Container Management: First Looks

John Hardy
Senior Principal Product Manager
jhardy@redhat.com

Itamar Heim
Senior Director, Software Engineering
itamar@redhat.com

25th June 2015
Disclaimer

This information is provided for discussion purposes only and is subject to change for any or no reason.
Virtualization is Great
BUT with it came VM Sprawl
Containers are about micro-services...
Expect 10X scale of VMs!

And... expect them to run in VMs
(so we’ll talk about managing through the layers)
Elephant in the Room - How will we manage containers?
What is Atomic?

- RHEL Atomic is a variation of Red Hat Enterprise Linux 7
- Components
  - systemd
  - Kubernetes
  - Docker
  - SELinux
- JEOS for Containers
- OSTree vs. Yum / RPM
- Everything is a Container
Container Solutions
Solutions to Develop, Run, and Manage container-based applications

**RED HAT ATOMIC ENTERPRISE PLATFORM**

Powered by Red Hat Enterprise Linux, an integrated infrastructure platform designed to run, orchestrate, and scale multi-container based applications and services.

**OPENSHIFT ENTERPRISE by Red Hat®**

An integrated hybrid cloud application platform for application development and deployment that facilitates DevOps workflows and needs.

**RED HAT CLOUD SUITE for Applications**

Solution providing both Infrastructure-as-a-Service (IaaS) for massive scalability and Platform-as-a-Service (PaaS) for faster application delivery, combined with a unified management framework that supports hybrid deployment models.
## Compatibility Matrix

<table>
<thead>
<tr>
<th>Audience</th>
<th>Capability</th>
<th>RH Atomic Enterprise Platform</th>
<th>OpenShift Enterprise by RH</th>
<th>RH Cloud Suite for Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operations</strong></td>
<td>Container optimized host</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Orchestration</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Large scale deployments</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Certified ecosystem</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Developers</strong></td>
<td>App lifecycle management</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Continuous integration</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Developer tooling</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Large scale deployments</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Enterprise Architects</strong></td>
<td>VMs + Containers</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Unified Management</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Hybrid Cloud</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Full stack, fully integrated</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Linux Containers - Concerns

53% say security is their biggest concern about containers

43% say performance is their biggest concern about containers

41% say integration is their biggest concern about containers

35% say management is their biggest concern about containers

35% say certification is their biggest concern about containers

Base: 194 IT operations and development decision-makers at enterprises in APAC, EMEA, and North America Source: A commissioned study conducted by Forrester Consulting on behalf of Red Hat, January 2015
Cockpit
Cockpit is an **interactive remote** RHEL admin interface
GOALS

1. RHEL usable by non-expert admins
2. Complex RHEL features discoverable
COCKPIT IS

Zero footprint
COCKPIT IS

Works out of the box
COCKPIT IS

Respects other configuration tools/systems
Cockpit Demo Video

https://www.youtube.com/watch?v=d70YKDUq77Y
Interactive System Configuration

Client side

Cockpit web app

Network service

cockpit-ws
WebSocket port 9090

cockpit-bridge

User session

bash and command line tools

System APIs

Kernel

systemd

NetworkManager

journal

Docker

OSTree

storaged

SSH terminal

sshd
SSH port 22
GARTNER: IAAS REFERENCE ARCHITECTURE AND CMPS

Source: Gartner (July 2012)
Release Schedule

Note: Red Hat CloudForms may NOT align directly to a ManageIQ release of the same month/quarter.

Note: Red Hat CloudForms version numbering is guidance only.
Holistic

Disk Failure!

Availability?
Relationships

- HR Application
- Service

- Kubernetes Nodes

- Cluster

- Pods

- Containers

- Docker Images

- Regions

- Virtual Machines

- Nodes

- Physical Server

- Storage

- Array

- Disk
Red Hat CloudForms Demos
Dashboard Demo Video

https://www.youtube.com/watch?v=Ko4hqe6HrQ0
Topology Demo Video
https://www.youtube.com/watch?v=N51b-TB3Zqw
Project, Replicator, SmartState Demo Video

https://www.youtube.com/watch?v=Oc7DCabuT4k
SmartState and Genealogy Demo Video
https://www.youtube.com/watch?v=Y56m6fnaBRg
Architecture
Pluggable Provider Architecture

- Microsoft SCVMM
- VMware vSphere
- NetApp
- Amazon AWS
- Kubernetes
- OpenStack
- OpenShift
- Middleware
- Satellite
- RHEV
- Red Hat Storage
- Content
- Virt
- Storage
- Network
- Cloud
- Containers
- Apps

CloudForms

#redhat #rhsummit
Provider Components

CloudForms

Provider Componentry

- Inventory
- Events
- Metrics
- Operations
- Provisioning
- Introspection
Provider Components for Kubernetes/OpenShift

CloudForms

Provider Componentry

- Inventory
- Events
- Metrics
- Operations
- Provisioning
- Introspection

Heapster (InfluxDB or Hawkular)

Kubernetes

OpenShift

CloudForms State Machine

Custom code to docker mount

Deployment

Registry

Content/Errata

Satellite
Thursday, June 25  1:20 pm - 2:20 pm

Amadeus uses next-generation containerized application platform with OpenShift (Room 206)

Red Hat Enterprise Linux 7 Atomic Host special interest group panel (Room 306)

Atomic architectures & containerized, application-centric IT (Room 302)

Immutable infrastructure, containers, & the future of microservices (Room 310)
Thursday, June 25 2:30 pm - 3:30 pm

Red Hat CloudForms roadmap (Room 206)

Continuous integration & continuous delivery via containers (Room 313)

Operating and managing an Atomic container-based infrastructure (Room 302)
Thursday, June 25 3:40 pm - 4:40 pm

Container security: Do containers actually contain? Should you care? (Room 304)

Enterprise containers 101 (Room 200)
Red Hat's container roadmap

room 312 Thursday, June 25 4:50 pm - 5:50 pm
Friday

Containers versus virtualization
Room 302 - 9:45 am - 10:45 am

Containerizing applications, existing and new
Ballroom B-2 - 9:00 am - 11:00 am

Containers & config management (Docker & Puppet)
Room 206 - 11:00 am - 12:00 pm
Questions?

John Hardy
Senior Principal Product Manager
jhardy@redhat.com

Itamar Heim
Senior Director, Software Engineering
itamar@redhat.com
LEARN. NETWORK.
EXPERIENCE OPEN SOURCE.