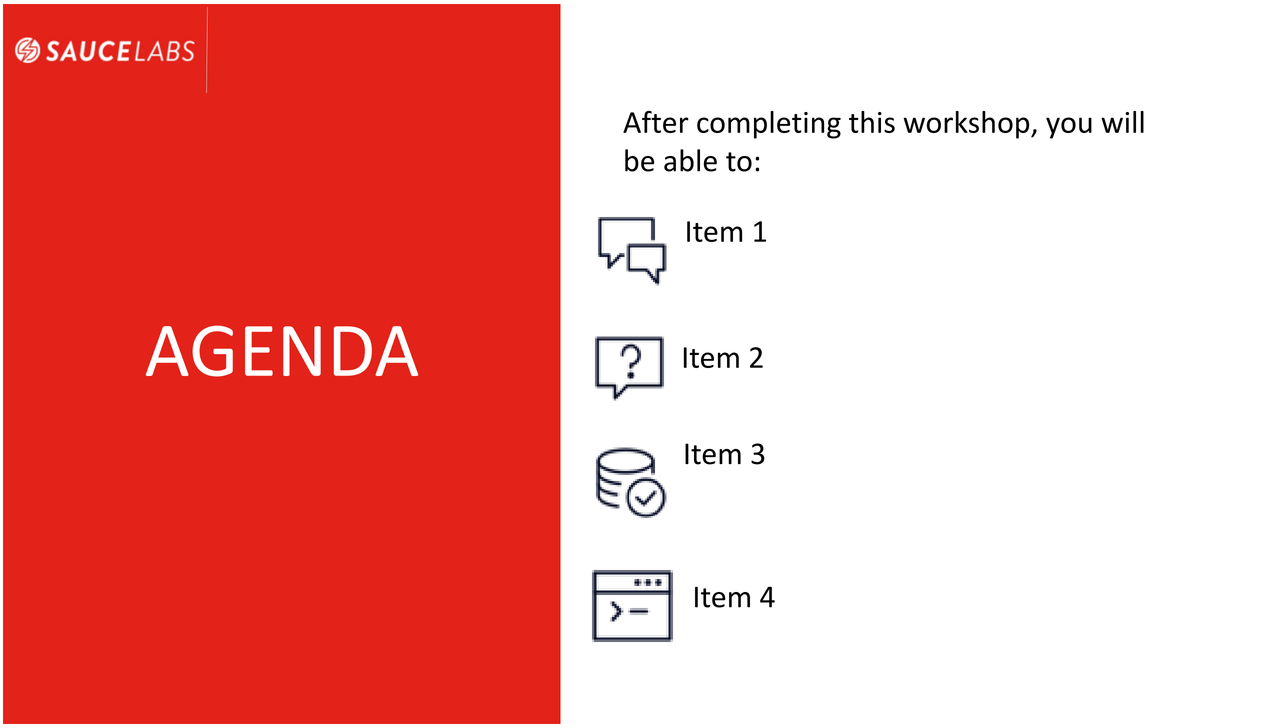
WELCOME TO THE WORKSHOP

Creating a Continuous Delivery Pipeline with Automated Testing

Josh Grant, STPCon 2019

1



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AGENDA

After completing this workshop, you will be able to:

- Item 1
- Item 2
- Item 3
- Item 4

2

Trainer Photo.

Your Trainer

Trainer NAME.

3

The New World of DevOps

4

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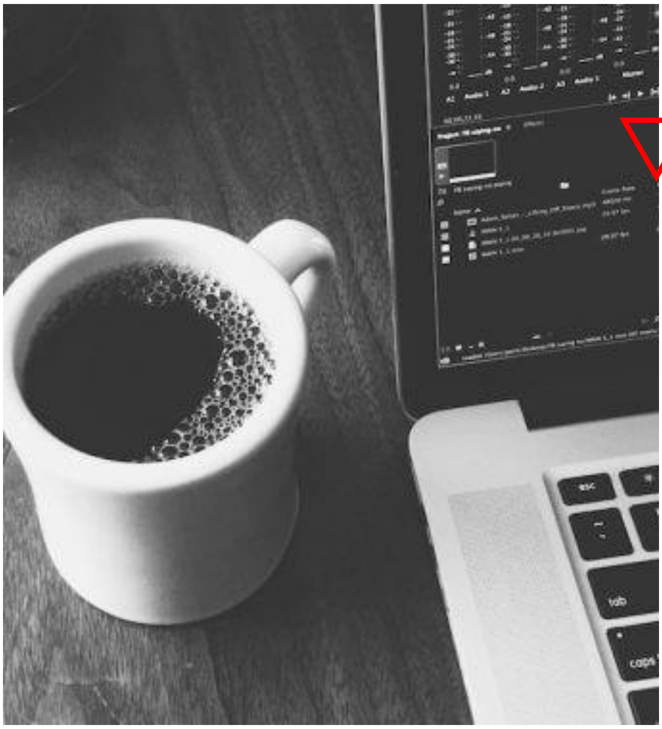
Buzz Word Salad

5



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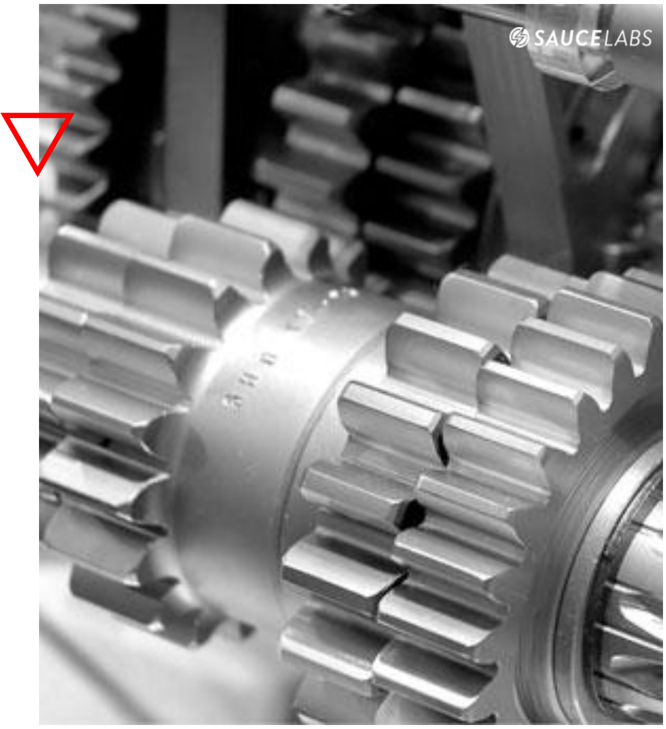
The Whole Point

- What the Money Wants
- More Sales
- More Users
- What the User Wants

6

More Agile

- Deliver Quality Software More Frequently
- Continuous Delivery Requires Continuous Testing



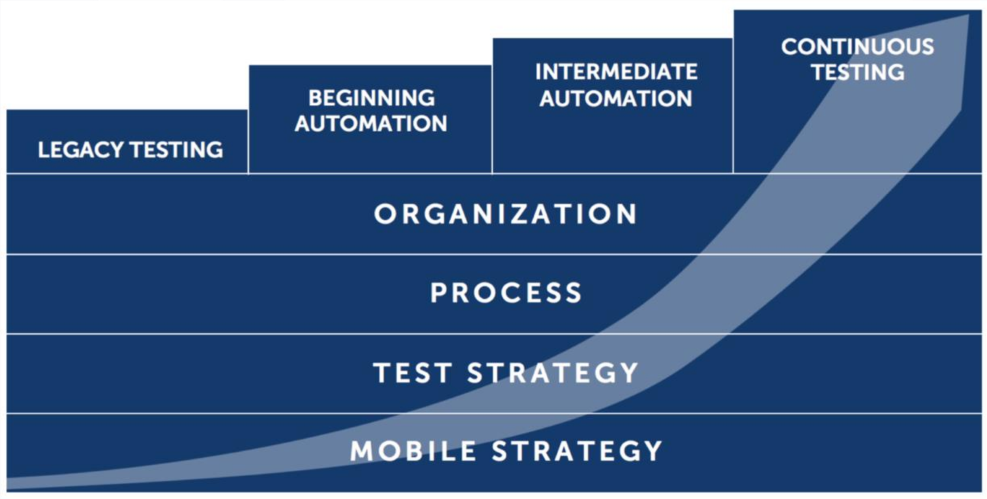
7

The Path to CI/CD

	Waterfall	Fast Waterfall	Continuous Integration	Continuous Delivery
Process	*Traditional sequential design model*	*Initial adoption of Agile*	*Agile Practice Embraced*	*Fully automated Development process*
Tools	***Manual testing dominates***	***Automated testing begins***	***Automated testing dominates;*** *manual only for debugging*	***Continuous Testing***
People	*Dev. & QA completely separate*	*Dev. & QA start communicate*	*Dev. and QA collaborate closely*	*Dev. and QA functions merge*

8

Customer Journey



LEGACY TESTING

BEGINNING AUTOMATION

INTERMEDIATE AUTOMATION

CONTINUOUS TESTING

ORGANIZATION

PROCESS

TEST STRATEGY

MOBILE STRATEGY

9

Vectors of Change

Know the state of all your environment components.

- Philosophy
- Organization
- Application Structure
- Code Versioning
- Dev Process
- Deployment

10

Philosophy Changes

Mean Time to Failure
vs
Mean Time to Recovery

- Proactive vs Reactive
- Expense
- Reliability
- Incentives
- Perception

11

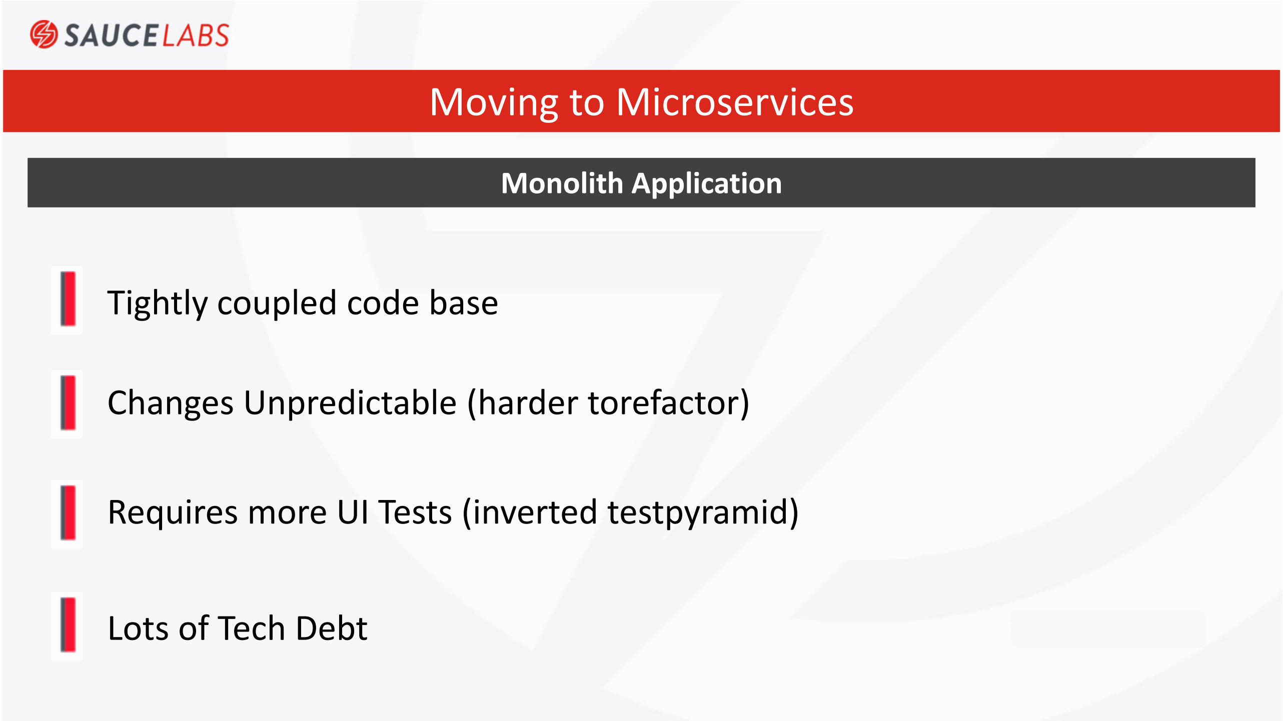
Organizational Changes

- Tester as a distinct role going away
- Developers are becoming testers
- Responsible for the quality of their own code
- Writing all of the necessary tests
- Ensuring the entire build and deployment
- Cross-Functional Agile TeamsSelf-contained team can convert idea to delivered solution

12

Moving to Microservices

13

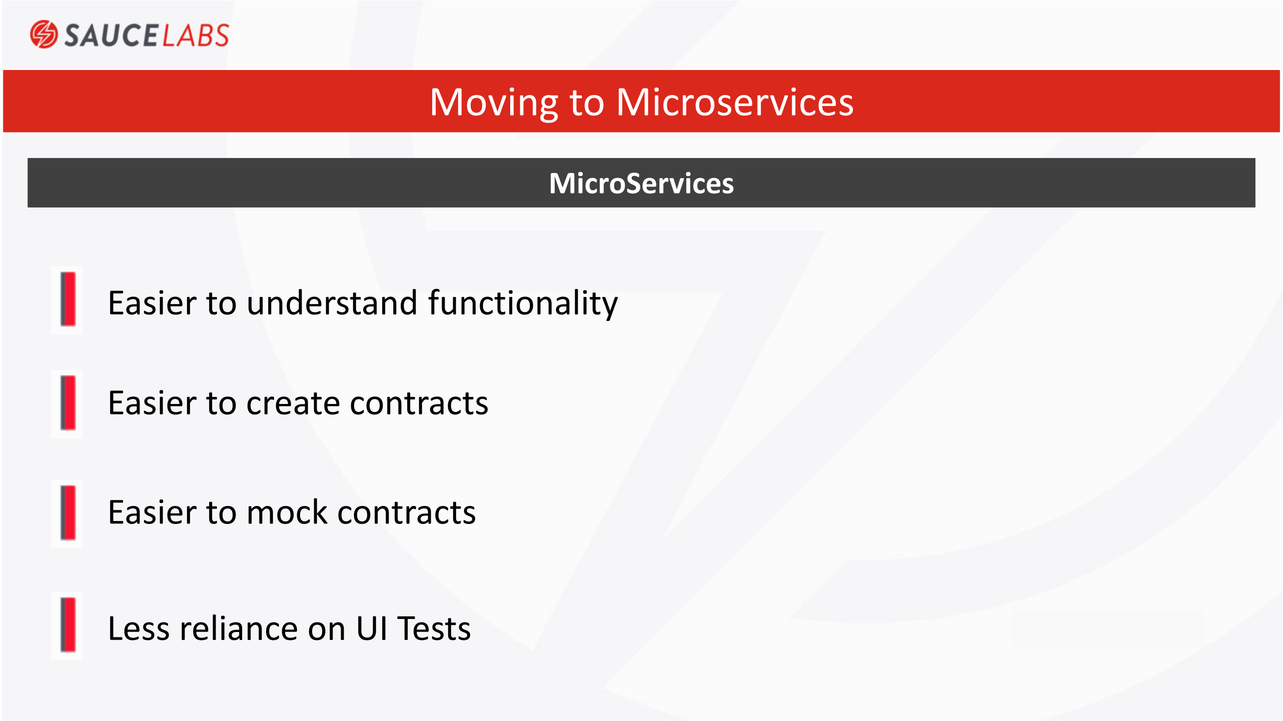


Moving to Microservices

Monolith Application

- Tightly coupled code base
- Changes Unpredictable (harder torefactor)
- Requires more UI Tests (inverted testpyramid)
- Lots of Tech Debt

14



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Moving to Microservices

MicroServices

- Easier to understand functionality
- Easier to create contracts
- Easier to mock contracts
- Less reliance on UI Tests

15

Application Changes

Kill the Monolith Applications

- Class for each page
- MicroService All the Things
- Mock Services, not Tests
- Contract Testing

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Code Versioning

Feature Branch
vs
Trunk Based Development

17

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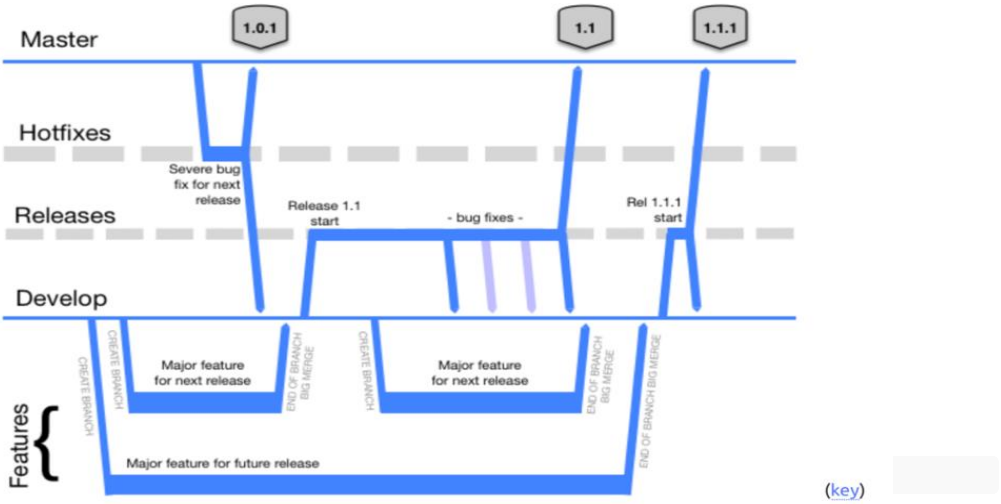
Feature Branches - Gitflow



- Diagram copied from Vincent Driessen's 2010 article on GitFlow: "A successful Git branching model"

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Feature Branches - Merge Party!!!!

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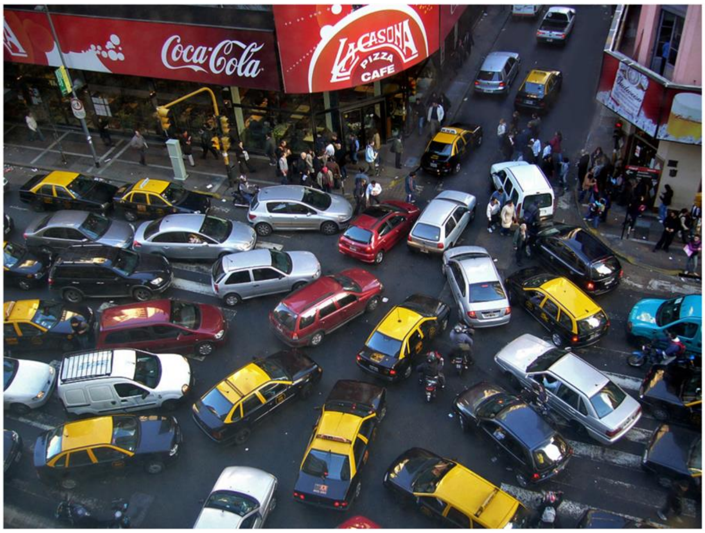
Feature Branches - Merge Party?

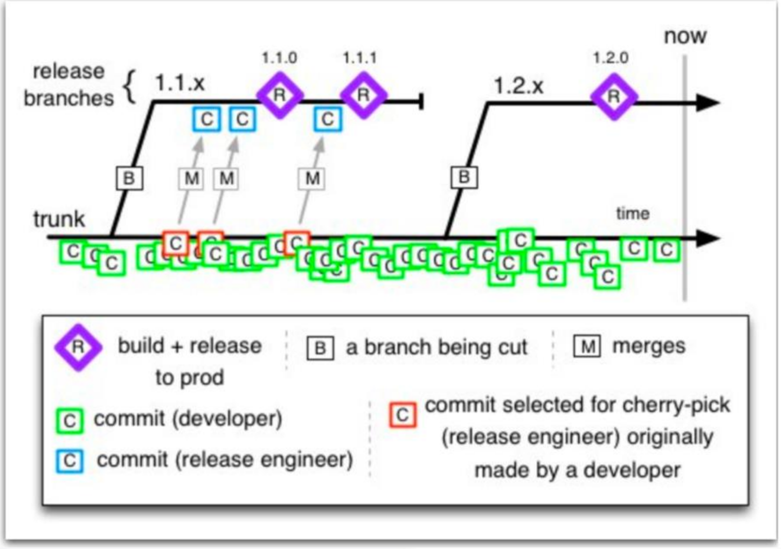
20

Feature Branches - Merging is Hard



21

Trunk Based



22

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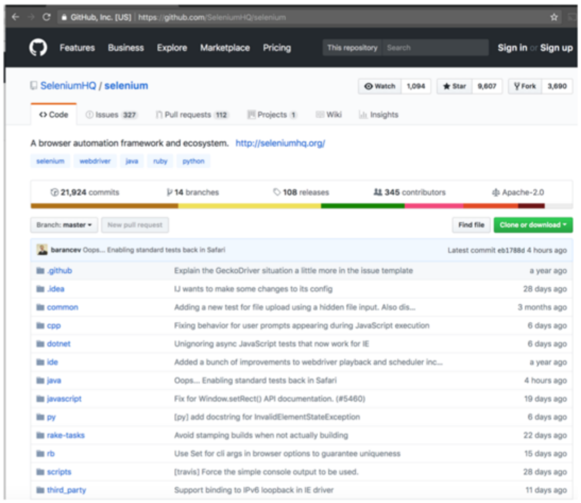
Mono Repo

Repeatable actions that scale across ALL pages

- Can *not* do true Continuous Delivery/Deployment
- Difficult to coordinate testing different versions of the same code base
- Always know exact readiness level of master for deployment



A browser automation framework and ecosystem. http://seleniumhq.org/

barancev Oops... Enabling standard tests back in Safari — Latest commit eb1788d 4 hours ago

.github	Explain the GeckoDriver situation a little more in the issue template	a year ago
.idea	IJ wants to make some changes to its config	28 days ago
common	Adding a new test for file upload using a hidden file input. Also dis...	3 months ago
cpp	Fixing behavior for user prompts appearing during JavaScript execution	6 days ago
dotnet	Unignoring async JavaScript tests that now work for IE	6 days ago
ide	Added a bunch of improvements to webdriver playback and scheduler inc...	a year ago
java	Oops... Enabling standard tests back in Safari	4 hours ago
javascript	Fix for Window.setRect() API documentation. (#5460)	19 days ago
py	[py] add docstring for InvalidElementStateException	6 days ago
rake-tasks	Avoid stamping builds when not actually building	22 days ago
rb	Use Set for cli args in browser options to guarantee uniqueness	15 days ago
scripts	[travis] Force the simple console output to be used.	28 days ago
third_party	Support binding to IPv6 loopback in IE driver	11 days ago

23

Process Changes

- Sprints vs Kanban
- Time Based vs Event Driven Testing

24

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Deployment Changes

- A container image is a lightweight, stand-alone, executable package of a piece of software that includes everything needed to run it: code, runtime, system tools, system libraries, settings.
- Kubernetes can schedule and run application containers on clusters of physical or virtual machines. Dispatcher orchestrating placement and timing of all container operations.
- Moving from a host-centric infrastructure to a container-centric infrastructure, which provides the full advantages and benefits inherent to containers. Kubernetes provides the orchestration to build a scalable container-centric deployment environment.

docker

kubernetes

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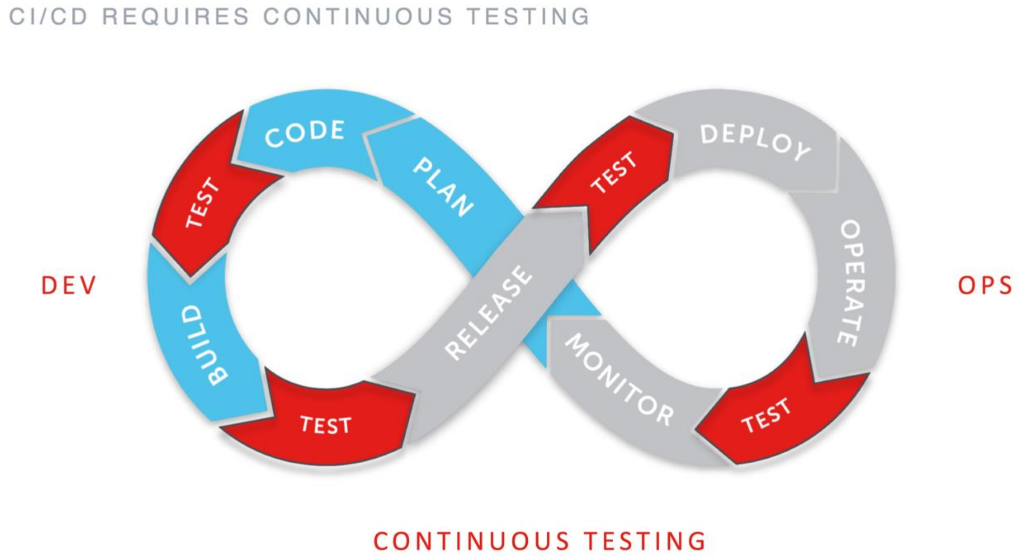
The Modern Development Tool Chain



SETTING UP A JENKINS PIPELINE DEMO

27

Jenkins Plugins

- Add Sauce Connect Plugin
- Add Github Pull Request Builder Plugin

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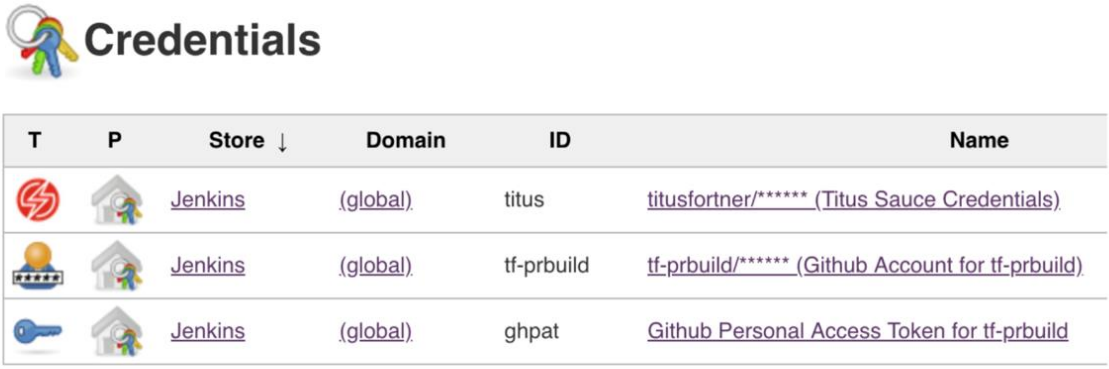
28

Jenkins Credentials

- Create Sauce Labs Credentials
- Create Secret Key Credentials for GitHub with Personal Access Token
- Create Username/Password Credentials for GitHub

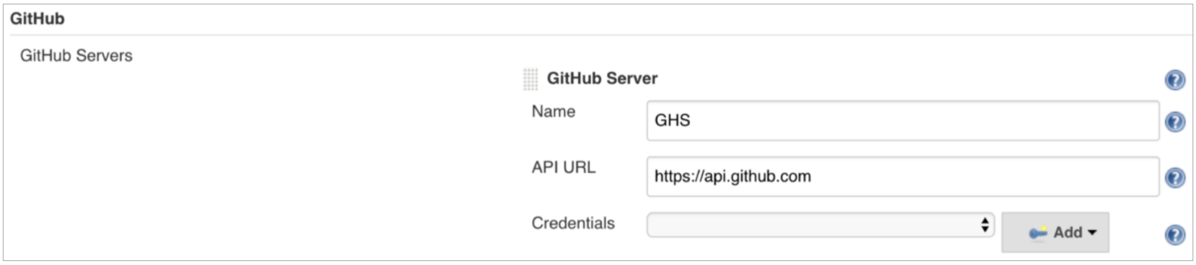


Credentials

T	P	Store ↓	Domain	ID	Name
	🏠	Jenkins	(global)	titus	titusfortner/****** (Titus Sauce Credentials)
👤	🏠	Jenkins	(global)	tf-prbuild	tf-prbuild/****** (Github Account for tf-prbuild)
🔑	🏠	Jenkins	(global)	ghpat	Github Personal Access Token for tf-prbuild

Jenkins Configure - GitHub

- Make sure API URL is correct
- It will be different if you have an Enterprise Account



GitHub

GitHub Servers

GitHub Server

Name: GHS

API URL: https://api.github.com

Credentials:

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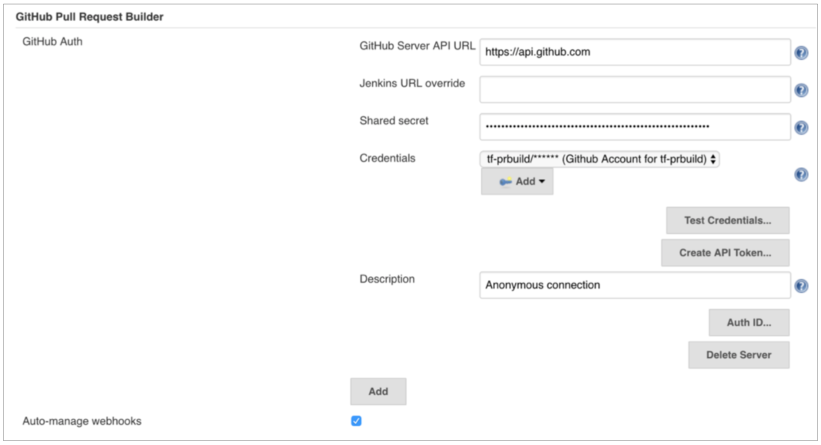
Jenkins Configure -Github Pull Request Plugin

- Make sure API URL is correct
- Use GitHub Username/Password Credentials



GitHub Pull Request Builder

GitHub Auth

GitHub Server API URL: https://api.github.com

Jenkins URL override:

Shared secret: ••

Credentials: tf-prbuild/****** (Github Account for tf-prbuild)

Description: Anonymous connection

Auto-manage webhooks ☑

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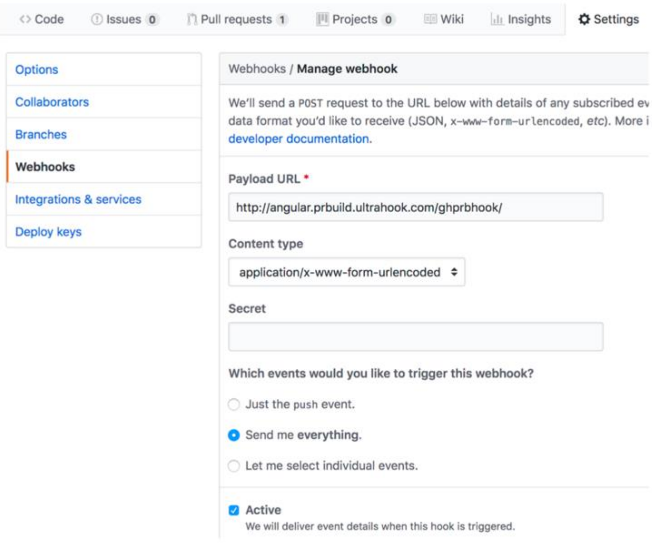
GitHub Project Setup

- Create a WebHook to point to Jenkins



Webhooks / **Manage webhook**

We'll send a `POST` request to the URL below with details of any subscribed ev
data format you'd like to receive (JSON, `x-www-form-urlencoded`, *etc*). More i
developer documentation.

Payload URL *

http://angular.prbuild.ultrahook.com/ghprbhook/

Content type

application/x-www-form-urlencoded

Secret

Which events would you like to trigger this webhook?

○ Just the `push` event.

● Send me **everything**.

○ Let me select individual events.

☑ Active

We will deliver event details when this hook is triggered.

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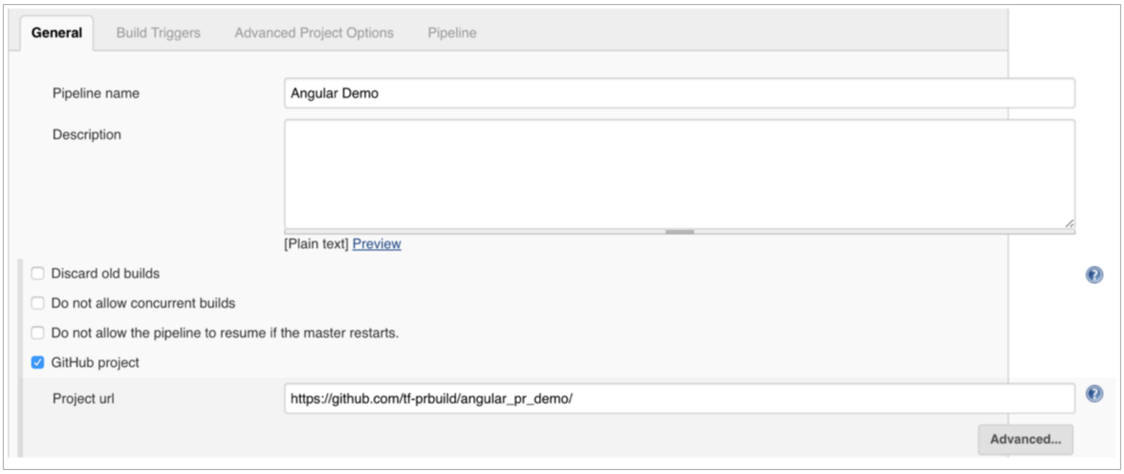
Jenkins Pipeline Project

- Point to GitHub Project



Pipeline name: Angular Demo

Description:

[Plain text] Preview

□ Discard old builds

□ Do not allow concurrent builds

□ Do not allow the pipeline to resume if the master restarts.

☑ GitHub project

Project url: https://github.com/tf-prbuild/angular_pr_demo/

33

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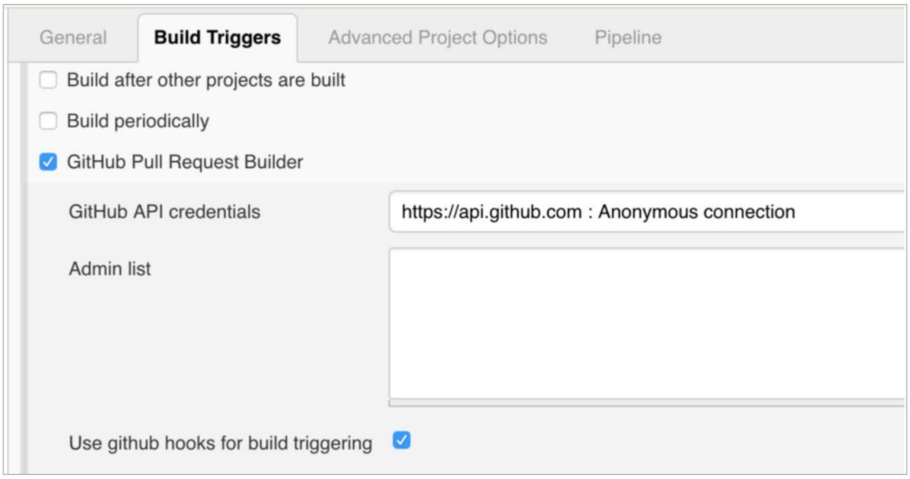
Jenkins Pipeline Build Trigger

- Use API for GHPRB Trigger
- Make sure hooks checkbox is checked



□ Build after other projects are built

□ Build periodically

☑ GitHub Pull Request Builder

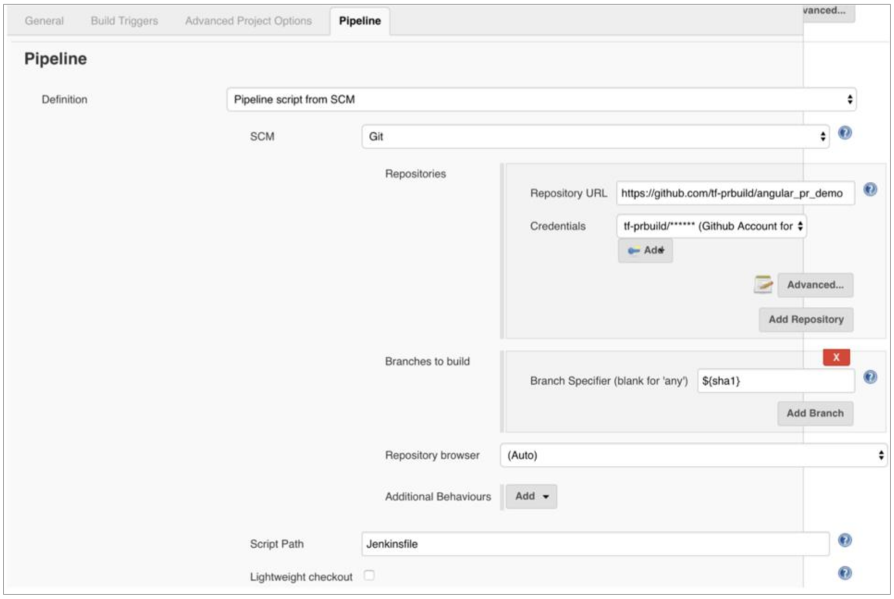
GitHub API credentials: https://api.github.com : Anonymous connection

Admin list:

Use github hooks for build triggering ☑

34

Jenkins Pipeline Settings



Pipeline

Definition: Pipeline script from SCM

SCM: Git

Repositories

Repository URL: https://github.com/tf-prbuild/angular_pr_demo

Credentials: tf-prbuild/****** (Github Account for

Branches to build

Branch Specifier (blank for 'any'): ${sha1}

Repository browser: (Auto)

Additional Behaviours: Add

Script Path: Jenkinsfile

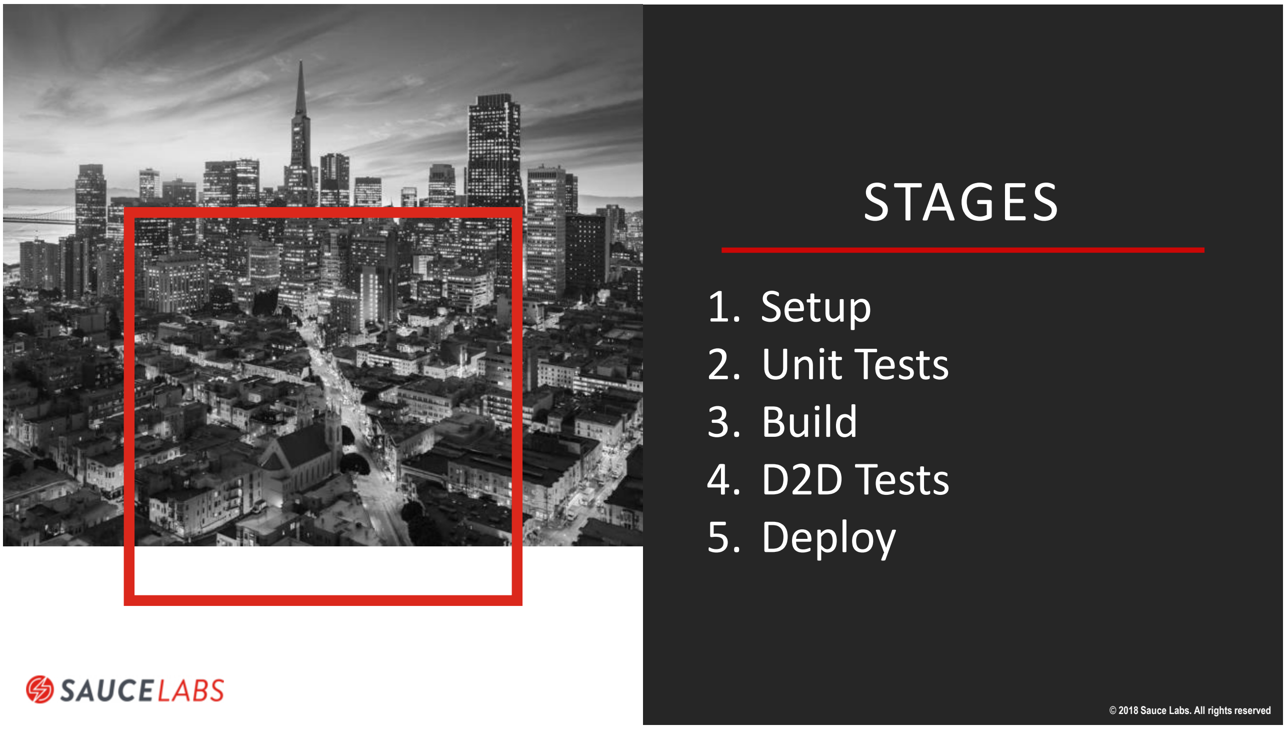
Lightweight checkout □

35

Jenkins Pipeline Settings

- Specify SCM & GitHub
- Specify Repository
- Specify Credentials for GitHub Username/Password
- Branch Specifier needs to be: ${sha1}
- Make sure “Lightweight checkout” is NOT checked

36



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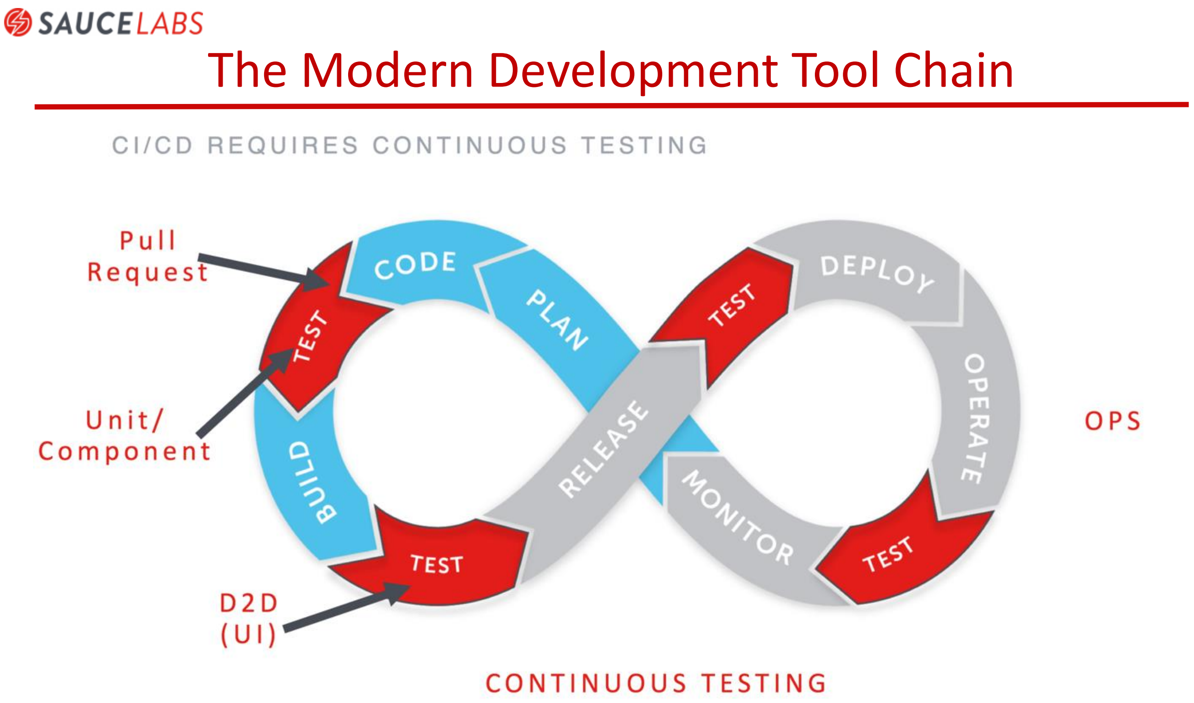
STAGES

1. Setup
2. Unit Tests
3. Build
4. D2D Tests
5. Deploy

37



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The Modern Development Tool Chain

CI/CD REQUIRES CONTINUOUS TESTING

38

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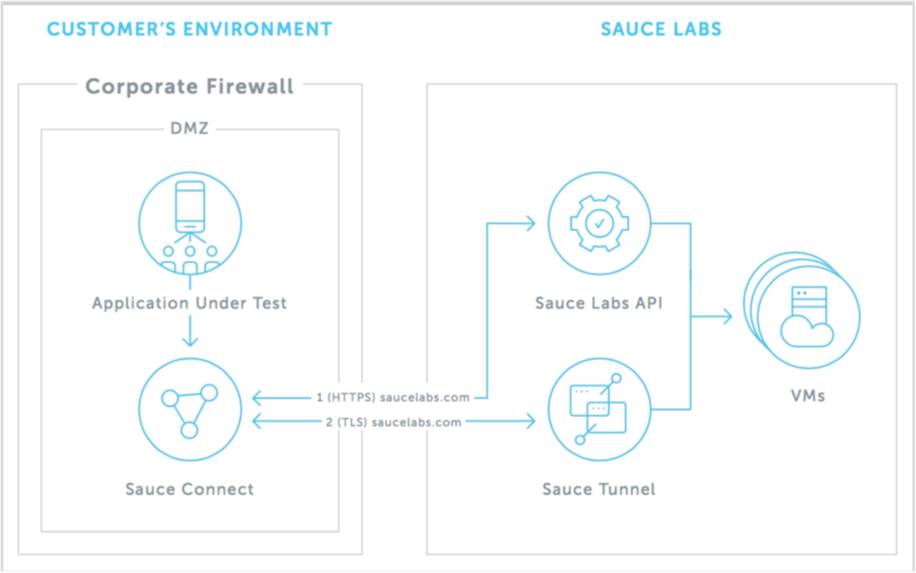
Sauce Connect



39

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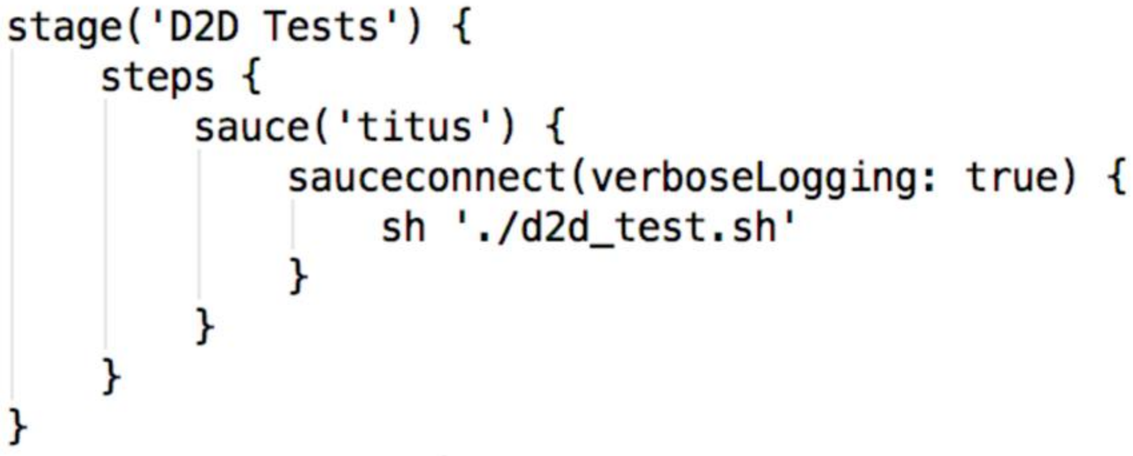
JenkinsFile - Sauce Connect



```
stage('D2D Tests') {
    steps {
        sauce('titus') {
            sauceconnect(verboseLogging: true) {
                sh './d2d_test.sh'
            }
        }
    }
}
```

40

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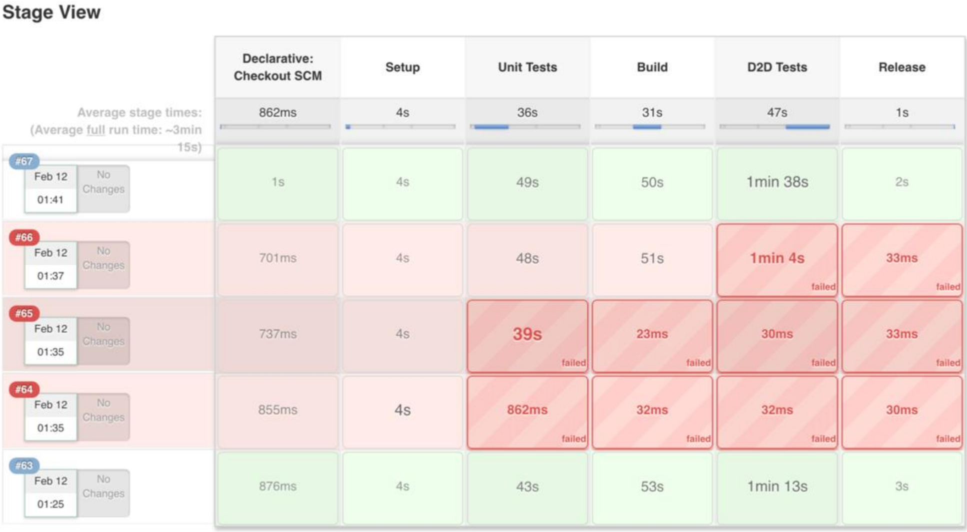
Pipeline Results



Stage View

Average stage times: (Average full run time: ~3min 15s)	Declarative: Checkout SCM	Setup	Unit Tests	Build	D2D Tests	Release
	862ms	4s	36s	31s	47s	1s
#67 Feb 12 01:41 No Changes	1s	4s	49s	50s	1min 38s	2s
#66 Feb 12 01:37 No Changes	701ms	4s	48s	51s	1min 4s failed	33ms failed
#65 Feb 12 01:35 No Changes	737ms	4s	39s failed	23ms failed	30ms failed	33ms failed
#64 Feb 12 01:35 No Changes	855ms	4s	862ms failed	32ms failed	32ms failed	30ms failed
#63 Feb 12 01:25 No Changes	876ms	4s	43s	53s	1min 13s	3s

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PR Process Summary

- Code inspection
- All Unit Tests
- Unit Test Coverage Check
- All Integration Tests
- All UI Tests
- UI Test Coverage
- Merge
- Deploy to Prod
- UI Test on Prod

Let’s do this!