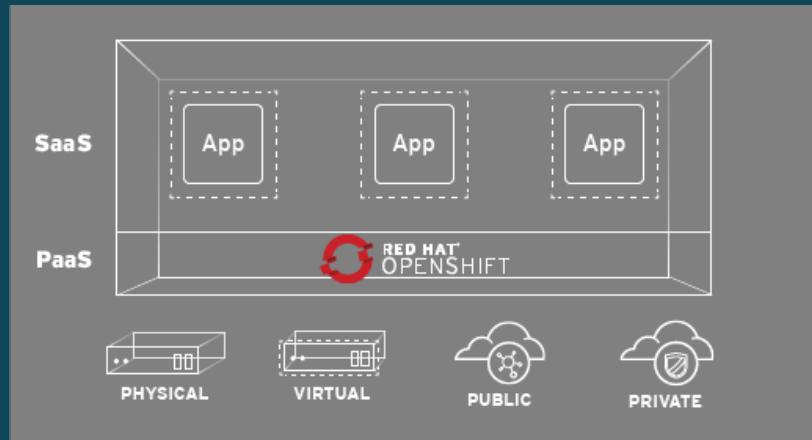
Hosted



Hybrid

# Platform Infrastructure

- Shift from virtualization to scale-out cloud infrastructure
- Rapid growth in public cloud usage for enterprises
- Hybrid cloud deployments span private & multiple public clouds



# EdLogics Migrated to a Dedicated Containerized Cloud Infrastructure



Faster time to market.

Greater cost-efficiency and reliability through a multi-tenant, dedicated cloud.

Scalability to support rapid growth.

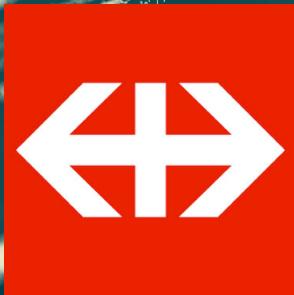
Compliance with key regulations, such as HIPAA and FedRamp.

Business continuity through resiliency and failover capabilities.

Tools and automation to support a DevOps approach to software development and delivery

# Development Process

- Shift to more agile development and deployment processes
- Increased collaboration between Development & Operations
- Move from Continuous Integration to Continuous Deployment



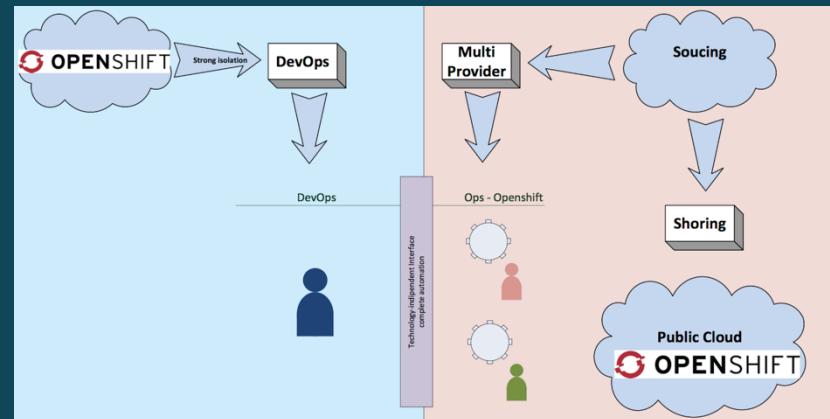
Waterfall



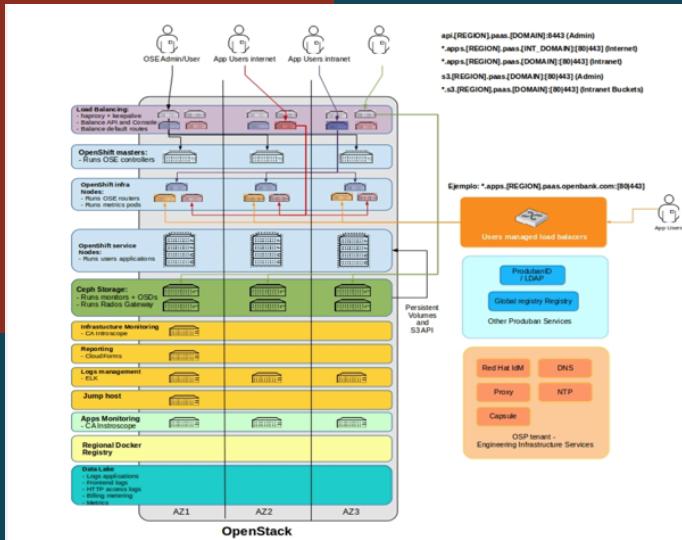
Agile



DevOps



# Evolving Development Process at Produban (Santander Bank)



Increased collaboration between Dev and Ops

Reduced deployment time & improved time to market

Automated deployment tasks, reduce failures

Provide a global service to reduce infrastructure and operation costs.

Enabled continuous software delivery & reduced resolution time of problems

# Evolving Development Process at Airbus

## Expectations

Rapid application development & deployment in the Cloud

Optimized resources usage with better application scaling

## Solution

Deployed OpenShift for Java & PHP

Based on container technology to fully support multiple languages, databases..

Integrated with existing lifecycle solutions

## Results

Deliver quicker with a higher user satisfaction

Reduce recurring and nonrecurring costs

Open Source & DevOps are accelerators to increase collaboration



*Continuous tuning & fortnightly release*



# Containers Transform



# What Are Containers?



*It Depends on Who You  
Ask*

## Sys-Admins / Ops

- Sandboxed application processes on a shared Linux OS kernel
- Simpler, lighter, and denser than virtual machines
- Portable across different environments

## Developers

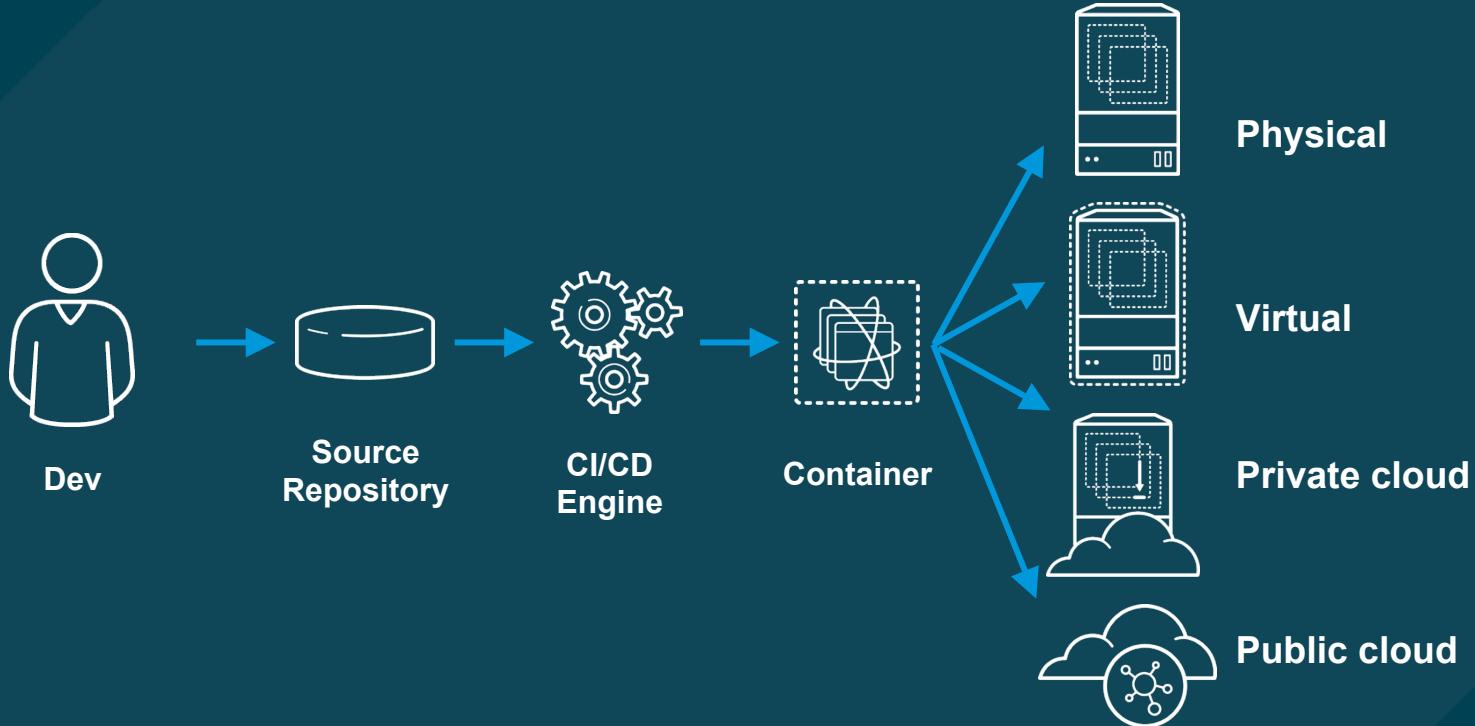
- Package my application and all of its dependencies
- Deploy to any environment in seconds and enable CI/CD
- Easily access and share containerized components

# Containers - An Evolution in Application Deployment

- Enable efficiency and automation for microservices, but also support traditional applications
- Enable faster and more consistent deployments from Development to Production
- Enable application portability across 4 infrastructure footprints: Physical, Virtual, Private & Public Cloud



# DevOps With Containers Across the Hybrid Cloud?



# The Business Benefits Of Containers



5 year  
ROI  
**531**  
%



Average Annual  
Benefits per 100  
Developers  
**\$1.29M**



Payback  
Period  
**8 Months**

# Critical features for both Dev and Ops

Self-Service



Multi-language



Automation



Collaboration



Seamless



RED HAT<sup>®</sup>  
OPENSHIFT



Standards-based



Web-scale



Open Source



Enterprise  
Grade



Secure

# Trusted Container OS



## Enterprise Container Host

Container Runtime & Packaging  
(Docker)

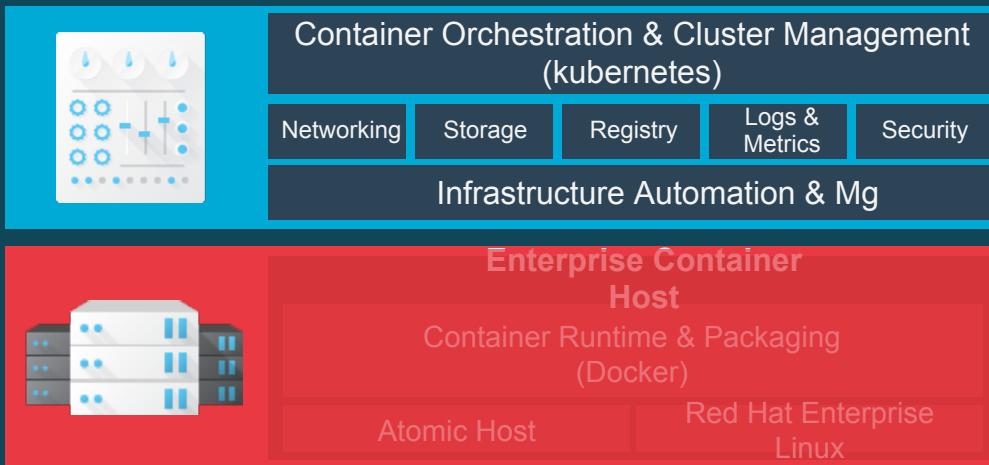
Atomic Host

Red Hat Enterprise Linux

Trusted by Fortune Global  
500 companies



# Enterprise Kubernetes

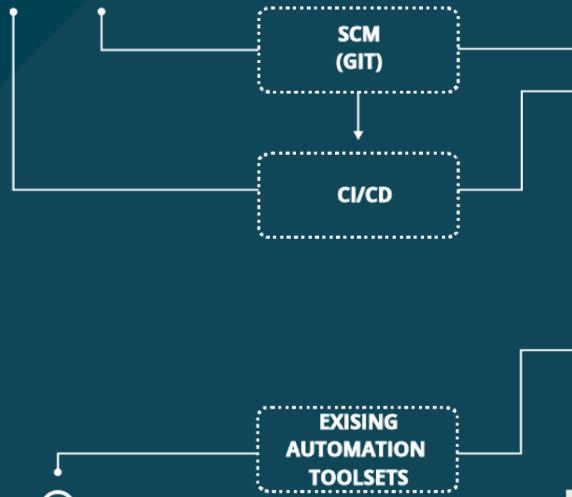


**kubernetes**  
Cloudforms  
Red Hat  
Storage

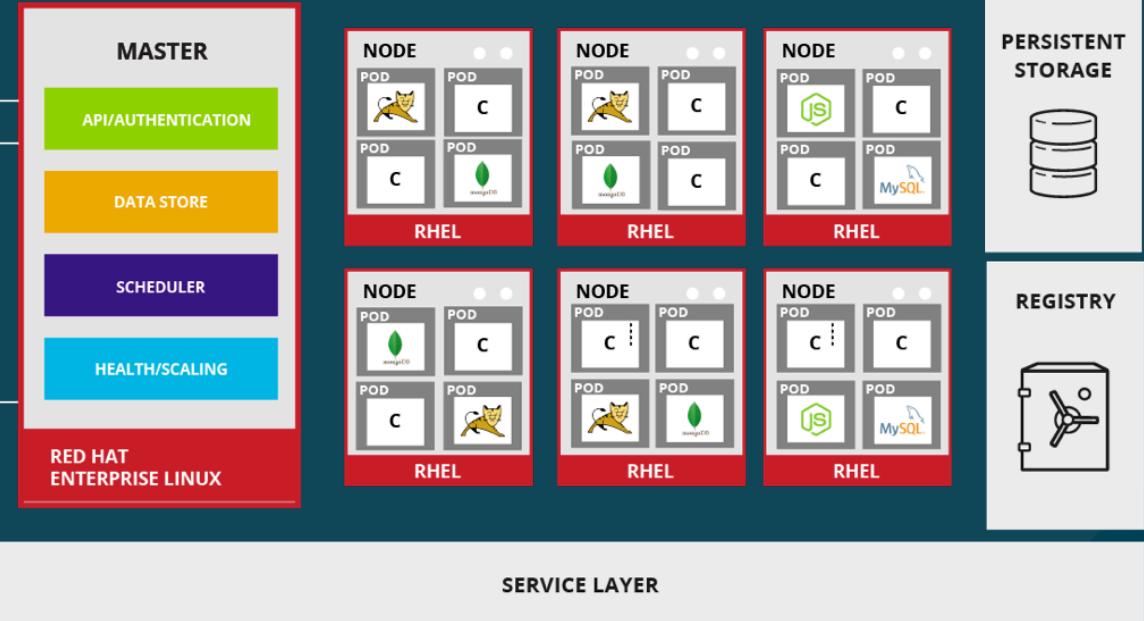
# 10,000 foot overview



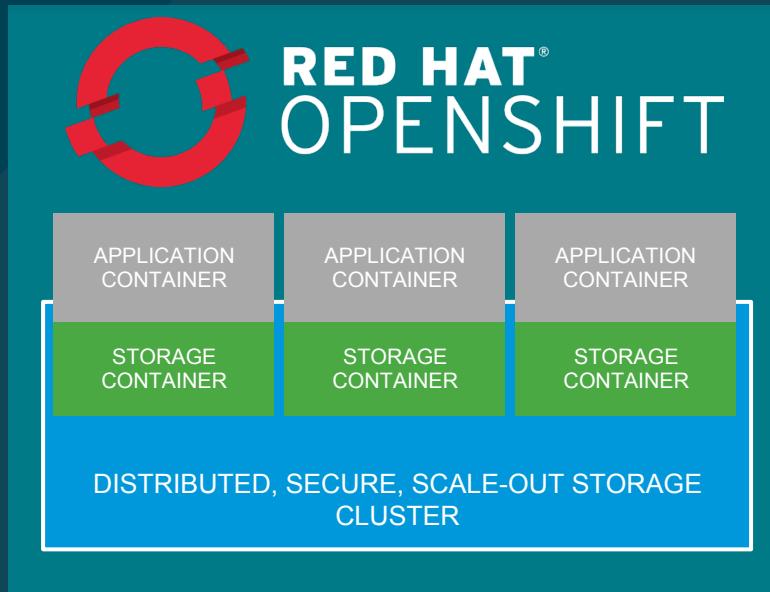
DEVELOPER



OPERATIONS

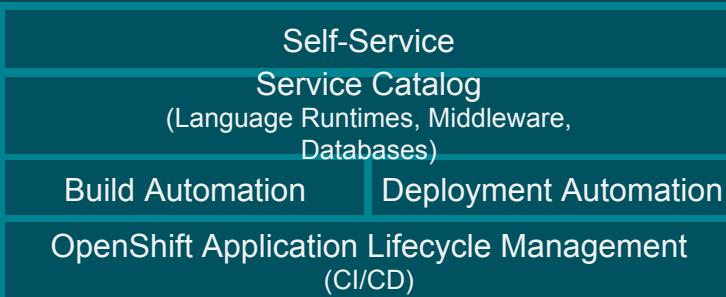


# Container-Native Storage for OpenShift



- Containerized Red Hat Gluster Storage
- Native integration with OpenShift Container Platform
- Unified Orchestration using Kubernetes for applications and storage
- Greater control & ease of use for developers
- Lower TCO through convergence
- Single Vendor Support

# Enterprise Container Platform



**Source-2-Image  
Application Pipelines  
Dev Tools**

# Source 2 Image Walk Through

Code



git



DEV

Build

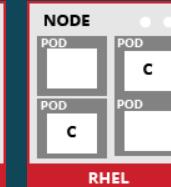
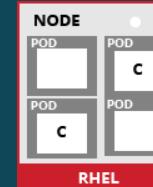
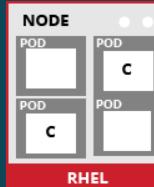


Container  
Image



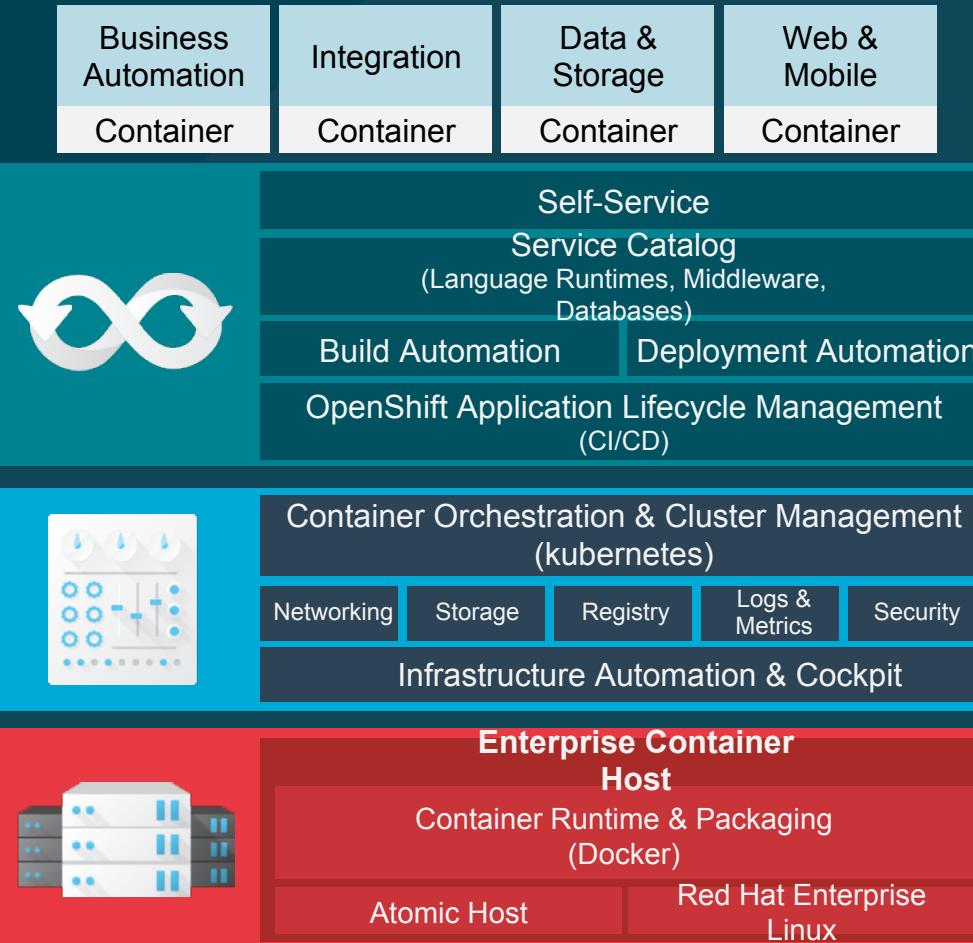
Registry

Deploy



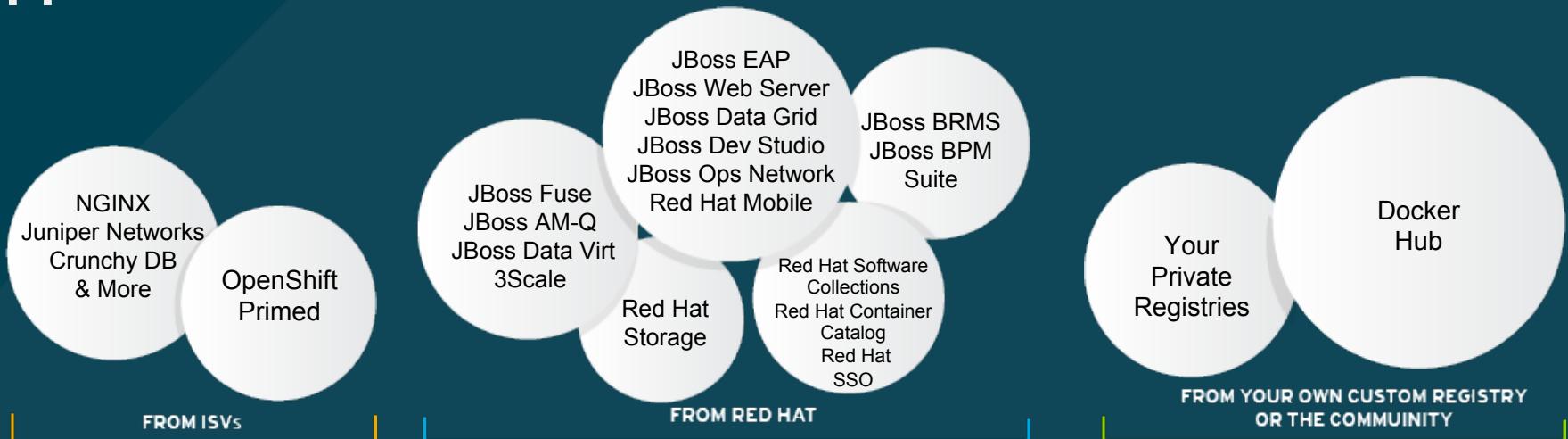
OPS

# Traditional, Stateful, and Microservices-based Apps



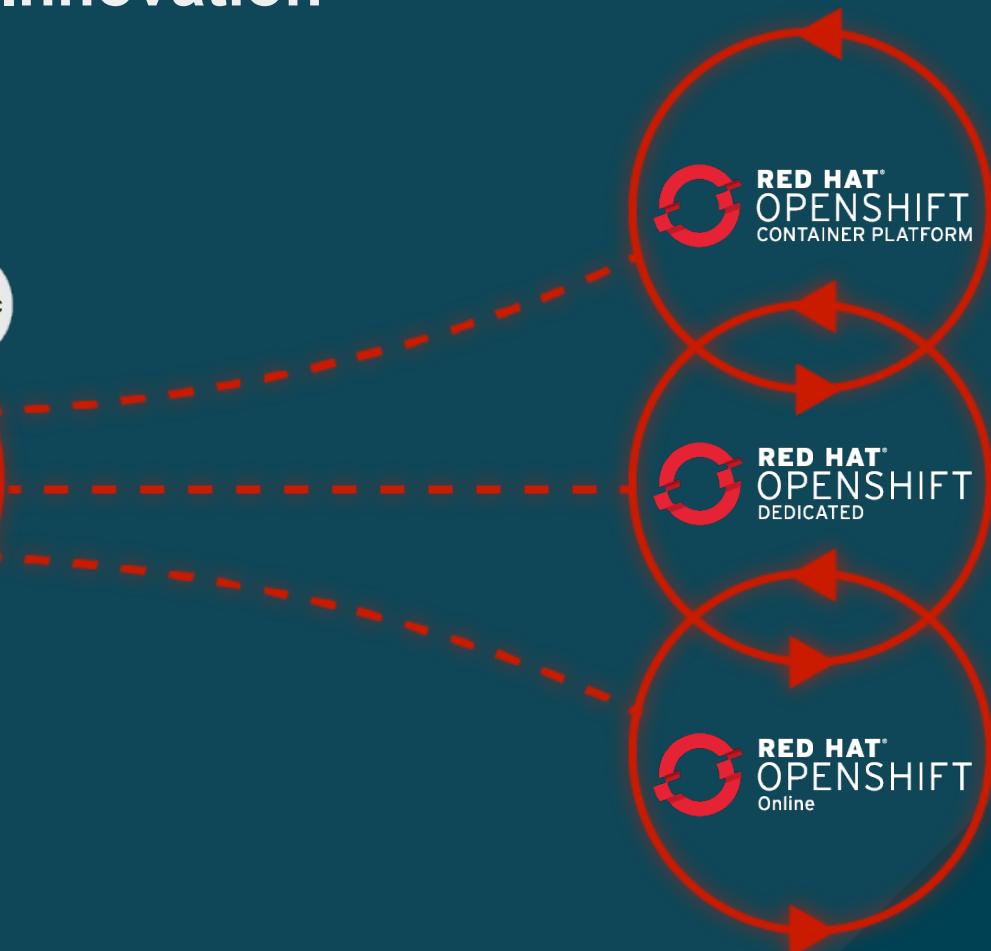
**JBOSS EAP**  
**JBOSS DATA GRID**  
**JBOSS DATA VIRTUALIZATION**  
**JBOSS AM-Q**  
**JBOSS BRMS**  
**JBOSS BPM**  
**JBOSS FUSE**  
**RED HAT MOBILE**  
**3 Scale**

# Application Services



RED HAT®  
OPENSHIFT

# Community Powered Innovation



# Facilitating A Rich Container Ecosystem



Represented by a broad coalition of industry leaders focused on common standards for software containers



Create and drive the adoption of a new computing paradigm that is optimized for modern distributed systems



# OpenShift Quotes



"At Amadeus we want to continue to get much closer to our customers from a technological standpoint; to deliver applications more quickly, and to provide a much more flexible platform that can adapt to change easily and can accommodate different business models in the process. Although we are still in the early stages of deployment, we have seen already that the flexibility of the OpenShift platform and the support we have received from Red Hat has allowed us to begin to take our application to the next level and expand it to a wider customer base."

- DIETMAR FAUSERVP ARCHITECTURE, QUALITY AND GOVERNANCE AT AMADEUS

"With OpenShift Dedicated and Drupal, we can get a lot done without the cost of the additional full-time employees we would have needed to have it all on-premise," said Hylton."

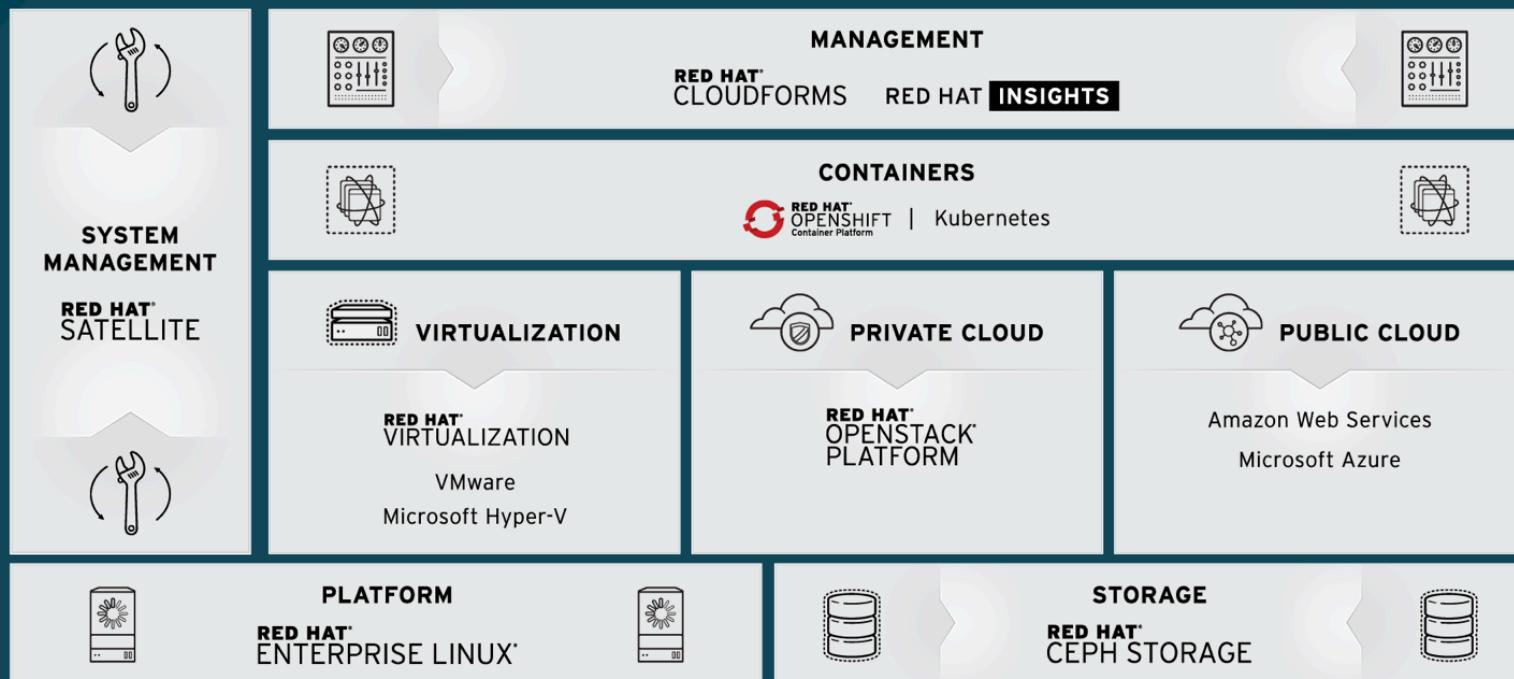
- BILLY HYLTON DIGITAL SERVICES DIRECTOR, STATE OF NORTH CAROLINA

"This collaboration agreement with Red Hat will help us to capitalize on the opportunities offered by cloud computing technologies, in order to continue making strides in our process of becoming a more flexible and scalable digital bank."

- RICARDO MORENO HEAD OF ENGINEERING, AT BBVA

# Comprehensive Cloud Suite

## RED HAT<sup>®</sup> CLOUD SUITE



CL0074-01



# Red Hat Open Innovation Labs

## MODERNIZE TRADITIONAL APPS

- Extend applications
- Optimize applications
- Scale applications
- Expose to orchestration

## INNOVATION ACCELERATED

## DEVELOP CONTEMPORARY APPS

- Develop on PaaS environment
- Transform how you design and develop apps
- Adopt lean and agile principles
- Master DevOps practices



### COLLABORATION

Space to work,  
innovate, and discuss



### RESIDENCY

An eight-week accelerated  
teaming engagement



### COMMUNITY INCUBATION

Communities  
supporting innovation

# Consulting - Smart Start

MODERNIZE APPLICATION DELIVERY WITH CONTAINER  
Infrastructure      DevOps      Applications

**Program  
increment 0**  
Smart Start

Discover

Discovery Session

Design

Container Platform Smart Start

Container Platform Design Workshop

**Program  
increment 1**  
Groundwork

Discover  
Design  
Deploy

Operationalizing  
container  
platforms

Continuous  
delivery

Container adoption for  
application development

**Program  
increment 2**  
Automation

Discover  
Design  
Deploy

Container-  
driven  
continuous  
delivery

Migrating  
workloads to  
containers

Microservice  
development  
for container  
platforms

**Program  
increment 3**

Discover  
Design

redhat



## Enterprise Public Cloud

The power and flexibility of your own scalable OpenShift 3 cluster, installed and backed by the experience of Red Hat Engineering, Operations, and Support.

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



# Get Involved With Zero Commitment



Quickly build, host, and scale containerized applications in the public cloud, operated and supported by Red Hat.

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



Where users, partners, customers, and contributors come together to collaborate and work together on OpenShift.

<https://commons.openshift.org/>



Origin is the upstream community project that powers OpenShift.

<https://openshift.org/>



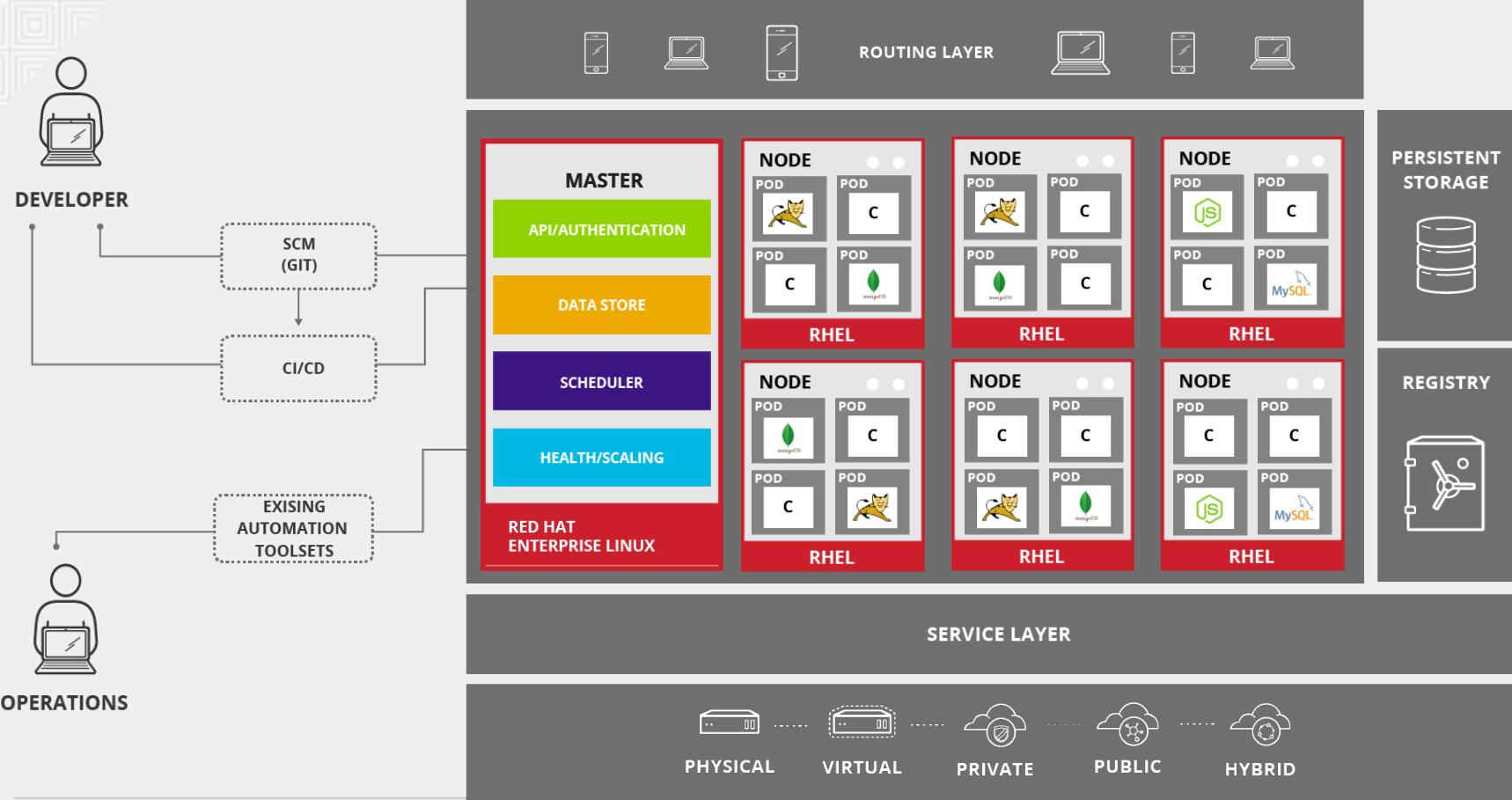
A photograph of a large stack of shipping containers in a port terminal. The containers are stacked high, filling the frame. In the background, industrial structures like cranes and other shipping containers are visible under a clear sky.

# OpenShift

Architecture Overview



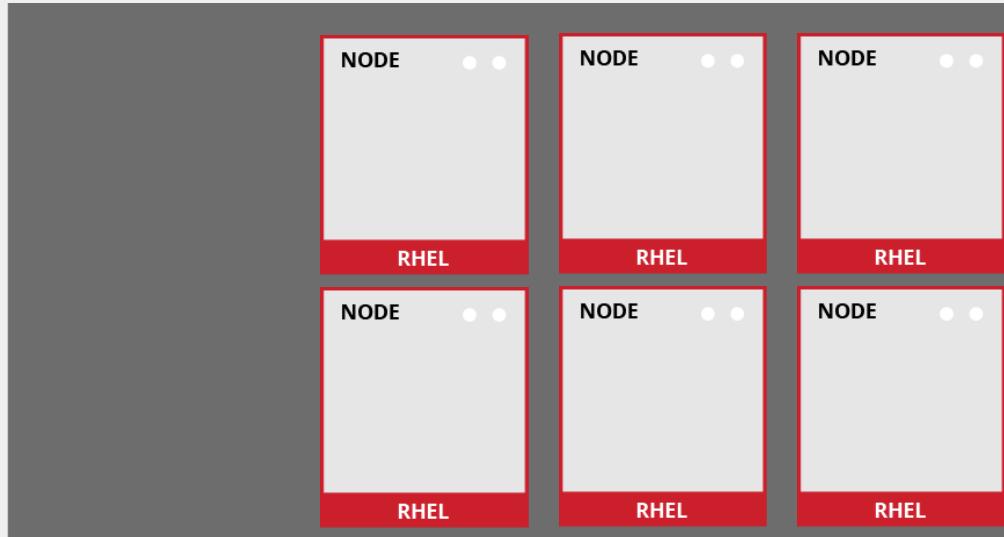
# 10,000 foot overview



# OpenShift runs on your choice of infrastructure



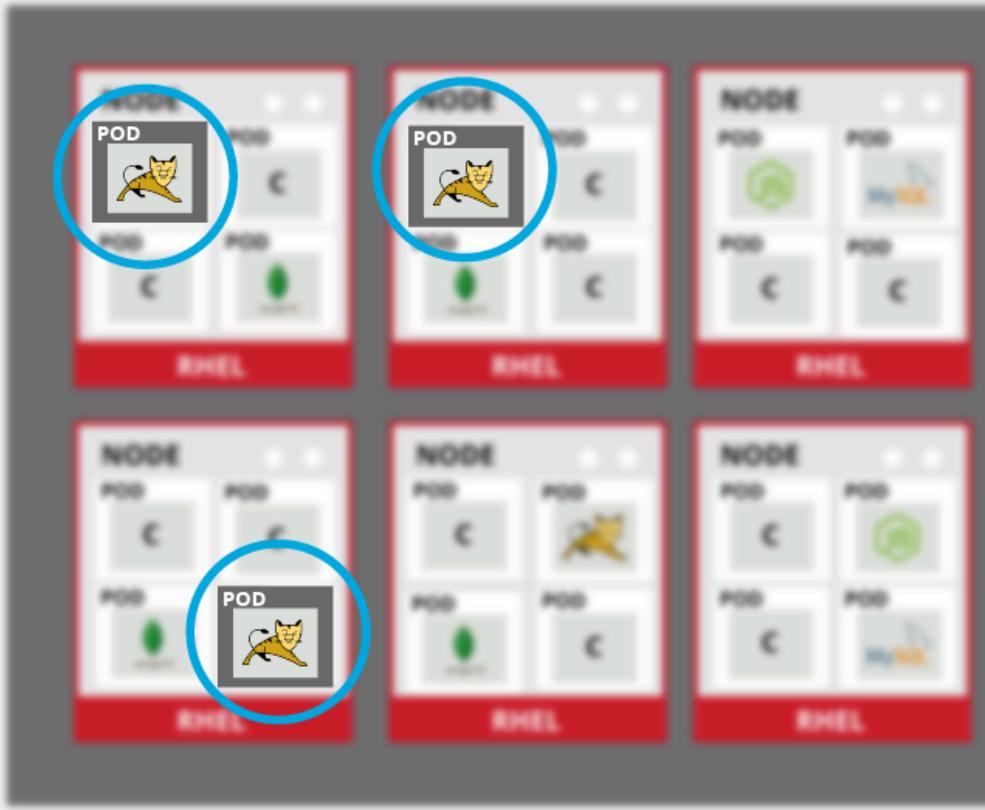
# Nodes are instances of RHEL where apps will run



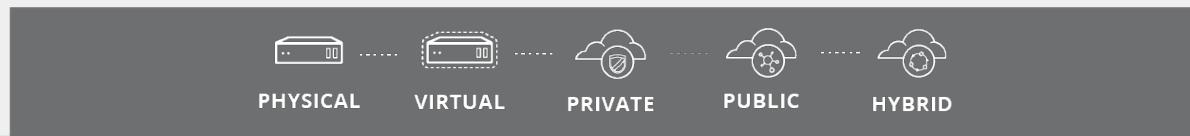
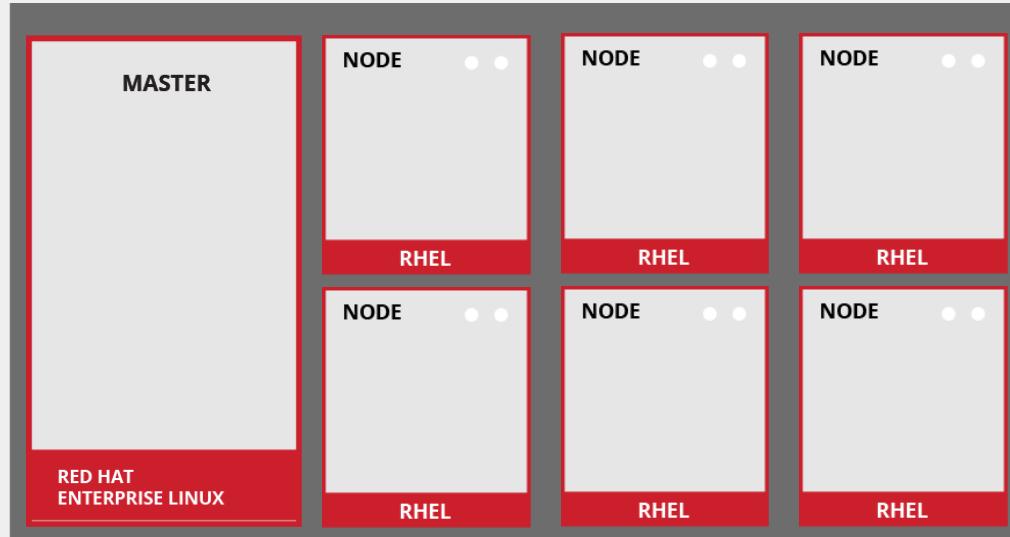
# Apps and components run in containers



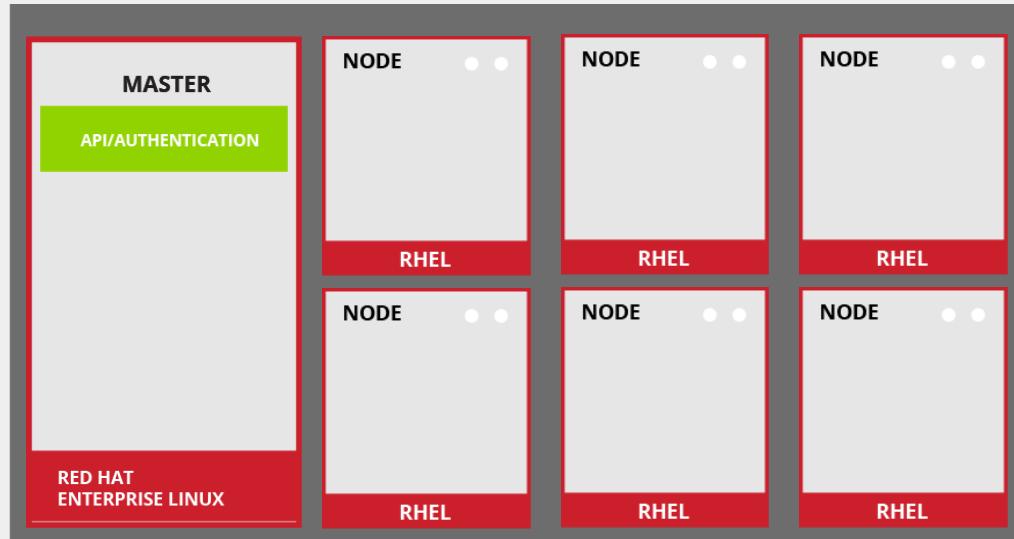
# Pods are the orchestrated unit in OpenShift



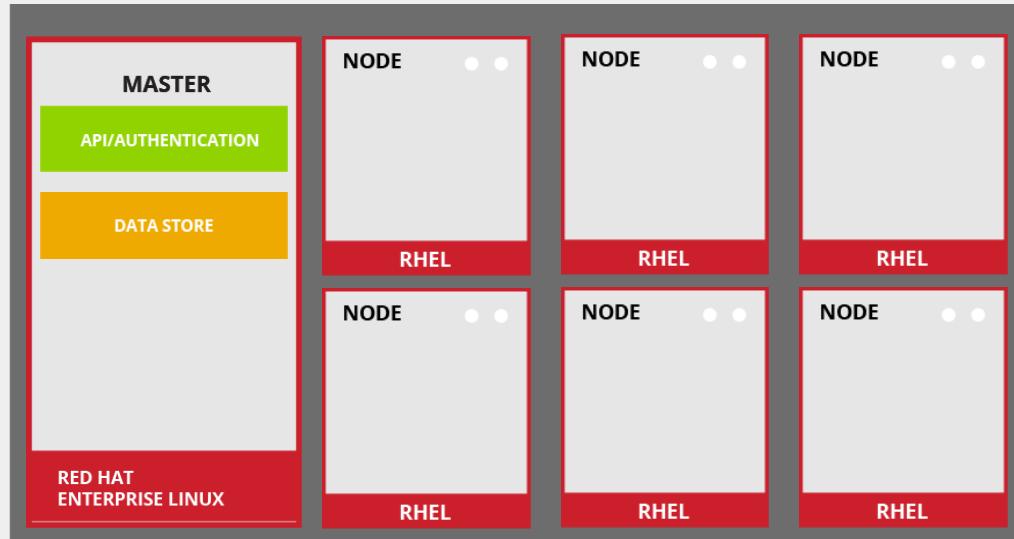
# Masters are the Control Plane



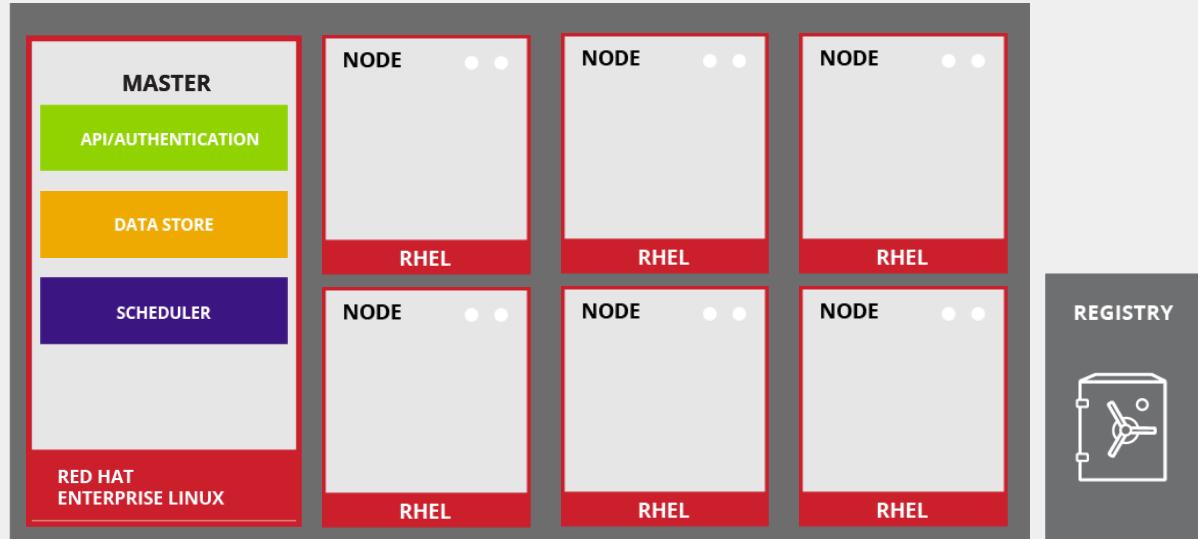
# API and Authentication



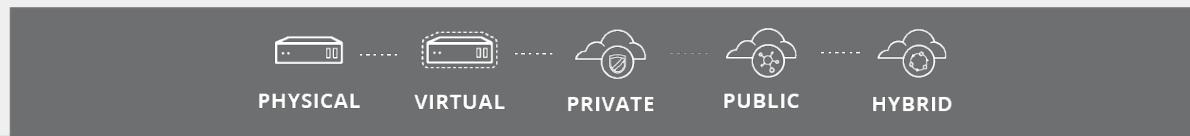
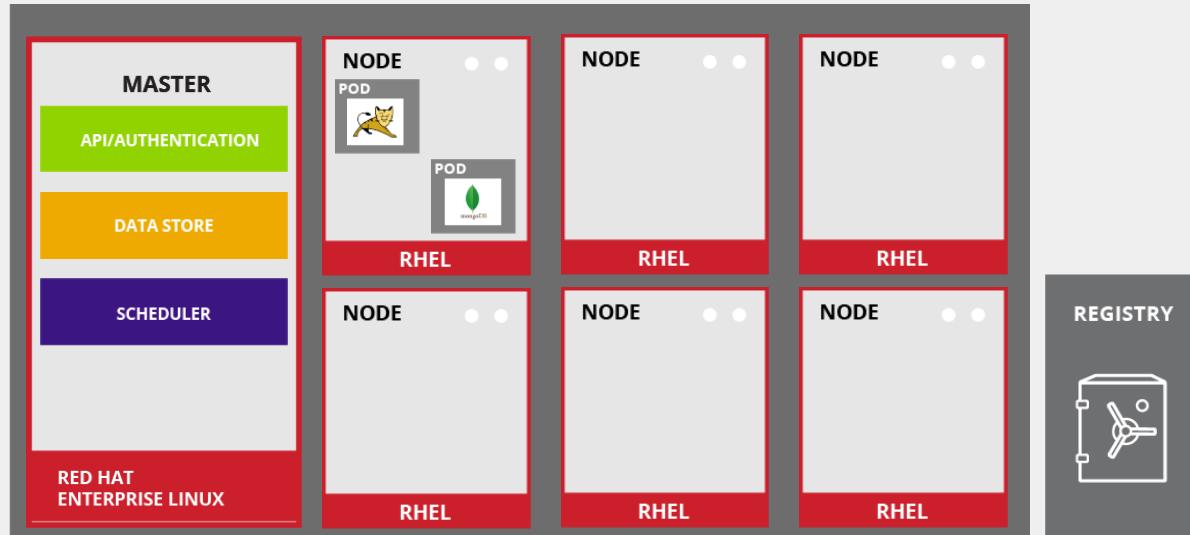
# Desired and Current State



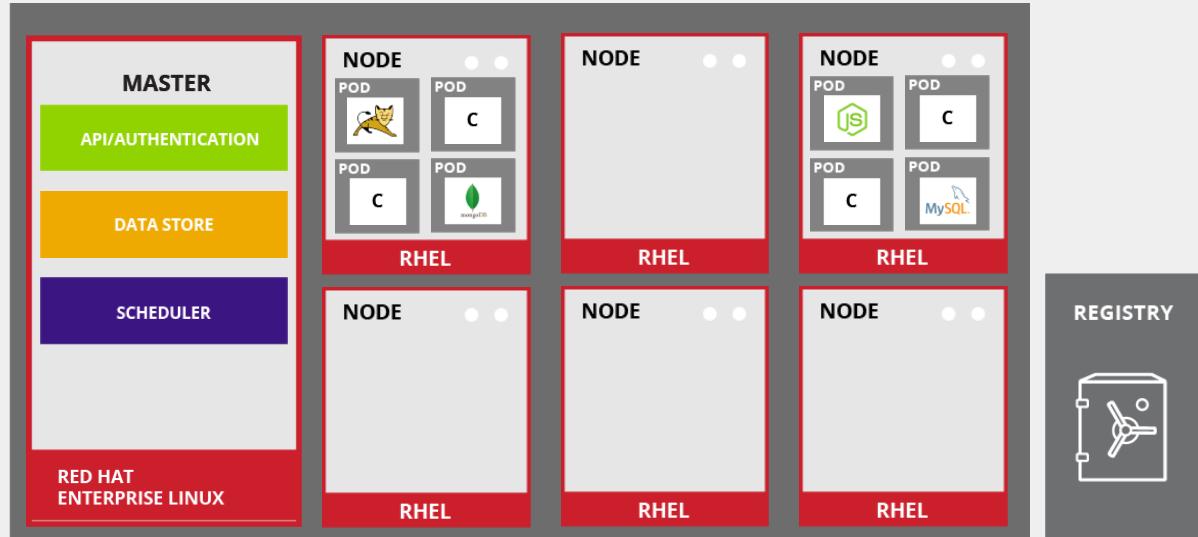
# Scheduler Pulls From The Registry



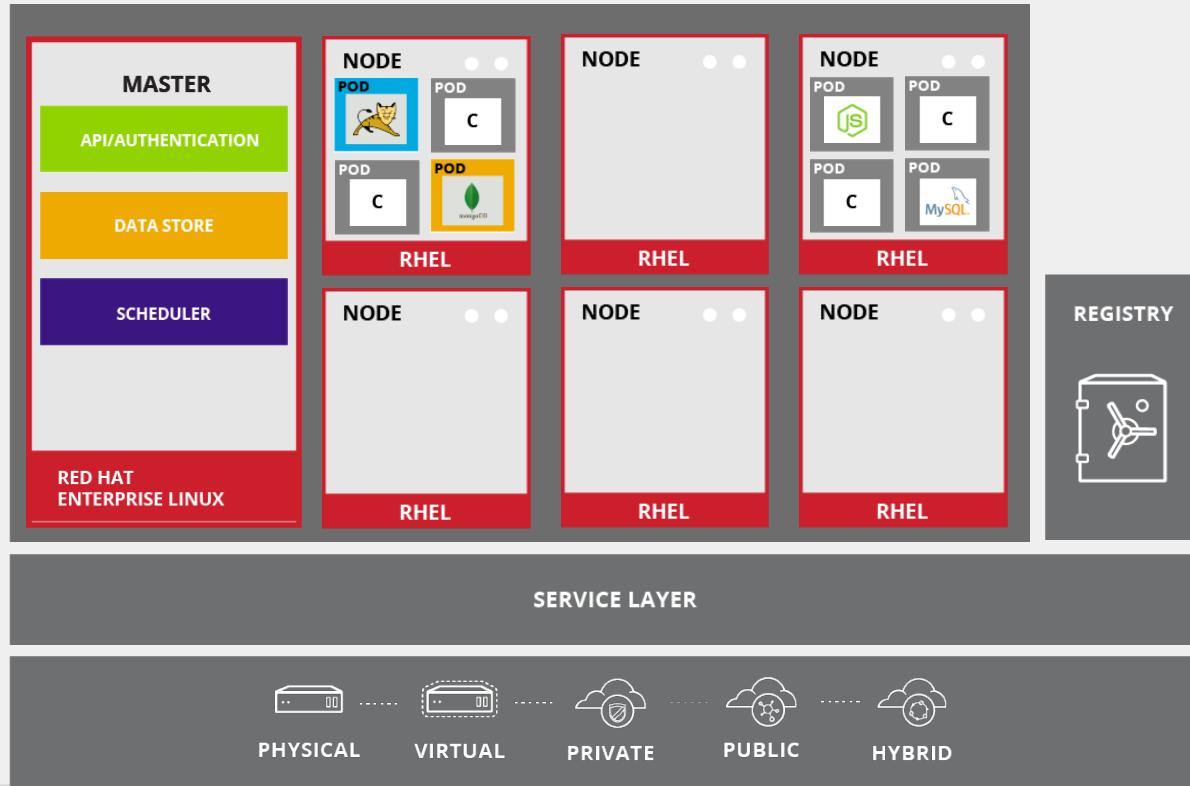
# Orchestration and Scheduling



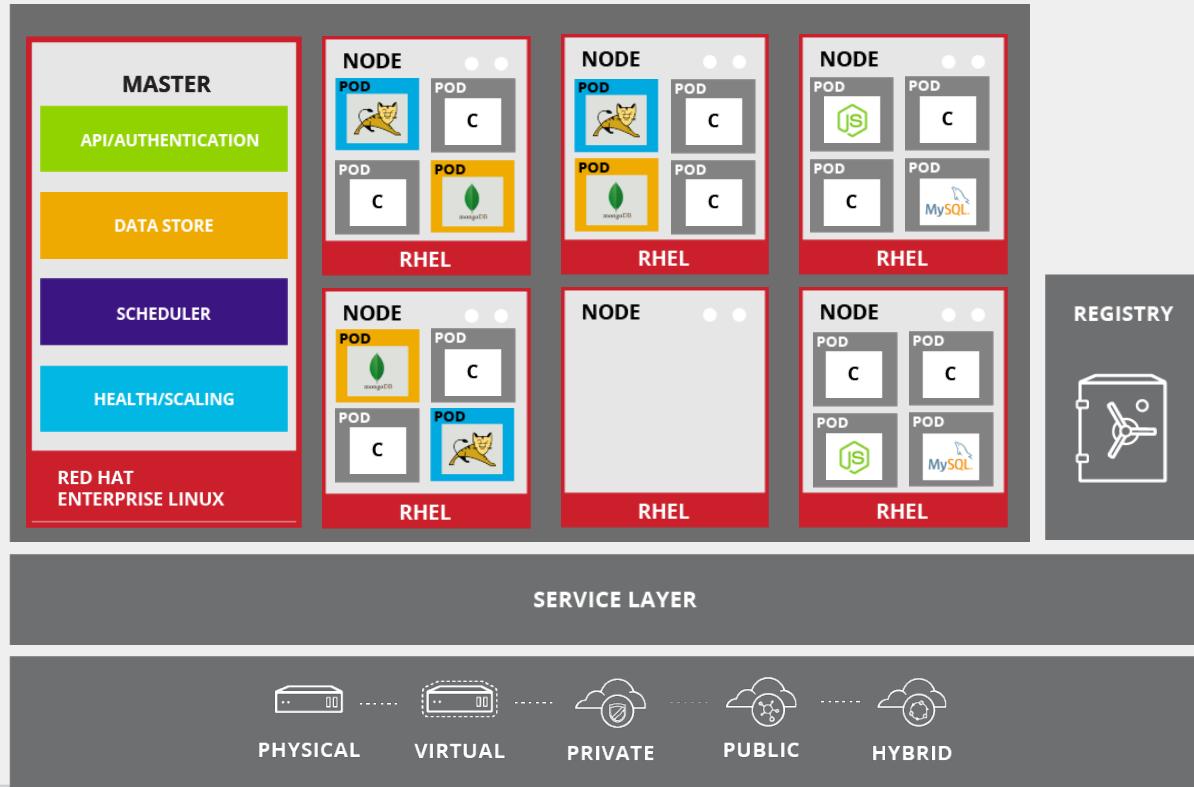
# Placement by Policy



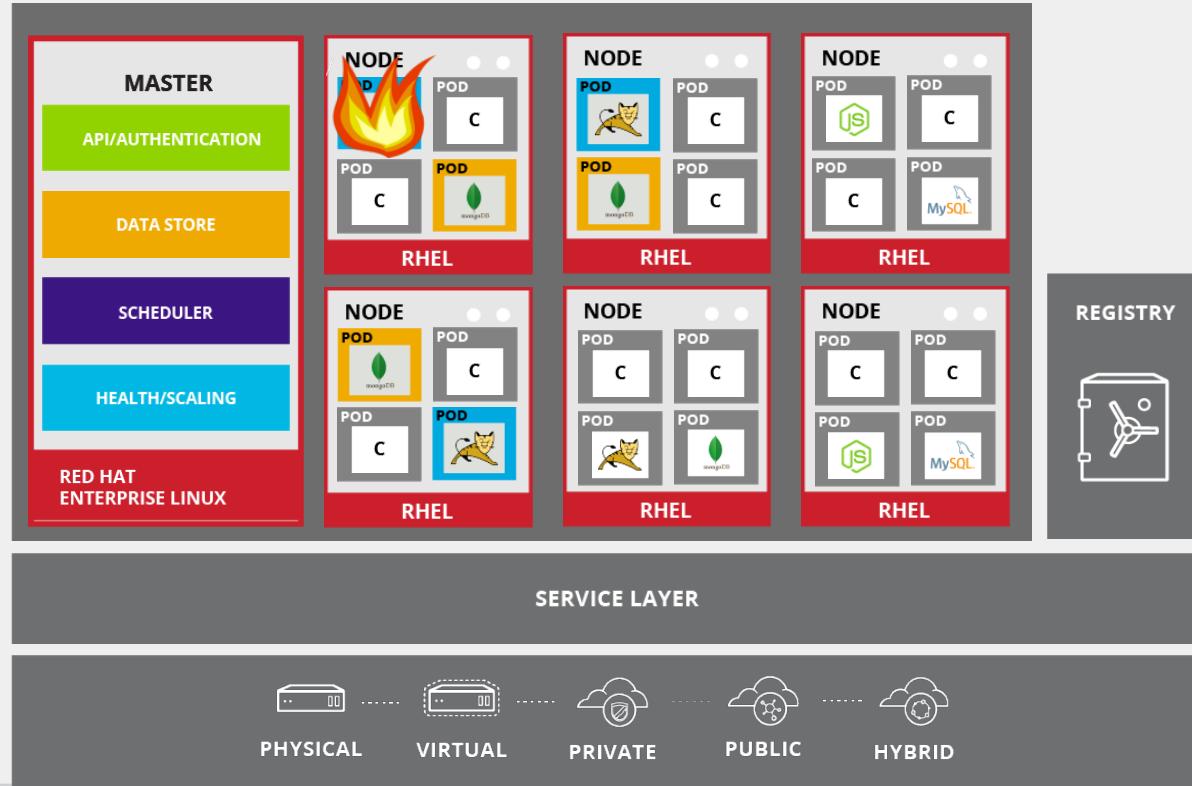
# Services connect application components



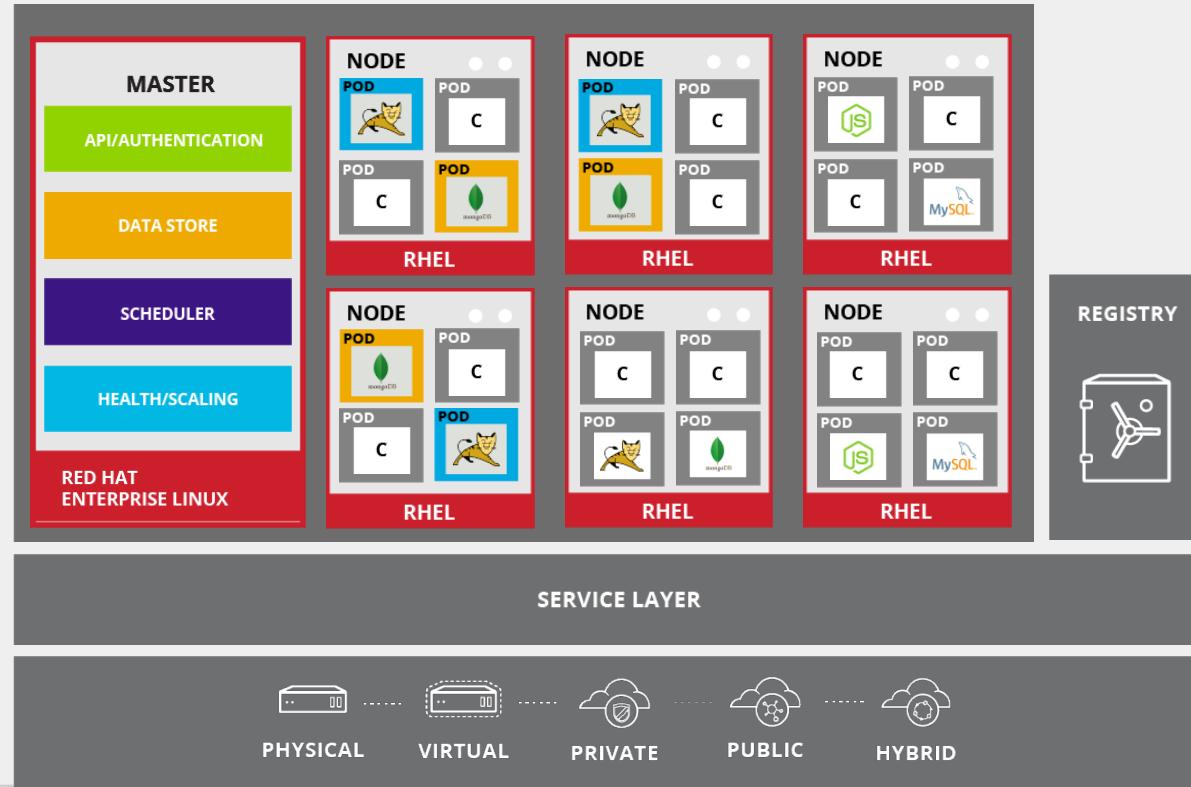
# Health and Scaling



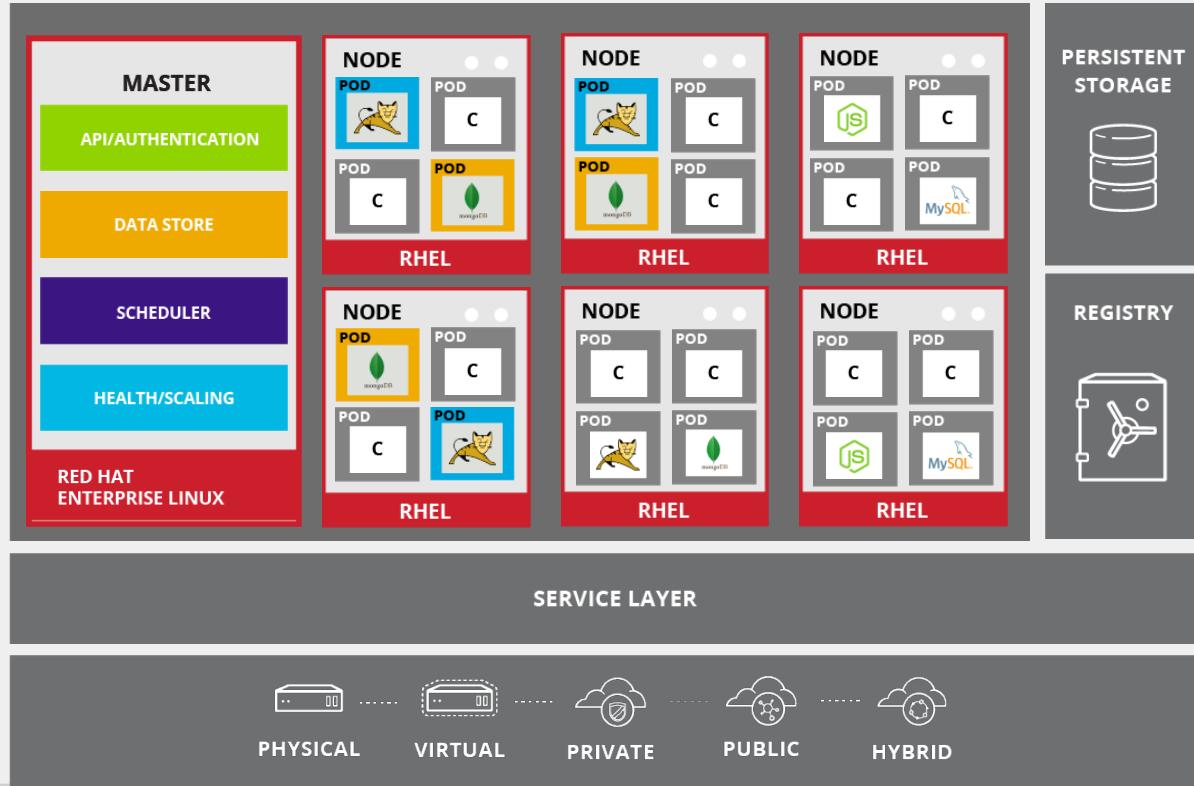
# What about unhealthy Pods?



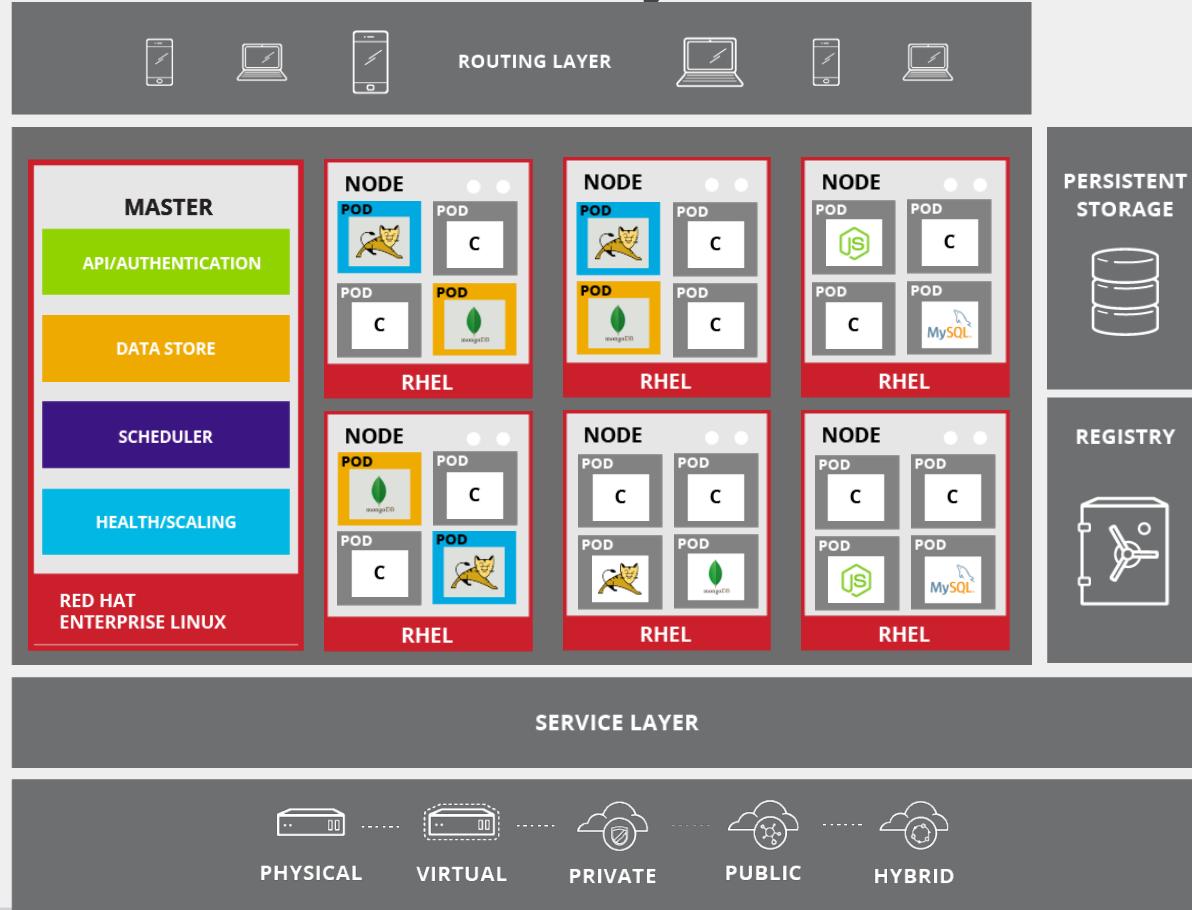
# The Master remediates Pod failures



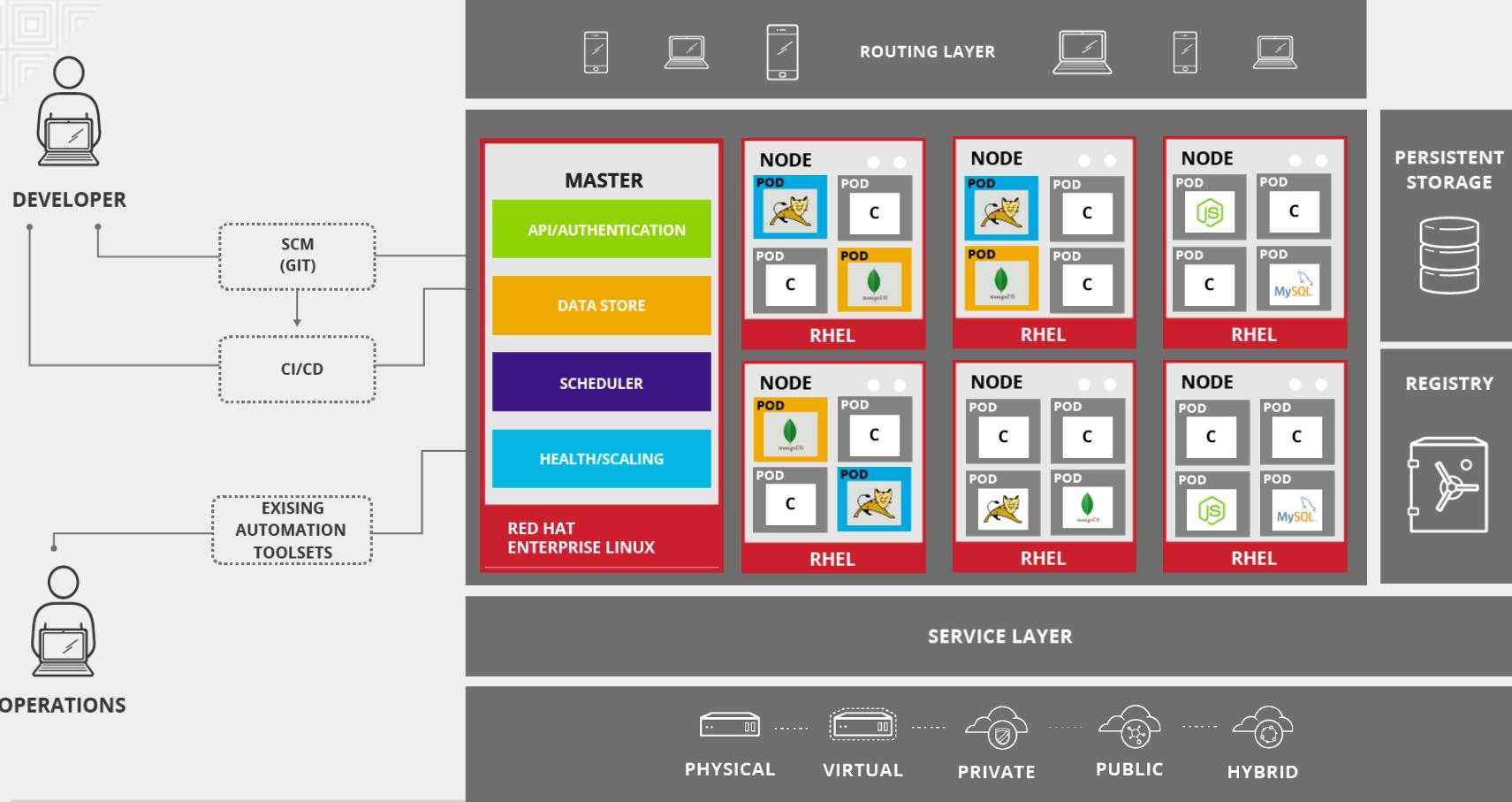
# What about app data?



# Routing layer for external accessibility



# Access via Web UI, CLI, IDE, API



A photograph of a large stack of shipping containers in a port terminal. The containers are stacked high, filling the frame. In the center, a yellow gantry crane is positioned over the containers, its arm extending horizontally. The sky above is clear and blue.

# OpenShift

## Source-to-Image



# Source 2 Image Walk Through

Code



git



DEV

Build

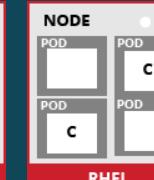
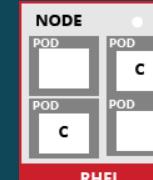
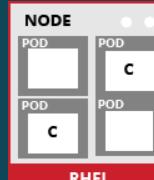


Container  
Image



Registry

Deploy



OPS

# Source 2 Image Walk Through



DEV

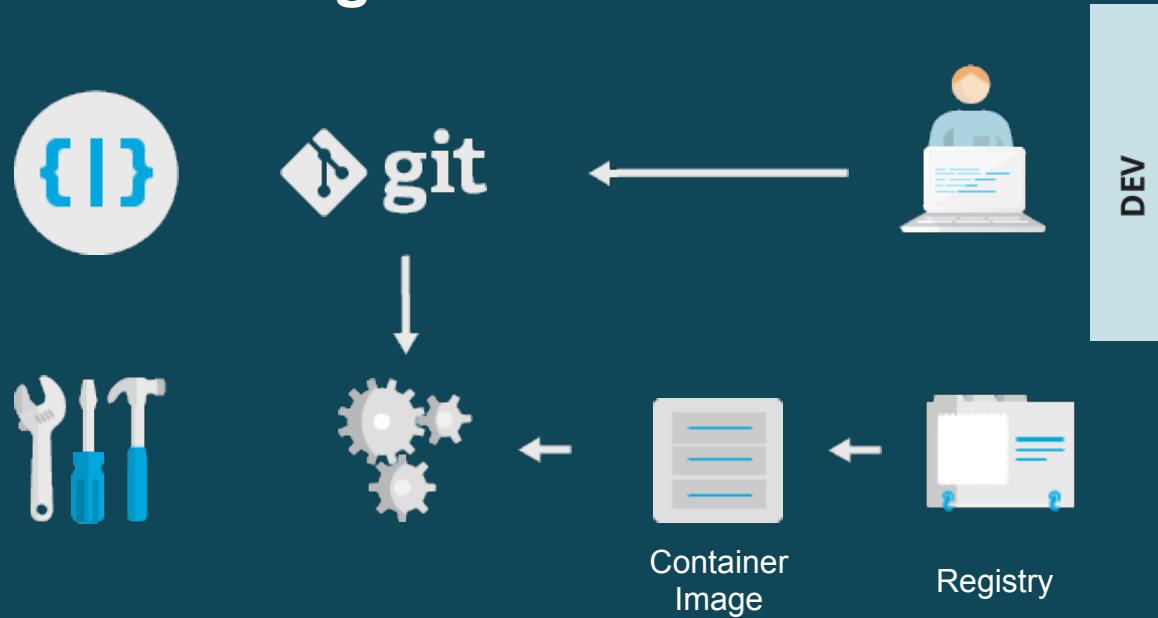
## Code

Developers can leverage existing development tools and then access the OpenShift Web, CLI or IDE interfaces to create new application services and push source code via GIT. OpenShift can also accept binary deployments or be fully integrated with a customer's existing CI/CD environment.

# Source 2 Image Walk Through

## Build

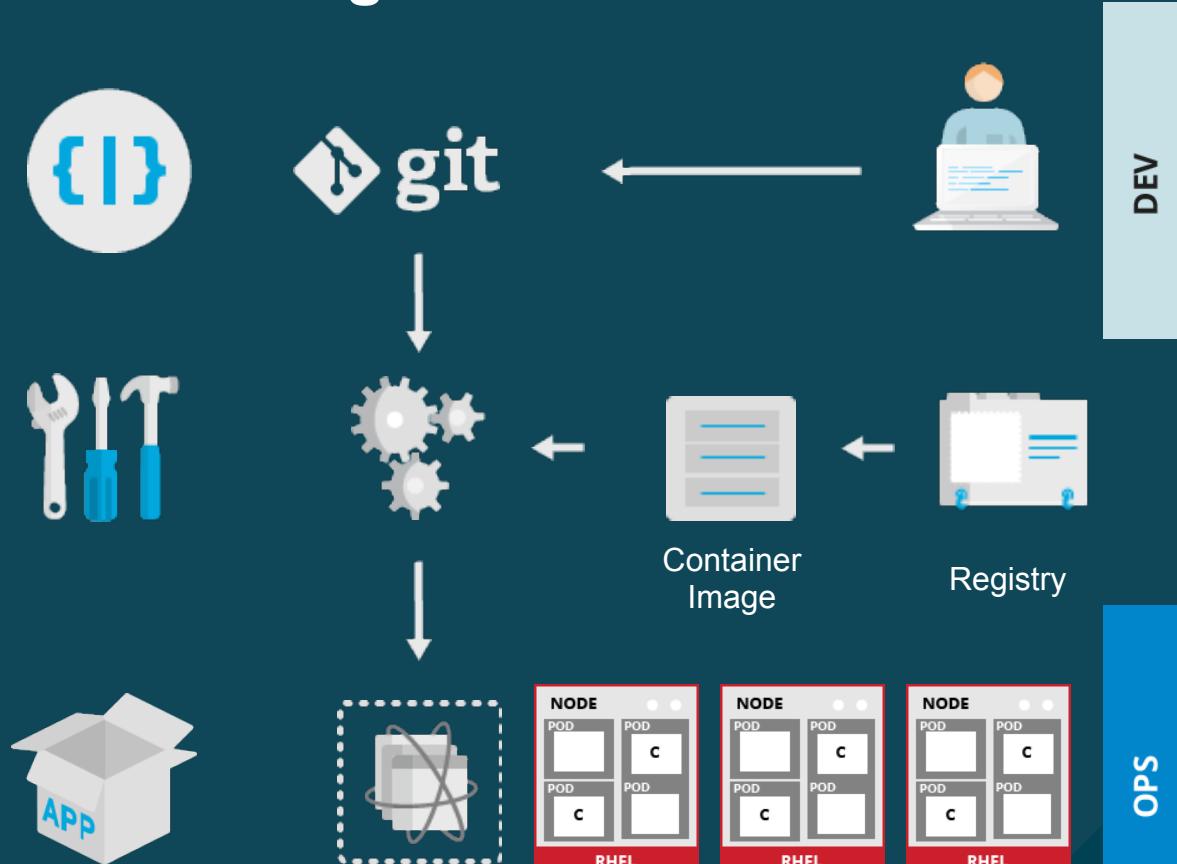
OpenShift automates the Docker image build process with Source-to-Image (S2I). S2I combines source code with a corresponding Builder image from the integrated Docker registry. Builds can also be triggered manually or automatically by setting a Git webhook. Add in Build pipelines



# Source 2 Image Walk Through

## Deploy

OpenShift automates the deployment of application containers across multiple Node hosts via the Kubernetes scheduler. Users can automatically trigger deployments on application changes and do rollbacks, configure A/B deployments & other custom deployment types.



A black and white photograph showing a massive stack of shipping containers in a port terminal. The containers are stacked high, filling the frame. In the foreground, there's industrial equipment, likely a straddle carrier or a truck, used for moving these large units. The background shows more stacks of containers under a clear sky.

# OpenShift

## Customer Case Studies



# Customer Wins

Insert Your Customer  
Logo Here

## Business Challenges

---

- Insert info here.

## Key Benefits

---

- Insert info here.

# **Commercial Reference Customers**

# Customer Wins

**BBVA**

## Business Challenges

---

- Insert info here.

## Key Benefits

---

- Insert info here.

# Customer Wins



## Business Challenges

---

- Customers want more on-demand enterprise web & mobile apps
- Needed faster time to market for new CA SaaS offerings
- Wanted a common platform for multiple product teams to build apps on

## Key Benefits

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- Enables product teams to more quickly build, deploy and update apps
- Able to experiment and take apps from concept to production faster
- Containers provide better utilization of hardware and horizontal scaling

# Customer Wins

---



## Business Challenges

---

- Leading financial analytics software provider, with solutions to calculate risk such as FICO credit score
- Wanted to expand their business by diversifying their offerings and serving new markets
- Decided to build a new FICO Analytics Cloud to enable online access to FICO tools & services

## Key Benefits

---

- On-demand platform allows FICO clients to build the applications they need and get faster time to value
- OpenShift automates provisioning and systems management of the FICO platform stack to improve IT operational efficiency
- OpenShift also provides an embedded solution for on-premise platform delivery
- Red Hat provides expert consulting and support to keep FICO offerings up and running smoothly

# Customer Wins

---



## Business Challenges

---

- Cisco IT organization has to support thousand of application developers
- Built out large virtualization farm to provide developer environments (over 15,000 JVMs deployed)
- Needed to improve developer productivity and expand access to new languages/frameworks
- Poor infrastructure utilization and hard to manage

## Key Benefits

---

- Automated provisioning for developers via new Lightweight Application Environment (LAE)
- Able to offer standardized stacks for different languages including Java and Node.js
- Containers provide better infrastructure utilization and easier to manage operationally
- Benefit from Red Hat's technical depth and world class support

# Customer Wins

---



## Business Challenges

---

- Company plays both in HR and Finance industries and is constantly challenged to innovate
- Technology has to be consistent with the continuous delivery process adopted
- Heterogeneous Environment - ability to run Weblogic and Spring applications
- Unattended automated release process - platform must also be able to recover to a known stable state

## Key Benefits

---

- Consistency between environments - code pushed to other environments react the same way
- Developer Path to Innovation - enabled developers to make changes, in a consistent manner.
- Empowered developers to do what they needed to do without requiring IT Ops engagement.
- Higher application density with the same hardware resources

# Customer Wins

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THE UNIVERSITY  
*of* NORTH CAROLINA  
at CHAPEL HILL

## Business Challenges

---

- 29,000 Students and 11,000 Staff
- Needed a comprehensive, dynamic solution for frequent provisioning requests and, in particular, managed servers
- Use of outside vendors would potentially increase security concerns, costs, and further complicate system administration

## Key Benefits

---

- Open, self-service development and hosting environment for a more innovative campus community
- Ability to focus on development tasks and content—not infrastructure management
- A fully-integrated, interoperable platform
- Improved system security for better peace of mind
- Provide students and staff members with self-service, on-demand application stacks

# Customer Wins

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**University of Technology in Sydney**

## Business Challenges

---

- 39,000 Students and 3,110 Staff
- The IT department was experiencing service bottlenecks and wasted resources in three different areas:
  - student experience
  - virtual machines
  - legacy data

## Key Benefits

---

- Standardization and automation of development and operations (DevOps) processes
- Support for many coding languages and frameworks
- Reduced waste and costs with the ability to share many applications on the same infrastructure
- Users wouldn't need to modify existing applications to suit the new environment

# Customer Wins

---



## Business Challenges

---

- Highly competitive retail online market
- Needed to increase performance and flexibility of the application architecture
- Hybrid Cloud Environment - infrastructure should run both on premises and on the cloud

## Key Benefits

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- Monolithic to microservices - highly flexible microservices architecture for developers and operations
- Automated provisioning and management of the platform stack - needed to meet growing business demand for new application services
- Loosely coupled components enabled better utilization and management of assets.

# Customer Wins

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T-Systems

## Business Challenges

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- Capturing new growth areas focusing on platform based products, "productized" services, and a cloud ecosystem.
- Build a software platform to upgrade customer's legacy software for business applications in the cloud.
- Reduce costs and provide flexibility for programming languages, frameworks, and runtime environments.

## Key Benefits

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- OpenShift was able to offer T-Systems' customers their choice of development and integration tools.
- Faster application delivery and deliver solutions in days instead of months.
- Strength in the container management layers
- Integration of their predominant middleware deployments and their new cloud platform.

# **Public Sector Reference Customers**

# Customer Wins

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Supporting Space and Naval  
Warfare Systems Center Pacific

## Business Challenges

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- Provide a consistent and controlled hosting environment to test and deploy applications across multiple environments.
- Reduce time and cost to develop and sustain an expanding portfolio
- Comply with strict United States Department of Defense application security requirements

## Key Benefits

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- Can now prototype 4-5 times more application scenarios per day
- Ability to provide new capabilities to users, including faster application deployment at a lower cost.
- Increased interoperability of products
- Better scalability between datacenter and laptop environments