

October 24th, 2015 • Bay Area Drupal Camp

# DRUPAL ON DOCKER

John Bickar *Web Developer, Stanford Web Services*

Scotty Logan *IT Architect, Stanford Emerging Technology*

# Infrastructure



# Cardinal at Work

<https://cardinalatwork.stanford.edu>

Stanford University

## Cardinal at Work

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“To me, Stanford is a family of incredibly dedicated and professional individuals who are the best at what they do.”  
**Kahlil Wells**  
Assistant Director  
Student Dining, West Campus

**Zhenan Bao**  
Professor of Chemical Engineering, and, by courtesy, of Materials Science and Engineering and of Chemistry

**Priscilla Fides**  
Assistant Dean of Administrative Operations

**Calendar**

OCT 23	Your Health Care Benefits in Retirement
OCT 26	Employee Open Enrollment Information Session (at Clark Center)
OCT 26	Network & Learn Series 2: Maximizing Your Current Role, Meeting 2

[View full calendar >](#)

**I am...**

- A Lifelong Learner
- A Parent
- A Postdoc /f
- A Retiree
- An Aspiring Leader
- Healthy Minded

**I want to...**

- Contact the University HR Service Team
- View 2016 Open Enrollment plan changes
- View Stanford holidays
- Get help paying for tuition or training
- Discover child care offerings and resources
- View the job description library
- Explore career development opportunities
- Read employee news and announcements
- Find tips and resources for managers

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 **allstrikethatFriday:** A beautiful rainbow lights up the sky after a rain shower at the Stanford Panhandle, photographed by staff member Chris Crimson. [#StanfordatWork](#)

**News**

**SEPTEMBER 16, 2015** Setting Goals: Why It's Easier Than You Think

**SEPTEMBER 30, 2015** #CardinalConnect: Fall on the Farm

**SEPTEMBER 28, 2015** Retirees: Gear Up for Benefits Open Enrollment

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**Stanford 125**

 1891 - 2016

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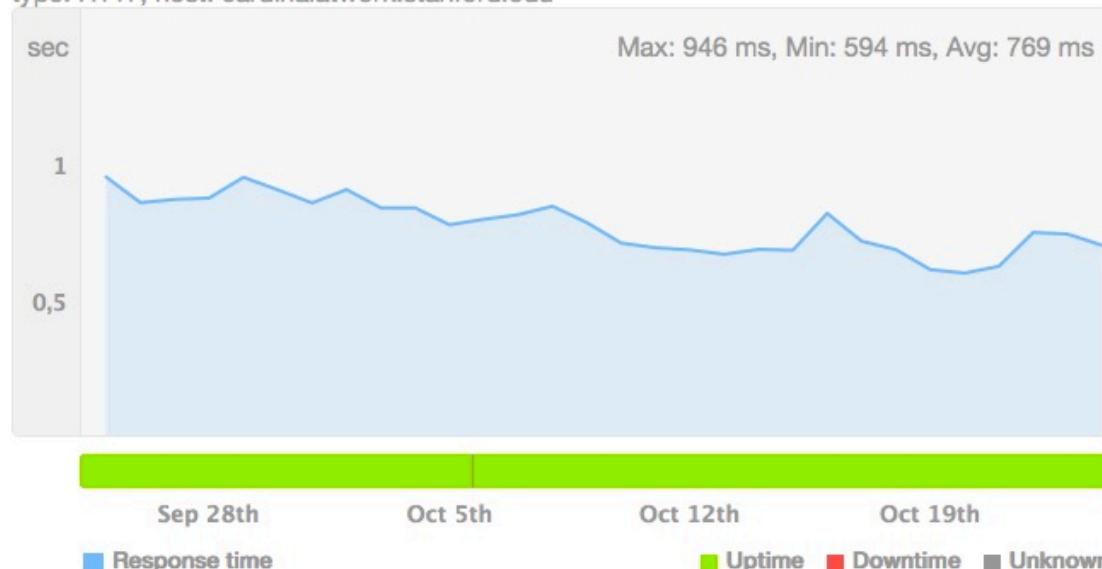
Last month ▼ ▶ grid Probe filter ▼

< >

## Cardinal at Work

Edit check

type: HTTP, host: cardinalatwork.stanford.edu



DOWNTIME

N/A

(0 outages)

UPTIME

100%

Uptime changes

Response time log

Test result log

Filter ▼

FROM	TO	DURATION	
10/05/2015 05:06:...	10/24/2015 06:45:...	18d 13h 40m	<span>edit</span>
10/05/2015 05:02:...	10/05/2015 05:06:...	4m	<span>edit</span>
09/24/2015 06:46:...	10/05/2015 05:02:...	11d 10h 15m	<span>edit</span>



NO FILTER ▾

MEDIAN ▾

ONE MONTH

ONE WEEK

YESTERDAY

TODAY

REAL-TIME

● 0-4s SATISFIED    ● 4-16s TOLERATING    ● 16s+ FRUSTRATED

1.1s

MEDIAN LOAD TIME



235,494

TOTAL PAGEVIEWS



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**Stanford 125**

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Last month



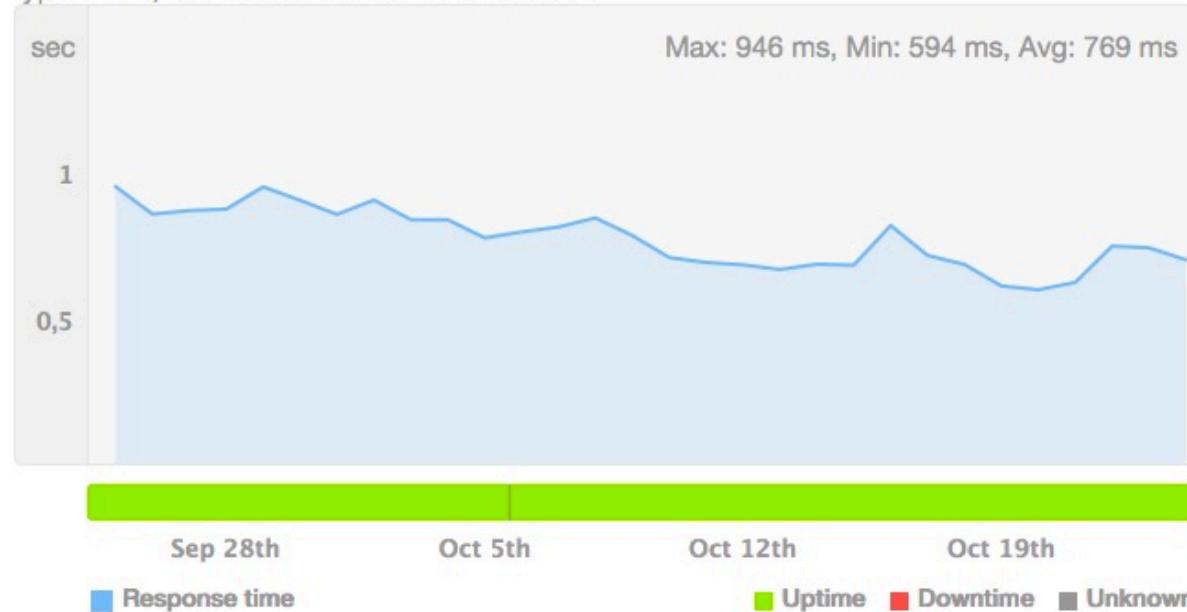
Probe filter



## Cardinal at Work

Edit check

type: HTTP, host: cardinalatwork.stanford.edu



DOWNTIME

N/A

(0 outages)

UPTIME

100%

Uptime changes      Responses

Filter

FROM



TO



10/05/2015 05:06:...      10/24/2015 06:45:...      18d 13h 40m



10/05/2015 05:02:...      10/05/2015 05:06:...      4m



09/24/2015 06:46:...      10/05/2015 05:02:...      11d 10h 15m



# Users

Last month



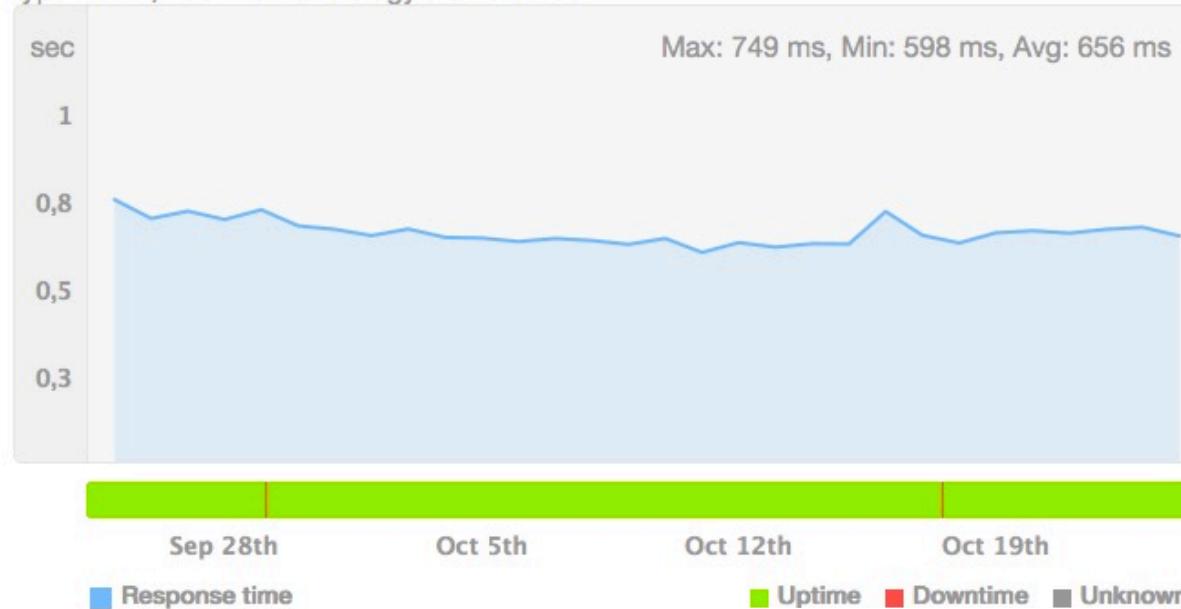
Probe filter



## Human Biology on Anchorage

Edit check

type: HTTP, host: humanbiology.stanford.edu



DOWNTIME

**2m**

(2 outages)

UPTIME

**100%**

Uptime changes

Response

Filter

FROM



10/17/2015 01:33:...

10/24/2015 06:47:...

6d 17h 14m



10/17/2015 01:32:...

10/17/2015 01:33:...

1m



09/29/2015 03:42:...

10/17/2015 01:32:...

18d 9h 50m



# Don't

Last 7 days



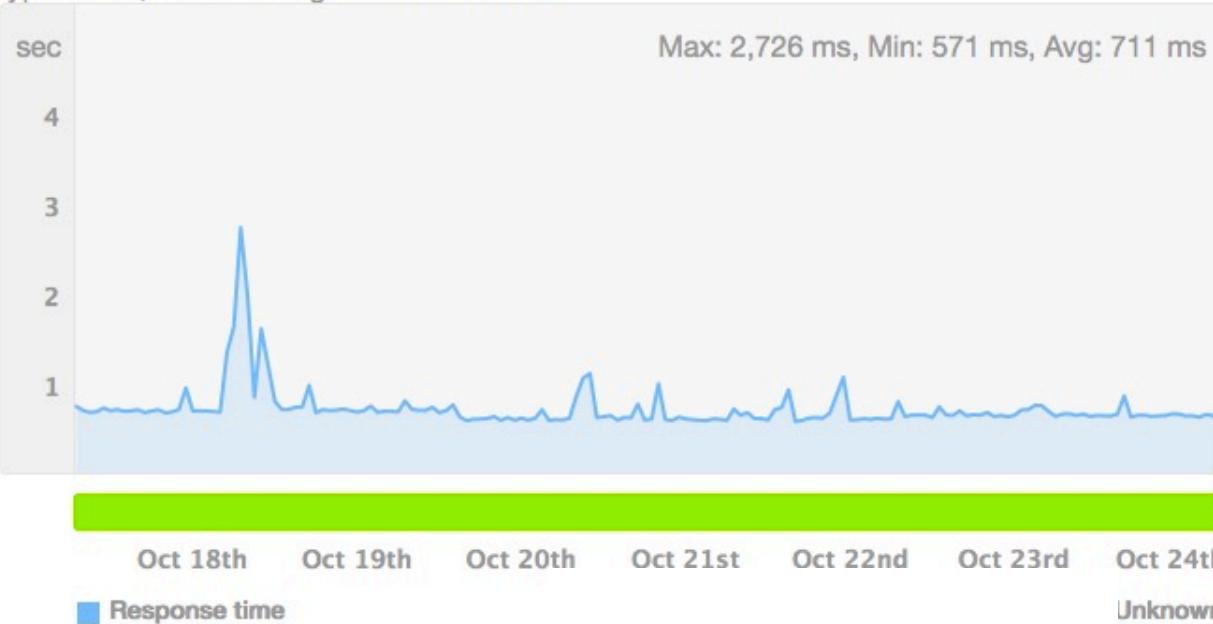
Probe filter



## Admin Guide

type: HTTP, host: adminguide.stanford.edu

Edit check



DOWNTIME

N/A

(0 outages)

UPTIME

100%

Uptime changes

Response time

Filter

# Care

FROM



TO

DURATION



10/17/2015 06:53:...

10/24/2015 06:53:...

7d



Last 7 days



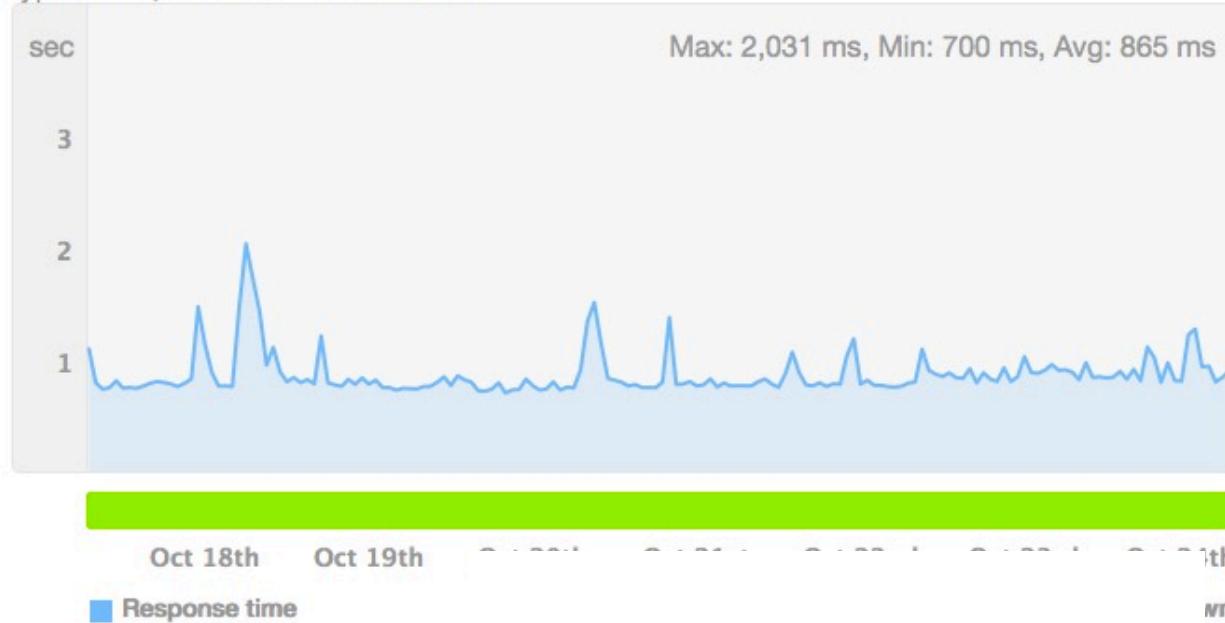
Probe filter



## Arabic

type: HTTP, host: arabic.stanford.edu

Edit check



DOWNTIME

N/A

(0 outages)

UPTIME

100%

Uptime changes

Response

Filter

# About

FROM



TO

DURATION



10/17/2015 06:54:...

10/24/2015 06:54:...

7d



Last 7 days

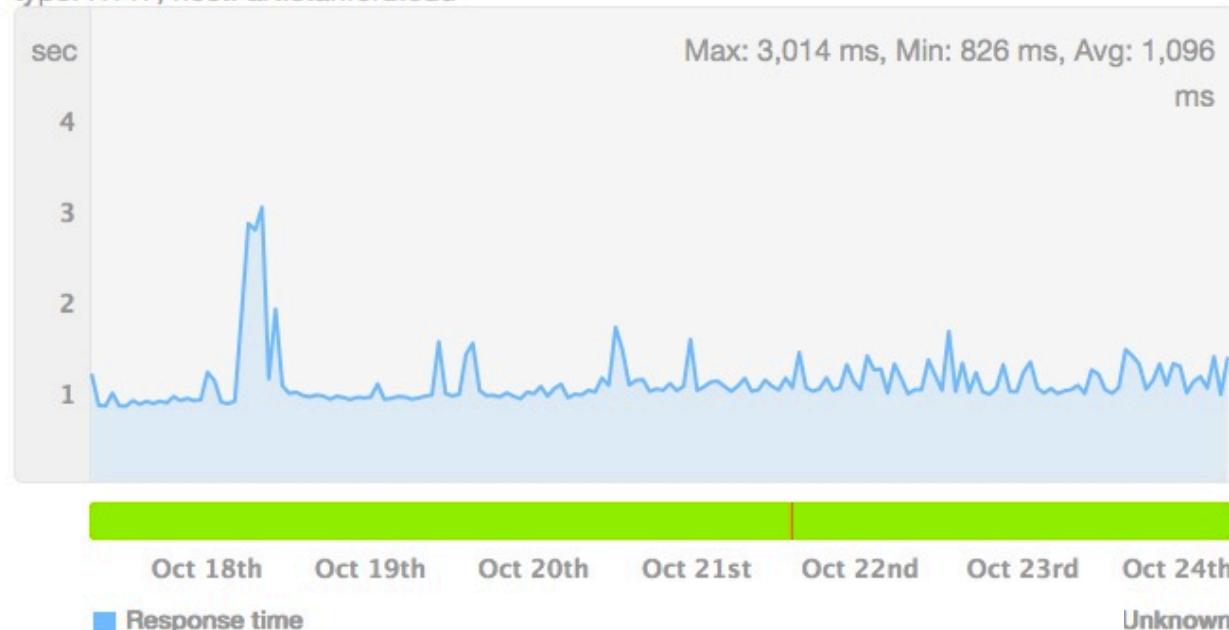


Probe filter

## Art and Art History

type: HTTP, host: art.stanford.edu

Edit check



DOWNTIME

1m

(1 outages)

UPTIME

99.99%

Uptime changes

Response time

Filter

# Your

FROM



TO

DURATION



10/21/2015 02:04:...

10/24/2015 06:53:...

2d 16h 49m



Last 7 days

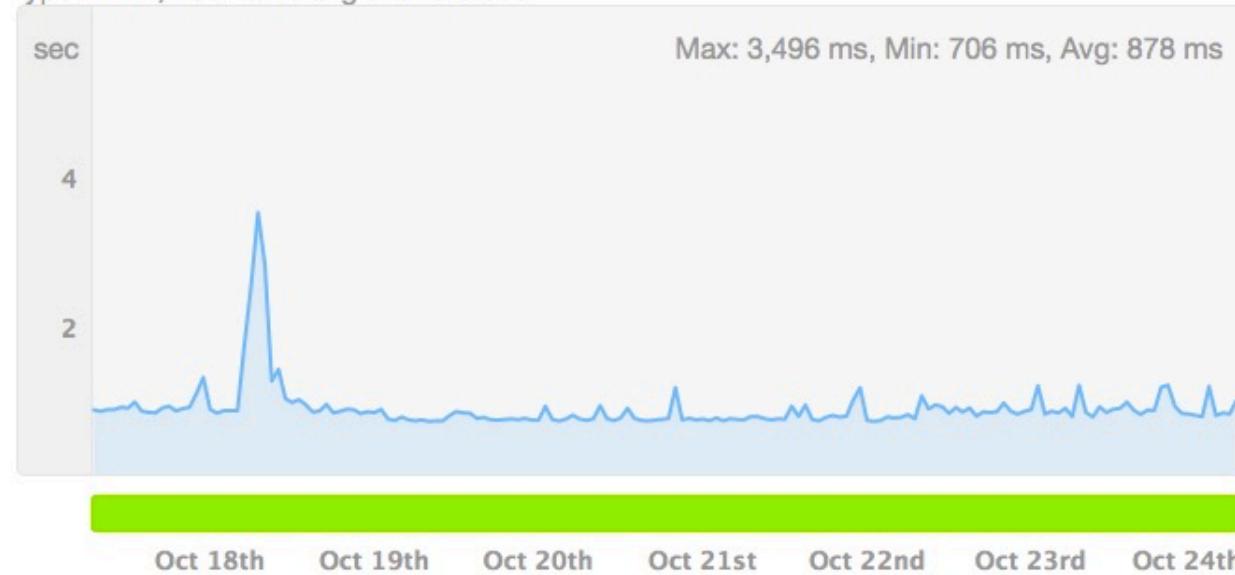


Probe filter

## African and Middle Eastern (AME)

type: HTTP, host: amelang.stanford.edu

Edit check



DOWNTIME

N/A

(0 outages)

UPTIME

100%

# Infrastructure

FROM



TO

DURATION



10/17/2015 06:53:...

10/24/2015 06:53:...

6d 23h 59m





Pingdom BOT 13:06

History is down (Incident #6595)  
[history.stanford.edu](http://history.stanford.edu) • View details

Residential Education is down (Incident #6593)  
[resed.stanford.edu](http://resed.stanford.edu) • View details

VPGE is down (Incident #6594)  
[vpge.stanford.edu](http://vpge.stanford.edu) • View details

Office of General Counsel is down (Incident #6597)  
[ogc.stanford.edu](http://ogc.stanford.edu) • View details

Graduate Life Office is down (Incident #6596)  
[glo.stanford.edu](http://glo.stanford.edu) • View details

SAL - Student Activities and Leadership - VPSA is down (Incident #6599)  
[sal.stanford.edu](http://sal.stanford.edu) • View details

Structural Geology is down (Incident #6598)  
[structuralgeology.stanford.edu](http://structuralgeology.stanford.edu) • View details

Ho Center for Business Studies is down (Incident #6600)  
[hcbs.stanford.edu](http://hcbs.stanford.edu) • View details

Wireless is down (Incident #6603)  
[wireless.stanford.edu](http://wireless.stanford.edu) • View details

Postdoc Benefits is down (Incident #6604)  
[sites.stanford.edu](http://sites.stanford.edu) • View details

Alcohol is down (Incident #6602)  
[alcohol.stanford.edu](http://alcohol.stanford.edu) • View details

The One Hundred Year Study on Artificial Intelligence (AIS) is down (Incident #6601)  
[ai100.stanford.edu](http://ai100.stanford.edu) • View details

# Until they do

# OPEN ENROLLMENT



**Make Your Elections**  
Monday, October 26 –  
Friday, November 13



**THEY SAID I COULD BE ANYTHING**



**SO I BECAME A LOAF**

# WHAT IS DOCKER?



docker

# BACKGROUND

# Hardware-based Web Server(s)



**THEY TOLD ME I COULD BE ANYTHING**



**SO I BECAME A CLOUD**

# Summer 2014: Drupal on AWS Elastic Beanstalk



Amazon Elastic  
Beanstalk

**FALL 2015: ANCHORAGE**

# WHY DOCKER?

A shiny silver 1950s Ford Fairlane car is parked on a paved surface in front of a backdrop depicting a rocky hillside. The car's body reflects the surrounding environment, highlighting its metallic finish. The license plate on the front bumper reads "7609 CONN."

Ooh...shiny

# HOW IT WORKS

# **RUNNING THE WEB SERVER**

# Components

Elastic Load Balancer (ELB)

Simple Storage Service (S3)

MySQL Database (on Amazon RDS)

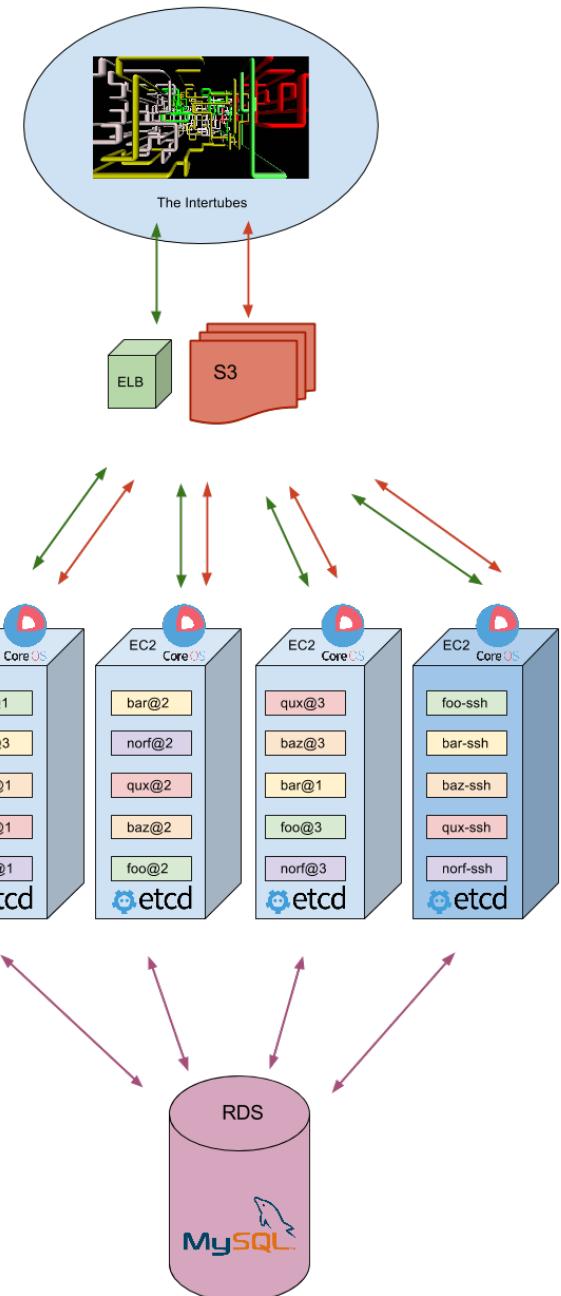
Elastic Compute Cloud (EC2) instances running CoreOS

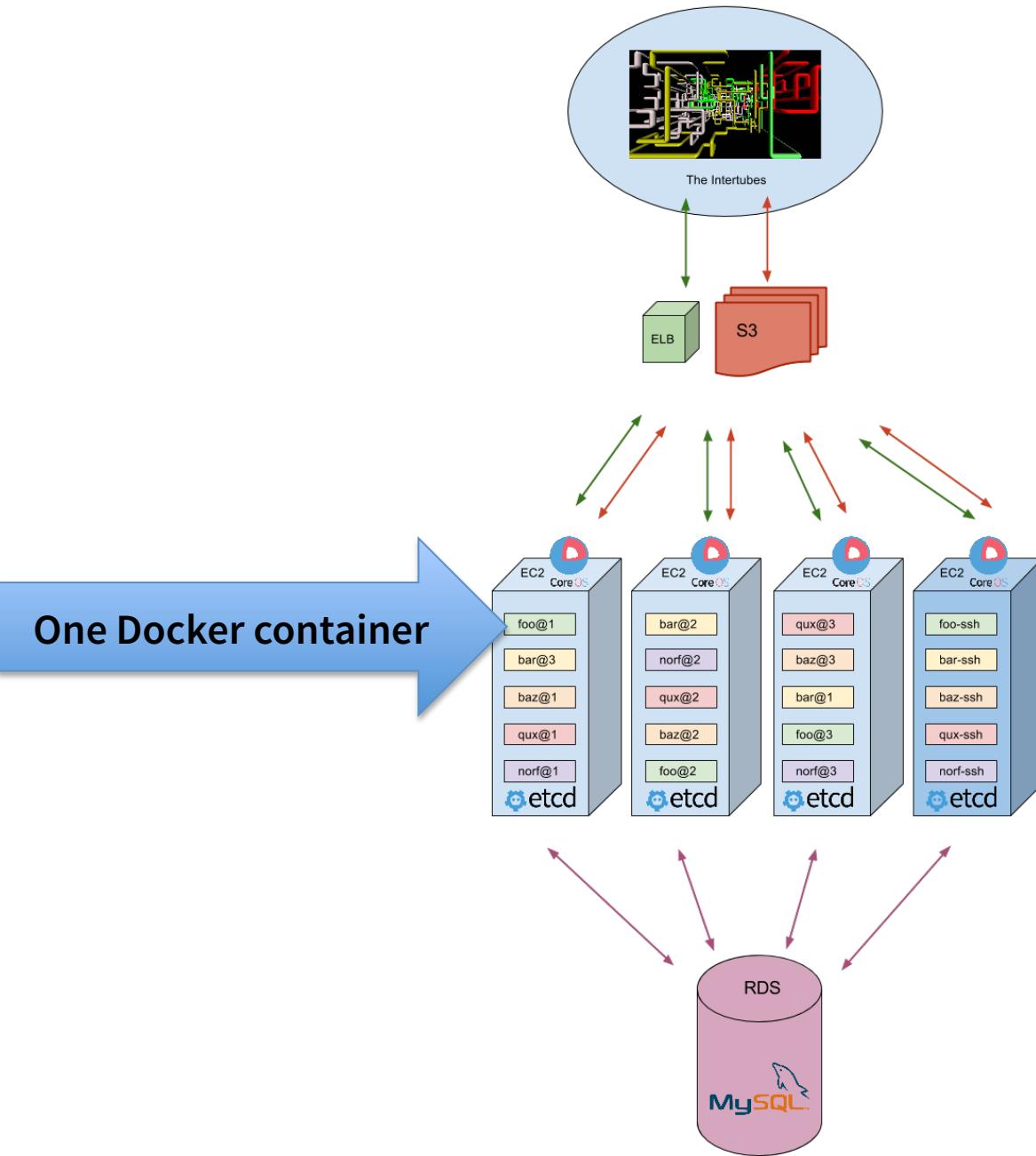
CoreOS includes:

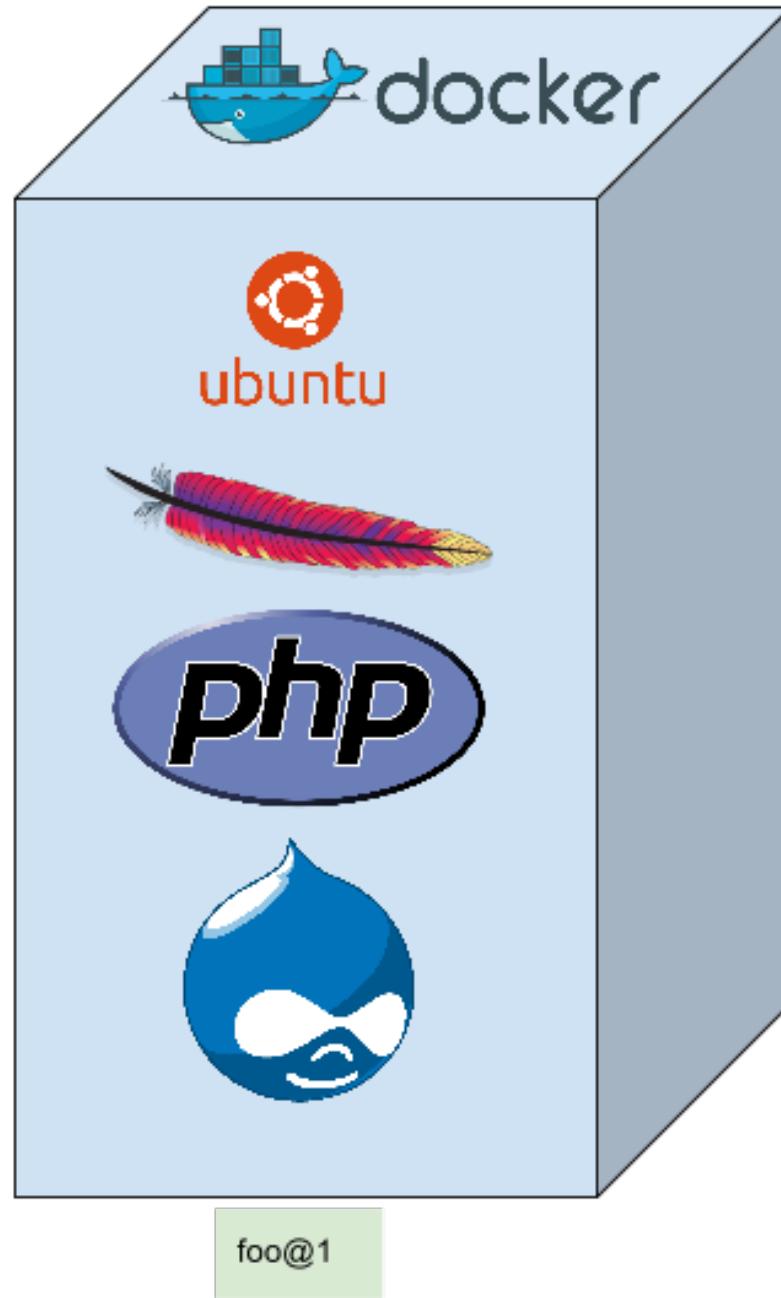
- Automated OS updates and restarts (can schedule)

- etcd – key/value metadata storage

- fleetctl – supports deploying (Docker) containers across a cluster of CoreOS machines

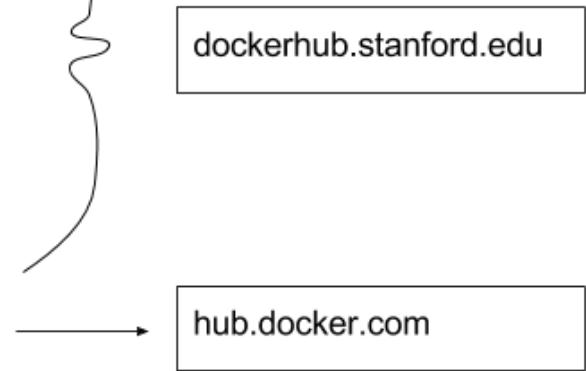






# DOCKER IMAGE HIERARCHY

sws/foo	sws/bar	sws/baz
sws/jumpstart	sws/jsplus	sws/jsa
sws/drupal		
core/lamp		
core/ubuntu		
ubuntu:trusty		



dockerhub.stanford.edu

hub.docker.com

# **So What?**



# **So What?**

sws/foo	sws/bar	sws/baz
sws/jumpstart	sws/jsplus	sws/jsa
sws/drupal		
core/lamp		
core/ubuntu		
ubuntu:trusty		



dockerhub.stanford.edu



hub.docker.com

(Yeah, right.)



docker

# BUILDING THE IMAGES



master

&gt; badcamp / +

Download zip

Name	Last Update	Last Commit	>	c252325440b – Initial commit for BADCamp	history
Dockerfile	about a minute ago	John Bickar	Initial commit for BADCamp		
README.md	about a minute ago	John Bickar	Initial commit for BADCamp		
badcamp.make	about a minute ago	John Bickar	Initial commit for BADCamp		
docker_deploy	11 days ago	John Bickar	Initial commit for JS+		
favicon.ico	11 days ago	John Bickar	Initial commit for JS+		
site-install.sh	11 days ago	John Bickar	Initial commit for JS+		

README.md

## About this repo

This is a Dockerfile and a set of drush make files to create a BADCamp image, on top of the Stanford Sites Jumpstart Plus image.

## Building the image

1. Build with:

```
docker build -t sws/badcamp .
```

```
1 FROM dockerhub.stanford.edu/sws/drupal
2
3 MAINTAINER John Bickar <jbickar@stanford.edu>
4
5 RUN mkdir -p /root/.ssh
6 # Add our github deployment key
7 ADD docker_deploy /root/.ssh/id_rsa
8 RUN chmod -R 700 /root/.ssh && \
9     chown -R root:root /root/.ssh
10
11 # Add the key for github.com to our known_hosts file
12 RUN ssh-keyscan github.com >> /root/.ssh/known_hosts
13
14 # Add our drush make file
15 RUN git clone git@github.com:SU-SWS/stanford-jumpstart-deployer /usr/lib/stanford-jumpstart-deployer --branch=7.x-4.x
16 ADD badcamp.make /usr/lib/badcamp.make
17
18 WORKDIR /var/www
19
20 # Run drush make for Jumpstart Plus
21 RUN drush make --concurrency=4 /usr/lib/stanford-jumpstart-deployer/make/production/jumpstart-plus.make .
22 # RUN drush make --concurrency=4 --no-core /usr/lib/badcamp.make .
23
24 # Add our favicon to the /var/www root, to prevent 404s
25 ADD favicon.ico /var/www/favicon.ico
26
27 # Add our site-install script
28 ADD site-install.sh /usr/lib/site-install.sh
29
30 # Make a sites/default/webauth directory and make it writable by www-data.
31 # Remove this once AWSDISC-374 is resolved
32 RUN mkdir -p /var/www/sites/default/webauth && \
33     chown -R www-data:www-data /var/www/sites/default/webauth
```

sws/foo	sws/bar	sws/baz
sws/jumpstart	sws/jsplus	sws/jsa
sws/drupal		
core/lamp		
core/ubuntu		
ubuntu:trusty		

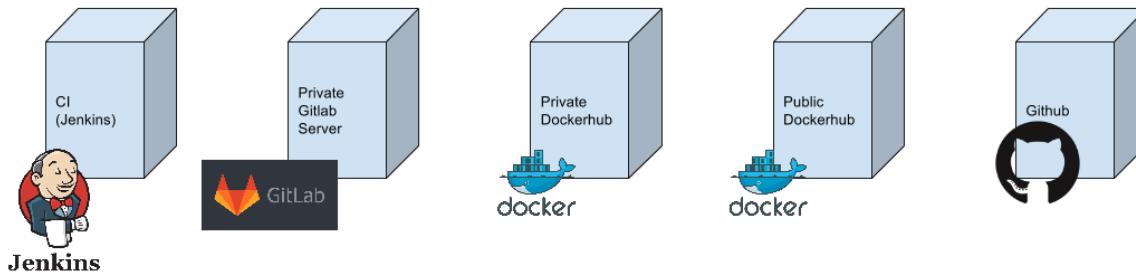
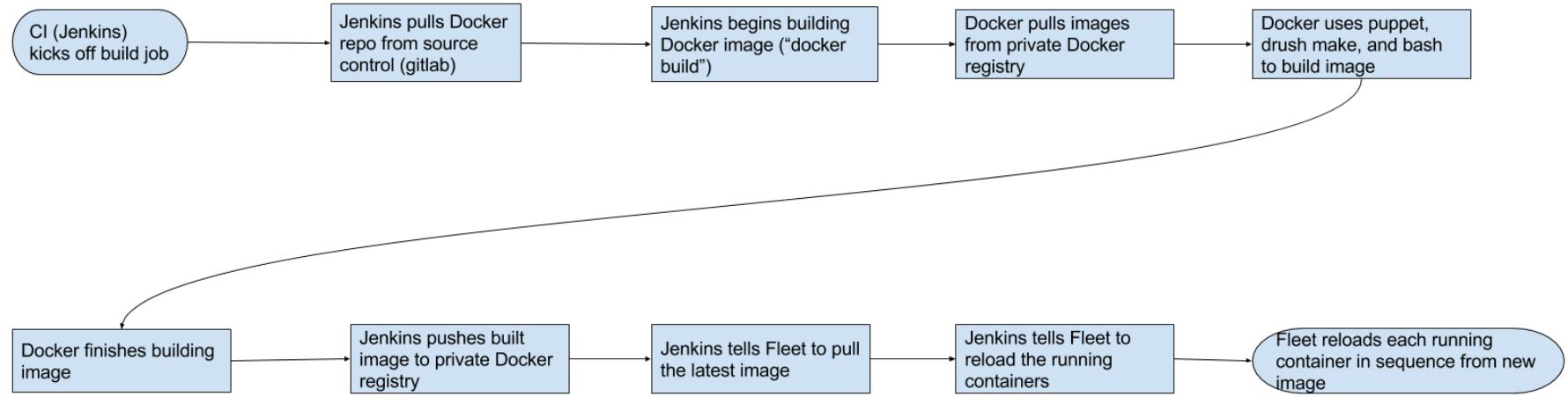


dockerhub.stanford.edu



hub.docker.com

```
1 FROM dockerhub.stanford.edu/sws/drupal
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9     chown -R root:root /root/.ssh
10
11 # Add the key for github.com to our known_hosts file
12 RUN ssh-keyscan github.com >> /root/.ssh/known_hosts
13
14 # Add our drush make file
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17
18 WORKDIR /var/www
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30 # Make a sites/default/webauth directory and make it writable by www-data.
31 # Remove this once AWSDISC-374 is resolved
32 RUN mkdir -p /var/www/sites/default/webauth && \
33     chown -R www-data:www-data /var/www/sites/default/webauth
```



[Back to Project](#)  
[Status](#)  
[Changes](#)  
**Console Output** 1 Start Job  
[View as plain text](#)  
[Edit Build Information](#)  
[Git Build Data](#)  
[No Tags](#)

## Console Output

```

Started by user jbickar
Building in workspace /var/jenkins_home/jobs/sws-badcamp/workspace
Cloning the remote Git repository
Cloning repository git@git.itlab.stanford.edu:sws/badcamp.git
  > git init /var/jenkins_home/jobs/sws-badcamp/workspace # timeout=10
Fetching upstream changes from git@git.itlab.stanford.edu:sws/badcamp.git
  > git --version # timeout=10
using GIT_SSH to set credentials Jenkins CI for Git.ITLab
  > git -c core.askpass=true fetch --tags --progress git@git.itlab.stanford.edu:sws/badcamp.git +refs/heads/*:refs/remotes/origin/*
  > git config remote.origin.url git@git.itlab.stanford.edu:sws/badcamp.git # timeout=10
  > git config --add remote.origin.fetch +refs/heads/*:refs/remotes/origin/* # timeout=10
  > git config remote.origin.url git@git.itlab.stanford.edu:sws/badcamp.git # timeout=10
Fetching upstream changes from git@git.itlab.stanford.edu:sws/badcamp.git
using GIT_SSH to set credentials Jenkins CI for Git.ITLab
  > git -c core.askpass=true fetch --tags --progress git@git.itlab.stanford.edu:sws/badcamp.git +refs/heads/*:refs/remotes/origin/*
  > git rev-parse refs/remotes/origin/master^{commit} # timeout=10
  > git rev-parse refs/remotes/origin/origin/master^{commit} # timeout=10
Checking out Revision c252325440b5c51d0cfbcbb6c47895d75407a6b3 (refs/remotes/origin/master)
  > git config core.sparsecheckout # timeout=10
  > git checkout -f c252325440b5c51d0cfbcbb6c47895d75407a6b3
First time build. Skipping changelog.
[workspace] $ docker build -t dockerhub.stanford.edu/sws/badcamp:jenkins-sws-badcamp-1 --no-cache=true .
Sending build context to Docker daemon 72.7 kB

Sending build context to Docker daemon
Step 0 : FROM dockerhub.stanford.edu/sws/drupal
  --> 933087de0f46
Step 1 : MAINTAINER John Bickar <jbickar@stanford.edu>
  --> Running in a30bcd5fe8e
  --> 00c3aa6f45b6
Removing intermediate container a30bcd5fe8e
Step 2 : RUN mkdir -p /root/.ssh
  --> Running in dec22cee9d2c
  --> blebaefc50a0
Removing intermediate container dec22cee9d2c
Step 3 : ADD docker_deploy /root/.ssh/id_rsa
  --> 168f44821a33
Removing intermediate container 3ecc38e7ce87
Step 4 : RUN chmod -R 700 /root/.ssh &&      chown -R root:root /root/.ssh
  --> Running in e9e6f22f8db2
  --> 03831a4fff40
Removing intermediate container e9e6f22f8db2
Step 5 : RUN ssh-keyscan github.com >> /root/.ssh/known_hosts
  --> Running in 85560877f21b
[91m# github.com SSH-2.0-libssh-0.7.0
[0m[91m# github.com SSH-2.0-libssh-0.7.0
[0m[91mno hostkey alg
[0m--> 5f9bc8ced2be
Removing intermediate container 85560877f21b
Step 6 : RUN git clone git@github.com:SU-SWS/stanford-jumpstart-deployer /usr/lib/stanford-jumpstart-deployer --branch=7.x-4.x
  --> Running in 62d93bc354ad
[91mCloning into '/usr/lib/stanford-jumpstart-deployer'...
[0m[91mWarning: Permanently added the RSA host key for IP address '192.30.252.128' to the list of known hosts.

```

**5 drush make**



```
Step 6 : RUN git clone git@github.com:SU-SWS/stanford-jumpstart-deployer /usr/lib/stanford-jumpstart-deployer --branch=7.x-4.x
--> Running in 62d93bc354ad
[91mCloning into '/usr/lib/stanford-jumpstart-deployer'...
[0m[91mWarning: Permanently added the RSA host key for IP address '192.30.252.128' to the list of known hosts.
[0m ---> ba7d9bde7ab5
Removing intermediate container 62d93bc354ad
Step 7 : ADD badcamp.make /usr/lib/badcamp.make
--> 8745ac00020e
Removing intermediate container 83f8c16122e0
Step 8 : WORKDIR /var/www
--> Running in 4fa9e5426d9a
--> 8ac745ec3943
Removing intermediate container 4fa9e5426d9a
Step 9 : RUN drush make --concurrency=4 /usr/lib/stanford-jumpstart-deployer/make/production/jumpstart-plus.make .
--> Running in 627f96bacc1c
[91mBeginning to build                                         [ok]
/usr/lib/stanford-jumpstart-deployer/make/production/jumpstart-plus.make.
[0m[91mdrupal-7.39 downloaded.                                     [ok]
[0m[91m >> stanford_sites_jumpstart_plus cloned from          [ok]
git@github.com:SU-SWS/stanford_sites_jumpstart_plus.git.
[0m[91m >> stanford_landing_page cloned from                  [ok]
git@github.com:SU-SWS/stanford_landing_page.git.
    >> Checked out branch 7.x-4.5-dev+1.                           [ok]
[0m[91m >> Checked out branch 7.x-1.2.                           [ok]
[0m[91m >> stanford_sites_jumpstart cloned from              [ok]
git@github.com:SU-SWS/stanford_sites_jumpstart.git.
[0m[91m >> Checked out branch 7.x-4.5-dev+1.                           [ok]
[0m[91m >> stanford_sites_abstract cloned from                 [ok]
git@github.com:SU-SWS/stanford_sites_abstract.git.
    >> Checked out branch 7.x-4.2-dev+1.                           [ok]
```

THE #1 PROGRAMMER EXCUSE  
FOR LEGITIMATELY SLACKING OFF:  
"MY CODE'S COMPILING."



**6 Finish Build**

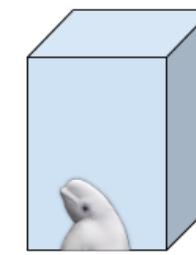
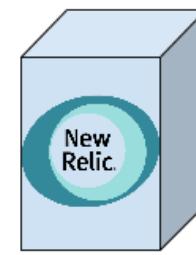
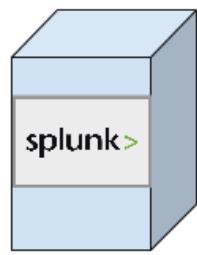
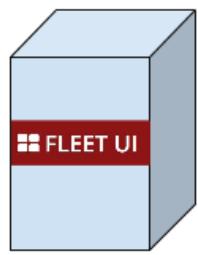
**7 Docker Push**

```
-----  
Removing intermediate container 31525d91ad4f  
Step 12 : RUN mkdir -p /var/www/sites/default/webauth && chown -R www-data:www-data /var/www/sites/default/webauth  
--> Running in 088c64a30f19  
--> f24d6d66871d  
Removing intermediate container 088c64a30f19  
Successfully built f24d6d66871d  
[workspace] $ docker tag --force=true f24d6d66871d dockerhub.stanford.edu/sws/badcamp:latest  
[workspace] $ docker push dockerhub.stanford.edu/sws/badcamp:jenkins-sws-badcamp-1  
The push refers to a repository [dockerhub.stanford.edu/sws/badcamp] (len: 1)  
  Sending image list  
Pushing repository dockerhub.stanford.edu/sws/badcamp (1 tags)  
Image 91e54dfb1179 already pushed, skipping  
Image 66d453a4e360 already pushed, skipping
```

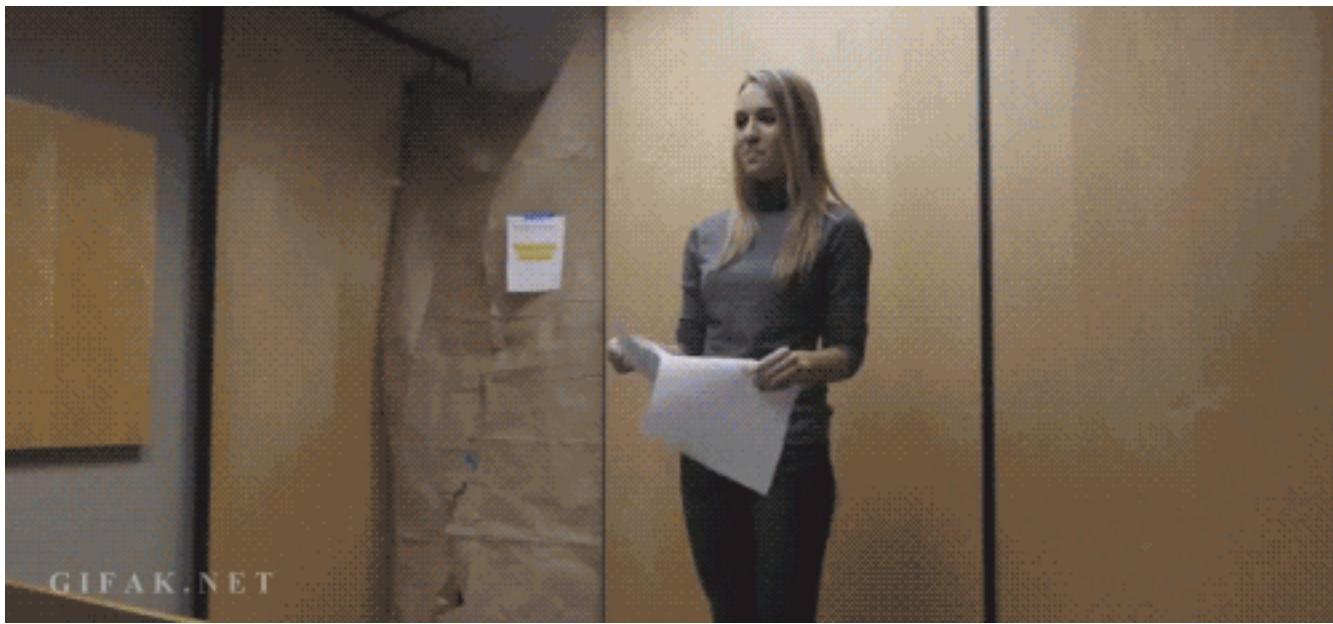
8,9,10 Fleet pulls latest images, and reloads each running container in sequence

```
-----  
SSH: Connecting from host [048fc93f54db]  
SSH: Connecting with configuration [ci] ...  
SSH: EXEC: STDOUT/STDERR from command [/var/lib/apps/bin/deploy.sh restart badcamp] ...  
stop badcamp-ssh.service  
start badcamp-ssh.service  
Unit badcamp-ssh.service launched on 9e64dfea.../10.42.5.56  
badcamp-ssh.service running  
stop badcamp@1.service  
start badcamp@1.service  
Unit badcamp@1.service launched on 14a8e0f6.../10.42.5.94  
badcamp@1.service running  
  
stop badcamp@2.service  
start badcamp@2.service  
Unit badcamp@2.service launched on 23e53d12.../10.42.5.166  
badcamp@2.service running  
  
stop badcamp@3.service  
start badcamp@3.service  
Unit badcamp@3.service launched on e2bb50ce.../10.42.5.34  
badcamp@3.service running  
  
SSH: EXEC: completed after 388,128 ms  
SSH: Disconnecting configuration [ci] ...  
SSH: Transferred 0 file(s)  
Build step 'Send files or execute commands over SSH' changed build result to SUCCESS  
Discard old builds...  
Finished: SUCCESS
```

# SUPPORTING SERVICES



# LIVE DEMO TIME!



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