



Cloudy Middleware

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About

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Agenda

1. Why PaaS?
2. The JBoss PaaS
3. OpenShift
4. Demo



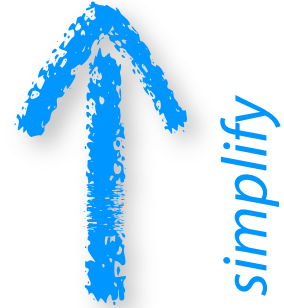
WHY PAAS?

Why PaaS?

Development

- ✓ **Focus** on applications
- ✗ **Stop** dealing with the stack

Ease of use



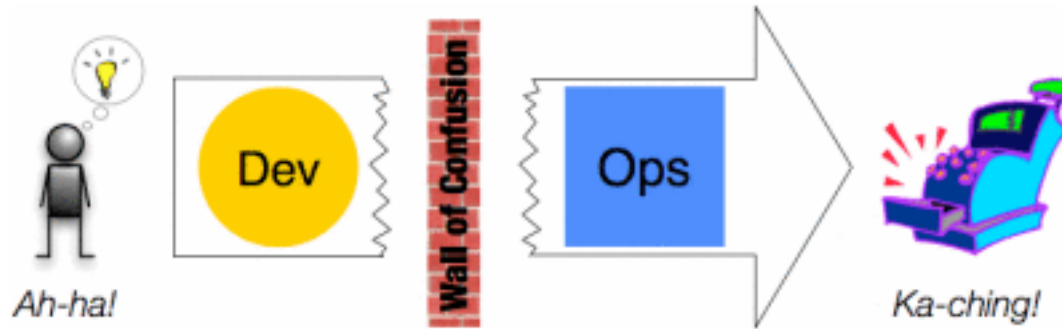
Operations

- ✗ **Stop** dealing with the application
- ✓ **Focus** on infrastructure



Efficiency

PaaS: The “Other” DevOps



PaaS is the smart answer to DevOps' problem statement

Source: <http://dev2ops.org/blog/2010/11/7/devops-is-not-a-technology-problem-devops-is-a-business-prob.html>, accessed 2011-04-29.

Administration is Hard Work

SETUP SERVER

Setup cloud server	5'
Setup user accounts & keys on cloud server	10'
Install stack	10'
Install stack extensions & libraries	10'
Patch Stack	10'

SCALING

Setup/configure load balancer	15'
Setup database & replication	30'
Clone application stack to additional server	60'

SET IT UP ONCE 5-8hrs

AUTOMATE IT 25-40hrs

SECURITY

Configure security for stack	30'
Configure firewall	10'
Install change audit	30'

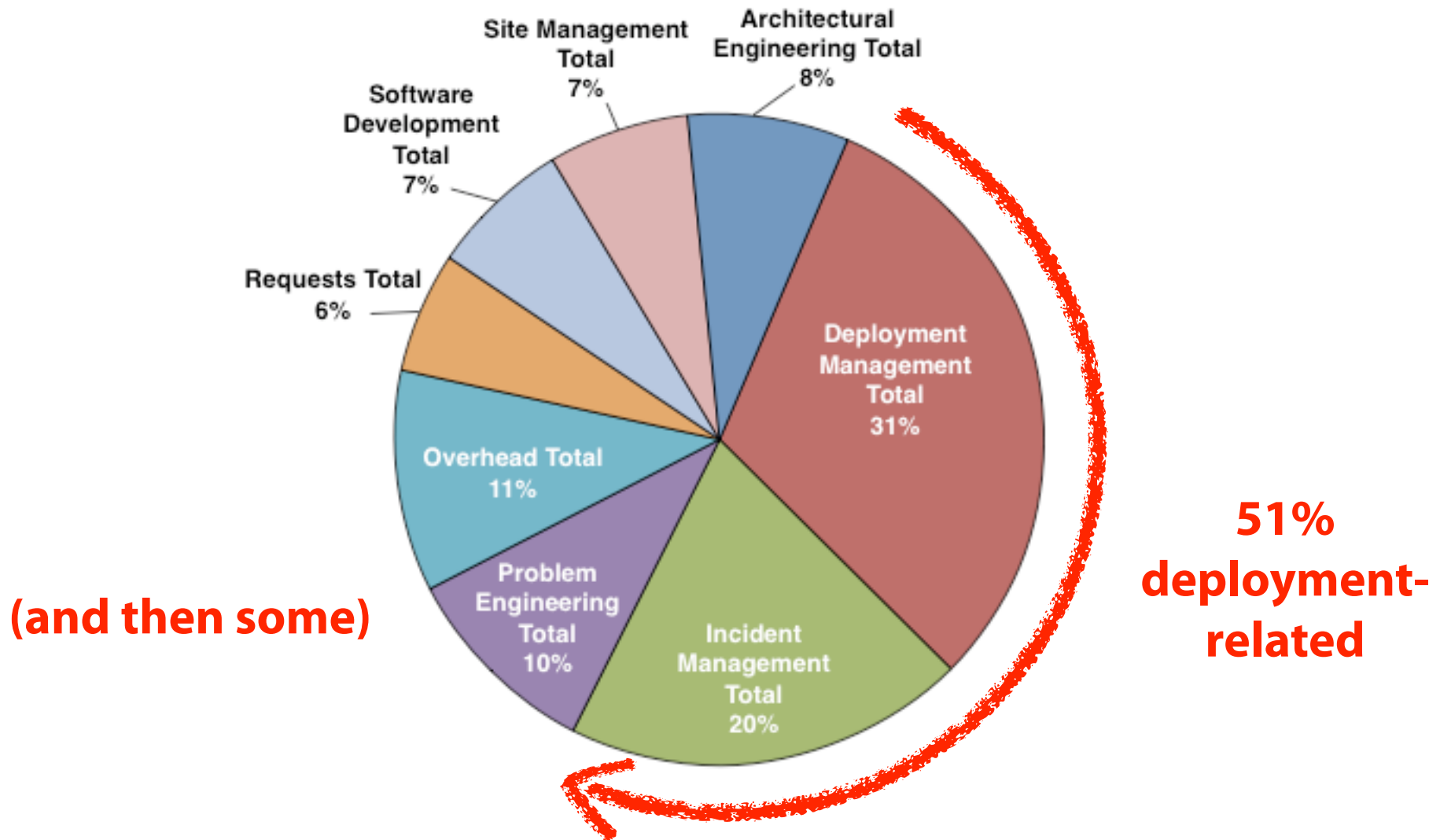
ADAPT IT TO CHANGE Ugh!
(diff. release/cloud)

MONITORING

Install system monitoring	30'
Install/configure application monitoring	10'
Install/configure log aggregation	30'
Setup log indexer service for search	30'

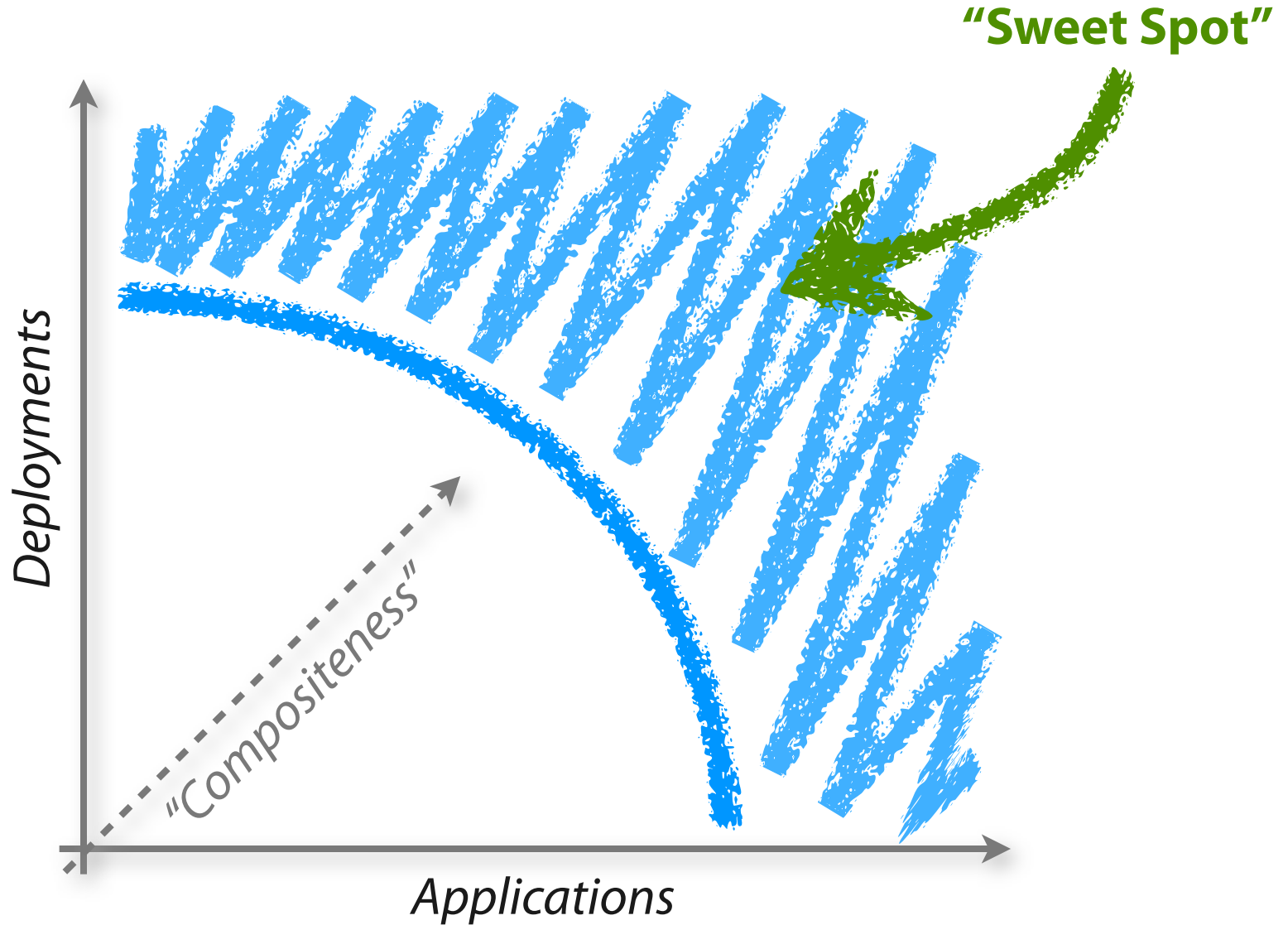
Total: 5-8h

Deployment is Hard Work



Source: Hamilton: "Service Design Best Practices", AWS, 2009, http://www.mvdirona.com/jrh/TalksAndPapers/JamesHamilton_POA20090226.pdf, accessed 2011-04-01.

PaaS Sweet Spot



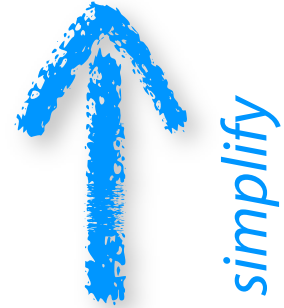
Which PaaS?

Development

✓ **Focus** on applications

✗ **Stop** dealing with the stack

Ease of use



Operations

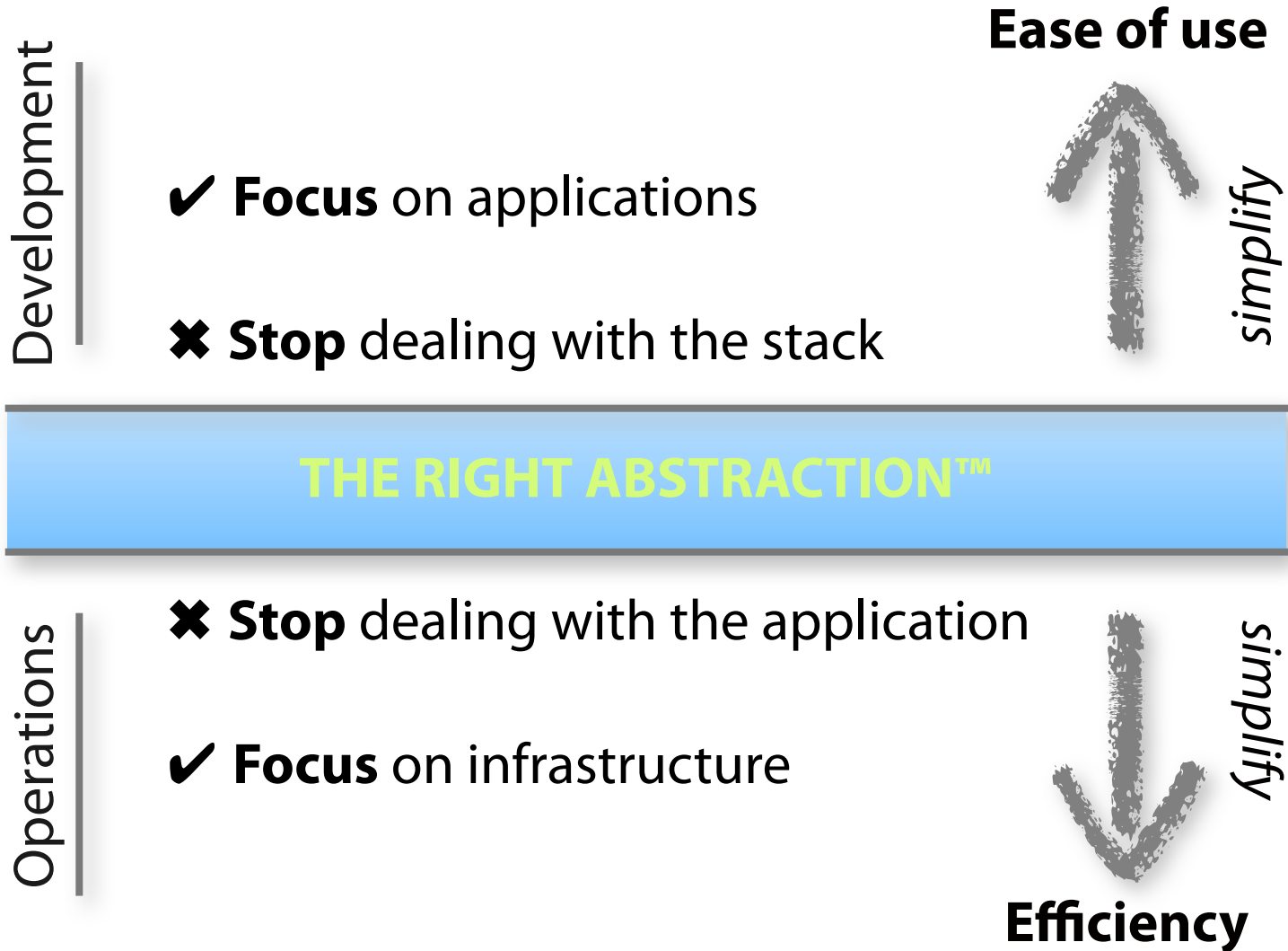
✗ **Stop** dealing with the application

✓ **Focus** on infrastructure

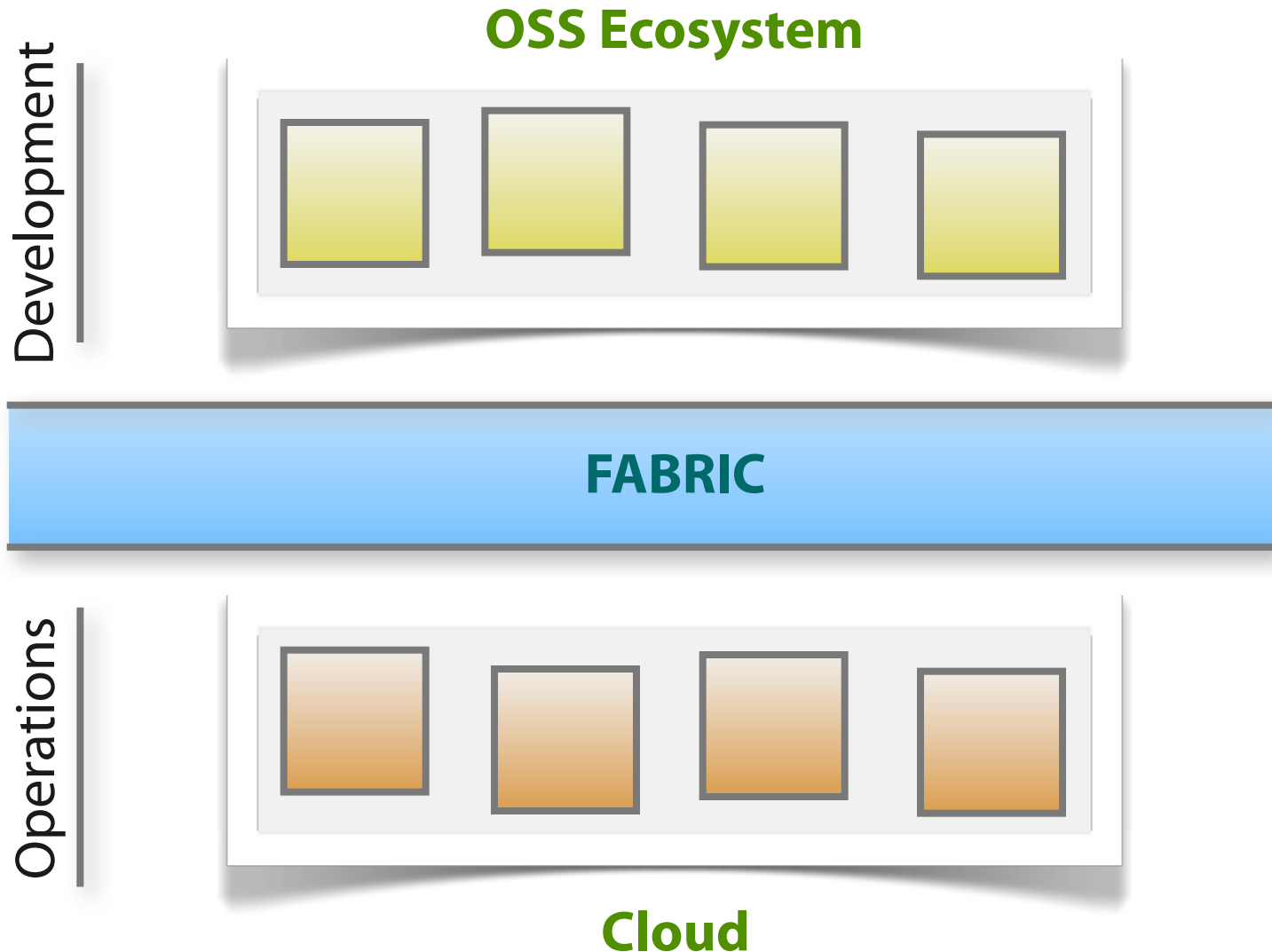
Efficiency



Which PaaS?



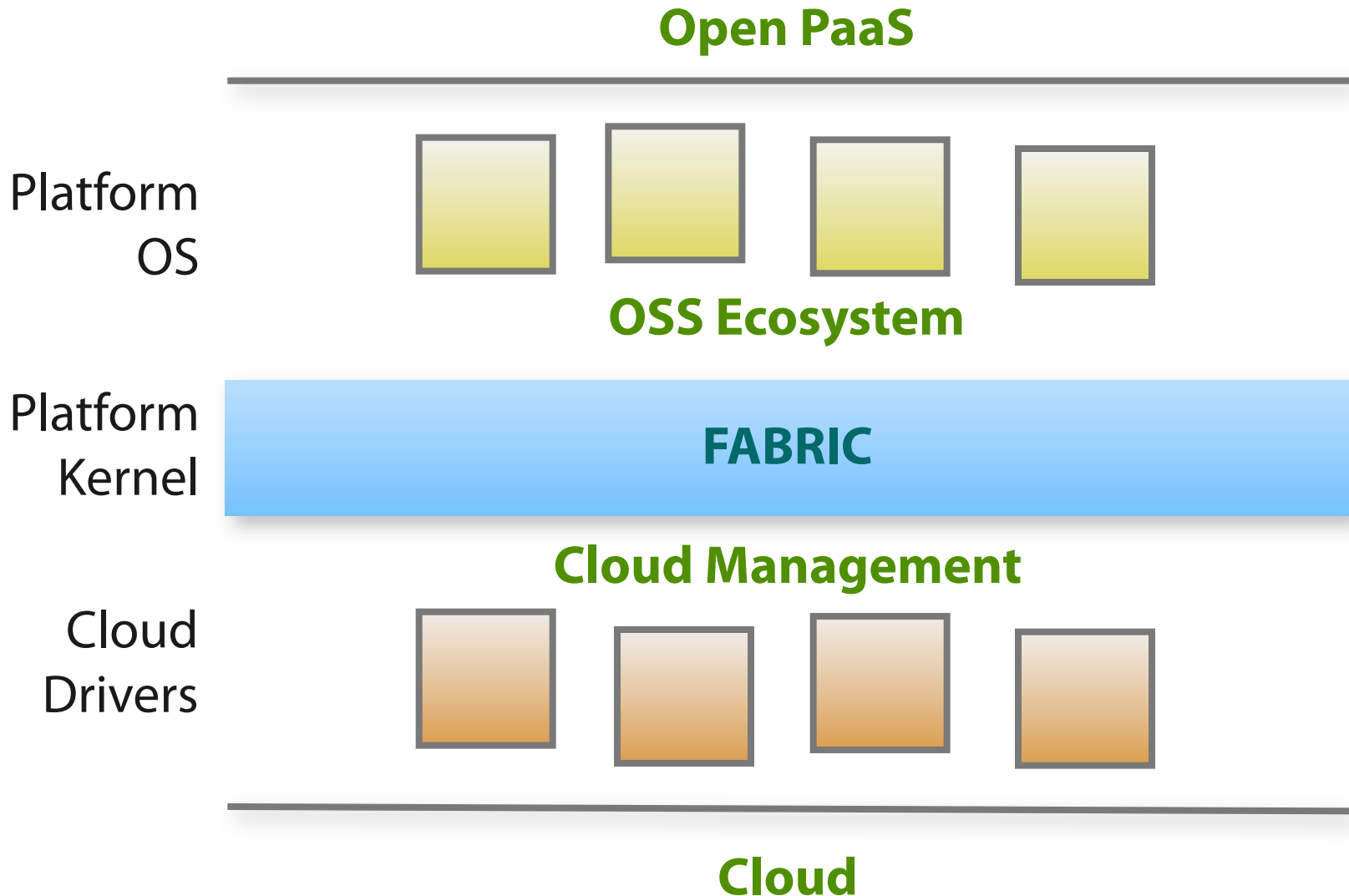
PaaS: The Right Abstraction™



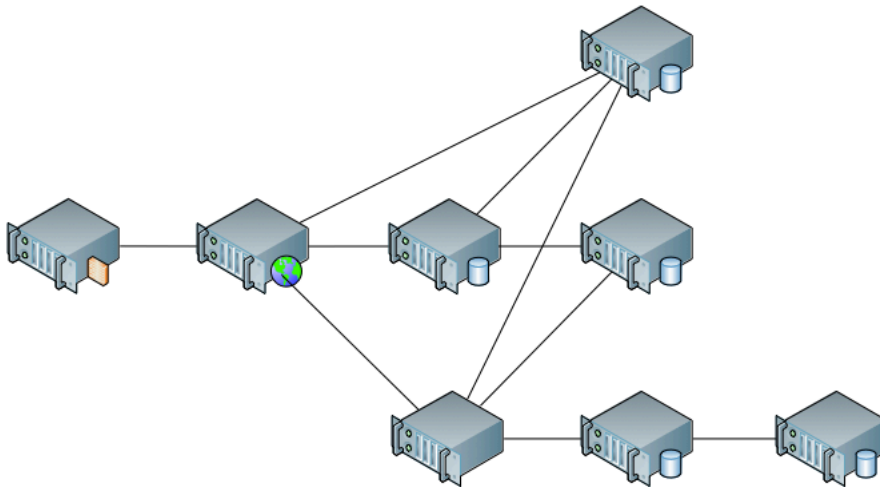
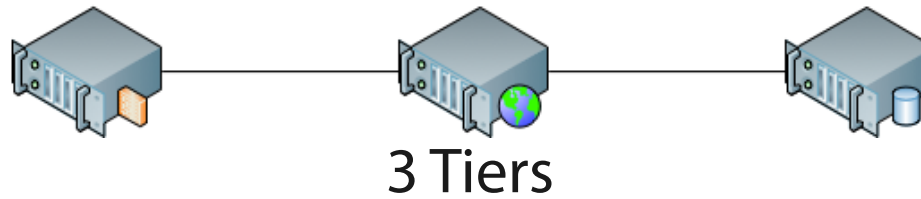
Why Cloud?

1. **Cost:** CAPEX, metered
2. **Convenience:** self-service, on-demand
3. **Allure:** elasticity promises scalability

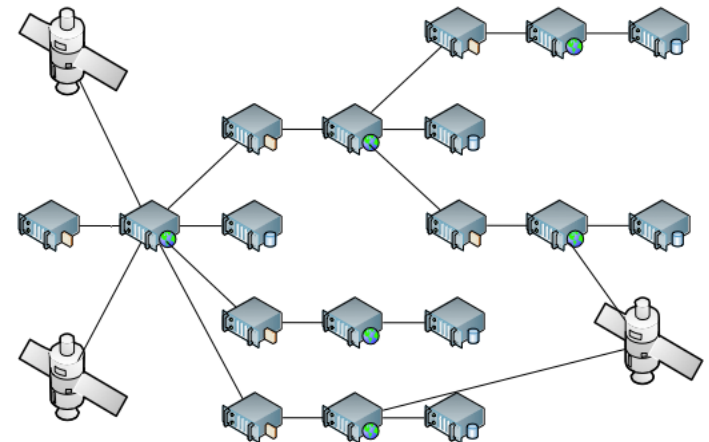
PaaS: The New Linux



Application Architectures

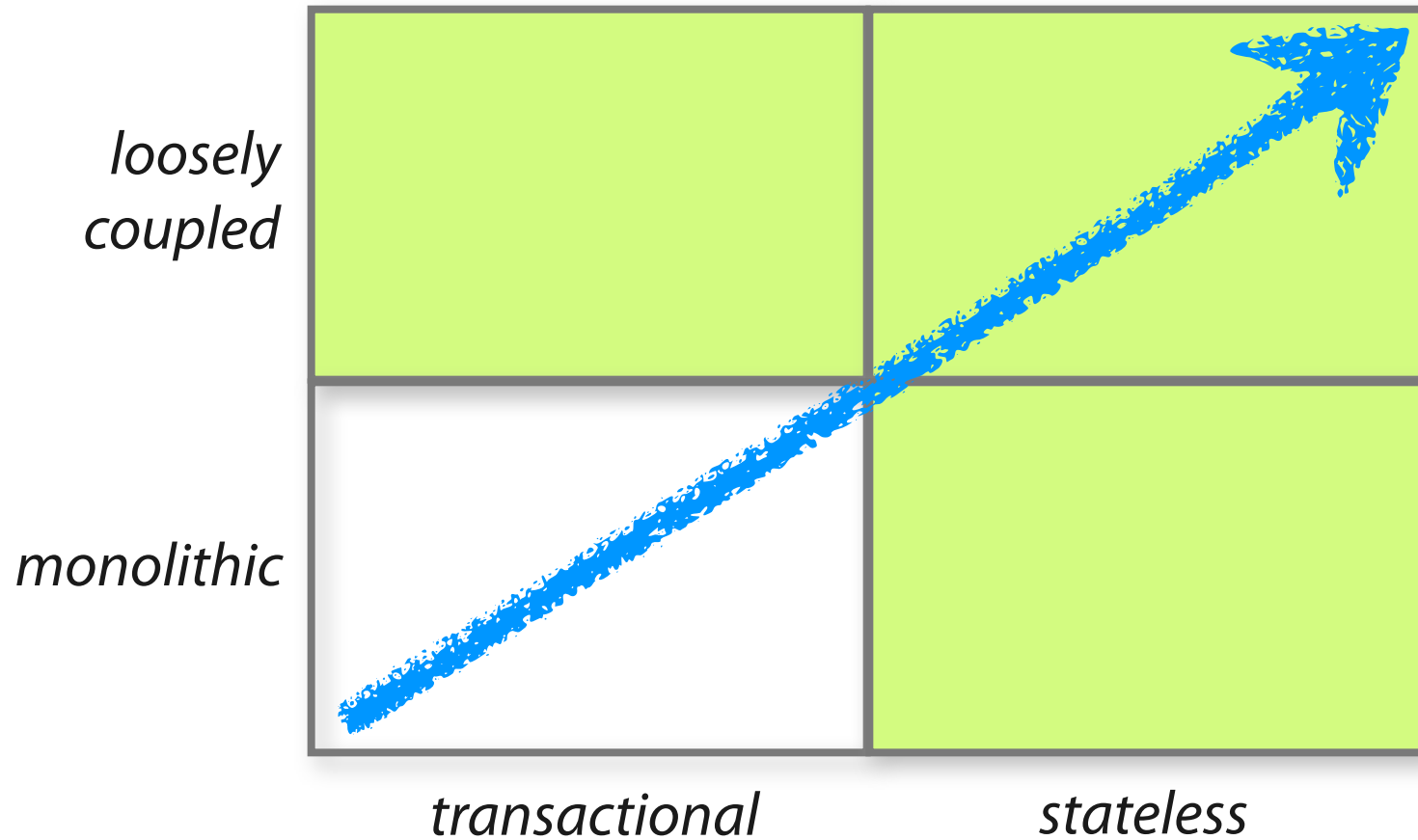


Distributed Apps: NoSQL, KV-Stores



Composite Apps

Architectural Styles





What is JBoss PaaS?

Current PaaS approaches

Far too simplistic

- Not standards based
- Little relevance to existing middleware offerings
- Restricts application capabilities
 - So much for dynamic elasticity
 - Existing s/w investments are irrelevant

Limitations are not based on architectural issues

- Security implications

Vendor lock-in dominates

Present and future directions

Build on our existing implementations

We must provide a natural upgrade path for existing users

- We cannot afford to repeat the DCE/CORBA, DCOM/.NET or CORBA/J(2)EE days

Evolution rather than revolution

If the answer is “Cloud 2010” the question is wrong!

Today “Cloud” means “servers”

- More processors outside of “servers” than inside

JBoss PaaS

Users will want to deploy existing applications more dynamically to cloud environments

- Traditional on-premise, standards-based Java
- Want to be able to use existing programming models to deploy traditionally and within cloud environments
- Interoperability between traditional and cloud

Red Hat will create a PaaS offering that will use standard programming technologies to bridge the worlds of on-premise and cloud deployments

- Support the needs of cloud only PaaS opportunities while protecting customers from programming model and API changes

JBoss PaaS Principles

Address existing JEE/Java deployment plus cloud

Use existing components of the JBoss portfolio – don't reinvent the wheel

Don't invent a closed, proprietary system with new APIs – don't have to change the programming model

Deploy current JEE/Java on-premise plus cloud deployment

- Make them inter-operable (Future proof investment)
- Deployment environment “agnostic” (elastic)

JBoss PaaS Principles

Developer Centric

- PaaS enable from the viewpoint of the developer
 - CDI
- Integrate tooling for cloud D&D with JBDS
- Make easier for developers to use cloud

Standards Based

- Support PaaS and other cloud standards as they exist
- Define or drive standards where they don't exist
 - JSR 347

JBoss PaaS Principles

Optimize for Red Hat IaaS offerings and leverage

Market needs addressed by JBoss PaaS:

- Lower costs – greater utilization of resources on demand
- Make deployment easier and more abstracted
- Elasticity to scale on demand

JBoss PaaS capabilities

Elastic runtime

- Utilize more compute/storage capacity automatically
- JEE services as true services, not co-located within same VM/Container

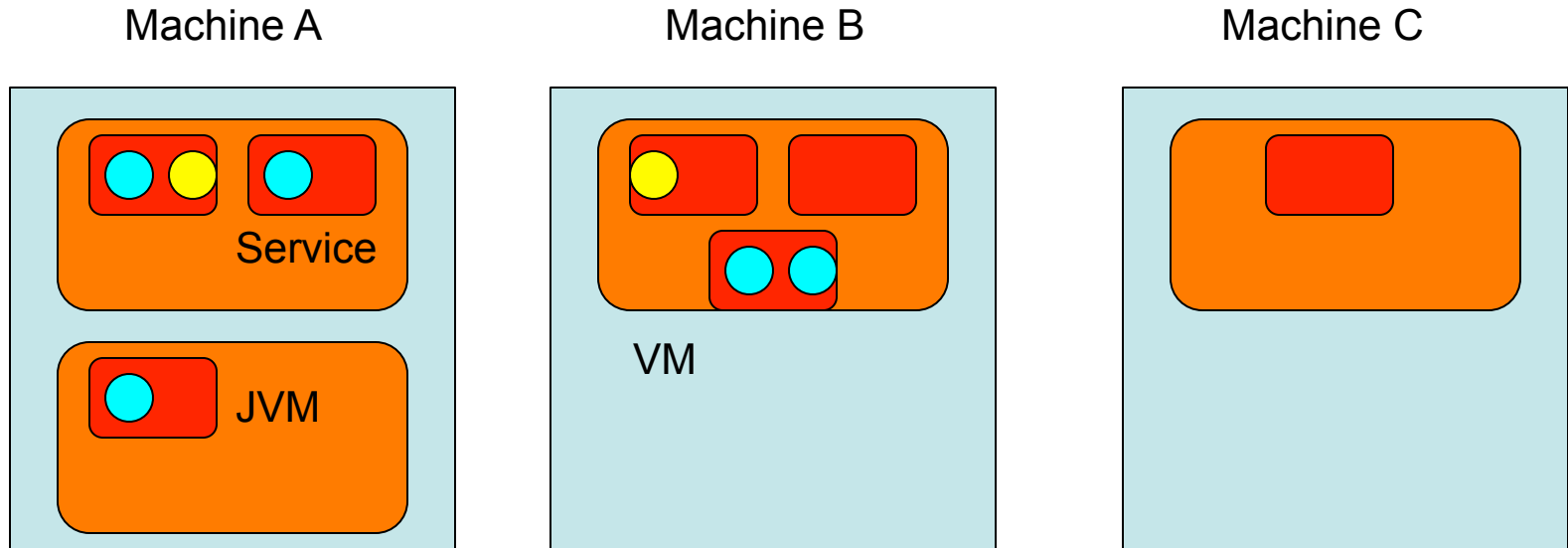
Development

- Runtime hosted as a service in cloud (test deploy)
- Develop (tools) locally – then deploy in Cloud

Abstraction to all configuration considerations

- Data store, clustering, network, security services
- Automatic deployment
- Workflow for deployment

Services, VMs and JVMs



Java EE services (in blue) split across machines, VMs and JVMs

Service instance may abstract more cloud instances

- Hierarchical structure of machines, VMs etc.

Similar deployment structure for applications

JBoss PaaS futures

Lifetime application management (tool chain)

- Works across on-premise & clouds
- Supports heterogeneous deployments
- Build time tools
- Deployment tools
- Ongoing operational & management tools

Developer tools (IDE)

- Expansion of developer tools for easier seamless development

How are we going to do it?

Stage 1

- Begin with JBoss EAP and development tools
- Concentrate on the application platform

Stage 2

- Incorporate other “integration” technology for PaaS enablement – ESB, BPM, presentation technologies
- SOA natural architectural approach for PaaS/SaaS



OPENSIFT

Makara Vision

PROVISION, DEPLOY, MANAGE, MONITOR & SCALE
EXISTING APPLICATIONS
ON CLOUDS



Makara

Built around monitoring

Control, portability, and *visibility*

OpenShift

Two interaction models:

1. OpenShift Express

- “Runtime-as-a-Service”: simple, git-based interaction


2. OpenShift Flex

- “Middleware-as-a-Service”
- Optimized for existing models
 - Nodes
 - Middleware, frameworks, services
 - Software ecosystem
- Operations use cases: self-serve, user management



DEMO

Application Overview



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INTRO CLOUDS CLUSTERS SERVERS **APPLICATIONS** PERFORMANCE LOGS EVENTS

All Applications APPLICATION NAME weld-pastecode STATUS Started STOP RESTART

OVERVIEW COMPONENTS FILES CONFIGURE DEPLOY CHANGES

These are your application's parameters. You can edit the details here, or work with the application itself on the following pages.

CLUSTER DNS
Staging1392187622.stg.rhcloud.com

Running applications can be reached under `http://<host>[:port]/<context>` where:

- 'host' is either a local node IP address, the load balancer address (if any), or a configured domain name,
- 'port' is the port specified in the static web server configuration (default: 80), and
- 'context' is the application's context path (if any).


START STOP RESTART EXPORT DELETE COPY TO...

DEPLOYMENT HISTORY

Restore a previous deployment to your development work space.

DEPLOYMENT	LAST MODIFIED	COMMENTS	ACTIONS
1	Sun May 1 2011 12:34:44 PM	Onboarded sample app weld-pastecode	RESTORE

Component Selection

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INTRO CLOUDS CLUSTERS SERVERS **APPLICATIONS** PERFORMANCE LOGS EVENTS

All Applications

APPLICATION NAME
weld-pastecode

STATUS
Started

STOP

RESTART

OVERVIEW COMPONENTS FILES CONFIGURE DEPLOY CHANGES

Your application depends on some components for support. You'll need a language runtime and application server.

APPLICATION COMPONENTS

Application Type
JBoss

Web Server
Apache HTTP Server (Web Tier) (www-static.apache2 2.2.3-45 i686.vpm)

Application Server Version
JBoss Application Server 6.1.0 (jboss-6.0.0 6.0.0-15 all.vpm)

Language Version
JDK 6.0 (jdk6-1.6.0 1.6.0-11-16 i686.vpm)

Database
MySQL Server 5.1.52 (mysql-server 5.1.52-8 amd64.vpm)

☐ This application sends email (you must use the Settings tab to configure the cluster to send email)

CANCEL

SAVE

Other Components

☐ Zend Framework 1.10.8(zend-framework-1.10.8_1.10.8-2_i686.vpm)

☐ Memcached 1.4.5(memcached-1.4.5_1.4.5-4_i686.vpm)


☐ mongoDB-1.6.5(mongodb_1.6.5-23_amd64.vpm)

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File Management

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INTRO CLOUDS CLUSTERS SERVERS APPLICATIONS PERFORMANCE LOGS EVENTS

All Applications APPLICATION NAME weld-pastecode STATUS Started STOP RESTART

OVERVIEW COMPONENTS FILES CONFIGURE DEPLOY CHANGES 1

These are your application's files. If this is the first time you're bringing the application in from outside the OpenShift Flex system then these files should be the same as before the import. Application files may be edited in an ssh session, or uploaded via scp or rsync/ssh by logging in as the username "admin" and the admin password set on cluster creation. Please avoid modifying the ".git" directory. With rsync, please use "--exclude .git". Location: /home/admin/weld-pastecode/shared/bundle

Show All Files ▼ UPLOAD FILE REFRESH

bundle

bin

weld-pastecode-ds.xml

weld-pastecode.war.extracted

META-INF

WEB-INF

display.xhtml

favicon.ico

functions.js

help.xhtml

history.xhtml

home.xhtml

img

index.html

jsScripts.xhtml

pagination.xhtml

rightMenuDefault.xhtml

style

syntaxhighlighter

template.xhtml

File Name: bundle/weld-pastecode.war.extracted/display.xhtml


```
<link rel="alternate stylesheet" href="syntaxhighlighter/styles/shThemeFadeToGray.css" type="text/css"
title="FadeToGray Theme" media="screen"/>
<link rel="alternate stylesheet" href="syntaxhighlighter/styles/shThemeMidnight.css" type="text/css" title="Midnight
Theme" media="screen"/>
<link rel="alternate stylesheet" href="syntaxhighlighter/styles/shThemeRDark.css" type="text/css" title="Dark Theme"
media="screen"/>
<link rel="alternate stylesheet" href="syntaxhighlighter/styles/shThemeDjango.css" type="text/css" title="Django Theme"
media="screen"/>
</ui:define>

<ui:define name="mainarea">
  <div class="contentHeader">
    Submitted by #{pasteWindow.codeFragment.user} <h:outputText value="on"
rendered=#{pasteWindow.codeFragment.friendlyDate != 'just now'}"/> #{pasteWindow.codeFragment.friendlyDate}
    <div style="float:right">
      <a href="download?id=#{pasteWindow.codeFragment.hash == null ? pasteWindow.codeFragment.id :
pasteWindow.codeFragment.hash}" style="text-decoration: none;">DOWNLOAD</a>
    </div>
  </div>

  <div class="formRow">
    <h:outputLabel for="theme" value="Choose theme: "/>
    <h:selectOneMenu id="theme" value=#{pasteWindow.theme}" onchange="chooseStyle(this.value);"> <!--
this.form.submit() -->
    <f:selectItems value=#{themes}" var="theme" itemLabel=#{theme.name}" itemValue=#{theme.name}" />
    </h:selectOneMenu>
  </div>

  <!--h:outputLabel for="unwrap" value="Unwrap code: "/>
  <h:selectBooleanCheckbox id="unwrap" onchange="unwrap('codearea');"/>-->


  <div class="displayCode">
    <pre class="brush: #{pasteWindow.codeFragment.language.brush}">#{pasteWindow.codeFragment.text}</pre>
  </div>
</ui:define>
```

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Configuration

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INTRO CLOUDS CLUSTERS SERVERS **APPLICATIONS** PERFORMANCE LOGS EVENTS

[All Applications](#) APPLICATION NAME **weld-pastecode** STATUS **Started** [STOP](#) [RESTART](#)


OVERVIEW COMPONENTS FILES **CONFIGURE** DEPLOY CHANGES

These files configure the components that your application uses to run. For direct file access, ssh as "admin" with the admin password configured when the cluster was created. Location: /home/admin/weld-pastecode/shared/info/setup

[www-static.apache2](#) [jdk6-1.6.0](#) **[jboss-6.0.0](#)** [mysql-server](#) [Internal Variables](#) [Expert Mode](#)

Port offset (unique per application):	<input type="text" value="0"/>	i
Naming:	<input type="text" value="1099"/>	i
Naming RMI:	<input type="text" value="1098"/>	i
Web service:	<input type="text" value="8083"/>	i
Unified invoker connector:	<input type="text" value="4446"/>	i
Invoker JRMP:	<input type="text" value="4444"/>	i
HA-JNDI:	<input type="text" value="1100"/>	i
HA-JNDI RMI:	<input type="text" value="1101"/>	i
HTTP connector:	<input type="text" value="8080"/>	i
HTTPS connector:	<input type="text" value="8443"/>	i
AJP connector:	<input type="text" value="8009"/>	i
HornetQ Netty:	<input type="text" value="5445"/>	i
HornetQ Netty SSL:	<input type="text" value="5446"/>	i
HornetQ Netty batch:	<input type="text" value="5455"/>	i
JBossTS recovery manager:	<input type="text" value="4712"/>	i
JBossTS Transaction Status Manager:	<input type="text" value="4713"/>	i

Deployment

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INTRO CLOUDS CLUSTERS SERVERS APPLICATIONS PERFORMANCE LOGS EVENTS

All Applications APPLICATION NAME weld-pastecode STATUS Started STOP RESTART

OVERVIEW COMPONENTS FILES CONFIGURE **DEPLOY CHANGES 1**

Check the deployment summary to see what you've changed. When you're ready to deploy you can choose a deployment mode. If you need to edit anything, return to previous steps.

DEPLOY CHANGES 1 FILES TO 4 CLOUD SERVER(S) COMMENT Changed the textbox label Rolling Restart DEPLOY REVERT ALL

✓ FILES MODIFIED IN DEVELOPMENT: 1

bundle

weld-pastecode.war.extracted

display.xhtml

✓ CONFIGURATION FILES MODIFIED: 0

No files found

✓ FILES MODIFIED IN PRODUCTION: 0

No files found

File Name: bundle/weld-pastecode.war.extracted/display.xhtml

Diff Settings

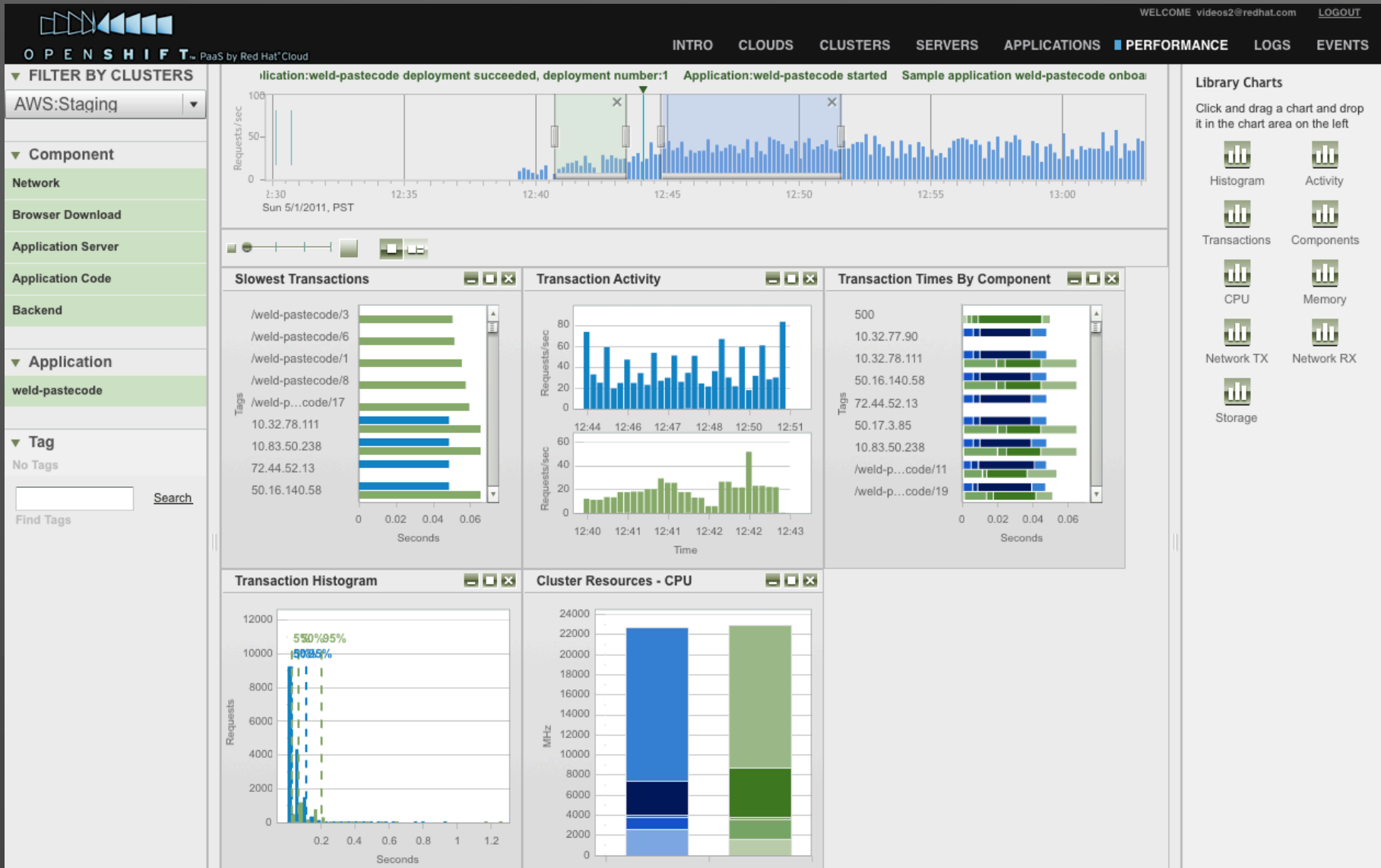
```
diff --git a/bundle/weld-pastecode.war.extracted/display.xhtml b/bundle/weld-pastecode.war.extracted/display.xhtml
index dc300da..b10a02d 100644
--- a/bundle/weld-pastecode.war.extracted/display.xhtml
+++ b/bundle/weld-pastecode.war.extracted/display.xhtml
@@ -33,7 +33,7 @@
<ui:define name="mainarea">
  <div class="contentHeader">
    Posted by #{pasteWindow.codeFragment.user} <h:outputText value="on" rendered="#{pasteWindow.codeFragment.friendlyDate != 'just now'}" /> #{pasteWindow.codeFragment.friendlyDate}
  + Submitted by #{pasteWindow.codeFragment.user} <h:outputText value="on" rendered="#{pasteWindow.codeFragment.friendlyDate != 'just now'}" />
  #{pasteWindow.codeFragment.friendlyDate}
  <div style="float:right">
    <a href="download?id=#{pasteWindow.codeFragment.hash == null ? pasteWindow.codeFragment.id : pasteWindow.codeFragment.hash}" style="text-decoration: none;">DOWNLOAD</a>
  </div>
```

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Performance Monitoring



Library Charts

Click and drag a chart and drop it in the chart area on the left



Histogram



Activity



Transactions



Components



CPU



Memory



Network TX

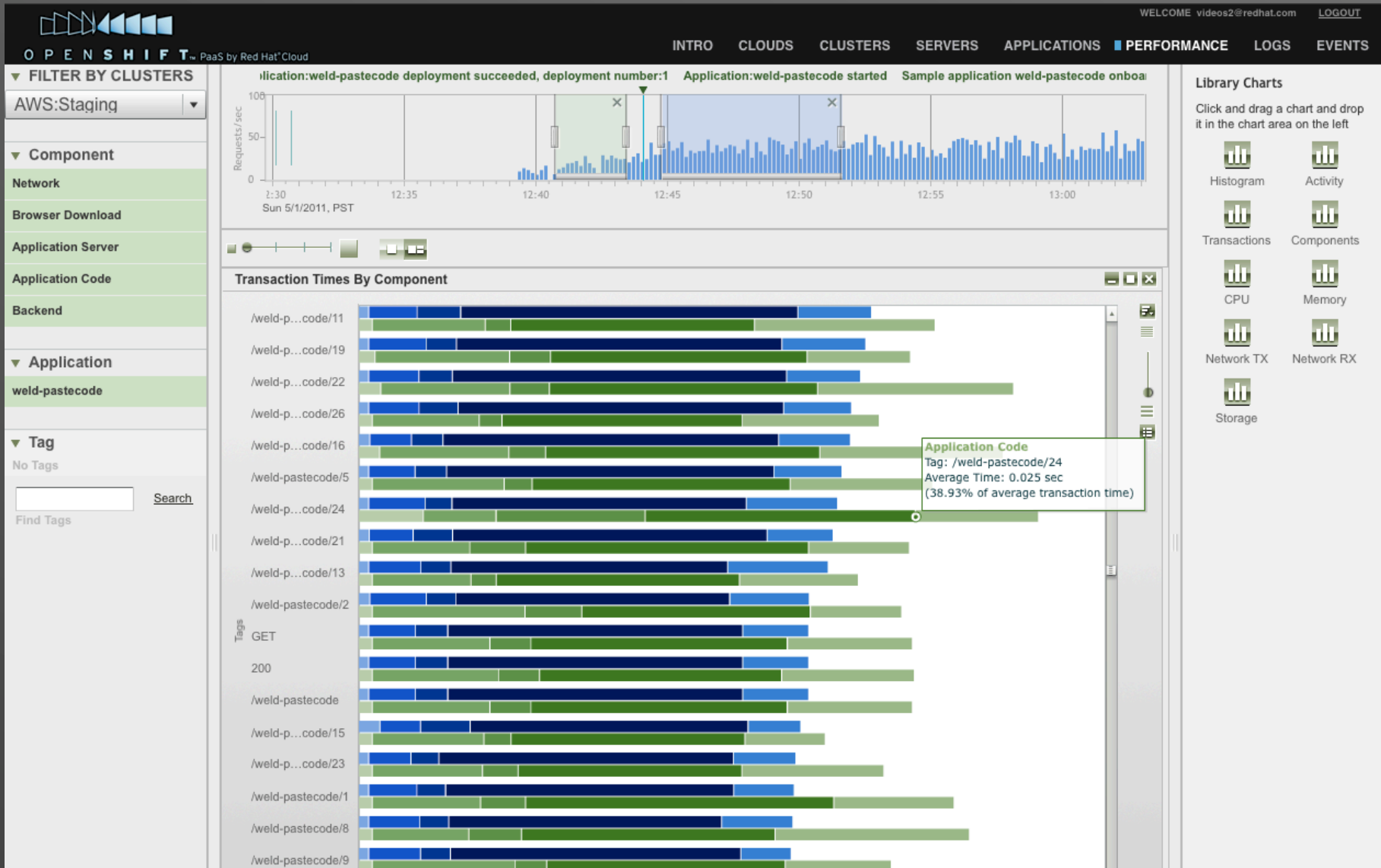


Network RX

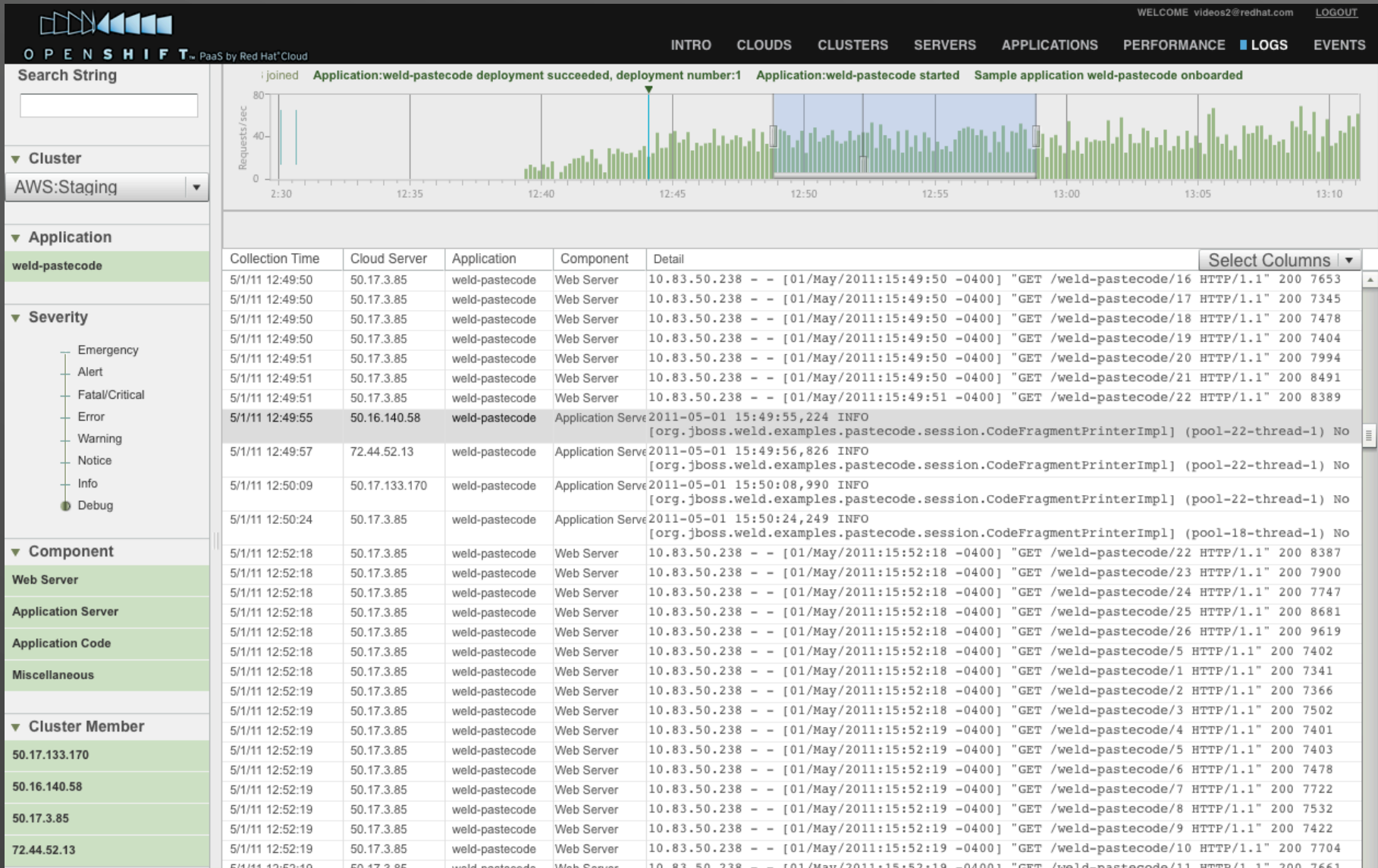


Storage

Transaction Monitoring



Log Management



Events




OPENSHIFT™ PaaS by Red Hat® Cloud

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[INTRO](#) [CLOUDS](#) [CLUSTERS](#) [SERVERS](#) [APPLICATIONS](#) [PERFORMANCE](#) [LOGS](#) **EVENTS**

Status	Name	Start Time	Elapsed time
<u>Completed</u>	Updating load balancer: 'us-east-1/Staging1392187622'	Sun May 01 12:30:40	0 min 6 sec
<u>Completed</u>	Joining cloud server: '72.44.52.13' to cluster: 'Staging'	Sun May 01 12:30:06	0 min 34 sec
<u>Completed</u>	Joining cloud server: '50.17.3.85' to cluster: 'Staging'	Sun May 01 12:29:30	0 min 36 sec
<u>Completed</u>	Joining cloud server: '50.16.140.58' to cluster: 'Staging'	Sun May 01 12:28:48	0 min 42 sec
<u>Completed</u>	Creating 3 cloud server(s) for cluster with tag: 'Staging1392187622'	Sun May 01 12:26:52	1 min 56 sec
<u>Completed</u>	Building cluster: 'Staging' on cloud server: '50.17.133.170'	Sun May 01 12:25:10	1 min 41 sec
<u>Completed</u>	Creating load balancer: 'Staging1392187622'	Sun May 01 12:25:01	0 min 5 sec
<u>Completed</u>	Creating 1 cloud server(s) for cluster with tag: 'Staging1392187622'	Sun May 01 12:24:30	0 min 30 sec
<u>Completed</u>	Creating cluster: 'Staging'	Sun May 01 12:24:30	6 min 16 sec
<u>Completed</u>	Authenticating: 'AWS'	Sun May 01 12:19:48	0 min 6 sec
<u>Completed</u>	Linking to cloud account: 'AWS'	Sun May 01 12:19:48	0 min 7 sec

Auto-Scaling

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INTRO CLOUDS **CLUSTERS** SERVERS APPLICATIONS PERFORMANCE LOGS EVENTS

All Clusters **Staging : EDIT**

OVERVIEW **AUTO-SCALING** DATABASE EMAIL SETTINGS

All servers in the cluster will use the settings configured here.

Auto-Scale Settings

☒ Enable Auto-Scaling

MINIMUM CLOUD SERVERS MAXIMUM CLOUD SERVERS

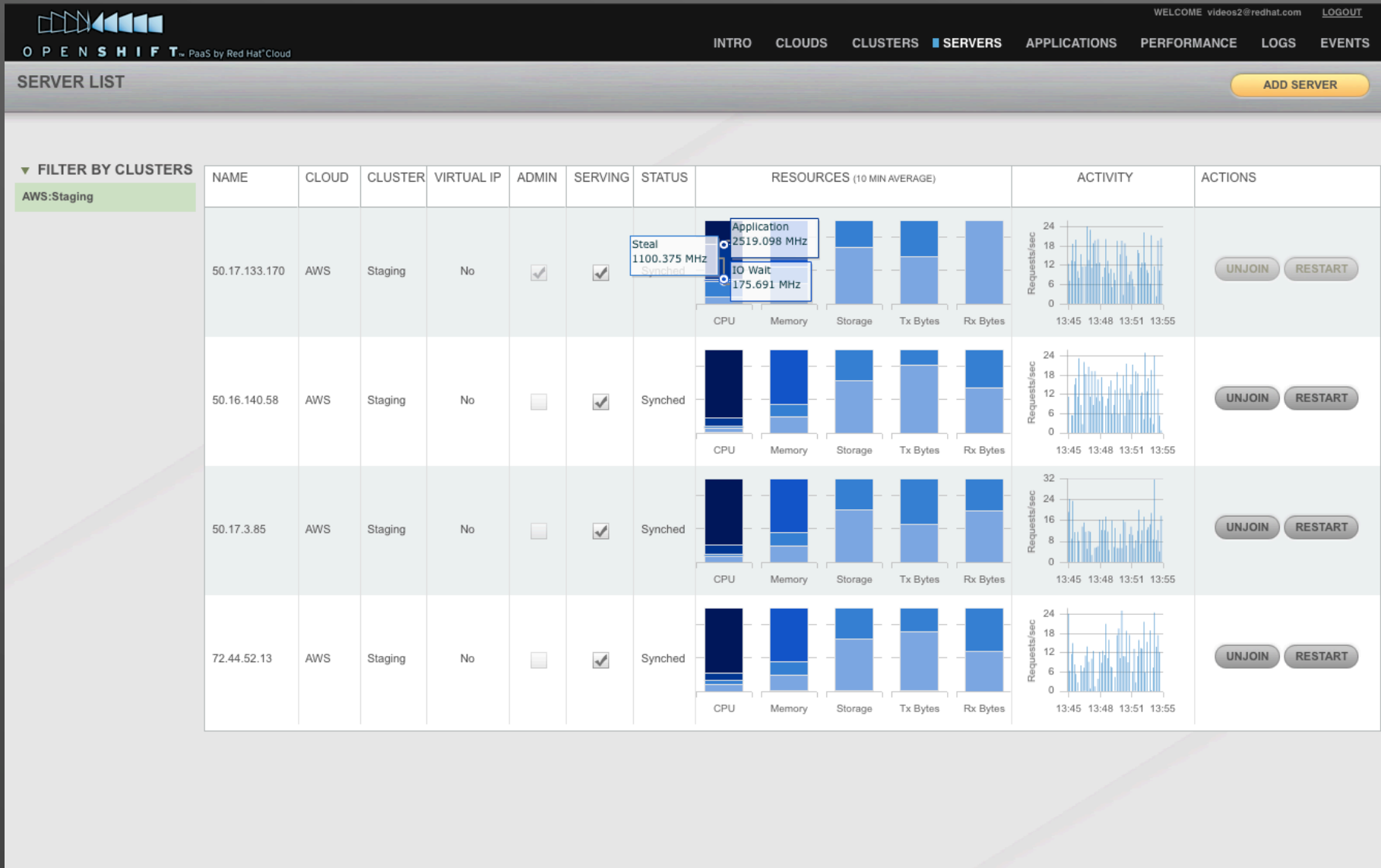
Scaling Threshold Configuration

SCALING STRATEGY

Scale up if Requests greater than requests / second for minutes (evaluated every 10 minutes)

Scale down if Requests less than requests / second for minutes (evaluated every 20 minutes)

Server Monitoring





INTRODUCTION

BEGINNING TASKS

Welcome to OpenShift. During signup, you configured a cloud provider, allocated cloud servers into a server cluster, and deployed a sample application. Here you can re-do those steps but why not move on to other guides? Each guide will start with a few explanatory screenshots and then navigate you to the right page to get started.

TRY IT



DEFINE A CLOUD ACCOUNT

You already setup your cloud account during signup but if you'd like to use an additional cloud account or re-enter your cloud credentials, start here.

TRY IT



CREATE A SERVER CLUSTER

During signup, you created a server cluster. Come back here if you've deleted it and want to create one again, or if you want to create additional server clusters. Multiple applications can share a server cluster (and thus a URL space and scaling policies) or you can create a server cluster for each application.

TRY IT



DEPLOY SAMPLE APPLICATION

During signup, you deployed an application from the library of samples. If you've deleted it, or want to deploy another one, this guide will get you started. Keep in mind that running multiple applications on the same cluster requires more resources... usually RAM is the constraining resource.

TRY IT

VIEW RUNNING APPLICATION

Find the URL to use to exercise the running application

TRY IT

RECONFIGURE SAMPLE APPLICATION

Learn a little about application deployment definitions by making a simple change to the application's URL routing configuration

TRY IT

SCALE SAMPLE APPLICATION

Scale up to handle more load, or scale down to save money

TRY IT

MONITOR APPLICATION PERFORMANCE

Monitor the performance of your application.

TRY IT

DEFINE AND DEPLOY YOUR OWN APPLICATION

Now that you've used a sample application, upload your own application to get deployed in the cloud

RESOURCES

HOW-TO GUIDES

- [Getting Started with OpenShift Flex](#)
- [Deploying JBoss with OpenShift Flex](#)
- [Deploying Drupal with OpenShift Flex](#)

Q&A

THANKS!

