



#redhat #rhsummit

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# WHAT DOES AN AWARD-WINNING RESTAURANT AND OPEN INNOVATION LABS HAVE IN COMMON?



# THE OPEN INNOVATION LABS DEVOPS EXPERIENCE

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# THE TALK

The Open Innovation Labs DevOps Experience.

## Steps in the Journey

The Business Case for Digital Transformation

Labs as Transformation of Red Hat

The Red Hat Open Innovation Labs Journey

Q & A

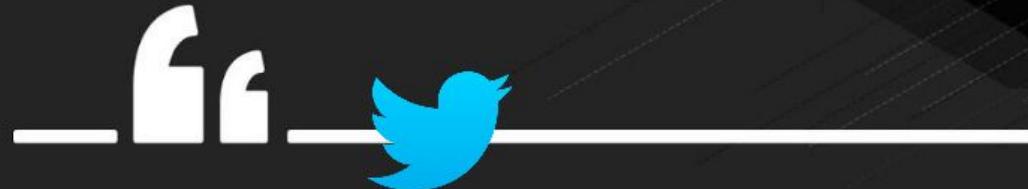
# THE AGE OF DIGITAL TRANSFORMATION



The average life expectancy of a Fortune 500 company has declined from around 75 years half a century ago to less than 15 years today.

Deloitte Shift Index





By 2020, more than 75% of the S&P 500 will be companies that we have not heard of yet.

Professor Richard Foster,  
Yale University, in Lean Enterprise

”



By 2020 every business  
will become a digital  
predator or digital prey.

Nigel Fenwick,  
Forrester Research, 2015



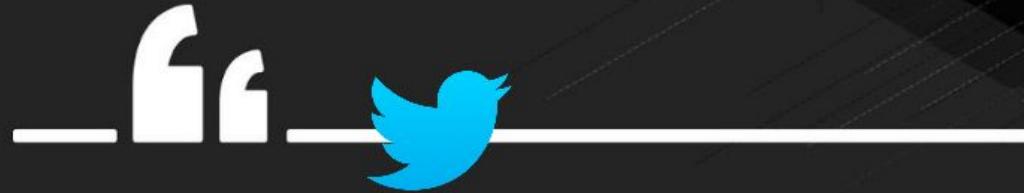


87% of surveyed executives  
believe digital technologies  
will disrupt their industries ...

MIT Sloan Management Review, 2016

“

*\* from “Teaching Elephants to Dance (and Fly!)”, Burr Sutter*



... yet only 44% indicated their organizations were taking appropriate measures to avert disruption.

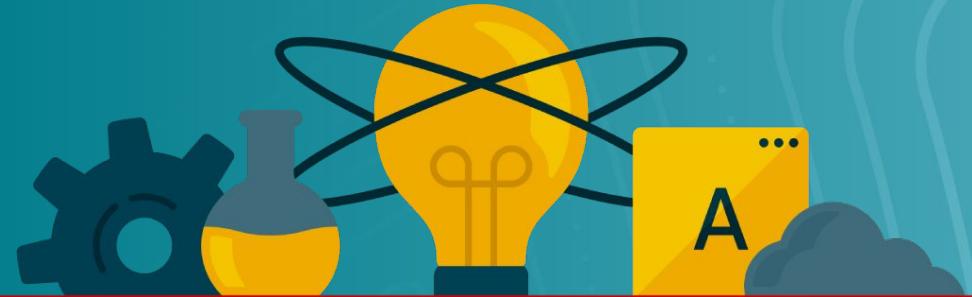
MIT Sloan Management Review, 2016

”



***DIGITAL TRANSFORMATION IS NOT JUST  
ABOUT DISRUPTION OF TECHNOLOGY<sup>1</sup>***

<sup>1</sup><https://www.i-scoop.eu/digital-transformation>



# RED HAT OPEN INNOVATION LABS



EXPERIENCE DEVOPS  
IN OUR KITCHEN

# LABS VALUE PROPOSITION

THE MICHELIN STAR RESTAURANT



## THE KITCHEN

- Open, collaborative workspace
- The best ingredients and tools
- Built for speed & experimentation
- Boston, London, Singapore

# LABS VALUE PROPOSITION

THE MICHELIN STAR RESTAURANT



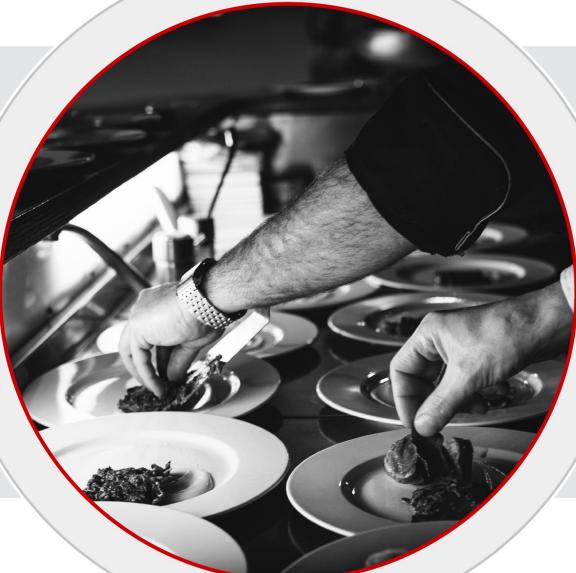
## THE CHEFS

- Variety of world-class skill sets
- Everyone is accountable
- Shared culture and passion

[Photo] Cook It Raw  
<http://www.eater.com/2011/12/16/6629185/inside-cook-it-raw-where-the-worlds-great-chefs-gather>

# LABS VALUE PROPOSITION

THE MICHELIN STAR RESTAURANT



## THE METHOD

- Speed & control with pipelines
- Try, Learn, Modify
- Mentoring accelerates learning

# LABS VALUE PROPOSITION

THE MICHELIN STAR RESTAURANT



## THE MEAL

- Continuously invents new dishes
- Instant, honest feedback
- Memorable experiences create authentic enthusiasm

# BUILD SOFTWARE THE RED HAT WAY IN OPEN INNOVATION LABS



## EXPERIMENT

Rapidly build prototypes, do DevOps, and be agile.



## IMMERSE YOUR TEAM

Work side-by-side with experts in a residency-style engagement.



## CATALYZE INNOVATION

Bring modern application development back to your team.



**DISRUPTION**  
RAPIDLY CO-CREATE AN INNOVATIVE  
OR DISRUPTIVE PRODUCT

A large cargo ship, likely an oil tanker, is shown from a low angle, being towed by a tugboat. The ship's deck is filled with numerous shipping containers. The scene is set in a body of water with hills visible in the background. A large, semi-transparent teal box is overlaid on the middle-left portion of the ship, containing the text.

# TRANSFORMATION

CREATE THE CATALYST TO CHANGE  
THE OIL TANKER'S COURSE

A black and white photograph of a snowy forest. A road cuts through the center of the image, with a dark-colored car driving away from the viewer. The trees on both sides are heavily laden with snow, creating a dense, textured background.

# THE ROAD TRIP

EXPERIENCE STATE-OF-THE-ART  
APPLICATION DEVELOPMENT AND DEVOPS

# Digital Darwinism

## The Developer's Journey



Re-Org to  
DevOps



Self-Service,  
On-Demand,  
Elastic  
Infrastructure



Automation  
Puppet, Chef,  
Ansible,  
Kubernetes



CI & CD  
Deployment  
Pipeline

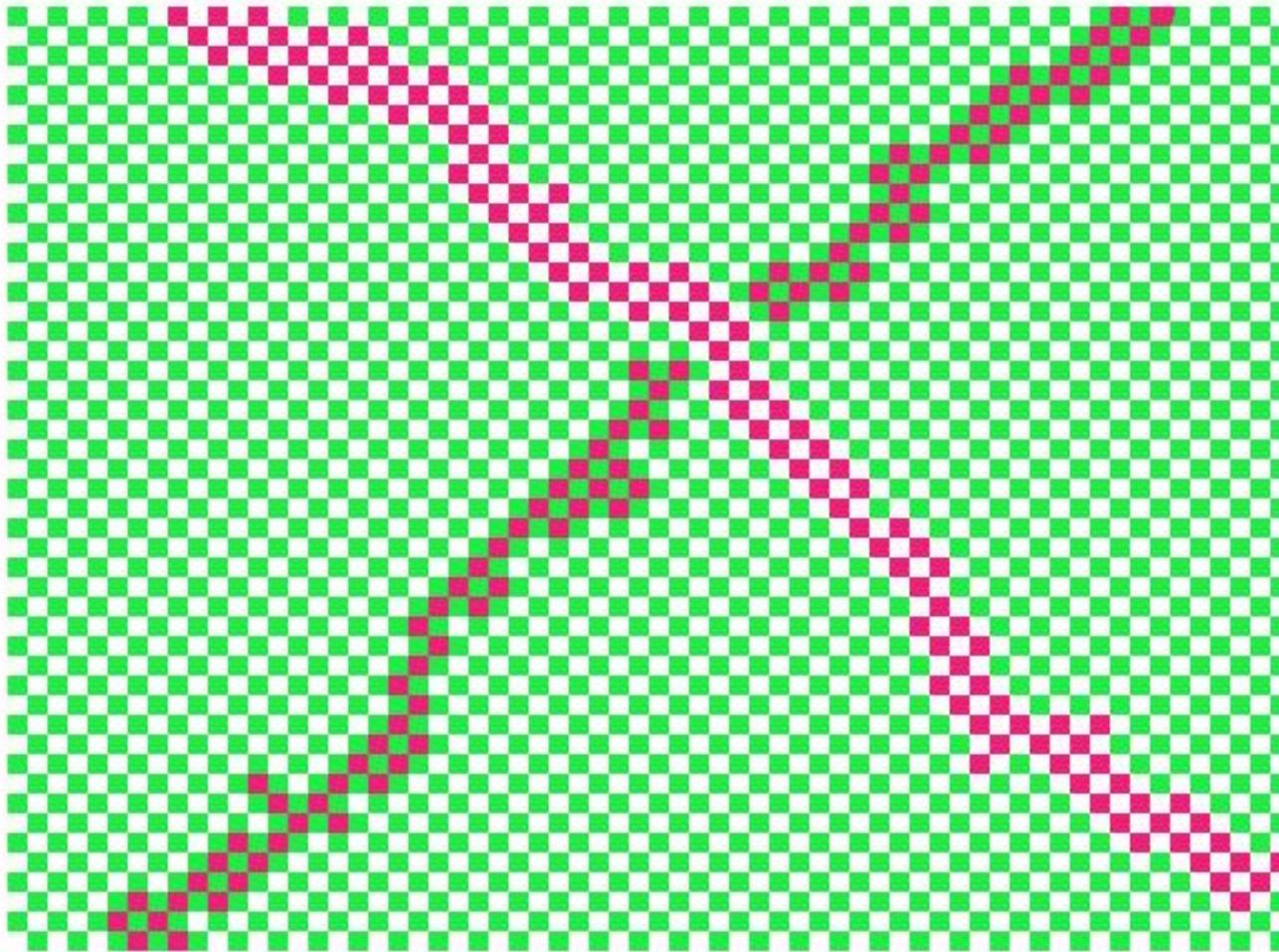


Advanced  
Deployment  
Techniques



Microservices  
(and flying  
elephants!)

# RE-ORG TO DEVOPS



# BUILDING A CROSS FUNCTIONAL TEAM

**Red Hat Open Innovation Labs**

Start small

Prioritize who you need

Be selective

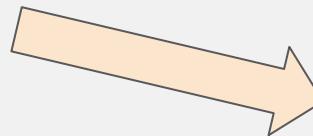
Cross train as much as possible

Diverge and converge as a team when making hard decisions

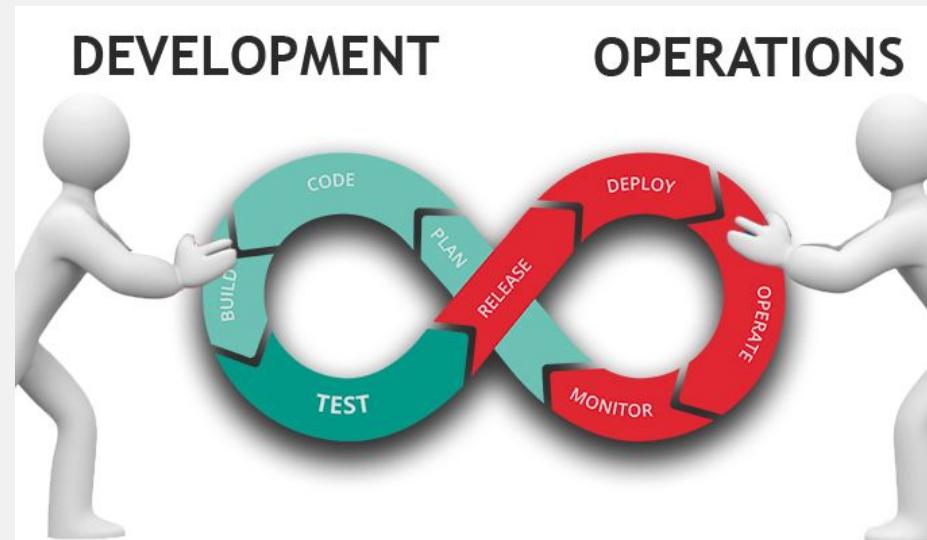
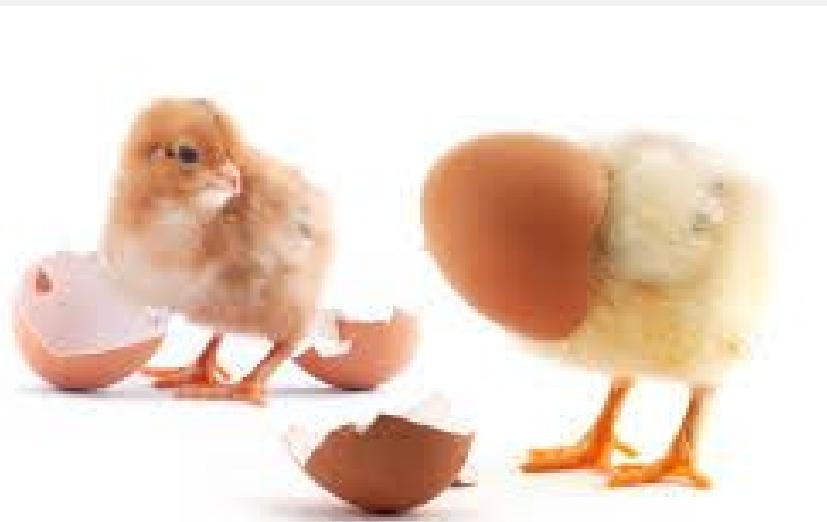
Constantly collect feedback and pivot

# SELF-SERVICE, ELASTIC INFRASTRUCTURE

# ENABLE INNOVATION AND ELIMINATE GRUMPY PEOPLE



*"Two monologues do not make a dialogue." - Jeff Daly*



# THE OPEN INNOVATION LABS AND INFRASTRUCTURE

How to run “everywhere”

Focused on Container based deployments

**Labs** operate on private and public cloud

OpenStack, AWS, Google Cloud, Azure, VMware, Bare Metal

Use Ansible and Ansible Tower for idempotent configurations

OpenShift Dedicated is a great fit



# PUSH-BUTTON INFRASTRUCTURE (PBI)

# GET YOUR HANDS ON ALL CAPABILITIES OF THE TECHNOLOGY

Start innovating on day one with automated access to our push-button infrastructure.

## DESIGN YOUR OWN OPEN INNOVATION LABS TECHNOLOGY STACK

Use this interactive menu to mix and match the services, tools, and infrastructure to create your own, customized, Open Innovation Lab technology stack that meets your application development needs. Hover over each service to learn more. When you're finished selecting, click submit to receive your own personalized technology stack, which you can save, share, and use as a springboard for your own app development.

**- APPLICATION DEVELOPMENT**

**RED HAT ENTERPRISE OPEN SOURCE**

**BEST-IN-CLASS OPEN SOURCE**

**INFRASTRUCTURE**

**DATA STORE**

**DEVOPS TOOLS**

**CONTAINER PLATFORM**

**HOSTING INFRASTRUCTURE**

**MY OPEN INNOVATION LAB STACK**

**- VIEW PRODUCT STACK**

**AUTOMATION**

**APPLICATION DEVELOPMENT**

**INFRASTRUCTURE**

**DATA STORE**

**DEVOPS TOOLS**

**SOURCE CONTROL MANAGEMENT**

**COLLABORATION**

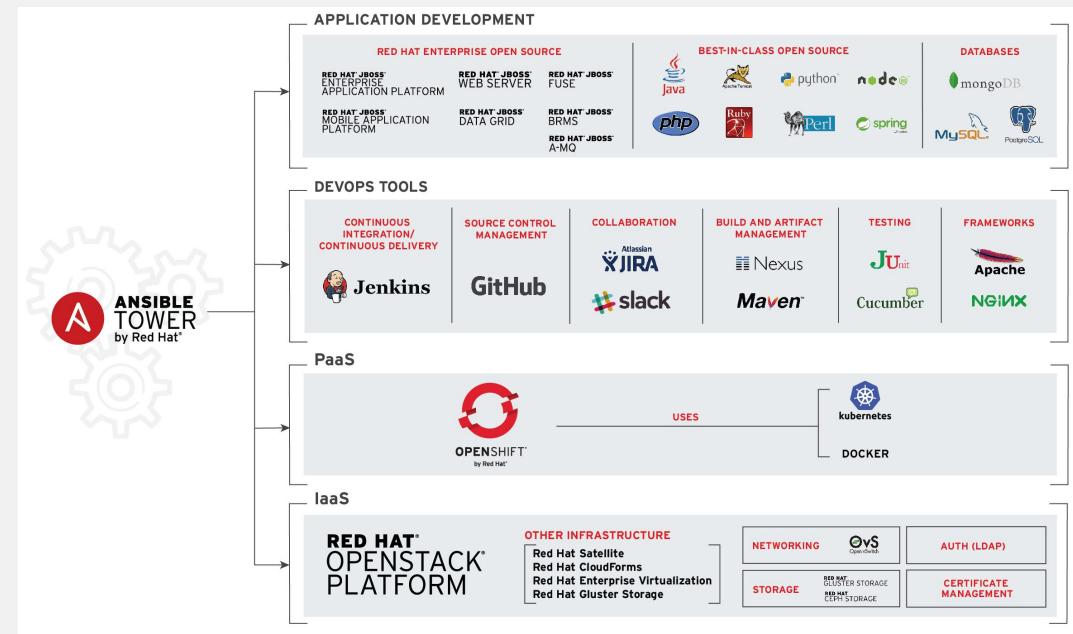
**BUILD AND ARTIFACT MANAGEMENT**

**TESTING**

**CODE QUALITY**

**CODE REVIEW**

**http://red.ht/labs**



# AUTOMATION; OPENShift, ANSIBLE K8S, IaC



# THE OLD FASHION WAY

Manual Install, Configure, Test ...

## What is wrong with this?

# WE'VE GOT A BRIGHT IDEA!!



LET'S AUTOMATE ...

# THE ULTIMATE SOLUTION

...let's use bash<sup>♪</sup>

A row of lightbulbs, with one glowing brightly while others are dark. The glowing bulb is in the foreground, casting a warm glow. The other bulbs are dark and lined up in the background.

<sup>♪</sup> there is absolutely nothing wrong with using bash

# BUILDING A CASL, AND KEEP EXPANDING IT

## *CONTAINER AUTOMATION SOLUTIONS LAB*

Grew quickly, but our scope expanded

**ansible** deployments of infrastructure components

OpenStack + public cloud

## **Infrastructure-as-Code (IaC)**

Our Open Source repo

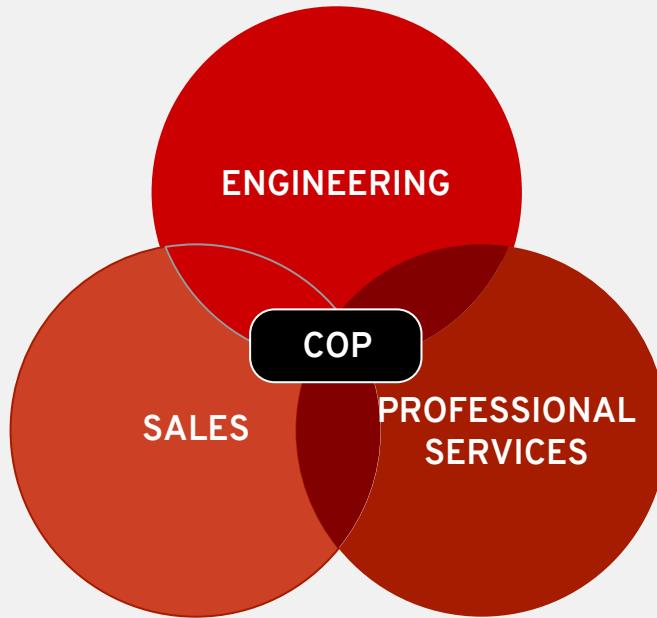
<https://github.com/redhat-cop/casl-ansible>

Team is an active contributor upstream

<https://github.com/openshift/openshift-ansible-contrib>

*“The Third Way [of DevOps] is about creating a culture that fosters two things: continual experimentation, taking risks and learning from failure; and understanding that repetition and practice is the prerequisite to mastery.”*

# RED HAT COMMUNITIES OF PRACTICE



Forum for cross-silo collaboration

Internal, global communities

All of Red Hat is invited to contribute

# OPENSHIFT CONTAINER PLATFORM (OCP)

*<https://www.openshift.com/container-platform/customers.html>*

*The industry's most secure and comprehensive enterprise-grade container platform based on industry standards, Docker and Kubernetes.<sup>1</sup>*

A shift for all parties involved

For Dev team: Infrastructure responsibility is on the Ops team

For Ops team: Application responsibility is on the Dev team

... one happy DevOps family

# OPENShift, K8S AND CONTAINERS

Kubernetes and Containers  
allow developers to truly focus on the app

Kubernetes and Containers  
a consistent approach for Ops team to provide infra

**Applications and Projects**  
What is the best deployment approach?

# CI & CD DEPLOYMENT PIPELINE

# IT COMES FULL CIRCLE - SORT OF

## The story behind the Open Innovation Labs pipeline

Started out with the “Build Pipeline” and multiple projects for stages

It includes parallel tracks for projects

Does not look very modern or impressive



Explored the fabric8 community solution(s)

Impressive work, but not necessary a fit for labs out-of-the-box

# EXPLORATORY STEPS

## The story behind the Labs pipeline - CONT'

## “We need Jenkins 2.0”

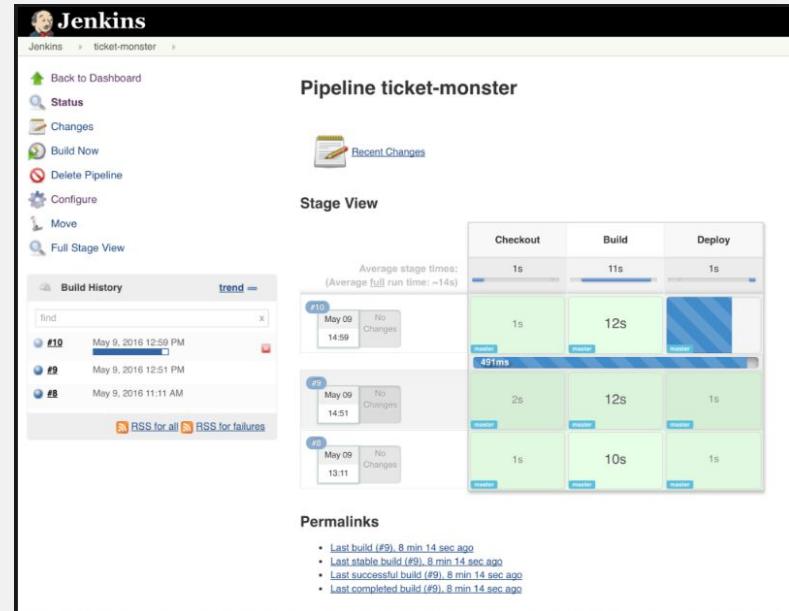
Not included with OpenShift at the time

## Moved on to the “Pipeline Plugin”

# Using DSLs to drive pipeline generation

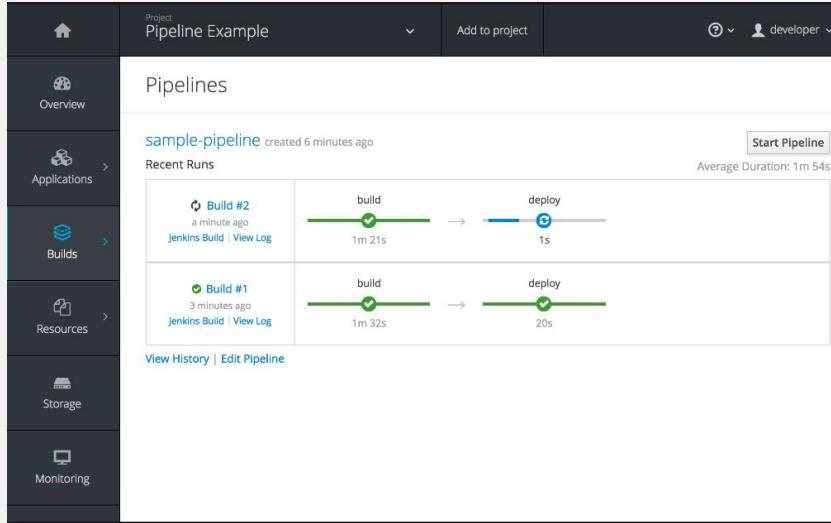
Developed Groovy and Java code to dynamically build pipelines

A lot of overhead and needs upkeep



# THE CIRCLE IS (ALMOST) COMPLETE

The story behind the Labs pipeline - CONT'



Project Pipeline Example

Pipelines

sample-pipeline created 6 minutes ago

Recent Runs

Build #2 a minute ago Jenkins Build | View Log

build → deploy

1m 21s 1s

Build #1 3 minutes ago Jenkins Build | View Log

build → deploy

1m 32s 20s

Start Pipeline

Average Duration: 1m 54s

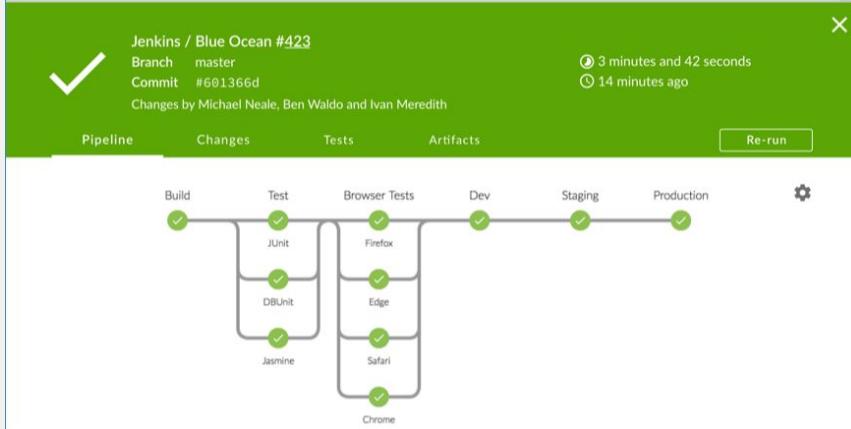
View History | Edit Pipeline

Jenkins 2.x part of OpenShift

OpenShift pipelines “natively”

# BLUE OCEAN

## The story behind the Labs pipeline - CONT'



Jenkins Blue Ocean used with Customers

Parallel Tracks for Builds / Deployments

Modern and Appealing Layout

# EVERYTHING MOVES AT LIGHTNING SPEED

**Have you ever asked:** Are we keeping up with the evolution of our tool chain?

Jenkins 1.x, 2.x, Pipeline Plugin, OpenShift Plugin, Blue Ocean  
Lots of customization means consuming a lot of resources

Make smart decisions and stick with them, for example:

who/what is responsible for resource creation & configuration  
who/what is responsible for app lifecycle

# ADVANCED DEPLOYMENT TECHNIQUES

# COMPLETE SETUP IN MINUTES

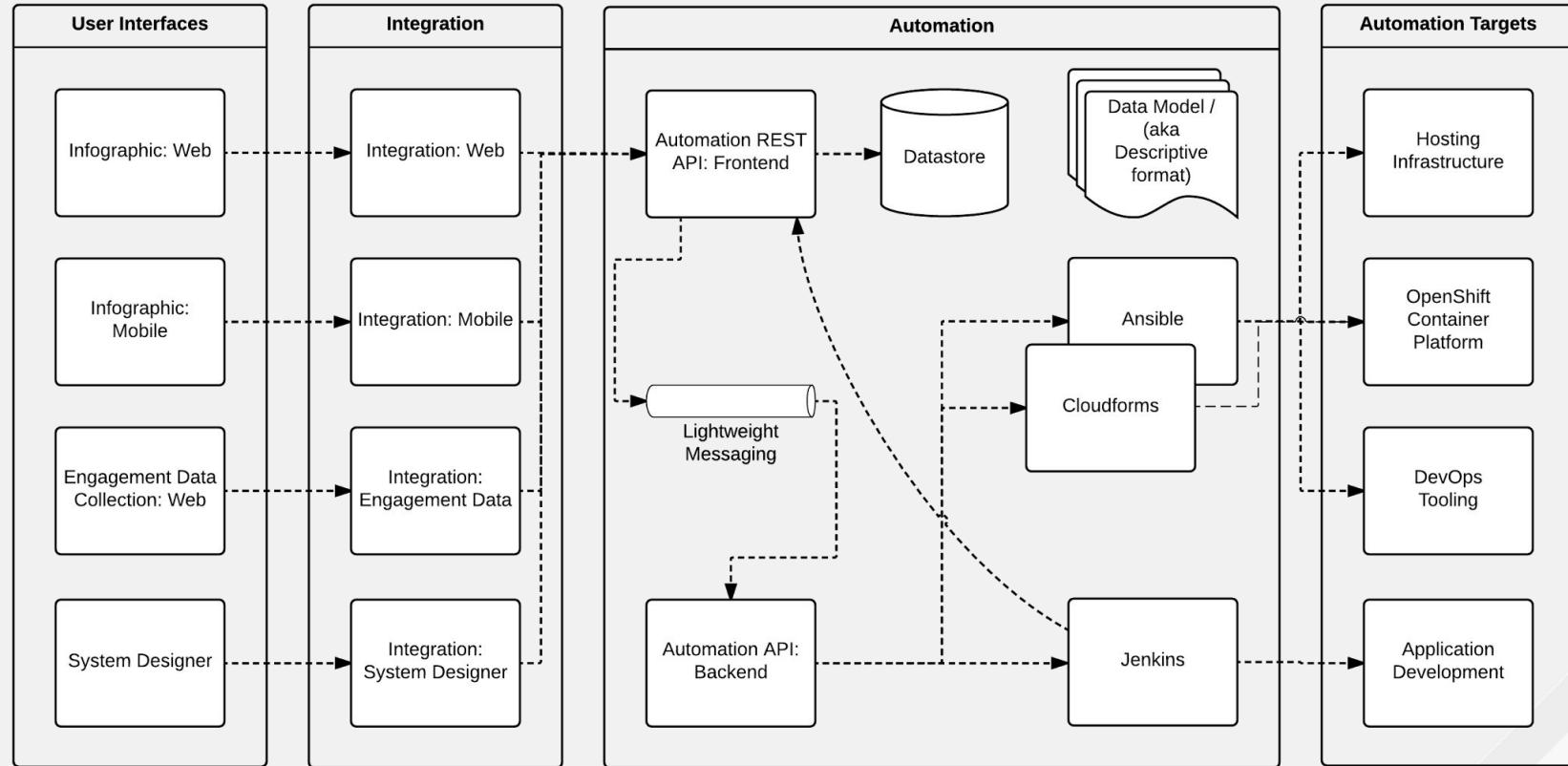
Labs has a need to quickly stand up new environments

We want to eliminate the complexity of the infrastructure

Enable quick re-deployments

Recall PBI - Push Button Infrastructure?

# PBI Conceptual Architecture



# ANSIBLE STACKS

ansible-stacks<sup>1</sup> built to consume the Automation API

## Automation Api

does not automate anything itself

defined using swagger<sup>2</sup>

application to store data, enables Labs to automate deployments<sup>3</sup>

<sup>1</sup> <https://github.com/rht-labs/ansible-stacks>

<sup>2</sup> <https://github.com/rht-labs/api-design>

<sup>3</sup> <https://github.com/rht-labs/automation-api>

# ANSIBLE STACKS - THE ROAD TRIP

Many options have been considered and tossed

Why build something that is not needed?

Remember who your customer is

At times a bit bumpy

How to best model OpenShift and K8S objects?

Why re-invent the wheel?

# DEMO POWERED BY ALL THE ABOVE

Labs is hosting a powerful and very interactive demo  
powered by all the above mentioned tools:  
infographic, CASL, ansible-stacks, automation-api

Come see us after the talk if you want to check it out

# NEXT STEPS

# WRAP UP

Microservices

Lab Build Outs - London, Boston

Come visit: <http://red.ht/labs>

# Q & A



# THANK YOU



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