redhat.

OPENSHIFT

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May 2018

Agenda

- Container Discussion
- See how Red Hat OpenShift Container Platform makes it easy to build containers from source code
- Deploy sample applications on Red Hat OpenShift Container Platform

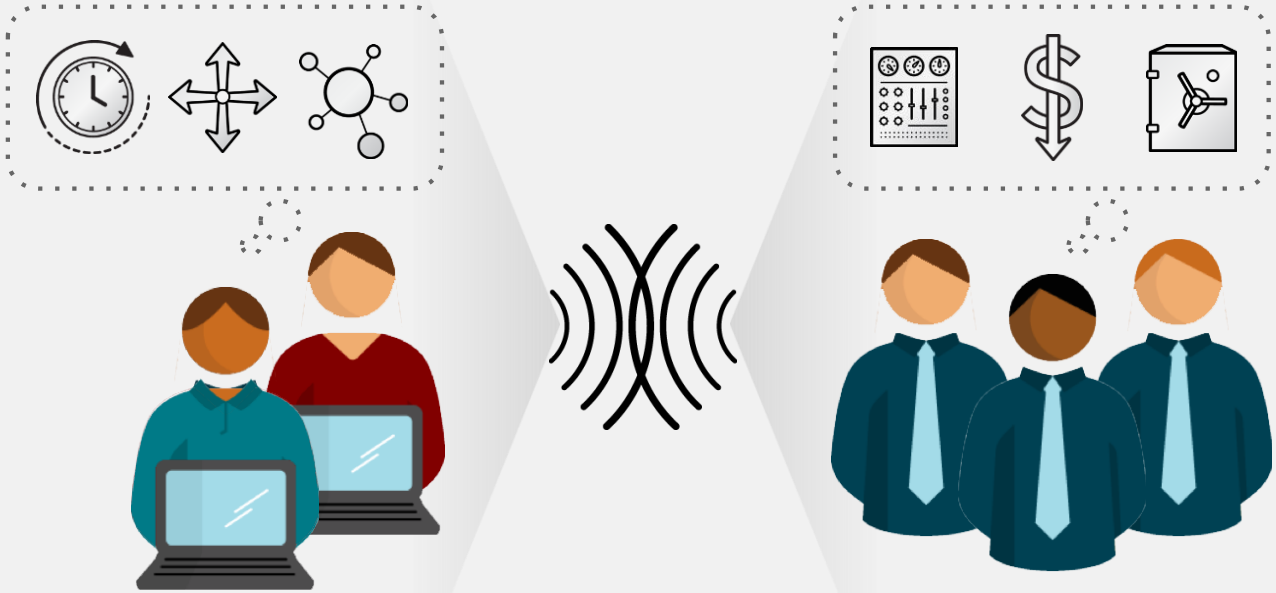
Introductions

- Name
- Role/Title
- Experience/knowledge with Containers?

Goal – Answer These Questions

- Who are the characters?
- What is the problem?
- What is the setting?
- How do you solve the problem?
- What happens at the end, what do you get out of it?

THE CHARACTERS

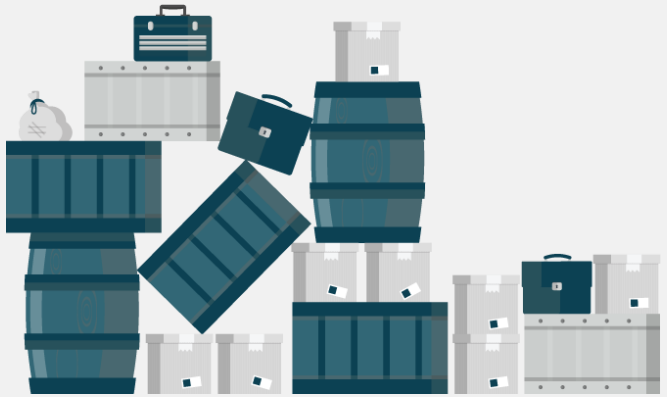


DEVELOPERS

I.T. OPERATIONS

The Problem

- Applications require complicated installation and integration every time they are deployed
- Lots of Friction
- Leads to poor quality of delivered service
- Larger Deployments
- Avoid pain by deploying less often



DEVOPS - Setting

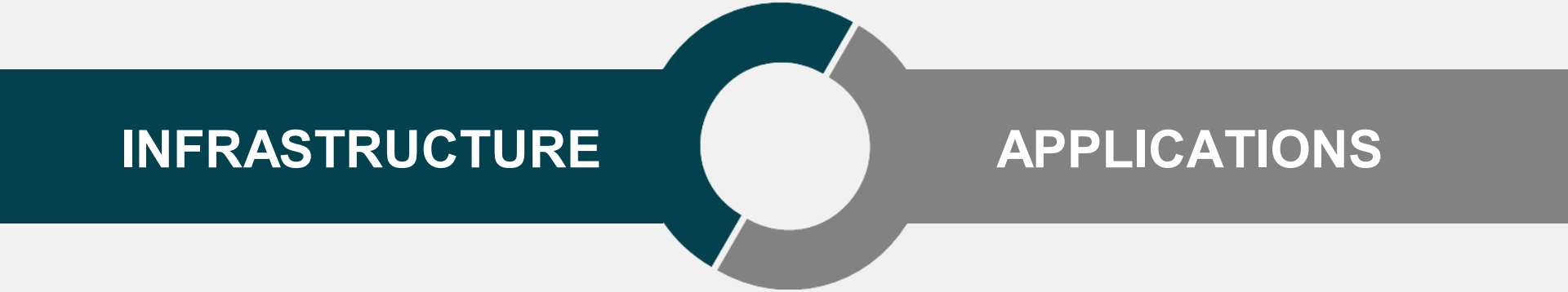
Everything as code	Application monitoring
Automate everything	Rapid feedback
Continuous Integration/Delivery	Rebuild vs. Repair
Application is always “releaseable”	Delivery pipeline

The Solution

- **Adopt a container strategy**
- Allows applications to be easily shared and deployed.
- Simplifies the automation that DevOps provides
- Provide consistent environment for Developers and Operations
- Write once – deploy anywhere

WHAT ARE CONTAINERS?

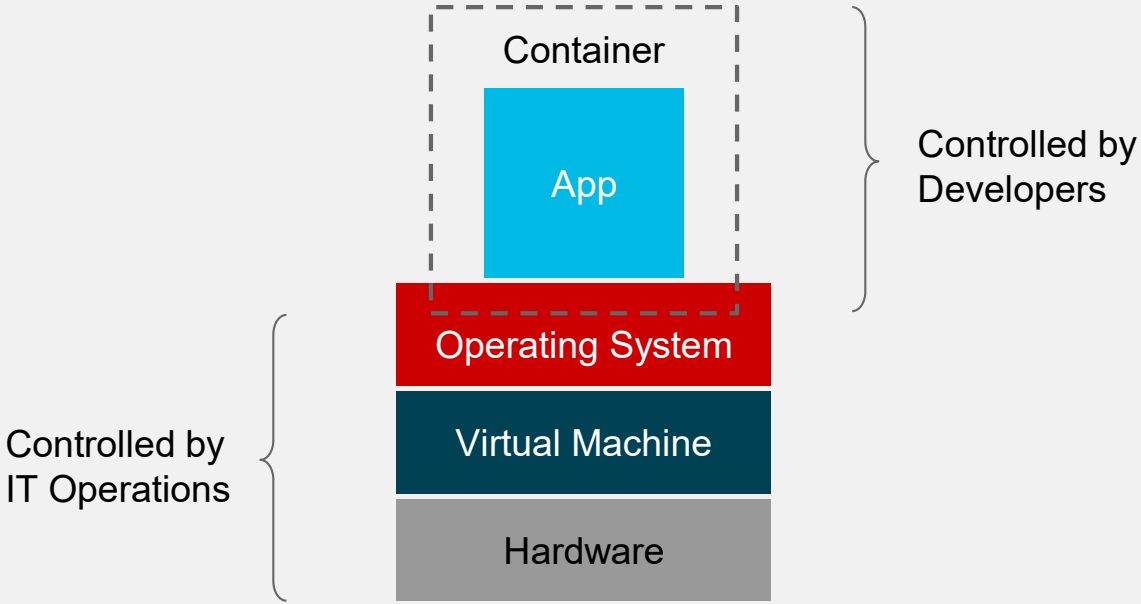
It Depends Who You Ask



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

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

THE SOLUTION



WE NEED MORE THAN JUST CONTAINERS

WE NEED ORCHESTRATION!!!

Scheduling
Decide where to deploy containers

Security
Control who can do what

Lifecycle and health
Keep containers running despite failures

Scaling
Scale containers up and down

Discovery
Find other containers on the network

Persistence
Survive data beyond container lifecycle

Monitoring
Visibility into running containers

Aggregation
Compose apps from multiple containers

- Kubernetes - open-source ORCHESTRATION framework
- Developed by Google
- Manages container lifecycle, health, scaling
- Has its own Command Line Interface and API

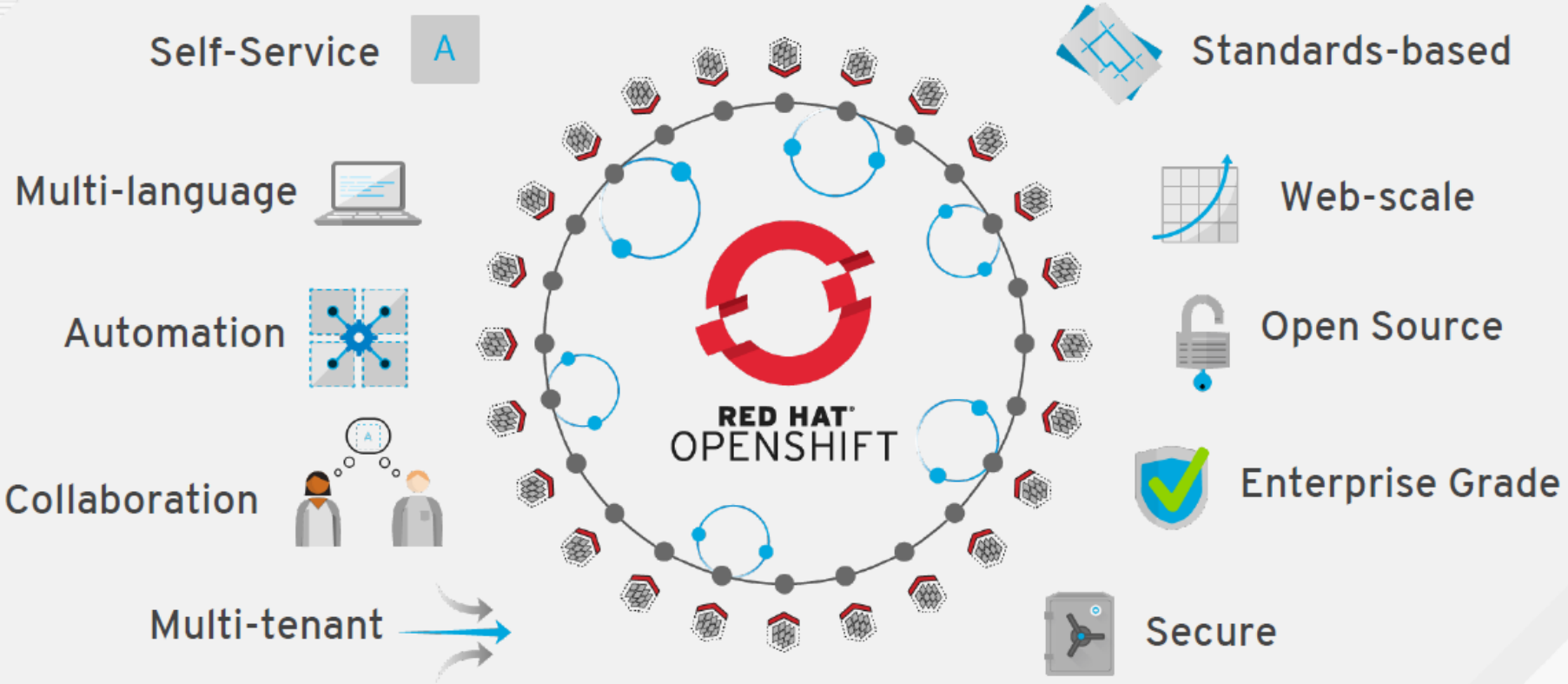
- Red Hat is THE top contributor to Kubernetes, after Google

kubernetes

BUT WAIT, THERE'S MORE!

Multi-tenancy	Teams and Collaboration
Routing & Load Balancing	Quota Management
CI/CD Pipelines	Image Build Automation
Role-based Authorization	Container Isolation
Capacity Management	Vulnerability Scanning
Infrastructure Visibility	Chargeback

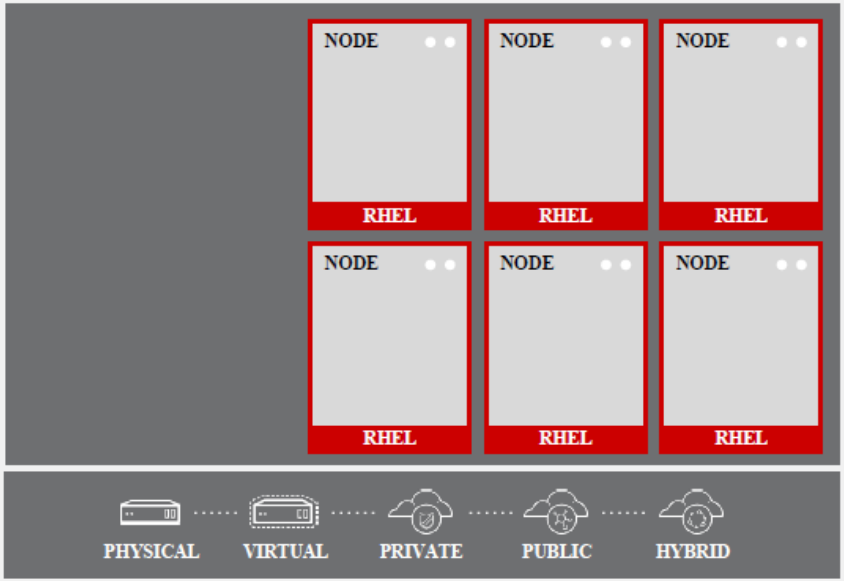
- Docker
- Kubernetes
- Building, Distributing and Running containers at scale
- Leading enterprise distribution of Kubernetes
- Rapid Application
- Deployment
- Scaling


Self-Service
Multi-language
Automation
Collaboration
Multi-tenant
RED HAT
OPENSHIFT
Standards-based
Web-scale
Open Source
Enterprise Grade
Secure

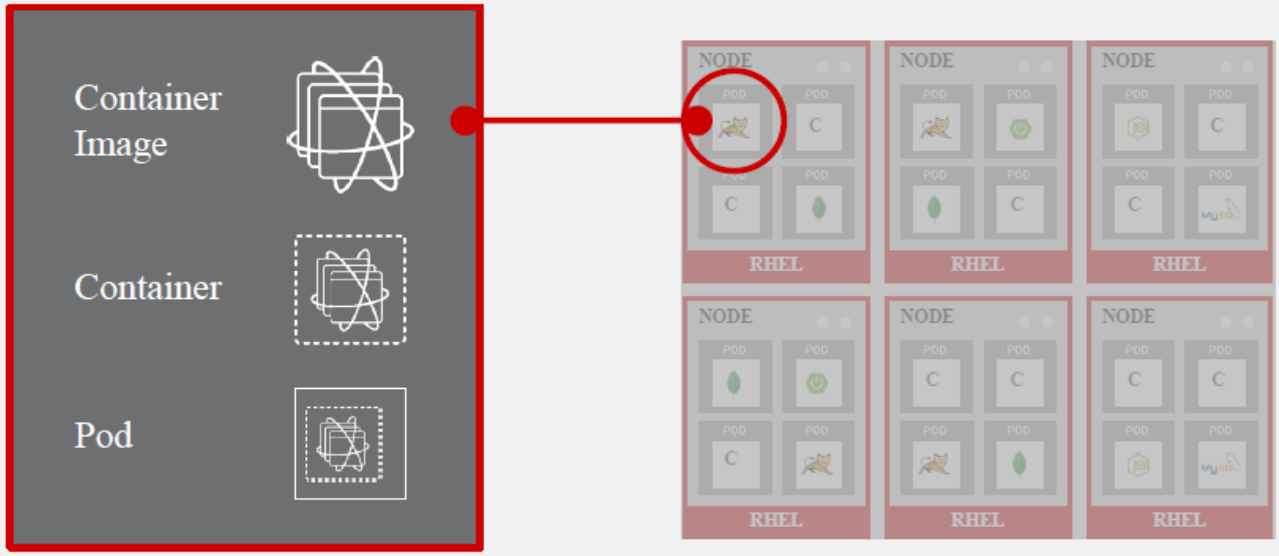
ARCHITECTURE

YOUR CHOICE OF INFRASTRUCTURE

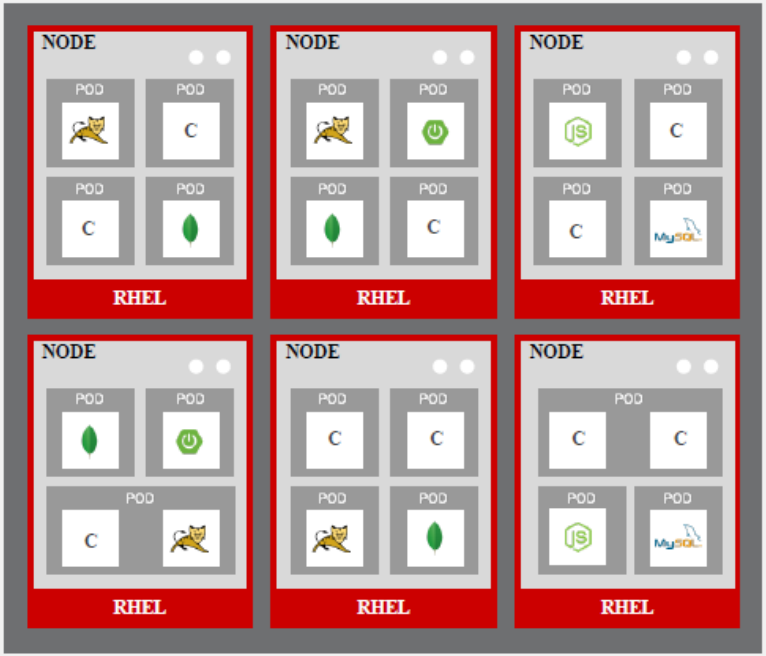
NODES RHEL INSTANCES WHERE APPS RUN



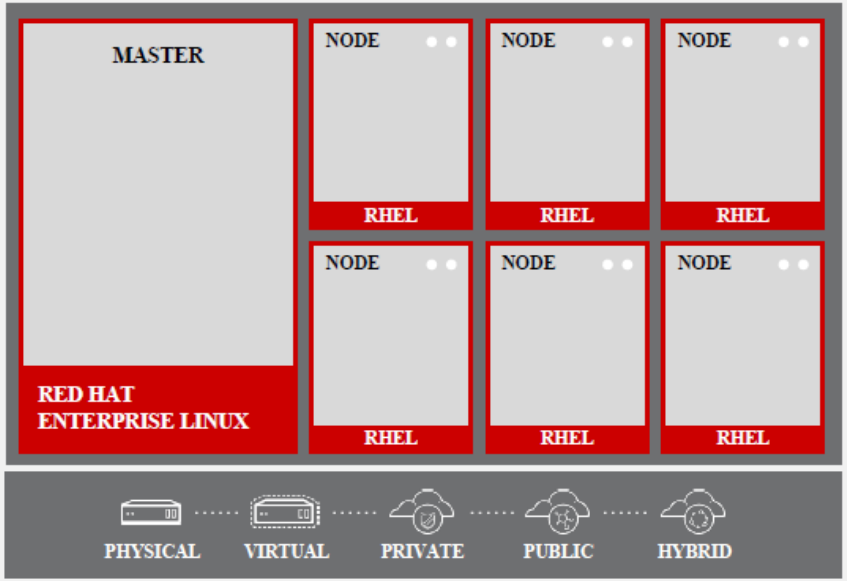
APPS RUN IN CONTAINERS



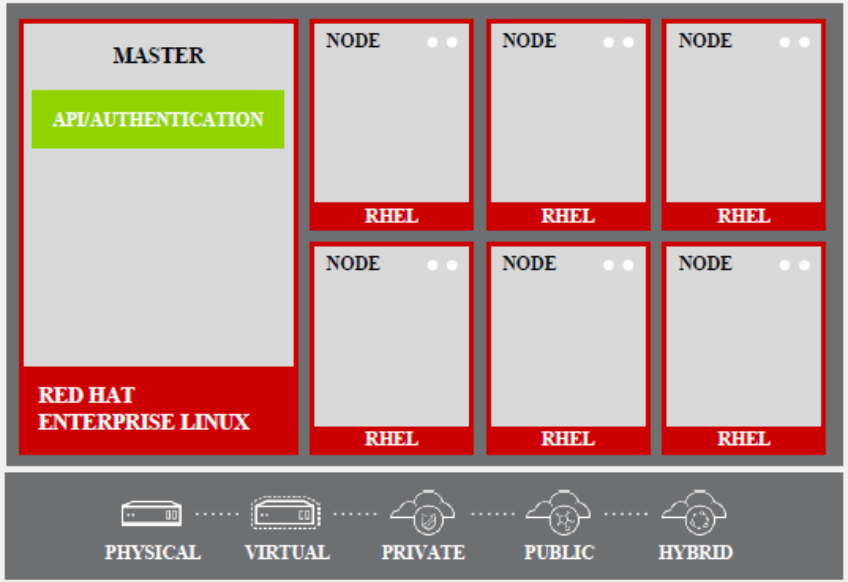
PODS ARE THE UNIT OF ORCHESTRATION



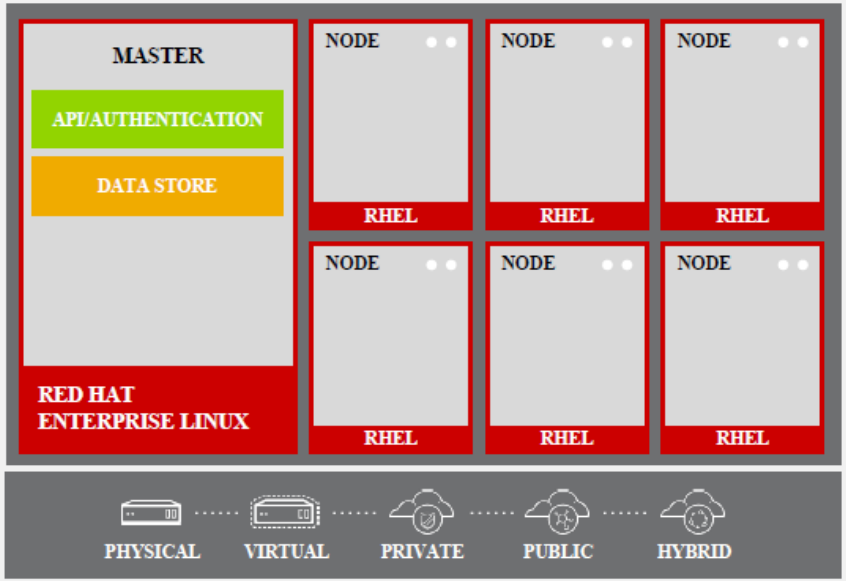
MASTERS ARE THE CONTROL PLANE



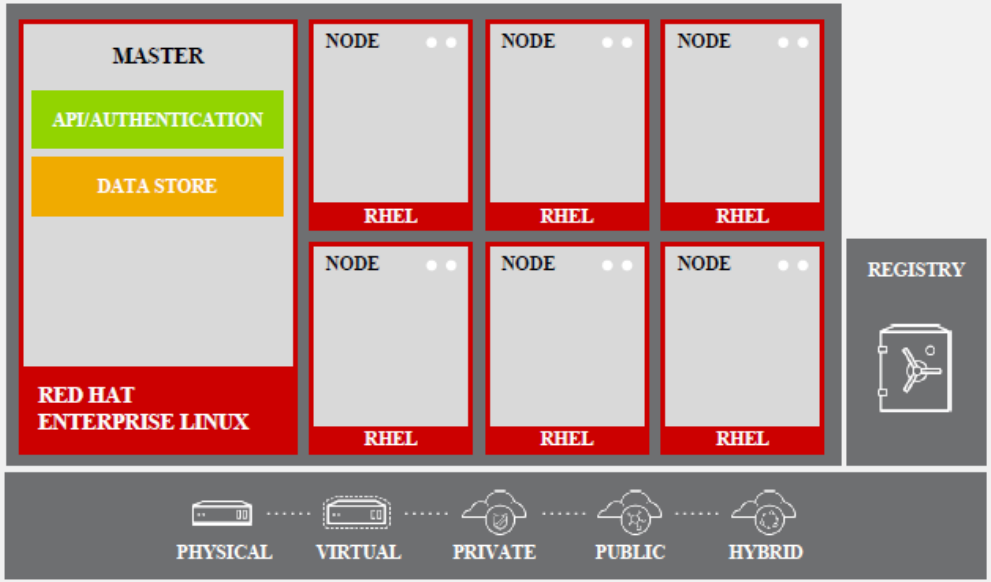
API AND AUTHENTICATION



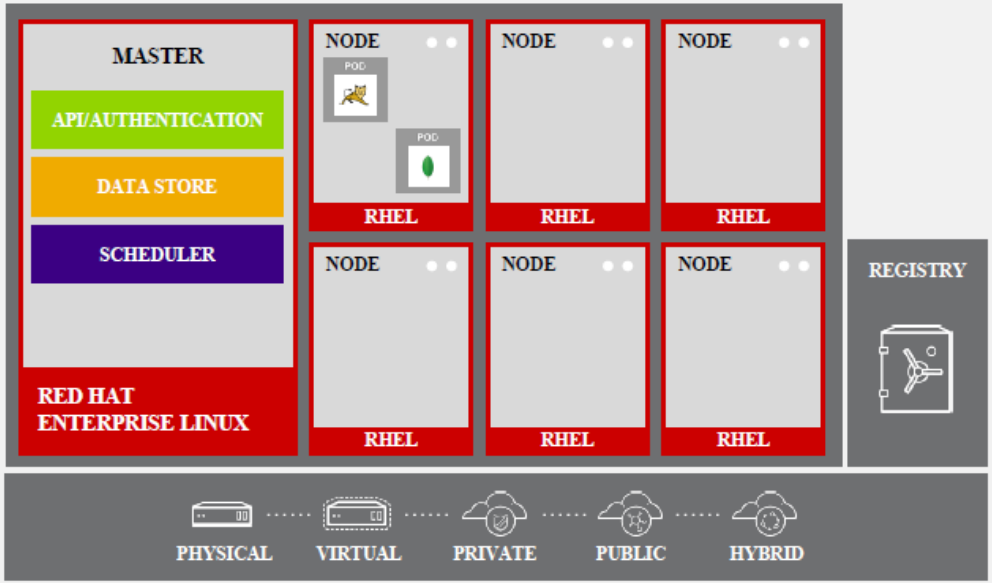
DESIRED AND CURRENT STATE



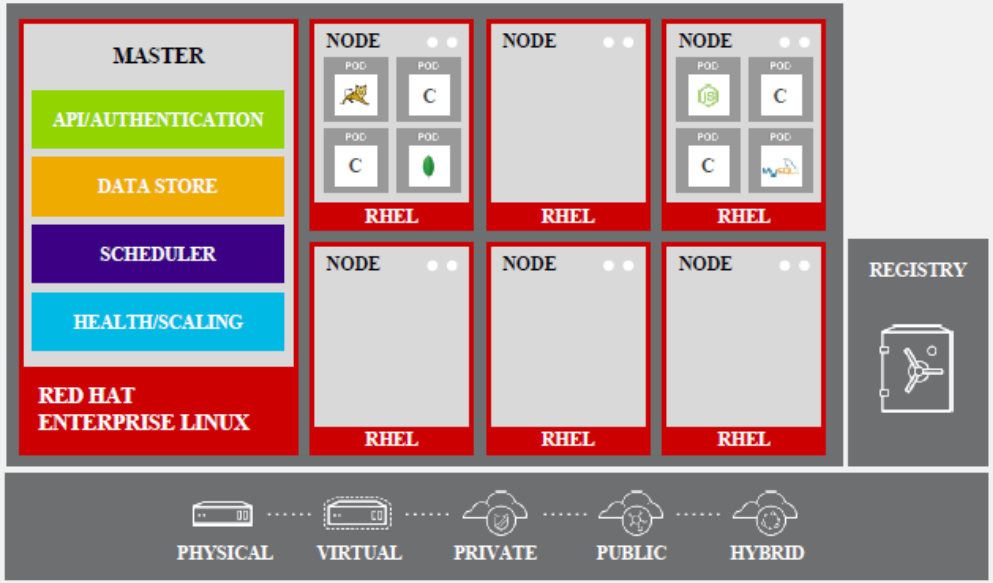
INTEGRATED CONTAINER REGISTRY



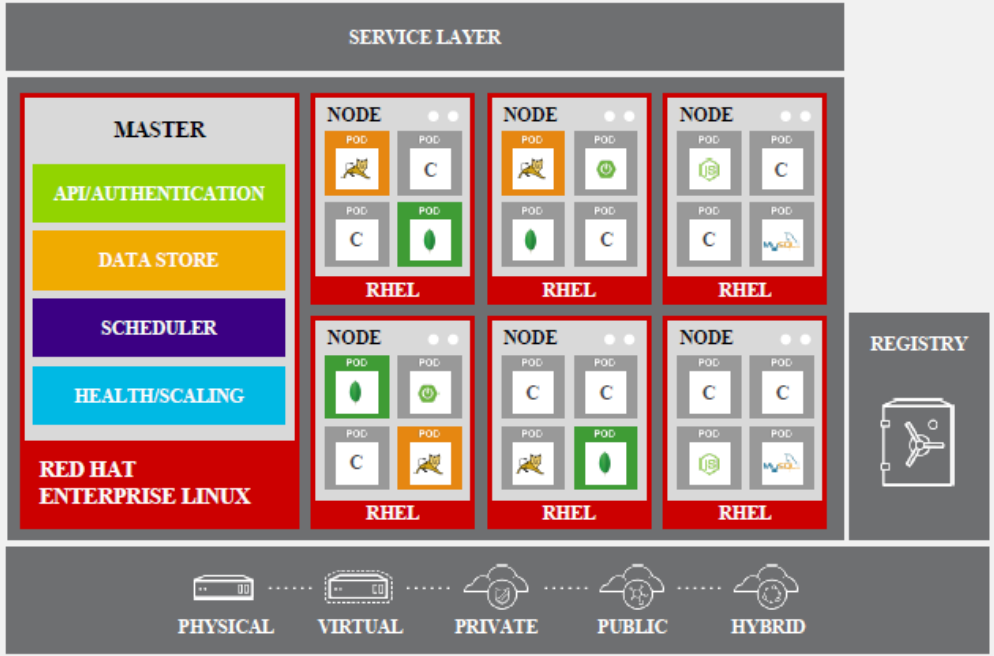
ORCHESTRATION AND SCHEDULING



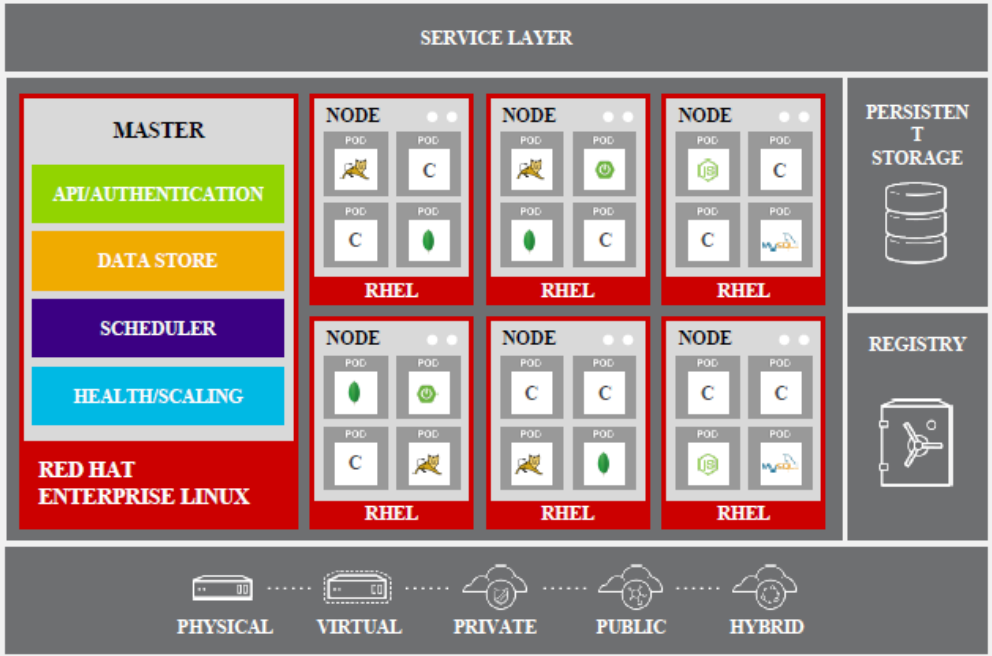
AUTOSCALING PODS



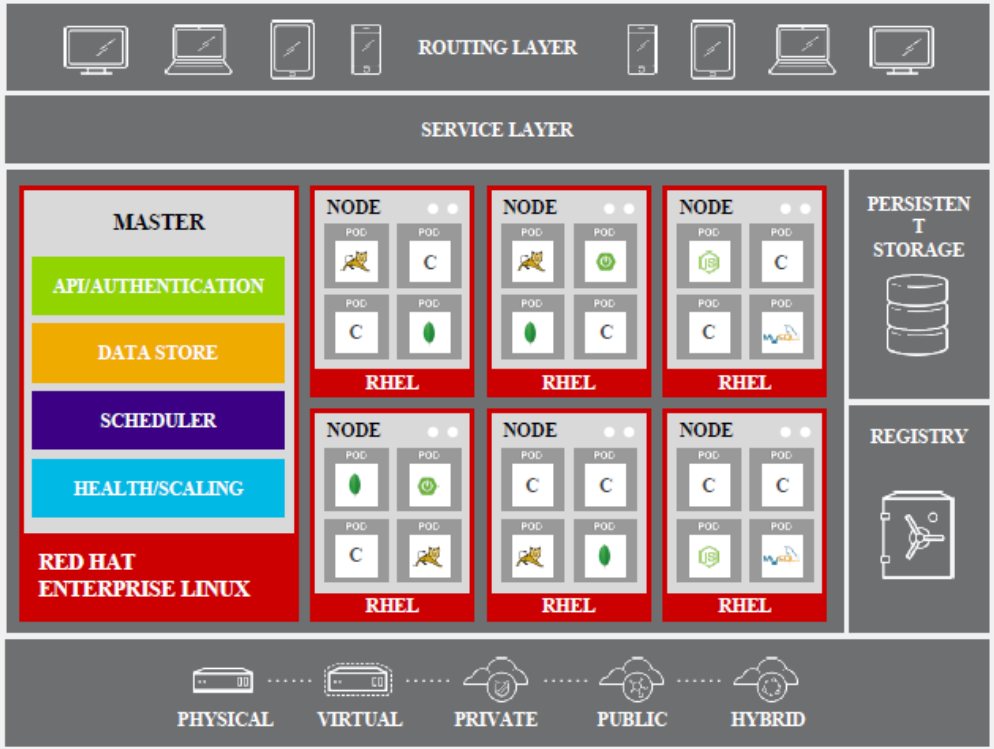
SERVICE DISCOVERY



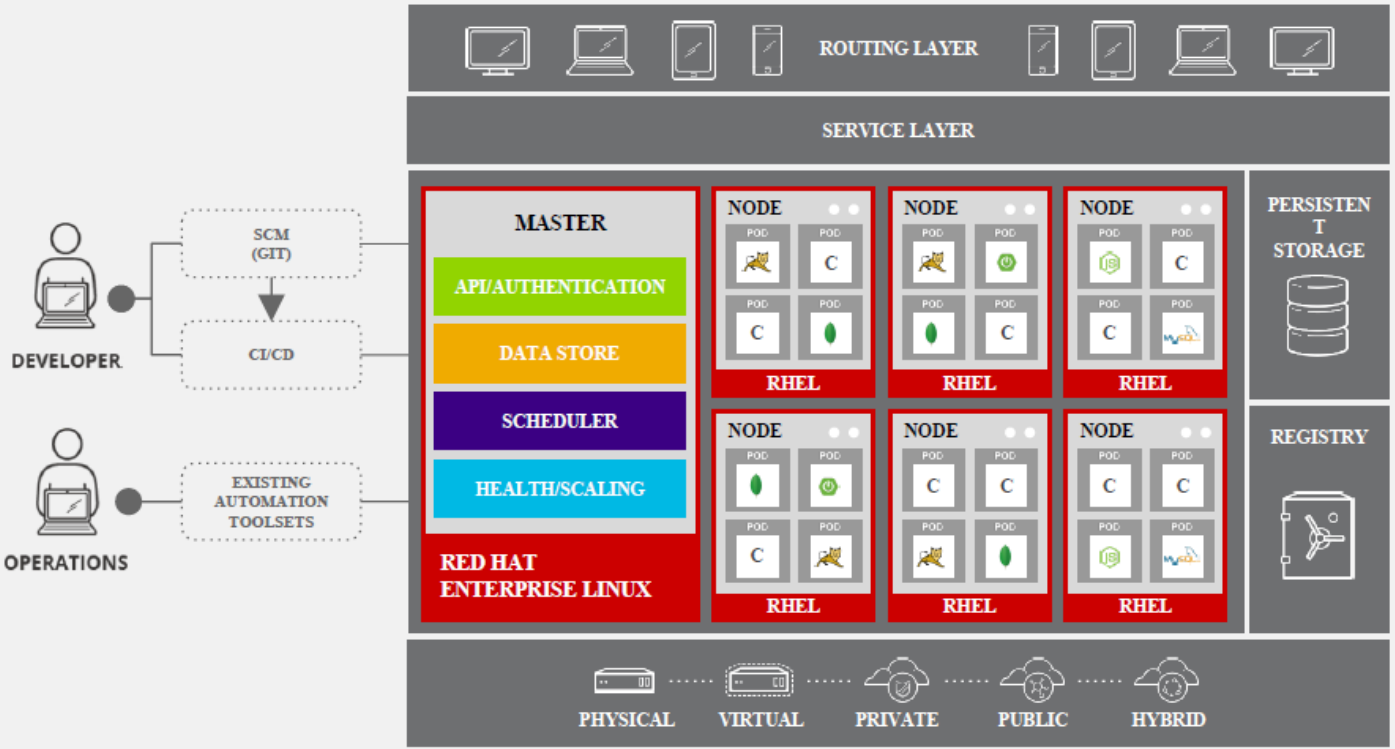
PERSISTENT DATA IN CONTAINERS



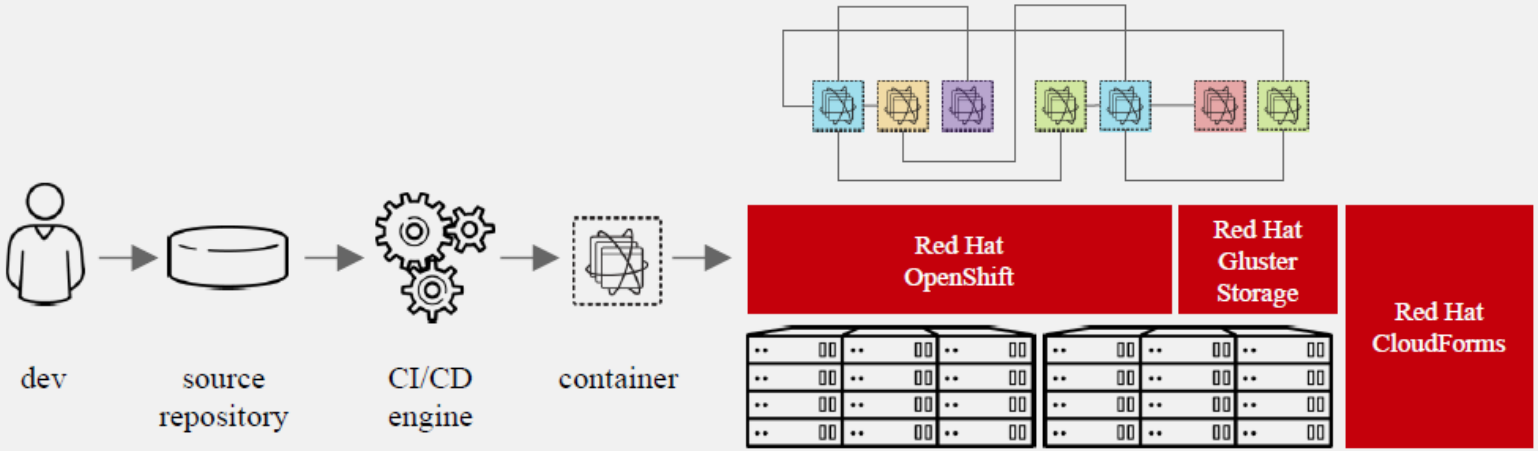
ROUTING AND LOAD-BALANCING



ACCESS VIA WEB, CLI, IDE AND API



DEVOPS WITH CONTAINERS



Lab Material

https://tinyurl.com/y9ee8ctd

OpenShift Console Login

https://master.vizuri.openshiftworkshop.com

OC Login

oc login https://master.vizuri.openshiftworkshop.com –u <user#>
Password: r3dh4t1!

THANK YOU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facebook.com/redhatinc


linkedin.com/company/red-hat


twitter.com/RedHatNews


youtube.com/user/RedHatVideos

SECURING CONTAINERS: 10 LAYERS OF SECURITY

1. Container Host & Multi-tenancy
2. Container Content
3. Container Registries
4. Building Containers
5. Deploying Containers
6. Container Platform
7. Network Isolation
8. Storage
9. API Management
10. Federated Clusters

[10 Layers of Container Security Presentation]

No Avoiding Diverse Workload Requests

Cloud Native

- Replication Control
- PV assignment
- Autoscale
- DaemonSet
- podSpec
- Templates
- Spring/JDK
- Circuit Breaker
- Java Platform Classes

Ordinal Services

- classic clusters
- storage to instance pairing
- local storage
- IP/Hostname tolerance
- Leader Election
- HA Pods

Low Latency

- NUMA
- Device Passthrough
- sysctl support
- network separation
- sequenced startups
- SELinux Control
- non-VXLAN
- multi-home pods
- kernel modules
- hugepages

Off Platform Services

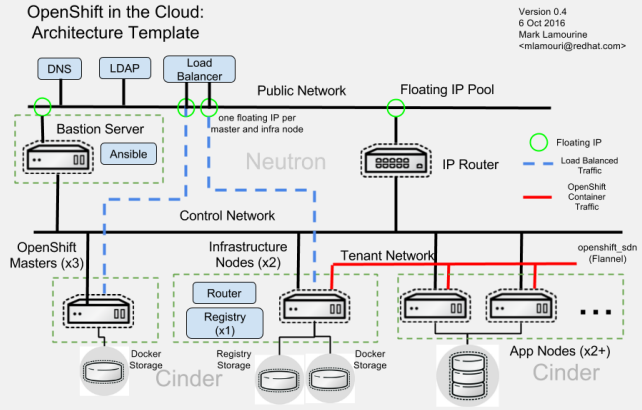
- Service Broker
- Metering
- Variable Propagation
- Service Linking
- Service Discovery
- Service Permission

E2E Provider Integration

Reference Architecture Implementation Guides

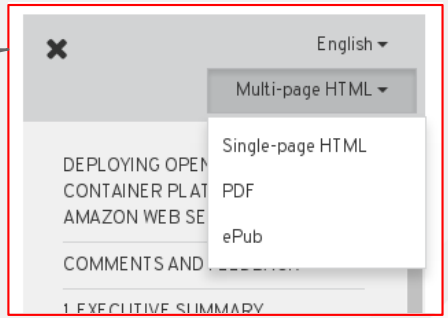
	OpenShift Container Platform (ocp-supplemental = 2-4 wks after GA)			
	3.5-ocps	**3.6-ocps**	**3.7-ocps**	**3.8-ocps**
AWS	3.5	3.6	-	3.8
GCE	3.5	3.6	-	3.8
VMware	3.5	3.6	-	3.8
Azure	3.5[1]	3.6	-	3.8
OSP	3.4 (3.5[1]) on 10	Upgrade Scenarios	3.6 on 11	3.7 on 11

[1]Currently in review



NEW

Available in multiple formats



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Service Broker

- General Service Broker API
- Service Parameterization
- Generalization and Removal of Cloud Foundry Requirements
- Binding Semantics
- AUTH
- Foundation for Service Catalog + Marketplace

github.com/servicebroker/servicebroker

Using Ansible to Orchestrate OpenShift Services

Overview

- Define, extend, and deliver “simple” to “complex” multi-container OpenShift services
- Standardized approach to using Ansible to manage and provision applications
- Leverage existing investment in Ansible roles/playbooks
- Easy management of applications for “simple” cloud-native apps

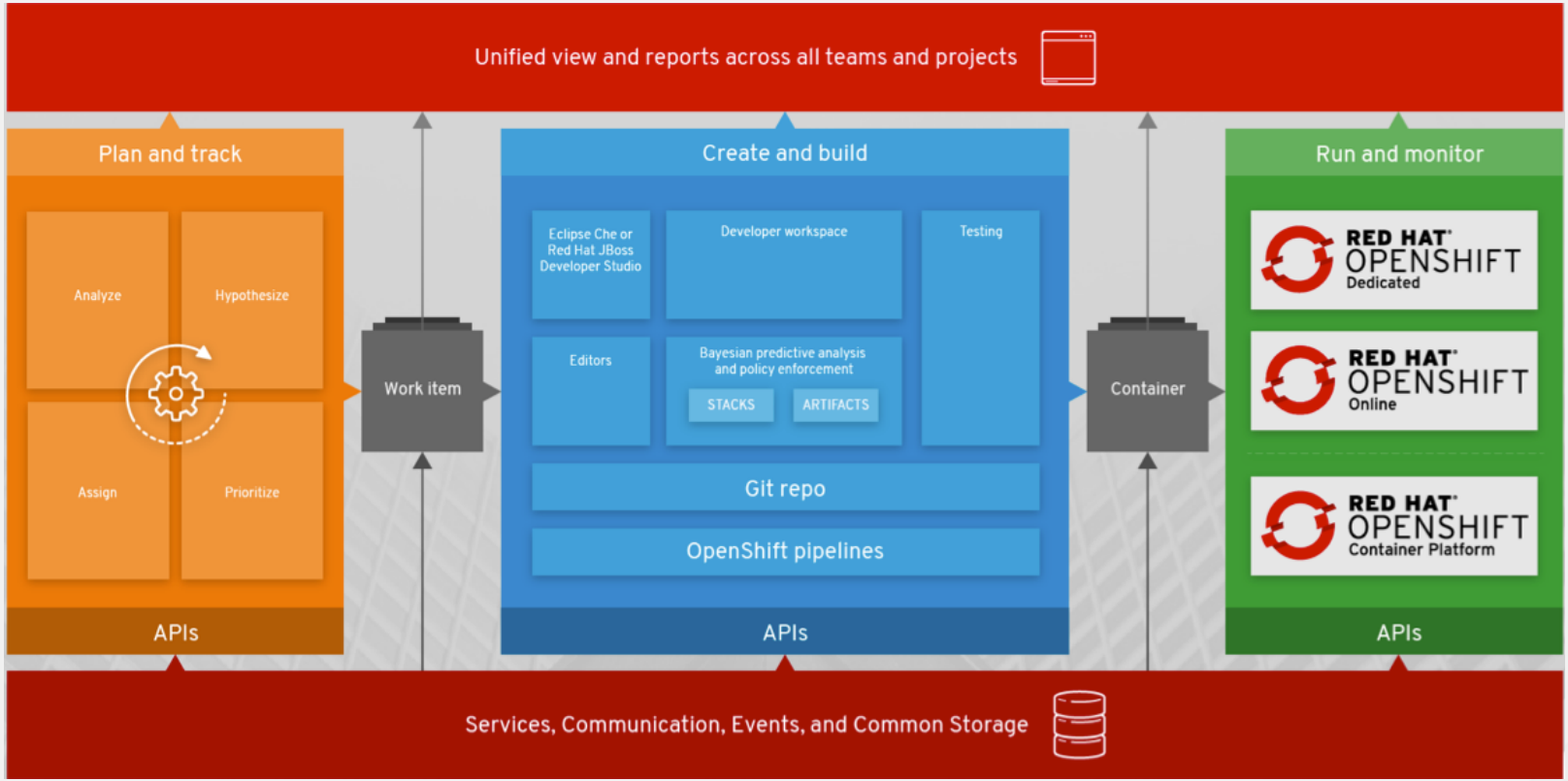
Ansible Service Broker

- Embraces Service Catalog and Open Service Broker API concepts
- *Supports:*
  - Traditional S2I deployments
  - Provisioning of pre-existing images
  - Orchestrating off-platform (public cloud) services
  - Deploying multi-service solutions

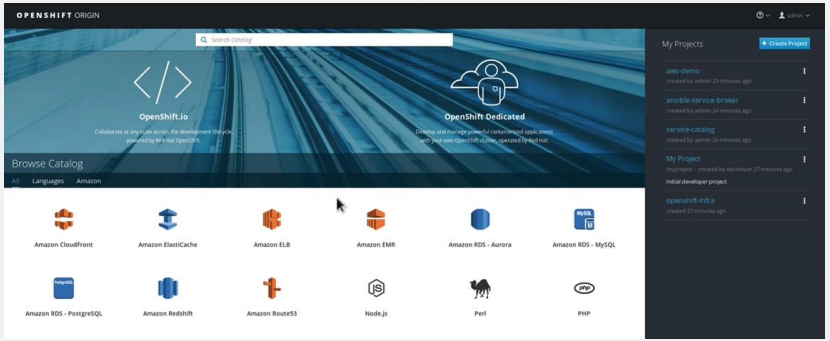
Ansible Playbook Bundle

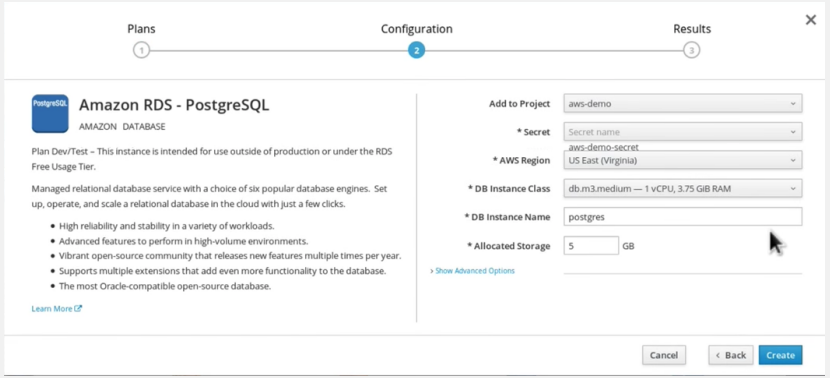
- Lightweight application definition *(meta-container)*
- Simple directory employing:
  - Named playbooks [provision, bind, …] to perform Open Service Broker actions
  - Metadata containing a list of required / optional parameters during deployment
  - Embedded Ansible runtime

Developer Tools-aaS : OpenShift.io



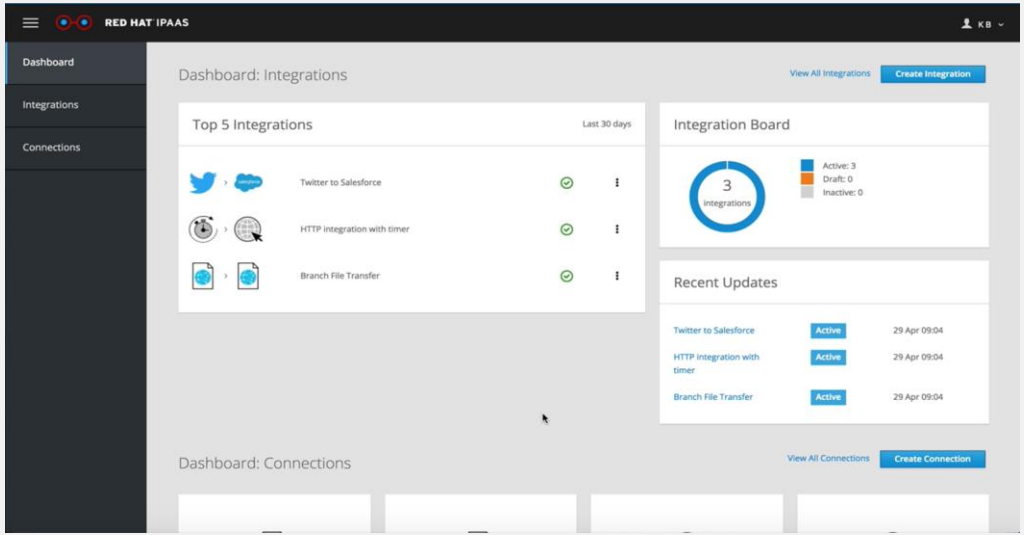
Amazon AWS Services in OpenShift





- Native integration of AWS services in OpenShift via Open Service Broker API
- Eliminates complexity of provisioning, security model and resource consumption of AWS services
- Users will be able to bind their containerized apps running in OpenShift, to services running on AWS, directly from the OpenShift Console
- OpenShift configures all project dependencies, runtime configurations and automates deployments
- Joint support path for applications using OpenShift integration with AWS; GA projected for Q4 CY17
- More details: Press release, Andy Jassy's video, blog, demo video

Integration Platform-as-a-Service (iPaas)

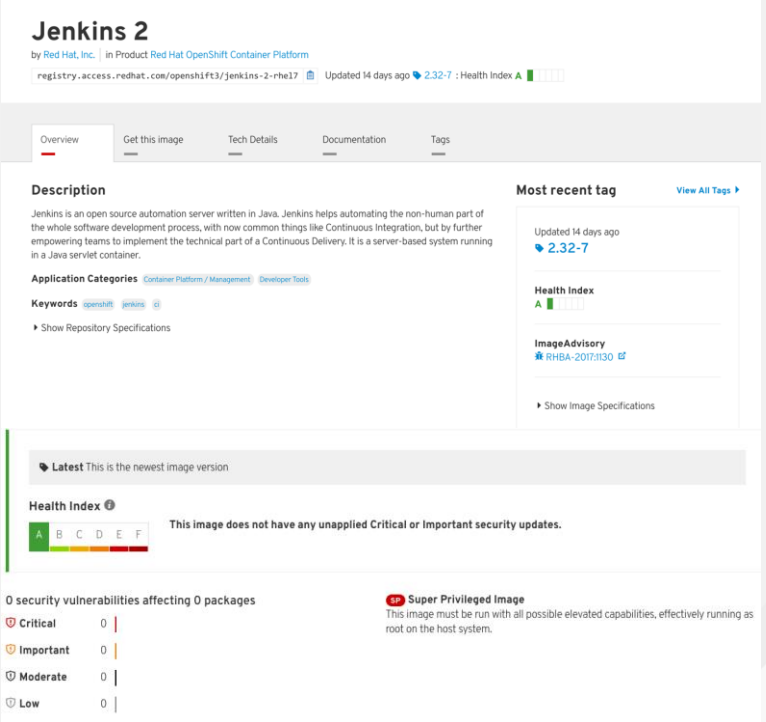


- Integration platform for low-code environments and non-technical users
- Create, connect and manage integrations between commons systems and data sources quickly (no installation needed)
- Create and connect APIs using web based tooling (3scale API Management)
- Point and click tools to build, test & deploy integrations
- Based on Syndesis.io, JBOSS Fuse, Apache Camel and OpenShift
- Currently in public preview
- More details: Blog, demo video

Container Catalog & Health Index

- Container quality and security rating
- Based on age and impact of unapplied security errata
- Includes A to F grade and image advisories
- Integrated into Red Hat Container Catalog at access.redhat.com/containers

- Link to [Press Release]



CLOUDFORMS 4.5 & CONTAINER MANAGEMENT

RED HAT® CLOUDFORMS + OPENSHIFT

Ansible Automation, User Experience & Monitoring

Ansible Automation Inside

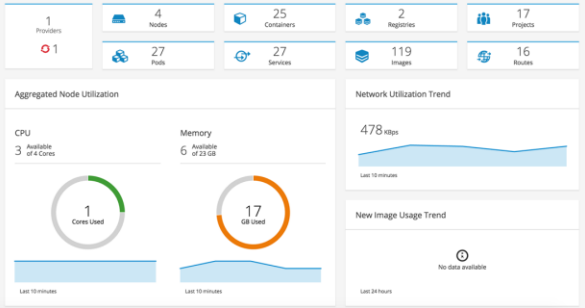
- Default automation language for Red Hat CloudForms

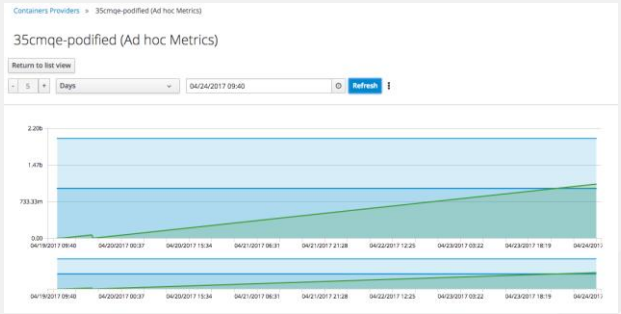
User Experience

- Dashboard update, new widgets
- Topology enhancement
- Predefined Container Roles, Reports
- External Logging Integration

Monitoring

- Ad hoc Metrics
- Performance Reports
- From Hawkular





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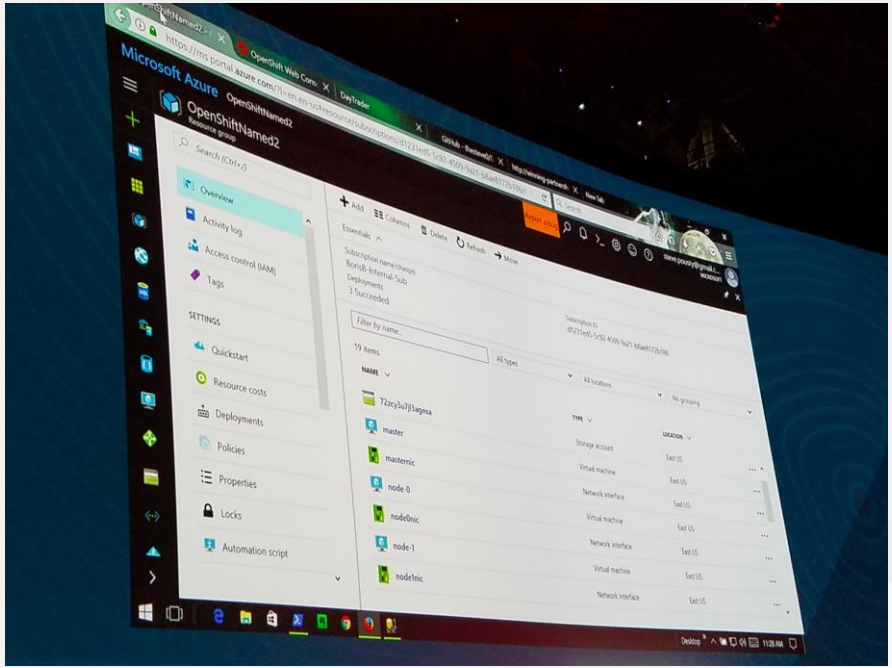
Windows Containers on OpenShift (Preview)

- Upstream project to improve Windows Containers and Kubernetes support
- Collaboration between Microsoft, Red Hat and Kubernetes (Windows SIG)
- Demo of OpenShift running mixed cluster with Windows Containers/Windows Server 2016 Nodes running with Linux Containers/RHEL Nodes
- Running in OpenShift (kube pod) running .NET 4.5. With a java container as well.
- Watch the demo video.



Partner Solutions

- 41 OpenShift Sponsor Partners at Summit
- 17 Primed Partners at Summit
- 35+ meetings with partners @ Summit
- Press Releases - 5 Partner-led; 1 Red Hat-led
  - AWS, BlackDuck, EnterpriseDB, BigSwitch, JFrog and Avi Networks
- Container Health Index Release
  - 18 Partner Quotes/Mentions supporting release

WHO IS DOING THIS?

read more at openshift.com/customers

KEYBANK

JOHN RZESZOTARSKI
Director of DevOps

Thursday, May 4
Day 3 keynote (afternoon)

As with many large companies, KeyBank found that application delivery resulted in complexity growth over time, with slow manual testing, quarterly release cycles and outages resulting in poor Mean-to-time-Resolution (MTTR). KeyBank recently went cloud-native and built a DevOps practice while using Red Hat OpenShift Container Platform. KeyBank's DevOps team wanted to embrace an approach that also provided greater security for customer information.

KEYBANK - Going Cloud-Native

"On Day 1 of our acquisition of a new bank, 10 changes were put into production, with 0 defects, during the middle of the day. That is the power of OpenShift." -- John Rzeszotarski, Dir. DevOps, Keybank

- One of Top 15 banks in the US
- Acquiring banks to reshape their market.
- Challenging regulatory environment made changes difficult.
- Using OpenShift to heavily focus on Containers, Automated Testing and Continuous Delivery.
- Migrating monolithic applications to Microservices.
- OpenShift is driving their DevOps journey. Better collaboration between Devs and Ops.

Our "containergeddon" is now orchestrated on OpenShift

View the KeyBank keynote, read the KeyBank blog and press release

KEY BANK - Going Cloud-Native

"On Day 1 of our acquisition of a new bank - 10 changes were put into production, with 0 defects, during the middle of the day - that is the power of OpenShift."

OPTUM - Digital Transformation Journey

"Speed to Value" is one of our new business metrics. We're now delivering application updates monthly or weekly. It's about changing the operating model." -- John Hodgson, Sr. Dir, Optum

- Technology arm of UnitedHealthcare Group (Fortune #6)
- 250k employees, 10k developers
- Redefining how software is used for healthcare
- Over 4000 applications on OpenShift
- 20+ Mission Critical applications on OpenShift, including all links to 3rd-party health providers
- Deploying new SaaS applications to over 19k desktops
- Moving from private data centers to Hybrid Cloud
- Building "Cloud Scaffolding" (push-button-infrastructure) for developers, in partnership with Red Hat Open Innovation Labs
- Technology Development Program hired 17 developers in 2009, which grew to 1600 developers in 2016.

View the Optum keynote & view theCube interview

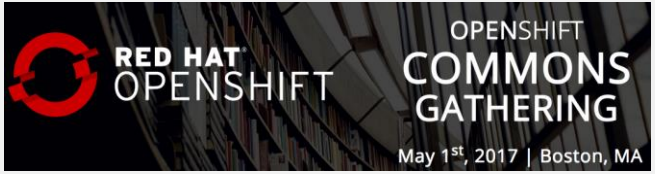
OPTUM - Digital Transformation Journey

"Speed to Value" is one of our new business metrics. We're now delivering application updates monthly or weekly. It's about changing the operating model."

2017 Red Hat Summit Breakout Sessions

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

About OpenShift Commons



Community of OpenShift customers, partners and users to connect, share best practices and collaborate on upstream projects

270+ member organizations in over 70 countries and rapidly growing
Gatherings typically scheduled around KubeCon & Red Hat Summit

At Red Hat Summit: 360+ attendees from 140 member orgs

Customer presentations from: Macquarie Bank, ATPCO, Point 72 Asset Mgmt, Swiss Federal Railways, Inmarsat, and more

Learn more and become a member: commons.openshift.org

OpenShift Commons Presentations

ATPCO Video | Slides	MACQUARIE Video | Slides	ca technologies Video | Slides
SBB Video | Slides	CISCO Video | Slides	inmarsat Video | Slides
MASSACHUSETTS GENERAL HOSPITAL Video | Slides	LA POSTE Video | Slides	Point72 Asset Management Video | Slides

Detailed OpenShift Commons recap including videos, slides and ask-the-experts sessions

Containers in production are real. And they are real on OpenShift.

Blog: [The Breadth and Reach of the OpenShift Marketplace]

OUR HYBRID CLOUD PORTFOLIO

FY2017 subscription revenue and y/y growth

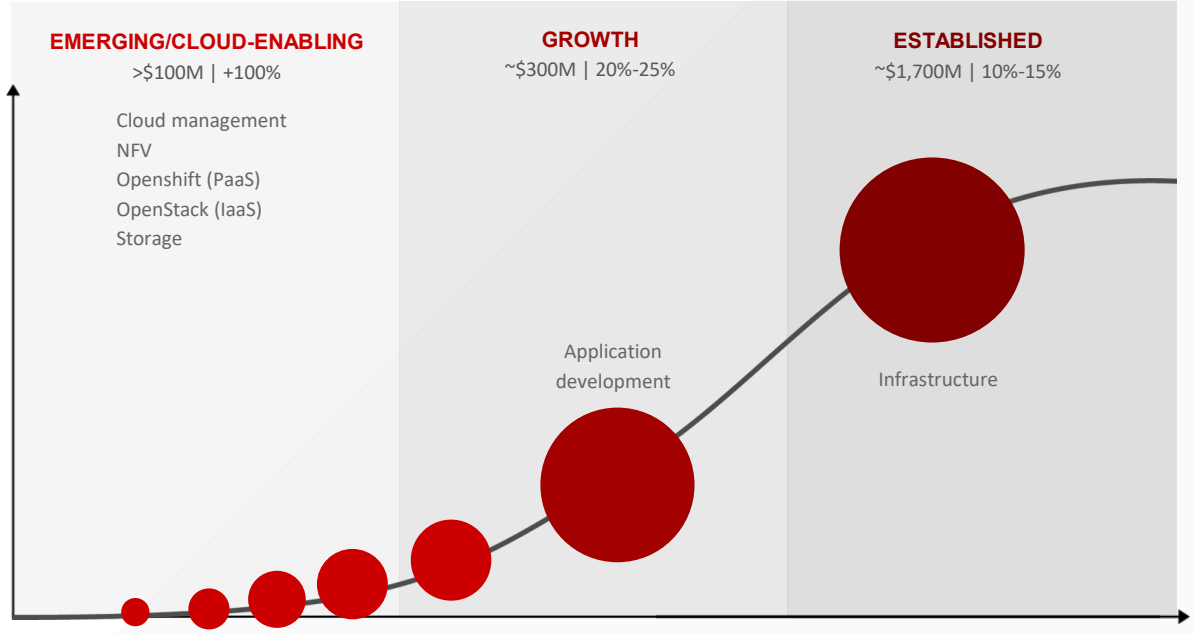
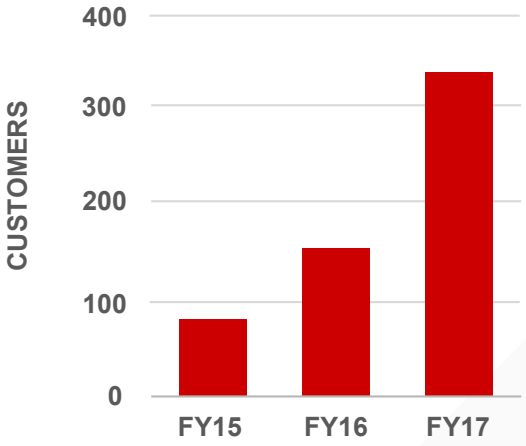


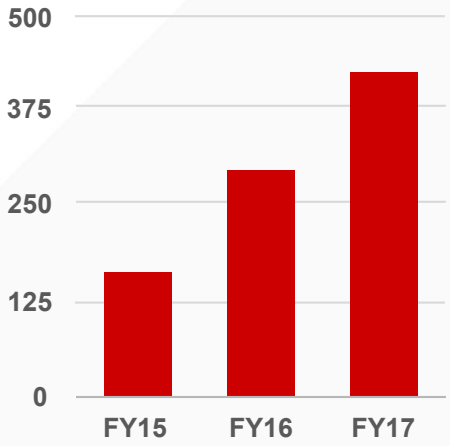
Chart for illustration purposes only. Not to be construed as guidance.

CUSTOMER ADOPTION OF TOP EMERGING TECHNOLOGIES

RED HAT® OPENSHIFT

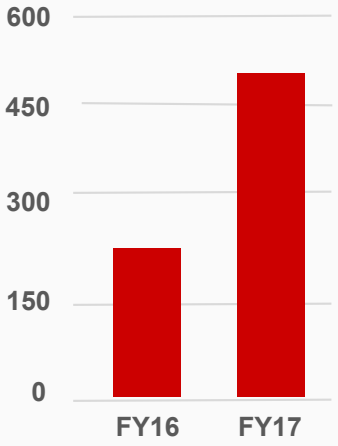


RED HAT® OPENSTACK® PLATFORM



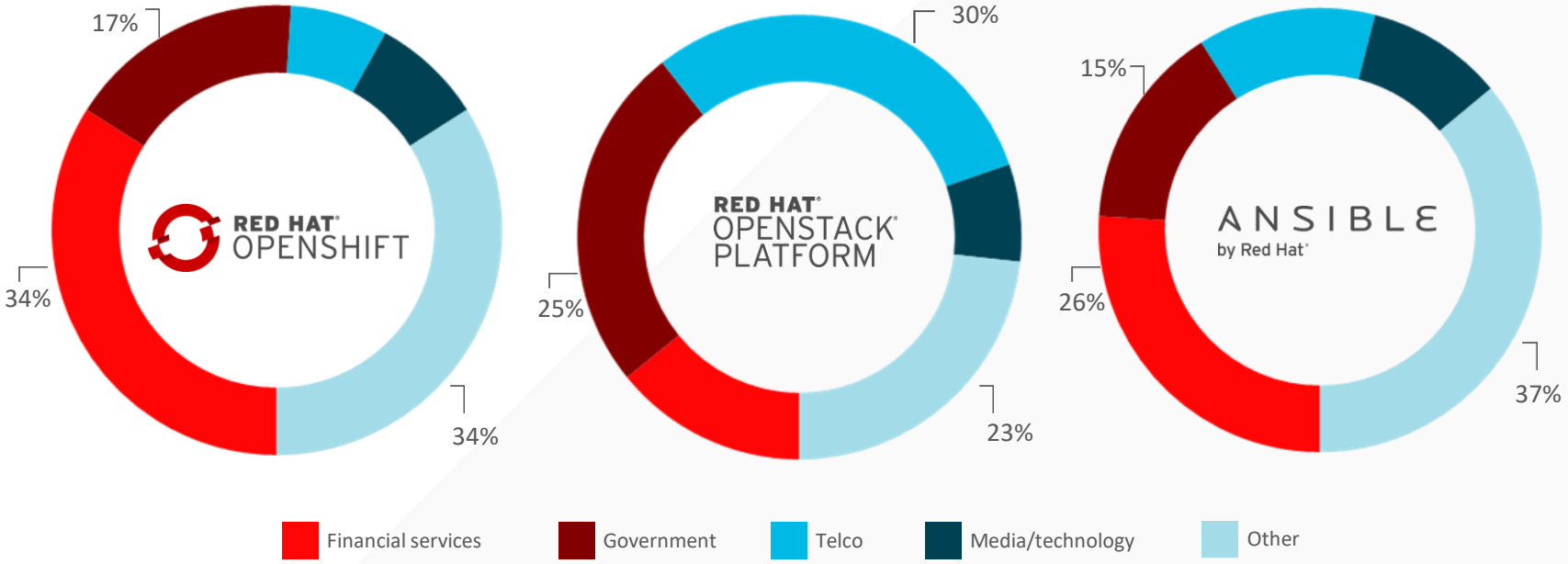
ANSIBLE by Red Hat®

(acquired FY16)



Source: company customer subscription data

TOP EMERGING TECHNOLOGY ADOPTION BY VERTICAL



*Verticals distribution based on FY17 annualized subscription data

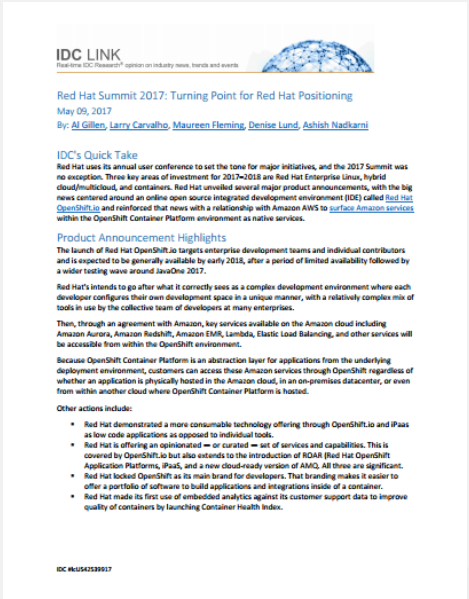
Analyst views of Red Hat Summit 2017

Red Hat 2017: Turning point for Red Hat Positioning

“Red Hat Summit always provides insight into where the company is heading, and Red Hat Summit 2017 was no exception. OpenShift.io addresses a hole in the company's portfolio.

The AWS partnership combines Red Hat's open source heritage with AWS's rapid innovation of public cloud services on comprehensive infrastructure.

Red Hat is making big plans to stay in sync with the industry moving forward.” -- IDC, May 2017



IDC LINK

Real-time IDC Research™ opinion on industry news, trends and events

Red Hat Summit 2017: Turning Point for Red Hat Positioning

May 09, 2017

By: Al Gillen, Larry Carvalho, Maureen Fleming, Denise Lund, Ashish Nadkarni

IDC's Quick Take

Red Hat uses its annual user conference to set the tone for major initiatives, and the 2017 Summit was no exception. Three key areas of investment for 2017–2018 are Red Hat Enterprise Linux, hybrid cloud/multicloud, and containers. Red Hat unveiled several major product announcements, with the big news centered around an online open source integrated development environment (IDE) called Red Hat OpenShift.io and reinforced that news with a relationship with Amazon AWS to surface Amazon services within the OpenShift Container Platform environment as native services.

Product Announcement Highlights

The launch of Red Hat OpenShift.io targets enterprise development teams and individual contributors and is expected to be generally available by early 2018, after a period of limited availability followed by a wider testing wave around JavaOne 2017.

Red Hat's intends to go after what it correctly sees as a complex development environment where each developer configures their own development space in a unique manner, with a relatively complex mix of tools in use by the collective team of developers at many enterprises.

Then, through an agreement with Amazon, key services available on the Amazon cloud including Amazon Aurora, Amazon Redshift, Amazon EMR, Lambda, Elastic Load Balancing, and other services will be accessible from within the OpenShift environment.

Because OpenShift Container Platform is an abstraction layer for applications from the underlying deployment environment, customers can access these Amazon services through OpenShift regardless of whether an application is physically hosted in the Amazon cloud, in an on-premises datacenter, or even from within another cloud where OpenShift Container Platform is hosted.

Other actions include:

- Red Hat demonstrated a more consumable technology offering through OpenShift.io and iPaas as low code applications as opposed to individual tools.
- Red Hat is offering an opinionated — or curated — set of services and capabilities. This is covered by OpenShift.io but also extends to the introduction of ROAR (Red Hat OpenShift Application Platforms, iPaaS, and a new cloud-ready version of AMQ. All three are significant.
- Red Hat locked OpenShift as its main brand for developers. That branding makes it easier to offer a portfolio of software to build applications and integrations inside of a container.
- Red Hat made its first use of embedded analytics against its customer support data to improve quality of containers by launching Container Health Index.

IDC #lcUS42539917

Top Blog Posts

What makes us Red Hat -- Paul Cormier
Containers are Linux -- Joe Fernandes
The Breadth and Reach of the OpenShift Marketplace -- Brian Gracely
AWS and Red Hat -- Digging a little deeper -- Chris Morgan

RED HAT OPEN INNOVATION LABS

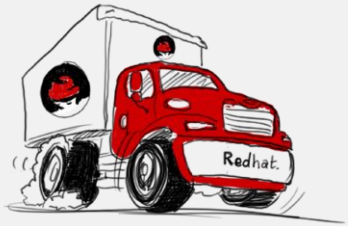
MODERNIZE TRADITIONAL APPS
- Extend applications
- Optimize applications
- Scale applications
- Expose to orchestration

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



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