

DOCKER AND JENKINS.

Orchestrating Continuous Delivery



 ALEXSOTOB - LORDOFTHEJARS.COM



SOFTWARE IS EATING THE WORLD

```
vars  
way  
SwapiGateway  
vice  
PlanetService  
AverageFormatter  
AverageFormatterProducer  
PlanetResources  
StarWarsApplication  
ources  
app  
addle  
file  
N  
ew.bat  
nsfile  
ngs.gradle  
rwaris.iml  
al Libraries  
g: Version Control > Terminal  
nd Plugins  
IntelliJ IDEA is ready to update. (today 12:50)  
34 @Inject  
35 planetService planetService;  
36  
37 @Inject  
38 @AverageFormatter  
39 DecimalFormat averageFormatter;  
40 }  
41 @GET  
42 @Path("/rotation/average")  
43 @Produces(MediaType.TEXT_PLAIN)  
44 @Asynchronous  
45 public void calculateAverageOfRotation(@Suspended final AsyncResponse response) {  
46     JsonObject planets = swapiGateway.getAllPlanets();  
47     final JSONArray results = planets.getJsonArray("results");  
48     double average = planetService.calculateAverageOfRotation(results);  
49     final Response<Object> averageResponse = Response.accepted(averageFormatter.format(average)).build();  
50     response.setResponse(averageResponse);  
51 }  
52 }  
53 }  
54 }  
55 }
```







Software Update

There is a new version of your Tesla Model S software. Schedule installation, install now or close window to postpone.

12

00

1

10

2

20

AM

3

30

PM

4

40

8 hr 47 min from now

SET FOR THIS TIME

INSTALL NOW



This update will take approximately 45 min.

During the update process you will not be able to drive the vehicle or use the touchscreen, and your car alarm may be disarmed for a short duration. The car must be in PARK.

Tesla's Model S Safety Solution: Software

BY DOUG NEWCOMB DECEMBER 5, 2013 6 COMMENTS

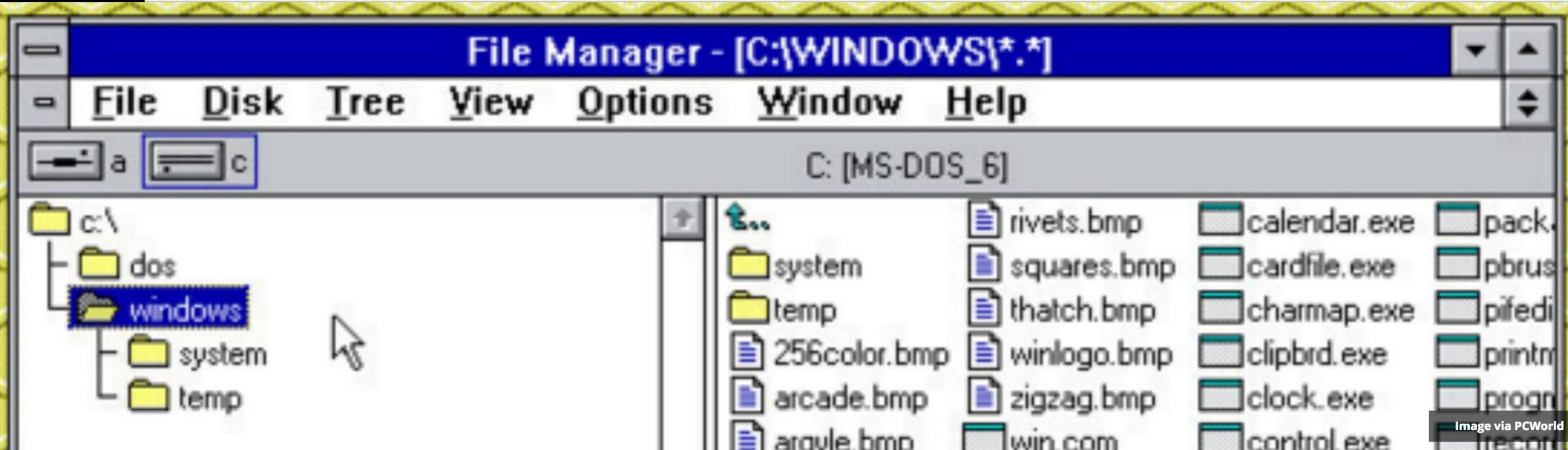
A recent over-the-air upgrade increases highway ground clearance after vehicles struck road debris and caught fire.

44 
SHARES



Most automakers typically respond to an investigation by government safety regulators by providing documents, and by approaching federal officials with a certain deference. Tesla, of course, is not a typical automaker.

The electric vehicle (EV) company and its CEO Elon Musk met news of a recent National Highway Traffic Safety Administration (NHTSA) **investigation into fires involving the Tesla Model S** with a mix of bluster, statistics, and a software upgrade. While these tactics are unorthodox in the staid automotive world, they're in character for Tesla and particularly for Musk.



EUROPE

Windows 3.1 Is Still Alive, And It Just Killed a French Airport

By Pierre Longeray

November 13, 2015 | 1:30 pm



\$57 Million Slot Machine Win Blamed on Software Error, Casino Won't Pay

ANDY CHALK | 13 DECEMBER 2011 11:18 PM

65

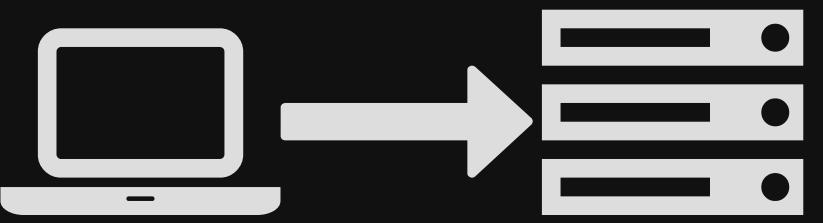
A man who won \$57 million from a slot machine is taking the casino to court after it told him it was a software error and refused to pay up.

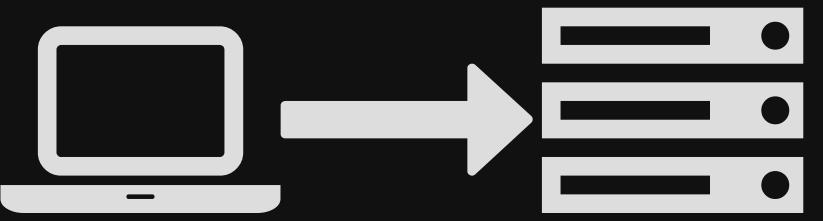
It was a very good day for Behar Merlaku of Switzerland when a slot machine at an Austrian casino went bells-and-whistles bananas, telling him he'd won the grand prize of \$57 million. But it quickly turned into a very bad day when he attempted to claim his prize and was told by the casino owners that a software error had triggered the machine and that they weren't going to pay up. They offered him \$100 and a free meal instead, and he, quite naturally, told them to get bent.



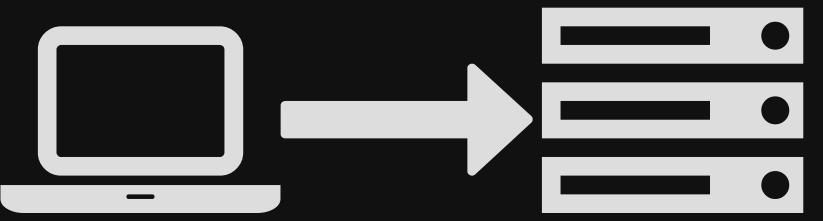
In the casino's defense, the top prize is meant for a five-slot match and Merlaku apparently only matched four slots, but the machine said he won and in his mind, that's all there is to it. So he's taking the casino to court in what is considered the largest claim of its kind ever and one to which casino operators around the world are paying very close attention.

"The jackpot came up loud and clear. There was music and the sum I had won - nearly €43 million - was displayed on the screen," Merlaku said in an interview on Austrian television. "I was so overjoyed and in my head I began calculating what I could do with all this money."

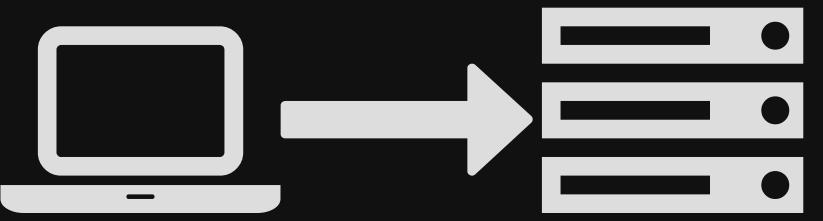




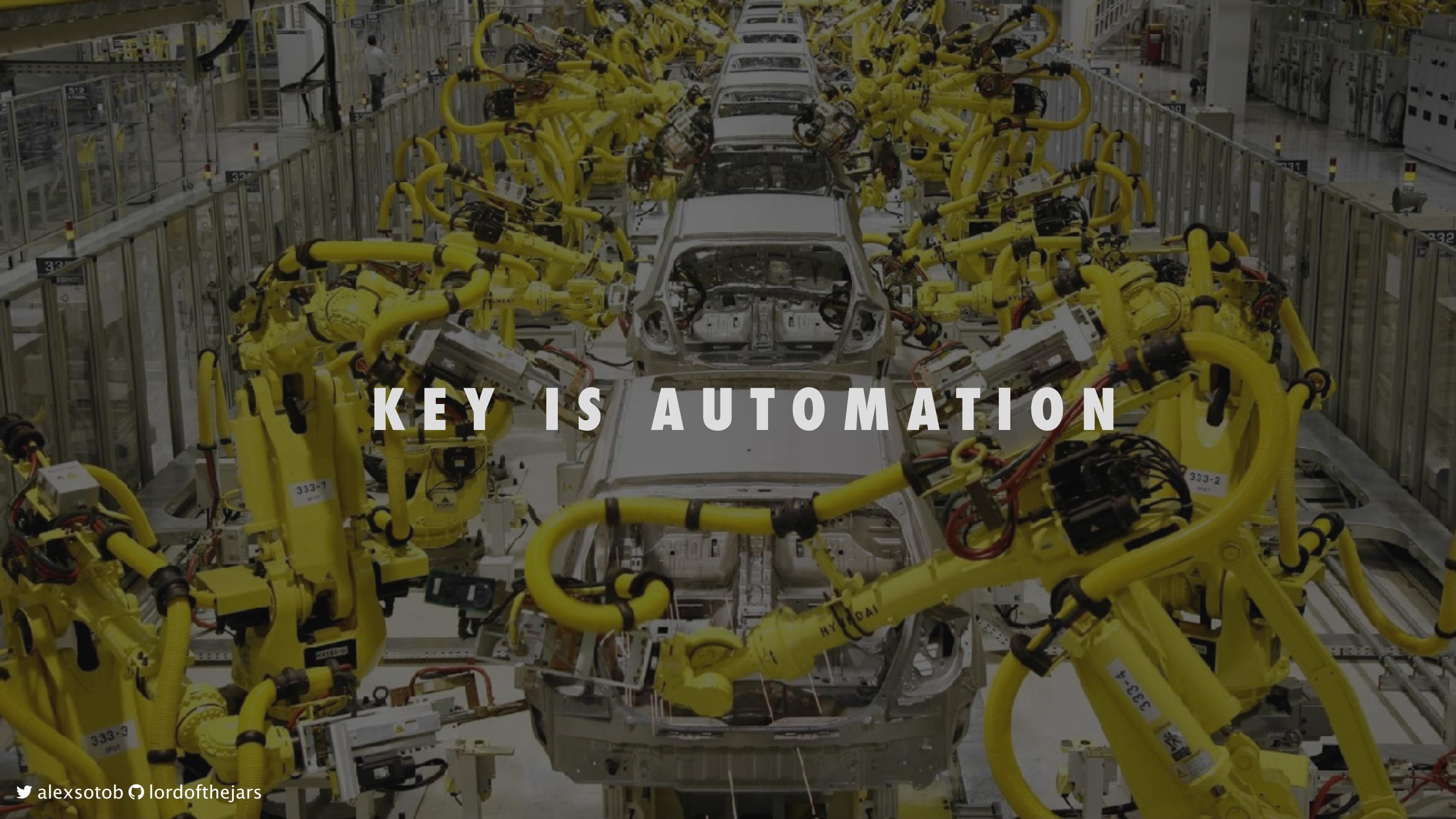
Faster



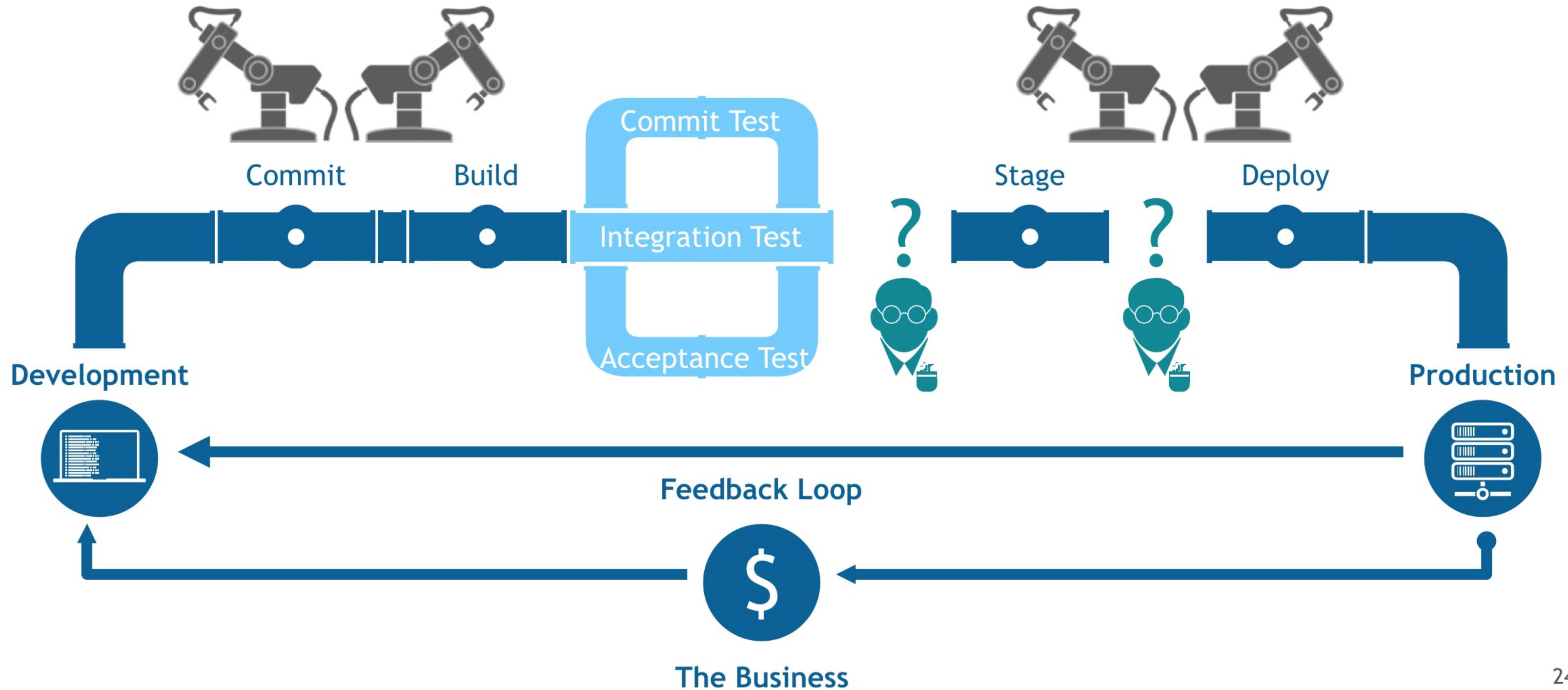
Faster
Sooner

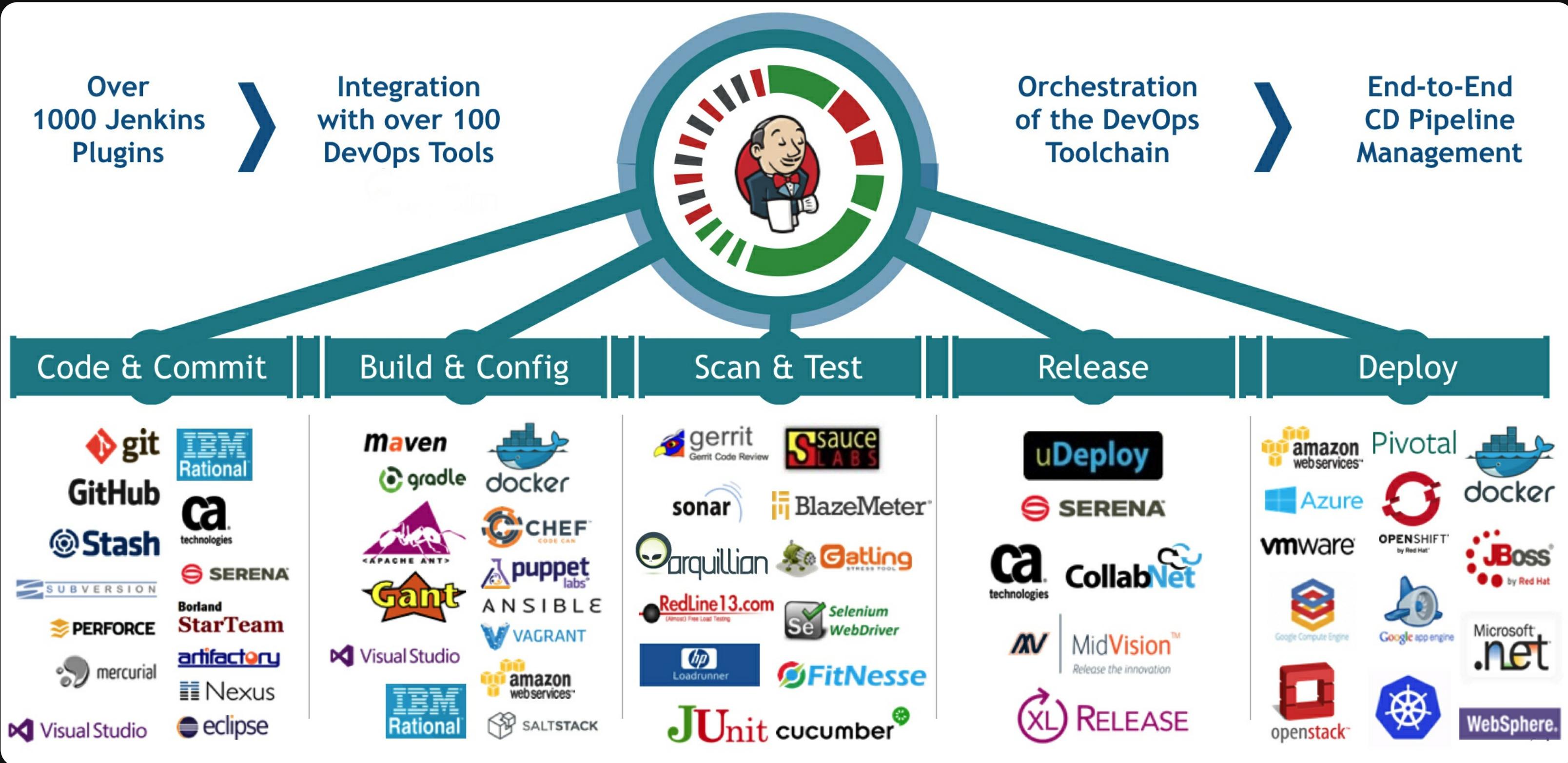


Faster
Sooner
Better

A wide-angle photograph of an industrial factory floor, likely an automotive plant. Numerous yellow industrial robots with black and grey components are positioned around a series of white car chassis. The robots are performing various assembly tasks. The background shows a complex network of overhead conveyor belts, metal structures, and other industrial equipment. The lighting is bright and even, typical of a factory environment.

KEY IS AUTOMATION





Dev



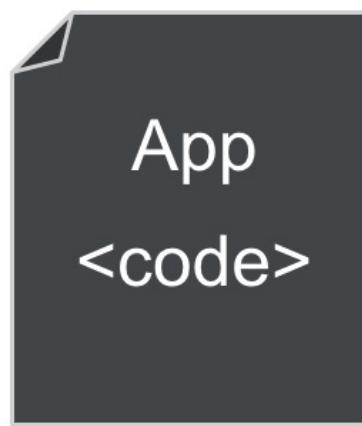
DEV Server/VM

QA



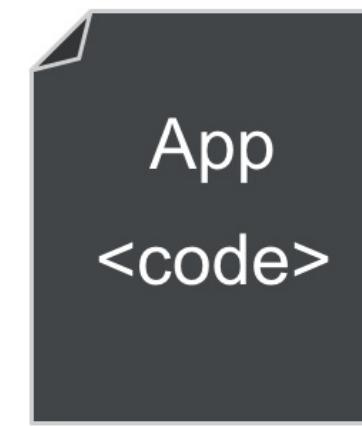
QA Server/VM

Staging



STG Server/VM

Prod



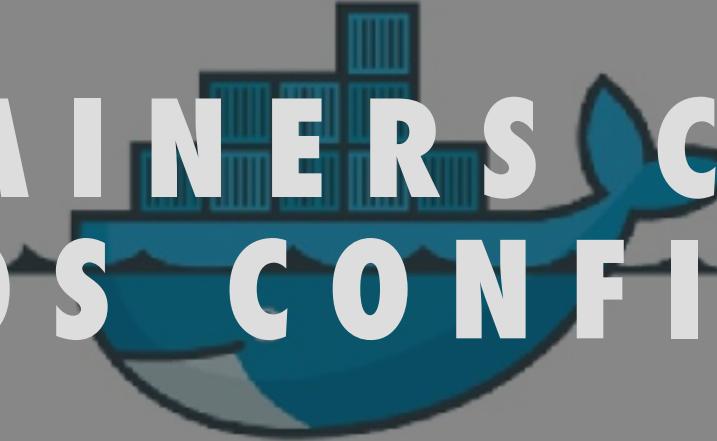
PROD Server/VM



SPEED + FRICTION = **HEAT**

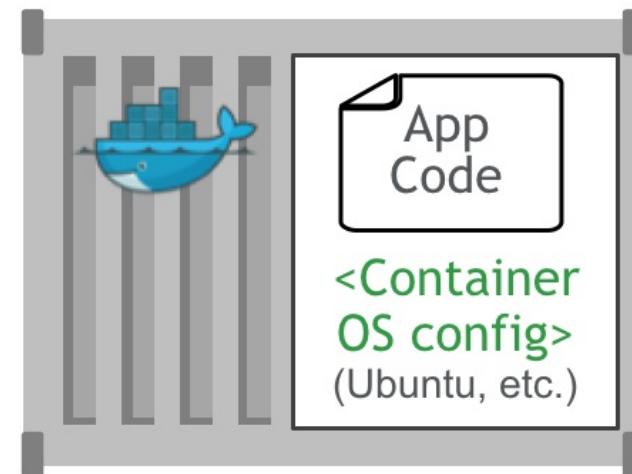


GO - GO - GO



CONTAINERS CODIFY
OS CONFIG

Dev

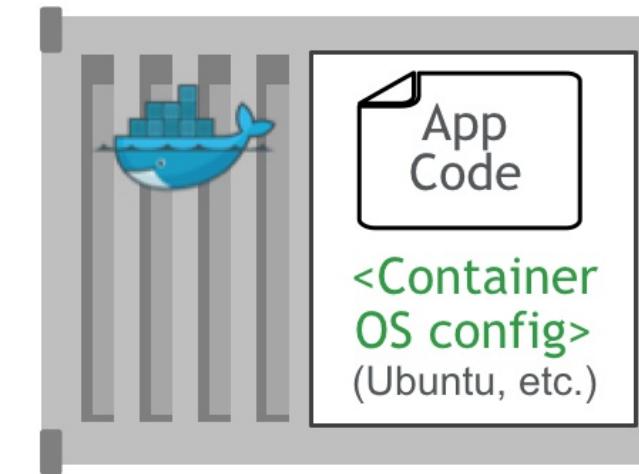


<DEV OS config>



DEV Server/VM

QA

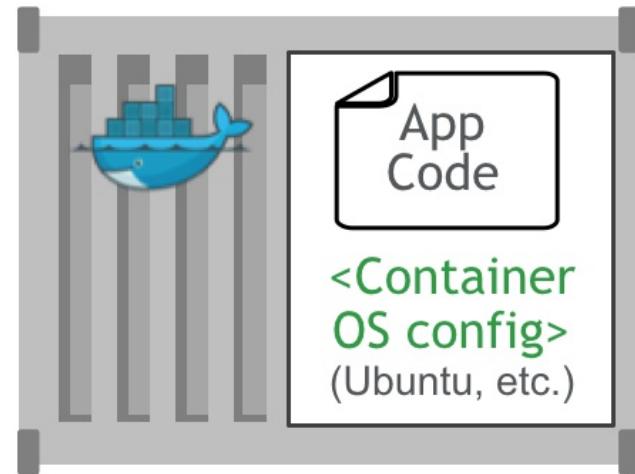


<QA OS config>

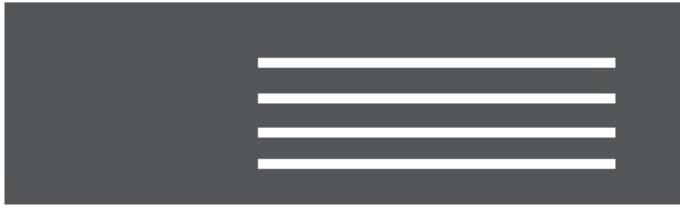


QA Server/VM

Staging

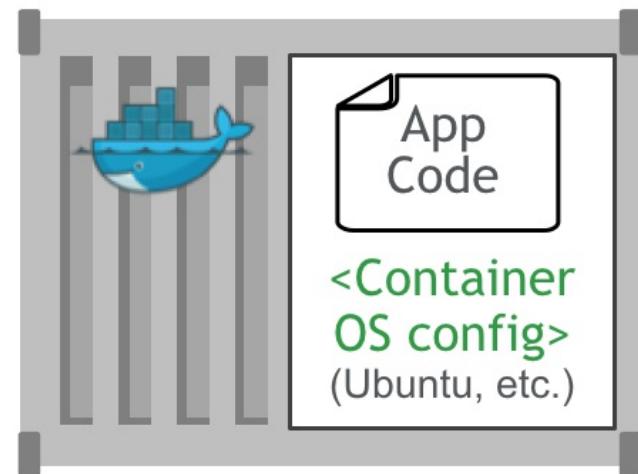


<STG OS config>

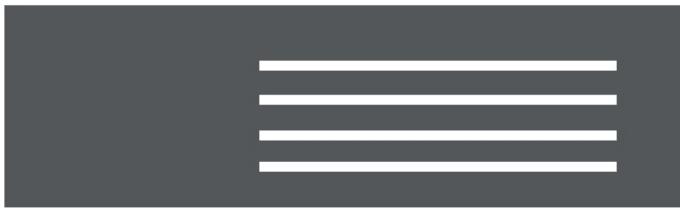


STG Server/VM

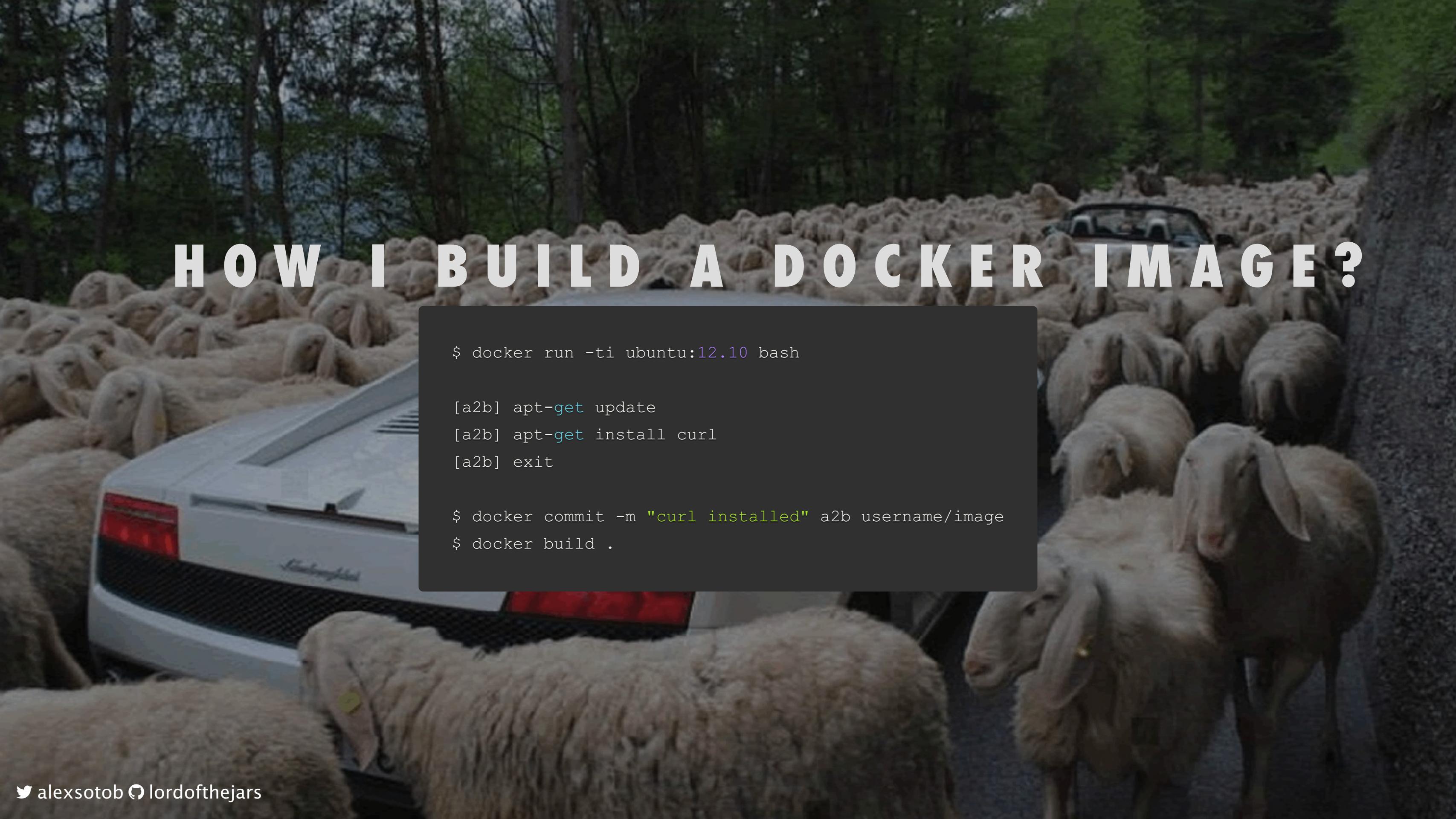
Prod



<PROD OS config>

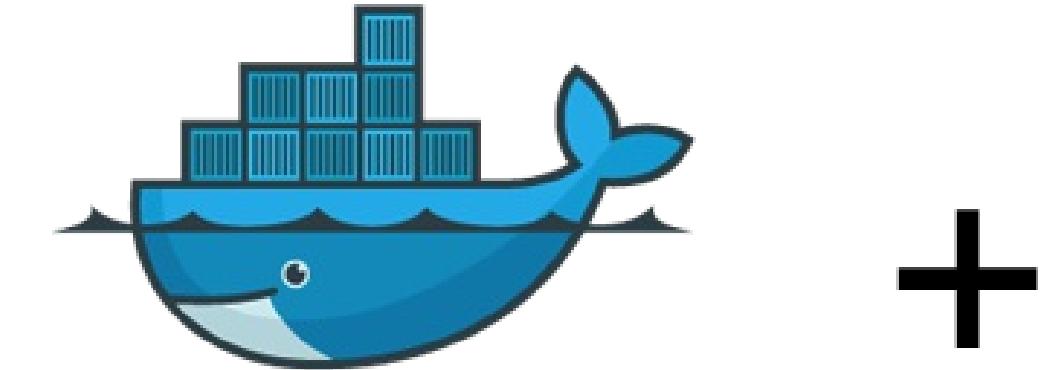


PROD Server/VM



HOW I BUILD A DOCKER IMAGE?

```
$ docker run -ti ubuntu:12.10 bash  
  
[a2b] apt-get update  
[a2b] apt-get install curl  
[a2b] exit  
  
$ docker commit -m "curl installed" a2b username/image  
$ docker build .
```



+



docker

J E N K I N S : D O C K E R A N D C D

Docker Hub Notification: triggers downstream jobs when a tagged container is pushed to Docker Hub

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Docker Traceability: identifies which build pushed a particular container, displays on Jenkins builds page

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Docker: use a docker host to dynamically provision a slave, run a single build, then tear-down

JENKINS : DOCKER AND CD

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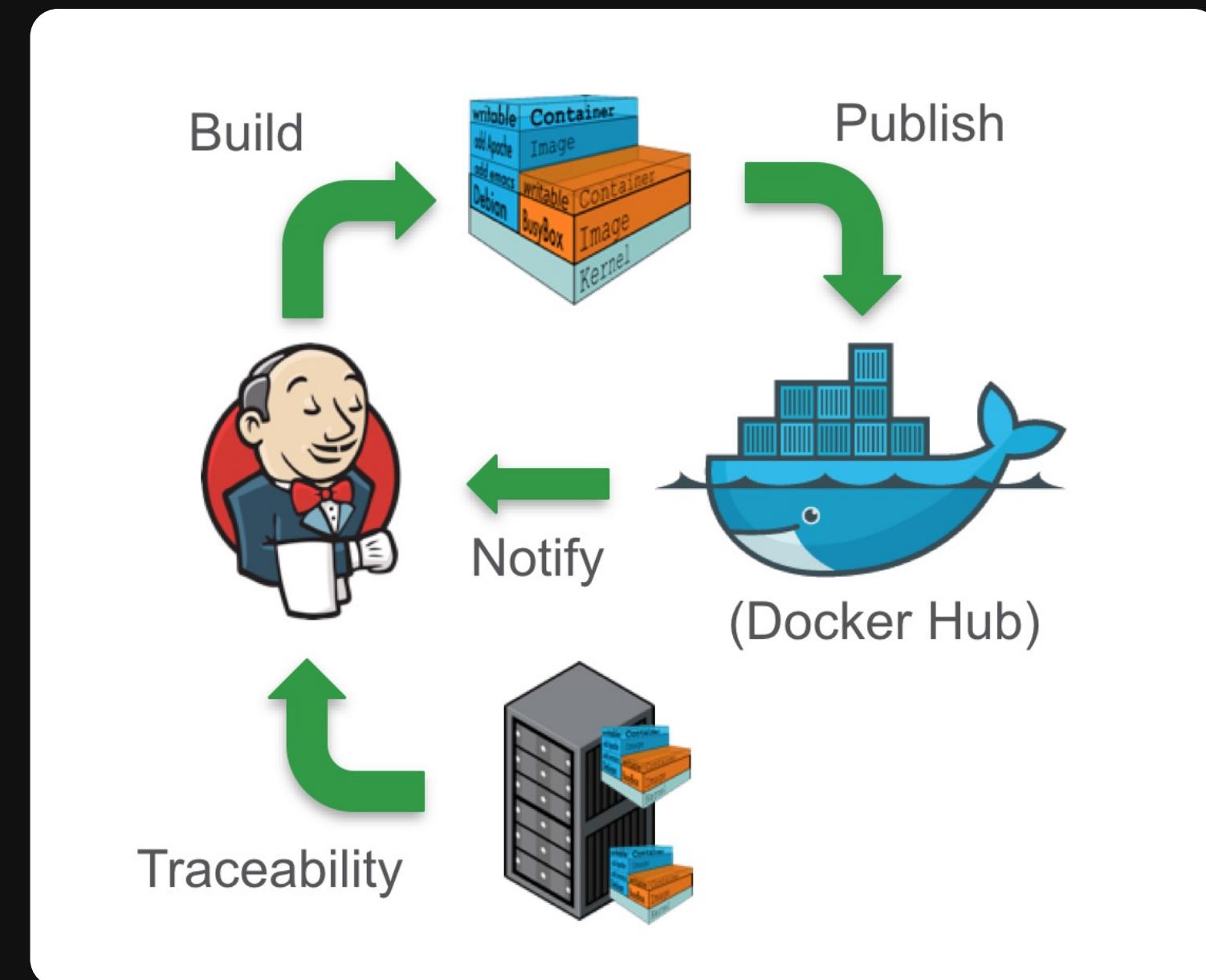
Docker Traceability: identifies which build pushed a particular container, displays on Jenkins builds page

Docker Custom Build Environment: specifies customized build environments as Docker containers

Docker: use a docker host to dynamically provision a slave, run a single build, then tear-down

Build and Publish : builds projects that have a Dockerfile and pushes the resultant tagged image to Docker Hub

BUILD, TEST, & DEPLOY DOCKER IMAGES FROM JENKINS



D O C K E R H U B N O T I F I C A T I O N P L U G I N

Add Webhook

Webhook Name:

Hook URL 0

x

Create

Add URL

Build Triggers

- Trigger builds remotely (e.g., from scripts) ?
- Build after other projects are built ?
- Build periodically ?
- Build pull requests to the repository ?
- Build when a change is pushed to GitHub ?
- Build when another project is promoted ?
- Monitor Docker Hub for image changes ?
 - Any referenced Docker image can trigger this job ?
 - Specified repositories will trigger this job ?

Repositories

harniman/mobile-deposit-api

Configure Trigger

DOCKER TRACEABILITY PLUGIN



Back to Project

Status

Changes

Console Output

Edit Build Information

Delete Build

Environment Variables

See Fingerprints

Docker Fingerprints

Previous Build



Docker fingerprints for Docker-demos » create and publish docker image #26 harniman/mobile-deposit-api:26

Image Summary	Created on	Introduced
ID: b66a31c7b100c0916ee86a0f2ca4295dfa057fdb341624a089ff93be08c973f8	23 min	Docker-demos/create and publish docker image #26
ID: 1e7c8f53a87dcd96a141e8a534873813867f408f2e255421ee8c7a5175aa976f	23 min	Docker-demos/create and publish docker image #26

 [New Item](#) [People](#) [Build History](#) [Project Relationship](#) [Check File Fingerprint](#) [Manage Jenkins](#) [Support](#) [Credentials](#) [Failure Cause Management](#) [Pooled Virtual Machines](#) [Docker Traceability](#)[**Build Queue**](#)

No builds in the queue.

[**Build Executor Status**](#) [master](#)1 Idle
2 Idle [jenkins-beedemo-local-a37896b67a6d](#)1 Idle
2 Idle [linux-slave-1](#)

1 Idle

 [linux-slave-2](#)

1 Idle

 [linux-slave-3](#)

1 Idle

 [osx-slave-1](#)

1 Idle

 [vagrant \(offline\)](#) [windows-webstart \(offline\)](#)

Docker Traceability

Provides information about Docker deployments related to this Jenkins installation. The detailed info about Docker images and containers is available through links in the list below.

The plug-in provides an extended API. See [API docs](#)

Registered containers

Container Info	Deployment summary
Name: /furious_varahamihira ID/Source: 2119264ec3a41817339cdd6fedfc0cd1e8fad3b0d991db5df7fdb69abb893a1 (outside Jenkins) Base image: "harmiman/mobile-deposit-api:25" Base image ID: f40dd14f5fdc291cd5e886fb5be63c6b41057900951708f6dd23b60cc64dd88c (from Docker-demos/create and publish docker image #25) Parent images: None	On: Blue (ID: unknown) Last status: DEPLOYED Running: true Exit code: 0 Started at: 2015-10-08T13:04:46.452217263Z Finished at: 0001-01-01T00:00:00Z
Name: /drunk_kilby ID/Source: 29a402532fdc54b3570277ee985f85c59aa69eba2320ea2d7bb0503c1162505 (outside Jenkins) Base image: "harmiman/mobile-deposit-api:25" Base image ID: f40dd14f5fdc291cd5e886fb5be63c6b41057900951708f6dd23b60cc64dd88c (from Docker-demos/create and publish docker image #25) Parent images: None	On: unknown (ID: unknown) Last status: DEPLOYED Running: true Exit code: 0 Started at: 2015-10-08T13:08:45.79075068Z Finished at: 0001-01-01T00:00:00Z
Name: /reverent_hawking ID/Source: 439715d5fefc786ea0f4e228b7351361a2f1444953b5cb494b70cd095e92be3 (outside Jenkins) Base image: "harmiman/mobile-deposit-api:27" Base image ID: fb5889de7e6e4a3681acc17c6bd9e7de901cf8e61c525b97014491347cdd9787 (from Docker-demos/create and publish docker image #27) Parent images: None	On: mymac (ID: unknown) Last status: STOPPED Running: false Exit code: 143 Started at: 2015-10-09T08:40:32.525257255Z Finished at: 2015-10-09T08:40:33.108667878Z
Name: /desperate_banach ID/Source: 7a1d1bb25e4dbe4743194affc849f9c0ae3ca6c54bb934d58e0ac31c70526336 (outside Jenkins) Base image: "harmiman/mobile-deposit-api:24" Base image ID: 3ca3d81bf3d7349bbbe6f1e90be3683151d33420e8e616eaacd082c4dd2309 (from Docker-demos/create and publish docker image #24) Parent images: None	On: unknown (ID: unknown) Last status: STOPPED Running: false Exit code: 143 Started at: 2015-10-08T13:11:49.471354074Z Finished at: 2015-10-08T13:11:49.740646905Z
Name: /angry_bhaskara ID/Source: 7aa8cbe1ce83d6e1c8441a900db5b5214721fb21582447446e798ece7f480f97 (outside Jenkins) Base image: "harmiman/mobile-deposit-api" Base image ID: b43afa407c288e8d82c6e99c259b5137999ad53840c468747c876366e98828ed (from Docker-demos/create and publish docker image #20) Parent images: None	On: prod-server-1 (ID: unknown) Last status: DEPLOYED Running: true Exit code: 0 Started at: 2015-10-08T12:52:23.87176479Z Finished at: 0001-01-01T00:00:00Z
Name: /happy_raman ID/Source: 8ddabb80d5b5911f53dbafac5b167cfe3c115c0bd205053d61c88459f8eaba75 (outside Jenkins) Base image: "harmiman/mobile-deposit-api:25" Base image ID: f40dd14f5fdc291cd5e886fb5be63c6b41057900951708f6dd23b60cc64dd88c (from Docker-demos/create and publish docker image #25) Parent images: None	On: unknown (ID: unknown) Last status: STOPPED Running: false Exit code: 143 Started at: 2015-10-08T13:10:38.144916474Z Finished at: 2015-10-08T13:10:38.568757629Z



Container /reverent_hawking

Introduced 1 hr 28 min ago outside Jenkins

MD5: 4397f15d5fefc786ea0f4e226b735136

Usage

This file has not been used anywhere else.

Container Info

The information below has been retrieved from the latest report (2015-10-09T09:40:33Z).

- Name: /reverent_hawking
- Container ID: 4397f15d5fefc786ea0f4e226b7351361a2f1444953b5cb494b70cd095e92be3
- Origin: (outside Jenkins)
- Created on: 2015-10-09T08:40:32.065977462Z

Sources

- Image ID: [fb5889de7e6e4a3681acc17c6bd9e7de901cf8e61c525b97014491347cd9767](#) (from [Docker-demos/create and publish docker image #27](#))
- Image name: "harniman/mobile-deposit-api:27"
- Parent images: None

Status

- Running on: mymac (ID: unknown)
- Last status: STOPPED
- Pid: 0
- Exit code: 143
- Started at: 2015-10-09T08:40:32.525257255Z
- Finished at: 2015-10-09T08:40:33.108667878Z

Raw data

- [Last record in JSON](#)



Deployment Events

Time	Event	State
2015-10-09T09:40:32Z	DEPLOYED	running: true, paused: false, exit code:0
2015-10-09T09:40:33Z	STOPPED	running: false, paused: false, exit code:143

DOCKER PLUGIN

Images

Docker Template

ID	kmaDEL/dind-jenkins-slave:1.0	?
Labels	docker	?
Usage	Only build jobs with label restrictions matching this node	?
Credentials	jenkins	?
	Add	
Remote Filing System Root	/home/jenkins	?
Remote FS Root Mapping		?
Instance Cap	4	?
DNS		?
Port bindings	1234	?
Bind all declared ports	<input checked="" type="checkbox"/>	
Hostname		

 Advanced...

Delete Docker Template

[Add Docker Template](#) ▾

List of Images to be launched as slaves

DOCKER CUSTOM BUILD ENVIRONMENT PLUGIN

Build Environment

- Abort the build if it's stuck
- Build inside a Docker container



Docker image to use

Build from Dockerfile



Pull docker image from repository



Image id/tag

maven:3.3.3-jdk-8



Docker Host URI



Server credentials

- none -

Add



Docker registry credentials

- none -

Add



Volumes

Add



force Pull



Run in privileged mode

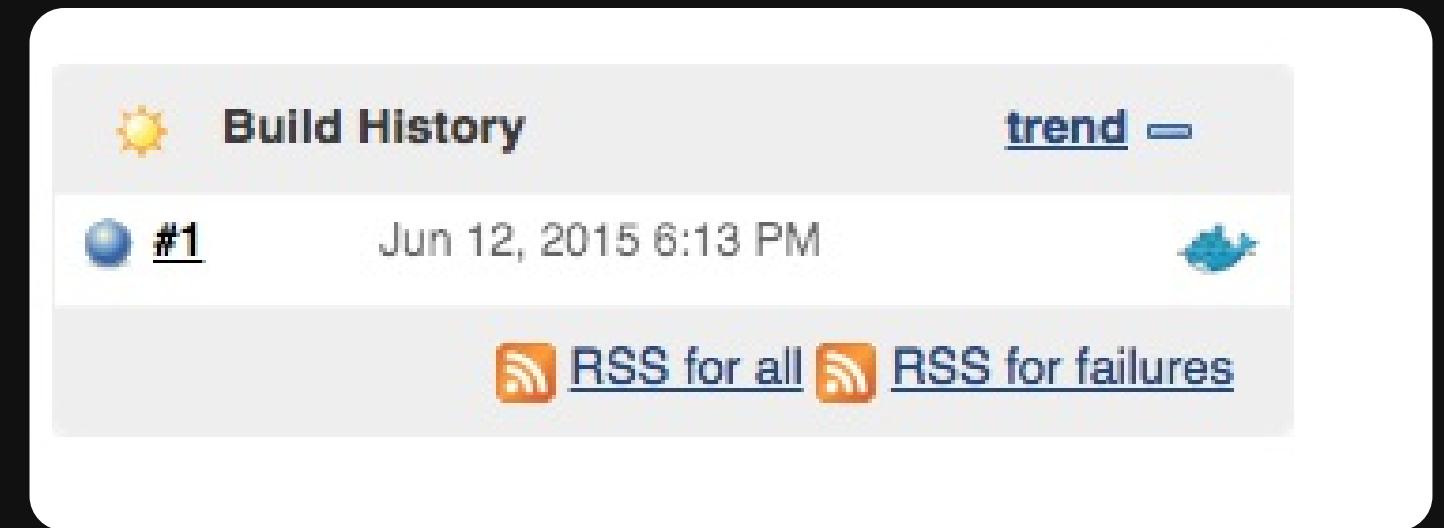


Verbose



User group





BUILD AND PUBLISH PLUGIN

Post-build Actions

Archive the artifacts

Files to archive `**/*.jar, .docker/Dockerfile`



Build #75 (Oct 8, 2015 12:03:10 PM)

[add description](#)



Build Artifacts

[Dockerfile](#)

[mobile-deposit-api-0.0.19-SNAPSHOT.jar](#)

218 B [view](#)

17.71 MB [view](#)

Copy artifacts from another project

Project name

Docker-demos/build and test



Which build

Latest successful build



Stable build only

Artifacts to copy

**/*.jar, **/Dockerfile



Artifacts not to copy



Target directory



Parameter filters



Flatten directories

Optional

Fingerprint Artifacts



Result variable suffix



Docker Build and Publish

Repository Name ?

Tag

Docker server URI ?

Server credentials Add

Docker registry URL ?

Registry credentials Add

Skip Push
Do not push image to registry/index on successful completion

No Cache
Force rebuild - do not user docker cache (may be slower)

Force Pull
Update the source image before building even when it exists locally

Skip Build
Do not build the image

Create fingerprints ?

Skip Decorate
Do not decorate the build name

Skip tag as latest
Do not tag this build as the latest

Build Context

Dockerfile Path
The project root path for the build. Defaults to the workspace root if not specified.

Path to the Dockerfile for this build. File must be relative to build context. Can be used to specify a Dockerfile with a non-standard filename. Uses Docker client default if not specified.

Delete



**NO MORE BUILD
JOBS / UP / DOWNSTREAMS PLEASE !!!!**

PIPELINE PLUGIN

Continuous Delivery as Code

FEATURES OF PIPELINE PLUGIN

Configuration in Source Repositories

FEATURES OF PIPELINE PLUGIN

Configuration in Source Repositories

Less click-and-type, more code

FEATURES OF PIPELINE PLUGIN

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Less click-and-type, more code

From simple to complex

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From simple to complex

Survives Jenkins restarts & connection losses (\$)

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Reusable Definitions

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Reusable Definitions

Build history/trend segregated per branches

FEATURES OF PIPELINE PLUGIN

Configuration in Source Repositories

Less click-and-type, more code

From simple to complex

Survives Jenkins restarts & connection losses (\$)

Reusable Definitions

Build history/trend segregated per branches

UI (\$ -> OSS)

Pipeline

Definition

Pipeline script from SCM

SCM

None



Script Path

Jenkinsfile



Pipeline DSL Reference



Snippet Generator



Steps

Sample Step

archive: Archive artifacts



Includes



Excludes



Generate Groovy

JENKINSFILE (1 / 3)

```
stage 'compileAndUnit'
node {
    git branch: 'master', url: 'https://github.com/lordofthejars/starwars.git'
    gradle 'clean test'
    stash excludes: 'build/*', includes: '**', name: 'source'
    stash includes: 'build/jacoco/*.exec', name: 'unitCodeCoverage'
    step([$class: 'JUnitResultArchiver', testResults: '**/build/test-results/*.xml'])
}

stage 'codeQuality'
parallel 'pmd' : {
    node {
        unstash 'source'
        gradle 'pmdMain'
        step([$class: 'PmdPublisher', pattern: 'build/reports/pmd/*.xml'])
    }
}, 'jacoco': {
    node {
        unstash 'source'
        unstash 'unitCodeCoverage'
        gradle 'jacocoTestReport'
    }
}
```

JENKINSFILE (2 / 3)

```
stage 'assemble-binaries'

node('linux') {
    unstash 'source'
    withEnv(["SOURCE_BUILD_NUMBER=${env.BUILD_NUMBER}"]) {
        gradle 'assemble'
    }
}

input message: "Deploy Application to QA ?"

stage name: 'Deploy to QA', concurrency: 1
node {
    echo "Application Deployed to QA."
}
```

JENKINSFILE (3 / 3)

```
gradle = load 'jenkins/gradle.groovy'

withCredentials([[$class: 'UsernamePasswordMultiBinding',
    credentialsId: 'MyID', usernameVariable: 'GIT_USERNAME',
    passwordVariable: 'GIT_PASSWORD']] ) {
    sh "git tag -a some_tag -m 'Jenkins'"
    sh "git push https://${env.GIT_USERNAME}:${env.GIT_PASSWORD}@ --tags"
}

def mvnHome tool 'Maven 3.3.3'
sh "${mvnHome}/bin/mvn -B verify"
```

 Global credentials (unrestricted)

Credentials that should be available irrespective of domain specification to requirements matching.

Name	Kind
 test/******** (slave)	Username with password
 aaa/******** (MyID)	Username with password

DOCKER PIPELINE INTEGRATION

JENKINSFILE (1 / 2)

```
docker.withRegistry('https://lordofthejars-docker-continuous_delivery.bintray.io', 'd4fc3fa9-39f7-47ea-a57c-795642f90989') {  
    git 'git@github.com:lordofthejars/busybox.git'  
    def newApp = docker.build "lordofthejars-docker-continuous_delivery.bintray.io/lordofthejars/javatest:${env.BUILD_TAG}"  
    newApp.push()  
}  
  
docker.image('lordofthejars/javatest').withRun {c ->  
    sh './executeTests.sh'  
}
```

JENKINSFILE (2 / 2)

```
docker.image('maven:3.3.3-jdk-8').inside('-v ~/.m2/repository:/m2repo -u 1000:50') {
    git '...your-sources...'
    sh 'mvn -Dmaven.repo.local=/m2repo clean install'
}

docker.withServer('tcp://swarm.mycorp.com:2376', 'swarm-certs') {
    docker.image('httpd').withRun('-p 8080:80') {c ->
        sh "curl -i http://${hostIp(c)}:8080/"
    }
}

def hostIp(container) {
    sh "docker inspect -f {{.Node.Ip}} ${container.id} > hostIp"
    readFile('hostIp').trim()
}
```

StarWars - Stage View



カップを楽しもう!!

100,000名

にアタル

DIFFERENT WAYS OF DOING SAME THINGS WITH DSL

SIMPLE BUILD FOR PIPELINE PLUGIN

J E N K I N S F I L E

```
simpleBuild {  
    machine = "hi-speed"  
    docker = "java:1.9"  
  
    env = [  
        FOO : 42,  
        BAR : "YASS"  
    ]  
  
    git_repo = "https://github.com/cloudbeers/PR-demo"  
  
    before_script = "echo before"  
    script = 'echo after $FOO'  
    after_script = 'echo done now'  
  
    notifications = [  
        email : "foo@bar.com"  
    ]  
}
```



LET'S WIND
DOWN

CONCLUSIONS

Automation is the Key

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Automation is the Key
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Jenkins is Ready For Docker and CD
Pipeline as Code gives you Freedom



ONLY ONE PIECE OF THE JIGSAW

80:54

FCB 3 - 1 CEL

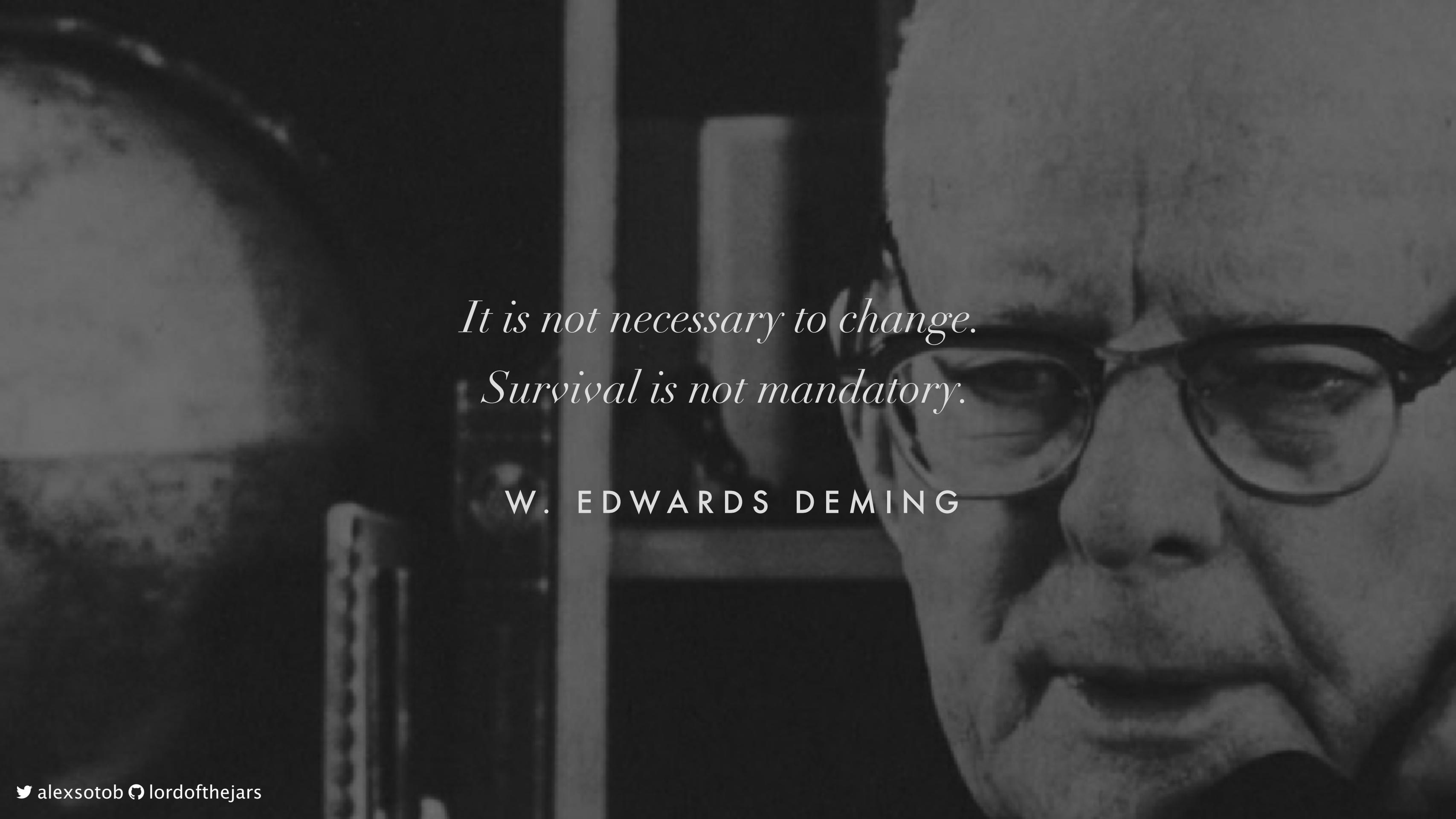
FOLLOW THE RULES, ADAPT TO YOUR
NEEDS



CLOUD BEES



JENKINS



*It is not necessary to change.
Survival is not mandatory.*

W. EDWARDS DEMING



QUESTIONS



http://www.slideshare.net/asotobu/jenkins-docker



asotobu@gmail.com

<https://github.com/lordofthejars/starwars>

<https://wiki.jenkins-ci.org/display/JENKINS/Pipeline+Plugin>

<https://wiki.jenkins-ci.org/display/JENKINS/CloudBees+Docker+Pipeline+Plugin>

<https://wiki.jenkins-ci.org/display/JENKINS/CloudBees+Docker+Traceability>

<https://wiki.jenkins-ci.org/display/JENKINS/CloudBees+Docker+Build+and+Publish+plugin>

<https://wiki.jenkins-ci.org/display/JENKINS/CloudBees+Docker+Hub+Notification>

<https://wiki.jenkins-ci.org/display/JENKINS/Docker+Plugin>

<https://github.com/jenkinsci/simple-build-for-pipeline-plugin>