

JENKINS X

automated CI/CD solution for cloud native applications
on Kubernetes

<https://jenkins-x.io/>

tedwon <jwon@redhat.com>

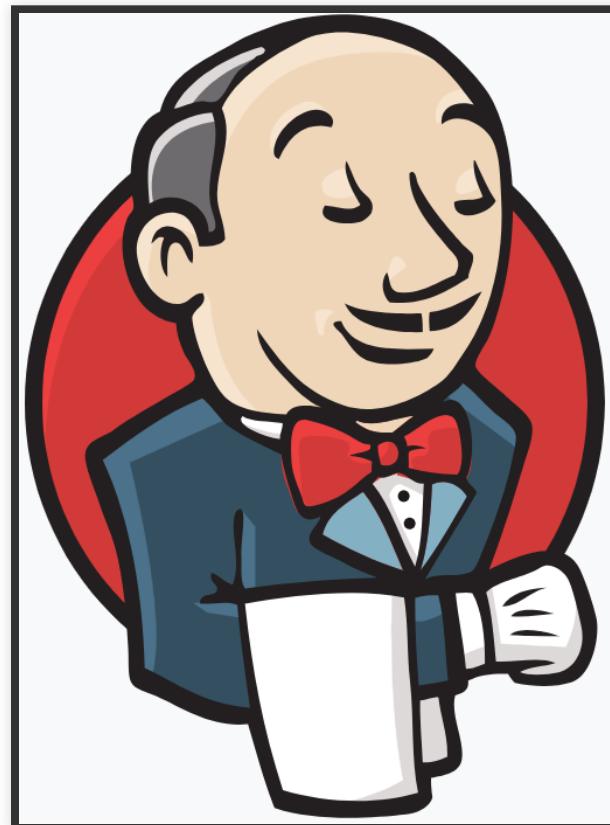
**I AM A RED HAT JBOSS SENIOR SME AT
SEOUL**

SOFTWARE MAINTENANCE ENGINEER

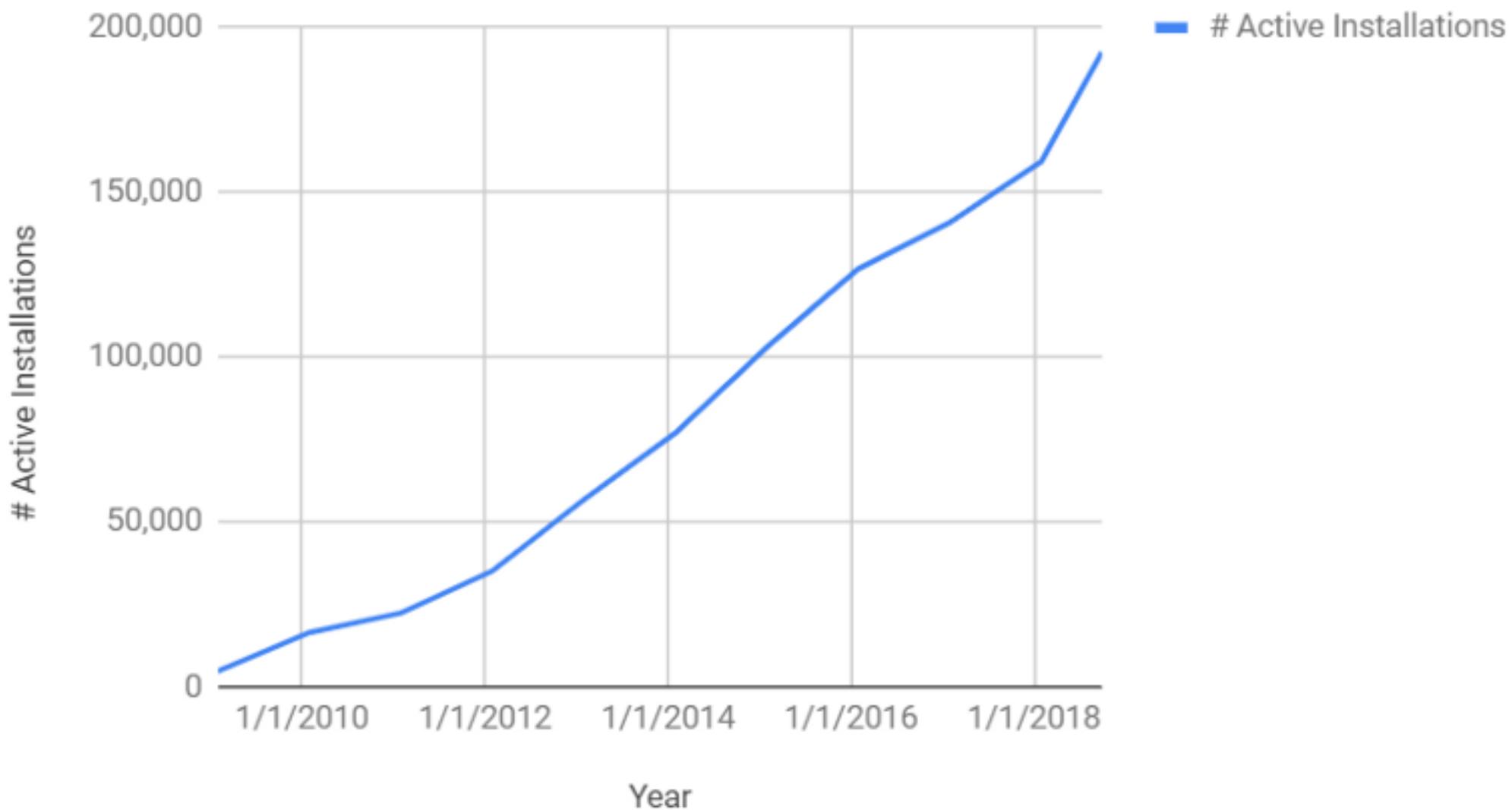
JENKINS VS JENKIS X

JENKINS

- <https://jenkins.io/>

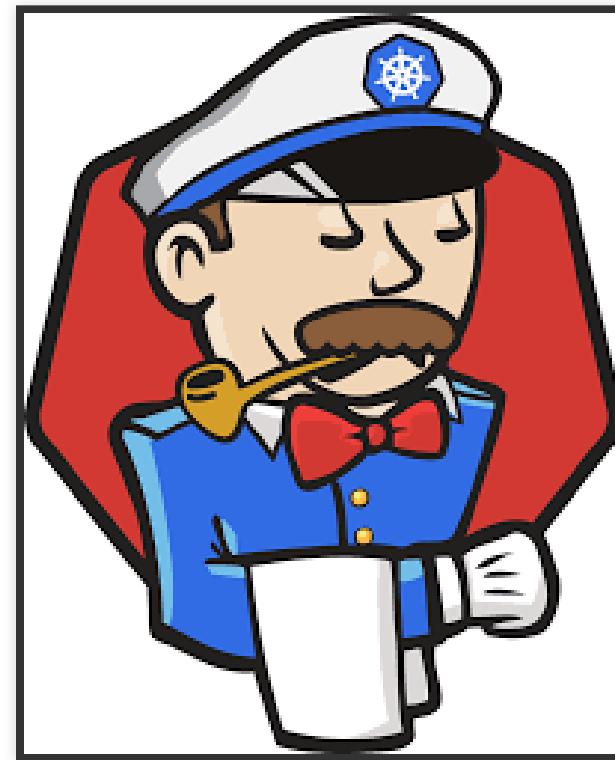


Active Installations vs. Year



JENKINS X

- <https://jenkins-x.io/>



JENKINS X - WHAT WE NEED TO DO

Code change ⇒ Pull Request ⇒ Review

⇒ Merge ⇒ Staging ⇒ Production

WHAT ARE THE CHANGES?

- Move from on premise to cloud
- Move from VMs to containers
- Immutable infrastructure for DevOps
- Kubernetes has become the defacto standard
- Move from monoliths to microservices
- Become high performing teams via CI/CD

WHAT ARE THE CHALLENGES?

- How do I migrate my applications to the cloud?
- How do dev teams work with Kubernetes?
- What do I need to start developing, building and deploying?
- How do I wire everything together?
- How do I access my applications?

STARTED BY JAMES STRACHAN



James Strachan

@jstrachan

Following

I'm super excited to announce Jenkins X:
automated CI / CD for kubernetes
jenkins.io/blog/2018/03/1 ... please let us
know what you think! jenkins-x.io
[#CICDforK8s](#)



3:10 AM - 20 Mar 2018

451 Retweets 695 Likes



STARTED BY JAMES STRACHAN

- Released at March of this year, 2018
 - <https://twitter.com/jstrachan/status/9757967221474>
 - <https://goo.gl/ceLcmq>
 - <https://github.com/jenkins-x/jx/graphs/contributors>
- Founder of Groovy, Apache ActiveMQ/Camel
 - <https://www.linkedin.com/in/jstrachan/>
 - <https://medium.com/@jstrachan>

STARTED BY JAMES STRACHAN

- Developed similar project in Red Hat until last year, 2017
 - <https://goo.gl/4re3G7>
- gofabric8
 - <https://github.com/fabric8io/gofabric8>
 - <http://fabric8.io/>

FEATURES OF JENKINS X

- Automated CI and CD
- Environment Promotion via GitOps
- Pull Request Preview Environments
- Feedback on Issues and Pull Requests

SUPPORTED CLOUD PROVIDERS

- Google Container Engine
- OpenShift
- Amazon Elastic Container Service
- Azure Container Service
- IBM Cloud Kubernetes Service
- Oracle Cloud Container Engine

https://jenkins-x.io/commands/jx_create_cluster/

HOW DOES JENKINS X HELP?

- Jenkins
 - CI/CD pipeline solution
- Nexus
 - Artifact repository
- <https://helm.sh>
 - Package manager for Kubernetes

HOW DOES JENKINS X HELP?

- Chartmuseum
 - Helm Chart repository
- Monocular
 - Web UI for helm charts
- <https://draft.sh>
 - Build packs to bootstrap applications
- Skaffold
 - Tool for building docker images on kubernetes

HELM CHART

- Helm Chart is a packaging format.
- A chart is a collection of files that describe a related set of Kubernetes resources.

```
~/demo/charts/demo(master) » tree .
```

```
.
├── Chart.yaml
├── Makefile
├── README.md
├── charts
├── templates
│   ├── NOTES.txt
│   ├── _helpers.tpl
│   ├── deployment.yaml
│   └── service.yaml
└── values.yaml
```



tedwon

All

+

S	W	Name ↓	Last Success	Last Failure	Last Duration
		demo1030	10 min - log	N/A	1.9 sec
		environment-jwon-k8s-cluster-1030-production	2 min 10 sec - log	N/A	2.3 sec
		environment-jwon-k8s-cluster-1030-staging	10 min - log	N/A	1.9 sec
		starter1030	7 min 10 sec - log	N/A	2.4 sec

Icon: [S](#) [M](#) [L](#)[Legend](#) [RSS for all](#) [RSS for failures](#) [RSS for ju](#)ler
y
ationship
Fingerprint
Oceans
s

queue.

or Status



Jenkins

[Pipelines](#)[Administration](#)[Logout](#)[Pipelines](#) [New Pipeline](#)

NAME	HEALTH	BRANCHES	PR	
tedwon / demo1030		1 passing	-	
tedwon / environment-jwon-k8s-cluster-1030-production		1 passing	-	
tedwon / environment-jwon-k8s-cluster-1030-staging		1 passing	-	
tedwon / starter1030		1 passing	-	

aster ↗

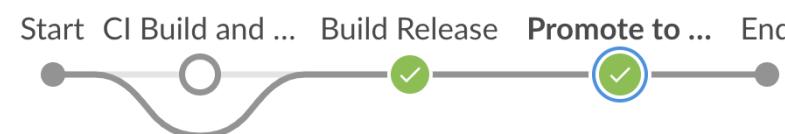
7m 15s

Changes by jwon

9919ea

20 hours ago

Push event to branch master



to Environments - 4m 11s

[Restart Promote to Environments](#)

step changelog --version v\$(cat ../../VERSION) — Shell Script

step helm release — Shell Script

promote -b --all-auto --timeout 1h --version \$(cat ../../VERSION) — Shell Script

Delete workspace when build is done



Browse

 Browse assets and components

Filter

	Name ↑	Type	Format	Status	URL	Health
	jenkins-public	proxy	maven2	Online - Remote Available		
	jitpack	proxy	maven2	Online - Remote Available		
	maven-central	proxy	maven2	Online - Remote Available		
	maven-group	group	maven2	Online		
	maven-jenkinsci	proxy	maven2	Online - Remote Available		
	maven-public	group	maven2	Online		
	maven-releases	hosted	maven2	Online		
	maven-snapshots	hosted	maven2	Online		
	nuget-group	group	nuget	Online		
	nuget-hosted	hosted	nuget	Online		
	nuget.org-proxy	proxy	nuget	Online - Ready to Connect		
	spring-milestone	proxy	maven2	Online - Remote Available		
	spring-release	proxy	maven2	Online - Remote Available		

Jenkins X Apps

[Charts](#) • [About](#)

Discover & launch great
Kubernetes-ready apps

Search charts...

2 charts ready to deploy



demo1030

chartmuseum



starter

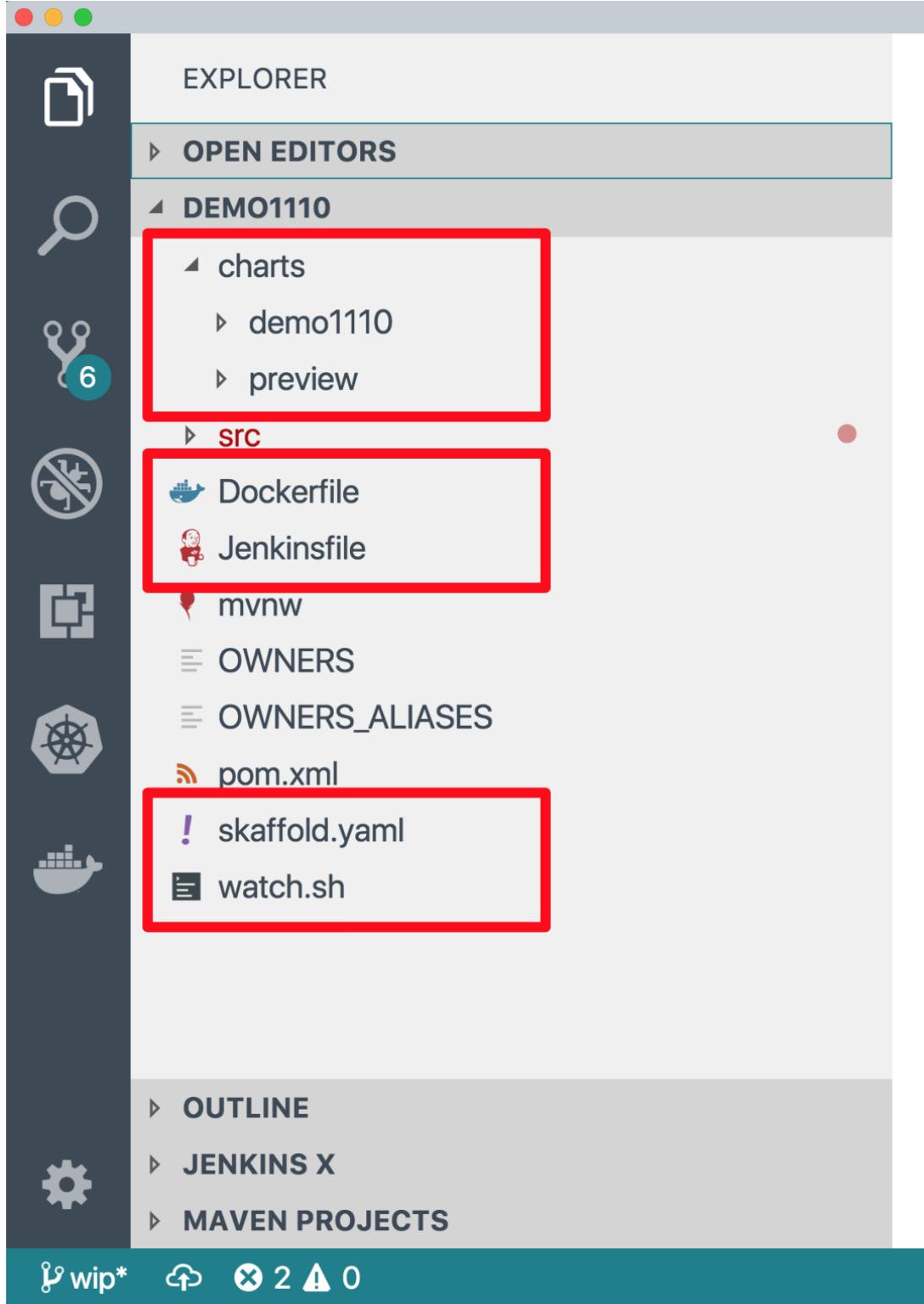
chartmuseum

HOW DOES JENKINS X HELP?

```
jx open
```

jenkins	http://jenkins.jx.x.x.x.x.nip.io
jenkins-x-chartmuseum	http://chartmuseum.jx.x.x.x.x.nip.io
jenkins-x-docker-registry	http://docker-registry.jx.x.x.x.x.nip.io
jenkins-x-monocular-ui	http://monocular.jx.x.x.x.x.nip.io
nexus	http://nexus.jx.x.x.x.x.nip.io

IMPORT MAVEN PROJECT



The screenshot shows the Visual Studio Code (VS Code) interface with the following details:

- EXPLORER** sidebar:
 - OPEN EDITORS**: JX
 - JX**: .vscode, angular-io-quickstart, demo1110 (containing .mvn, .settings, charts, src, target, .classpath, .dockerignore, .gitignore, .helmignore, .project)
 - Dockerfile** (highlighted in green)
 - Jenkinsfile**
 - mvnw**
 - mvnw.cmd**
 - OWNERS**
 - OWNERS_ALIASES**
 - pom.xml**
 - OUTLINE**
 - JENKINS X**
 - MAVEN PROJECTS**
- Dockerfile — jx** editor tab:
 - Dockerfile** (highlighted in blue)
 - Content:

```
1 FROM openjdk:8-jdk-slim
2 ENV PORT 8080
3 ENV CLASSPATH /opt/lib
4 EXPOSE 8080
5
6 # copy pom.xml and wildcards to avoid this command failing if there's no target/
7 COPY pom.xml target/lib*/ /opt/lib/
8
9 # NOTE we assume there's only 1 jar in the target dir
10 # but at least this means we don't have to guess the name
11 # we could do with a better way to know the name -- or to always create an app.jar
12 COPY target/*.jar /opt/app.jar
13 WORKDIR /opt
14 CMD ["java", "-jar", "app.jar"]
```
- Bottom status bar**: wip, 0, 0, Ln 1, Col 24, Spaces: 4, UTF-8, LF, Dockerfile, smiley icon, bell icon.

The screenshot shows the Visual Studio Code interface with the following details:

- File Explorer (Left):** Shows the project structure under "OPEN EDITORS".
 - JX**: Contains ".vscode", "angular-io-quickstart", "demo1110" (selected), and various configuration files like ".mvn", ".settings", "charts", "src", "target", ".classpath", ".dockerignore", ".gitignore", ".helmignore", ".project", and "Dockerfile".
 - Jenkinsfile**: The active file, highlighted with a green bar.
 - OUTLINE**, **JENKINS X**, and **MAVEN PROJECTS** are also listed.
- Editor (Center):** Displays the Jenkinsfile content in Groovy syntax.

```
1 pipeline {  
2     agent {  
3         label "jenkins-maven"  
4     }  
5     environment {  
6         ORG = 'tedwon'  
7         APP_NAME = 'demo1110'  
8         CHARTMUSEUM_CREDS = credentials('jenkins-x-chartmuseum')  
9     }  
10    stages {  
11        stage('CI Build and push snapshot') {  
12            when {  
13                branch 'PR-*'  
14            }  
15            environment {  
16                PREVIEW_VERSION = "0.0.0-SNAPSHOT-$BRANCH_NAME-$BUILD_NUMBER"  
17                PREVIEW_NAMESPACE = "$APP_NAME-$BRANCH_NAME".toLowerCase()  
18                HELM_RELEASE = "$PREVIEW_NAMESPACE".toLowerCase()  
19            }  
20            steps {  
21                container('maven') {  
22                    sh "mvn versions:set -DnewVersion=$PREVIEW_VERSION"  
23                    sh "mvn install"  
24                    sh 'export VERSION=$PREVIEW_VERSION && skaffold build -f skaffold.yaml'  
25  
26                    sh "jx step post build --image $DOCKER_REGISTRY/$ORG/$APP_NAME:$PREVI  
27                }  
28            }  
29        }  
30        dir ('./charts/preview') {
```
- Bottom Status Bar:** Shows "Ln 1, Col 1" and "Spaces: 2" followed by file encoding options: "UTF-8", "LF", "Groovy". It also includes icons for "wip", "cloud", "x", "0", "▲", "0", and a smiley face.
- Bottom Right:** Includes a page number "29".

[Code](#)[Issues 13](#)[Pull requests 7](#)[Projects 0](#)[Wiki](#)[Insights](#)Branch: [master](#) ▾[draft-packs](#) / [packs](#) / [maven](#) /[Create new file](#)[Upload files](#)[Find file](#)[riqbal-rocketlawyer](#)

Disable concurrent builds on master

Latest commit 175f15f 24 days ago

..

 charts	fixed typo	2 months ago
 preview	fix #1134	4 months ago
 .dockerignore	remove `Dockerfile` from `.dockerignore`	7 months ago
 .gitignore	feat:(gradle) got working gradle pack	8 months ago
 .helmignore	include a .helmignore file so we dont package up unwanted files	5 months ago
 Dockerfile	lets switch to slim jdk images	6 months ago
 Jenkinsfile	Disable concurrent builds on master	24 days ago
 skaffold.yaml	fix: skaffold dev profile by using the proper tag	2 months ago
 watch.sh	feat:(watch) add watch script for java projects	2 months ago

Branch: master ▾

[draft-packs](#) / [packs](#) /[Create new file](#)[Upload files](#)[Find file](#)

H

[riqbal-rocketlawyer](#) Disable concurrent builds on master

Latest commit 175f15f 24 day

..

[appserver](#)

Disable concurrent builds on master

24 day

[csharp](#)

Disable concurrent builds on master

24 day

[go](#)

Disable concurrent builds on master

24 day

[gradle](#)

Disable concurrent builds on master

24 day

[javascript](#)

Disable concurrent builds on master

24 day

[liberty](#)

Disable concurrent builds on master

24 day

[maven](#)

Disable concurrent builds on master

24 day

[php](#)

fix: skaffold dev profile by using the proper tag

2 month

[python](#)

Disable concurrent builds on master

24 day

[ruby](#)

Disable concurrent builds on master

24 day

[rust](#)

Disable concurrent builds on master

24 day

[scala](#)

Disable concurrent builds on master

24 day

[swift](#)

fix: skaffold dev profile by using the proper tag

2 month

[README.md](#)

moved from jenkins x draft fork

8 month

ENVIRONMENT PROMOTION VIA GITOPS

```
jx env  
  
? Pick environment: [Use arrows to move, type to filter]  
> dev  
  production  
  staging
```

- Development Environment
- Staging Environment
- Production Environment

```
~/jx » jx get env
NAME      LABEL      KIND      PROMOTE    NAMESPACE      ORDER CLUSTER SOURCE
dev       Development Development Never    jx            0
staging   Staging     Permanent   Auto     jx-staging    100          https://github.com/tedwon/environment-jwon-k8s-cluster-1110-staging.git
production Production Permanent   Manual   jx-production 200          https://github.com/tedwon/environment-jwon-k8s-cluster-1110-production.git
```

DEMO & ENVIRONMENT GIT REPOSITORY

[environment-jwon-k8s-cluster-1030-staging](#)

● Makefile ⚙ Apache License 2.0 Updated 16 hours ago



[environment-jwon-k8s-cluster-1030-production](#)

● Makefile ⚙ Apache License 2.0 Updated 18 hours ago



[demo1030](#)

● Makefile Updated 20 hours ago



JX GET APPLICATIONS

```
~/jx » jx get apps
APPLICATION STAGING PODS URL                                     PRODUCTION PODS URL
demo1110  0.0.1  1/1  http://demo1110.jx-staging.35.243.86.163.nip.io
starter1110 1.0.1  1/1  http://starter1110.jx-staging.35.243.86.163.nip.io
```

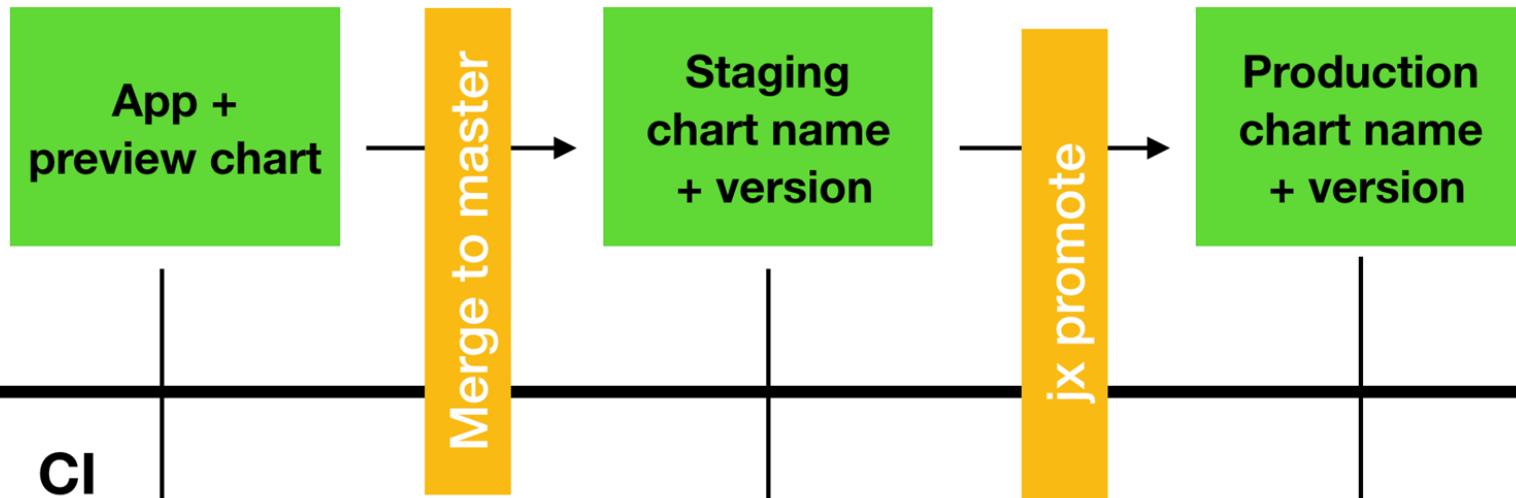
```
~/jx » jx get apps
APPLICATION STAGING PODS URL                                PRODUCTION PODS URL
demo1110  0.0.1  1/1  http://demo1110.jx-staging.35.243.86.163.nip.io
starter1110 1.0.1  1/1  http://starter1110.jx-staging.35.243.86.163.nip.io
```

JX GET PREVIEWS

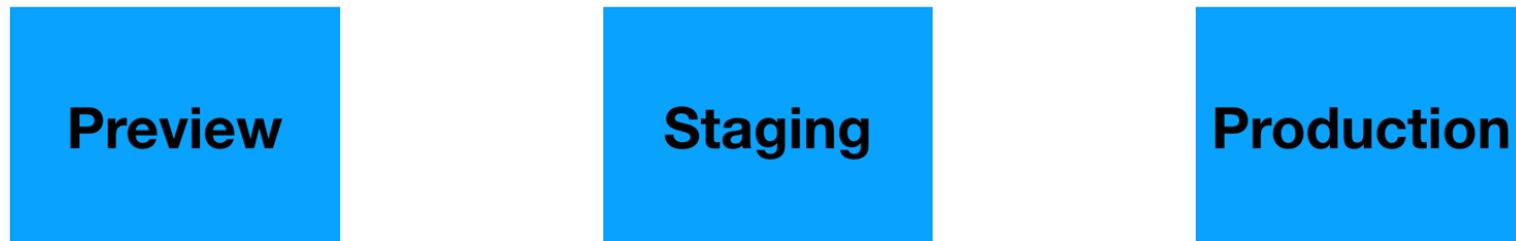
```
~/jx » jx get previews
PULL REQUEST          NAMESPACE      APPLICATION
https://github.com/pull/2/pull/2 jx-pull-2-pr-2 http://demo1110.jx-pull-2-pr-2.35.243.86.163.nip.io
```

```
~/jx » jx get previews
PULL REQUEST          NAMESPACE          APPLICATION
https://github.com/pull/2/pull/2  jx-pull-2-pr-2  http://demo1110.jx-pull-2-pr-2.35.243.86.163.nip.io
```

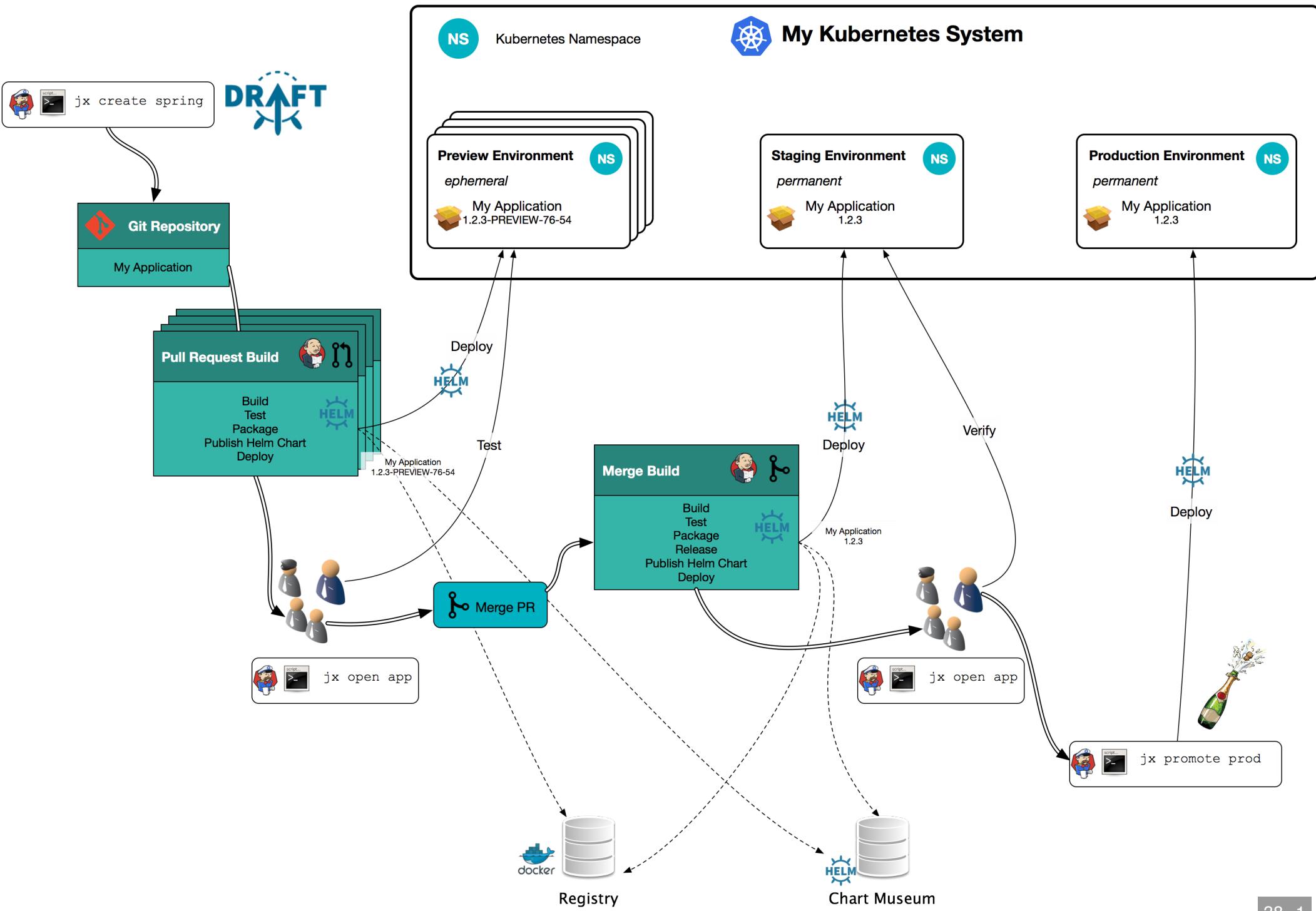
Git Repositories

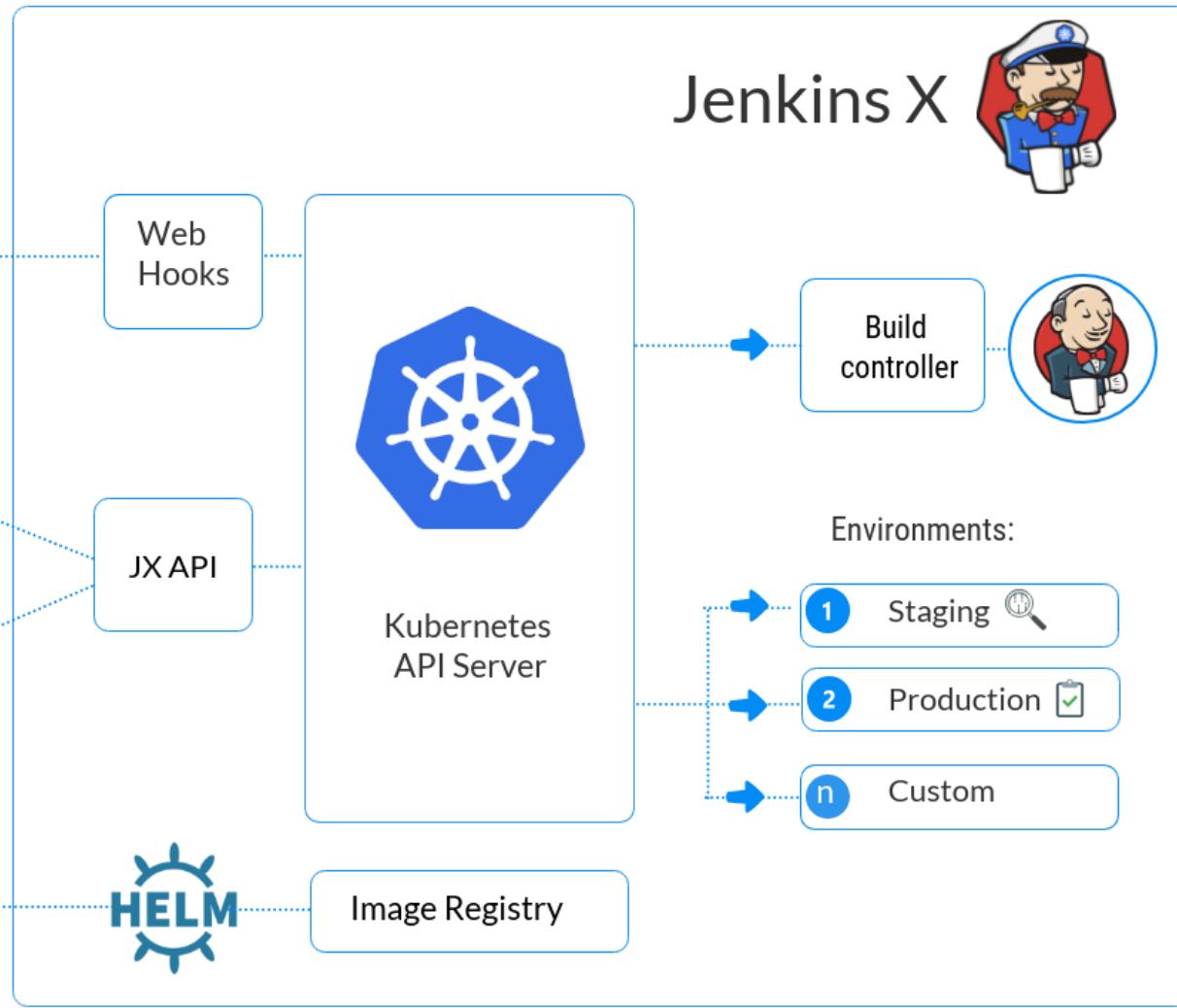


Jenkins



Environments in Kubernetes





HOW DO WE SETUP KUBERNETES + JENKINS X?

- Install the jx command line tool
 - <http://jenkins-x.io/getting-started/install/>

```
macOs:
```

```
brew tap jenkins-x/jx
brew install jx
```

```
linux:
```

```
curl -L https://github.com/jenkins-x/jx/releases/download/v1.3.46
sudo mv jx /usr/local/bin
```

HOW DO WE SETUP KUBERNETES + JENKINS X?

- If using the public cloud use:

`jx create cluster aws`

`jx create cluster gke`

`jx create cluster aks`

HOW DO WE SETUP KUBERNETES + JENKINS X?

- If you have a cluster already - ensure RBAC enabled then:

```
jx install --provider=openshift
```

CREATE CLUSTER GKE

Google Container Engine \$300 free credit

<https://console.cloud.google.com/freetrial>



Billing

Overview

내 결제 계정



SHOW INFO



Overview



Budgets & alerts



Transactions



Billing export



Payment settings



Payment method



Reports

Billing account overview

Payment overview

Billing account ID:

Organization: redhat.com

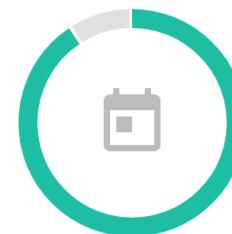
Credits



\$247.24

Credits remaining

Out of \$300.00



331

Days remaining

Ends Oct 7, 2019

Projects linked to this billing account

Project name	Project ID	
jwon-k8s-project	jwon-k8s-project	
management console translation	management-conso-1538970061460	
my jx project	my-jx-project	

VSCODE JENKINS X EXTENSION

EXPLORER

- OPEN EDITORS
- JX
- OUTLINE
- JENKINS X
 - Pipelines
 - tedwon
 - demo1110
 - master
 - pull requests
 - PR-2
 - 1
 - Checkout Source
 - CI Build and push snapshot
 - Pull Request
 - Preview Application
 - Build Release
 - Promote to Environments
 - Clean up
 - MAVEN PROJECTS

TERMINAL



```
Stage "Promote to Environments" skipped due to when condition
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Declarative: Post Actions)
[Pipeline] cleanWs
[WS-CLEANUP] Deleting project workspace... [WS-CLEANUP] done
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // withCredentials
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline

GitHub has been notified of this commit's build result

Finished: SUCCESS
-----
--
```

~/jx » tedwon@mymac

DEMO

- Creating GKE Kubernetes cluster with Jenkins X
- Creating Spring Boot app
- Creating code change
- Promoting to Production

jx create spring



DEMO - DEPLOY SPRING BOOT APP

`jx create cluster gke`

DEMO - DEPLOY SPRING BOOT APP

- Create Cluster GKE Record:
 - <https://asciinema.org/a/210859>

DEMO - DEPLOY SPRING BOOT APP

`jx create spring -d web -d actuator`

DEMO - DEPLOY SPRING BOOT APP

- Record: <https://asciinema.org/a/210872>
- Automatically set up CI/CD pipelines for new + imported projects
- Setups up git repository
- Adds webhooks on git to trigger Jenkins pipelines on PR / master
- Triggers the first pipeline

JENKINS X - WHAT WE NEED TO DO

Code change ⇒ Pull Request ⇒ Review

⇒ Merge ⇒ Staging ⇒ Production

DEMO - JENKINS X ON PULL REQUEST

```
jx create issue -t 'add a homepage'

git checkout -b wip

vi src/main/resources/static/index.html

git add src

git commit -a -m 'add a homepage fixes #1'

git push origin wip

jx create pullrequest -t "add a homepage fixes #1"
```

DEMO - JENKINS X ON PULL REQUEST

- Builds and tests
- Creates preview docker image + helm chart
- Creates a Preview Environment and comments on the PR with the link
 - <https://github.com/tedwon/demo1030/pull/2>



A screenshot of a GitHub pull request comment. The comment was made by a user named rawlingsj 17 hours ago. It includes a small profile picture of the user. The comment text is: "PR built and available in a preview environment `rawlingsj-node3-pr-2` [here](#)". There are "Owner" and "+" buttons with a smiley face icon at the top right of the comment box.

DEMO - JENKINS X PROMOTION VIA GITOPS

`jx promote --version 0.0.2 --env production`

DEMO - JENKINS X PROMOTION VIA GITOPS

- Each environment stores its configuration as helm charts in a git repository
 - Reuse the Pull Request workflow for changes
- To promote a version to, say, Production Jenkins X submits a Pull Request
 - The Promote step waits for the Pull Request CI build to complete

JENKINS X ROADMAP

<https://jenkins-x.io/contribute/roadmap/>

JENKINS X SLACK

Kubernetes 

tedwon

New Threads

Starred

jenkins-x-user

Channels

announcements

jenkins-x-dev

kubernetes-users

Direct Messages 

slackbot

tedwon (you)

Apps 

#jenkins-x-user

☆ | 901 | 6 | got an issue? Please raise it here: <https://github.com/jenkins-x/jx/iss>

James Rawlings 7:38 PM Thursday, November 8th
the `jx-basic-auth` secret lives in the `jx` namespace so I wonder if you're still running in a different namespace by chance?

Remko 7:38 PM
i checked all namespaces available

Remko 7:44 PM
i just did a jx upgrade platform and now the jx-basic-auth is there

 1

might be a version issue

Added to your starred items

Eric 7:47 PM
Quick question. Is there a way to create a new environment as a clone (same version matrix) of an existing one? Basically pretty much a clone of much of the git repository? Also, to migrate a full version matrix from an environment to an environment (basically migrate everything from QA to Prod) (again, a simple update of the environment git project)? Or is it in the plan? If not, I could have a stab at it as we're going to need it (we're starting to migrate our Dev/CI/CD workflow to jx). I've never done any go but the code looks easy enough to extend.

 7 replies Last reply 3 days ago

Remko 8:43 PM
@James Strachan or @James Rawlings in which version is this issue fixed ?

Remko 8:43 PM
<https://github.com/jenkins-x/jx/issues/1873>

 jvz
[#1873 Cannot run `jx upgrade ingress` in tillerless mode](#)

Summary

When I try to run `jx upgrade ingress` to enable TLS in tillerless mode, I get an error.

Steps to reproduce the behavior

```
jx create cluster gke -v 1.10.7-gke.2 --prow --skip-tiller
```

+ Message #jenkins-x-user  

Search    

Thread

#jenkins-x-user

tedwon Yesterday at 4:31 PM
* PR pipeline build log:
<http://jenkins.jx.35.243.86.163.nip.io/job/tedwon/job/demo1110/job/PR-2/1/consoleFull>

~ » kubectl get pods --namespace jx-pull-2-pr-2
tedwon@mymac
NAME READY STATUS RESTARTS AGE
jx-pull-2-pr-2-preview-9b4d496bd-lr9vv 1/1
Running 0 4h14m

~ » jx get preview
tedwon@mymac
PULL REQUEST APPLICATION
<https://github.com/pull/2/pull/2> jx-pull-2-pr-2
<http://demo1110.jx-pull-2-pr-2.35.243.86.163.nip.io>

7 replies

James Strachan 23 hours ago
the PR looks to be running fine? <http://demo1110.jx-pull-2-pr-2.35.243.86.163.nip.io>

James Strachan 23 hours ago
wonder if you were low on resources earlier or something? `jx status` can help

tedwon 14 hours ago
It seem that the preview pod was deleted by I created another PR for different project.

tedwon 14 hours ago
now it is back to normal by rebuild the pr.

tedwon 14 hours ago
<http://demo1110.jx-pull-2-pr-2.35.243.86.163.nip.io>

TRY IT OUT!

- <https://jenkins-x.io/getting-started/>
- JBUG Jenkins X Hands-on <https://goo.gl/oBbHxA>



SPECIAL THANKS TO

Jungho Cha <jcha@redhat.com>

THANK YOU

JBUG Korea

facebook.com/groups/jbossusergroup/

REFERENCES

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- <https://developer.okta.com/blog/2018/07/11/ci-cd-spring-boot-jenkins>
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- https://www.youtube.com/watch?v=uHe7R_iZSLU
- <https://jenkins.io/blog/2018/07/19/jenkins-x-accelerate>

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- <https://www.dropbox.com/s/2l3yudybl8dx4j7/2.pdf?dl=0>
- <http://www.itworld.co.kr/news/107527>
- <https://www.redhat.com/en/blog/integrating-ansible-jenkins-cicd-process>

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- <https://dzone.com/articles/what-is-gitops-really>
- <https://jenkins-x.io/developing/git/#using-a-different-git-provider-for-environments>
- JBUG Jenkins X Hands-on <https://goo.gl/oBbHxA>