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# Meeting the challenge with PaaS: OpenShift in the enterprise

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Cloud Domain Architect, Red Hat

**Anderson Silva**
Manager, Platform Operations, Red Hat

# Topics

- What is OpenShift?
- Business Drivers
- Architecture
- Our Path from Proof of Concept to Production
- Real World Examples
- Lessons Learned

# Who we are: Tom Benninger

- Cloud Domain Architect on Enterprise Architecture Team.
- Designed IT's OpenShift Enterprise services.
- With Red Hat for 10 years, including JBoss time.
- Deep experience with supporting production services.
- Twitter: @tomben

# Who we are: Anderson Silva

# Who we are: Anderson Silva

- Manager, Platform Operations
- 7th year at Red Hat
- In 2012, I was part of the Openshift Online Operations team
- Fedora Package Maintainer
- Red Hat Certified Architect

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# WHAT IS OPENSHIFT?

## In under two minutes

# Platform as a Service (Paas)

“OpenShift is Red Hat's Platform-as-a-Service (PaaS) that allows developers to quickly develop, host, and scale applications in a cloud environment.”

# Enterprise Vs Online Vs Origin

**OpenShift Origin** - The Open Source project where development and engineering happens. Free and OpenSource.

**OpenShift Online** - Hosted PaaS in the cloud.

**OpenShift Enterprise** – Provide PaaS in your own environments.

https://www.openshift.com/products

# Key Terminology

| | |
|---|---|
| **App** | Your Application to run in OpenShift. |
| **Gear** | The resource container your application lives in. |
| **Node** | A host where gears are run. |
| **District** | A collection of nodes that applications can move between. |
| **Cartridge** | Resources that your application can use. Think middleware, databases, cron, jenkins, etc. |
| **Broker** | What manages apps, gears, nodes, etc. |

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# BUSINESS DRIVERS

## What does OpenShift Enterprise do for your enterprise?

# What do you need?

## Increased Velocity

## Increased Efficiency

# What do you need? velocity

## Increased Velocity

- Produce services faster
- Meet missions goals
- Improve competitiveness
- Increase revenue

## Increased Efficiency

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## Increased Velocity

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## Increased Efficiency

- Self service for developers
- Automate operations
- Increase infrastructure density
- Reduce costs

# What do you need to do to launch a service?

- Traditional hardware datacenter: Months.

  Idea → Budget → Buy HW → Install HW → Config OS → Etc.

- Virtualized datacenter: Weeks.

  Idea → Request VM → Config OS → Deploy Middleware → Etc.

- OpenShift Enterprise: Minutes to days.

  Prebuilt capacity, then: Idea → Code → Push to OpenShift.

# From 'Time To Market' to MTBIAMSH

**Mean Time Between Idea and Making Stuff Happen**

(Coined by @adrianco)

- Develop Fast.
- One time tools.
- Fail fast if you need to.

# Better application environments

- Standard Code Environment and Cartridges

  Provide the exact same environment from developer sandbox to production.

- Tools built in

  No more time writing simple management scripts.

- Open Source Platform

  Developers can know exactly how everything is works.

- Flexible Customization

  Build in the features you need.

# Self service

Working with IT/Operations can be hard.

(Working with Humans can be hard.)

Why do it?

- Be Lean. Remove waste. (Muda)
- Empowered developers == Happy developers.

# Bonus: under the desk applications

# Bonus: under the desk applications

Sometimes business critical apps run on people's desktops.

This should never happen.

- Make sure critical processes run on supported systems.
- Let people keep control of their applications.
- Everyone wins.

# ARCHITECTURE

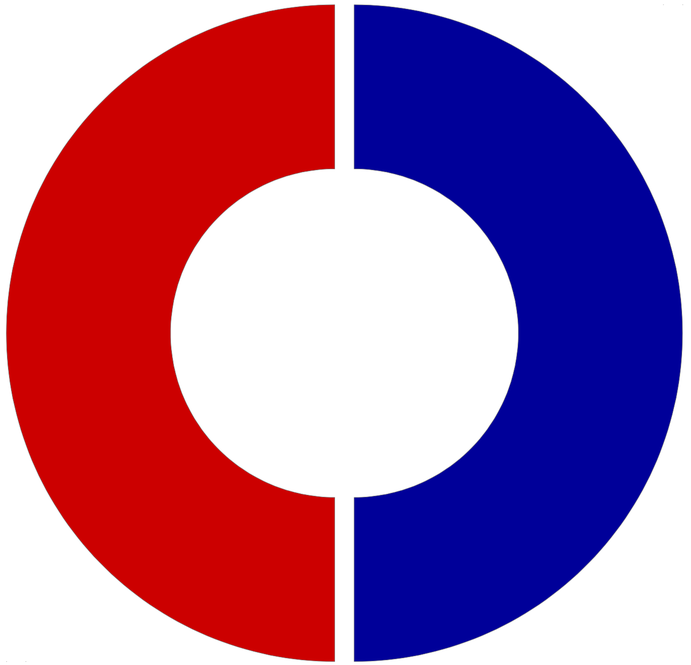
# OpenShift Enterprise

OpenShift Enterprise is normally presented as a single service.

# OpenShift Enterprise

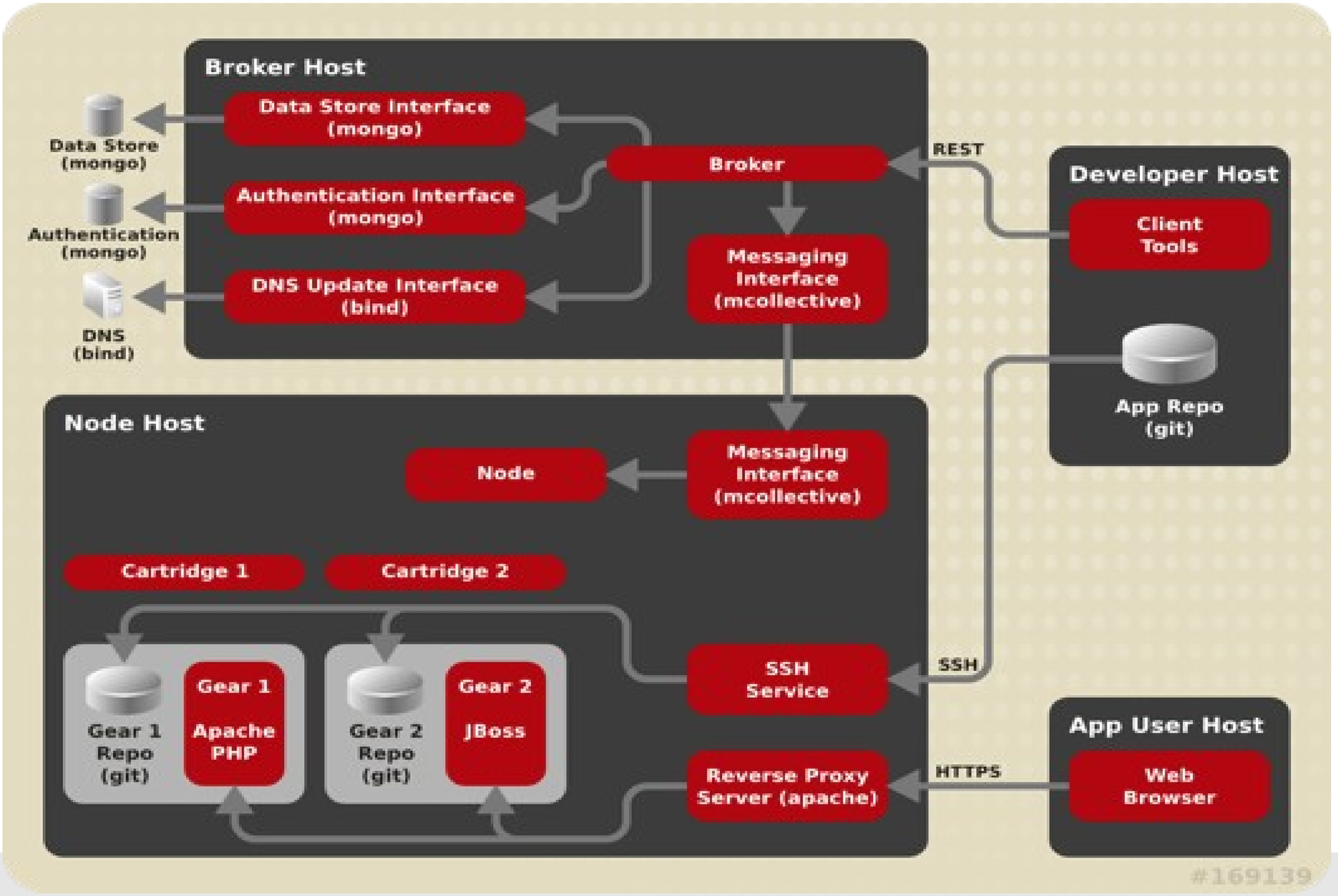
There are really two parts

Broker Services
(Management)



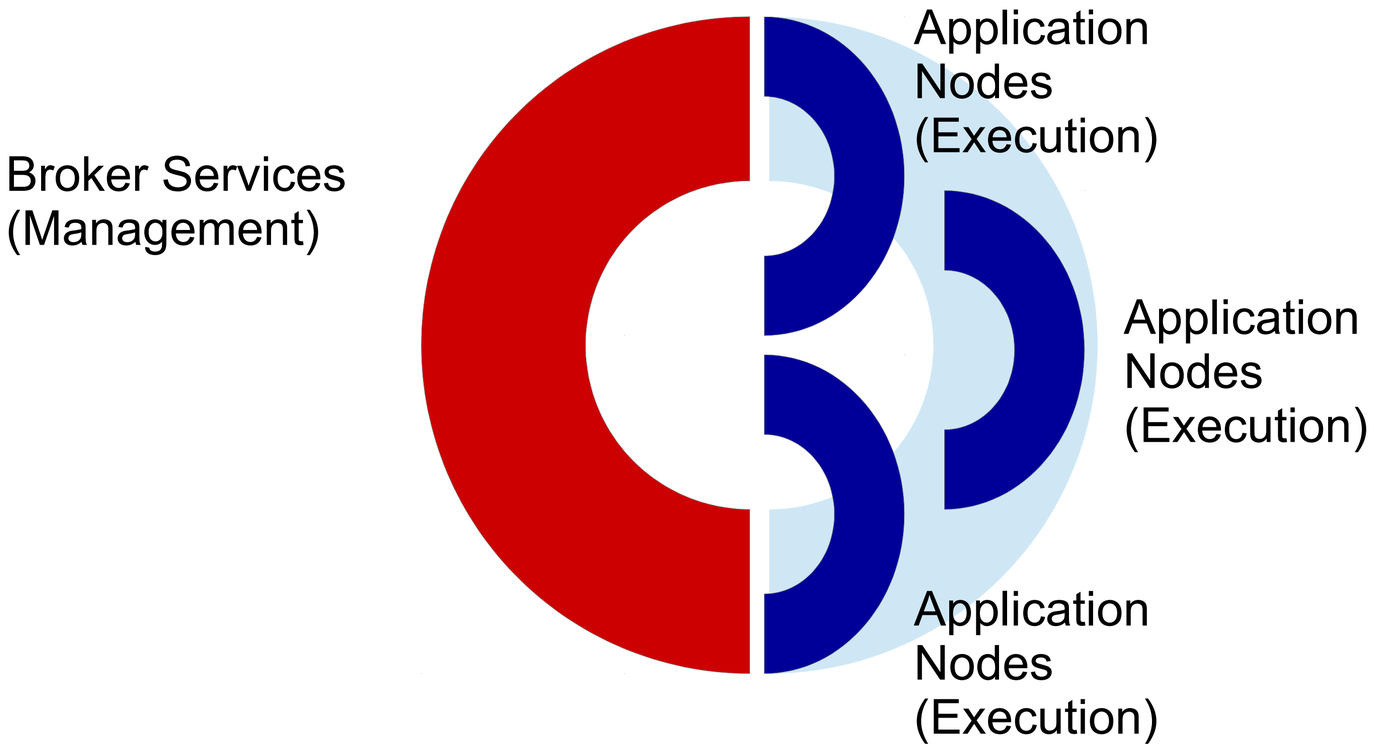
Application Nodes
(Execution)

# Architecture



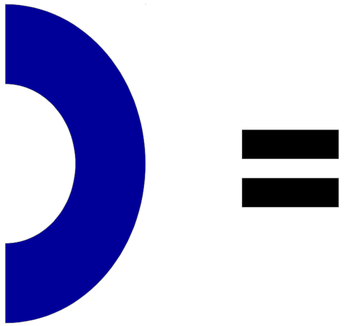
# OpenShift Enterprise

You can split and replicate the nodes sets to your advantage




Red Hat IT calls these OpenShift Security Zones

# OpenShift Security Zones



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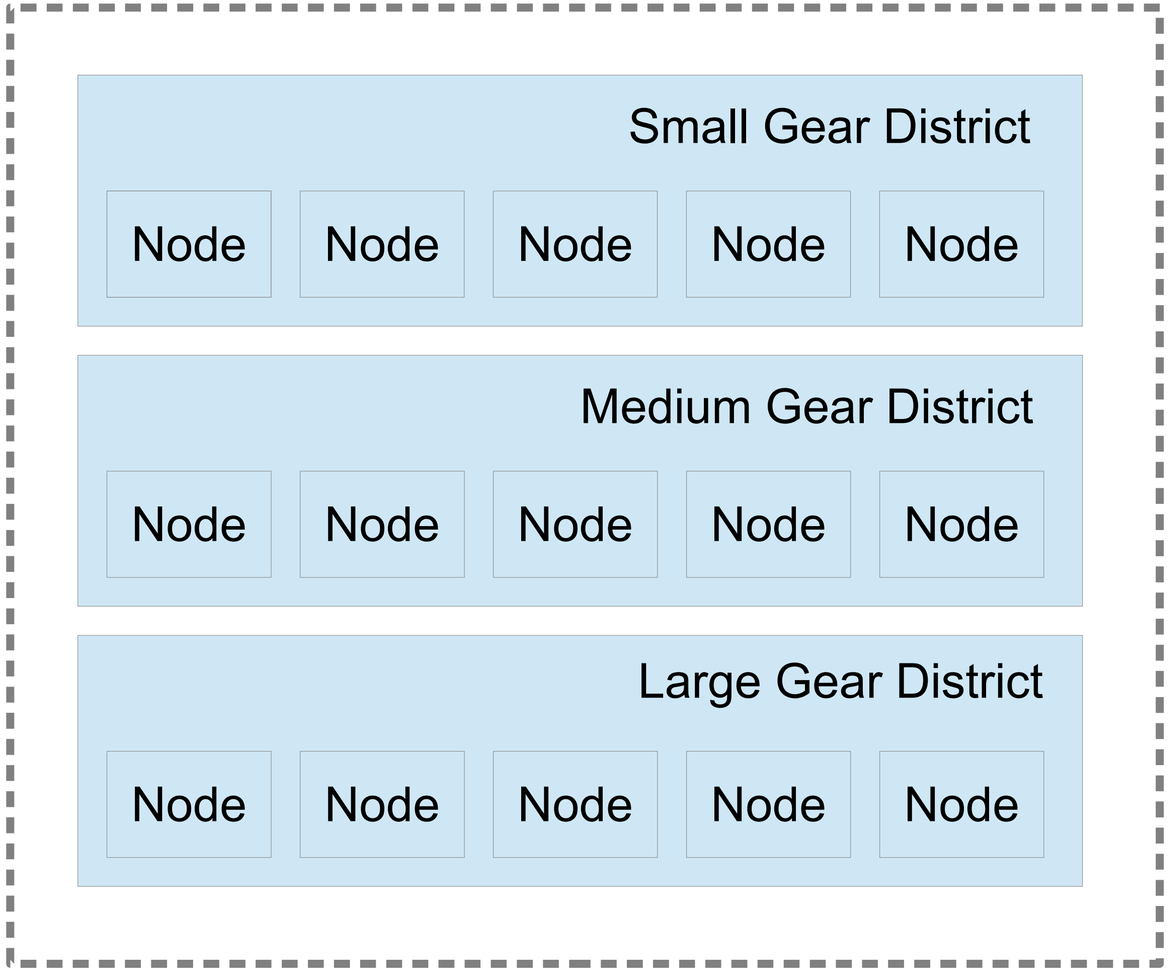
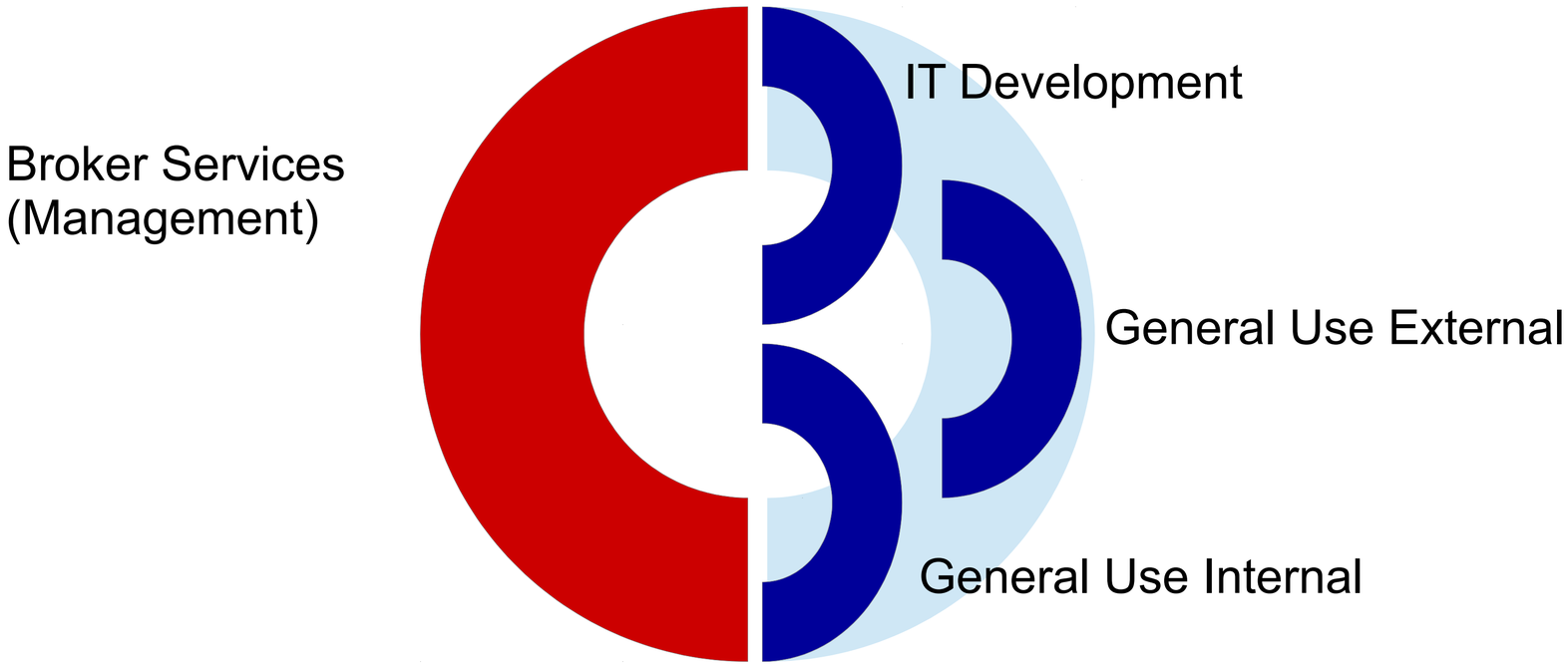


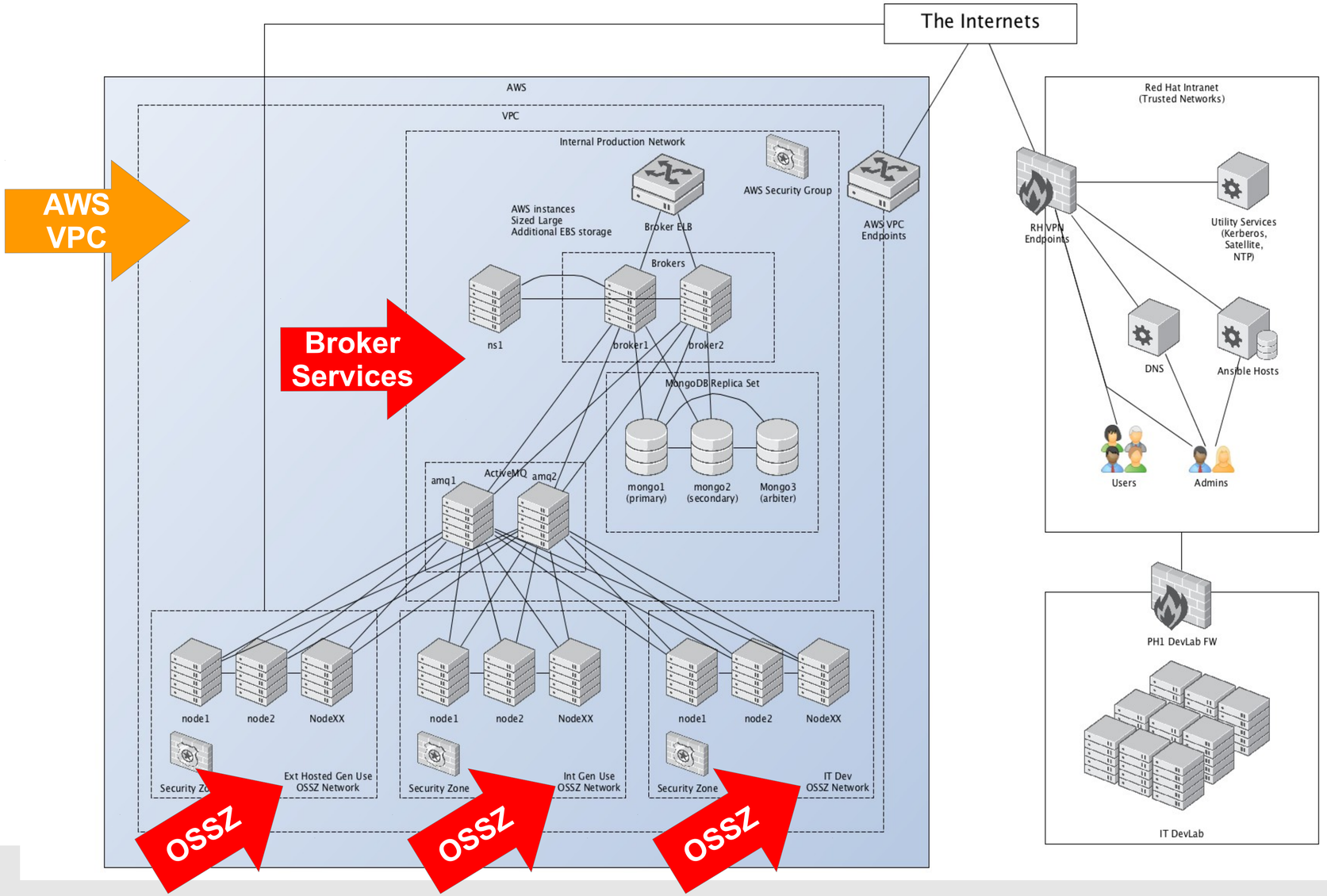
# OpenShift Enterprise

You can split and replicate the nodes sets to your advantage




Red Hat IT calls these OpenShift Security Zones

# A more detailed view of our architecture



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# Proof of Concept to Production

## Our Path

# Step 1: IT test deployment

- Alpha of OpenShift Enterprise.
- Minimal installation.
- Limited to IT use only.
- Focused on gaining operational knowledge.
- Tested application deployment.

# Step 2: establish architecture / operating model

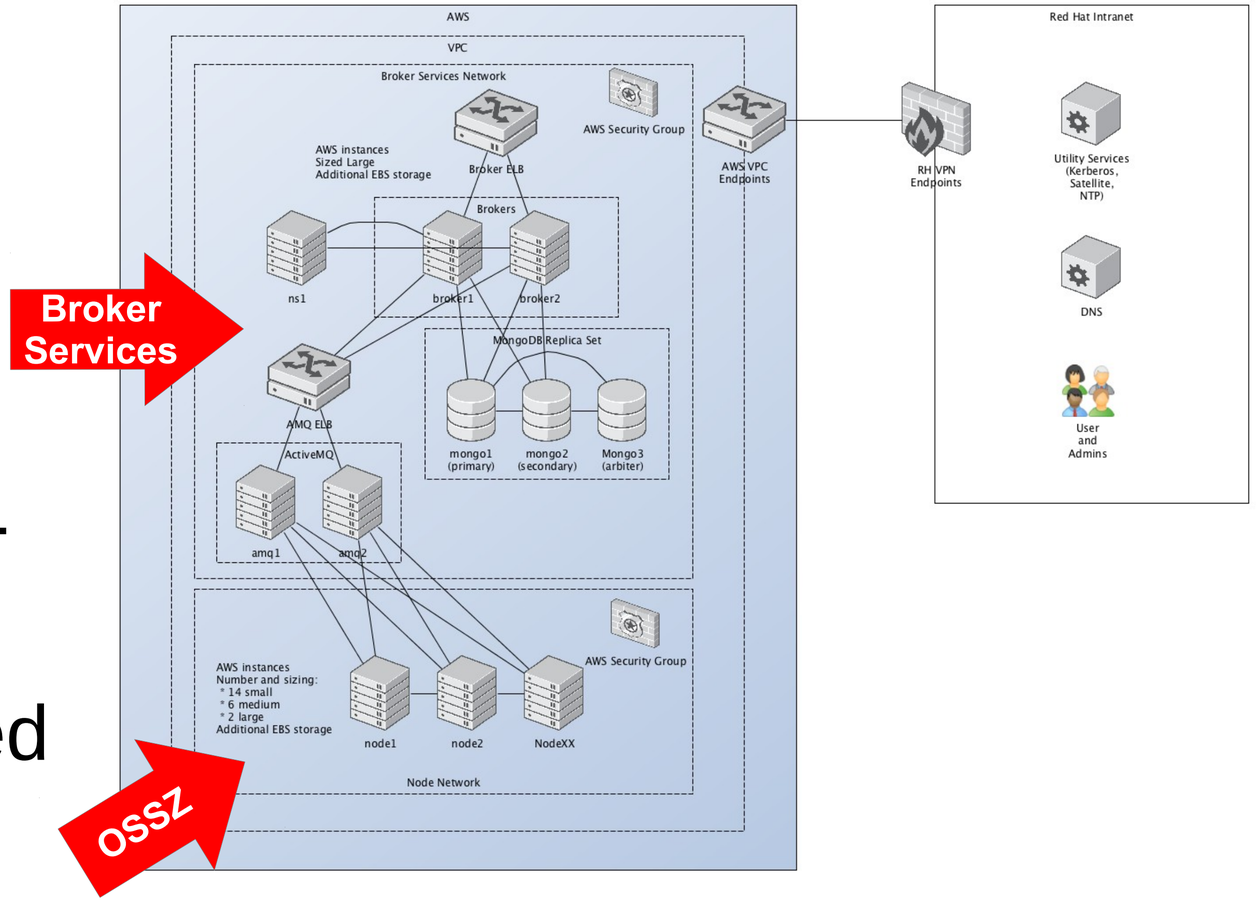
- Service definition and road map.
- Creation of AWS VPC for isolated development.
- Internal services only.
- Evaluated multiple tools for monitoring, configuration management, and provisioning.

Operating Model:

- Where will this live?
- How will we support it?
- Who gets paged in night if it breaks?
- How do we do all the things?

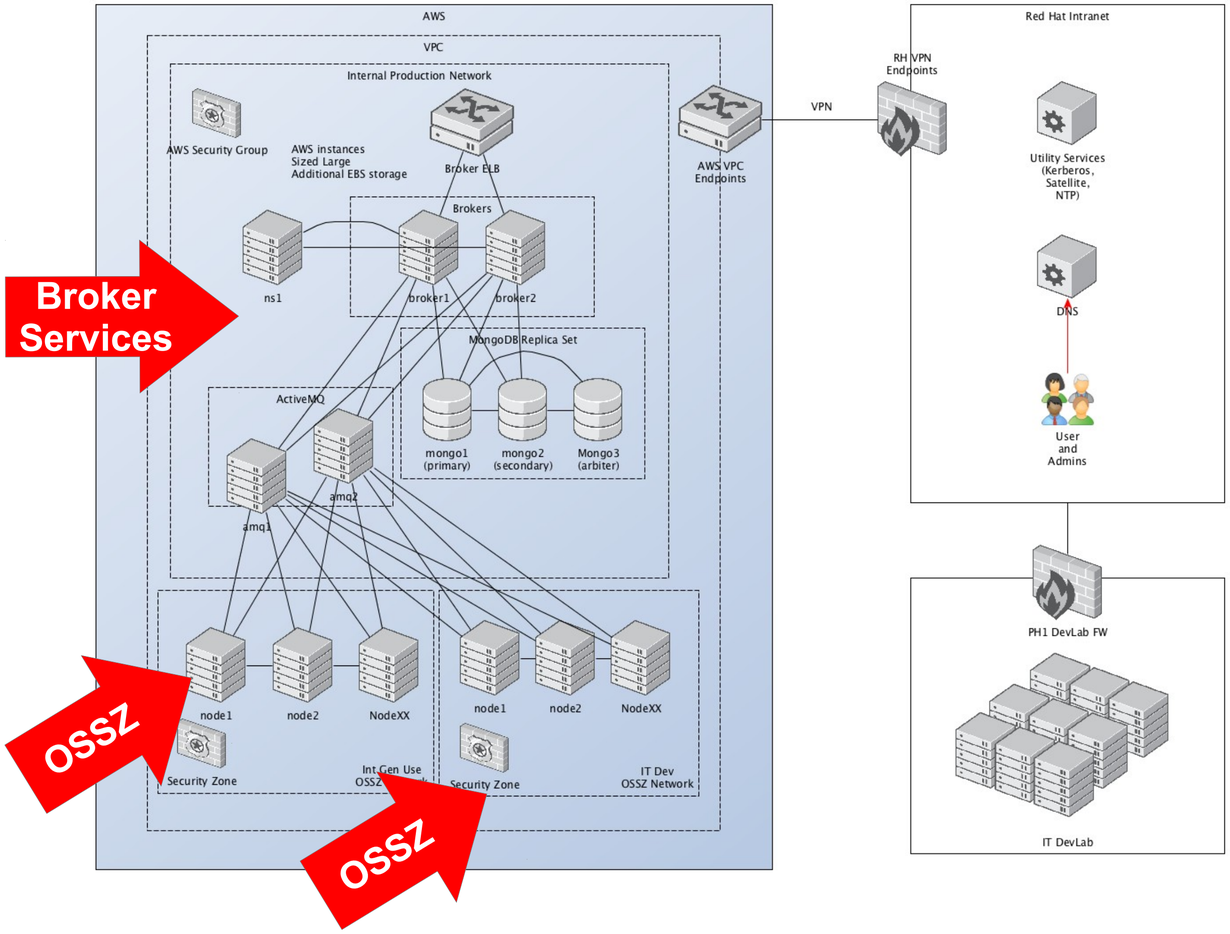
# Step 3: open proof of concept

- 90 day, company wide evaluation.
- Internal services only.
- Limited SLAs.
- OpenShift Enterprise v1.2 pre-release.
- Over 200 applications deployed



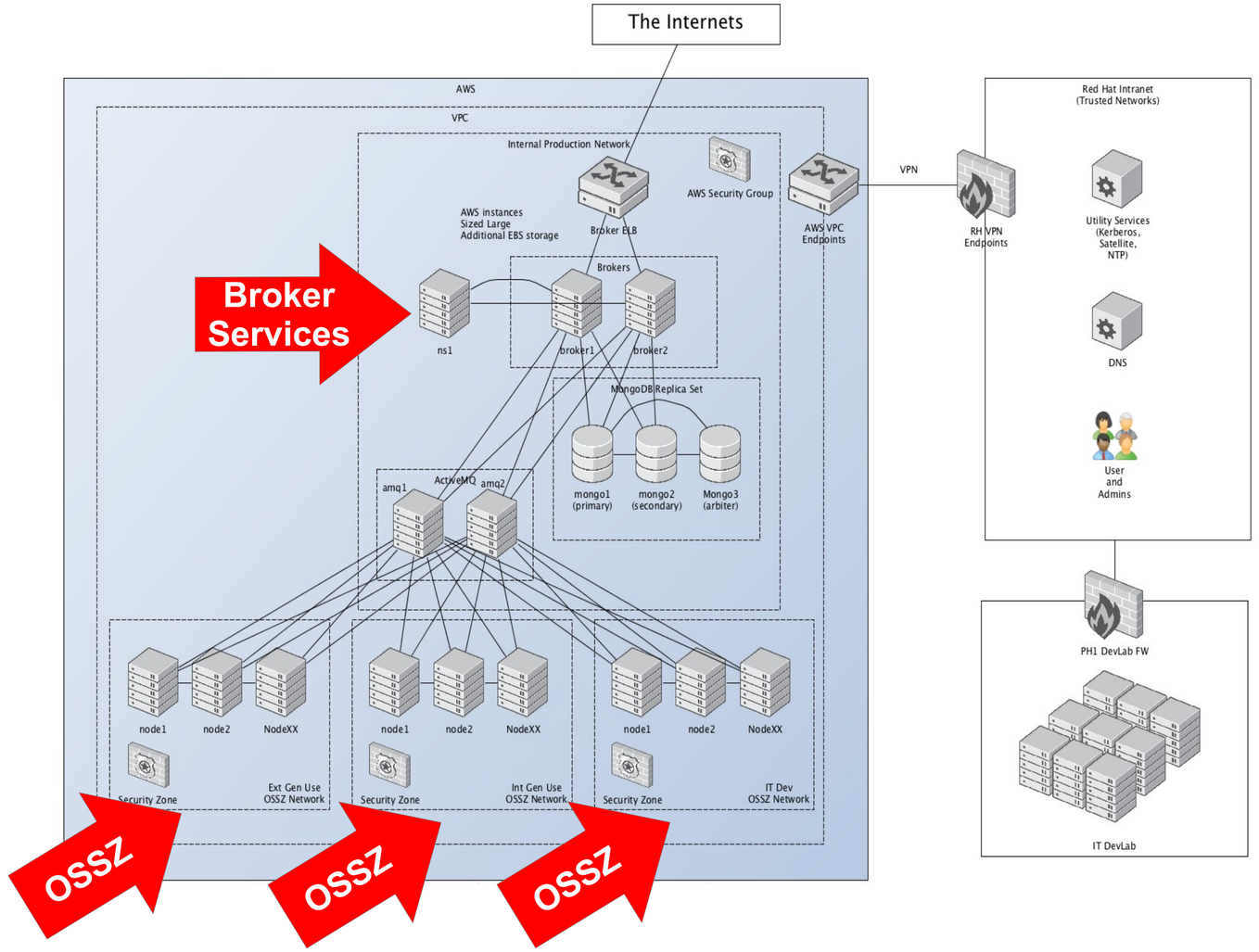
# Step 4: revised architecture / operating model

- Multiple OpenShift Enterprise Security Zones.
- Encrypted all data volumes by default.
- Improved system patching.
- Enhanced monitoring.



# Step 5: production

- Production SLAs.
- Externally accessible applications!
- 30 days: 130 new apps.
- Currently: Over 500 apps.
- Popular cartridges: JBoss EAP, MySQL, PHP, Python, Jenkins.



# Step 5: next steps

- More specialized Security Zones
- Providing more service in our PaaS:
  - Enabling standard SSO capabilities for applications.
  - Enabling self service development certificates.
  - Better application monitoring.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# REAL WORLD EXAMPLES

## Using OpenShift Enterprise to Solve Real Problems

redhat.

OPENSHIFT ENTERPRISE Administration Console

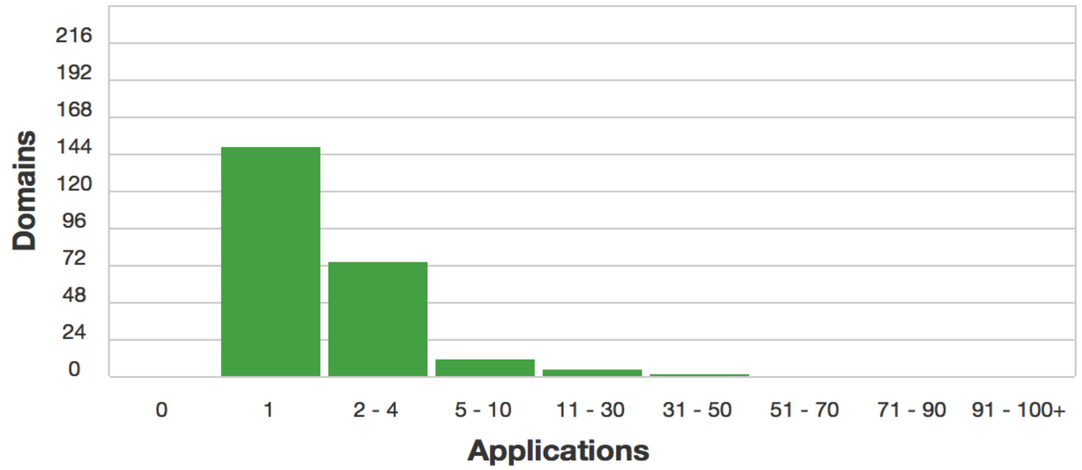
Overview Search Stats Suggestions

User search

# System Stats

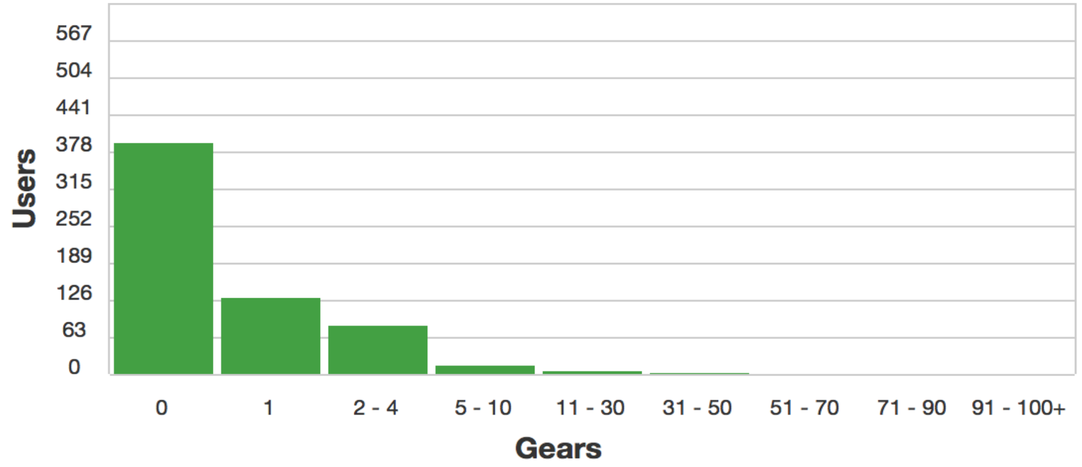
APPLICATIONS
523

PER DOMAIN




USERS
623

GEARS PER USER



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Labs

For more information on CVE-2014-0160 (Heartbleed), please see this announcement.

# Labs



To help you use Red Hat products to their full potential, our engineers have developed a set of tools within Red Hat Access Labs to support customer success. Red Hat Access Labs is built on OpenShift Enterprise, enabling continuous delivery and continuous innovation.

We invite you to try these tools and tell us what you think. As our customer community collaborates and offers feedback, these applications will grow and change quickly. Get started here with the featured labs below!

## Featured Labs

### Heartbleed Detector

Version: 1.0.6

Detect whether a given host is susceptible to CVE-2014-0160 -heartbleed-

Go to App | More info

### Kdump Helper

Version: 1.1.2

Generate a script to configure kdump

Go to App | More info

### Load Balancer Configuration Tool

Version: 1.0.10

Plug in information about your Apache and JBoss configuration and get sane baseline configuration files.

Go to App | More info

Load Balancer Configuration Tool

https://access.redhat.com/labs/lbconfig/#/?apache_cores=4&apache_instances_per_server=1&apache_servers=1&jboss_cores=4

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Labs > Load Balancer Configuration Tool

# Load Balancer Configuration Tool

Go to info page

Version: 1.0.5

This tool is designed to help create an optimal balance between apache-based load balancers and JBoss application servers. Input information about your current or planned deployment to generate a configuration files and advice about how you can increase your environment's performance

## Apache Configuration

| | |
|---|---|
| Servers | 1 |
| Cores per server | 4 |
| MPM type | Prefork \| Worker \| Winnt |
| Module | mod_jk \| mod_proxy \| mod_cluster |

## Usage

Please fill out the form to the left

- Apache MPM type not chosen!
- Apache module not chosen!
- JBoss version not chosen!

## JBoss Configuration

| | |
|---|---|
| Version | EAP 6 \| EAP 5 \| EAP 4 |
| Servers | 2 |

https://access.redhat.com/labs/lbconfig/#/?apache_cores=4&apache_instances_per_server=1&apache_servers=1&jboss_cores=4&jboss_jvms=1&jboss_servers=2&long_running=false&mpmtype

## JBoss Configuration

Version: EAP 6 | EAP 5 | EAP 4

Servers: 2

Cores per server: 4

JVMs per server: 1

## Environment

- [x] Is there a firewall between Apache and JBoss?
- [ ] Are Apache and JBoss on the same server?
- [ ] Does the server handle long running requests?

## Apache Configuration Output

The MaxClients is optimal at 200 * the count of CPU cores for the prefork mpm and 300 * the count of CPU cores for the worker mpm.

### MPM module configuration:

```
<IfModule mpm_prefork_module>
    ServerLimit          1200
    StartServers         5
    MinSpareServers      5
    MaxSpareServers      20
    MaxClients           1200
    MaxRequestsPerChild 0
</IfModule>
```

### httpd.conf / mod_proxy configuration:

```
<Proxy balancer://mycluster>
# NOTE! The following commented lines are example values only! please
modify them to suit your environment
# BalancerMember ajp://192.168.1.0:8009 route=node0 loadfactor=1
ping=10 ttl=600 keepalive=On
# BalancerMember ajp://192.168.1.1:8009 route=node1 loadfactor=1
ping=10 ttl=600 keepalive=On
```

# Heartbleed Detector

Plug in your hostname and port to detect whether your host is susceptible to CVE-2014-0160. Please only use this to scan servers you have permission to. We log all scans.

If you are interested in scanning internal systems you can download the offline Heartbleed scanning tool. The offline tool is not supported and is provided for informational purposes only.

## Input

Hostname: openshift.com

Port: 443

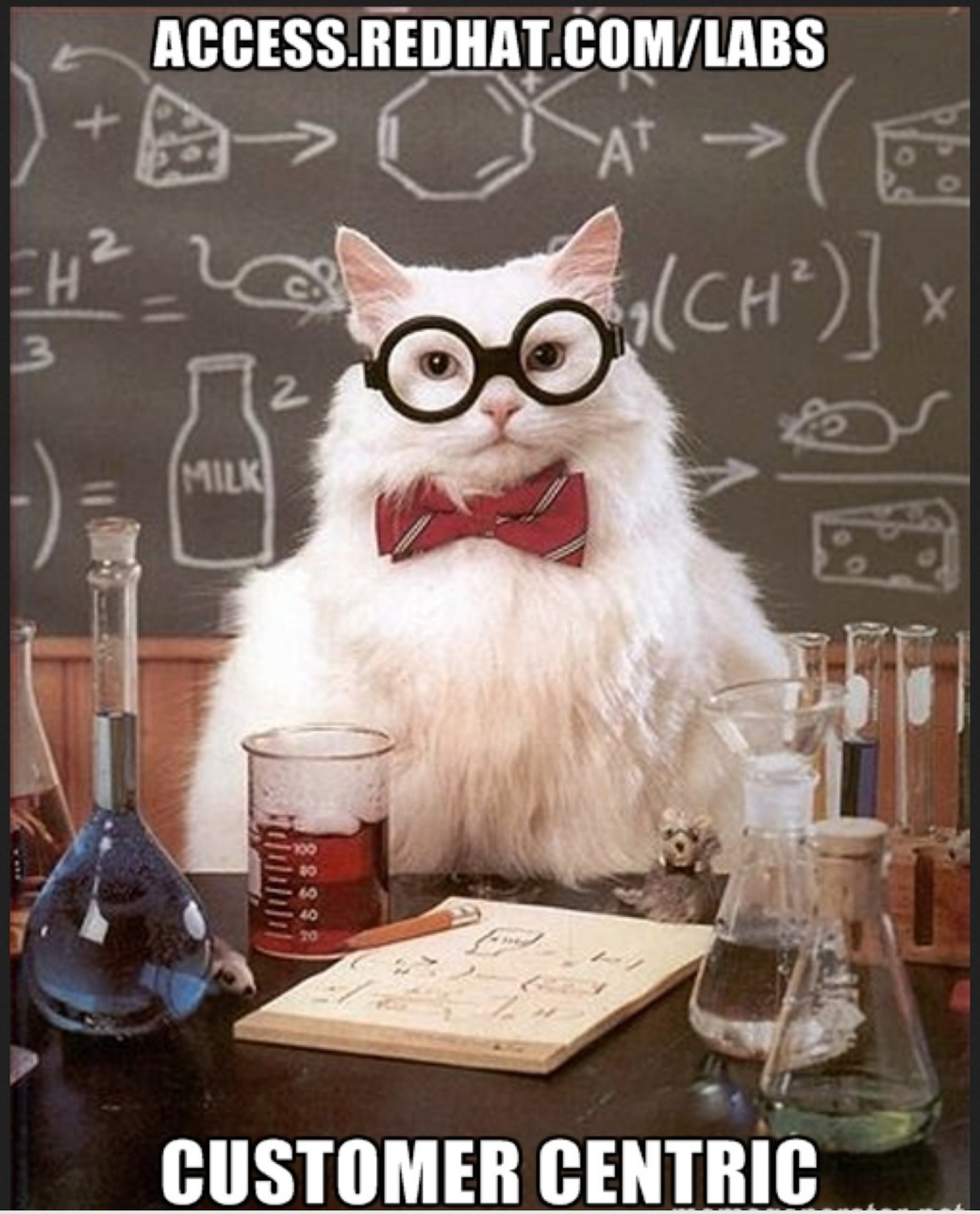
Check

## Results for openshift.com:443

### Status: Not Vulnerable

The host **openshift.com:443** seems to be **not affected** by CVE-2014-0160

Please see the solution for CVE-2014-0160 for more information though.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RED HAT JBOSS BPM SUITE

Home | Authoring | Deploy | Process Management | Tasks | Dashboards | Find | User: jboss

search...

# Welcome to JBoss BPM Suite 6

A unified platform for building Realtime Intelligent Business Process Management Solutions.
One place to model, deploy, execute, manage and monitor business activities.

## Model

Create Projects and Model Business Assets.

## Deploy

Create and Manage Deployments.

## Manage Processes

View and Manage Process States.

## Manage Tasks

View and Take Actions on Assigned Tasks.

## Monitor

Monitor Business Activity and Track KPIs.

### Design Business Assets:

- Business Processes
- Data Models
- User Forms
- Business Rules
- Simulations

We provide an all-in-one framework for organizing and deploying projects:

**Organizations**
Organize workspaces by group or department. Setting up groups in BRMS enables broad-level access management.

**Repositories**
All projects and assets are stored in GIT repositories (every Organizational Unit needs to have at least one repository).

**Projects**
A project is a collection of all the assets and information needed to build a complete functional system.

An example project structure:

**Retail Banking**

**Loan Processing**

New Morgtages

Refinancing

javascript:void(0);

# jBPM Suite 6 Training Course

# Partner & Associate Centric


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# LESSONS LEARNED

## From an IT Operations Perspective

# IT as a Customer

# Community

# Community

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lists.openshift.redhat.com
IRC on freenode: #openshift #openshift-dev
Google+, Facebook, Twitter

# Q&A