

# JENKINS X

automated CI/CD solution for cloud native applications  
on Kubernetes

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

JBUG Korea

@tedwon

# AT KOREA DEVELOPER CONFERENCE

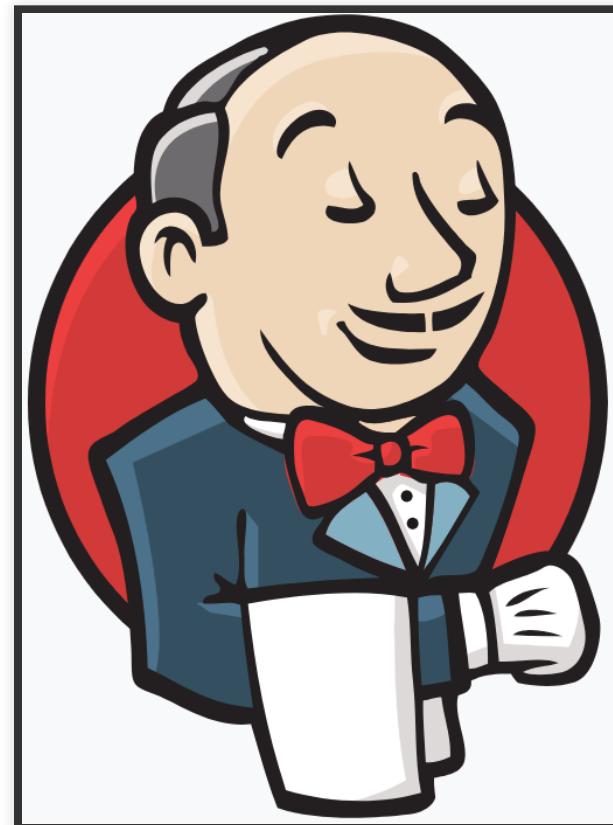
개발자를 위한 공감 세미나 : 17번째 이야기

Saturday, 17th November, 2018

# JENKINS VS JENKIS X

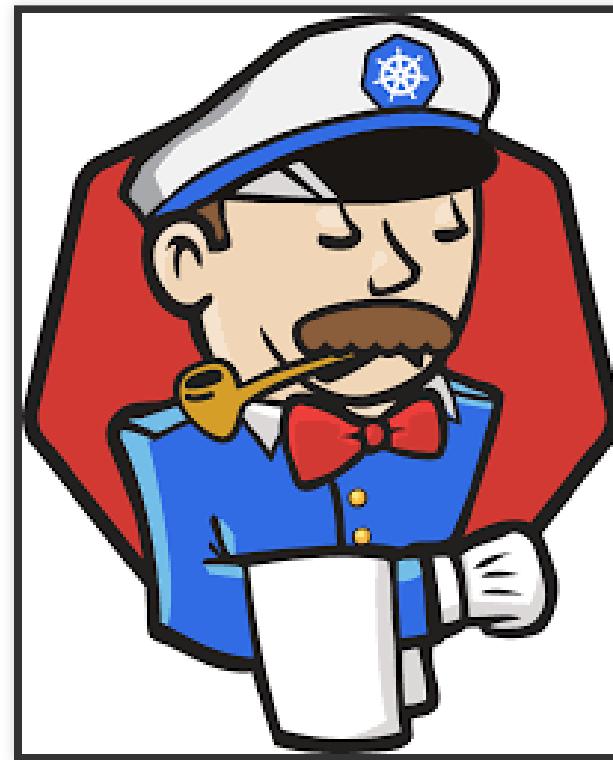
# JENKINS

- <https://jenkins.io/>



# JENKINS X

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



# JENKINS X - WHAT WE DO

Code change ⇒ Pull Request ⇒ Review

⇒ Merge ⇒ Staging ⇒ Production

# WHAT ARE THE NEW CHANGES?

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

# WHAT ARE THE NEW 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 can I see my applications log?

**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](https://jenkins.io/blog/2018/03/1) ... please let us  
know what you think! [jenkins-x.io](https://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
- Red Hat OpenShift
- Amazon Elastic Container Service
- Azure Container Service
- IBM Cloud Kubernetes Service
- Oracle Cloud Container Engine
- minikube, minishift

[https://jenkins-x.io/commands/jx\\_create\\_cluster/](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
```



Kubernetes Engine

## Workloads

REFRESH

DEPLOY

Clusters

Workloads

Services

Applications

Configuration

Storage

Workloads are deployable units of computing that can be created and managed in a cluster.



Is system object : False



Filter workloads



Columns ▾

Name ^	Status	Type	Pods	Namespace	Cluster
jenkins	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110
jenkins-x-chartmuseum	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110
jenkins-x-controllercommitstatus	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110
jenkins-x-controllerrole	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110
jenkins-x-controllerteam	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110
jenkins-x-controllerworkflow	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110
jenkins-x-docker-registry	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110
jenkins-x-gcactivities	✓ OK	Cron Job	0/0	jx	jwon-k8s-cluster-1110
jenkins-x-gcpreviews	✓ OK	Cron Job	0/0	jx	jwon-k8s-cluster-1110
jenkins-x-heapster	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110
jenkins-x-mongodb	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110
jenkins-x-monocular-api	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110
jenkins-x-monocular-prerender	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110
jenkins-x-monocular-ui	✓ OK	Deployment	1/1	jx	jwon-k8s-cluster-1110

Marketplace



All [tedwon] [Jenkins] +

Not Secure | jenkins.jx.35.200.29.158.nip.io/job/tedwon/

# Jenkins

4 search admin log out

Jenkins tedwon

ENABLE AUTO REFRESH

Up Status Configure New Item Delete Folder People Build History Project Relationship Check File Fingerprint Open Blue Ocean Rename Config Files Credentials New View

**tedwon**

All +

S	W	Name	Last Success	Last Failure	Last Duration	Fav
	☀️	<a href="#">demo1030</a>	10 min - <a href="#">log</a>	N/A	1.9 sec	 
	☀️	<a href="#">environment-jwon-k8s-cluster-1030-production</a>	2 min 10 sec - <a href="#">log</a>	N/A	2.3 sec	 
	☀️	<a href="#">environment-jwon-k8s-cluster-1030-staging</a>	10 min - <a href="#">log</a>	N/A	1.9 sec	 
	☀️	<a href="#">starter1030</a>	7 min 10 sec - <a href="#">log</a>	N/A	2.4 sec	 

Icon: [S](#) [M](#) [L](#)

Legend  [RSS for all](#)  [RSS for failures](#)  [RSS for just latest builds](#)

**Build Queue** =  
No builds in the queue.

**Build Executor Status** =

Page generated: Oct 31, 2018 3:27:10 AM UTC [REST API](#) [Jenkins ver. 2.143](#)



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	-	

jenkins / tedwon/demo1030 / [+](#)

Not Secure | jenkins.jx.35.200.29.158.nip.io/blue/organizations/jenkins/tedwon%2Fdemo1030/detail/master/2/pipeline

✓ [tedwon / demo1030 < 2](#)

Pipeline Changes Tests Artifacts [Logout](#)

Branch:master 7m 15s Changes by jwon  
Commit 19919ea 20 hours ago Push event to branch master

Start CI Build and ... Build Release Promote to ... End

Promote to Environments - 4m 11s

[Restart Promote to Environments](#) [Download](#)

✓ > ix sten changelog --version v\$(cat ..../VERSION) — Shell Script	6s
✓ > ix sten helm release — Shell Script	13s
✓ > ix promote -b --all-auto --timeout 1h --version \$(cat ..../VERSION) — Shell Script	3m 52s
✓ > Delete workspace when build is done	<1s

21

Browse - Nexus Repository Manager

Not Secure | nexus.jx.35.200.29.158.nip.io/#browse/browse

Sonatype Nexus Repository Manager  
oss 3.13.0-01

Search components

Sign in

Welcome

Search

**Browse**

**Browse** Browse assets and components

Filter

	Name ↑	Type	Format	Status	URL	Health check	
	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

[Contribute](#)

Github  
Slack

[How to use](#)

What is Helm?  
[Documentation](#)

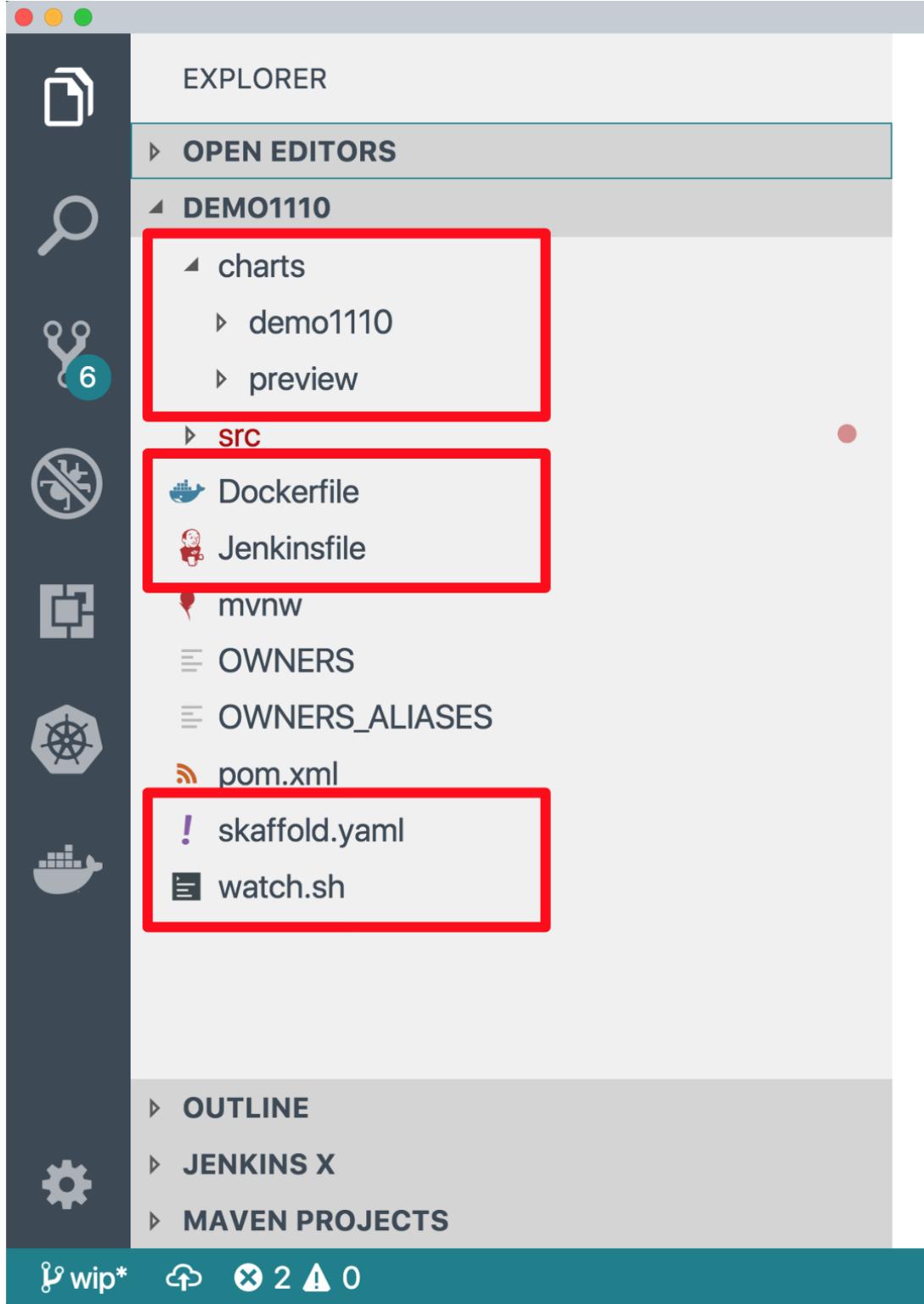
Monocular is an [Open Source project](#) | v0.7.3

# HOW DOES JENKINS X HELP?

```
jx open
```

jenkins	<a href="http://jenkins.jx.x.x.x.x.nip.io">http://jenkins.jx.x.x.x.x.nip.io</a>
jenkins-x-chartmuseum	<a href="http://chartmuseum.jx.x.x.x.x.nip.io">http://chartmuseum.jx.x.x.x.x.nip.io</a>
jenkins-x-docker-registry	<a href="http://docker-registry.jx.x.x.x.x.nip.io">http://docker-registry.jx.x.x.x.x.nip.io</a>
jenkins-x-monocular-ui	<a href="http://monocular.jx.x.x.x.x.nip.io">http://monocular.jx.x.x.x.x.nip.io</a>
nexus	<a href="http://nexus.jx.x.x.x.x.nip.io">http://nexus.jx.x.x.x.x.nip.io</a>

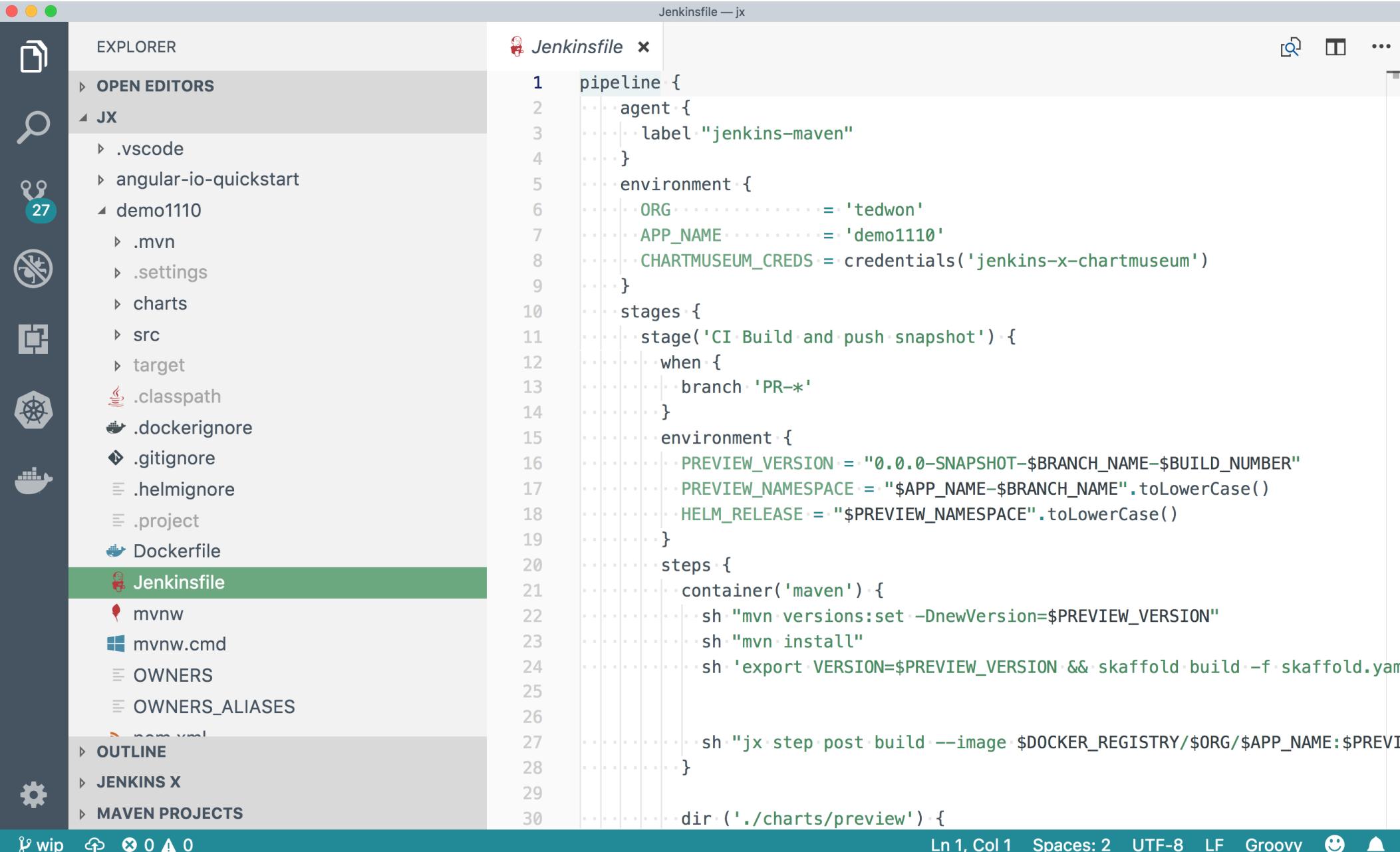
# **IMPORT MAVEN PROJECT**



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.



[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

..

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

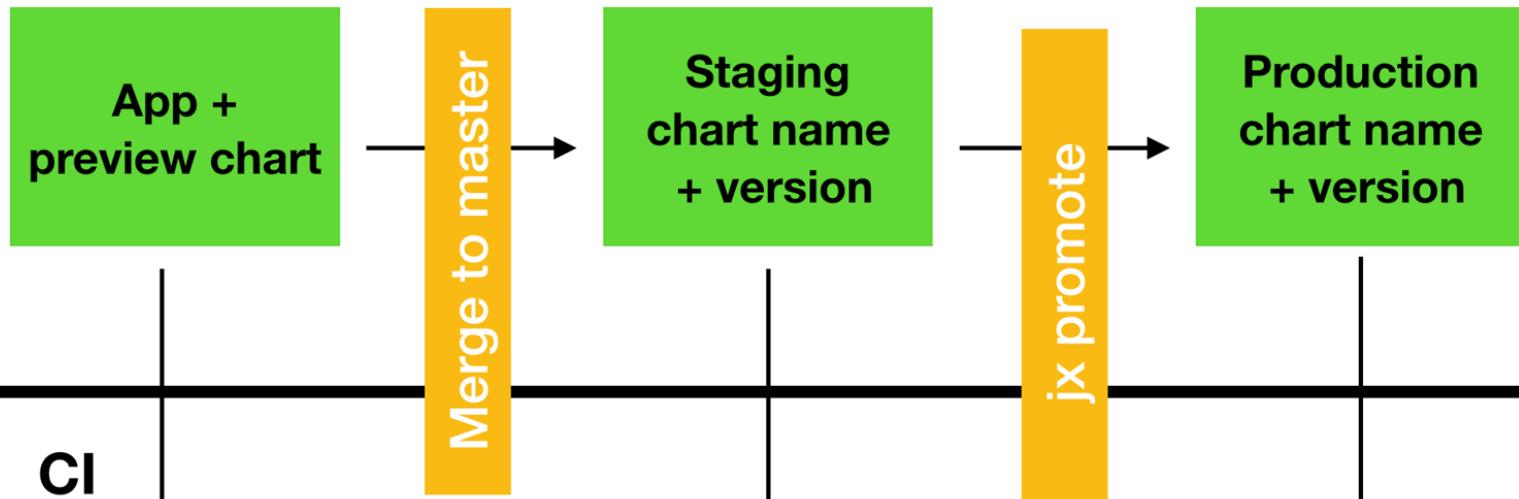
```
~/jx » jx get apps
APPLICATION STAGING PODS URL                                PRODUCTION PODS URL
demo1110  0.0.1  1/1  http://demo1110.jx-staging.35.243.86.163.nip.io
starter1110 1.0.1  1/1  http://starter1110.jx-staging.35.243.86.163.nip.io
```

# JX GET PREVIEWS

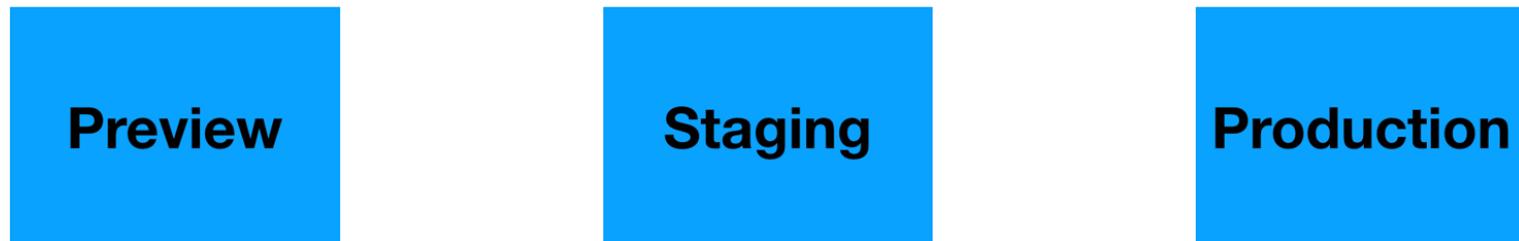
```
~/jx » jx get previews
PULL REQUEST           NAMESPACE      APPLICATION
https://github.com/pull/2/pull/2 jx-pull-2-pr-2 http://demo1110.jx-pull-2-pr-2.35.243.86.163.nip.io
```

```
~/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
```

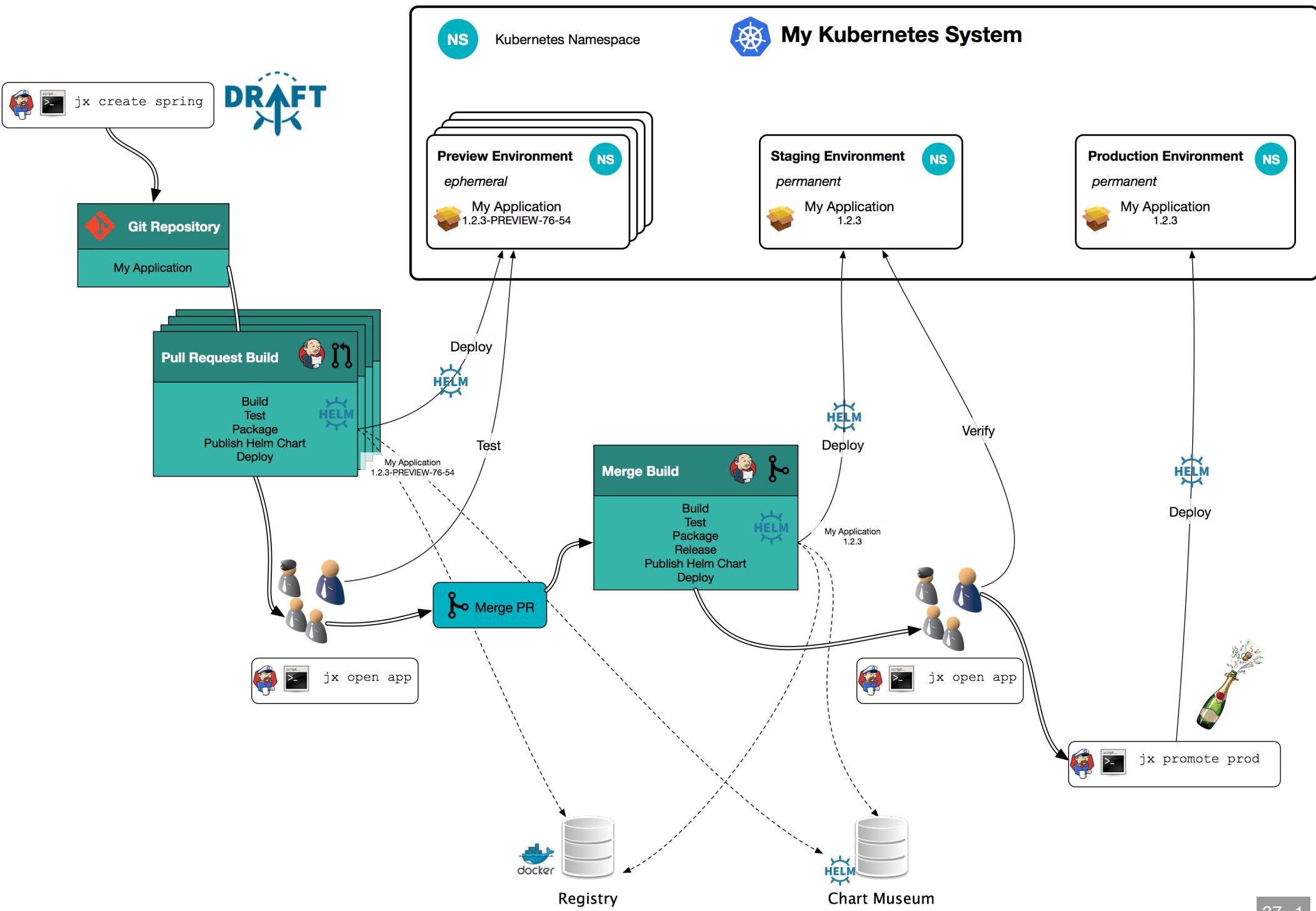
## Git Repositories

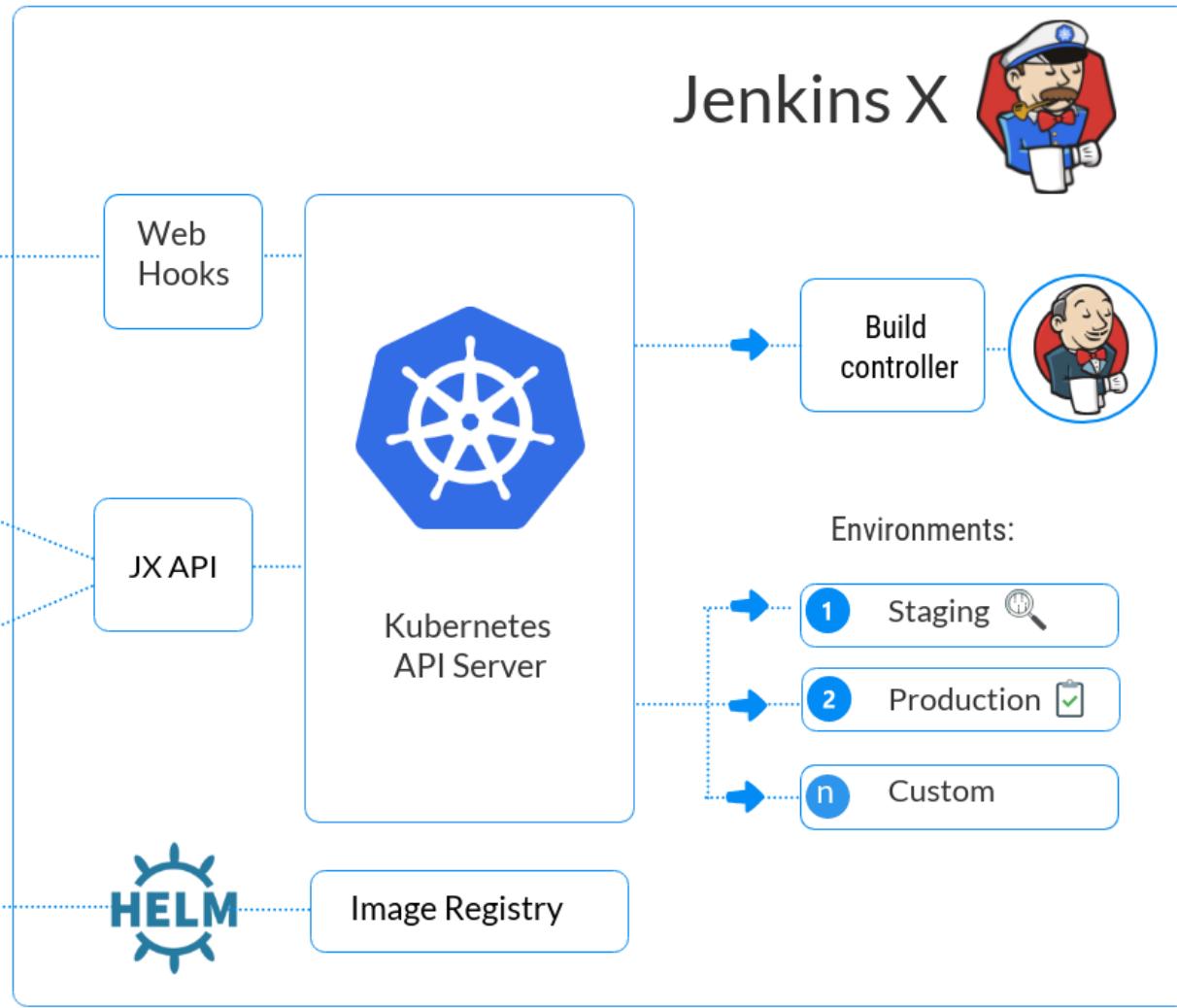


Jenkins



## 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

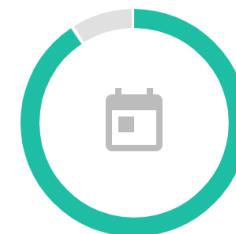
## Credits



\$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

# **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

# 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"

jx get preview
```

# DEMO - JENKINS X ON PULL REQUEST

- 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>



# **DEMO - JENKINS X PROMOTION VIA GITOPS**

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

# JENKINS X SLACK

[kubernetes.slack.com](https://kubernetes.slack.com)

#jenkins-x-user

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>

# JENKINS X ROADMAP

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

# TRY IT OUT!

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



# **SPECIAL THANKS TO**

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**THANK YOU**

**JBUG Korea**

[facebook.com/groups/jbossusergroup/](https://facebook.com/groups/jbossusergroup/)

# SOURCES & REFERENCES

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- <https://developer.okta.com/blog/2018/07/11/ci-cd-spring-boot-jenkins>
- <https://jenkins.io/blog/2018/03/19/introducing-jenkins-x>
- [https://www.youtube.com/watch?v=uHe7R\\_iZSLU](https://www.youtube.com/watch?v=uHe7R_iZSLU)
- <https://jenkins.io/blog/2018/07/19/jenkins-x-accelerate>

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- <https://dzone.com/articles/jenkins-x-the-good-bad-and-ugly>
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