OpenShift Advanced Management with Red Hat CloudForms

Itamar Heim
Federico Simoncelli
June 2016
Agenda

- Intro to CloudForms and OpenShift
- CloudForms OpenShift Provider
- Cross-Linking
- Alerts
- Reports
- Chargeback
- OpenSCAP Scanning and Compliance Policies
- Roadmap
CloudForms
Comprehensive Cloud Management
COMPLEXITY IS GOING THROUGH THE ROOF

CONTAINERS
100x

PHYSICAL
1x

VIRTUAL
10x

PRIVATE CLOUD
10x

PUBLIC CLOUD
10x

SOFTWARE-DEFINED NETWORKING

SOFTWARE-DEFINED STORAGE
WHAT IS NEEDED?

- Unified management
- Comprehensive insight
- Full operational control

... a.k.a. Cloud Management Platform
### VM and Instance "32DemoMaster"

<table>
<thead>
<tr>
<th>Properties</th>
<th>Details</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>10.3.19.209</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>5</td>
</tr>
<tr>
<td>CPU Affinity</td>
<td>3</td>
</tr>
<tr>
<td>Snapshots</td>
<td>0</td>
</tr>
<tr>
<td>Resources</td>
<td>Available</td>
</tr>
<tr>
<td>Management Engine GUID</td>
<td>27735d16-1bdb-11e4-8693-001a4d258002</td>
</tr>
</tbody>
</table>

#### Lifecycle
- **Discovered**: Thu May 19 15:41 UTC 2016
- **Last Analyzed**: Never
- **Retirement Date**: Never

#### Relationships
- **Infrastructure Provider**: vCenter
- **Cluster**: Production
- **Host**: bdi15ce16.redhat.com
- **Resource Pool**: Default for Cluster / Deployment Role, Production
- **Datastores**: cmbx-shared2
- **Service**: None
- **Genetalogy**: Show parent and child VMs
- **DR History**: None
- **Analysis History**: None

#### 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**: 0
- **Groups**: 0

#### Configuration
- **Packages**: 0
- **Inf Processes**: 0
- **Files**: 0

#### Datastore Allocation Summary
- **Number of Disks**: 2
- **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 Datastore 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

- **Vulnerable Bash Package (ShellShock)**
  - Description: Express (VM and Instance.Guest Applications : Name CONTAINS "bash" AND RHN VM and Instance.Guest Applications : Version = "4.1.2" CHECK ALL Release REGULAR EXPRESSION [i] MATCHES "15[:][a-zA-Z0-9]{2}[:][a-zA-Z0-9]{1,3}[a-zA-Z0-9]{1,2}[:][0-9]{1,3}"

Events

- **VM Compliance Check**
  - Actions:
    - Send Email to Security Team
    - Mark as Non-Compliant
    - Generate log message

Notes

This policy is based on 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_5.1.351.2
Alert "Host Datastore < 5% of Free Space"

Info
- Active: No
- Based On: Host / Node
- What to Evaluate: Expression
- Driving Event: <No Event Configured>
- Notification Frequency: 10 Minutes

Expression
FHD Host / Node:Datastores:Name NOT NULL CHECK ANY Used Space Percent of Total > 95

Send E-mail
- From: (Default: ctadmin@ctserver.com)
- To:

Belongs to Alert Profiles
- This Alert is not assigned to any Alert Profiles.
Region "Region 1" Utilization Trend Summary

Options
- Trends for past: 1 Week
- Classification: <None>
- Time Profile: UTC

Trend of CPU Used (MHz)
- Trend Max Used
- Trend Avg Used
- Max Available

Trend of Memory Used (MB)
- Trend Max Used
- Trend Avg Used
- Max Available

Trend of Used Disk Space (GB)
- Trend Max Used
- Trend Avg Used
- Max Total

* Information shown is based on available trend data from 06/15/16 to 06/21/16 in the UTC time zone.
Region "Region 1" Bottlenecks Summary

Options

- Event Groups: ALL
- Show Host Events: Off
- Time Zone: (GMT+00:00) UTC

Severity: 1
Message: Memory - Peak Aggregate Used for Child VMs for Collected Intervals (MB) is projected to reach 13.4 GB (90% of Memory Max Total)
Time Stamp: 06/17/16 18:33:49 UTC
SELF-SERVICE AUTOMATED PROVISIONING
Deployment of Self-Service Resources

Requests -> Service Delivery

RBAC -> Quota Enforcement

Quota -> "Intelligent" Workload Placement

Role-Based Access Controls

Approval Workflow

Management

Chargeback

BLOCK DIAGRAM

CLOUDFORMS

#redhat #rhsummit
Upcoming Service Designer
OpenShift
Award-winning private PaaS
Overview

**SERVICE**: achievement-development.apps-test.redhatkeynote.com

- **Container**: achievement-green
  - Image: development/achievement-2019021023117-17
  - Ports: 8080/TCP (http), 8778/TCP (g礼拜), 8888/TCP (ping)

- **1 pod**

**SERVICE**: achievement-postgresql

- **Container**: postgresql-master
  - Image: openshift/postgresql:9.2-centos7
  - Ports: 5432/TCP

- **1 pod**

**SERVICE**: achievement-slave

- **Container**: postgresql-slave
  - Image: openshift/postgresql:9.2-centos7
  - Ports: 5432/TCP

- **1 pod**

Details

- **Pod**: A pod contains one or more Docker containers that run together on a node, containing your application code.
- **Service**: A service groups pods and provides a common DNS name and an optional, load-balanced IP address to access them.
- **Deployment**: A deployment is an update to your application, triggered by a changed image or configuration.
The files belonging to this database system will be owned by user "postgres".
This user must also own the server process.

The database cluster will be initialized with Locale "en_US.UTF-8".
The default database encoding has accordingly been set to "UTF8".
The default text search configuration will be set to "english".

Fixing permissions on existing directory /var/lib/postgresql/data/userdata ... ok
creating subdirectories ... ok
selecting default max_connections ... 100
selecting default shared_buffers ... 32MB
creating configuration files ... ok
creating template1 database in /var/lib/postgresql/data/userdata/bane1 ... ok
initializing pg_waldir ... ok
initializing dependencies ... ok
creating system views ... ok
loading system objects' descriptions ... ok
creating collations ... ok
creating data types ... ok
creating pl/resensitive objects ... ok
creating information schema ... ok
loading PostgreSQL server-side language ... ok
collecting statistics ... ok
validating database template ... ok
copying template to template0 ... ok
creating template0 to postgres ... ok

Success. You can now start the database server using:
  
  postgres -D /var/lib/postgresql/data/userdata

or
  pg_ctl -D /var/lib/postgresql/data/userdata -l logfile start

WARNING: enabling "trust" authentication for local connections
You can change this by editing pg_hba.conf or using the option -A or
  -auth-local and -auth-host. The next time you run initdb.
waiting for server to start... done
When you navigate away from this pod, any processes running in these terminals will quit.
Overview

Details

Select an object to see more details.

A pod contains one or more Docker containers that run together on a node, containing your application code.

A service groups pods and provides a common DNS name and an optional, load-balanced IP address to access them.

A deployment is an update to your application, triggered by a changed image or configuration.
# COCKPIT

- systemd
- NetworkManager
- Journal
- sssd

# CLI

- Kubernetes
- Docker
- OSTree

---

**Presentation Tier**
The user experience

**"Logic Tier"**
The configuration tools and stateful subsystems.

**"Data Tier"**
Where the rubber meets the road
RHEL Admin Interface

Discoverable and usable admin interface on every Atomic Host

- Troubleshoot host instances
- Interact with containers
- Accessible over SSH
- Zero footprint
- Project called “Cockpit”
CloudForms
For the OpenShift Operator
<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>0</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>default</td>
<td></td>
<td>OpenShift Keynote (Test)</td>
<td>0</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>3</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>demo</td>
<td></td>
<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>
<td></td>
<td>OpenShift Keynote (Test)</td>
<td>4</td>
<td>9</td>
<td>12</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>gogs</td>
<td></td>
<td>OpenShift Keynote (Prod)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>gogs</td>
<td></td>
<td>OpenShift Keynote (Test)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>jenkins</td>
<td></td>
<td>OpenShift Keynote (Prod)</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>jenkins</td>
<td></td>
<td>OpenShift Keynote (Test)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>logging</td>
<td></td>
<td>OpenShift Keynote (Prod)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>logging</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>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 (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>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>openshift-infra</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-infra</td>
<td></td>
<td>OpenShift Keynote (Prod)</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
development (Summary)

Properties

- Name: development
- Creation timestamp: Tue Jun 14 09:06:47 UTC 2016
- Resource version: 2915

Relationships

- Containers Provider: OpenShift Keynote (Test)
- Routes: 4
- Services: 9
- Replicas: 12
- Pods: 32
- Nodes: 9

Smart Management

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

Properties
- Name: gamebus
- Resource version: 1967794
- Session affinity: None
- Type: ClusterIP
- Port: 172.30.233.56

Port Configurations
- Name: <Unnamed>
  - Protocol: TCP
  - Port: 9001
  - Target Port: 9001
  - Node Port: 1

Labels
- template: gamebus-services
- keyhole: 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
Providers Cross-Linking
### ip-172-18-1-223.ec2.internal (Summary)

#### Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>ip-172-18-1-223.ec2.internal</td>
</tr>
<tr>
<td>Creation Timestamp</td>
<td>Tue Jan 14 09:56:59 UTC 2016</td>
</tr>
<tr>
<td>Resource Version</td>
<td>1027180</td>
</tr>
<tr>
<td>Number of CPU Cores</td>
<td>8</td>
</tr>
<tr>
<td>Memory</td>
<td>31 GB</td>
</tr>
<tr>
<td>Max Pods Capacity</td>
<td>110</td>
</tr>
<tr>
<td>System BIOS UUID</td>
<td>EC2F542A-566D-1023-0DFA-SC72S516635D3</td>
</tr>
<tr>
<td>Machine ID</td>
<td>e5f1f61bf6f4b3dbb9f2f17f8b112eb</td>
</tr>
<tr>
<td>Infrastructure Machine ID</td>
<td>ares://vpc-16t1a-c7042823</td>
</tr>
<tr>
<td>Runtime version</td>
<td>docker:19.11</td>
</tr>
<tr>
<td>Kubernetes version</td>
<td>v1.20.3-384c5</td>
</tr>
<tr>
<td>Provision</td>
<td>v1.20.3-384c5</td>
</tr>
<tr>
<td>Operating System Distribution</td>
<td>Red Hat Enterprise Linux Server 7.2 (Maipo)</td>
</tr>
<tr>
<td>Kernel version</td>
<td>3.10.0-327.10.1-a7.8.64</td>
</tr>
</tbody>
</table>

#### Relationships

- **Containers Provider**: OpenShift Keynote (Test)
- **Routes**: 1
- **Services**: 2
- **Replicas**: 4
- **Pods**: 9
- **Containers**: 9
- **Underlying Instance**: keynote-boston-test-demo-app-node

#### Conditions

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Last Transition Time</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>OutOfDisk</td>
<td>False</td>
<td>2016-08-14 09:46:59 UTC</td>
<td>KubletHasSufficientDisk</td>
</tr>
<tr>
<td>Ready</td>
<td>True</td>
<td>2016-08-14 09:47:09 UTC</td>
<td>KubletReady</td>
</tr>
</tbody>
</table>

#### Smart Management

- **Red Hat Tags**: No Red Hat Tags have been assigned
Leveraging CloudForms Alerts
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
<table>
<thead>
<tr>
<th>Description</th>
<th>Active</th>
<th>Based On</th>
<th>What is evaluated</th>
<th>Email</th>
<th>SNMP</th>
<th>Event on Timeline</th>
<th>Management Event Raised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster DRS not enabled</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster HA not enabled</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU Ready &gt; 4000 ms for more than 10 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Datacenter VMs &gt; 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Host Event Log Error - Failed to validate VM IP address</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Host Datatstore &lt; 5% of Free Space</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Host Event Log Error - Memory Exceed Soft Limit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Host CPUs &gt; 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM CD Drive or Floppy Connected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM CPU count was decreased</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM CPU count was increased</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Environment Tag =&gt; Datatstore Environment Tag</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Environment Tag =&gt; Host Environment Tag</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Guest C: Drive &lt; 10% Free</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Guest Windows Event Log Error - NTPClient</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Memory Balloon &gt; 250 in last 30 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Memory was decreased</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Memory was increased</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Migration &gt; 1 in last 30 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Power On &gt; 2 in last 15 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Silver and CPU &gt; 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Silver and RAM &gt; 2 GB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VMs on local storage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM Unregistered</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VMVMotion &gt; 1 in last 30 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Adding a new Alert

Info
- Description: VM Disk Usage > 90%
- Active: ✔
- Based On: VM and Instance
- What to Evaluate: Expression (Custom)
- Driving Event: Hourly (Custom)
- Notification Frequency: 10 Minutes

Expression (Choose an element of the expression to edit)

VM and Instance: Disk 1 Used Percent Of Provisioned > 90

E-mail
- Send an E-mail: ✔
  - From: (Default: cdfirin@cserv.com)
  - To: fsimone@redhat.com
- Add a User: None Available or All Selected
- Add (enter manually)

SNMP Trap
- Send an SNMP Trap:  

Timeline Event
Adding a new Alert

**Info**

- Description: Host is non-responsive
- Active: 
- Based On: Host / Node
- What to Evaluate: Expression (Custom)
- Driving Event: Hourly Timer
- Notification Frequency: 10 Minutes

**Expression (Choose an element of the expression to edit)**

Host / Node: Power State = "NonResponsive"

**E-mail**

- Send an E-mail: 
- From: (Default: cladmin@cserv.com)
- To: fsimone@redhat.com
- Add a User: None Available or All Selected

**SNMP Trap**

Send an SNMP Trap

**Timeline Event**
CloudForms Reports
CloudForms Reports

- Based on collected resources and utilization data in a single pane-of-glass fashion
- Aggregation and slicing of collected data
- Dashboard Widgets based on Reports
- Out-of-the-box Reports
https://youtu.be/982UshkrBdY
## Adding a new Report

### Basic Report Info

<table>
<thead>
<tr>
<th>Menu Name</th>
<th>Nodes by RAM Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Nodes by RAM Memory</td>
</tr>
</tbody>
</table>

### Configure Report Columns

**Base the report on**

- **Nodes**

**Available Fields:**

- CPU - Aggregate Usage Rate for Child VMs for Collected Intervals 30 Day Avg (MHz)
- CPU - Aggregate Usage Rate for Child VMs for Collected Intervals 30 Day High Avg (MHz)
- CPU - Aggregate Usage Rate for Child VMs for Collected Intervals 30 Day Low Avg (MHz)
- CPU - Peak Usage Rate Avg for Collected Intervals 30 Day Avg (%)
- CPU - Peak Usage Rate Avg for Collected Intervals 30 Day High Avg (%)
- CPU - Peak Usage Rate Avg for Collected Intervals 30 Day Low Avg (%)
- CPU - Peak Usage Rate Avg for Collected Intervals Without Host Overhead 30 Day Avg (%)
- CPU - Peak Usage Rate Avg for Collected Intervals Without Host Overhead 30 Day High Avg (%)
- CPU - Peak Usage Rate Avg for Collected Intervals Without Host Overhead 30 Day Low Avg (%)
- Container Runtime Version

**Selected Fields:**

- Name
- Hardware : RAM

---

Add | Cancel
Basic Report Info

Menu Name: Nodes by RAM Memory
Title: Nodes by RAM Memory

Chart Preview (up to 50 rows)

Report Preview (up to 50 rows)

<table>
<thead>
<tr>
<th>Name</th>
<th>Hardware RAM (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>oshif01.eng.lab.tlv.redhat.com</td>
<td>7.6 GB</td>
</tr>
<tr>
<td>oshif03.eng.lab.tlv.redhat.com</td>
<td>3.7 GB</td>
</tr>
<tr>
<td>oshif04.eng.lab.tlv.redhat.com</td>
<td>1.8 GB</td>
</tr>
<tr>
<td>oshif02.eng.lab.tlv.redhat.com</td>
<td>1.8 GB</td>
</tr>
</tbody>
</table>
Chargeback
For OpenShift Projects
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>Range</th>
<th>Rate</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Start</td>
<td>Finish</td>
<td>Fixed</td>
</tr>
<tr>
<td>CPU</td>
<td>Allocated CPU Count</td>
<td>0.0</td>
<td>infinity</td>
<td>1.0</td>
</tr>
<tr>
<td>CPU</td>
<td>Used CPU</td>
<td>0.0</td>
<td>infinity</td>
<td>0.0</td>
</tr>
<tr>
<td>Cpu Cores</td>
<td>Used CPU Cores</td>
<td>0.0</td>
<td>infinity</td>
<td>1.0</td>
</tr>
<tr>
<td>Disk I/O</td>
<td>Used Disk I/O</td>
<td>0.0</td>
<td>infinity</td>
<td>0.0</td>
</tr>
<tr>
<td>Fixed</td>
<td>Fixed Compute Cost 1</td>
<td>0.0</td>
<td>infinity</td>
<td>0.0</td>
</tr>
<tr>
<td>Fixed</td>
<td>Fixed Compute Cost 2</td>
<td>0.0</td>
<td>infinity</td>
<td>0.0</td>
</tr>
<tr>
<td>Memory</td>
<td>Allocated Memory</td>
<td>0.0</td>
<td>infinity</td>
<td>0.0</td>
</tr>
<tr>
<td>Memory</td>
<td>Used Memory</td>
<td>0.0</td>
<td>infinity</td>
<td>0.0</td>
</tr>
<tr>
<td>Network I/O</td>
<td>Used Network I/O</td>
<td>0.0</td>
<td>100.0</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100.0</td>
<td>infinity</td>
<td>0.5</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>
<tr>
<td></td>
<td>Default</td>
</tr>
</tbody>
</table>
Report "Chargeback for Projects"

**Report Info**

- **Title**: Chargeback for Projects
- **Sort By**: Start Date, Project Name
- **Based On**: Chargeback for Projects
- **User**: admin
- **EVM Group**: EvmGroup-super_administrator
- **Updated On**: 06/20/16 15:20:39 UTC

**Schedules**

- Report is not Scheduled.

**Widgets**

- Report doesn't belong to Widgets.
<table>
<thead>
<tr>
<th>Date Range</th>
<th>Project Name</th>
<th>Archived</th>
<th>Cpu Cores</th>
<th>Memory Used Cost</th>
<th>Network I/O Used Cost</th>
<th>Project Uid</th>
<th>Provider Name</th>
<th>Provider Uid</th>
<th>Total Cost</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>06/1 9/2016</td>
<td>achievement-microservice</td>
<td>No</td>
<td>1.00</td>
<td>$26.59</td>
<td>$12.00</td>
<td>308a2a64-32a7-11e6-a8 9f-0a80e0945001</td>
<td>OpenShift Kecnote (Test)</td>
<td>d4c-42010a0000b</td>
<td>$39.59</td>
<td>59</td>
</tr>
<tr>
<td>06/1 9/2016</td>
<td>default</td>
<td>No</td>
<td>4.04</td>
<td>$8.41</td>
<td>$330.22</td>
<td>763a1cb3-3205-11e6-a8 9f-0a80e0945001</td>
<td>OpenShift Kecnote (Test)</td>
<td>d4c-42010a0000b</td>
<td>$34.26</td>
<td>2.68</td>
</tr>
<tr>
<td>06/1 9/2016</td>
<td>default</td>
<td>No</td>
<td>6.00</td>
<td>$10.67</td>
<td>$202.48</td>
<td>297a3747-2c76-11e6-97 71-0e83333440c7d</td>
<td>OpenShift Kecnote (Test)</td>
<td>d4c-42010a0000b</td>
<td>$21.15</td>
<td>9.15</td>
</tr>
<tr>
<td>06/1 9/2016</td>
<td>demo</td>
<td>No</td>
<td>1.00</td>
<td>$2.87</td>
<td>$12.00</td>
<td>142b27a8-33d9-11e6-a8 9f-0a80e0945001</td>
<td>OpenShift Kecnote (Prod)</td>
<td>08f9827e-34b3-11e6-bd 4c-42010a0000b</td>
<td>$15.87</td>
<td>87</td>
</tr>
<tr>
<td>06/1 9/2016</td>
<td>demo</td>
<td>No</td>
<td>3.00</td>
<td>$30.83</td>
<td>$36.00</td>
<td>df3e5e3c-2698-11e6-910-0e2df229c871</td>
<td>OpenShift Kecnote (Prod)</td>
<td>08f9827e-34b3-11e6-bd 4c-42010a0000b</td>
<td>$69.39</td>
<td>63</td>
</tr>
<tr>
<td>06/1 9/2016</td>
<td>development</td>
<td>No</td>
<td>12.91</td>
<td>$184.05</td>
<td>$174.74</td>
<td>529dee6b-320f-11e6-a5 67-0aefbf3f77fd</td>
<td>OpenShift Kecnote (Test)</td>
<td>d4c-42010a0000b</td>
<td>$37.11</td>
<td>1.71</td>
</tr>
<tr>
<td>06/1 9/2016</td>
<td>development</td>
<td>No</td>
<td>12.09</td>
<td>$153.73</td>
<td>$144.00</td>
<td>96a4e16f-30ab-11e6-a8 b5-0e26f229c371</td>
<td>OpenShift Kecnote (Prod)</td>
<td>08f9827e-34b3-11e6-bd 4c-42010a0000b</td>
<td>$30.53</td>
<td>9.83</td>
</tr>
<tr>
<td>06/1 9/2016</td>
<td>gogs</td>
<td>No</td>
<td>1.00</td>
<td>$2.14</td>
<td>$12.00</td>
<td>6472b118-32b5-11e6-a5 67-0aefbf3f77fd</td>
<td>OpenShift Kecnote (Test)</td>
<td>d4c-42010a0000b</td>
<td>$15.54</td>
<td>14</td>
</tr>
<tr>
<td>06/1 9/2016</td>
<td>gogs</td>
<td>No</td>
<td>1.00</td>
<td>$2.30</td>
<td>$12.00</td>
<td>4054d8d7-2d89-11e6-ba 10-12e9bb2a231</td>
<td>OpenShift Kecnote (Prod)</td>
<td>08f9827e-34b3-11e6-bd 4c-42010a0000b</td>
<td>$15.73</td>
<td>30</td>
</tr>
</tbody>
</table>
Scanning Container Images With OpenSCAP
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
https://youtu.be/TZljzVr0G18
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
- Description: Has high severity OpenSCAP rule results
  - Scopes/Expressions: Expression FIND Image.Openscap Rule Results : Result = "fail" CHECK ANY Severity = "High"

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

Notes
- No notes have been entered.
openshift3/metrics-heapster (Summary)

Properties

<table>
<thead>
<tr>
<th>Name</th>
<th>openshift3/metrics-heapster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tag</td>
<td>3.1.0</td>
</tr>
<tr>
<td>Image ID</td>
<td>docker/28014e621032d5b48a26da3f4b09e5eb99d5d3c57a42ce66d938721b91</td>
</tr>
<tr>
<td>Full Name</td>
<td>rom-img:docker01.build.eng.bos.redhat.com:5000/openshift3/metrics-heapster:3.1.0</td>
</tr>
<tr>
<td>Operating System Distribution</td>
<td>redhat</td>
</tr>
<tr>
<td>Product Type</td>
<td>Linux</td>
</tr>
<tr>
<td>Product Name</td>
<td>Red Hat Enterprise Linux Server release 7.2 Beta (Maeve)</td>
</tr>
</tbody>
</table>

Compliance

| Status                  | Non-Compliant as of 5 Minutes Ago |

History | Available

Relationships

<table>
<thead>
<tr>
<th>Containers Provider</th>
<th>Molecule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image Registry</td>
<td>rom-img:docker01.build.eng.bos.redhat.com:5000/openshift3/metrics-heapster:3.1.0</td>
</tr>
<tr>
<td>Projects</td>
<td>1</td>
</tr>
<tr>
<td>Ports</td>
<td>1</td>
</tr>
<tr>
<td>Containers</td>
<td>1</td>
</tr>
<tr>
<td>Nodes</td>
<td>1</td>
</tr>
</tbody>
</table>

Smart Management

My Company Tags | No My Company Tags have been assigned |

Configuration

<table>
<thead>
<tr>
<th>Packages</th>
<th>149</th>
</tr>
</thead>
<tbody>
<tr>
<td>OpenSCAP Results</td>
<td>6195</td>
</tr>
<tr>
<td>OpenSCAP HTML</td>
<td>Available</td>
</tr>
<tr>
<td>Last scan</td>
<td>Mon Jun 19 17:34:03 UTC 2016</td>
</tr>
<tr>
<td>Name</td>
<td>Vendor</td>
</tr>
<tr>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>filesystem</td>
<td></td>
</tr>
<tr>
<td>base system</td>
<td></td>
</tr>
<tr>
<td>nss-sof t oken-free t</td>
<td></td>
</tr>
<tr>
<td>glibc</td>
<td></td>
</tr>
<tr>
<td>libstdc++</td>
<td></td>
</tr>
<tr>
<td>bash</td>
<td></td>
</tr>
<tr>
<td>pcre</td>
<td></td>
</tr>
<tr>
<td>zlib</td>
<td></td>
</tr>
<tr>
<td>bz2-1.0s</td>
<td></td>
</tr>
<tr>
<td>nspr</td>
<td></td>
</tr>
<tr>
<td>popt</td>
<td></td>
</tr>
<tr>
<td>chconfg</td>
<td></td>
</tr>
</tbody>
</table>

Asc. by: Vendor
<table>
<thead>
<tr>
<th>Name</th>
<th>Result</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160008</td>
<td>fail</td>
<td>Medium</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160008</td>
<td>fail</td>
<td>Medium</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160428</td>
<td>fail</td>
<td>Medium</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160007</td>
<td>fail</td>
<td>Medium</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160428</td>
<td>fail</td>
<td>Medium</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160007</td>
<td>fail</td>
<td>Medium</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160379</td>
<td>fail</td>
<td>High</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20151981</td>
<td>fail</td>
<td>High</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20152617</td>
<td>fail</td>
<td>Medium</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160301</td>
<td>fail</td>
<td>High</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160379</td>
<td>fail</td>
<td>High</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20151981</td>
<td>fail</td>
<td>Medium</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20152617</td>
<td>fail</td>
<td>High</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160008</td>
<td>fail</td>
<td>Medium</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160301</td>
<td>fail</td>
<td>High</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160379</td>
<td>fail</td>
<td>High</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20151981</td>
<td>fail</td>
<td>Medium</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20152617</td>
<td>fail</td>
<td>High</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160008</td>
<td>fail</td>
<td>Medium</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160301</td>
<td>fail</td>
<td>High</td>
</tr>
<tr>
<td>xccdf_com.redhat.rhsa_rule_oval.com.redhat.rhsa-def-20160379</td>
<td>fail</td>
<td>High</td>
</tr>
</tbody>
</table>
openshift3/metrics-heapster (Compliance History - Last 10 Checks)

- Compliance Check on 06/20/15 17:34:52 UTC
  - Policy: OpenSCAP
  - Condition: Has high severity OpenSCAP rule results

- Compliance Check on 06/20/15 17:20:42 UTC
  - Policy: OpenSCAP
  - Condition: Has high severity OpenSCAP rule results

- Compliance Check on 06/20/15 16:20:28 UTC

- Compliance Check on 06/20/15 16:00:09 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>manageiq-img-scan-f20a3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark ID</td>
<td>xccdf_com.redhat.rhsa_benchmark_generated-ccf</td>
</tr>
<tr>
<td>Started at</td>
<td>2016-06-17T12:13:12</td>
</tr>
<tr>
<td>Finished at</td>
<td>2016-06-17T12:19:12</td>
</tr>
<tr>
<td>Performed by</td>
<td></td>
</tr>
</tbody>
</table>

CPE Platforms

<table>
<thead>
<tr>
<th>Addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>F01</td>
</tr>
<tr>
<td>F02</td>
</tr>
<tr>
<td>F03</td>
</tr>
<tr>
<td>F04</td>
</tr>
<tr>
<td>F05</td>
</tr>
<tr>
<td>F06</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% passed

Severity of failed rules

Medium - 1 high

Score

<table>
<thead>
<tr>
<th>Scoring system</th>
<th>Score</th>
<th>Maximum</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>url.xccdf.scoring.default</td>
<td>99.321709</td>
<td>100.000000</td>
<td>99.32%</td>
</tr>
</tbody>
</table>

Rule Overview

- pass
- fail
- fixed
- error

Search through XCCDF rules

Search

Group rules by: Default
Roadmap
Disclaimer
The content set forth herein does not constitute in any way a binding or legal agreement or impose any legal obligation or duty on Red Hat. This information is provided for discussion purposes only and is subject to change for any or no reason.
OpenShift Deployment

- **Deploy OpenShift**
  - on existing machines (VMs / bare-metal)
  - on VMs/Instances provisioned by ManageIQ

- **Support different topologies of deployment**
  - Single/Multi-Master (internal / external etcd)
  - Infrastructure Nodes
  - Router, Registry and Metrics Support
  - Existing NFS and POC internal NFS Support

- **Future: support Life-Cycle operations**
  - Node additions and upgrades
Create Containers Provider

Deployment Details

1A. General
- Name: MyNewOSProvider

1B. Masters & Nodes
- Type:
  - OpenShift Origin
  - OpenShift Enterprise

1C. CDN Channel
- Provider to provision on:
  - Use existing VMs from an existing provider
  - Create new VMs on provider
  - Specify a list of machines to deploy on (No existing provider)
Create Containers Provider

Deployment Details

Configuration

Review

2A. Authentication Type
Select authentication type
- Allow All
- HTTPassword
- LDAP
- Request Header
- OpenID Connect
- Google
- GitHub

2B. Authentication Details

2C. Settings

Cancel  Back  Next
More Roadmap

- Service Designer
- CloudForms in a container/pods
- Build Operational Experience out of the box
- Improve Chargeback and OpenSCAP policies
- Common Logging
Q & A
Thank You !