Red Hat Containerization Strategies

Presenter: Scott McCarty

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About Me

No, Really, What I Have Actually Done:

- Background in Web Operations and DevOps (before it was called that)
- Experience in: Government Research, Startups, Enterprise Customers

What I Do Now:

- Senior Principal Technical Product Marketing Manager: Containers
- A lot of technical thought leadership

Goals Today

- Provide operational confidence in running containers
- Demonstrate that Red Hat is a leader in containers
- Share a bunch of aha! moments we have had

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About All of You

Straw Poll Time!

- How many of you have deployed Docker containers in production?
- How many of you have deployed Docker containers in development?
- How many of you have fingers on keyboard, played with Docker containers?
- How many of you have read a story about Docker and kinda get it?
- How many of you want the aha! moment to happen with containers?

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Use Cases

These are good for Developers, Sysadmins and Architects...

- Experimentation
- Distributed Services (Even Client/Server)
- Distributed Batch Processing (Big Data)
- Building Demos (Embrace doing it wrong)
- Hiring Technical People
- And on and on and on

How does all of this work?

I am going to start simple and work up...

- Fancy files
- Fancy processes
- Fancy file servers
- Fancy...wait...the rest does get more complicated
  - Operational Aspects (orchestration, backups, monitoring, quotas, rbac)
  - Build Aspects (Docker builds, intermodal containers)
  - End User Aspects (GUI, CLI, IDE Integration, RBAC)

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Docker Containers on Disk

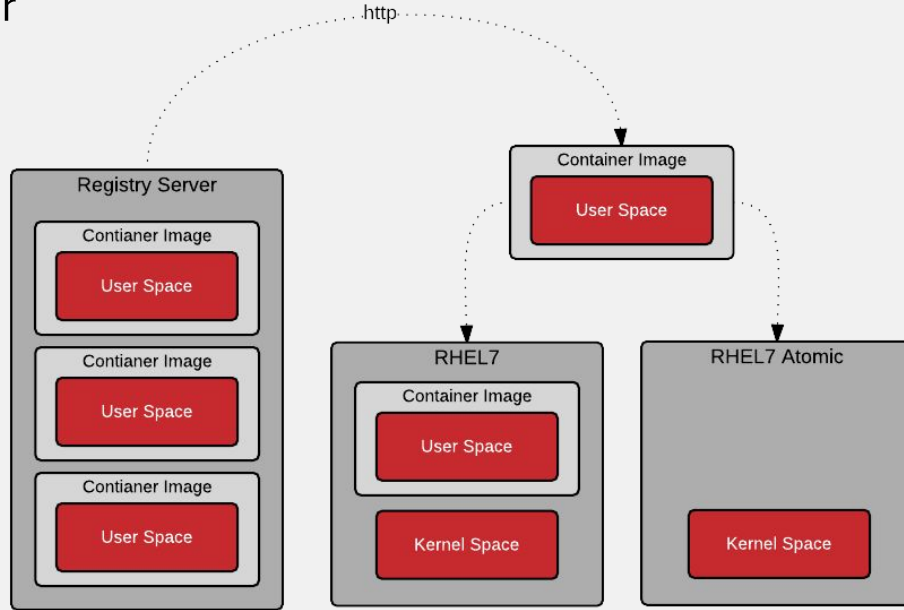These are really just fancy files...

Docker Container Images

What's the difference between virtualization anyway?
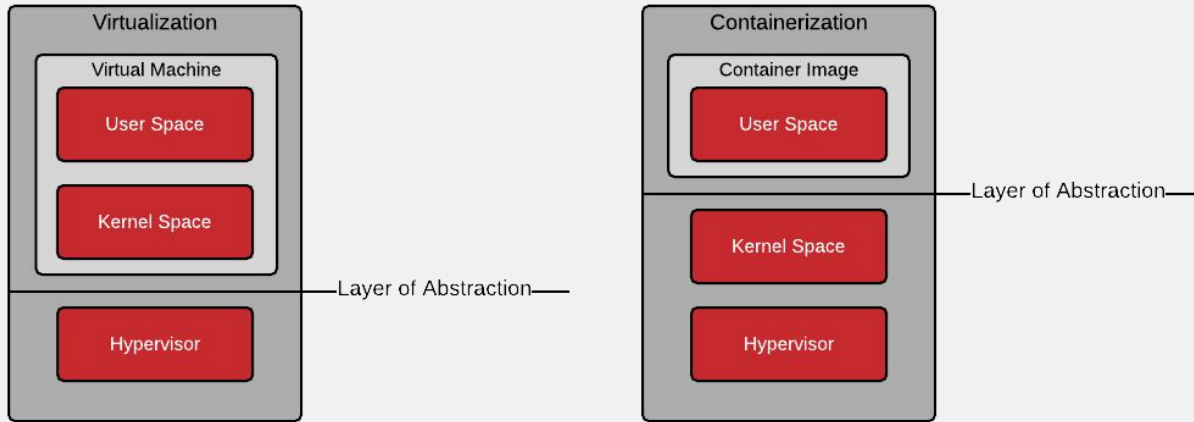
Registry Infrastructure

Fancy file server

Docker Container Images

Actually, they are repositories

Command: docker pull registry.access.redhat.com/rhel7/rhel:latest

Decomposition: access.registry.redhat.com / rhel7 / rhel : latest
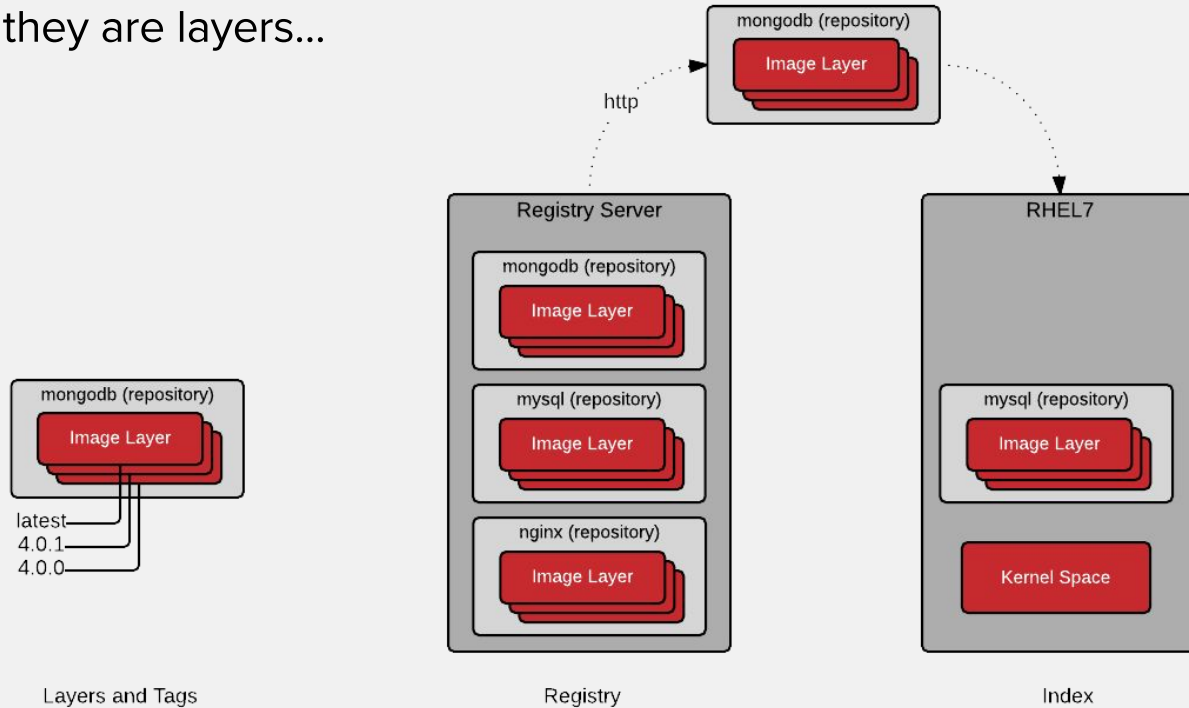
Generalization: Registry Server / namespace / repo : tag

Putting It All Together

Actually, they are layers…

Layers and Tags
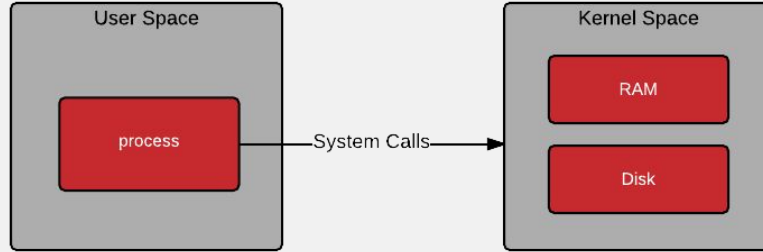
Registry

Index

Linux Containers in Memory
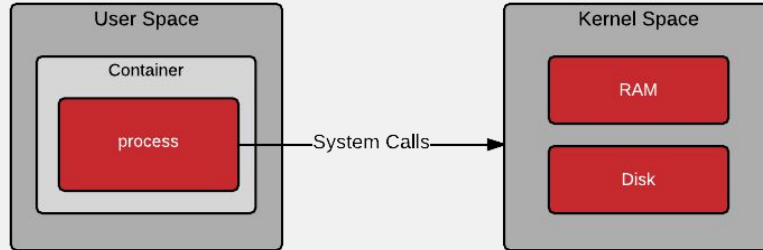
These are really just fancy processes...

Linux Containers

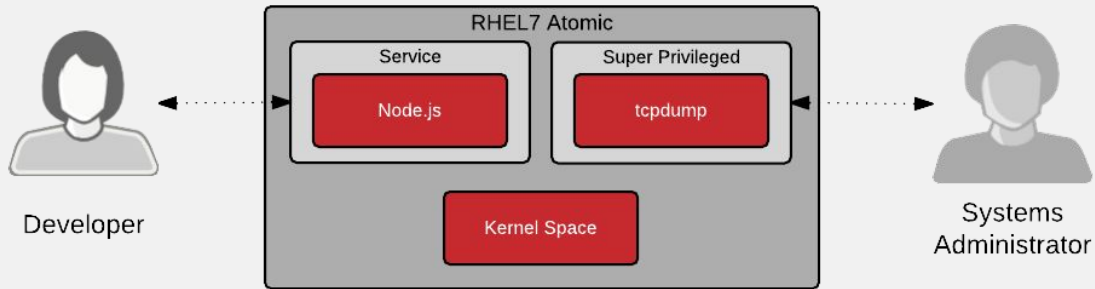So these are really just applications?

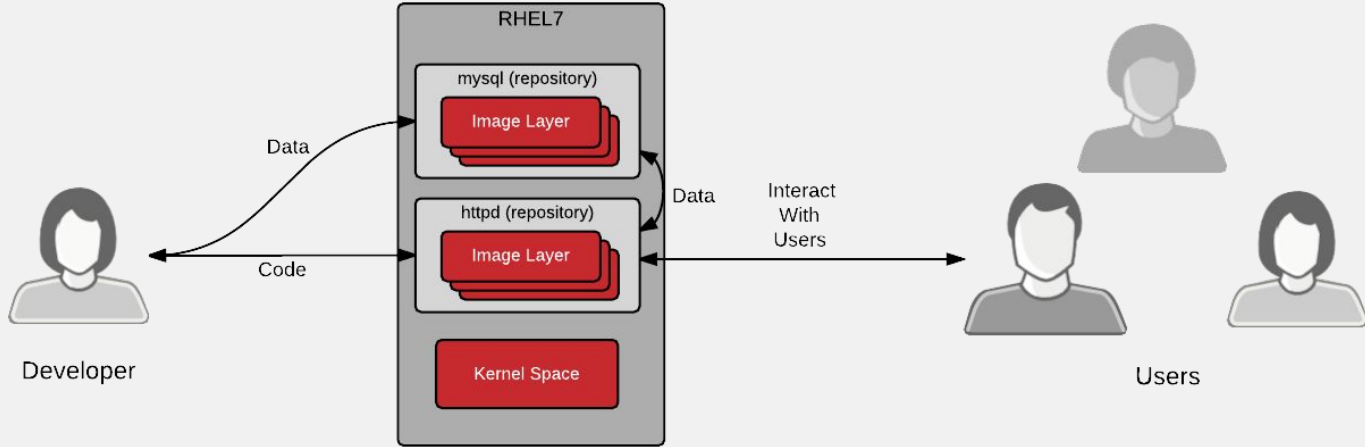Regular Linux Process

Containerized Process

Linux Containers

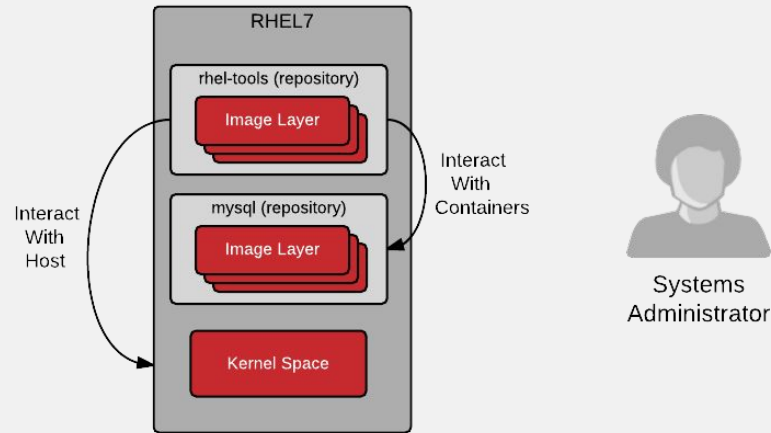So it really depends on the type of workload?

Application Containers

This is what most people think of with Docker

Super Privileged Containers

This often blows people's minds

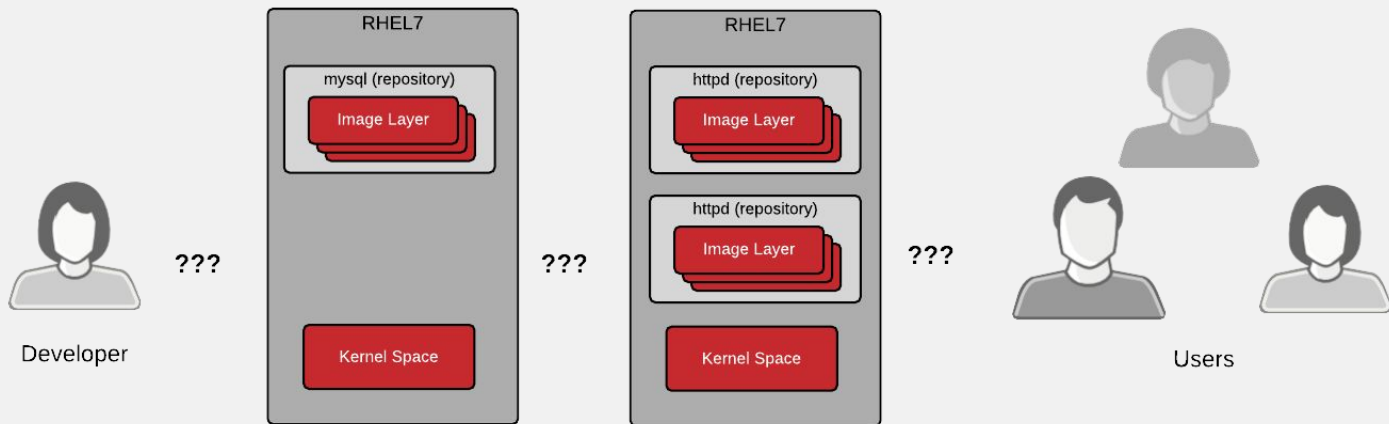# Let's Get More Advanced

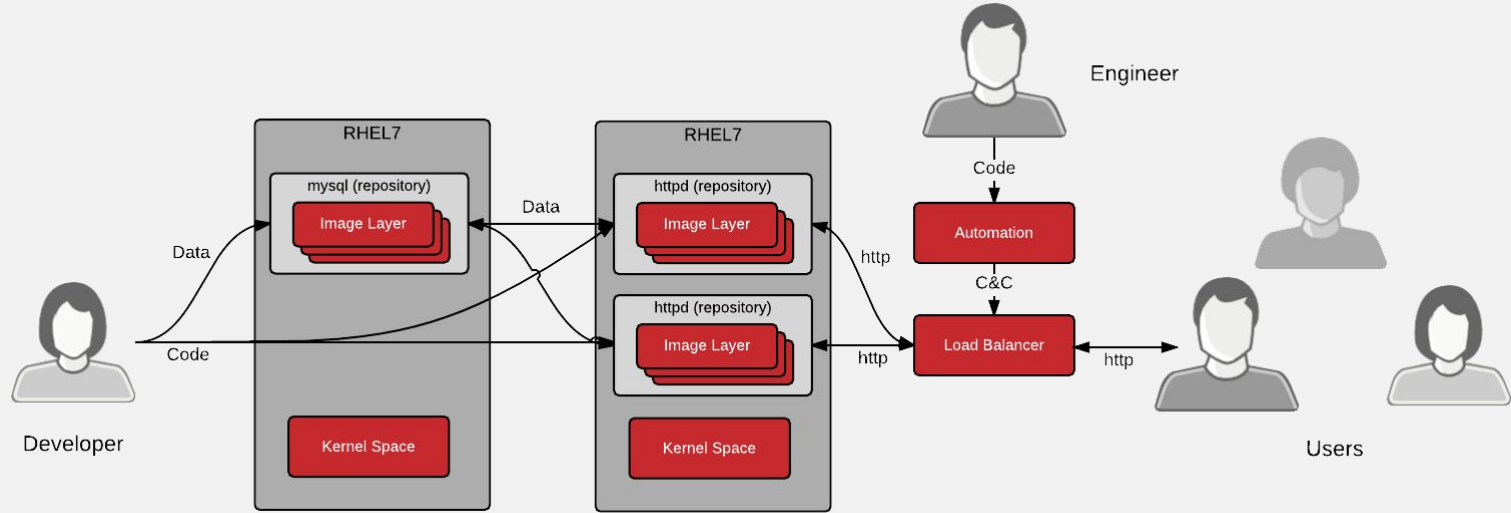Let's Talk About the Data Center...

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Application Containers

This Changes Everything

Application Containers

You Can Build it Yourself But This is Ugly...

Application Containers

This Standardizes Everything

Red Hat OpenShift Enterprise

OPENSHIFT
ENTERPRISE
by Red Hat®

| CONTAINER | CONTAINER | CONTAINER | CONTAINER | CONTAINER |

SELF-SERVICE

| OPENSHIFT SERVICES | SERVICE CATALOG |

| OPENSHIFT BUILDS | OPENSHIFT DEPLOYMENTS |

APPLICATION LIFECYCLE AUTOMATION

| ORCHESTRATION | CLUSTER SERVICES |

| NETWORKING | STORAGE | REGISTRY | TELEMETRY | SECURITY |

PACKAGING FORMAT

| RED HAT ENTERPRISE LINUX | ATOMIC HOST |

| PHYSICAL | VIRTUAL | OPENSTACK | AWS |
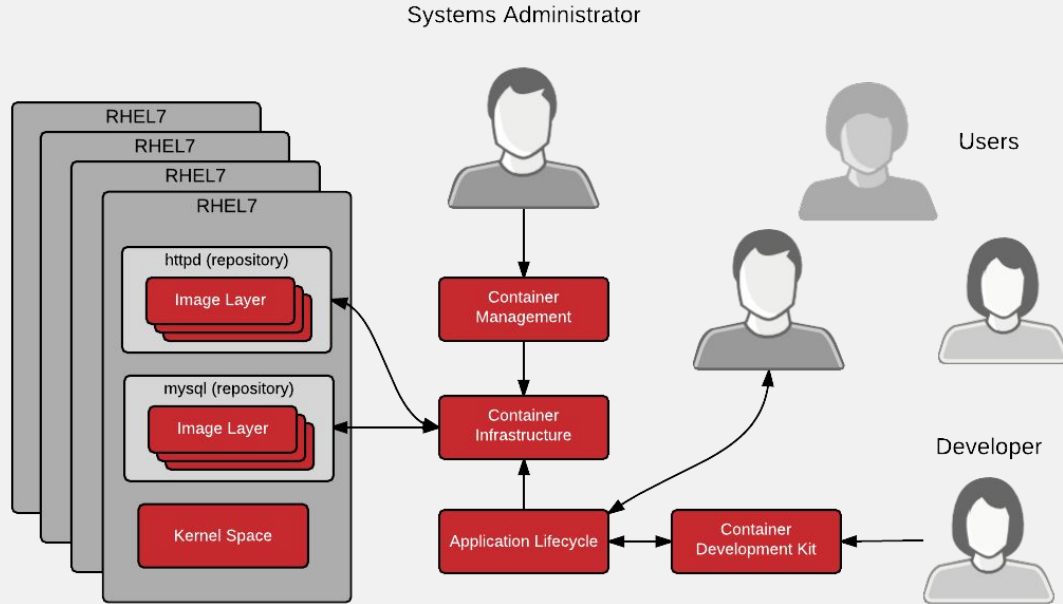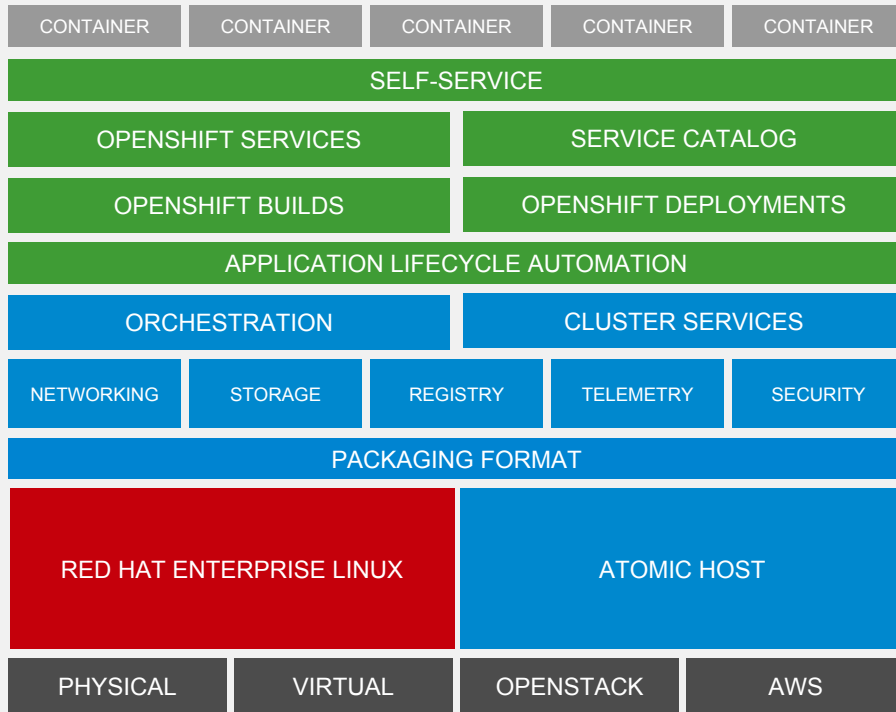
RED HAT®
ATOMIC ENTERPRISE
PLATFORM

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Red Hat Atomic Enterprise Platform

When you hear "Atomic", think containers….
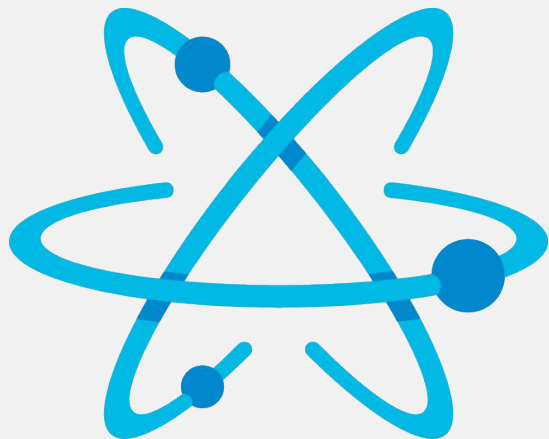
RED HAT ATOMIC

- An integrated infrastructure platform powered by Red Hat Enterprise Linux that is designed to run, orchestrate, and scale container-based applications and services
- Easily manage and scale applications and infrastructure through a managed cluster of container hosts
- Gain application resiliency and elasticity via orchestration and service aggregation

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Red Hat Atomic Enterprise Platform

Optimized container infrastructure solution for deploying, running, and managing distributed applications

Atomic Host - a container-optimized, minimal footprint OS powered by Red Hat Enterprise Linux

Atomic Runtime and Packaging Format - standardized container packaging format and runtime, powered by Docker (and OCI)
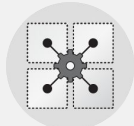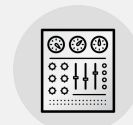
Orchestration - for complex multi-container services, powered by Kubernetes
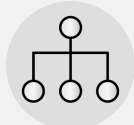
Cluster Services - Scheduling for services across a container host cluster, powered by Kubernetes

Registry - integrated storage and management for sharing container images

Telemetry - logging and metrics for pods/containers, services and underlying infrastructure to make informed decisions

Automation to dynamically provision and configure container host clusters

Networking - scalable, multi-host container networking, powered by Open vSwitch, that runs anywhere Red Hat Enterprise Linux runs

Storage, with persistent storage plugins to enable running of stateful services in }containers

Security to prevent tenants from compromising other occupants

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OpenShift Enterprise by Red Hat

Application delivery platform designed for traditional and cloud native applications
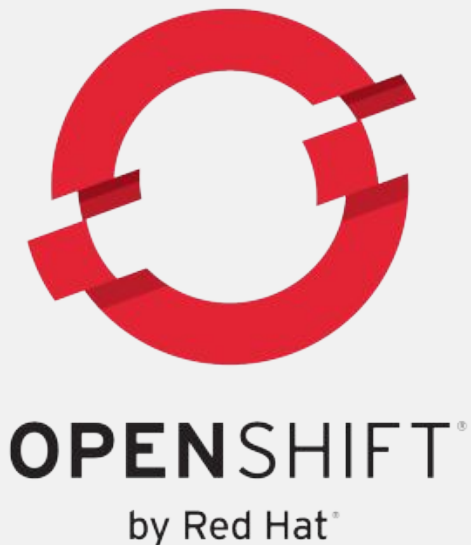
- An integrated hybrid cloud application platform for application development and deployment that facilitates DevOps workflows and needs
- Develop, build, and manage container based applications with application lifecycle management and a rich developer experience
- Easily turn source code into running applications with source-to-image capabilities

What's New in Red Hat OpenShift 3.1

ACCELERATING APPLICATION DELIVERY AND MODERNIZATION

- Streamlined app creation flows
- Usability and logging improvements
- Access to new Middleware Services

ONE PLATFORM FOR TRADITIONAL AND CLOUD NATIVE APPLICATIONS

- Run stateful and stateless applications with container level persistent storage
- New storage plugins
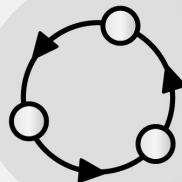
BUILT-IN OPERATIONAL MANAGEMENT AND AUTOMATION

- Comprehensive real-time visibility
- Container event automation with model-driven workflows
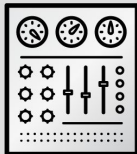
BACKED BY A GROWING PARTNER AND COMMUNITY ECOSYSTEM

- New Storage plugins
- Pluggable Networking
- Development Tools

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Container Support in CloudForms

- Red Hat CloudForms 4 adds new providers for OpenShift and Containers
- Monitor containers running in OpenShift Enterprise
- Docker and Kubernetes aware (containers, pods, services...)
- OpenShift provider adds even more features (projects, users, registries, images)
- Included with OpenShift Enterprise subscriptions
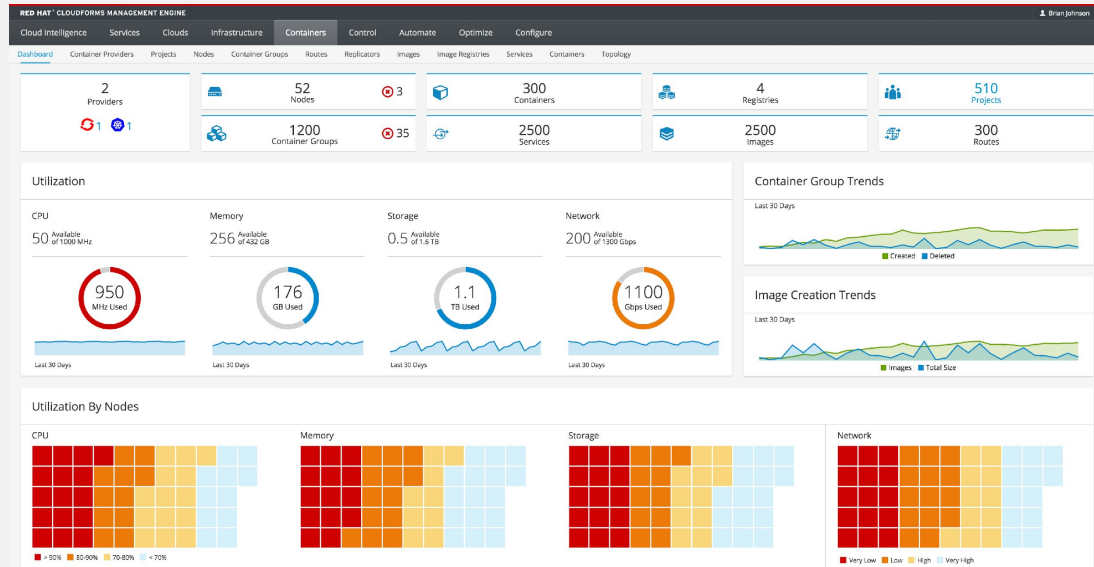
Red Hat Container Solutions

MIDDLEWARE AND MOBILITY SERVICES

CERTIFIED APPLICATIONS VIA ISV ECOSYSTEM

RED HAT®
CLOUD SUITE
for Applications

- Unified management from bare metal to containers
- Scalable infrastructure
- Hybrid deployment management

Seamlessly manage from infrastructure to applications based on OpenStack
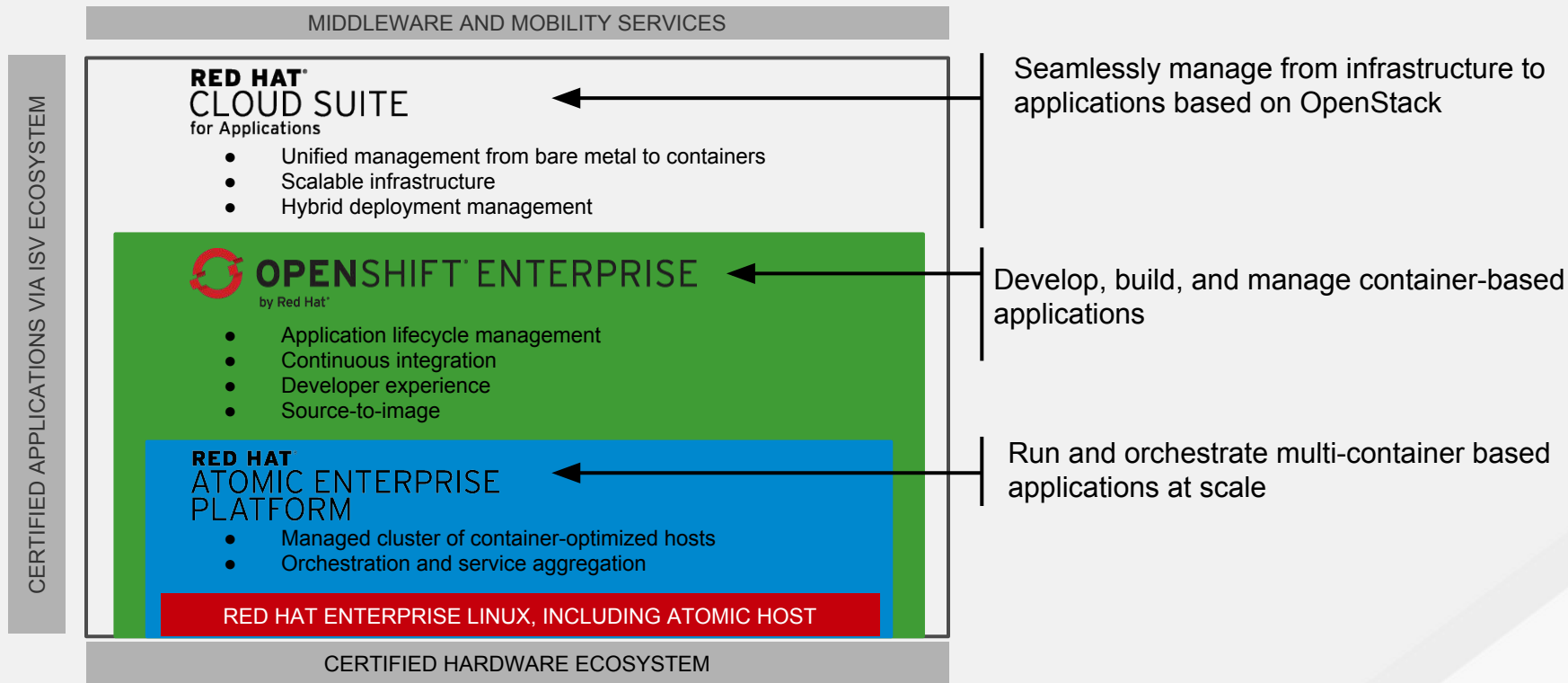
OPENSHIFT® ENTERPRISE
by Red Hat®

- Application lifecycle management
- Continuous integration
- Developer experience
- Source-to-image

Develop, build, and manage container-based applications

RED HAT
ATOMIC ENTERPRISE
PLATFORM

- Managed cluster of container-optimized hosts
- Orchestration and service aggregation

Run and orchestrate multi-container based applications at scale

RED HAT ENTERPRISE LINUX, INCLUDING ATOMIC HOST

CERTIFIED HARDWARE ECOSYSTEM

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Call to Action

Engage Technical Resources

People

- Technical Account Manager
- Solutions Architect
- Me Scott McCarty @fatherlinux :-)

Literature

- http://developerblog.redhat.com/2014/05/15/practical-introduction-to-docker-containers/
- http://developerblog.redhat.com/2016/01/13/a-practical-introduction-to-docker-container-terminology/
- http://rhelblog.redhat.com/2015/07/29/architecting-containers-part-1-user-space-vs-kernel-space/
- http://rhelblog.redhat.com/2015/09/17/architecting-containers-part-2-why-the-user-space-matters-2/
- http://rhelblog.redhat.com/2015/11/10/architecting-containers-part-3-how-the-user-space-affects-your-application/

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THANK YOU