Wearing Many Red Hats
Multifaceted Container Management
Federico Simoncelli
Stef Walter
June 2016
Get Ready: Dive into Containers
Get Set: Container Infrastructure
Go: Container Management
Business Automation
CONTAINER
Integration
CONTAINER
Data
CONTAINER
Web & Mobile
CONTAINER
3rd party frameworks
CONTAINER

LIFECYCLE AUTOMATION
(Self-service, CI/CD, Image Stream)
CONTAINER MANAGEMENT
(Monitoring, Capacity, Policies)
CONTAINER INFRASTRUCTURE SERVICES
(Orchestration & Scheduling, Storage, Registry, Security, Networking)

ENTERPRISE- GRADE CONTAINER OS
Physical
Virtual
Private
Public

CloudForms
Ansible
Storage
Satellite
Developer Studio
CDK
Get Ready: Dive into Containers
Red Hat CDK

Simplified Setup

Handy Examples

Tools for Build & Deploy
1. Download Container Development Kit
2. Download additional components
3. Install Container Development Kit
4. Build your first container
Ansible Container

Build Docker images and orchestrate containers using Ansible playbooks

- Reliably consume and extend docker-compose
- Orchestration even during the build process
- Can be integrated in your existing Ansible automation
- Bridge toward OpenShift
Get Set: Container Infrastructure
Container Infrastructure:

Containers on their own are not enough

Operating System

Red Hat Enterprise Linux

Orchestration Platform

Openshift

built on Kubernetes

Image Registry

Atomic Registry

Built on Openshift
Container Infrastructure:

Container Operating System
atomic upgrades and rollback for the operating system
OSTree: Atomic Operating System Changes
RHEL Admin Interface

Discoverable and usable admin interface on every Atomic Host

- Project called “Cockpit”
- Troubleshoot host instances
- Interact with containers
- Browser on port 9090 or SSH
- Integrates with management tooling
- Extensible
Operating System: Red Hat Enterprise Linux Atomic Host 7.2
Version: cockpit-base.1
Host Name: localhost.localdomain.localdomain
Domain: Join Domain
System Time: 2016-06-16 10:21
Power Options: Restart
Performance Profile: atomic-guest
RED HAT ENTERPRISE LINUX ATOMIC HOST

Dashboard

CPU usage: 1%

Change resource limits

1024 shares

System
Services
Containers
Logs
Storage
Networking
Tools

https://youtu.be/fcAlCycQncN1
Pure interface, No management mid-tier
Cockpit
Ad-hoc
Interactive
Zero footprint
Container Infrastructure:

Orchestration Platform
Kubernetes Pods

- Docker Image
- Container
- Pod
Openshift Self-Service Web Console

Drive container-based applications, scaling, logs, metrics

- Developer focused
- Discoverable and interactive
- Deploy and scale apps
- Introspect running apps
- ... and much more
Container Infrastructure:

Atomic Registry
Atomic Registry Features

Standalone Openshift based Registry - Ready for the Enterprise

Choose Your Authentication
Integrate for a single sign-on (SSO) user experience

Choose Your Storage
Integrate with file, block and object storage solutions

Choose your Interface
Browser, CLI, API

Role-Based Access Control
Choose an access model that works for your enterprise
Atomic Registry Interface

Openshift based registry

- Based on Openshift
- Standalone deployable
- Authentication and access
- Mirroring images
- Integrated docker tooling
Images by project

- marmalade
- my-project
- pizzazz

Images pushed recently

- marmalade/busybox (a few seconds ago)
  - 1.1
  - 1.23
  - 1.24.0
  - 1.24.2
  - latest

- marmalade/another (a few seconds ago)
  - 5.1
  - 5.5
  - 5.6
  - 5.7
  - latest

- marmalade/origin (2 months ago)
  - latest

- marmalade/jugs (2 months ago)
  - 2.11
  - 2.5
  - 2.8
  - latest
  - 2.9

- marmalade/busybee (2 months ago)
  - 0.x
  - latest

All images

New project

New image stream
Log into the registry:

```bash
$ sudo docker login -p rWABQ-1p7pkceW05LGxYfbcQ4nKySZT368jD1atR-Q -e unused -u unused registry
```

Push an image:

```bash
$ sudo docker tag myimage registry/project/name:tag
$ sudo docker push registry/project/name
```

Pull an image:

```bash
$ sudo docker pull registry/project/name:tag
```
Docker commands:

Log into the registry:
```
$ sudo docker login -p Hel71WHwP9S11tHQhE6KUJrzY041fxz2w3-wkFm_3-E -e unused -u unused
```

Push an image:
```
$ sudo docker tag myimage 10.111.112.101:5000/project/name:tag
$ sudo docker push 10.111.112.101:5000/project/name
```

Pull an image:
```
$ sudo docker pull 10.111.112.101:5000/project/name:tag
```

https://youtu.be/UtB8cirWNa8
You can always interact the infrastructure directly

but that’s not enough...
Go: Container Management
OpenShift Advanced Management with Red Hat CloudForms
Thursday Jun 30, 4:45 PM - 5:45 PM
Room 2004
CloudForms
Comprehensive Cloud Management

- Single-Pane of Glass
  - Monitoring
  - Management
- Management Framework
  - Infrastructure applications
- Policies and Alerts
- Automation
- Capacity Planning
### VM and Instance "32DemoMaster"

<table>
<thead>
<tr>
<th>Properties</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>32DemoMaster</td>
</tr>
<tr>
<td>Hostname</td>
<td>32DemoMaster</td>
</tr>
<tr>
<td>IP Address</td>
<td>10.3.5.209</td>
</tr>
<tr>
<td>Container</td>
<td>vmware; 4 CPUs (4 sockets x 1 core), 10240 MB</td>
</tr>
<tr>
<td>Parent Host Platform</td>
<td>ESXi</td>
</tr>
<tr>
<td>Platform Tools</td>
<td>toolsOK</td>
</tr>
<tr>
<td>Operating System</td>
<td>Red Hat Enterprise Linux 6 (64-bit)</td>
</tr>
<tr>
<td>Devices</td>
<td>[ ]</td>
</tr>
<tr>
<td>CPU Affinity</td>
<td>[ ]</td>
</tr>
<tr>
<td>Snapshots</td>
<td>[ ]</td>
</tr>
<tr>
<td>Advanced Settings</td>
<td>[ ]</td>
</tr>
<tr>
<td>Resources</td>
<td>Available</td>
</tr>
<tr>
<td>Management Engine GUID</td>
<td>27735d16-16d8-11e6-8639-001a4a25b6732</td>
</tr>
<tr>
<td>Lifecycle</td>
<td></td>
</tr>
<tr>
<td>Discovered</td>
<td>Thu May 19 15:41:29 UTC 2016</td>
</tr>
<tr>
<td>Last Analyzed</td>
<td>Never</td>
</tr>
<tr>
<td>Retirement Date</td>
<td>Never</td>
</tr>
<tr>
<td>Group</td>
<td>Tenant My Company access</td>
</tr>
</tbody>
</table>

### Compliance
- **Status:** Never Verified
- **History:** Not Available

### Power Management
- **Power State:** On
- **Last Boot Time:** Wed Dec 02 18:48:12 UTC 2015
- **State Changed On:** Thu May 19 15:41:29 UTC 2016

### Security
- **Users:** [ ]
- **Groups:** [ ]

### Configuration
- **Packages:** [ ]
- **Ini Processes:** [ ]
- **Files:** [ ]

### Datastore Allocation Summary
- **Number of Disks:** 3
- **Disks Aligned:** Unknown
- **Thin Provisioning Used:** True
- **Disks:** 60 GB
- **Total Allocation:** 60 GB

### Datastore Actual Usage Summary
- **Disks:** 60 GB
- **Snapshots:** 0 Bytes
- **Total Disks Used Space:** 60 GB
- **Unused/Overcommitted Allocation:** 0 Bytes

### Diagnostics
- **Planning Processes:** Not Available
- **Event Logs:** Not Available

### Smart Management
### Policy "Shell-Shock Vulnerability"

#### Basic Information
- **Active:** Yes
- **Created:** By Username admin on 06/02/18 at 00:18:26 UTC

#### Scope
- VM and Instance: OS Name INCLUDES "Linux"

#### Conditions

<table>
<thead>
<tr>
<th>Description</th>
<th>Scopes / Expressions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerable bash Package (ShellShock)</td>
<td>Express ( VM and Instance/Guest Applications/Name CONTAINS &quot;bash&quot; AND PWD/VM and Instance/Guest Applications/Version = &quot;4.1.2&quot; CHECK ALL Release REGULAR EXPRESSION)</td>
</tr>
</tbody>
</table>

#### Events

<table>
<thead>
<tr>
<th>Description</th>
<th>Actions</th>
</tr>
</thead>
</table>
| VM Compliance Check | - Send Email to Security Team  
- Mark as Non-Compliant  
- Generate log message |

#### Notes

This policy is based on [https://access.redhat.com/articles/1200223](https://access.redhat.com/articles/1200223). 
Red Hat Enterprise Linux 6: bash-4.1.2-15.el6_5.2  
bash-4.1.2-15.el6_5.1.93.2
CloudForms Alerts

- Notification of changes or threshold limits reached
  - Email
  - SNMP Traps
  - Timeline and Events
- Based on CloudForms Entities
- Evaluation System
  - Events
  - Reconfigurations
  - Performance
  - Custom
Providers Cross-Linking

- Service
- Pod
- Container
- Image
- Cluster
- Node
- Instance

#redhat #rhsummit
<table>
<thead>
<tr>
<th>Name</th>
<th>Display Name</th>
<th>Provider</th>
<th>Container Routes</th>
<th>Container Services</th>
<th>Container Replicators</th>
<th>Pods</th>
<th>Containers</th>
</tr>
</thead>
<tbody>
<tr>
<td>achievement-microservice</td>
<td></td>
<td>OpenShift Keynote (Test)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>che-proxy</td>
<td></td>
<td>OpenShift Keynote (Test)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>default</td>
<td></td>
<td>OpenShift Keynote (Prod)</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>7</td>
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<tr>
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<td>OpenShift Keynote (Test)</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>demo</td>
<td></td>
<td>OpenShift Keynote (Prod)</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>6</td>
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<td>demo</td>
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<td>OpenShift Keynote (Test)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>development</td>
<td></td>
<td>OpenShift Keynote (Prod)</td>
<td>4</td>
<td>11</td>
<td>12</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>development</td>
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<td>4</td>
<td>9</td>
<td>12</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>gogs</td>
<td></td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>gogs</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>jenkins</td>
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<td>1</td>
<td>2</td>
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<tr>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
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<tr>
<td>logging</td>
<td></td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>logging</td>
<td></td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>management-infra</td>
<td></td>
<td>OpenShift Keynote (Prod)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>management-infra</td>
<td></td>
<td>OpenShift Keynote (Test)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>openshift</td>
<td></td>
<td>OpenShift Keynote (Test)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>openshift</td>
<td></td>
<td>OpenShift Keynote (Prod)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>openshift</td>
<td></td>
<td>OpenShift Keynote (Test)</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>openshift</td>
<td></td>
<td>OpenShift Keynote (Test)</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
### development (Summary)

#### Properties

<table>
<thead>
<tr>
<th>Name</th>
<th>development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creation timestamp</td>
<td>Tue Jan 14 09:06:47 UTC 2016</td>
</tr>
<tr>
<td>Resource version</td>
<td>2915</td>
</tr>
</tbody>
</table>

#### Relationships

<table>
<thead>
<tr>
<th>Containers Provider</th>
<th>OpenShift:Keynote (Test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes</td>
<td>4</td>
</tr>
<tr>
<td>Services</td>
<td>9</td>
</tr>
<tr>
<td>Replicas</td>
<td>12</td>
</tr>
<tr>
<td>Pods</td>
<td>32</td>
</tr>
<tr>
<td>Nodes</td>
<td>9</td>
</tr>
</tbody>
</table>

#### Smart Management

- Red Hat Tags: No Red Hat Tags have been assigned
gamebus (Summary)

Properties
- Name: gamebus
- Resource version: 1367794
- Session affinity: None
- Type: ClusterIP
- Portal IP: 172.30.233.56

Port Configurations
- Name: <Unnamed>
  - Protocol: TCP
  - Port: 5001
  - Target Port: 9001
  - Node Port: 

Labels
- template: gamebus-services
- keyname: 1.0.0
- application: gamebus

Selector
- deploymentConfig: gamebus
- bluegreen: green

Relationships
- Containers Provider: OpenShift Keynote (Test)
- Project: development
- Routes: 1
- Pods: 1
- Nodes: 1

Smart Management
- Red Hat Tags: No Red Hat Tags have been assigned
### gamebus-green-1-ylala (Summary)

#### Properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase</td>
<td>Running</td>
</tr>
<tr>
<td>Creation timestamp</td>
<td>Tue Jun 21 16:06:38 UTC 2016</td>
</tr>
<tr>
<td>Resource version</td>
<td>1067784</td>
</tr>
<tr>
<td>Preschedule</td>
<td>Always</td>
</tr>
<tr>
<td>DNS Policy</td>
<td>ClusterFirst</td>
</tr>
<tr>
<td>IP Address</td>
<td>10.12.0.8</td>
</tr>
</tbody>
</table>

#### Labels

- deploymentConfig: gamebus green
- deploymentConfig: gamebus-green-1
- deployment: gamebus
- bluegreen: green
- application: gamebus-green

#### Node Selector

| node_type | compute |

#### Volumes

<table>
<thead>
<tr>
<th>Name</th>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>default-token-stdkp</td>
<td>SecretName</td>
<td>default-token-stdkp</td>
</tr>
</tbody>
</table>
gamebus-green-1-ylala Capacity & Utilization

Options

- Interval: Most Recent Hour
- Show: 15 Minutes
- Range: 06/21/10 16:02:00 to 06/21/10 16:17:00 UTC

Cores Used

- Number of Cores

Memory (MB)

- Avg Used
- Available

Network I/O (KBps)

- Avg I/O
achievement Capacity & Utilization

Options

- Interval: Hourly
- Date: 02/21/2016
- Time Profile: UTC

Cores Used
- Number of Cores: 0, 3, 10

Memory (MB)
- Avg Used: 1000, 2000, 1000

Network I/O (KBps)
- Avg I/O: 0, 500, 0
OpenSCAP Container Image Scan

- Scanning Pod instantiated in the container cluster
  - ManageIQ collects the results
- Scans scheduled at regular intervals and on a new Image discovery
- Out-of-the-Box Policies for Image compliance
  - Additional ones can be created by the users
- Results are pushed into OpenShift annotating Images
Policy "OpenSCAP"

Basic Information
- Active: Yes
- Created: By Username admin on 06/16/16 at 15:20:02 UTC

Scope
- No Policy scope defined, the scope of this policy includes all elements.

Conditions
- Has high severity OpenSCAP rule results
  - Description: Expression FIND Image.Openscap Rule Results: Result = "fail" CHECK ANY Severity = "High"

Events
- Container Image Compliance Check
  - Actions: Mark as Non-Compliant, Prevent container image from running on OpenShift

Notes
- No notes have been entered.
openshift3/metrics-heapster (Compliance History - Last 10 Checks)

- **Compliance Check** on 06/20/16 17:34:32 UTC
- **Policy**: OpenSCAP

- **Condition**: Has high severity OpenSCAP rule results

- **Compliance Check** on 06/20/16 17:20:42 UTC
- **Policy**: OpenSCAP

- **Condition**: Has high severity OpenSCAP rule results

- **Compliance Check** on 06/20/16 16:20:48 UTC

- **Compliance Check** on 06/20/16 16:00:38 UTC
Automatically generated XCCDF from OVAL file: com.redhat.rhsa-RHEL6.xml

This file has been generated automatically from oval definitions file.

Evaluation Characteristics

<table>
<thead>
<tr>
<th>Target machine</th>
<th>CPE Platforms</th>
<th>Addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>management-img-scan-f20a3</td>
<td></td>
<td>f20a3</td>
</tr>
<tr>
<td>Benchmark URL</td>
<td></td>
<td>/mpc.com.redhat.rhsa-RHEL6.ds.xml b22</td>
</tr>
<tr>
<td>Benchmark ID</td>
<td></td>
<td>xccdf_com.redhat.rhsa_benchmark_generated-xccdf</td>
</tr>
<tr>
<td>Started at</td>
<td></td>
<td>2016-06-16T12:13:12</td>
</tr>
<tr>
<td>Finished at</td>
<td></td>
<td>2016-06-16T12:13:12</td>
</tr>
<tr>
<td>Performed by</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compliance and Scoring

The target system did not satisfy the conditions of 7 rules! Please review rule results and consider applying remediation.

Rule results

100% pass

Severity of failed rules

4 medium to 1 high

Score

<table>
<thead>
<tr>
<th>Scoring system</th>
<th>Score</th>
<th>Maximum</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>um:xccdf:scoring:default</td>
<td>99.32179</td>
<td>100.00000</td>
<td>99.32%</td>
</tr>
</tbody>
</table>

Rule Overview

Search through XCCDF rules
Containers Chargeback

- Monetary charges reports based on Utilization
- Chargeback totals per Project (Namespace)
  - CPU Cores usage
  - Memory usage
  - Network usage (when available)
### Compute Chargeback Rate "Default"

#### Basic Info

<table>
<thead>
<tr>
<th>Description</th>
<th>Default</th>
</tr>
</thead>
</table>

#### Rate Details

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Rate</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Allocated CPU Count</td>
<td>1.0</td>
<td>0.0 USD / Day / Cpu</td>
</tr>
<tr>
<td>CPU</td>
<td>Used CPU</td>
<td>0.0</td>
<td>0.02 USD / Day / MHz</td>
</tr>
<tr>
<td>Cpu Cores</td>
<td>Used CPU Cores</td>
<td>1.0</td>
<td>0.02 USD / Day / Cpu core</td>
</tr>
<tr>
<td>Disk I/O</td>
<td>Used Disk I/O</td>
<td>0.0</td>
<td>0.005 USD / Hour / KBps</td>
</tr>
<tr>
<td>Fixed</td>
<td>Fixed Compute Cost 1</td>
<td>0.0</td>
<td>0.0 USD / Day</td>
</tr>
<tr>
<td>Fixed</td>
<td>Fixed Compute Cost 2</td>
<td>0.0</td>
<td>0.0 USD / Month</td>
</tr>
<tr>
<td>Memory</td>
<td>Allocated Memory</td>
<td>0.0</td>
<td>0.0 USD / Day / MB</td>
</tr>
<tr>
<td>Memory</td>
<td>Used Memory</td>
<td>0.0</td>
<td>0.02 USD / Day / MB</td>
</tr>
<tr>
<td>Network I/O</td>
<td>Used Network I/O</td>
<td>0.0</td>
<td>0.5 USD / Hour / KBps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100.0</td>
<td>0.005 USD / Hour / KBps</td>
</tr>
</tbody>
</table>
## Compute Rate Assignments

### Basic Info

**Assign To**
- Selected Containers Providers

### Selections

<table>
<thead>
<tr>
<th>Name</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>OpenShift Keynote (Prod)</td>
<td>Default</td>
</tr>
<tr>
<td>OpenShift Keynote (Test)</td>
<td>&lt;Nothing&gt;</td>
</tr>
</tbody>
</table>

**Rate Options:**
- Default
- <Nothing>
Adding a new Report

Basic Report Info
- Menu Name: Chargeback for Projects
- Title: Chargeback for Projects

Configure Report Columns
- * Base the report on: Chargeback for Projects

Available Fields:
- Cpu Cores Used Metric
- Fixed Compute Cost 1
- Fixed Compute Cost 2
- Fixed Total Cost
- Memory Used
- Network I/O Used

Selected Fields:
- Archived
- Cpu Cores Used Cost
- Memory Used Cost
- Network I/O Used Cost
- Project Uid
- Provider Name
- Provider Uid
- Total Cost

Add | Cancel
Report "Chargeback for Projects"

<table>
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<tr>
<th>Report Info</th>
<th>Saved Reports</th>
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<tr>
<td>Title</td>
<td>Chargeback for Projects</td>
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Schedules

- Report is not Scheduled.

Widgets

- Report doesn't belong to Widgets.
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Red Hat Cloud Suite
Red Hat Cloud Suite

Build modern apps with modern IT

- QuickStart Cloud Installer
- Red Hat CloudForms
- Private Virtualization and Cloud
  - Includes: RHEV, Red Hat OpenStack Platform, OpenShift
  - Supports: VMware, AWS, Azure, GCE
- Red Hat Insights
- Red Hat Satellite
- Red Hat Ceph Storage
# Container Management

<table>
<thead>
<tr>
<th>Runtime</th>
<th>Deployment</th>
<th>Content</th>
<th>Management</th>
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<tbody>
<tr>
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<td>“Double-Click”</td>
<td>OpenShift Local</td>
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<td>CloudForms</td>
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<td>Platform</td>
<td>Cockpit for Hosts</td>
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<td>QuickStart Cloud Installer</td>
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<td>Insights</td>
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Red Hat QuickStart Cloud Installer

Web-based graphical user interface to provision cloud products
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Operational analytics from Red Hat

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Security > Local users enabled with vsftpd

DETECTED ISSUE

This Docker container has local user accounts enabled for the vsftpd daemon. FTP transmits unencrypted usernames and passwords over insecure networks for authentication, and should be disabled unless absolutely necessary, or only enabled for specific accounts that require it.

Red Hat recommends denying system users access to the server from their user accounts.

STEPS TO RESOLVE

To disable all user accounts in vsftpd, add the following directive to /etc/vsftpd/vsftpd.conf:

```
local_enable=NO
```

And restart the vsftpd service:

```
service vsftpd restart
```

To make the changes to the docker container permanent, please commit the change at the end container shutdown:

```
[host]# docker commit <docker_image_uuid>
```
Security > Special DROWN: Cross-protocol attack on TLS using SSLv2 (CVE-2016-0800) in Container Image

DETECTED ISSUE
This host is vulnerable because it has vulnerable package openssl-libs-1.0.1e-34.e17_0.3 installed.

This package does not have a patch for CVE-2015-0293 applied, which makes the system especially vulnerable. This is known as Special DROWN. An attacker can use this flaw to perform active man-in-the-middle (MITM) attacks and impersonate a TLS server to connecting TLS client in a matter of minutes.

Fortunately, it does not seem to run any processes that use OpenSSL libraries.

A new cross-protocol attack against a vulnerability in the SSLv2 protocol has been found. It can be used to passively decrypt collected TLS/SSL sessions from any connection that used an RSA key exchange option set on a server that supports SSLv2. Even if a given service does not support SSLv2, the connection is still vulnerable if another service does and shares the same RSA private key.

A more efficient variant of the attack exists against unpatched OpenSSL servers using versions that predate security advisories released on March 19, 2015 (see CVE-2015-0293).

STEPS TO RESOLVE
Red Hat recommends that you update to the latest RHEL docker image for your container:

```bash
[host]# docker pull <docker_image_uuid>
```
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Satellite vFuture Atomic Registry workflow
- Pull and push and sync
- DevOps registry-churn happens inside and outside of Satellite
- DevOps churn into environment triggers a library rev and promote
Q & A
Thank You!